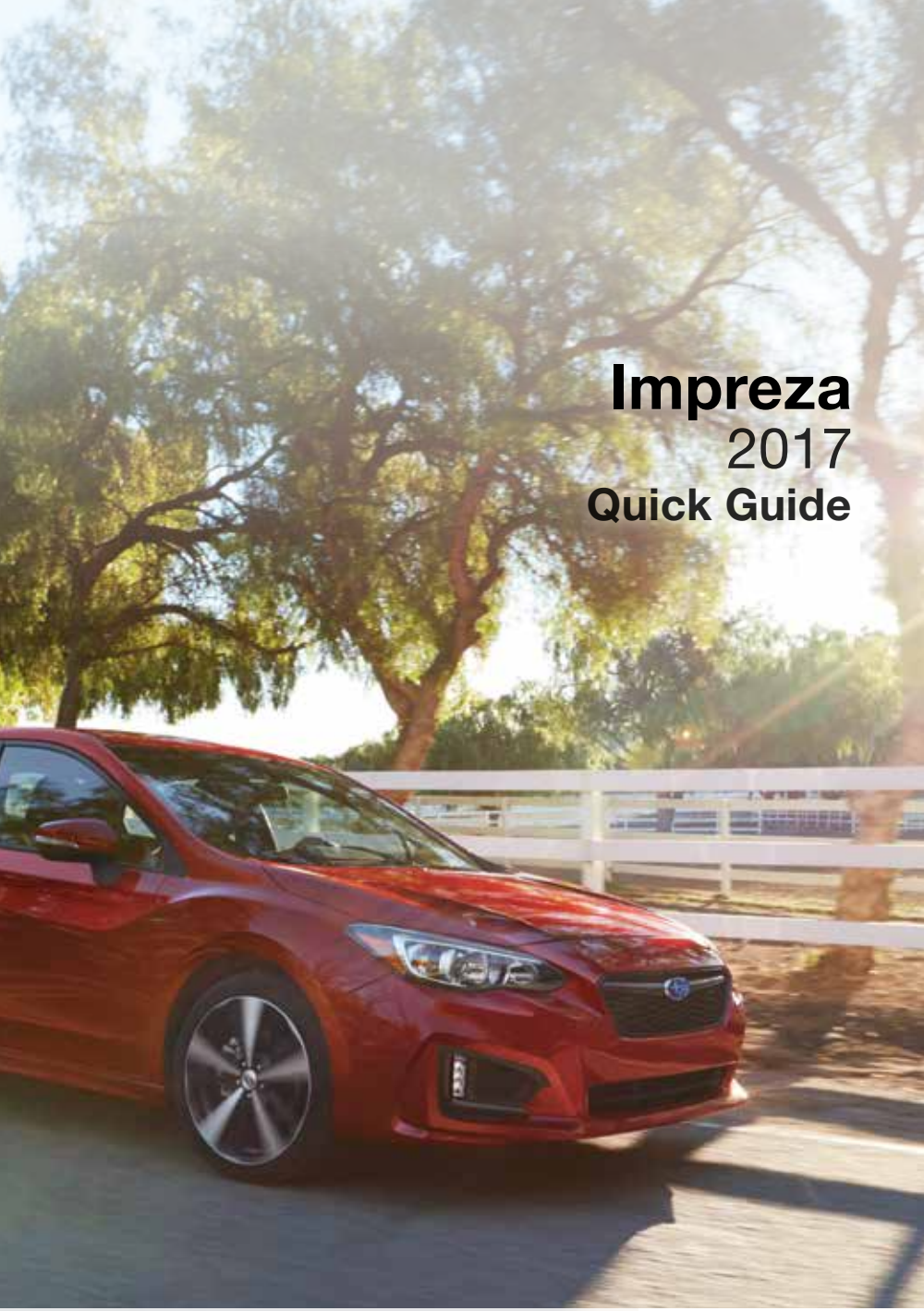


Impreza
2017
Quick Guide

Love. It's what makes a Subaru, a Subaru.

SUBARU
Confidence in Motion

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Remote Keyless Entry

1. Lock/Arm

- Press to lock all doors and trunk and activate the security alarm.
- If any of the doors or the trunk are not fully closed, an electronic chirp will sound and the hazard lights will flash to alert you that the doors or the trunk are not properly closed.
- To activate the vehicle finder function, press three times (within five seconds). If you are within 30 feet of the vehicle, the horn will sound one time and the hazard lights will flash three times.

2. Unlock/Disarm

- Press once to unlock the driver's door.
- Press twice (within five seconds) to unlock all doors.
- When the "Unlock/Disarm" button is pressed, the dome and map lights will illuminate if the dome light switch is in the middle position.

3. Opening the Trunk Lid

- Press to unlock the trunk lid. An electronic chirp will sound twice and the hazard lights will flash twice.

4. Panic Alarm

- Press once and the horn will sound and the hazard lights will flash.
- Press any button on the remote to deactivate.



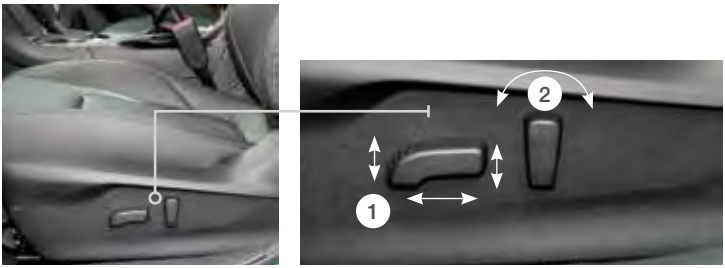
Keyless Access and Push Button Start (if equipped)

By simply carrying the access key in your pocket, you can lock and unlock doors, open the trunk and start your car without having to take the key fob out of your pocket.





Seating



Power Driver's Seat (if equipped)

1. **Forward/Backward, Angle and Height**
   Move the switch toward the front or rear to move the seat forward or backward. Pull the switch up or push down on the front of the switch to adjust the angle of the seat cushion. Pulling the switch straight up or pushing the switch straight down will adjust the height of the entire seat cushion.
2. **Seatback**
   Move the switch in the corresponding direction to adjust the angle of the seatback.

Seating

Seat Controls



1. Forward/Backward
   Pull up on the lever below the front of the driver's seat to move the seat forward or backward.
2. Raise/Lower Seat Cushion
   To adjust the height of the driver's seat, pull up or push down the seat height adjustment lever, located on the lower left side front of the seat.
3. Recline Seatback
   To adjust the seatback to the desired position, pull up on the recline lever, located on the lower left rear of the driver's seat or lower right rear of the passenger's seat. Do not adjust seats while driving.

Heated Seats (if equipped)

Switches are located on the center console between the driver's and passenger's seats; choose low (bottom of switch) for normal heating or high (top of switch) for rapid heating. Choose the center position to turn off the seat heaters.



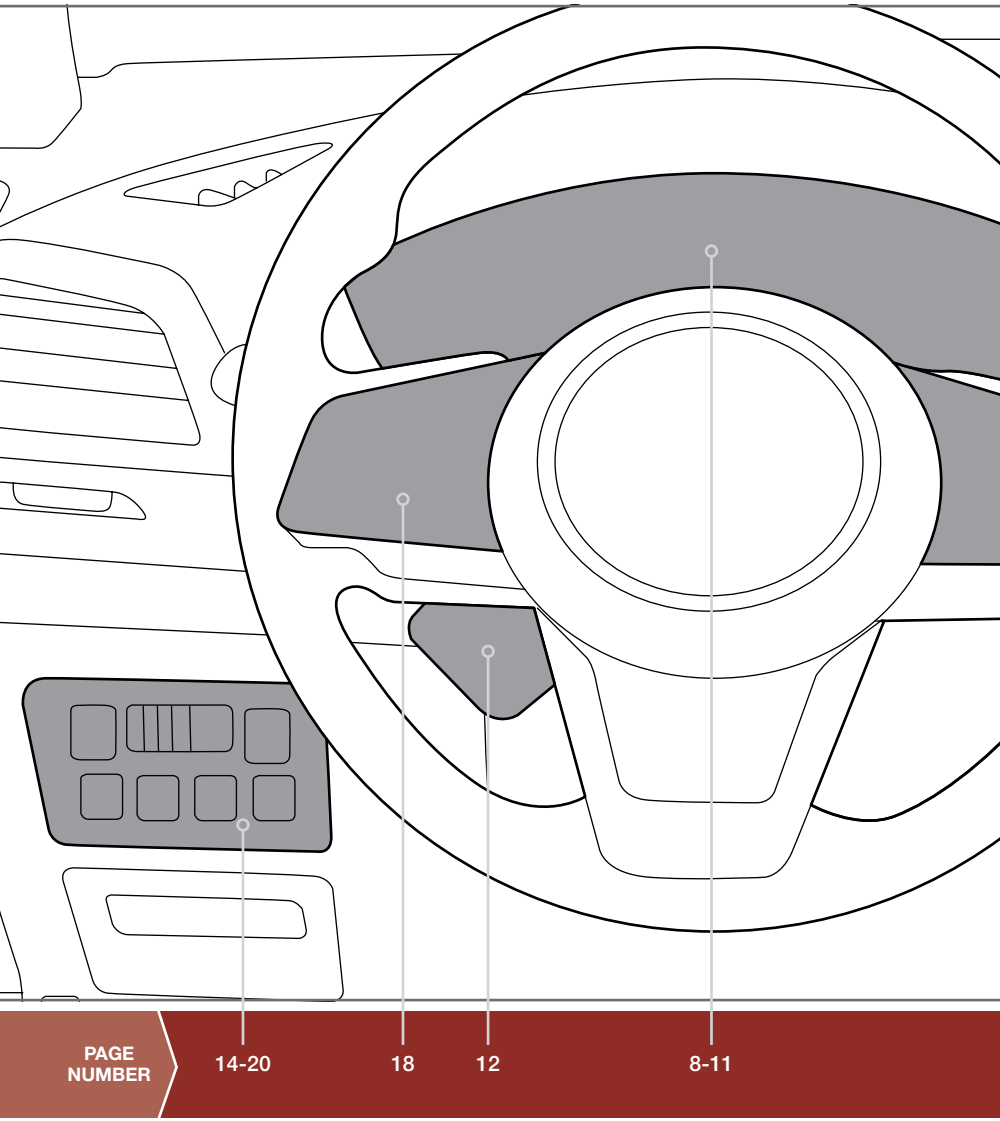
Folding the Rear Seat

Lower the headrests. Pull up on the release knob on the seat side that you want to fold down. To return the seatback to its original position, raise the seatback until it locks into place, making sure that it is securely locked.





Instrument Panel



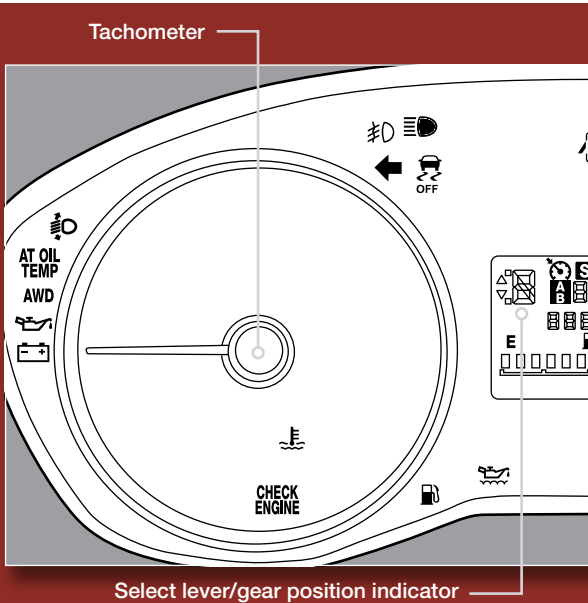
Clock

Press the “+” button to advance the time or the “–” button to reverse the time. Vehicles with a navigation system, please refer to the separate “Operating Instructions for Navigation System.”

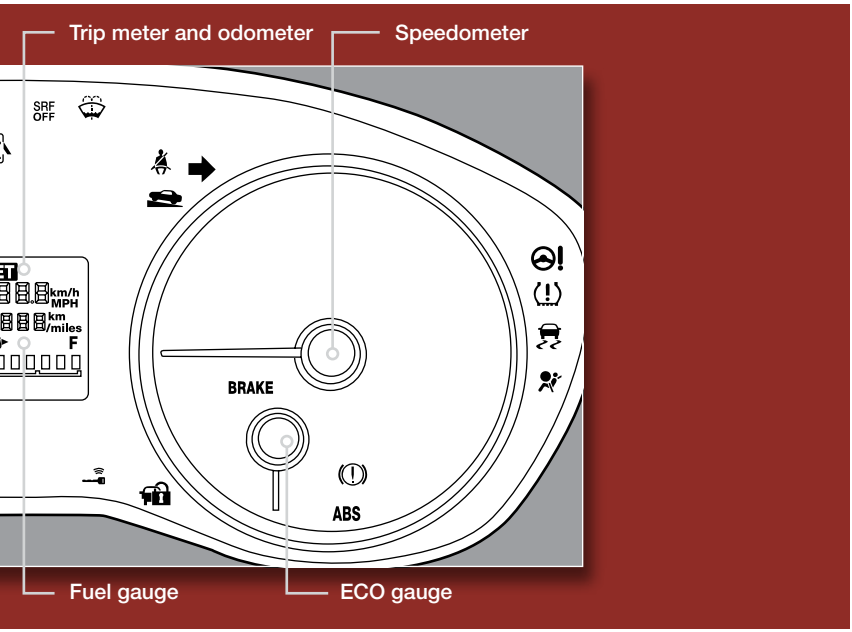
Gauges

Impreza 2.0i
Impreza 2.0i Premium

- Immediate Attention
- Caution
- Informational



	Seatbelt warning	BRAKE /	Brake system
PASSENGER	Front passenger seatbelt warning	/	Hot coolant temperature/ Cold coolant temperature
	SRS airbag system		High beam indicator light
	Security indicator light	AT OIL TEMP	AT OIL TEMP (Automatic Transmission)
	Door open	ABS /	ABS warning
	Charge warning		Low fuel
	Oil pressure warning	AWD	All-Wheel Drive (Automatic Transmission)
	Power steering warning		Vehicle Dynamics Control/Vehicle Dynamics Control operation



OFF	Vehicle Dynamics Control OFF	/	Keyless Access with Push Button Start System (if equipped)
CHECK ENGINE	CHECK ENGINE/ Malfunction indicator		Turn signals
	Tire pressure warning light		Front fog light indicator light (if equipped)
ON /	Front passenger frontal airbag ON (located on overhead console)		Headlight indicator light
OFF /	Front passenger frontal airbag OFF (located on overhead console)		Cruise control indicator light
	Engine oil level warning light	SET	Cruise control SET indicator light
	Windshield washer fluid warning		
	Incline Start Assist		

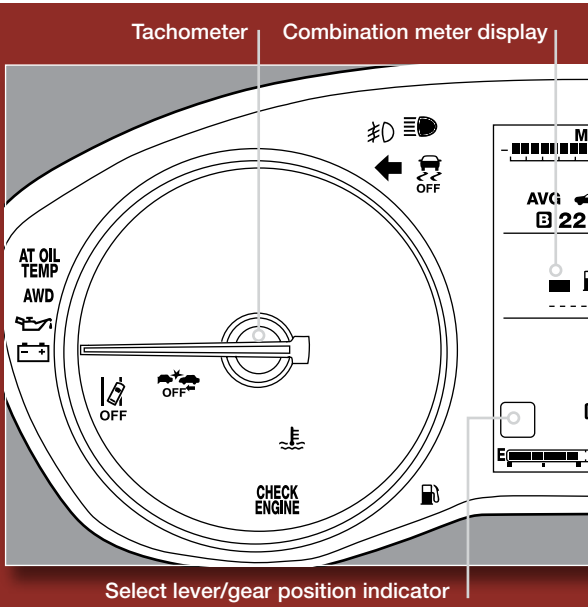
Gauges

Impreza 2.0i Premium with Driver Assist Technology option package

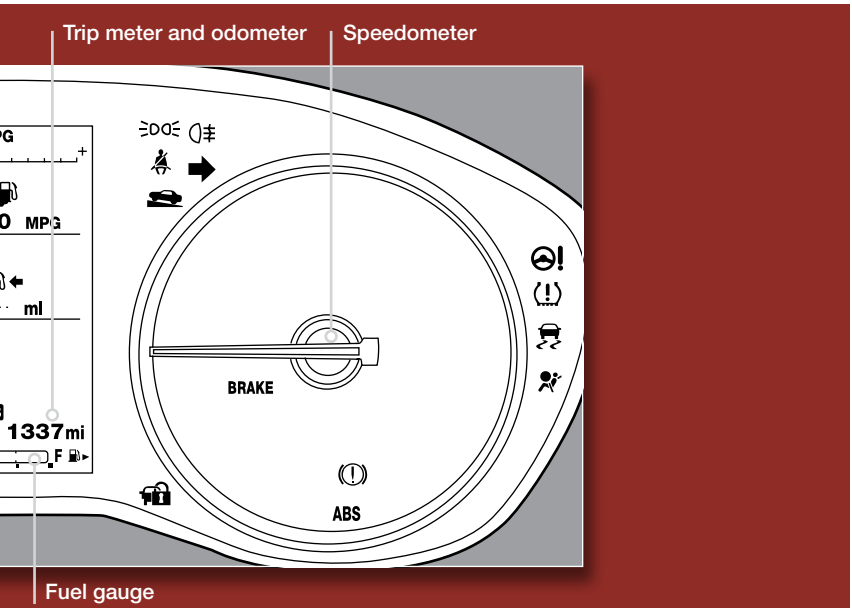
Impreza 2.0i Sport

Impreza 2.0i Limited

- Immediate Attention
- Caution
- Informational



	Seatbelt warning	BRAKE /	Brake system
PASSENGER	Front passenger seatbelt warning	/	Hot coolant temperature/ Cold coolant temperature
	SRS airbag system		High beam indicator light
	Security indicator light	AT OIL TEMP	AT OIL TEMP (Automatic Transmission)
	Door open	ABS /	ABS warning
	Charge warning		Low fuel
	Oil pressure warning	AWD	All-Wheel Drive (Automatic Transmission)
	Power steering warning		Vehicle Dynamics Control/Vehicle Dynamics Control operation



OFF	Vehicle Dynamics Control OFF	/	Keyless Access with Push Button Start System (if equipped)
CHECK ENGINE	CHECK ENGINE/ Malfunction indicator		Turn signals
	Tire pressure warning light		Front fog light indicator light (if equipped)
ON /	Front passenger frontal airbag ON (located on overhead console)		Headlight indicator light
OFF /	Front passenger frontal airbag OFF (located on overhead console)		Cruise control indicator light
	Engine oil level warning light	SET	Cruise control SET indicator light
	Windshield washer fluid warning		
	Incline Start Assist		

Personalize

Tilt and Telescopic Steering Column

Push the lever down firmly to adjust the height and lengthwise position of the column; firmly push the lever back up to lock the column in place. Do not adjust while driving.





Power Exterior Mirrors

Turn the knob to the “L” side to adjust the left-hand mirror or to the “R” side to adjust the right-hand mirror. Move the knob in the direction you want to move the mirror. Then return the knob to the neutral/center position.





Combination Meter Display Controls (if equipped)

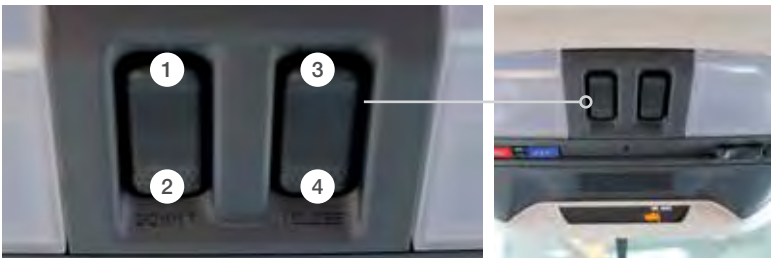
Use the controls to display and switch selected items in the combination meter display. Please refer to your Owner’s Manual for details on these controls.





Power Moonroof (if equipped)

With the moonroof in the fully closed position, press the switch ① to tilt the rear of the moonroof up. Press and hold the switch ② to lower the moonroof. Press the switch ③ to fully open the moonroof. Press the switch ④ to close the moonroof. To stop the moonroof in a midway position while opening or closing, momentarily press the switch to the ③ side or ④ side.



HomeLink® 5 Accessory Mirror (if equipped)

The HomeLink 5 accessory mirror provides three buttons to replace up to three hand-held radio frequency remotes used to activate devices such as garage door openers, gate openers, entry door locks, security systems and home lighting. Please see your Owner's Manual for programming instructions or visit **www.subaru.com/homelink** to view a how-to video.



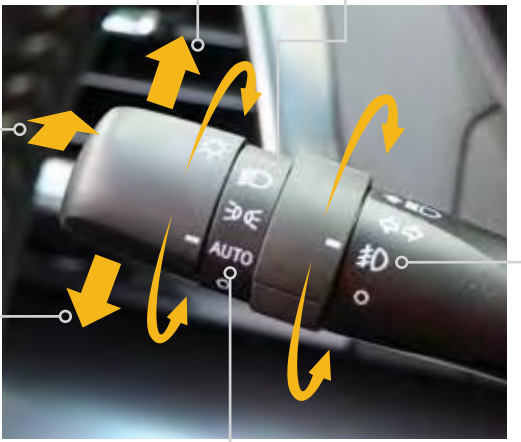
Controls

Light Controls

Push forward to change from low beam to high beam. Pull the lever back to center to return to low beam.

Push up for right turn signal.

Turns on headlights, instrument panel illumination, parking lights, tail lights and license plate lights.



Push down for left turn signal.

Turns on fog lights (if equipped).

AUTO: The vehicle's lights are automatically on or off depending on the level of the outside light.

While the light switch is on, rotate the dial downward to dim the instrument panel illumination. Rotate the dial upward to make the illumination brighter. When the dial is fully rotated upward, the instrument panel illumination becomes full bright.





Windshield Wipers

To turn on the wipers, press the wiper control lever down one level for intermittent, two levels for low, or three levels for high speed. Return the lever to the "OFF" position to stop the wipers. For a single wipe, move the lever up. To spray washer fluid, pull and hold the lever toward you.

Rear Wiper (5-door only)

To operate the rear wiper, rotate the end of the knob upward to the intermittent, continuous, or wash position. When the rear wiper is off, rotate the knob downward to wash and wipe the rear window.

Daytime Running Lights

Daytime running lights are standard on your vehicle. Only a reduced brightness high beam will be automatically turned on when the engine has started, the parking brake is fully released and the light switch is in the "OFF" or "" position. The brightness of the illumination of the high beam headlights is reduced by the daytime running light system. You must always switch on your headlights when it is dark outside by turning the light switch to the "" position.

Controls



Manual Climate Control System

1. Air Flow Control Dial

The air flow control dial allows you to choose the direction of air flow. Rotate the dial for the desired air flow position.

Defrost/Defog

To clear the windshield and front door windows of fog or frost, rotate the air flow control dial to the defrost position, set the temperature control to the red position, and set the fan speed control to the fastest speed.

2. Rear Window Defogger Button

Press the rear window defogger button to turn on the defogger. The defogger will automatically shut off after about 15 minutes. If the window clears before that time, you can press the button again to turn it off. This button also turns the heated mirrors on and off, if equipped.

3. Fan Speed Control Dial

Rotate the fan speed control dial to select the desired fan speed.

4. Recirculated/Outside Air Button

Press the air inlet selection button to prevent outside air from being drawn into the passenger compartment. If the button is pushed in, press it again to draw outside air into the compartment. TO PREVENT WINDSHIELD FOGGING, DO NOT REMAIN IN THE RECIRCULATED MODE FOR AN EXTENDED PERIOD OF TIME.

5. Temperature Control Dial

Rotate the temperature control dial from blue for cool, to red for warm.

6. Air Conditioning Button

Press the “A/C” button to activate the air conditioning. Press it again to turn off the air conditioning.





Located in the multi-function display; top center of dash

Automatic Climate Control System (if equipped)

1. Automatic On and Off
This system automatically controls outlet air temperature, fan speed, air flow distribution, air inlet control, and air conditioner compressor operation. Press "AUTO" to activate. Press "OFF" to turn off the system.

2. Temperature Control Dial
Rotate the dial clockwise to increase the temperature or rotate the dial counterclockwise to decrease the temperature and maintain a comfortable climate within the driver and passenger compartment. The temperature is displayed digitally on the screen.

Operation in Manual Mode

3. Recirculated/Outside Air Button
Press the air inlet selection button to prevent outside air from being drawn into the passenger compartment. Press the button again to allow outside air into the compartment. TO PREVENT WINDSHIELD FOGGING, DO NOT REMAIN IN THE RECIRCULATED MODE FOR AN EXTENDED PERIOD OF TIME.

4. Fan Speed Control Knob
Rotate the fan speed control knob to select one of seven different fan speed positions.

5. Air Flow Mode Selection Dial
Turn the "MODE" dial to select the desired air flow mode. The selected air flow mode – either ventilation, bi-level, heat or heat-defrost – is shown on the display.

6. Air Conditioner Button
Press the "A/C" button to activate the air conditioning. Press it again to turn off the air conditioning.

7. Defroster Button
Press the button to defrost or dehumidify the windshield and front door windows.

8. Rear Window Defogger Button
Press the button to turn on the defogger. It will automatically shut off after about 15 minutes. If the window clears before that time, you can press the button again to turn it off.

9. Maximum Air Conditioner Button
For quicker cooling, press the "MAX A/C" button.

Controls

Steering Wheel Audio Controls (if equipped)

With any of the radio modes selected, press the left or right arrow button to skip through your presets. In CD mode, press the buttons to skip forward or back a track.



Push the switch up (+) to increase volume or down (–) to decrease volume.

Press the button to select the desired audio mode – FM, AM, SAT, CD, AUX, MEDIA.

Talk switch; please refer to the “Bluetooth audio” section in your Owner’s Manual.

USB Port

The USB port is located in the front of the center console. You can connect a portable music player to the USB port and hear the music stored on it through the vehicle speakers. Press the “SOURCE” button located on the audio system repeatedly until the USB mode is selected.



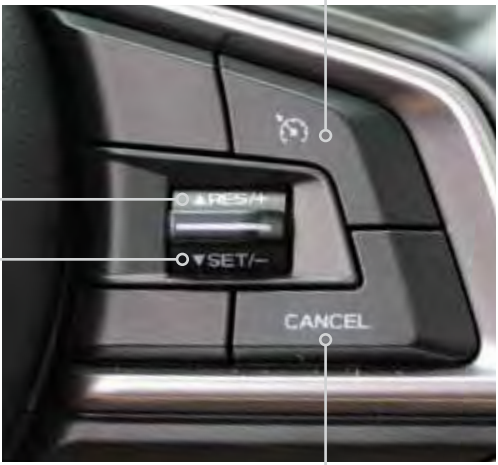
Auxiliary Input Jack

The 3.5mm auxiliary input jack is located in the front of the center console. You can connect a portable music player to the auxiliary jack and hear the music stored on it through the vehicle speakers. Press the “SOURCE” button located on the audio system to select the auxiliary mode.

Cruise Control

To activate the cruise control, press the "" button. The indicator light on the instrument panel will turn on. To deactivate cruise control, press the "" button again.

To resume your speed after canceling, push the switch to the "RES" side.



Press the accelerator pedal until your vehicle reaches the desired speed. Push the switch to the "SET" side and release. Ease off the accelerator pedal. Your vehicle will maintain the desired speed.

To cancel the cruise control, push the brake pedal or press the "CANCEL" button. If you have a manual transmission, you can push in the clutch pedal.

Increase Speed

Push up the "RES/SET" switch to the "RES" side; hold until your vehicle reaches the desired speed and release. To increase speed using the accelerator pedal, press the pedal until you reach the desired speed. Push down the "RES/SET" switch to the "SET" side to set the speed.

Decrease Speed

Push down the "RES/SET" switch to the "SET" side; hold until your vehicle slows to the desired speed and release. To decrease the speed using the brake pedal, press the pedal to release cruise control temporarily. When the speed decreases to the desired speed, push down the "RES/SET" switch to the "SET" side to set the speed.

While Operating

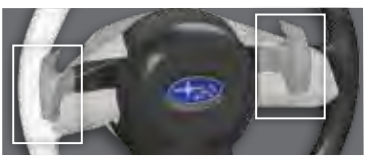


Instrument Panel Switches (lower left)

Please refer to your Owner's Manual for details on these switches.

1. **Steering Responsive Headlights OFF switch** (if equipped)
2. **Traction Mode / Vehicle Dynamics Control OFF switch**
3. **Blind Spot Detection / Rear Cross Traffic Alert OFF switch** (if equipped)

Paddle Shift Control Switches (if equipped)



- Temporary use: Even when the selector is in the "D" (Drive) position, you can temporarily shift the gear by pulling the "+" or "–" paddle shift control switch. The transmission will automatically switch back to Normal Mode.
- When the selector lever is in Manual Mode, shift to the next higher gear by pulling the "+" paddle shift control switch on the steering wheel. Pull the "–" paddle shift control switch to shift into the next lower gear.

Manual Shifting Operation

- Arrow-shaped lights in the center of the instrument panel show whether an upshift is possible and whether a downshift is possible.



Automatic Transmission Shift Mode

The automatic transmission gives you ultimate control with two different driving modes: Normal Mode and Manual Mode.

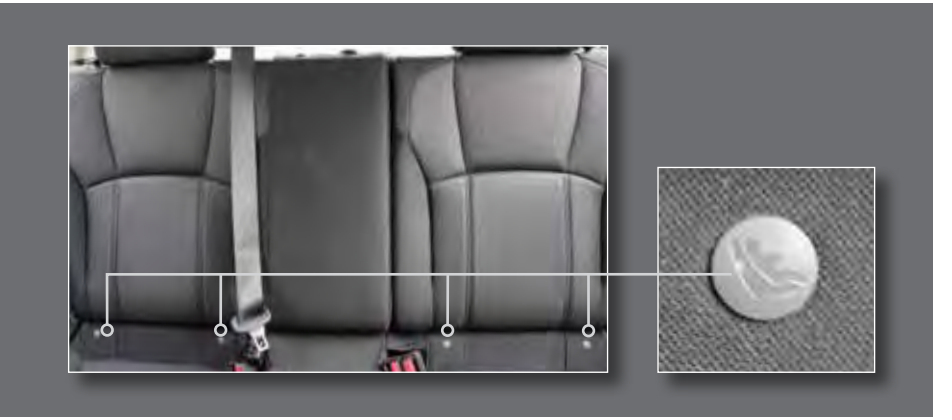
Normal Mode

When the selector lever is in the “D” (Drive) position, the transmission is in Normal shift mode. The shift position indicator on the instrument panel shows “D” and the transmission automatically shifts into a suitable forward gear.

Manual Mode

In Manual Mode, you select the desired gear position to obtain necessary acceleration and engine braking. Moving the selector lever left into the manual gate (1) from the “D” (Drive) position causes the transmission to change into Manual Mode. To shift, use the paddle shift control switches. The shift position indicator shows the selected gear position.

Safety/In Case of Emergency



Child Restraint System

For maximum safety, first carefully read the LATCH system instructions from the device manufacturer, as well as the installation instructions in your Owner's Manual, to properly install the LATCH compatible restraint system. Use the appropriate seatbelts or anchorages provided in your vehicle. Children age 12 and under must properly occupy the rear seat at all times.

Child Safety Locks

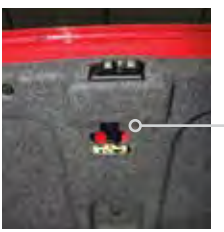
The child safety locks are located on the inside edges of the rear doors. In the locked position, the rear doors can only be opened from the outside.





Internal Child Safety Trunk Release with Self-Illuminating Handle (4-Door only)

In the event that children or adults become locked inside the trunk, this luminescent handle allows them to open the lid from inside the trunk. To open, simply pull the yellow handle downward as indicated by the arrow on the handle, and then push up on the lid.





4-Door:





5-Door:





Location of Spare Tire and Jack

A jack handle is stored under the floor of the trunk (4-door) or the cargo area (5-door). A jack and a towing hook are stored in the tool bucket in the center of the spare tire. Also, a tool bag that contains a wheel nut wrench and a screwdriver is equipped with the vehicle.

Emergency Towing Your All-Wheel Drive Vehicle

Since Subaru Symmetrical All-Wheel Drive distributes engine power to all four wheels, improper towing will severely damage your AWD system. A flatbed truck is the only recommended way to properly transport your AWD vehicle. If towing is necessary, it is best done by your Subaru retailer or a commercial towing service.

Subaru Roadside Assistance

Subaru Roadside Assistance is free and standard on every 2017 Subaru vehicle. Coverage is automatic; there are no forms to complete. Subaru Roadside Assistance is available anytime during the 3-year/36,000-mile Subaru Limited Warranty, whichever comes first.* A Subaru Roadside Assistance decal has been affixed to the driver's door window.

Subaru Roadside Assistance:
1-800-261-2155

Exclusions

Specifically excluded from Subaru Roadside Assistance coverage are service requests or claims resulting from: accidents, vandalism, acts of God, violation of any laws, misuse and abuse, or vehicle modifications not recommended by the manufacturer.

*See your retailer for details.

Additional Information

Fuel

Use regular unleaded gasoline with an octane rating of 87 AKI or higher. Consult the Owner's Manual for more detailed information.

Fuel Capacity

- 13.2 US gal (50 liters, 11.0 Imp gal)
- When the low fuel indicator light is displayed on the instrument panel, approximately 2 US gal (7.5 liters, 1.65 Imp gal) of fuel remain.
- If you have recently fueled your vehicle, the check engine light on the instrument panel may stay on due to a missing or loose fuel filler cap (the cap should be tightened until a click is heard).

Fuel Filler Lid Release

The fuel filler lid release is located on the floor to the left of the driver's seat. To open the fuel filler lid, pull the fuel filler lever up and release.



Engine Oil

Use only the following oils:

- ILSAC GF-5, which can be identified with the ILSAC certification mark (Starburst mark).
- Or API classification SN with the words “RESOURCE CONSERVING.”

  - Use 0W-20 synthetic, replacement intervals 6,000 miles under normal driving conditions. No requirement at the first 3,000 miles.

Engine Oil Capacity

- 4.7 US qt (4.4 liters, 3.9 Imp qt)

Engine Compartment

Please refer to your Owner's Manual for more information.

2.0i Engine



1. Brake Fluid Reservoir
2. Main Fuse Box
3. Battery
4. Windshield Washer Tank
5. Radiator Cap
6. Engine Oil Filler Cap
7. Engine Coolant Reservoir
8. Engine Oil Filter
9. Engine Oil Dipstick
10. Air Cleaner Element

Notes

Notes

Vehicle Delivery Checklist

Delivery Information

V.I.N. _____

Delivery Date _____

Owner(s) _____

Phone _____

Email _____

Registration & Appointment

MySubaru	❑ Enrolled
SUBARU STARLINK™ Registration	❑ Declined
1st Service Appointment	❑ Initiated

Manuals & Warranties

- ❑ Review vehicle manuals & maintenance schedule
- ❑ Review warranty information (Basic, Powertrain, Tire, Wear Items & Adjustments)
- ❑ Review Subaru Roadside Assistance 1 (800) 261-2155

Retailer Orientation

- ❑ Parts & Service departments locations & hours
- ❑ Service Advisor introduction and/or business card
- ❑ Service appointment & Early Bird drop-off procedures

Vehicle Condition

- ❑ Exterior/Interior is clean and undamaged
- ❑ Verify that all equipment, accessories and options are present

Note any exceptions: _____

_____

_____

Steering Wheel & Instrument Panel

- ❑ Master and Valet Keys, Keyless Access System* operation, Push Button Start* and Remote Start*
- ❑ Tilt/Telescopic Steering Column Adjustments and Paddle Shift operation*
- ❑ Steering Wheel Controls
- ❑ Headlights, DRL, Parking Lights, Hazard Lights, Interior Lights, Fog Lights*, Autolights* and Welcome/Goodbye Lighting*
- ❑ Front & Rear* Wiper and Washer Controls
- ❑ Gauges, Warning Lights, Multi Function Display*, Information Display settings and Parking Brake operation

STARLINK Audio System, Bluetooth & Safety/Security

- ❑ Bluetooth - Pair owner's phone(s) & show operation (Download SUBARU STARLINK and MySubaru Apps*)
- ❑ STARLINK Audio and Navigation* system controls (Sources, Presets, List & Back buttons)

Safety, Comfort & Convenience

- ❑ All Wheel Drive System, Emergency towing of AWD, VDC, X-Mode* and Hill Holder* operation
- ❑ Rear Vision Camera
- ❑ All Weather Package operation - Heated Seats, Exterior Mirrors & Windshield Wiper De-icer
- ❑ Review operation of climate control system
- ❑ Power windows, locks, exterior mirrors, seat including Memory Function* and Power Moonroof* operation
- ❑ Hood Release and fluid reservoir locations
- ❑ Fuel Filler Door, Trunk Release, Rear Gate operation and location of Spare Tire*, Jack & Tools

Driver Assist Technology

- ❑ Subaru EyeSight™ System*, Steering Responsive Foglights* and Steering Responsive Headlights*
- ❑ Reverse Automatic Braking System*
- ❑ Blind Spot Detection*, Lane Change Assist* and Rear Cross Traffic Alert*
- ❑ High Beam Assist*

*If Applicable

Owner Signature(s) _____

Subaru Sales Consultant _____

Subaru Sales Manager _____

Subaru of America, Inc., Subaru Plaza,
P.O. Box 6000, Cherry Hill, NJ 08034-6000



MSA5B1701A
Issued January 2017
Printed in USA 01/17



PRECAUTION

PC

1. Precaution

CAUTION

Please clearly understand and adhere to the following general precautions for environmental protection and to avoid minor or serious injury to the person doing the work or people in the area.

1. VEHICLE DYNAMICS CONTROL (VDC)

Handle the VDC as a total system. Do not disassemble or attempt to repair individual parts. Follow the directions in this manual when performing maintenance on the VDCCM&H/U. When parts other than those specified are disassembled, it is possible that the VDC system will not operate when needed or cause it to operate incorrectly and result in injury.

2. BRAKE FLUID

If brake fluid gets in your eyes or on your skin, do the following:

- Wash eyes and seek immediate medical attention.
- Wash your skin with soap and then rinse thoroughly with water.

3. RADIATOR FAN

The radiator fan may rotate without warning, even when the engine is not ON. Do not place your hand, cloth, tools or other items near the fan at any time.

4. ACTIVE GRILLE SHUTTER

The active grille shutter may open and close without warning, even when the engine is not ON. Do not place your hand, cloth, tools or other items nearby at any time.
To prevent unexpected deployment, turn the ignition switch to OFF and disconnect the ground cable from battery, then wait at least 30 seconds before starting work. Also, wait at least 30 seconds before starting work after connecting the battery.

5. ROAD TEST

Always conduct road tests in accordance with traffic rules and regulations to avoid bodily injury and interrupting traffic.

6. AIRBAG

To prevent bodily injury from unexpected deployment of airbags and unnecessary maintenance, follow the instructions in this manual when performing maintenance on the airbag components and nearby, around front of the vehicle (radiator panel, front wheel apron, front side frame, front bumper, front hood panel, front fender panel), around side of the vehicle (front door panel, rear door panel, center pillar, rear fender panel, side sill, rear wheel apron), around rear of the vehicle (the rear seat cushion, rear floor pan, rear sub frame assembly) and the airbag wiring harnesses and nearby.
To prevent unexpected deployment, turn the ignition switch to OFF and disconnect the ground cable from battery, then wait at least 60 seconds to discharge electricity before starting work. Removing or installing the components or the connectors with the ignition switch ON will electrically impair them.

7. AIRBAG AND SEAT BELT PRETENSIONER DISPOSAL

To prevent bodily injury from unexpected airbag deployment, do not dispose the airbag modules or seat belt pretensioner in the same way as other waste. Follow all government regulations concerning disposal of refuse.

8. AIRBAG MODULE

Adhere to the following when handing and storing the airbag module to prevent bodily injury from unexpected deployment:

- Do not hold the harnesses or connectors to carry the module.
- Do not face the bag in the direction that it opens towards yourself or other people.
- Do not face the bag in the direction that it opens towards the floor or walls.

9. AIRBAG SPECIAL TOOL

To prevent unexpected deployment, always use special tools for the area where the operation with special tools are required.

10. WINDOW

Always wear protective goggles when working around any glass to prevent glass fragments from damaging your eyes.

11. WINDOW ADHESIVE

Always use the recommended or equivalent adhesive when attaching glass to prevent it from falling off, resulting in accidents and injury.

12. OIL

When handling oil, adhere to the following to prevent unexpected accident.

- Prepare a container and cloth to prevent scattering of oil when performing work where oil can be spilled. If the oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

13. FUEL

When handling and storing fuel, adhere to the following to prevent from unexpected accident.

- The fuel is flammable. Do not put it close to a fire or spark.
- Prepare a container and cloth to prevent scattering of fuels when performing work where fuels can be spilled. If the oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

14. ENGINE COOLANT

When handling engine coolant, adhere to the following to prevent from unexpected accident.

- Never remove the radiator cap since engine coolant may blow out when the engine is hot.
- Prepare a container and cloth to prevent scattering of engine coolant when performing work where engine coolant can be spilled. If the oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Follow all government and local regulations concerning disposal of refuse when disposing.

15. AIR CONDITIONER REFRIGERANT

In order to prevent from global warming, avoid releasing air conditioner refrigerant into the atmosphere. Using a refrigerant recovery system, discharge and recycle it.

16. REMOVAL AND INSTALLATION OPERATION OF HOSES, ETC

1. BEFORE THE REMOVAL AND INSTALLATION OPERATION OF HOSES, ETC.

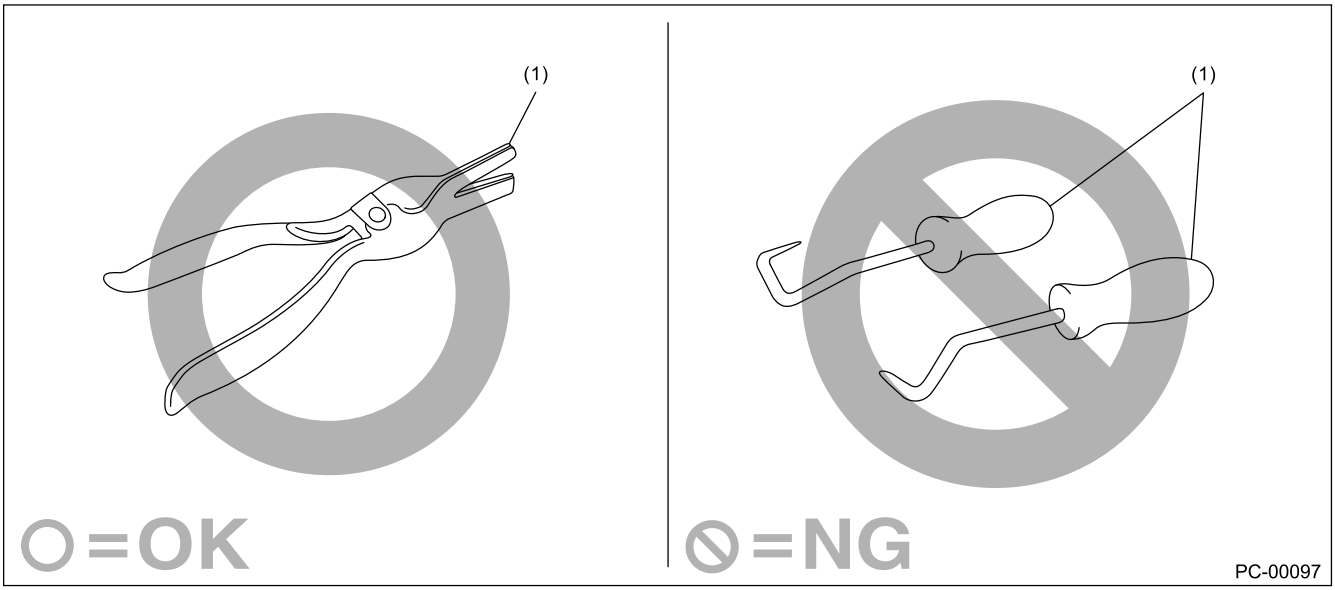
- If you keep using the damaged or deformed hose, it results bleeds or leakage of the fat adheres or disconnection of the hose. Be careful not to spill fat adheres on exhaust pipes, etc. during

maintenance to prevent emitting smoke or causing fires.

- Perform the operation with the hose removed. If the operation is performed without removing the hose, it may damage inner surface of the hose.

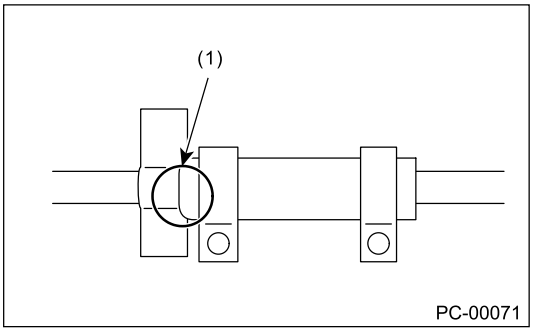
2. REMOVAL AND INSTALLATION OPERATION OF HOSES, ETC. DURING THE INSPECTION

- **Follow the instructions below when removing hose.**
  - When removing the hose, do not use a pointed hose remover (hose plucker). Inner portion of the hose can be damaged.

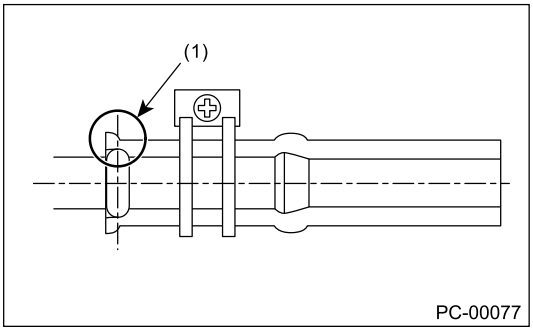


(1) Hose remover

  - When removing the hose using pliers, be sure to cover the hose with cloth and rotate the hose slightly to extract straight.
- **If you keep using the hose, perform the inspection below and replace the hose with a new part if faulty.**
  - Replace the hose with a new part if it rides over the stay or the top of spool.



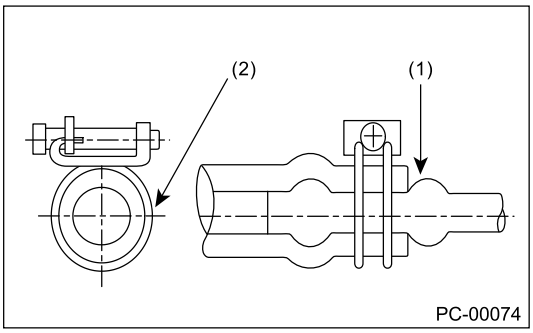
(1) Hose rides over the stay

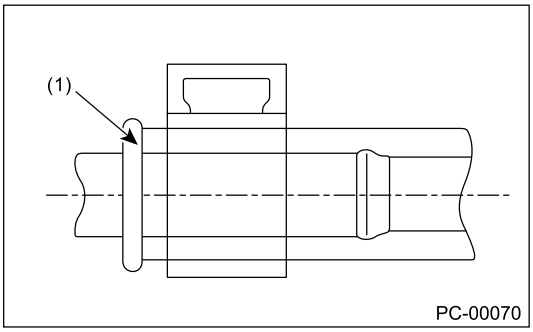


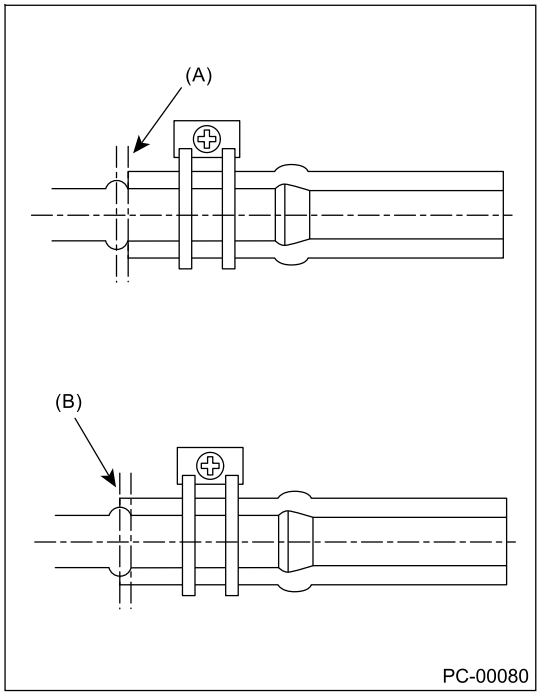
(1) Hose rides over the top of spool

- Check if the surface and the inner surface of the hose are damaged, cracked, bend, hardened, softened, swelled, peeled or deformed due to the adherence or the entry of the foreign matter by bending the hose. Replace with the new part if faulty.

- **Follow the instructions below during installation.**
  - Check carefully for assembling position.
  - Never use lubricants.
  - Insert the hose to the specified position (stopper or spool) securely. (The hose should stop at the position between the spool top and root.)







(1) Push against the spool. (Insert the hose and prevent it from becoming wrinkled.)

(2) Tighten the hose cramp completely.

(A) OK position (bottom of spool)

(B) OK position (top of spool)

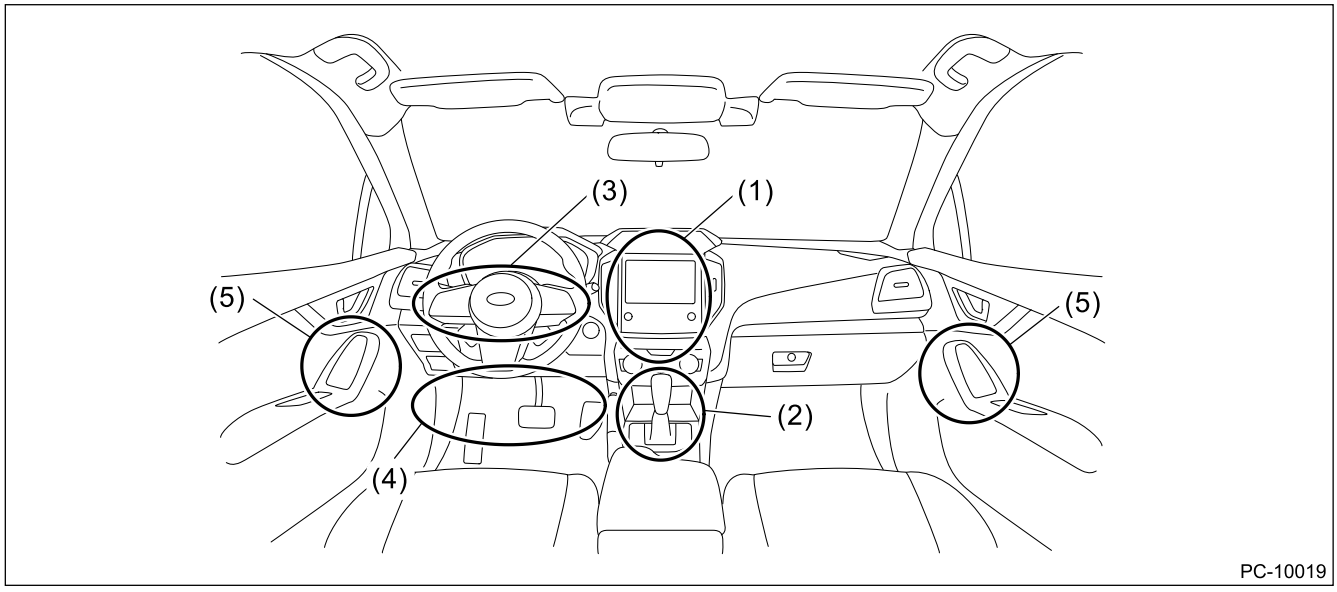
- Check if the position, direction and hose layout of the hose clamp are correct. (Check if the position, direction, length and the gap around are correct, or if it is different from the condition before the work)
- After the installation, check that the hose is installed securely and there is no leakage. (Check if it is fixed securely with the clamp)

- **For hose clips and hose clamps, perform the inspection below and replace them with a new part if faulty.**
  - Check for deformation, rust, damage or foreign matters.
  - For hose clip, check if it works and has clamping force.
  - For hose clamp, check if it can tighten screw, not ovalized or the screw is not damaged.
- **For hose pipes, perform the inspection below and replace with a new part if faulty.**
  Check if the pipe is not damaged, rusted, peeled (peeled plates included), covered with foreign matter, bent, compressed or cracked.
- **For the parts below, replaces with a new part when the hose is removed or the installation position is changed.**
  CVTF oil cooler hose, fuel hose (delivery) (except for those with quick connector)

17. HANDLING PRECAUTIONS FOR SILICON-CONTAINING SPRAY

When a silicon-containing lubricant is used, rust inhibitor or glazing agent adheres to the electrical contact of the relay or switch, which may produce silica dioxide (SiO_2). This may cause poor connection.

- Never spray directly to the electrical equipment.
- When using the spray close to the electrical equipment, always put the cover on it. Special care must be exercised especially when using the spray to the locations shown in the figure below and their surrounding areas.



(1) Audio, heater control switch
(2) Shift/select lever switch, parking switch
(3) Combination switch, steering switch, paddle shift switch
(4) Stop light switch, clutch switch, clutch start switch
(5) Power window switch

- If the residual silicon remains in the vicinity of the electrical equipment after the spray has been used, the vaporized silicon stands around the electrical equipment and it may adhere to electrical contact. After using the spray, be sure to wipe the silicon off with a cloth.

- Even when using the spray to the place away from the electrical equipment, the droplet of the spray may be splashed to the periphery. Use as small amount of spray as possible, and take care not to splash the silicon to the periphery.

Note:

The “silicon” used in this section refers to “silicone”, that is, silicon polymer.

18. CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT

1. PROHIBITED AREA FOR STICKER ATTACHMENT AND INSPECTION

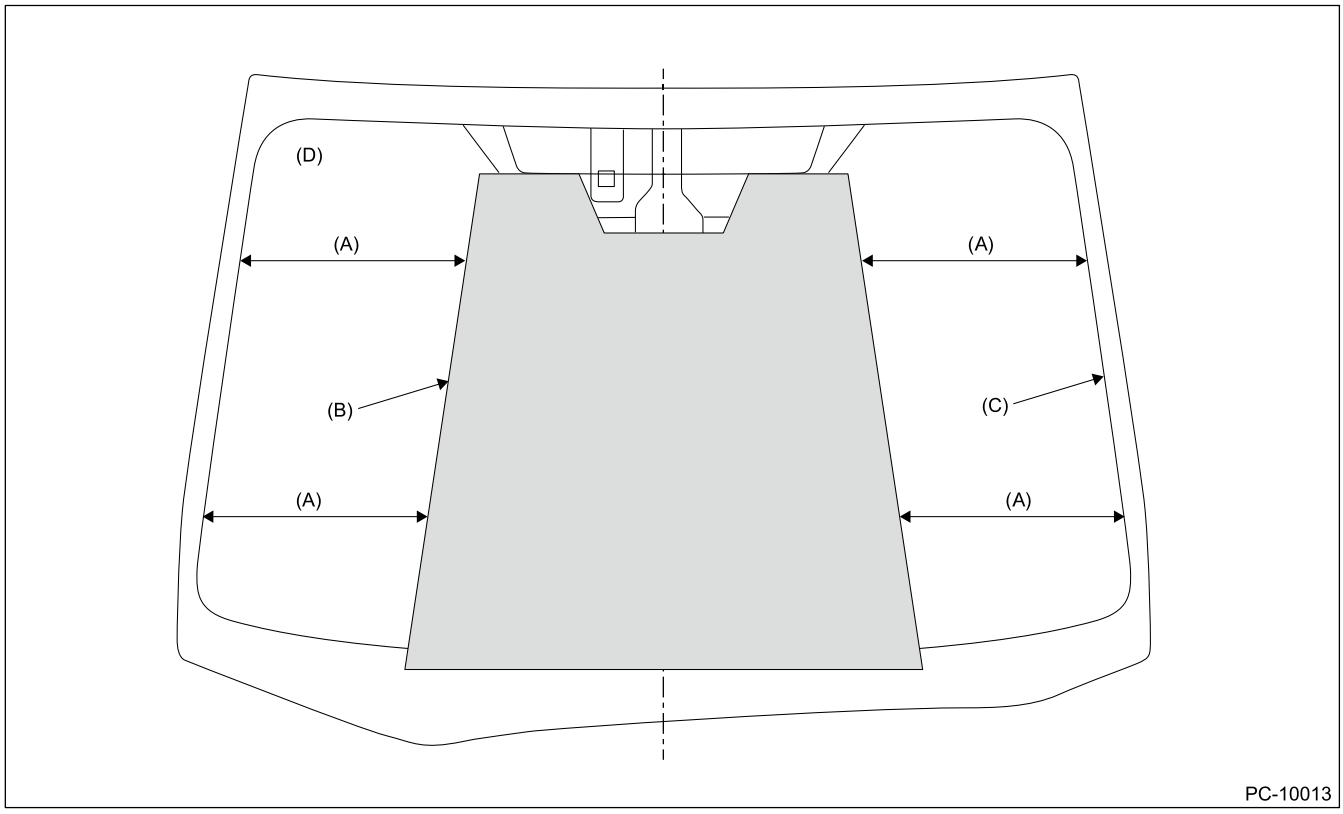
Do not attach stickers in the prohibited area on the windshield as follows. In addition, there must be no oil film, dirt or scratch in the prohibited area that obstructs the visibility of each stereo camera. Clean the windshield glass if oil film, dirt or fogging is found on the glass, and repair or replace if the windshield is scratched. The vehicle inspection label that is required to be attached on the windshield should be attached on the specified position. If stickers or windshield-related issues adversely affect the visibility of the camera, the functions of HBA and EyeSight may not work properly.

Note:

- **Clean the windshield glass if dirt or fogging is found on the glass. Repair or replace the glass if damage is found.**
- **Be careful not to leave scratch or anything else on the lens.**
- **Do not attach any foreign matter such as oil and fluid.**
- **When cleaning the inner side of the windshield glass, be careful not to touch the lens of the stereo camera. Take care so that the glass cleaner is not applied to the lens. Before starting the operation, cover the camera cover opening with dust-free paper such as copy paper to avoid interference with the camera lens, and attach the paper using tape while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure. If touched, replace the stereo camera.**
- **When replacing the windshield glass, be sure to replace the part for the EyeSight.**
- **If the glass is removed or replaced, always perform the stereo camera adjustment and inspection.**

Prohibited area for model with EyeSight (including with HBA)

The illustration below shows from the passenger compartment.

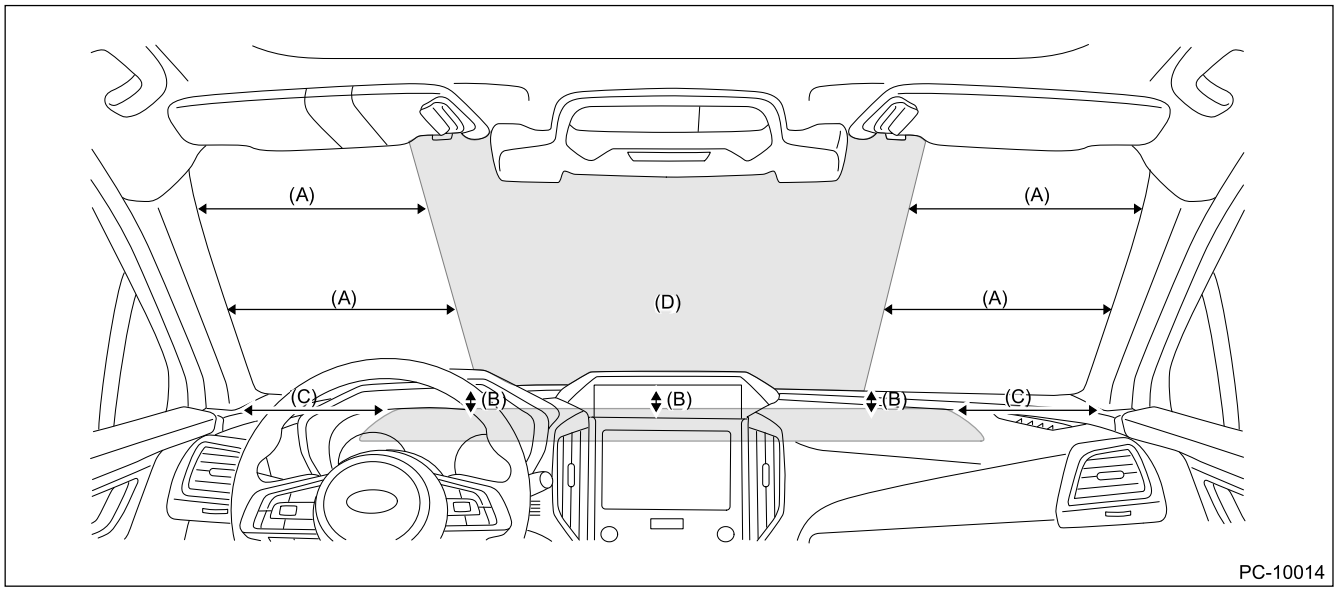


(A) 335 mm (13.2 in)
(B) Prohibited area
(C) Ceramic line
(D) Vehicle inspection label

2. PROHIBITED AREA OF DASHBOARD AND INSPECTION

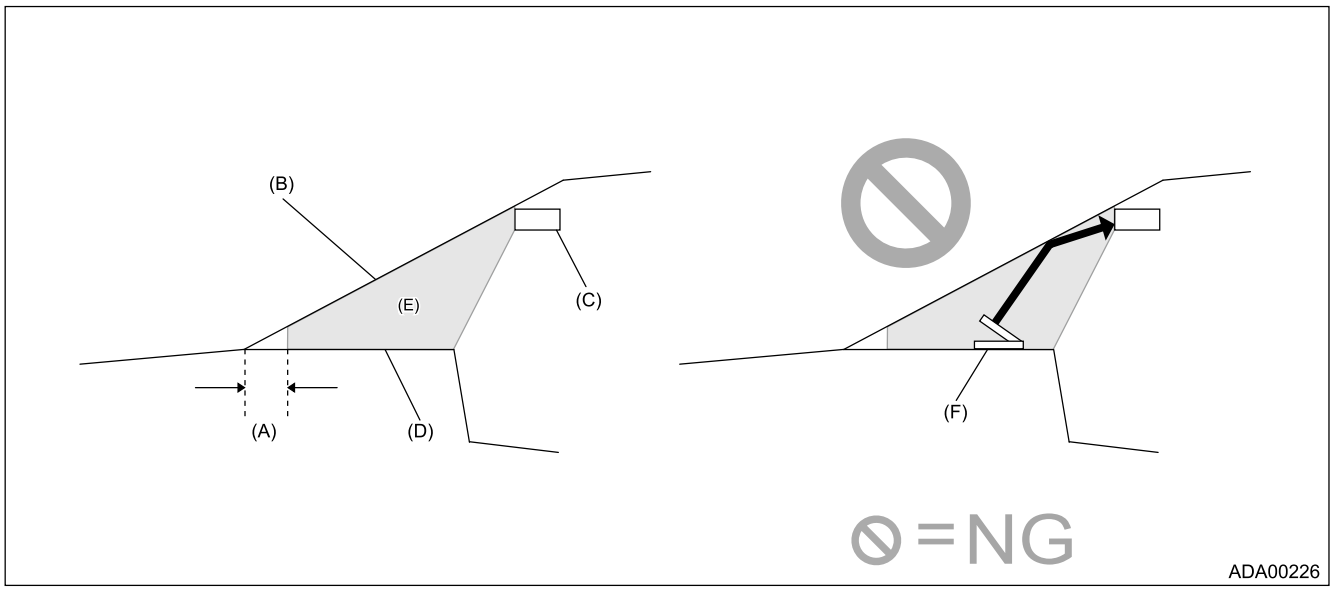
There must be no oil film, dirt, scratch or fogging that obstructs the forward visibility of the stereo camera. Do not stick or attach the aftermarket parts on the prohibited area (E) shown as follows. If abnormality of the function occurs due to light reflection or glass reflection, even though placed outside the prohibited area, change the attachment position or installation position. Attaching a sticker or antenna or installing a wide type mirror will affect the visibility of the stereo camera, causing the function not to operate correctly. In addition, placing a navigation system, ETC device or an object on the dashboard will cause reflection on the windshield glass, affecting the recognition of the stereo camera, thus causing the function not to operate correctly.

- Front view



(A) 335 mm (13.2 in)
(B) 139 mm (5.5 in)
(C) 243 mm (9.6 in)
(D) Prohibited area of windshield

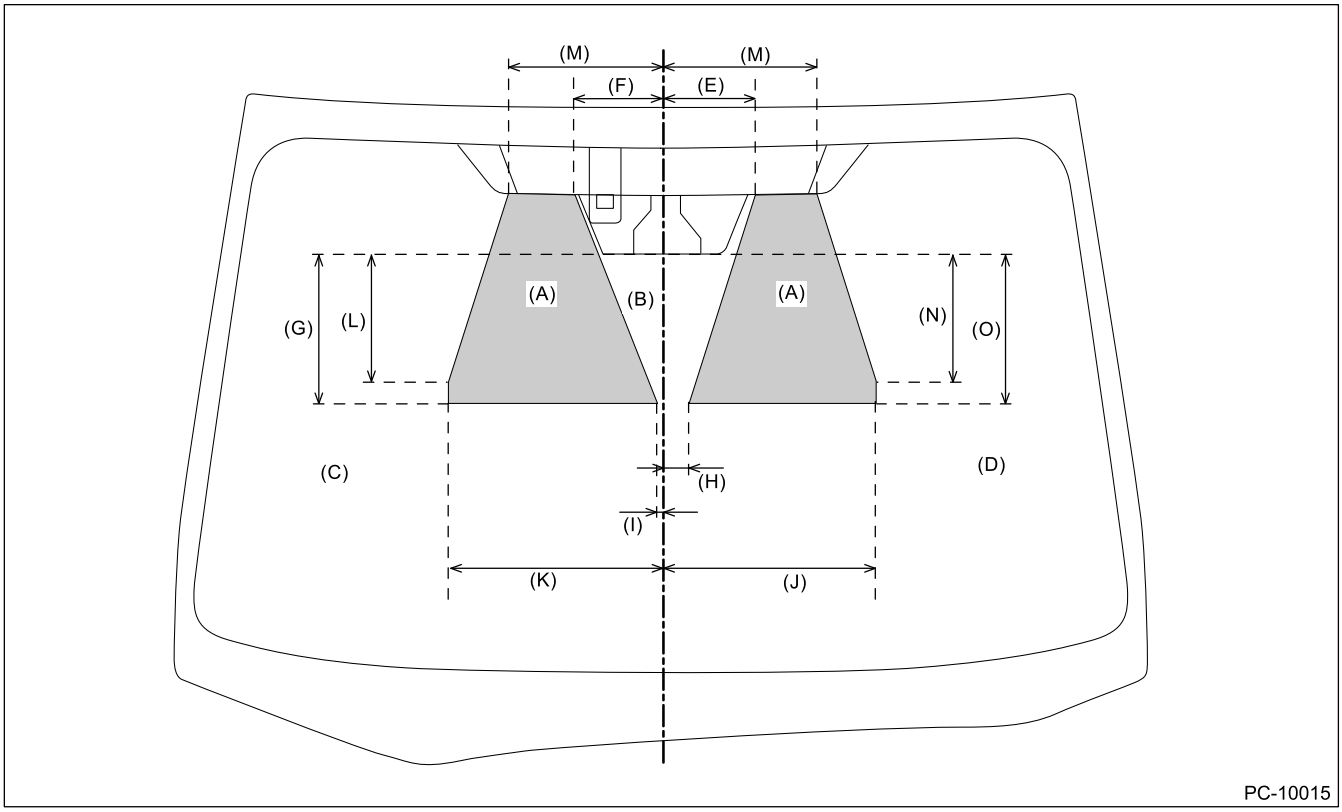
- Side view



(A) 139 mm (5.5 in)
(B) Windshield glass
(C) Stereo camera cover
(D) Dashboard
(E) Prohibited area
(F) External monitor etc.

3. PROHIBITED AREA FOR REPAIR AND INSPECTION

The illustration below shows from the passenger compartment.
If the damage is found in the glass repair prohibited area, always replace the glass. Damage in the prohibited area can affect the recognition of the stereo camera even if it is repaired, and thereby EyeSight function may not operate properly.



(A) Glass repair prohibited area
(F) 128.7 mm (5.1 in)
(K) 313.7 mm (12.4 in)

(B) Glass repairable area

(C) Glass repairable area (LH side)

(D) Glass repairable area (RH side)

(E) 133.8 mm (5.3 in)

(G) 226 mm (8.9 in)

(H) 38 mm (1.5 in)

(I) 6.7 mm (0.3 in)

(J) 311.7 mm (12.3 in)

(L) 192.8 mm (7.6 in)

(M) 225.3 mm (8.9 in)

(N) 193.3 mm (7.6 in)

(O) 225.5 mm (8.9 in)

FOREWORD

FW

1. Foreword

FOREWORD

These manuals are used when performing maintenance, repair or diagnosis of Subaru IMPREZA.
Applicable model:
2017 MY GK*****, GT*****
The manuals contain the latest information at the time of publication. Changes in the specifications, methods, etc. may be made without notice.
Refer to HELP for how to use this manual.

IDENTIFICATION

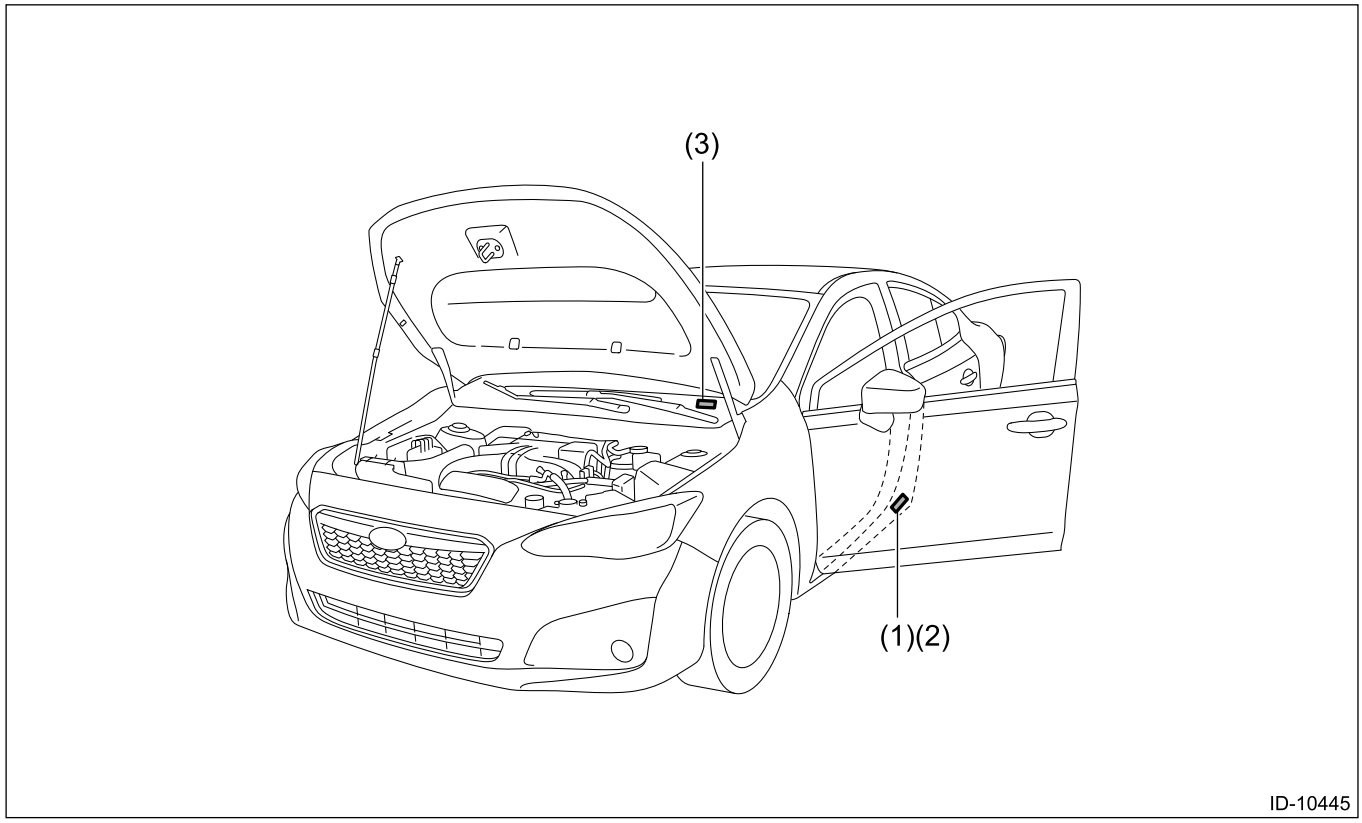
ID

1. Identification

1. IDENTIFICATION NUMBER & LABEL LOCATIONS

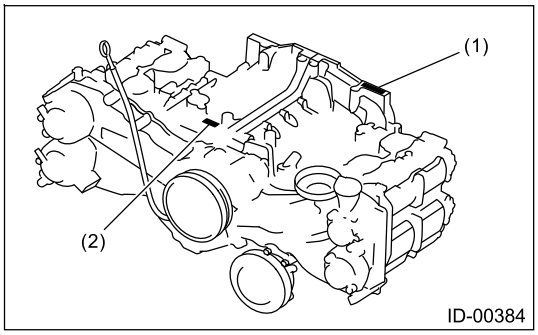
The V.I.N. (Vehicle Identification Numbers) is used to classify the vehicle.

- **Positioning of the label for identification**



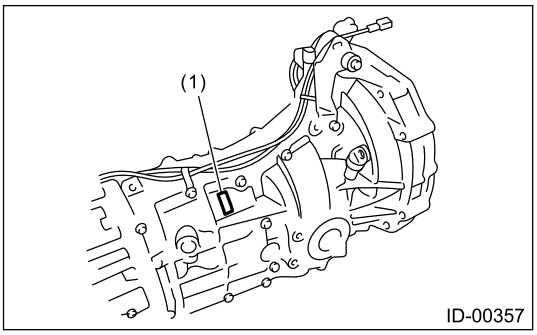
(1) FMVSS and CMVSS label (2) Model number label (attached to right side of vehicle) (3) VIN plate

- **Engine**



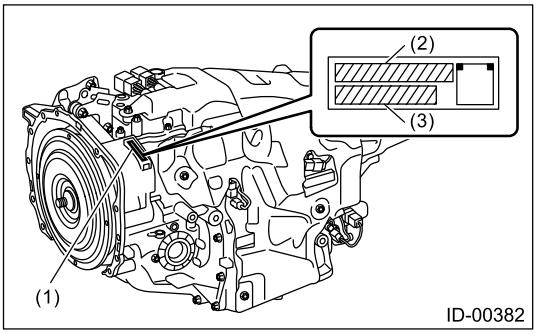
(1) Engine serial number (punch mark)
(2) Engine type (casting) crankcase upper side

- **Manual transmission**
  5MT



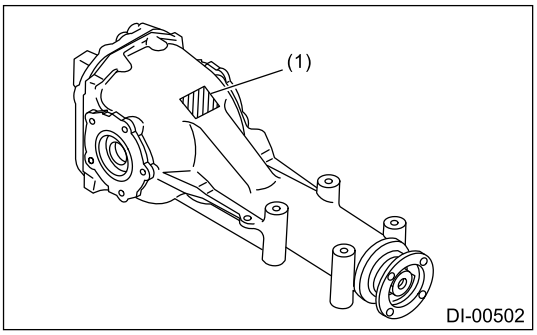
(1) MT type and transmission serial number label

- **Automatic transmission**
  CVT



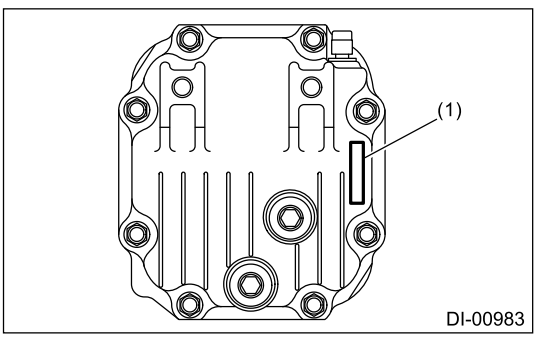
(1) Label
(2) CVT type label
(3) Transmission serial No. label

- **Rear differential**
  T-type



(1) Identification (white paint)

VA1-type

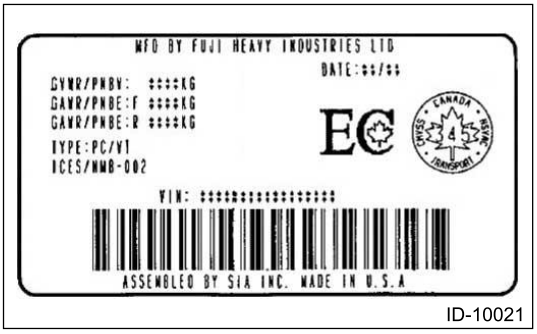


(1) Type (label)

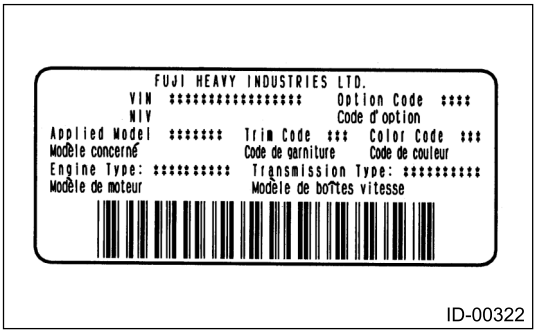
- **FMVSS label**
  For U.S.A.



- **CMVSS label**
  For Canada



- **Model number label**



2. MEANING OF V.I.N

The meaning of the V.I.N. is as follows:

]4S3GKAK6XHG600001[

The starting and ending brackets ( ] [ ) are stop marks.

Digits	Code	Meaning	Details
1 — 3	4S3	Manufacturer body area	4S3: 4 door • 5 door for U.S., Canada
4	G	Car line	G: IMPREZA
5	K	Body type	K: 4 door T: 5 door
6	A	Displacement class	A: 2.0 L non-turbo

Digits	Code	Meaning	Details
7	K	Grade	A: Base B: Premium D: Premium +EyeSight +Blind Spot Detection E: Premium N F: Premium P +Blind Spot Detection G: Premium P +Navi +Blind Spot Detection H: Premium P +EyeSight +Blind Spot Detection J: Premium P +Navi +EyeSight +Blind Spot Detection K: Sport L: Sport +Harman/Kardon +Blind Spot Detection M: Sport +Harman/Kardon +EyeSight +Blind Spot Detection N: Limited P: Limited +Navi R: Limited +Blind Spot Detection S: Limited +Navi +Blind Spot Detection T: Limited +EyeSight +Blind Spot Detection U: Limited +Navi +EyeSight +Blind Spot Detection V: Limited N +Blind Spot Detection W: Limited N +Navi +Blind Spot Detection Y: Limited N +EyeSight +Blind Spot Detection Z: Limited N +Navi +EyeSight +Blind Spot Detection
8	6	Restraint	6: Manual belts, dual airbag, side airbag for seat back, curtain airbag for roof, driver’s knee airbag
9	X	Check digit	0 — 9 & X
10	H	Model year	H: 2017MY
11	G	Transmission type	1: Full-time AWD single range 5 speed MT 3: Full-time AWD CVT
12 — 17	600001	Serial number	600001 — 699999: 4 door 700001 — 899999: 5 door

3. MODEL NUMBER LABEL

The model number label indicates: the applied model, the option code, the trim code, the engine type, the transmission type, and the exterior color code. This information is helpful when placing orders for parts.

GK7AY1E

Digits	Code	Meaning	Details
1	G	Series	G: IMPREZA
2	K	Body type	K: 4 door T: 5 door
3	7	Total engine displacement / drive system	7: 2.0L AWD
4	A	Model year	A: 2017MY

Digits	Code	Meaning	Details
5	Y	Destination	Y: U.S., Canada and Mexico
6	1	Grade	1: 2.0i 2: 2.0 i-Premium 3: 2.0 i-NP 4: 2.0 i-Premium+ 5: 2.0 i-Sport 6: 2.0 i-Limited 7: 2.0 i-NL B: 2.0 i-Premium EyeSight D: 2.0 i-Premium+EyeSight E: 2.0 i-Limited EyeSight F: 2.0 i-NL EyeSight G: 2.0 Sport EyeSight
7	E	Fuel feed system / transmission	E: DI DOHC non-turbo single range 5MT L: DI DOHC non-turbo CVT

The engine and transmission type are as follows.

ENGINE

FB20DXZAKA

Digits	Code	Meaning	Details
1 and 2	FB	Engine type symbol	FB: 4 cylinder gasoline
3 and 4	20	Displacement	20: 2.0 L
5	D	Valve train/fuel supply system/steering	D: DOHC DI non-turbo (LH)
6	X	Exhaust regulations	X: U.S., Canada and Mexico
7	Z	Intake/exhaust system	Z: Intake AVCS, exhaust AVCS, TGV, EGR
8	A	Mounted transmission	A: 5MT H: CVT
9 and 10	KA	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

TRANSMISSION (MT)

TY758VDJCA

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	Y	Transmission system	Y: Full-time AWD MT center differential
3 and 4	75	Distance between gear center	75: Between main shaft and drive pinion
5	8	Classification	8: 5MT
6	V	Transmission basic specifications	V: Full-time AWD single range 5MT with viscous coupling center differential

Digits	Code	Meaning	Details
7	D	Mounted engine	D: 2.0 L DOHC non-turbo
8 — 10	JCA	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

TRANSMISSION (CVT)

TR580GDJAB

Digits	Code	Meaning	Details
1	T	Transmission	T: Transmission
2	R	Transmission system	R: Full-time AWD CVT
3 and 4	58	Distance between pulley centers	58: Between pulley centers
5	0	Classification	0: CVT
6	G	Transmission specifications	G: Without Auto Start Stop, with CVTF cooler (with warmer feature), without CVTF cooler (air cooler)
7	D	Mounted engine	D: 2.0 L DOHC non-turbo
8 — 10	JAB	Detailed specifications	Used when ordering parts. For details, refer to the parts catalog.

REAR DIFFERENTIAL

Identification	Reduction gear ratio	LSD
42	3.700	None
T2	4.111	None

OPTION CODE

MB

- 1-digit number

	A	D	E	I	J	L	M	N	R	S	V
Aluminum wheel	○	○	○	○	○	○	—	○	○	○	○
Smart entry & push button start	○	—	○	—	○	○	—	○	—	○	—
Manual A/C	○	—	—	—	—	—	○	○	—	—	—
Leather package	○	○	○	○	○	○	—	○	○	○	○
Genuine leather seat	—	—	○	○	○	—	—	—	—	○	○
Standard audio	—	—	—	—	—	—	—	—	—	—	—
Premium audio	○	—	—	○	○	○	—	—	—	○	—
Navigation	—	○	○	—	—	—	—	—	—	—	○
Harman/Kardon + Premium audio	—	—	—	—	—	—	—	○	—	—	—
Advanced package	—	—	—	○	○	○	—	○	—	—	○

	Y	Z	2	3	4
Aluminum wheel	○	○	○	○	○
Smart entry & push button start	○	○	—	—	—

	Y	Z	2	3	4
Manual A/C	—	—	○	○	—
Leather package	○	○	○	—	○
Genuine leather seat	○	—	—	—	—
Standard audio	—	—	—	—	—
Premium audio	—	—	—	—	○
Navigation	○	○	—	—	—
Harman/Kardon + Premium audio	—	—	—	—	—
Advanced package	○	○	—	—	—

- 2-digit number

	B	C	D	L	P	R
Side airbag	○	○	○	○	○	○
Curtain airbag	○	○	○	○	○	○
LED headlight	—	—	○	—	—	○
Cold weather package	—	○	○	○	○	○
Sunroof	—	—	—	○	○	○
Power seat	—	—	—	○	—	—

4. IMMOBILIZER REGISTRATION TYPE

- Model without keyless access with push button start
  Refer to “Type B” described in “REGISTRATION MANUAL FOR IMMOBILIZER”.
- Model with keyless access with push button start
  Refer to “Type D” described in “REGISTRATION MANUAL FOR IMMOBILIZER”.

PERIODIC MAINTENANCE SERVICES

PM

1. General Description
2. Schedule
3. Engine Oil
4. Engine Oil Filter
5. Spark Plug
6. V-belt
7. Fuel Line
8. Fuel Filter
9. Air Cleaner Element
10. Cooling System
11. Engine Coolant
12. Clutch System
13. Transmission Gear Oil
14. CVTF
15. Front & Rear Differential Gear Oil
16. Brake Line
17. Brake Fluid
18. Disc Brake Pad and Disc
19. Parking Brake
20. Suspension
21. Wheel Bearing
22. Axle Boots & Joints
23. Tire Inspection and Rotation
24. Steering System (Power Steering)
25. A/C Filter

GENERAL DESCRIPTION

Be sure to perform periodic maintenance in order to maintain vehicle performance and find problems before they occur.

MAINTENANCE SCHEDULE

1. MODEL WITH US SPECIFICATION

Maintenance item		Maintenance interval [Number of months or km (miles), whichever occurs first]													
	Months	3	6	12	18	24	30	36	42	48	54	60	66	To be continued to the next table.	Remarks
	×1,000 km	4.8	9.6	19.2	28.8	38.4	48	57.6	67.2	76.8	86.4	96	105.6		
	×1,000miles	3	6	12	18	24	30	36	42	48	54	60	66		
1	Engine oil		R	R	R	R	R	R	R	R	R	R	R		Note 1.
2	Engine oil filter		R	R	R	R	R	R	R	R	R	R	R		Note 1.
3	Spark plug											R			
4	V-belt						I					I			
5	Fuel line						I					I			Note 4. Note 5.
6	Fuel filter														Note 2. Note 5.
7	Air cleaner element						R					R			Note 6.
8	Cooling system						I					I			Note 8.
9	Engine coolant	Replace after the first 11 years or 220,000 km (137,500 miles), and every six years or 120,000 km (75,000 miles) thereafter													Note 8.
10	Clutch system			I		I		I		I		I			
11	Transmission gear oil						I					I			
12	CVTF						I					I			
13	Front & rear differential gear oil						I					I			
14	Brake line			I		I		I		I		I			Note 4.

Maintenance item		Maintenance interval [Number of months or km (miles), whichever occurs first]													
15	Brake fluid / clutch fluid (MT model only)						R					R			Note 3.
16	Disc brake pad and disc			I		I		I		I		I			Note 4.
17	Parking brake			I		I		I		I		I			Note 4.
18	Suspension			I		I		I		I		I			Note 4.
19	Wheel bearing											I			
20	Axle boots and joints			I		I		I		I		I			Note 4.
21	Tire rotation		P	P	P	P	P	P	P	P	P	P	P		Note 7.
22	Steering system (Power steering)			I		I		I		I		I			Note 4.
23	A/C filter	Replace every 12 months or 19,200 km (12,000 miles)													Note 6.

Maintenance item		Maintenance interval [Number of months or km (miles), whichever occurs first]												
	Months	Continued from previous table	72	78	84	90	96	102	108	114	120	126	132	Remarks
	×1,000 km		115.2	124.8	134.4	144	153.6	163.2	172.8	182.4	192	201.6	211.2	
	×1,000miles		72	78	84	90	96	102	108	114	120	126	132	
1	Engine oil		R	R	R	R	R	R	R	R	R	R	R	Note 1.
2	Engine oil filter		R	R	R	R	R	R	R	R	R	R	R	Note 1.
3	Spark plug										R			
4	V-belt					I					I			
5	Fuel line					I					I			Note 4. Note 5.
6	Fuel filter		R											Note 2. Note 5.
7	Air cleaner element					R					R			Note 6.
8	Cooling system					I					I			Note 8.
9	Engine coolant	Replace after the first 11 years or 220,000 km (137,500 miles), and every six years or 120,000 km (75,000 miles) thereafter												Note 8.
10	Clutch system		I		I		I		I		I		I	
11	Transmission gear oil					I					I			
12	CVTF					I					I			
13	Front & rear differential gear oil					I					I			
14	Brake line		I		I		I		I		I		I	Note 4.
15	Brake fluid / clutch fluid (MT model only)					R					R			Note 3.
16	Disc brake pad and disc		I		I		I		I		I		I	Note 4.
17	Parking brake		I		I		I		I		I		I	Note 4.

Maintenance item		Maintenance interval [Number of months or km (miles), whichever occurs first]												
18	Suspension		I		I		I		I		I		I	Note 4.
19	Wheel bearing										I			
20	Axle boots and joints		I		I		I		I		I		I	Note 4.
21	Tire rotation		P	P	P	P	P	P	P	P	P	P	P	Note 7.
22	Steering system (Power steering)		I		I		I		I		I		I	Note 4.
23	A/C filter	Replace every 12 months or 19,200 km (12,000 miles)												Note 6.

Symbol

R: Replace

I: Inspection

P: Perform

Note:

1. **When the vehicle is used under severe conditions, replace the engine oil and engine oil filter every 3 months or 4,800 km (3,000 miles).**
2. **When the vehicle is used under extremely low or high temperature conditions, the fuel filter may become dirty. Therefore, it should be replaced frequently.**
3. **When the vehicle is used in high humidity area or mountain area, replace the brake fluid every 15 months or 24,000 km (15,000 miles).**
4. **When the vehicle is used under severe conditions, check every 6 months or 9,600 km (6,000 miles).**
5. **This inspection is not required to maintain emission warranty eligibility and it does not affect the manufacturer's obligations under EPA's in-use compliance program.**
6. **When the vehicle is used under extremely dusty conditions, the air cleaner element and A/C filter should be replaced more often.**
7. **A tire should be replaced when the tread wear indicator appears as a solid band across the tread. The indicators appear when the remaining tread has been worn to 1.6 mm (0.063 in) or less.**
8. **To prevent cooling system leakage, be sure to add SUBARU genuine cooling system conditioner when replacing coolant.**

EXAMPLES OF SEVERE CONDITIONS

a. Drive repeatedly at short distance. (Maintenance items 1 and 2)
b. Drive repeatedly on bumpy muddy road. (Maintenance items 14, 15 and 17)
c. Drive repeatedly in dusty conditions. (Maintenance items 7 and 23)
d. Drive in extremely cold weather. (Maintenance items 1, 2, 16, 18, 20 and 22)
e. Area where salt or other corrosive used. (Maintenance items 5, 14, 15, 16, 17 and 20)
f. Coastal area. (Maintenance item 5)

PERIODIC MAINTENANCE SERVICES > Engine Oil

INSPECTION

Refer to “LUBRICATION (H4DO)” section for engine oil inspection. Ref. to LUBRICATION(H4DO)>Engine Oil>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Engine Oil

REPLACEMENT

Refer to “LUBRICATION (H4DO)” section for engine oil replacement. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.

REPLACEMENT

Refer to “LUBRICATION (H4DO)” section for engine oil filter replacement. Ref. to LUBRICATION(H4DO)>Oil Filter.

REPLACEMENT

Refer to “IGNITION (H4DO)” section for spark plug replacement. Ref. to IGNITION(H4DO)>Spark Plug.

PERIODIC MAINTENANCE SERVICES > V-belt

INSPECTION

Refer to “MECHANICAL (H4DO)” section for V-belt inspection. Ref. to MECHANICAL(H4DO)>V-belt>INSPECTION.

PERIODIC MAINTENANCE SERVICES > V-belt

REPLACEMENT

Refer to “MECHANICAL (H4DO)” section for V-belt replacement. Ref. to MECHANICAL(H4DO)>V-belt.

INSPECTION

The fuel line is located mostly internally, so check pipes, areas near pipes, and engine compartment piping for rust, hose and tube damage, loose band, etc. If faulty parts are found, repair or replace them. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Fuel Filter

REPLACEMENT

For fuel filter replacement procedure, refer to “FUEL INJECTION (FUEL SYSTEMS) (H4DO)”. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filter.

PERIODIC MAINTENANCE SERVICES > Fuel Filter

INSPECTION

If the filter is clogged, or if the replacement interval has been reached, replace it.

REPLACEMENT

Refer to “INTAKE (INDUCTION) (H4DO)” section for air cleaner element replacement. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Element.

INSPECTION

1. RADIATOR

Check that there are no engine coolant leaks from the hose connections. Refer to “COOLING (H4DO)” section for radiator inspection. Ref. to COOLING(H4DO)>Radiator>INSPECTION.

2. RADIATOR CAP

Refer to “COOLING (H4DO)” section for radiator cap inspection. Ref. to COOLING(H4DO)>Radiator Cap>INSPECTION.

3. COOLING FAN

Refer to “COOLING (H4DO)” section for cooling fan inspection. Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION.

4. COOLING SYSTEM

Start the engine, and then inspect that it does not overheat or it is not cooled excessively. If it overheats or it is cooled excessively, check the cooling system.

INSPECTION

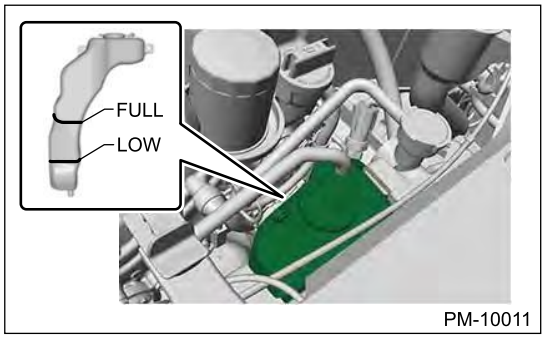
Caution:

- **Do not use water instead of coolant.**
- **Refer to "RECOMMENDED MATERIALS" section for recommended engine coolant.** **Ref. to RECOMMENDED MATERIALS > ENGINE COOLANT.**

1. Park the vehicle on a level surface.
2. Make sure the engine coolant level in the reservoir tank is between "FULL" and "LOW" when the engine is cold.

   Note:

   If the engine coolant level drops, make sure that there are no engine coolant leakage, and add engine coolant to the "FULL" line.



3. Remove the radiator cap and make sure that the radiator is filled with engine coolant up to the filler neck position.

REPLACEMENT

Refer to "COOLING (H4DO)" section for engine coolant replacement. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.

INSPECTION AND ADJUSTMENT

Refer to “CLUTCH SYSTEM” section for inspection and adjustment of clutch system. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSPECTION. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.

PERIODIC MAINTENANCE SERVICES > Transmission Gear Oil

INSPECTION

For transmission gear oil inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Transmission Gear Oil

REPLACEMENT

For transmission gear oil replacement, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>REPLACEMENT.

PERIODIC MAINTENANCE SERVICES > CVTF

INSPECTION

For CVTF inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>INSPECTION.

PERIODIC MAINTENANCE SERVICES > CVTF

REPLACEMENT

For CVTF replacement, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>REPLACEMENT.

INSPECTION

1. FRONT DIFFERENTIAL (MT model)

Front differential gear oil of MT model lubricates the transmission and differential together. For inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>INSPECTION.

2. FRONT DIFFERENTIAL (CVT MODEL)

For inspection of CVT model front differential gear oil, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>INSPECTION.

3. REAR DIFFERENTIAL

Refer to “DIFFERENTIALS” section for rear differential gear oil inspection. Ref. to DIFFERENTIALS>Differential Gear Oil>INSPECTION.

REPLACEMENT

1. FRONT DIFFERENTIAL (MT model)

Front differential gear oil of MT model lubricates the transmission and differential together. For replacement, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>REPLACEMENT.

2. FRONT DIFFERENTIAL (CVT MODEL)

For replacement of front differential gear oil, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>REPLACEMENT.

3. REAR DIFFERENTIAL

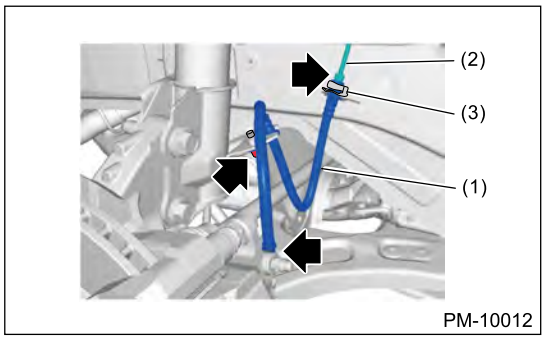
Refer to “DIFFERENTIALS” section for rear differential gear oil replacement. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.

INSPECTION

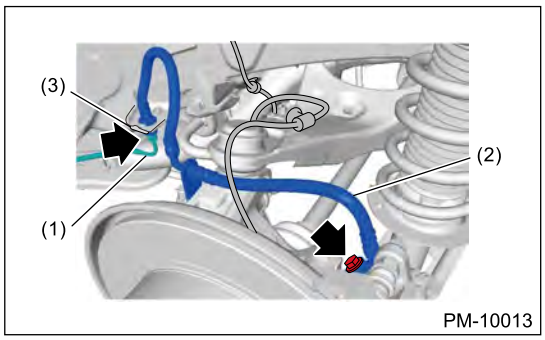
1. BRAKE LINE

1. Check for scratches, swelling, corrosion, traces of fluid leakage on the brake hoses or pipe joints.
2. Make sure that brake pipes/hoses do not interfere with adjacent parts and there is no loose connector/clamp during driving.
3. Check any trace of fluid leakage, scratches, etc. on master cylinder, wheel cylinder and hydraulic unit.

   Note:
   - **When the brake fluid level in the reservoir tank is lower than specified limit, the brake warning light on the combination meter will illuminate.**
   - **Visually check the brake hose for damage. (Use a mirror where it is difficult to see)**



(1) Front brake hose
(2) Front brake pipe
(3) Clamp



(1) Brake pipe
(2) Rear brake hose
(3) Clamp

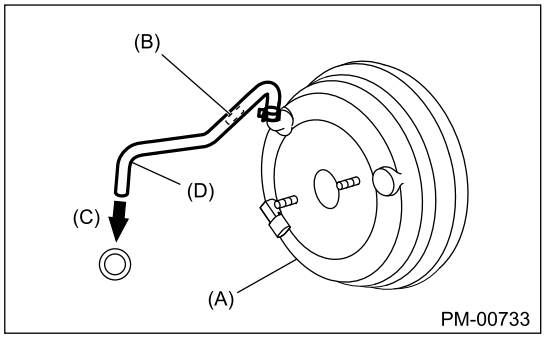
2. SERVICE BRAKE

Refer to "BRAKE" section for foot brake inspection. Ref. to BRAKE>Brake Pedal>INSPECTION.

3. BRAKE SERVO SYSTEM

1. With the engine off, depress the brake pedal several times applying the same pedal force. Check that the travel distance should not change.
2. With the brake pedal depressed, start the engine. Check that the pedal moves slightly toward the floor.

3. With the brake pedal depressed, stop the engine and keep the pedal depressed for 30 seconds. Check that the pedal height does not change.
4. A check valve is built into the brake booster nipple. Disconnect the vacuum hose to inspect function of check valve.
   Check that check valve ventilates from booster side to engine side. Also, check that there is no ventilation from engine side to booster side.



(A) Brake booster
(B) Check valve
(C) Engine side
(D) Vacuum hose

5. Check the vacuum hose for cracks or other damage.
   Caution:
   When installing the vacuum hose on the engine and brake booster, do not use soapy water or lubricating oil on their connections.
6. Check that the vacuum hose is securely tightened.

PERIODIC MAINTENANCE SERVICES > Brake Fluid

INSPECTION

Refer to “BRAKE” section for brake fluid inspection. Ref. to BRAKE>Brake Fluid>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Brake Fluid

REPLACEMENT

Refer to “BRAKE” section for brake fluid replacement. Ref. to BRAKE>Brake Fluid>REPLACEMENT.

INSPECTION

Refer to “BRAKE” section for disc brake pad and disc inspection. Ref. to BRAKE>Front Brake Pad>INSPECTION. Ref. to BRAKE>Rear Brake Pad>INSPECTION. Ref. to BRAKE>Front Disc Rotor>INSPECTION. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Parking Brake

INSPECTION

Refer to “PARKING BRAKE” for parking brake inspection. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSPECTION.

PERIODIC MAINTENANCE SERVICES > Parking Brake

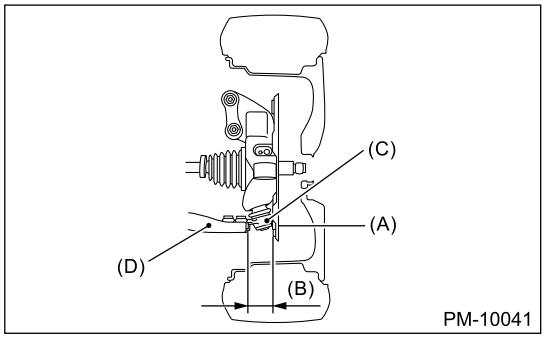
ADJUSTMENT

Refer to “PARKING BRAKE” for parking brake adjustment. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

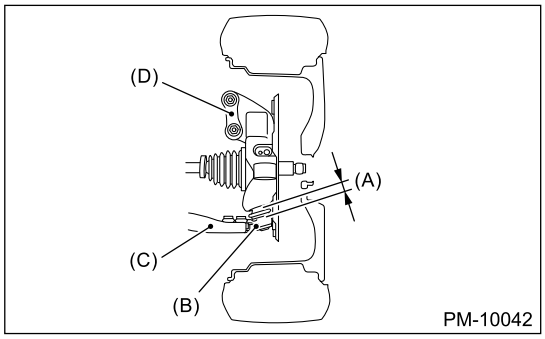
INSPECTION

1. FRONT SUSPENSION BALL JOINT

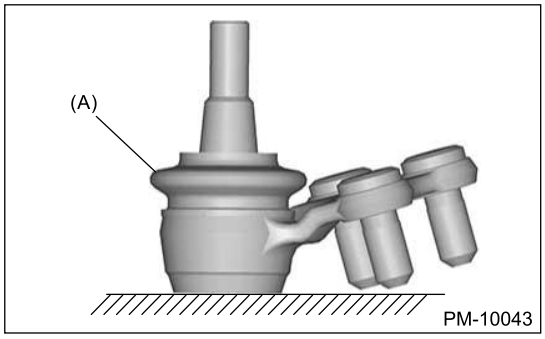
1. Lift up the vehicle until front wheels are off ground.
2. Grasp the bottom of tire and move it in and out in axial direction. If movement (B) is observed between the brake disc cover (A) and end of front arm (D), ball joint (C) may be excessively worn.



3. Next, grasp the end of front arm (C) and move it up and down. If movement (A) between the housing (D) and front arm (C) boss is observed, ball joint (B) may be excessively worn.



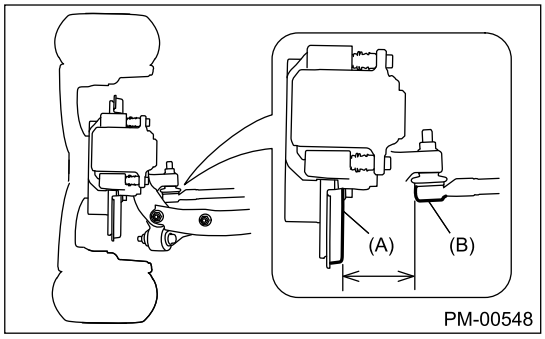
4. If the relative movement is observed in the preceding two steps, remove and inspect the ball joint. If the free play exceeds standard value, replace the ball joint. Ref. to FRONT SUSPENSION>Ball Joint.
5. Damage of dust boots
   Visually inspect the ball joint dust boots. Replace if ball joint is damaged.
   Note:
   When the front arm ball joint is removed or replaced, check the toe-in of front wheel. If it is not within the specified value, adjust the toe-in. Ref. to FRONT SUSPENSION>Wheel Alignment.



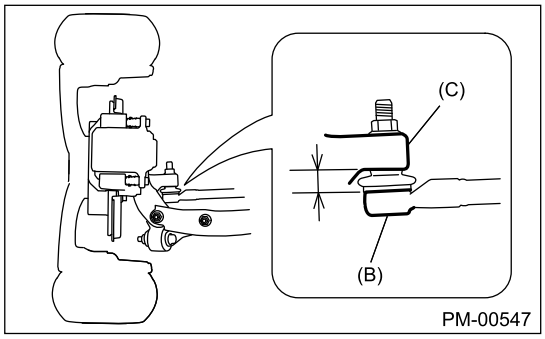
(A) Dust boots

2. REAR SUSPENSION BALL JOINT

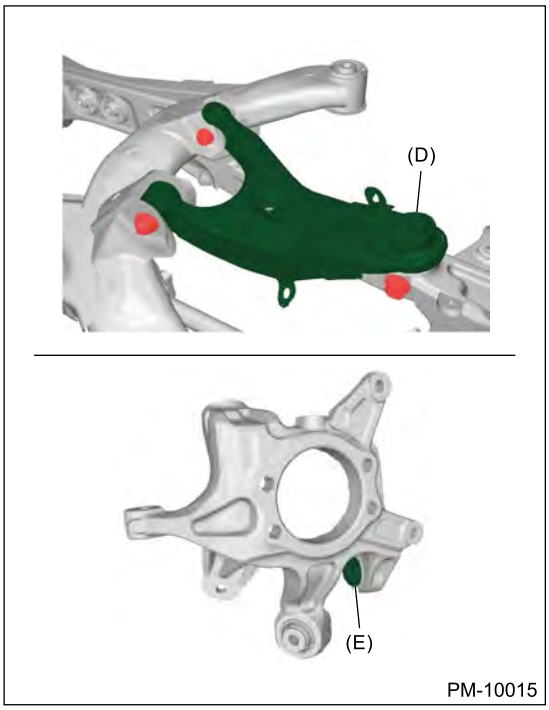
1. Lift up the vehicle until rear wheels are off ground.
2. Grasp the bottom of tire and move it in and out in axial direction.
3. If movement is observed between the brake disc cover (A) and end of rear lateral link assembly - front (B), ball joint may be excessively worn.



4. Grasp the end of rear lateral link assembly - front (B) and move it up and down. If movement is observed between the housing (C) and rear lateral link assembly - front (B) boss, ball joint may be excessively worn.



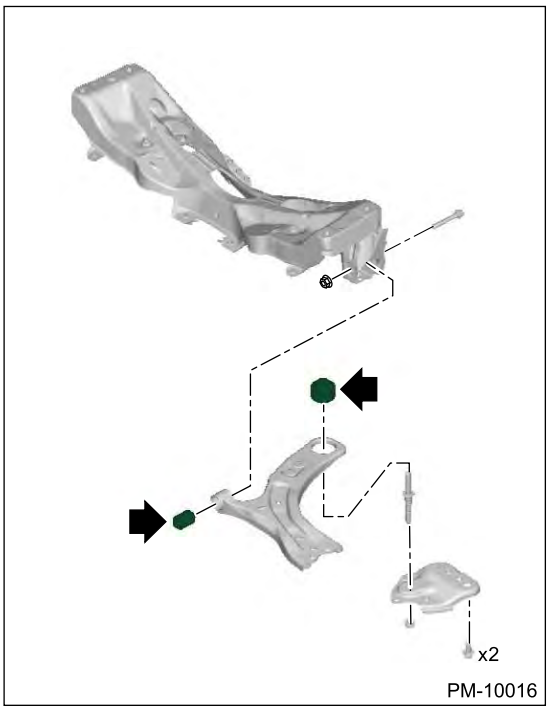
5. If the movement related to the previous two steps is observed, replace the rear lateral link assembly - front. Ref. to REAR SUSPENSION>Rear Lateral Link (front).
6. Damage of dust boots
   Visually inspect the ball joint dust boots. Replace if rear lateral link assembly - front is damaged.
7. Check the upper arm ball joint (D) and the pillow ball bushing (E) of housing in the same manner.



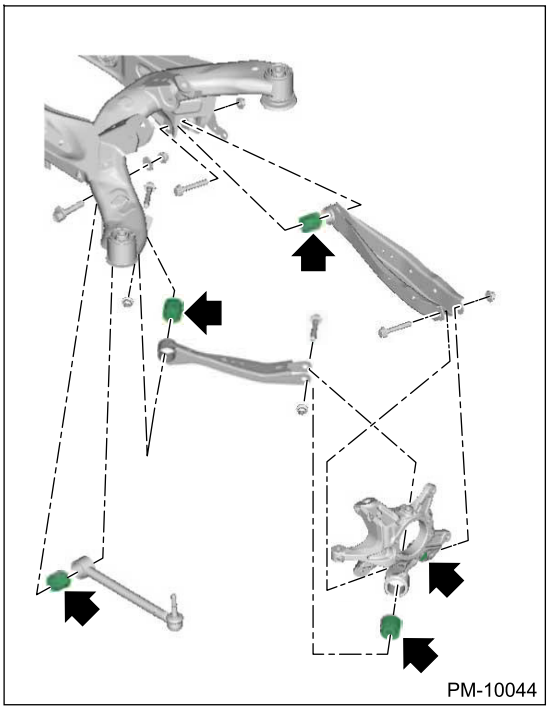
3. FRONT, REAR SUSPENSION BUSHING

Apply pressure with tire lever etc, and inspect the bushing for excessive wear or damage. If defective, replace the bushing.

- Front suspension bushing



- Rear suspension bushing



4. SUSPENSION HEIGHT

Refer to “FRONT SUSPENSION” section for suspension height inspection. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > SUSPENSION HEIGHT.

5. WHEEL ALIGNMENT

Measure and adjust the front and rear wheel alignment at a time. Refer to “Front Suspension” section for measurement and adjustment of wheel alignment. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.

6. OIL LEAKAGE OF STRUT AND SHOCK ABSORBER

Visually inspect the front strut and rear shock absorber for oil leakage. Replace the front strut and rear shock absorber if oil leaks excessively.

7. TIGHTNESS OF BOLTS AND NUTS

Check the bolts and nuts for looseness. Retighten the bolts and nuts to specified torque. If the self-locking nuts and bolts are removed, replace them with new parts. Ref. to FRONT SUSPENSION>General Description. Ref. to REAR SUSPENSION>General Description.

8. DAMAGE TO SUSPENSION PARTS

Check the following parts and the fastening portion of the vehicle body for deformation or excessive rusting which impairs the suspension. Thoroughly remove the deposits of the lower spring seat of strut where dust or mud are likely piled up. If necessary, replace the damaged parts with new parts. If minor rust formation, pitting, etc. are noted, remove the rust and take rust prevention measure.

- Front suspension
  - Front arm
  - Crossmember
  - Strut
- Rear suspension
  - Sub frame

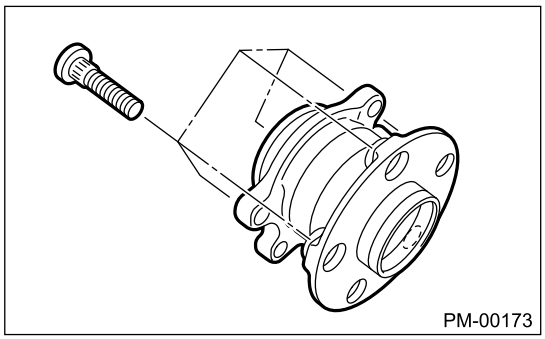
  - Rear lateral link assembly - front
  - Rear lateral link
  - Upper arm
  - Trailing link
  - Shock absorber
- In the area where salt is sprayed to melt snow on a road in winter, check suspension parts for damage caused by rust every 12 months after lapse of 60 months. Take rust prevention measures as required.

INSPECTION

1. FRONT WHEEL BEARING

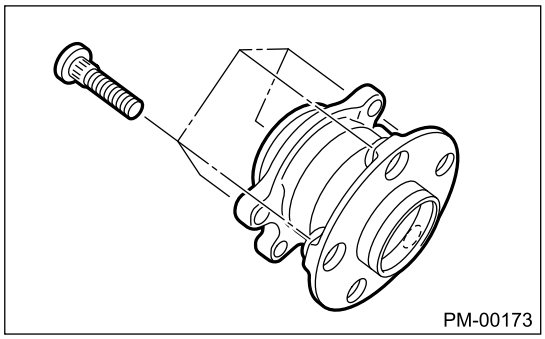
Note:
Inspect the condition of front wheel bearing grease.

1. Jack-up the front side of vehicle.
2. While holding the front wheel by hand, swing it in and out to check bearing free play.
3. Loosen the wheel nuts, and remove the front wheel.
4. If the bearing free play exists in step 2) above, attach a dial gauge to the hub and measure axial play in axial direction.
   Service limit:
   Straight-ahead position within 0.05 mm (0.0020 in)
5. Remove the bolts and self-locking nuts, and extract the front arm from front crossmember.
6. Remove the joint of front drive shaft from transmission. Ref. to DRIVE SHAFT SYSTEM>Front Axle.
7. While supporting the front drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
   If the hub is noisy or binds, replace the front axle.



2. REAR WHEEL BEARING

1. Jack-up the rear side of vehicle.
2. While holding the rear wheel by hand, swing it in and out to check bearing free play.
3. Loosen the wheel nuts, and remove the rear wheel.
4. If the bearing free play exists in step 2) above, attach a dial gauge to the hub and measure axial play in axial direction.
   Service limit:
   Straight-ahead position within 0.05 mm (0.0020 in)
5. Remove the joint of rear drive shaft from rear differential. Ref. to DRIVE SHAFT SYSTEM>Rear Drive Shaft.
6. While supporting rear drive shaft horizontally with one hand, turn the hub with the other hand to check for noise or binding.
   If the hub is noisy or binds, replace the rear axle.

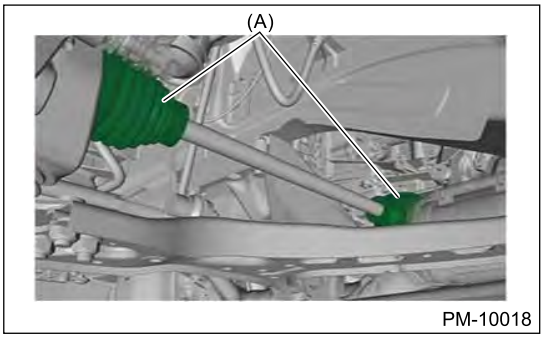

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INSPECTION

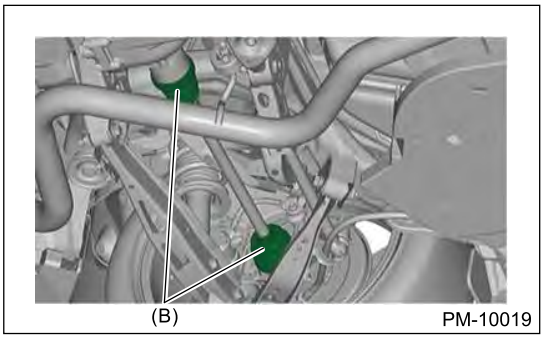
1. FRONT AND REAR AXLE BOOTS

Inspect the front axle boots (A) and rear axle boots (B) for deformation, damage or failure. If faulty, replace with new part. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft. Ref. to DRIVE SHAFT SYSTEM>Rear Drive Shaft.

- Front



- Rear



2. PROPELLER SHAFT

Inspect the propeller shaft for damage or failure. If faulty, replace with new part. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft.

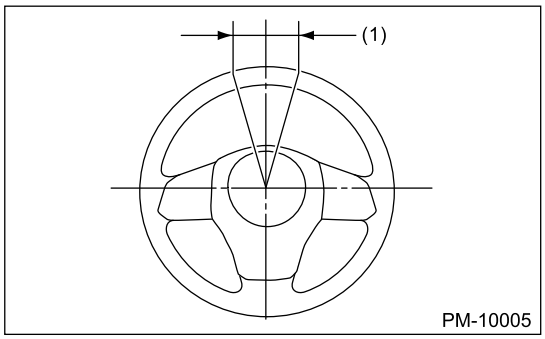
INSPECTION

Refer to “WHEEL AND TIRE SYSTEM” section for tire inspection and rotation. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION.

INSPECTION

1. STEERING WHEEL

1. Set the steering wheel in a straight-ahead position, and check the wheel spokes to make sure they are correctly set in their specified positions.
2. Lightly turn the steering wheel to the left and right to determine the point where front wheels start to move.
   Measure the distance of the movement of steering wheel (periphery).
   Steering wheel free play:
   0 — 17 mm (0 — 0.67 in)



(1) Steering wheel free play

   Move the steering wheel toward the shaft to check if there is play in the direction.
   Play limit:
   0.5 mm (0.020 in)
3. Drive the vehicle and check the following items.
   (1) Steering force:
   The effort required for steering should be smooth and even at all points, and should not vary.
   (2) Pulled to one side:
   Steering wheel should not be pulled to one side while driving on a level surface.
   (3) Wheel runout:
   Steering wheel should not show any sign of runout.
   (4) Return status:
   Steering wheel should return to its original position after it has been turned and then released.

2. STEERING SHAFT JOINT

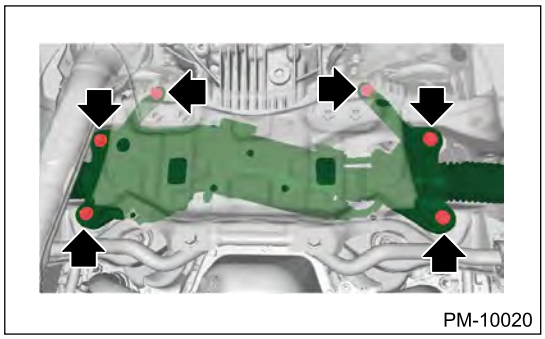
If steering wheel play is excessive, disconnect the universal joint of steering shaft and then check the play where the joints cross and yawing torque. Also, check the seal for damage or serrations for wear. If the joint is loose, retighten the mounting bolts to the specified torque. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint.

Tightening torque:
24 N·m (2.4 kgf-m, 17.4 ft-lb)

3. GEARBOX

1. Set the steering wheel in the straight position, then rotate it 90° in both the left and right directions.
   While steering wheel is being rotated, check the looseness of the gearbox.
   Tightening torque:

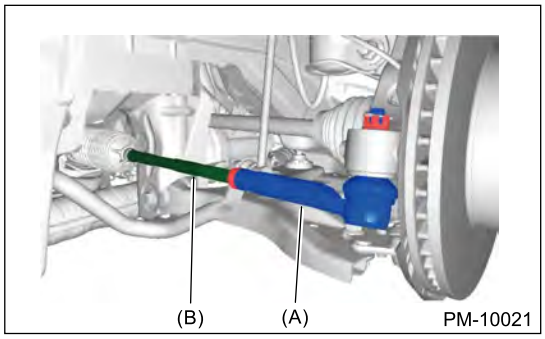
60 N·m (6.1 kgf-m, 44.3 ft-lb)



2. Check the boot for damage, cracks or deterioration.
3. With the vehicle stopped on a level surface, quickly turn the steering wheel to the left and right. While steering wheel is being rotated, check the gear backlash. If any noise is noticed, adjust the gear backlash. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox>ADJUSTMENT > GEARBOX BACKLASH ADJUSTMENT.

4. TIE-ROD

1. Check the tie-rod and tie-rod end for bend, cracks or other damages.



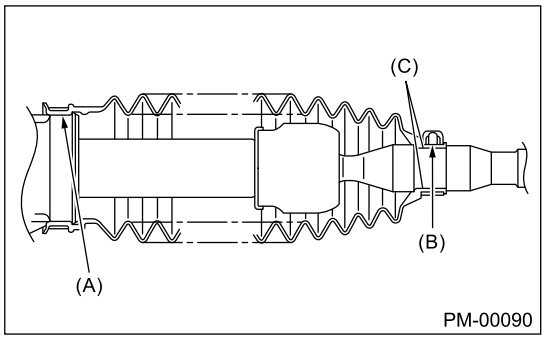
(A) Tie-rod end
(B) Tie-rod

2. Confirm that the connections of knuckle ball joints for play, and then check for damage on dust boots and free play of ball studs. If castle nut is loose, retighten it to the specified torque, then tighten further up to a maximum of 60° until the cotter pin hole is aligned.
   Tightening torque:
   27 N·m (2.75 kgf-m, 19.9 ft-lb)
3. Check the tightening of tie-rod end lock nut. If it is loose, tighten it to the specified torque.
   Tightening torque:
   85 N·m (8.7 kgf-m, 62.7 ft-lb)

5. GEARBOX BOOTS

Inspect both sides of the gearbox boot as follows, and correct the defects if necessary.

1. The (A) and (B) positions of the gearbox boot are fitted in (A) and (C) grooves of gearbox and the rod.
2. Clips are fitted onto the boot grooves to the positions (A) and (B) of the boot.
3. Check that there is no cracks or holes in the boot.
   Note:
   Rotate (B) position of gearbox boot against the torsion produced by the adjustment of toe-in etc. Apply grease to the groove (C).



6. MOUNTING BOLT

Inspect the bracket mounting bolts for looseness, and retighten them if necessary.

7. CHECK HARNESS

Check the harness of the electric power steering for cracks or damages.
Replace the harness or electric power steering gear box with a new part if necessary.

8. CHECK POWER STEERING CONTROL MODULE

Check for the electric power steering diagnostic trouble codes. If the diagnostic trouble code is detected, perform the diagnosis. Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
Replace the electric power steering gear box with a new part if necessary.

REPLACEMENT

Refer to “AIR CONDITIONER” section for A/C filter replacement. Ref. to AIR CONDITIONER>A/C Filter>REPLACEMENT.

PRE-DELIVERY INSPECTION

PI

1. Pre-delivery Inspection

GENERAL DESCRIPTION

The purposes of the pre-delivery inspection (PDI) are as follows.

- Remove the vehicle protective parts for transportation.
- Check that the vehicle or parts before delivery are not damaged during transportation or storage.
- Check that the vehicle after repair is normal.
- Make sure to provide a complete vehicle to customer.

For above reasons, SOA service centers must carry out the PDIs before delivery of vehicle.
Besides, all SOA service center and PDI center check the condition of all vehicles to make sure to take responsibility.

PRE-DELIVERY INSPECTION

PRE-DELIVERY INSPECTION (PDI) PROCEDURE

Perform the procedures indicated in the table below.

Static checks just after vehicle receipt

Item	Check point
1. Appearance	1. If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents. If the protective coating has been removed, visually check the painted body surfaces in detail for damage or rust. 2. Visually check the glass and light lenses for any damage, cracks or excessive gaps between body sheet metal. 3. Visually check the plated parts for any damage. 4. Check the instrument panel, console and trim for stains or dirt.
2. Tire	1. Check the tires for damage, defective, and dents on wheels. 2. Check the tire air pressure.
3. Fuse installation	If the vehicle is about to be delivered to customer, attach a back-up fuse.
4. Door lock/unlock and open/close operations	1. Using the key, check the door can be locked or unlocked normally. 2. Open and close all doors to check that there are no problems. 3. Operate the power door lock switch to check that all doors and the rear gate lock and unlock normally.
5. Child safety lock	Check the child safety lock system operates normally.
6. Trunk lid open/close operations	1. Operate the trunk lock release lever to check that the trunk lid opens normally. 2. Open and close the trunk lid to check that there are no problems.

Item	Check point
7. Rear gate lock/unlock and open/close operation	1. Check if the rear gate can be unlocked normally through the emergency hole. 2. Open and close the rear gate to check that there are no problems. 3. Operate the power door lock switch to check that all doors and the rear gate lock and unlock normally.
8. Operation check of trunk lid release lever	Operate the trunk lid release lever to check that the trunk lock is unlocked normally.
9. Fuel lid opener lock release lever	Operate the fuel lid opener to check that the fuel filler lid can be unlocked normally.
10. Accessory	Check that the following accessories are equipped. • Owner’s manual • Warranty booklet • Maintenance note • Spare key • Key No. plate • Jack • Tool set • Spare tire or puncture repair kit • Towing hook
11. Front hood lock release	Operate the front hood lock release lever to check that the front hood opens normally.
12. Battery	Check the battery for any abnormal conditions such as rust or traces of battery fluid leaks.
13. Brake fluid	Check the brake fluid amount.
14. Engine oil	Check the engine oil amount.
15. Transmission gear oil	Check that the transmission gear oil level is normal.
16. CVTF	Check for leakage of CVTF.
17. CVT front differential oil	Check for leakage of CVT front differential oil.
18. Rear differential gear oil	Check for leakage of gear oil from the rear differential.
19. Engine coolant	Check the engine coolant level.
20. Clutch fluid	Check the clutch fluid amount.
21. Window washer fluid	Check the window washer fluid amount.
22. Front hood latch	Check that the front hood is closed normally and locked securely.
23. Keyless entry system	Check that the keyless entry system operates normally.
24. Keyless access system	Check that the keyless access system operates normally.
25. Alarm system	Check that the alarm system operates normally.
26. Seat	1. Check the seat surfaces for stains or dirt. 2. Check the seat installation conditions and functionality.
27. Seat belt	1. Check the seat belt installation conditions and functionality. 2. Check the seat belt warning system operates normally.

Item	Check point
28. TPMS (U.S. model)	If the display of TPMS warning light does not operate normally, perform the diagnosis by referring to TPMS (Diagnosis).

Checks with the engine running

Item	Check point
29. Grommet installation	Install the grommet provided in the SPACER CTR or HOLDER ASSY JACK to the tie-down hole. (When equipped)
30. Delivery (test) mode	Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.
31. Immobilizer system	1. Check that the engine starts with all keys that are equipped on vehicle. 2. Check that the security indicator light operates normally.
32. Push button start	Using the access key that is equipped on vehicle, operate the push button start function to check engine start and stop operations.
33. Starting condition	Start the engine and check that the engine starts smoothly.
34. Exhaust system	Check that the exhaust noise is normal and no leaks are found.
35. Indicator and warning lights	Check that all indicator lights and warning lights are operating correctly.
36. Heater & ventilation	Check that the heater & ventilation system operates normally.
37. Air conditioner	Check that the air conditioner operates normally.
38. Multi-function display (MFD)	Check that the Multi-Function Display (MFD) function operates normally.
39. Audio	Check the radio and AUX operate normally.
40. Navigation	Check the navigation and AUX operate normally.
41. Telematics system	Check that the indicator light on the overhead console or on the stereo camera cover assembly goes off.
42. Accessory power supply socket	Check that the accessory power supply socket operates normally.
43. Lighting system	Check that the lighting system operates normally.
44. Illumination control	Check that the illumination control operates normally.
45. Window washer system	Check that the window washer system operates normally.
46. Wiper system	Check that the wiper system operates normally.
47. Wiper deicer	Check that the wiper deicer operates normally.
48. Power window	Check that the power window operates normally.
49. Sunroof	Check that the sunroof operates normally.
50. Rear defogger system	Check that the rear defogger system operates normally.
51. Door mirror	Check that the remote control mirror and heated mirror operate normally.
52. Room mirror	Check that the automatic anti-glare function operates normally.

Item	Check point
53. Steering heater	Check that the steering heater operates normally.
54. Blind Spot Detection / Rear Cross Traffic Alert (BSD/RCTA)	1. Press the BSD/RCTA OFF switch several times to check that the system is activated and deactivated correctly. 2. Check the rear bumper around the sensor for dirt, scratch, affixed stickers and poor paint coating.
55. Reverse Automatic Braking (RAB)	1. Check that the RAB system is activated and deactivated correctly. 2. Check the sonar sensor installed on the rear bumper for parts missing, dirt, scratch, foreign objects, etc.
56. Diagnostic trouble code (DTC) check	Check that the diagnostic trouble code (DTC) is not detected.

Dynamic test with the vehicle running

Item	Check point
57. Brake test	Check the foot brake for normal operations.
58. Parking brake	Check that the parking brake operates normally.
59. Shift control	Check that the shift patterns are correct.
60. Cruise control	Check that the cruise control system operates normally.
61. Subaru EyeSight	Check that the Subaru EyeSight operates normally.

Checks after dynamic test

Item	Check point
62. Power steering system (electric power steering model)	Check the steering warning light operation.
63. Fluid leakage	Check for fluid/oil leaks.
64. Water leak test	Spray the vehicle with water and check for water leaks.
65. Appearance 2	1. Remove the protective coating (if equipped). 2. Check the body paints for damage and stain. 3. Check the plated parts for damage and rust.

1. APPEARANCE

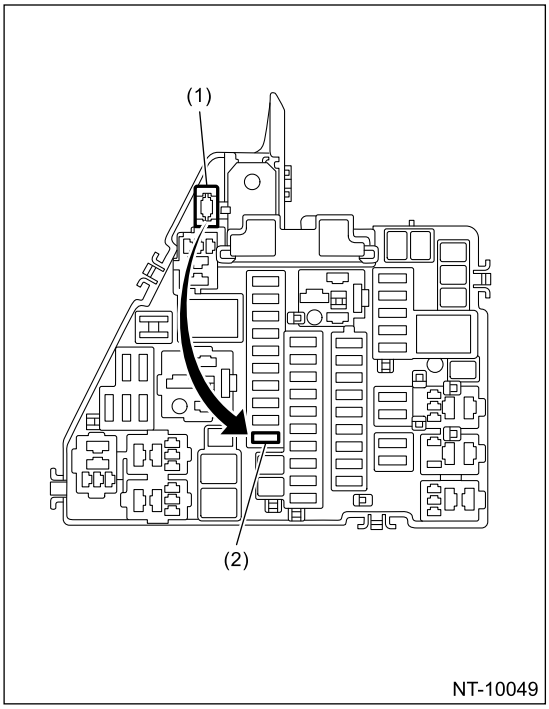
- If the vehicle is covered with protective coating, visually check the vehicle body for damage and dents.
- When there is no protective coating, check the body paints for damage or stains in detail and repair as necessary.
- Check the window glass, door glass, and lights for any cracks or damage, and replace as necessary.
- Visually check the plated parts, such as the grilles and door knobs, for damage or loss of gloss and replace the parts as necessary.
- Check the instrument panel, console and trim for stains or dirt.
- Check the keyless key or access key for dirt, and wipe off if necessary.

2. TIRES

- Check the tires for damage, defective, and dents on wheels.
- Check the tire size, spare tire and tire air pressure described on the tire air pressure label (driver’s side).

3. FUSE INSTALLATION

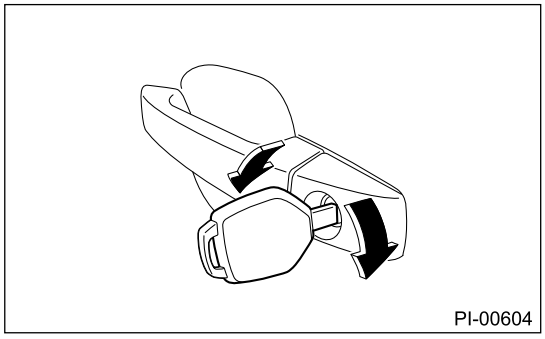
Backup fuse (30 A) remains removed to prevent the battery consumption when vehicles are delivered. Install the backup fuse by following the illustration. Besides, removing the backup fuse from the fuse holder deactivates the control during shipping (delivery mode).



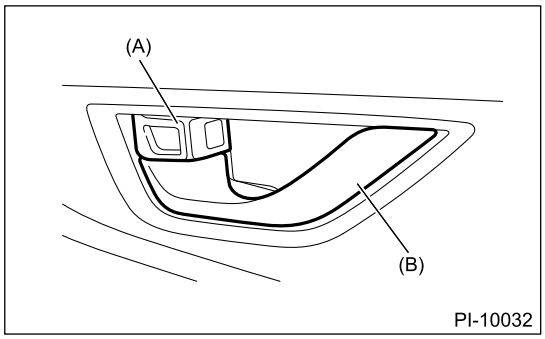
(1) Backup fuse holder
(2) Backup fuse inlet

4. LOCK/UNLOCK AND OPEN/CLOSE OPERATION OF DOORS

1. Using the key, lock and unlock the door several times to check for normal operation. Open and close the door several times for smooth movement.



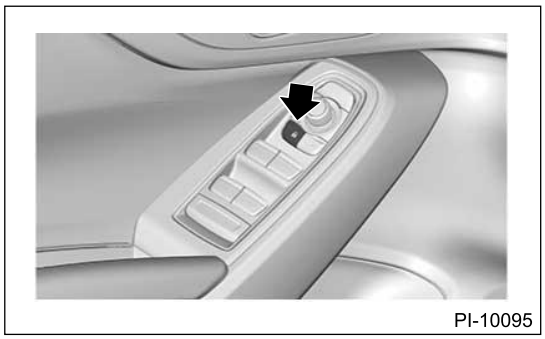
2. Completely close the driver's door, and then check the smooth movement with operating door lock knob from lock to unlock several times. Set the door lock knob (A) to lock position. Then pull the inner remote (B) to ensure that doors will not open.
   For other doors, place the door lock knob (A) to lock position and then pull the inner remote (B) to ensure that doors will not open.



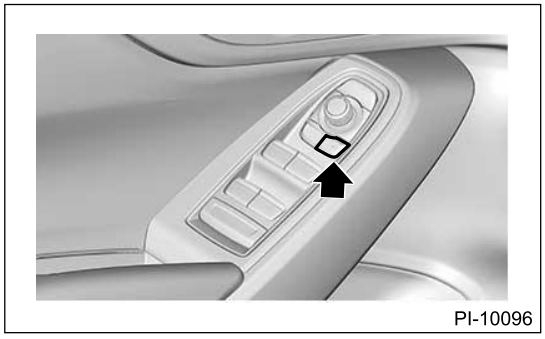
(A) Door lock knob

(B) Inner remote

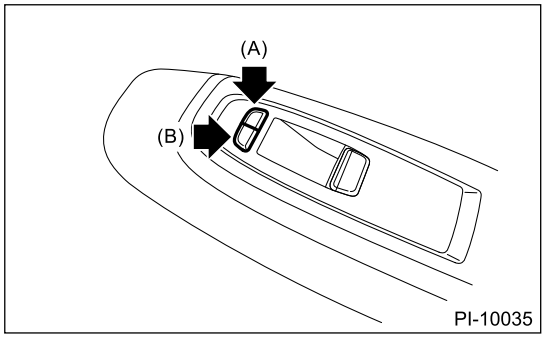
3. Close all the doors, and then press the lock on power door lock switch at driver's side. Check that all doors (including the rear gate) lock.



4. Press the driver's side power door lock switch to unlock side. Check that all doors including rear gate are unlocked.



5. Check that the passenger's power door lock switch locks and unlocks normally in the same manner.



(A) Lock

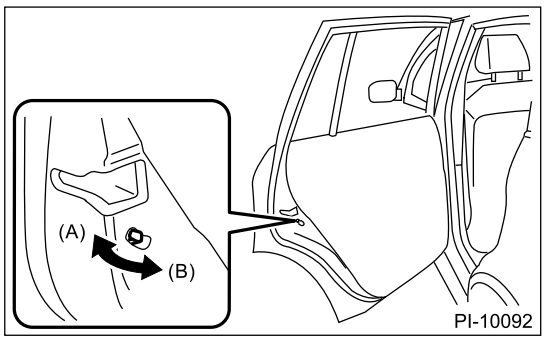
(B) Unlock

6. Insert the key to ignition switch, and open the driver's side door. Press lock on power door lock.

Check that the door is not locked.

5. CHILD SAFETY LOCK

1. Set the child safety lock lever on both rear doors to the lock position.
2. Close the rear doors completely.
3. Check that the lock levers of the rear doors are in the unlock position. Then, pull inner remote of rear doors to ensure that doors will not open.
4. Pull the outer handles of rear doors to ensure that doors will open.



(A) Unlock

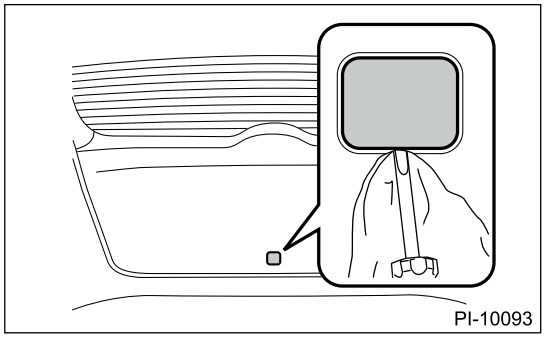
(B) Lock

6. TRUNK LID OPEN/CLOSE OPERATIONS

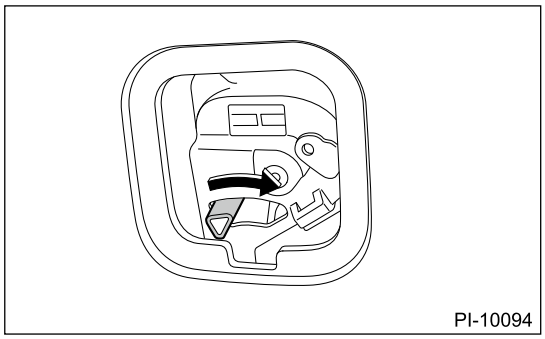
1. Operate the trunk lock release lever to check that the trunk lid opens.
2. Open and close the trunk lid several times for smooth movement.

7. REAR GATE LOCK/UNLOCK AND OPEN/CLOSE OPERATIONS

1. Open and close the rear gate several times for smooth movement.
2. Operate the rear gate emergency release lever to check that the rear gate can be locked and unlocked properly.
   (1) Remove the cover inside the rear gate.



(2) Operate the lever using a tool such as a screwdriver to check that the rear gate is unlocked normally.

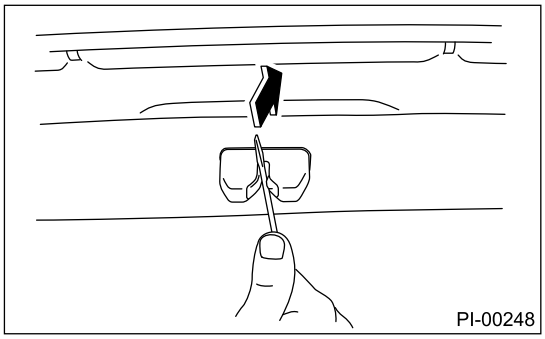


8. OPERATION CHECK OF TRUNK LID RELEASE HANDLE

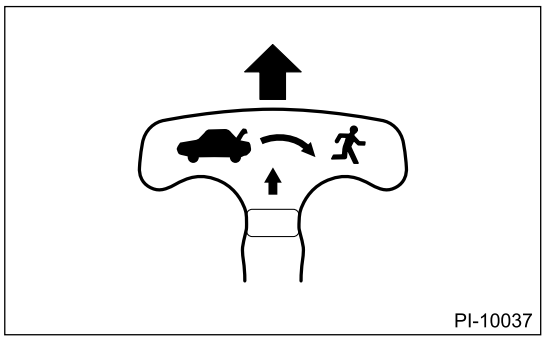
Caution:

Do not check the trunk lid release handle when in the trunk. If the trunk lid release handle is defective, you may be trapped in.

1. Use a flat tip screwdriver. Slide the screwdriver blade from the slit aperture of the lock assembly fully to the end until you hear a click. This places the latch in the locked position.



2. Make sure the latch is released by pulling the yellow trunk lid release handle in the direction of arrow.



9. FUEL LID OPENER LOCK RELEASE LEVER

Operate the fuel lid lock release lever to check that the fuel lid is unlocked normally. Check that the filler cap is securely closed.

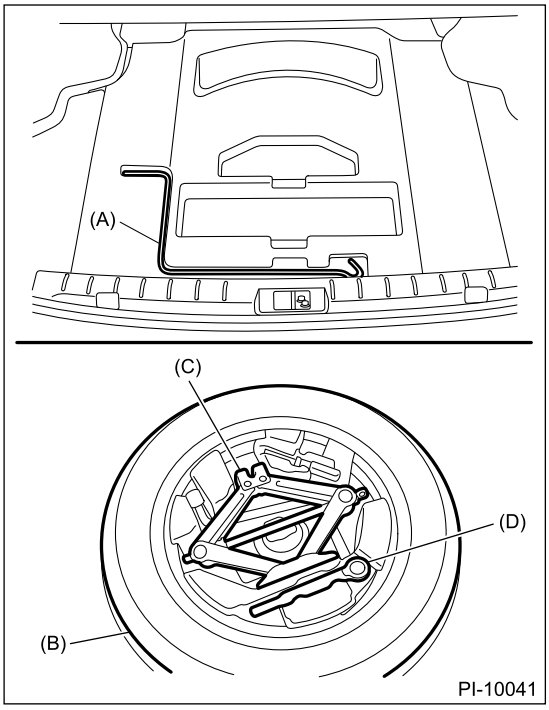
10. ACCESSORY

Check that the following accessories are provided.

- Owner’s manual
- Warranty booklet
- Maintenance note
- Spare key
- Key No. plate

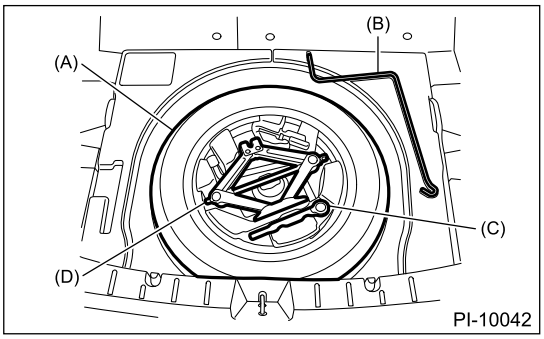
- Jack
- Tool set
- Spare tire or puncture repair kit
- Towing hook (eyebolt)

4 door



(A) Jack handle
(B) Spare tire
(C) Jack
(D) Towing hook (eyebolt)

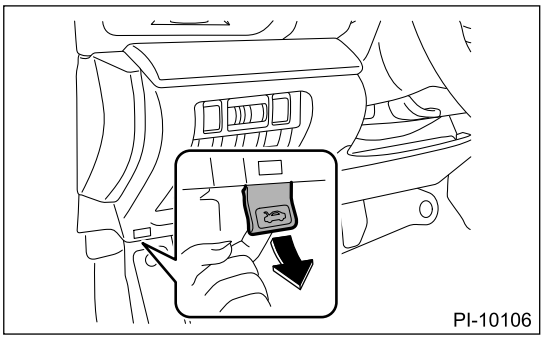
5 door



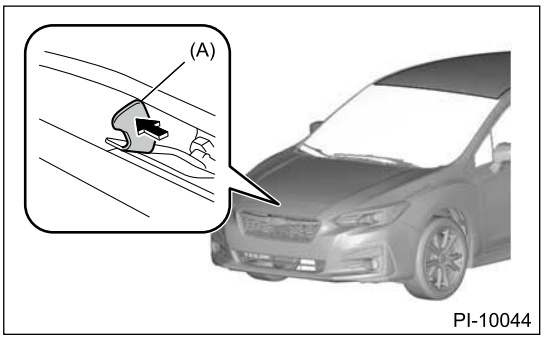
(A) Spare tire
(B) Jack handle
(C) Towing hook (eyebolt)
(D) Jack

11. FRONT HOOD LOCK RELEASE

Operate the front hood release lever to check that the front hood is unlocked normally.

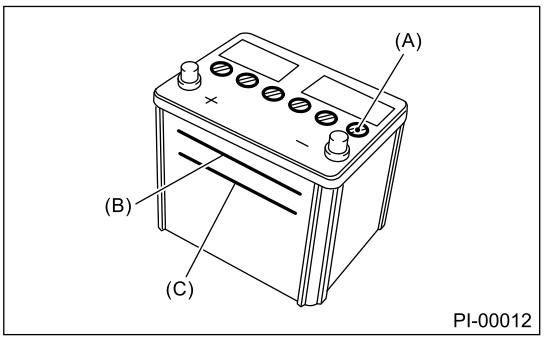


Operate the lever (A) and check that the front hood is opened normally.



12. BATTERY

Check the battery terminals to make sure that there are no rust or corrosion due to fluid leaks. Check that the battery caps are securely tightened.



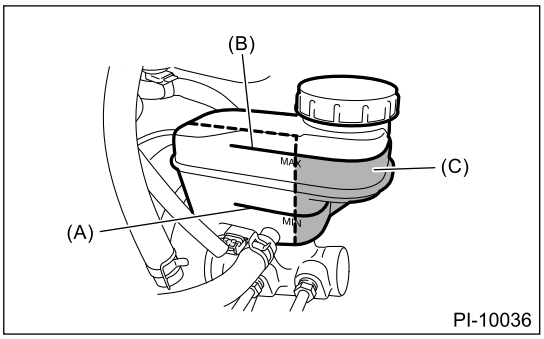
(A) Cap
(B) Upper level
(C) Lower level

13. BRAKE FLUID

Caution:

- **If the brake fluid is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.**
- **Always check the level using the specified direction because there is a partition in the reservoir tank.**

Check that the brake fluid level is normal from a straight view or within 90° to the right and left forward. If the amount is insufficient, carry out a brake line test to identify brake fluid leaks and check the brake operation. After that, refill the brake fluid tank with the specified type of fluid.



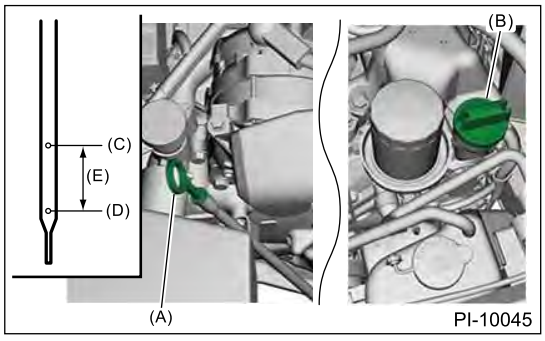
(A) MIN. level
(B) MAX. level
(C) Brake fluid

14. ENGINE OIL

1. Park the vehicle on a level surface.
2. Remove the oil level gauge and wipe away the oil.
3. Reinsert the oil level gauge all the way. Be sure that the oil level gauge is correctly inserted and properly orientated.
4. Pull out the oil level gauge again, and check both sides of the oil level gauge. Use a lower side to determine the engine oil level. If the engine oil level is below "L" line, add oil to bring the level up to "F" line.
5. Start the engine, and spread the oil in engine room.
6. After turning off the engine, wait a few minutes for the oil to return to the oil pan before checking the oil level.

Note:

To prevent overfilling of engine oil, do not add oil above "F" line when the engine is cold.



(A) Engine oil level gauge
(B) Engine oil filler cap
(C) "F" line
(D) "L" line
(E) Approx. 1 L (1.1 US qt, 0.9 Imp qt)

15. TRANSMISSION GEAR OIL

Check the transmission gear oil amount. If the amount of gear oil is insufficient, check for leaks. Then, add the necessary amount of the specified gear oil. For transmission gear oil inspection, refer to "MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)" section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>INSPECTION.

16. CVTF

Check for leakage of CVTF.

Caution:

If the CVTF is spilt over exhaust pipe, wipe it off completely with cloth to avoid emitting smoke or causing a fire.

17. CVT FRONT DIFFERENTIAL OIL

Check for leakage of CVT front differential gear oil.

Caution:

If gear oil is spilt over the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.

18. REAR DIFFERENTIAL GEAR OIL

Check for leakage of gear oil from the rear differential.

Caution:

If the rear differential gear oil is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

19. ENGINE COOLANT

Check the coolant amount on the reservoir. If the amount of engine coolant is insufficient, check that no leaks are found. Then, add the necessary amount of coolant with the specified concentration.

Caution:

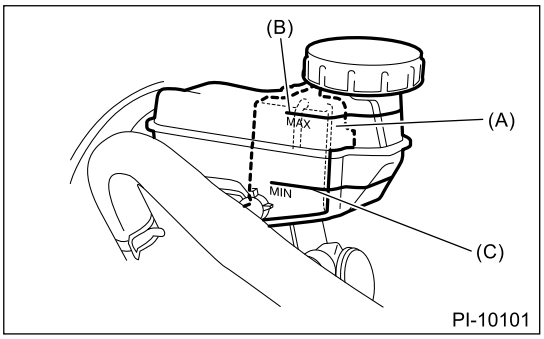
If the coolant is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

20. CLUTCH FLUID

Caution:

- **If any clutch fluid is spilt on the exhaust pipe, wipe it off with a cloth to avoid emitting smoke or causing a fire.**
- **This reservoir tank has the brake fluid chamber and the clutch fluid chamber. When checking the fluid level, always check the fluid from the clutch fluid chamber side where the tank hose is connected.**

Check that the clutch fluid level is normal. If the amount of fluid is insufficient, check that no leaks are found. Then, add the necessary amount of specified fluid.



(A) Clutch fluid chamber

(B) MAX. level

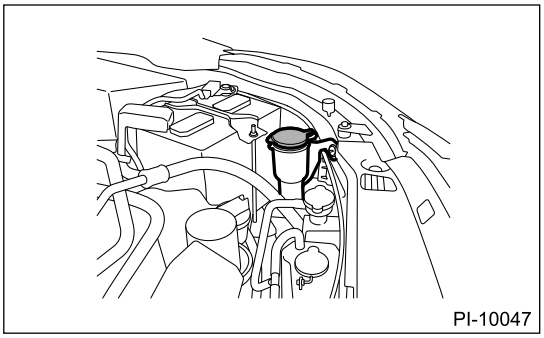
(C) MIN. level

21. WINDOW WASHER FLUID

Check the window washer fluid amount. If the amount of washer fluid is insufficient, check that no leaks are found. Then, add the necessary amount of washer fluid.

Note:

If there is the vibration, water comes into the layer of air in the washer tank and the water level may drop. This is not a malfunction.



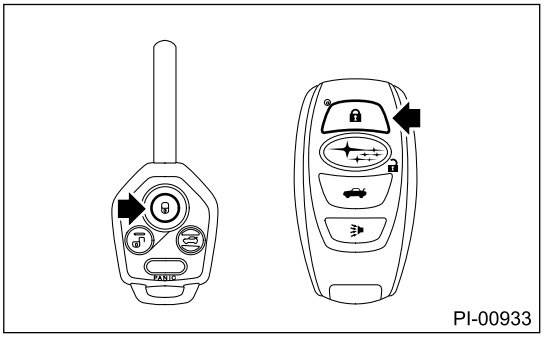
22. FRONT HOOD LATCH

Close the front hood. Check that the front hood is completely latched.

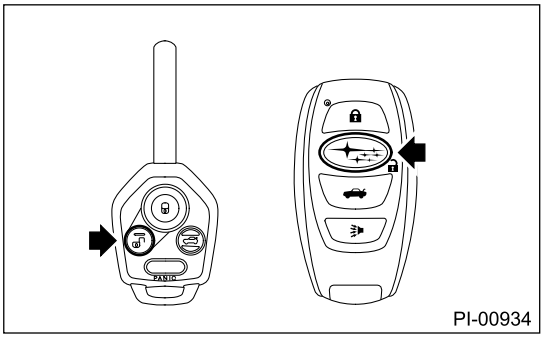
23. KEYLESS ENTRY SYSTEM

Check the keyless entry system operations as follows:

- Fully open all the door windows.
- Remove the key from the ignition switch and close all the doors including rear gate.
- Press the “LOCK” button momentarily on the keyless transmitter. Check that all the doors become locked, the buzzer sounds once, and the hazard lights flash once.

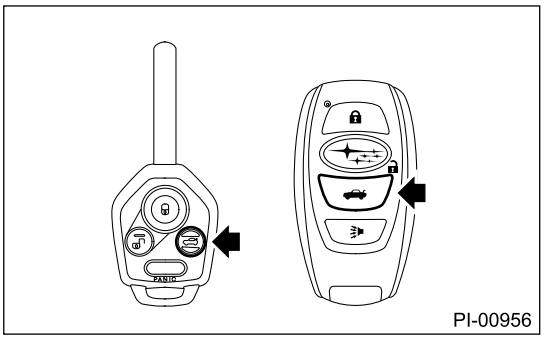


- Press the “UNLOCK” button momentarily on the keyless transmitter. Check that the driver’s door is unlocked, the buzzer sounds twice, and the hazard lights flash twice.
- Within 5 seconds, press the “UNLOCK” button momentarily on the keyless transmitter. Check that all doors (including rear gate) are unlocked, the buzzer sounds twice, and the hazard lights flash twice.

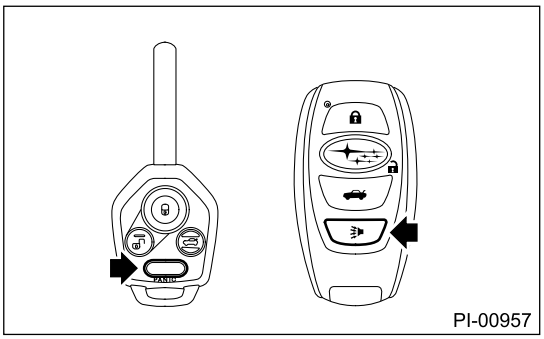


- Lock all the doors including rear gate. Check that the buzzer sounds twice, and the hazard lights flash twice, when the trunk open button is pressed to unlock the rear gate. Press the rear gate

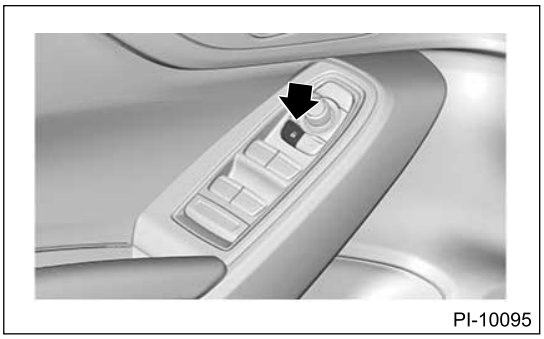
opener button and check that the rear gate opens. (Wagon model)
- Check that the buzzer sounds twice, and the hazard lights flash twice, when the trunk open button is held down to unlock the trunk lid. (Sedan model)



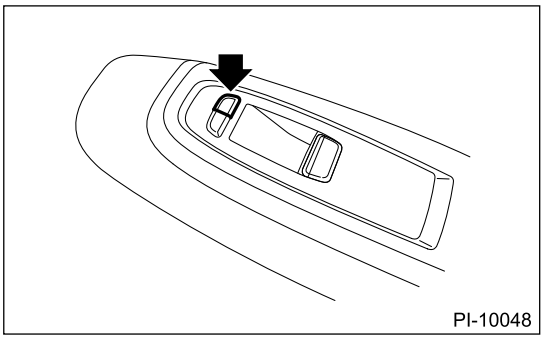
- Press the “PANIC” button of the keyless transmitter. Check that the panic mode (the horn keeps sounding) is initiated. Also, check that this condition continues for 30 seconds or until when any of the buttons on the keyless transmitter are pressed.



- Press the “LOCK” button momentarily on the keyless transmitter with one of the doors (including the rear gate) open. Check that the buzzer sounds 5 times, and the hazard light flashes 5 times to notify the door not being fully closed. Next, close all the doors including rear gate. Check if all doors are locked and buzzer sounds once and the hazard light flashes once.
- With one of the doors open (including the rear gate), press the “LOCK” side of the power door lock switch. Next, close all the doors including rear gate. Check if all doors are locked and buzzer sounds once and the hazard light flashes once.
  - Driver’s side



  - Passenger’s side



Alarm sound operational check

- The system uses the buzzer and sounds the alarm when the door is locked or unlocked. The alarm sound can be turned OFF. To turn the alarm sound from ON to OFF, close all doors, (with the key not inserted in the key cylinder), hold down the “UNLOCK” side of the power door lock switch and insert the key in the key cylinder. Within 10 seconds, insert and take out the key for 5 times or more, and within 10 seconds after that, open and close the driver’s door. With the door closed, the hazard light will flash 3 times, indicating that the alarm sound has been turned OFF. To turn the alarm sound from OFF to ON, perform this procedure again. The hazard light will flash 3 times, indicating that the alarm has been turned ON.

24. KEYLESS ACCESS SYSTEM

Caution:

- **When performing the check, check one access key at a time, separating individual keys.**
- **Do not leave any separated access keys in the vehicle.**

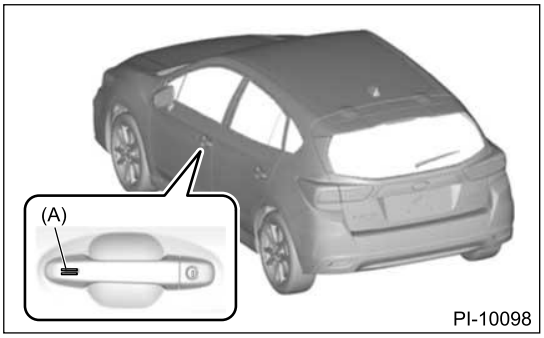
Note:

The following inspections show the initial settings. When the settings are different from the initial settings, use Subaru Select Monitor to check the details of each setting for inspections. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>LIST.

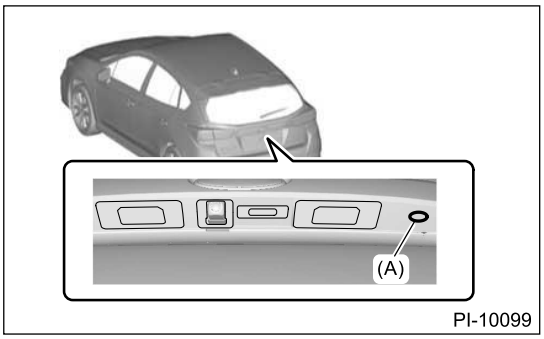
- While carrying the access key, check that the room light illuminates when you move close to the front door handles of the vehicle whose doors are all locked.
- While carrying the access key, check that all doors and the rear gate are locked, and the hazard lights flash when you touch the touch sensor (lock) of the front door or press the rear lock button of the rear gate.

  Note:

  - **The hazard lights flash twice when unlocking.**
  - **The hazard lights flash once when locking.**

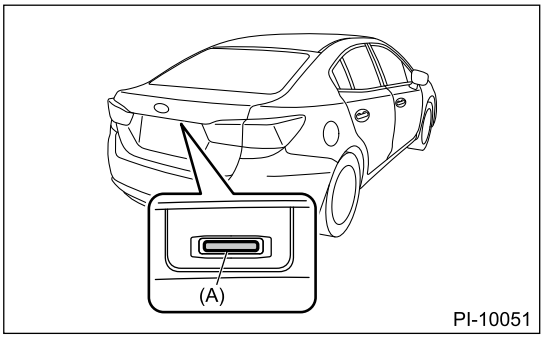


(A) Touch sensor (lock)



(A) Rear lock button

- While carrying the access key, check that the trunk unlocks and the hazard lights flash twice when you press the trunk opener button.

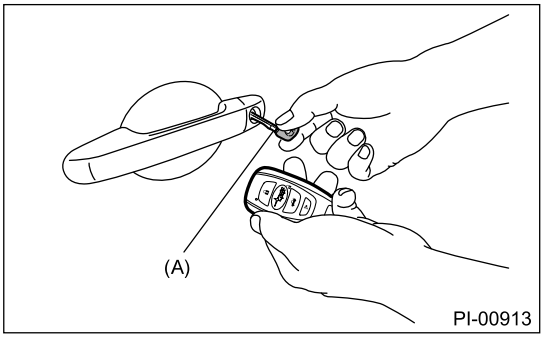


(A) Trunk opener button

- Manually operate the access key button to check the lock/unlock of doors and rear gate, and the flashing of hazard lights.
- Check the mechanical key attached to the access key can be used for locking/unlocking.

Caution:

The mechanical key is a single groove type. Insert the mechanical key with the groove side facing the front side of the vehicle.



(A) Mechanical key

- Check that the warning buzzer sounds and the door-lock does not operate, when the doors are closed with the access key left in the vehicle and the touch sensor (lock) on door is touched, or the rear lock button on rear gate is pressed.

Caution:

Remove the mechanical key from the access key and hold the mechanical key.

- With the access key in the trunk, check that the warning buzzer sounds and the trunk unlocks when you press the trunk opener button.

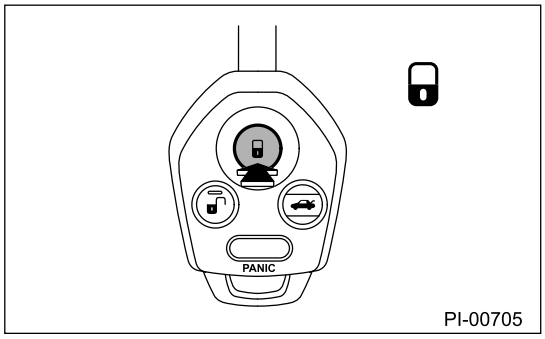
25. ALARM SYSTEM

MODEL WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START

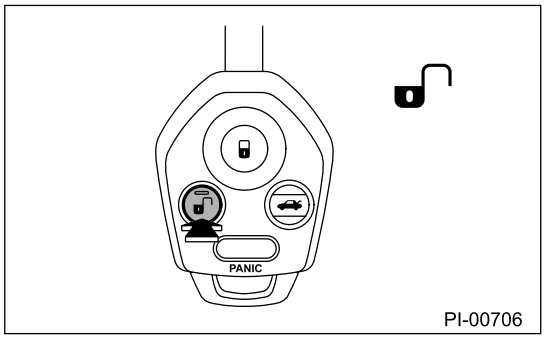
Note:

The following inspections show the initial settings. When the settings are different from the initial settings, use Subaru Select Monitor to check the details of each setting for inspections. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION.

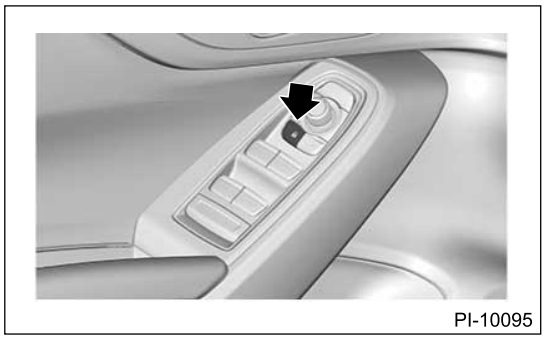
1. Fully open all the door windows.
2. Remove the key from the ignition switch and close all the doors including trunk and rear gate.
3. Press the "LOCK" button momentarily on the keyless transmitter. All doors are locked, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.



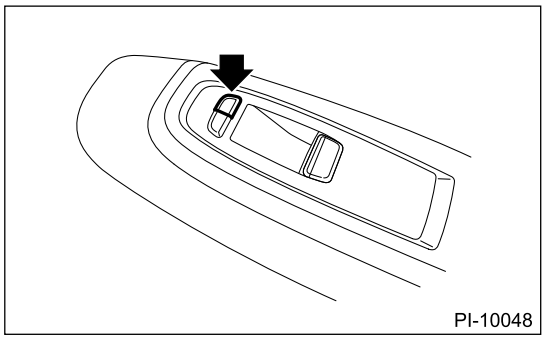
4. Press the "UNLOCK" button momentarily on the keyless transmitter. The door of the driver's seat is unlocked, the security indicator light blinks, and the alarm system is disarmed.



5. Press the "LOCK" button once on the keyless transmitter with one of the doors (including the rear gate) open. Check that the buzzer sounds 5 times to give the door not fully closed warning. However, when the "LOCK" button on the keyless transmitter is pressed with the trunk open, the door not fully closed warning with the buzzer sounds 5 times is not performed. The doors are locked when all doors (including the trunk and rear gate) are closed, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.
6. Press the "UNLOCK" button momentarily on the keyless transmitter. The door of the driver's seat is unlocked, the security indicator blinks, and the alarm system is disarmed.
7. With one of the doors open (including the trunk and rear gate), press the "LOCK" side of the power door lock switch. The doors are locked when all doors (including the trunk and rear gate) are closed, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.
   - Driver's side


PI-10095

- Passenger’s side

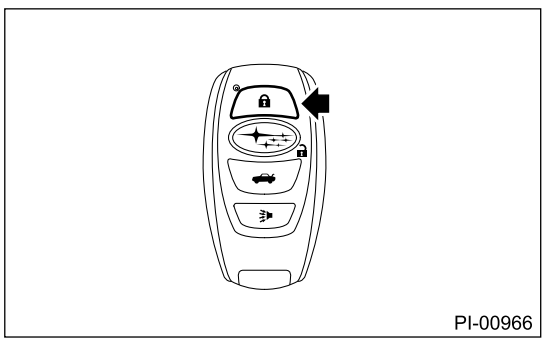

PI-10048

8. Unlock a door using the inner lock knob or the key and open the door while the security system is in the set mode. Check if the alarm condition occurs (horn sounds continuously, hazard light blinks, security indicator light illuminates). Check if this condition lasts until any button of the keyless transmitter is pressed or until the ignition switch is turned to IGN ON after inserting the key into the ignition switch.
   Note:
   The alarm sounds for three minutes with the door open.
9. When none of above is applicable, perform troubleshooting for the security system.

MODEL WITH KEYLESS ACCESS WITH PUSH BUTTON START

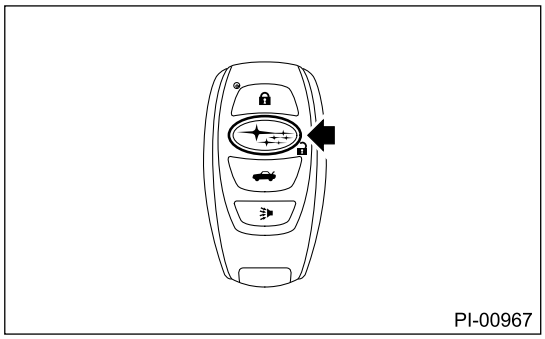
Note:
The following inspections show the initial settings. When the settings are different from the initial settings, use Subaru Select Monitor to check the details of each setting for inspections. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION.

1. Fully open all the door windows.
2. Close all the doors and rear gate.
3. Press the “LOCK” button momentarily on the access key. All doors are locked, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.

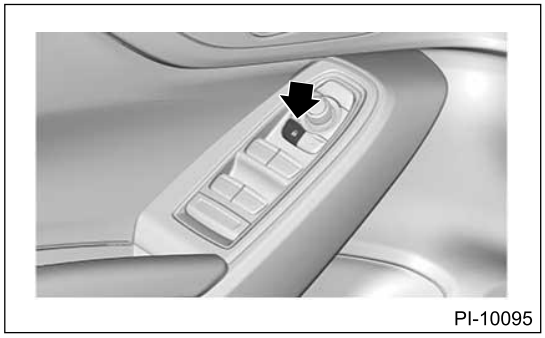

PI-00966

4. Press the “UNLOCK” button momentarily on the access key. The door of the driver’s seat is

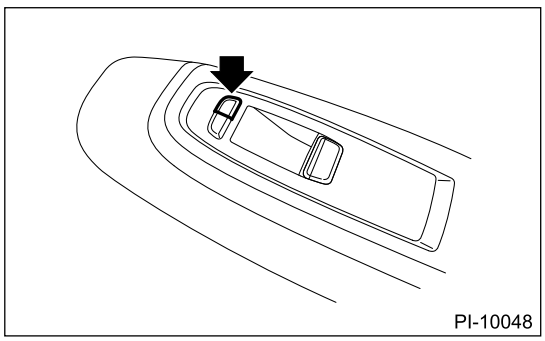
unlocked, the security indicator light blinks, and the alarm system is disarmed.



5. Press the “LOCK” button once on the access key with one of the doors (including the rear gate) open. Check that the buzzer sounds 5 times to give the door not fully closed warning. However, when the “LOCK” button on the keyless transmitter is pressed with the trunk open, the door not fully closed warning with the buzzer sounds 5 times is not performed. The doors are locked when all doors (including the trunk and rear gate) are closed, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.
6. Press the “UNLOCK” button momentarily on the access key. The door of the driver’s seat is unlocked, the security indicator blinks, and the alarm system is disarmed.
7. With one of the doors open (including the trunk and rear gate), press the “LOCK” side of the power door lock switch. The doors are locked when all doors (including the trunk and rear gate) are closed, and the security indicator light blinks faster for 30 seconds and blinks slowly twice repeatedly, then the alarm system is in set condition.
   - Driver’s side



   - Passenger’s side



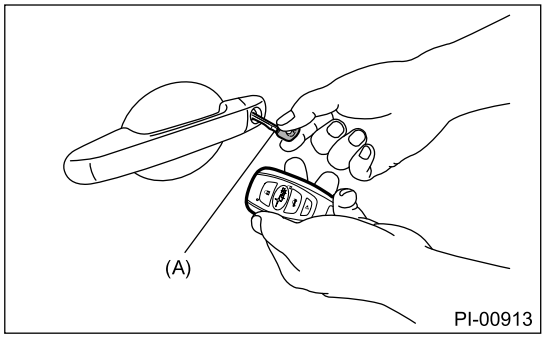
8. Unlock a door using the mechanical key and open the door while the security system is in the set mode. Check if the alarm condition occurs (horn sounds continuously, hazard light blinks, security indicator light illuminates). Check if this condition lasts until any button on the access key is pressed or until the ignition switch is turned to ACC.

Caution:

The mechanical key is a single groove type. Insert the mechanical key with the groove side facing the front side of the vehicle.

Note:

The alarm sounds for three minutes with the door open.



(A) Mechanical key

9. When none of above is applicable, perform troubleshooting for the security system.

26. SEAT

1. Check the seat surfaces for stains or dirt.
2. Check that each seat provides full functionality in sliding, reclining, and lifter. Check all available functions of the rear seat such as backrest tilt knob.
3. Check the passenger's seat occupant detection system.
   (1) Empty the passenger's seat and turn the ignition switch to ON.
   (2) Check that the passenger airbag ON/OFF indicator lights both turn on simultaneously for approximately six seconds, and after turning off for two seconds, only the OFF light illuminates.



4. With a person weighing approximately 70 kg (155 lb) or more sitting in the passenger's seat, check whether the ON light of the passenger's airbag ON/OFF indicator illuminates or not.
5. Have the passenger get out of the passenger's seat, and check whether the OFF light of the passenger side airbag ON/OFF indicator illuminates.

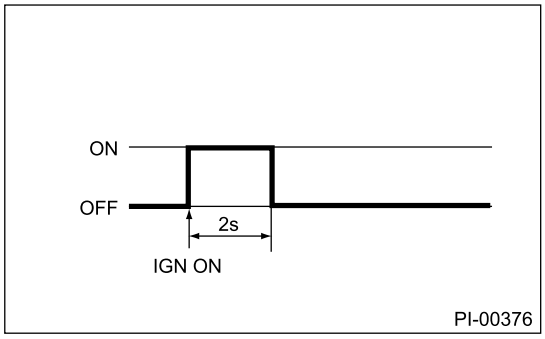
27. SEAT BELT

1. Check installation condition of seat belt.
2. Pull out the seat belt and then release it. Check that the belt retracts smoothly.
3. Check seat belt warning function.
   (1) Turn the ignition switch to ON with the driver's and passenger's seat belt detached.
   (2) Check the driver's and passenger's seat belt warning light blink for approx. 6 seconds and the buzzer sounds intermittently.
   (3) Then, check the seat belt warning light illuminates and blinks repeatedly at a cycle of approx.

15 seconds. (If no passenger is on the passenger's seat, the seat belt warning light on passenger's seat does not operate.)

28. TPMS (U.S. MODEL)

1. Turn the ignition switch to ON, and check TPMS warning light for normal operation.
   - Normal operation (IG ON (light check))



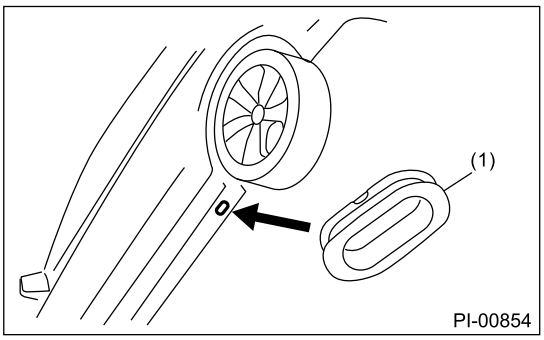
2. If the TPMS warning light display does not operate normally, check and repair the system. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Basic Diagnostic Procedure.

29. GROMMET INSTALLATION

Install the grommet provided in the SPACER CTR or HOLDER ASSY JACK to the tie-down hole.

Caution:

Make sure that the tie-down hole is firmly plugged with the grommet. Otherwise, dust, smell, etc. may come into the passenger compartment indirectly from the rear quarter, via the side sill from the tie-down hole.



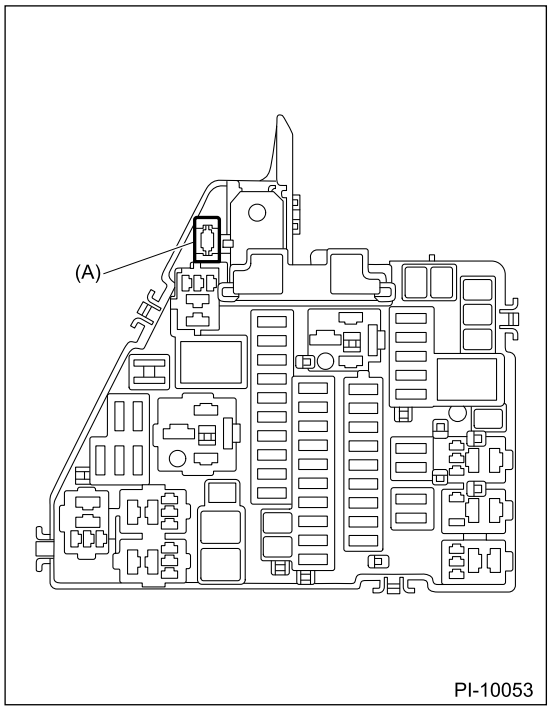
(1) Grommet

30. DELIVERY (TEST) MODE

1. Install the delivery (test) mode fuse with ignition switch to OFF.

   Caution:

   Do not use any fuses that are installed on the vehicle.



(A) DELIVERY (TEST) MODE FUSE

2. Turn the ignition switch to ON and check that the malfunction indicator light starts blinking.
3. If the malfunction indicator light blinks, return the ignition key to LOCK.
4. Remove the delivery (test) mode fuse and attach it to the spare fuse holder provided on the fuse box cover.
5. Then, turn the ignition key to ON again.
6. Make sure that the malfunction indicator light is off. If the malfunction indicator light blinks, carry out an engine diagnosis.

31. IMMOBILIZER SYSTEM

1. Check that the engine starts with all keys that are equipped on vehicle.
2. Check that the security indicator light blinks in 60 seconds after turning the ignition switch from ON to ACC or to OFF, and immediately after removing the key. (Models without the keyless access with push button start)
3. Immediately after turning ignition switch from ON to OFF, and immediately after opening/closing a door while the ignition switch is in ON or ACC with the engine stopped and the access key is outside the vehicle, check that the security indicator light is blinking. (Model with keyless access with push button start)

   Note:

   If malfunctions occur, refer to "IMMOBILIZER (DIAGNOSTICS)". **Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.**

32. PUSH BUTTON START FUNCTION

1. Get into the vehicle while carrying the access key, with the vehicle in P range and the brake pedal OFF, and check that it cycles through ACC → IGN ON → IGN OFF every time the push button ignition switch is pressed, and that the indicator light for the push button ignition switch is illuminated in orange when the ignition switch is in the ACC and IGN ON positions.
2. Get into the vehicle while carrying the access key, with the vehicle in P range and the brake pedal ON, check that the indicator light for the push button ignition switch is illuminated in green.

Note:

While the select lever button is being pressed, the indicator light of the push button ignition switch does not illuminate in green even if the shift position is in the P range.

3. Get into the vehicle while carrying the access key, with the vehicle in P range and the brake pedal ON, check that the engine starts when you press the push button ignition switch.
4. With the vehicle stopped, the engine running and in P range, check that the engine stops when you press the push button ignition switch.
5. With the vehicle stopped, the engine running and in N range, check that the engine stops when you press the push button ignition switch, and cycles through ACC → IGN ON each time you press the push button ignition switch.

33. STARTING CONDITION

Start the engine and check that the engine starts smoothly. If the battery voltage is low, recharge or replace the battery. If any noises are observed, immediately stop the engine and check and repair the abnormal components.

34. EXHAUST

Listen to the exhaust noise to see if no noises are observed. Check that no leaks are found.

35. INDICATOR AND WARNING LIGHTS

Check that all indicator lights and warning lights are operating correctly.

36. HEATER & VENTILATION

Operate the heater & ventilation system to check for normal airflow outlet control, air inlet control, airflow capacity and heating performance.

37. AIR CONDITIONER

Operate the air conditioner. Check that the A/C compressor operates normally and enough cooling is provided.

Note:

To prevent the insufficient lubrication of the air conditioner, operate the air conditioner for five minutes at idling.

38. MULTI FUNCTION DISPLAY (MFD)

Check that the Multi-Function Display (MFD) function operates normally.

39. AUDIO

1. Check if the AM/FM radio broadcasting can be heard.
2. Check that all the radio functions work properly and the noise level is normal.
3. Check the CD and AUX for normal operation.
4. Check that the AUX is installed into the console without looseness.
5. Check that the rearview camera operates normally.

40. NAVIGATION SYSTEM

1. Check all display functions for normal operation. (Refer to the operation manual.)
2. Check that the navigation system operates normally.
3. Check the radio, CD (DVD) player and AUX for normal operation.
4. Check that the AUX is installed into the console without looseness.

5. Check that the rearview camera operates normally.

41. TELEMATICS SYSTEM

Check that the indicator light on the overhead console or on the stereo camera cover assembly goes off.

42. ACCESSORY POWER SUPPLY SOCKET

- Check the operation of the front accessory power supply socket.
- Check operation of the accessory power supply socket in console box.

43. LIGHTING

1. Check the headlight operations. When pulling out the key, check if the headlight illuminates by turning the headlight switch from OFF to ON.
2. Check the stop light operation.
3. Check other lights for normal operations.

44. ILLUMINATION CONTROL

Check that the illumination control operates normally.

45. WINDOW WASHER SYSTEM

Check that the window washer system injects washer fluid to the specified area of the windshield and rear window glass. Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>ADJUSTMENT > NOZZLE - WINDSHIELD WASHER. Ref. to WIPER AND WASHER SYSTEMS>Rear Washer>INSPECTION > INSPECTING THE SPRAY POSITION.

46. WIPER SYSTEM

Check the front and rear wipers for normal operations.

47. WIPER DEICER

Check that the wiper deicer operates normally.

Note:

When an ambient temperature is 5°C or more, wiper deicer operation is cancelled. Press the switch for 3 seconds or more to perform the compulsory operation.

48. POWER WINDOW

- Operate the power window switches one by one to check that each of the power windows goes up and down without noises.
- Check AUTO UP/AUTO DOWN operate properly by operating the power window switch on driver's and passenger's seat sides.

Caution:

If battery has been removed, AUTO UP does not operate properly because initialized. In this case, perform the initial setting (reset A) and check AUTO UP operates properly.

Note:

Check the power window if the door glass of the driver's seat does not open/close automatically. Ref. to POWER WINDOW(DIAGNOSTICS) >Basic Diagnostic Procedure.

49. SUNROOF

Check that the sunroof operates normally.

50. REAR DEFOGGER SYSTEM

Press the rear defogger switch and check that the light inside the switch is activated for approx. 15 minutes and the rear defogger automatically turns to OFF.

51. DOOR MIRROR

- Check that the remote control mirror operates normally.
- Check that the heated mirror operates normally.

52. ROOM MIRROR

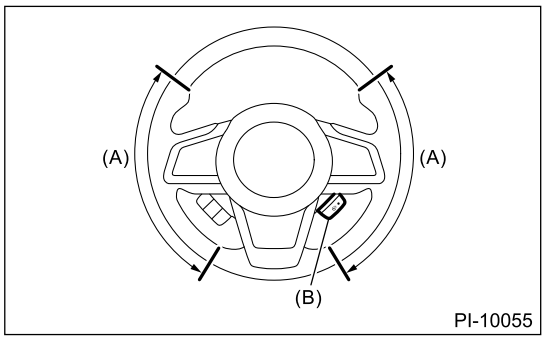
Check that the automatic anti-glare function operates normally.

53. STEERING HEATER

Note:

Perform the inspection when the temperature around the steering wheel is 40°C or less.

1. Turn the heater switch to ON, and check that the indicator light illuminates.
2. Check if the heater area of the steering wheel becomes warm.
   The heater may not operate if the temperature of the steering wheel or in its peripheral area is approx. 40°C or more. This is because of a temperature control function, and therefore is not a malfunction.

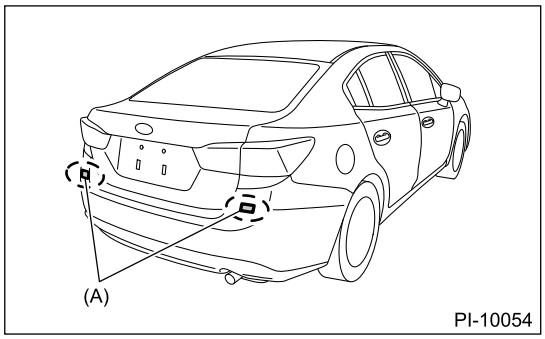


(A) Heater area

(B) Heater switch

54. BLIND SPOT DETECTION / REAR CROSS TRAFFIC ALERT (BSD/RCTA)

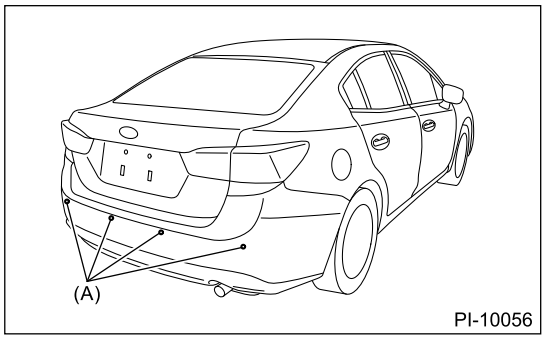
1. Check that the BSD/RCTA system is activated and deactivated correctly.
   (1) Press the BSD/RCTA OFF switch to check that "BSD/RCTA OFF" is displayed in the combination meter.
   (2) Press the BSD/RCTA OFF switch again to check that the indicators of the right and left side door mirrors illuminate → go off and "BSD/RCTA OFF" is displayed in the combination meter.
   (3) Check that the BSD/RCTA error message is not displayed.
2. Check the rear bumper around the radar sensor for dirt, scratch, affixed stickers and poor paint coating.
   - If any dirt is found, clean it off so that the rear bumper is not damaged.
   - If any stickers are affixed, remove it so that the rear bumper is not damaged.
   - If the bumper is damaged or has poor paint coating, refer to "CAUTION" in "Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)". Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>General Description>CAUTION.



(A) Radar sensor

55. REVERSE AUTOMATIC BRAKING (RAB)

1. Check that the RAB system is activated and deactivated correctly.
   (1) Start the engine and let the engine idle for 6 seconds or more, and then shift the select lever to "R" range.
   (2) Check that "RAB" and "RAB OFF" turn off in the combination meter.
   (3) Check that the RAB warning is displayed on the rearview camera screen of the navigation system and "RAB" and "P△" indicators illuminate in green.
   (4) Select "RAB" displayed on the screen, and check that "RAB OFF" is displayed in the combination meter when "RAB OFF/ON" is switched and "RAB OFF" is conducted.
   (5) Select "P△" displayed on the screen, and check that "P△ OFF/ON" can be switched.
2. Check the sonar sensor installed on the rear bumper for parts missing, dirt, scratch, foreign objects, etc.
   - The sensor surface must not stick out or sink in at 0.5 mm or more from the rear bumper surface.
     If the sensor surface largely sinks in, the sensor may not engaged in the holder behind the bumper. In this case, check the installation condition of the sensor after removing the bumper.
   - Make sure that there are no foreign objects (tape, stickers, dust or dirt) on the sonar sensor surface.
     If there is a layer of foreign objects on the sensor surface, remove completely so that no residue remains.



(A) Sonar sensor

56. DIAGNOSTIC TROUBLE CODE (DTC) CHECK

Read the diagnostic trouble code and check that the diagnostic trouble code is not detected.
If any diagnostic trouble code is detected, clear all.

1. Read Diagnostic Trouble Code

Note:
For detailed operation procedures, refer to "Application help".

2. Clear Memory Mode

Note:
For detailed operation procedures, refer to "Application help".

57. BRAKE TEST

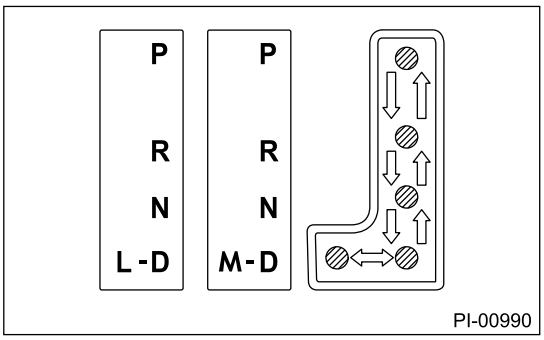
Check the foot brake for normal operations.

58. PARKING BRAKE

Check that the parking brake operates normally. When pulling the parking brake lever with a force of 200 N (20 kgf, 45 lb), check that the lever stroke of parking brake lever is 7 to 8 notches.

59. SHIFT CONTROL

- **CVT MODEL**
  1. Turn the ignition switch to ON.
  2. While brake pedal is not depressed, check if the select lever does not move from "P" range.
  3. While brake pedal is depressed, check if the select lever moves from "P" range.
  4. Set the select lever to other than "P" range.
  5. When the ignition switch is turned to OFF, check if the ignition key switch cannot be removed.
  6. Set the selector lever to each gear position and check the shifting while driving the vehicle. Operate the paddle shift at manual mode and check the shifting while driving the vehicle.



Selector position	Gear position						
	1st	2nd	3rd	4th	5th	6th	7th
D	Continuously variable speed change						
Manual mode	OK	OK	OK	OK	OK	OK	OK

  7. Set the select lever to other than "P" range. (Models without the keyless access with push button start)
  8. When the ignition switch is turned to OFF, check if the ignition key switch cannot be removed. (Models without the keyless access with push button start)

- **MT model**
  Check for smooth operation to each position.

60. CRUISE CONTROL

Operate the cruise control system. Check that the system is activated and deactivated correctly. (In the delivery mode, the cruise control does not operate, even when the cruise control switch is pressed.)

61. SUBARU EYESIGHT

- Operate the EyeSight system. Check that the system is activated and deactivated correctly.
- Check the stereo camera cover opening for foreign matter.
- Check the glass in front of stereo camera for dirt and stickers.
- Check the lens and filter of the stereo camera for dirt such as fingerprints.
- Check the filter at lens portion of stereo camera for damage.
- According to the "CAUTION" section, check the windshield glass and dashboard in front of stereo camera to make sure that no aftermarket part is adhered or attached in the prohibited area. Ref. to CAUTION > CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT.
- When delivering the vehicle, explain to the customer to make sure not to touch the filter at lens portion of the stereo camera.

62. POWER STEERING SYSTEM (ELECTRIC POWER STEERING MODEL)

Check that the electric power steering warning light illuminates when the ignition switch is turned to ON, and that the electric power steering warning light goes off after the engine is started.

63. FLUID LEAKAGE

Check entire areas of the vehicle for any trace of engine coolant/engine oil/transmission fluid leaks.

64. WATER LEAK TEST

Spray the vehicle with water using a hose and check that no water enters the passenger compartment.

- Before performing the water leakage test, remove anything that may obstruct the operation or which must be kept dry.
- Close all the windows and doors securely. Close the front hood, trunk lid and rear gate before starting the test.
- Connect a hose to a tap, and spray water on the vehicle. The rate of water spray must be approx. 20 — 25 L (5.3 — 6.6 US gal, 4.4 — 5.5 Imp gal) per minute.
  When spraying water on areas adjacent to the floor and wheel house, increase the pressure. When spraying water on areas other than the floor and wheel house, decrease the pressure. But the force of water must be made strong occasionally by pressing the end of the hose.
  Note:
  Be sure to keep the hose at least 10 cm (3.9 in) away from vehicle.

Check the following areas.

- Front window and body framework mating portion
- Door mating portions
- Glass mating portions
- Rear quarter window mating portions
- Rear window and body framework mating portion
- Around roof drips

If any dampness in the compartments is discovered after the water has been applied, carefully check all the areas that may have possibly contributed to the leak.

65. APPEARANCE 2

1. If protective coating (wrap guard) is applied, remove it.

Note:

- **When removing the wrap guard, using steam will make it easier to remove.**
- **Vehicle left for a extended periods or at low temperatures, spray the vehicle with water heated 50 — 60°C (122 — 140°F) to raise the surface temperature before peeling off the wrap guard. Do not use the water heated to over 60°C (140°F).**
- **If the adhesive remains exist on the coated surface, soak a flannel rag, etc. with a small amount of coating wax or solvent such as oil benzene and IPA, put the soaked cloth on the remains lightly, and then wipe them off with a flannel rag etc.**
- **Keep solvent from touching the resin or rubber parts. Do not use coating wax or solvents while the component surface temperature is hot due to hot weather etc.**
- **If the coated surface is swollen out due to seams or moisture, expose the vehicle to the sunlight for a few hours or heat the seam and swollen portions using a dryer etc.**
- **Dispose of the peeled wrap guard as burnable industrial garbage.**

2. Check the whole vehicle body for flaking paint, damage by transportation, corrosion, dirt, cracks or blisters.

   Note:

   - **It is better to determine an inspection pattern in order to avoid missing an area, since the total inspection area is wide.**
   - **Do not repair the body paint unless absolutely necessary. Also, if the vehicle is in need of repair to remove scratches or corroded paint, the repair area must be limited to the minimum. Re-painting and spray painting must be avoided as much as possible.**

3. Check each window glass for scratches carefully. Slight damage may be removed by polishing with cerium oxide. (Fill a cup half with cerium oxide, and add warm water to it. Then agitate the content until it turns to wax. Apply this wax to a soft cloth, and polish the glass with it.)
4. Check each portion of the vehicle body and underside components for the formation of rust. If rust is discovered, remove it with sandpaper of #80 to #180 and treat the surface with rust preventive. After this treatment is completed, flush the portion thoroughly, and prepare the surface for repair painting.
5. Check each portion of body and all of the exterior parts for deformation or distortion. Also, check each light lens for cracks.
6. Peel the protective tape, vinyl wrapping and identification seal attached to the following places.
   - Seat
   - Door trim
   - Floor carpet
   - Side sill
   - Rear shelf
   - Aluminum pedal
   - Rear wiper
   - Door mirror
   - Handle - door outer
   - Cover - handle outer
   - Fuel opener lever
   - Instrument panel
   - Fog light

RECOMMENDED MATERIALS

RM

1. Recommended Materials

1. GENERAL

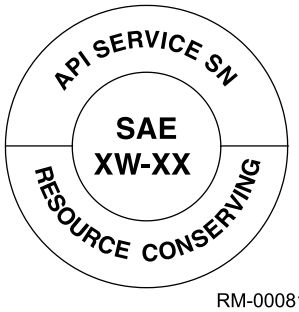
To insure the best performance, always use the specified oil, gasoline, adhesive, sealant, etc. or a substitute of equivalent quality.

2. FUEL

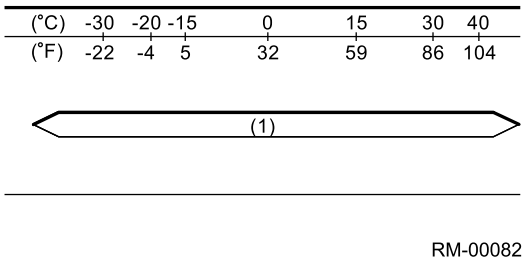
- Use unleaded gasoline because using leaded gasoline may cause a malfunction.
- Do not use the low quality gasoline, or improper fuel such as diesel fuel, fuel alcohol, or gasoline additive because they will adversely affect on engine components and fuel system components.
- Always use gasoline that is equivalent to that prescribed in the owner's manual or that of high octane value. There is the possibility of damaging or improper operation of the engine and fuel injection system if the specifications are not observed. Use the prescribed gasoline type to maintain proper vehicle performance.

3. LUBRICANT

Use the lubricants shown in the table below, or equivalent. See the table below to choose the correct SAE viscosity.

<table>
<tr><th rowspan="2">Lubricant</th><th colspan="2">Recommended materials</th></tr>
<tr><th colspan="2">Engine oil standard</th></tr>
<tr><td>Engine oil
Choose oil suitable for the standard from the right.</td><td>

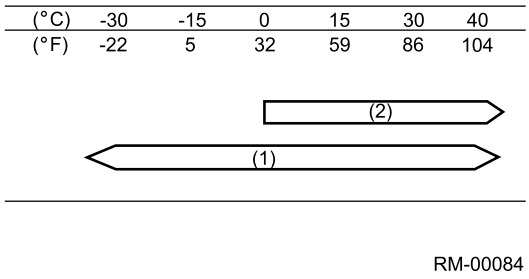
RM-00081
Those with SN "Resource Conserving" logo in case of API standard.</td><td>or


RM-00002
Those with GF-5 "starburst mark" displayed on top of the container in case of ILSAC standard.</td></tr>
<tr><td colspan="3">SAE viscosity No. and applicable temperature</td></tr>
<tr><td colspan="3">

RM-00082
(1) 0W-20 (synthetic oil) Specified</td></tr>
</table>

Lubricant	Recommended materials
	API standard

Lubricant	Recommended materials
	API standard
Rear differential gear oil (T type)*	GL-5
SAE viscosity No. and applicable temperature	



(1) 75W-90 (recommended)
(2) 90

*

Caution:

Do not mix two different kinds or makes of gear oil.

4. FLUID

Use the fluids specified in the table below. Do not mix two different kinds or makes of fluid.

Caution:

- **Be sure to use the recommended CVTF. Using material except recommended one would cause trouble.**
- **If an alternative transmission gear oil is used, you may not have expected functionality and performance.**

Fluid	Recommended materials	Item number	Alternative
Transmission fluid	SUBARU CVT FLUID LINEARTRONIC II	K0425Y0711	—
Transmission gear oil	SUBARU GEAR OIL EXTRA MT	—	GL-5 (75W-90)
CVT front differential gear oil	SUBARU GEAR OIL EXTRA MT	—	GL-5 (75W-90)
Rear differential gear oil (VA type)	SUBARU GEAR OIL EXTRA MT	—	GL-5 (75W-90)
Brake fluid and clutch fluid	FMVSS No. 116 DOT3 or DOT4	—	—

5. ENGINE COOLANT

Use genuine engine coolant to protect the engine.

Engine coolant	Recommended materials	Item number	Alternative
Coolant	SUBARU SUPER COOLANT (Concentrated type)	—	—

Engine coolant	Recommended materials	Item number	Alternative
	SUBARU SUPER COOLANT (Diluted type)	K0670Y0001	
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protective agent	Cooling system conditioner	SOA345001	—

6. REFRIGERANT

Standard air conditioners installed on this vehicle uses HFC134a refrigerant. Do not mix it with other refrigerants. Also, do not use air conditioner compressor oil other than ND-OIL8.

Air Conditioner	Recommended materials	Item number	Alternative
Refrigerant	HFC134a	—	—
Compressor oil	ND-OIL8	—	—

7. GREASE

Use grease and supplementary lubricants shown in the table below.

Grease	Application point	Application point	Recommended materials (item No.)	Alternative
Supplementary lubricants	Exhaust	Oxygen sensor	Spray type lubricant (004301003)	—
Grease	MT	MT main shaft (spline parts)	NICHIMOLY N-130	—
		MT main shaft (oil seal lip)		
		Transfer driven gear (front roller bearing, rear roller bearing)		
		Clutch operating cylinder		
		Clutch release bearing (inner circumference)		
		Clutch release lever		
		Clutch master cylinder push rod	SILICONE GREASE G-40M	—
		Gear shift lever	NIGTIGHT LYW No. 2 grease	—
		Clutch pedal		
	Brake	MT brake pedal		
		CVT brake pedal	Multemp TAS No.2	—
		Clevis pin connecting the operating rod and brake pedal	Shell Gadus S2 V220	—
	CVT	Select lever	Multemp D	—
	Door	Door latch	SILICONE GREASE G-30M (004404002)	—

Grease	Application point	Application point	Recommended materials (item No.)	Alternative
		Door striker		
	Steering	Steering gearbox (rack and pinion)	Multemp AC-P	—
		Steering gearbox (boot and tie-rod installation parts)	SILICONE GREASE G-40M	—
	Brake	Disc brake (lock pin, guide pin)	NIGLUBE RX-2 (000041000)	—
		Brake pad clip	Molykote M7439	—
		Between front brake pad and shim	Molykote AS-880N (K0777YA010)	—
		Between rear brake pad and shim	WAKO grease V160	—
		Brake shoe (parking brake)	Molykote 44MA	—
	Drive shaft	Front axle AAR	One-Luber GKN-C	—
		Front axle AC	Olistamoly 2LN584/Lo	—
		Front axle PTJ	NKG302	—
		Front axle EBJ	NKG814	—
		Rear axle EBJ		
		Rear axle DOJ		
		Rear axle BJ		—
		Rear axle DOJ		

8. ADHESIVE

Use the adhesives shown in the table below, or equivalent.

Adhesive	Application point	Application point	Recommended materials	Alternative
Adhesive	Glass and body	Windshield glass, rear window glass, rear quarter glass, rear gate glass and body	• Dow Automotive's adhesive: ESSEX U-400HV or the equivalent • Glass primer: U-401 and U-402 • Painted surface primer: U-413	—

9. SEAL MATERIAL

Use the seal material shown in the table below, or an alternative.

Seal material	Application point	Application point	Recommended materials (item No.)	Alternative
Seal material	Engine	Oil pressure switch	THREE BOND 1324 (004403042)	—
		PCV valve	THREE BOND 1217G	—

Seal material	Application point		Application point	Recommended materials (item No.)	Alternative
			Engine oil pan	(K0877Y0100), THREE BOND 1217H	
			Separator cover		
			Camshaft cap		
			Cylinder block		
			Rocker cover		
			Chain cover		
			Oil pan upper		
			Cylinder head		
			Cylinder head gasket		
			Camshaft carrier		
			Camshaft bearing cap		
	MT		MT transmission case	THREE BOND 1215B	DOW CORNING No. 7038, THREE BOND 1215 (004403007)
			MT transfer case		
	CVT		CVT extension case		
			CVT transmission case		
			CVT drive pinion retainer		
			CVT oil pump chain cover		
			Transmission oil pan	THREE BOND 1217B (K0877YA020)	—
	Steering		Steering adjusting screw	THREE BOND 1324G	—
	Door	Front	Sealing cover	3M Butyl Tape 8626	—
		Rear			
	Rear differential	VA-type	Drive pinion shaft and self-locking nut (seating face)	THREE BOND 1324 (004403042)	—
			Hypoid driven gear bolt		
		T-type	Drive pinion shaft and self-locking nut (seating face)		
			Hypoid driven gear bolt		
			Filler plug, drain plug	THREE BOND 1105 (004403010)	DOW CORNING No. 7038
			Side retainer bolt	THREE BOND 1110F	THREE BOND 1110B

REPAIR CONTENTS

RC

1. Repair Contents

NOTE

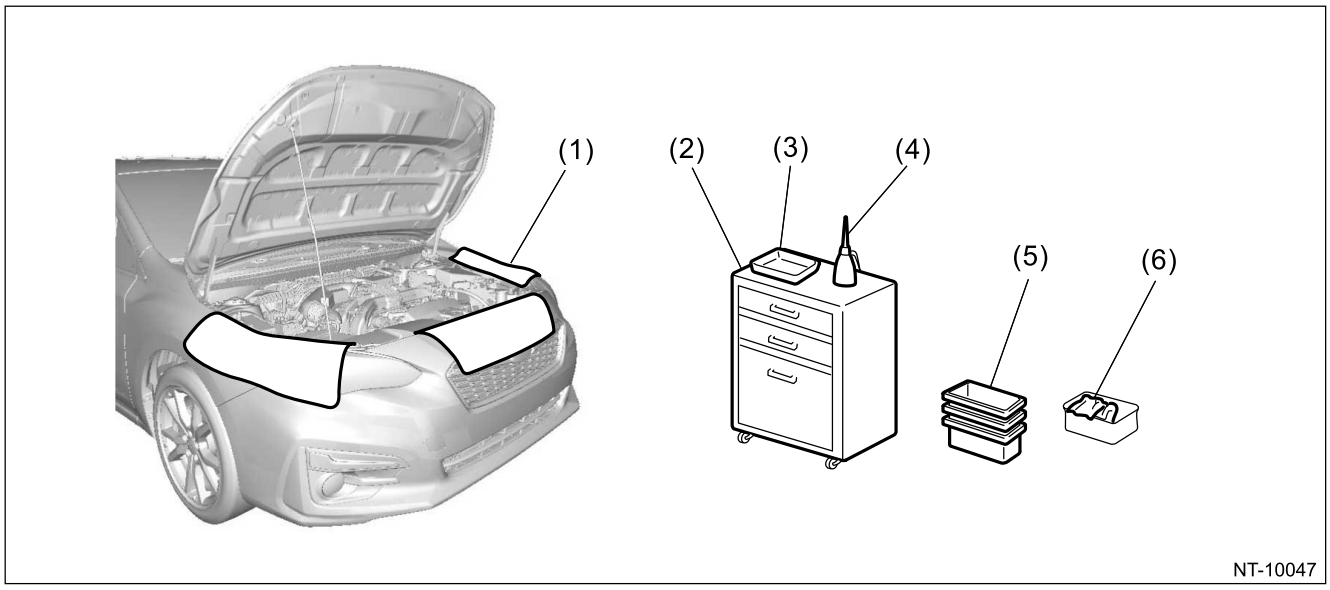
This section describes basic points that the service operator must understand before performing the service operation.

1. APPEARANCE

- Always wear clean work clothing.
- Wear a cap and protective shoes.

2. PROTECTION OF VEHICLE UNDER MAINTENANCE AND PREPARATION OF TOOLS/EQUIPMENT

- Before work, cover the vehicle body. (Ex. grille cover, fender cover, seat cover and floor mat cover)
- Before performing the service operation, prepare tools, equipment, container box, grease and cloth etc.



(1) Fender cover
(2) Tools/equipment case
(3) Tray
(4) Oil
(5) Container box
(6) Cloth

3. SAFETY

- Before work, set the wheel stoppers to secure the vehicle.
- When performing work by multiple workers, call to each other to make sure that service operation is performed safely.
- Ventilate the room when starting the engine.
- When performing the service operation of high-temperature parts like muffler, or rotating parts like fan and other movable parts, be careful not to get burned or injured.
- For the jack-up and lift up, set the tool to the proper location to support the vehicle correctly. And use the safety device properly when lifting up.

4. SERVICE OPERATION

- By identifying the vehicle problems thoroughly before work, service operation will be performed effectively.
- Before removing parts, confirm the installation condition or the damage of the parts.
- To reinstall parts properly, leave a note of the condition before work as necessary.
- For a part which needs positioning, take appropriate action such as putting alignment marks.

- For a removed part, clean it as necessary and check for damage and defect before installation. If a part is damaged or does not work properly, replace it with a new part.
- Removing or installing the components or the connectors with the ignition switch ON will electrically impair them.
- Reconnect the harness connectors for each control module one or more minutes after disconnecting them.
- For installation of the bolt, nut, and screws, use tools suitable for each dimension, and use them vertically and securely.

5. SERVICE PARTS

- A removed part must be organized to avoid mixing up with similar parts. When same parts are used in multiple locations, such as pistons in engine, manage the parts by using labels with cylinder No. so that the parts are not installed to the wrong location.
- Always replace nonreusable parts such as gasket and O-ring with new parts.
- After work, have a customer confirm the replaced part.
- Use genuine parts for maximum performance and maintenance when conducting repairs. Subaru/FHI will not be responsible for poor performance resulting from the use of parts except for genuine parts.

6. SETTING OPERATION FOR PARTS REPLACEMENT, REMOVAL/INSTALLATION

Operation list

Main replacement part / operation	Necessary operation	Phenomenon when not performed / disabled function	Reference
• TCM • Transmission assembly • Control valve body assembly	1. Transmission learning value initialization 2. Transmission learning operation	• Abrupt engine increase • Excessive shift shock	Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control>PROCEDURE.
• VDC control module and hydraulic control unit (VDCCM&H/U) • Steering angle sensor • Steering column assembly • Steering gearbox assembly • Steering wheel assembly • Universal joint assembly • Front wheel alignment adjustment • For others, refer to the operation instructions for each part.	1. VDC sensor midpoint setting 2. Parameter selection and registration (when replacing VDCCM&H/U)	• VDC system does not operate normally (Warning light illuminates) • Difference of steering effort between right and left • EyeSight does not operate normally	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE.

Main replacement part / operation	Necessary operation	Phenomenon when not performed / disabled function	Reference
• Rear vehicle height sensor • Auto headlight beam leveler CM	1. Auto headlight beam leveler system initialization/reinitialization	• AUTO HEADLIGHT BEAM LEVELER SYSTEM	Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.
• Regulator & motor assembly - front (RH, LH) • Glass assembly - front door (RH, LH), sash assembly - partition (RH, LH) or sash assembly lower (RH, LH) • Weather strip body side flange front (RH, LH)	1. Power window system initialization	• Door glass automatic open/close function • Auto-reverse function • Operation after key OFF (IG OFF)	Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION.

Note:

For settings or other procedures for immobilizer related part, refer to "REGISTRATION MANUAL FOR IMMOBILIZER".

7. BATTERY

- **ACTIONS TO TAKE AFTER REMOVING BATTERY OR DISCONNECTING GROUND TERMINAL**

  When removing the battery or disconnecting the battery terminal, always be sure to turn the ignition switch to OFF and disconnect the battery ground terminal first.

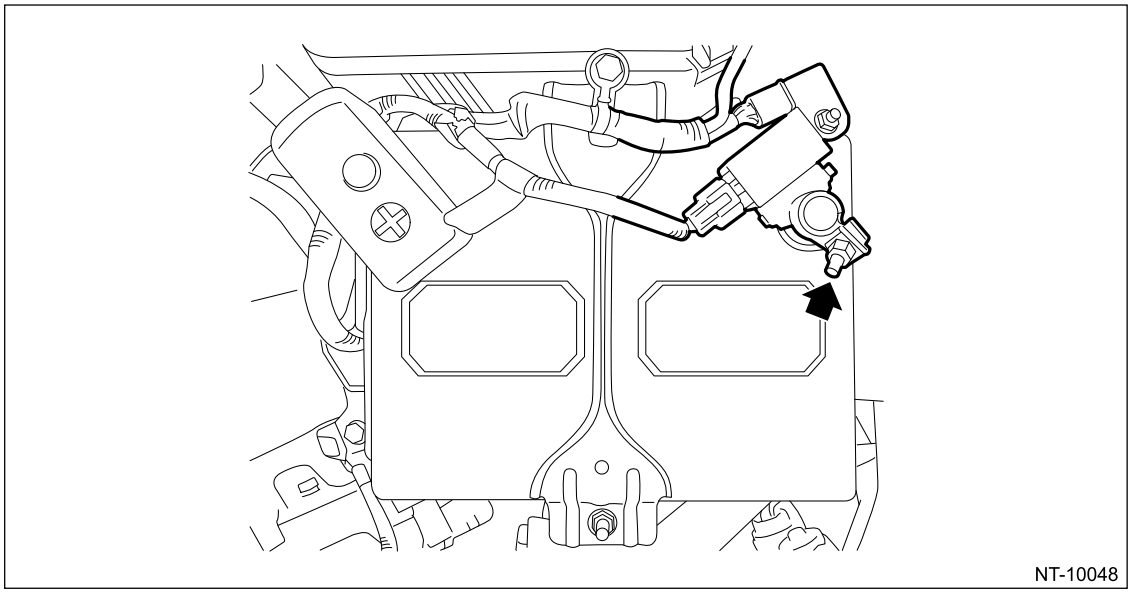
  When removing the battery or disconnecting the battery terminal, power supply is cut off and the information stored in the computer memory is volatilized. Therefore, setting information of some devices is initialized to the factory default. The device and functions initialized by removing battery are as follows.

No.	Item	Job contents when connecting battery
1	Clock	Set the clock to the current time.
2	MFD	Set to the contents checked before disconnecting the battery.
3	Audio (settings that the customer set)	Set to the contents checked before disconnecting the battery.
4	Navigation system (settings that the customer set)	• Time setting is not necessary because the time information is received via GPS. • Set the sound and other settings (items that were set in the selection) to the contents checked before disconnecting the battery.
5	Temperature setting of fully automatic air conditioner (settings that the customer set)	Set to the contents checked before disconnecting the battery.

No.	Item	Job contents when connecting battery
6	Steering lock system (model with keyless access with push button start)	If the engine does not start, initialize the steering lock system. For the initialization procedure, refer to "KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)" section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.
7	EyeSight (model with EyeSight)	Set to the contents checked before disconnecting the battery.
8	Electronic throttle system	Turn the ignition switch to ON, wait for 10 seconds or more, and start the engine.
9	Engine control system	• Let the engine run at idle until it fully warms up (the radiator fan turns 2 times or more) under no electrical load condition. • After the battery ground terminal is connected, wait for 10 seconds or more to turn the ignition switch to ON.
10	Past trouble history (memory code)	—

- **GROUND TERMINAL REMOVAL OR INSTALLATION**

1. Disconnect the ground cable from battery.



Note:

Open the trunk or rear gate as necessary before disconnecting the ground terminal from the battery.

2. Connect the battery ground terminal.

Note:

- **Install the battery sensor while holding it by hand to prevent rotating.**
- **Clean the battery cable terminals and apply grease to retard the formation of corrosion.**
- **Connect the positive (+) terminal, and then connect the negative (-) terminal of the battery.**
- **Since DTCs may be detected, after the battery ground terminal is connected, wait for 10 seconds or more to turn the ignition switch to ON.**
- **After the battery is installed, initial diagnosis of the electronic throttle control is performed. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**
- **For battery replacement procedures, refer to "STARTING/CHARGING SYSTEMS (H4DO)" section. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.**

Tightening torque:

5 N·m (0.5 kgf-m, 3.7 ft-lb)

8. OTHER ADJUSTMENT OPERATIONS BEFORE DELIVERING THE VEHICLE TO CUSTOMER

Due to service and parts replacement convenience, perform the following operations before delivering the vehicle to the customer.

No.	Item	Check operation	Adjustment operation	Additional adjustment operations when replacing parts
1	Positions of devices • Steering • Room mirror • Door mirror • Seat • Air conditioner vent grille	Is the device set to the same position when the vehicle was received from the customer?	Adjust the device to the similar position when the vehicle was received from the customer.	When removing/installing each device • Meter, instrument panel, steering column, etc. • Room mirror, roof trim, sunroof assembly, etc. • Door mirror, door panel, etc. • Seat, floor carpet, etc. • Vent grille, instrument panel, console box, etc.
2	Positions of switches • Wiper, light (AUTO or OFF) • Headlight beam leveler • Illumination control • Room light • Seat heater, etc.	Is the switch set to the same position when the vehicle was received from the customer?	Set the switch to the same position when the vehicle was received from the customer.	When removing/installing each switch
3	Position of antenna	Is the antenna set to the same position when the vehicle was received from the customer?	Adjust the position of antenna.	When removing/installing the antenna and washing the vehicle

9. PARTS CLEANING

Caution:

Do not spray parts cleaner directly to rubber parts such as bushing or other resin parts.

- Perform the operation in a clean location and use extra caution in dust proofing.
- Clean the items (except for assembly components) with steam, etc. before disassembly. During steam cleaning, wrap the air breather, oil level gauge, connectors, etc. with vinyl tape to prevent steam from entering inside the parts.
- Use an appropriate cleaning solvent.
- Do not clean rubber parts such as O-ring, gasket and oil seal with cleaning solution.

10. FASTENERS NOTICE

Fasteners must be tightened to the specified torque.
Do not apply paint, lubricant, rust retardant or other substance to the surface around bolts, nuts, etc. Doing so will make it difficult to obtain the correct torque and result in looseness and other problem.

11. ABOUT SCREWS

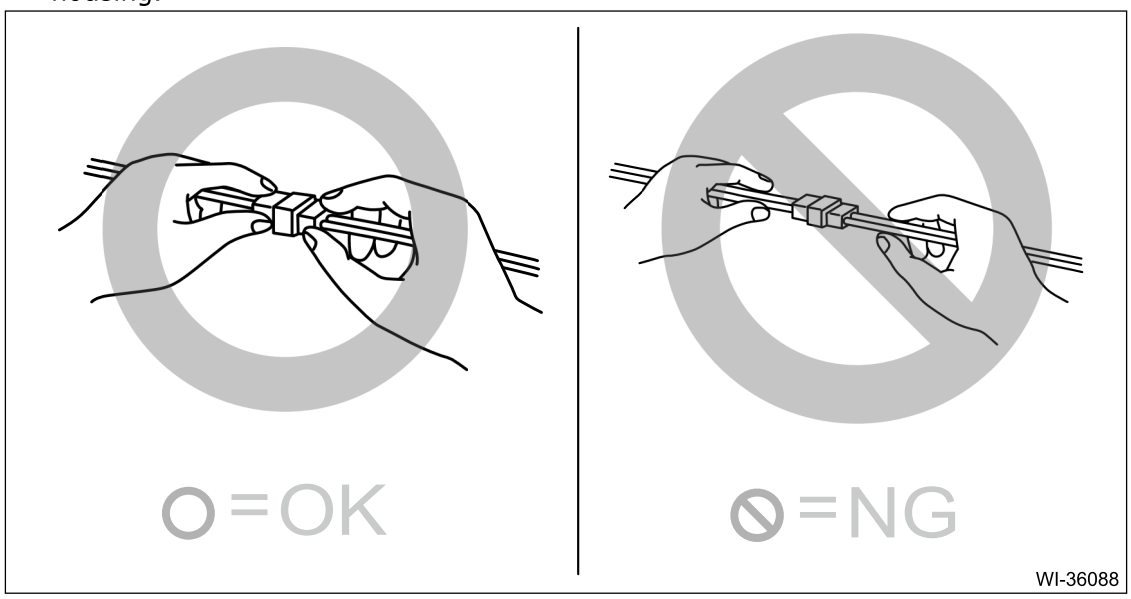
Use an appropriate sized tool. Insert a screw vertically into the hole. Check for any loose screws after installation.
If improper tools are used or screws are inserted obliquely to the hole, the screws cannot be installed correctly, which may result in insufficient tightening force or damage on the hole.

12. STATIC ELECTRICITY DAMAGE

Do not touch the control modules, connectors, logic boards and other such parts when there is a risk of static electricity. Always use a static electricity prevention cord or touch grounded metal for the elimination of static electricity before conducting work.

13. TROUBLESHOOTING OF ELECTRICAL SYSTEM

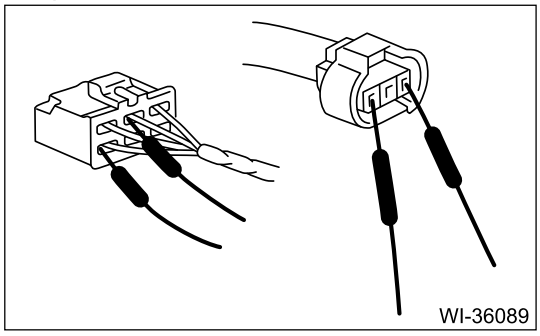
1. Always refer to "CAUTION" of "General Description" in the same models service manual before starting the diagnostics and repair.
2. Always refer to the cautions of each section when diagnosing and repairing each system and component.
3. The battery cable must be disconnected from the negative terminal after the ignition switch is set to the OFF position, unless otherwise required by the diagnostics.
4. When disconnecting a connector, do not pull the harness, but pull while holding the connector housing.



5. Confirm the locking shape completely before disconnecting a connector. In addition, firmly push in

the connector until a click sounds when connecting a connector.

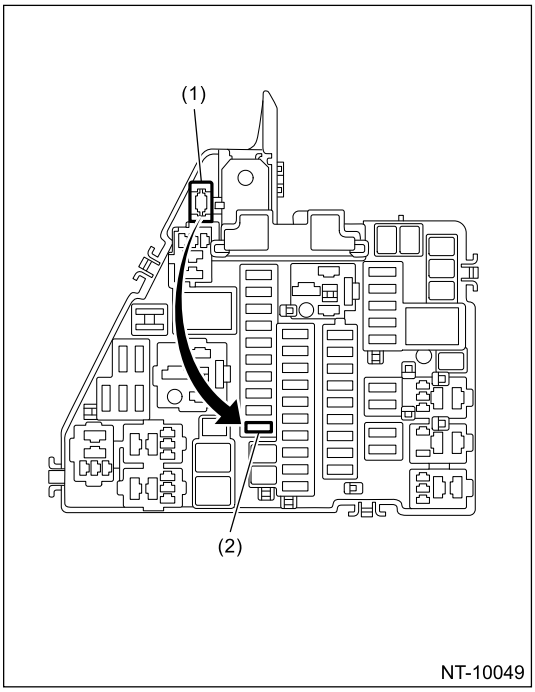
6. When checking continuity between connector terminals, or measuring voltage across the terminal and ground, always touch tester probe(s) to terminals from the harness side.
   If the probe is too thick to gain access to the terminal, do not push it in forcibly but use a mini test lead.
7. When measuring the voltage or resistance of individual sensor or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal. Never insert the tapered pin into the terminal at this time. Doing so may cause internal deformation and a malfunction can occur.
   Caution:
   If a taper pin or the like has been inserted into the connector terminal, replace the connector.
8. To check water-proof connectors (which are not measurable from the harness side), touch tester probes on the terminal side and be very careful not to bend or damage the terminals.



9. Securely fasten the harness with clamps and clips so that the harness does not interfere with the body end parts, edges, bolts or screws.
10. When installing a harness and a component, be careful not to catch them on the harness.
11. Sensors, relays, units, etc., are sensitive to strong impacts. Handle them with extra care so that they are not dropped or mishandled.
12. When inspecting the airbag system, in order to avoid malfunction, always refer to “CAUTION” of “General Description” of the airbag system in the same model’s service manual.

14. FUSE

Backup fuse (30 A) remains removed to prevent the battery consumption when vehicles are delivered. Install the backup fuse by following the illustration. Besides, removing the backup fuse from the fuse holder deactivates the control during shipping (delivery mode).



(1) Backup fuse holder

(2) Backup fuse inlet

15. IMMOBILIZER RELATED PART

- Do not replace the immobilizer related parts with the parts from other vehicle.
- Registration of the immobilizer is necessary when a immobilizer-related control module has been replaced. For detailed operation procedure, refer to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume.

16. LIFT AND JACK

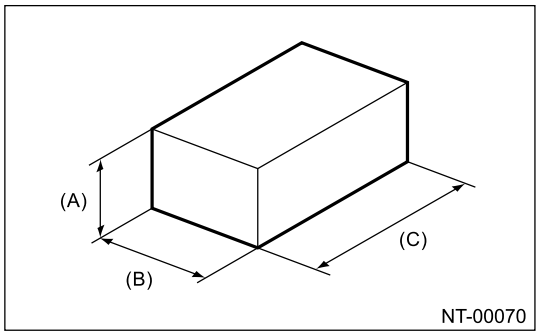
When using a lift or shop jack to raise a vehicle or using rigid rack to support a vehicle, always follow instructions concerning jack-up points and weight limits to prevent the vehicle from falling, which could result in injury. Be especially careful that the vehicle is balanced before raising it. Be sure to set the wheel stoppers when jacking-up only the front or rear side of the vehicle.

Caution:

Select the lift attachment so that the side sill does not contact the lift arm.

Note:

- **When using a lift, follow its operation manual.**
- **When the side sill cover contacts the lift arm, use a lift attachment.**
- **Do not work or leave unattended while the vehicle is supported with jack, support it with rigid racks.**
- **Be sure to use the rigid racks with rubber attached to cradle to support the vehicle.**
- **When using a lift, use an attachment or something similar.**
- **When using a plate lift, use a rubber attachment. Place the attachment to the specified position of the vehicle, by adjusting front/rear and left/right sides accordingly.**



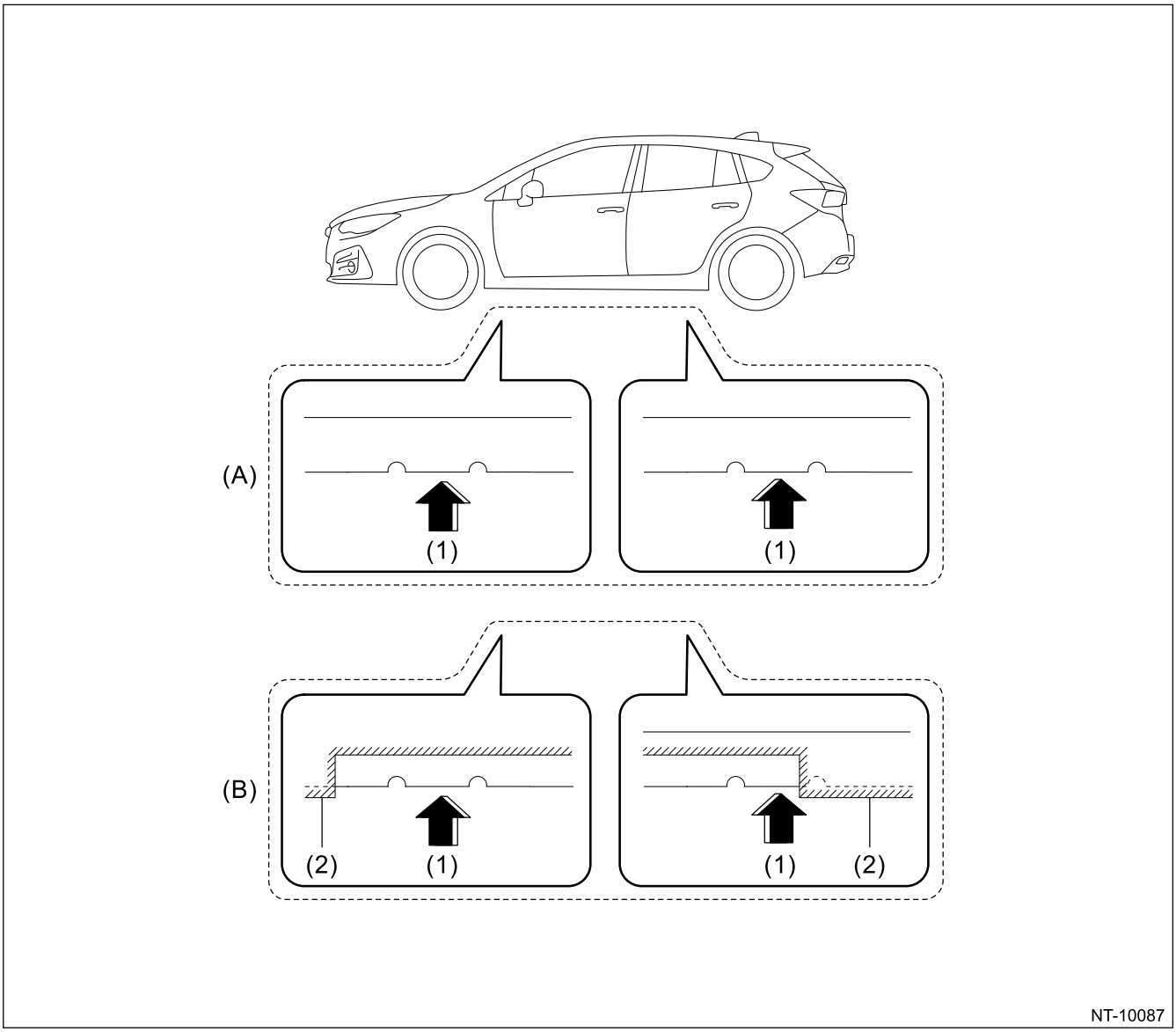
(A) 80 mm (3.1 in) or more

(B) 80 — 100 mm (3.15 — 3.94 in)

(C) 120 — 200 mm (4.72 — 7.87 in)

- **Align the cushion rubber center part of plate lift with the center part of rubber attachment.**
- **Do not use the plate lift whose attachment does not reach the supporting locations.**

- **SUPPORT LOCATIONS**



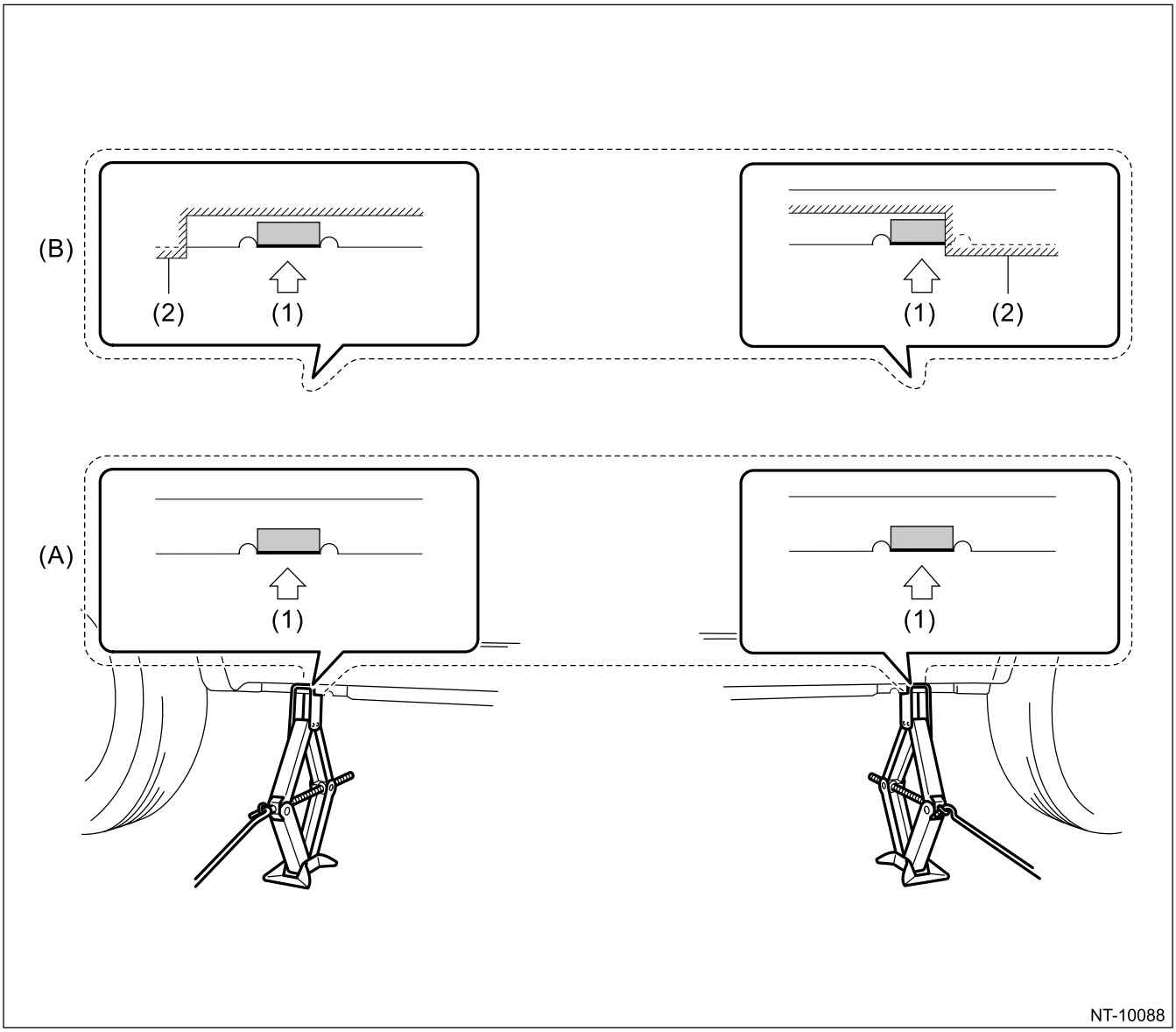
(A) Model without side spoiler

(B) Model with side spoiler

(1) Jack-up point

(2) Side spoiler

- **PANTOGRAPH JACK**



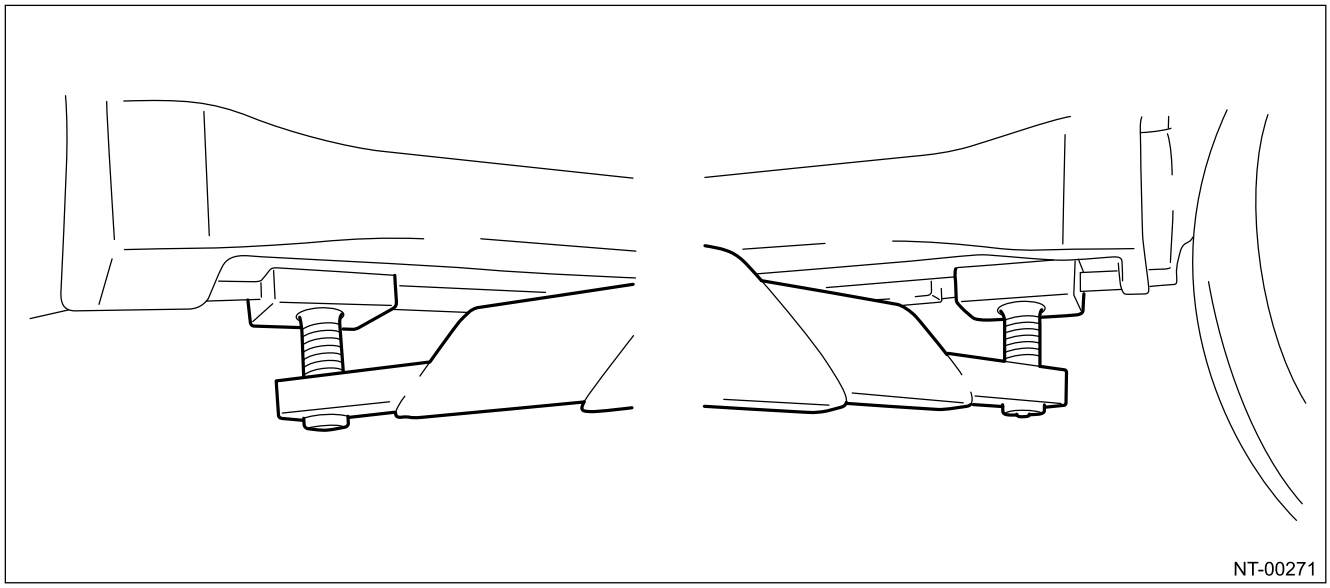
(A) Model without side spoiler

(B) Model with side spoiler

(1) Jack-up point

(2) Side spoiler

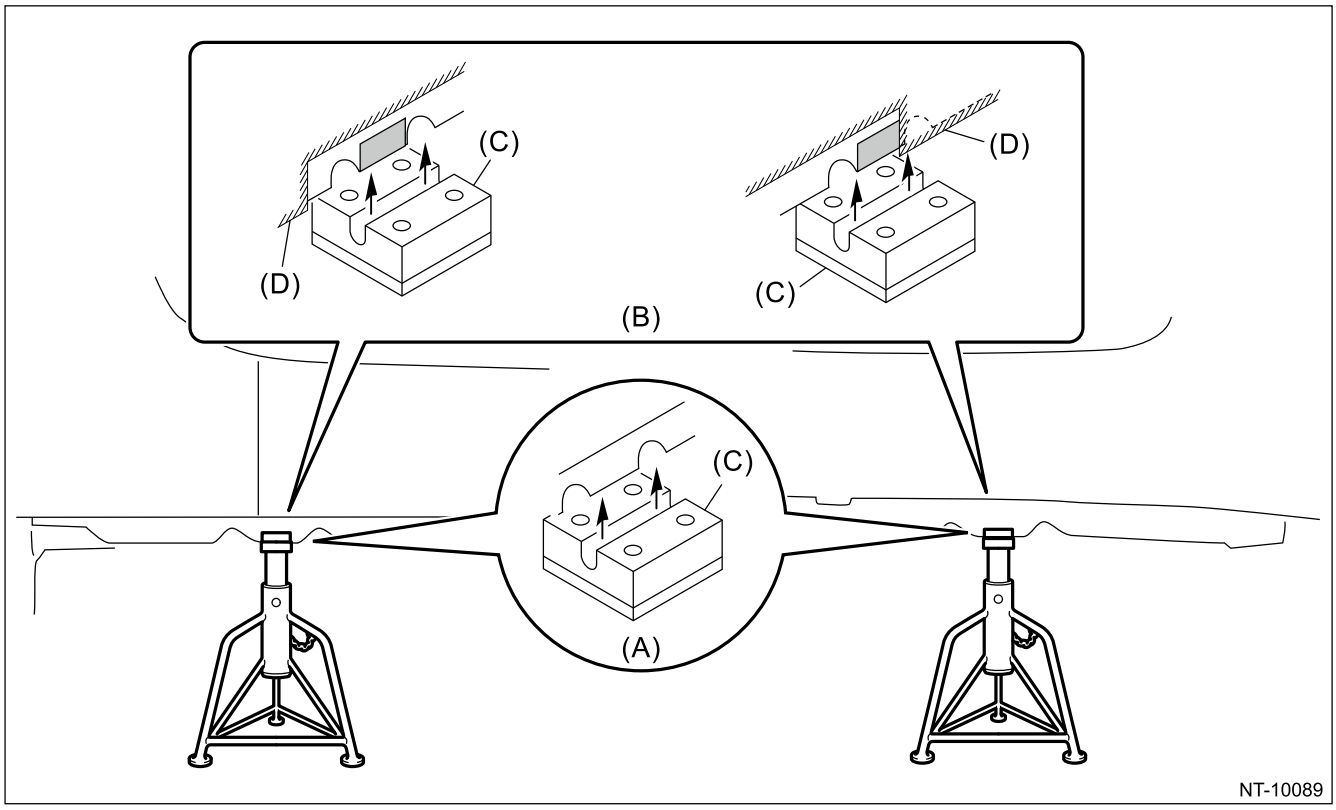
- **LIFT**



Caution:

For models with spoiler garnish, use a spacer or an attachment to lift up the vehicle securely at jack up point without the side garnish contacting the lift.

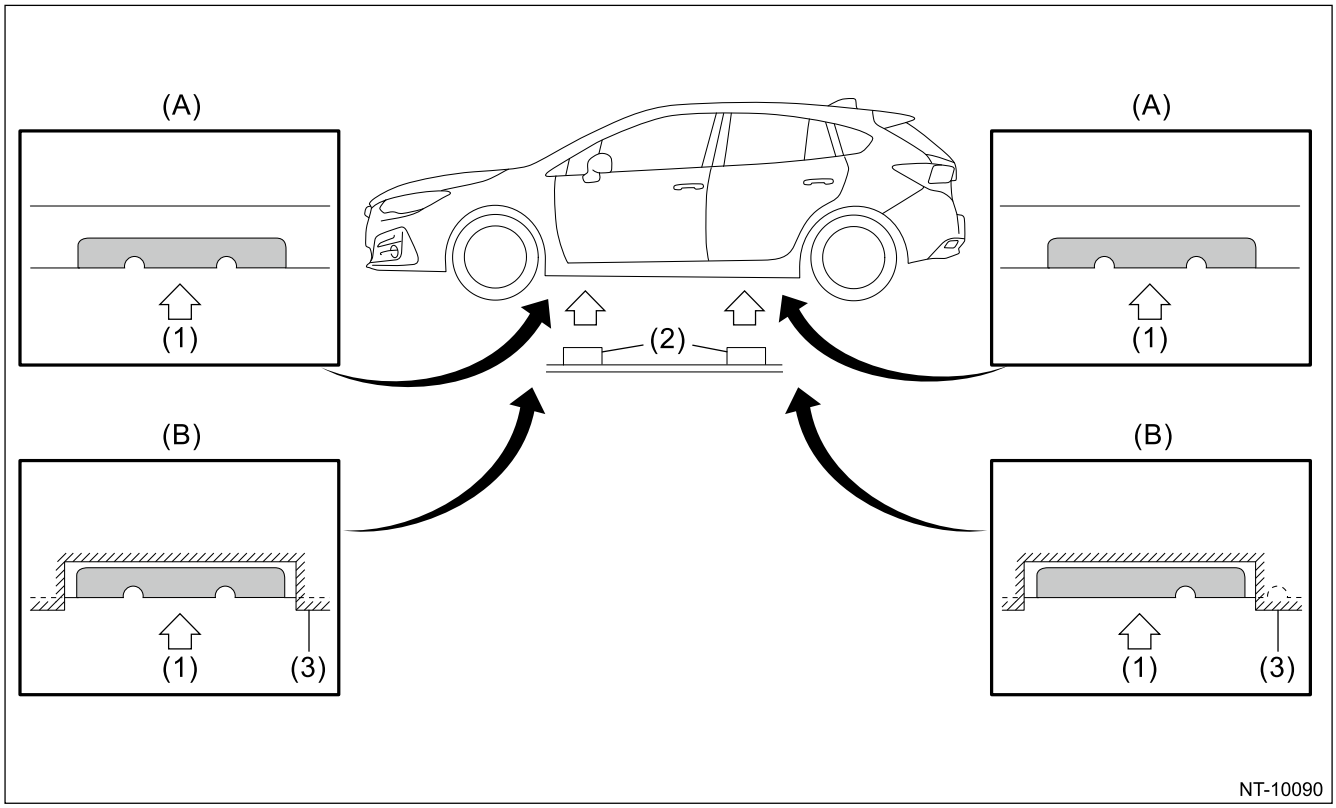
- **RIGID RACK**



(A) Model without side spoiler (B) Model with side spoiler (C) Attachment

(D) Side spoiler

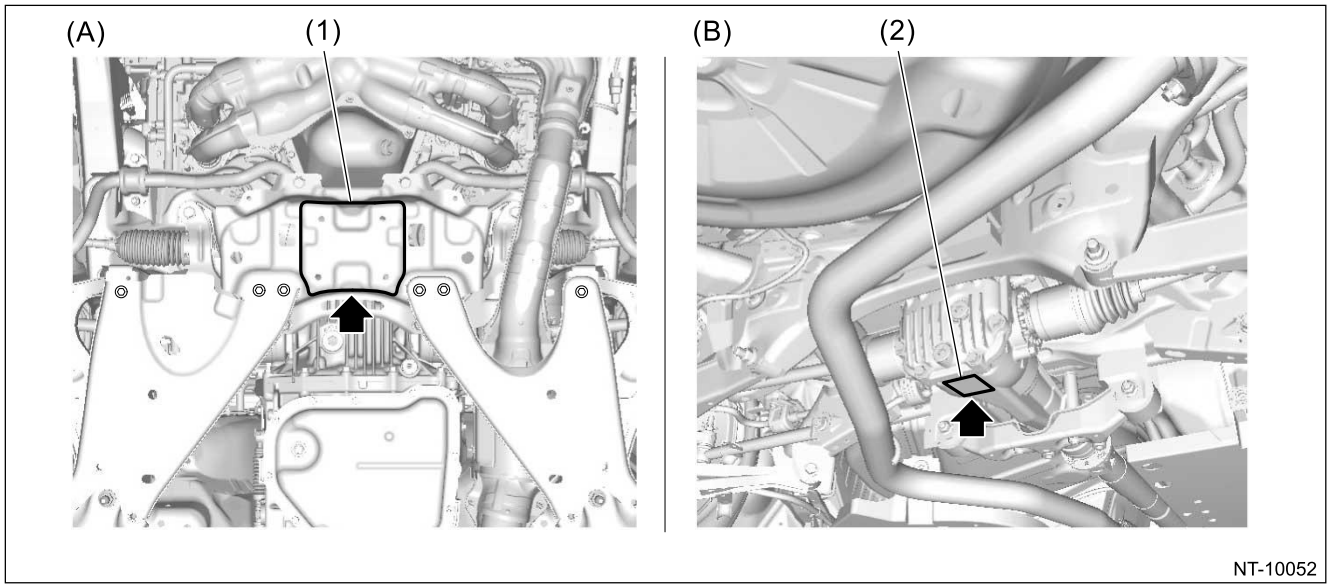
- **PLATE LIFT**



(A) Model without side spoiler (B) Model with side spoiler

(1) Jack-up point (2) Attachment (3) Side spoiler

- **JACK-UP POINT (WHEN USING A GARAGE JACK)**



(A) Front (B) Rear

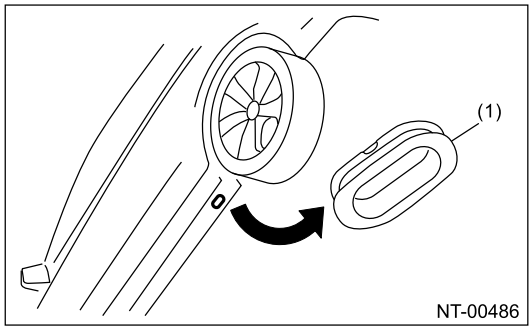
(1) Crossmember support - front (2) Rear differential

Caution:

If jacking up the front side of the vehicle, make sure that the jack is attached at the center of the jack-up plate not at the sides.

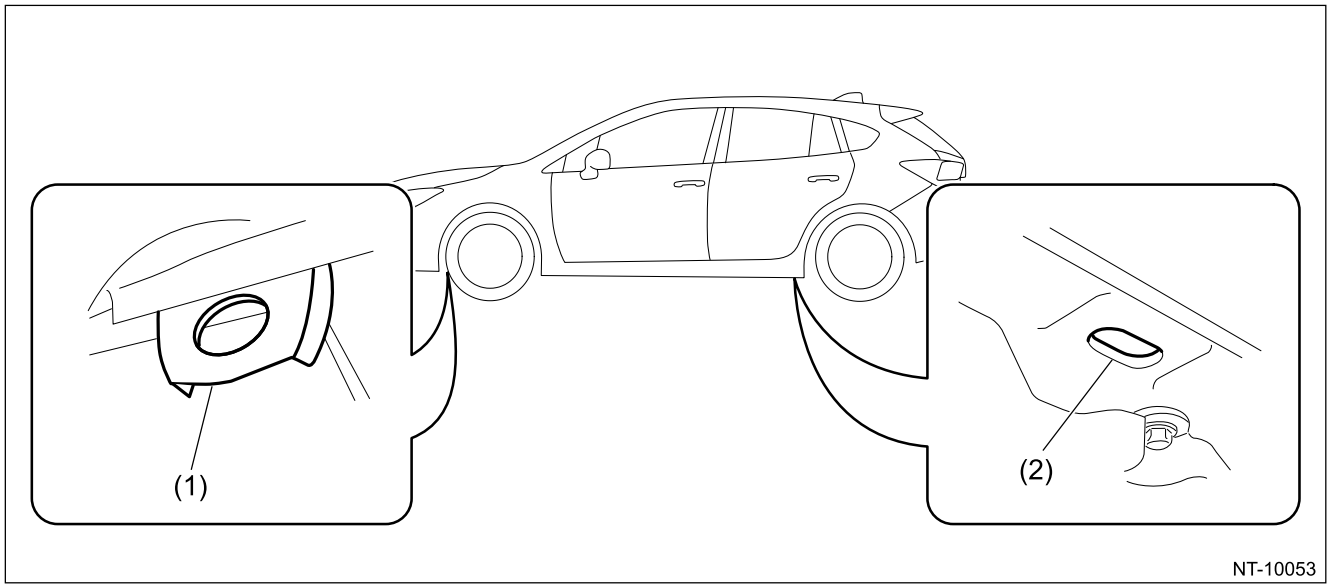
17. TIE-DOWNS

Tie-downs are used when transporting vehicles and when using the chassis dynamo. Remove the grommet of the tie-down hole and install the tie-down only to the specified locations on the vehicle.



(1) Grommet

- **TIE-DOWN LOCATION**



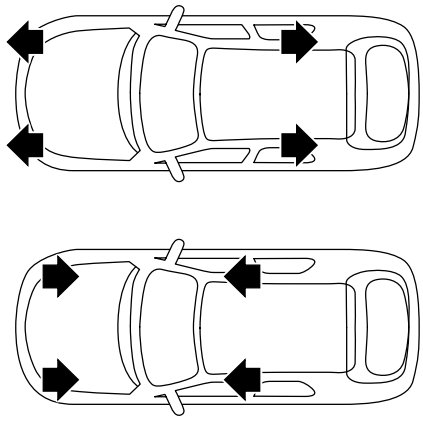
(1) Hook for tie-down (2) Tie-down hole

- **CHAIN DIRECTION AT TIE-DOWN CONDITION**

Caution:

- **Pull the front and rear of the vehicle in the opposite direction, and pull the left and right of the vehicle in the same direction.**
- **Patterns except for the followings (recommended) are not allowed.**

	Recommended

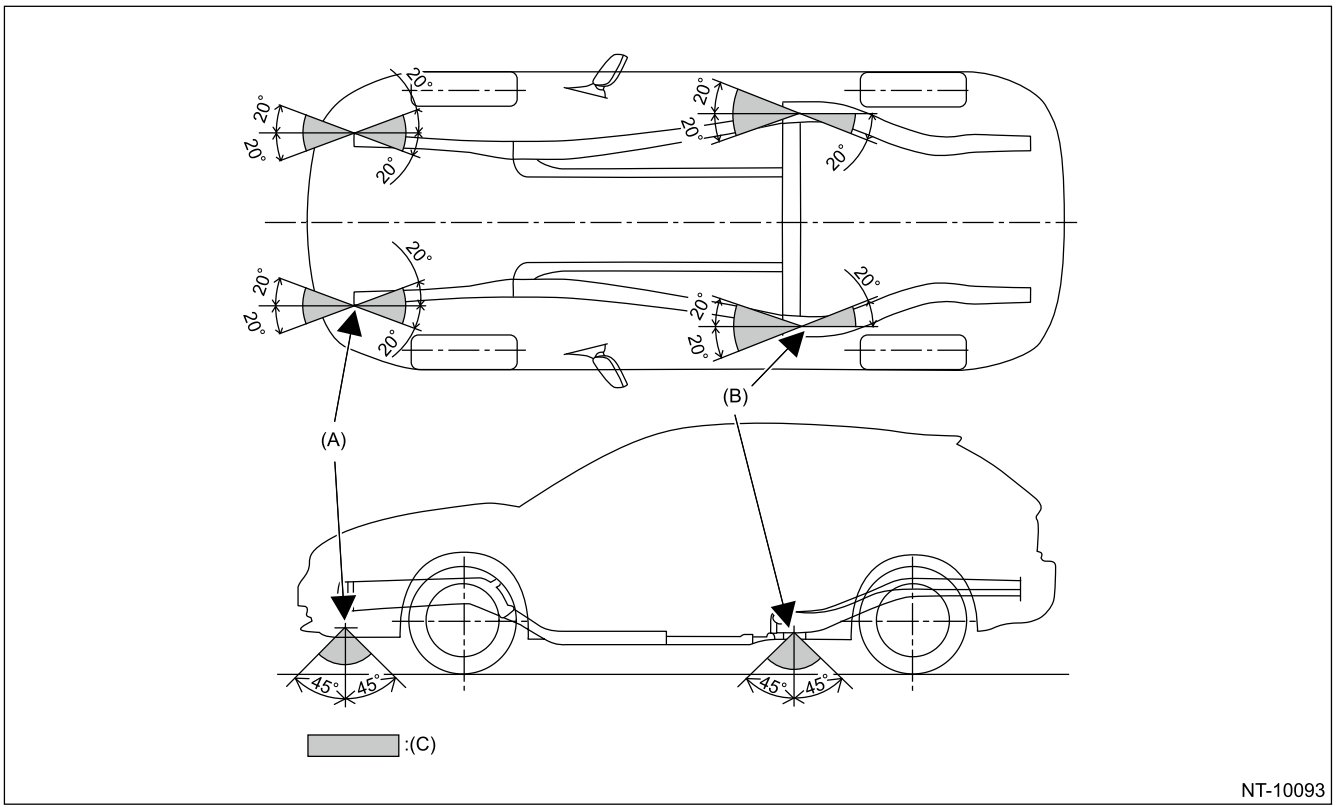
	Recommended
Tie-down direction	 NT-00214

- **TIE-DOWN RANGE**

  For ground transportation

  Caution:

  When the vehicle is tied down from vehicle inside, hook the hooks of tie-down chain on the rear tie-down holes from vehicle inside. When the vehicle is tied down from vehicle outside, hook the hooks of tie-down chain on the rear tie-down hooks from vehicle outside.



(A) Front tie-down hook (B) Rear tie-down hole (C) Chain pulling range at tie-

down condition

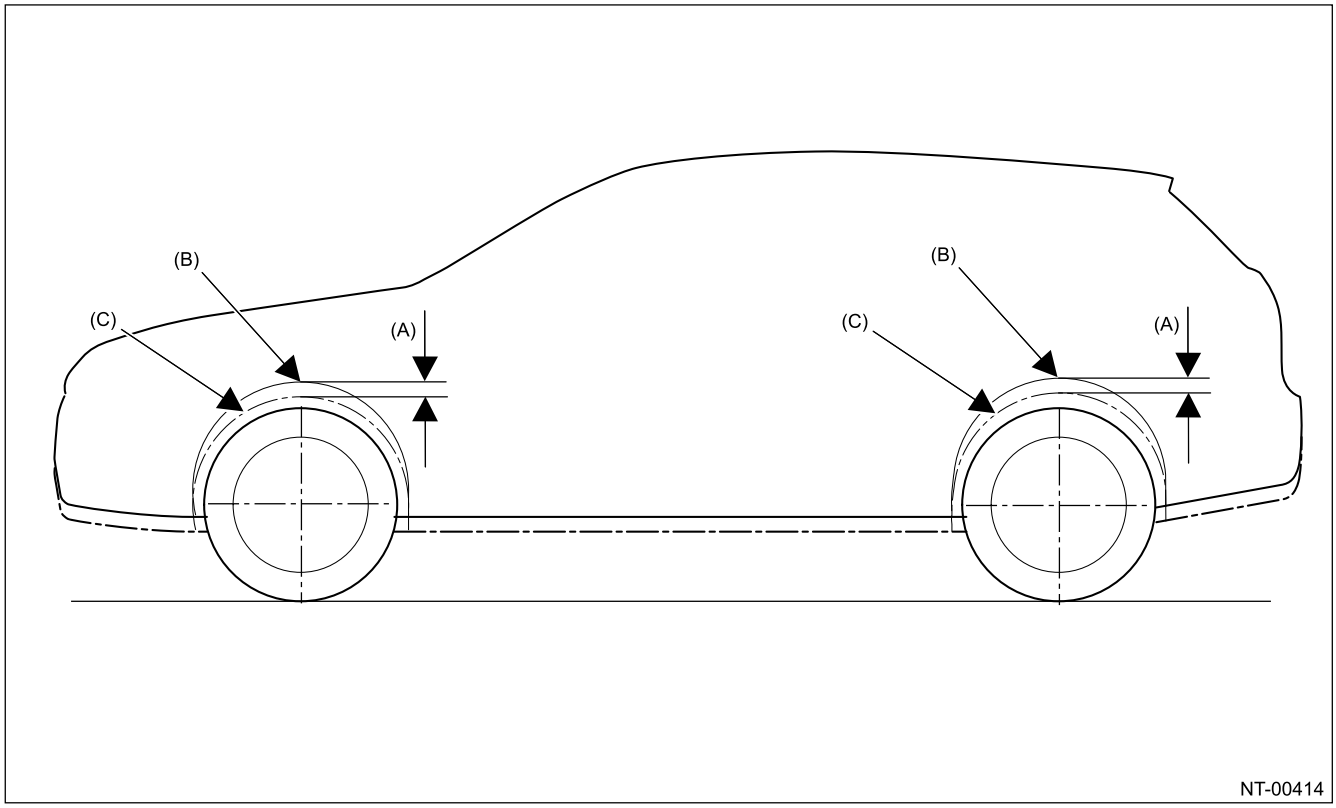
- **VEHICLE SINKING VOLUME AT TIE-DOWN CONDITION**

Caution:

Sinking amount of the vehicle at tie-down condition should be less than 50 mm (1.97 in) and make sure to fix the vehicle securely.

Check to see if the tensions of chains or belts at tie-down condition are appropriate in the following procedures.

1. Before tie-down, measure the distance between the highest tire point and highest arch point at the center of wheel.
2. After tie-down, measure the distance between the highest tire point and highest arch point at the center of wheel.
3. If the distance (A) between the measured value of 1) and 2) above is less than 50 mm (1.97 in), it is judged as OK. If the distance is 50 mm (1.97 in) or more, it is judged as NG because the tension is too high.



(B) Arch position before tie-down (C) Arch position after tie-down

NOTES FOR THE USE OF TIE-DOWN HOOK

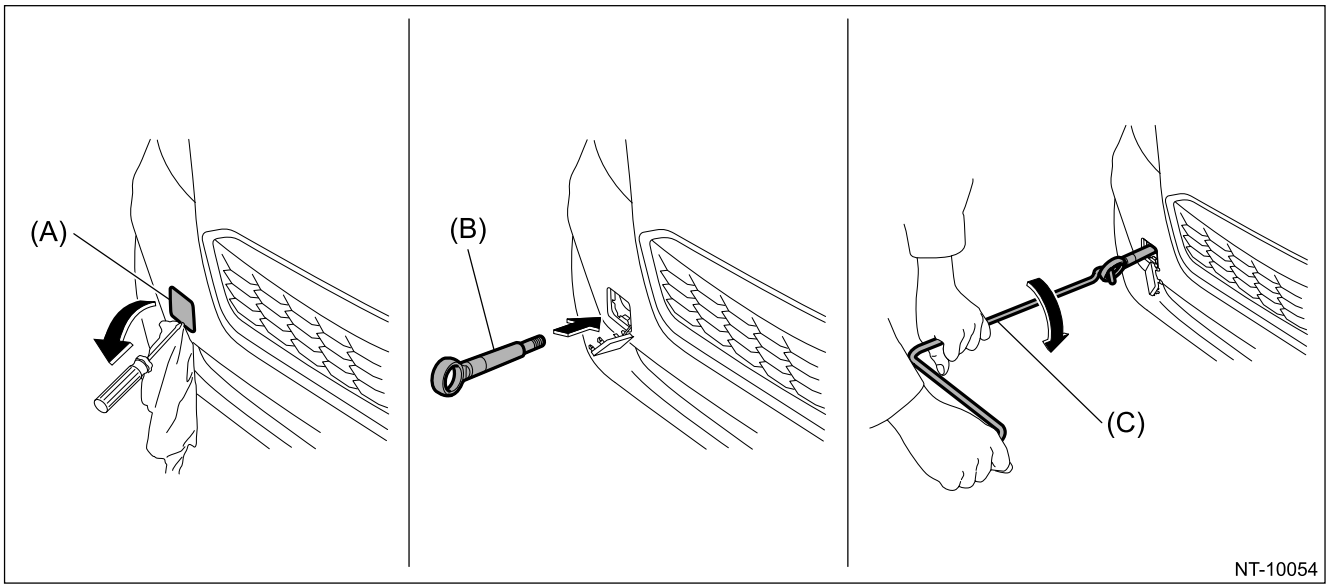
When the vehicle is tied down from vehicle inside, hook the hooks of tie-down chain from vehicle inside, and when the vehicle is tied down from vehicle outside, hook the hooks of tie-down chain from vehicle outside.

For front tie-down hook, use S hook and J hook, and for rear tie-down hole, use S hook, J hook and T hook. T hook can be used only for rear tie-down hole.

18. TOWING

Avoid towing vehicles except when the vehicle cannot be driven. For models with AWD, CVT or VTD, use a loader instead of towing. When towing other vehicles, pay attention to the following to prevent hook or vehicle damage resulting from excessive weight.

- Do not tow other vehicles with a front tie-down hook.
- Make sure the vehicle towing is heavier than the vehicle being towed.
- When towing the vehicle equipped with Subaru EyeSight, be sure to hold down the pre-collision brake OFF switch to turn OFF the pre-collision brake function. (Check that the pre-collision brake OFF indicator light in the meter lights up.)
- Front
  Remove the hook cover, and install the towing hook (eyebolt).
  Caution:
  Make sure to detach the towing hook (eyebolt) after towing. If the hook remains attached, airbag may not operate properly when receiving a shock from front side. And it may also affect the crash performance of the vehicle.

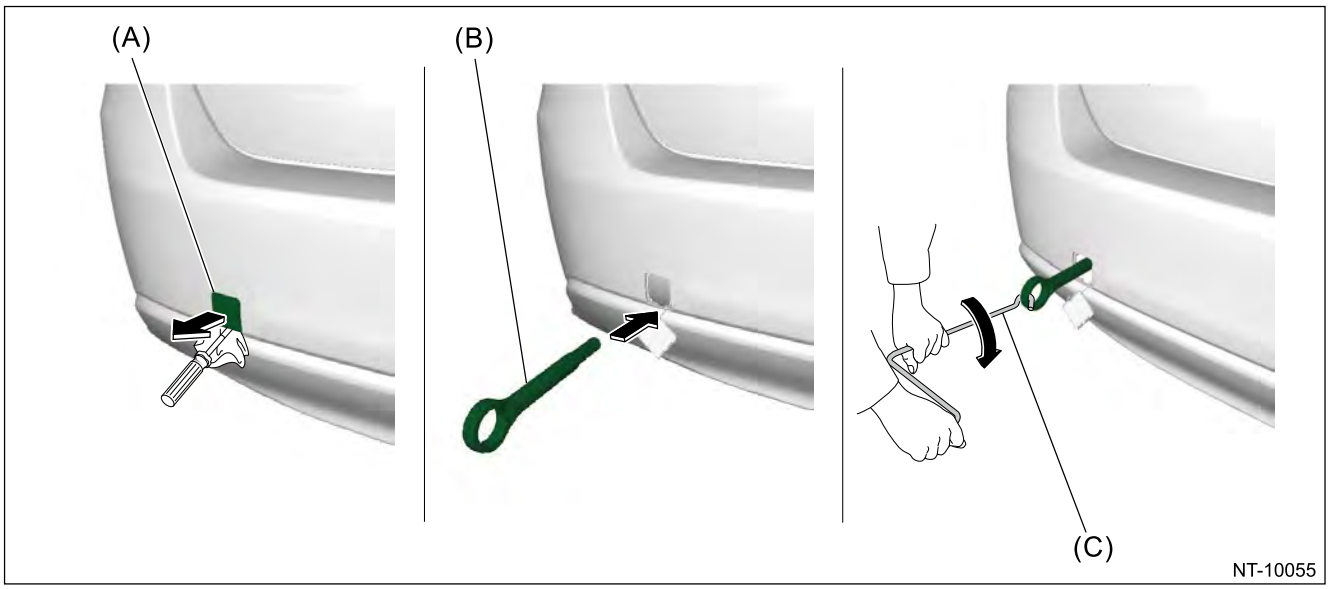


(A) Hook cover (B) Towing hook (eyebolt) (C) Jack handle

- Rear
  Remove the hook cover, and install the towing hook (eyebolt).

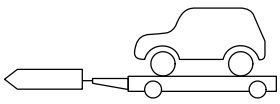
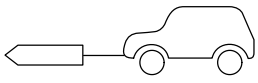
Caution:

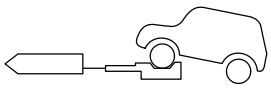
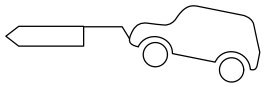
Make sure to detach the towing hook (eyebolt) after towing. If the hook remains attached, the fuel leakage control function of the fuel pump may not operate properly when receiving a shock from rear side. And it may also affect the crash performance of the vehicle.



(A) Hook cover (B) Towing hook (eyebolt) (C) Jack handle

- Precautions

Towing	Precautions	MT	CVT
Lifting up four wheels (on a trailer)  NT-00023	Towing the vehicle after lifting up all four wheels is a basic rule for AWD model.	○	○
Rope  NT-00024	• Check if both front and rear wheels are rotated normally. • CVT model driving conditions: Driving speed of 30 km/h (19 MPH) or less Driving distance of 50 km (31 miles) or less	○	▲

Towing	Precautions	MT	CVT
Raising the front wheels  NT-00025	Prohibited for full-time AWD model.	×	×
Lifting up the front wheels  NT-00026	• Prohibited, due to damage on bumper, front grille, etc. • Do not raise the vehicle with bumper.	×	×

○Marked: OK, Marked ×: Prohibited, Marked ▲: Conditionally OK

Caution:

- **Place the shift lever in "N" position during towing.**
- **Do not lift up the rear wheels to avoid unsteady rotation.**
- **Turn the ignition key to "ACC", then check the steering wheel moves freely. (Models without the keyless access with push button start)**
- **Turn the ignition switch to "ACC" or "ON" position, and check that the steering wheel moves freely. (Model with keyless access with push button start)**
- **Release the parking brake to avoid tire dragging.**
- **Since the power steering does not work, be careful for the heavy steering effort. (When engine is stopped)**
- **Since the servo brake does not work, be careful that the brake is not applied effectively. (When engine is stopped)**
- **In case of the malfunction of internal transmission or drive system, lift up four wheels (on a trailer) for towing.**
- **Do not use towing hook (eyebolt) except when towing.**
- **While being towed with all four wheels on the ground, turn the engine switch to ON but do not start the engine.**
- **If the ignition switch is ON while being towed with a rope, the pedestrian alert system may sound. (This is not a malfunction.)**

19. CARRIER CAR

Before lowering the vehicle from the carrier car, perform the following operations.

Caution:

Always perform the following operations before lowering the vehicle from the carrier car. Otherwise, the power unit will rotate reversely, which may cause the damage to the engine, vacuum pump, and transmission.

1. Start the engine.
2. Set the transmission shift position into driving direction of the vehicle. (When the vehicle drives forward, do not shift the transmission in R range. When the vehicle drives rearward, do not set the transmission to 1 — 5 speed, or to D range.)

   Caution:

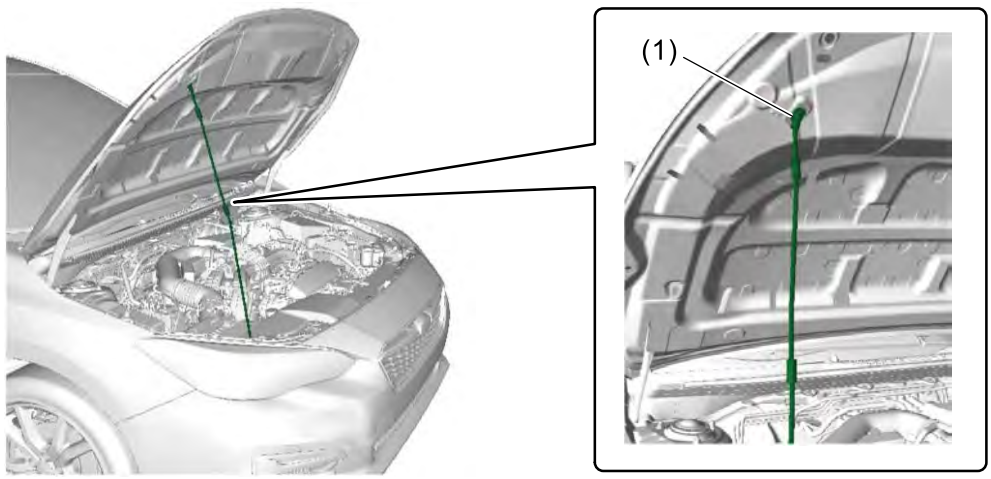
   Be sure to perform 2) mentioned above even if the engine cannot be started in some reasons.

20. FRONT HOOD STAY

1. Always attach the stay to the normal position when performing works such as inspections and general maintenance.

   Caution:

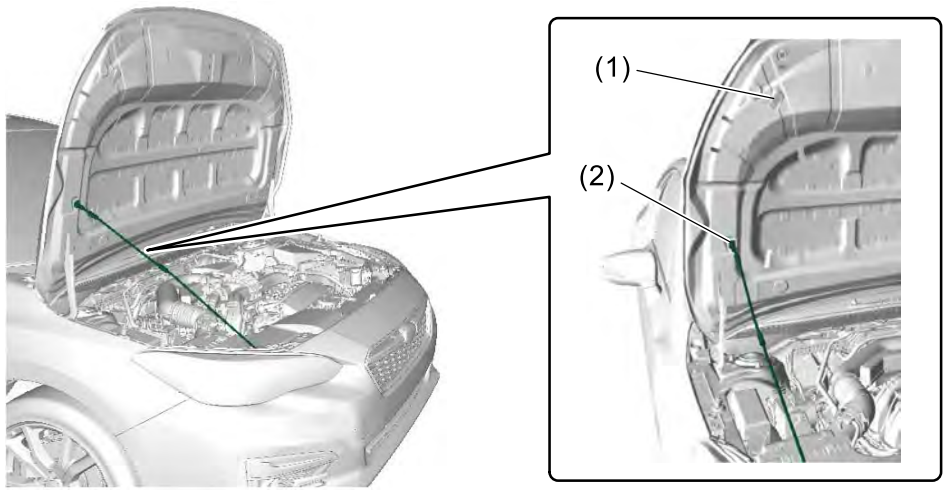
   - **During the inspection and general maintenance, always be sure to turn the ignition switch to OFF.**
   - **At the inspection and general maintenance, do not detach the stay.**



NT-10056

(1) Normal attached position

2. When wider front hood opening is necessary, set the stay to the lower position (hood hinge) as shown in the figure.



NT-10057

(1) Normal attached position
(2) Installation position at full open

21. GENERAL SCAN TOOL

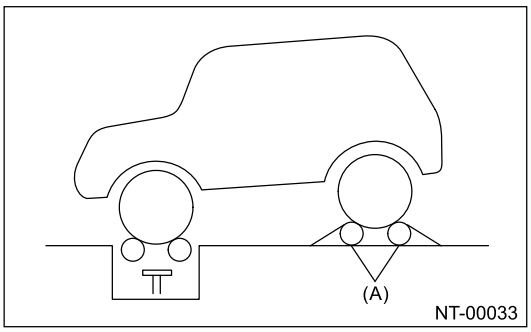
Using general scan tools will greatly improve the efficiency of repairing engine electronic controls. Subaru Select Monitor can be used to diagnose the engine, VDC, air conditioner and other electrically controlled parts.

22. AWD CIRCUIT MEASURES

1. Full-time AWD MT model
   Since viscous coupling (limited slip differential) is used in the center differential, cut-off of AWD circuit cannot be carried out.
2. Full-time AWD CVT model
   Since electronically controlled MP-T hydraulic multi-plate clutch is adapted for center differential, switch to FWD by using Subaru Select Monitor.

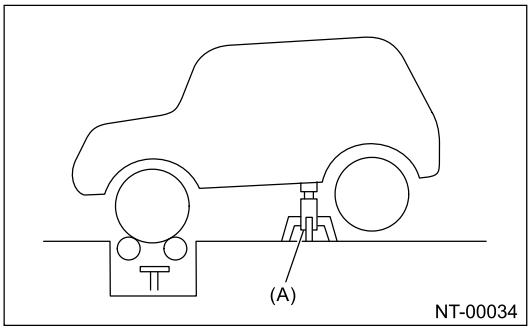
23. SPEEDOMETER TEST

1. Rear wheel free roller system
   (1) Set the free roller on the floor of rear wheel side securely according to the wheel base and rear tread of the vehicle.
   (2) Let the vehicle ride on the tester and free roller gently.
   Caution:
   Fix the vehicle using a pulling metal (chain or wire) to the front and rear towing hooks or tie-down hook to prevent the lateral runout of front wheels and springing out of vehicle.



(A) Free roller

   (3) Set the speedometer tester.
   (4) Conduct the speedometer test work.
   Caution:
   Do not operate the clutch quickly and do not accelerate or decelerate suddenly during work.
2. Rear wheel jack-up system
   (1) Set the vehicle on speedometer tester.
   Caution:
   Fix the vehicle using a pulling metal (chain or wire) to the front and rear towing hooks or tie-down hook to prevent the lateral runout of front wheels and springing out of vehicle.
   (2) Jack up the rear wheels and set the rigid racks to the specified locations of side sill.



(A) Rigid rack

(3) Conduct the speedometer test work.

Caution:

Do not operate the clutch quickly and do not accelerate or decelerate suddenly during work.

24. BRAKE TEST

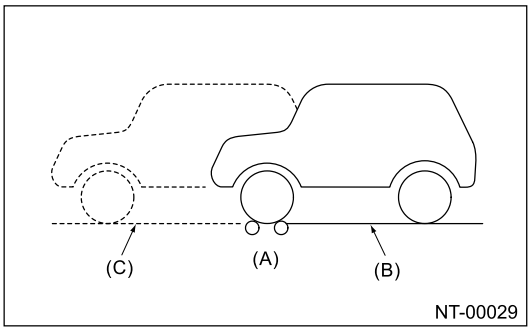
1. Full-time AWD MT model

(1) Perform this test after driving the vehicle for 2 — 3 km (1.24 — 1.86 miles) on road in order to stabilize the viscous torque of viscous coupling.

(2) Keep the front or rear wheels on the ground for this test.

Note:

Effect of the viscous torque on braking force will be added approx. 25 kg compared with FWD model.



(A) Brake tester

(B) Position for measuring front wheel

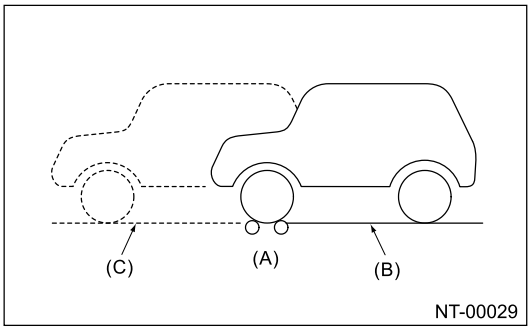
(C) Position for measuring rear wheel

(3) When the brake dragging force is large.

- Check the dragging of brake pad or brake shoe.
- Since it may be affected by the viscosity of viscous coupling, jack up either of the front or rear two wheels to check the each wheel rotation condition with the viscous coupling affection removed.

2. Full-time AWD CVT model

(1) Keep the front or rear wheels on the ground during measurement.



(A) Brake tester
(B) Position for measuring front wheel
(C) Position for measuring rear wheel

(2) When the brake dragging force is large.

- Check the dragging of brake pad or brake shoe.

Specifications:

	Braking force
Rear wheel total	10% or more of load on front or rear wheels
Difference between right and left wheels	8% or less of load on front or rear wheels
Grand total	50% or more of vehicle weight at the time of test

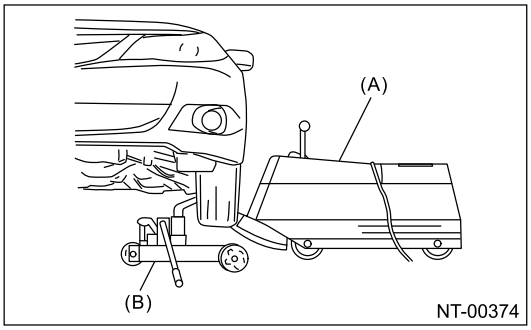
- When measurement is difficult to carry out because both of front wheels are locked, brake force measurement in this condition conforms to standard grand total.

25. ON THE CAR WHEEL BALANCING

Caution:

- **Carry out the procedures after measuring the balance of each single tire.**
- **Set the vehicle so that the front and rear wheels are the same height.**
- **Make sure that the VDC is deactivated.**
- **Release the parking brake during measurement.**
- **Rotate each wheel by hands, and make sure it rotates without dragging.**
- **Do not operate the clutch quickly and do not accelerate or decelerate suddenly during work.**
- **When an error is indicated during engine drive, do not use the motor drive together.**

1. Set the rigid rack to the specified locations of side sill, jack up the front or rear two wheels of non-measuring side and set the pickup stands to two wheels of measuring side.



(A) Balancer body

(B) Pickup stand (left and right)

2. For drive wheel, drive the tires with engine for measurement.
3. For non-drive wheel, drive the tires from the on the car wheel balancer for measurement.

SPECIFICATIONS

SPC

1. Impreza

SPECIFICATIONS > Impreza

DIMENSION

Model			4 door	5 door
Overall length		mm (in)	4,625 (182.1)	4,460 (175.6)
Overall width		mm (in)	1,777 (70)	
Overall height (at C.W.*1)		mm (in)	1,455 (57.3)	1,495 (58.9)*2 1,480 (58.3)*3 1,455 (57.3)*4
Compartment	Length	mm (in)	2,085 (82.1)	
	Width	mm (in)	1,520 (59.8)	
	Height	mm (in)	1,200 (47.2), 1,180 (46.5)*5	
Wheelbase		mm (in)	2,670 (105.1)	
Tread	Front	mm (in)	1,540 (60.6)	
	Rear	mm (in)	1,545 (60.8)	
Minimum road clearance		mm (in)	130 (5.1)	

*1: Curb weight

*2: With roof rail

*3: Without roof rail (shark fin antenna)

*4: Without roof rail (pole antenna)

*5: With sunroof

SPECIFICATIONS > Impreza

ENGINE

Model		2.0 L DOHC non-turbo
Engine type		Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
Valve arrangement		DOHC
Bore × stroke	mm (in)	84.0 × 90.0 (3.31 × 3.54)
Displacement	cm^3 (cu in)	1,995 (121.7)
Compression ratio		12.5
Ignition order		1 — 3 — 2 — 4
Idle speed at parking or neutral position	r/min	CVT: 775±100 MT: 700±100
Maximum output	kW (HP)/[r/min]	113 (152)/6,000
Maximum torque	N·m (kgf-m, ft-lb)/[r/min]	196 (20.0, 145)/4,000

SPECIFICATIONS > Impreza

ELECTRICAL

Model		2.0 L DOHC non-turbo
Ignition timing (at idling)	BTDC	6°±10°
Spark plug	Type and manufacturer	NGK: DILKAR7B8
Generator		12 V — 130 A
Battery	Type	75D23L
	Nominal capacity	5 HR: 52 Ah [25°C (77°F)]
	Nominal voltage	12 V
	CCA	530 A
	BCI group number (∗)	35

(∗) Battery size reference information (Not guaranteed by FHI)

TRANSMISSION

1. MT

Model		2.0 L DOHC non-turbo
Transmission type		5MT
Clutch type		DSPD
Gear ratio	1st	3.454
	2nd	1.888
	3rd	1.296
	4th	0.972
	5th	0.738
	Rev.	3.333
Reduction gear (front)	Type of gear	Hypoid
	Gear ratio	4.111
Transfer reduction	Type of gear	Helical
	Gear ratio	1.000
Reduction gear (rear) Final reduction	Type of gear	Hypoid
	Gear ratio	4.111

5MT: 5-forward speeds and 1-reverse with synchromesh
DSPD: Dry Single Plate Diaphragm

2. CVT

Model		2.0 L DOHC non-turbo
Transmission type		CVT
Clutch type		TCC
Gear ratio	Forward	3.439 — 0.489
	Rev.	3.522
Reduction gear Final	Type of	Hypoid

(front)	reduction	gear	
		Gear ratio	3.700
Transfer reduction ratio			1.000
Reduction gear (rear)		Type of gear	Hypoid
		Gear ratio	3.700

CVT: Forward continuously variable speed change, 1-reverse
TCC: Torque Converter Clutch

SPECIFICATIONS > Impreza

STEERING

Model	2.0 L DOHC non-turbo
Type	Rack and pinion
	Electric power steering
Turns, lock to lock	2.5
Minimum turning radius m (ft)	5.4 (17.72)

SPECIFICATIONS > Impreza

SUSPENSION

Model	2.0 L DOHC non-turbo
Front	Macpherson strut type suspension
Rear	Double-wishbone type suspension

SPECIFICATIONS > Impreza

BRAKE

Model	2.0 L DOHC non-turbo
Service brake system	Dual circuit hydraulic with vacuum suspended power unit
Front	Ventilated disc brake
Rear	Solid disc brake
Parking brake	Mechanical on rear brakes

SPECIFICATIONS > Impreza

TIRE

Model	2.0 L DOHC non-turbo		
Wheel size	16 × 6 $^{1}/_{2}$ J	17 × 7 J	18 × 7 $^{1}/_{2}$ J
Tire size	P205/55R16 89V	205/50R17 89V	P225/40R18 88V
Type	Tubeless, steel belted radial		

SPECIFICATIONS > Impreza

CAPACITY

Model	2.0 L DOHC non-turbo

			5MT	CVT
Fuel tank		L (US gal, Imp gal)	50 (13.2, 11)	
Engine oil	Total capacity (at overhaul)	L (US qt, Imp qt)	5.3 (5.6, 4.7)	
	Filling amount of engine oil L (US qt, Imp qt)	When replacing engine oil and oil filter	4.4 (4.7, 3.9)	
		When replacing engine oil only	4.2 (4.4, 3.7)	
Transmission gear oil		L (US qt, Imp qt)	3.5 (3.7, 3.1)	—
CVTF		L (US qt, Imp qt)	—	10.48 — 10.98 (11.1 — 11.6, 9.2 — 9.7)
CVT front differential gear oil		L (US qt, Imp qt)	—	1.21 — 1.31 (1.3 — 1.4, 1.1 — 1.2)
Rear differential gear oil		L (US qt, Imp qt)	0.8 (0.8, 0.7)	
Engine coolant		L (US qt, Imp qt)	7.6 (8.0, 6.7)	7.8 (8.2, 6.9)

WEIGHT

Model			4 door										
			2.0 L DOHC non-turbo										
			2.0 i				2.0 i-Premium						
			5MT		CVT		5MT		CVT				
OP code			U5	C5	U5	C5	C5	C4	U5	U5	U5	C5	C4
			MB	MB	MB	MB	RC	2B	3B	3C	3P	RC	2B
Curb weight (C.W.)	Total	kg (lb)	1,349 (2,974)	1,349 (2,974)	1,376 (3,034)	1,376 (3,034)	1,369 (3,018)	1,374 (3,029)	1,393 (3,071)	1,394 (3,073)	1,406 (3,100)	1,396 (3,078)	1,399 (3,084)
	Front	kg (lb)	797 (1,757)	797 (1,757)	821 (1,810)	821 (1,810)	808 (1,781)	806 (1,777)	830 (1,830)	831 (1,832)	835 (1,841)	832 (1,834)	828 (1,825)
	Rear	kg (lb)	552 (1,217)	552 (1,217)	555 (1,224)	555 (1,224)	561 (1,237)	568 (1,252)	563 (1,241)	563 (1,241)	571 (1,259)	564 (1,244)	571 (1,259)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		—	—	—	—	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		—	—	—	—	—	—	—	—	—	—	—
	Manual A/C		❍	❍	❍	❍	—	❍	❍	❍	❍	—	❍
	Leather package		—	—	—	—	❍	❍	—	—	—	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—	—	—
	Standard audio		❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	Premium audio		—	—	—	—	—	—	—	—	—	—	—
	Navigation		—	—	—	—	—	—	—	—	—	—	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—	—	—	—	—	—

	Advanced package	—	—	—	—	—	—	—	—	—	—	—
	Side airbag	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	Curtain airbag	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight	—	—	—	—	—	—	—	—	—	—	—
	Cold weather package	—	—	—	—	❍	—	—	❍	❍	❍	—
	Sunroof	—	—	—	—	—	—	—	—	❍	—	—
	Power seat	—	—	—	—	—	—	—	—	—	—	—

Model			4 door								
			2.0 L DOHC non-turbo								
			2.0 i-Premium EyeSight		2.0 i-Premium+						
			CVT		5MT				CVT		
OP code			U5	U5	C5	C5	C5	C5	C5	C5	C5
			3C	3P	4P	4L	DP	DL	4L	DP	DL
Curb weight (C.W.)	Total	kg (lb)	1,401 (3,089)	1,413 (3,115)	1,391 (3,067)	1,392 (3,069)	1,396 (3,078)	1,398 (3,082)	1,417 (3,124)	1,421 (3,133)	1,422 (3,135)
	Front	kg (lb)	833 (1,836)	838 (1,847)	818 (1,803)	819 (1,806)	821 (1,810)	821 (1,810)	842 (1,856)	844 (1,861)	844 (1,861)
	Rear	kg (lb)	568 (1,253)	575 (1,268)	573 (1,264)	573 (1,263)	575 (1,268)	577 (1,272)	575 (1,268)	577 (1,272)	578 (1,274)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		—	—	—	—	—	—	—	—	—
	Manual A/C		❍	❍	—	—	—	—	—	—	—
	Leather package		—	—	❍	❍	❍	❍	❍	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—
	Standard audio		❍	❍	—	—	—	—	—	—	—
	Premium audio		—	—	❍	❍	—	—	❍	—	—
	Navigation		—	—	—	—	❍	❍	—	❍	❍
	Harman/Kardon + Premium audio		—	—	—	—	—	—	—	—	—
	Advanced package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight		—	—	❍	❍	❍	❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍	❍	❍	❍	❍	❍

	Sunroof	—	❍	❍	❍	❍	❍	❍	❍	❍
	Power seat	—	—	—	❍	—	❍	❍	—	❍

Model			4 door			
			2.0 L DOHC non-turbo			
			2.0 i-Premium+ EyeSight			
			CVT			
OP code			C5	C5	C5	C5
			LP	LL	ZP	ZL
Curb weight (C.W.)	Total	kg (lb)	1,422 (3,135)	1,423 (3,137)	1,427 (3,146)	1,428 (3,148)
	Front	kg (lb)	844 (1,861)	845 (1,863)	847 (1,867)	847 (1,867)
	Rear	kg (lb)	578 (1,274)	578 (1,274)	580 (1,279)	581 (1,281)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍
	Manual A/C		—	—	—	—
	Leather package		❍	❍	❍	❍
	Genuine leather seat		—	—	—	—
	Standard audio		—	—	—	—
	Premium audio		❍	❍	—	—
	Navigation		—	—	❍	❍
	Harman/Kardon + Premium audio		—	—	—	—
	Advanced package		❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍
	LED headlight		❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍
	Sunroof		❍	❍	❍	❍

	Power seat	—	❍	—	❍

Model			4 door								
			2.0 L DOHC non-turbo								
			Sport								
			5MT				CVT				
OP code			U5	U5	U5	U5	U5	U5	U5	U5	C4
			AC	AP	NP	NL	AC	AP	NP	NL	NP
Curb weight (C.W.)	Total	kg (lb)	1,395 (3,075)	1,408 (3,104)	1,414 (3,117)	1,416 (3,122)	1,420 (3,131)	1,432 (3,157)	1,439 (3,172)	1,441 (3,177)	1,439 (3,172)
	Front	kg (lb)	818 (1,803)	823 (1,814)	825 (1,819)	826 (1,821)	841 (1,854)	846 (1,865)	848 (1,870)	849 (1,872)	840 (1,852)
	Rear	kg (lb)	577 (1,272)	585 (1,290)	589 (1,298)	590 (1,301)	579 (1,277)	586 (1,292)	591 (1,302)	592 (1,305)	599 (1,320)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Manual A/C		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Leather package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—
	Standard audio		—	—	—	—	—	—	—	—	—
	Premium audio		❍	❍	—	—	❍	❍	—	—	—
	Navigation		—	—	—	—	—	—	—	—	—
	Harman/Kardon + Premium audio		—	—	❍	❍	—	—	❍	❍	❍
	Advanced package		—	—	❍	❍	—	—	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight		—	—	—	—	—	—	—	—	—
	Cold weather package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Sunroof		—	❍	❍	❍	—	❍	❍	❍	❍

	Power seat	—	—	—	❍	—	—	—	❍	—

Model			4 door	
			2.0 L DOHC non-turbo	
			2.0 Sport EyeSight	
			CVT	
OP code			U5	U5
			NP	NL
Curb weight (C.W.)	Total	kg (lb)	1,442 (3,179)	1,443 (3,181)
	Front	kg (lb)	850 (1,874)	851 (1,876)
	Rear	kg (lb)	592 (1,305)	592 (1,305)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍
	Keyless access with push button start		❍	❍
	Manual A/C		❍	❍
	Leather package		❍	❍
	Genuine leather seat		—	—
	Standard audio		—	—
	Premium audio		—	—
	Navigation		—	—
	Harman/Kardon + Premium audio		❍	❍
	Advanced package		❍	❍
	Side airbag		❍	❍
	Curtain airbag		❍	❍

	LED headlight	—	—
	Cold weather package	❍	❍
	Sunroof	❍	❍
	Power seat	—	❍

Model			4 door					
			2.0 L DOHC non-turbo					
			2.0 i-Limited					
			CVT					
OP code			U5	U5	U5	U5	U5	U5
			ED	SD	ER	SR	YD	JD
Curb weight (C.W.)	Total	kg (lb)	1,415 (3,120)	1,410 (3,108)	1,427 (3,146)	1,422 (3,135)	1,416 (3,122)	1,411 (3,111)
	Front	kg (lb)	842 (1,856)	840 (1,852)	847 (1,867)	844 (1,861)	842 (1,856)	840 (1,852)
	Rear	kg (lb)	573 (1,264)	570 (1,256)	580 (1,279)	578 (1,274)	574 (1,266)	571 (1,259)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍
	Manual A/C		—	—	—	—	—	—
	Leather package		❍	❍	❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍	❍	❍
	Standard audio		—	—	—	—	—	—
	Premium audio		—	❍	—	❍	—	❍
	Navigation		❍	—	❍	—	❍	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—
	Advanced package		—	—	—	—	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍

	Curtain airbag	❍	❍	❍	❍	❍	❍
	LED headlight	❍	❍	❍	❍	❍	❍
	Cold weather package	❍	❍	❍	❍	❍	❍
	Sunroof	—	—	❍	❍	—	—
	Power seat	❍	❍	❍	❍	❍	❍

Model			4 door					
			2.0 L DOHC non-turbo					
			2.0 i-Limited					
			CVT					
OP code			U5	U5	C5	C5	C4	C4
			YR	JR	VR	IR	JR	YR
Curb weight (C.W.)	Total	kg (lb)	1,429 (3,150)	1,424 (3,139)	1,446 (3,188)	1,441 (3,177)	1,431 (3,155)	1,437 (3,168)
	Front	kg (lb)	847 (1,867)	844 (1,861)	854 (1,883)	851 (1,876)	840 (1,852)	842 (1,856)
	Rear	kg (lb)	582 (1,283)	580 (1,279)	592 (1,305)	590 (1,301)	591 (1,303)	595 (1,312)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	—	—	❍	❍
	Manual A/C		—	—	—	—	—	—
	Leather package		❍	❍	❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍	❍	❍
	Standard audio		—	—	—	—	—	—
	Premium audio		—	❍	—	❍	❍	—
	Navigation		❍	—	❍	—	—	❍
	Harman/Kardon + Premium audio		—	—	—	—	—	—
	Advanced package		❍	❍	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍

	Curtain airbag	❍	❍	❍	❍	❍	❍
	LED headlight	❍	❍	❍	❍	❍	❍
	Cold weather package	❍	❍	❍	❍	❍	❍
	Sunroof	❍	❍	❍	❍	❍	❍
	Power seat	❍	❍	❍	❍	❍	❍

Model			4 door					
			2.0 L DOHC non-turbo					
			2.0 i-Limited EyeSight					
			CVT					
OP code			U5	U5	U5	U5	C5	C5
			YR	JR	YD	JD	YR	JR
Curb weight (C.W.)	Total	kg (lb)	1,433 (3,159)	1,428 (3,148)	1,421 (3,133)	1,416 (3,122)	1,453 (3,203)	1,447 (3,190)
	Front	kg (lb)	848 (1,870)	846 (1,865)	844 (1,861)	841 (1,854)	855 (1,885)	853 (1,881)
	Rear	kg (lb)	585 (1,289)	582 (1,283)	577 (1,272)	575 (1,268)	598 (1,318)	594 (1,309)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍
	Manual A/C		—	—	—	—	—	—
	Leather package		❍	❍	❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍	❍	❍
	Standard audio		—	—	—	—	—	—
	Premium audio		—	❍	—	❍	—	❍
	Navigation		❍	—	❍	—	❍	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—
	Advanced package		❍	❍	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍
	LED headlight		❍	❍	❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍	❍	❍
	Sunroof		❍	❍	—	—	❍	❍

	Power seat	❍	❍	❍	❍	❍	❍

Model			5 door										
			2.0 L DOHC non-turbo										
			2.0 i				2.0 i-Premium					2.0 i-NP	
			5MT		CVT		5MT		CVT				
OP code			U5	C5	U5	C5	C5	C4	U5	U5	U5	C5	C4
			MB	MB	MB	MB	RC	2B	3B	3C	3P	RC	2B
Curb weight (C.W.)	Total	kg (lb)	1,354 (2,985)	1,354 (2,985)	1,382 (3,047)	1,382 (3,047)	1,375 (3,031)	1,381 (3,045)	1,402 (3,091)	1,403 (3,093)	1,415 (3,120)	1,402 (3,091)	1,406 (3,100)
	Front	kg (lb)	794 (1,750)	794 (1,750)	819 (1,806)	819 (1,806)	805 (1,775)	803 (1,770)	828 (1,825)	829 (1,828)	833 (1,836)	829 (1,828)	825 (1,819)
	Rear	kg (lb)	560 (1,235)	560 (1,235)	563 (1,241)	563 (1,241)	570 (1,256)	578 (1,275)	574 (1,266)	574 (1,265)	582 (1,284)	573 (1,263)	581 (1,281)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		—	—	—	—	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		—	—	—	—	—	—	—	—	—	—	—
	Manual A/C		❍	❍	❍	❍	—	❍	❍	❍	❍	—	❍
	Leather package		—	—	—	—	❍	❍	—	—	—	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—	—	—
	Standard audio		❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	Premium audio		—	—	—	—	—	—	—	—	—	—	—
	Navigation		—	—	—	—	—	—	—	—	—	—	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—	—	—	—	—	—
	Advanced package		—	—	—	—	—	—	—	—	—	—	—
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍

	Curtain airbag	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight	—	—	—	—	—	—	—	—	—	—	—
	Cold weather package	—	—	—	—	❍	—	—	❍	❍	❍	—
	Sunroof	—	—	—	—	—	—	—	—	❍	—	—
	Power seat	—	—	—	—	—	—	—	—	—	—	—

Model			5 door								
			2.0 L DOHC non-turbo								
			2.0 i-Premium EyeSight		2.0 i-Premium+						
			CVT		5MT				CVT		
OP code			U5	U5	C5	C5	C5	C5	C5	C5	C5
			3C	3P	4P	4L	DP	DL	4L	DP	DL
Curb weight (C.W.)	Total	kg (lb)	1,410 (3,108)	1,422 (3,135)	1,397 (3,080)	1,399 (3,084)	1,402 (3,091)	1,404 (3,095)	1,427 (3,146)	1,428 (3,148)	1,423 (3,137)
	Front	kg (lb)	832 (1,834)	836 (1,843)	816 (1,799)	816 (1,799)	818 (1,803)	819 (1,806)	841 (1,854)	842 (1,856)	839 (1,850)
	Rear	kg (lb)	578 (1,274)	586 (1,292)	581 (1,281)	583 (1,285)	584 (1,288)	585 (1,289)	586 (1,292)	586 (1,292)	584 (1,287)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		—	—	—	—	—	—	—	—	—
	Manual A/C		❍	❍	—	—	—	—	—	—	—
	Leather package		—	—	❍	❍	❍	❍	❍	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—
	Standard audio		❍	❍	—	—	—	—	—	—	—
	Premium audio		—	—	❍	❍	—	—	❍	—	—
	Navigation		—	—	—	—	❍	❍	—	❍	❍
	Harman/Kardon + Premium audio		—	—	—	—	—	—	—	—	—
	Advanced package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight		—	—	❍	❍	❍	❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍	❍	❍	❍	❍	❍

	Sunroof	—	❍	❍	❍	❍	❍	❍	❍	❍
	Power seat	—	—	—	❍	—	❍	❍	—	❍

Model			5 door			
			2.0 L DOHC non-turbo			
			2.0 i-Premium+ EyeSight			
			CVT			
OP code			C5	C5	C5	C5
			LP	LL	ZP	ZL
Curb weight (C.W.)	Total	kg (lb)	1,428 (3,148)	1,430 (3,153)	1,433 (3,159)	1,435 (3,164)
	Front	kg (lb)	842 (1,856)	842 (1,856)	844 (1,861)	845 (1,863)
	Rear	kg (lb)	586 (1,292)	588 (1,297)	589 (1,298)	590 (1,301)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍
	Manual A/C		—	—	—	—
	Leather package		❍	❍	❍	❍
	Genuine leather seat		—	—	—	—
	Standard audio		—	—	—	—
	Premium audio		❍	❍	—	—
	Navigation		—	—	❍	❍
	Harman/Kardon + Premium audio		—	—	—	—
	Advanced package		❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍
	LED headlight		❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍
	Sunroof		❍	❍	❍	❍

	Power seat	—	❍	—	❍

Model			5 door								
			2.0 L DOHC non-turbo								
			Sport								
			5MT				CVT				
OP code			U5	U5	U5	U5	U5	U5	U5	U5	C4
			AC	AP	NP	NL	AC	AP	NP	NL	NP
Curb weight (C.W.)	Total	kg (lb)	1,398 (3,082)	1,410 (3,108)	1,416 (3,122)	1,418 (3,126)	1,422 (3,135)	1,435 (3,164)	1,441 (3,177)	1,443 (3,181)	1,442 (3,179)
	Front	kg (lb)	820 (1,808)	824 (1,817)	827 (1,823)	827 (1,823)	843 (1,858)	847 (1,867)	850 (1,874)	851 (1,876)	842 (1,856)
	Rear	kg (lb)	578 (1,274)	586 (1,291)	589 (1,299)	591 (1,303)	579 (1,277)	588 (1,297)	591 (1,303)	592 (1,305)	600 (1,323)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Manual A/C		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Leather package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Genuine leather seat		—	—	—	—	—	—	—	—	—
	Standard audio		—	—	—	—	—	—	—	—	—
	Premium audio		❍	❍	—	—	❍	❍	—	—	—
	Navigation		—	—	—	—	—	—	—	—	—
	Harman/Kardon + Premium audio		—	—	❍	❍	—	—	❍	❍	❍
	Advanced package		—	—	❍	❍	—	—	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight		—	—	—	—	—	—	—	—	—
	Cold weather package		❍	❍	❍	❍	❍	❍	❍	❍	❍
	Sunroof		—	❍	❍	❍	—	❍	❍	❍	❍

	Power seat	—	—	—	❍	—	—	—	❍	—

Model			5 door	
			2.0 L DOHC non-turbo	
			2.0 Sport EyeSight	
			CVT	
OP code			U5	U5
			NP	NL
Curb weight (C.W.)	Total	kg (lb)	1,444 (3,183)	1,445 (3,186)
	Front	kg (lb)	852 (1,878)	852 (1,878)
	Rear	kg (lb)	592 (1,305)	593 (1,308)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍
	Keyless access with push button start		❍	❍
	Manual A/C		❍	❍
	Leather package		❍	❍
	Genuine leather seat		—	—
	Standard audio		—	—
	Premium audio		—	—
	Navigation		—	—
	Harman/Kardon + Premium audio		❍	❍
	Advanced package		❍	❍
	Side airbag		❍	❍
	Curtain airbag		❍	❍

	LED headlight	—	—
	Cold weather package	❍	❍
	Sunroof	❍	❍
	Power seat	—	❍

Model			5 door							
			2.0 L DOHC non-turbo							
			2.0 i-Limited							
			CVT							
OP code			U5 ED	U5 SD	U5 ER	U5 SR	U5 YD	U5 JD	U5 YR	U5 JR
Curb weight (C.W.)	Total	kg (lb)	1,425 (3,142)	1,419 (3,128)	1,437 (3,168)	1,432 (3,157)	1,426 (3,144)	1,421 (3,133)	1,438 (3,170)	1,433 (3,159)
	Front	kg (lb)	852 (1,878)	841 (1,854)	848 (1,870)	845 (1,863)	843 (1,858)	841 (1,854)	848 (1,870)	845 (1,863)
	Rear	kg (lb)	573 (1,264)	578 (1,274)	589 (1,298)	587 (1,294)	583 (1,286)	580 (1,279)	590 (1,300)	588 (1,296)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍	❍	❍
	Manual A/C		—	—	—	—	—	—	—	—
	Leather package		❍	❍	❍	❍	❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍	❍	❍	❍	❍
	Standard audio		—	—	—	—	—	—	—	—
	Premium audio		—	❍	—	❍	—	❍	—	❍
	Navigation		❍	—	❍	—	❍	—	❍	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—	—	—
	Advanced package		—	—	—	—	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍	❍	❍

	Curtain airbag	❍	❍	❍	❍	❍	❍	❍	❍
	LED headlight	❍	❍	❍	❍	❍	❍	❍	❍
	Cold weather package	❍	❍	❍	❍	❍	❍	❍	❍
	Sunroof	—	—	❍	❍	—	—	❍	❍
	Power seat	❍	❍	❍	❍	❍	❍	❍	❍

Model			5 door			
			2.0 L DOHC non-turbo			
			2.0 i-NL			
			CVT			
OP code			C5	C5	C4	C4
			VR	IR	JR	YR
Curb weight (C.W.)	Total	kg (lb)	1,448 (3,192)	1,443 (3,181)	1,441 (3,177)	1,447 (3,190)
	Front	kg (lb)	854 (1,883)	852 (1,878)	841 (1,854)	844 (1,861)
	Rear	kg (lb)	594 (1,309)	591 (1,303)	600 (1,323)	603 (1,329)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍
	Keyless access with push button start		—	—	❍	❍
	Manual A/C		—	—	—	—
	Leather package		❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍
	Standard audio		—	—	—	—
	Premium audio		—	❍	❍	—
	Navigation		❍	—	—	❍
	Harman/Kardon + Premium audio		—	—	—	—
	Advanced package		❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍

	Curtain airbag	❍	❍	❍	❍
	LED headlight	❍	❍	❍	❍
	Cold weather package	❍	❍	❍	❍
	Sunroof	❍	❍	❍	❍
	Power seat	❍	❍	❍	❍

Model			5 door					
			2.0 L DOHC non-turbo					
			2.0 i-Limited EyeSight				2.0 i-NL EyeSight	
			CVT					
OP code			U5	U5	U5	U5	C5	C5
			YR	JR	YD	JD	YR	JR
Curb weight (C.W.)	Total	kg (lb)	1,443 (3,181)	1,438 (3,170)	1,431 (3,155)	1,425 (3,142)	1,455 (3,208)	1,449 (3,194)
	Front	kg (lb)	849 (1,872)	847 (1,867)	845 (1,863)	842 (1,856)	857 (1,889)	855 (1,885)
	Rear	kg (lb)	594 (1,309)	591 (1,303)	586 (1,292)	583 (1,286)	598 (1,319)	594 (1,309)
Gross vehicle weight (G.V.W.)		kg (lb)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)	1,950 (4,299)
Gross axle weight (G.A.W.)	Front	kg (lb)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)	990 (2,183)
	Rear	kg (lb)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)	1,000 (2,205)
Option	Aluminum wheel		❍	❍	❍	❍	❍	❍
	Keyless access with push button start		❍	❍	❍	❍	❍	❍
	Manual A/C		—	—	—	—	—	—
	Leather package		❍	❍	❍	❍	❍	❍
	Genuine leather seat		❍	❍	❍	❍	❍	❍
	Standard audio		—	—	—	—	—	—
	Premium audio		—	❍	—	❍	—	❍
	Navigation		❍	—	❍	—	❍	—
	Harman/Kardon + Premium audio		—	—	—	—	—	—
	Advanced package		❍	❍	❍	❍	❍	❍
	Side airbag		❍	❍	❍	❍	❍	❍
	Curtain airbag		❍	❍	❍	❍	❍	❍
	LED headlight		❍	❍	❍	❍	❍	❍
	Cold weather package		❍	❍	❍	❍	❍	❍

	Sunroof	❍	❍	—	—	❍	❍
	Power seat	❍	❍	❍	❍	❍	❍

CO(H4DO)

1. General Description
2. Radiator Fan System
3. Engine Coolant
4. Water Pump
5. Water Pipe
6. Thermostat
7. Radiator
8. Radiator Cap
9. Radiator Fan and Fan Motor Assembly
10. Radiator Fan Relay
11. Reservoir Tank
12. Active Grille Shutter
13. Engine Cooling System Trouble in General

SPECIFICATION

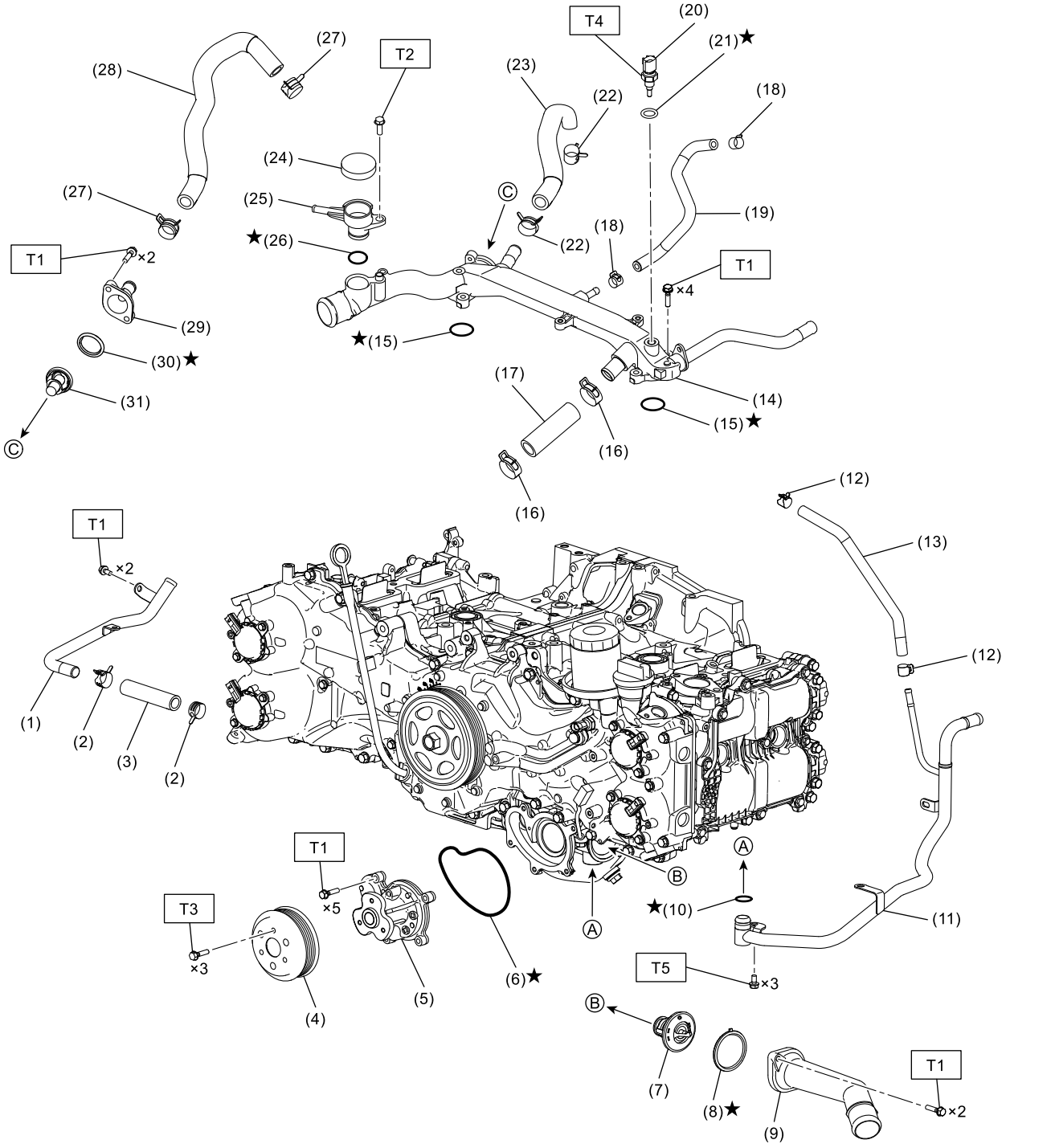
Cooling system				Electric fan + Forced engine coolant circulation system
Total engine coolant capacity L (US qt, Imp qt)			CVT model	Approx. 7.8 (8.2, 6.9)
			MT model	Approx. 7.6 (8.0, 6.7)
Water pump	Type			Centrifugal impeller type
	Discharge performance	Discharge rate L (US gal, Imp gal)/min		214 (56.5, 47.1)
		Pump speed — Discharge pressure		8,580 r/min — 88 kPa (8.9 mAq)
		Engine coolant temperature		80°C (176°F)
	Impeller diameter mm (in)			56 (2.20)
	Number of impeller vanes			7
	Pump pulley effective diameter mm (in)			100 (3.94)
Thermostat	Type			Wax pellet type
	Starting temperature to open		Engine side	90 — 94°C (194 — 201°F)
			Water tank pipe side	48 — 52°C (118 — 126°F)
	Fully opens		Engine side	100°C (212°F)
			Water tank pipe side	63°C (145°F)
	Valve lift mm (in)		Engine side	8.0 (0.315) or more
			Water tank pipe side	6.0 (0.236) or more
	Valve opening size mm (in)		Engine side	32 (1.26)
			Water tank pipe side	22 (0.87)
Radiator fan	Motor input	Main fan W		120
		Sub fan W		120
	Fan diameter / Blade	Main fan		300 mm (11.8 in) /9
		Sub fan		300 mm (11.8 in) /11
Radiator	Type			Side flow, pressure type
	Core dimensions	Width × Height × Thickness mm (in)		660 × 373.3 × 12.1 (25.98 × 14.70 × 0.48)
	Pressure range in which cap valve is open kPa (kg/cm^2, psi)		Positive pressure side Standard	93 — 123 (0.95 — 1.25, 14 — 18)
			Positive pressure side Limit	83 (0.85, 12)
			Negative pressure side Standard	−1.0 — −4.9 or less (−0.01 — −0.05, −0.1 — −0.7)

	Fins				Corrugated fin type
Water tank pipe	Pressure range in which cap valve is open	kPa (kg/cm^2, psi)	Positive pressure side	Standard	122 — 152 (1.24 — 1.55, 18 — 22)
				Limit	112 (1.14, 16)
Reservoir tank	Capacity			L (US qt, Imp qt)	0.45 (0.48, 0.40)

	Recommended materials	Item number	Alternative
Engine coolant	SUBARU SUPER COOLANT (concentrated type)	—	—
	SUBARU SUPER COOLANT (diluted type)	K0670Y0001	
Water for dilution	Distilled water	—	Soft water or tap water
Cooling system protective agent	Cooling system conditioner	SOA345001	—

COMPONENT

1. ENGINE COOLING SYSTEM



CO-10096

(1) Water pipe RH
(2) Clip
(3) Water hose
(4) Water pump pulley
(5) Water pump ASSY
(6) Gasket
(7) Thermostat
(8) Gasket
(14) Water tank pipe ASSY
(15) O-ring
(16) Clip
(17) Water hose
(18) Clip
(19) Preheater hose
(20) Engine coolant temperature sensor
(21) Gasket
(27) Clip
(28) Water hose
(29) Thermostat cover (CVT model)
(30) Gasket (CVT model)
(31) Thermostat (CVT model)

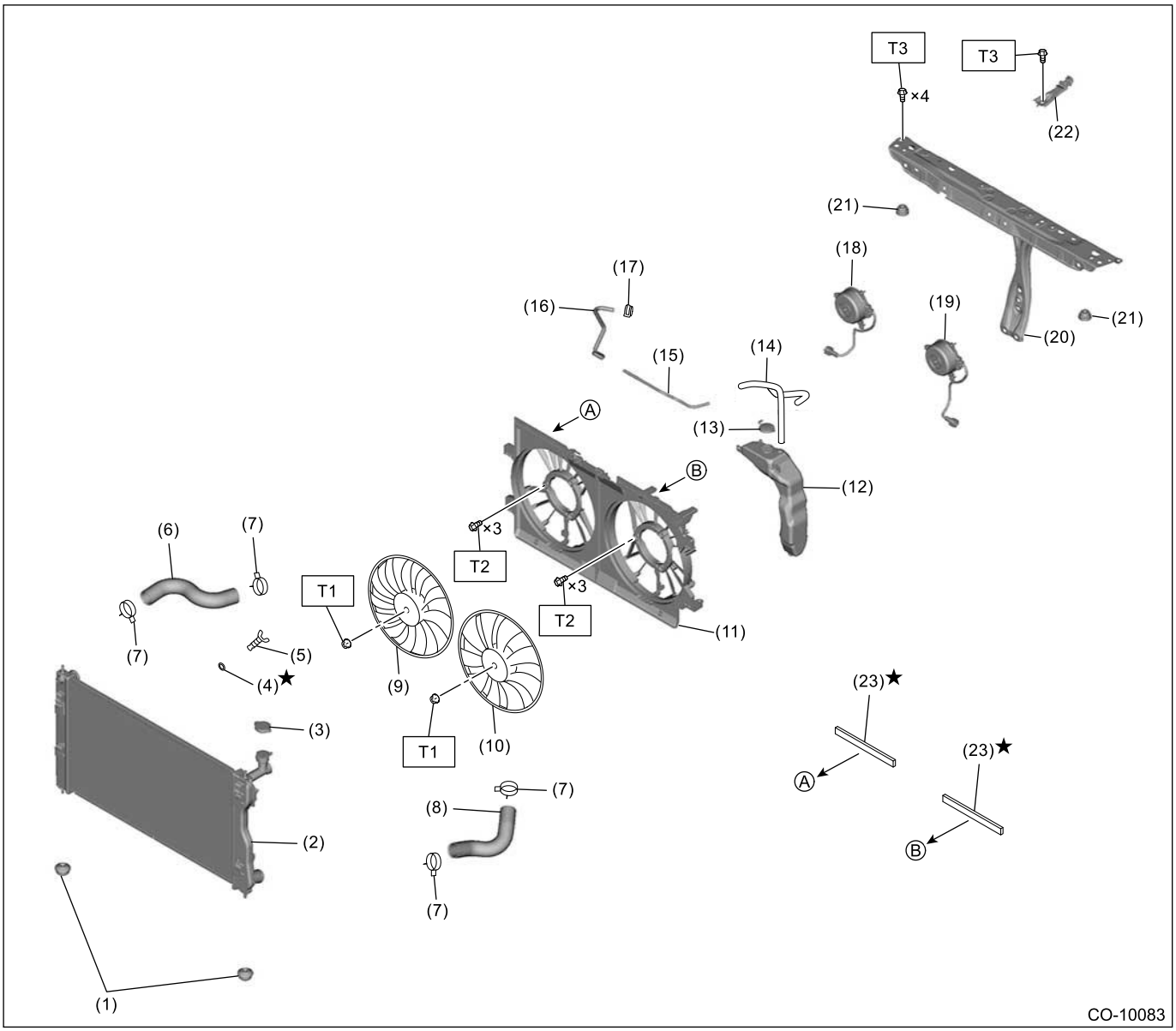
Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

(9) Thermostat cover
(10) O-ring
(11) Water pipe LH
(12) Clip
(13) Preheater hose
(22) Clip
(23) Water hose
(24) Water tank pipe cap
(25) Filler neck
(26) O-ring

T2: 7 (0.7, 5.2)
T3: 14 (1.4, 10.3)
T4: 16 (1.6, 11.8)
T5: Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE LH.

2. RADIATOR & RADIATOR FAN

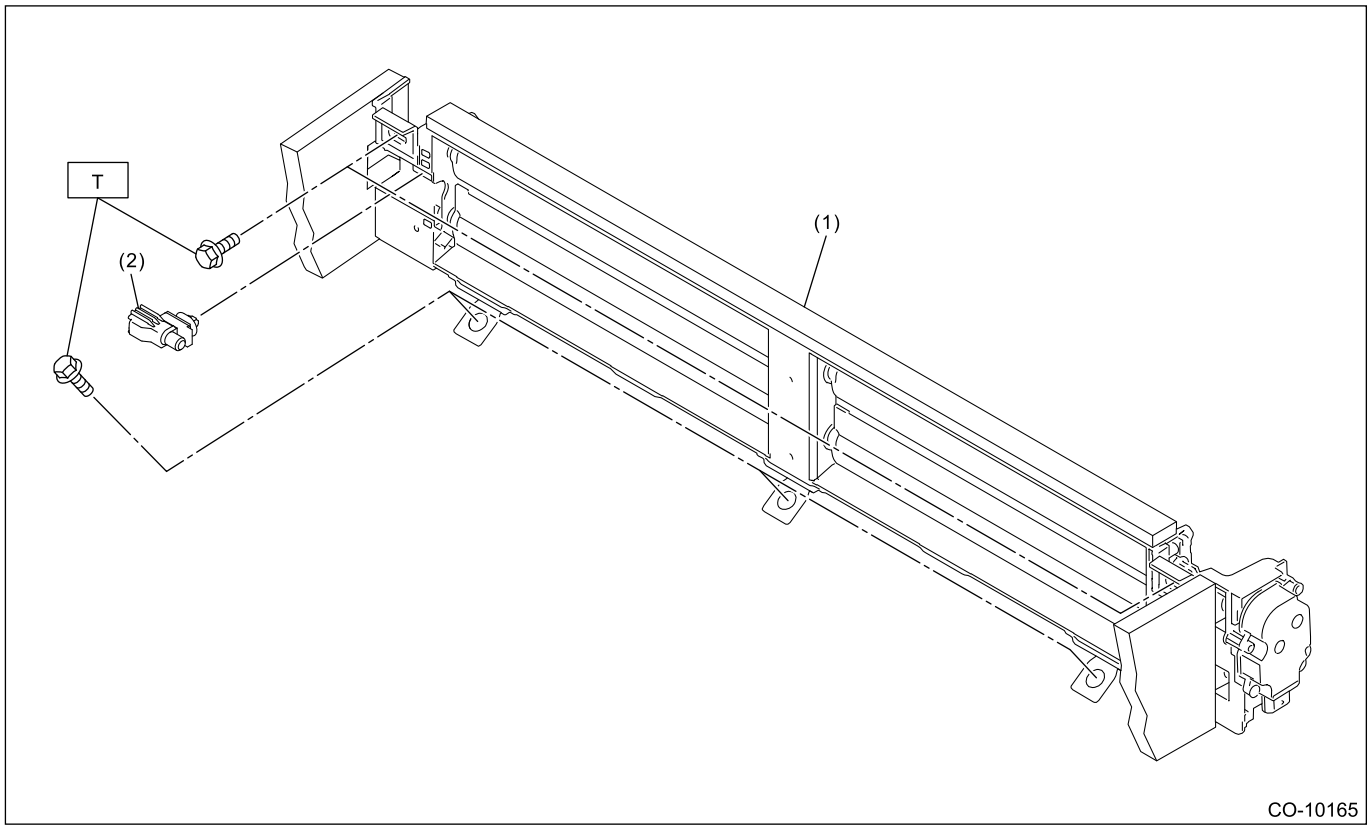


(1) Radiator lower cushion
(2) Radiator
(3) Radiator cap
(4) O-ring
(5) Radiator drain plug
(6) Radiator inlet hose
(7) Clip
(8) Radiator outlet hose
(9) Radiator sub fan
(10) Radiator main fan
(11) Radiator fan shroud
(12) Reservoir tank
(13) Reservoir tank cap
(14) Over flow hose
(15) Over flow pipe
(16) Over flow hose
(17) Clip
(18) Sub fan motor
(19) Main fan motor
(20) Radiator upper frame
(21) Cushion
(22) Hood stay bracket
(23) Radiator gasket

Tightening torque: N·m (kgf-m, ft-lb)

T1: 3.43 (0.35, 2.53)
T2: 4.41 (0.45, 3.25)
T3: 18 (1.8, 13.3)

3. ACTIVE GRILLE SHUTTER



(1) Active grille shutter (2) Ambient sensor

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.8, 5.5)

COOLING(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prepare a container and cloth to prevent scattering of engine coolant when performing work where engine coolant can be spilled. If the oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.

- Be sure to tighten the fasteners including bolts and nuts to the specified torque.
- Follow all government and local regulations concerning disposal of refuse when disposing engine coolant.
- If the engine coolant splashes, completely remove and clean it.

PREPARATION TOOL

1. SPECIAL TOOL

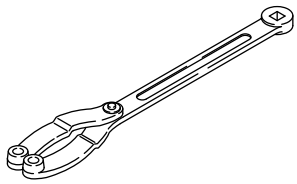
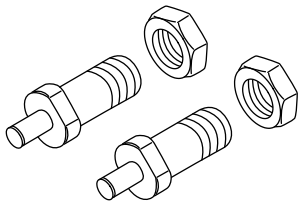
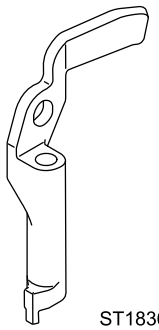
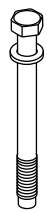
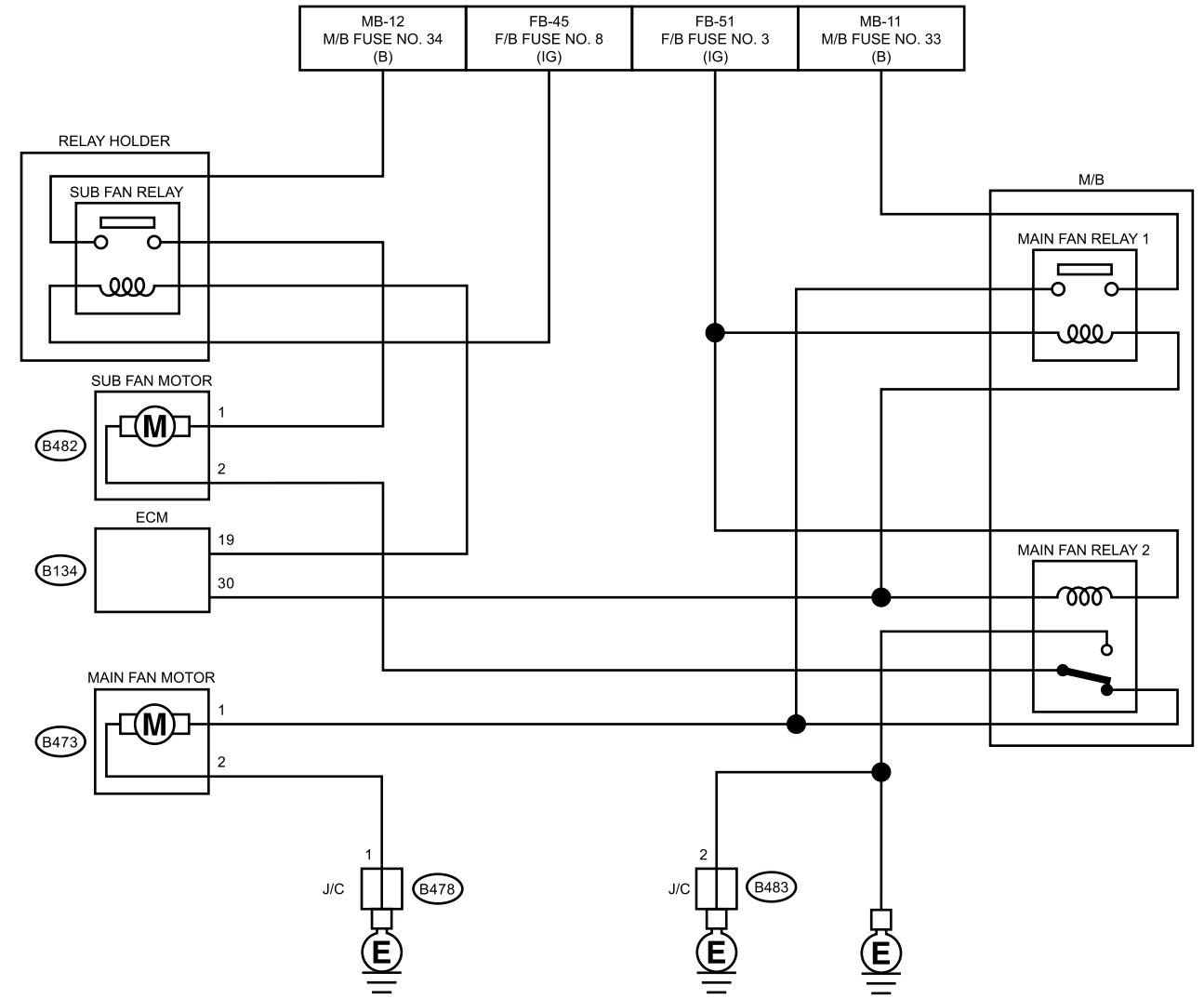
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18355AA000	18355AA000	PULLEY WRENCH	• Used for removing and installing water pump pulley. • Used with PULLEY WRENCH PIN SET (18334AA020).
 ST18334AA020	18334AA020	PULLEY WRENCH PIN SET	• Used for removing and installing water pump pulley. • Used together with PULLEY WRENCH (18355AA000).
 ST18360AA040	18360AA040	HANGER	• Used for removing and installing the water pipe assembly LH. • Used together with BOLT (1836AA050).
 ST18363AA050	18363AA050	BOLT	• Used for removing and installing the water pipe assembly LH. • Used together with HANGER (18360AA040).

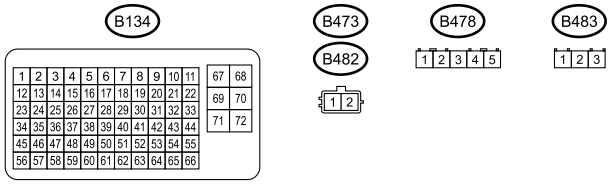
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Radiator cap tester	Used for checking radiator and radiator cap.
DST-i	Used together with Subaru Select Monitor 4.

WIRING DIAGRAM





CO-10098

INSPECTION

Caution:

- **Be careful not to let your hands or other objects get caught in the rotating parts.**
- **Since some of the power supply circuits are shared with other system, check such system other than the radiator fan system for faulty conditions before proceeding any further.**
- **Since more than one faulty conditions may occur simultaneously, once work is done perform "Basic Inspection of Radiator Fan System" to confirm that the system is working properly.**
- **Since battery discharge may occur, charge the battery as necessary.** **Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>CHARGE.**

Operating condition:

Vehicle speed	A/C compressor load	Engine coolant temperature		
		Increase: 98°C (208°F) or less Decrease: 96°C (205°F) or less	Increase: 99 — 104°C (210 — 219°F) Decrease: 97 — 102°C (207 — 216°F)	Increase: 105°C (221°F) or more Decrease: 103°C (217°F) or more
		Radiator fan operation	Radiator fan operation	Radiator fan operation
During acceleration: 19 km/h (12 MPH) or less During deceleration: 10 km/h (6 MPH) or less	OFF	OFF	Low-Speed	High-Speed
	Low	Low-Speed	Low-Speed	High-Speed
	High	High-Speed	High-Speed	High-Speed
During acceleration: 20 — 69 km/h (12 — 43 MPH) During deceleration: 11 — 64 km/h (7 — 40 MPH)	OFF	OFF	Low-Speed	High-Speed
	Low	High-Speed	High-Speed	High-Speed
	High	High-Speed	High-Speed	High-Speed
During acceleration: 70 — 134 km/h (43 — 83 MPH) During deceleration: 65 — 129 km/h (40 — 80 MPH)	OFF	OFF	Low-Speed	High-Speed
	Low	OFF	Low-Speed	High-Speed
	High	Low-Speed	High-Speed	High-Speed
During acceleration: 135 km/h (84 MPH) or more	OFF	OFF	OFF	High-Speed
	Low	OFF	Low-Speed	High-Speed

Vehicle speed	A/C compressor load	Engine coolant temperature		
		Increase: 98°C (208°F) or less Decrease: 96°C (205°F) or less	Increase: 99 — 104°C (210 — 219°F) Decrease: 97 — 102°C (207 — 216°F)	Increase: 105°C (221°F) or more Decrease: 103°C (217°F) or more
		Radiator fan operation	Radiator fan operation	Radiator fan operation
During deceleration: 130 km/h (81 MPH) or more				
	High	OFF	Low-Speed	High-Speed

1. BASIC INSPECTION OF RADIATOR FAN SYSTEM

1. CHECK DTC.

Read the DTC using the Subaru Select Monitor 4.

Note:

For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

Is DTC detected?

Yes

(1) Repair the corresponding system.

(2) Go to 2.

No

Go to 2.

2. RADIATOR FAN SYSTEM OPERATION CHECK.

Note:

If the radiator fans are always running, go to "INSPECTION WHEN RADIATOR FANS DO NOT STOP". Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION > INSPECTION WHEN RADIATOR FANS DO NOT STOP.

1. Install the test mode fuse.
2. Turn to IG ON.
3. Check the radiator fan operation.

Do the radiator main fan and sub fan rotate in the order of "OFF → Low speed revolution → High speed revolution"?

Yes	System is normal. Restore the vehicle to its original state.
No	Inspect corresponding malfunction using "Table for Diagnostics Procedure with Phenomenon".

Table for Diagnostics Procedure with Phenomenon

Note:

If phenomenon does not match with any of the phenomenon described below, inspect fuse, relay and ground contacts for failure.

	Sub fan	Main fan	Sub fan	Main fan	Sub fan	Main fan	Sub fan	Main fan
Stop control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Low speed control	Stop	Stop	At high speed	Stop	At low speed	At low speed	At low speed	At low speed
High speed control	Stop or high speed	Stop or high speed	At high speed	Stop or high speed	At high speed	Stop	Stop	At high speed
Reference	Inspection when radiator fans do not rotate (A) Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (A).		Inspection when radiator fans do not rotate (B) Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (B).		Inspection when radiator fans do not rotate (C) Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (C).		Inspection when radiator fans do not rotate (D) Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE>INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (D).	

2. INSPECTION WHEN RADIATOR FANS DO NOT ROTATE

- **INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (A)**

1. CHECK SUB FAN FUSE.

1. Disconnect the ground cable from battery.
2. Remove the sub fan fuse.
3. Check sub fan fuse.

Is the sub fan fuse OK?

Yes — Go to 2.

No — Go to 13.

2. CHECK SUB FAN RELAY.

1. Remove the sub fan relay.
2. Perform unit check for the sub fan relay.

Is the sub fan relay OK?

Yes — Go to 3.

No

(1) Replace the sub fan relay.
(2) Restore the vehicle to its original state.

3. CHECK MAIN FAN RELAY 2.

1. Remove the main fan relay 2.
2. Perform unit check for the main fan relay 2.

Is the main fan relay 2 OK?

Yes — Go to 4.

No

(1) Replace the main fan relay 2.
(2) Restore the vehicle to its original state.

4. CHECK SUB FAN MOTOR.

1. Disconnect the connector from the sub fan motor.
2. Connect the battery terminal to the sub fan motor.

Does the sub fan motor rotate properly?

Yes	Go to 5.
No	(1) Replace the sub fan motor. (2) Restore the vehicle to its original state.

5. CHECK MAIN FAN MOTOR.

1. Disconnect the connector from the main fan motor.
2. Connect the battery terminal to the main fan motor.

Does the main fan motor rotate properly?

Yes	Go to 6.
No	(1) Replace the main fan motor. (2) Restore the vehicle to its original state.

6. CONTINUITY CHECK OF HARNESS BETWEEN MAIN FAN MOTOR AND CHASSIS GROUND.

Check continuity of harness between the main fan motor and chassis ground.

Is there continuity?

Yes	Go to 7.
No	(1) Repair the harness between the main fan motor and chassis ground. (2) Restore the vehicle to its original state.

7. CONTINUITY CHECK OF HARNESS BETWEEN MAIN FAN RELAY 2 AND MAIN FAN MOTOR.

Check continuity of harness between main fan relay 2 and the main fan motor.

Is there continuity?

Yes — Go to 8.

No — (1) Repair the harness between main fan relay 2 and the main fan motor.
(2) Restore the vehicle to its original state.

8. CONTINUITY CHECK OF HARNESS BETWEEN SUB FAN MOTOR AND MAIN FAN RELAY 2.

Check continuity of harness between the sub fan motor and the main fan relay 2.

Is there continuity?

Yes — Go to 9.

No — (1) Repair the harness between the sub fan motor and the main fan relay 2.
(2) Restore the vehicle to its original state.

9. CONTINUITY CHECK OF HARNESS BETWEEN SUB FAN RELAY AND SUB FAN MOTOR.

Check continuity of harness between sub fan relay and sub fan motor.

Is there continuity?

Yes — Go to 10.

No — (1) Repair the harness between sub fan relay and sub fan motor.
(2) Restore the vehicle to its original state.

10. CONTINUITY CHECK OF HARNESS BETWEEN SUB FAN FUSE AND SUB FAN RELAY.

Check continuity of harness between sub fan fuse and sub fan relay.

Is there continuity?

Yes — Go to 11.

No — (1) Repair the harness between sub fan fuse and sub fan relay.
(2) Restore the vehicle to its original state.

11. CONTINUITY CHECK OF HARNESS BETWEEN A/C IG FUSE AND SUB FAN RELAY.

Check continuity of harness between A/C IG fuse and sub fan relay.

Is there continuity?

Yes — Go to 12.

No — (1) Repair the harness between A/C IG fuse and sub fan relay.
(2) Restore the vehicle to its original state.

12. CONTINUITY CHECK OF HARNESS BETWEEN SUB FAN RELAY AND ECM.

Check continuity of harness between sub fan relay and ECM.

Is there continuity?

Yes — (1) Check for poor contact of the connectors due to wear damage of connector pins. If they are OK, replace the ECM.
(2) Restore the vehicle to its original state.

No — (1) Repair the harness between sub fan relay and ECM.
(2) Restore the vehicle to its original state.

13. CHECK SUB FAN RELAY.

1. Remove the sub fan relay.
2. Perform unit check for the sub fan relay.

Is the sub fan relay OK?

Yes — Go to 14.

No
(1) Replace the sub fan relay.
(2) Replace the sub fan fuse.
(3) Restore the vehicle to its original state.

14. INSULATION CHECK OF HARNESS BETWEEN SUB FAN FUSE AND SUB FAN RELAY.

Check insulation of harness and chassis ground between sub fan fuse and sub fan relay.

Are they insulated?

Yes
(1) Replace the sub fan fuse.
(2) Restore the vehicle to its original state.

No
(1) Repair the harness between sub fuse and sub fan relay.
(2) Replace the sub fan fuse.
(3) Restore the vehicle to its original state.

• INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (B)

1. CHECK MAIN FAN RELAY 2.

1. Disconnect the ground cable from battery.
2. Remove the main fan relay 2.
3. Perform unit check for the main fan relay 2.

Is the main fan relay 2 OK?

Yes — Go to 2.

No
(1) Replace the main fan relay 2.
(2) Restore the vehicle to its original state.

2. CHECK MAIN FAN RELAY 1.

1. Remove the main fan relay 1.
2. Perform unit check for the main fan relay 1.

Is the main fan relay 1 OK?

Yes	Go to 3.
No	(1) Replace the main fan relay 1. (2) Restore the vehicle to its original state.

3. INSULATION CHECK OF HARNESS BETWEEN SUB FAN MOTOR AND MAIN FAN RELAY 2.

1. Disconnect the connector from the sub fan motor.
2. Check insulation of harness and chassis ground between the sub fan motor and the main fan relay 2.

Are they insulated?

Yes	Go to 4.
No	(1) Repair the harness between the sub motor and the main fan relay 2. (2) Restore the vehicle to its original state.

4. INSULATION CHECK OF HARNESS BETWEEN MAIN FAN RELAY 2 AND MAIN FAN MOTOR.

1. Disconnect the connector from the main fan motor.
2. Check insulation of harness and chassis ground between main fan relay 2 and the main fan motor.

Are they insulated?

Yes	(1) Replace the main fan motor. (2) Restore the vehicle to its original state.
No	(1) Repair the harness between main fan relay 2 and the main fan motor. (2) Restore the vehicle to its original state.

- **INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (C)**

1. CHECK MAIN FAN FUSE.

1. Disconnect the ground cable from battery.
2. Remove the main fan fuse.
3. Check the main fan fuse.

Is the fuse OK?

Yes — Go to 2.

No — Go to 3.

2. CHECK MAIN FAN RELAY 1.

1. Remove the main fan relay 1.
2. Perform unit check for the main fan relay 1.

Is the main fan relay 1 OK?

Yes
(1) Repair the harness between the main fan fuse and the main fan relay 1.
(2) Restore the vehicle to its original state.

No
(1) Replace the main fan relay 1.
(2) Restore the vehicle to its original state.

3. CHECK MAIN FAN RELAY 1.

1. Remove the main fan relay 1.
2. Perform unit check for the main fan relay 1.

Is the main fan relay 1 OK?

Yes — Go to 4.

No
(1) Replace the main fan relay 1.
(2) Replace the main fan fuse.
(3) Restore the vehicle to its original state.

4. INSULATION CHECK OF HARNESS BETWEEN MAIN FAN FUSE AND MAIN FAN RELAY 1.

Check insulation of harness and chassis ground between the main fan fuse and the main fan relay 1.

Are they insulated?

Yes

(1) Replace the main fan fuse.
(2) Restore the vehicle to its original state.

No

(1) Repair the harness between the main fan fuse and the main fan relay 1.
(2) Replace the main fan fuse.
(3) Restore the vehicle to its original state.

- **INSPECTION WHEN RADIATOR FANS DO NOT ROTATE (D)**

1. CHECK MAIN FAN RELAY 2.

1. Disconnect the ground cable from battery.
2. Remove the main fan relay 2.
3. Perform unit check for the main fan relay 2.

Is the main fan relay 2 OK?

Yes

Go to 2.

No

(1) Replace the main fan relay 2.
(2) Restore the vehicle to its original state.

2. CONTINUITY CHECK OF HARNESS BETWEEN MAIN FAN RELAY 1 AND MAIN FAN RELAY 2.

1. Remove the main fan relay 1.
2. Check continuity of harness between the main fan relay 1 and the main fan relay 2.

Is there continuity?

Yes

(1) Repair the harness between the main fan relay 2 and the chassis ground.
(2) Restore the vehicle to its original state.

No

(1) Repair the harness between the main fan relay 1 and the main fan relay 2.
(2) Restore the vehicle to its original state.

3. INSPECTION WHEN RADIATOR FANS DO NOT STOP

- **INSPECTION WHEN MAIN FAN AND SUB FAN DO NOT STOP**

1. CHECK SUB FAN RELAY.

1. Disconnect the ground cable from battery.
2. Remove the sub fan relay.
3. Perform unit check for the sub fan relay.

Is the sub fan relay OK?

Yes	Go to 2.
No	(1) Replace the sub fan relay. (2) Restore the vehicle to its original state.

2. INSULATION CHECK OF HARNESS BETWEEN SUB FAN RELAY AND SUB FAN MOTOR.

1. Connect the battery ground terminal.
   Note:
   Sub fan relay is removed.
2. Turn to IG ON.
3. Check the radiator fan operation.

Do the sub fan motor and the main fan motor rotate?

Yes	(1) Repair the harness between sub fan relay and sub fan motor. (2) Restore the vehicle to its original state.
No	Go to 3.

3. INSULATION CHECK OF HARNESS BETWEEN SUB FAN RELAY AND ECM.

1. Disconnect the ground cable from battery.
2. Disconnect the ECM connector.
3. Check insulation of harness and chassis ground between sub fan relay and ECM.

Are they insulated?

Yes	(1) Replace the ECM. (2) Restore the vehicle to its original state.
No	(1) Repair the harness between sub fan relay and ECM. (2) Restore the vehicle to its original state.

- **INSPECTION WHEN ONLY MAIN FAN DOES NOT STOP**

1. CHECK MAIN FAN RELAY 1.

1. Disconnect the ground cable from battery.
2. Remove the main fan relay 1.
3. Perform unit check for the main fan relay 1.

Is the main fan relay 1 OK?

Yes	Go to 2.
No	(1) Replace the main fan relay 1. (2) Restore the vehicle to its original state.

2. INSULATION CHECK OF HARNESS BETWEEN MAIN FAN MOTOR AND SUB FAN MOTOR.

1. Connect the battery ground terminal.

   Note:

   Main fan relay 1 is removed.
2. Turn to IG ON.
3. Check the radiator fan operation.

Does the main fan motor rotate?

Yes	(1) Repair the harness between the main fan motor and the sub fan motor. (2) Restore the vehicle to its original state.
No	(1) Replace the ECM. (2) Restore the vehicle to its original state.

INSPECTION

Caution:

- **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
- **If the engine coolant splashes, completely remove and clean it.**

Recommended engine coolant:

Refer to "SPECIFICATION" for recommended engine coolant. Ref. to COOLING(H4DO)>General Description>SPECIFICATION.

Engine coolant concentration:

Refer to "ADJUSTMENT" for the recommended engine coolant concentration. Ref. to COOLING(H4DO)>Engine Coolant>ADJUSTMENT.

Note:

The SUBARU Super Coolant contains anti-freeze and anti-rust agents, and is especially made for Subaru engines with an aluminum cylinder block. Be sure to use SUBARU Super Coolant, since other coolant may cause corrosion.

1. Park the vehicle on a level surface.
2. Check the engine coolant amount, and add the engine coolant if the coolant level is low.
   Note:
   If it is necessary to add the coolant, make sure that there are no engine coolant leaks.
   (1) Make sure the engine coolant level in the reservoir tank is between "FULL" and "LOW" with the engine in a cold condition.
   (2) Open the radiator cap and make sure that the radiator is filled with the engine coolant up to its filler neck position.

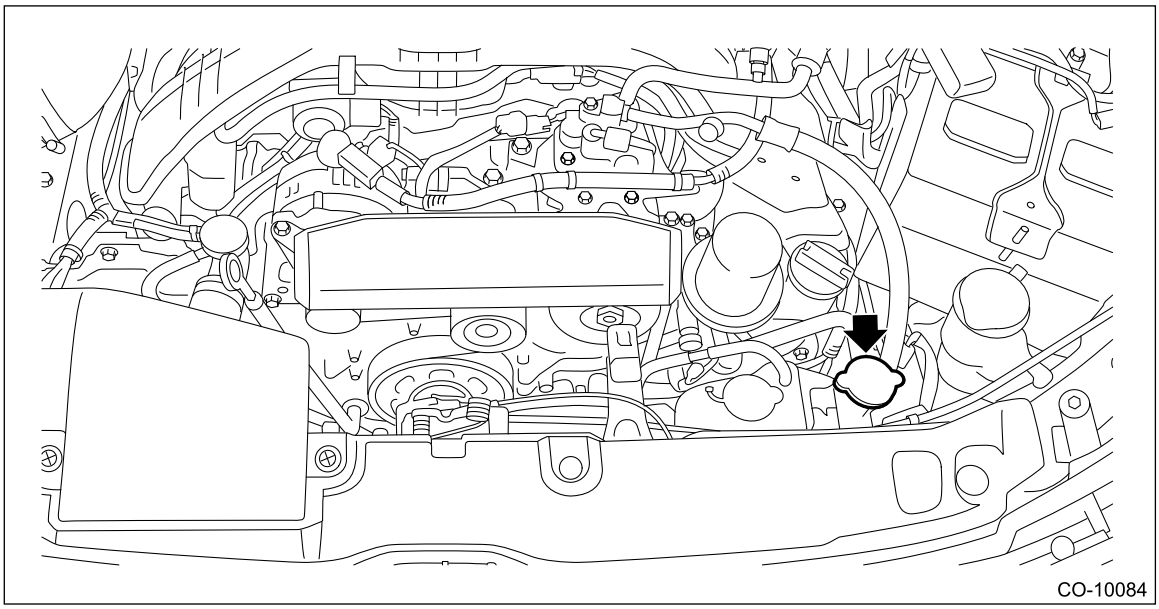
REPLACEMENT

1. DRAINING OF ENGINE COOLANT

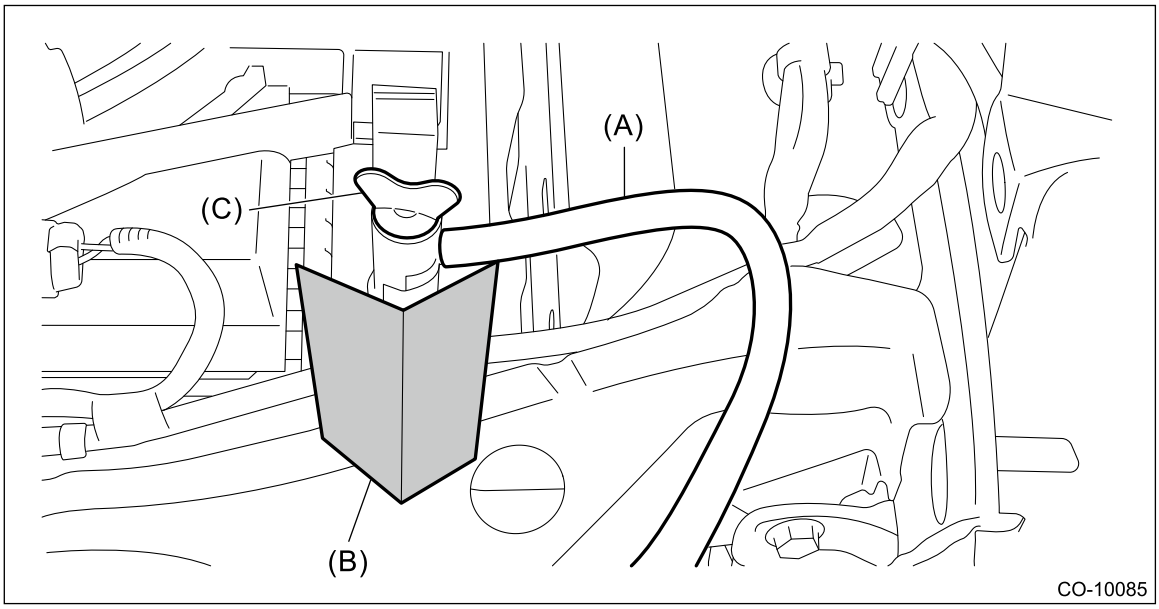
Caution:

- **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
- **If the engine coolant splashes, completely remove and clean it.**

1. Remove the radiator cap.



2. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Connect hose (A) to the drain pipe of the radiator.
   Note:
   Use a hose with an inner diameter of 8.0 mm (0.315 in).
4. Place a vinyl cover (B) at the neck of the radiator drain plug.
   Caution:
   This is necessary to prevent splash of the engine coolant.
5. Loosen the radiator drain plug (C) to drain engine coolant.



6. After draining the engine coolant, remove the radiator drain plug.
7. Install the radiator drain plug with a new O-ring.
8. Remove hoses and the vinyl cover.
9. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
10. Drain the coolant from reservoir tank.

2. FILLING OF ENGINE COOLANT

Caution:

- **For CVT models, set the select lever to "P" or "N" range (for MT models, the shift lever in neutral) during work, and do not shift the lever.**
- **If the engine coolant splashes, completely remove and clean it.**

Recommended engine coolant:

Refer to "SPECIFICATION" for recommended engine coolant. Ref. to COOLING(H4DO)>General Description>SPECIFICATION.

Engine coolant concentration:

Refer to "ADJUSTMENT" for the recommended engine coolant concentration. Ref. to COOLING(H4DO)>Engine Coolant>ADJUSTMENT.

Engine coolant level:

Refer to "SPECIFICATION" for engine coolant level. Ref. to COOLING(H4DO)>General Description>SPECIFICATION.

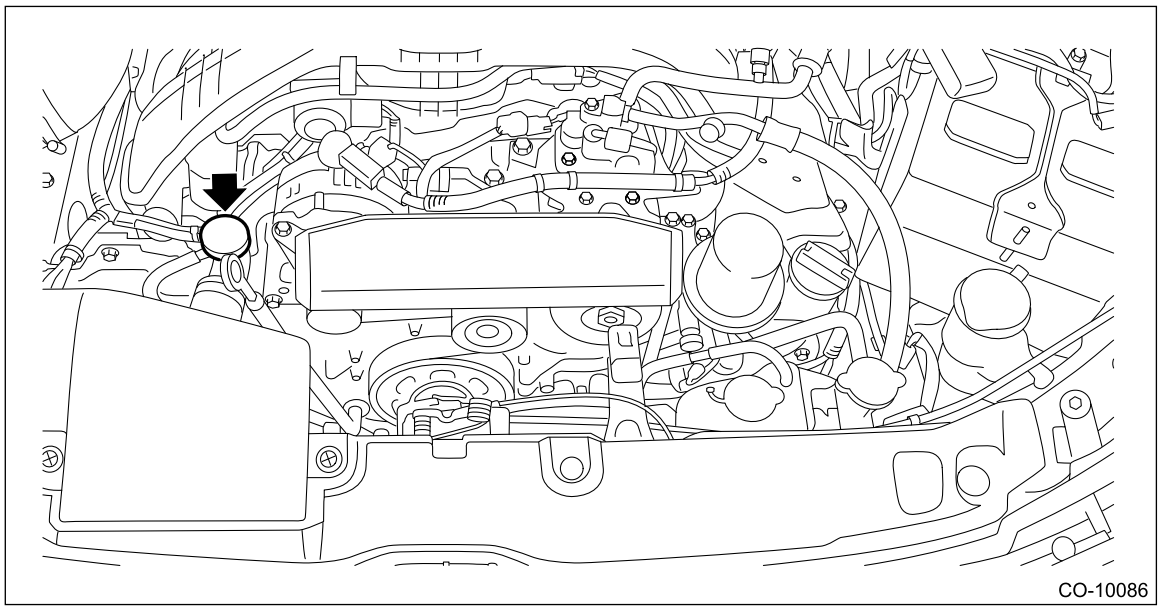
Cooling system protective agent:

Refer to "SPECIFICATION" for cooling system protective agent. Ref. to COOLING(H4DO)>General Description>SPECIFICATION.

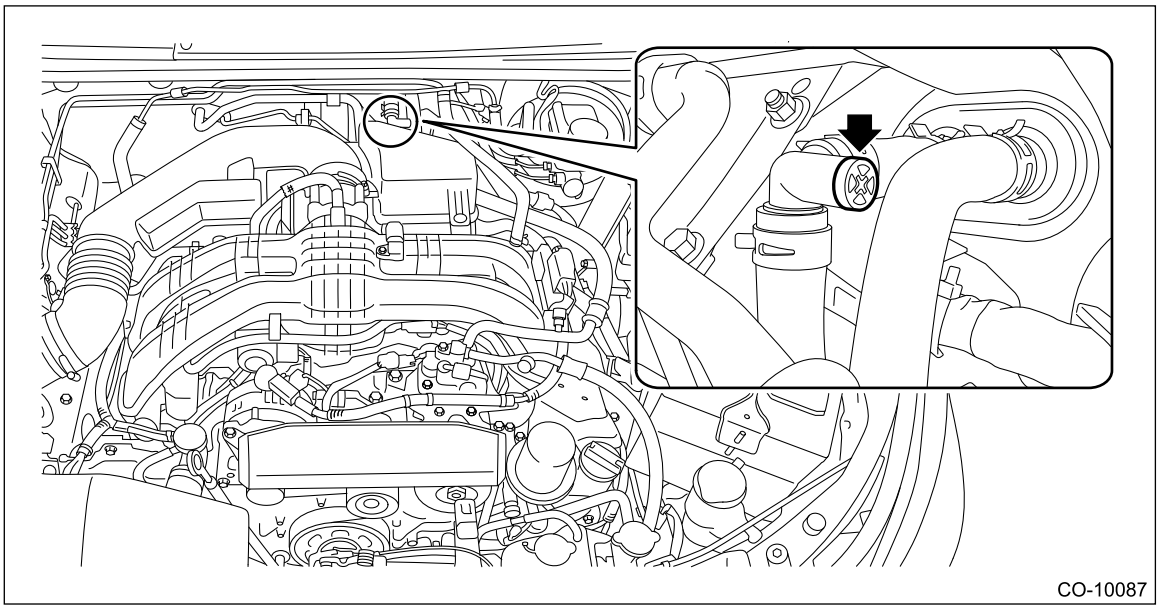
Note:

The SUBARU Super Coolant contains anti-freeze and anti-rust agents, and is especially made for Subaru engines with an aluminum cylinder block. Be sure to use SUBARU Super Coolant, since other coolant may cause corrosion.

1. Remove the water tank pipe cap.



2. Loosen the air bleed plug on the heater outlet hose.



3. Pour in cooling system conditioner.
   Note:
   Pour it from the radiator side.
4. Pour engine coolant into the radiator and top off to the opening of the water tank pipe cap.
   Note:
   Pour it from the radiator side.
5. Install the water tank pipe cap.
   Caution:
   Always use the water tank pipe cap, since its function is different from the radiator cap.
6. After pouring in the engine coolant, close the air bleeding plug when the engine coolant comes out of the air bleeding plug on the heater outlet hose.
7. Pour engine coolant into the radiator up to the filler neck position.
8. Fill engine coolant into the reservoir tank up to "FULL" level.
9. Install the reservoir tank cap.
10. Install the radiator cap.
11. Start the engine, and race 5 to 6 times at 3,000 r/min or less, then stop the engine.
    Note:
    Complete this operation within 40 seconds.
12. After stopping the engine, wait for at least 1 minute and then remove the radiator cap. If the engine coolant level drops, add engine coolant into radiator up to the filler neck position.
    Note:
    Do not remove the water tank pipe cap, or the engine coolant may over flow.
13. Perform the procedures 10), 11) and 12) again.
14. Install the radiator cap.
15. Start the engine and operate the heater at maximum hot position and the blower speed setting at "LO", and the A/C switch at "OFF".
16. Run the engine at 3,000 r/min or less until the radiator fan starts and then stops.
    Caution:
    Frequently check the engine coolant temperature in order to avoid overheat.
17. Stop the engine and wait until the engine coolant temperature lowers to 30°C (86°F) or less.
18. Remove the radiator cap. If the engine coolant level drops, add engine coolant into the radiator up to the filler neck position and the reservoir tank to "FULL" level.
19. Attach the radiator cap and reservoir tank cap properly.

20. Set the heater setting to maximum hot position, the blower speed setting to “LO”, and the A/C switch to “OFF”, and start the engine. Perform racing at 3,000 r/min or less. If the flowing sound is heard from the heater core, repeat the procedures from step 16).

ADJUSTMENT

1. PROCEDURE TO ADJUST THE SUBARU SUPER COOLANT CONCENTRATION

Caution:

Use the SUBARU Super Coolant with a 50 — 60% concentration in order to obtain maximum anti-freeze and anti-rust performance.

Engine coolant and diluting water:

Refer to “SPECIFICATION” for recommended engine coolant and diluting water. Ref. to COOLING(H4DO)>General Description>SPECIFICATION.

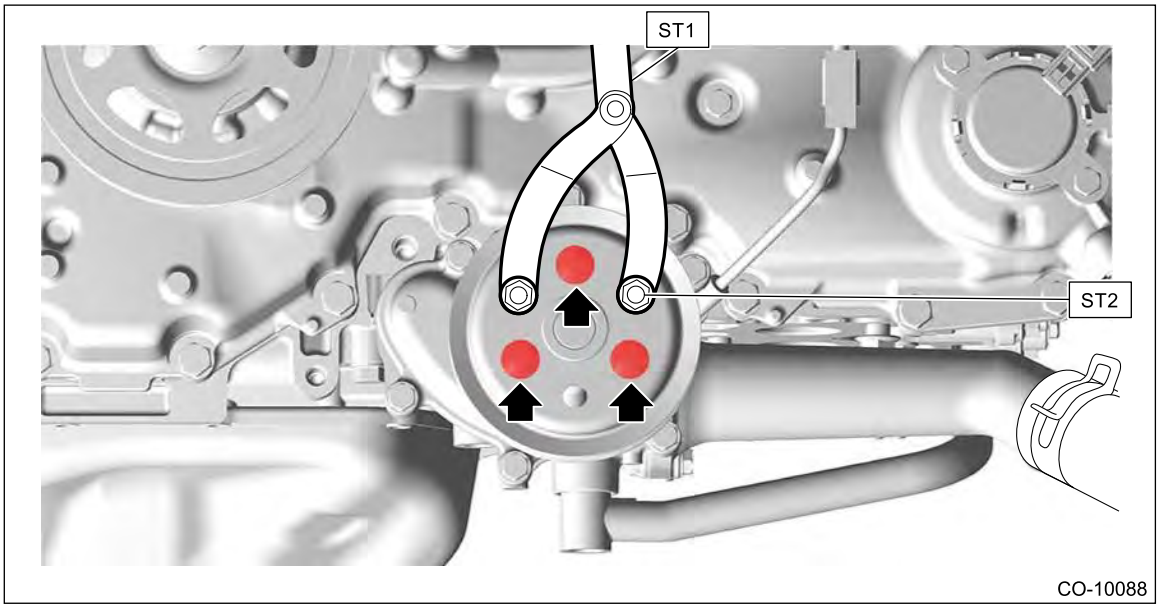
To adjust the concentration of SUBARU Super Coolant according to temperature, find the proper SUBARU Super Coolant concentration in the table, and add dilution water to the SUBARU Super Coolant (concentrated type) until it reaches the proper dilution.

Relationship of SUBARU Super Coolant concentration and freezing temperature			
SUBARU Super Coolant concentration	50%	55%	60%
Freezing temperature	−36°C (−33°F)	−41°C (−42°F)	−50°C (−58°F)

REMOVAL

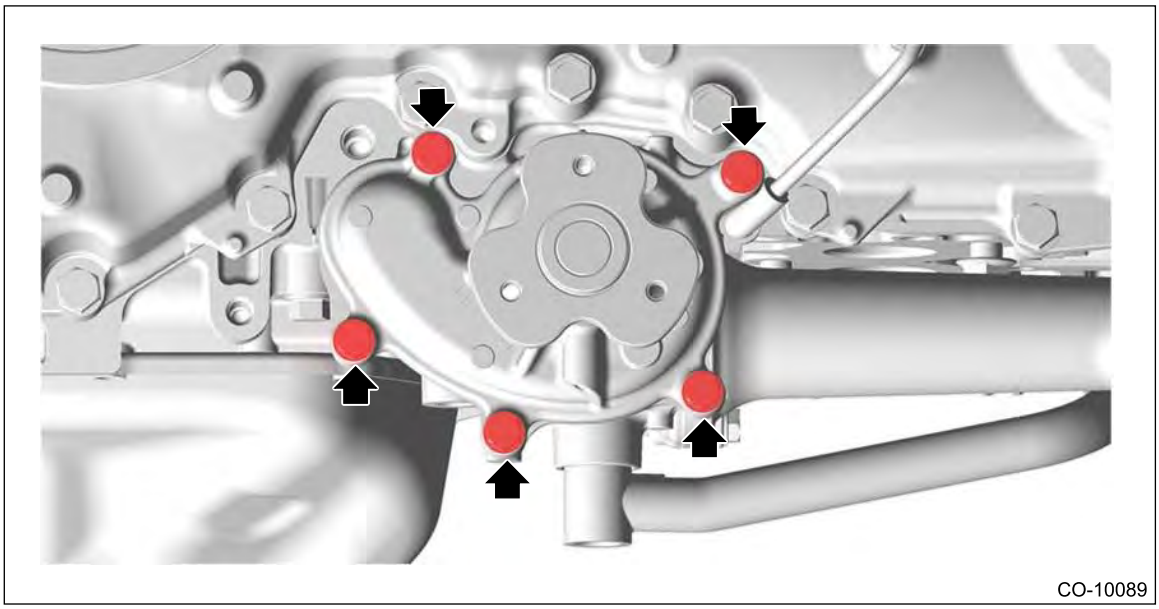
1. WATER PUMP PULLEY

1. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT.
2. Using the ST1 and ST2, remove the water pump pulley.
   Preparation tool:
   ST1: PULLEY WRENCH (18355AA000)
   ST2: PULLEY WRENCH PIN SET (18334AA020)



2. WATER PUMP

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the water pump pulley. Ref. to COOLING(H4DO)>Water Pump>REMOVAL > WATER PUMP PULLEY.
3. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
4. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
5. Remove the water pump.



COOLING(H4DO) > Water Pump

INSTALLATION

1. WATER PUMP PULLEY

1. Using the ST1 and ST2, install the water pump pulley.
   Preparation tool:
   ST1: PULLEY WRENCH (18355AA000)
   ST2: PULLEY WRENCH PIN SET (18334AA020)
   Tightening torque:
   14 N·m (1.4 kgf-m, 10.3 ft-lb)
2. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.

2. WATER PUMP

1. Set a new gasket, and install the water pump.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
3. Install the water pump pulley. Ref. to COOLING(H4DO)>Water Pump>INSTALLATION > WATER PUMP PULLEY.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

COOLING(H4DO) > Water Pump

INSPECTION

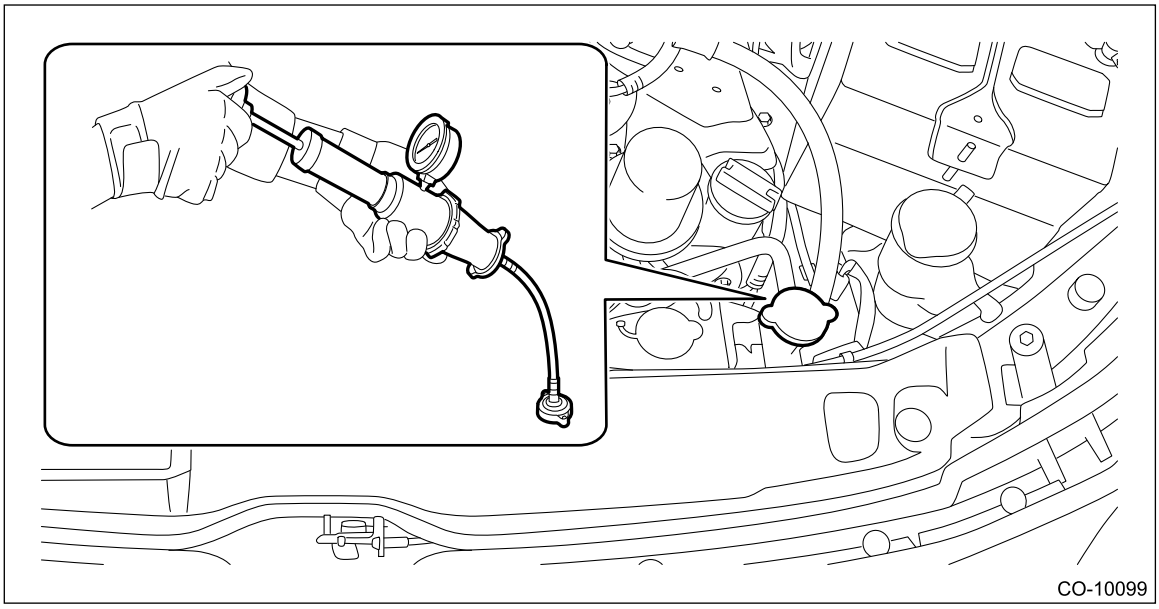
1. Check for leaks.
   Caution:
   - **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
   - **If the engine coolant splashes, completely remove and clean it.**

   (1) Remove the radiator cap.

(2) Fill the radiator with engine coolant, and then install the radiator cap tester to the filler neck of radiator.

Caution:

Be careful not to deform the filler neck of radiator when installing and removing the radiator cap tester.



(3) Apply a pressure of 157 kPa (1.6 kg/cm^2, 23 psi) to the radiator and check the following points:

- Leakage from the flow path of the engine coolant or its vicinity
- Significant pressure drop

Caution:

Be careful of engine coolant from spurting out when removing the radiator cap tester.

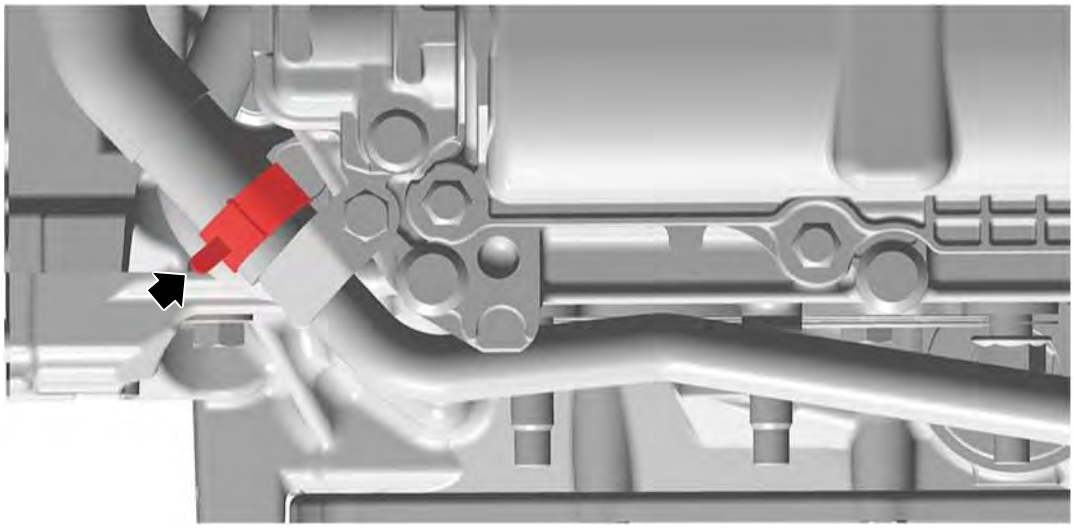
2. Check that there is no deformation, cracks or other damages.

3. Check the water pump bearing for smooth rotation.

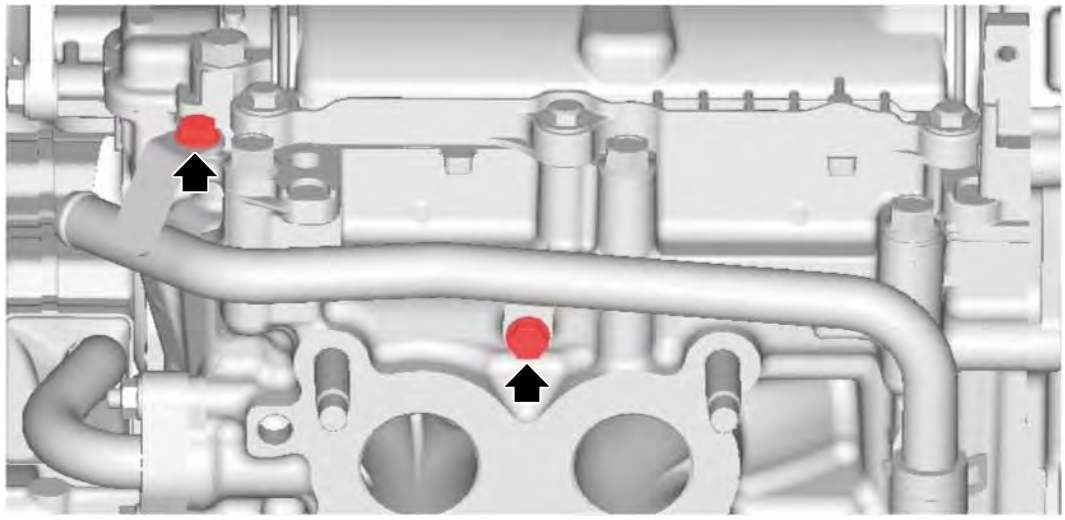
REMOVAL

1. WATER PIPE RH

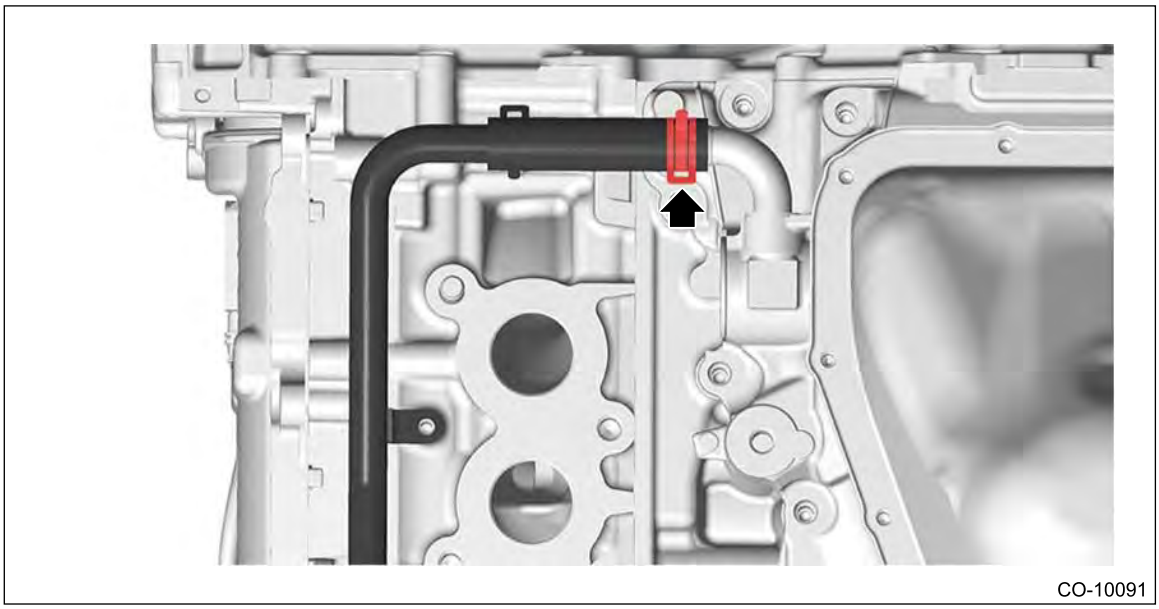
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
4. Disconnect the water hoses (rear side).


CO-10090

5. Remove the bolts securing the water pipe RH.

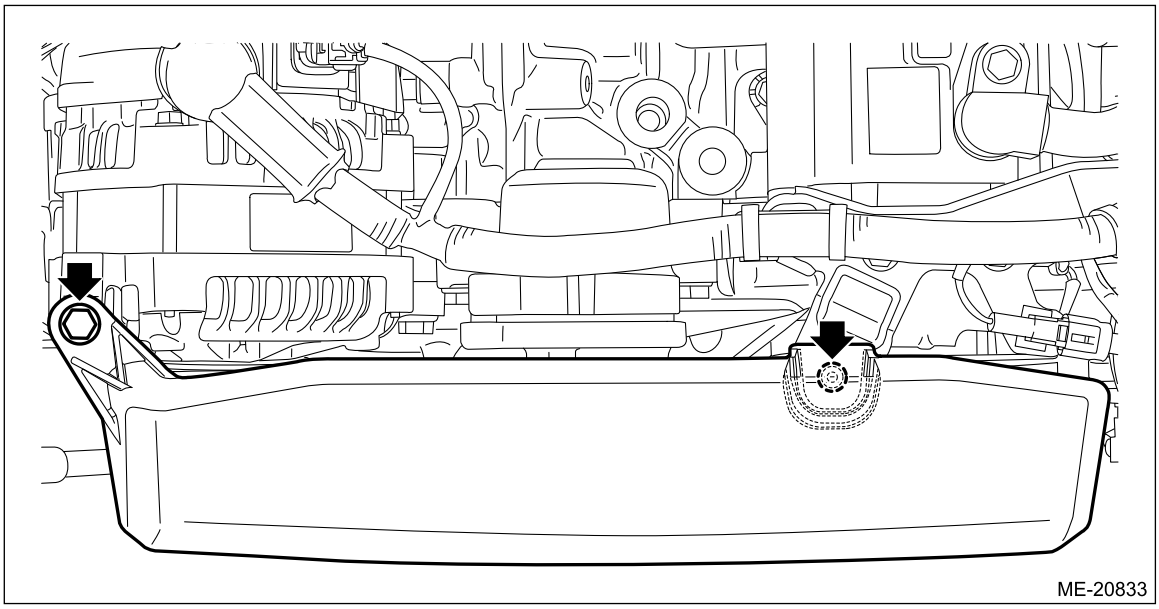

CO-10128

6. Remove the water hose (front side) and the water pipe RH as an assembly.

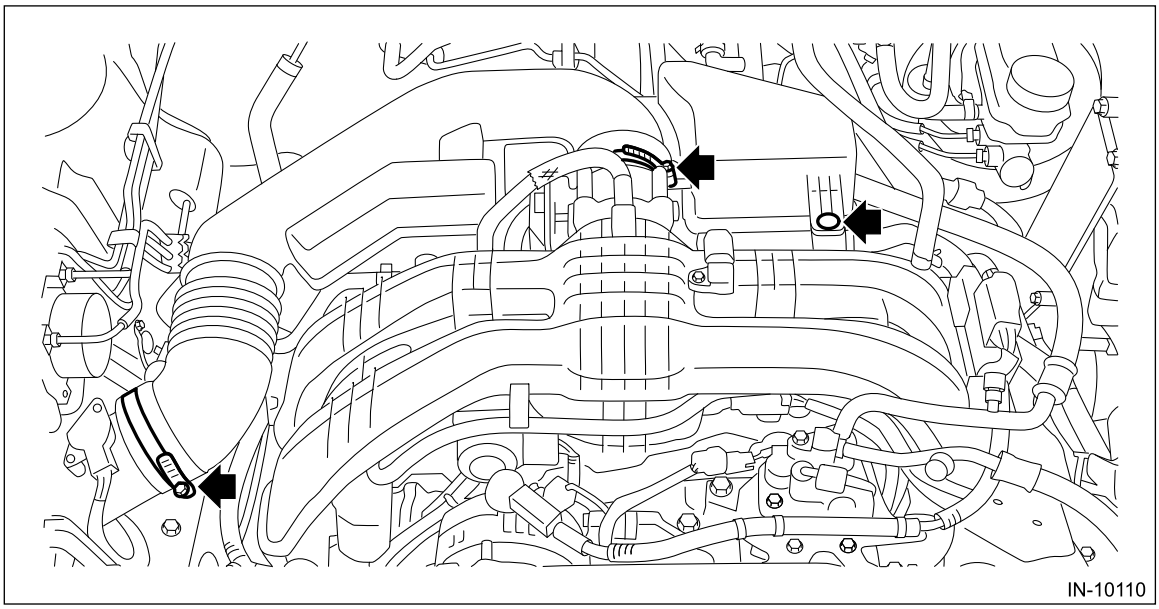


2. WATER PIPE LH

1. Remove the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>DISASSEMBLY.
2. Fully open the front hood. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the V-belt covers.



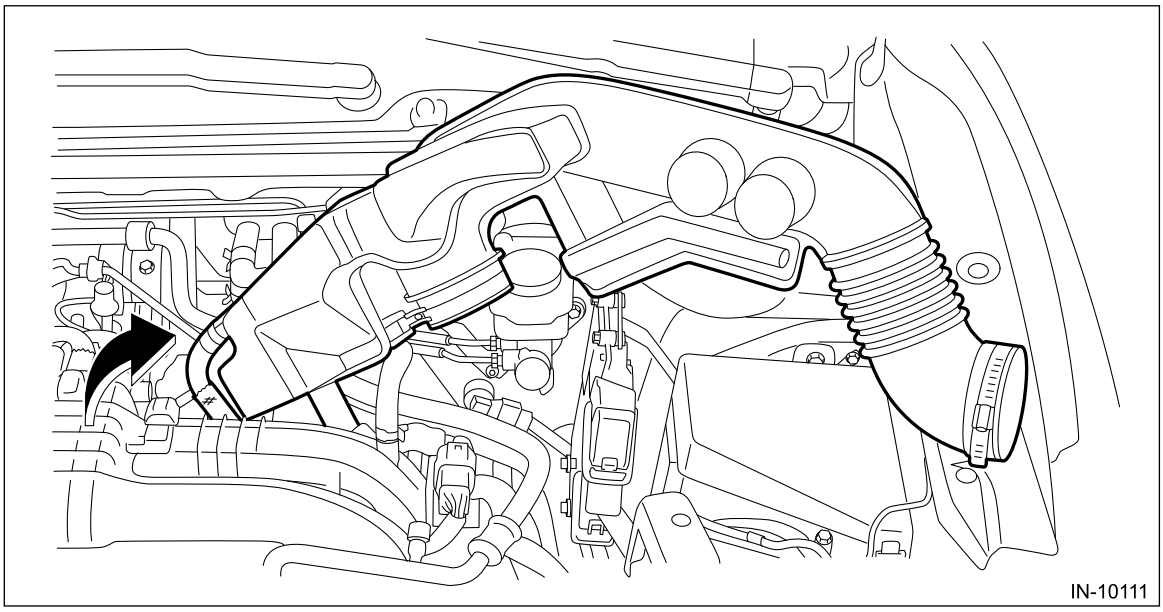
5. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
6. Remove the clip from the air intake boot, and loosen the clamp.



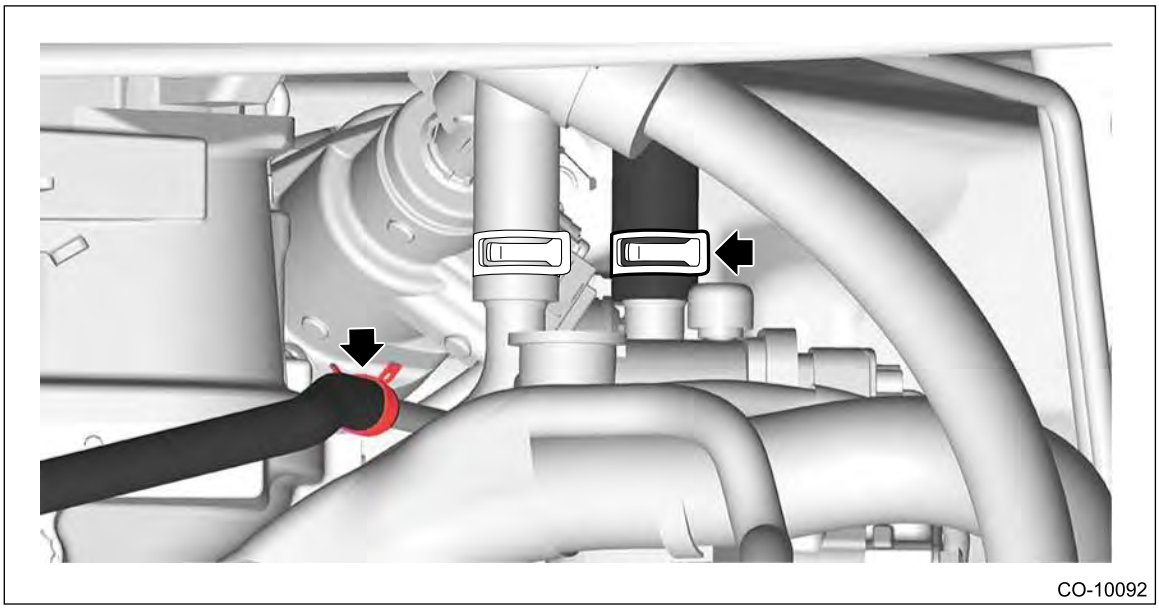
7. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

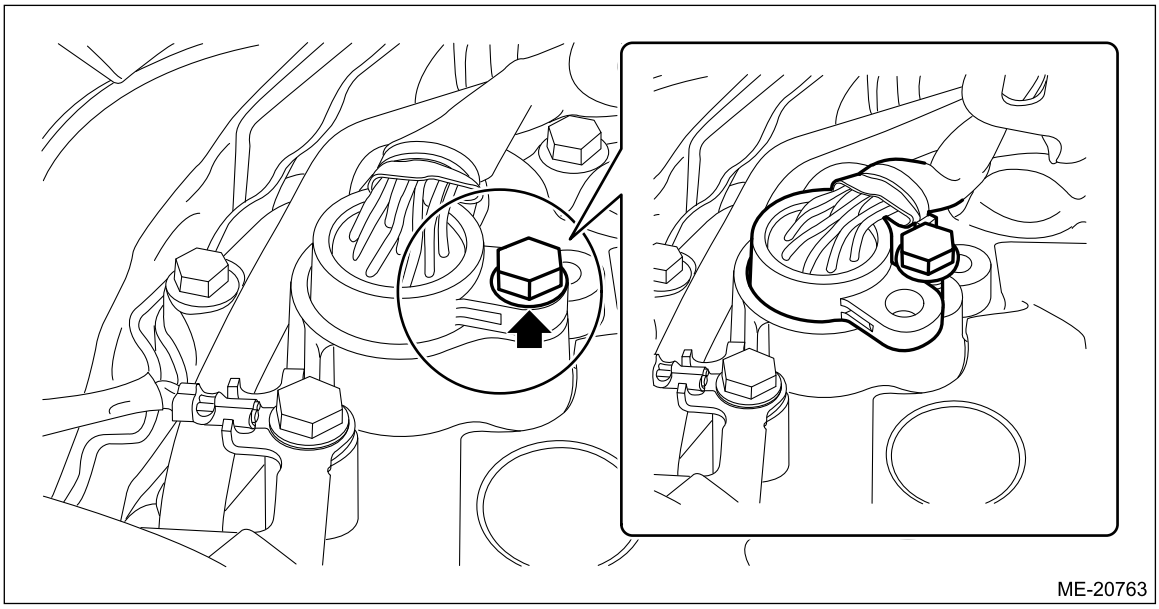
Be careful not to pull out the PCV hose.



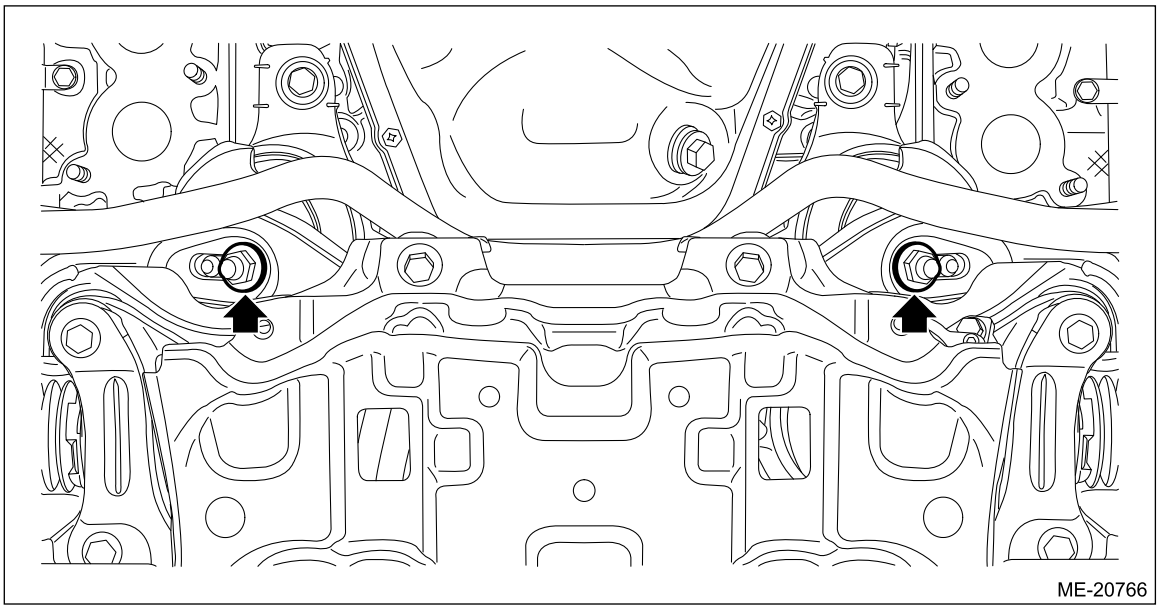
8. Disconnect the preheater hose and the heater outlet hose from the water pipe LH.



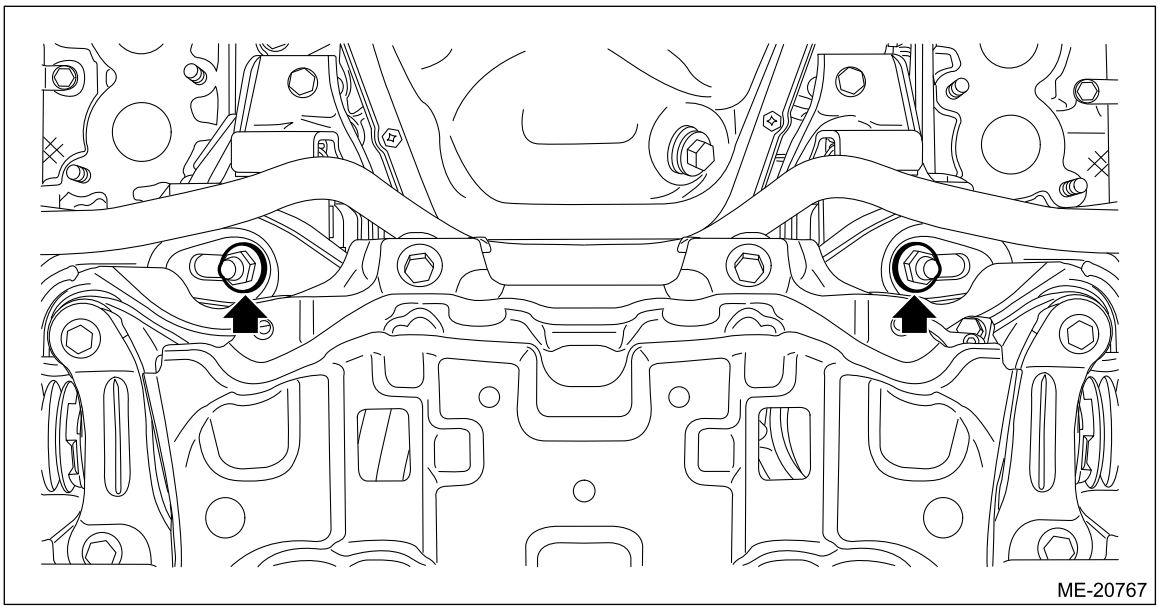
9. Remove the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>REMOVAL.
10. Turn the valve cover clockwise till the bolt hole can be seen as shown in the figure, and temporary tighten it with a bolt to prevent it from rotating. (CVT model)



11. Remove the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.
12. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
13. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
14. Remove the nuts which secure the engine mounting to the crossmember. (CVT model)



15. Remove the nuts which secure the engine mounting to the crossmember. (MT model)



16. Attach the ST1 and ST2.

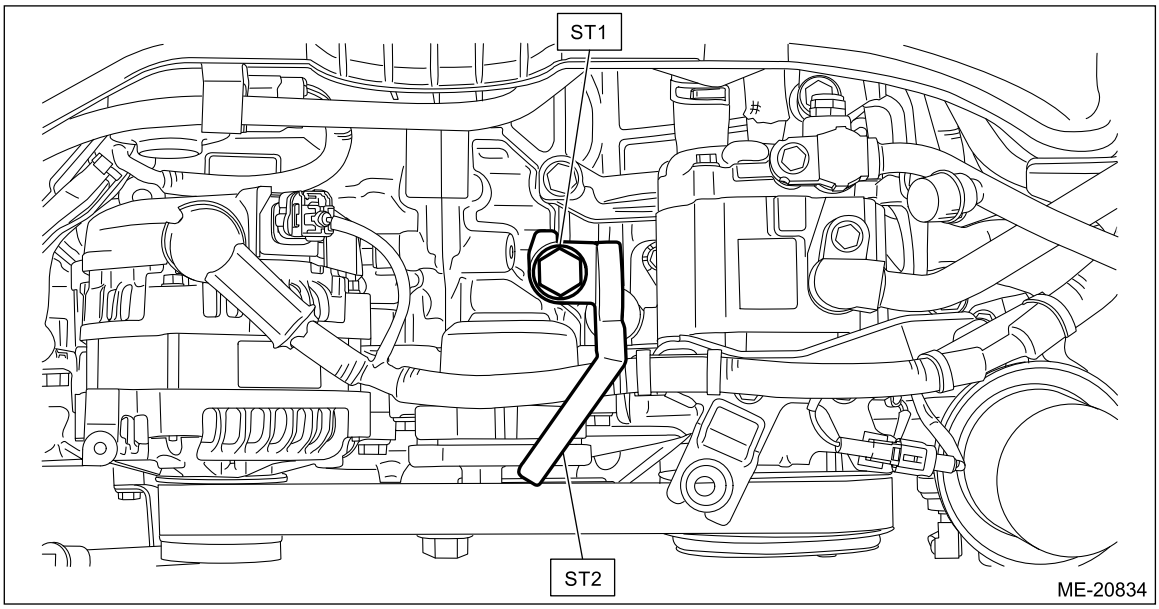
Preparation tool:

ST1: BOLT (18363AA050)

ST2: HANGER (18363AA040)

Tightening torque:

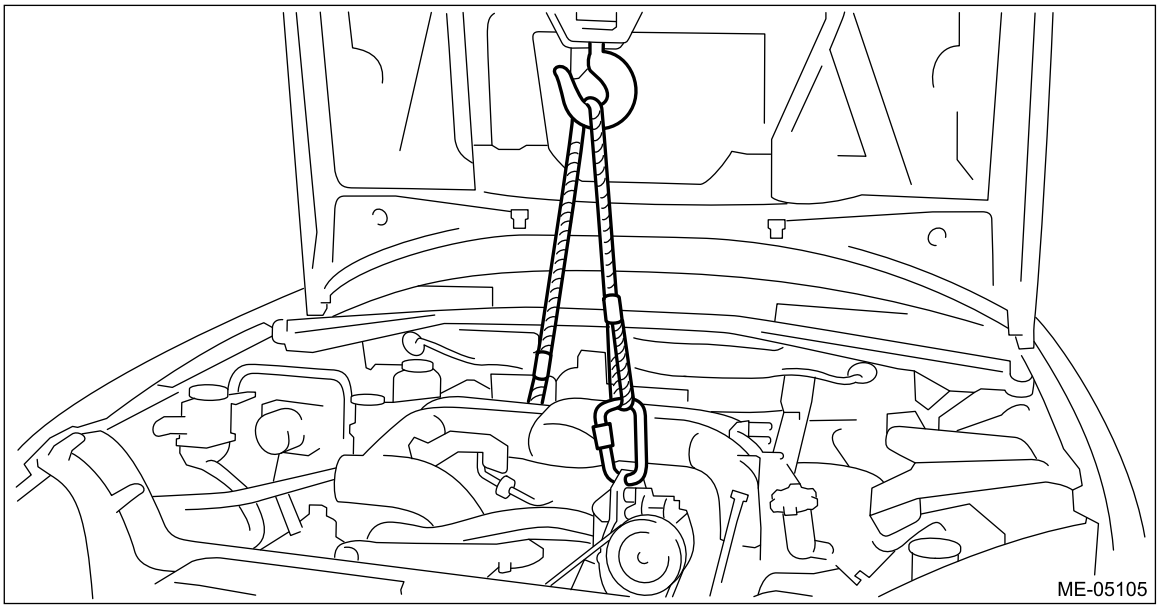
43 N·m (4.4 kgf-m, 31.7 ft-lb)



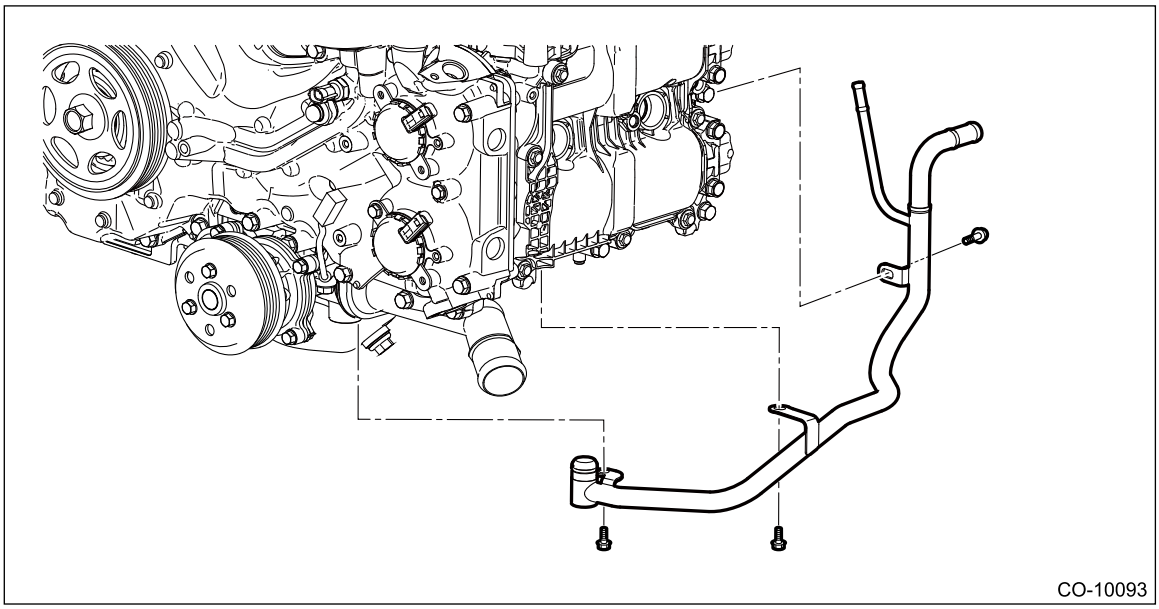
17. Lift up the engine with a lifting device and wire ropes.

Caution:

When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.

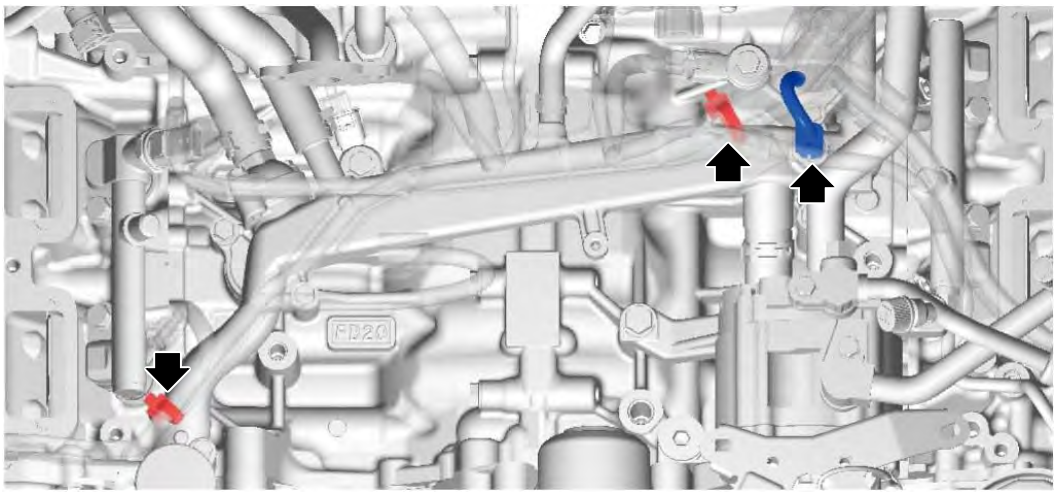


18. Remove the water pipe LH.

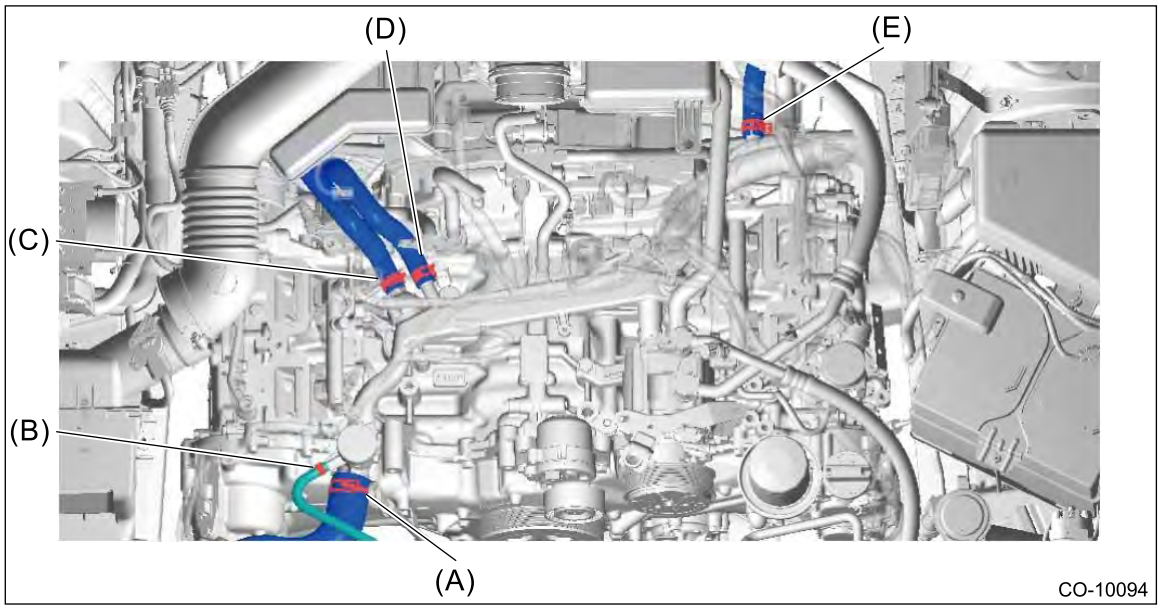


3. WATER TANK PIPE ASSY

1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
4. Remove the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>REMOVAL.
5. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
6. Remove the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
7. Disconnect the connector from the engine coolant temperature sensor, and remove the engine wiring harness from the water tank pipe.

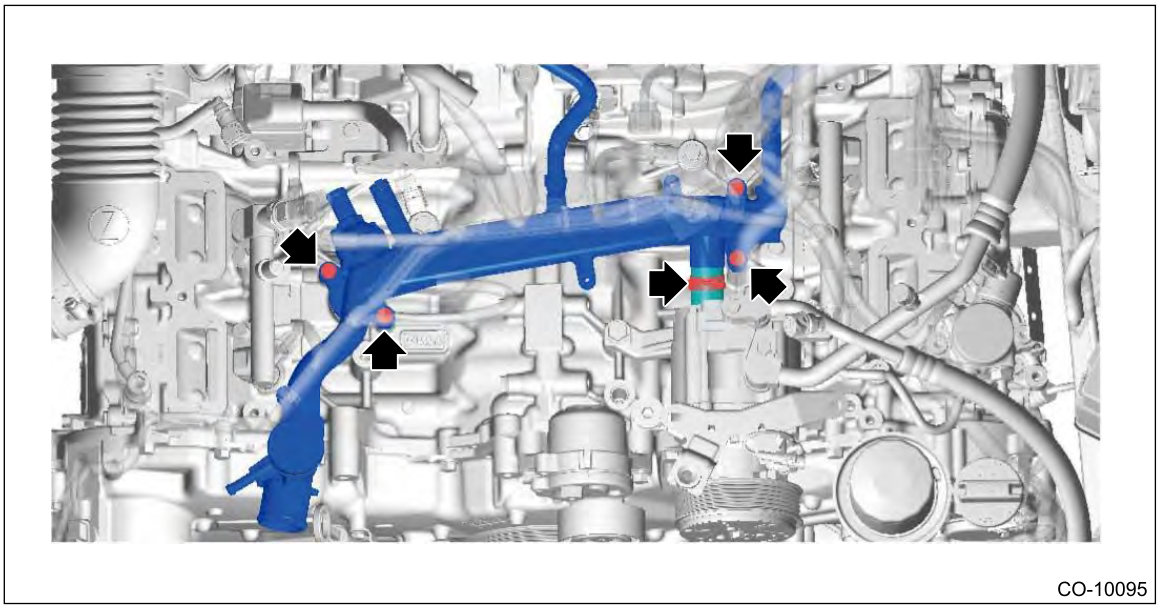


8. Disconnect each hose shown in the figure.



(A) Radiator inlet hose
(B) Over flow hose
(C) Water hose (CVT model)
(D) Water hose
(E) Heater inlet hose

9. Remove the bolts securing the water tank pipe assembly, and disconnect the water hose (front side) to remove the water pipe assembly.



COOLING(H4DO) > Water Pipe

INSTALLATION

1. WATER PIPE RH

1. Set the water hose (front side) and the water pipe RH as an assembly.
2. Install the bolts securing the water pipe RH.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
3. Connect the water hose (rear side).
4. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

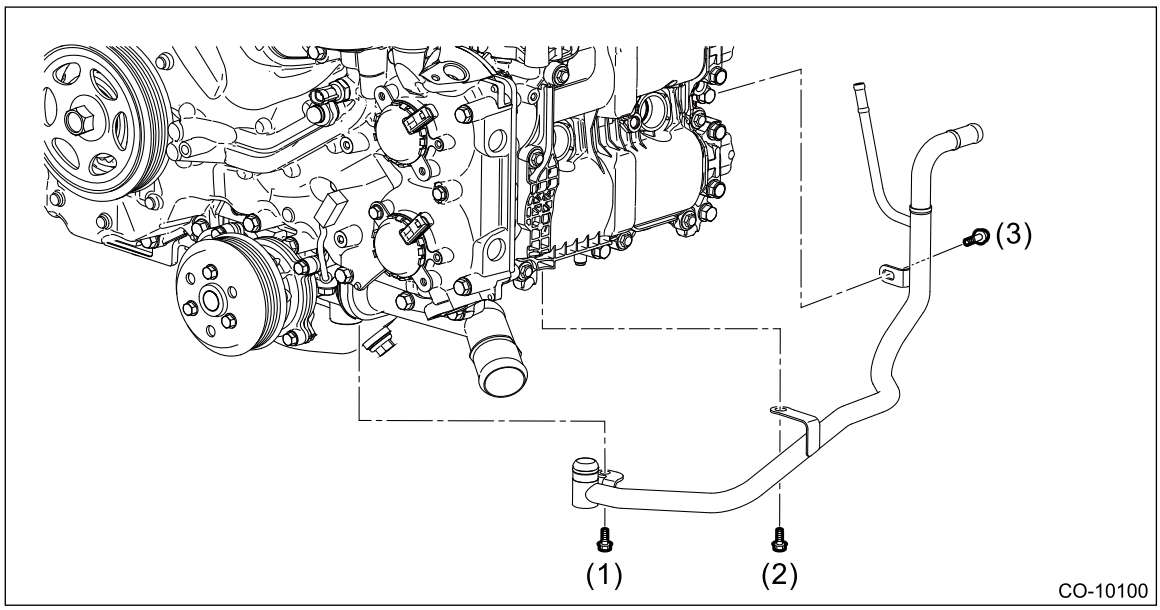
6. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

2. WATER PIPE LH

1. Temporarily install the water pipe LH with a new O-ring.
2. Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



3. Lower the engine and remove the lifting device and wire ropes.
4. Remove the ST.
5. Install the nuts which hold the engine mounting to the crossmember. (CVT model)

Caution:

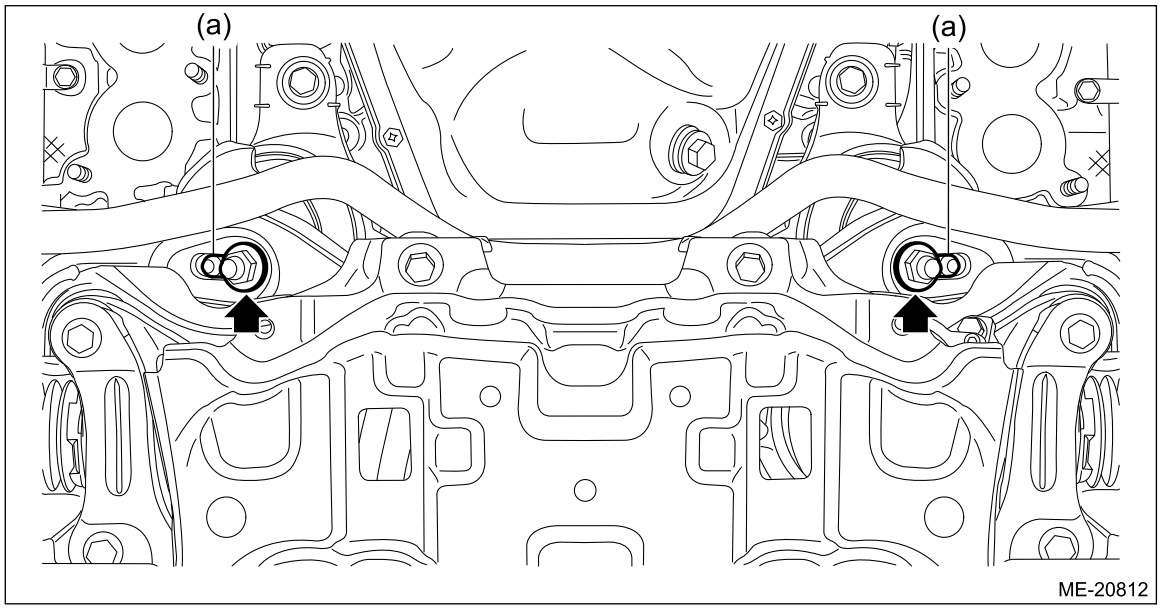
Use new nuts.

Note:

Make sure that locators (a) of the engine mounting are securely inserted.

Tightening torque:

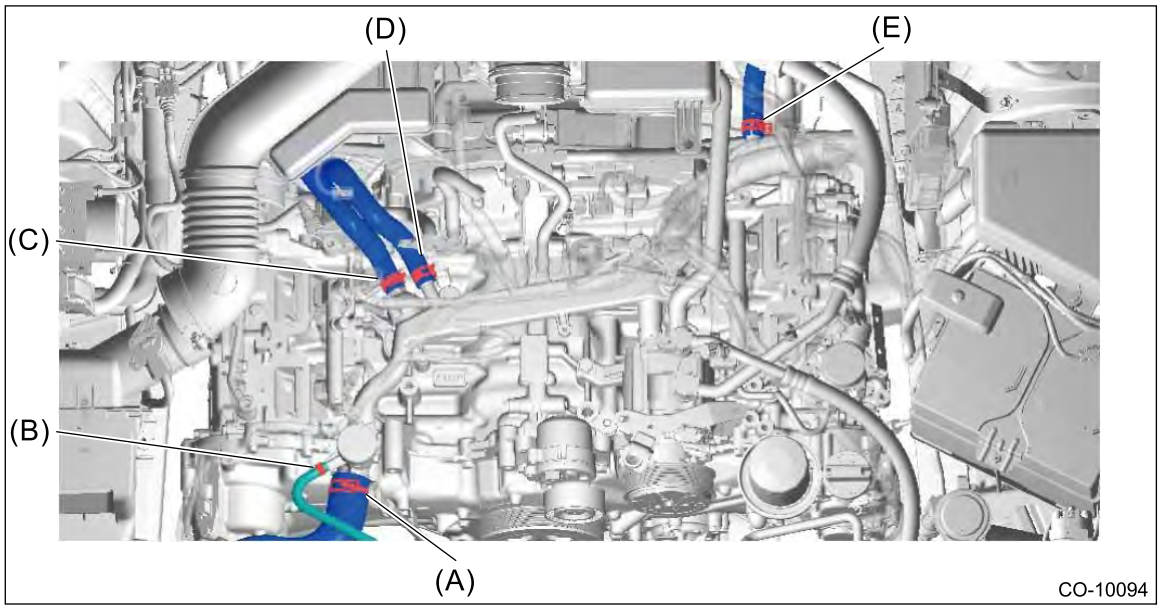
90 N·m (9.2 kgf-m, 66.4 ft-lb)



6. Install the nuts which hold the engine mounting to the crossmember. (MT model)
   Caution:
   Use new nuts.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
7. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
8. Install the valve cover in original position. (CVT model)
   Tightening torque:
   7 N·m (0.7 kgf-m, 5.2 ft-lb)
9. Install the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>INSTALLATION.
10. Install the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.
11. Connect the preheater hose and the heater outlet hose to the water pipe LH.
12. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
13. Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
14. Install the V-belt cover.
    Tightening torque:
    7 N·m (0.7 kgf-m, 5.2 ft-lb)
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
16. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.
17. Set the front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
18. Install the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>ASSEMBLY.

3. WATER TANK PIPE ASSY

1. Set a new O-ring and the water tank pipe assembly, and then connect the water hose (front side).
2. Install the bolts securing the water tank pipe assembly.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
3. Connect each hose shown in the figure.



(A) Radiator inlet hose
(B) Over flow hose
(C) Water hose (CVT model)
(D) Water hose
(E) Heater inlet hose

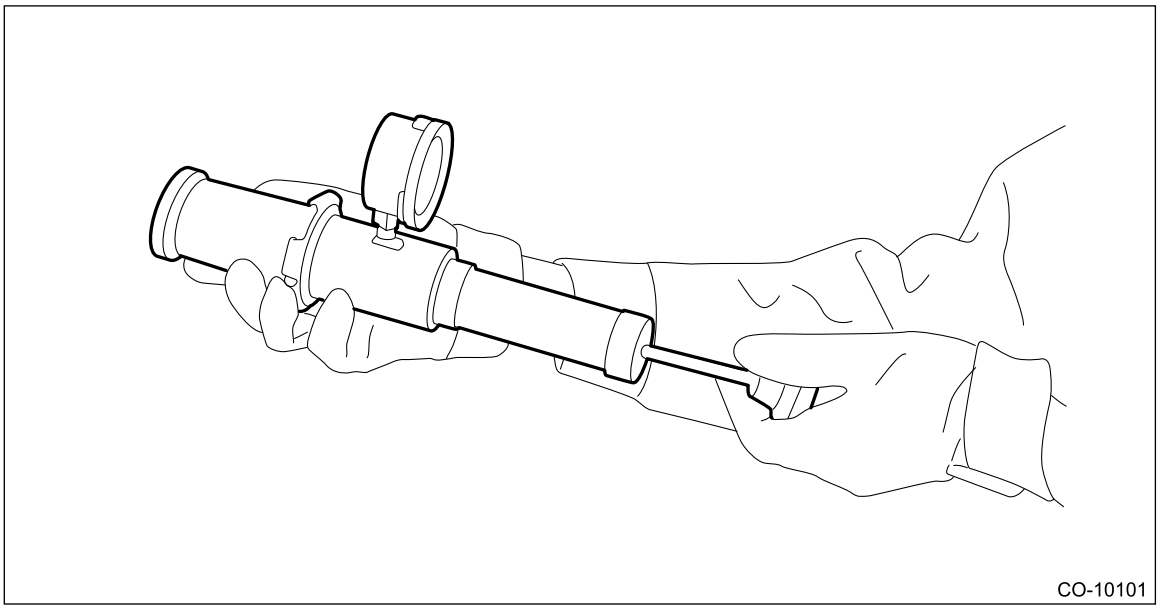
4. Connect the connector to the engine coolant temperature sensor, and install the engine wiring harness to the water tank pipe assembly.
5. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
6. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
7. Install the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
9. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

COOLING(H4DO) > Water Pipe

INSPECTION

1. WATER TANK PIPE CAP

1. Check that there is no deformation, cracks or other damages.
2. Check the opening pressure of the water tank pipe cap.
   (1) Remove the water tank pipe cap.
   Caution:
   - **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
   - **If the engine coolant splashes, completely remove and clean it.**
   (2) Attach the radiator cap tester to the water tank pipe cap.



(3) Increase pressure until the radiator cap tester gauge needle stops. The water tank pipe cap is functioning properly if it holds the service limit pressure for 5 — 6 seconds. Replace the water tank pipe cap if it opens under pressure at or less than the service limit value.

Caution:

Be sure to remove foreign matter and rust in advance. Otherwise, results of pressure test will be incorrect.

Specification:

122 — 152 kPa (1.24 — 1.55 kg/cm^2, 18 — 22 psi)

Service limit:

112 kPa (1.14 kg/cm^2, 16 psi)

2. OTHER INSPECTIONS

1. Check for leaks.

Caution:

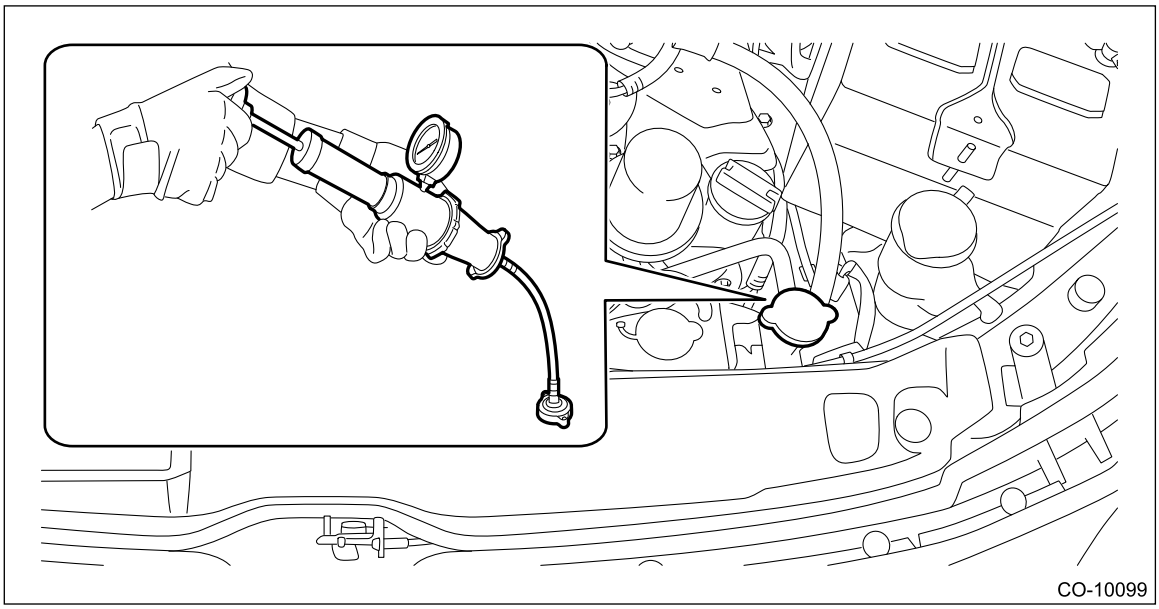
- **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
- **If the engine coolant splashes, completely remove and clean it.**

(1) Remove the radiator cap.

(2) Fill the radiator with engine coolant, and then install the radiator cap tester to the filler neck of radiator.

Caution:

Be careful not to deform the filler neck of radiator when installing and removing the radiator cap tester.



(3) Apply a pressure of 157 kPa (1.6 kg/cm^2, 23 psi) to the radiator and check the following points:

- Leakage from the flow path of the engine coolant or its vicinity
- Significant pressure drop

Caution:

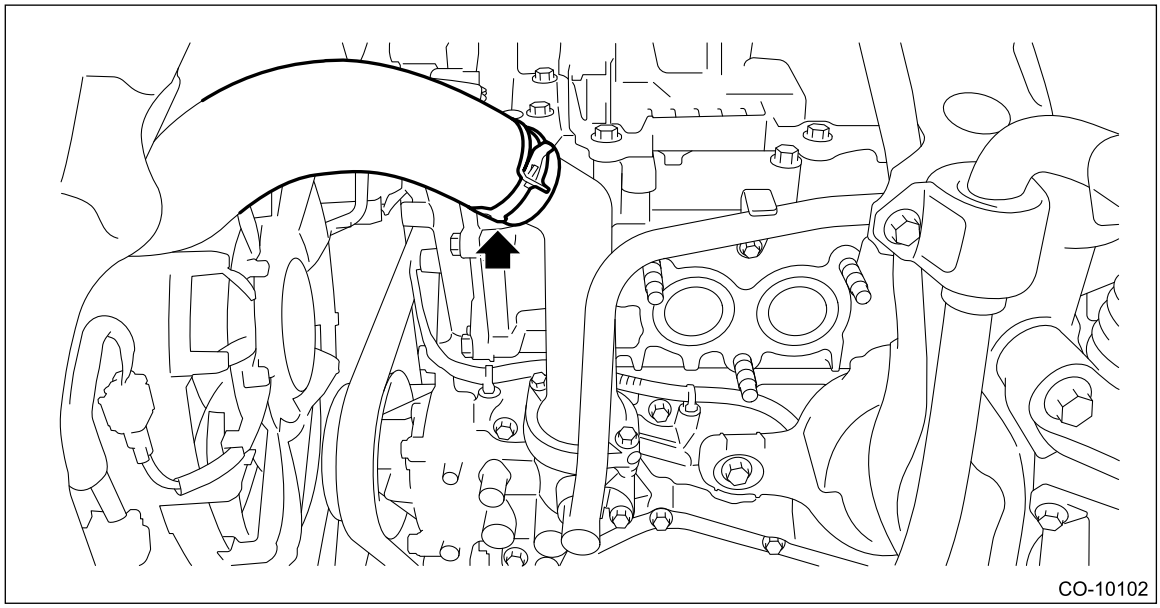
Be careful of engine coolant from spurting out when removing the radiator cap tester.

2. Check that there is no deformation, cracks or other damages.

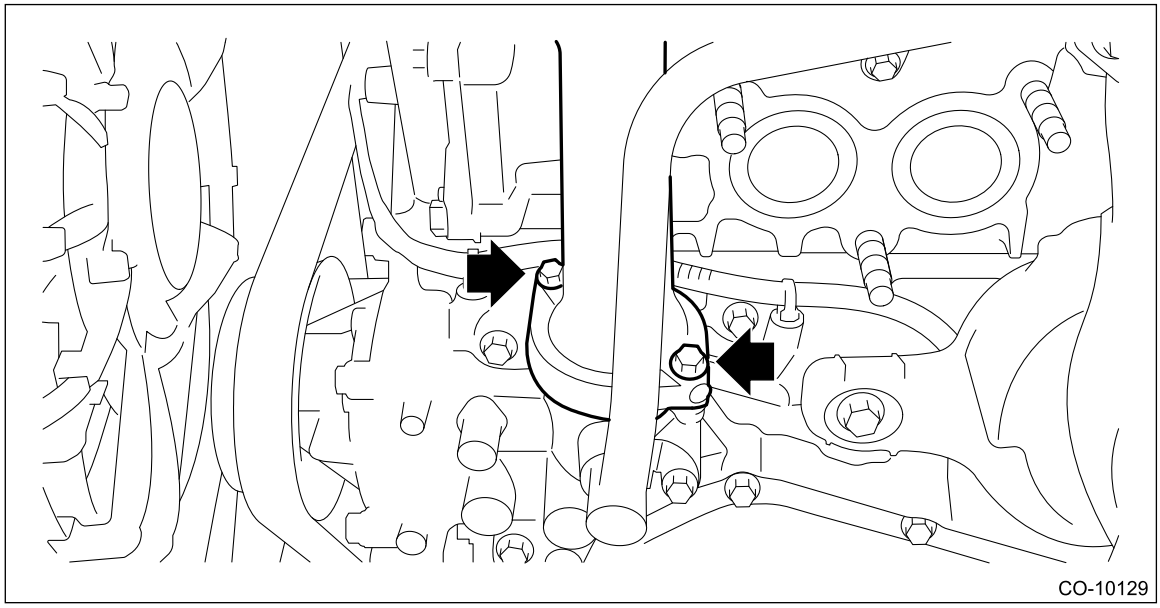
REMOVAL

1. ENGINE SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
4. Disconnect radiator outlet hose.



5. Remove the thermostat cover, and then remove the thermostat.



6. Remove the gasket from thermostat.

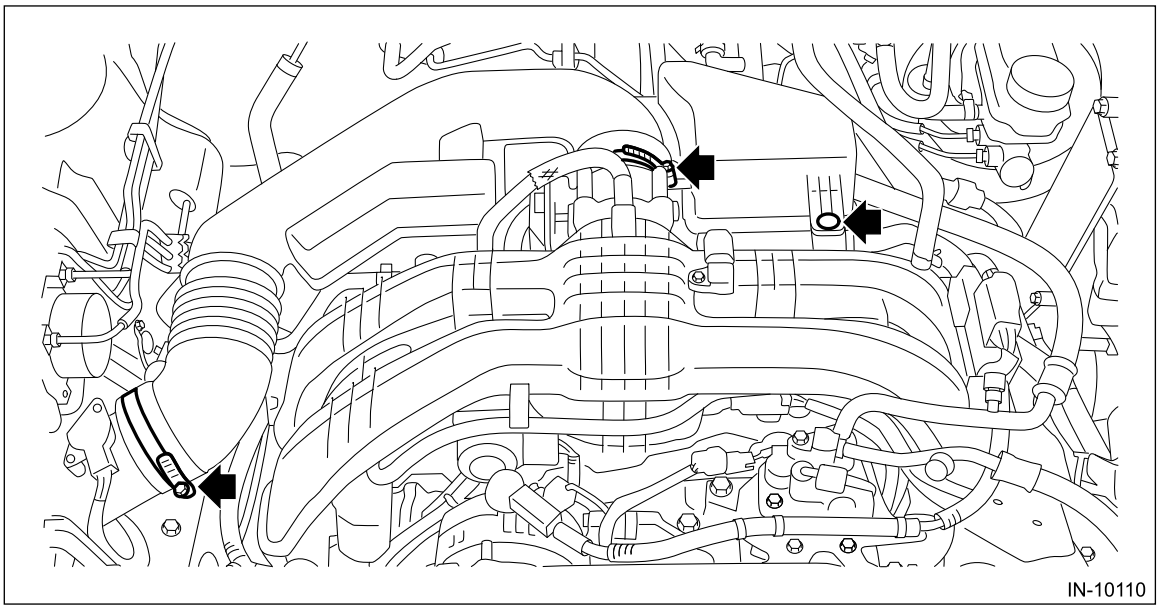
2. WATER TANK PIPE SIDE

Note:
Thermostat on the water tank pipe side is featured on CVT models only.

1. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING

OF ENGINE COOLANT.

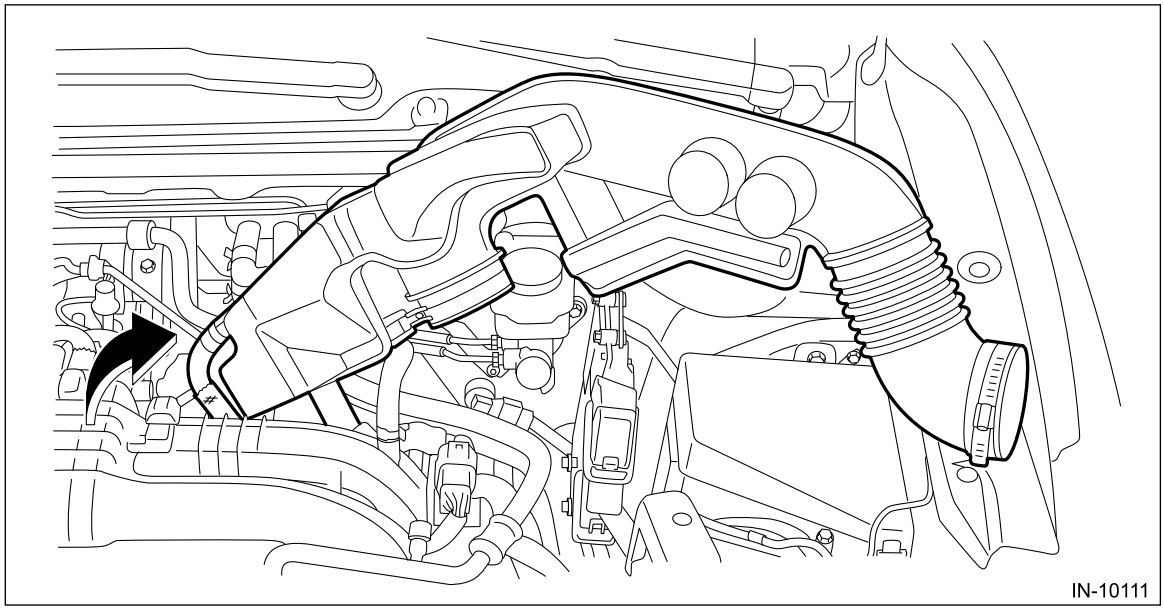
2. Remove the clip from the air intake boot, and loosen the clamp.



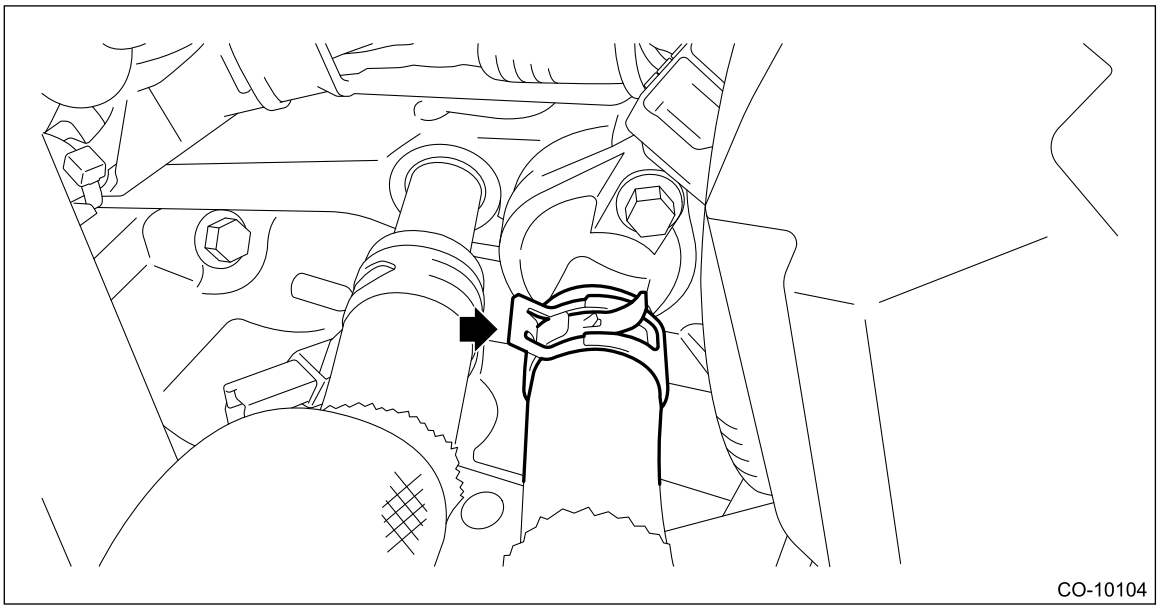
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

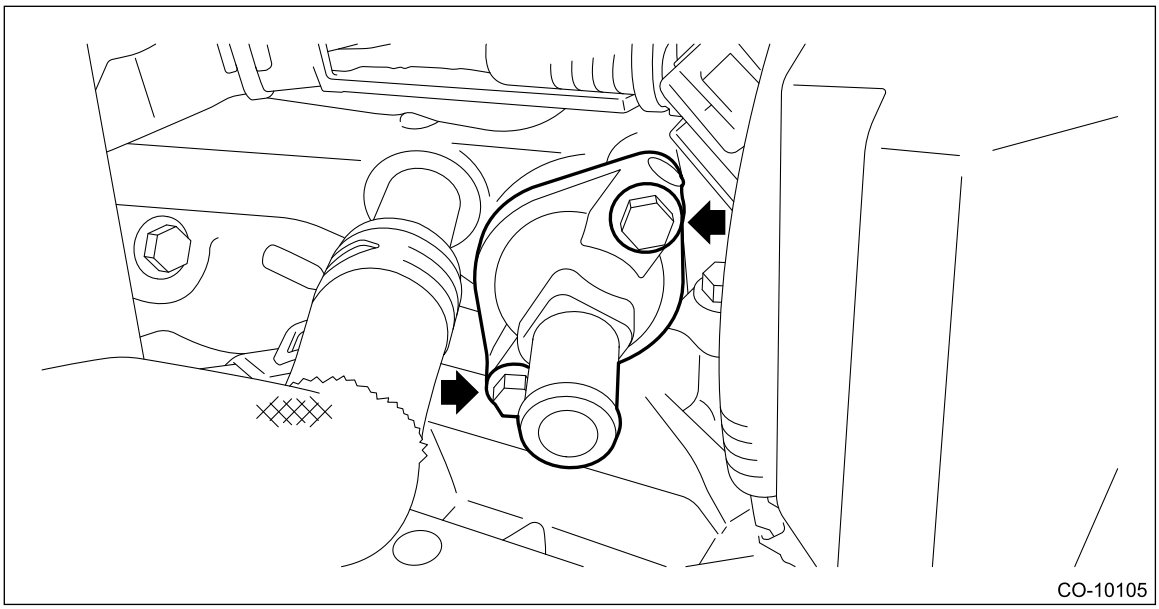
Be careful not to pull out the PCV hose.



4. Disconnect the water hoses.



5. Remove the thermostat cover, and then remove the thermostat.



6. Remove the gasket from thermostat.

COOLING(H4DO) > Thermostat

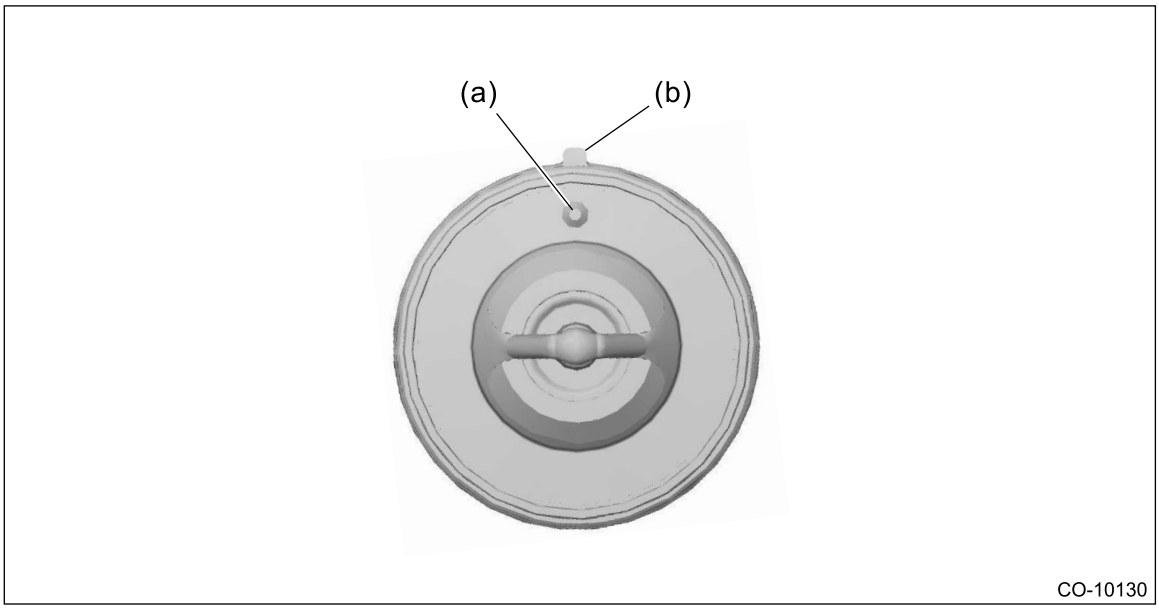
INSTALLATION

1. ENGINE SIDE

1. Install a new gasket to the thermostat.

Note:

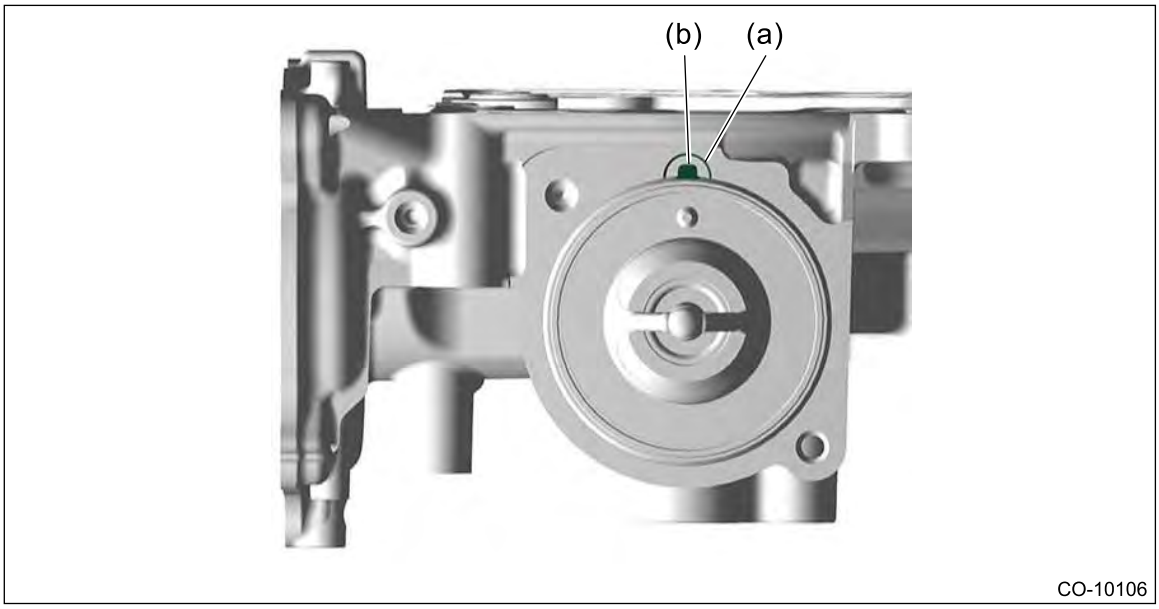
Align the positions of the jiggle pin (a) and the positioning rib (b) of the gasket.



2. Install the thermostat and thermostat cover.

Note:

Align the positions of groove (a) of the oil pan upper and the positioning rib (b) of the gasket.



Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

3. Connect the radiator outlet hose.
4. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

2. WATER TANK PIPE SIDE

1. Install a new gasket to the thermostat.
2. Install the thermostat and thermostat cover.

Note:

When installed, the air vent hole should face upward.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

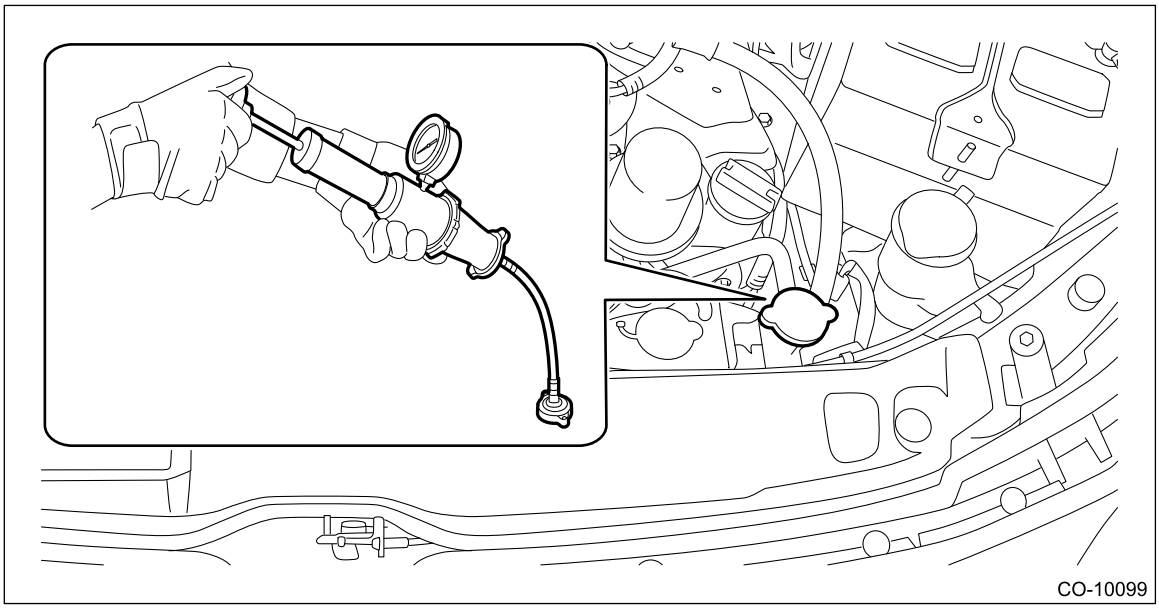
3. Connect the water hose.
4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

COOLING(H4DO) > Thermostat

INSPECTION

1. Check for leaks.
   Caution:
   - **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
   - **If the engine coolant splashes, completely remove and clean it.**

   (1) Remove the radiator cap.
   (2) Fill the radiator with engine coolant, and then install the radiator cap tester to the filler neck of radiator.
   Caution:
   Be careful not to deform the filler neck of radiator when installing and removing the radiator cap tester.



   (3) Apply a pressure of 157 kPa (1.6 kg/cm^2, 23 psi) to the radiator and check the following points:
   - Leakage from the flow path of the engine coolant or its vicinity
   - Significant pressure drop

   Caution:
   Be careful of engine coolant from spurting out when removing the radiator cap tester.
2. Check that there is no deformation, cracks or other damages.
3. Check that the thermostat valve closes completely at an ambient temperature.
4. Immerse the thermostat and a thermometer in water. Raise water temperature gradually, and check the temperature and the valve lift amount when the valve begins to open and when the valve

is fully opened. Replace the thermostat if faulty.

Note:

- **During the test, agitate the water for even temperature distribution.**
- **Leave the thermostat in the boiling water for five minutes or more before measuring the valve lift.**
- **Hold the thermostat with a wire or the like to avoid contacting with container bottom.**

Starting temperature to open:

Engine side

90 — 94°C (194 — 201°F)

Water tank pipe side

48 — 52°C (118 — 126°F)

Full open temperature:

Engine side

100°C (212°F)

Water tank pipe side

63°C (145°F)

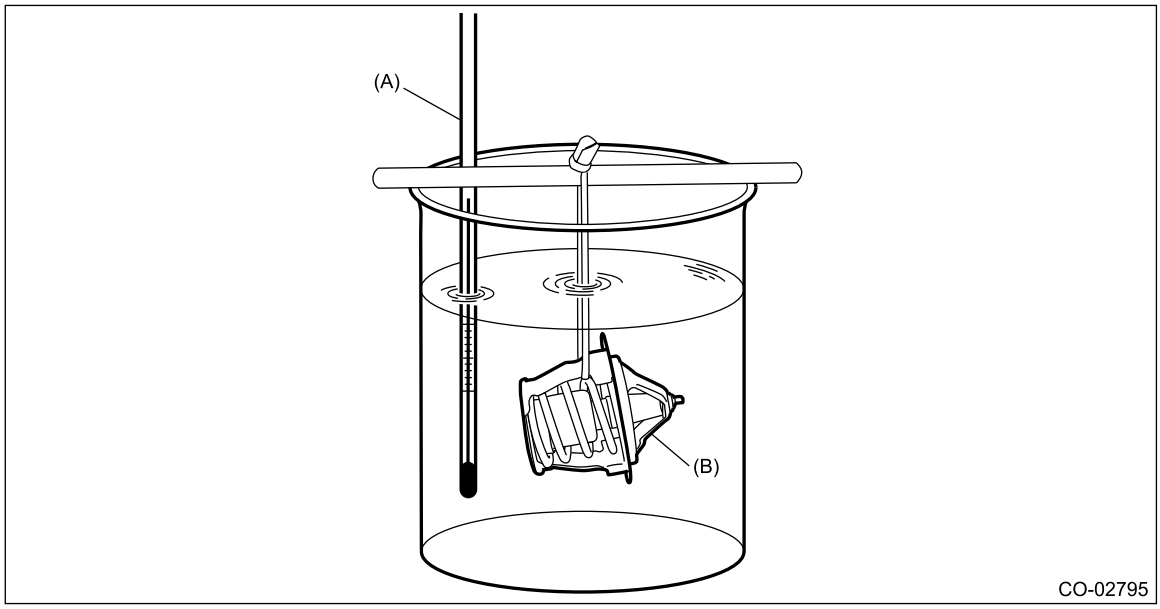
Total valve lift:

Engine side

8.0 mm (0.315 in) or more

Water tank pipe side

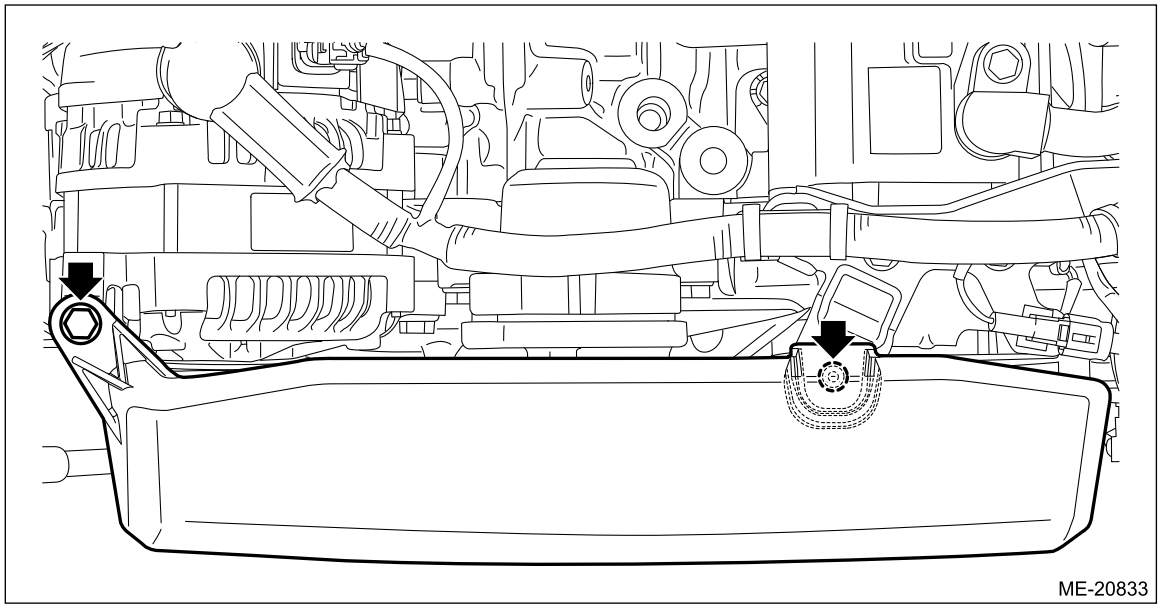
6.0 mm (0.236 in) or more



(A) Thermometer (B) Thermostat

REMOVAL

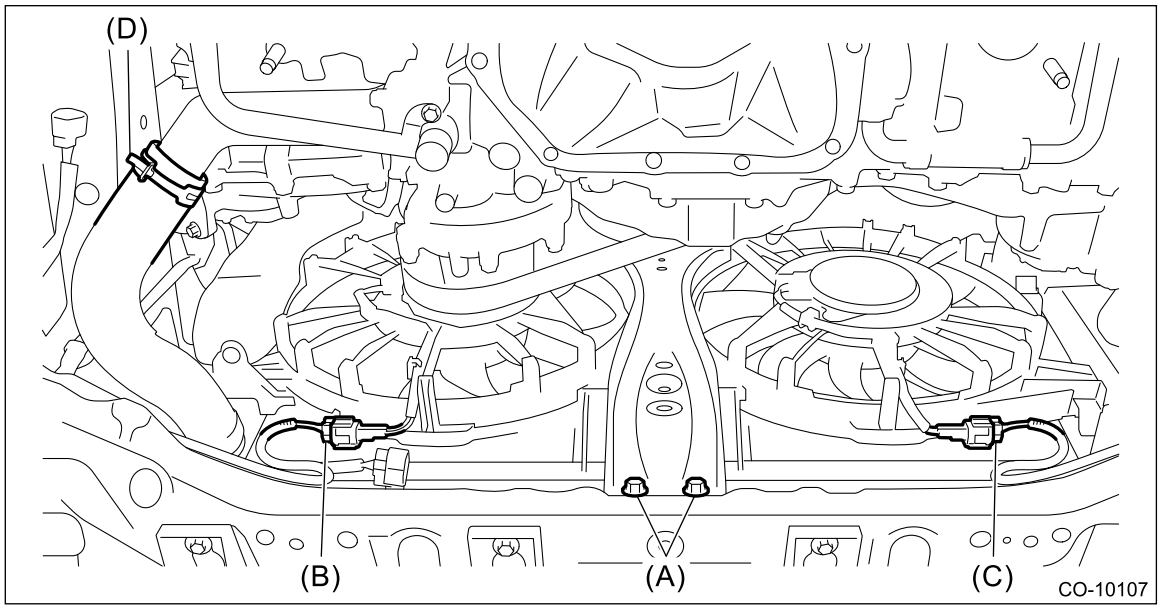
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the V-belt covers.



3. Collect the refrigerant from A/C system. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure.

   Note:

   This step is necessary only if the radiator and the condenser are removed as an assembly.
4. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
5. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
6. Remove the lower side bolts (A) securing the radiator upper frame.
7. Disconnect main fan motor connector (B) and sub fan motor connector (C).
8. Disconnect radiator outlet hose (D).

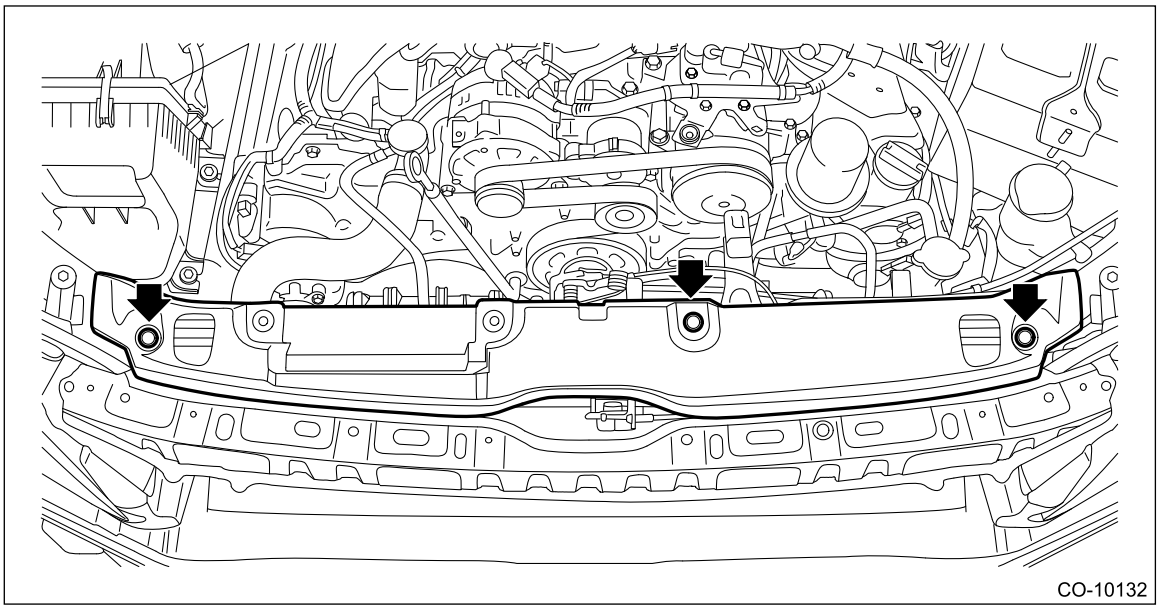


9. Remove the reservoir tank. Ref. to COOLING(H4DO)>Reservoir Tank>REMOVAL.

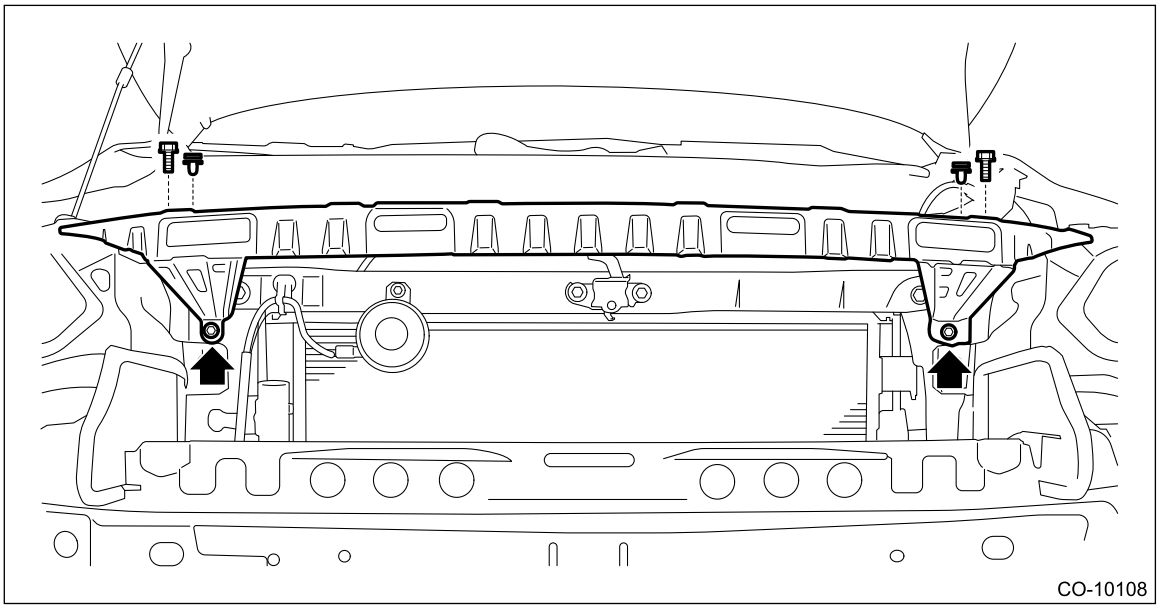
10. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.

11. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.

12. Remove the cover UPR - front.

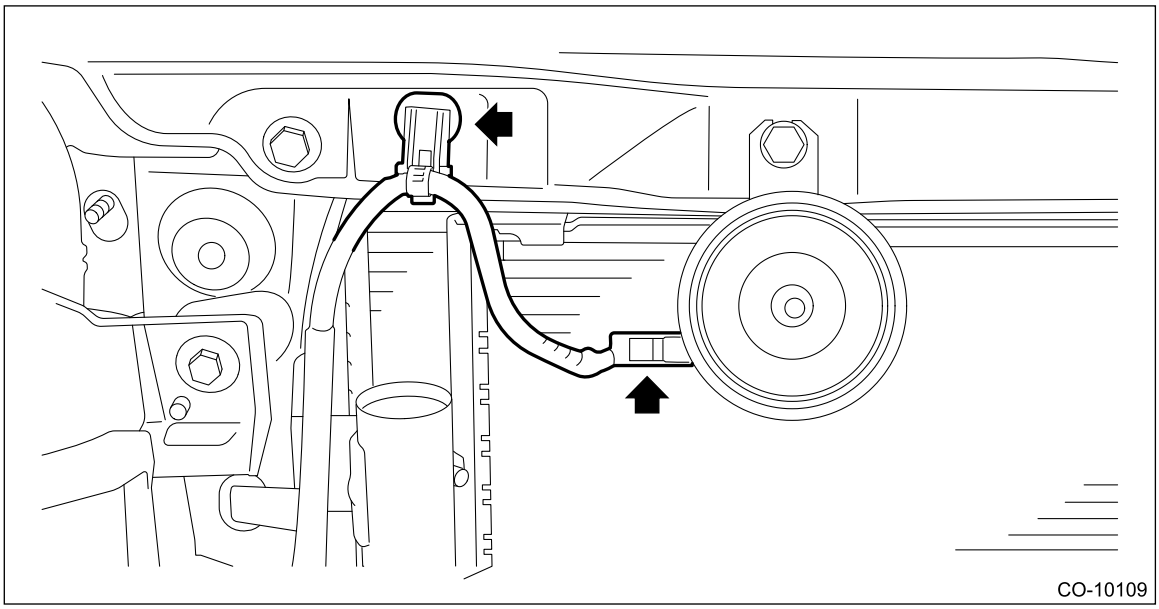


13. Remove the bracket - bumper UPR.

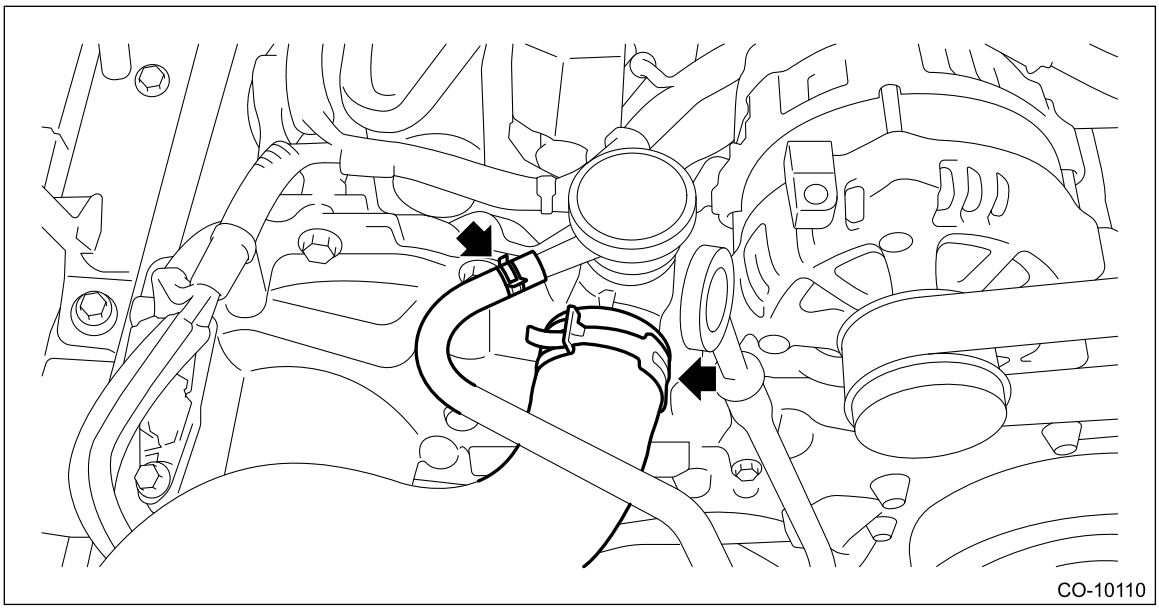


14. Remove the front hood lock assembly. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>REMOVAL.

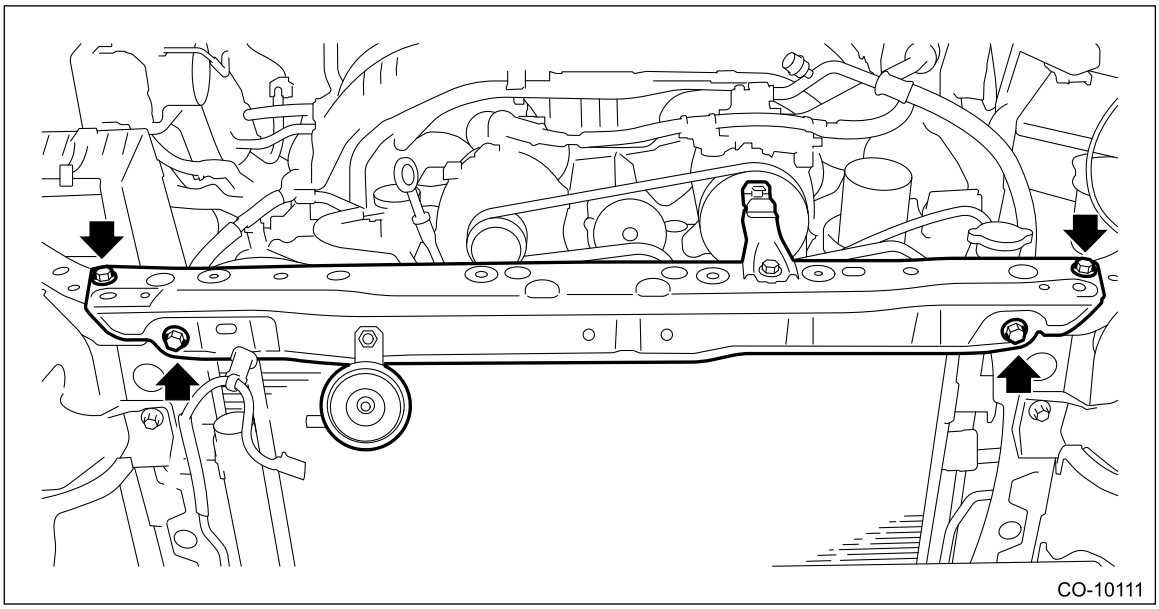
15. Disconnect the connector from the horn, and remove the clip.



16. Disconnect the radiator inlet hoses and over flow hose.



17. Remove the upper side bolts securing the radiator upper frame, and remove the radiator upper frame.



18. When removing the condenser together

(1) Detach the hose - pressure discharge and the pipe - evaporator cooling. Ref. to AIR CONDITIONER>Condenser>REMOVAL.

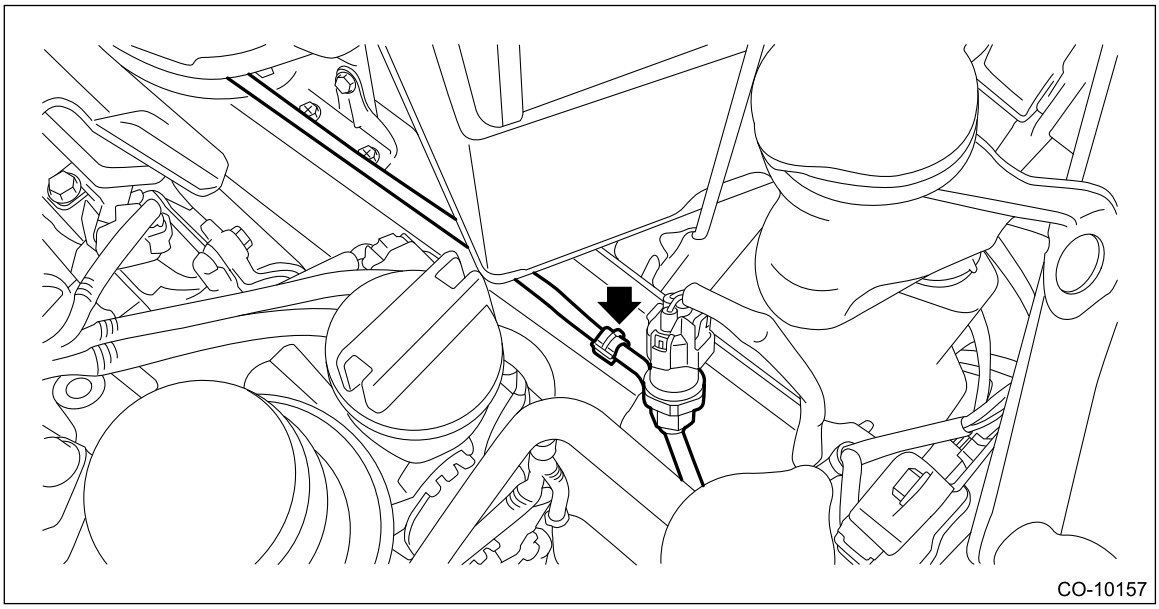
(2) Remove the radiator, radiator fan & fan motor assembly, and the condenser as an assembly.

(3) Remove the condenser. Ref. to AIR CONDITIONER>Condenser>REMOVAL.

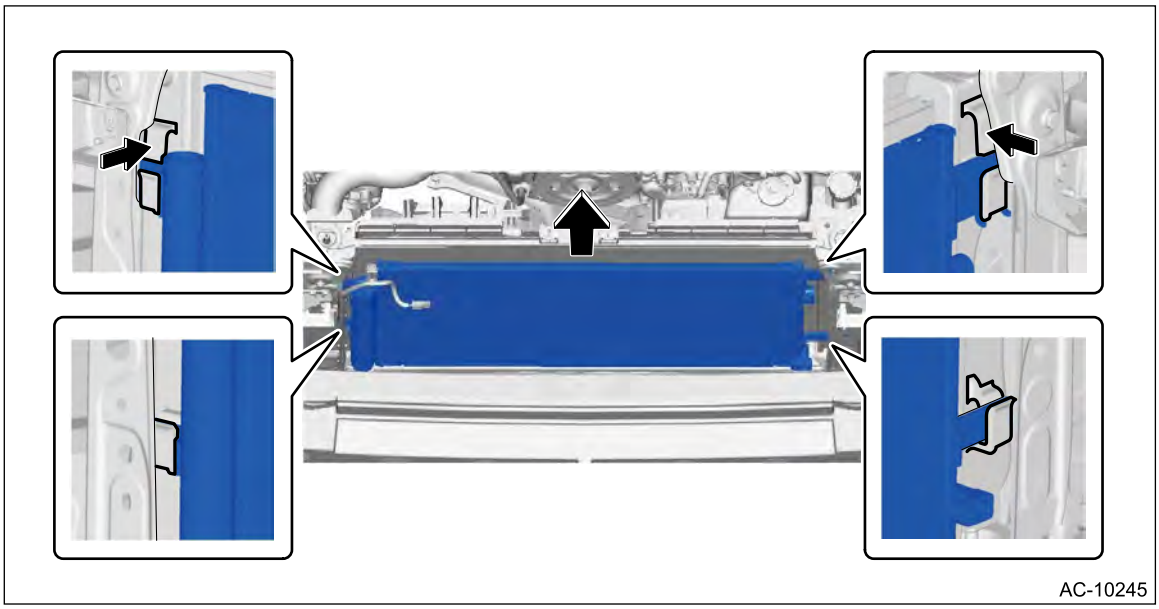
(4) Remove the radiator fan and fan motor assembly. Ref. to COOLING(H4DO)>Radiator Fan and Fan Motor Assembly>REMOVAL.

19. When condenser is not removed

(1) Remove the pipe - evaporator cooling from the clip.



(2) Disengage the claws, and separate the radiator and the condenser a part.



(3) Remove the radiator and the radiator fan & fan motor assembly as an assembly.
(4) Remove the radiator fan and fan motor assembly. Ref. to COOLING(H4DO)>Radiator Fan and Fan Motor Assembly>REMOVAL.

COOLING(H4DO) > Radiator

INSTALLATION

1. When assembled together with condenser
   (1) Assemble the radiator fan & fan motor assembly. Ref. to COOLING(H4DO)>Radiator Fan and Fan Motor Assembly>INSTALLATION.
   (2) Assemble the condenser. Ref. to AIR CONDITIONER>Condenser>INSTALLATION.
   (3) Install the radiator, radiator fan & fan motor assembly, and the condenser as an assembly.
   (4) Connect the hose - pressure discharge and the pipe - evaporator cooling. Ref. to AIR CONDITIONER>Condenser>INSTALLATION.
2. When condenser is not removed
   (1) Install the radiator fan and fan motor assembly. Ref. to COOLING(H4DO)>Radiator Fan and Fan Motor Assembly>INSTALLATION.
   (2) Install the radiator and the radiator fan & fan motor assembly as an assembly.
   (3) Install the condenser to the radiator.
   (4) Install the pipe - evaporator cooling to the clip.
3. Set the radiator upper frame, and install the upper side bolts securing the radiator upper frame.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
4. Connect the radiator inlet hoses and over flow hose.
5. Connect the horn connector and install the clip.
6. Install the front hood lock assembly. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>INSTALLATION.
7. Install the bracket - bumper UPR.
   Tightening torque:
   7.5N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the cover UPR - front.
9. Install the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
10. Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.

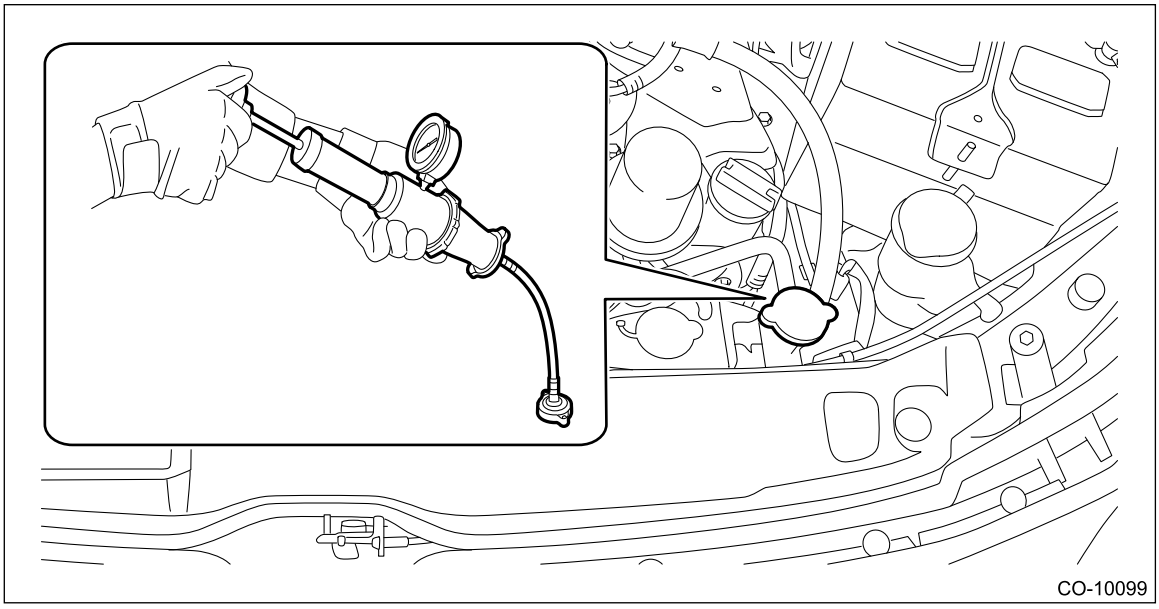
11. Install the reservoir tank. Ref. to COOLING(H4DO)>Reservoir Tank>INSTALLATION.
12. Connect the radiator outlet hose.
13. Connect the main fan motor connector and the sub fan motor connector.
14. Install the lower side bolts securing the radiator upper frame.
    Tightening torque:
    18 N·m (1.8 kgf-m, 13.3 ft-lb)
15. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
16. Install the V-belt cover.
    Tightening torque:
    7 N·m (0.7 kgf-m, 5.2 ft-lb)
17. Charge the A/C system with refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure.
    Note:
    This step is necessary only if the condenser has been removed.
18. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
19. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

COOLING(H4DO) > Radiator

INSPECTION

1. Check for leaks.
   Caution:
   - **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
   - **If the engine coolant splashes, completely remove and clean it.**

   (1) Remove the radiator cap.
   (2) Fill the radiator with engine coolant, and then install the radiator cap tester to the filler neck of radiator.
   Caution:
   Be careful not to deform the filler neck of radiator when installing and removing the radiator cap tester.



(3) Apply a pressure of 157 kPa (1.6 kg/cm^2, 23 psi) to the radiator and check the following

points:

- Leakage from the flow path of the engine coolant or its vicinity
- Significant pressure drop

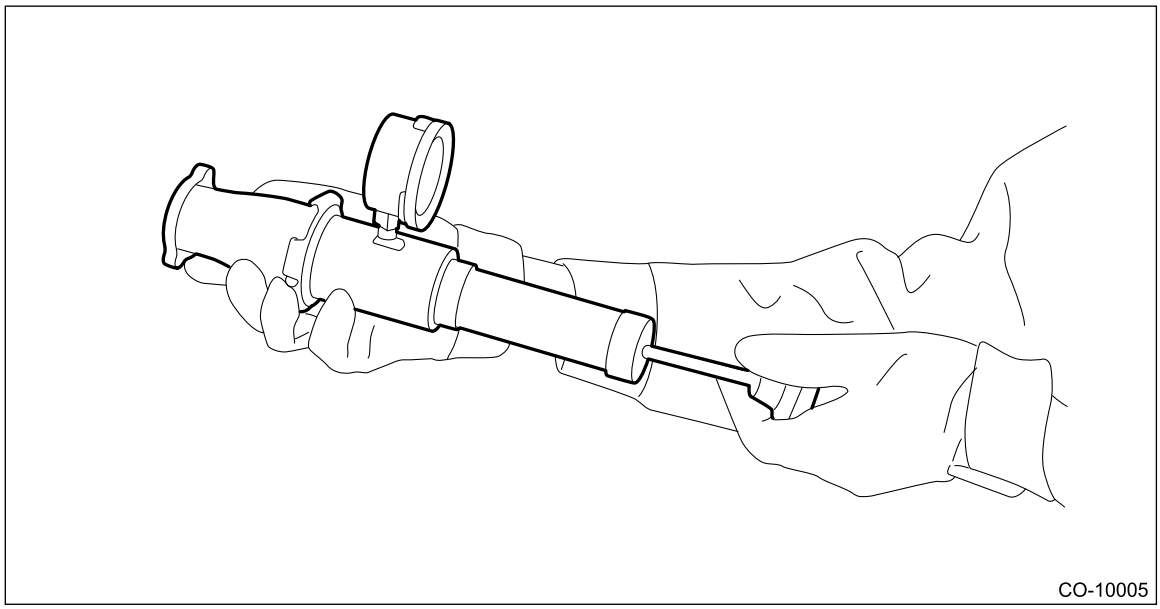
Caution:

Be careful of engine coolant from spurting out when removing the radiator cap tester.

2. Check that there is no deformation, cracks or other damages.
3. Check the radiator fins for clogging.

INSPECTION

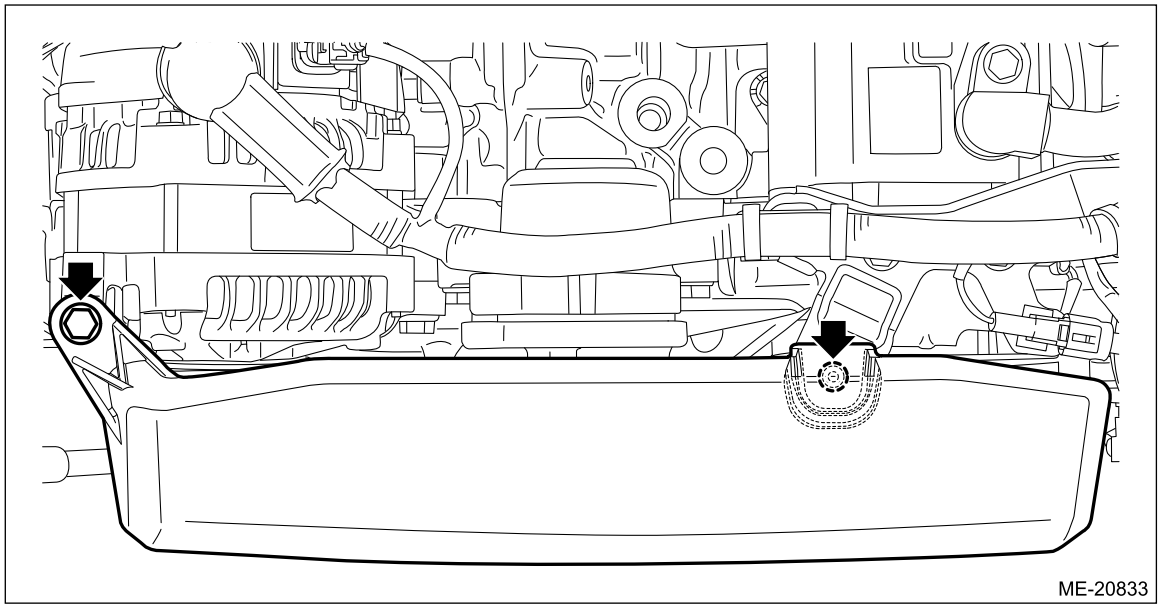
1. Check that there is no deformation, cracks or other damages.
2. Check the opening pressure of the radiator cap.
   (1) Remove the radiator cap.
   Caution:
   - **The engine coolant is pressurized when it is hot. Wait until engine coolant cools down before proceeding the work.**
   - **If the engine coolant splashes, completely remove and clean it.**
   (2) Attach radiator cap tester.



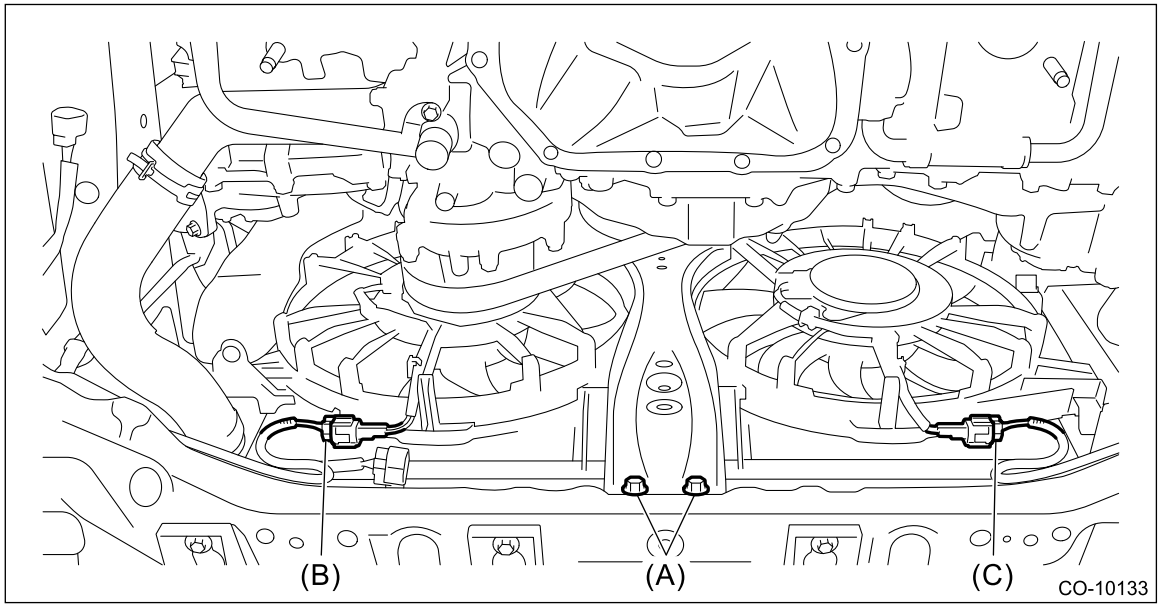
   (3) Increase pressure until the radiator cap tester gauge needle stops. Radiator cap is functioning properly if it holds the service limit pressure for 5 — 6 seconds. Replace the radiator cap if its valve opens at less than the service limit.
   Caution:
   Be sure to remove foreign matter and rust from the cap in advance. Otherwise, results of pressure test will be incorrect.
   Specification:
   93 — 123 kPa (0.95 — 1.25 kg/cm^2, 14 — 18 psi)
   Service limit:
   83 kPa (0.85 kg/cm^2, 12 psi)

REMOVAL

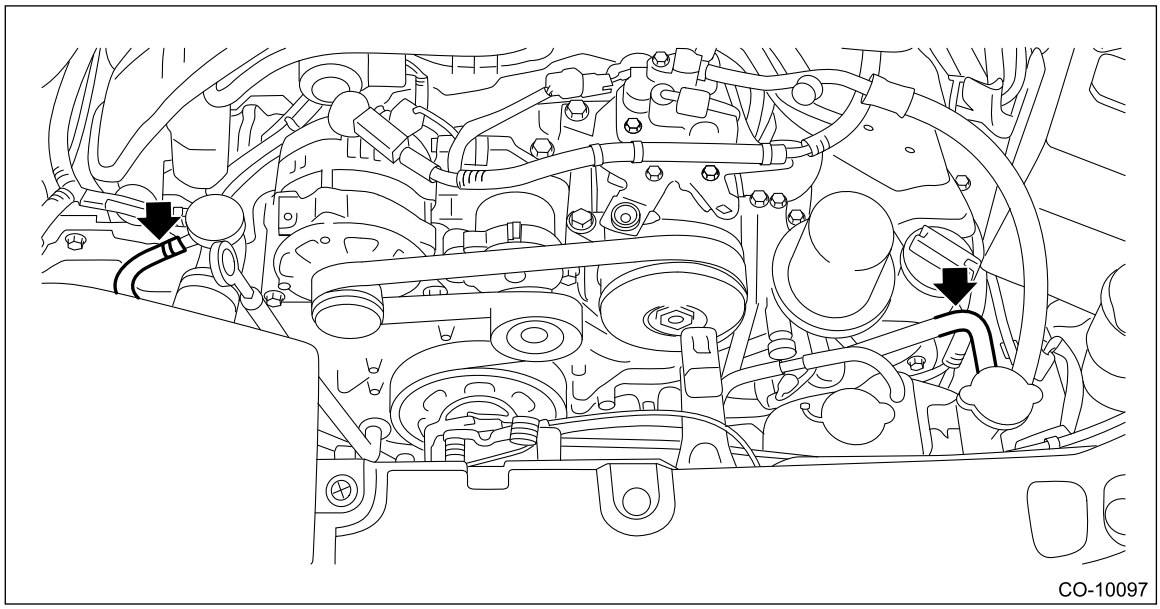
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the V-belt covers.



3. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the lower side bolts (A) securing the radiator upper frame.
5. Disconnect main fan motor connector (B) and sub fan motor connector (C).



6. Disconnect the over flow hose.

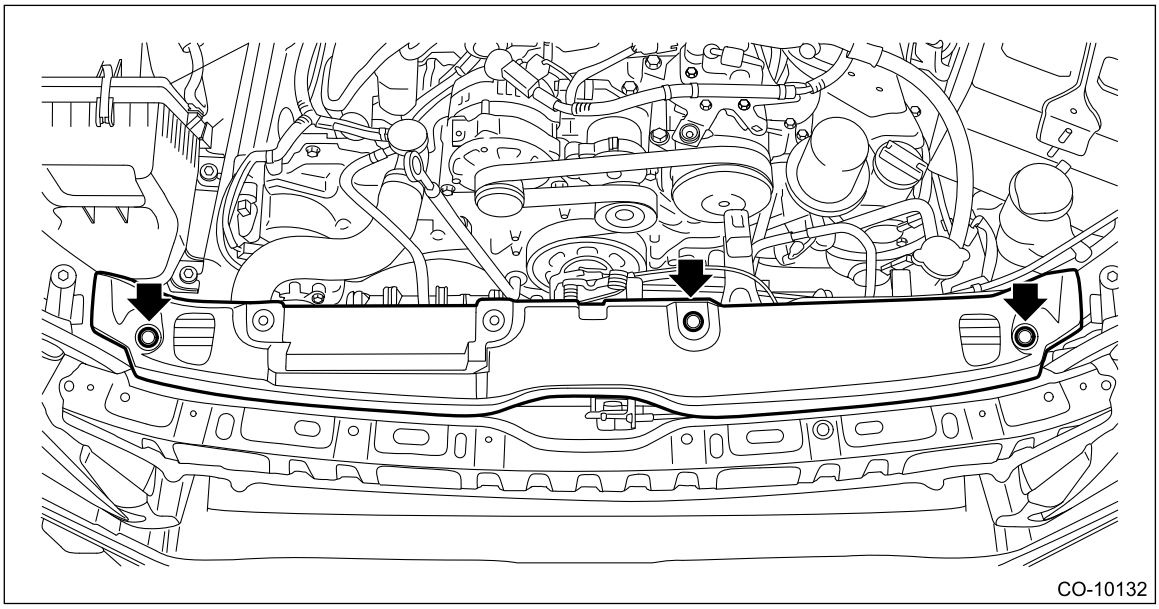


7. Remove the reservoir tank. Ref. to COOLING(H4DO)>Reservoir Tank>REMOVAL.

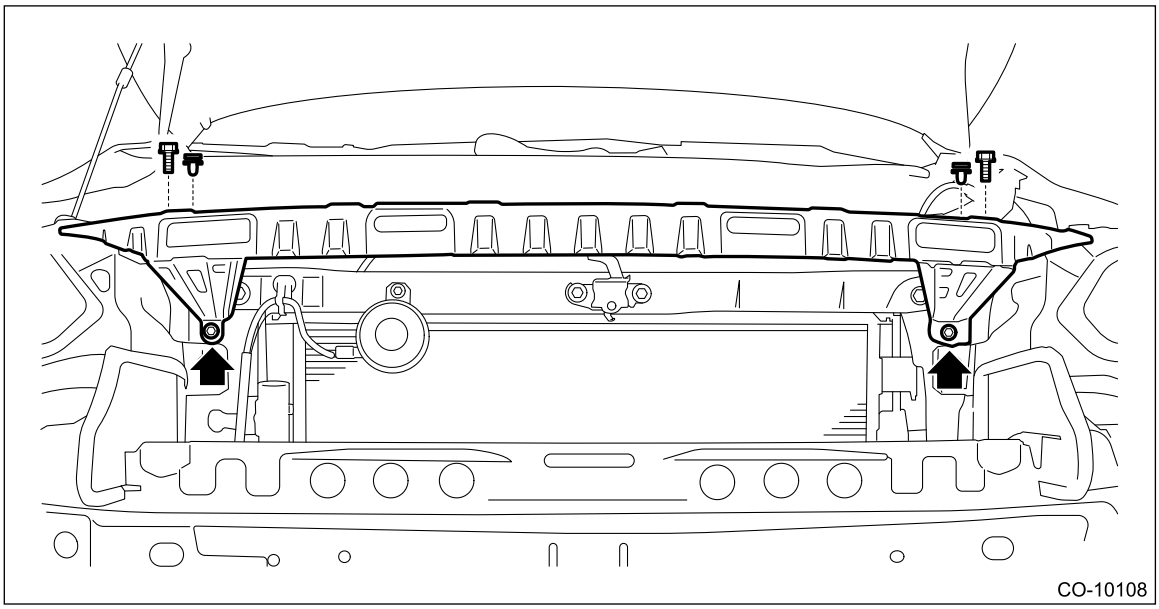
8. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.

9. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.

10. Remove the cover UPR - front.

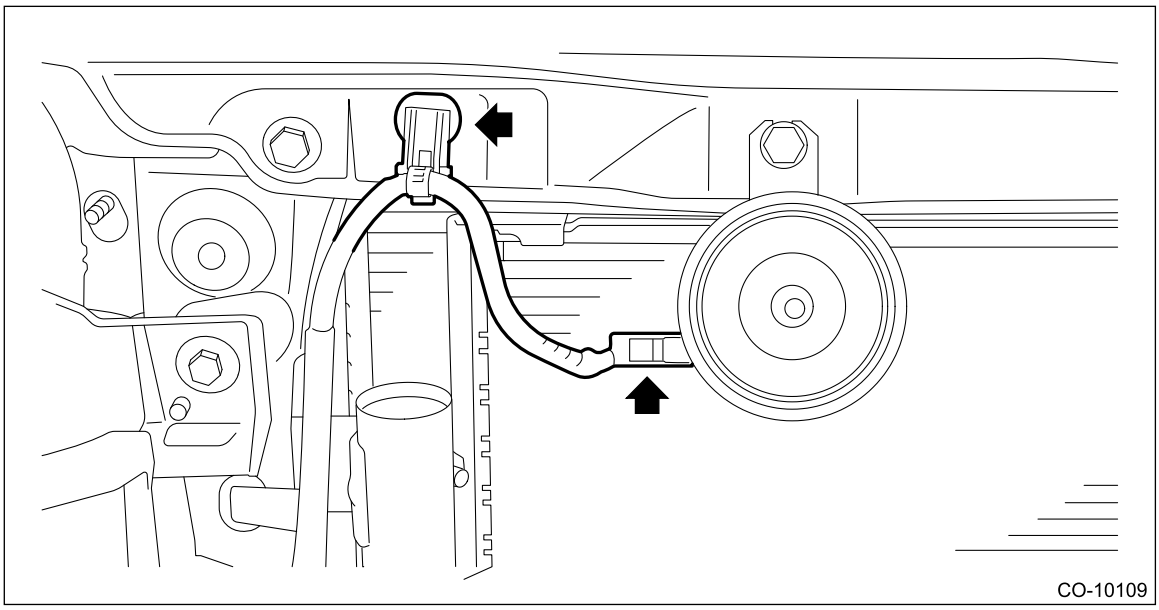


11. Remove the bracket - bumper UPR.

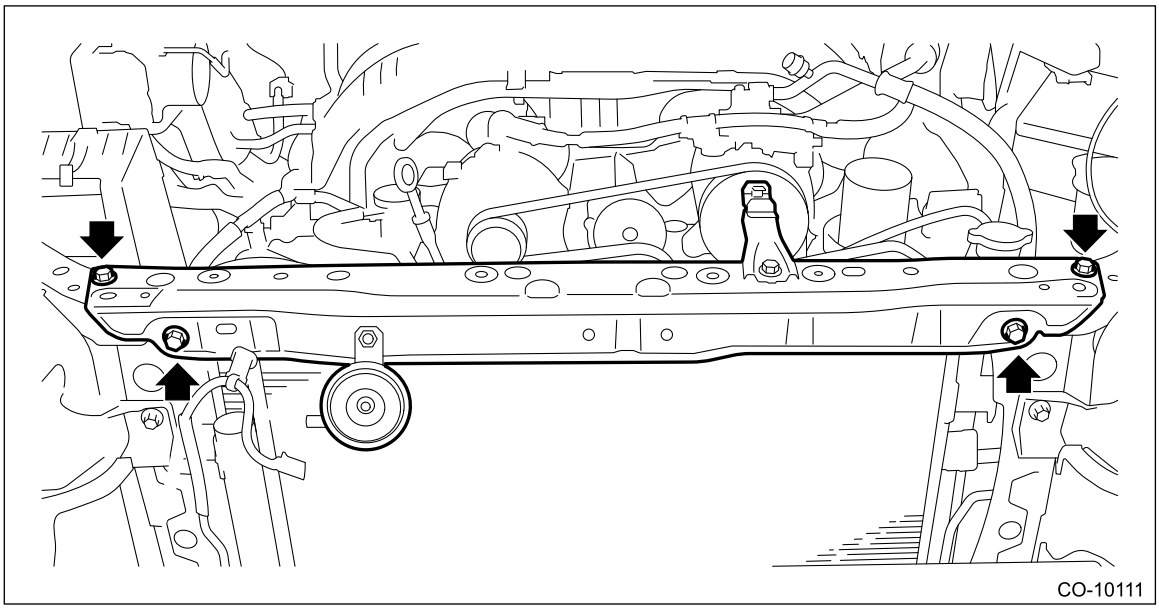


12. Remove the front hood lock assembly. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>REMOVAL.

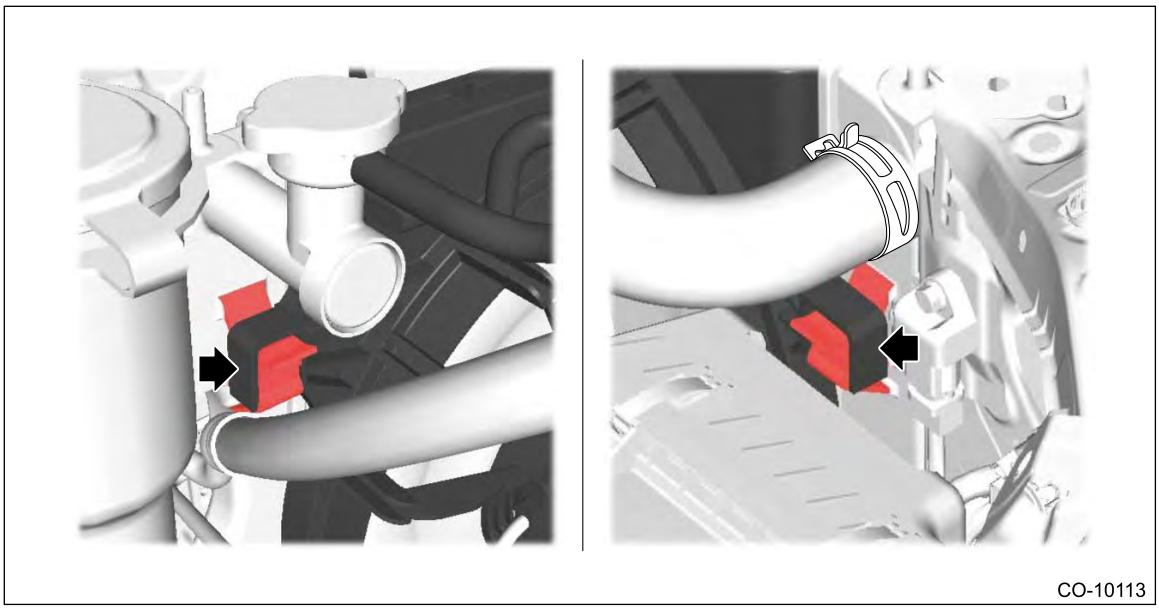
13. Disconnect the connector from the horn, and remove the clip.



14. Remove the upper side bolts securing the radiator upper frame, and remove the radiator upper frame.



15. Disengage the claws and remove the radiator fan and fan motor assembly.



COOLING(H4DO) > Radiator Fan and Fan Motor Assembly

INSTALLATION

1. Install the radiator fan and fan motor assembly.
2. Set the radiator upper frame, and install the upper side bolts securing the radiator upper frame.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
3. Connect the horn connector and install the clip.
4. Install the front hood lock assembly. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>INSTALLATION.
5. Install the bracket - bumper UPR.
   Tightening torque:
   7.5 N·m (0.8 kfg-m, 5.5 ft-lb)
6. Install the cover UPR - front.
7. Install the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
8. Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake

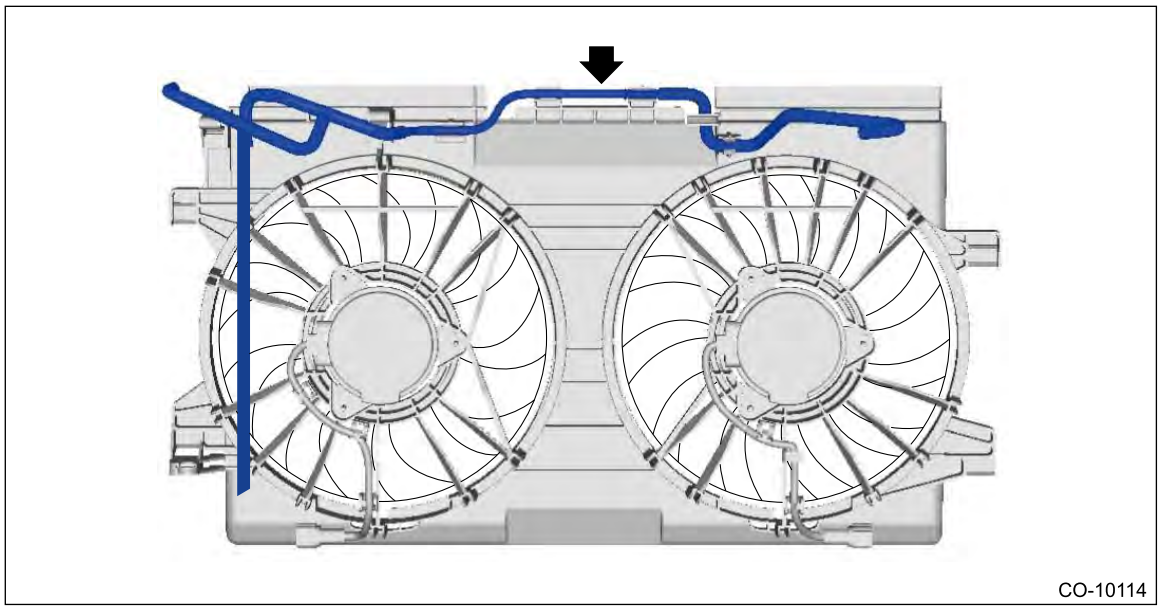
Duct>INSTALLATION.

9. Install the reservoir tank. Ref. to COOLING(H4DO)>Reservoir Tank>INSTALLATION.
10. Connect the over flow hose.
11. Connect the main fan motor connector and the sub fan motor connector.
12. Install the lower side bolts securing the radiator upper frame.
    Tightening torque:
    18 N·m (1.8 kgf-m, 13.3 ft-lb)
13. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
14. Install the V-belt cover.
    Tightening torque:
    7 N·m (0.7 kgf-m, 5.2 ft-lb)
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

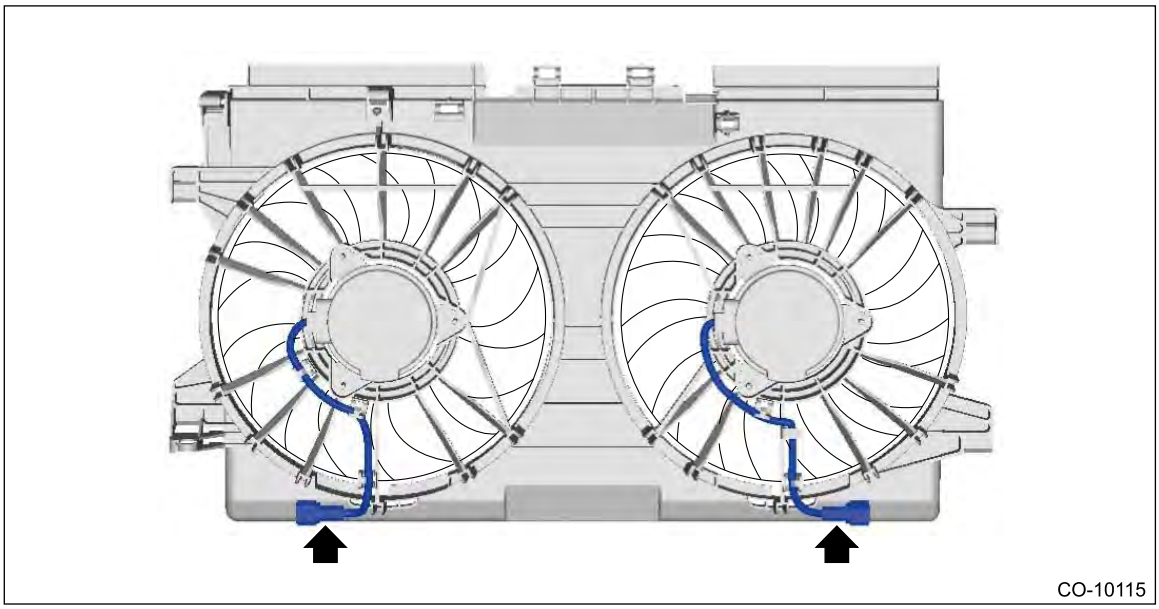
COOLING(H4DO) > Radiator Fan and Fan Motor Assembly

DISASSEMBLY

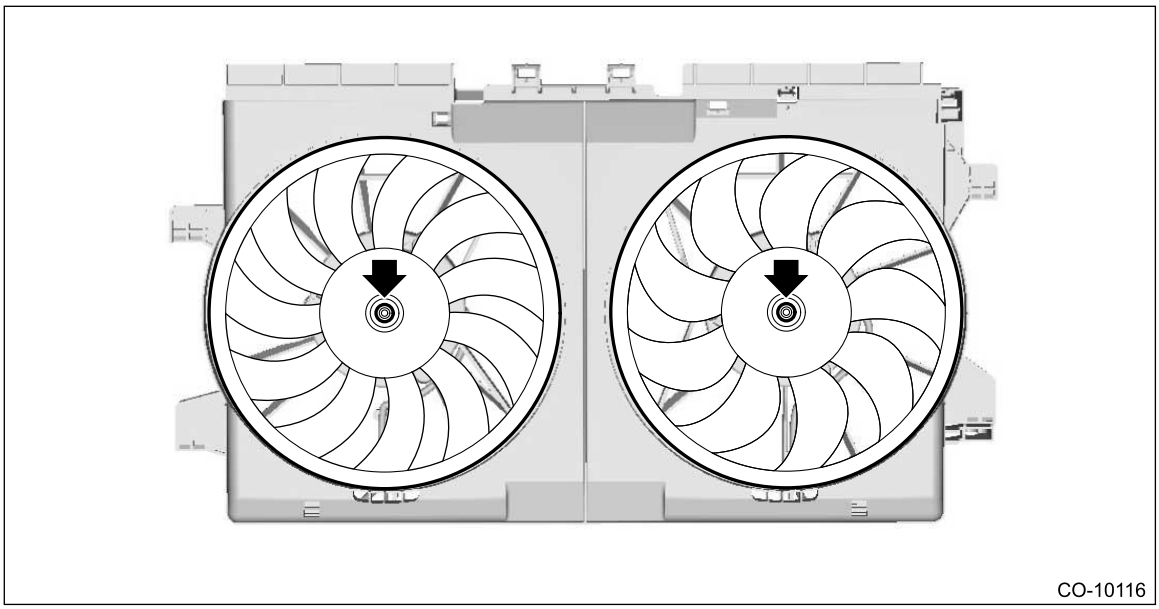
1. Remove the over flow hose and the over flow pipe.



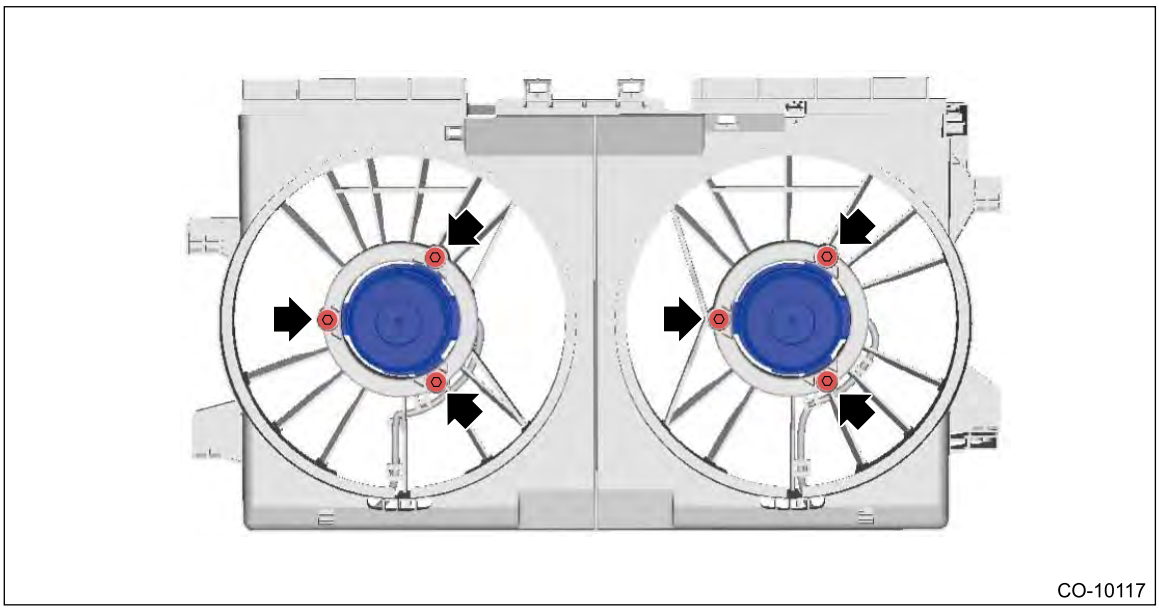
2. Remove the main fan motor harness and the sub fan motor harness.



3. Remove the radiator main fan and radiator sub fan.



4. Remove the main fan motor and the sub fan motor.



ASSEMBLY

1. Install the main fan motor and the sub fan motor.
   Tightening torque:
   4.41 N·m (0.45 kgf-m, 3.25 ft-lb)
2. Install the radiator main fan and the radiator sub fan.
   Tightening torque:
   3.43 N·m (0.3 kgf-m, 2.5 ft-lb)
3. Install the main fan motor harness and the sub fan motor harness.
4. Install the over flow hose and the over flow pipe.

INSPECTION

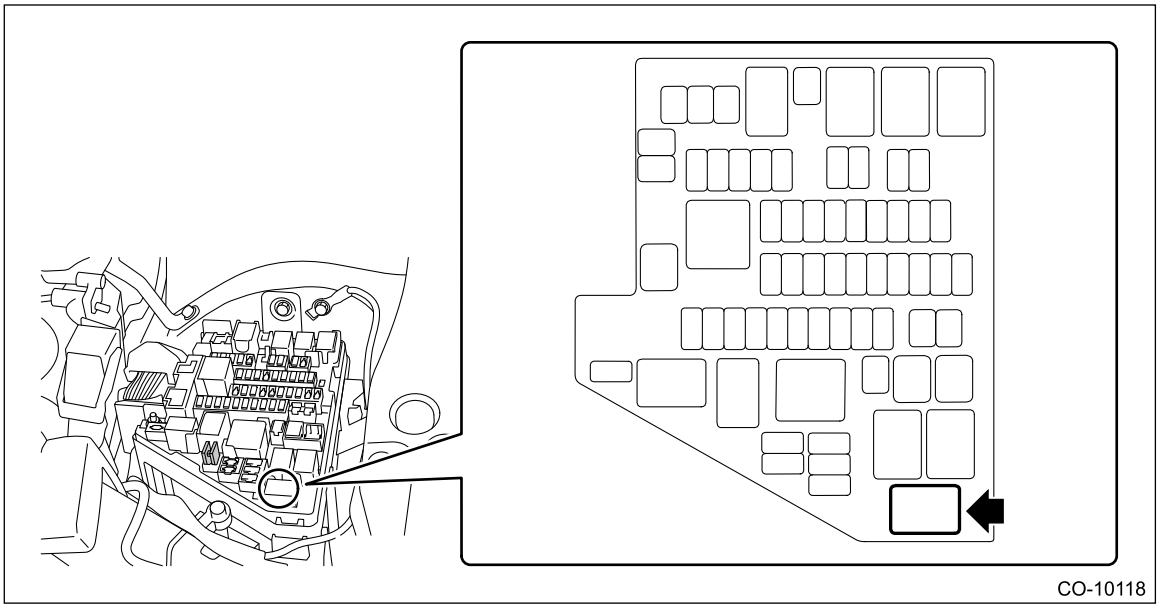
Check that there is no deformation, cracks or other damages.

Note:

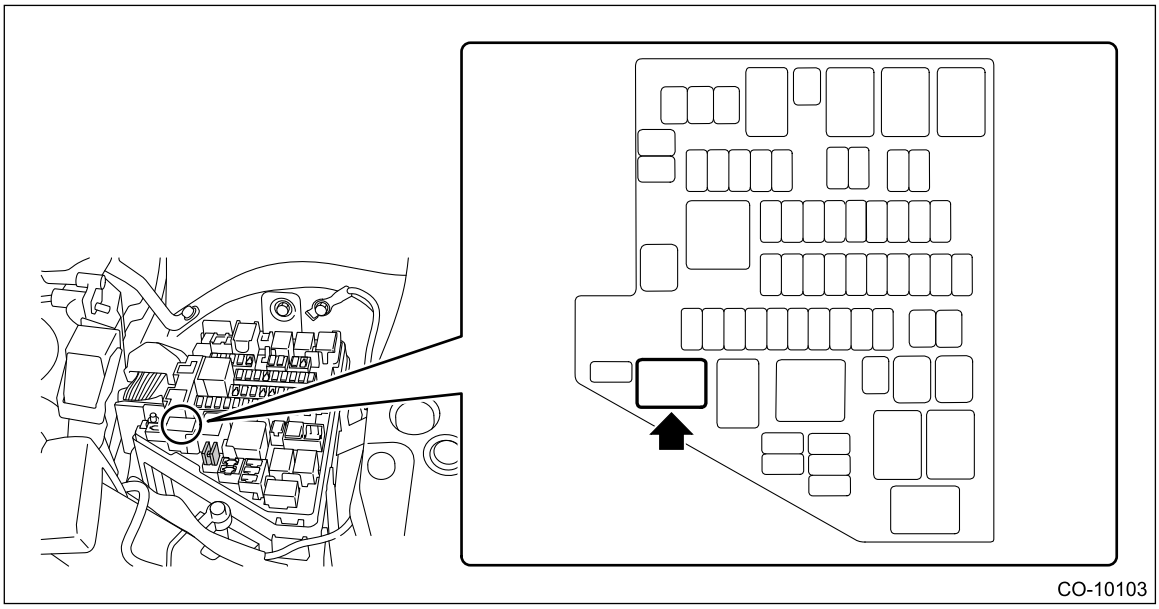
For information about operation confirmation, refer to the radiator fan system. **Ref. to COOLING(H4DO)>Radiator Fan System>INSPECTION.**

LOCATION

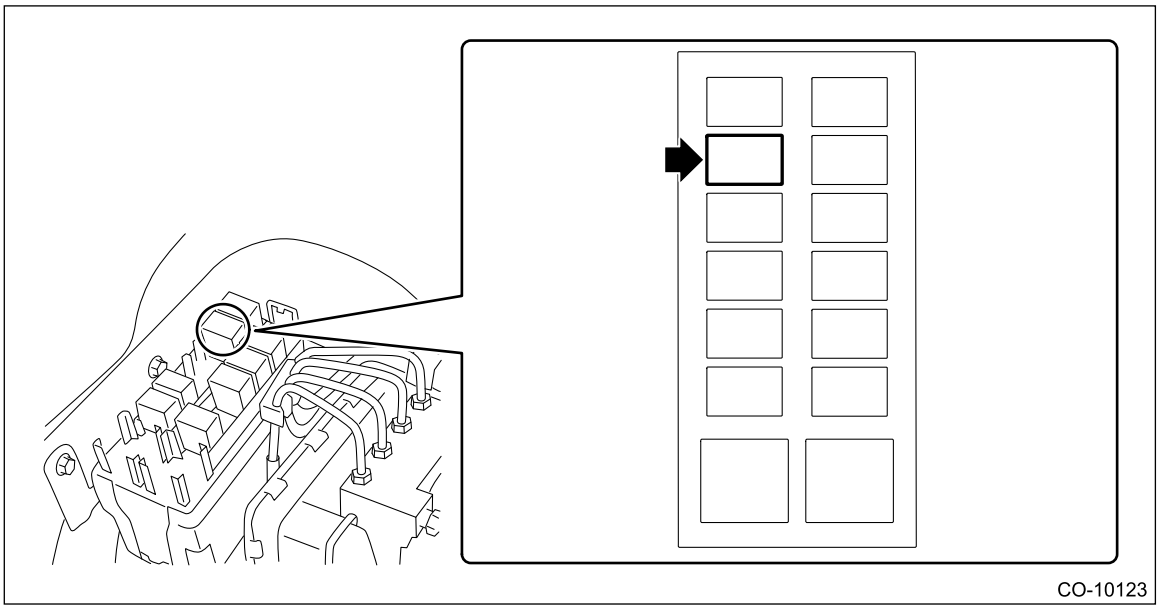
- Main fan relay 1



- Main fan relay 2



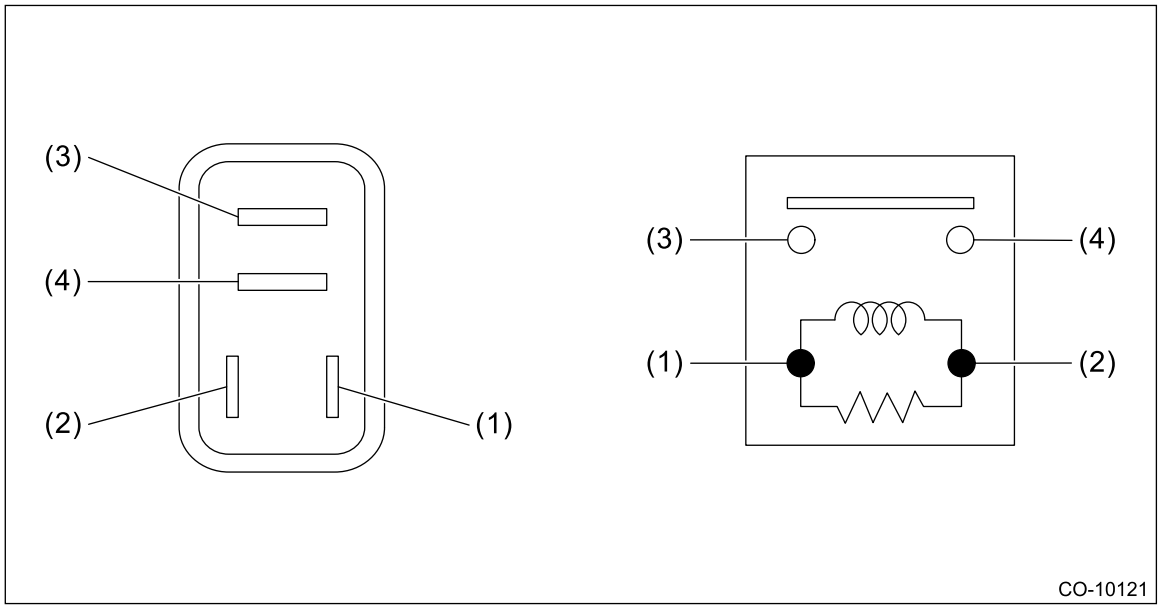
- Sub fan relay



COOLING(H4DO) > Radiator Fan Relay

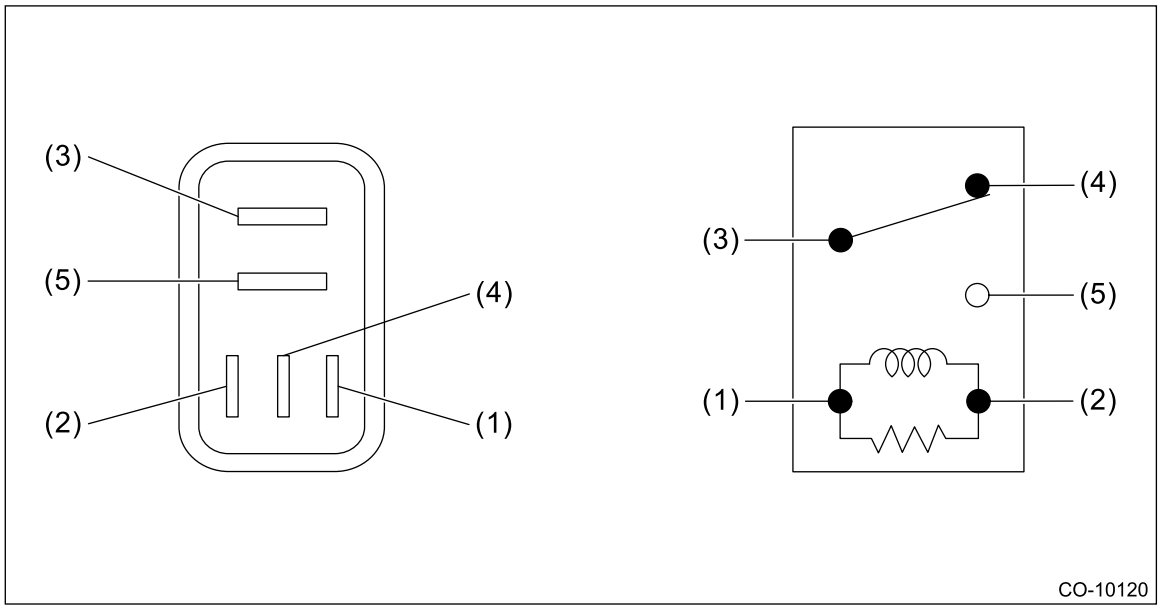
INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check the resistance between terminals. Replace the relay if it is faulty.
   - Main fan relay 1



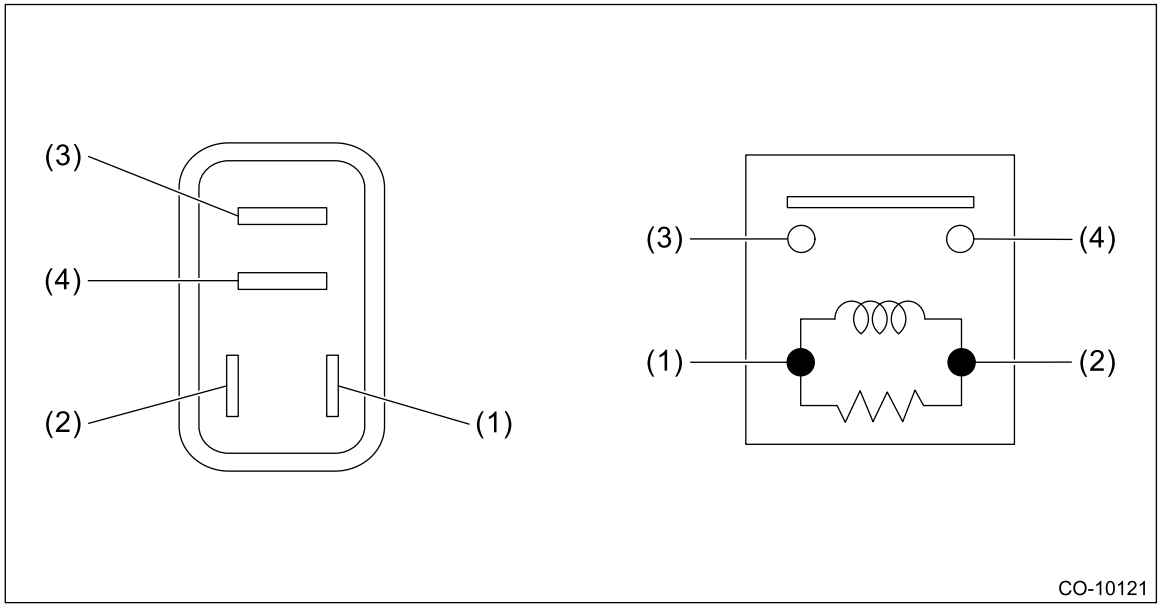
Terminal No.	Inspection conditions	Standard
3 — 4	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

   - Main fan relay 2



Terminal No.	Inspection conditions	Standard
3 — 4	Always	Less than 1 Ω
3 — 5	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	1 MΩ or more
3 — 5	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

- Sub fan relay

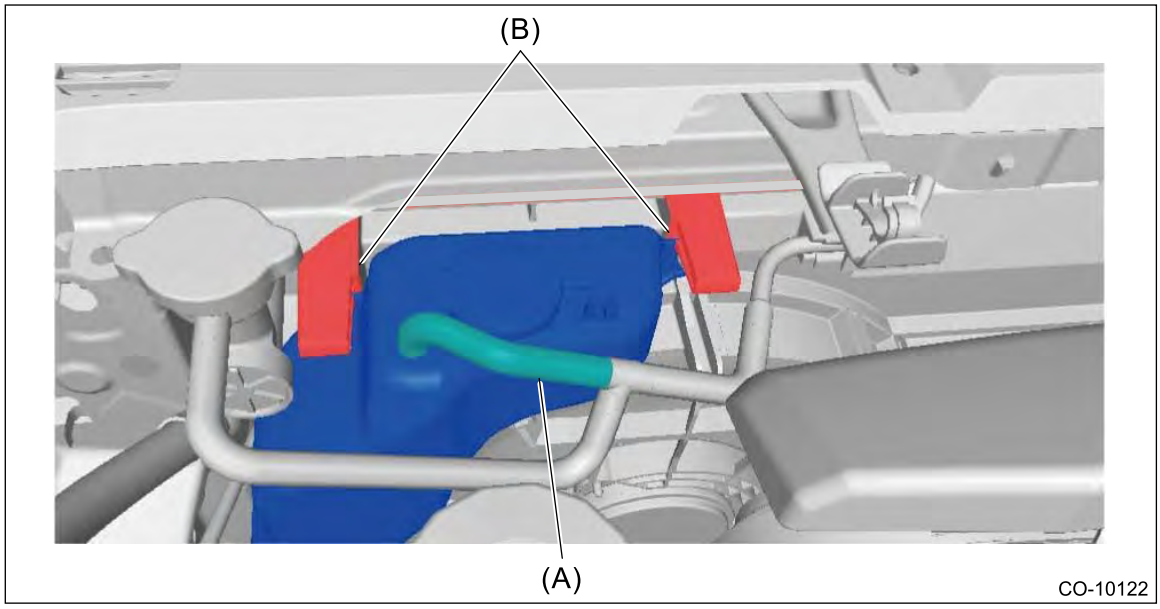


Terminal No.	Inspection conditions	Standard
3 — 4	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

COOLING(H4DO) > Reservoir Tank

REMOVAL

1. Pull out the over flow hose (A) from the reservoir tank.
2. Disengage the claw (B) and remove the reservoir tank.



COOLING(H4DO) > Reservoir Tank

INSTALLATION

1. Install the reservoir tank.
2. Install the over flow hose.

COOLING(H4DO) > Reservoir Tank

INSPECTION

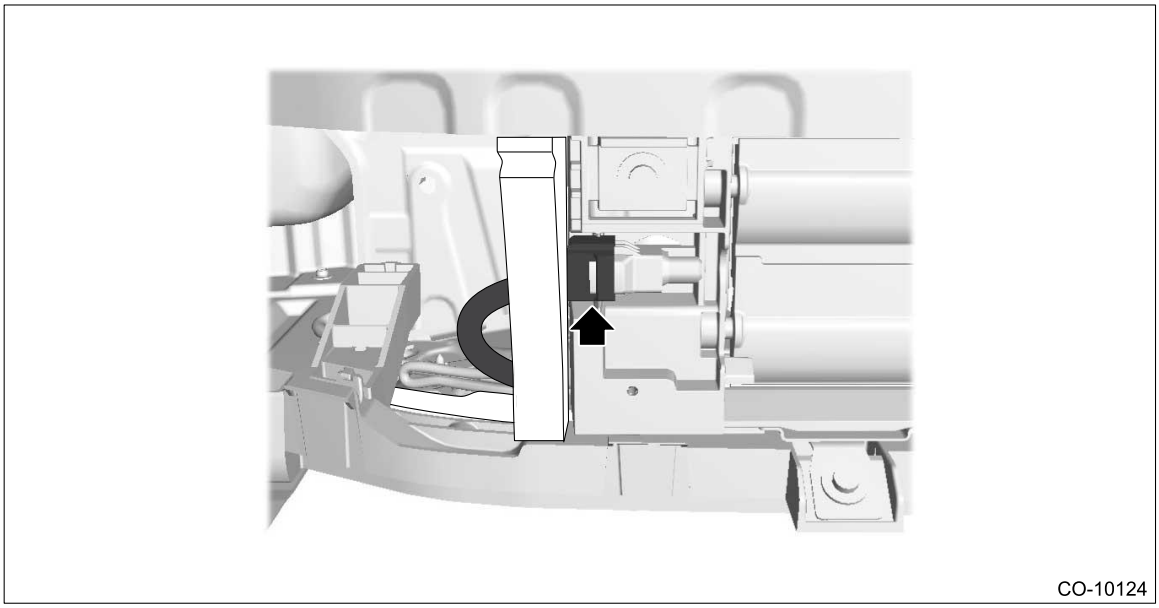
Check that there is no deformation, cracks or other damages.

REMOVAL

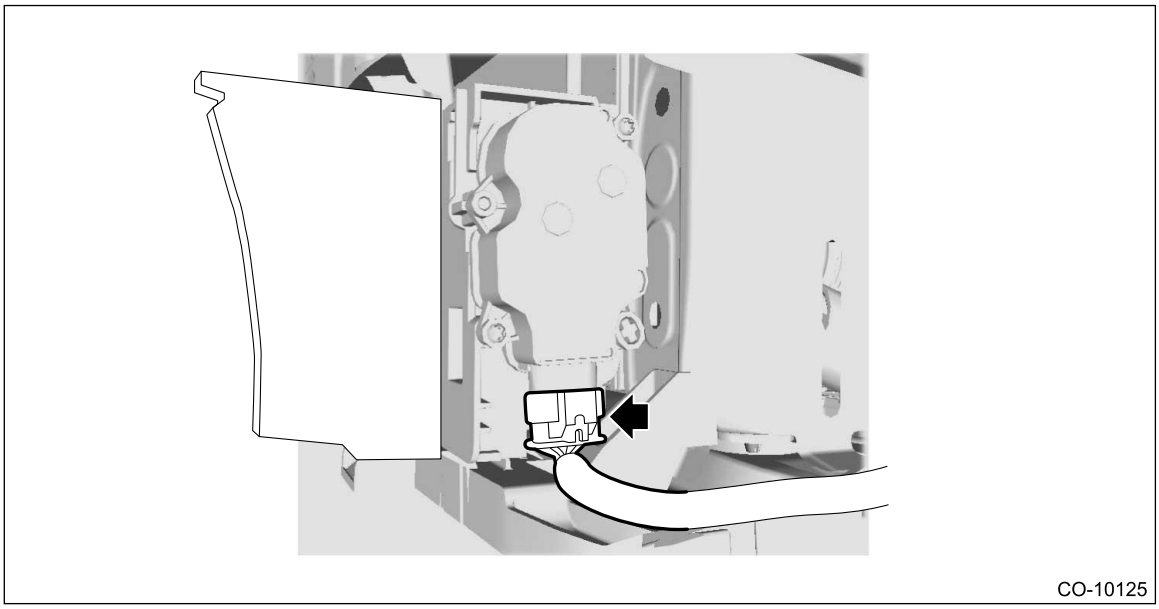
Note:

Active grille shutter is installed on only some models.

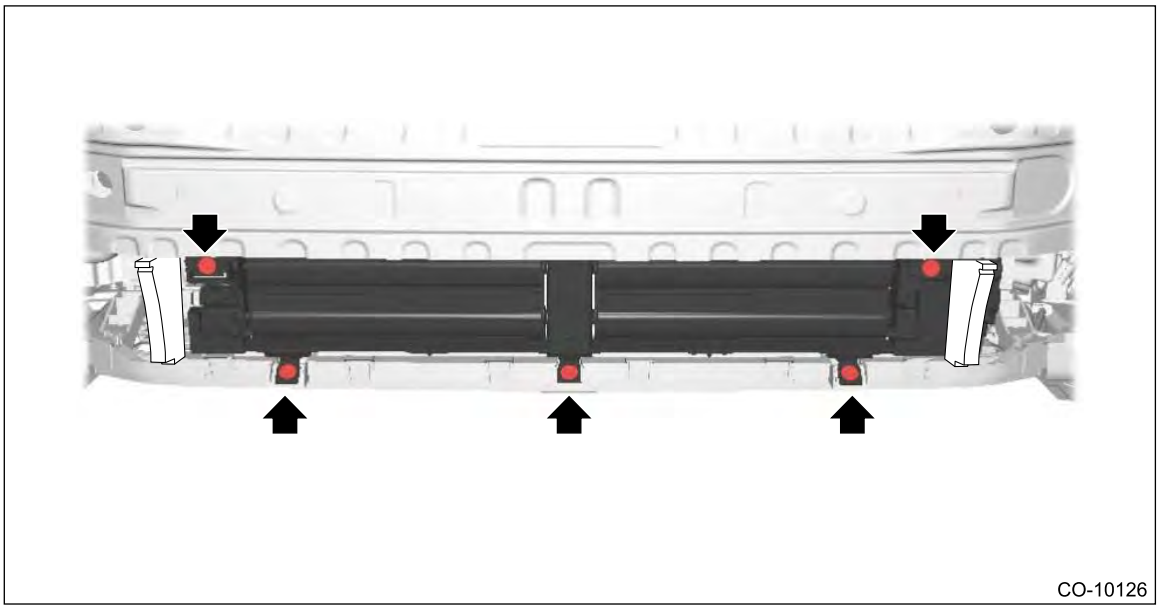
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Disconnect the connector from ambient sensor.



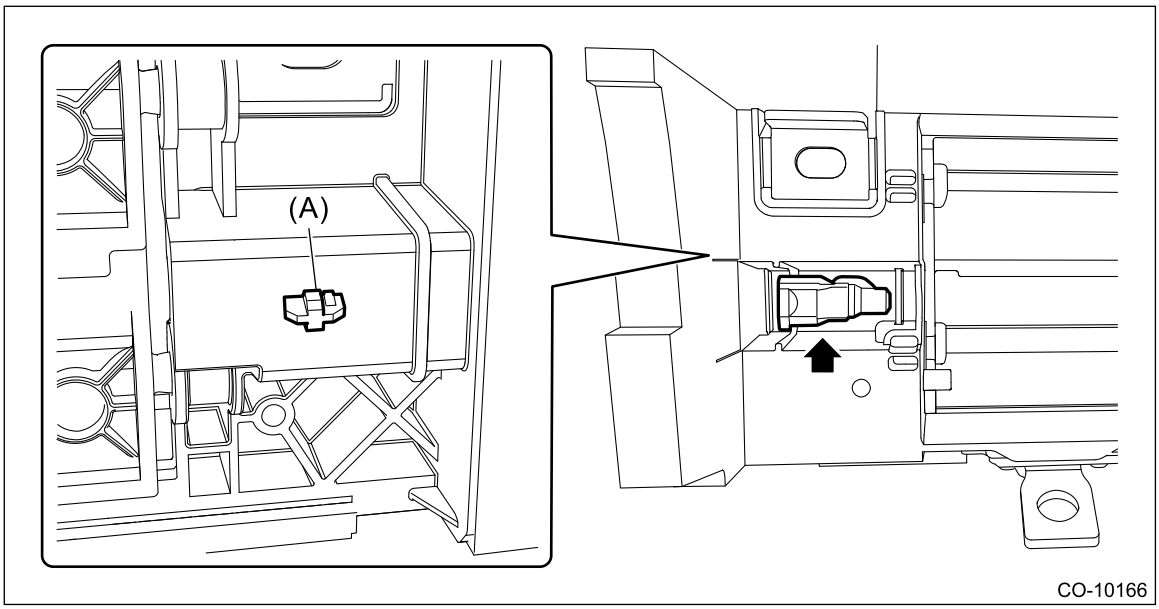
4. Disconnect the connector from the active grille shutter actuator.



5. Remove the active grille shutter.



6. Remove the clip (A) to remove the ambient sensor.



COOLING(H4DO) > Active Grille Shutter

INSTALLATION

1. Install the ambient sensor.
2. Install the active grille shutter.
   Tightening torque:
   7.5 N·m (0.8 gf-m, 5.5 ft-lb)
3. Connect the connector to the active grille shutter actuator.
4. Connect the connector to the ambient sensor.
5. Install the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. When the active grille shutter has been replaced, perform the calibration (execute the system operation check for ACTGS control). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test>OPERATION.

COOLING(H4DO) > Active Grille Shutter

INSPECTION

Check that there is no deformation, cracks or other damages.

INSPECTION

Trouble	Possible cause	Corrective action
Over-heating	a. Engine coolant leaks, insufficient engine coolant	Check for coolant leaks, and repair or replace faulty parts if necessary. If no faulty parts are found, fill engine coolant.
	b. Clogged engine coolant passage	Clean or replace faulty parts.
	c. Defective radiator cap	Replace the radiator cap.
	d. Malfunction of thermostat	Replace the thermostat.
	e. Malfunction of water pump	Replace water pump.
	f. Clogged radiator fin	Clean the radiator fin. If it is not possible to clean, repair or replace the radiator.
	g. Radiator fan system malfunction	Check the radiator fan system, and repair or replace faulty parts.
	h. Excessive back pressure in exhaust system	Clean or replace faulty parts.
	i. Engine oil leaking into engine coolant	Repair or replace the faulty parts, clean the engine coolant passage, and then fill engine coolant.
Over cooling	a. Ambient temperature extremely low	Warm-up the engine sufficiently.
	b. Defective thermostat	Replace the thermostat.
Engine coolant leaks	a. Leakage from water pump	Replace water pump.
	b. Leakage from water hose	Repair or replace faulty parts.
	c. Leakage from water pipe	Repair or replace faulty parts.
	d. Leakage from cylinder head gasket	Replace the cylinder head gasket.
	e. Cracked or damaged cylinder head or cylinder block	Replace faulty parts.
	f. Cracked or damaged thermostat cover	Replace the thermostat cover.
	g. Leakage from radiator	Repair or replace the radiator.
	h. Leakage from heater core	Replace the heater core.
Noise	a. Air mixed in the engine coolant passage	Bleed air from the engine coolant.
	b. Malfunction of water pump	Replace water pump.
	c. Malfunction of radiator fan or fan motor	Replace the radiator fan or fan motor.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)

EC(H4DO)

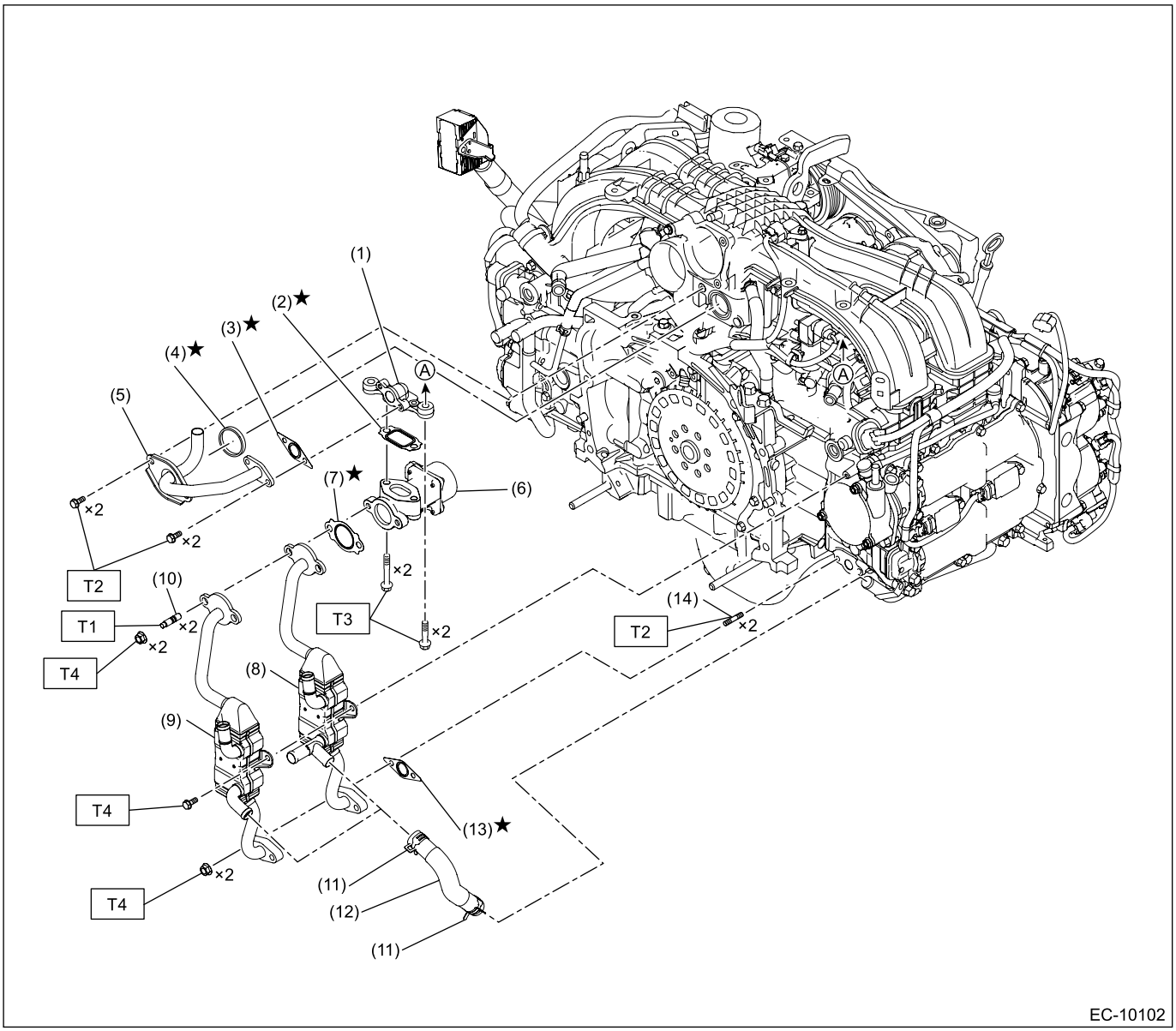
1. General Description
2. Front Catalytic Converter
3. Rear Catalytic Converter
4. Canister
5. Purge Control Solenoid Valve
6. EGR Control Valve
7. EGR Pipe
8. EGR Cooler
9. Fuel Level Sensor
10. Drain Filter
11. Leak Check Valve Assembly
12. PCV Connector
13. PCV Hose
14. PCV Valve

COMPONENT

1. CANISTER, PURGE CONTROL SOLENOID VALVE, DRAIN FILTER AND LEAK CHECK VALVE ASSEMBLY

For components of canister, purge control solenoid valve, drain filter and leak check valve assembly, refer to FU (H4DO). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT.

2. EXHAUST GAS RECIRCULATION CONTROL CIRCUIT RANGE/PERFORMANCE



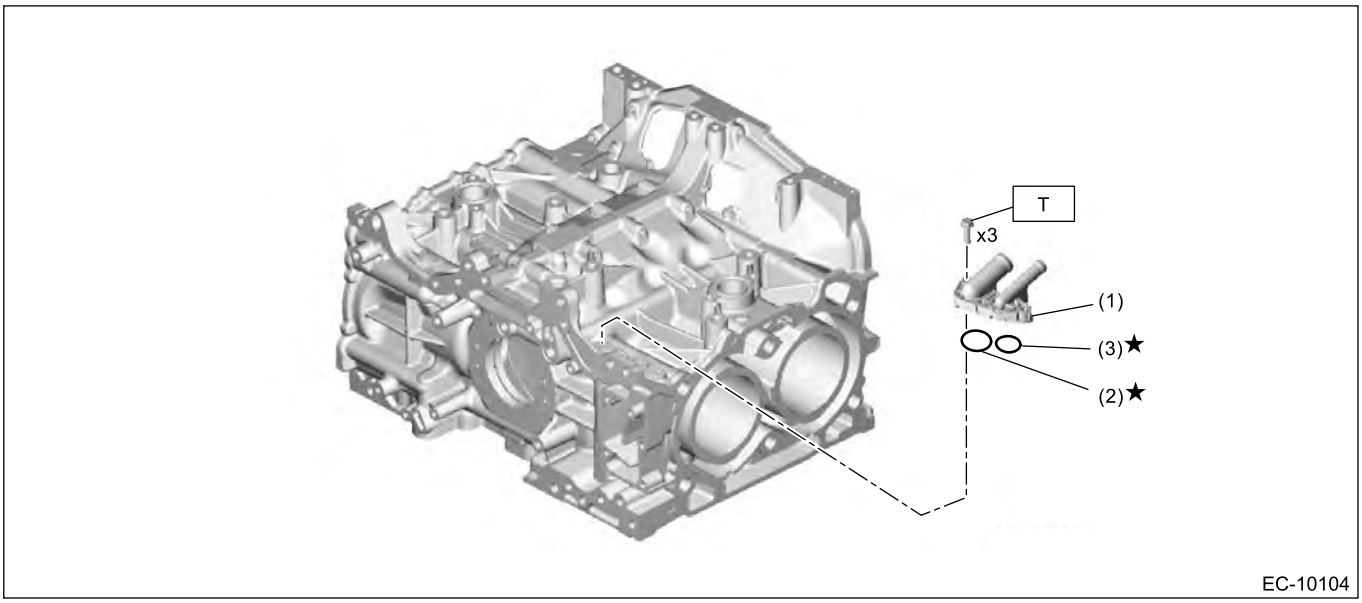
EC-10102

(1) EGR pipe adapter
(2) Gasket
(3) Gasket
(4) O-ring
(5) EGR pipe
(6) EGR control valve
(7) Gasket
(8) EGR cooler (CVT model)
(9) EGR cooler (MT model)
(10) Stud bolt
(11) Clip
(12) Water hose
(13) Gasket
(14) Stud bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 5 (0.5, 3.7)
T2: 6.4 (0.7, 4.7)
T3: 19 (1.9, 14.0)
T4: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>EGR Cooler>INSTALLATION.

3. PCV SYSTEM 1



(1) PCV connector

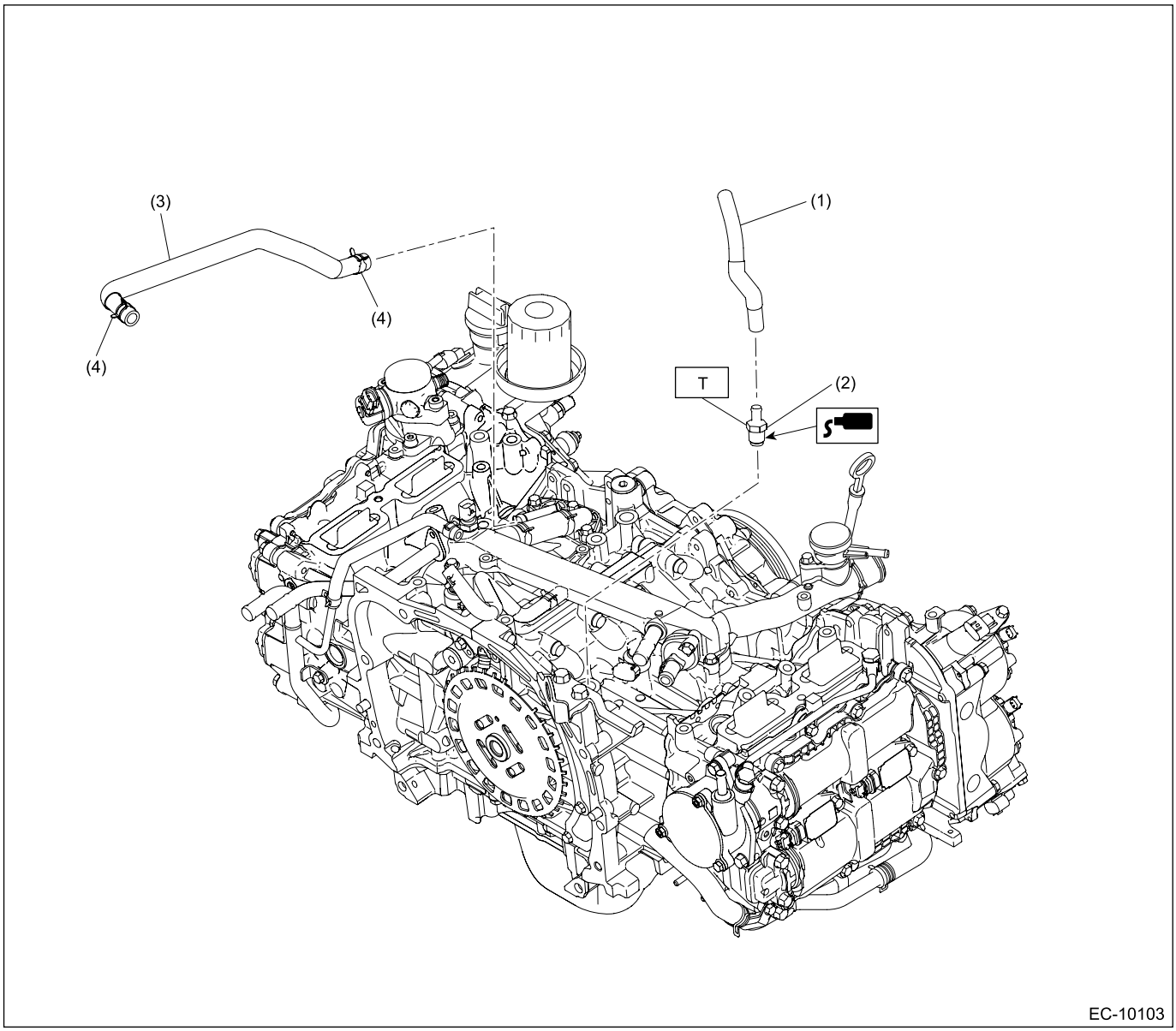
(2) O-ring

(3) O-ring

Tightening torque: N·m (kgf-m, ft-lb)

T: 6.4 (0.7, 4.7)

4. PCV SYSTEM 2



(1) PCV hose A	(3) PCV hose B	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) PCV valve	(4) Clip	***T: 23 (2.3, 17.0)***

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.

- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
TORX® E8	Used for removing and installing EGR control valve stud bolts.
Circuit tester	Used for measuring resistance, voltage and current.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Front Catalytic Converter

REMOVAL

The front catalytic converter is integrated into the front exhaust pipe; therefore, refer to "Front Exhaust Pipe" for the removal procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Front Catalytic Converter

INSTALLATION

The front catalytic converter is integrated into the front exhaust pipe; therefore, refer to "Front Exhaust Pipe" for the installation procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Front Catalytic Converter

INSPECTION

The front catalytic converter is integrated into the front exhaust pipe; therefore, refer to "Front Exhaust Pipe" for the inspection procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSPECTION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Rear Catalytic Converter

REMOVAL

The rear catalytic converter is integrated into the front exhaust pipe; therefore, refer to “Front Exhaust Pipe” for the removal procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Rear Catalytic Converter

INSTALLATION

The rear catalytic converter is integrated into the front exhaust pipe; therefore, refer to “Front Exhaust Pipe” for the installation procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Rear Catalytic Converter

INSPECTION

The rear catalytic converter is integrated into the front exhaust pipe; therefore, refer to “Front Exhaust Pipe” for the inspection procedure. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSPECTION.

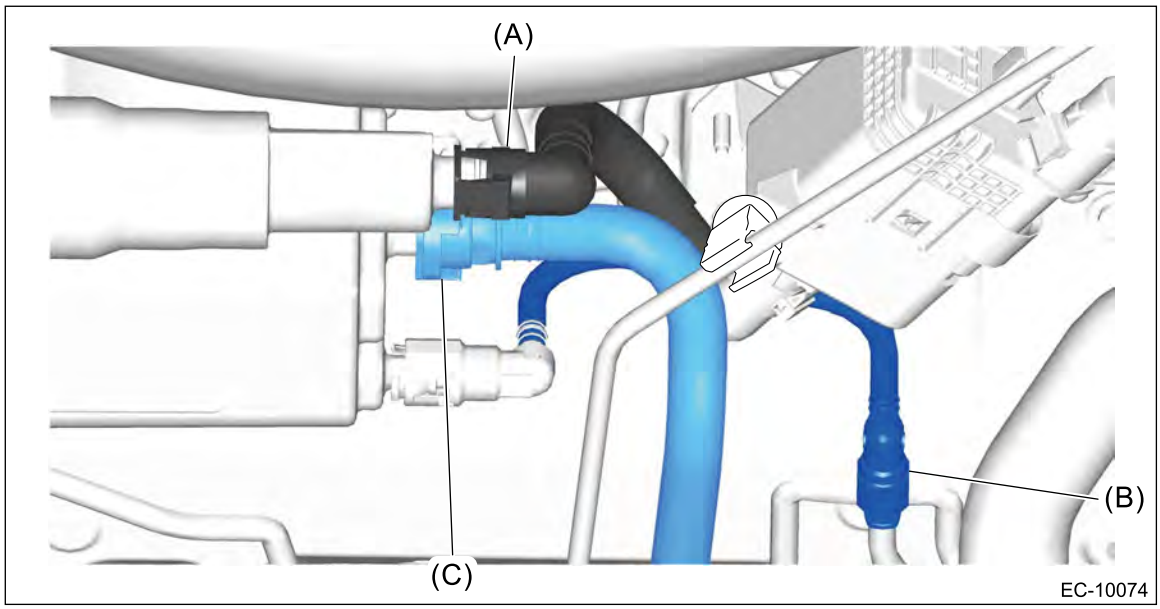
REMOVAL

1. Remove the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>REMOVAL.

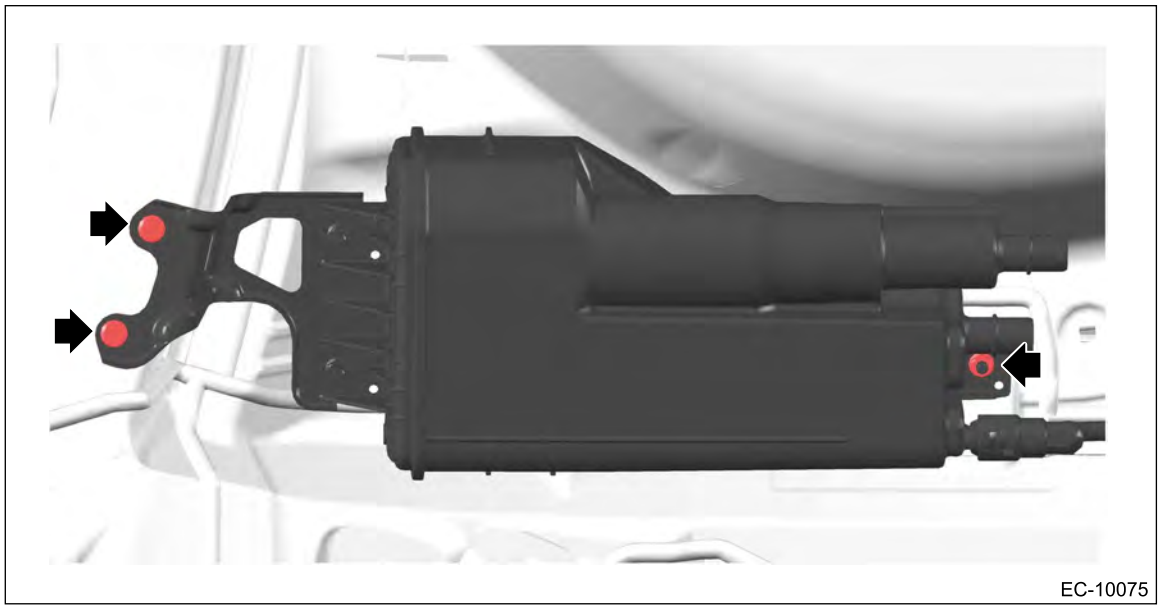
   Note:

   This operation procedure would be possible by simply lowering the rear differential to the position that the work is possible. In that case, it is not necessary to pull out the drive shaft from the rear differential.

2. Disconnect the drain tube (A) and purge tube (B). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE E). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE G).
3. Disconnect the vent tube (C). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE F).



4. Remove the canister.



5. Disconnect the purge tube from the canister. Ref. to FUEL INJECTION (FUEL SYSTEMS)

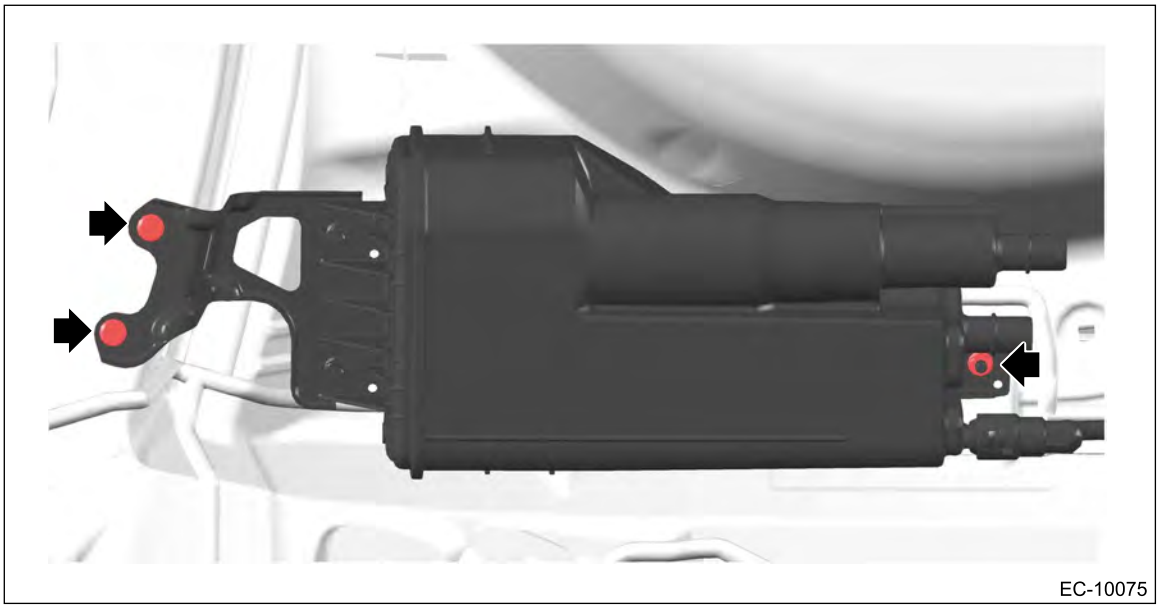
(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE D).

6. Remove the canister bracket.

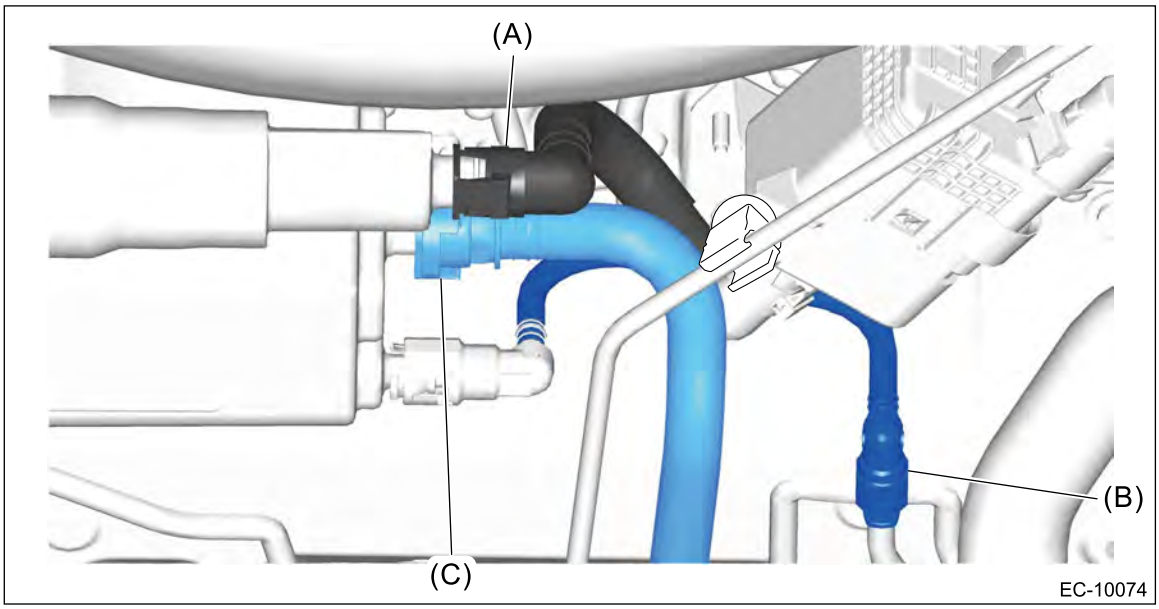
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Canister

INSTALLATION

1. Install the canister bracket.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Connect the purge tube to the canister. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE D).
3. Install the canister.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)



4. Connect the drain tube (A) and purge tube (B). Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE E). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE G).
5. Connect the vent tube (C). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE F).



6. Install the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>INSTALLATION.

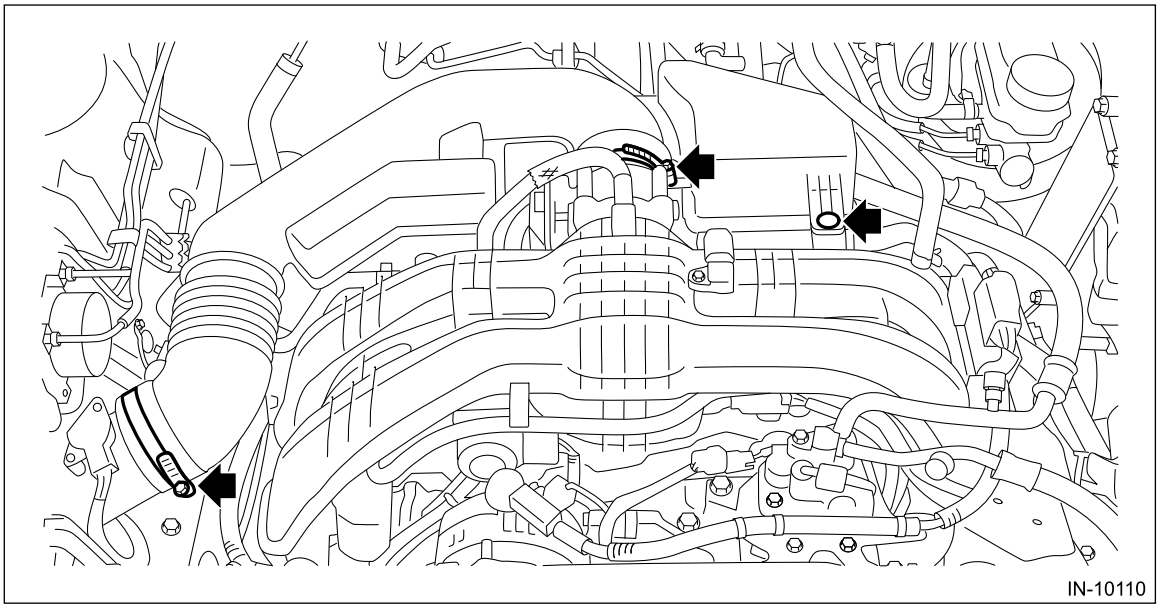
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Canister

INSPECTION

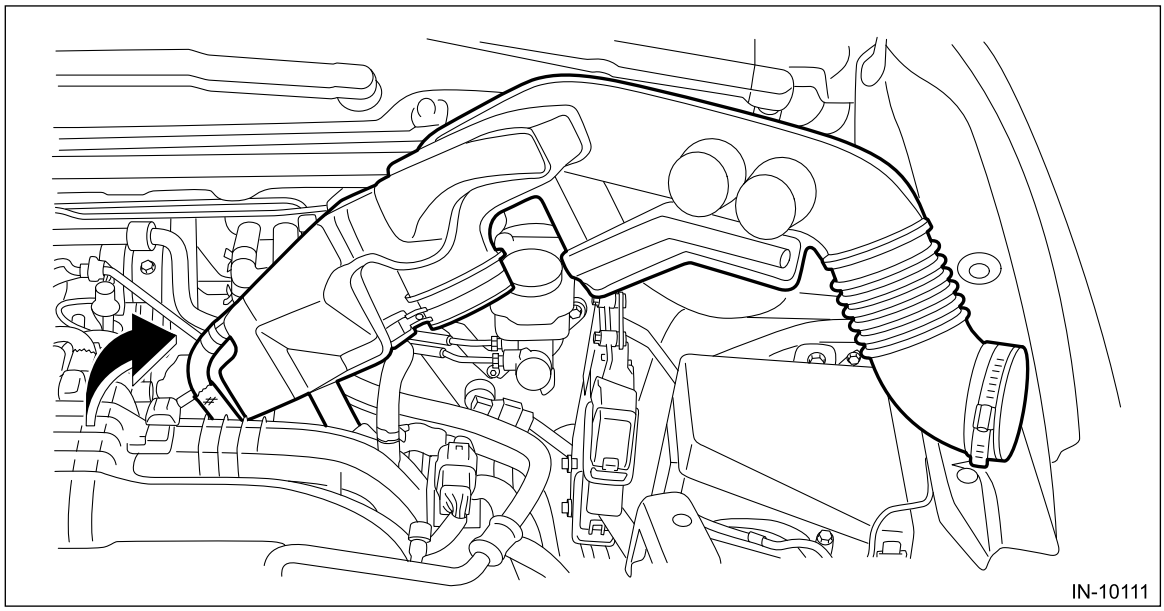
1. Check that the canister has no deformation, cracks or other damages.
2. Check that the tube has no cracks, damage or loose part.

REMOVAL

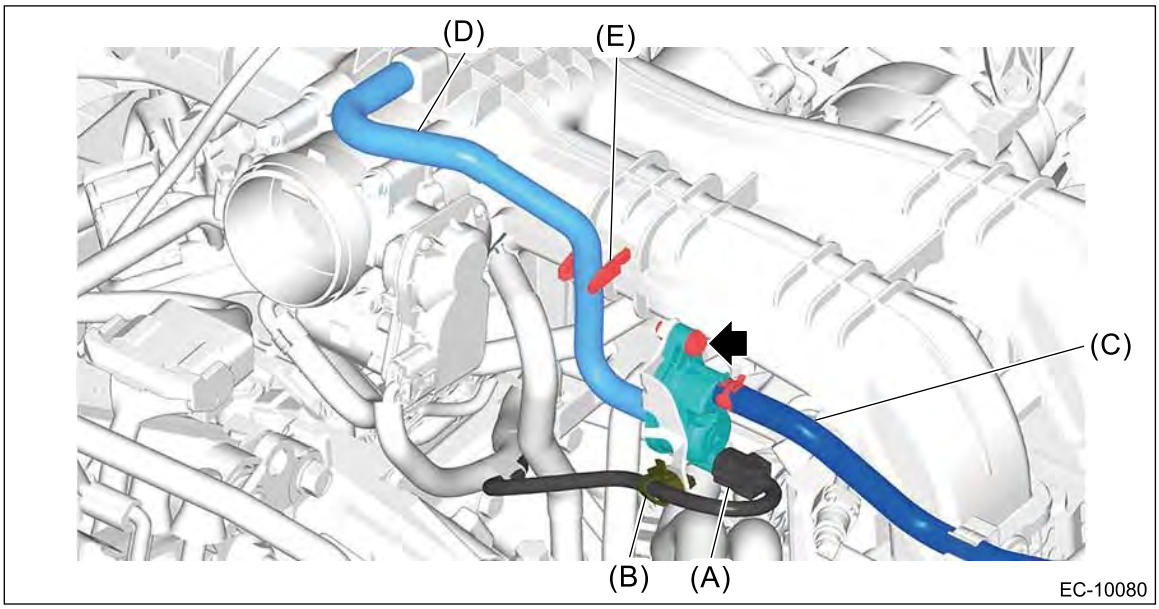
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



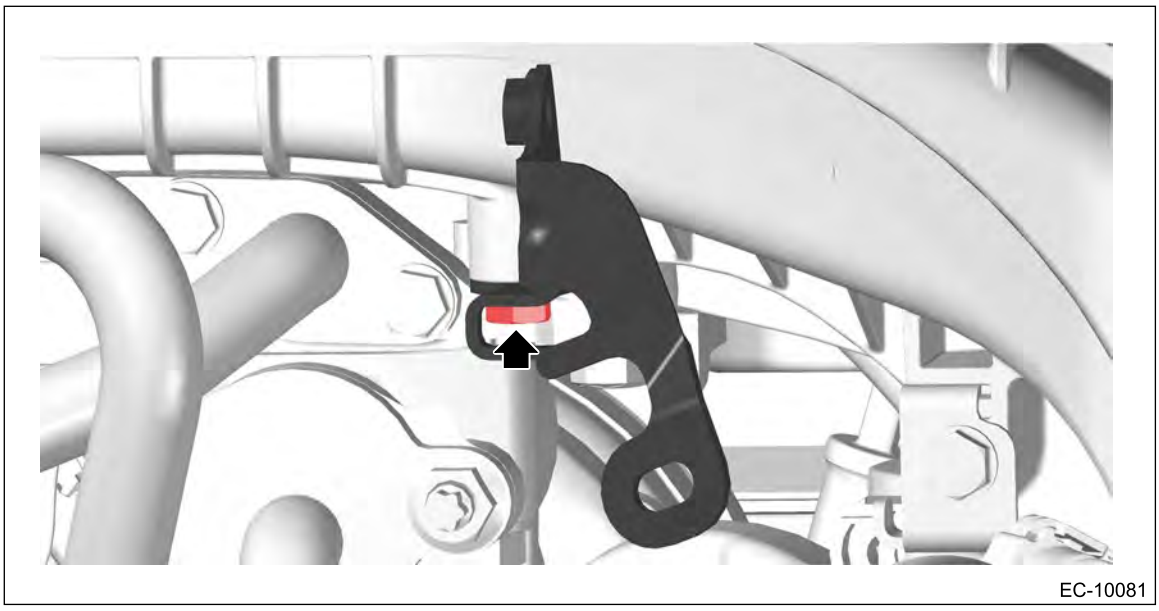
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



4. Disconnect the connector (A), and disconnect the clip (B) which secures the engine wiring harness from the purge control solenoid valve bracket.
5. Disconnect the purge hose (C).
6. Disconnect the vacuum hose (D) from the intake manifold assembly, and remove the vacuum hose (D) from the clip (E).
7. Remove the bolt securing the purge control solenoid valve, and remove the purge control solenoid valve.



8. Remove the purge control solenoid valve bracket.



9. Remove the vacuum hose from the purge control solenoid valve.

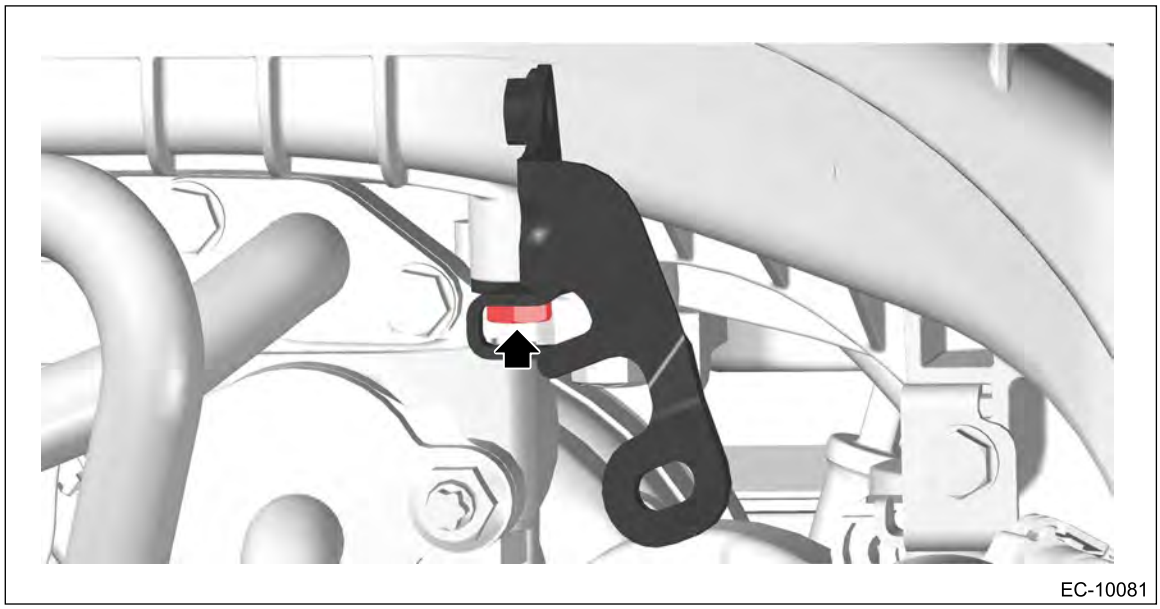
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Purge Control Solenoid Valve

INSTALLATION

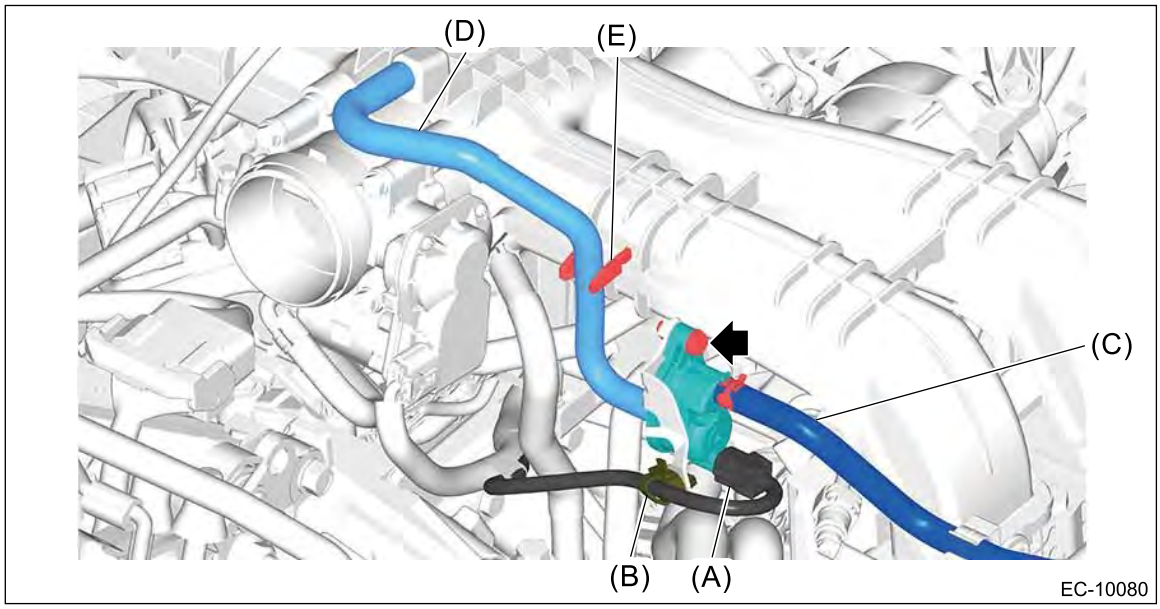
1. Connect the vacuum hose to the purge control solenoid valve.
2. Install the purge control solenoid valve bracket.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)


EC-10081

3. Install the purge control solenoid valve.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
4. Connect the vacuum hose (D) to the intake manifold assembly, and install the vacuum hose (D) to the clip (E).
5. Connect the purge hose (C).
6. Connect the clip (B) which secures the engine wiring harness to the purge control solenoid valve bracket, and connect the connector (A).



EC-10080

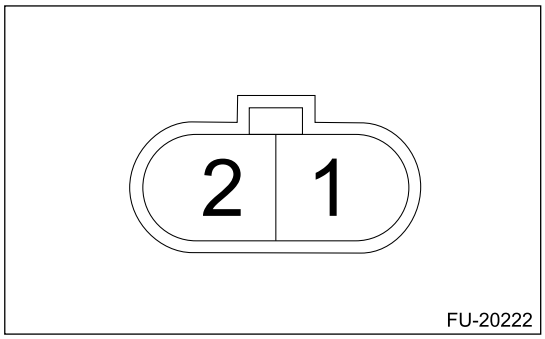
7. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Purge Control Solenoid Valve

INSPECTION

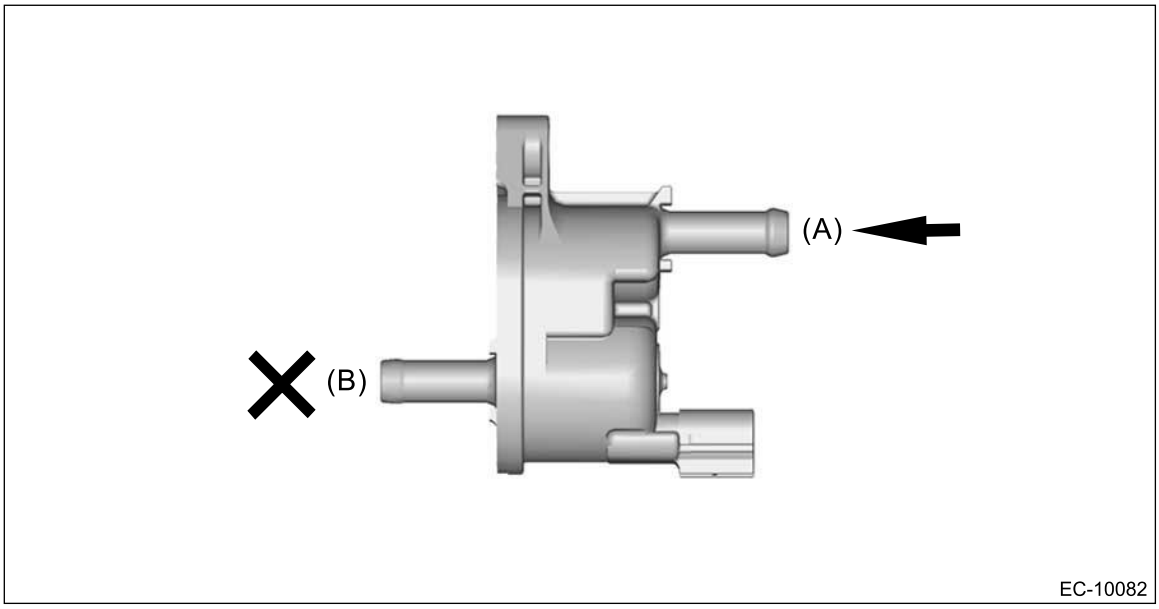
1. PURGE CONTROL SOLENOID VALVE

1. Check that the purge control solenoid valve has no deformation, cracks or other damages.
2. Measure the resistance between the purge control solenoid valve terminals.

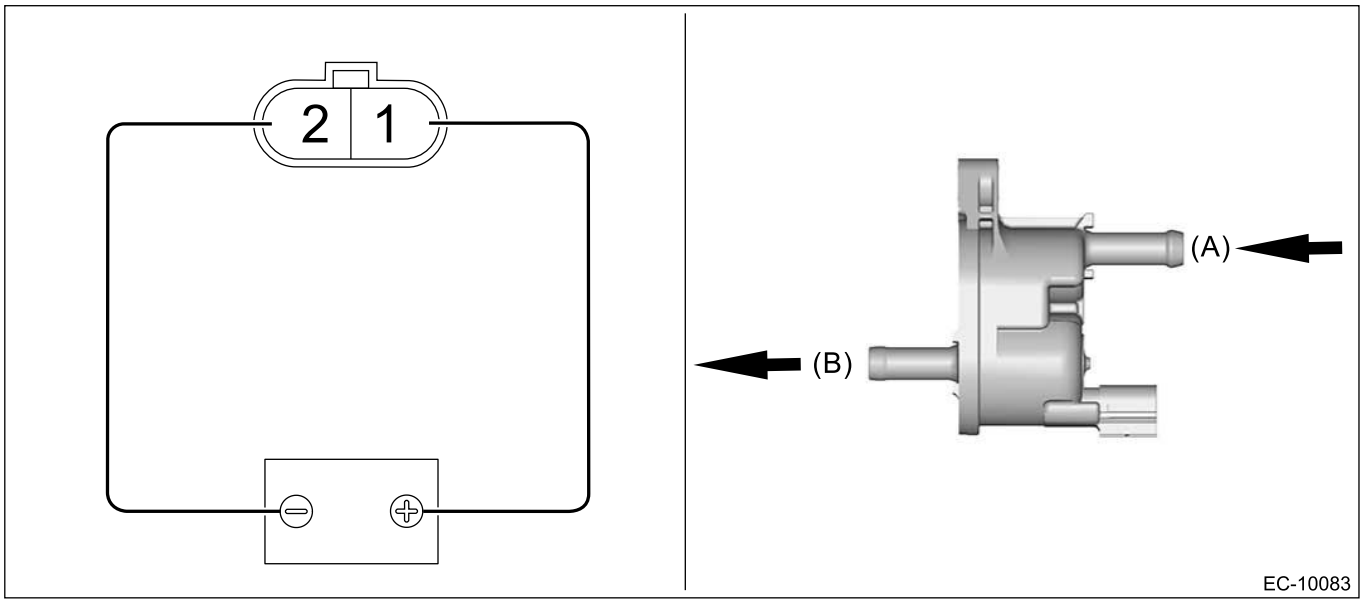


Terminal No.	Standard
1 and 2	24.5±1.5 Ω (when 20°C (68°F))

3. Check that air does not come out from (B) when air is blown into (A).



4. Connect the battery positive terminal to the terminal No. 1 and the battery negative terminal to the terminal No. 2. Check that air is discharged from (B), when supplying air to (A).

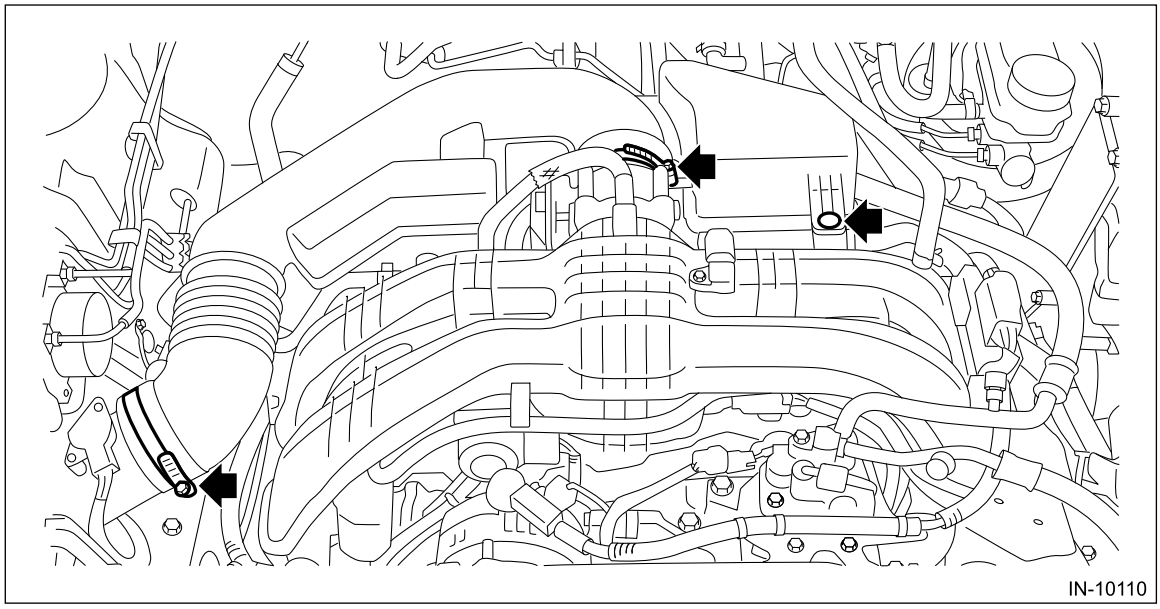


2. OTHER INSPECTIONS

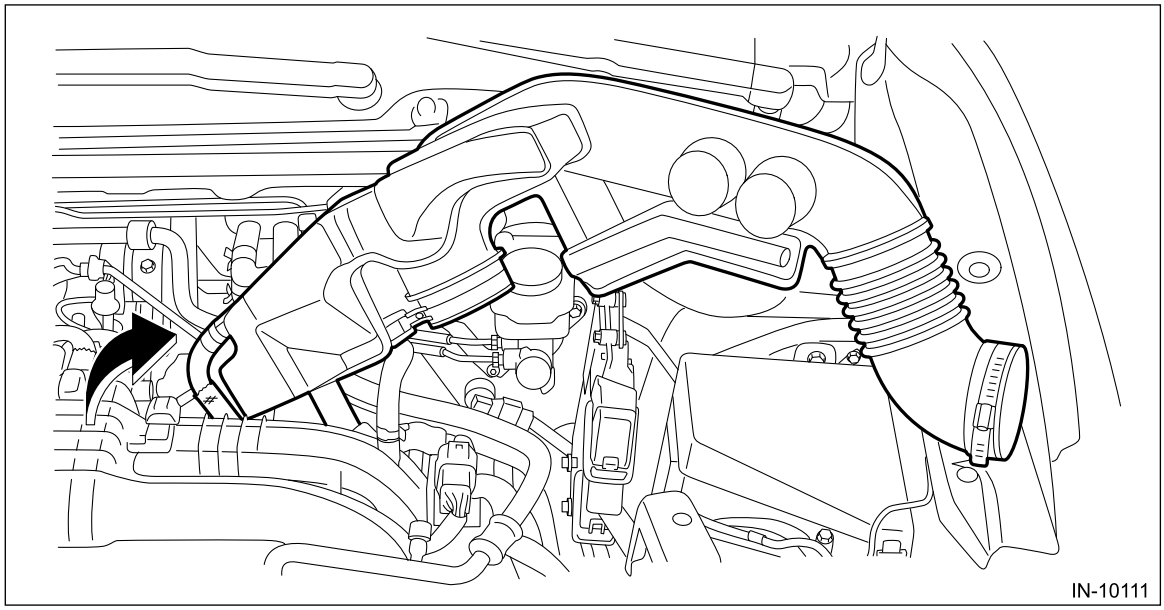
Check the vacuum hose for cracks, damage or looseness.

REMOVAL

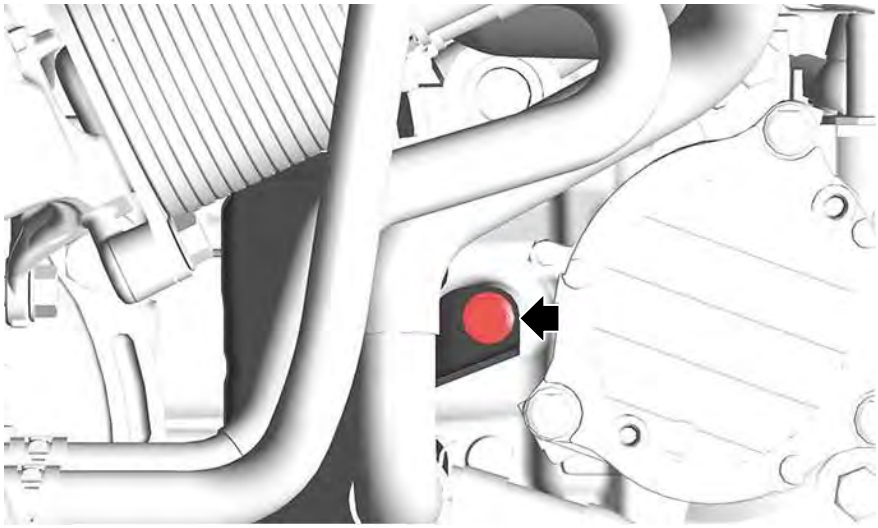
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



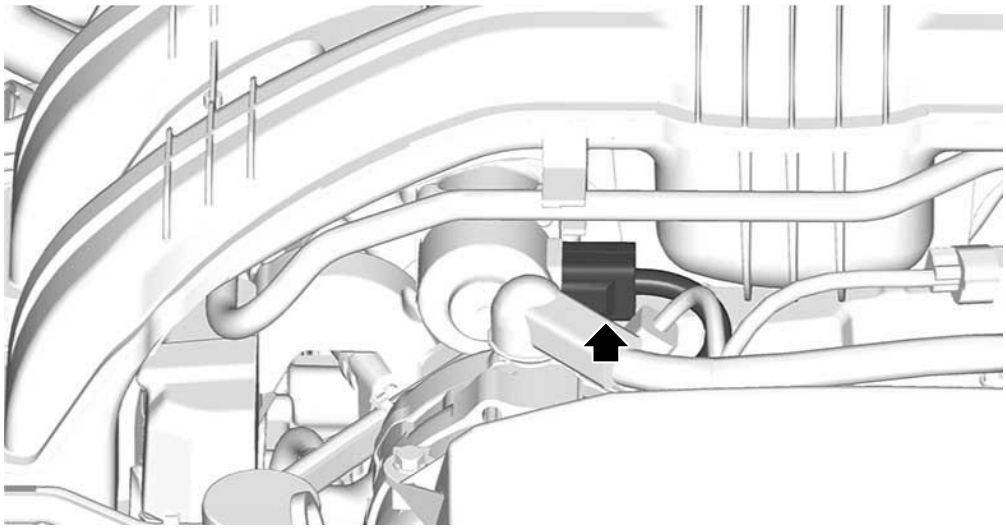
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



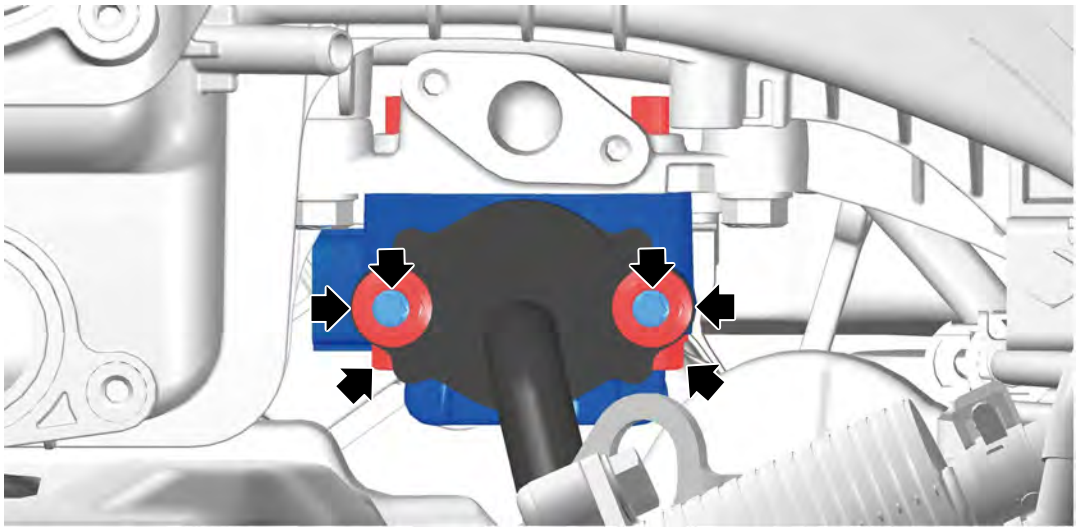
4. Loosen the bolts holding the EGR cooler to the cylinder head RH.


EC-10088

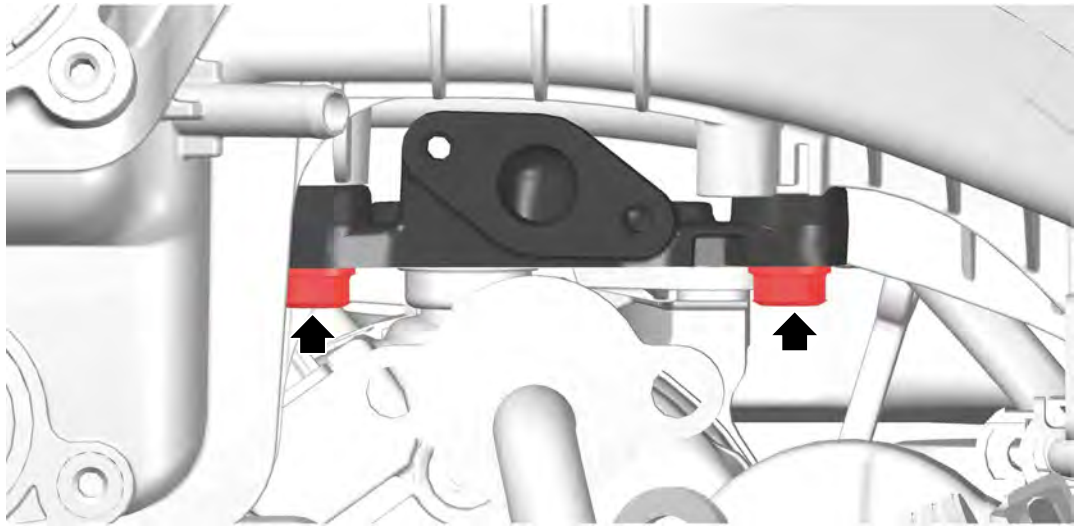
5. Remove the EGR pipe. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>EGR Pipe>REMOVAL.
6. Remove the PCV hose A. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Hose>REMOVAL.
7. Disconnect the connector.


EC-10087

8. Remove the nuts securing the EGR cooler, and remove the stud bolts using TORX®E8.
9. Remove the EGR control valve from the EGR pipe adapter.


EC-10086

10. Remove the EGR pipe adapter from the intake manifold assembly.


EC-10098

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Control Valve

INSTALLATION

1. Install the EGR pipe adapter to the intake manifold assembly.
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)

2. Set a new gasket and install the EGR control valve to the EGR pipe adapter.
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)

3. Set a new gasket, and install the stud bolts using TORX®E8.
Tightening torque:
5 N·m (0.5 kgf-m, 3.7 ft-lb)

4. Install the nuts securing the EGR cooler.
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)

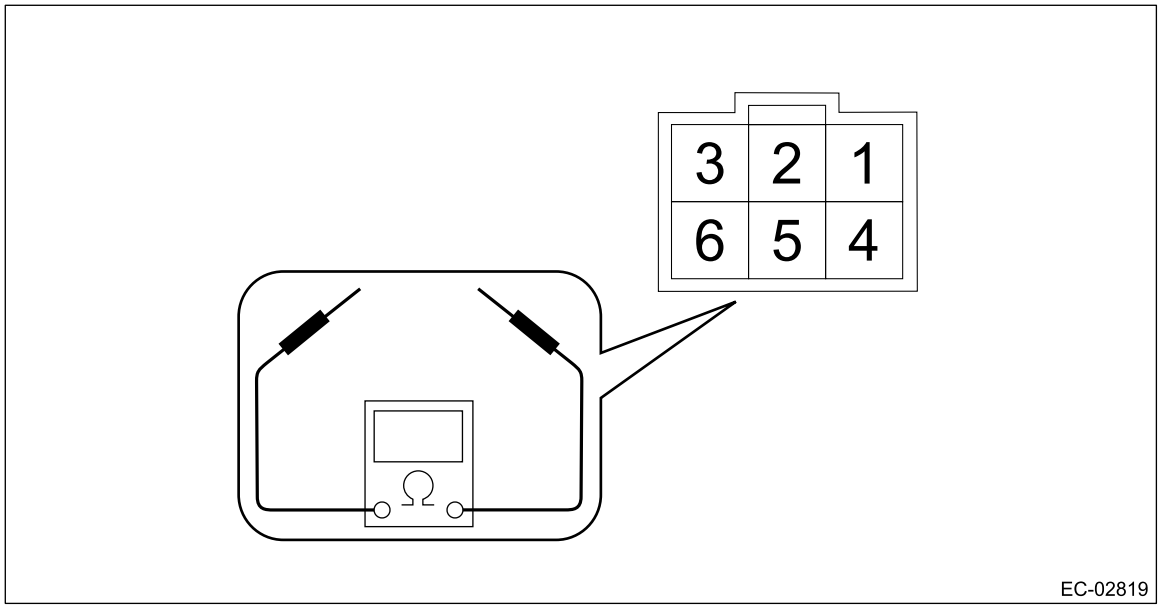
5. Connect the connector.

6. Install the PCV hose A. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Hose>INSTALLATION.
7. Install the EGR pipe. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>EGR Pipe>INSTALLATION.
8. Tighten the bolts holding the EGR cooler to the cylinder head RH.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
9. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Control Valve

INSPECTION

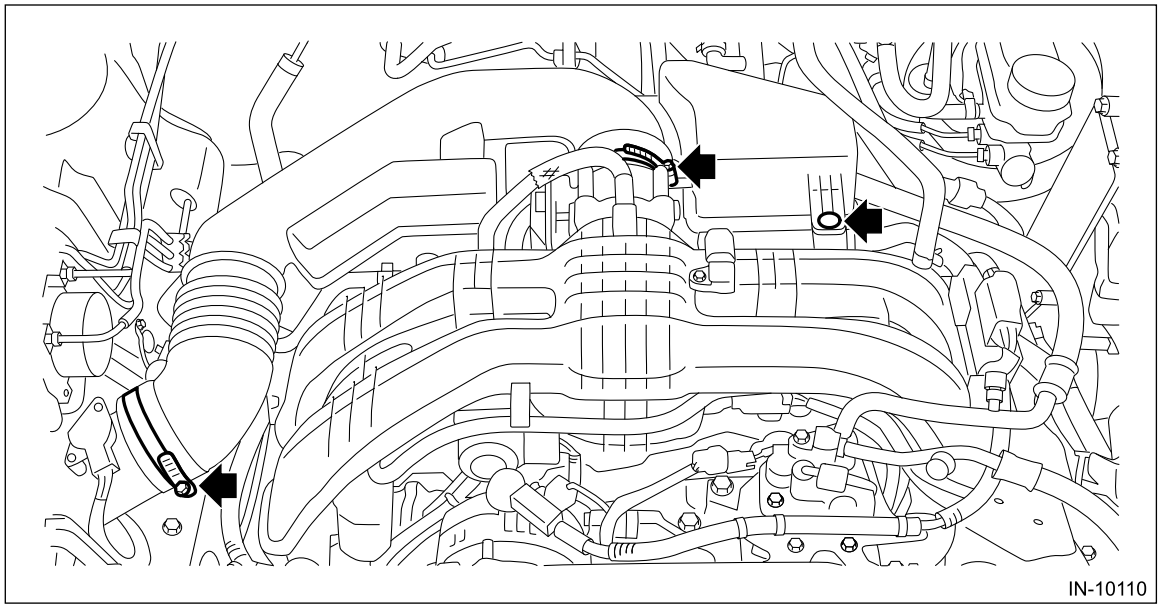
1. Check that the EGR control valve has no deformation, cracks or other damages.
2. Measure the resistance between EGR control valve terminals.



Terminal No.	Standard
2 and 1	15±2 Ω
2 and 3	15±2 Ω
5 and 4	15±2 Ω
5 and 6	15±2 Ω

REMOVAL

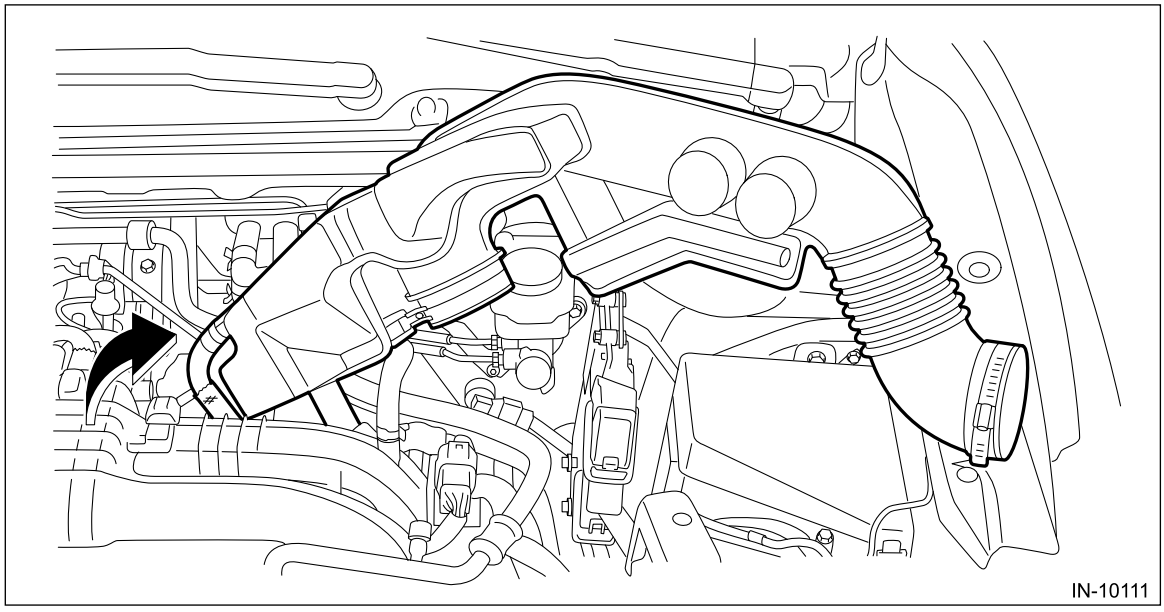
1. Remove the clip from the air intake boot, and loosen the clamp.



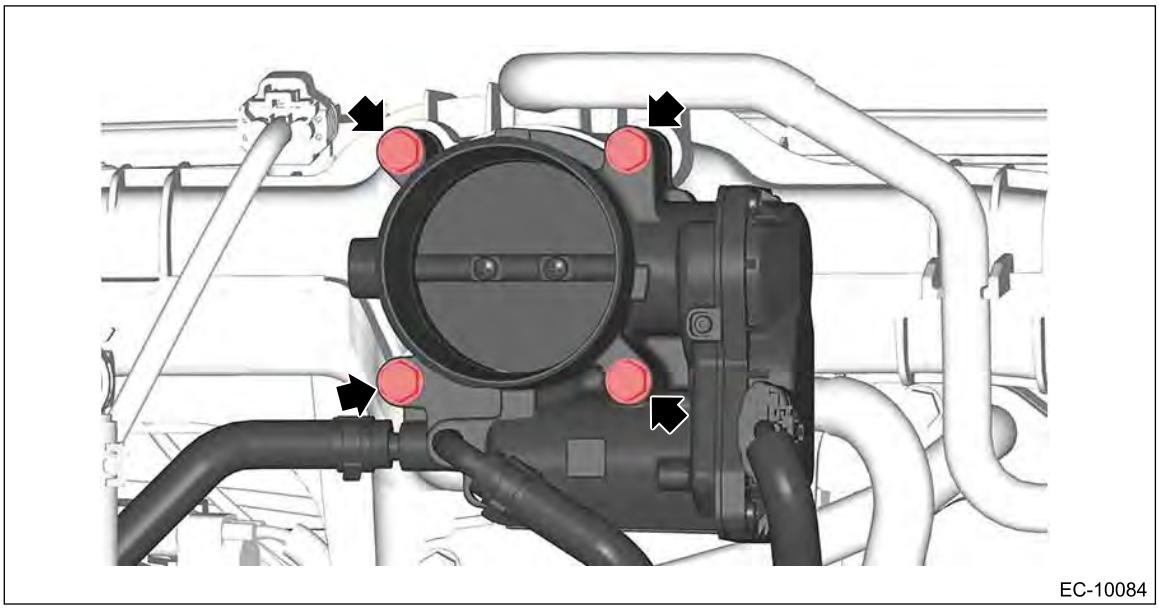
2. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

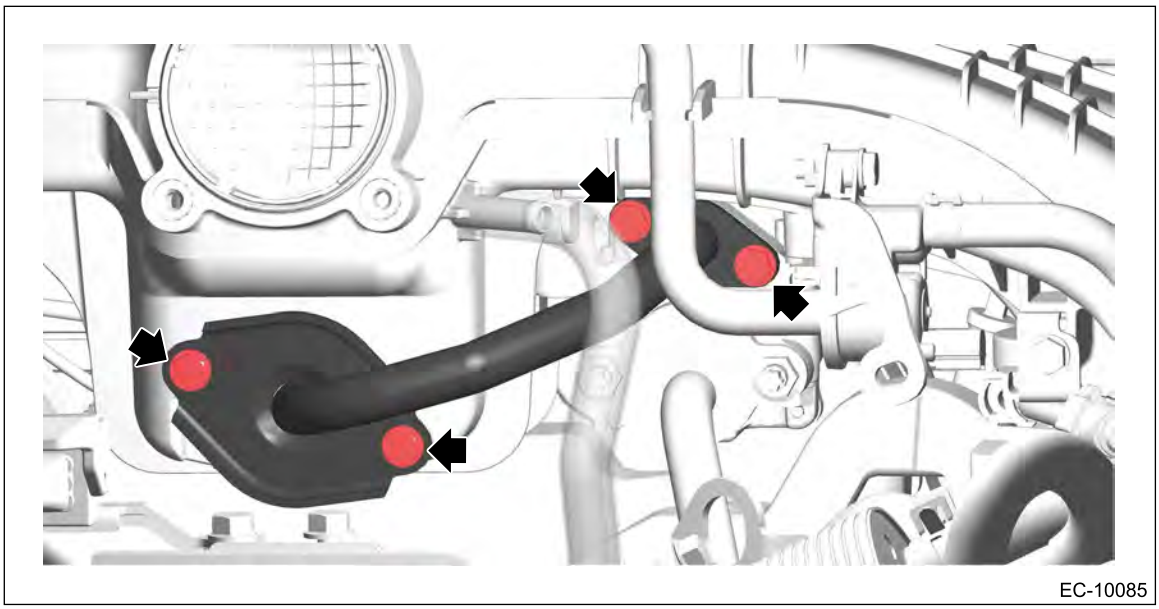
Be careful not to pull out the PCV hose.



3. Remove the bolts securing the throttle body to the intake manifold assembly, and tilt the throttle body to the rear side of vehicle.


EC-10084

4. Remove the bolts securing the EGR pipe to the intake manifold assembly and EGR control valve, and remove the EGR pipe.


EC-10085

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Pipe

INSTALLATION

1. Use a new gasket and install the EGR pipe to the intake manifold assembly and EGR control valve.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Install the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSTALLATION.
3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

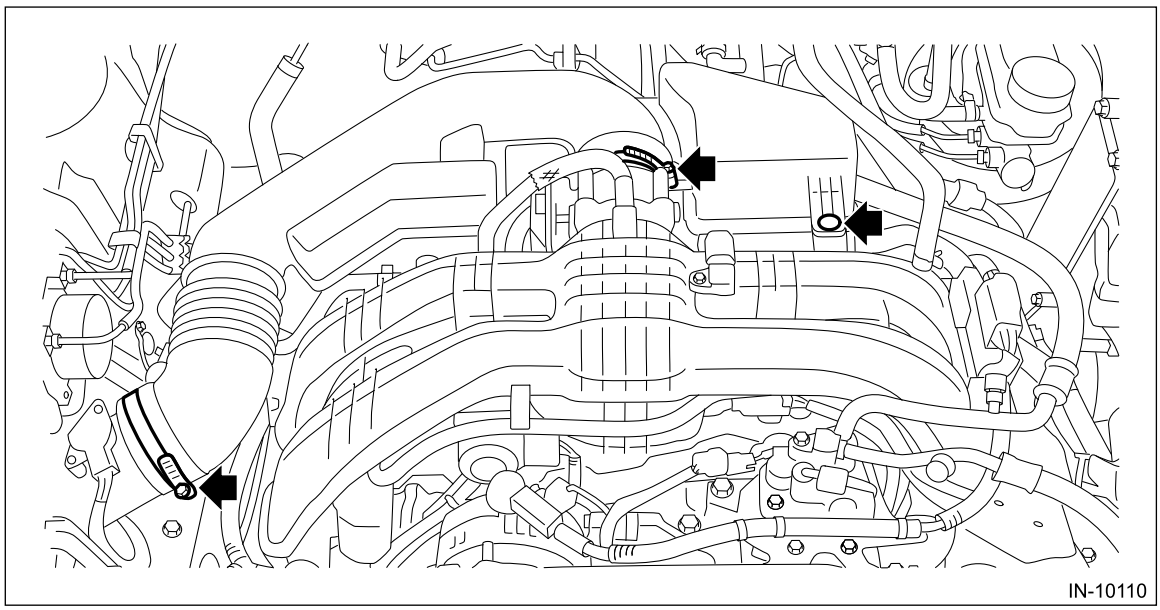
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Pipe

INSPECTION

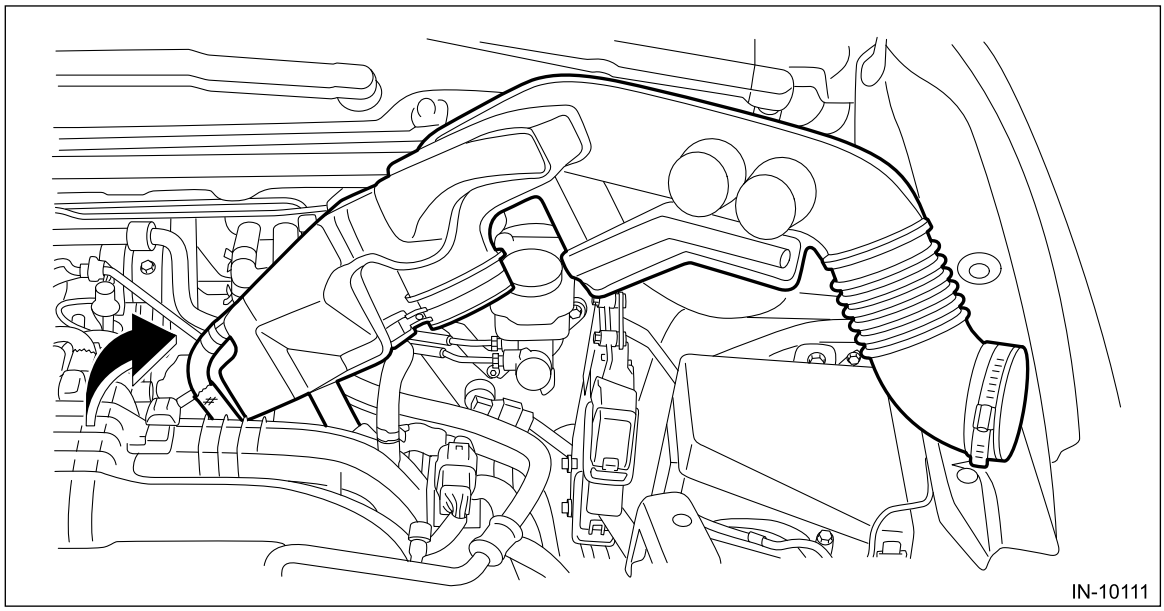
Check that the EGR pipe has no deformation, cracks or other damages.

REMOVAL

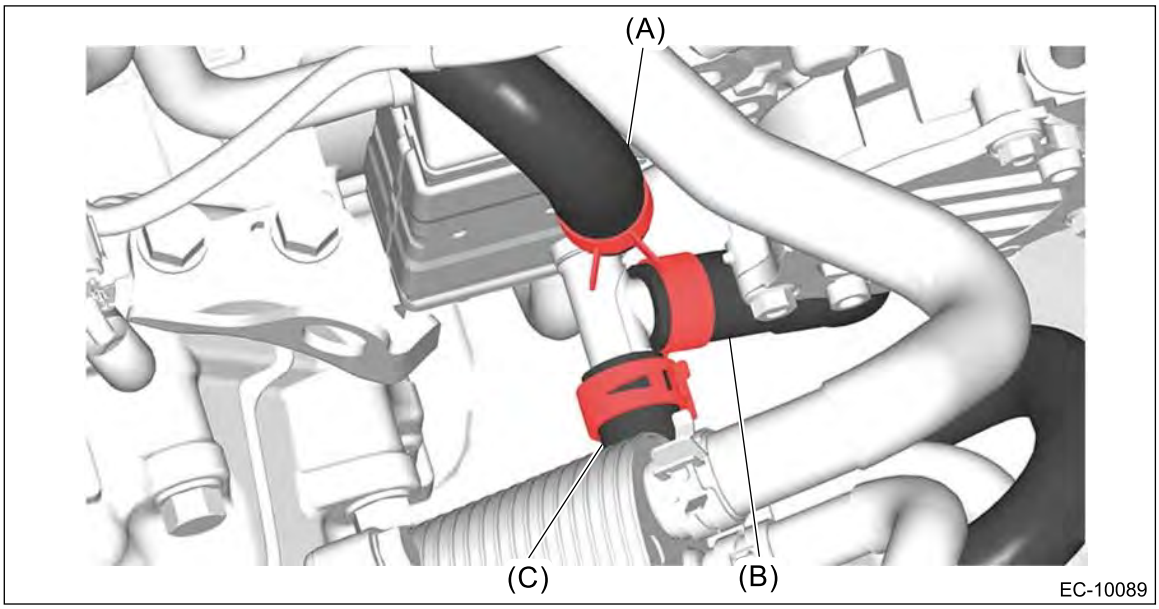
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the clip from the air intake boot, and loosen the clamp.



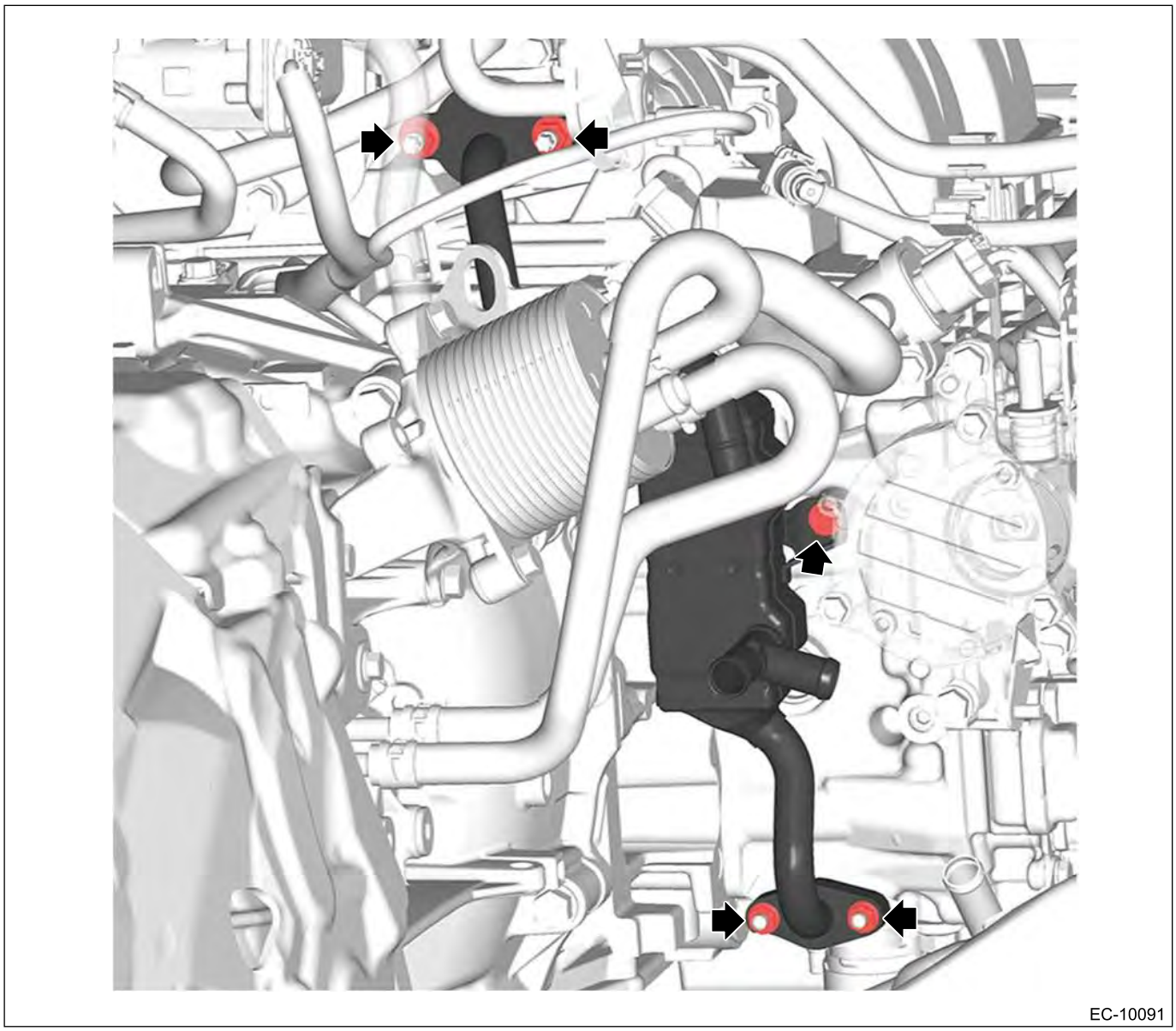
4. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



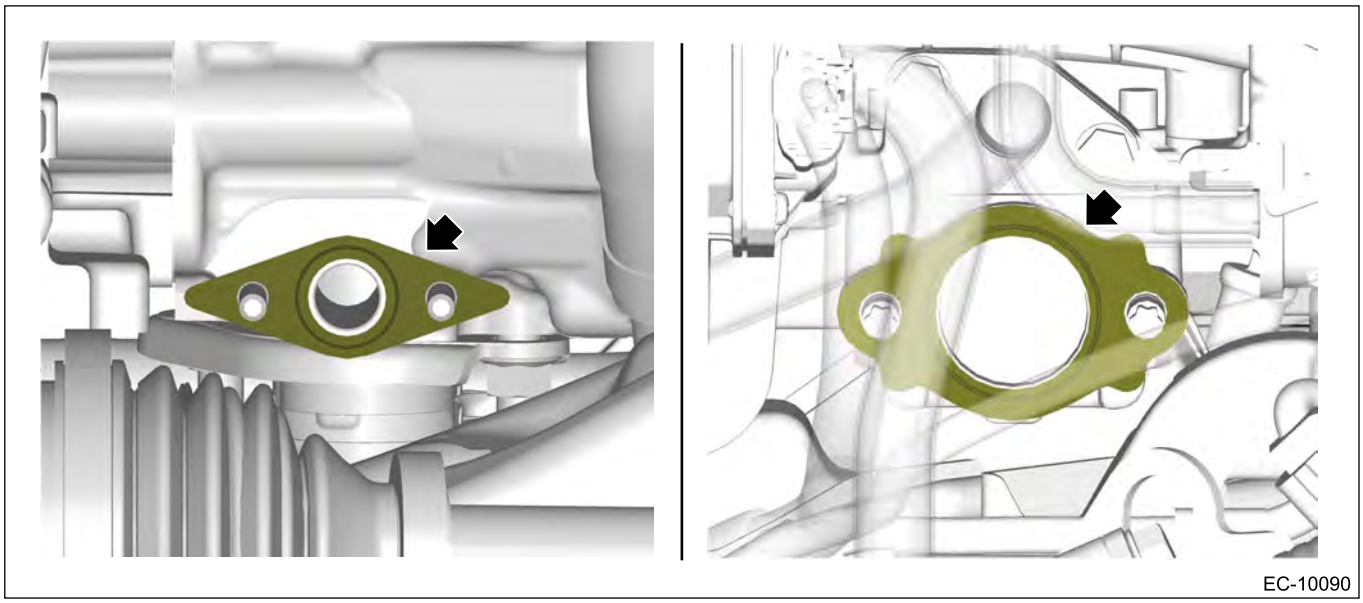
5. Disconnect the water hose (A), water hose (B) and the water hose (C).
   Note:
   Disconnecting the water hose (C) is only for the CVT model.



6. Remove the nuts and bolts which secure the EGR cooler to the EGR control valve and cylinder head RH, and remove the EGR cooler.



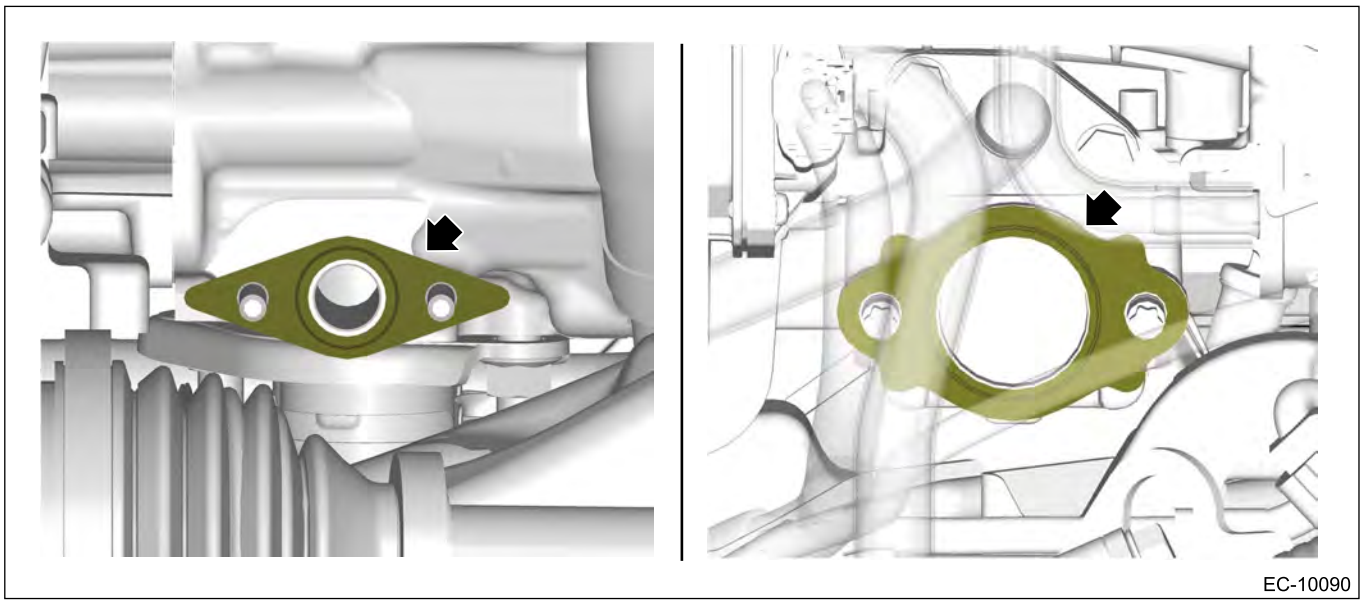
7. Remove the gasket from the stud bolt.



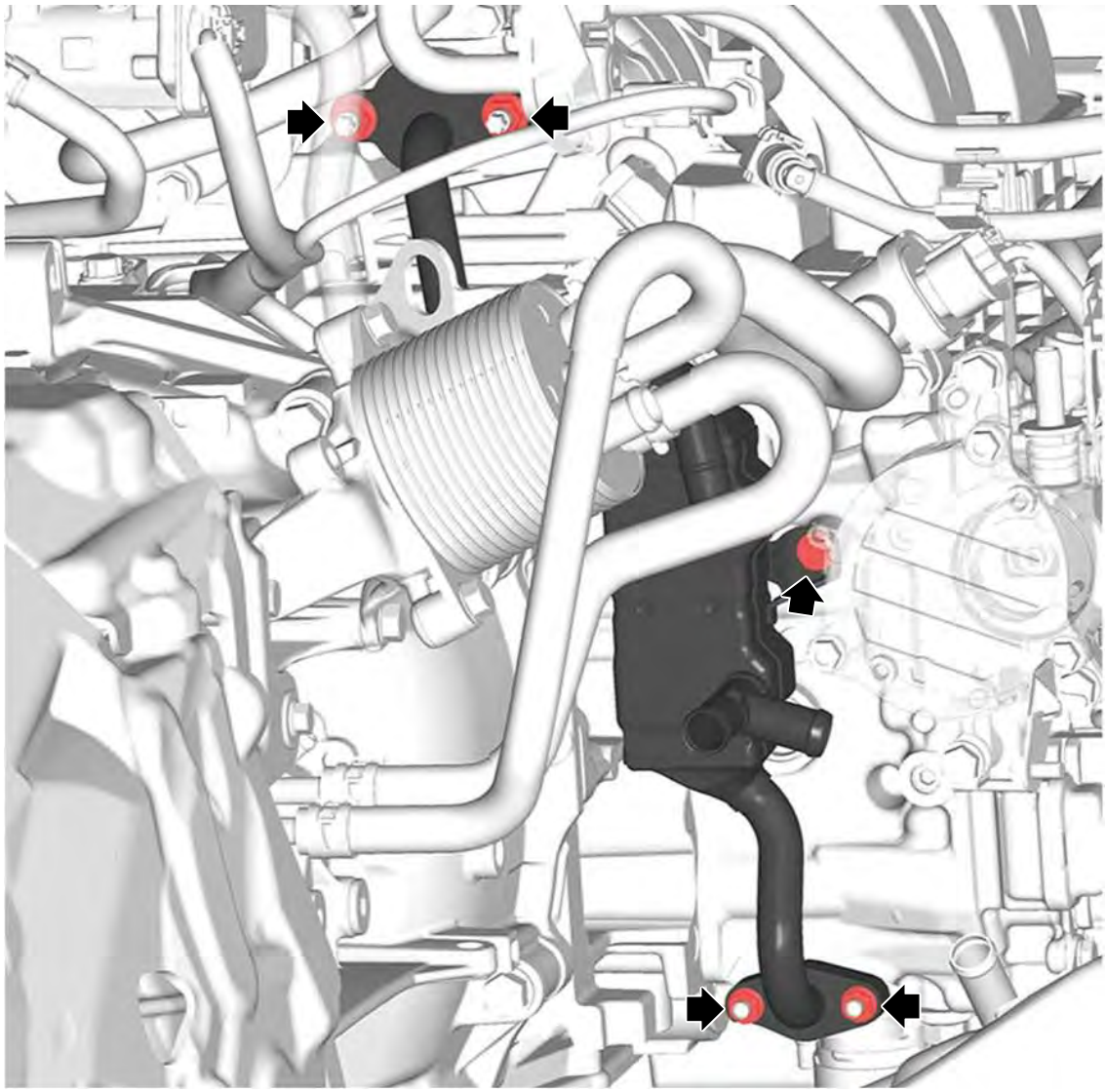
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Cooler

INSTALLATION

1. Set new gasket to the stud bolt.



2. Set the EGR cooler, and temporarily tighten the nuts and bolts securing the EGR cooler to the EGR control valve and cylinder head RH.



EC-10091

3. Tighten the nuts and bolts securing the EGR cooler in the numerical order shown in the figure.

(1) Tighten the nuts securing the EGR cooler to the cylinder head RH.

Note:

Tighten in the numerical order as shown in the figure left ➡ right ➡ left.

Tightening torque:

T1: 9 N·m (0.9 kgf-m, 6.6 ft-lb)

(2) Tighten the nuts securing the EGR cooler to the EGR control valve.

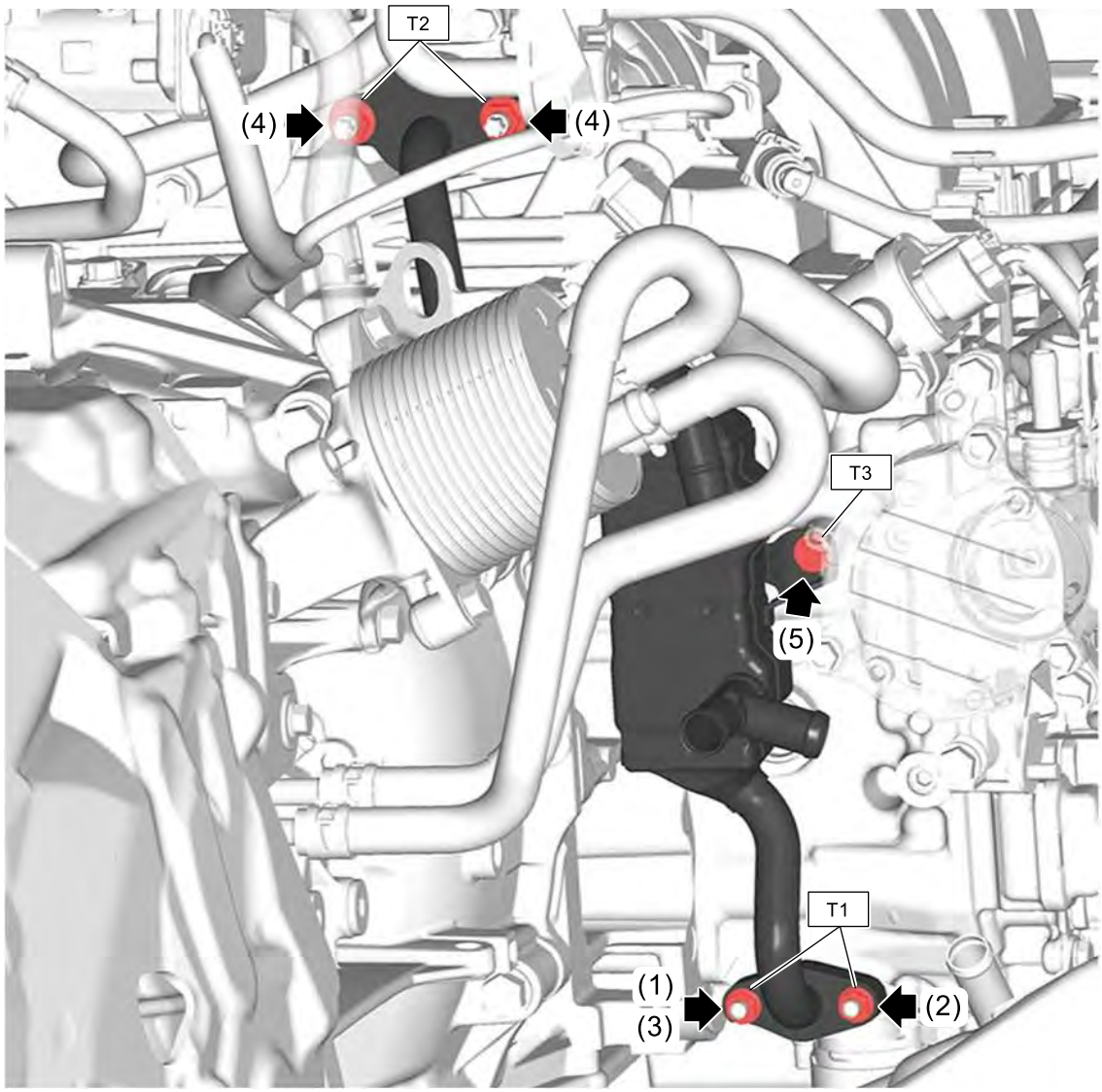
Tightening torque:

T2: 19 N·m (1.9 kgf-m, 14.0 ft-lb)

(3) Tighten the bolts holding the EGR cooler to the cylinder head RH.

Tightening torque:

T3: 6.4N·m (0.7 kgf-m, 4.7 ft-lb)

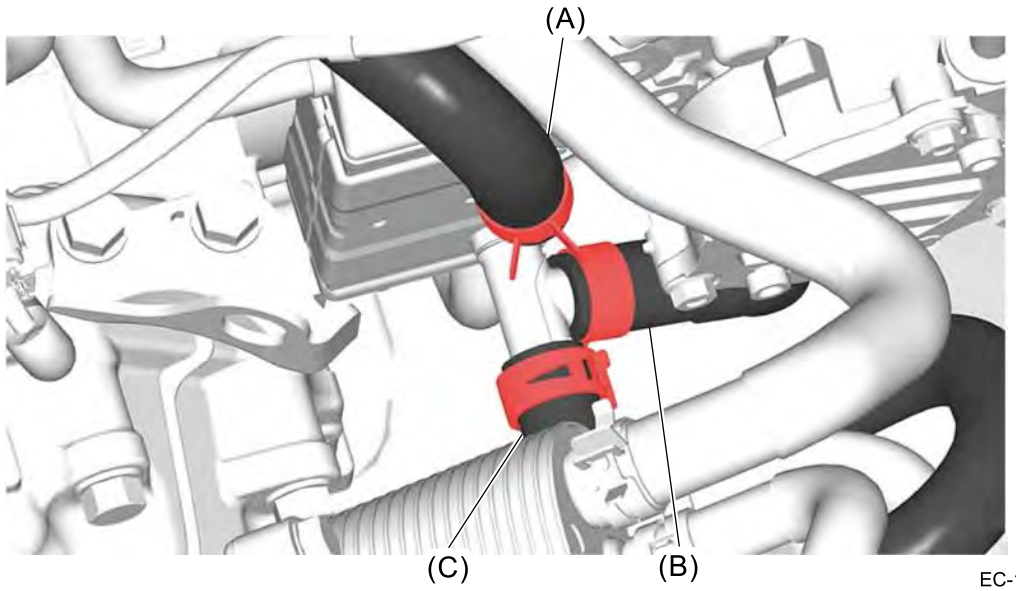


EC-10092

4. Connect the water hose (A), water hose (B) and the water hose (C).

Note:

Connecting the water hose (C) is only for the CVT model.



EC-10089

5. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > EGR Cooler

INSPECTION

1. Check that the EGR cooler has no deformation, cracks or other damages.
2. Check that the hose has no cracks, damage or loose part.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Fuel Level Sensor

REMOVAL

For removal procedures, refer to the "FU(H4DO)" section. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>REMOVAL.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Fuel Level Sensor

INSTALLATION

For installation procedures, refer to the "FU(H4DO)" section. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Fuel Level Sensor

INSPECTION

For inspection procedures, refer to the "FU(H4DO)" section. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>INSPECTION.

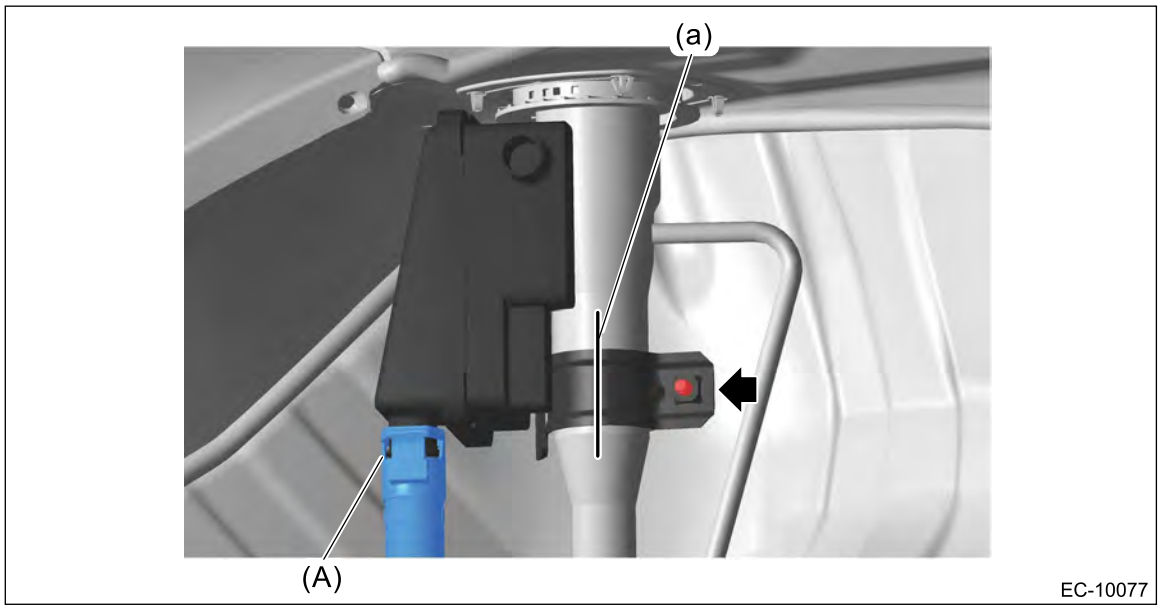
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Drain Filter

REMOVAL

1. Remove the rear wheel RH. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Lift up the vehicle.
3. Remove the rear mud guard RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>REMOVAL.
4. Disconnect the drain tube (A).
5. Remove the bolts which hold the drain filter bracket, and remove the drain filter.

Note:

Using a marker pen, make alignment marks (a) on the fuel filler pipe and the drain filter bracket.



EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Drain Filter

INSTALLATION

1. Install the bolts which hold the drain filter bracket to install the drain filter.

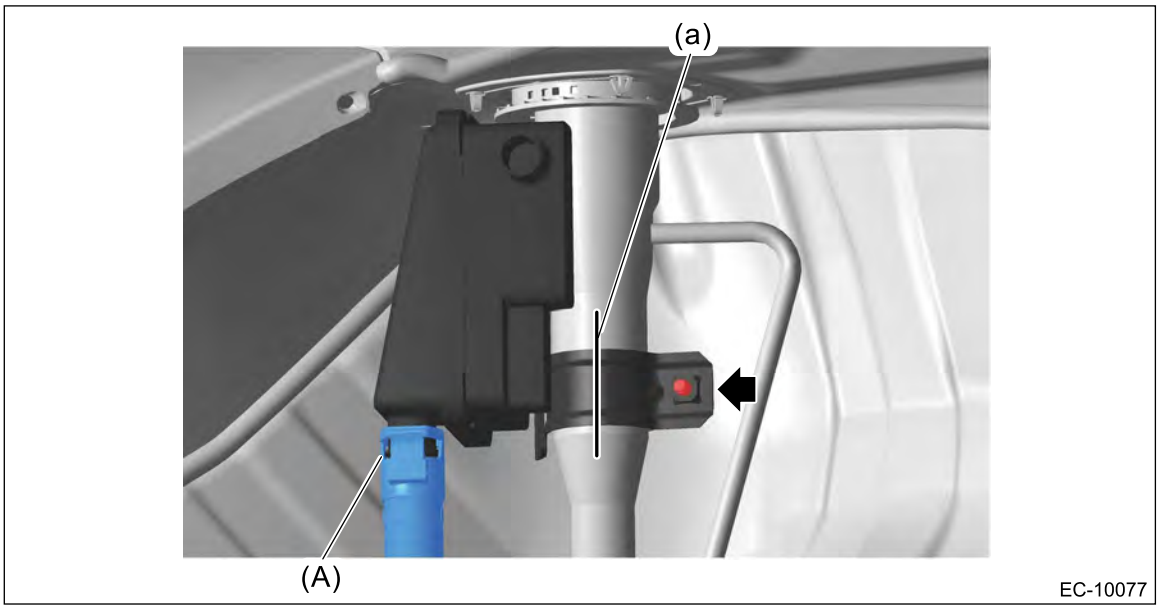
Note:

Install the drain filter bracket to the fuel filler pipe by aligning the alignment mark (a).

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

2. Connect the drain tube (A). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE E).



3. Install the rear mud guard RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>INSTALLATION.
4. Lower the vehicle.
5. Install the rear wheel RH. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Drain Filter

INSPECTION

1. Check that the drain filter and drain tube have no deformation, cracks or other damages.
2. Check that no foreign substances are clogged in the drain filter.

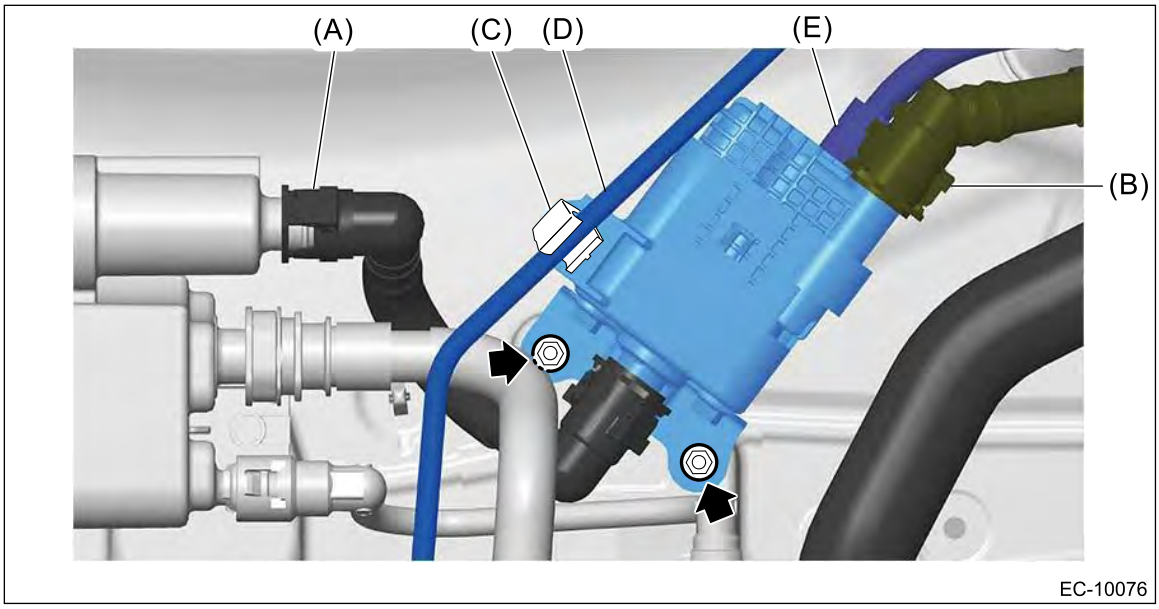
EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Leak Check Valve Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>REMOVAL.

   Note:

   This operation procedure would be possible by simply lowering the rear differential to the position that the work is possible. In that case, it is not necessary to pull out the drive shaft from the rear differential.
3. Disconnect drain tube A (A) and drain tube B (B). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE E).
4. Remove the circulate tube (D) from the clip (C).
5. Disconnect the connector (E).
6. Remove the leak check valve assembly.



7. Disconnect the drain tube A from the leak check valve assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE E).
8. Remove the leak check valve assembly bracket.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Leak Check Valve Assembly

INSTALLATION

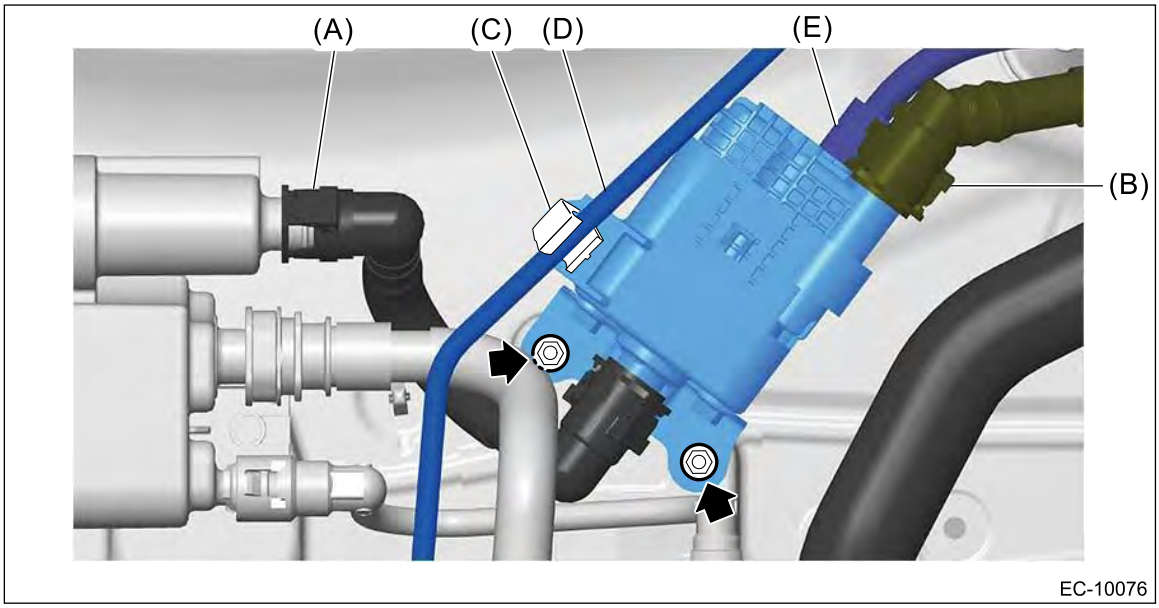
1. Install the leak check valve assembly bracket.

   Tightening torque:

   8 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Connect the drain tube A to the leak check valve assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE E).
3. Install the leak check valve assembly.

Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)

4. Connect the connector (E).
5. Install the circulate tube (D) to the clip (C).
6. Connect drain tube A (A) and drain tube B (B). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE E).



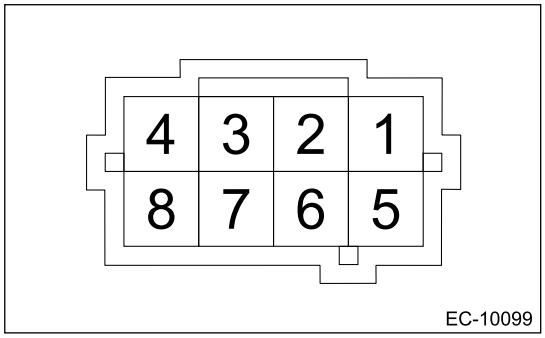
7. Install the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > Leak Check Valve Assembly

INSPECTION

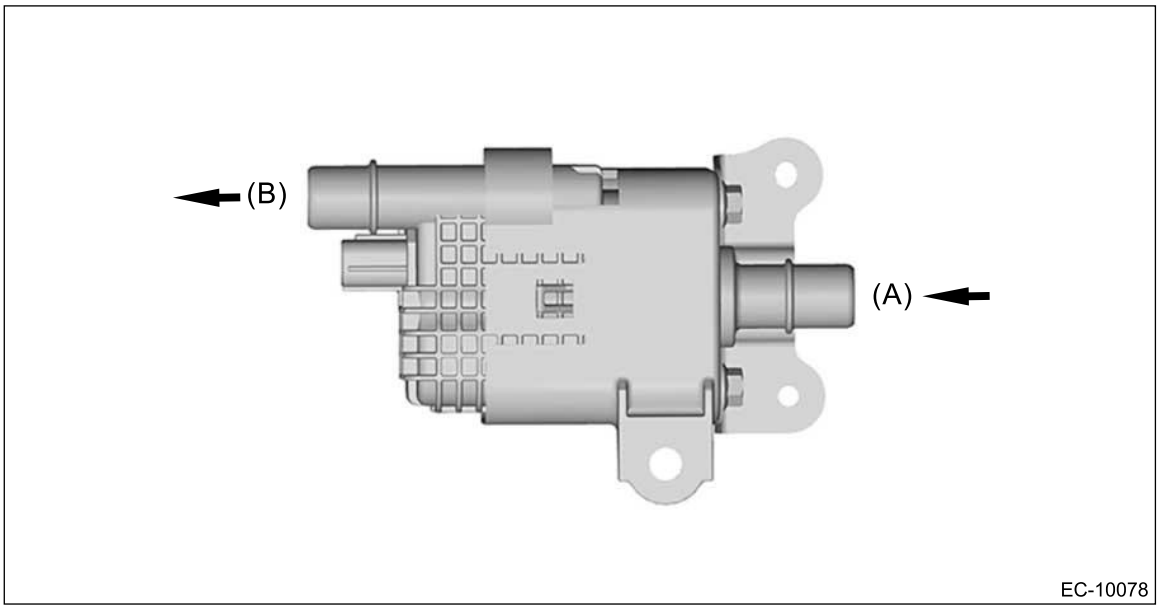
1. CHECK SWITCHING VALVE

1. Check the resistance between switching valve terminals.



Terminal No.	Standard
1 and 5	27^{+3}_{-2} Ω (when 20°C (68°F))
	31±4 Ω (60°C (when 140°F))

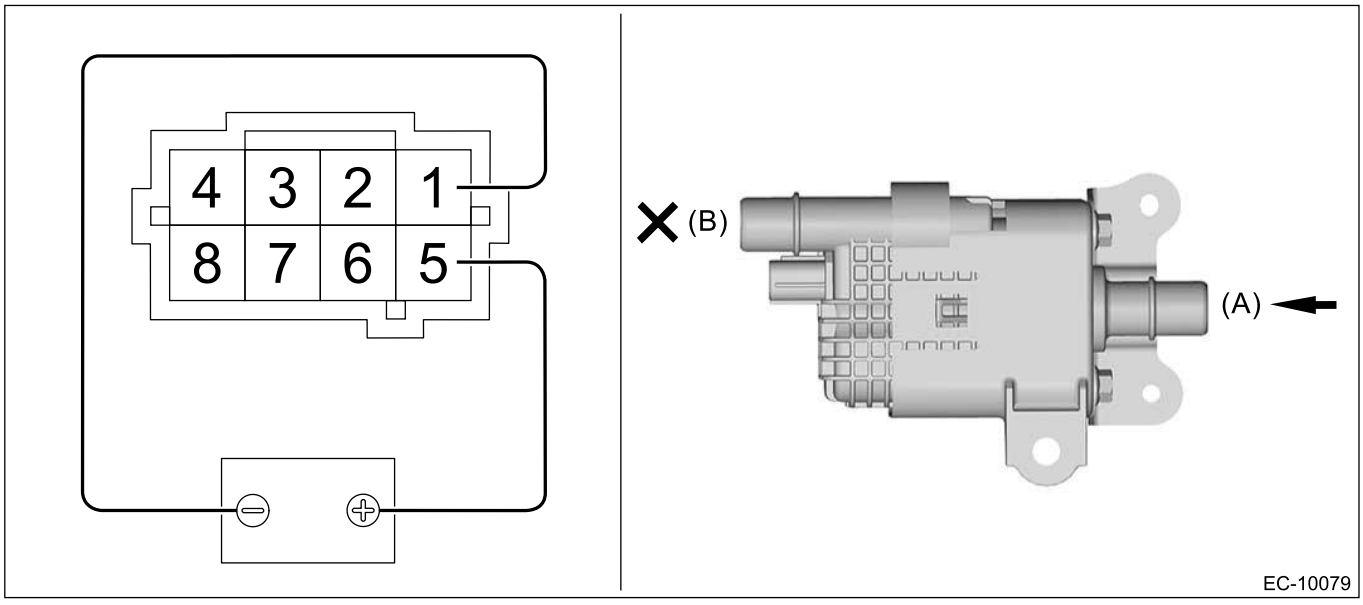
2. Check that air is discharged from (B) when air is blown into (A).



3. Connect the battery positive terminal to the terminal No. 5 and the battery negative terminal to the terminal No. 1. Check that air is not discharged from (B), when supplying air to (A).

Note:

The purpose of this inspection is to check the valve movement, and it would be success if a large change of flow can be checked resulting from valve opening/closing. Therefore, it does not indicate a malfunction if a small amount of flow from (B) is detected when the valve is opened.

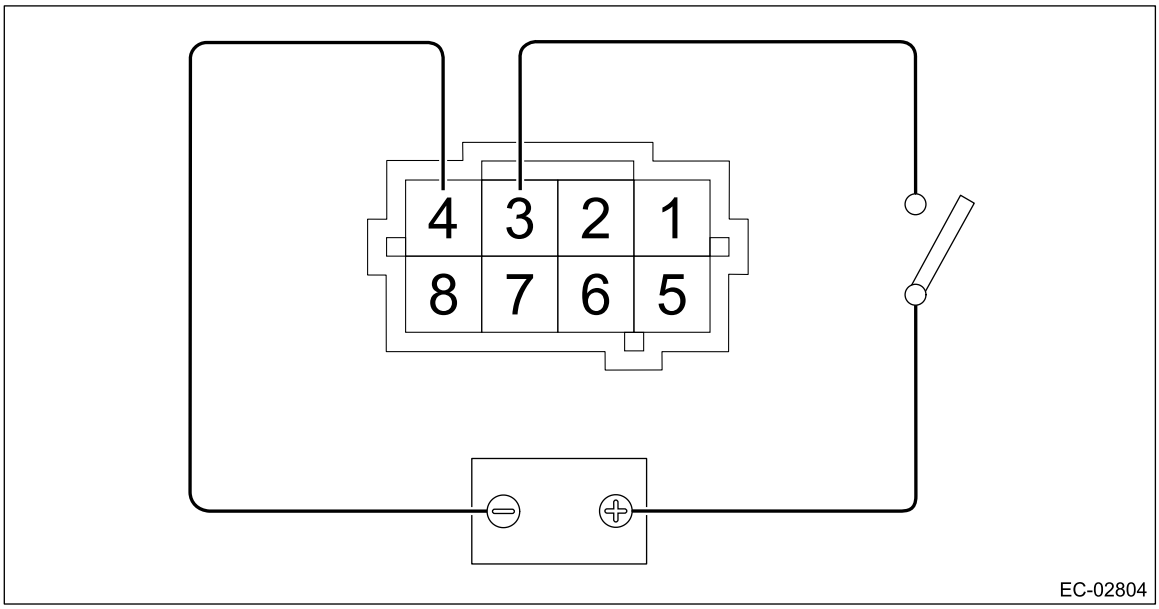


2. CHECK VACUUM PUMP

1. Connect the battery positive terminal to terminal No. 3 and the battery ground terminal to terminal No. 4, and inspect the vacuum pump operation.

Caution:

Do not operate the vacuum pump for 5 minutes or more.

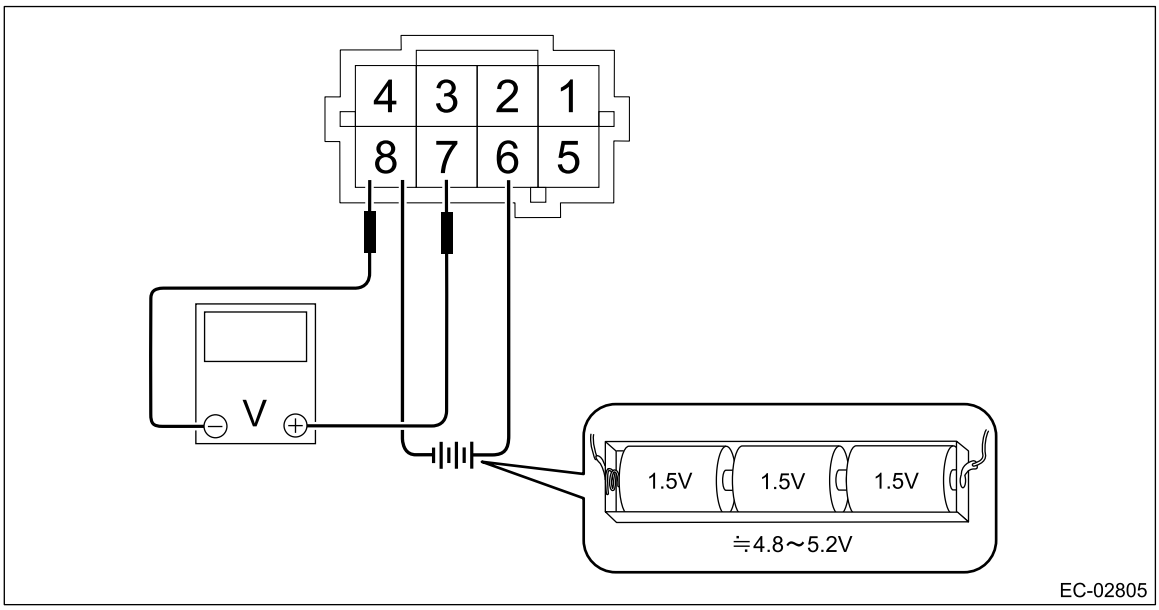


3. CHECK PRESSURE SENSOR

1. Use a new dry-cell battery, and connect dry-cell battery positive terminal to terminal No. 6 and dry-cell battery ground terminal to terminal No. 8, circuit tester positive side to terminal No. 7 and the circuit tester ground side to terminal No. 8.

Note:

- **Using a circuit tester, check that the initial voltage of each dry-cell battery is 1.6 V or more. And also check that the voltage of three batteries in series is between 4.8 — 5.2 V.**
- **For power supply, 5 V DC constant voltage power source can also be used.**



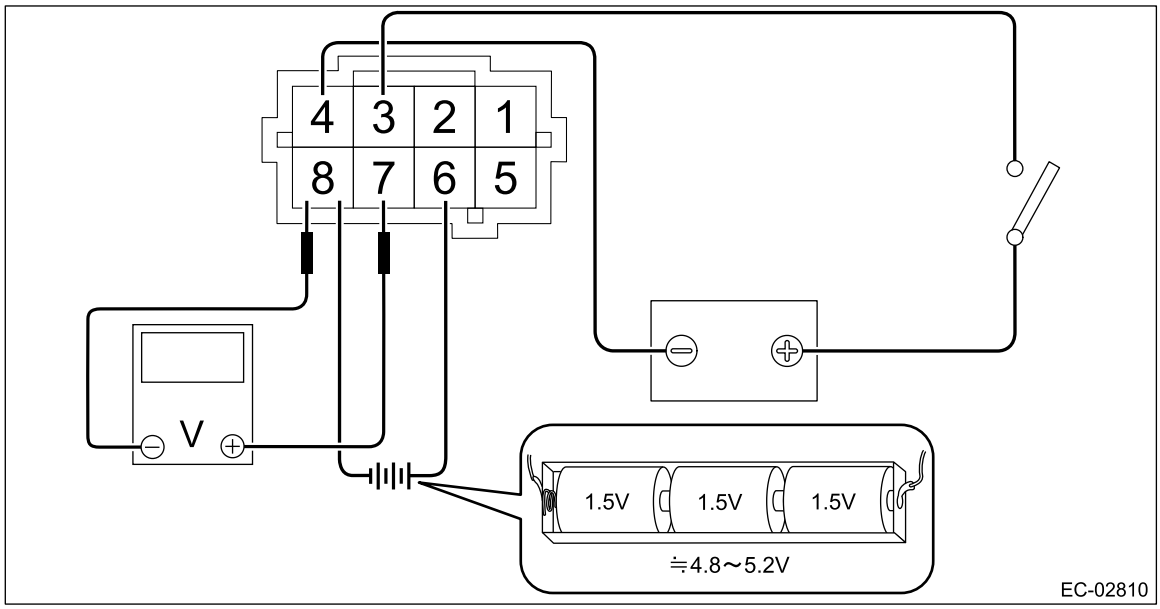
2. Check the voltage at a normal atmospheric pressure.

Note:

The atmospheric pressure at higher altitude is lower than normal. Therefore, the voltage is lower than the standard value.

Terminal No.	Standard
7 (+) and 8 (−)	Approx. 3.5 V (when 25°C (77°F))

3. Connect the battery positive terminal to terminal No. 3 and the battery ground terminal to terminal No. 4, and check that there is a voltage drop from the voltage measured in step 2) when the vacuum pump is operated.



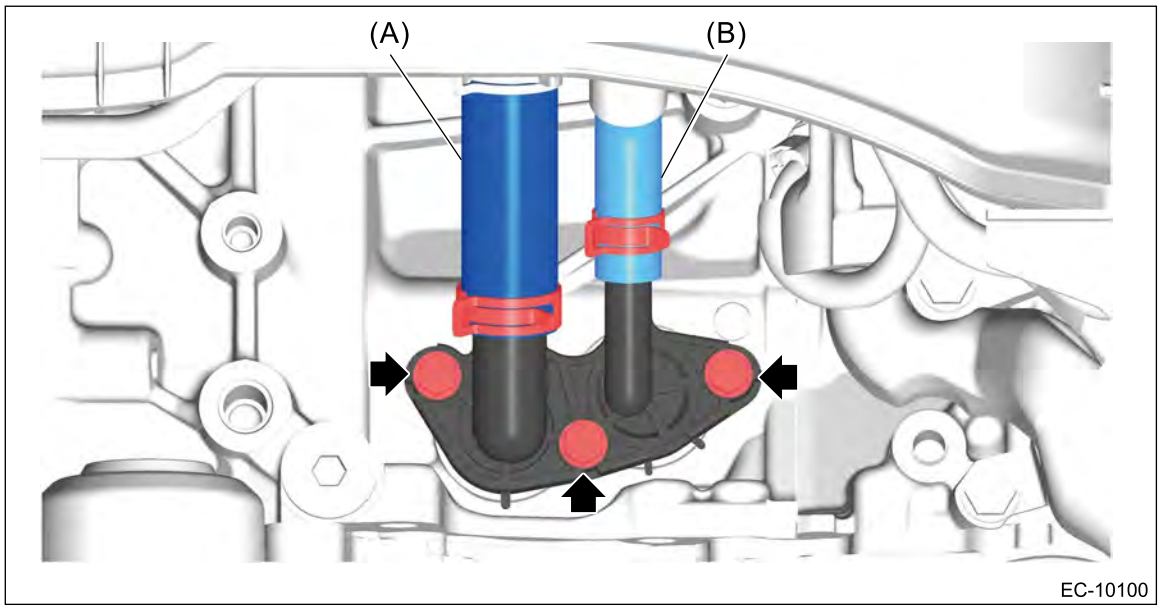
4. OTHER INSPECTIONS

Check that the leak check valve assembly has no deformation, cracks or other damages.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Connector

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the A/C compressor. Ref. to AIR CONDITIONER>Compressor>REMOVAL.
   Note:
   This operation procedure would be possible by simply moving aside the A/C compressor to the position that it does not interfere with the work. In that case, it is not necessary to disconnect the hose - pressure suction and the hose - pressure discharge from the A/C compressor.
4. Disconnect the water hose (A) and PCV hose (B) from the PCV connector, and remove the PCV connector.



EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Connector

INSTALLATION

1. By using new O-rings, install the PCV connector, and connect water hose and PCV hose to the PCV connector.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Install the A/C compressor. Ref. to AIR CONDITIONER>Compressor>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Connector

INSPECTION

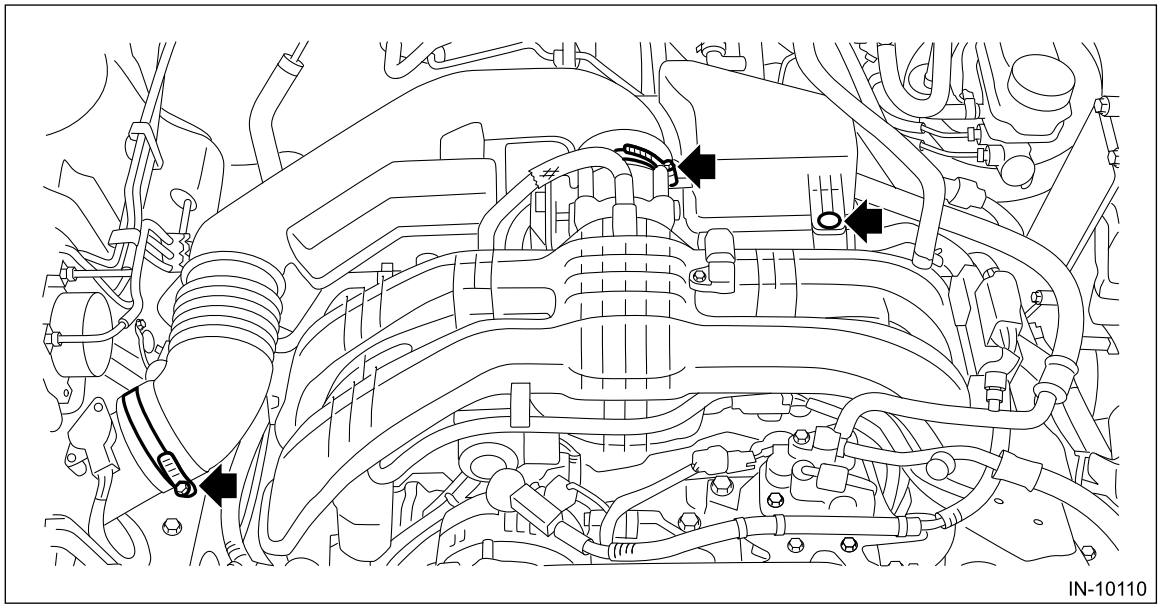
Check that the PCV connector has no deformation, cracks or other damages.

REMOVAL

Caution:

Do not remove except when the PCV hose is broken.

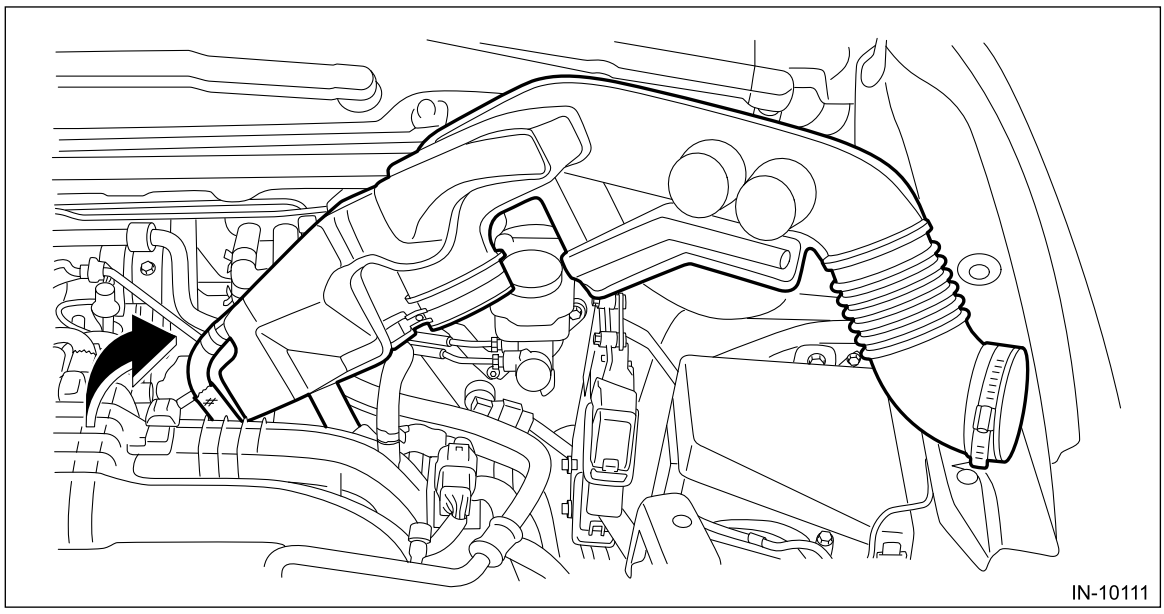
1. Remove the clip from the air intake boot, and loosen the clamp.



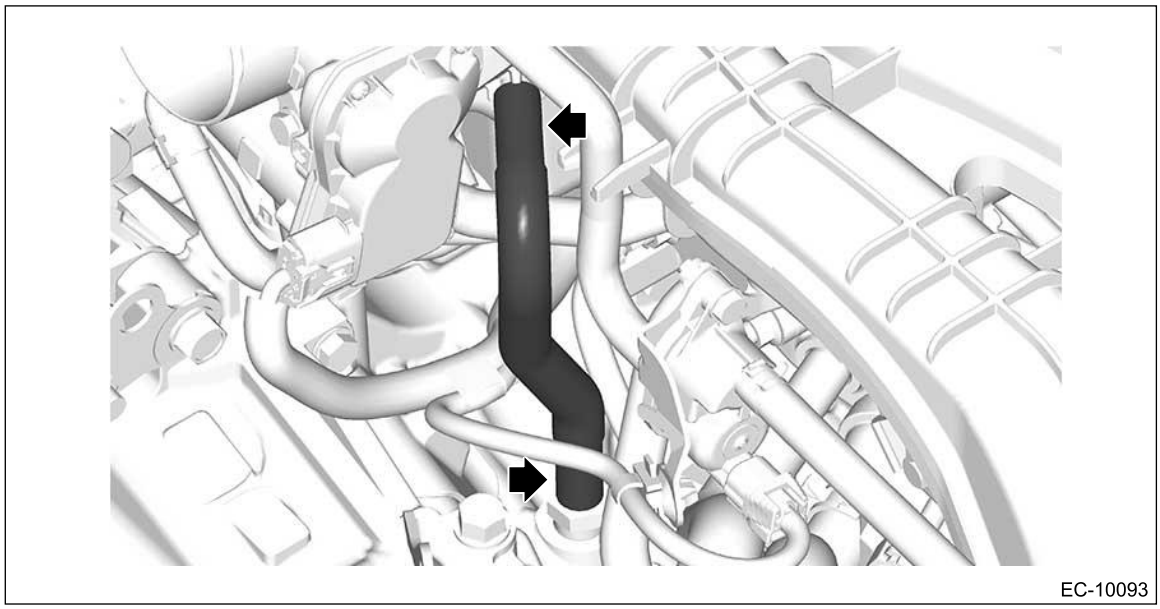
2. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

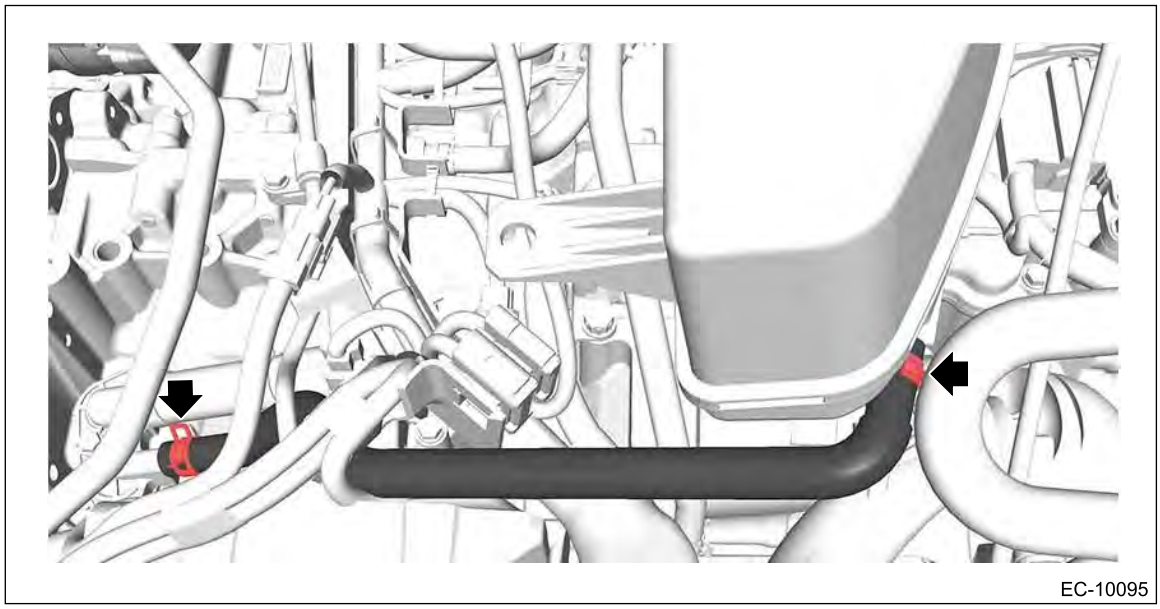
Be careful not to pull out the PCV hose.



3. Remove the PCV hose A from the intake manifold assembly and the PCV valve.



4. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Intake Manifold Assembly>REMOVAL.
5. Remove the A/C compressor. Ref. to AIR CONDITIONER>Compressor>REMOVAL.
   Note:
   This operation procedure would be possible by simply moving aside the A/C compressor to the position that it does not interfere with the work. In that case, it is not necessary to disconnect the hose - pressure suction and the hose - pressure discharge from the A/C compressor.
6. Remove the PCV hose B from the PCV connector and the air intake boot.



EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Hose

INSTALLATION

1. Attach the PCV hose B to the PCV connector and the air intake boot.
2. Install the A/C compressor. Ref. to AIR CONDITIONER>Compressor>INSTALLATION.
3. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Intake Manifold Assembly>INSTALLATION.
4. Connect the PCV hose A to the intake manifold assembly and the PCV valve.

5. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Hose

INSPECTION

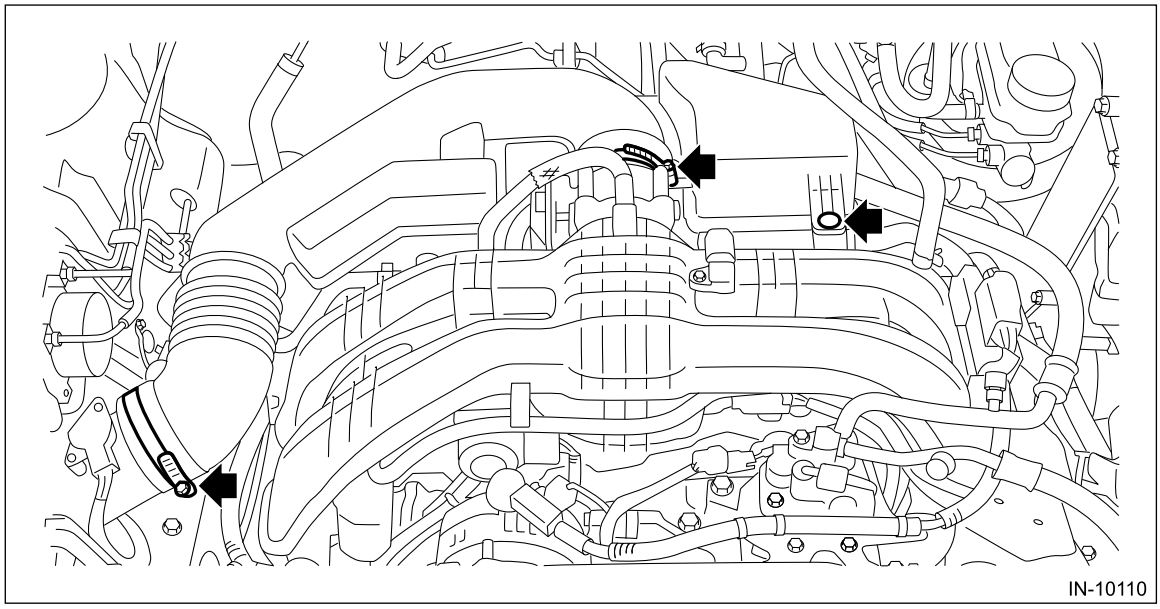
Check that the PCV hose has no cracks, damage or loose part.

REMOVAL

Caution:

Do not remove unless the PCV valve is broken.

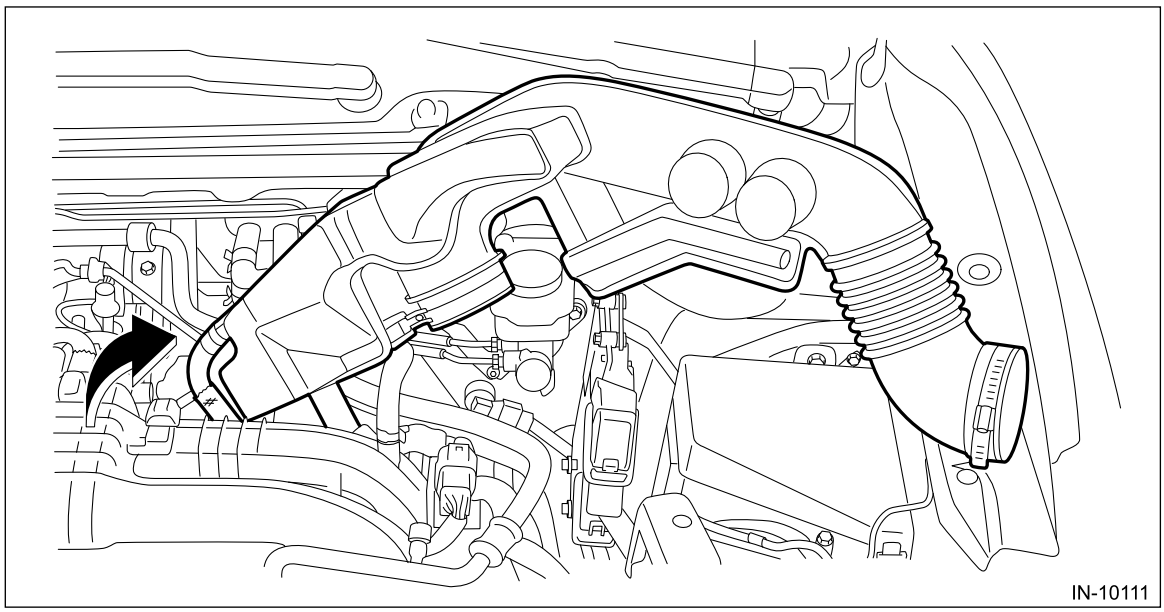
1. Remove the clip from the air intake boot, and loosen the clamp.



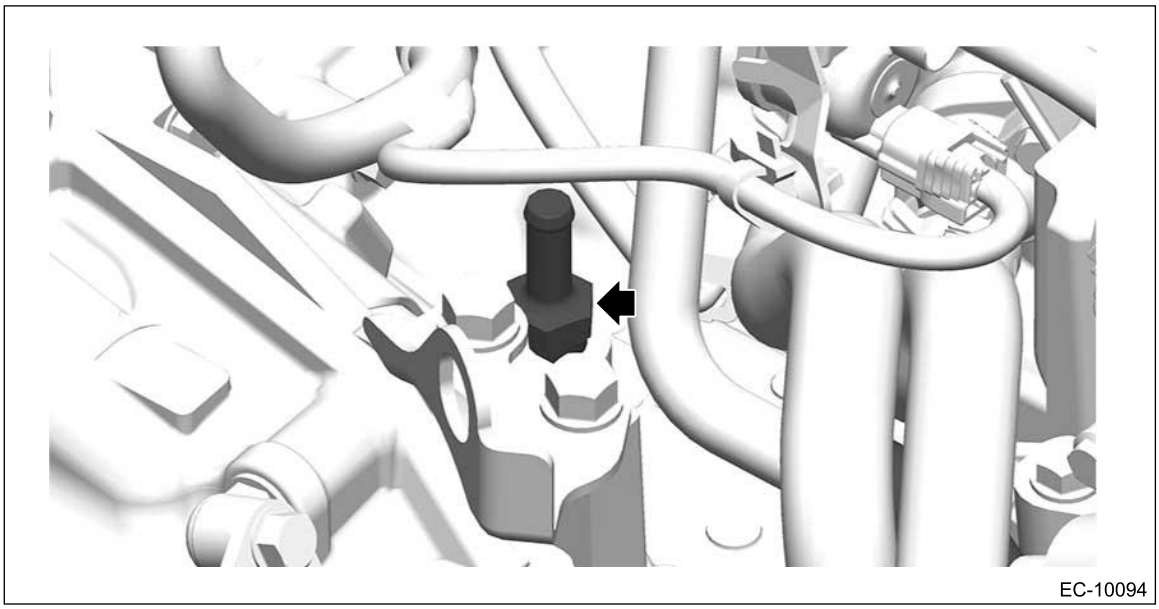
2. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.



3. Remove the PCV hose A. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Hose>REMOVAL.
4. Remove the PCV valve from the cylinder block RH.



5. Remove seal material from the PCV valve and the mating surface of the cylinder block RH.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Valve

INSTALLATION

1. Apply seal material to the bolt threads of PCV valve, and install the PCV valve onto the cylinder block RH.

   Note:

   Before applying the seal material, degrease bolt threads of PCV valve and the mating surface of the cylinder block RH.

   Seal material:

   THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

   Tightening torque:

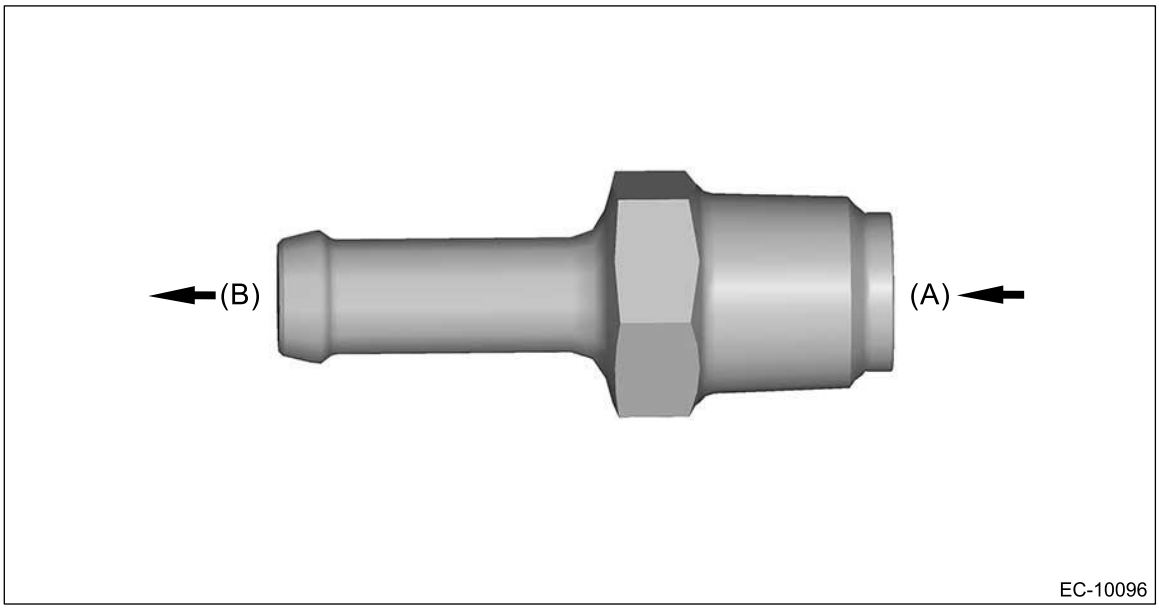
   23 N·m (2.3 kgf-m, 17.0 ft-lb)
2. Connect the PCV hose A. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Hose>INSTALLATION.
3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO) > PCV Valve

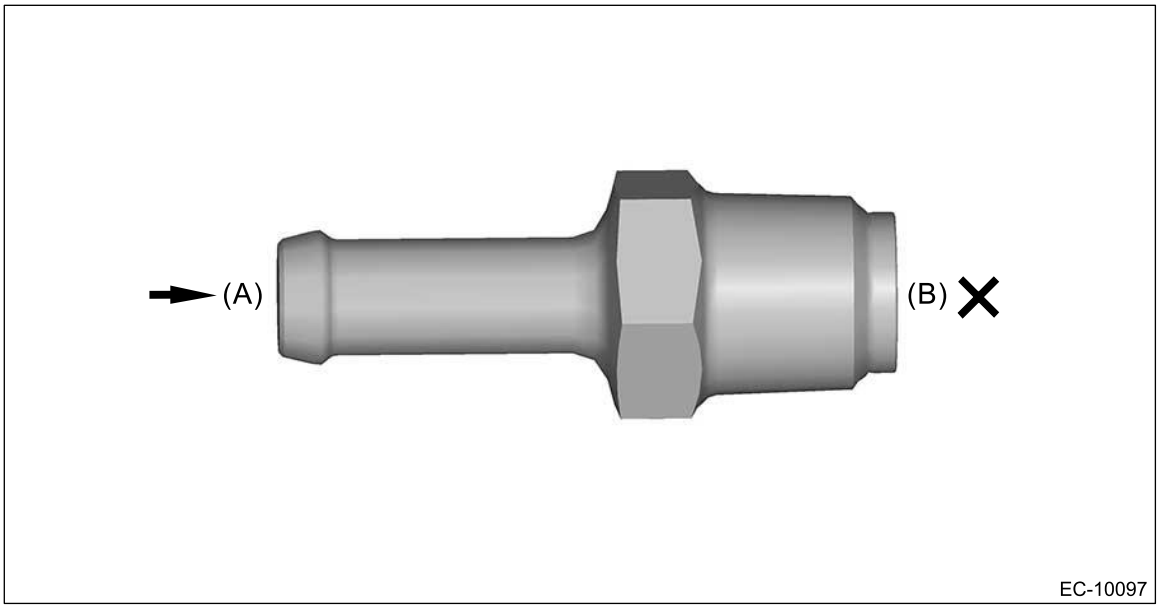
INSPECTION

1. PCV VALVE

1. Check that the PCV valve has no deformation, cracks or other damages.
2. Check that air is discharged from (B) when air is blown into (A).



3. Check that air does not come out from (B) when air is blown into (A).



2. OTHER INSPECTIONS

Check that the PCV hose has no cracks, damage or loose part.

EXHAUST(H4DO)

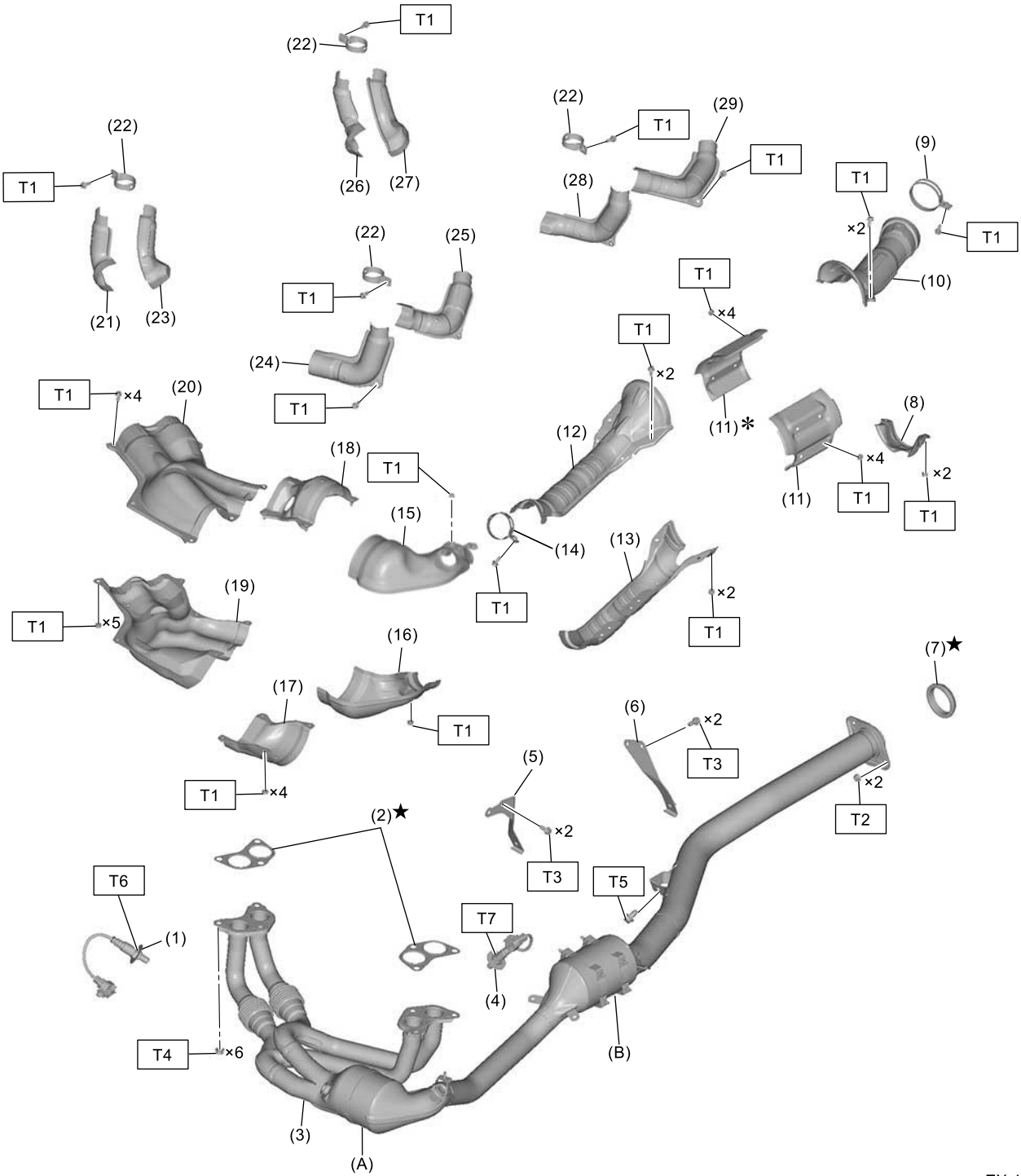
EX(H4DO)

1. General Description
2. Front Exhaust Pipe
3. Rear Exhaust Pipe
4. Muffler

COMPONENT

1. FRONT EXHAUST PIPE

- Type A



EX-10610

(A) Front catalytic converter (B) Rear catalytic converter

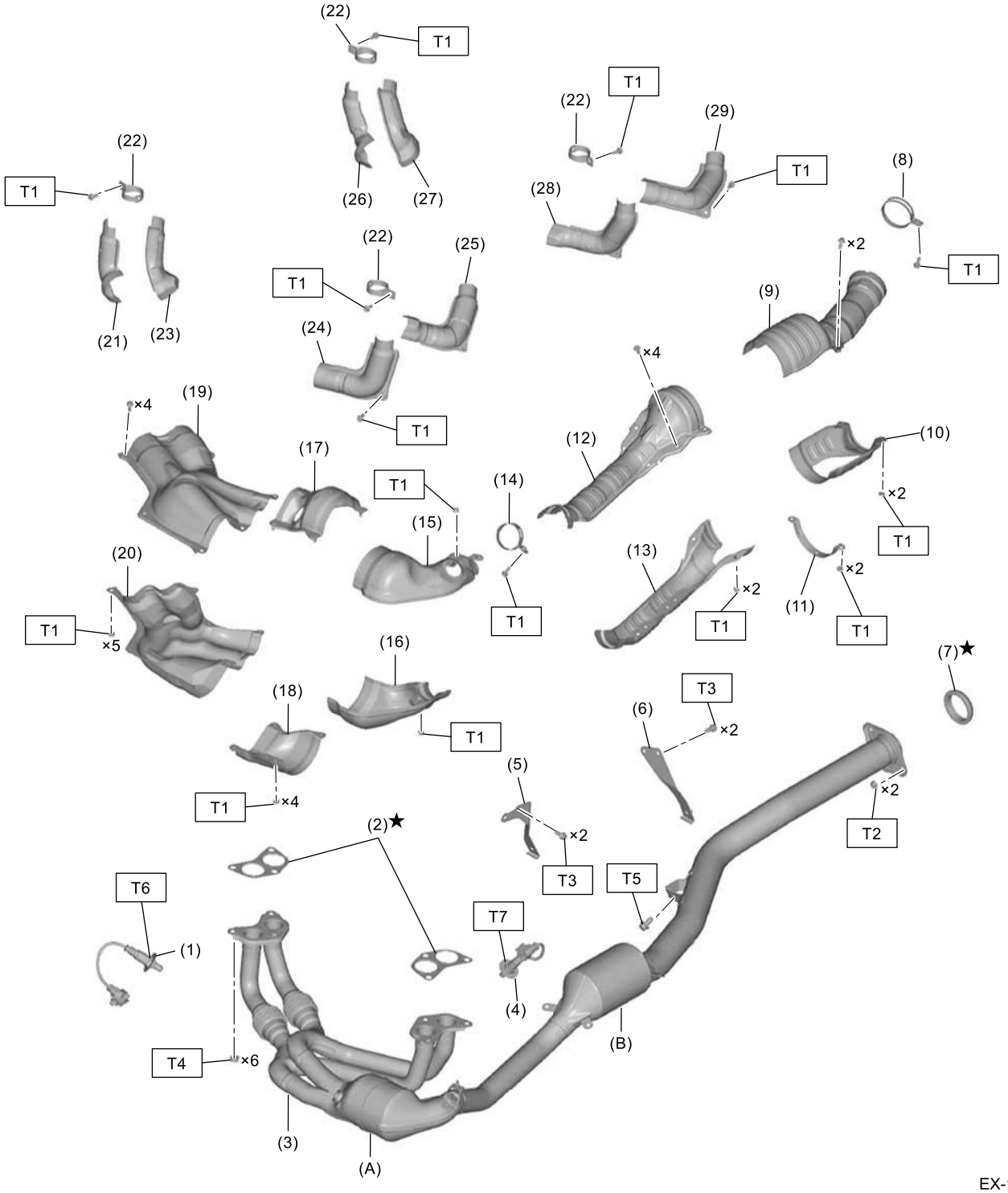
(1) Front oxygen (A/F) sensor
(2) Gasket
(3) Front exhaust pipe
(4) Rear oxygen sensor
(5) Hanger bracket (MT model)
(6) Hanger bracket (CVT model)
(7) Gasket
(8) Exhaust cover
(9) Band
(10) Exhaust cover
(11) Exhaust cover
(12) Exhaust cover
(13) Exhaust cover
(14) Band
(15) Exhaust cover
(16) Exhaust cover
(17) Exhaust cover
(18) Exhaust cover
(19) Exhaust cover
(20) Exhaust cover
(21) Exhaust cover
(22) Band
(23) Exhaust cover
(24) Exhaust cover
(25) Exhaust cover
(26) Exhaust cover
(27) Exhaust cover
(28) Exhaust cover
(29) Exhaust cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 13 (1.3, 9.6)
T2: 18 (1.8, 13.3)
T3: 23 (2.3, 17.0)
T4: 30 (3.1, 22.1)
T5: 35 (3.6, 25.8)
T6: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor>INSTALLATION.
T7: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Rear Oxygen Sensor>INSTALLATION.

∗Equipped only on CVT model.

- Type B


(22)
T1
(26)
(27)
(22)
T1
(29)
T1
(28)
(8)
T1
(22)
T1
(21)
(23)
(22)
T1
(25)
(24)
T1
×2
(9)
×4
(12)
(10)
×2
T1
(19)
×4
(17)
T1
(15)
(14)
T1
(13)
×2
T1
(11)
×2
T1
(20)
T1
×5
(16)
T1
(18)
T1
×4
(7)★
T3
(6)
×2
(5)
×2
T3
×2
T2
(2)★
T6
(1)
T7
(4)
T5
T4
×6
(3)
(A)
(B)

EX-10580

(A) Front catalytic converter (B) Rear catalytic converter

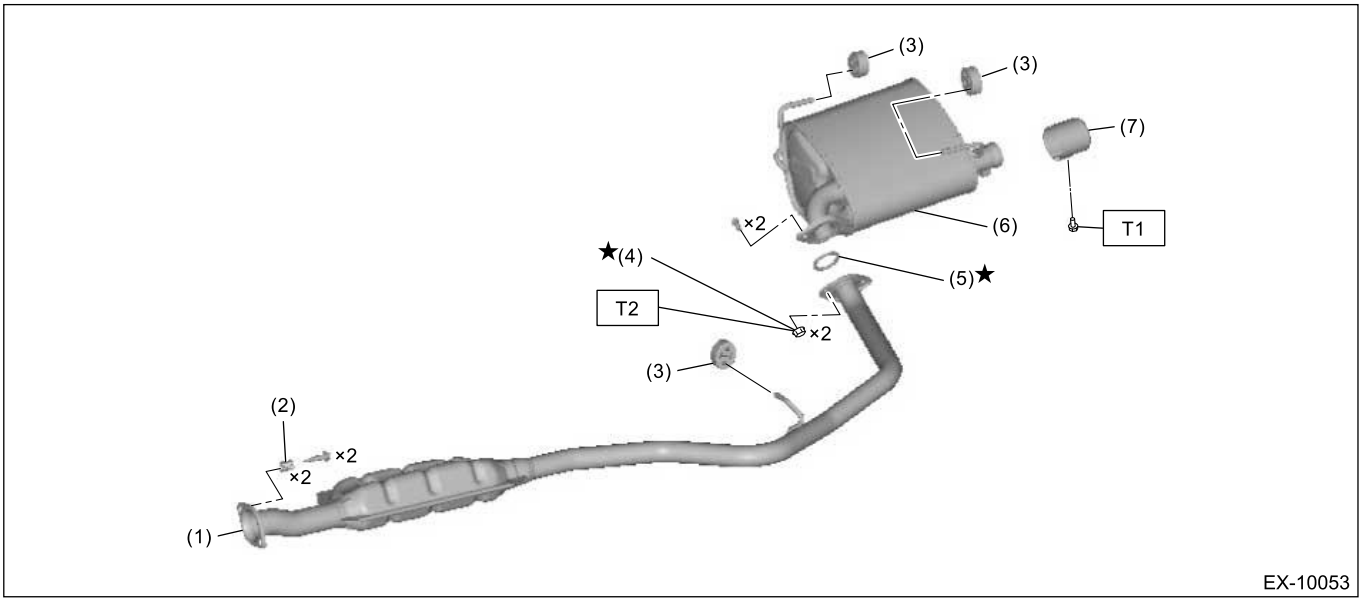
(1) Front oxygen (A/F) sensor
(2) Gasket
(3) Front exhaust pipe
(4) Rear oxygen sensor
(5) Hanger bracket (MT model)
(6) Hanger bracket (CVT model)
(7) Gasket
(8) Band
(9) Exhaust cover
(10) Exhaust cover
(11) Clamp
(12) Exhaust cover
(13) Exhaust cover
(14) Band
(15) Exhaust cover
(16) Exhaust cover
(17) Exhaust cover
(18) Exhaust cover
(19) Exhaust cover
(20) Exhaust cover
(21) Exhaust cover
(22) Band
(23) Exhaust cover
(24) Exhaust cover
(25) Exhaust cover
(26) Exhaust cover
(27) Exhaust cover
(28) Exhaust cover
(29) Exhaust cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 13 (1.3, 9.6)
T2: 18 (1.8, 13.3)
T3: 23 (2.3, 17.0)
T4: 30 (3.1, 22.1)
T5: 35 (3.6, 25.8)
T6: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor>INSTALLATION.
T7: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Rear Oxygen Sensor>INSTALLATION.

2. REAR EXHAUST PIPE AND MUFFLER

- 4 door model



(1) Rear exhaust pipe
(2) Spring
(3) Cushion rubber
(5) Gasket
(6) Muffler
(7) Muffler cutter (models with

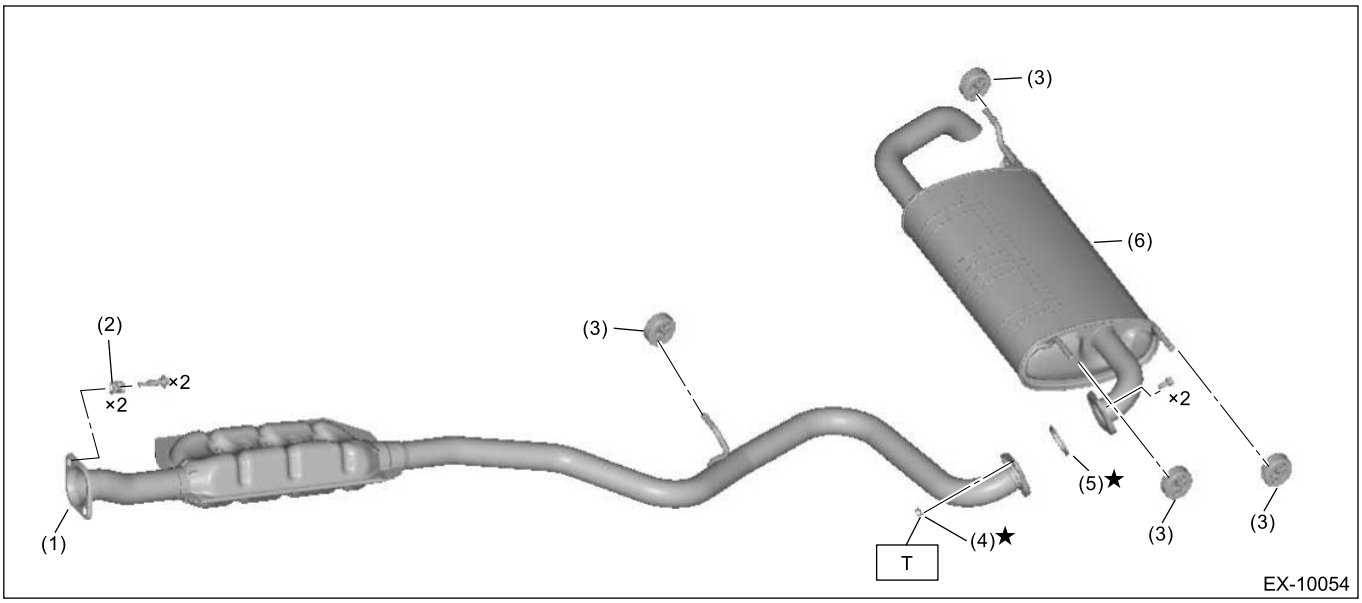
Tightening torque: N·m (kgf-m, ft-lb)

T1: 6 (0.6, 4.4)
T2: 48 (4.9, 35.4)

muffler cutter)

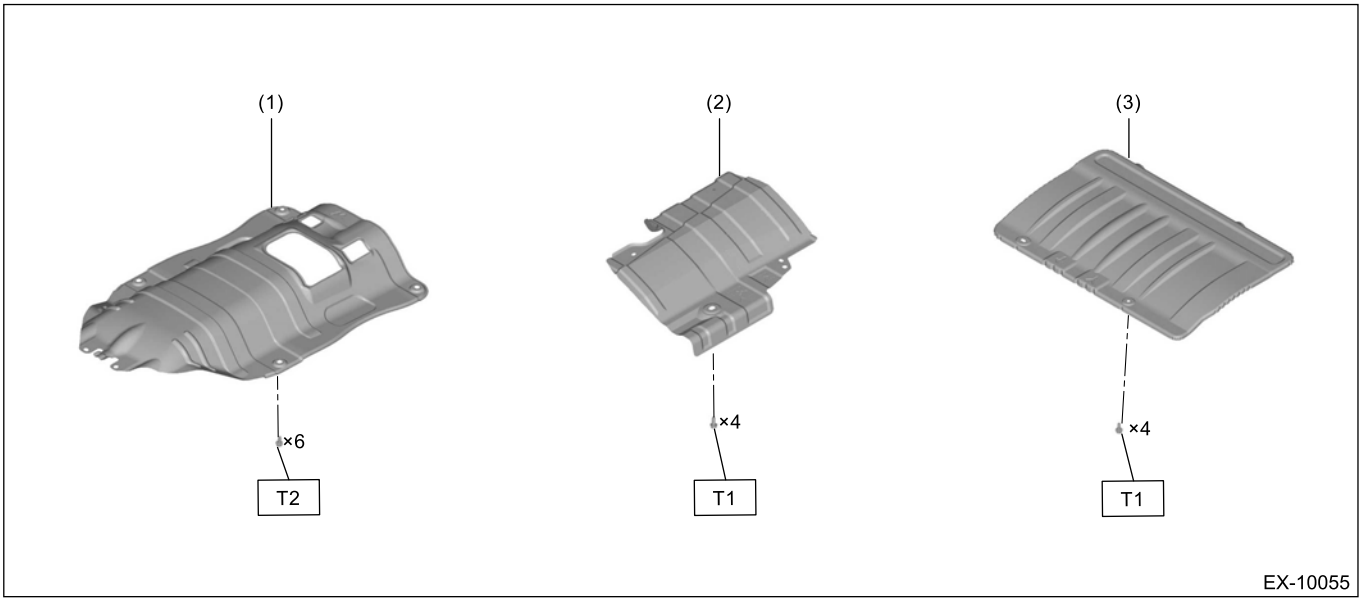
(4) Self-locking nut

- 5 door model



(1) Rear exhaust pipe	(4) Self-locking nut	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Spring	(5) Gasket	***T: 48 (4.9, 35.4)***
(3) Cushion rubber	(6) Muffler	

3. HEAT SHIELD COVER



(1) Center exhaust cover	(3) Rear exhaust cover (5 door model)	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Rear exhaust cover (4 door model)		***T1: 10 (1.0, 7.4)***
		T2: 18 (1.8, 13.3)

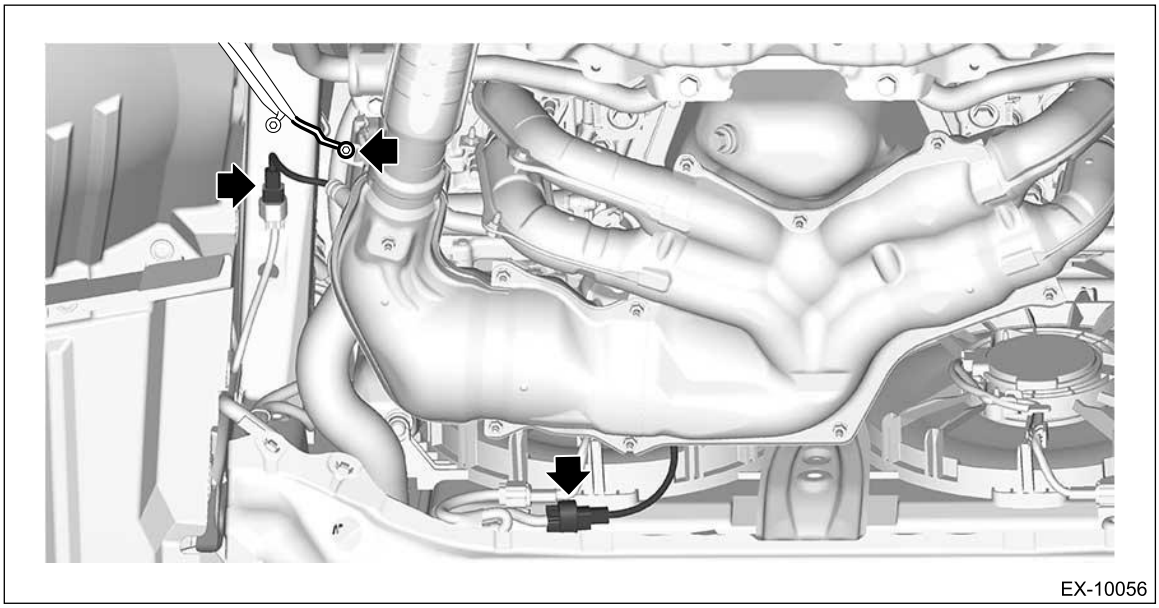
CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.
- If any grease and oil adheres to the exhaust pipe, completely wipe it off to avoid emitting smoke or causing a fire.

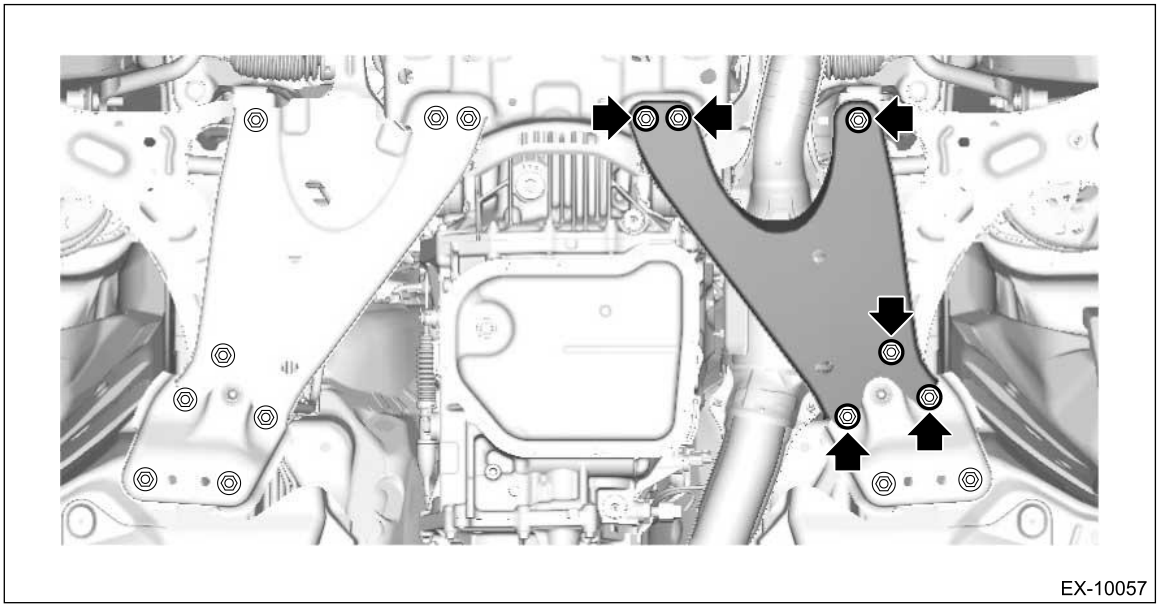
REMOVAL

Caution:
Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.

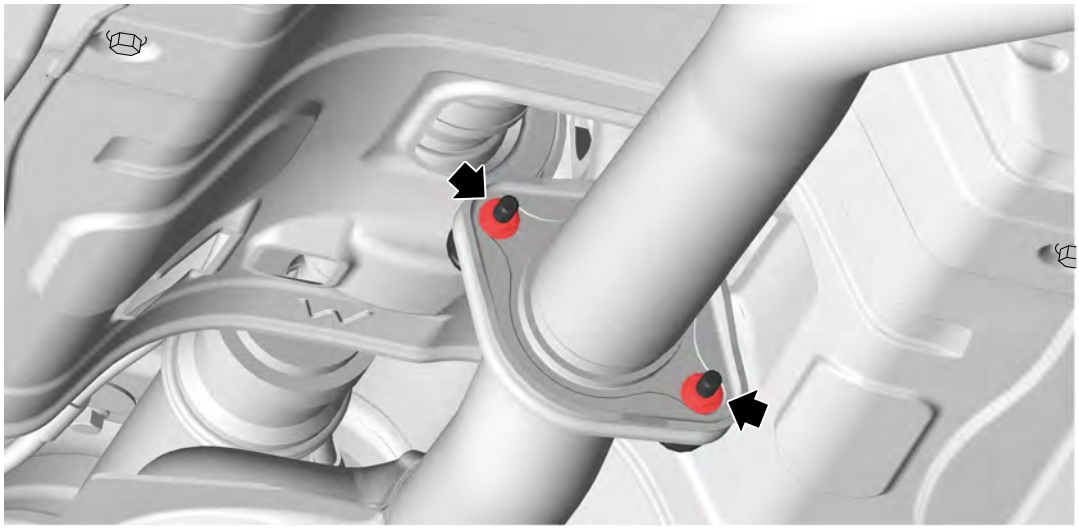
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Disconnect the front oxygen (A/F) sensor connector, rear oxygen sensor connector and the ground cord.



4. Remove the crossmember support - rear LH.

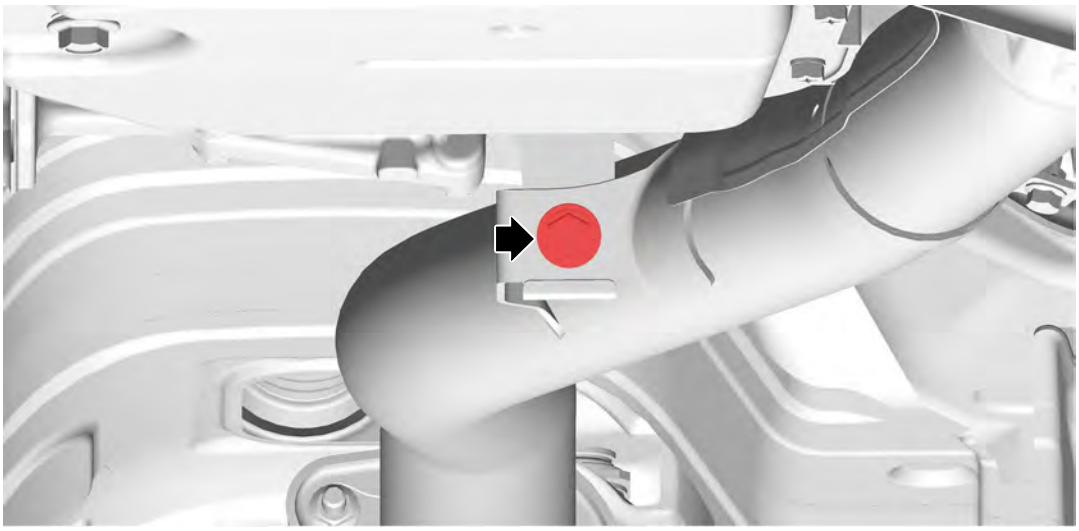


5. Separate the front exhaust pipe and rear exhaust pipe.



EX-10058

6. Remove the bolt which holds front exhaust pipe to hanger bracket.

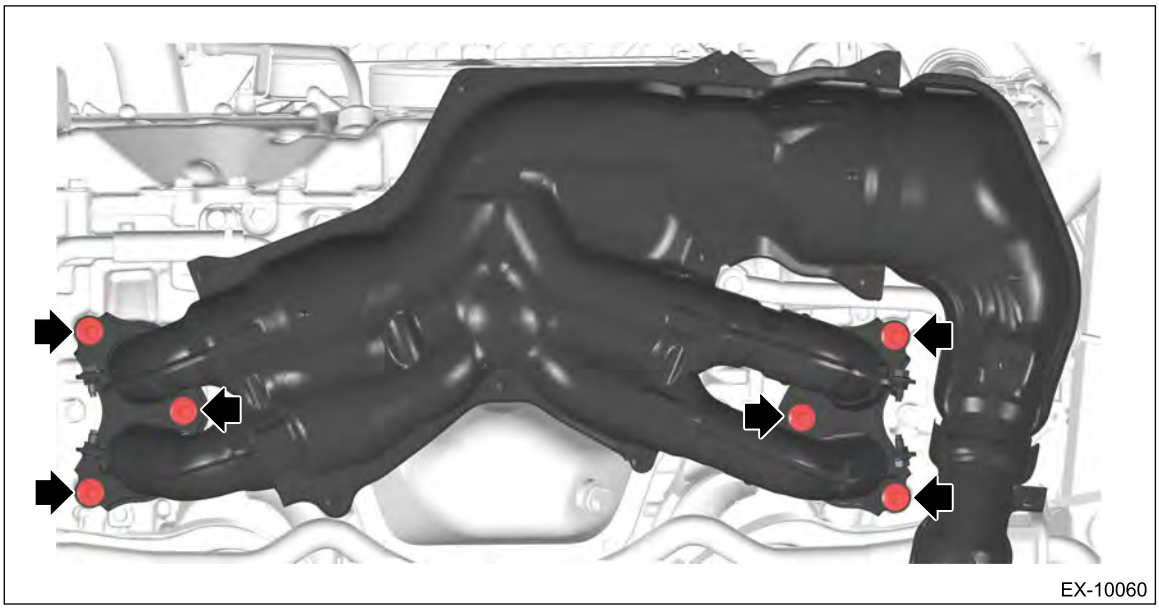


EX-10059

7. Remove the front exhaust pipe.

Caution:

The front exhaust pipe is very heavy. Be careful not to drop it when removing.



EXHAUST(H4DO) > Front Exhaust Pipe

INSTALLATION

1. Set new gasket to the rear exhaust pipe.
2. Set a new gasket, and temporarily install the front exhaust pipe.
3. Install the bolts which secure front exhaust pipe to hanger bracket.
   Tightening torque:
   35 N·m (3.6 kgf-m, 25.8 ft-lb)
4. Tighten the nuts which hold the front exhaust pipe.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
5. Connect the front exhaust pipe and rear exhaust pipe.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
6. Install the crossmember support - rear LH.
   Tightening torque:
   70 N·m (7.1 kgf-m, 51.6 ft-lb)
7. Connect the front oxygen (A/F) sensor connector, rear oxygen sensor connector and the ground cord.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXHAUST(H4DO) > Front Exhaust Pipe

DISASSEMBLY

1. Remove the front oxygen (A/F) sensor and rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor>REMOVAL. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Rear Oxygen Sensor>REMOVAL.
2. Remove each exhaust cover.

EXHAUST(H4DO) > Front Exhaust Pipe

ASSEMBLY

1. Install each exhaust cover.
   Tightening torque:
   13 N·m (1.3 kgf-m, 9.6 ft-lb)
2. Install the front oxygen (A/F) sensor and rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor>INSTALLATION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Rear Oxygen Sensor>INSTALLATION.

EXHAUST(H4DO) > Front Exhaust Pipe

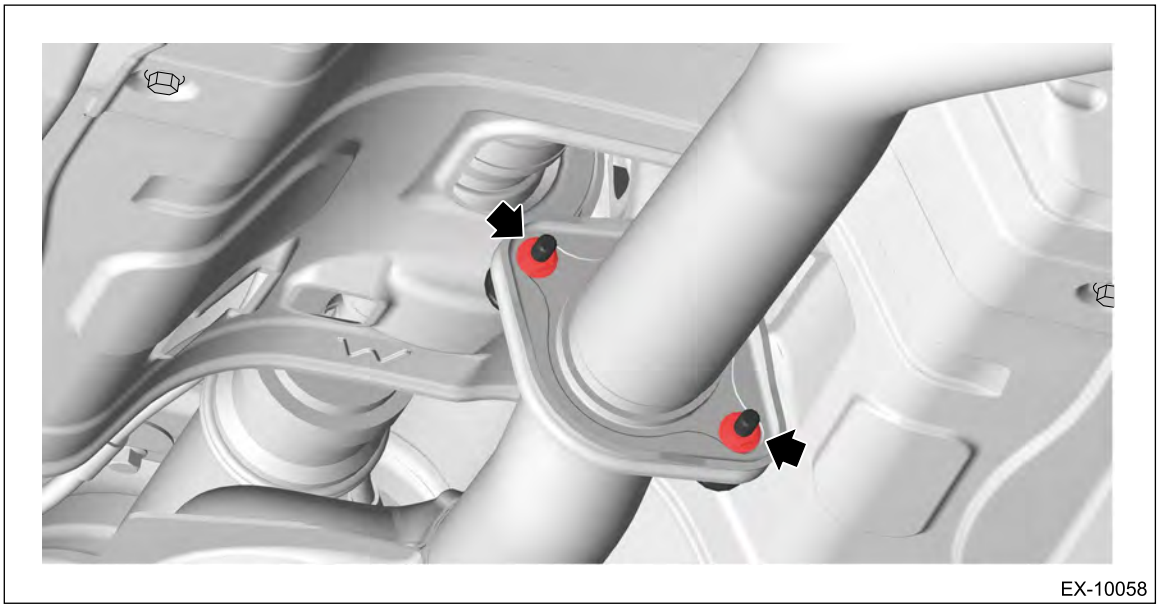
INSPECTION

1. Check that no leaks are found.
2. Check for deformation, damage, or excessive rusting.
3. Check for any foreign matter adhered.
4. Check for clogging.

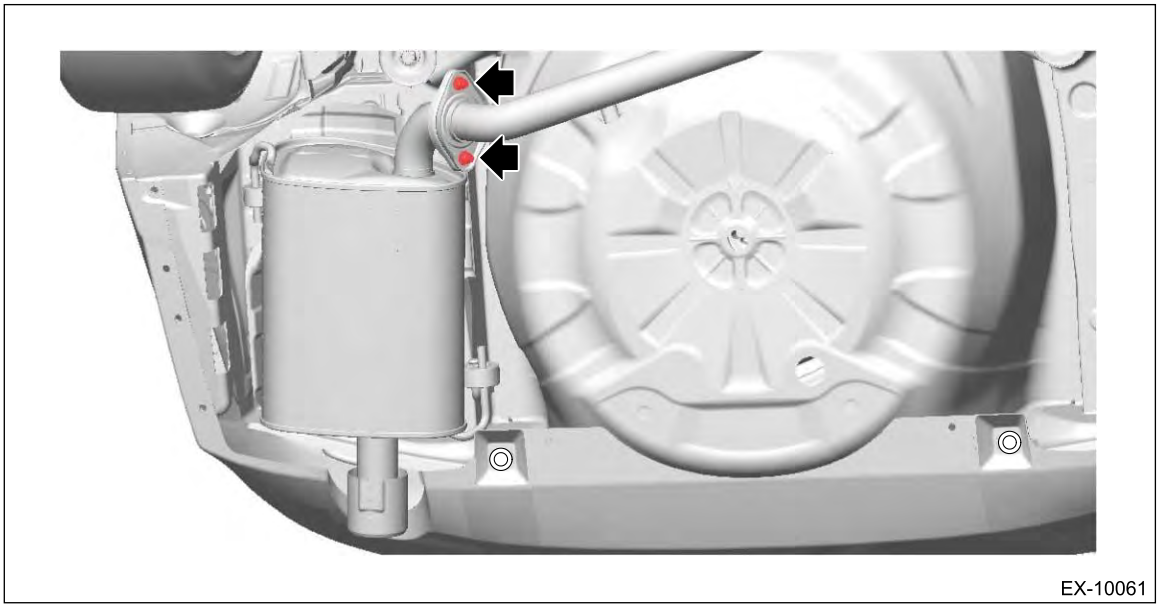
REMOVAL

Caution:
Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.

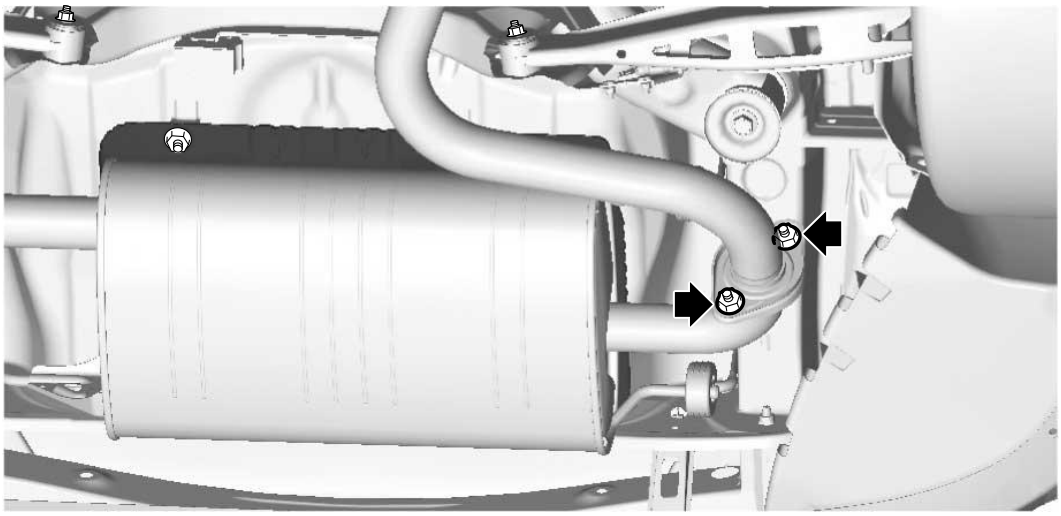
1. Separate the front exhaust pipe and rear exhaust pipe.
   Caution:
   Be careful not to let the muffler contact the rear bumper.



2. Disconnect the rear exhaust pipe and muffler.
   Caution:
   Be careful not to drop the rear exhaust pipe.
   - 4 door model

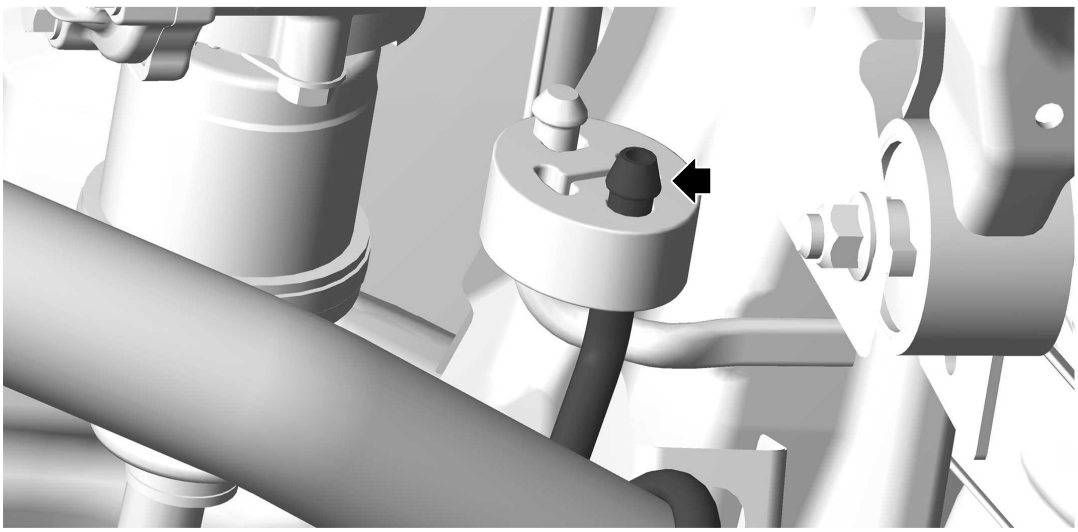


   - 5 door model



EX-10062

3. Apply a coat of spray type lubricant to the mating area of cushion rubber.
4. Remove the rear exhaust pipe.



EX-10063

EXHAUST(H4DO) > Rear Exhaust Pipe

INSTALLATION

1. Set new gasket to the rear exhaust pipe. (Front side)
2. Apply a coat of spray type lubricant to the mating area of cushion rubber.
3. Install the rear exhaust pipe.

   Note:

   After installation, degrease the cushion rubber.
4. Set a new gasket, and connect the rear exhaust pipe and muffler.

   Caution:

   Be sure to use a new self-locking nut.

   Tightening torque:

   48 N·m (4.9 kgf-m, 35.4 ft-lb)
5. Connect the front exhaust pipe and rear exhaust pipe.

   Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

EXHAUST(H4DO) > Rear Exhaust Pipe

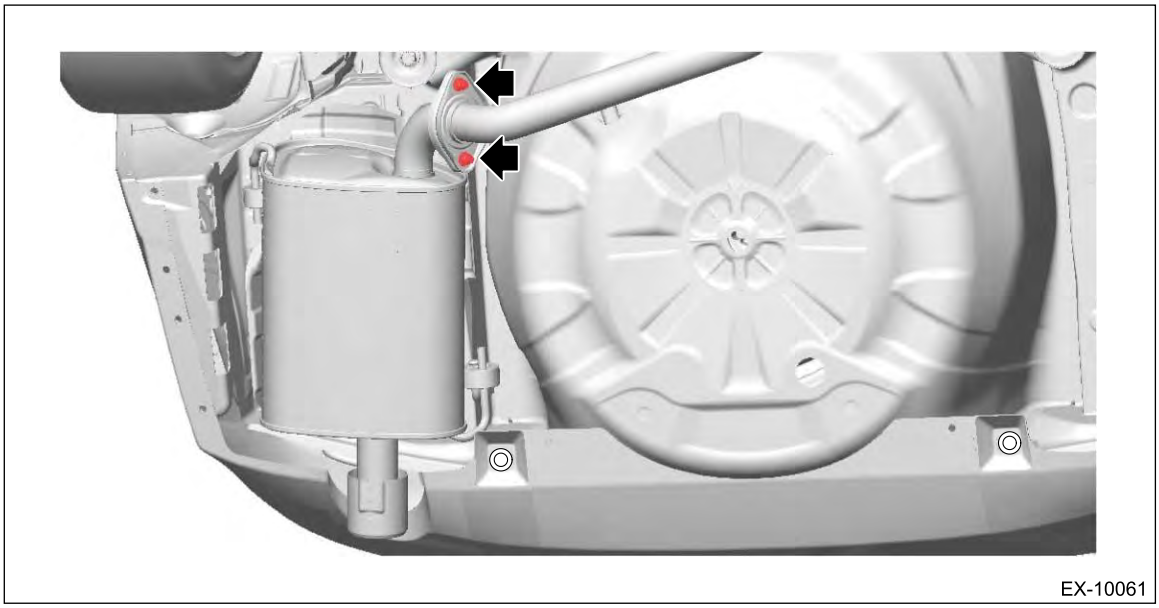
INSPECTION

1. Check that no leaks are found.
2. Check for deformation, damage, or excessive rusting.
3. Check for any foreign matter adhered.
4. Check for clogging.
5. Check the cushion rubber for wear or crack.

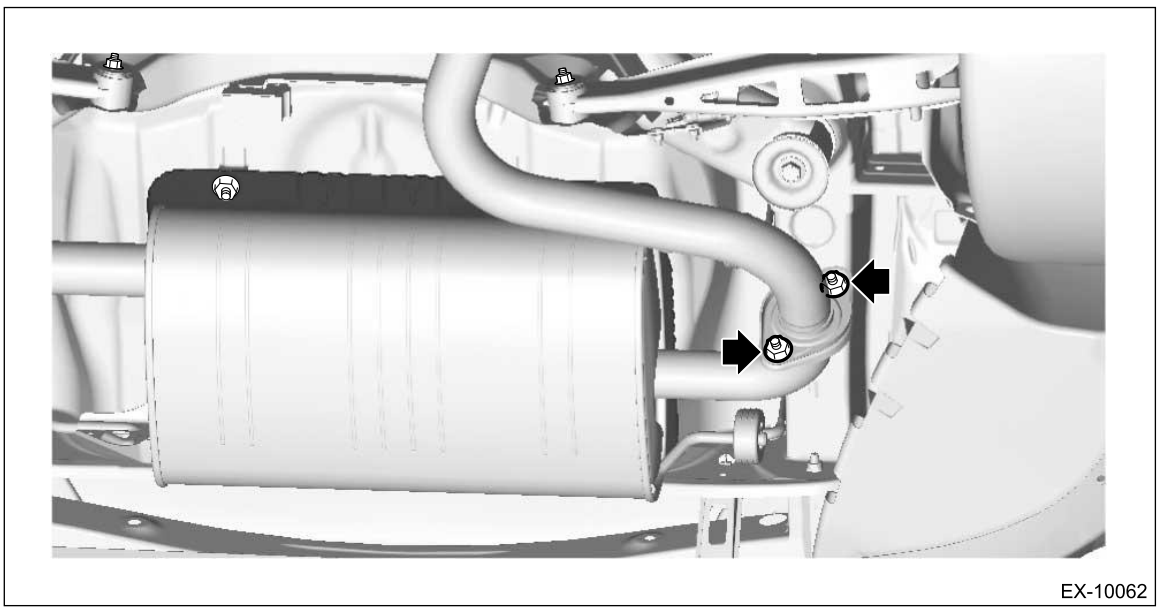
REMOVAL

Caution:
Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.

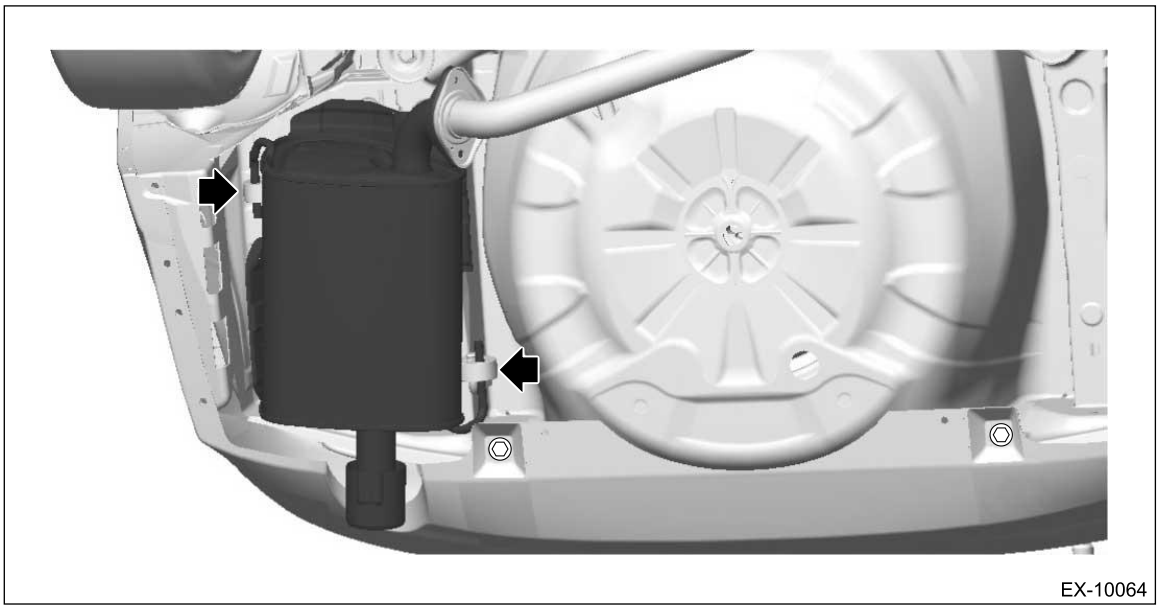
1. Disconnect the rear exhaust pipe and muffler.
   - 4 door model



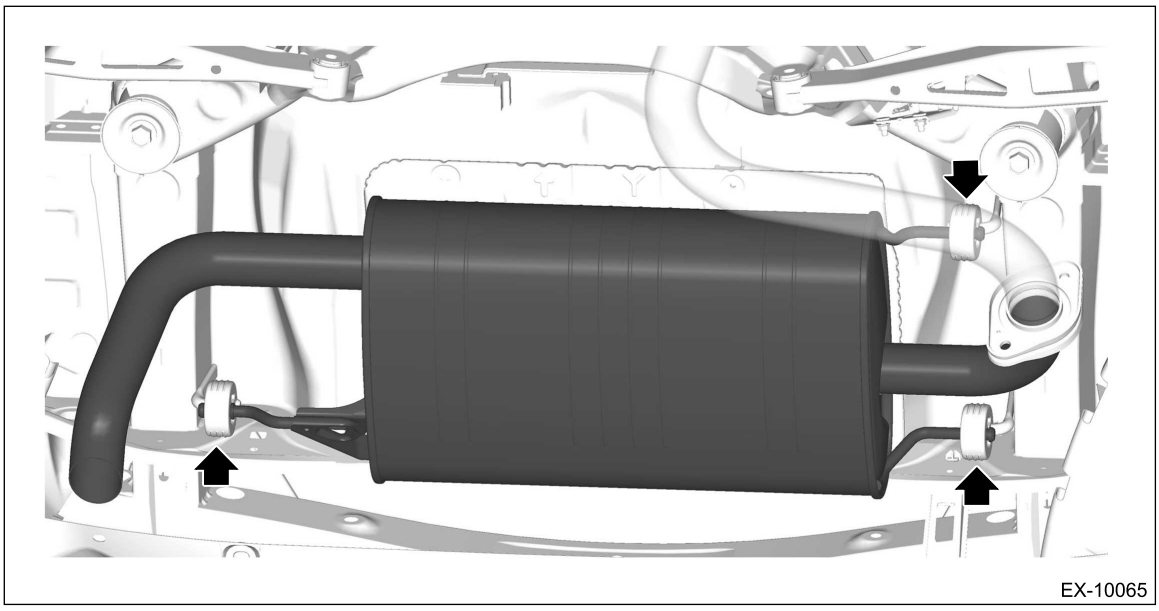
   - 5 door model



2. Apply a coat of spray type lubricant to the mating area of cushion rubber.
3. Remove the muffler.
   Caution:
   Be careful not to let the muffler contact the rear bumper.
   - 4 door model

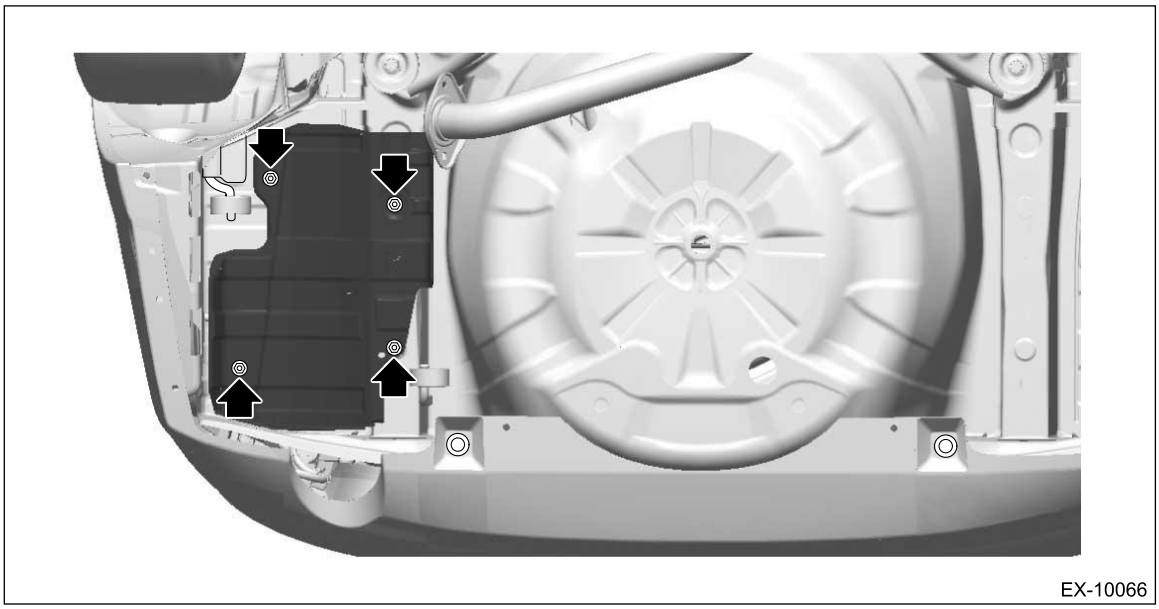


- 5 door model

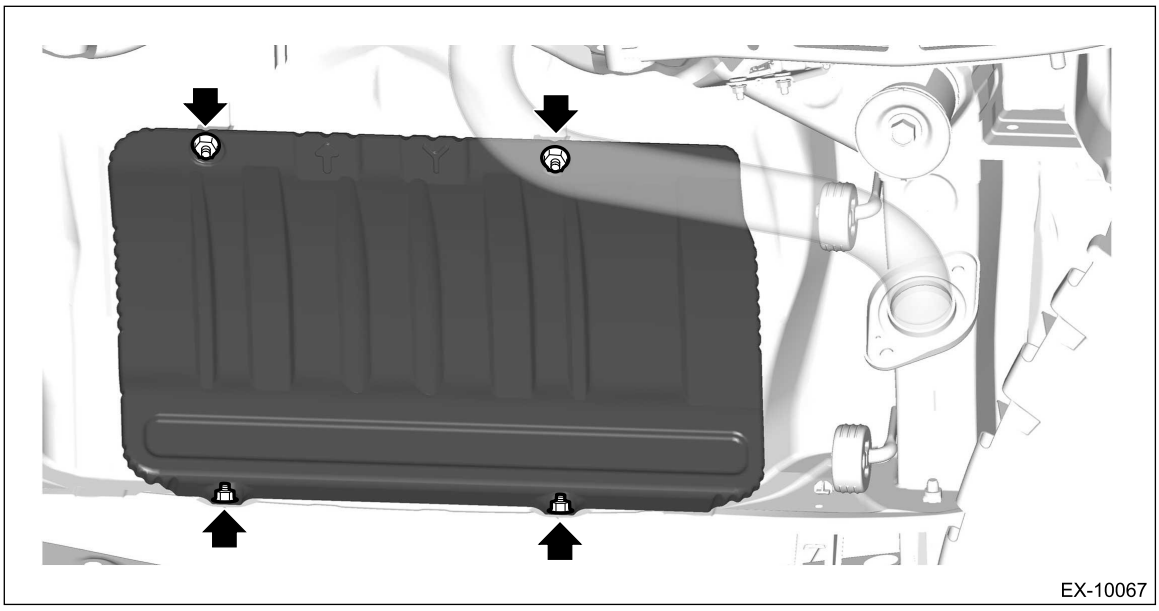


4. Remove the heat shield cover.

- 4 door model



- 5 door model



EXHAUST(H4DO) > Muffler

INSTALLATION

1. Install the heat shield cover.
   Tightening torque:
   10 N·m (1.0 kgf-m, 7.4 ft-lb)
2. Apply a coat of spray type lubricant to the mating area of cushion rubber.
3. Install the muffler.
   Note:
   After installation, degrease the cushion rubber.
4. Set a new gasket, and connect the rear exhaust pipe and muffler.
   Caution:
   Be sure to use a new self-locking nut.
   Tightening torque:
   48 N·m (4.9 kgf-m, 35.4 ft-lb)

INSPECTION

1. Check that no leaks are found.
2. Check for deformation, damage, or excessive rusting.
3. Check for any foreign matter adhered.
4. Check for clogging.
5. Check the cushion rubber for wear or crack.

FUEL INJECTION (FUEL SYSTEMS)(H4DO)

FU(H4DO)

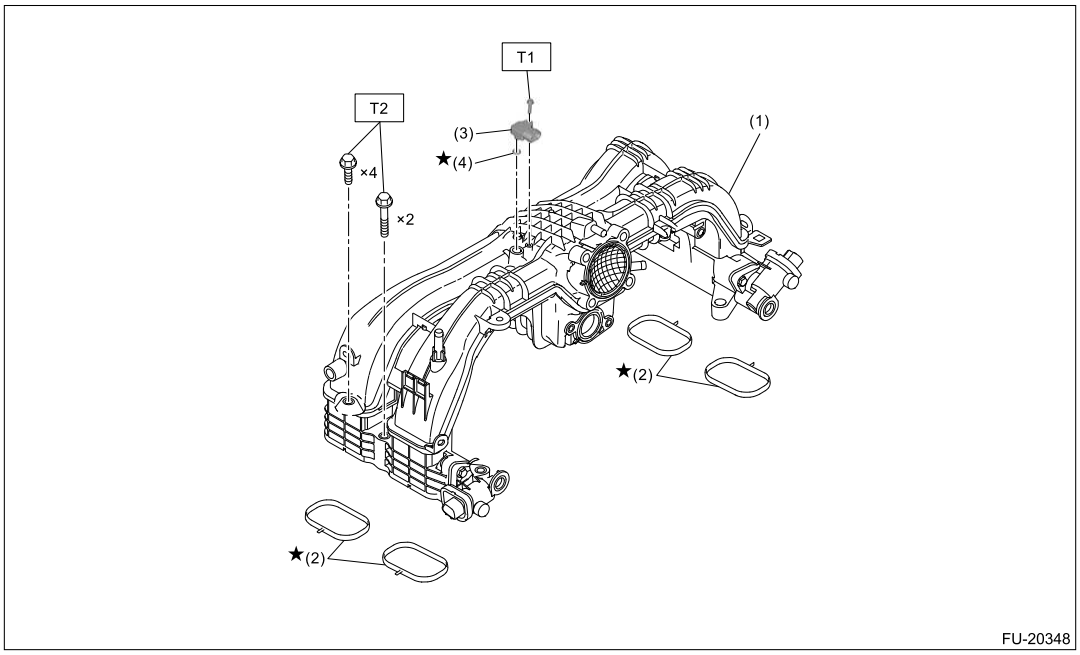
1. General Description
2. Throttle Body
3. Intake Manifold Assembly
4. Tumble Generator Valve
5. Tumble Generator Valve Actuator
6. Fuel Insulator
7. Fuel Injector
8. Fuel Pressure Sensor
9. High Pressure Fuel Pump
10. High Pressure Fuel Delivery Pipe
11. Engine Wiring Harness
12. Engine Coolant Temperature Sensor
13. Engine Oil Temperature Sensor
14. Crankshaft Position Sensor
15. Crankshaft Position Sensor Plate
16. Camshaft Position Sensor
17. Oil Control Solenoid
18. Knock Sensor
19. Throttle Position Sensor
20. Mass Air Flow and Intake Air Temperature Sensor
21. Manifold Absolute Pressure Sensor
22. Front Oxygen (A/F) Sensor
23. Rear Oxygen Sensor
24. Engine Control Module (ECM)
25. Main Relay
26. Fuel Pump Relay
27. Fuel
28. Fuel Tank Protector
29. Fuel Tank
30. Fuel Filler Pipe
31. Fuel Pump
32. Fuel Level Sensor
33. Fuel Filter
34. Fuel Delivery and Evaporation Lines
35. Fuel System Trouble in General

SPECIFICATION

Fuel tank	Capacity	50 L (13.2 US gal, 11.0 Imp gal)
	Location	Under rear seat
Fuel pump	Type	Impeller
	Shutoff discharge pressure	830 kPa (8.46 kg/cm^2, 120.3 psi) or less
	Discharge rate	70 L (18.5 US gal, 15.4 Imp gal)/h or more [12.5 V at 400 kPa (4.1 kg/cm^2, 58.0 psi)]
Fuel filter		In-tank type

COMPONENT

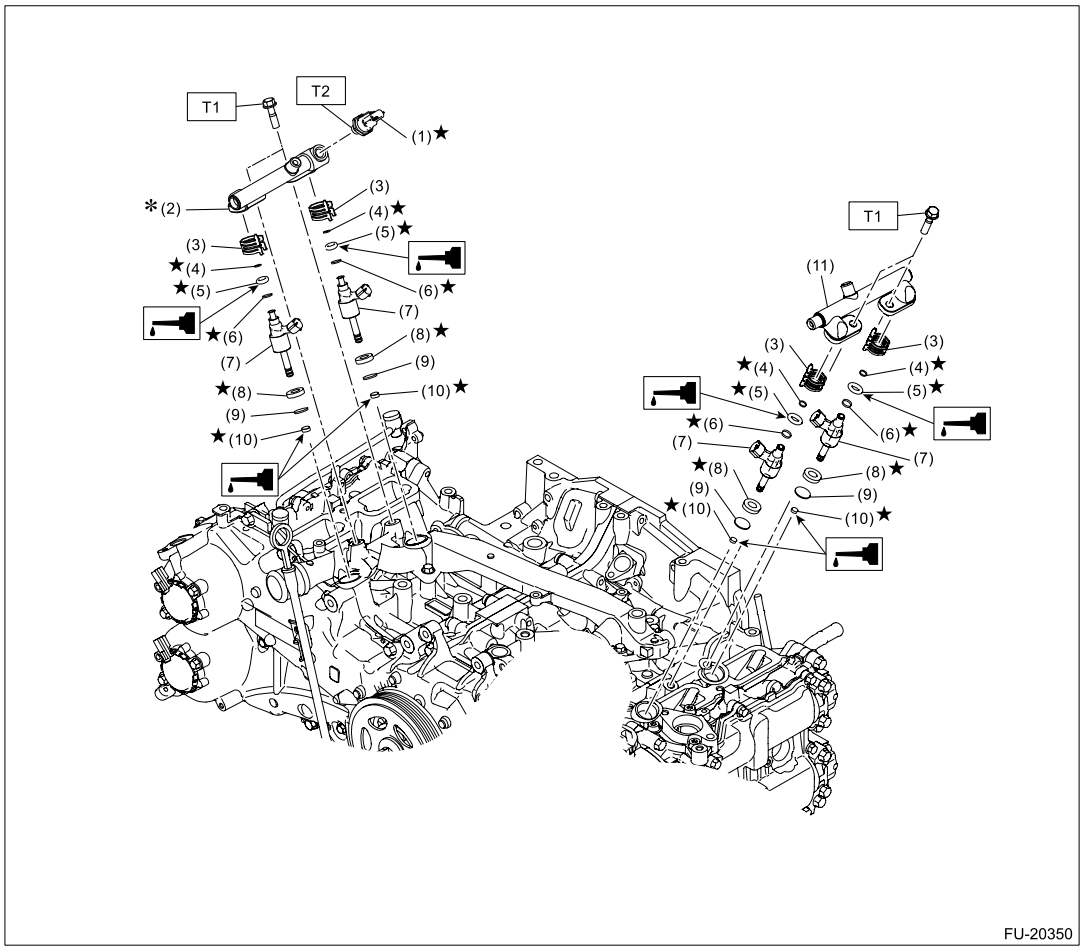
1. INTAKE MANIFOLD ASSY



(1) Intake manifold ASSY
(2) Gasket
(3) Manifold absolute pressure sensor
(4) O-ring

Tightening torque: N·m (kgf-m, ft-lb)
T1: 3.4 (0.3, 2.5)
T2: 25 (2.5, 18.4)

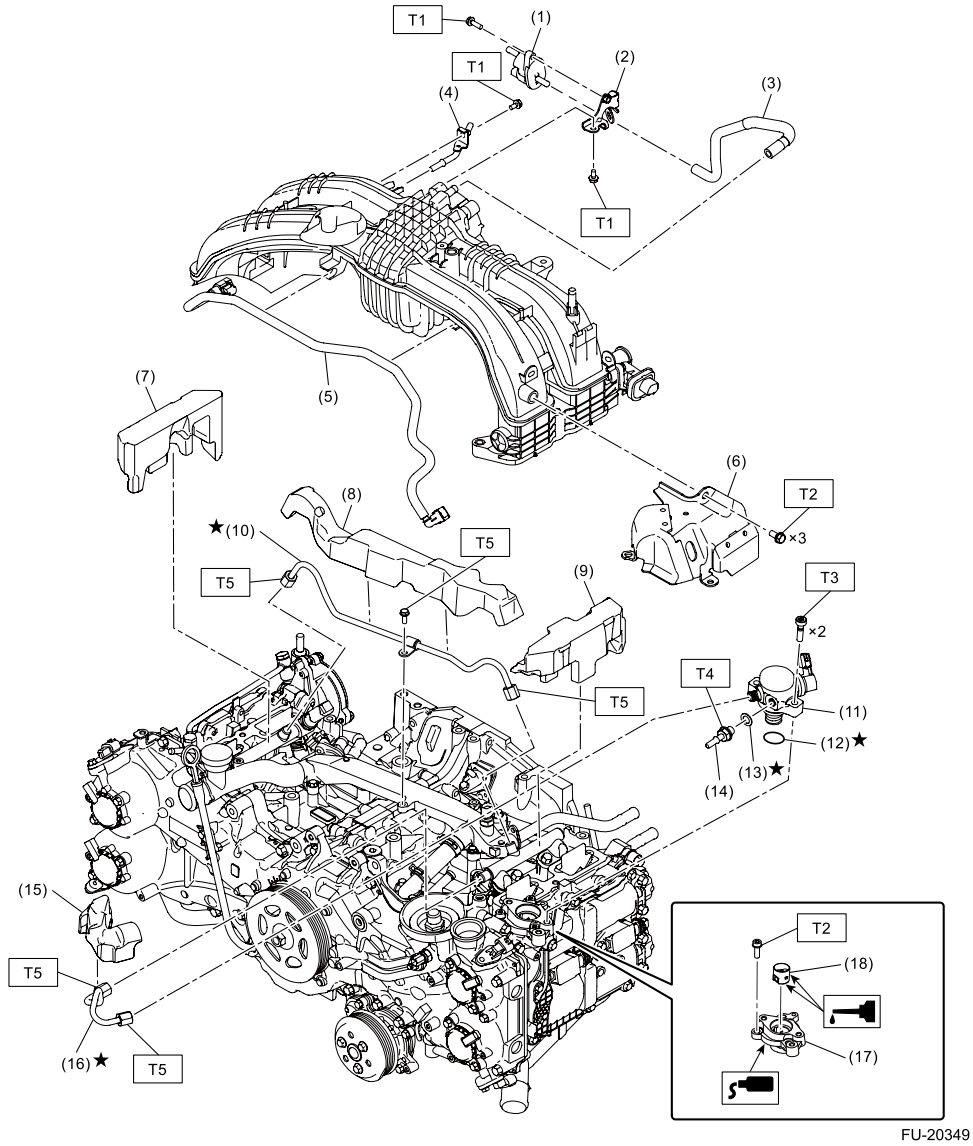
2. FUEL INJECTOR



(1) Fuel pressure sensor	(6) Back-up ring	(11) Fuel injector pipe LH
(2) Fuel injector pipe RH	(7) Fuel injector	
(3) Fuel injector holder	(8) Slider washer	***Tightening torque: N·m (kgf-m, ft-lb)***
(4) Stopper ring	(9) C-ring	***T1: 19 (1.9, 14.0)***
(5) O-ring seal	(10) Fuel injector seal	***T2: 46 (4.7, 33.9)***

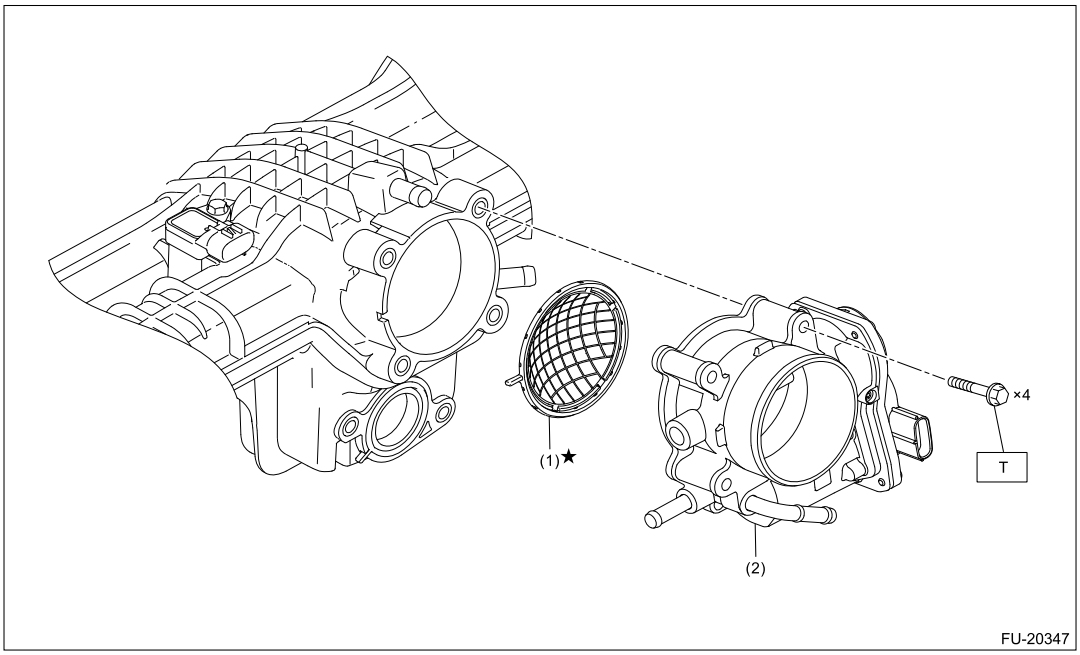
* When removing the fuel pressure sensor from the fuel injector pipe RH, replace it with a new one.

3. FUEL PIPE



(1) Purge control solenoid valve	(10) High-pressure fuel delivery pipe assembly	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Purge control solenoid valve bracket	(11) High-pressure fuel pump	***T1: 6.4 (0.7, 4.7)***
(3) Vacuum hose	(12) O-ring	***T2: 19 (1.9, 14.0)***
(4) Fuel pipe	(13) Gasket	***T3: 21 (2.1, 15.5)***
(5) Fuel delivery pipe A	(14) Fuel delivery pipe B	***T4: 48 (4.9, 35.4)***
(6) Fuel pipe protector	(15) Fuel pipe insulator No. 4	***T5: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION.***
(7) Fuel pipe insulator No. 1	(16) High-pressure fuel delivery pipe	
(8) Fuel pipe insulator No. 2	(17) High-pressure fuel pump case	
(9) Fuel pipe insulator No. 3	(18) Fuel pump lifter	

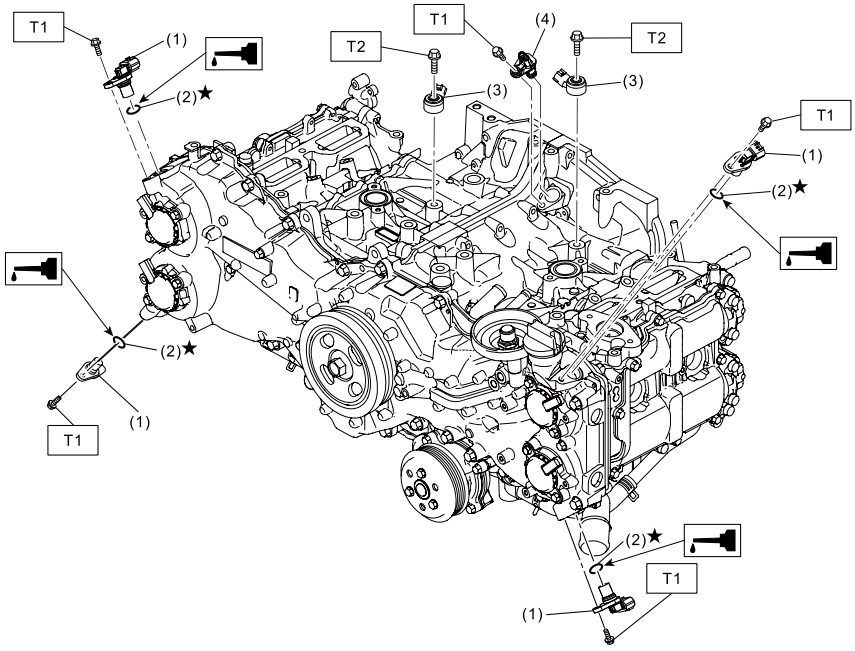
4. THROTTLE BODY

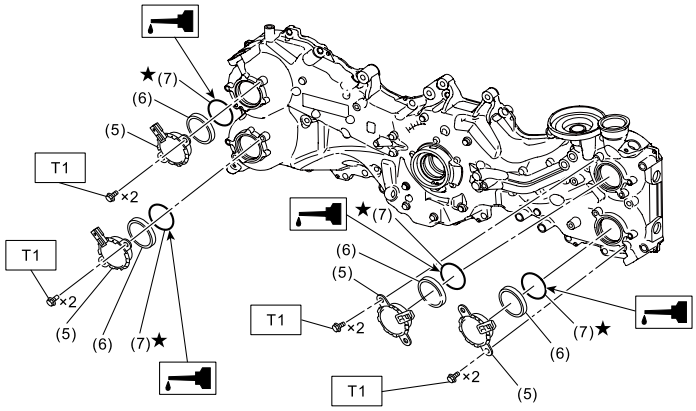


(1) Gasket
(2) Throttle body

Tightening torque: N·m (kgf-m, ft-lb)
T: 8 (0.8, 5.9)

5. CRANKSHAFT POSITION SENSOR, CAMSHAFT POSITION SENSOR, KNOCK SENSOR AND OIL CONTROL SOLENOID

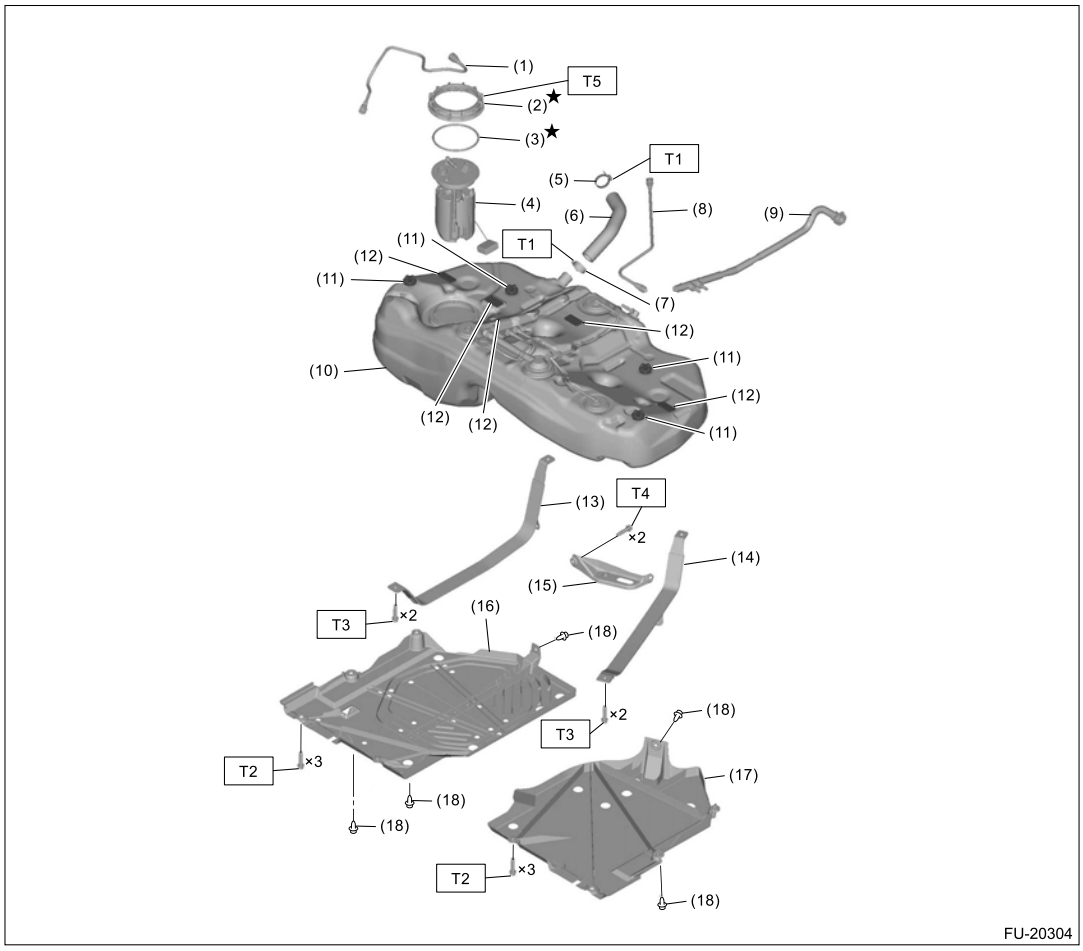




FU-20392

(1) Camshaft position sensor	(5) Oil control solenoid	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) O-ring	(6) Back-up ring	***T1: 6.4 (0.7, 4.7)***
(3) Knock sensor	(7) O-ring	***T2: 25 (2.5, 18.4)***
(4) Crankshaft position sensor		

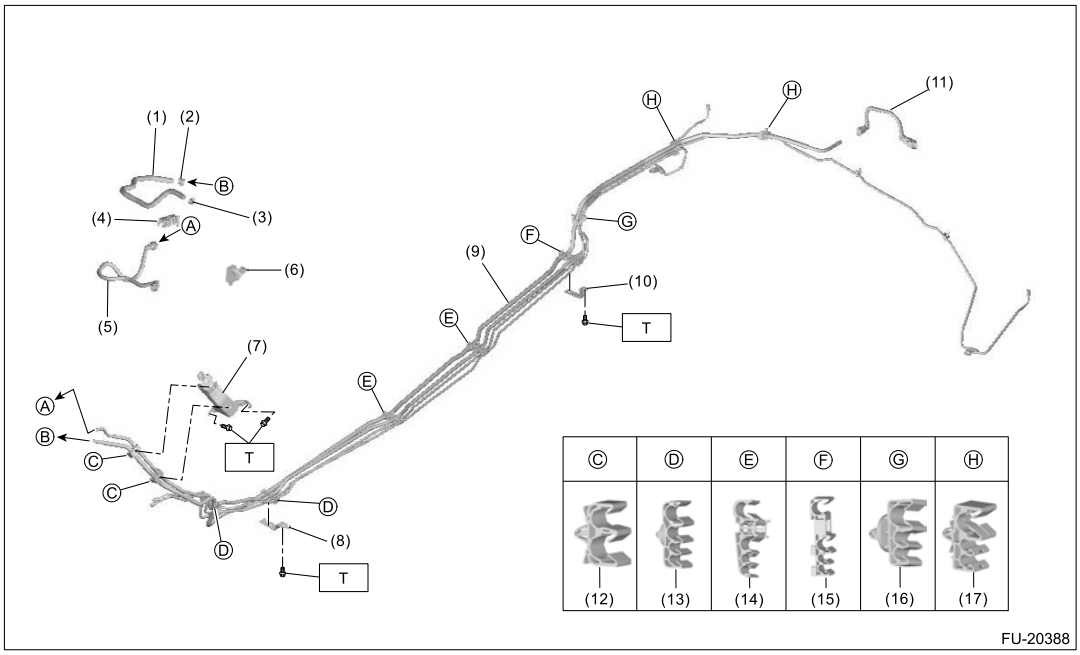
6. FUEL TANK



(1) Fuel delivery tube	(10) Fuel tank	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Ring nut	(11) Cushion	***T1: 2.5 (0.3, 1.8)***
(3) Fuel pump gasket	(12) Cushion	***T2: 18 (1.8, 13.3)***
(4) Fuel pump assembly	(13) Fuel tank band RH	***T3: 33 (3.4, 24.3)***
(5) Clamp	(14) Fuel tank band LH	***T4: 37 (3.8, 27.3)***
(6) Fuel filler hose	(15) Fuel tank band bracket	***T5: 130 (13.3, 95.9)***
(7) Clamp	(16) Fuel tank protector RH	
(8) Circulate tube	(17) Fuel tank protector LH	
(9) Vent tube	(18) Clip	

7. FUEL LINE

- Fuel line 1

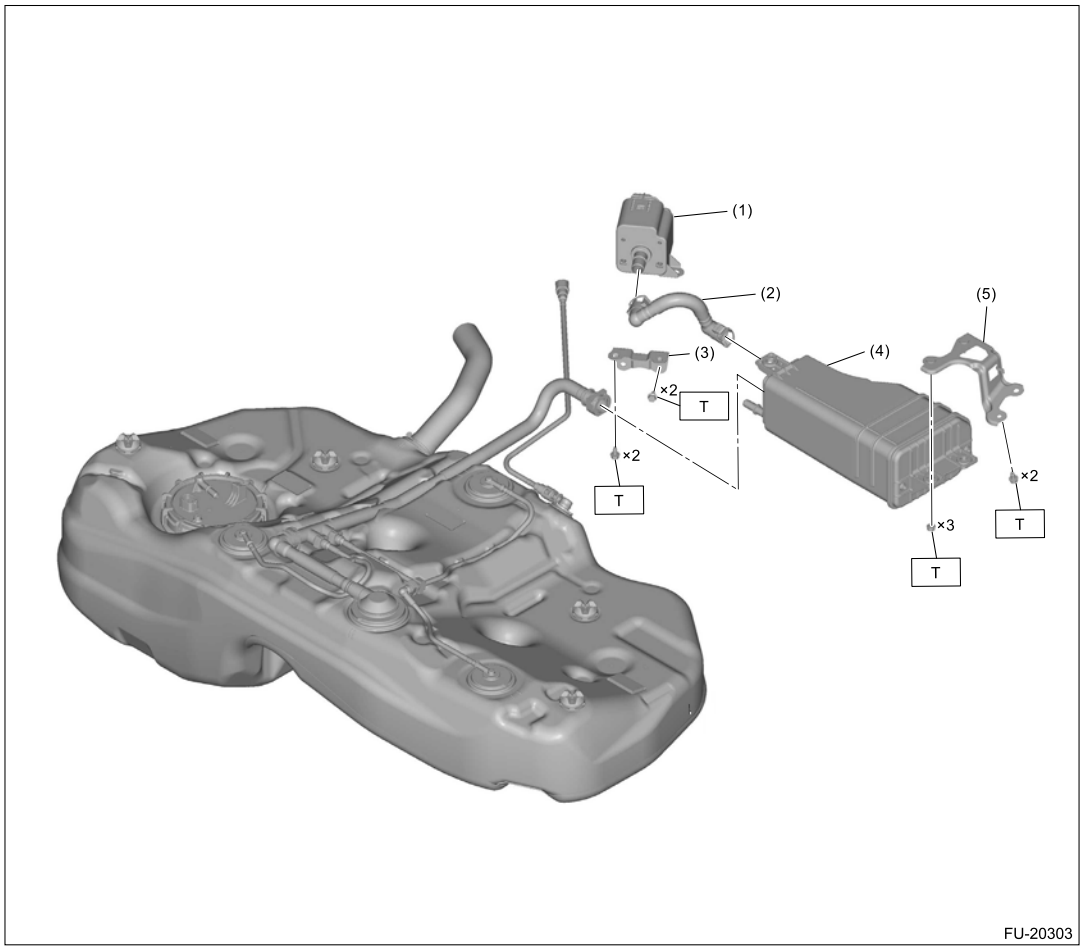


(1) Purge hose
(2) Clip
(3) Clip
(4) Fuel delivery tube clamp
(5) Fuel delivery tube
(6) Tube and hose clamp
(7) Fuel pipe bracket A
(8) Fuel pipe bracket B
(9) Fuel pipe ASSY
(10) Fuel pipe bracket C
(11) Purge tube
(12) Pipe clamp
(13) Pipe clamp
(14) Pipe clamp
(15) Pipe clamp
(16) Pipe clamp
(17) Pipe clamp

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.8, 13.3)

- Fuel line 2



(1) Leak check valve ASSY

(2) Drain tube

(3) Leak check valve ASSY bracket

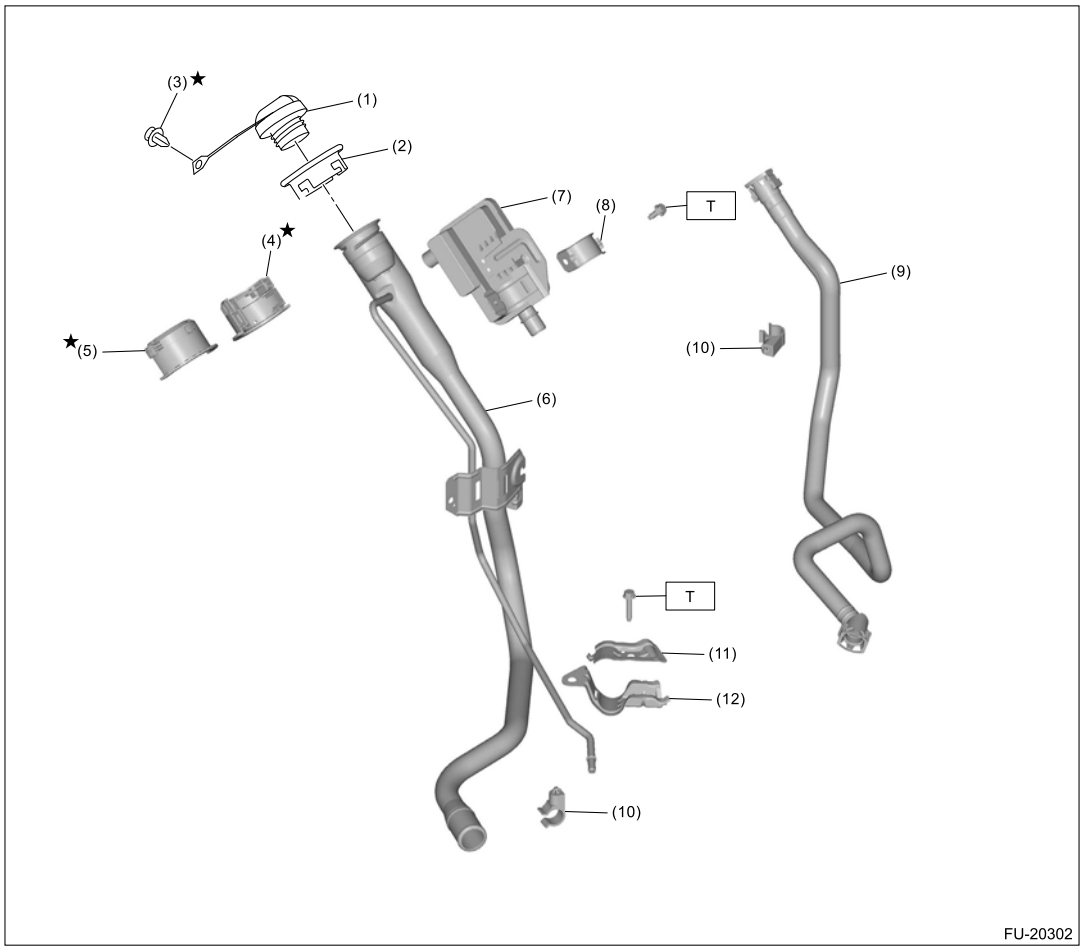
(4) Canister

(5) Canister bracket

Tightening torque: N·m (kgf-m, ft-lb)

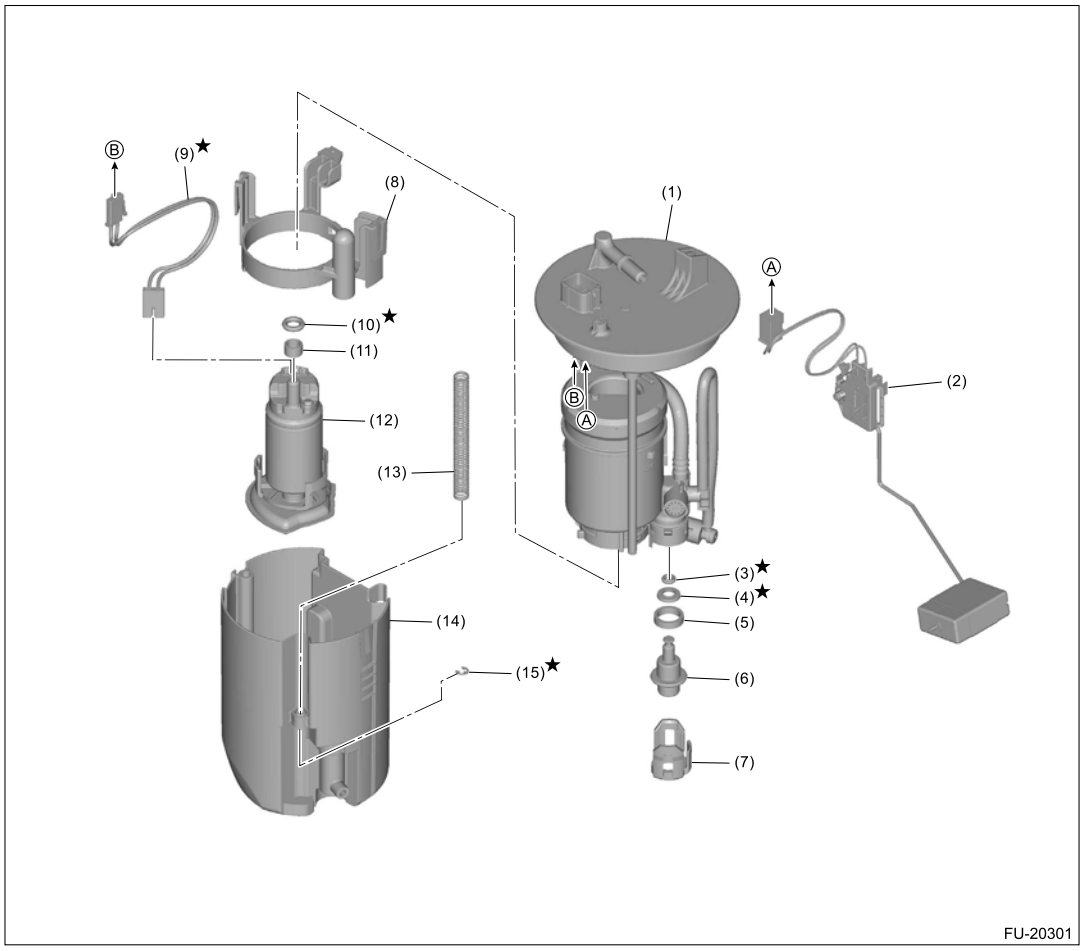
T: 8 (0.8, 5.9)

8. FUEL FILLER PIPE



(1) Fuel filler cap	(6) Fuel filler pipe	(11) Upper bracket
(2) Fuel filler pipe protector	(7) Drain filter assembly	(12) Lower bracket
(3) Clip	(8) Drain filter bracket	
(4) Neck holder A	(9) Drain tube	***Tightening torque: N·m (kgf-m, ft-lb)***
(5) Neck holder B	(10) Tube clamp	***T: 7.5 (0.8, 5.5)***

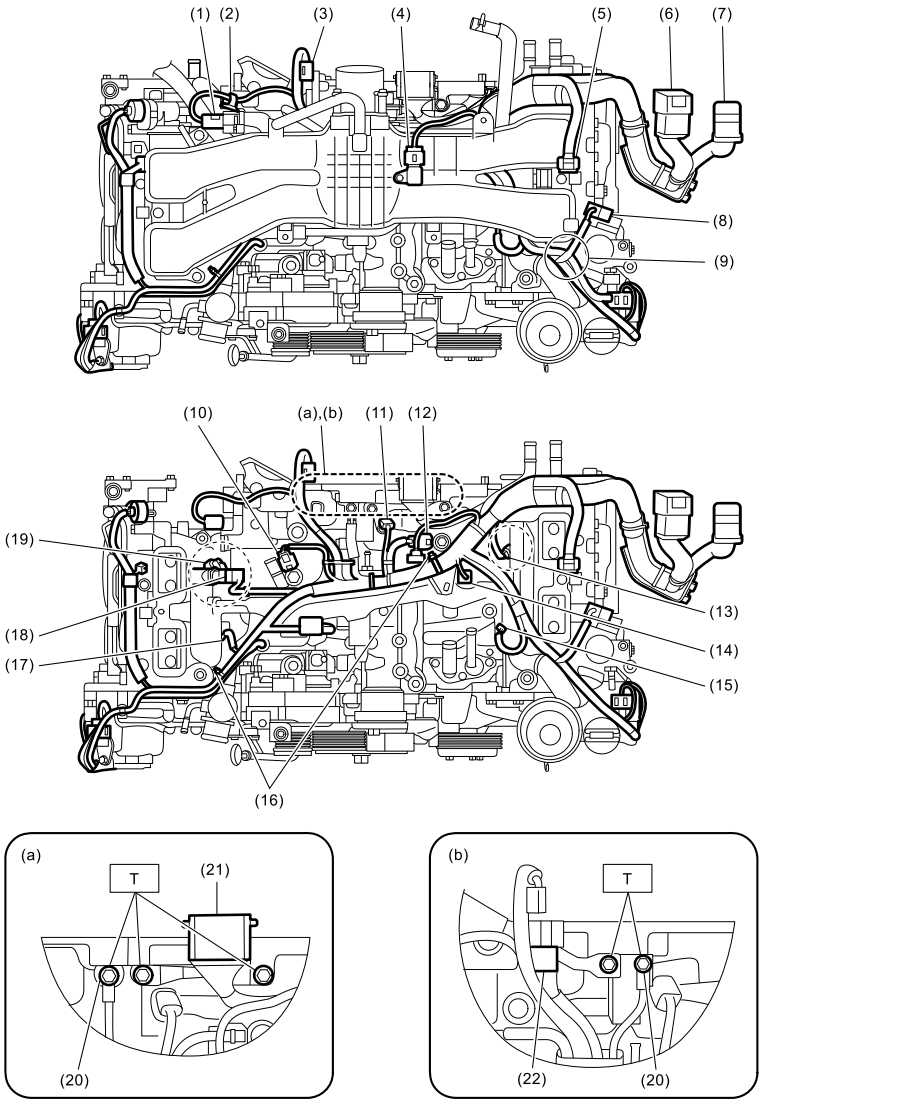
9. FUEL PUMP



(1) Fuel filter ASSY	(6) Pressure regulator	(11) Spacer
(2) Fuel level sensor	(7) Pressure regulator cap	(12) Fuel pump
(3) O-ring	(8) Fuel pump holder	(13) Spring
(4) O-ring	(9) Connector cable	(14) Fuel chamber ASSY
(5) Back-up ring	(10) O-ring	(15) Clip

10. ENGINE WIRING HARNESS

- Structural diagram 1



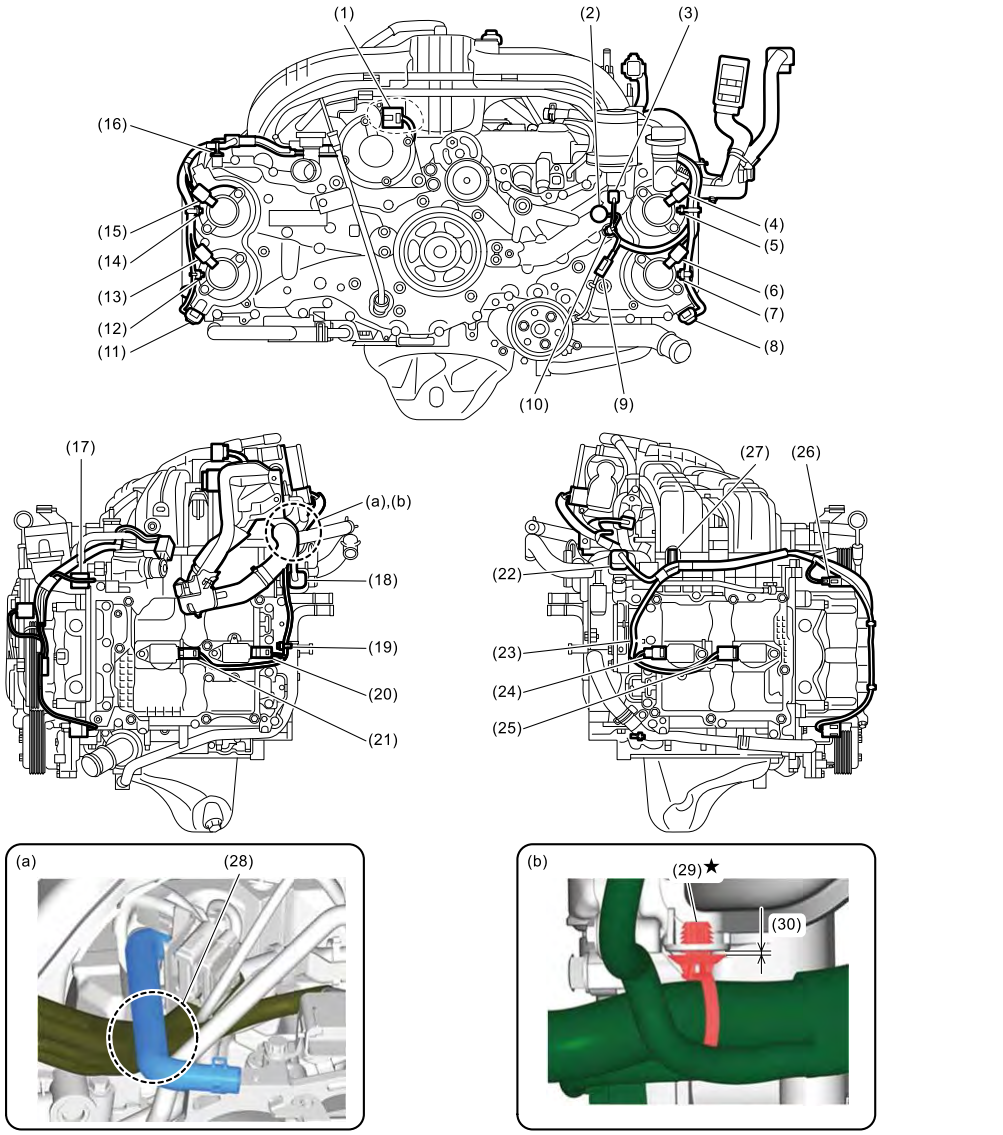
FU-20351

(1) Purge control solenoid valve connector
(2) Secure the clip to the purge control solenoid valve bracket.
(3) Throttle position sensor connector
(4) Manifold absolute pressure sensor connector
(5) Multi-wire connector
(6) ECM connector (114P)
(7) M/B connector (76P)
(8) High-pressure fuel pump connector
(9) Pass the harness of high-pressure fuel pump on the upper side of fuel delivery pipes.
(10) Knock sensor connector RH side
(11) Crankshaft position sensor connector
(12) Knock sensor connector LH side
(13) Fuel injector connector (#4)
(14) Engine coolant temperature sensor connector
(15) Fuel injector connector (#2)
(16) Secure a clip to the water tank pipe assembly.
(17) Fuel injector connector (#1)
(18) Fuel pressure sensor connector
(19) Fuel injector connector (#3)
(20) Engine ground
(21) CVT docking connector (secured to engine wiring harness stay)
(22) MT docking connector (secured to engine wiring harness stay)

Tightening torque: N·m (kgf-m, ft-lb)

T: 19 (1.9, 14.0)

- Structural diagram 2



FU-21665

(1) EGR control valve connector
(2) Oil pressure switch
(3) Engine oil temperature sensor connector
(4) Intake oil control solenoid connector LH
(5) Secure the clip to the screw hole.
(6) Exhaust oil control solenoid connector LH
(7) Secure the clip to the screw hole.
(8) Exhaust camshaft position sensor connector LH
(9) Oil level switch
(10) Secure the clip to the screw hole.
(11) Exhaust camshaft position sensor connector RH
(12) Secure the clip to the screw hole.
(13) Exhaust oil control solenoid connector RH
(14) Secure the clip to the screw hole.
(15) Intake oil control solenoid connector RH
(16) Secure the clip to the screw hole.
(17) Intake camshaft position sensor LH
(18) Tumble generator valve actuator connector LH

(19) Secure the clip to the screw hole.
(20) Ignition coil connector (#4)
(21) Ignition coil connector (#2)
(22) Tumble generator valve actuator connector RH
(23) Secure the clip to the screw hole.
(24) Ignition coil connector (#3)
(25) Ignition coil connector (#1)
(26) Intake camshaft position sensor RH
(27) Secure a clip to the intake manifold assembly.
(28) Route the PCV hose to upper side, and route the engine wiring harness to under side.
(29) Clip
(30) The gap after the stopper is inserted must be 3 mm (0.12 in) or less.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Place "NO OPEN FLAMES" signs near the working area.
- Always ventilate sufficiently after removing/installing the fuel system components.
- Prepare a container and cloth to prevent scattering of fuels when performing work where fuels can be spilled. If the oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Always inspect for fuel leaks after removing/installing the fuel system components.
- Follow all government and local regulations concerning disposal of refuse when disposing fuel.
- Always use new application oil during work.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

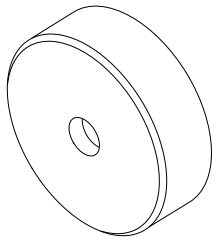
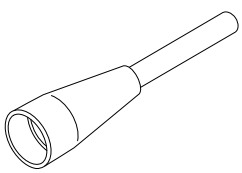
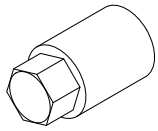
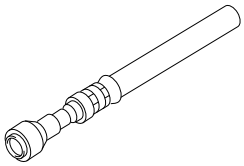
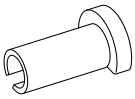
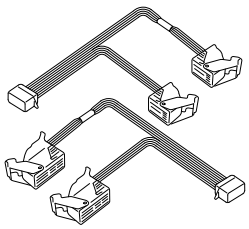
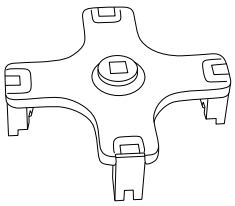
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18271AA020	18271AA020 (Newly adopted tool)	ADJUSTER	Used for installing the fuel injector seal.
 ST18671AA050	18671AA050 (Newly adopted tool)	GUIDE	Used for installing the fuel injector seal.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20399AG000	20399AG000	STRUT MOUNT SOCKET	Used for removing and installing the engine coolant temperature sensor and engine oil temperature sensor. **Note:** **STRUT MOUNT SOCKET (20099PA000) can also be used.**
 ST42075AG690	42075AG690	FUEL HOSE	Used for draining fuel. **Note:** **This is the SUBARU genuine part.**
 ST42099AE000	42099AE000	QUICK CONNECTOR RELEASE	Used for removing the quick connector on the fuel hose.
 ST18460AA120	18460AA120 (Newly adopted tool)	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.
 ST42099FL000	42099FL000 (Newly adopted tool)	ST FUEL PUMP	Used for removing and installing the fuel pump.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

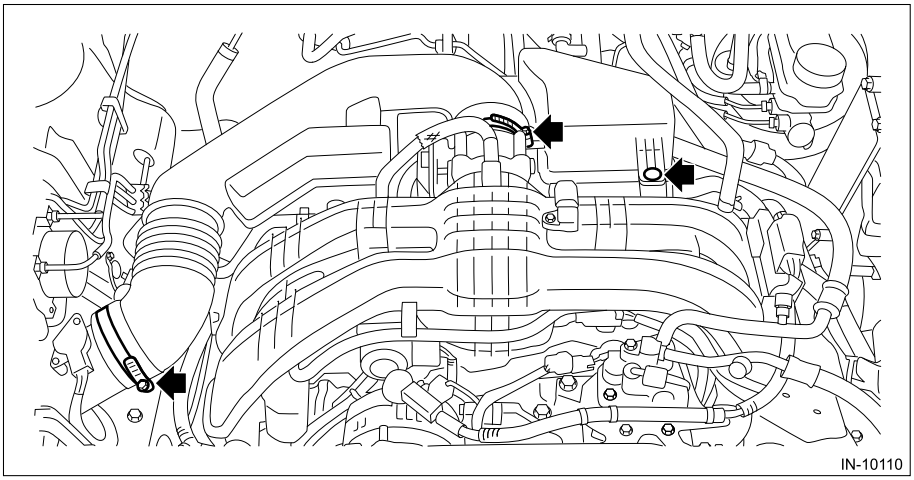
2. GENERAL TOOL

TOOL NAME	REMARKS

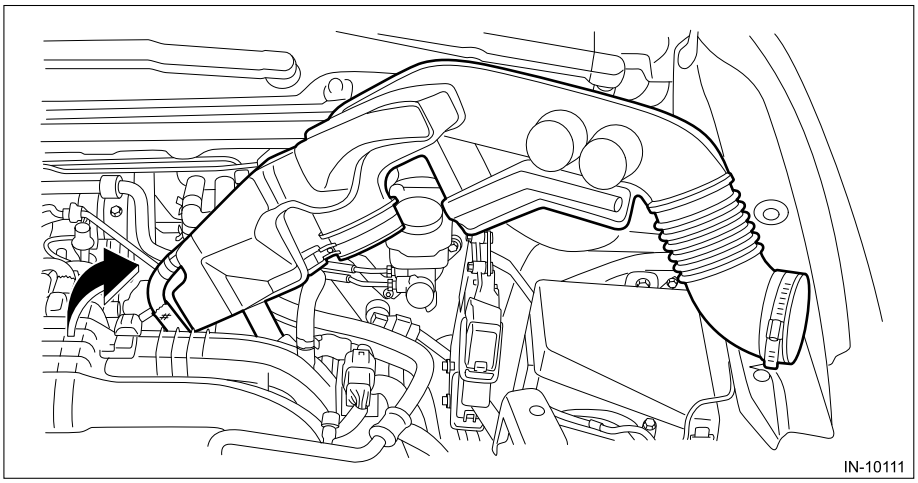
TOOL NAME	REMARKS
TORX® E8	Used for removing and installing EGR control valve stud bolts.
TORX PLUS® 40IP	Used for removing and installing high-pressure fuel pump.
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for inspecting the waveform of each sensor.
Mighty Vac	Used for inspecting the manifold absolute pressure sensor.
DST-i	Used together with Subaru Select Monitor 4.

REMOVAL

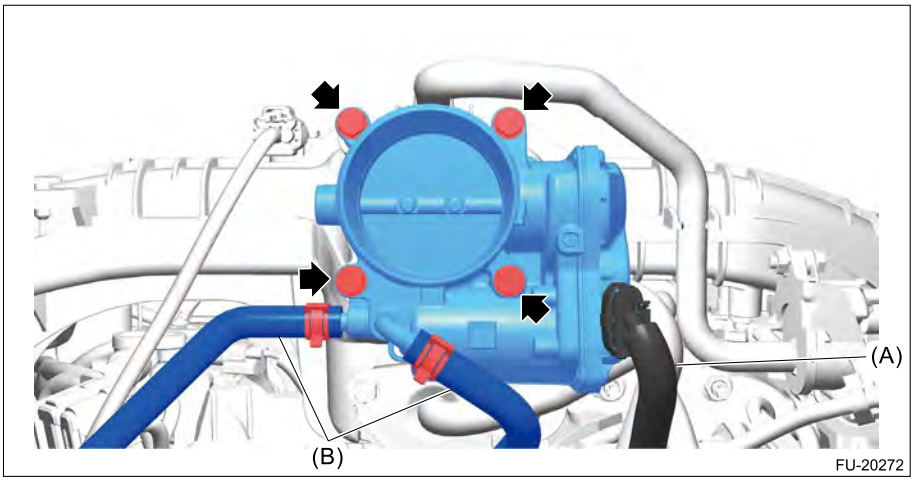
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain approximately 3.0 L (3.2 US qt, 2.6 Imp qt) of engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the clip from the air intake boot, and loosen the clamp.



4. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



5. Disconnect the connectors (A) from the throttle position sensor.
6. Disconnect the preheater hose (B) from the throttle body.
7. Remove the throttle body from the intake manifold assembly.



INSTALLATION

1. Set a new gasket and install the throttle body to the intake manifold assembly.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Connect the connector to the throttle position sensor.
3. Connect the preheater hoses to the throttle body.
4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

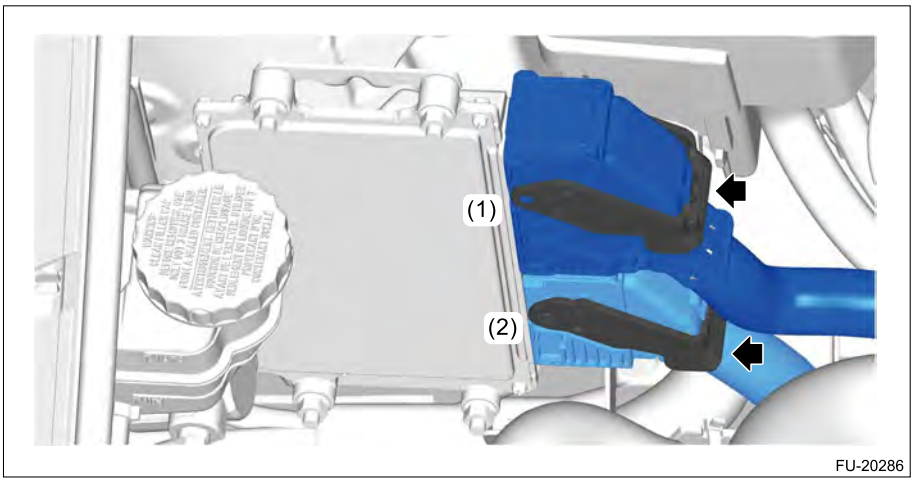
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Throttle Body

INSPECTION

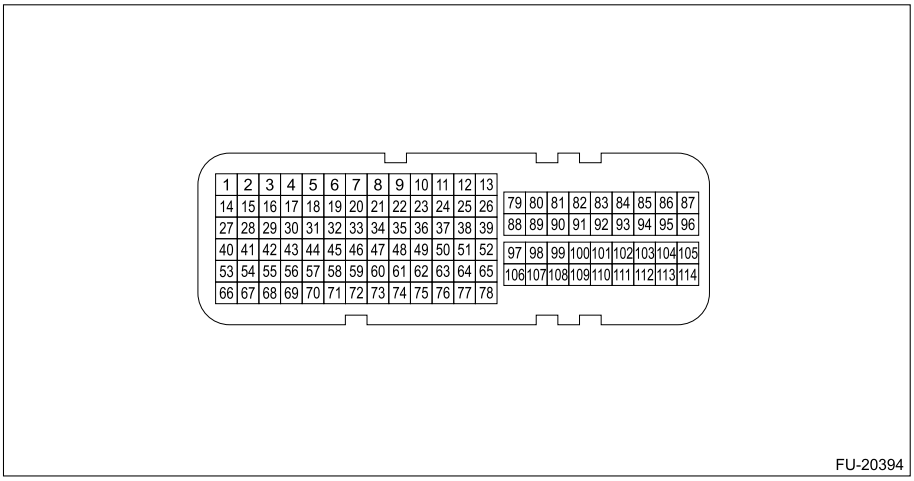
1. THROTTLE SENSOR (METHOD WITH CIRCUIT TESTER)

Note:
Individual difference of the accelerator pedal may not be corrected sufficiently on the ECM side after DTCs were cleared or the battery was removed and installed on the vehicle. Therefore, when the reference voltage is not reached after following the procedure, repeat the ignition switch ON (engine OFF) and ignition switch OFF operations 40 times at intervals of three seconds or more, and then measure the voltage again.

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector from ECM in numerical order as shown in the figure.



3. Attach the ST between the ECM, engine wiring harness and the bulkhead wiring harness. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.
   Special Tool:
   CHECK BOARD (18460AA120)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Turn the ignition switch to ON. (Engine OFF)
6. Measure the voltage between ECM connector terminals.



Throttle sensor	Accelerator pedal	Terminal No.	Standard
Main	Not depressed (full closed)	29 (+) and 30 (−)	Approx. 0.6 — 1.2 V
	Depressed (full opened)		Approx. 3.8 — 4.4 V
Sub	Not depressed (full closed)	43 (+) and 30 (−)	Approx. 1.4 — 2.0 V
	Depressed (full opened)		Approx. 4.0 — 4.6 V

7. After inspection, install the related parts in the reverse order of removal.

Note:

For installation procedures of ECM connectors, refer to Engine Control Module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSTALLATION.

2. THROTTLE SENSOR (METHOD WITH SUBARU SELECT MONITOR)

Note:

- **Individual difference of the accelerator pedal may not be corrected sufficiently on the ECM side after DTCs were cleared or the battery was removed and installed on the vehicle. Therefore, using the Subaru Select Monitor, check that the accelerator opening angle signal indicates 100%, when the accelerator pedal is fully depressed, and then perform the inspection.**
- **If the accelerator opening angle signal does not indicate 100%, check the accelerator pedal. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal>INSPECTION.**

1. Turn the ignition switch to ON. (Engine OFF)
2. While reading the accelerator opening angle signal and throttle sensor voltage using Subaru Select Monitor, depress the accelerator pedal to fully open and fully closed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

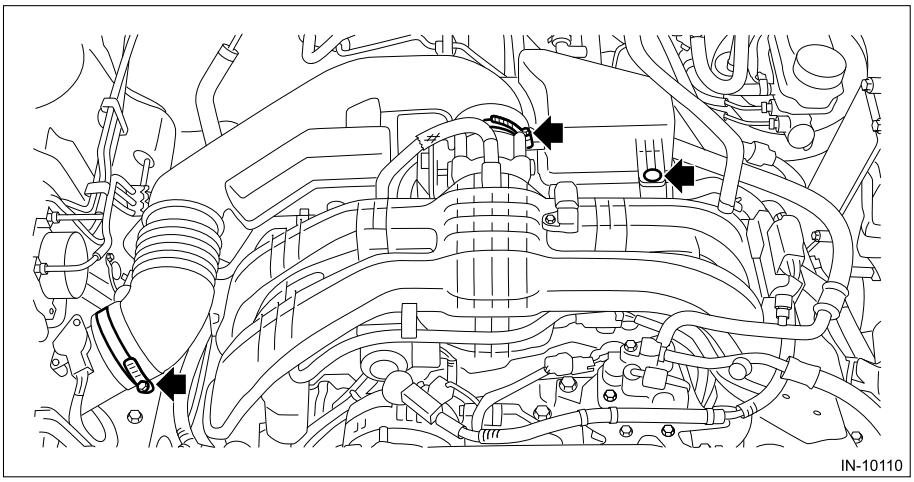
Throttle sensor	Acceleration opening angle signal	Standard
Main	0.0%	Approx. 0.6 — 1.2 V
	100.0%	Approx. 3.8 — 4.4 V
Sub	0.0%	Approx. 1.4 — 2.0 V
	100.0%	Approx. 4.0 — 4.6 V

3. OTHER INSPECTIONS

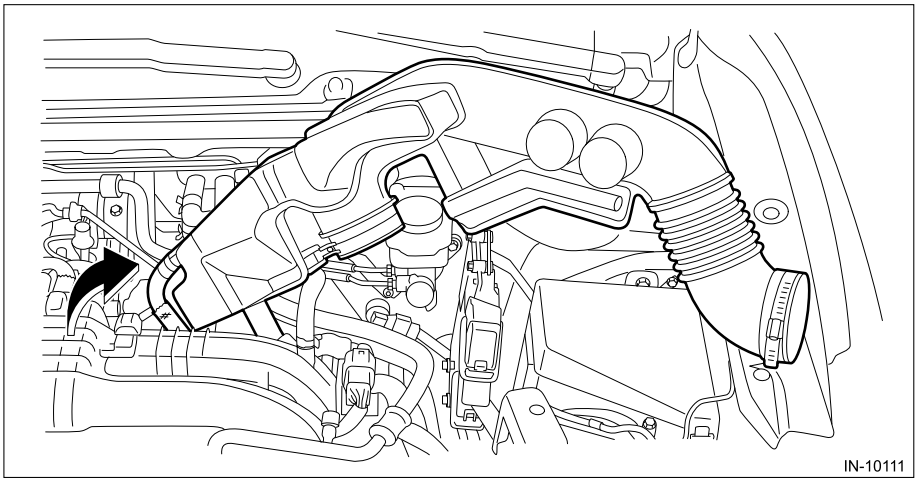
1. Check that the throttle body has no deformation, cracks or other damages.
2. Check that the preheater hose has no cracks, damage or loose part.

REMOVAL

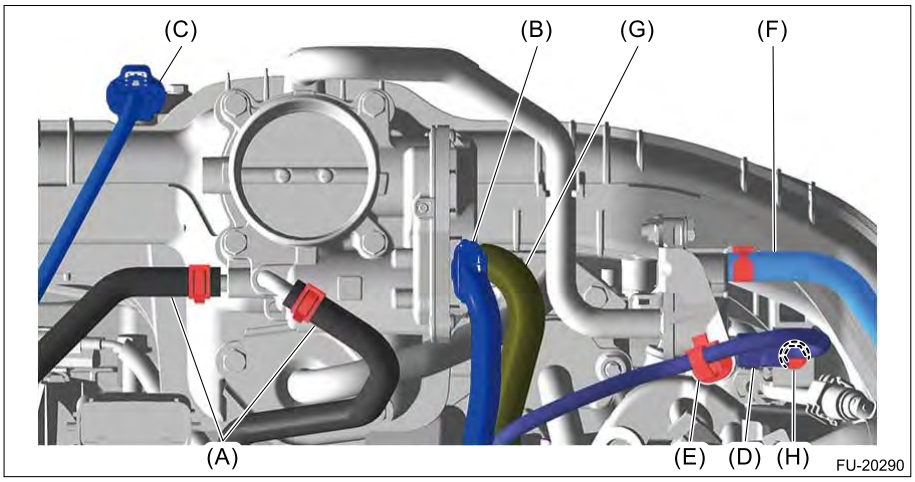
1. If the fuel delivery tube is disconnected after removing the intake manifold assembly, perform the following work.
   (1) Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
   (2) Open the fuel filler lid and remove the fuel filler cap.
   Note:
   This operation is required to release the inner pressure of the fuel tank.
2. Remove the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
3. Drain approximately 3.0 L (3.2 US qt, 2.6 Imp qt) of coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
4. Remove the clip from the air intake boot, and loosen the clamp.



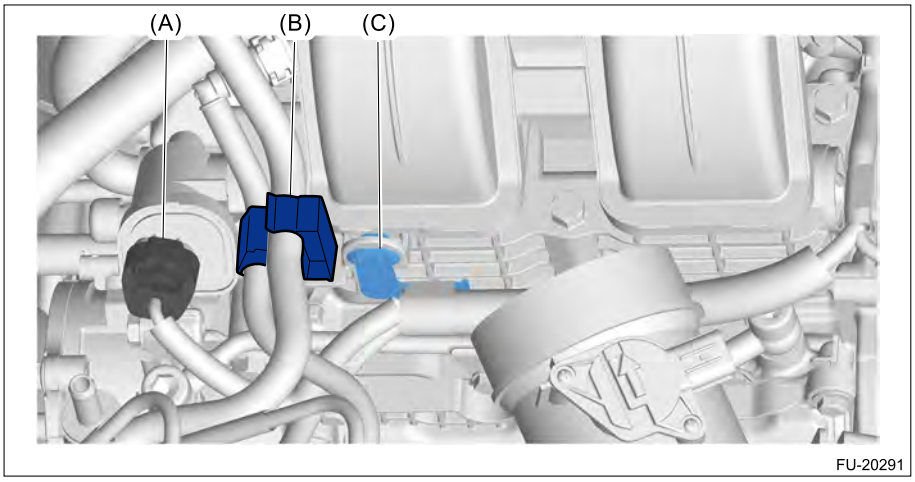
5. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



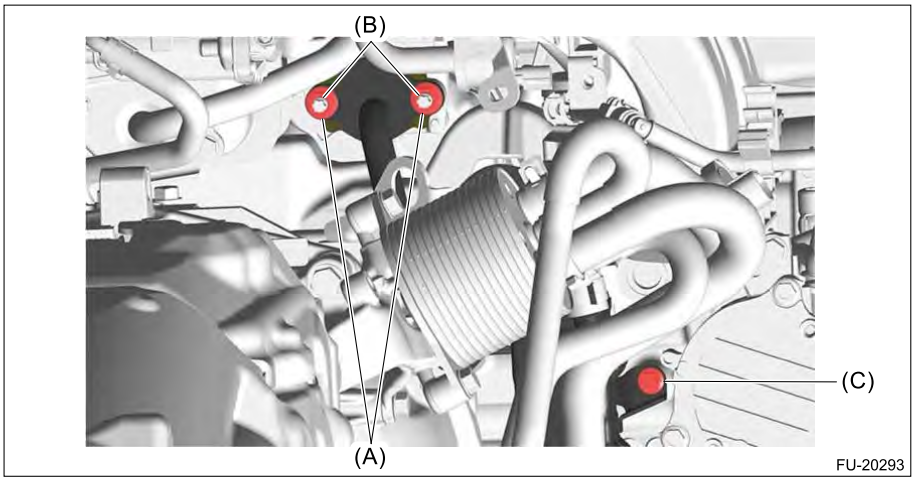
6. Disconnect the preheater hose (A) from the throttle body, and disconnect the connector (B).
7. Disconnect the connector (C) from manifold absolute pressure sensor.
8. Disconnect the connector (D) from the purge control solenoid valve, and remove clip (E).
9. Disconnect the evaporation hose (F) from the purge control solenoid valve.
10. Disconnect the PCV hose (G).
11. Remove the bolt (H) securing the fuel pipe.



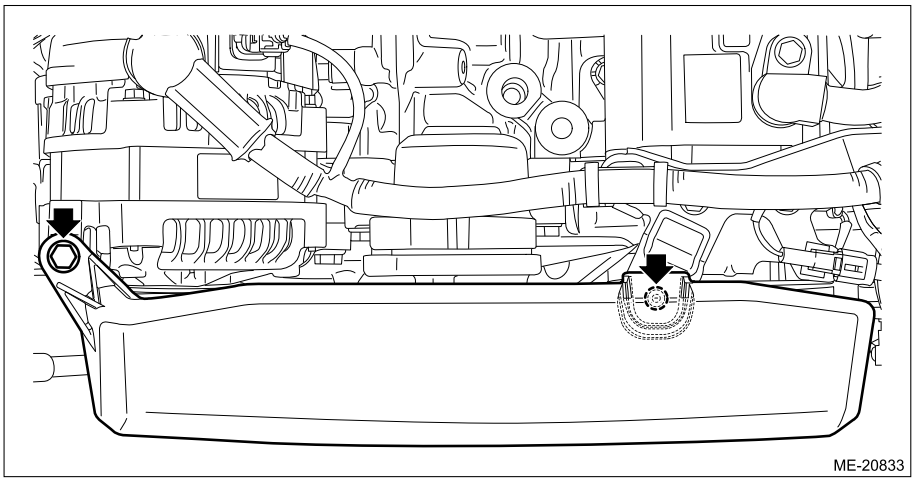
12. Disconnect the connector (A) from the tumble generator valve RH.
13. Remove the fuel delivery tube clamp (B).
14. Remove clip (C) securing the engine wiring harness.



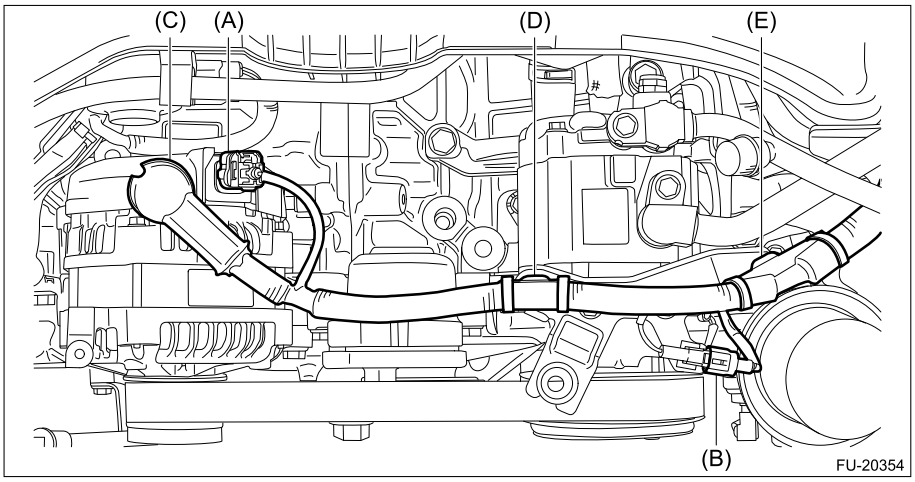
15. Remove nut (A) securing the EGR cooler to the EGR control valve.
16. Remove stud bolt (B) using TORX® E8.
17. Loosen bolts (C) securing the EGR cooler to the cylinder head RH.



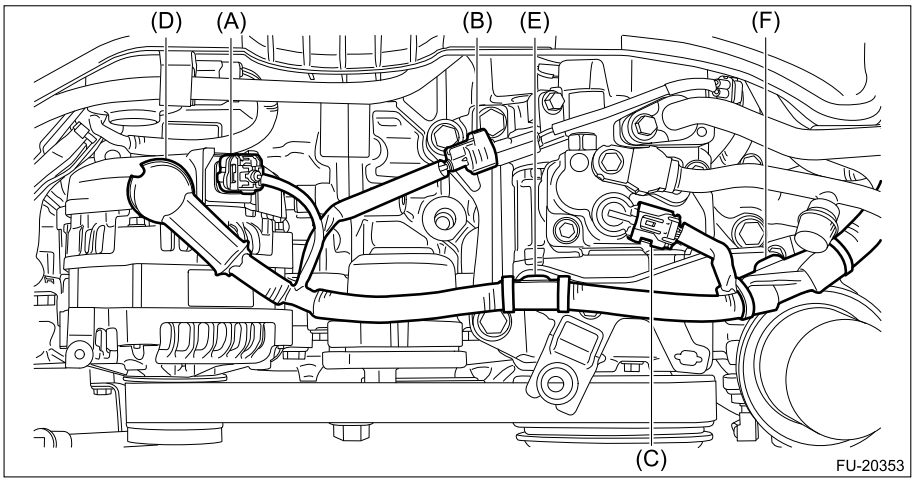
18. Remove the V-belt covers.



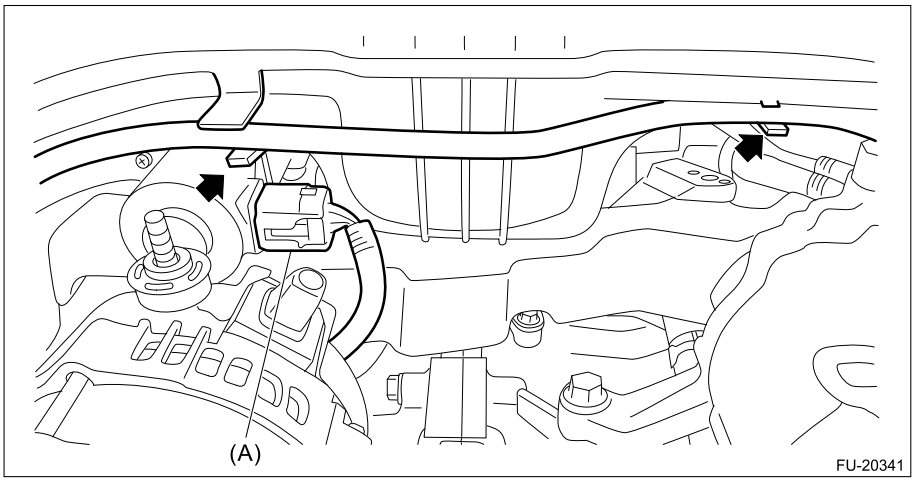
19. Disconnect the connector (A), connector (B) and terminal (C). (Fixed capacity A/C model)
20. Remove the clip (D) and clip (E) that secure the battery cable. (Fixed capacity A/C model)



21. Disconnect the connector (A), connector (B), connector (C) and terminal (D). (Variable capacity A/C model)
22. Remove the clip (E) and clip (F) that secure the battery cable. (Variable capacity A/C model)



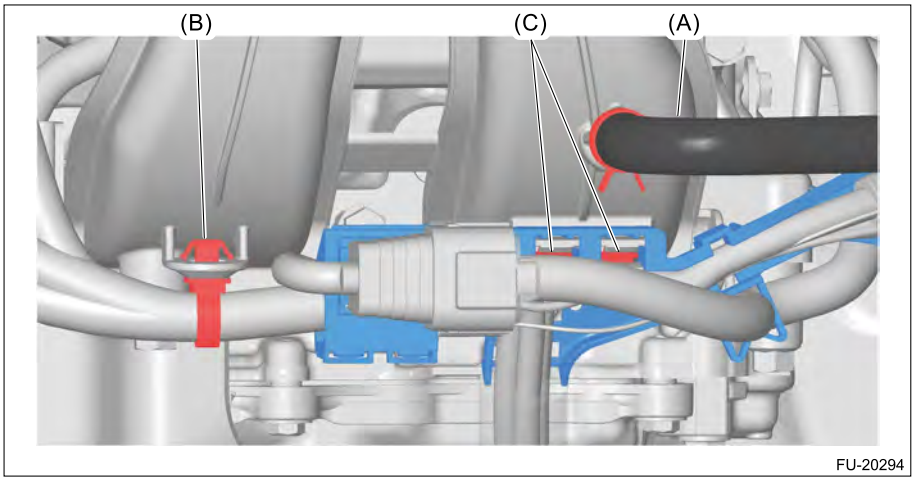
23. Disconnect the connector (A) from the EGR control valve.
24. Remove the fuel delivery tube.



25. Disconnect the brake booster vacuum hose (A).

26. Remove clip (B) securing battery cable.

27. Disengage 2 claws (C) and remove the harness protector.

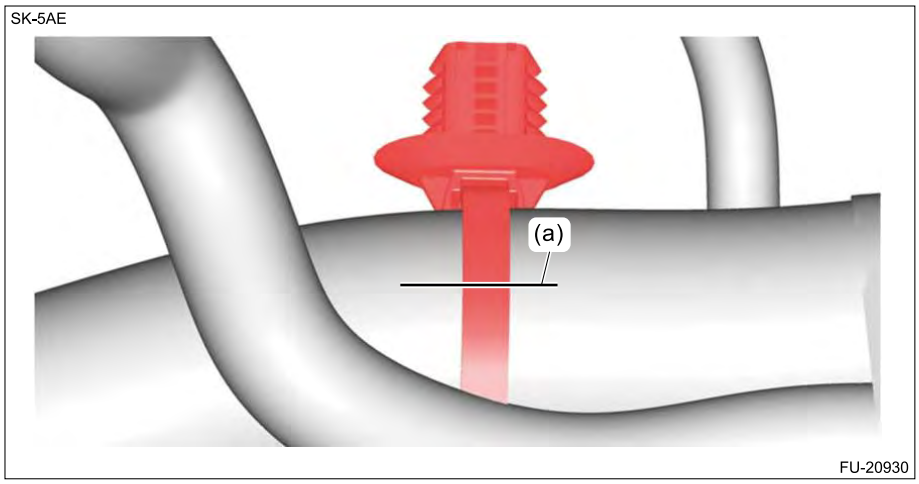


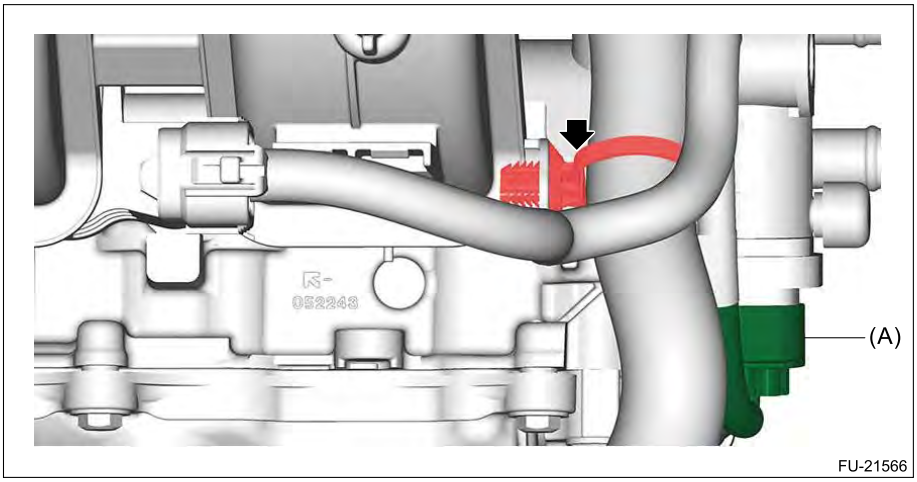
28. Disconnect the connector (A) from the tumble generator valve LH.

29. Use a pair of nippers to cut off the clip securing the engine wiring harness, and remove the clip from the intake manifold assembly.

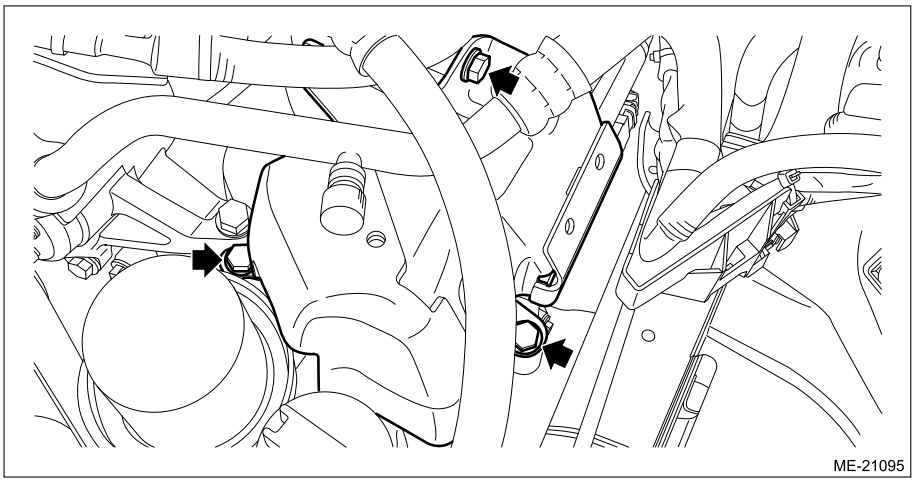
Note:

Put alignment marks (a) on the clip and the engine wiring harness.



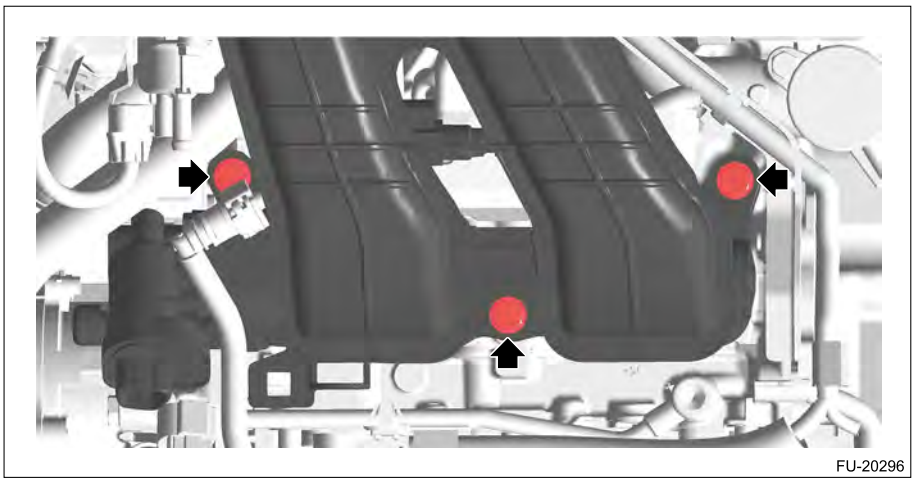


30. Remove the fuel pipe protector.

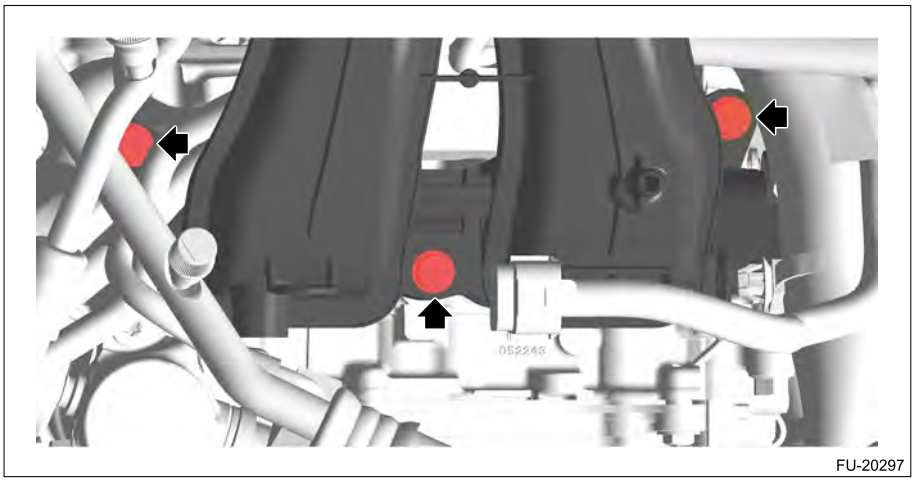


31. Remove the intake manifold assembly.

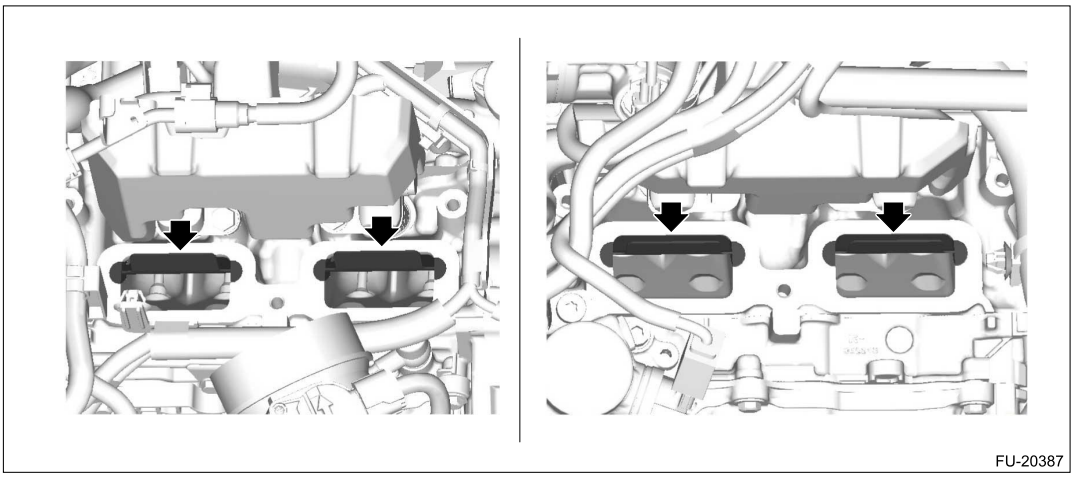
- RH side



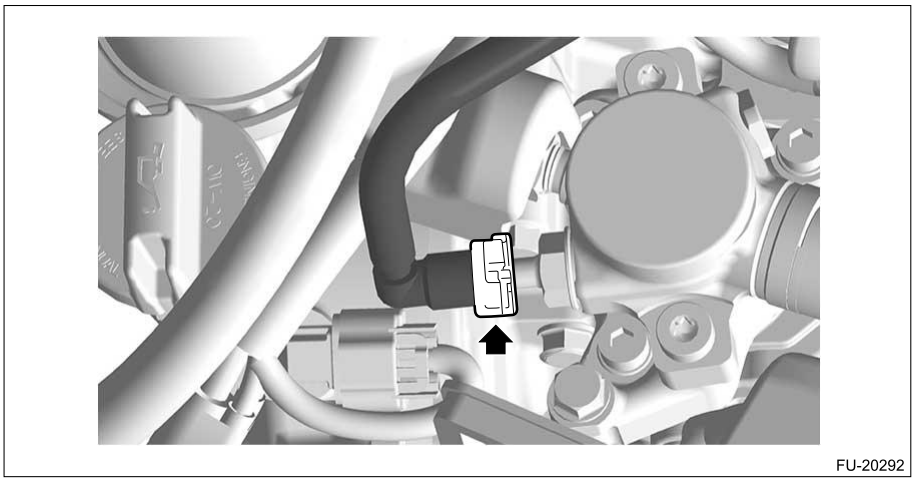
- LH side



32. Remove the cylinder head plate from cylinder head.

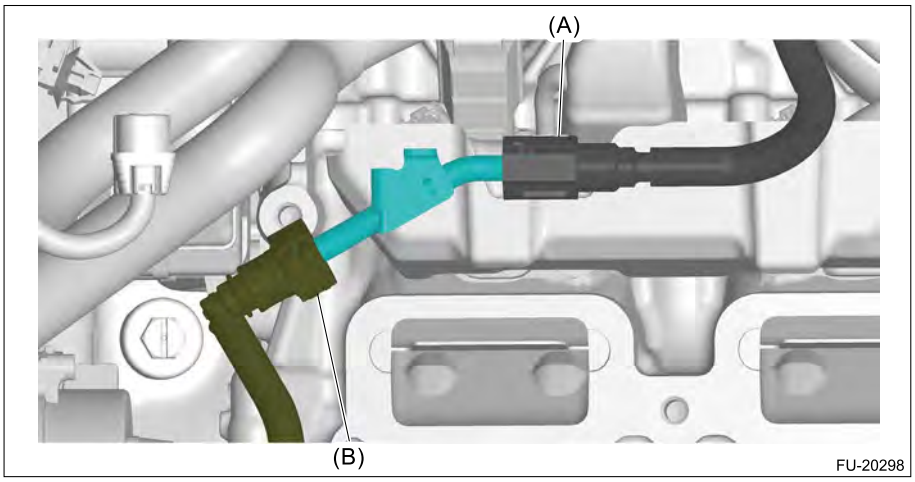


33. Disconnect the fuel delivery pipe from the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE C).



34. Disconnect the fuel delivery pipe (A) from the fuel pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE B).

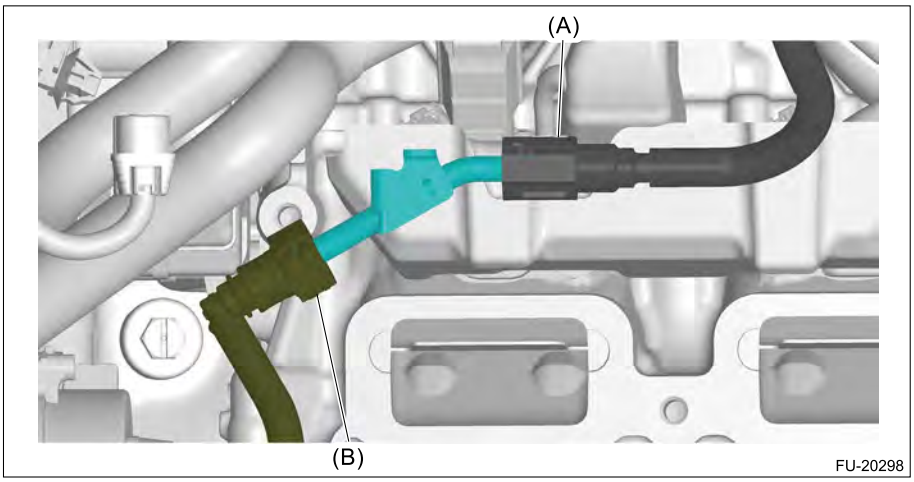
35. Disconnect the fuel delivery cube (B) from the fuel pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE A).



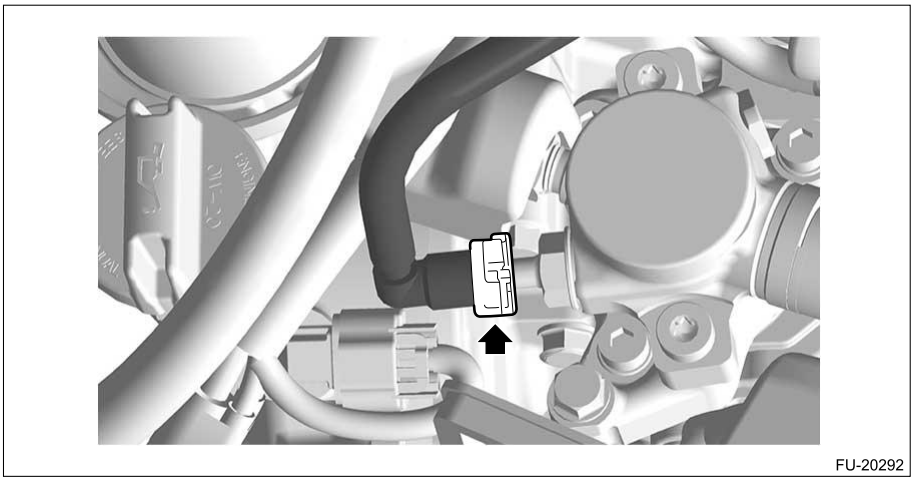
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Intake Manifold Assembly

INSTALLATION

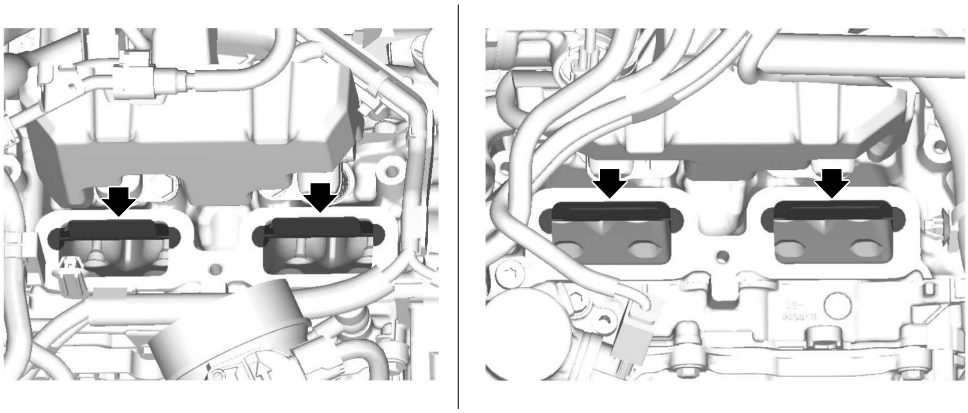
1. Connect the fuel delivery tube (B) to the fuel pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE A).
2. Connect the fuel delivery pipe (A) to the fuel pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE B).



3. Connect the fuel delivery pipe to the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE C).



4. Install the cylinder head plate to the cylinder head.



FU-20387

5. Set a new gasket and install the intake manifold assembly.

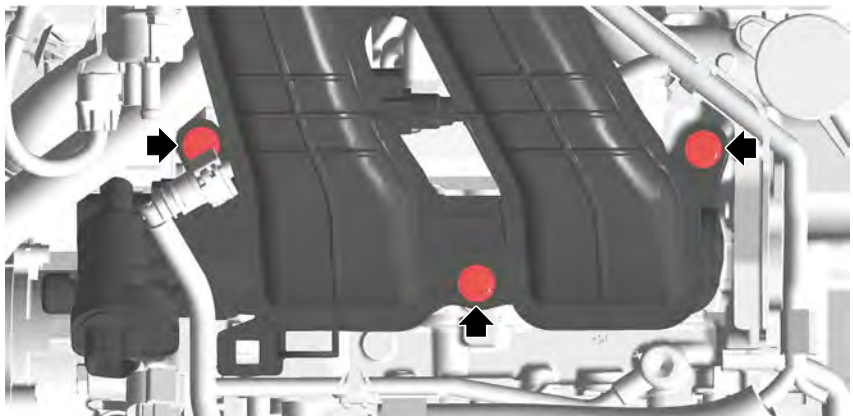
Note:

Be careful not to let the engine wiring harness be caught by the parts.

Tightening torque:

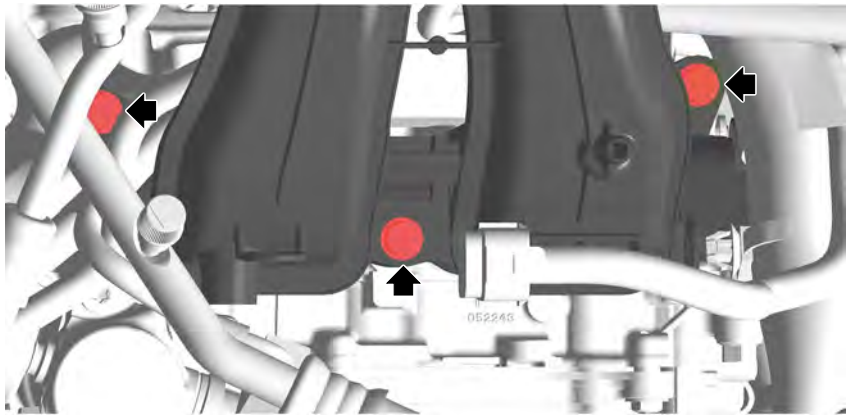
25 N·m (2.5 kgf-m, 18.4 ft-lb)

- RH side



FU-20296

- LH side

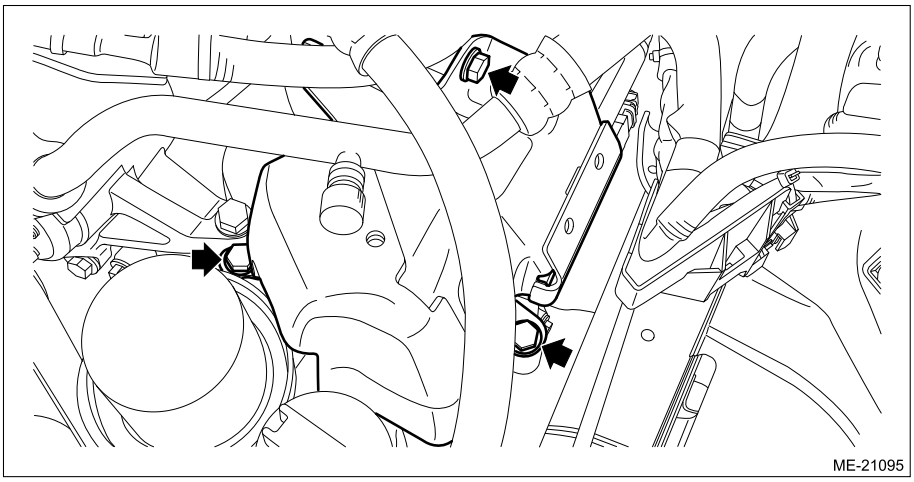


FU-20297

6. Install the fuel pipe protector.

Tightening torque:

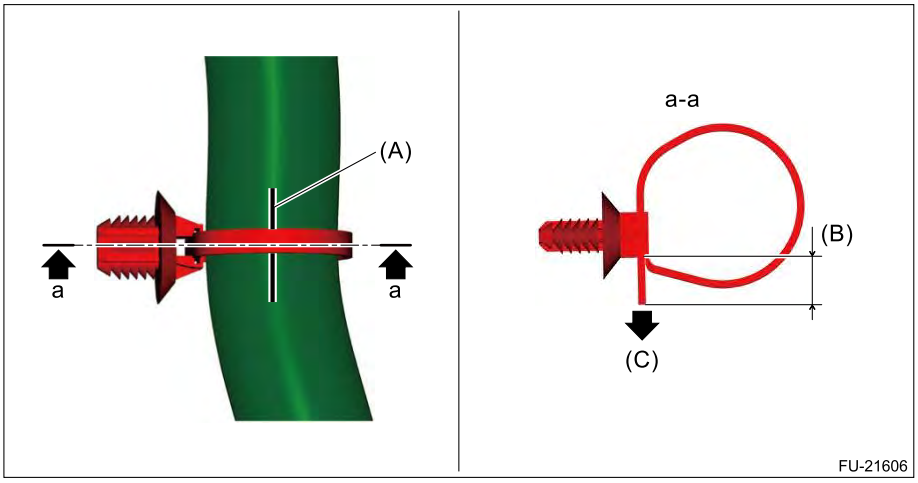
19 N·m (1.9 kgf-m, 14.0 ft-lb)



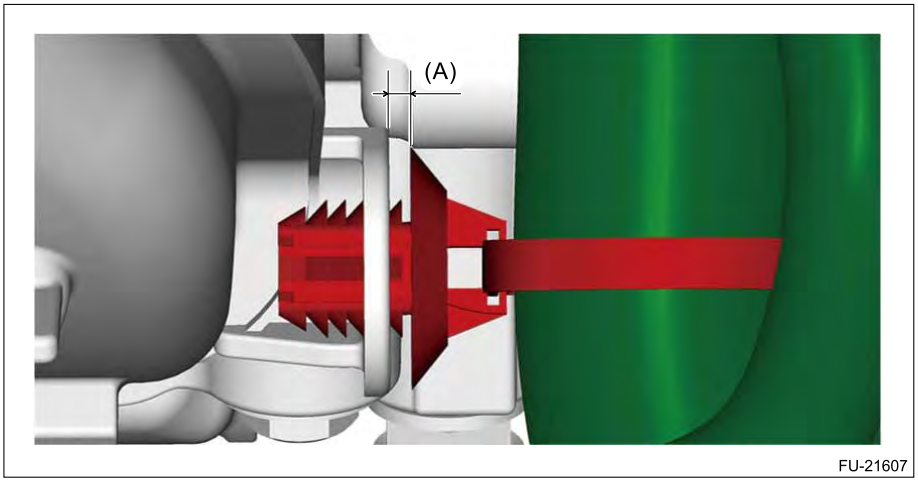
7. Hold the engine wiring harness with a new clip.

(1) Install the clip while aligning the alignment mark (A) of the engine wiring harness so that the band exposed length (B) comes on the vehicle lower side (C).

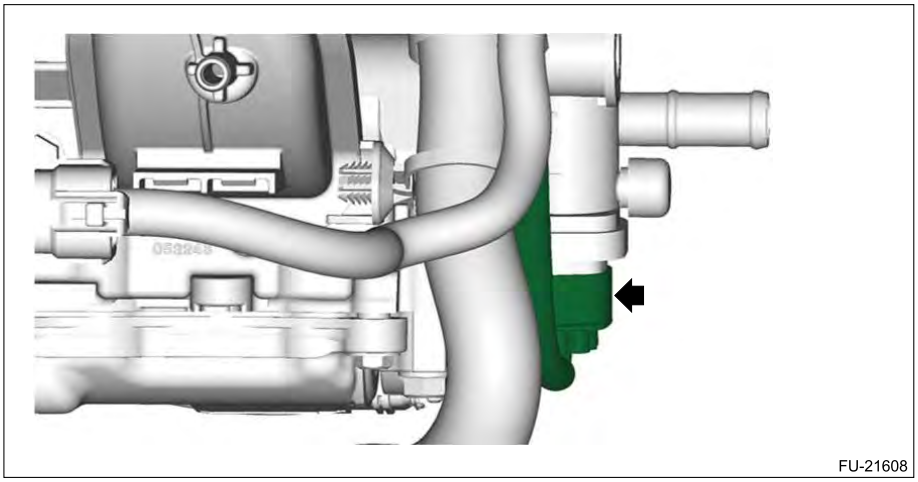
(2) Cut so that the band exposed length (B) becomes 5 mm (0.2 in) or less.



(3) Insert the clip all the way to the end and install so that the gap after inserting (A) becomes 3 mm (0.12 in) or less.



8. Connect the connector to the tumble generator valve LH.



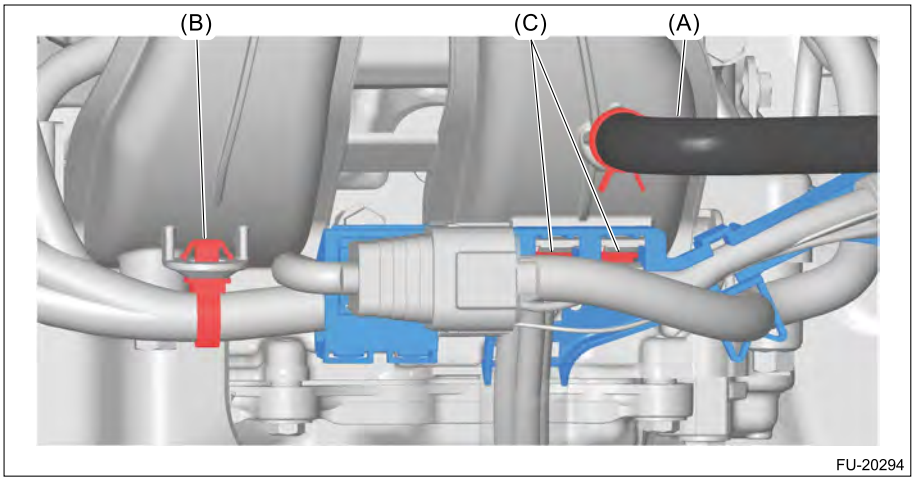
9. Install the harness protector.

Note:

Make sure 2 claws (C) are securely engaged in each position.

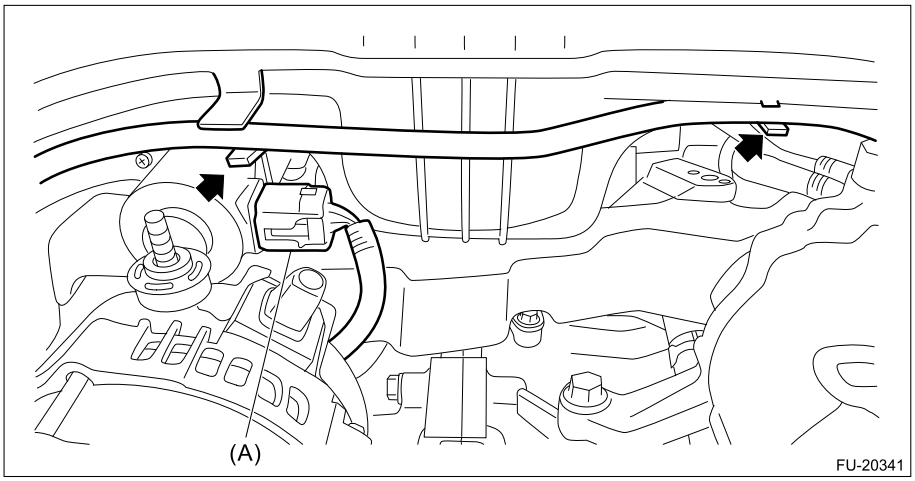
10. Install the clip (B) securing the battery cables.

11. Connect the brake booster vacuum hose (A).



12. Connect the connector (A) to the EGR control valve.

13. Install the fuel delivery tube.

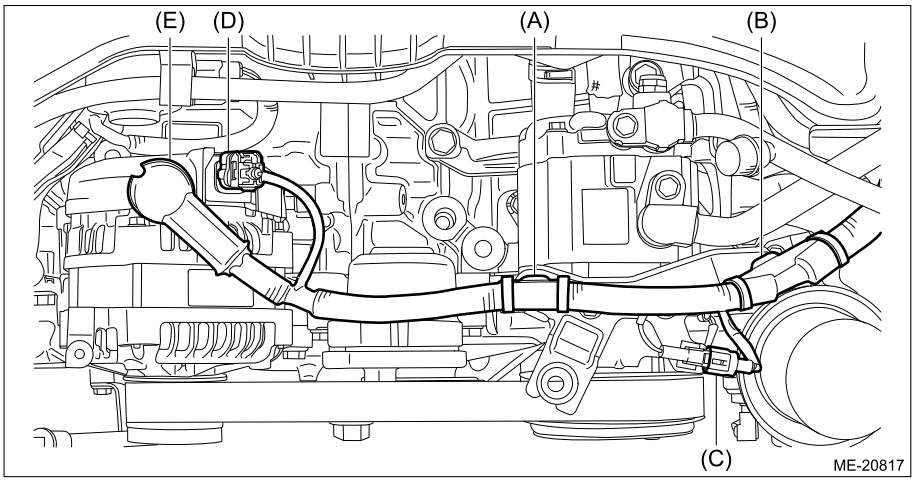


14. Secure the battery cable with the clip (A) and clip (B) in place. (Fixed capacity A/C model)

15. Connect the connector (C), connector (D), and the terminal (E). (Fixed capacity A/C model)

Tightening torque:

15.5 N·m (1.6 kfg-m, 11.4 ft-lb)

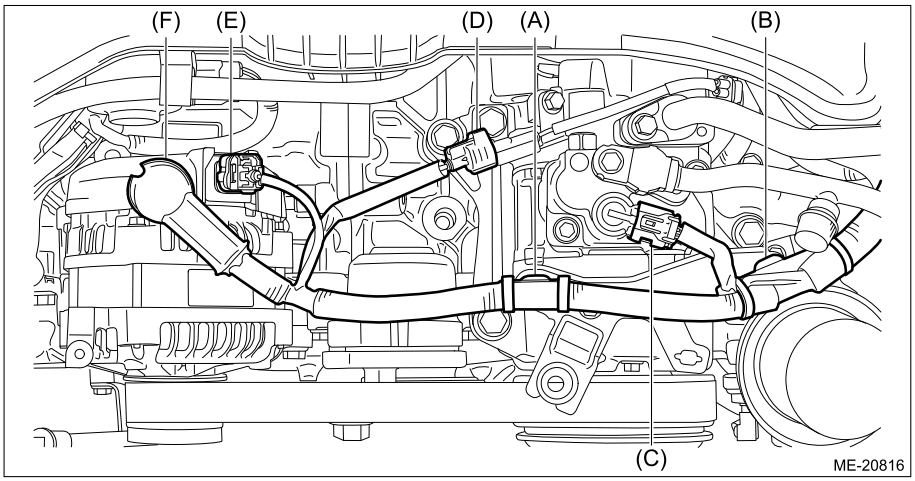


16. Secure the battery cable with the clip (A) and clip (B) in place. (Variable capacity A/C model)

17. Connect the connector (C), connector (D), connector (E), and the terminal (F). (Variable capacity A/C model)

Tightening torque:

15.5 N·m (1.6 kfg-m, 11.4 ft-lb)



18. Install the V-belt cover.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)

19. Set a new gasket, and stud bolt (B) using TORX® E8.

Tightening torque:

5 N·m (0.5 kgf-m, 3.7 ft-lb)

20. Install the nut (A) securing the EGR cooler to the EGR control valve.

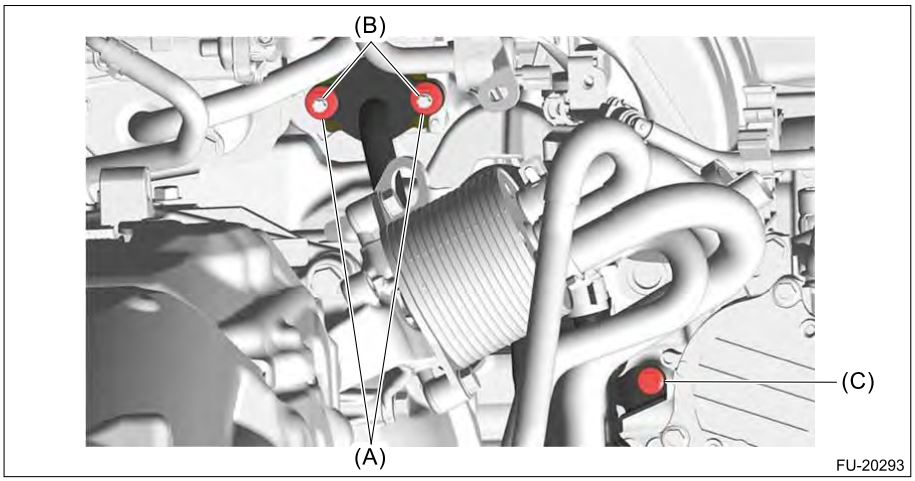
Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)

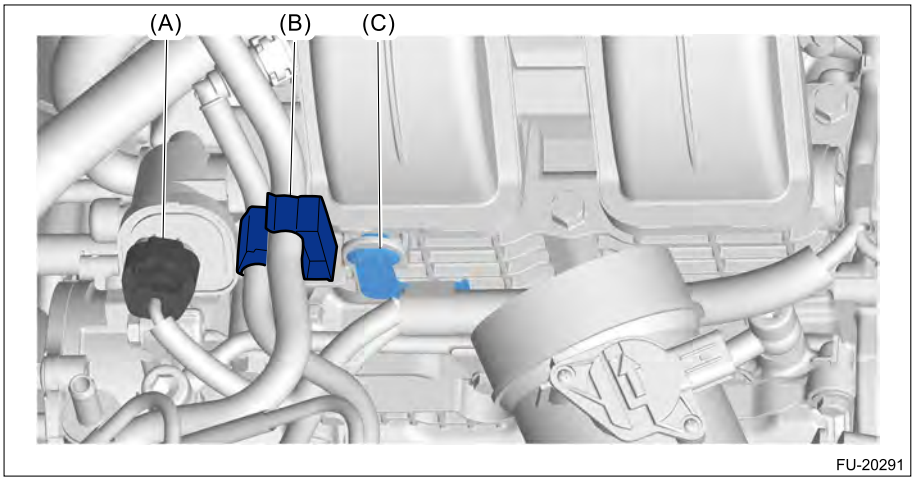
21. Tighten the bolt (C) which secures the EGR cooler to the cylinder head RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

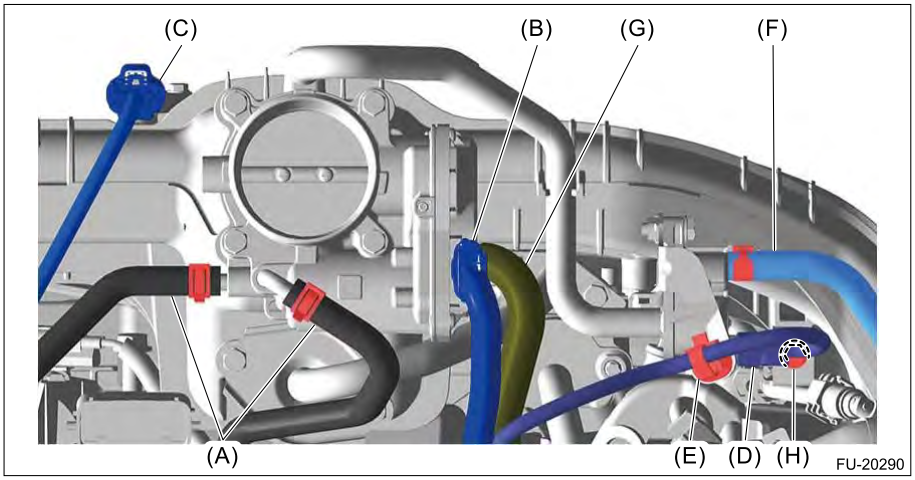


22. Connect the connector (A) to the tumble generator valve RH.
23. Install the fuel delivery tube clamp (B).
24. Install the clip (C) securing the engine wiring harness.



25. Connect the preheater hose (A) to the throttle body, and connect the connector (B).
26. Connect the connector (C) to the manifold absolute pressure sensor.
27. Connect the connector (D) to the purge control solenoid valve, and install clip (E).
28. Connect the evaporation hose (F) to the purge control solenoid valve.
29. Connect the PCV hose (G).
30. Install the bolt (H) securing the fuel pipe.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



31. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
32. Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.
33. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Intake Manifold Assembly

DISASSEMBLY

1. Remove the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>REMOVAL.
2. Remove the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>REMOVAL.
3. Remove the EGR pipe. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Pipe>REMOVAL.
4. Remove the EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Control Valve>REMOVAL.
5. Remove the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor>REMOVAL.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Intake Manifold Assembly

ASSEMBLY

1. Install the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor>INSTALLATION.
2. Install the EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Control Valve>INSTALLATION.
3. Install the EGR pipe. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Pipe>INSTALLATION.
4. Install the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSTALLATION.
5. Install the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Intake Manifold Assembly

INSPECTION

1. Check that the intake manifold assembly and the fuel pipe have no deformation, cracks and other damages.
2. Check that the hose has no cracks, damage or loose part.
3. Check tumble generator valve for contamination or clogging.

SPECIFICATION

The tumble generator valve is integrated in the intake manifold assembly.
Refer to “Intake Manifold Assembly” for removal and installation. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.

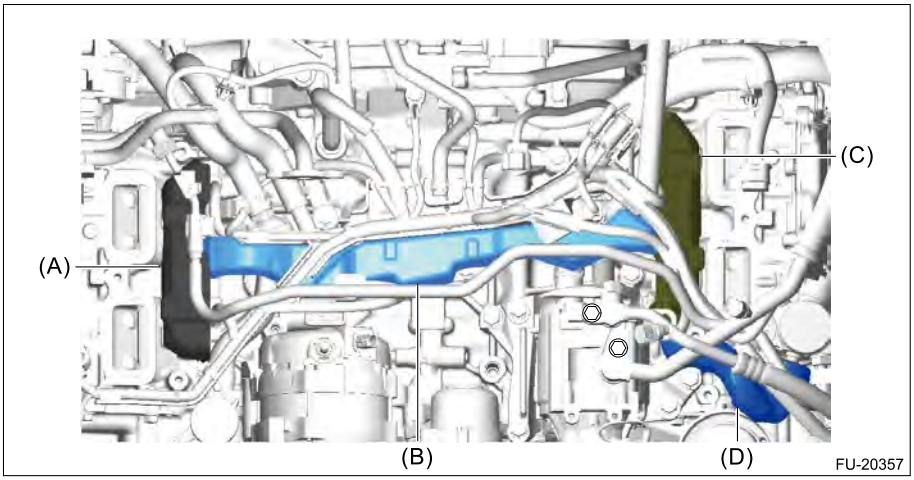
SPECIFICATION

The tumble generator valve actuator must not be removed from the intake manifold assembly since it is integrated in the intake manifold assembly.
Refer to "Intake Manifold Assembly" for removal and installation. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Insulator

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the fuel insulator.



(A) Fuel insulator No. 1 (B) Fuel insulator No. 2 (C) Fuel insulator No. 3
(D) Fuel insulator No. 4

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Insulator

INSTALLATION

1. Install the fuel insulator.
   Caution:
   - **If substantial amount of fuel or parts cleaner come into contact with the fuel insulator, replace it with a new one.**
   - **If only small amount of fuel comes into contact with the fuel insulator, wait for the fuel evaporate before installing it.**
2. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Insulator

INSPECTION

Check that the fuel insulator has no deformation, cracks or other damages.

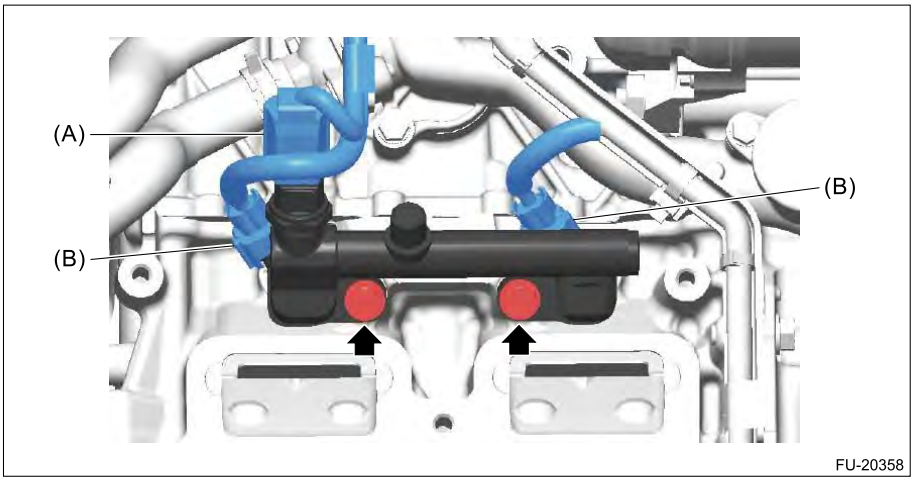
REMOVAL

1. FUEL INJECTOR RH

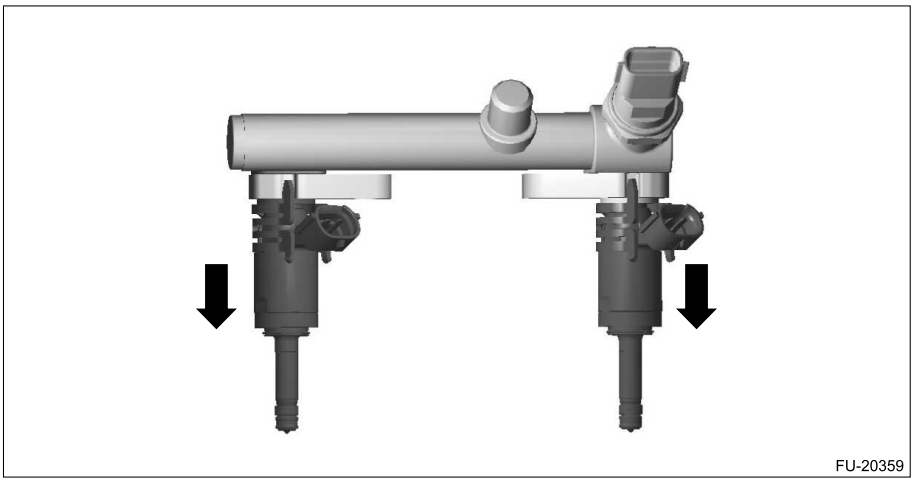
Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
3. Disconnect the connector (A) from the fuel pressure sensor, and disconnect the connector (B) from the fuel injector.
4. Remove the bolts securing the fuel injector pipe RH, and remove the fuel injector and the fuel injector pipe RH as an assembly.



5. Remove the fuel injectors from the fuel injector pipe RH.



2. FUEL INJECTOR LH

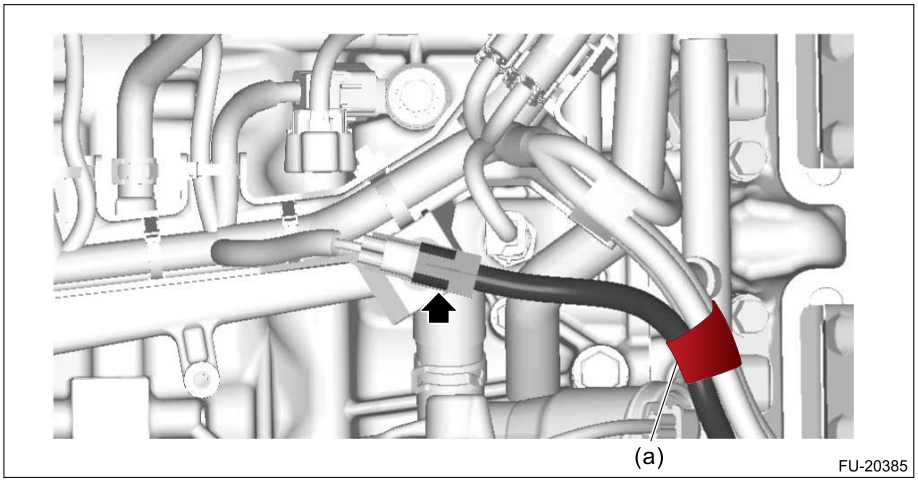
Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

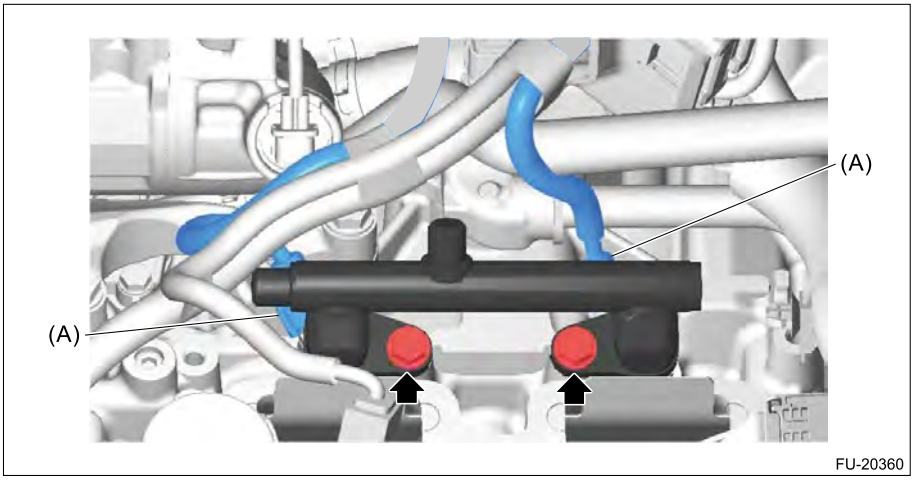
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
3. Remove the high-pressure fuel delivery pipes. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE.
4. Disconnect the connectors (A) from fuel injector.

   Note:

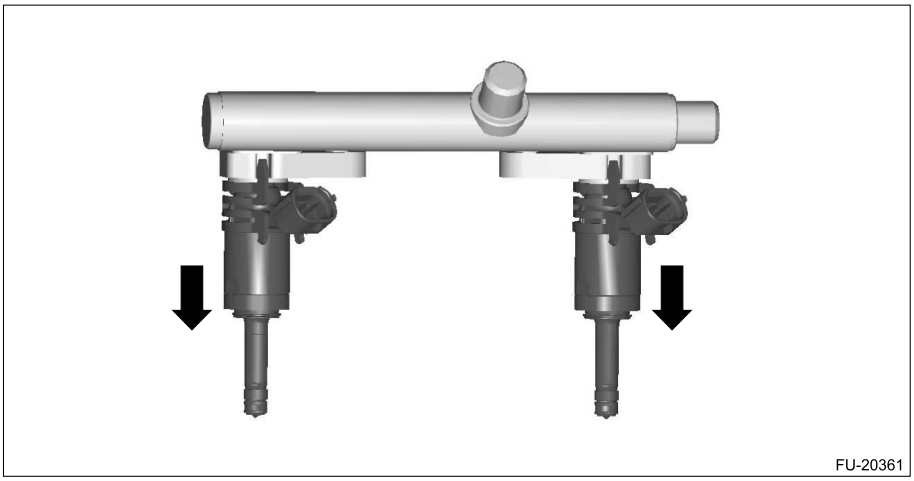
   Disconnect the fuel injector #2 connector of the variable capacity A/C model at the intermediate harness side, and remove the tape (a).



5. Remove the bolts securing the fuel injector pipe LH, and remove the fuel injector and the fuel injector pipe LH as an assembly.



6. Remove the fuel injectors from the fuel injector pipe LH.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Injector

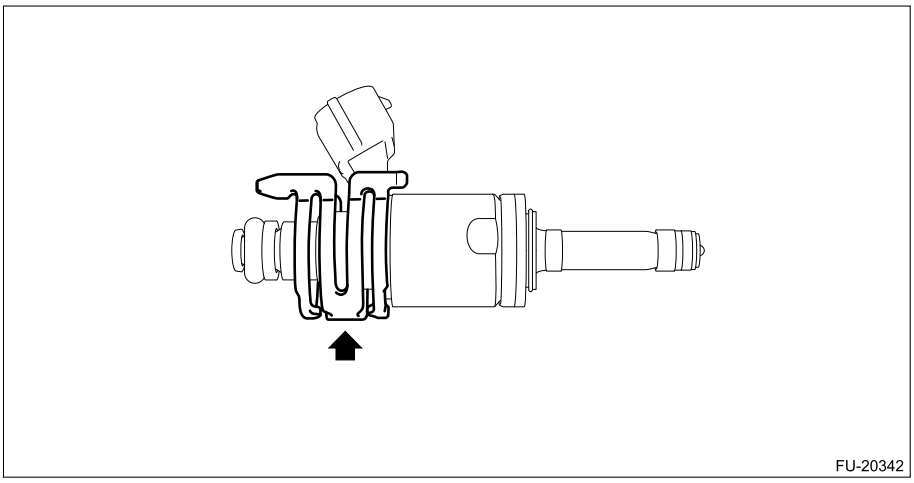
INSTALLATION

1. FUEL INJECTOR RH

1. Replace the following parts with new ones. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REPLACEMENT.

- Fuel injector seal
- Slider washer
- Back-up ring
- O-ring seal
- Stopper ring

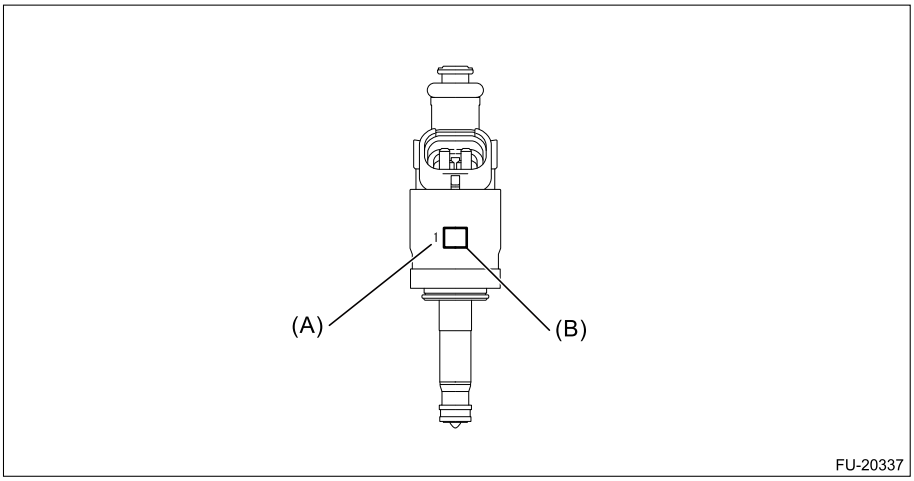
2. Install the fuel injector holder to the fuel injector assembly.



3. Align the protrusion of the fuel injector holder to the anti-rotation slot of the fuel injector pipe RH, and install the fuel injector straight to the fuel injector pipe RH.

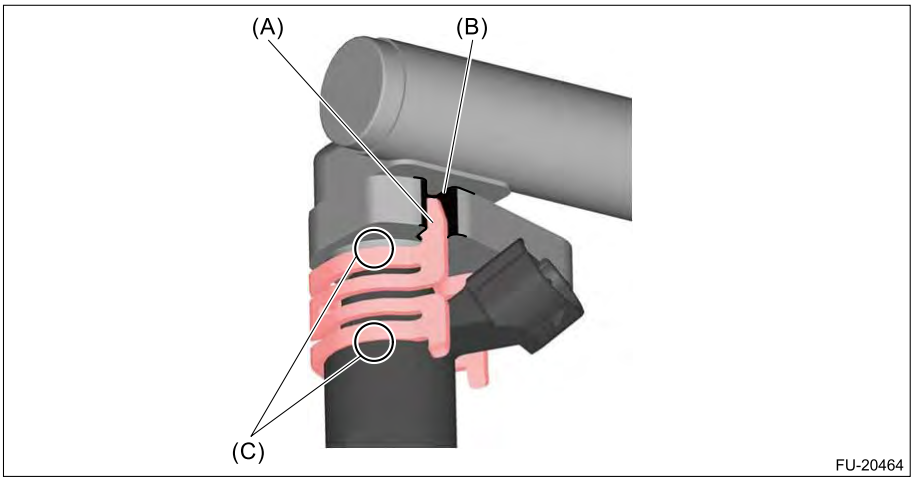
Caution:

- **Degrease inside of the fuel injector insertion hole of the fuel injector pipe.**
- **Check the inside of the fuel injector insertion hole of the fuel injector pipe for foreign materials or damage.**
- **Be careful not to allow gasoline to contact with the fuel injector seal and the inside of the mounting hole.**
- **Apply liquid paraffin to the O-ring seal and install it.**
- **In order to prevent damaging the O-ring seal, do not install the fuel injector to the fuel injector pipe by tilting or twisting it.**
- **Make sure there is no gap between the fuel injector pipe and the fuel injector holder.**
- **When replacing the fuel injector assembly, select the assembly with the same flow rate stratification number.**



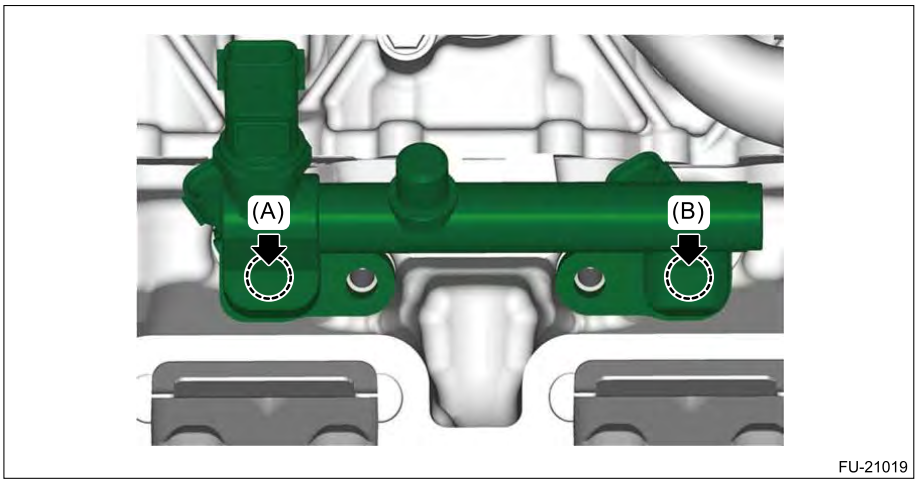
(A) Flow rate stratification number

(B) QR code

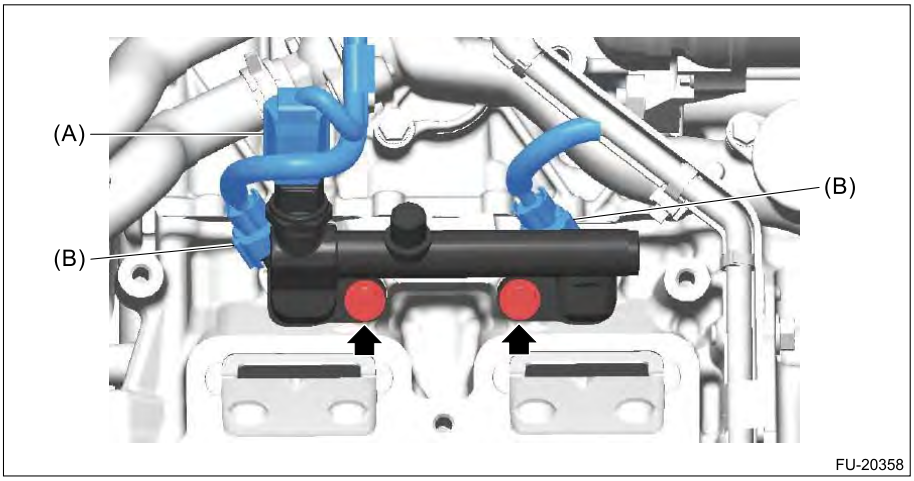


(A) Protrusion portion (B) Anti-rotation slot (C) No gap allowed.

4. Insert the fuel injector pipe RH and fuel injector as a single unit into the cylinder head, and align their positions. Then, evenly press the sections (A) and (B).
   Caution:
   - **When installing, apply liquid paraffin to the fuel injector seal.**
   - **In order to prevent damaging the O-ring seal, do not install the fuel injector pipe and fuel injector by tilting them toward the cylinder head.**



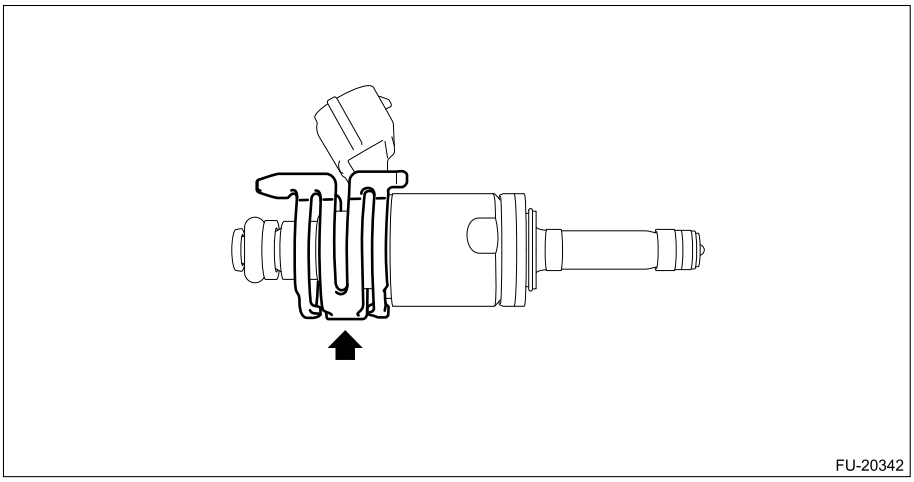
5. Tighten the bolts which hold the fuel injector pipe RH.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14.0 ft-lb)
6. Connect connector (B) to the fuel injector, and connect connector (A) to the fuel pressure sensor.



7. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. FUEL INJECTOR LH

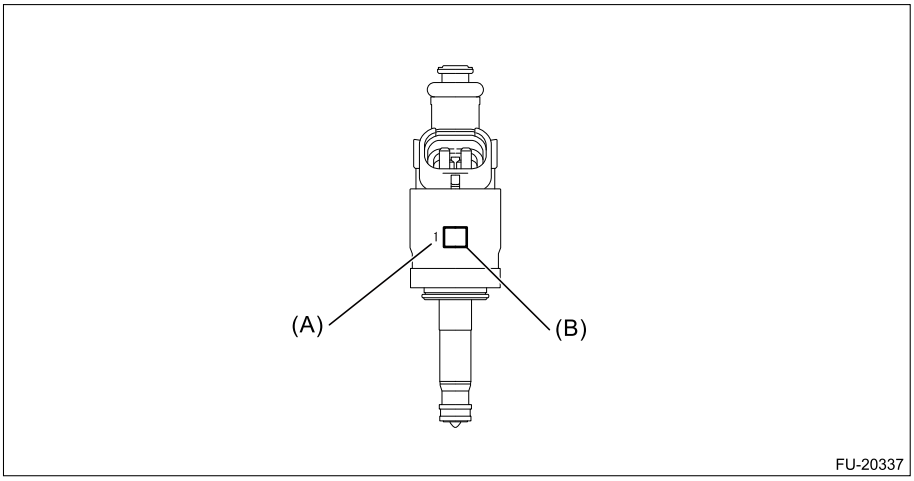
1. Replace the following parts with new ones. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REPLACEMENT.
   - Fuel injector seal
   - Slider washer
   - Back-up ring
   - O-ring seal
   - Stopper ring
2. Install the fuel injector holder to the fuel injector assembly.



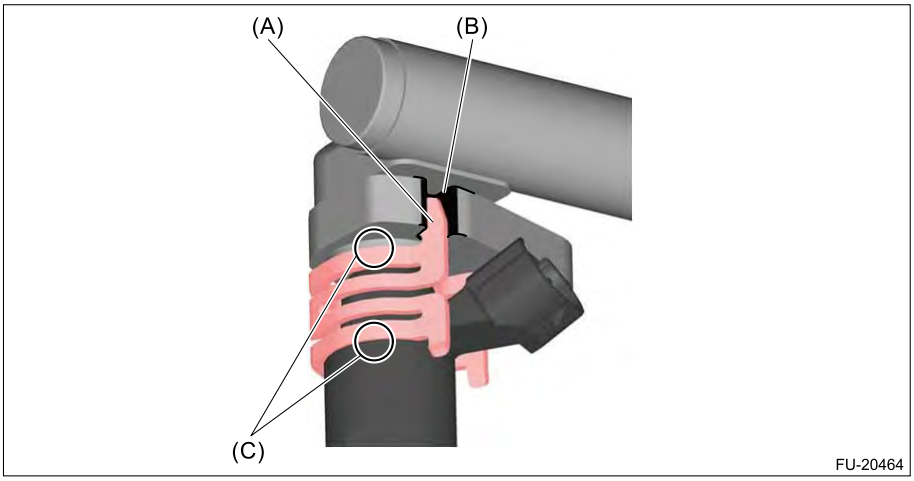
3. Align the protrusion of the fuel injector holder to the anti-rotation slot of the fuel injector pipe LH, and install the fuel injector straight to the fuel injector pipe LH.

Caution:

- **Degrease inside of the fuel injector insertion hole of the fuel injector pipe.**
- **Check the inside of the fuel injector insertion hole of the fuel injector pipe for foreign materials or damage.**
- **Be careful not to allow gasoline to contact with the fuel injector seal and the inside of the mounting hole.**
- **Apply liquid paraffin to the O-ring seal and install it.**
- **In order to prevent damaging the O-ring seal, do not install the fuel injector to the fuel injector pipe by tilting or twisting it.**
- **Make sure there is no gap between the fuel injector pipe and the fuel injector holder.**
- **When replacing the fuel injector assembly, select the assembly with the same flow rate stratification number.**



(A) Flow rate stratification number (B) QR code

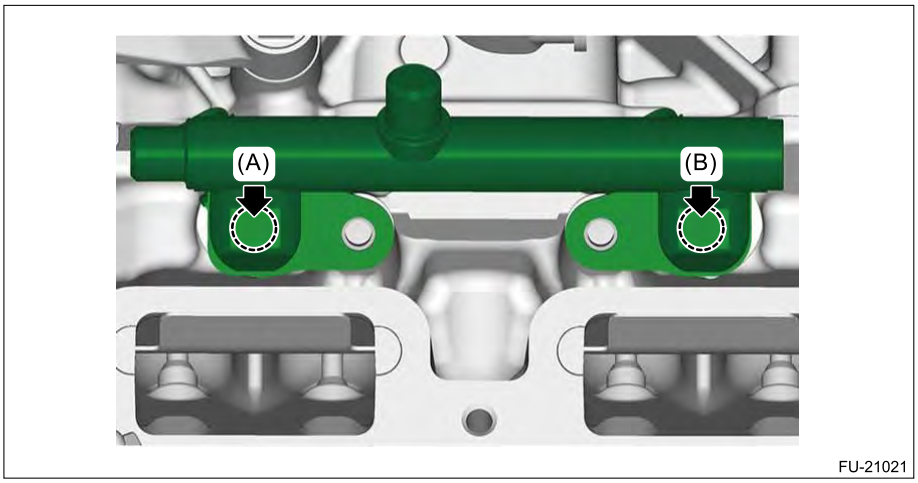


(A) Protrusion portion (B) Anti-rotation slot (C) No gap allowed.

4. Insert the fuel injector pipe LH and fuel injector as a single unit into the cylinder head, and align their positions. Then, evenly press the sections (A) and (B).

Caution:

- **When installing, apply liquid paraffin to the fuel injector seal.**
- **In order to prevent damaging the O-ring seal, do not install the fuel injector pipe and fuel injector by tilting them toward the cylinder head.**



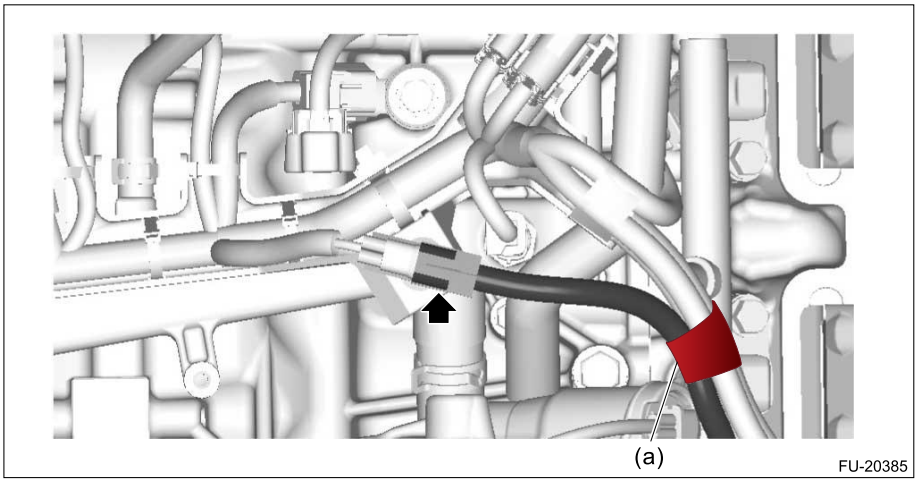
5. Tighten the bolts which hold the fuel injector pipe LH, and connect the connector (A).

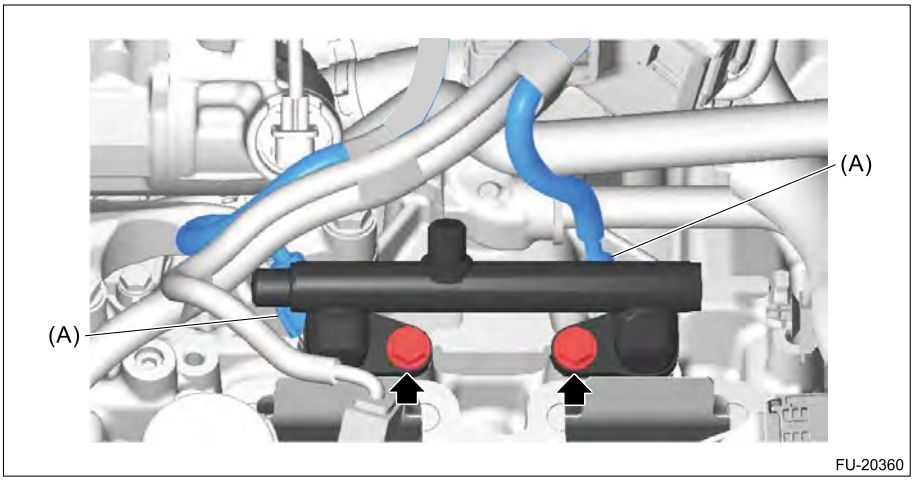
Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)

Note:

Connect the fuel injector #2 connector of the variable capacity A/C model at the intermediate harness side and secure with tape (a).





6. Install the high-pressure fuel delivery pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE.
7. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure

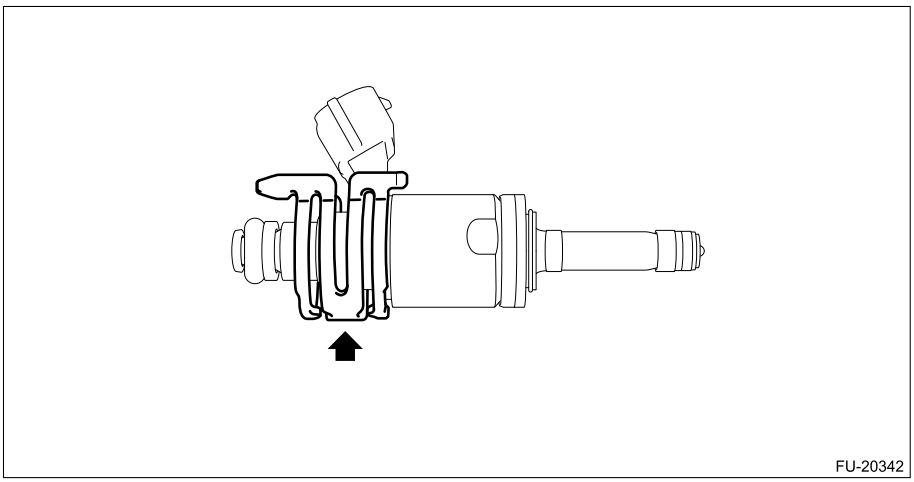
Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.

8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

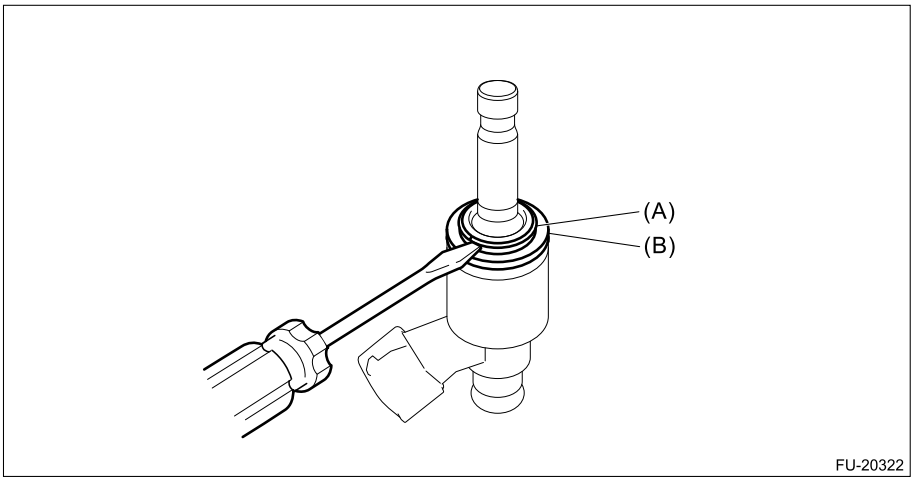
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Injector

REPLACEMENT

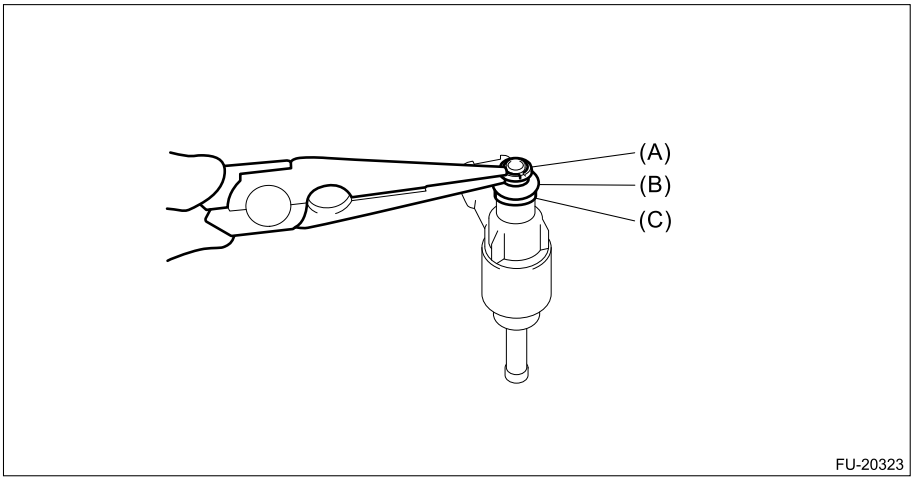
1. Remove the fuel injector holder.



2. Remove the circlip (A) and slider washer (B).



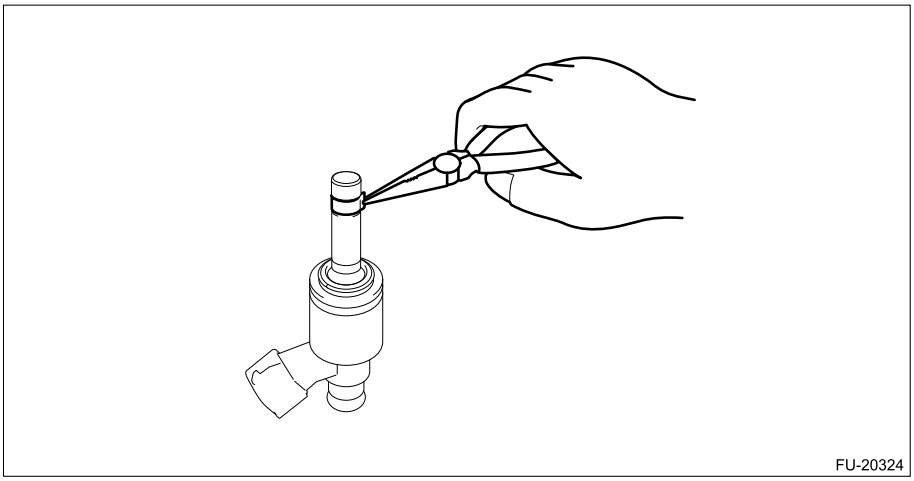
3. Remove the stopper ring (A).
4. Remove the O-ring (B) and backup ring (C).



5. Gradually expand the fuel injector seal and remove the fuel injector seal.

Caution:

- **Be careful not to apply too much force when pinching the fuel injector seal, or the fuel injector groove may be damaged.**
- **If the tip of the fuel injector assembly is hit or the assembly is dropped, replace the fuel injector assembly with a new one.**

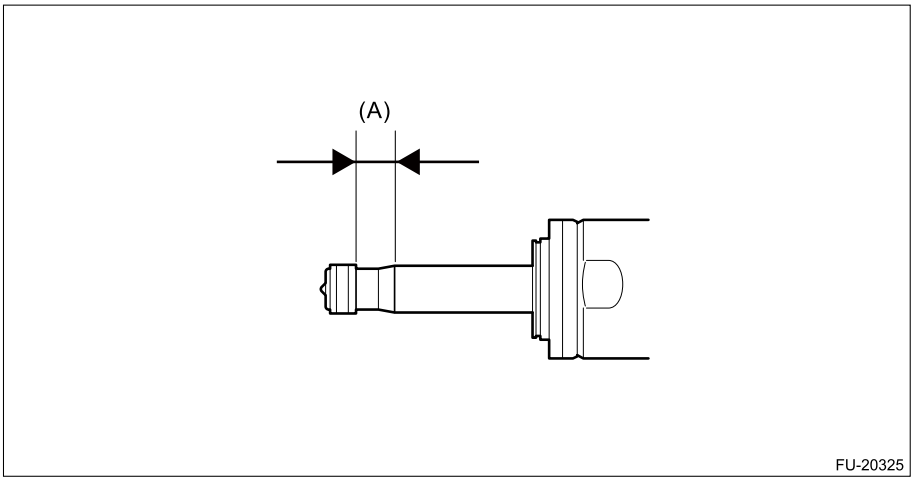


6. Install the fuel injector seal.

(1) Remove carbon from area (A) shown in the following figure (sides of fuel injector and the groove for seal).

Caution:

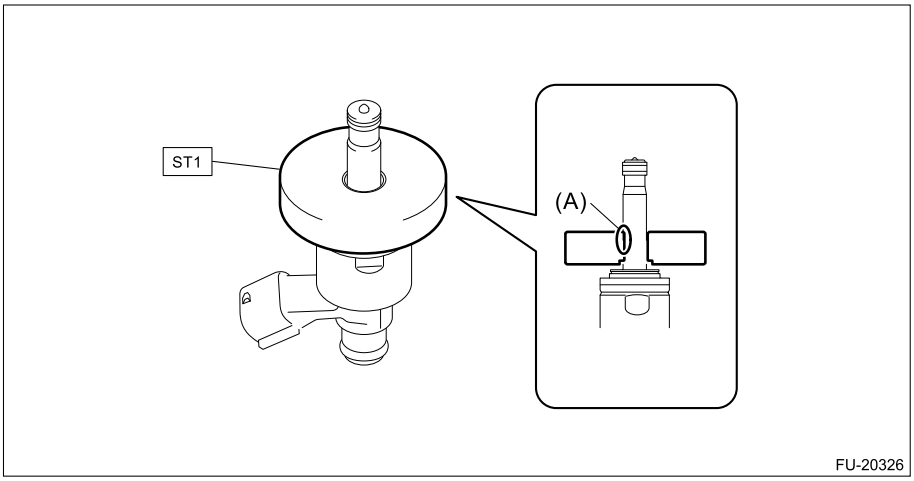
- **Do not attempt to clean the tip.**
- **Do not use a wire-brush.**
- **If the tip of the fuel injector assembly is hit or the assembly is dropped, replace the fuel injector assembly with a new one.**



(2) Set ST1 on a fuel injector, with the tapered side (A) and the ST number facing toward the tip of the fuel injector.

Preparation tool:

ST1: ADJUSTER (18271AA020)



(3) Install new fuel injector seal (A) on ST2.

Caution:

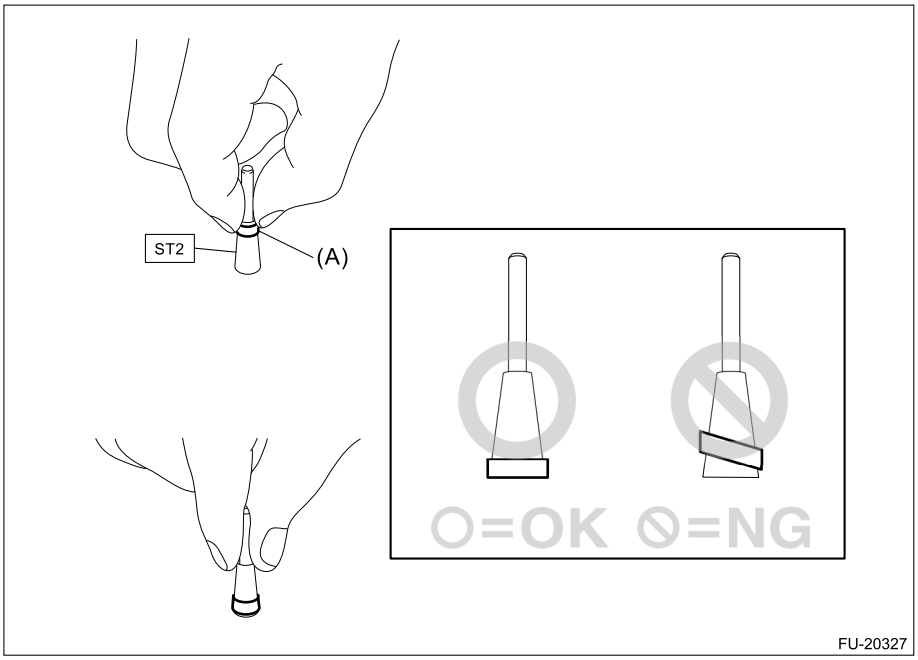
When setting the fuel injector seal on the ST2, be careful not to set it obliquely, or the seal is stretched and become hard to be fixed.

Note:

Apply liquid paraffin to the fuel injector seal.

Preparation tool:

ST2: GUIDE (18671AA050)



(4) Set the ST2 with the fuel injector seal installed on the tip of the fuel injector, and push down on the fuel injector seal with fingers and install to the fuel injector groove as shown in the figure.

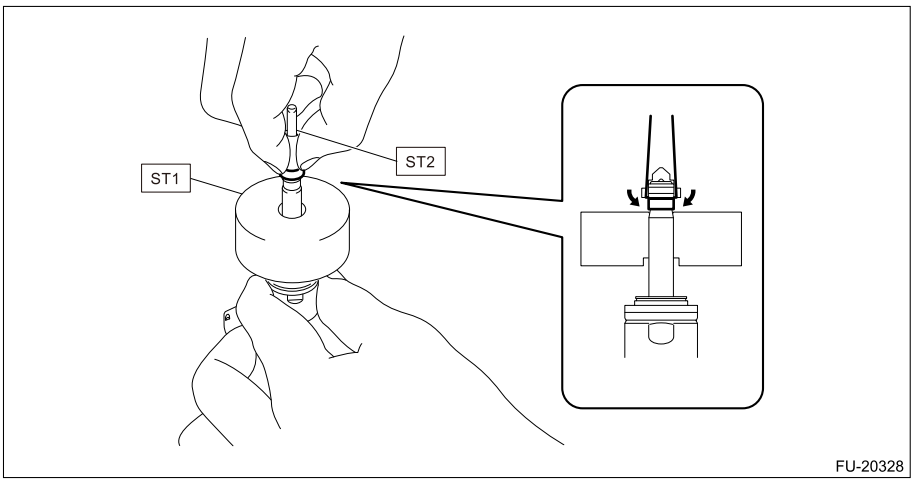
Caution:

Make sure that the entire perimeter of the fuel injector seal fit in the groove.

Preparation tool:

ST1: ADJUSTER (18271AA020)

ST2: GUIDE (18671AA050)



(5) Slowly pull up the ST1 toward the tip side of fuel injector while lightly pressing down the fuel injector seal with the ST2 to make the fuel injector seal rest in the fuel injector groove.

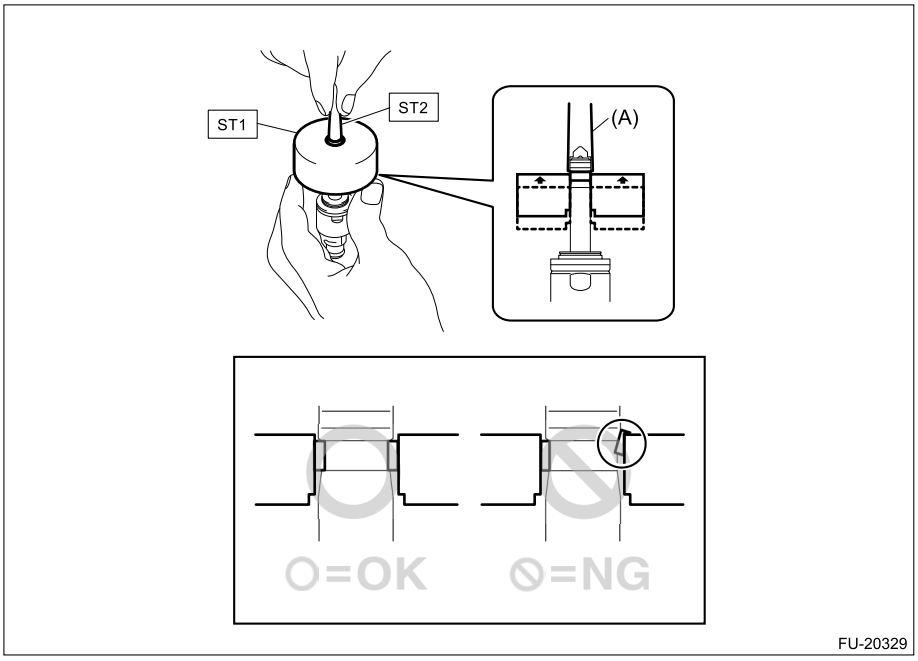
Caution:

Be careful not to let the fuel injector seal get caught in the ST1 and the fuel injector groove. If it get caught, replace the seal with a new one.

Preparation tool:

ST1: ADJUSTER (18271AA020)

ST2: GUIDE (18671AA050)



(A) Hold

(6) Slowly pull up the ST1 toward the tip side of fuel injector, and hold in position for at least 5 seconds when the fuel injector seal of the connector side reaches to the straight section of the ST1, and fix the condition of the fuel injector seal.

Caution:

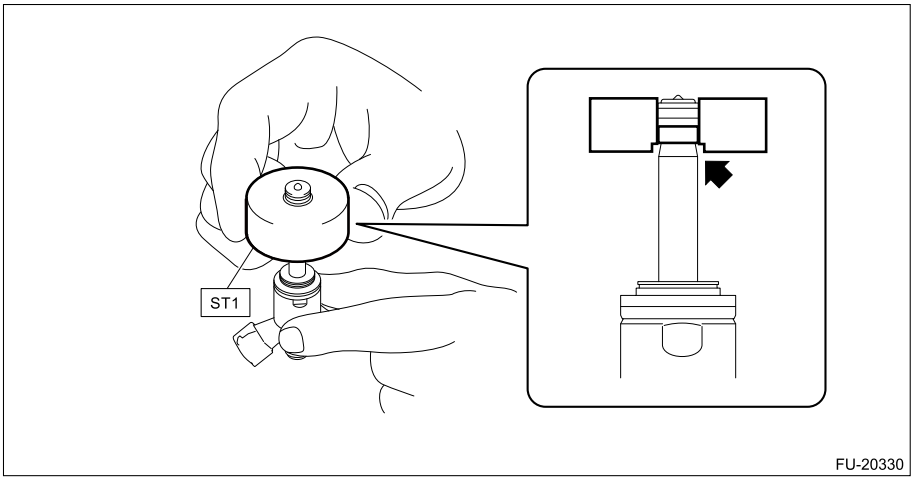
Be careful not to let the fuel injector seal get caught in the ST1 and the fuel injector groove. If it get caught, replace the seal with a new one.

Note:

- **The straight section is where the bottom end of the fuel injector seal and the bottom end of the ST1 meet.**
- **If it is hard to lift up the ST1, try to slowly lift the ST1 by shaking it side to side.**

Preparation tool:

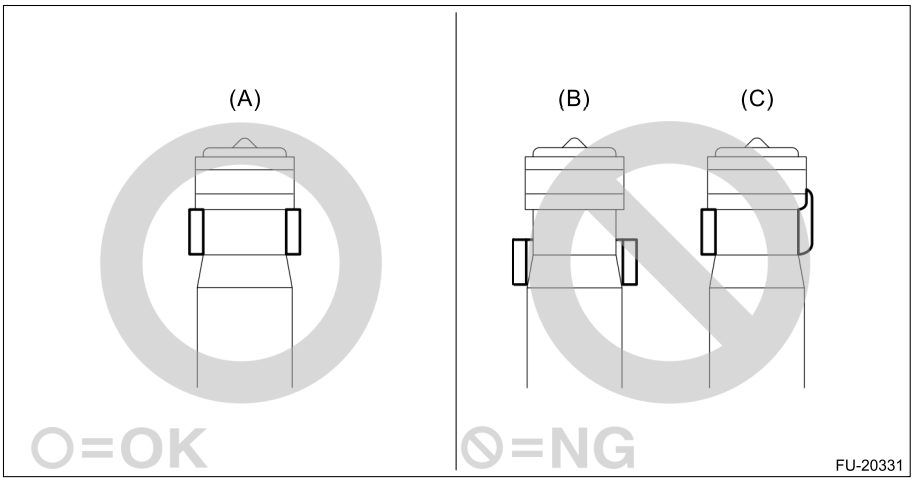
ST1: ADJUSTER (18271AA020)



(7) After installing the fuel injector seal, check the seal for scratches, crushed area, or dislocation from the groove.

Caution:

If scratches, crushed area, or dislocation from the groove is found, replace the fuel injector seal with a new one.



7. Install the fuel injector assembly.

Caution:

If the tip of the fuel injector assembly is hit or the assembly is dropped, replace the fuel injector assembly with a new one.

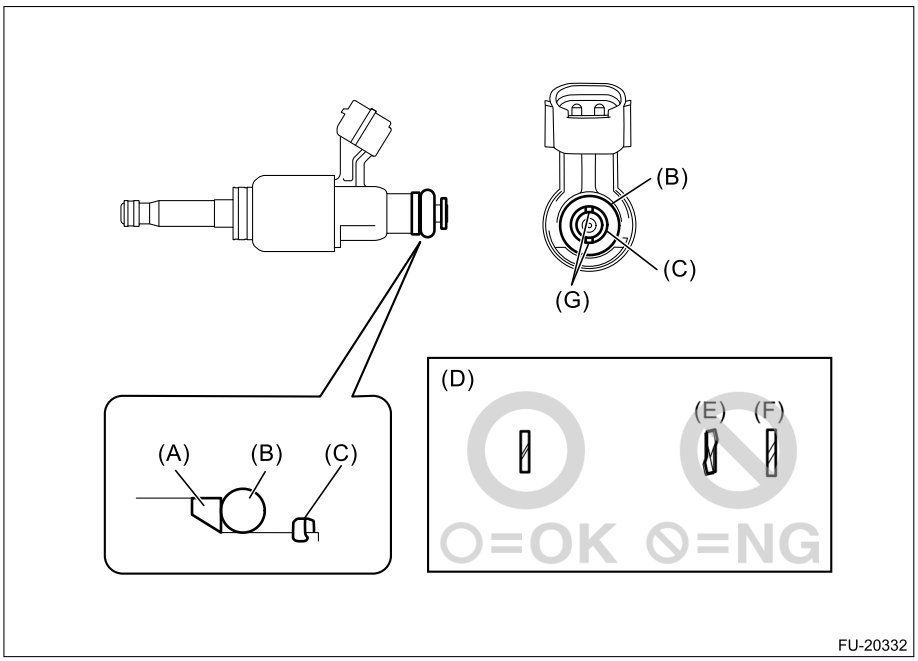
(1) Install new backup ring, new O-ring seal and new stopper ring as shown in the figure.

Caution:

- **Check the O-ring seal groove of the fuel injector for foreign materials or damage.**
- **Make sure that the orientation of the back-up ring is correct.**
- **When installing the stopper ring, the groove should face toward the fuel injector pipe.**
- **Make sure that the installation order of the backup ring and O-ring seal is correct.**
- **There should be no expansion or ride over at the backup ring gap.**
- **After assembling the parts, there should be no foreign materials or damage on the fuel injector seal.**

Note:

Apply liquid paraffin to the O-ring seal.

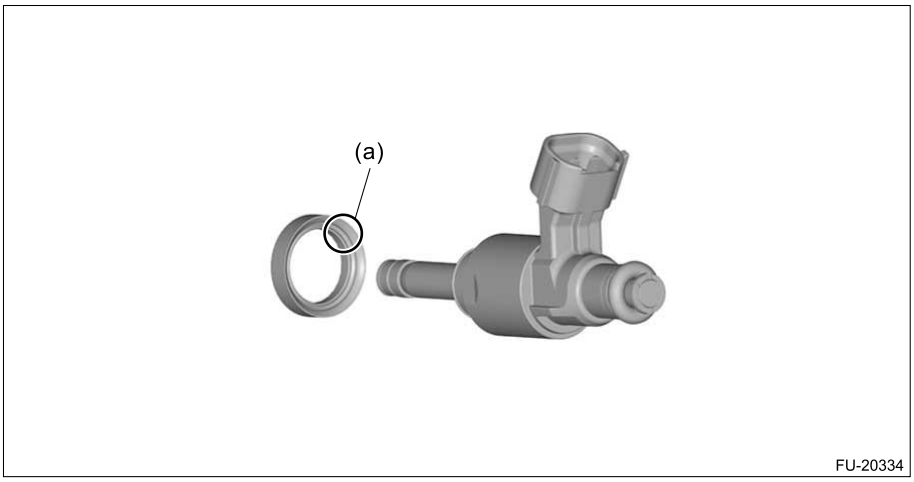


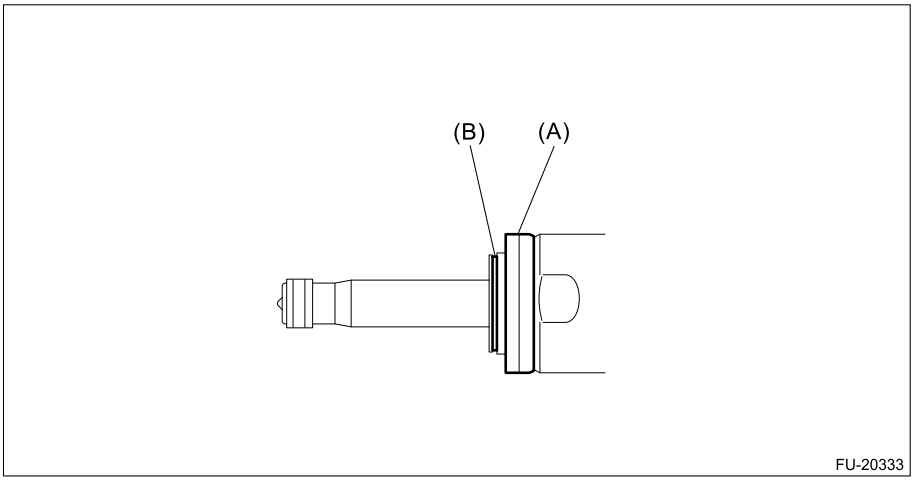
(A) Back-up ring
(B) O-ring seal
(C) Stopper ring
(D) Back-up ring gap
(E) Ride over
(F) Expansion
(G) Groove

(2) Install a circlip and new slider washer.

Caution:

When installing the slider washer, the groove side (a) should face toward the fuel injector.



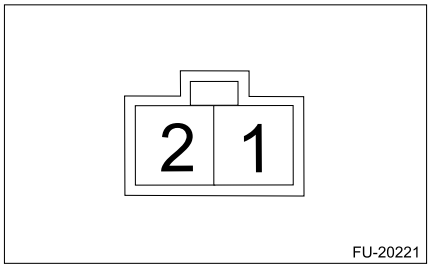


(A) C-ring (B) Slider washer

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Injector

INSPECTION

1. Check that the fuel injector has no deformation, cracks or other damages.
2. Measure the resistance between fuel injector terminals.



Terminal No.	Standard
1 and 2	Approx.1.9Ω (when 20°C (68°F))

REMOVAL

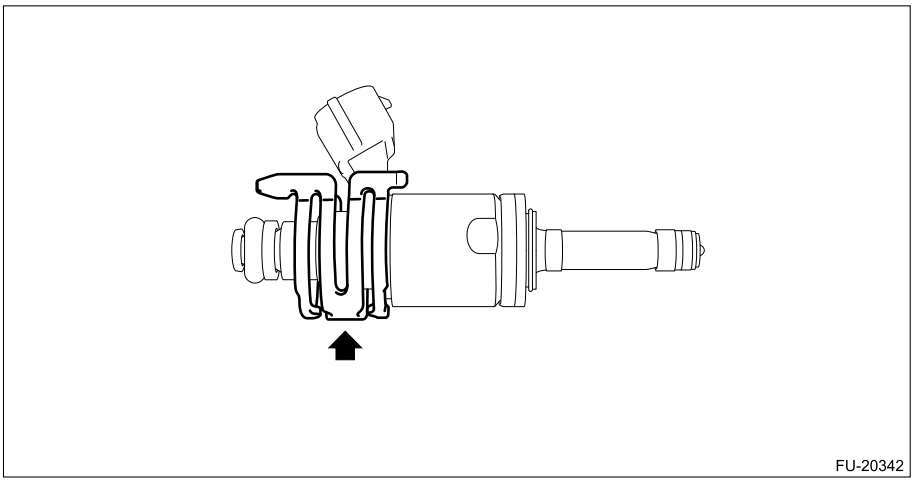
Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

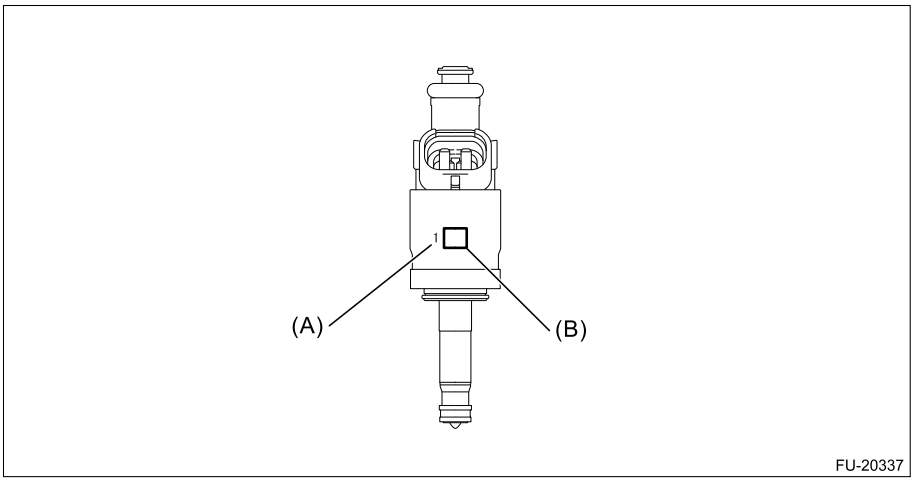
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the fuel injector RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REMOVAL > FUEL INJECTOR RH.

INSTALLATION

1. Replace the following parts with new ones. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REPLACEMENT.
   - Fuel injector seal
   - Slider washer
   - Back-up ring
   - O-ring seal
   - Stopper ring
2. Install the fuel injector holder to the fuel injector assembly.

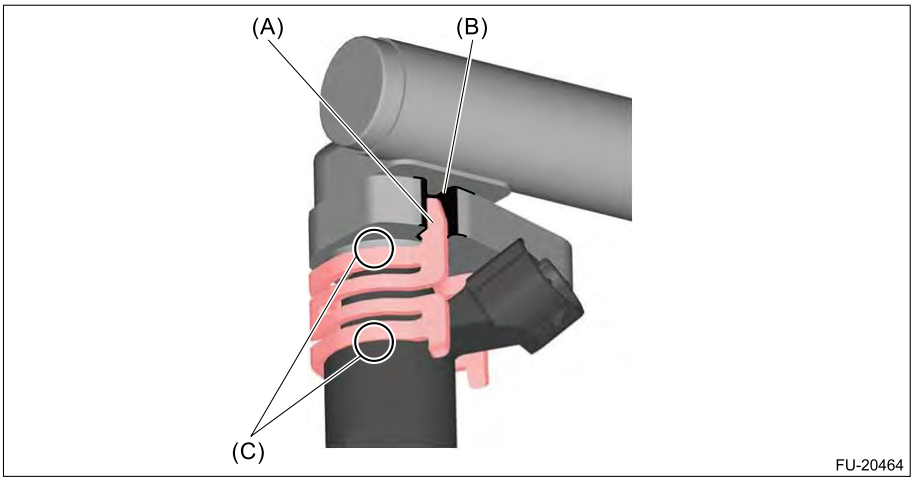


3. Align the protrusion of the fuel injector holder to the anti-rotation slot of the fuel injector pipe RH, and install the fuel injector straight to the fuel injector pipe RH.
   Caution:
   - **Always use a new fuel injector pipe RH.**
   - **Check the inside of the fuel injector insertion hole of the fuel injector pipe for foreign materials or damage.**
   - **Be careful not to allow gasoline to contact with the fuel injector seal and the inside of the mounting hole.**
   - **Apply liquid paraffin to the O-ring seal and install it.**
   - **In order to prevent damaging the O-ring seal, do not install the fuel injector to the fuel injector pipe by tilting or twisting it.**
   - **Make sure there is no gap between the fuel injector pipe and the fuel injector holder.**
   - **When replacing the fuel injector assembly, select the assembly with the same flow rate stratification number.**



(A) Flow rate stratification number

(B) QR code



(A) Protrusion portion

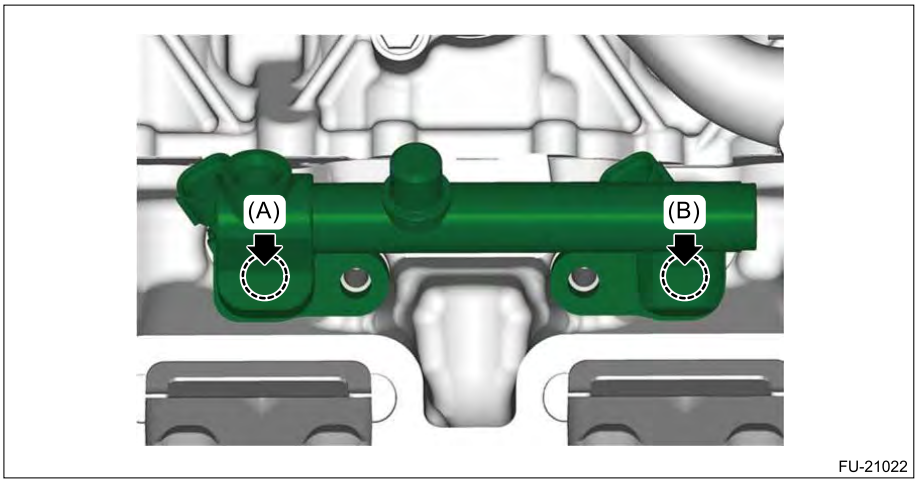
(B) Anti-rotation slot

(C) No gap allowed.

4. Insert the fuel injector pipe RH and fuel injector as a single unit into the cylinder head, and align their positions. Then, evenly press the sections (A) and (B).

Caution:

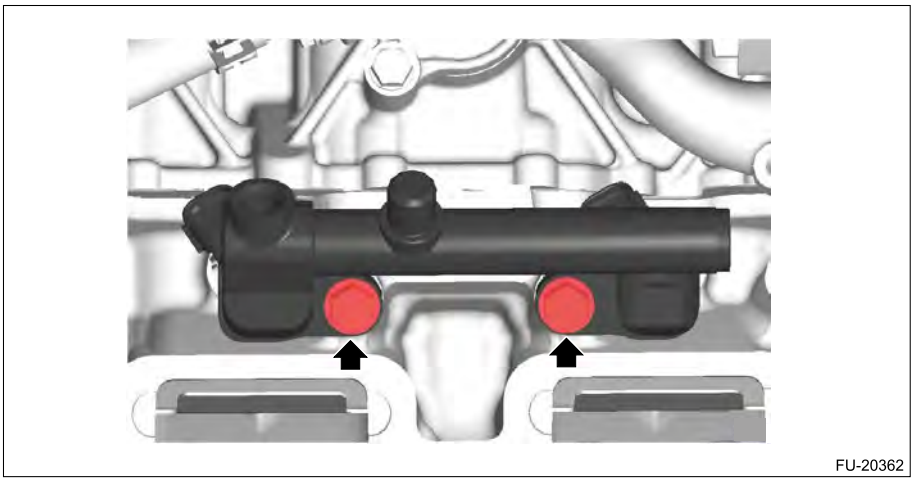
- **When installing, apply liquid paraffin to the fuel injector seal.**
- **In order to prevent damaging the O-ring seal, do not install the fuel injector pipe and fuel injector by tilting them toward the cylinder head.**



5. Tighten the bolts which hold the fuel injector pipe RH.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



6. Temporarily tighten the fuel pressure sensor to the fuel injector pipe RH until it cannot be turned by hand.

Caution:

Always use a new fuel pressure sensor.

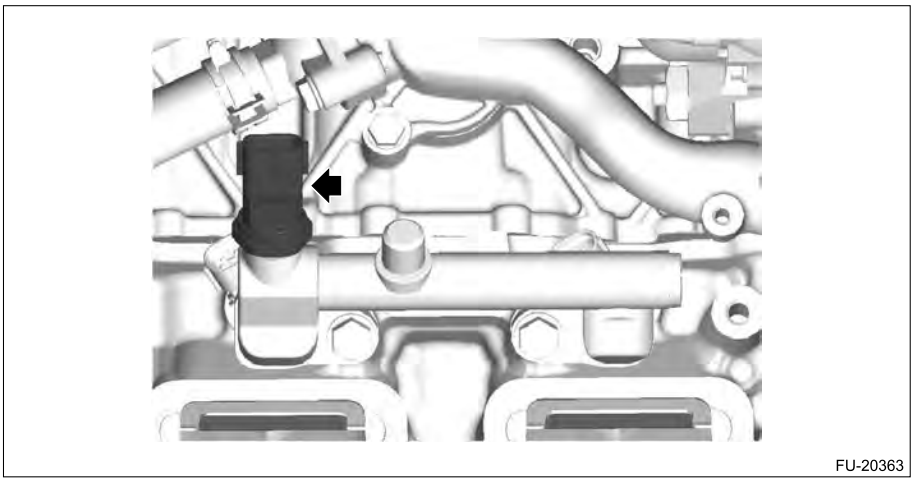
7. Tighten the fuel pressure sensor.

Caution:

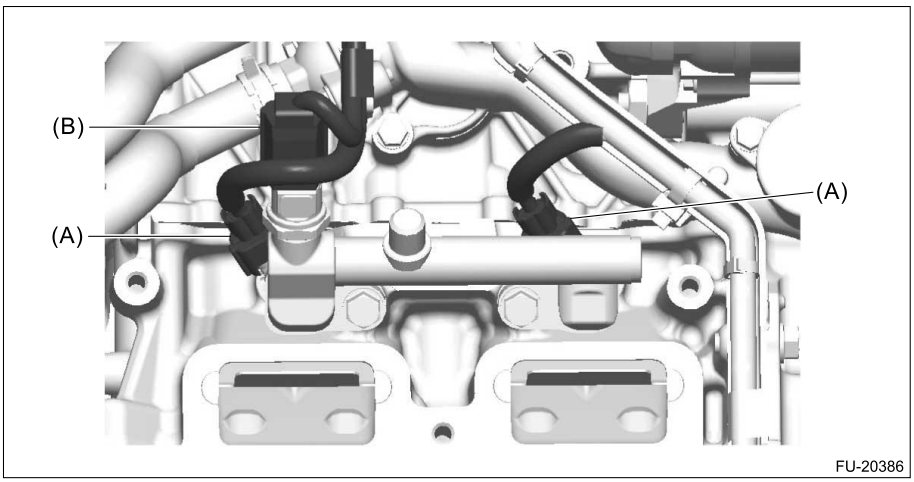
- **Be careful not to spill oil on the screw sections of the fuel pressure sensor and the fuel injector pipe RH.**
- **Be careful not to let foreign matter enter into the fuel pressure sensor during installation.**
- **The sensor should be installed perpendicularly to the fuel pressure sensor's threaded hole of the fuel injector pipe RH, and tightened to the specified torque.**
- **Do not recheck the tightening torque after tightening the fuel pressure sensor with specified torque.**

Tightening torque:

46 N·m (4.7 kgf-m, 33.9 ft-lb)



8. Connect connector (A) to the fuel injector, and connect connector (B) to the fuel pressure sensor.



9. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.

10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pressure Sensor

INSPECTION

Check that the fuel pressure sensor has no deformation, cracks or other damages.

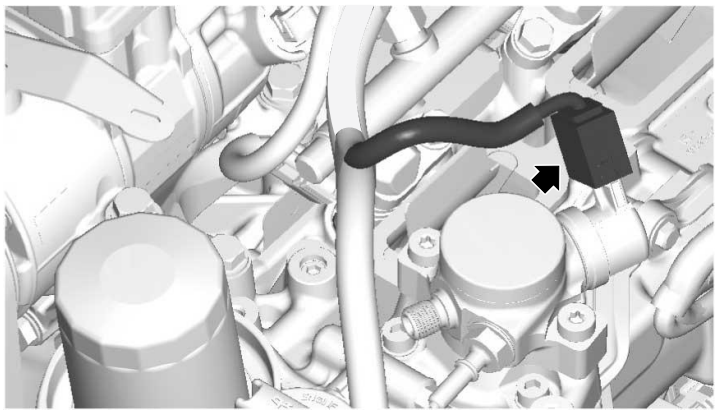
REMOVAL

1. HIGH-PRESSURE FUEL PUMP

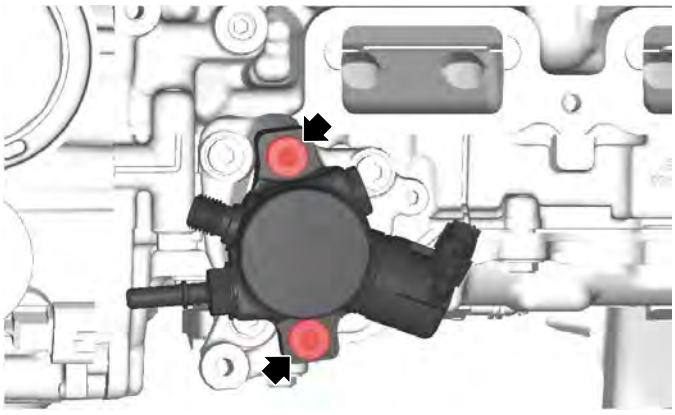
Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

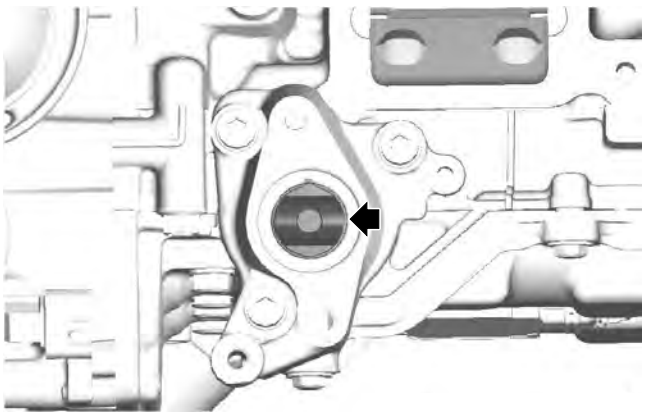
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the high-pressure fuel delivery pipes. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE.
3. Disconnect the connector from high-pressure fuel pump.


FU-20364

4. Using TORX PLUS® 40IP, remove the high-pressure fuel pump.

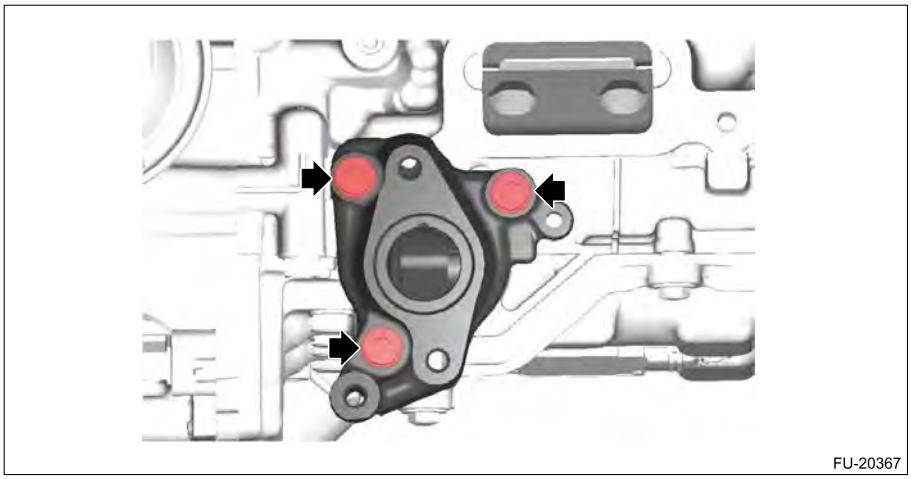

FU-20365

5. Remove the fuel pump lifter from the fuel pump case.


FU-20366

2. HIGH-PRESSURE FUEL PUMP CASE

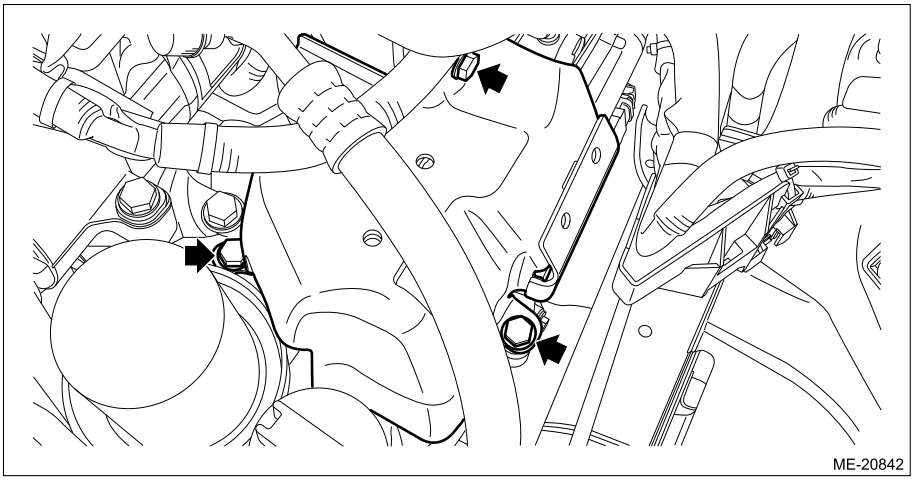
1. Remove the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>REMOVAL > HIGH-PRESSURE FUEL PUMP.
2. Remove the high-pressure fuel pump case from the cam carrier assembly LH.



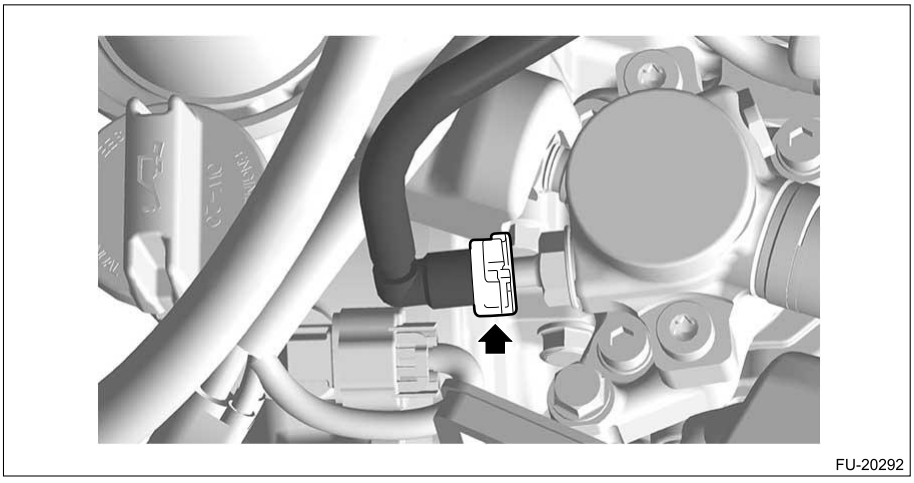
3. Remove liquid gasket from the high-pressure fuel pump case and the cam carrier assembly LH.

3. FUEL DELIVERY PIPE

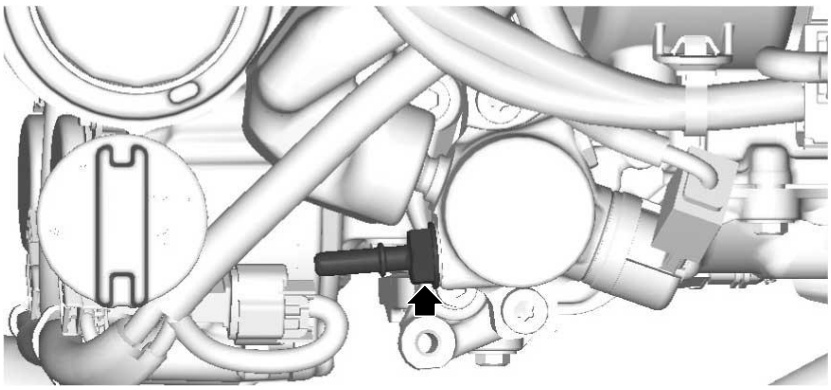
1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Remove the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
3. Remove the fuel pipe protector.



4. Disconnect the fuel delivery pipe A from the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE C).



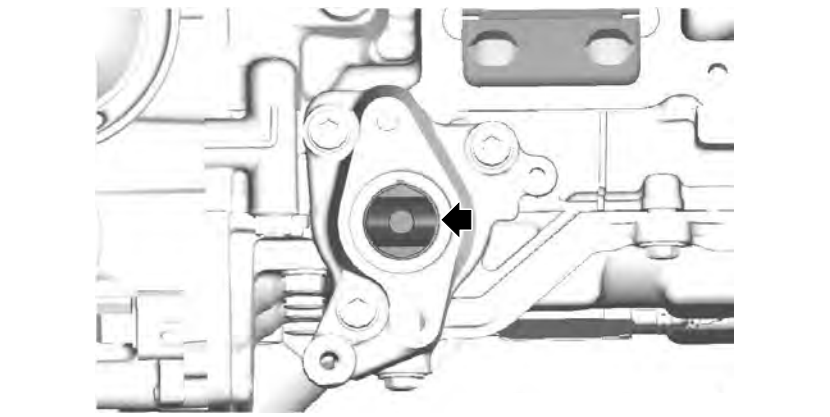
5. Remove the fuel delivery pipe B from the high-pressure fuel pump.


FU-20395

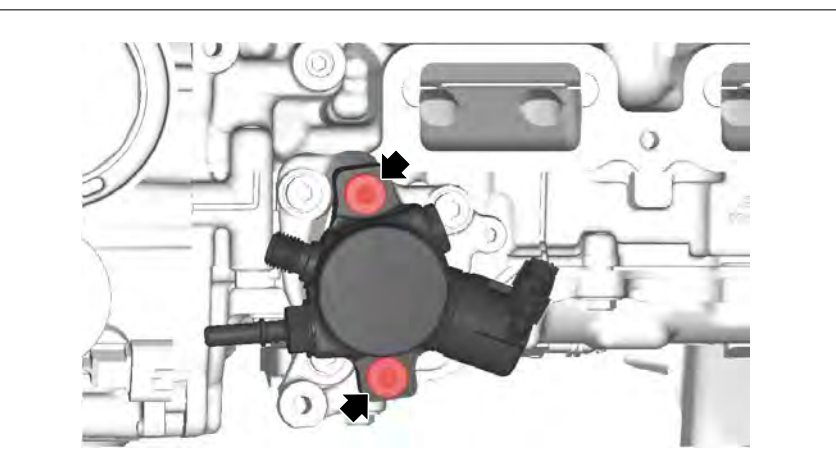
INSTALLATION

1. HIGH-PRESSURE FUEL PUMP

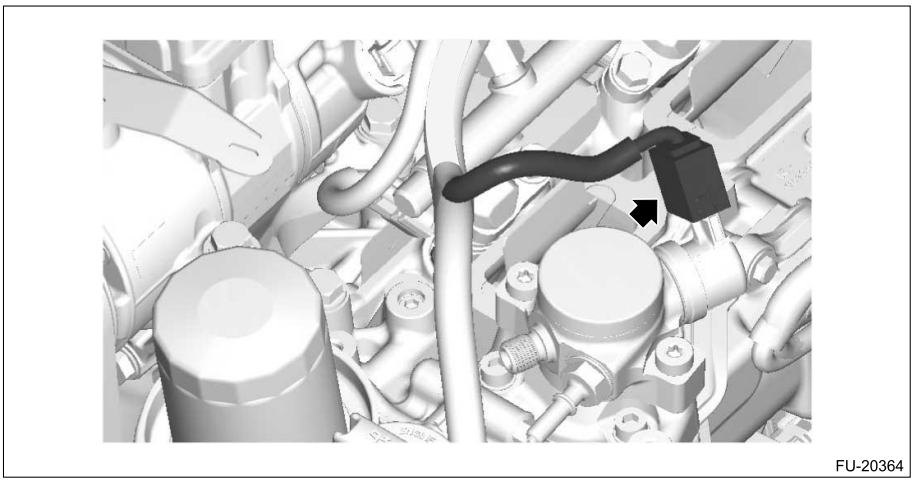
1. Install the fuel pump lifter to the high-pressure fuel pump case.
   Note:
   - **Apply engine oil to the side of the high-pressure fuel pump case and to the bottom surface of the fuel pump lifter.**
   - **After installing the fuel pump lifter, rotate the crankshaft in order to set the fuel pump lifter comes to the lowest position.**


FU-20366

2. Set a new O-ring, using TORX PLUS® 40IP, install the high-pressure fuel pump.
   Tightening torque:
   21 N·m (2.1 kgf-m, 15.5 ft-lb)


FU-20365

3. Connect the connector to the high-pressure fuel pump.

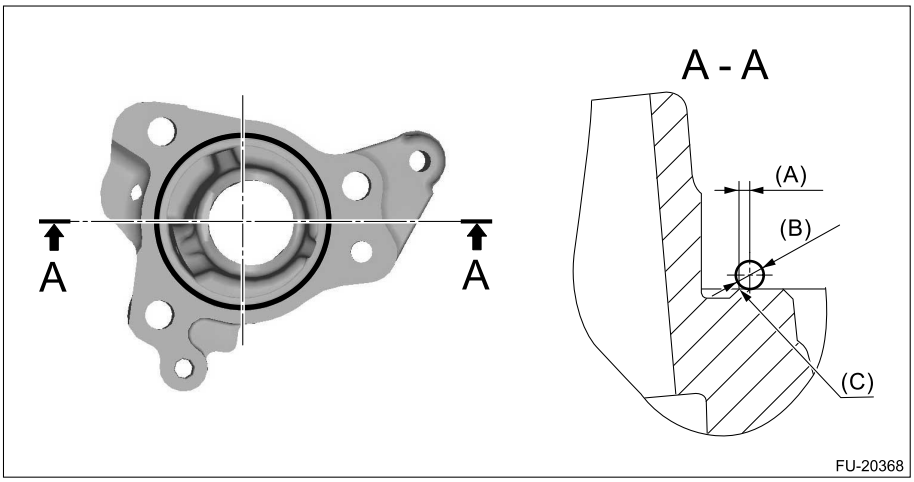


4. Install the high-pressure fuel delivery pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. HIGH-PRESSURE FUEL PUMP CASE

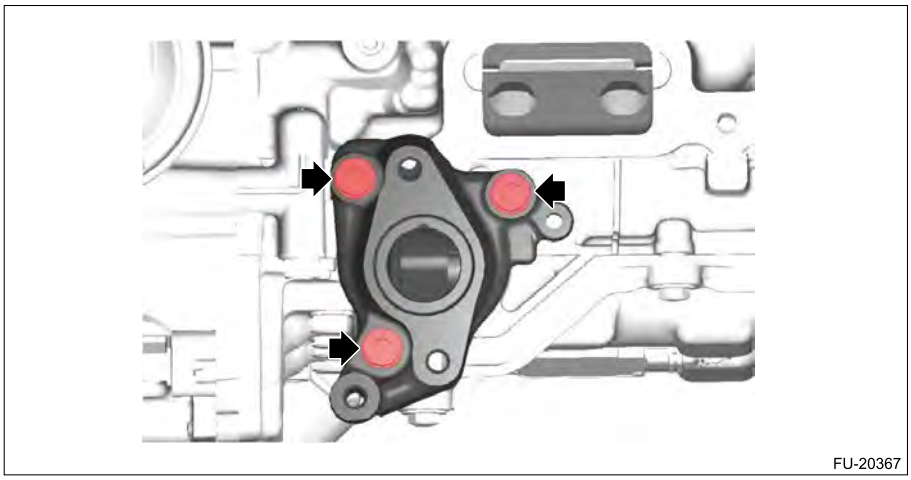
1. Apply liquid gasket to the mating surfaces of fuel pump case, and install the high-pressure fuel pump case.
   Note:
   - **Before applying liquid gasket, degrease the old liquid gasket seal surface of the high-pressure fuel pump case and the cam carrier assembly LH.**
   - **Install within 5 min. after applying liquid gasket.**

   Liquid gasket:
   THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent
   Liquid gasket applying diameter:
   3.5±1 mm (0.1181±0.0394 in)



(A) Within 1 mm (within 0.0394 in) (B) 3.5 mm (0.1181 in) (C) Chamfer edge

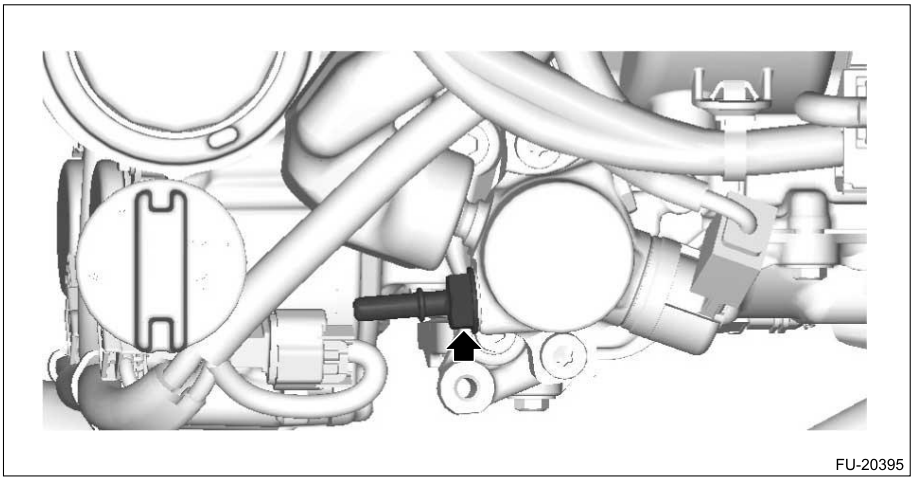
2. Install the high-pressure fuel pump case to the cam carrier assembly LH.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14.0 ft-lb)


FU-20367

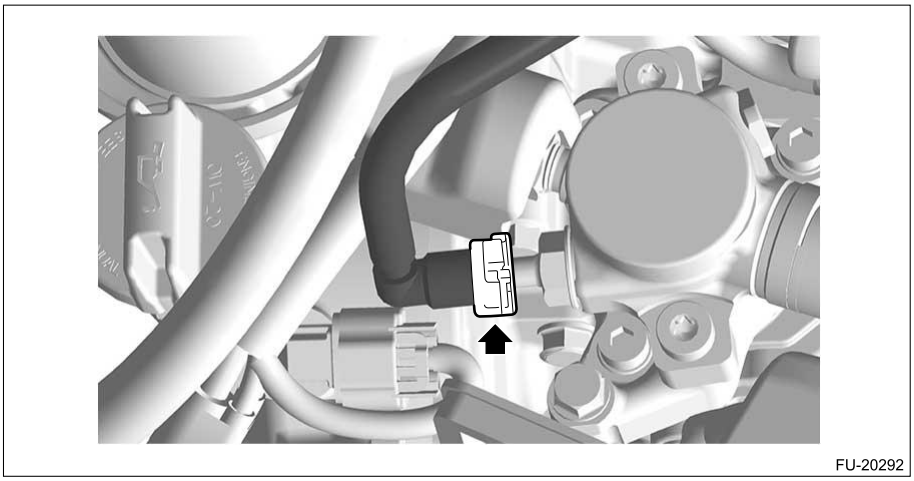
3. Install the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSTALLATION > HIGH-PRESSURE FUEL PUMP.

3. FUEL DELIVERY PIPE

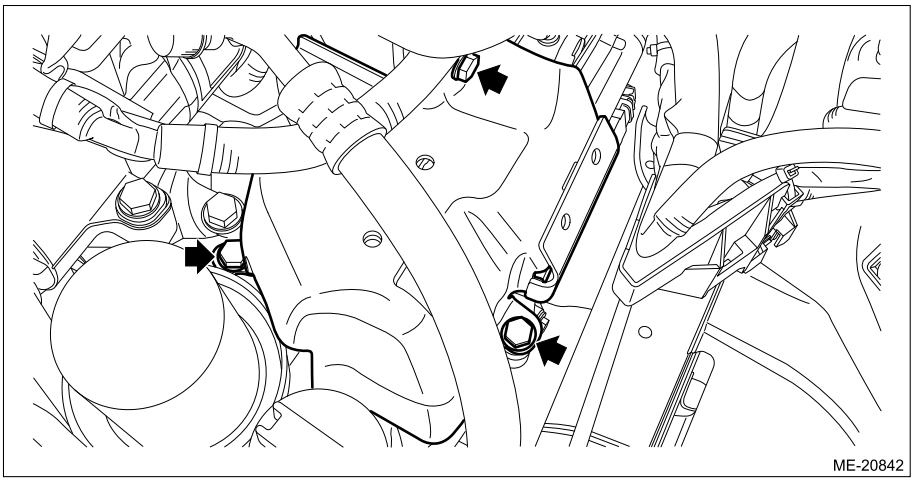
1. Using a new gasket, install the fuel delivery pipe B to the high-pressure fuel pump.
   Tightening torque:
   48 N·m (4.9 kgf-m, 35.4 ft-lb)


FU-20395

2. Connect the fuel delivery pipe A to the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE C).


FU-20292

3. Install the fuel pipe protector.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14.0 ft-lb)



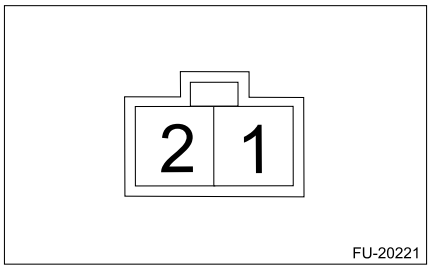
4. Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > High Pressure Fuel Pump

INSPECTION

1. CHECK HIGH-PRESSURE FUEL PUMP

1. Check that the high-pressure fuel pump has no deformation, cracks or other damages.
2. Measure the resistance between high-pressure fuel pump terminals.



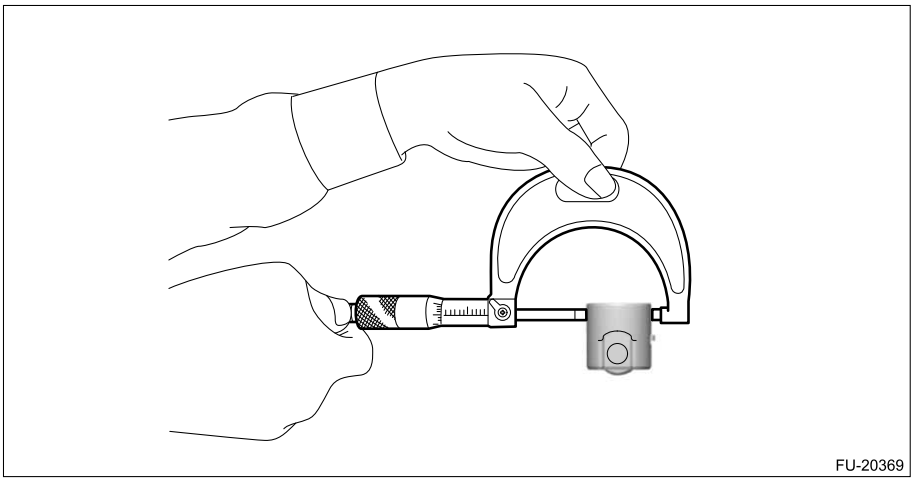
Terminal No.	Standard
1 and 2	0.5Ω (when 20°C (68°F))

2. CHECK THE HIGH-PRESSURE FUEL PUMP CASE AND FUEL PUMP LIFTER

1. Check that the high-pressure fuel pump case and the fuel pump lifter have no deformation, cracks or other damages.
2. Check the clearance between the fuel pump lifter and high-pressure fuel pump case bore. Check the clearance between fuel pump lifter and high-pressure fuel pump case bore by measuring the outer diameter of fuel pump lifter and the inner diameter of high-pressure fuel pump case bore respectively.
   (1) Measure the outer diameter of fuel pump lifter with a micrometer.

Note:

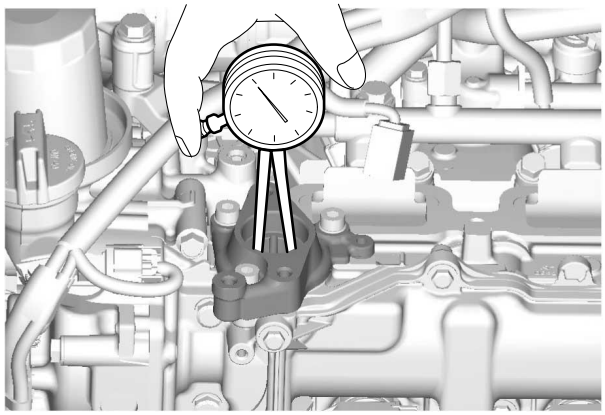
- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure at several points, and take notes of the value of most worn location.**



(2) Using a caliper gauge, measure the inner diameter of high-pressure fuel pump case bore.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure at several points, and take notes of the value of most worn location.**



FU-20370

(3) Calculate the clearance between the fuel pump lifter and high-pressure fuel pump case bore. If it is not within the standard, replace the fuel pump lifter and high-pressure fuel pump case as a set.

Clearance between fuel pump lifter and high-pressure fuel pump case bore:

Standard

0.055 — 0.108 mm (0.0022 — 0.0043 in)

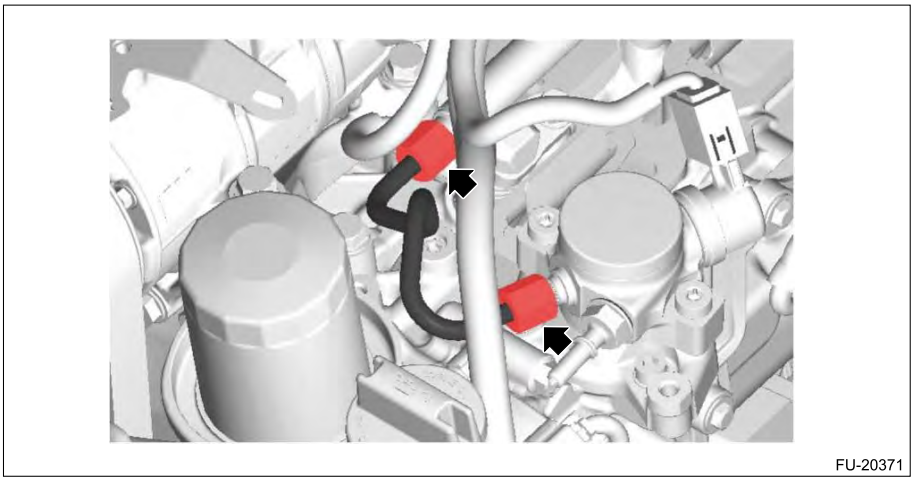
REMOVAL

1. HIGH-PRESSURE FUEL DELIVERY PIPE

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the fuel pipe insulator No. 3 and fuel pipe insulator No. 4. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>REMOVAL.
4. Remove the high-pressure fuel delivery pipes.



2. HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the pipes using a container or cloth.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the fuel pipe insulator No. 1, fuel pipe insulator No. 2 and fuel pipe insulator No. 3. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>REMOVAL.
4. Remove the flare nut (A) and bolt (B), and then remove the high-pressure fuel delivery pipe assembly.

代替画像1

この画像は代替画像です

INSTALLATION

1. HIGH-PRESSURE FUEL DELIVERY PIPE

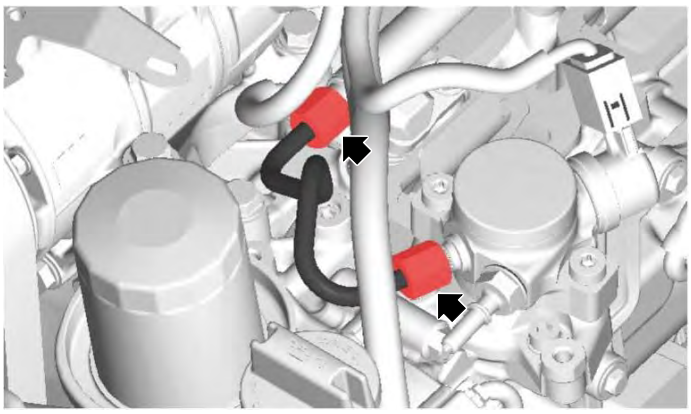
1. Temporarily tighten the flare nut of the high-pressure fuel delivery pipe by hand until it seats, and tighten the flare nuts on both ends.

Caution:

- **Always use a new high-pressure fuel delivery pipe.**
- **Check that the seal surface of the fuel injector pipe LH and the high-pressure fuel pump have no deformation, cracks or other damages.**
- **Check that the seal surface of the fuel injector pipe LH and the high-pressure fuel pump have no foreign materials.**

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



2. Install the fuel pipe insulator No. 3 and fuel pipe insulator No. 4. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>INSTALLATION.
3. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY

1. Install the high-pressure fuel delivery pipe assembly.

Caution:

- **Always use a new high-pressure fuel delivery pipe assembly.**
- **Check that the seal surface of the fuel injector pipe have no deformation, cracks or other damages.**
- **Check that the seal surface of the fuel injector pipe have no foreign materials.**

(1) Temporarily tighten the flare nut (A) to the fuel injector pipe by hand until it is seated, and secure the high-pressure fuel delivery pipe assembly to the water pipe assembly using bolts (B).

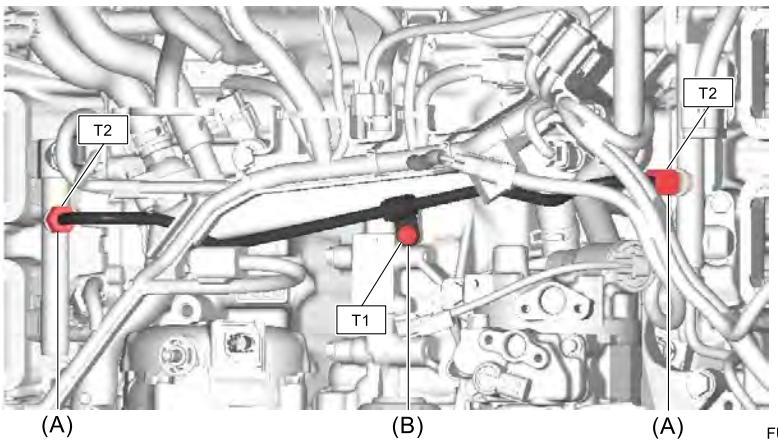
Tightening torque:

T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

(2) Tighten the flare nuts (A).

Tightening torque:

T2: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



2. Install the fuel pipe insulator No. 1, fuel pipe insulator No. 2 and fuel pipe insulator No. 3. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>INSTALLATION.
3. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > High Pressure Fuel Delivery Pipe

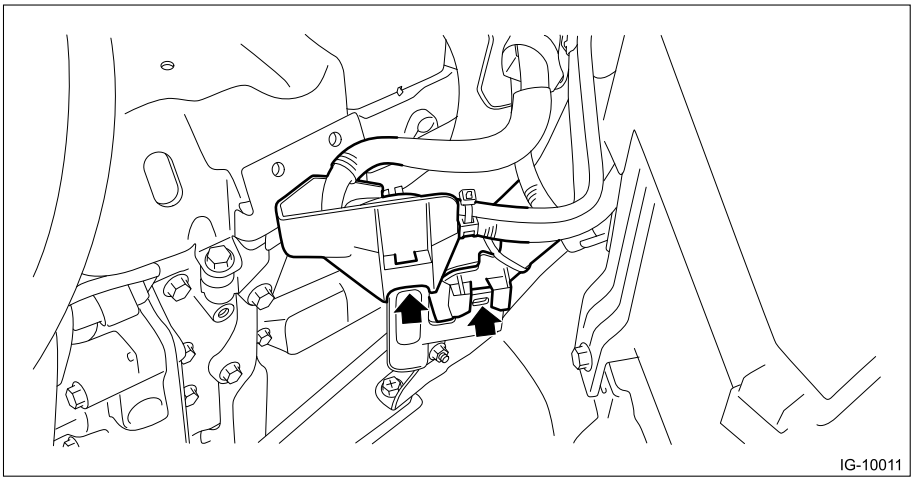
INSPECTION

Check that the high-pressure fuel delivery pipe and the high-pressure fuel delivery pipe assembly have no deformation, cracks and other damages.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Wiring Harness

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the fuel insulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>REMOVAL.
4. Remove the engine wiring harness and the battery cables from the bracket.

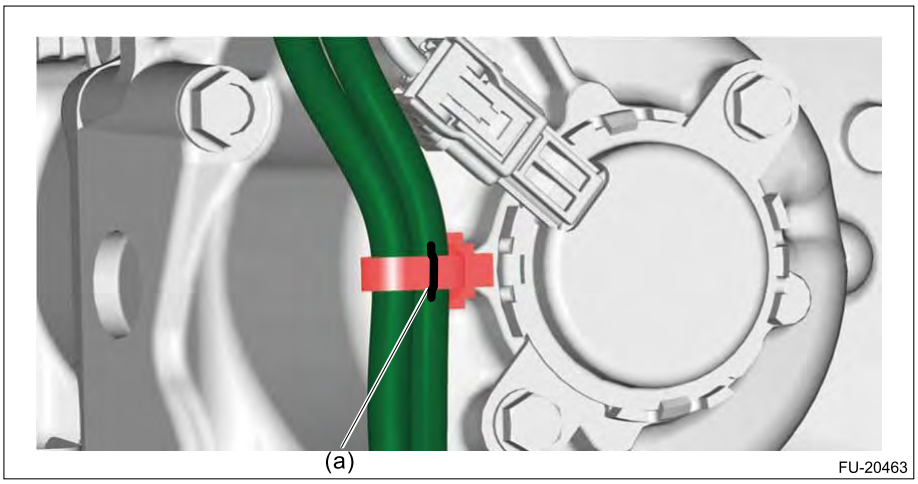


5. Disconnect each connector to remove the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > ENGINE WIRING HARNESS.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Wiring Harness

INSTALLATION

1. Set the engine wiring harness to the engine, and connect each connector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > ENGINE WIRING HARNESS.
   Note:
   - **If the clip is damaged, replace it with a new part.**
   - **Before replacing the clip, put an alignment mark (a) on both engine wiring harness and clip to remove the clip, and then align to the alignment mark (a) to attach a new clip to the engine wiring harness.**



2. Install the fuel insulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Insulator>INSTALLATION.
3. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

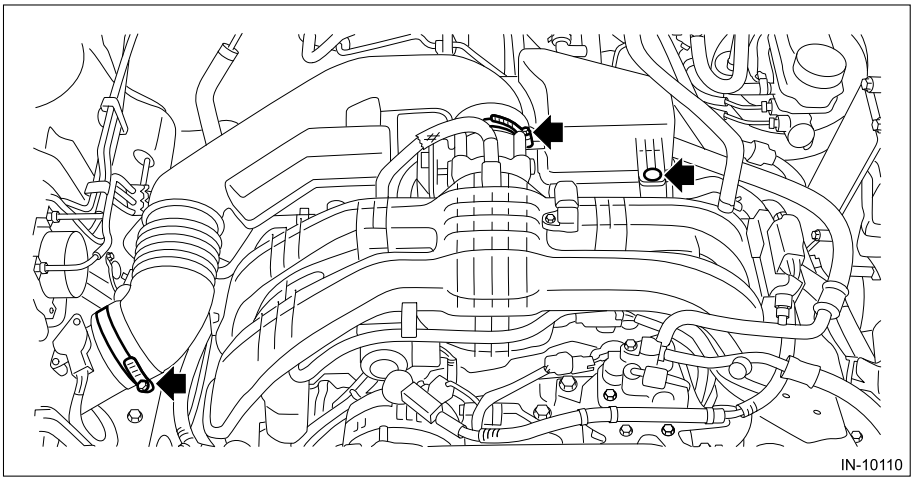
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Wiring Harness

INSPECTION

Check that the engine wiring harness does not have deformation, cracks and any other damage.

REMOVAL

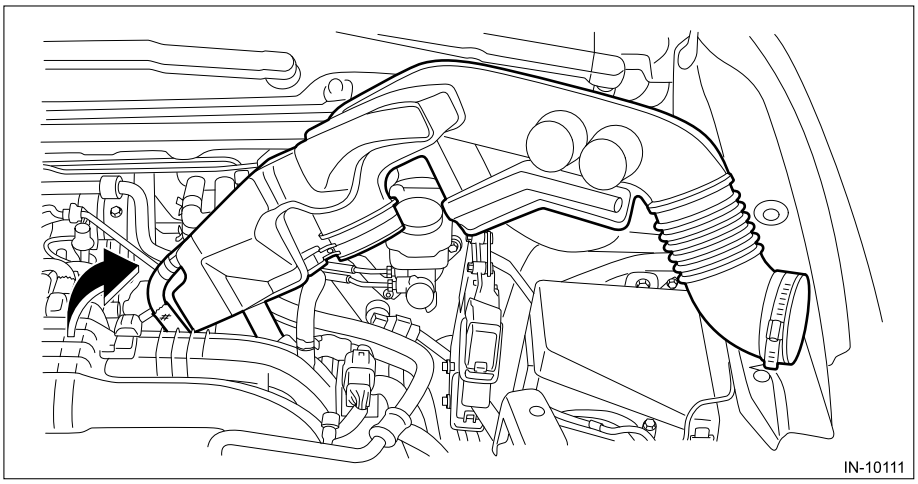
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
3. Remove the clip from the air intake boot, and loosen the clamp.



4. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.



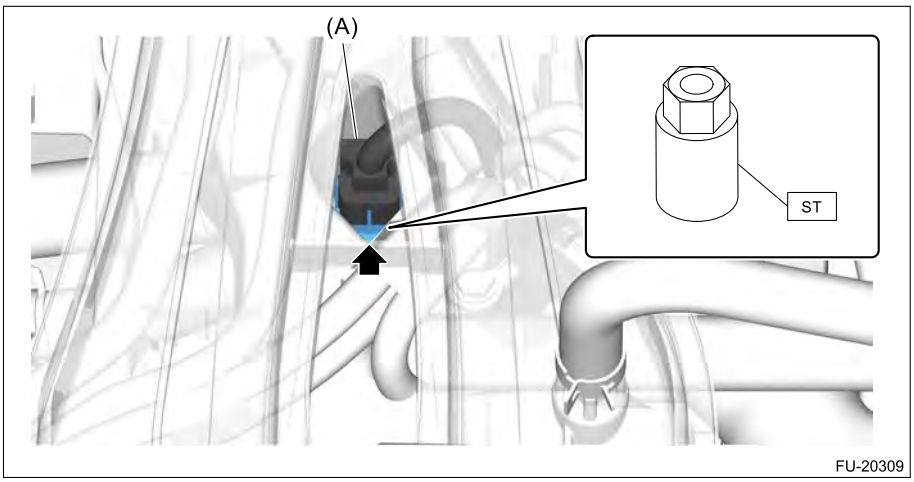
5. Disconnect the connector (A) from the engine coolant temperature sensor, and remove the engine coolant temperature sensor using the ST.

Note:

STRUT MOUNT SOCKET (20099PA000) can also be used.

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Coolant Temperature Sensor

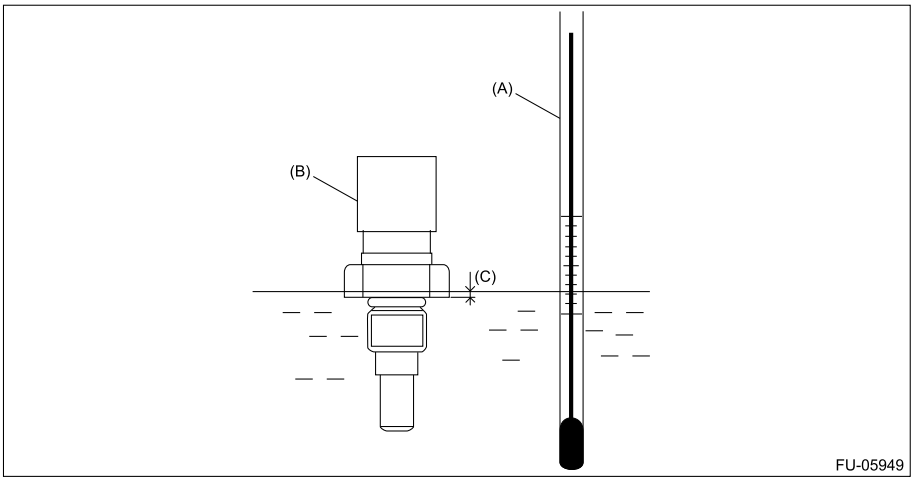
INSTALLATION

1. Set a new gasket, install the engine coolant temperature sensor using the ST.
   Note:
   STRUT MOUNT SOCKET (20099PA000) can also be used.
   Preparation tool:
   ST: STRUT MOUNT SOCKET (20399AG000)
   Tightening torque:
   16 N·m (1.6 kgf-m, 11.8 ft-lb)
2. Connect the connector to engine coolant temperature sensor.
3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Coolant Temperature Sensor

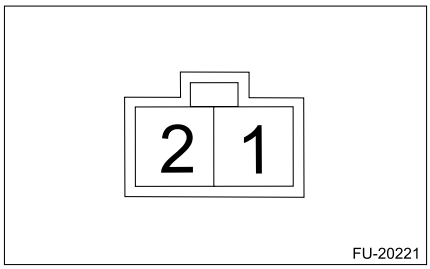
INSPECTION

1. Check that the engine coolant temperature sensor has no deformation, cracks or other damages.
2. Immerse the engine coolant temperature sensor and a thermometer in water.
   Caution:
   Take care not to allow water to get into the engine coolant temperature sensor connector. Completely remove any water inside.



(A) Thermometer (B) Engine coolant temperature sensor (C) Hexagonal part height: To approx. $^{1}/_{3}$

3. Raise water temperature gradually, measure the resistance between the engine coolant temperature sensor terminals when the temperature is 20°C (68°F) and 80°C (176°F).
   Note:
   Agitate the water for even temperature distribution.



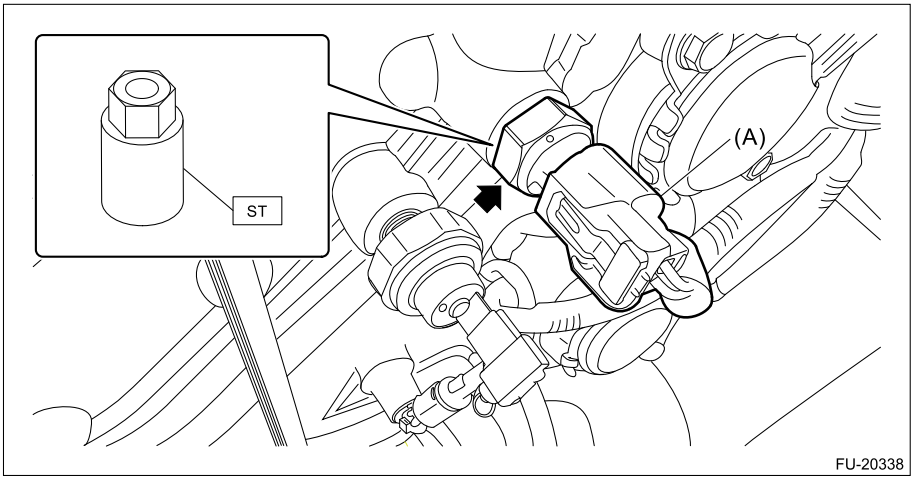
Water temperature	Terminal No.	Standard
20°C (68°F)	1 and 2	Approx. 2.45±0.2 kΩ
80°C (176°F)		Approx. 0.318±0.013 kΩ

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Oil Temperature Sensor

REMOVAL

Caution:
If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emission of smoke or causing a fire.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (A) from the engine oil temperature sensor, and remove the engine oil temperature sensor from the chain cover using the ST.
   Note:
   STRUT MOUNT SOCKET (20099PA000) can also be used.
   Preparation tool:
   ST: STRUT MOUNT SOCKET (20399AG000)



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Oil Temperature Sensor

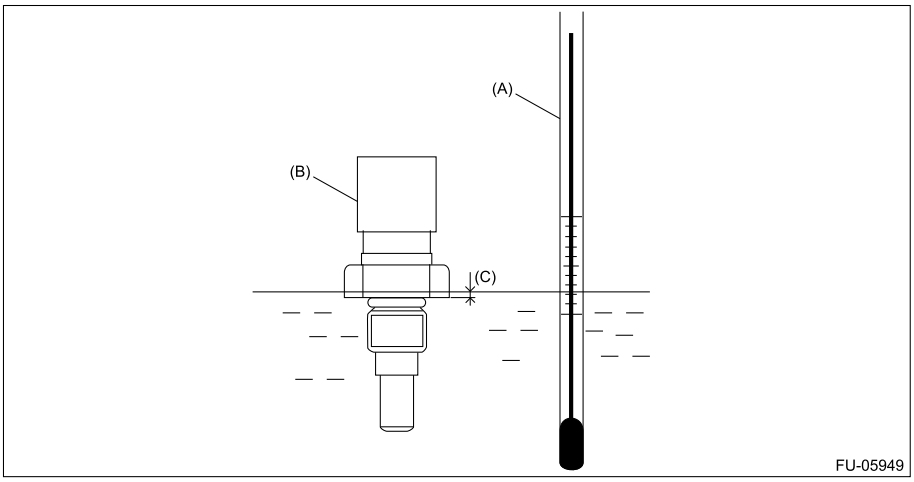
INSTALLATION

1. Set a new gasket, install the engine oil temperature sensor to the chain cover using the ST.
   Note:
   STRUT MOUNT SOCKET (20099PA000) can also be used.
   Preparation tool:
   ST: STRUT MOUNT SOCKET (20399AG000)
   Tightening torque:
   16 N·m (1.6 kgf-m, 11.8 ft-lb)
2. Connect the connector to the engine oil temperature sensor.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Oil Temperature Sensor

INSPECTION

1. Check that the engine oil temperature sensor has no deformation, cracks or other damages.
2. Immerse the engine oil temperature sensor and a thermometer in water.
   Caution:
   Take care not to allow water to get into the engine oil temperature sensor connector. Completely remove any water inside.

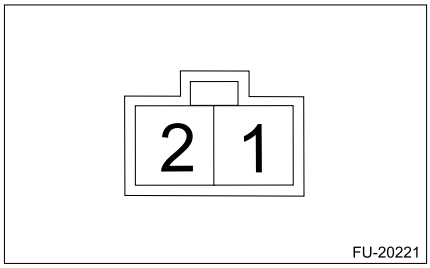


(A) Thermometer (B) Engine oil temperature sensor (C) Hexagonal part height: To approx. $^{1}/_{3}$

3. Raise water temperature gradually, measure the resistance between the engine oil temperature sensor terminals when the temperature is 20°C (68°F) and 80°C (176°F).

Note:

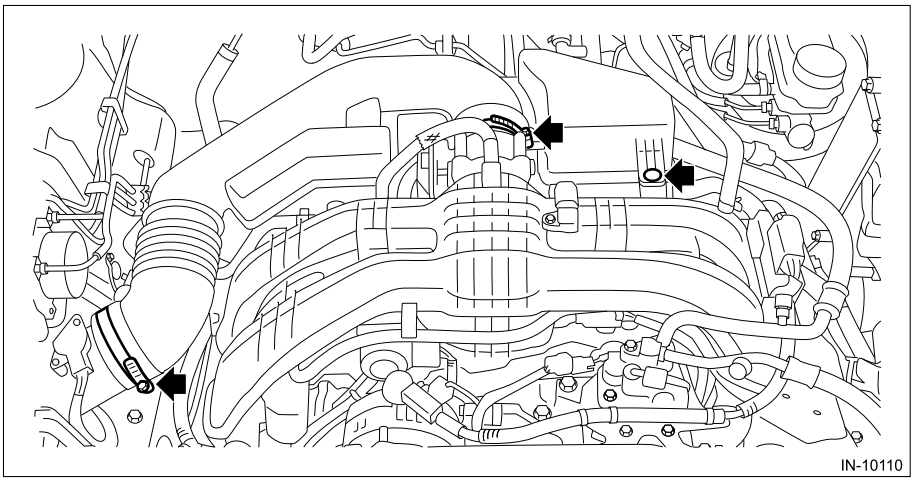
Agitate the water for even temperature distribution.



Water temperature	Terminal No.	Standard
20°C (68°F)	1 and 2	Approx. 2.45±0.2 kΩ
80°C (176°F)		Approx. 0.318±0.013 kΩ

REMOVAL

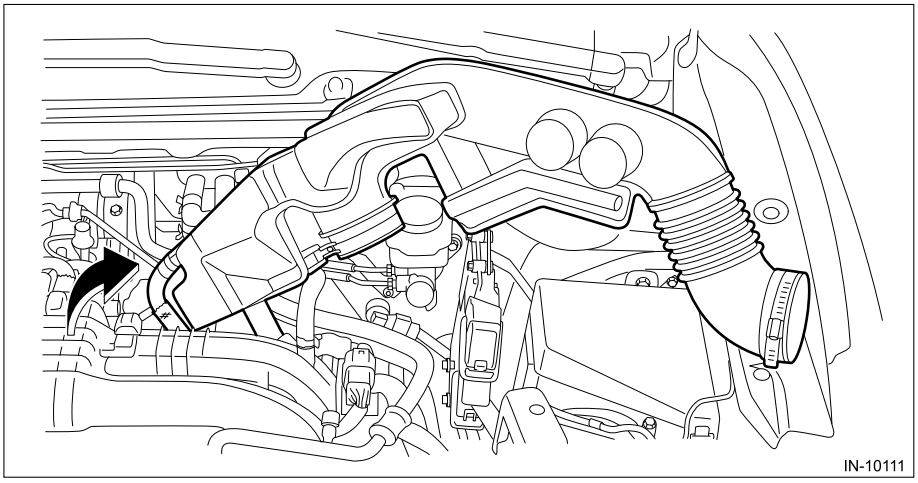
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



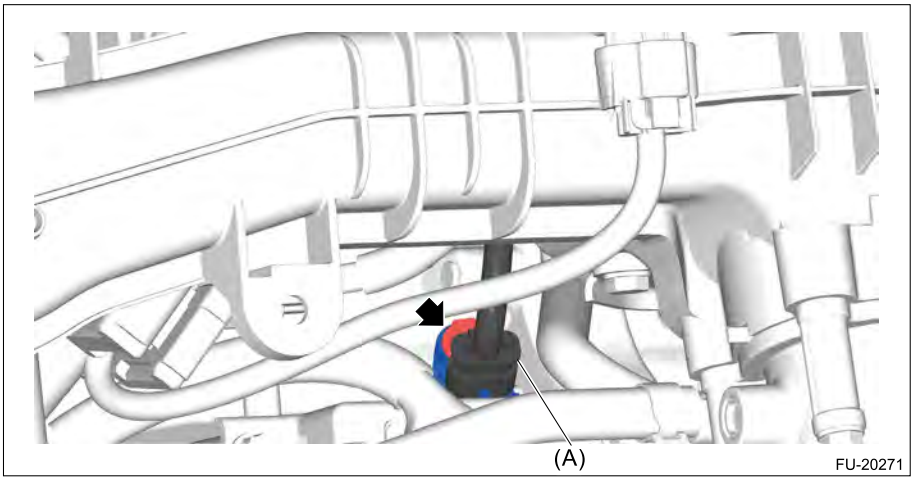
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.



4. Disconnect the connector (A) from the crankshaft position sensor, and remove the crankshaft position sensor from the cylinder block.



INSTALLATION

1. Install the crankshaft position sensor to the cylinder block, and connect the connector to the crankshaft position sensor.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

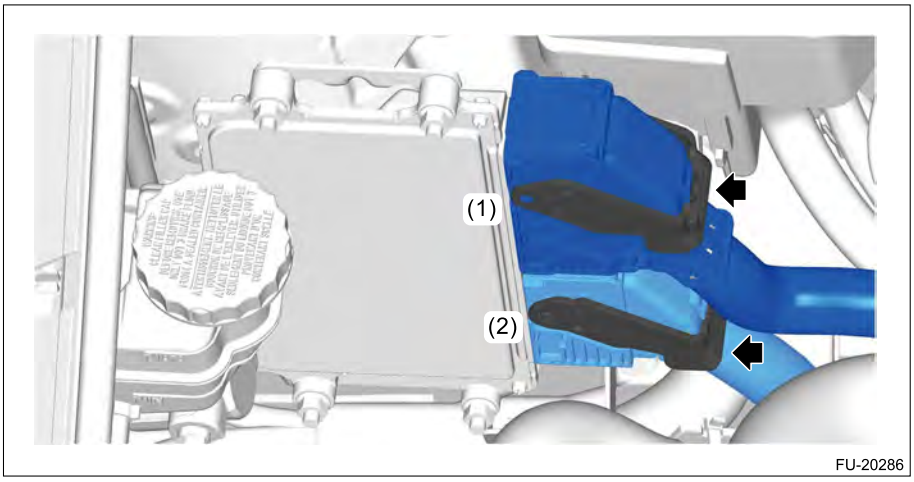
2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Crankshaft Position Sensor

INSPECTION

1. CRANKSHAFT POSITION SENSOR

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Prepare an oscilloscope.
3. Disconnect the connector from ECM in numerical order as shown in the figure.

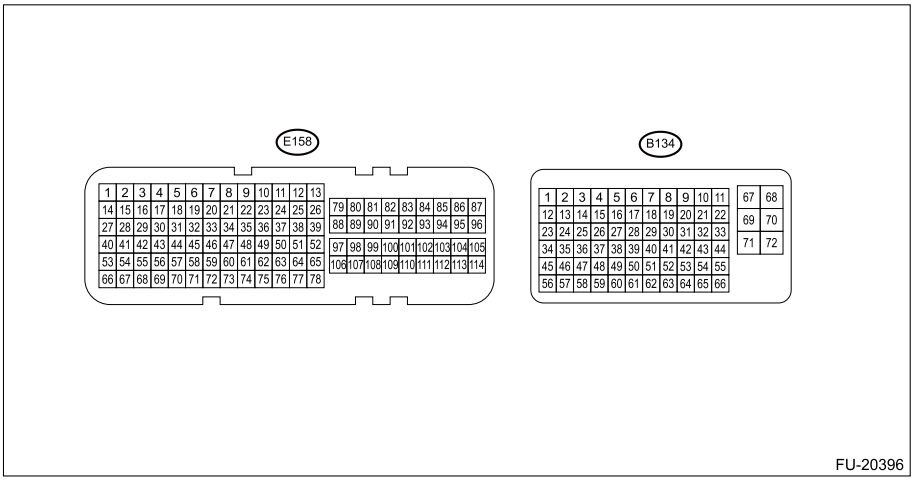


4. Attach the ST between the ECM, engine wiring harness and the bulkhead wiring harness. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Special Tool:

CHECK BOARD (18460AA120)

5. Connect the probe to ST.



Terminal No.	Probe
(E158) No. 66	+
(B134) No. 69	–

6. Start the engine and let it idle.
7. Check the waveforms and voltage.

Note:

For waveform and voltage, refer to "Control Module (ECM) I/O Signal". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

8. After inspection, install the related parts in the reverse order of removal.

Note:

For installation procedures of ECM connectors, refer to Engine Control Module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSTALLATION.

2. OTHER INSPECTIONS

Check that the crankshaft position sensor has no deformation, cracks or other damages.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Crankshaft Position Sensor Plate

REMOVAL

The crankshaft position sensor plate is tightened together with the drive plate or flywheel; therefore, refer to “Drive Plate” or “Flywheel” for removal procedure. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>REMOVAL. Ref. to CLUTCH SYSTEM>Flywheel>REMOVAL.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Crankshaft Position Sensor Plate

INSTALLATION

The crankshaft position sensor plate is tightened together with the drive plate or flywheel; therefore, refer to “Drive Plate” or “Flywheel” for installation procedure. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>INSTALLATION. Ref. to CLUTCH SYSTEM>Flywheel>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Crankshaft Position Sensor Plate

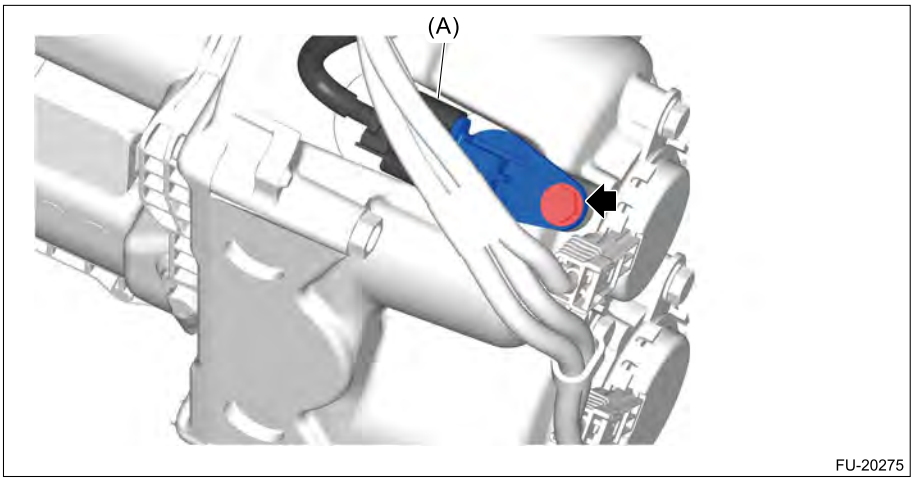
INSPECTION

Check that the crankshaft position sensor plate has no deformation, cracks or other damages.

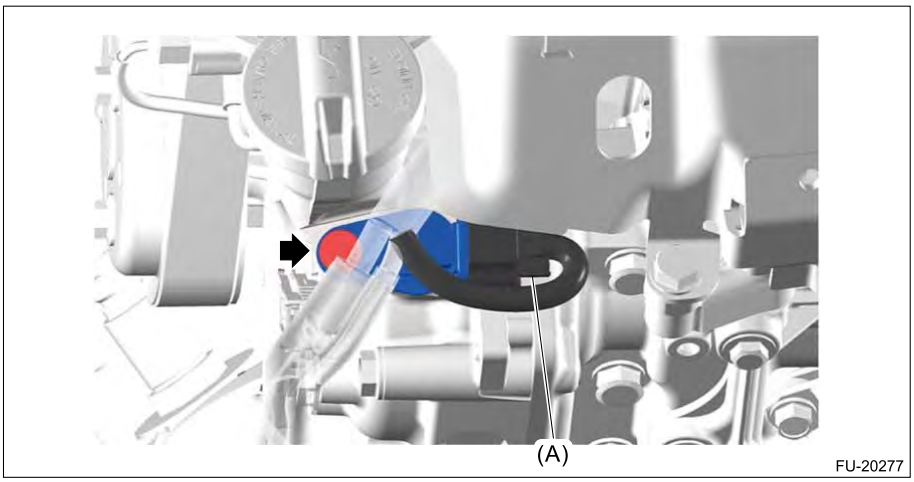
REMOVAL

1. INTAKE SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Disconnect the connector (A) from the camshaft position sensor, and remove the camshaft position sensor from the chain cover.
   - RH side

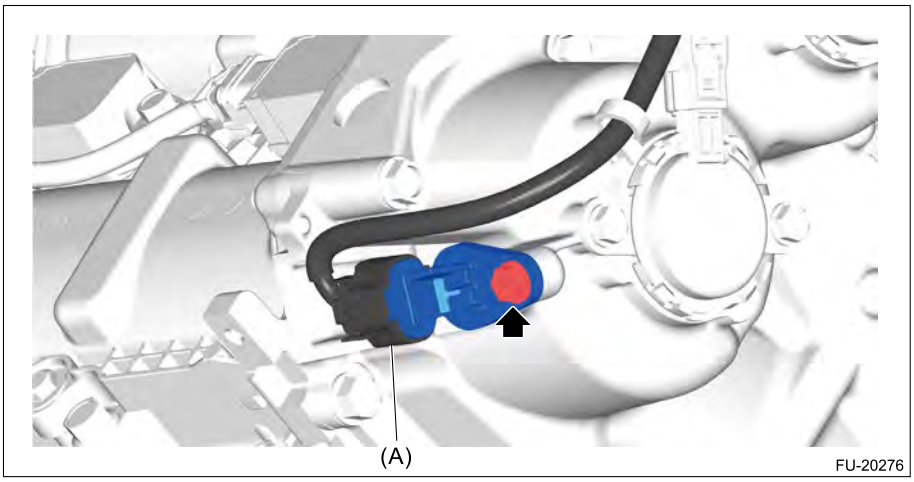


- LH side

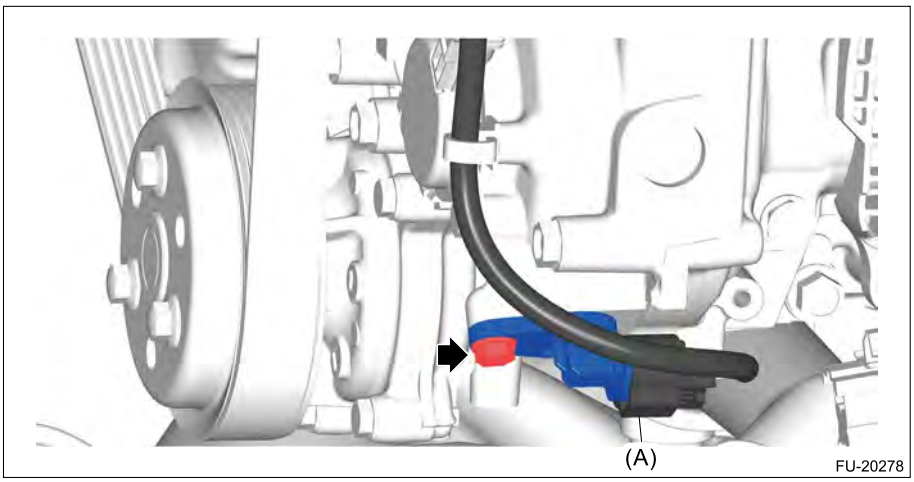


2. EXHAUST SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Disconnect the connector (A) from the camshaft position sensor, and remove the camshaft position sensor from the chain cover.
   - RH side



- LH side



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Camshaft Position Sensor

INSTALLATION

1. INTAKE SIDE

1. Install the camshaft position sensor to the chain cover with new O-ring.
   Note:
   Apply engine oil to O-ring.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Connect the connectors to camshaft position sensor.
3. Install the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. EXHAUST SIDE

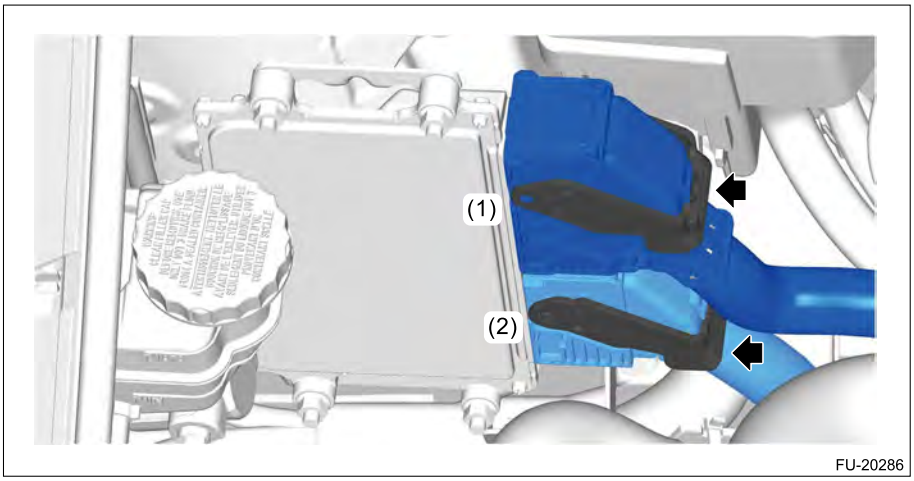
1. Install the camshaft position sensor to the chain cover with new O-ring.
   Note:
   Apply engine oil to O-ring.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Connect the connectors to camshaft position sensor.
3. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Camshaft Position Sensor

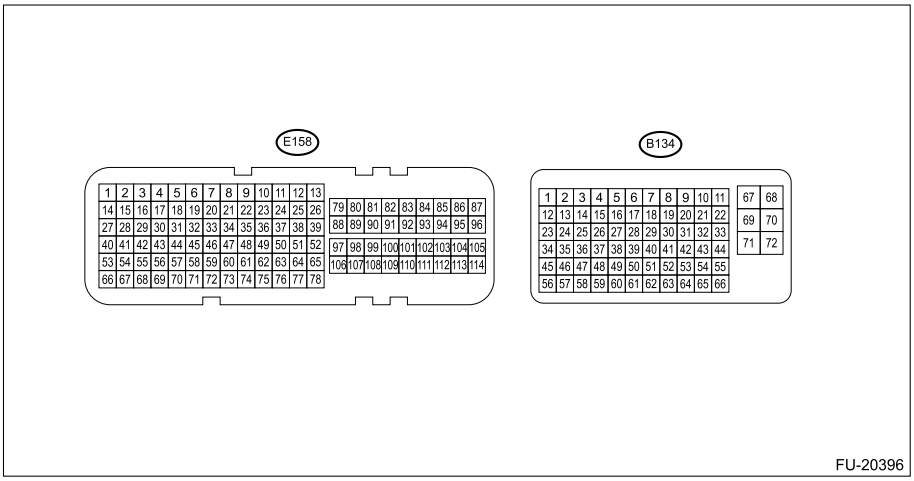
INSPECTION

1. CAMSHAFT POSITION SENSOR

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Prepare an oscilloscope.
3. Disconnect the connector from ECM in numerical order as shown in the figure.



4. Attach the ST between the ECM, engine harness and the bulkhead wiring harness. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.
   Special Tool:
   CHECK BOARD (18460AA120)
5. Connect the probe to ST.



Camshaft position sensor		Terminal No.	Probe
Intake	RH	(E158) No. 78	+
	LH	(E158) No. 77	+
Exhaust	RH	(E158) No. 65	+
	LH	(E158) No. 64	+
RH and LH		(B134) No. 69	–

6. Start the engine and let it idle.
7. Check the waveforms and voltage.
   Note:
   For waveform and voltage, refer to "Control Module (ECM) I/O Signal". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.
8. After inspection, install the related parts in the reverse order of removal.

Note:
For installation procedures of ECM connectors, refer to Engine Control Module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSTALLATION.

2. OTHER INSPECTIONS

Check that the camshaft position sensor has no deformation, cracks or other damages.

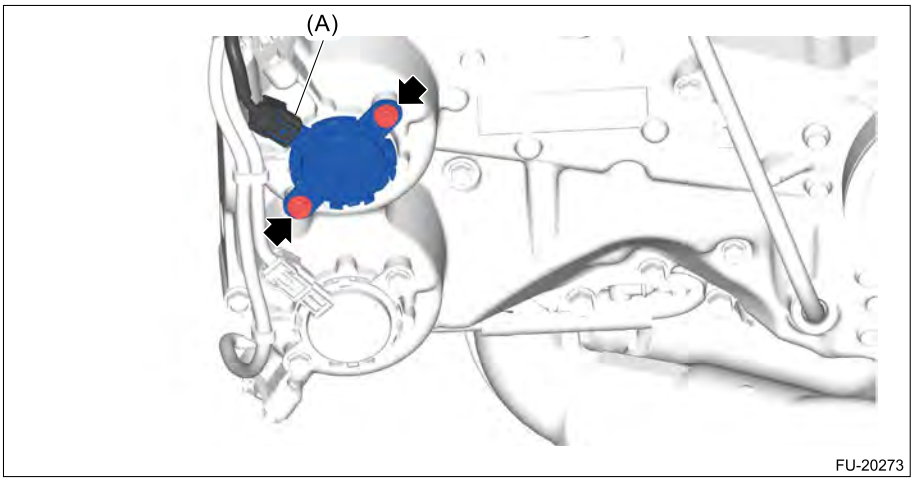
REMOVAL

Caution:

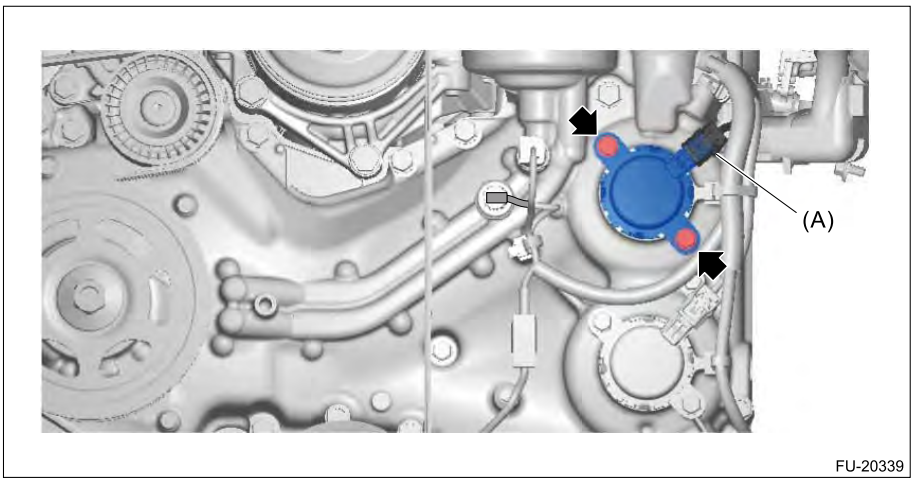
If the engine oil is spilt over exhaust pipe or the under cover, wipe it off with cloth to avoid emission of smoke or causing a fire.

1. INTAKE SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Disconnect the connector (A) from the oil control solenoid, and remove the oil control solenoid from the chain cover.
   - RH side

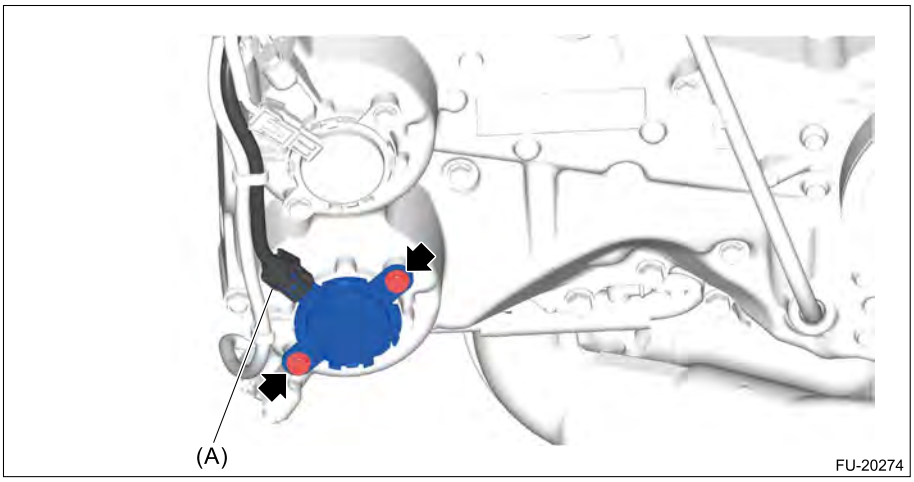


   - LH side

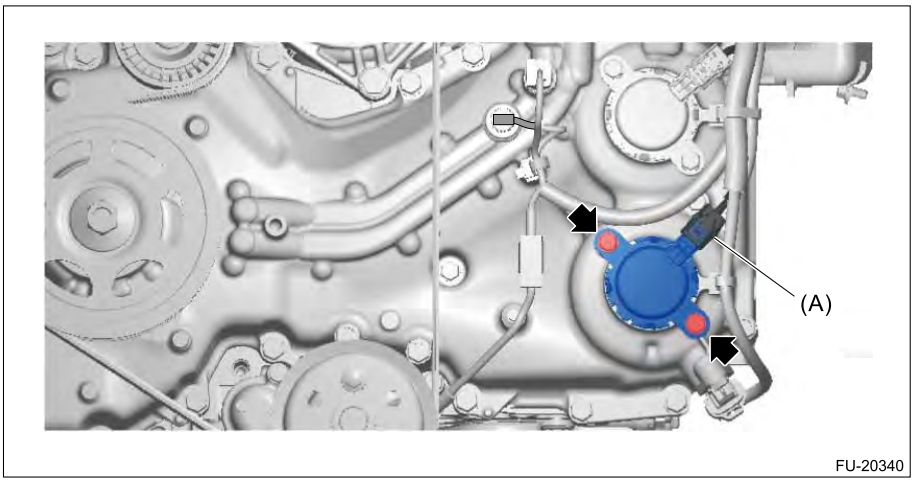


2. EXHAUST SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Disconnect the connector (A) from the oil control solenoid, and remove the oil control solenoid from the chain cover.
   - RH side



- LH side



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Oil Control Solenoid

INSTALLATION

1. INTAKE SIDE

1. Using a new O-ring, install the intake oil control solenoid to the chain cover.
   Note:
   Apply engine oil to O-ring.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Connect the connector to the intake oil control solenoid.
3. Install the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

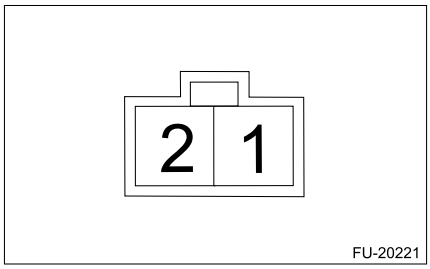
2. EXHAUST SIDE

1. Using a new O-ring, install the intake oil control solenoid to the chain cover.
   Note:
   Apply engine oil to O-ring.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Connect the connector to the intake oil control solenoid.
3. Install the air intake duct. (RH side only) Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Oil Control Solenoid

INSPECTION

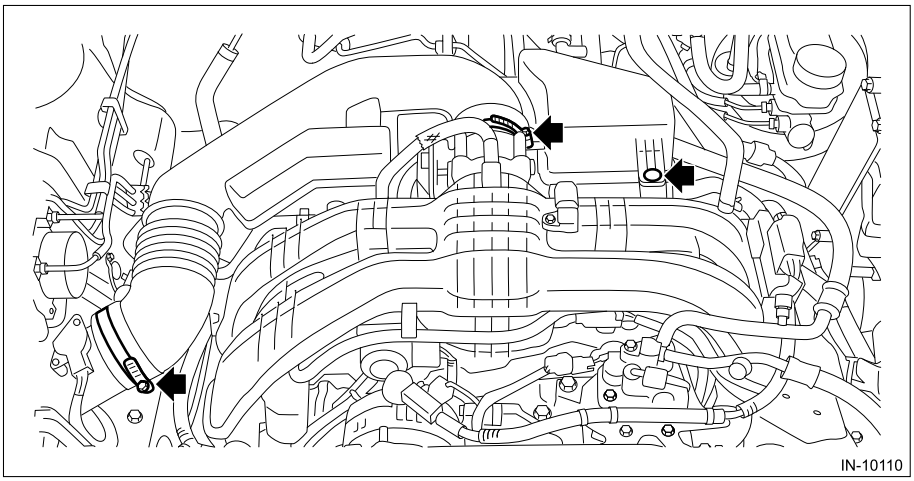
1. Check that the oil control solenoid has no deformation, cracks or other damages.
2. Measure the resistance between the oil control solenoid terminals.



Terminal No.	Standard
1 and 2	7.25±0.4Ω (when 20°C (68°F))

REMOVAL

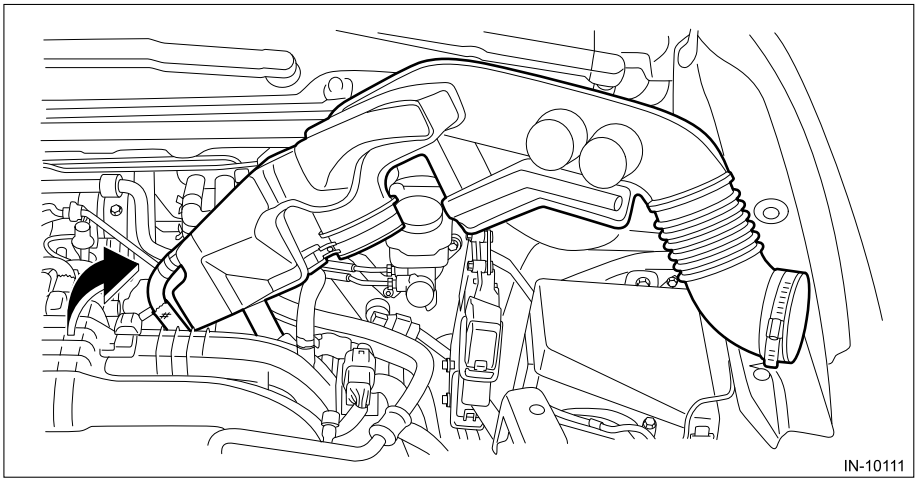
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



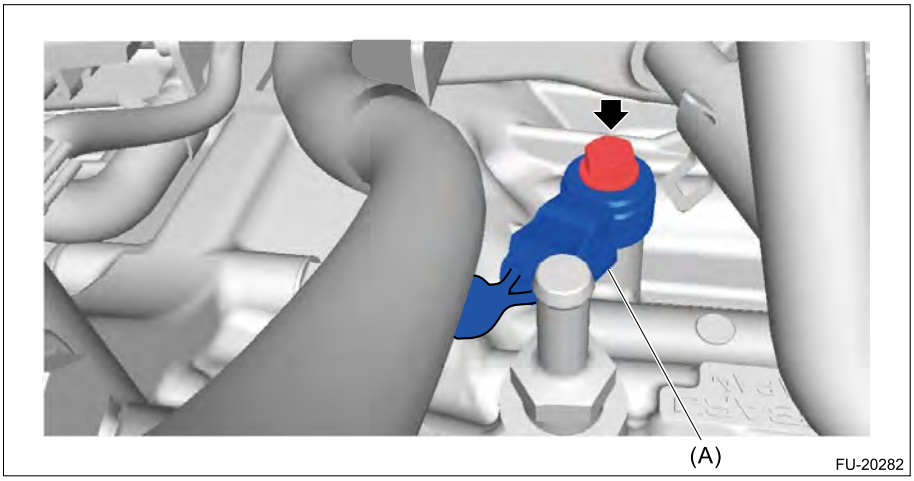
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

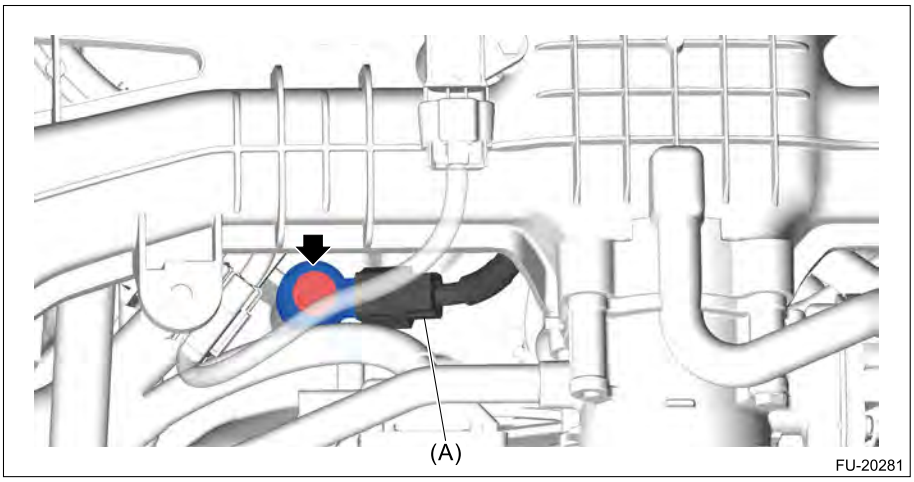
Be careful not to pull out the PCV hose.



4. Disconnect the connector (A) from the knock sensor, and remove the knock sensor from the cylinder block.
   - RH side



   - LH side

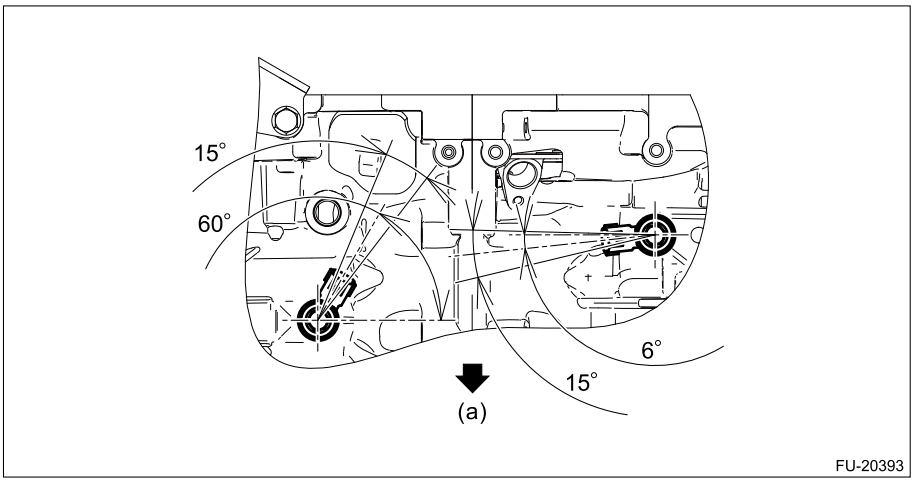


FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Knock Sensor

INSTALLATION

1. Install the knock sensor to the cylinder block, and connect the connector to the knock sensor.
   Note:
   - **Knock sensor must be positioned so that the connector center comes within the range shown in the figure.**
   - **Make sure that the knock sensor and its connector do not touch the adjacent parts.**

   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)



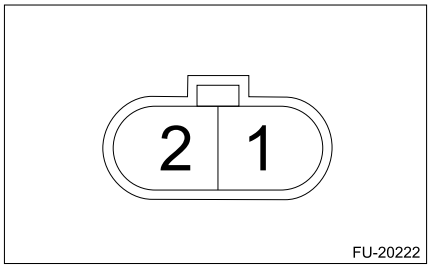
(A) Front of engine

2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Knock Sensor

INSPECTION

1. Check that the knock sensor has no deformation, cracks or other damages.
2. Measure the resistance between knock sensor terminals.



Terminal No.	Standard
1 and 2	560±28 kΩ

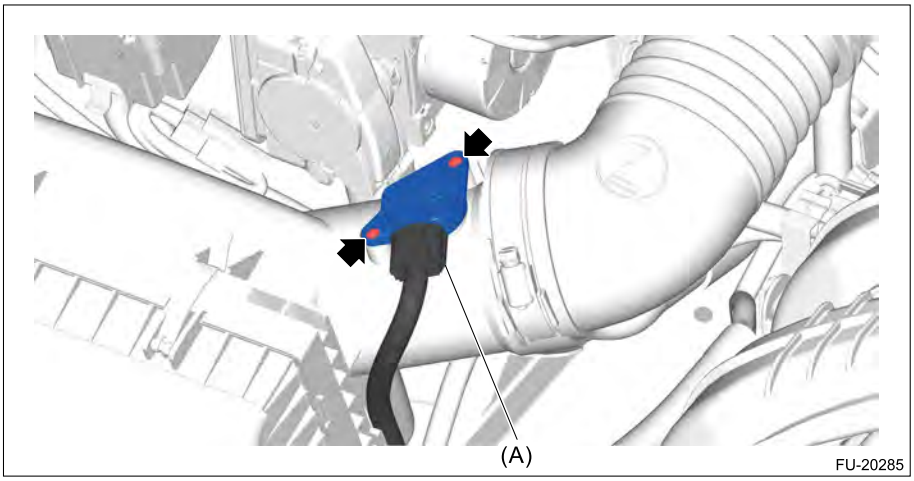
SPECIFICATION

Throttle body is a non-disassembled part, so do not remove the throttle position sensor from throttle body.
Refer to “Throttle Body” for removal and installation procedure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>REMOVAL. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Mass Air Flow and Intake Air Temperature Sensor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (A) from the mass air flow and intake air temperature sensor, and remove the mass air flow and intake air temperature sensor.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Mass Air Flow and Intake Air Temperature Sensor

INSTALLATION

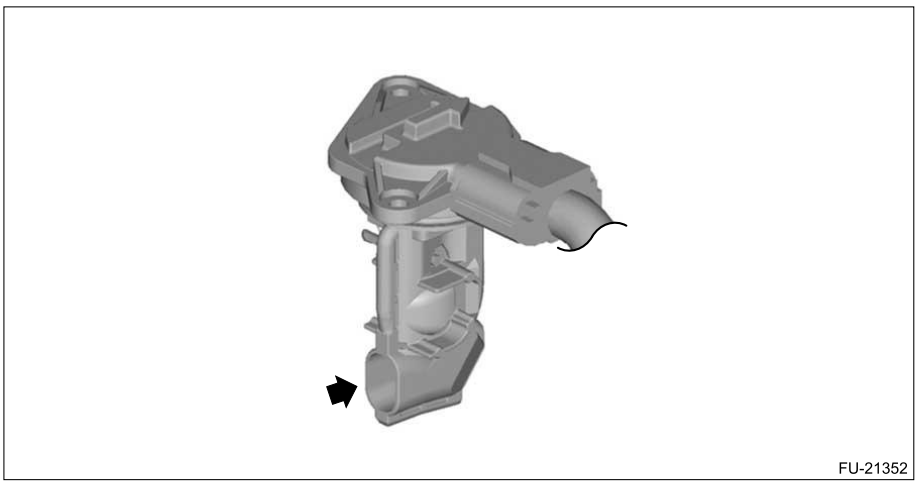
1. Install the mass air flow and intake air temperature sensor, and connect the connector to the mass air flow and intake air temperature sensor.
   Tightening torque:
   1 N·m (0.1 kgf-m, 0.7 ft-lb)
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Mass Air Flow and Intake Air Temperature Sensor

INSPECTION

1. CHECK THE MASS AIR FLOW SENSOR UNIT

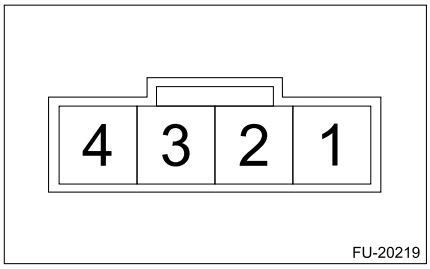
1. Remove the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>REMOVAL.
   Note:
   Do not disconnect the connector.
2. Turn the ignition switch to ON. (Engine OFF)
3. Using the Subaru Select Monitor, read the intake air amount. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
4. Check that the intake air amount changes when air is blown to the mass air flow sensor unit in the arrow direction.
   Caution:
   Be careful that no dust enter inside the unit when air is blown.



5. After inspection, install the related parts in the reverse order of removal.

2. CHECK THE INTAKE AIR TEMPERATURE SENSOR UNIT

Measure the resistance between intake air temperature sensor terminals.



Temperature	Terminal No.	Standard
−20°C (−4°F)	2 and 4	16.0±2.4 kΩ
20°C (68°F)		2.45±0.24 kΩ
60°C (140°F)		0.58±0.087 kΩ

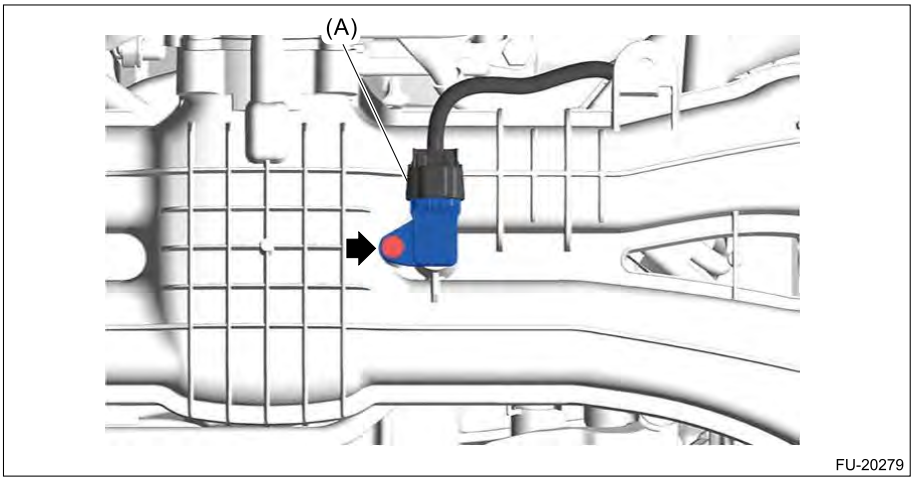
3. OTHER INSPECTIONS

1. Check that the mass air flow and intake air temperature sensor has no deformation, cracks or other damages.
2. Check that the mass air flow and intake air temperature sensor has no dirt.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Manifold Absolute Pressure Sensor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector (A) from the manifold absolute pressure sensor, and remove the manifold absolute pressure sensor from intake manifold assembly.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Manifold Absolute Pressure Sensor

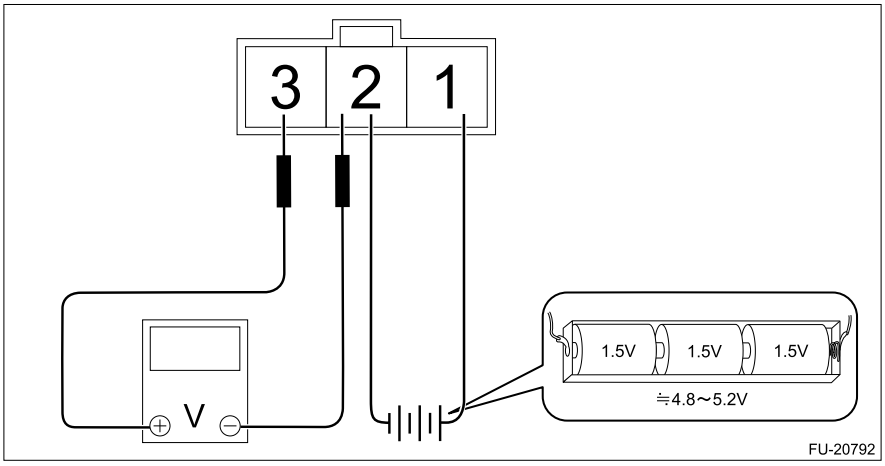
INSTALLATION

1. Using a new O-ring, install the manifold absolute pressure sensor to the intake manifold assembly.
   Tightening torque:
   3.4 N·m (0.3 kgf-m, 2.5 ft-lb)
2. Connect the connector to the manifold absolute pressure sensor.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Manifold Absolute Pressure Sensor

INSPECTION

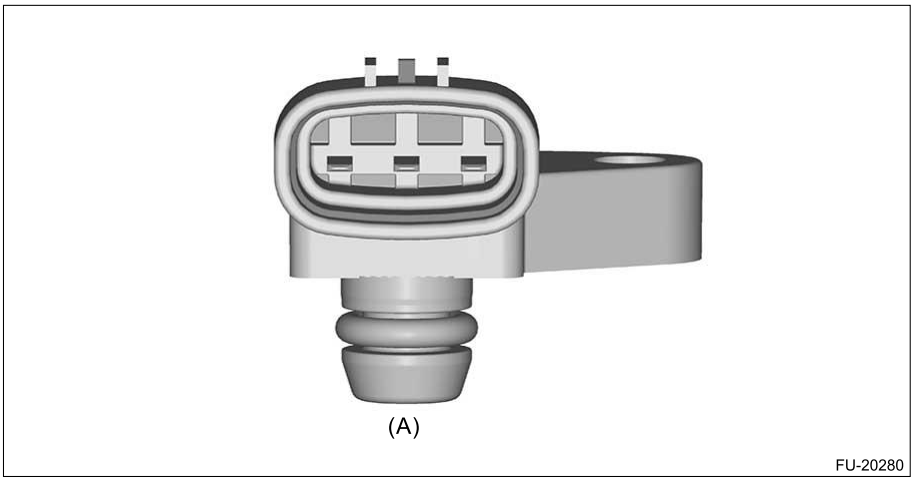
1. Check that the manifold absolute pressure sensor has no deformation, cracks or other damages.
2. Using new dry cell batteries, connect the battery positive terminal to terminal No. 1 and the battery ground terminal to terminal No. 2, and connect the circuit tester positive terminal to terminal No. 3 and the circuit tester ground terminal to terminal No. 2.
   Note:
   - **Using a circuit tester, check that the initial voltage of each dry-cell battery is 1.6 V or more. And also check that the voltage of three batteries in series is between 4.8—5.2 V.**
   - **For power supply, 5 V DC constant voltage power source can also be used.**



3. Check the voltage at a normal atmospheric pressure.
   Note:
   The atmospheric pressure at higher altitude is lower than normal. Therefore, the voltage is lower than the standard value.

Terminal No.	Standard
3 (+) and 2 (−)	Approx. 4.65 V (when 25°C (77°F))

4. Connect the Mighty Vac to the pressure port (A) of manifold absolute pressure sensor.



5. Check the voltage when generating vacuum using Mighty Vac.

Caution:

Do not apply a vacuum that exceeds −105 kPa (−1.07 kg/cm^2, −15.2 psi). Doing so may damage the manifold absolute pressure sensor.

Note:

When vacuum occurs at the pressure port of manifold absolute pressure sensor, the voltage will drop from the value as in step 3).

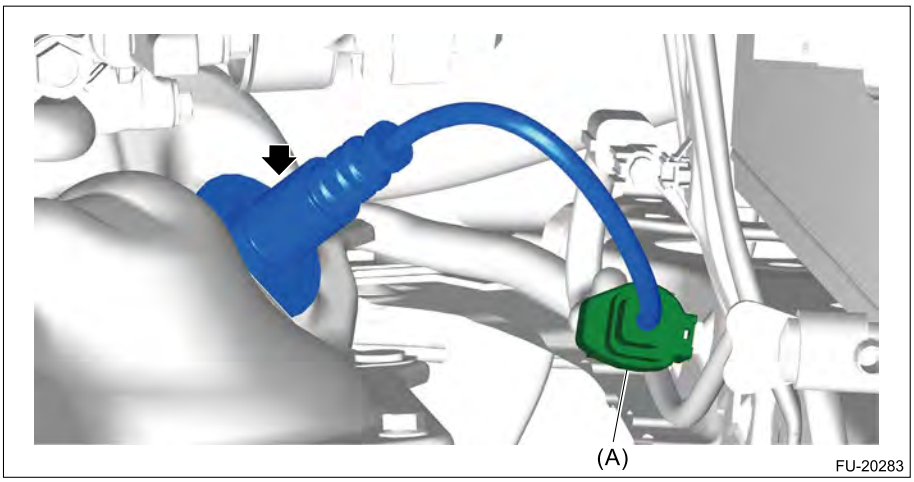
Pressure	Terminal No.	Standard
−105 kPa (−1.07 kg/cm^2, −15.2 psi)	3 (+) and 2 (−)	Approx. 0.4 V (when 25°C (77°F))

REMOVAL

Caution:
Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Apply spray-type lubricant (004301003) or equivalent to the threaded portion of front oxygen (A/F) sensor, and leave it for one minute or more.
5. Disconnect the front O_2 (A/F) sensor connector (A), and remove the front O_2 (A/F) sensor.

   Caution:
   When removing the front oxygen (A/F) sensor, wait until exhaust pipe cools, otherwise it will damage the exhaust pipe.



INSTALLATION

Caution:
If lubricant is spilt over the exhaust pipe, wipe it off with cloth to avoid emission of smoke or causing a fire.

1. Before installing front oxygen (A/F) sensor, apply anti-seize compound only to the threaded portion of front oxygen (A/F) sensor to make the next removal easier.

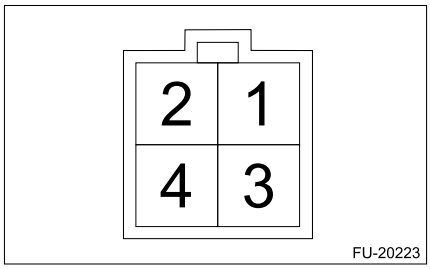
   Caution:
   Never apply anti-seize compound to the protector of front oxygen (A/F) sensor.

   Anti-seize compound:
   NEVER-SEEZ NSN, JET LUBE SS-30 or equivalent
2. Install the front O_2 (A/F) sensor, and connect the front O_2 (A/F) sensor connector.

   Tightening torque:
   21 N·m (2.1 kgf-m, 15.5 ft-lb)
3. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

1. Check that the front oxygen (A/F) sensor has no deformation, cracks or other damages.
2. Measure the resistance between front oxygen (A/F) sensor terminals.



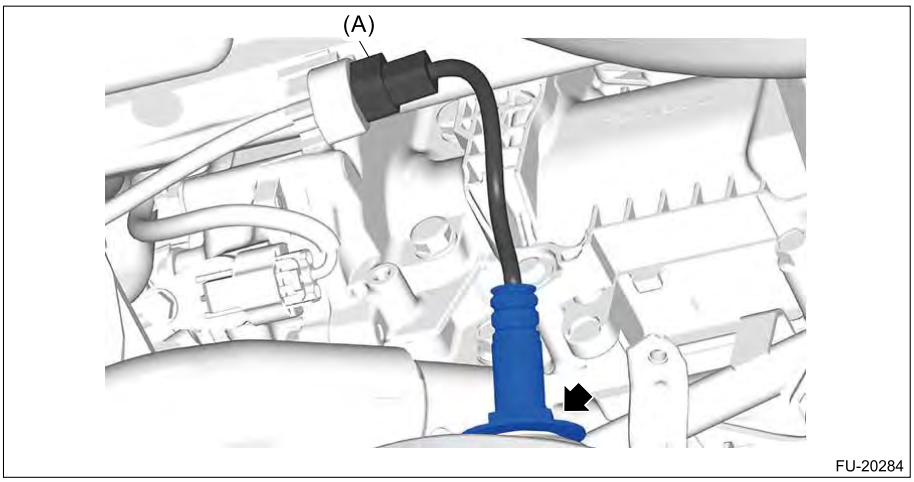
Terminal No.	Standard
1 and 2	2.0±0.2Ω (when 20°C (68°F))

REMOVAL

Caution:
Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Apply spray-type lubricant (004301003) or equivalent to the threaded portion of rear oxygen sensor, and leave it for one minute or more.
5. Disconnect the rear O_2 sensor connector (A), and remove the rear O_2 sensor.

   Caution:
   When removing the rear oxygen sensor, wait until exhaust pipe cools, otherwise it will damage the exhaust pipe.



INSTALLATION

Caution:
If lubricant is spilt over the exhaust pipe, wipe it off with cloth to avoid emission of smoke or causing a fire.

1. Before installing rear oxygen sensor, apply the anti-seize compound only to the threaded portion of rear oxygen sensor to make the next removal easier.

   Caution:
   Never apply anti-seize compound to the protector of rear oxygen sensor.

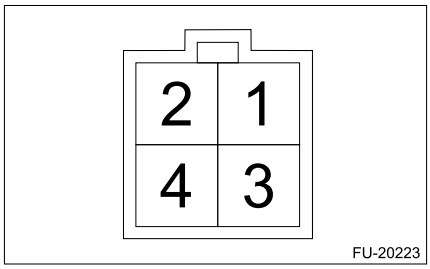
   Anti-seize compound:
   NEVER-SEEZ NSN, JET LUBE SS-30 or equivalent
2. Install the rear O_2 sensor, and connect the rear O_2 sensor connector.

   Caution:
   Do not cross the rear O2 sensor harness with the ground cord during installation.

   Tightening torque:
   21 N·m (2.1 kgf-m, 15.5 ft-lb)
3. Install the under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

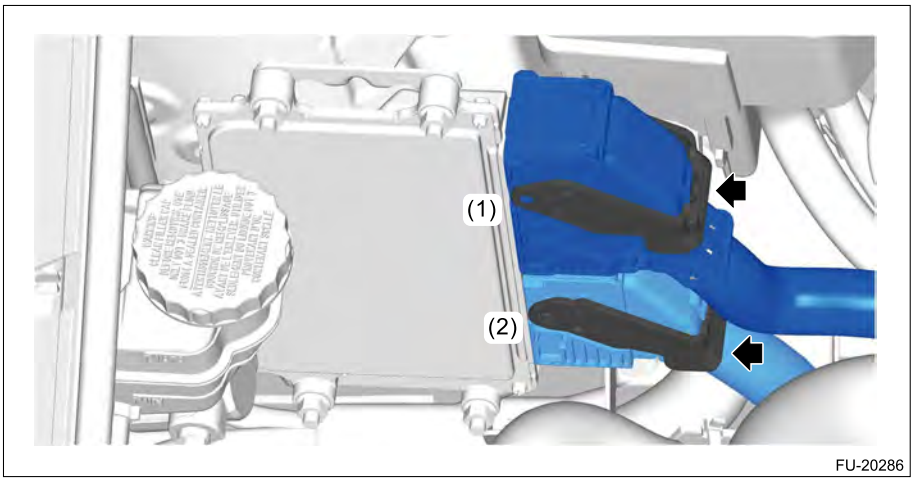
1. Check that the rear oxygen sensor has no deformation, cracks or other damages.
2. Measure the resistance between rear oxygen sensor terminals.



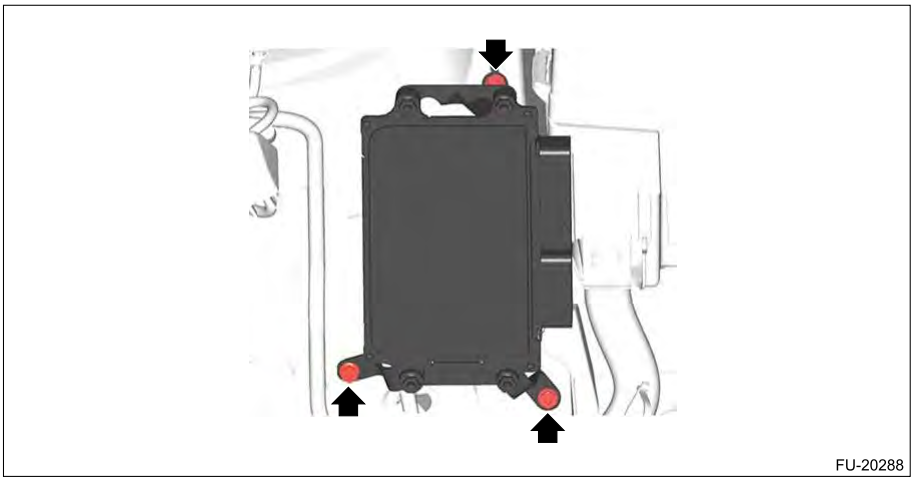
Terminal No.	Standard
1 and 2	$5.6^{+0.8}_{-0.6}$ Ω (when 20°C (68°F))

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector in numerical order as shown in the figure.



3. Remove the ECM from vehicle.



4. Remove the ECM bracket.

INSTALLATION

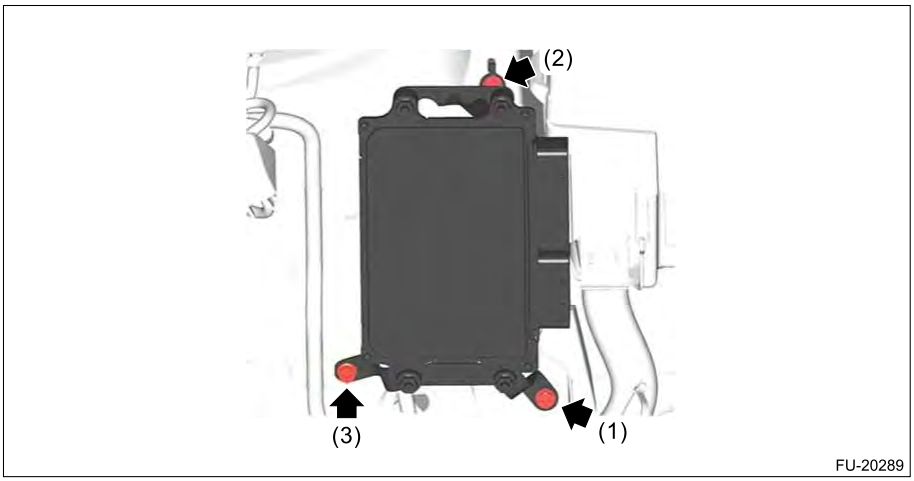
Caution:

- **When the ECM of model with immobilizer has been replaced, be sure to perform the registration of immobilizer system. (Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".)**
  - **For model without keyless access with push button start, refer to the Type B in "REGISTRATION MANUAL FOR IMMOBILIZER".**
  - **For model with keyless access with push button start, refer to the Type D in "REGISTRATION MANUAL FOR IMMOBILIZER".**
- **When the ECM has been replaced, be sure to perform the registration of VIN. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Work Support.**

Note:

When replacing the ECM, be careful not to use the ECM of wrong specification to avoid any damage on the fuel injection system.

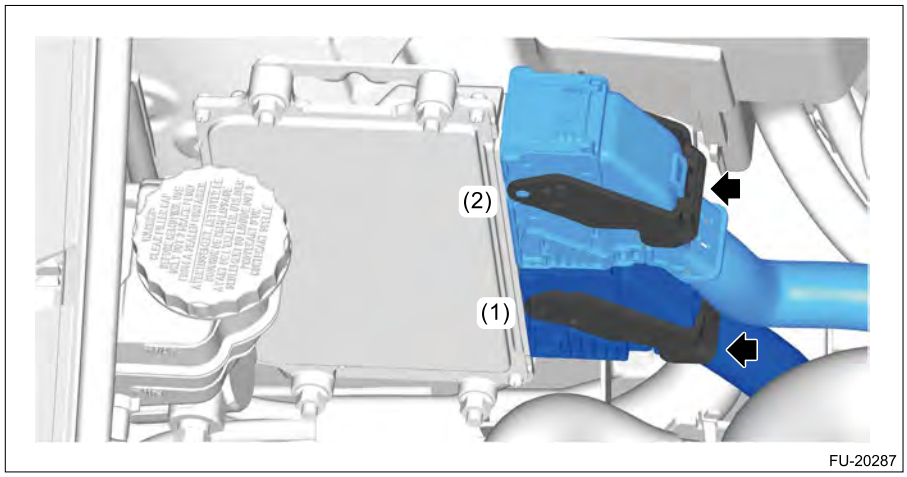
1. Install the ECM bracket.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Temporarily install the ECM to the vehicle, tighten the fasteners in numerical order as shown in the figure.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



3. Connect the connector in numerical order as shown in the figure.

Caution:

To prevent damage to the connector, when connecting the connector, insert the connector straight in until it stops, and while maintaining the position, lock the lever.



4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Engine Control Module (ECM)

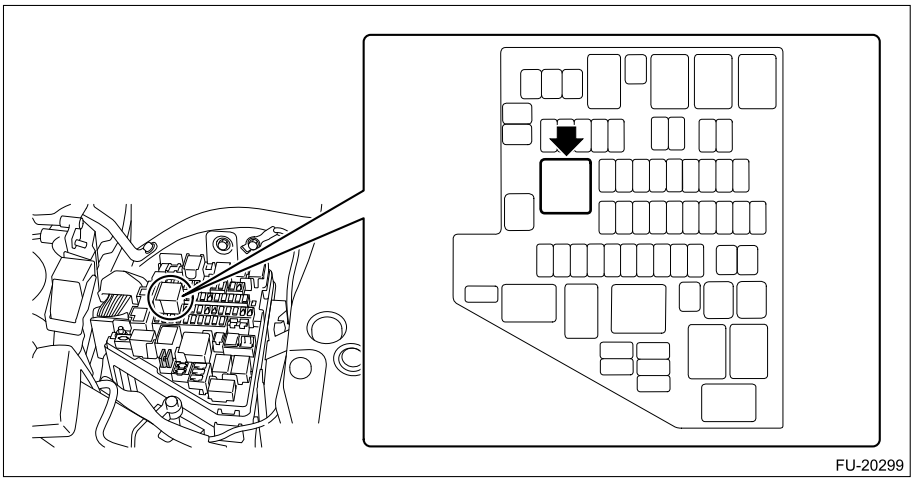
INSPECTION

Check that the ECM has no deformation, cracks or other damages.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Main Relay

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the main relay from main fuse box.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Main Relay

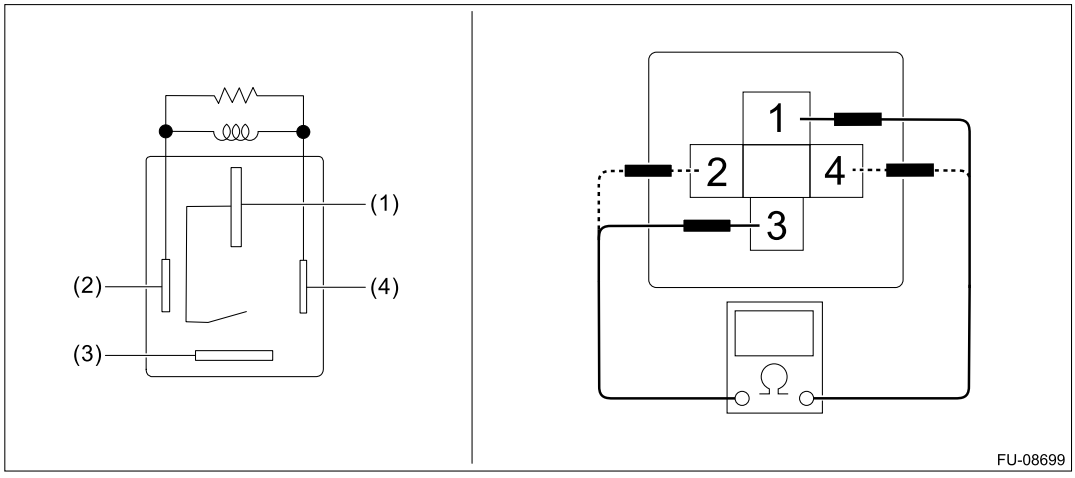
INSTALLATION

1. Install the main relay to the main fuse box.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Main Relay

INSPECTION

1. Check that the main relay has no deformation, cracks or other damages.
2. Measure the resistance between main relay terminals.

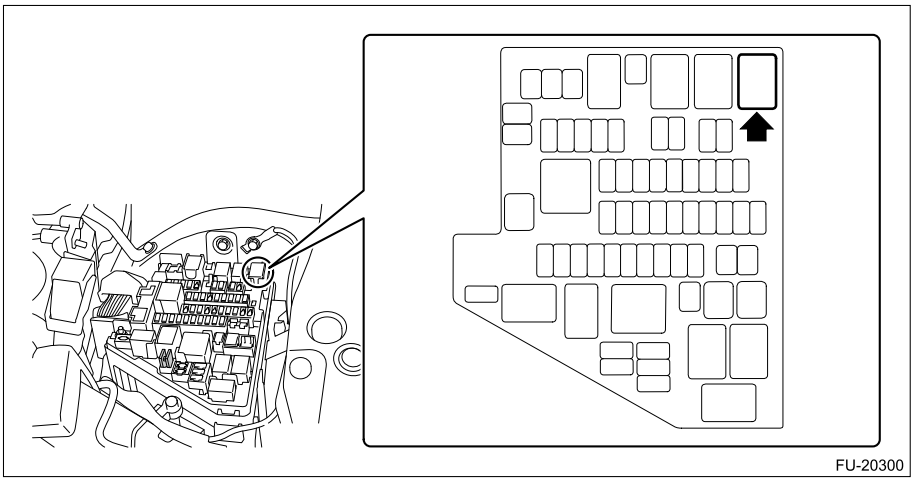


Terminal No.	Inspection conditions	Standard
3 — 4	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pump Relay

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the fuel pump relay from the main fuse box.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pump Relay

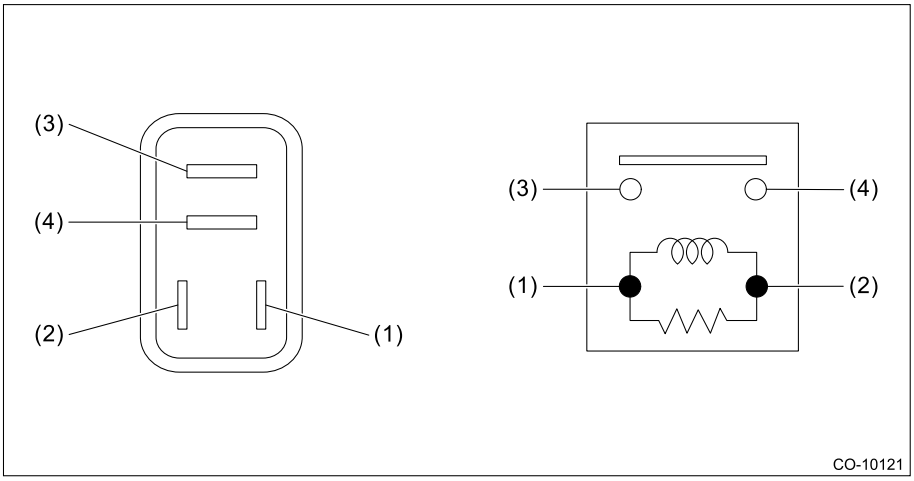
INSTALLATION

1. Install the fuel pump relay to the main fuse box.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pump Relay

INSPECTION

1. Check that the fuel pump relay has no deformation, cracks or other damages.
2. Measure the resistance between fuel pump relay terminals.



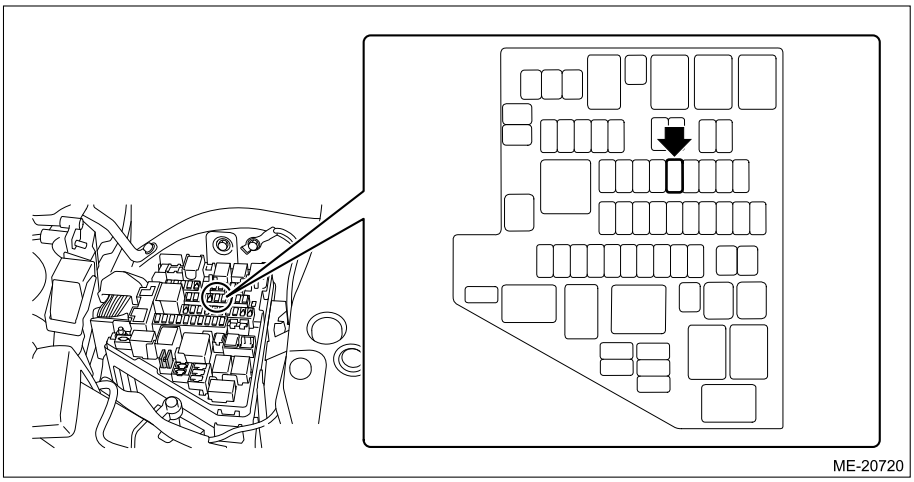
Terminal No.	Inspection conditions	Standard
3 — 4	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

PROCEDURE

1. RELEASING OF FUEL PRESSURE

Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
Be careful not to spill fuel.

1. Remove the fuse of fuel pump from main fuse box.



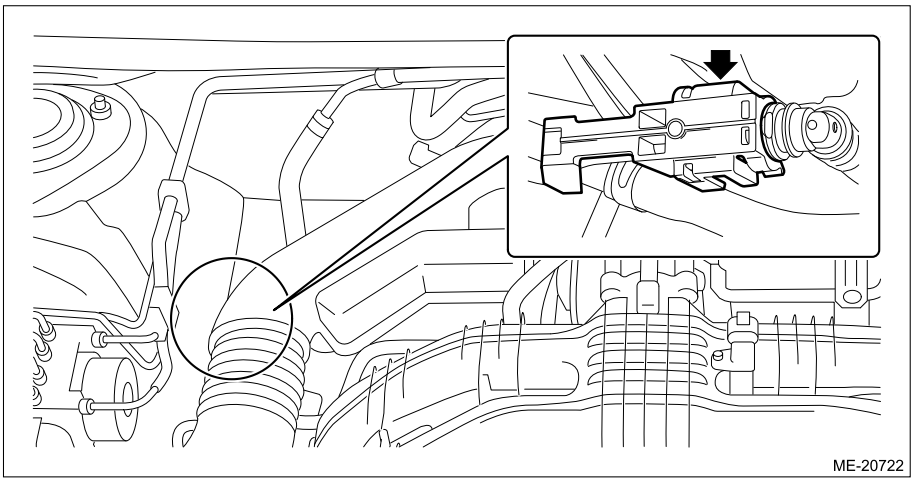
2. Start the engine and run it until it stalls.
3. After the engine stalls, crank it for five more seconds.
4. Turn the ignition switch to OFF.
5. Install the fuse of fuel pump to the main fuse box.

2. DRAINING FUEL (WITH SUBARU SELECT MONITOR)

Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
Be careful not to spill fuel.
Note:

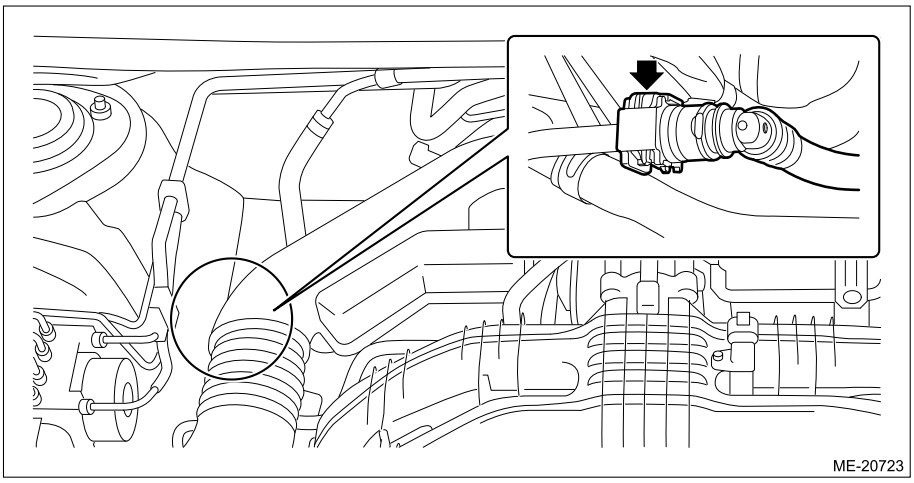
- **If the fuel pump cannot be driven, refer to the procedures for draining from the fuel filler hose. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > DRAINING FUEL (THROUGH THE FUEL FILLER HOSE).**
- **Be careful not to let the battery run-out.**
- **Be aware that the fuel may remain in the fuel tank after draining the fuel.**

1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Remove the fuel delivery tube clamp from the fuel delivery tube.



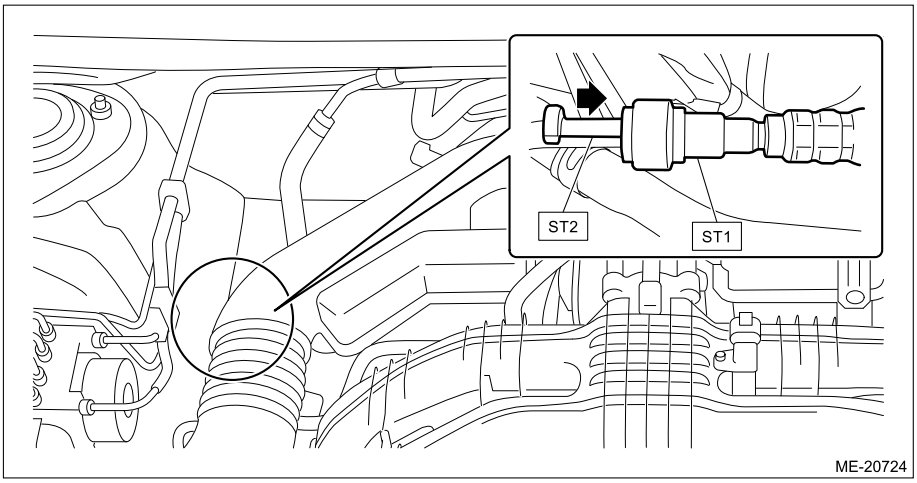
3. Disconnect the quick connector on the fuel delivery tube from the fuel pipe assembly. Ref. to FUEL INJECTION (FUEL

SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE A).



4. Connect the ST to the fuel pipe assembly.
   Note:
   The ST is a SUBARU genuine part.
   Special Tool:
   FUEL HOSE (42075AG690)
5. Connect the gasoline proof hose to ST and put the end of the hose in the container.
6. Drive the fuel pump and drain the fuel using Subaru Select Monitor.
   Caution:
   Be careful not to spill fuel.
   Note:
   For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".
7. Install the related parts in the reverse order after draining the fuel.
   Caution:
   - **Be careful not to spill fuel.**
   - **Catch the fuel from the tubes using a container or cloth.**
   - **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
   - **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
   - **When it is difficult to lock the slider, check that the connector is fully inserted.**
   - **After locking the slider, check again that the quick connector is securely connected.**

   Note:
   - **When disconnecting the ST1, install the ST2 to the fuel pipe assembly, and press the ST2 in the direction of arrow to disconnect the quick connector on the ST1.**
     Preparation tool:
     ST1: FUEL HOSE (42075AG690)
     ST2: QUICK CONNECTOR RELEASE (42099AE000)



- **For information about connecting the quick connector on the fuel delivery tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE A).**

3. DRAINING FUEL (THROUGH THE FUEL FILLER HOSE)

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

- **Be careful not to spill fuel.**
- **Fuel may remain in the fuel filler pipe. Drain the fuel from the fuel filler pipe through the fill opening using the gasoline proof pump and the gasoline proof hose (⌀10 or less) before the operation.**

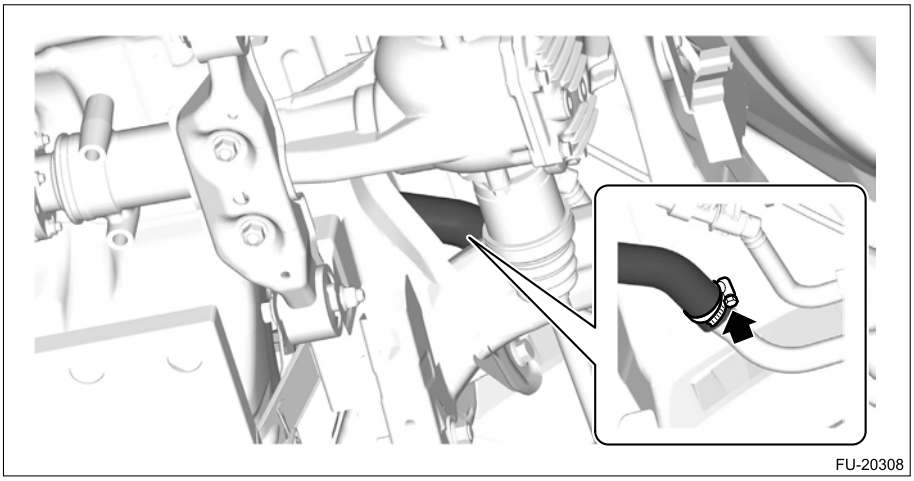
Note:

Be aware that the fuel may remain in the fuel tank after draining the fuel.

1. Lift up the vehicle.
2. Remove the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL. Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.
3. Open the fuel filler lid and remove the fuel filler cap.
4. Drain the fuel from the fuel filler pipe through the filler opening using the gasoline proof pump and the gasoline proof hose (⌀10 or less).
5. Disconnect the fuel filler hose from the fuel filler pipe assembly.

   Caution:

   - **Be careful not to spill fuel.**
   - **Catch the fuel from hoses using a container or cloth.**



6. Set the container under the vehicle and insert the gasoline proof hose (⌀10 or less) into the fuel filler hose to drain the fuel.

   Caution:

   Be careful not to spill fuel.
7. Install the related parts in the reverse order after draining the fuel.

   Note:

   For information about connecting fuel filler hose, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > FUEL FILLER HOSE CONNECTION.

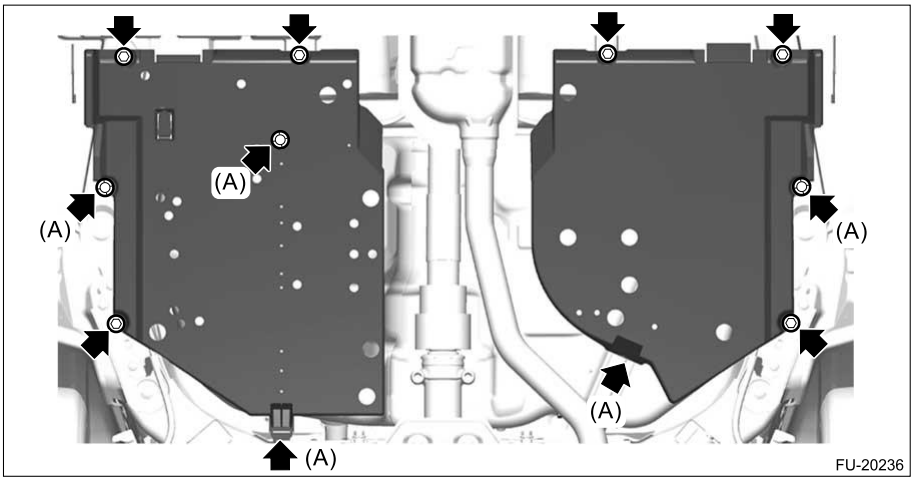
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Tank Protector

REMOVAL

Note:

The fuel tank protector LH is installed on only some models.

1. Lift up the vehicle.
2. Remove the bolt and clip (A) and remove the fuel tank protector.



FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Tank Protector

INSTALLATION

1. Install the fuel tank protector.

   Tightening torque:

   18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Lower the vehicle.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Tank Protector

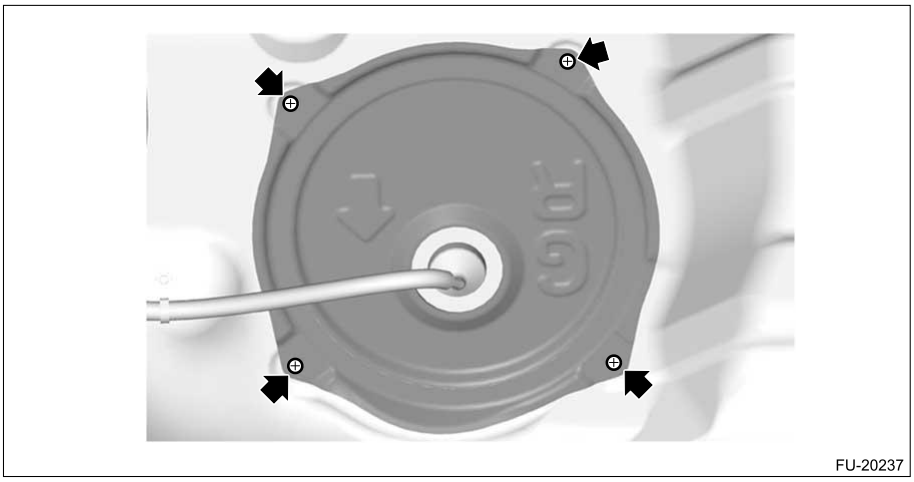
INSPECTION

Check that the fuel tank protector has no deformation, cracks or other damages.

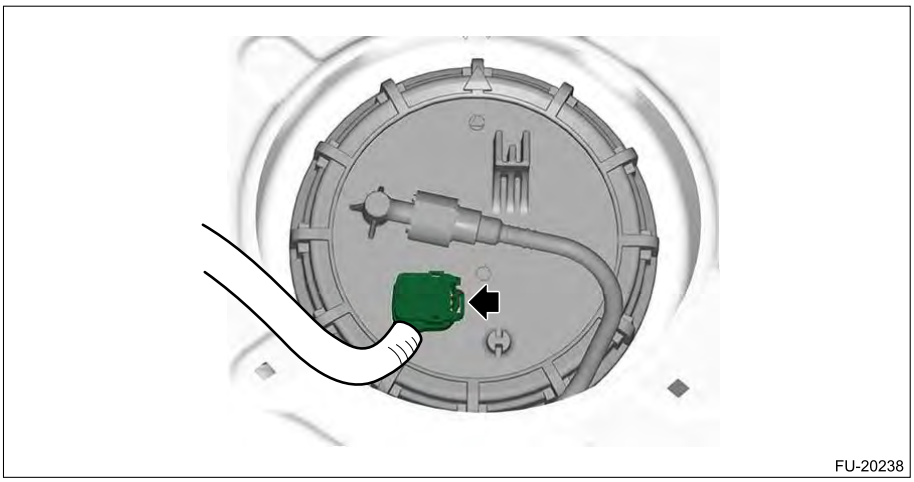
REMOVAL

Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**

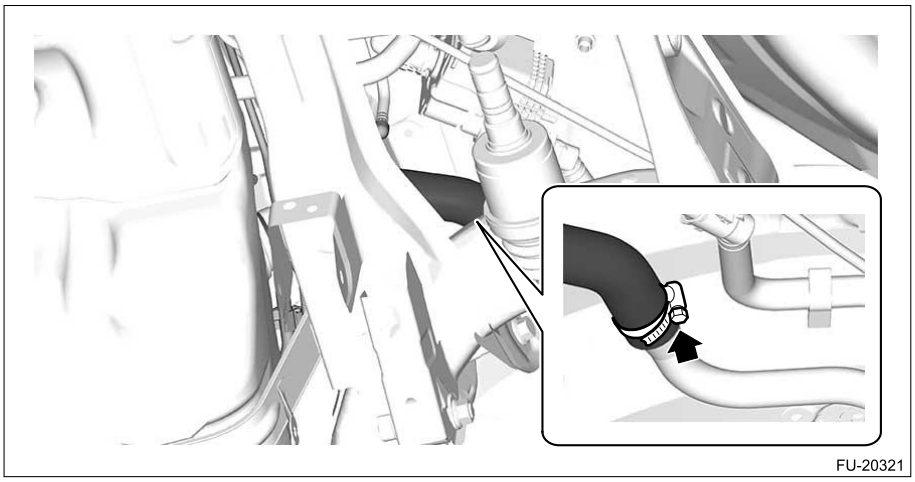
1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Drain fuel. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > DRAINING FUEL (WITH SUBARU SELECT MONITOR).
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the rear seat cushion. Ref. to SEATS>Rear Seat>REMOVAL.
5. Remove the service hole cover of fuel pump.


FU-20237

6. Disconnect the connector from fuel pump.

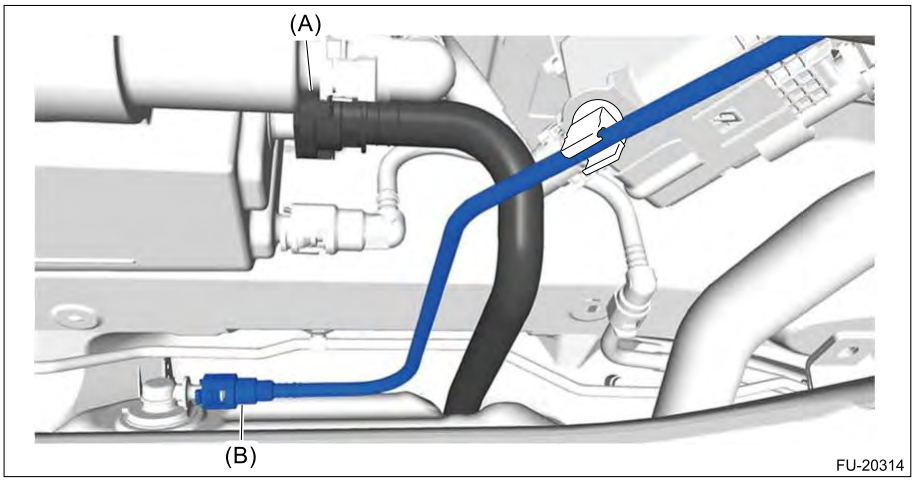

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7. Lift up the vehicle.
8. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.
9. Remove the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL. Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.
10. Remove the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>REMOVAL.
11. Disconnect the fuel filler hose from the fuel filler pipe assembly.

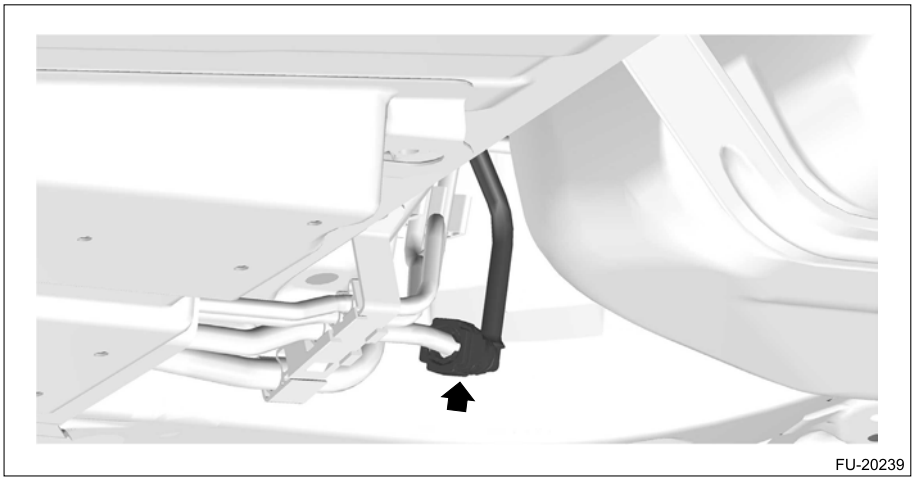


12. Disconnect the vent tube (A) from the canister. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE F).

13. Disconnect the circulate tube (B) from the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE D).



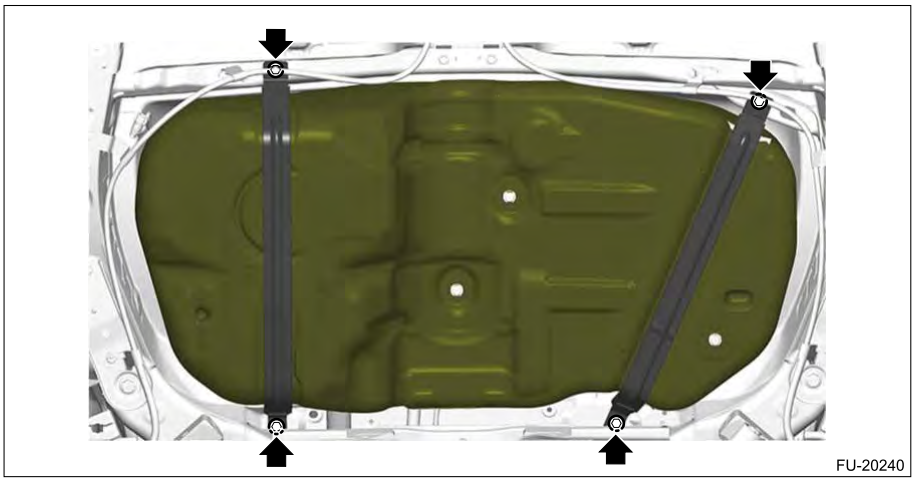
14. Disconnect the fuel delivery tube from the fuel delivery pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE A).



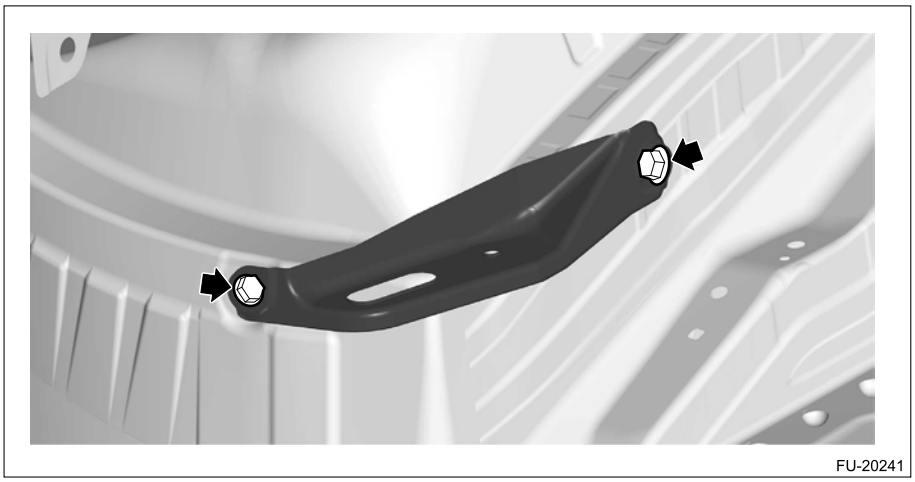
15. Support the fuel tank with a transmission jack, remove the bolts from the fuel tank band, and remove the fuel tank from the vehicle.

Caution:

- **A helper is required to perform this work.**
- **Since one side of the fuel tank is heavier than the other side, be careful not to drop it.**


FU-20240

16. Remove the fuel tank band bracket.


FU-20241

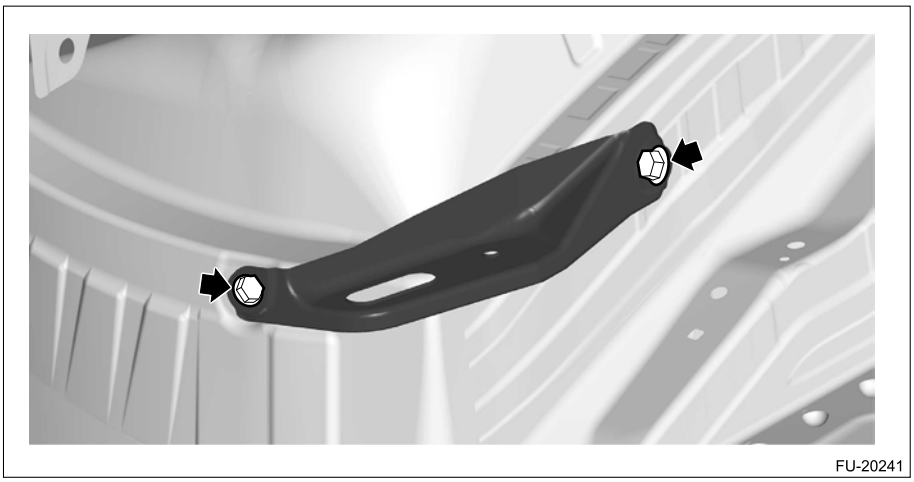
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Tank

INSTALLATION

1. Install the fuel tank band bracket.

Tightening torque:

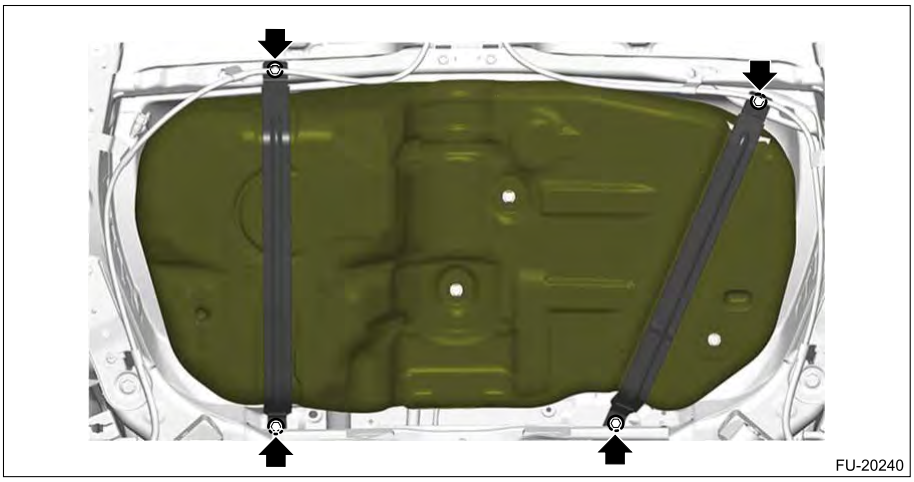
37 N·m (3.8 kgf-m, 27.3 ft-lb)


FU-20241

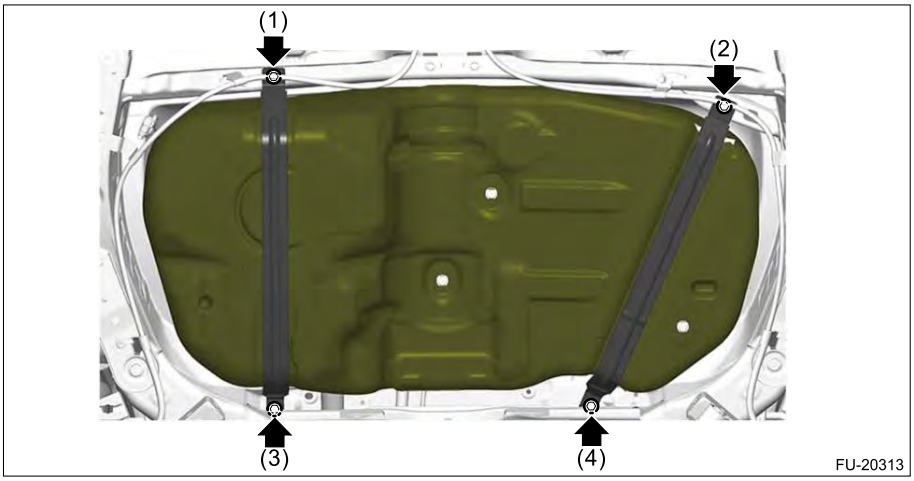
2. Support the fuel tank with a transmission jack, set the fuel tank in place, and temporarily tighten the bolts of the fuel tank band.

Warning:

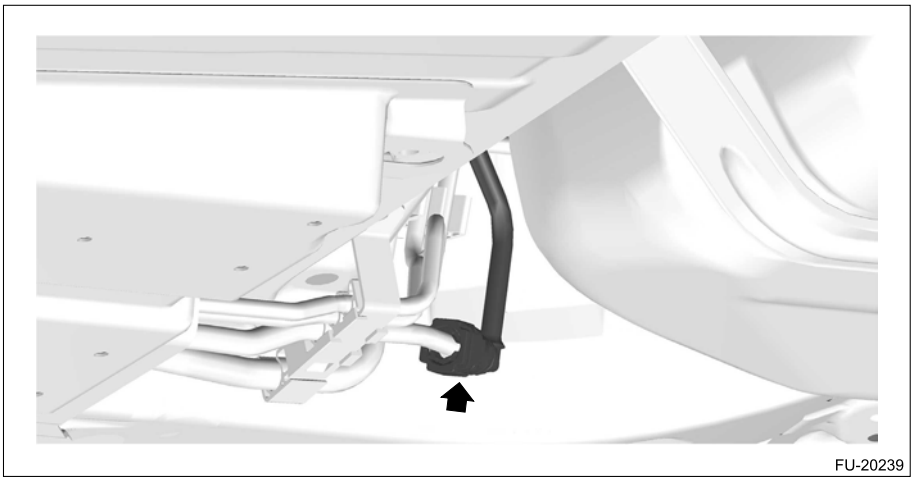
A helper is required to perform this work.



3. Tighten the bolts of the fuel tank band in the order shown in the figure.
Tightening torque:
33 N·m (3.4 kgf-m, 24.3 ft-lb)

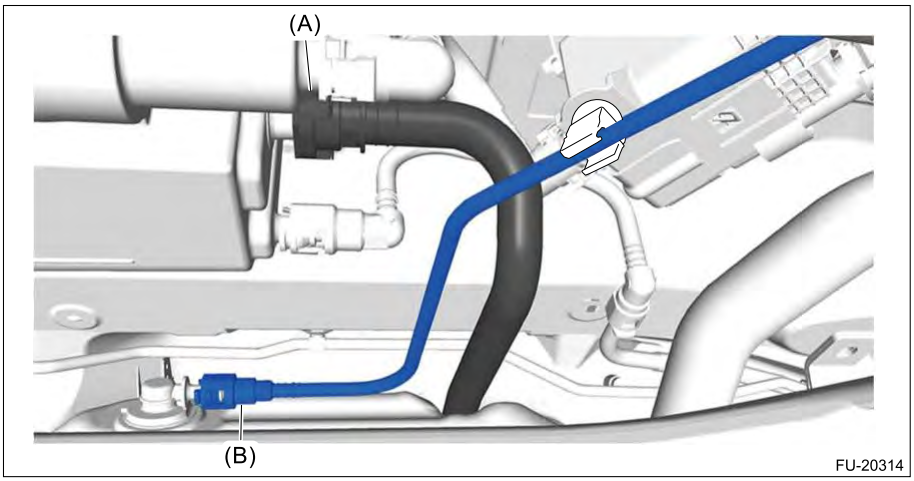


4. Connect the fuel delivery tube to the fuel delivery pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE A).

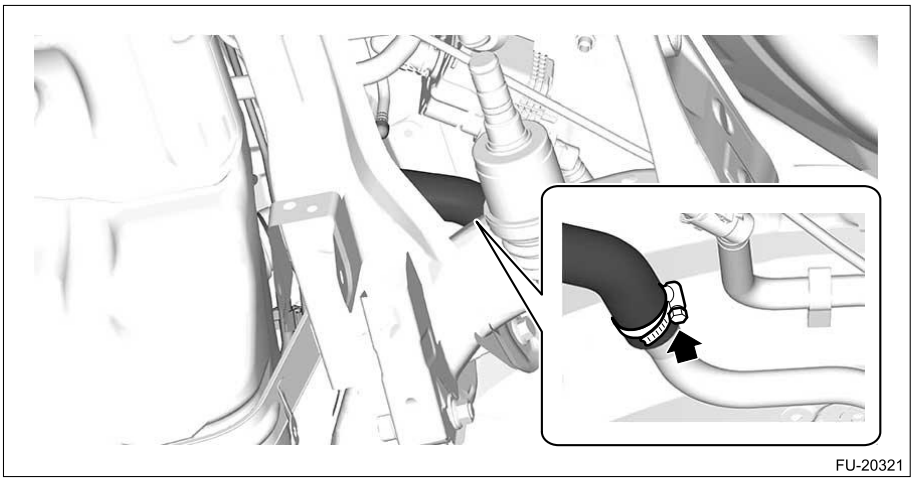


5. Connect the vent tube (A) to the canister. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE F).

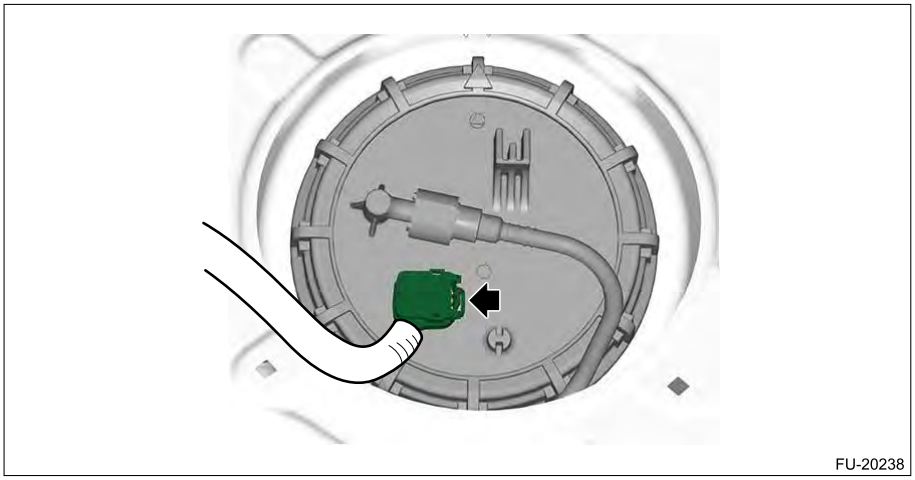
6. Connect the circulate tube (B) to the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE D).



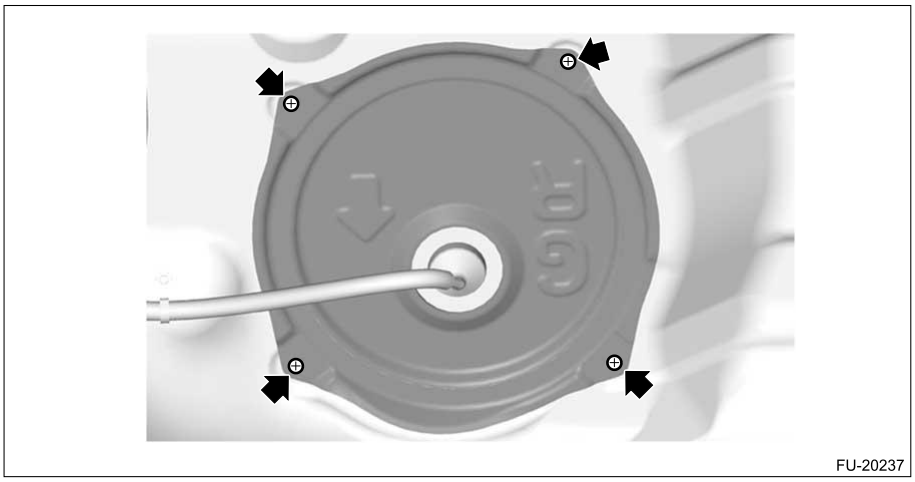
7. Connect the fuel filler hose to the fuel filler pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > FUEL FILLER HOSE CONNECTION.



8. Install the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>INSTALLATION.
9. Install the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION. Ref. to EXHAUST(H4DO)>Muffler>INSTALLATION.
10. Install the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
11. Lower the vehicle.
12. Connect the connector to the fuel pump.



13. Install the service hole cover of fuel pump.



14. Install the rear seat cushion. Ref. to SEATS>Rear Seat>INSTALLATION.
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Tank

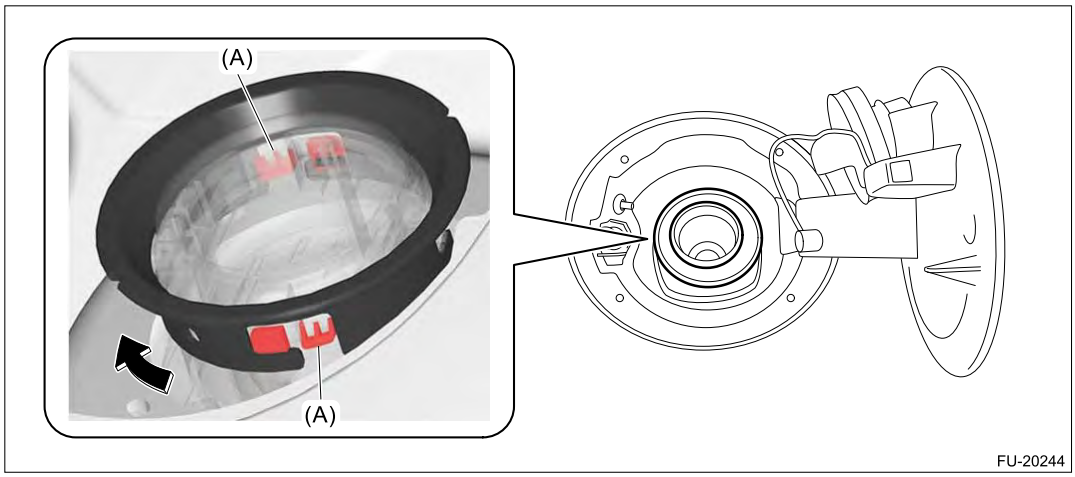
INSPECTION

1. Check that the fuel tank and fuel pipe have no deformation, cracks and other damages.
2. Check that the fuel hose and tube have no cracks, damage or loose part.

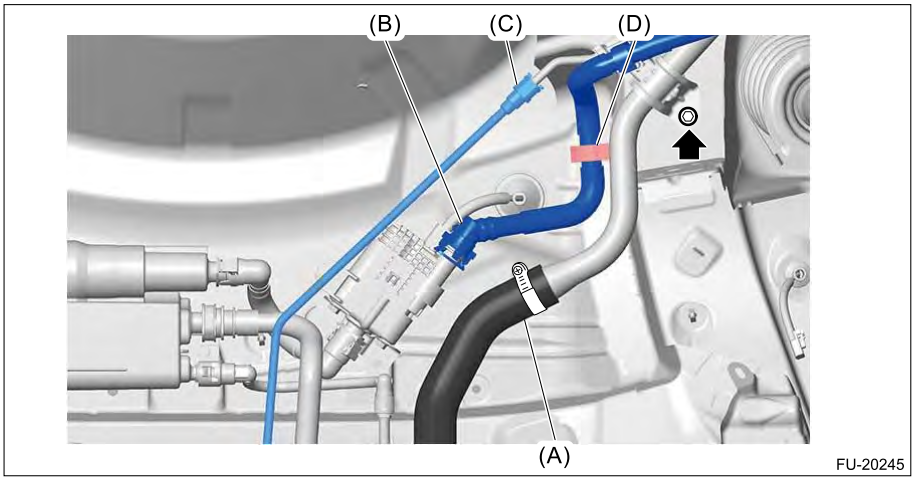
REMOVAL

Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
Be careful not to spill fuel.

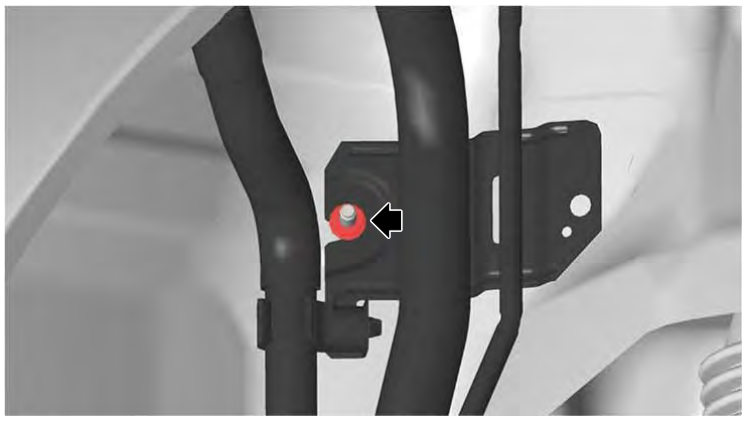
1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Drain fuel. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > DRAINING FUEL (WITH SUBARU SELECT MONITOR).
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Open the fuel filler lid and remove the fuel filler cap.
5. Turn the fuel filler pipe protector in the direction of the arrow to unlock while pressing in the claw (A), and remove it.



6. Remove the rear sub frame assembly. Ref. to REAR SUSPENSION>Sub Frame>REMOVAL.
7. Remove the rear mud guard RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>REMOVAL.
8. Disconnect the fuel filler hose (A), drain tube (B) and circulate tube (C) from the fuel filler pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE E). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE D).
9. Remove the drain tube from clip (D).
10. Remove the bolts which secure the fuel filler pipe assembly.



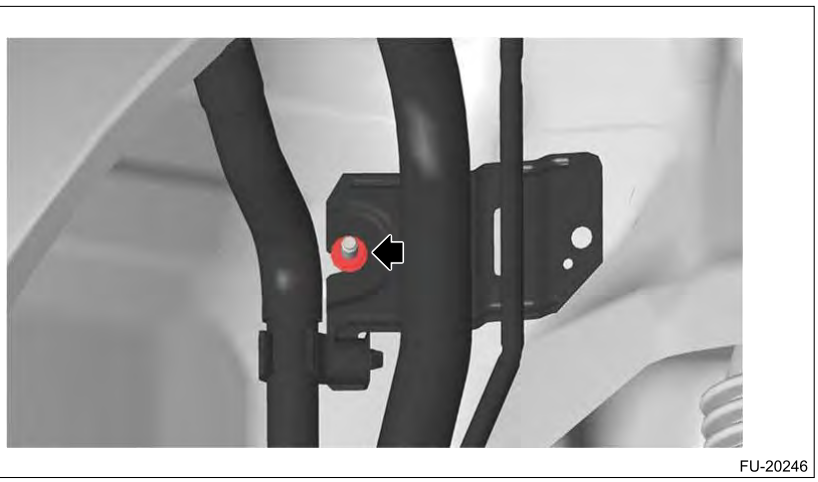
11. Remove the nuts which secure the fuel filler pipe assembly, and remove the fuel filler pipe assembly from underneath of the vehicle.


FU-20246

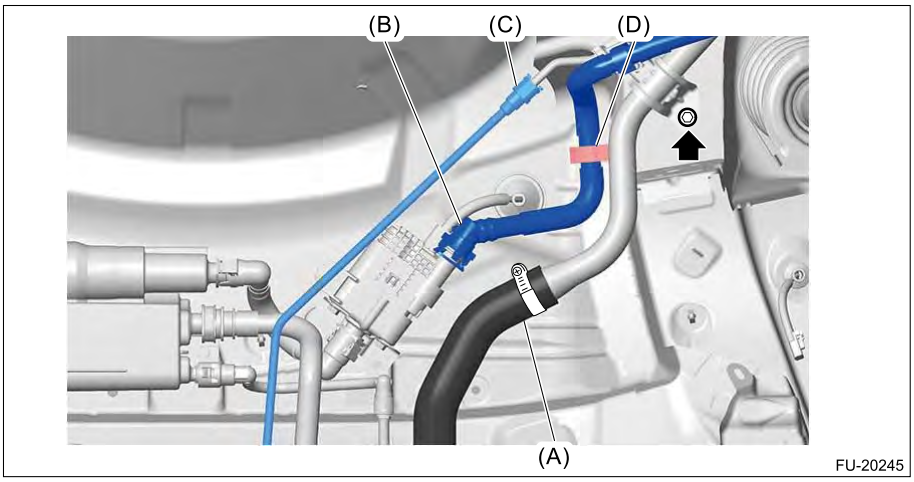
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Filler Pipe

INSTALLATION

1. Open the fuel filler lid.
2. Insert the fuel filler pipe assembly into the ring clip from inside of the rear fender.
3. Install the nuts securing the fuel filler pipe assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)


FU-20246

4. Install the bolts securing the fuel filler pipe assembly.
5. Install the drain tube to clip (D).
6. Connect the fuel filler hose (A), drain tube (B) and circulate tube (C) to the fuel filler pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE D). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE E). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > FUEL FILLER HOSE CONNECTION.



7. Install the rear mud guard RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>INSTALLATION.
8. Install the rear sub frame assembly. Ref. to REAR SUSPENSION>Sub Frame>INSTALLATION.
9. Install the fuel filler pipe protector.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

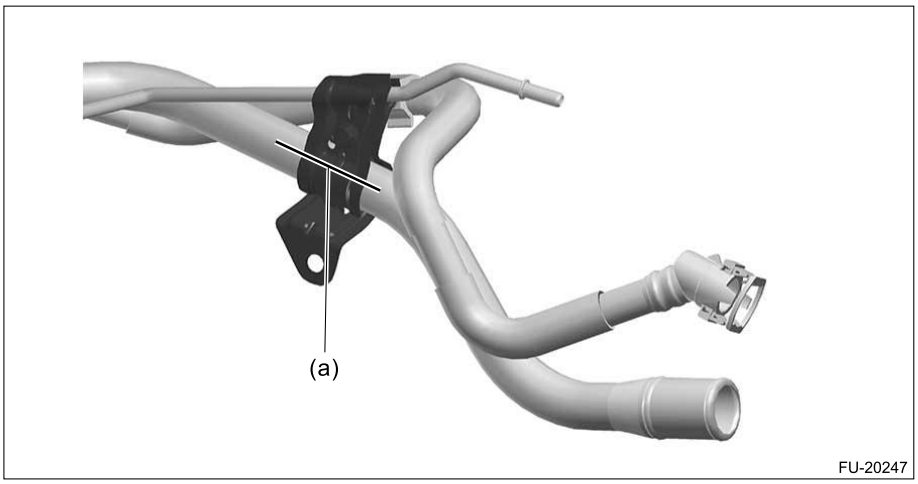
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Filler Pipe

DISASSEMBLY

1. Remove the drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter>REMOVAL.
2. Disassemble the fuel filler pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL FILLER PIPE.

Note:

Using a marker pen, make alignment marks (a) to use for positioning brackets during assembly.



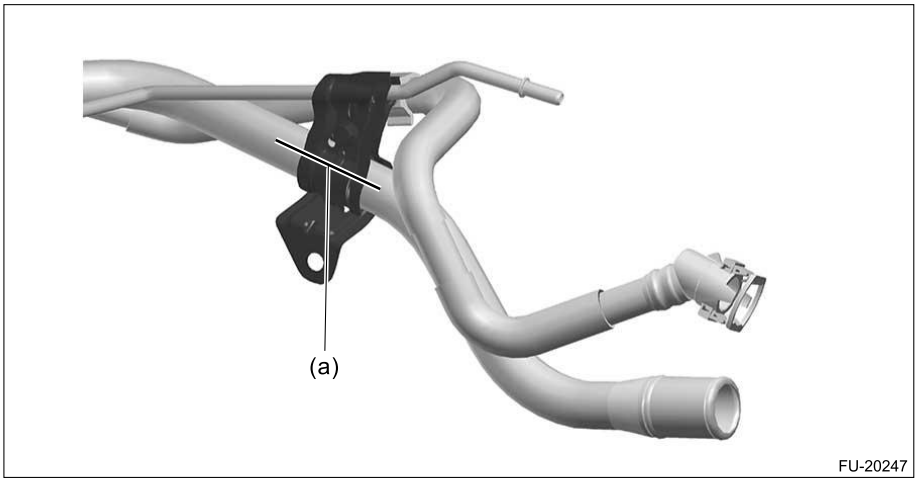
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Filler Pipe

ASSEMBLY

1. Assemble the fuel filler pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL FILLER PIPE.

Note:

Install the fuel filler pipe bracket to the fuel filler pipe by aligning the alignment marks (a).



2. Install the drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Filler Pipe

INSPECTION

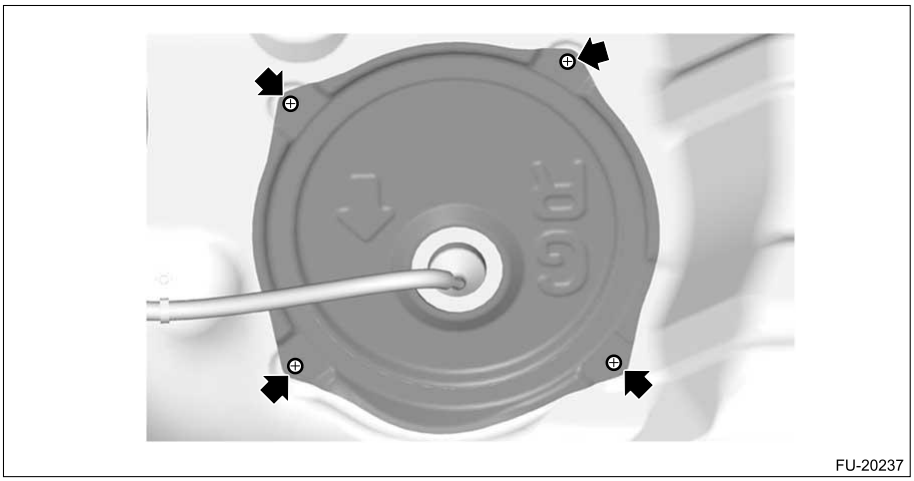
1. Check that the fuel filler pipe assembly has no deformation, cracks or other damages.
2. Check that the fuel hose has no cracks, damage or loose part.

REMOVAL

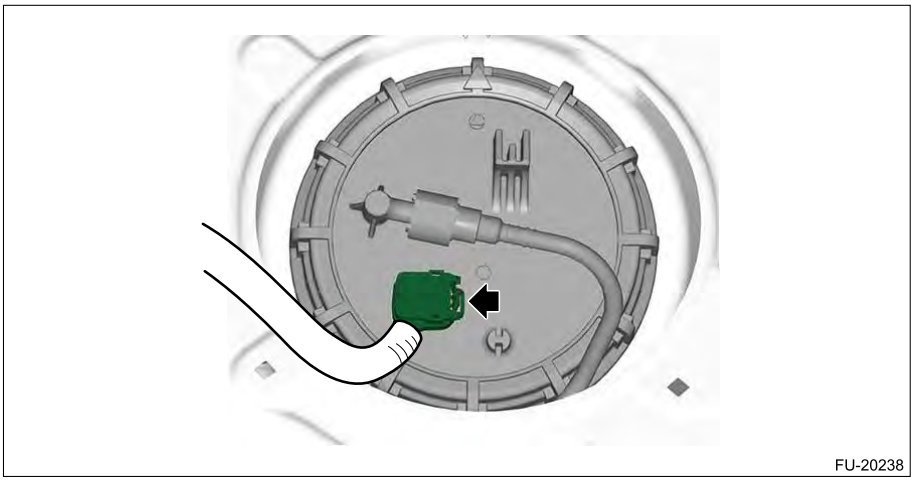
Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**
- **If the fuel gauge indicates that two thirds or more of the fuel is remaining, be sure to drain fuel before starting work to avoid the fuel to spill.**

Note:
Fuel pump assembly consists of fuel pump, fuel filter and fuel level sensor.

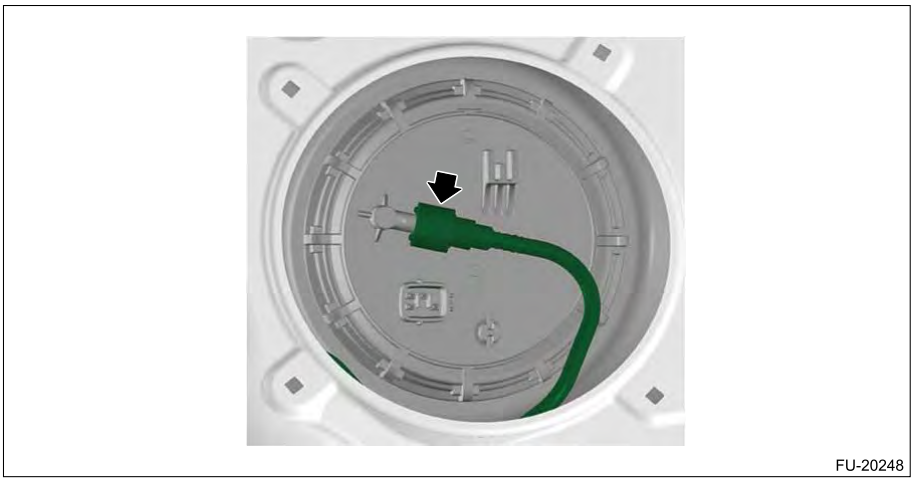
1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Drain fuel. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > DRAINING FUEL (WITH SUBARU SELECT MONITOR).
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the rear seat cushion. Ref. to SEATS>Rear Seat>REMOVAL.
5. Remove the service hole cover of fuel pump.


FU-20237

6. Disconnect the connector from fuel pump.


FU-20238

7. Disconnect the fuel delivery tube. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE D).


FU-20248

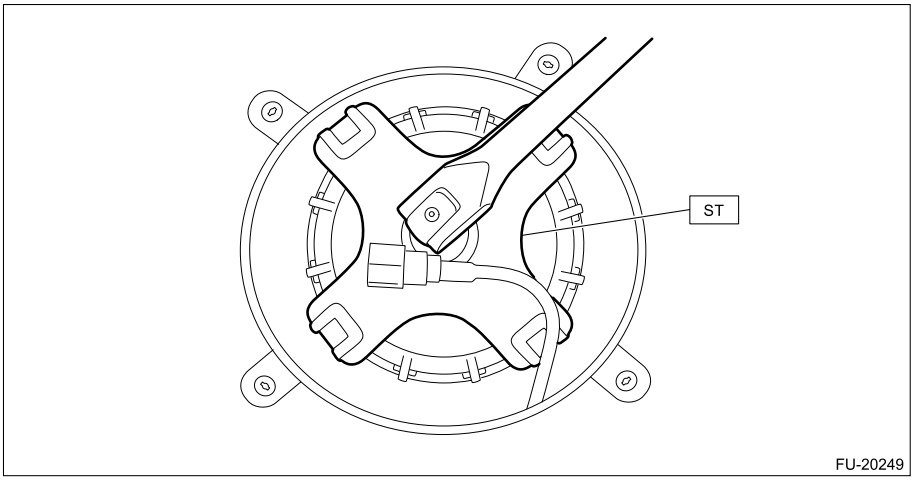
8. Remove the ring nut using the ST.

Caution:

- **Be careful not to damage the tube with the ST.**
- **Before setting the ST, move the tube above the ST.**

Preparation tool:

ST: ST FUEL PUMP (42099FL000)



FU-20249

9. Remove the fuel pump assembly from the fuel tank.

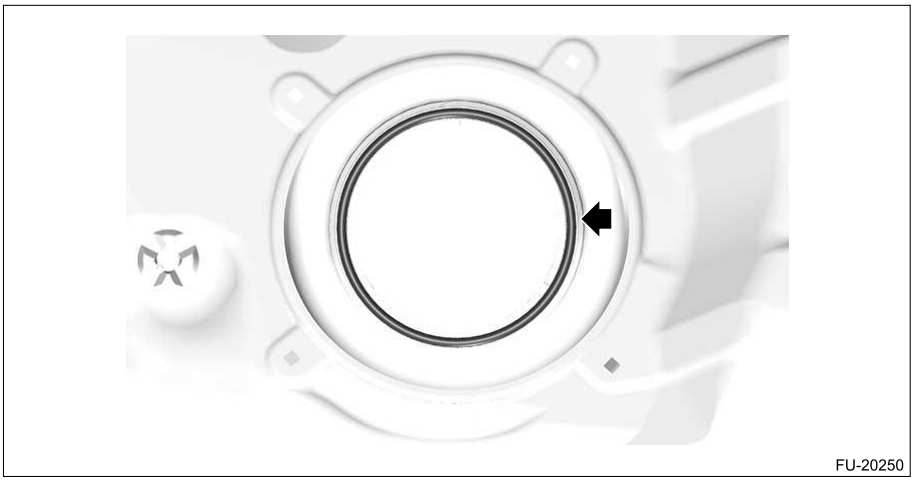
Caution:

Be careful not to let the arm and float of fuel level sensor contact the fuel tank.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pump

INSTALLATION

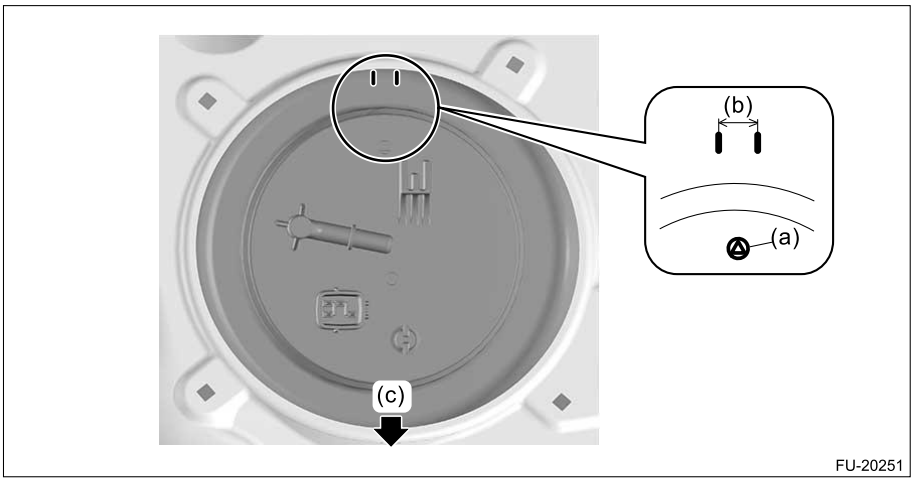
1. Install a new gasket to the fuel tank.


FU-20250

2. Set the fuel pump to the position shown in the figure.

Caution:

- **Be careful not to spill any fuel over the gasket. If any fuel is spilled onto the gasket, wipe it off completely.**
- **Set the arm and float of the fuel level sensor while paying attention to prevent them from contacting the fuel tank. If the arm of the fuel level sensor is bent, the fuel gauge may not read correctly.**



(a) Position mark (fuel pump) (b) Installation position range mark (fuel tank) (c) Front side of vehicle

3. Use a new ring nut, temporarily tighten the ring nut.
4. Using the ST, tighten the ring nut.

Caution:

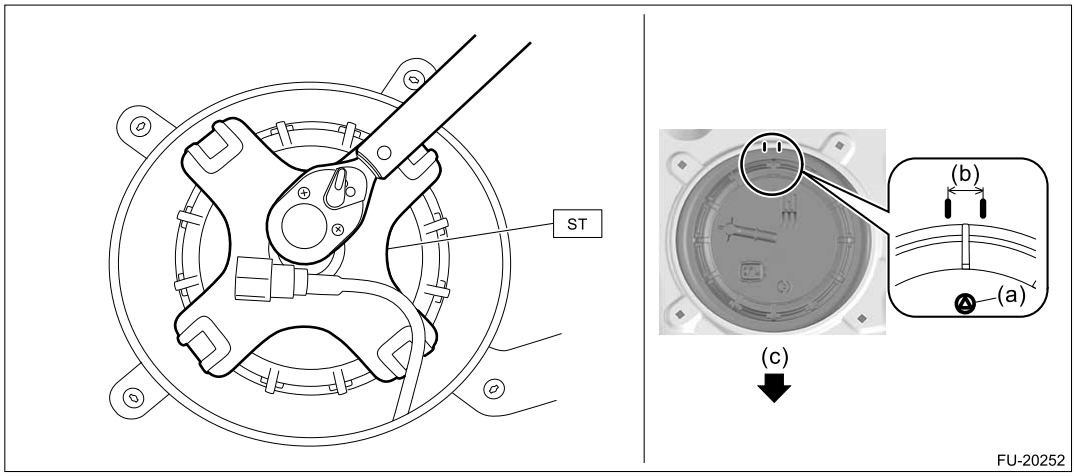
- **Be careful not to damage the tube with the ST.**
- **Before setting the ST, move the tube above the ST.**
- **Be sure to tighten firmly to the specified torque in order to avoid looseness.**
- **Make sure that the position mark on the fuel pump is located within the installation position range mark on the fuel tank as shown in the figure.**

Preparation tool:

ST: ST FUEL PUMP (42099FL000)

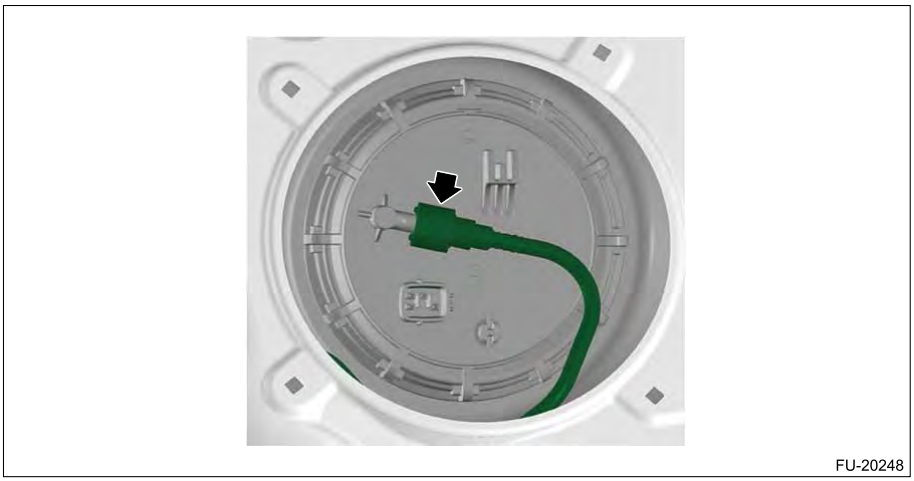
Tightening torque:

130 N·m (13.3 kgf-m, 95.9 ft-lb)

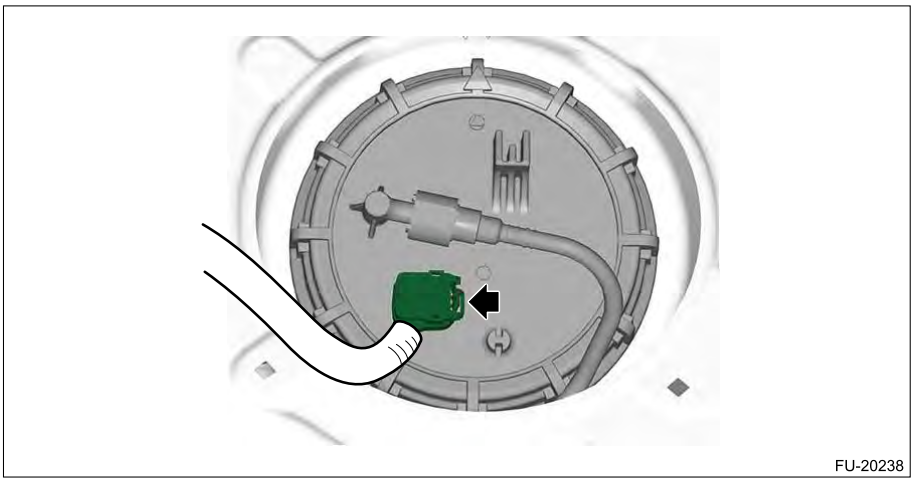


(a) Position mark (fuel pump) (b) Installation position range mark (fuel tank) (c) Front side of vehicle

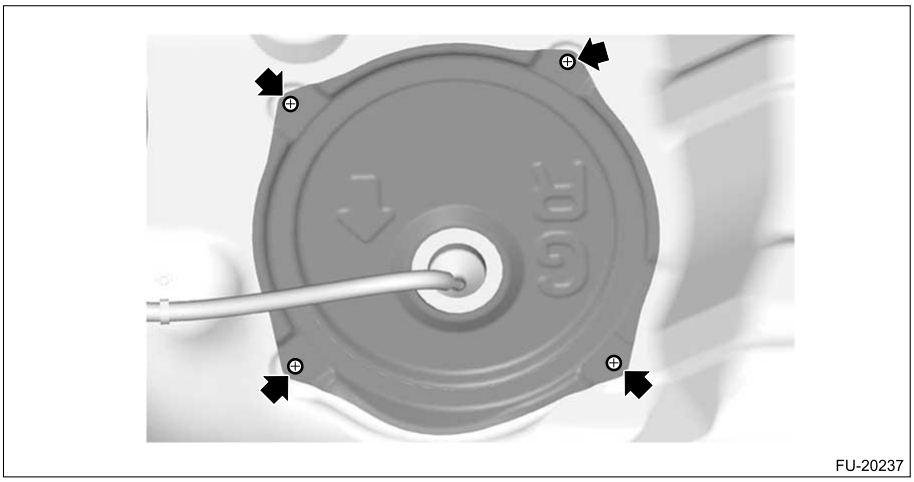
5. Connect the fuel delivery tube. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE D).


FU-20248

6. Connect the connector to the fuel pump.


FU-20238

7. Install the service hole cover of fuel pump.


FU-20237

8. Install the rear seat cushion. Ref. to SEATS>Rear Seat>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

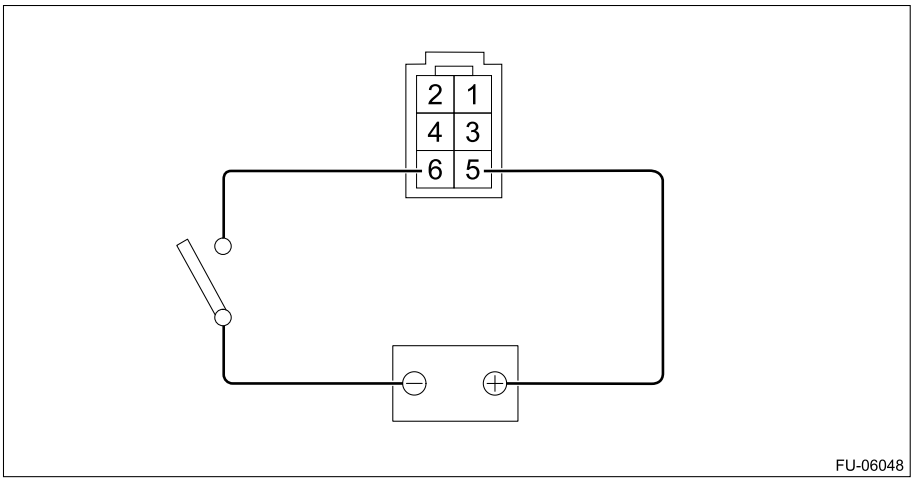
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Pump

INSPECTION

1. Check that the fuel pump has no deformation, cracks or other damages.
2. Connect the battery positive terminal to terminal No. 5 and the battery ground terminal to terminal No. 6, and inspect the fuel pump operation.

Warning:

- **Wipe off fuel completely.**
- **Keep the battery as far apart from fuel pump as possible.**
- **Do not run the fuel pump for a long time under non-load condition.**


2 1
4 3
6 5
FU-06048

REMOVAL

Warning:

Place "NO OPEN FLAMES" signs near the working area.

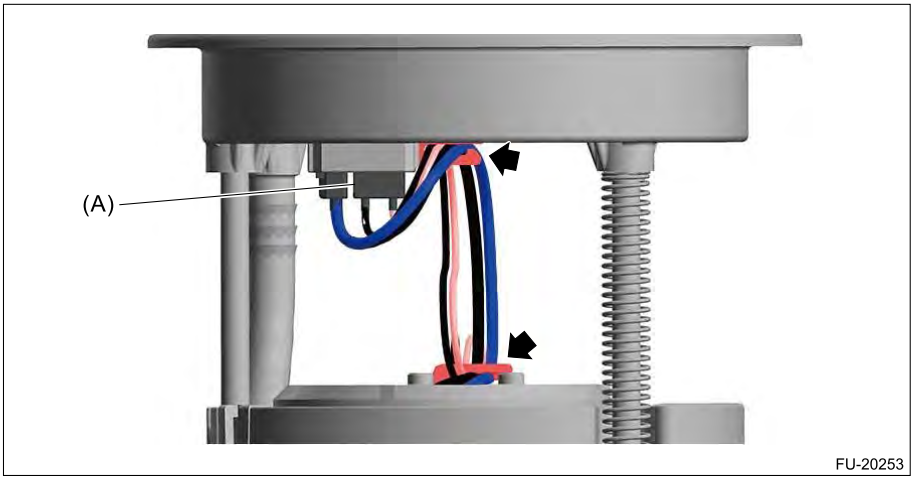
Caution:

- **Be careful not to spill fuel.**
- **If the fuel gauge indicates that two thirds or more of the fuel is remaining, be sure to drain fuel before starting work to avoid the fuel to spill.**

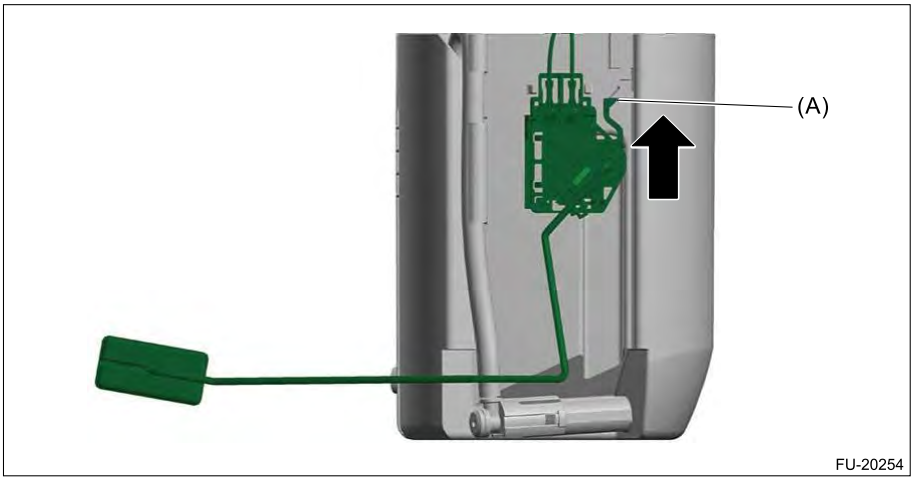
Note:

The fuel level sensor is built in fuel pump assembly.

1. Remove the fuel pump assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>REMOVAL.
2. Disconnect the fuel level sensor connector (A), and pull out the connector cable and fuel level sensor harness from the clip.



3. While pressing the claw (A) of the fuel level sensor, slide the fuel level sensor in the direction of the arrow, and remove the fuel level sensor.

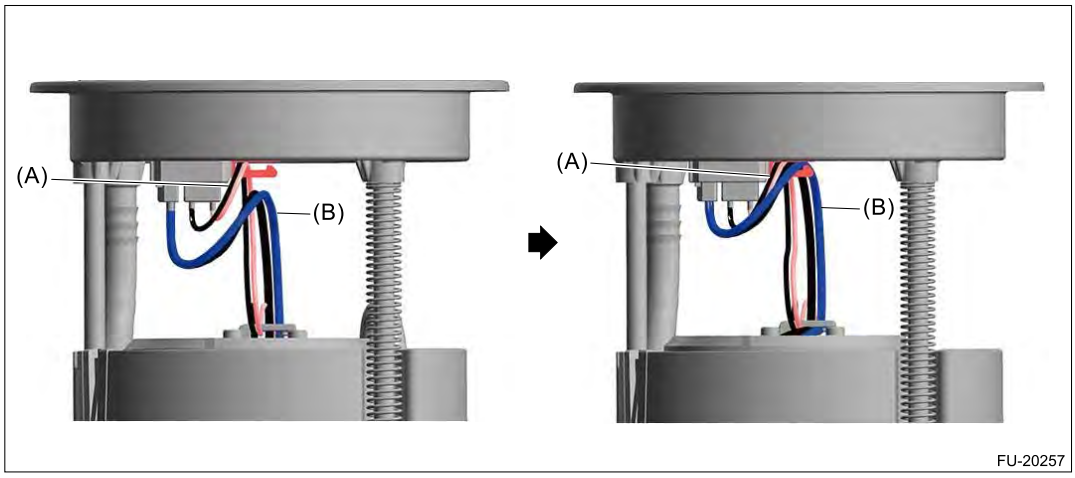


INSTALLATION

1. Install the fuel level sensor to the fuel pump assembly.

   Caution:

   Be sure to install the fuel level sensor harness to the clip first, then install the connector cable. Otherwise, malfunction may occur.



(A) Fuel level sensor harness (B) Connector cable

2. Install the fuel pump assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSTALLATION.

FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Level Sensor

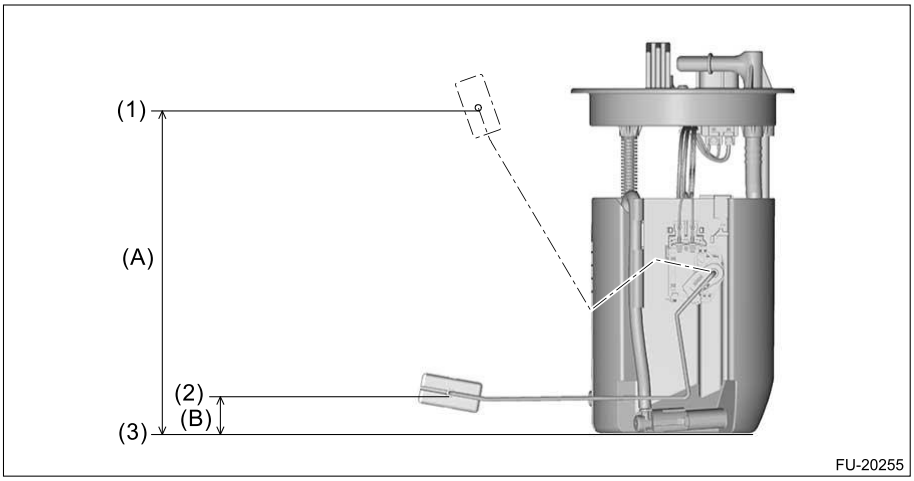
INSPECTION

1. Check that the fuel level sensor has no damage.

2. Measure the fuel level sensor float position.

Note:

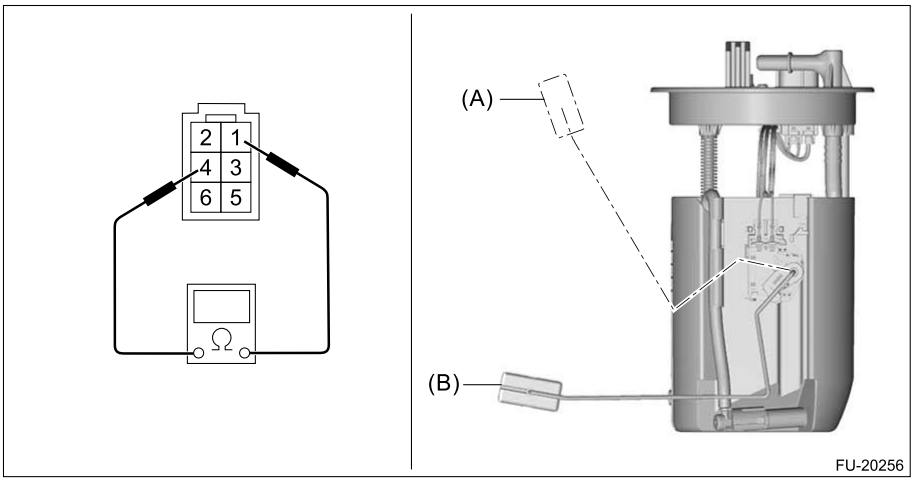
When inspecting the fuel level sensor, perform the work with the sensor installed to the fuel pump.



(1) FULL (2) EMPTY (3) Fuel tank seating surface

Float position	Standard
FULL — Fuel tank seating surface (A)	198.9 ± 3.5 mm (7.831 ± 0.157 in)
EMPTY — Fuel tank seating surface (B)	23.2 ± 3.5 mm (0.913 ± 0.157 in)

3. Check the resistance between fuel level sensor terminals by the connector on top of the fuel pump.



Float position	Terminal No.	Standard
FULL (A)	1 and 2	17.4±2.0Ω
EMPTY (B)		410.0±4.5Ω

REMOVAL

Warning:

Place "NO OPEN FLAMES" signs near the working area.

Caution:

- **Be careful not to spill fuel.**
- **If the fuel gauge indicates that two thirds or more of the fuel is remaining, be sure to drain fuel before starting work to avoid the fuel to spill.**
- **Be careful not to drop or apply any impact to the fuel pump during work. This may deteriorate its performance.**

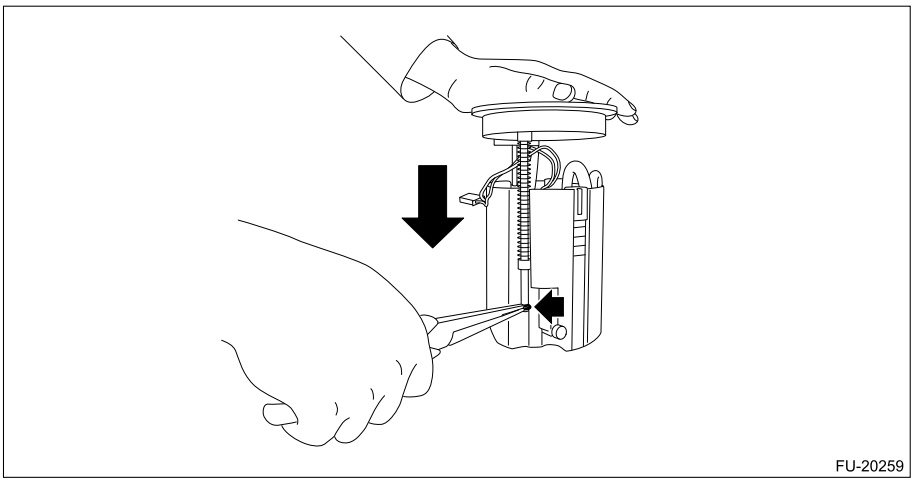
Note:

The fuel filter is built in fuel pump assembly.

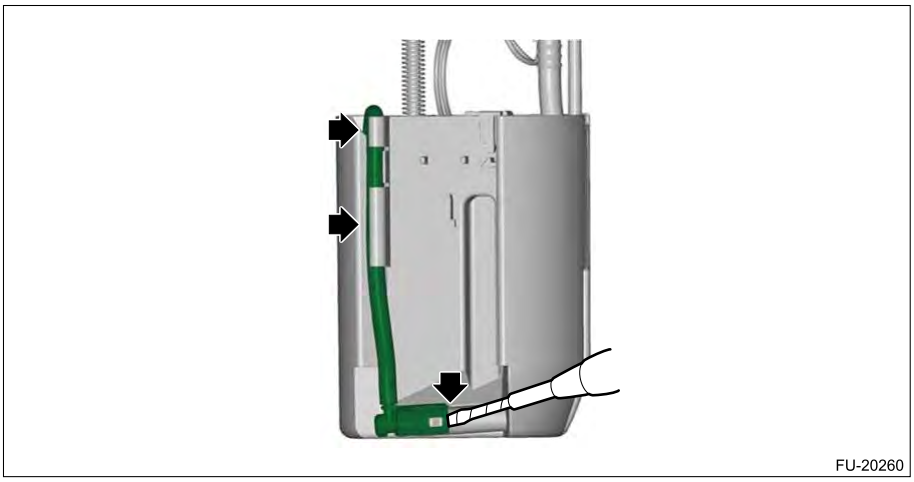
1. Remove the fuel pump assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>REMOVAL.
2. Remove the fuel level sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>REMOVAL.
3. Disconnect the connector cable.



4. Push the fuel filter assembly in the direction of the arrow to compress, and detach the connecting clip.



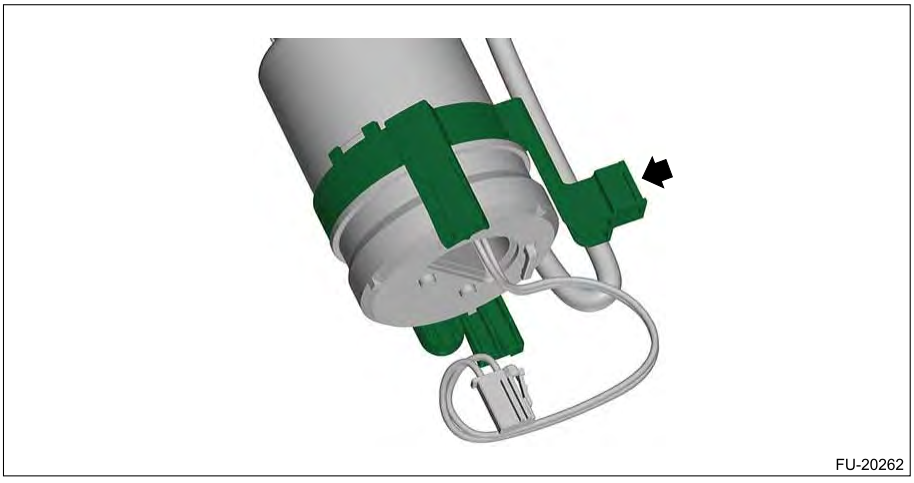
5. Release the claw using a flat tip screwdriver or similar tool wrapped with a protection tape, and remove the tube assembly from the fuel chamber assembly.



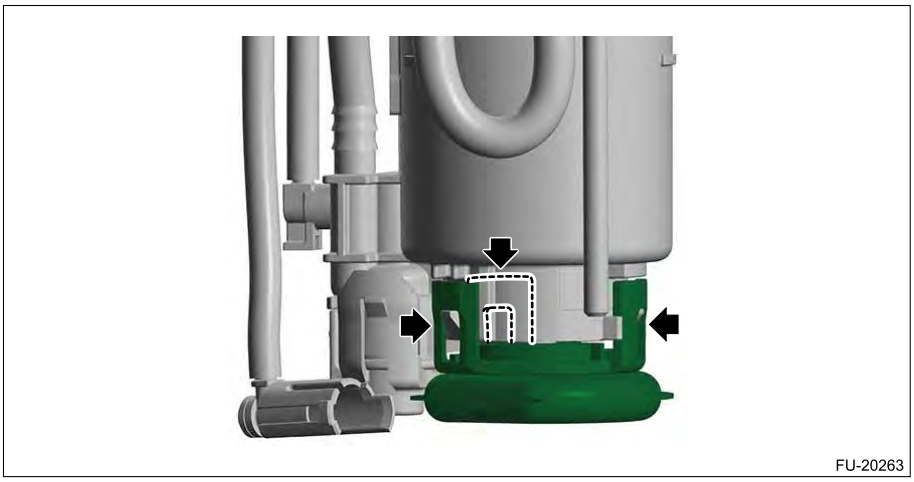
6. Disengage three claws on the fuel pump holder from the fuel chamber assembly, and remove the fuel filter assembly.



7. Remove the fuel pump holder.



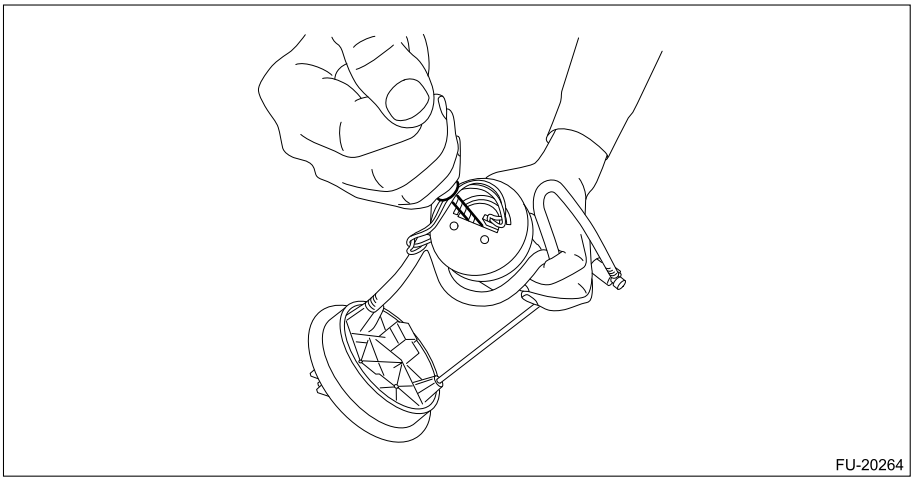
8. Disengage three claws on the fuel pump.



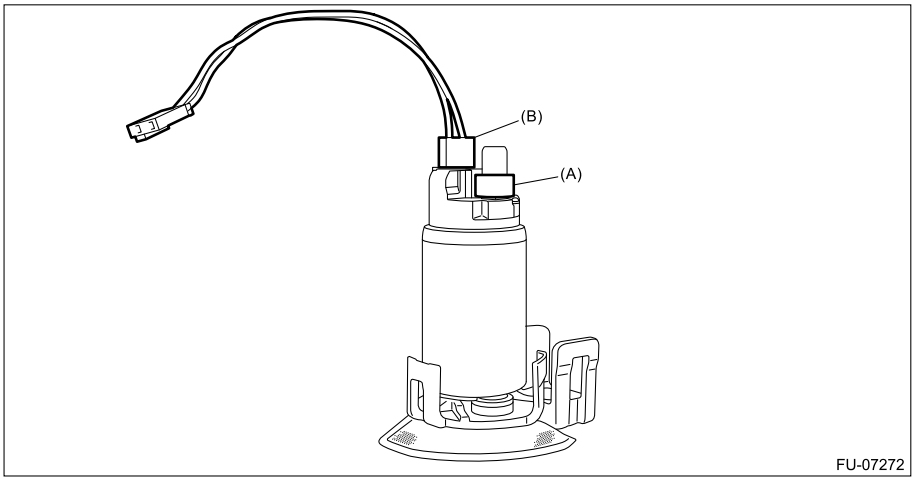
9. Using a flat tip screwdriver or similar tool wrapped with a protection tape, press on the fuel pump and remove the fuel pump from the fuel filter assembly.

Caution:

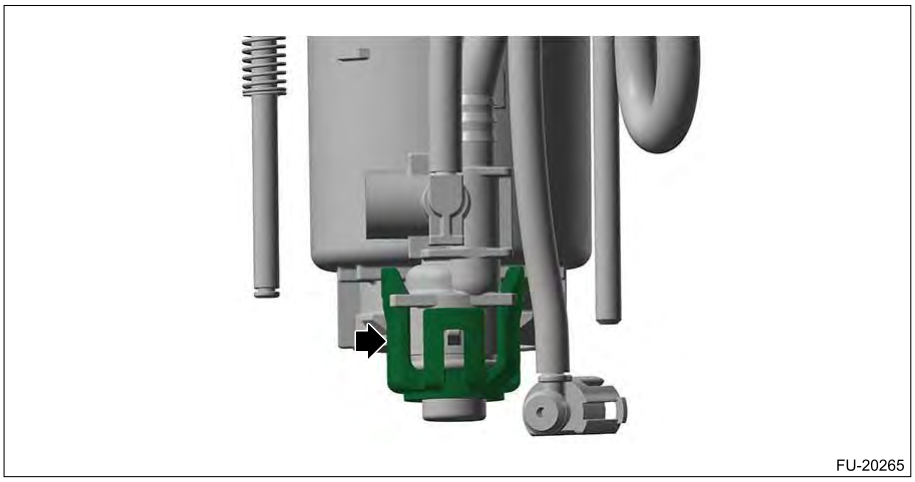
If O-rings remain on the fuel filter assembly side, they must be carefully removed using a precision screwdriver or similar tool wrapped with a protection tape.



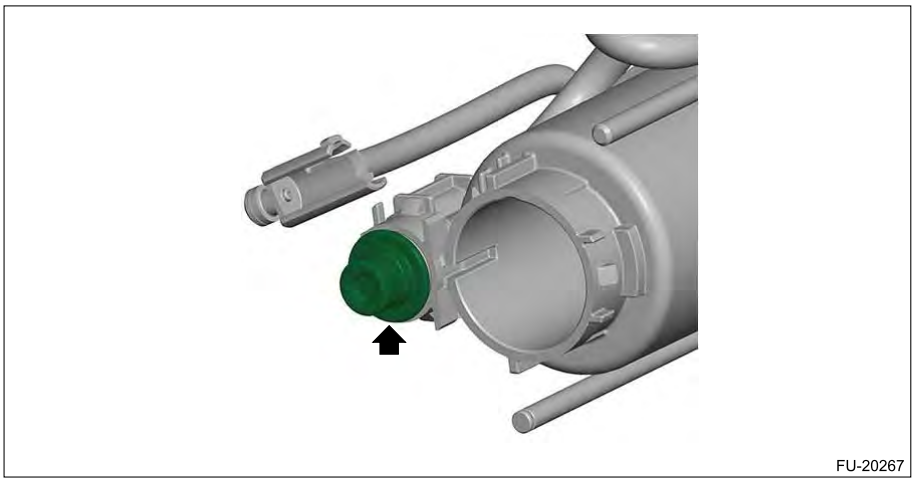
10. Remove the spacer (A) and connector cable (B) from the fuel pump.



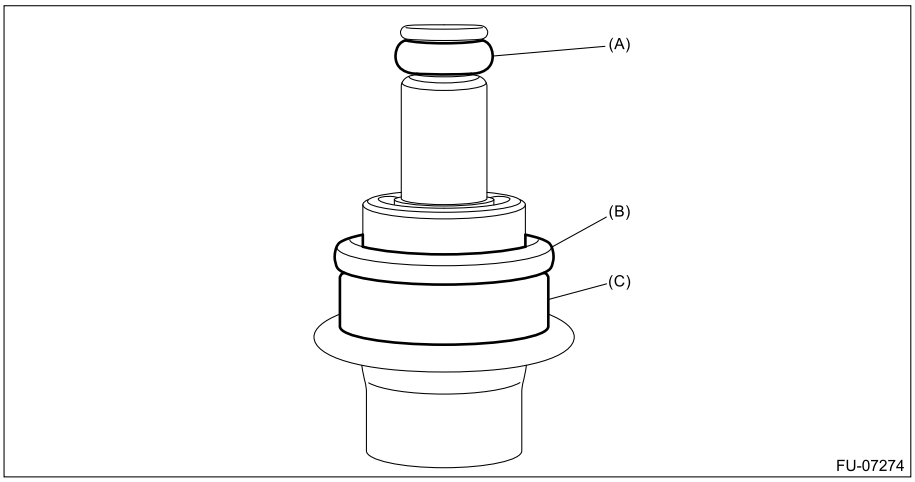
11. Remove the pressure regulator cap.



12. Remove the pressure regulator from the fuel filter assembly.



13. Remove O-ring (A), O-ring (B), and backup ring (C) from the pressure regulator.



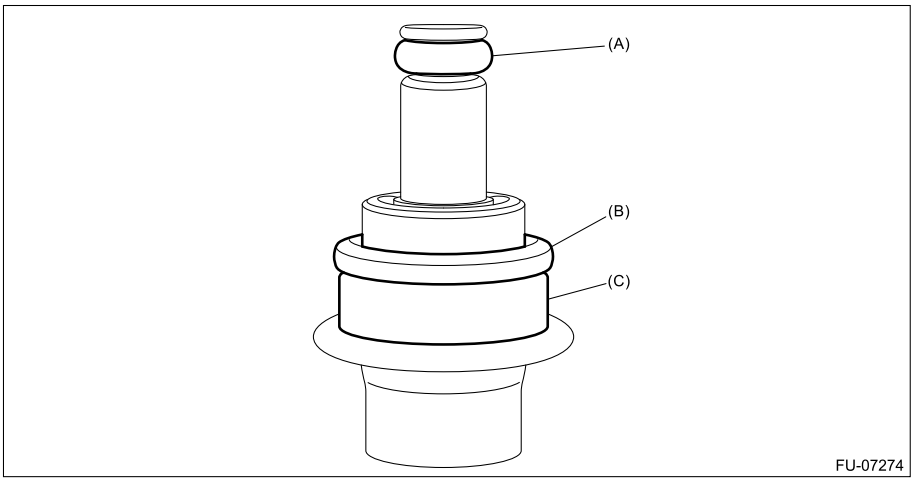
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Filter

INSTALLATION

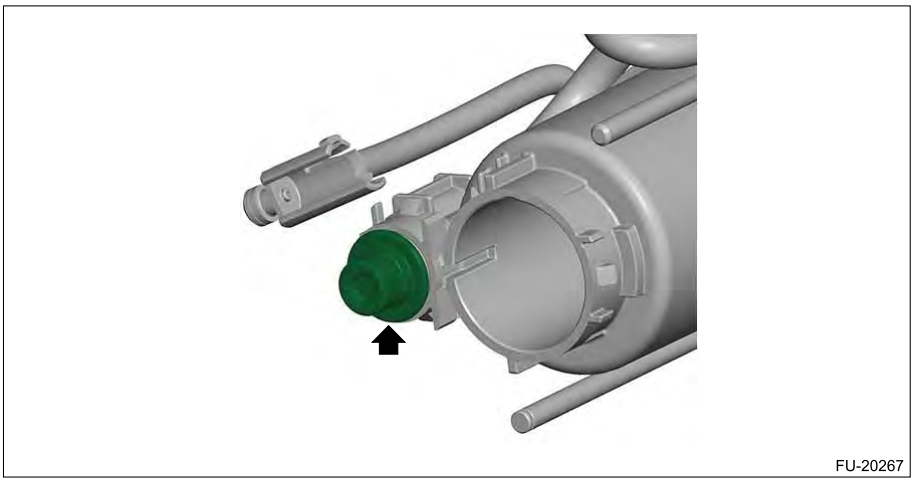
1. Install O-ring (A), new O-ring (B), and backup ring (C) to the pressure regulator.

Note:

Apply gasoline to the O-ring and backup ring.



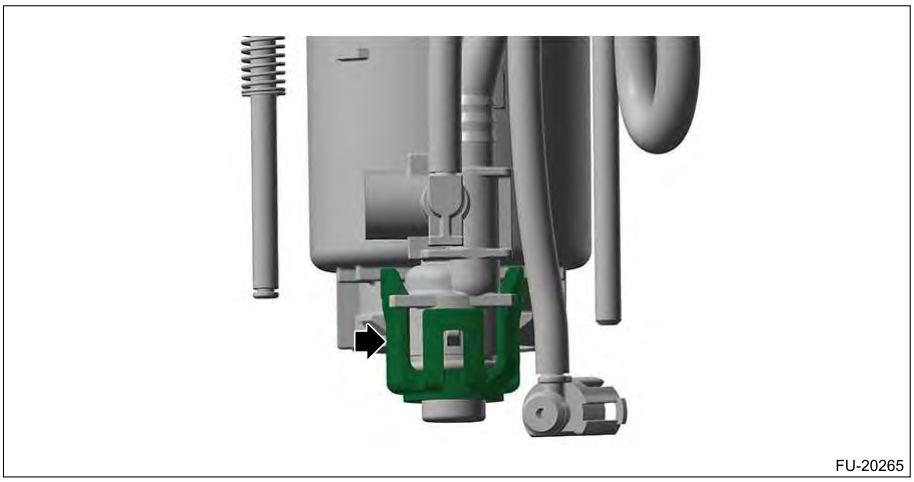
2. Install the pressure regulator to the fuel filter assembly.



3. Install the pressure regulator cap.

Note:

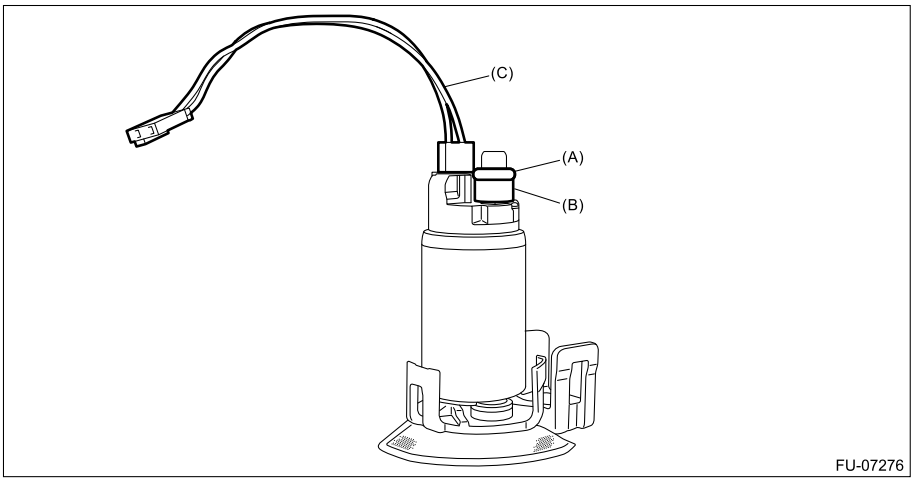
After installation, make sure 3 claws are securely engaged in each position.



4. Install new O-ring (A), spacer (B), and new connector cable (C) to the fuel pump.

Note:

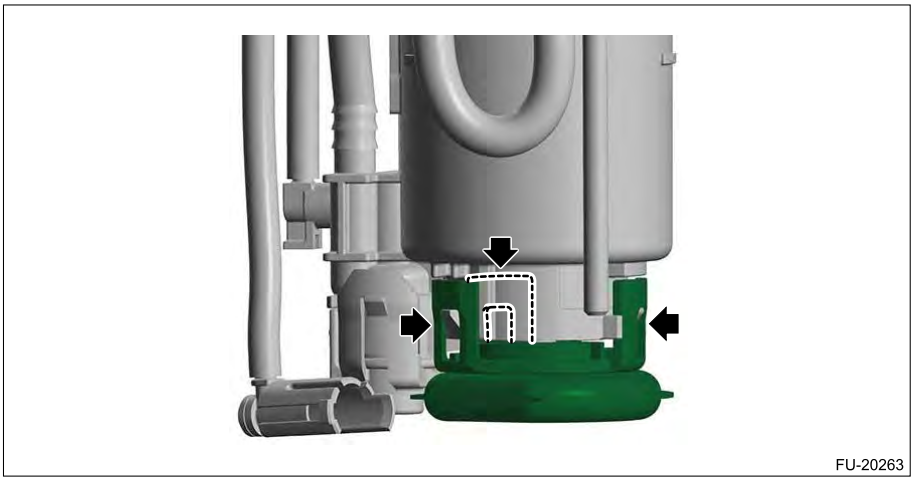
Apply gasoline to the O-rings and the spacer.



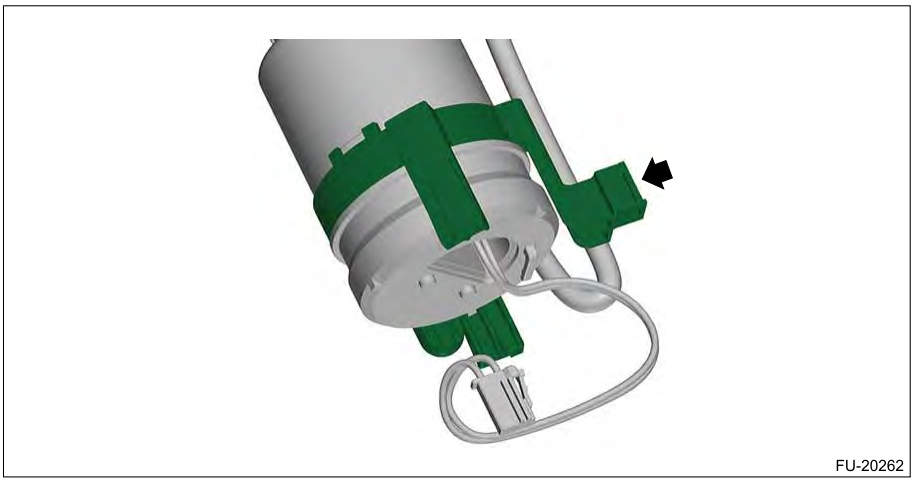
5. Install the fuel pump to the fuel filter assembly.

Note:

After installation, make sure 3 claws are securely engaged in each position.



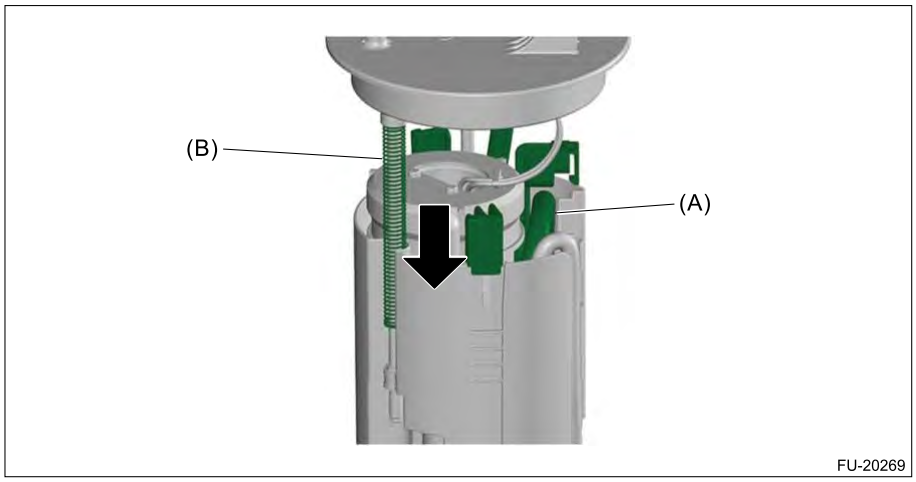
6. Install the fuel pump holder.



7. Install the fuel filter assembly to the fuel chamber assembly.

Note:

- **Set the tube (A) and spring (B) for the fuel filter assembly as shown in the figure.**



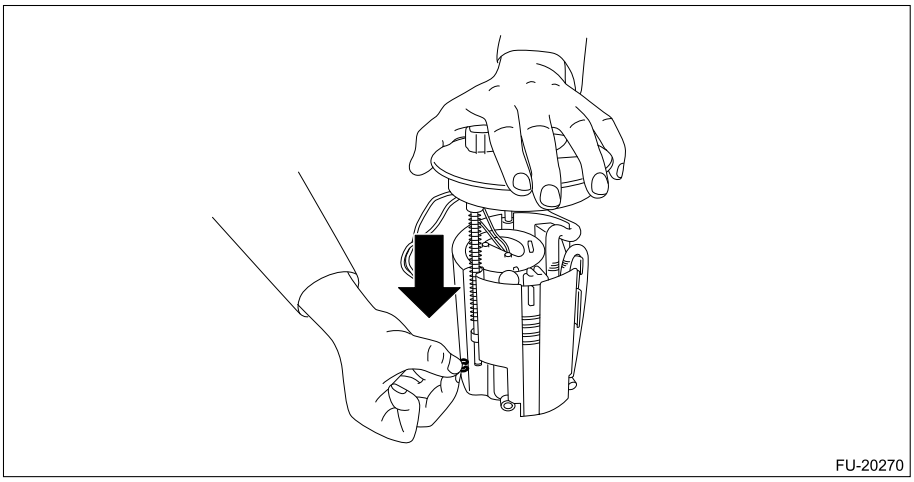
- **Check that the claws fastening the fuel camber assembly and the fuel filter assembly are securely engaged.**



8. Connect the tube assembly to the fuel chamber assembly.



9. Push the fuel filter assembly in the direction of the arrow to compress, and attach new clip.

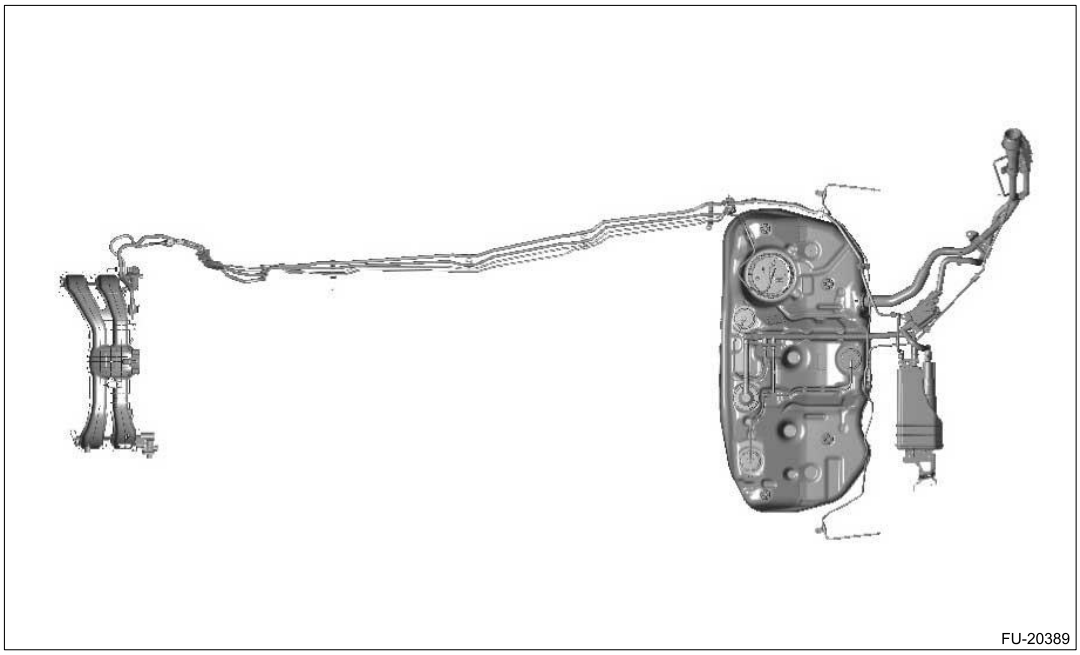


10. Connect the connector cable.



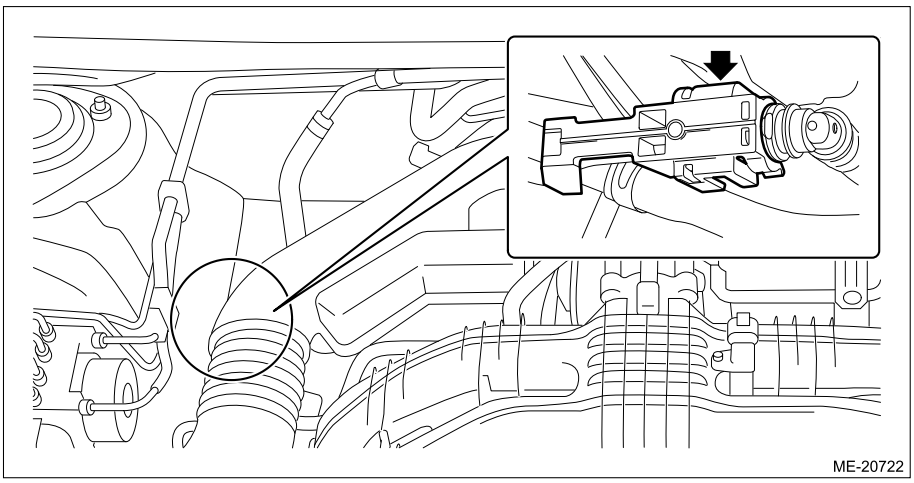
11. Install the fuel level sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>INSTALLATION.
12. Inspect the fuel level sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor>INSPECTION.
13. Install the fuel pump assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSTALLATION.

REMOVAL

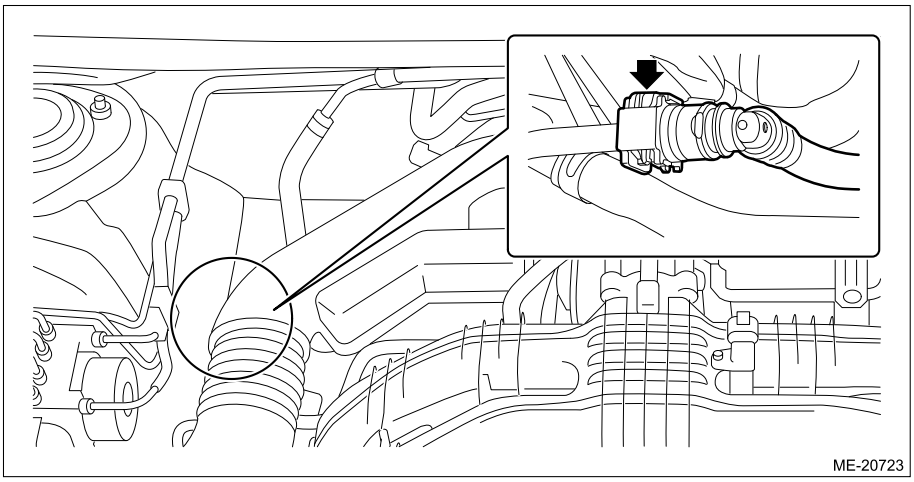


Warning:
Place "NO OPEN FLAMES" signs near the working area.
Caution:
Be careful not to spill fuel.

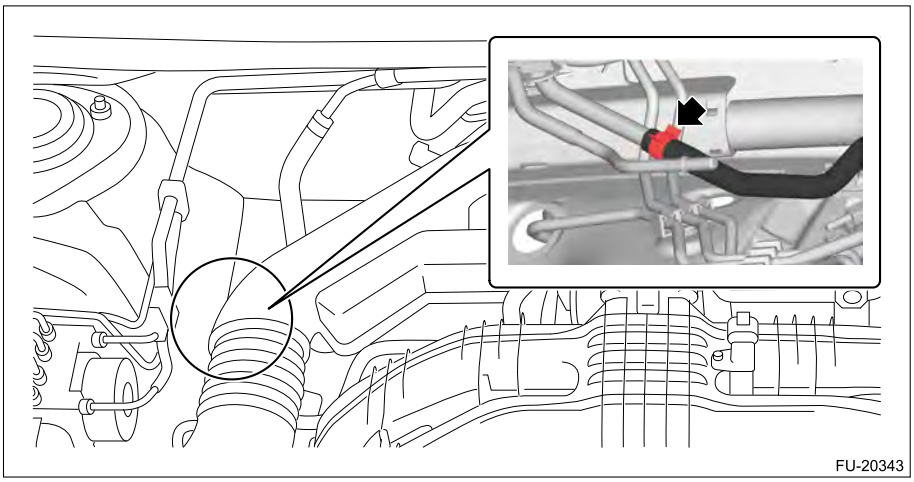
1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Drain fuel. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > DRAINING FUEL (WITH SUBARU SELECT MONITOR).
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Open the fuel filler lid and remove the fuel filler cap.
   Note:
   This operation is required to release the inner pressure of the fuel tank.
5. Remove the fuel delivery tube clamp from the fuel delivery tube.



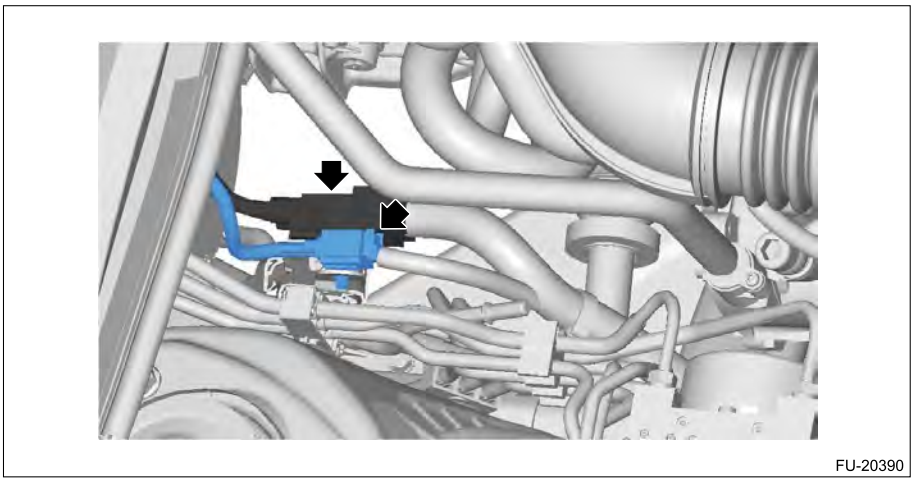
6. Disconnect the quick connector on the fuel delivery tube from the fuel pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE A).



7. Disconnect the evaporation hose from the fuel pipe assembly.

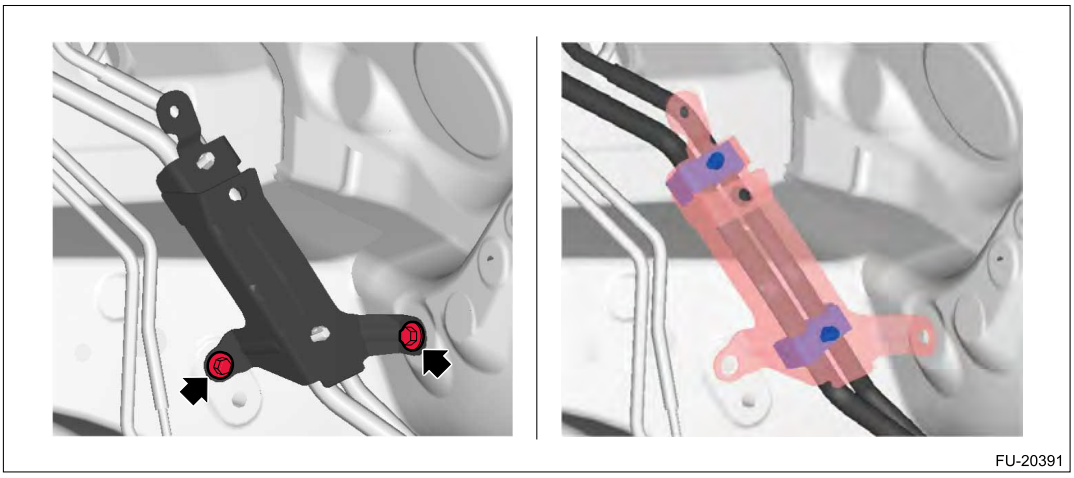


8. Remove the connector from the fuel pipe bracket A.



9. Lift up the vehicle.

10. Remove the bolts securing the fuel bracket A, and remove the pipe clamp from the fuel pipe assembly.

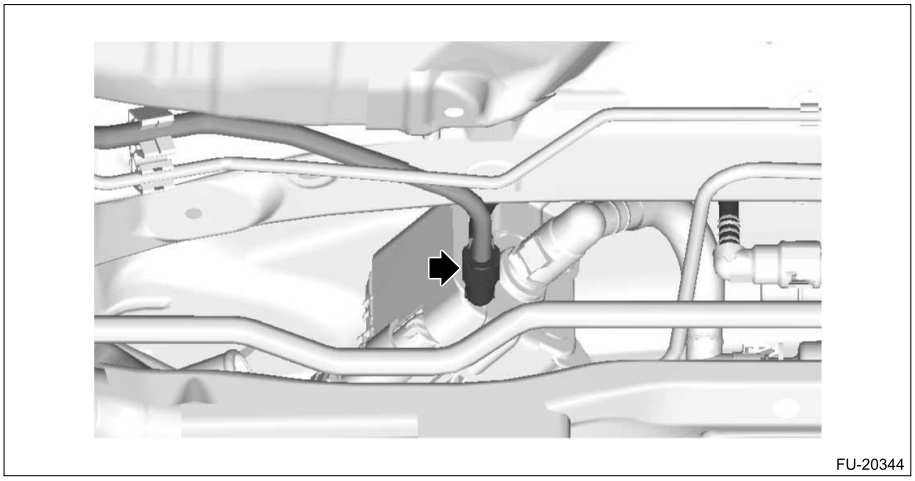


11. Remove the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank>REMOVAL.

12. Remove individual tubes and hoses from the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL TANK.

- For information about disconnecting fuel delivery tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE D).
- For information about disconnecting the circulate tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE G).
- For information about disconnecting the vent tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE F). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE H).

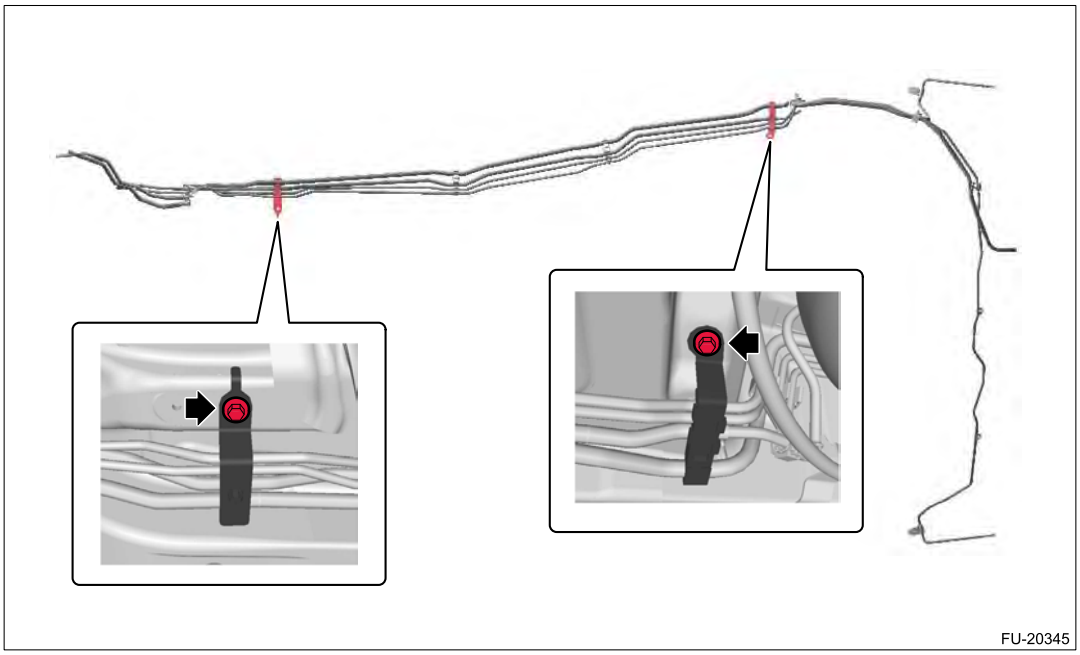
13. Disconnect the purge tube from the fuel pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>REMOVAL > QUICK CONNECTOR DISCONNECTION (TYPE G).



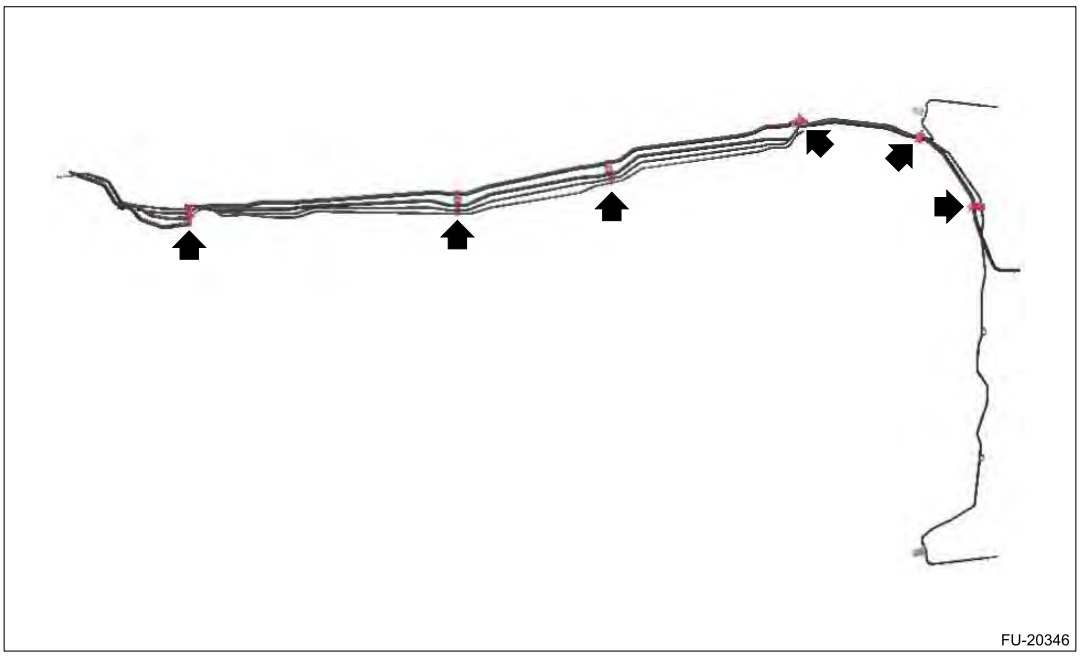
14. Remove the floor under protector RH. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>REMOVAL.

15. Disconnect the brake pipe. Ref. to BRAKE>Brake Hose>REMOVAL > FRONT BRAKE HOSE. Ref. to BRAKE>Brake Pipe>REMOVAL > CENTER AND REAR BRAKE PIPE.

16. Remove the bolts securing the fuel pipe bracket B and the fuel pipe bracket C, and remove the pipe clamp from the fuel pipe assembly.



17. Remove the fuel pipe assembly from the pipe clamp.

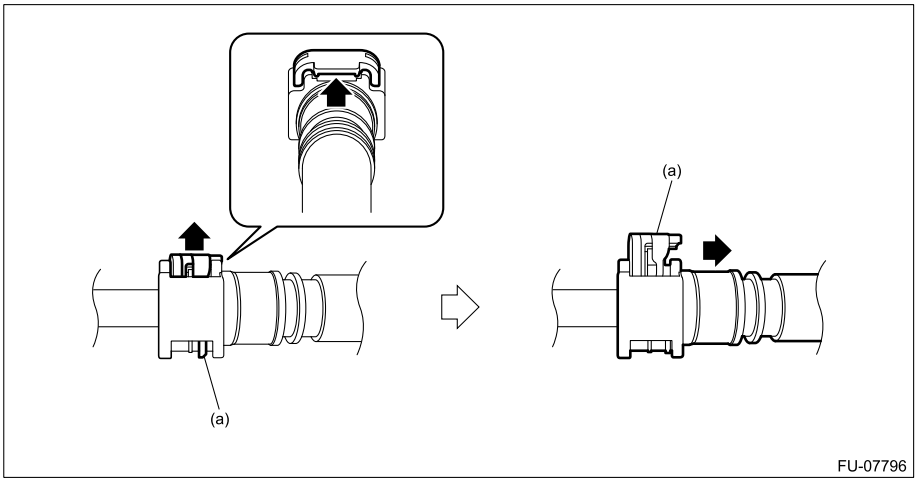


1. QUICK CONNECTOR DISCONNECTION (TYPE A)

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**

Disconnect the quick connector as shown in the figure.



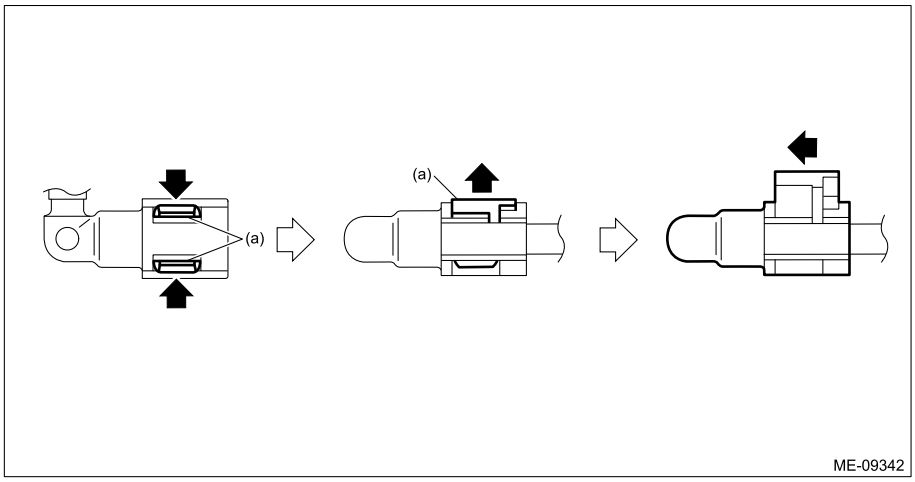
(a) Slider

2. QUICK CONNECTOR DISCONNECTION (TYPE B)

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**

Disconnect the quick connector as shown in the figure.



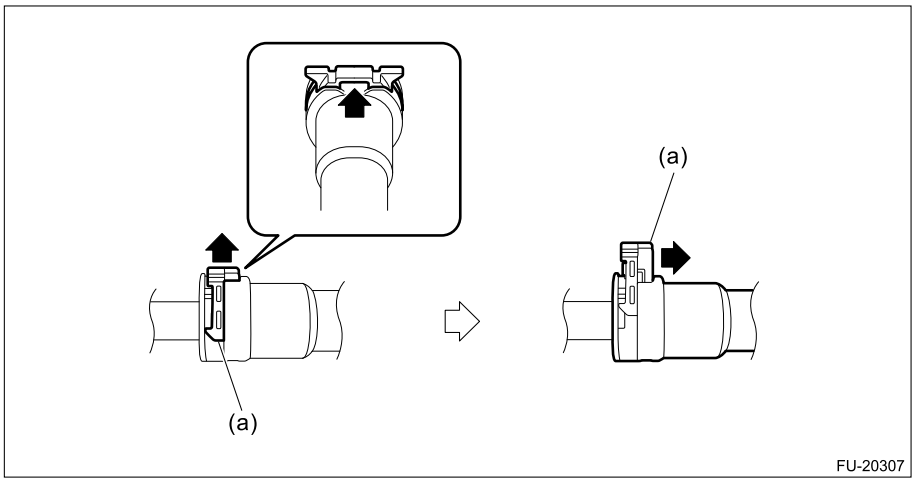
(a) Slider

3. QUICK CONNECTOR DISCONNECTION (TYPE C)

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**

Disconnect the quick connector as shown in the figure.



(a) Slider

4. QUICK CONNECTOR DISCONNECTION (TYPE D)

- When using ST
  1. Attach the ST to the pipe and push the ST in the direction of arrow mark to disconnect the quick connector.

     Preparation tool:

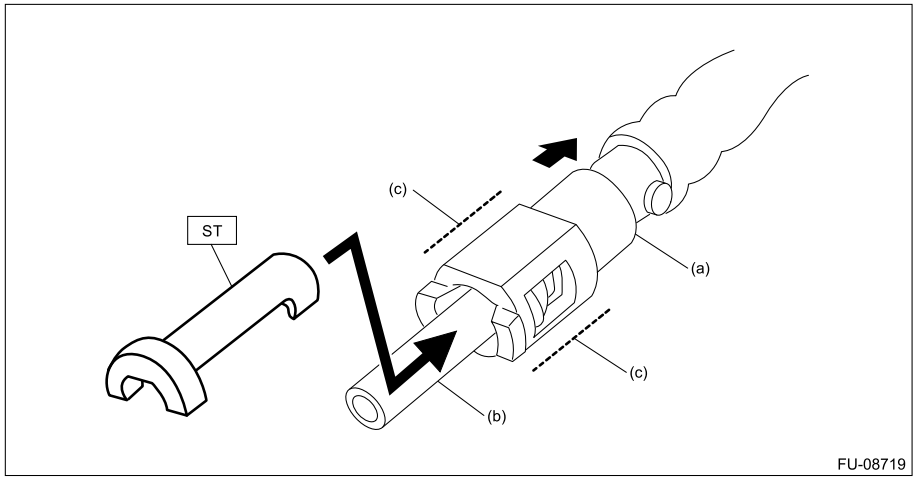
     ST: QUICK CONNECTOR RELEASE (42099AE000)

     Caution:

     - **Be careful not to spill fuel.**
     - **Catch the fuel from hoses using a container or cloth.**
     - **Holding the portion (c) shown in the figure, pull the connector in axial direction.**
     - **If the connector and pipe are sticking to each other, push and pull the connector with the ST pushed, and then pull the connector after it starts moving freely.**
     - **When disconnecting the connector, do not bend or twist the tube forcibly. If the tube is bent, replace with a new part.**

     Note:

     Clean the pipe and quick connector, if they are covered with dust.

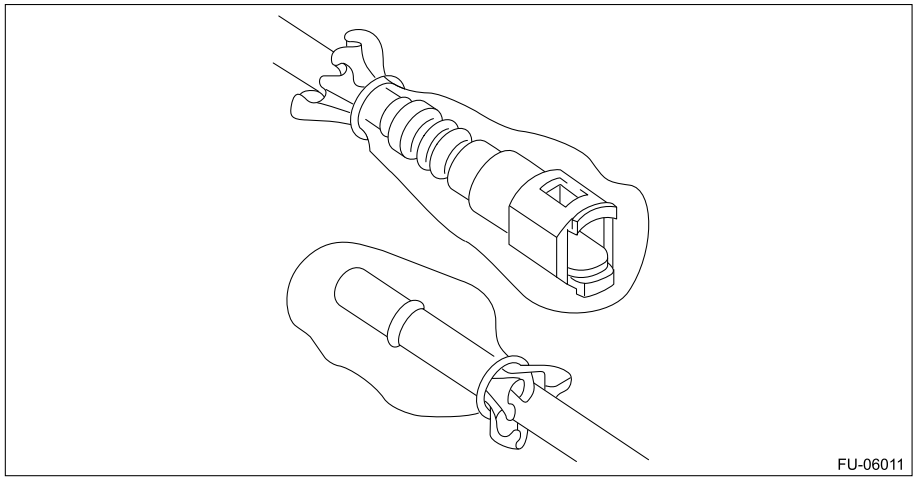


(a) Quick connector (b) Pipe (c) Connector holding position

  2. To prevent from damaging or entering foreign matter, wrap the pipes and quick connectors with plastic bag etc.

     Caution:

     When reusing the retainer, do not disconnect the retainer from the connector.



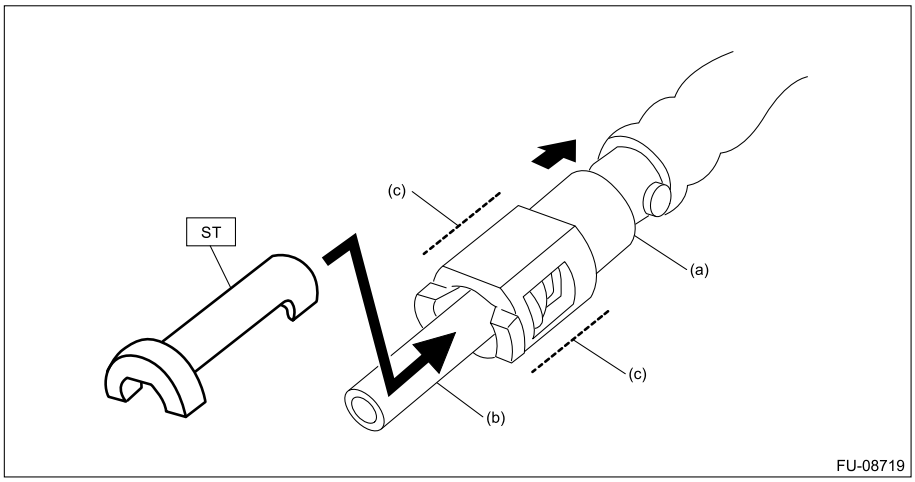
- When not using ST
  1. Push the retainer in the direction of the arrow, disconnect the quick connector from pipe.

Caution:

- **Be careful not to spill fuel.**
- **Catch the fuel from hoses using a container or cloth.**
- **Holding the portion (d) shown in the figure, pull the connector in axial direction.**
- **If the connector and pipe are sticking to each other, push and pull the connector with the retainer pushed in the direction of the arrow, and then pull the connector after it starts moving freely.**
- **When disconnecting the connector, do not bend or twist the tube forcibly. If the tube is bent, replace with a new part.**

Note:

Clean the pipe and quick connector, if they are covered with dust.



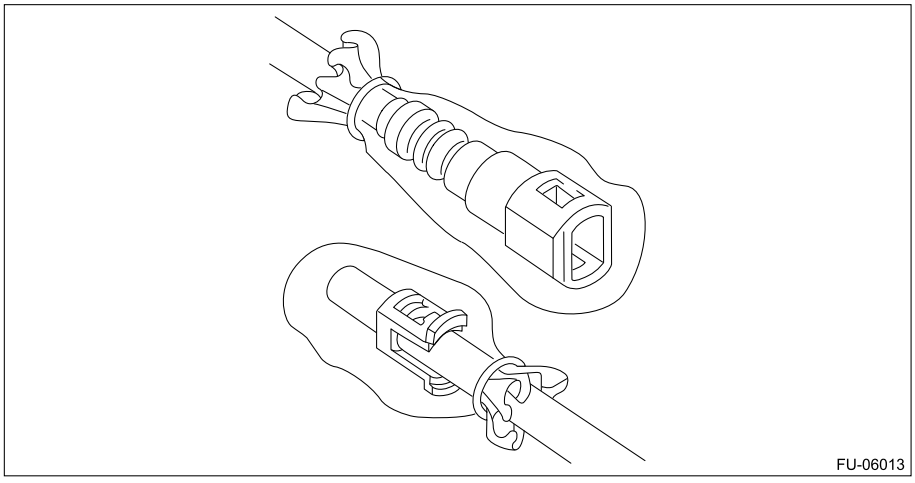
(a) Quick connector (c) Pipe (d) Connector holding position

(b) Retainer

2. To prevent from damaging or entering foreign matter, wrap the pipes and quick connectors with plastic bag etc.

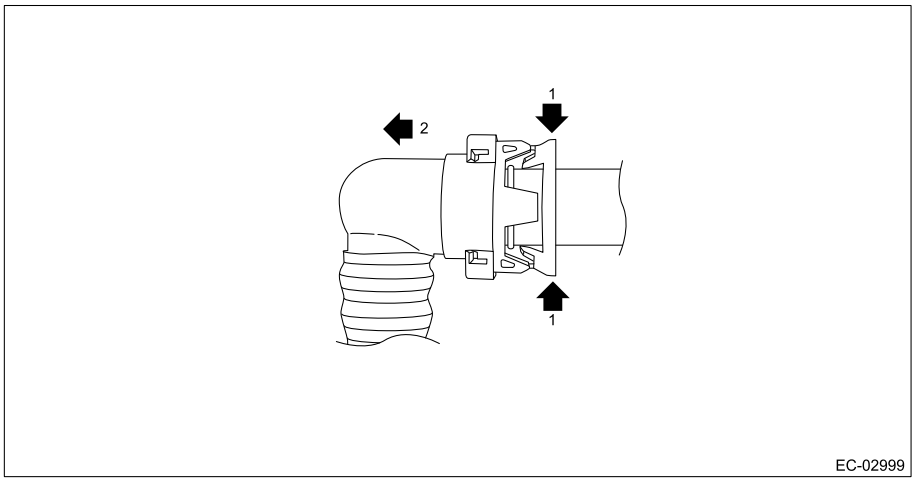
Caution:

When reusing the retainer, do not disconnect the retainer from the pipe.



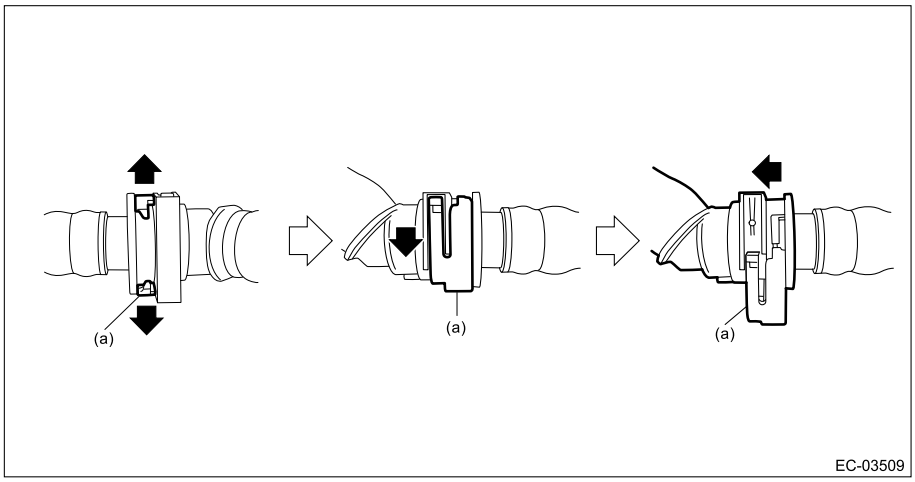
5. QUICK CONNECTOR DISCONNECTION (TYPE E)

Disconnect the quick connector as shown in the figure.



6. QUICK CONNECTOR DISCONNECTION (TYPE F)

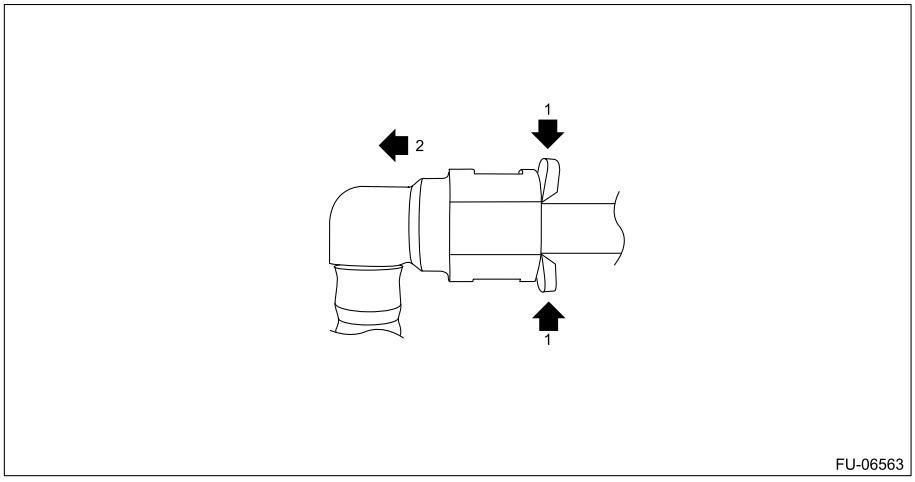
Disconnect the quick connector as shown in the figure.



(a) Slider

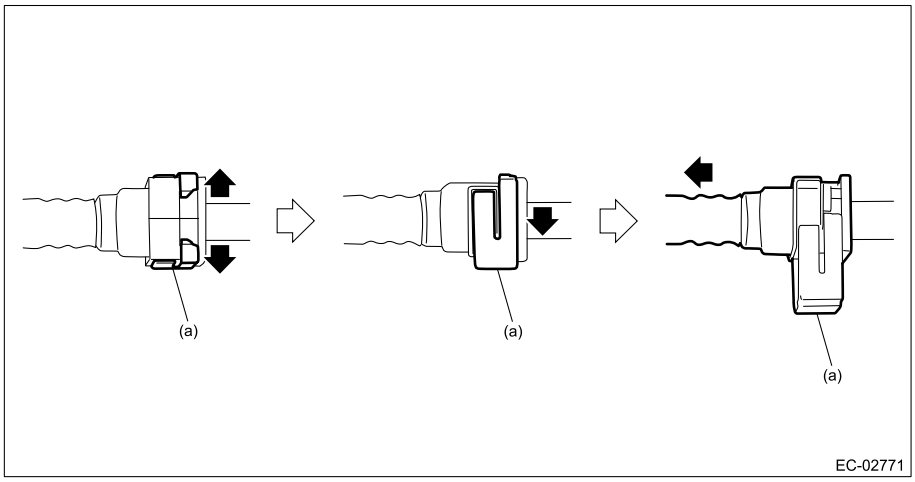
7. QUICK CONNECTOR DISCONNECTION (TYPE G)

Disconnect the quick connector as shown in the figure.



8. QUICK CONNECTOR DISCONNECTION (TYPE H)

Disconnect the quick connector as shown in the figure.

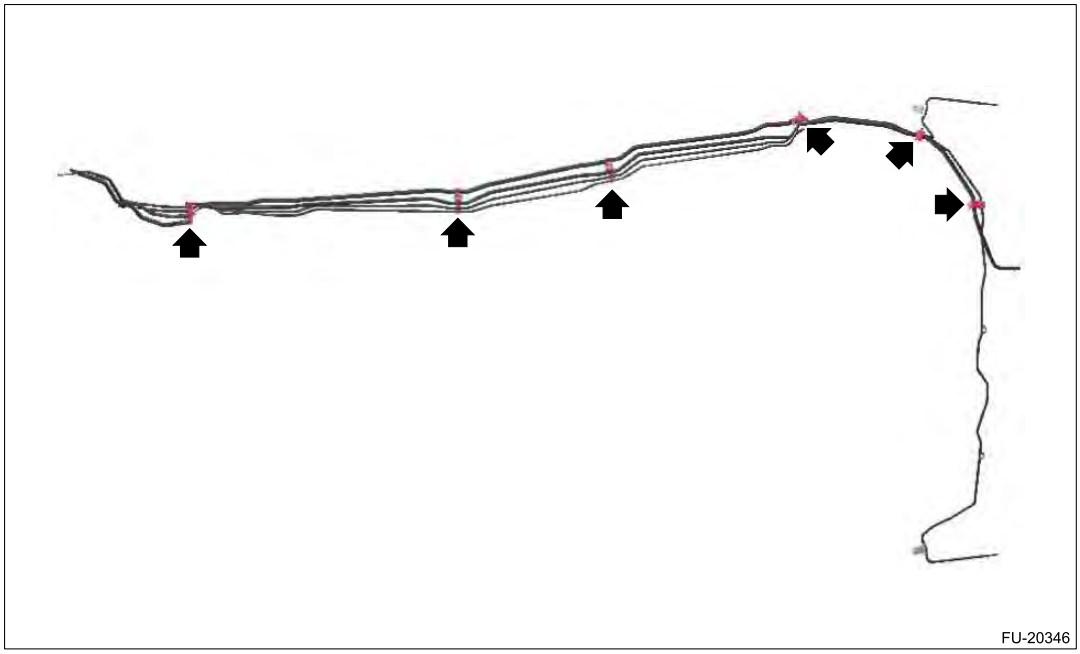


(a) Slider

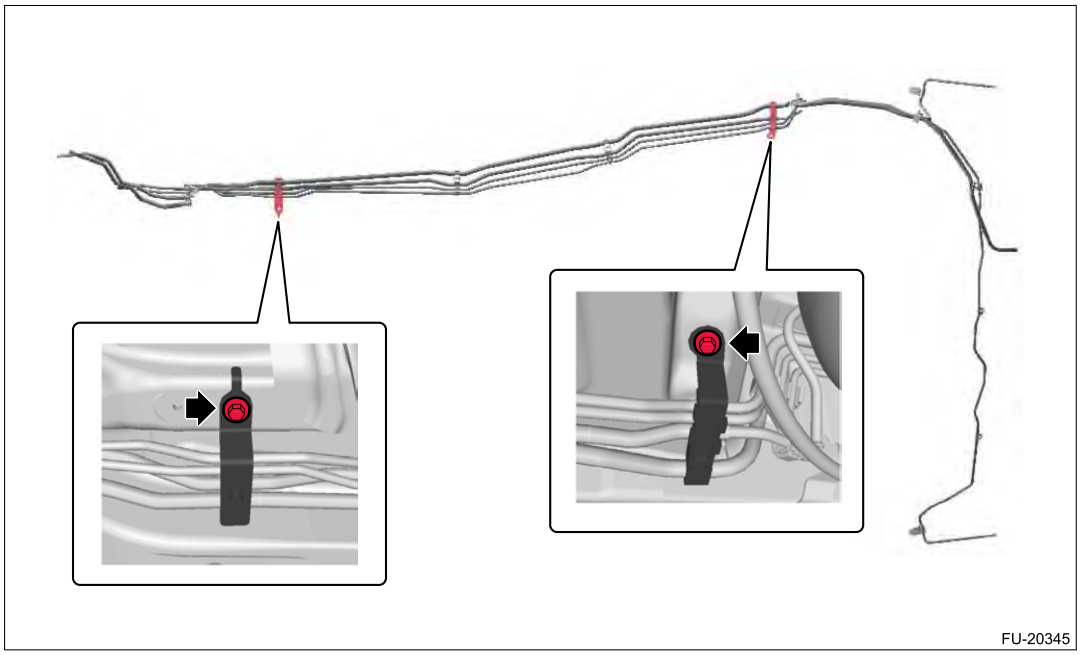
FUEL INJECTION (FUEL SYSTEMS)(H4DO) > Fuel Delivery and Evaporation Lines

INSTALLATION

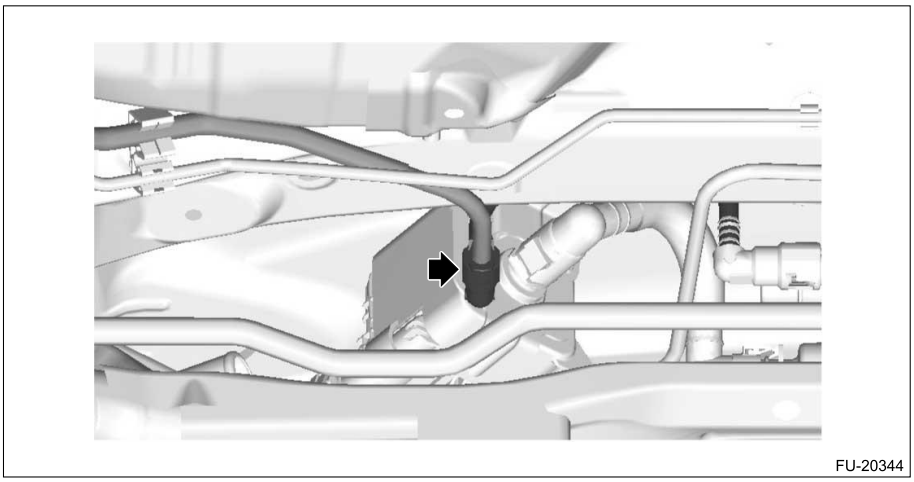
1. Install the fuel pipe assembly to the pipe clamp.



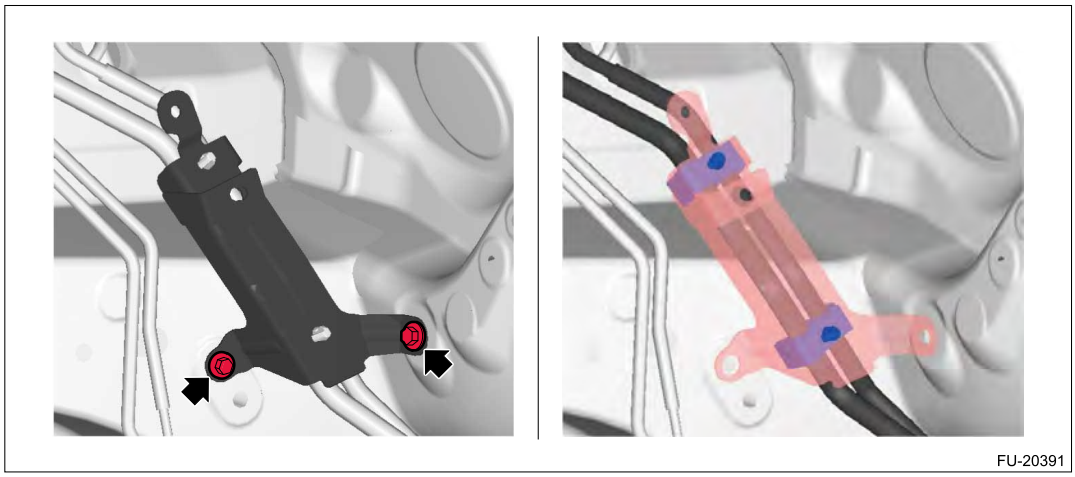
2. Install the pipe clamp to the fuel pipe assembly, and then install the fuel pipe bracket B and fuel pipe bracket C.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)



3. Connect the brake pipes. Ref. to BRAKE>Brake Hose>INSTALLATION > REAR BRAKE HOSE. Ref. to BRAKE>Brake Pipe>INSTALLATION > CENTER AND REAR BRAKE PIPE.
4. Install the floor under protector RH. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>INSTALLATION.
5. Connect the purge tube to the fuel pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE G).

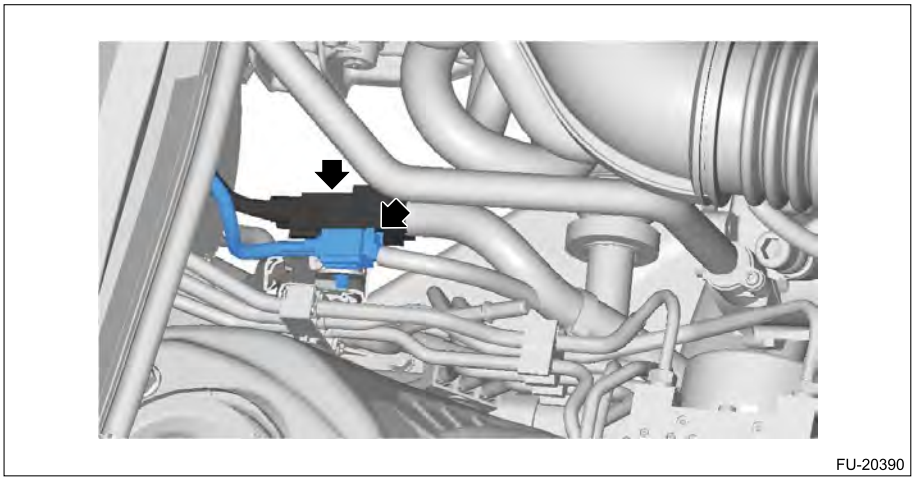


6. Connect individual tubes and hoses to the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL TANK.
   - For information about connecting fuel delivery tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE D).
   - For information about connecting the circulate tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE G).
   - For information about connecting the vent tube, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE F). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE H).
   - For information about connecting fuel filler hose, refer to "Fuel Delivery and Evaporation Lines". Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > FUEL FILLER HOSE CONNECTION.
7. Install the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank>INSTALLATION.
8. Install the pipe clamp to the fuel pipe assembly, and then install the fuel pipe bracket A.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)

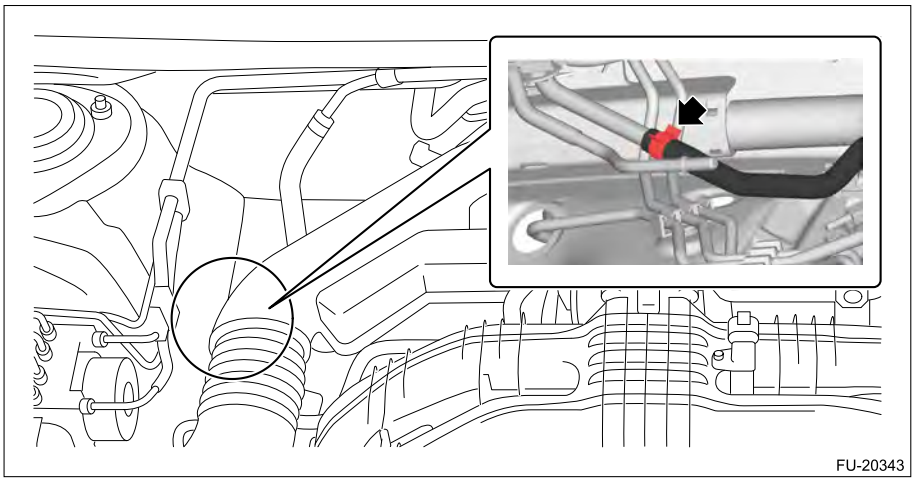


9. Lower the vehicle.

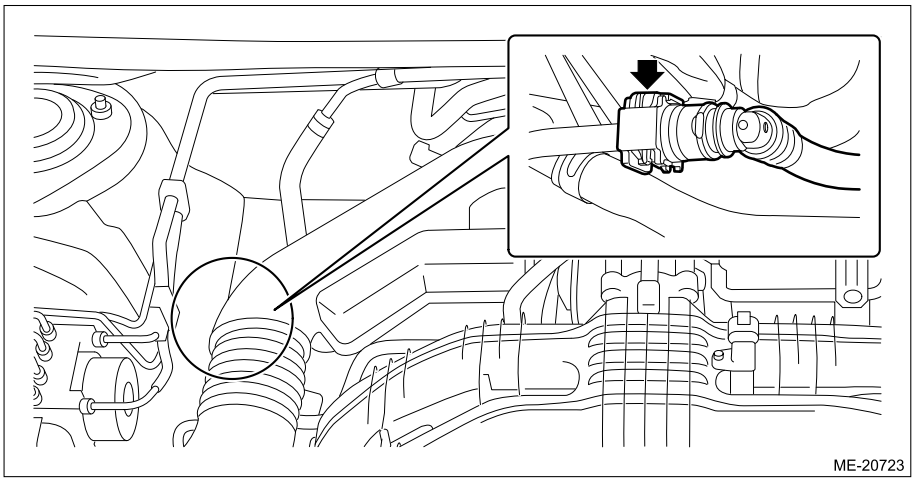
10. Install the connector to the fuel pipe bracket A.



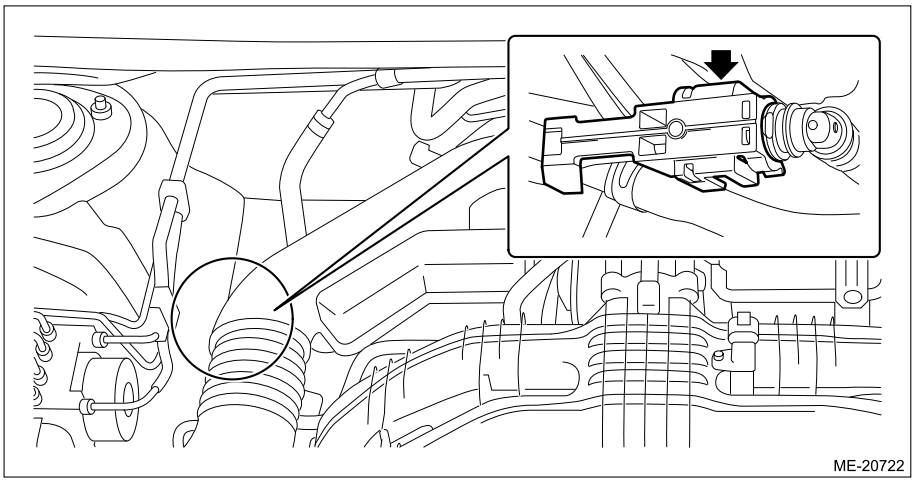
11. Connect the evaporation hose to fuel pipe assembly.



12. Connect the quick connector on the fuel delivery tube to the fuel pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Delivery and Evaporation Lines>INSTALLATION > QUICK CONNECTOR CONNECTION (TYPE A).



13. Install the fuel delivery tube clamp to the fuel delivery tube.



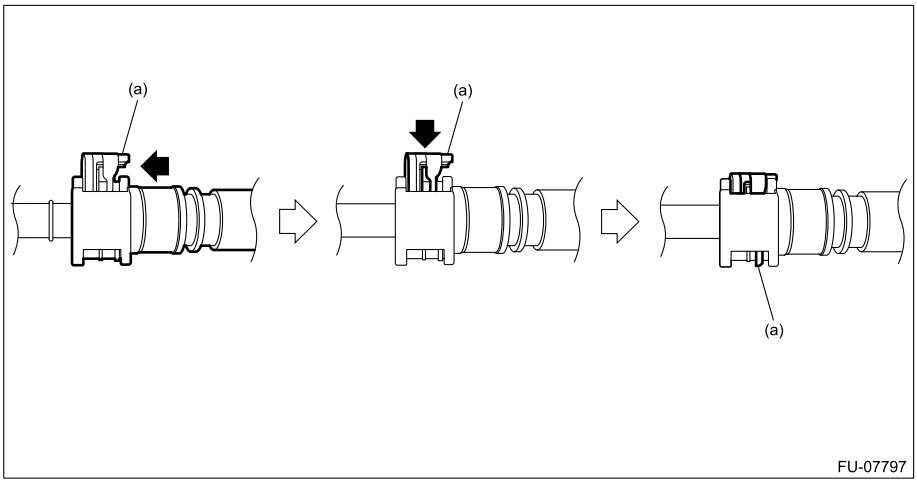
1. QUICK CONNECTOR CONNECTION (TYPE A)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check again that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.



(a) Slider

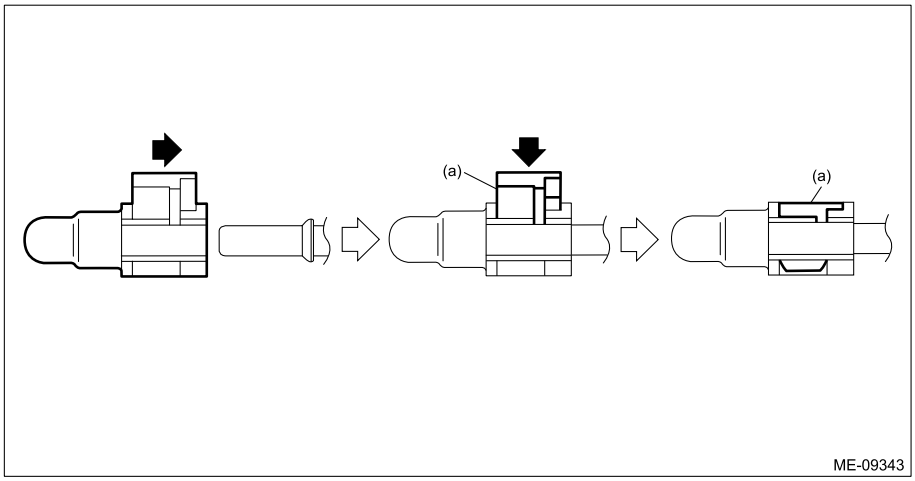
2. QUICK CONNECTOR CONNECTION (TYPE B)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check again that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.



(a) Slider

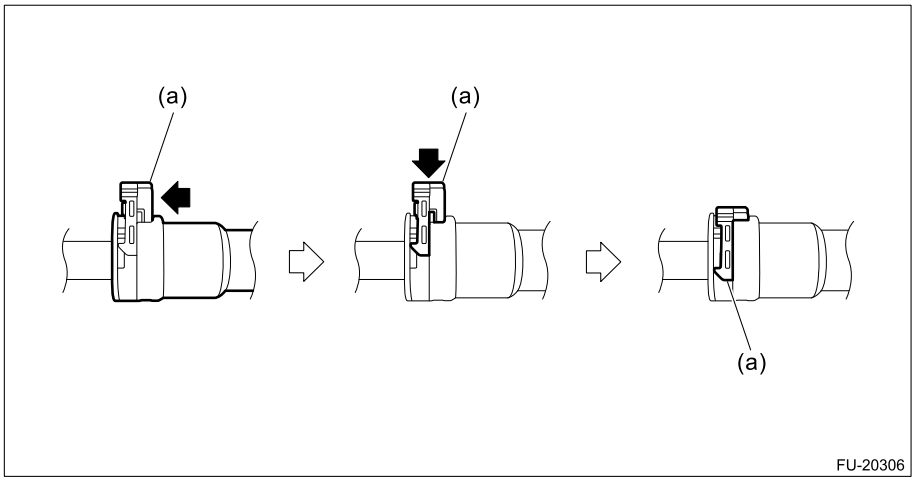
3. QUICK CONNECTOR CONNECTION (TYPE C)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check again that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.

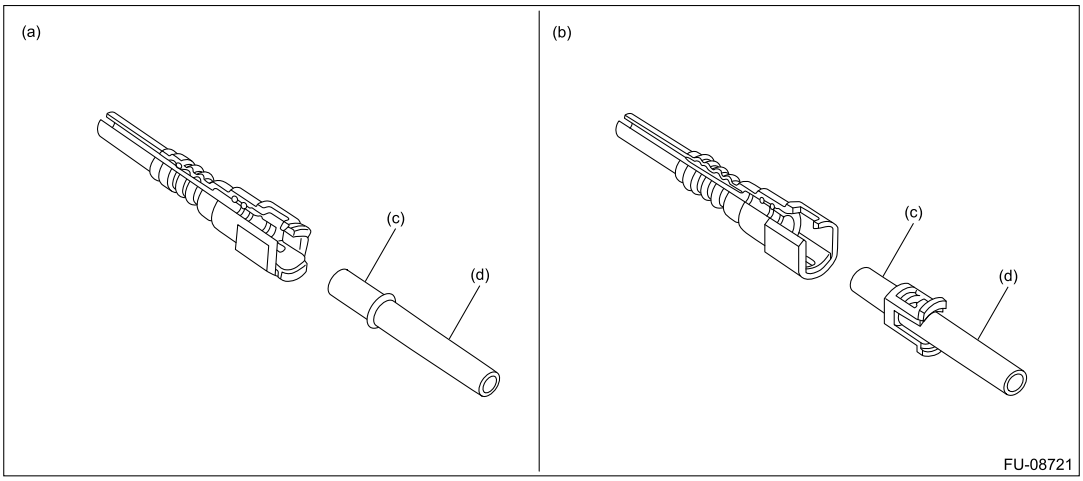


(a) Slider

4. QUICK CONNECTOR CONNECTION (TYPE D)

Caution:

- **Make sure there are no damage or dust on connections. If necessary, clean seal surface of pipe.**



(a) When removed using the ST (c) Seal surface (d) Pipe

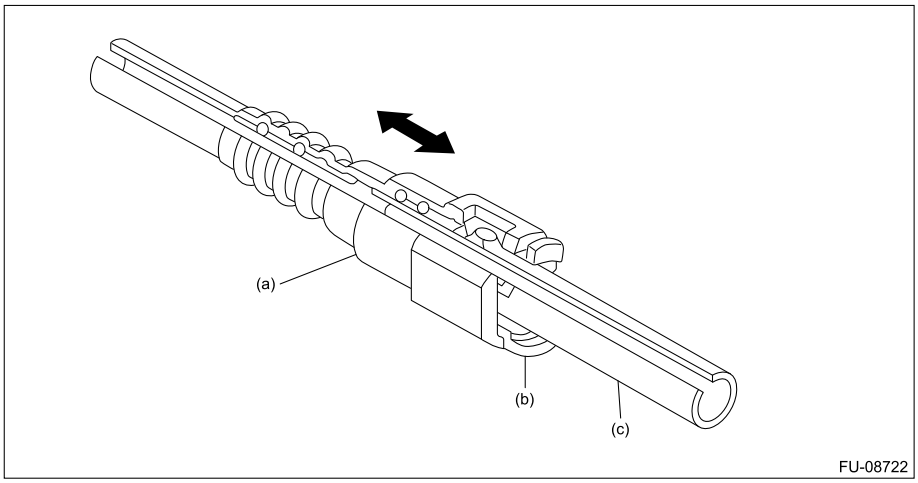
(b) When removed without using the ST

- **When reusing the retainer, make sure that neither scratches nor deformation exist on the retainer. If it is faulty, use a new part.**

Connect the quick connector.

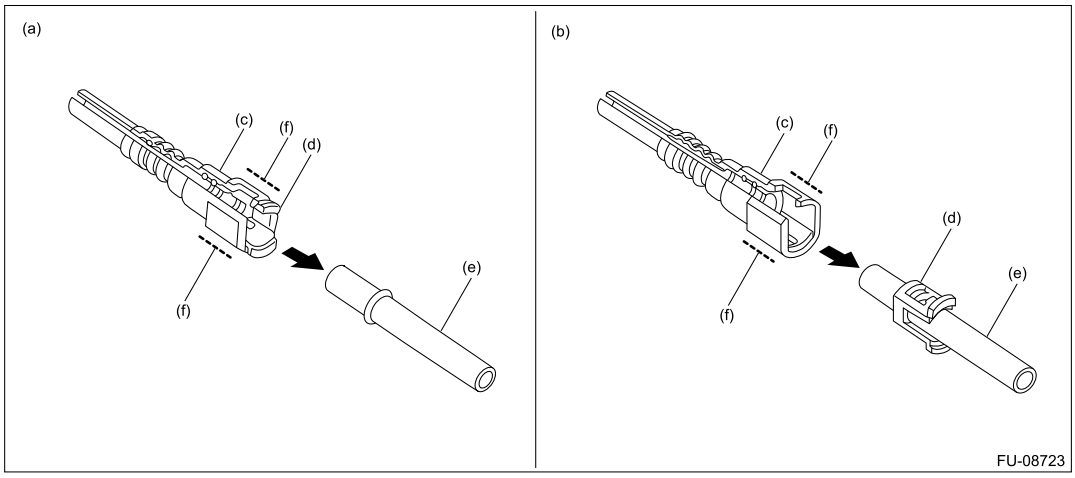
Caution:

- **Make sure that the quick connector is securely connected.**



(a) Quick connector (b) Retainer (c) Pipe

- **Make sure the two retainer pawls are engaged in their mating positions in the quick connector.**
- **Be sure to inspect tubes and their connections for any leakage of fuel.**
- **Holding the portion (f) shown in the figure, push in the connector in axial direction.**
- **When connecting the connector, do not bend or twist the tube forcibly. If the tube is bent, replace with a new part.**



(a) When removed using the ST
(b) When removed without using the ST
(c) Quick connector
(d) Retainer
(e) Pipe
(f) Connector holding position

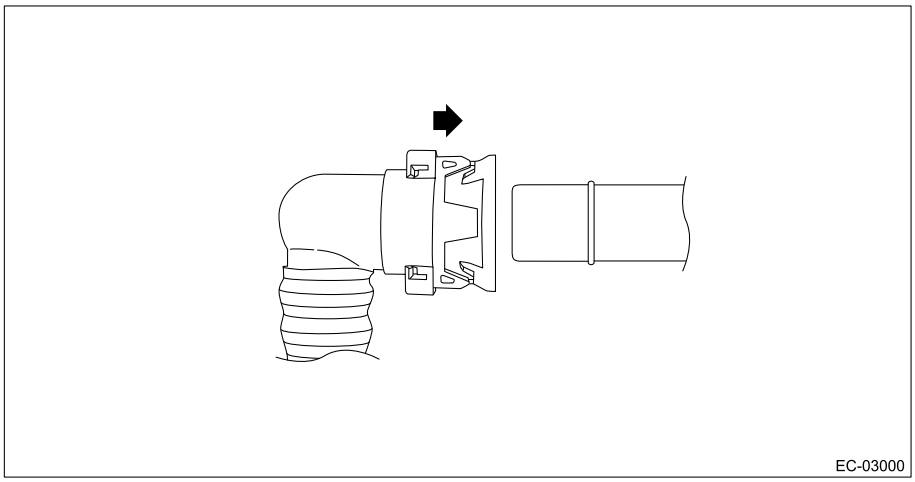
5. QUICK CONNECTOR CONNECTION (TYPE E)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **Make sure that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.



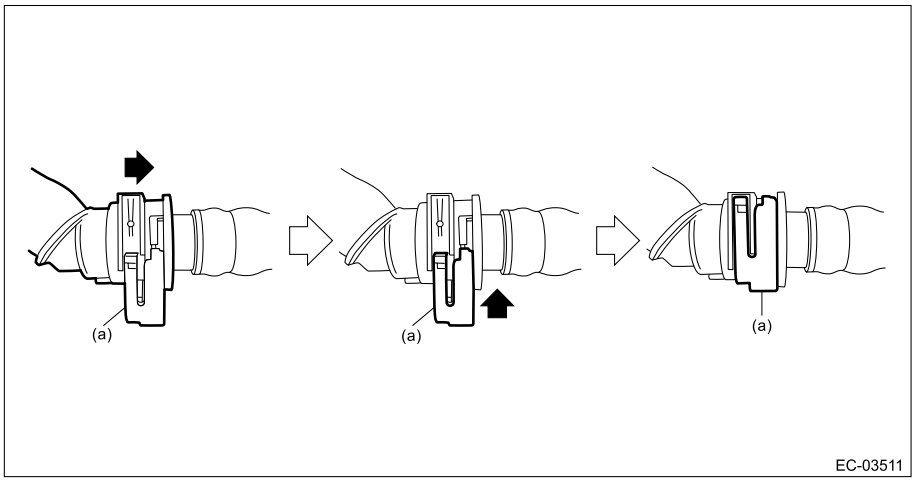
6. QUICK CONNECTOR CONNECTION (TYPE F)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check again that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.



(a) Slider

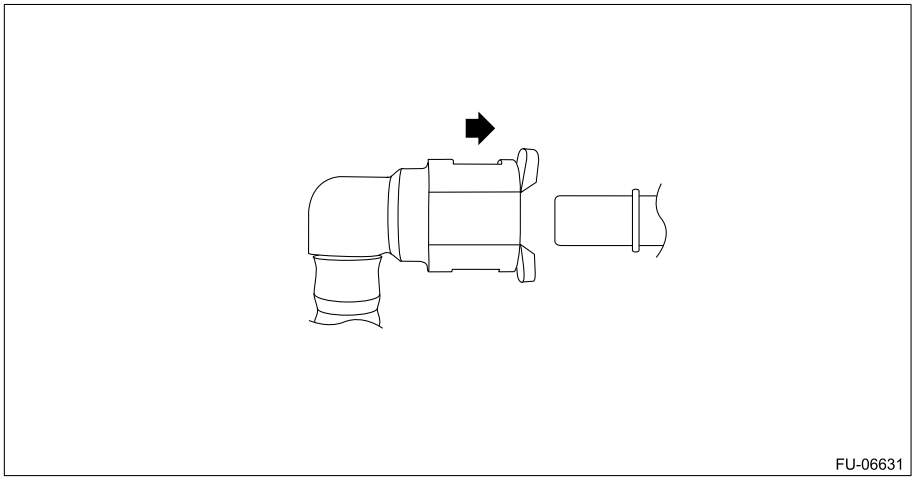
7. QUICK CONNECTOR CONNECTION (TYPE G)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **Make sure that the quick connector is securely connected.**

Note:

Connect the quick connector as shown in the figure.



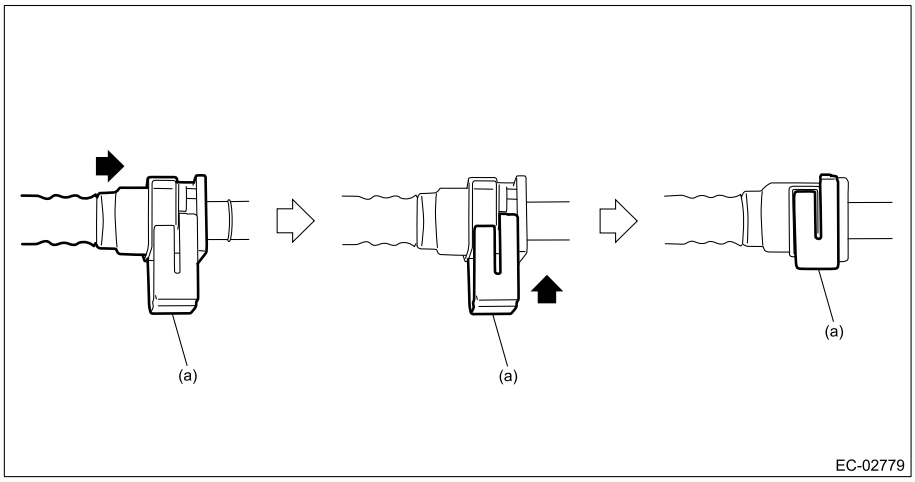
8. QUICK CONNECTOR CONNECTION (TYPE H)

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check again that the quick connector is securely connected.**

Note:

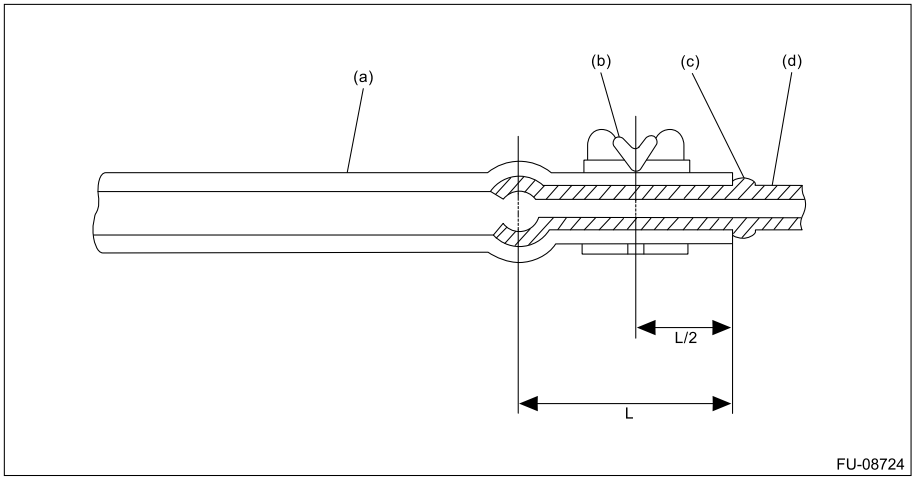
Connect the quick connector as shown in the figure.



(a) Slider

9. EVAPORATION HOSE CONNECTION

Connect by inserting it to the pipe until it reaches the spool or bump.



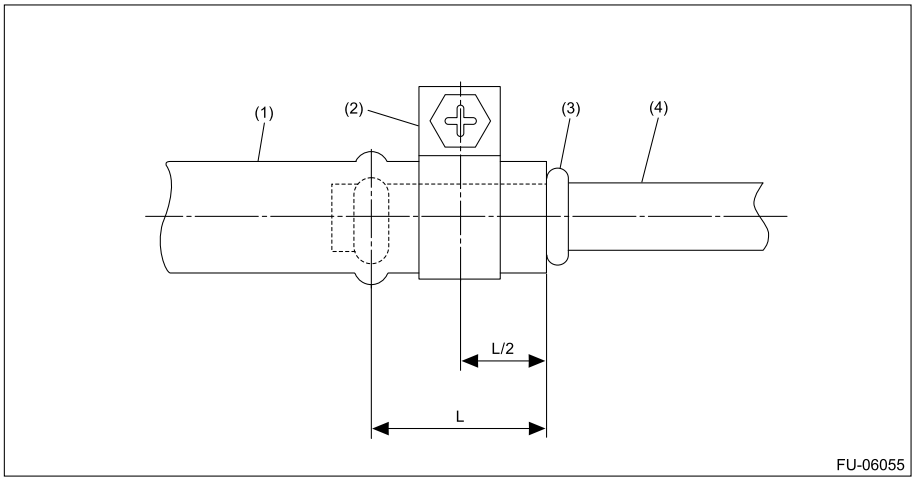
(a) Hose
(b) Clip
(c) Spool or bump
(d) Pipe

10. FUEL FILLER HOSE CONNECTION

Securely insert the hose to the spool, and then install the clamp as shown in the figure.

Tightening torque:

2.5 N·m (0.3 kgf-m, 1.8 ft-lb)



(1) Fuel filler hose
(2) Clamp
(3) Spool
(4) Fuel filler pipe

INSPECTION

1. Check that the fuel pipe has no deformation, cracks or other damages.
2. Check that the hose and tube have no cracks, damage or loose part.

INSPECTION

Trouble	Possible cause	Corrective action
Insufficient fuel supply to fuel injector	a. Fuel pump does not operate.	
	❍Defective terminal contact	Inspect contact, especially ground, and tighten it securely.
	❍Trouble in electromagnetic or electronic circuit parts	Replace the faulty parts.
	b. Decline of fuel pump function	Replace the fuel pump.
	c. Clogged fuel filter	Replace the fuel filter. Clean or replace the fuel tank if necessary.
	d. Clogged or bent fuel line pipe, hose or tube	Clean, correct or replace the fuel line pipe, hose or tube.
	e. Air is mixed in fuel system.	Check the fuel line connections, correct or replace the defective part.
	f. Damaged diaphragm of pressure regulator	Replace the fuel filter assembly.
Leakage or blow out of fuel	a. Loose connections of fuel line pipe, hose or tube	Check the fuel line connections, correct or replace the defective part.
	b. Cracked fuel line pipe, hose or tube	Replace the fuel line pipe, hose or tube.
	c. Cracked fuel tank or defective welded part	Replace the fuel tank.
	d. Clogged or bent fuel line pipe, hose or tube	Clean, correct or replace the fuel line pipe, hose or tube.
Gasoline smell inside of compartment	a. Loose connections of fuel line pipe, hose or tube	Check the fuel line connections, correct or replace the defective part.
	b. Defective ring clip or fuel filler pipe assembly gasket	Correct or replace the gasket.
	c. Defective canister	Replace the canister.
Defective fuel gauge	a. Defective operation of fuel level sensor	Replace the fuel level sensor.
	b. Defective operation of combination meter Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.	Replace the combination meter.
Noise	a. Large operation noise or vibration of fuel pump	Replace the fuel pump.

Note:

- **When the vehicle is left unattended for an extended period of time, water may accumulate in the fuel tank. Fill fuel fully to prevent the problem.**
- **In snow-covered areas, mountainous areas, skiing areas, etc. where ambient temperatures drop to 0°C (32°F) or less throughout the winter season, use a water removing agent in the fuel system to prevent freezing fuel system and accumulating water.**
- **When water is accumulated in fuel filter, fill the water removing agent in the fuel tank.**
- **Before using water removing agent, follow the cautions noted on the bottle.**

IG(H4DO)

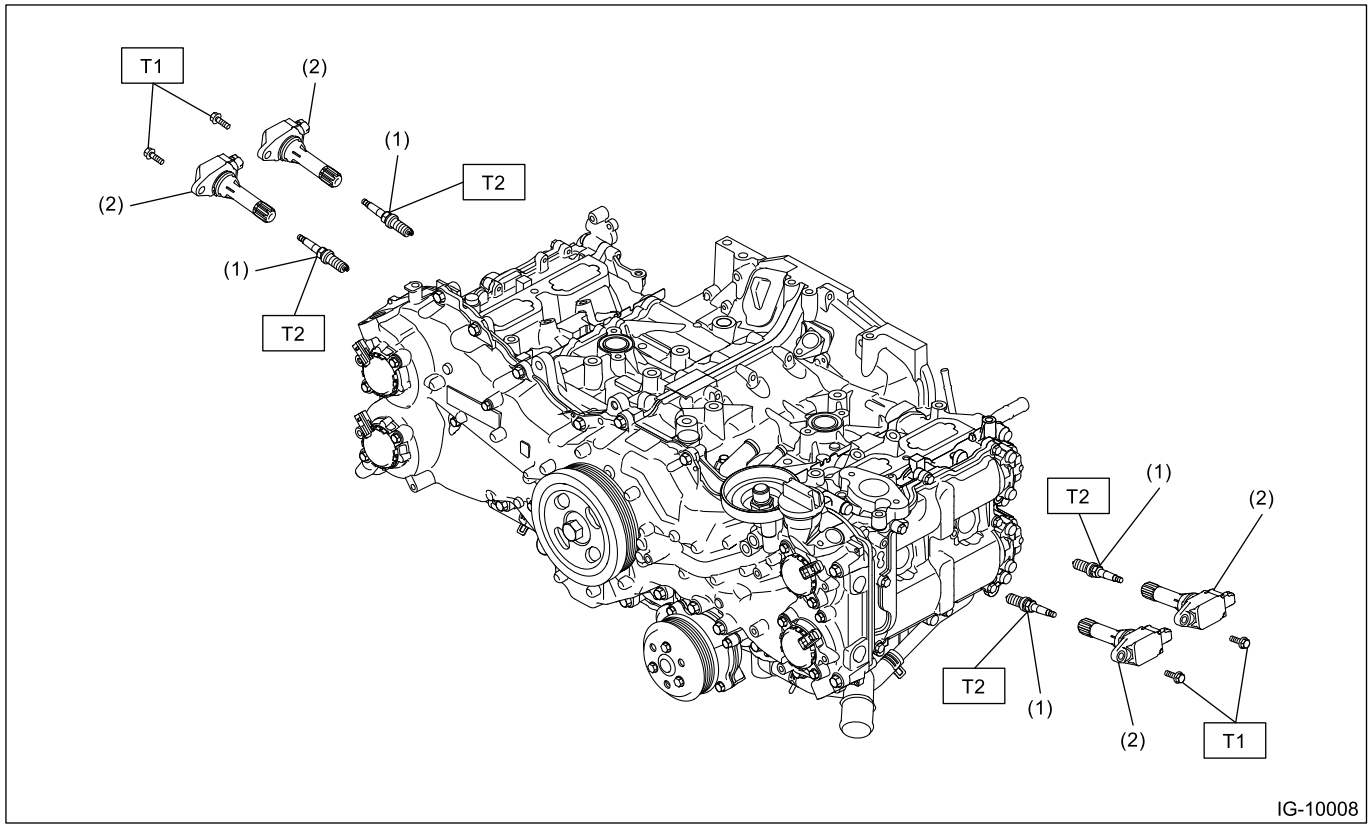
1. General Description
2. Spark Plug
3. Ignition Coil

SPECIFICATION

Item			Specifications
Ignition coil	Manufacturer and type		Hitachi: EIC-3330
	Ignition system		Independent ignition coil
Spark plug	Manufacturer and type		NGK: DILKAR7B8
	Thread size (diameter, pitch, length) mm		12, 1.25, 26.5
	Spark plug gap mm (in)	Standard	0.8 (0.031)
	Electrode		Center electrode: Iridium Ground electrode: Platinum

IGNITION(H4DO) > General Description

COMPONENT



(1) Spark plug

(2) Ignition coil

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8.0 (0.8, 5.9)

T2: 18 (1.8, 13.3)

IGNITION(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.

- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

REMOVAL

1. RH SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the ignition coil (RH side). Ref. to IGNITION(H4DO)>Ignition Coil>REMOVAL > RH SIDE.
3. Remove the spark plug.

2. LH SIDE

1. Remove the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
2. Remove the ignition coil (LH side). Ref. to IGNITION(H4DO)>Ignition Coil>REMOVAL > LH SIDE.
3. Remove the spark plug.

INSTALLATION

1. RH SIDE

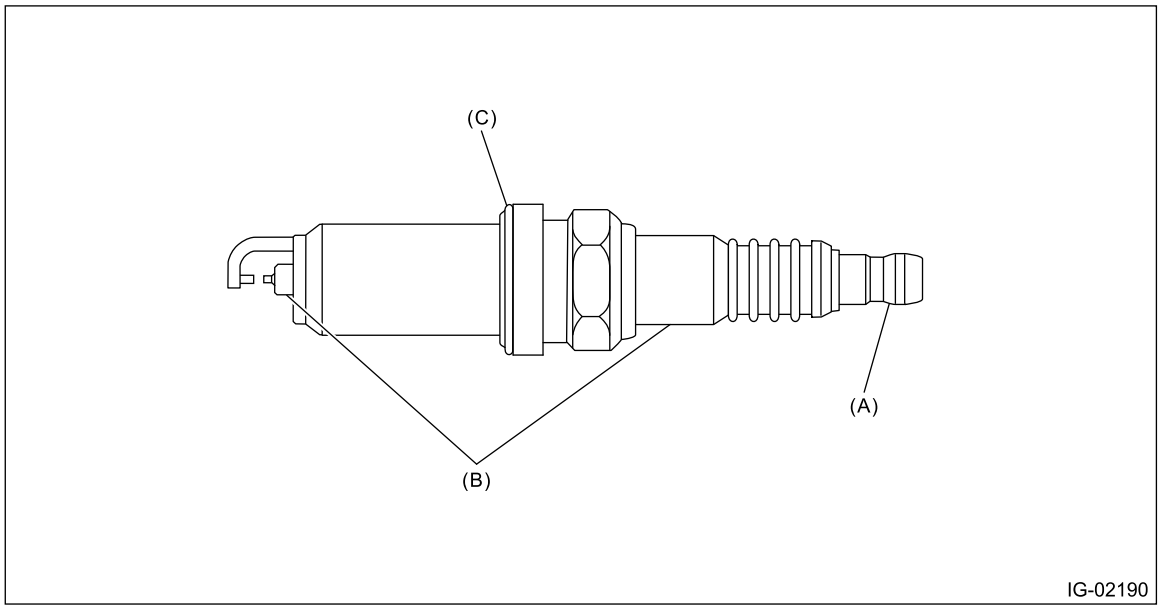
1. Install the spark plug.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the ignition coil (RH side). Ref. to IGNITION(H4DO)>Ignition Coil>INSTALLATION > RH SIDE.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. LH SIDE

1. Install the spark plug.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the ignition coil (LH side). Ref. to IGNITION(H4DO)>Ignition Coil>INSTALLATION > LH SIDE.
3. Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.

INSPECTION

1. Check the spark plug for damage. If defective, replace the spark plug.

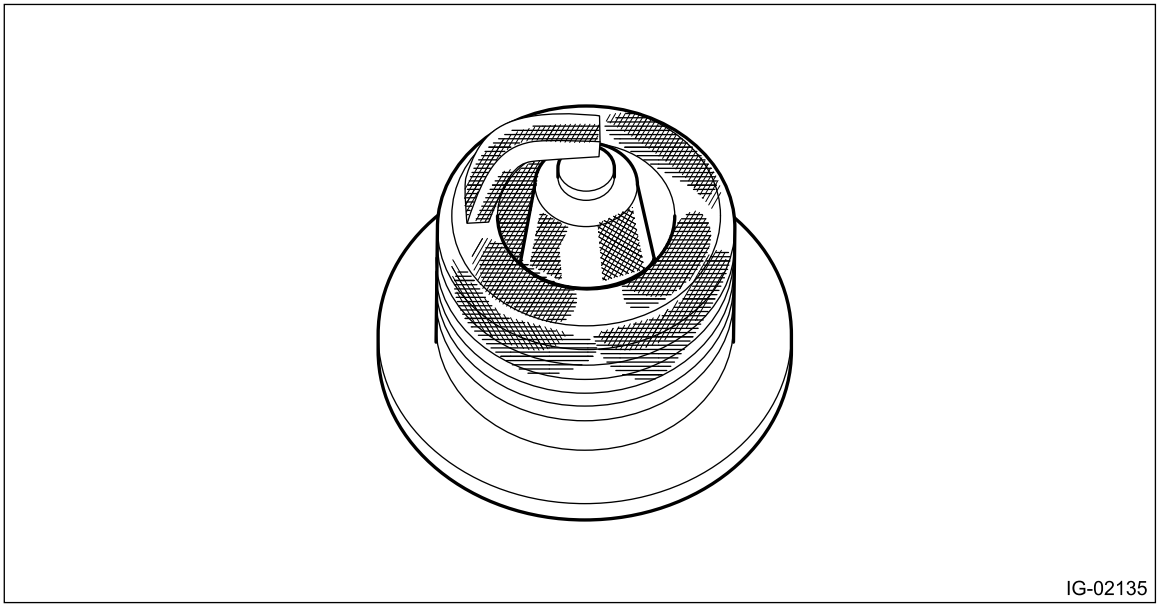


(A) Terminal damage or looseness (B) Crack or damage in insulator (C) Damaged gasket

2. Check the spark plug electrode and condition of the insulator. If abnormal, check and repair the cause and replace the spark plug.

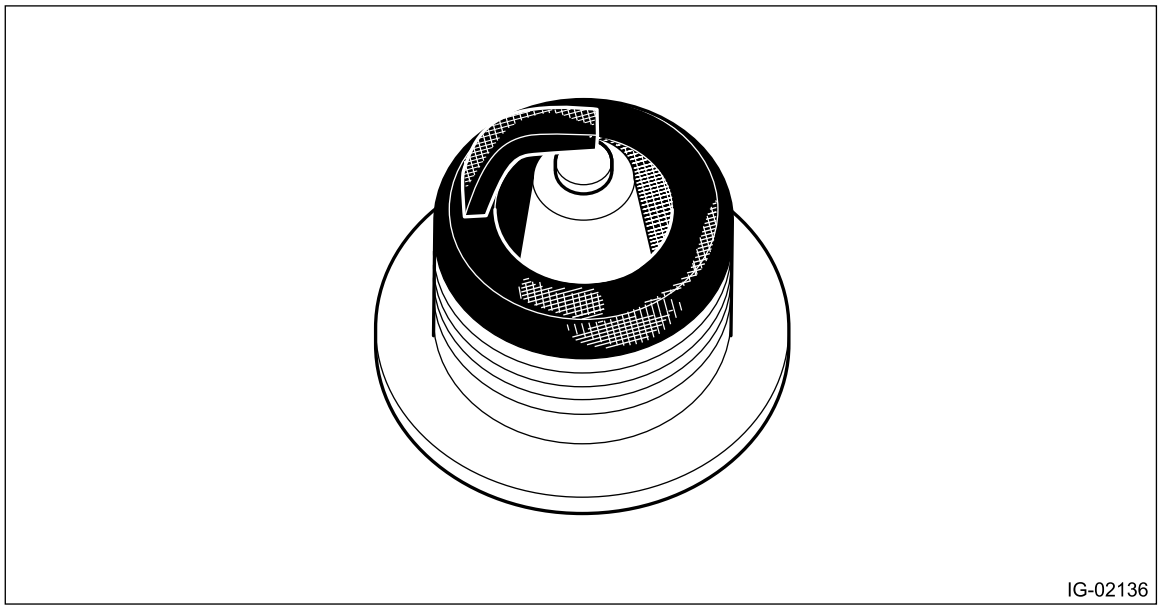
(1) Normal:

Brown to grayish-tan deposits and slight electrode wear indicate correct spark plug heat range.



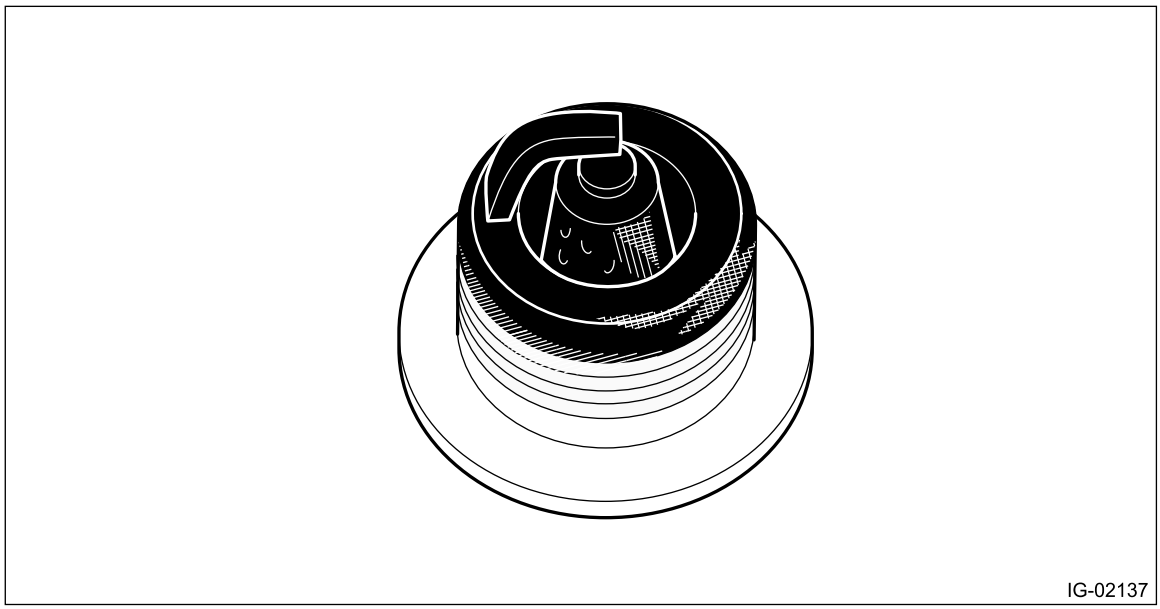
(2) Carbon fouled:

Dry fluffy carbon deposits on the insulator and electrode are mostly caused by slow-speed driving in town, weak ignition, too rich fuel mixture, etc.



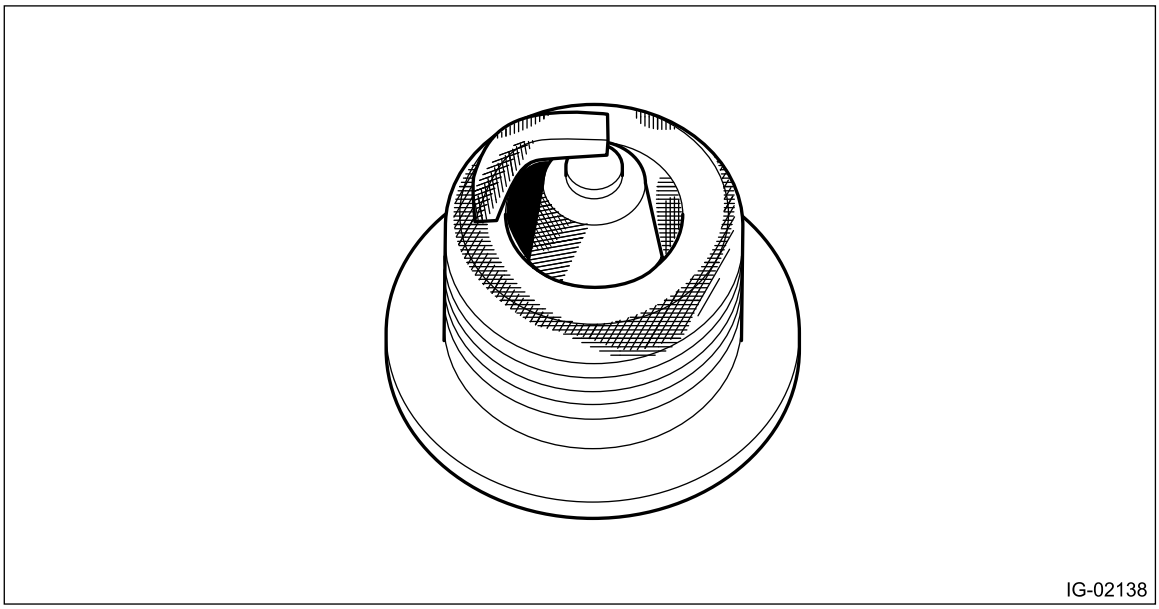
(3) Oil fouled:

Wet black deposits show oil entrance into combustion chamber through worn piston rings or increased clearance between valve guides and valve stems.



(4) Overheating:

A white or light gray insulator with black or brown spots and bluish burnt electrodes indicate engine overheating, wrong selection of fuel, or loose spark plugs.



3. Using a nylon brush, etc., clean and remove the carbon or oxide deposits from the spark plug. If deposits are too stubborn, replace the spark plugs.

   Note:

   - **Never use a plug cleaner.**
   - **Do not use a metal brush as it may damage the electrode area.**

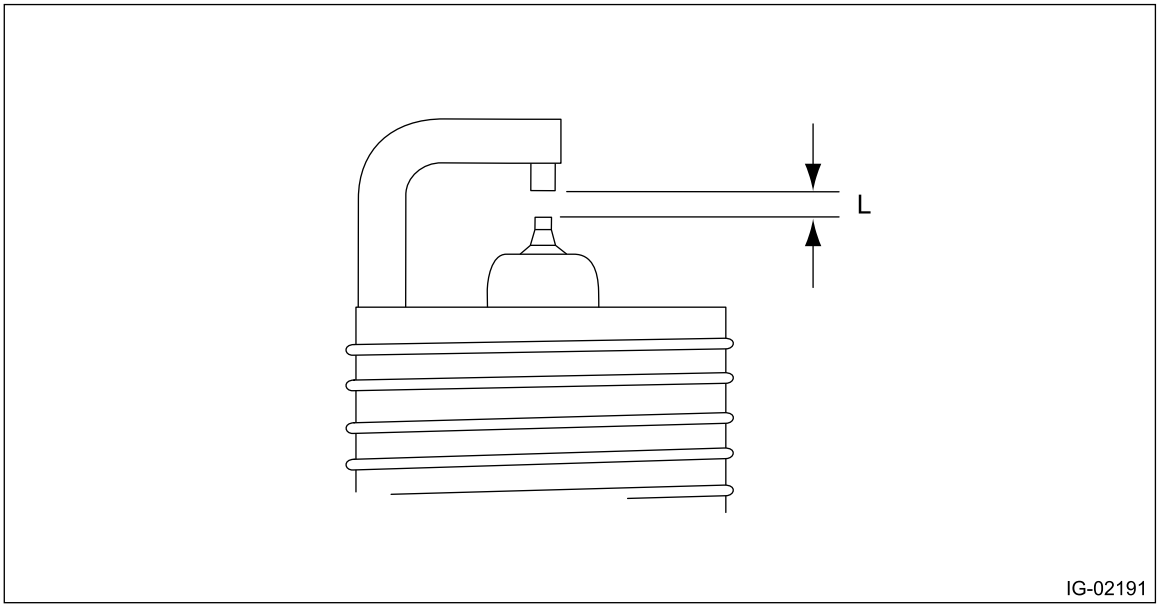
4. Check the spark plug gap "L" using a gap gauge. If it is not within the standard, replace the spark plug.

   Caution:

   Do not adjust the gap, because the iridium plug is used.

   Standard

   0.8 mm (0.031 in)



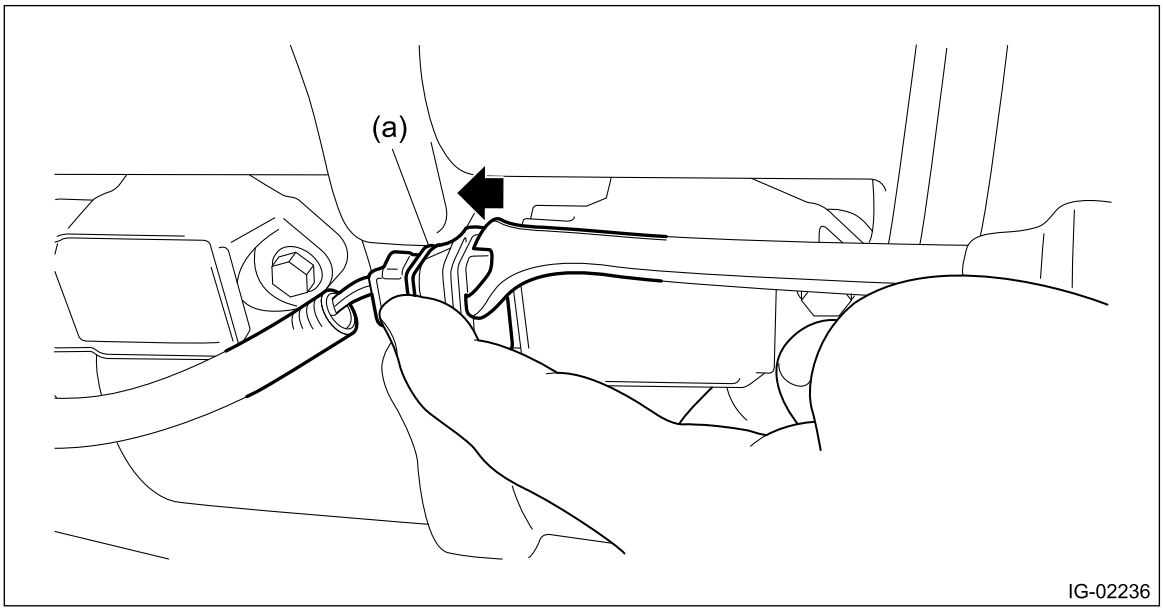
REMOVAL

1. RH SIDE

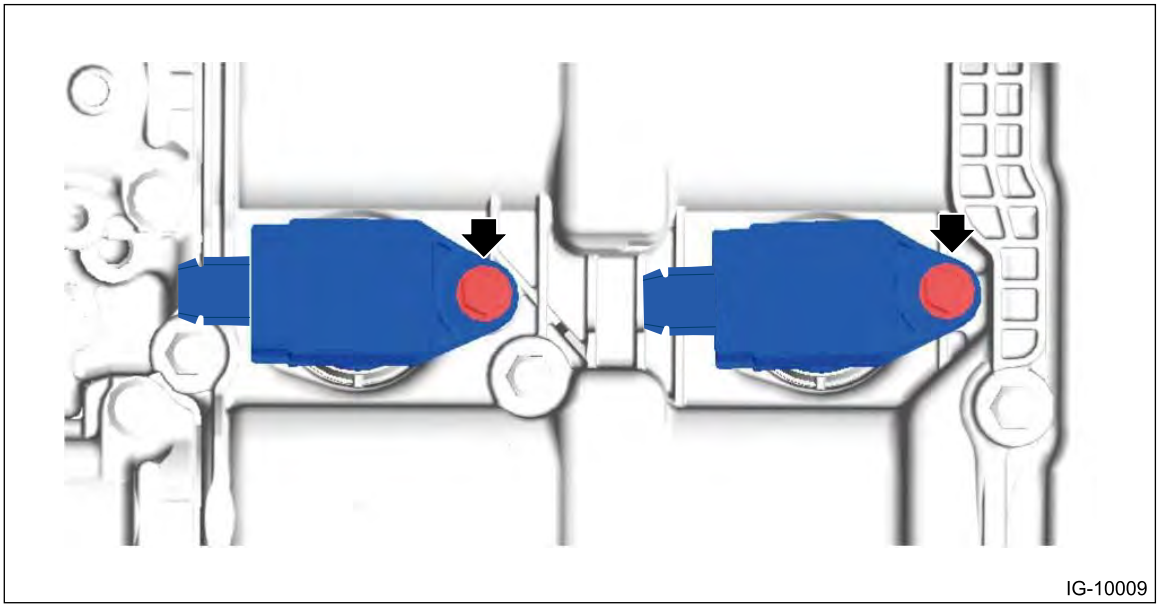
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>REMOVAL.
3. Disconnect the connector from ignition coil.

   Note:

   While pressing the spring (a) shown in the figure, slide it in the direction of the arrow with a clip remover.

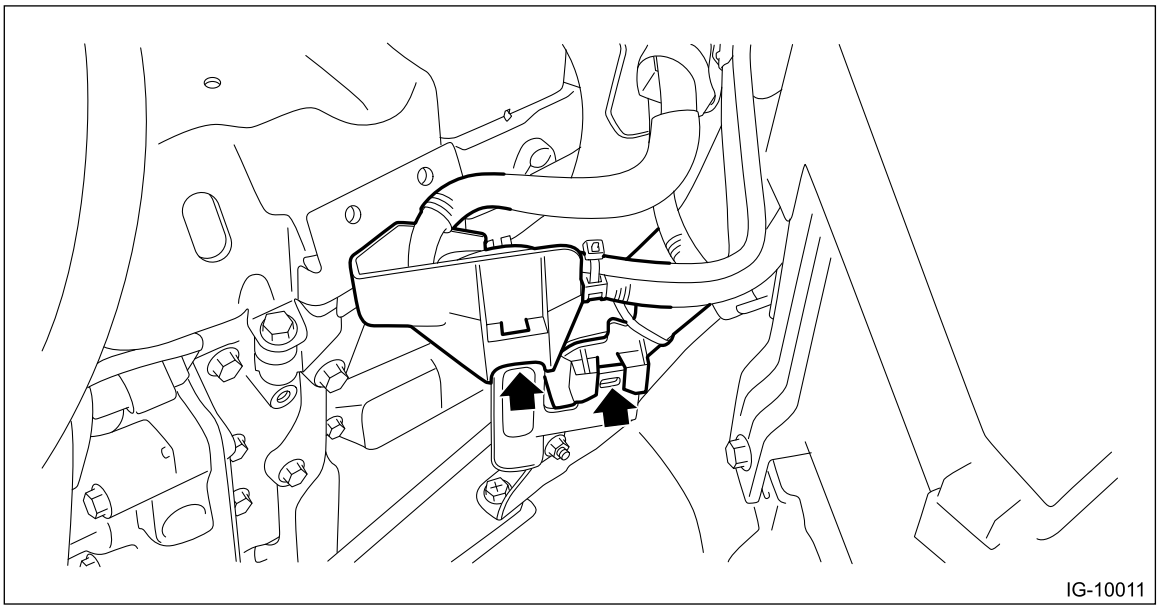


4. Remove the ignition coil.

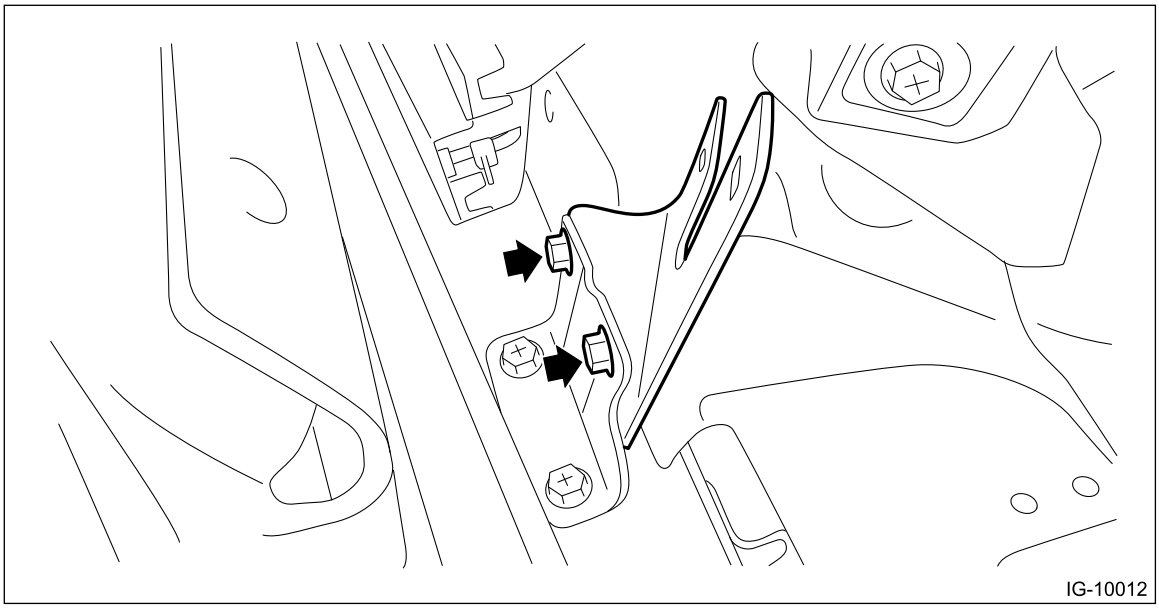


2. LH SIDE

1. Remove the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
2. Remove the engine wiring harness and the battery cables from the bracket.



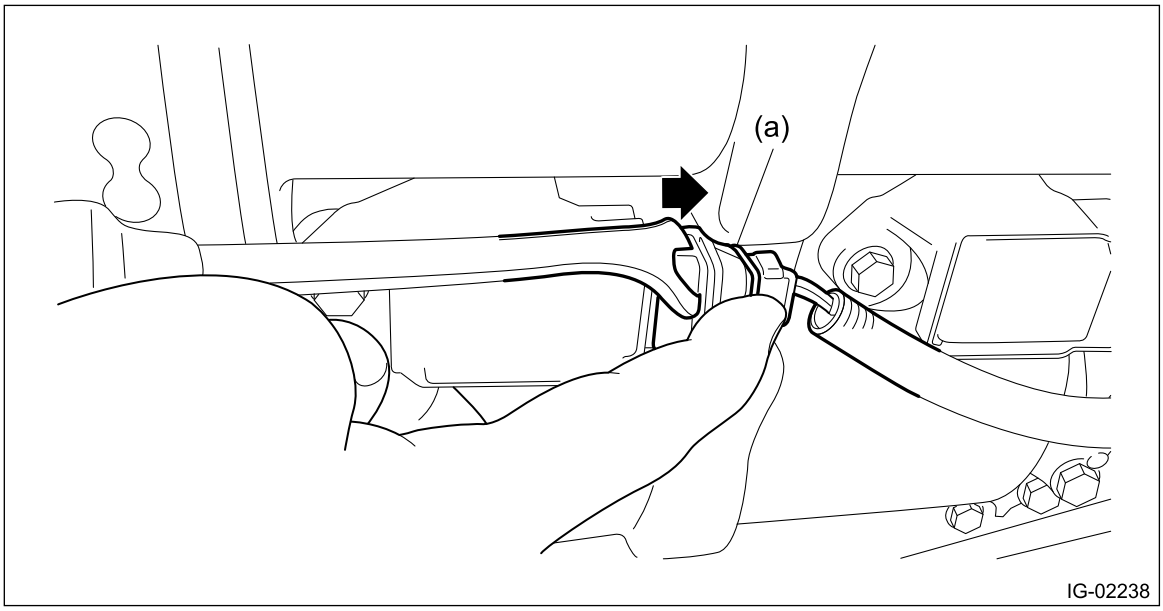
3. Separate the bracket.



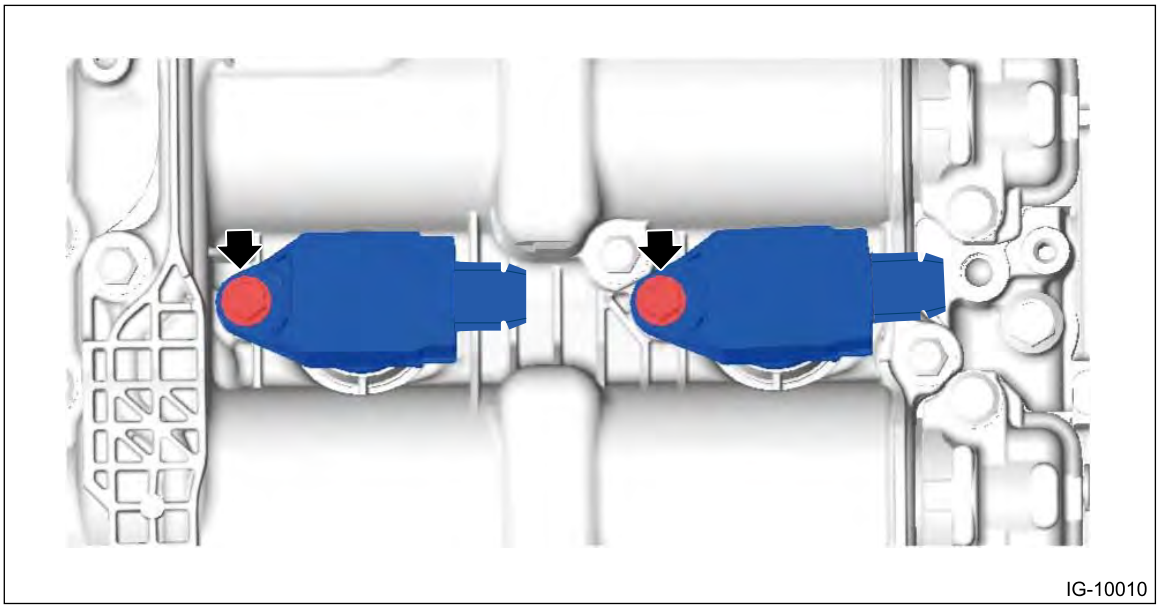
4. Disconnect the connector from ignition coil.

Note:

While pressing the spring (a) shown in the figure, slide it in the direction of the arrow with a clip remover.



5. Remove the ignition coil.



IGNITION(H4DO) > Ignition Coil

INSTALLATION

1. RH SIDE

1. Install the ignition coil.

Caution:

Degrease the mounting bolts, rocker cover installation portion and ignition coil installation hole.

Tightening torque:

8.0 N·m (0.8 kgf-m, 5.9 ft-lb)

2. Connect the connector to the ignition coil.

3. Install the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner

Case>INSTALLATION.

4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. LH SIDE

1. Install the ignition coil.
   Caution:
   Degrease the mounting bolts, rocker cover installation portion and ignition coil installation hole.
   Tightening torque:
   8.0 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Connect the connector to the ignition coil.
3. Connect the bracket.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the engine wiring harness and the battery cable to the bracket.
5. Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.

IGNITION(H4DO) > Ignition Coil

INSPECTION

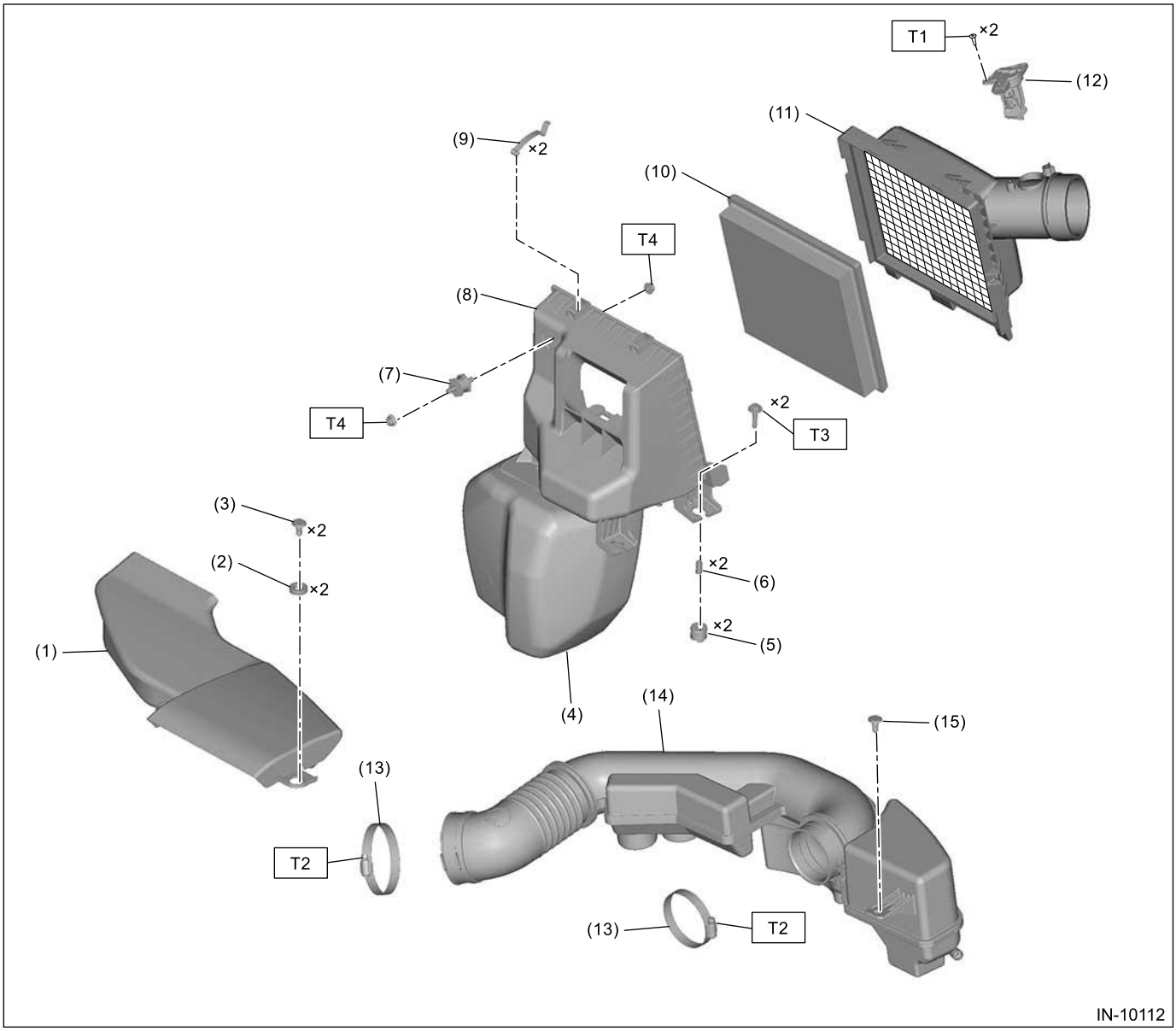
1. Check that there is no deformation, cracks or other damages.
2. Check that there is no electric leakage from other than the center tip.
3. For inspection procedure of ignition control system, refer to “Diagnostics for Engine Starting Failure”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

INTAKE (INDUCTION)(H4DO)

IN(H4DO)

1. General Description
2. Air Cleaner Element
3. Air Intake Duct
4. Air Cleaner Case
5. Air Intake Boot

COMPONENT



(1) Air intake duct	(8) Air cleaner case (front)	(15) Clip
(2) Cushion	(9) Clip	
(3) Clip	(10) Air cleaner element	***Tightening torque: N·m (kgf-m, ft-lb)***
(4) Resonator chamber	(11) Air cleaner case (rear)	***T1: 1 (0.1, 0.7)***
(5) Cushion	(12) Mass air flow and intake air temperature sensor	***T2: 3 (0.3, 2.2)***
(6) Spacer	(13) Clamp	***T3: 6 (0.6, 4.4)***
(7) Cushion	(14) Air intake boot	***T4: 7.5 (0.8, 5.5)***

CAUTION

- Prior to starting work, pay special attention to the following:

1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
2. Protect the vehicle using a seat cover, fender cover, etc.
3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.

- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

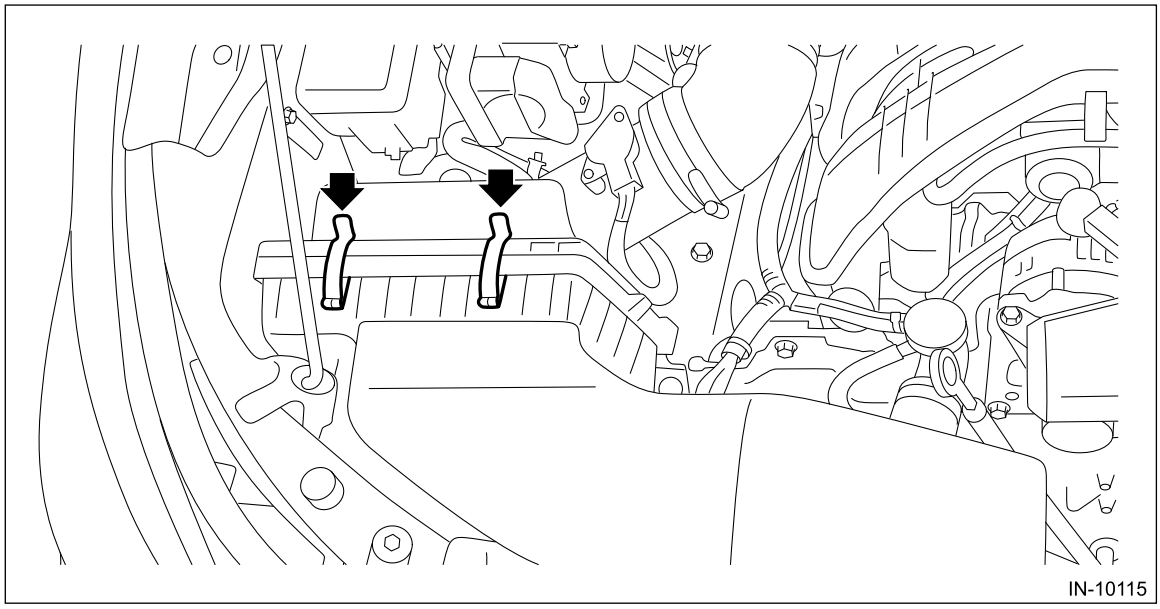
INTAKE (INDUCTION)(H4DO) > Air Cleaner Element

REMOVAL

1. Disengage the clip, and remove the air cleaner element.

Caution:

Be sure to lift up the air cleaner case (rear) before releasing the claws on the bottom of the air cleaner case. Otherwise the air cleaner element may be damaged.



INTAKE (INDUCTION)(H4DO) > Air Cleaner Element

INSTALLATION

1. Set the air cleaner element and install the air cleaner case (rear).

Caution:

- **Be sure to use SUBARU genuine air cleaner element suitable to the engine type. Otherwise the engine performance may decrease.**
- **Install the air cleaner element so that the printed surface is on the upper side.**

Note:

- **If any foreign matter is found in the air cleaner case, clean it.**
- **Install by aligning the claws located on the bottom of the air cleaner case.**

INTAKE (INDUCTION)(H4DO) > Air Cleaner Element

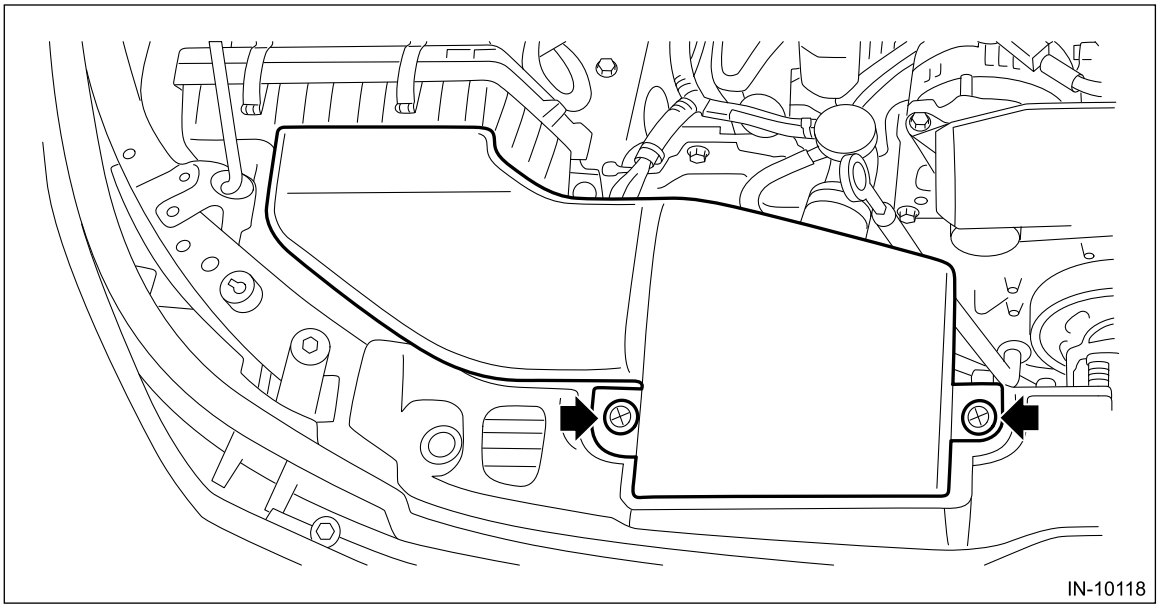
INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check for excessive dirt.
3. Replace the air cleaner case (rear) if the HC absorption filter is damaged.

INTAKE (INDUCTION)(H4DO) > Air Intake Duct

REMOVAL

Remove the clips and remove the air intake duct.



INTAKE (INDUCTION)(H4DO) > Air Intake Duct

INSTALLATION

Install the air intake duct.

INTAKE (INDUCTION)(H4DO) > Air Intake Duct

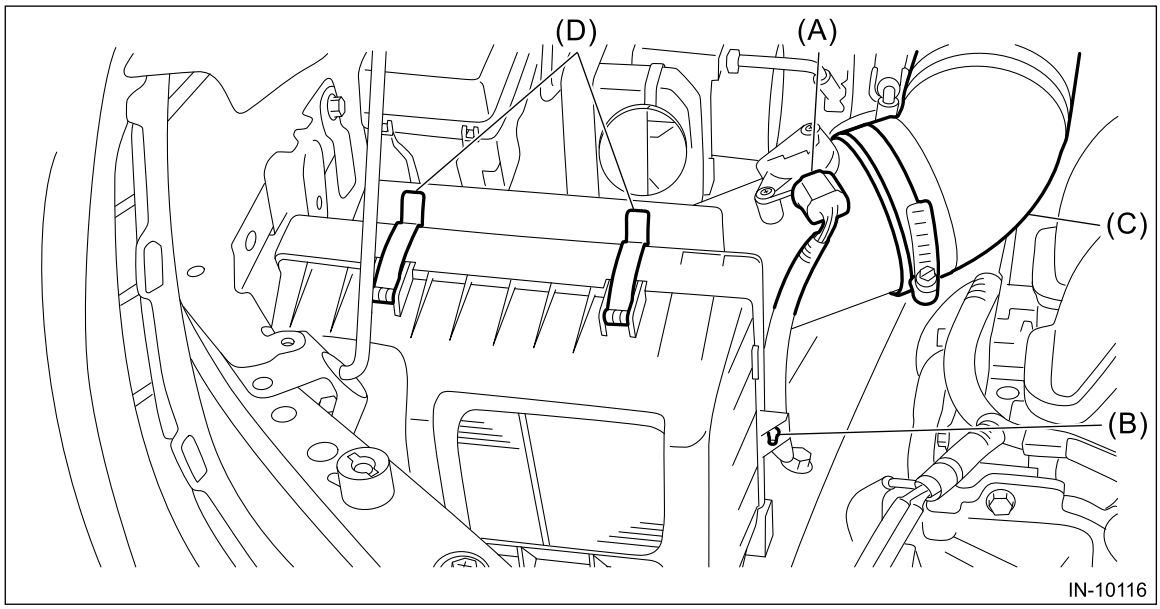
INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check inside for foreign matter.

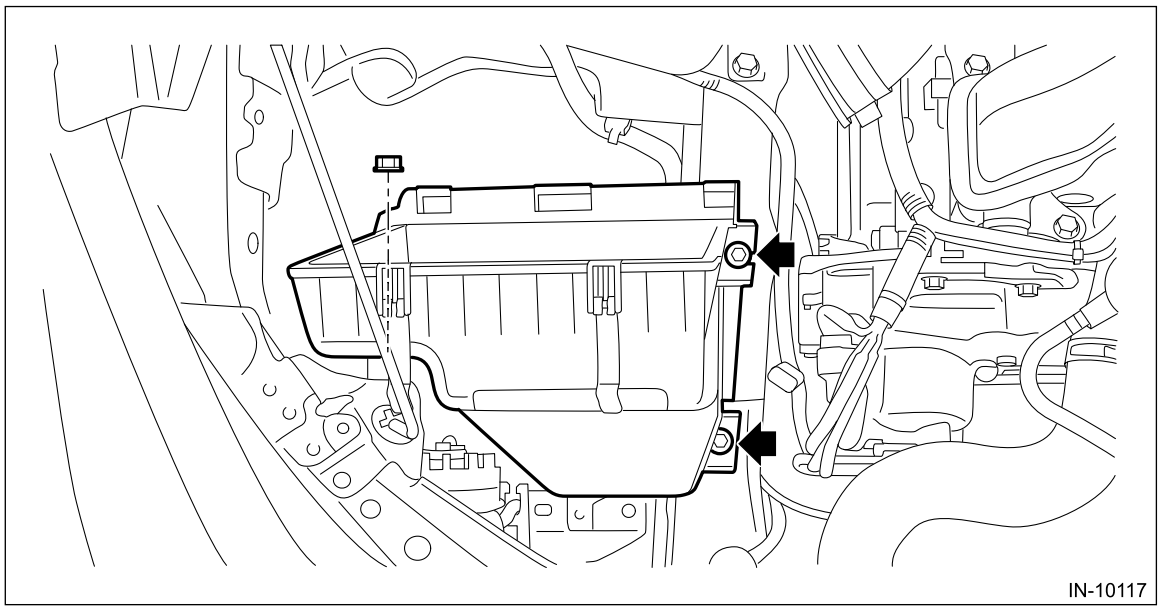
INTAKE (INDUCTION)(H4DO) > Air Cleaner Case

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Disconnect the connector (A) from the mass air flow and intake air temperature sensor, and remove the clip (B).
4. Disconnect the air intake boot (C), remove the clip (D), and remove the air cleaner case (rear) and air cleaner element.



5. Remove the air cleaner case (front).



INTAKE (INDUCTION)(H4DO) > Air Cleaner Case

INSTALLATION

1. Install the air cleaner case (front).
   Tightening torque:
   Bolt
   6 N·m (0.6 kgf-m, 4.4 ft-lb)

Nut

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

2. Set the air cleaner element and install the air cleaner case (rear).

Caution:

Install the air cleaner element so that the printed surface is on the upper side.

Note:

- **If any foreign matter is found in the air cleaner case, clean it.**
- **Install by aligning the claws located on the bottom of the air cleaner case.**

3. Connect the air intake boot.

Tightening torque:

3 N·m (0.3 kgf-m, 2.2 ft-lb)

4. Connect the connector to the mass air flow and intake air temperature sensor, and secure the harness with clip.
5. Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INTAKE (INDUCTION)(H4DO) > Air Cleaner Case

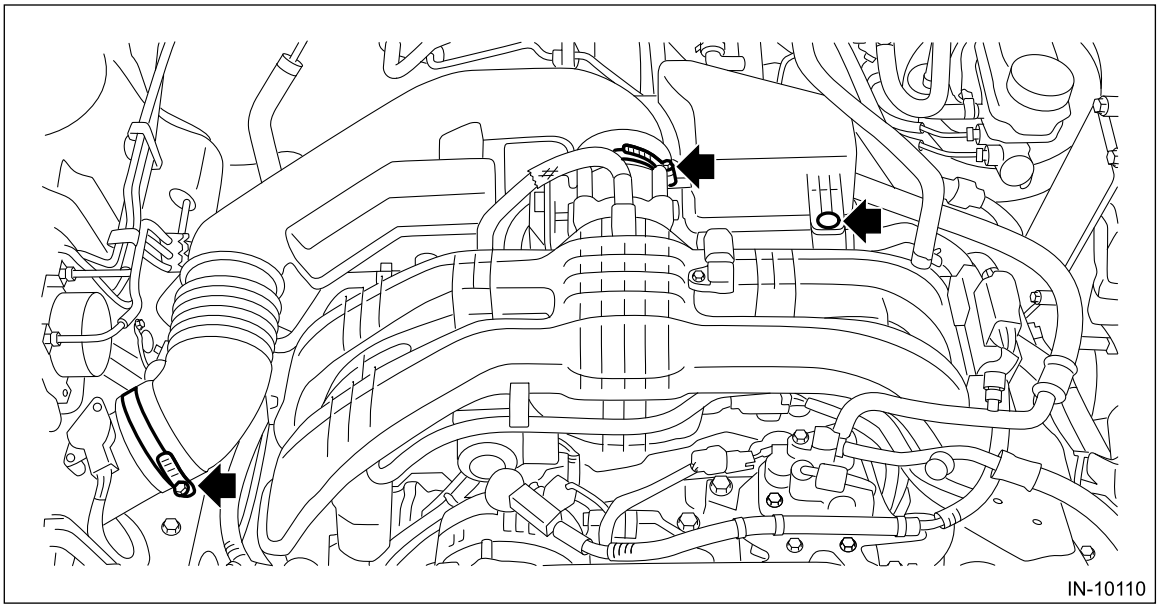
INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check inside for foreign matter.
3. Replace the air cleaner case (rear) if the HC absorption filter is damaged.

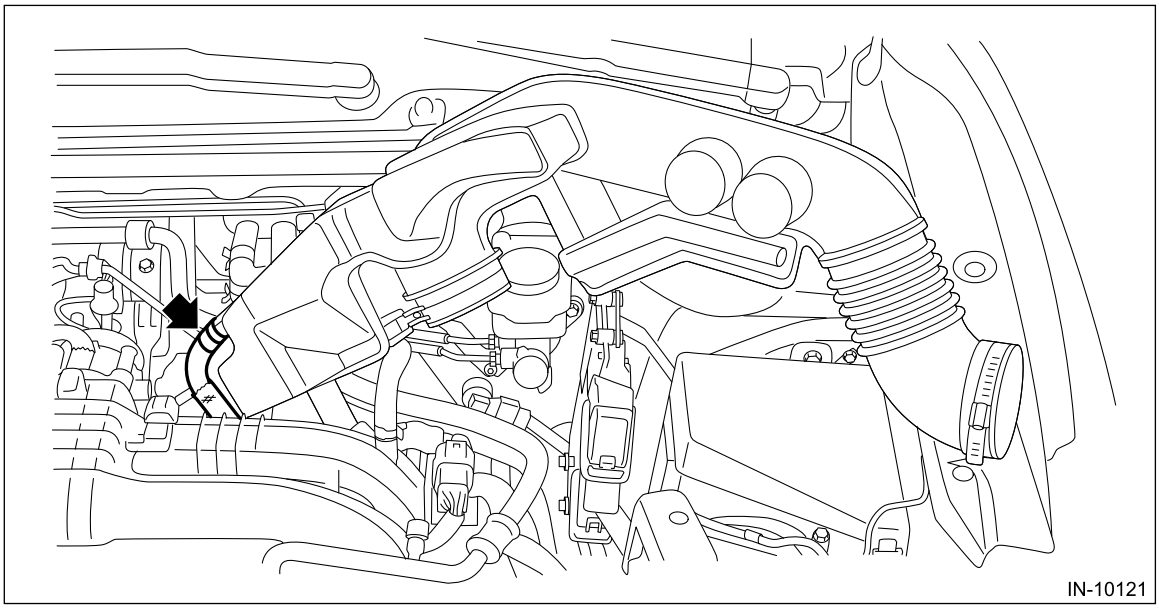
INTAKE (INDUCTION)(H4DO) > Air Intake Boot

REMOVAL

1. Remove the clips, and loosen the clamps.



2. Disconnect the PCV hose and remove the air intake boot.



INTAKE (INDUCTION)(H4DO) > Air Intake Boot

INSTALLATION

1. Connect the PCV hose and set the air intake boot.
2. Install the clips, and tighten the clamps.

   Tightening torque:

   3 N·m (0.3 kgf-m, 2.2 ft-lb)

INTAKE (INDUCTION)(H4DO) > Air Intake Boot

INSPECTION

1. Check that there is no deformation, cracks or other damages.

2. Check inside for foreign matter.

LUBRICATION(H4DO)

LU(H4DO)

1. General Description
2. Oil Pressure System
3. Engine Oil
4. Oil Pump
5. Oil Pan
6. Oil Pressure Switch
7. Oil Pipe
8. Oil Filter
9. Oil Level Switch
10. Engine Lubrication System Trouble in General

SPECIFICATION

Lubrication method					Forced lubrication
Oil pump	Pump type				Trochoid type
	Number of teeth	Inner rotor			10
		Outer rotor			11
	Outer rotor diameter × Thickness			mm (in)	71.4 × 14 (2.81 × 0.55)
	Performance (Oil temperature 120°C (248°F))	600 r/min	Discharge pressure	kPa (kg/cm^2, psi)	34 (0.3, 4.9)
			Discharge rate	L (US qt, Imp qt)/min	5.8 (6.1, 5.1) or more
		6,000 r/min	Discharge pressure	kPa (kg/cm^2, psi)	298 (3.0, 43.2)
			Discharge rate	L (US qt, Imp qt)/min	46.6 (49.3, 41.0) or more
	Relief valve working pressure (2-step relief)	1st opening pressure		kPa (kg/cm^2, psi)	150 (1.5, 21.7)
		Main opening pressure		kPa (kg/cm^2, psi)	700 (7.1, 101.5)
Oil filter	Filter type				Full-flow filter type
	Filtration area			cm^2 (sq in)	867 (134.3)
	By-pass valve opening pressure			kPa (kg/cm^2, psi)	160 (1.6, 23.2)
	Outer diameter × Width			mm (in)	67.4×87.1 (2.65 × 3.43)
	Installation screw specifications				M 20 ×1.5
Oil pressure switch	Type				Immersed contact point type
	Operating voltage				12 V
	Warning light operating pressure			kPa (kg/cm^2, psi)	14.7 (0.1, 2.1)
	Proof pressure			kPa (kg/cm^2, psi)	981 (10, 142.2)
Engine oil	Total capacity (at overhaul)			L (US qt, Imp qt)	5.3 (5.6, 4.7)
	When replacing engine oil and oil filter			L (US qt, Imp qt)	4.4 (4.7, 3.9)
	When replacing engine oil only			L (US qt, Imp qt)	4.2 (4.4, 3.7)

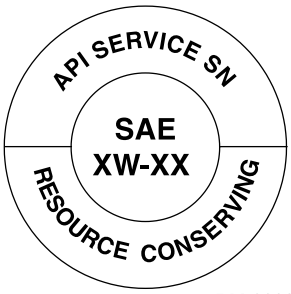
Specified engine oil:

Caution:

- **Use 0W-20 (synthetic oil).**
- **It is acceptable to fill with an engine oil of another brand, but make sure to use the following engine oil specified by Subaru.**

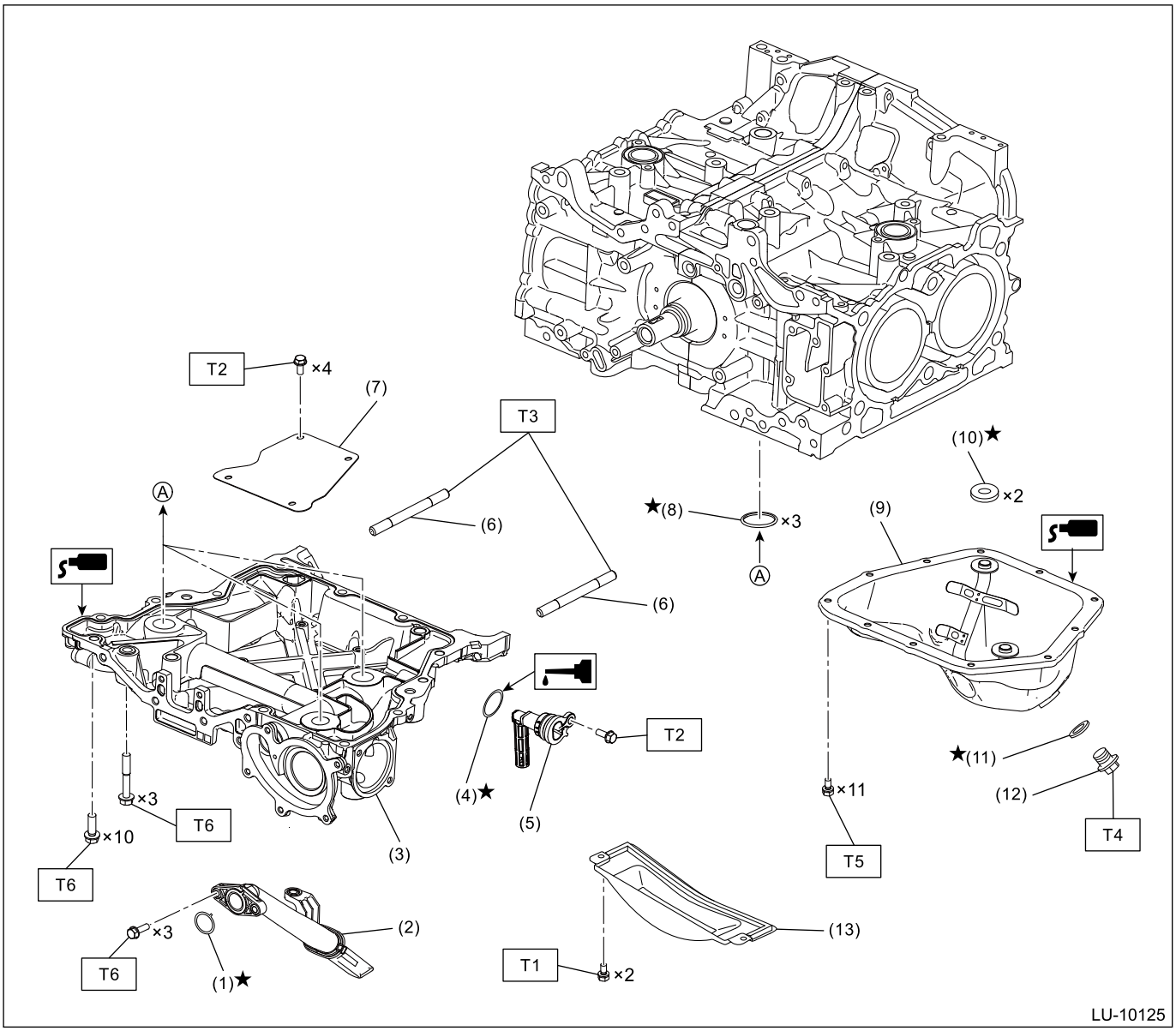
Note:

Engine oil with proper viscosity helps the engine maintain its ideal temperature, and the cranking speed is increased when the oil is heated due to a reduction of viscosity friction.

Engine oil standard		SAE viscosity No.
 RM-00081 Those with SN "Resource Conserving" logo in case of API standard.	or	 RM-00002 Those with GF-5 "starburst mark" displayed on top of the container in case of ILSAC standard.	0W-20 (synthetic oil)

COMPONENT

1. OIL PAN

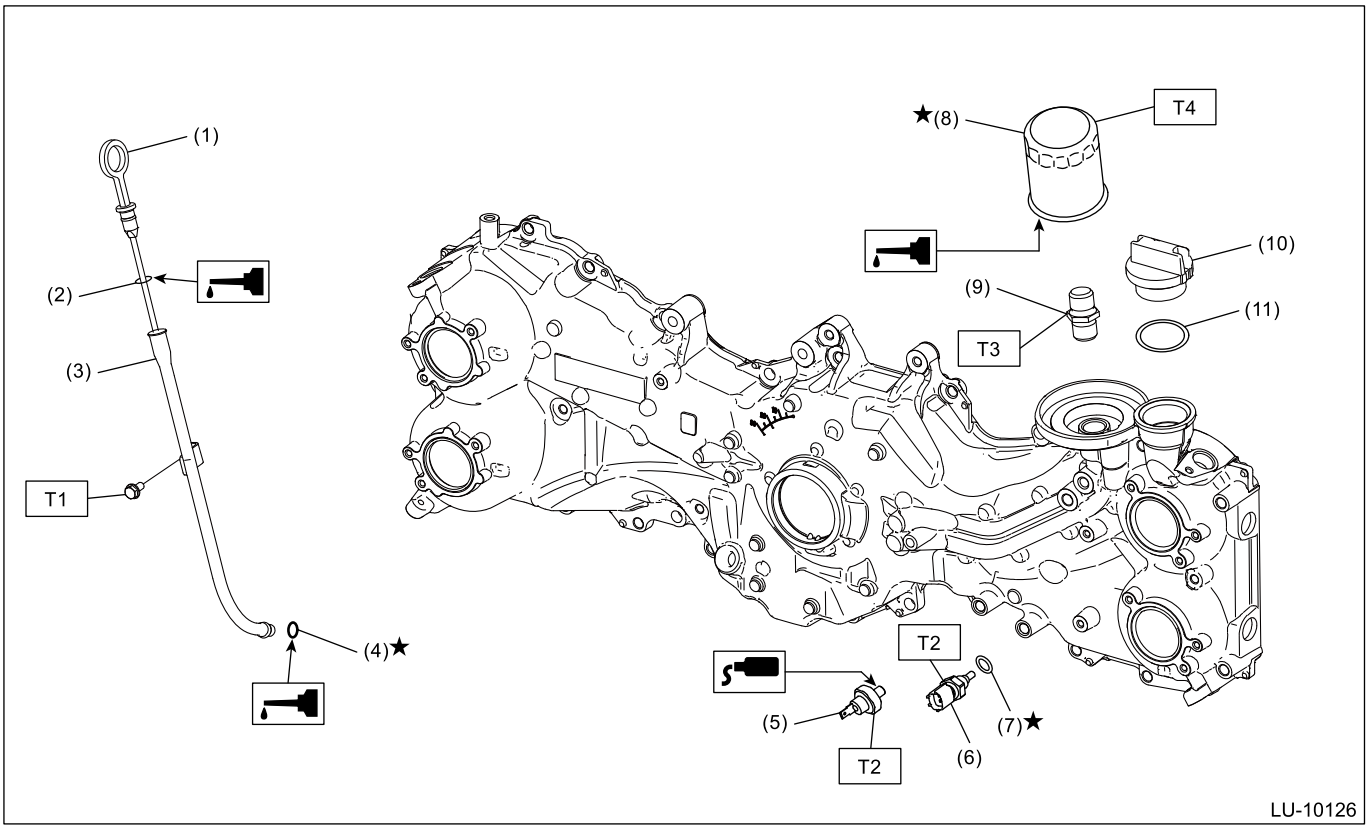


(1) O-ring
(2) Oil strainer
(3) Oil pan upper
(4) O-ring
(5) Oil level switch
(6) Stud bolt
(7) Baffle plate
(8) O-ring
(9) Oil pan
(10) Gasket
(11) Gasket
(12) Drain plug
(13) Clutch housing cover (MT model)

Tightening torque: N·m (kgf-m, ft-lb)

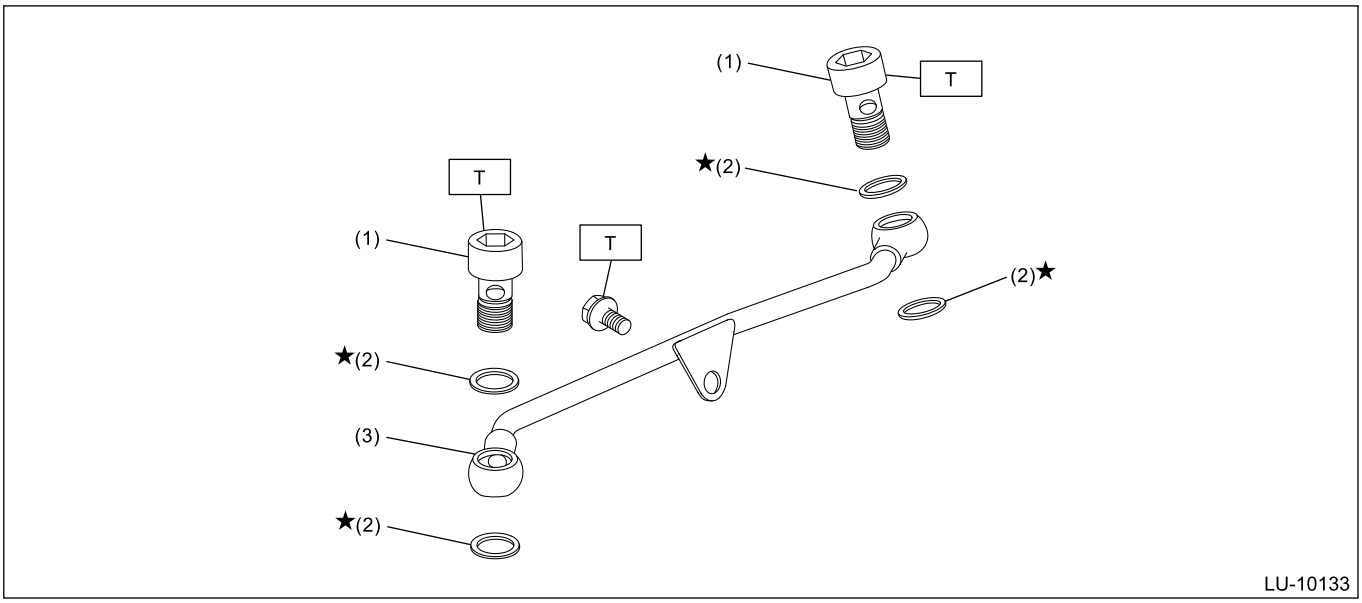
T1: 5 (0.5, 3.7)
T2: 6.4 (0.7, 4.7)
T3: 10 (1.0, 7.4)
T4: 41.7 (4.3, 30.8)
T5: Ref. to LUBRICATION(H4DO)>Oil Pan>INSTALLATION > OIL PAN.
T6: Ref. to LUBRICATION(H4DO)>Oil Pan>INSTALLATION > OIL PAN UPPER.

2. OIL FILTER AND OIL LEVEL GAUGE



(1) Oil level gauge	(7) Gasket	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) O-ring	(8) Oil filter	***T1: 6.4 (0.7, 4.7)***
(3) Oil level gauge guide	(9) Oil pump union	***T2: 18 (1.8, 13.3)***
(4) O-ring	(10) Oil filler cap	***T3: 45 (4.6, 33.2)***
(5) Oil pressure switch	(11) Gasket	***T4:*** Ref. to LUBRICATION(H4DO)>Oil Filter>INSTALLATION > OIL FILTER.
(6) Engine oil temperature sensor		

3. OIL PIPE



(1) Union bolt

(2) Gasket

(3) Oil pipe

Tightening torque: N·m (kgf-m, ft-lb)

T: Ref. to LUBRICATION(H4DO)>Oil Pipe>INSTALLATION.

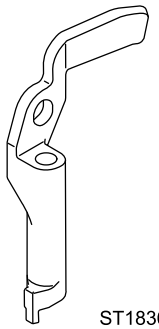
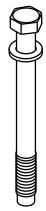
LUBRICATION(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prepare a container and cloth when performing work which oil possibly spills. If oil spills, wipe it off immediately to prevent from penetrating into floor or flowing out for environmental protection.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.
- If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.
- Follow all government and local regulations concerning disposal of refuse when disposing of oil.
- Always use new application oil during work.

PREPARATION TOOL

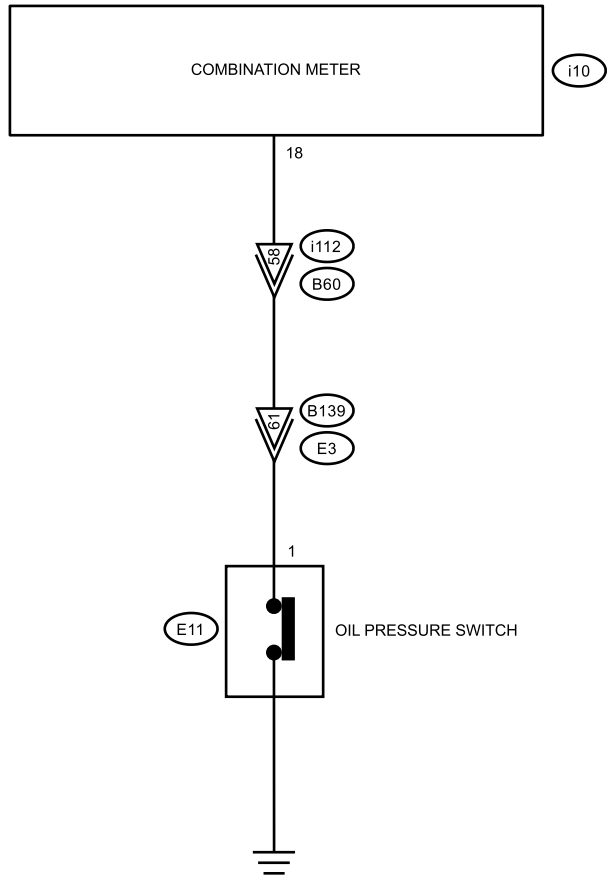
1. SPECIAL TOOL

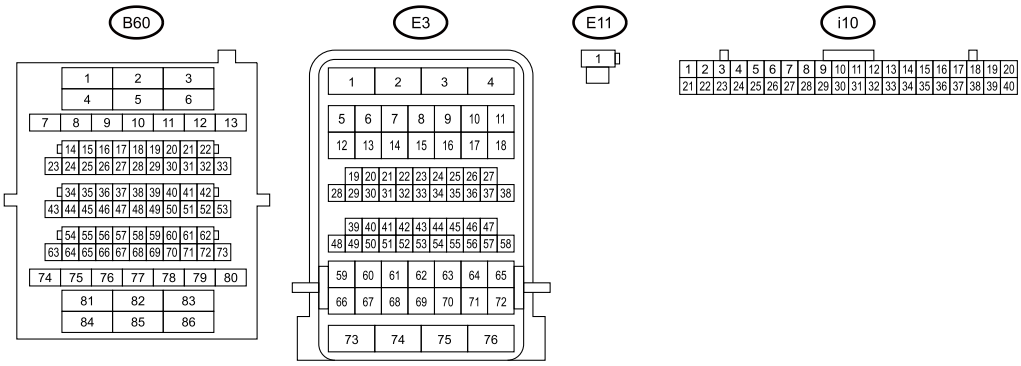
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18360AA040	18360AA040	HANGER	• Used for removing and installing oil level switch. • Used together with BOLT (18363AA050).
 ST18363AA050	18363AA050	BOLT	• Used for removing and installing oil level switch. • Used together with HANGER (18360AA040).
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Oil filter wrench (65/67 mm 14 Flutes)	Used for removing and installing oil filter.
Oil pan seal cutter	Used for removing oil pan.
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

WIRING DIAGRAM





LU-10127

INSPECTION

INSPECTION WHEN OIL PRESSURE WARNING LIGHT IS ILLUMINATED

1. CHECK DTC.

Read the DTC using the Subaru Select Monitor 4.

Note:

For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

Is DTC detected?

Yes

(1) Repair the corresponding system.
(2) Go to 2.

No

Go to 2.

2. CHECK ENGINE OIL LEVEL.

Check the engine oil level.

Is engine oil level normal?

Yes

Go to 3.

No

(1) Adjust the engine oil level to a proper amount.
(2) Go to 3.

3. CHECK OIL PRESSURE WARNING LIGHT.

Start the engine, and check if the oil pressure warning light goes off.

Does the oil pressure warning light go off?

Yes

System is normal.
Restore the vehicle to its original state.

No

Go to 4.

4. CHECK OIL PRESSURE SWITCH.

1. Turn the ignition to OFF.
2. Disconnect the ground cable from battery.
3. Disconnect the terminal from oil pressure switch, and wrap the terminal with vinyl tape for insulation.
4. Connect the battery ground terminal.
5. Start the engine.
6. Check if the oil pressure warning light goes off.

Does the oil pressure warning light go off?

Yes — Go to 6.

No — Go to 5.

5. CHECK INSULATION OF HARNESS BETWEEN COMBINATION METER AND OIL PRESSURE SWITCH.

1. Turn the ignition to OFF.
2. Disconnect the ground cable from battery.
3. Disconnect the connector from the combination meter.
4. Check insulation of harness and chassis ground between combination meter and oil pressure switch.

Are they insulated?

Yes
(1) Replace the combination meter.
(2) Restore the vehicle to its original state.

No
(1) Repair the harness between combination meter and oil pressure switch.
(2) Restore the vehicle to its original state.

6. CHECK OIL PRESSURE.

Check the oil pressure by using the oil pressure gauge.

Is the oil pressure is normal?

Yes
(1) Replace the oil pressure switch.
(2) Restore the vehicle to its original state.

No
Repair the engine assembly.

INSPECTION

Caution:

If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

Recommended engine oil:

Refer to "SPECIFICATION" for recommended engine oil. Ref. to LUBRICATION(H4DO)>General Description>SPECIFICATION.

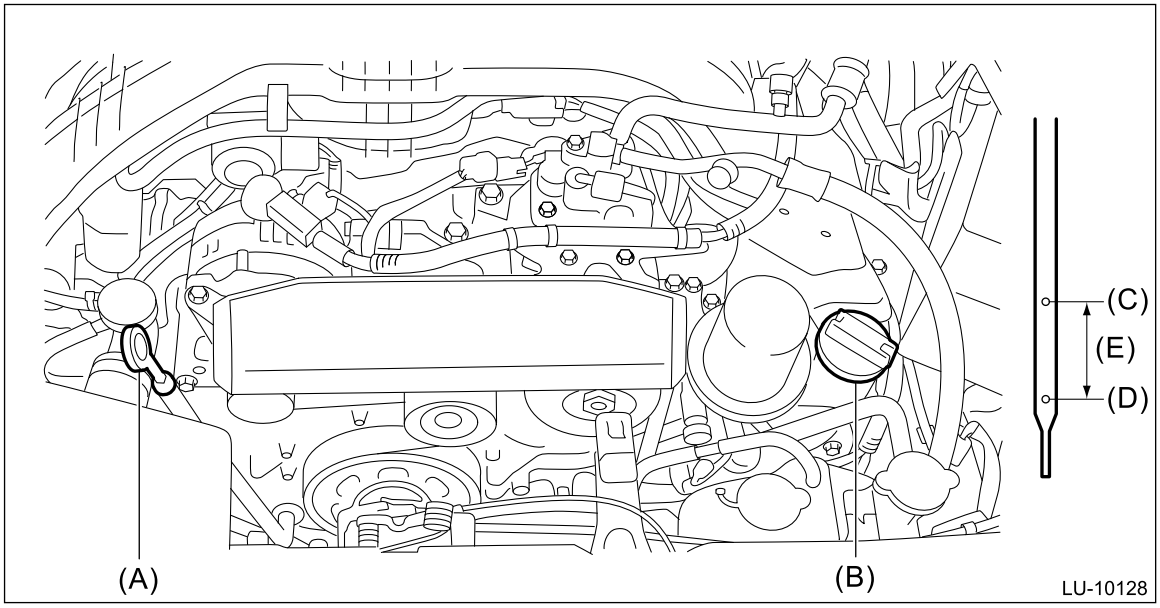
1. Park the vehicle on a level surface.
2. Pull out the oil level gauge, and wipe away the oil.
3. Insert the oil level gauge all the way.

   Note:

   Be sure that the oil level gauge is correctly inserted and properly orientated.
4. Pull out the oil level gauge, and check both sides of the oil level gauge. Use a lower side to determine the engine oil level. If the engine oil level is below the "L" line, check for oil leakage from engine, and add oil up to the "F" line.
5. Start the engine, and confirm that the oil pressure warning light goes off.
6. After turning off the engine, wait a few minutes until the engine oil returns back to the oil pan, then check the oil level.

   Note:

   - **Be careful not to add oil above the "F" line when the engine is cold.**
   - **As the oil level gauge is used for daily inspection, standard of "F" line and "L" line of the oil level gauge is set for the condition that engine is cold.**



(A) Oil level gauge
(B) Oil filler cap
(C) "F" line
(D) "L" line
(E) Approx. 1.0 L (1.1 US qt, 0.9 Imp qt)

REPLACEMENT

Caution:

If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

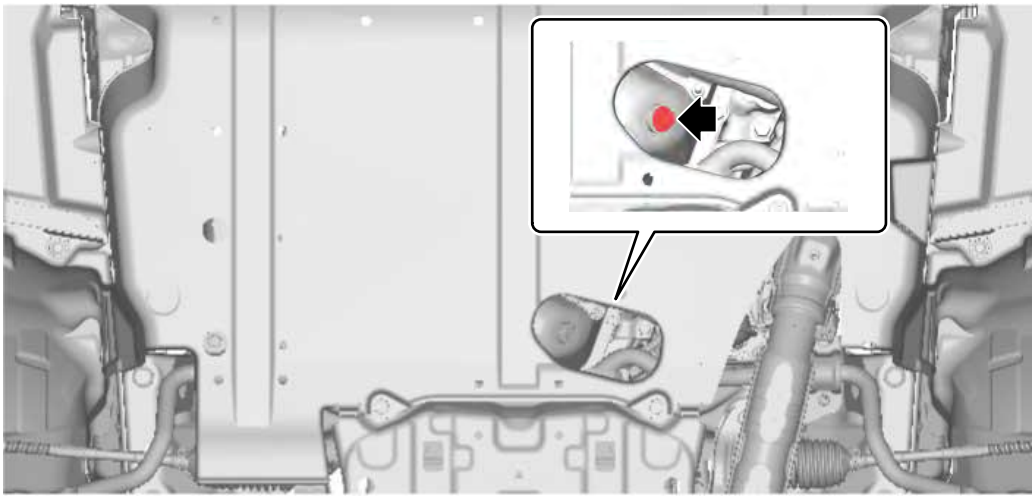
Recommended engine oil:

Refer to "SPECIFICATION" for recommended engine oil. Ref. to LUBRICATION(H4DO)>General Description>SPECIFICATION.

Engine oil capacity:

Refer to "SPECIFICATION" for engine oil capacity. Ref. to LUBRICATION(H4DO)>General Description>SPECIFICATION.

1. Remove the oil filler cap.
2. Drain engine oil by loosening the drain plug.



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3. Using a new gasket to install the drain plug.

   Tightening torque:

   41.7 N·m (4.3 kgf-m, 30.8 ft-lb)
4. Add engine oil up to the "F" line on oil level gauge.
5. Install the oil filler cap.
6. Check the engine oil level. Ref. to LUBRICATION(H4DO)>Engine Oil>INSPECTION.

SPECIFICATION

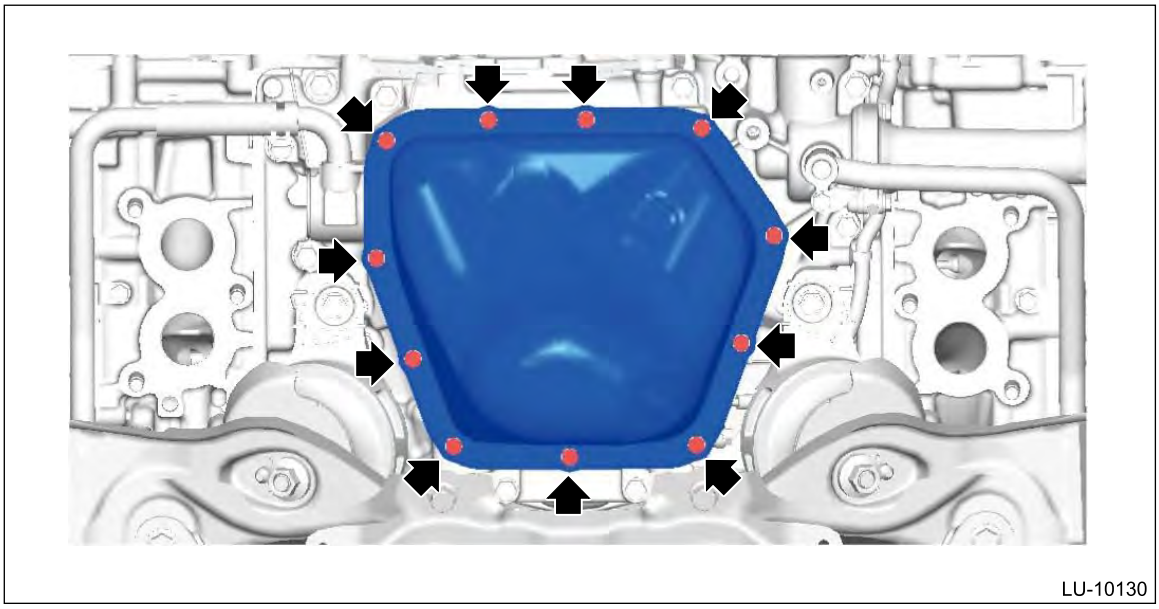
The oil pump cannot be disassembled.
Refer to “Chain Cover” for removal and installation procedures. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

REMOVAL

Caution:
If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

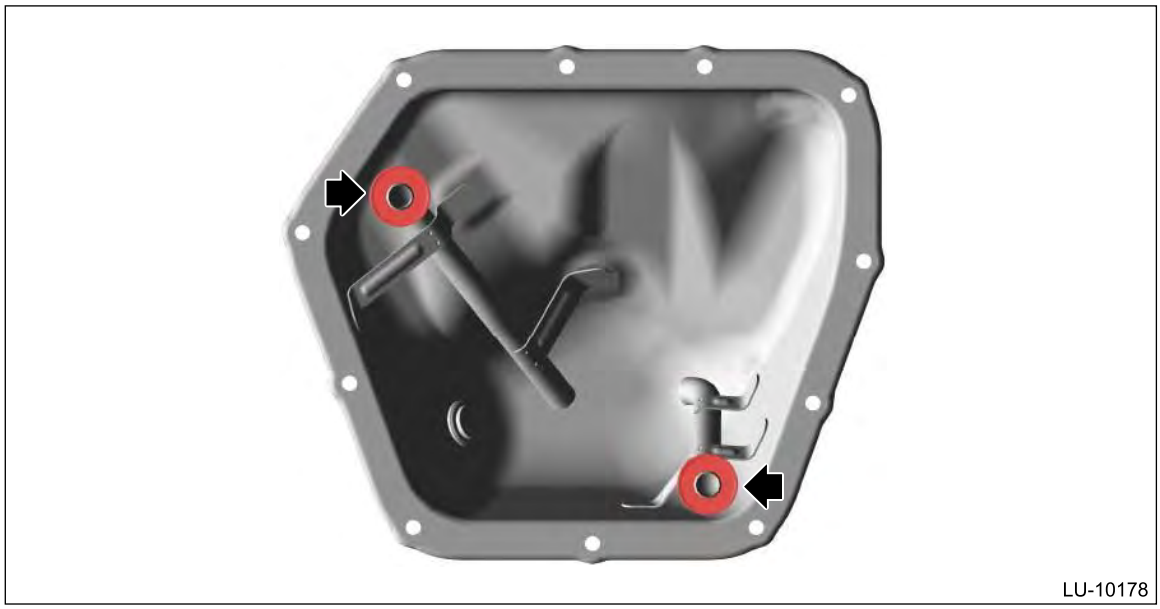
1. OIL PAN

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Drain the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
3. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
4. Remove the stabilizers. Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL.
5. Remove the bolts which hold the oil pan.

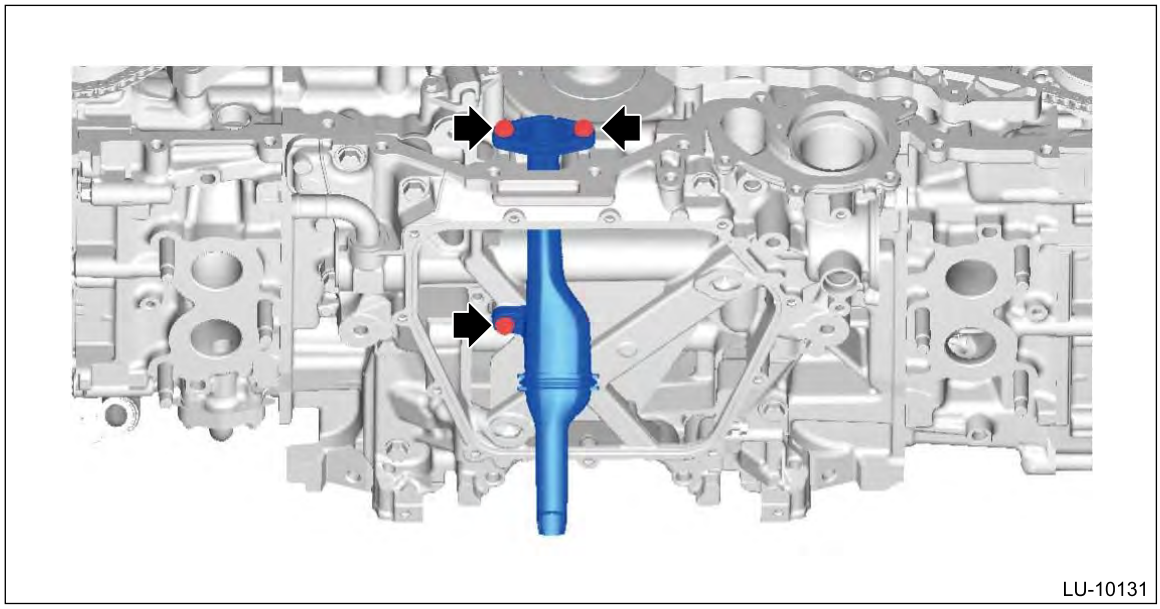


6. Insert an oil pan seal cutter into the gap between oil pan and oil pan upper, and remove the oil pan.
   Caution:
   - **Do not use the tools other than the oil pan seal cutter, in order to prevent damaging the oil pan and oil pan upper.**
   - **Do not twist with excessive force. The oil pan may be deformed.**

   Note:
   When removing, open the front side of the oil pan first, in order to avoid the interference with the oil strainer.
7. Remove the gasket from the oil pan.

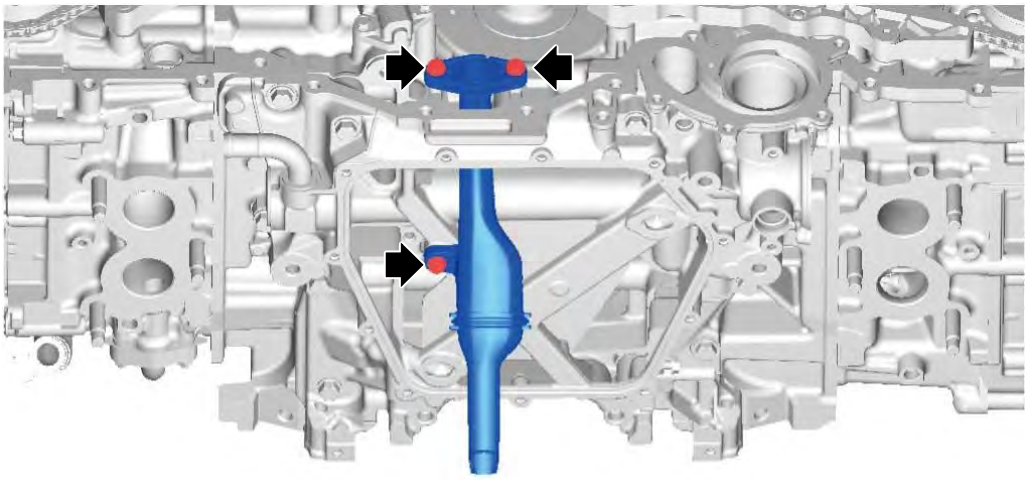


8. Remove the liquid gasket from the oil pan and the oil pan upper.
9. When removing the oil strainer
   (1) Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
   (2) Remove the oil strainer.



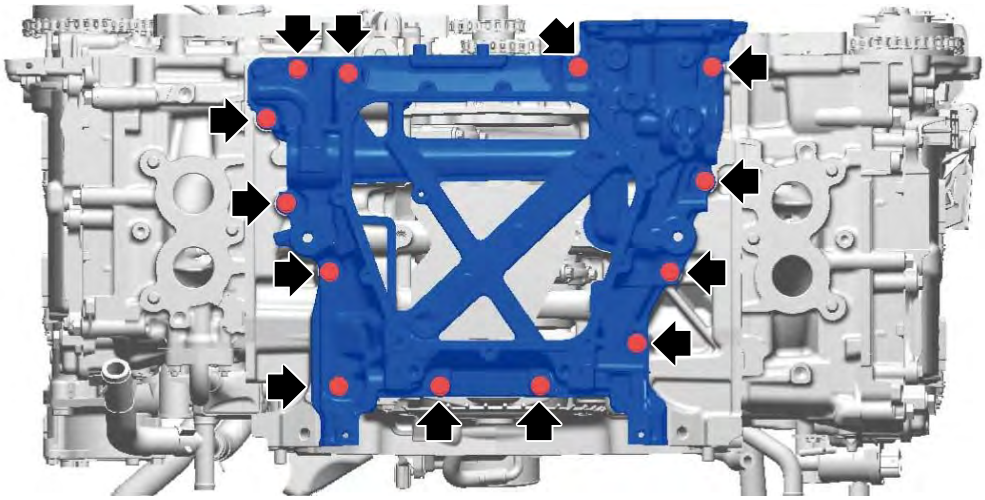
2. OIL PAN UPPER

1. Remove the engine assembly. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the water pump. Ref. to COOLING(H4DO)>Water Pump>REMOVAL.
3. Remove the thermostat cover. Ref. to COOLING(H4DO)>Thermostat>REMOVAL.
4. Remove the water pipe RH. Ref. to COOLING(H4DO)>Water Pipe>REMOVAL > WATER PIPE RH.
5. Remove the water pipe LH. Ref. to COOLING(H4DO)>Water Pipe>REMOVAL > WATER PIPE LH.
6. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
7. Remove the oil level switch. Ref. to LUBRICATION(H4DO)>Oil Level Switch>REMOVAL.
8. Remove the oil pan. Ref. to LUBRICATION(H4DO)>Oil Pan>REMOVAL > OIL PAN.
9. Remove the oil strainer.



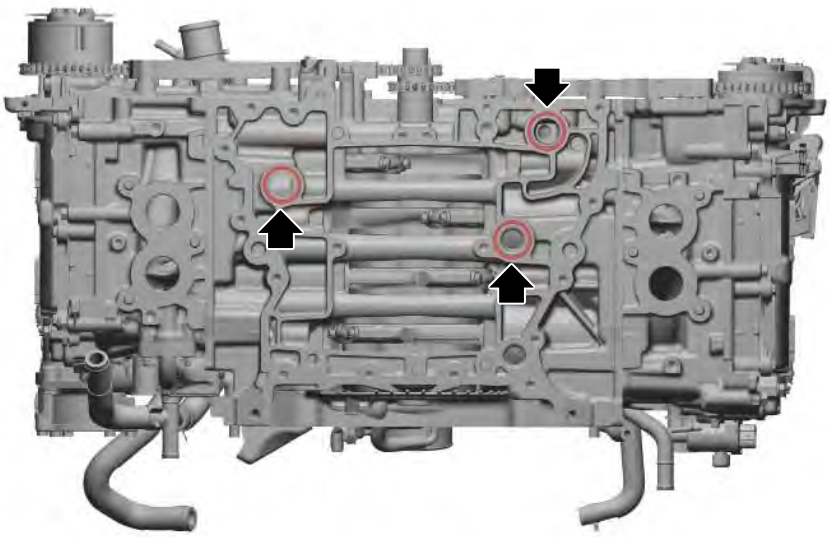
LU-10131

10. Remove the oil pan upper.



LU-10132

11. Remove the O-ring from the cylinder block.



LU-10179

12. Remove the liquid gasket from oil pan upper and cylinder block.

LUBRICATION(H4DO) > Oil Pan

INSTALLATION

1. OIL PAN

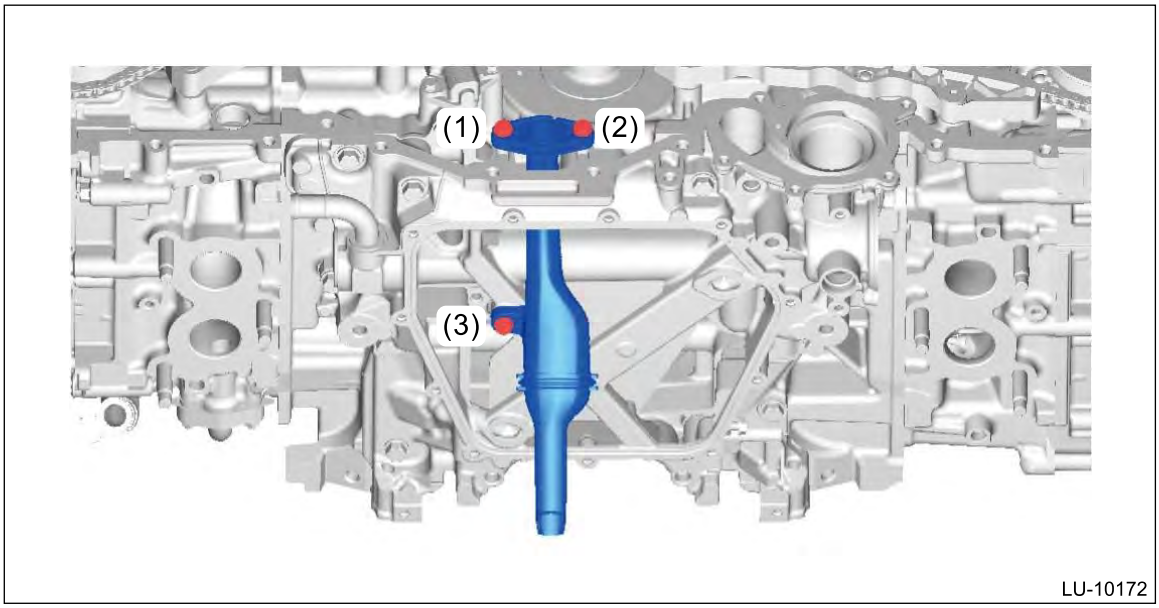
1. When removing the oil strainer

(1) Temporarily install the oil strainer.

(2) Tighten the bolts in the numerical order as shown in the figure.

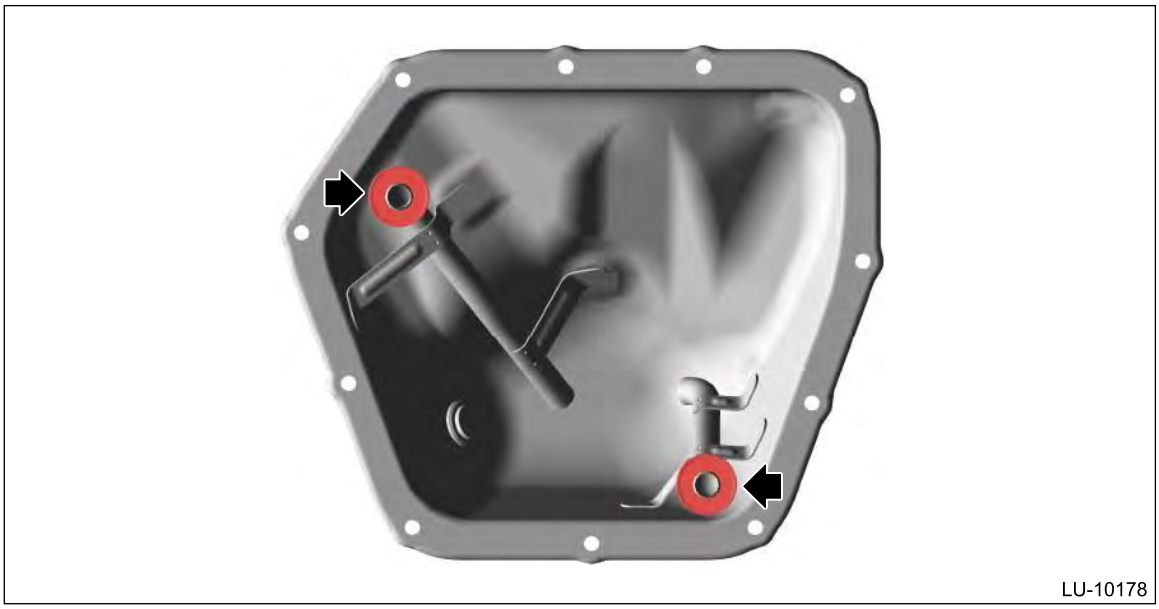
Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



(3) Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

2. Install a new gasket to the oil pan.



3. Apply liquid gasket to the mating surface of the oil pan as shown in the figure, and install the oil pan.

Note:

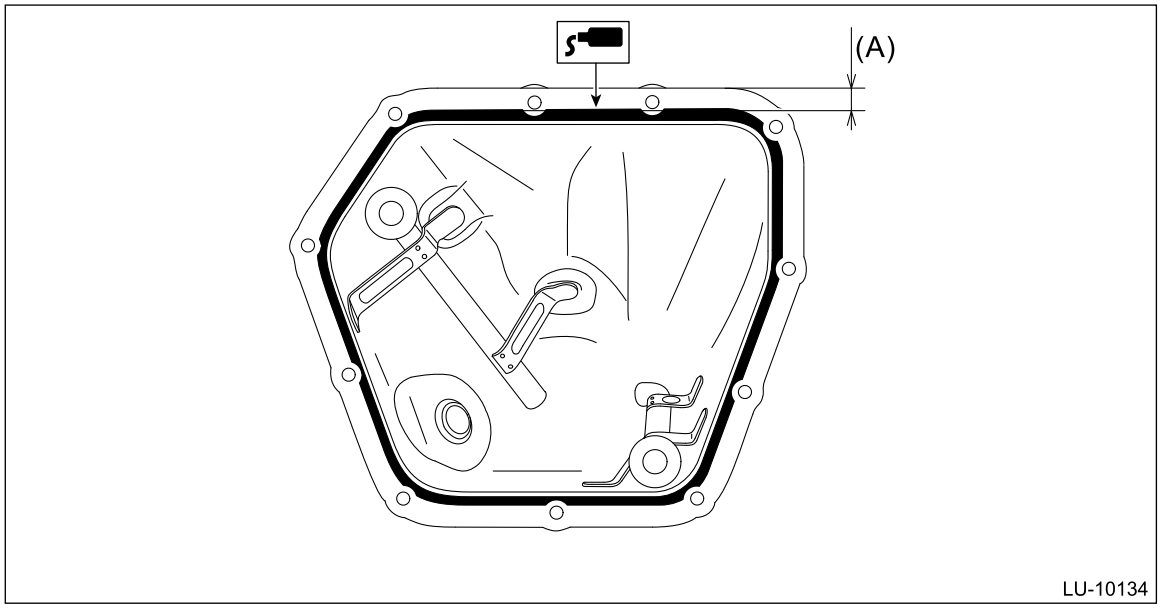
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the oil pan and the oil pan upper.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4.5 ± 0.5 mm (0.1772 ± 0.0197 in)

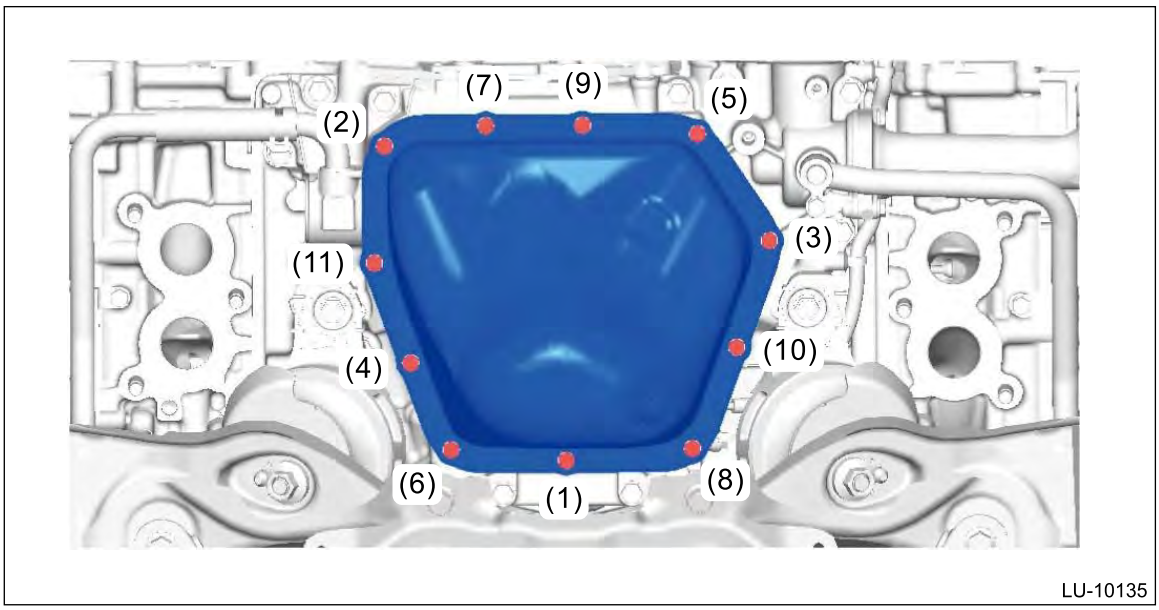


(A) 12.0 mm (0.4724 in) or more, 13.0 mm (0.5118 in) or less

4. Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



5. Install the stabilizer. Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION.

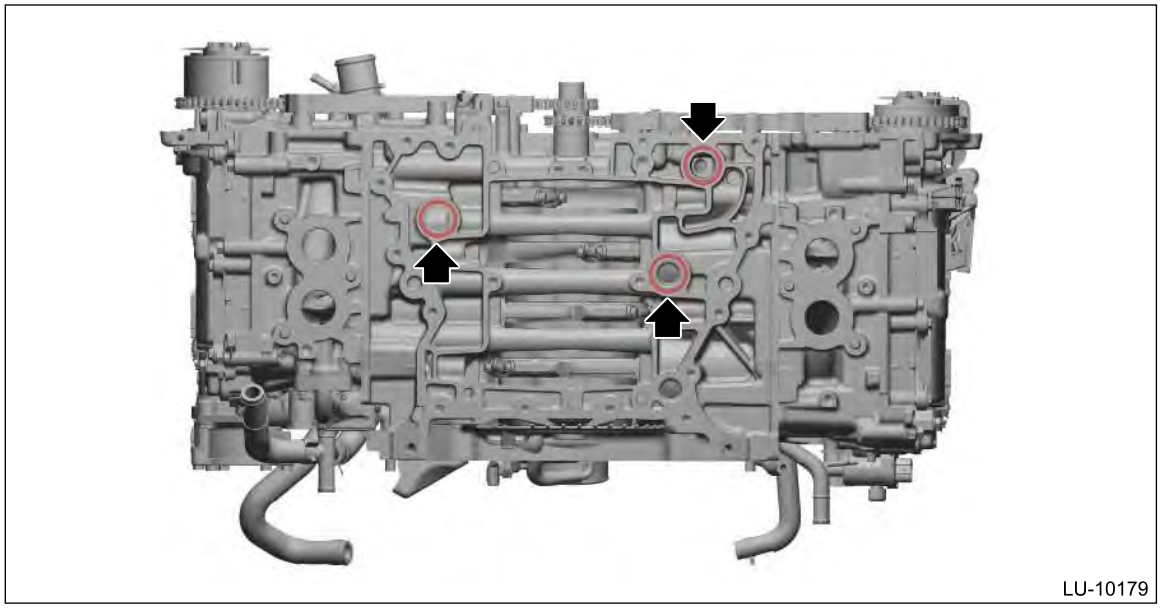
6. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

7. Refill the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.

8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. OIL PAN UPPER

1. Install a new O-ring to the cylinder block.



2. Apply liquid gasket to the mating surface of the oil pan upper as shown in the figure, and install the oil pan upper to the cylinder block.

Note:

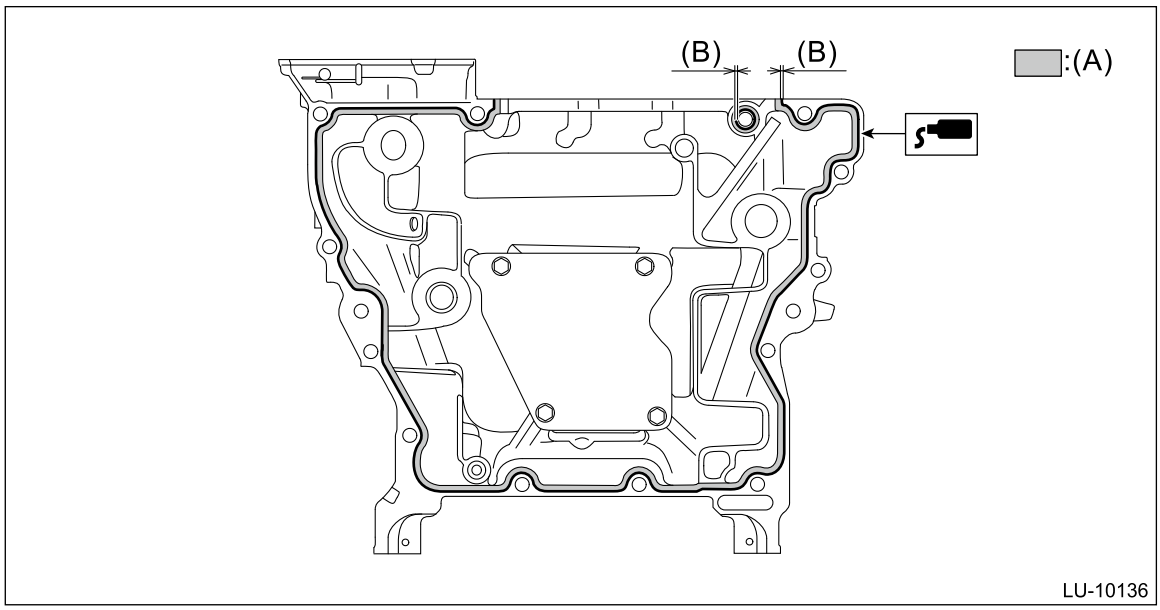
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the oil pan upper and the cylinder block.**
- **Install within 5 min. after applying liquid gasket.**
- **Application of liquid gasket on the chamfer surface around the bolt hole is allowed.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4±0.5 mm (0.1575±0.0197 in)



(A) Chamfer surface

(B) 0 mm (0 in) or more, 2.0 mm (0.0787 in) or less

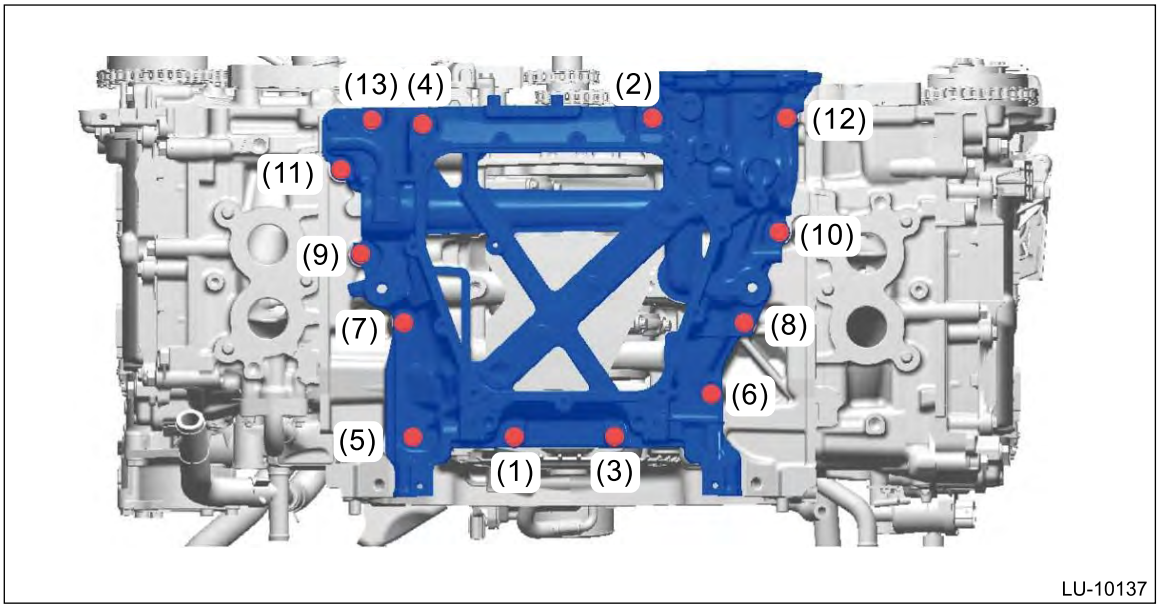
3. Tighten the bolts in the numerical order as shown in the figure.

Note:

After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.

Tightening torque:

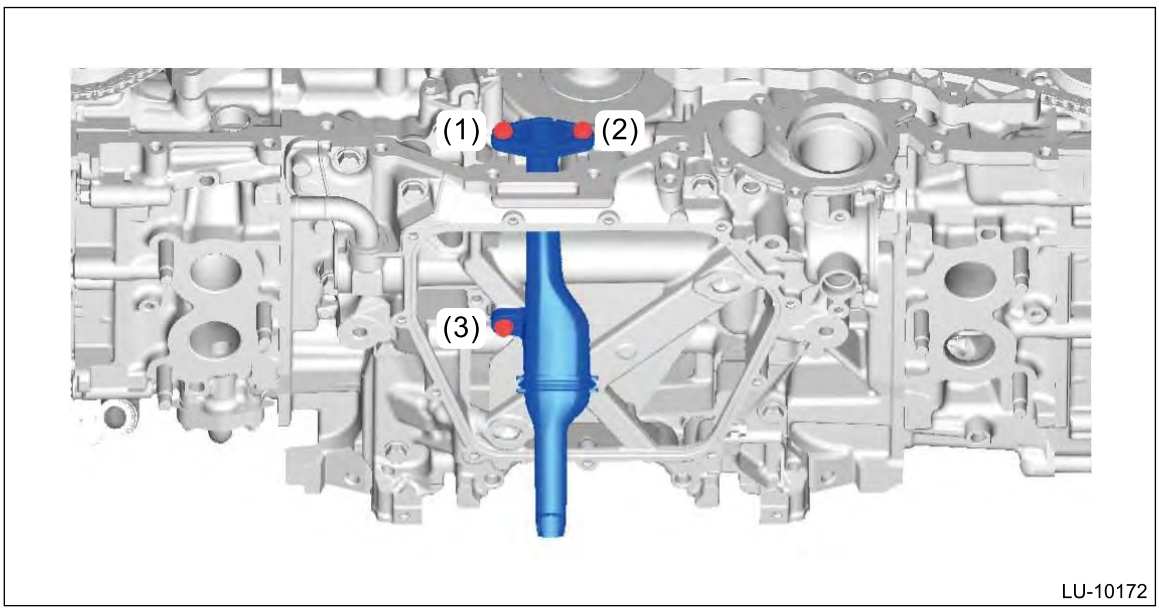
18 N·m (1.8 kgf-m, 13.3 ft-lb)



4. Temporarily install the oil strainer.
5. Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



6. Install the oil pan. Ref. to LUBRICATION(H4DO)>Oil Pan>INSTALLATION > OIL PAN.
7. Install the oil level switch. Ref. to LUBRICATION(H4DO)>Oil Level Switch>INSTALLATION.
8. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.
9. Install the water pipe LH. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE LH.
10. Install the water pipe RH. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE RH.
11. Install the thermostat cover. Ref. to COOLING(H4DO)>Thermostat>INSTALLATION.

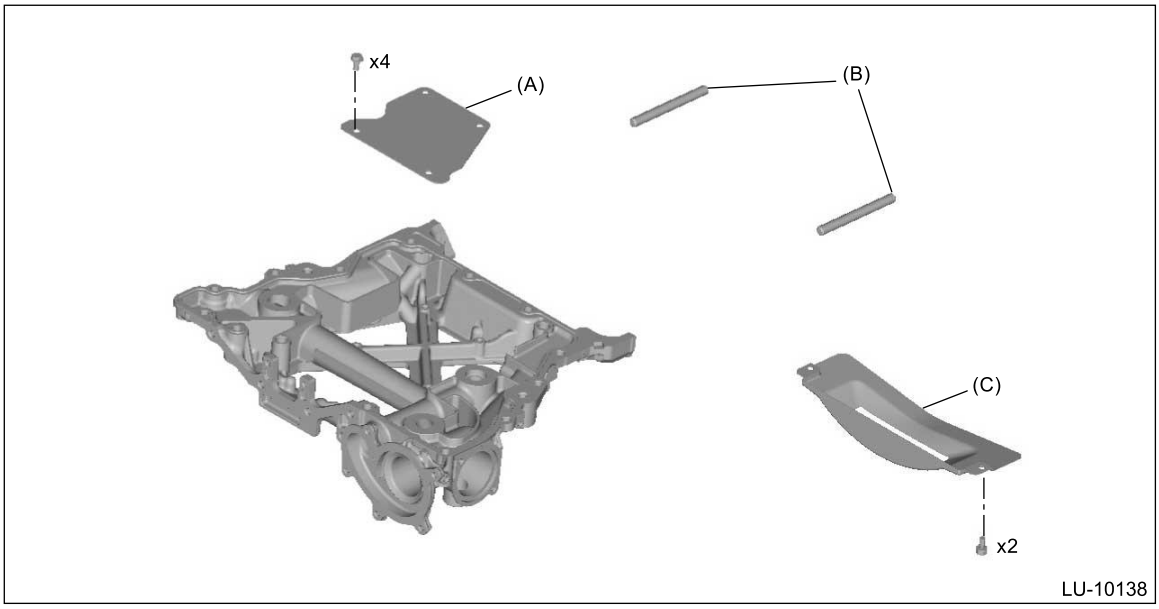
12. Install the water pump. Ref. to COOLING(H4DO)>Water Pump>INSTALLATION.
13. Install the engine. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.
14. Refill the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
16. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.

LUBRICATION(H4DO) > Oil Pan

DISASSEMBLY

1. OIL PAN UPPER

1. Remove the baffle plate (A).
2. Remove the stud bolt (B).
3. Remove the clutch housing cover (C). (MT model)



LUBRICATION(H4DO) > Oil Pan

ASSEMBLY

1. OIL PAN UPPER

1. Install the clutch housing cover. (MT model)
   Tightening torque:
   5 N·m (0.5 kgf-m, 3.7 ft-lb)
2. Install the stud bolt.
   Tightening torque:
   10 N·m (1.0 kgf-m, 7.4 ft-lb)
3. Install the baffle plate.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

LUBRICATION(H4DO) > Oil Pan

INSPECTION

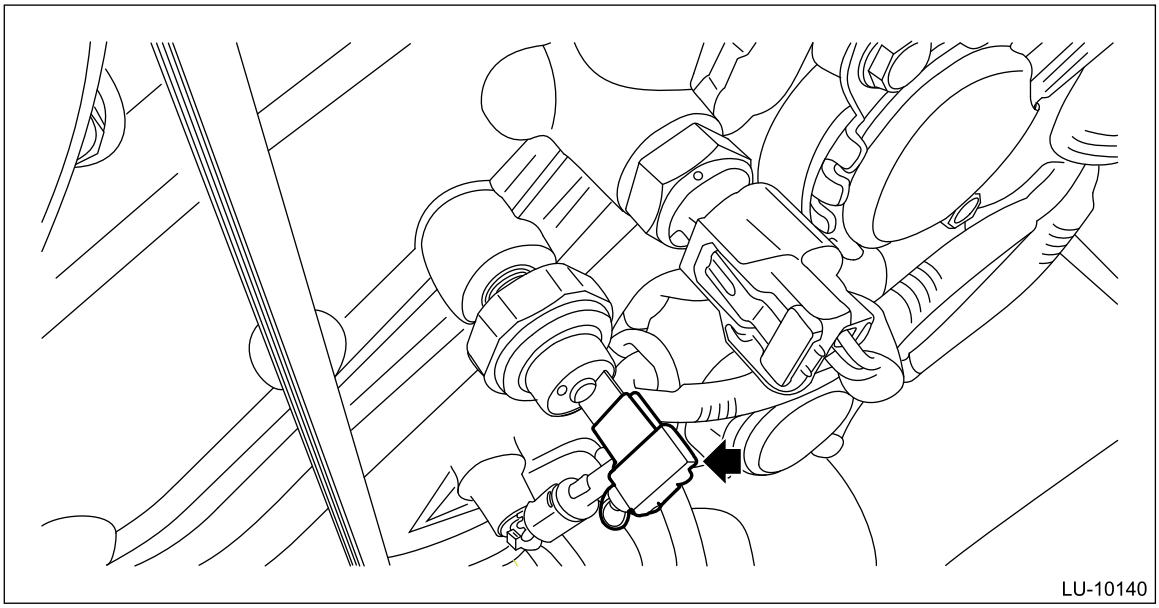
1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check the oil passages for clogging.

LUBRICATION(H4DO) > Oil Pressure Switch

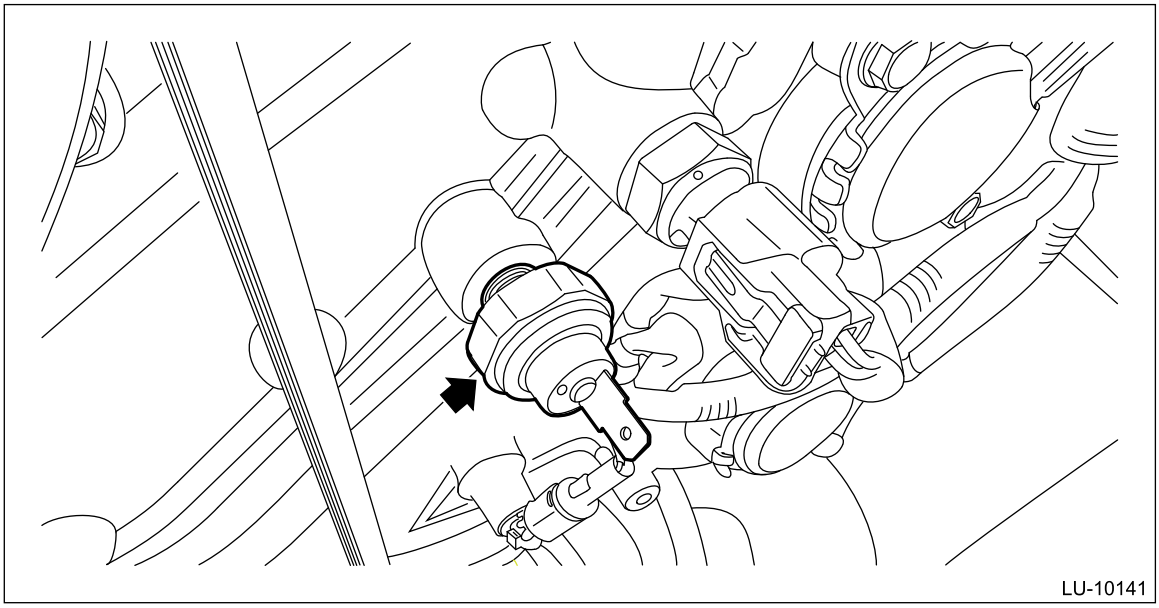
REMOVAL

Caution:
If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector from oil pressure switch.



3. Remove the oil pressure switch.
   Caution:
   Catch the engine oil using cloth to prevent it from splashing.



4. Remove seal material from the oil pressure switch and the thread portions of the chain cover.

LUBRICATION(H4DO) > Oil Pressure Switch

INSTALLATION

1. Apply seal material to the bolt threads of oil pressure switch, and install the oil pressure switch.

Note:

Before applying the seal material, degrease the oil pressure switch and the thread portions of the chain cover.

Seal material:

THREE BOND 1324 (Part No. 004403042) or equivalent

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

2. Connect the connector to the oil pressure switch.
3. Check the engine oil level and replenish the engine oil if necessary. Ref. to LUBRICATION(H4DO)>Engine Oil>INSPECTION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LUBRICATION(H4DO) > Oil Pressure Switch

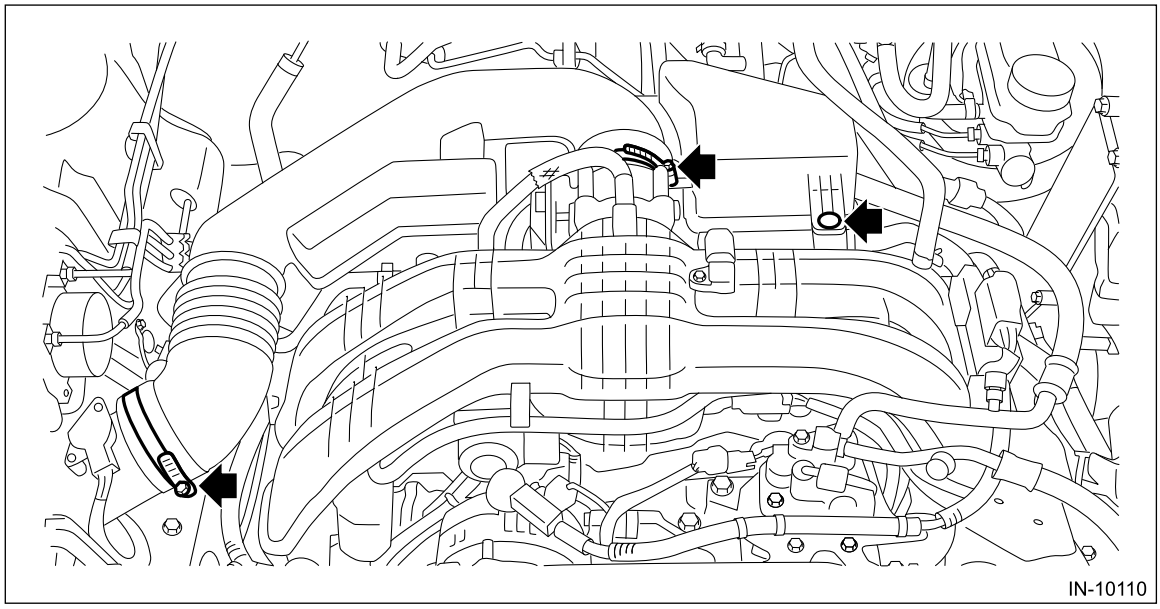
INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.

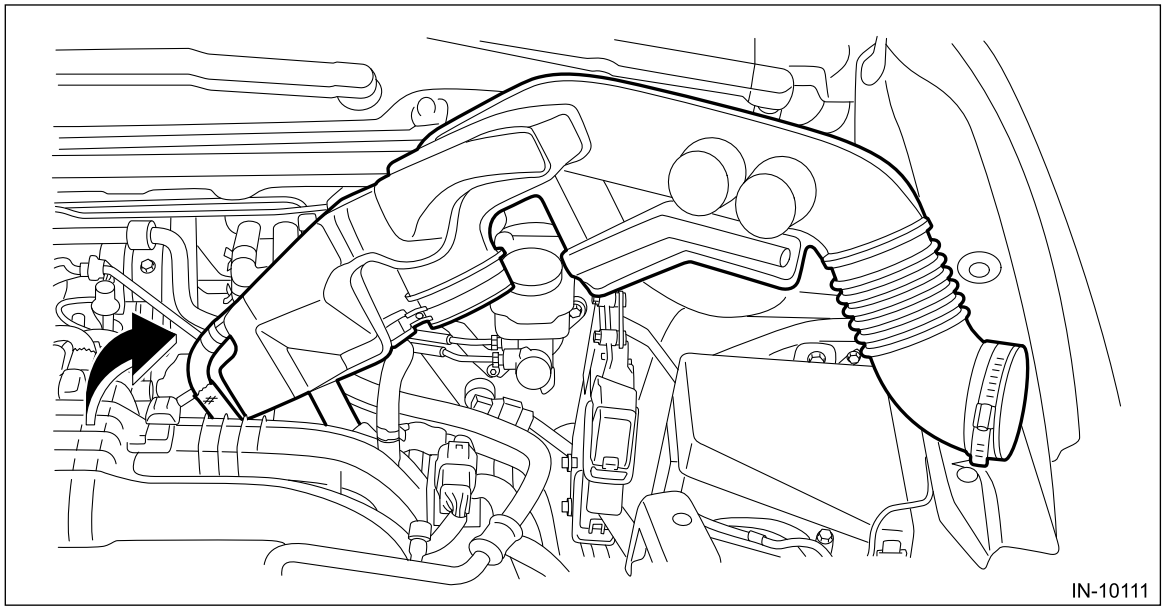
REMOVAL

Caution:
If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

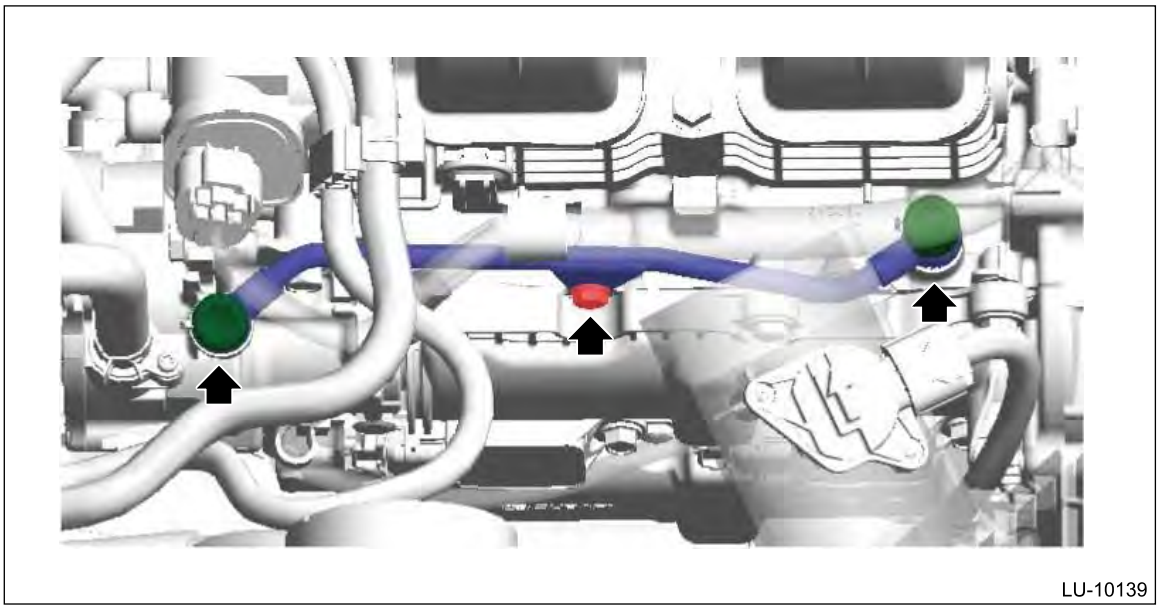
1. Remove the clip from the air intake boot, and loosen the clamp.



2. Remove the air intake boot, and place it aside so that it does not interfere with the work.
Caution:
Be careful not to pull out the PCV hose.



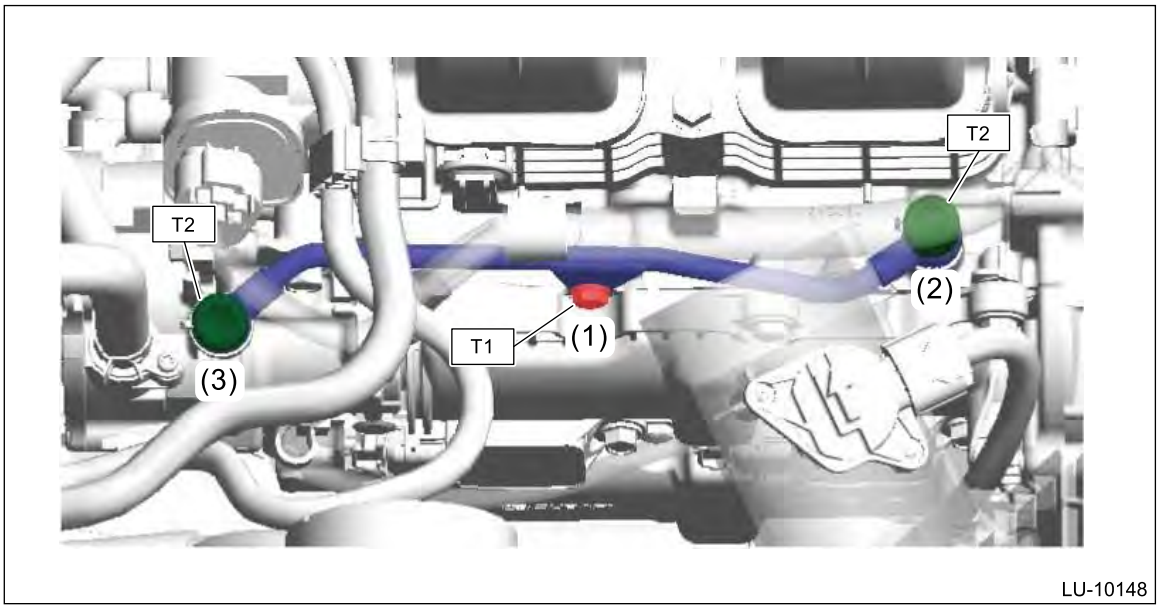
3. Remove the oil pipe.
Caution:
Catch the engine oil using cloth to prevent it from splashing.


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LUBRICATION(H4DO) > Oil Pipe

INSTALLATION

1. Apply engine oil to the threaded portion for mounting the union bolt on the vacuum pump and cam carrier.
2. Use a new gasket to temporarily attach the oil pipe.
3. Tighten the union bolts and bolt in the numerical order as shown in the figure.
   Tightening torque:
   T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
   T2: 20 N·m (2.0 kgf-m, 14.8 ft-lb)



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4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Check the engine oil level and replenish the engine oil if necessary. Ref. to LUBRICATION(H4DO)>Engine Oil>INSPECTION.

LUBRICATION(H4DO) > Oil Pipe

INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check the oil passages for clogging.

REMOVAL

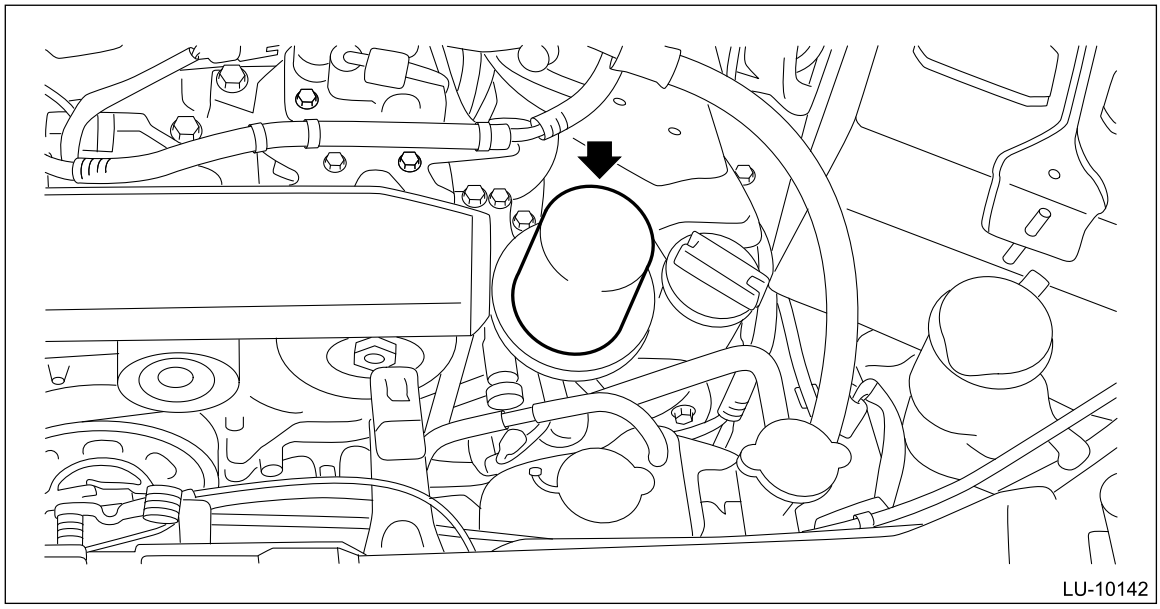
Caution:
If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

1. OIL FILTER

1. Remove the oil filter.

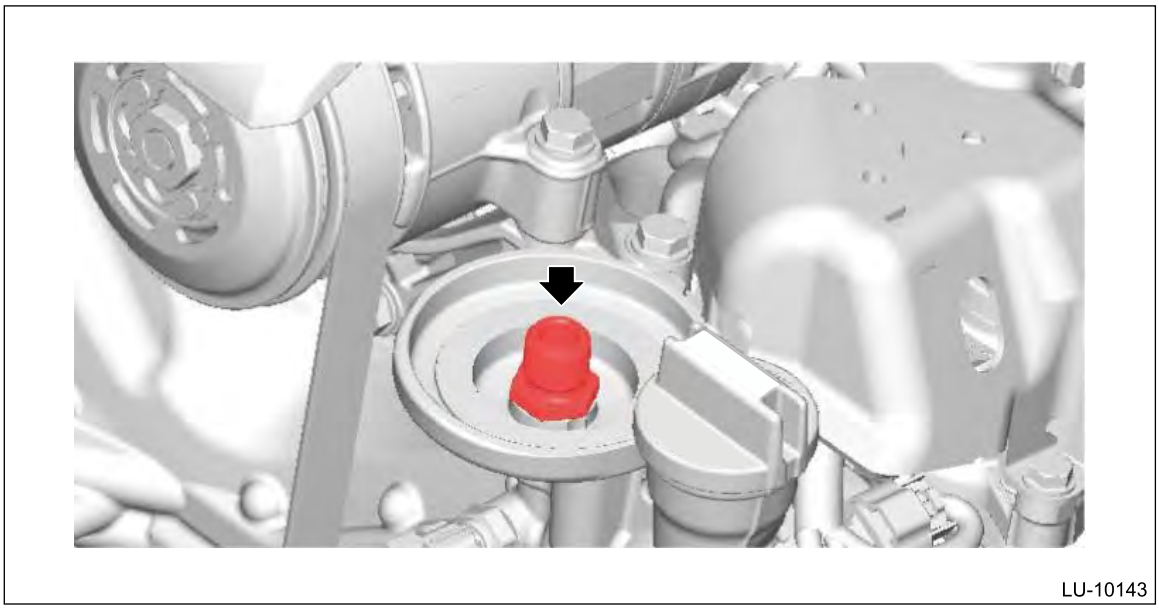
Note:
If there is water or dust on the oil filter installation portion, clean it before removing the oil filter.

Preparation tool:
Oil filter wrench (65/67 mm 14 Flutes)



2. OIL PUMP UNION

1. Remove the oil filter. Ref. to LUBRICATION(H4DO)>Oil Filter>REMOVAL > OIL FILTER.
2. Remove the oil pump union.



LUBRICATION(H4DO) > Oil Filter

INSTALLATION

1. OIL FILTER

Caution:

Do not tighten excessively, or engine oil may leak.

1. Clean the oil filter installation surface.
2. Obtain a new oil filter and apply a thin coat of engine oil to the seal rubber.
3. Install the oil filter by turning it by hand, being careful not to damage the seal rubber of the oil filter.
4. Tighten further (approx. 7/8 turn) after the seal rubber of the oil filter contacts the chain cover. When using a torque wrench, tighten to 12 N·m (1.2 kgf-m, 8.9 ft-lb).

   Preparation tool:

   Oil filter wrench (65/67 mm 14 Flutes)
5. Check the engine oil level and replenish the engine oil if necessary. Ref. to LUBRICATION(H4DO)>Engine Oil>INSPECTION.

2. OIL PUMP UNION

1. Install the oil pump union.

   Tightening torque:

   45 N·m (4.6 kgf-m, 33.2 ft-lb)
2. Install the oil filter. Ref. to LUBRICATION(H4DO)>Oil Filter>INSTALLATION > OIL FILTER.

LUBRICATION(H4DO) > Oil Filter

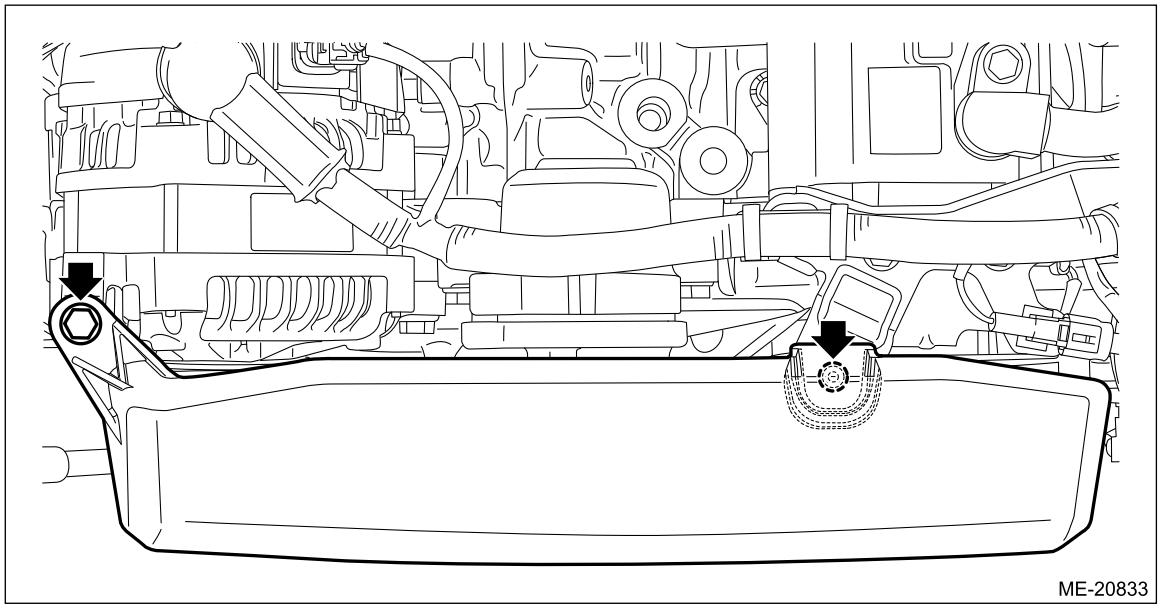
INSPECTION

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.
3. Check the oil passages for clogging.

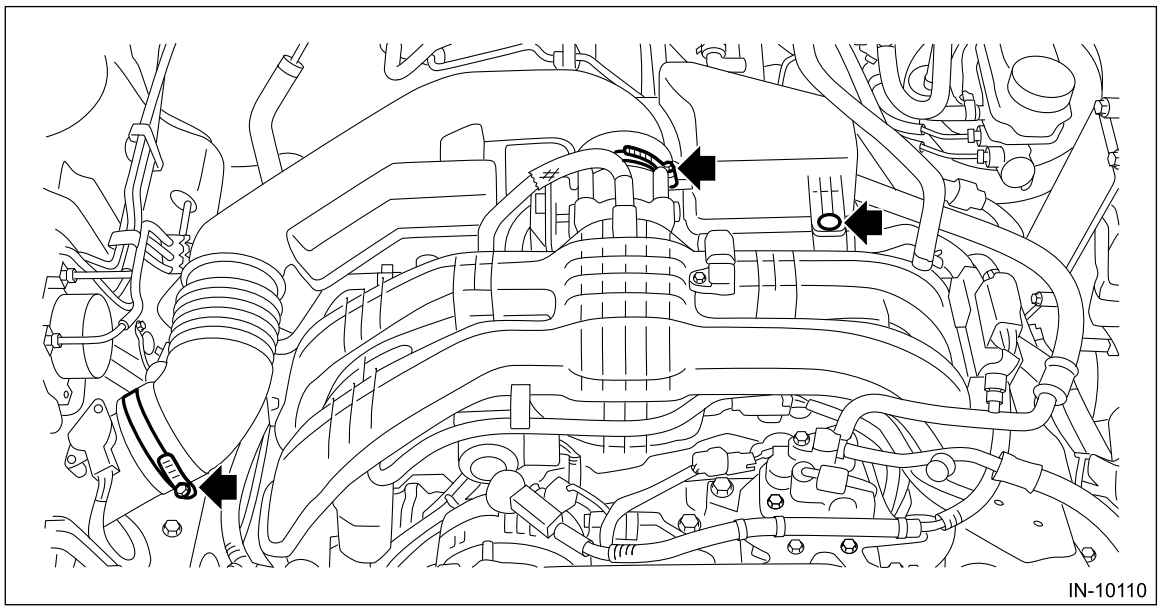
REMOVAL

Caution:
If the engine oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.

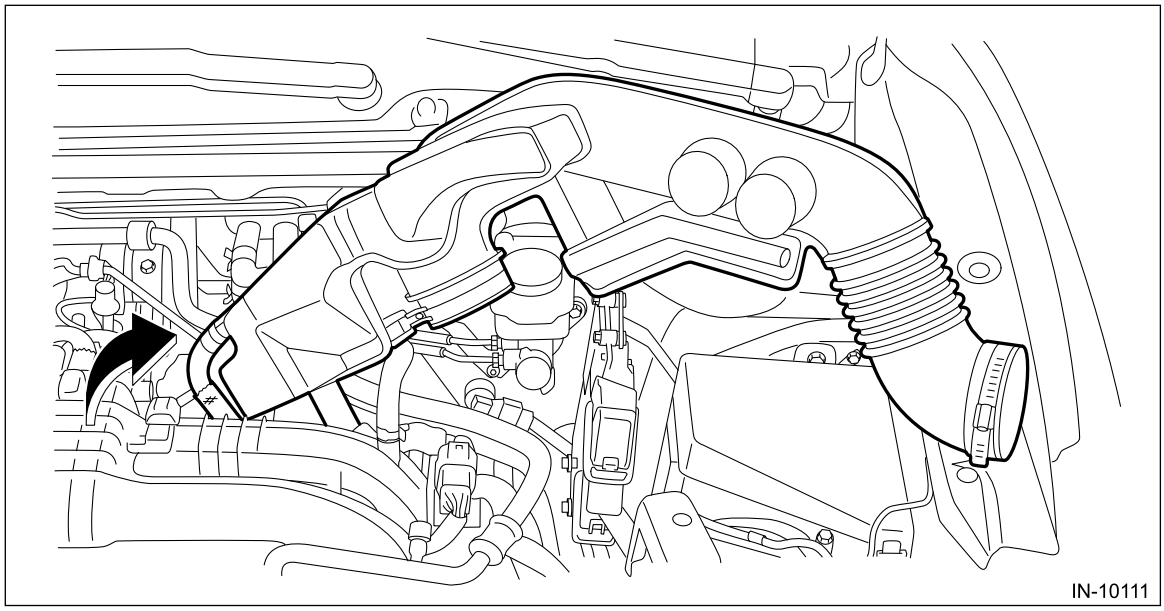
1. Remove the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>DISASSEMBLY.
2. Fully open the front hood. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the V-belt covers.



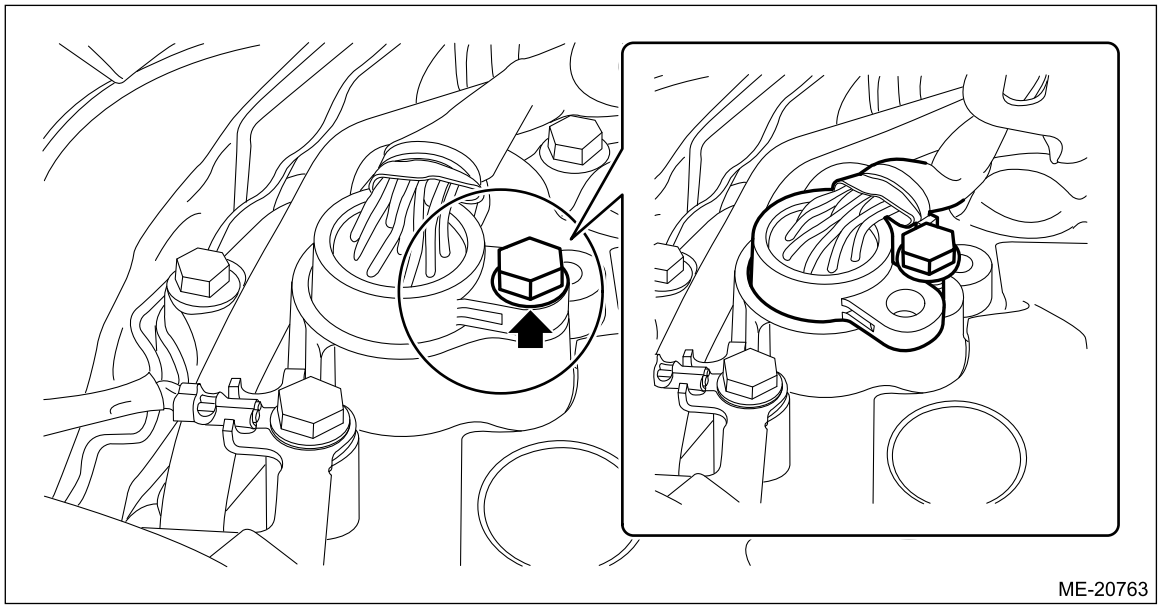
5. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
6. Remove the clip from the air intake boot, and loosen the clamp.



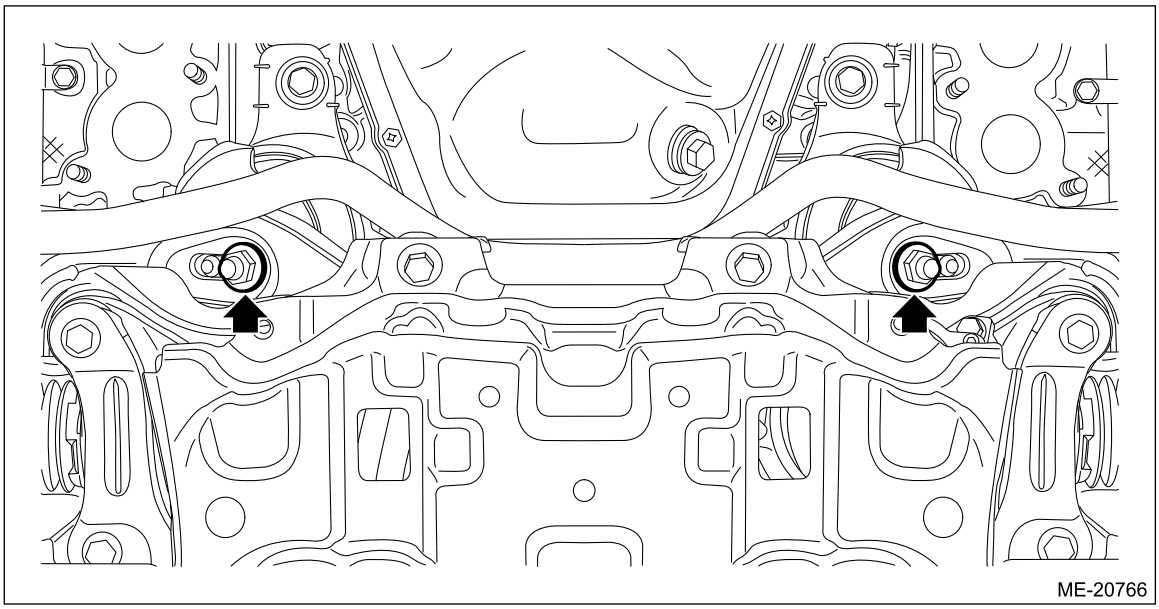
7. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



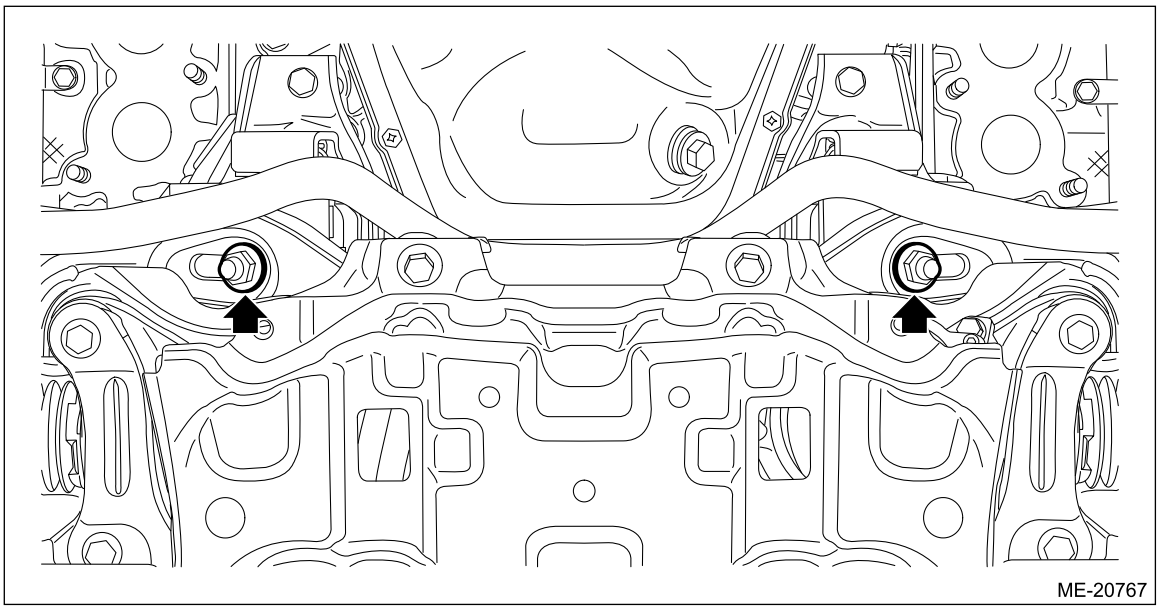
8. Remove the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>REMOVAL.
9. Turn the valve cover clockwise till the bolt hole can be seen as shown in the figure, and temporary tighten it with a bolt to prevent it from rotating. (CVT model)



10. Remove the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.
11. Drain the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
12. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
13. Remove the nuts which secure the engine mounting to the crossmember. (CVT model)



14. Remove the nuts which secure the engine mounting to the crossmember. (MT model)



15. Remove the electric power steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox>REMOVAL.

16. Attach the ST1 and ST2.

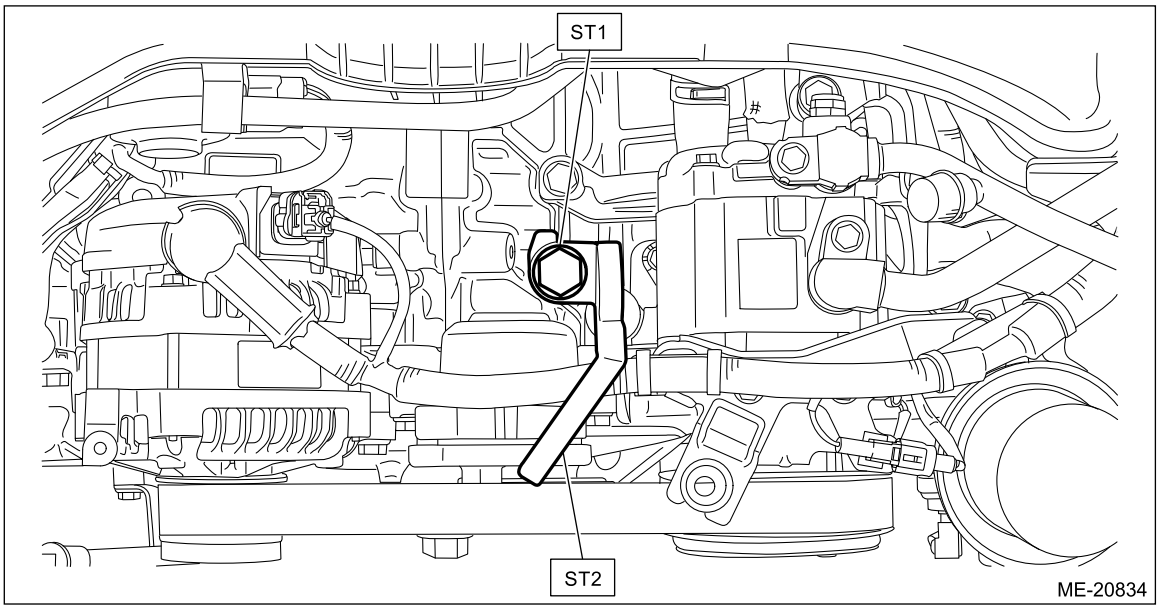
Preparation tool:

ST1: BOLT (18363AA050)

ST2: HANGER (18360AA040)

Tightening torque:

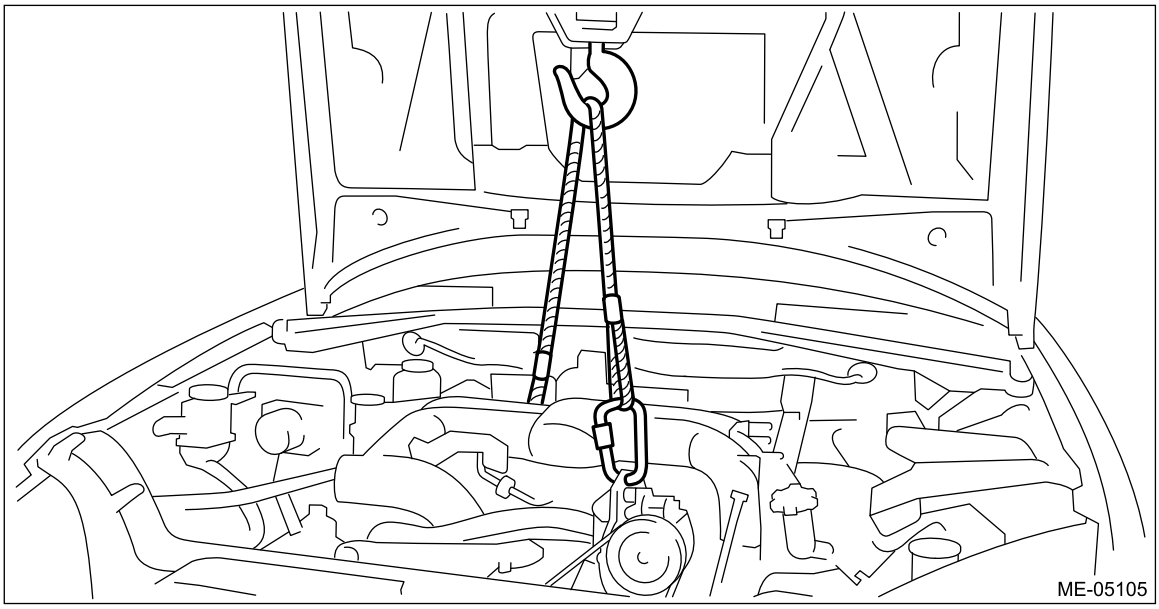
43N·m (4.4 kgf-m, 31.7 ft-lb)



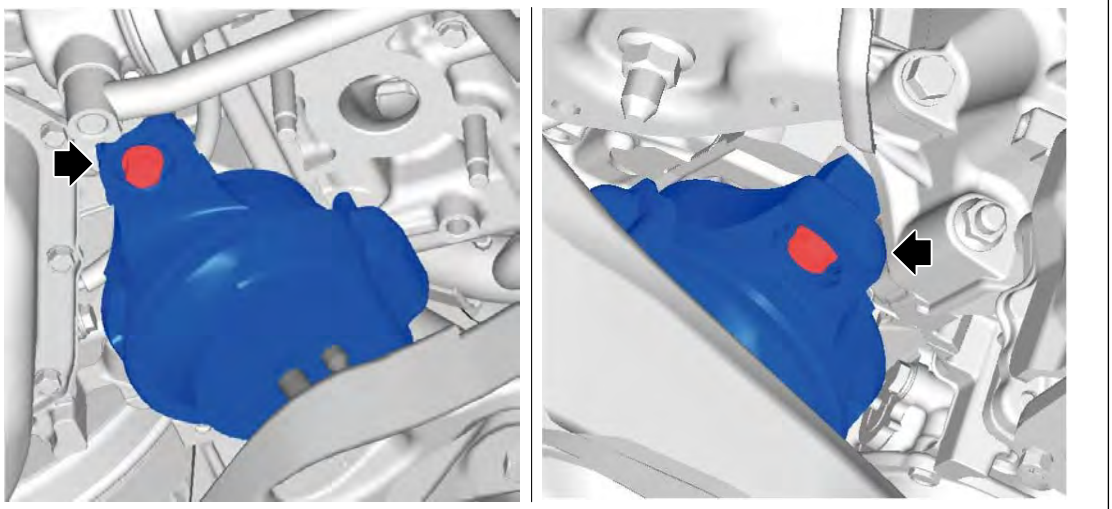
17. Lift up the engine with a lifting device and wire ropes.

Caution:

When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.

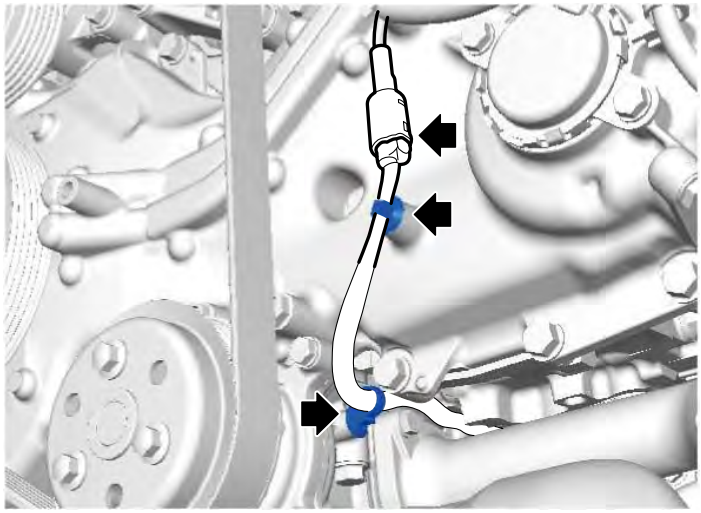


18. Remove the engine mounting LH.



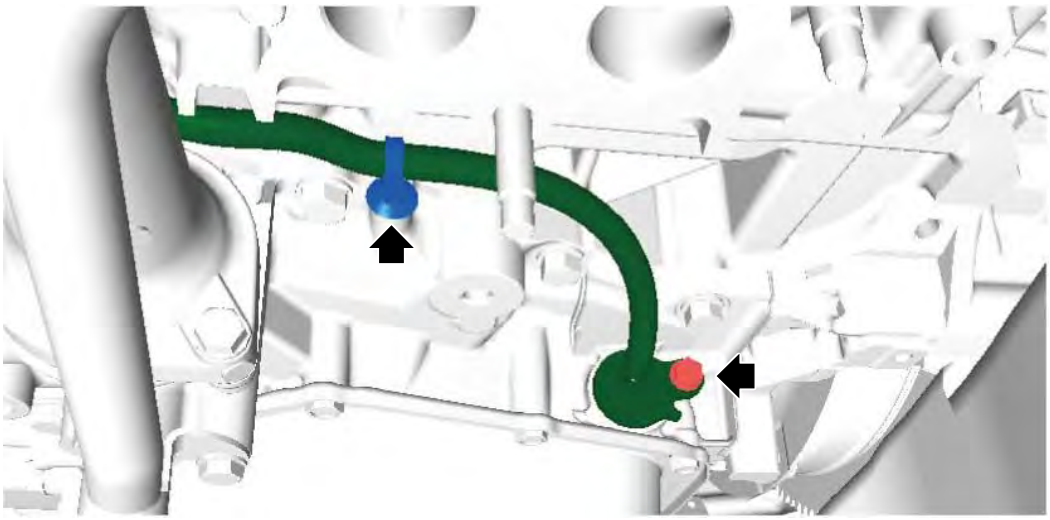
LU-10144

19. Disconnect the connector and remove the clips.



LU-10145

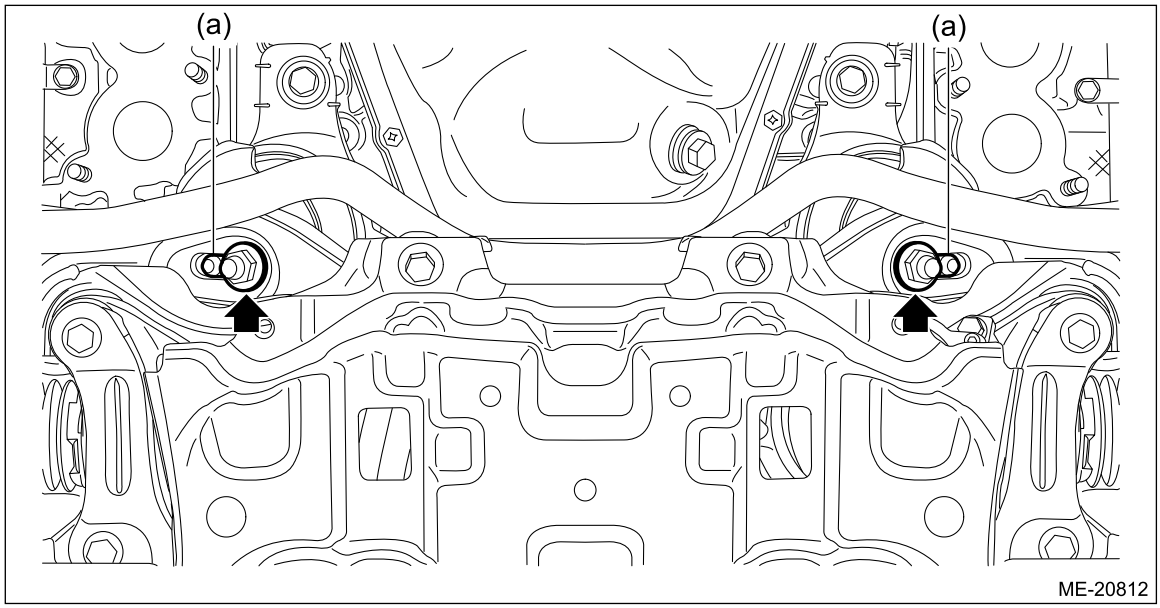
20. Remove the clip to remove the oil level switch.



LU-10146

INSTALLATION

1. Install the oil level switch, and install the clip.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)
2. Connect the connector and install the clip.
3. Install the engine mounting LH.
   Tightening torque:
   35 N·m (3.6 kgf-m, 25.8 ft-lb)
4. Lower the engine and remove the lifting device and wire ropes.
5. Remove the ST.
6. Install the nuts which hold the engine mounting to the crossmember. (CVT model)
   Caution:
   Use new nuts.
   Note:
   Make sure that locators (a) of the engine mounting are securely inserted.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)



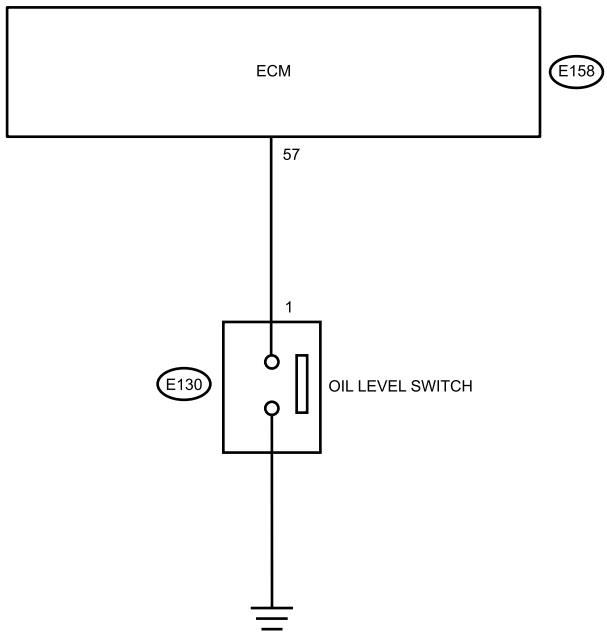
7. Install the nuts which hold the engine mounting to the crossmember. (MT model)
   Caution:
   Use new nuts.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
8. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
9. Install the valve cover in original position. (CVT model)
   Tightening torque:
   7 N·m (0.7 kgf-m, 5.2 ft-lb)
10. Install the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>INSTALLATION.
11. Install the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.
12. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake

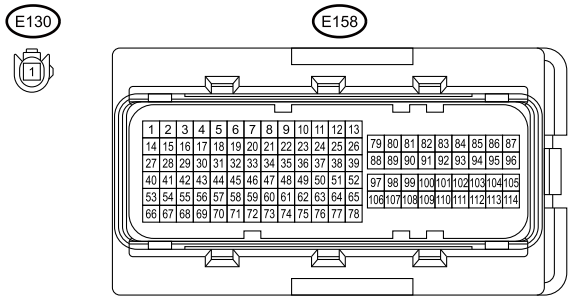
Boot>INSTALLATION.

13. Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.
14. Install the V-belt cover.
    Tightening torque:
    7 N·m (0.7 kgf-m, 5.2 ft-lb)
15. Refill the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
16. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
17. Set the front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
18. Install the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>ASSEMBLY.

LUBRICATION(H4DO) > Oil Level Switch

WIRING DIAGRAM


ECM
E158
57
1
E130
OIL LEVEL SWITCH


E130
1
E158
1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18 19 20 21 22 23 24 25 26
27 28 29 30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63 64 65
66 67 68 69 70 71 72 73 74 75 76 77 78
79 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96
97 98 99 100 101 102 103 104 105
106 107 108 109 110 111 112 113 114

LU-10147

INSPECTION

1. INSPECTION WHEN ENGINE OIL LEVEL WARNING LIGHT IS ON

1. CHECK DTC.

Read the DTC using the Subaru Select Monitor 4.

Note:

For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

Is DTC detected?

Yes — (1) Repair the corresponding system.
(2) Go to 2.

No — Go to 2.

2. CHECK ENGINE OIL LEVEL.

Check the engine oil level.

Is engine oil level normal?

Yes — Go to 3.

No — (1) Adjust the engine oil level to a proper amount.
(2) Go to 3.

3. CHECK ENGINE OIL LEVEL WARNING LIGHT.

1. Turn to IG ON.
2. Check if engine oil level warning light goes off.

Does the engine oil level warning light go off?

Yes — System is normal.
Restore the vehicle to its original state.

No — Go to 4.

4. CHECK OIL LEVEL SWITCH.

1. Turn the ignition to OFF.
2. Disconnect the ground cable from battery.
3. Disconnect the oil level switch connector.
4. Check continuity between the oil level switch terminal and chassis ground.

Is there continuity?

Yes — Go to 5.

No — Replace the oil level switch.
Restore the vehicle to its original state.

5. CHECK CONTINUITY OF ENGINE HARNESS.

1. Disconnect the engine harness and the bulkhead harness.
2. Check continuity between the connector on the engine harness oil pressure switch side and the connector on the engine harness bulkhead side.

Is there continuity?

Yes — Go to 6.

No — (1) Repair the engine harness.
(2) Restore the vehicle to its original state.

6. CHECK CONTINUITY OF BULKHEAD HARNESS.

1. Disconnect the ECM connector.
2. Check continuity between the bulkhead harness connector on the engine harness side and the bulkhead harness connector on the ECM side.

Is there continuity?

Yes — Go to 7.

No — (1) Repair the bulkhead harness.
(2) Restore the vehicle to its original state.

7. CHECK COMBINATION METER.

1. Restore the vehicle to its original state.
2. Perform the self-diagnosis display mode of combination meter.

Is combination meter OK?

Yes	(1) Check for poor contact due to the wear of connector pin etc., and if no fault is found, replace the ECM. (2) Restore the vehicle to its original state.
No	(1) Replace the combination meter. (2) Restore the vehicle to its original state.

2. OTHER INSPECTIONS

1. Check for oil leaks.
2. Check that there is no deformation, cracks or other damages.

INSPECTION

Before performing diagnostics, make sure that the engine oil level is correct and no oil leakage exists.

Trouble	Possible cause	Corrective action
The oil pressure warning light illuminates.	a. Oil pressure switch failure	Replace the oil pressure switch.
	b. Low oil pressure	
	❍ Clogging of oil filter	Replace the oil filter.
	❍ Clogged or broken oil strainer	Clean or replace the oil strainer.
	❍ Clogged oil passage	Clean or replace faulty parts.
	❍ Defective oil pump	Replace the chain cover.
	❍ Insufficient engine oil (degradation, etc.)	Replace engine oil.
	c. Short circuit of the harness	Repair the harness.
The oil pressure warning light does not illuminate.	a. Malfunction of combination meter	Replace the combination meter.
	b. Oil pressure switch failure	Replace the oil pressure switch.
	c. Open circuit of harness	Repair the harness.

ME(H4DO)

1. General Description
2. Compression
3. Idle Speed
4. Ignition Timing
5. Intake Manifold Vacuum
6. Engine Oil Pressure
7. Fuel Pressure
8. Cam Clearance
9. Engine Assembly
10. Engine Mounting
11. Preparation for Overhaul
12. Vacuum Pump
13. V-belt
14. Crank Pulley
15. Chain Cover
16. Timing Chain Assembly
17. Cam Sprocket
18. Crank Sprocket
19. Rocker Cover
20. Camshaft
21. Cam Carrier
22. Cylinder Head
23. Cylinder Block
24. Intake and Exhaust Valve
25. Piston
26. Connecting Rod
27. Crankshaft
28. Symptoms and causes
29. Engine Noise

SPECIFICATION

Engine	Model			2.0 L
	Cylinder arrangement			Horizontally opposed, liquid cooled, 4-cylinder, 4-stroke gasoline engine
	Valve system mechanism			Chain driven, double overhead camshaft, 4-valve/cylinder
	Bore × Stroke mm (in)			84.0 × 90.0 (3.31 × 3.54)
	Displacement cm^3 (cu in)			1,995 (121.7)
	Compression ratio			12.5
	Compression pressure (at 200 — 300 r/min) kPa (kg/cm^2, psi)		Standard	1,050 — 1,400 (11 — 14, 152 — 203)
	Number of piston rings			Compression ring: 2 Oil ring: 1
	Intake valve timing	Open	Max. retard	ATDC 37°
			Min. advance	BTDC 41°
		Close	Max. retard	ABDC 103°
			Min. advance	ABDC 25°
	Exhaust valve timing	Open	Max. retard	ABDC 3°
			Min. advance	BBDC 52°
		Close	Max. retard	ATDC 47°
			Min. advance	BTDC 8°
	Cam clearance mm (in)	Intake	Standard	$0.13^{+0.02}_{-0.04}$ $(0.0051^{+0.0008}_{-0.0016})$
		Exhaust	Standard	$0.22^{+0.02}_{-0.04}$

				$(0.0087^{+0.0008}_{-0.0016})$
	Idle speed (For CVT model, select lever in "P" or "N" range. For MT model, gear shift lever in neutral position.) r/min	No load	Standard	CVT model: 775±100
				MT model: 700±100
		A/C ON	Standard	800 — 900±50
	Ignition order			1 → 3 → 2 → 4
	Ignition timing BTDC/{r/min}		Standard	CVT model: 6°±10°/775
				MT model: 6°±10°/700

Note:

OS: Oversize US: Undersize

Camshaft	Bending mm (in)			Limit	0.020 (0.0008)
	Cam lobe height mm (in)	Intake	Valve drive section	Standard	40.34 — 40.44 (1.5882 — 1.5921)
			Fuel pump drive section	Standard	44.35 — 44.45 (1.7461 — 1.7500)
		Exhaust		Standard	39.66 — 39.76 (1.5614 — 1.5654)
	Cam base circle diameter mm (in)			Standard	34.0 (1.3386)
	Journal outer diameter mm (in)			Standard	25.946 — 25.963 (1.0215 — 1.0222)
	Thrust clearance mm (in)			Standard	0.068 — 0.116 (0.0027 — 0.0047)
	Oil clearance mm (in)			Standard	0.037 — 0.072 (0.0015 — 0.0028)
Cylinder head	Warpage (mating surface with cylinder block) mm (in)			Limit	0.020 (0.0008)
	Grinding limit mm (in)				98.45 (3.8760) or less
	Height mm (in)			Standard	98.5 (3.8779)
Valve & valve guide	Valve overall length mm (in)			Intake	104.95 (4.1319)
				Exhaust	96.5 (3.7992)
	Valve head edge thickness mm (in)		Intake	Standard	0.8 — 1.2 (0.0315 — 0.0472)
			Exhaust	Standard	1.0 — 1.4 (0.0394 — 0.0551)
	Valve stem outer diameter mm (in)		Intake	Standard	5.455 — 5.470 (0.2148 — 0.2154)
			Exhaust	Standard	5.445 — 5.460 (0.2144 — 0.2150)
	Valve guide inner diameter mm (in)			Standard	5.500 — 5.512 (0.2165 — 0.2170)
	Clearance between valve and valve guide mm (in)		Intake	Standard	0.030 — 0.057 (0.0012 — 0.0022)

		Exhaust	Standard	0.040 — 0.067 (0.0016 — 0.0026)
	Valve guide protrusion amount mm (in)		Standard	11.4 — 11.8 (0.4488 — 0.4646)
Valve & valve shim	Valve stem end outer diameter mm (in)	Intake	Standard	5.455 — 5.470 (0.2148 — 0.2154)
		Exhaust	Standard	5.445 — 5.460 (0.2144 — 0.2150)
	Valve shim inner diameter mm (in)		Standard	5.500 — 5.560 (0.2165 — 0.2189)
	Clearance between valve and valve shim mm (in)	Intake	Standard	0.030 — 0.105 (0.0012 — 0.0041)
		Exhaust	Standard	0.040 — 0.115 (0.0016 — 0.0045)
Valve seat	Seating width between valve and valve seat mm (in)	Intake	Standard	0.8 — 1.6 (0.0315 — 0.0630)
		Exhaust	Standard	1.1 — 1.7 (0.0433 — 0.0669)
	Seating angle between valve and valve seat			45°
	Seating position between valve and valve seat			Valve face center
Valve spring	Free length (Reference) mm (in)		Standard	42.64 (1.6787)
	Tension/spring height N (kgf, lb)/mm (in)	Set	Standard	182 — 210 (18.56 — 21.41, 40.92 — 47.22)/33.0 (1.2992)
		Lift	Standard	475 — 525 (48.43 — 53.53, 106.80 — 118.04)/22.0 (0.8661)
	Squareness (at height of 30 mm (1.1811 in))		Standard	2.5°, 1.4 mm (0.0551 in) or less
Cylinder block & piston	Cylinder block warpage (Mating surface with cylinder head) mm (in)		Limit	0.025 (0.0010)
	Grinding limit of cylinder block mm (in)			204.95 (8.0689) or less
	Height of cylinder block mm (in)		Standard	205.0 (8.0709)
	Inner diameter of cylinder liner mm (in)	Cylinder bore size mark A	Standard	84.005 — 84.015 (3.3073 — 3.3077)
		Cylinder bore size mark B	Standard	83.995 — 84.005 (3.3069 — 3.3073)
	Cylindricality of cylinder liner mm (in)		Limit	0.030 (0.0012)
	Out-of-roundness of cylinder liner mm (in)		Limit	0.030 (0.0012)
	Piston grade point mm (in)			38.0 (1.4961)

	Piston outer diameter mm (in)	Standard Size	Grade A	Standard	83.995 — 84.005 (3.3069 — 3.3073)
			Grade B	Standard	83.985 — 83.995 (3.3065 — 3.3069)
		0.25 (0.0098) OS		Standard	84.235 — 84.255 (3.3163 — 3.3171)
		0.50 (0.0197) OS		Standard	84.485 — 84.505 (3.3262 — 3.3270)
	Clearance between cylinder liner and piston mm (in)			Standard	0.000 — 0.020 (0.0000 — 0.0008)
	Inner diameter of cylinder liner boring limit (diameter) mm (in)				84.505 (3.3270) or less
Piston and piston pin	Degree of fit				Piston pin must be fitted into position with thumb at 20°C (68°F).
	Clearance between piston and piston pin mm (in)			Standard	0.004 — 0.008 (0.0002 — 0.0003)
Piston ring	Closed gap mm (in)	Compression ring	Top ring	Standard	0.20 — 0.25 (0.0079 — 0.0098)
			Second ring	Standard	0.40 — 0.50 (0.0157 — 0.0197)
		Oil ring (Upper rail and lower rail)		Standard	0.10 — 0.35 (0.0039 — 0.0138)
	Clearance between compression ring and piston mm (in)		Top ring	Standard	0.040 — 0.080 (0.0016 — 0.0031)
			Second ring	Standard	0.030 — 0.070 (0.0012 — 0.0028)
Connecting rod and connecting rod bearing	Bend or twist per 100 mm (3.9370 in) in length mm (in)			Limit	0.10 (0.0039)
	Thrust clearance mm (in)			Standard	0.070 — 0.330 (0.0028 — 0.0130)
	Connecting rod bearing thickness (at center) mm (in)		Standard size	Standard	1.492 — 1.508 (0.0587 — 0.0594)
			0.03 (0.0012) US	Standard	1.511 — 1.515 (0.0595 — 0.0596)
			0.05 (0.0020) US	Standard	1.521 — 1.525 (0.0599 — 0.0600)
			0.25 (0.0098) US	Standard	1.621 — 1.625 (0.0638 — 0.0640)
	Oil clearance mm (in)			Standard	0.017 — 0.047 (0.0007 — 0.0019)
Piston pin &	Clearance between piston pin and connecting rod bushing mm (in)			Standard	0.004 — 0.026 (0.0002 — 0.0010)

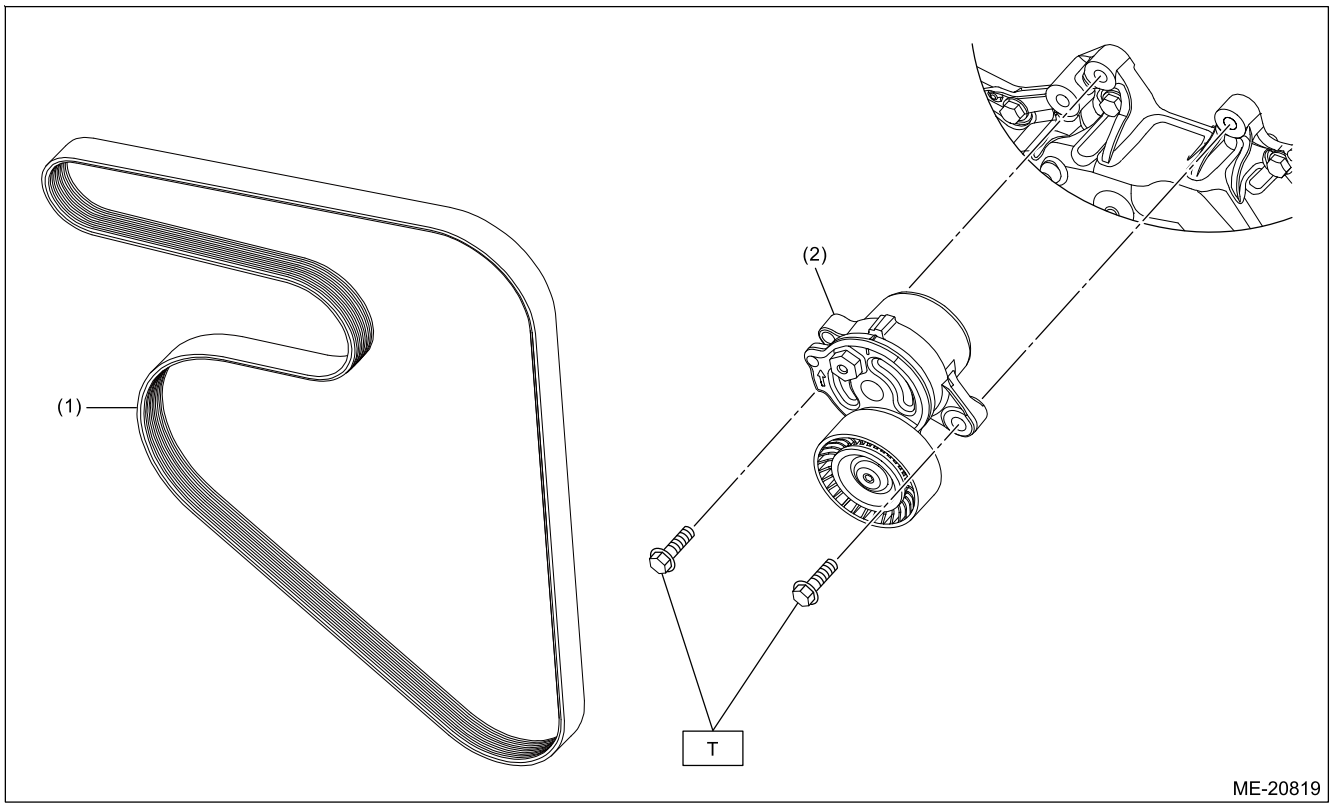
connecting rod bushing					
Crankshaft and crankshaft bearing	Bending		mm (in)	Limit	0.035 (0.0014)
	Crankshaft pin	Cylindricality	mm (in)	Limit	0.006 (0.0002)
		Out-of-roundness	mm (in)	Limit	0.005 (0.0002)
		Grinding limit (dia.)	mm (in)		47.726 (1.8790) or less
	Crankshaft journal	Cylindricality	mm (in)	Limit	0.006 (0.0002)
		Out-of-roundness	mm (in)	Limit	0.005 (0.0002)
		Grinding limit (dia.)	mm (in)		67.735 (2.6667) or less
	Crankshaft pin outer diameter		mm (in)	Standard size	Standard	47.976 — 48.000 (1.8888 — 1.8898)
				0.03 (0.0012) US	Standard	47.946 — 47.970 (1.8876 — 1.8886)
				0.05 (0.0020) US	Standard	47.926 — 47.950 (1.8868 — 1.8878)
				0.25 (0.0098) US	Standard	47.726 — 47.750 (1.8790 — 1.8799)
	Crankshaft journal outer diameter		mm (in)	Standard size	Standard	67.985 — 68.003 (2.6766 — 2.6773)
				0.03 (0.0012) US	Standard	67.955 — 67.979 (2.6754 — 2.6763)
				0.05 (0.0020) US	Standard	67.935 — 67.959 (2.6746 — 2.6755)
				0.25 (0.0098) US	Standard	67.735 — 67.759 (2.6667 — 2.6677)
	Crankshaft bearing thickness (at center)		mm (in)	#1, #2, #3, #4	Standard size	Standard	2.498 — 2.513 (0.0983 — 0.0989)
					0.03 (0.0012) US	Standard	2.519 — 2.522 (0.0992 — 0.0993)
					0.05 (0.0020) US	Standard	2.529 — 2.532 (0.0996 — 0.0997)
					0.25	Stan	2.629 — 2.632 (0.1035 —

			(0.0098) US	dard	0.1036)
		#5	Standard size	Standard	2.496 — 2.511 (0.0983 — 0.0989)
			0.03 (0.0012) US	Standard	2.517 — 2.520 (0.0991 — 0.0992)
			0.05 (0.0020) US	Standard	2.527 — 2.530 (0.0995 — 0.0996)
			0.25 (0.0098) US	Standard	2.627 — 2.630 (0.1034 — 0.1035)
	Thrust clearance		mm (in)	Standard	0.130 — 0.308 (0.0051 — 0.0121)
	Oil clearance		mm (in)	Standard	0.013 — 0.031 (0.0005 — 0.0012)

MECHANICAL(H4DO) > General Description

COMPONENT

1. V-BELT AND V-BELT TENSIONER



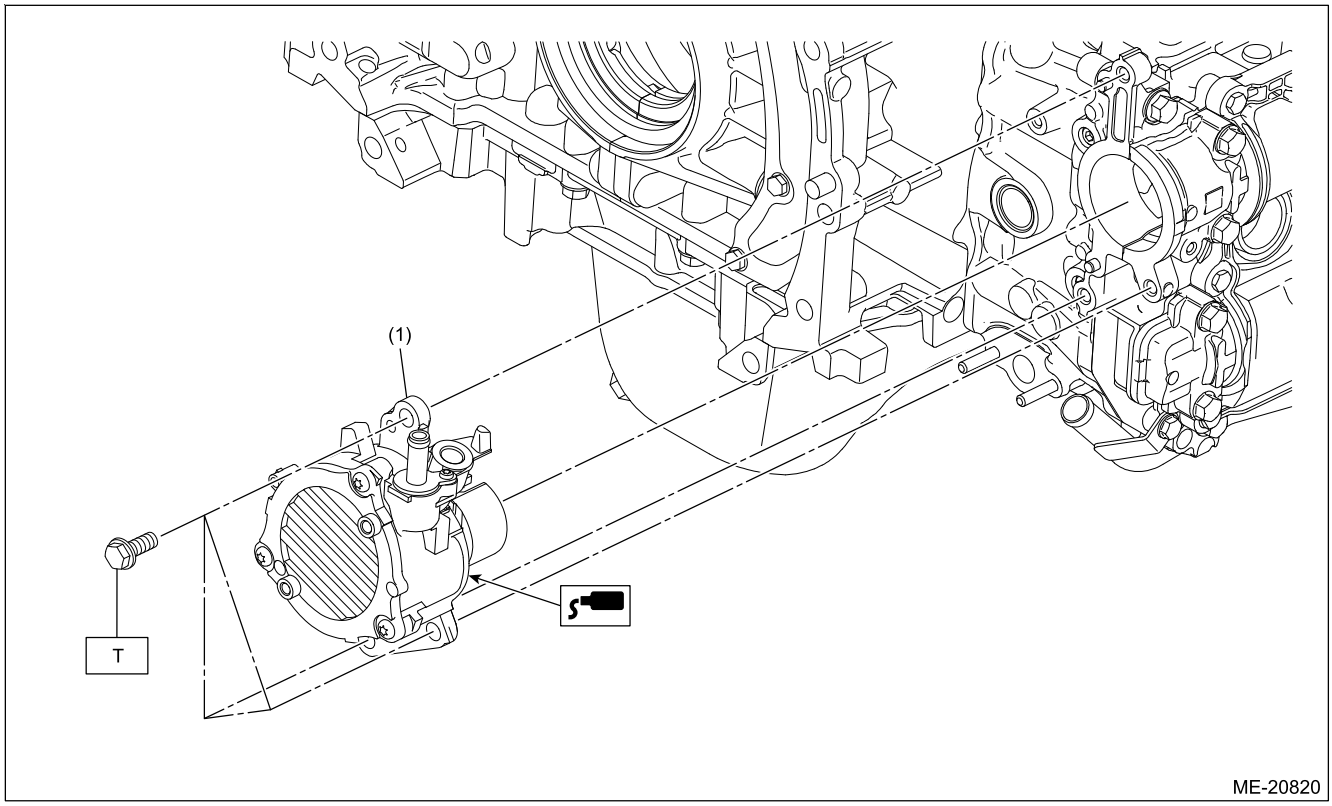
(1) V-belt

(2) V-belt tensioner

Tightening torque: N·m (kgf-m, ft-lb)

T: 19 (1.9, 14.0)

2. VACUUM PUMP

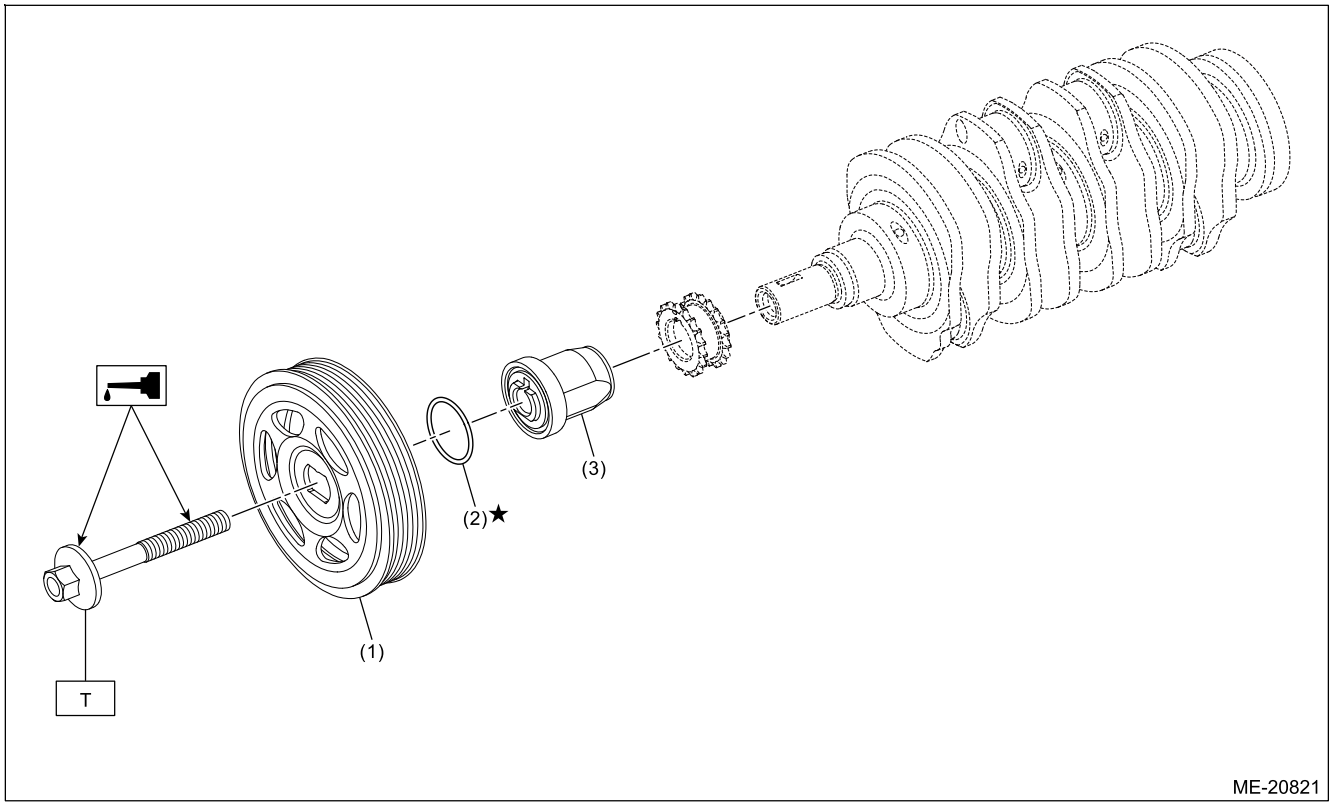


(1) Vacuum pump

Tightening torque: N·m (kgf-m, ft-lb)

T: 16 (1.6, 11.8)

3. CRANK PULLEY



(1) Crank pulley

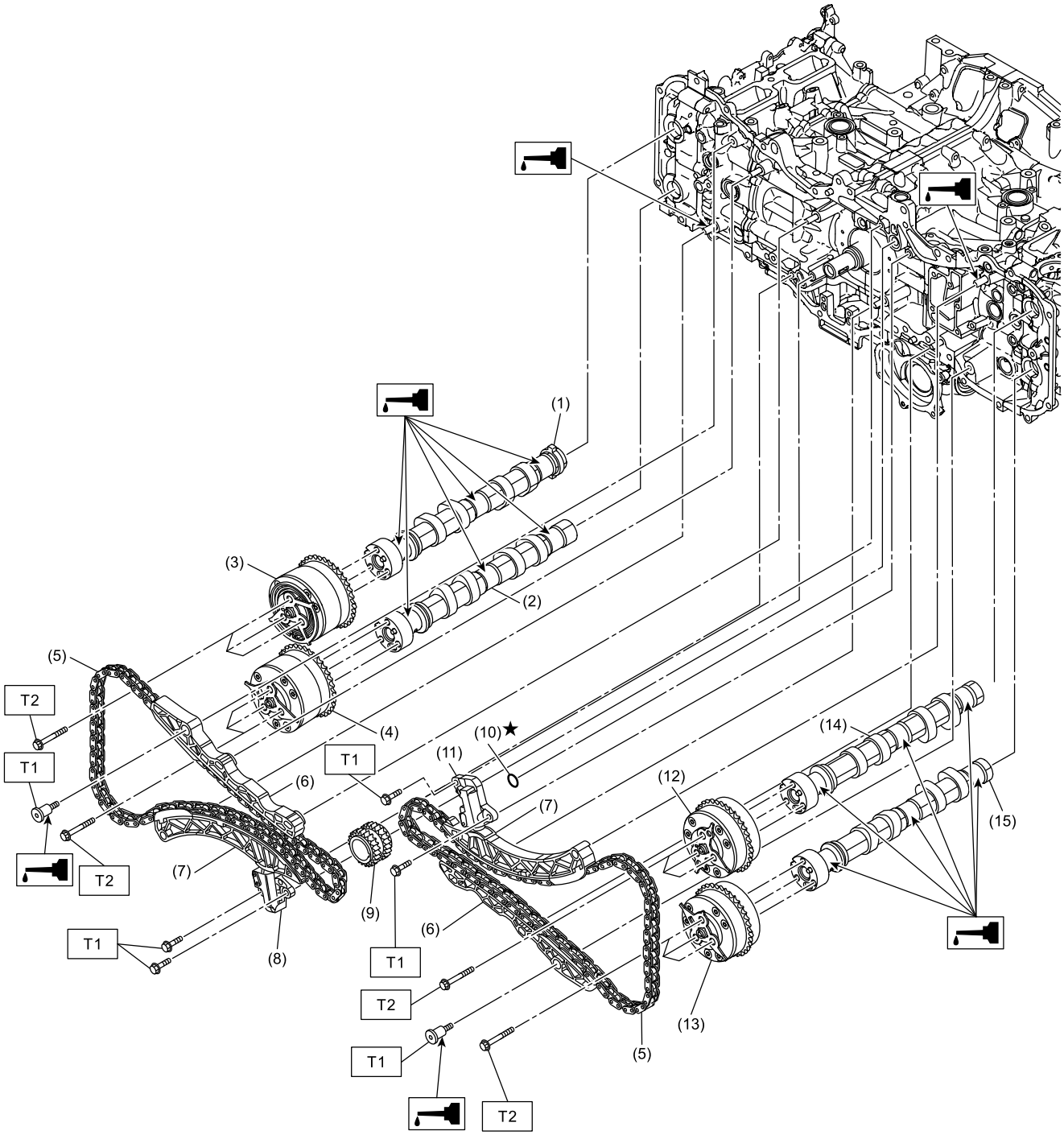
(2) O-ring

(3) Crank pulley boss

Tightening torque: N·m (kgf-m, ft-lb)

T: Ref. to MECHANICAL(H4DO)>Crank Pulley>INSTALLATION.

4. TIMING CHAIN & CAMSHAFT



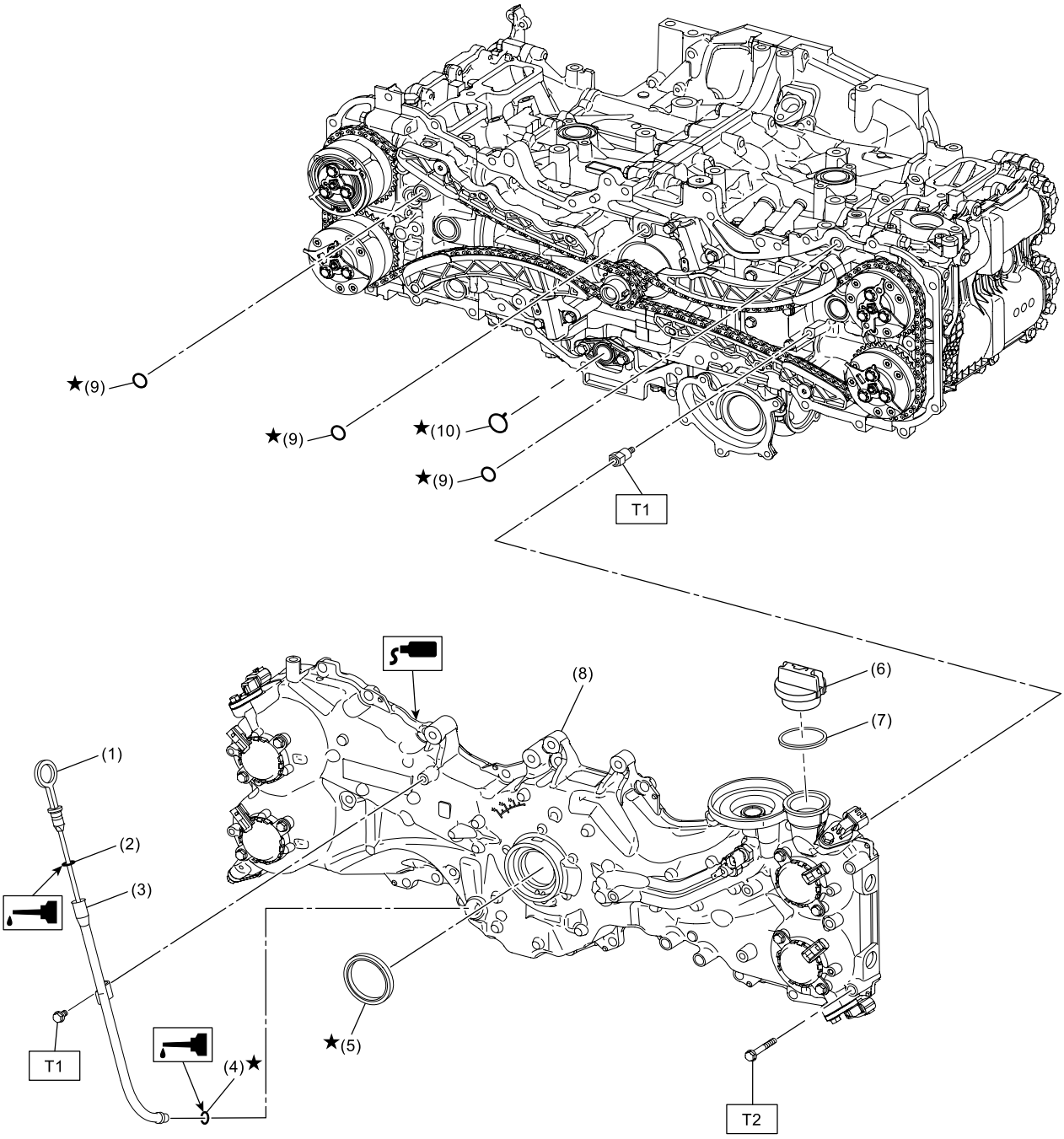
ME-20822

(1) Intake camshaft RH
(2) Exhaust camshaft RH
(3) Intake cam sprocket RH
(4) Exhaust cam sprocket RH
(5) Timing chain
(6) Chain guide
(7) Chain tension lever
(8) Chain tensioner RH
(9) Crank sprocket
(10) O-ring
(11) Chain tensioner LH
(12) Intake cam sprocket LH
(13) Exhaust cam sprocket LH
(14) Intake camshaft LH
(15) Exhaust camshaft LH

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)
T2: 18 (1.8, 13.3)

5. CHAIN COVER



ME-20823

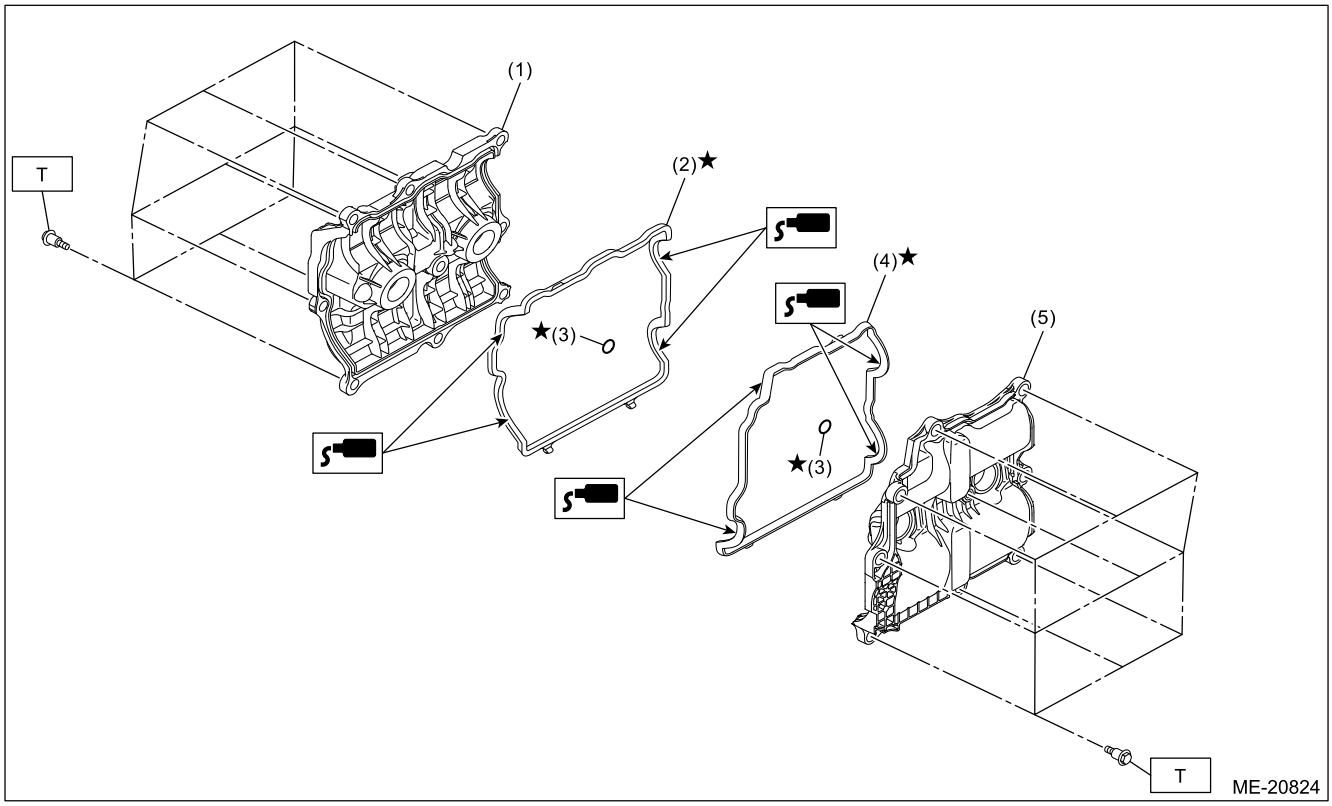
(1) Oil level gauge
(2) O-ring
(3) Oil level gauge guide
(4) O-ring
(5) Front oil seal
(6) Oil filler cap
(7) Gasket
(8) Chain cover
(9) O-ring
(10) O-ring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

6. ROCKER COVER



(1) Rocker cover RH

(2) Rocker cover gasket RH

(3) Rocker cover gasket

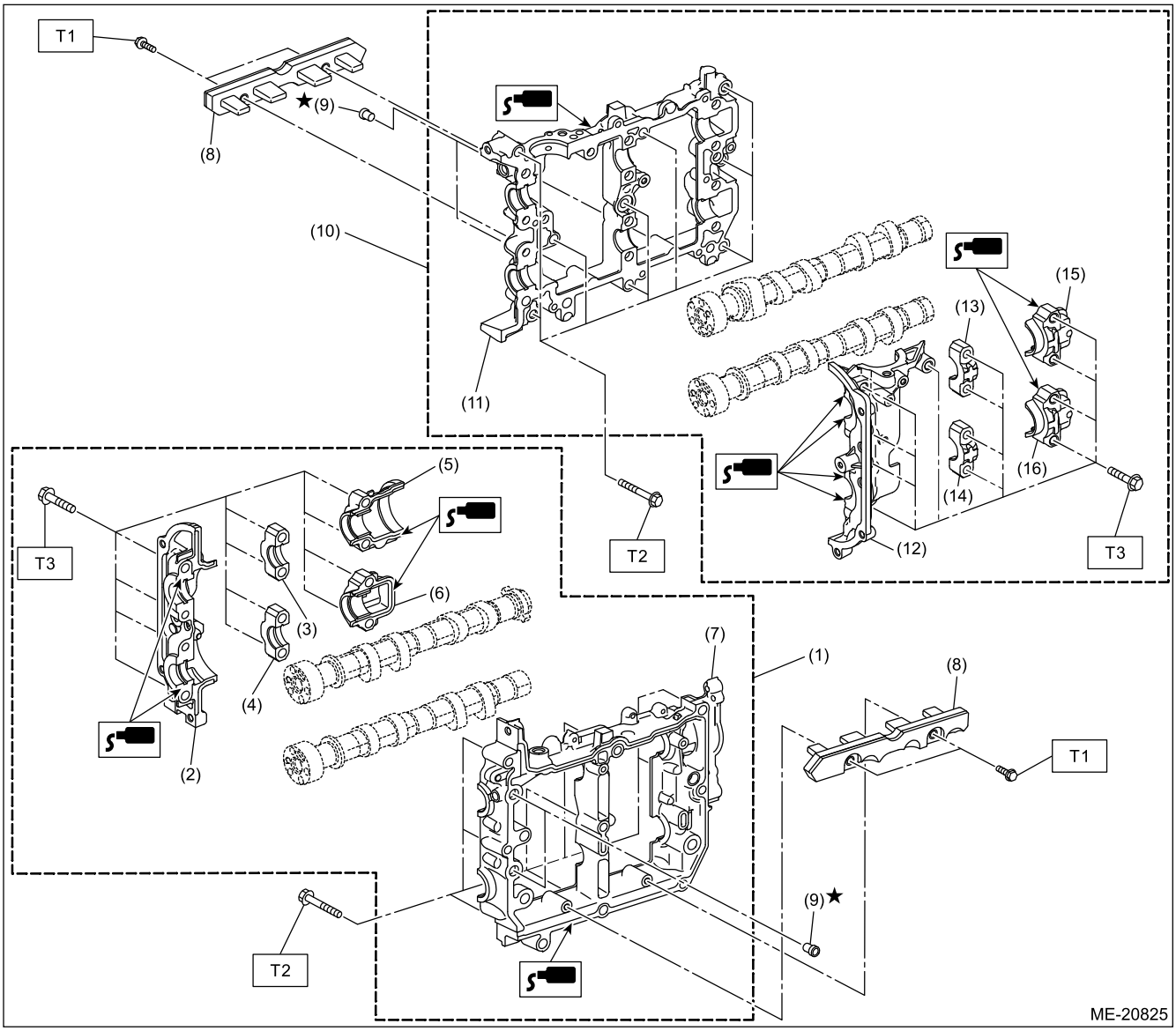
(4) Rocker cover gasket LH

(5) Rocker cover LH

Tightening torque: N·m (kgf-m, ft-lb)

T: Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION.

7. CAM CARRIER



(1) Cam carrier ASSY RH
(2) Front camshaft cap RH
(3) Intake center camshaft cap RH
(4) Exhaust center camshaft cap RH
(5) Intake rear camshaft cap RH
(6) Exhaust rear camshaft cap RH
(7) Cam carrier RH
(8) Oil spacer
(9) Filter
(10) Cam carrier ASSY LH
(11) Cam carrier LH
(12) Front camshaft cap LH
(13) Intake center camshaft cap LH
(14) Exhaust center camshaft cap LH
(15) Intake rear camshaft cap LH
(16) Exhaust rear camshaft cap LH

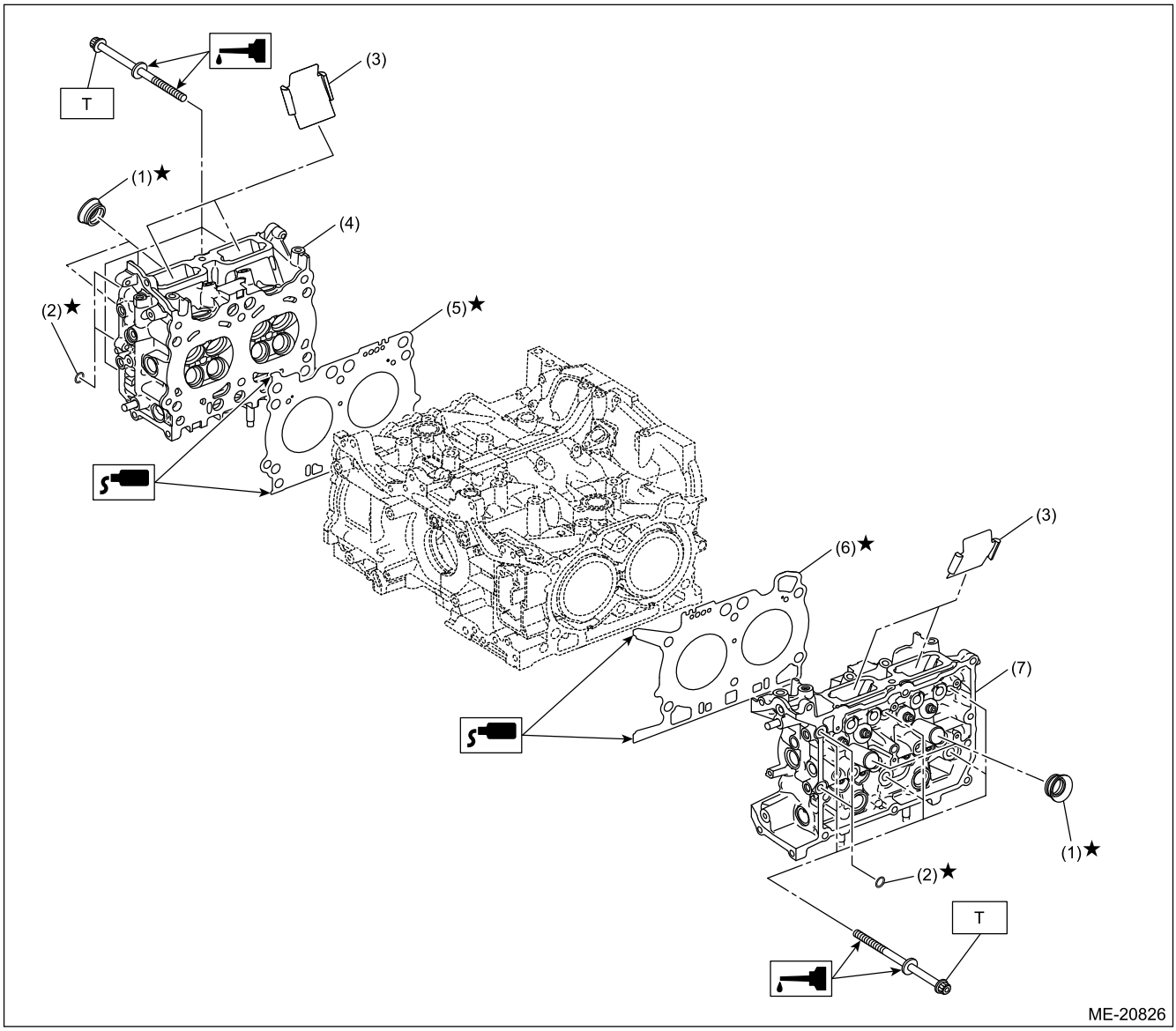
Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)

T2: Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION.

T3: Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.

8. CYLINDER HEAD

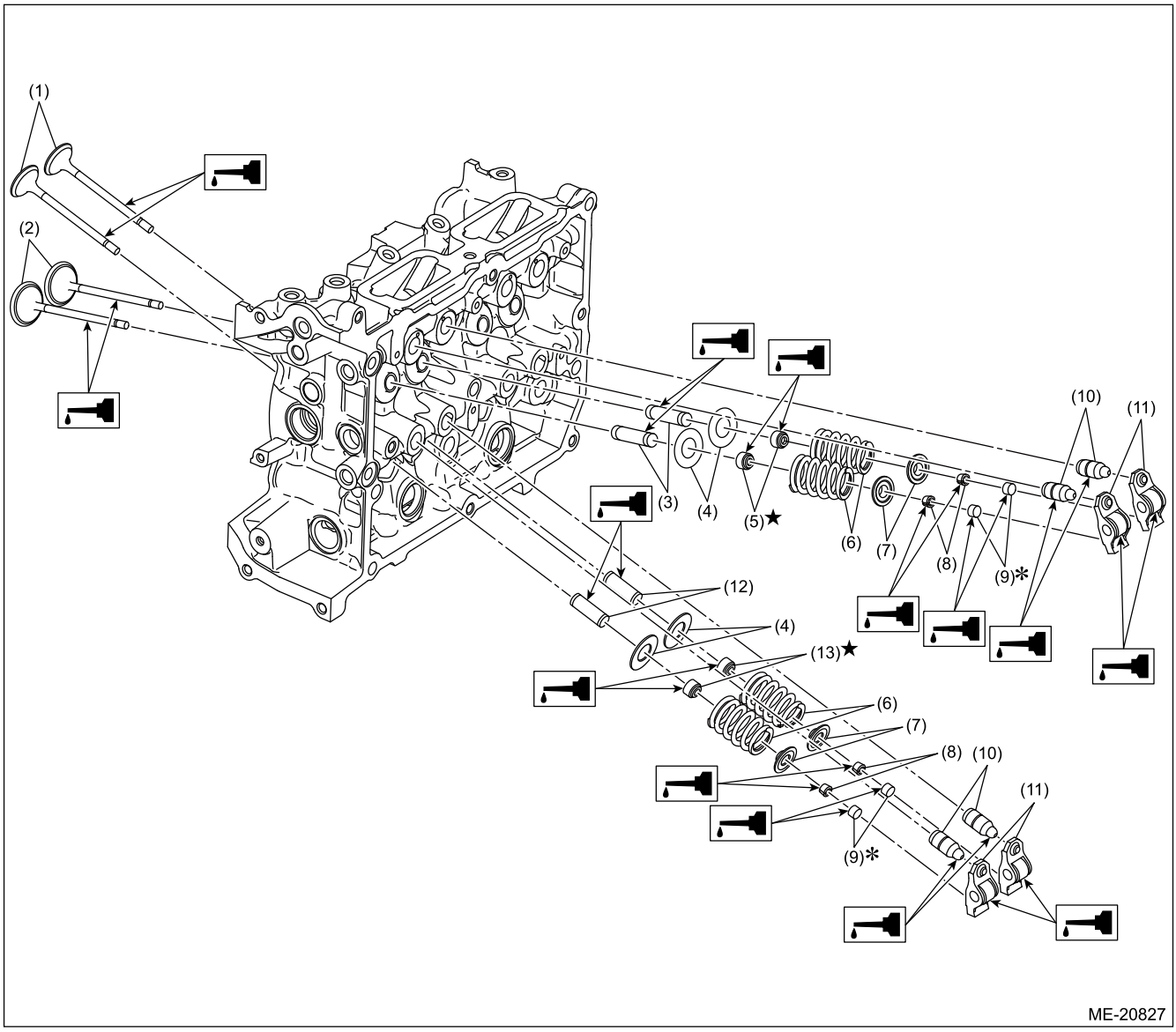


(1) Spark plug pipe gasket
(2) O-ring
(3) Cylinder head plate
(4) Cylinder head RH
(5) Cylinder head gasket RH
(6) Cylinder head gasket LH
(7) Cylinder head LH

Tightening torque: N·m (kgf-m, ft-lb)

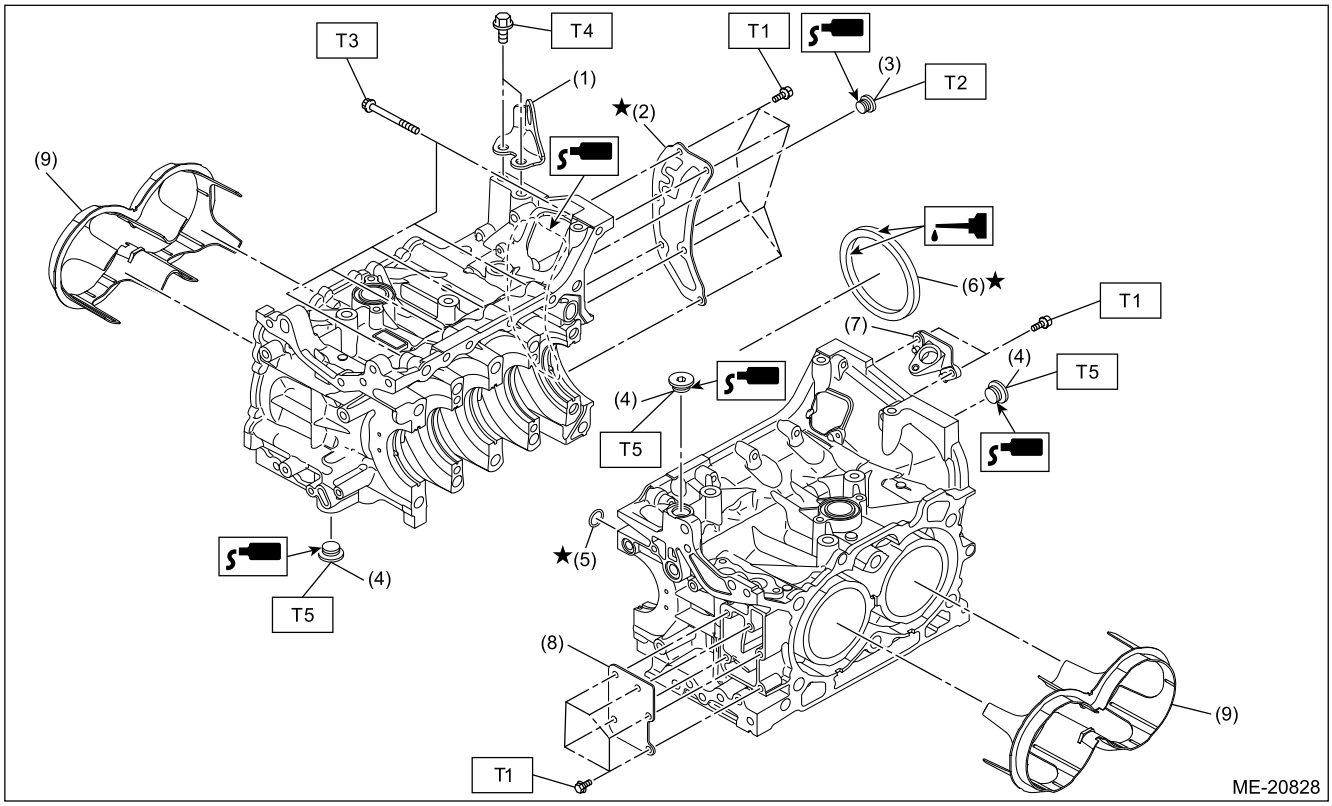
T: Ref. to MECHANICAL(H4DO)>Cylinder Head>INSTALLATION.

9. VALVE ASSEMBLY



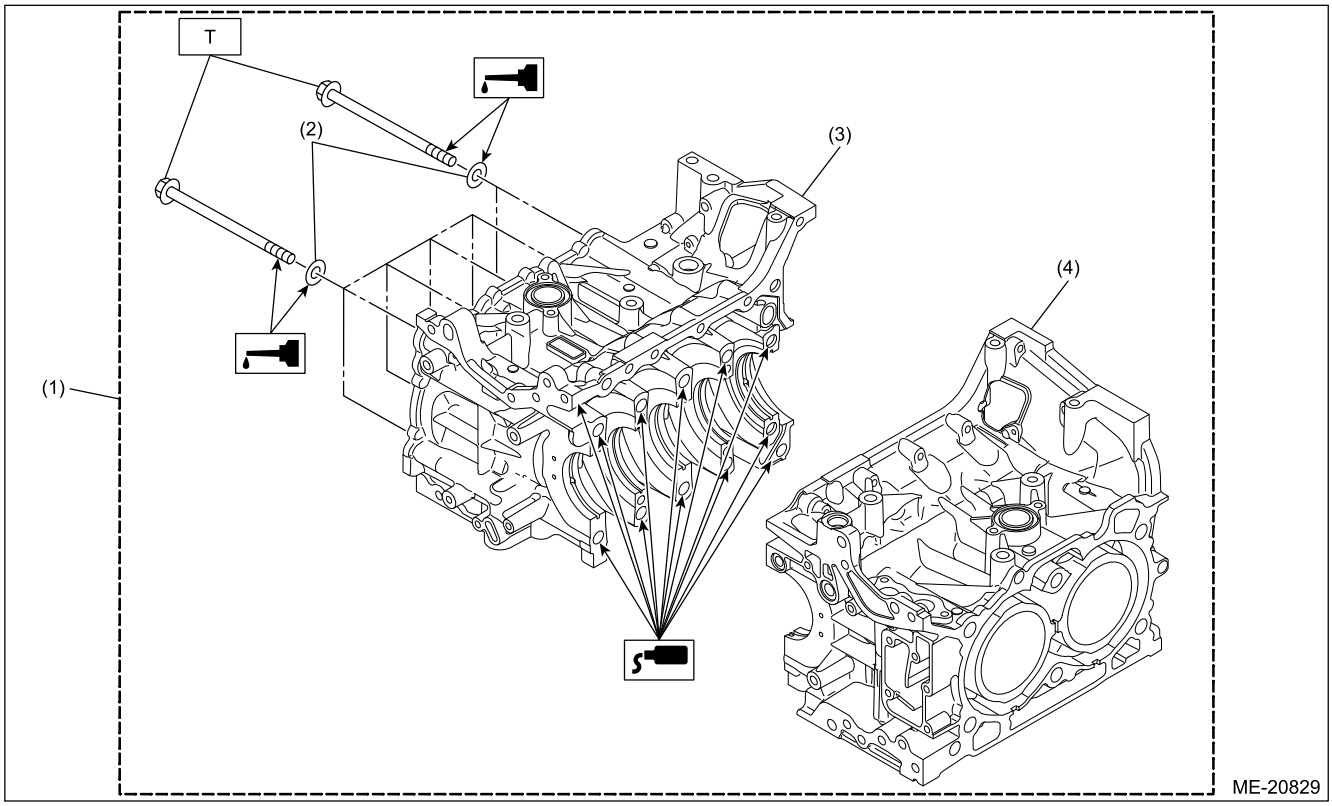
(1) Exhaust valve
(2) Intake valve
(3) Intake valve guide
(4) Valve spring seat
(5) Intake valve oil seal
(6) Valve spring
(7) Valve spring retainer
(8) Valve collet
(9) Valve shim
(10) Roller rocker arm pivot
(11) Roller rocker arm
(12) Exhaust valve guide
(13) Exhaust valve oil seal

10. CYLINDER BLOCK 1



(1) Engine rear hanger	(6) Rear oil seal	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Oil separator cover	(7) Crankshaft position sensor holder	***T1: 6.4 (0.7, 4.7)***
(3) Cylinder block plug	(8) Cylinder block plate	***T2: 16 (1.6, 11.8)***
(4) Main gallery plug	(9) Water jacket spacer	***T3: 25 (2.5, 18.4)***
(5) O-ring		***T4: 36 (3.7, 26.6)***
		T5: Ref. to MECHANICAL(H4DO)>Cylinder Block>ASSEMBLY > CYLINDER BLOCK.

11. CYLINDER BLOCK 2



(1) Cylinder block ASSY

(2) Washer

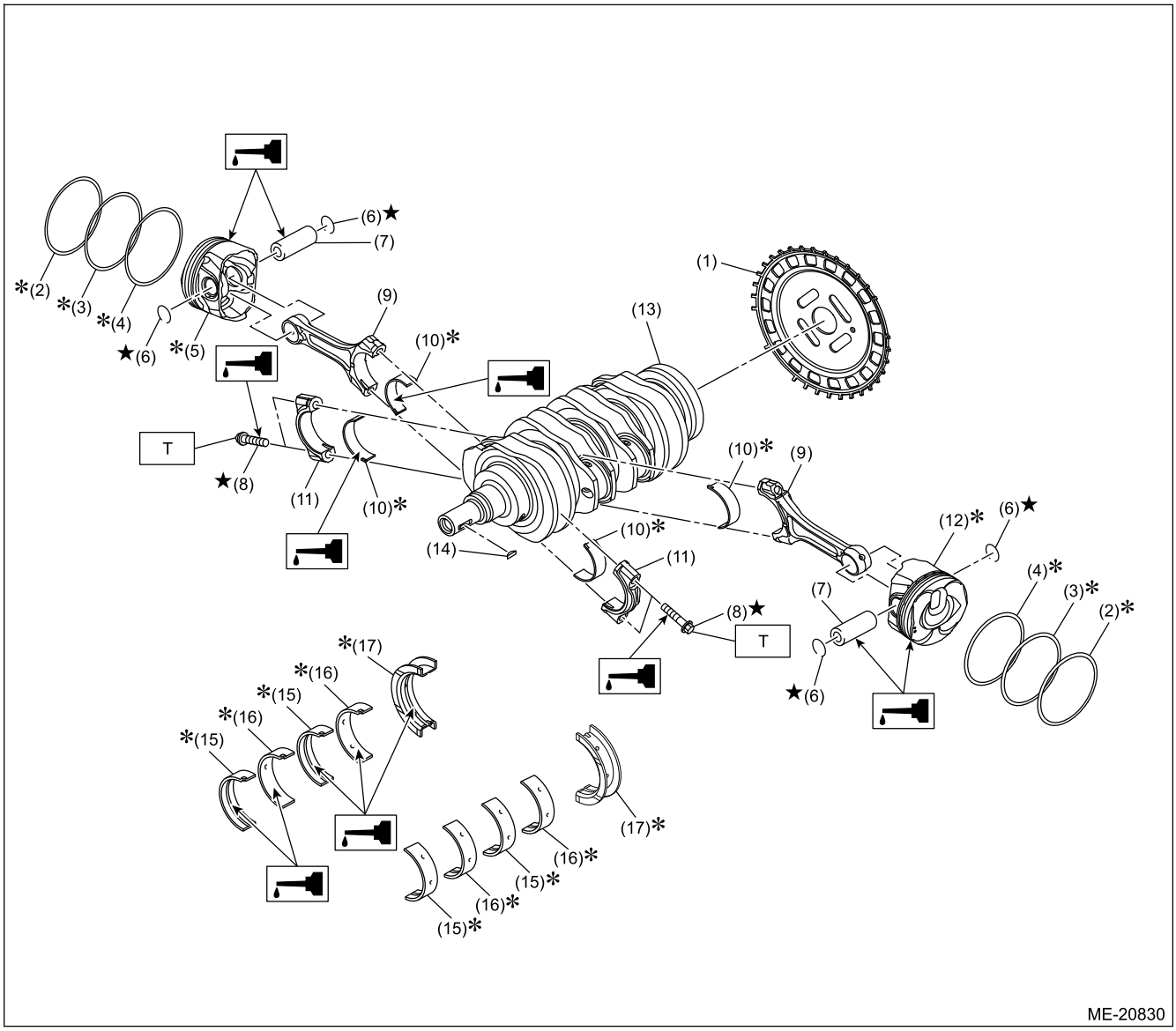
(3) Cylinder block RH

(4) Cylinder block LH

Tightening torque: N·m (kgf-m, ft-lb)

T: Ref. to MECHANICAL(H4DO)>Cylinder Block>INSTALLATION.

12. CRANKSHAFT AND PISTON



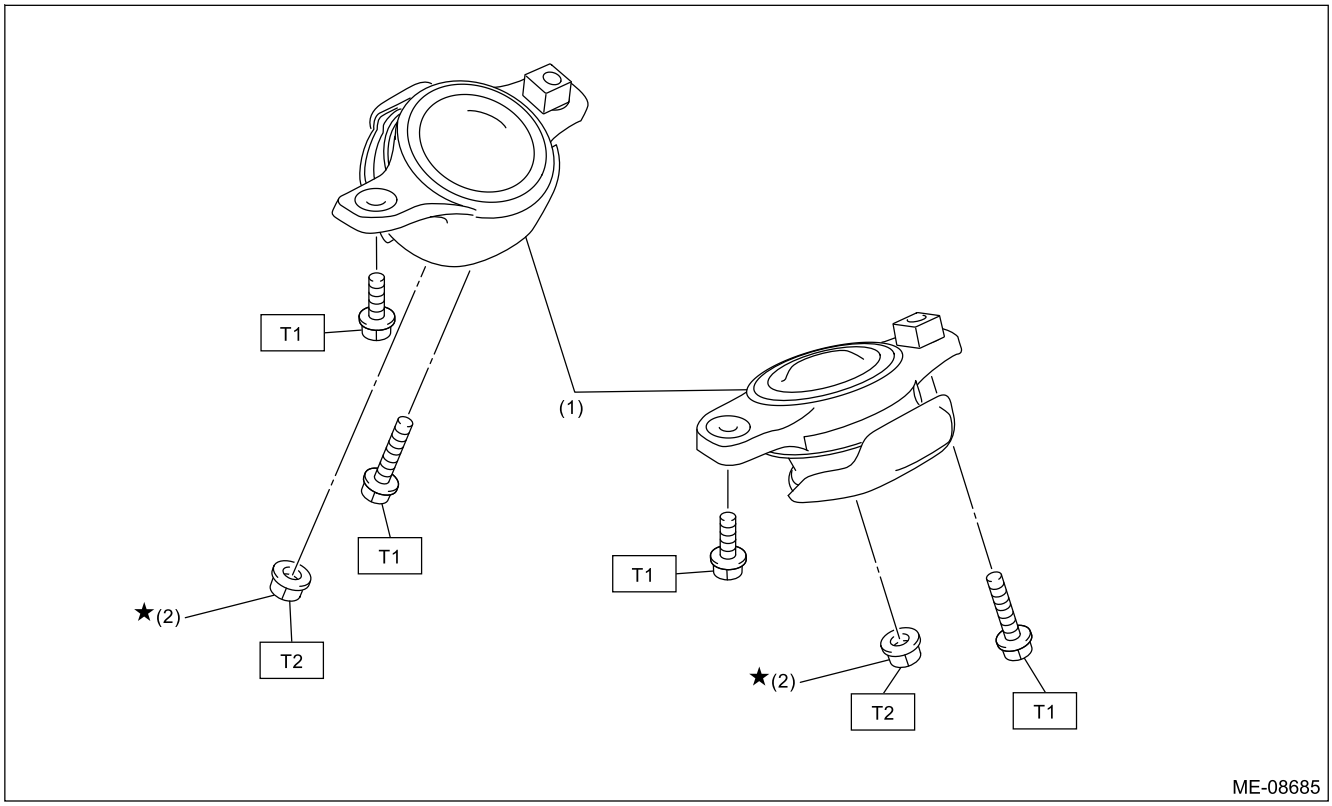
(1) Crankshaft position sensor plate
(2) Top ring
(3) Second ring
(4) Oil ring
(5) Piston RH
(6) Circlip
(7) Piston pin
(8) Connecting rod cap bolt
(9) Connecting rod
(10) Connecting rod bearing
(11) Connecting rod cap
(12) Piston LH
(13) Crankshaft
(14) Woodruff key
(15) Crankshaft bearing #1, #3
(16) Crankshaft bearing #2, #4
(17) Crankshaft bearing #5

Tightening torque: N·m (kgf-m, ft-lb)

T: Ref. to MECHANICAL(H4DO)>Cylinder Block>INSTALLATION.

13. ENGINE MOUNTING

- CVT model



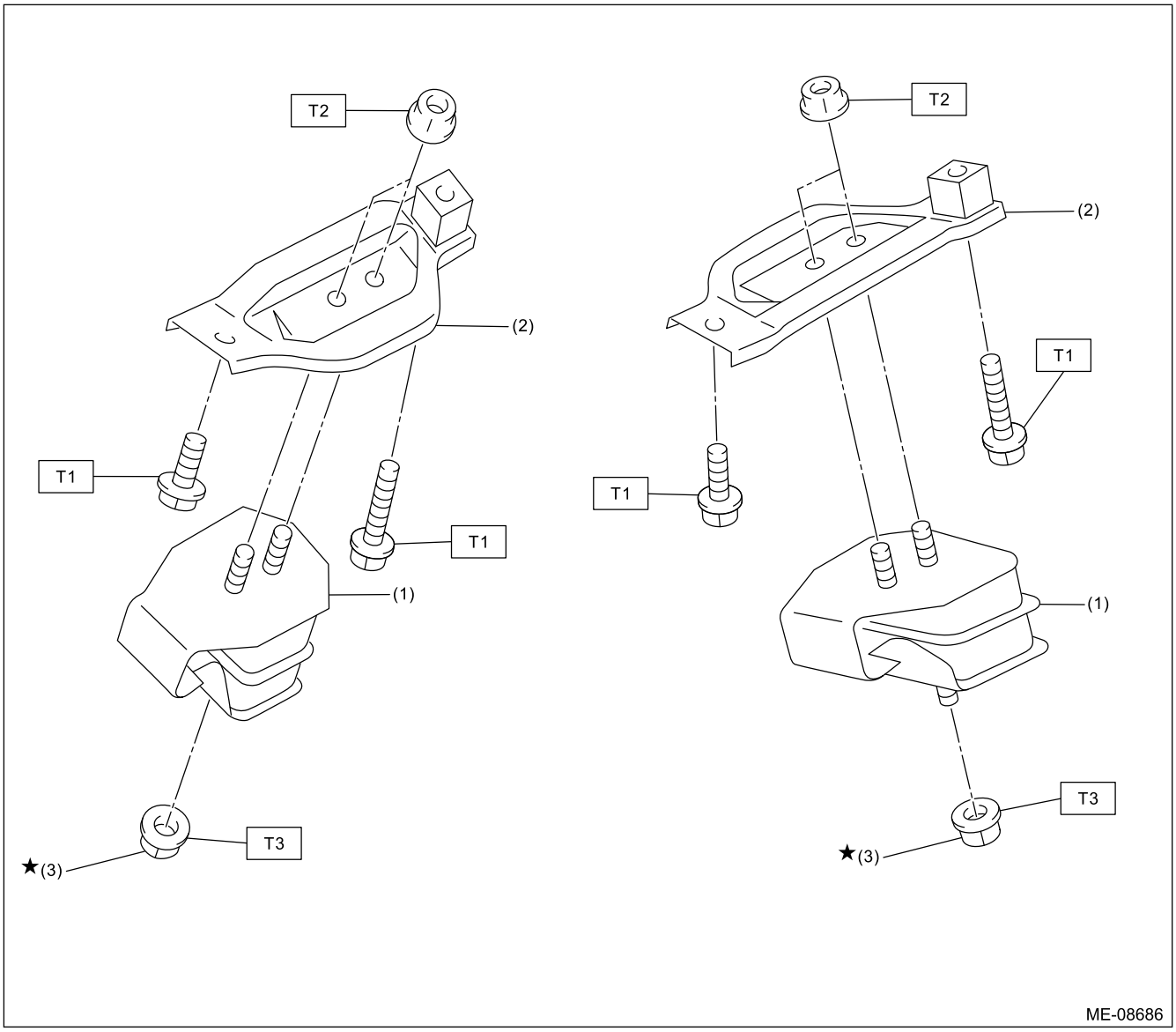
(1) Front cushion rubber (2) Nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 35 (3.6, 25.8)

T2: 90 (9.2, 66.4)

- MT model



(1) Front cushion rubber	(3) Nut	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Front engine mounting bracket		***T1: 35 (3.6, 25.8)***
		T2: 42 (4.3, 31.0)
		T3: 90 (9.2, 66.4)

MECHANICAL(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove or install the engine in an area where chain hoists, lifting devices, etc. are available for ready use. When lifting up the vehicle, make sure to support the vehicle at the jack-up points.
- Be careful not to let any oil or grease contact the clutch disc or flywheel.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Rotating parts and sliding parts such as piston, bearing and gear should be coated with oil when being assembled.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.
- Always use new application oil during work.

PREPARATION TOOL

1. SPECIAL TOOL

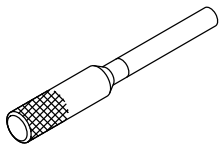
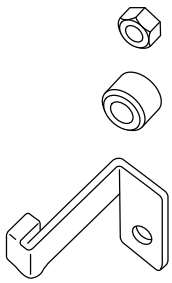
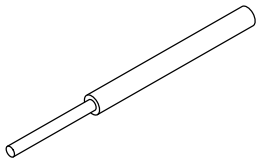
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499267300	499267300	STOPPER PIN	Used for removing and installing the V-belt tensioner assembly.
 ST-498277200	498277200	STOPPER SET	Used for preventing the torque converter from falling when removing and installing the engine. (CVT model)
 ST-499765700	499765700	VALVE GUIDE REMOVER AND INSTALLER	Used for removing and installing valve guide.

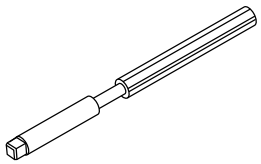
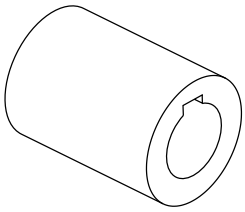
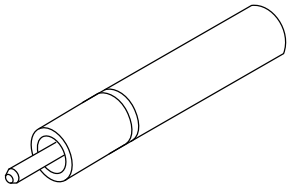
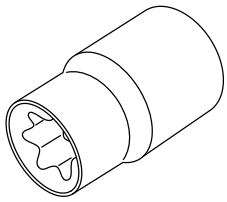
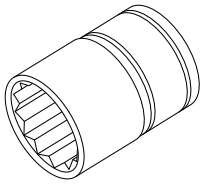
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499765900	499765900	VALVE GUIDE REAMER	Used for reaming valve guides.
 ST18252AA000	18252AA000	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 ST18261AA010	18261AA010	VALVE OIL SEAL GUIDE	Used for press-fitting of intake valve oil seals and exhaust valve oil seals.
 ST18270AA020	18270AA020	SOCKET	Used for removing and installing connecting rod.
 ST18270AA050	18270AA050 (Newly adopted tool)	SOCKET	Used for installing the drive plate mounting bolt. **Note:** • **This tool is made by KYOTO TOOL CO., LTD. (KTC). Item number: B3-14W** • **To make it easier to obtain, it has been specified as a special tool.**

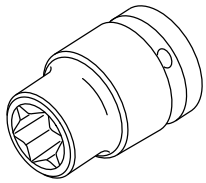
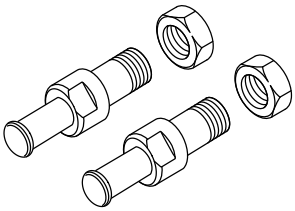
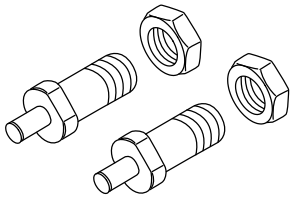
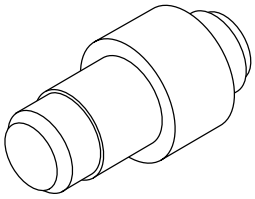
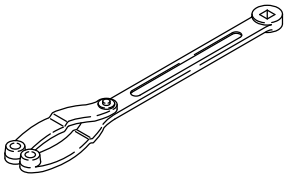
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18270KA010	18270KA010	SOCKET	Used for installing and removing cam sprocket.
 ST18334AA000	18334AA000	PULLEY WRENCH PIN SET	• Used for removing and installing the crank pulley. • Used together with PULLEY WRENCH (18355AA000).
 ST18334AA020	18334AA020	PULLEY WRENCH PIN SET	• Used for rotating the intake cam sprocket LH. • Used together with PULLEY WRENCH (18355AA000).
 ST18350AA000	18350AA000	CONNECTING ROD BUSHING REMOVER AND INSTALLER	Used for removing and installing the connecting rod bushing at connecting rod small end.
 ST18355AA000	18355AA000	PULLEY WRENCH	• Used for removing and installing the crank pulley. • Used for rotating the intake cam sprocket LH. • Used together with PULLEY WRENCH PIN SET (18334AA000) or PULLEY WRENCH PIN SET (18334AA020).

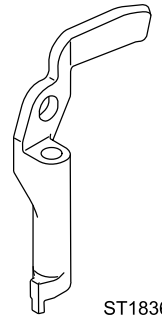
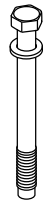
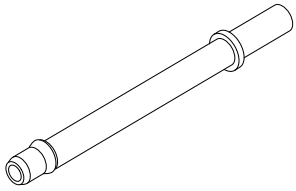
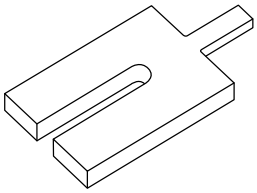
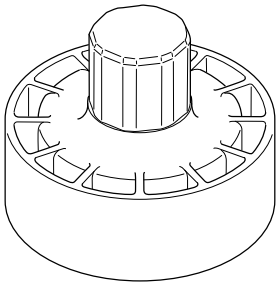
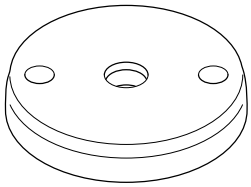
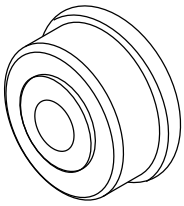
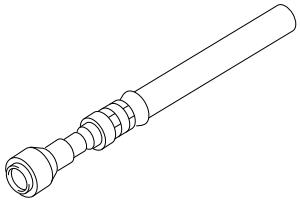
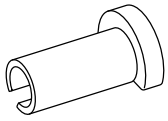
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18360AA040	18360AA040	HANGER	• Used for removing and installing engine. • Used for removing and installing rocker cover. • Used together with BOLT (18363AA050).
 ST18363AA050	18363AA050	BOLT	• Used for removing and installing engine. • Used for removing and installing rocker cover. • Used together with HANGER (18360AA040).
 ST18471AA000	18471AA000	FUEL PIPE ADAPTER	Used for inspecting the fuel pressure.
 ST18632AA030	18632AA030	STAND ASSY	Used for removing and installing rocker cover.
 ST18657AA030	18657AA030	OIL SEAL INSTALLER	• Used for installing the rear oil seal of engine. • Used together with OIL SEAL GUIDE (18671AA020).

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18671AA020	18671AA020	OIL SEAL GUIDE	• Used for installing the rear oil seal of engine. • Used together with OIL SEAL INSTALLER (18657AA030).
 ST41399FG020	41399FG020	SPECIAL TOOL B	Used for installing the front oil seal of engine.
 ST42075AG690	42075AG690	FUEL HOSE	Used for inspecting the fuel pressure. **Note:** **This is the SUBARU genuine part.**
 ST42099AE000	42099AE000	QUICK CONNECTOR RELEASE	Used for removing FUEL HOSE (42075AG690). **Note:** **FUEL HOSE (42075AG690) is used for checking the fuel pressure.**
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Compression gauge	Used for measuring compression.
Vacuum gauge	Used for measuring intake manifold vacuum.
Oil pressure gauge	Used for measuring engine oil pressure.
Fuel pressure gauge	Used for measuring fuel pressure.
Thickness gauge	Used for various inspections.
Engine stand	Used for disassembling and assembling engine.
Angle gauge	Used for angle tightening.
Valve spring compressor	Used for removing and installing valve spring.
Piston ring compressor	Used for installing the piston into the cylinder block.
DST-i	Used together with Subaru Select Monitor 4.

INSPECTION

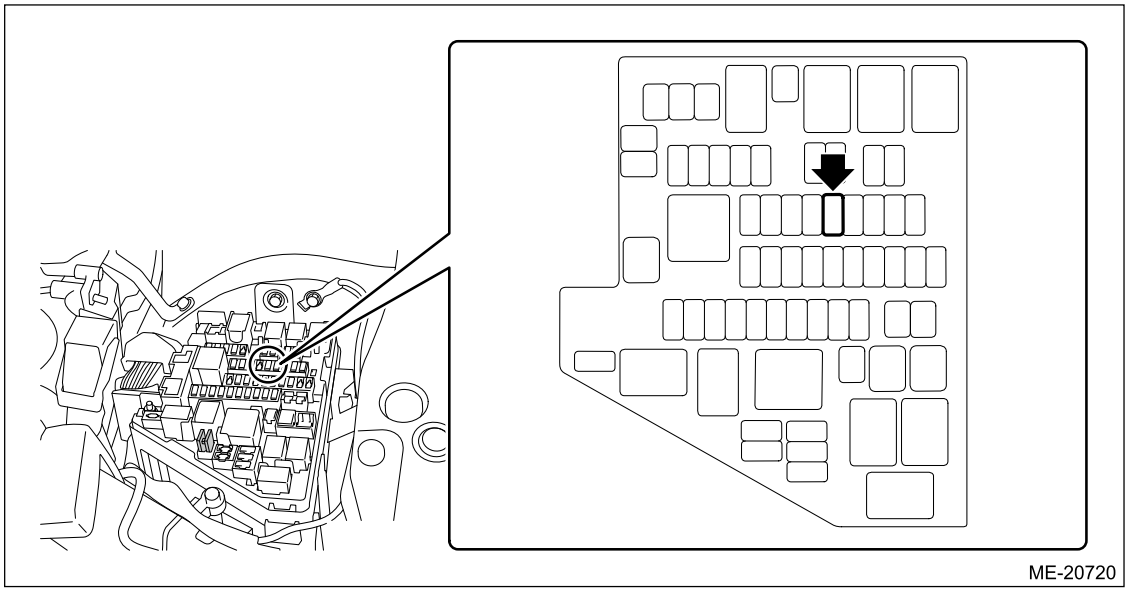
Caution:

After warming-up, engine becomes very hot. Be careful not to burn yourself during measurement.

Note:

- **Before checking the compression pressure, the compression condition of each cylinder can be confirmed as a guide by using the compression measurement mode in Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test>OPERATION.**
- **In the compression measurement mode, the compression condition is judged by each cylinder speed. The high speed cylinder has low compression pressure and low speed cylinder has high compression pressure.**

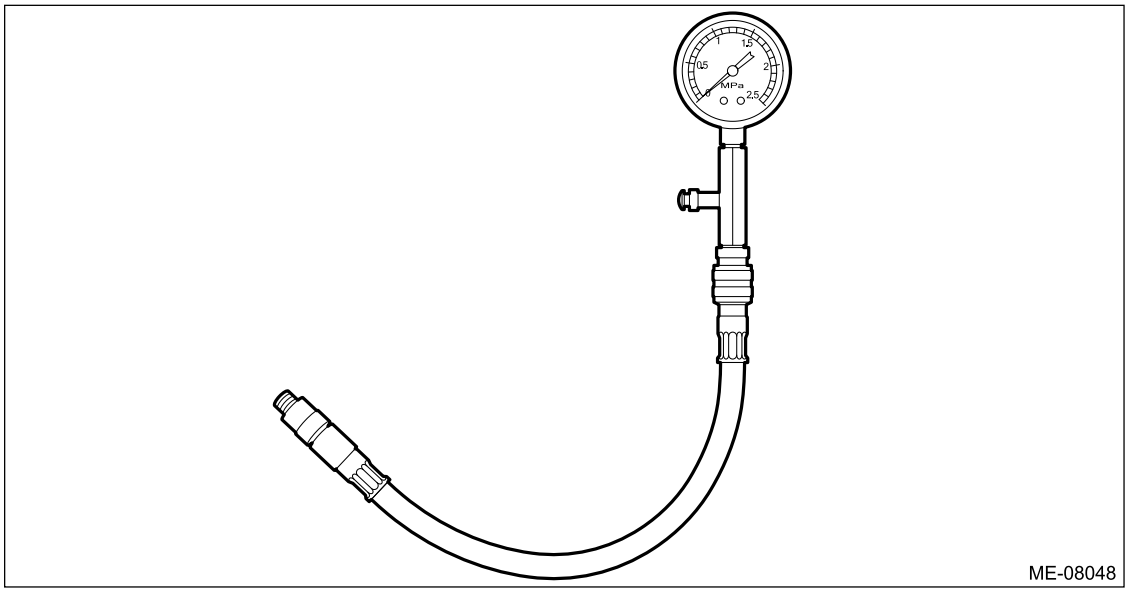
1. After warming-up the engine, turn the ignition switch to OFF.
2. Make sure that the battery is fully charged.
3. Check the starter motor for satisfactory performance and operation.
4. Remove the fuse of fuel pump from main fuse box.



5. Start the engine and run it until it stalls.
6. After the engine stalls, crank it for five more seconds.
7. Turn the ignition switch to OFF.
8. Remove all spark plugs. Ref. to IGNITION(H4DO)>Spark Plug>REMOVAL.
9. Install the compression gauge to the spark plug hole.

   Note:

   When using a screw-in type compression gauge, the screw should be less than 25 mm (0.98 in) long.



10. Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.

11. Turn the ignition switch to ON.

12. Depress the accelerator pedal to full throttle.

13. Crank the engine by starter motor and read the value when the needle of the compression gauge becomes stable.

Note:

- **Perform at least two measurements per cylinder, and make sure that the values are correct.**
- **If the compression pressure is out of the standard value, check or adjust the pistons, valves and cylinders.**

Compression pressure (at 200 — 300 r/min):

Standard

1,050 — 1,400 kPa (11 — 14 kg/cm^2, 152 — 203 psi)

Difference between cylinders

100 kPa (1 kg/cm^2, 14 psi) or less

14. After inspection, install the related parts in the reverse order of removal.

Note:

When compression pressure is checked, the malfunction indicator light illuminates and DTCs may be stored in ECM. When the malfunction indicator light has illuminated, perform the Clear Memory Mode. Ref. to COMMON (DIAGNOSTICS)>Clear memory>OPERATION.

INSPECTION

1. Before checking the idle speed, check the following item:
   (1) Check the air cleaner element is free from clogging, ignition timing is correct, spark plugs are in good condition, and hoses are connected properly.
   (2) Check the malfunction indicator light does not illuminate.
2. Warm up the engine.
3. Read the engine idle speed using Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor>OPERATION.

   Note:
   - **Idle speed cannot be adjusted manually, because the idle speed is automatically adjusted.**
   - **If idle speed is out of the standard value, refer to the General Diagnosis Table under "Engine Control System". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.**

   (1) Check the idle speed when no-loaded. (Headlight, blower fan, rear defroster, radiator fan, A/C A/C and etc. are OFF)

   Idle speed (No load, and for CVT model, select lever in "P" or "N" range. For MT model, gear shift lever in neutral position.)

   Standard

   775±100 r/min (CVT model)
   700±100 r/min (MT model)

   (2) Check the idle speed when loaded. (Turn the A/C switch to ON and operate the compressor for at least one minute before measurement.)

   Idle speed (A/C on, and for CVT model, select lever in "P" or "N" range. For MT model, gear shift lever in neutral position.)

   Standard

   800 — 900±50 r/min

INSPECTION

Caution:
After warming-up, engine becomes very hot. Be careful not to burn yourself at measurement.

1. Before checking the ignition timing, check the following item:
   (1) Check the air cleaner element is free from clogging, spark plugs are in good condition, and hoses are connected properly.
   (2) Check the malfunction indicator light does not illuminate.
2. Warm up the engine.
3. Read the ignition timing using Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor>OPERATION.

   Note:
   If ignition timing is out of the standard value, check the ignition control system. Refer to "Engine Control System". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.

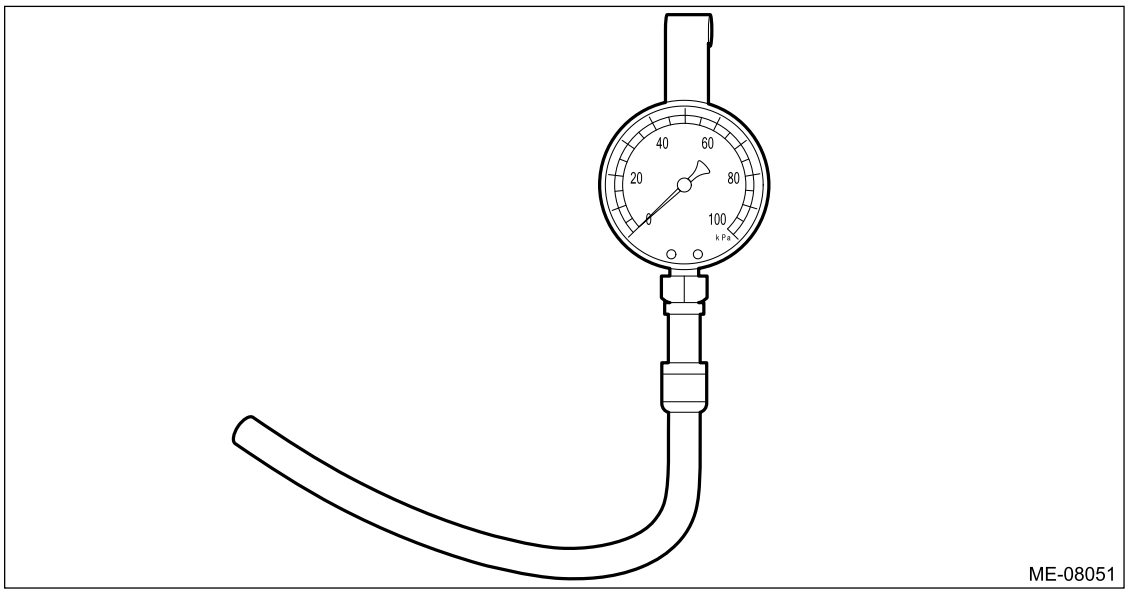
   Ignition timing [BTDC/{r/min}]:
   Standard
   6°±10°/775 (CVT model)
   6°±10°/700 (MT model)

INSPECTION

1. Warm up the engine.
2. Disconnect the brake booster vacuum hose from the intake manifold assembly.



3. Connect the vacuum gauge to the installation area for the brake booster vacuum hose of the intake manifold assembly.



4. Keep the engine at idle speed and read the vacuum gauge indication.

Note:

Condition of engine inside can be diagnosed by observing the behavior of the vacuum gauge needle as described in table below.

Intake manifold vacuum (A/C is at idling, A/C OFF):

Standard

−60.0 kPa (−450 mmHg, −17.72inHg) or more

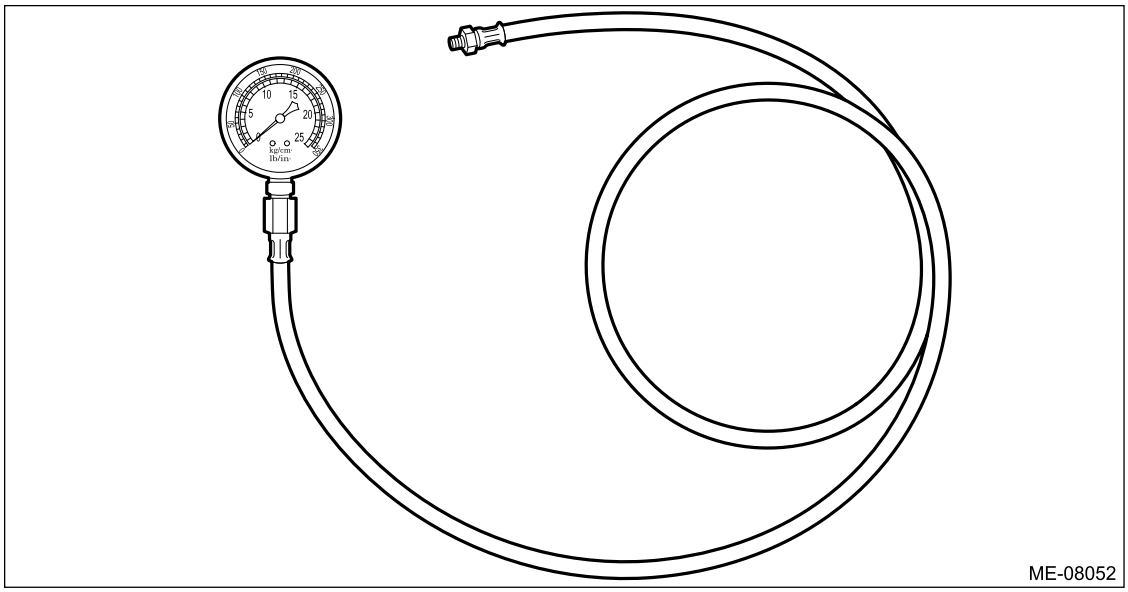
Diagnosis of engine condition by inspection of intake manifold vacuum	
Vacuum gauge needle behavior	**Possible engine condition**

Diagnosis of engine condition by inspection of intake manifold vacuum	
Vacuum gauge needle behavior	**Possible engine condition**
1. Needle is steady but lower than standard value. This tendency becomes more evident as engine temperature rises.	Leakage around intake manifold gasket, disconnection or damage of vacuum hose
2. Needle intermittently drops below the standard value.	Leakage around cylinder
3. Needle drops suddenly and intermittently from the standard value.	Sticky valve
4. When engine speed is gradually increased, needle begins to vibrate rapidly at certain speed, and then vibration increases as engine speed increases.	Weak or broken valve springs
5. Needle vibrates above and below the standard value in narrow range.	Defective ignition system

5. After inspection, install the related parts in the reverse order of removal.

INSPECTION

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the oil pressure switch. Ref. to LUBRICATION(H4DO)>Oil Pressure Switch>REMOVAL.
3. Install the oil pressure gauge to the installation area for the oil pressure switch of the chain cover.



4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Start the engine, and check the oil pressure.

Note:

- **Standard value is based on an engine oil temperature of 80°C (176°F).**
- **If the oil pressure is out of the specification, check oil pump, oil filter and lubrication line. Ref. to LUBRICATION(H4DO)>Engine Lubrication System Trouble in General>INSPECTION.**
- **If the oil pressure warning light is ON and oil pressure is within standard, check the oil pressure switch. Ref. to LUBRICATION(H4DO)>Engine Lubrication System Trouble in General>INSPECTION.**

Engine oil pressure:

CVT model

While idling (no load and select lever in "P" or "N" range)

Standard

56 kPa (0.6 kg/cm^2, 8 psi) or more

At 3,000 r/min

Standard

230 kPa (2.3 kg/cm^2, 33 psi) or more

MT model

While idling (no load and gear shift lever in neutral position)

Standard

48 kPa (0.5 kg/cm^2, 7 psi) or more

At 3,000 r/min

Standard

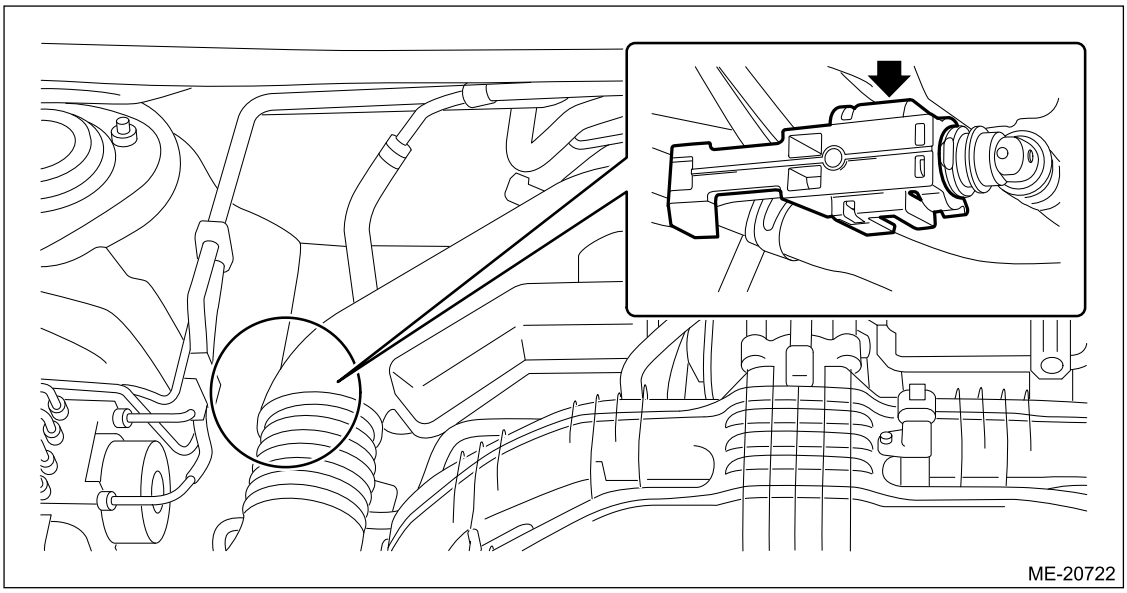
230 kPa (2.3 kg/cm^2, 33 psi) or more

6. After inspection, install the related parts in the reverse order of removal.

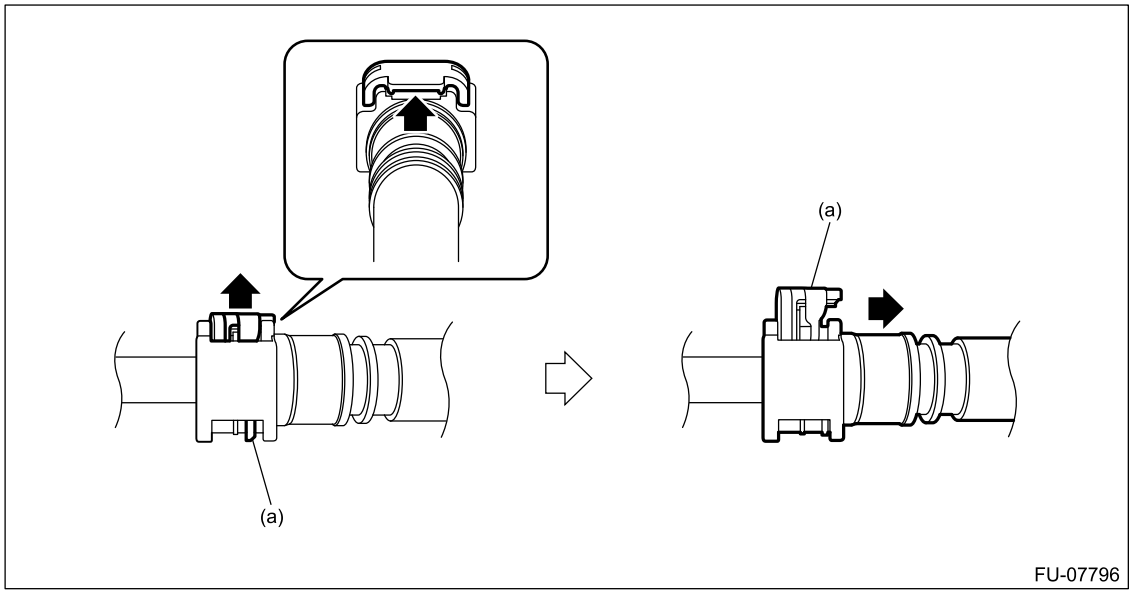
INSPECTION

1. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
2. Open the fuel filler lid and remove the fuel filler cap.
   Note:
   This operation is required to release the inner pressure of the fuel tank.
3. Disconnect the fuel delivery tube from the fuel pipe assembly, and connect the fuel pressure gauge.
   Caution:
   - **Be careful not to spill fuel.**
   - **Catch the fuel from the tubes using a container or cloth.**

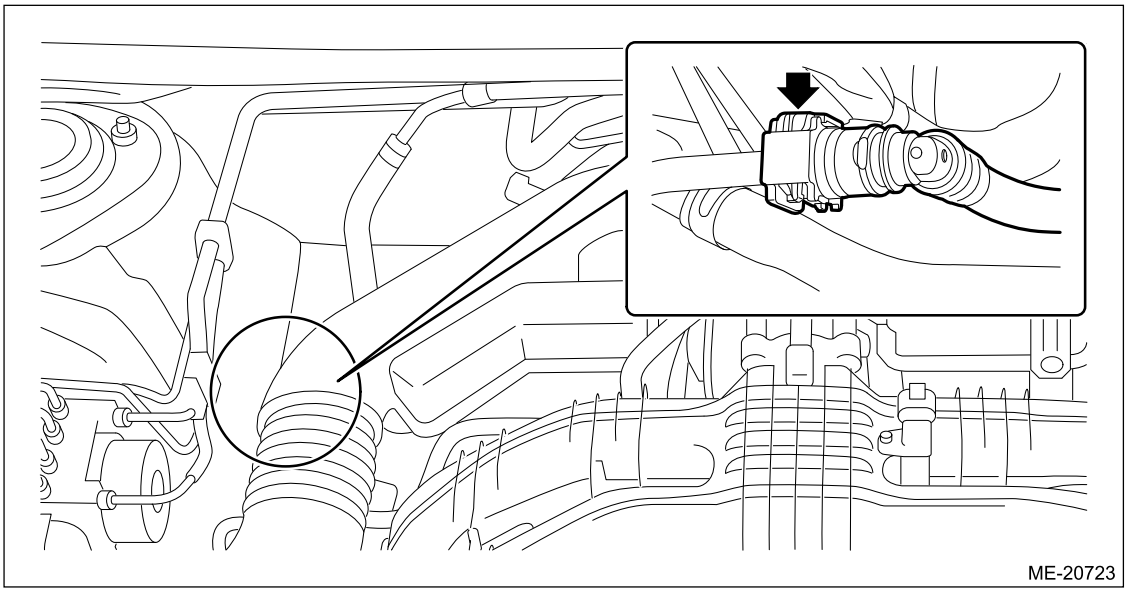
   (1) Remove the fuel delivery tube clamp from the fuel delivery tube.



   (2) Disconnect the quick connector on the fuel delivery tube from the fuel pipe assembly.
   Note:
   Disconnect the quick connector as shown in the figure.



(a) Slider



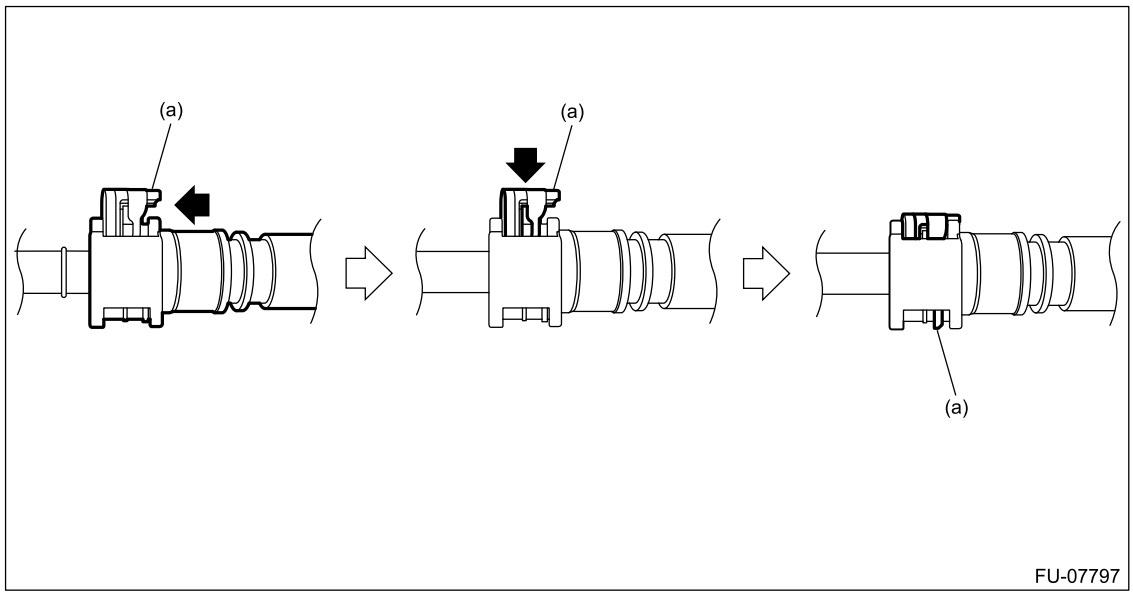
(3)Connect the fuel pressure gauge with ST1 and ST2.

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector with slider, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check that the quick connector is securely connected.**

Note:

- **ST1 is a SUBARU genuine part.**
- **When connecting the ST2 to the quick connector on the fuel delivery tube, connect it as shown in the figure.**

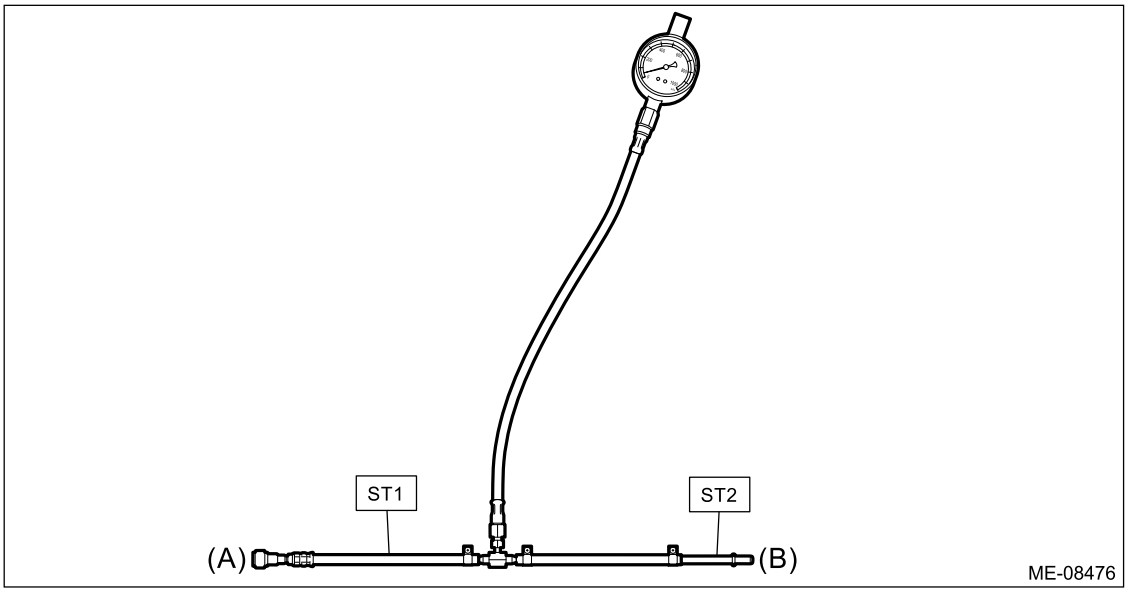


(a) Slider

Preparation tool:

ST1: FUEL HOSE (42075AG690)

ST2: FUEL PIPE ADAPTER (18471AA000)



(A) Fuel pipe ASSY side (B) Fuel delivery tube side

4. Start the engine.
5. Check the fuel pressure after warming up the engine.

Note:

- **The fuel pressure gauge readings becomes 10 — 20 kPa (0.1 — 0.2 kg/cm^2, 1 — 3 psi) higher than standard values during high-altitude operations.**
- **Check or replace the fuel pump and fuel delivery line if the fuel pressure is out of the standard.**

Fuel pressure:

Standard

350 — 450 kPa (3.5 — 4.6 kg/cm^2, 50 — 66 psi)

6. After inspection, install the related parts in the reverse order of removal.

Caution:

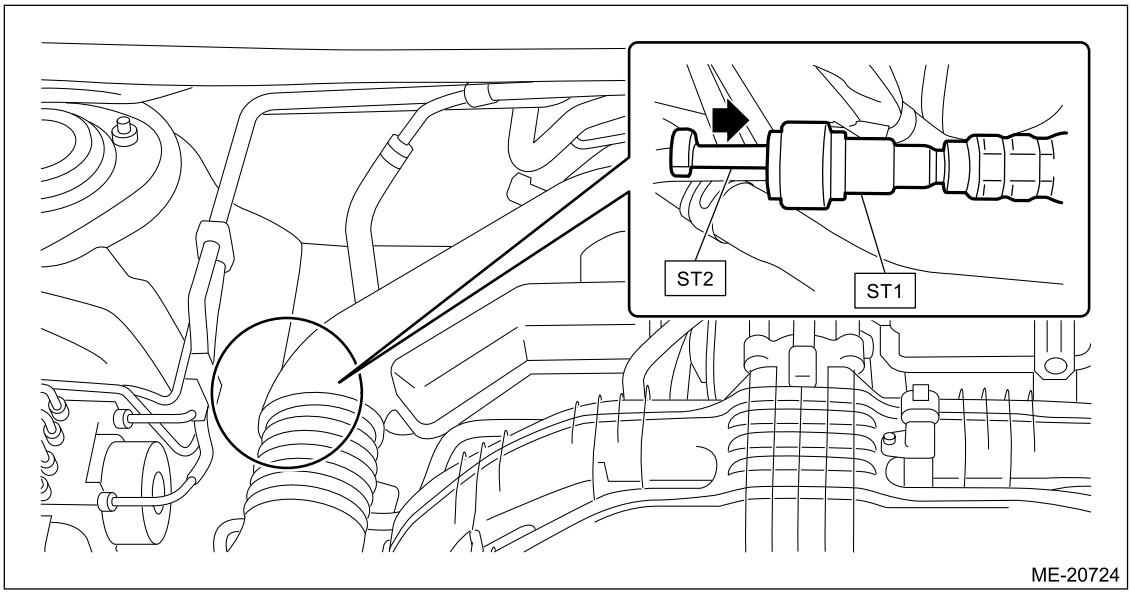
- **Before removing the fuel pressure gauge, release the fuel pressure.**
- **Be careful not to spill fuel.**
- **Catch the fuel from hoses and tubes using a container or cloth.**
- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector with slider, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check that the quick connector is securely connected.**

Note:

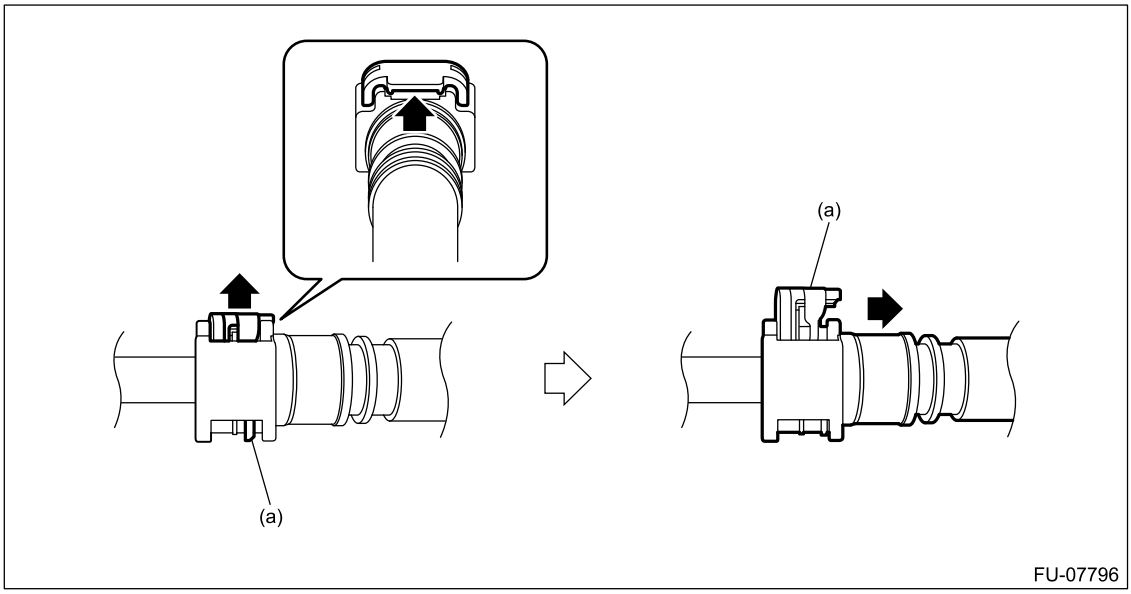
- **When disconnecting the ST1, install the ST2 to the fuel pipe assembly, and press the ST2 in the direction of arrow to disconnect the quick connector on the ST1.**

  Preparation tool:

  ST2: QUICK CONNECTOR RELEASE (42099AE000)

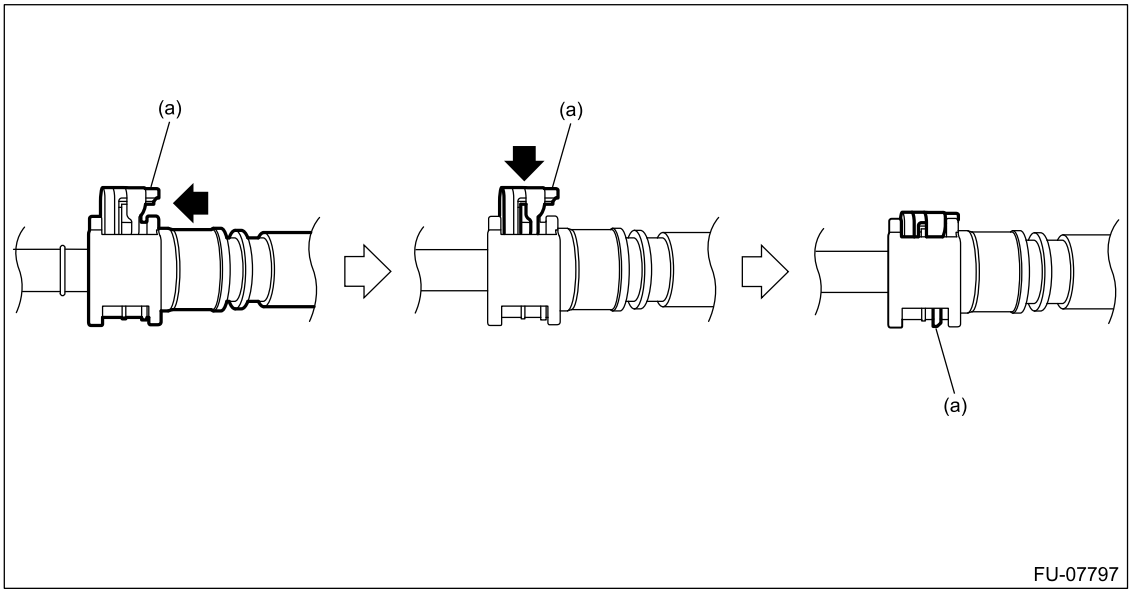


- **Disconnect the quick connector on the fuel delivery tube as shown in the figure.**



(a) Slider

- **Connect the quick connector on the fuel delivery tube as shown in the figure.**



(a) Slider

INSPECTION

1. WHEN TIMING CHAIN ASSEMBLY IS NOT REMOVED

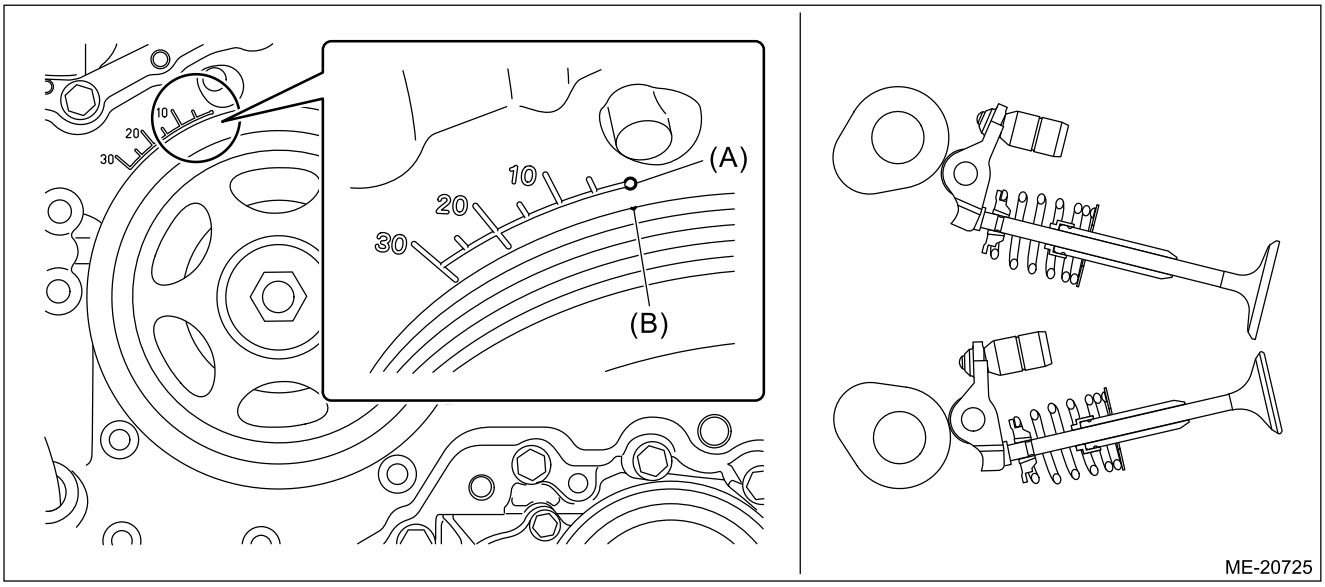
Caution:

When working on the vehicle, if engine oil is spilt onto the exhaust pipe, wipe it off with cloth to avoid emission of smoke or causing a fire.

Note:

- **Inspection of cam clearance should be performed while engine is cold.**
- **If the engine is removed from vehicle, performing the steps 1) to 2) is not necessary.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL.
4. When inspecting #1 and #3 cylinders
   (1) Remove the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER RH.
   Note:
   When working on the vehicle, place a suitable container under the vehicle.
   (2) Set #1 cylinder piston to top dead center of compression stroke by rotating the crank pulley clockwise using the socket wrench.
   Note:
   When the timing mark (B) on crank pulley is aligned to the 0° in timing gauge (A) on chain cover as shown in the figure, the #1 cylinder piston is located at TDC of compression stroke if the intake camshaft and exhaust camshaft does not depress the #1 cylinder intake side roller rocker arm (intake valve) and exhaust side roller rocker arm (exhaust valve). If roller rocker arm (valve) is depressed, turn the crank pulley by 360° in order to make #1 cylinder piston at TDC of compression stroke.



(3) Check the cam clearance for #1 cylinder intake, #1 cylinder exhaust and #3 cylinder exhaust.

Note:

- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Intake

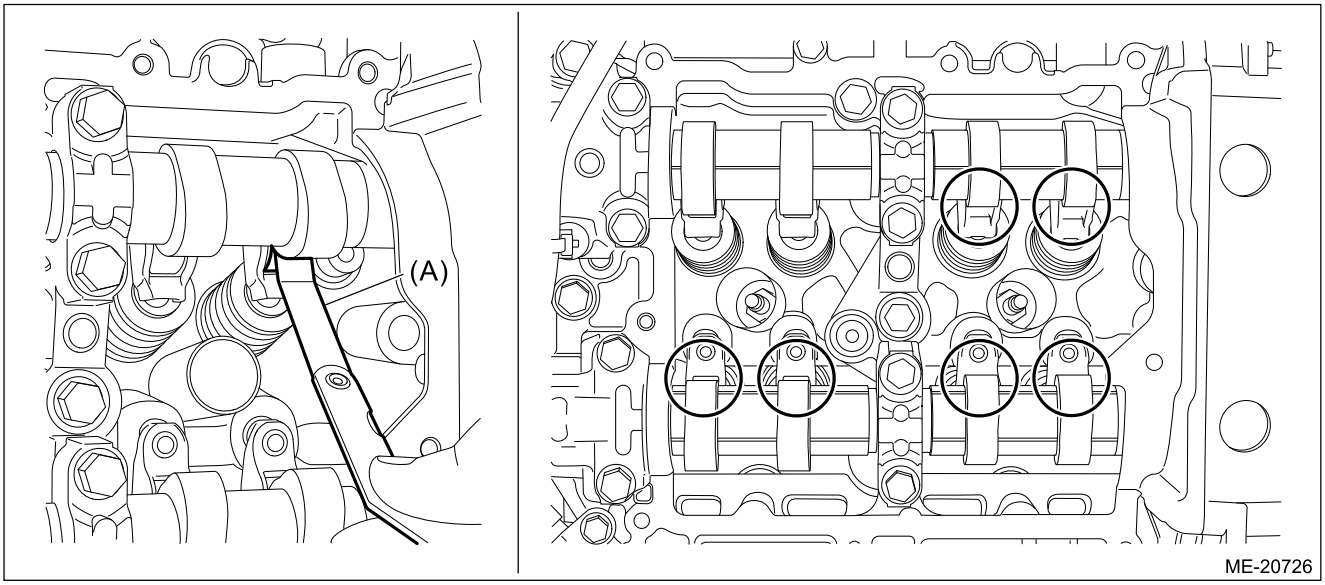
Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

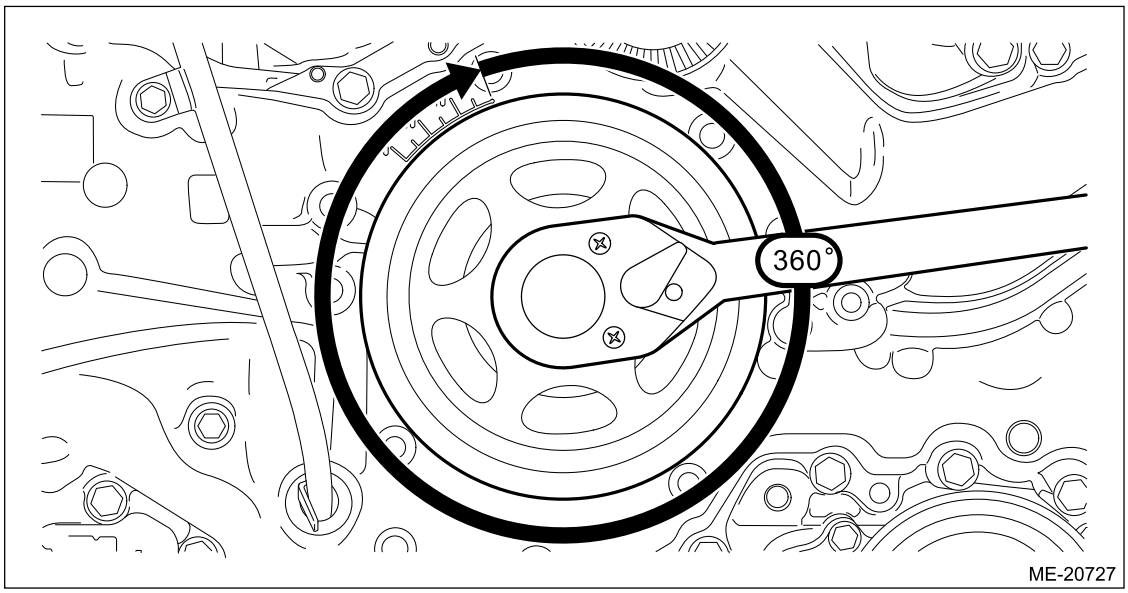
Exhaust

Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)



(4) Turn the crank pulley by 360°.



(5) Check the cam clearance of #3 cylinder intake.

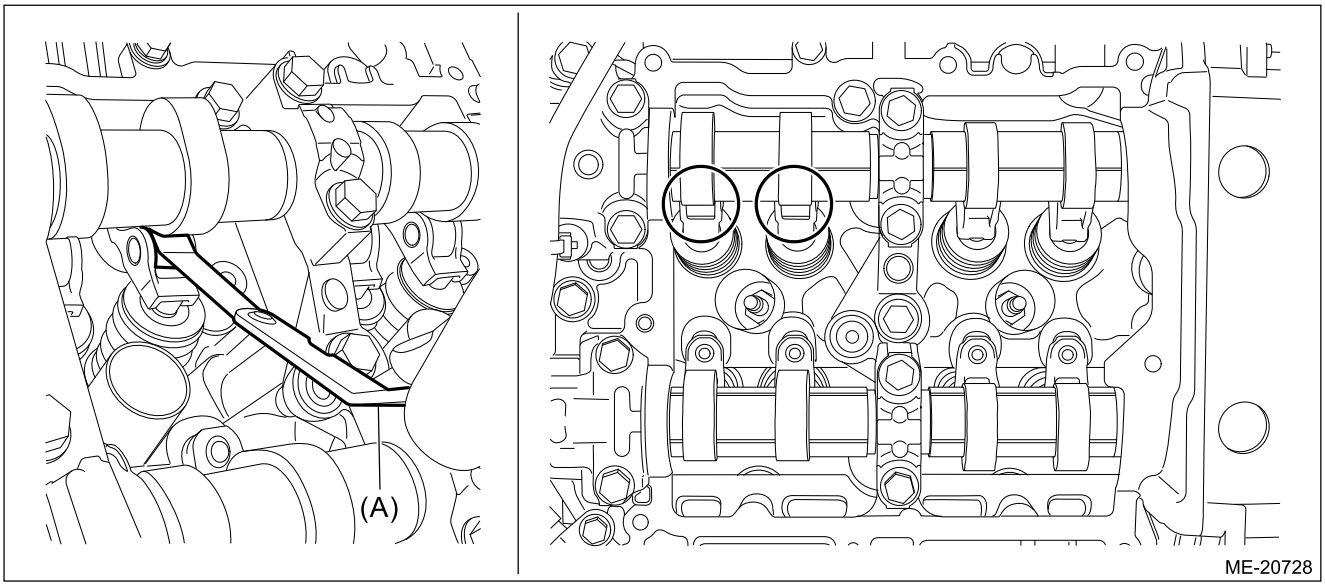
Note:

- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)



5. When inspecting #2 and #4 cylinders

(1) Remove the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER LH.

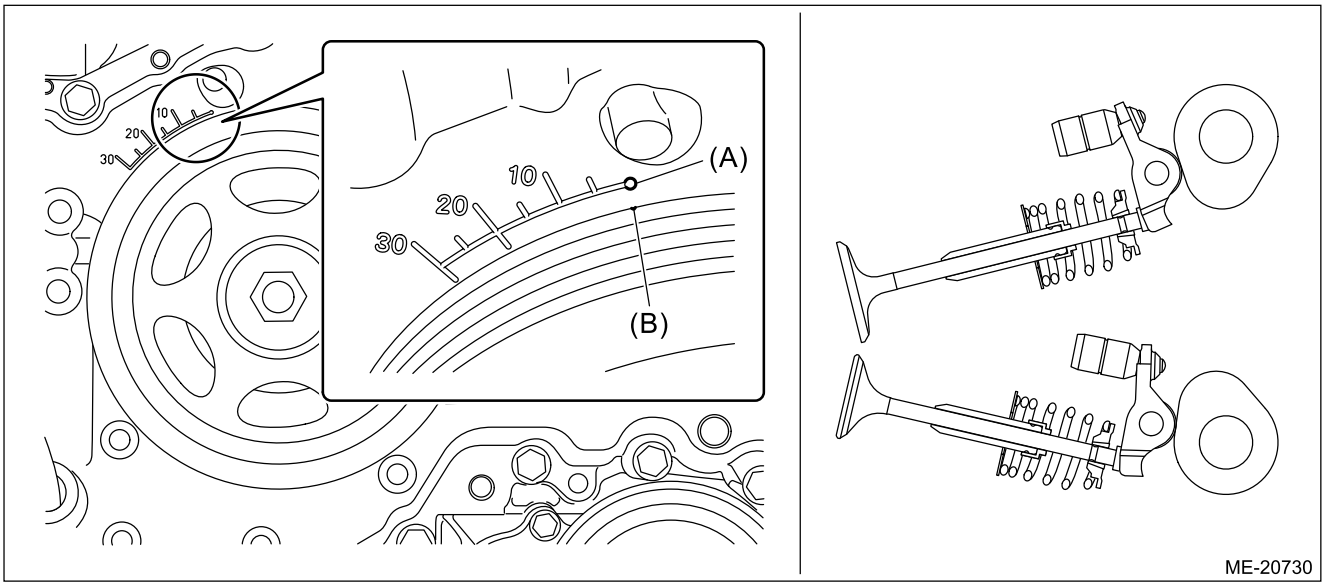
Note:

When working on the vehicle, place a suitable container under the vehicle.

(2) Set #2 cylinder piston to top dead center of compression stroke by rotating the crank pulley clockwise using the socket wrench.

Note:

When the timing mark (B) on crank pulley is aligned to the 0° in timing gauge (A) on chain cover as shown in the figure, the #2 cylinder piston is located at TDC of compression stroke if the intake camshaft and exhaust camshaft does not depress the #2 cylinder intake side roller rocker arm (intake valve) and exhaust side roller rocker arm (exhaust valve). If roller rocker arm (valve) is depressed, turn the crank pulley by 360° in order to make #2 cylinder piston at TDC of compression stroke.



(3) Check the cam clearance for #2 cylinder intake, #2 cylinder exhaust and #4 cylinder exhaust.

Note:

- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Intake

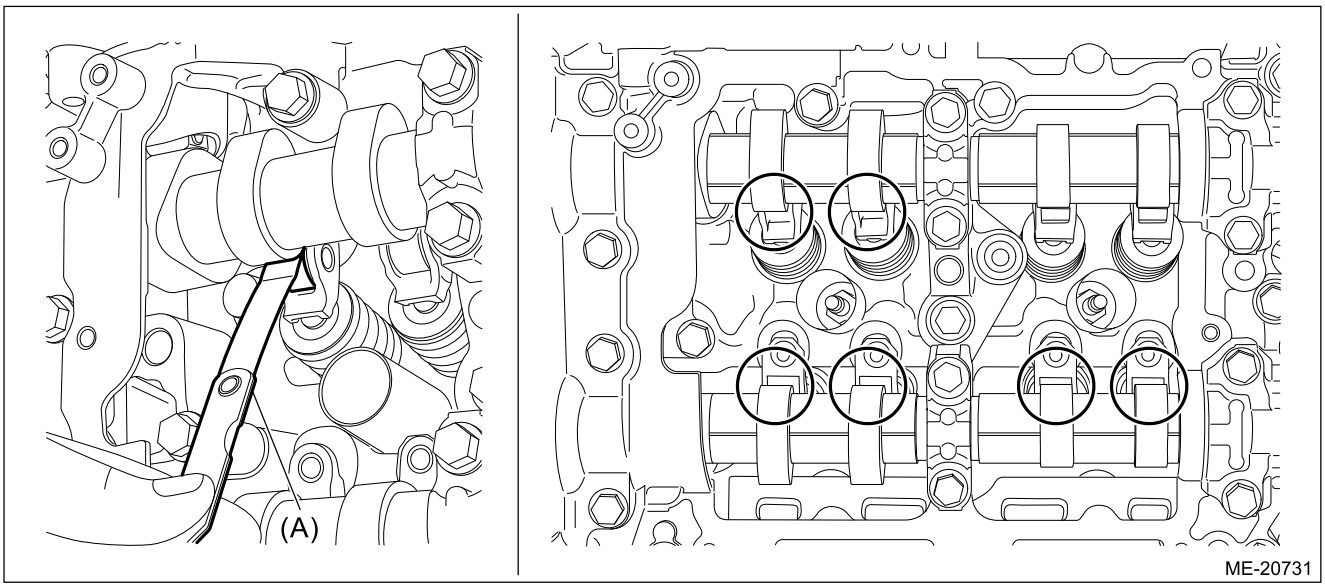
Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

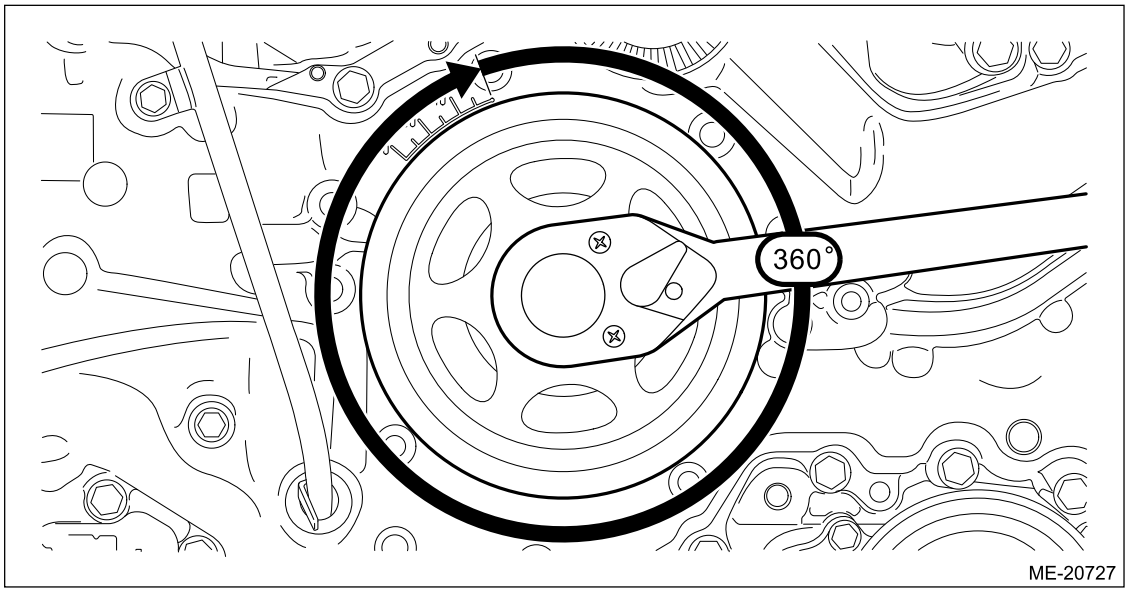
Exhaust

Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)



(4) Turn the crank pulley by 360°.



(5) Check the cam clearance of #4 cylinder intake.

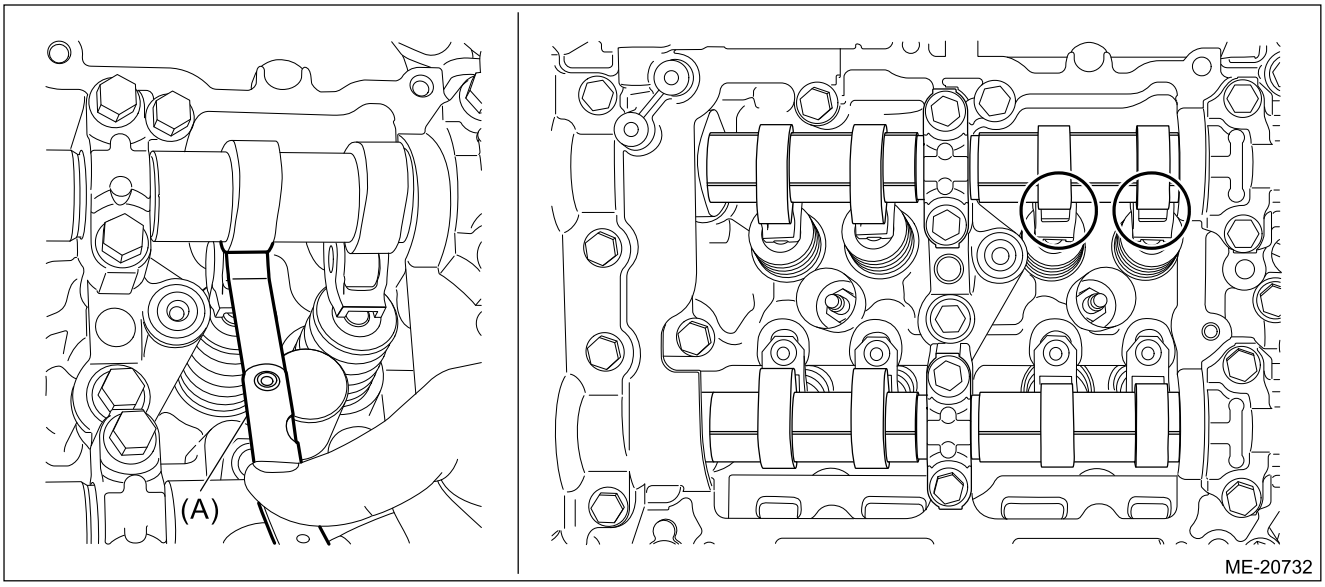
Note:

- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)



6. If necessary, adjust the cam clearance. Ref. to MECHANICAL(H4DO)>Cam Clearance>ADJUSTMENT.

7. After inspection, install the related parts in the reverse order of removal.

2. WHEN TIMING CHAIN ASSEMBLY IS REMOVED

Note:

Inspection of cam clearance should be performed while engine is cold.

1. When inspecting #1 and #3 cylinders

(1) Remove the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL >

ROCKER COVER RH.

Note:

When working on the vehicle, place a suitable container under the vehicle.

(2) Check the #1 and #3 cylinder cam clearance.

Caution:

Intake and exhaust camshafts can be independently rotated with the timing chain removed. When the intake valve and exhaust valve lift at the same time, the valve heads contact each other and valve stem may bend. Do not turn it to the outside of range of zero lift (cam base circle position) (in range where it can be turned lightly by hand).

Note:

- **For cam clearance inspection, adjust the cam base circle position so that the thickness gauge (A) can be inserted easily by hand turning the camshaft (cam sprocket) to be measured.**
- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Intake

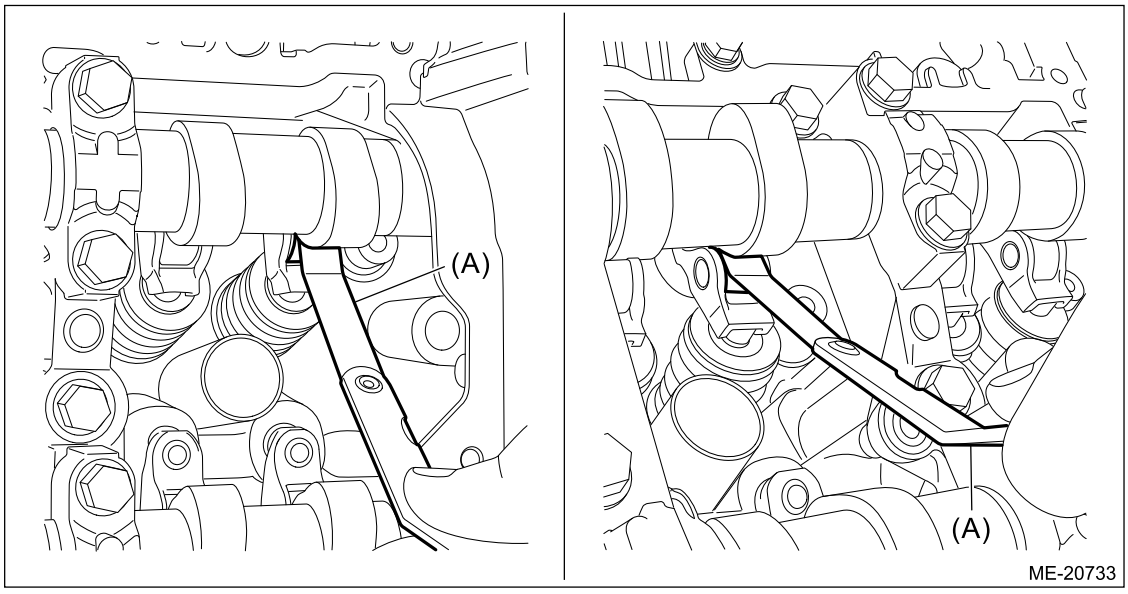
Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

Exhaust

Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)



2. When inspecting #2 and #4 cylinders

(1) Remove the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER LH.

Note:

When working on the vehicle, place a suitable container under the vehicle.

(2) Check the #2 and #4 cylinder cam clearance.

Caution:

Intake and exhaust camshafts can be independently rotated with the timing chain removed. When the intake valve and exhaust valve lift at the same time, the valve heads contact each other and valve stem may bend. Do not turn it to the outside of range of zero lift (cam base circle position) (in range where it can be turned lightly by hand).

Note:

- **Because the intake camshaft is pressurized by the high-pressure fuel pump, it is almost impossible to turn the intake camshaft lightly by hand. Since the zero-lift position is adjusted at the removal of the timing chain LH, measure the cam clearance at that position.**
- **For cam clearance inspection on exhaust side, adjust the cam base circle position so that the thickness gauge (A) can be inserted easily by hand turning the exhaust camshaft (cam sprocket).**
- **Measure the roller surface of cam base circle and roller rocker arm using thickness gauge (A).**
- **If the measured value is out of standard, take notes of the value in order to adjust the cam clearance later on.**

Cam clearance:

Intake

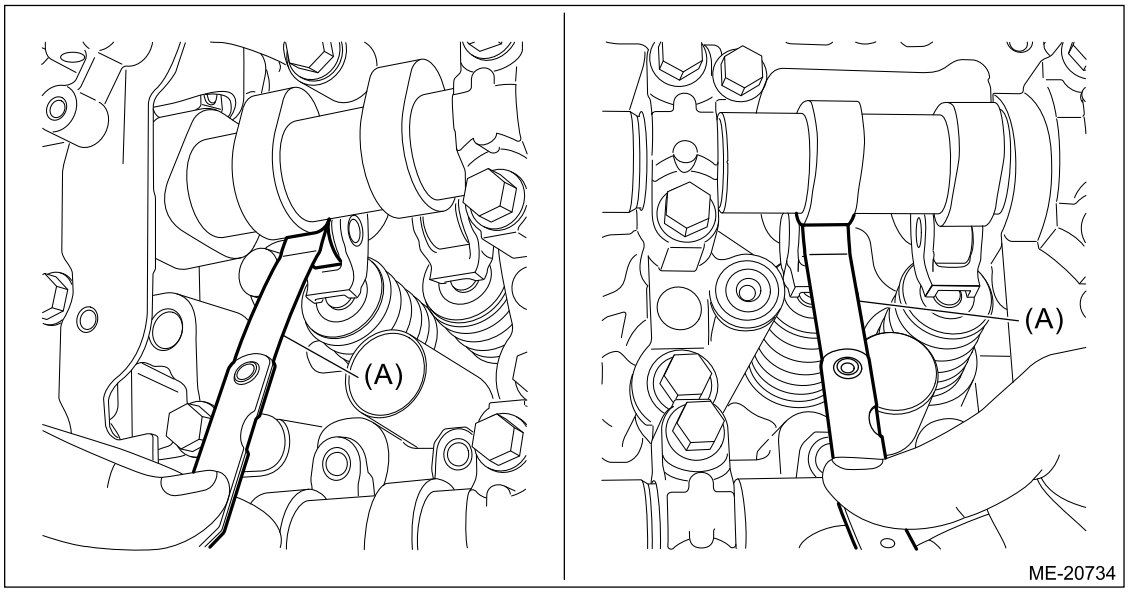
Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

Exhaust

Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)



3. If necessary, adjust the cam clearance. Ref. to MECHANICAL(H4DO)>Cam Clearance>ADJUSTMENT.
4. After inspection, install the related parts in the reverse order of removal.

MECHANICAL(H4DO) > Cam Clearance

ADJUSTMENT

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.

3. When adjusting #1 and #3 cylinders

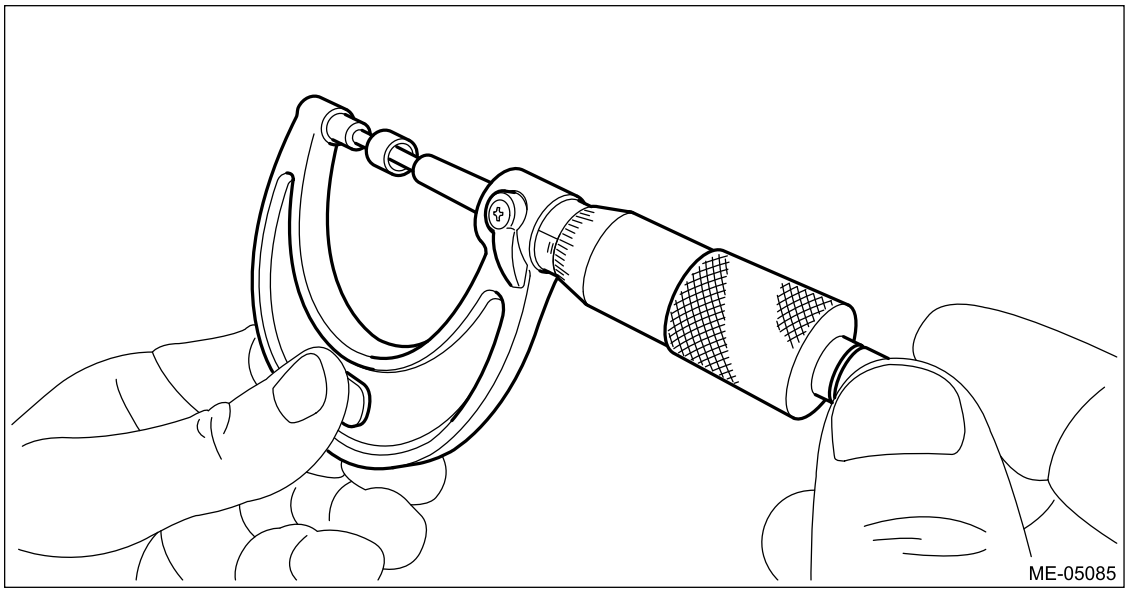
(1) Remove the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN RH.

(2) Remove the cam carrier RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER RH.

(3) Measure the thickness of valve shim using micrometer.

Note:

Measurement should be performed at a temperature of 20°C (68°F).



(4) Select a valve shim of suitable thickness using the measured cam clearance and valve shim thickness.

Note:

Use a new valve shim.

Intake side: S = T+1.69 × (V−0.13 mm (0.0051 in)) Exhaust side: S = T+1.87 × (V−0.22 mm (0.0087 in))
S: Valve shim thickness required V: Measured cam clearance T: Current valve shim thickness

(5) Install the cam carrier RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER RH.

(6) Check all the cam clearance of RH side at this time. If the cam clearance is not within the standard value, repeat the procedure over again from step (2).

Note:

When the removing/installing of cam carrier RH has been performed, cam clearance may be outside the standard value. Checking of all cam clearance of RH side is necessary. Refer to INSPECTION of "Cam Clearance" for the cam clearance inspection. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.

Cam clearance:

Intake

Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

Exhaust

Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)

4. When adjusting #2 and #4 cylinders

(1) Remove the timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN LH.

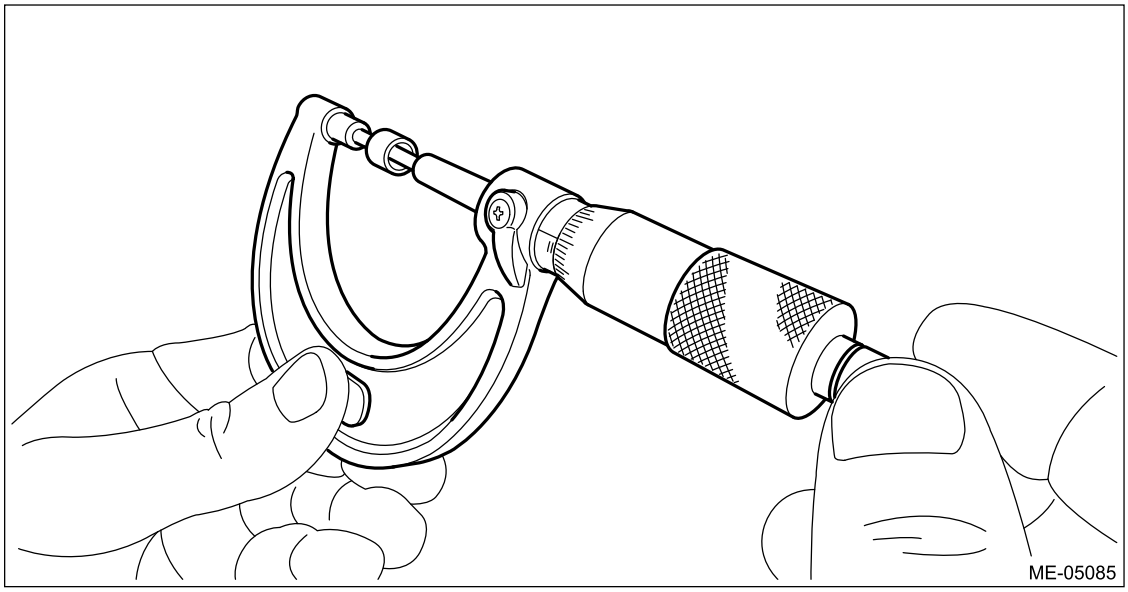
(2) Remove the intake manifold. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.

(3) Remove the cam carrier LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER LH.

(4) Measure the thickness of valve shim using micrometer.

Note:

Measurement should be performed at a temperature of 20°C (68°F).



(5) Select a valve shim of suitable thickness using the measured cam clearance and valve shim thickness.

Note:

Use a new valve shim.

Intake side: S = T+1.69 × (V−0.13 mm (0.0051 in))
Exhaust side: S = T+1.87 × (V−0.22 mm (0.0087 in))
S: Valve shim thickness required
V: Measured cam clearance
T: Current valve shim thickness

(6) Install the cam carrier LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER LH.

(7) Check all the cam clearance of LH side at this time. If the cam clearance is not within the standard value, repeat the procedure over again from step (3).

Note:

When the removing/installing of cam carrier LH has been performed, cam clearance may be outside the standard value. Checking of all cam clearance of LH side is necessary. Refer to INSPECTION of "Cam Clearance" for the cam clearance inspection. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.

Cam clearance:

Intake

Standard

$0.13^{+0.02}_{-0.04}$ mm ($0.0051^{+0.0008}_{-0.0016}$ in)

Exhaust

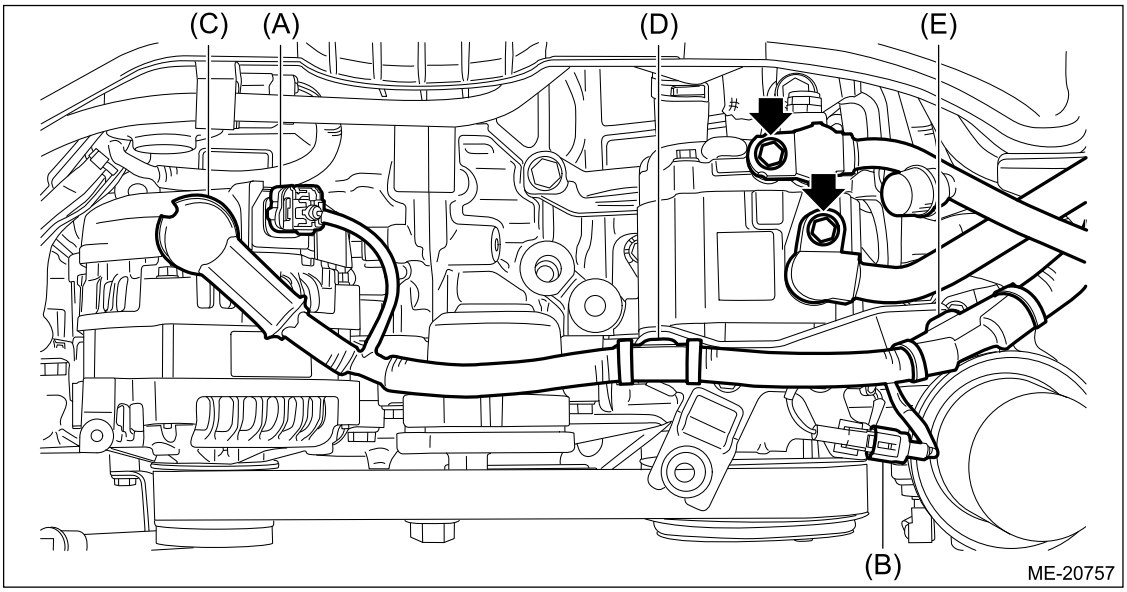
Standard

$0.22^{+0.02}_{-0.04}$ mm ($0.0087^{+0.0008}_{-0.0016}$ in)

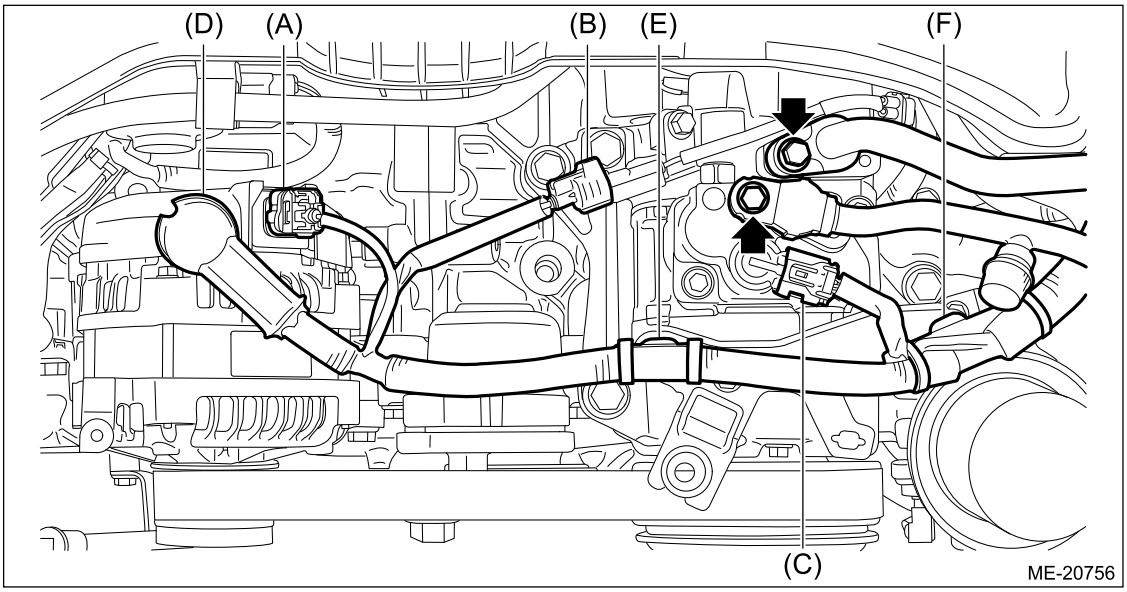
5. After adjustment, install the related parts in the reverse order of removal.

REMOVAL

1. Remove the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>DISASSEMBLY.
2. Fully open the front hood. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
3. Collect the refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
4. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
5. Open the fuel filler lid and remove the fuel filler cap.
   Note:
   This operation is required to release the inner pressure of the fuel tank.
6. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Remove the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.
8. Remove the air cleaner case (rear). Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>REMOVAL.
9. Remove the radiator. Ref. to COOLING(H4DO)>Radiator>REMOVAL.
10. Disconnect the connector (A), connector (B) and terminal (C). (Fixed capacity A/C model)
11. Remove the clip (D) and clip (E) that secure the battery cable. (Fixed capacity A/C model)
12. Disconnect the hose-pressure suction and the hose-pressure discharge from the A/C compressor. (Fixed capacity A/C model) Ref. to AIR CONDITIONER>Hose and Pipe>REMOVAL.



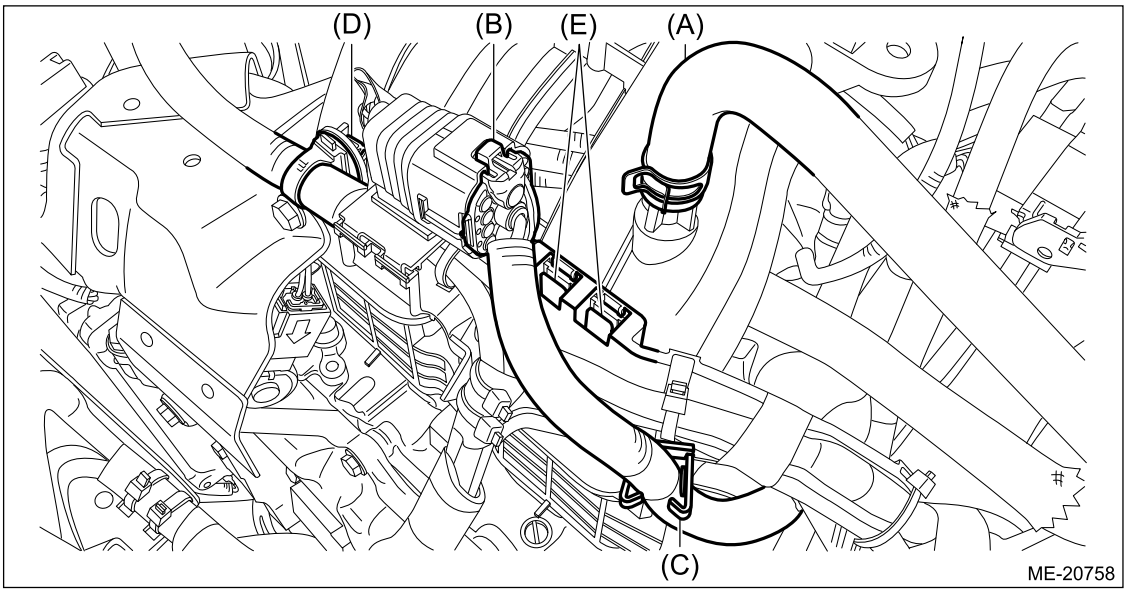
13. Disconnect the connector (A), connector (B), connector (C) and terminal (D). (Variable capacity A/C model)
14. Remove the clip (E) and clip (F) that secure the battery cable. (Variable capacity A/C model)
15. Disconnect the hose-pressure suction and the hose-pressure discharge from the A/C compressor. (Variable capacity A/C model) Ref. to AIR CONDITIONER>Hose and Pipe>REMOVAL.



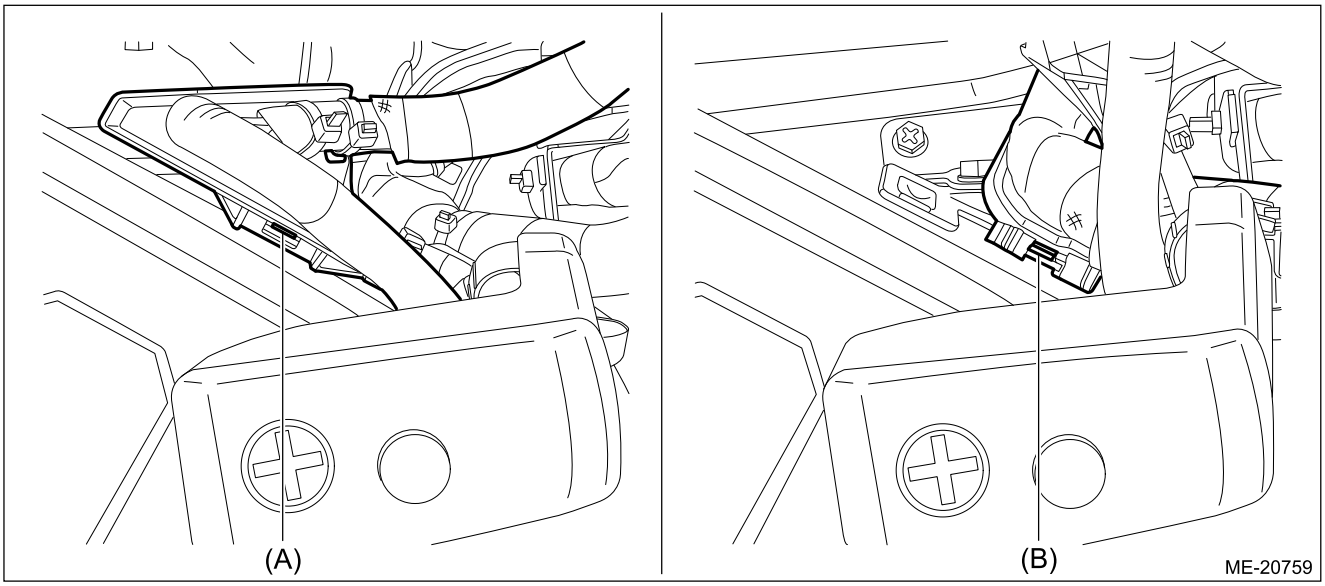
16. Disconnect the brake booster vacuum hose (A).

17. Disconnect the connector (B), and remove the engine wiring harness from the clip (C).

18. Remove the clip (D) and clip (E) from the intake manifold assembly.

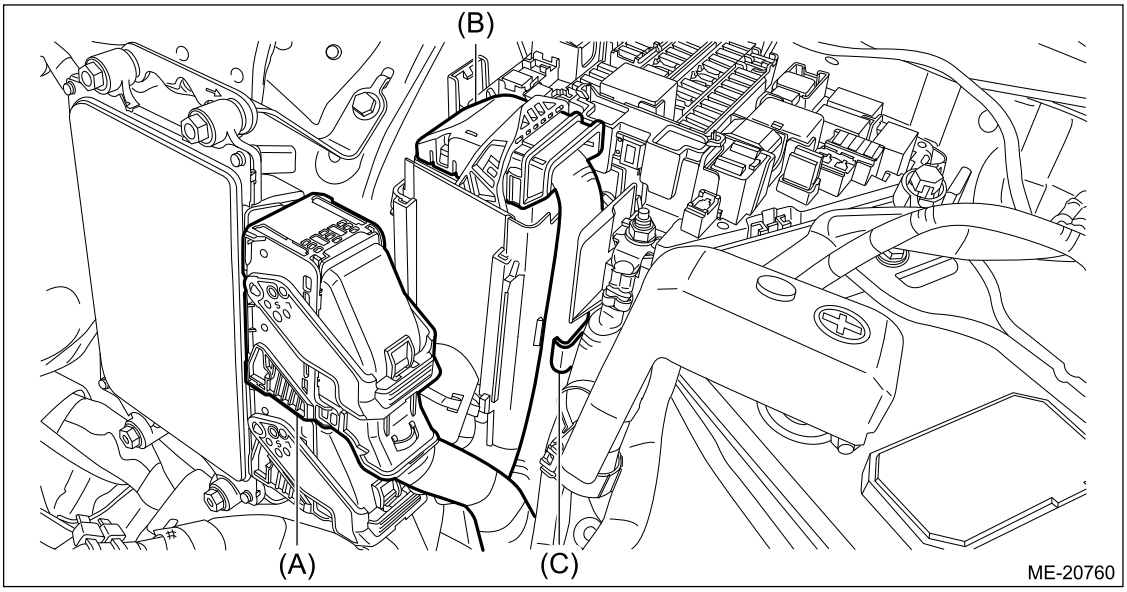


19. Disengage the claw (A) which holds the battery cable to the bracket, and disengage the claw (B) which holds the engine wiring harness.

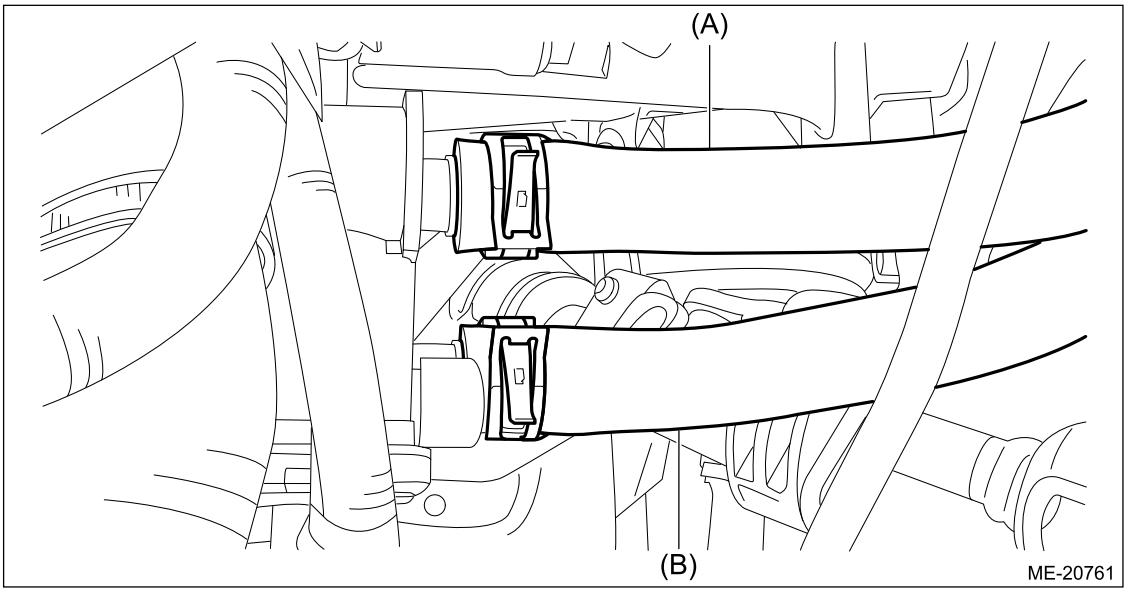


20. Disconnect the connector (A) from the ECM, and disconnect the connector (B) from the main fuse box.

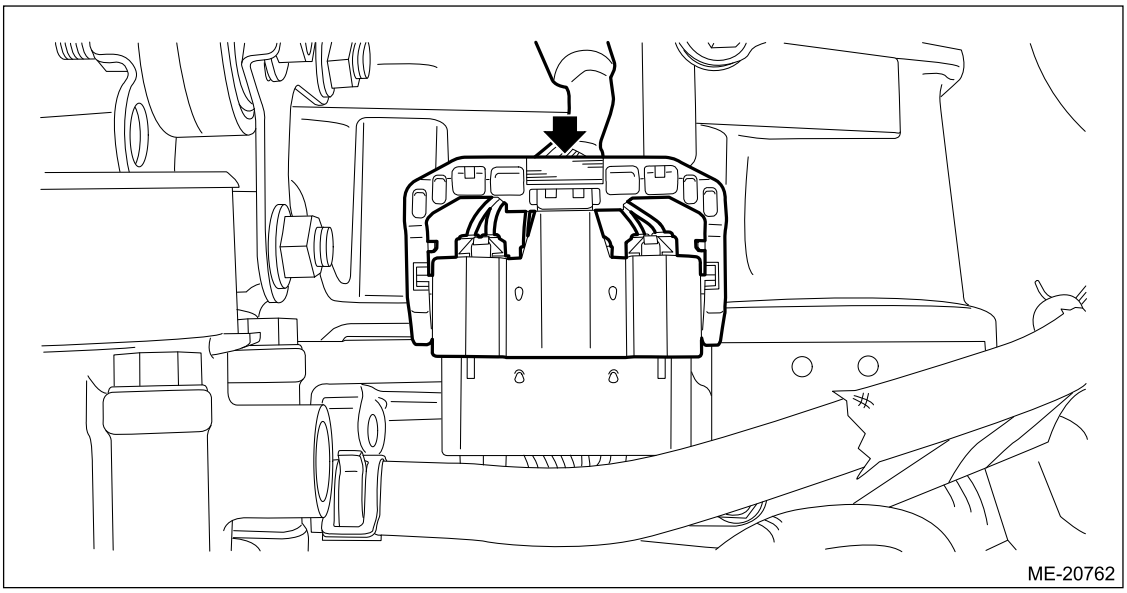
21. Remove the engine wiring harness from the clip (C), and place it aside so that it does not interfere with work.



22. Disconnect the heater inlet hose (A) and the heater outlet hose (B).



23. Disconnect the transmission harness connector from the engine wiring harness. (CVT model)

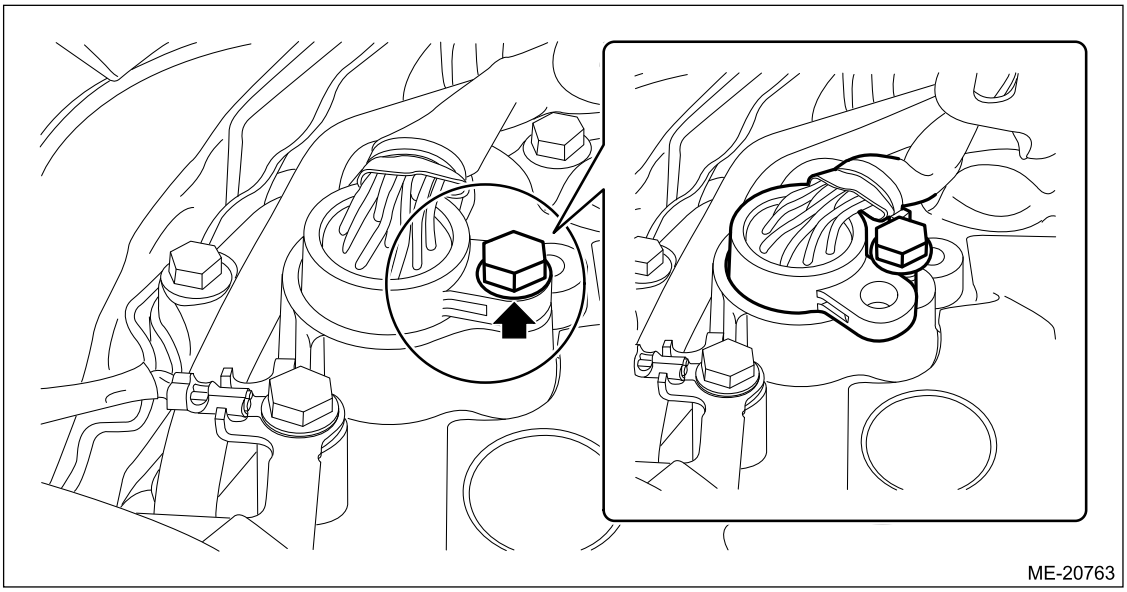


24. Remove the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>REMOVAL.

25. Remove the bolt which holds the transmission harness to the valve cover, and turn the transmission harness clockwise till the bolt hole can be seen as shown in the figure, and tighten the bolt to temporary lock the harness. (CVT model)

Note:

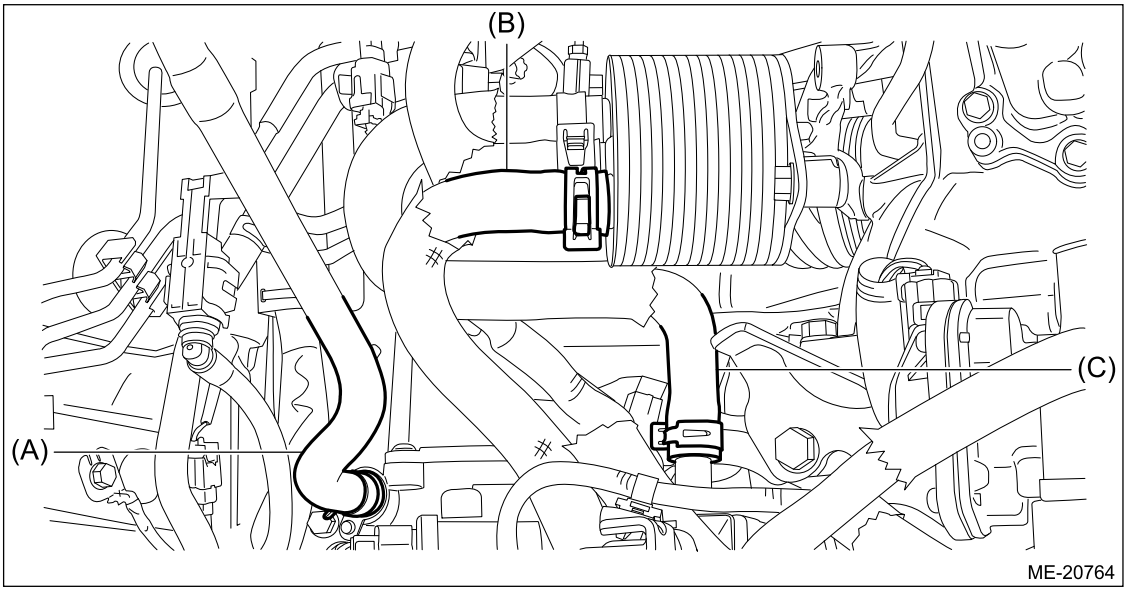
This procedure is required to prevent the transmission harness from touching the vehicle body during engine removal/installation.



26. Remove the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.

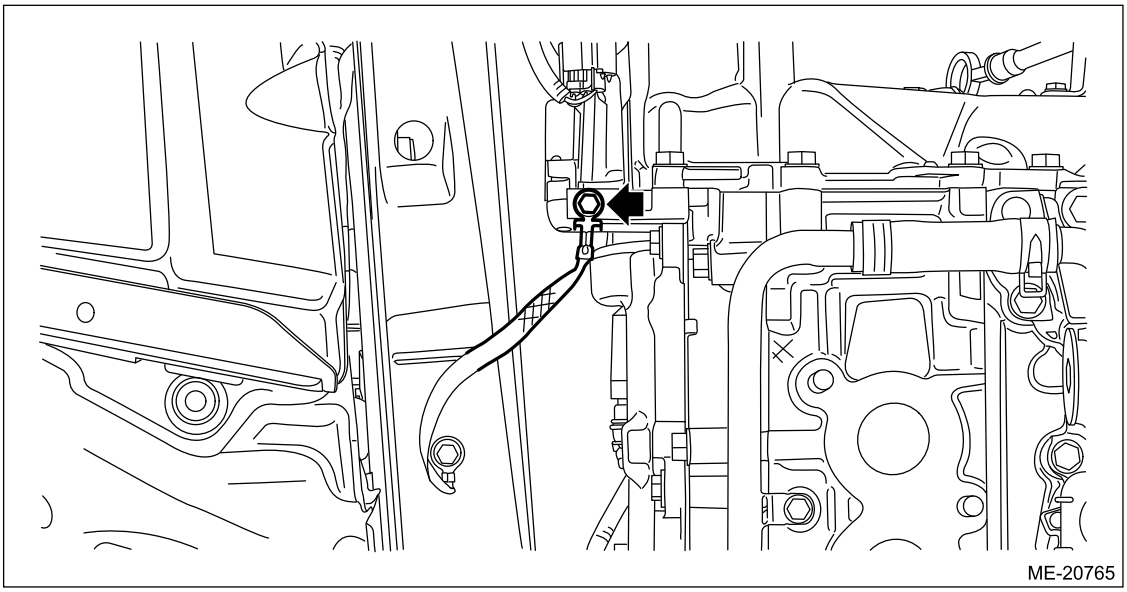
27. Disconnect the brake booster vacuum hose (A) from the brake vacuum pump.

28. Disconnect the water hose (B) and water hose (C) from the CVTF cooler (with warmer feature) and the EGR cooler. (CVT model)

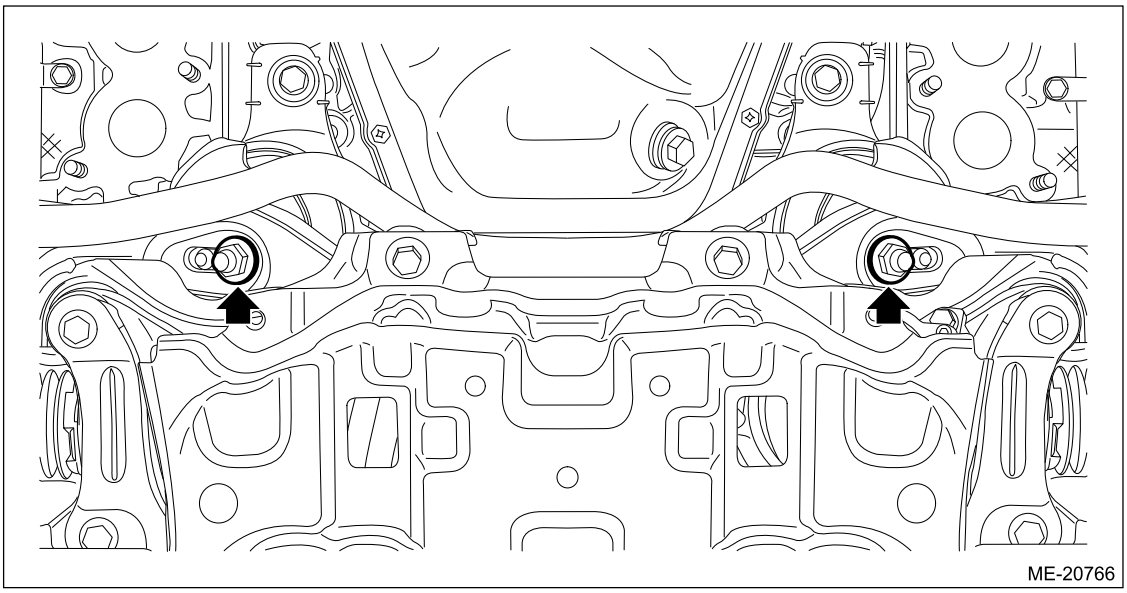


29. Lift up the vehicle.

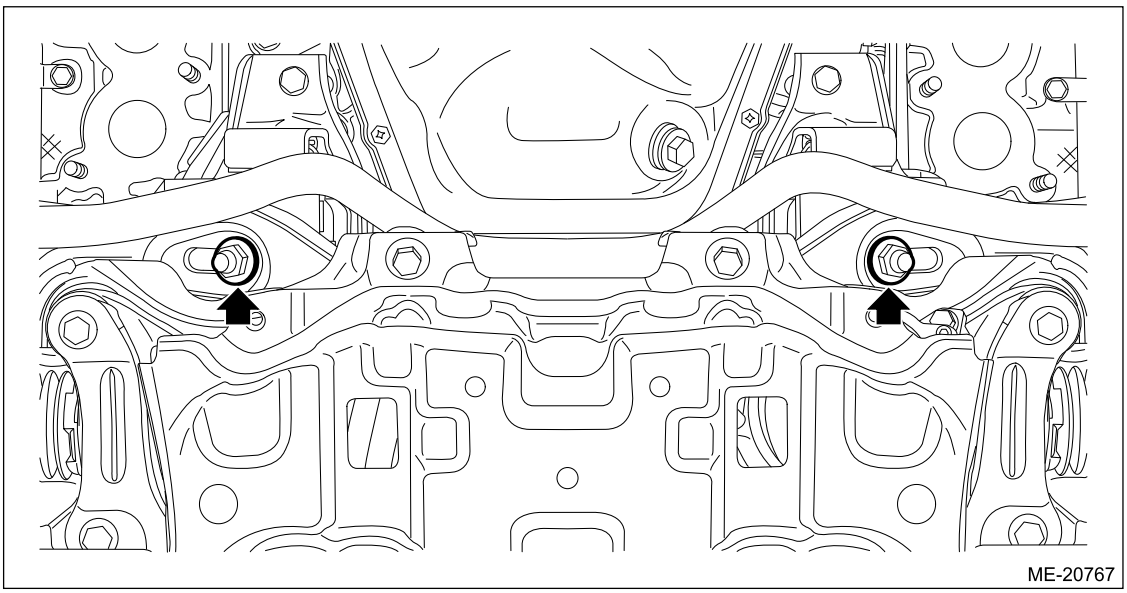
30. Disconnect the ground cord on the engine side.



31. Remove the nuts which secure the engine mounting to the crossmember. (CVT model)



32. Remove the nuts which secure the engine mounting to the crossmember. (MT model)

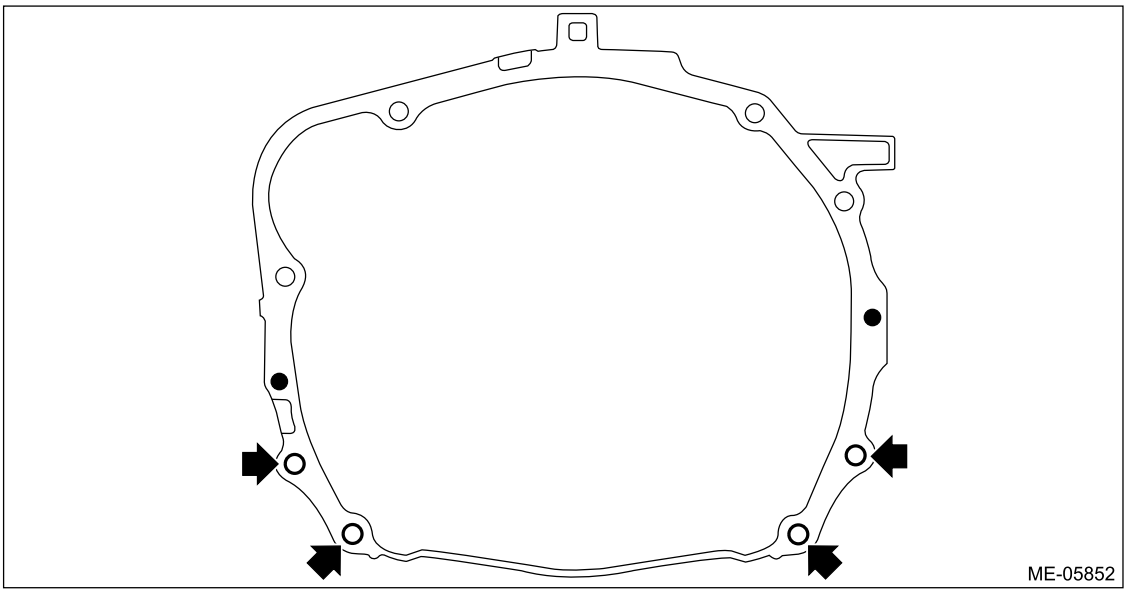


33. Remove the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember

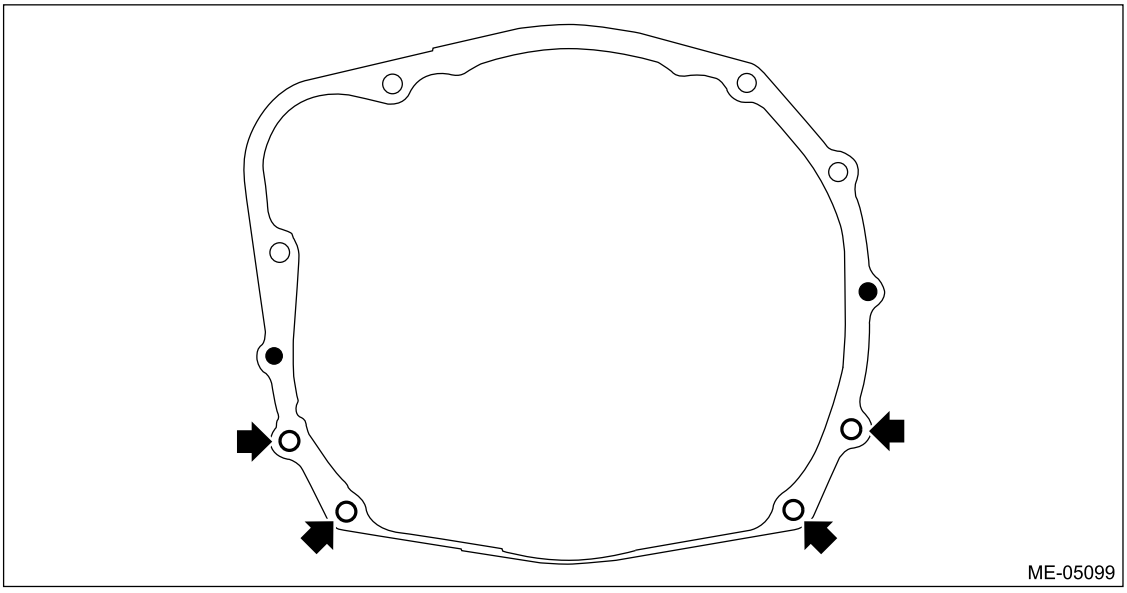
Support>REMOVAL.

34. Remove the bolts and nuts which hold the lower side of transmission to the engine.

- CVT model



- MT model



35. Lower the vehicle.

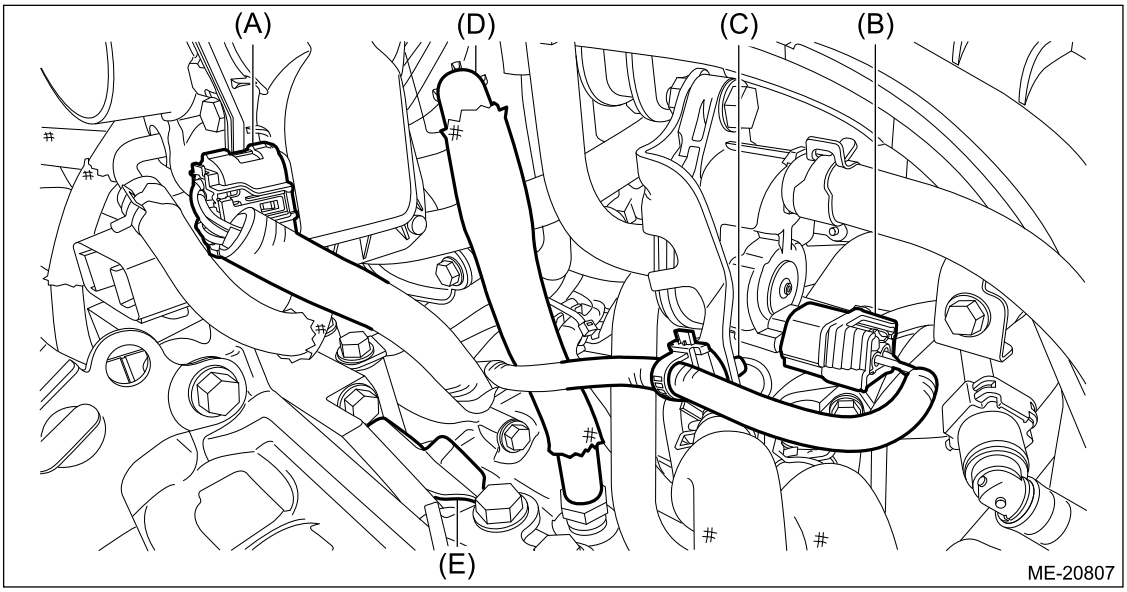
36. Remove the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>REMOVAL.

37. Separate the torque converter assembly from drive plate. (CVT model)

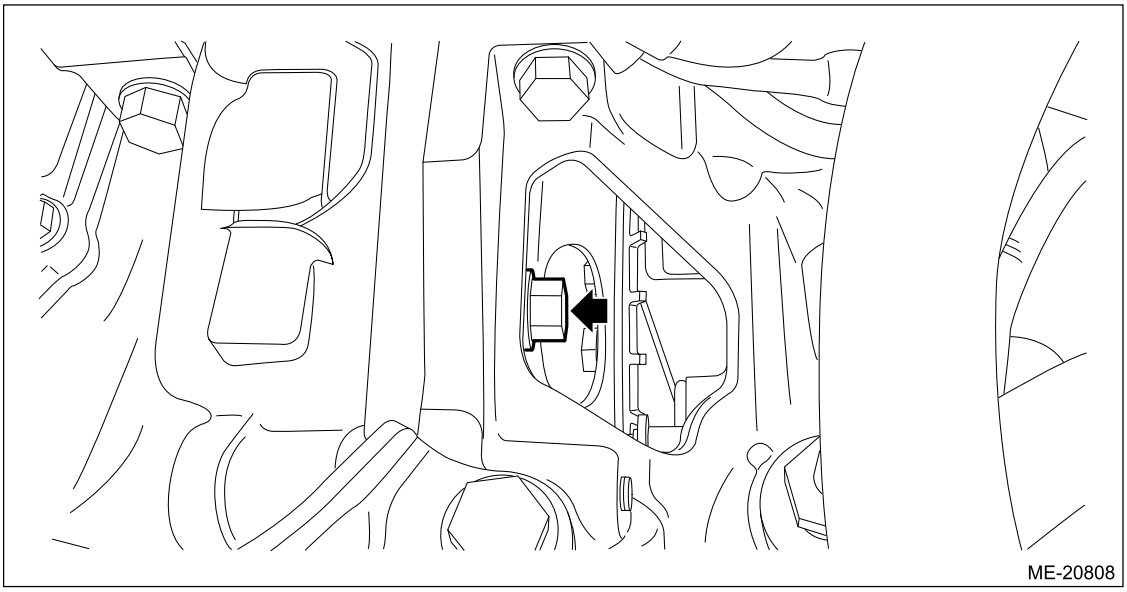
(1) Disconnect the connector (A) and connector (B), and remove the clip (C) from the bracket.

(2) Disconnect the PCV hose (D) from the intake manifold assembly and the PCV valve, and then remove the PCV hose (D).

(3) Remove the plug (E) from the service hole.



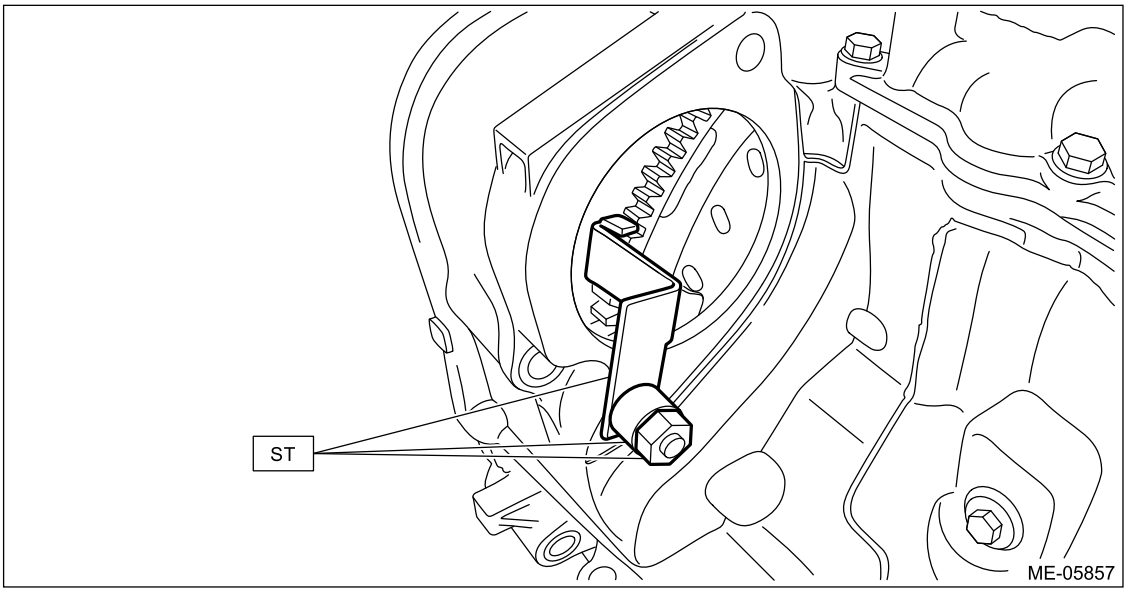
(4) Insert the wrench into the crank pulley bolt, and rotate the crank pulley to remove the bolts (6 places) securing the torque converter assembly to the drive plate.



(5) Attach the ST to the converter case.

Preparation tool:

ST: STOPPER SET (498277200)



38. Disconnect the fuel delivery tube and evaporation hose.

Caution:

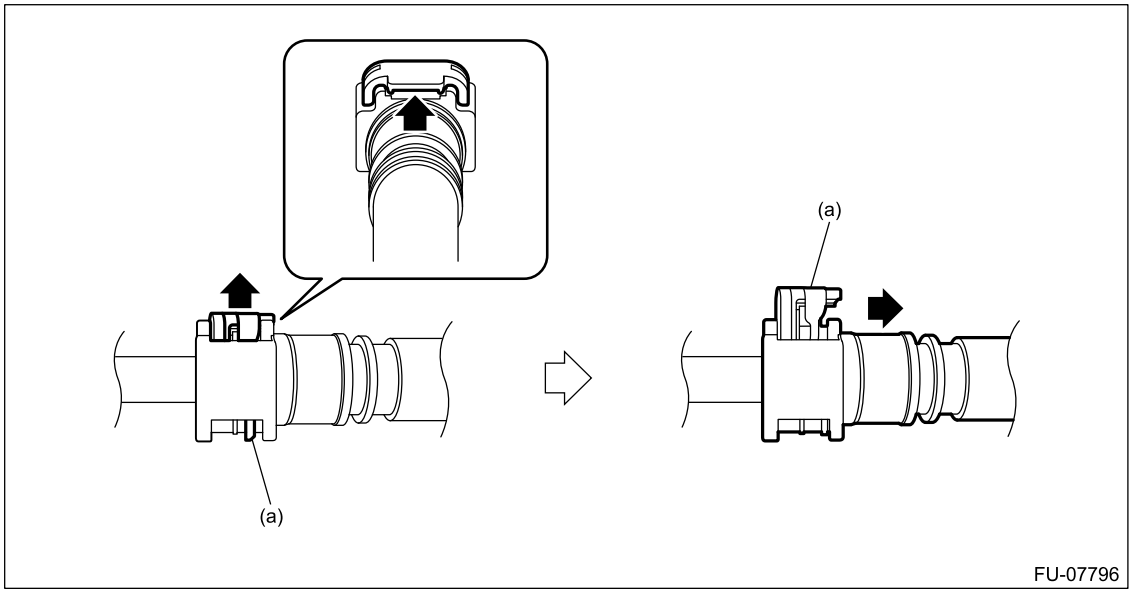
- **Be careful not to spill fuel.**
- **Catch the fuel from the tubes using a container or cloth.**

(1) Disconnect the evaporation hose (A) from the purge control solenoid valve, and remove the evaporation hose (A) from the clip (B).

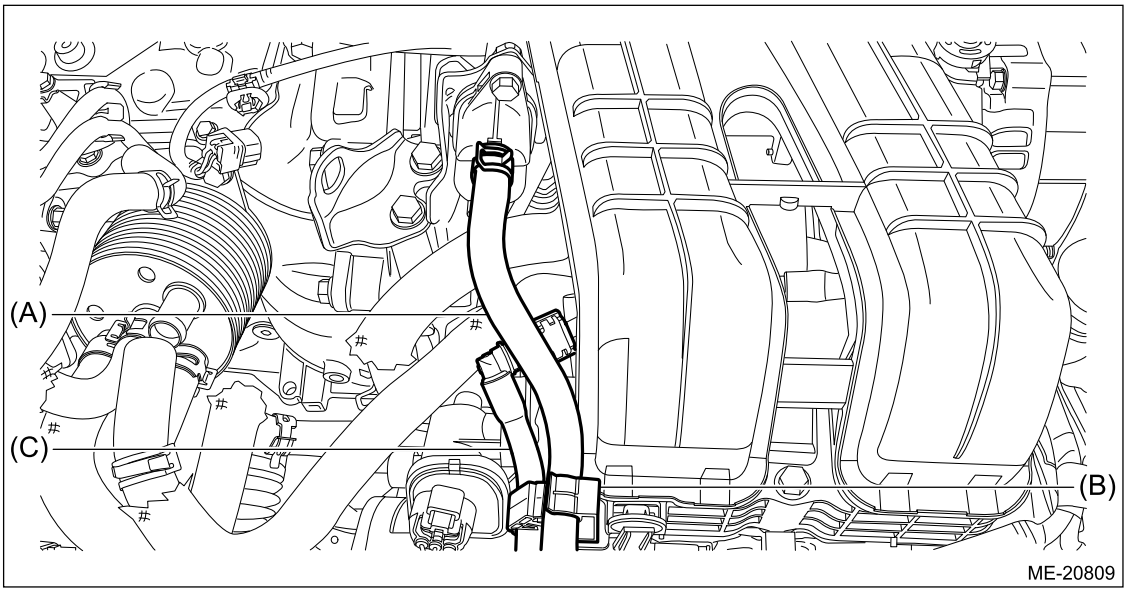
(2) Remove the clip (B) from the intake manifold assembly, and disconnect the quick connector of the fuel delivery tube (C) from the fuel pipe.

Note:

Disconnect the quick connector as shown in the figure.



(a) Slider



39. Separate the engine and transmission.

Caution:

Before removing the engine away from transmission, check to be sure no work has been overlooked.

(1) Using the ST1, install the ST2 to the engine unit.

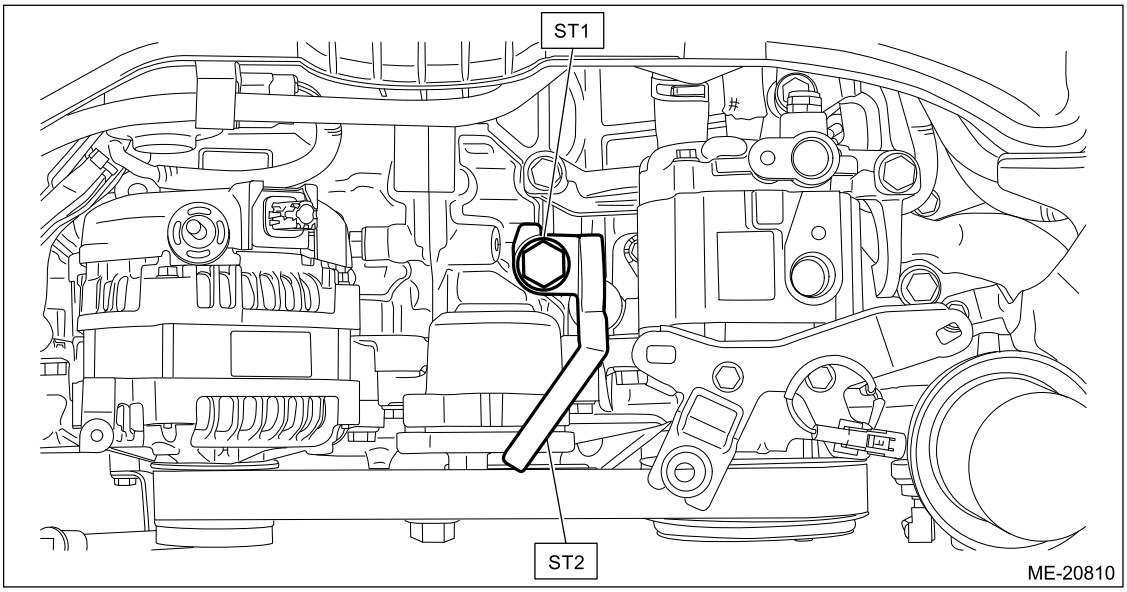
Preparation tool:

ST1: BOLT (18363AA050)

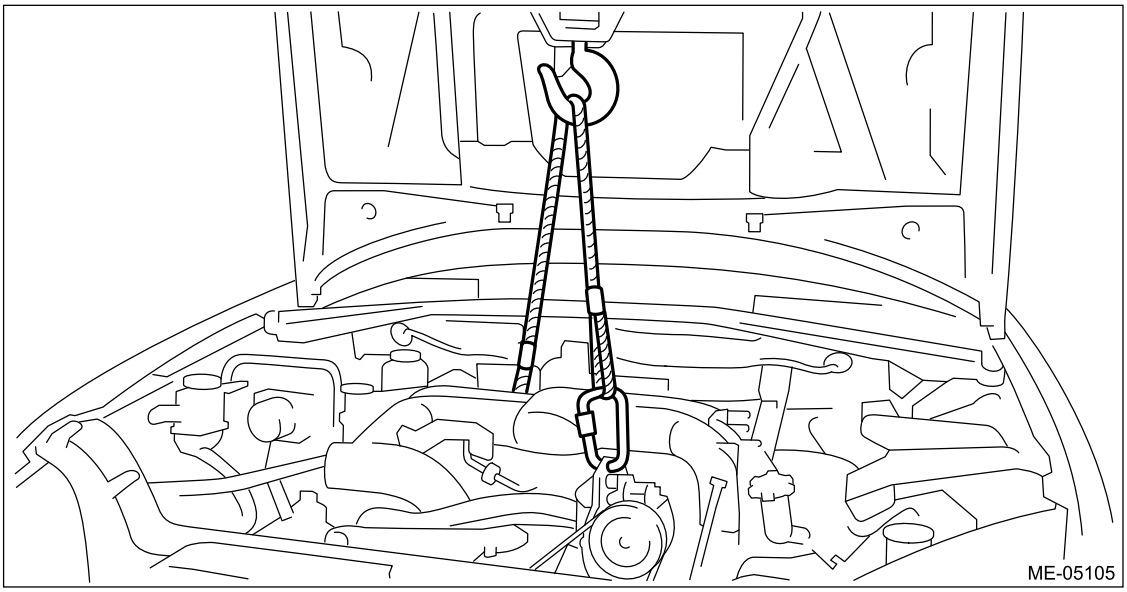
ST2: HANGER (18360AA040)

Tightening torque:

43 N·m (4.4kgf-m, 31.7 ft-lb)



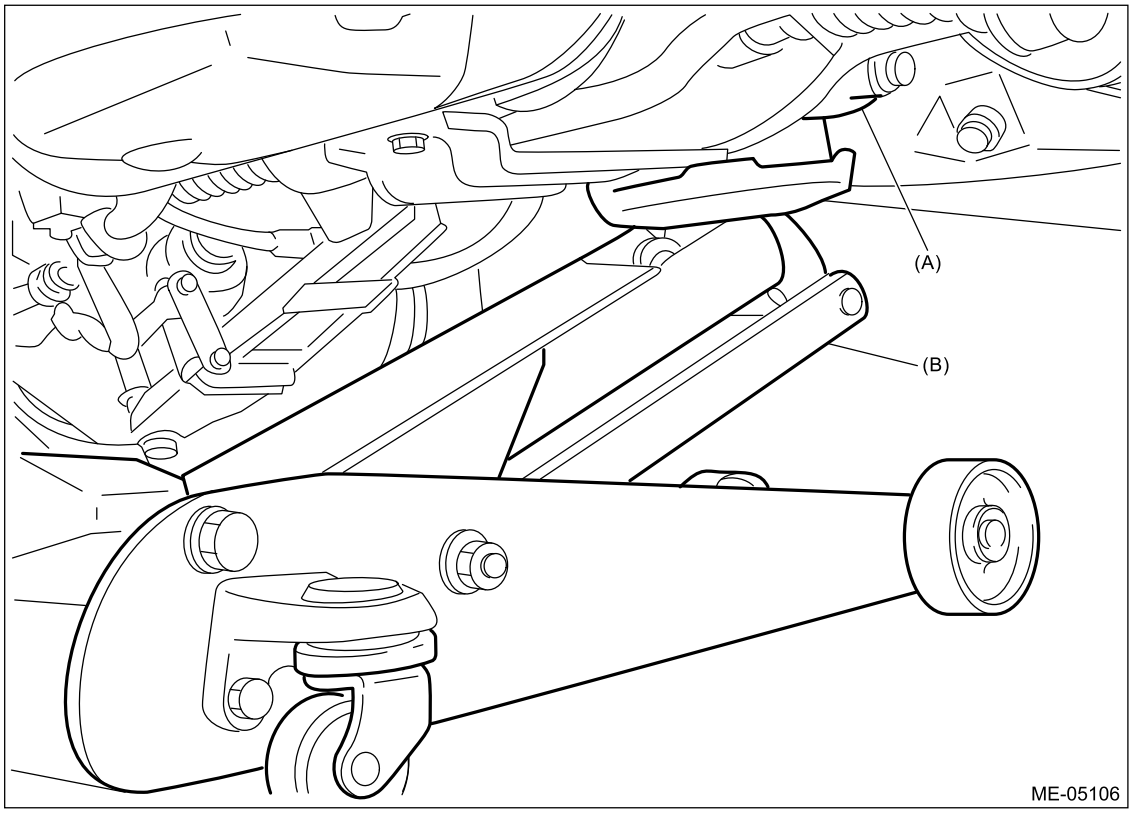
(2) Support the engine with a lifting device and wire ropes.



(3) Support the transmission with a garage jack.

Caution:

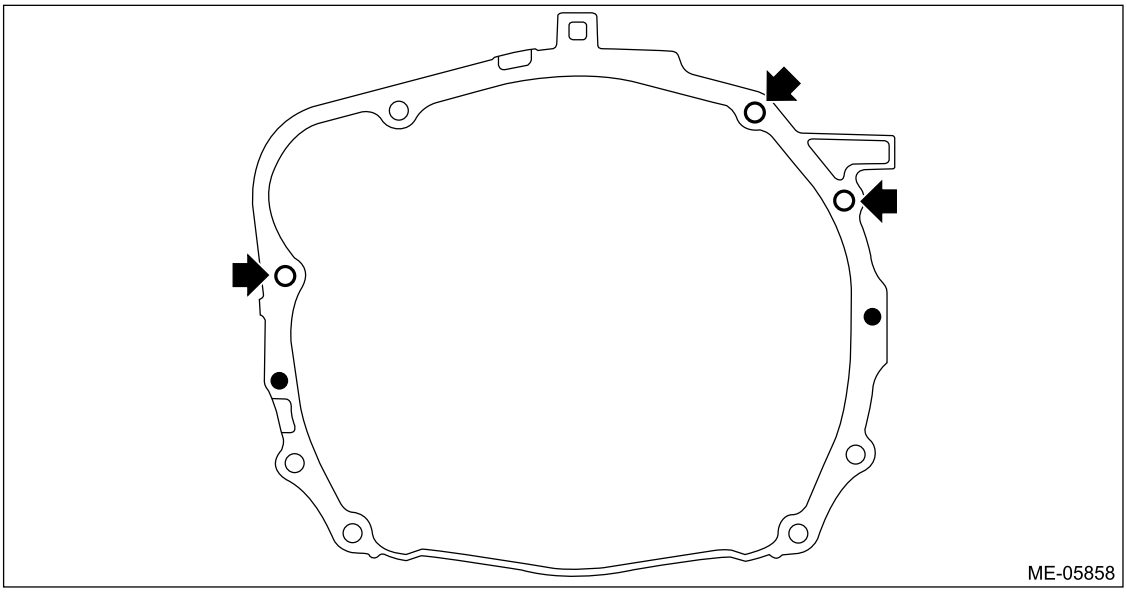
Be sure to perform this procedure to prevent the transmission from lowering by its own weight.



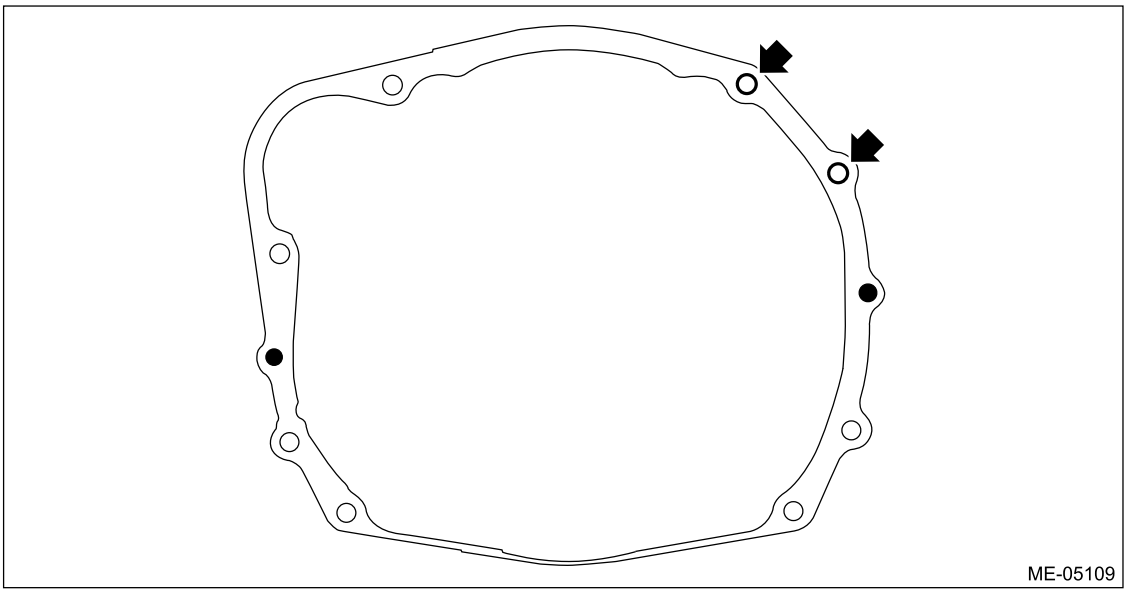
(A) Transmission (B) Garage jack

(4) Remove the bolts which hold the upper side of the transmission to the engine.

- CVT model



- MT model



40. Remove the engine from the vehicle.

Note:

Be careful not to damage adjacent parts or body panels with crank pulley, oil level gauge, etc.

(1) Slightly raise the engine.

(2) Raise the transmission with garage jack.

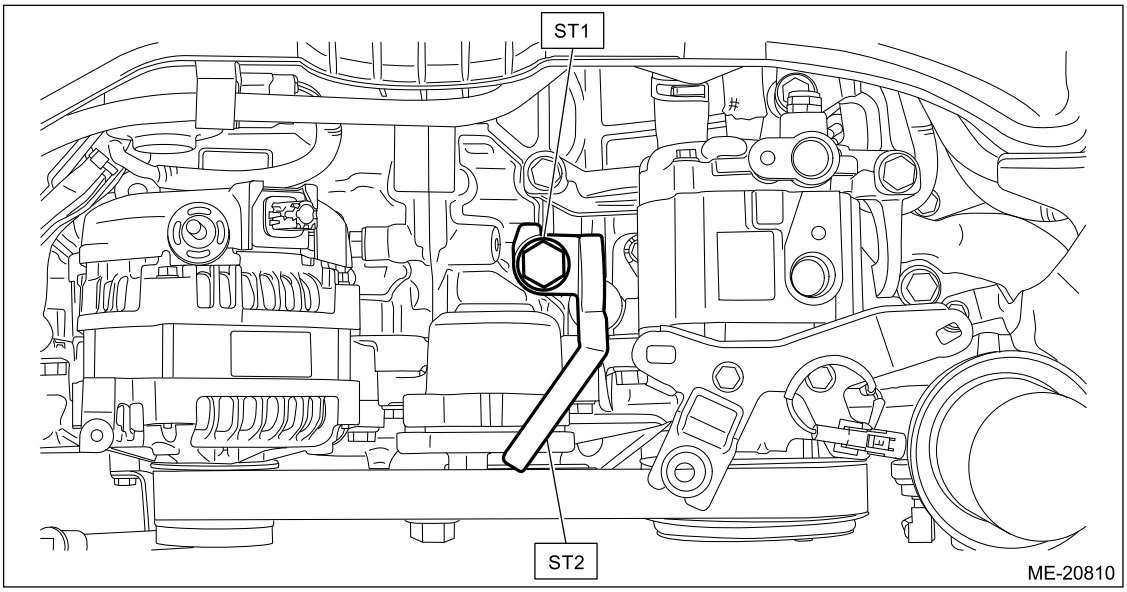
(3) Move the engine horizontally until engine is withdrawn from transmission. (CVT model)

(4) Move the engine horizontally until main shaft is withdrawn from clutch cover. (MT model)

(5) Slowly move the engine away from engine compartment.

41. Remove the engine mounting from the engine.

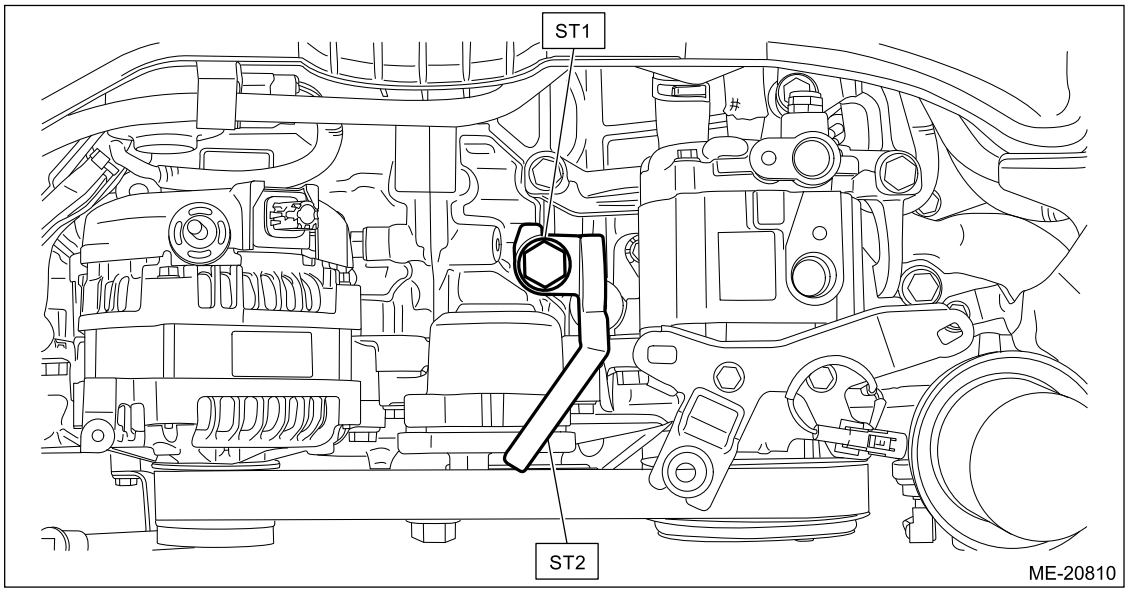
42. Remove the ST1 and ST2 from the engine unit.



MECHANICAL(H4DO) > Engine Assembly

INSTALLATION

1. Using the ST1, install the ST2 to the engine unit.
   Preparation tool:
   ST1: BOLT (18363AA050)
   ST2: HANGER (18360AA040)
   Tightening torque:
   43 N·m (4.4 kgf-m, 31.7 ft-lb)



2. Install the engine mounting onto the engine.
   Tightening torque:
   35 N·m (3.6 kgf-m, 25.8 ft-lb)
3. Apply a small amount of grease to splines of main shaft. (MT model)
   Grease:
   NICHIMOLY N-130 or equivalent
4. Position the engine in engine compartment and align it with transmission.

Note:

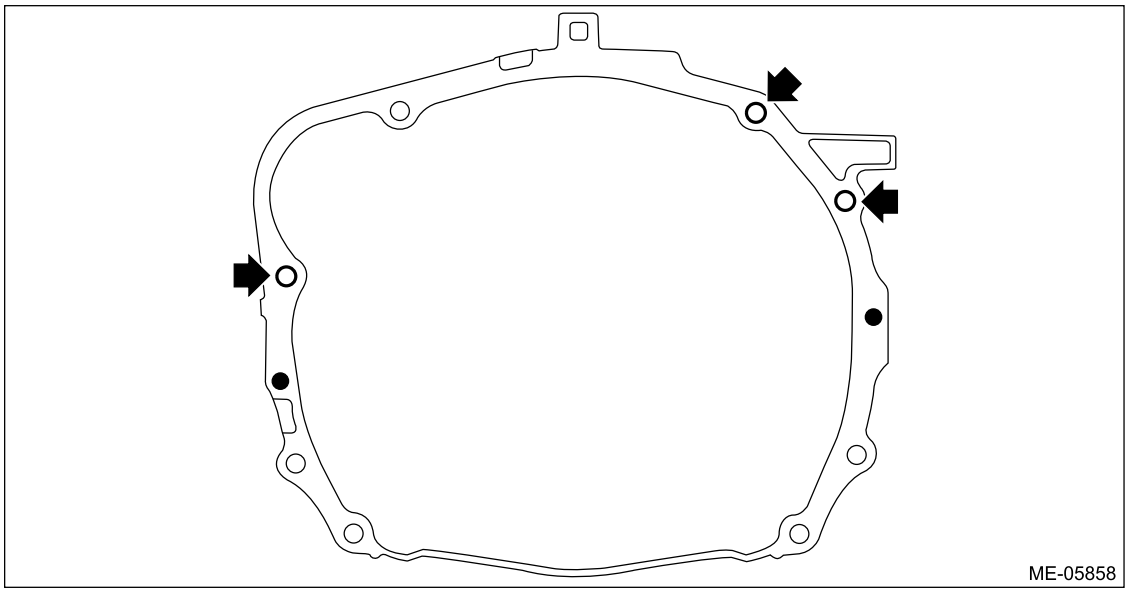
Be careful not to damage adjacent parts or body panels with crank pulley, oil level gauge, etc.

5. With a lifting device and a garage jack, slowly lower the engine.
6. Install the bolts which hold upper side of transmission to engine.

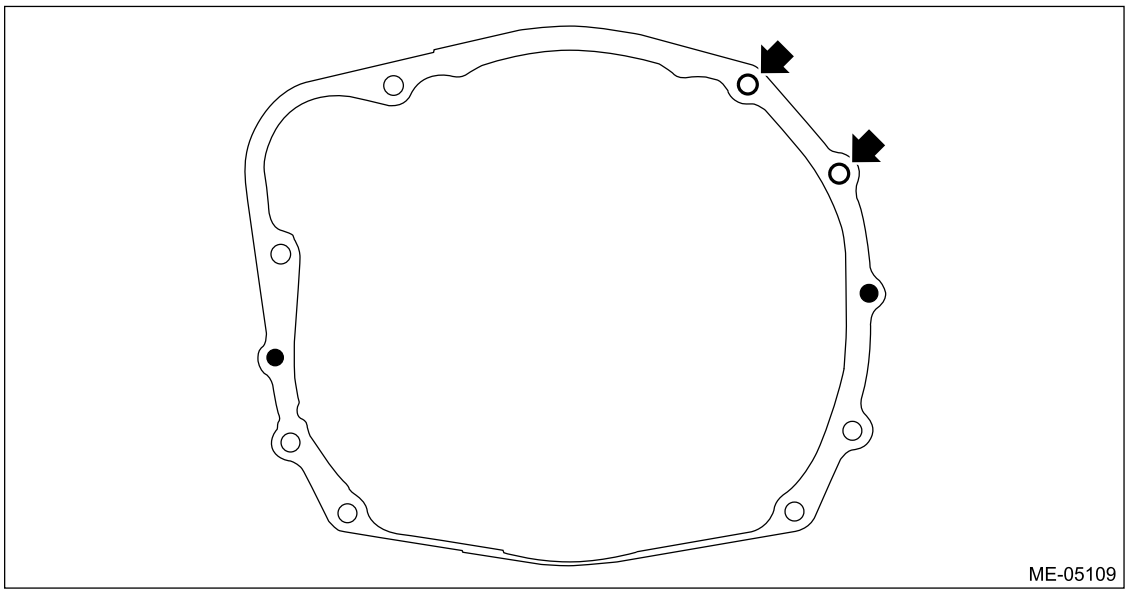
Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

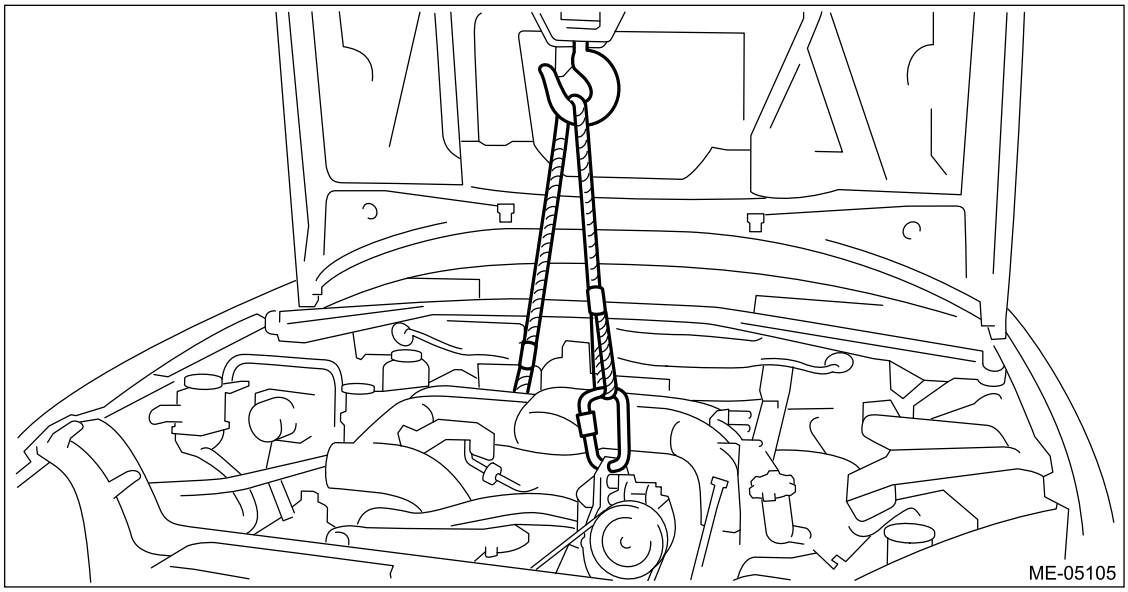
- CVT model



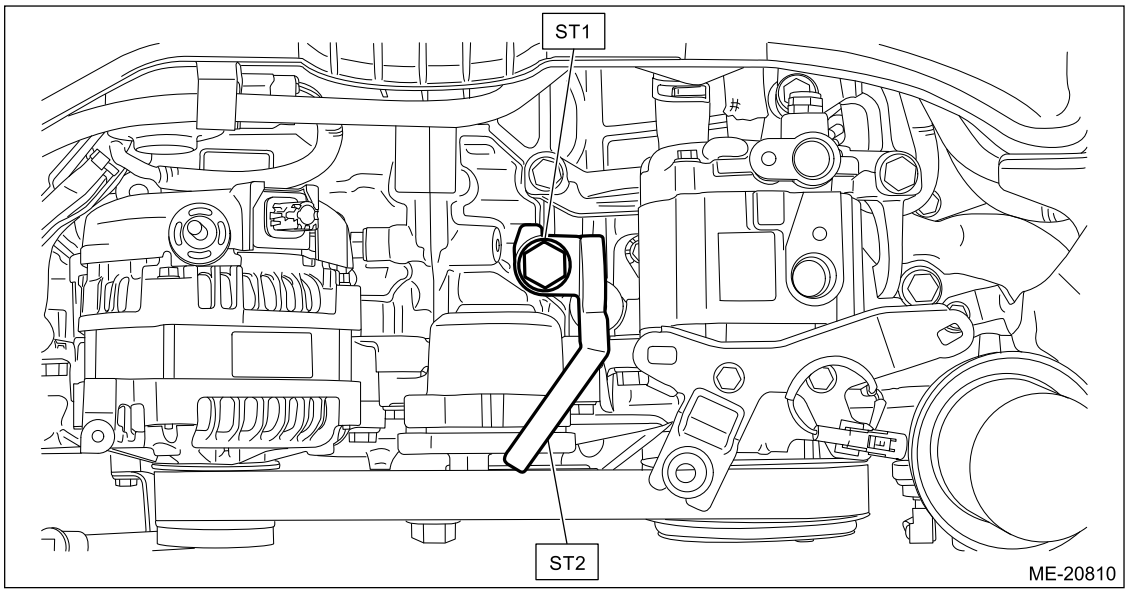
- MT model



7. Remove the garage jack.
8. Remove the lifting device and wire ropes.



9. Remove the ST1 and ST2 from the engine unit.

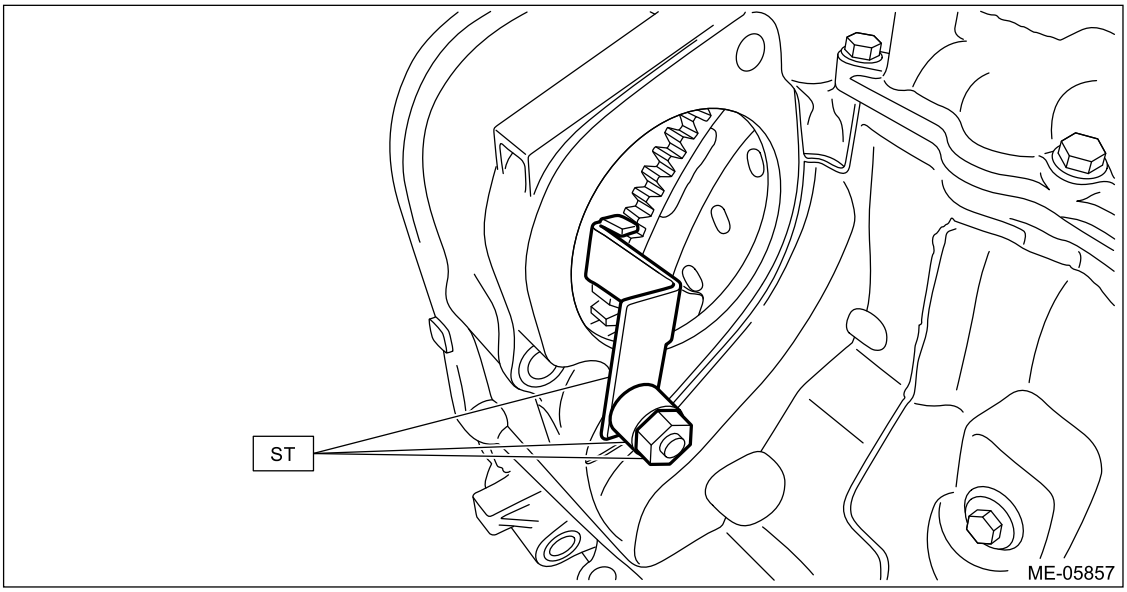


10. Install the torque converter assembly to the drive plate. (CVT model)

(1) Remove the ST from converter case.

Note:

Be careful not to drop the ST into the converter case when removing the ST.



(2) Insert the wrench into the crank pulley bolt, and rotate the crank pulley to install the bolts (6 places) which hold the torque converter assembly to the drive plate using the ST.

Note:

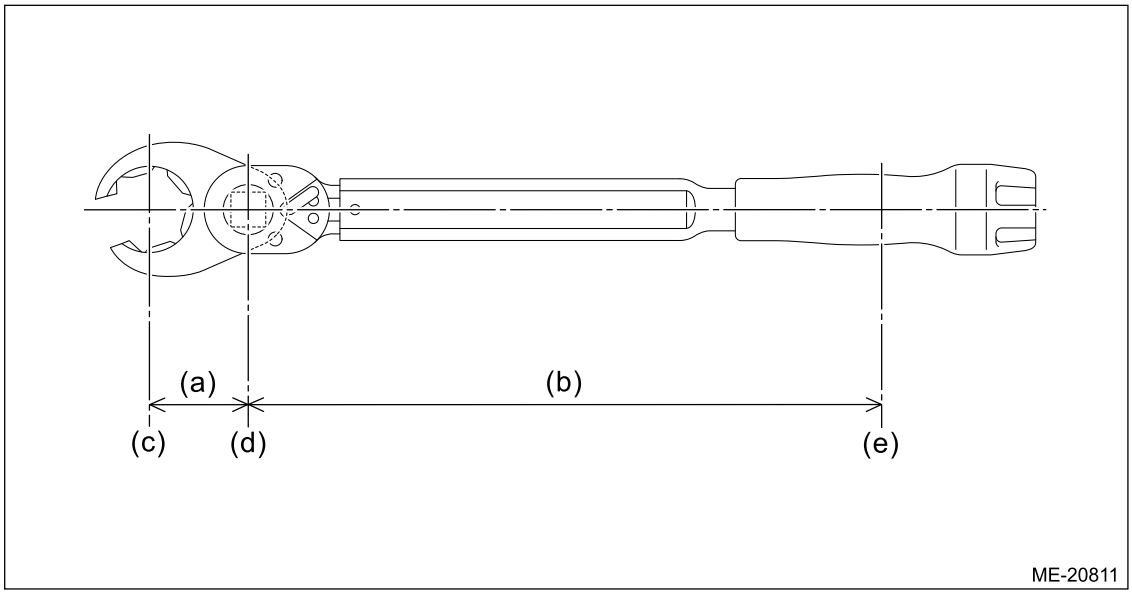
- **Be careful not to drop bolts into the converter housing.**
- **When not using the ST, use a crowfoot wrench for tightening.**
- **Use the following formula to calculate the reading of a torque wrench when tightening with a crowfoot wrench.**

Calculation formula
T= 25 N·m (2.5 kgf-m, 18.4ft-lb) × L1/ (L1+L2)

T: Reading of the torque wrench
L1: Effective length of the torque wrench
L2: Effective length of the crowfoot wrench

Note:

If the effective length of the tool used is unknown, consult the manufacturer of the tool.



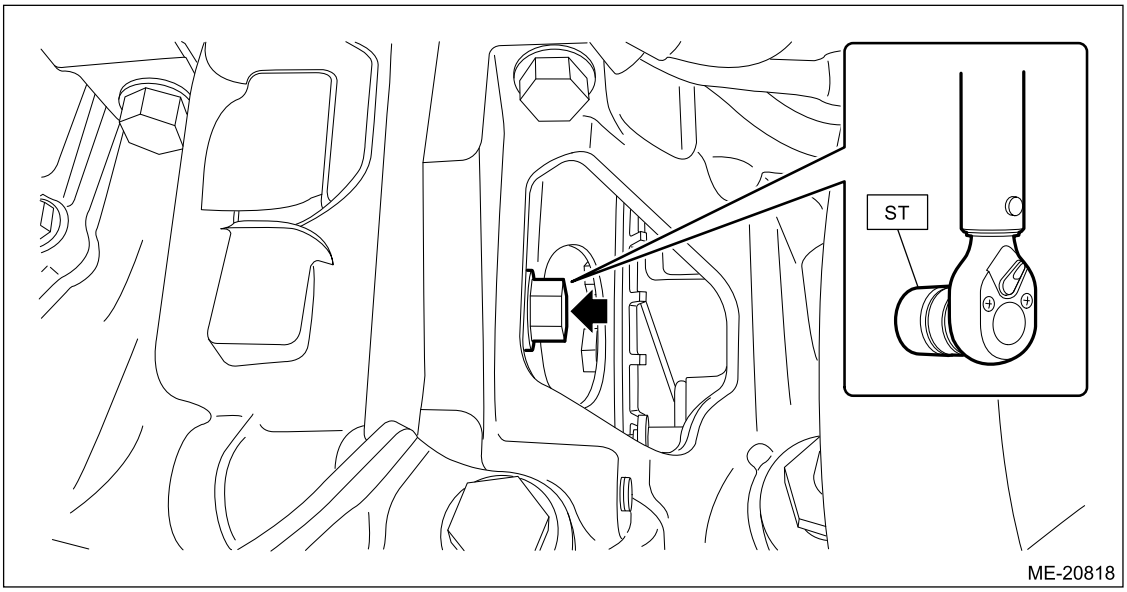
(a) Effective length of the crowfoot wrench
(b) Effective length of the torque wrench
(c) Center of the open end of crowfoot wrench
(d) Center of drive angle of the torque wrench
(e) Center of the position where a force is applied by hand

Preparation tool:

ST: SOCKET (18270AA050)

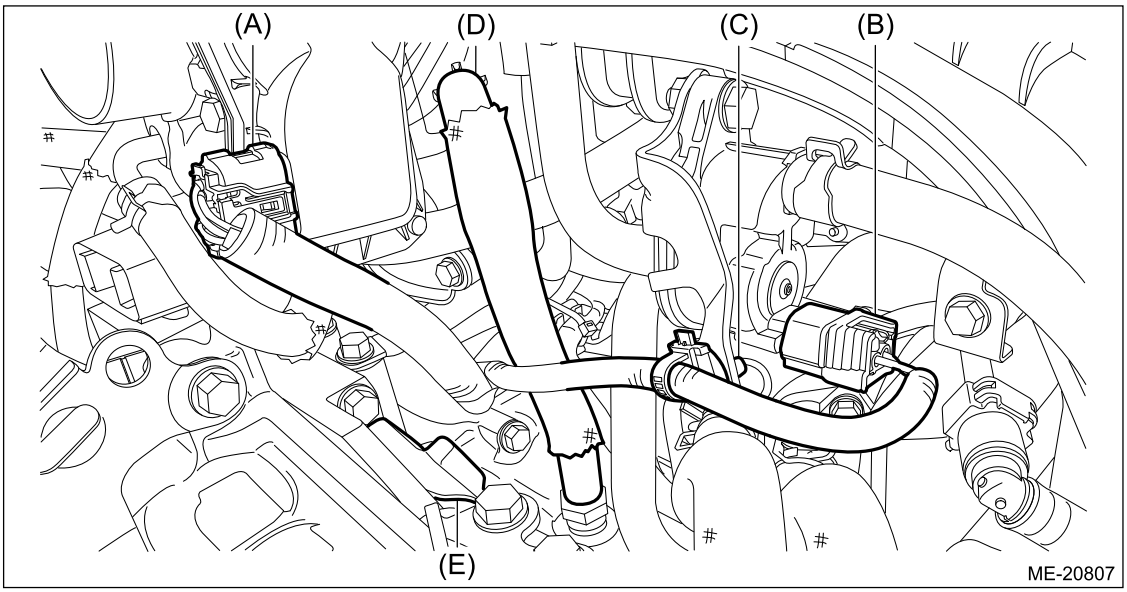
Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



(3) Install plug (E) to the service hole, and connect the PCV hose (D) to the intake manifold assembly and the PCV valve.

(4) Install the clip (C) to the bracket, and connect connector (B) and connector (A).



11. Install the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSTALLATION.

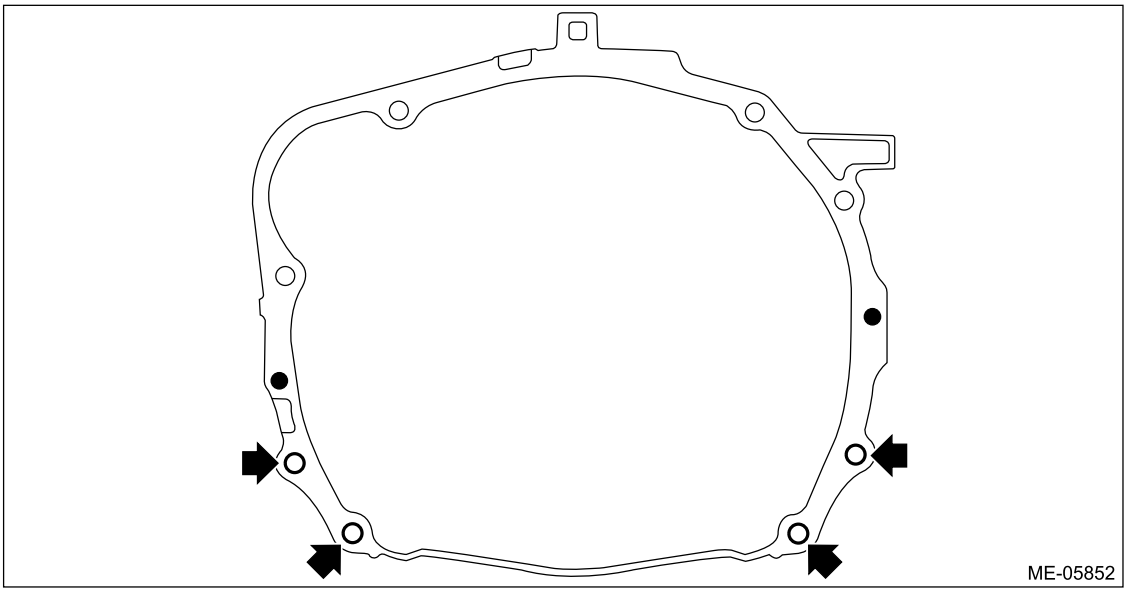
12. Lift up the vehicle.

13. Install the bolts and nuts which hold lower side of the transmission to engine.

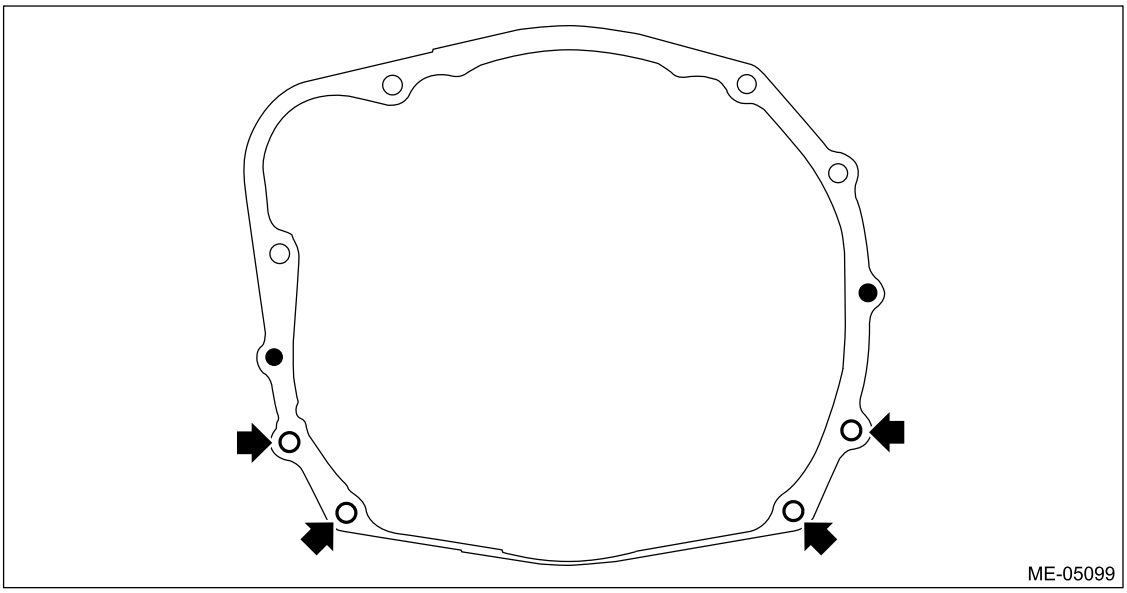
Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

- CVT model



- MT model



14. Install the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.

15. Install the nuts which hold the engine mounting to the crossmember. (CVT model)

Caution:

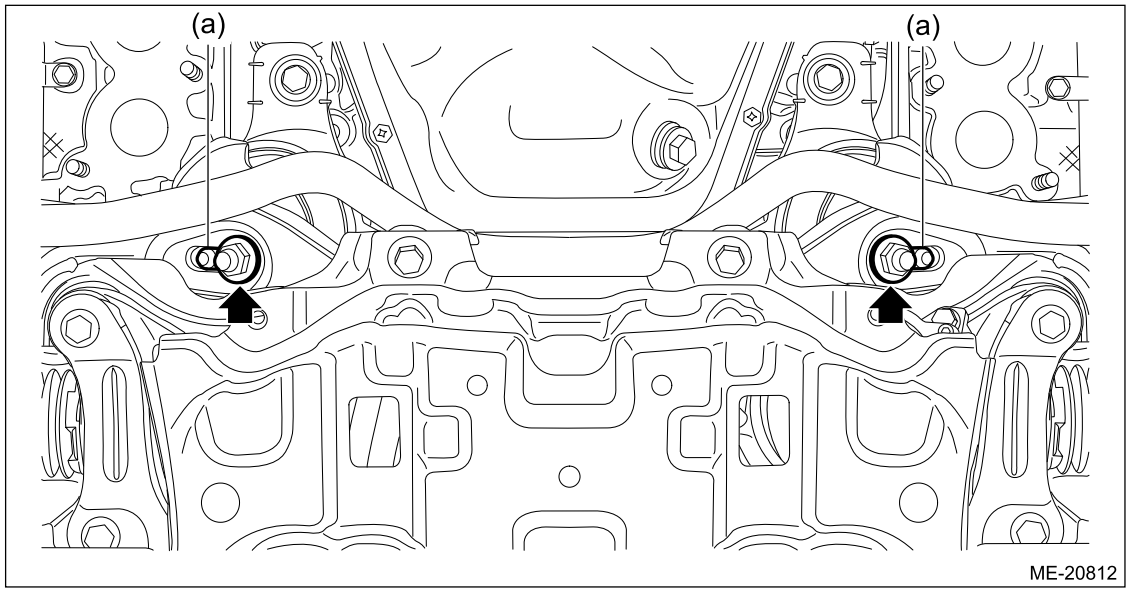
Use new nuts.

Note:

Make sure that locators (a) of the engine mounting are securely inserted.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



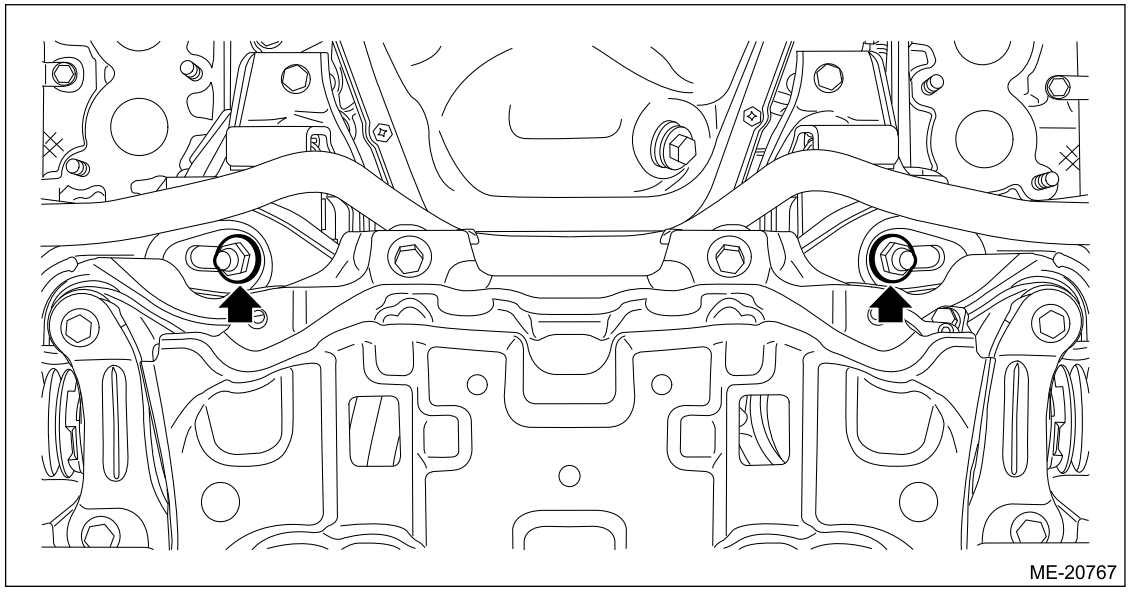
16. Install the nuts which hold the engine mounting to the crossmember. (MT model)

Caution:

Use new nuts.

Tightening torque:

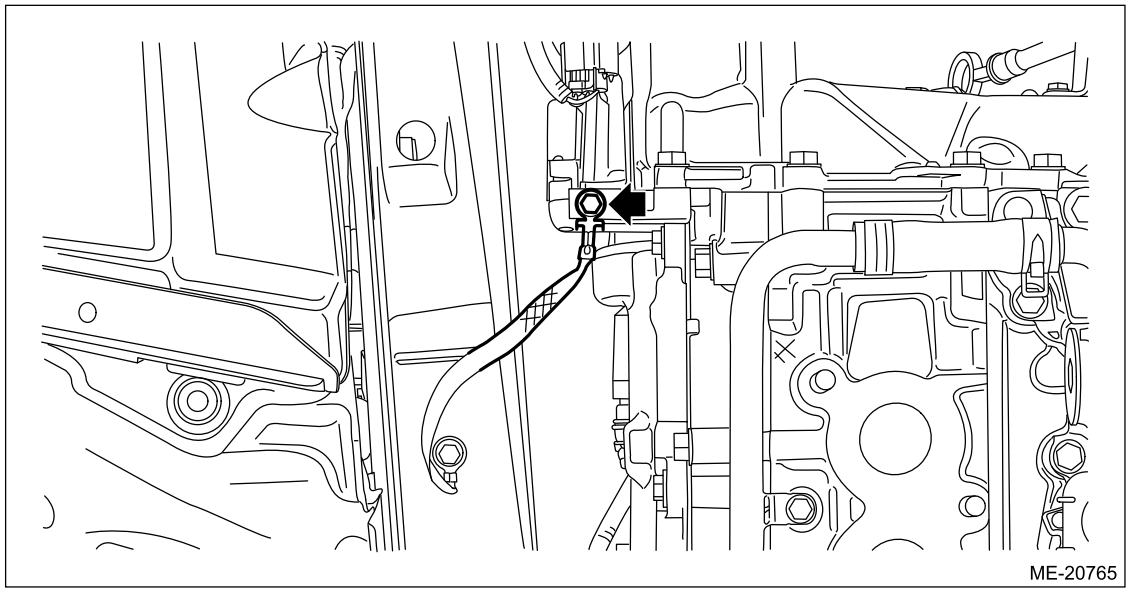
90 N·m (9.2 kgf-m, 66.4 ft-lb)



17. Connect the ground cord.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



18. Lower the vehicle.

19. Connect the fuel delivery tube and evaporation hose.

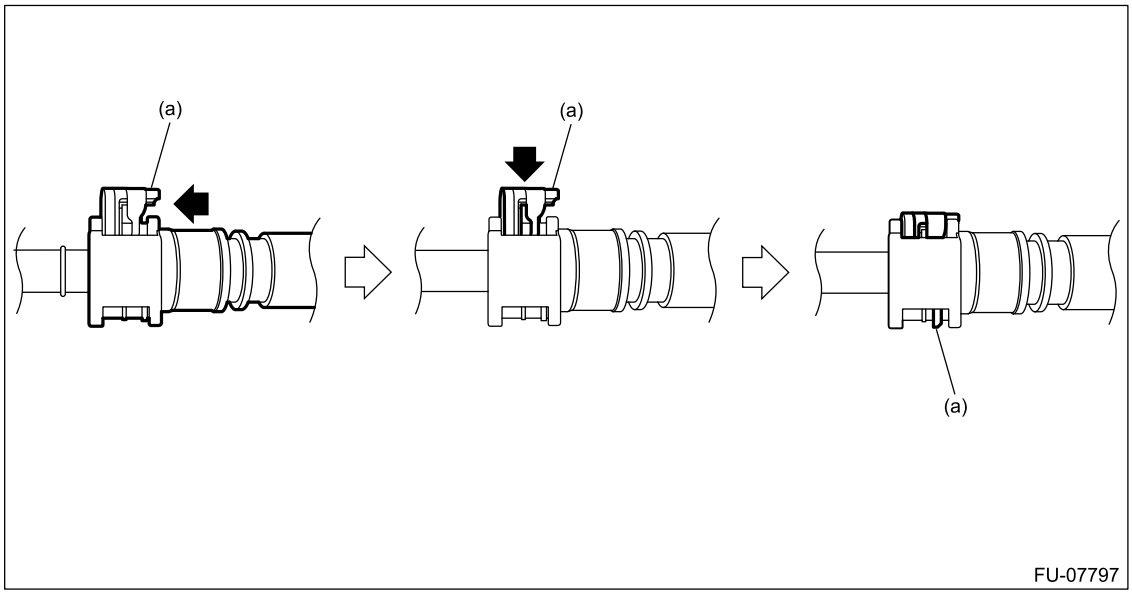
(1) Connect the quick connector on the fuel delivery tube (C) to the fuel pipe, and install clip (B) to the intake manifold assembly.

Caution:

- **Check that there is no damage or dust on the quick connector. If necessary, clean the seal surface of the pipe.**
- **When connecting the quick connector, make sure to insert it all the way in before locking the slider.**
- **When it is difficult to lock the slider, check that the connector is fully inserted.**
- **After locking the slider, check that the quick connector is securely connected.**

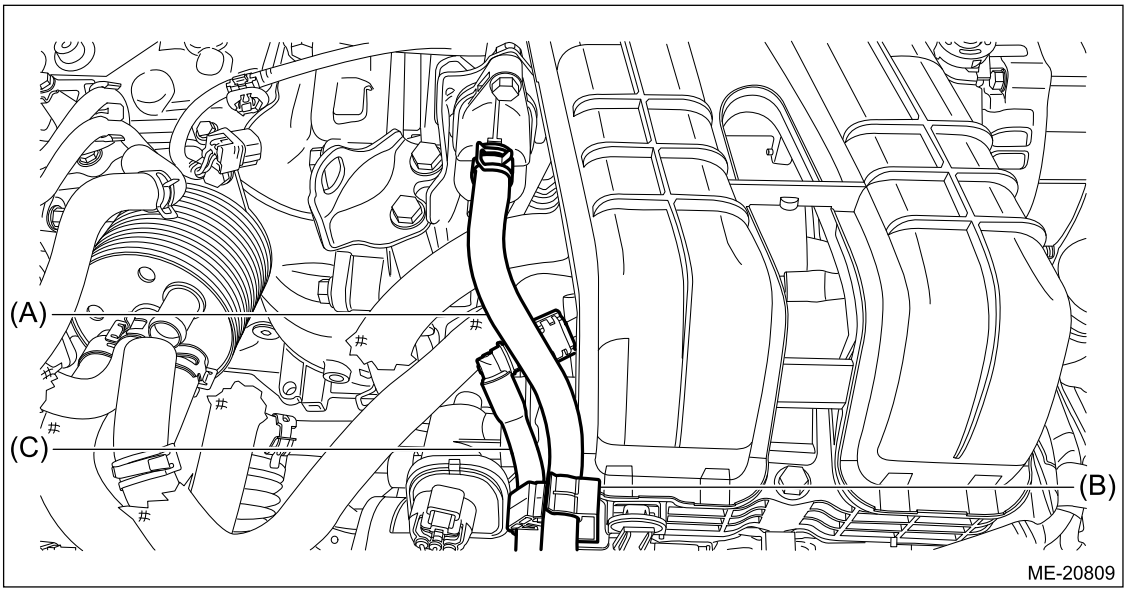
Note:

Connect the quick connector as shown in the figure.



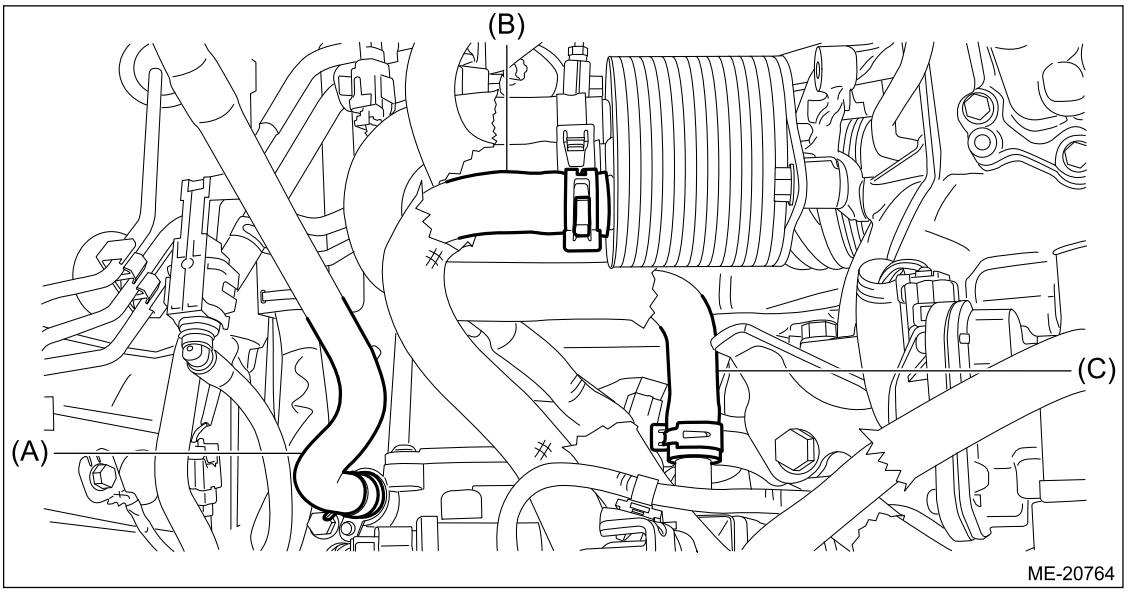
(a) Slider

(2) Connect the evaporation hose (A) to clip (B), and connect evaporation hose (A) to purge control solenoid valve.



20. Connect the water hose (C) and water hose (B) to the CVTF cooler (with warmer feature) and the EGR cooler. (CVT model)

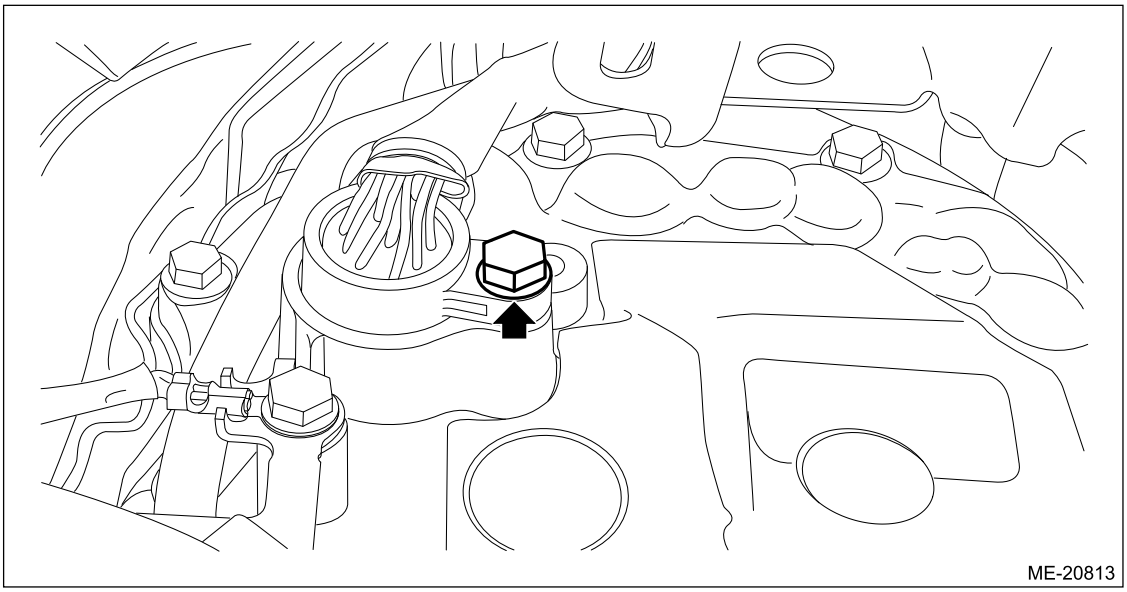
21. Connect the brake booster vacuum hose (A) to the brake vacuum pump.



22. Remove the bolt and turn the transmission harness counterclockwise to install the transmission harness to the valve cover. (CVT model)

Tightening torque:

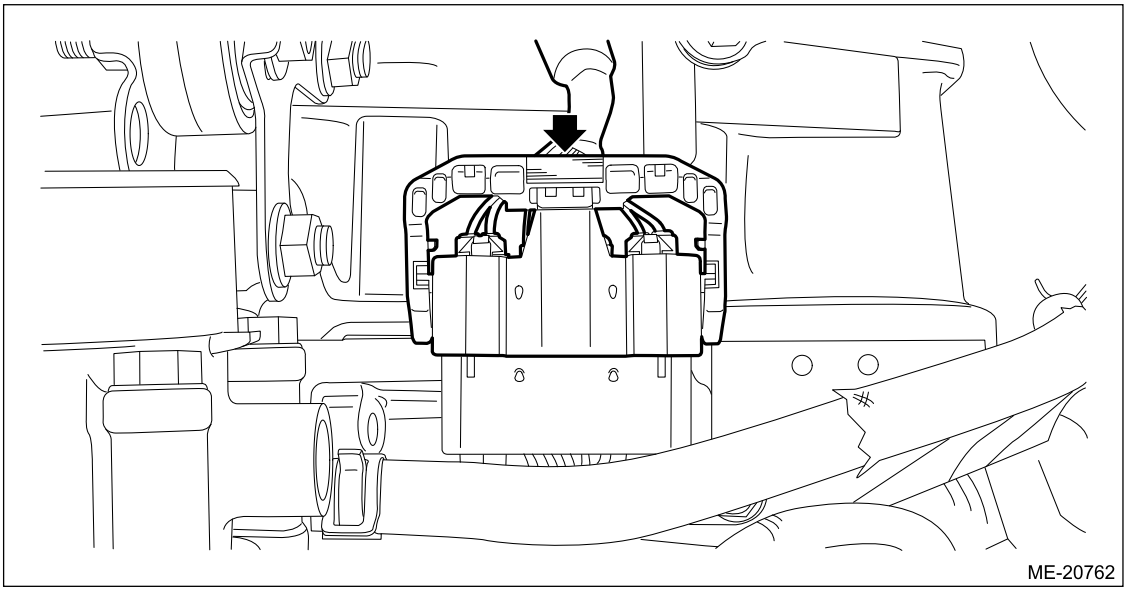
7 N·m (0.7 kgf-m, 5.2 ft-lb)



23. Install the TCM. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>INSTALLATION.

24. Install the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.

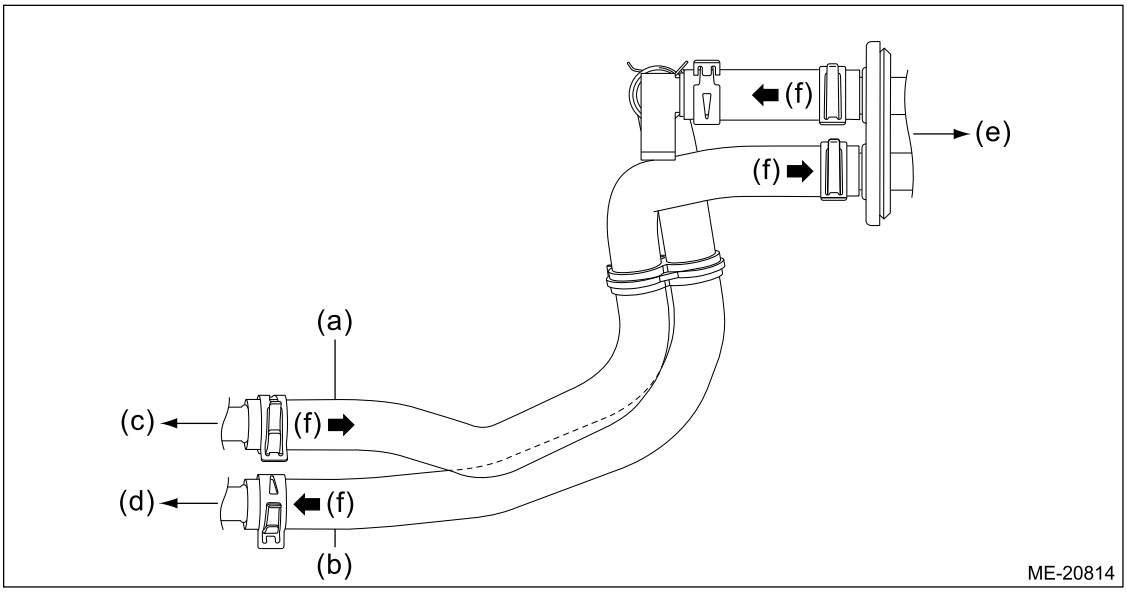
25. Connect the transmission harness connector to the engine wiring harness. (CVT model)



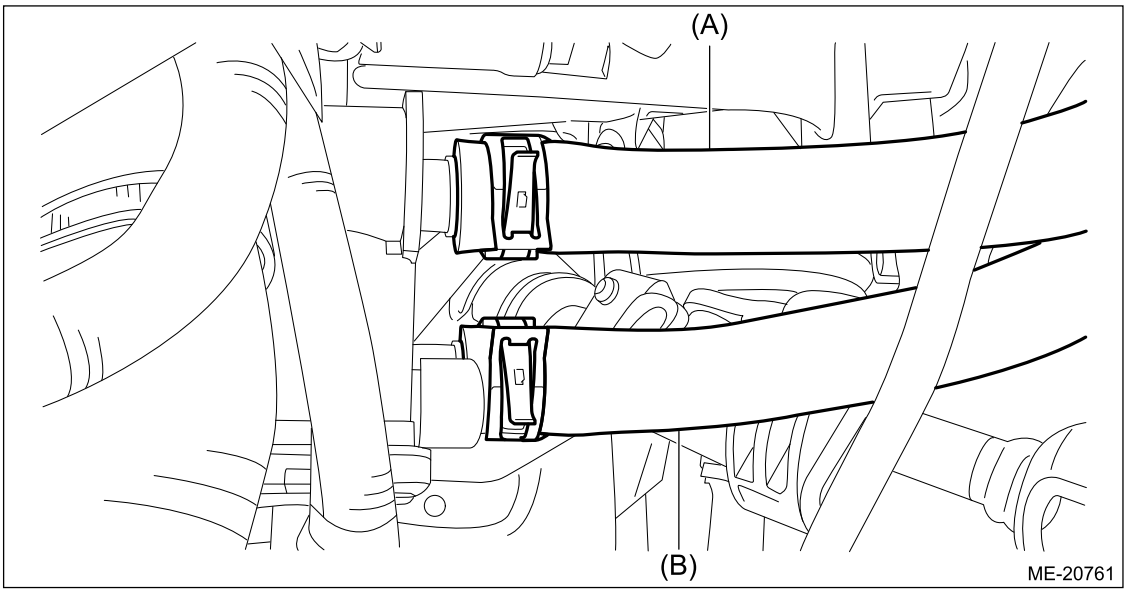
26. Connect the heater inlet hose (A) and the heater outlet hose (B).

Note:

Be careful not to mix up the heater inlet hose and the heater outlet hose when connecting them.



(a) Heater inlet hose
(b) Heater outlet hose
(c) To water pipe ASSY
(d) To water pipe LH
(e) To heater core ASSY
(f) Engine coolant flow

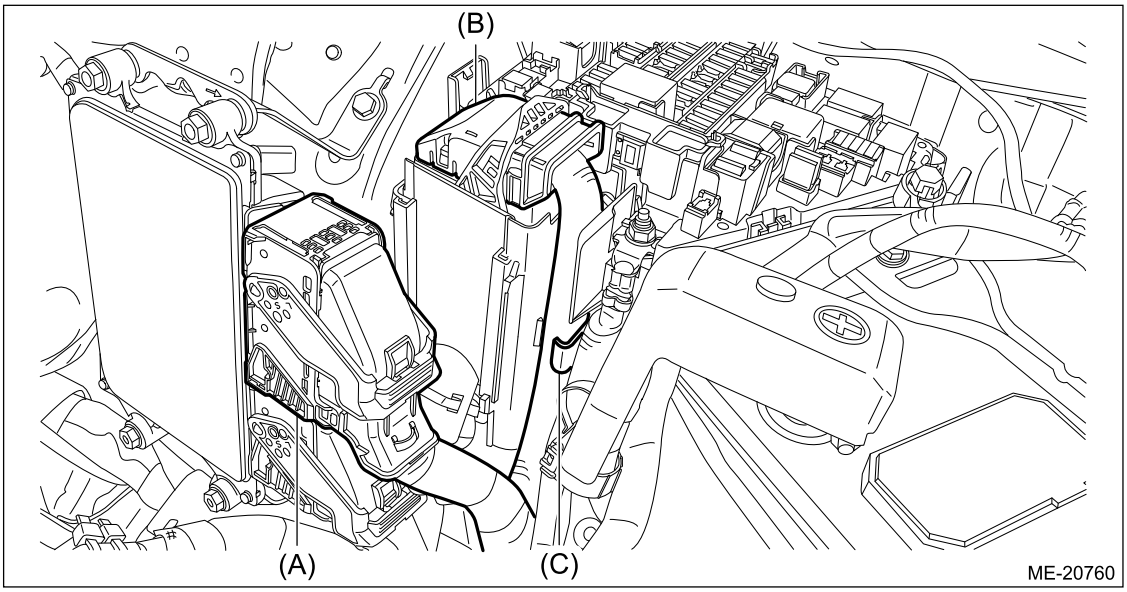


27. Place the engine wiring harness and attach the engine wiring harness to the clip (C).

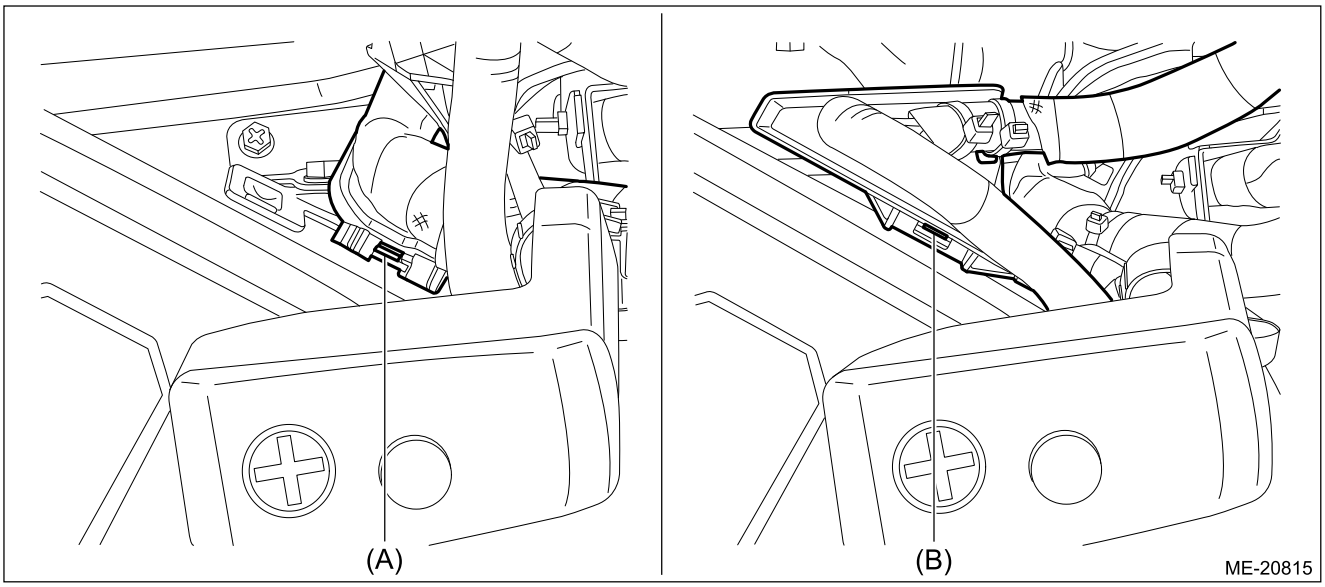
28. Connect the connector (B) to the main fuse box, and connect the connector (A) to the ECM.

Caution:

To prevent damage to the connector (A), when connecting the connector (A), insert the connector (A) straight in until it stops, and while maintaining the position, lock the lever.



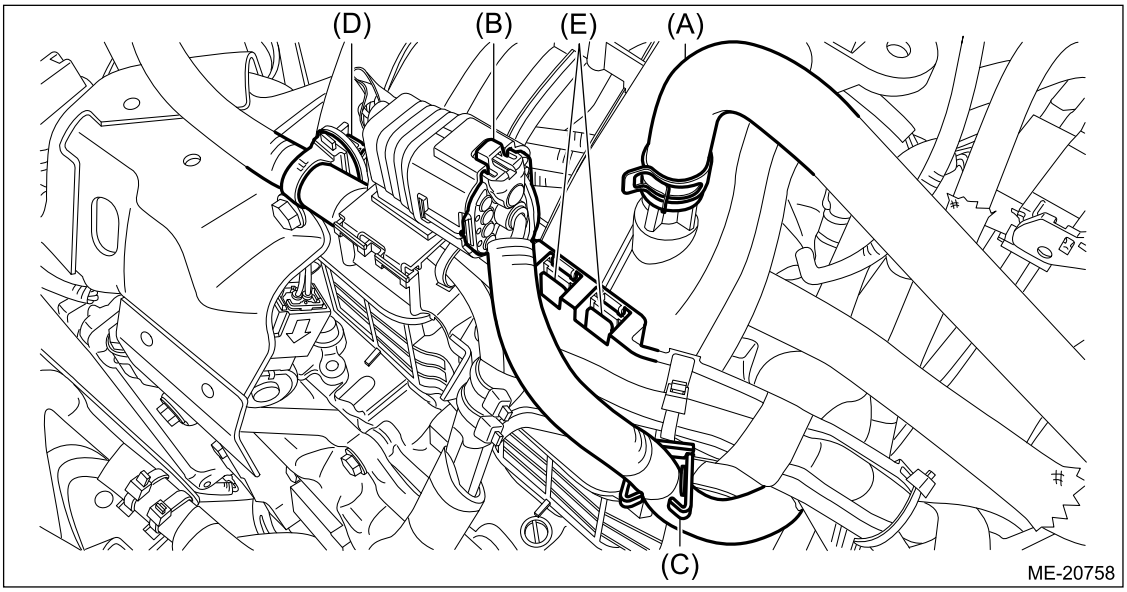
29. Secure the engine wiring harness (A) to the bracket, and secure the battery cable (B) in place.



30. Install the clip (E) and clip (D) to the intake manifold assembly.

31. Install the engine wiring harness to the clip (C), and connect the connector (B).

32. Connect the brake booster vacuum hose (A).



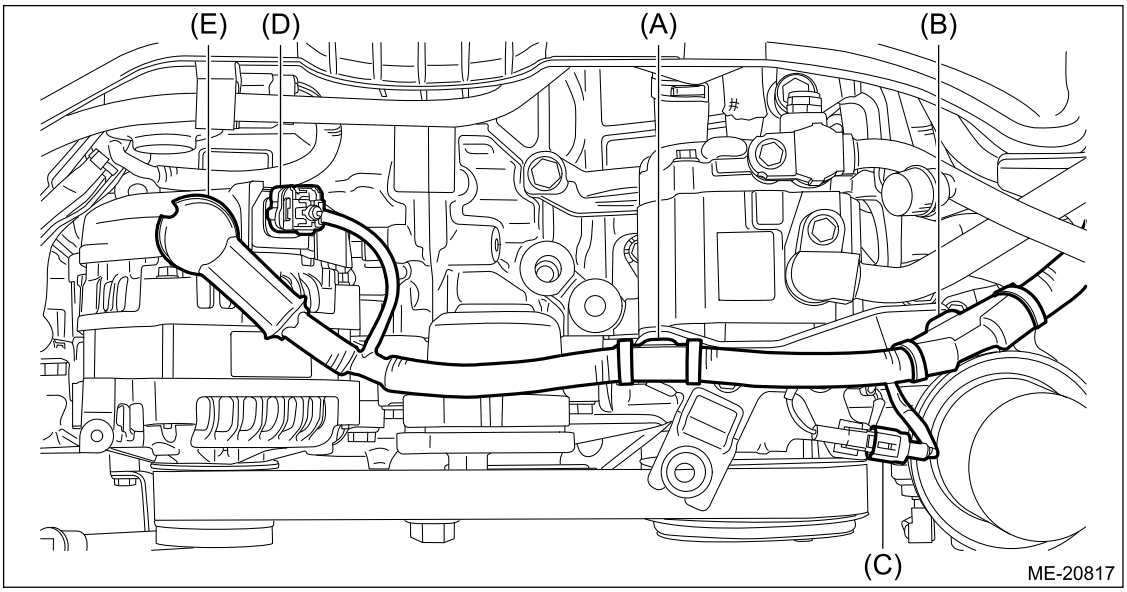
33. Connect the hose - pressure suction and the hose - pressure discharge to the A/C compressor. (Fixed capacity A/C model) Ref. to AIR CONDITIONER>Hose and Pipe>INSTALLATION.

34. Secure the battery cable with the clip (A) and clip (B) in place. (Fixed capacity A/C model)

35. Connect the connector (C), connector (D), and the terminal (E). (Fixed capacity A/C model)

Tightening torque:

15.5 N·m (1.6 kgf-m, 11.4 ft-lb)



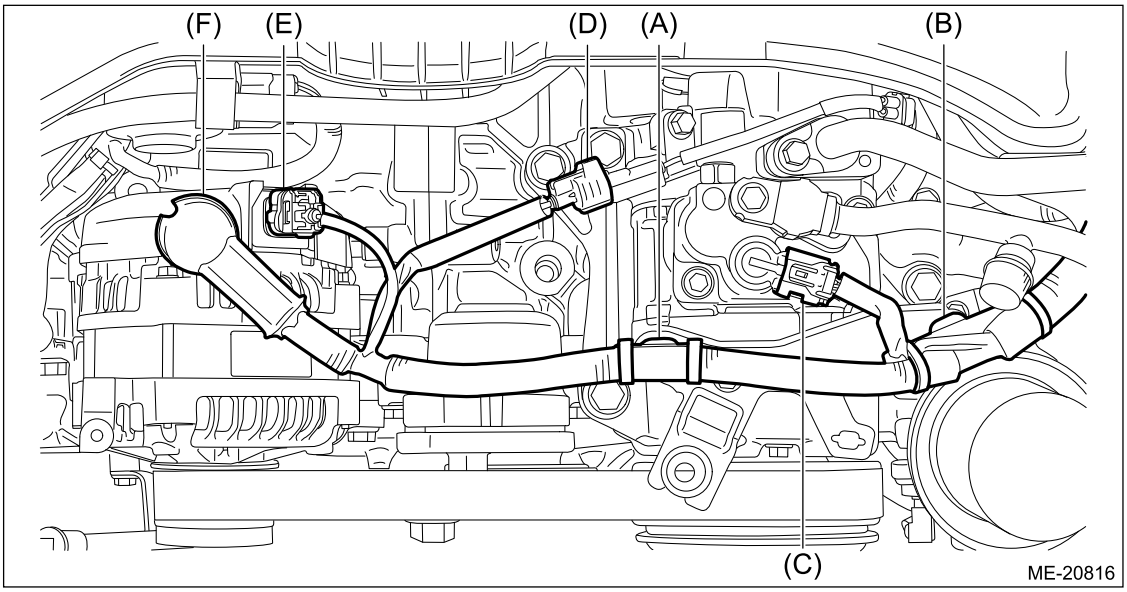
36. Connect the hose-pressure suction and the hose-pressure discharge to the A/C compressor. (Variable capacity A/C model) Ref. to AIR CONDITIONER>Hose and Pipe>INSTALLATION.

37. Secure the battery cable with the clip (A) and clip (B) in place. (Variable capacity A/C model)

38. Connect the connector (C), connector (D), connector (E), and the terminal (F). (Variable capacity A/C model)

Tightening torque:

15.5 N·m (1.6 kgf-m, 11.4 ft-lb)



39. Install the radiator. Ref. to COOLING(H4DO)>Radiator>INSTALLATION.
40. Install the air intake case (rear). Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>INSTALLATION.
41. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
42. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
43. Install the fuel filler cap, and close the fuel filler lid.
44. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.
45. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > FILLING OF ENGINE COOLANT.
46. Set the front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.
47. Install the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>ASSEMBLY.
48. Close the front hood.

MECHANICAL(H4DO) > Engine Assembly

INSPECTION

1. Check that pipes, hoses, connectors and clamps are installed firmly.
2. Check the engine coolant is at specified level.
3. Start the engine and check for exhaust gas, engine coolant, leaks of fuel, etc. Also check for noise and vibrations.

MECHANICAL(H4DO) > Engine Mounting

REMOVAL

1. Remove the crossmember. Ref. to FRONT SUSPENSION>Crossmember>REMOVAL.
2. Remove the engine mounting from the engine.

MECHANICAL(H4DO) > Engine Mounting

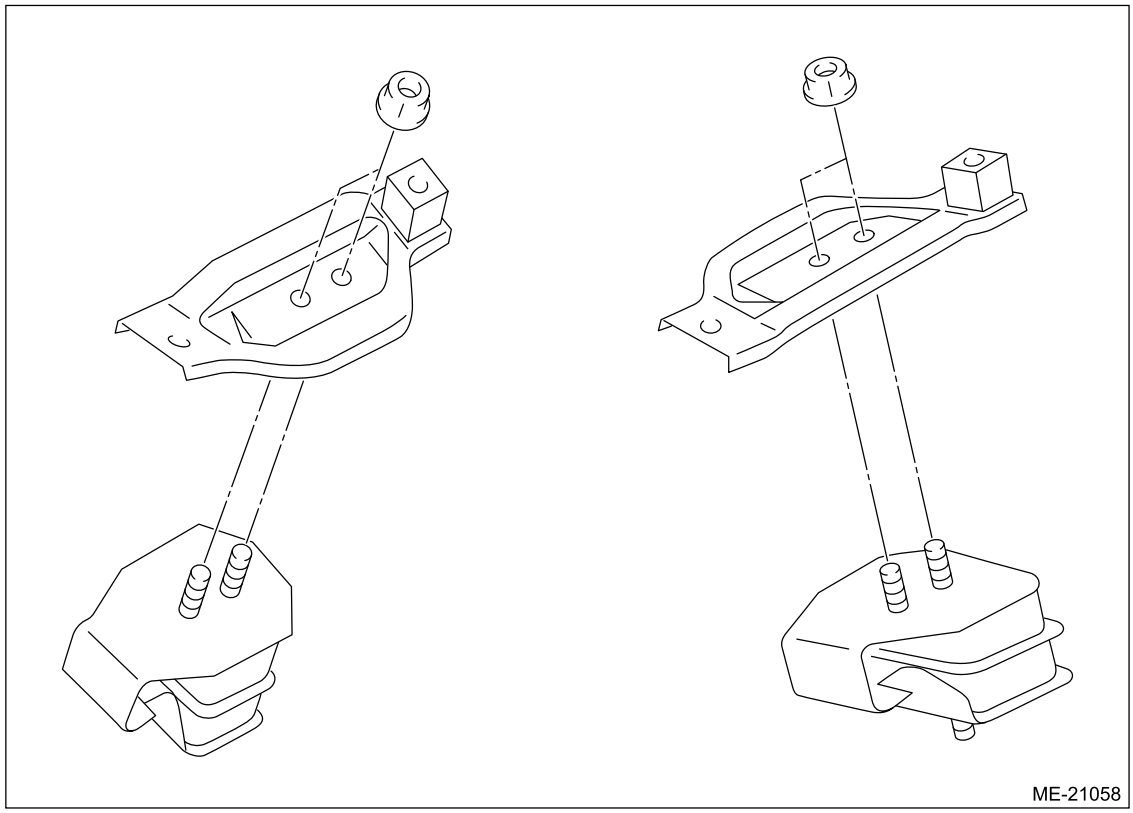
INSTALLATION

1. Install the engine mounting onto the engine.
   Tightening torque:
   35 N·m (3.6 kgf-m, 25.8 ft-lb)
2. Install the crossmember. Ref. to FRONT SUSPENSION>Crossmember>INSTALLATION.

MECHANICAL(H4DO) > Engine Mounting

DISASSEMBLY

Remove the front cushion rubber from the front engine mounting bracket. (MT model)



MECHANICAL(H4DO) > Engine Mounting

ASSEMBLY

Install the front cushion rubber to the front engine mounting bracket. (MT model)
Tightening torque:
42 N·m (4.3kgf-m, 31.0 ft-lb)

MECHANICAL(H4DO) > Engine Mounting

INSPECTION

Make sure that there are no cracks or other damages.

PROCEDURE

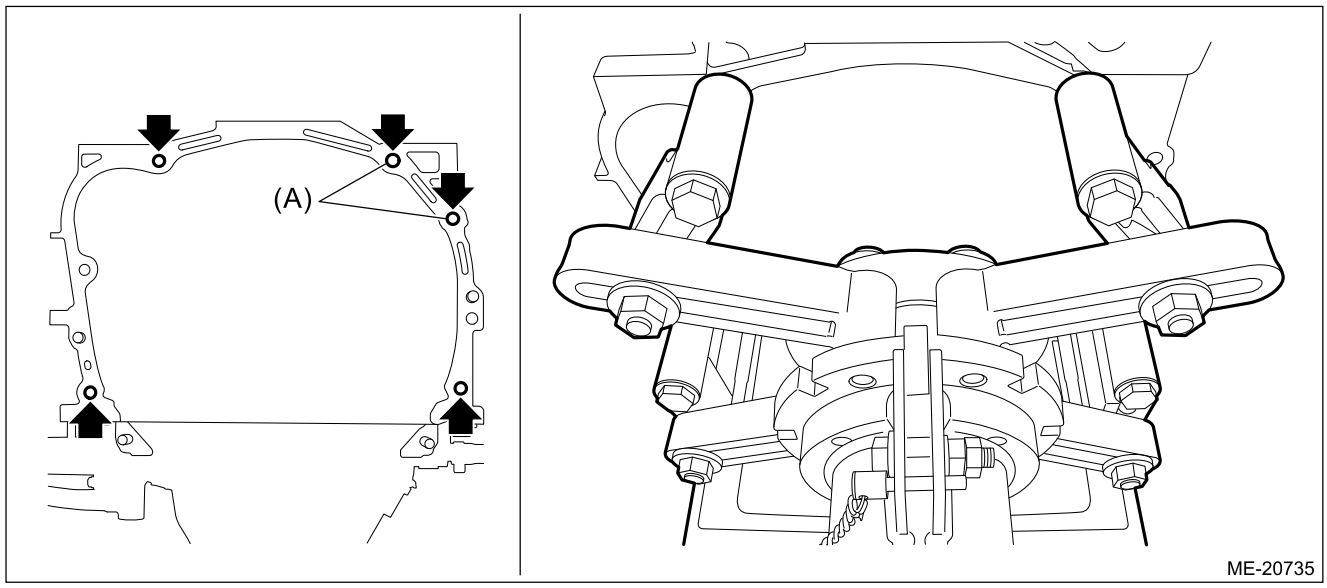
1. After engine has been removed from the vehicle, mount the engine to the engine stand while being careful of the following.
   (1) When mounting the engine stand, follow the instructions of engine stand used.
   (2) When disassembling the cylinder block, remove the following parts first, and then mount the engine stand.
      1. Remove the crankshaft position sensor plate with drive plate. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>REMOVAL.
      2. Remove the clutch disc and cover. (MT model) Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>REMOVAL.
      3. Remove the crankshaft position sensor plate with flywheel. (MT model) Ref. to CLUTCH SYSTEM>Flywheel>REMOVAL.
   (3) Mount the engine stand using the points shown by the arrows in the figure.

   Caution:

   Be sure to mount the engine stand at four points. Otherwise, the engine damage may occur.

   Note:

   - **For points (A), either of them can be used for mounting the engine stand.**
   - **The engine stand shown in the figure is just for reference.**



2. In this section the procedures described under each index are all connected and stated in order. The procedure for overhauling of the engine will be completed when you go through all steps in the process.
   Therefore, in this section, to conduct the particular procedure within the flow of a section, you need to go back and conduct the procedure described previously in order to do that particular procedure.

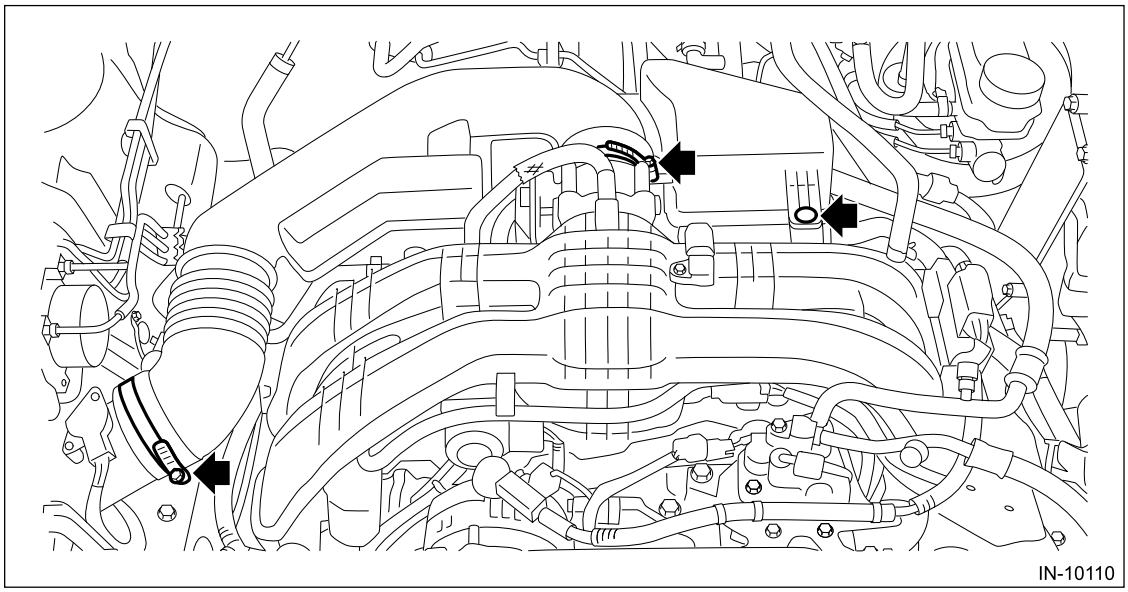
REMOVAL

Note:
When replacing a single part, perform the work with the engine assembly installed to body.

1. When working on the vehicle

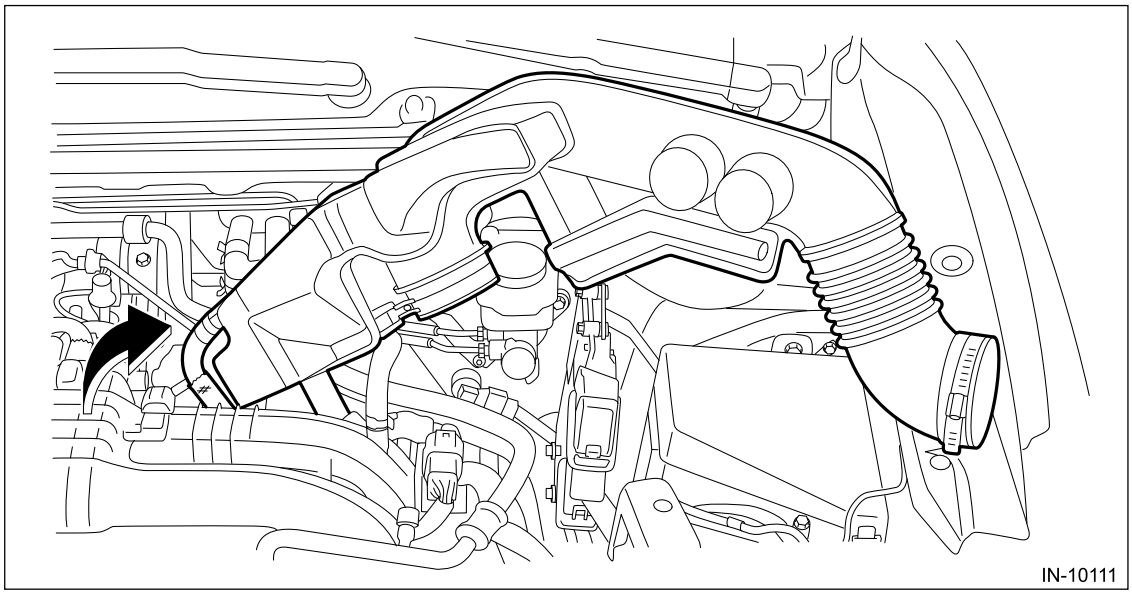
Note:
When working on the vehicle, perform the following steps also.

(1) Remove the clip from the air intake boot, and loosen the clamp.

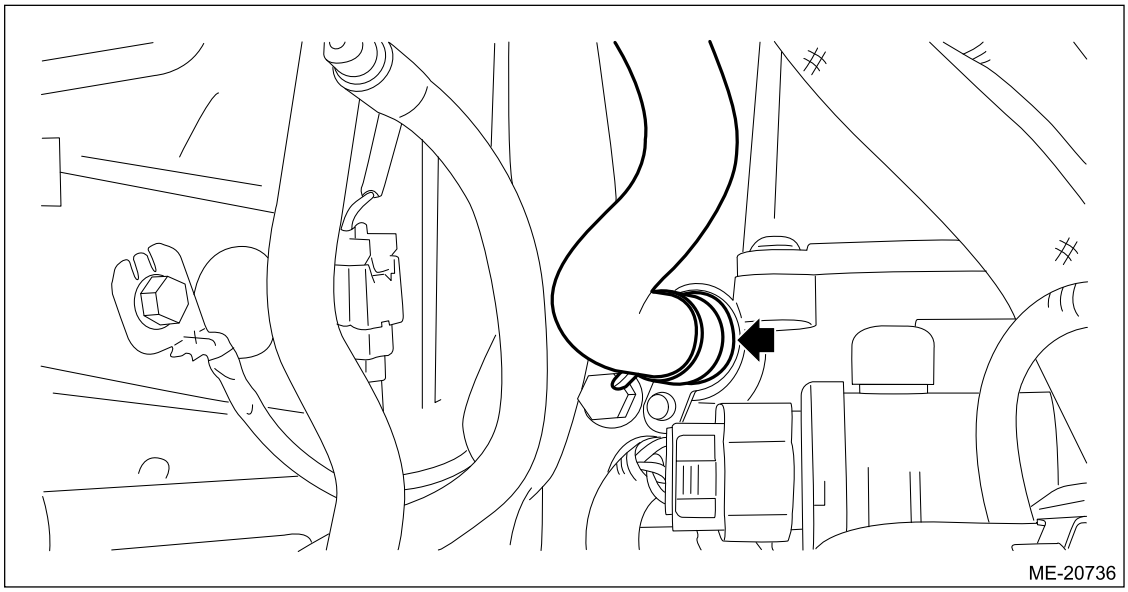


(2) Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:
Be careful not to pull out the PCV hose.



(3) Disconnect the brake booster vacuum hose from the vacuum pump.

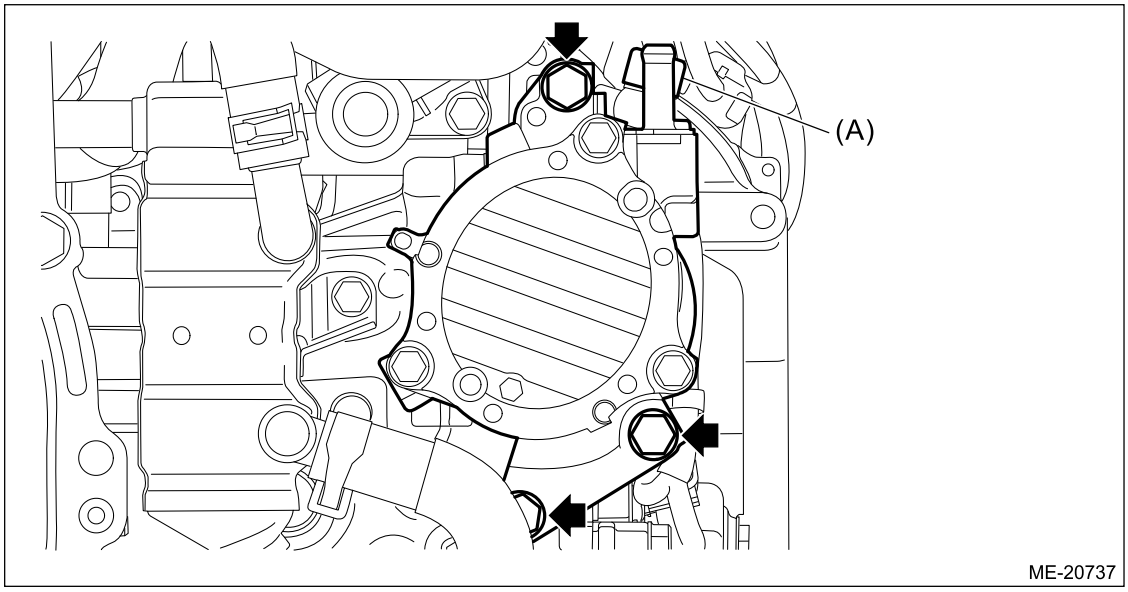


(4) Remove the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.

2. Remove the bolts (A) securing the oil pipe, and remove the vacuum pump.

Note:

The vacuum pump cannot be disassembled.



3. Remove liquid gasket from the vacuum pump mounting surface of the engine, and the surface of the vacuum pump.

MECHANICAL(H4DO) > Vacuum Pump

INSTALLATION

1. Apply liquid gasket to the vacuum pump as shown in the figure.

Note:

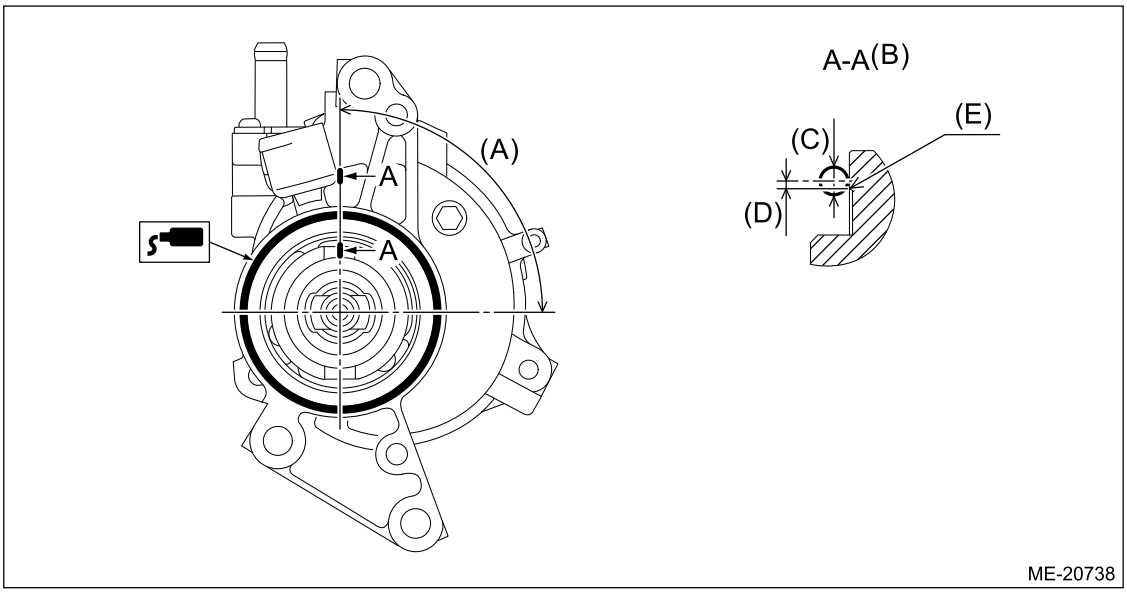
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine where the vacuum pump is mounted on, and the surface of the vacuum pump.**
- **When applying liquid gasket, the start and the end of application should cross at the point within the range A shown in the figure.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

3±1 mm (0.1181±0.0394 in)



(A) Range A (range where application can start)

(B) Liquid gasket applying position of mating surface

(C) ⌀3±1 mm (0.1181±0.0394 in)

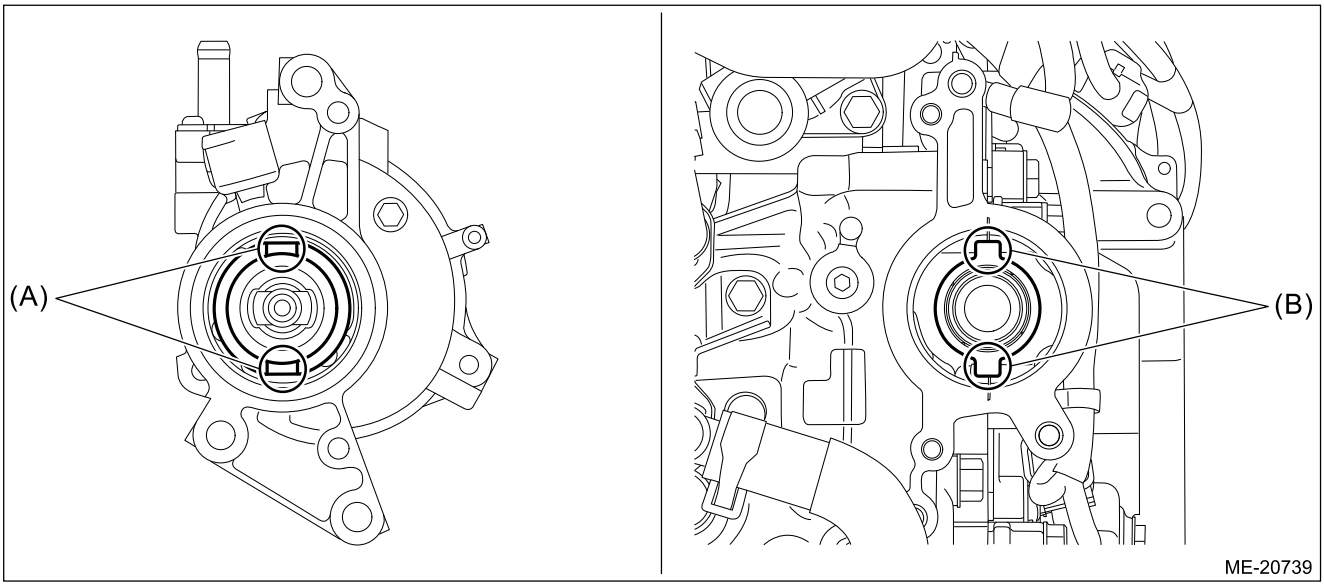
(D) Within 1 mm (0.0394 in)

(E) Chamfer edge

2. Install the vacuum pump.

Note:

When installing the vacuum pump, align the slot on the vacuum pump shaft (A) with the protrusion on the intake camshaft RH (B).



Tightening torque:

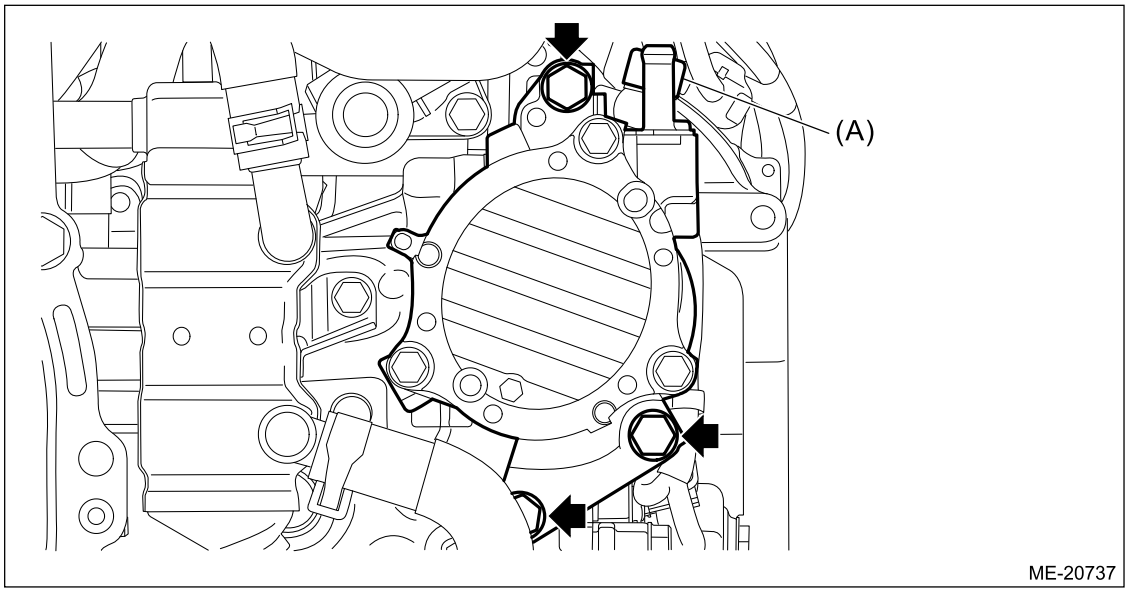
16 N·m (1.6 kgf-m, 11.8 ft-lb)

3. Apply engine oil to the threaded portion for the vacuum pump union bolt.

4. Set a new gasket on the oil pipe, and secure the oil pipe with the union bolt (A).

Tightening torque:

20 N·m (2.0 kgf-m, 14.8 ft-lb)



5. When working on the vehicle

Note:

When working on the vehicle, perform the following steps also.

(1) Install the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.

(2) Connect the brake booster vacuum hose to the vacuum pump.

(3) Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

MECHANICAL(H4DO) > Vacuum Pump

INSPECTION

Check that the vacuum pump has no deformation, cracks or other damages.

REMOVAL

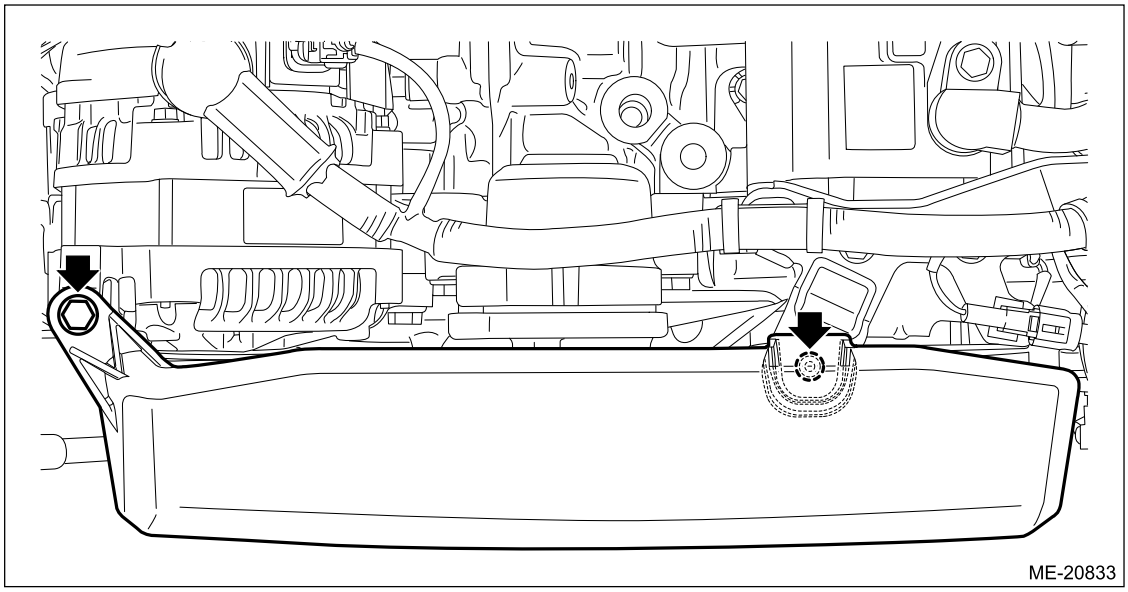
Note:
When replacing a single part, perform the work with the engine assembly installed to body.

1. V-BELT

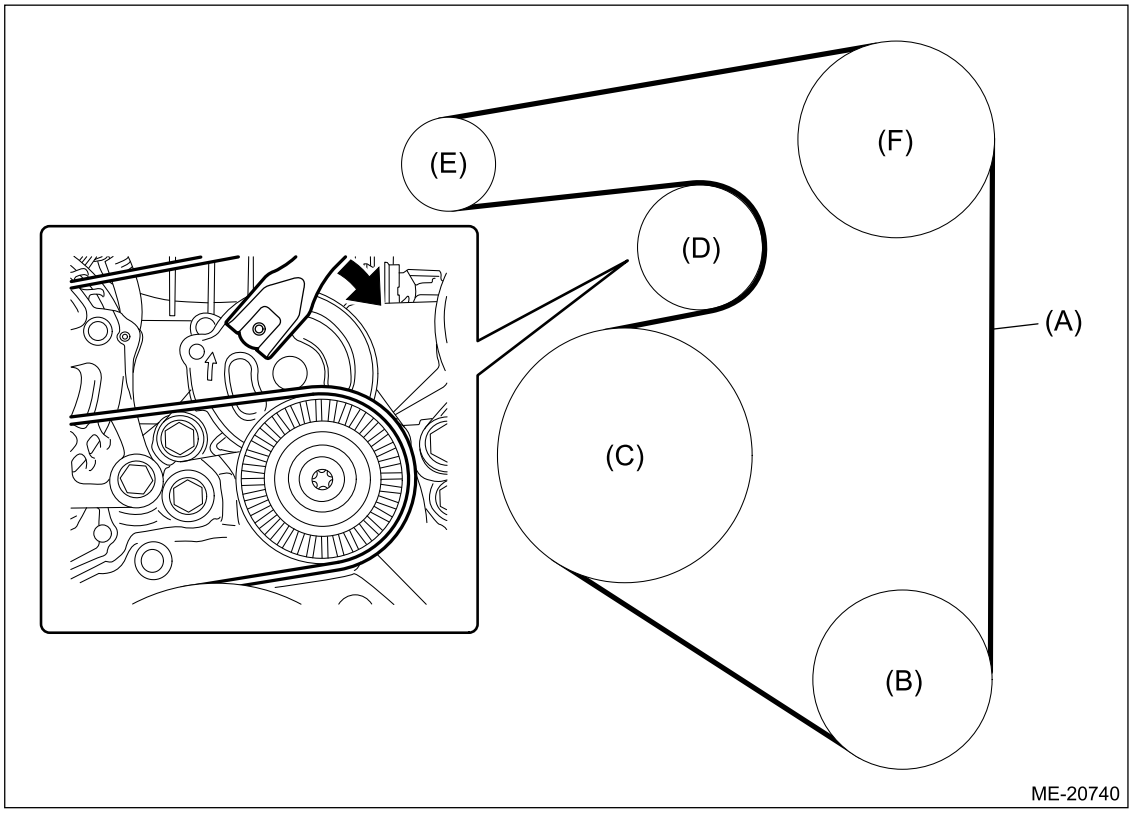
1. When working on the vehicle

Note:
When working on the vehicle, perform the following steps also.

(1) Remove the V-belt covers.



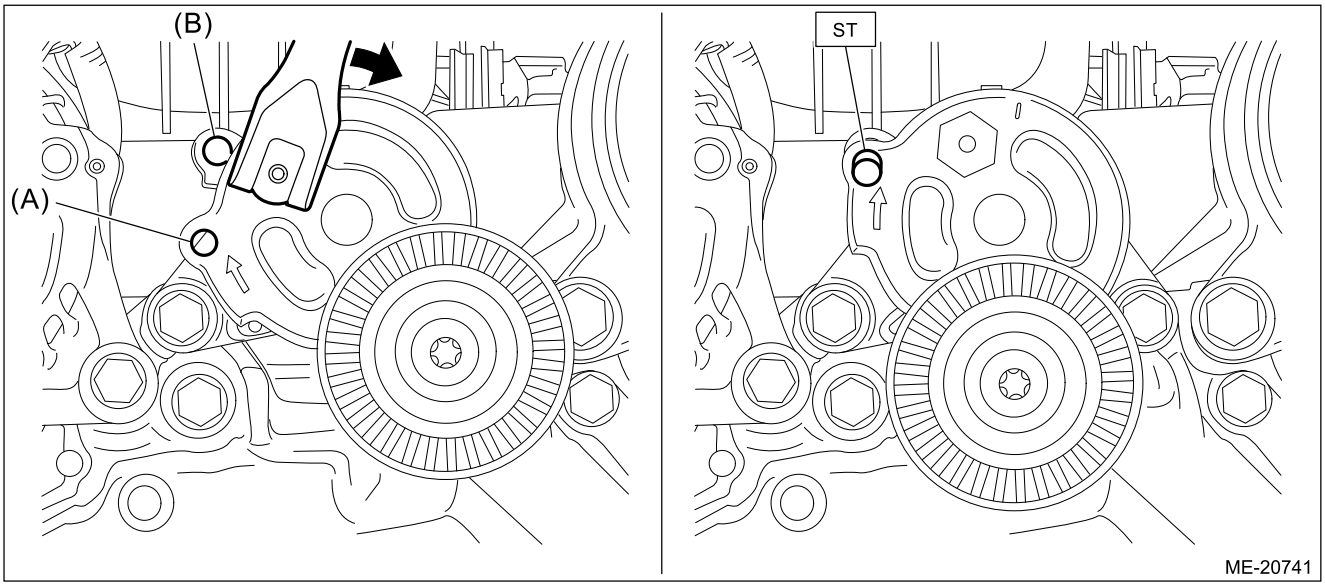
2. Attach the tool to the V-belt tensioner assembly, and rotate the tool clockwise to loosen and remove the V-belt.



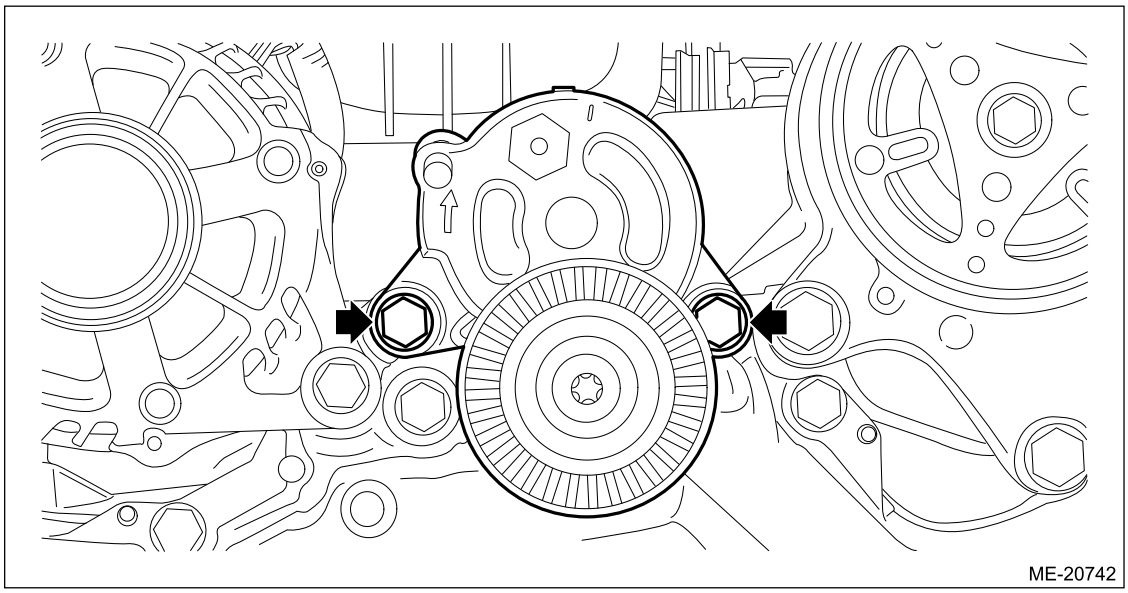
(A) V-belt
(B) Water pump pulley
(C) Crank pulley
(D) V-belt tensioner ASSY
(E) Generator pulley
(F) A/C compressor pulley

2. V-BELT TENSIONER ASSEMBLY

1. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT.
2. Prepare for removing the V-belt tensioner assembly.
   (1) Attach the tool to the V-belt tensioner assembly, and rotate the tool clockwise so that the stopper pin hole (A) aligns with the stopper pin hole (B). Insert the ST or 5 mm hex wrench into the holes.
   Preparation tool:
   ST: STOPPER PIN (499267300)



3. Remove the V-belt tensioner assembly.



MECHANICAL(H4DO) > V-belt

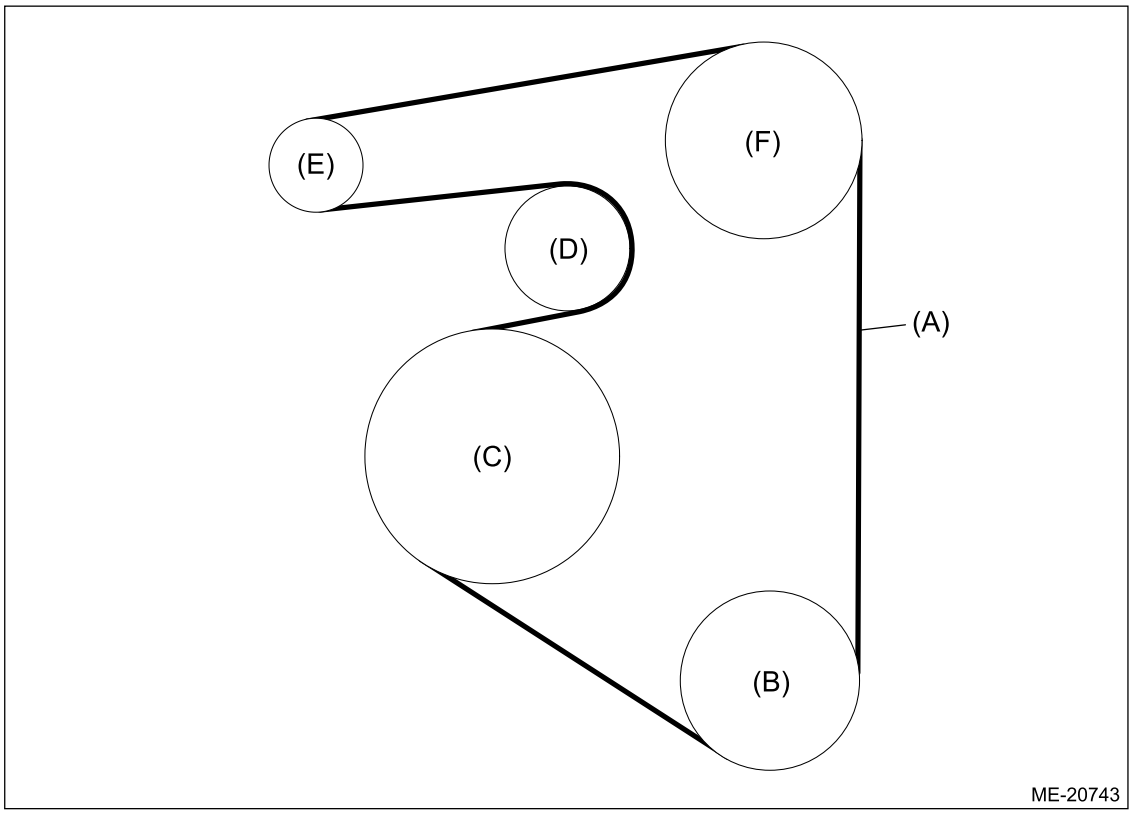
INSTALLATION

1. V-BELT

1. Attach the tool to the V-belt tensioner assembly, and rotate the tool clockwise to remove the V-belt as shown in the figure.

Caution:

- **When reusing the V-belt, wipe off dust and water with cloth.**
- **Do not use the V-belt if there is any oil, grease or coolant on the belt.**
- **Be careful not to rub the V-belt end surface with bare hands; exposed core may cause injury.**
- **Wipe off any dust, oil and water on the groove of each pulley with cloth.**



(A) V-belt
(B) Water pump pulley
(C) Crank pulley
(D) V-belt tensioner assembly
(E) Generator pulley
(F) A/C compressor pulley

2. When working on the vehicle

Note:

When working on the vehicle, perform the following steps also.

(1) Install the V-belt cover.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)

2. V-BELT TENSIONER ASSEMBLY

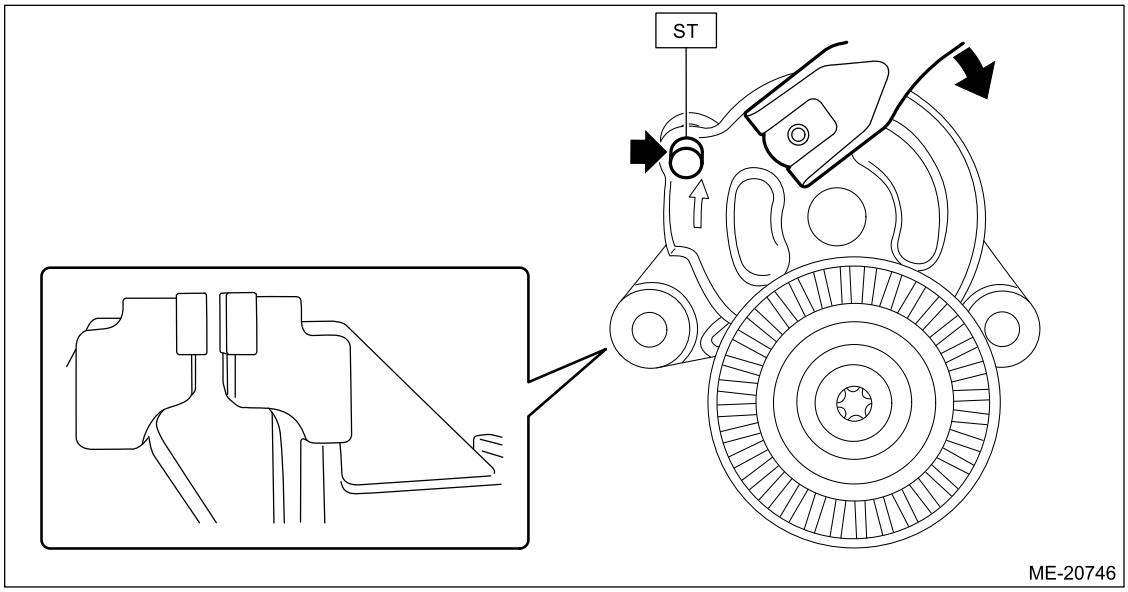
1. The V-belt tensioner assembly is replaced.

Note:

When replacing the V-belt tensioner assembly, also perform the following steps.

(1) Set the V-belt tensioner assembly to be discarded on a vice.

(2) Attach the tool to the V-belt tensioner assembly, and rotate the tool clockwise to remove the ST or 5 mm hex wrench.

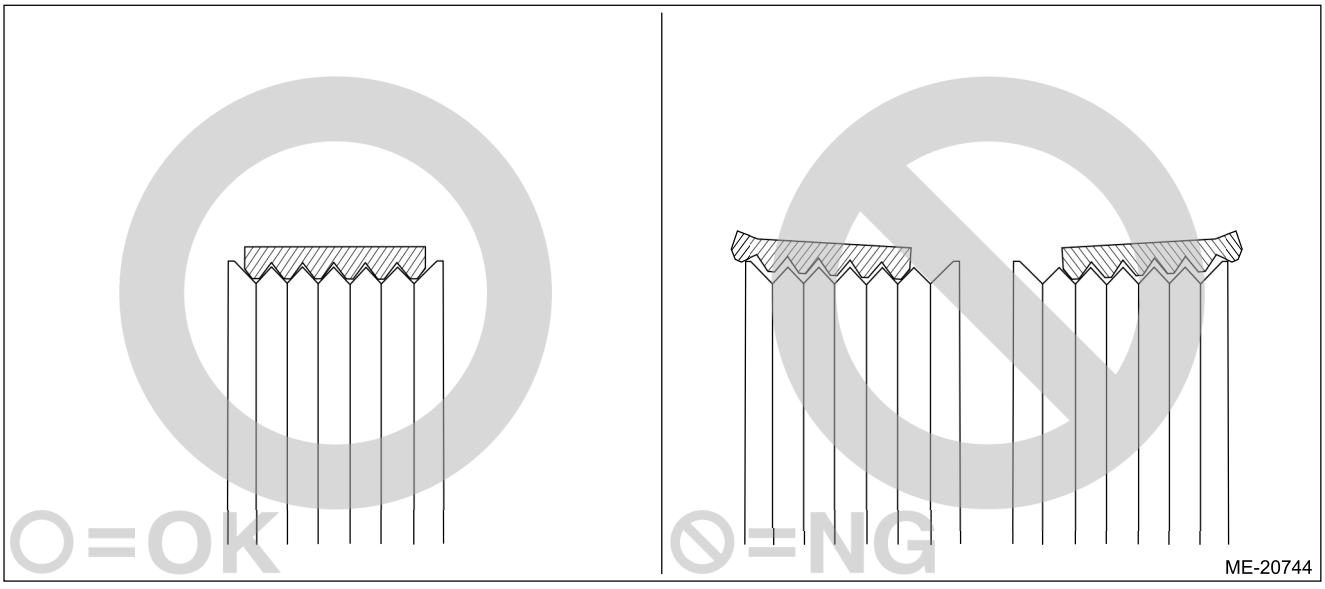


2. Install the V-belt tensioner assembly.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14.0 ft-lb)
3. Attach the tool to the V-belt tensioner assembly, and rotate the tool clockwise to remove the ST or 5 mm hex wrench.
4. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.

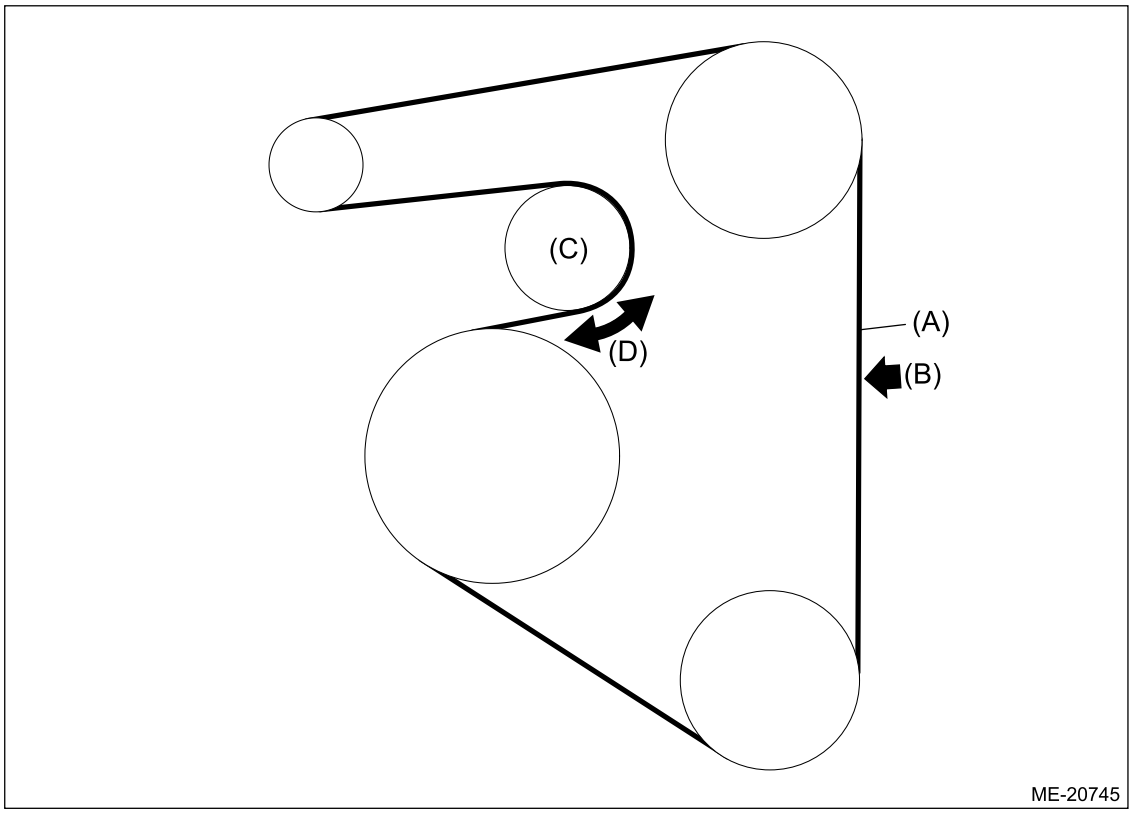
MECHANICAL(H4DO) > V-belt

INSPECTION

1. Check the V-belt for cracks, tear or wear.
2. Check the V-belt tensioner assembly for deformation, cracks and any other damage.
3. Check that the V-belt ribs are securely placed on the rib grooves for each pulley.



4. Check that the V-belt tensioner assembly (C) moves in the direction of arrow (D), when the V-belt (A) is pushed and released by the area indicated by the arrow (B).

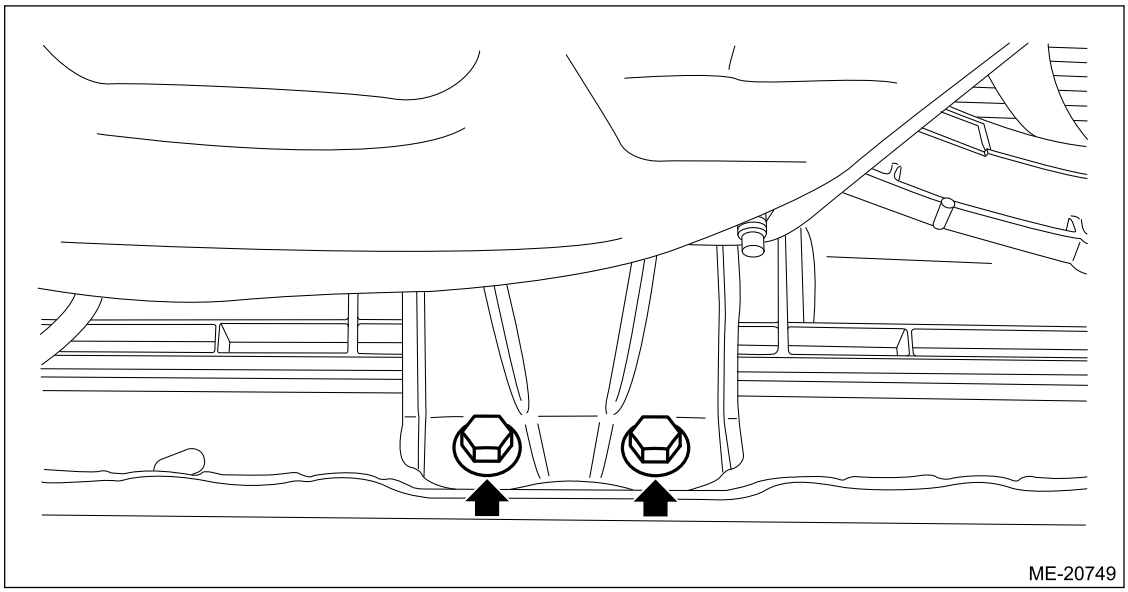


5. Start the engine and confirm that the V-belt rotates smoothly and no abnormal noise is emitted.

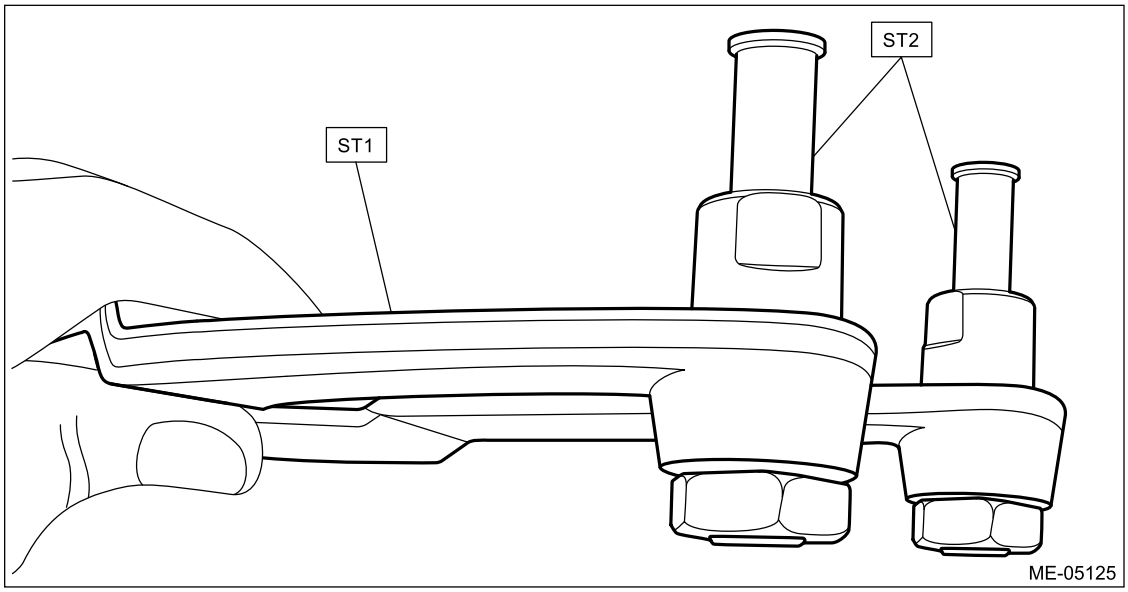
REMOVAL

Note:
When replacing a single part, perform the work with the engine assembly installed to body.

1. When working on the vehicle
   Note:
   When working on the vehicle, perform the following steps also.
   (1) Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
   (2) Remove the front under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
   Note:
   This procedure is performed only when the crank pulley bolt contacts the radiator upper frame, causing the bolt not to come off.
   (3) Remove the bolts securing the lower side of the radiator upper frame.
   Note:
   This procedure is performed only when the crank pulley bolt contacts the radiator upper frame, causing the bolt not to come off.



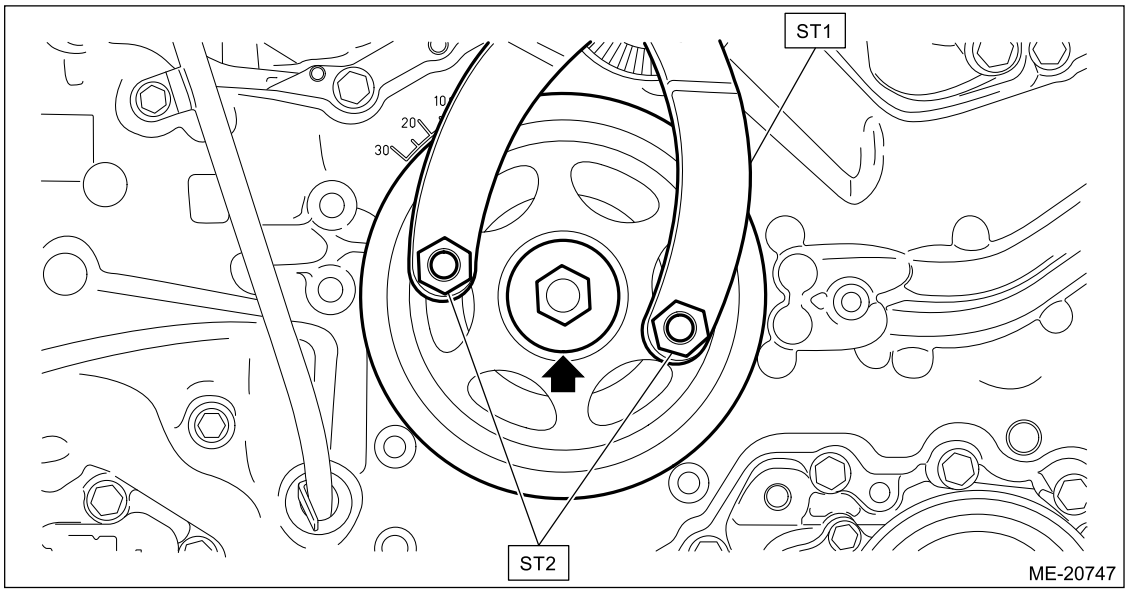
2. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT.
3. Use the ST1 and ST2 to lock the crank pulley, remove the crank pulley bolt.
   Note:
   To prevent damaging ST1, attach the ST2 onto the ST1 as shown in the figure below.



Preparation tool:

ST1: PULLEY WRENCH (18355AA000)

ST2: PULLEY WRENCH PIN SET (18334AA000)



4. Remove the crank pulley.

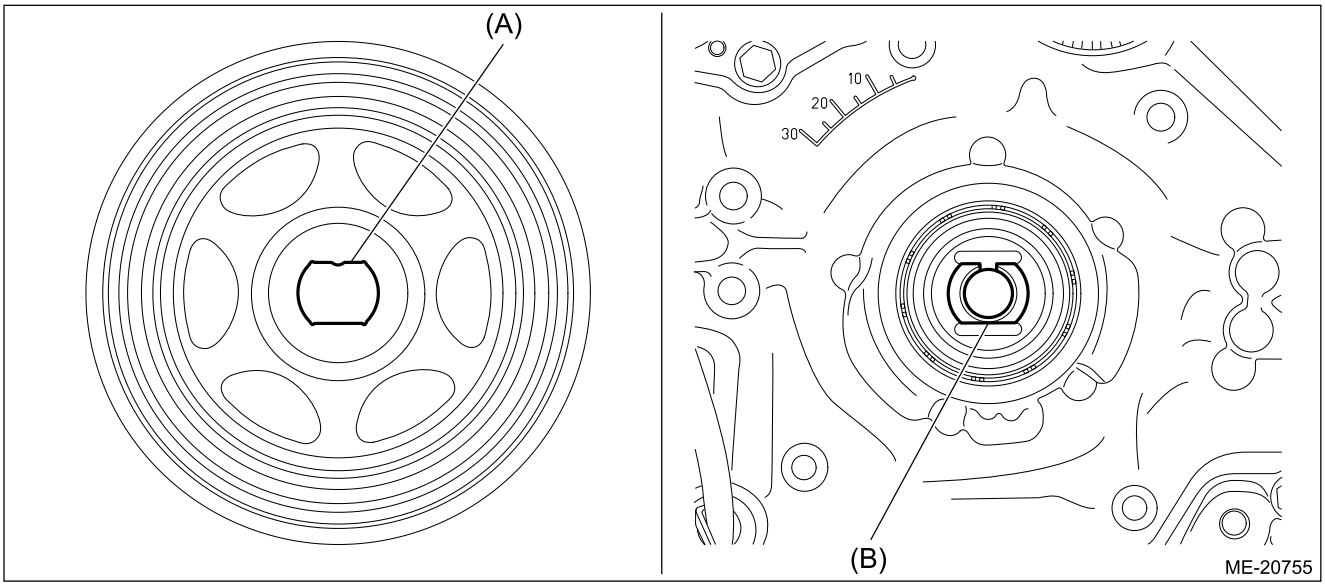
MECHANICAL(H4DO) > Crank Pulley

INSTALLATION

1. Clean the crankshaft thread using compressed air.
2. Apply engine oil to the crank pulley bolt seat and thread.
3. Install the crank pulley.
   (1) Install new O-ring to the crank pulley boss.
   (2) Set the crank pulley to the crank pulley boss.

Note:

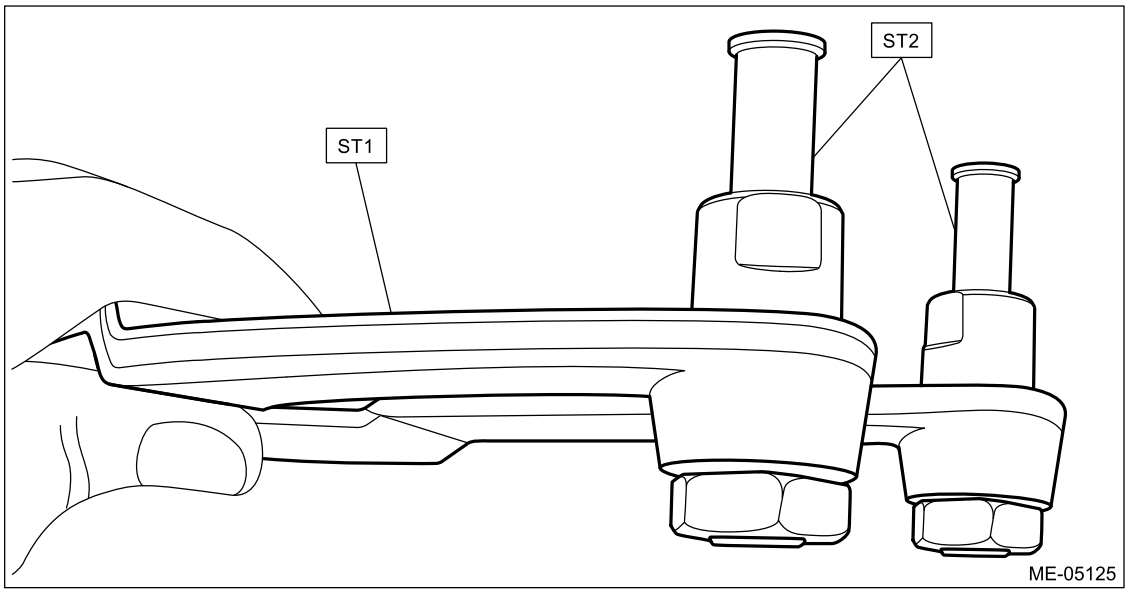
Install the crank pulley by aligning the flat sides (A) of the crank pulley and the flat sides (B) of the crank pulley boss.



(3) Use the ST1 and ST2 to lock the crank pulley, and temporarily tighten the crank pulley bolt.

Note:

To prevent damaging ST1, attach the ST2 onto the ST1 as shown in the figure below.



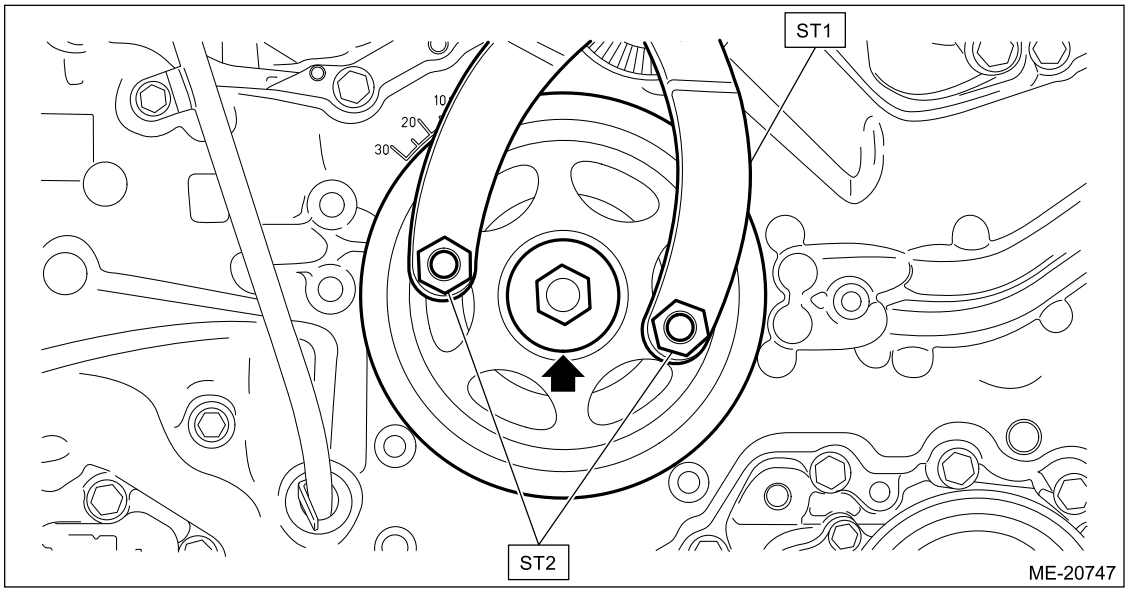
Preparation tool:

ST1: PULLEY WRENCH (18355AA000)

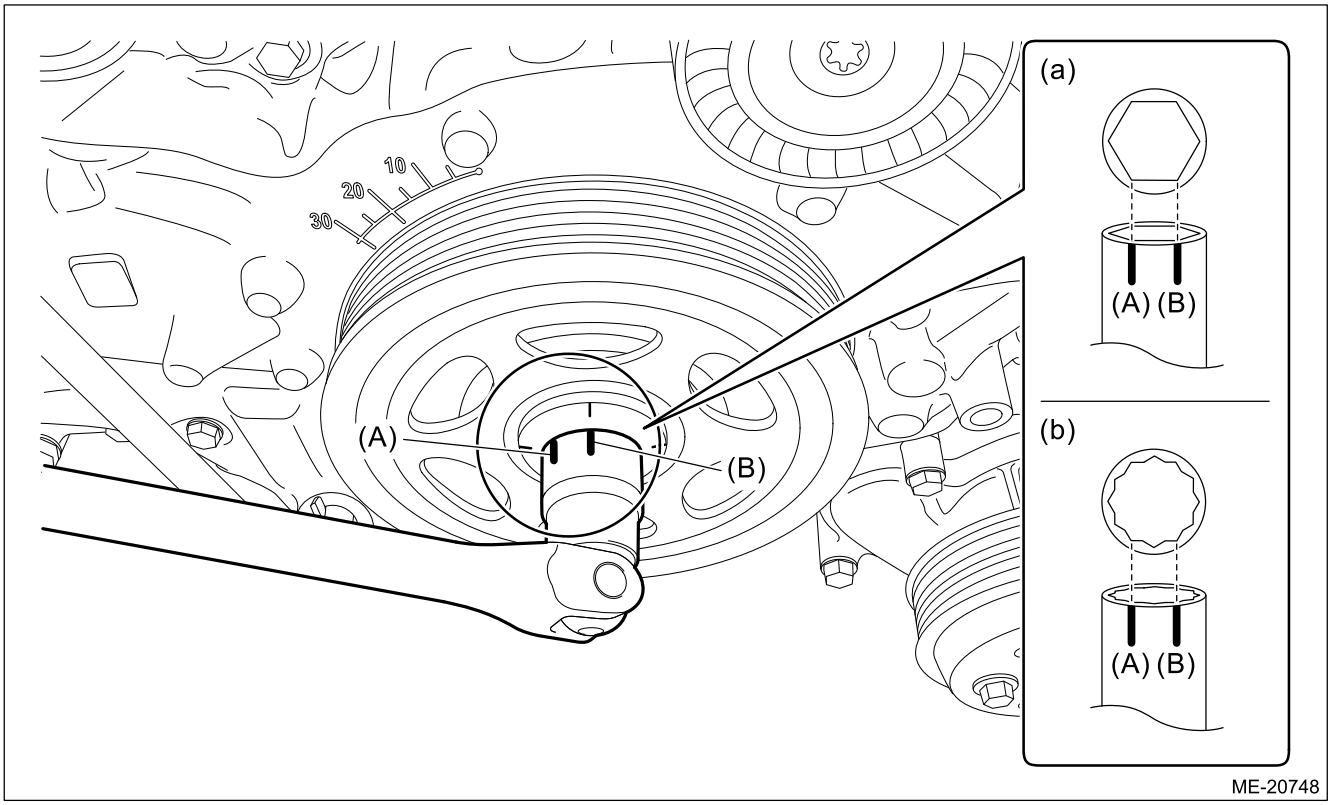
ST2: PULLEY WRENCH PIN SET (18334AA000)

Tightening torque:

80 N·m (8.2 kgf-m, 59.0 ft-lb)

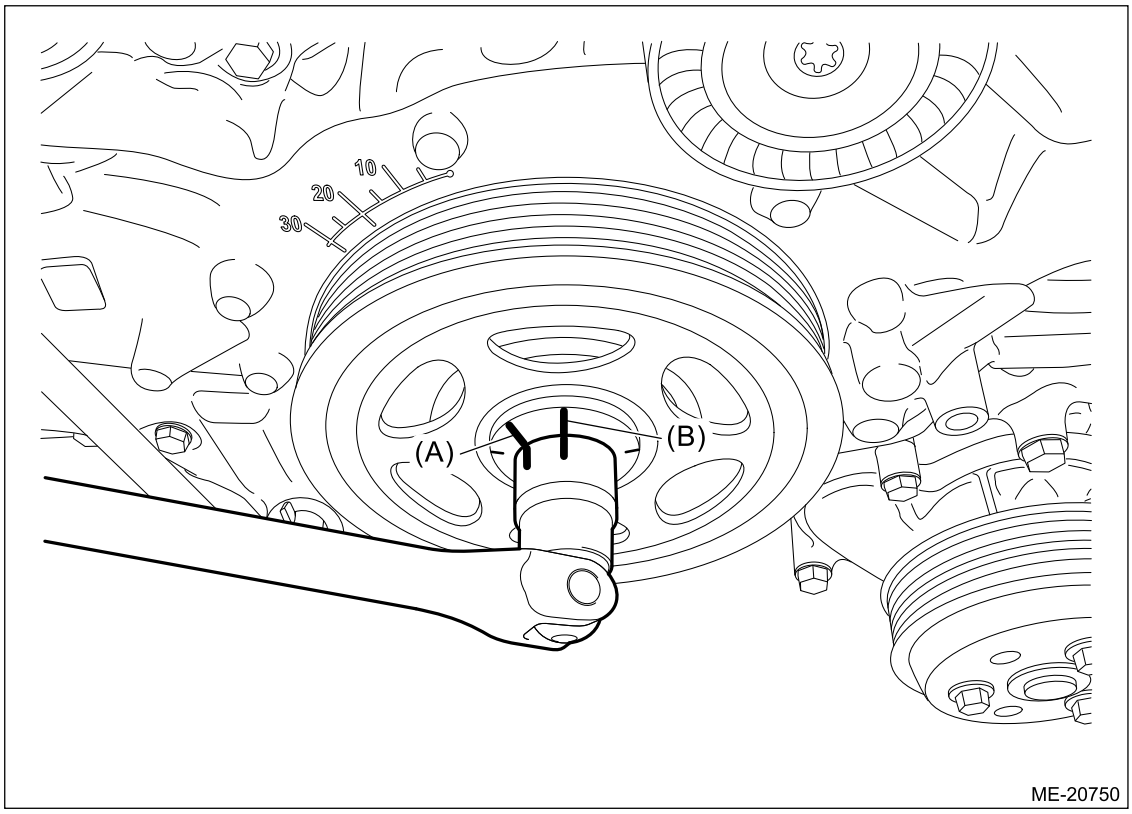


(4) Draw reference lines (A) and (B) using a marker to set the socket to the crank pulley bolt as shown in the figure.

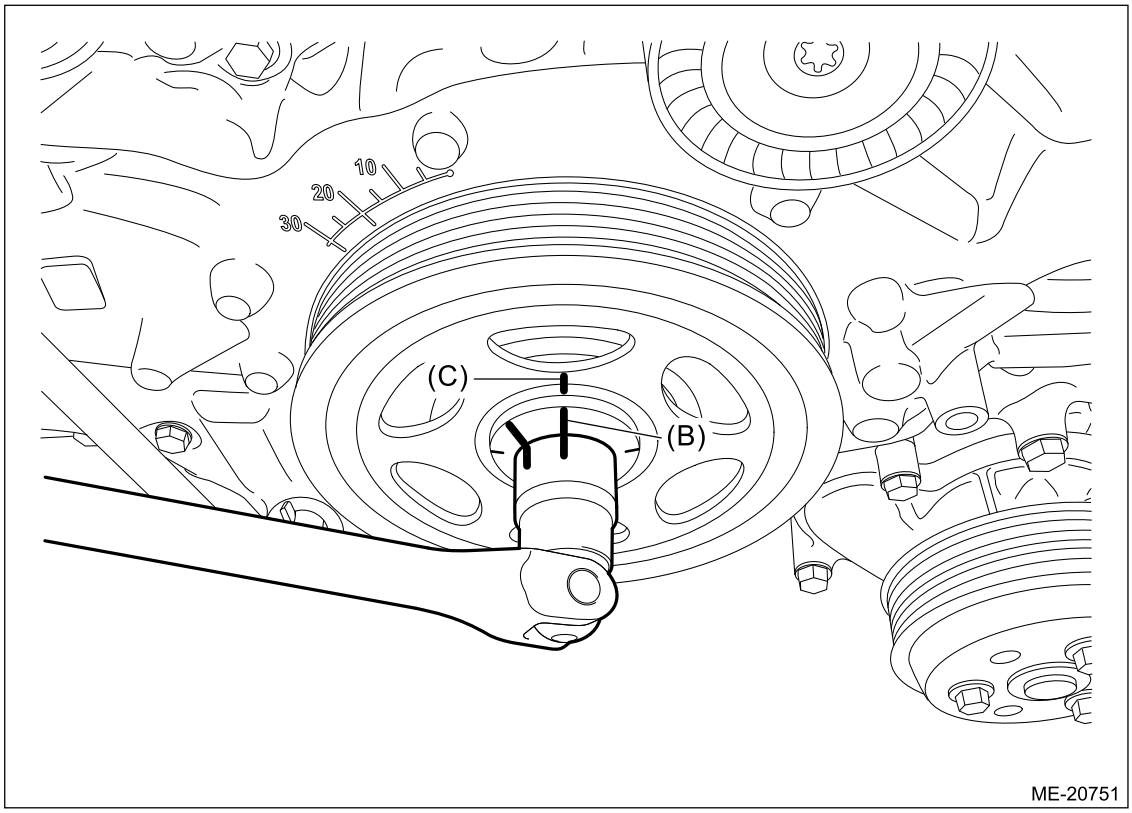


(a) When using 6-point socket (b) When using 12-point socket

(5) Draw reference lines (A) and (B) on the crank pulley bolt using a marker as shown in the figure.



(6) Draw end line (C) on crank pulley using a marker at the same position as reference line (B) drawn on the crank pulley bolt in step (5).



(7) Use the ST1 and ST2 to lock the crank pulley, and tighten the crank pulley bolt until the reference line (A) and end line (C) are aligned.

Note:

It should be approx. 60° when reference line (A) and end line (C) are aligned.

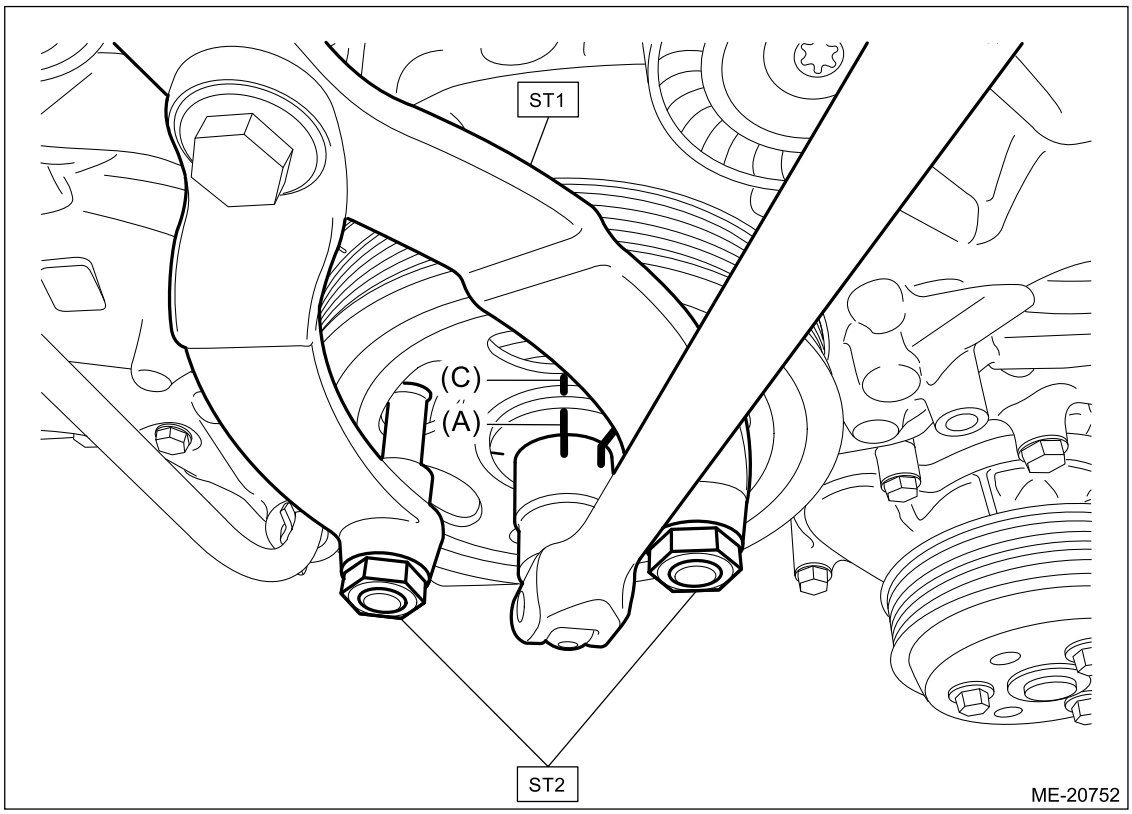
Preparation tool:

ST1: PULLEY WRENCH (18355AA000)

ST2: PULLEY WRENCH PIN SET (18334AA000)

Tightening angle:

60°±5°



4. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.

5. When working on the vehicle

Note:

When working on the vehicle, perform the following steps also.

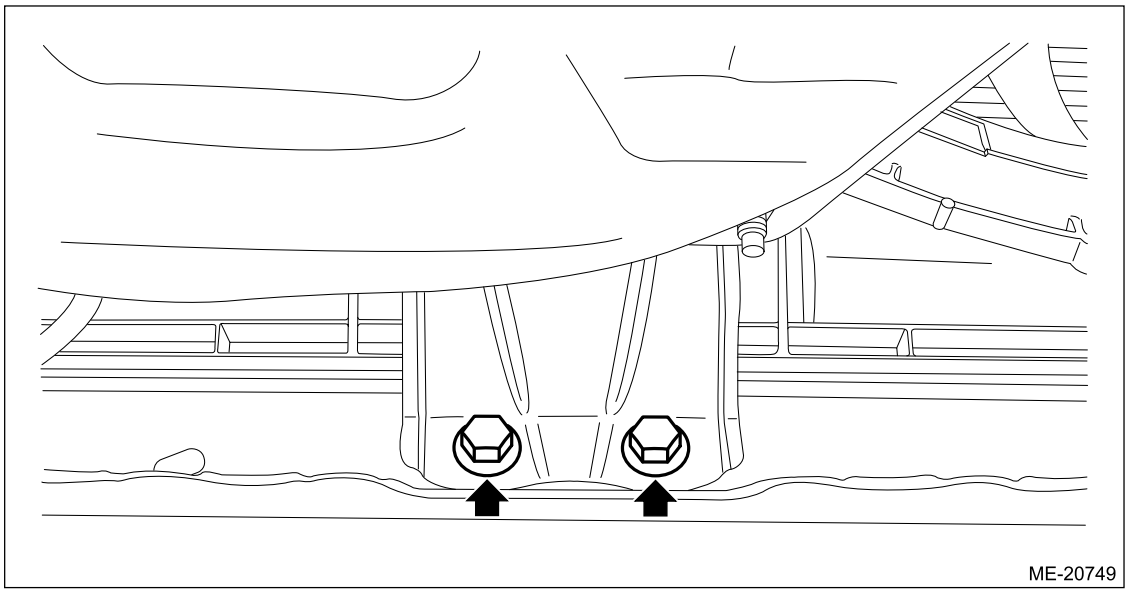
(1) Install the bolts securing the lower side of the radiator upper frame.

Note:

This procedure is performed only when the component is removed for installation/removal of the crank pulley bolt.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



(2) Install the front under cover. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>INSTALLATION.

Note:

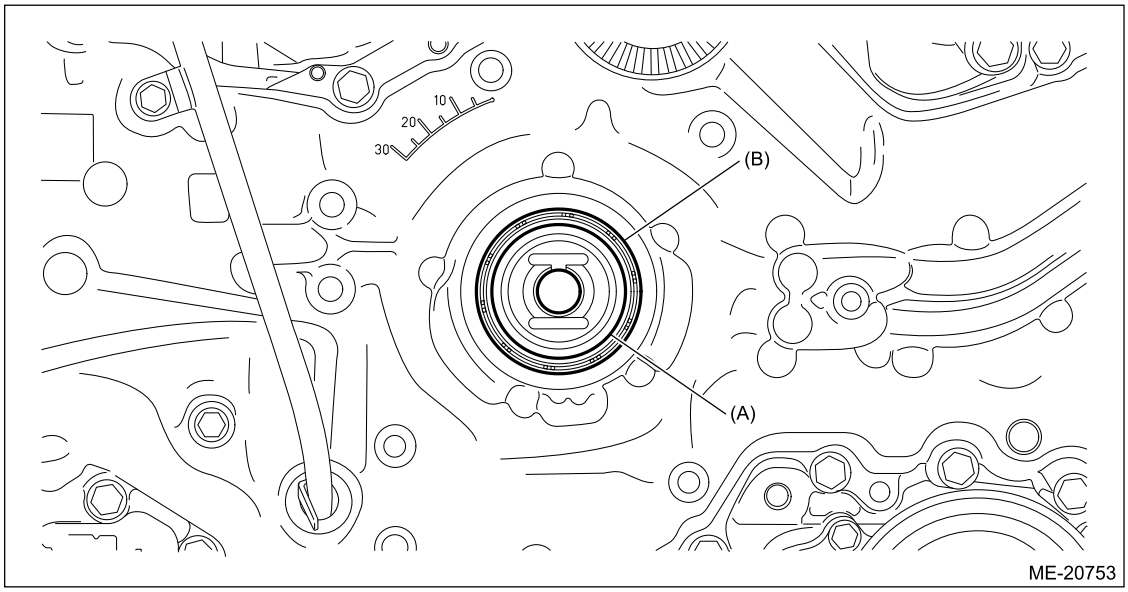
This procedure is performed only when the component is removed for installation/removal of the crank pulley bolt.

(3) Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.

MECHANICAL(H4DO) > Crank Pulley

INSPECTION

1. Check that the crank pulley and crank pulley boss have no deformation, cracks or other damages.
2. Inspect for oil leakage from the front oil seal. If there is an oil leak, replace the front oil seal with a new part according to the following procedures.
   (1) Remove the crank pulley. Ref. to MECHANICAL(H4DO)>Crank Pulley>REMOVAL.
   (2) Remove the crank pulley boss (A) from the chain cover, and remove the front oil seal (B).



(3) Degrease the press-fit section for the chain cover front oil seal, and install the front oil seal to the chain cover using ST.

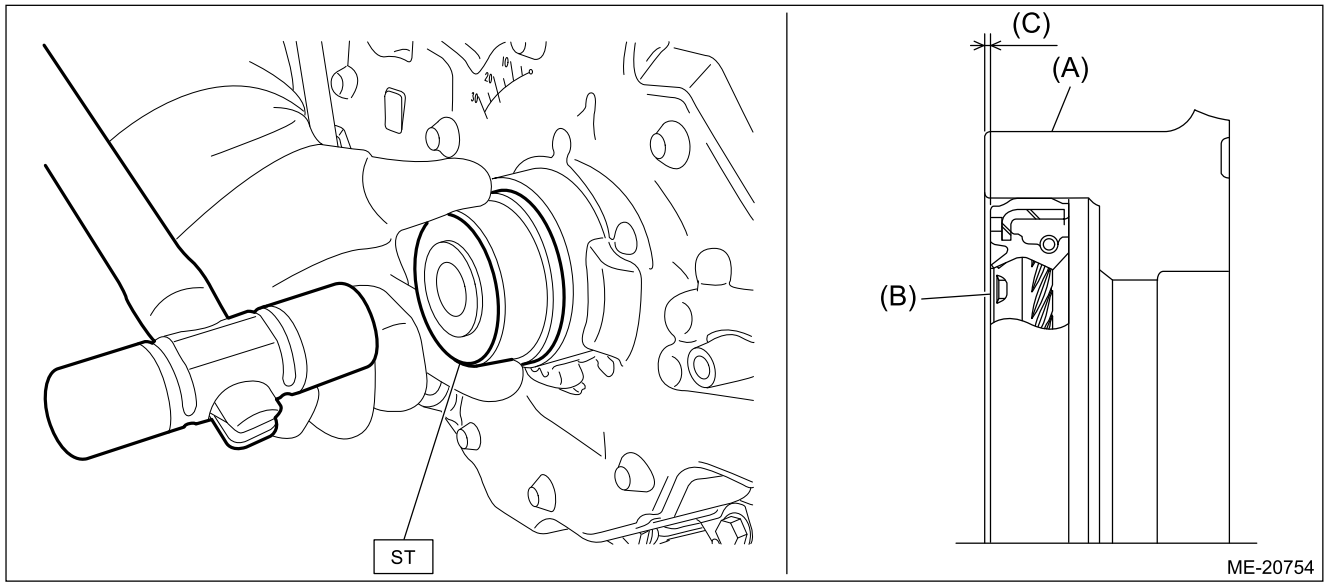
Caution:

Do not apply fluid such as engine oil to the front oil seal and the chain cover; otherwise engine oil leakage may occur.

ST 41399FG020 SPECIAL TOOL B

Front oil seal press-fit position:

1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in) position from chain cover end face



(A) Chain cover

(B) Oil seal

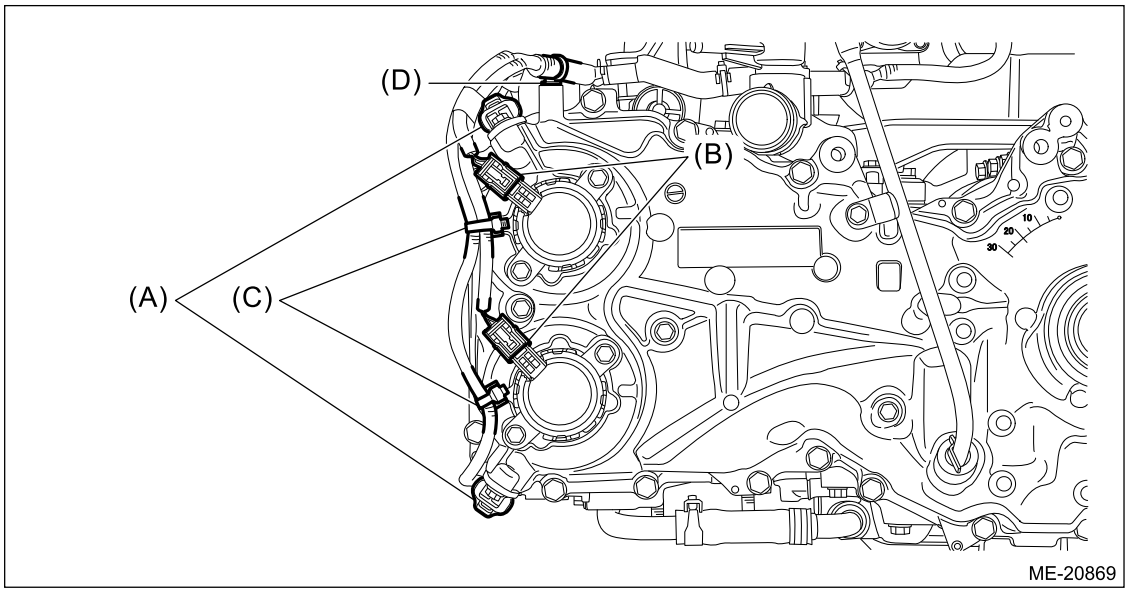
(C) Front oil seal press-fit position (1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in) position from chain cover end face)

(4) Install in the reverse order of removal after replacement.

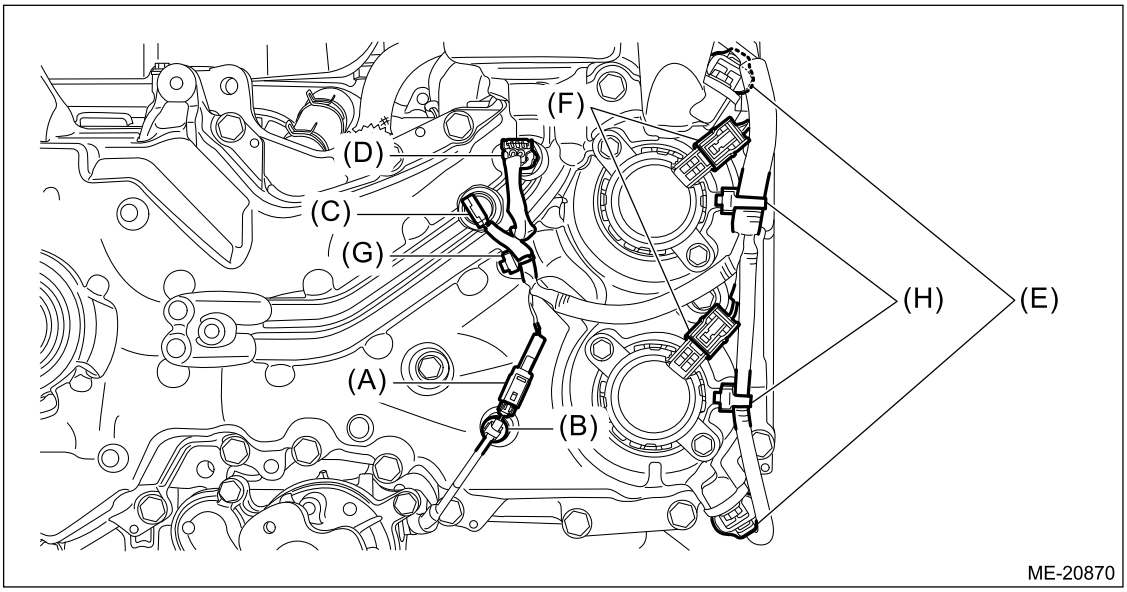
REMOVAL

Note:
When replacing a single part, perform the work with the engine assembly installed to body.

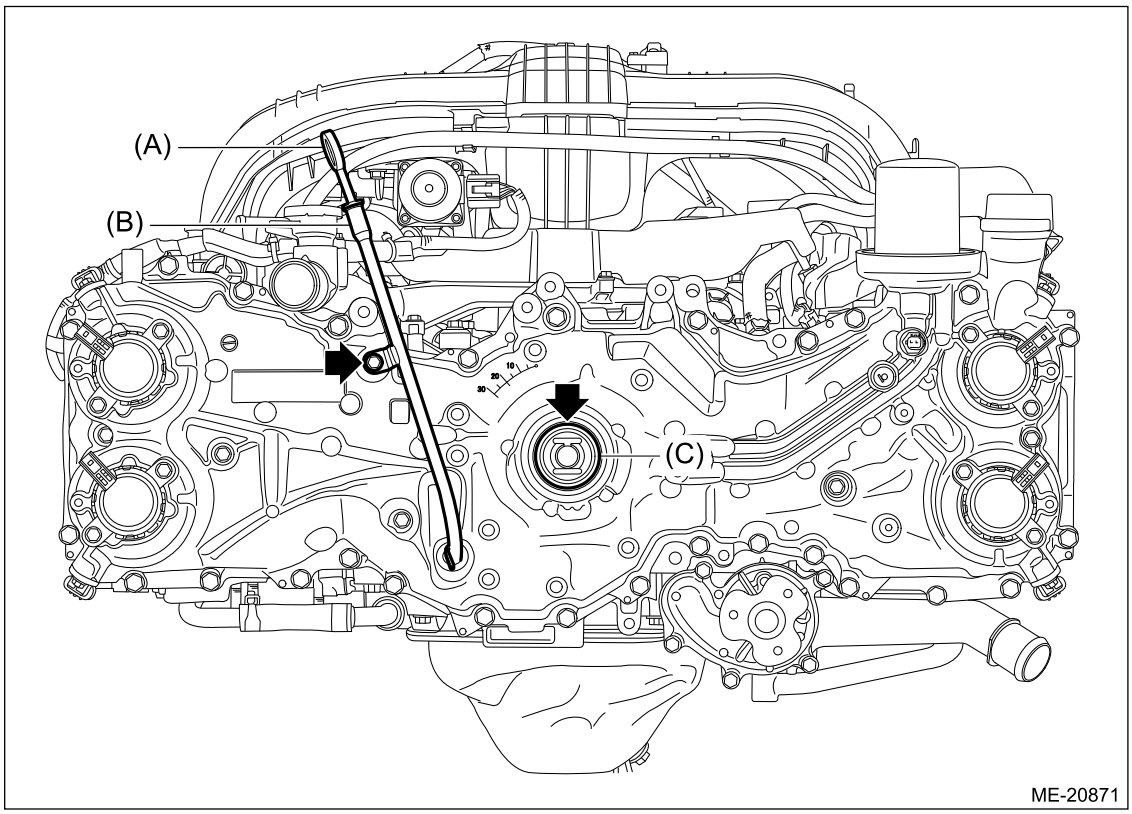
1. When working on the vehicle
   Note:
   When working on the vehicle, perform the following steps also.
   (1) Remove the radiator and the condenser as a assembly. Ref. to COOLING(H4DO)>Radiator>REMOVAL.
2. Drain the engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
3. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT.
4. Remove the V-belt tensioner assembly. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT TENSIONER ASSEMBLY.
5. Remove the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>REMOVAL.
6. Remove the A/C compressor. Ref. to AIR CONDITIONER>Compressor>REMOVAL.
7. Remove the water pump pulley. Ref. to COOLING(H4DO)>Water Pump>REMOVAL > WATER PUMP.
8. Remove the crank pulley. Ref. to MECHANICAL(H4DO)>Crank Pulley>REMOVAL.
9. Disconnect the connector (A) and connector (B) to remove the clip (C) and clip (D) securing the engine harness.



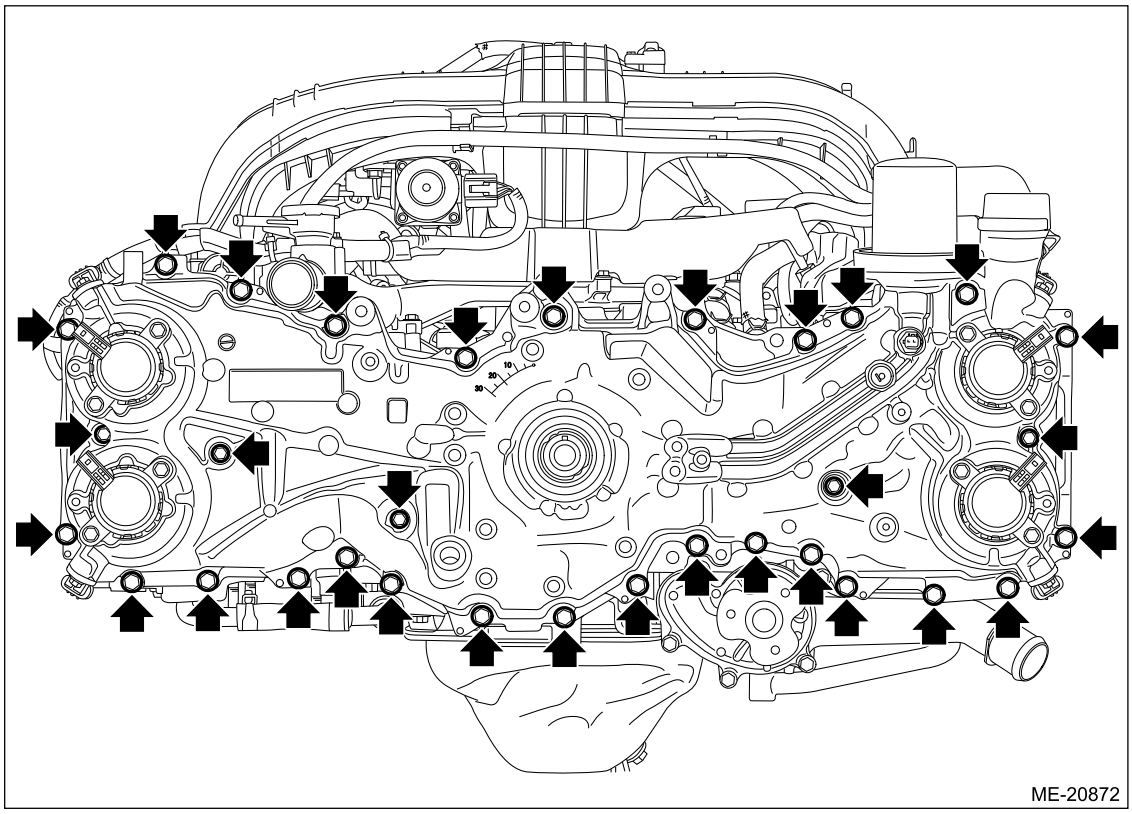
10. Disconnect the connector (A) and remove the clip (B) securing the oil level switch harness.
11. Disconnect the terminal (C), connector (D), connector (E) and connector (F), and remove the clip (G) and clip (H) securing the engine harness.



12. Pull out the oil level gauge (A), and remove the oil level gauge guide (B) and crank pulley boss (C).



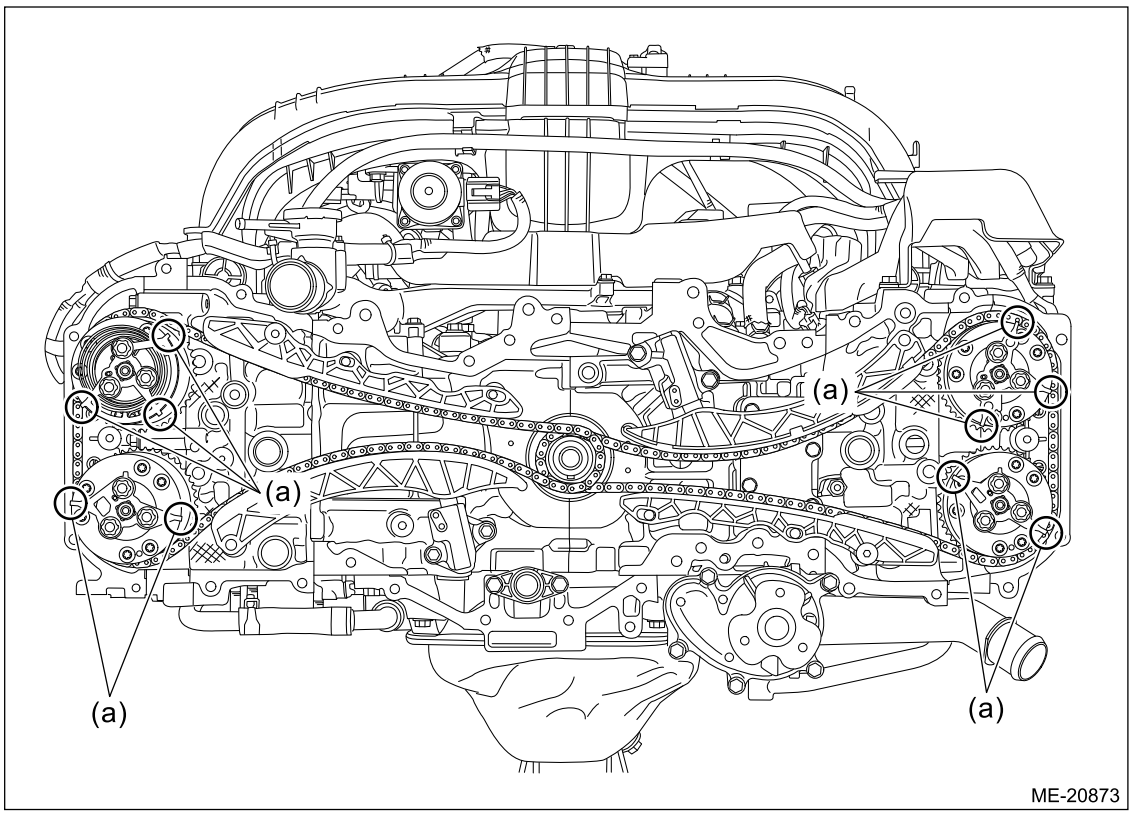
13. Remove the bolts securing the chain cover to the engine.

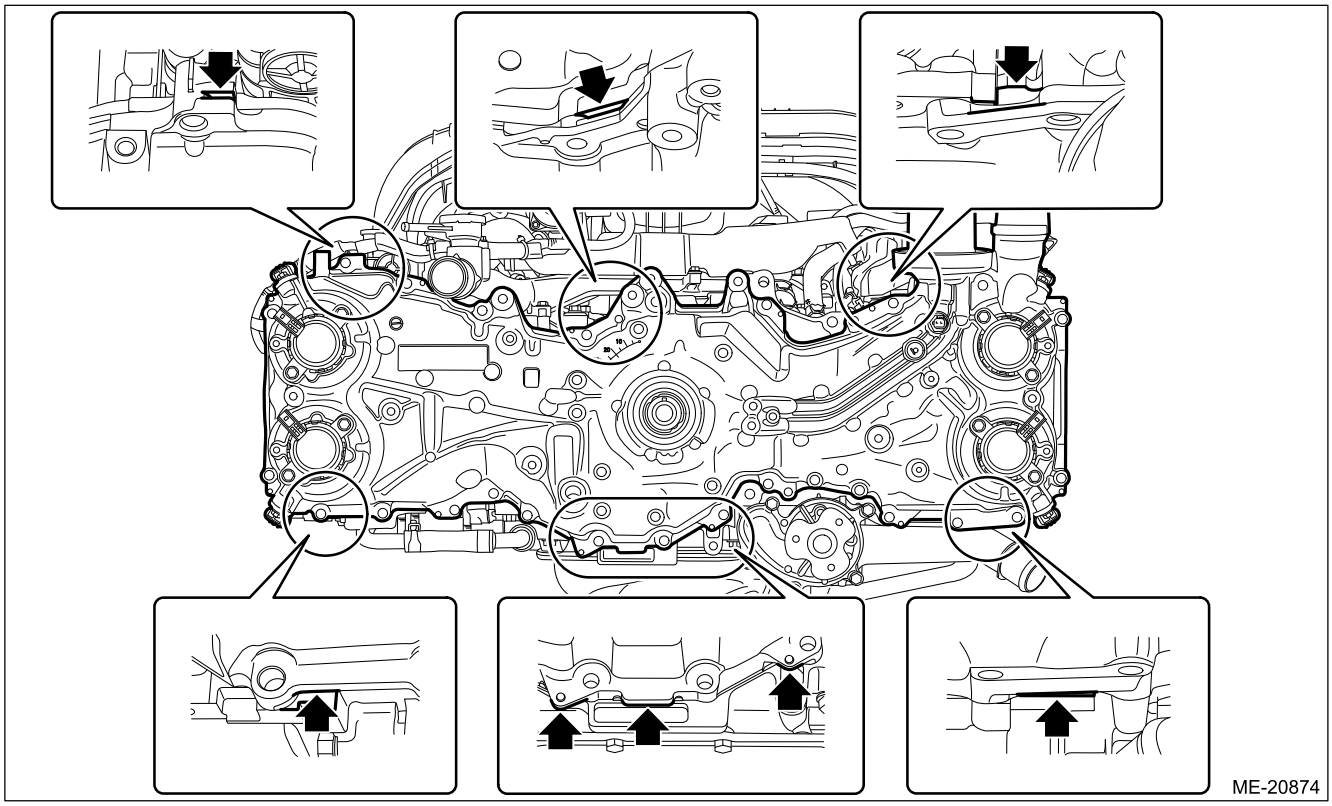


14. Expand the area shown in the figure using a crowbar or a similar tool wrapped in tape for protection, and remove the chain cover from the engine.

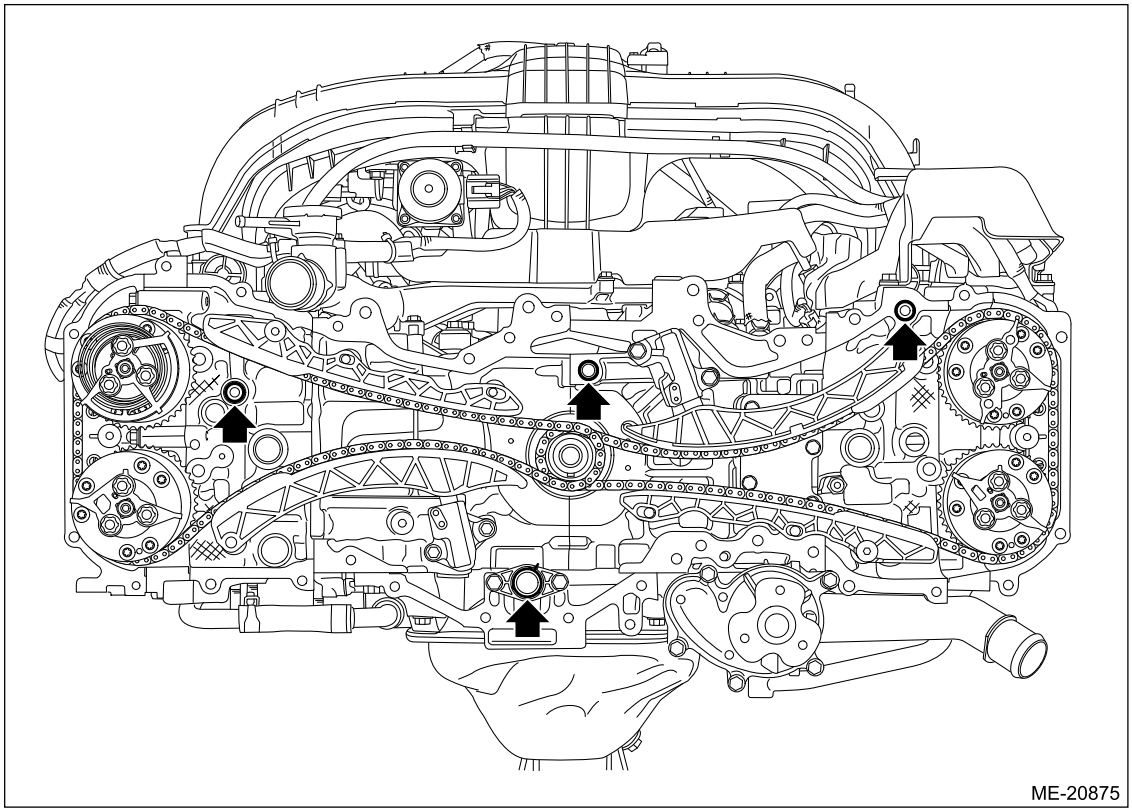
Caution:

The chain cover may contact the protrusion (a) of cam sprocket sensor plate and cause damage. When removing the chain cover, move the chain cover horizontally until it cannot contact with the cam sprocket, and then remove it carefully.



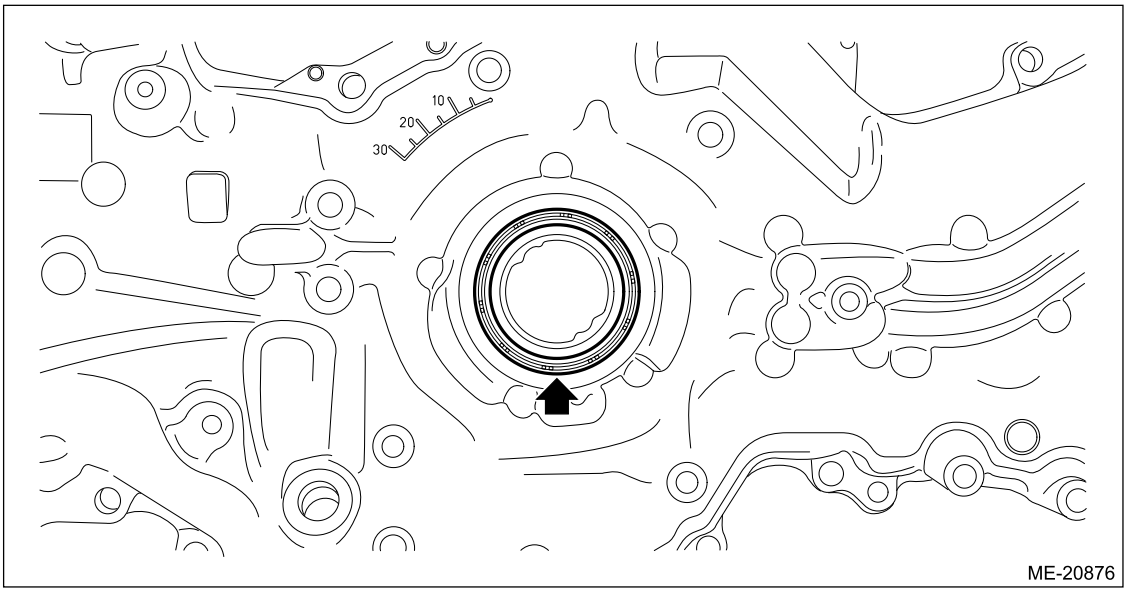


15. Remove the O-rings from cylinder head RH, cylinder head LH, cylinder block LH and the oil strainer.



16. Remove the liquid gasket from the chain cover and engine unit.

17. Remove the front oil seal from the chain cover.



MECHANICAL(H4DO) > Chain Cover

INSTALLATION

1. Degrease the press-fit section for the chain cover front oil seal, and install new front oil seal using ST.

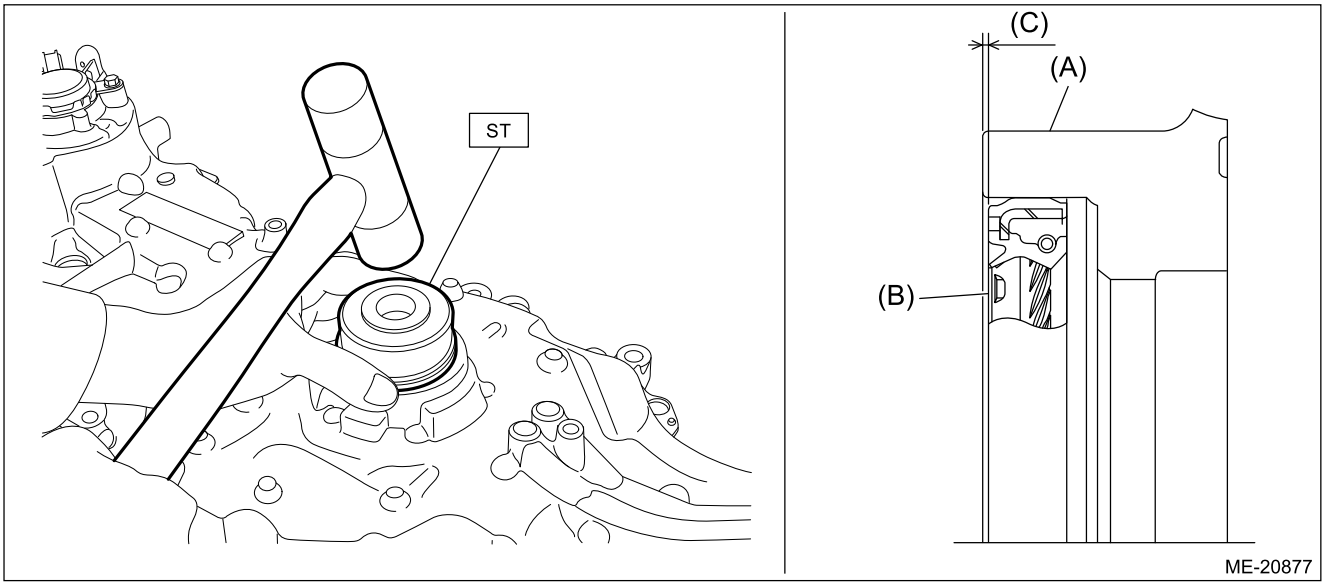
Caution:

Do not apply fluid such as engine oil to the front oil seal and the chain cover; otherwise engine oil leakage may occur.

ST 41399FG020 SPECIAL TOOL B

Front oil seal press-fit position:

1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in) position from chain cover end face



(A) Chain cover

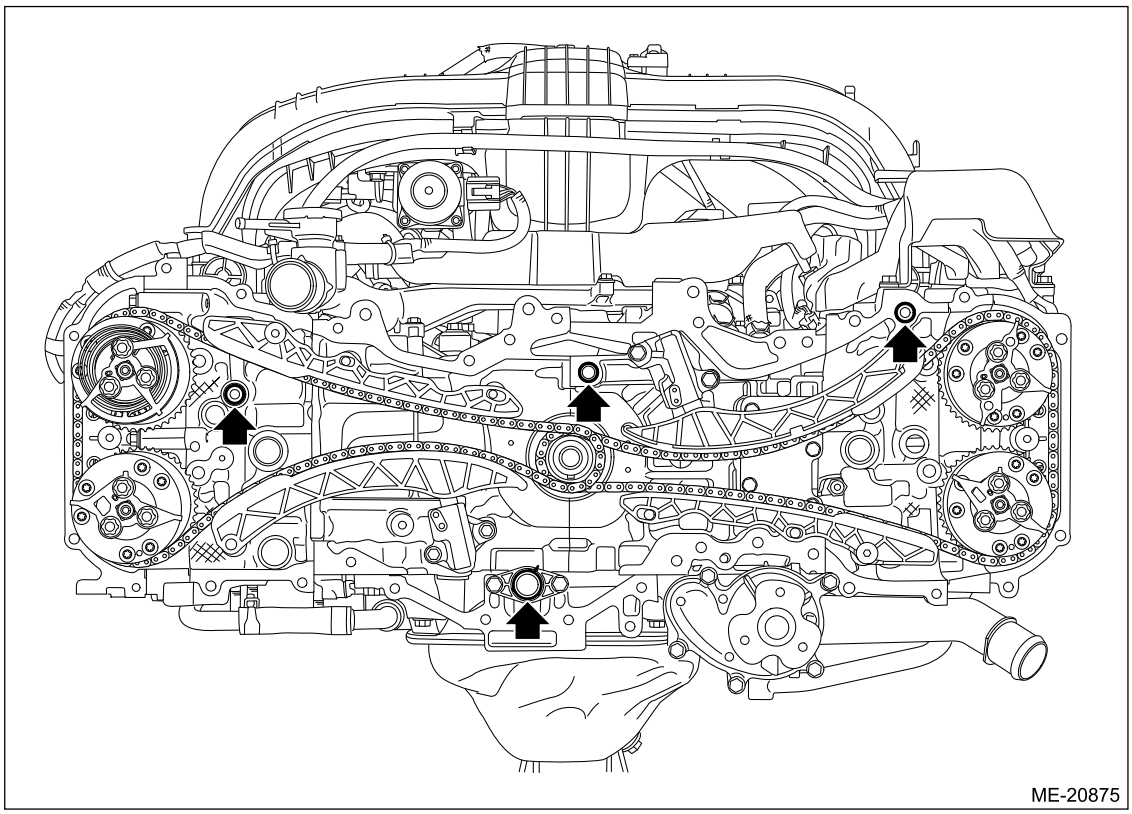
(B) Oil seal

(C) Front oil seal press-fit position (1^{+0}_{-1} mm ($0.0039^{+0}_{-0.0039}$ in) position from chain cover end face)

2. Install new O-rings to cylinder head RH, cylinder head LH, cylinder block LH and oil strainer.

Note:

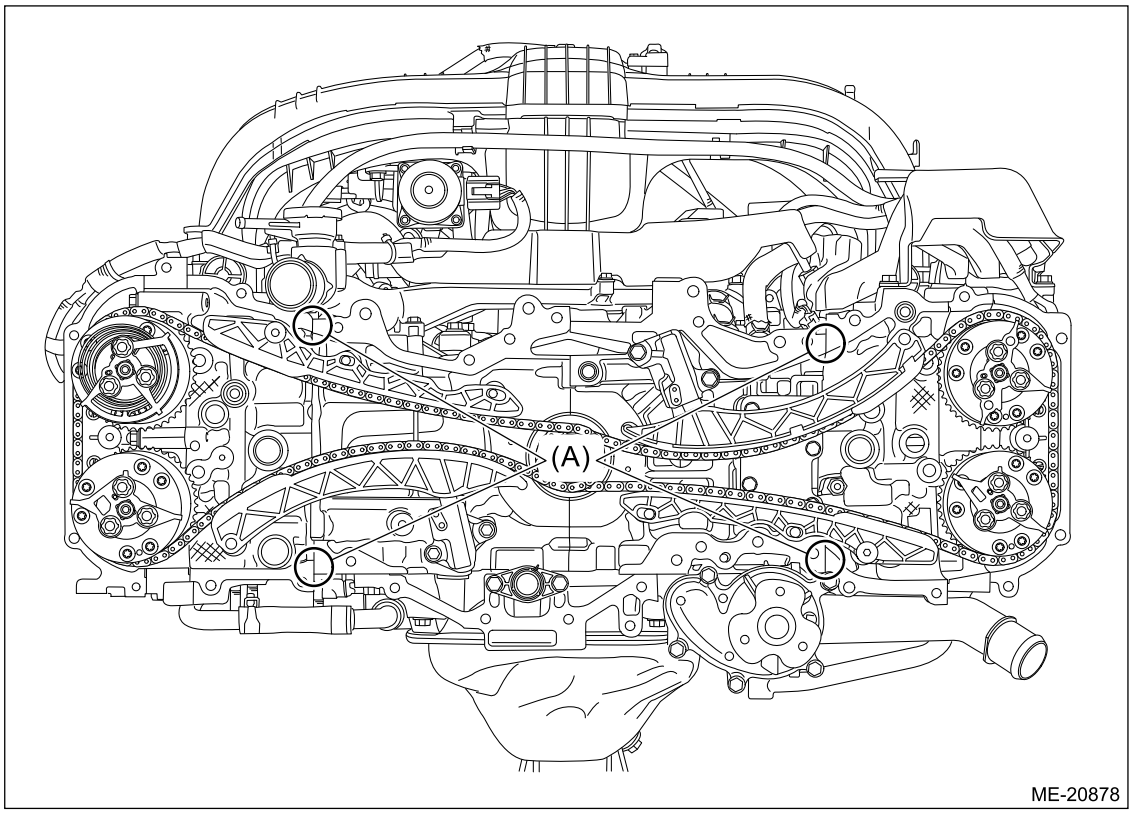
Apply a coat of engine oil to the O-rings.



3. If there are gaps between head gasket and the chain cover seal surface between the cylinder head and cylinder block (A), apply liquid gasket into the gaps.

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent



4. Apply liquid gasket to the chain cover mating surface and center boss (5 places) as shown in the

figure.

Note:

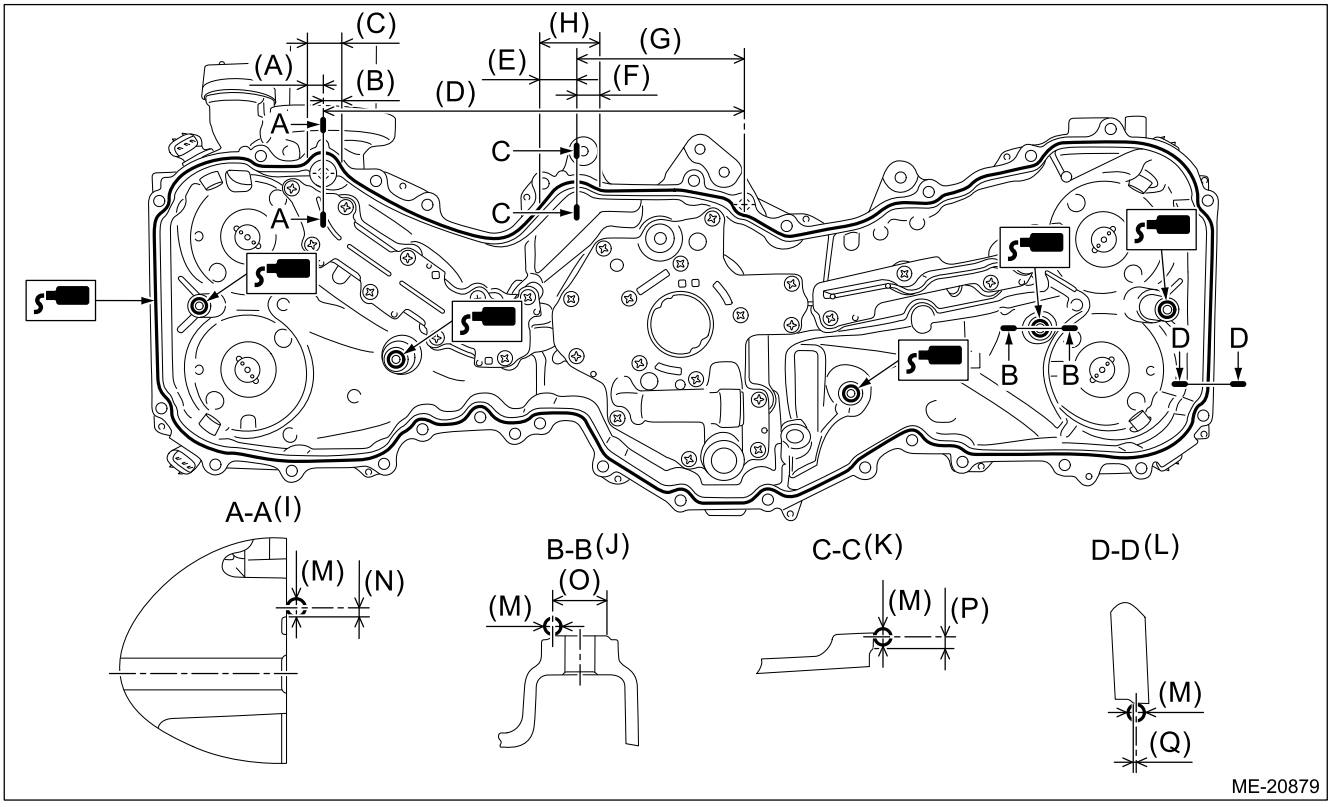
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine and chain cover.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4±0.5 mm (0.1575±0.0197 in)

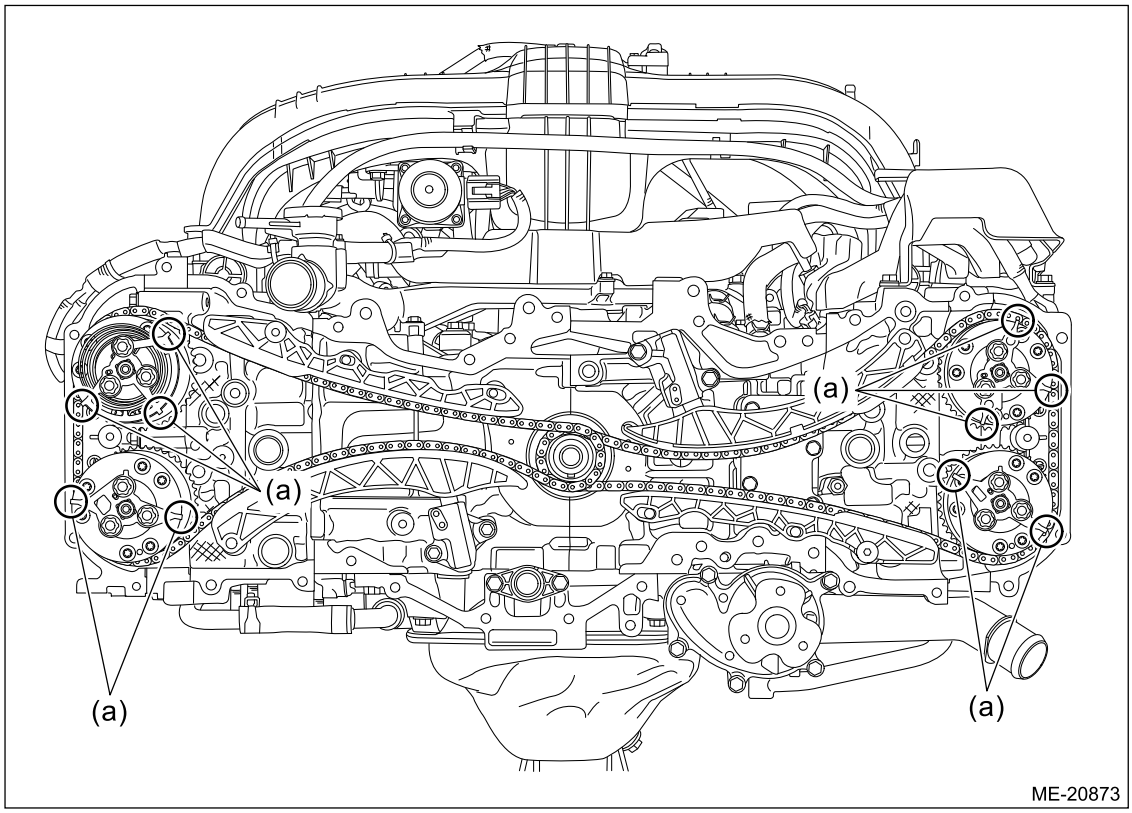


(A)	14.5 mm (0.5709 in)	(G)	127 mm (5.0000 in)	(M)	⌀4±0.5 mm (0.1575±0.0197 in)
(B)	17.5 mm (0.6890 in)	(H)	Range B	(N)	2.3 mm (0.0906 in)
(C)	Range A	(I)	Liquid gasket applying position of mating surfaces of range A	(O)	⌀12 mm (0.4724 in)
(D)	316.2 mm (12.4488 in)	(J)	Liquid gasket applying position of center boss (5 places)	(P)	2.8 mm (0.1102in)
(E)	24.5 mm (0.9646 in)	(K)	Liquid gasket applying position of mating surfaces of range B	(Q)	1 mm (0.0394in)
(F)	18.5 mm (0.7283 in)	(L)	Liquid gasket applying position of mating surfaces other than range A and range B		

5. Set the chain cover, and tighten the bolts in numerical order as shown in the figure.

Caution:

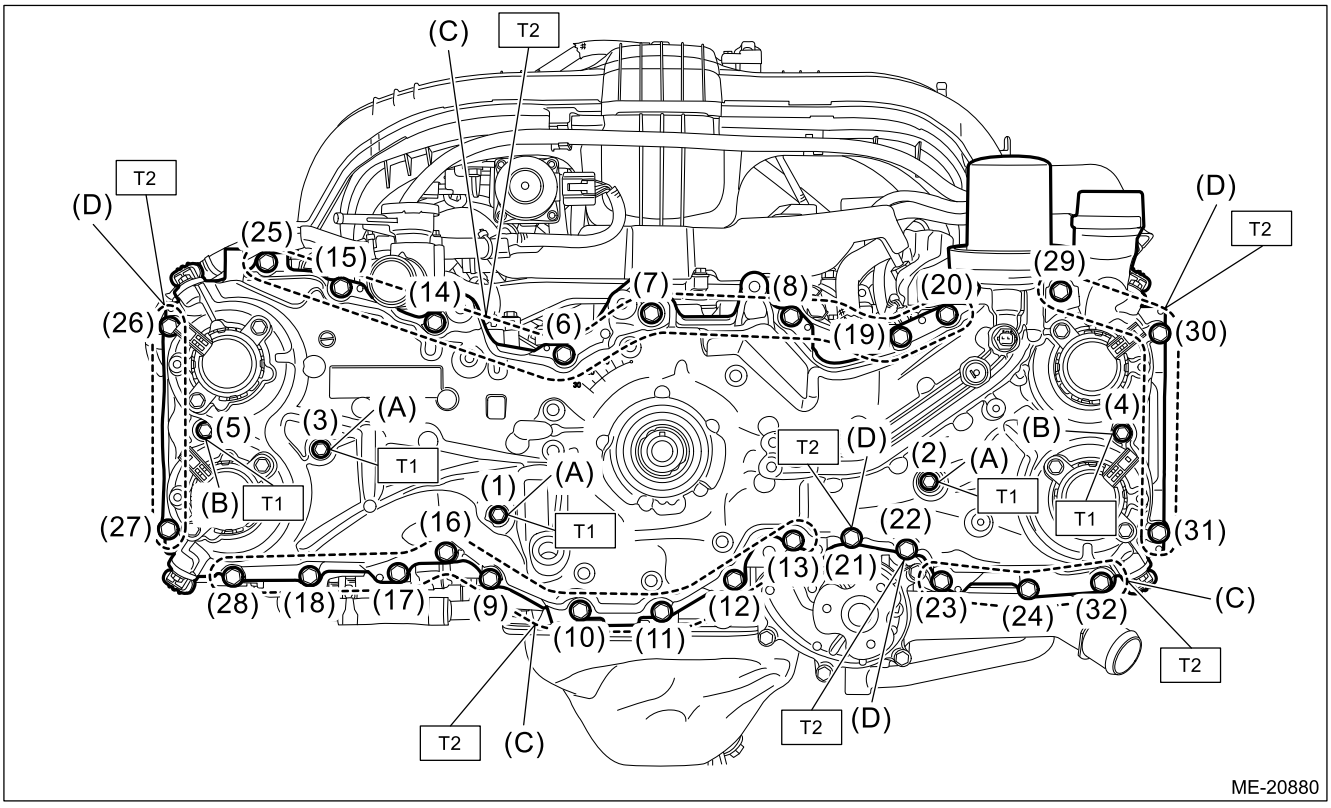
The chain cover may contact the protrusion (a) of cam sprocket sensor plate and cause damage. When setting the chain cover, move the chain cover horizontally and set it while taking care not to contact with the cam sprocket.



Tightening torque:

T1: 10 N·m (1.0 kgf-m, 7.4 ft-lb)

T2: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



(A) M6 × 20 (C) M8 × 25 (D) M8 × 60

(B) M6 × 50

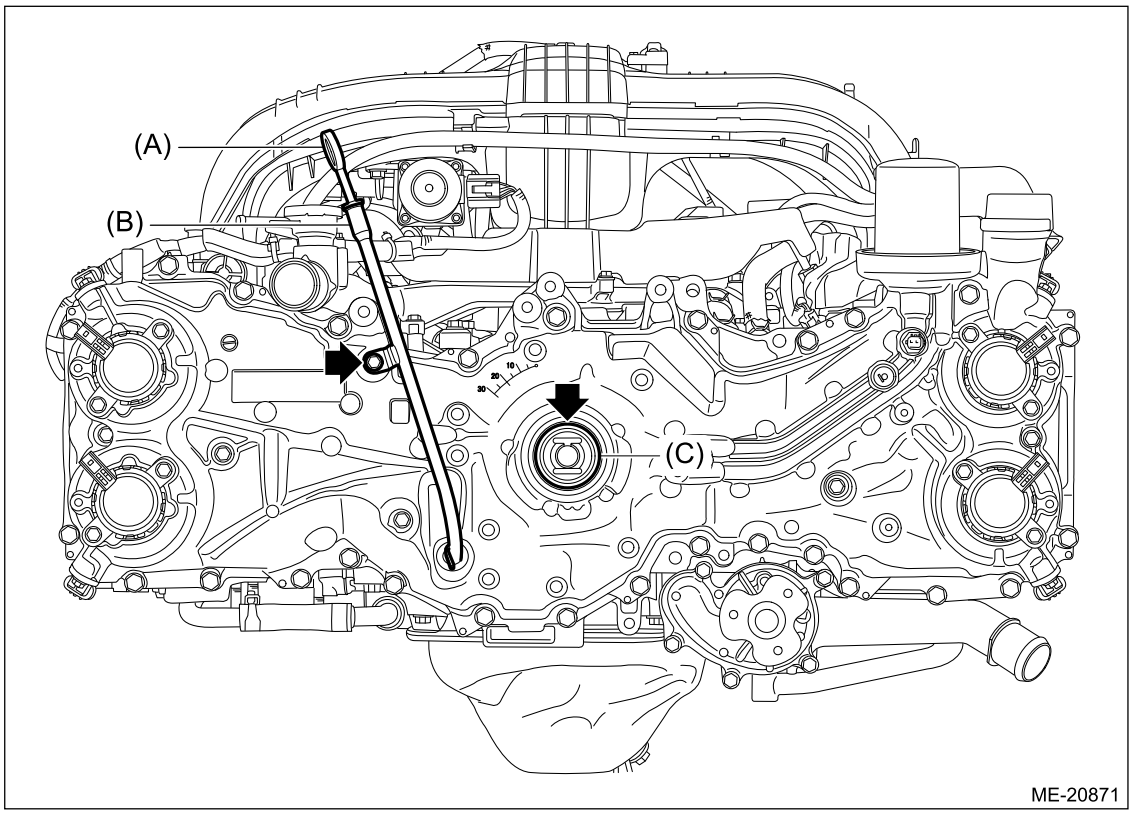
6. Install the crank pulley boss (C) and oil level gauge guide (B), and insert the oil level gauge (A).

Note:

- **Use a new O-ring to the oil level gauge guide.**
- **Apply a light coat of engine oil to the O-rings of the oil level gauge guide and the oil level gauge.**

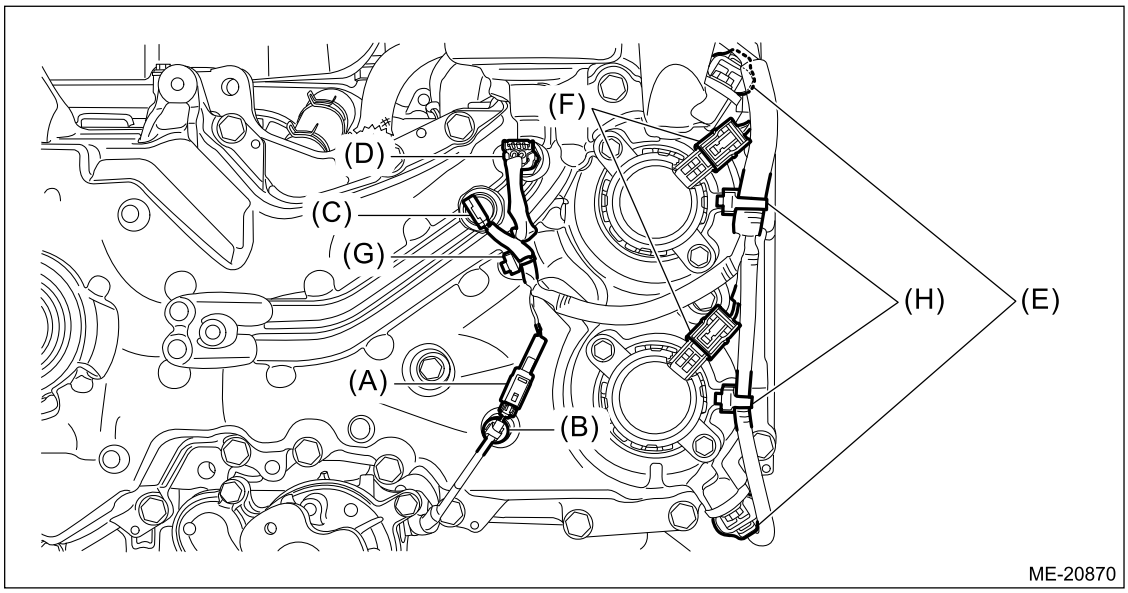
Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

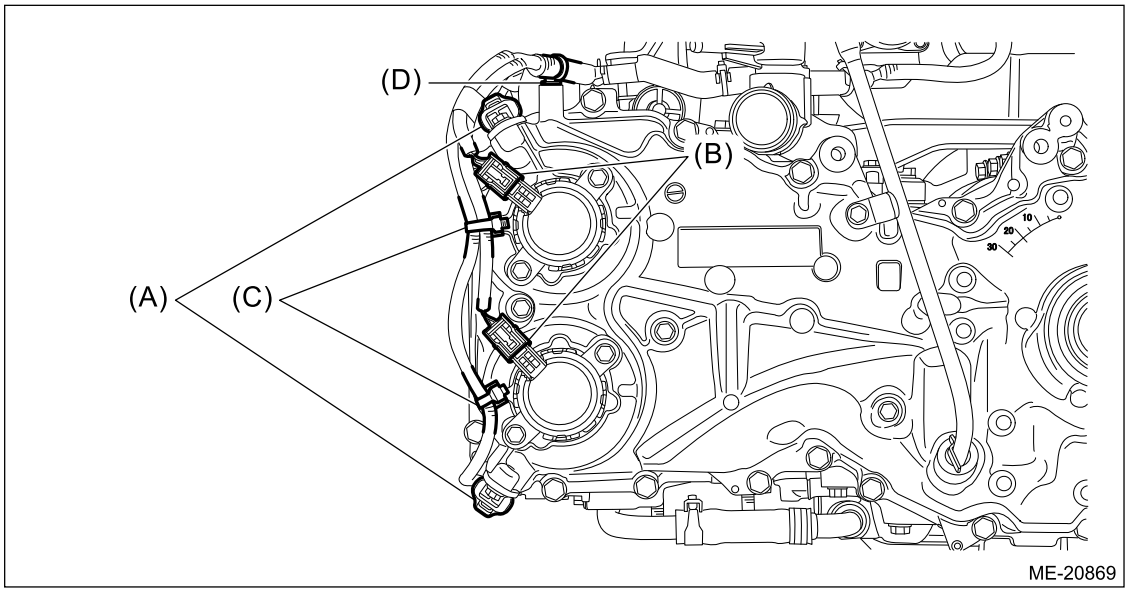


7. Secure the engine harness with clip (H) and clip (G), and connect connector (F), connector (E), connector (D) and terminal (C).

8. Secure the oil level switch harness with clip (B), and connect the connector (A).



9. Secure the engine harness with clip (D) and clip (C), and connect connector (B) and connector (A).



10. Install the crank pulley. Ref. to MECHANICAL(H4DO)>Crank Pulley>INSTALLATION.
11. Install the water pump pulley. Ref. to COOLING(H4DO)>Water Pump>INSTALLATION > WATER PUMP.
12. Install the A/C compressor. Ref. to AIR CONDITIONER>Compressor>INSTALLATION.
13. Install the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>INSTALLATION.
14. Install the V-belt tensioner assembly. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT TENSIONER ASSEMBLY.
15. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.
16. Fill engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.
17. When working on the vehicle

    Note:

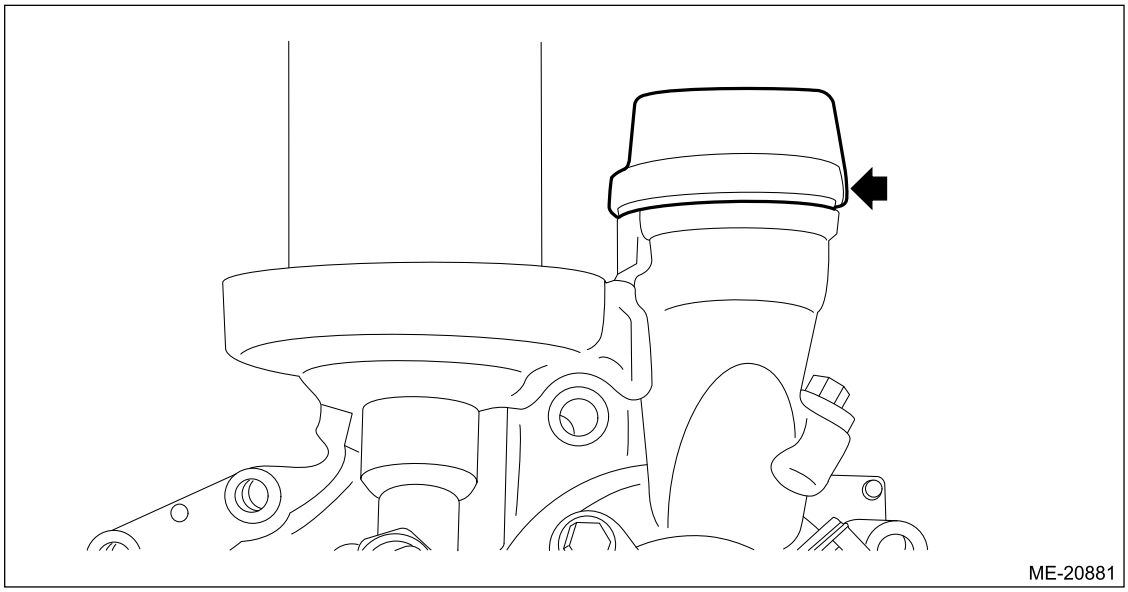
    When working on the vehicle, perform the following steps also.

    (1) Install the radiator and the condenser as a assembly. Ref. to COOLING(H4DO)>Radiator>INSTALLATION.

MECHANICAL(H4DO) > Chain Cover

DISASSEMBLY

1. Remove the oil filler cap.



2. Remove the engine oil filter and the oil pump union. Ref. to LUBRICATION(H4DO)>Oil Filter>REMOVAL.
3. Remove the oil pressure switch. Ref. to LUBRICATION(H4DO)>Oil Pressure Switch>REMOVAL.
4. Remove the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Oil Temperature Sensor>REMOVAL.
5. Remove the oil control solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>REMOVAL.
6. Remove the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>REMOVAL.

MECHANICAL(H4DO) > Chain Cover

ASSEMBLY

1. Install the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.
2. Install the oil control solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSTALLATION.
3. Install the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Oil Temperature Sensor>INSTALLATION.
4. Install the oil pressure switch. Ref. to LUBRICATION(H4DO)>Oil Pressure Switch>INSTALLATION.
5. Install the engine oil filter and the oil pump union. Ref. to LUBRICATION(H4DO)>Oil Filter>INSTALLATION.
6. Install the oil filler cap.

MECHANICAL(H4DO) > Chain Cover

INSPECTION

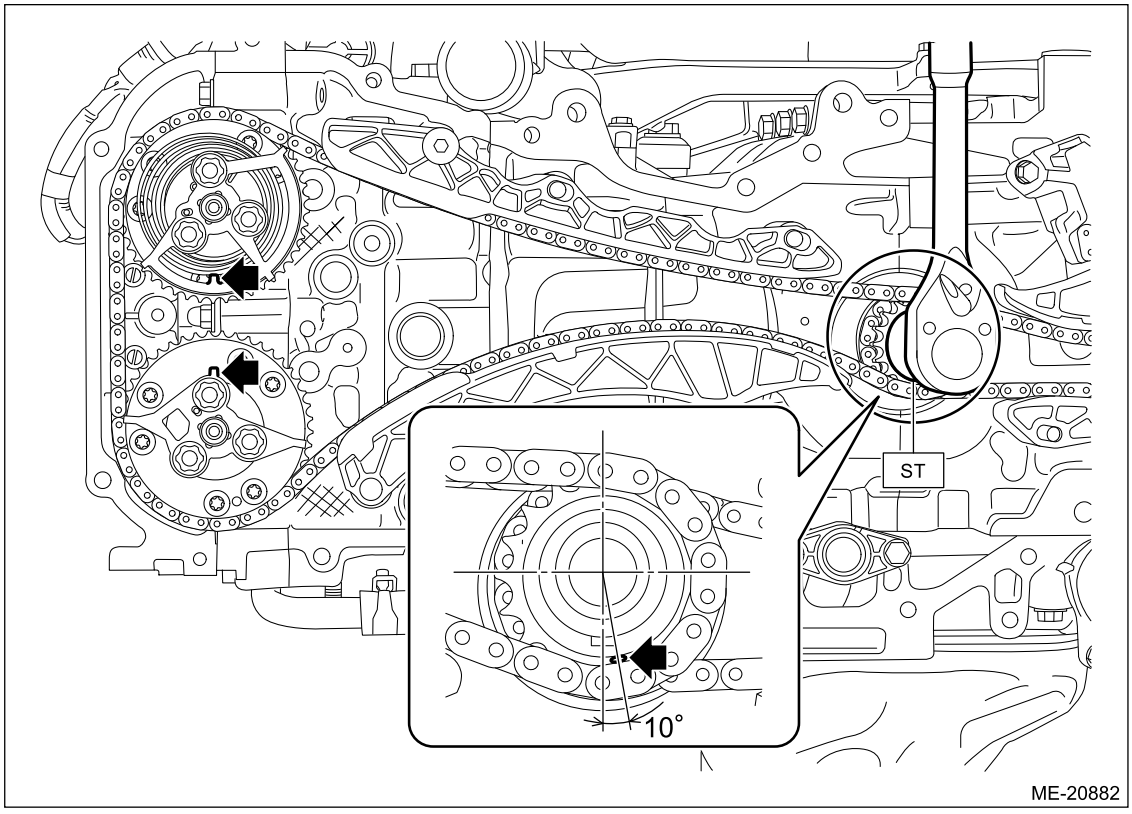
Check that the chain cover does not have deformation, cracks and any other damage.

REMOVAL

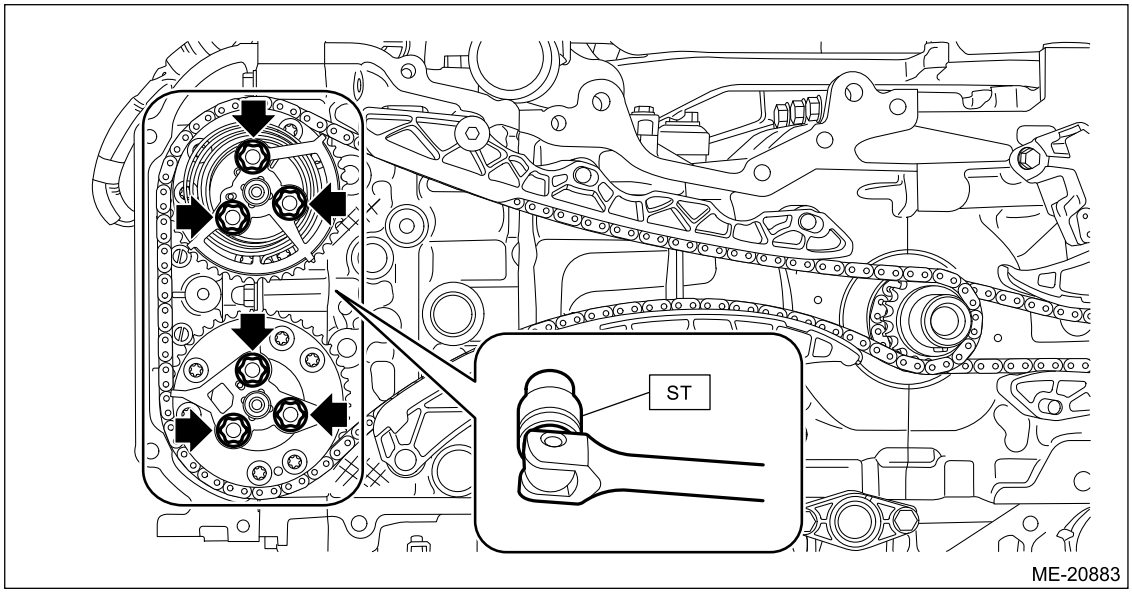
1. TIMING CHAIN RH

Note:
When replacing a single part, perform the work with the engine assembly installed to body.

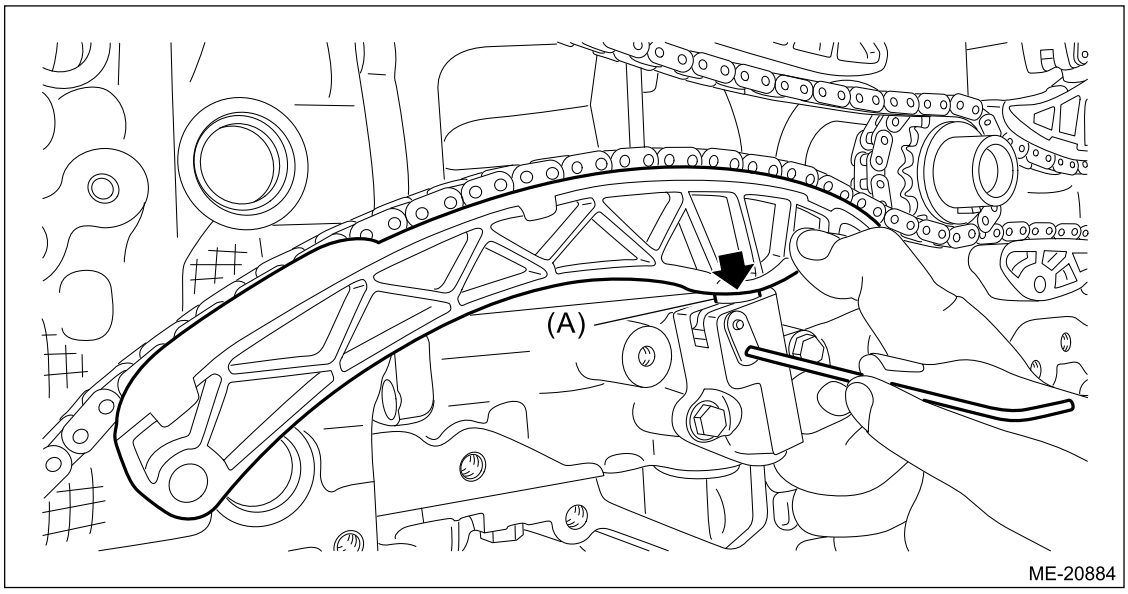
1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Using the ST and by turning the crankshaft, align the alignment mark of crank sprocket, the alignment mark (protrusion) of the intake cam sprocket RH and the alignment mark (protrusion) of the exhaust cam sprocket RH to the positions as shown in the figure.
   Note:
   If the alignment marks are aligned to the positions as shown in the figure, the crankshaft key is located at six o'clock position.
   Preparation tool:
   ST: CRANKSHAFT SOCKET (18252AA000)



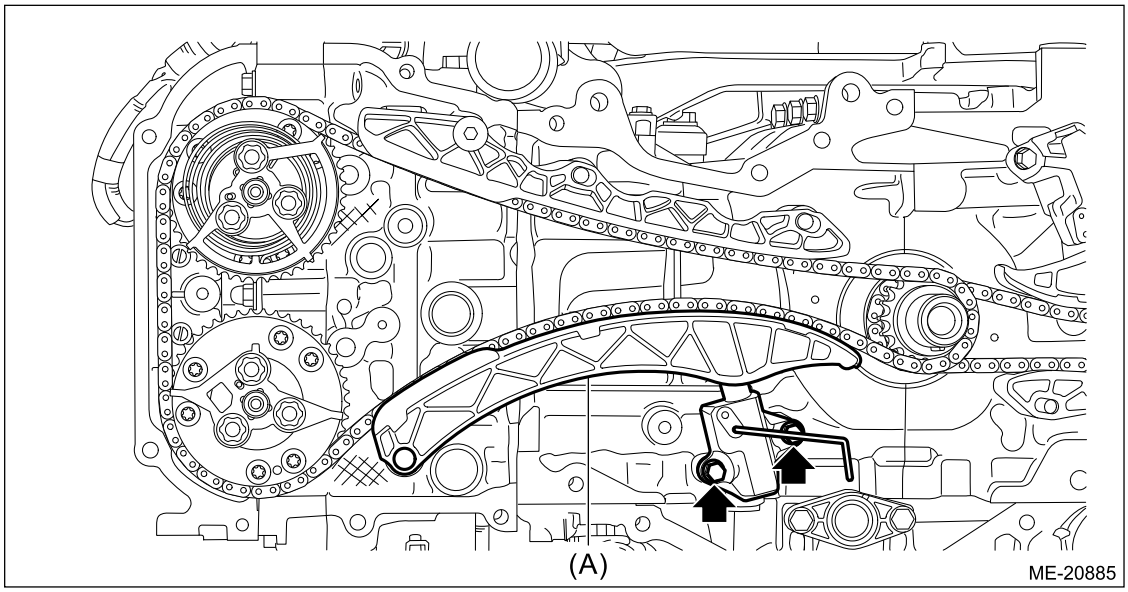
3. When the cam sprocket RH is removed, and the cam carrier RH is disassembled
   Note:
   Follow also steps below when the cam sprocket RH is removed, and the cam carrier RH is disassembled.
   (1) Using the ST, loosen the bolts which hold the intake cam sprocket RH and exhaust cam sprocket RH.
   Note:
   In order to prevent damage on each component, be careful not to loosen the bolts too much.
   Preparation tool:
   ST: SOCKET (18270KA010)



4. Push down the chain lever tensioner RH, and with a 2.5 mm (0.0984 in) dia. stopper pin or a 2.5 mm dia. hex wrench inserted into the stopper pin hole in the chain tensioner RH, secure the plunger (A).



5. Remove the chain tensioner RH, and remove the chain tensioner lever RH (A).



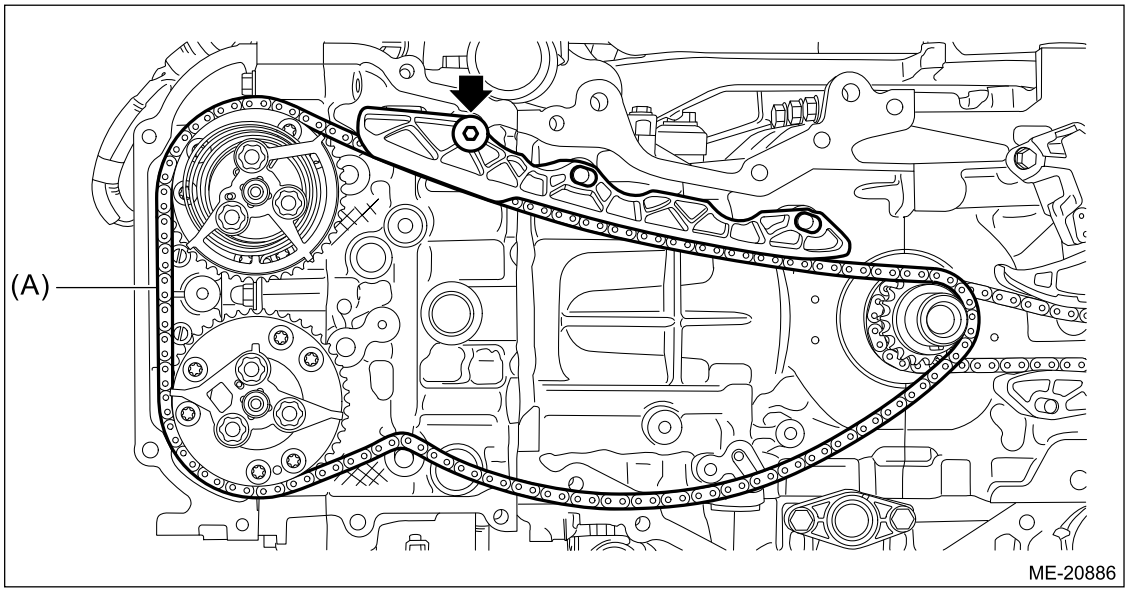
6. Remove the chain guide RH, and remove the timing chain RH (A).

Caution:

- **If the timing chain RH is not installed, the intake camshaft RH and exhaust camshaft RH are kept at zero-lift position. All cams on the camshaft are not pressing down the roller rocker arm (intake valve and exhaust valve). (Under this condition, all valves remain unlifted.)**
- **Intake camshaft RH and exhaust camshaft RH can be independently rotated with the timing chain RH removed. When the intake valve and exhaust valve lift at the same time, the valve heads contact each other and valve stem may bend. Do not turn it to the outside of range of zero-lift (in range where it can be turned lightly by hand).**

Note:

To avoid mixing with LH side, keep the removed part in order.



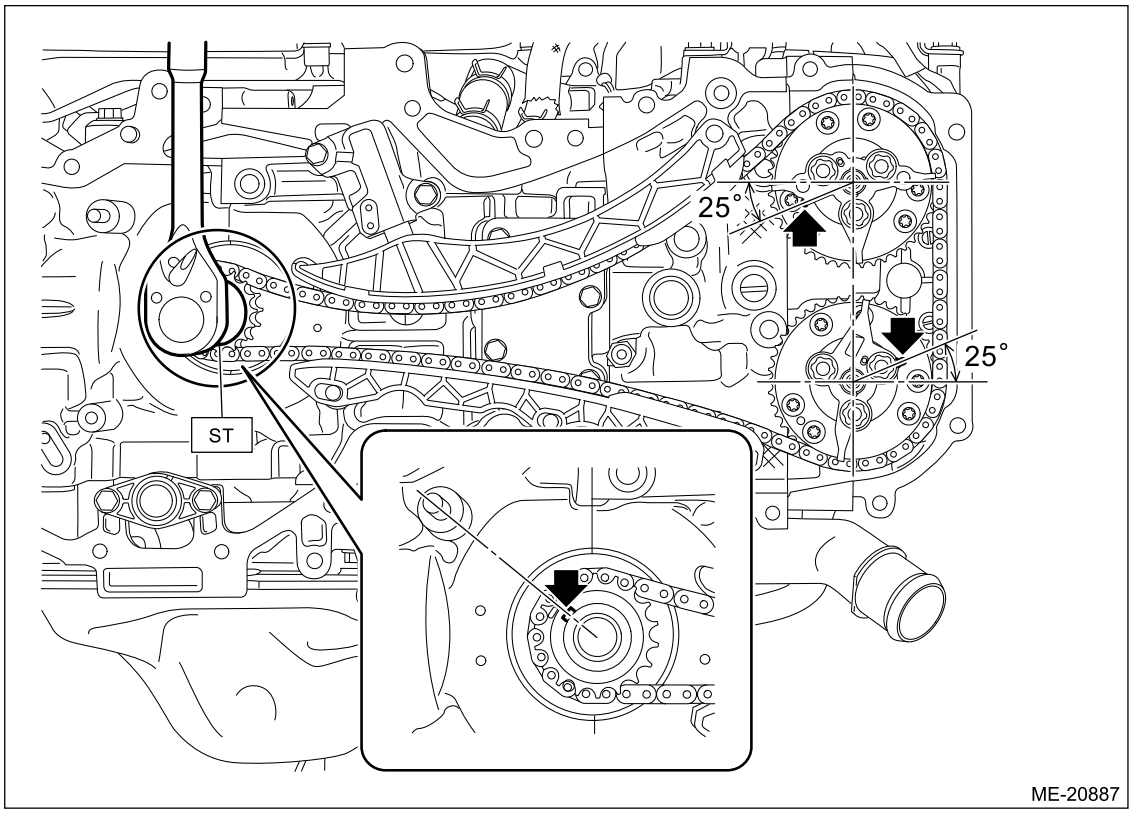
2. TIMING CHAIN LH

1. Remove the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN RH.

2. Using the ST and by turning the crankshaft, align the key of the crankshaft, the alignment mark (protrusion) of the intake cam sprocket LH and the alignment mark (protrusion) of the exhaust cam sprocket LH to the positions as shown in the figure.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



3. When the cam sprocket LH is removed, and the cam carrier LH is disassembled

Note:

Follow also steps below when the cam sprocket LH is removed, and the cam carrier LH is disassembled.

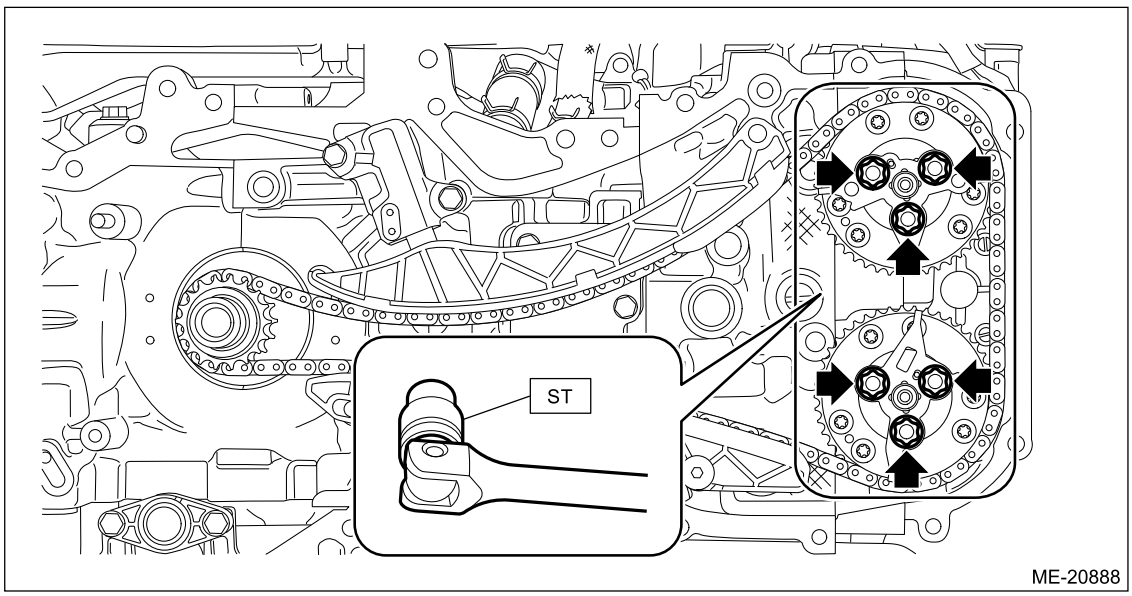
(1) Using the ST, loosen the bolts which hold the intake cam sprocket LH and exhaust cam sprocket LH.

Caution:

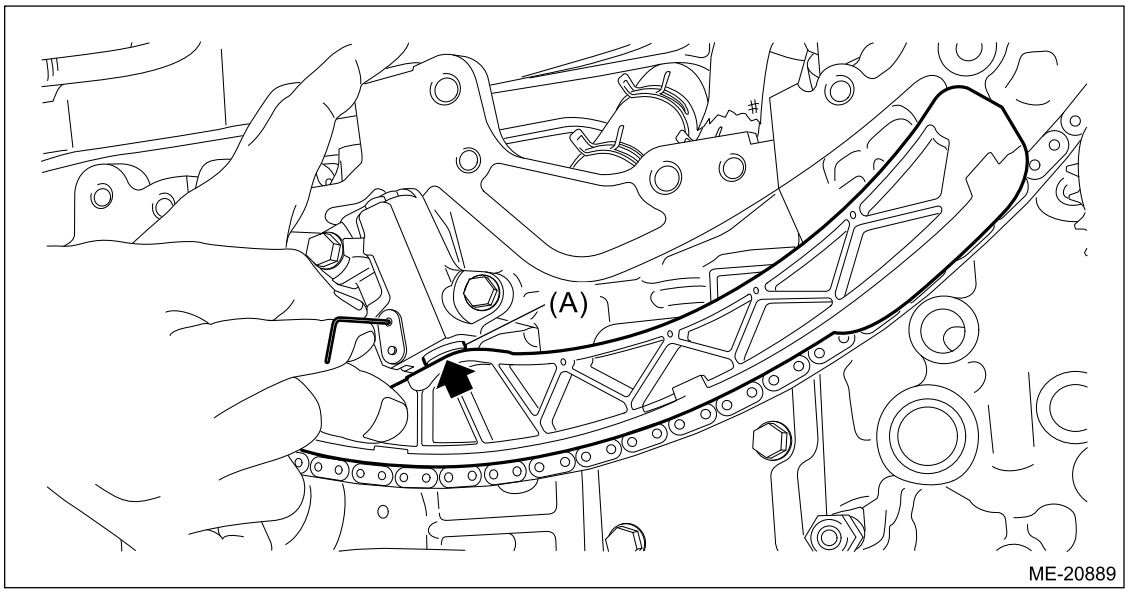
In order to prevent damage on each component, be careful not to loosen the bolts too much.

Preparation tool:

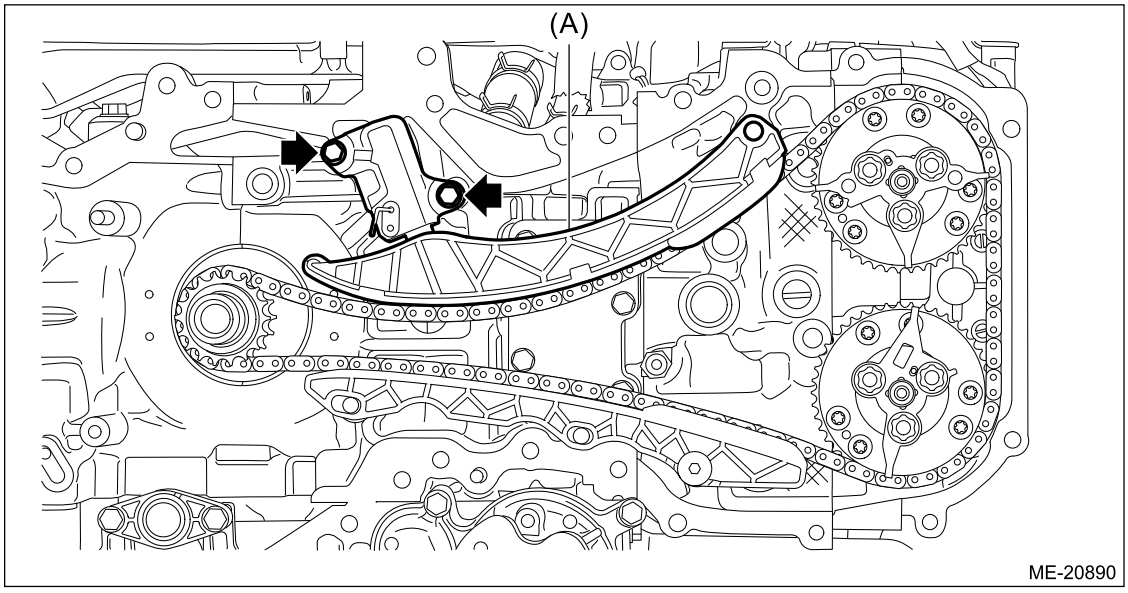
ST: SOCKET (18270KA010)



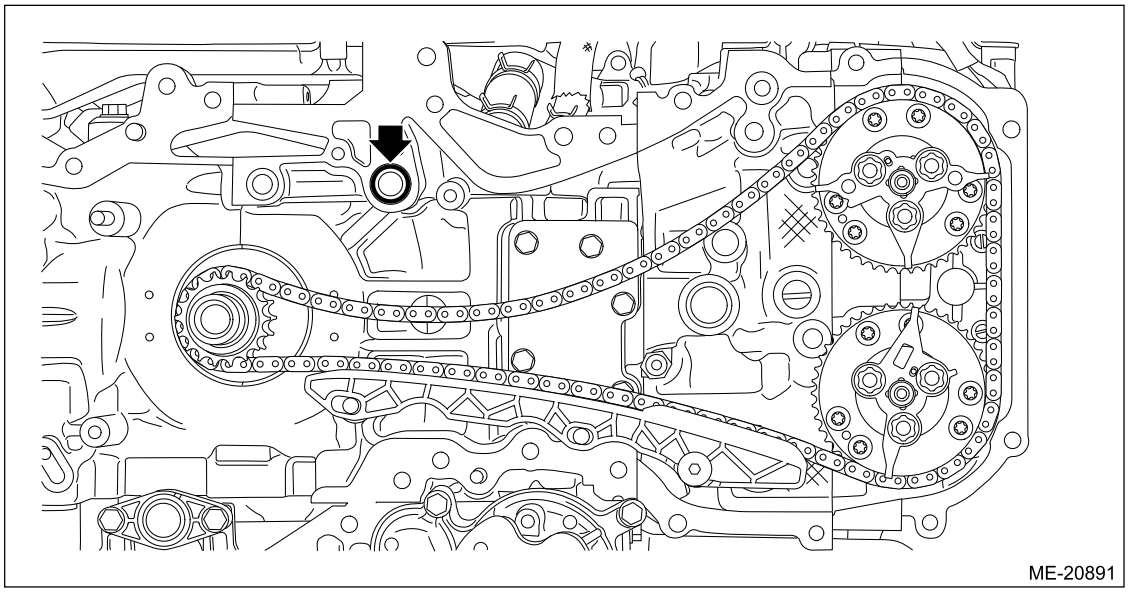
4. Push down the chain tensioner lever LH as shown in the figure, and insert a stopper pin (clips, etc.) with a diameter of 1.2 mm (0.0472in) or less, or 1.2 mm hex wrench into the stopper pin hole in the chain tensioner LH to secure the plunger (A).



5. Remove the chain tensioner LH, and remove the chain tensioner lever LH (A).



6. Remove the O-ring from the cylinder block LH.



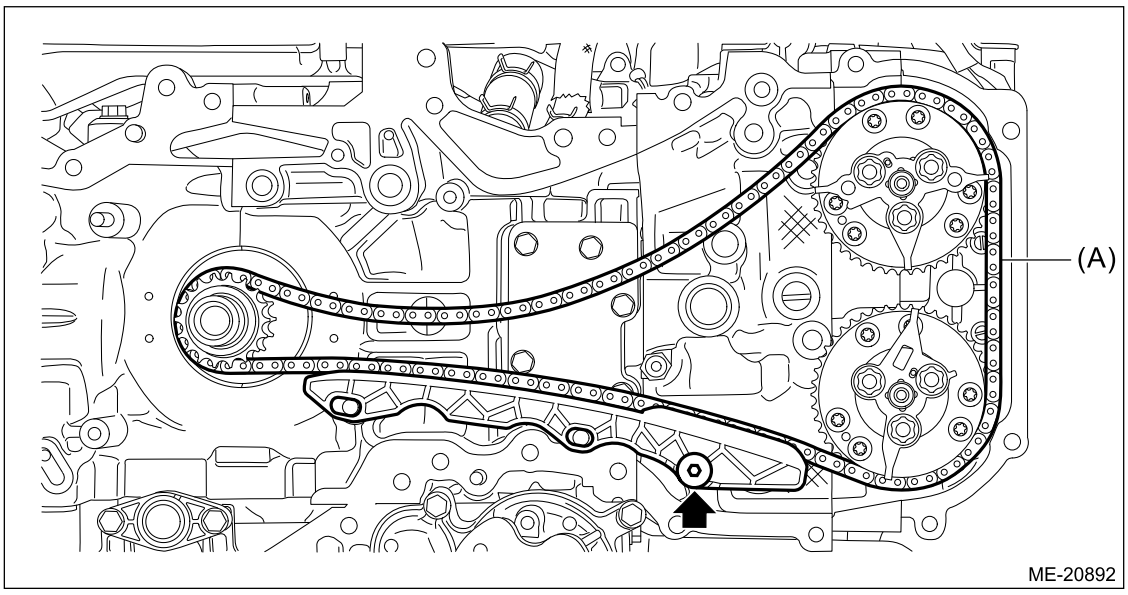
7. Remove the chain guide LH, and remove the timing chain LH (A).

Caution:

- **If the timing chain LH is not installed, the exhaust camshaft LH is kept at zero-lift position. All cams on the exhaust camshaft LH are not pressing down the roller rocker arm (exhaust valve). (Under this condition, exhaust valves remain unlifted.)**
- **Intake camshaft LH is kept at lift position. All cams on the intake camshaft LH are pressing down the roller rocker arm (intake valve). (Under this condition, intake valves remain lifted.)**
- **Intake camshaft LH and exhaust camshaft RH can be independently rotated with the timing chain LH removed. When the exhaust camshaft LH is turned, the valve heads contact each other and valve stem may bend as described in above. Do not turn the exhaust camshaft LH to the outside of range of zero-lift (in range where it can be turned lightly by hand).**
- **#1 piston and #4 piston are located near TDC. If the intake camshaft LH is turned, the valve and the piston may contact and valve stem may bend. Do not turn the intake camshaft LH at this time.**

Note:

To avoid mixing with RH side, keep the removed part in order.



8. Using the ST and by turning the crankshaft approximately 200° clockwise, align the alignment marks

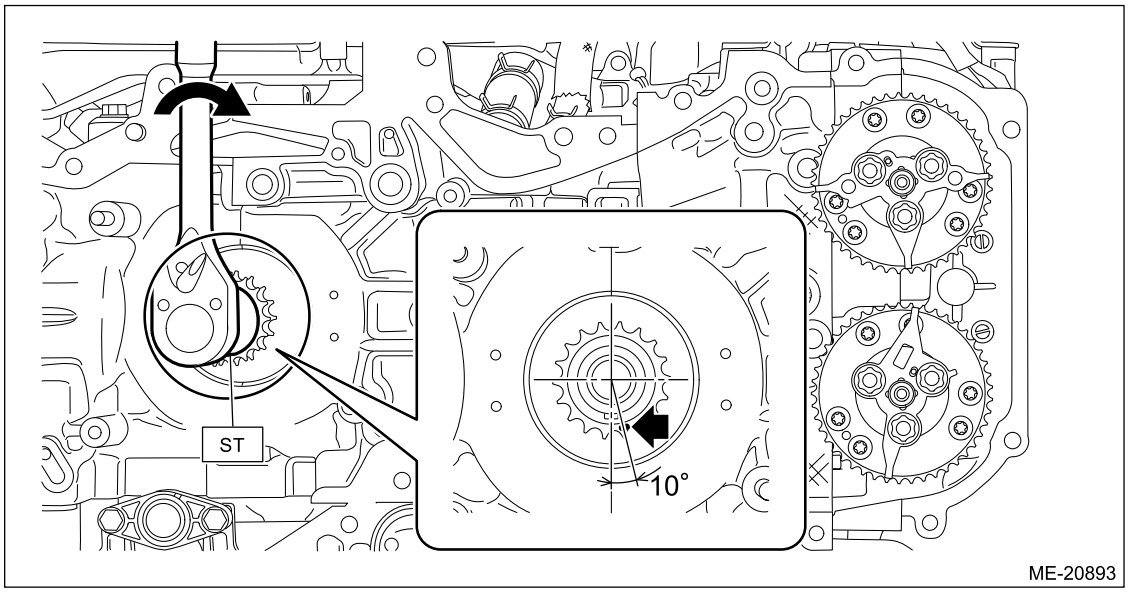
of crank sprocket to the positions as shown in the figure.

Caution:

- **This procedure is required to prevent the valve and piston contacting with each other, by moving the all pistons to the middle of the cylinders.**
- **Never turn counterclockwise because the valve and piston may contact. Counterclockwise turn is allowed only when adjusting precisely the alignment marks, after turning the crank sprocket alignment mark clockwise near the position as shown in the figure.**

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



9. Using ST1 and ST2 by turning the intake cam sprocket LH approximately 170° clockwise, align the alignment marks (protrusion) of intake cam sprocket LH to the positions (zero-lift position) as shown in the figure.

Caution:

- **After this work, when the intake valve and exhaust valve lift at the same time, the valve heads contact each other and valve stem may bend. Do not turn the intake camshaft LH and exhaust camshaft LH to the outside of range of zero-lift (in range where it can be turned lightly by hand).**
- **Perform the operation carefully since the ST comes off easily.**

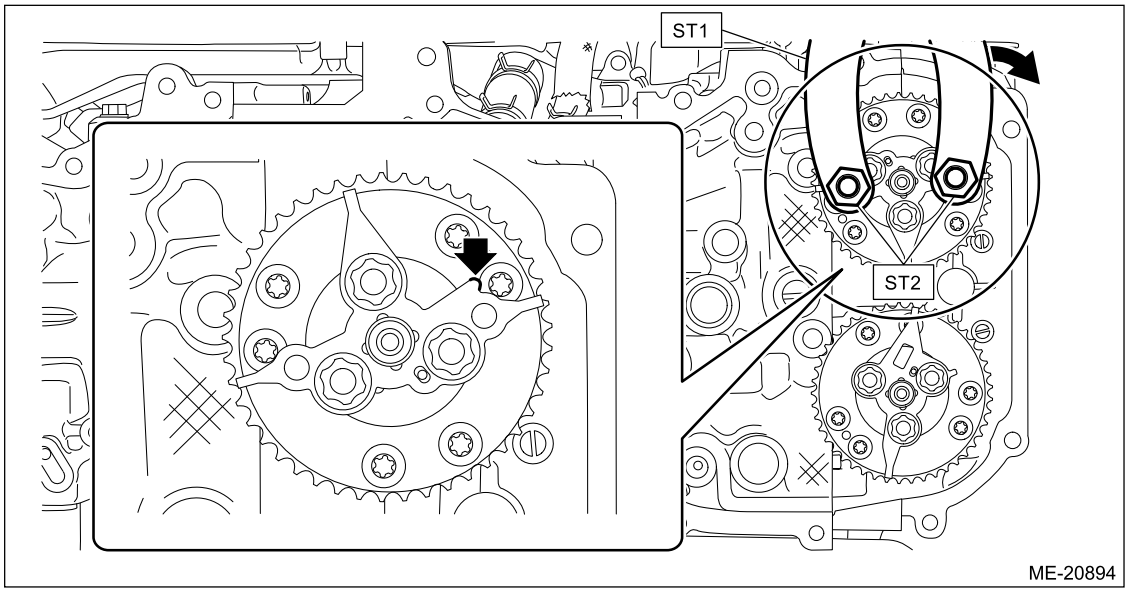
Note:

Intake camshaft LH has four peaks of drive sections for the high-pressure fuel pump. Therefore, there is little range where it can be turned lightly by hand in zero-lift position.

Preparation tool:

ST1: PULLEY WRENCH (18355AA000)

ST2: PULLEY WRENCH PIN SET (18334AA020)


ST1
ST2
ME-20894

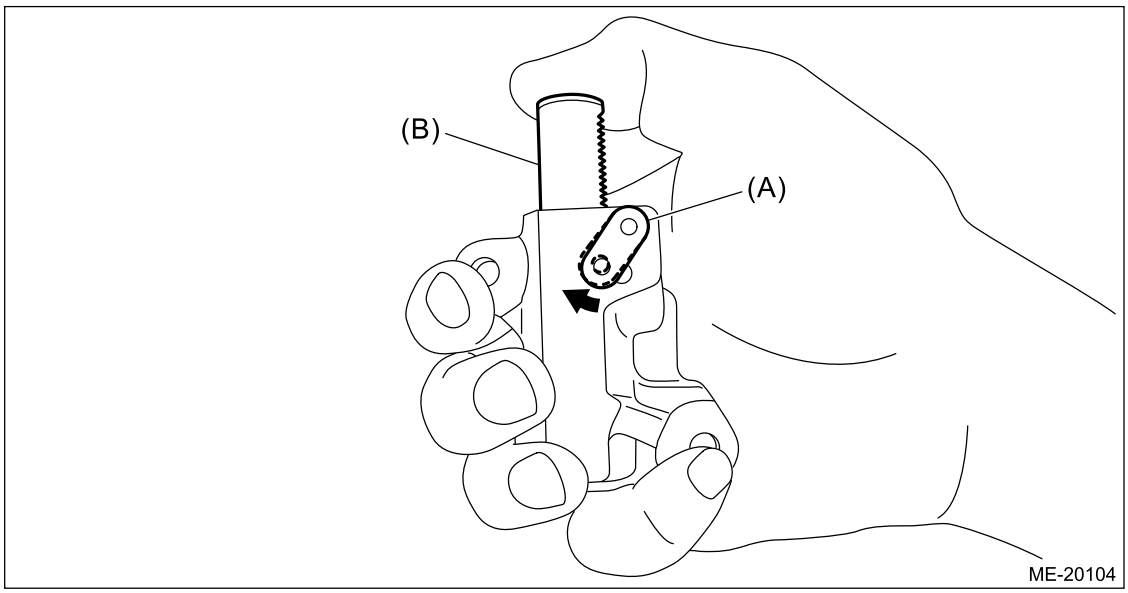
INSTALLATION

1. TIMING CHAIN LH

Note:

- **Be careful that the foreign matter is not into or onto the assembled component during installation.**
- **Apply engine oil to all component parts of the timing chain.**

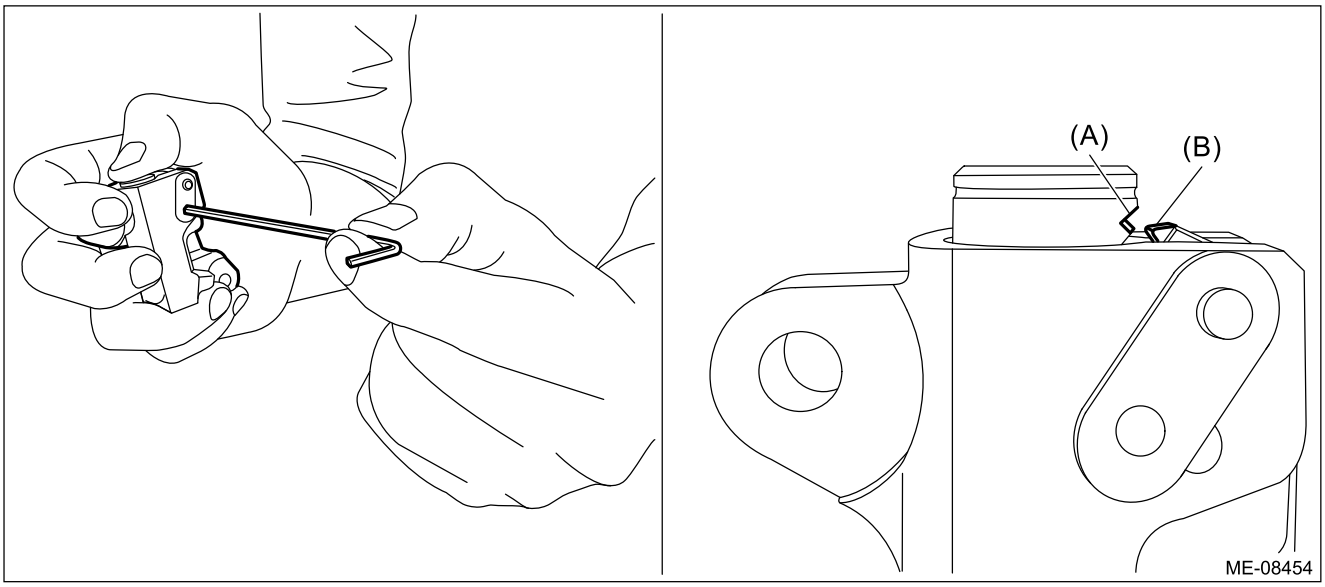
1. Prepare to attach the chain tensioner LH.
(1) Move the link plate (A) in the direction of arrow to press in the plunger (B).



(2) In order to secure the plunger, insert a stopper pin (clips, etc.) with a diameter of 1.2 mm (0.0472in) or less, or 1.2 mm hex wrench into the stopper pin hole.

Note:

If the stopper pin hole on the link plate and the stopper pin hole on the chain tensioner are not aligned, check that the first notch of plunger rack (A) is engaged with the stopper tooth (B). If not engaged, retract the plunger a little so that the first notch of plunger rack (A) is engaged with the stopper tooth (B).



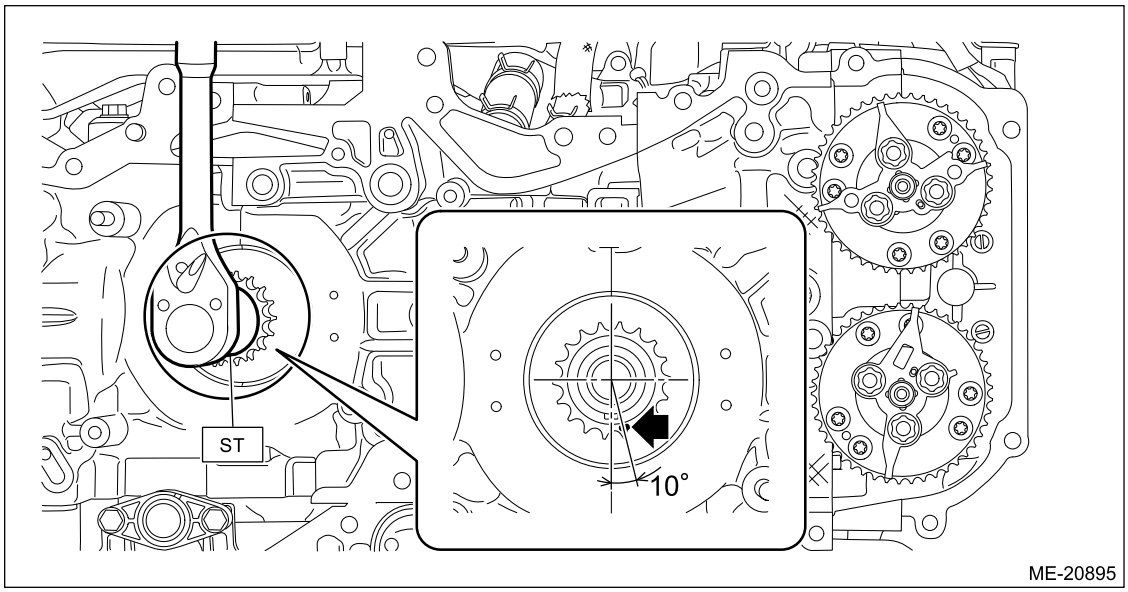
2. Check that the alignment mark of the crank sprocket is located at the position shown in the figure. If not aligned, using the ST turn the crankshaft to align the crank sprocket alignment mark to the position shown in the figure.

Note:

This procedure is required to prevent the valve and piston contacting with each other in the next step.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



3. Using ST1 and ST2, by turning the intake cam sprocket LH, align the alignment marks (protrusion) to the positions as shown in the figure.

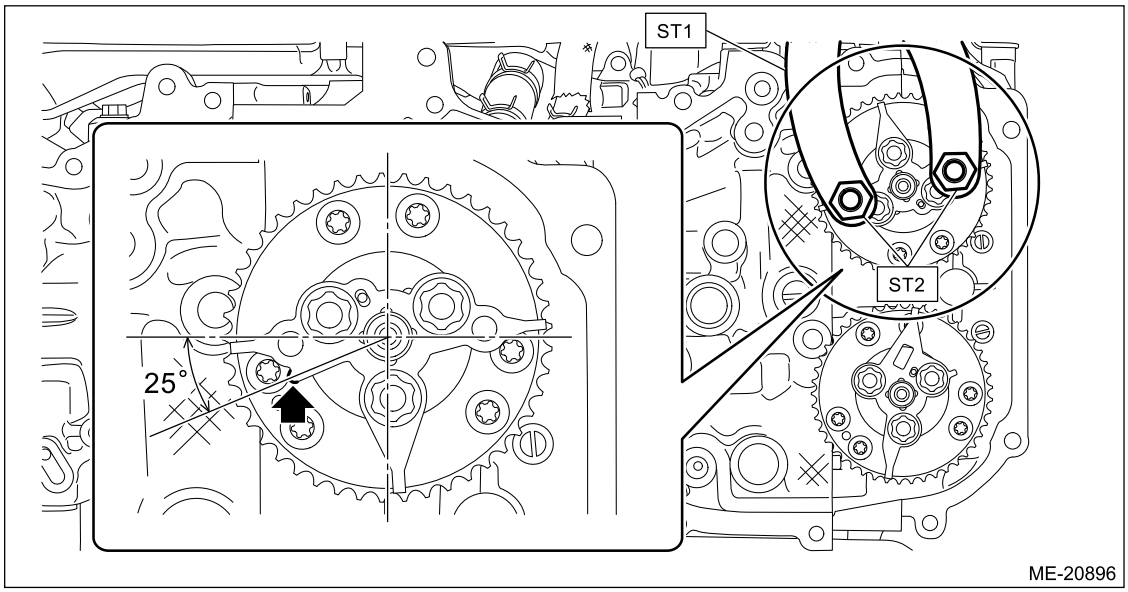
Caution:

- **When the intake valve and exhaust valve lift at the same time, the valve heads contact each other and valve stem may bend. Do not turn the exhaust camshaft LH.**
- **Perform the operation carefully since the ST comes off easily.**

Preparation tool:

ST1: PULLEY WRENCH (18355AA000)

ST2: PULLEY WRENCH PIN SET (18334AA020)



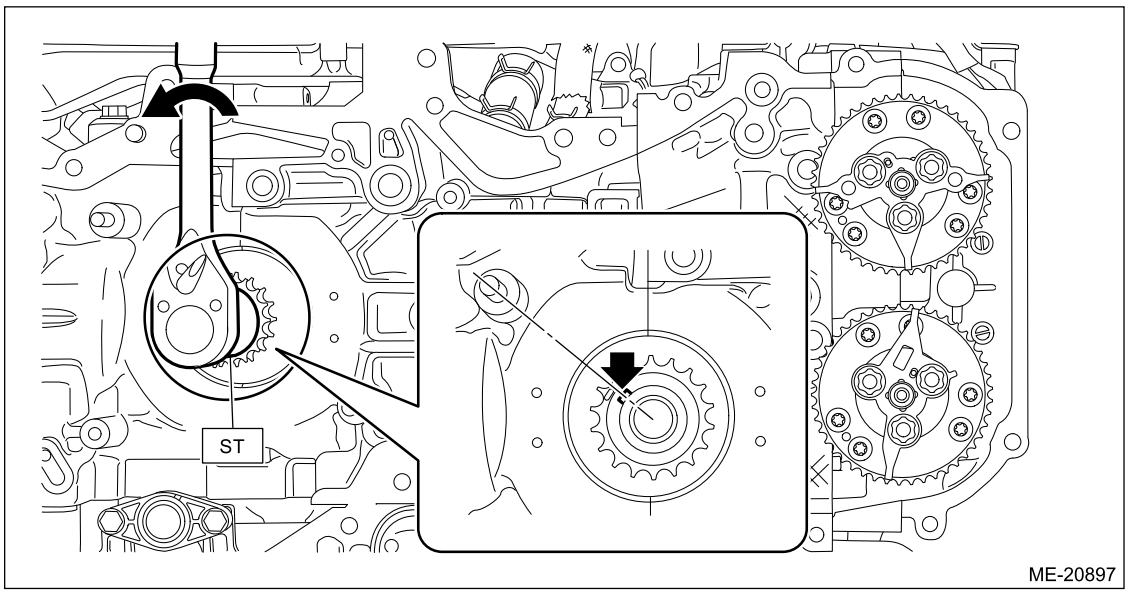
4. Using the ST and by turning the crankshaft approximately 200° counterclockwise, align the alignment marks of crankshaft key to the positions as shown in the figure.

Caution:

Never turn clockwise because the valve and piston may contact. Clockwise turn is allowed only when adjusting the key position precisely, after turning the crankshaft counterclockwise to bring the key near the position as shown in the figure.

Preparation tool:

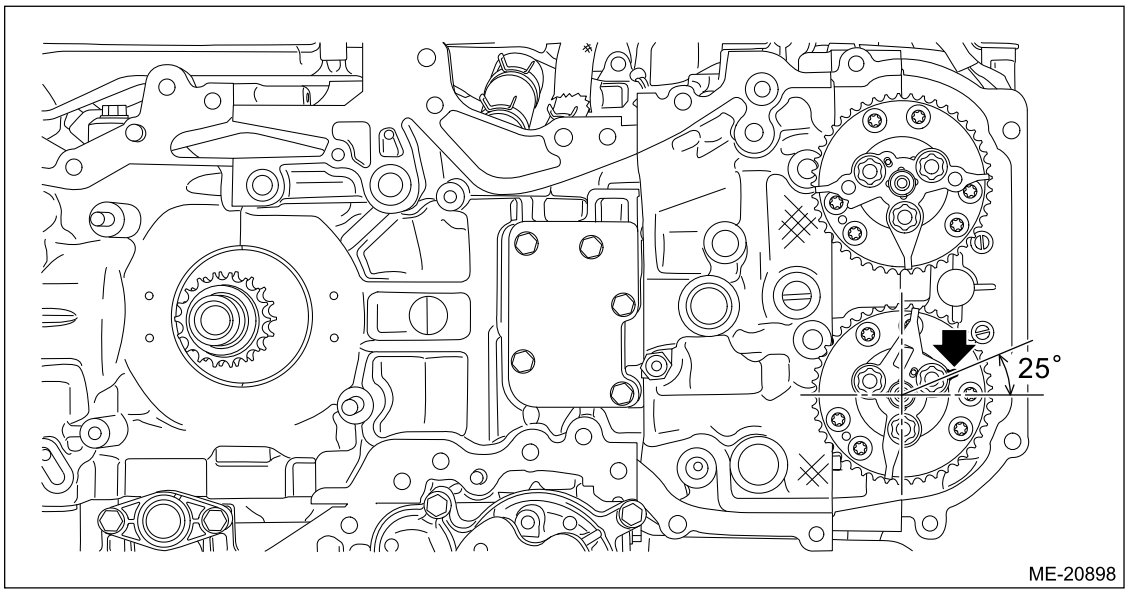
ST: CRANKSHAFT SOCKET (18252AA000)



5. Align the alignment mark (protrusion) of exhaust cam sprocket LH to the position shown in the figure.

Caution:

To prevent valve damage, turn the exhaust cam sprocket LH only within the range of zero-lift (in range where it can be turned lightly by hand).



6. Install the timing chain LH and the timing chain guide LH.

(1) Match the timing chain mark (deep blue) to the alignment mark of the crank sprocket.

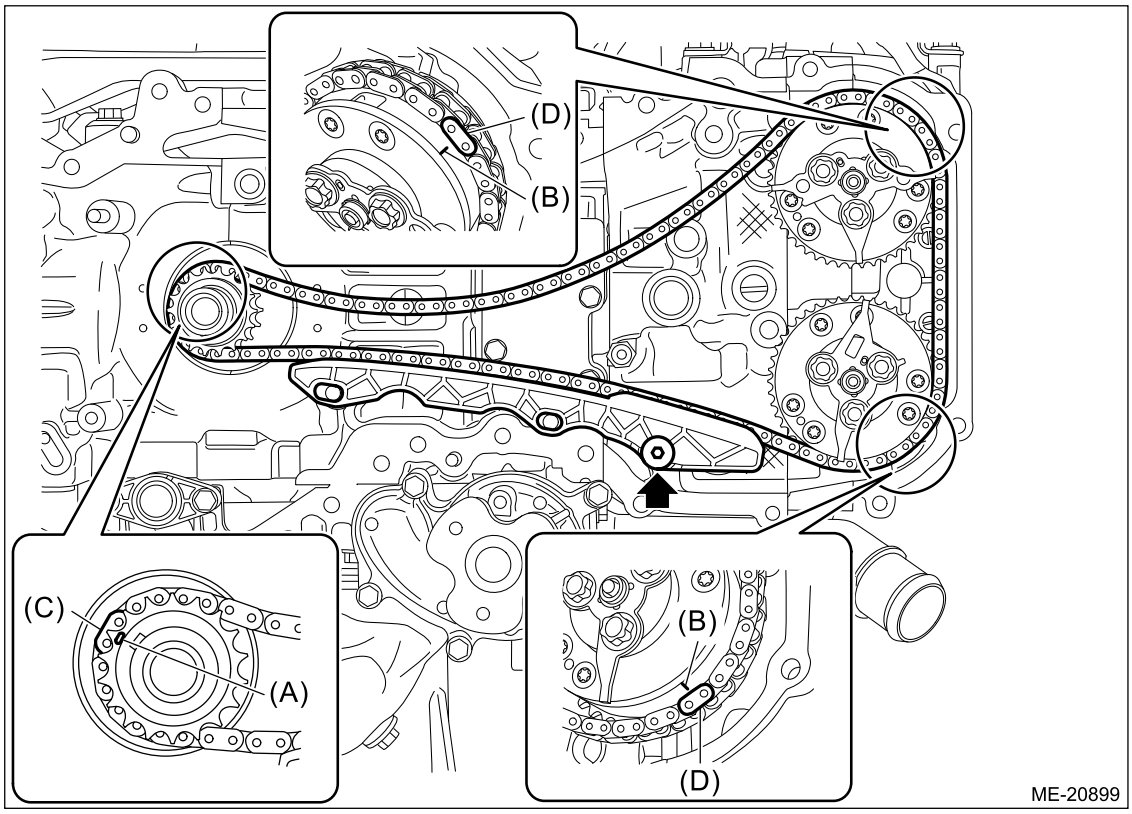
(2) Match the timing chain mark (yellow) to the timing mark position of the intake cam sprocket LH.

(3) Match the timing chain mark (yellow) to the timing mark position of the exhaust cam sprocket LH.

(4) Install timing chain guide LH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

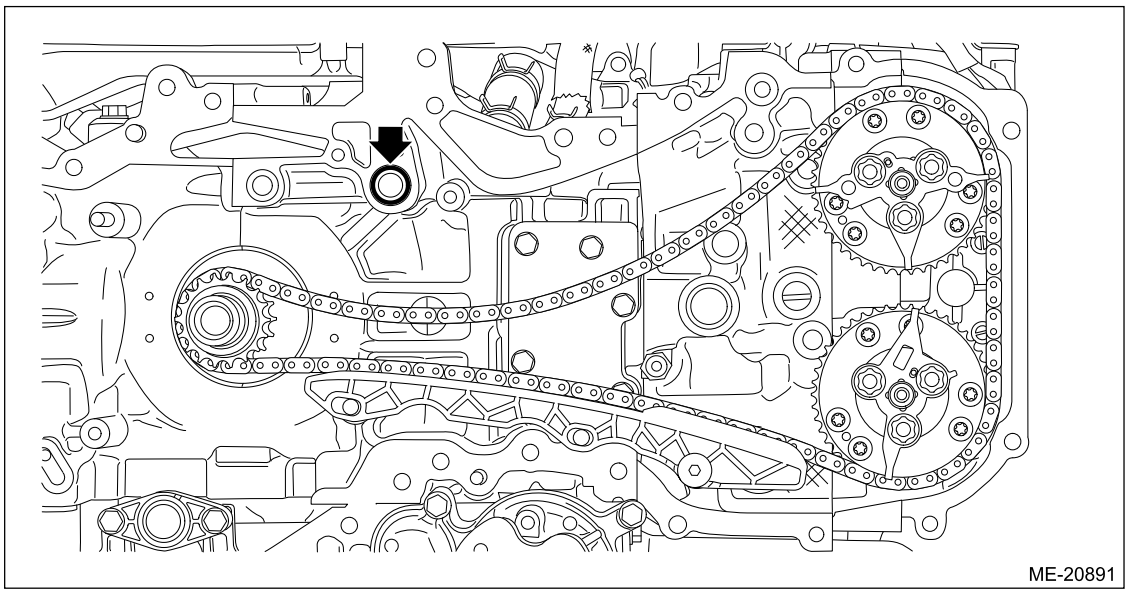


(A) Alignment mark
(B) Timing mark
(C) Deep blue
(D) Yellow

7. Install O-rings to the cylinder block LH.

Note:

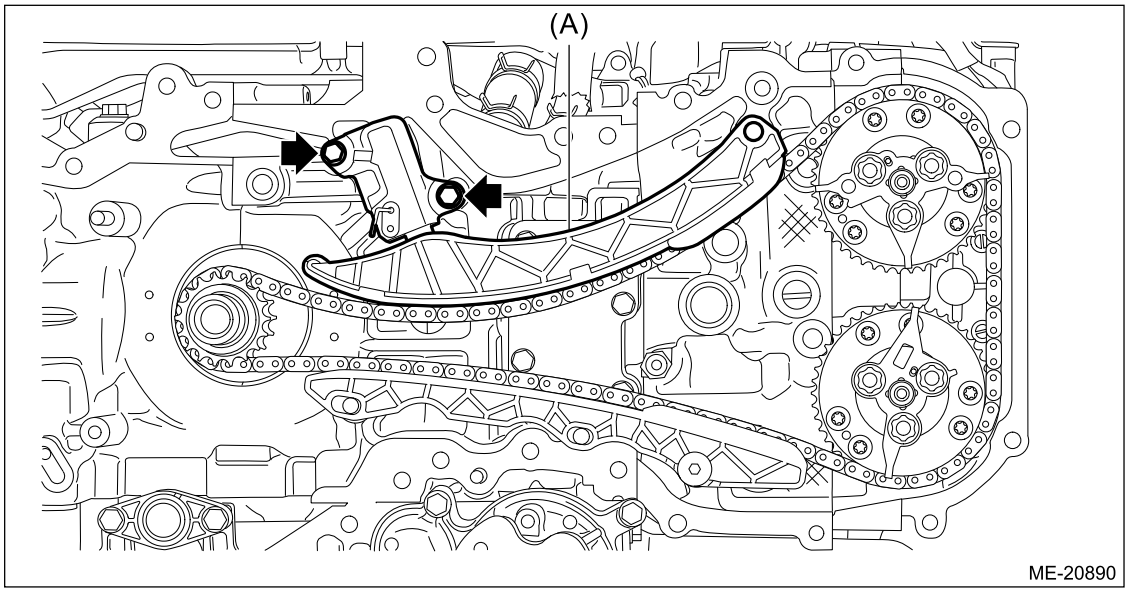
Use new O-rings.



8. Install the chain tensioner lever LH (A) and chain tensioner LH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



9. Pull out the stopper pin from the chain tensioner LH.

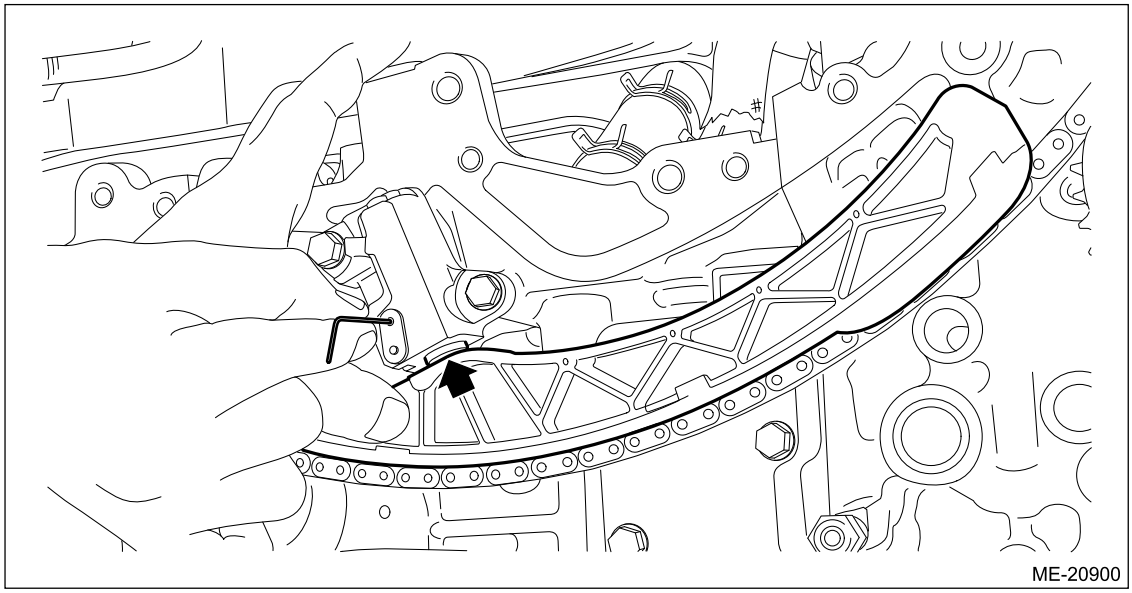
Caution:

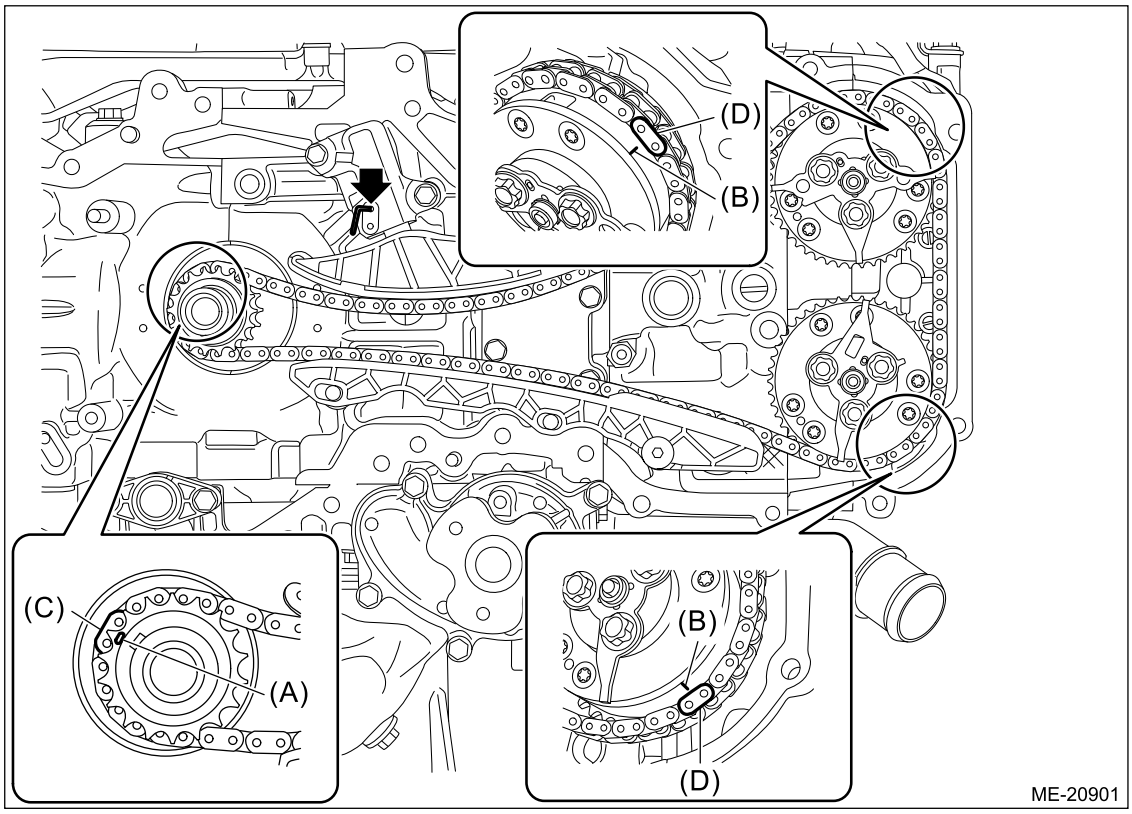
Confirm the following before pulling out the stopper pin.

- **Matching of the timing chain mark (deep blue) to the alignment mark of the crank sprocket.**
- **Matching of the timing chain mark (yellow) to the timing mark position of the intake cam sprocket LH.**
- **Matching of the timing chain mark (yellow) to the timing mark position of the exhaust cam sprocket LH.**

Note:

If the stopper pin cannot be removed, lift the chain tension lever LH to remove as shown in the figure.





(A) Alignment mark
(B) Timing mark
(C) Deep blue
(D) Yellow

10. When the cam sprocket LH has been removed, and the cam carrier LH has been disassembled

Note:

Follow also steps below when the cam sprocket LH has been removed, and the cam carrier LH has been disassembled.

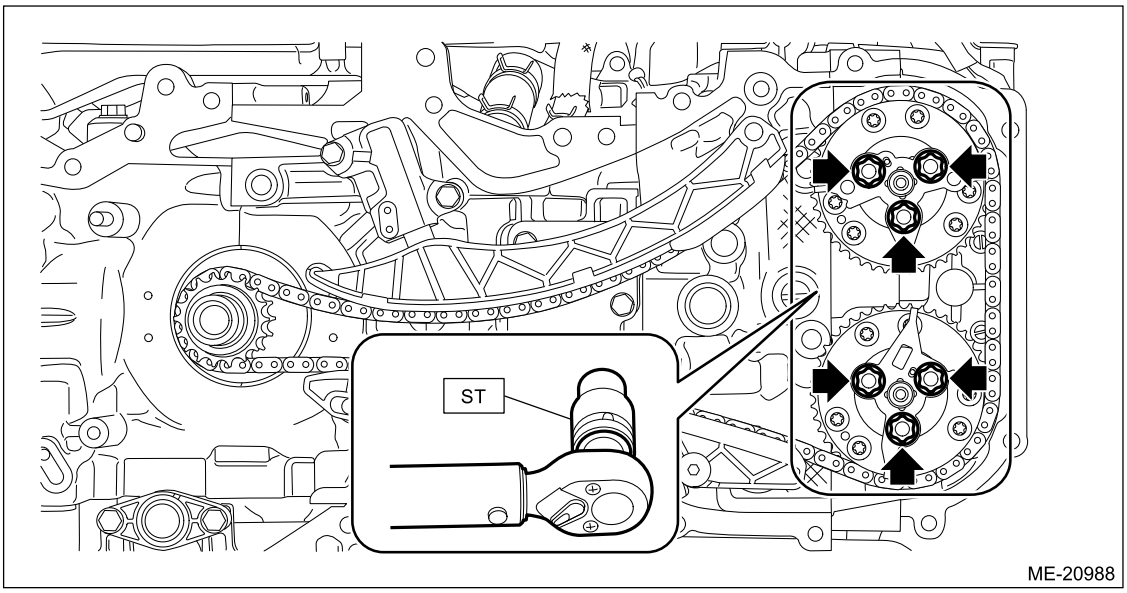
(1) Using the ST, tighten the bolts which hold the intake cam sprocket LH and exhaust cam sprocket LH.

Preparation tool:

ST: SOCKET (18270KA010)

Tightening torque:

18N·m (1.8 kgf-m, 13.3 ft-lb)



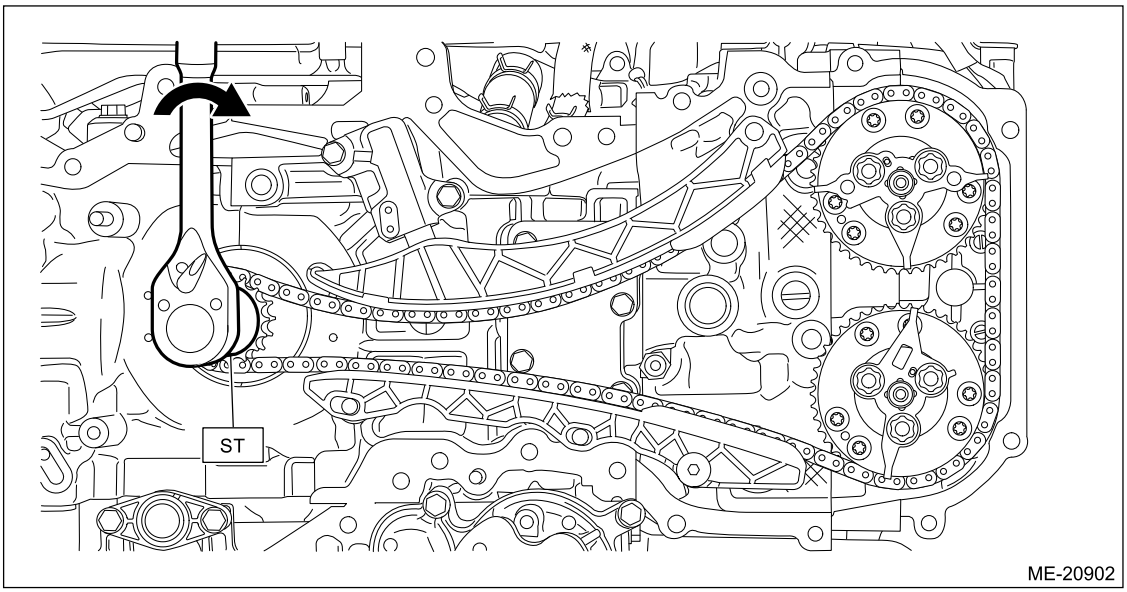
11. Using the ST, turn the crankshaft clockwise, and make sure that there are no abnormal conditions.

Caution:

Always make sure to perform this confirmation.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



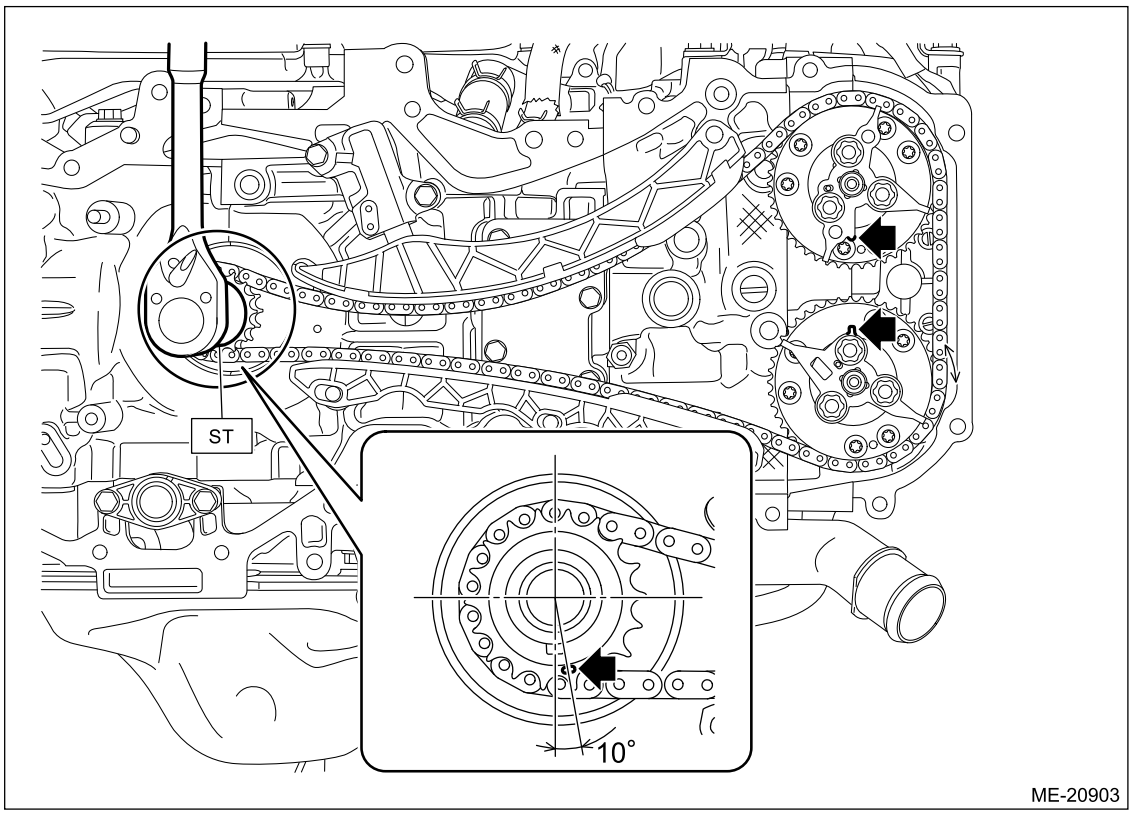
12. Using the ST and by turning the crankshaft, align the alignment mark of crank sprocket, the alignment mark (protrusion) of the intake cam sprocket LH and the alignment mark (protrusion) of the exhaust cam sprocket LH to the positions as shown in the figure.

Note:

If the alignment marks are aligned to the positions as shown in the figure, the crankshaft key is located at six o'clock position.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



13. Install the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN RH.

2. TIMING CHAIN RH

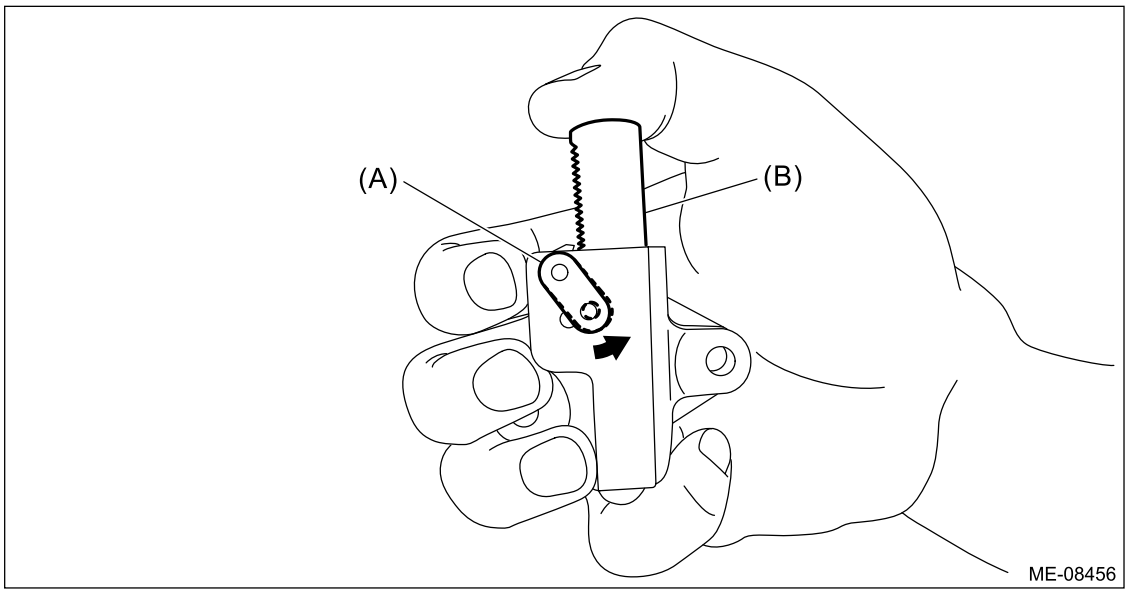
Note:

- **Be careful that the foreign matter is not into or onto the assembled component during installation.**
- **Apply engine oil to all component parts of the timing chain.**

1. Install timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN LH.

2. Prepare to attach the chain tensioner RH.

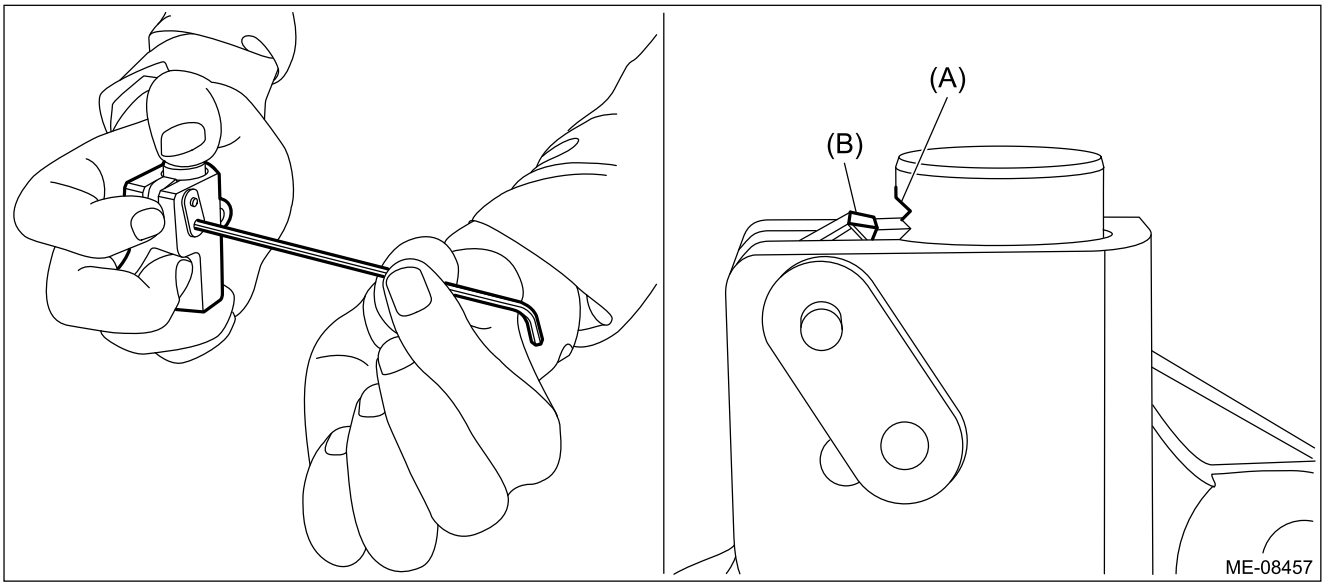
(1) Move the link plate (A) in the direction of arrow to press in the plunger (B).



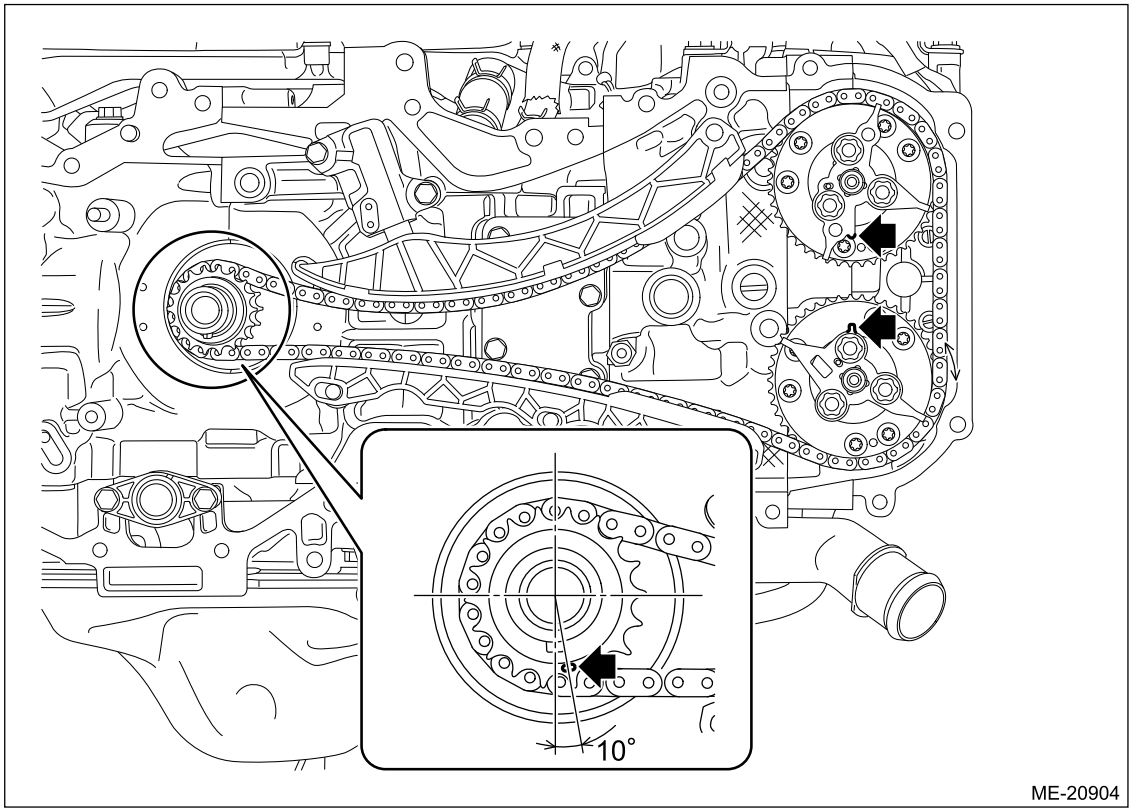
(2) In order to secure the plunger, insert a stopper pin with a diameter of 2.5 mm (0.0984in) or 2.5 mm hex wrench into the stopper pin hole.

Note:

If the stopper pin hole on the link plate and the stopper pin hole on the chain tensioner are not aligned, check that the first notch of plunger rack (A) is engaged with the stopper tooth (B). If not engaged, retract the plunger a little so that the first notch of plunger rack (A) is engaged with the stopper tooth (B).



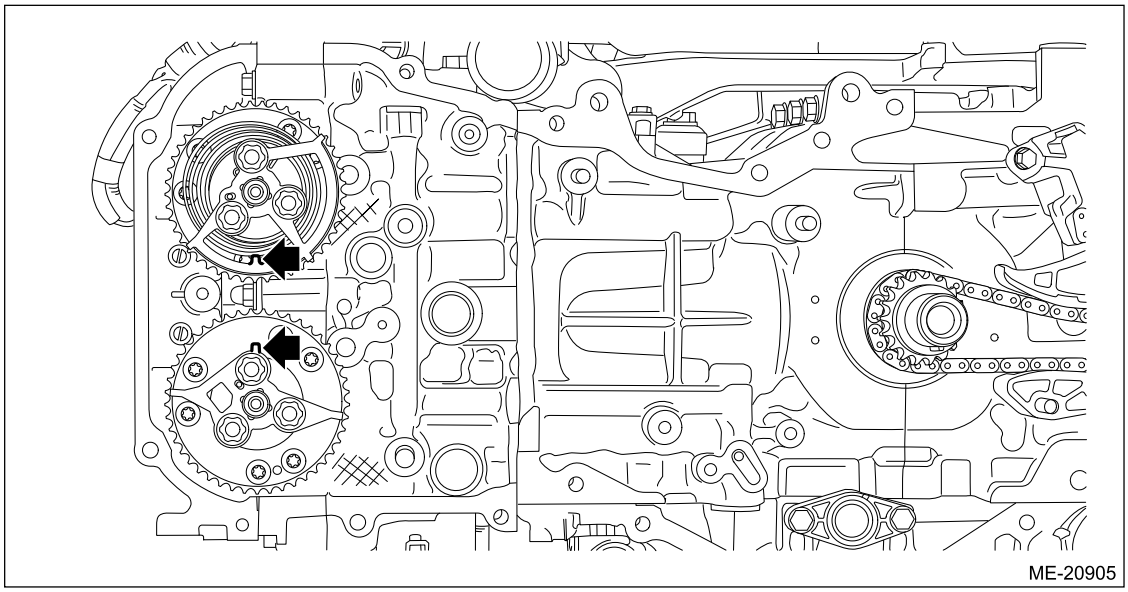
3. Make sure that the alignment mark of the crank sprocket, the alignment mark (protrusion) of the intake cam sprocket LH and the alignment mark (protrusion) of the exhaust cam sprocket LH are aligned to the positions as shown in the figure.



4. Align the alignment mark (protrusion) of the intake cam sprocket RH and the alignment mark (protrusion) of the exhaust cam sprocket RH to the positions as shown in the figure.

Caution:

To prevent valve damage, turn the intake cam sprocket RH and exhaust cam sprocket RH only within the range of zero-lift (in range where it can be turned lightly by hand).



5. Install the timing chain RH and the timing chain guide RH.

(1) Match the timing chain mark (deep blue) to the alignment mark of the crank sprocket.

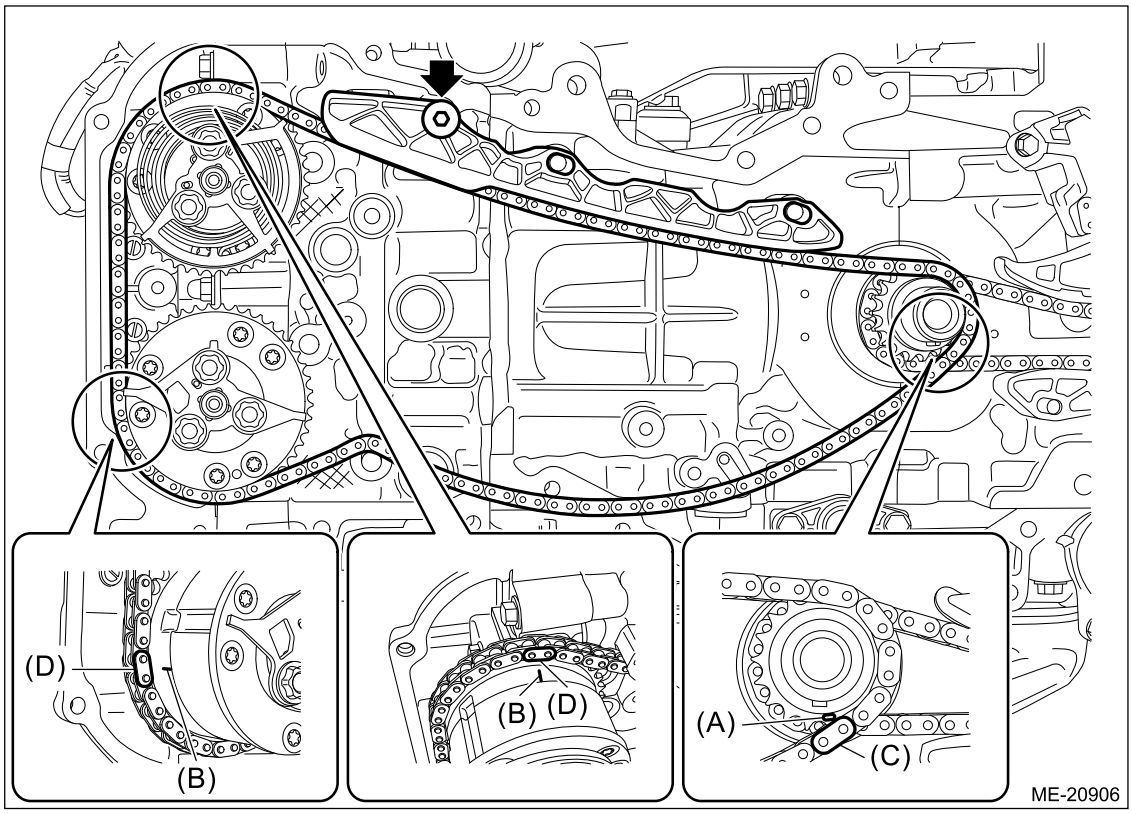
(2) Match the timing chain mark (yellow) to the timing mark position of the intake cam sprocket RH.

(3) Match the timing chain mark (yellow) to the timing mark position of the exhaust cam sprocket RH.

(4) Install the timing chain guide RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



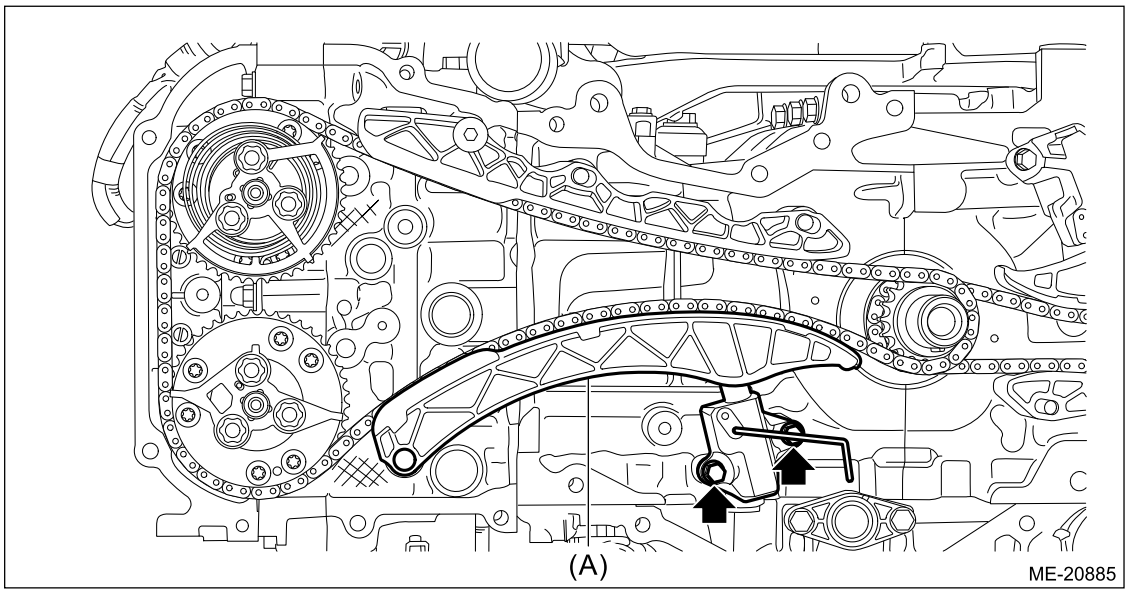
(A) Alignment mark (C) Deep blue (D) Yellow

(B) Timing mark

6. Install the chain tensioner lever RH (A) and chain tensioner RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

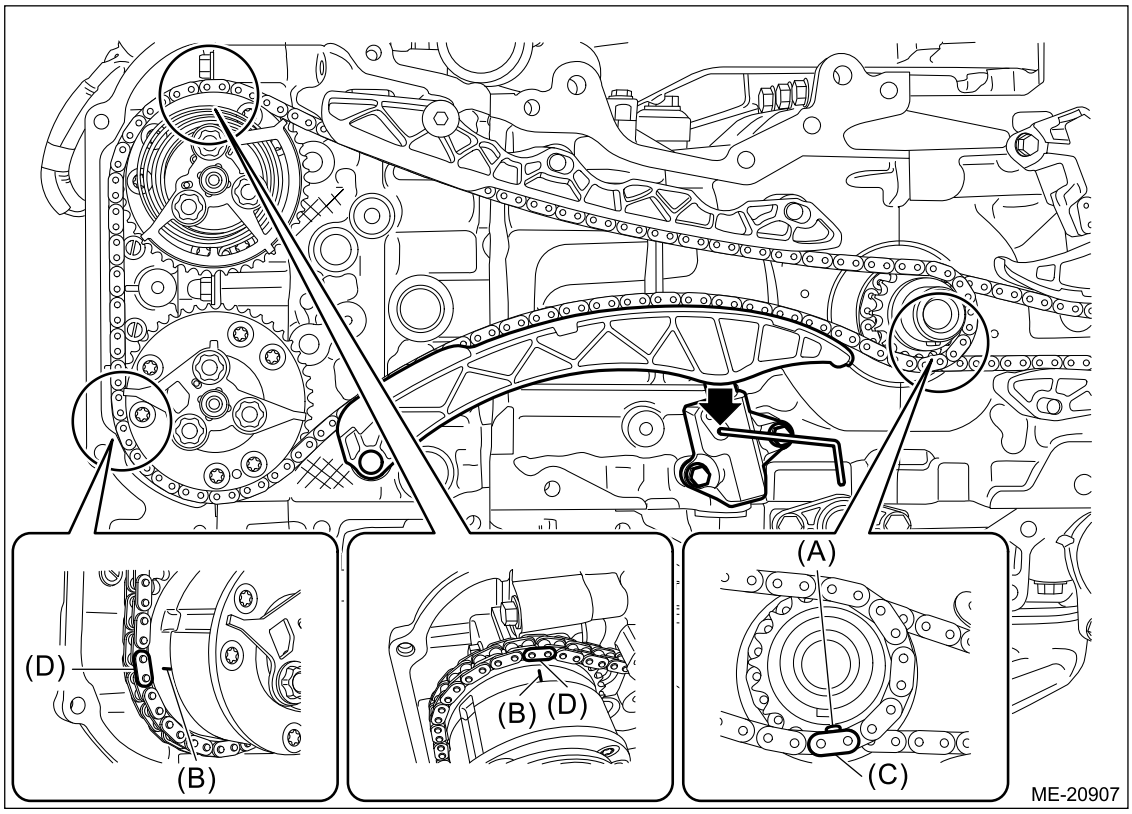


7. Pull out the stopper pin from the chain tensioner RH.

Caution:

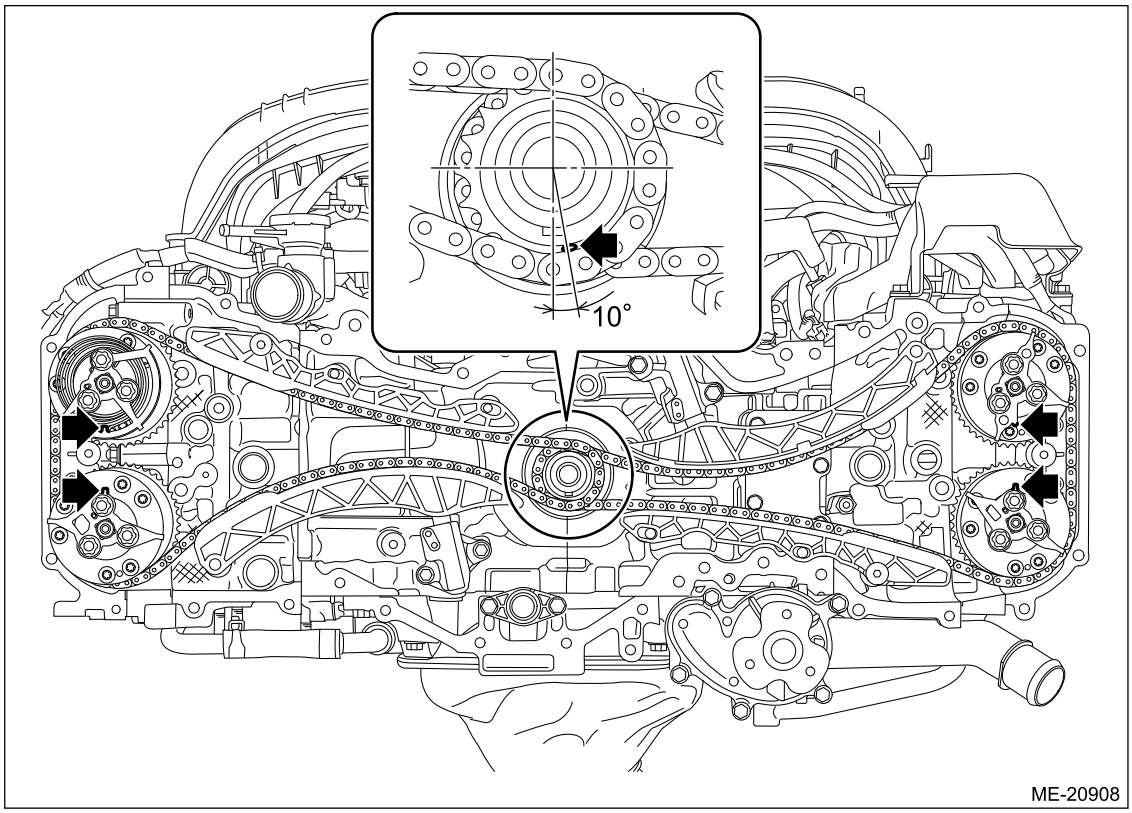
Confirm the following before pulling out the stopper pin.

- **Matching of the timing chain mark (deep blue) to the alignment mark of the crank sprocket.**
- **Matching of the timing chain mark (yellow) to the timing mark position of the intake cam sprocket RH.**
- **Matching of the timing chain mark (yellow) to the timing mark position of the exhaust cam sprocket RH.**



(A) Alignment mark
(B) Timing mark
(C) Deep blue
(D) Yellow

8. Make sure that the alignment mark of the cam sprocket and the alignment mark (protrusion) of the crank sprocket are aligned to the positions as shown in the figure.



9. When the cam sprocket RH has been removed, and the cam carrier RH has been disassembled

Note:

Follow also steps below when the exhaust cam sprocket RH has been removed, and the cam carrier RH has been disassembled.

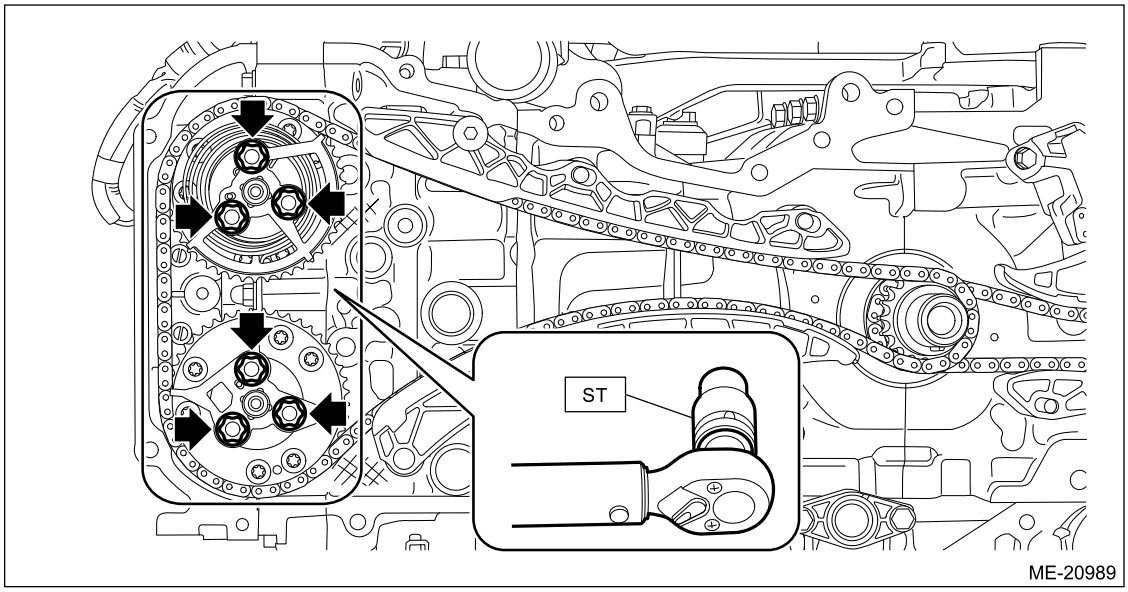
(1) Using the ST, tighten the bolts which hold the intake cam sprocket RH and exhaust cam sprocket RH.

Preparation tool:

ST: SOCKET (18270KA010)

Tightening torque:

18N·m (1.8 kgf-m, 13.3 ft-lb)



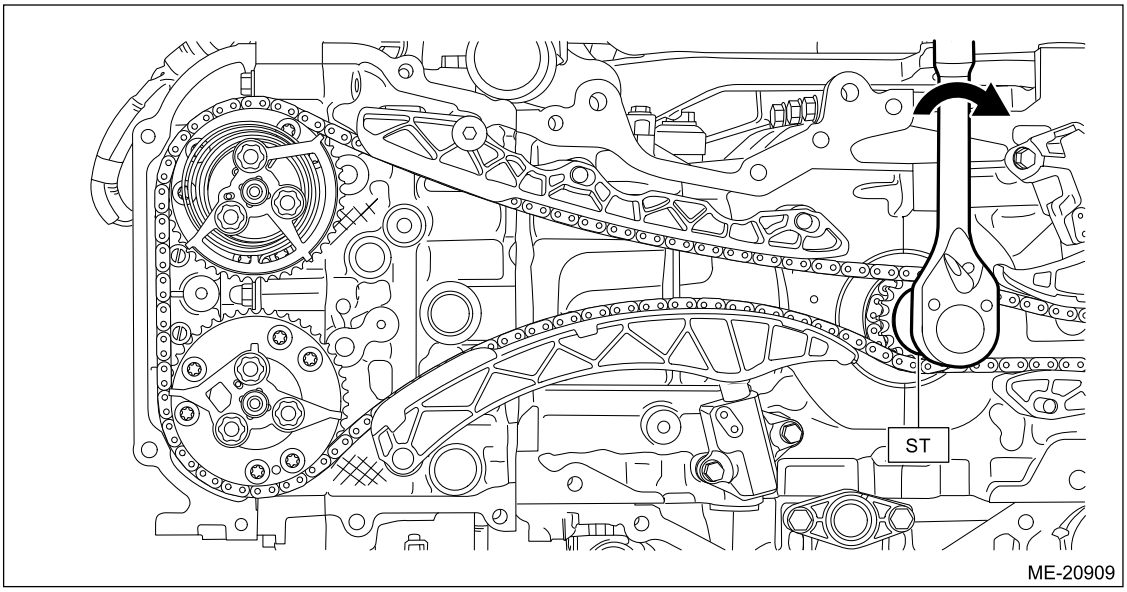
10. Using the ST, turn the crankshaft clockwise, and make sure that there are no abnormal conditions.

Caution:

Always make sure to perform this confirmation.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



11. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

MECHANICAL(H4DO) > Timing Chain Assembly

INSPECTION

1. Check the timing chain, chain guide, chain tensioner lever and chain tensioner for deformation, cracks or other damages.
2. Check the chain guide and chain tensioner lever for abnormal wear.

REMOVAL

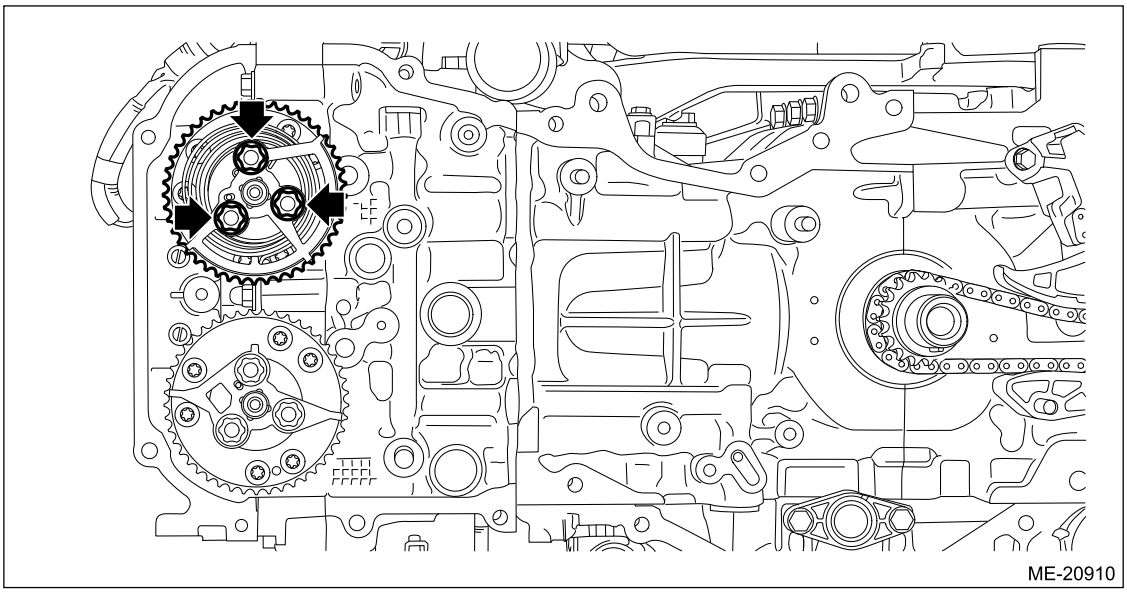
1. CAM SPROCKET RH

Note:

When replacing a single part, perform the work with the engine assembly installed to body.

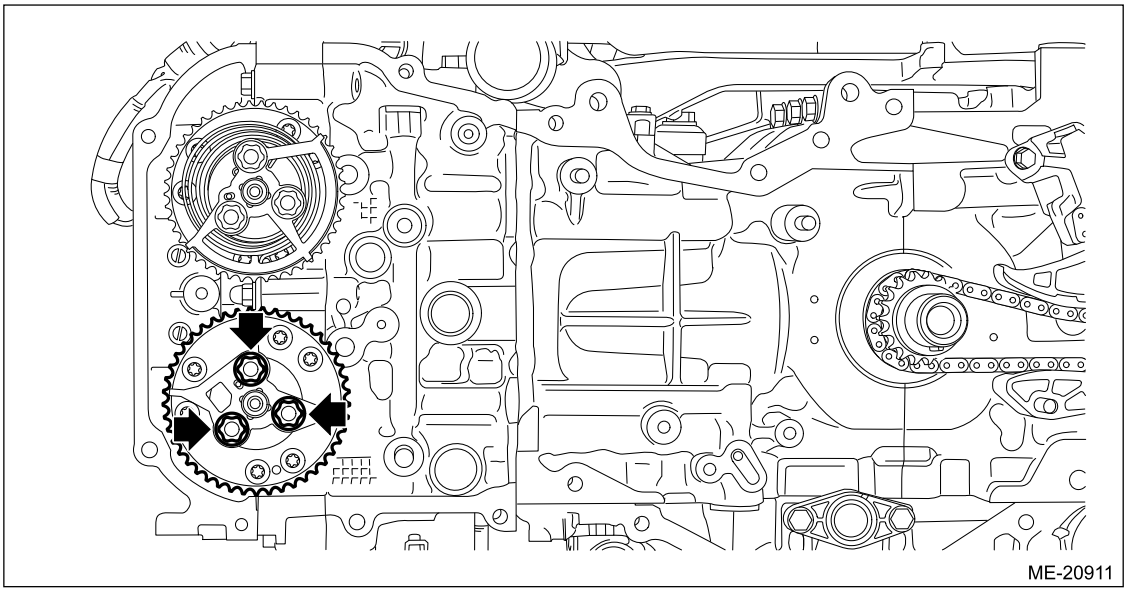
INTAKE CAM SPROCKET RH

1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Remove the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN RH.
3. Remove the intake cam sprocket RH.



EXHAUST CAM SPROCKET RH

1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Remove the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN RH.
3. Remove the exhaust cam sprocket RH.



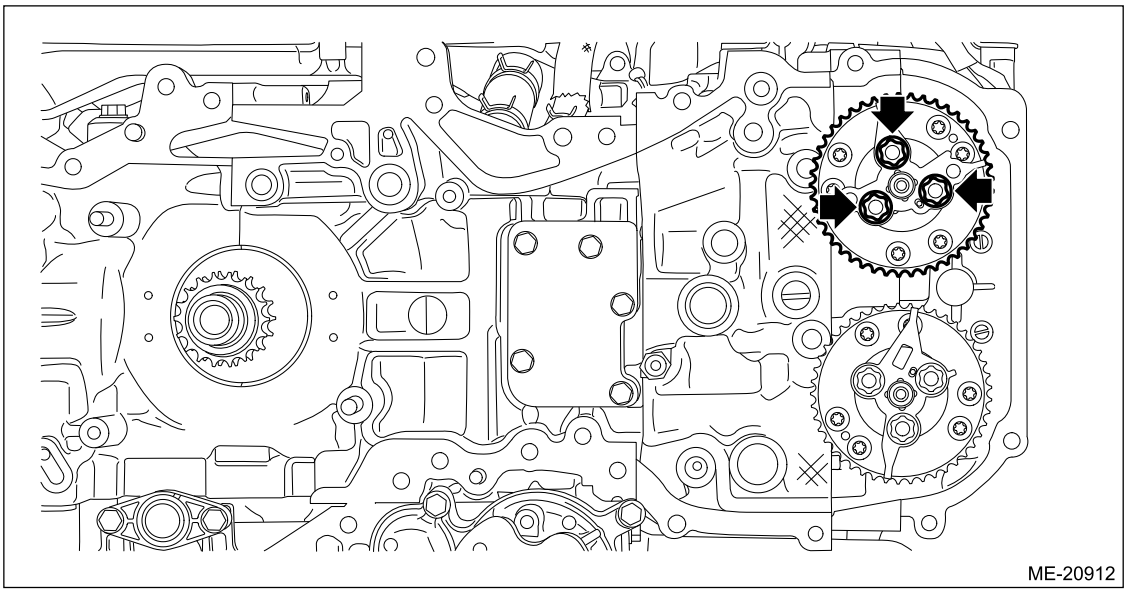
2. CAM SPROCKET LH

Note:

When replacing a single part, perform the work with the engine assembly installed to body.

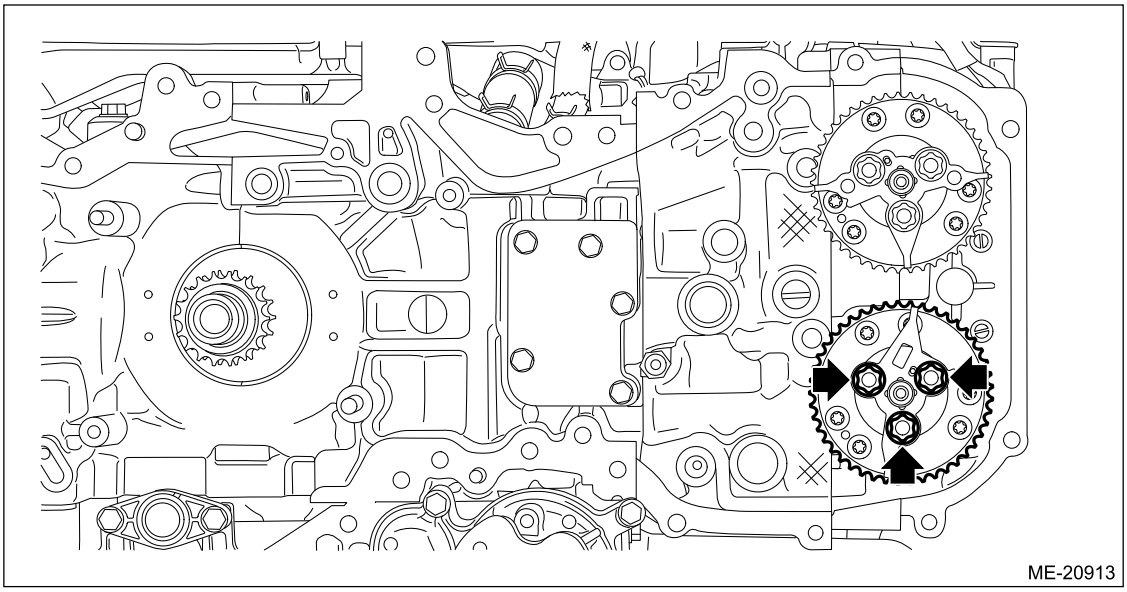
INTAKE CAM SPROCKET LH

1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Remove the timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN LH.
3. Remove the intake cam sprocket LH.



EXHAUST CAM SPROCKET LH

1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Remove the timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN LH.
3. Remove the exhaust cam sprocket LH.



MECHANICAL(H4DO) > Cam Sprocket

INSTALLATION

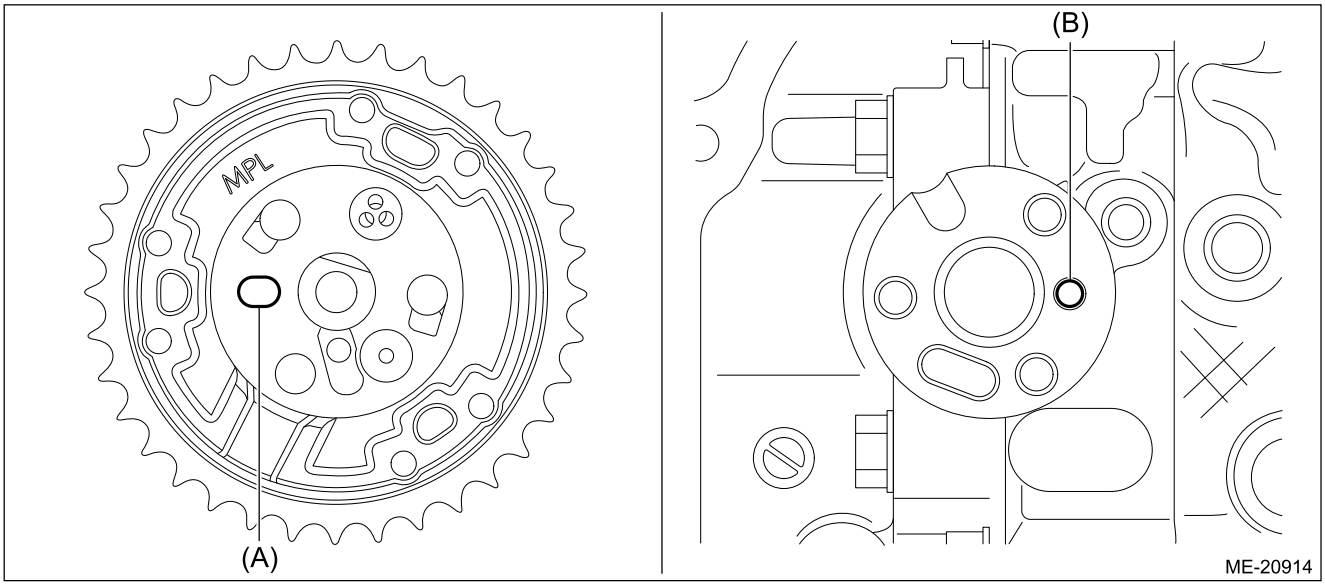
1. CAM SPROCKET RH

INTAKE CAM SPROCKET RH

1. Install the intake cam sprocket RH by aligning the knock hole (A) of intake cam sprocket RH and the knock pin (B) of intake camshaft RH.

   Note:

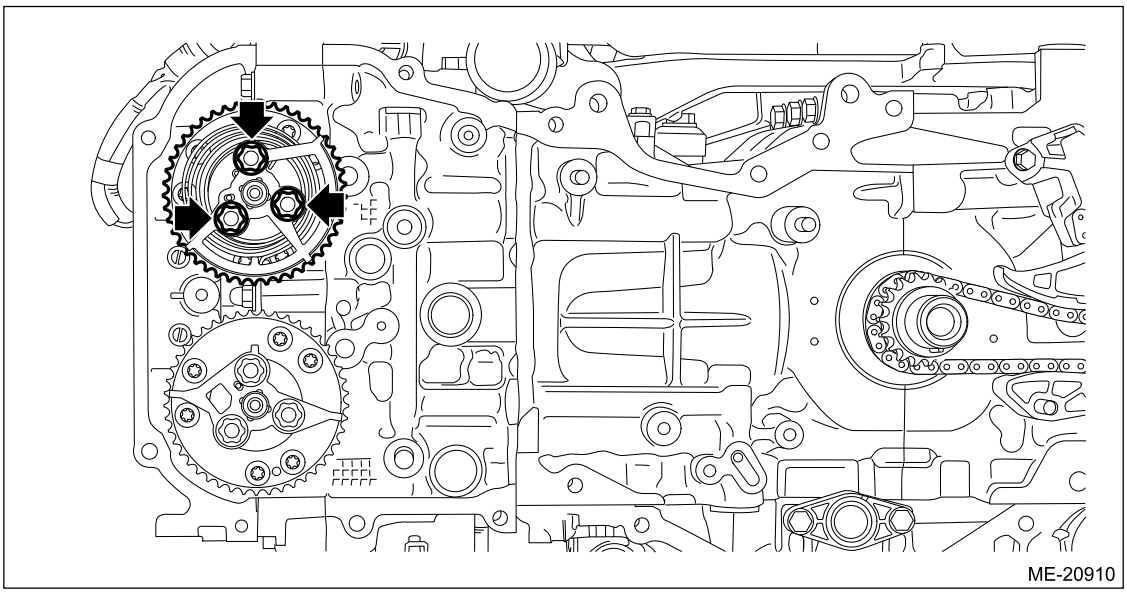
   Before installation, check that there is no foreign matter on the intake cam sprocket RH and intake camshaft RH.



2. Tighten the bolts securing the intake cam sprocket RH by hand.

   Note:

   Tighten the bolts until the intake cam sprocket RH contacts the intake camshaft RH by hand.



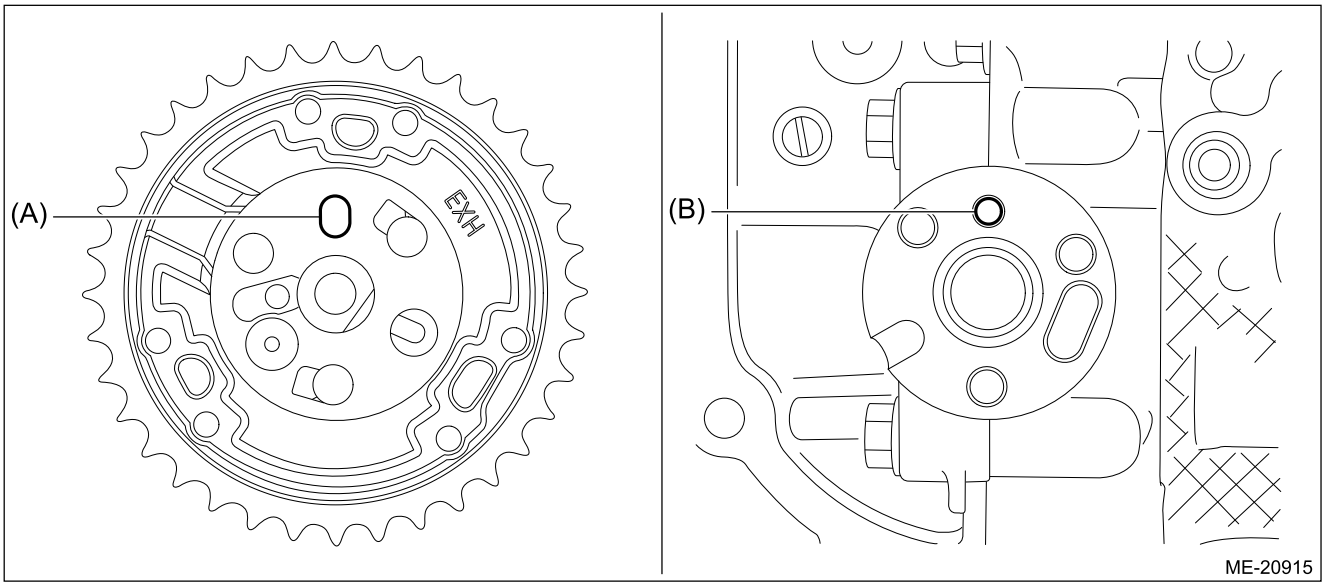
3. Install the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN RH.
4. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

EXHAUST CAM SPROCKET RH

1. Install the exhaust cam sprocket RH by aligning the knock hole (A) of exhaust cam sprocket RH and the knock pin (B) of exhaust camshaft RH.

   Note:

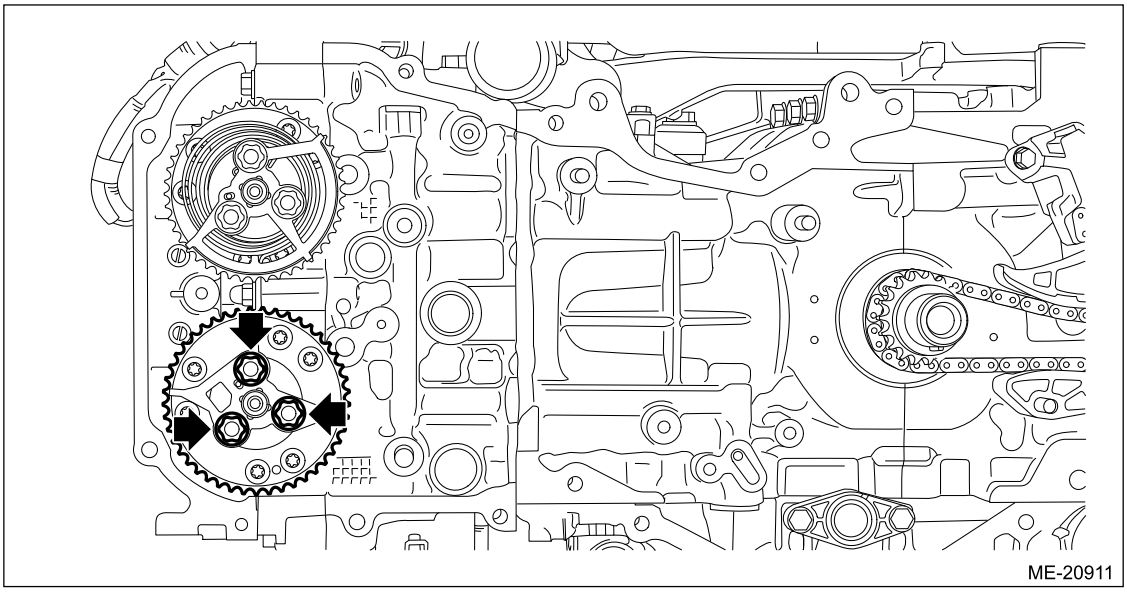
   Before installation, check that there is no foreign matter on the exhaust cam sprocket RH and exhaust camshaft RH.



2. Tighten the bolts securing the exhaust cam sprocket RH by hand.

Note:

Tighten the bolts until the exhaust cam sprocket RH contacts the exhaust camshaft RH by hand.



3. Install the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN RH.
4. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

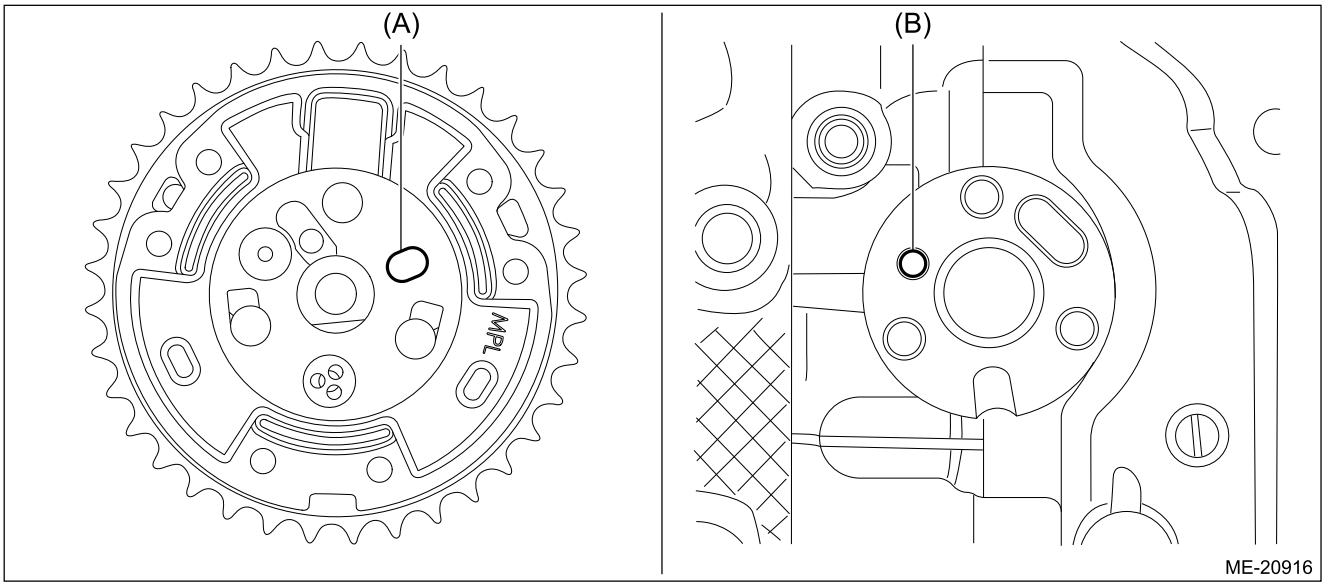
2. CAM SPROCKET LH

INTAKE CAM SPROCKET LH

1. Install the intake cam sprocket LH by aligning the knock hole (A) of intake cam sprocket LH and the knock pin (B) of intake camshaft LH.

Note:

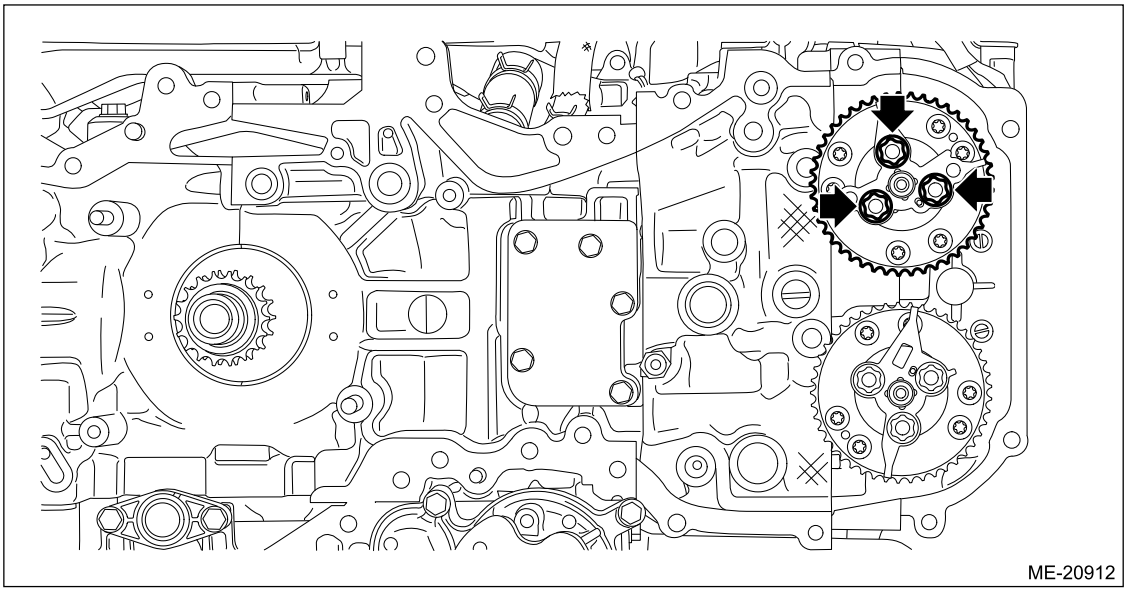
Before installation, check that there is no foreign matter on the intake cam sprocket LH and intake camshaft LH.



2. Tighten the bolts securing the intake cam sprocket LH by hand.

Note:

Tighten the bolts until the exhaust cam sprocket LH contacts the exhaust camshaft LH by hand.



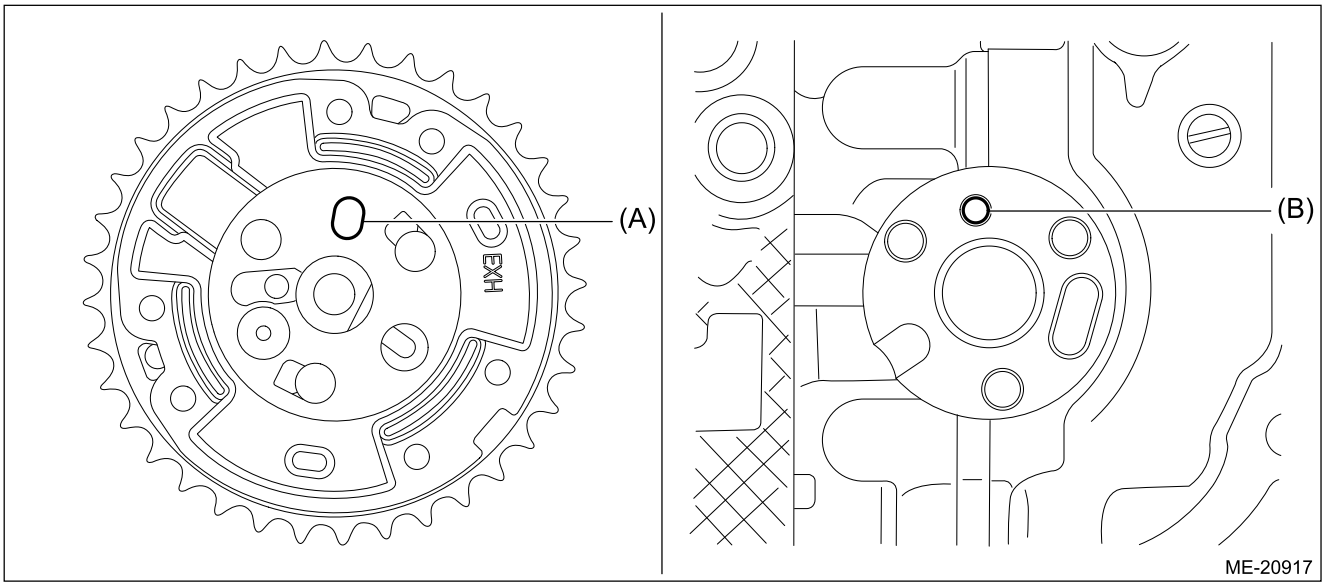
3. Install timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN LH.
4. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

EXHAUST CAM SPROCKET LH

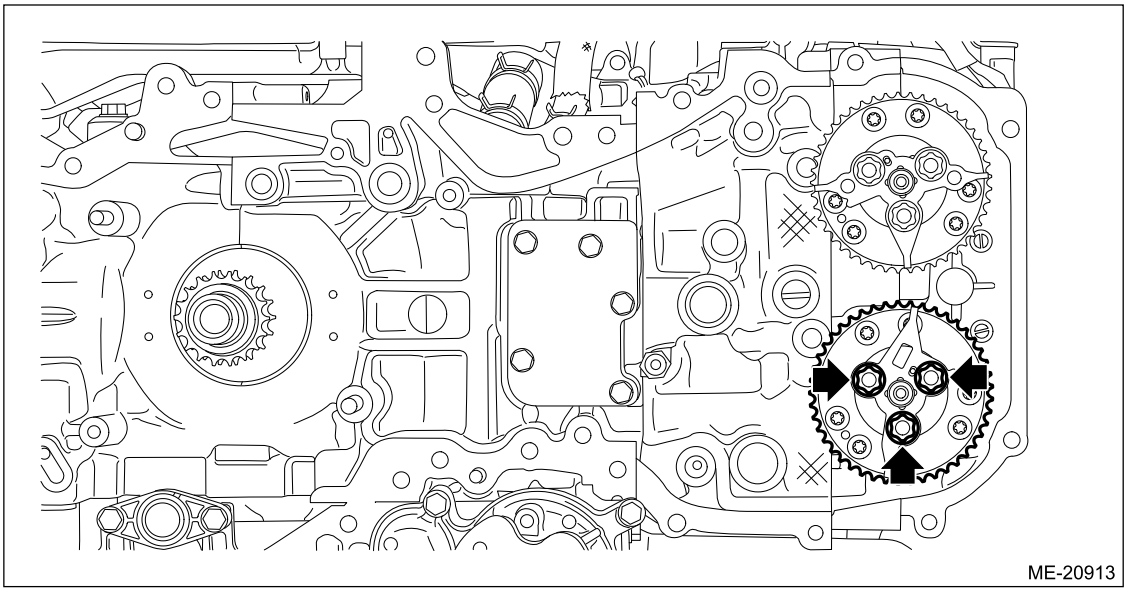
1. Install the exhaust cam sprocket LH by aligning the knock hole (A) of exhaust cam sprocket LH and the knock pin (B) of exhaust camshaft LH.

Note:

Before installation, check that there is no foreign matter on the exhaust cam sprocket LH and exhaust camshaft LH.



2. Tighten the bolts securing the exhaust cam sprocket LH by hand.
   Note:
   Tighten the bolts until the exhaust cam sprocket LH contacts the exhaust camshaft LH by hand.



3. Install timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN LH.
4. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

MECHANICAL(H4DO) > Cam Sprocket

INSPECTION

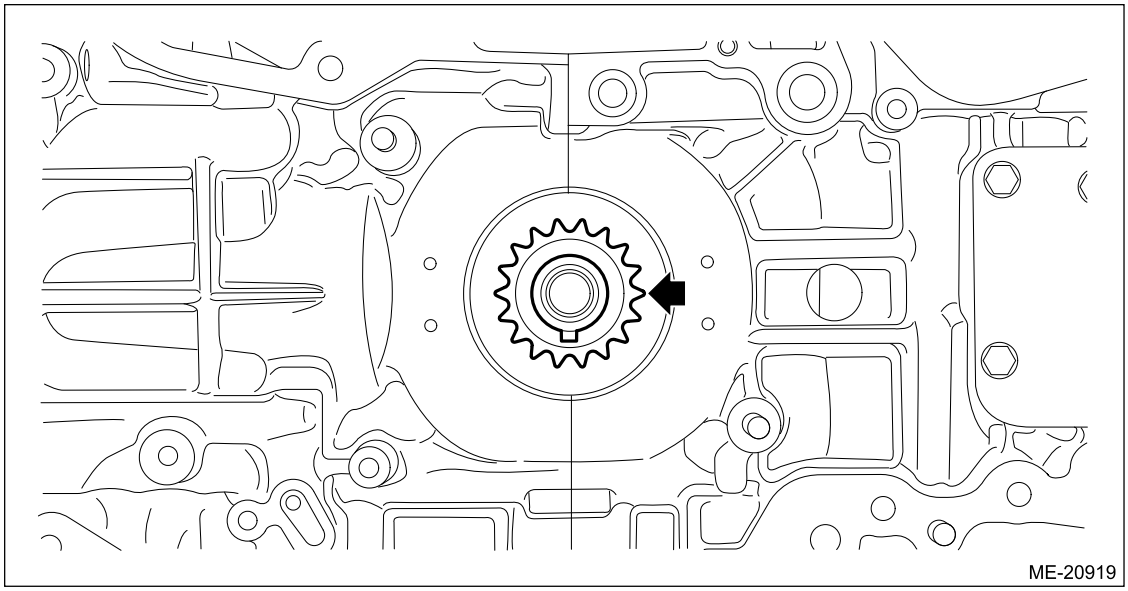
Check the cam sprocket teeth for abnormal wear and scratches.

MECHANICAL(H4DO) > Crank Sprocket

REMOVAL

Note:
When replacing a single part, perform the work with the engine assembly installed to body.

1. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
2. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
3. Remove the crank sprocket.



MECHANICAL(H4DO) > Crank Sprocket

INSTALLATION

1. Install the crank sprocket.
   Note:
   The direction of installation is not specified for the crank sprocket.
2. Install the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION.
3. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

MECHANICAL(H4DO) > Crank Sprocket

INSPECTION

1. Check the crank sprocket teeth for abnormal wear and scratches.
2. Make sure there is no free play between crank sprocket and key.

REMOVAL

1. ROCKER COVER RH

Note:

When replacing a single part, perform the work with the engine assembly installed to body.

1. When working on the vehicle

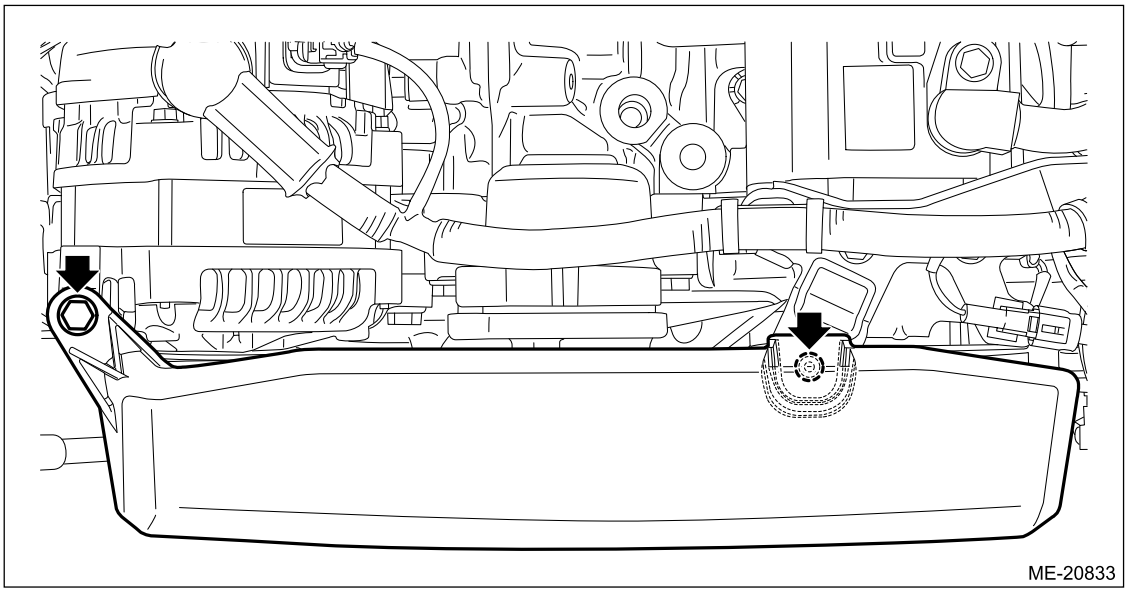
Note:

When working on the vehicle, perform the following steps also.

(1) Remove the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>DISASSEMBLY.

(2) Fully open the front hood. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.

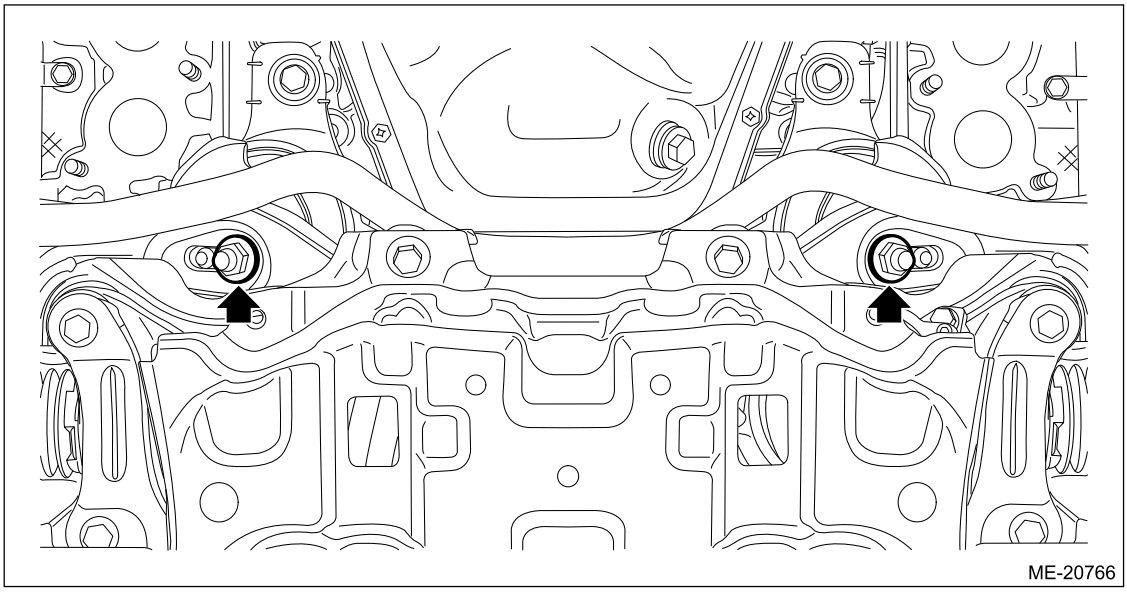
(3) Remove the V-belt covers.



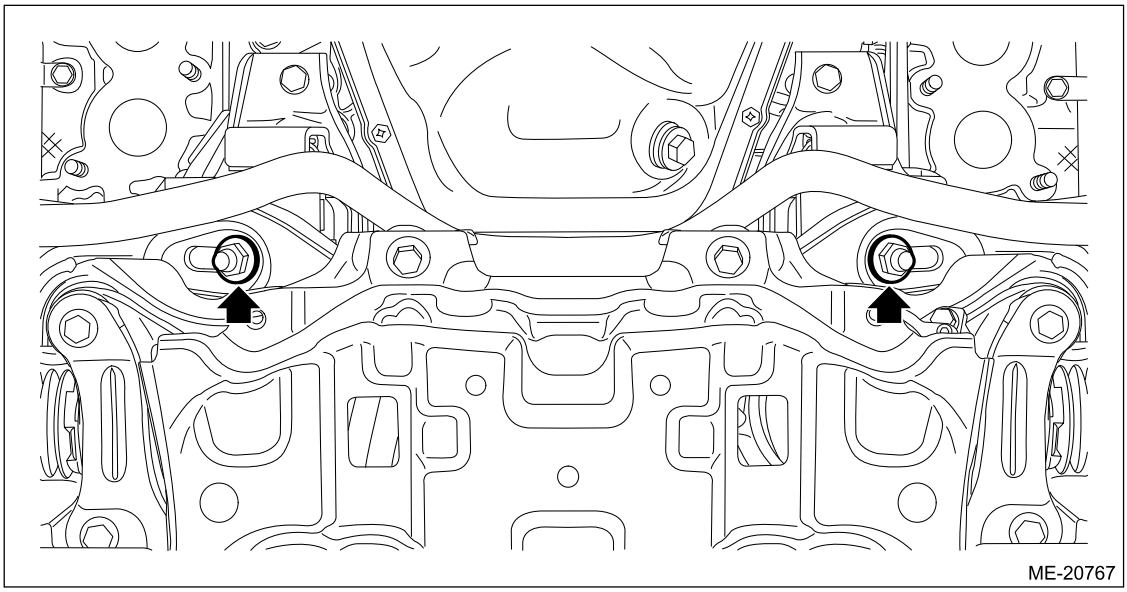
(4) Remove the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>REMOVAL.

(5) Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

(6) Remove the nuts which secure the engine mounting to the crossmember. (CVT model)



(7) Remove the nuts which secure the engine mounting to the crossmember. (MT model)



(8) Lower the vehicle.

(9) Remove the pitching stopper. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.

(10) Remove the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.

(11) Using the ST1, install the ST2 to the engine unit.

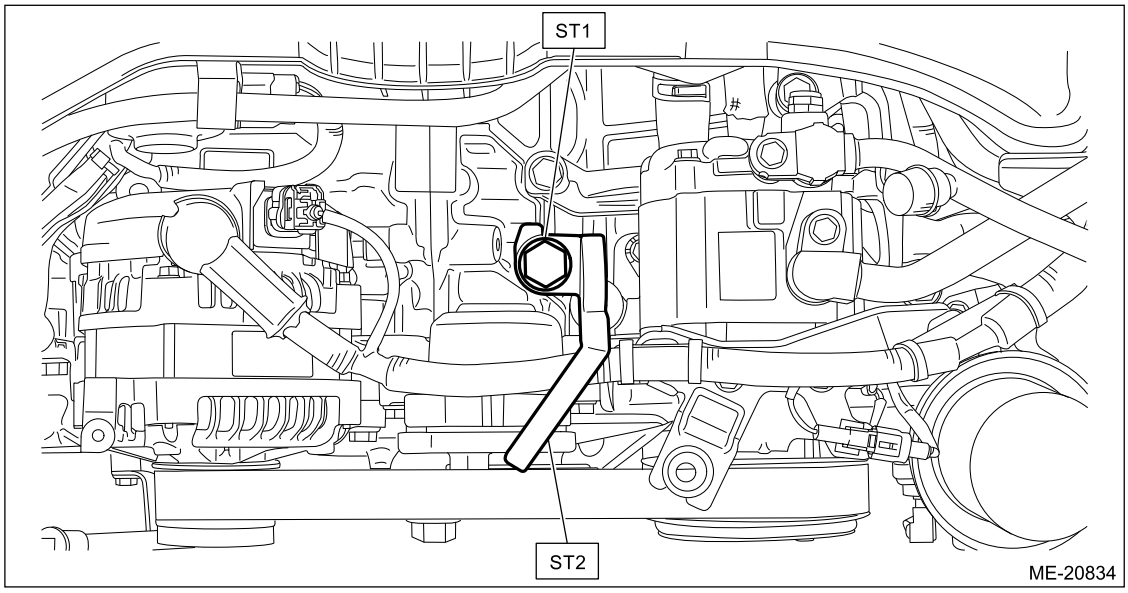
Preparation tool:

ST1: BOLT (18363AA050)

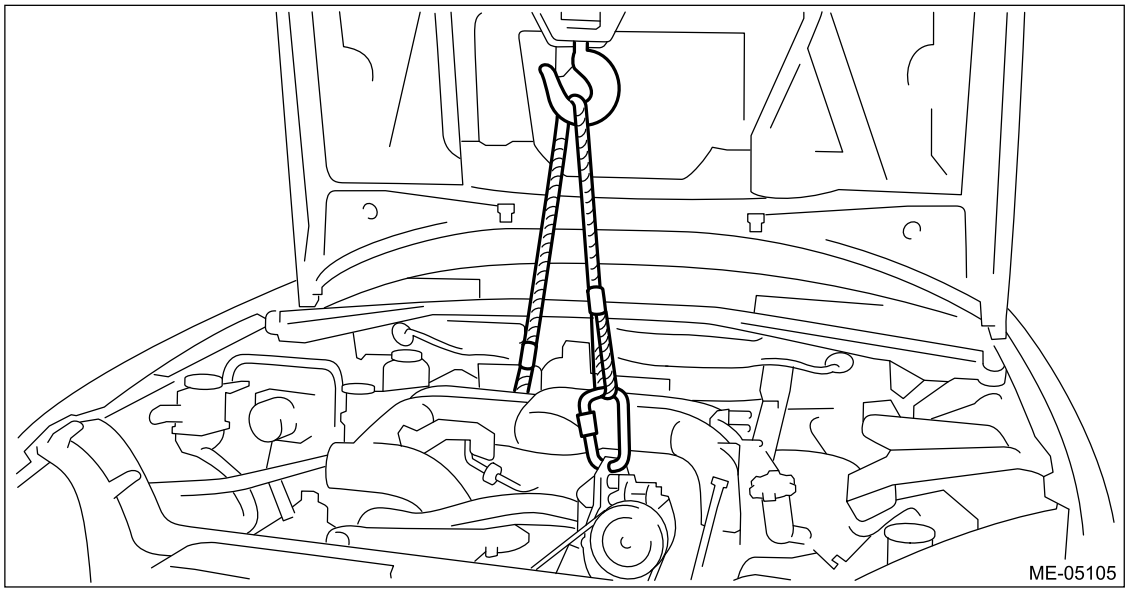
ST2: HANGER (18360AA040)

Tightening torque:

43 N·m (4.4 kgf-m, 31.7 ft-lb)



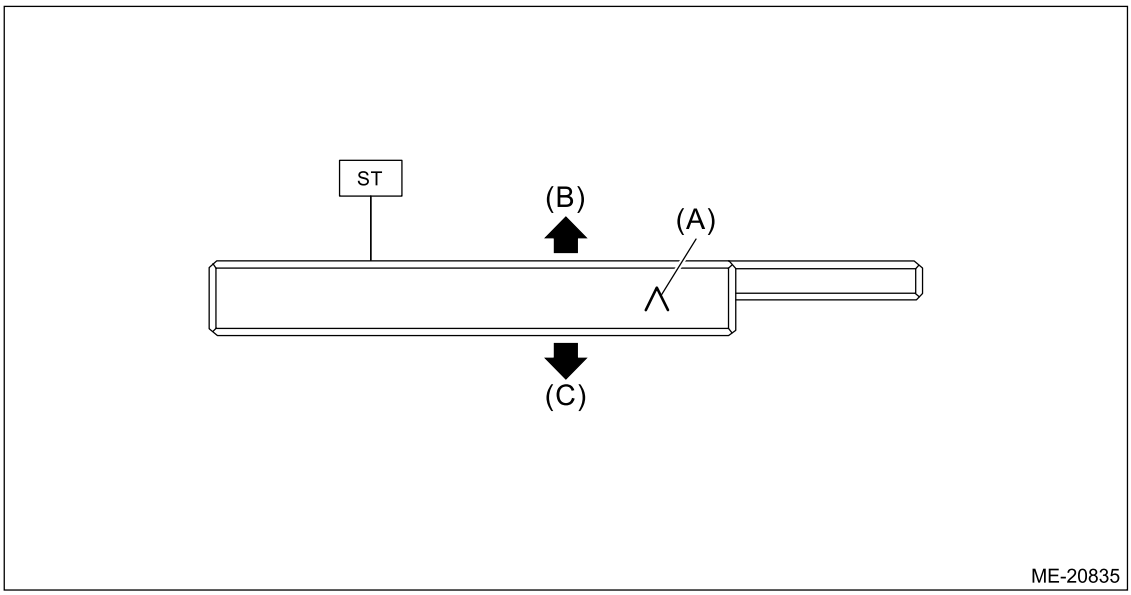
(12) Support the engine with a lifting device and wire ropes.



(13) While gradually lifting up the engine, set the ST between the engine mount RH and crossmember, and then slowly lower the engine.

Caution:

- **When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.**
- **To avoid damaging the ST, be sure to set the ST as shown in the figure.**

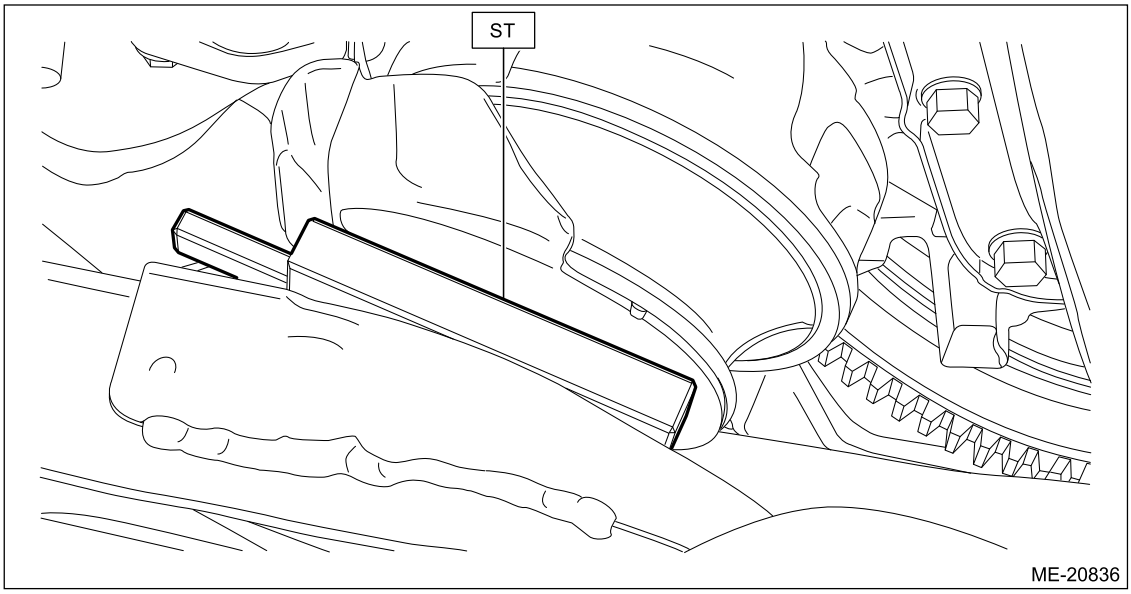


(A) Direction mark (B) Engine mounting side (C) Crossmember side

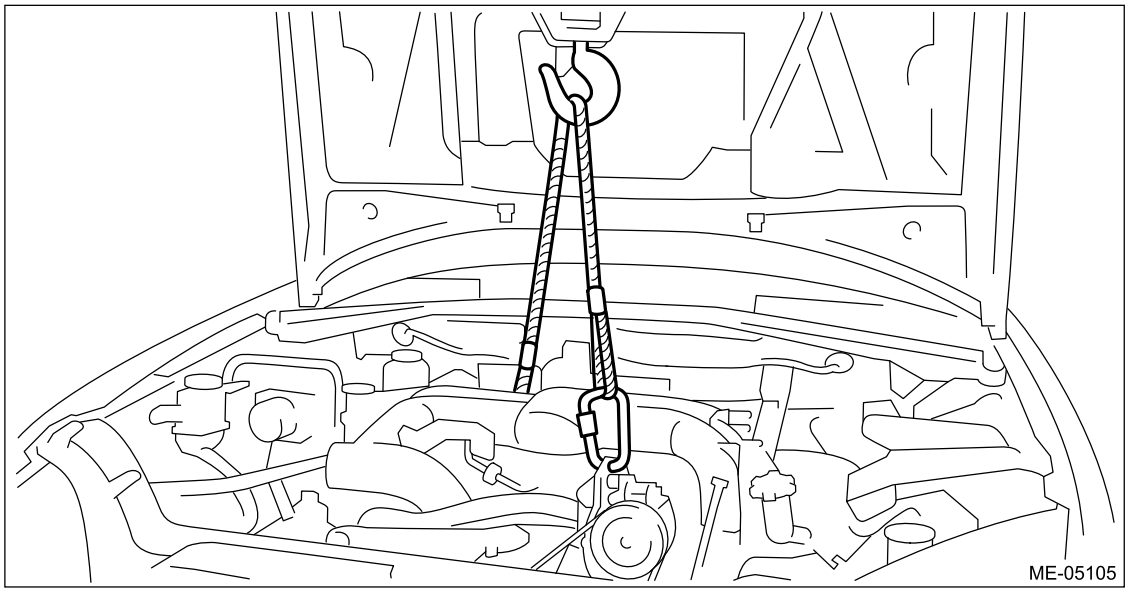
- **After lowering the engine, rock the engine to check that the ST does not come off.**

Preparation tool:

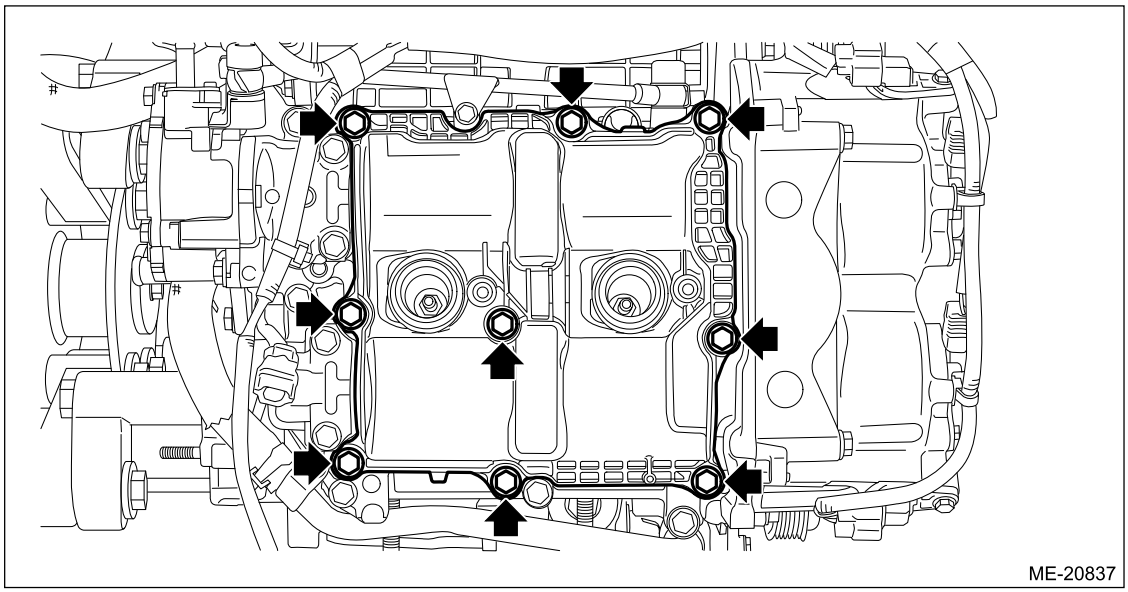
ST: STAND ASSY (18632AA030)



(14) Remove the lifting device and wire ropes.



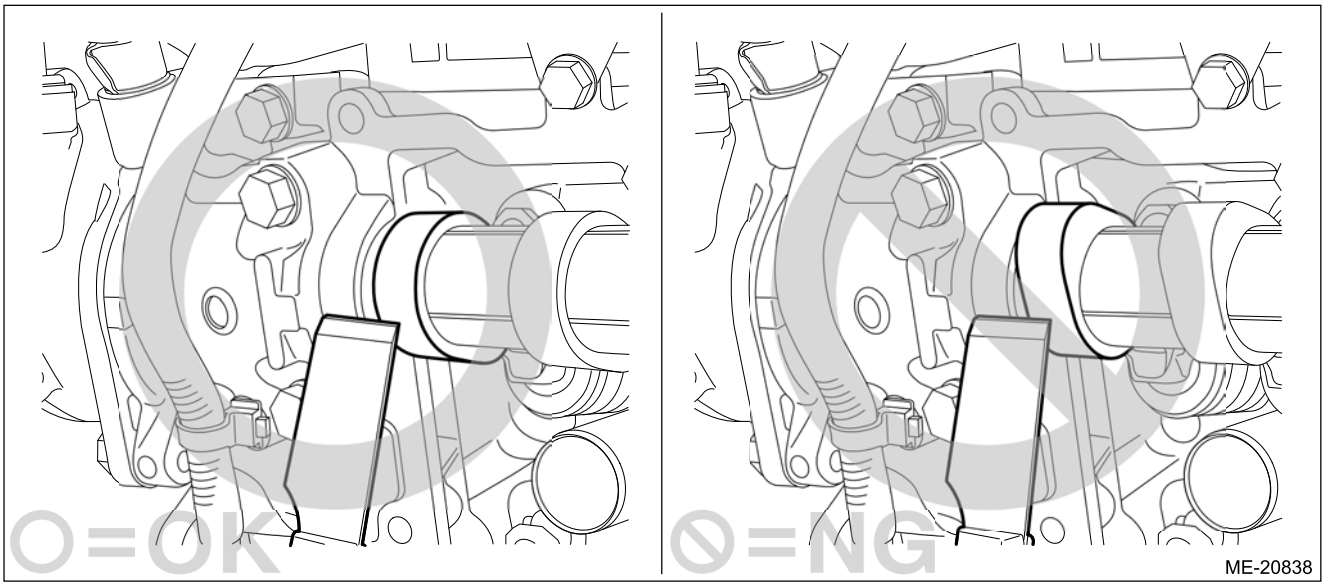
2. Remove the #1 ignition coil and the #3 ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil>REMOVAL.
3. Remove the rocker cover RH.

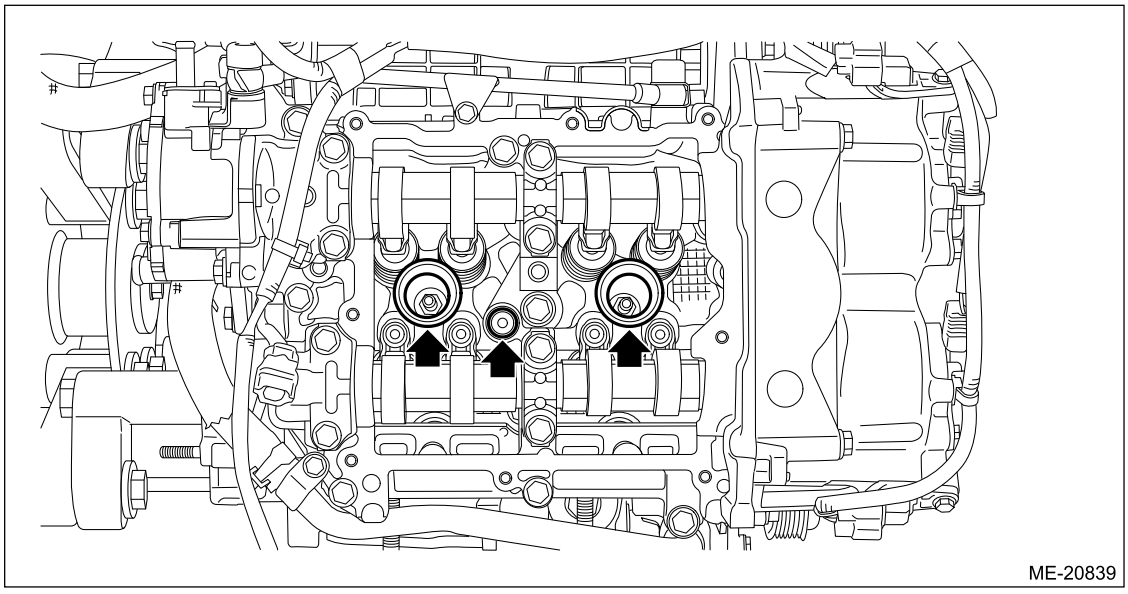


4. Remove the rocker cover gasket (ring type) and the spark plug pipe gasket, and remove the liquid gasket.

Caution:

- **When removing the liquid gasket from engine unit using scraper, use special care not to damage the cam lobe of camshaft RH.**
- **If the cam lobe of camshaft RH interferes, turn the crankshaft to the position where the scraper does not touch.**





5. Remove the rocker cover gasket RH from the rocker cover RH, and remove the liquid gasket.

2. ROCKER COVER LH

Note:

When replacing a single part, perform the work with the engine assembly installed to body.

1. When working on the vehicle

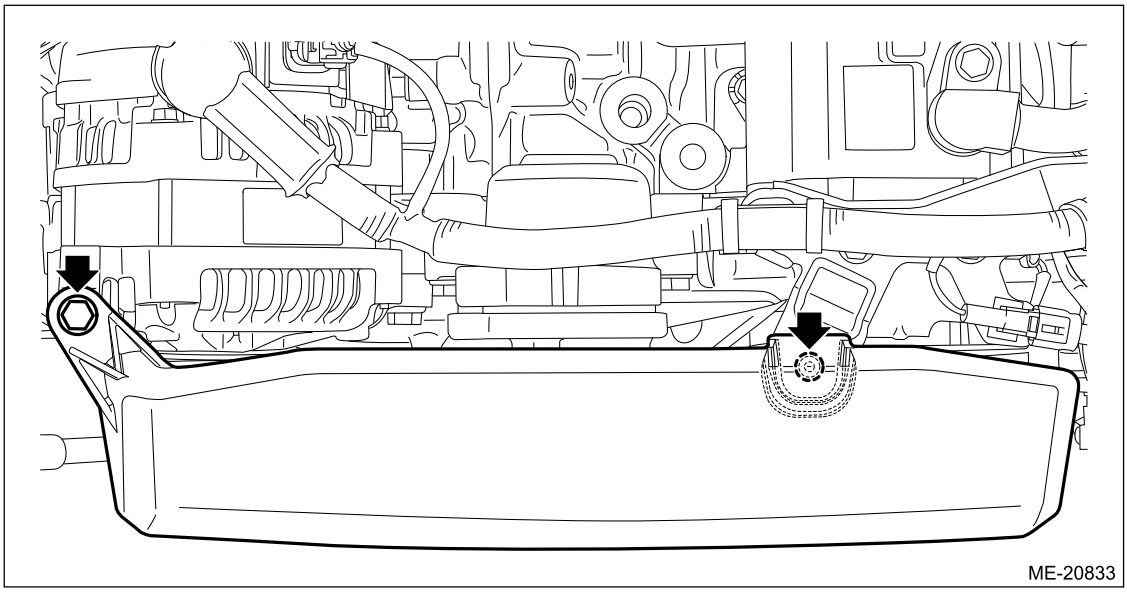
Note:

When working on the vehicle, perform the following steps also.

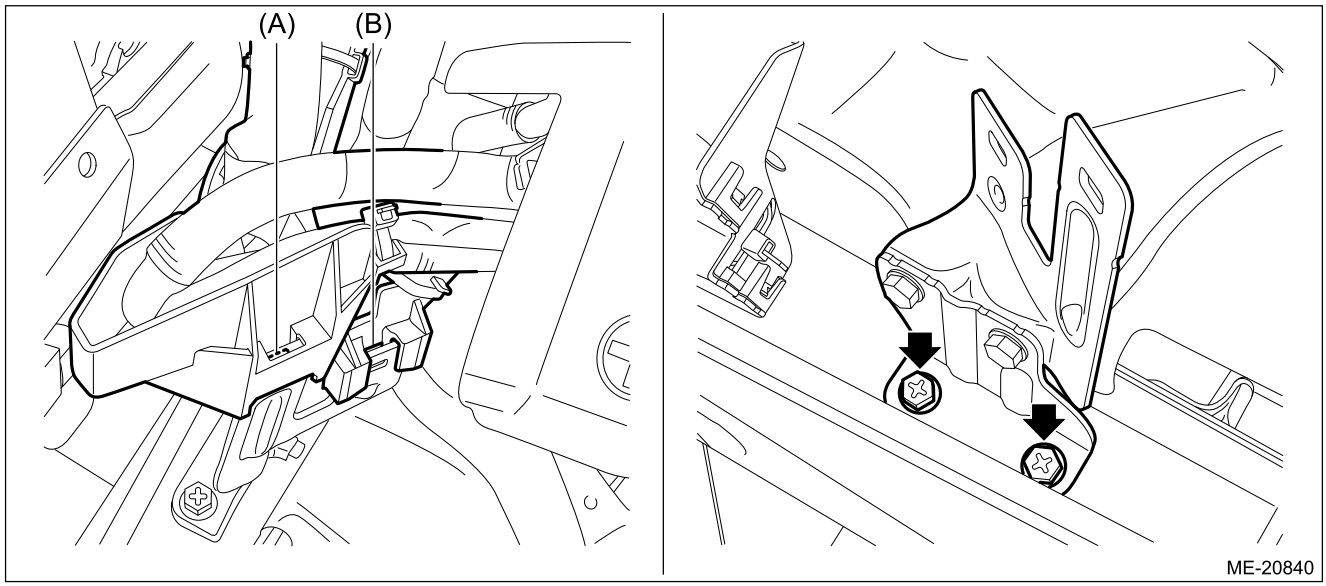
(1) Remove the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>DISASSEMBLY.

(2) Fully open the front hood. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.

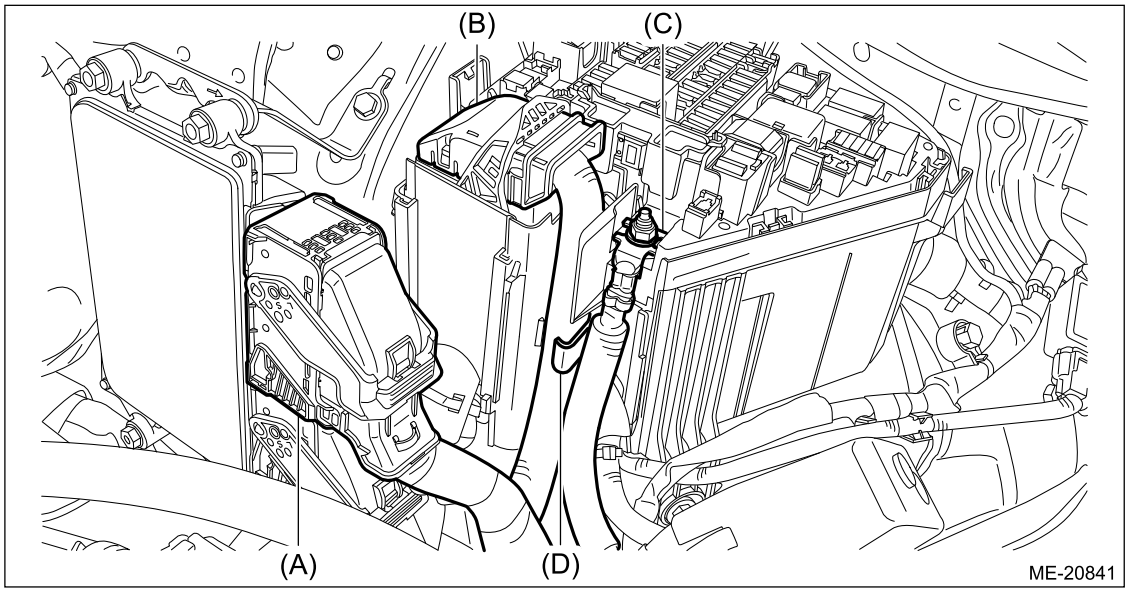
(3) Remove the V-belt covers.



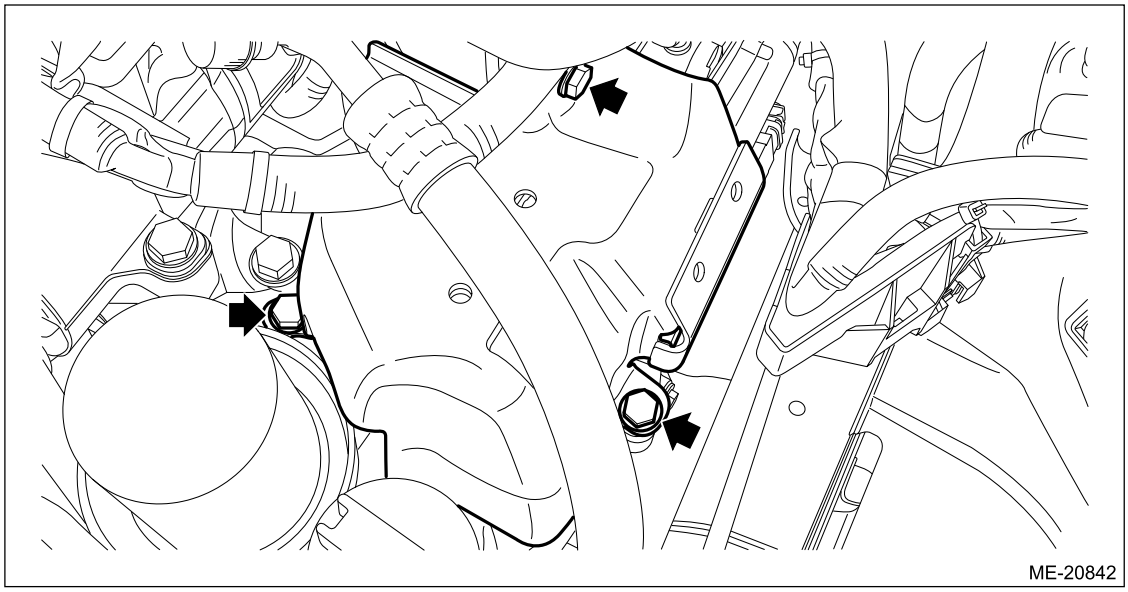
(4) Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
(5) Remove the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
(6) Disengage the claw (A) which holds the battery cable to the bracket, and disengage the claw (B) which holds the engine wiring harness.
(7) Remove the bracket from the vehicle.



(8) Disconnect connector (A) from ECM.
(9) Disconnect connector (B) and terminal (C) from the main fuse box.
(10) Remove the engine wiring harness from the clip (D), place it aside so that it does not interfere with work.

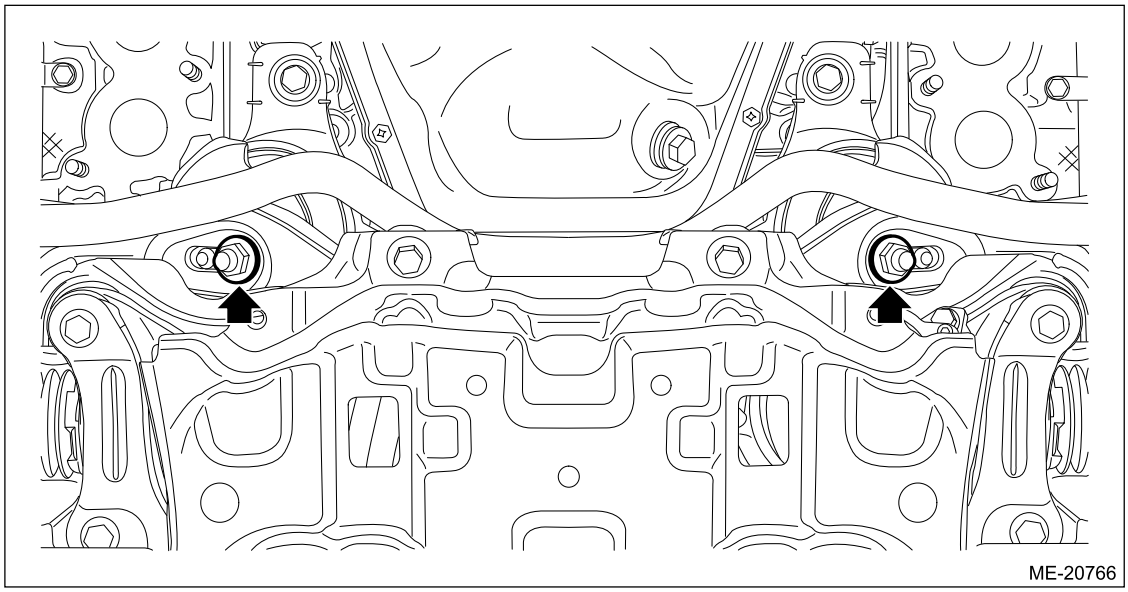


(11) Remove the fuel pipe protector from the high-pressure fuel pump case and intake manifold assembly.

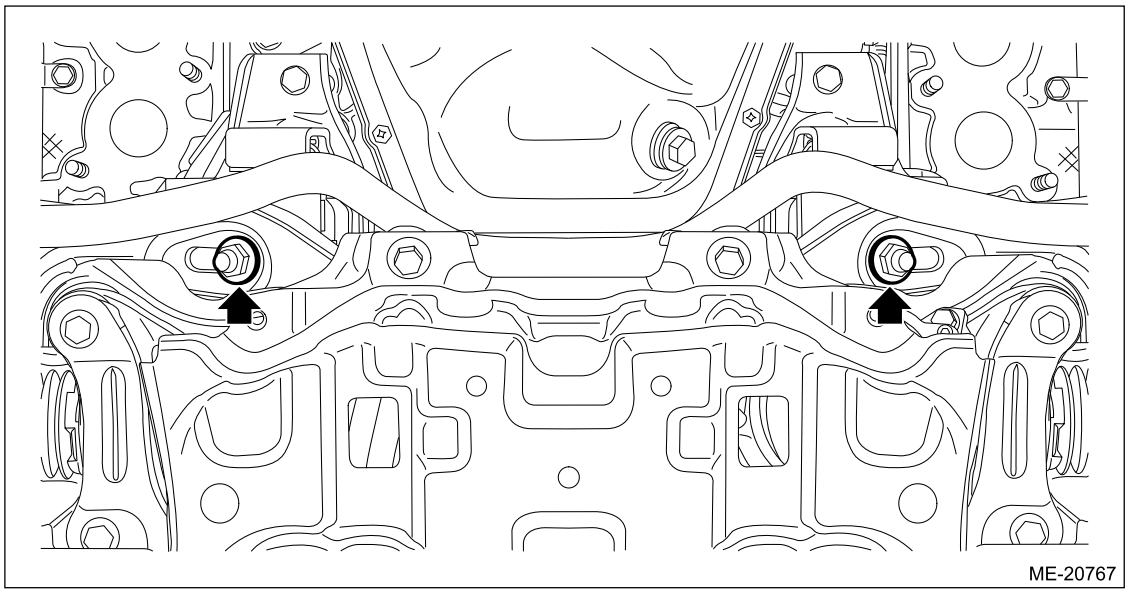


(12) Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

(13) Remove the nuts which secure the engine mounting to the crossmember. (CVT model)



(14) Remove the nuts which secure the engine mounting to the crossmember. (MT model)



(15) Lower the vehicle.

(16) Remove the pitching stopper. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.

(17) Remove the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>REMOVAL > PITCHING STOPPER.

(18) Using the ST1, install the ST2 to the engine unit.

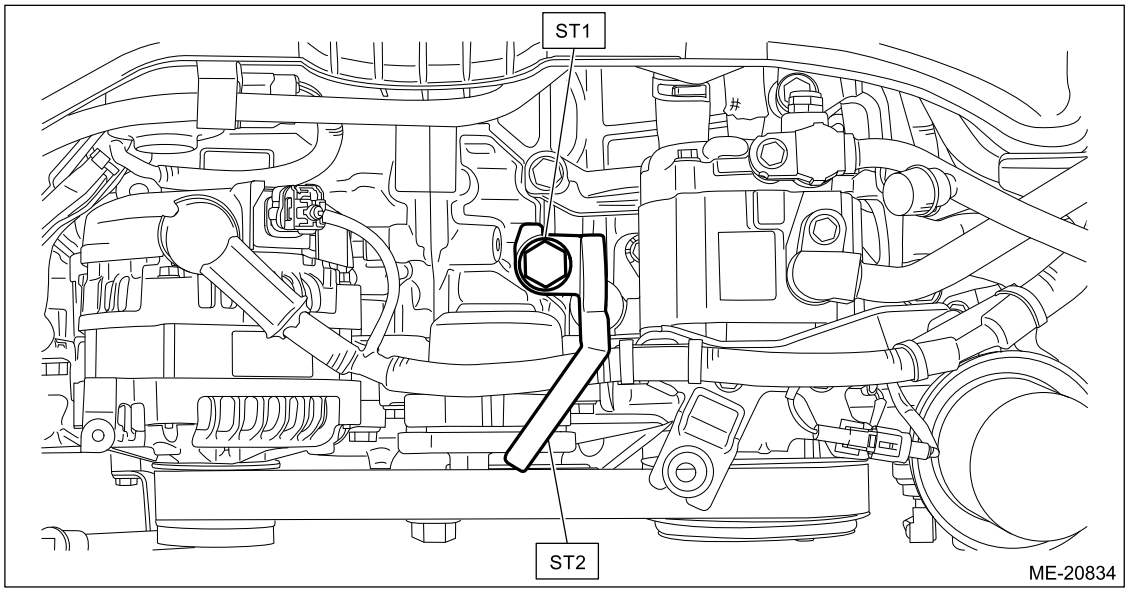
Preparation tool:

ST1: BOLT (18363AA050)

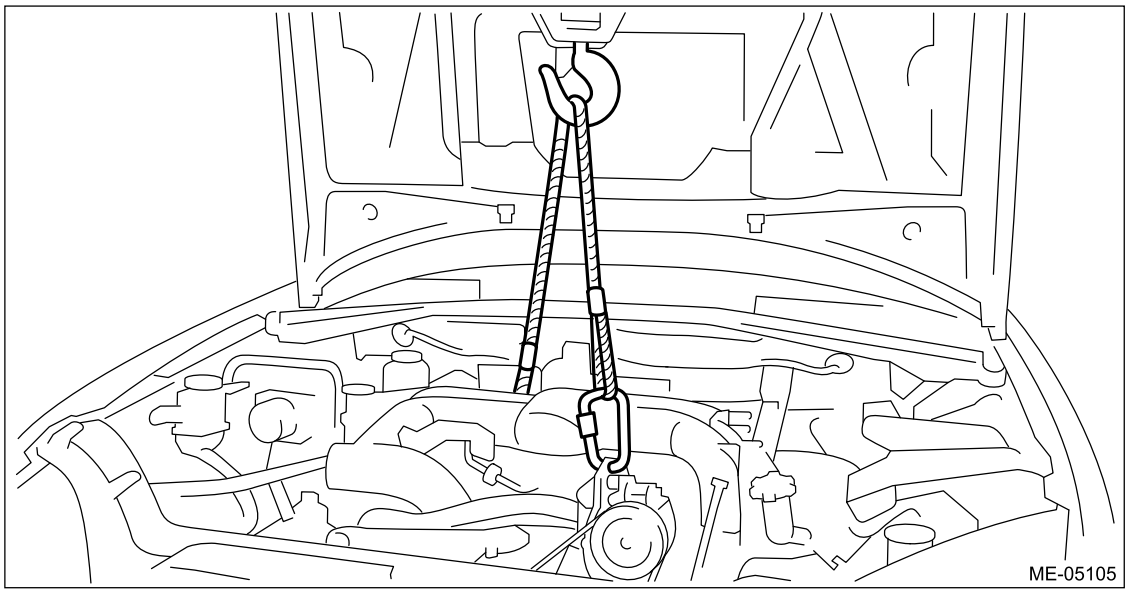
ST2: HANGER (18360AA040)

Tightening torque:

43 N·m (4.4 kgf-m, 31.7 ft-lb)



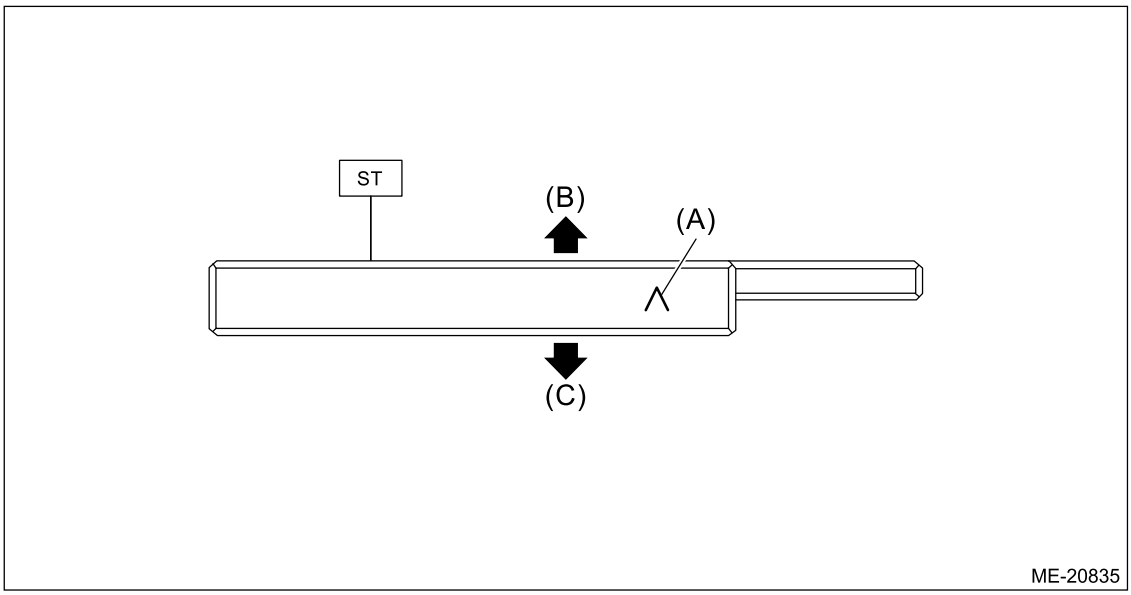
(19) Support the engine with a lifting device and wire ropes.



(20) While gradually lifting up the engine, set the ST between the engine mount LH and crossmember, and then slowly lower the engine.

Caution:

- **When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.**
- **To avoid damaging the ST, be sure to set the ST as shown in the figure.**

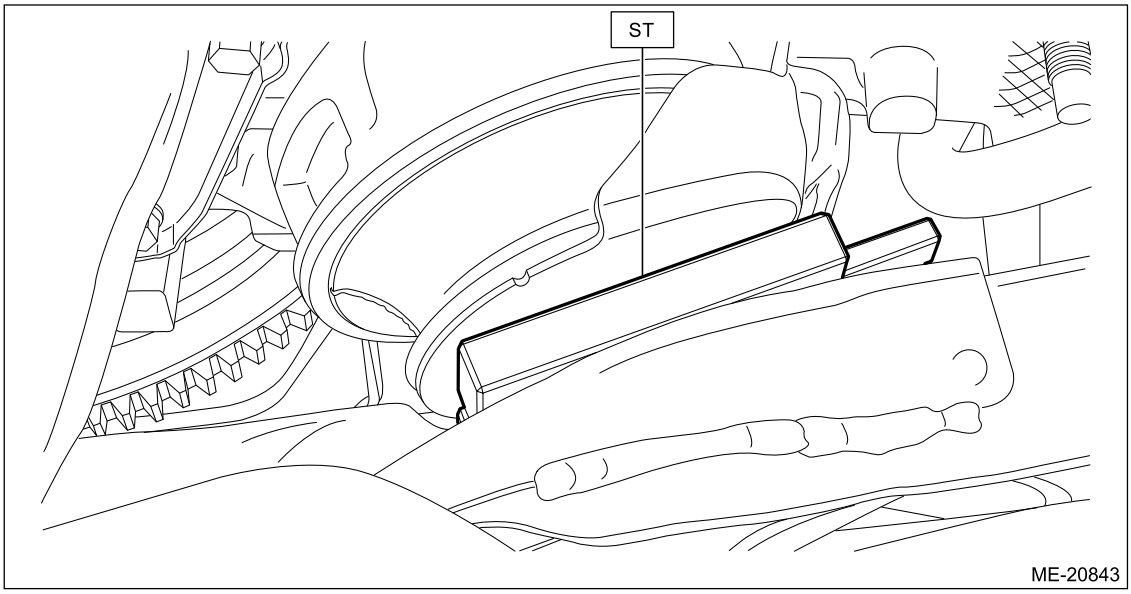


(A) Direction mark (B) Engine mounting side (C) Crossmember side

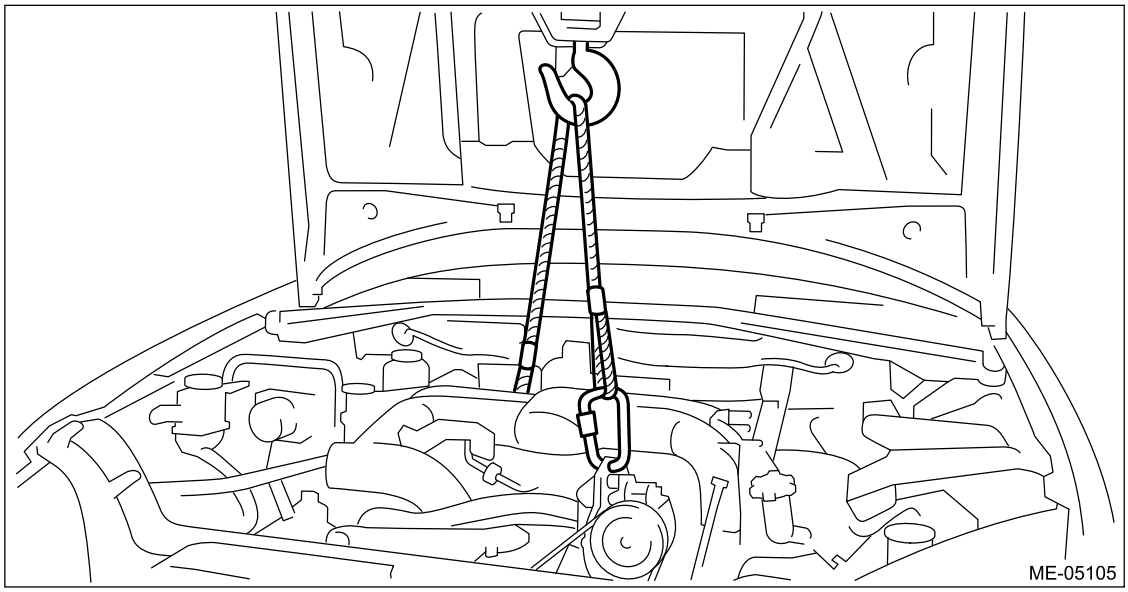
- **After lowering the engine, rock the engine to check that the ST does not come off.**

Preparation tool:

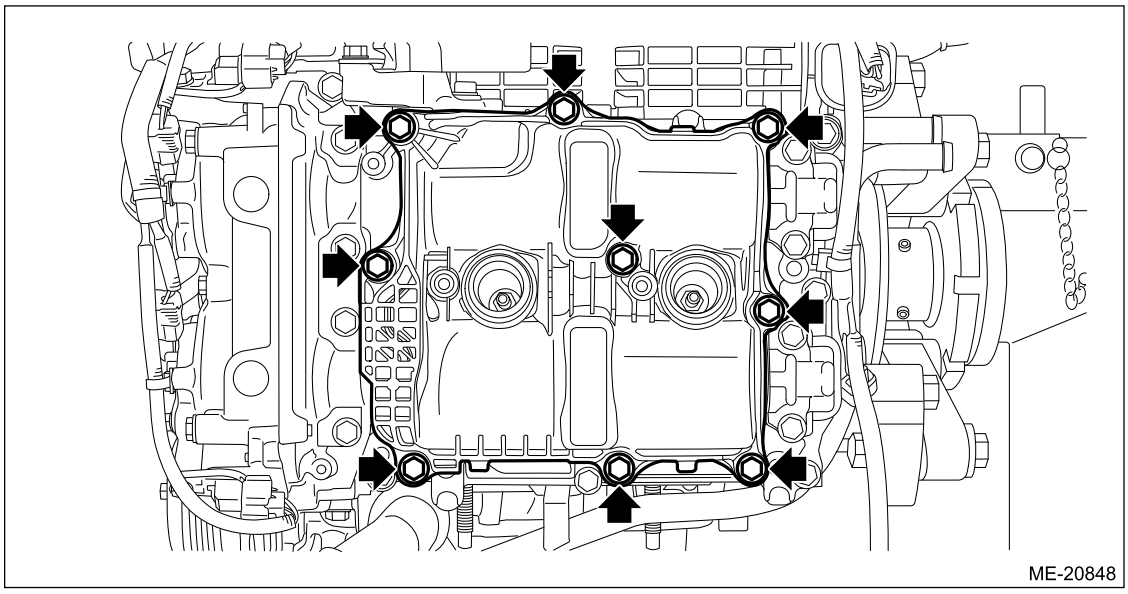
ST: STAND ASSY (18632AA030)



(21) Remove the lifting device and wire ropes.



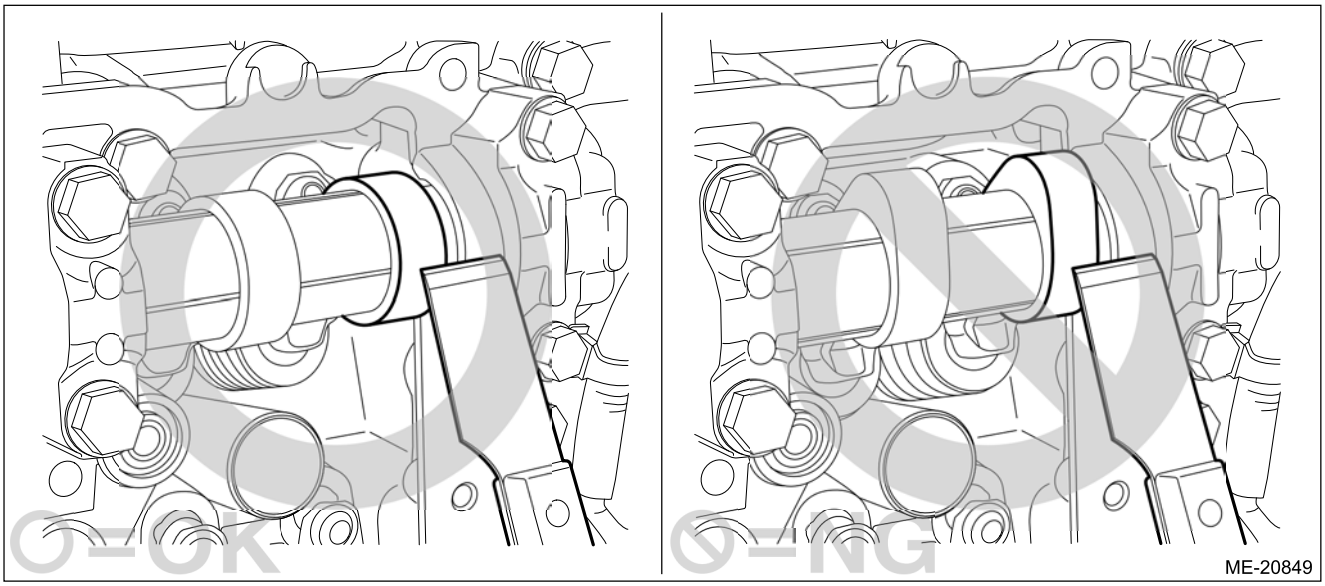
2. Remove the #2 ignition coil and the #4 ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil>REMOVAL.
3. Remove the rocker cover LH.

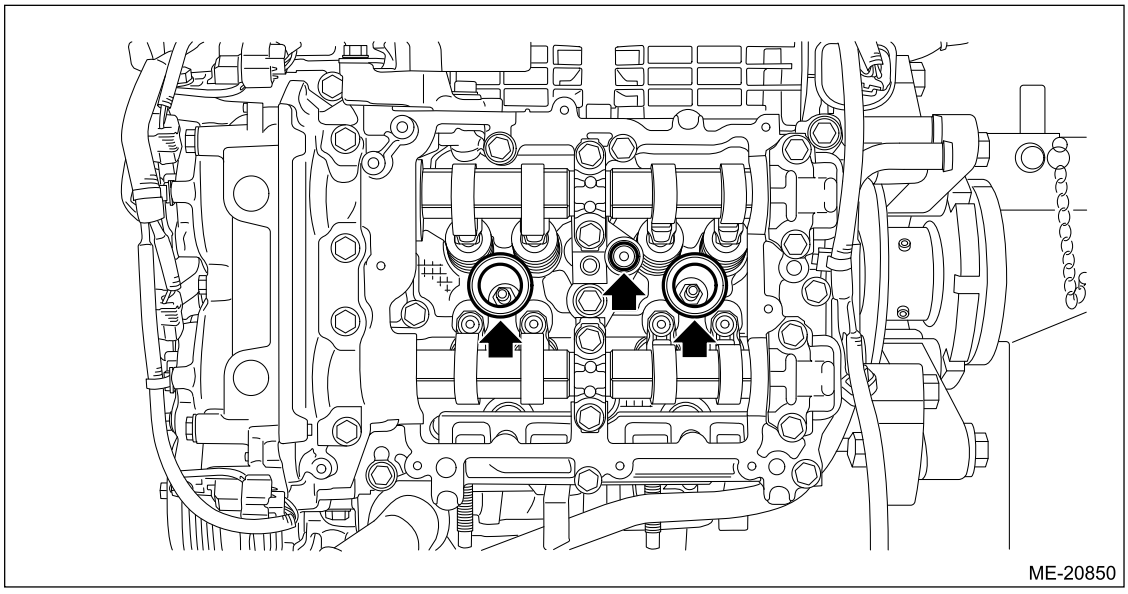


4. Remove the rocker cover gasket (ring type) and the spark plug pipe gasket, and remove the liquid gasket.

Caution:

- **When removing the liquid gasket from engine unit using scraper, use special care not to damage the cam lobe of camshaft LH.**
- **If the cam lobe of camshaft LH interferes, turn the crankshaft to the position where the scraper does not touch.**





5. Remove the rocker cover gasket LH from the rocker cover LH, and remove the liquid gasket.

MECHANICAL(H4DO) > Rocker Cover

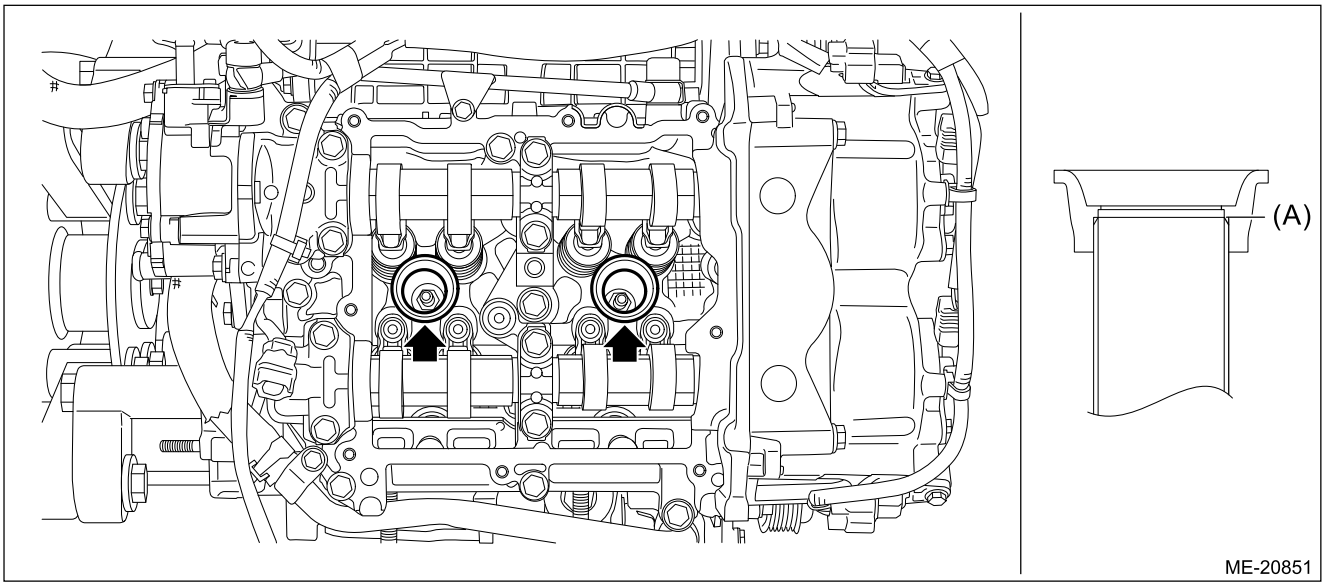
INSTALLATION

1. ROCKER COVER RH

1. Install new spark plug pipe gaskets to #1 spark plug pipe and #3 spark plug pipe.

Note:

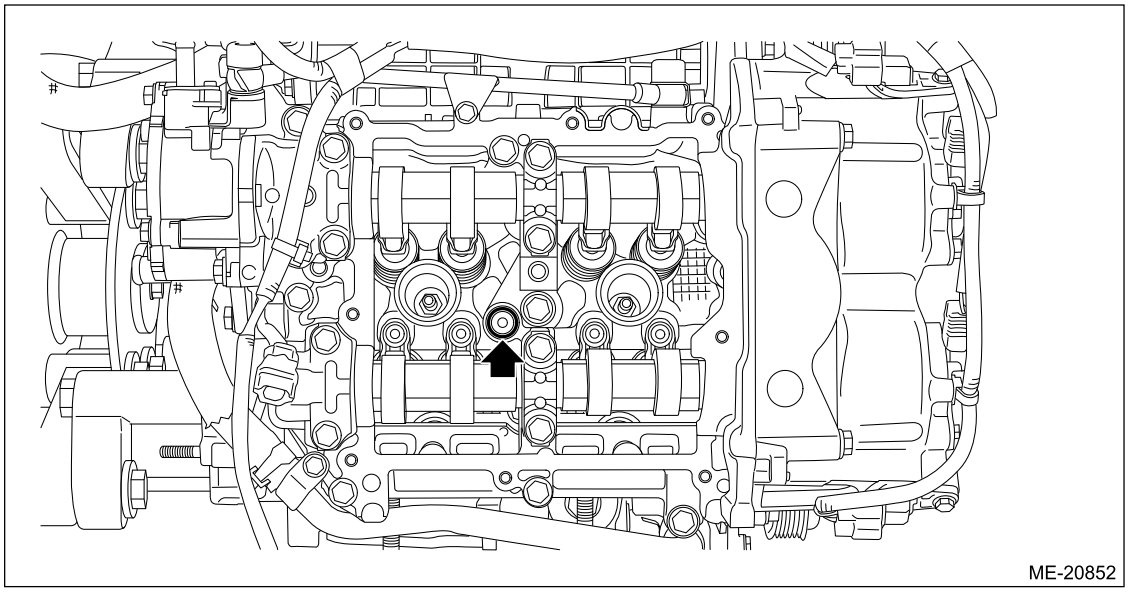
Apply a light coat of engine oil to the spark plug pipe gaskets, and insert them onto the spark plug pipe edge (A).



2. Install new rocker cover gasket (ring type) to the cam carrier RH.

Note:

If this work is performed on the vehicle, apply a light coat of Vaseline to the rocker cover gasket (ring type) to prevent it from falling off.



3. Install new rocker cover gasket RH to the rocker cover RH.

4. Apply liquid gasket to the mating surface of rocker cover RH as shown in the figure.

Note:

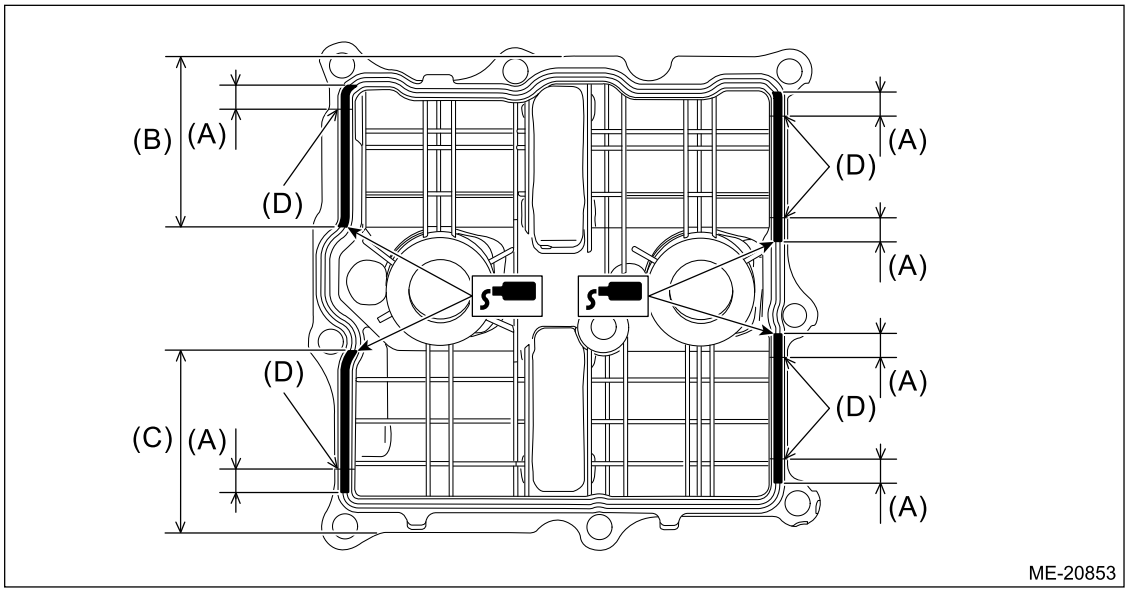
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine.**
- **Be careful not to allow liquid gasket to be squeezed out from rocker cover RH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

3±1 mm (0.1181±0.0394 in)



(A) 10 mm (0.3937 in) or more (C) 72.9 mm (2.8701 in) or more (D) Arch starting point
(B) 74 mm (2.9134 in) or more

5. Install the rocker cover RH to the cam carrier RH.

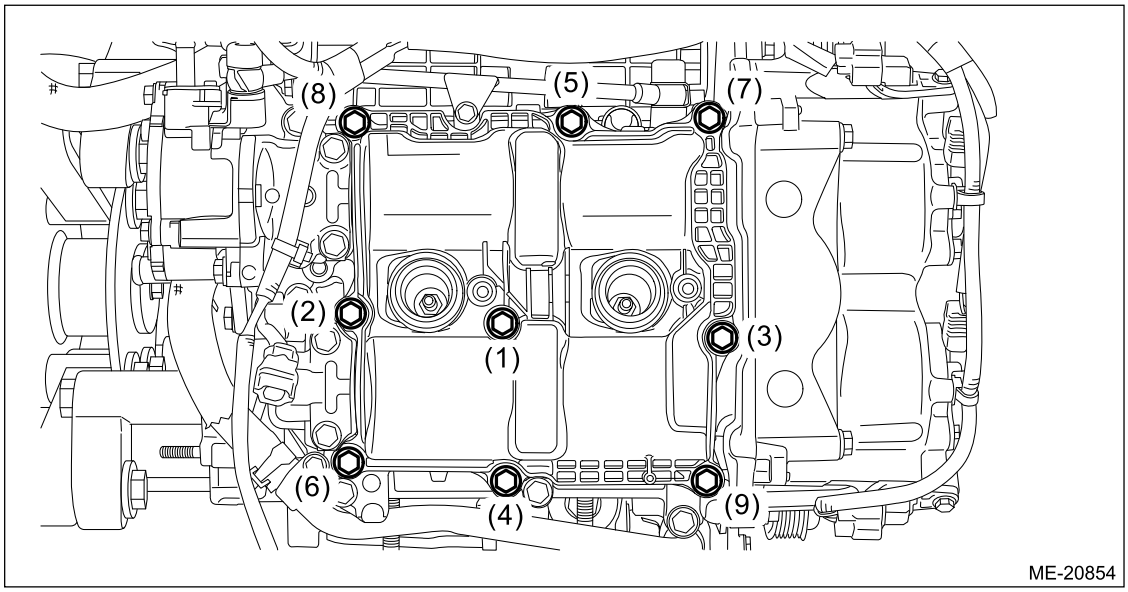
(1) Set the rocker cover RH on the cam carrier RH, and fasten all bolts until their two full threads engage.

(2) Tighten all bolts with a torque of 6.4 N·m (0.7 kgf-m, 4.7 ft-lb) in numerical order as shown in the figure.

(3) Once again, tighten all bolts with a torque of 6.4 N·m (0.7 kgf-m, 4.7 ft-lb) in numerical order as shown in the figure.

Note:

This procedure is necessary to stabilize torque.



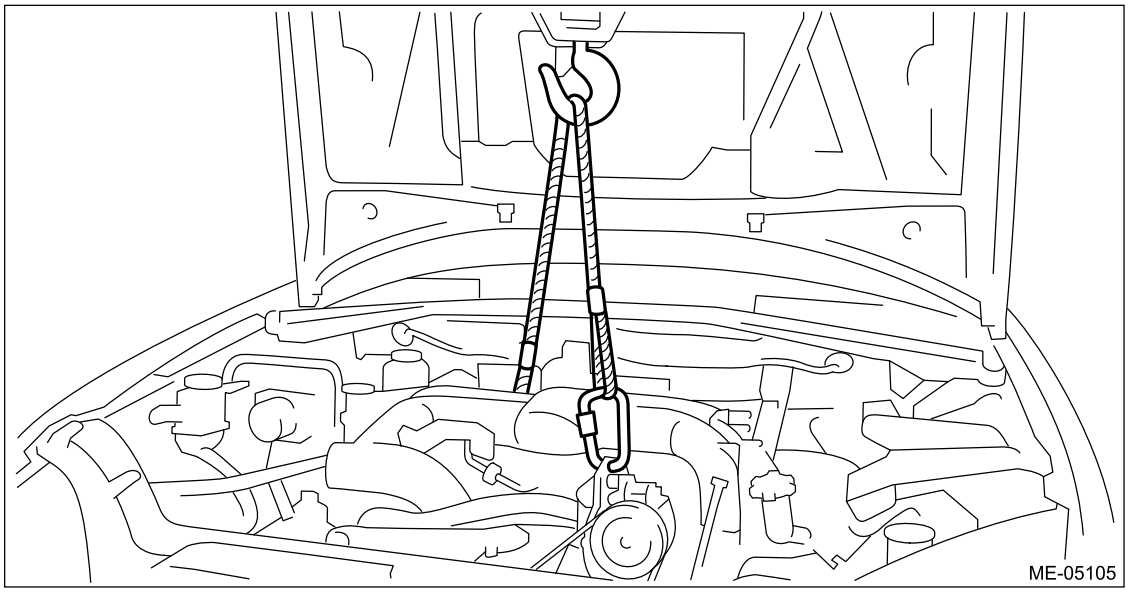
6. Install the #1 ignition coil and the #3 ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil>INSTALLATION.

7. When working on the vehicle

Note:

When working on the vehicle, perform the following steps also.

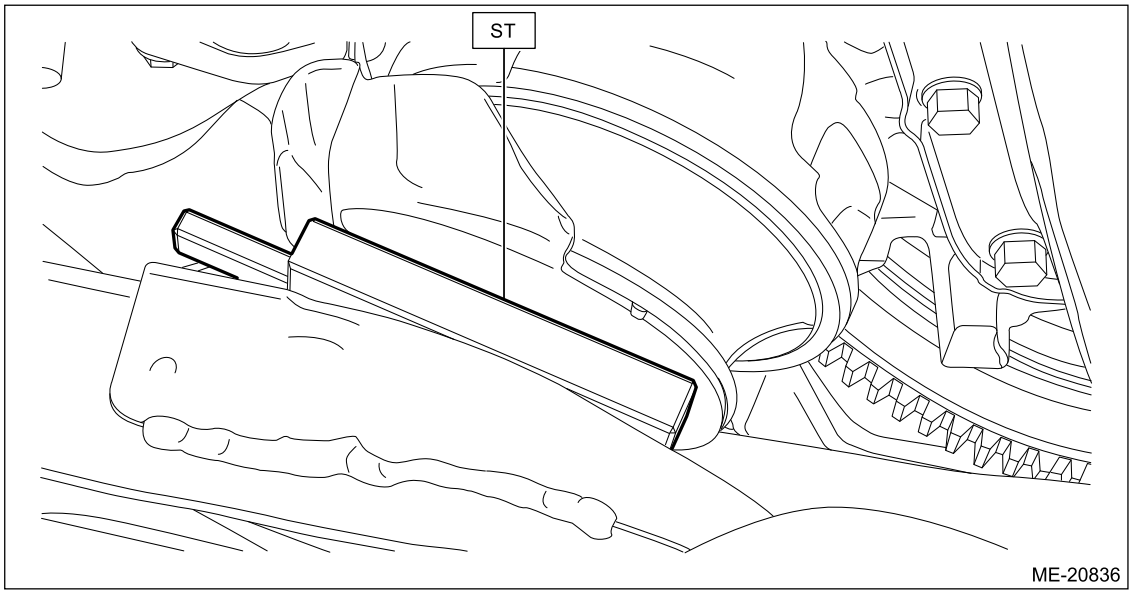
(1) Support the engine with a lifting device and wire ropes.



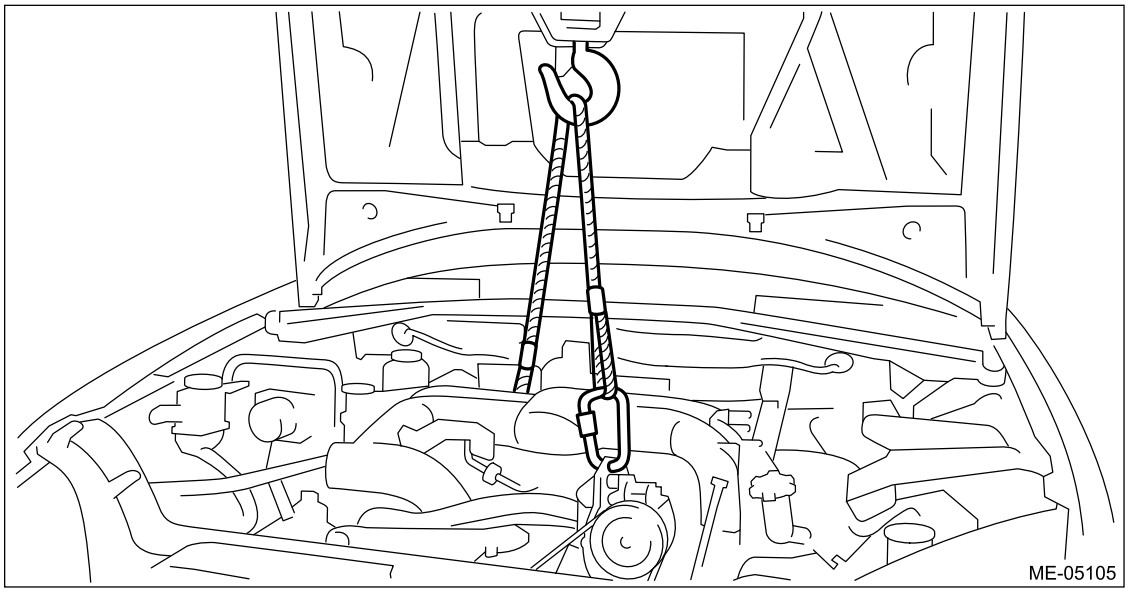
(2) Lift the engine a little, and remove the ST.

Caution:

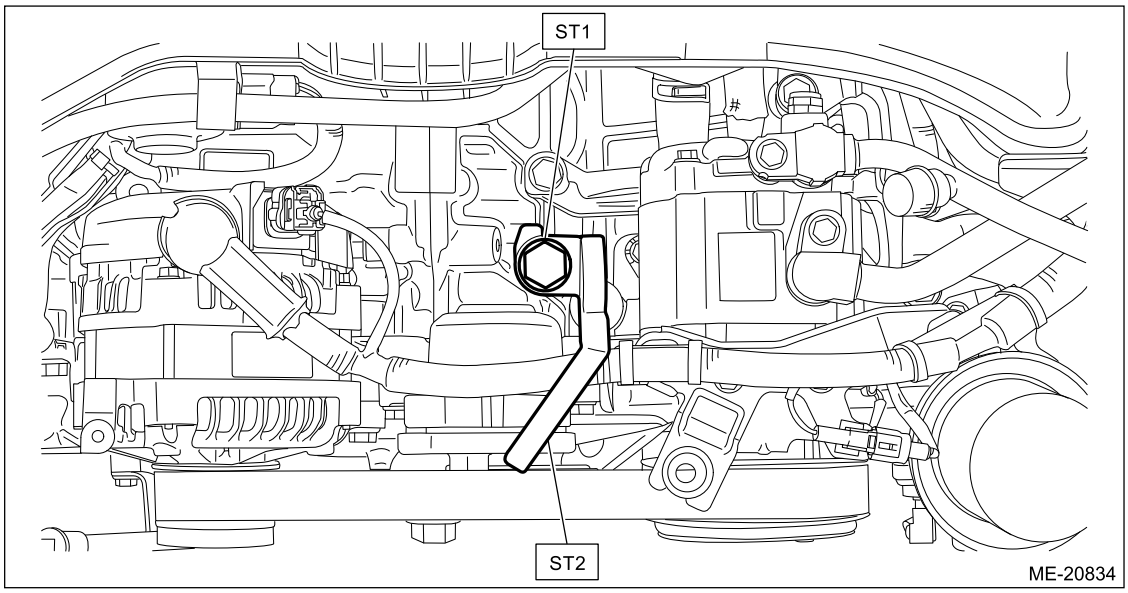
When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.



(3) Lower the engine and remove the lifting device and wire ropes.



(4) Remove the ST1 and ST2 from the engine unit.



(5) Install the pitching stopper. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.

(6) Install the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.

(7) Lift up the vehicle.

(8) Install the nuts which hold the engine mounting to the crossmember. (CVT model)

Caution:

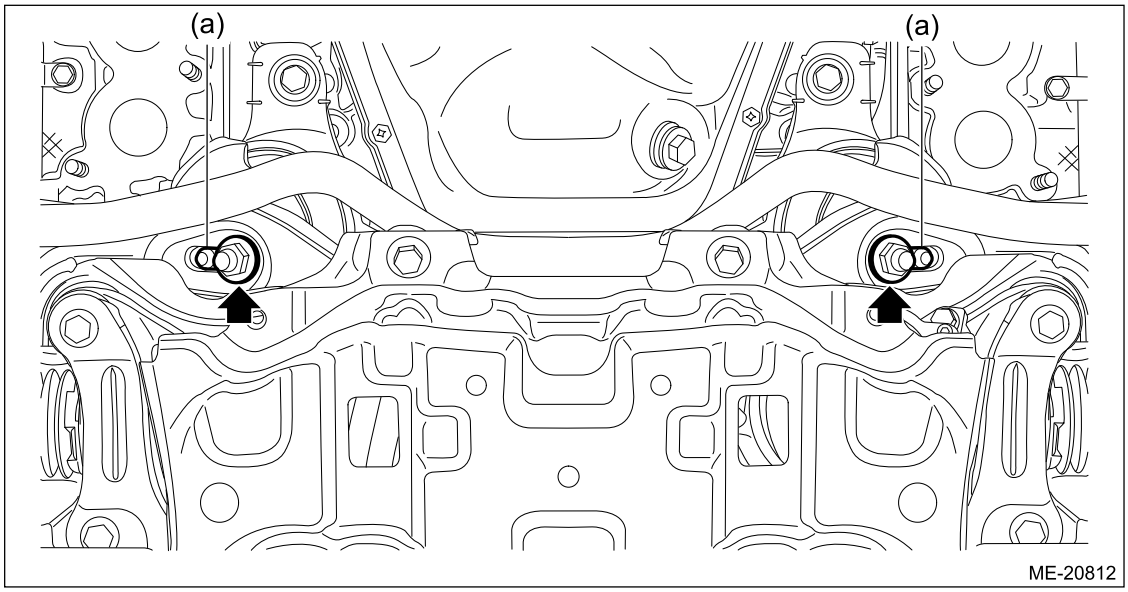
Use new nuts.

Note:

Make sure that locators (a) of the engine mounting are securely inserted.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



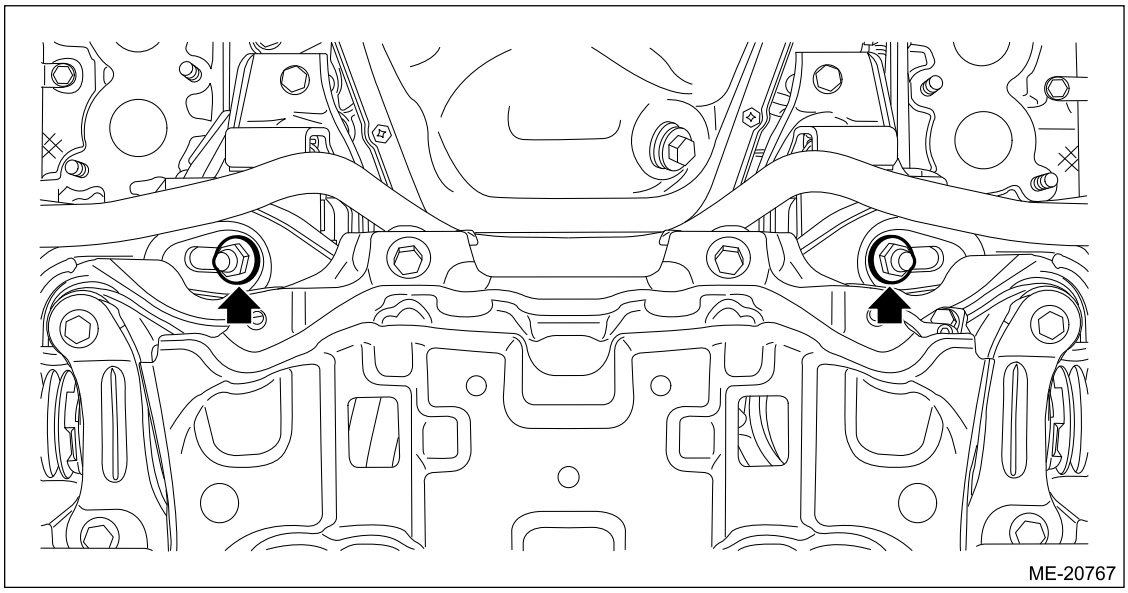
(9) Install the nuts which hold the engine mounting to the crossmember. (MT model)

Caution:

Use new nuts.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



(10) Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

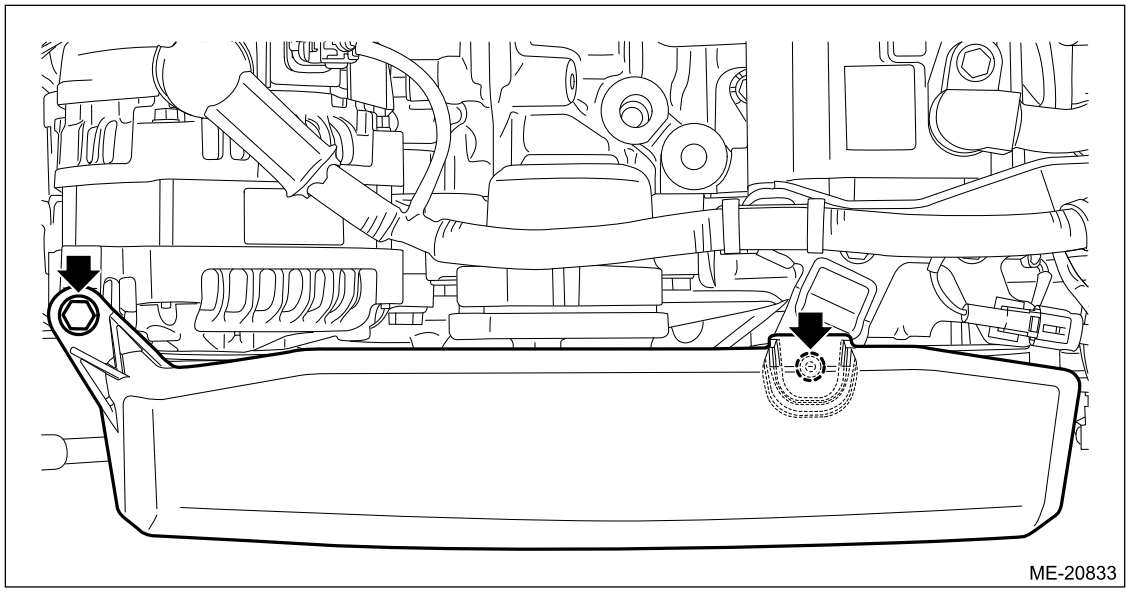
(11) Lower the vehicle.

(12) Install the air cleaner case. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Case>INSTALLATION.

(13) Install the V-belt cover.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



(14) Set the front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.

(15) Install the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>ASSEMBLY.

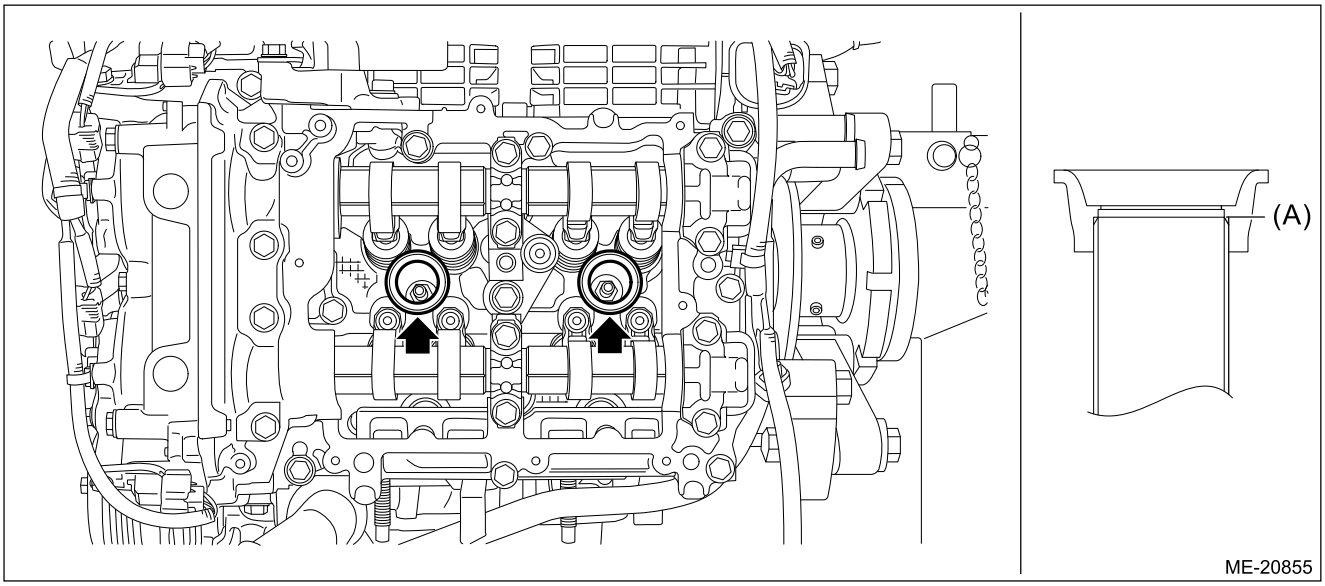
(16) Close the front hood.

2. ROCKER COVER LH

1. Install new spark plug pipe gaskets to #2 spark plug pipe and #4 spark plug pipe.

Note:

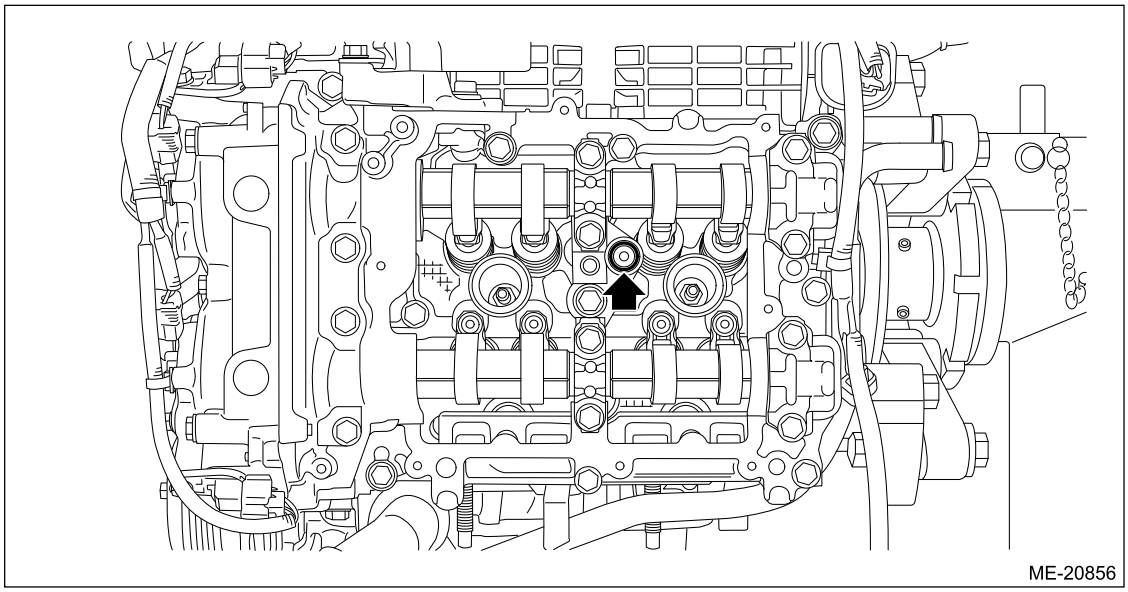
Apply a light coat of engine oil to the spark plug pipe gaskets, and insert them onto the spark plug pipe edge (A).



2. Install new rocker cover gasket (ring type) to the cam carrier LH.

Note:

If this work is performed on the vehicle, apply a light coat of Vaseline to the rocker cover gasket (ring type) to prevent it from falling off.



3. Install new rocker cover gasket LH to the rocker cover LH.

4. Apply liquid gasket to the mating surface of rocker cover LH as shown in the figure.

Note:

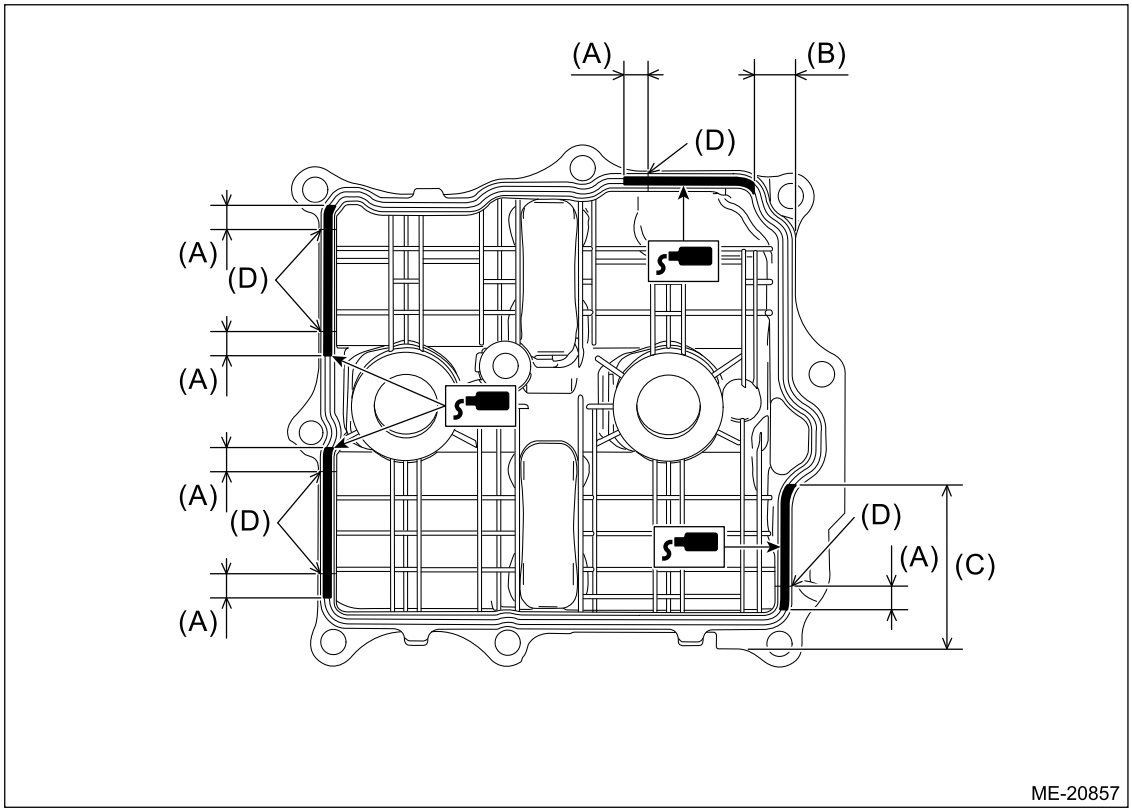
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the engine.**
- **Be careful not to allow liquid gasket to be squeezed out from rocker cover LH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

3±1 mm (0.1181±0.0394 in)



(A) 10 mm (0.3937 in) or more (C) 70.7 mm (2.7835 in) or more (D) Arch starting point

(B) 17.3 mm (0.6811 in) or more

5. Install the rocker cover LH to the cam carrier LH.

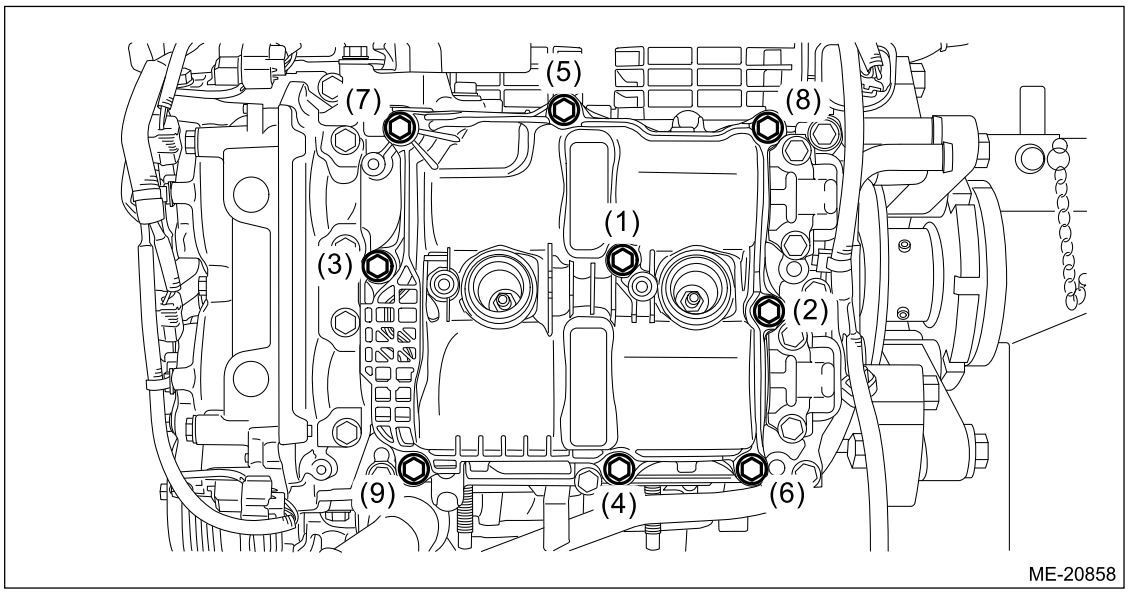
(1) Set the rocker cover LH on the cam carrier LH, and fasten all bolts until their two full threads engage.

(2) Tighten all bolts with a torque of 6.4 N·m (0.7 kgf-m, 4.7 ft-lb) in numerical order as shown in the figure.

(3) Once again, tighten all bolts with a torque of 6.4 N·m (0.7 kgf-m, 4.7 ft-lb) in numerical order as shown in the figure.

Note:

This procedure is necessary to stabilize torque.



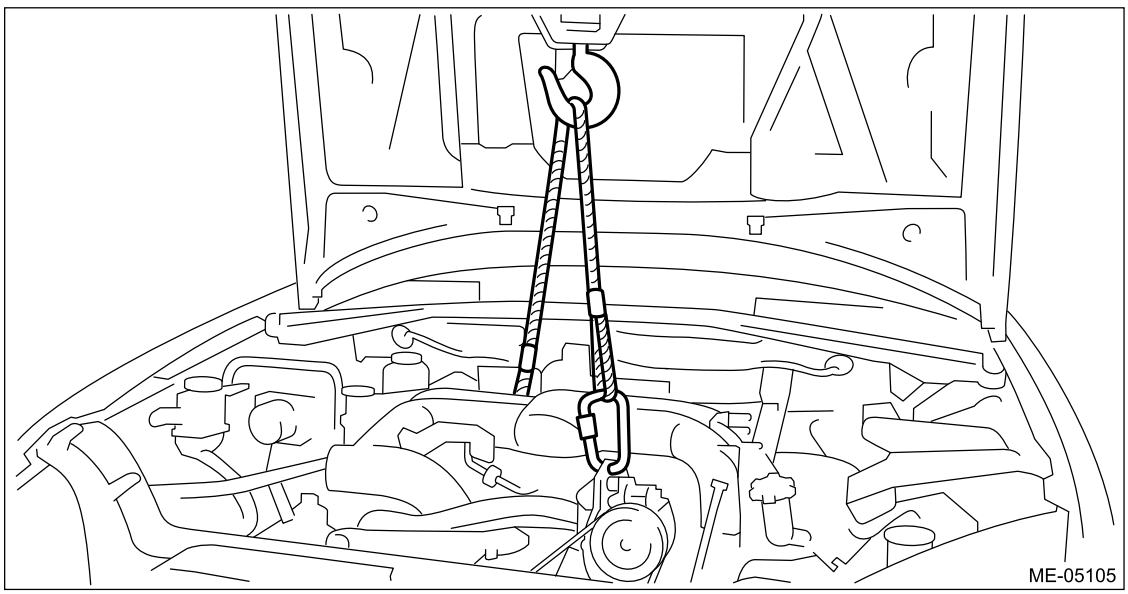
6. Install the #2 ignition coil and the #4 ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil>INSTALLATION.

7. When working on the vehicle

Note:

When working on the vehicle, perform the following steps also.

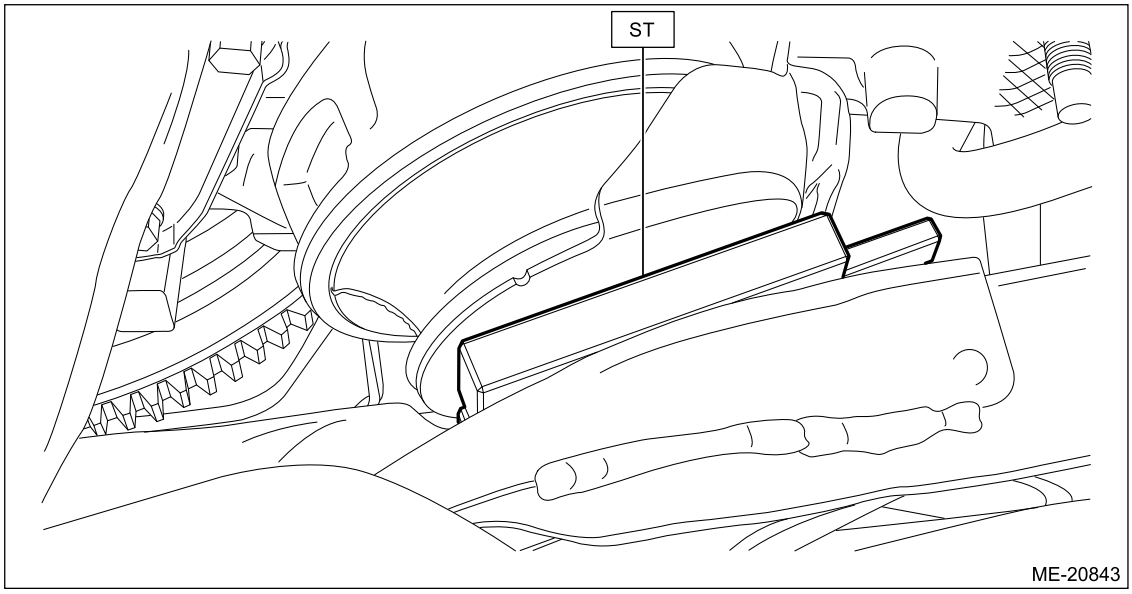
(1) Support the engine with a lifting device and wire ropes.



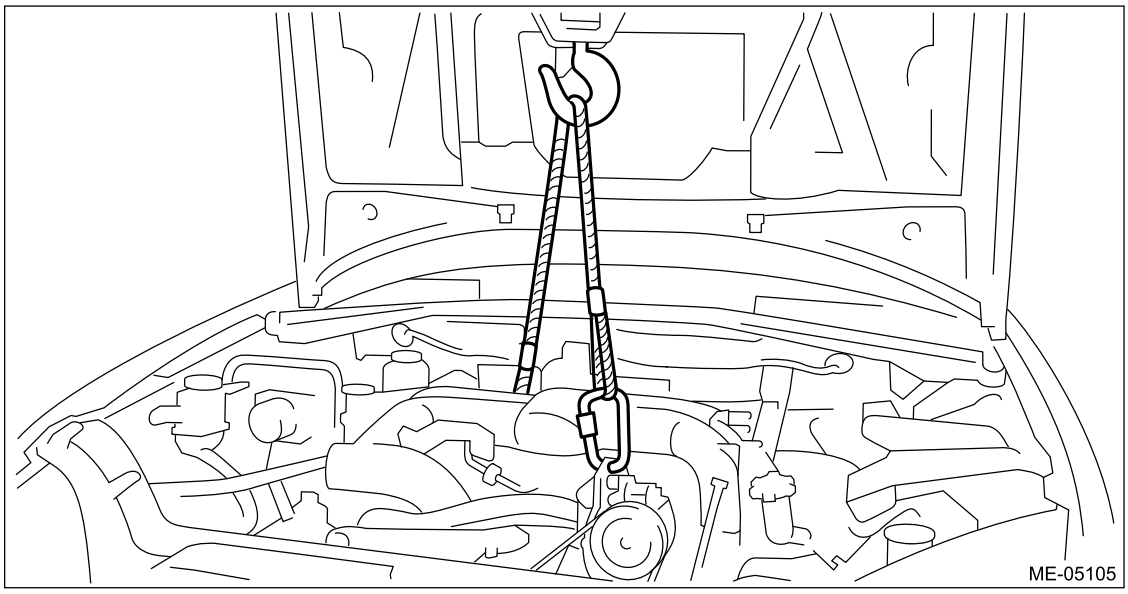
(2) Lift the engine a little, and remove the ST.

Caution:

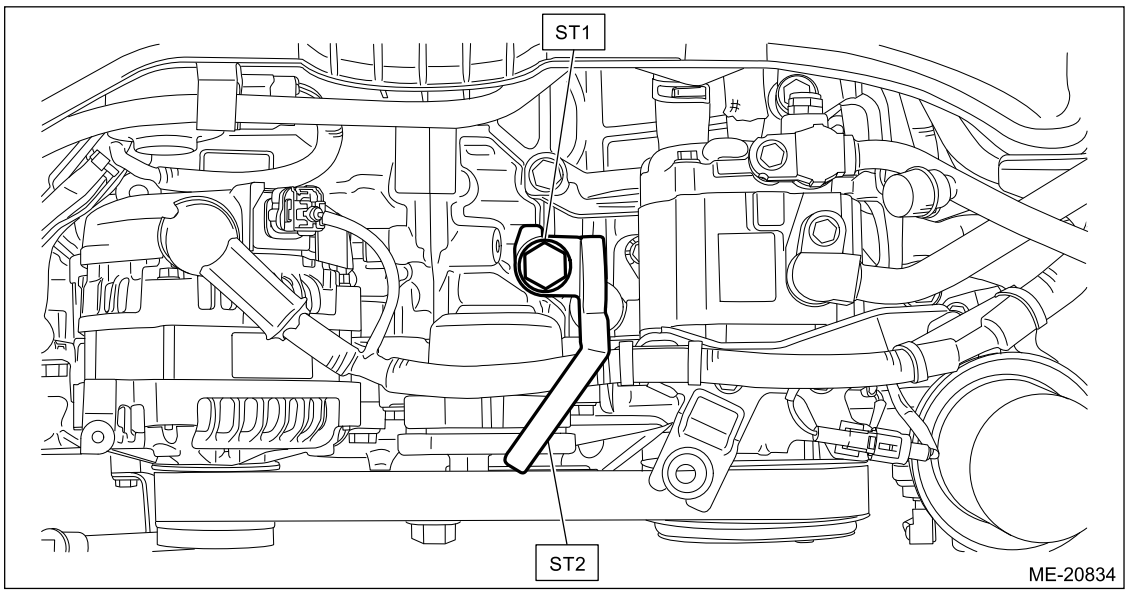
When lifting up the engine, pay attention to the clearance of each part and be careful not to lift the engine too much, in order to prevent damaging the vehicle.



(3) Lower the engine and remove the lifting device and wire ropes.



(4) Remove the ST1 and ST2 from the engine unit.



(5) Install the pitching stopper. (CVT model) Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.

(6) Install the pitching stopper. (MT model) Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Mounting System>INSTALLATION > PITCHING STOPPER.

(7) Lift up the vehicle.

(8) Install the nuts which hold the engine mounting to the crossmember. (CVT model)

Caution:

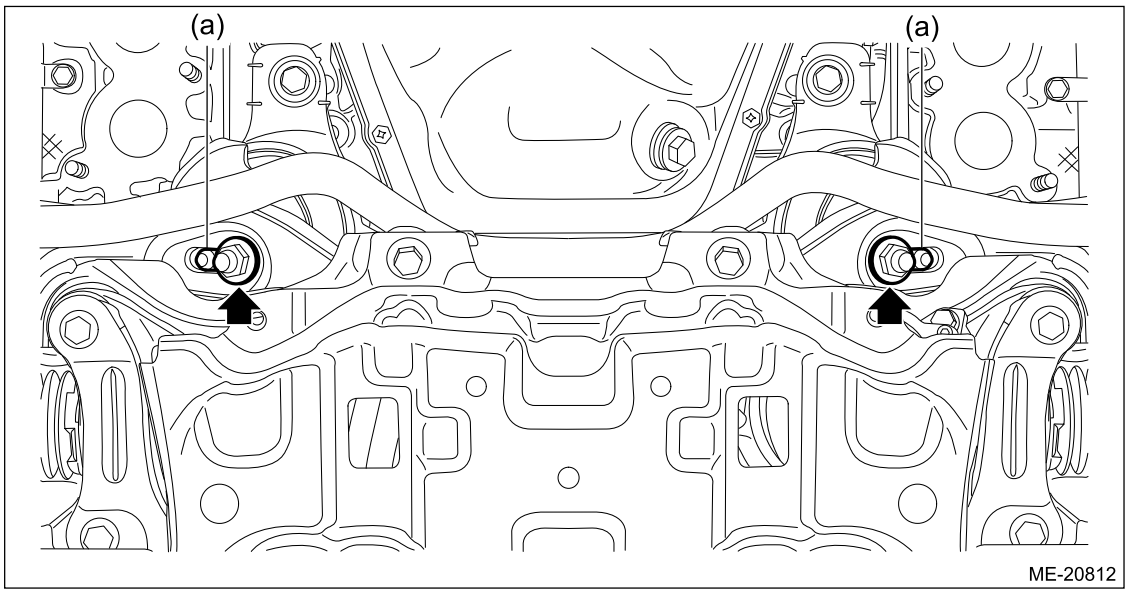
Use new nuts.

Note:

Make sure that locators (a) of the engine mounting are securely inserted.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



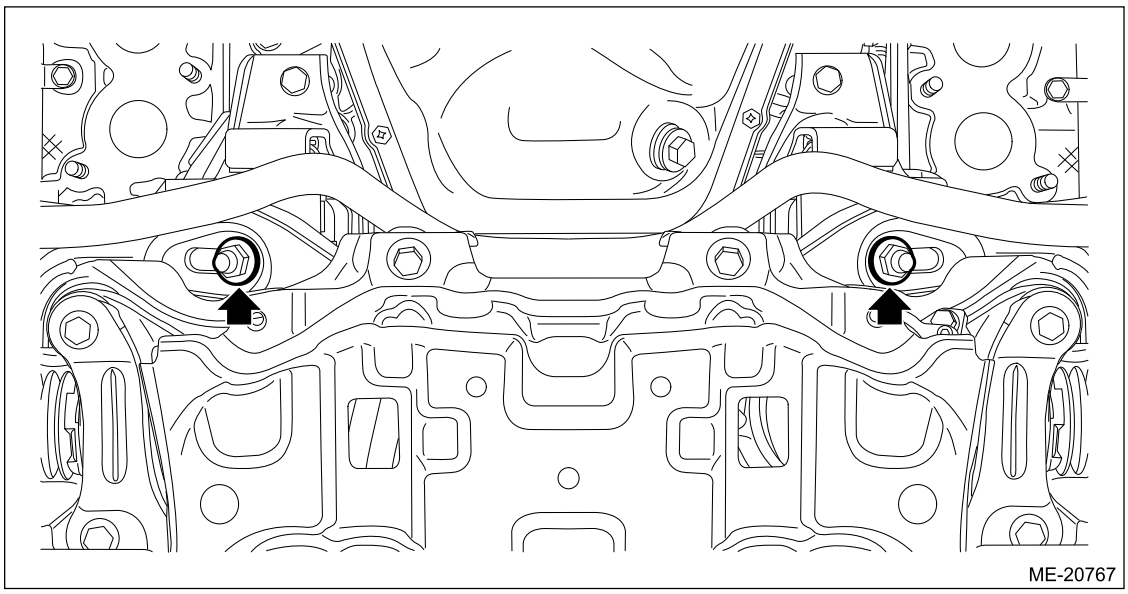
(9) Install the nuts which hold the engine mounting to the crossmember. (MT model)

Caution:

Use new nuts.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)



(10) Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

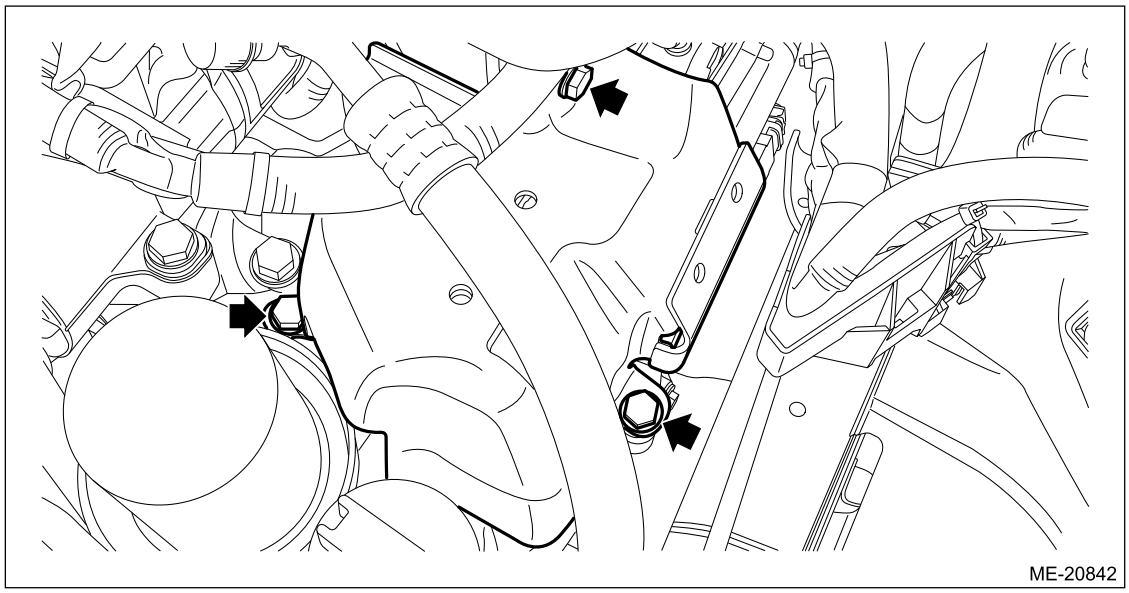
(11) Lower the vehicle.

(12) Install the fuel pipe protector to the high-pressure fuel pump case and intake manifold

assembly.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)



(13) Place the engine wiring harness and attach the engine wiring harness to the clip (D).

(14) Connect terminal (C) and connector (B) to the main fuse box.

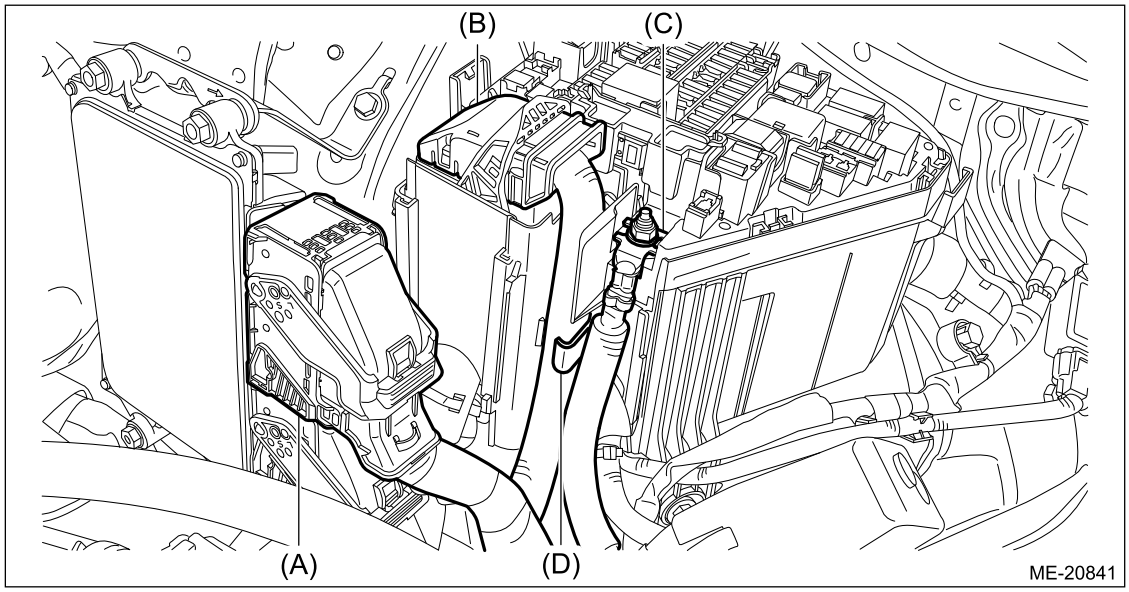
Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

(15) Connect connector (A) to ECM.

Caution:

To prevent damage to the connector (A), when connecting the connector (A), insert the connector (A) straight in until it stops, and while maintaining the position, lock the lever.

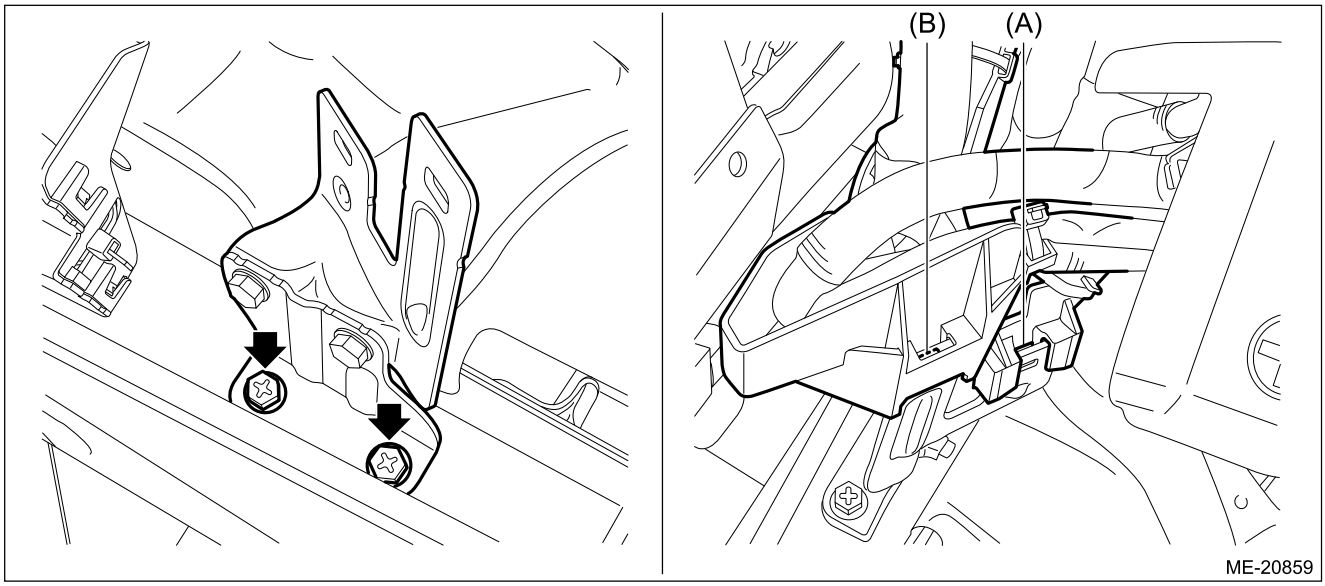


(16) Install the bracket to the vehicle.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

(17) Secure the engine wiring harness (A) to the bracket, and secure the battery cable (B) in place.



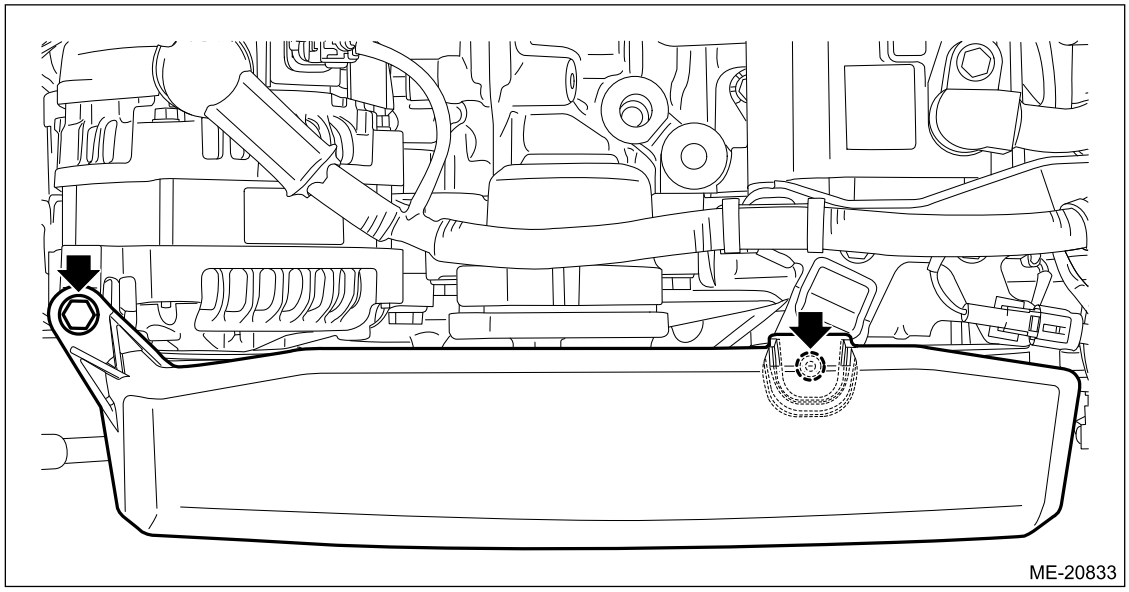
(18) Install the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.

(19) Install the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>INSTALLATION.

(20) Install the V-belt cover.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



(21) Set the front hood to the normal position. Ref. to REPAIR CONTENTS>NOTE > FRONT HOOD STAY.

(22) Install the striker - front hood. Ref. to EXTERIOR BODY PANELS>Front Hood>ASSEMBLY.

(23) Close the front hood.

MECHANICAL(H4DO) > Rocker Cover

INSPECTION

Check that the rocker cover does not have deformation, cracks and any other damage.

REMOVAL

1. CAMSHAFT RH

The camshaft RH and cam carrier are designed as removing as a unit. Refer to “Cam Carrier” for removal procedures of camshaft RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>DISASSEMBLY > CAM CARRIER RH.

2. CAMSHAFT LH

The camshaft LH and cam carrier are designed as removing as a unit. Refer to “Cam Carrier” for removal procedures of camshaft LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>DISASSEMBLY > CAM CARRIER LH.

INSTALLATION

1. CAMSHAFT RH

The camshaft RH and cam carrier are designed as installing as a unit. Refer to “Cam Carrier” for installation procedures of camshaft RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY > CAM CARRIER RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER RH.

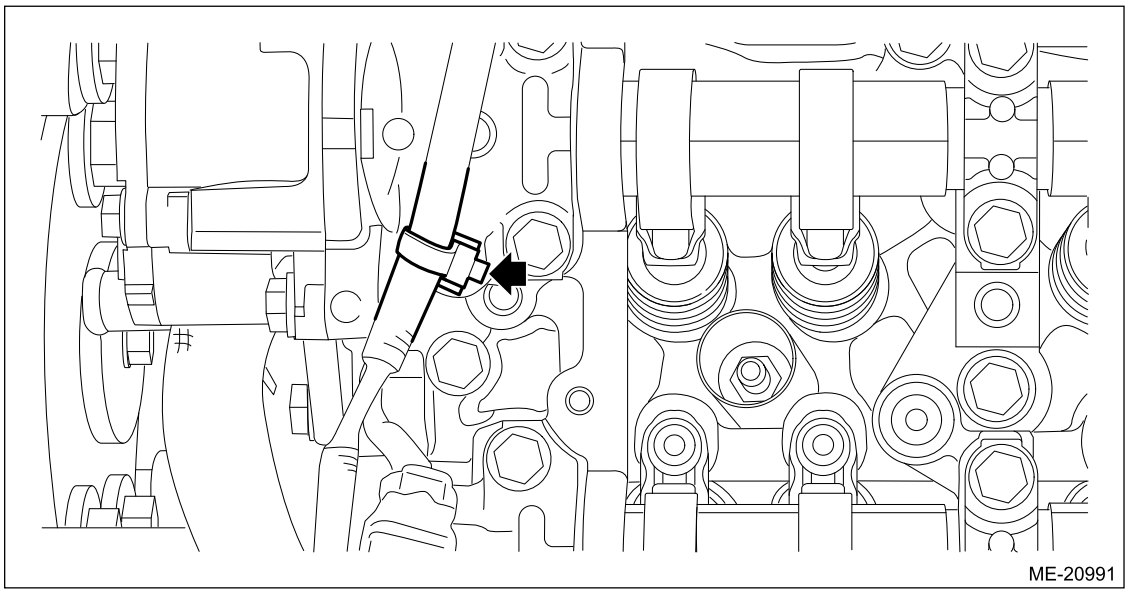
2. CAMSHAFT LH

The camshaft LH and cam carrier are designed as installing as a unit. Refer to “Cam Carrier” for installation procedures of camshaft LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY > CAM CARRIER LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER LH.

REMOVAL

1. CAM CARRIER RH

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
3. Remove the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN RH.
4. Remove the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER RH.
5. Remove the water pipe RH. Ref. to COOLING(H4DO)>Water Pipe>REMOVAL > WATER PIPE RH.
6. Remove the clip holding the engine harness from cam carrier RH.



7. When disassembling the cam carrier RH

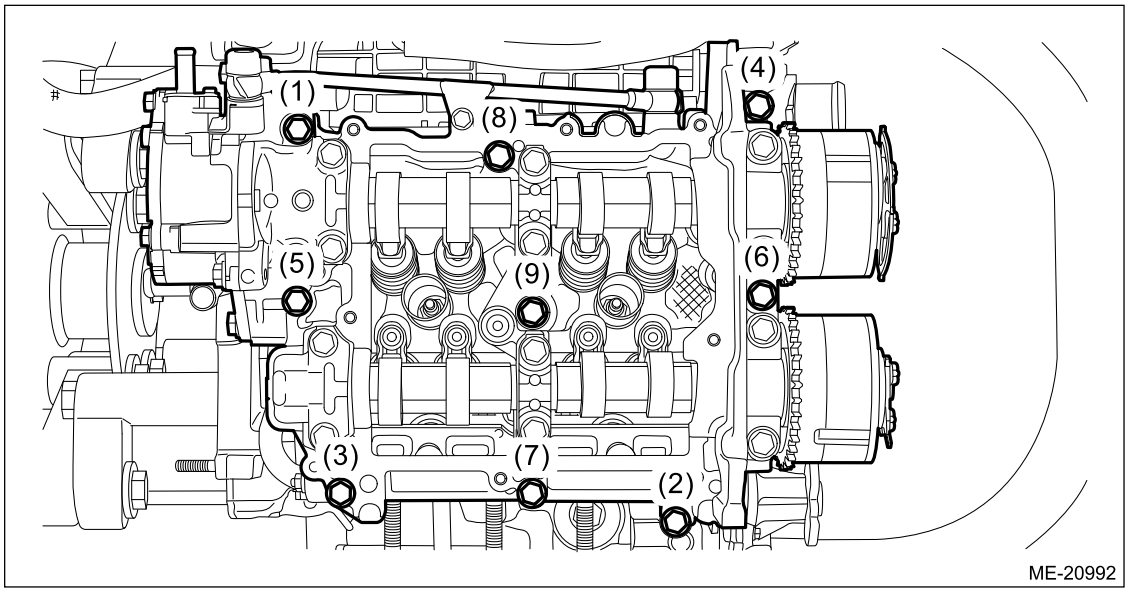
   Note:

   When disassembling the cam carrier RH, perform the following steps also.

   (1) Remove the oil pipe. Ref. to LUBRICATION(H4DO)>Oil Pipe>REMOVAL.

   (2) Remove the vacuum pump. Ref. to MECHANICAL(H4DO)>Vacuum Pump>REMOVAL.

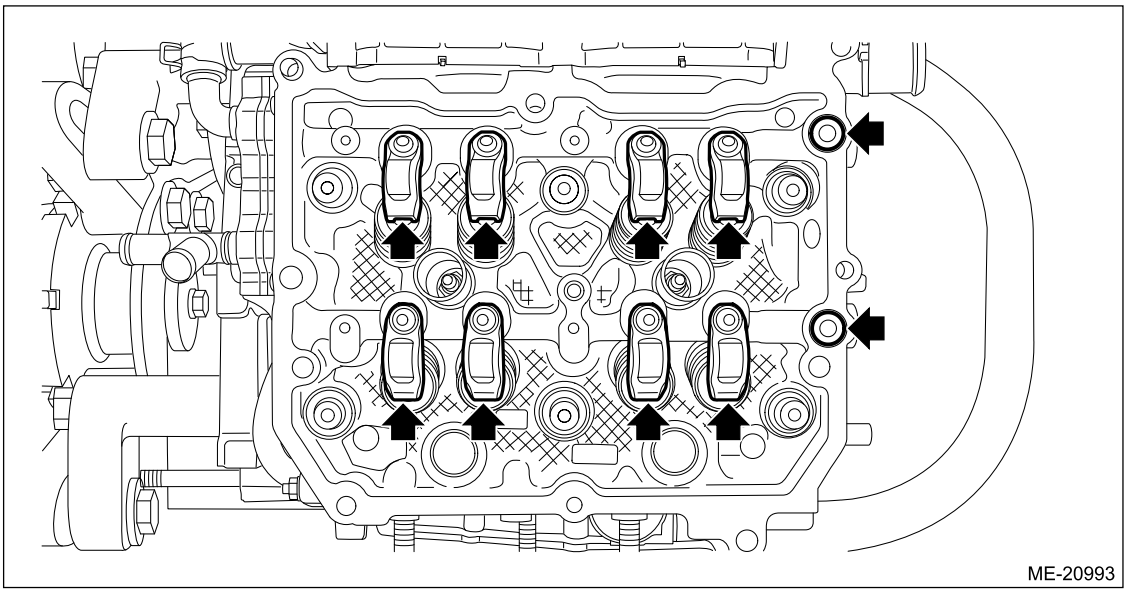
   (3) Remove the cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket>REMOVAL > CAM SPROCKET RH.
8. Set the part so that the cam carrier RH is on the upper side.
9. Loosen the bolts holding the cam carrier RH equally, a little at a time in numerical sequence as shown in the figure and remove the cam carrier RH.



10. Remove the O-ring and the roller rocker arm from cylinder head RH.

Note:

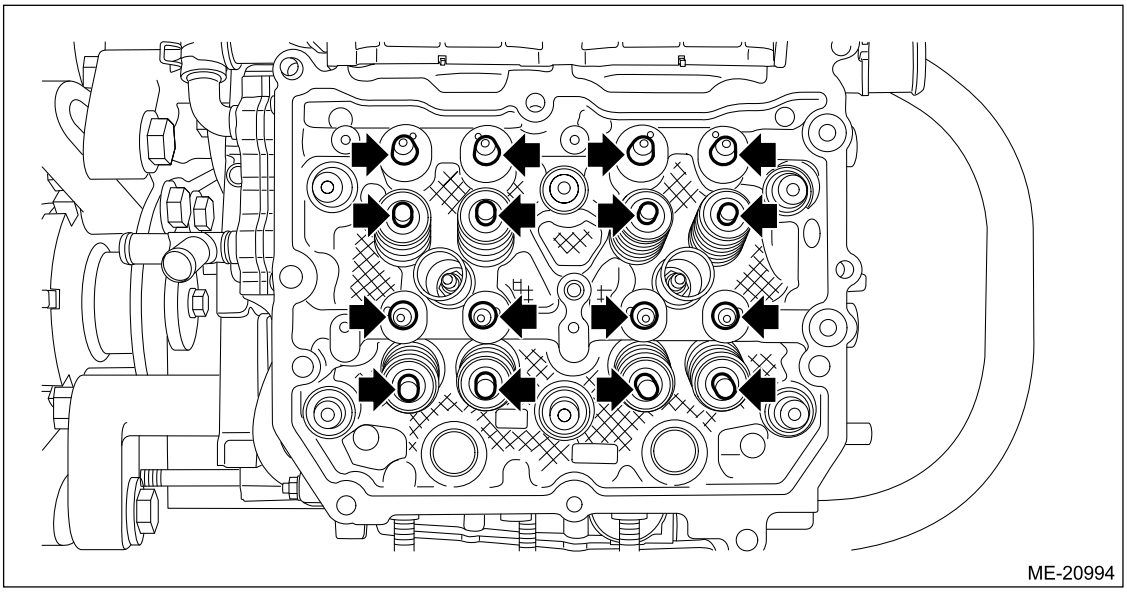
Be careful not to confuse the roller rocker arms.



11. Remove the valve shim and the roller rocker arm pivot from cylinder head RH.

Note:

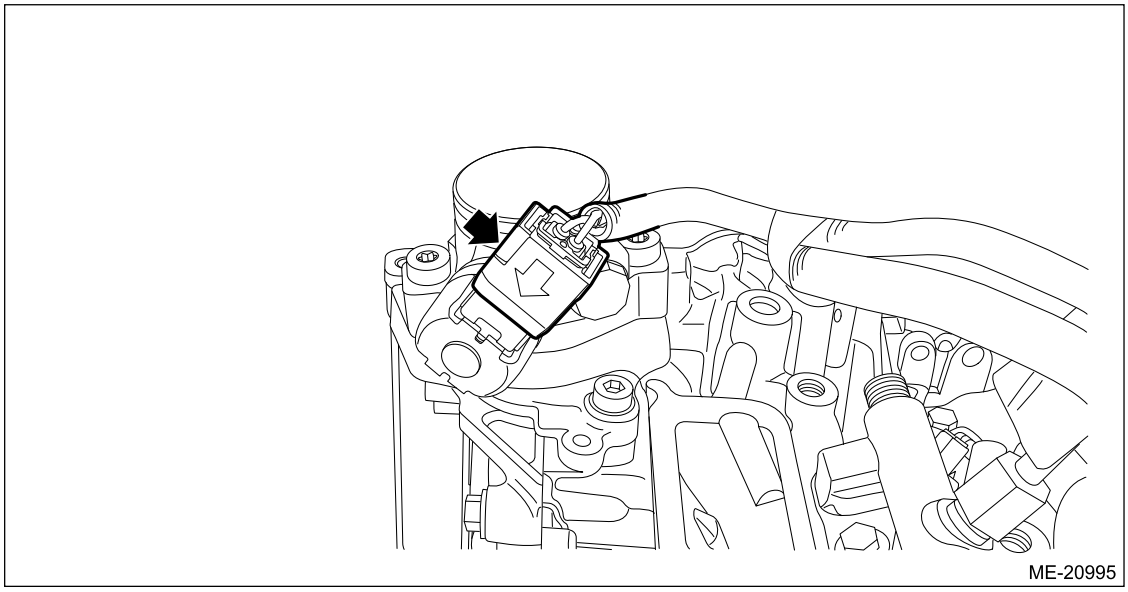
Be careful not to confuse the valve shim and the roller rocker arm pivot.



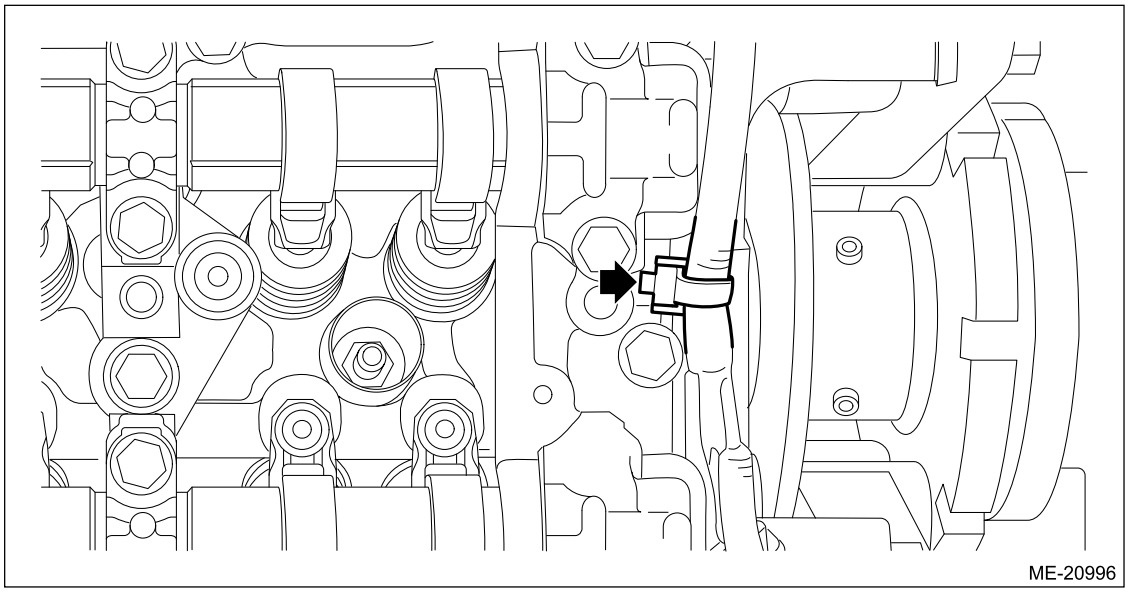
12. Remove the liquid gasket from cam carrier RH and cylinder head RH.

2. CAM CARRIER LH

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
3. Remove the timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL > TIMING CHAIN LH.
4. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
5. Remove the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER LH.
6. Remove the water pipe LH. Ref. to COOLING(H4DO)>Water Pipe>REMOVAL > WATER PIPE LH.
7. Remove the high-pressure fuel delivery pipes. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE.
8. Disconnect the connector from high-pressure fuel pump.



9. Remove the clip holding the engine harness from cam carrier LH.



10. When disassembling the cam carrier LH

Note:

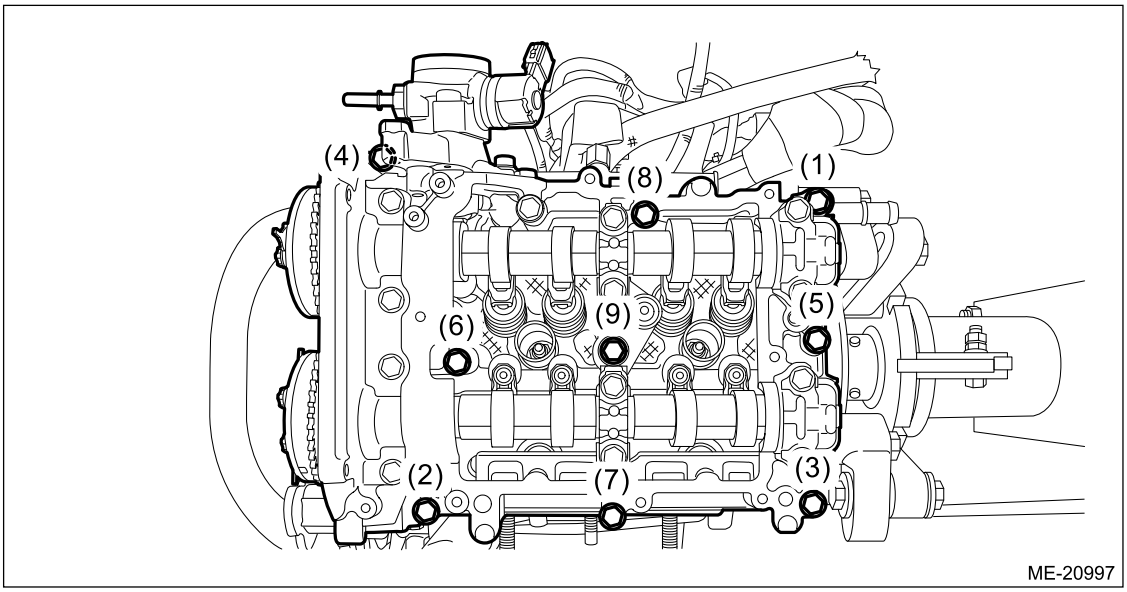
When disassembling the cam carrier LH, perform the following steps also.

(1) Remove the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>High Pressure Fuel Pump>REMOVAL.

(2) Remove the cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket>REMOVAL > CAM SPROCKET LH.

11. Set the part so that the cam carrier LH is on the upper side.

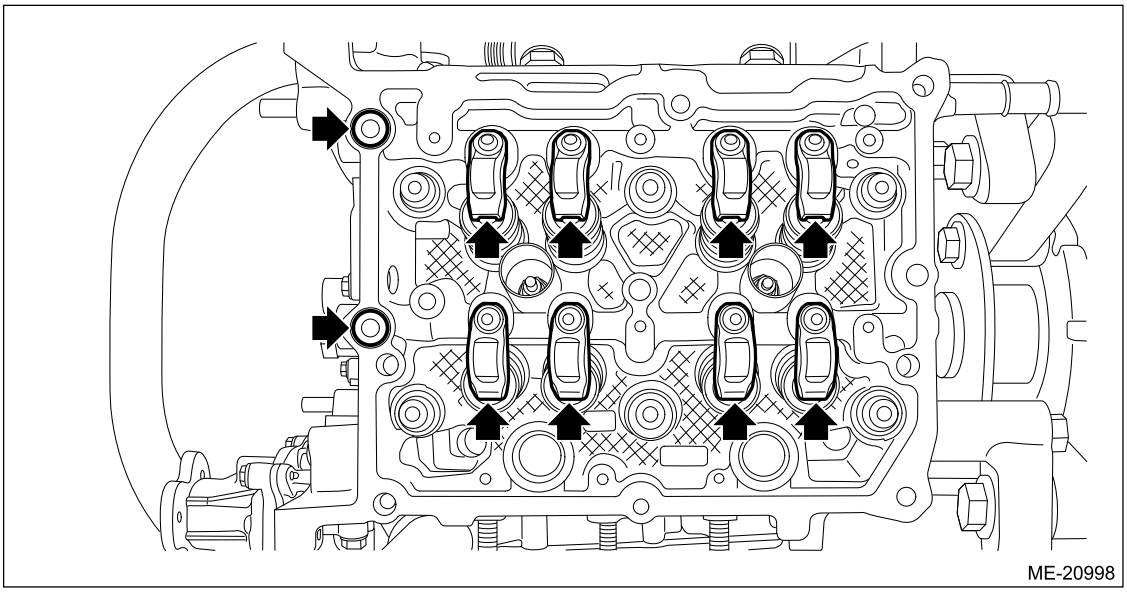
12. Loosen the bolts holding the cam carrier LH equally, a little at a time in numerical sequence as shown in the figure and remove the cam carrier LH.



13. Remove the O-ring and the roller rocker arm from cylinder head LH.

Note:

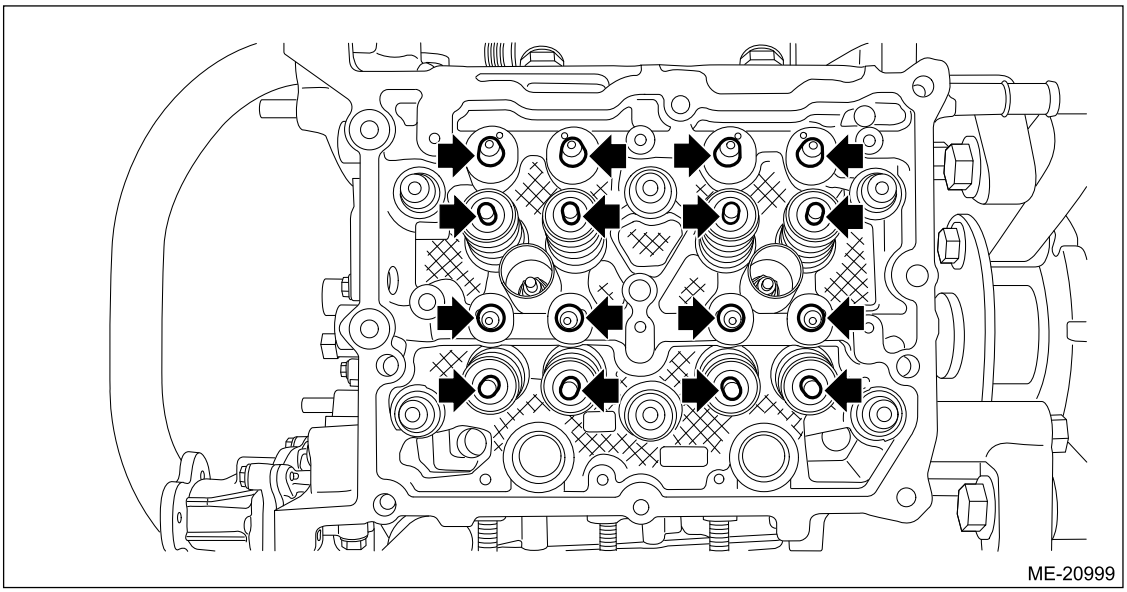
Be careful not to confuse the roller rocker arms.



14. Remove the valve shim and the roller rocker arm pivot from cylinder head LH.

Note:

Be careful not to confuse the valve shim and the roller rocker arm pivot.



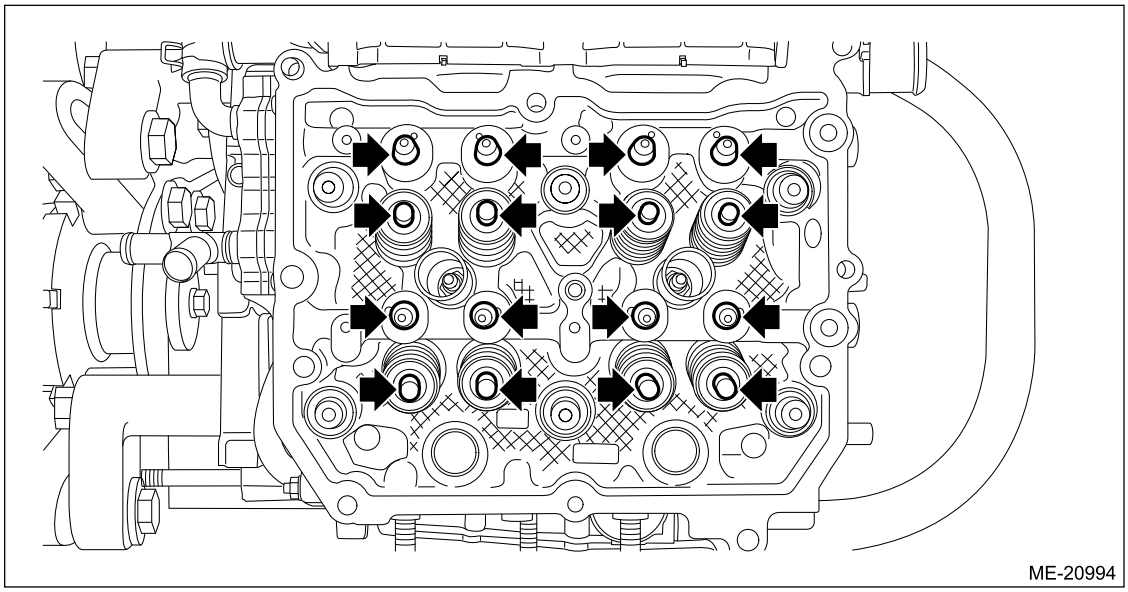
15. Remove the liquid gasket from cam carrier LH and cylinder head LH.

MECHANICAL(H4DO) > Cam Carrier

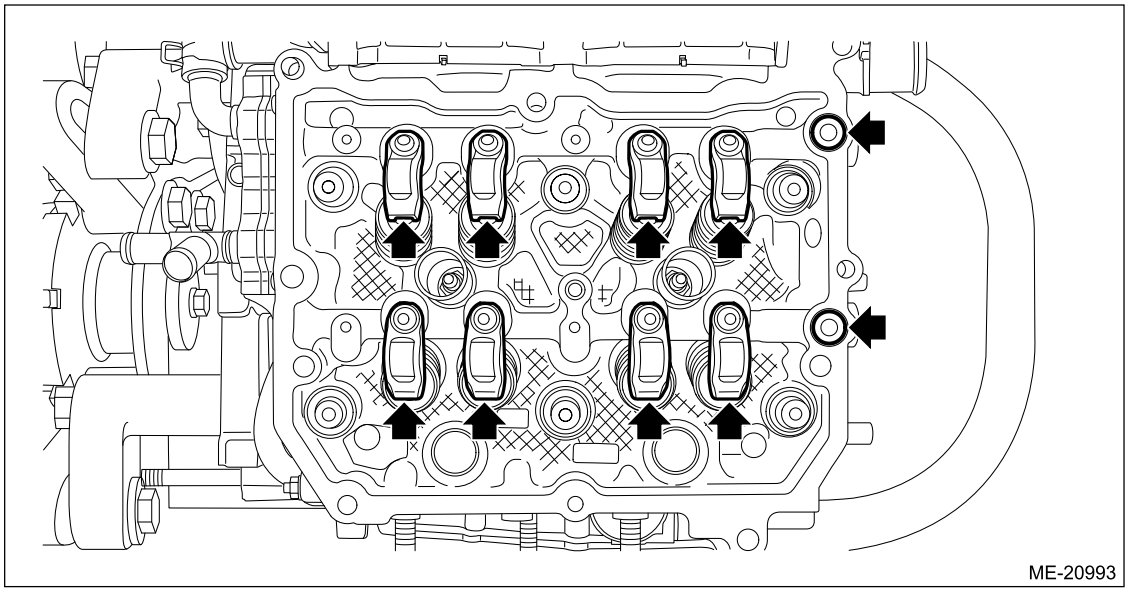
INSTALLATION

1. CAM CARRIER RH

1. Set the part so that the cylinder head RH is on the upper side.
2. Apply engine oil to the valve shim and the roller rocker arm pivot, and install the valve shim and the roller rocker arm pivot to the cylinder head RH.



3. Apply engine oil to new O-ring and the roller rocker arm, and install the O-ring and the roller rocker arm to the cylinder head RH.



4. Apply liquid gasket to the mating surface of cam carrier RH as shown in the figure.

Note:

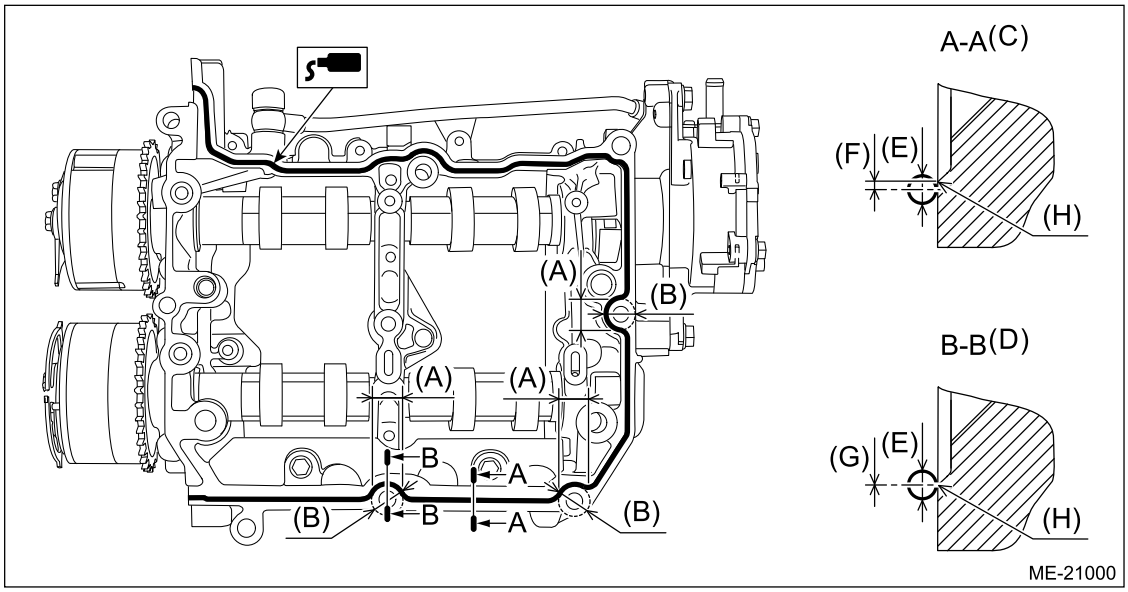
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the cylinder head RH and cam carrier RH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4±0.5 mm (0.1575±0.0197 in)



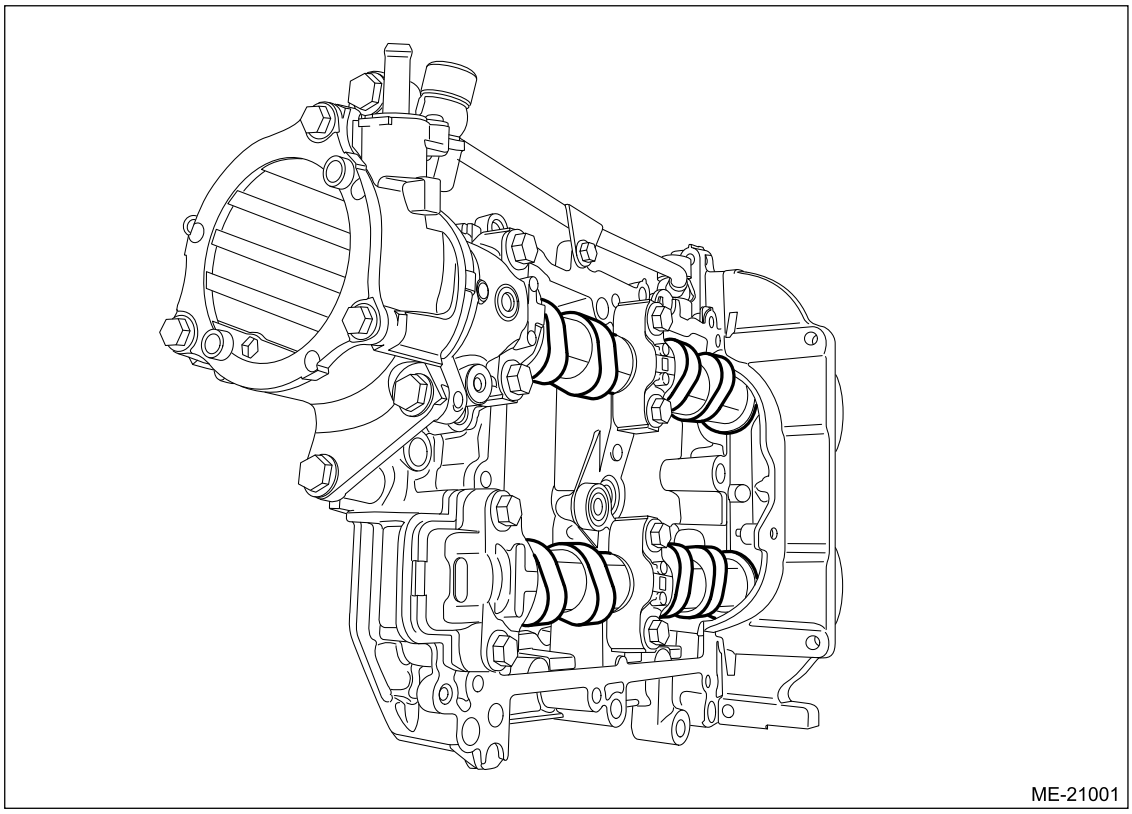
(A)	Range A	(D)	Liquid gasket applying position of mating surfaces of range A	(G)	0±0.5 mm (0±0.0197 in)
(B)	⌀18 mm (0.7087 in)	(E)	⌀4±0.5 mm (0.1575±0.0197 in)	(H)	Chamfer edge
(C)	Liquid gasket applying position of mating surfaces other than range A	(F)	⌀1±1 mm (0.0394±0.0394 in)		

5. Install the cam carrier RH to the cylinder head RH.

(1) Set the cam carrier RH to the cylinder head RH.

Note:

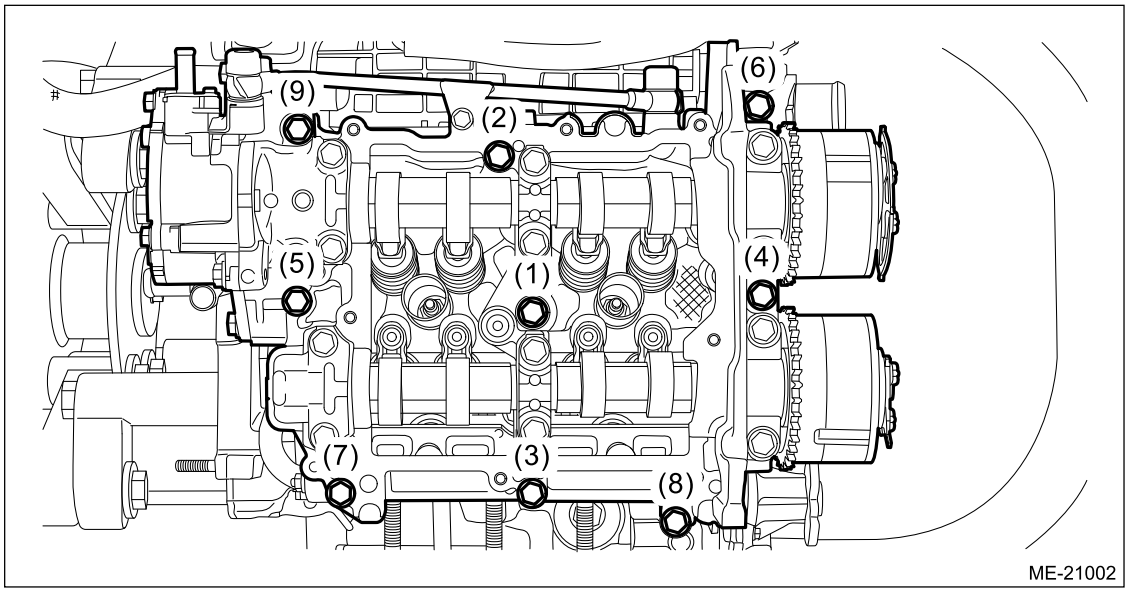
Position the intake camshaft RH and the exhaust camshaft RH to the zero-lift position as shown in the figure.



(2) Tighten all bolts with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.
(3) Loosen the bolts (3 places) by 180° in numerical order (3) → (2) → (1) as shown in the figure.
(4) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (1) → (2) → (3) as shown in the figure.
(5) Loosen the bolts (3 places) by 180° in numerical order (8) → (6) → (4) as shown in the figure.
(6) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (4) → (6) → (8) as shown in the figure.
(7) Loosen the bolts (3 places) by 180° in numerical order (7) → (9) → (5) as shown in the figure.
(8) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (5) → (9) → (7) as shown in the figure.

Note:

After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.



6. Set the part so that the intake manifold is on the upper side.
7. When the cam carrier RH has been disassembled

   Note:

   When the cam carrier RH has been disassembled, perform the following steps also.

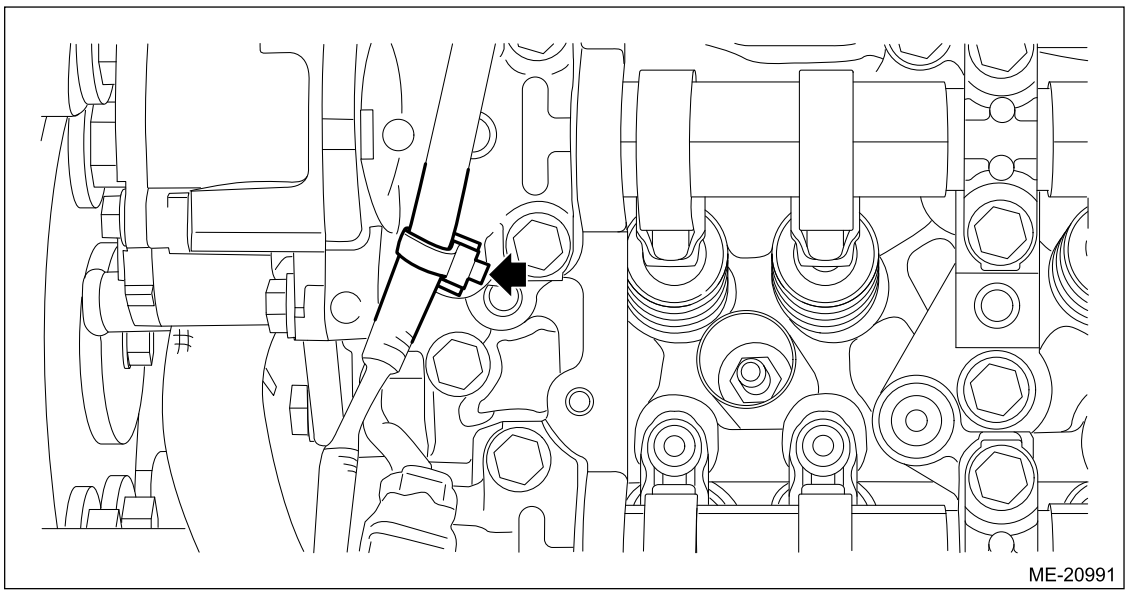
   (1) Install the cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket>INSTALLATION > CAM SPROCKET RH.

   (2) Install the vacuum pump. Ref. to MECHANICAL(H4DO)>Vacuum Pump>INSTALLATION.

   Note:

   When installing the vacuum pump, do not turn the intake camshaft RH to the outside of range of zero-lift (in range where it can be turned lightly by hand).

   (3) Install the oil pipe. Ref. to LUBRICATION(H4DO)>Oil Pipe>INSTALLATION.
8. Check the cam clearance. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.
9. Secure the engine harness to the cam carrier RH with a clip.



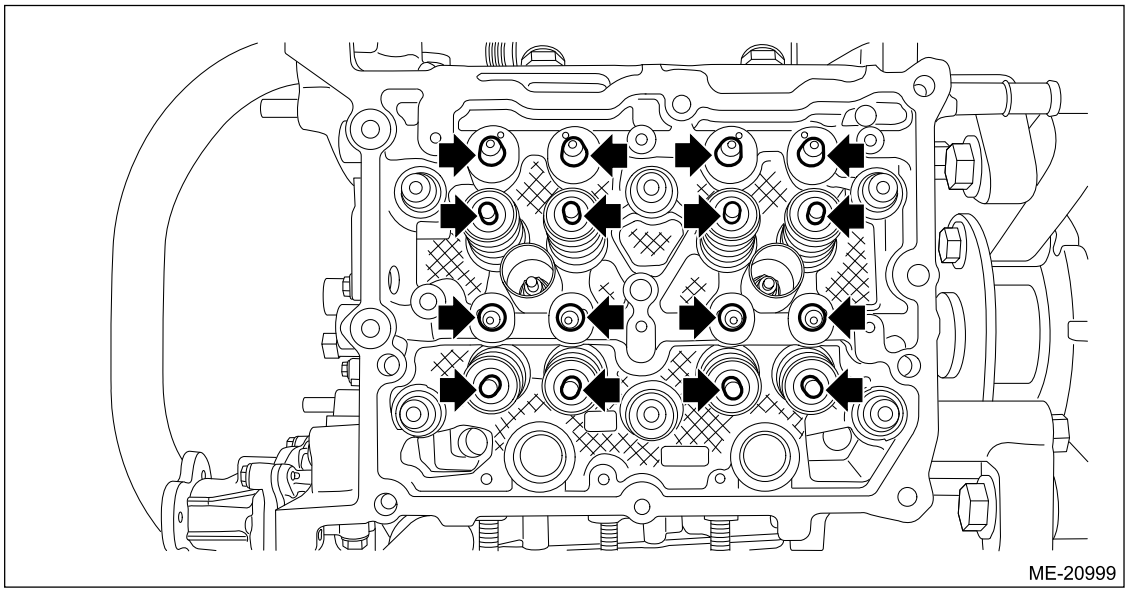
10. Install the water pipe RH. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE RH.
11. Install the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION > ROCKER COVER RH.
12. Install the timing chain RH. Ref. to MECHANICAL(H4DO)>Timing Chain

Assembly>INSTALLATION > TIMING CHAIN RH.

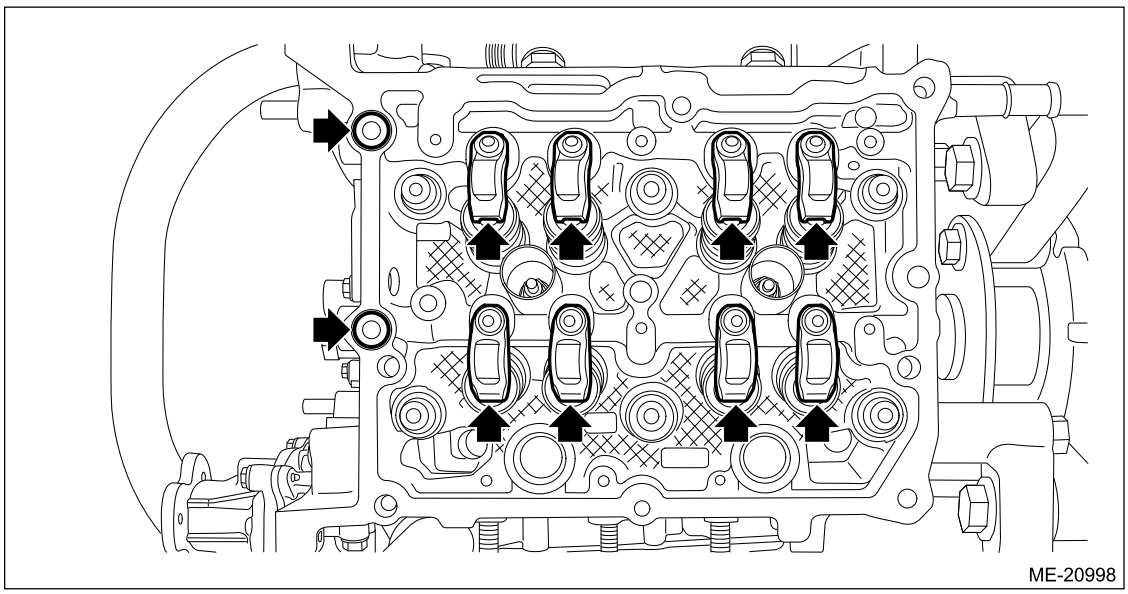
13. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.
14. Install the engine to the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.

2. CAM CARRIER LH

1. Set the part so that the cylinder head LH is on the upper side.
2. Apply engine oil to the valve shim and the roller rocker arm pivot, and install the valve shim and the roller rocker arm pivot to the cylinder head LH.



3. Apply engine oil to new O-ring and the roller rocker arm, and install the O-ring and the roller rocker arm to the cylinder head LH.



4. Apply liquid gasket to the mating surface of cam carrier LH as shown in the figure.

Note:

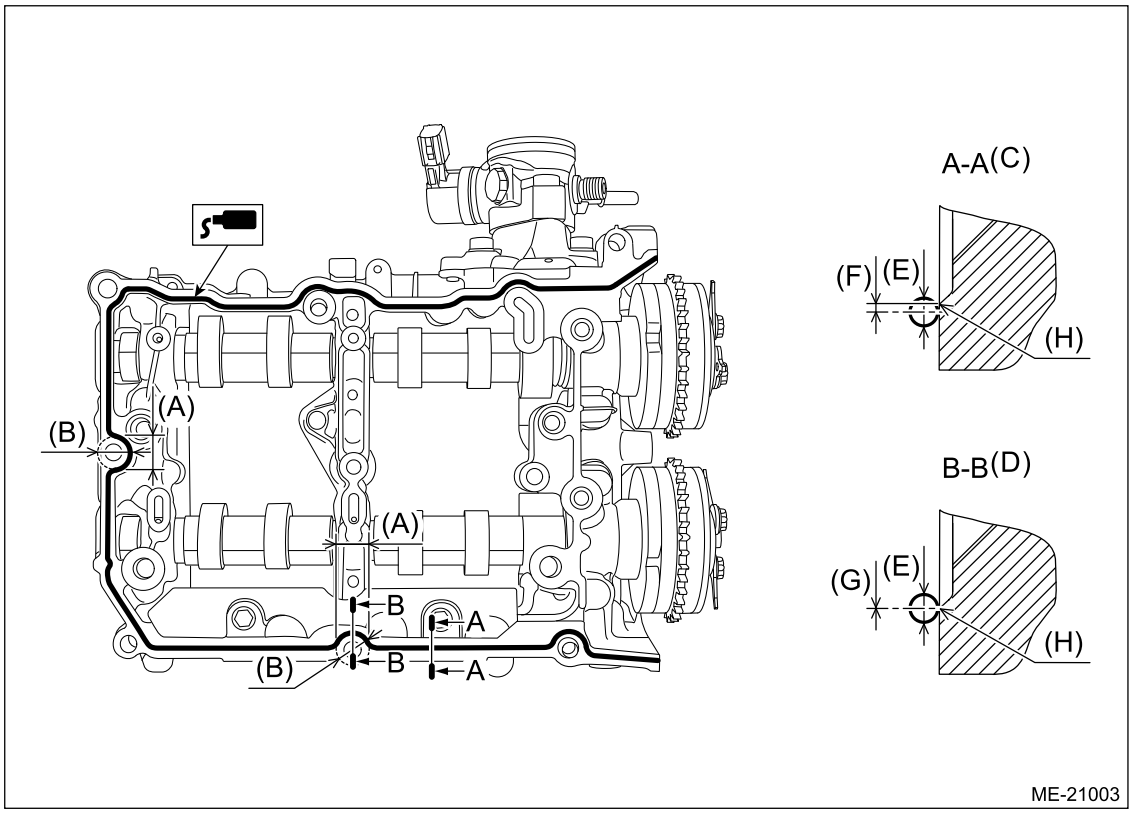
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the cylinder head LH and cam carrier LH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

4±0.5 mm (0.1575±0.0197 in)



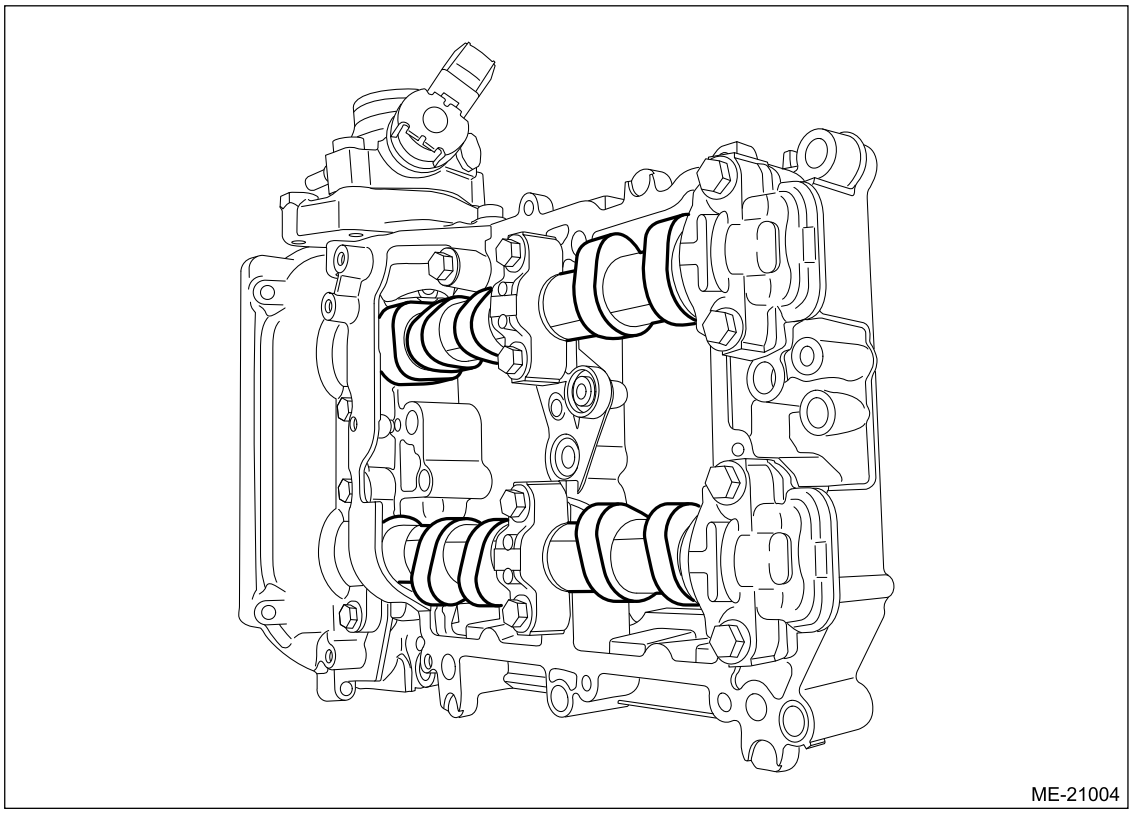
(A)	Range A	(D)	Liquid gasket applying position of mating surfaces of range A	(G)	0±0.5 mm (0±0.0197 in)
(B)	⌀18 mm (0.7087 in)	(E)	⌀4±0.5 mm (0.1575±0.0197 in)	(H)	Chamfer edge
(C)	Liquid gasket applying position of mating surfaces other than range A	(F)	⌀1±1 mm (0.0394±0.0394 in)		

5. Install the cam carrier LH to the cylinder head LH.

(1) Set the cam carrier LH to the cylinder head LH.

Note:

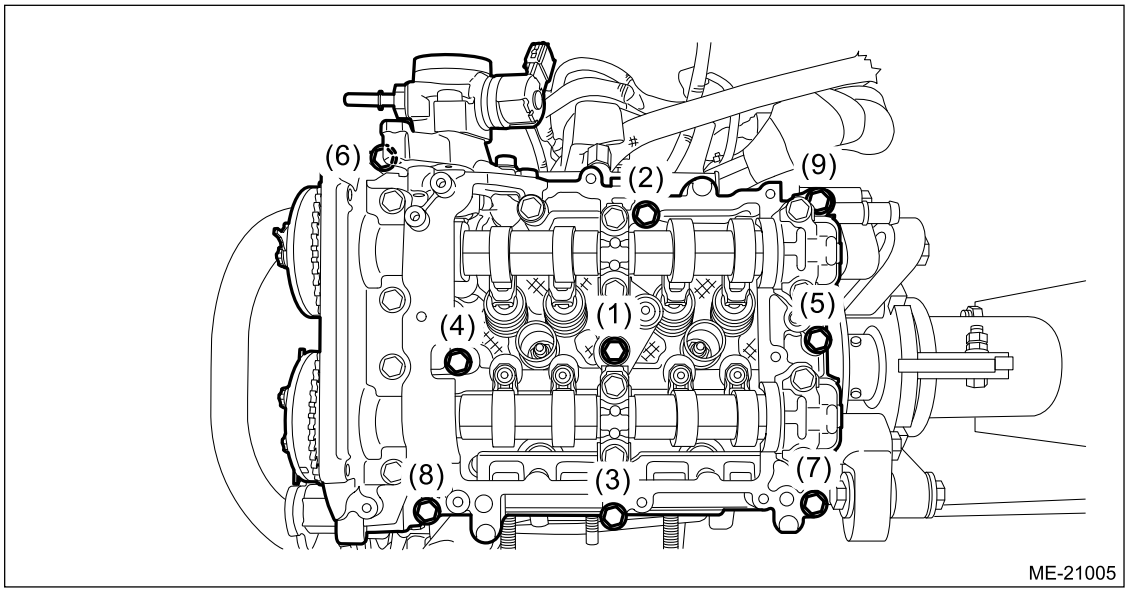
Position the intake camshaft LH and the exhaust camshaft LH to the zero-lift position as shown in the figure.



(2) Tighten all bolts with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order as shown in the figure.
(3) Loosen the bolts (3 places) by 180° in numerical order (3) → (2) → (1) as shown in the figure.
(4) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (1) → (2) → (3) as shown in the figure.
(5) Loosen the bolts (3 places) by 180° in numerical order (8) → (6) → (4) as shown in the figure.
(6) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (4) → (6) → (8) as shown in the figure.
(7) Loosen the bolts (3 places) by 180° in numerical order (7) → (9) → (5) as shown in the figure.
(8) Tighten the bolts (3 places) with a torque of 18 N·m (1.8 kgf-m, 13.3 ft-lb) in numerical order (5) → (9) → (7) as shown in the figure.

Note:

After tightening, if the liquid gasket is squeezed out onto the seal surface of the chain cover, completely remove any squeezed-out liquid gasket.



6. Set the part so that the installation surface of the intake manifold is on the upper side.
7. When the cam carrier LH has been disassembled

   Note:

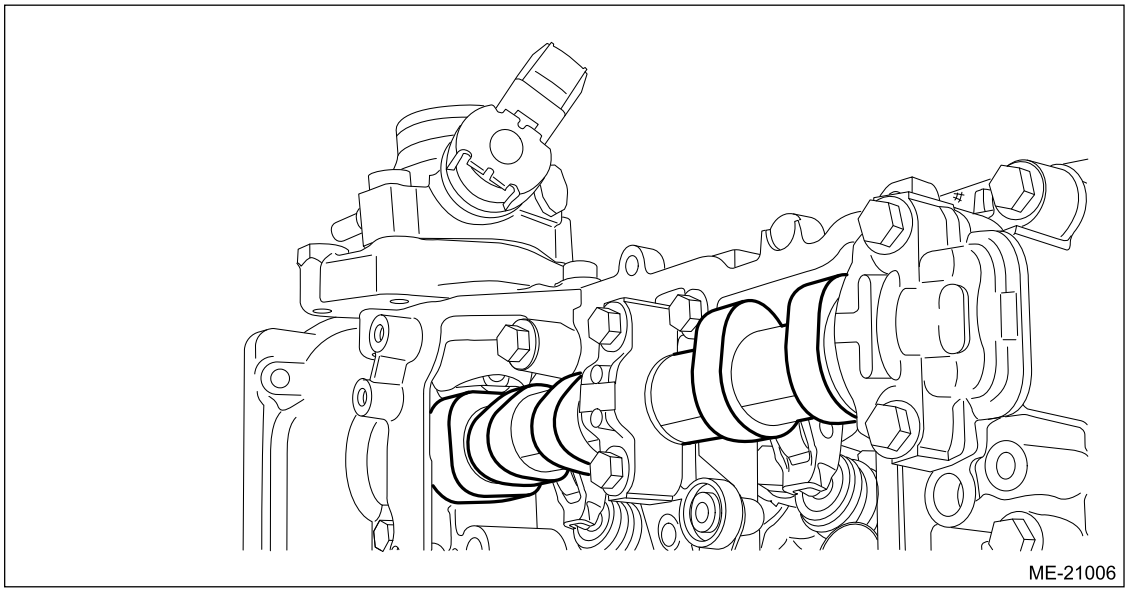
   When the cam carrier LH has been disassembled, perform the following steps also.

   (1) Install the cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket>INSTALLATION > CAM SPROCKET LH.

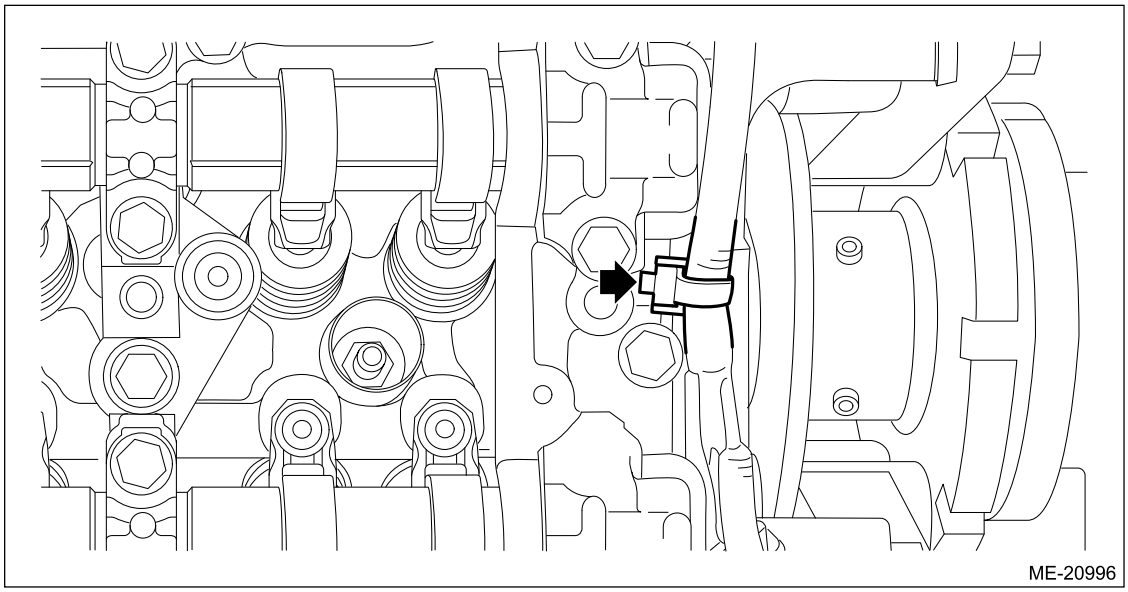
   (2) Install the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSTALLATION.

   Note:

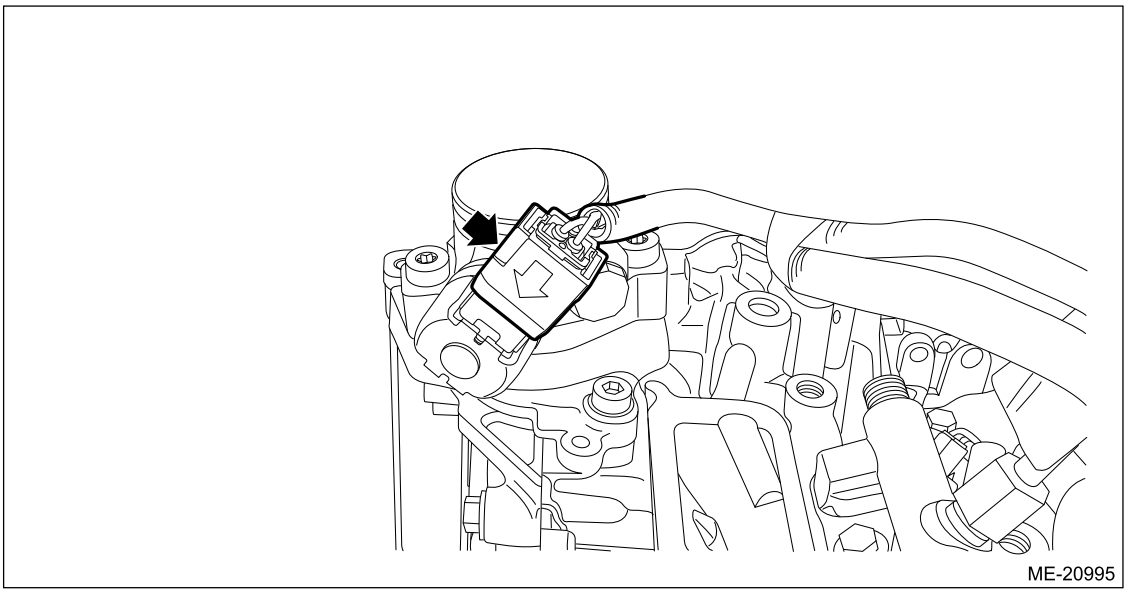
   Install the high-pressure fuel pump so that the cam lobes on the intake camshaft LH are positioned as shown in the figure. Perform adjustment within the range of zero-lift (in range where it can be turned lightly by hand).



8. Check the cam clearance. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.
9. Secure the engine harness to the cam carrier LH with a clip.



10. Connect the connector to the high-pressure fuel pump.



11. Install the high-pressure fuel delivery pipe. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE.

12. Install the water pipe LH. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER PIPE LH.

13. Install the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION > ROCKER COVER LH.

14. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.

15. Install timing chain LH. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>INSTALLATION > TIMING CHAIN LH.

16. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

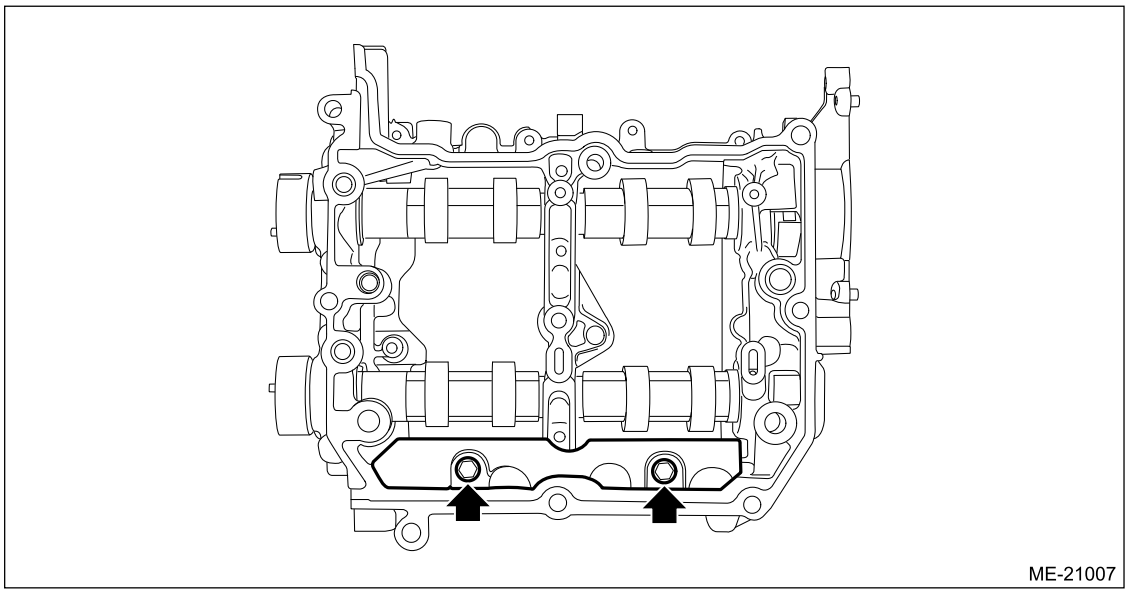
17. Install the engine to the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.

MECHANICAL(H4DO) > Cam Carrier

DISASSEMBLY

1. CAM CARRIER RH

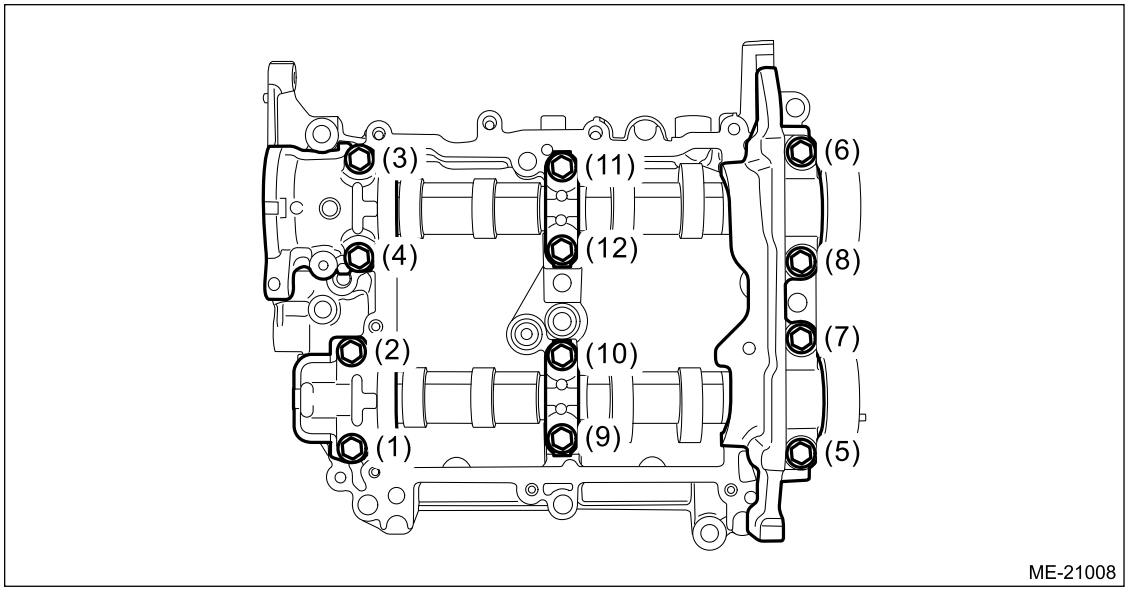
1. Remove the oil spacer from cam carrier RH.



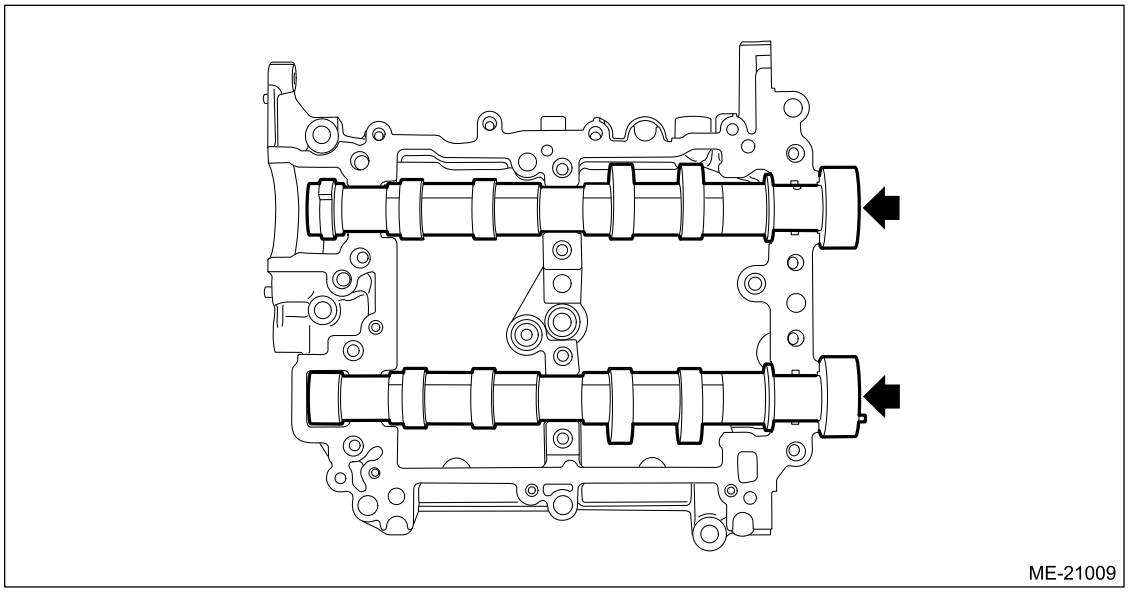
2. Loosen the bolts (front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH, and exhaust rear camshaft cap RH) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.

Note:

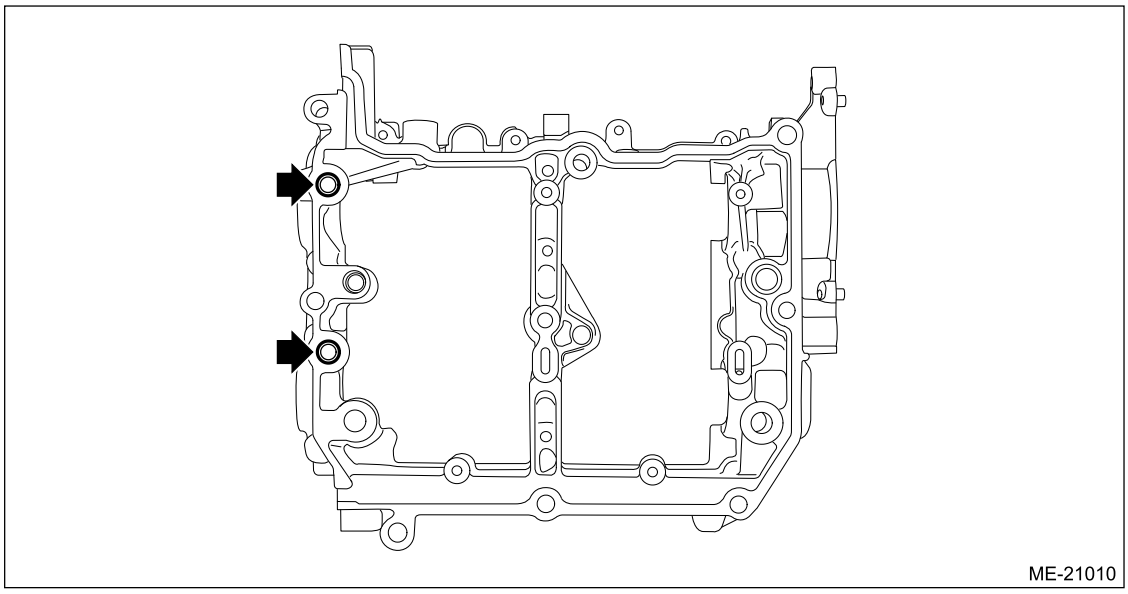
Arrange camshaft caps in order so that they can be installed in their original positions.



3. Remove the intake camshaft RH and the exhaust camshaft RH from cam carrier RH.



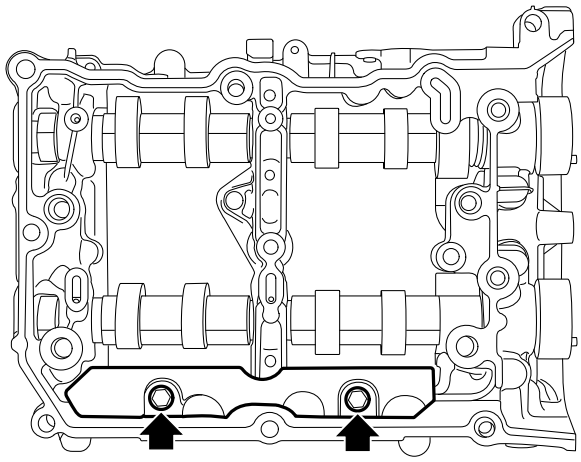
4. Remove the filter from cam carrier RH.



5. Remove the liquid gasket from cam carrier RH and front camshaft cap RH, intake rear camshaft cap RH and exhaust rear camshaft cap RH.

2. CAM CARRIER LH

1. Remove the oil spacer from cam carrier LH.

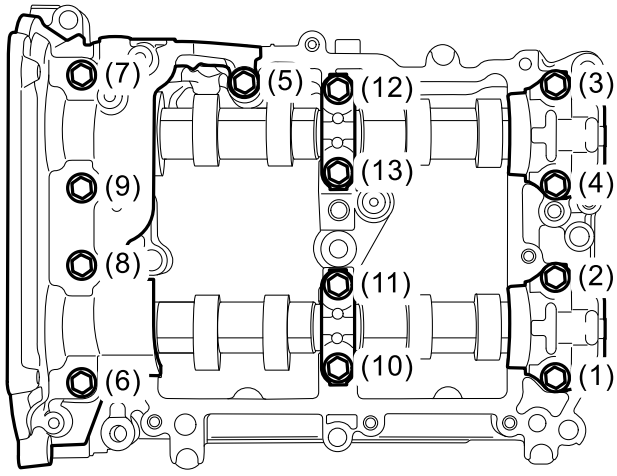


ME-21011

2. Loosen the bolts (front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.

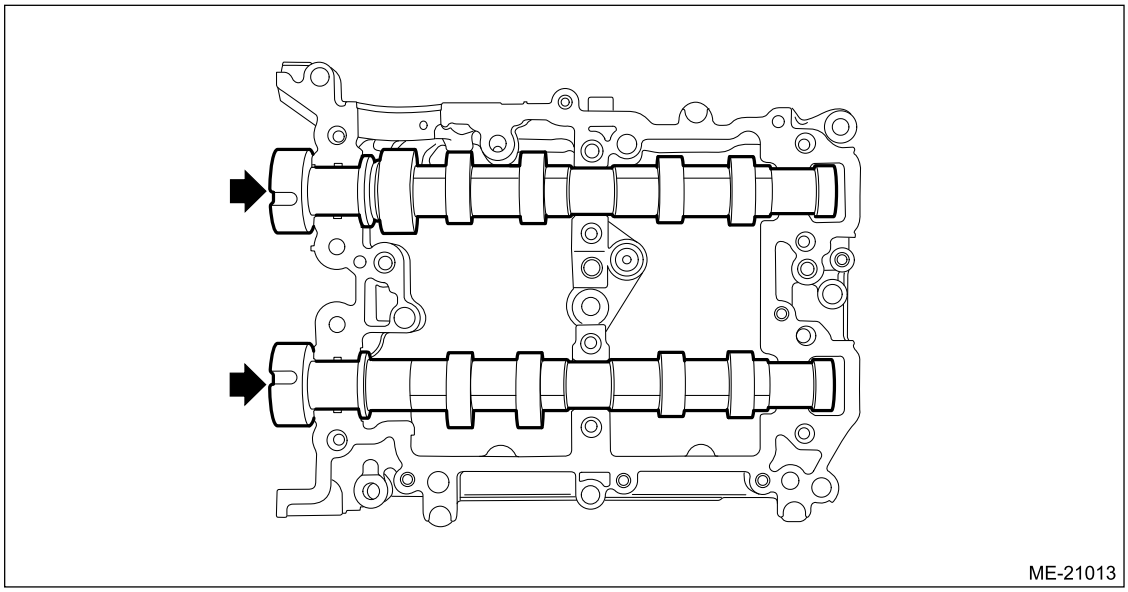
Note:

Arrange camshaft caps in order so that they can be installed in their original positions.

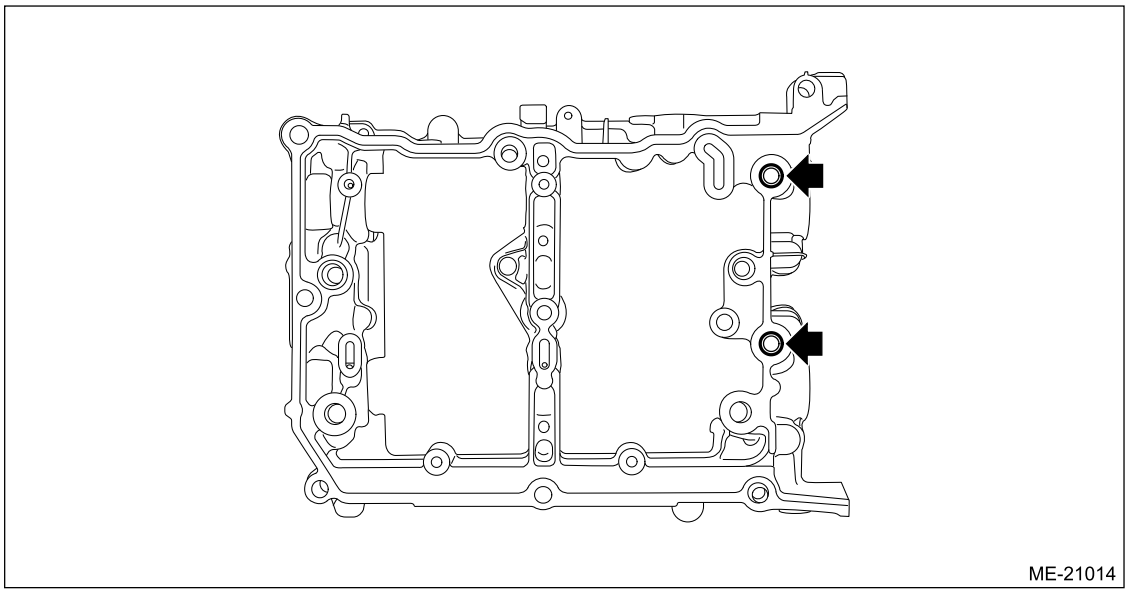


ME-21012

3. Remove the intake camshaft LH and the exhaust camshaft LH from cam carrier LH.



4. Remove the filter from cam carrier LH.



5. Remove the liquid gasket from cam carrier LH and front camshaft cap LH, intake rear camshaft cap LH and exhaust rear camshaft cap LH.

MECHANICAL(H4DO) > Cam Carrier

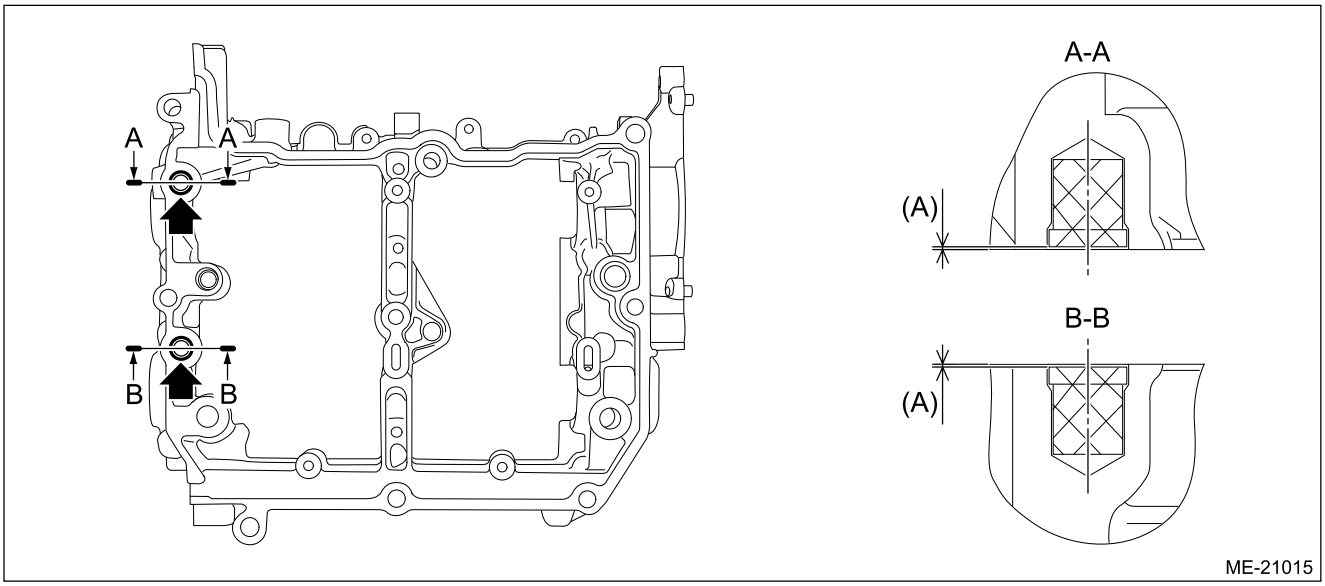
ASSEMBLY

1. CAM CARRIER RH

1. Install new filter to the cam carrier RH.

Filter insert position:

$0^{+0}_{-0.5}$ mm ($^{+0}_{-0.0197}$ in) position from cam carrier RH end face



(A) 0 — 0.5 mm (0 — 0.0197 in)

2. Set the intake camshaft RH and the exhaust camshaft RH to the cam carrier RH.

Note:

Apply engine oil to the journals of cam carrier RH before setting the intake camshaft RH and exhaust camshaft RH.

3. Install the front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH and exhaust rear camshaft cap RH.

(1) Apply liquid gasket to the mating surface of front camshaft cap RH, intake rear camshaft cap RH and exhaust rear camshaft cap RH as shown in the figure.

Caution:

- **Do not apply liquid gasket excessively. Applying excessively may cause excess gasket to flow toward camshaft journal, resulting in engine seizure.**
- **Do not apply liquid gasket excessively to the intake center camshaft cap RH and exhaust center camshaft cap RH.**

Note:

- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the front camshaft cap RH, intake rear camshaft cap RH, exhaust rear camshaft cap RH, and cam carrier RH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

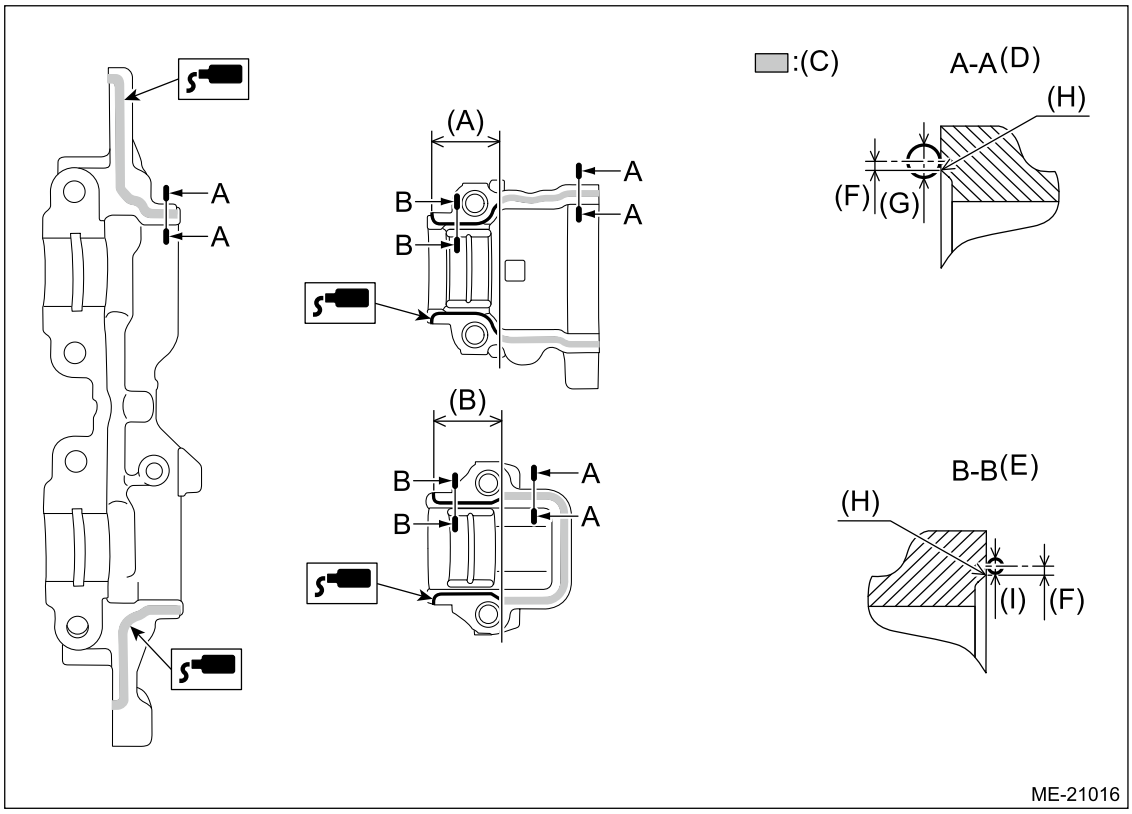
Liquid gasket applying diameter:

Mating surfaces other than range A

2±0.5 mm (0.0787±0.0197 in)

Mating surfaces of range A

3±0.5 mm (0.1181±0.0197 in)



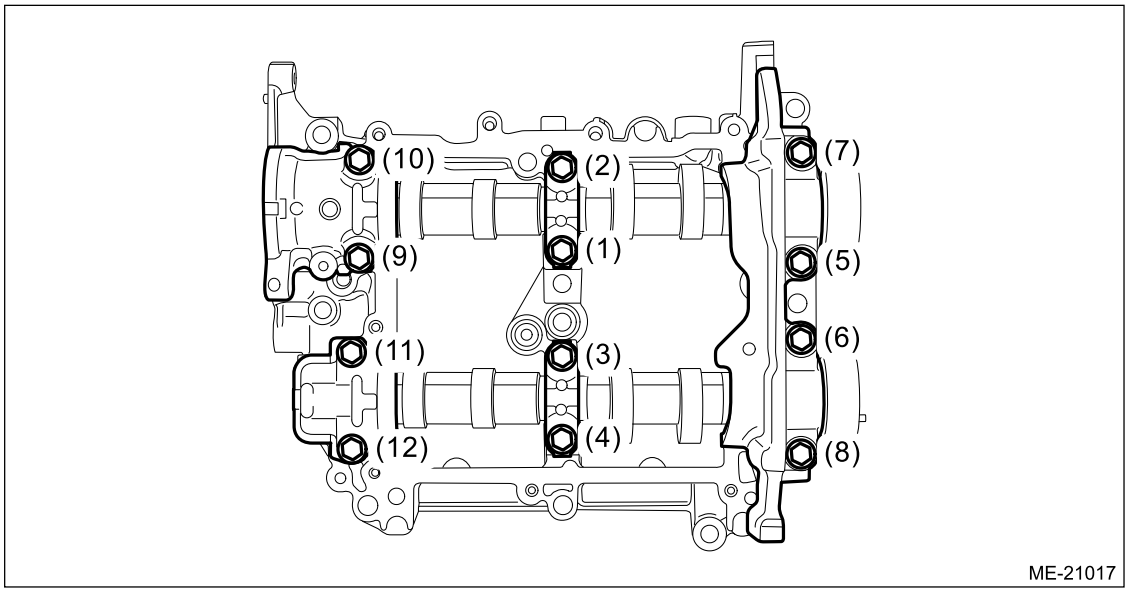
(A) 29 mm (1.1417 in)	(D) Liquid gasket applying position of mating surfaces of range A	(G) ⌀3±0.5 mm (0.1181±0.0197 in)
(B) 28.5 mm (1.1220 in)	(E) Liquid gasket applying position of mating surfaces other than range A	(H) Chamfer edge
(C) Range A	(F) Within 1 mm (0.0394 in)	(I) ⌀2±0.5 mm (0.0787±0.0197 in)

(2) Apply engine oil to the journals of each camshaft cap before setting the camshaft cap.

(3) Tighten the bolts which secure front camshaft cap RH, intake center camshaft cap RH, intake rear camshaft cap RH, exhaust center camshaft cap RH and exhaust rear camshaft cap RH in numerical order as shown in the figure.

Tightening torque:

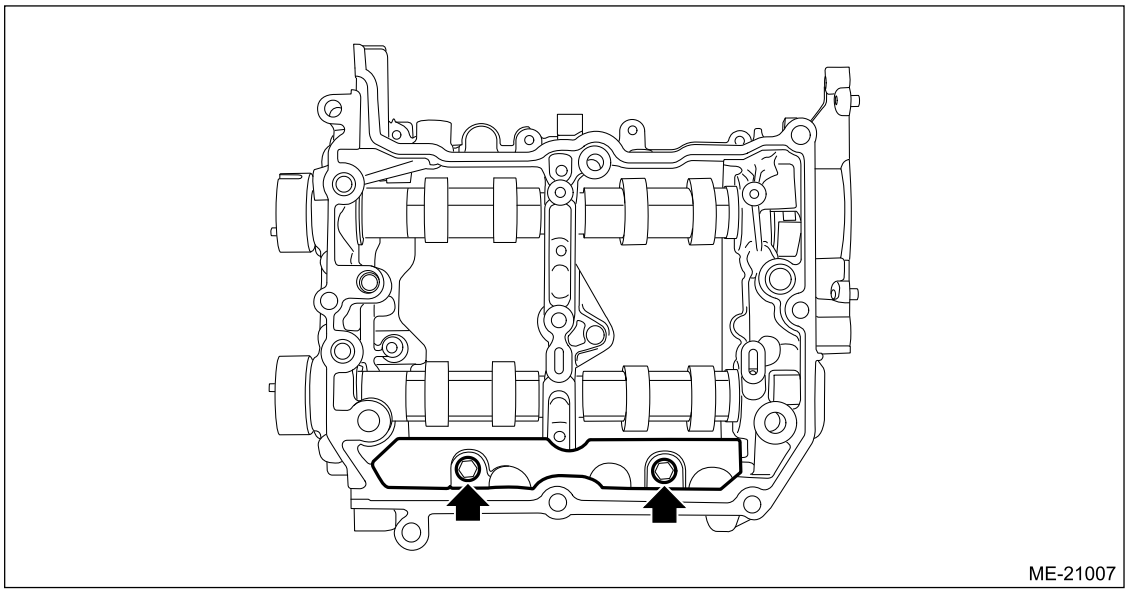
18 N·m (1.8 kgf-m, 13.3 ft-lb)



4. Install the oil spacer to the cam carrier RH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

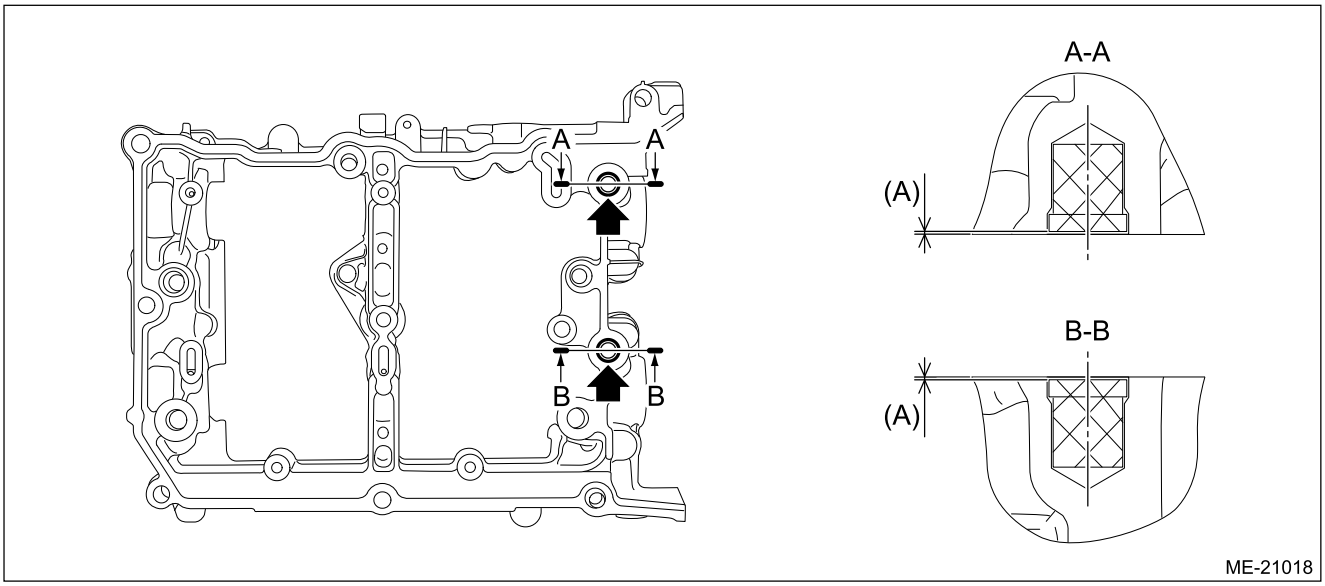


2. CAM CARRIER LH

1. Install new filter to the cam carrier LH.

Filter insert position:

$0^{+0}_{-0.5}$ mm ($^{+0}_{-0.0197}$ in) position from cam carrier LH end face



(A) 0 — 0.5 mm (0 — 0.0197 in)

2. Set the intake camshaft LH and the exhaust camshaft LH to the cam carrier LH.

Note:

Apply engine oil to the journals of cam carrier LH before setting the intake camshaft LH and exhaust camshaft LH.

3. Install the front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH.

(1) Apply liquid gasket to the mating surface of front camshaft cap LH, intake rear camshaft cap LH and exhaust rear camshaft cap LH as shown in the figure.

Caution:

- **Do not apply liquid gasket excessively. Applying excessively may cause excess gasket to flow toward camshaft journal, resulting in engine seizure.**
- **Do not apply liquid gasket excessively to the intake center camshaft cap LH and exhaust center camshaft cap LH.**

Note:

- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the front camshaft cap LH, intake rear camshaft cap LH, exhaust rear camshaft cap LH, and cam carrier LH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

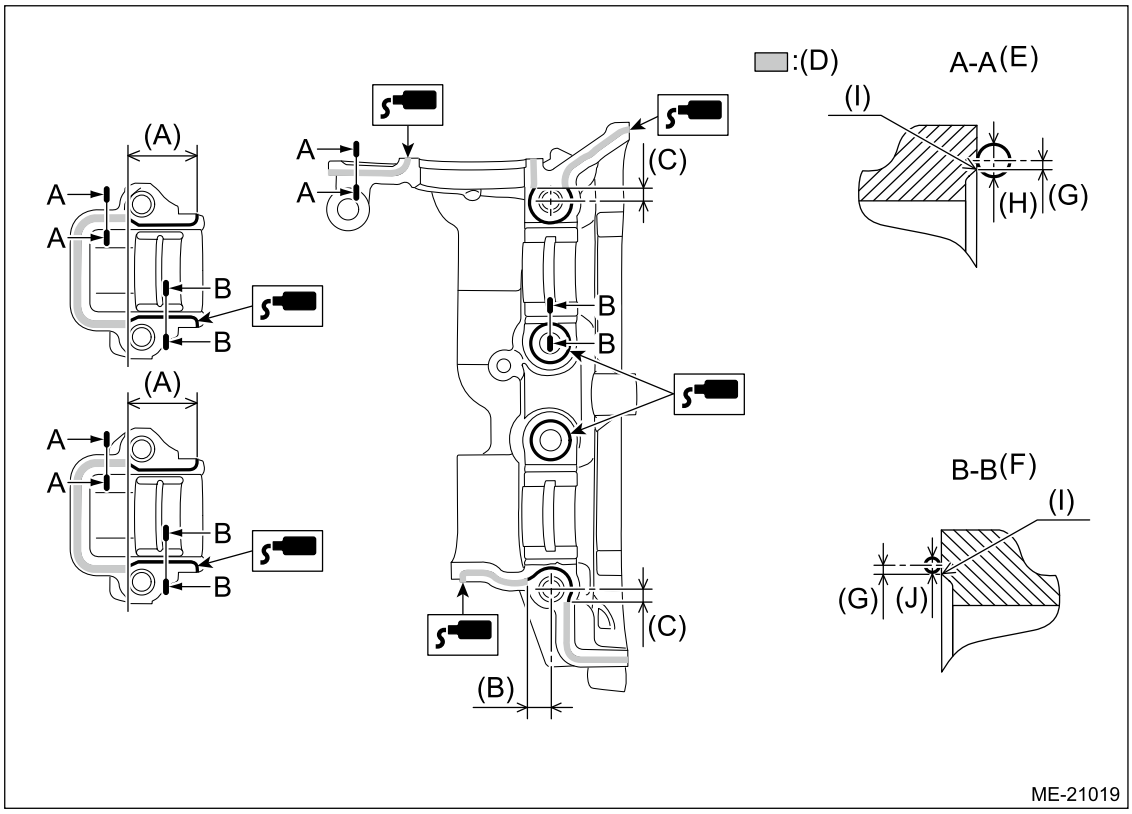
Liquid gasket applying diameter:

Mating surfaces other than range A

2±0.5 mm (0.0787±0.0197 in)

Mating surfaces of range A

3+0.5 mm (0.1181±0.0197 in)



(A) 28.5 mm (1.1220 in)

(B) 8.5 mm (0.3346 in)

(C) 5.5 mm (0.2165 in)

(D) Range A

(E) Liquid gasket applying position of mating surfaces of range A

(F) Liquid gasket applying position of mating surfaces other than range A

(G) Within 1 mm (0.0394 in)

(H) ⌀3±0.5 mm (0.1181±0.0197 in)

(I) Chamfer edge

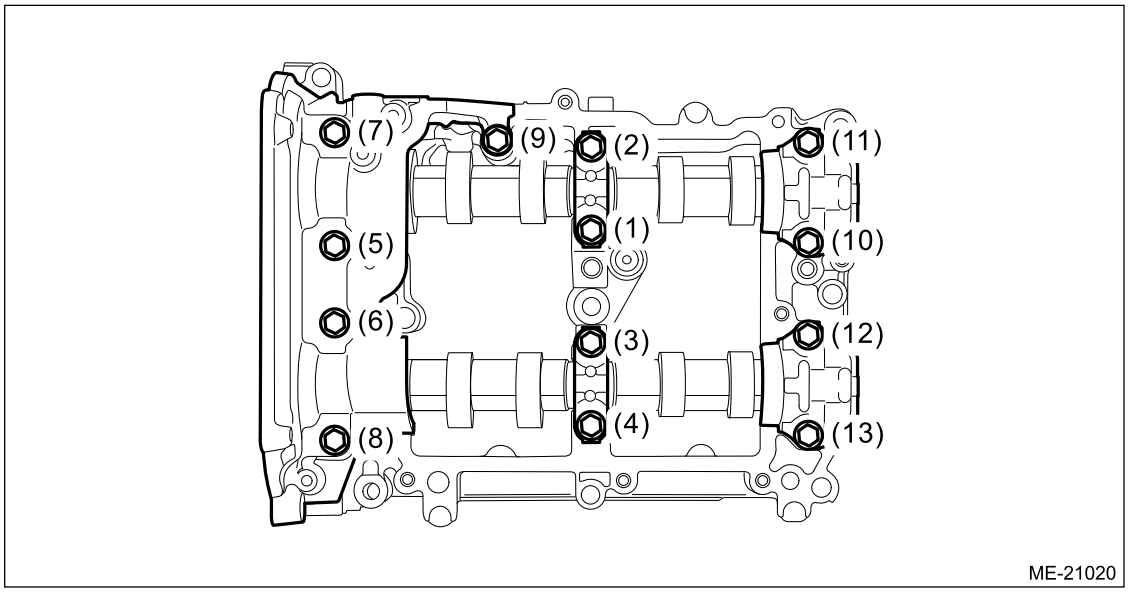
(J) ⌀2±0.5 mm (0.0787±0.0197 in)

(2) Apply engine oil to the journals of each camshaft cap before setting the camshaft cap.

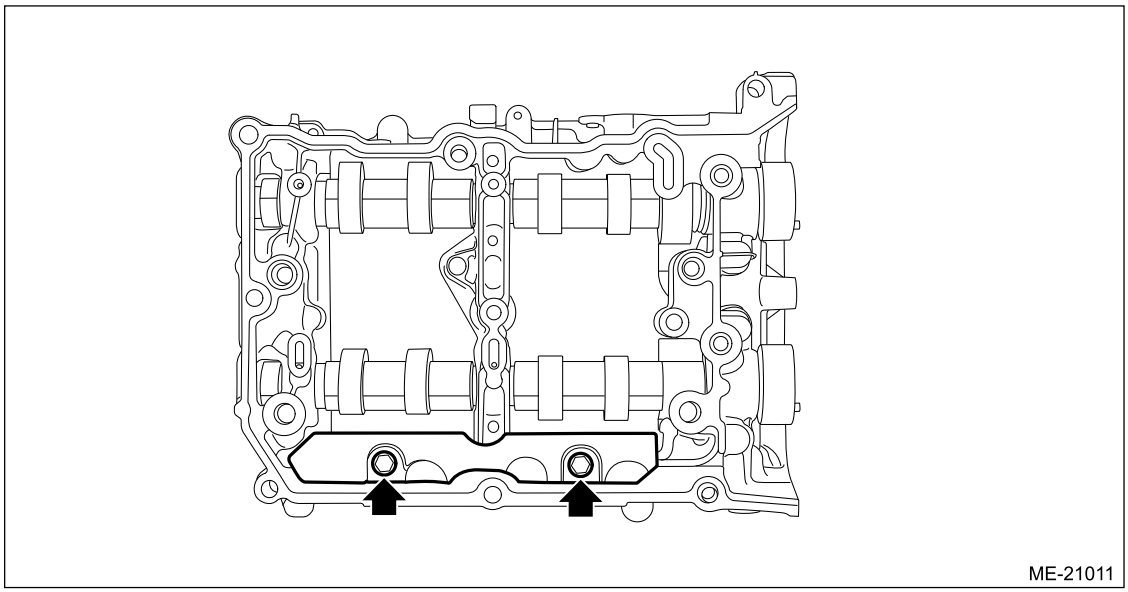
(3) Tighten the bolts which secure front camshaft cap LH, intake center camshaft cap LH, intake rear camshaft cap LH, exhaust center camshaft cap LH and exhaust rear camshaft cap LH in numerical order as shown in the figure.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



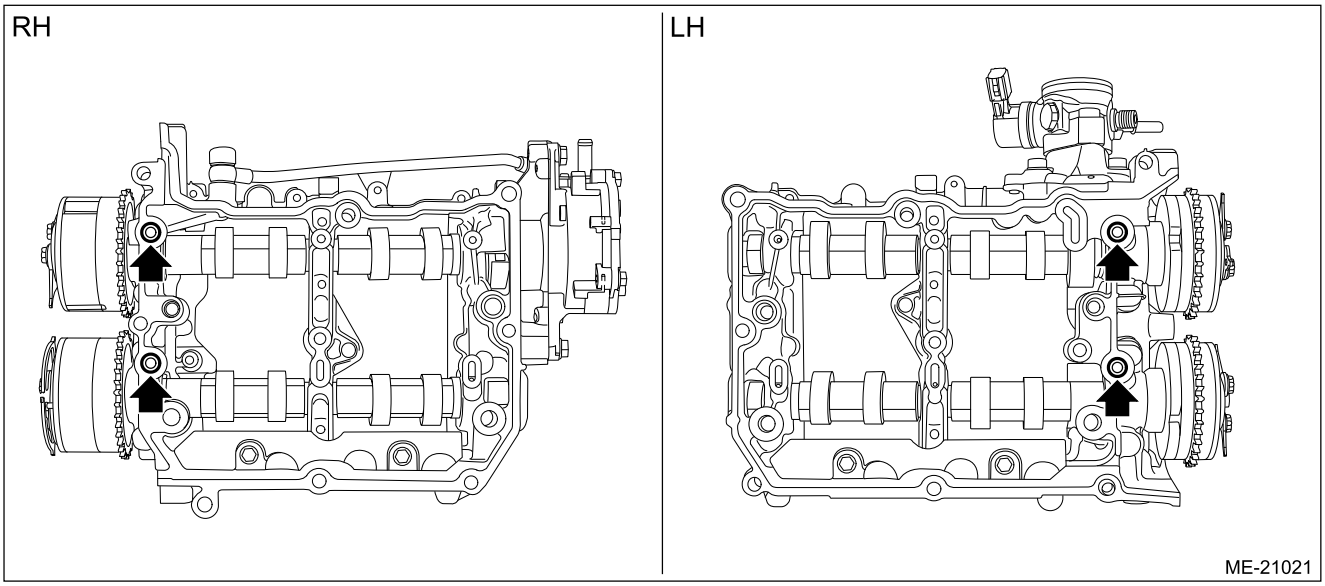
4. Install the oil spacer to the cam carrier LH.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



MECHANICAL(H4DO) > Cam Carrier

INSPECTION

1. Visually check the cam carrier filter, and if clogging is found, replace with a new part.



2. Check the camshaft journals for damage and wear. Replace the camshaft if faulty.
3. Check the cam face condition of camshaft, and remove the minor faults by grinding with oil stone. Replace the camshaft if uneven wear is found.
4. Using a dial gauge, check the camshaft bend. If it exceeds the limit, replace the camshaft.

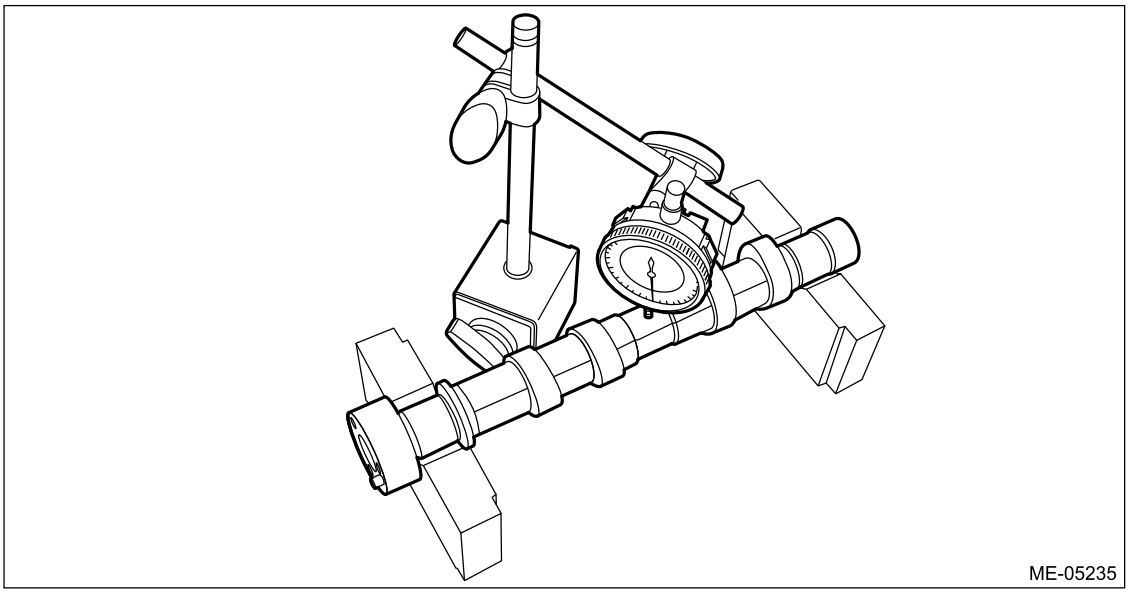
Note:

Measurement should be performed at a temperature of 20°C (68°F).

Camshaft bend:

Limit

0.020 mm (0.0008 in)



5. Check the cam lobe height “H” and cam base circle diameter “A” of camshaft as shown in the figure, using micrometer. If it is not within the standard, replace the camshaft.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Perform measurement of cam lobe height for fuel pump drive section at two points.**

Camshaft cam lobe overall height H:

Intake

Valve drive section

Standard

40.34 — 40.44 mm (1.5882 — 1.5921 in)

Fuel pump drive section

Standard

44.35 — 44.45 mm (1.7461 — 1.7500 in)

Exhaust

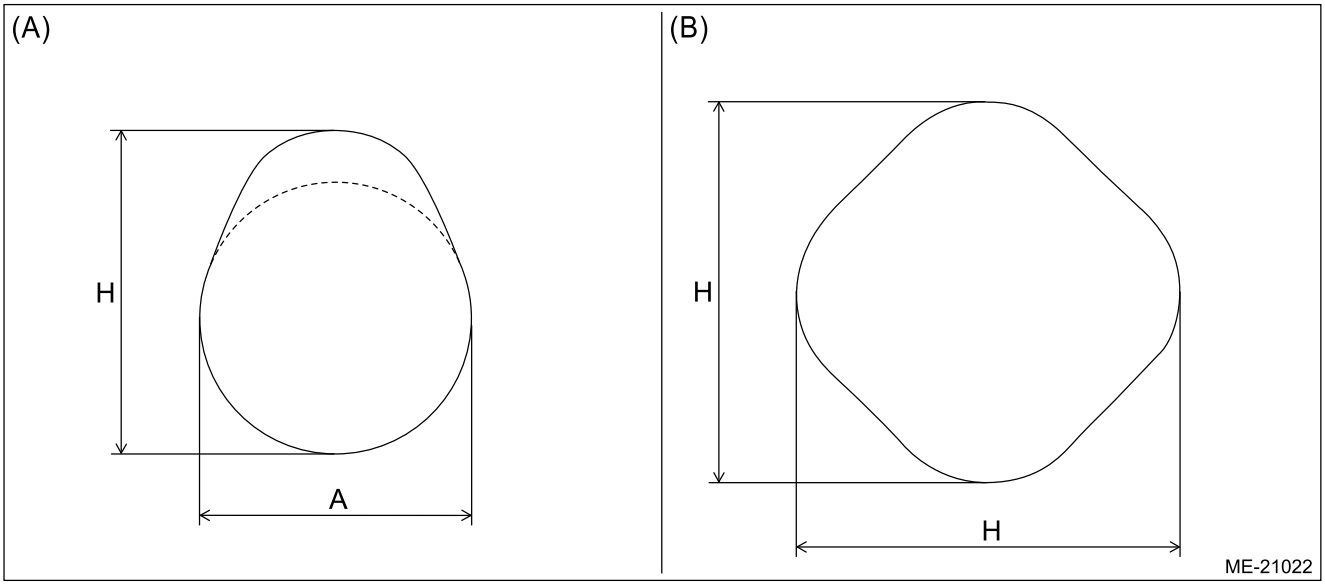
Standard

39.66 — 39.76 mm (1.5614 — 1.5654 in)

Camshaft cam base circle diameter A:

Standard

34.0 mm (1.3386 in)



(A) Valve drive section (B) Fuel pump drive section

6. Check the camshaft journal outer diameter using micrometer. If it is not within the standard, replace the camshaft.

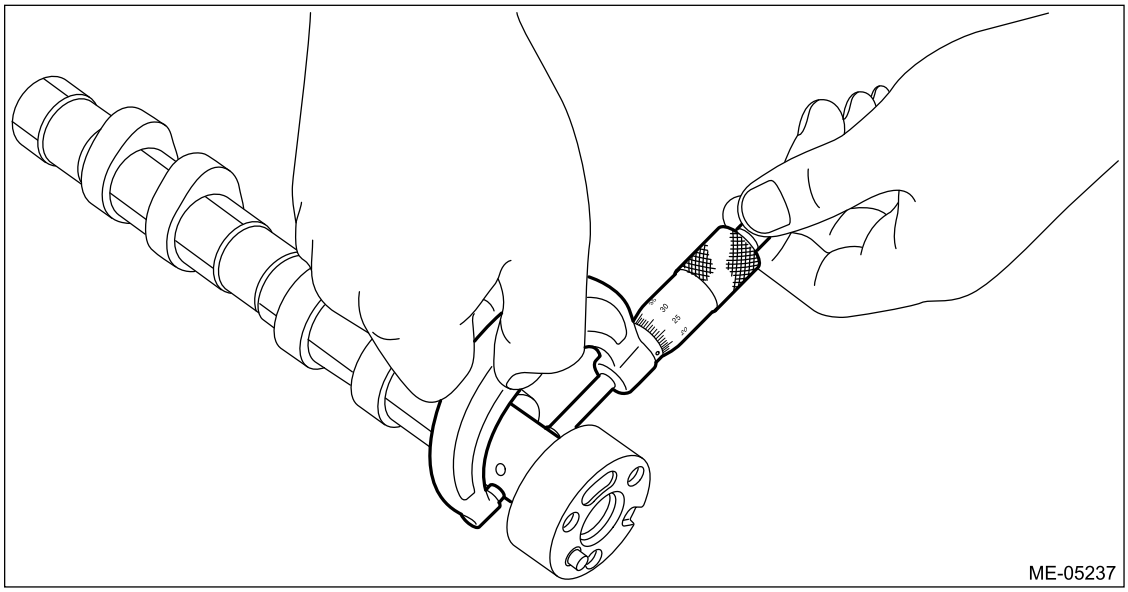
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure outer diameter of each journal at several points, and read the value of most worn location.**

Camshaft journal outer diameter:

Standard

25.946 — 25.963 mm (1.0215 — 1.0222 in)



7. Using a dial gauge, check the thrust clearance of the camshaft. If it is not within the standard or if uneven wear is found, replace each camshaft cap and cam carrier as a set. If necessary replace the camshaft.

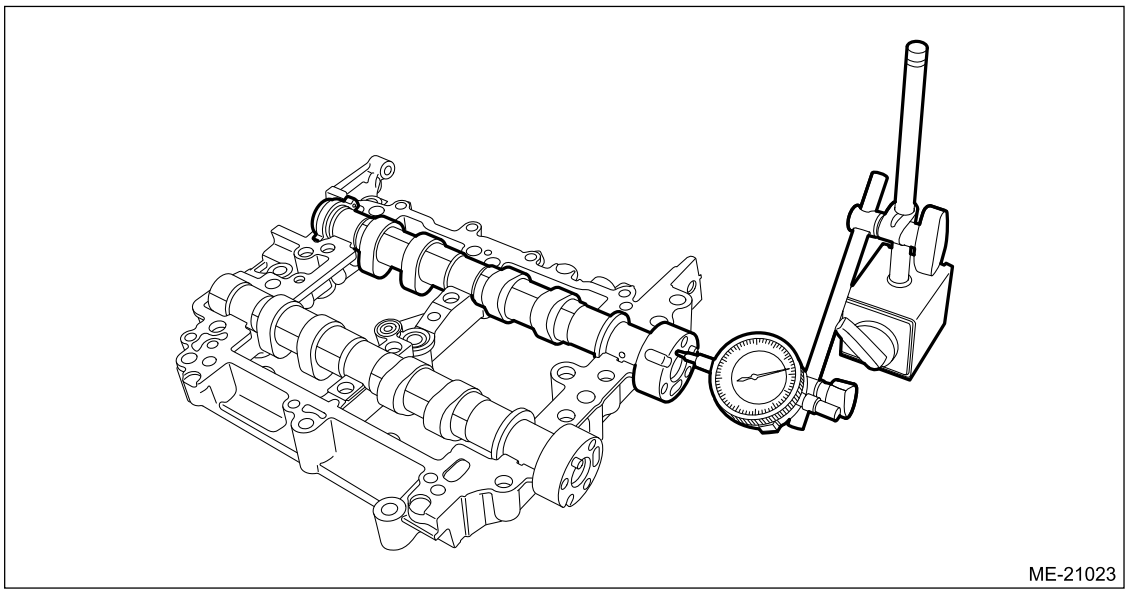
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Set the dial gauge at end surface of camshaft.**

Camshaft thrust clearance:

Standard

0.068 — 0.116 mm (0.0027 — 0.0047 in)



8. Check the oil clearance on the camshaft using a plastigauge.

Note:

Measurement should be performed at a temperature of 20°C (68°F).

(1) Remove the liquid gasket from cam carrier and front camshaft cap, intake rear camshaft cap and exhaust rear camshaft cap.

(2) Clean each camshaft cap and cam carrier journals.

(3) Set the camshaft to the cam carrier.

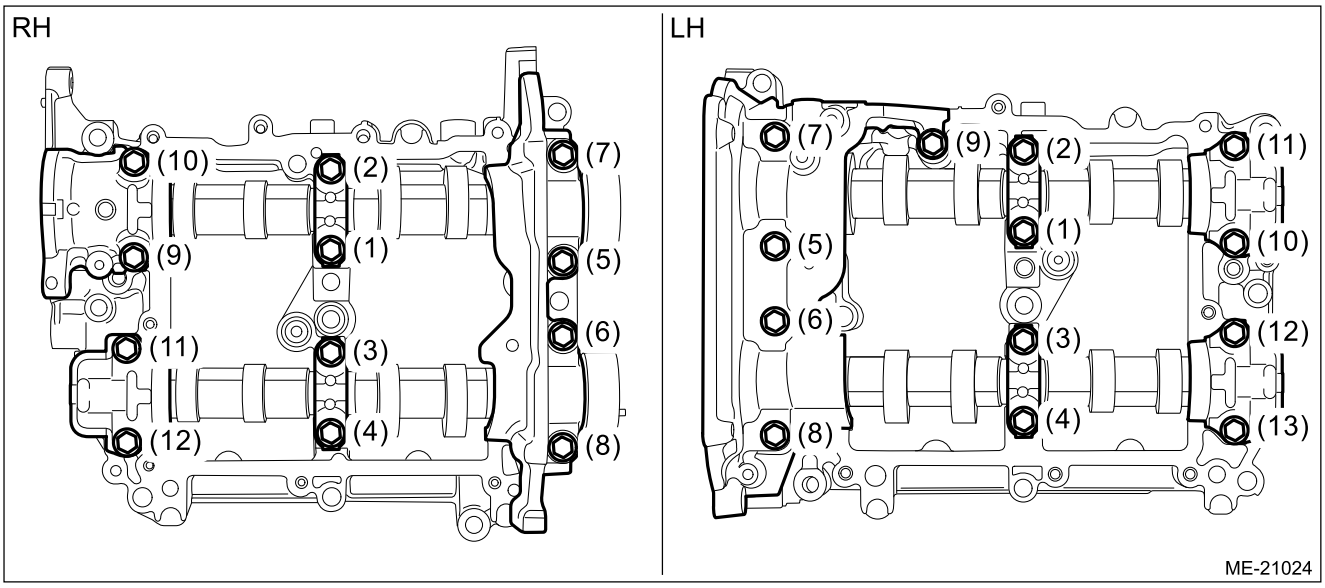
(4) Place a plastigauge across the camshaft journals of each camshaft and set the camshaft caps.

(5) Tighten the bolts which secure front camshaft cap, intake center camshaft cap, intake rear camshaft cap, exhaust center camshaft cap and exhaust rear camshaft cap in numerical order as

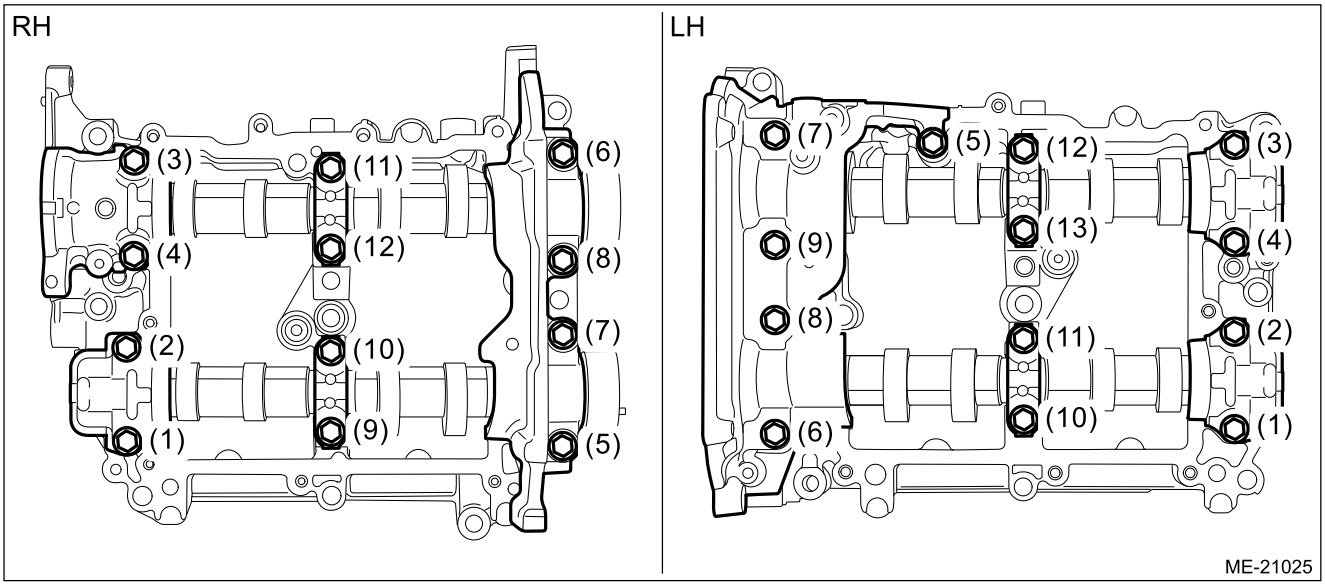
shown in the figure.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



(6) Loosen the bolts (front camshaft cap, intake center camshaft cap, intake rear camshaft cap, exhaust center camshaft cap and exhaust rear camshaft cap) equally, a little at a time in numerical sequence as shown in the figure, and remove each camshaft cap.

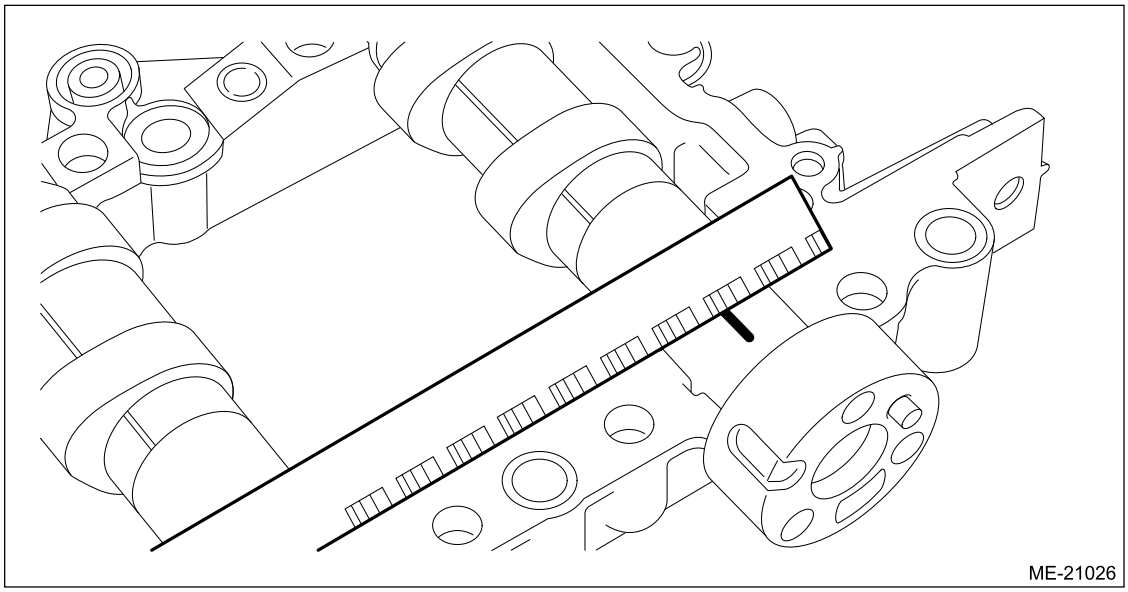


(7) Determine camshaft oil clearance by matching the widest point of plastigauge on each journal against scale printed on a package of plastigauge. If it is not within the standard, replace each camshaft cap and cam carrier as a set. If necessary replace the camshaft.

Camshaft oil clearance:

Standard

0.037 — 0.072 mm (0.0015 — 0.0028 in)



(8) Completely remove the plastigauge.

REMOVAL

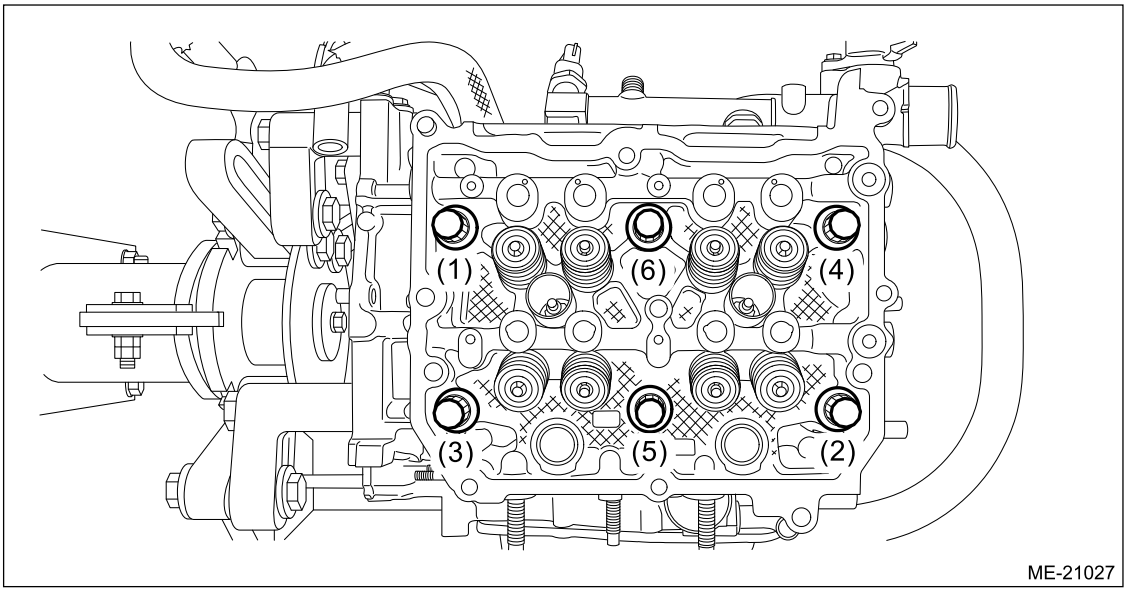
1. CYLINDER HEAD RH

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
3. Remove the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>REMOVAL.
4. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
5. Remove the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER RH.
6. Remove the cam carrier RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER RH.
7. Remove the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
8. Remove the EGR cooler. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Cooler>REMOVAL.
9. When disassembling the cylinder head RH

   Note:

   When disassembling the cylinder head RH, perform the following steps also.

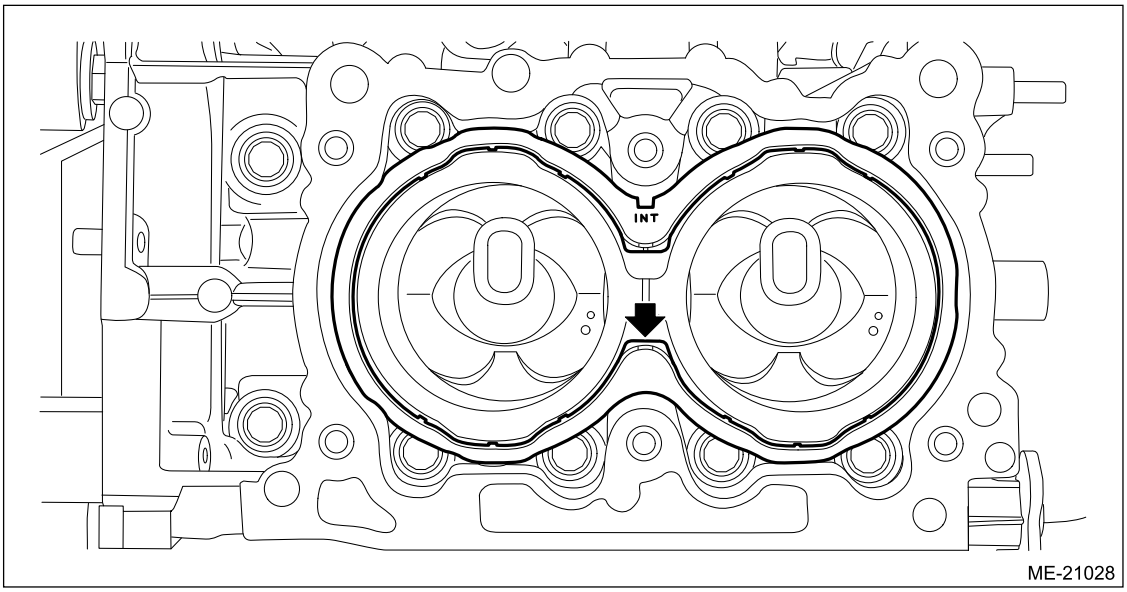
   (1) Remove the fuel injector RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REMOVAL > FUEL INJECTOR RH.
10. Set the part so that the cylinder head RH is on the upper side.
11. Loosen the bolts securing the cylinder head RH equally, a little at a time in numerical sequence as shown in the figure and remove the cylinder head bolt.



12. While tapping the cylinder head RH with a plastic hammer, separate to remove it from the cylinder block RH.
13. Remove the cylinder head gasket RH.

    Caution:

    Be careful not to scratch the mating surface of cylinder head and cylinder block.
14. Remove the water jacket spacer from the cylinder block RH.



15. Remove the liquid gasket from the cylinder head RH and cylinder block RH.

2. CYLINDER HEAD LH

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.

2. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.

3. Remove the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>REMOVAL.

4. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.

5. Remove the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL > ROCKER COVER LH.

6. Remove the cam carrier LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL > CAM CARRIER LH.

7. Remove the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>REMOVAL > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.

8. When disassembling the cylinder head LH

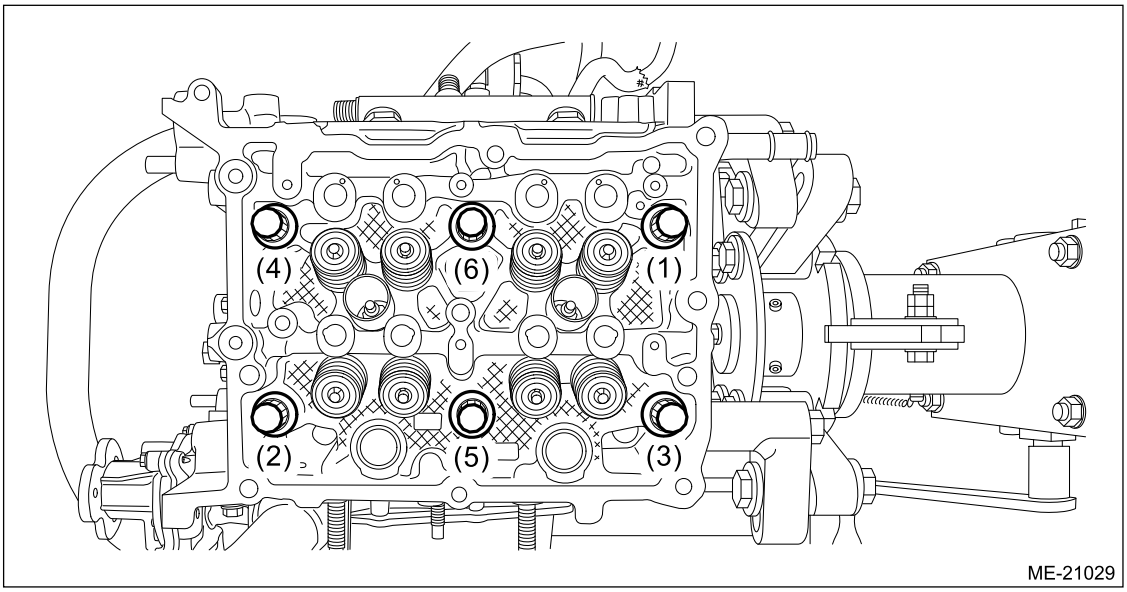
Note:

When disassembling the cylinder head LH, perform the following steps also.

(1) Remove the fuel injector LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REMOVAL > FUEL INJECTOR LH.

9. Set the part so that the cylinder head LH is on the upper side.

10. Loosen the bolts securing the cylinder head LH equally, a little at a time in numerical sequence as shown in the figure and remove the cylinder head bolt.



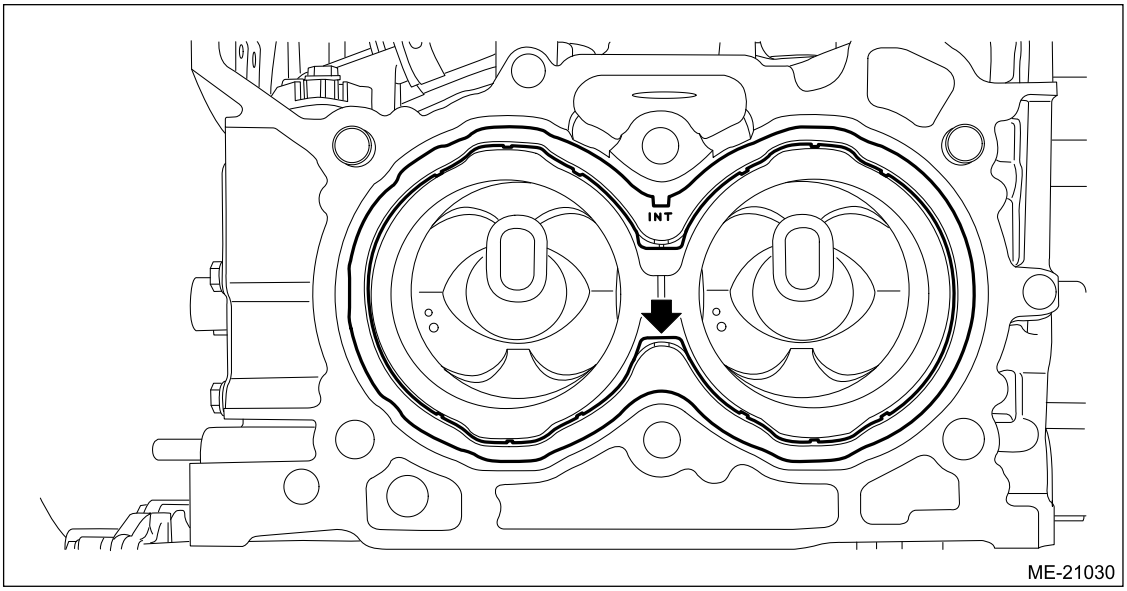
11. While tapping the cylinder head LH with a plastic hammer, separate to remove it from the cylinder block LH.

12. Remove the cylinder head gasket LH.

Caution:

Be careful not to scratch the mating surface of cylinder head and cylinder block.

13. Remove the water jacket spacer from the cylinder block LH.



14. Remove the liquid gasket from cylinder head LH and cylinder block LH.

MECHANICAL(H4DO) > Cylinder Head

INSTALLATION

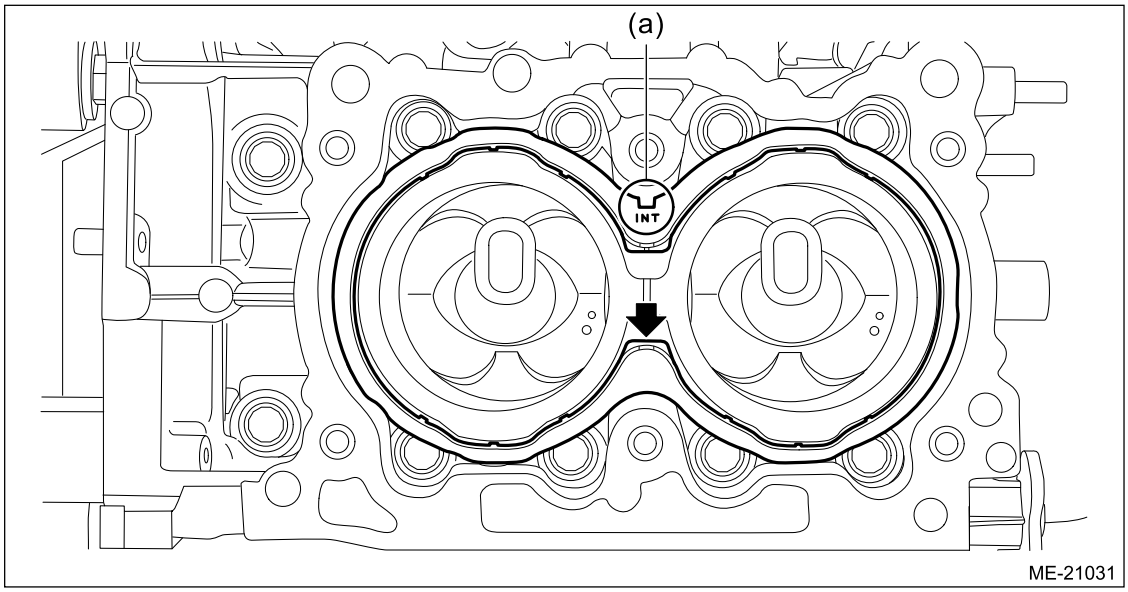
1. CYLINDER HEAD RH

1. Set the part so that the cylinder block RH is on the upper side.

2. Install the water jacket spacer to the cylinder block RH.

Note:

When installing a water jacket spacer, make sure that the notch (a) comes to the intake side.



3. Clean the bolt holes in the cylinder block RH.

Caution:

To avoid erroneous tightening of the bolts, clean out the bolt holes sufficiently by blowing with compressed air to eliminate engine coolant etc.

4. Apply liquid gasket to both sides of new cylinder head gasket RH as shown in the figure.

Note:

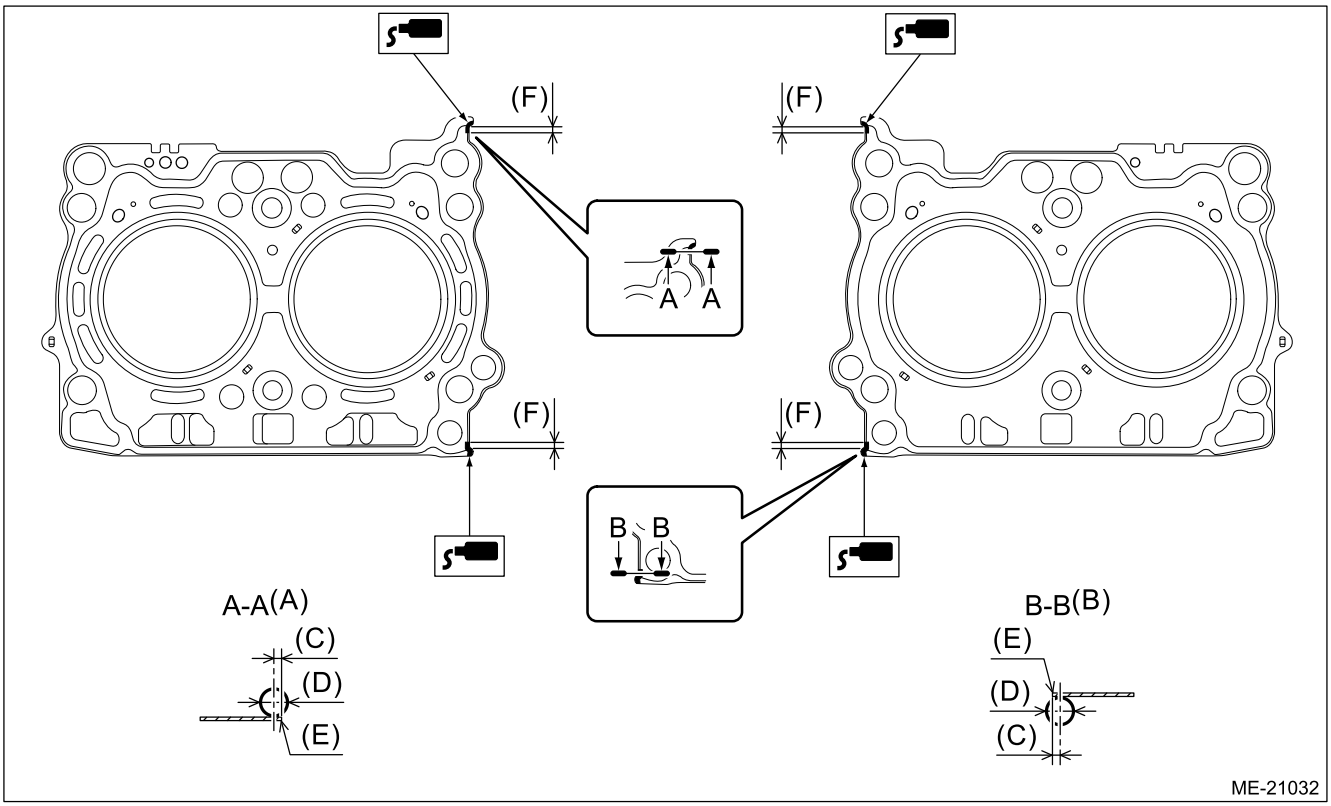
- **Before applying liquid gasket, degrease the mating surface of cylinder blocks RH and cylinder head RH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

3±1 mm (0.1181±0.0394 in)



(A) Liquid gasket applying position to the cylinder head side

(B) Liquid gasket applying position to the cylinder block side

(C) Within 1 mm (0.0394 in)

(D) ⌀3±1 mm (0.1181±0.0394 in)

(E) Cylinder head gasket edge

(F) Overlap margin of bead end and liquid gasket: 3 — 10 mm (0.1181 — 0.3937 in)

5. Attach the cylinder head gasket RH.

Note:

Check that liquid gasket RH is squeezed out from the cylinder head gasket.

6. Install the cylinder head RH to the cylinder block RH.

Caution:

Be careful not to scratch the mating surface of cylinder head RH and cylinder block RH.

(1) Clean the cylinder head bolt threads and apply sufficient engine oil to the washer and cylinder head bolts threads.

(2) Mount the cylinder head RH onto the cylinder block RH, and tighten all cylinder head bolts with a torque of 29 N·m (3.0 kgf-m, 21.4 ft-lb) in numerical order as shown in the figure.

(3) Tighten all cylinder head bolts further with a torque of 100 N·m (10.2 kgf-m, 73.8 ft-lb) in numerical order as shown in the figure.

Caution:

If the bolt makes stick-slip sound during tightening, repeat the procedure from step 3). In that case, the cylinder head gasket RH can be reused. But it is necessary to remove liquid gasket completely from cylinder block RH, cylinder head RH and cylinder head gasket RH and re-apply to them.

(4) Loosen all cylinder head bolts by 180° in the reverse order of tightening in step (3).

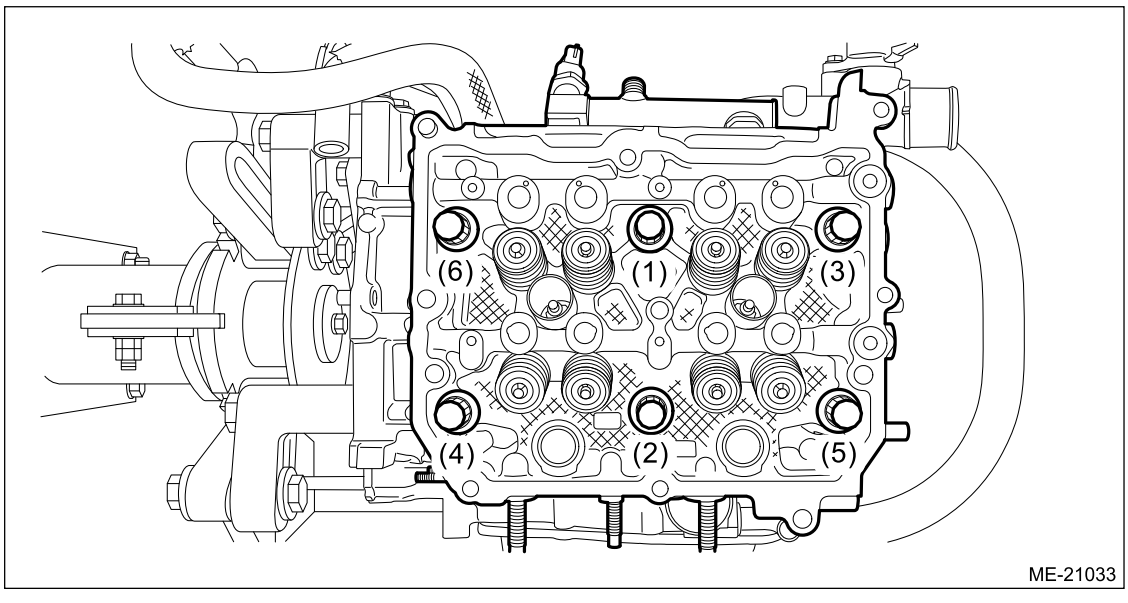
(5) Once again, loosen all cylinder head bolts by 180° in the reverse order of tightening in step (3).

(6) Tighten all cylinder head bolts with a torque of 42 N·m (4.3 kgf-m, 31.0 ft-lb) in numerical order as shown in the figure.

(7) Using an angle gauge, tighten all cylinder head bolts by 78° — 82° in numerical order as shown in the figure.

(8) Using an angle gauge, tighten the cylinder head bolts (2 places) by 73° — 77° in the order of (1) →(2) as shown in the figure.

(9) Using an angle gauge, tighten the cylinder head bolts (4 places) by 28° — 32° in the order of (3) → (4) → (5) → (6) as shown in the figure.



7. Set the part so that the installation surface of the intake manifold is on the upper side.

8. When the cylinder head RH has been disassembled

Note:

When the cylinder head RH has been disassembled, perform the following steps also.

(1) Install the fuel injector RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSTALLATION > FUEL INJECTOR RH.

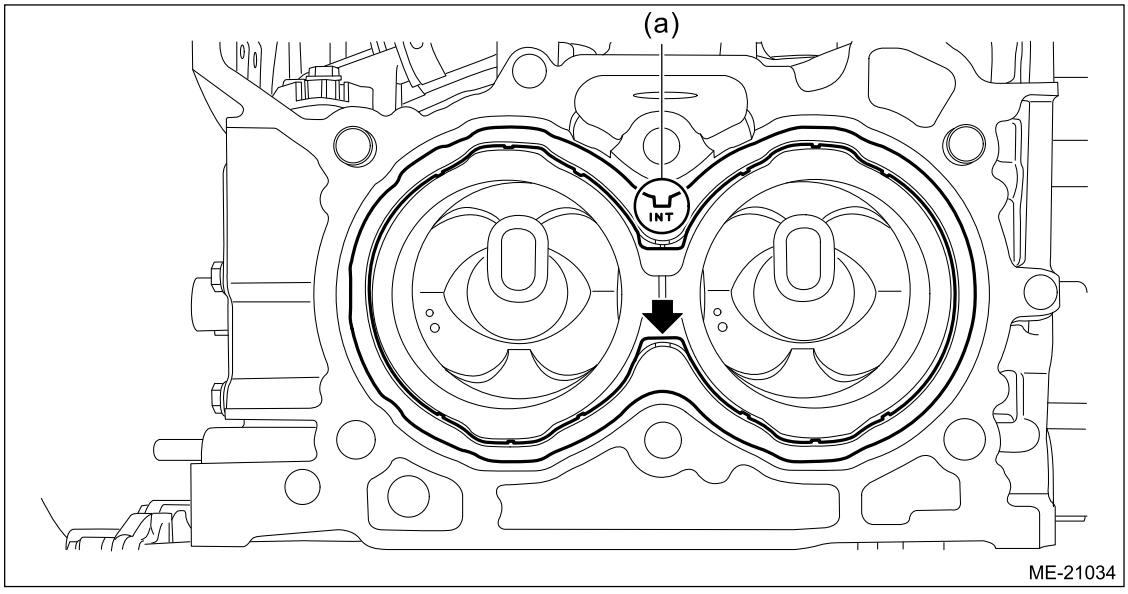
9. Install the EGR cooler. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Cooler>INSTALLATION.
10. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.
11. Install the cam carrier RH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER RH.
12. Install the rocker cover RH. Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION > ROCKER COVER RH.
13. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.
14. Install the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>INSTALLATION.
15. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
16. Install the engine to the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.

2. CYLINDER HEAD LH

1. Set the part so that the cylinder block LH is on the upper side.
2. Install the water jacket spacer to the cylinder block LH.

Note:

When installing a water jacket spacer, make sure that the notch (a) comes to the intake side.



3. Clean the bolt holes in the cylinder block LH.

Caution:

To avoid erroneous tightening of the bolts, clean out the bolt holes sufficiently by blowing with compressed air to eliminate engine coolant etc.

4. Apply liquid gasket to both sides of new cylinder head gasket LH as shown in the figure.

Note:

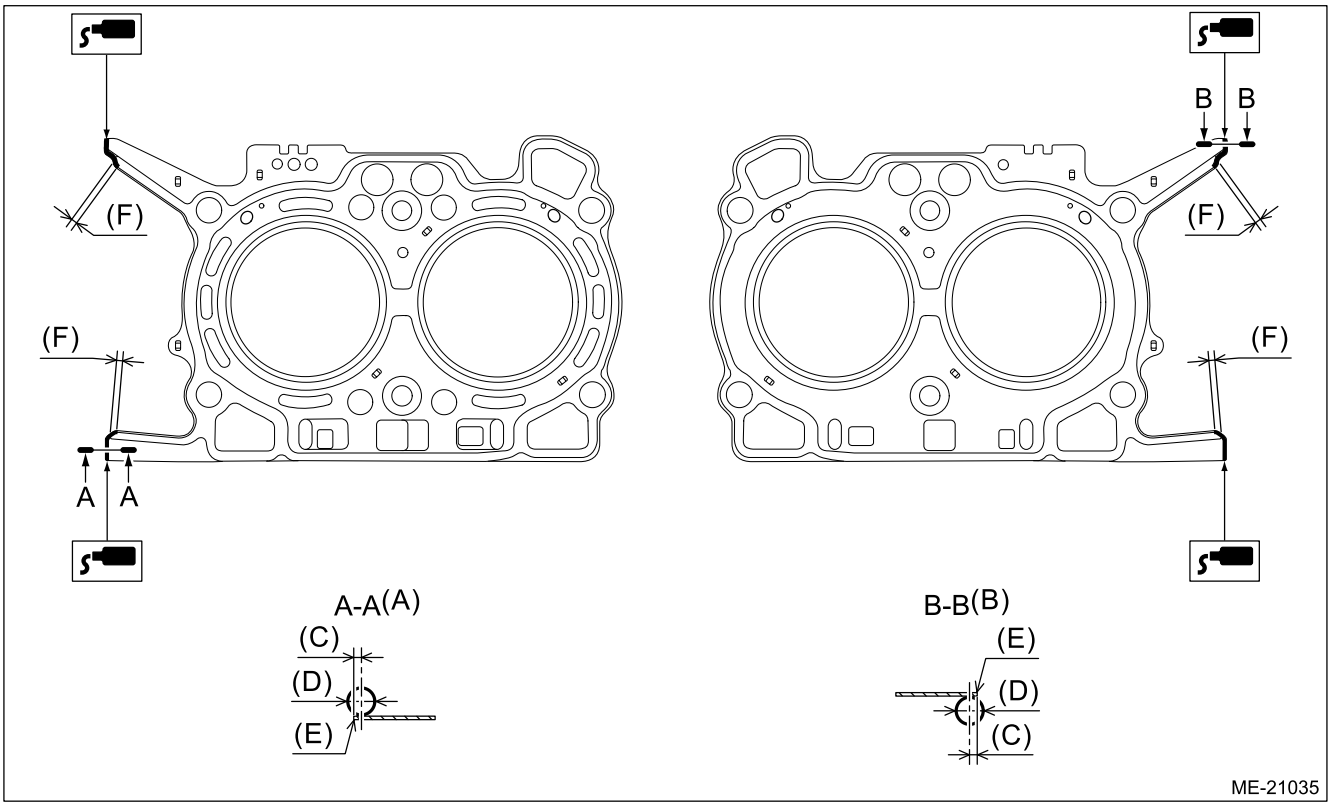
- **Before applying liquid gasket, degrease the mating surface of cylinder blocks LH and cylinder head LH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

3±1 mm (0.1181±0.0394 in)



(A) Liquid gasket applying position to the cylinder head side

(B) Liquid gasket applying position to the cylinder block side

(C) Within 1 mm (0.0394 in)

(D) ⌀3±1 mm (0.1181±0.0394 in)

(E) Cylinder head gasket edge

(F) Overlap margin of bead end and liquid gasket: 3 — 10 mm (0.1181 — 0.3937 in)

5. Attach the cylinder head gasket LH.

Note:

Check that liquid gasket is squeezed out from the cylinder head gasket LH.

6. Install the cylinder head LH to the cylinder block LH.

Caution:

Be careful not to scratch the mating surface of cylinder head LH and cylinder block LH.

(1) Clean the cylinder head bolt threads and apply sufficient engine oil to the washer and cylinder head bolts threads.

(2) Mount the cylinder head LH onto the cylinder block LH, and tighten all cylinder head bolts with a torque of 29 N·m (3.0 kgf-m, 21.4 ft-lb) in numerical order as shown in the figure.

(3) Tighten all cylinder head bolts further with a torque of 100 N·m (10.2 kgf-m, 73.8 ft-lb) in numerical order as shown in the figure.

Caution:

If the bolt makes stick-slip sound during tightening, repeat the procedure from step 3). In that case, the cylinder head gasket LH can be reused. But it is necessary to remove liquid gasket completely from cylinder block LH, cylinder head LH and cylinder head gasket LH and re-apply to them.

(4) Loosen all cylinder head bolts by 180° in the reverse order of tightening in step (3).

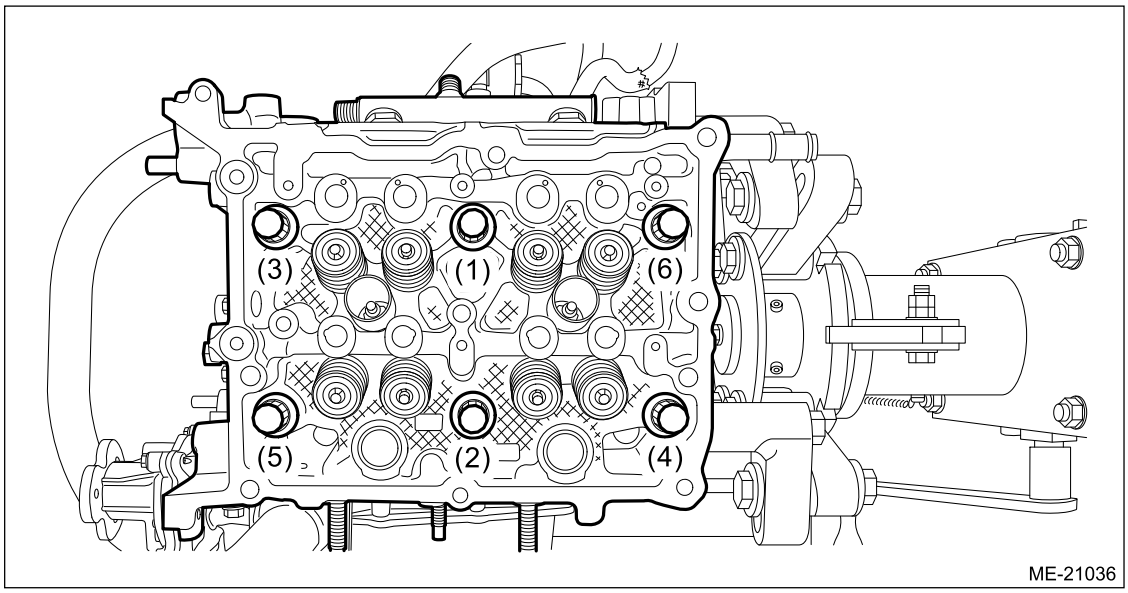
(5) Once again, loosen all cylinder head bolts by 180° in the reverse order of tightening in step (3).

(6) Tighten all cylinder head bolts with a torque of 42 N·m (4.3 kgf-m, 31.0 ft-lb) in numerical order as shown in the figure.

(7) Using an angle gauge, tighten all cylinder head bolts by 78° — 82° in numerical order as shown in the figure.

(8) Using an angle gauge, tighten the cylinder head bolts (2 places) by 73° — 77° in the order of (1) →(2) as shown in the figure.

(9) Using an angle gauge, tighten the cylinder head bolts (4 places) by 28° — 32° in the order of (3) → (4) → (5) → (6) as shown in the figure.



7. Set the part so that the installation surface of the intake manifold is on the upper side.

8. When the cylinder head LH has been disassembled

Note:

When the cylinder head LH has been disassembled, perform the following steps also.

(1) Install the fuel injector LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSTALLATION > FUEL INJECTOR LH.

9. Install the high-pressure fuel delivery pipe assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Delivery Pipe>INSTALLATION > HIGH-PRESSURE FUEL DELIVERY PIPE ASSEMBLY.

10. Install the cam carrier LH. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION > CAM CARRIER LH.

11. Install the rocker cover LH. Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION > ROCKER COVER LH.

12. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.

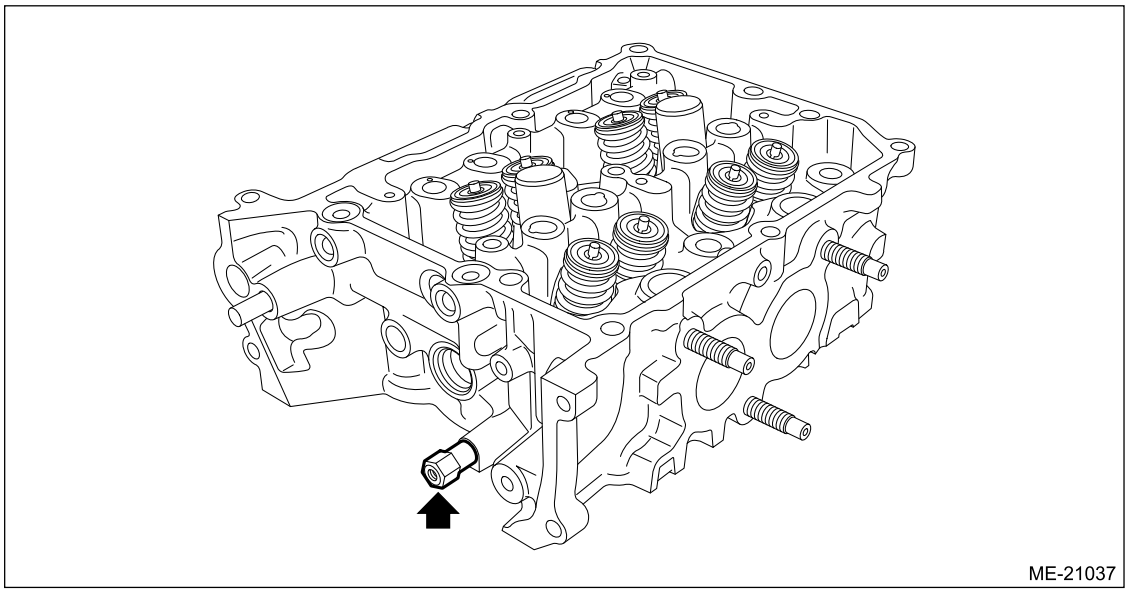
13. Install the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>INSTALLATION.

14. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.

15. Install the engine to the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.

DISASSEMBLY

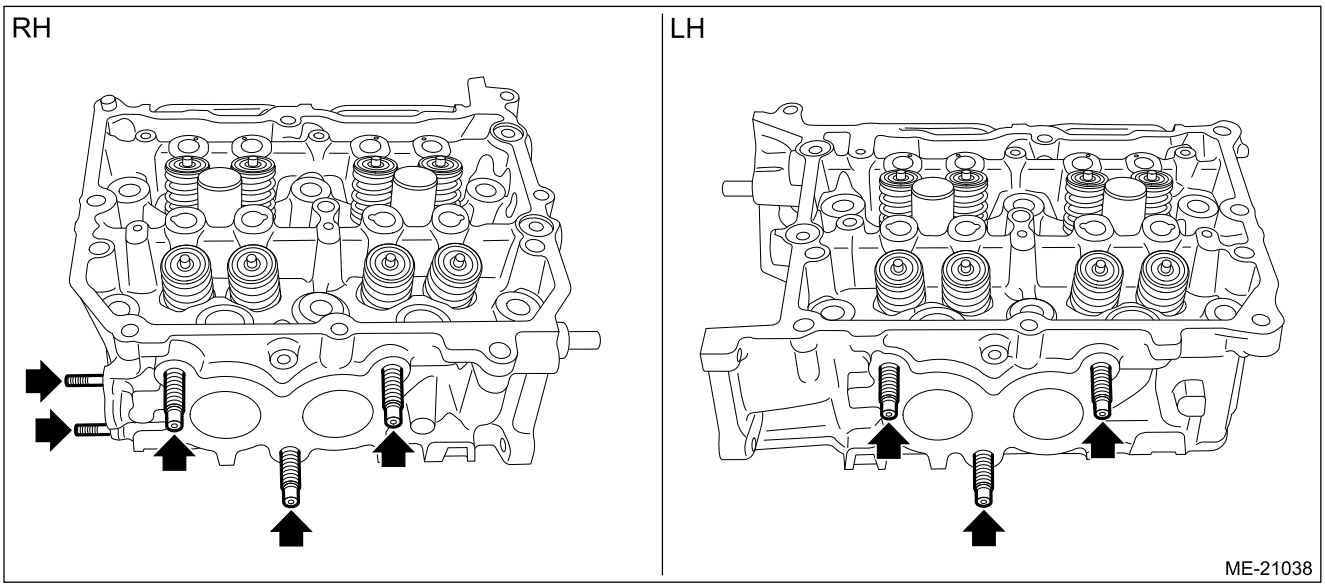
1. Remove the chain cover securing bolt from the cylinder head LH.



2. Remove the stud bolts from the cylinder head.

Note:

Remove if necessary.



3. Remove the valve collet, valve, valve spring retainer, valve spring and valve spring seat from the cylinder head RH.

Warning:

Metallic sodium is encapsulated in the exhaust valve. Metallic sodium is a strong alkaline material and thus prone to serious chemical reaction. When handling or disposing of the valve, be sure to confirm "DISPOSAL". Ref. to MECHANICAL(H4DO)>Cylinder Head>DISPOSAL.

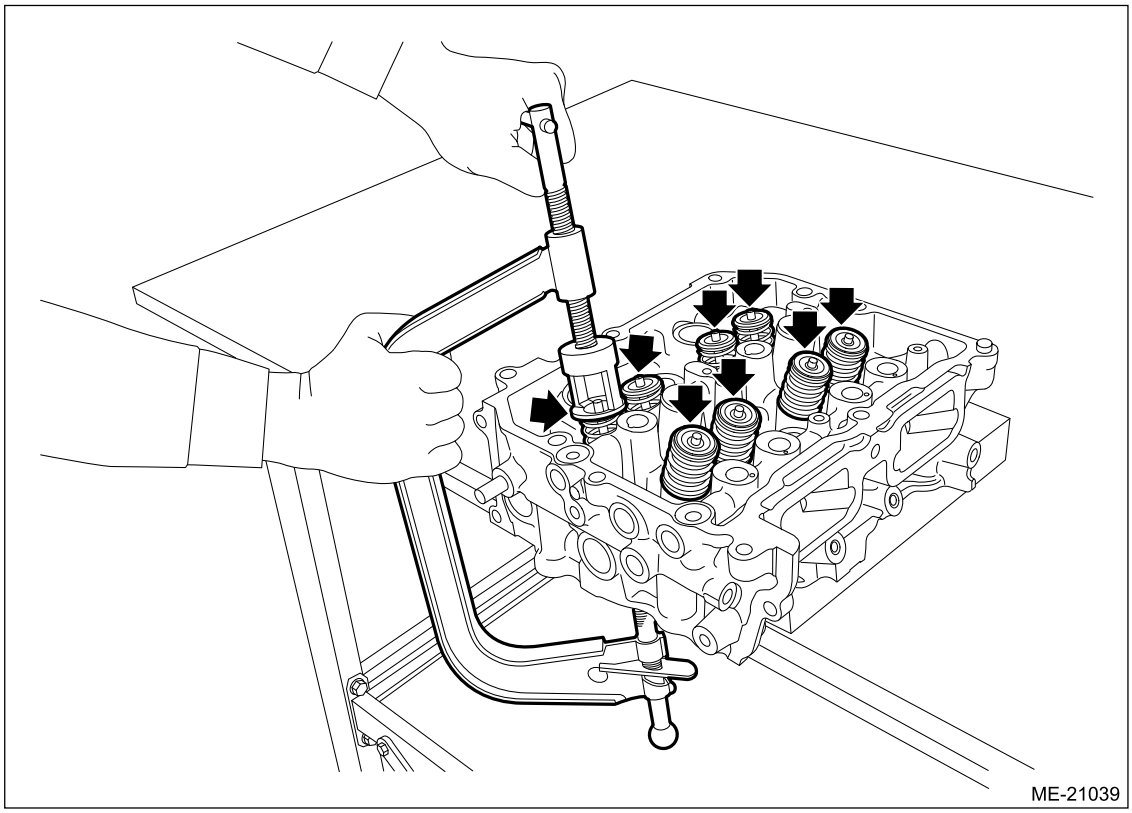
Caution:

During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head RH.

Note:

- **Mark each part to prevent confusion.**
- **Keep all the removed parts in order for re-installing in their original positions.**

(1) Using valve spring compressor, compress the valve spring and remove the valve collet.



(2) Remove valve, valve spring retainer, valve spring and valve spring seat.

4. Remove the valve collet, valve, valve spring retainer, valve spring and valve spring seat from the cylinder head LH.

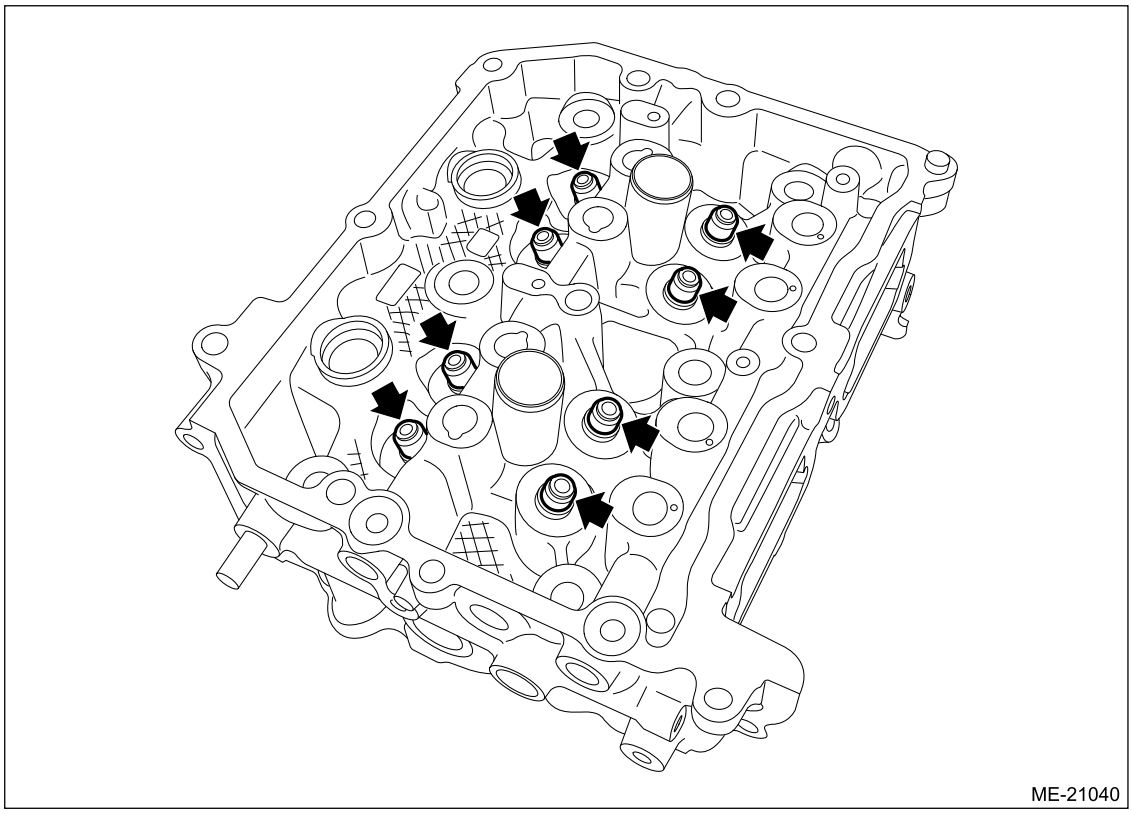
5. Remove the valve oil seals from valve guides of cylinder head RH.

Caution:

- **During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head RH.**
- **Use special care not to damage the cylinder head RH and guide during work.**

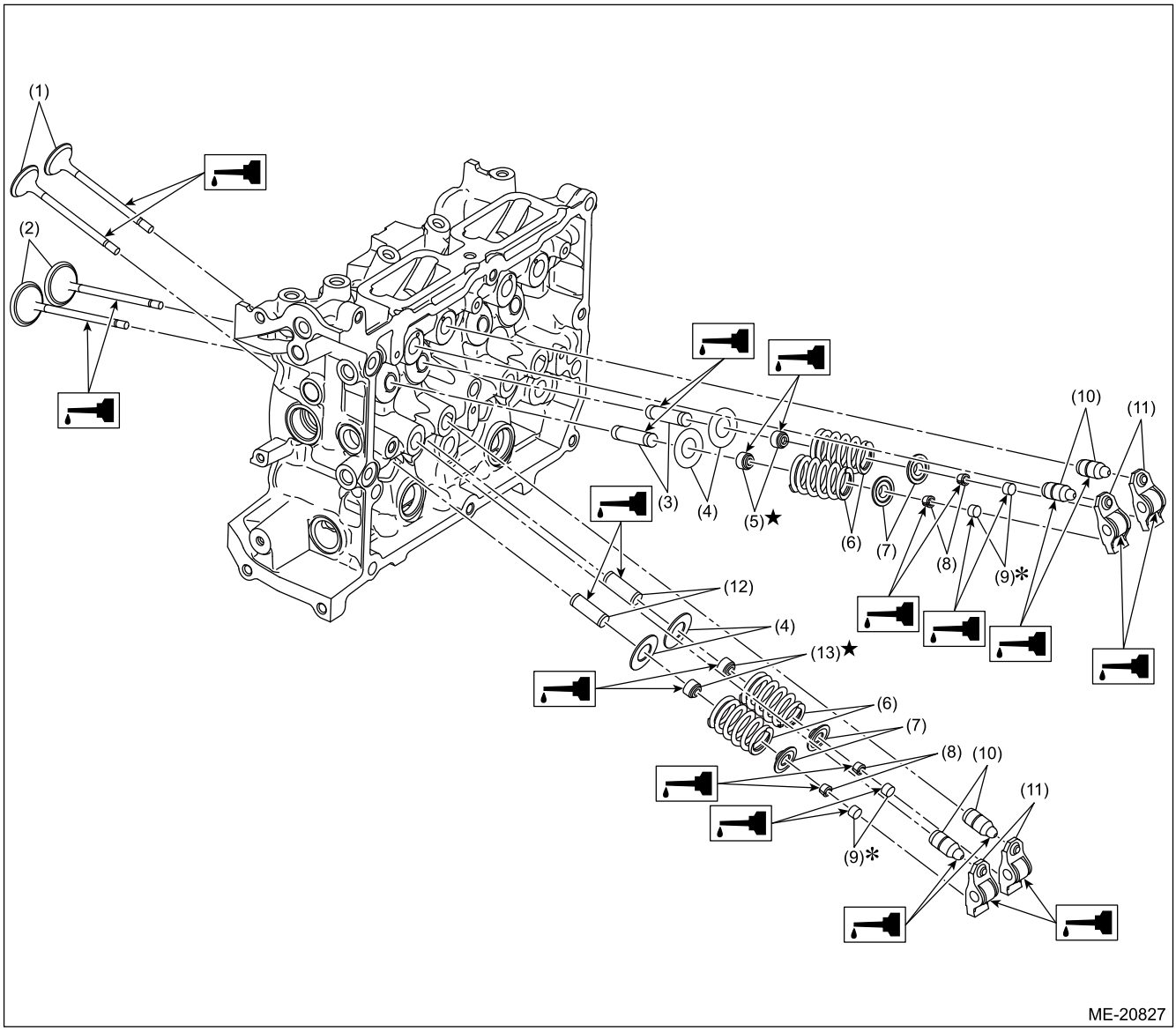
Note:

For removal of valve guide, refer to INSPECTION. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE & VALVE GUIDE.



6. For cylinder head LH, remove the valve oil seal in the same manner.

ASSEMBLY



(1) Exhaust valve
(2) Intake valve
(3) Intake valve guide
(4) Valve spring seat
(5) Intake valve oil seal
(6) Valve spring
(7) Valve spring retainer
(8) Valve collet
(9) Valve shim
(10) Roller rocker arm pivot
(11) Roller rocker arm
(12) Exhaust valve guide
(13) Exhaust valve oil seal

1. Using the ST, install new valve oil seals to valve guides of cylinder head RH.

Caution:

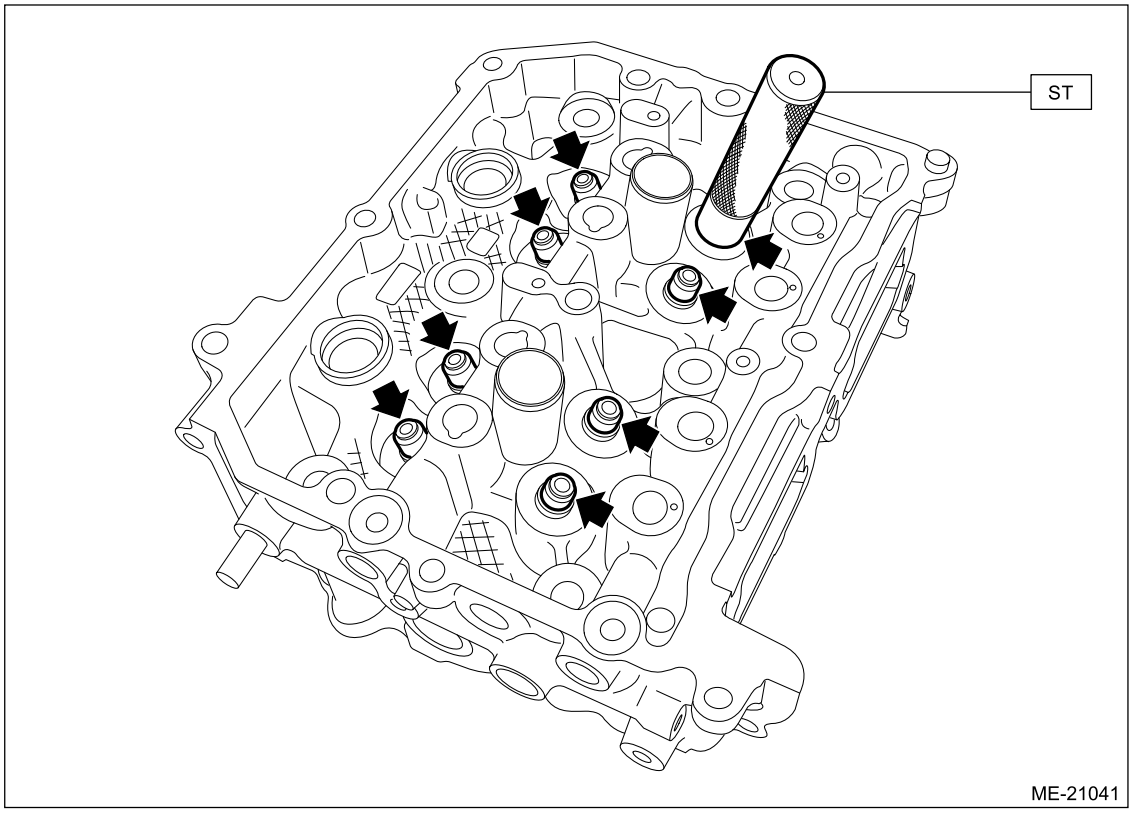
- **During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head RH.**
- **Use special care not to damage the cylinder head RH and guide during work.**
- **When installing the valve oil seal, press the ST with hands to install it and never drive the ST with a plastic hammer, otherwise the valve oil seal can be damaged.**

Note:

- **Apply engine oil to valve oil seal before installing.**
- **The intake valve oil seals and exhaust valve oil seals are distinguished by their colors.**
  Identification colors:
  Intake [Gray]
  Exhaust [Light green]
- **For installation of valve guide, refer to INSPECTION. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE & VALVE GUIDE.**

Preparation tool:

ST: VALVE OIL SEAL GUIDE (18261AA010)



2. For cylinder head LH, install the valve oil seal in the same manner.
3. Install the valve spring seat, valve spring, valve spring retainer, valve and valve collet to the cylinder head RH.

Caution:

During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head RH.

(1) Set the valve spring seat, valve spring and valve spring retainer onto the cylinder head RH.

Note:

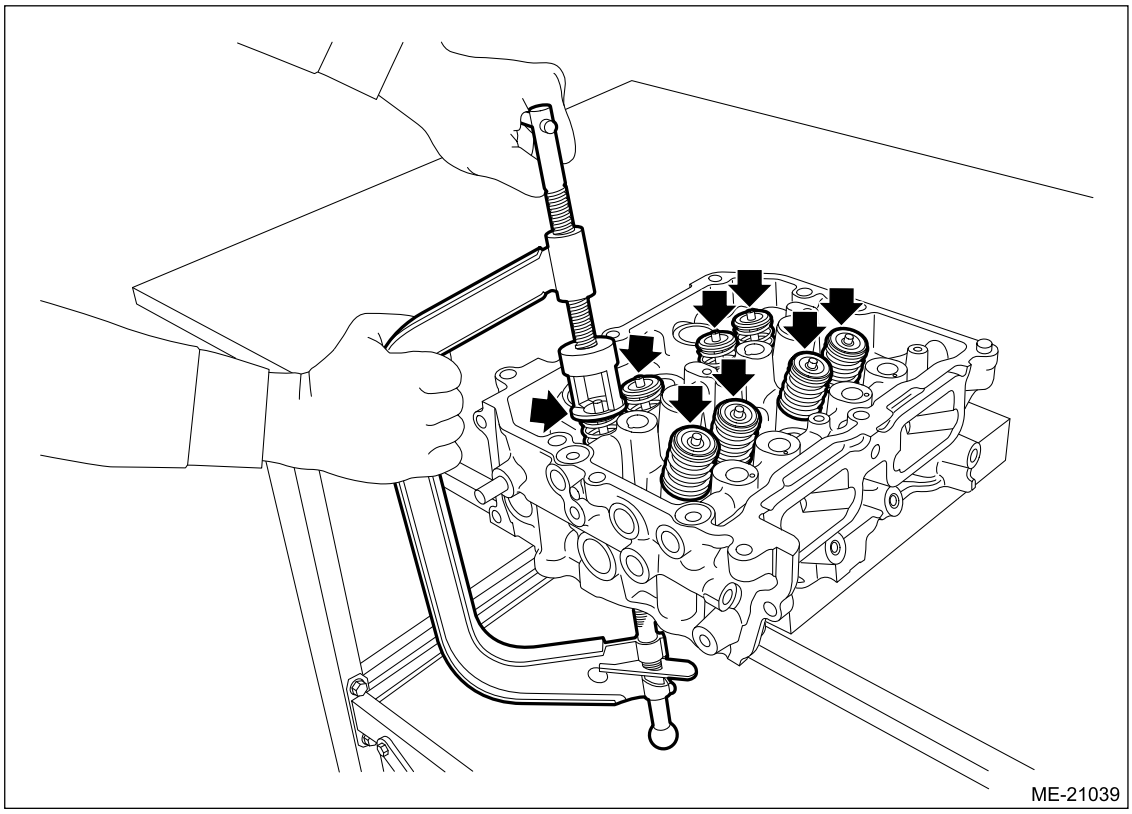
Be sure to install the valve spring with its larger diameter end facing the cylinder head side.

(2) Coat the valve stem of each valve with engine oil and insert the valve into valve guide.

Note:

When inserting the valve into valve guide, use special care not to damage the oil seal lip.

(3) Using valve spring compressor, compress the valve spring and install the valve collet.

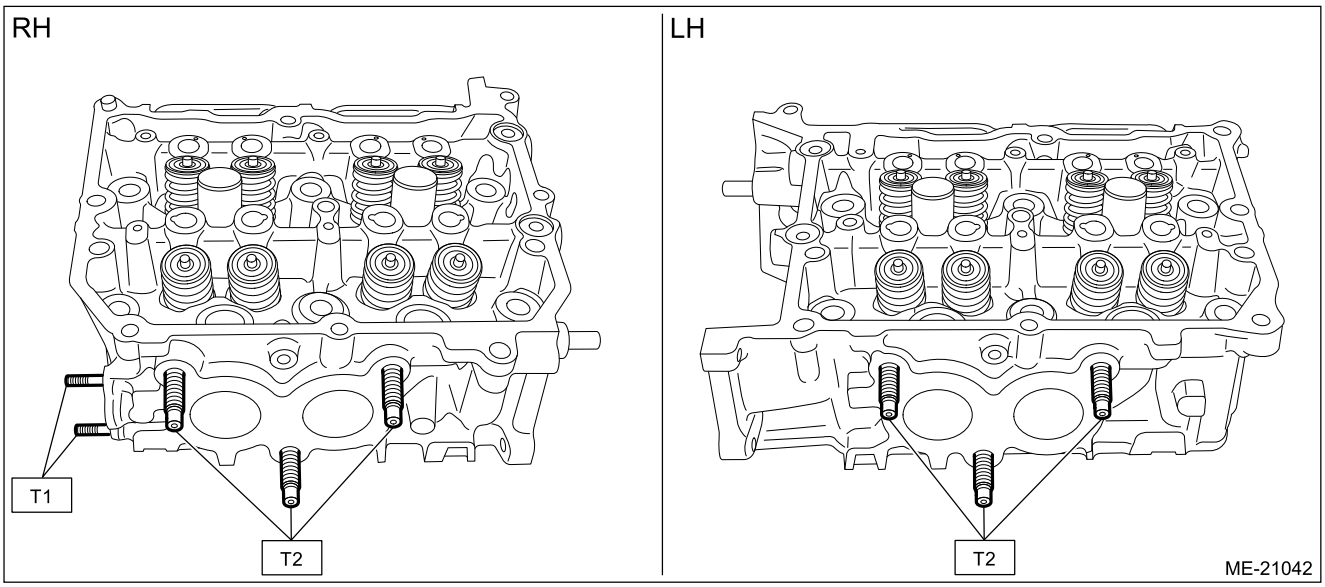


4. Install the valve spring seat, valve spring, valve spring retainer, valve and valve collet to the cylinder head LH.
5. Lightly tap the valve spring retainer with a plastic hammer, and make sure that the valve collet is securely attached.
6. Install the stud bolts onto cylinder heads.

   Tightening torque:

   T1: 6.4 N·m (0.7 kgf-m, 4.7 ft-lb)

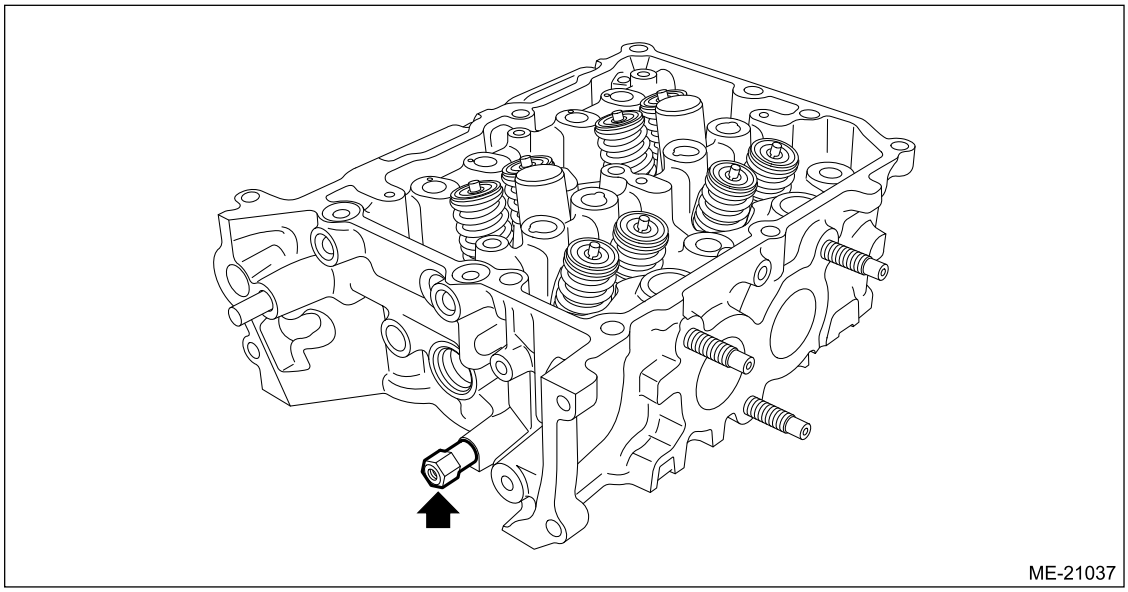
   T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)



7. Install the chain cover securing bolt to the cylinder head LH.

   Tightening torque:

   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



INSPECTION

1. CYLINDER HEAD

1. Visually inspect to make sure that there are no cracks, scratches or other damage.
2. Use liquid penetrant tester on the important sections to check for fissures.
3. Check that there are no marks of gas leaking or water leaking on gasket attachment surface.
4. Check the warping of the cylinder head mating surface that mates with cylinder block at the locations shown in the figure using a straight edge (A) and thickness gauge (B). If it exceeds the limit, correct the surface by grinding it with a surface grinder or replace the cylinder head.

   Note:
   - **Measurement should be performed at a temperature of 20°C (68°F).**
   - **If there is warpage on the cylinder head mating surface, the cylinder head bolt tightening torque and angle tightening may be improper. When installing the cylinder head, make sure that tightening torque and angle tightening work is performed precisely according to the operation procedures.**
   - **When the cylinder head is replaced, lap each valve. Refer to "VALVE SEAT" for lapping.**
     Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.

   Cylinder head warpage:

   Limit

   0.020 mm (0.0008 in)

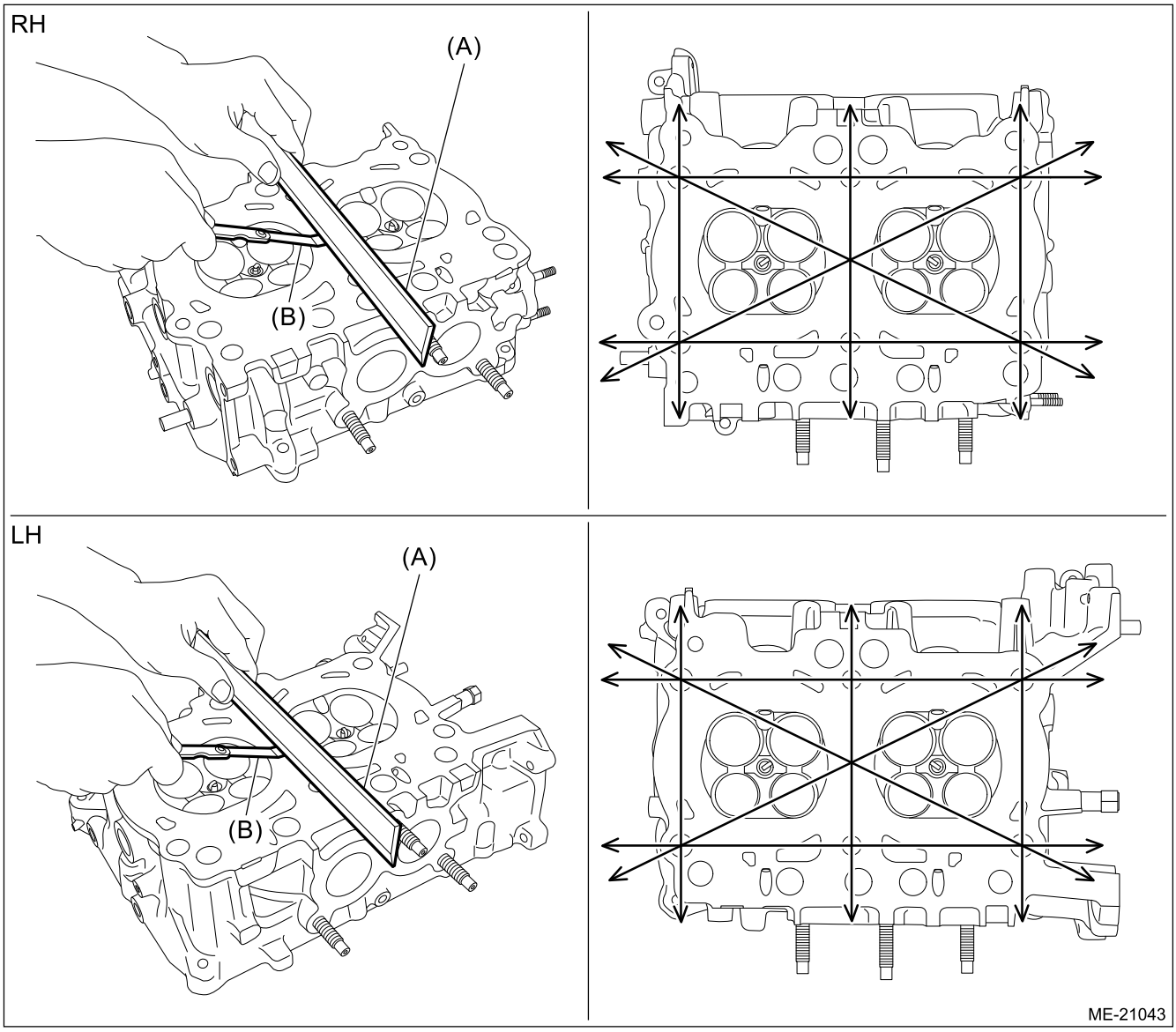
   Cylinder head grinding limit:

   98.45 mm (3.8760 in) or less

   Cylinder head height:

   Standard

   98.5 mm (3.8779 in)



2. VALVE & VALVE GUIDE

Warning:

Metallic sodium is encapsulated in the exhaust valve. Metallic sodium is a strong alkaline material and thus prone to serious chemical reaction. When handling or disposing of the valve, be sure to confirm "DISPOSAL". Ref. to MECHANICAL(H4DO)>Cylinder Head>DISPOSAL.

1. Check the valve flange and stem for damage, wear or deformation.
2. Measure the thickness "H" of valve head edge as shown in the figure using a caliper gauge. If it is not within the standard, replace the valve.

Note:

- **It is possible to differentiate between the intake valve and the exhaust valve by their overall length.**

  Valve overall length:

  Intake

  104.95 mm (4.1319 in)

  Exhaust

  96.5 mm (3.7992 in)

- **When the valve is replaced, lap the valve. Refer to "VALVE SEAT" for lapping. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.**

Valve head edge thickness H:

Intake (A)

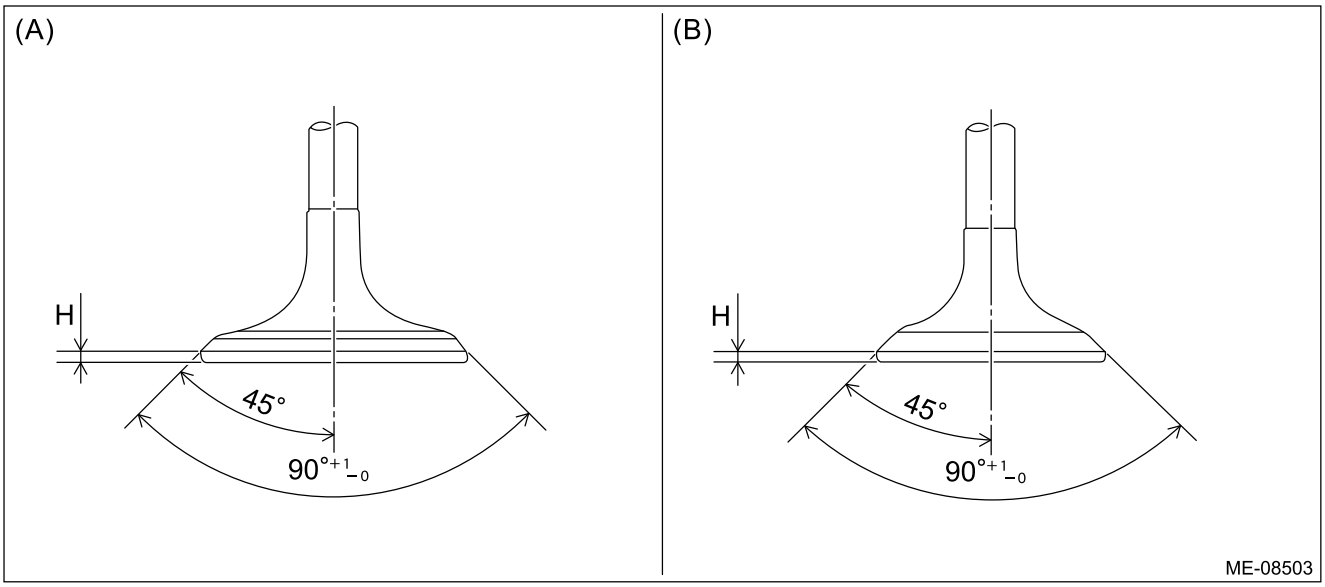
Standard

0.8 — 1.2 mm (0.0315 — 0.0472 in)

Exhaust (B)

Standard

1.0 — 1.4 mm (0.0394 — 0.0551 in)



3. Check the clearance between valve and valve guide. Check the clearance between valve and valve guide by measuring the outer diameter of valve stem and the inner diameter of valve guide respectively.

(1) Measure the outer diameter of valve stem with a micrometer. If it is not within the standard, replace the valve.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the outer diameter of the valve stem at the six locations as shown in the figure, and read the value of most worn location.**
- **When the valve is replaced, lap the valve. Refer to "VALVE SEAT" for lapping. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.**

Valve stem outer diameter:

Intake

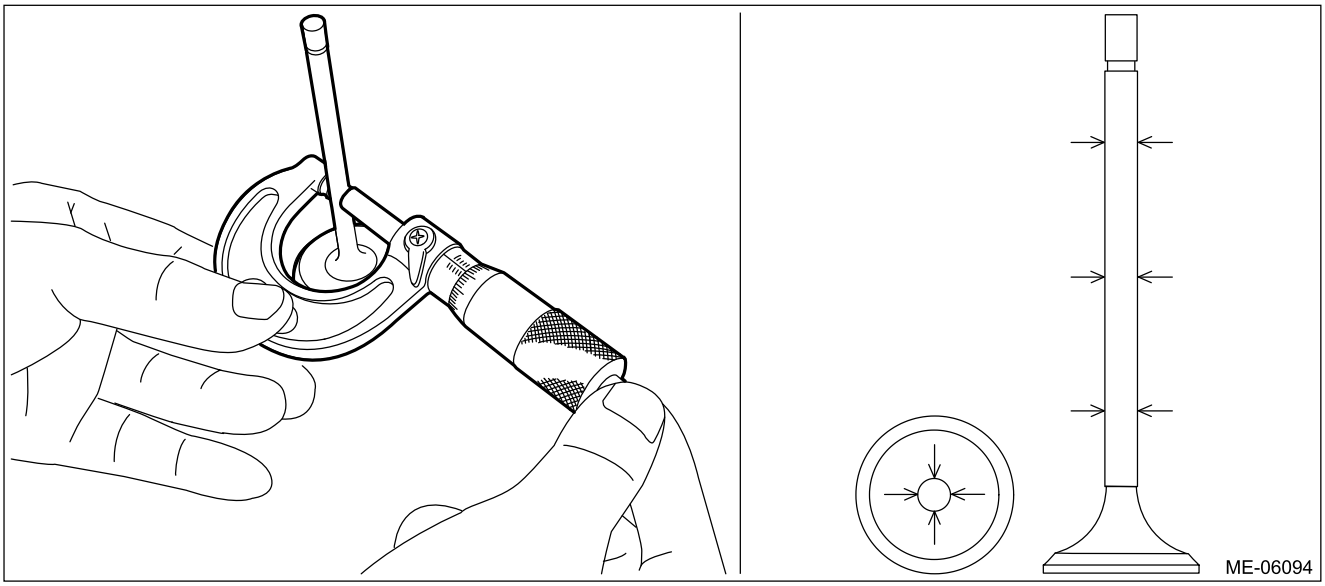
Standard

5.455 — 5.470 mm (0.2148 — 0.2154 in)

Exhaust

Standard

5.445 — 5.460 mm (0.2144 — 0.2150 in)



(2) Using a caliper gauge, measure the inner diameter of valve guide. If it is not within the standard, replace the valve guide. For replacement procedure, refer to step 4).

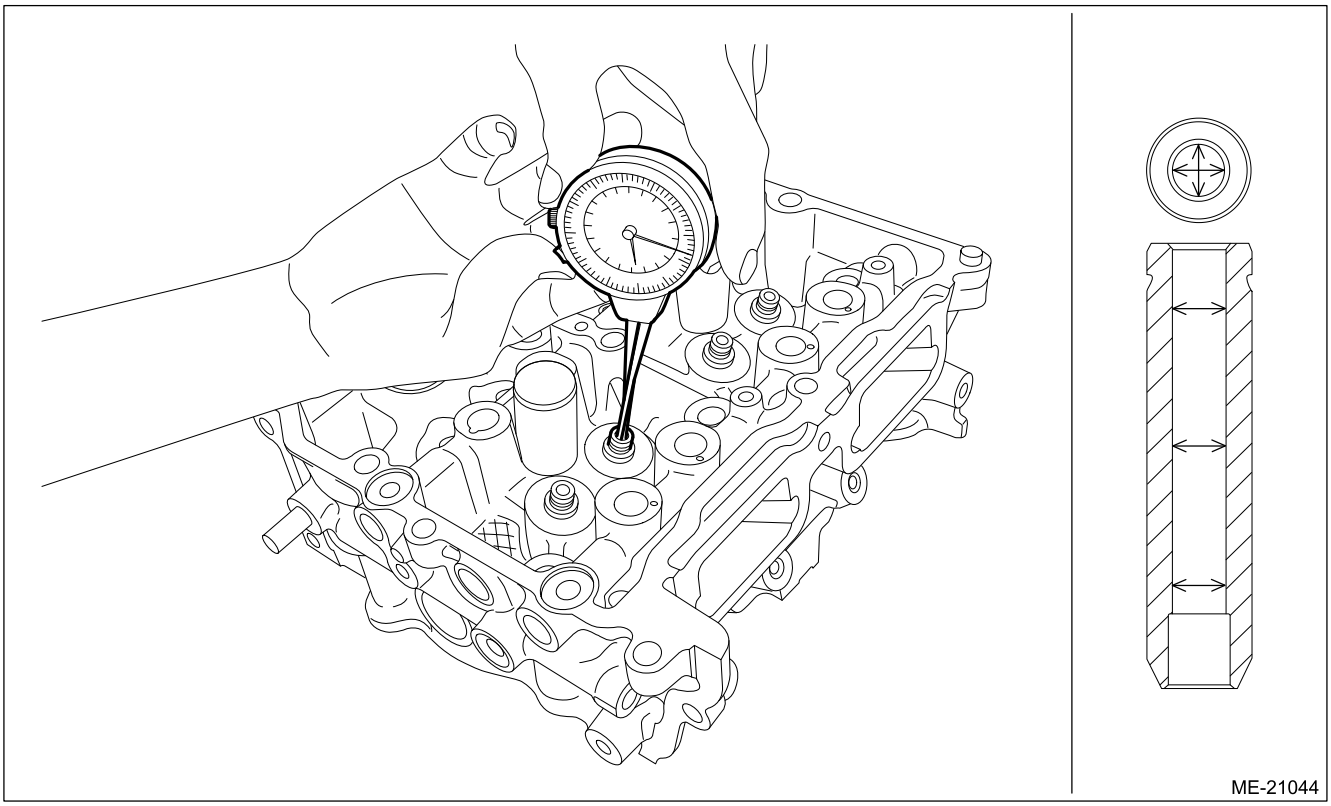
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the inner diameter of the valve guide at the six locations as shown in the figure, and read the value of most worn location.**

Valve guide inner diameter:

Standard

5.500 — 5.512 mm (0.2165 — 0.2170 in)



(3) Calculate the clearance between valve and valve guide.

Clearance between valve and valve guide:

Intake

Standard

0.030 — 0.057 mm (0.0012 — 0.0022 in)

Exhaust

Standard

0.040 — 0.067 mm (0.0016 — 0.0026 in)

4. If the clearance between valve and valve guide exceeds the standard, replace the valve or valve guide, whichever shows the greater amount of wear or damage. For replacement procedure of valve guide, refer to the following.

Note:

When the valve is replaced, lap the valve. Refer to "VALVE SEAT" for lapping. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.

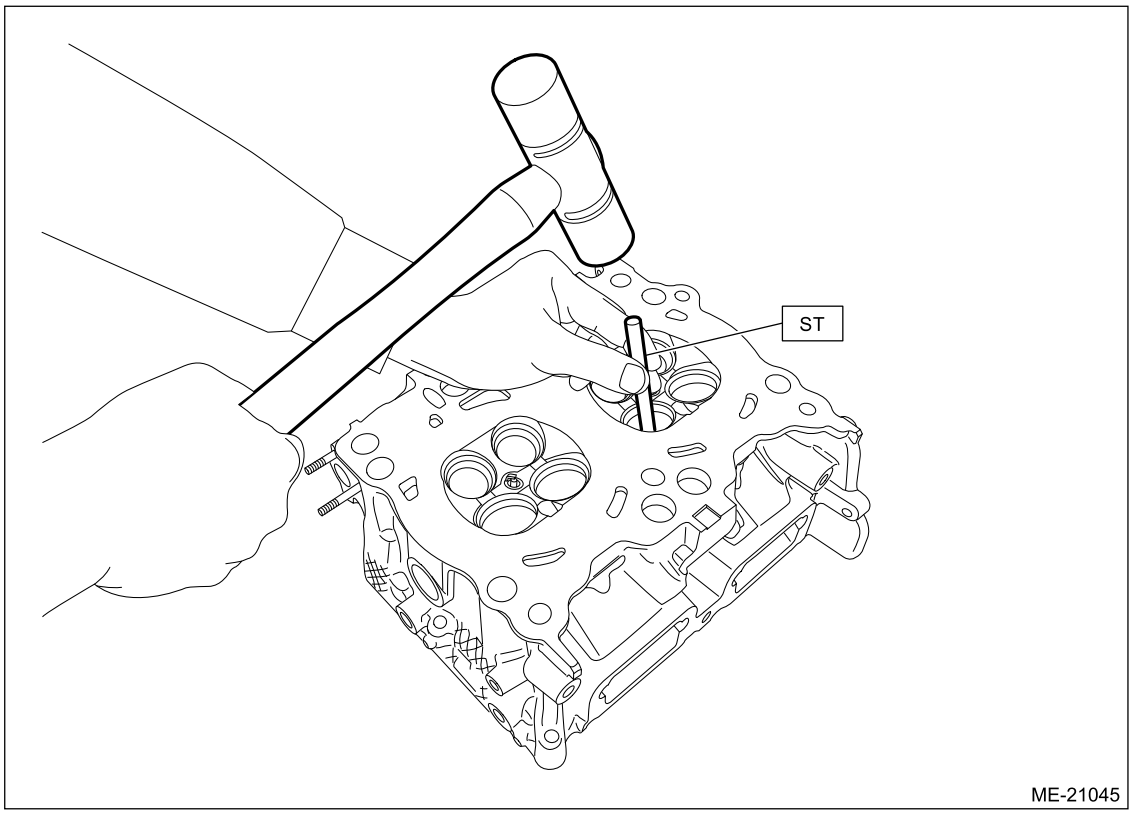
(1) Insert ST into the valve guide with the combustion chamber upward and remove the valve guide using plastic hammer.

Caution:

- **Place a wood board wrapped with a waste cloth to stabilize the cylinder head before work.**
- **Use special care not to damage the cylinder head during work.**
- **Always strike the ST vertically with a plastic hammer. Otherwise, the ST can be damaged.**

Preparation tool:

ST: VALVE GUIDE REMOVER AND INSTALLER (499765700)



(2) Before installing the valve guide, make sure that neither scratches nor damages exist on the inner surface of valve guide installation holes of cylinder head.

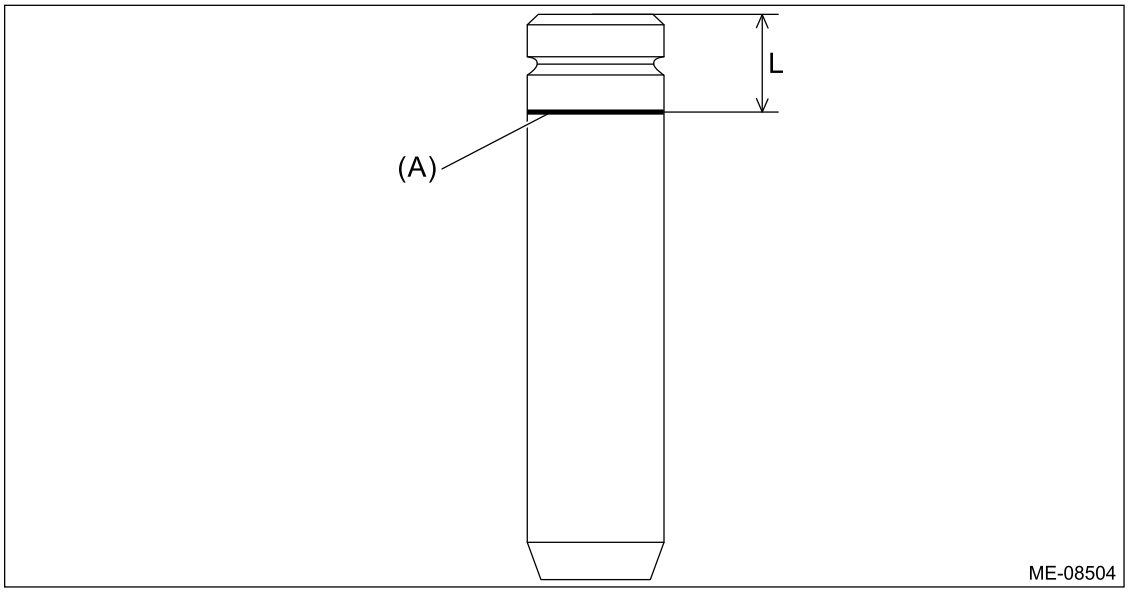
(3) Draw a reference line (A) used for insertion on the valve guide using a marker as shown in the figure.

Note:

A reference line for insert is used as a guide when tapping-in the valve guide.

Valve guide inserting reference line position L:

15 mm (0.5906 in)



(4) Apply a enough coat of engine oil to the valve guide, and set the valve guide on the cylinder head with the combustion chamber downward.

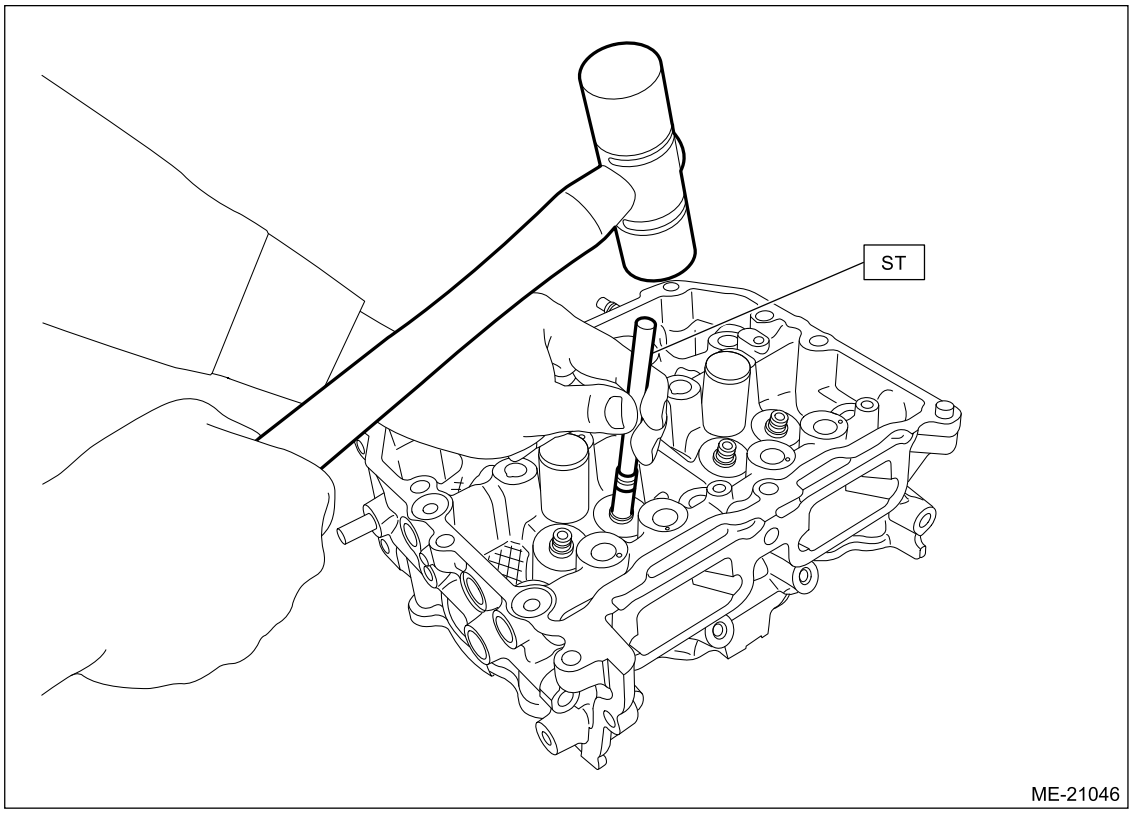
(5) Insert the ST into the valve guide, and tap-in the valve guide to the reference line (A) for insert using plastic hammer.

Caution:

- **During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head.**
- **Use special care not to damage the cylinder head during work.**
- **Always strike the ST vertically with a plastic hammer. Otherwise, the ST can be damaged.**

Preparation tool:

ST: VALVE GUIDE REMOVER AND INSTALLER (499765700)



(6) Measure the valve guide protrusion amount "L" as shown in the figure using a caliper gauge.

Insert the ST into the valve guide again, and tap-in the valve guide so that it is positioned within standard by referring to the measured value using plastic hammer.

Caution:

- **During work, place a waste cloth, etc. to avoid scratching the mating surface of the cylinder head.**
- **Use special care not to damage the cylinder head during work.**
- **Always strike the ST vertically with a plastic hammer. Otherwise, the ST can be damaged.**

Note:

Be careful not to tap-in excessively by repeating the steps of Tapping-in → Measurement → Tapping-in → Measurement ... when installing the valve guide.

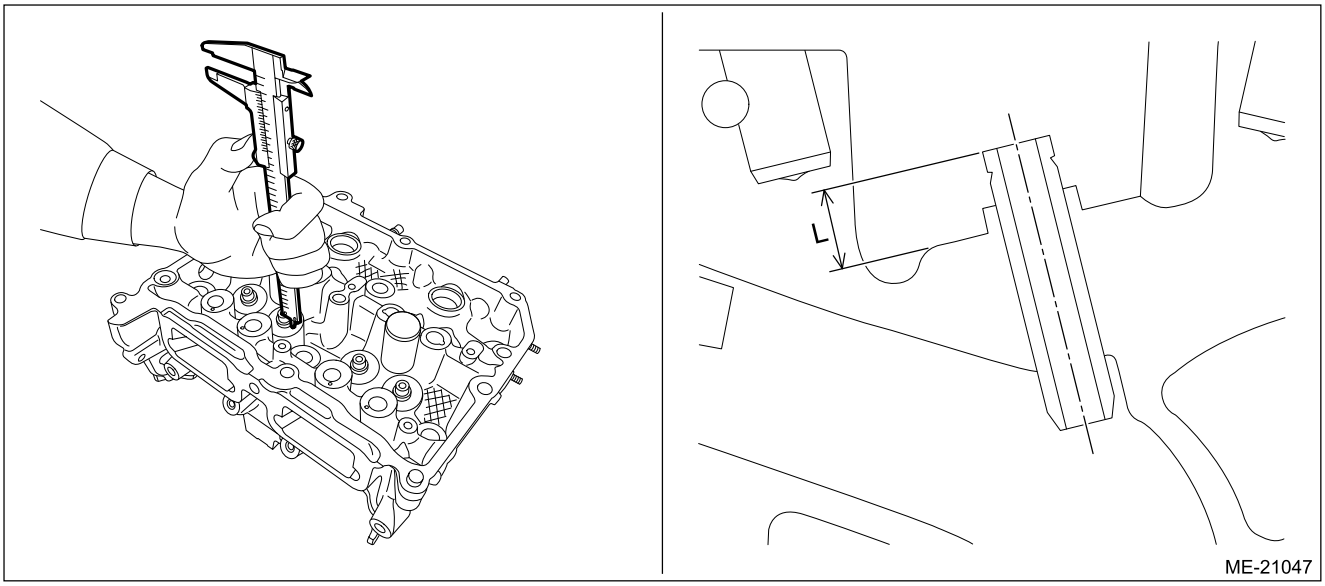
Preparation tool:

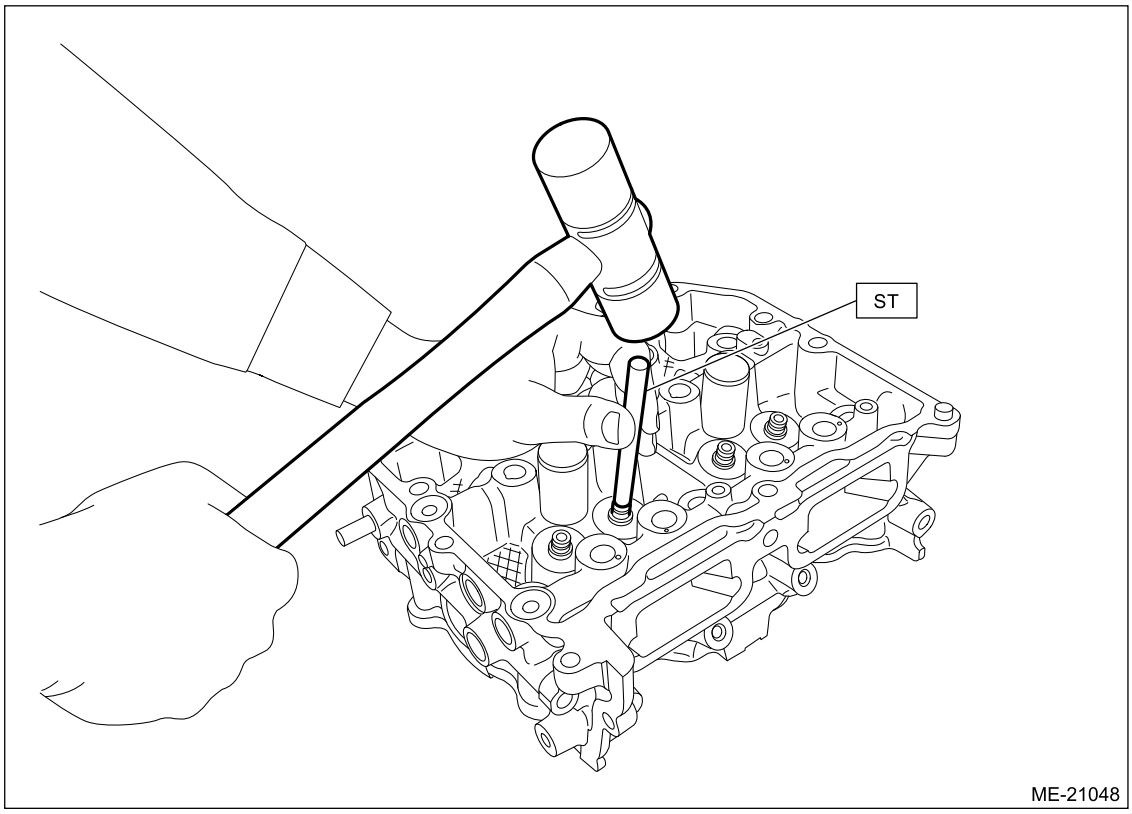
ST: VALVE GUIDE REMOVER AND INSTALLER (499765700)

Valve guide protrusion amount L:

Standard

11.4 — 11.8 mm (0.4488 — 0.4646 in)





(7) Ream the inside of valve guide with the combustion chamber upward using the ST. Put the ST in valve guide, and rotate the ST slowly clockwise while pushing it lightly. Bring the ST back while rotating it clockwise.

Caution:

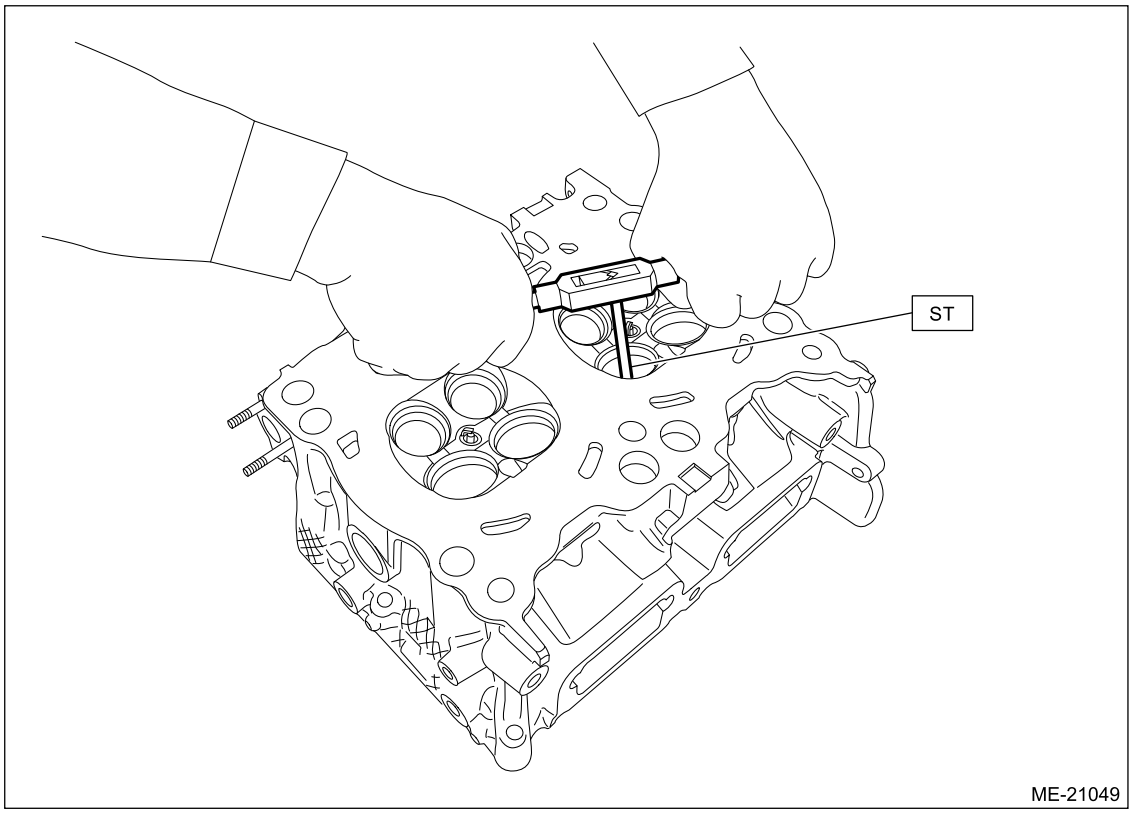
- **Place a wood board wrapped with a waste cloth to stabilize the cylinder head before work.**
- **Use special care not to damage the cylinder head during work.**

Note:

- **Apply engine oil to the ST.**
- **If the inner surface of valve guide is damaged, the edge of ST should be slightly ground with oil stone.**
- **If the inner surface of valve guide becomes lustrous and the ST does not chip, use a new ST or remedy the ST.**

Preparation tool:

ST: VALVE GUIDE REAMER (499765900)



(8) After reaming, clean the valve guide to remove chips.
(9) Check the seating width between valve and valve seat. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.

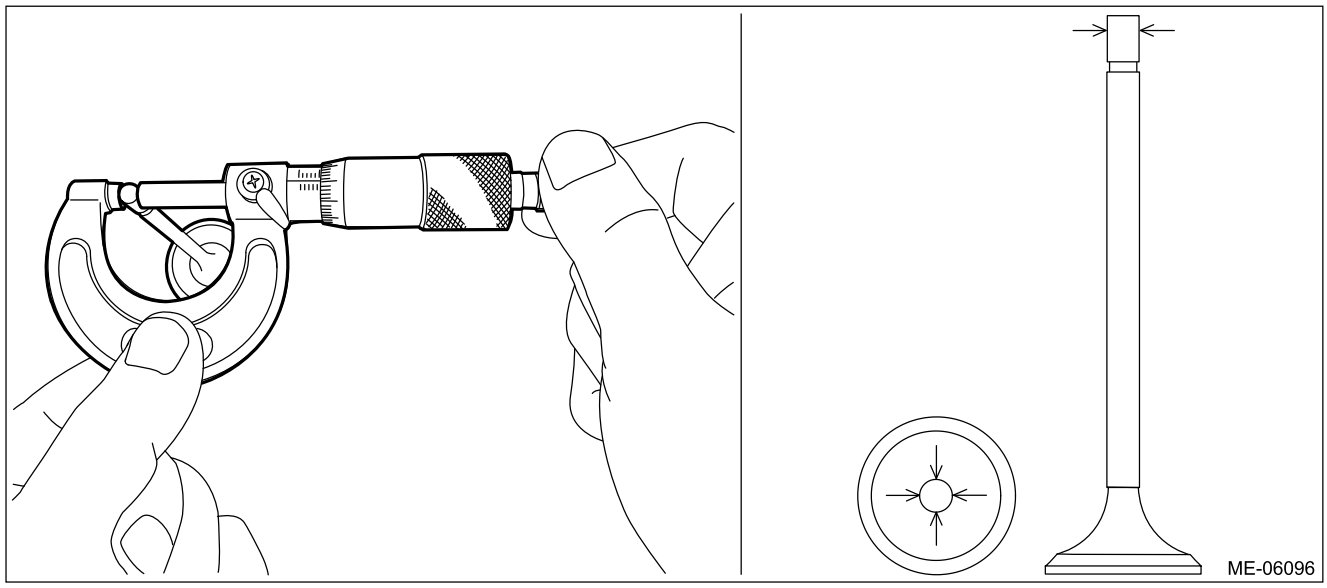
3. VALVE & VALVE SHIM

Warning:
Metallic sodium is encapsulated in the exhaust valve. Metallic sodium is a strong alkaline material and thus prone to serious chemical reaction. When handling or disposing of the valve, be sure to confirm "DISPOSAL". Ref. to MECHANICAL(H4DO)>Cylinder Head>DISPOSAL.

1. Visually check the valve shim for damage.
2. Check the clearance between valve and valve shim. Check the clearance between valve and valve shim by measuring the outer diameter of valve stem end and the inner diameter of valve shim respectively.
   (1) Measure the outer diameter of valve stem end with a micrometer. If it is not within the standard, replace the valve.
   Note:
   - **Measurement should be performed at a temperature of 20°C (68°F).**
   - **Measure the outer diameter of the valve stem end at the two locations as shown in the figure, and read the value of most worn location.**
   - **When the valve is replaced, lap the valve. Refer to "VALVE SEAT" for lapping. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.**

   Valve stem end outer diameter:
   Intake
   Standard
   5.455 — 5.470 mm (0.2148 — 0.2154 in)
   Exhaust
   Standard

5.445 — 5.460 mm (0.2144 — 0.2150 in)



(2) Using a caliper gauge, measure the inner diameter of valve shim. If it is not within the standard, replace the valve shim.

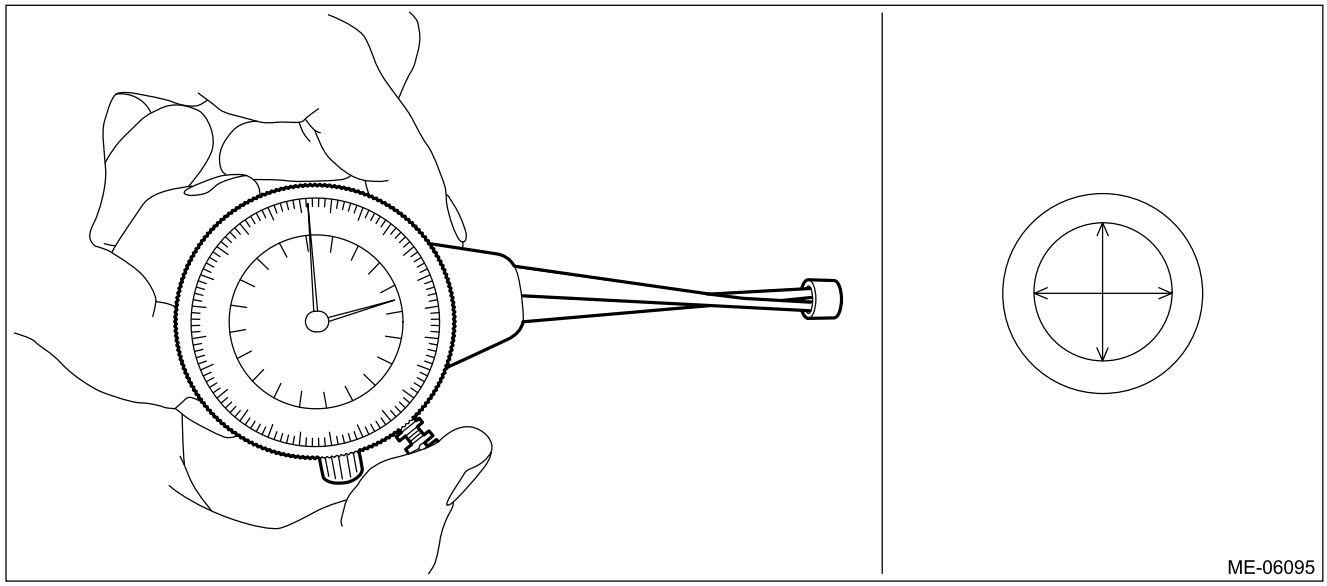
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the inner diameter of the valve shim at the two locations as shown in the figure, and read the value of most worn location.**
- **If the valve shim has to be replaced, check the cam clearance and replace with the suitable valve shim. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.**

Valve shim inner diameter:

Standard

5.500 — 5.560 mm (0.2165 — 0.2189 in)



(3) Calculate the clearance between valve and valve shim. If the clearance exceeds the standard, replace the valve or valve shim, whichever shows the greater amount of wear or damage.

Note:

- **When the valve is replaced, lap the valve. Refer to "VALVE SEAT" for lapping. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION > VALVE SEAT.**
- **If the valve shim has to be replaced, check the cam clearance and replace with the suitable valve shim. Ref. to MECHANICAL(H4DO)>Cam Clearance>INSPECTION > WHEN TIMING CHAIN ASSEMBLY IS REMOVED.**

Clearance between valve and valve shim:

Intake

Standard

0.030 — 0.105 mm (0.0012 — 0.0041 in)

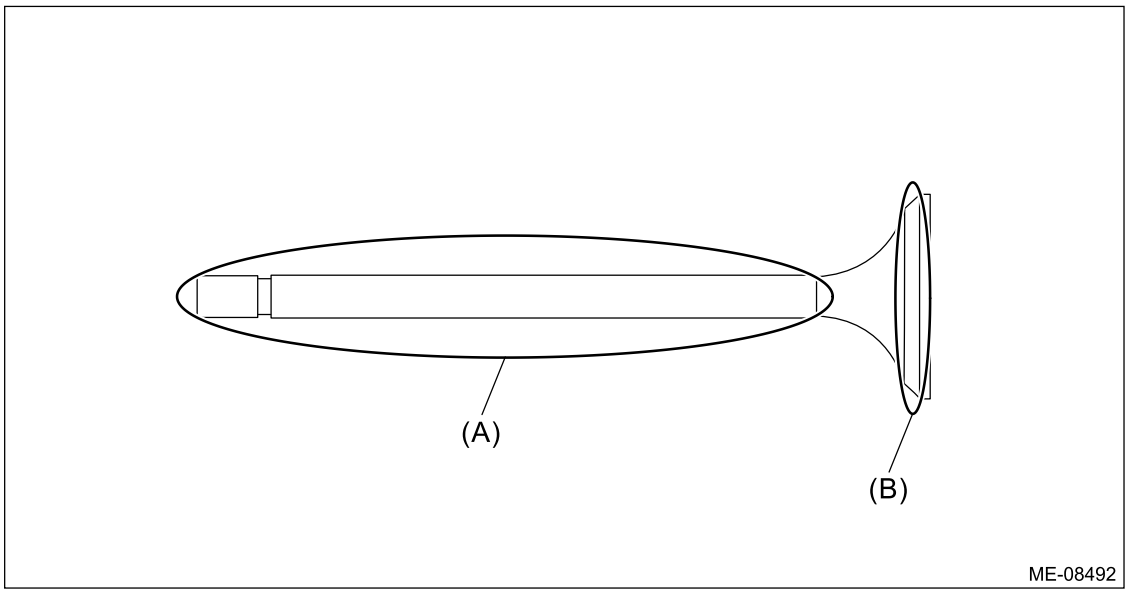
Exhaust

Standard

0.040 — 0.115 mm (0.0016 — 0.0045 in)

4. VALVE SEAT

1. Check the valve seat for damage and deformation.
2. Check the seating width and seating position between valve and valve seat for the intake valve seat and exhaust valve seat.
   (1) Clean the valve and valve seat.
   (2) Coat the stem (A) of the valve lightly with engine oil and apply red dye evenly on the valve face (B).



   (3) Using the valve lapper, slowly insert the valve with red dye applied into the valve guide. Lightly press the valve against the valve seat without turning the valve, and then slowly pull out the valve.
   (4) Check the seating width "W" of valve seat as shown in the figure, using a caliper gauge. Check the seating width "W" between valve and valve seat by measuring the width of red dye on the seating surface of valve seat. If the seating width "W" between valve and valve seat is out of the standard, correct the seating surface of valve seat using the valve seat cutter. For correcting procedures of the valve seat seating surface, refer to step 3).

Note:

- **When the red dye does not appear seamlessly on the valve seat seating surface, lap the valve. For lapping procedure, refer to step 4).**
- **When the red dye does not appear seamlessly on the valve seat seating surface even after lapping the valve, correct the valve seat seating surface using the valve seat cutter. For correcting procedures of the valve seat seating surface, refer to step 3).**

Seating width W between valve and valve seat:

Intake

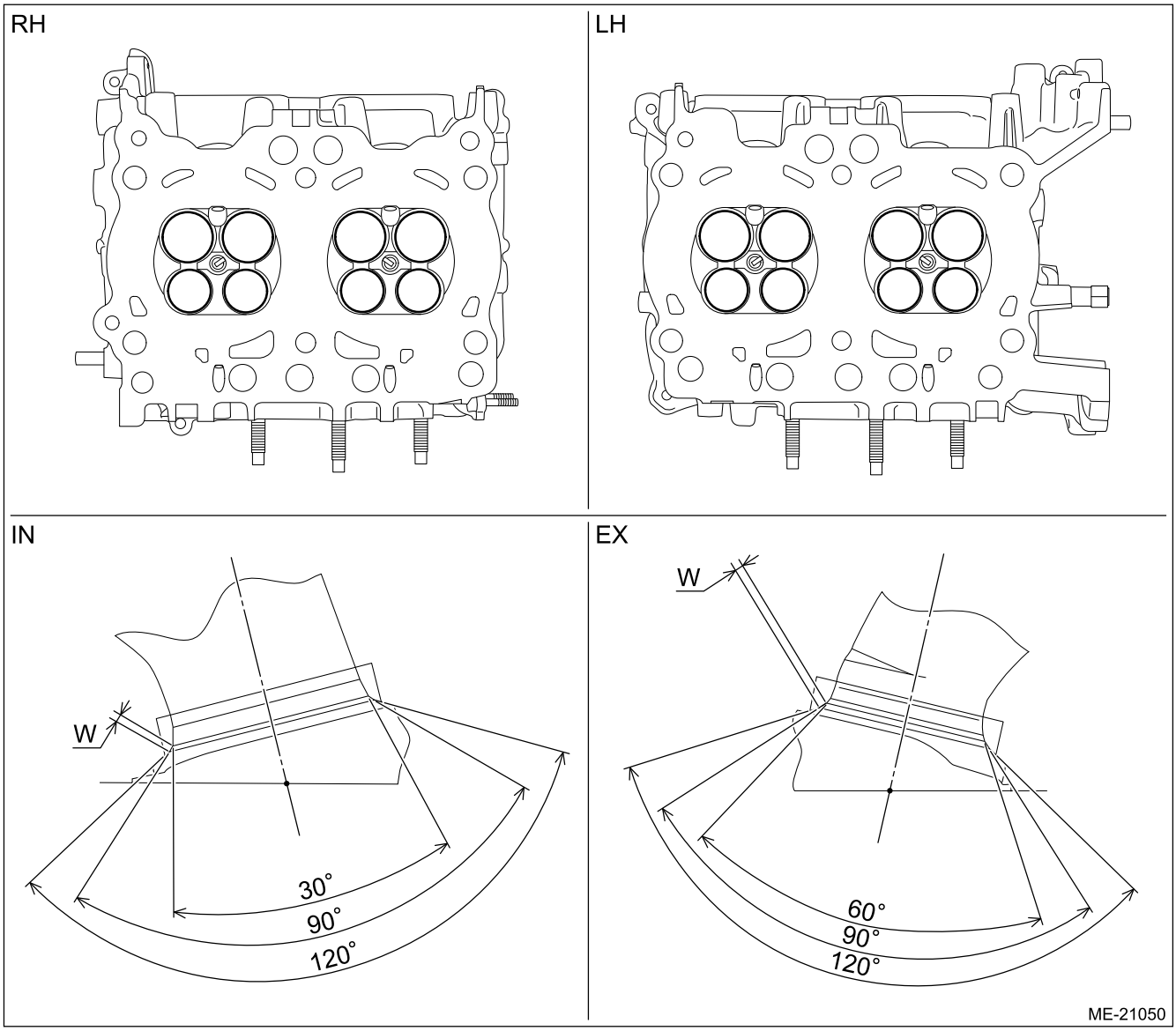
Standard

0.8 — 1.6 mm (0.0315 — 0.0630 in)

Exhaust

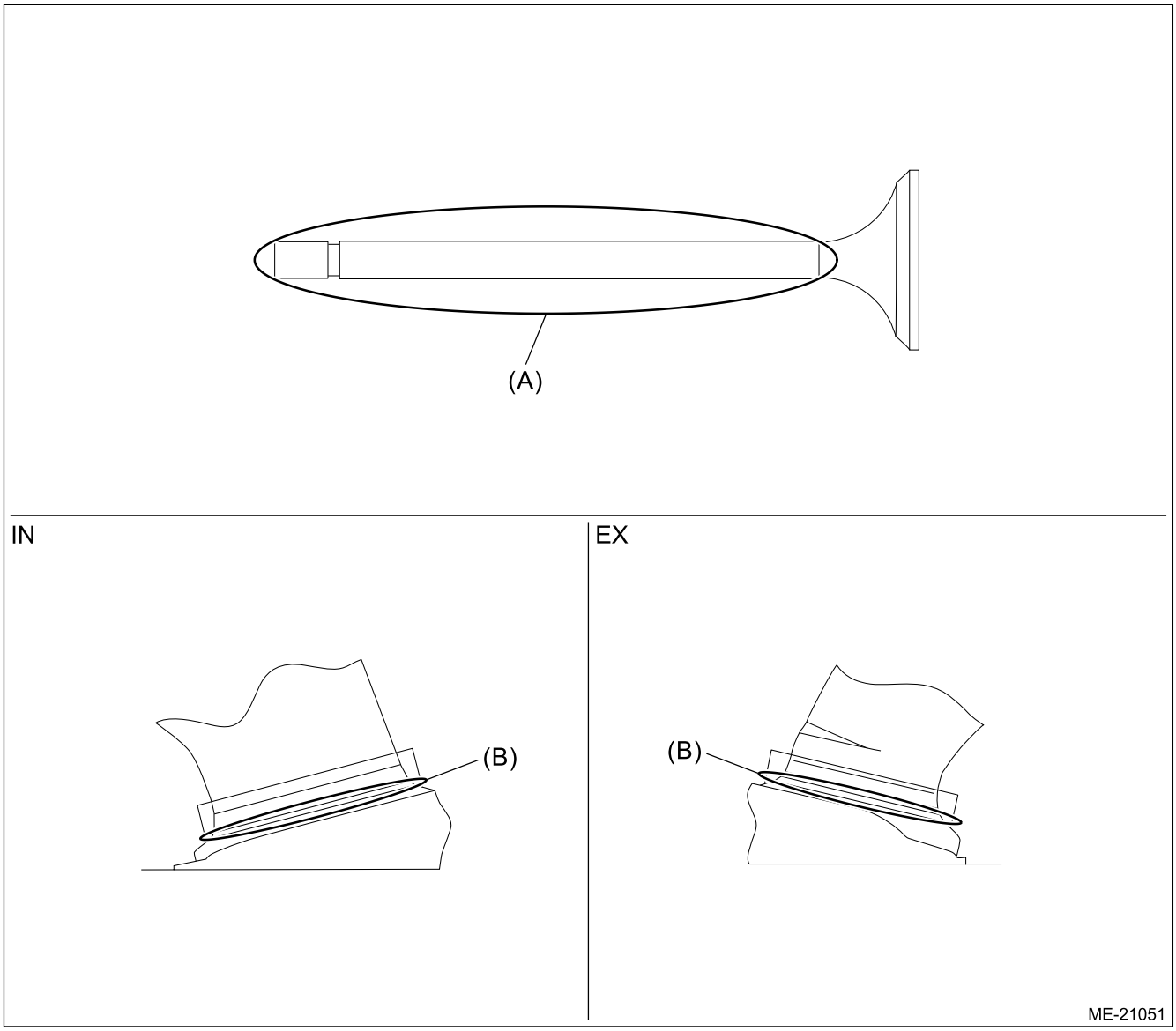
Standard

1.1 — 1.7 mm (0.0433 — 0.0669 in)



(5) Wipe off the red dye on the valve and valve seat completely.

(6) Coat the stem (A) of the valve lightly with engine oil and apply red dye evenly on the seating surface (B) between valve and valve seat.

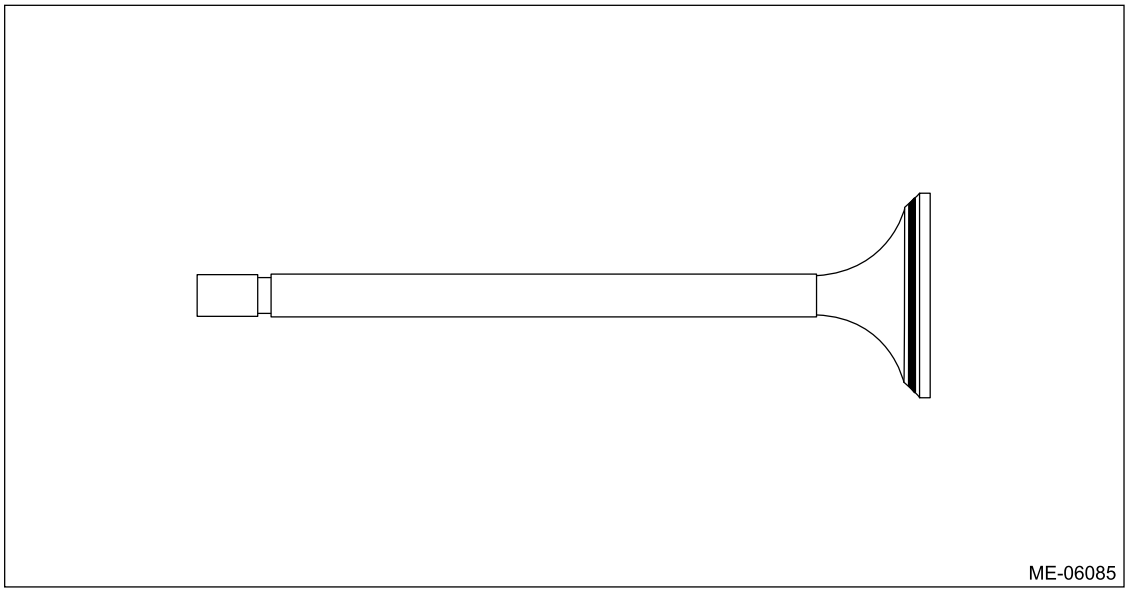


(7) Using the valve lapper, slowly insert the valve into the valve guide. Lightly press the valve against the valve seat without turning the valve, and then slowly pull out the valve.

(8) Check the seating position between valve and valve seat. Check the seating position between valve and valve seat by checking the position of red dye on the valve face. If the seating position between valve and valve seat is not at the center of valve face, correct the seating surface of valve seat using the valve seat cutter. For correcting procedures of the valve seat seating surface, refer to step 3).

Seating position between valve and valve seat:

Valve face center



(9) After inspection, wipe off the red dye completely.

3. When correcting the seating surfaces of valve seat

(1) Correct the seating angle between valve and valve seat using the 45° valve seat cutter.

Note:

- **Select the size of the valve seat cutter by referring to the outer diameters of the intake valve head and exhaust valve head.**

  Valve head outer diameter:

  Intake

  Standard

  33.9 — 34.1 mm (1.3346 — 1.3425 in)

  Exhaust

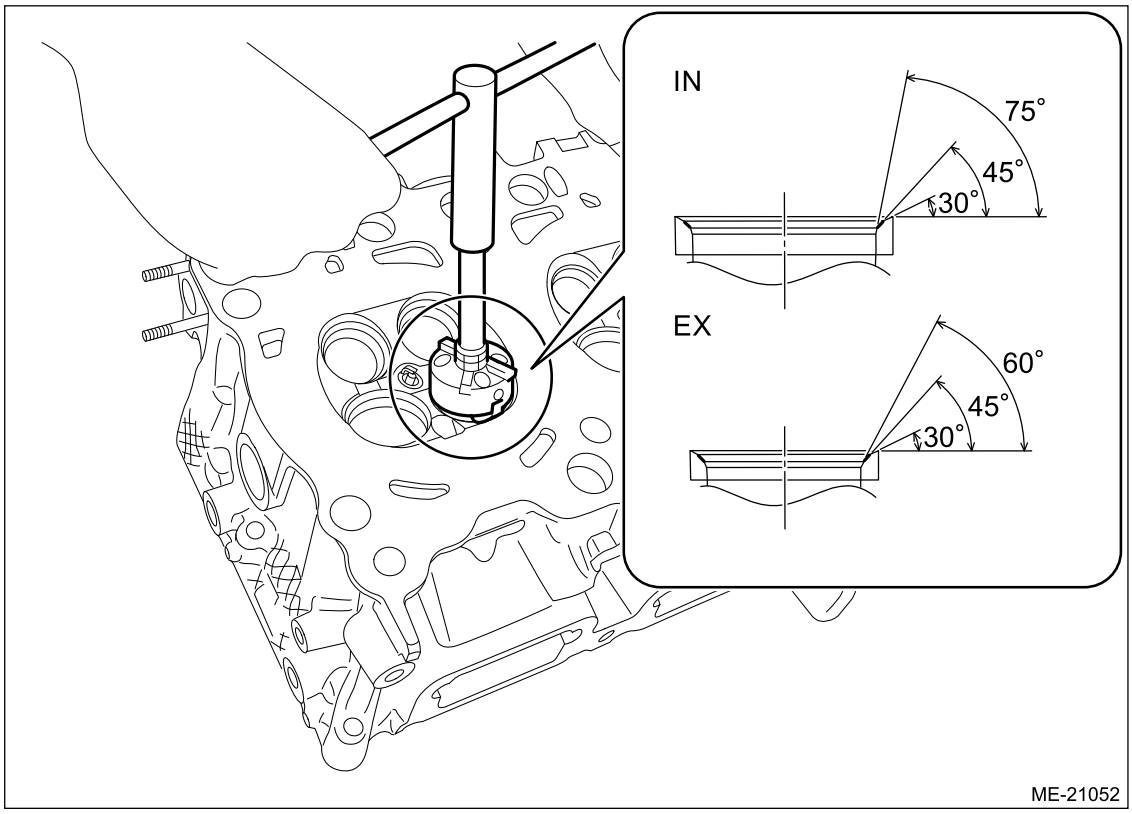
  Standard

  27.9 — 28.1 mm (1.0984 — 1.1063 in)

- **Grind the seating surface so that the seating width between valve and valve seat becomes slightly larger than the standard value.**
- **Gradually reduce pressure at the end of grinding process in order to avoid creating a gap on the valve seat correcting surface.**

Seating angle between valve and valve seat:

45°



(2) Lap the valve. For lapping procedure of the valve, refer to step 4).

(3) Check the seating position between valve and valve seat. For inspection of the seating position between valve and valve seat, refer to step 2).

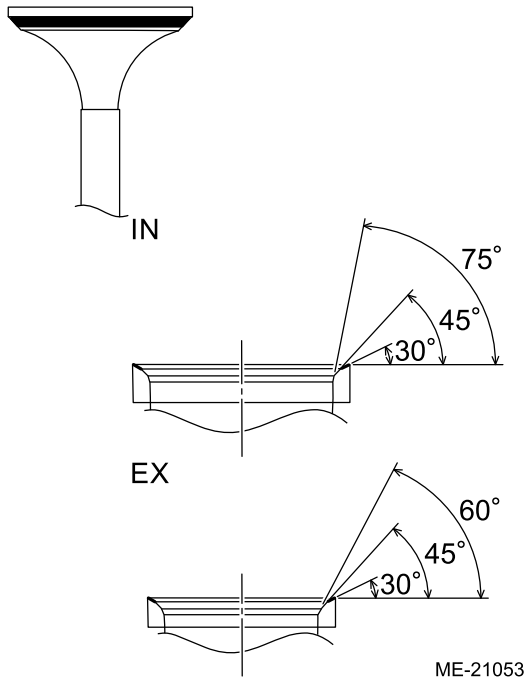
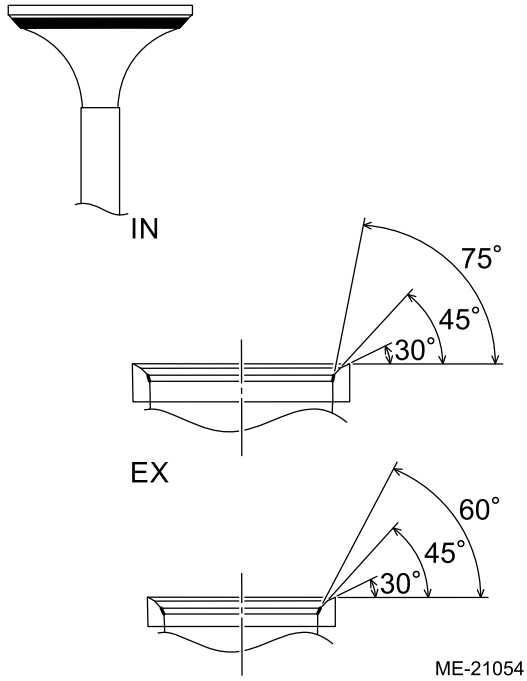
Note:

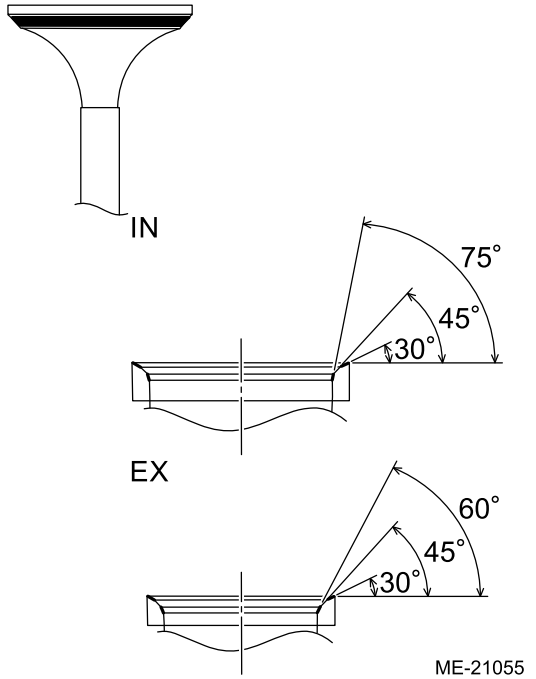
This procedure is necessary to select a seat cutter to be used in step (4).

(4) Using the 30°, 75° (IN) or 60° (EX) seat cutter, correct the valve seat so that the seating width between valve and valve seat becomes the standard value.

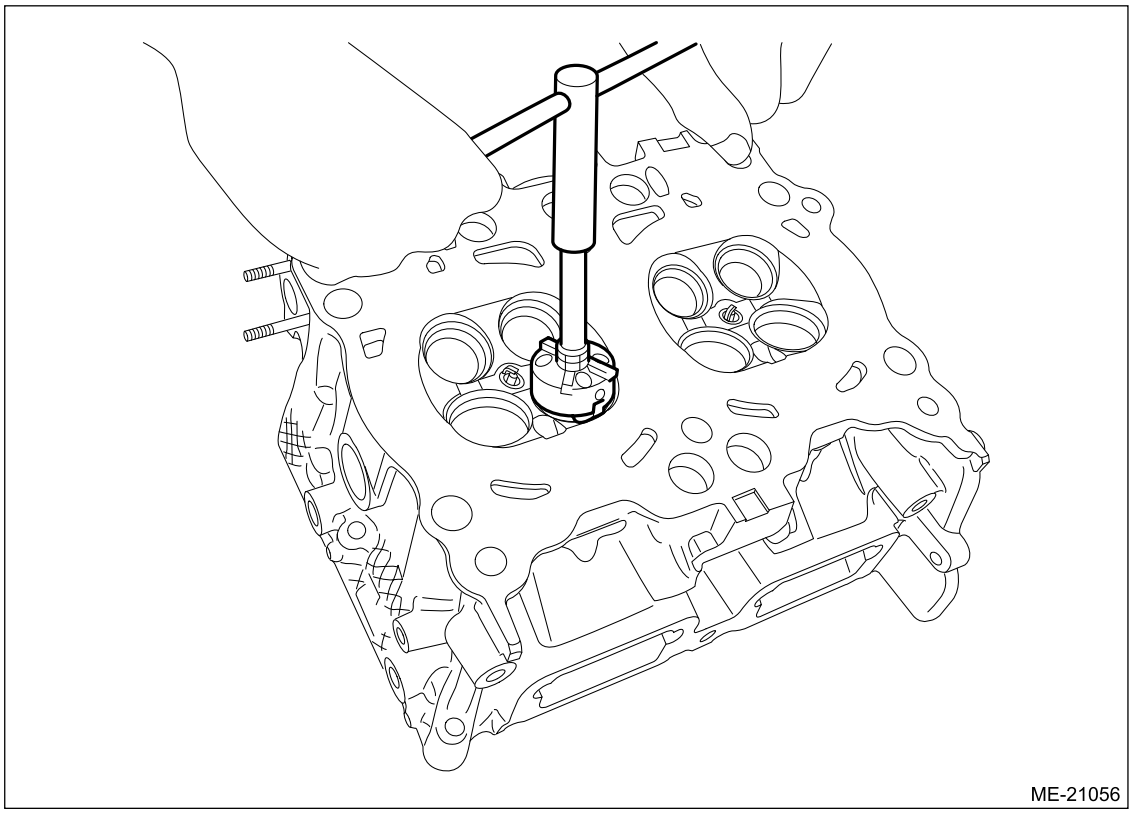
Note:

- **Select a proper valve seat cutter according to the following table.**

Seating position between valve and valve seat	Seat cutter selection
	When the seating position of valve face is high, grind the surface using the 30° seat cutter until seating width between valve and valve seat becomes the standard value.
	When the seating position of valve face is low, grind the surface using the 75° (IN) or 60° (EX) seat cutter until seating width between valve and valve seat becomes the standard value.

Seating position between valve and valve seat	Seat cutter selection
	When the seating position of valve face is at center, grind the surface evenly using the 30°, 75° (IN) or 60° (EX) seat cutters until seating width between valve and valve seat becomes the standard value.

- **Gradually reduce pressure at the end of grinding process in order to avoid creating a gap on the valve seat correcting surface.**



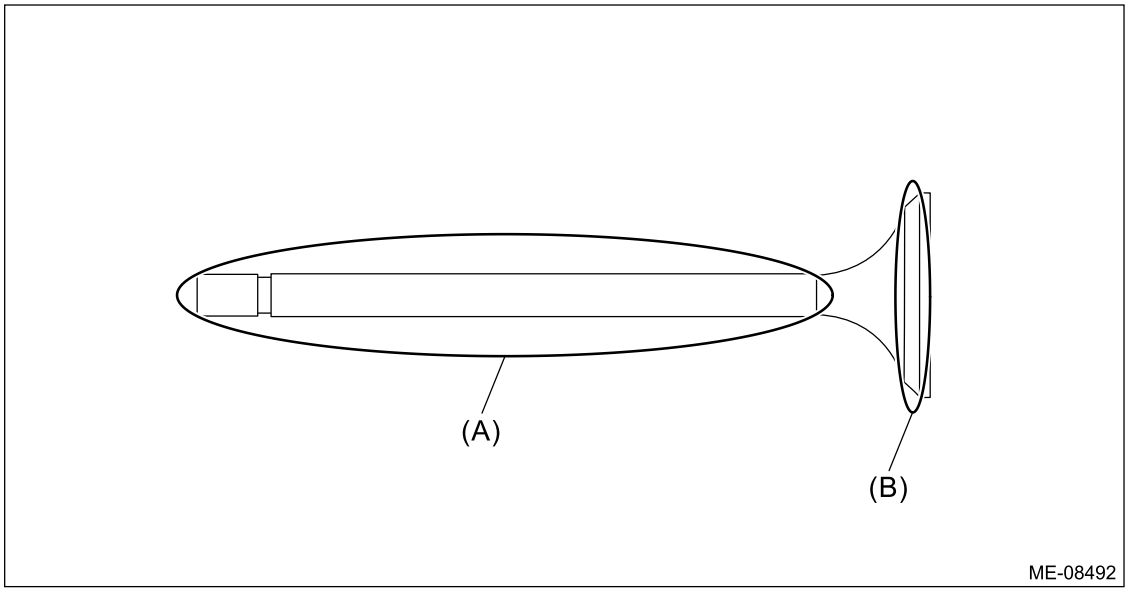
(5) Lap the valve. For lapping procedure of the valve, refer to step 4).

4. When lapping the valve

(1) Coat the stem (A) of the valve lightly with engine oil and put a small amount of valve compound evenly on the valve face (B).

Note:

- **Be careful not to put the valve compound more than necessary.**
- **To avoid damaging the valve guide and valve stem, be careful not to let the valve compound contact the valve stem.**



(2) Using the valve lapper, slowly insert the valve with the valve compound applied into the valve guide, and lap the seating surface between valve and valve seat. First, lift the valve and strike it against the valve seat twice, and then slightly turn the valve once. Repeat these steps as one set.

Note:

- **To prevent the seating width between valve and valve seat from exceeding the standard value, be careful not to keep turning the valve while pressing it against the valve seat during lapping.**
- **Be careful not to lift the valve too far during lapping in order to prevent the valve from coming off the valve guide.**

(3) Wipe off the valve compound on the valve and valve seat completely after lapping.

Note:

Be careful not to leave any valve compound in order to avoid malfunction.

(4) Check the seating width and seating position between valve and valve seat.

5. VALVE SPRING

1. Check the valve spring for damage and deformation.
2. Using a caliper gauge and valve spring tester,check the valve spring free length (reference) and tension/spring height. If it is not within the standard, replace the valve spring.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Valve spring free length is described as a reference. If only valve spring free length is out of the standard, it is not necessary to replace the valve spring.**

Valve spring free length (reference):

Standard

42.64 mm (1.6787in)

Valve spring tension/spring height:

Set

Standard

182 — 210 N (18.56 — 21.41 kgf, 40.92 — 47.22 lbf)/33.0 mm (1.299 in)

Lift

Standard

475 — 525 N (48.43 — 53.53 kgf, 106.80 — 118.04 lbf)/22.0 mm (0.866 in)

3. Using thickness gauge, surface plate and try square, check the squareness of the valve spring. If it is not within the standard, replace the valve spring.

Note:

Measurement should be performed at a temperature of 20°C (68°F).

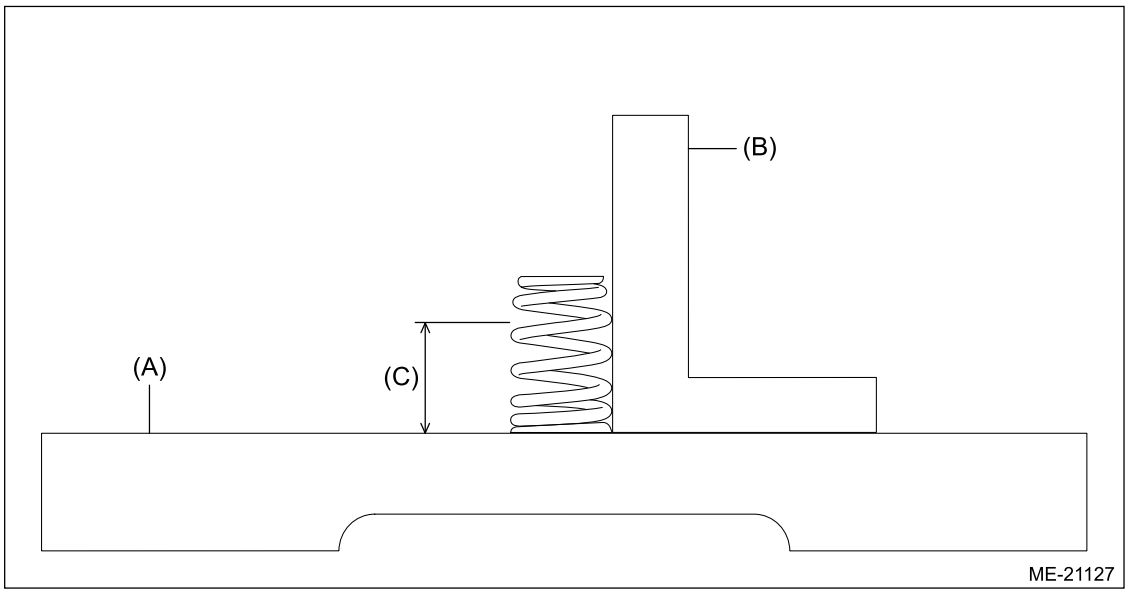
(1) Place the valve spring on the surface plate, with smaller diameter end facing up.

(2) Using try square and thickness gauge, measure the clearance at the point 30 mm (1.1811 in) from the bottom, between one coil and the square.

Valve spring squareness (at height of 30 mm (1.1811 in))

Standard

2.5°, 1.4 mm (0.0551 in) or less



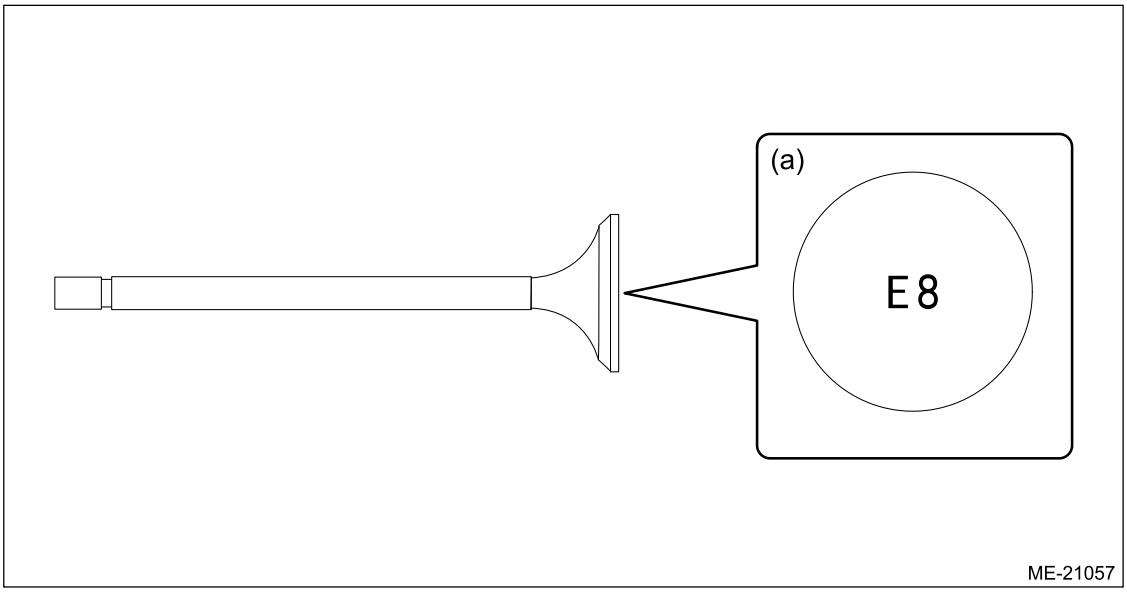
(a) Surface plate (b) Try square (c) 30 mm (1.1811 in)

MECHANICAL(H4DO) > Cylinder Head

DISPOSAL

Warning:

- **Metallic sodium is encapsulated in the exhaust valve. Metallic sodium is a strong alkaline material and poses a risk of causing a severe chemical reaction. Use great care when handling and disposing it.**
- **If the metallic sodium gets into your eyes, you may lose your sight. If it touches the skin, you may get burned severely or if it touches flame, fire may be caused by chemical reaction. Therefore, do not disassemble the exhaust valve.**
- **It is safe when the metallic sodium encapsulated in the exhaust valve is not exposed to the air.**
- **When the exhaust valve is broken, remove the broken exhaust valve, and dispose of the metallic sodium.**
- **Do not intentionally break the exhaust valve and take out the metallic sodium.**
- **Identify the exhaust valve in which the metallic sodium is encapsulated with the embossed mark.**

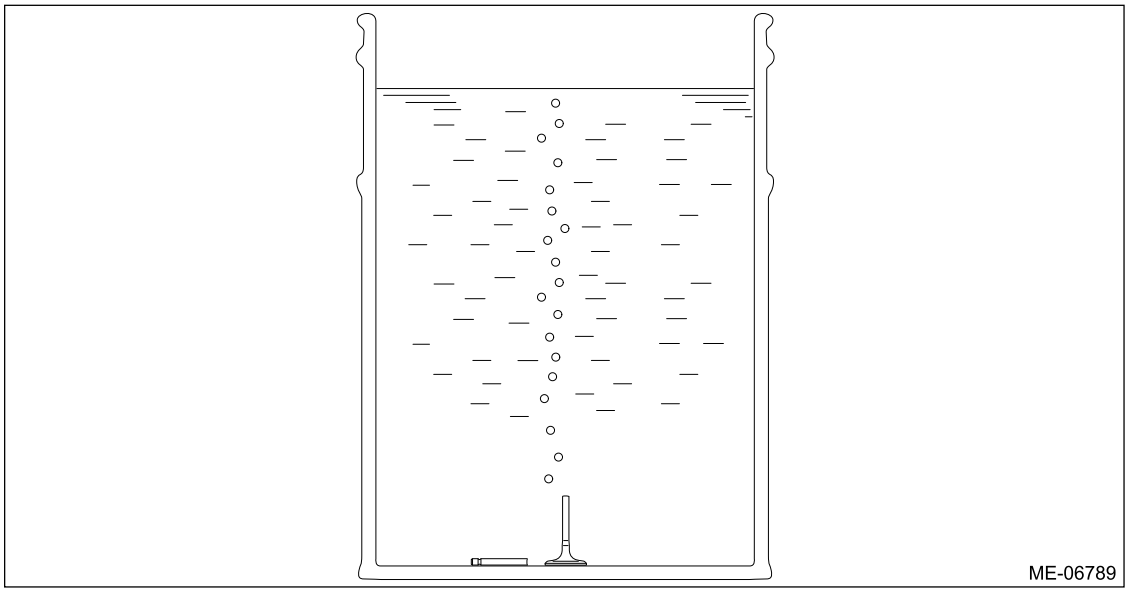


(a) Embossed mark
(Identification: E8)

Caution:

- **When disposing of the exhaust valve that is not broken, entrust the disposal processing to the industrial waste disposer in charge of dissolution treatment.**
- **When the exhaust valve is broken, remove it from the cylinder head, perform appropriate processing in the same manner as the general steel material.**
- **When performing processing, be careful of the following.**
  1. **Prepare the fire extinguisher nearby.**
  2. **Wear the protective goggles.**
  3. **Wear rubber gloves.**

1. Wear rubber gloves and remove the broken exhaust valve from the cylinder head.
2. Prepare large container (bucket or oil can) in well-ventilated place, and fill the container with water (10 L or more).
3. Using a pair of large tweezers or pliers, immerse the broken exhaust valve in the water vertically.
   Caution:
   - **Completely immerse the broken exhaust valve in the water.**
   - **Hydrogen gas is produced by the chemical reaction. Therefore, always keep the container away from open flames such as sparks.**
   - **Because the severe chemical reaction is developed, keep at least 2 to 3 m away from the container.**



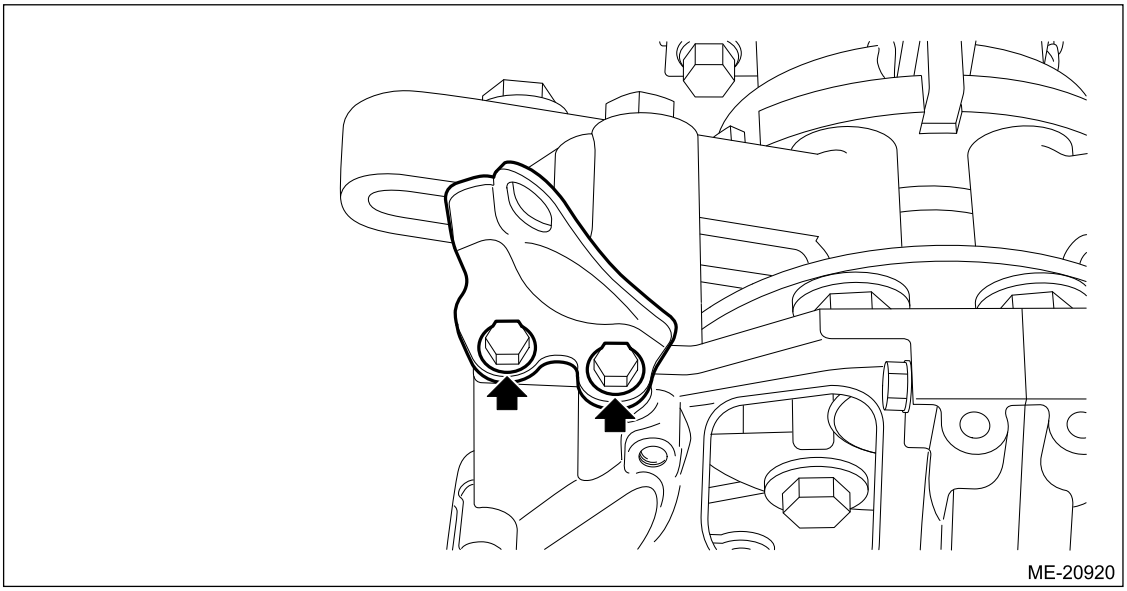
4. After completion of chemical reaction (after the elapse of 4 — 5 hours), carefully take out the exhaust valve using a pair of large tweezers or pliers, and dispose of the exhaust valve according to the same disposal procedure the general steel material.

Caution:

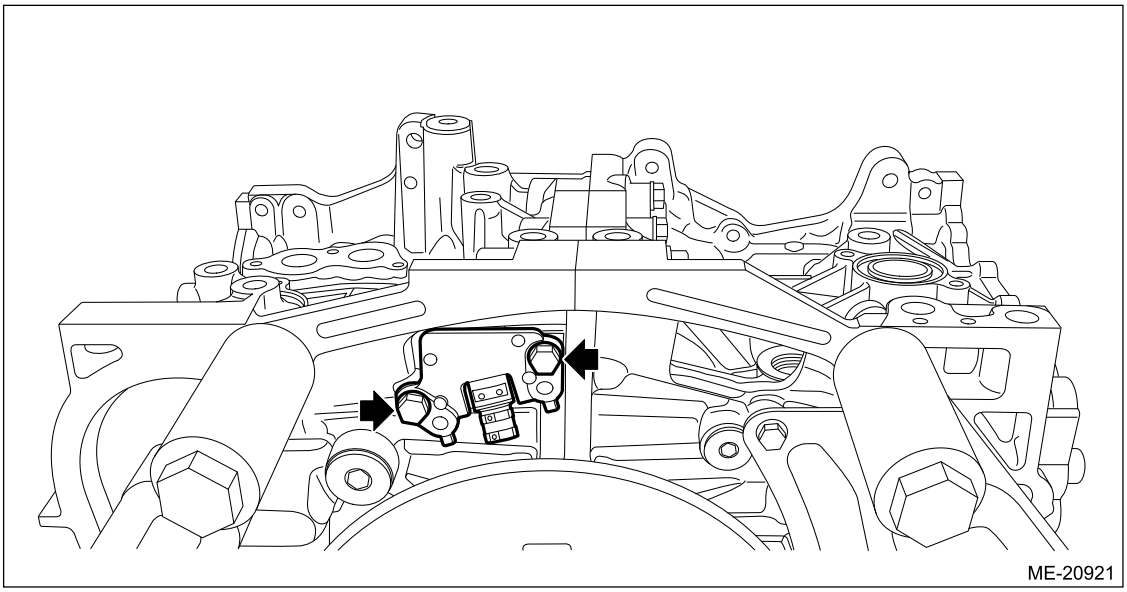
- **Concerning the liquid waste disposal of the liquid (sodium hydrate) produced in a chemical reaction, follow all governmental regulations and local regulations related to the liquid waste disposal.**
- **If the liquid produced in a chemical reaction (sodium hydrate) should touch the skin, immediately wash it away with plenty water.**

REMOVAL

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Remove the crankshaft position sensor plate with drive plate. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>REMOVAL.
3. Remove the clutch disc and cover. (MT model) Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>REMOVAL.
4. Remove the crankshaft position sensor plate with flywheel. (MT model) Ref. to CLUTCH SYSTEM>Flywheel>REMOVAL.
5. Remove the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>REMOVAL.
6. Remove the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>REMOVAL.
7. Remove the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>REMOVAL.
8. Remove the rocker cover. Ref. to MECHANICAL(H4DO)>Rocker Cover>REMOVAL.
9. Remove the cam carrier. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.
10. Remove the cylinder head. Ref. to MECHANICAL(H4DO)>Cylinder Head>REMOVAL.
11. Remove the oil pan upper. Ref. to LUBRICATION(H4DO)>Oil Pan>REMOVAL > OIL PAN UPPER.
12. Remove the crank sprocket. Ref. to MECHANICAL(H4DO)>Crank Sprocket>REMOVAL.
13. Remove the water tank pipe assembly. Ref. to COOLING(H4DO)>Water Pipe>REMOVAL > WATER TANK PIPE ASSY.
14. Remove the PVC connector. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Connector>REMOVAL.
15. Remove the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Knock Sensor>REMOVAL.
16. Remove the PCV valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Valve>REMOVAL.
17. Remove the engine rear hanger from cylinder block RH.



18. Remove the bolts securing the crankshaft position sensor holder from the cylinder block LH, and remove the crankshaft position sensor with crankshaft position sensor holder.



19. Set the part so that the cylinder block RH is on the upper side.

20. Remove the #1 and #3 connecting rod caps and pistons from the cylinder block.

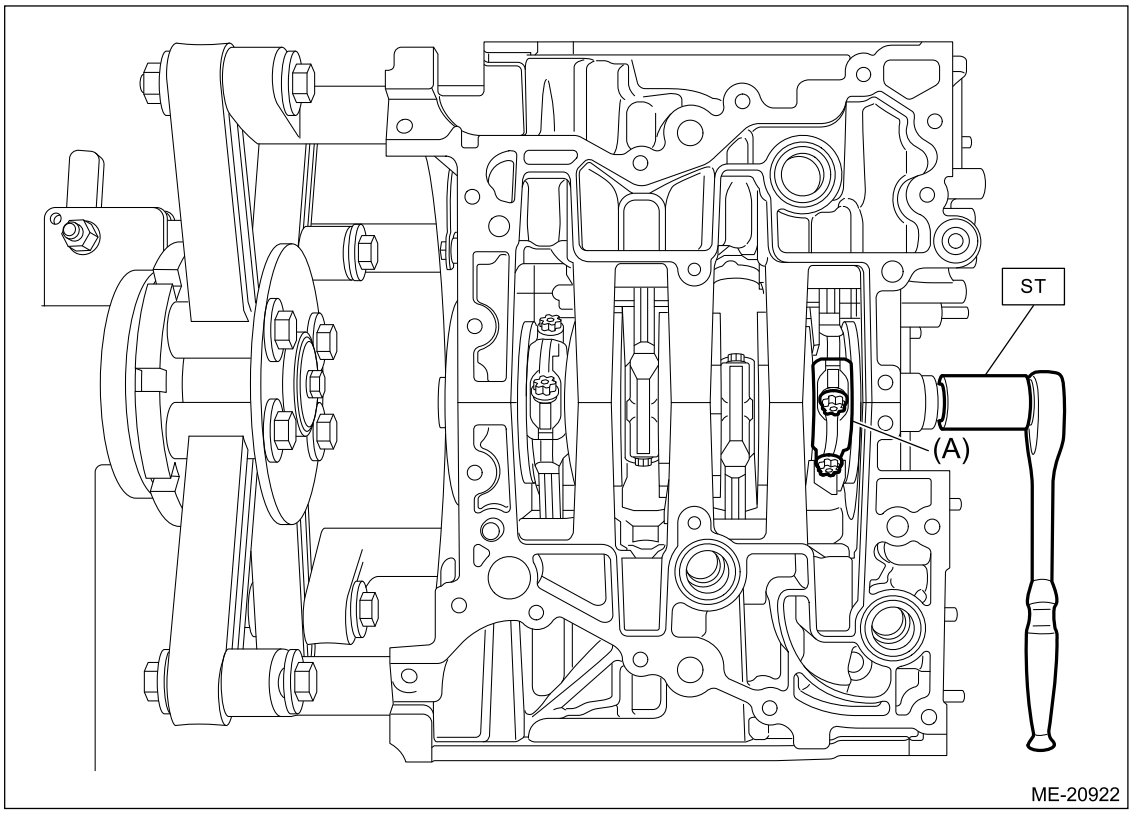
Note:

Mark each connecting rod cap and piston with a cylinder number.

(1) Using the ST, turn the crankshaft so that the #1 connecting rod cap (A) is located at the position shown in the figure.

Preparation tool:

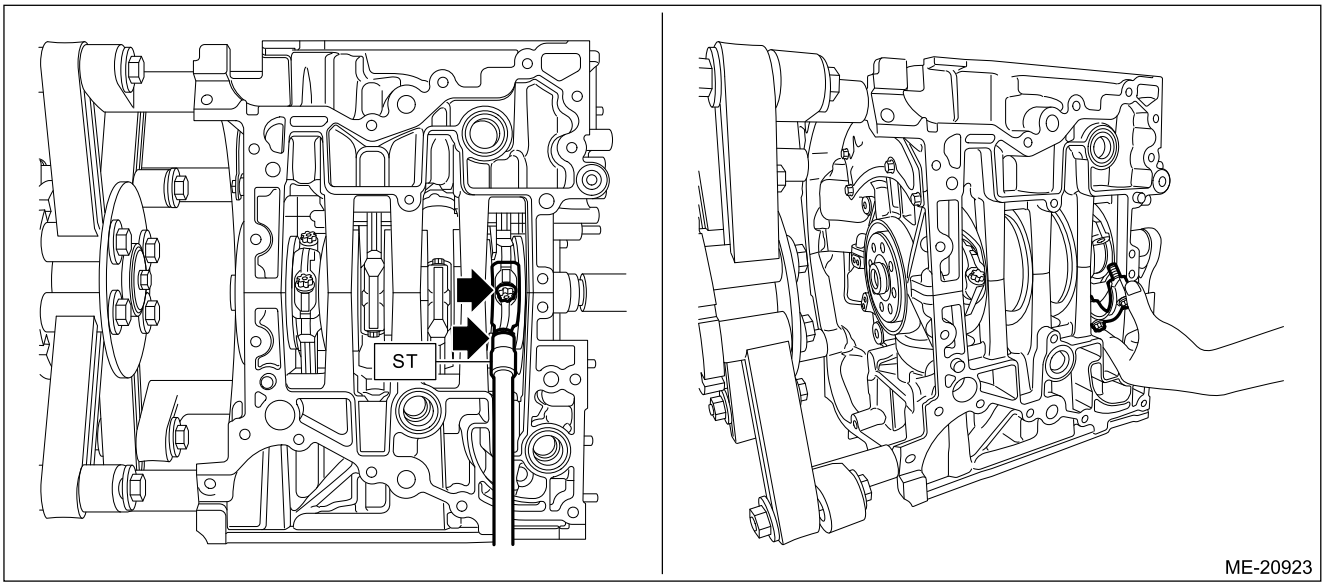
ST: CRANKSHAFT SOCKET (18252AA000)



(2) Using the ST, loosen the #1 connecting rod cap bolt, and remove the #1 connecting rod cap bolt and #1 connecting rod cap.

Preparation tool:

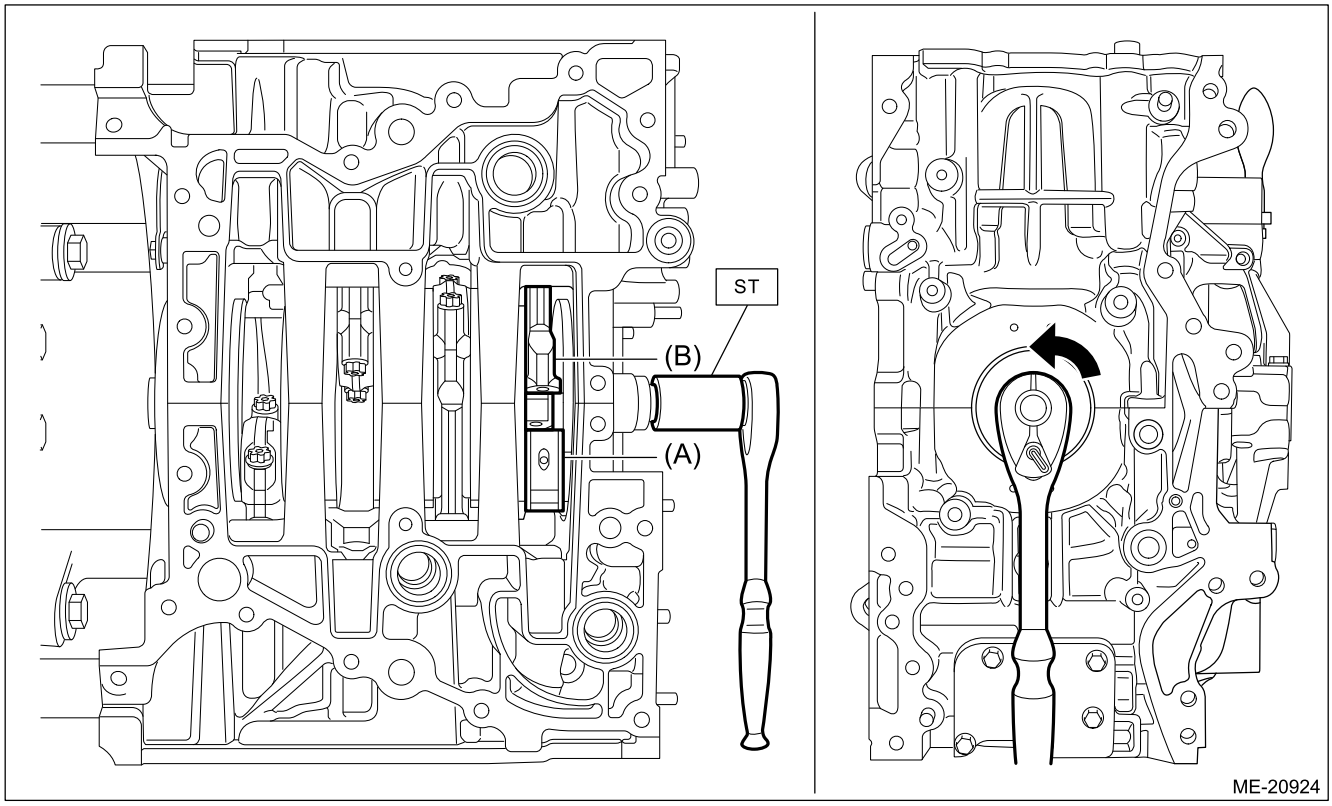
ST: SOCKET (18270AA020)



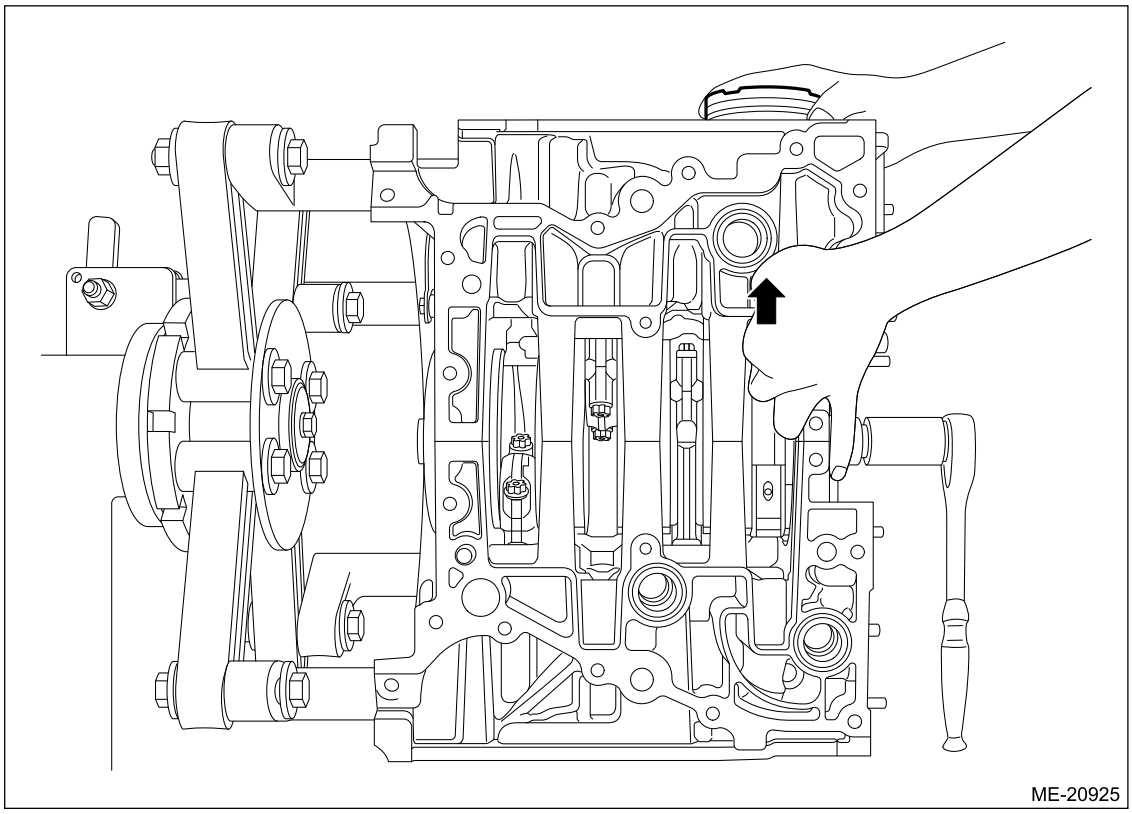
(3) Using the ST, turn the crankshaft counterclockwise and separate the positions of the #1 pin (A) of crankshaft and the large end (B) of #1 connecting rod.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



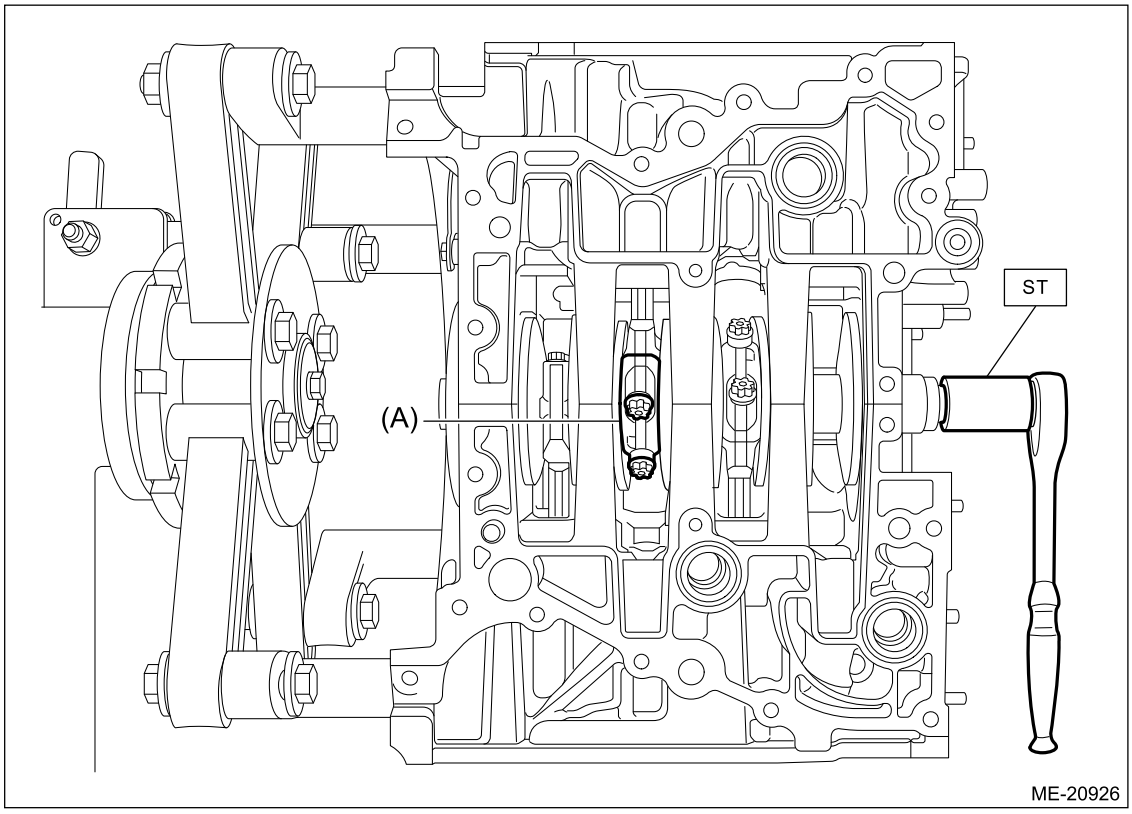
(4) Push the #1 connecting rod in the direction of the arrow, and remove the #1 piston with #1 connecting rod from the cylinder block.



(5) Using the ST, turn the crankshaft so that the #3 connecting rod cap (A) is located at the position shown in the figure.

Preparation tool:

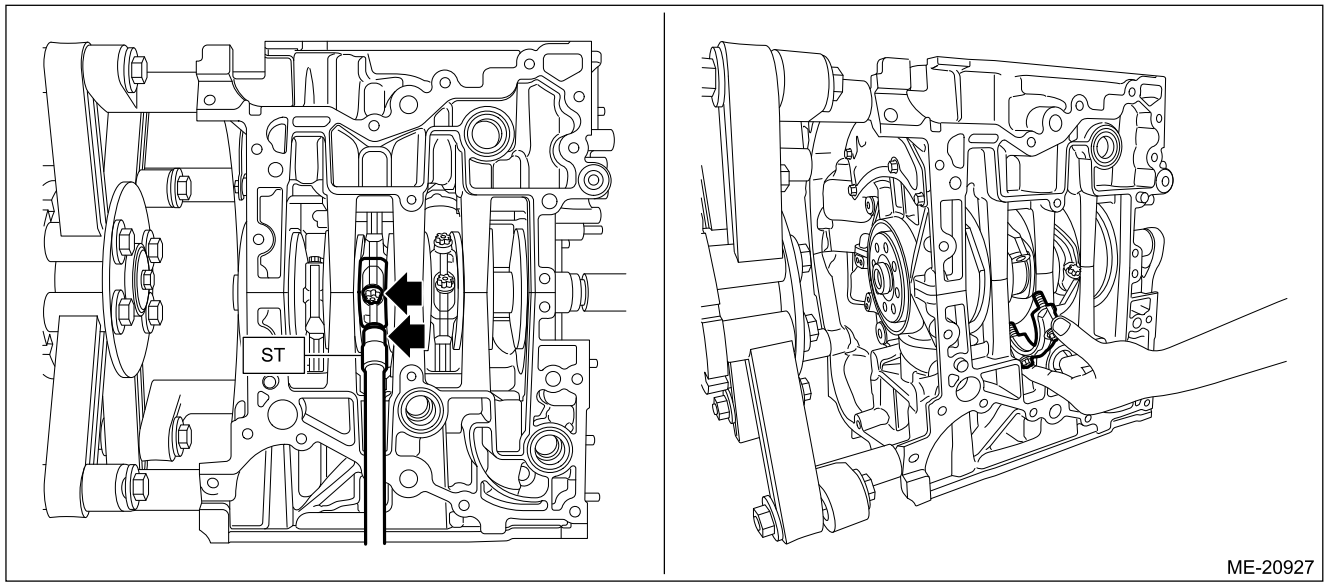
ST: CRANKSHAFT SOCKET (18252AA000)



(6) Using the ST, loosen the #3 connecting rod cap bolt, and remove the #3 connecting rod cap bolt and #3 connecting rod cap.

Preparation tool:

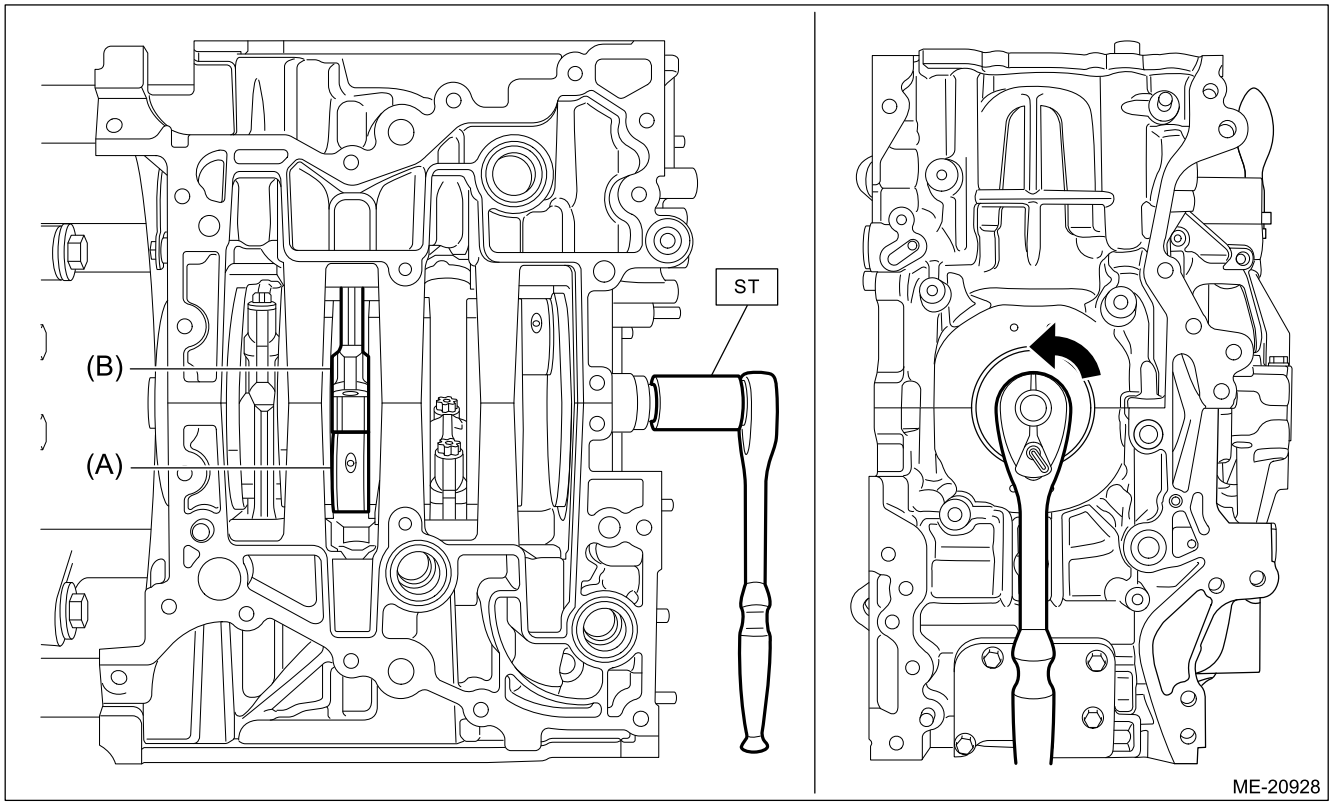
ST: SOCKET (18270AA020)



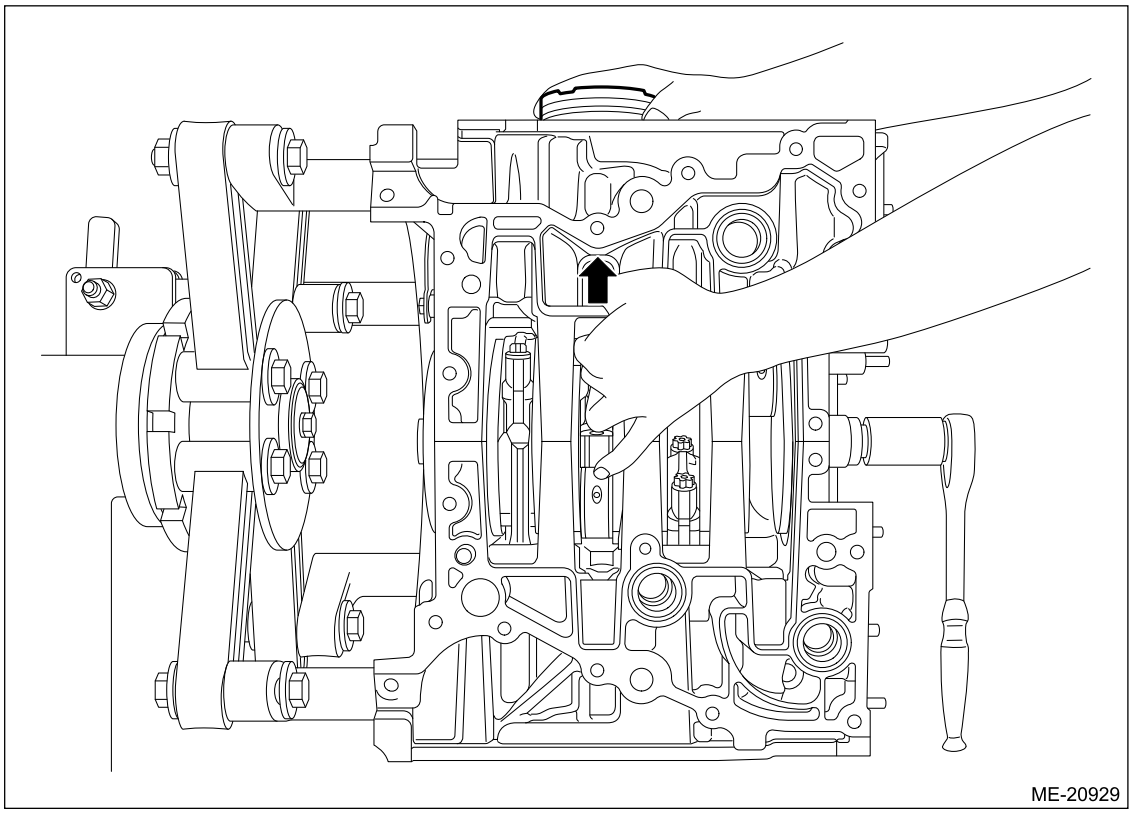
(7) Using the ST, turn the crankshaft counterclockwise and separate the positions of the #3 pin (A) of crankshaft and the large end (B) of #3 connecting rod.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



(8) Push the #3 connecting rod in the direction of the arrow, and remove the #3 piston with #3 connecting rod from the cylinder block.

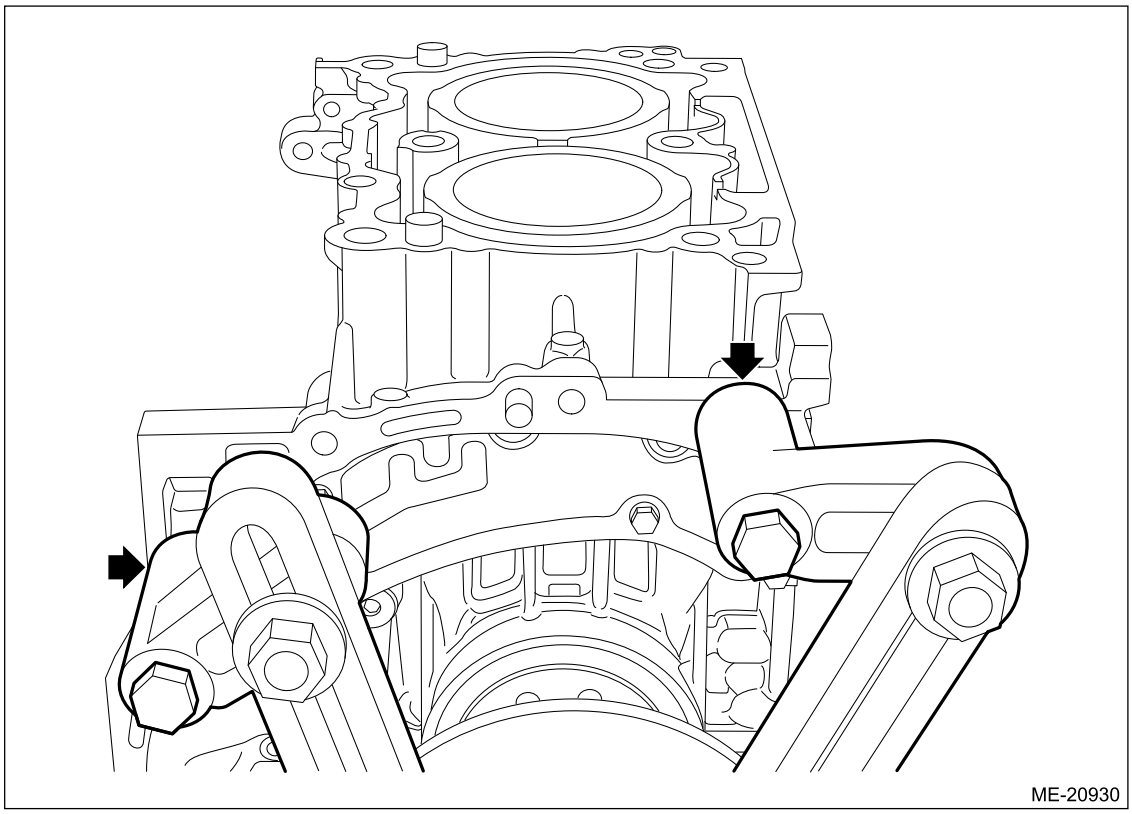


21. Set the part so that the cylinder block LH is on the upper side.

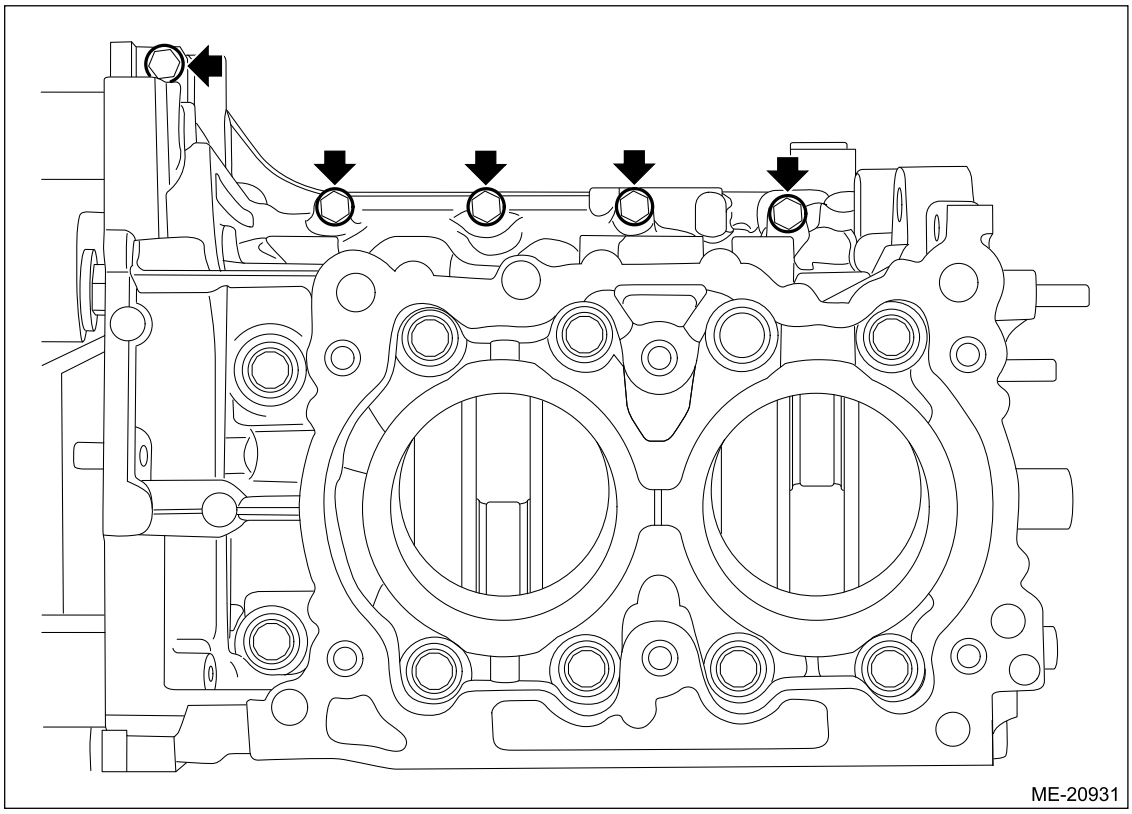
22. Remove #2 and #4 connecting rod caps and pistons in the same removal procedure as #1 and #3 connecting rod caps and pistons.

23. Set the part so that the cylinder block RH is on the upper side, and separate the cylinder block.

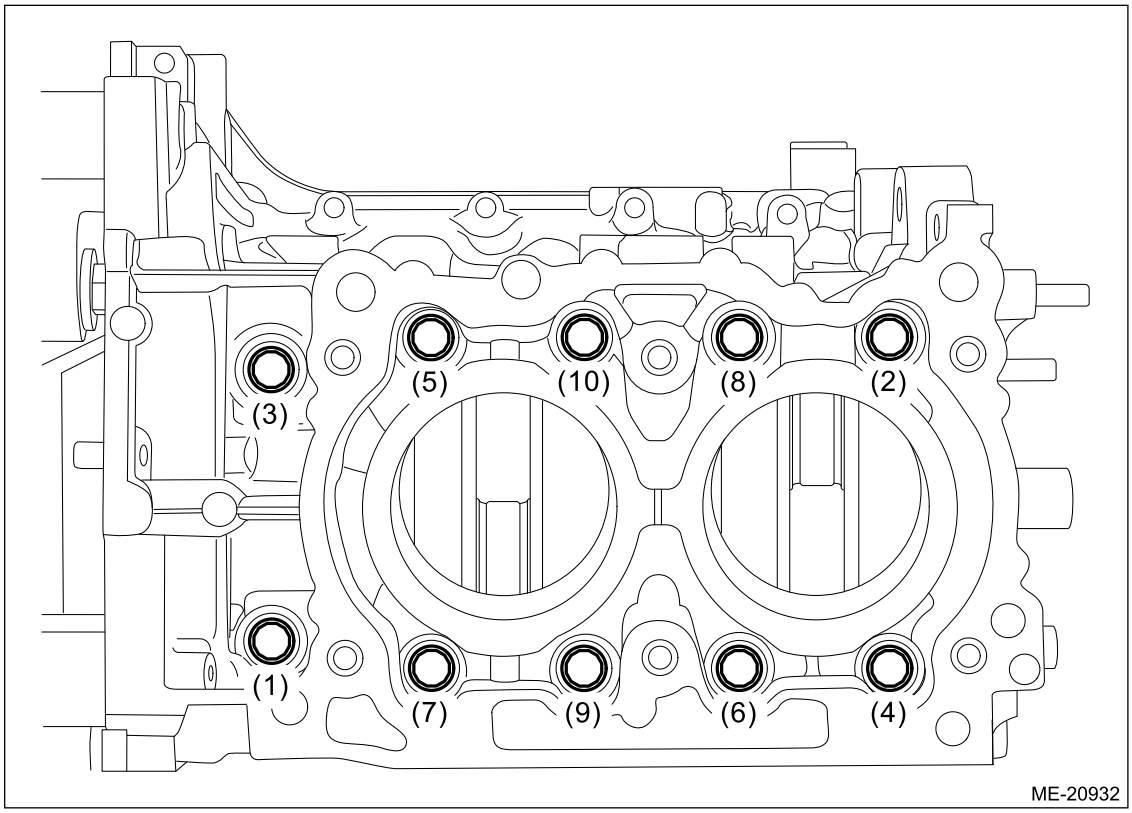
(1) Remove the engine stand from the cylinder block RH.



(2) Remove the bolt shown in the figure.



(3) Loosen the cylinder block mounting bolts in numerical order as shown in the figure, and then remove the bolts.

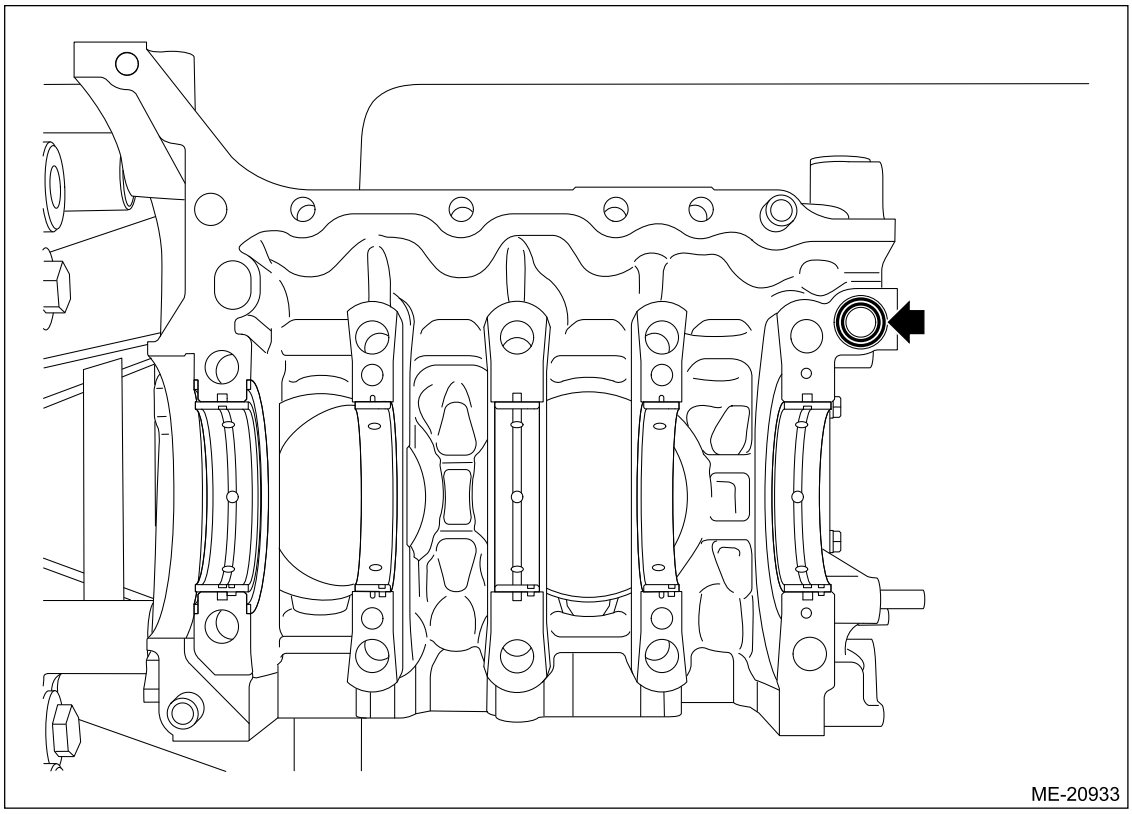


(4) While tapping the cylinder block RH with a plastic hammer, separate the cylinder block RH from the cylinder block LH.

Note:

Lift the cylinder block RH gradually, and confirm that the crankshaft is remaining in the cylinder block LH. Lifting the cylinder block RH carelessly may cause the crankshaft to fall off.

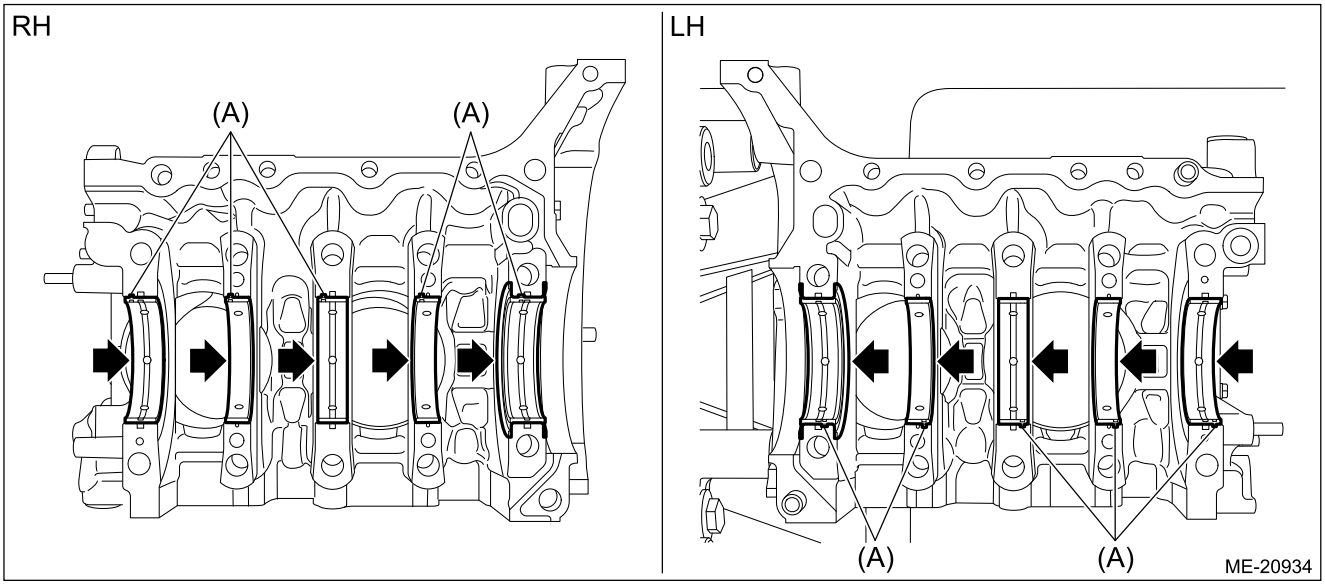
24. Remove the crankshaft from cylinder block LH, and remove the rear oil seal.
25. Remove the O-ring from the cylinder block LH.



26. Remove the crankshaft bearings from the cylinder block.

Note:

- **Be careful not to confuse the crankshaft bearing combination.**
- **Press the bearing at the end opposite to locking lip (A).**



27. Remove the liquid gasket from cylinder block.
28. Remove the cylinder block LH from the engine stand.

MECHANICAL(H4DO) > Cylinder Block

INSTALLATION

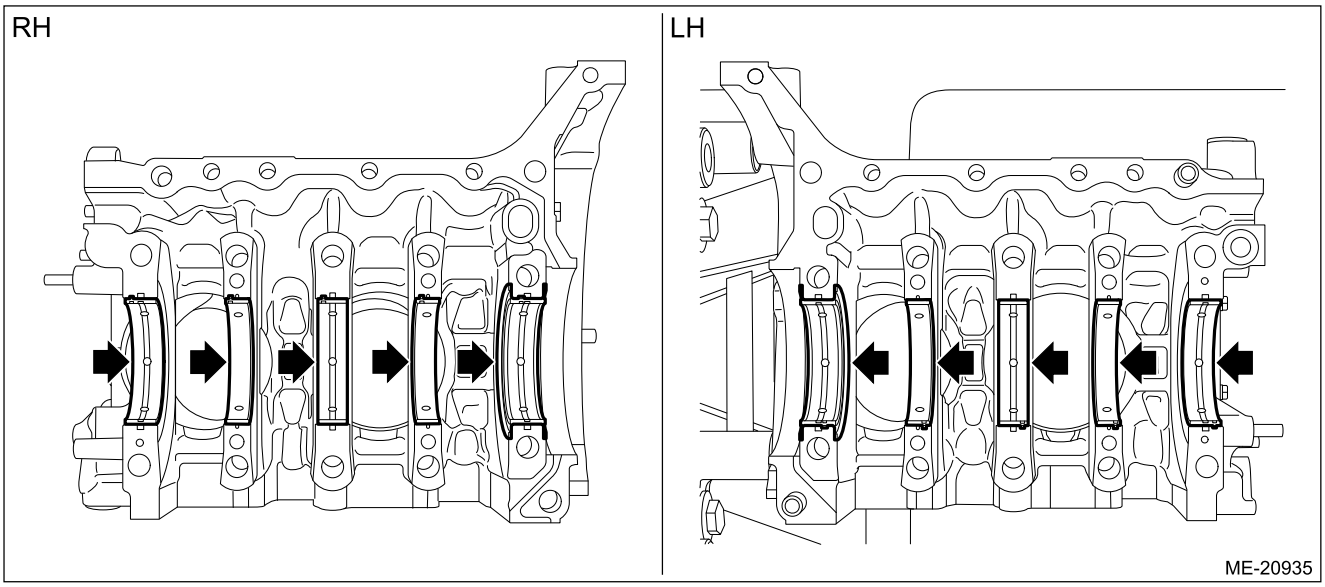
1. Install the cylinder block LH to the engine stand.
2. Apply engine oil to the crankshaft bearing, and install the crankshaft bearing to the cylinder block.

Caution:

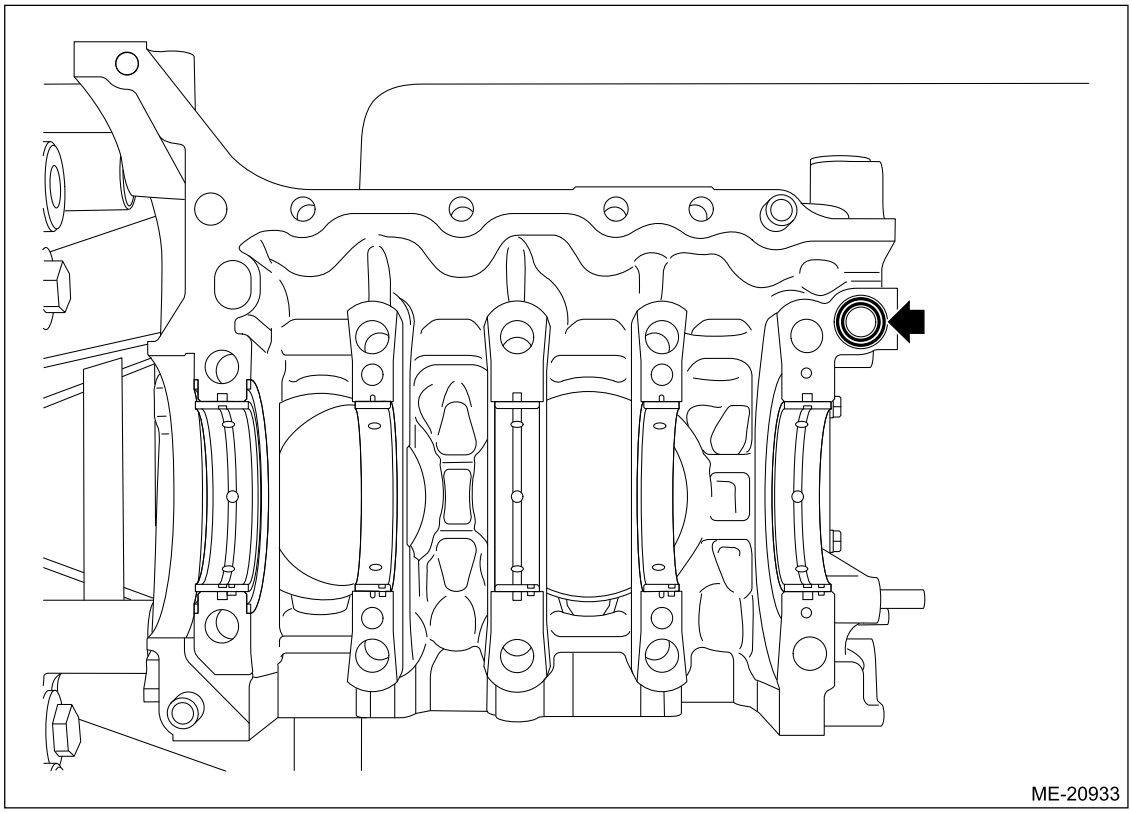
When performing the operation of the cylinder block RH, be careful of the following.

1. Place a wood board wrapped with a waste cloth to prevent the knock pin damage and to stabilize the cylinder block before work.

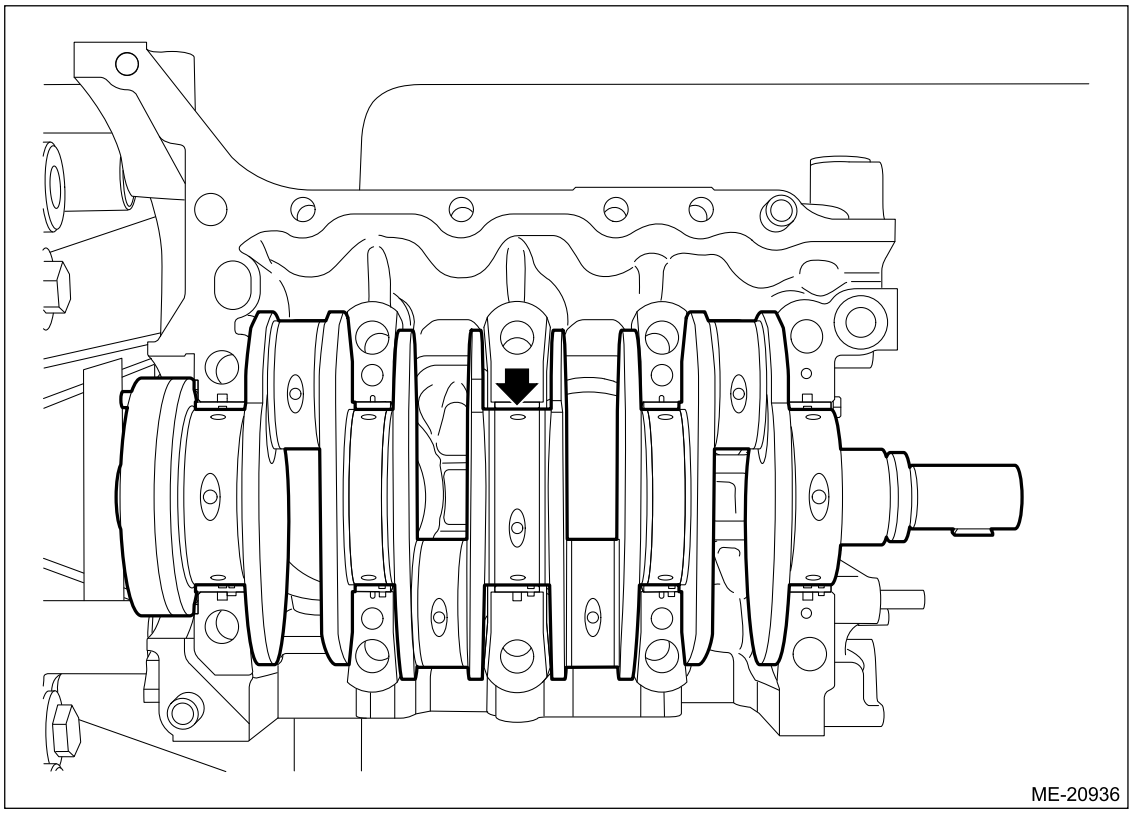
2. Be careful not to scratch the mating surface of cylinder block during work.



3. Install new O-rings to the cylinder block LH.



4. Apply engine oil to the crankshaft journal, and set the crankshaft to cylinder block LH.



5. Apply liquid gasket to the mating surface of cylinder block RH as shown in the figure.

Caution:

- **Place a wood board wrapped with a waste cloth to prevent the knock pin damage and to stabilize the cylinder block before work.**
- **Be careful not to scratch the mating surface of cylinder block during work.**
- **Do not let the liquid gasket overflow to the oil passage and crankshaft bearing portions, because the engine seizure may result.**

Note:

- **Before applying liquid gasket, degrease the old liquid gasket seal surface of the cylinder block RH and cylinder block LH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

Mating surfaces other than ranges A, B and C

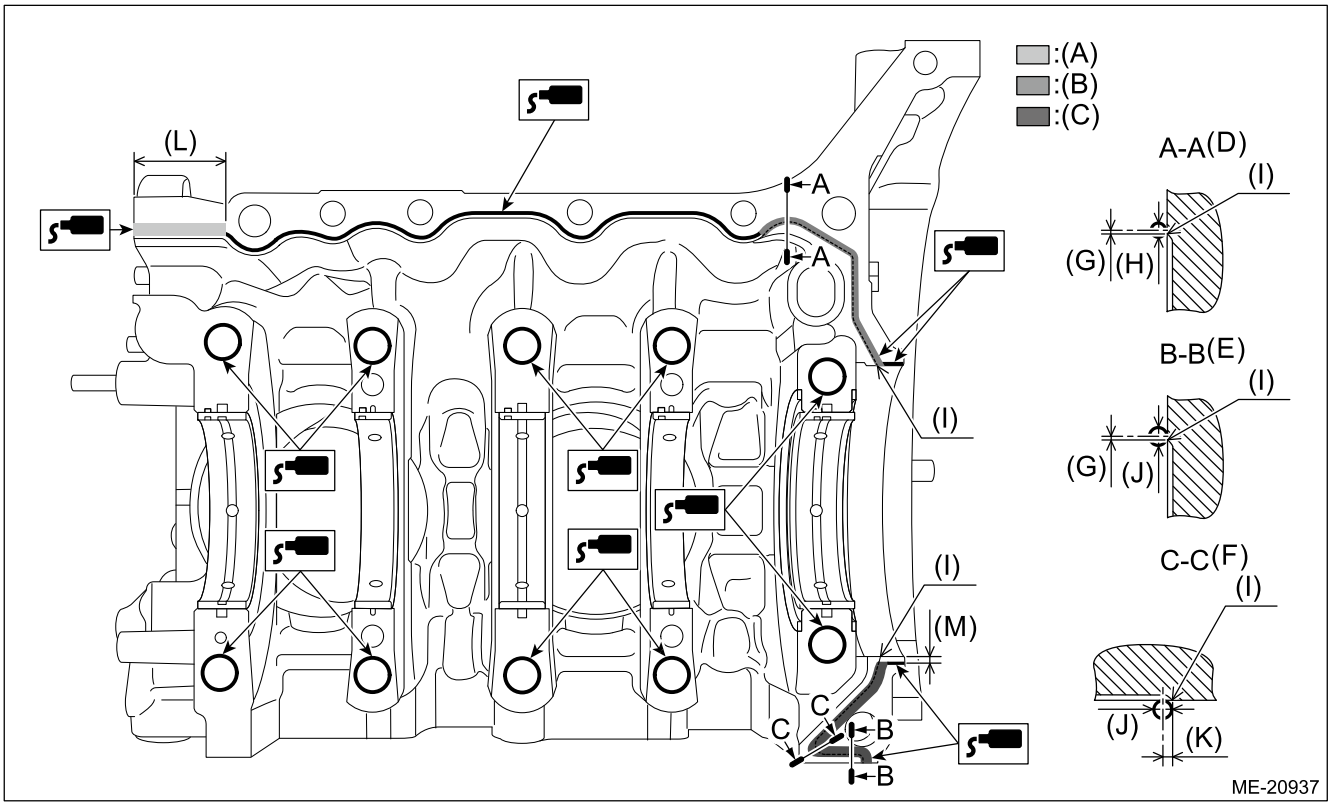
1±0.5 mm (0.0394±0.0197 in)

Mating surfaces of ranges A and C

4±0.5 mm (0.1575±0.0197 in)

Mating surfaces of range B

3.2±0.5 mm (0.1260±0.0197 in)



(A)	Range A	(F)	Liquid gasket applying position of mating surfaces (the edge) of range C	(K)	2 mm (0.0787 in)
(B)	Range B	(G)	Within 1 mm (0.0394 in)	(L)	36 mm (1.4173 in)
(C)	Range C	(H)	⌀3.2±0.5 mm (0.1260±0.0197 in)	(M)	2.5 mm (0.0984 in)
(D)	Liquid gasket applying position of mating surfaces of range B	(I)	Chamfer edge		
(E)	Liquid gasket applying position of mating surfaces (other than the edge) of range C	(J)	⌀4±0.5 mm (0.1575±0.0197 in)		

6. Install the cylinder block RH to the cylinder block LH.

7. Join the cylinder blocks.

Caution:

When tightening the mounting bolts, hold the cylinder block LH while not holding the cylinder block RH to ensure the joint accuracy of the cylinder block.

(1) Apply a coat of engine oil to the washers and cylinder block mounting bolt threads.

Note:

To prevent mixture of engine oil into the water jacket, do not apply a large amount.

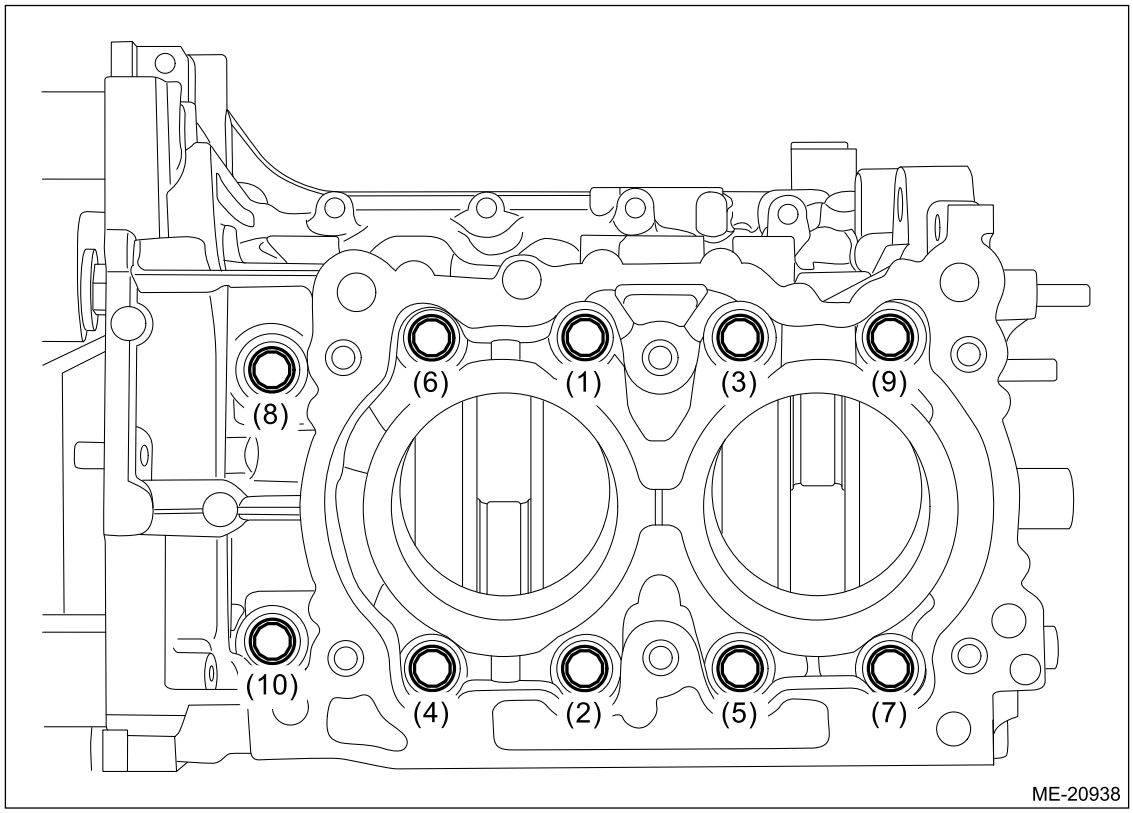
(2) Tighten all mounting bolts with a torque of 35 N·m (3.6 kgf-m, 25.8 ft-lb) in numerical order as shown in the figure.

(3) Loosen all mounting bolts by 180° in the reverse order of tightening in step (2).

(4) Tighten all mounting bolts with a torque of 35 N·m (3.6 kgf-m, 25.8 ft-lb) in numerical order as shown in the figure.

(5) Loosen the mounting bolts (4 places) by 180° in the order of (6) → (5) → (4) → (3) as shown in the figure.

(6) Tighten the mounting bolts (4 places) with a torque of 17 N·m (1.7kgf-m, 12.5 ft-lb) in the order of (3) → (4) → (5) → (6) as shown in the figure.
(7) Using an angle gauge, tighten the mounting bolts (4 places) with torque of 58°— 62° in the order of (3) → (4) → (5) → (6) as shown in the figure.
(8) Loosen the mounting bolts (6 places) by 180° in the order of (8) → (7) → (10) → (9) → (2) → (1) as shown in the figure.
(9) Tighten the mounting bolts (6 places) with a torque of 17 N·m (1.7kgf-m, 12.5 ft-lb) in the order of (1) → (2) → (9) → (10) → (7) → (8) as shown in the figure.
(10) Using an angle gauge, tighten the mounting bolts (3 places) with torque of 58°— 62° in the order of (1) → (2) → (9) as shown in the figure.
(11) Using an angle gauge, tighten the mounting bolt (10) (1 place) shown in the figure to the angle of 78°— 82°.
(12) Using an angle gauge, tighten the mounting bolt (7) (1 place) shown in the figure to the angle of 58°— 62°.
(13) Using an angle gauge, tighten the mounting bolt (8) (1 place) shown in the figure to the angle of 78°— 82°.



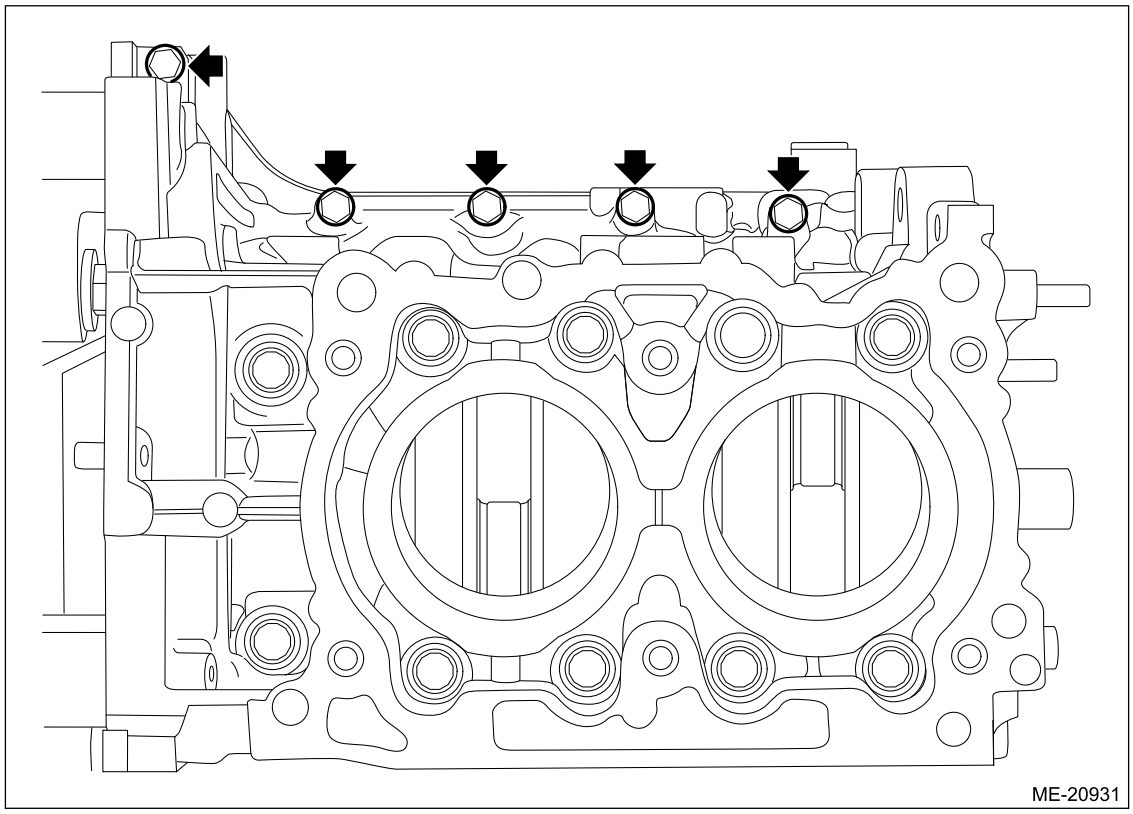
(14) Install the bolt shown in the figure.

Note:

After tightening, if the liquid gasket is squeezed out onto the seal surfaces of the chain cover and oil pan upper, remove any squeezed-out liquid gasket. Any liquid gasket on the chamfer area, however, should not be removed.

Tightening torque:

25 N·m (2.5kgf-m, 18.4ft-lb)



8. Set the part so that the installation surface of the oil pan upper is on the upper side.

9. Check that the piston ring gap for each piston is positioned correctly. Ref. to MECHANICAL(H4DO)>Cylinder Block>ASSEMBLY > PISTON AND CONNECTING ROD.

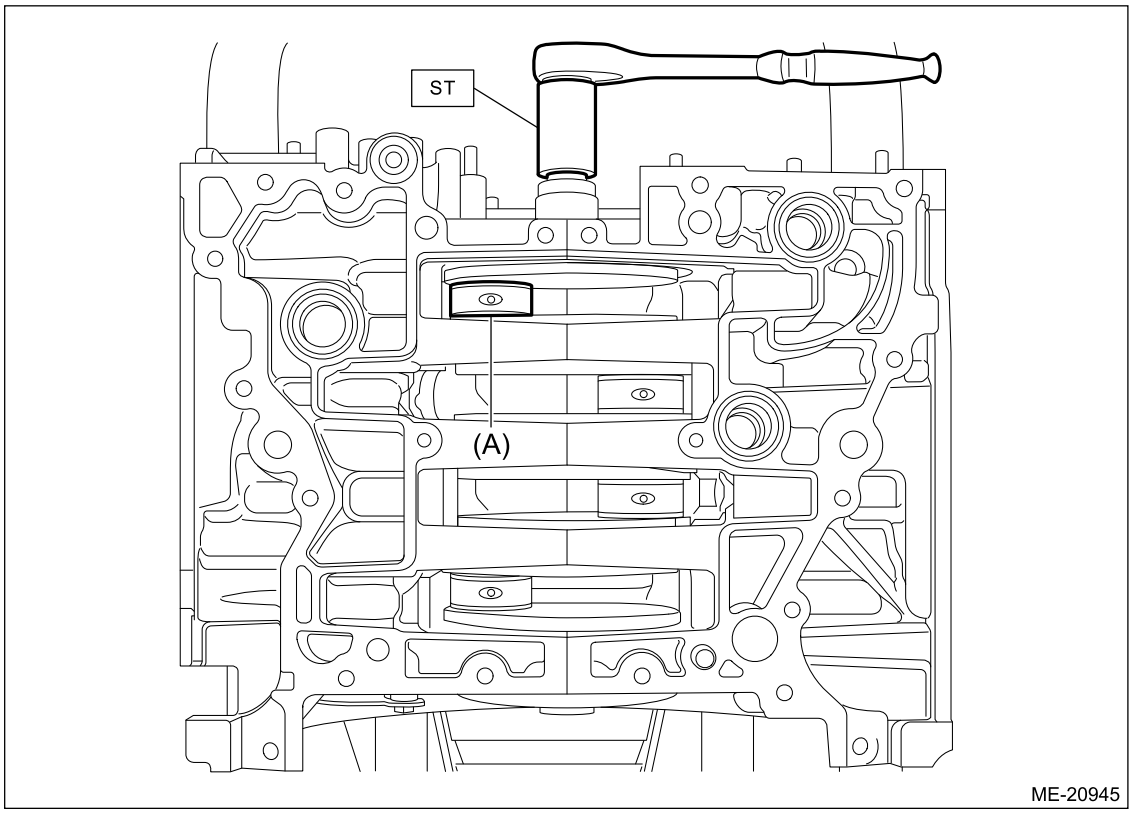
10. Install the piston and connecting rod to the cylinder block.

(1) Apply engine oil to the outer circumference of each piston, crankshaft pin, and in the cylinder block.

(2) Using the ST, turn the crankshaft so that the #1 pin (A) of crankshaft is positioned at TDC.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



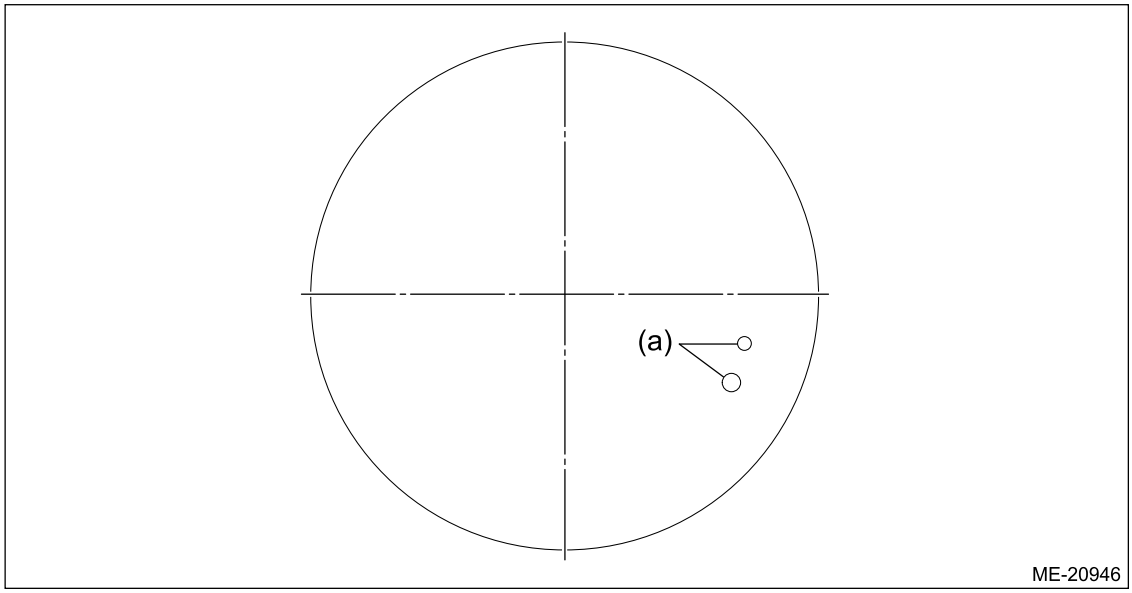
(3)Compress the piston ring using piston ring compressor, and insert the #1 connecting rod with #1 piston into cylinder block.

Caution:

- **Be careful not to damage the cylinder liner and #1 pin of crankshaft by the #1 connecting rod large end.**
- **Be careful not to apply strong impact when inserting to prevent connecting rod bearing from falling off.**

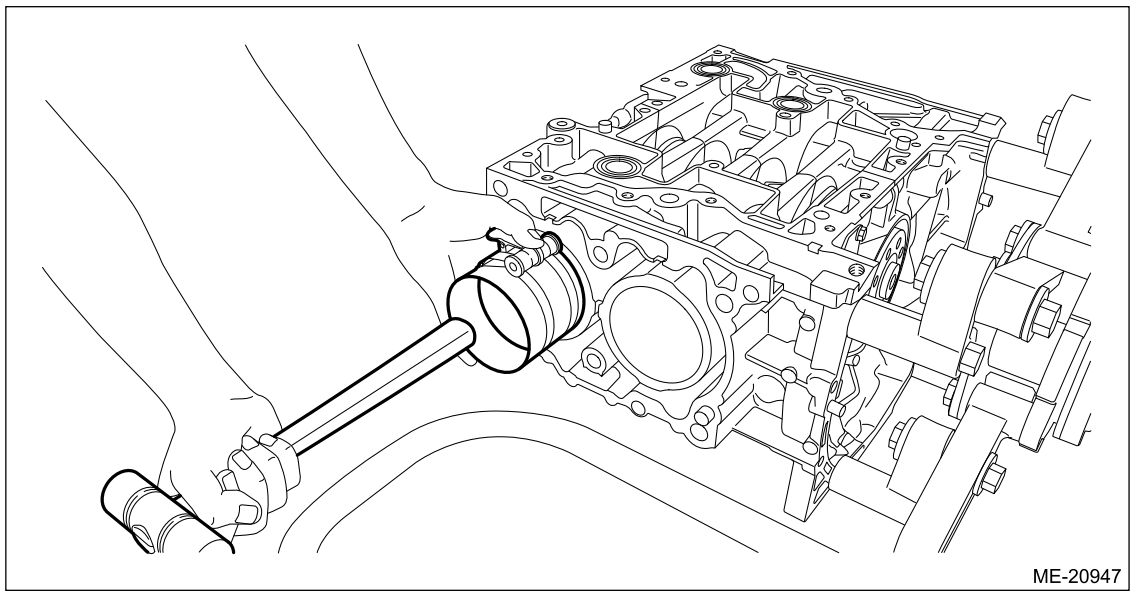
Note:

- **Face the piston front mark (round mark) towards the front of the engine.**



(a) Front mark

- **Insert while lightly tapping the crown of the piston with the handle of a plastic hammer.**



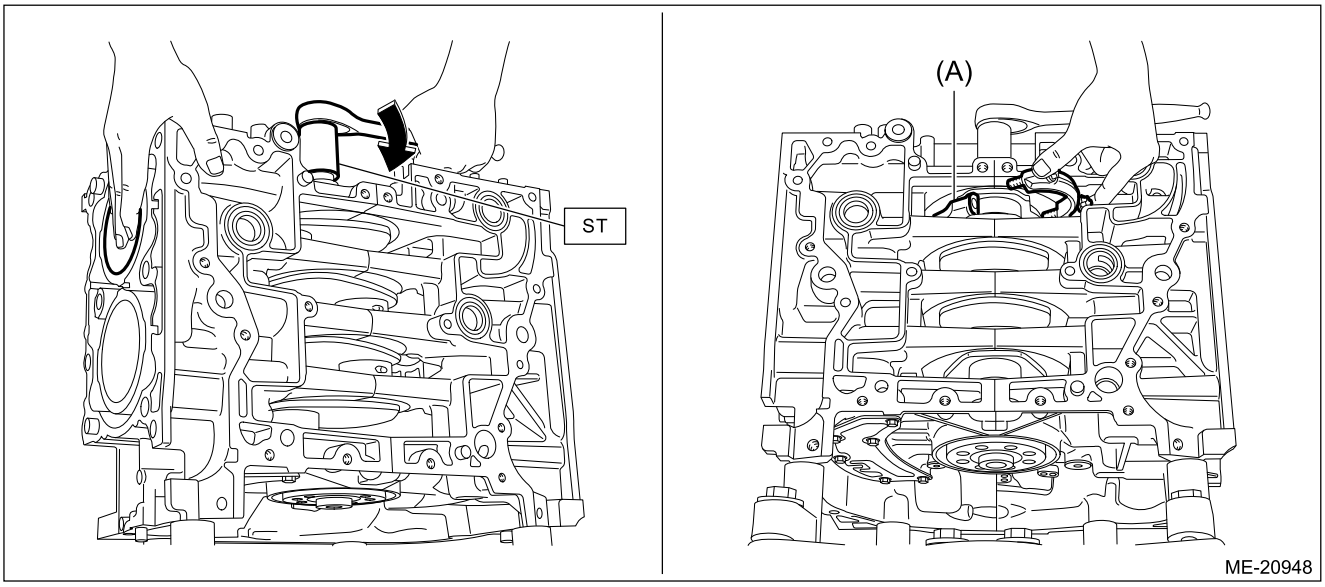
(4) Using the ST, turn the crankshaft counterclockwise so that the #1 pin of crankshaft and the large end (A) of #1 connecting rod are positioned as shown in the figure, while pressing the #1 piston crown, and then set the #1 connecting rod cap and #1 connecting rod cap bolt.

Note:

- **Each connecting rod has its own mating cap. Make sure that they are assembled correctly by checking their matching symbol.**
- **Use a new connecting rod cap bolt.**
- **Apply a coat of engine oil to the #1 connecting rod cap seat and the connecting rod cap bolt threads.**

Preparation tool:

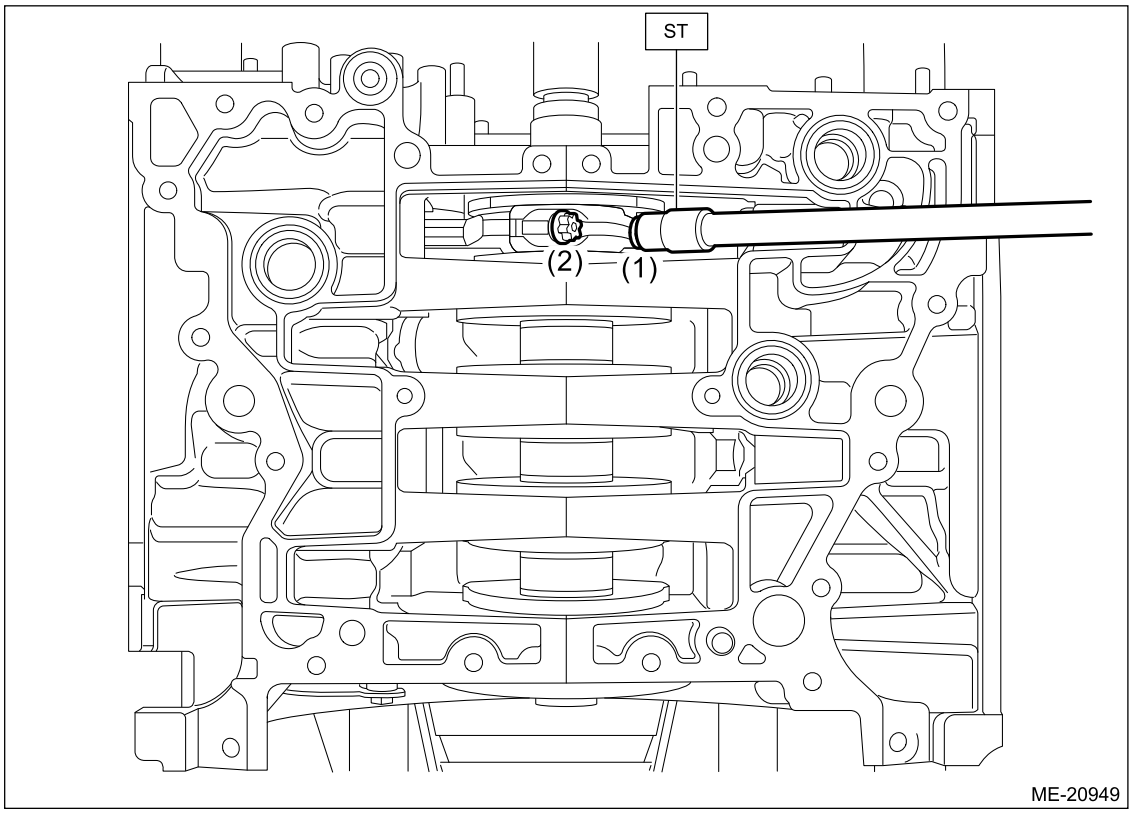
ST: CRANKSHAFT SOCKET (18252AA000)



(5) Using ST, tighten the #1 connecting rod cap bolts to 10 N·m (1.0 kgf-m, 7.4 ft-lb) in numerical order as shown in the figure, then retighten the bolts to 22 N·m (2.2 kgf-m, 16.2 ft-lb) in numerical order as shown in the figure.

Preparation tool:

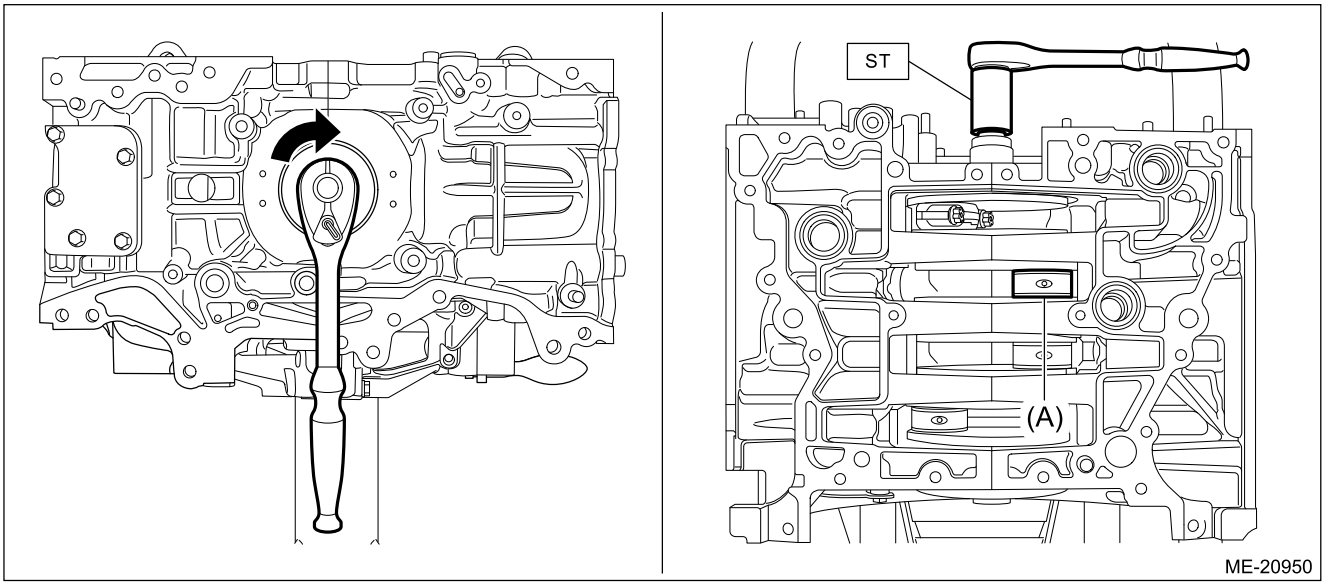
ST: SOCKET (18270AA020)



(6) Using the ST, turn the crankshaft clockwise so that the #2 pin (A) of crankshaft is positioned at TDC.

Preparation tool:

ST: CRANKSHAFT SOCKET (18252AA000)



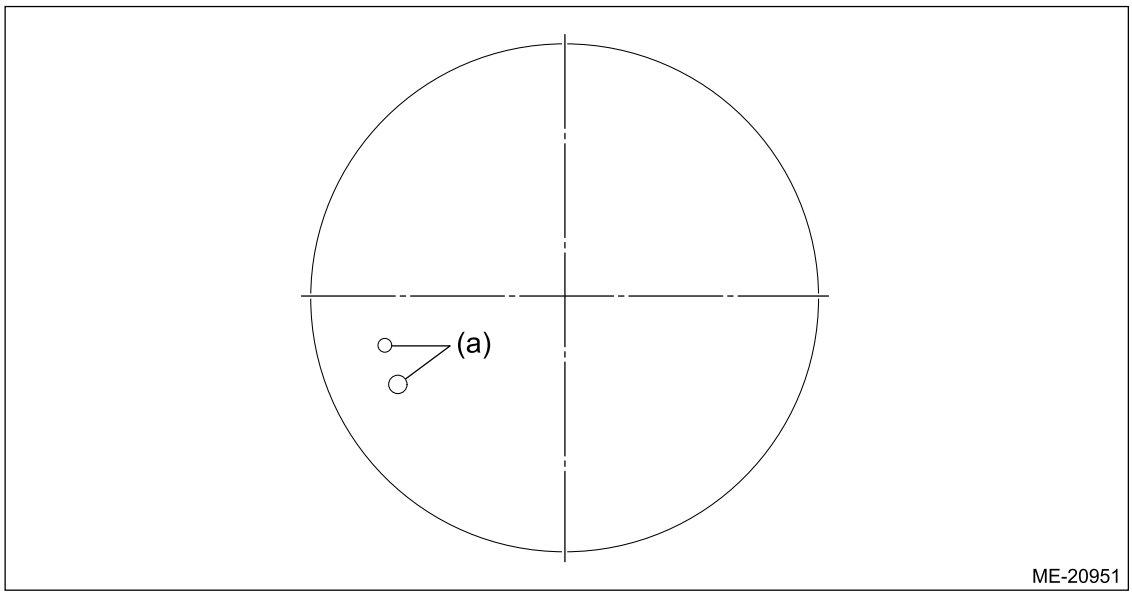
(7) Compress the piston ring using piston ring compressor, and insert the #2 connecting rod with #2 piston into cylinder block.

Caution:

- **Be careful not to damage the cylinder liner and #2 pin of crankshaft by the #2 connecting rod large end.**
- **Be careful not to apply strong impact when inserting to prevent connecting rod bearing from falling off.**

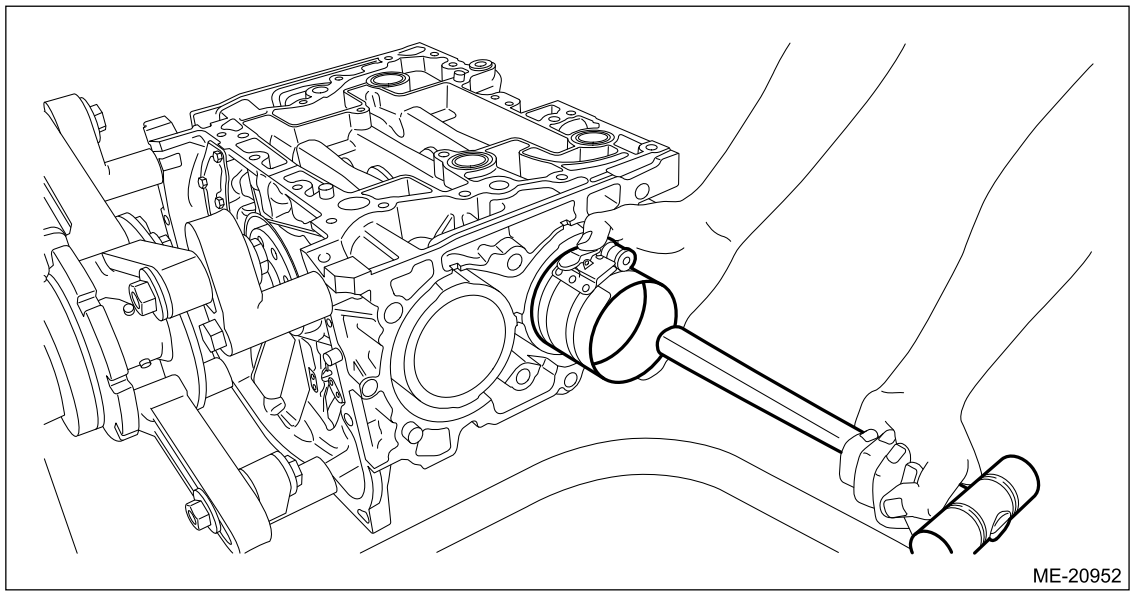
Note:

- **Face the piston front mark (round mark) towards the front of the engine.**



(a) Front mark

- **Insert while lightly tapping the crown of the piston with the handle of a plastic hammer.**



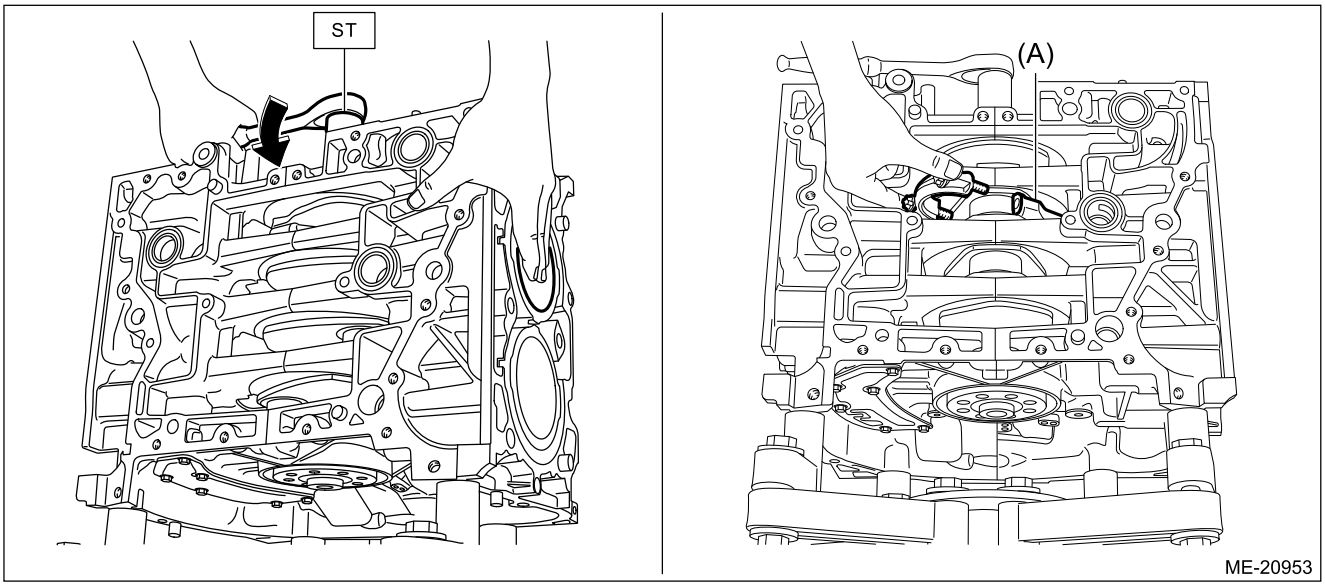
(8) Using the ST, turn the crankshaft clockwise so that the #2 pin of crankshaft and the large end (A) of #2 connecting rod are positioned as shown in the figure, while pressing the #2 piston crown, and then set the #2 connecting rod cap and #2 connecting rod cap bolt.

Note:

- **Each connecting rod has its own mating cap. Make sure that they are assembled correctly by checking their matching symbol.**
- **Use a new connecting rod cap bolt.**
- **Apply a coat of engine oil to the #2 connecting rod cap seat and the connecting rod cap bolt threads.**

Preparation tool:

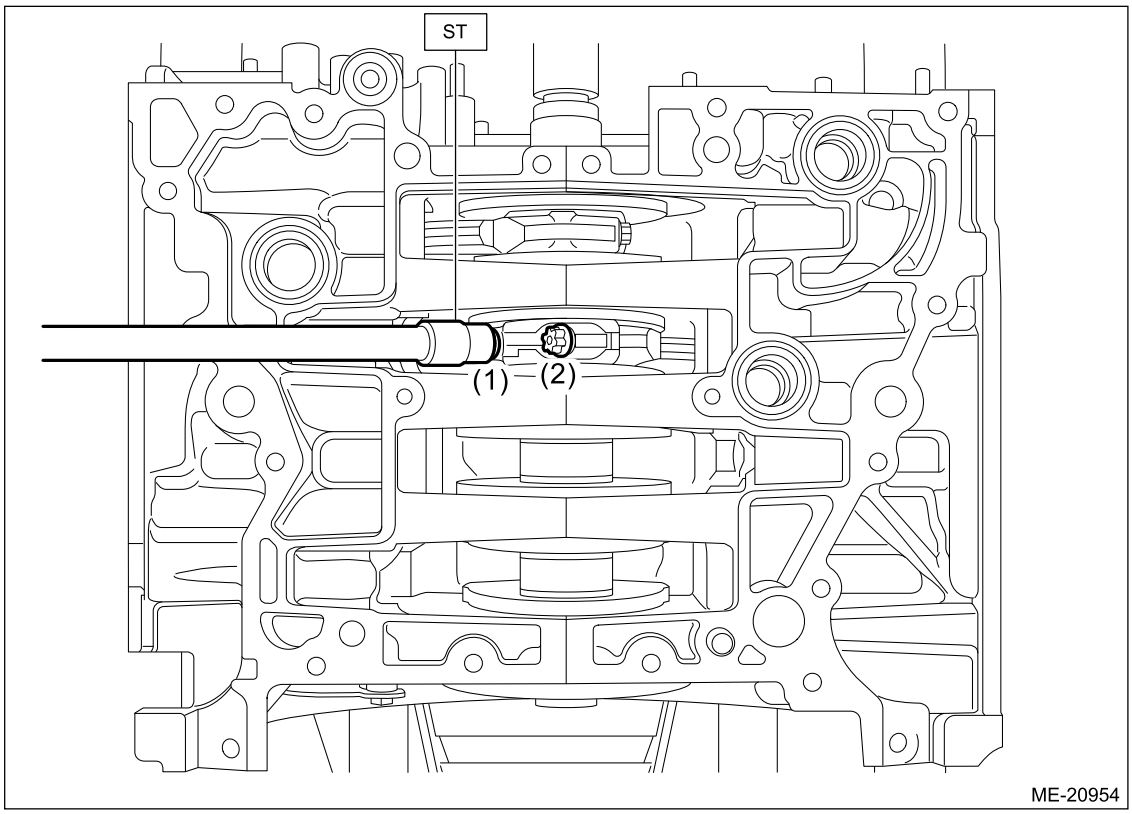
ST: CRANKSHAFT SOCKET (18252AA000)



(9) Using the ST, tighten the #2 connecting rod cap bolts to 10 N·m (1.0 kgf-m, 7.4 ft-lb) in numerical order as shown in the figure, then retighten the bolts to 22 N·m (2.2 kgf-m, 16.2 ft-lb) in numerical order as shown in the figure.

Preparation tool:

ST: SOCKET (18270AA020)

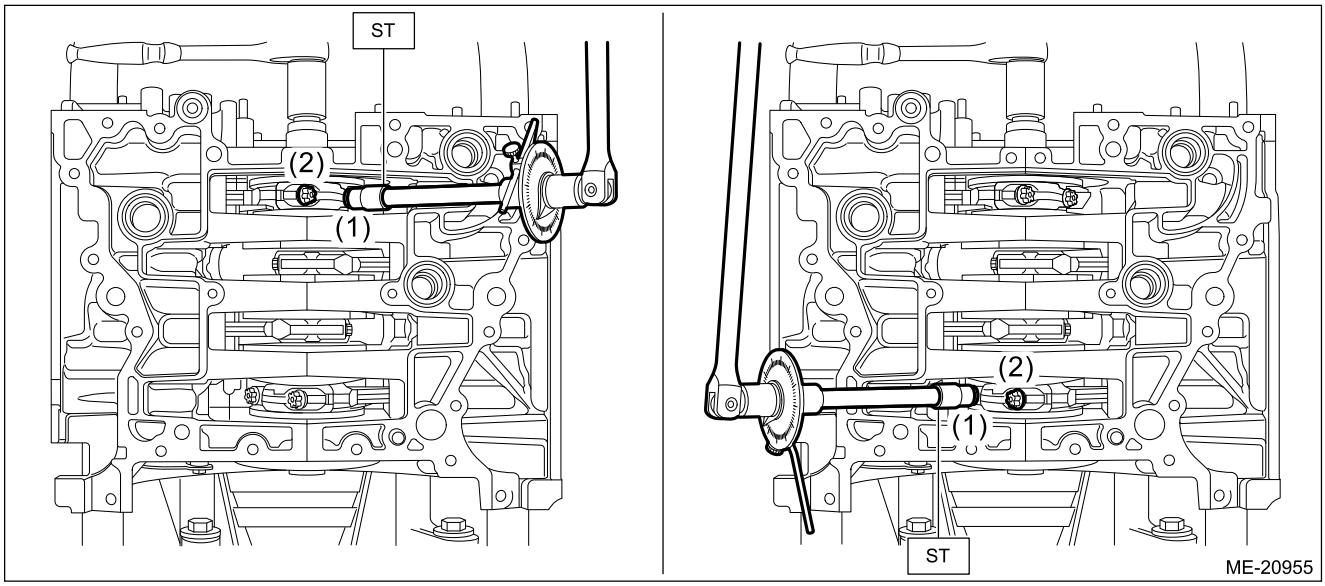


(10) Install #3 and #4 pistons and connecting rod caps in the same installation procedure as #1 and #2 pistons and connecting rod caps.

(11) Using the ST and angle gauge, tighten the #1 connecting rod cap bolts and #4 connecting rod cap bolts with a torque of 135°— 140° in numerical order as shown in the figure.

Preparation tool:

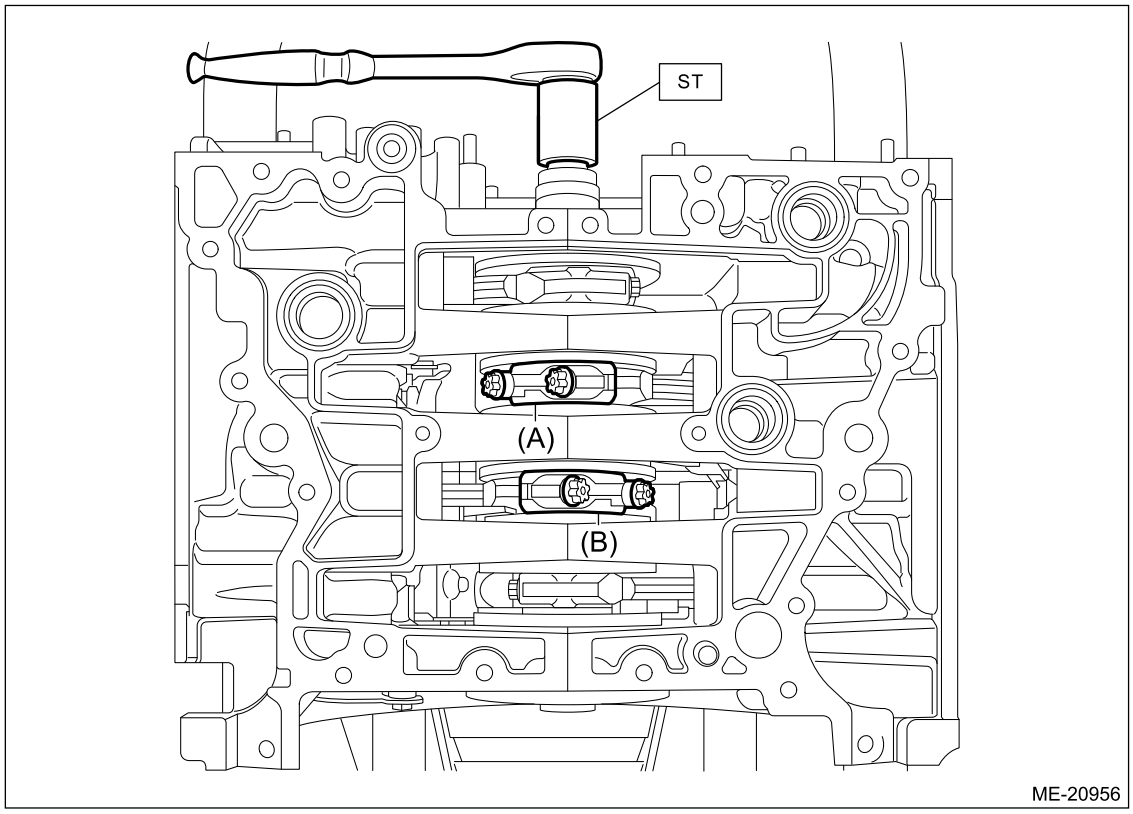
ST: SOCKET (18270AA020)



(12) Using the ST, turn the crankshaft so that the #2 connecting rod cap (A) and #3 connecting rod cap (B) is located at the position shown in the figure.

Preparation tool:

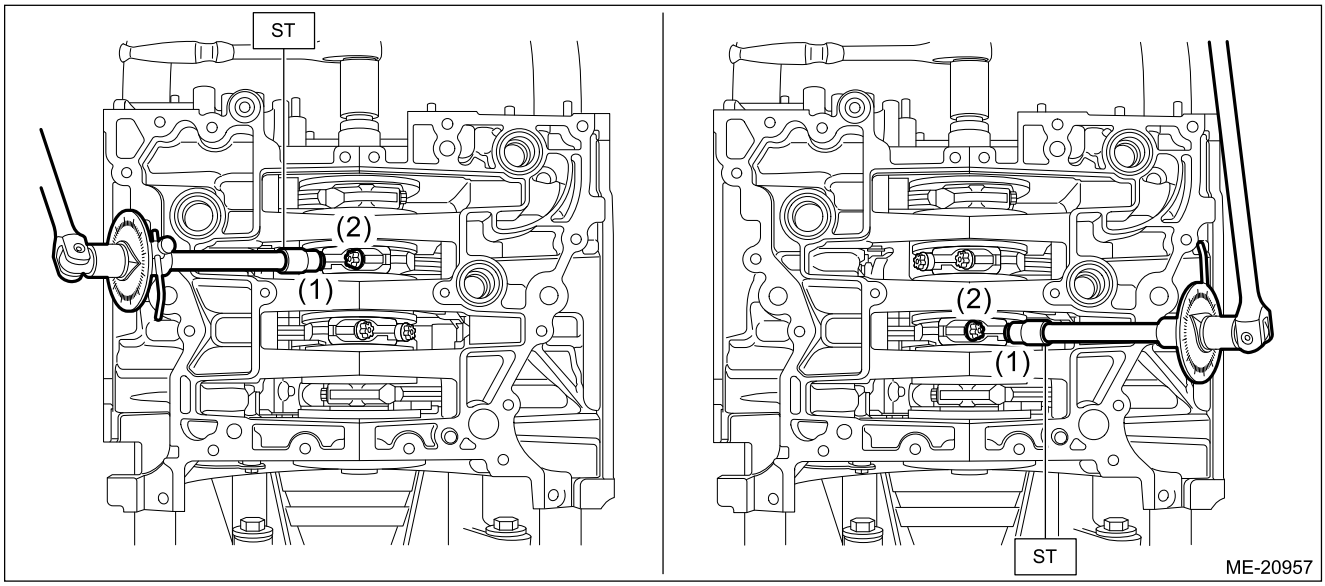
ST: CRANKSHAFT SOCKET (18252AA000)



(13) Using the ST and angle gauge, tighten the #2 connecting rod cap bolts and #3 connecting rod cap bolts with a torque of 135°— 140° in numerical order as shown in the figure.

Preparation tool:

ST: SOCKET (18270AA020)

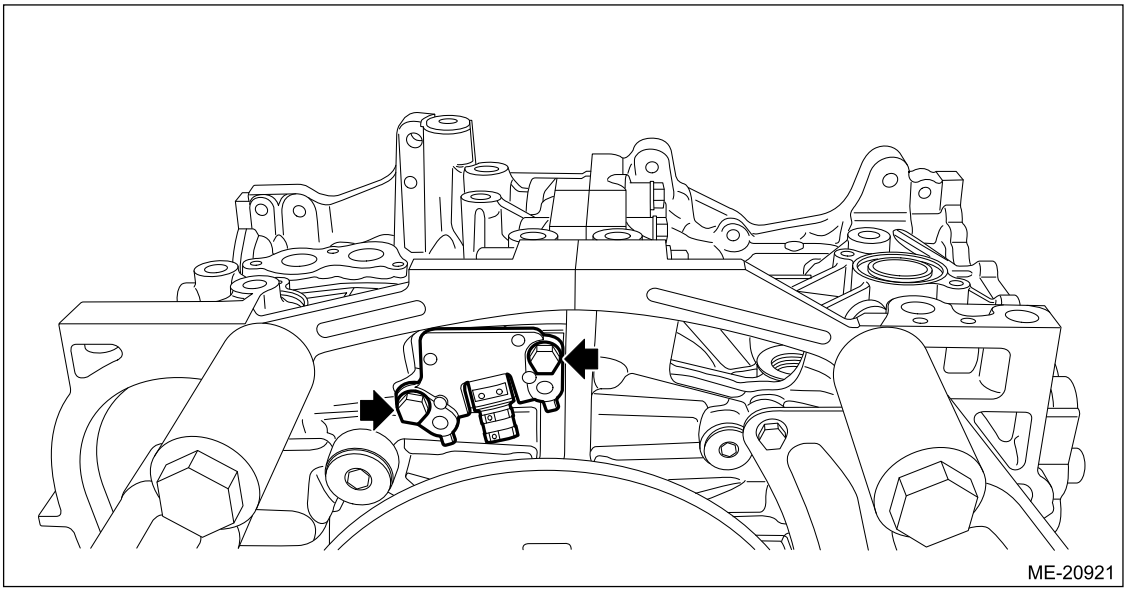


11. Set the part so that the installation surface of the intake manifold is on the upper side.

12. Install the crankshaft position sensor with crankshaft position sensor holder to the cylinder block LH.

Tightening torque:

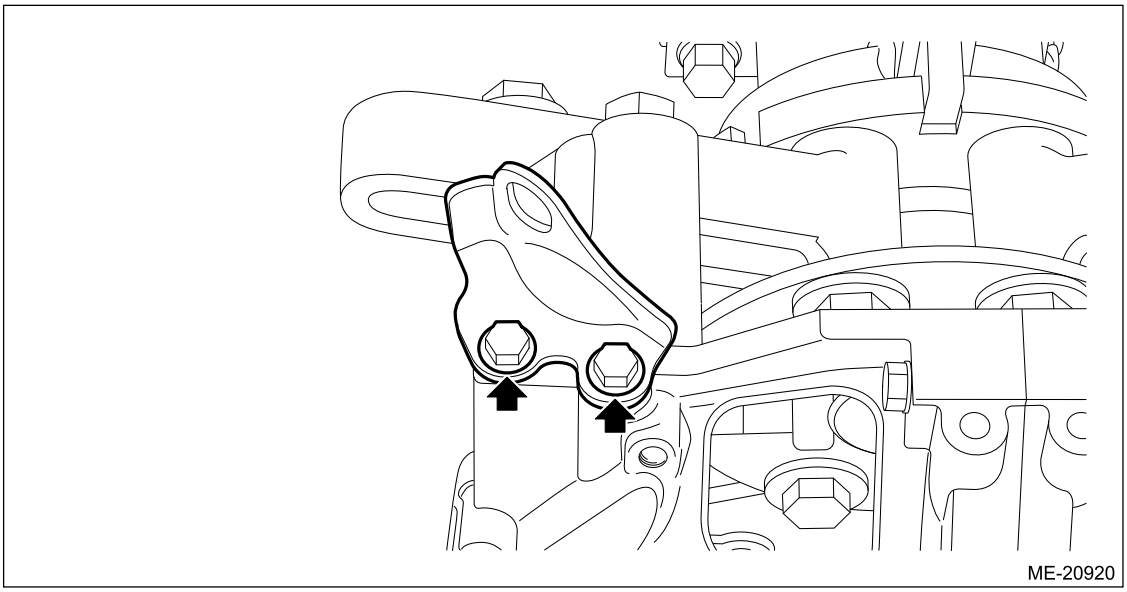
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



13. Install the engine rear hanger to the cylinder block RH.

Tightening torque:

36 N·m (3.7kgf-m, 26.6 ft-lb)

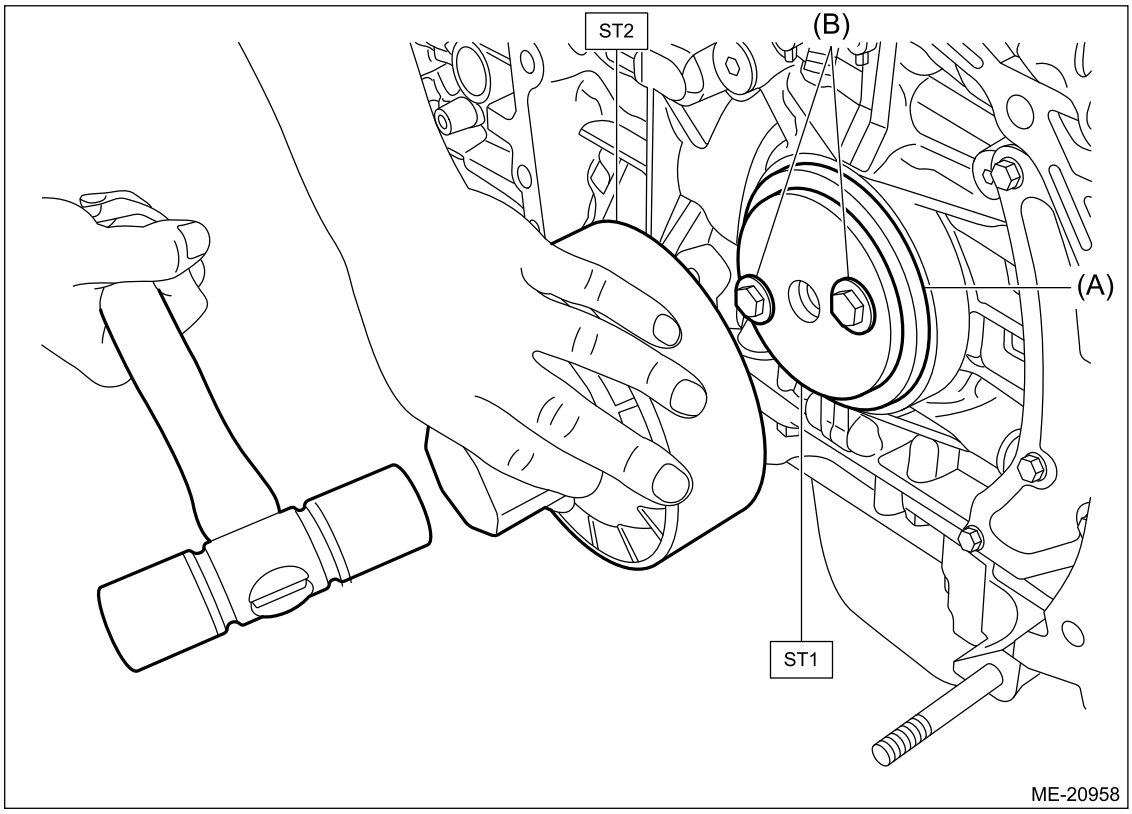


14. Install the PCV valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Valve>INSTALLATION.
15. Install the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Knock Sensor>INSTALLATION.
16. Install the PCV connector. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES) (H4DO)>PCV Connector>INSTALLATION.
17. Install the water tank pipe assembly. Ref. to COOLING(H4DO)>Water Pipe>INSTALLATION > WATER TANK PIPE ASSY.
18. Install the crank sprocket. Ref. to MECHANICAL(H4DO)>Crank Sprocket>INSTALLATION.
19. Install the oil pan upper. Ref. to LUBRICATION(H4DO)>Oil Pan>INSTALLATION > OIL PAN UPPER.
20. Install the cylinder head. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSTALLATION.
21. Install the cam carrier. Ref. to MECHANICAL(H4DO)>Cam Carrier>INSTALLATION.
22. Install the rocker cover. Ref. to MECHANICAL(H4DO)>Rocker Cover>INSTALLATION.
23. Install the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.
24. Install the engine wiring harness. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Wiring Harness>INSTALLATION.
25. Install the intake manifold assembly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Intake Manifold Assembly>INSTALLATION.
26. Apply a coat of engine oil to the oil seal inner periphery and outer periphery, and install new rear oil seal using ST1 and ST2.

    Preparation tool:

    ST1: OIL SEAL GUIDE (18671AA020)

    ST2: OIL SEAL INSTALLER (18657AA030)



(A) Rear oil seal

(B) Drive plate or flywheel mounting bolt

27. Install the crankshaft position sensor plate with drive plate. (CVT model) Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>INSTALLATION.

28. Install the crankshaft position sensor plate with flywheel. (MT model) Ref. to CLUTCH SYSTEM>Flywheel>INSTALLATION.

29. Install the clutch disc and cover. (MT model) Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>INSTALLATION.

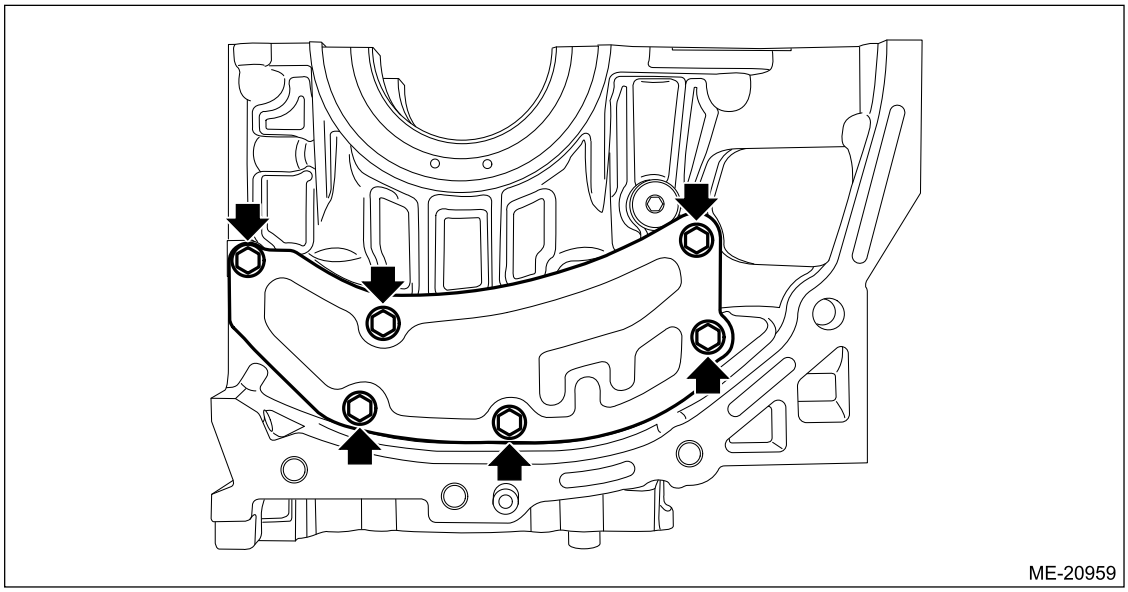
30. Install the engine to the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>INSTALLATION.

MECHANICAL(H4DO) > Cylinder Block

DISASSEMBLY

1. CYLINDER BLOCK

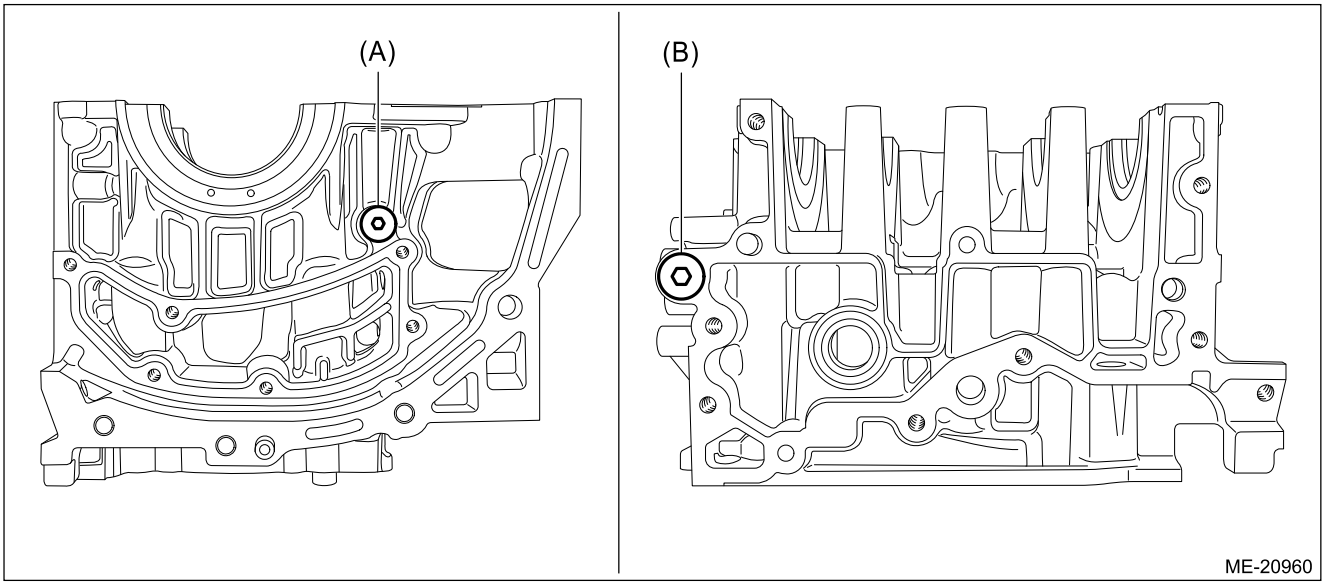
1. Remove the oil separator cover from cylinder block RH.



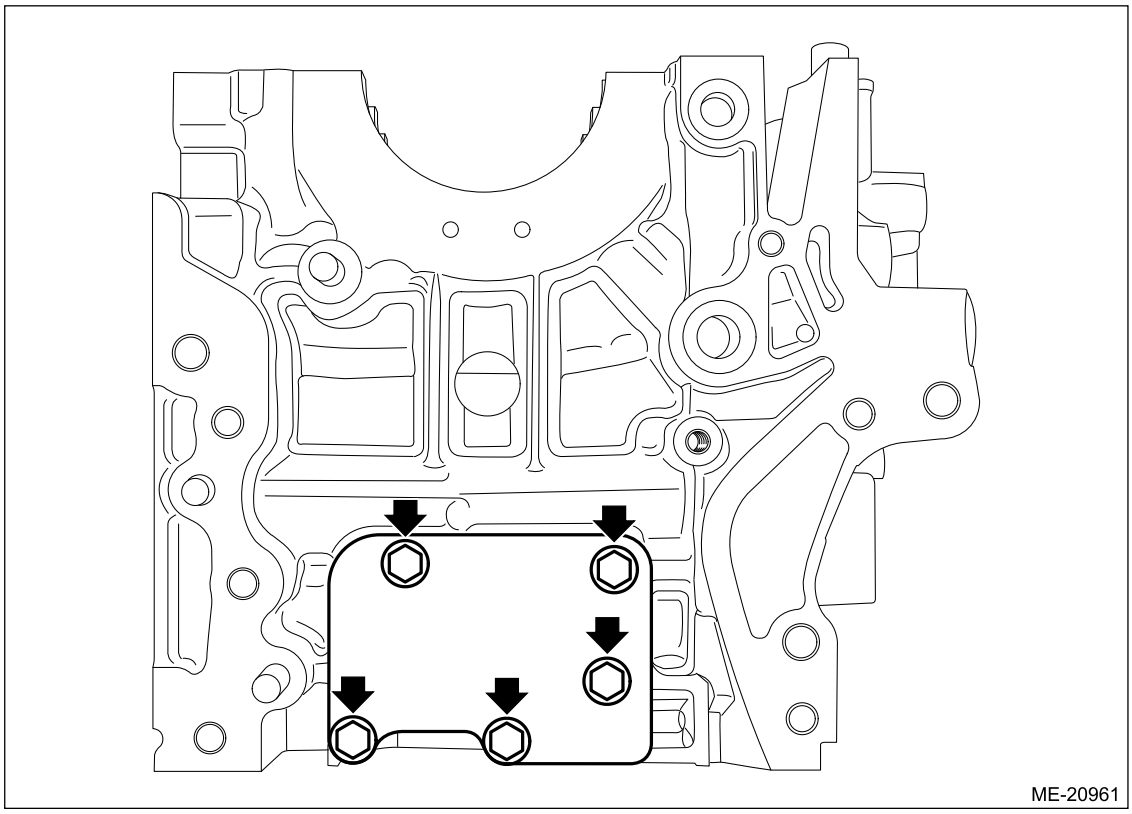
2. Remove the liquid gasket from cylinder block RH.
3. Remove the cylinder block plug (A) and the main gallery plug (B) from cylinder block RH.

Note:

- **Remove if necessary.**
- **After removing the parts, remove the liquid gasket from the thread holes of the cylinder block RH, and from the threaded portions of cylinder block plug and main gallery plug.**



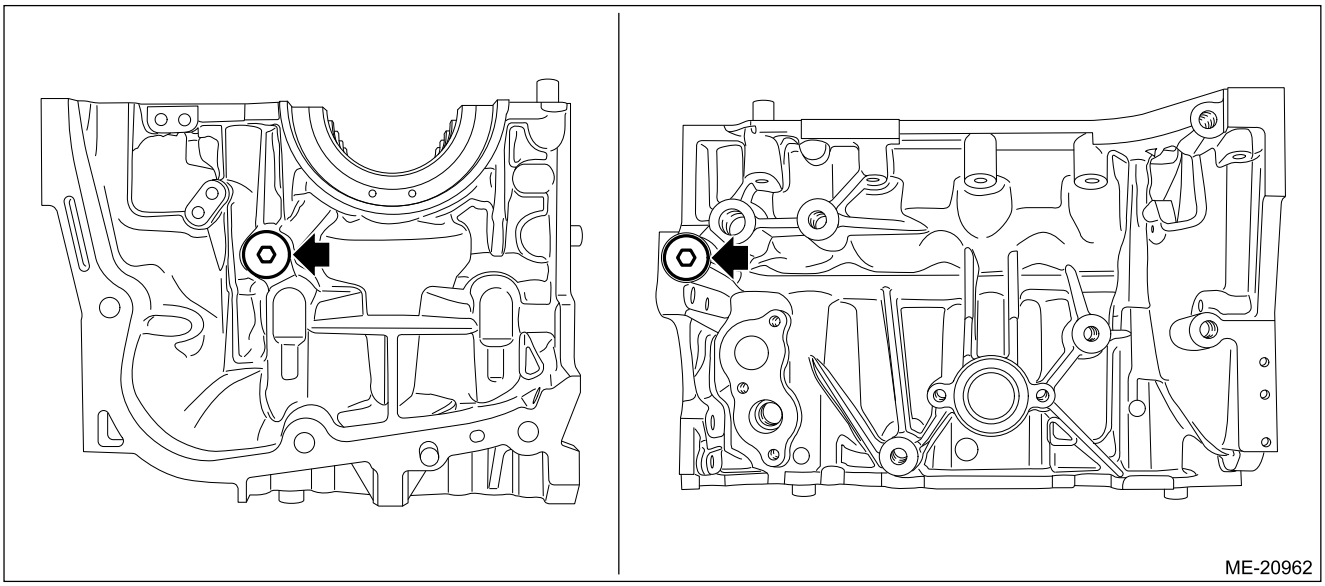
4. Remove the cylinder block plate from cylinder block LH.



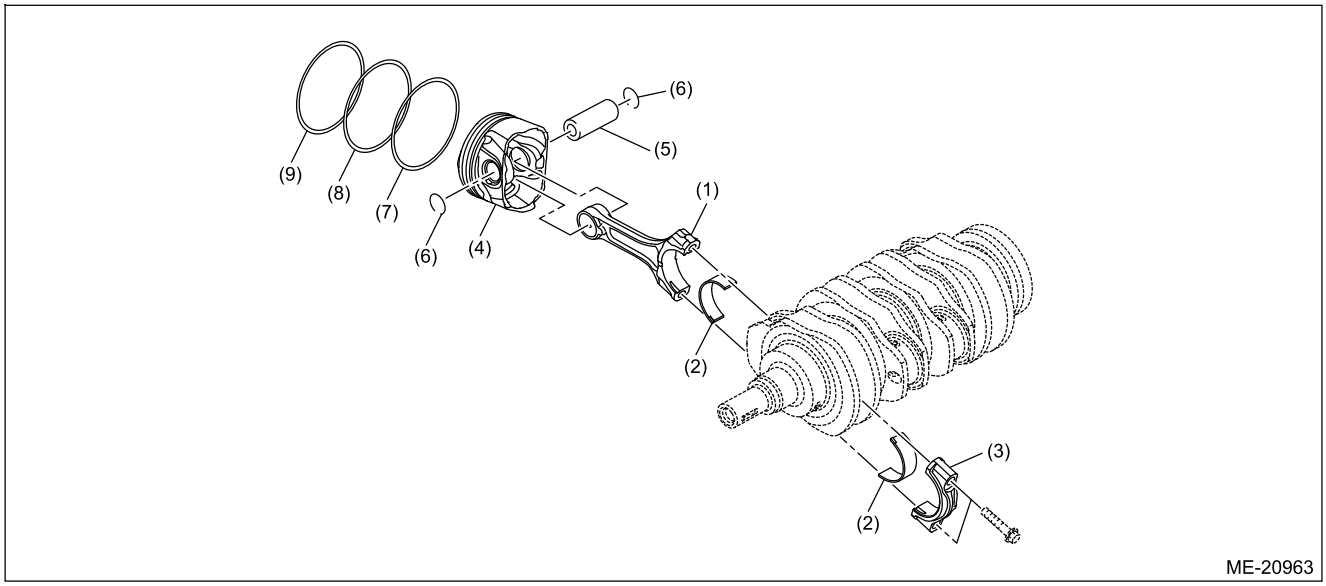
5. Remove the main gallery plug from cylinder block LH.

Note:

- **Remove if necessary.**
- **After removing the parts, remove the liquid gasket from the thread holes of the cylinder block LH and main gallery plug.**



2. PISTON AND CONNECTING ROD



(1) Connecting rod
(2) Connecting rod bearing
(3) Connecting rod cap
(4) Piston
(5) Piston pin
(6) Circlip
(7) Oil ring
(8) Second ring
(9) Top ring

Note:
To prevent confusion of various parts, mark each part.

1. Remove the connecting rod bearing from connecting rod and connecting rod cap.
2. Remove the piston rings from the piston.
   Note:
   Arrange the piston rings in order so that they can be installed in their original positions without confusion.
   (1) Remove the compression rings in the order of top ring and second ring, using piston ring expander.
   (2) Remove the oil rings in the order of upper rail, lower rail and expander by hand.
3. Remove the circlip on one end from the piston using a flat tip screwdriver.
   Note:
   Be careful not damage the piston and piston pin, by wrapping the tip of flat tip screwdriver with tape.
4. Remove the piston pin from piston, and remove the connecting rod from piston.
5. Remove the circlip on other end from the piston using a flat tip screwdriver.
   Note:
   Be careful not damage the piston and piston pin, by wrapping the tip of flat tip screwdriver with tape.

MECHANICAL(H4DO) > Cylinder Block

ASSEMBLY

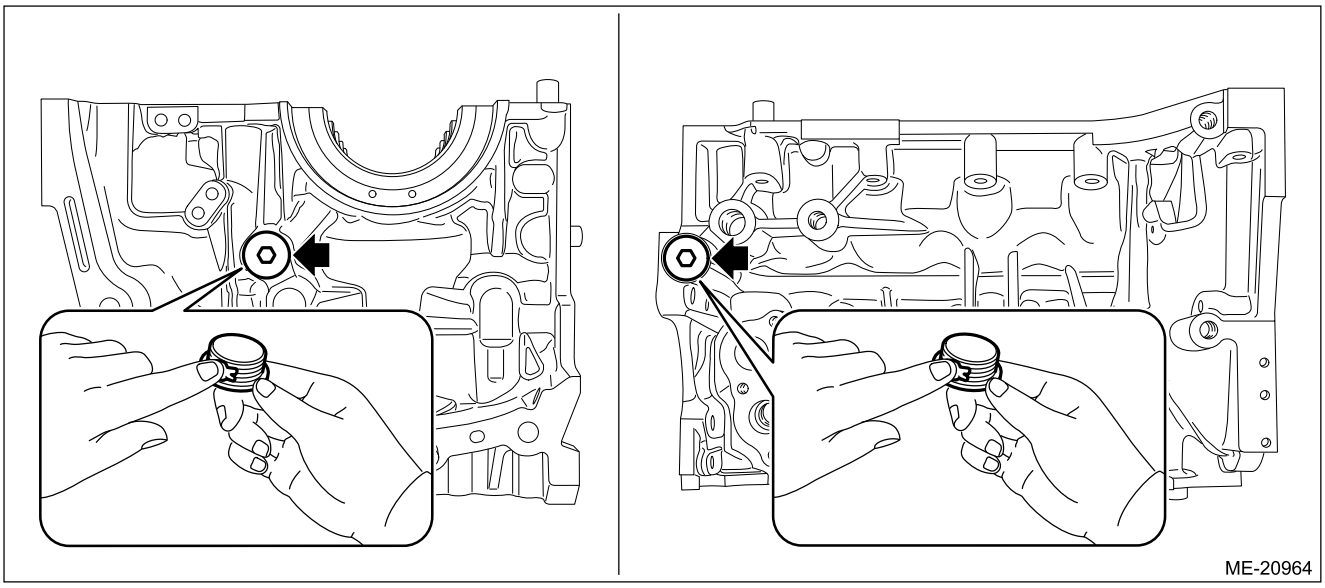
1. CYLINDER BLOCK

1. Apply liquid gasket to the threaded portion of the main gallery plug, and install the main gallery plug to the cylinder block LH.
   Note:
   Before applying liquid gasket, degrease the thread holes of the cylinder block LH and main gallery plug.
   Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

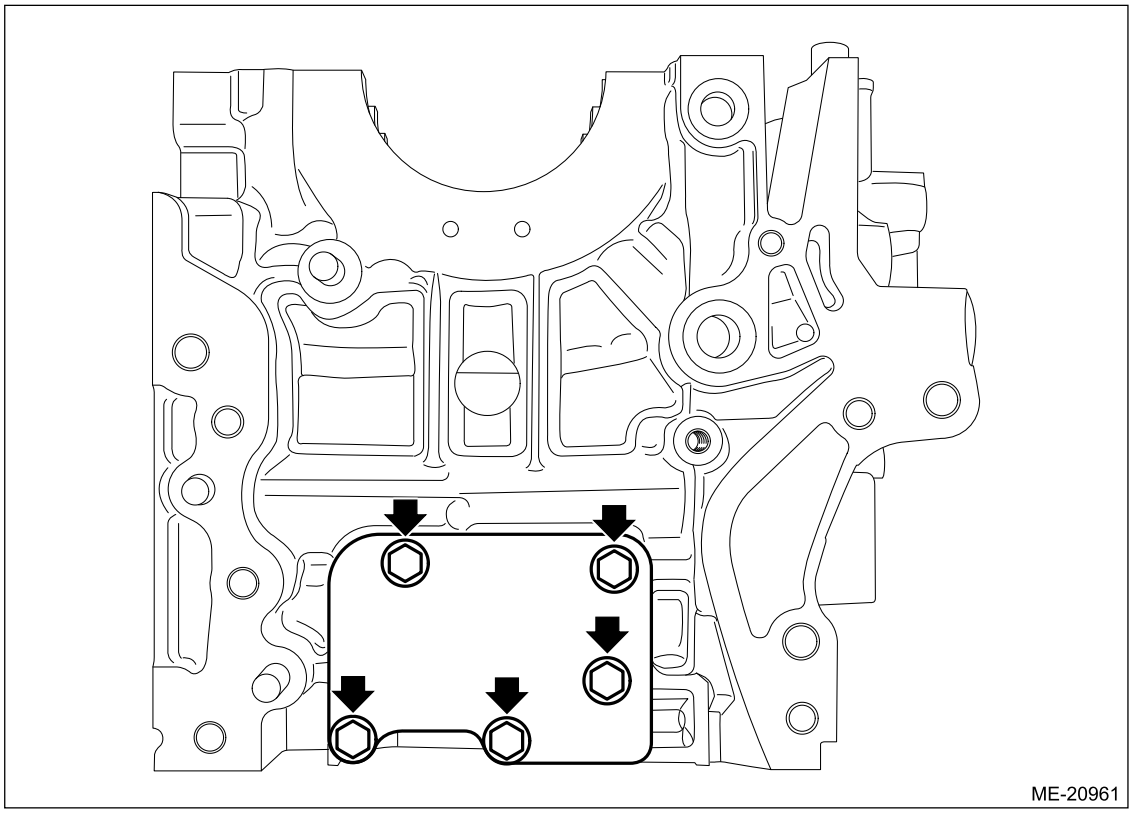
37 N·m (3.8 kgf-m, 27.3 ft-lb)



2. Install the cylinder block plate onto cylinder block LH.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



3. Apply liquid gasket to the threaded portions of cylinder block plug and main gallery plug, and install the cylinder block plug (A) and main gallery plug (B) to cylinder block RH.

Note:

Before applying liquid gasket, degrease the thread holes of the cylinder block RH, and the threaded portions of cylinder block plug and main gallery plug.

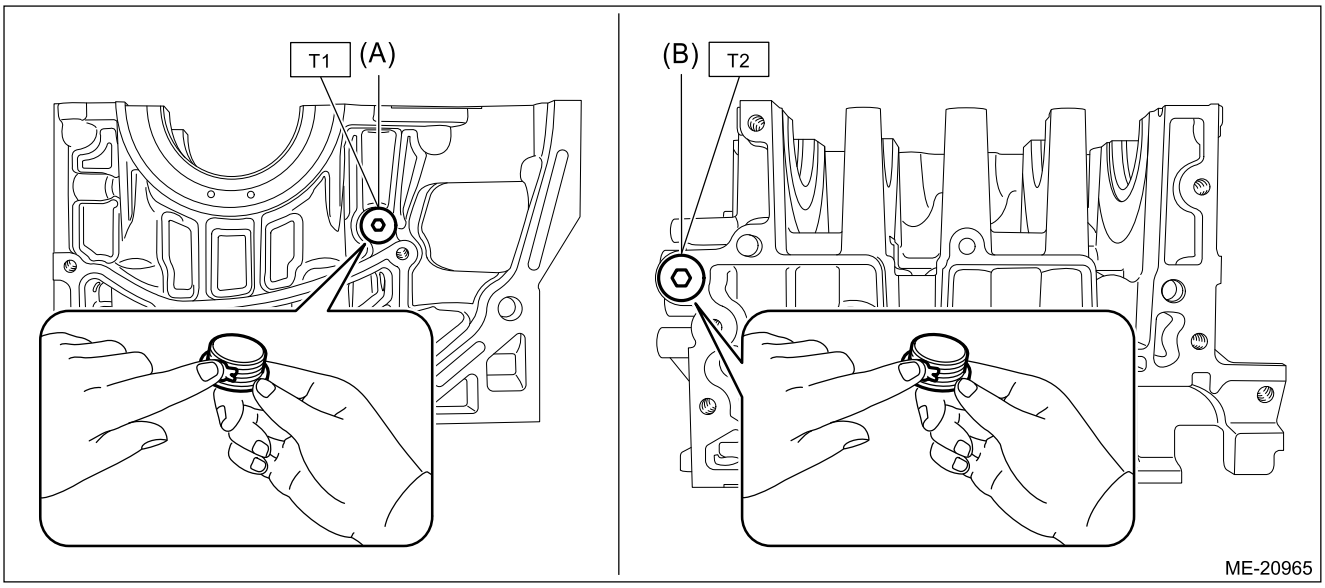
Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

T1: 16 N·m (1.6 kgf-m, 11.8 ft-lb)

T2: 37 N·m (3.8 kgf-m, 27.3 ft-lb)



4. Install the oil separator cover to the cylinder block RH.

(1) Apply liquid gasket to the mating surfaces of oil separator cover.

Note:

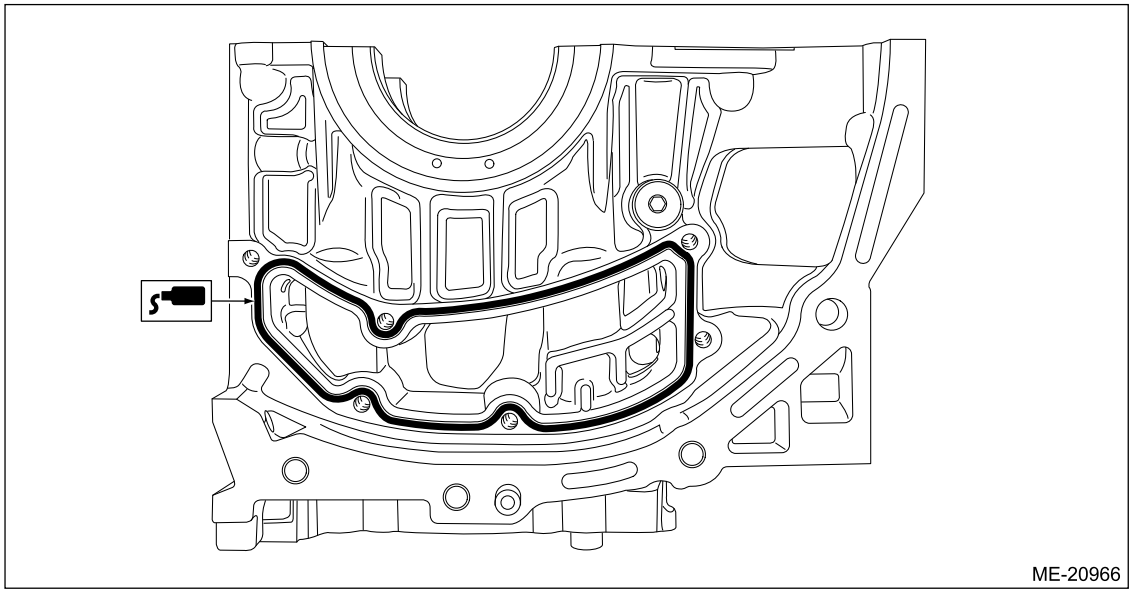
- **Use new oil separator cover.**
- **Before applying liquid gasket, degrease the old liquid gasket seal surface of cylinder block RH.**
- **Install within 5 min. after applying liquid gasket.**

Liquid gasket:

THREE BOND 1217G (Part No. K0877Y0100), THREE BOND 1217H or equivalent

Liquid gasket applying diameter:

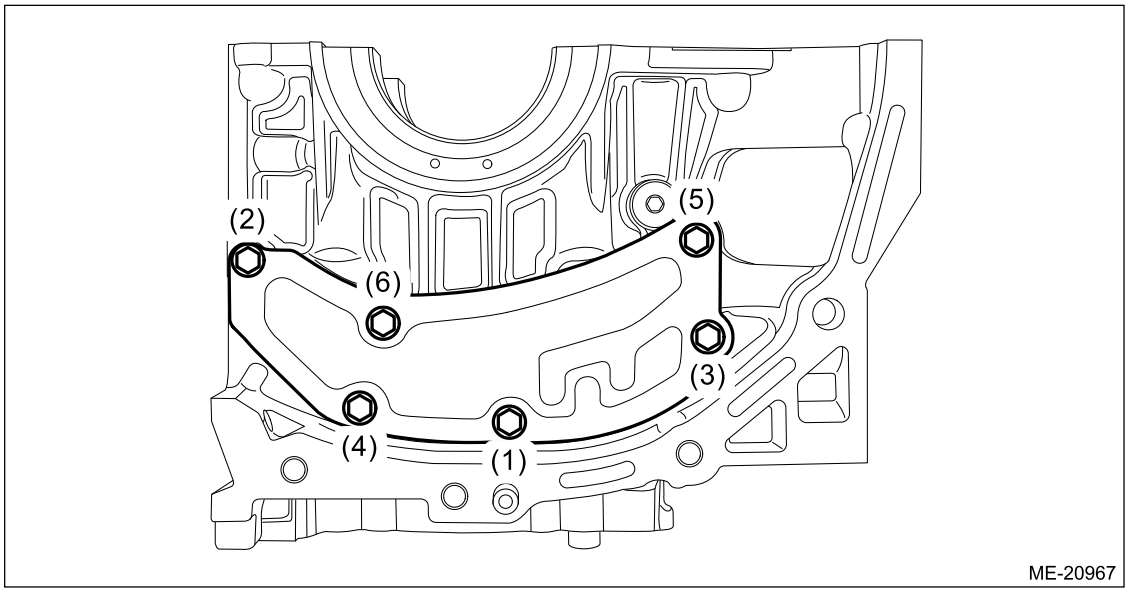
4±1 mm (0.1772±0.0394 in)



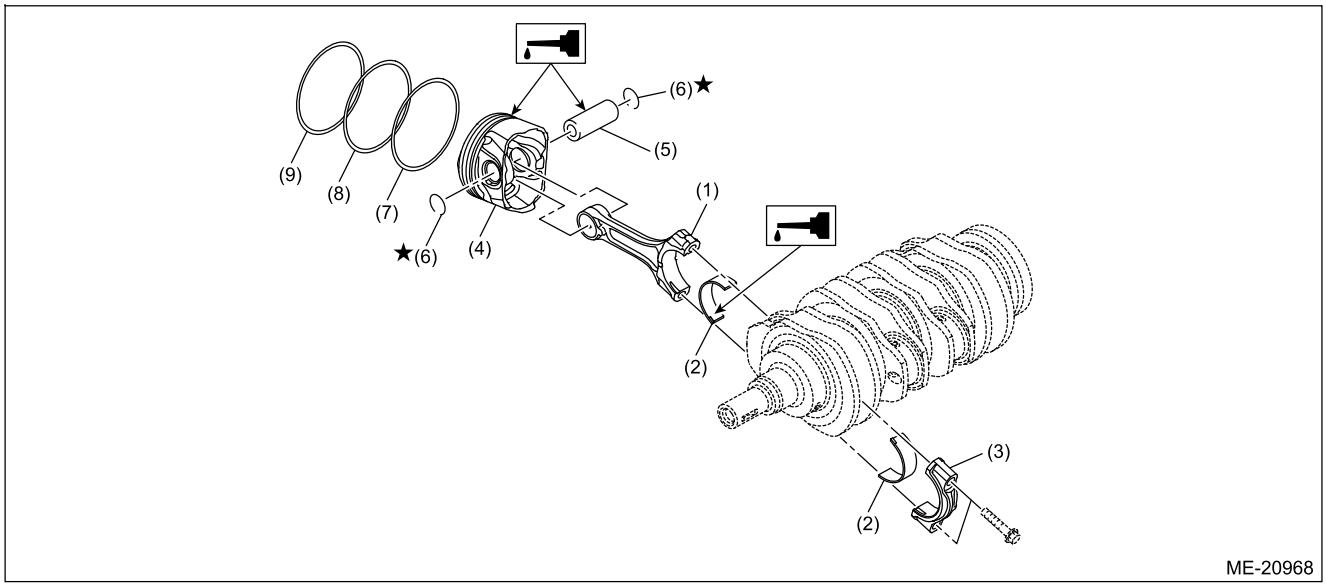
(2) Install the oil separator cover to the cylinder block RH, and tighten the oil separator cover bolts in numerical order as shown in the figure.

Tightening torque:

6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



2. PISTON AND CONNECTING ROD

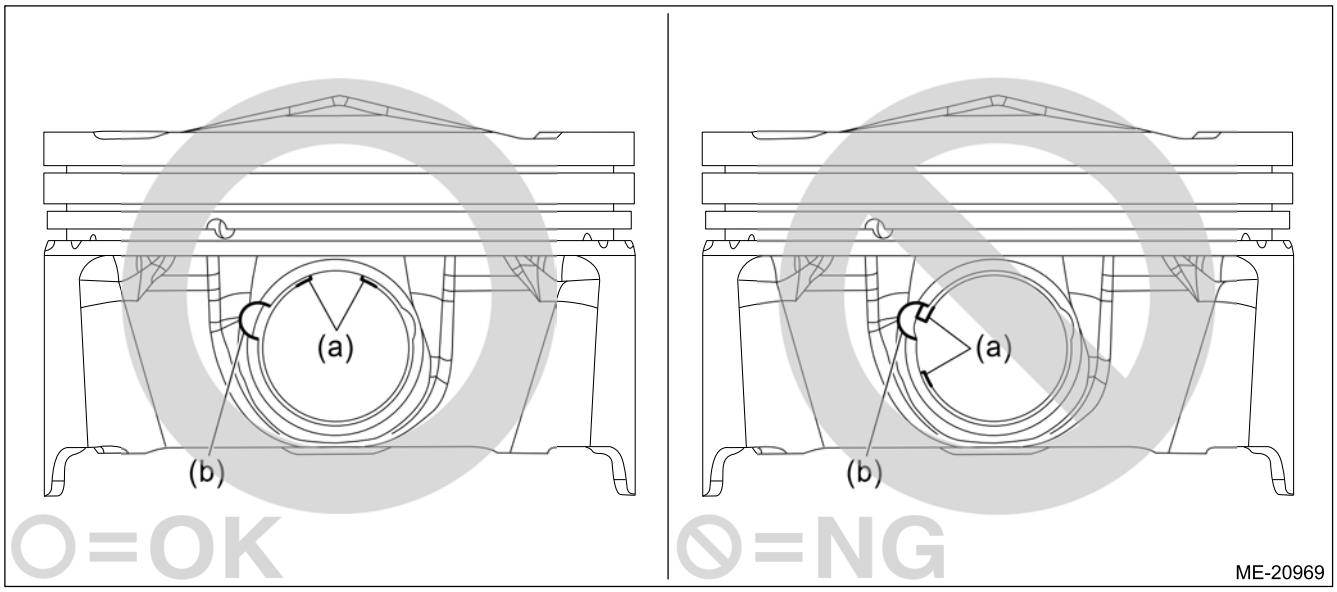


(1) Connecting rod	(4) Piston	(7) Oil ring
(2) Connecting rod bearing	(5) Piston pin	(8) Second ring
(3) Connecting rod cap	(6) Circlip	(9) Top ring

1. Install the connecting rod bearing to the connecting rod and connecting rod cap.
2. Install a new circlip on one side of the piston using a flat tip screwdriver.

Note:

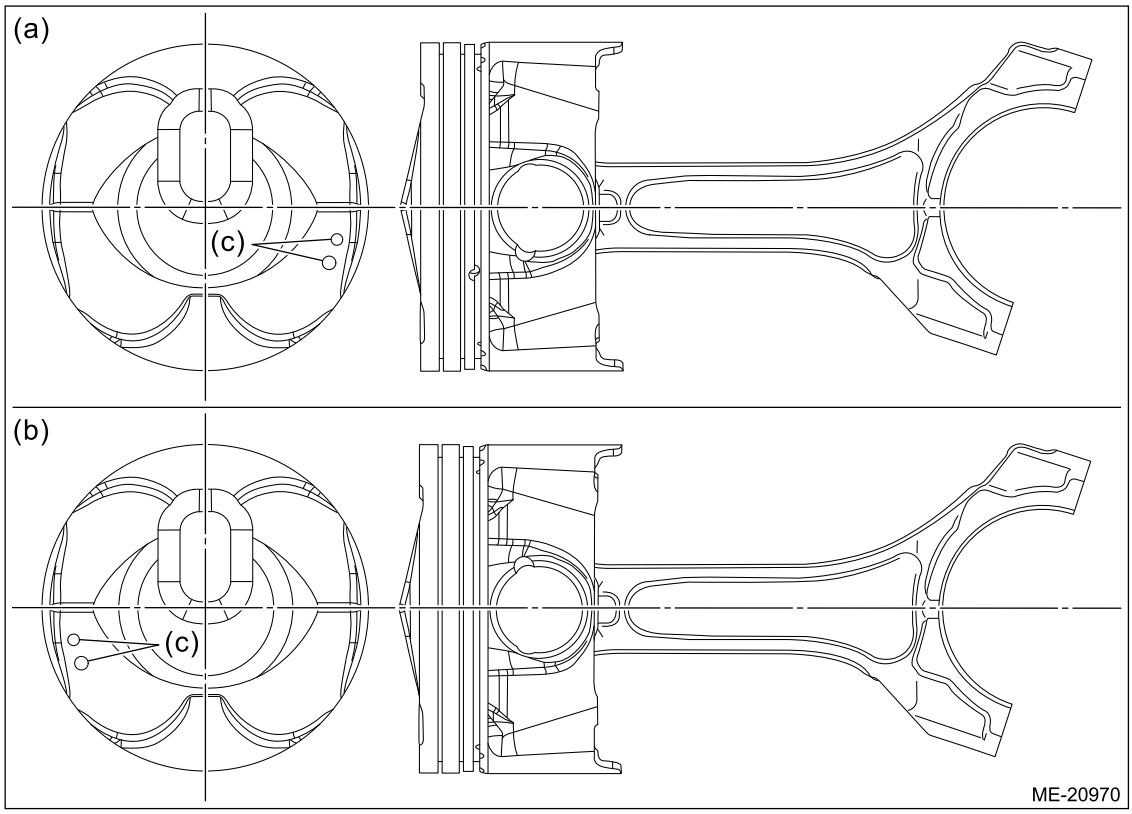
- **Be careful not damage the piston, by wrapping the tip of flat tip screwdriver with tape.**
- **Make sure the circlip is firmly inserted into the circlip groove.**
- **After installing the circlip, rotate the circlip so that its end part (a) and the cutout portion of circlip groove (b) do not match.**



3. Set the piston to the connecting rod.

Note:

Align the front mark of piston and the connecting rod direction correctly as shown in the figure.



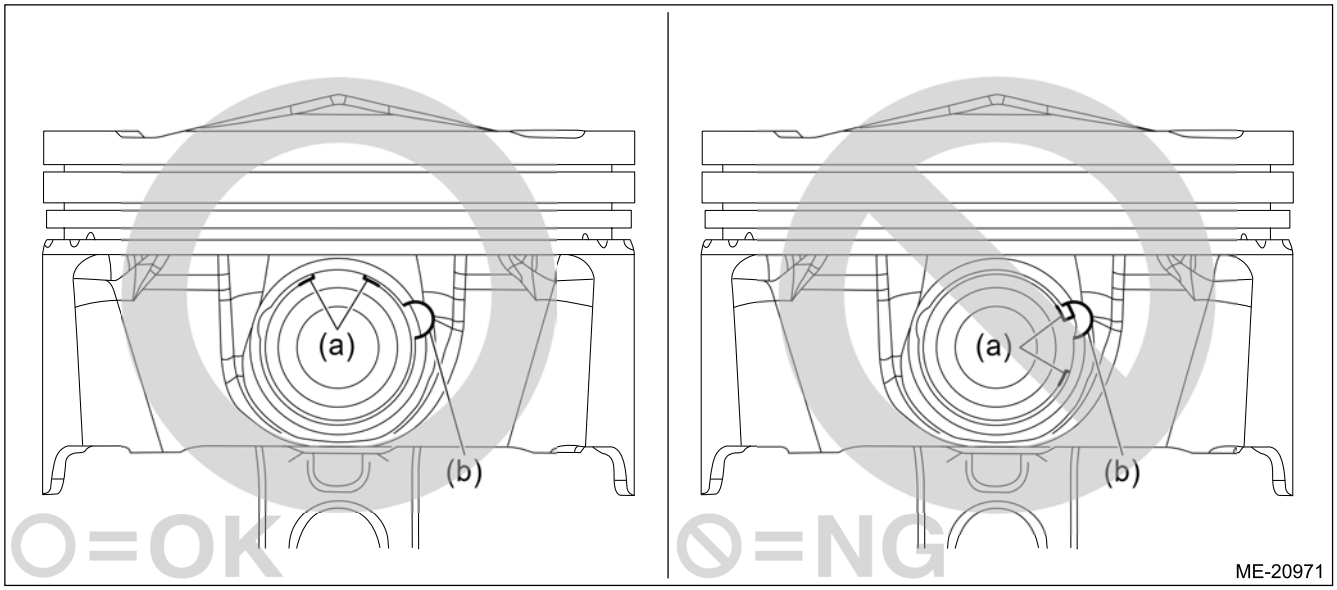
(a) RH side (#1 and #3) (b) LH side (#2 and #4) (c) Front mark

4. Apply engine oil to the piston pin, and attach the piston pin.

5. Install a new circlip on the piston using a flat tip screwdriver.

Note:

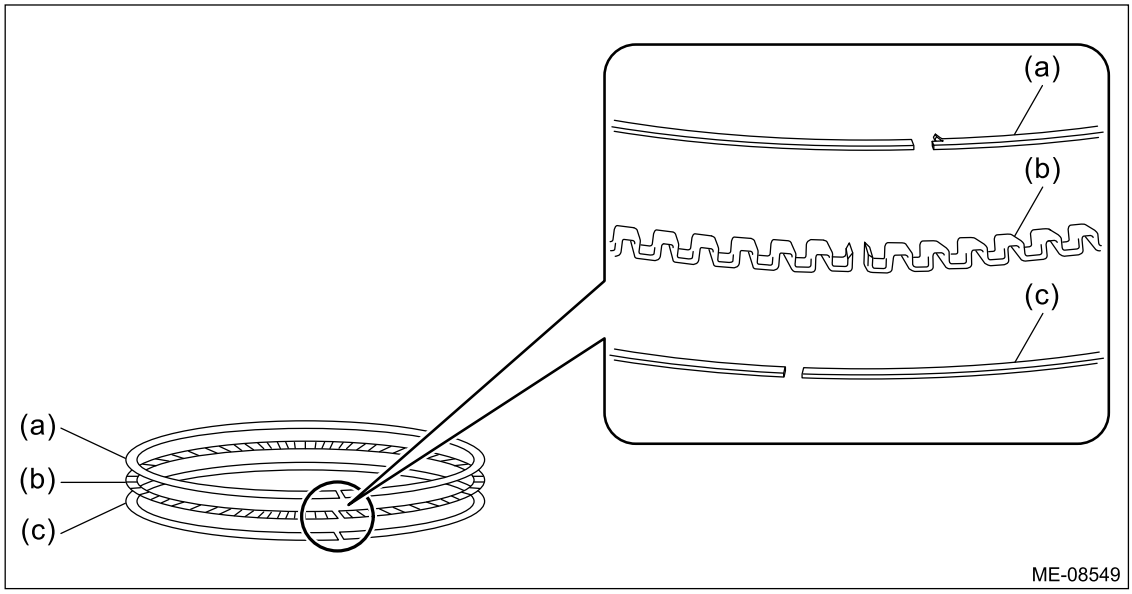
- **Be careful not damage the piston and piston pin, by wrapping the tip of flat tip screwdriver with tape.**
- **Make sure the circlip is firmly inserted into the circlip groove.**
- **After installing the circlip, rotate the circlip so that its end part (a) and the cutout portion of circlip groove (b) do not match.**



6. Install the oil rings to the piston in the order of expander, lower rail and upper rail by hand.

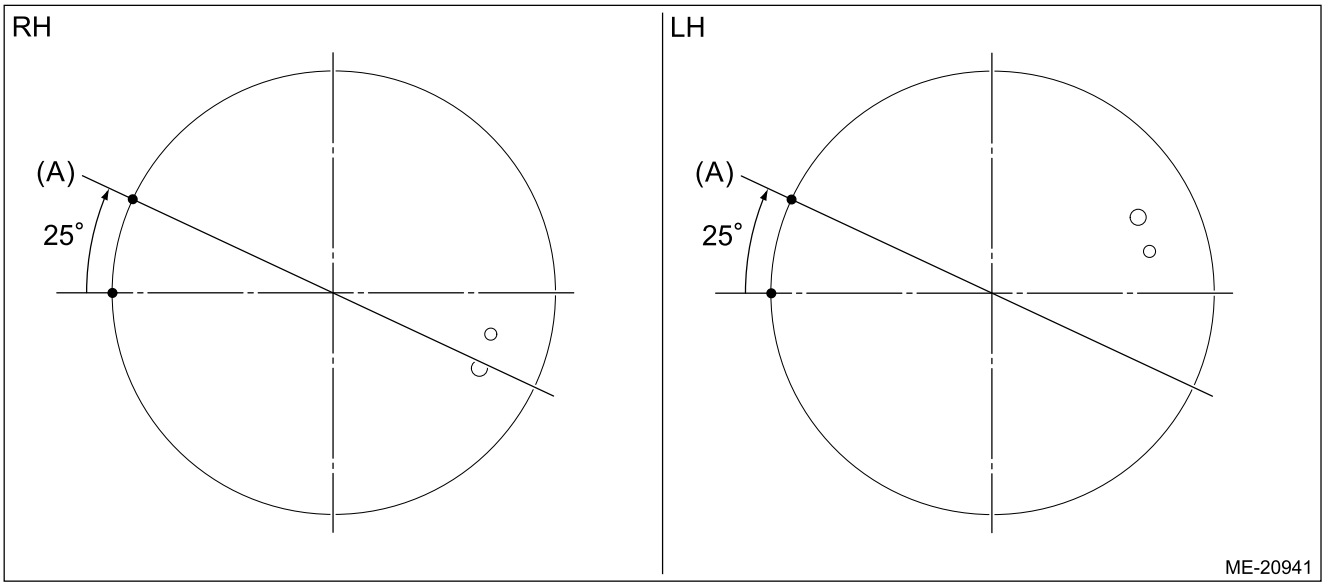
Note:

Oil ring consists of the upper rail, expander and lower rail.

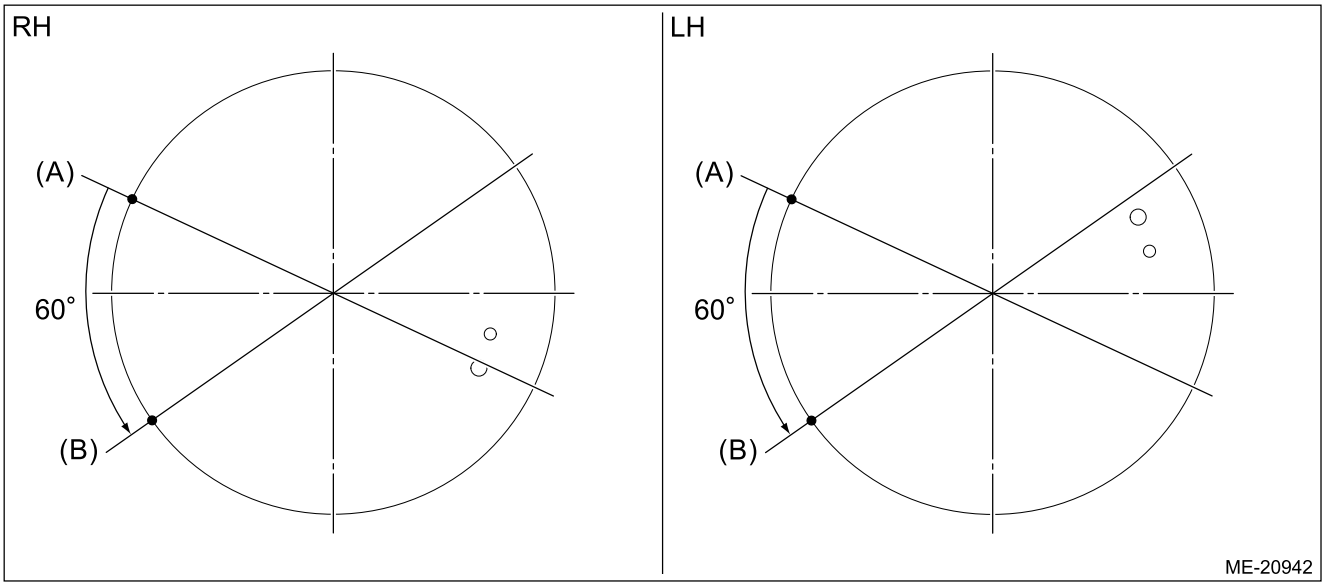


(a) Upper rail (b) Expander (c) Lower rail

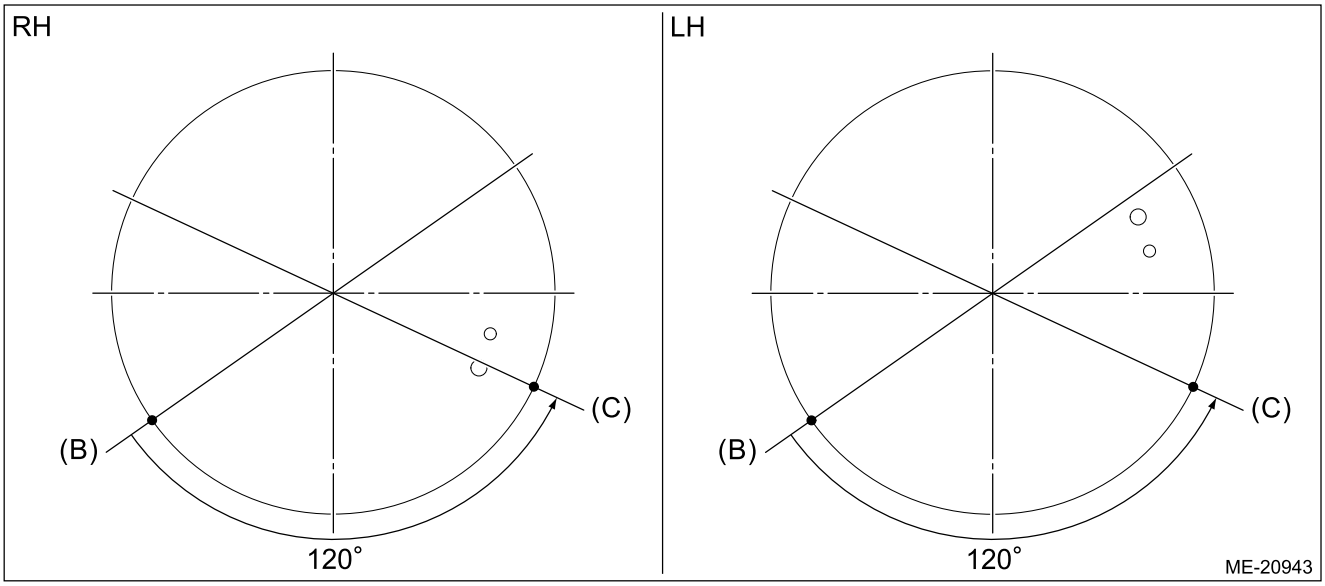
(1) Set the ring gap of the expander to the position (A).



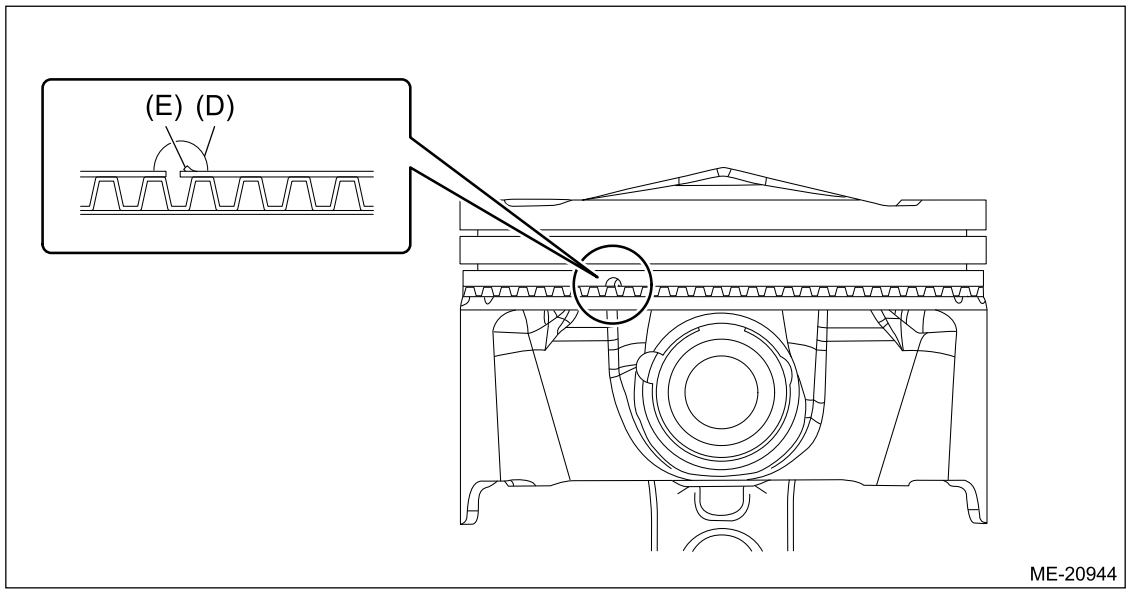
(2) Set the ring gap of the lower rail at position (B), located 60° counterclockwise from the position (A) in the figure.



(3) Set the ring gap of the upper rail at position (C), located 120° counterclockwise from the position (B) in the figure.



(4) Align the upper rail spin stopper (E) to the side hole (D) on the piston.

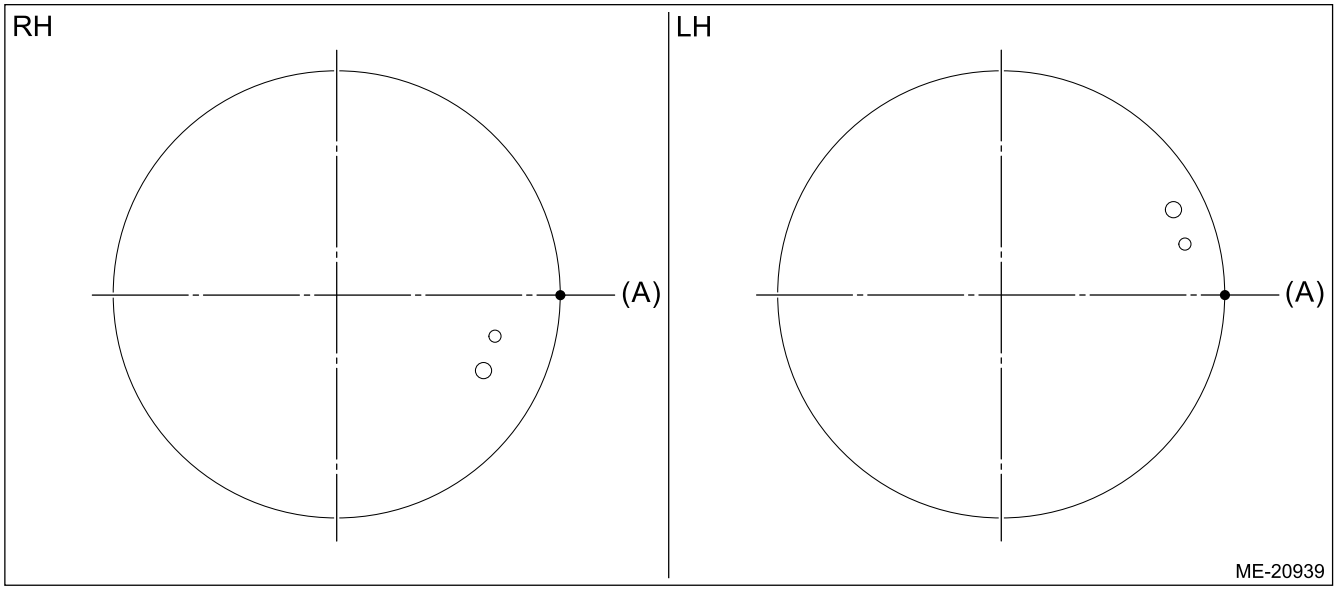


7. Install the compression rings to the piston in the order of second ring and top ring, using piston ring expander.

(1) Set the ring gap of the second ring to the position (A) in the figure.

Note:

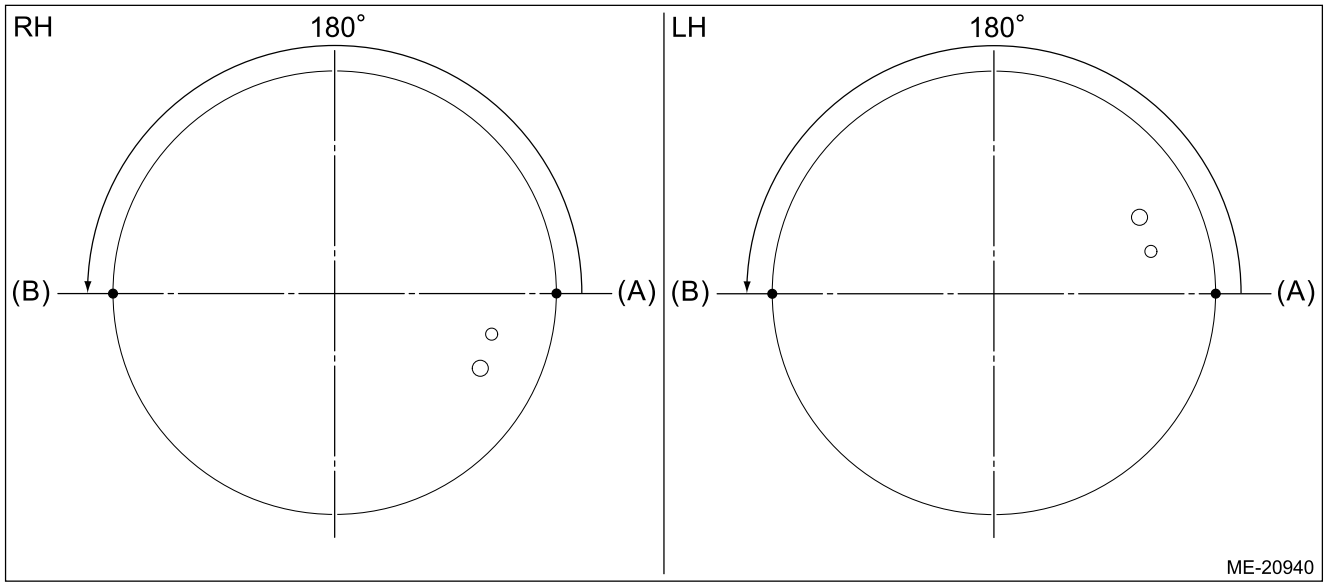
The ring mark (2HR) on the second ring should face the piston crown.



(2) Set the ring gap of top ring at (B) in the figure on the 180° opposite direction of (A).

Note:

The ring mark (1HR) of the top ring should face the piston crown.



8. Check again that the piston rings are installed correctly.
   Note:
   Also check that the ring gaps is not positioned within the range of piston skirt extended line.

MECHANICAL(H4DO) > Cylinder Block

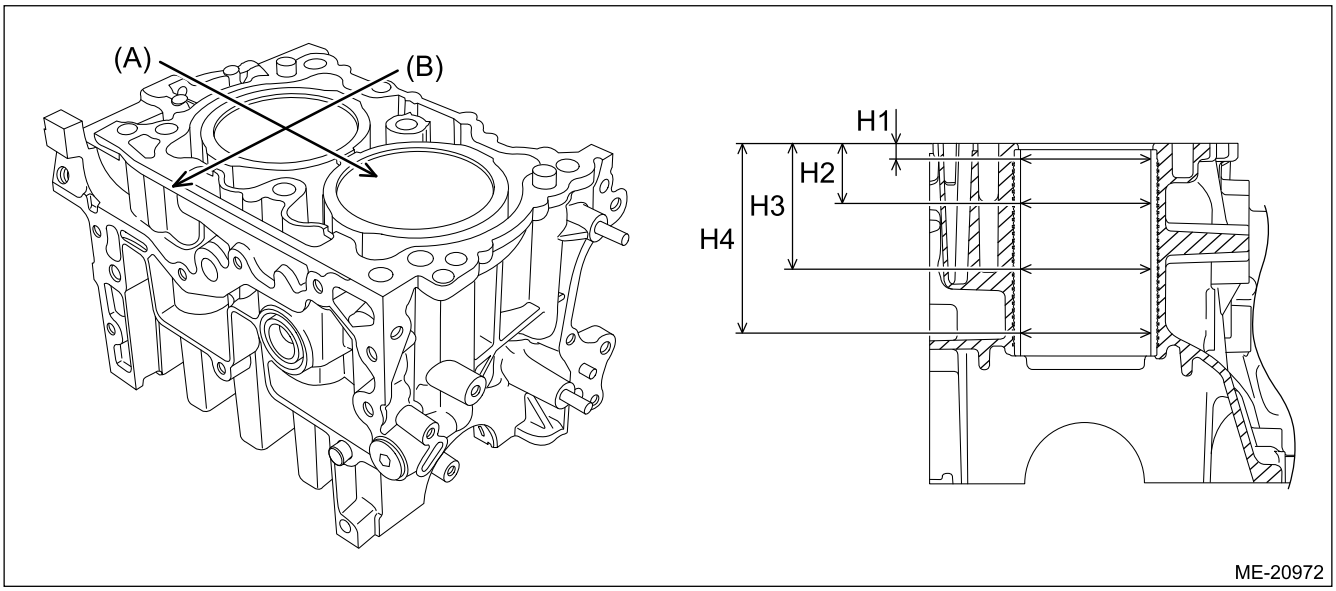
INSPECTION

1. CYLINDER BLOCK & PISTON

1. Visually inspect to make sure that there are no cracks, scratches or other damage.
2. Use liquid penetrant tester on the important sections to check for fissures.
3. Check that there are no traces of gas leaking or water leaking on the gasket attachment surface.
4. Check the oil passages for clogging.
5. Check for warpage of mating surfaces of the cylinder block that contacts cylinder head using a straight edge and thickness gauge. If it exceeds the limit, correct the surface by grinding it with a surface grinder or replace the cylinder block.
   Note:
   Measurement should be performed at a temperature of 20°C (68°F).
   Cylinder block warpage:
   Limit
   0.025 mm (0.0010 in)
   Grinding limit of cylinder block:
   204.95 mm (8.0689 in) or less
   Height of cylinder block:
   Standard
   205.0 mm (8.0709 in)
6. Using a cylinder bore gauge, check the cylindricality and out-of-roundness of cylinder liner. If they are not within the standard, perform reboring (including honing), or replace the cylinder block and piston as a set. For reboring and honing procedure, refer to step 8).

Note:

- **Measure the cylinder liner with cylinder blocks separated (into cylinder block RH and cylinder block LH).**
- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Write down all measurement values as the values are used in the next procedure.**
- **Measure the inner diameter of each cylinder liner in both the thrust and piston pin directions at the heights as shown in the figure.**



(A) Piston pin direction (B) Thrust direction

H1: 10 mm (0.3937 in) H2: 45 mm (1.7717 in) H3: 80 mm (3.1496 in)

H4: 105 mm (4.1339 in)

- **Calculate the cylindricality of cylinder liner by using the following formula.**

Calculation formula
C = The larger value between the calculation values C′ and C″ C′ = (D (a) − D (b))/2 C″ = (D(c)−D(d))/2
C: Cylindricality of cylinder liner D(a): The largest value of all the values obtained by measuring the cylinder liner inner diameter in the direction of the piston pin D(b): The smallest value of all the values obtained by measuring the cylinder liner inner diameter in the direction of the piston pin D(c): The largest value of all the values obtained by measuring the cylinder liner inner diameter in the thrust direction D(d): The smallest value of all the values obtained by measuring the cylinder liner inner diameter in the thrust direction

- **Calculate the out-of-roundness of cylinder liner at each measurement height by using the following formula.**

Calculation formula
R = (D(e)−D(f))/2
R: Out-of-roundness of cylinder liner D(e): The larger value between the measurement values in the piston pin direction and in the thrust direction of cylinder liner inner diameter

D(f): The smaller value between the measurement values in the piston pin direction and in the thrust direction of cylinder liner inner diameter

Cylindricality of cylinder liner:

Limit

0.030 mm (0.0012 in)

Out-of-roundness of cylinder liner:

Limit

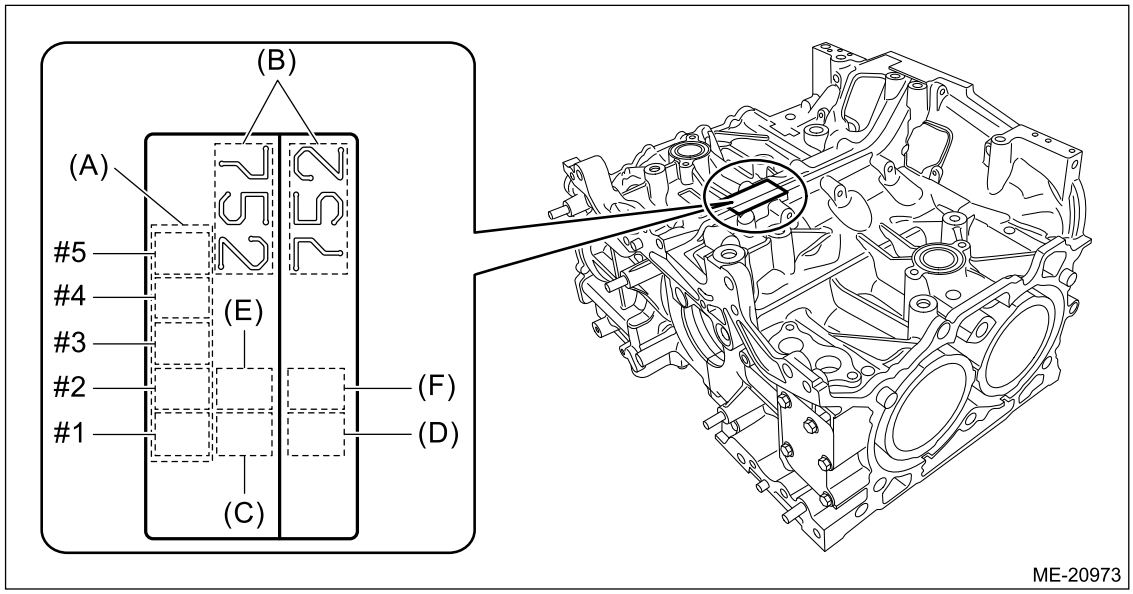
0.030 mm (0.0012 in)

7. Check the clearance between cylinder liner and piston. Check the clearance between cylinder liner and piston by measuring the inner diameter of cylinder liner and the outer diameter of piston respectively.

(1)Measure the inner diameter of cylinder liner. If they are not within the standard, perform reboring (including honing), or replace the cylinder block and piston as a set. For reboring and honing procedure, refer to step 8).

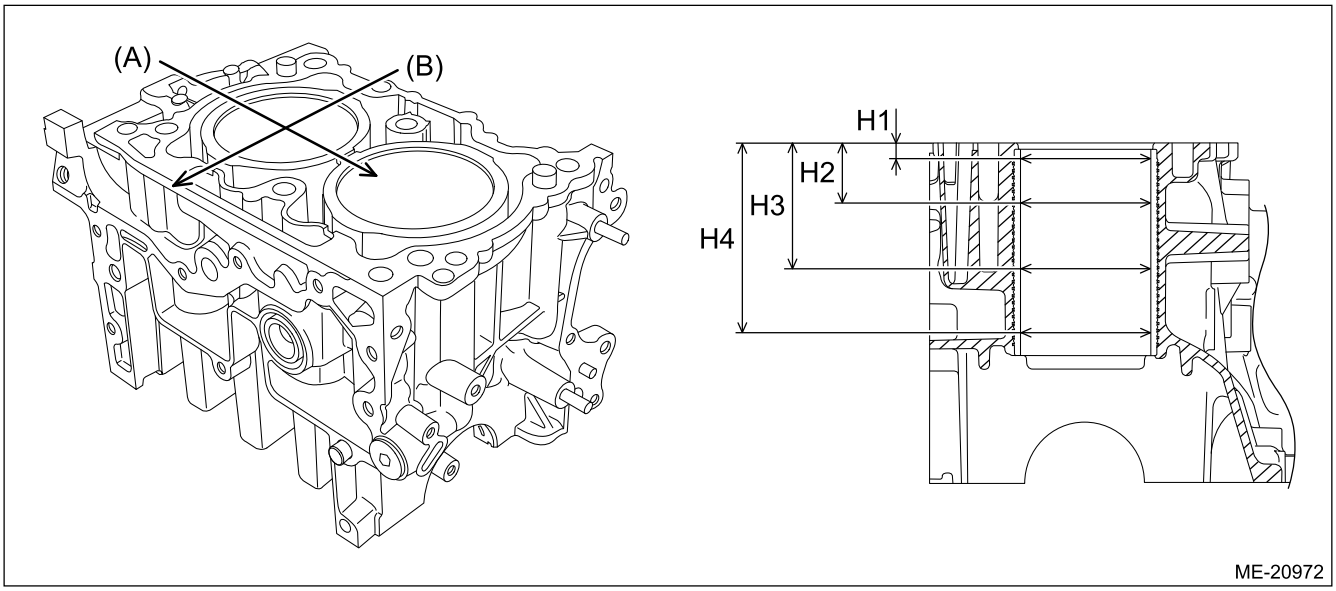
Note:

- **Measure the cylinder liner with cylinder blocks separated (into cylinder block RH and cylinder block LH).**
- **Measurement should be performed at a temperature of 20°C (68°F).**
- **The cylinder bore size mark is stamped on the upper face of the cylinder block.**



(A) Main journal size mark
(B) Cylinder block (RH) – (LH) combination mark
(C) #1 cylinder bore size mark
(D) #2 cylinder bore size mark
(E) #3 cylinder bore size mark
(F) #4 cylinder bore size mark

- **Measure the inner diameter of each cylinder liner in both the thrust and piston pin directions at the heights as shown in the figure and read the value of the most worn location.**



(A) Piston pin direction (B) Thrust direction

H1: 10 mm (0.3937 in) H2: 45 mm (1.7717 in) H3: 80 mm (3.1496 in)

H4: 105 mm (4.1339 in)

Inner diameter of cylinder liner:

Cylinder bore size mark A

Standard

84.005 — 84.015 mm (3.3073 — 3.3077 in)

Cylinder bore size mark B

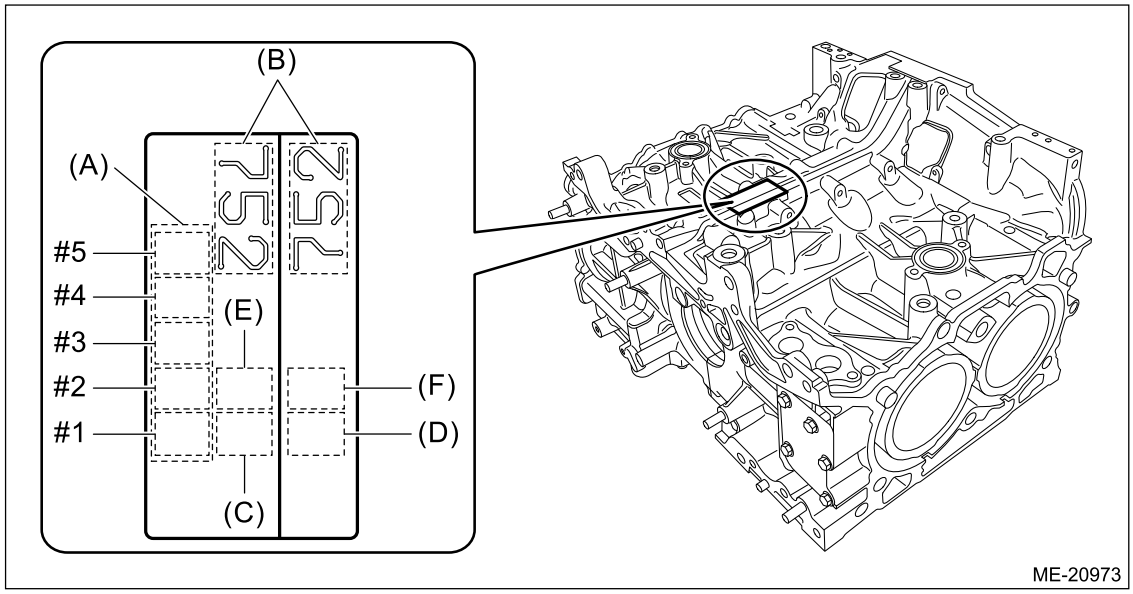
Standard

83.995 — 84.005 mm (3.3069 — 3.3073 in)

(2) Check the outer diameter of piston with a micrometer. If it is not within the standard, replace the piston.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the outer diameter of each piston in thrust direction at the height as shown in the figure.**
- **Standard sized pistons are classified into two grades, "A" and "B". These grades should be used as guide lines in selecting a standard piston.**
- **The grade can be judged by the stamp of cylinder bore size mark on the upper face of the cylinder block.**



(A) Main journal size mark
(B) Cylinder block (RH) – (LH) combination mark
(C) #1 cylinder bore size mark
(D) #2 cylinder bore size mark
(E) #3 cylinder bore size mark
(F) #4 cylinder bore size mark

- **If the piston is replaced, check the clearance between cylinder liner and piston in the step (3), and select a suitable sized piston.**

Piston grade point H:

38.0 mm (1.4961 in)

Piston outer diameter:

Standard size (grade A = cylinder bore size mark A)

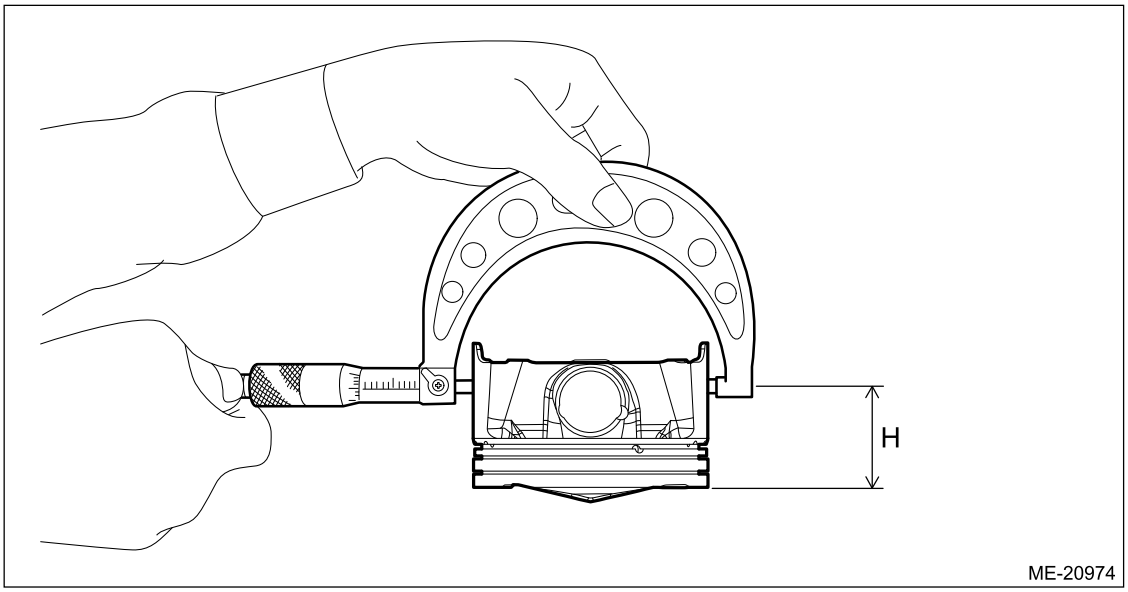
Standard

83.995 — 84.005 mm (3.3069 — 3.3073 in)

Standard size (grade B = cylinder bore size mark B)

Standard

83.985 — 83.995 mm (3.3065 — 3.3069 in)



(3) Calculate the clearance between cylinder liner and piston. If they are not within the standard, perform reboring (including honing), or replace the cylinder block and piston as a set. For reboring and honing procedure, refer to step 8).

Note:

The clearance between cylinder liner and piston is decided by matching the cylinder block bore size mark and the grade of piston outer diameter (grade A or B).

Clearance between cylinder liner and piston:

Standard

0.000 — 0.020 mm (0.0000 — 0.0008 in)

8. Reboring and honing

(1) If any of the cylindricality, out-of-roundness, inner diameter or clearance between cylinder liner and piston is out of standard or if there is any damage on the cylinder liner, perform reboring (including honing).

Caution:

When any of the cylinder liner needs reboring, all other cylinder liners must be rebored at the same time, and replaced with proper size pistons.

Oversize piston outer diameter:

0.25 mm (0.0098 in) oversize

Standard

84.235 — 84.255 mm (3.3163 — 3.3171 in)

0.50 mm (0.0197 in) oversize

Standard

84.485 — 84.505 mm (3.3262 — 3.3270 in)

(2) If the inner diameter of cylinder liner exceeds the limit after reboring (including honing), replace the cylinder block and piston as a set.

Note:

- **Immediately after reboring (including honing), the inner diameter of cylinder liner may differ from its real diameter due to temperature rise. Thus, when measuring the inner diameter of cylinder liner, wait until the temperature has cooled to 20°C (68°F).**
- **For the measurement of the inner diameter of cylinder liner, refer to step 7).**

Inner diameter of cylinder liner boring limit (diameter):

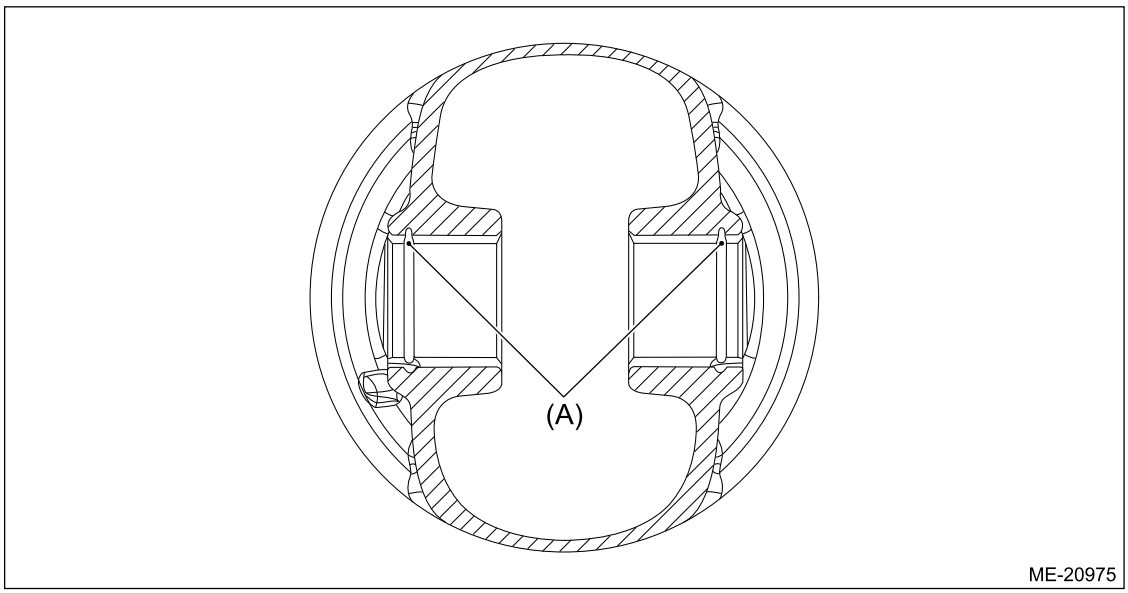
84.505 mm (3.3270 in) or less

2. PISTON AND PISTON PIN

1. Check the piston and piston pin for wear or crack.
2. Check the snap ring for distortion or wear.
3. Check the piston ring groove for damage.
4. Check the circlip groove (A) for burr.

Note:

If the burr is found, remove the burr from groove.

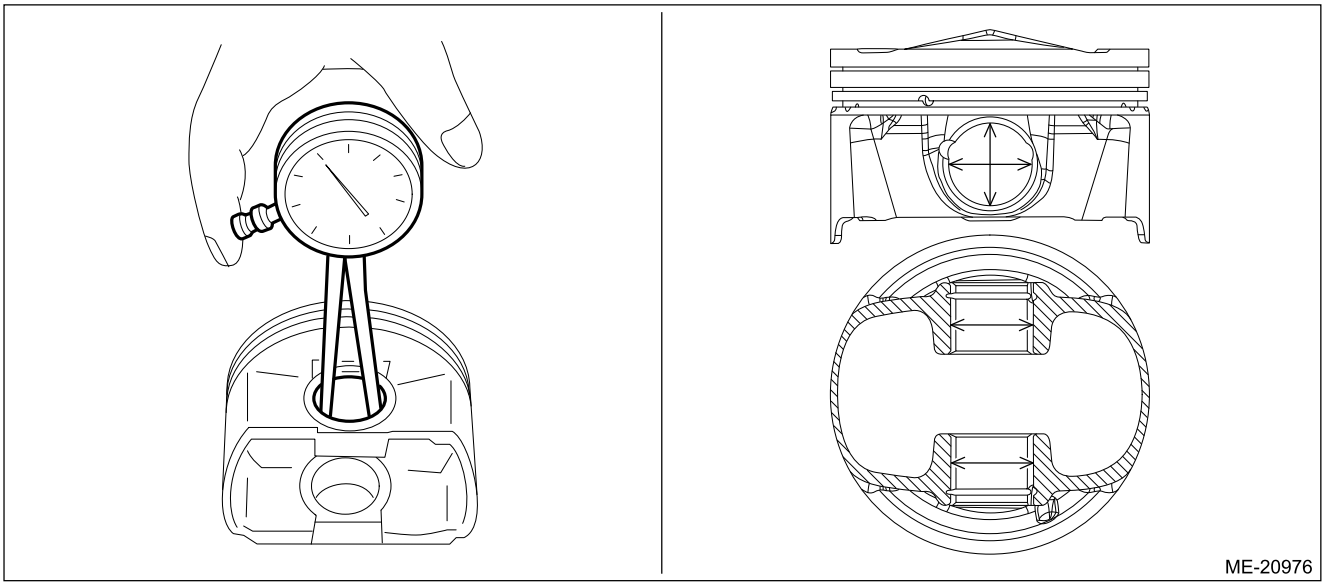


5. Check that the piston pin can be inserted into the piston with a thumb at 20°C (68°F).
6. Check the clearance between piston and piston pin. Check the clearance between piston and piston pin by measuring the inner diameter of piston pin hole and the outer diameter of piston pin respectively.

(1) Using a caliper gauge, measure the inner diameter of piston pin hole.

Note:

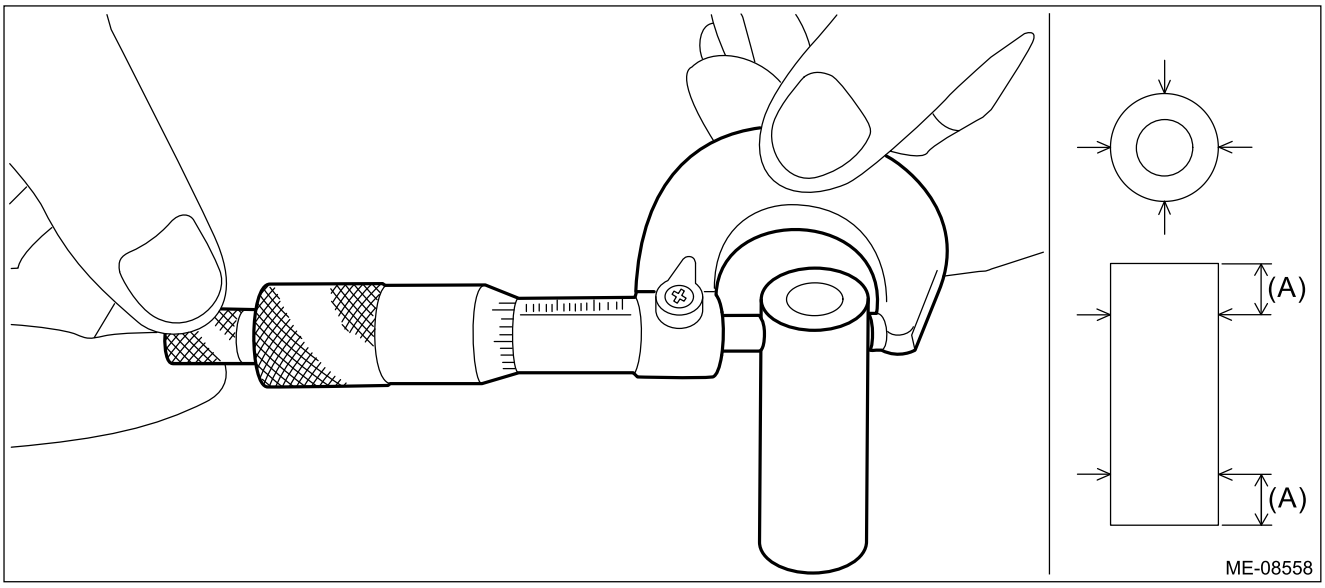
- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the inner diameter of the piston pin hole at the four locations as shown in the figure, and read the value of most worn location.**
- **Record the measured value.**



(2) Measure the outer diameter of piston pin with a micrometer.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the outer diameter of the piston pin at the four locations as shown in the figure, and read the value of most worn location.**
- **Record the measured value.**



(A) 10 mm (0.3937 in)

(3) Calculate the clearance between piston and piston pin. If it is not within the standard, replace the piston and piston pin as a set.

Clearance between piston and piston pin:

Standard

0.004 — 0.008 mm (0.0002 — 0.0003 in)

3. PISTON RING

1. Make sure the piston ring is not broken or damaged.
2. Using a cylindrical guide, insert the piston ring into the cylinder liner so that they are perpendicular to the cylinder wall, and check the piston ring gap using a thickness gauge. If it is not within the standard, replace the piston ring.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Use piston ring with same size as piston when replacing piston ring.**

Piston ring gap:

Compression ring (top ring)

Standard

0.20 — 0.25 mm (0.0079 — 0.0098 in)

Compression ring (second ring)

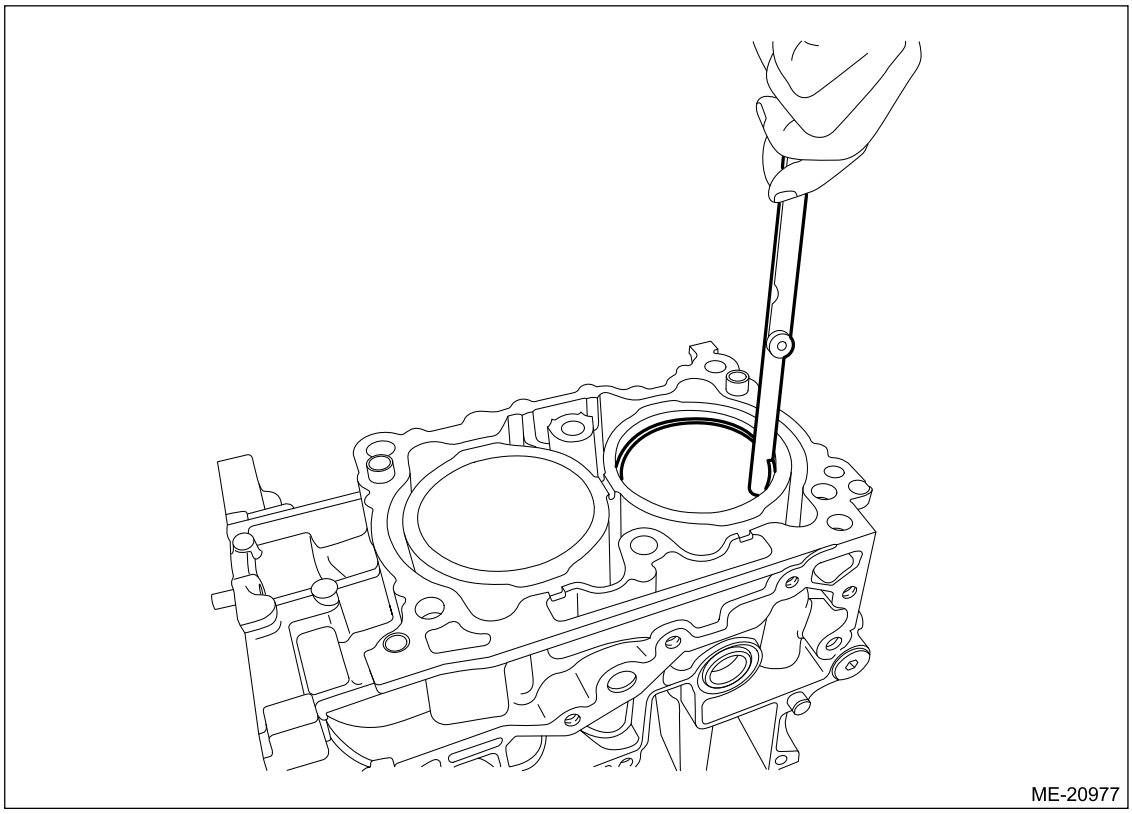
Standard

0.40 — 0.50 mm (0.0157 — 0.0197 in)

Oil ring (upper rail and lower rail)

Standard

0.10 — 0.35 mm (0.0039 — 0.0138 in)



3. Fit the compression ring straight into the piston ring groove, then check the clearance between compression ring and piston with a thickness gauge. If it is not within the standard, replace the compression ring.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Before inspecting the clearance, clean the piston ring groove and compression ring.**
- **Use compression ring with same size as piston when replacing compression ring.**

Clearance between compression ring and piston:

Top ring

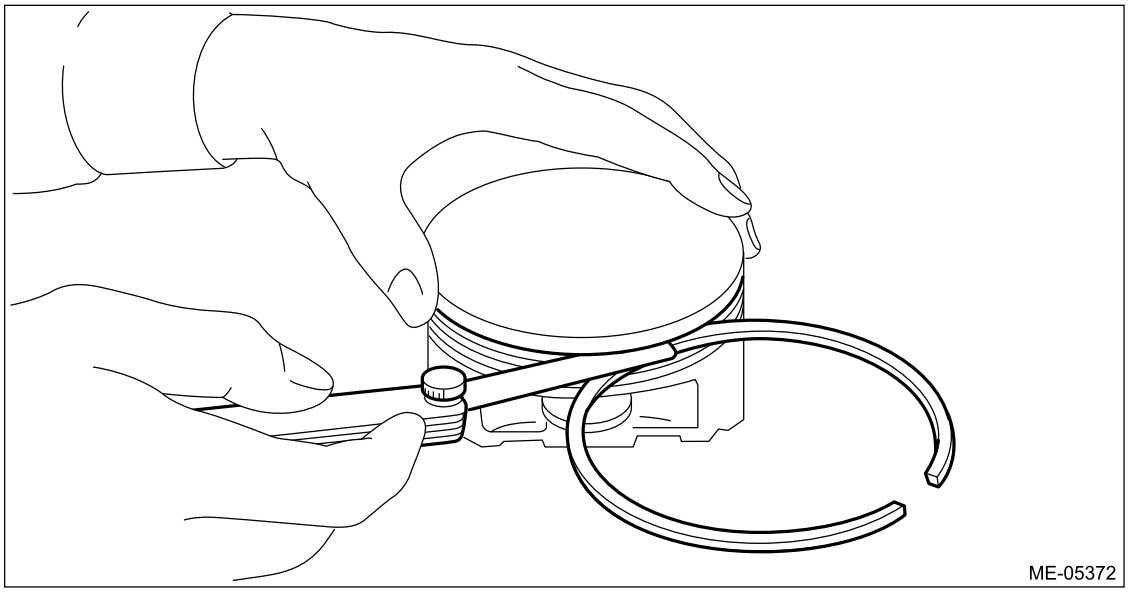
Standard

0.040 — 0.080 mm (0.0016 — 0.0031 in)

Second ring

Standard

0.030 — 0.070 mm (0.0012 — 0.0028 in)



4. CONNECTING ROD AND CONNECTING ROD BEARING

1. Check for bend or twist using a connecting rod aligner. If it exceeds the limit, replace the connecting rod.

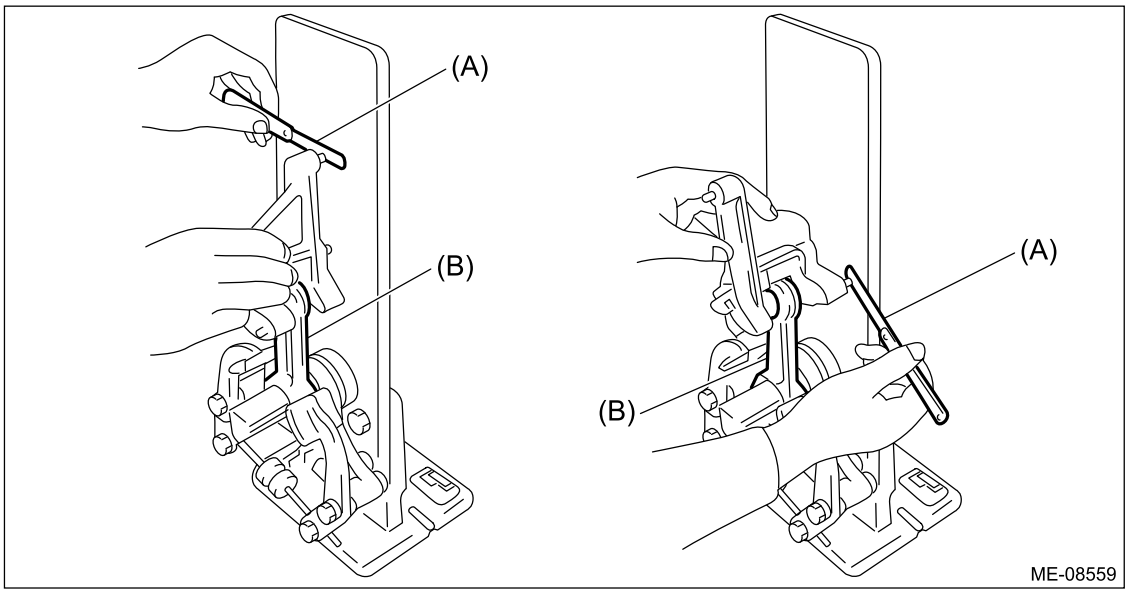
Note:

Measurement should be performed at a temperature of 20°C (68°F).

Bend or twist per 100 mm (3.9370 in) in length:

Limit

0.10 mm (0.0039 in)



(A) Thickness gauge (B) Connecting rod

2. Check that the large or small end thrust surface of each connecting rod is not damaged.

3. Check each connecting rod bearing for scar, peeling, seizure, melting or wear, etc.

4. Check the thrust clearance of each connecting rod using a thickness gauge.

Note:

Measurement should be performed at a temperature of 20°C (68°F).

(1) Clean the #1 connecting rod bearing and the #1 pin of crankshaft, and apply engine oil to the #1 pin of crankshaft.

(2) Set the #1 connecting rod bearing to the #1 connecting rod and #1 connecting rod cap.

(3) Set the #1 connecting rod, #1 connecting rod cap and #1 connecting rod cap bolt to the #1 pin of crankshaft.

Note:

- **Each connecting rod has its own mating cap. Make sure that they are assembled correctly by checking their matching symbol.**
- **Use a new connecting rod cap bolt.**
- **Apply a coat of engine oil to the #1 connecting rod cap bolt thread.**

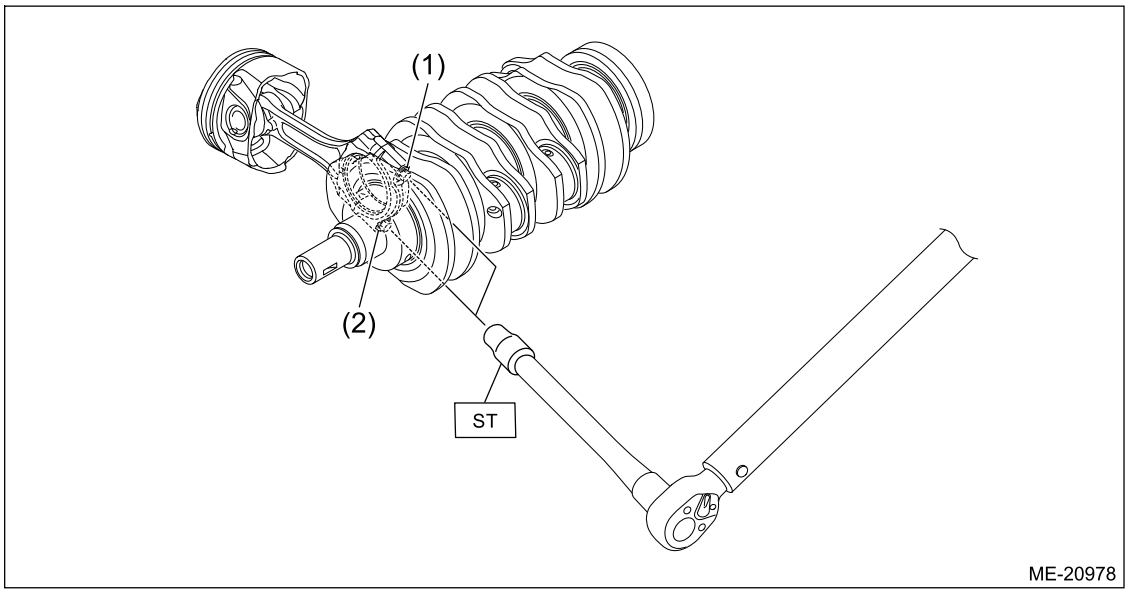
(4) Using ST, tighten the #1 connecting rod cap bolts to 10 N·m (1.0 kgf-m, 7.4 ft-lb) in numerical order as shown in the figure, then retighten the bolts to 22 N·m (2.2 kgf-m, 16.2 ft-lb) in numerical order as shown in the figure.

Caution:

- **Make sure to hold the crankshaft securely during work.**
- **When holding the crankshaft, be careful not to damage the crankshaft.**

Preparation tool:

ST: SOCKET (18270AA020)



(5) Using the ST and angle gauge, tighten the #1 connecting rod cap bolts with torque of 135° — 140° in numerical order as shown in the figure.

Caution:

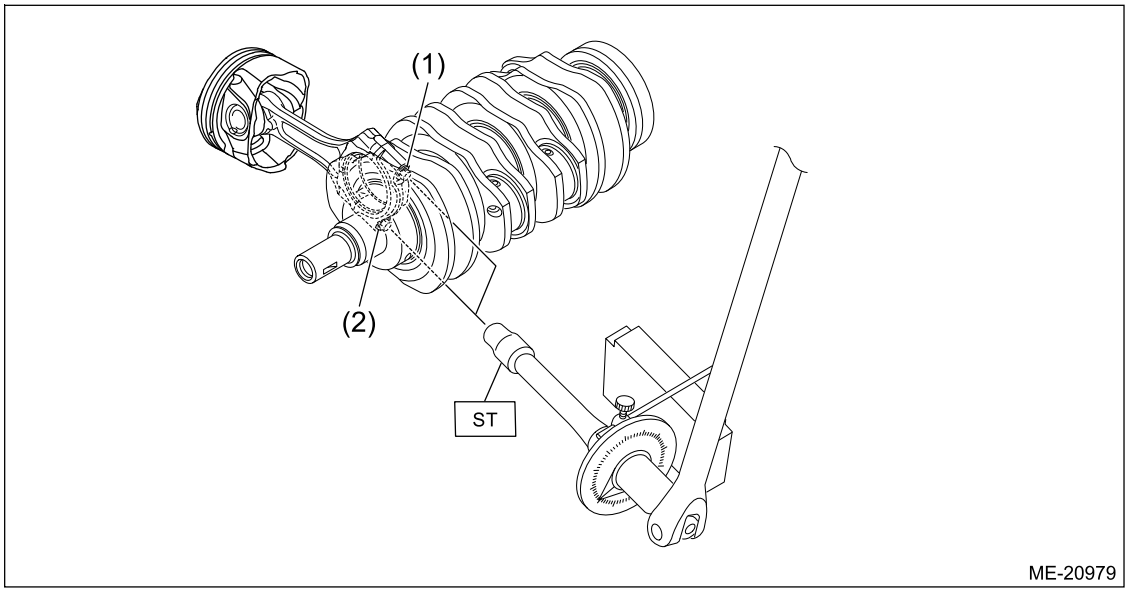
- **Make sure to hold the crankshaft securely during work.**
- **When holding the crankshaft, be careful not to damage the crankshaft.**

Note:

Prevent angle gauge from rotating using a V-block, etc.

Preparation tool:

ST: SOCKET (18270AA020)



(6) In the same manner, install the #2, #3 and #4 connecting rods.

(7) Check the thrust clearance of each connecting rod using a thickness gauge. If it is not within the standard, replace the connecting rod.

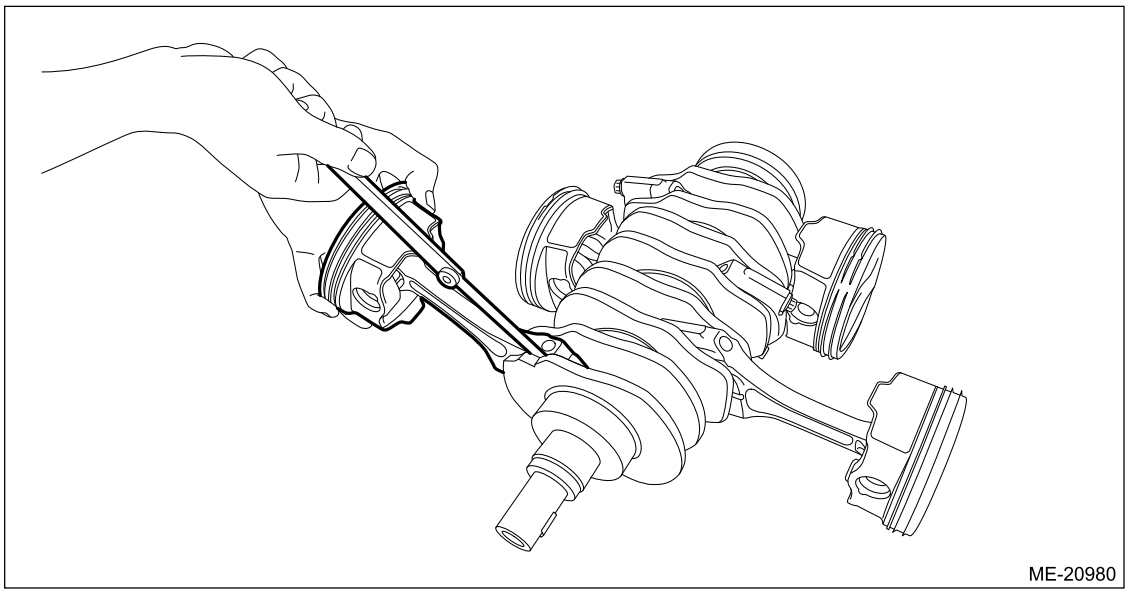
Note:

Measure the thrust clearance of each connecting rod at several points, and replace the connecting rod if there is uneven wear.

Connecting rod thrust clearance:

Standard

0.070 — 0.330 mm (0.0028 — 0.0130 in)



5. Check the oil clearance on each connecting rod bearing using plastigauge.

Note:

Measurement should be performed at a temperature of 20°C (68°F).

(1) Clean the #1 connecting rod bearing and the #1 pin of crankshaft.

(2) Set the #1 connecting rod bearing to the #1 connecting rod and #1 connecting rod cap.

(3) Place a plastigauge across the #1 pin of crankshaft, and set the #1 connecting rod, #1 connecting rod cap and #1 connecting rod cap bolt to the #1 pin of crankshaft.

Note:

- **Each connecting rod has its own mating cap. Make sure that they are assembled correctly by checking their matching symbol.**
- **Use a new connecting rod cap bolt.**
- **Apply a coat of engine oil to the #1 connecting rod cap bolt thread.**

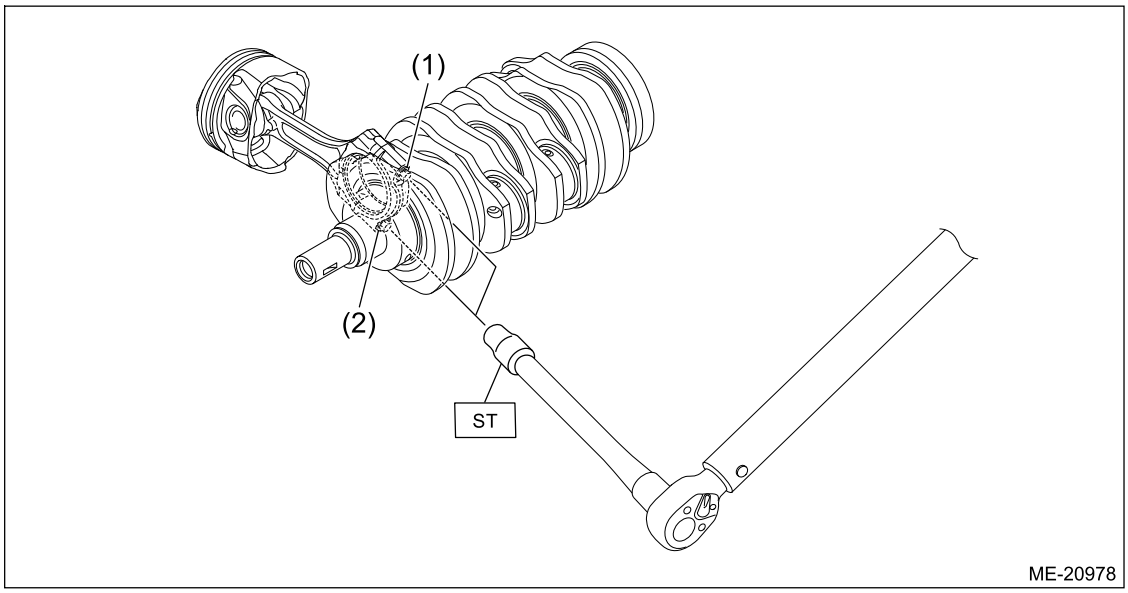
(4) Using the ST, tighten the #1 connecting rod cap bolts to 10 N·m (1.0 kgf-m, 7.4 ft-lb) in numerical order as shown in the figure, then retighten the bolts to 22 N·m (2.2 kgf-m, 16.2 ft-lb) in numerical order as shown in the figure.

Caution:

- **Make sure to hold the crankshaft securely during work.**
- **When holding the crankshaft, be careful not to damage the crankshaft.**
- **During tightening, be careful not to move the #1 connecting rod and the #1 connecting rod cap.**

Preparation tool:

ST: SOCKET (18270AA020)



(5) Using the ST and angle gauge, tighten the #1 connecting rod cap bolts with torque of 135° — 140° in numerical order as shown in the figure.

Caution:

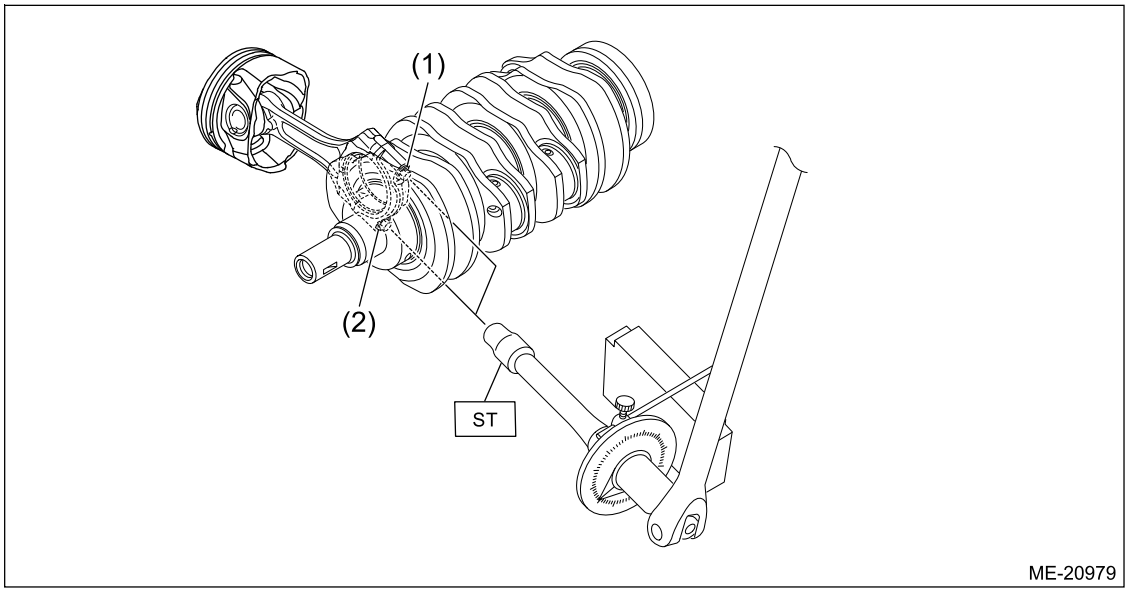
- **Make sure to hold the crankshaft securely during work.**
- **When holding the crankshaft, be careful not to damage the crankshaft.**
- **During tightening, be careful not to move the #1 connecting rod and the #1 connecting rod cap.**

Note:

Prevent angle gauge from rotating using a V-block, etc.

Preparation tool:

ST: SOCKET (18270AA020)



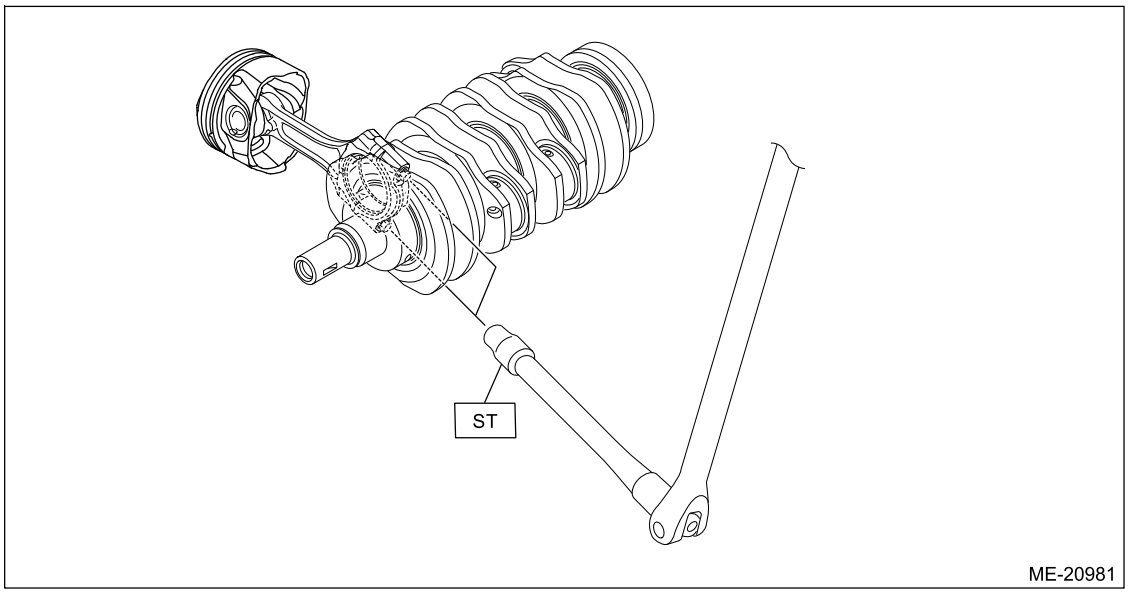
(6) Using the ST, loosen the #1 connecting rod cap bolt, and remove the #1 connecting rod cap bolt and #1 connecting rod cap.

Caution:

- **Make sure to hold the crankshaft securely during work.**
- **When holding the crankshaft, be careful not to damage the crankshaft.**
- **During removal, be careful not to move the #1 connecting rod and the #1 connecting rod cap.**

Preparation tool:

ST: SOCKET (18270AA020)



(7) Determine oil clearance of the #1 connecting rod bearing by matching the widest point of the plastigauge on #1 pin of crankshaft against scale printed on a package of the plastigauge. If it is not within the standard, replace the #1 connecting rod bearing.

Note:

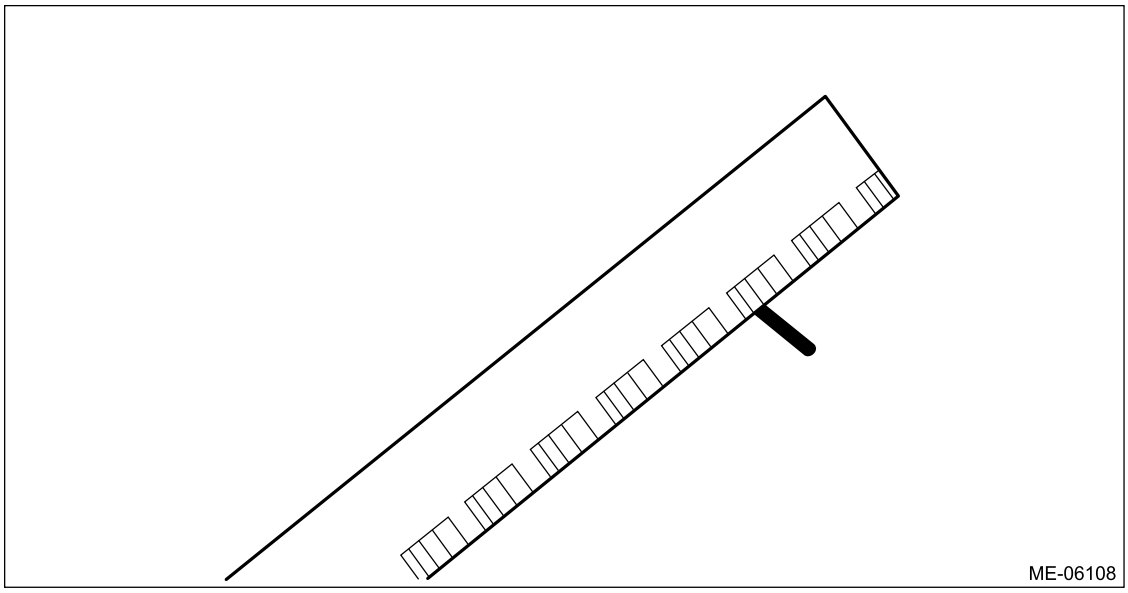
Measure the outer diameter of crankshaft pin using micrometer, and select the suitable size connecting rod bearing when replacing the connecting rod bearing.

		Unit: mm (in)
Bearing	**Connecting rod bearing thickness (at center)**	**Crankshaft pin outer diameter**
	Standard	**Standard**
Standard size	1.492 — 1.508 (0.0587 — 0.0594)	47.976 — 48.000 (1.8888 — 1.8898)
0.03 (0.0012) Undersize	1.511 — 1.515 (0.0595 — 0.0596)	47.946 — 47.970 (1.8876 — 1.8886)
0.05 (0.0020) Undersize	1.521 — 1.525 (0.0599 — 0.0600)	47.926 — 47.950 (1.8868 — 1.8878)
0.25 (0.0098) Undersize	1.621 — 1.625 (0.0638 — 0.0640)	47.726 — 47.750 (1.8790 — 1.8799)

Connecting rod bearing oil clearance:

Standard

0.017 — 0.047 mm (0.0007 — 0.0019 in)



(8) Completely remove the plastigauge.

(9) In the same manner, check oil clearance of the #2, #3 and #4 connecting rod bearings.

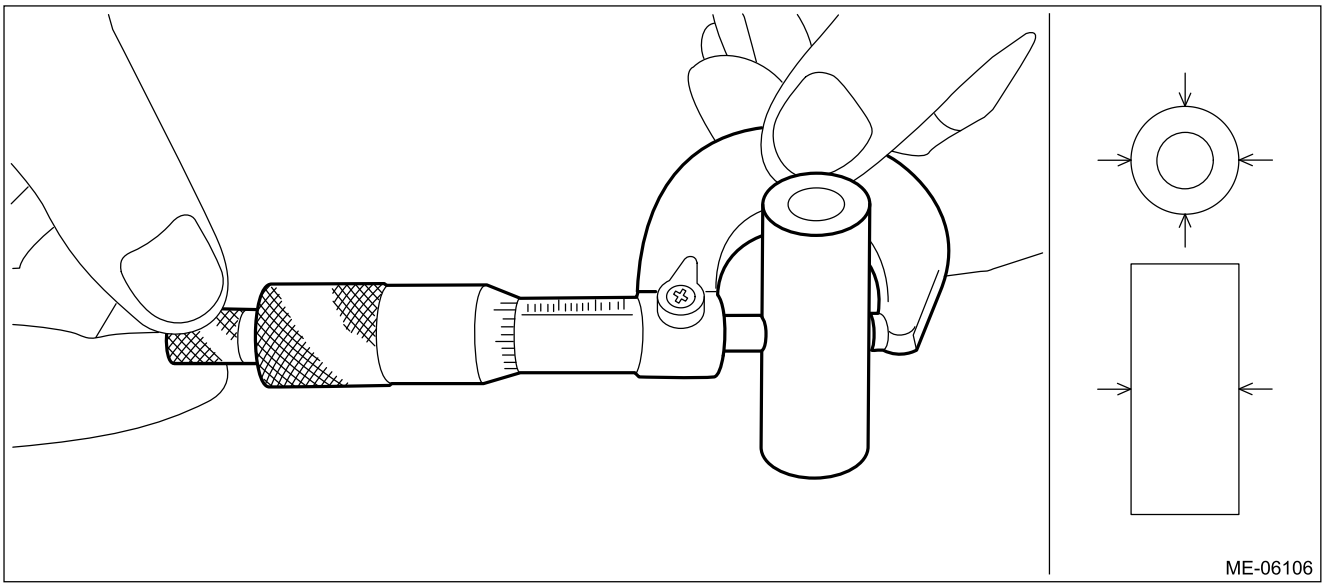
5. PISTON PIN & CONNECTING ROD BUSHING

1. Check that the connecting rod bushing is not damaged.
2. Check the clearance between piston pin and connecting rod bushing. Check the clearance between piston pin and connecting rod bushing by measuring the outer diameter of piston pin and the inner diameter of connecting rod bushing respectively.

(1) Measure the outer diameter of piston pin with a micrometer.

Note:

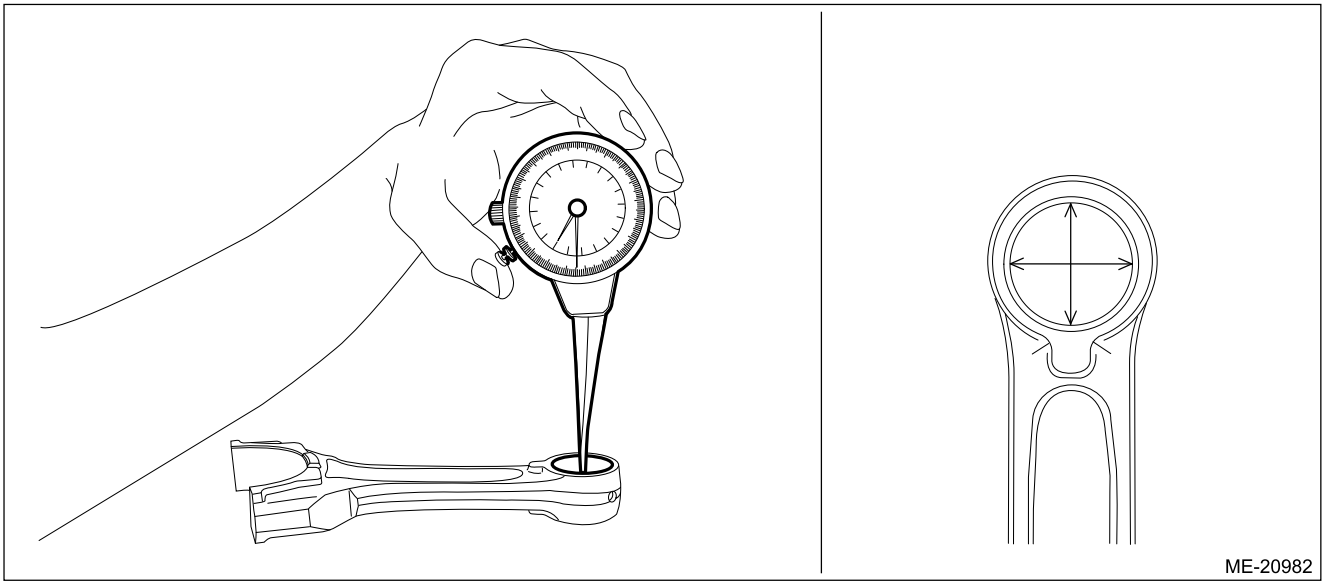
- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the outer diameter of the piston pin at the two locations as shown in the figure, and read the value of most worn location.**
- **Record the measured value.**



(2) Using a caliper gauge, measure the inner diameter of connecting rod bushing.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Measure the inner diameter of the connecting rod bushing at the two locations as shown in the figure, and read the value of most worn location.**
- **Record the measured value.**



(3) Calculate the clearance between piston pin and connecting rod bushing.

Clearance between piston pin and connecting rod bushing:

Standard

0.004 — 0.026 mm (0.0002 — 0.0010 in)

3. If the clearance between piston pin and connecting rod bushing is not within the standard, replace the connecting rod bushing and piston pin as a set. For replacement procedure of connecting rod bushing, refer to the following.

(1) Using the ST and a press, pull out the connecting rod bushing from the small end of the

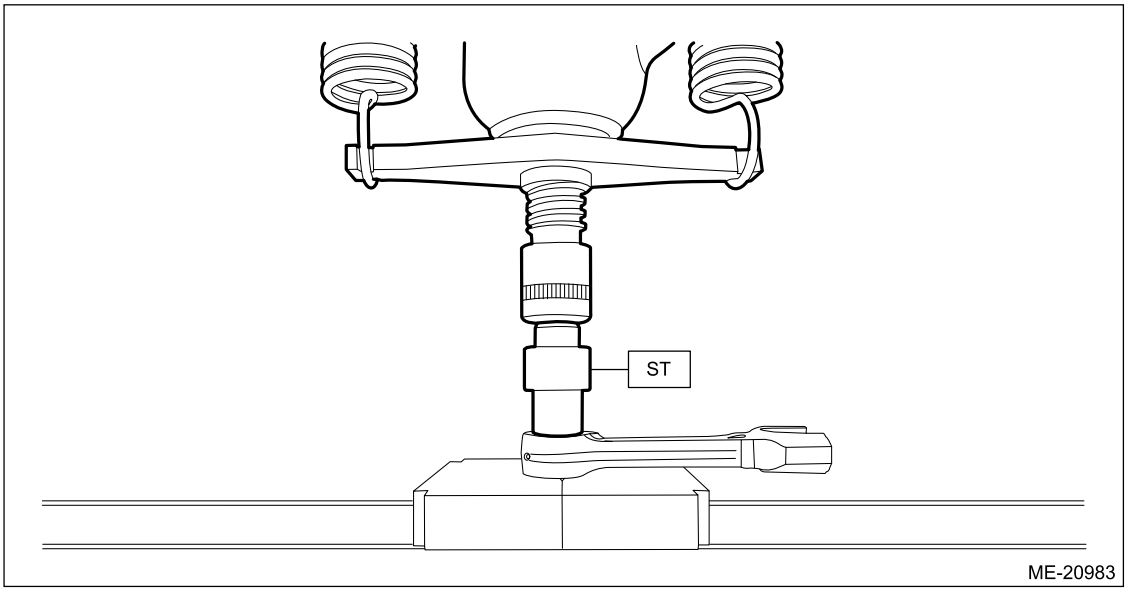
connecting rod.

Note:

The direction of ST for pulling out and for press fitting is different. Therefore, attention must be paid to the direction of usage for ST.

Preparation tool:

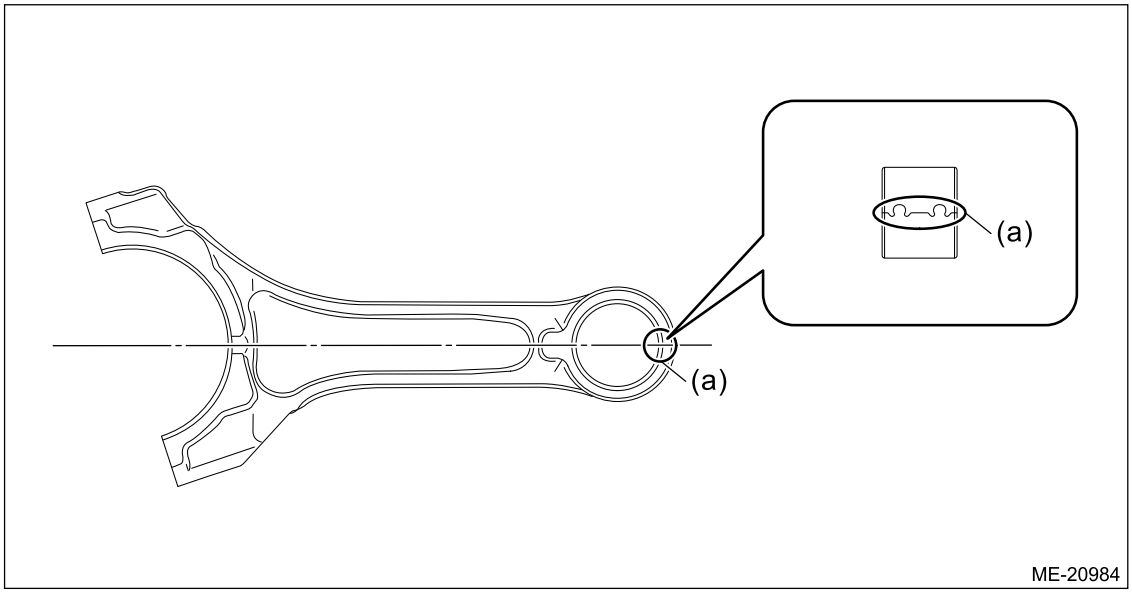
ST: CONNECTING ROD BUSHING REMOVER AND INSTALLER (18350AA000)



(2)Press the connecting rod bushing with ST and the press, after applying engine oil on the periphery of connecting rod bushing.

Note:

- **Clinch area of the connecting rod bushing is as shown in the figure.**

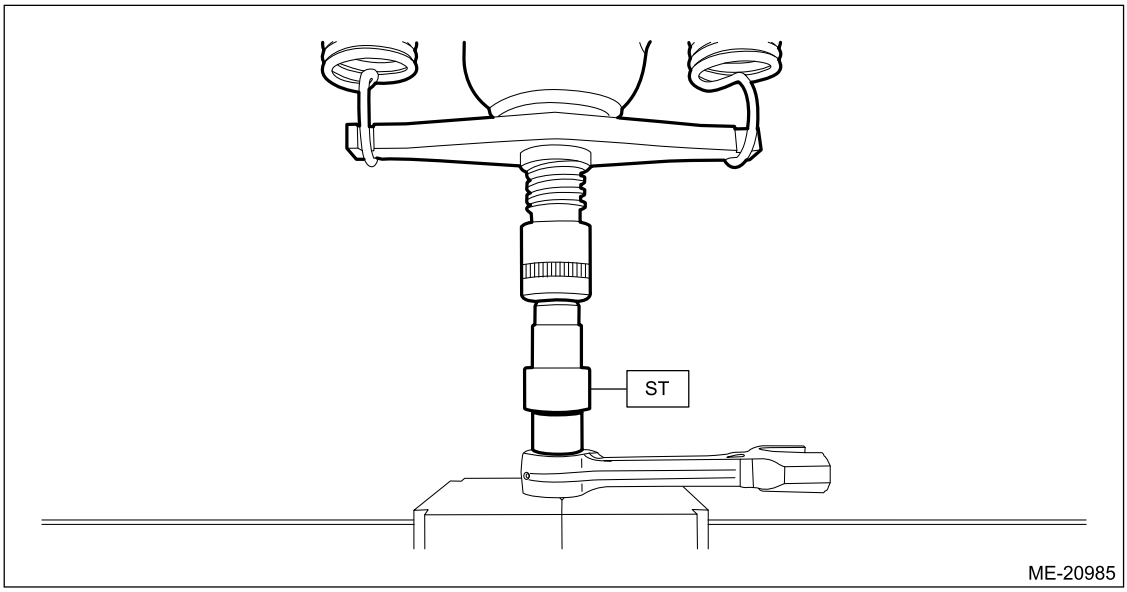


(a) Clinch area of connecting rod bushing

- **The direction of ST for pulling out and for press fitting is different. Therefore, attention must be paid to the direction of usage for ST.**

Preparation tool:

ST: CONNECTING ROD BUSHING REMOVER AND INSTALLER (18350AA000)



(3) Make two 3 mm (0.1181 in) holes in the pressed connecting rod bushing by aligning with the pre-manufactured holes provided on the small end of the connecting rod.

(4) Using a reamer, ream the inside surface of the connecting rod bushing. Insert the reamer in the connecting rod bushing, and turn slowly clockwise while pushing lightly. Bring the reamer back while rotating it clockwise.

Note:

- **Use a reamer with a diameter of ⌀22.**
- **Apply engine oil to the reamer.**
- **If the inner surface of connecting rod bushing is damaged, the edge of reamer should be slightly ground with oil stone.**
- **If the inner surface of connecting rod bushing becomes lustrous and the reamer does not chip, use a new reamer or remedy the reamer.**

(5) After completion of reaming, clean the connecting rod bushing to remove chips.

6. CRANKSHAFT AND CRANKSHAFT BEARING

1. Clean the crankshaft completely, and check it for cracks using liquid penetrant tester.
2. Using a dial gauge, check the crankshaft bend. If it exceeds the limit, grind to correct the crankshaft journal or replace the crankshaft.

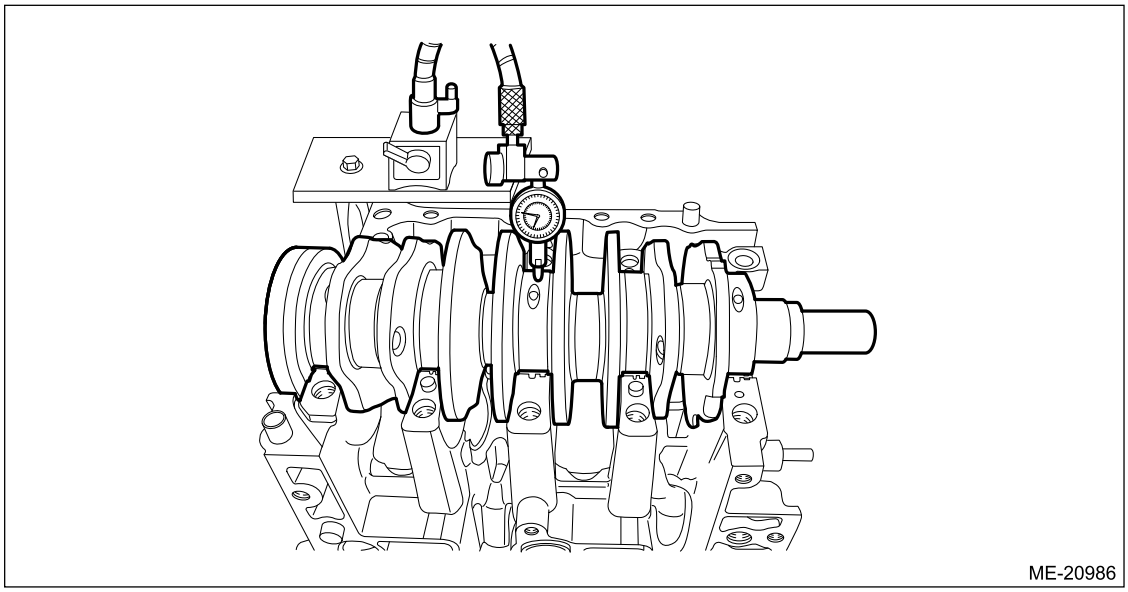
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **If a suitable V-block is not available, using just the #1 and #5 crankshaft bearings on cylinder block, position the crankshaft on cylinder block. Then, measure the crankshaft bend using a dial gauge.**
- **When grinding to correct the crankshaft journal, refer to step 3).**

Crankshaft bend:

Limit

0.035 mm (0.0014 in)



3. Using a micrometer, check the outer diameter of crankshaft pin, outer diameter of journal, cylindricality, and out-of-roundness. If it is not within the standard, replace the connecting rod bearing or crankshaft bearing, and grind to correct the crankshaft pin or journal or replace the crankshaft as required.

Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Select the suitable size connecting rod bearing or crankshaft bearing when replacing the connecting rod bearing or crankshaft bearing.**
- **When grinding to correct the crankshaft pin or journal, finish them to the suitable outer diameter as shown in the table below according to the undersize bearing to be used.**

Unit: mm (in)

Bearing	Connecting rod bearing thickness (at center)	Crankshaft pin outer diameter	Crankshaft bearing thickness (at center)		Crankshaft journal outer diameter
			#1, #2, #3, #4	#5	
	Standard	Standard	Standard	Standard	Standard
Standard size	1.492 — 1.508 (0.0587 — 0.0594)	47.976 — 48.000 (1.8888 — 1.8898)	2.498 — 2.513 (0.0983 — 0.0989)	2.496 — 2.511 (0.0983 — 0.0989)	67.985 — 68.003 (2.6766 — 2.6773)
0.03 (0.0012) Undersize	1.511 — 1.515 (0.0595 — 0.0596)	47.946 — 47.970 (1.8876 — 1.8886)	2.519 — 2.522 (0.0992 — 0.0993)	2.517 — 2.520 (0.0991 — 0.0992)	67.955 — 67.979 (2.6754 — 2.6763)
0.05 (0.0020) Undersize	1.521 — 1.525 (0.0599 — 0.0600)	47.926 — 47.950 (1.8868 — 1.8878)	2.529 — 2.532 (0.0996 — 0.0997)	2.527 — 2.530 (0.0995 — 0.0996)	67.935 — 67.959 (2.6746 — 2.6755)
0.25 (0.0098) Undersize	1.621 — 1.625 (0.0638 — 0.0640)	47.726 — 47.750 (1.8790 — 1.8799)	2.629 — 2.632 (0.1035 — 0.1036)	2.627 — 2.630 (0.1034 — 0.1035)	67.735 — 67.759 (2.6667 — 2.6677)

Crankshaft pin:

Cylindricality

Limit

0.006 mm (0.0002 in)

Out-of-roundness

Limit

0.005 mm (0.0002 in)

Grinding limit (dia.)

47.726 mm (1.8790 in) or less

Crankshaft journal:

Cylindricality

Limit

0.006 mm (0.0002 in)

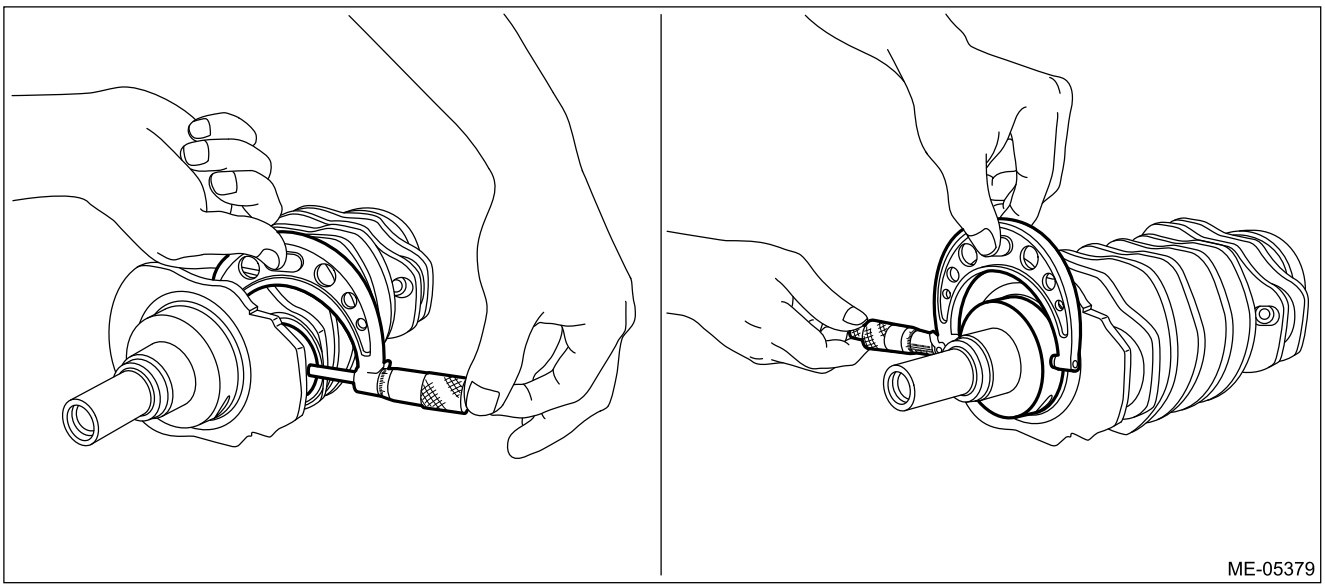
Out-of-roundness

Limit

0.005 mm (0.0002 in)

Grinding limit (dia.)

67.735 mm (2.6667 in) or less



4. Inspect the crankshaft bearing for scar, peeling, seizure, melting or wear, etc.
5. Use a thickness gauge to check the thrust clearance of crankshaft at thrust of #5 crankshaft bearing. If it is not within the standard, replace the #5 crankshaft bearing.

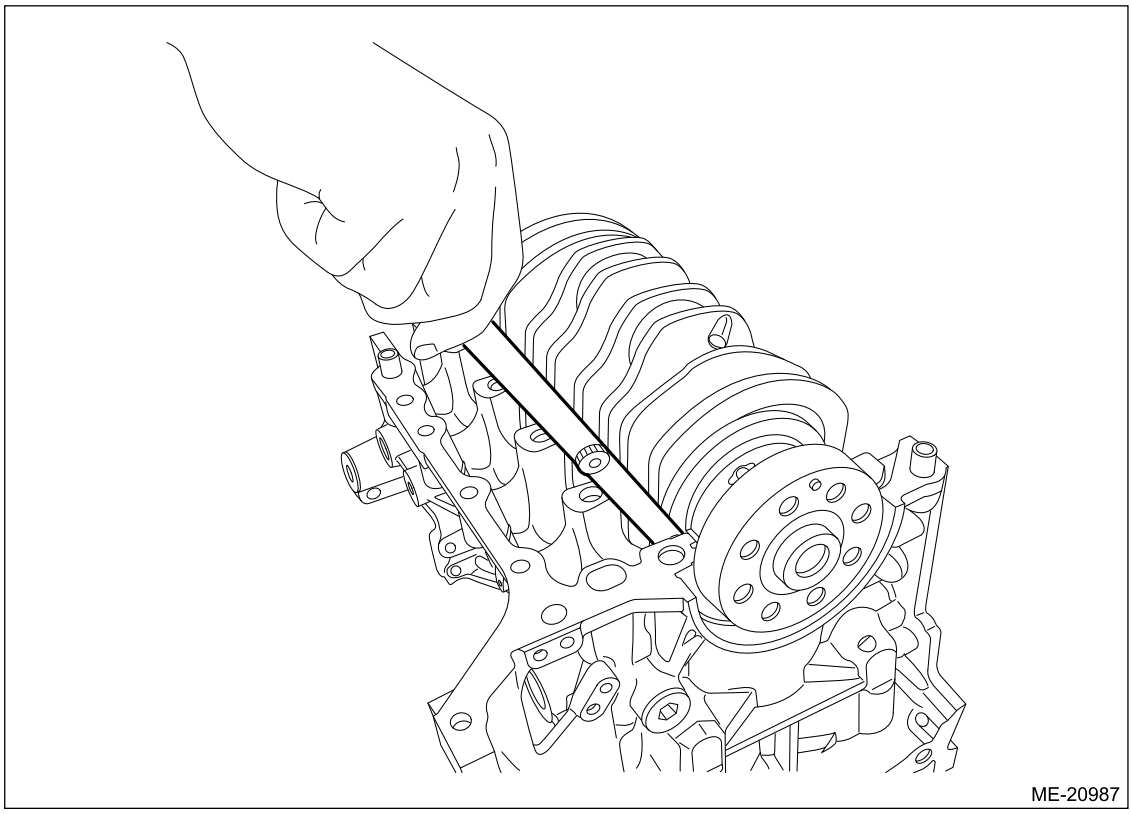
Note:

- **Measurement should be performed at a temperature of 20°C (68°F).**
- **Set all the crankshaft bearings onto the cylinder block, then mount the crankshaft on the cylinder block, and use a thickness gauge to measure the thrust clearance of crankshaft.**
- **Select the #5 crankshaft bearing of suitable size by referring to step 3) when replacing #5 crankshaft bearing.**

Crankshaft thrust clearance:

Standard

0.130 — 0.308 mm (0.0051 — 0.0121 in)



6. Check the oil clearance on each crankshaft bearing using plastigauge.

Note:

Measurement should be performed at a temperature of 20°C (68°F).

(1) Install the cylinder block LH to the engine stand.

Caution:

- **When the engine stand is not used, place a wood board wrapped with a waste cloth to prevent the knock pin damage and to stabilize the cylinder block before work.**
- **Be careful not to scratch the mating surface of cylinder block during work.**

(2) Remove the liquid gasket from cylinder block.

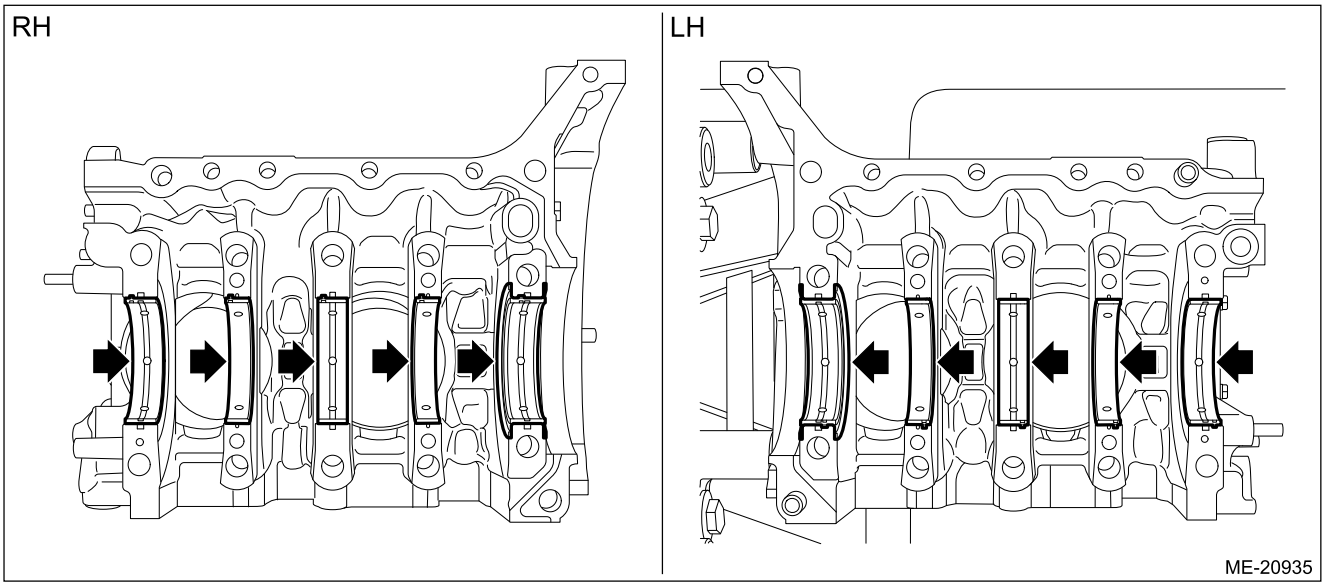
(3) Clean each crankshaft bearing and crankshaft journal.

(4) Set each crankshaft bearing to the cylinder block.

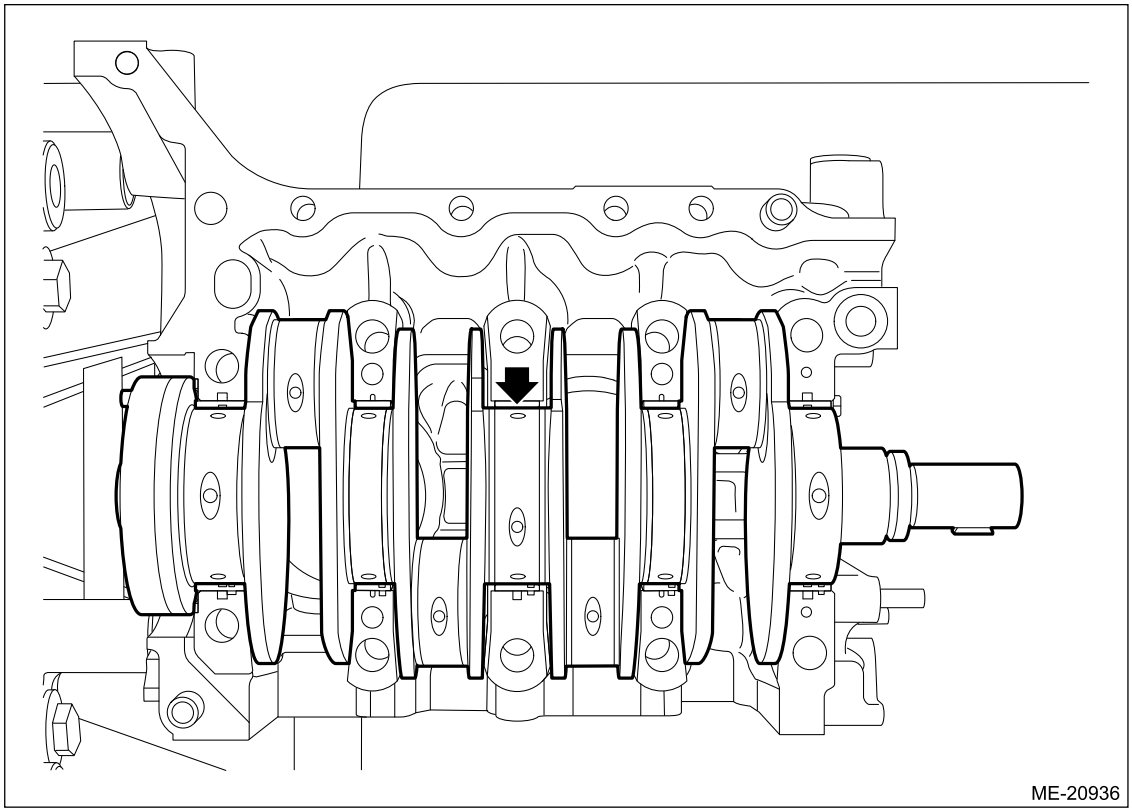
Caution:

When performing the operation of the cylinder block RH, be careful of the following.

1. **Place a wood board wrapped with a waste cloth to prevent the knock pin damage and to stabilize the cylinder block before work.**
2. **Be careful not to scratch the mating surface of cylinder block during work.**



(5) Set the crankshaft to the cylinder block LH.



(6) Place a plastigauge across the crankshaft journals and set the cylinder block RH to the cylinder block LH.

(7) Join the cylinder blocks.

Caution:

When tightening the mounting bolts, hold the cylinder block LH while not holding the cylinder block RH to ensure the joint accuracy of the cylinder block.

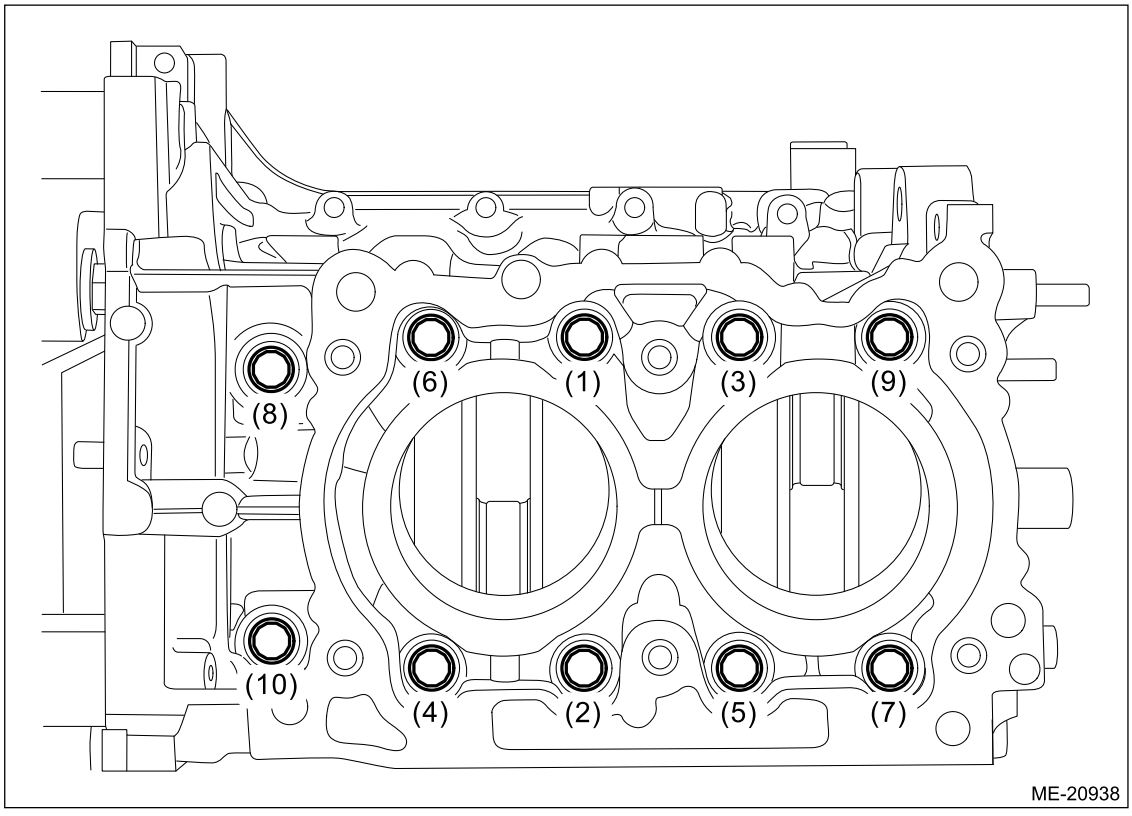
1. Apply a coat of engine oil to the washers and cylinder block mounting bolt threads.

   Note:

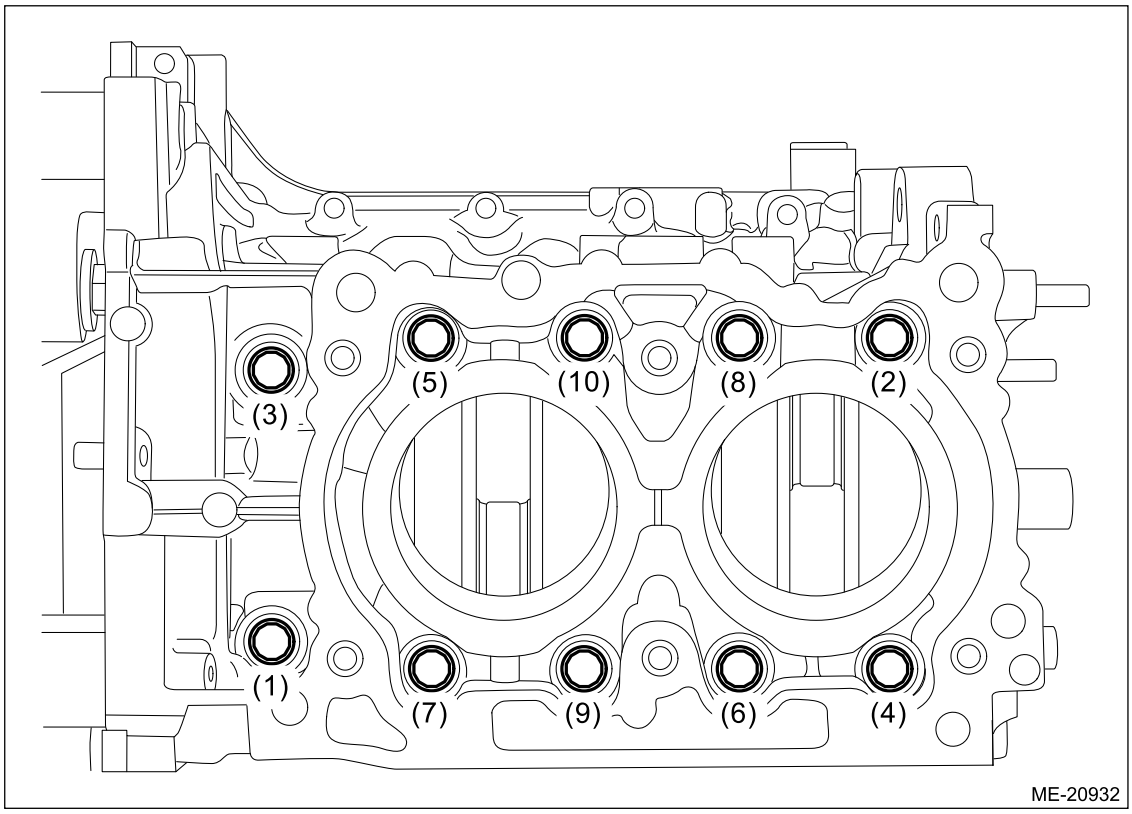
   To prevent mixture of engine oil into the water jacket, do not apply a large amount.

2. Tighten all mounting bolts with a torque of 35 N·m (3.6 kgf-m, 25.8 ft-lb) in numerical order as shown in the figure.

3. Loosen all mounting bolts by 180° in the reverse order of tightening in step 2.
4. Tighten all mounting bolts with a torque of 35 N·m (3.6 kgf-m, 25.8 ft-lb) in numerical order as shown in the figure.
5. Loosen the mounting bolts (4 places) by 180° in the order of (6) → (5) → (4) → (3) as shown in the figure.
6. Tighten the mounting bolts (4 places) with a torque of 17 N·m (1.7kgf-m, 12.5 ft-lb) in the order of (3) → (4) → (5) → (6) as shown in the figure.
7. Using an angle gauge, tighten the mounting bolts (4 places) with torque of 58° — 62° in the order of (3) → (4) → (5) → (6) as shown in the figure.
8. Loosen the mounting bolts (6 places) by 180° in the order of (8) → (7) → (10) → (9) → (2) → (1) as shown in the figure.
9. Tighten the mounting bolts (6 places) with a torque of 17 N·m (1.7kgf-m, 12.5 ft-lb) in the order of (1) → (2) → (9) → (10) → (7) → (8) as shown in the figure.
10. Using an angle gauge, tighten the mounting bolts (3 places) with torque of 58° — 62° in the order of (1) → (2) → (9) as shown in the figure.
11. Using an angle gauge, tighten the mounting bolt (10) (1 place) shown in the figure to the angle of 78° — 82°.
12. Using an angle gauge, tighten the mounting bolt (7) (1 place) shown in the figure to the angle of 58° — 62°.
13. Using an angle gauge, tighten the mounting bolt (8) (1 place) shown in the figure to the angle of 78°— 82°.



(8) Loosen the cylinder block mounting bolts in numerical order as shown in the figure, and then remove the bolts.



(9) While tapping the cylinder block RH with a plastic hammer, separate the cylinder block RH from the cylinder block LH.

Note:

Lift the cylinder block RH gradually, and confirm that the crankshaft is remaining in the cylinder block LH. Lifting the cylinder block RH carelessly may cause the crankshaft to fall off.

(10) Determine the crankshaft oil clearance by matching the widest point of the plastigauge on each journal against scale printed on a package of the plastigauge. If it is not within the standard, replace the crankshaft bearing, and grind to correct the crankshaft journal or replace the crankshaft as required.

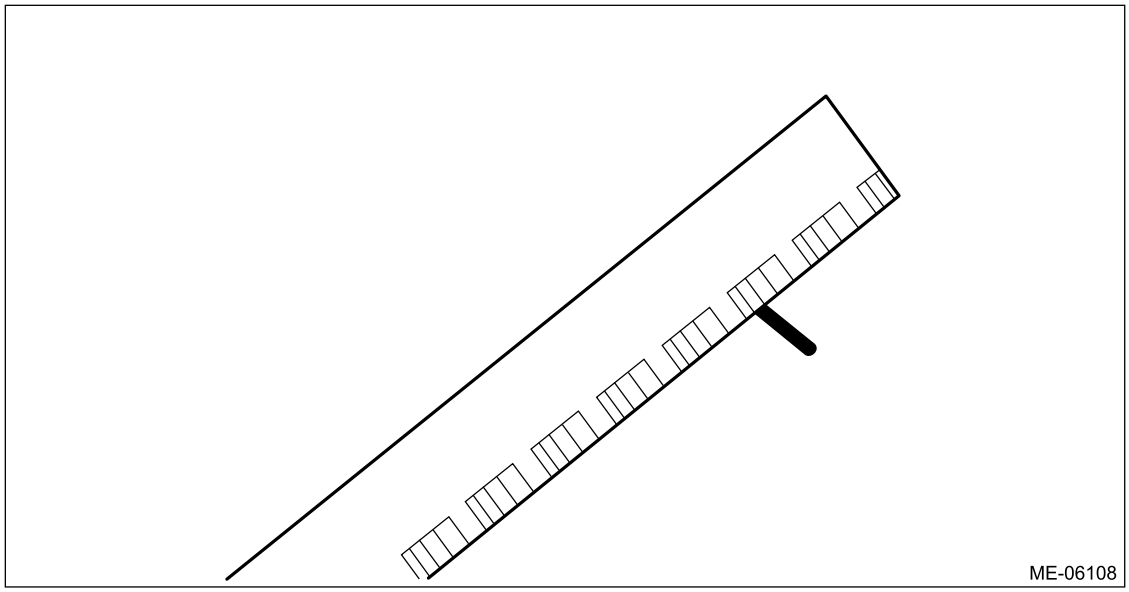
Note:

- **Select the crankshaft bearing of suitable size by referring to step 3) when replacing crankshaft bearing.**
- **When grinding to correct the crankshaft journal, finish it to the suitable outer diameter by referring to step 3) according to the undersize bearing to be used.**

Crankshaft oil clearance:

Standard

0.013 — 0.031 mm (0.0005 — 0.0012 in)



(11)Completely remove the plastigauge.

SPECIFICATION

Refer to “Cylinder Head” for removal and installation procedures of the intake and exhaust valves.

Ref. to MECHANICAL(H4DO)>Cylinder Head>REMOVAL.
Ref. to MECHANICAL(H4DO)>Cylinder Head>INSTALLATION.
Ref. to MECHANICAL(H4DO)>Cylinder Head>DISASSEMBLY.
Ref. to MECHANICAL(H4DO)>Cylinder Head>ASSEMBLY.

SPECIFICATION

Refer to “Cylinder Block” for removal and installation procedures of pistons.

Ref. to MECHANICAL(H4DO)>Cylinder Block>REMOVAL.
Ref. to MECHANICAL(H4DO)>Cylinder Block>INSTALLATION.
Ref. to MECHANICAL(H4DO)>Cylinder Block>DISASSEMBLY > PISTON AND CONNECTING ROD.
Ref. to MECHANICAL(H4DO)>Cylinder Block>ASSEMBLY > PISTON AND CONNECTING ROD.

SPECIFICATION

Refer to “Cylinder Block” for removal and installation procedures of connecting rod.

Ref. to MECHANICAL(H4DO)>Cylinder Block>REMOVAL.
Ref. to MECHANICAL(H4DO)>Cylinder Block>INSTALLATION.
Ref. to MECHANICAL(H4DO)>Cylinder Block>DISASSEMBLY > PISTON AND CONNECTING ROD.
Ref. to MECHANICAL(H4DO)>Cylinder Block>ASSEMBLY > PISTON AND CONNECTING ROD.

SPECIFICATION

Refer to “Cylinder Block” for removal and installation procedures of the crankshaft.

Ref. to MECHANICAL(H4DO)>Cylinder Block>REMOVAL.
Ref. to MECHANICAL(H4DO)>Cylinder Block>INSTALLATION.

INSPECTION

Note:

The "RANK" shown in the chart shows the possibilities of the cause of trouble in order from "Very often" to "Rarely".

A — Very often

B — Sometimes

C — Rarely

Symptoms	Problem parts etc.	Possible cause	RANK
1. Engine does not start.			
1) Starter does not turn.	Starter	Defective battery-to-starter harness	B
		Defective starter switch	C
		Defective relay	C
		Defective inhibitor switch	C
		Defective clutch start switch	C
		Defective starter	B
	Battery	Improper connection of terminal	A
		Run-down battery	A
		Defective charging system	B
	Friction	Seizure of crankshaft and connecting rod bearing	C
		Seized camshaft	C
		Seized or stuck piston and cylinder	C
	Immobilizer system Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.		A
2) Initial combustion does not occur.	Starter	Defective starter	C
	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Fuel line	Defective fuel pump and relay	A
		Clogged fuel line	C
		Lack of fuel or insufficient fuel	B
	Timing chain	Trouble	B
		Defective timing	B
	Compression	Incorrect cam clearance	C
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder head gasket	C
		Improper valve sealing	C
		Defective valve stem	C
		Worn or broken valve spring	B
		Worn or stuck piston rings, cylinder liner and piston	C
		Incorrect valve timing	B
		Improper engine oil (low viscosity)	B

Symptoms	Problem parts etc.	Possible cause	RANK
3) Initial combustion occurs.	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Defective intake manifold gasket	B
		Defective throttle body gasket	B
	Fuel line	Defective fuel pump and relay	C
		Clogged fuel line	C
		Lack of fuel or insufficient fuel	B
	Timing chain	Trouble	B
		Defective timing	B
	Compression	Incorrect cam clearance	C
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder head gasket	C
		Improper valve sealing	C
		Defective valve stem	C
		Worn or broken valve spring	B
		Worn or stuck piston rings, cylinder liner and piston	C
		Incorrect valve timing	B
		Improper engine oil (low viscosity)	B
4) Engine stalls after initial combustion.	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked intake duct	B
		Loosened or cracked PCV hose	C
		Loosened or cracked vacuum hose	C
		Defective intake manifold gasket	B
		Defective throttle body gasket	B
		Dirty air cleaner element	C
	Fuel line	Clogged fuel line	C
		Lack of fuel or insufficient fuel	B
	Timing chain	Trouble	B
		Defective timing	B
	Compression	Incorrect cam clearance	C
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder head gasket	C
		Improper valve sealing	C
		Defective valve stem	C
		Worn or broken valve spring	B
		Worn or stuck piston rings, cylinder and piston	C
		Incorrect valve timing	B
		Improper engine oil (low viscosity)	B

Symptoms	Problem parts etc.	Possible cause	RANK
2. Rough idle and engine stall	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked intake duct	A
		Loosened or cracked PCV hose	A
		Loosened or cracked vacuum hose	A
		Defective intake manifold gasket	B
		Defective throttle body gasket	B
		Defective PCV valve	C
		Loosened oil filler cap	B
		Dirty air cleaner element	C
	Fuel line	Defective fuel pump and relay	C
		Clogged fuel line	C
		Lack of fuel or insufficient fuel	B
	Timing chain	Defective timing	C
	Compression	Incorrect cam clearance	B
		Loosened spark plug or defective gasket	B
		Loosened cylinder head bolt or defective cylinder head gasket	B
		Improper valve sealing	B
		Defective valve stem	C
		Worn or broken valve spring	B
		Worn or stuck piston rings, cylinder and piston	B
		Incorrect valve timing	A
		Improper engine oil (low viscosity)	B
	Lubrication system	Incorrect oil pressure	B
		Defective rocker cover gasket	C
	Cooling system	Over-heating	C
	Other	Evaporative emission control system malfunction	A
		Stuck or damaged throttle valve	B
3. Low output, hesitation and poor acceleration	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked intake duct	A
		Loosened or cracked PCV hose	A
		Loosened or cracked vacuum hose	B
		Defective intake manifold gasket	B
		Defective throttle body gasket	B
		Defective PCV valve	B
		Loosened oil filler cap	B
		Dirty air cleaner element	A
	Fuel line	Defective fuel pump and relay	B
		Clogged fuel line	B
		Lack of fuel or insufficient fuel	C

Symptoms	Problem parts etc.	Possible cause	RANK
	Timing chain	Defective timing	B
	Compression	Incorrect cam clearance	B
		Loosened spark plug or defective gasket	B
		Loosened cylinder head bolt or defective cylinder head gasket	B
		Improper valve sealing	B
		Defective valve stem	C
		Worn or broken valve spring	B
		Worn or stuck piston rings, cylinder and piston	C
		Incorrect valve timing	A
		Improper engine oil (low viscosity)	B
	Lubrication system	Incorrect oil pressure	B
	Cooling system	Over-heating	C
		Over-cooling	C
	Other	Evaporative emission control system malfunction	A
4. Surging	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked intake duct	A
		Loosened or cracked PCV hose	A
		Loosened or cracked vacuum hose	A
		Defective intake manifold gasket	B
		Defective throttle body gasket	B
		Defective PCV valve	B
		Loosened oil filler cap	B
		Dirty air cleaner element	B
	Fuel line	Defective fuel pump and relay	B
		Clogged fuel line	B
		Lack of fuel or insufficient fuel	C
	Timing chain	Defective timing	B
	Compression	Incorrect cam clearance	B
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder head gasket	C
		Improper valve sealing	C
		Defective valve stem	C
		Worn or broken valve spring	C
		Worn or stuck piston rings, cylinder and piston	C
		Incorrect valve timing	A
		Improper engine oil (low viscosity)	B
	Cooling system	Over-heating	B

Symptoms	Problem parts etc.	Possible cause	RANK
	Other	Evaporative emission control system malfunction	C
5. Engine does not return to idle.	Engine control system Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked vacuum hose	A
	Other	Stuck or damaged throttle valve	A
6. Dieseling (run-on)	Engine control system Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.		A
	Cooling system	Over-heating	B
	Other	Evaporative emission control system malfunction	B
7. After burning in exhaust system	Engine control system Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened or cracked intake duct	C
		Loosened or cracked PCV hose	C
		Loosened or cracked vacuum hose	B
		Defective PCV valve	B
		Loosened oil filler cap	C
	Timing chain	Defective timing	B
	Compression	Incorrect cam clearance	B
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder head gasket	C
		Improper valve sealing	B
		Defective valve stem	C
		Worn or broken valve spring	C
		Worn or stuck piston rings, cylinder and piston	C
		Incorrect valve timing	A
	Lubrication system	Incorrect oil pressure	C
	Cooling system	Over-cooling	C
	Other	Evaporative emission control system malfunction	C
8. Knocking	Engine control system Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Loosened oil filler cap	B
	Timing chain	Defective timing	B
	Compression	Incorrect cam clearance	C
		Incorrect valve timing	B
	Cooling system	Over-heating	A
9. Excessive engine oil consumption	Intake system	Loosened or cracked PCV hose	A
		Defective PCV valve	B
		Loosened oil filler cap	C
	Compression	Defective valve stem	A

Symptoms	Problem parts etc.	Possible cause	RANK
		Worn or stuck piston rings, cylinder and piston	A
	Lubrication system	Loosened chain cover attaching bolts and defective gasket	B
		Defective oil filter gasket	B
		Defective crankshaft oil seal	B
		Defective rocker cover gasket	B
		Loosened oil drain plug or defective gasket	B
		Loosened oil pan mounting bolt or defective oil pan	B
10. Excessive fuel consumption	Engine control system Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure.		A
	Intake system	Dirty air cleaner element	A
	Timing chain	Defective timing	B
	Compression	Incorrect cam clearance	B
		Loosened spark plug or defective gasket	C
		Loosened cylinder head bolt or defective cylinder gasket	C
		Improper valve sealing	B
		Defective valve stem	C
		Worn or broken valve spring	C
		Worn or stuck piston rings, cylinder and piston	B
		Incorrect valve timing	B
	Lubrication system	Incorrect oil pressure	C
	Cooling system	Over-cooling	C

INSPECTION

Type of sound	Condition	Possible cause
Regular clicking sound	Sound increases as engine speed increases.	• Valve mechanism is defective • Incorrect cam clearance • Worn camshaft • Broken valve spring • Defective valve shim
Heavy and dull clank	Oil pressure is low.	• Worn crankshaft bearing • Worn connecting rod bearing
	Oil pressure is normal.	• Loosened flywheel mounting bolt • Damaged engine mounting
High-pitched clank	Sound is noticeable when accelerating with an overload condition.	• Ignition timing advanced • Accumulation of carbon inside combustion chamber • Wrong heat range of spark plug • Improper octane value gasoline
Clank noise when engine speed is (1,000 — 2,000 r/min)	Sound is reduced when the fuel injector of the noisy cylinder is stopped.*	• Worn crankshaft bearing • Worn connecting rod bearing
Knocking sound when engine is operating under idling speed and engine is warm	Sound is reduced when the fuel injector of the noisy cylinder is stopped.*	• Worn cylinder liner and piston ring • Broken or stuck piston ring • Worn piston pin and piton pin hole of piston
	Sound is not reduced if each fuel injector is stopped in turn.*	• Unusually worn valve rocker • Unusually worn valve shim • Worn cam sprocket • Worn journal of cam carrier and camshaft cap
Squeaky sound	—	• Insufficient generator lubrication
Rubbing sound	—	• Poor contact of generator brush and rotor
Gear scream when starting engine	—	• Defective ignition starter switch • Worn gear and starter pinion
Sound like polishing glass with a dry cloth	—	• Defective V-belt tensioner assembly (loose V-belt) • Defective water pump shaft
Hissing sound	—	• Insufficient compression • Air leakage in air intake system, hose, connection or manifold
Timing chain noise	—	• Loose timing chain • Timing chain contacting with adjacent part
Valve noise	—	• Incorrect cam clearance

*: Fuel injector can be stopped using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Active Test>OPERATION.

SPEED CONTROL SYSTEMS(H4DO)

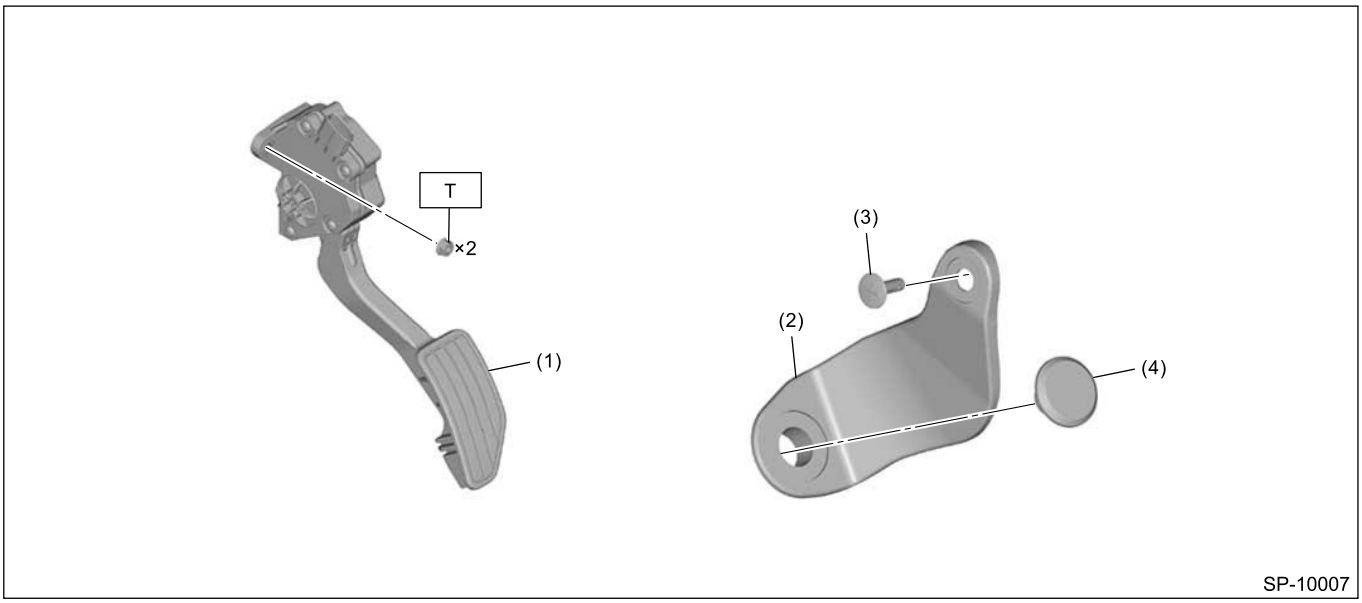
SP(H4DO)

1. General Description
2. Accelerator Pedal

SPECIFICATION

Accelerator pedal	Stroke	At pedal pad	50 — 60 mm (1.97 — 2.36 in)

COMPONENT



(1) Accelerator pedal ASSY
(2) Accelerator plate
(3) Clip
(4) Accelerator stopper

Tightening torque: N·m (kfg-m, ft-lb)

T: 7.5 (0.8, 5.5)

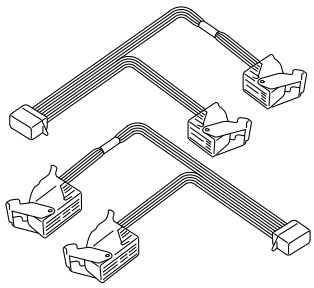
CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.

- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18460AA120	18460AA120 (Newly adopted tool)	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

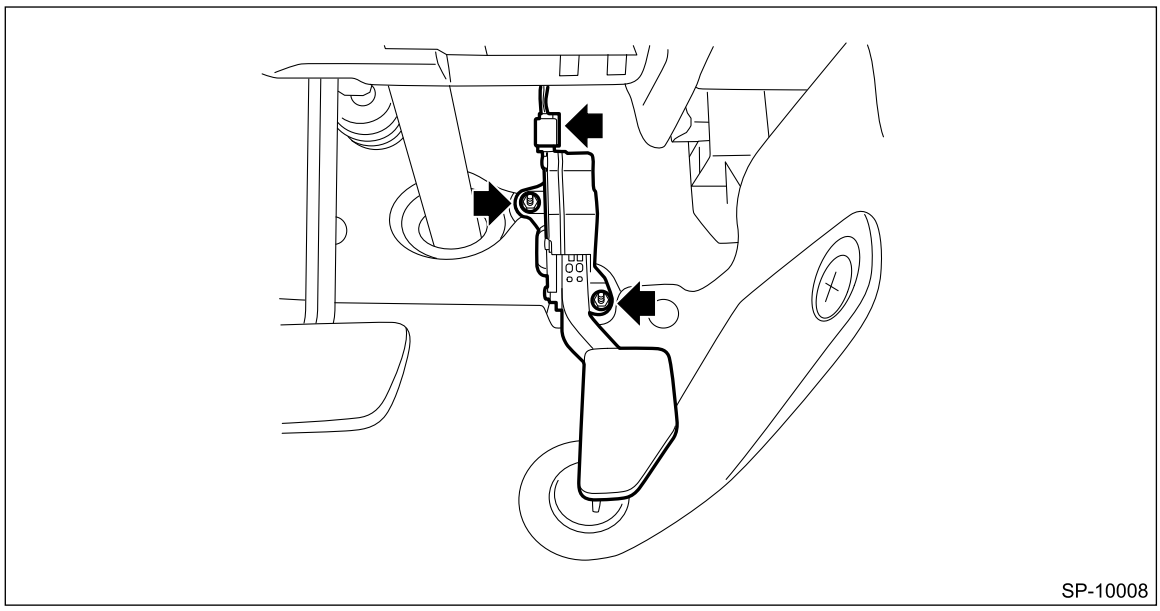
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

SPEED CONTROL SYSTEMS(H4DO) > Accelerator Pedal

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the connector and remove the accelerator pedal assembly.



SPEED CONTROL SYSTEMS(H4DO) > Accelerator Pedal

INSTALLATION

1. Install the accelerator pedal assembly, and connect the connector.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SPEED CONTROL SYSTEMS(H4DO) > Accelerator Pedal

DISASSEMBLY

Note:
The accelerator pedal cannot be disassembled.

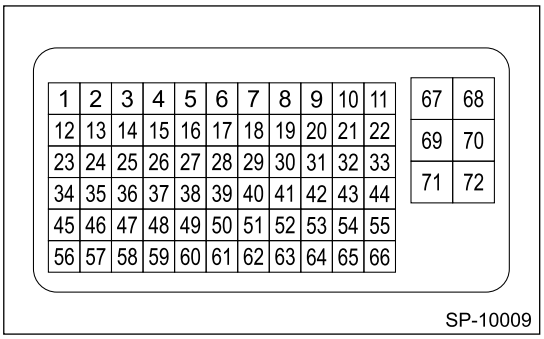
SPEED CONTROL SYSTEMS(H4DO) > Accelerator Pedal

INSPECTION

1. CHECK ACCELERATOR PEDAL SENSOR AREA (METHOD WITH CIRCUIT TESTER)

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Disconnect the ECM connector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
3. Attach the ST between ECM and the engine wiring harness and the bulkhead harness. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>CAUTION.
   Special tool:
   CHECK BOARD (18460AA120)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

5. Turn to IG ON.
6. Measure the voltage between ECM connector terminals.



Accelerator pedal sensor	Accelerator pedal	Terminal No.	Standard
Main	Not depressed (full closed)	66 (+) — 55 (−)	0.3 — 1.1 V
	Depressed (full opened)		2.3 — 3.8 V
Sub	Not depressed (full closed)	64 (+) — 65 (−)	0.3 — 1.1 V
	Depressed (full opened)		2.3 — 3.8 V

7. After inspection, restore the vehicle to its original state.

2. CHECK ACCELERATOR PEDAL SENSOR AREA (METHOD WITH SUBARU SELECT MONITOR 4)

Note:
Individual difference of the accelerator pedal may not be corrected sufficiently on the ECM side after DTCs were cleared or the battery was removed and installed on the vehicle. Therefore, when the accelerator opening angle signal does not indicate 100%, repeat the ignition switch ON (engine OFF) and ignition switch OFF operations at intervals of three seconds or more, until the accelerator opening angle signal indicates 100%.

1. Connect the Subaru Select Monitor 4.
2. Turn to IG ON.
3. Read the accelerator opening angle and the main accelerator sensor voltage using Subaru Select Monitor 4.
   Note:
   For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Accelerator pedal sensor	Accelerator pedal opening angle	Standard
Main	0.0%	0.3 — 1.1 V
	100.0%	2.3 — 3.8 V
Sub	0.0%	0.3 — 1.1 V
	100.0%	2.3 — 3.8 V

3. OTHER INSPECTIONS

1. Check that there is no deformation, cracks or other damages.
2. Check for smooth operation when the accelerator pedal is depressed.
3. Check if the accelerator pedal returns to its original position smoothly when the pedal is released.

STARTING/CHARGING SYSTEMS(H4DO)

SC(H4DO)

1. General Description
2. Charging System
3. Starter
4. Starter Relay
5. Generator
6. Battery
7. Battery Sensor

SPECIFICATION

Item			Specifications	
Vehicle model			CVT	MT
Starter	Type		Reduction type	
	Model		M000TC5371	M000TD1571
	Manufacturer		Mitsubishi Electric	
	Voltage and output		12 V — 1.0 kW	
	Direction of rotation		Counterclockwise (when observed from pinion)	
	Number of pinion teeth		9	8
	Armature commutator runout	Standard	0.05 mm (0.0020 in)	
		Limit	0.10 mm (0.0039 in)	
	Armature depth of segment mold	Standard	0.50 mm (0.020 in)	
	Brush length	Standard	12.45 mm (0.490 in)	12.3 mm (0.484 in)
		Limit	5.0 mm (0.197 in)	7.0 mm (0.276 in)
	Brush spring force	Standard	12.3 — 16.7 N (1.25 — 1.70 kgf, 2.77 — 3.75 lbf)	15.9 — 19.5 N (1.62 — 1.99 kgf, 3.57 — 4.38 lbf)
		Limit	3.6 N (0.37 kgf, 0.81 lbf)	2.5 N (0.25 kgf, 0.56 lbf)
	No-load characteristics	Voltage	11 V	
		Current	95 A or less	
Generator	Type		Rotating-field three-phase type, voltage regulator built-in type, each with load response control system	
	Model		104211-4020	
	Manufacturer		DENSO	
	Voltage and output		12 V — 130 A	
	Polarity on ground side		Negative	
	Direction of rotation		Clockwise (when observed from pulley side)	
	Stator connection		3-phase △ type	
	Output current		1,500 r/min — 41 A or more 2,500 r/min — 103 A or more 5,000 r/min — 130 A or more	
	Regulated voltage		14.0 — 14.6 V [25°C (77°F)]	
	Rotor slip ring outer diameter	Standard	14.2 — 14.8 mm (0.559 — 0.583 in)	
		Limit	14.0 mm (0.551 in)	
Battery	Type		75D23L	
	Nominal capacity		5 HR: 52 Ah [25°C (77°F)]	
	Nominal voltage		12 V	

	Item	Specifications
	CCA	530 A
	BCI group number*	35

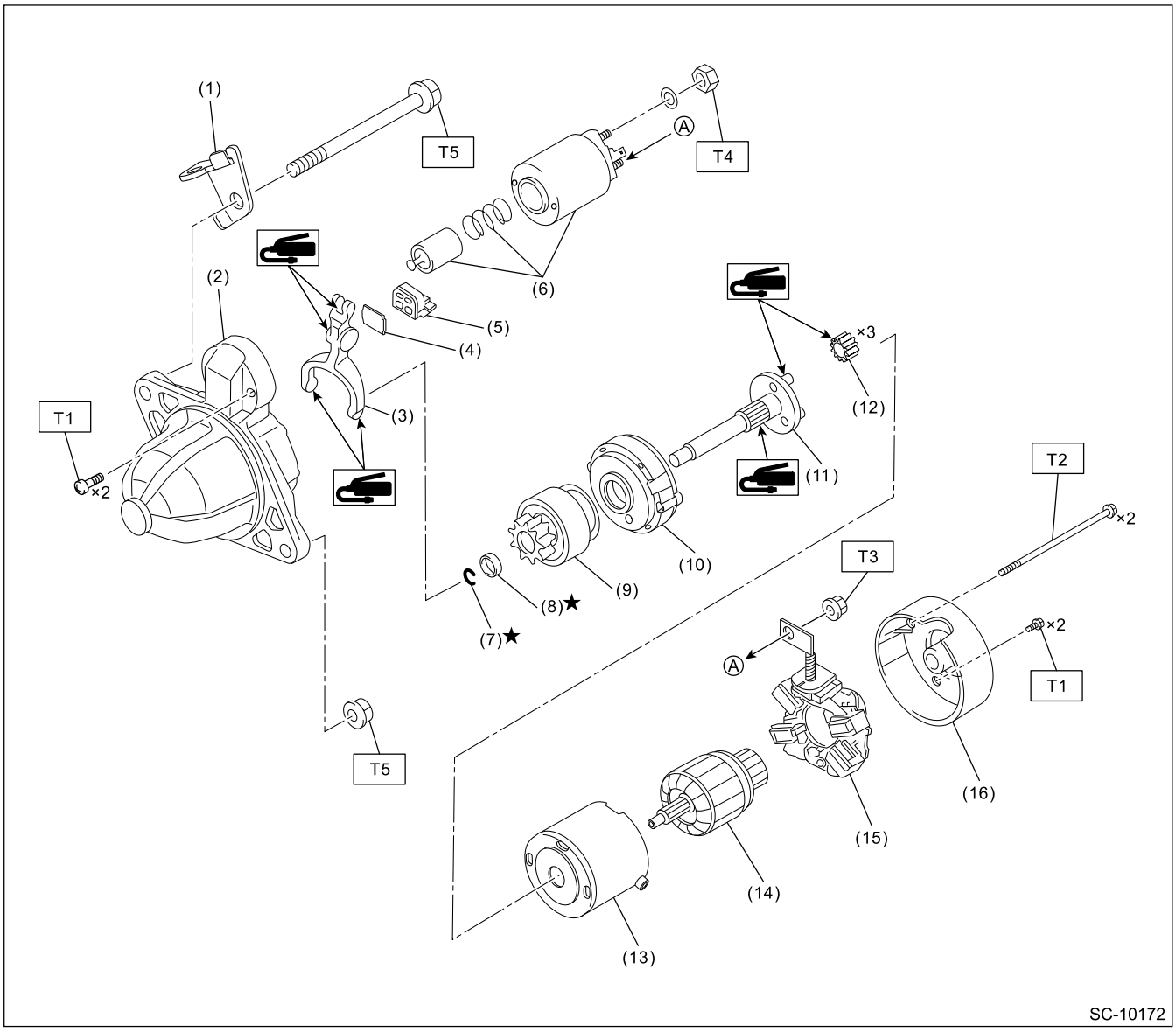
*Use the information about the battery size as a reference. This information shall not be guaranteed by FHI.

STARTING/CHARGING SYSTEMS(H4DO) > General Description

COMPONENT

1. STARTER

- CVT model

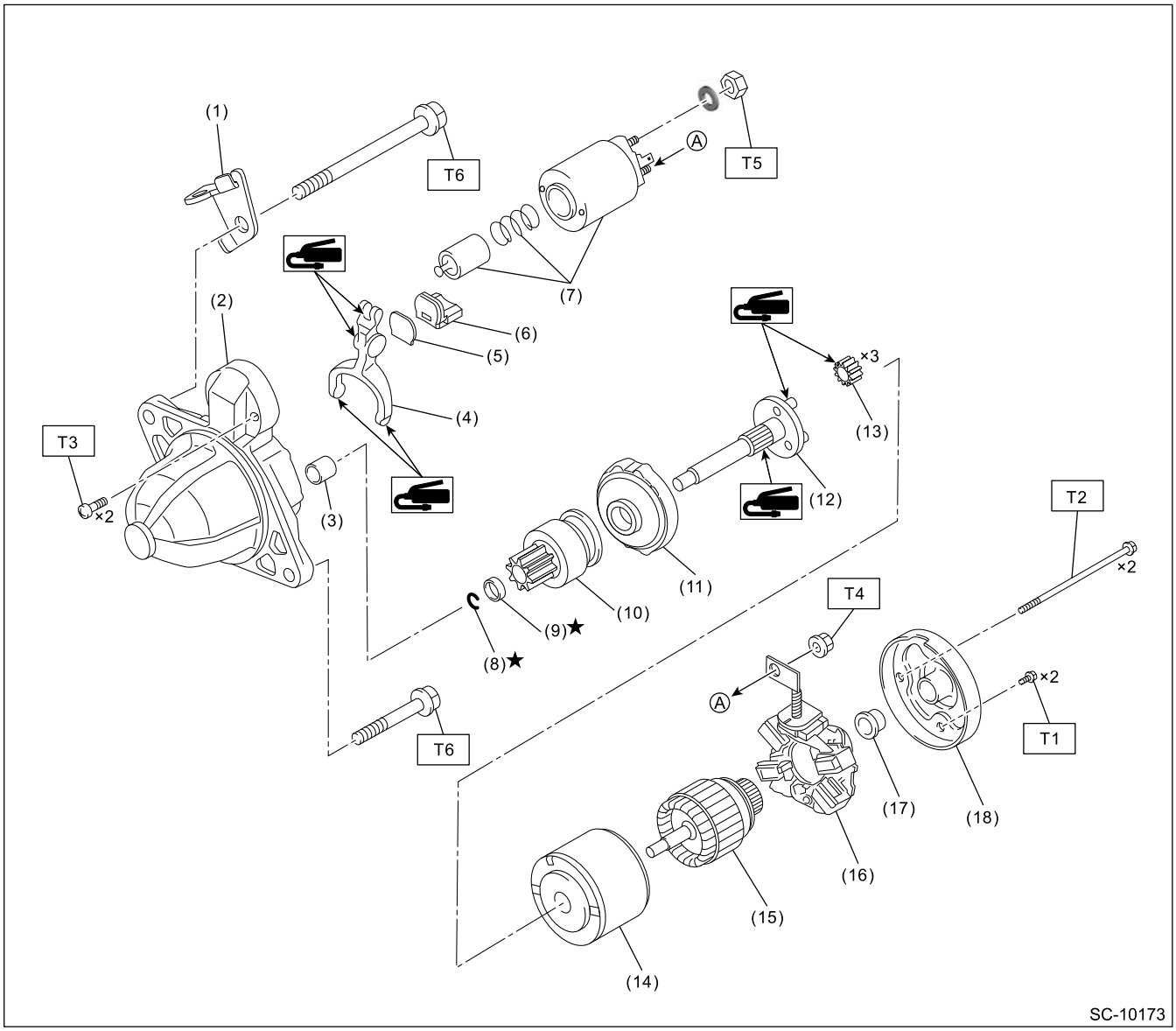


(1)	Cable stay	(9)	Overrunning clutch	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Starter housing	(10)	Internal gear	***T1:***	***3.4 (0.3, 2.5)***
(3)	Shift lever	(11)	Shaft	***T2:***	***3.5 (0.4, 2.6)***
(4)	Plate	(12)	Pinion gear	***T3:***	***10.7 (1.1, 7.9)***
(5)	Seal rubber	(13)	Yoke ASSY	***T4:***	***11 (1.1, 8.1)***

(6) Magnet switch ASSY
(7) Snap ring
(8) Stopper
(14) Armature ASSY
(15) Brush holder ASSY
(16) Starter cover

T5: 50 (5.1, 36.9)

- MT model

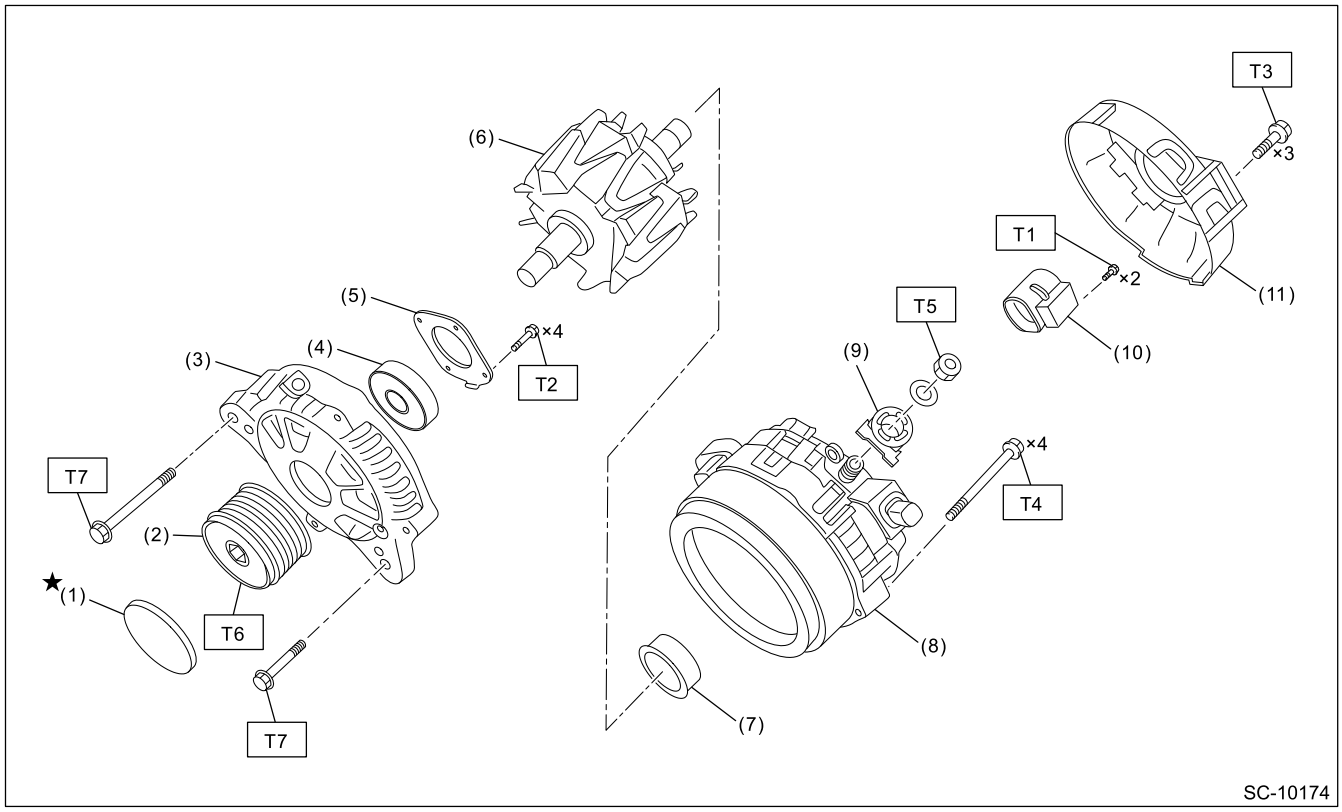


(1) Cable stay
(2) Starter housing
(3) Sleeve bearing
(4) Shift lever
(5) Plate
(6) Seal rubber
(7) Magnet switch ASSY
(8) Snap ring
(9) Stopper
(10) Overrunning clutch
(11) Internal gear
(12) Shaft
(13) Pinion gear
(14) Yoke ASSY
(15) Armature ASSY
(16) Brush holder ASSY
(17) Sleeve bearing
(18) Starter cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.4 (0.1, 1.0)
T2: 6 (0.6, 4.4)
T3: 7.5 (0.8, 5.5)
T4: 10 (1.0, 7.4)
T5: 11 (1.1, 8.1)
T6: 50 (5.1, 36.9)

2. GENERATOR

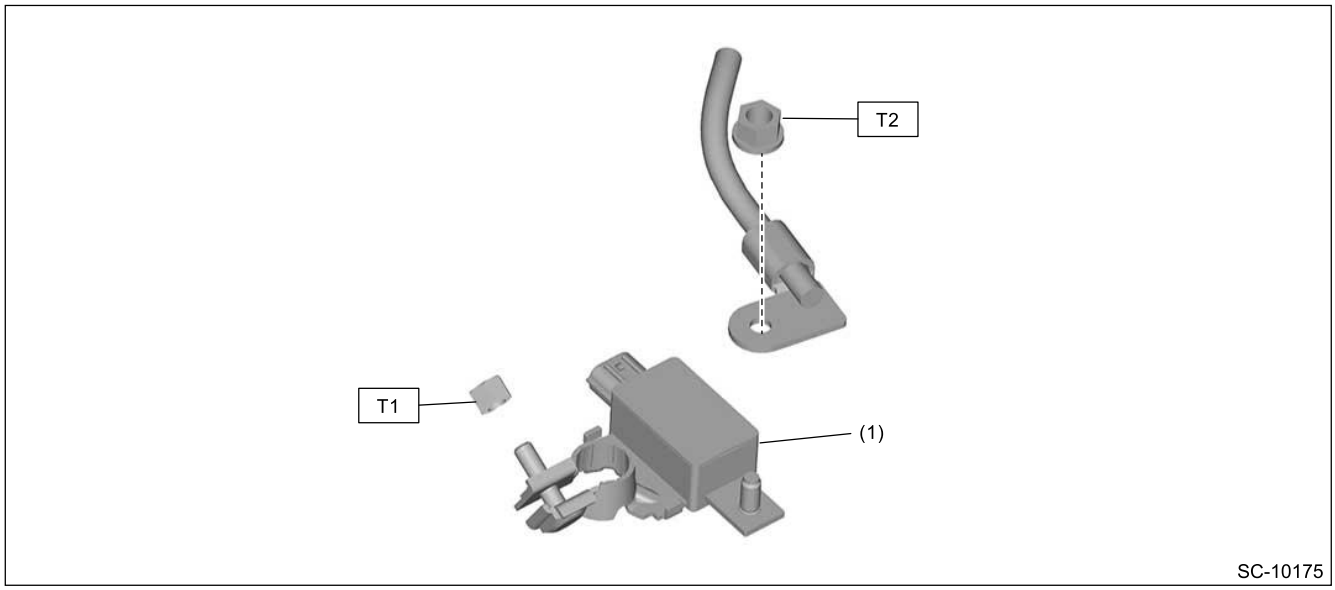


(1) Dust cover
(2) Pulley
(3) Front cover
(4) Ball bearing
(5) Bearing retainer
(6) Rotor ASSY
(7) Bearing cover
(8) Stator coil ASSY
(9) Bushing
(10) Brush ASSY
(11) Rear cover

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.76 (0.2, 1.3)
T2: 2.26 (0.2, 1.7)
T3: 4.55 (0.5, 3.4)
T4: 5.6 (0.6, 4.1)
T5: 15.5 (1.6, 11.4)
T6: 80 (8.2, 59)
T7: Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator> INSTALLATION.

3. BATTERY SENSOR



(1) Battery sensor

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6 (0.6, 4.4)

T2: 7.5 (0.8, 5.5)

STARTING/CHARGING SYSTEMS(H4DO) > General Description

CAUTION

- Prior to starting work, pay special attention to the following:
  1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
  2. Protect the vehicle using a seat cover, fender cover, etc.
  3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- Bolts, nuts and washers should be replaced with new parts as required.
- Be sure to tighten the fasteners including bolts and nuts to the specified torque.

STARTING/CHARGING SYSTEMS(H4DO) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

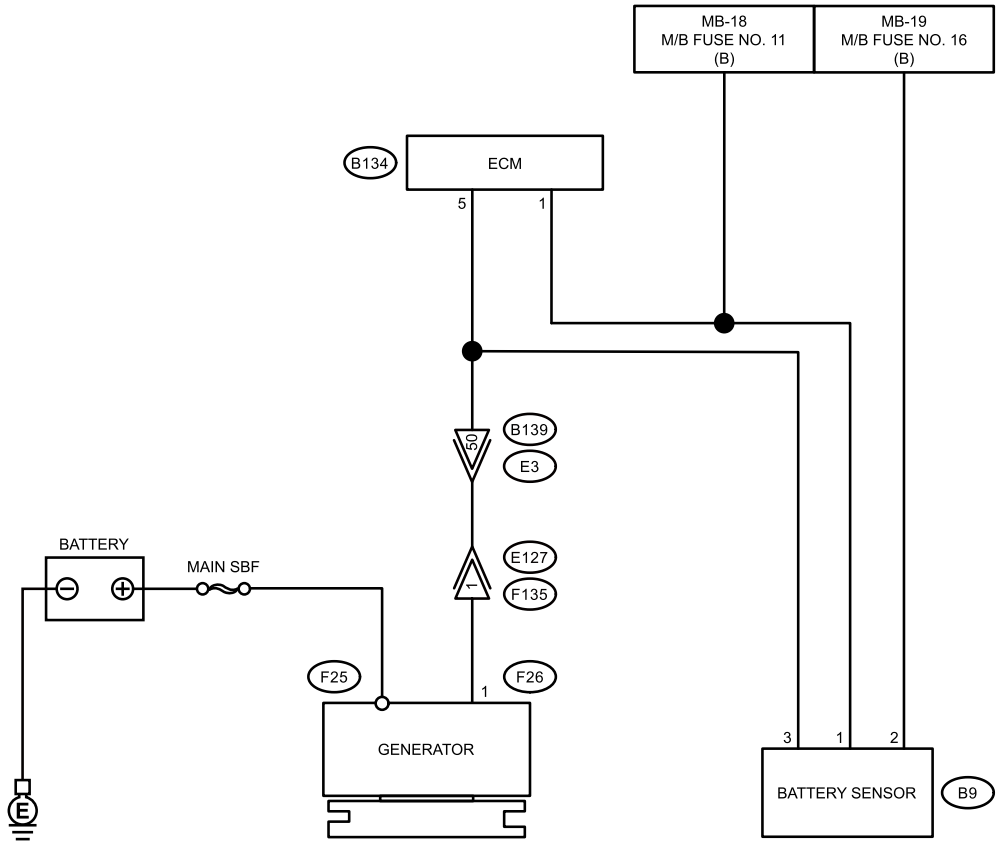
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

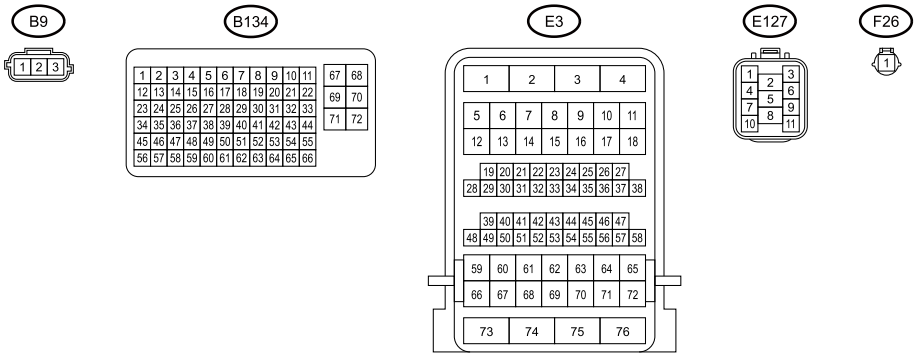
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current. **Note:** • **When measuring the standby current, prepare a circuit tester which can measure down to 1 mA.** • **When measuring the standby current for models with keyless access function, prepare an analog type.**

WIRING DIAGRAM





SC-10231

INSPECTION

INSPECTION WHEN OIL PRESSURE WARNING LIGHT IS ILLUMINATED

Note:

If the alternator overheats, the charge warning light illuminates temporarily.

1. CHECK DTC.

Read the DTC using the Subaru Select Monitor 4.

Note:

For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".

Is DTC detected?

Yes — (1) Repair the corresponding system.
(2) Go to 2.

No — Go to 2.

2. CHECK V-BELT.

Check the V-belt for abnormalities.

Is the V-belt normal?

Yes — Go to 3.

No — Replace the V-belt or V-belt tensioner assembly.

3. CHECK GENERATOR B TERMINAL.

Check the voltage of the generator terminal B.

Is the battery voltage applied?

Yes — Go to 4.

No — Repair the harness between generator and MAIN SBF.

4. CHECK CONTINUITY BETWEEN GENERATOR MAIN BODY AND CHASSIS GROUND.

Check continuity between generator main body and chassis ground.

Is there continuity?

Yes	Go to 5.
No	Check and repair the installation condition of the generator, chassis ground and engine ground.

5. CHECK COMBINATION METER.

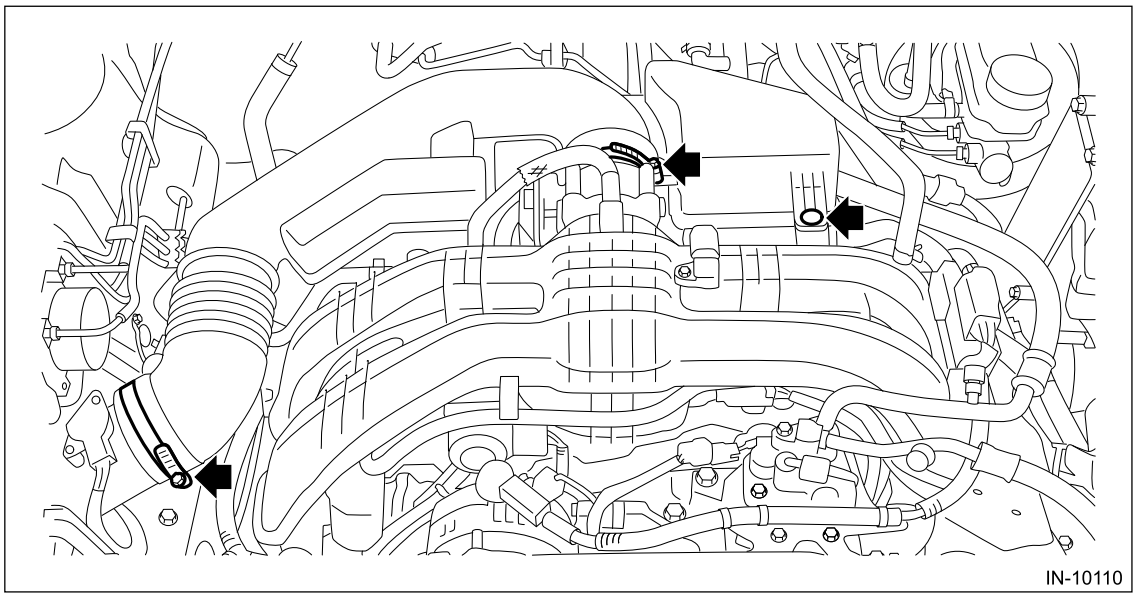
Perform the self-diagnosis of combination meter.

Is the charge warning light OK?

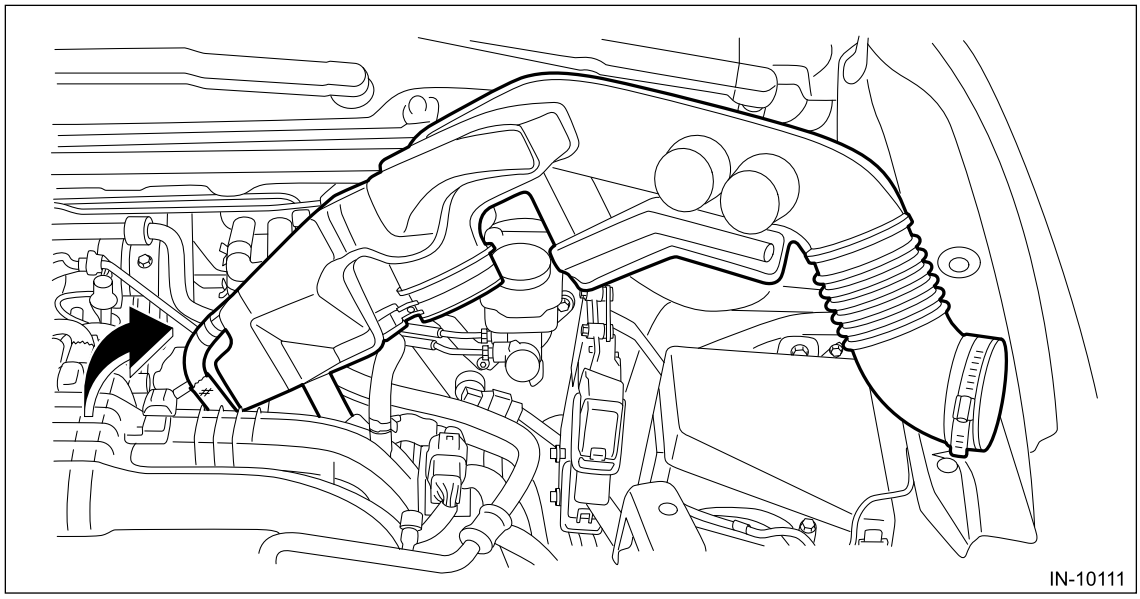
Yes	Repair or replace the generator.
No	Replace the combination meter.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



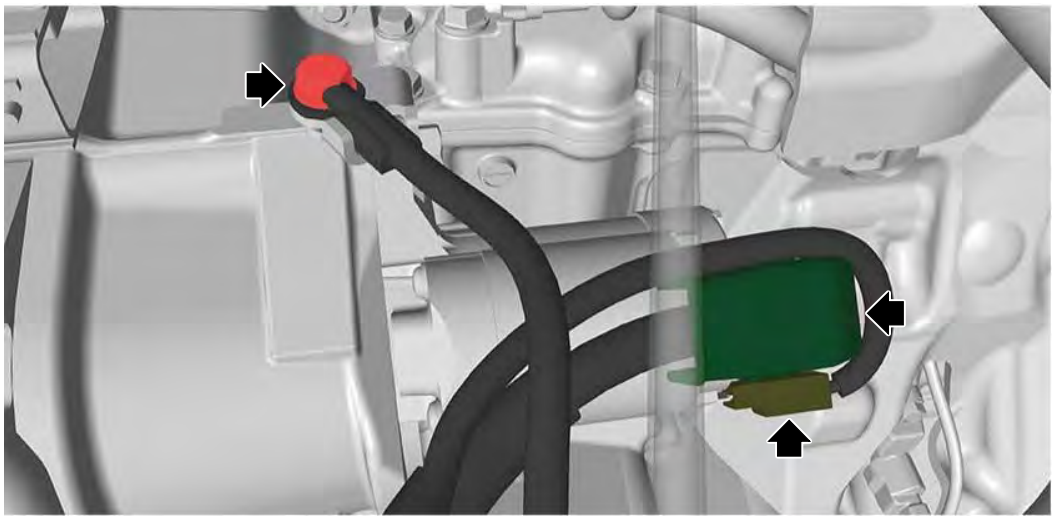
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



4. Remove the front wheel LH. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
5. Disconnect the connector, terminal B and ground terminal.

Caution:

In order to prevent damaging the ground terminal, fix the ground terminal when loosing the bolt, and avoid the part from rotating together while loosening the bolt.

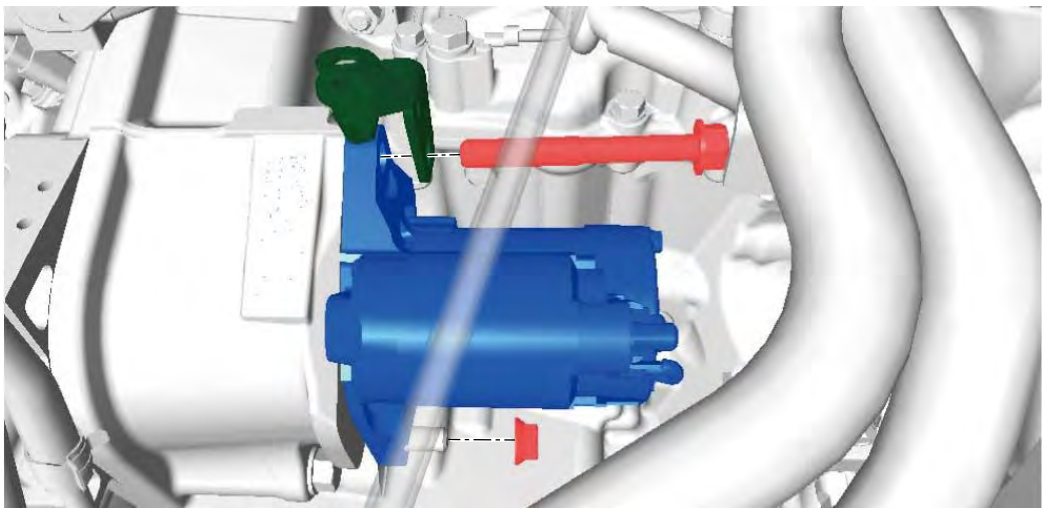


SC-10176

6. Remove the cable stay and starter.

Note:

For the MT model, a bolt is used in the lower side of the starter.



SC-10177

STARTING/CHARGING SYSTEMS(H4DO) > Starter

INSTALLATION

1. Install the starter and cable stay.

Note:

For the MT model, a bolt is used in the lower side of the starter.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

2. Connect the connector, terminal B and ground terminal.

Tightening torque:

Terminal B

11 N·m (1.1 kgf-m, 8.1 ft-lb)

Ground terminal

14 N·m (1.4 kgf-m, 10.3 ft-lb)

3. Install the front wheel LH. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

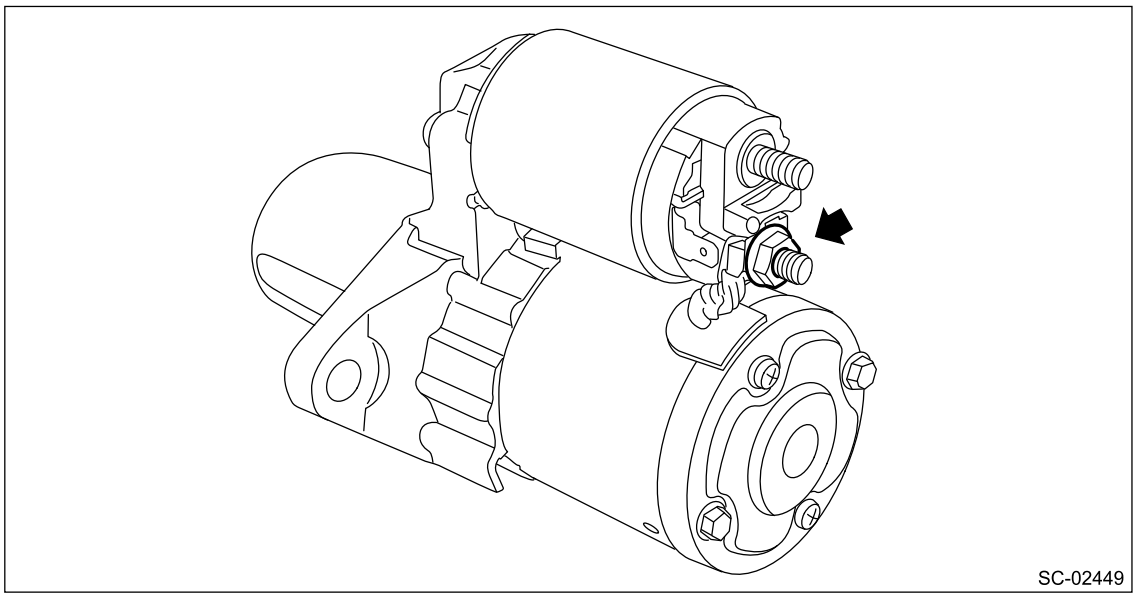
STARTING/CHARGING SYSTEMS(H4DO) > Starter

DISASSEMBLY

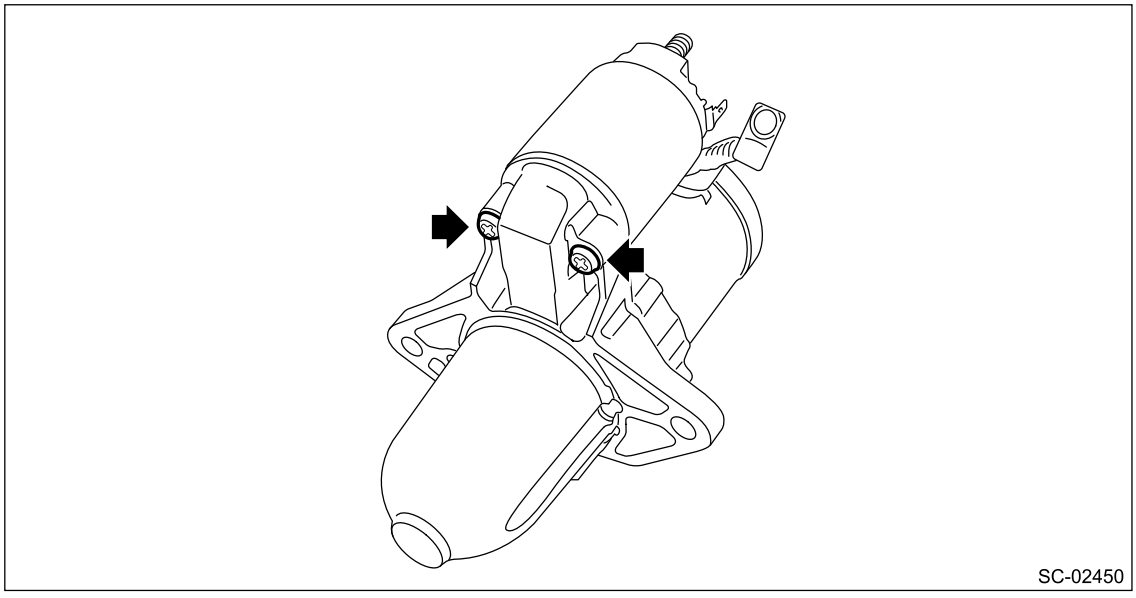
Caution:

The starter should be placed through a no-load test whenever it has been overhauled.

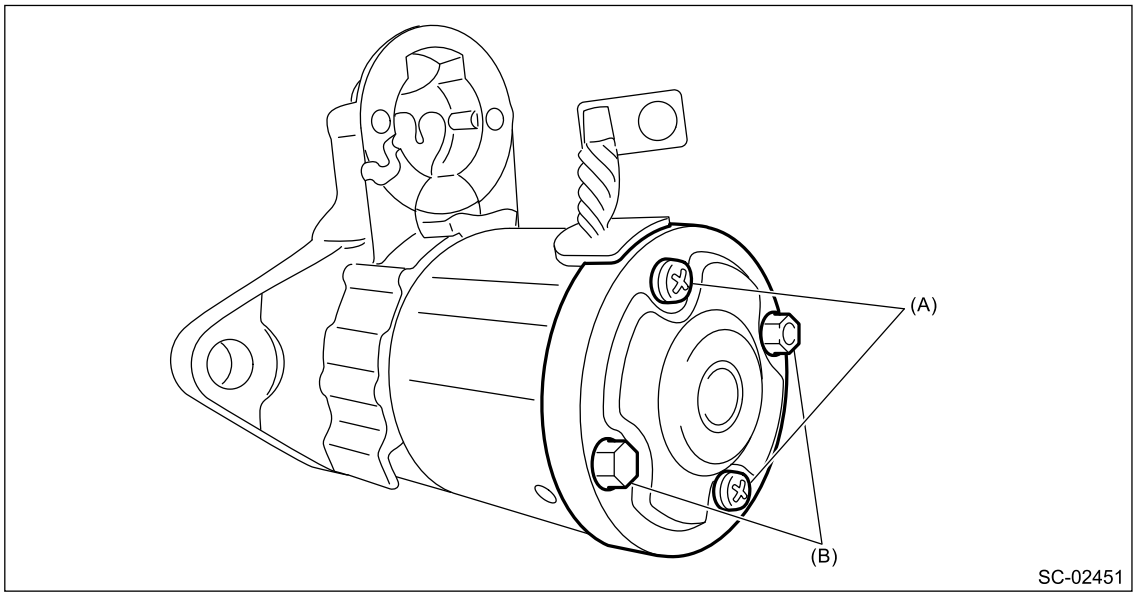
1. Disconnect the cable from the M terminal.



2. Remove the magnet switch assembly.



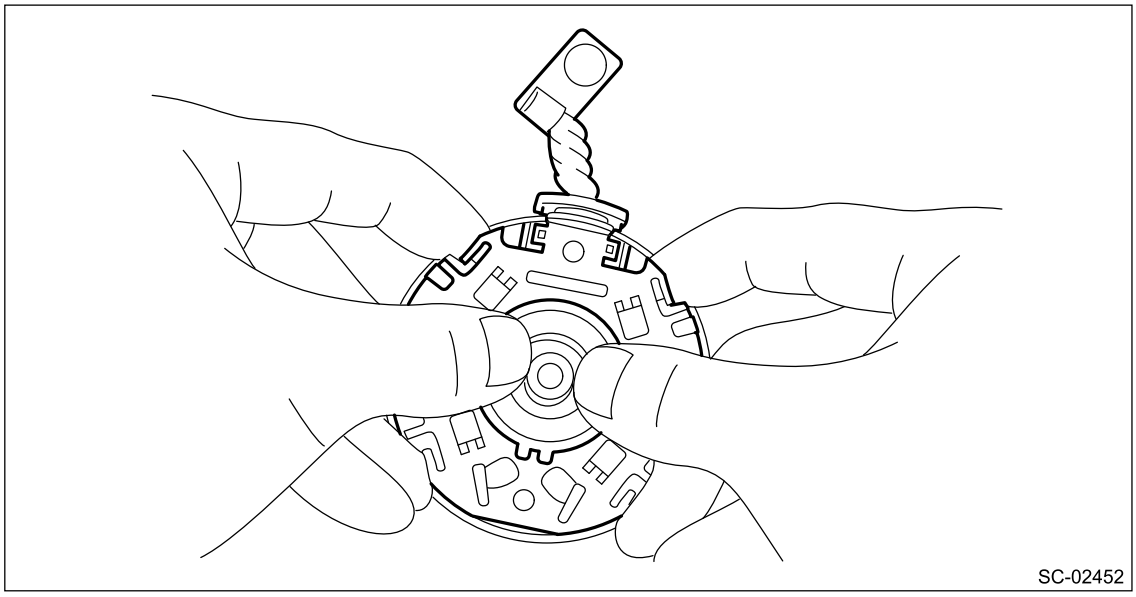
3. Remove the bolt (A) and through bolts (B), and remove the starter cover.



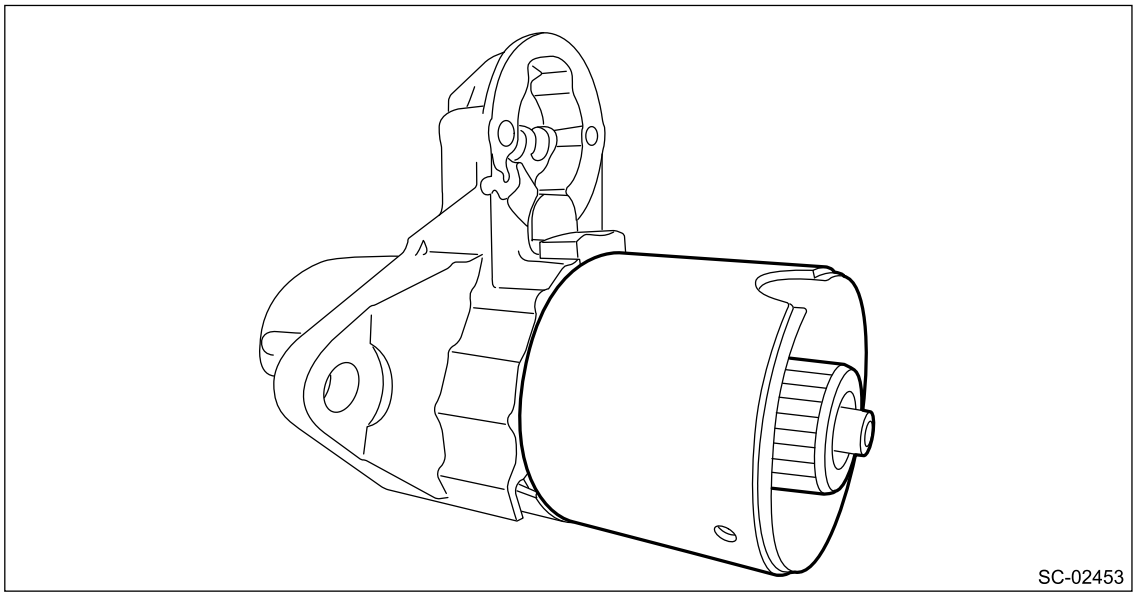
4. Remove the brush holder assembly.

Note:

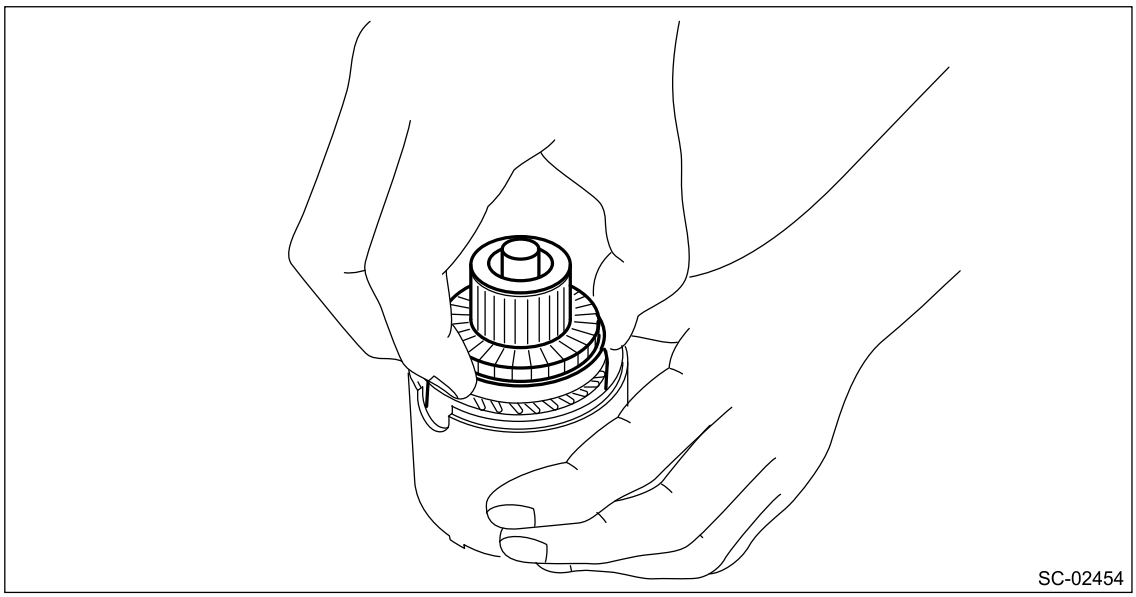
Hold the brush with your fingers so that the brush spring does not come flying out.



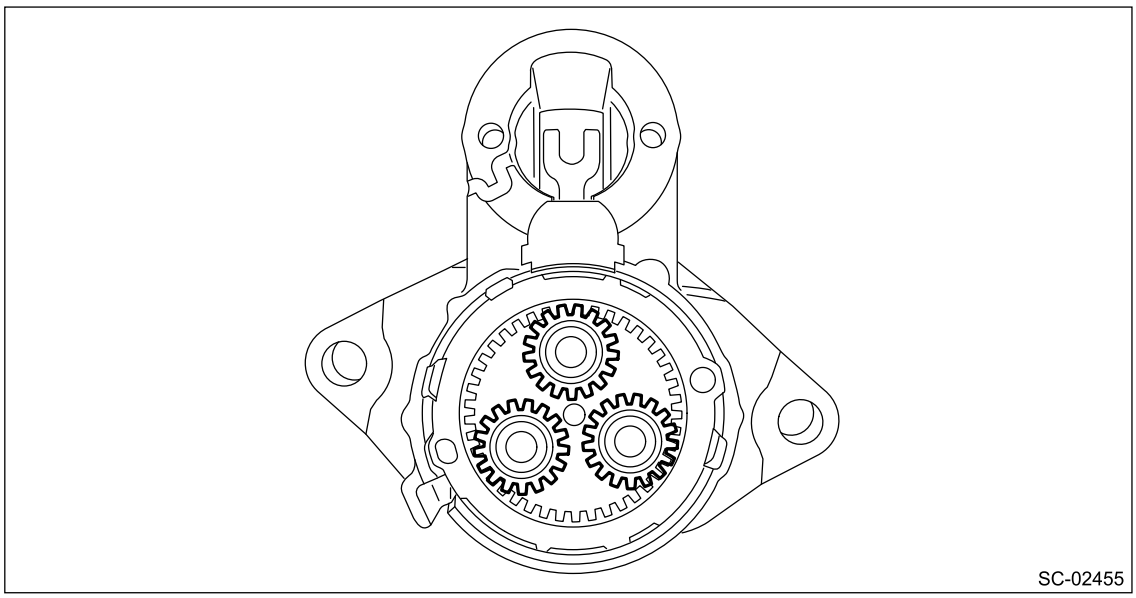
5. Remove the armature assembly and yoke assembly together as a single unit.



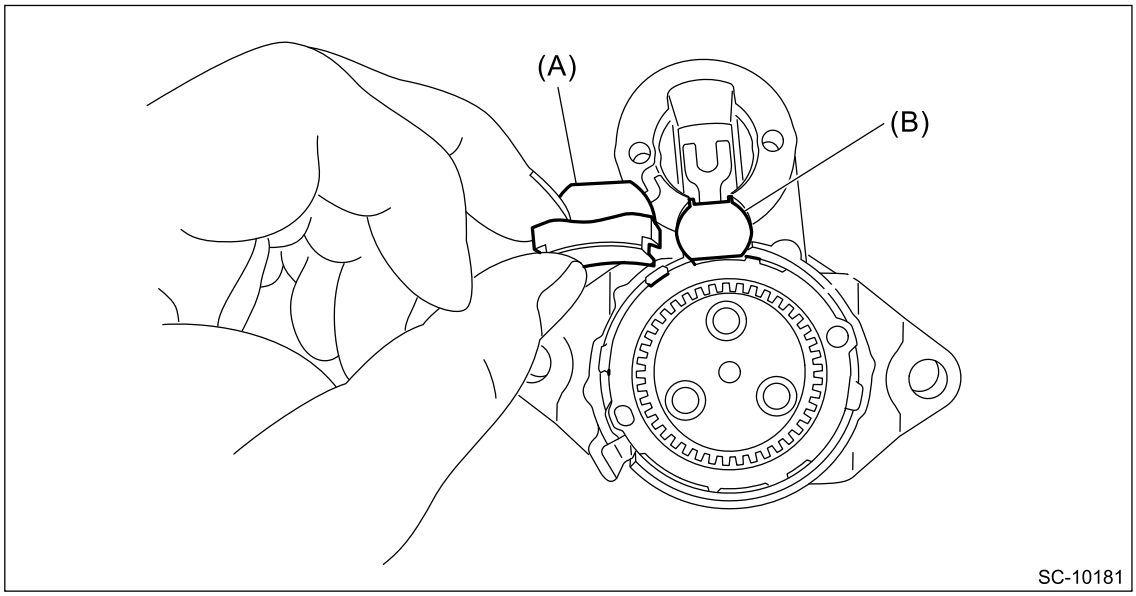
6. Separate the armature assembly and yoke assembly.



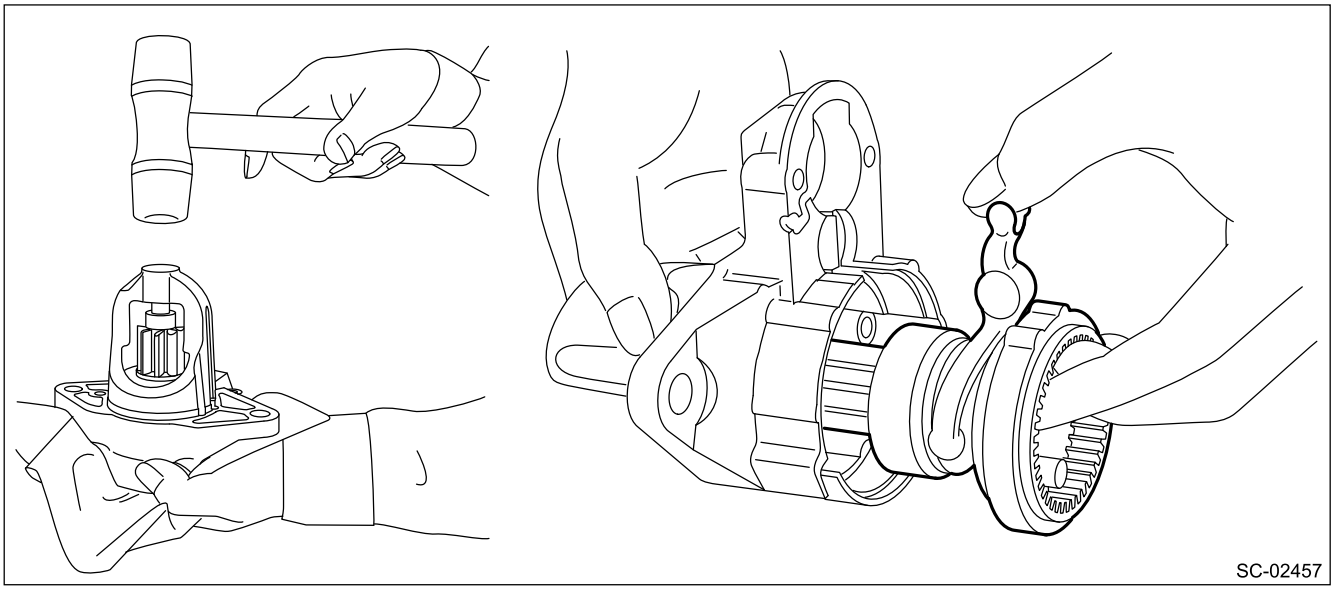
7. Remove the pinion gear.



8. Remove the seal rubber (A) and plate (B).

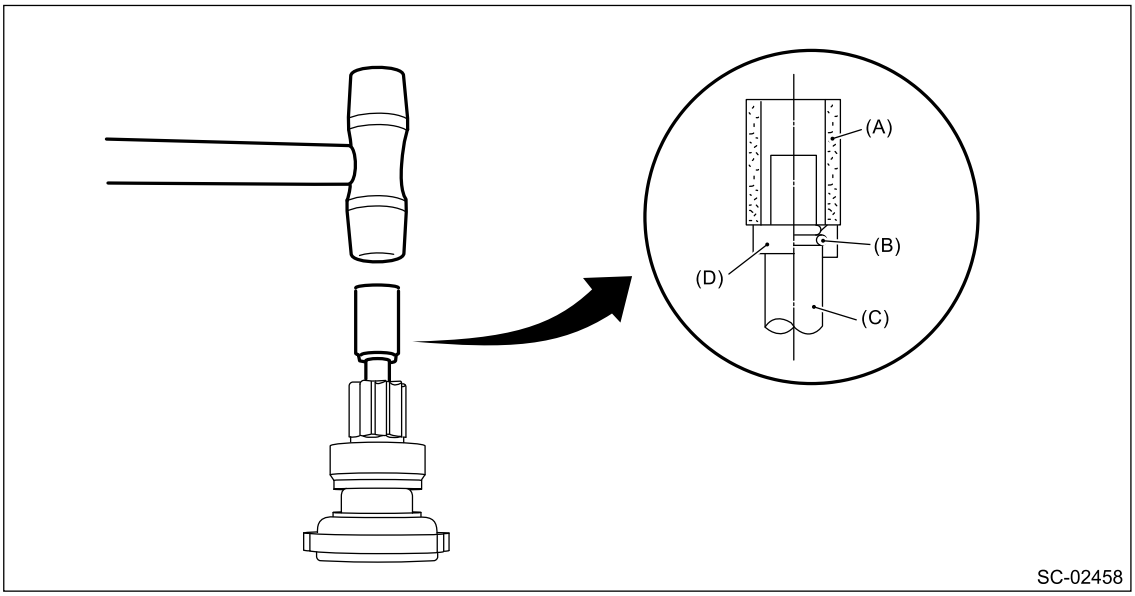


9. Lightly tap the starter housing with a plastic hammer as shown in the figure, and remove the overrunning clutch, internal gear, shaft and shift lever together as one unit.



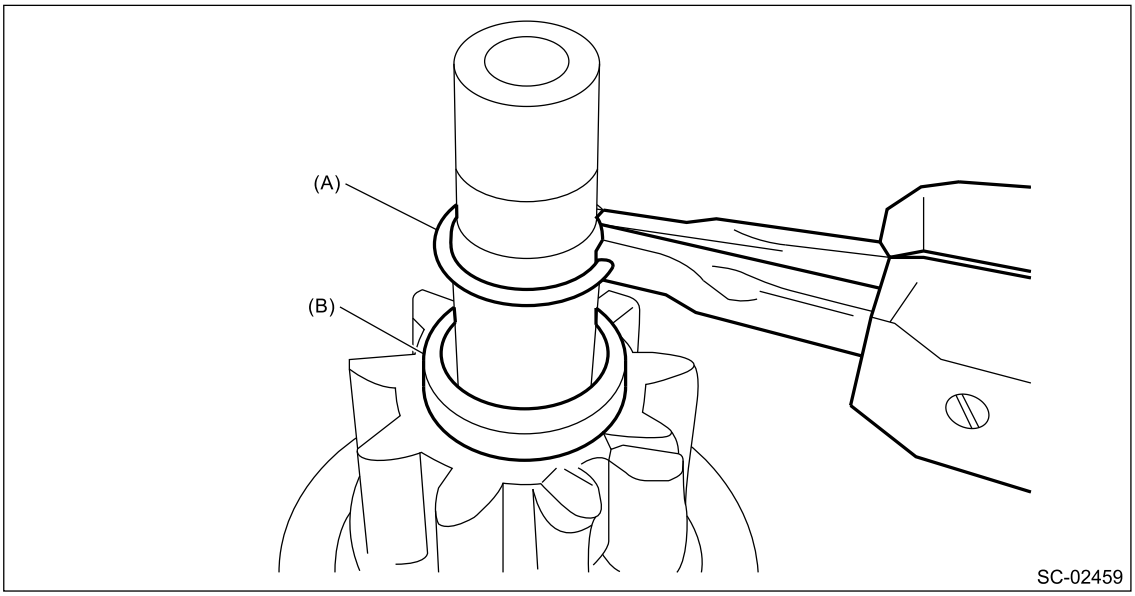
10. Use the following procedures to remove the overrunning clutch.

(1) Set an appropriate tool (suitable attachment, etc.), and remove the stopper from snap ring by lightly tapping the stopper with a plastic hammer.

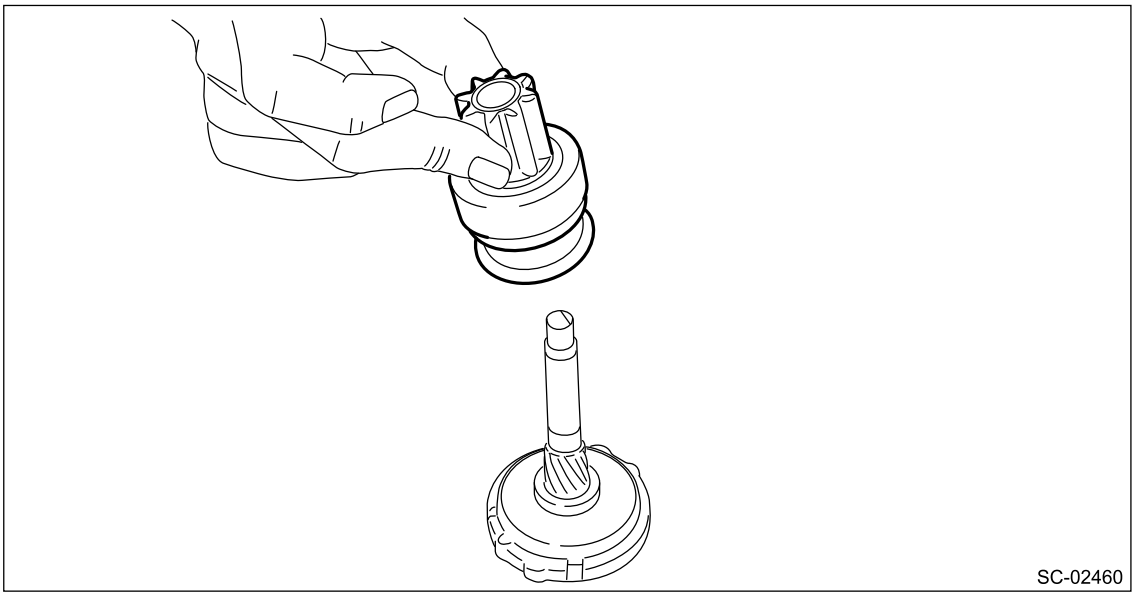


(A) Appropriate tool (B) Snap ring (C) Shaft
(D) STOPPER

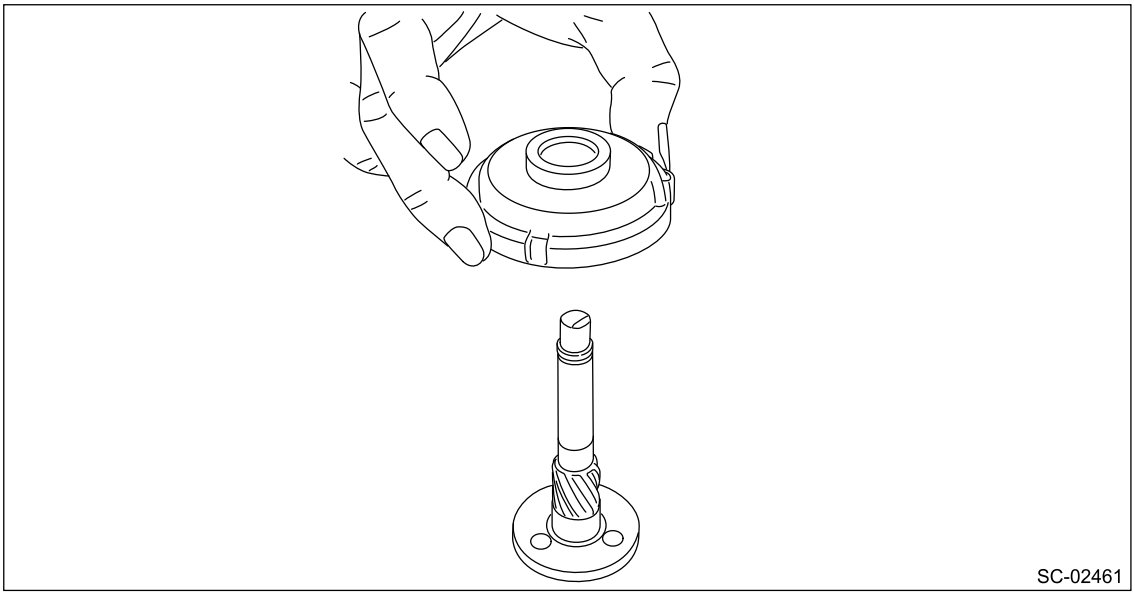
(2) Remove the snap ring (A), and remove the stopper (B).



(3) Remove the overrunning clutch.



11. Remove the internal gear.

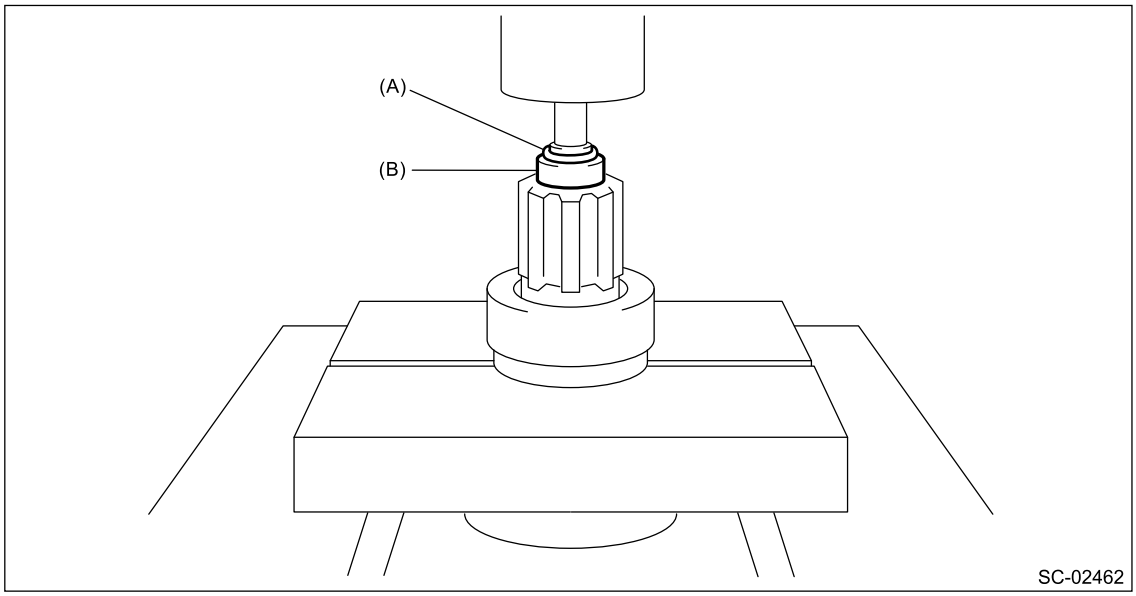


ASSEMBLY

1. Apply grease to the shaft sliding surfaces of the internal gear.
Grease:
Multemp #6129 or equivalent

2. Install the internal gear to the shaft.

3. Install the overrunning clutch as follows:
(1) Apply grease to the spline portion of the shaft.
Grease:
Multemp #6129 or equivalent
(2) Set the overrunning clutch.
(3) Pass a new stopper through, and attach a new snap ring.
(4) Using a press, pressure fit stopper (B) into snap ring (A).
Caution:
Do not apply any load to the internal gear.



4. Install the overrunning clutch, internal gear, shaft and shift lever as a single unit to the starter housing.

   Note:

   Apply grease to the moving parts of the shift lever.

   Grease:

   Multemp #6129 or equivalent

5. Apply grease to the inside of the internal gear and pinion gear, and attach the pinion gear to the internal gear assembly.

   Note:

   Apply grease evenly to the contact surfaces of each gear.

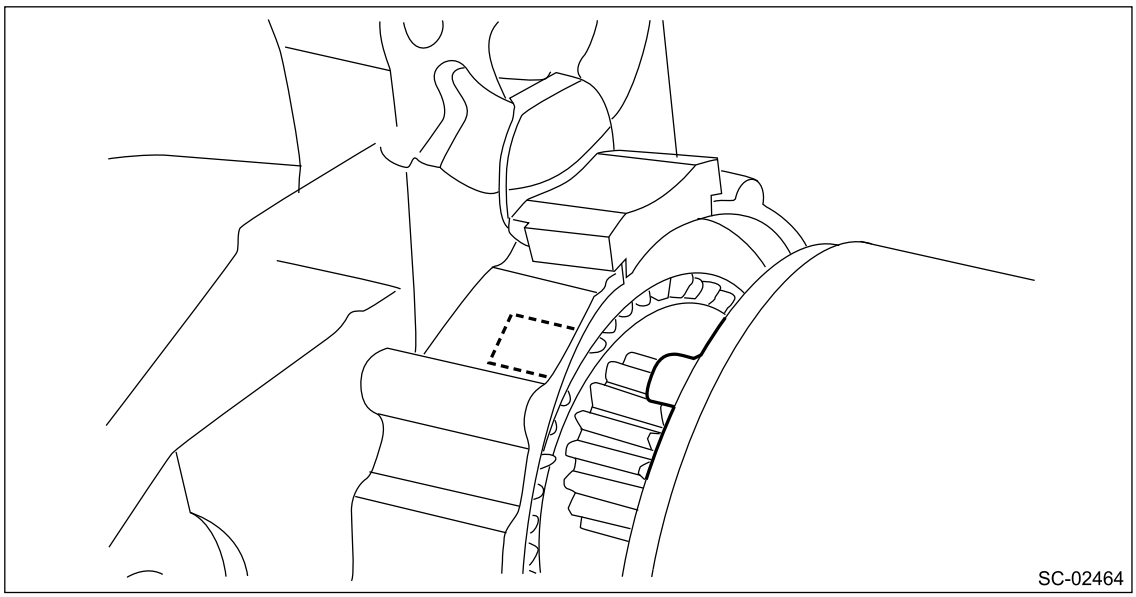
   Grease:

   Molykote® AG650 or equivalent

6. Install the plate and seal rubber.
7. Set the armature assembly to the yoke assembly.
8. Attach the armature assembly and yoke assembly to the starter housing together as a single unit.

   Note:

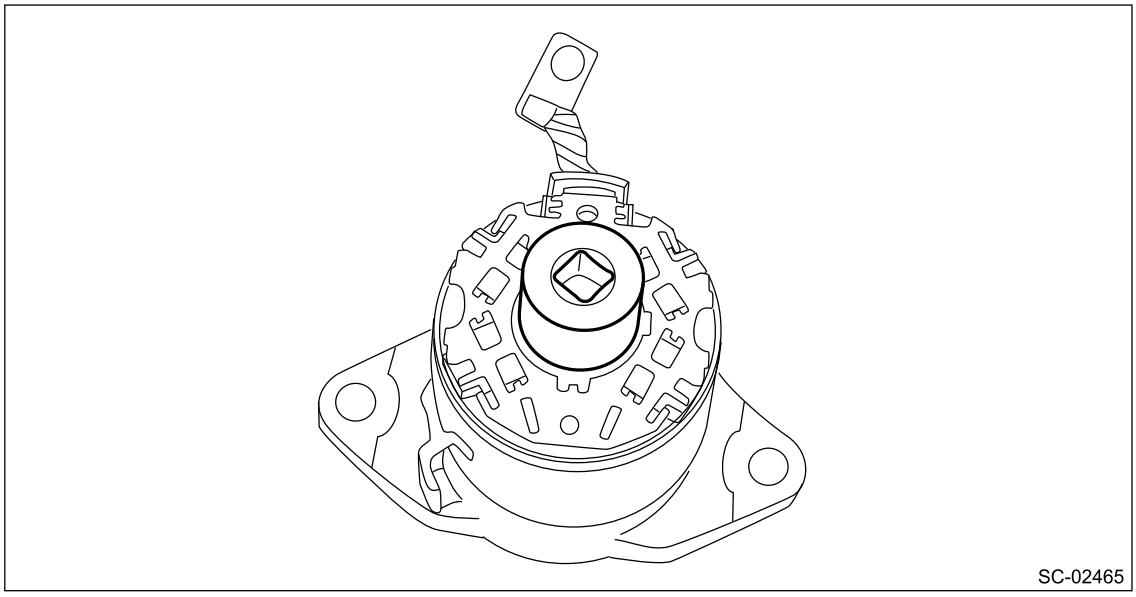
   As shown in the figure, match the protrusion of the yoke assembly to the cut out of the starter housing.



9. Use an appropriate tool (suitable attachment, etc.) to attach the brush holder assembly.

Note:

Be careful not to damage the brushes.



10. Set the starter cover, and secure the brush holder assembly with bolts.

Tightening torque:

CVT model

3.4 N·m (0.3 kgf-m, 2.5 ft-lb)

MT model

1.4 N·m (0.1 kgf-m, 1.0 ft-lb)

11. Install the through bolt.

Tightening torque:

CVT model

3.5 N·m (0.4 kgf-m, 2.6 ft-lb)

MT model

6 N·m (0.6 kgf-m, 4.4 ft-lb)

12. Install the magnet switch assembly.

Tightening torque:

CVT model

3.4 N·m (0.3 kgf-m, 2.5 ft-lb)

MT model

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

13. Connect the cable to the terminal M.

Tightening torque:

CVT model

10.7 N·m (1.1 kgf-m, 7.9 ft-lb)

MT model

10 N·m (1.0 kgf-m, 7.4 ft-lb)

STARTING/CHARGING SYSTEMS(H4DO) > Starter

INSPECTION

Note:

For the disassembly or assembly procedures required for inspection, refer to DISASSEMBLY or ASSEMBLY of Starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>DISASSEMBLY. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>ASSEMBLY.

1. ARMATURE ASSEMBLY

1. Check the commutator for signs of seizure or stepped wear. If the symptom is minor, use sandpaper to repair. If it cannot be repaired, replace the armature assembly.
2. Measure runout on the commutator.

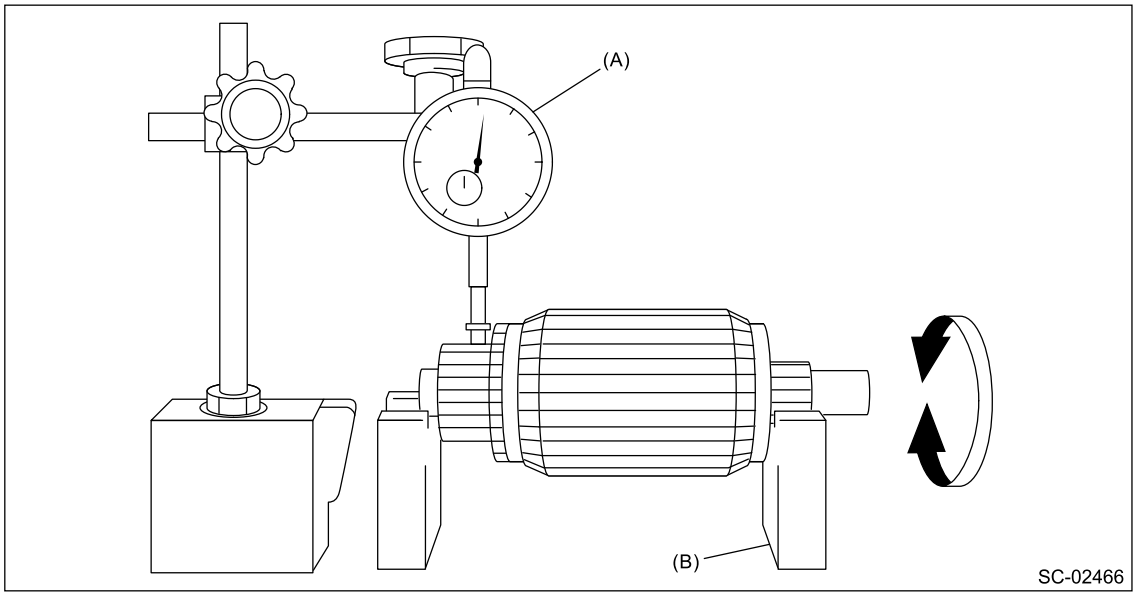
   Commutator runout:

   Standard

   0.05 mm (0.0020 in)

   Limit

   0.10 mm (0.0039 in)



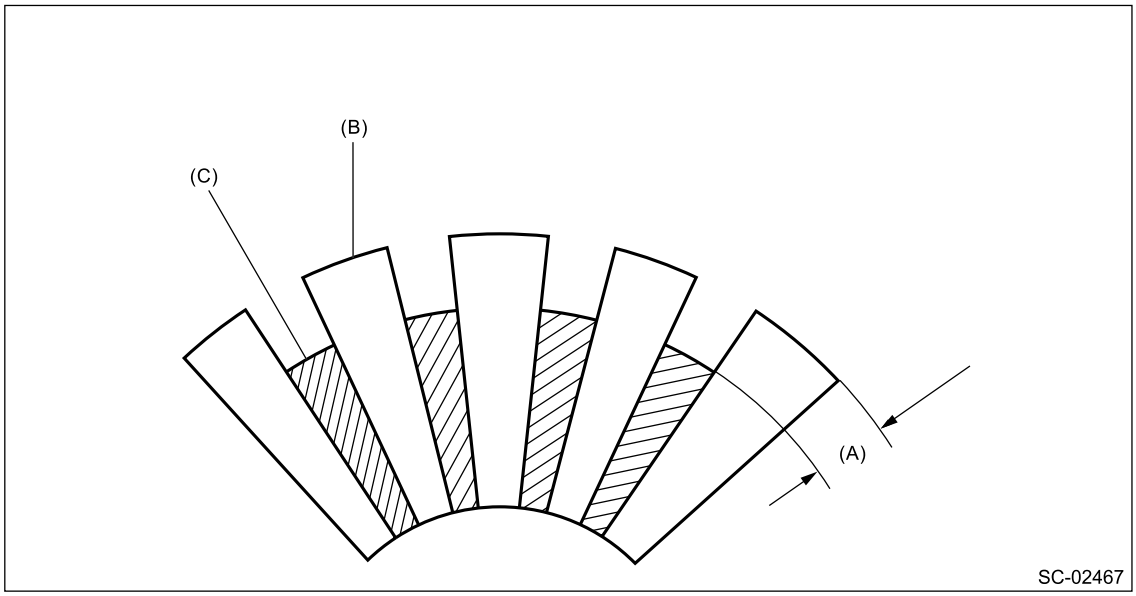
(A) Dial gauge (B) V-block

3. Measure the depth of the segment mold. If it is not within the specification, replace the armature assembly.

   Depth of segment mold:

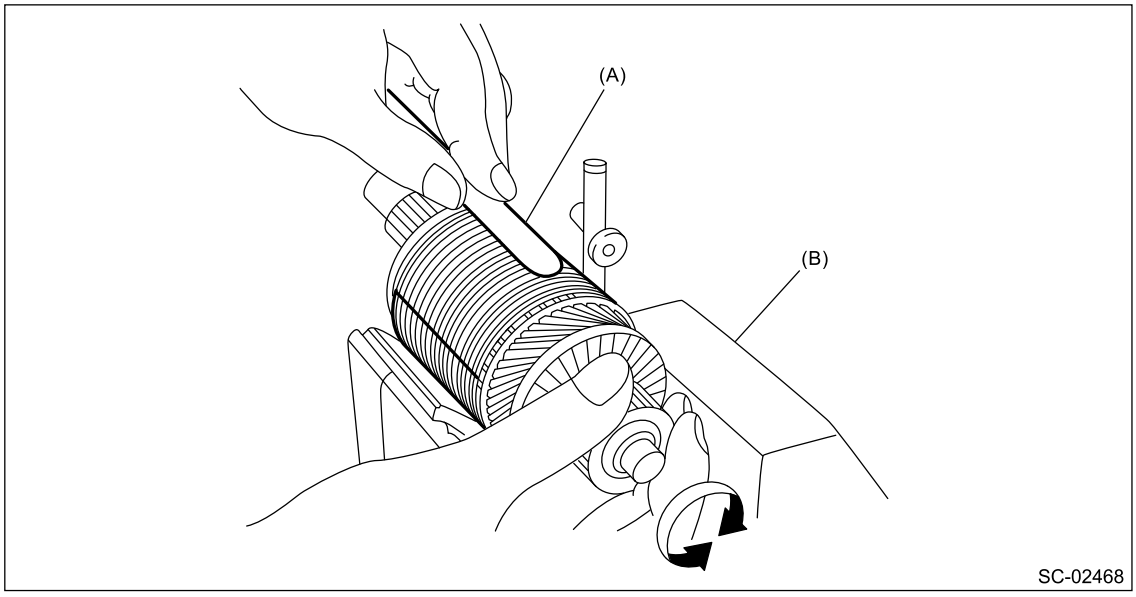
   Standard

   0.50 mm (0.020 in)



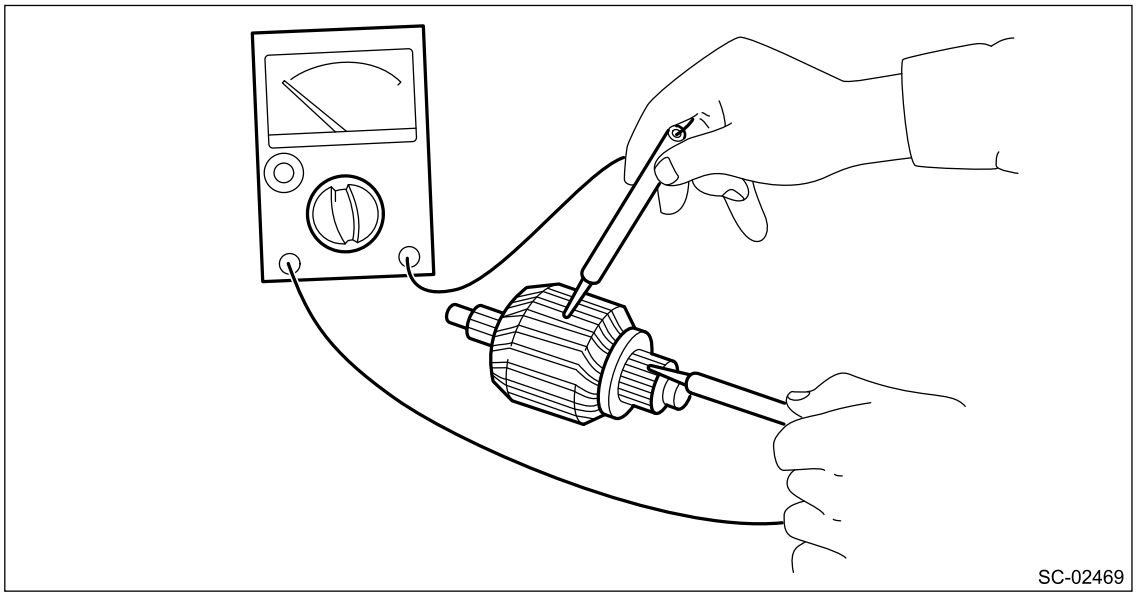
(A) Depth of mold (B) Segment (C) Mold

4. Place the armature assembly on the growler tester to check for short circuits. While slowly turning the armature assembly, support the steel sheet for the armature core. If the circuit of the armature is shorted, the steel sheet will vibrate, causing it to move towards the core. When the steel sheet has moved or vibrated, replace the armature.



(A) Steel sheet (B) Growler tester

5. Check insulation between commutator segment and shaft. If there is continuity, replace the armature assembly.



2. YOKE ASSEMBLY

Make sure that the pole is set at the predetermined position.

3. OVERRUNNING CLUTCH

Inspect the pinion, and if there is any wear or damage, replace the overrunning clutch. Also, check that the pinion rotates counterclockwise smoothly and does not rotate clockwise. If there is any fault, replace the overrunning clutch.

Caution:

To prevent spilling of grease, do not clean the overrunning clutch with oil.

4. BRUSH AND BRUSH HOLDER

1. Visually check the brush. If there is any abnormal wear or cracks, replace the brush.
2. Measure the length of the brush.

Brush length:

Standard

CVT model

12.45 mm (0.490 in)

MT model

12.3 mm (0.484 in)

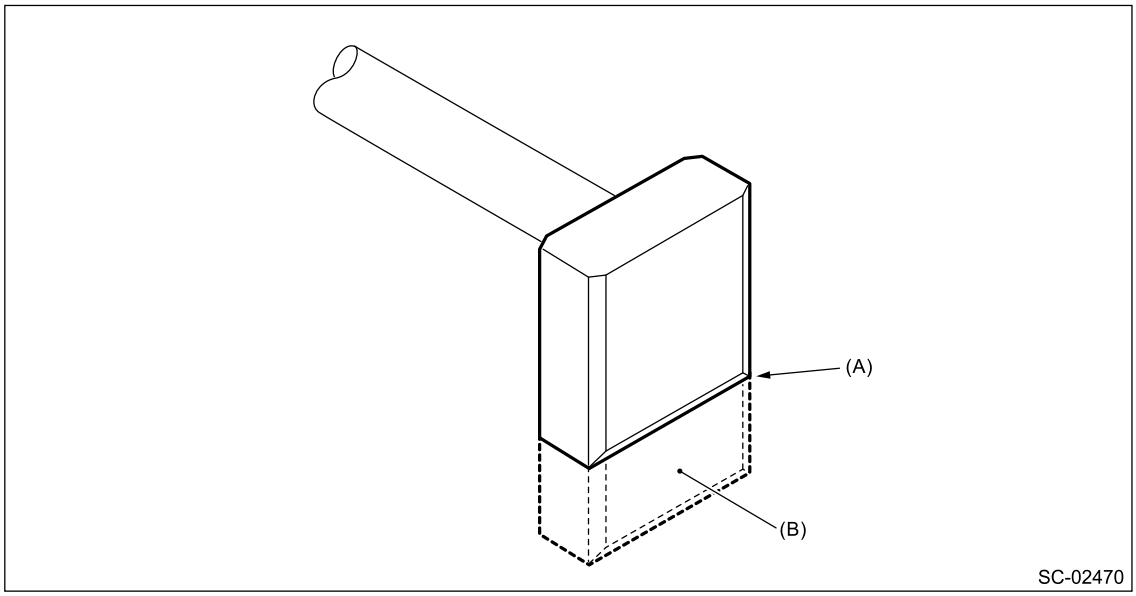
Limit

CVT model

5.0 mm (0.197 in)

MT model

7.0 mm (0.276 in)



(A) Service limit line (B) Brush

3. Check that the brush moves smoothly in the brush holder.
4. Measure the brush spring force with a spring scale.

Brush spring force:

Standard

CVT model

12.3 — 16.7 N (1.25 — 1.70 kgf, 2.77 — 3.75 lbf) (when new)

MT model

15.9 — 19.5 N (1.62 — 1.99 kgf, 3.57 — 4.38 lbf) (when new)

Limit

CVT model

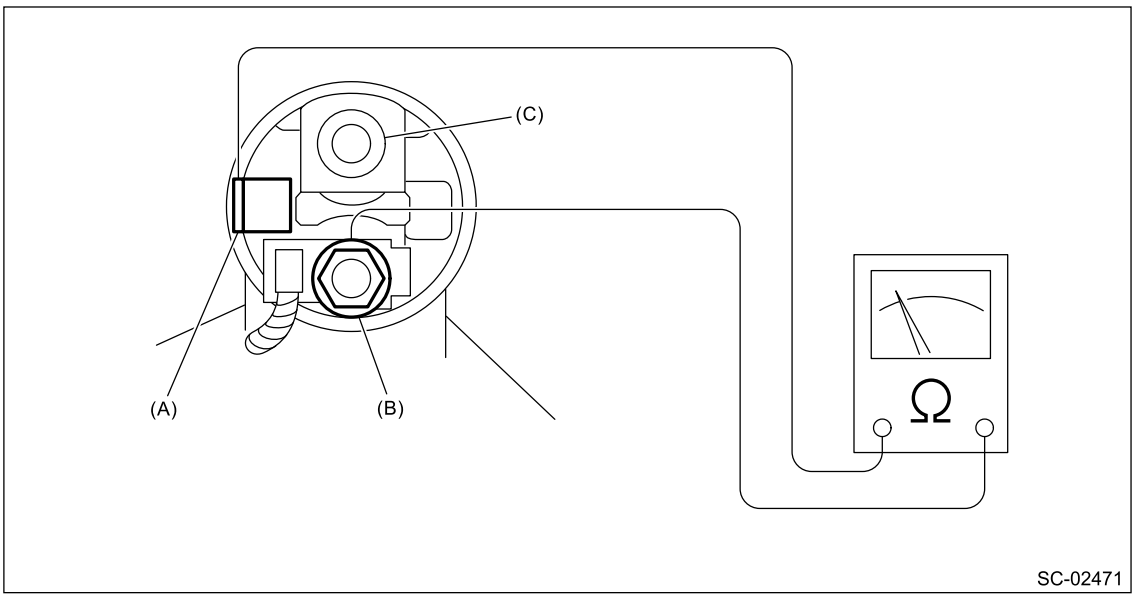
3.6 N (0.37 kgf, 0.81 lbf)

MT model

2.5 N (0.25 kgf, 0.56 lbf)

5. MAGNET SWITCH ASSEMBLY

Check the resistance between terminals shown in the following table.



(A) Terminal S (B) Terminal M (C) Terminal B

Terminals	Standard
Terminal S — terminal M	1 Ω or less
Terminal S — Ground	1 Ω or less
Terminal M — terminal B	1 MΩ or more

6. MAGNET SWITCH ASSEMBLY OPERATION

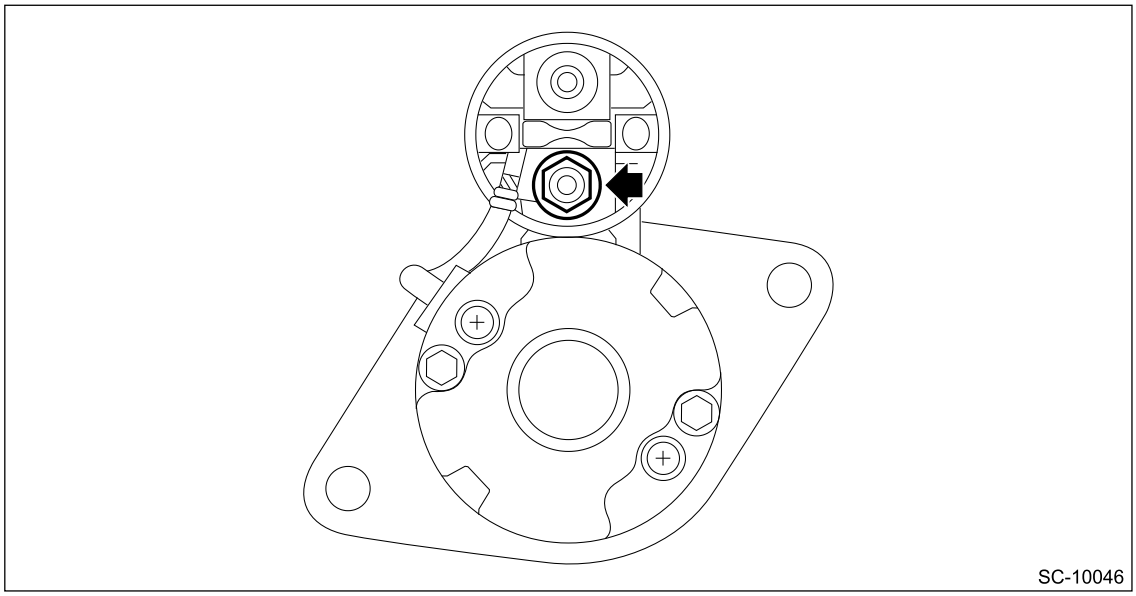
Caution:

Perform the inspection in a short period of time. (Within 3 to 5 seconds)

1. Loosen the nut which holds the cable to the M terminal.

   Note:

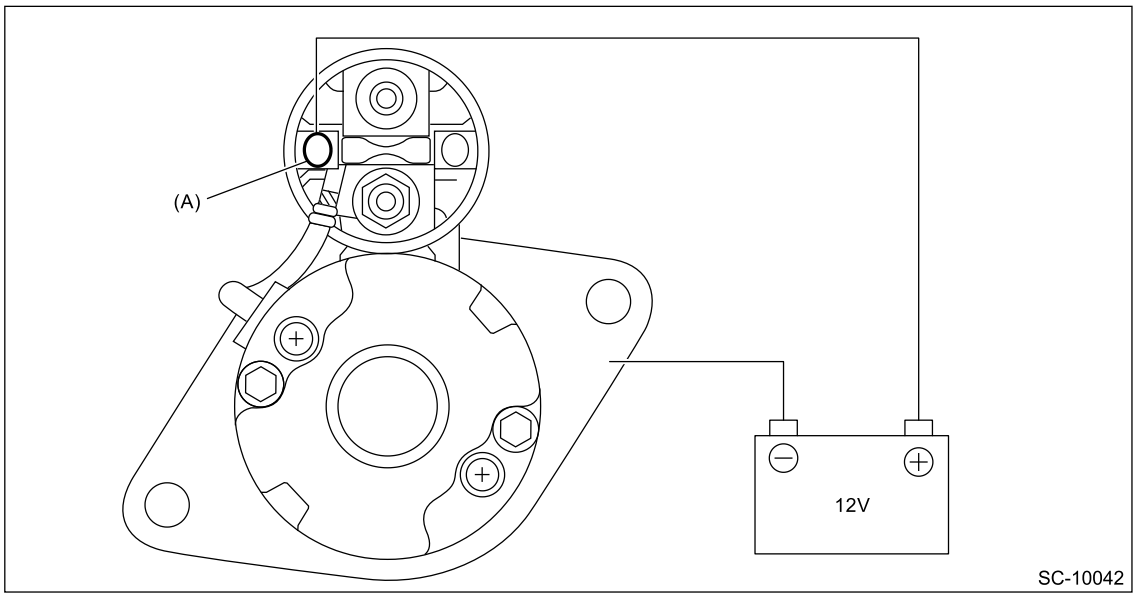
   This procedure is required to facilitate the cable removal from the M terminal.



2. Connect the battery positive terminal to the S terminal, and connect the battery negative terminal to the starter housing. Then, if the pinion protrudes, it is normal.

   Note:

   The motor may rotate while the pinion protrudes. This occurs due to current that flows to the motor via pull-in coil. This is not a problem.



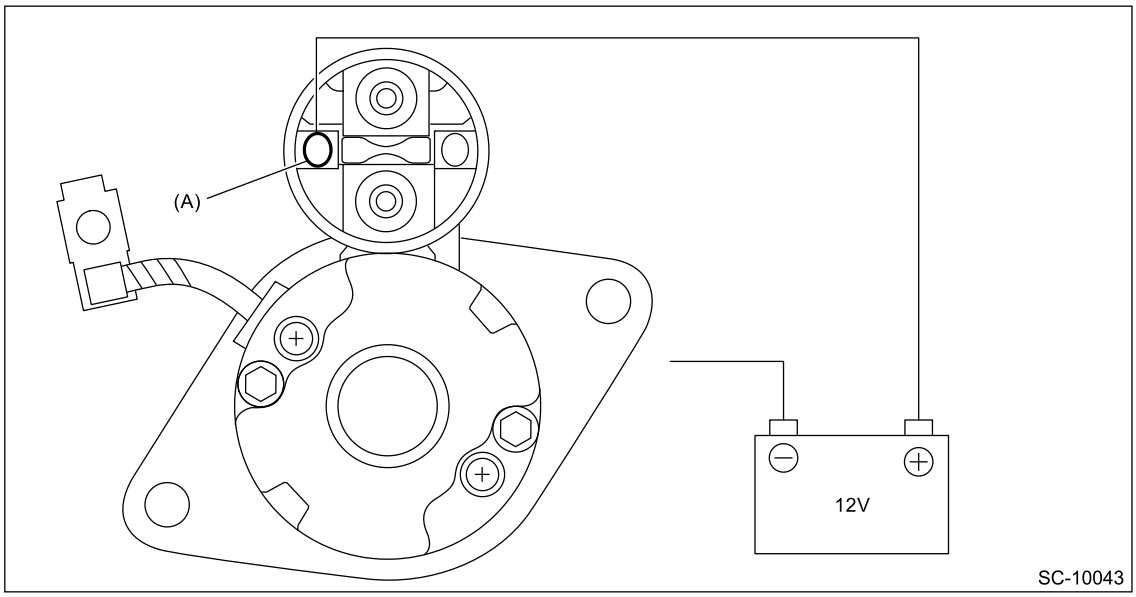
(A) Terminal S

3. Disconnect the cable from the M terminal. Check that the pinion is being protruded at this time.

Caution:

Hold the disconnected cable so that it does not contact the terminal or wiring.

4. Disconnect the battery negative terminal from the starter housing. Then, if the pinion returns to its original position, it is normal.

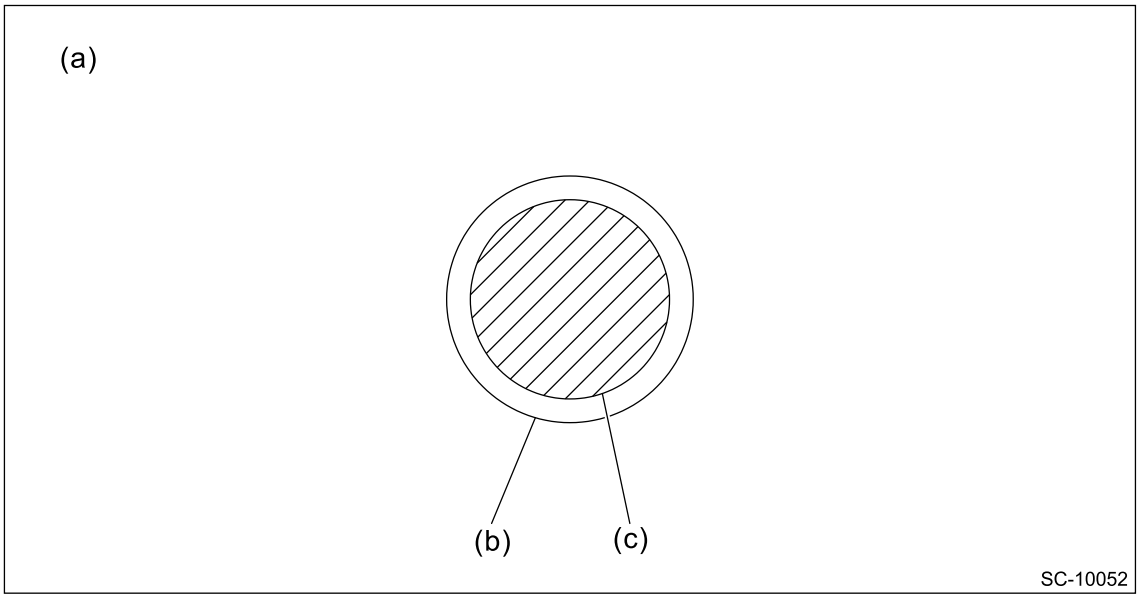


(A) Terminal S

7. NO-LOAD TEST

Caution:

- **Use a thick cable due to large current flowing through the cable.**
  - **For B terminal and ground, it is recommended that the cross-section area of continuity part (shaded part) should be 20 mm^2 (0.00310 sq in) or more. For S terminal, 1.25 mm^2 (0.00194 sq in) or more.**

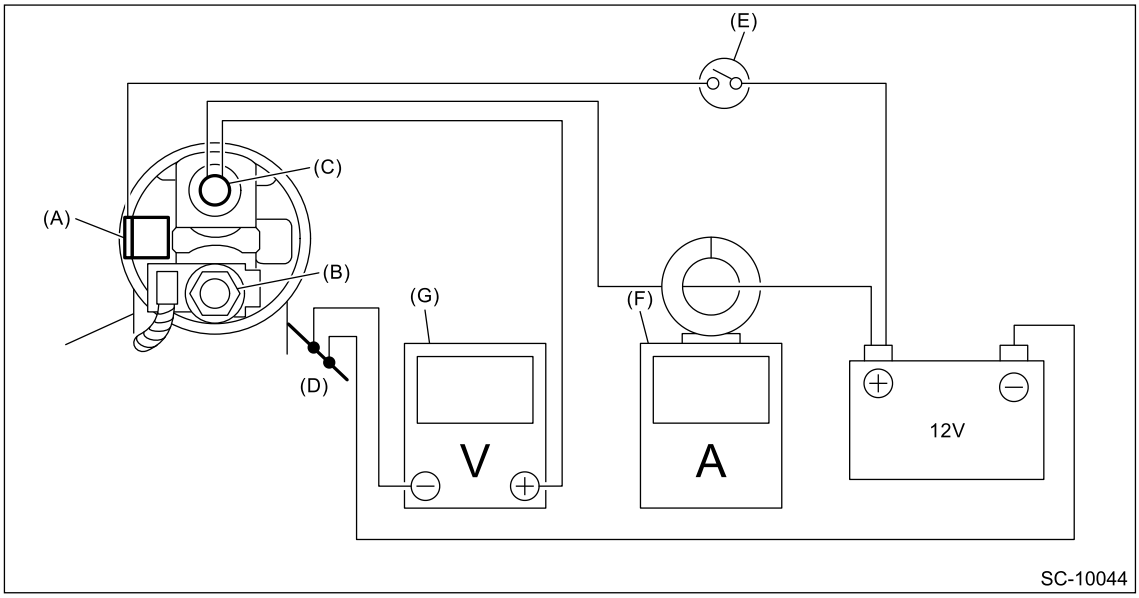


(a) Cable cross-section (b) Cable shield part (c) Cable continuity part

  - **It is possible to use a booster cable instead of wiring.**
- **Be careful not to burn yourself and cause a fire due to heat.**
- **Perform the no-load test in a short period of time. (Within 3 to 5 seconds)**

Note:

For no-load test, use the circuit shown in figure.



(A) Terminal S (B) Terminal M (C) Terminal B

(D) Magnet switch ASSY (E) Switch (F) Circuit tester with clamp-type ammeter

(G) Circuit tester

1. Using a vise, secure the starter.

Caution:

Be careful not to deform or damage the starter.

2. Turn the switch ON, and check that the pinion protrudes rapidly into the specified position and rotates powerfully without noise.
3. Check the current and voltage after its rotation speed stabilizes.

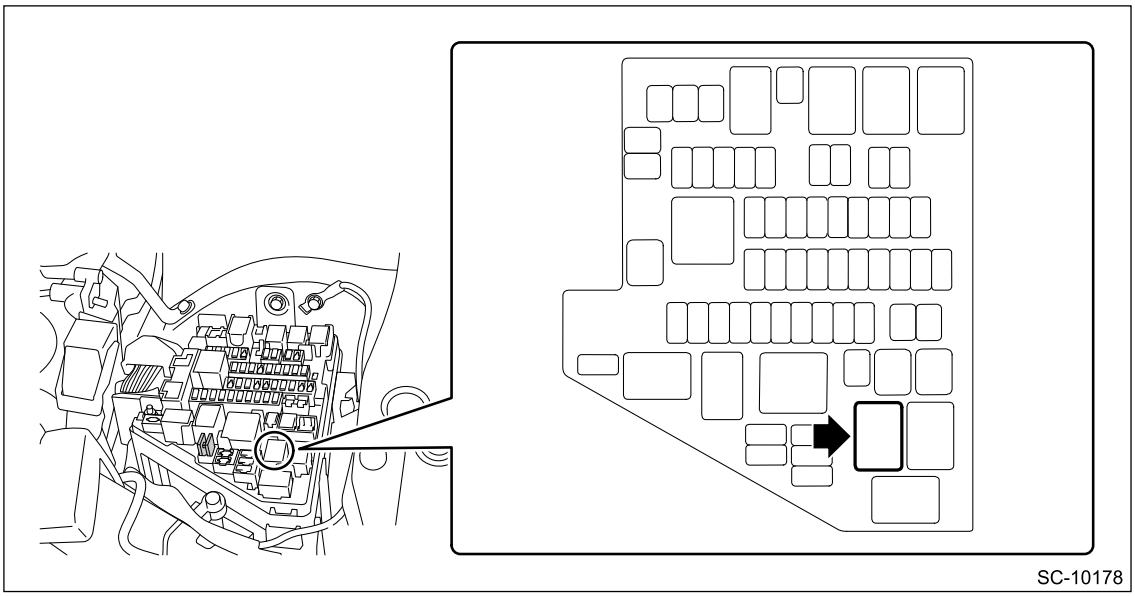
   Standard (current/voltage)

   95 A or less / approx. 11 V

8. OTHER INSPECTIONS

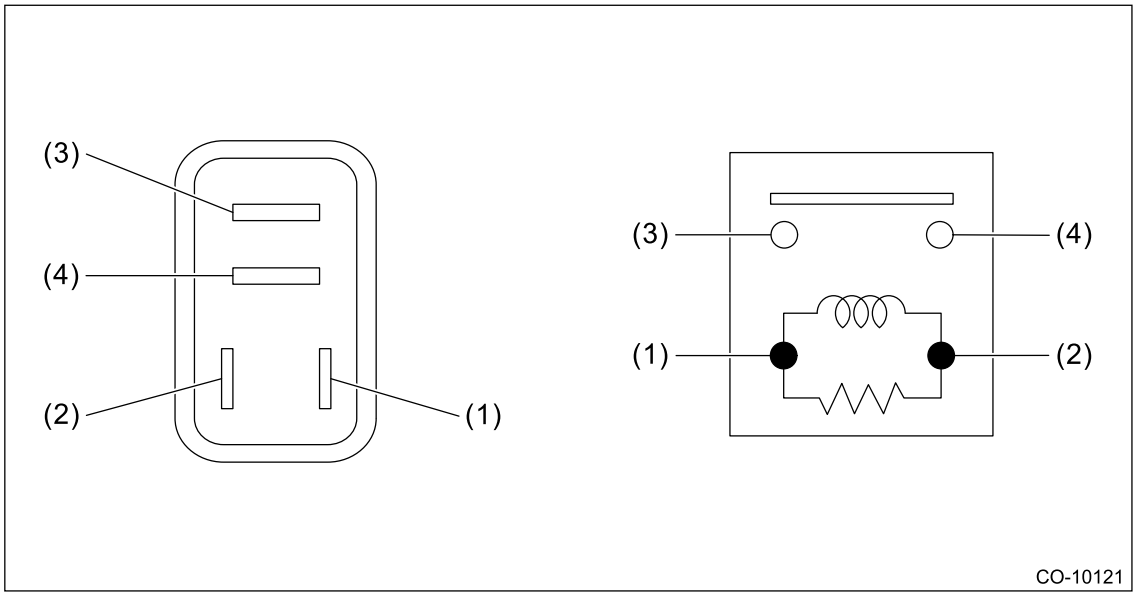
Check that there is no deformation, cracks or other damages.

LOCATION



INSPECTION

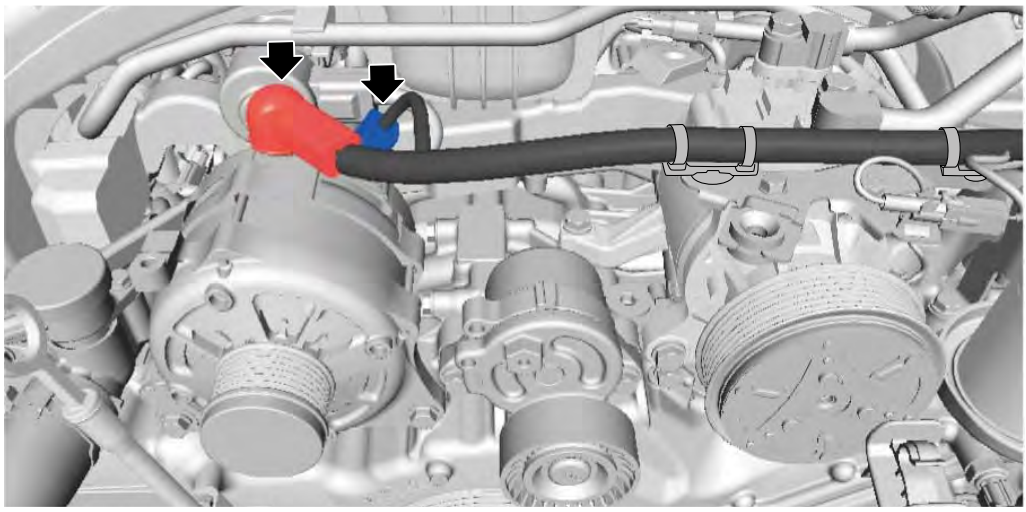
1. Check that there is no deformation, cracks or other damages.
2. Check the resistance between terminals. Replace the relay if it is faulty.



Terminal No.	Inspection conditions	Standard
3 — 4	Always	1 MΩ or more
3 — 4	Apply battery voltage between terminals 1 and 2.	Less than 1 Ω

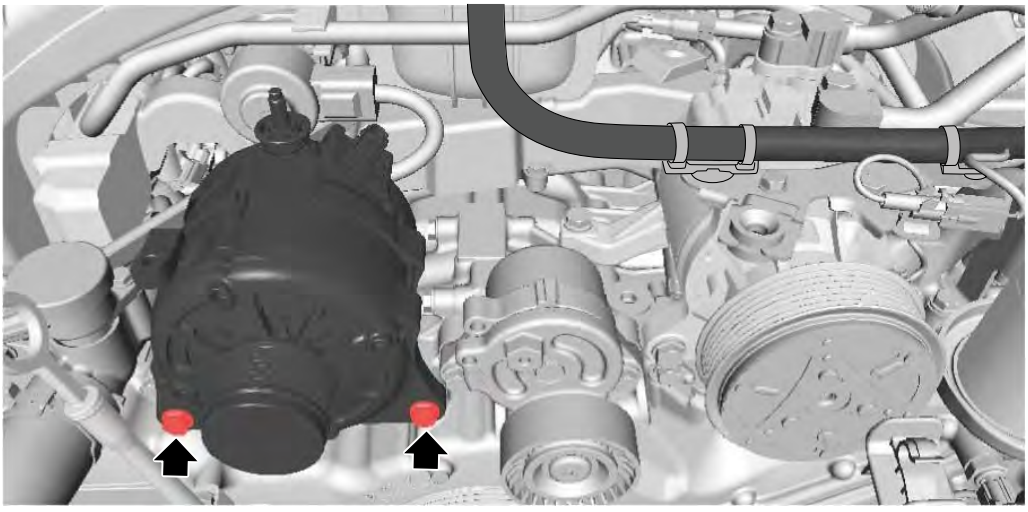
REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL > V-BELT.
3. Disconnect the connector and terminal B.



SC-10179

4. Remove the generator.



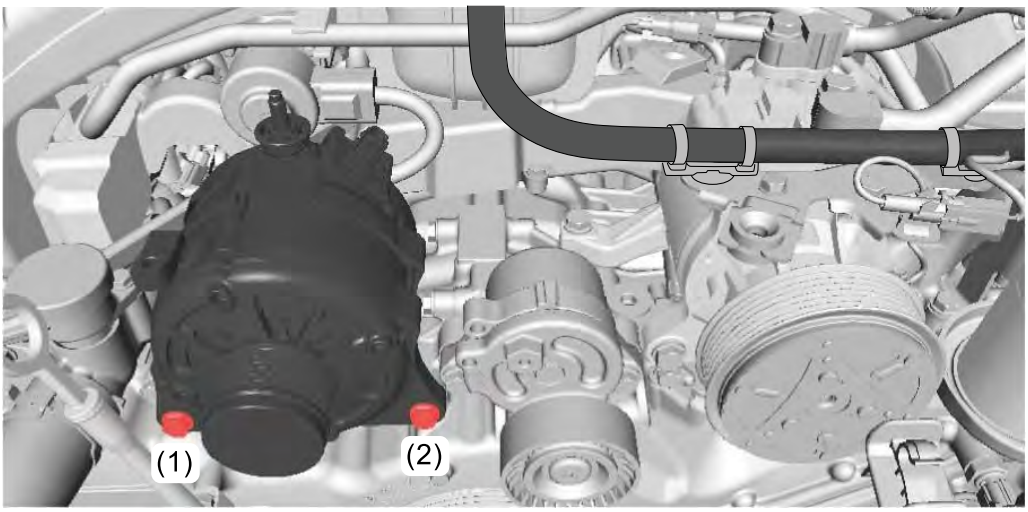
SC-10180

INSTALLATION

1. Temporarily install the generator.
2. Tighten the bolts in the numerical order as shown in the figure.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



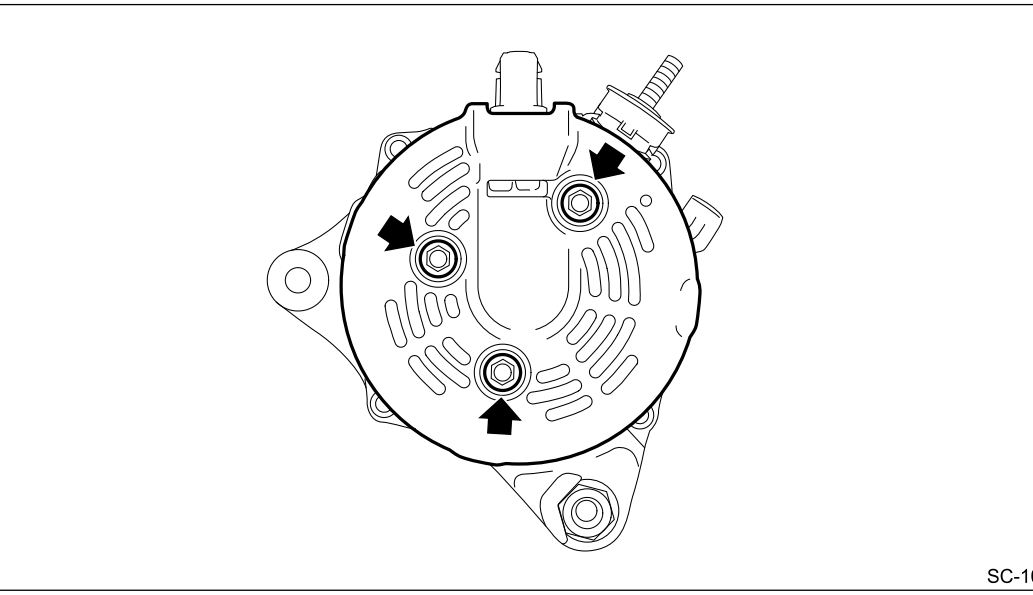
SC-10182

3. Connect the connector and terminal B.
   Tightening torque:
   15.5 N·m (1.6 kgf-m, 11.4 ft-lb)
4. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION > V-BELT.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

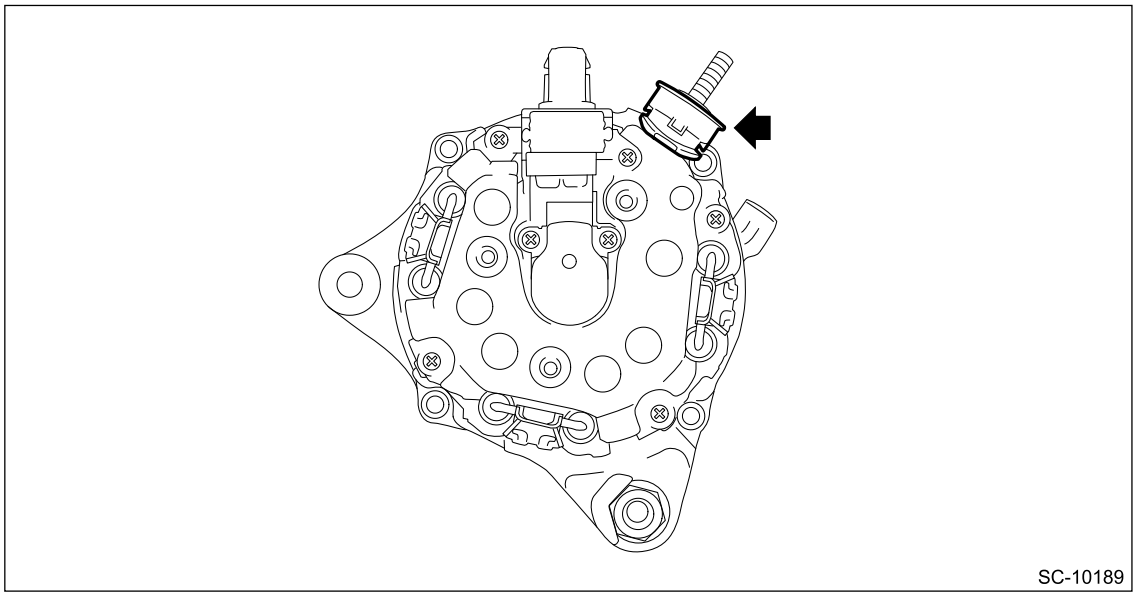
STARTING/CHARGING SYSTEMS(H4DO) > Generator

DISASSEMBLY

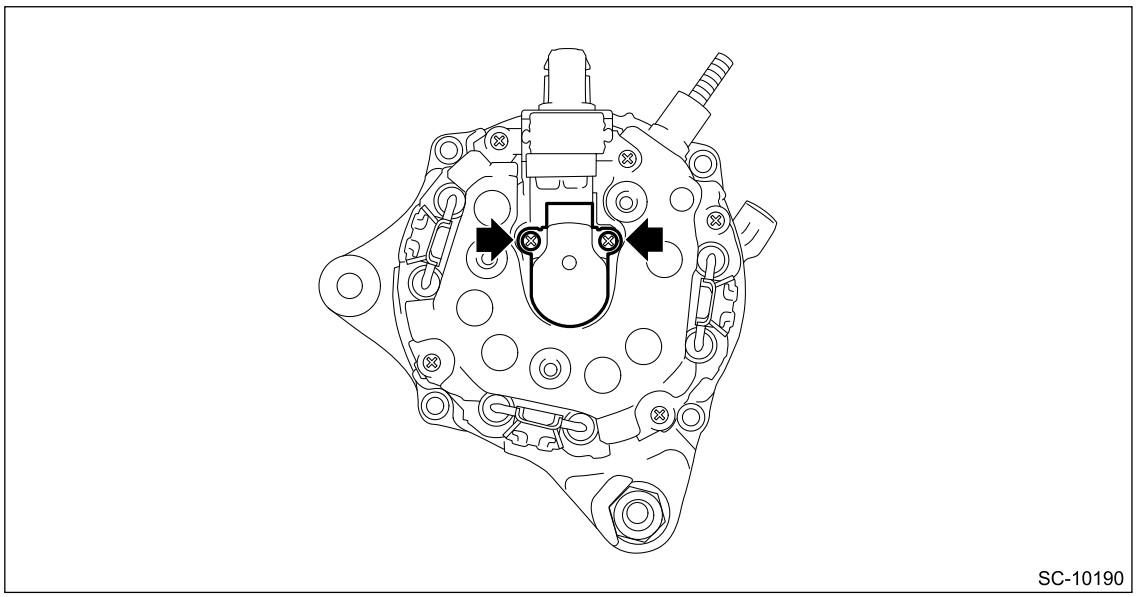
1. Remove the rear cover.


SC-10188

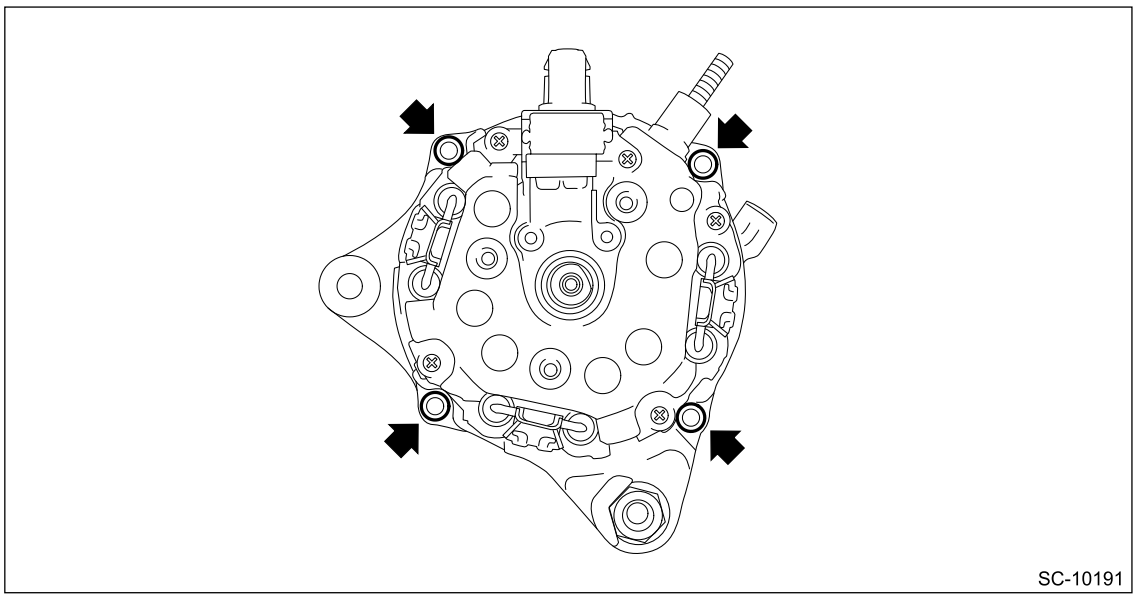
2. Remove the bushing from the terminal B.



3. Remove the brush assembly.



4. Remove the through bolt.

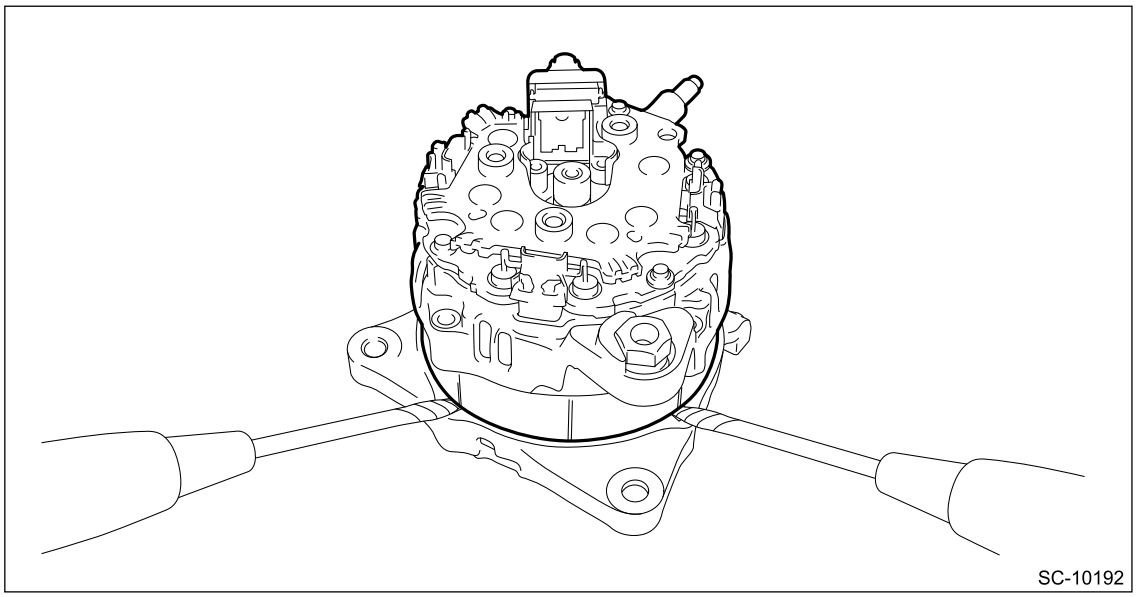


5. Insert a flat tip screwdriver or similar tool wrapped with protective tape into the gap between stator

core and the front cover, and remove the stator coil assembly from the rotor assembly.

Caution:

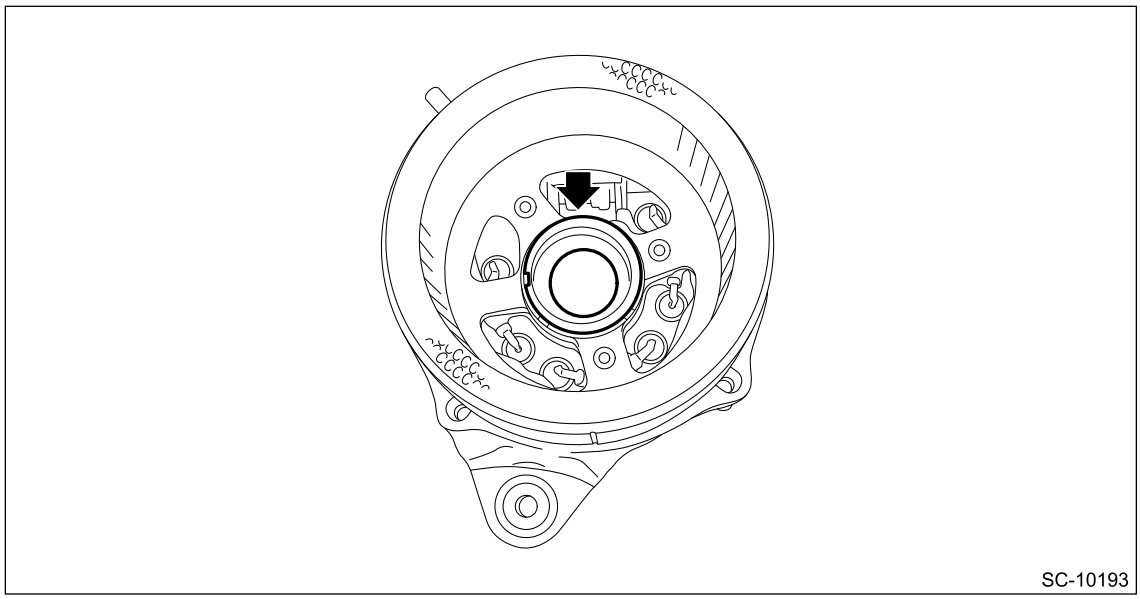
- **Be careful not to deform or damage the parts during operation.**
- **Disassemble while lifting the entire stator coil assembly evenly.**



6. Remove the bearing cover from the stator coil assembly.

Caution:

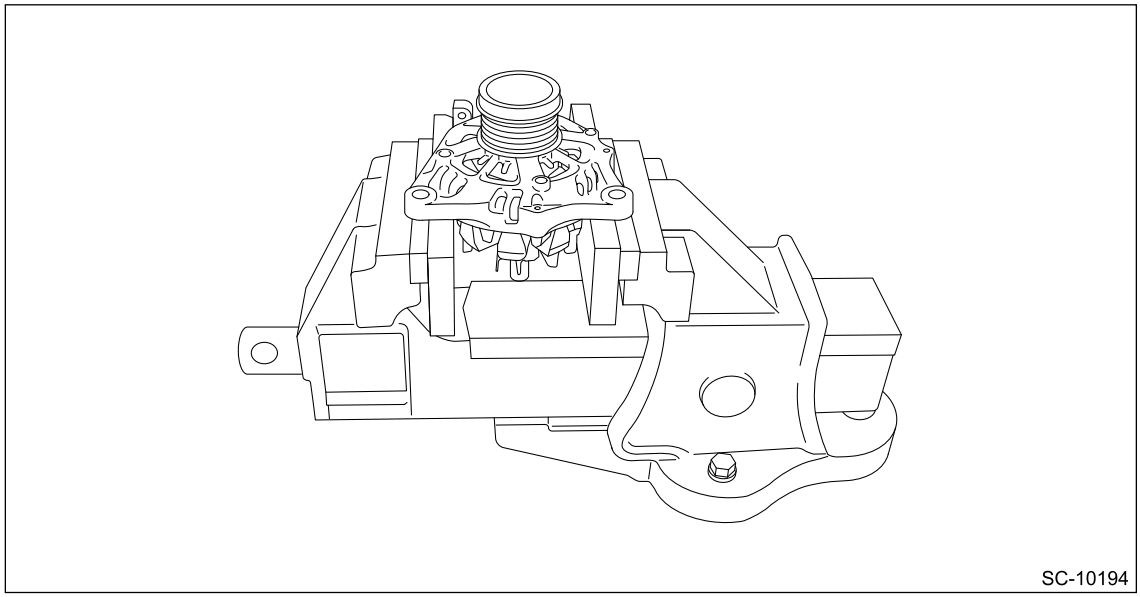
Do not reuse the bearing cover.



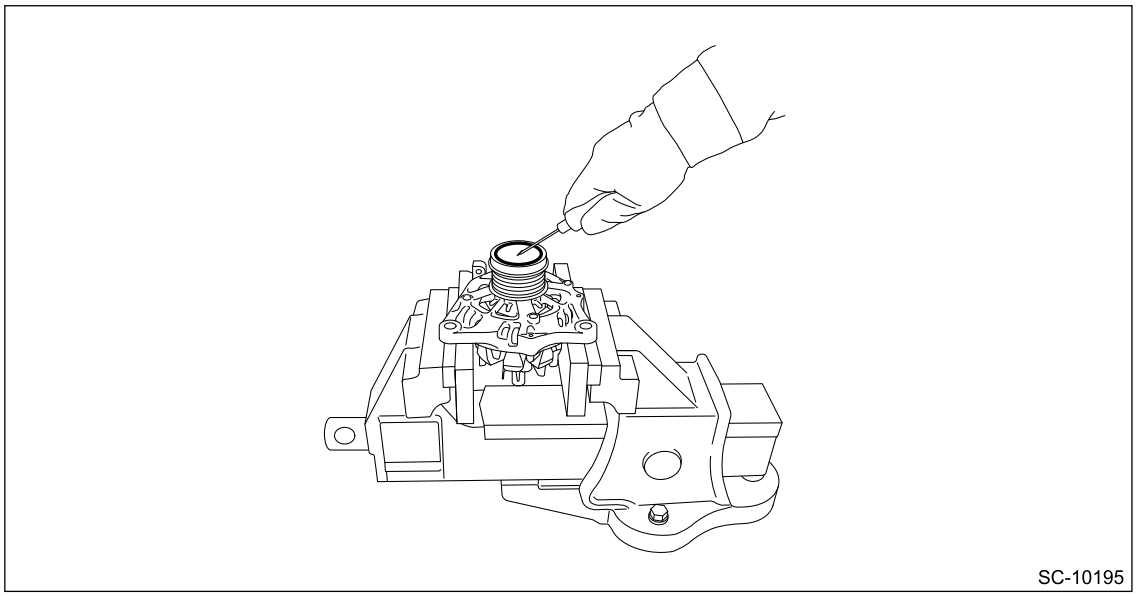
7. Using a vise, secure the rotor assembly.

Caution:

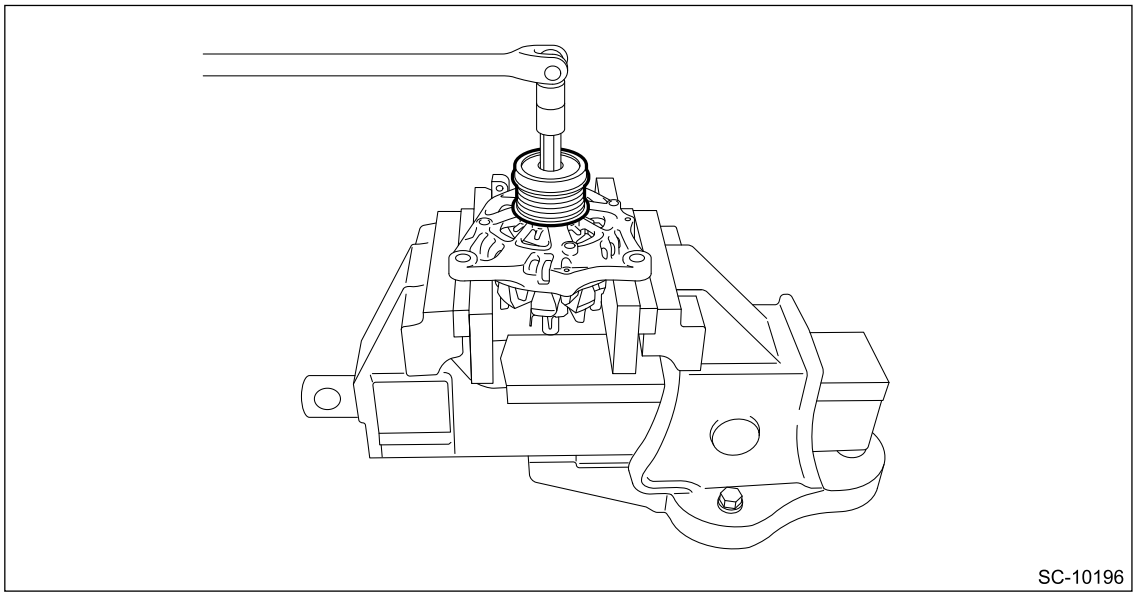
- **Place aluminum plates or wooden pieces between the contacting surfaces of the vise and rotor to prevent rotor damage.**
- **Be sure to hold it with the wider surface of the pole core.**
- **Do not tighten the vise more than necessary.**



8. Using a thin flat tip screwdriver, break and remove the dust cover.



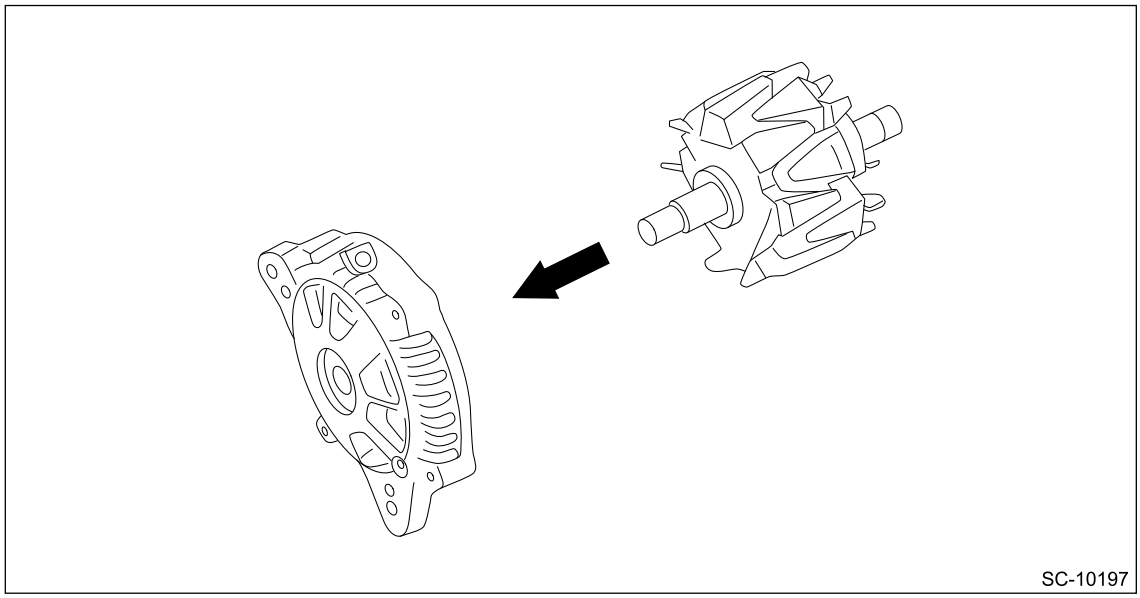
9. Remove the pulley.



10. Remove the front cover from the rotor assembly.

Note:

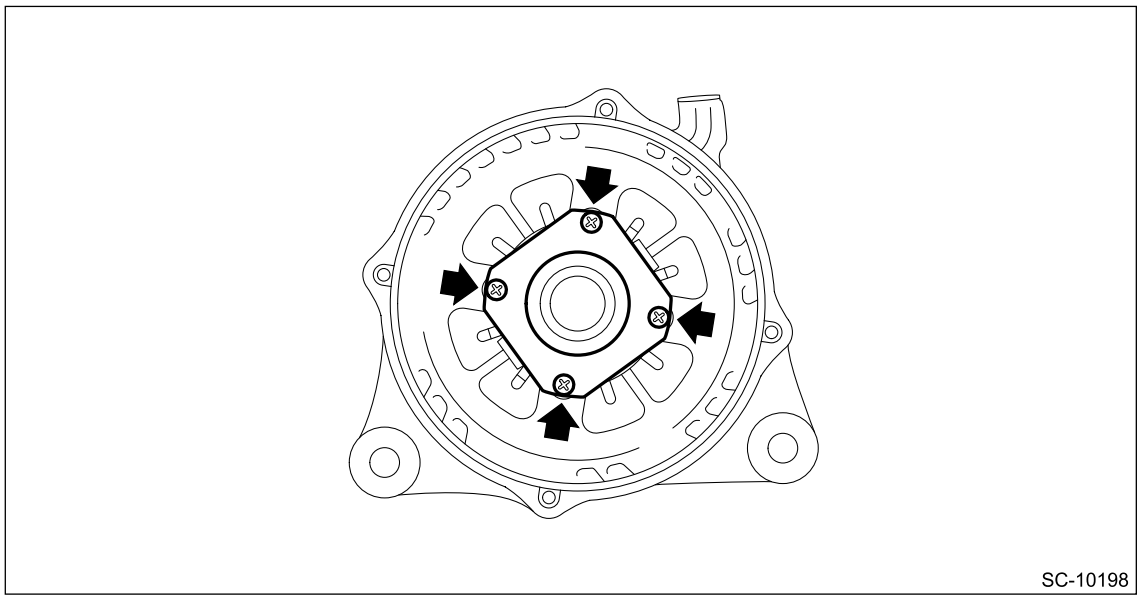
If it is stuck, use a press to remove.



11. Remove the bearing retainer from the front cover.

Note:

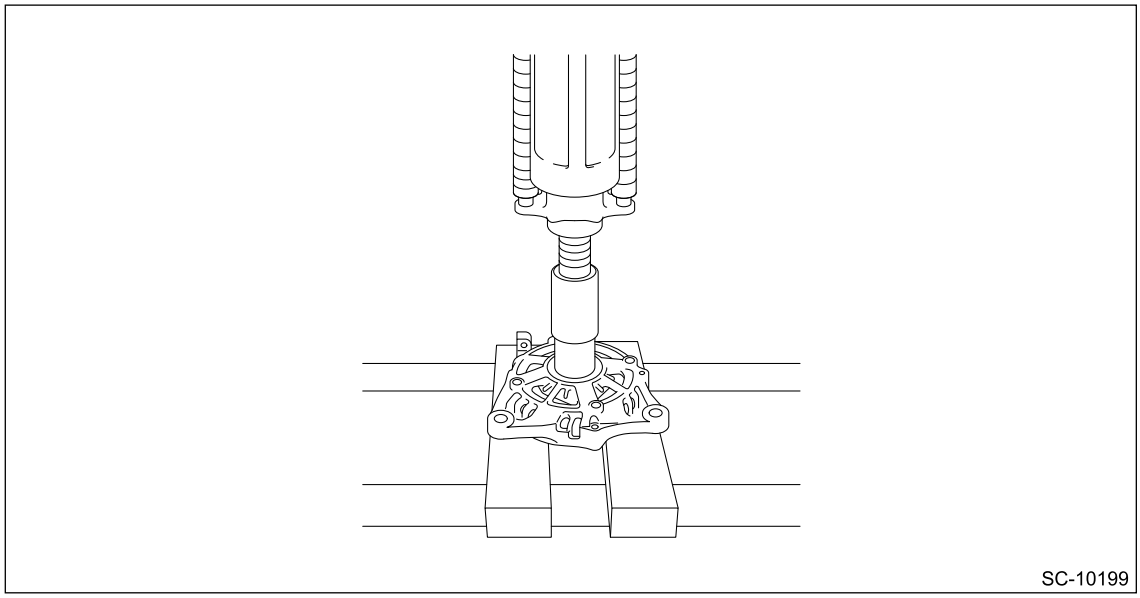
The following procedures from here are not necessary to be performed if bearing replacement is not required.



12. Use the press to remove the ball bearing from the front cover.

Caution:

Press the inner race of bearing using an attachment, etc. suitable for the press.



STARTING/CHARGING SYSTEMS(H4DO) > Generator

ASSEMBLY

1. Install a new ball bearing to the front cover using a press.

Caution:

- **Press the outer race of bearing using an attachment, etc. suitable for the press.**
- **Do not apply grease, etc. to the bearing.**
- **If grease, etc. adheres to the bearing mounting section, remove it completely.**

2. Install the bearing retainer to the front cover.

Tightening torque:

2.26 N·m (0.2 kgf-m, 1.7 ft-lb)

3. Using a vise, secure the rotor assembly.

Caution:

- **Place aluminum plates or wooden pieces between the contacting surfaces of the vise and rotor to prevent rotor damage.**
- **Be sure to hold it with the wider surface of the pole core.**
- **Do not tighten the vise more than necessary.**

4. Install the front cover to the rotor assembly.
5. Install the pulley.

   Tightening torque:

   80 N·m (8.2 kgf-m, 59.0 ft-lb)
6. Install a new dust cover.
7. Install a new bearing cover to the stator coil assembly.
8. Install the stator coil assembly to the rotor assembly.
9. Install the through bolt.

   Tightening torque:

   5.6 N·m (0.6 kgf-m, 4.1 ft-lb)
10. Install the brush assembly.

    Note:

    Install with the brush pressed using the lock pin, etc. Remove the lock pin after installation.

    Tightening torque:

    1.76 N·m (0.2 kgf-m, 1.3 ft-lb)
11. Install the bushing to the terminal B.
12. Install the rear cover.

    Tightening torque:

    4.55 N·m (0.5 kgf-m, 3.4 ft-lb)
13. Manually turn the pulley to check that the rotor rotates smoothly.

INSPECTION

Note:

For the disassembly or assembly procedures required for inspection, refer to DISASSEMBLY or ASSEMBLY of Generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>DISASSEMBLY. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>ASSEMBLY.

1. DIODE

Caution:

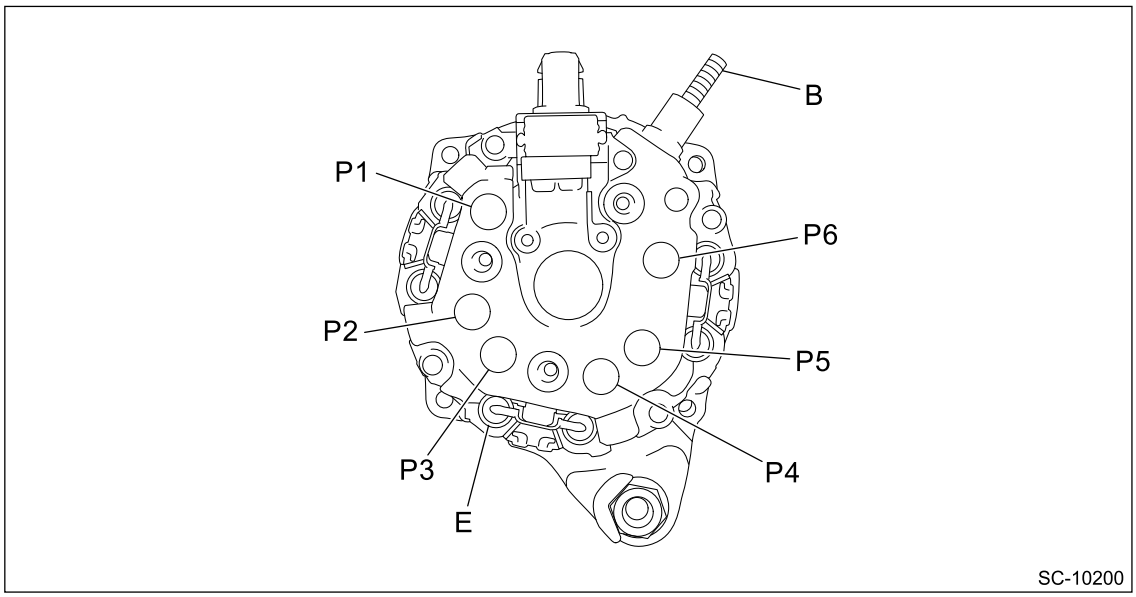
There is the possibility of damaging the diodes if a mega-tester or a similar measuring instrument is used. Never use a mega tester or equivalent for this test.

1. Check for continuity between the diode lead and terminal E or B. If continuity is not as shown in the table, replace the stator coil assembly.
   - At analog type tester

Tester lead		Continuity
−lead	+lead	
E	P1, P2, P3, P4, P5, P6	Yes
B		No
P1, P2, P3, P4, P5, P6	E	No
	B	Yes

- At digital type tester

Tester lead		Continuity
−lead	+lead	
E	P1, P2, P3, P4, P5, P6	No
B		Yes
P1, P2, P3, P4, P5, P6	E	Yes
	B	No



2. ROTOR ASSEMBLY

1. Inspect the slip rings for contamination or any roughness on the sliding surface.
2. Measure the slip ring outer diameter.

   Slip ring outer diameter:

   Standard

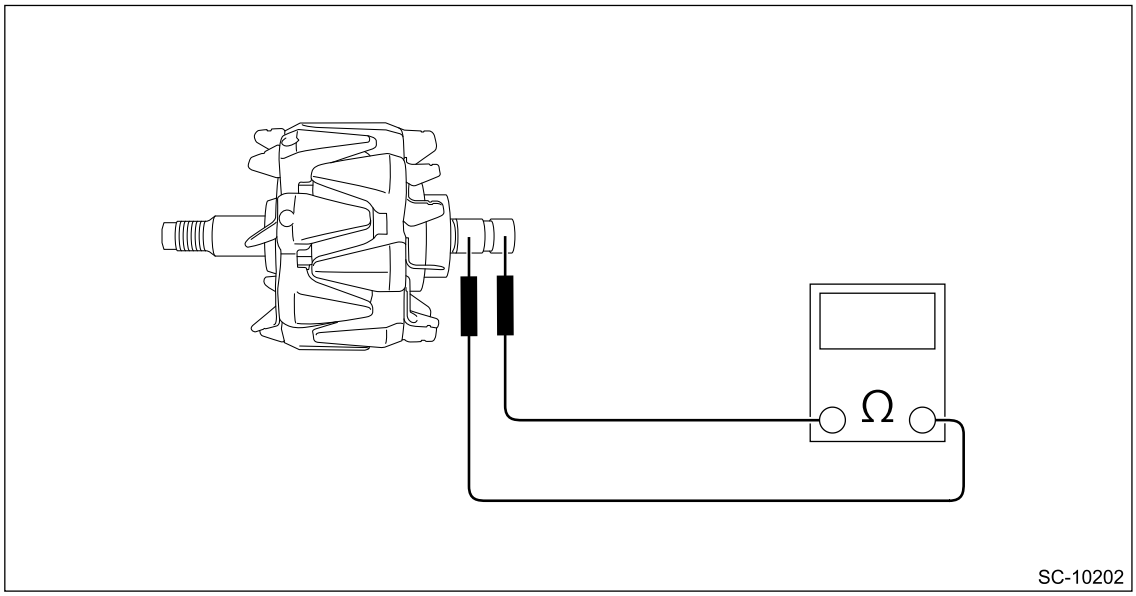
   14.2 — 14.8 mm (0.559 — 0.583 in)

   Limit

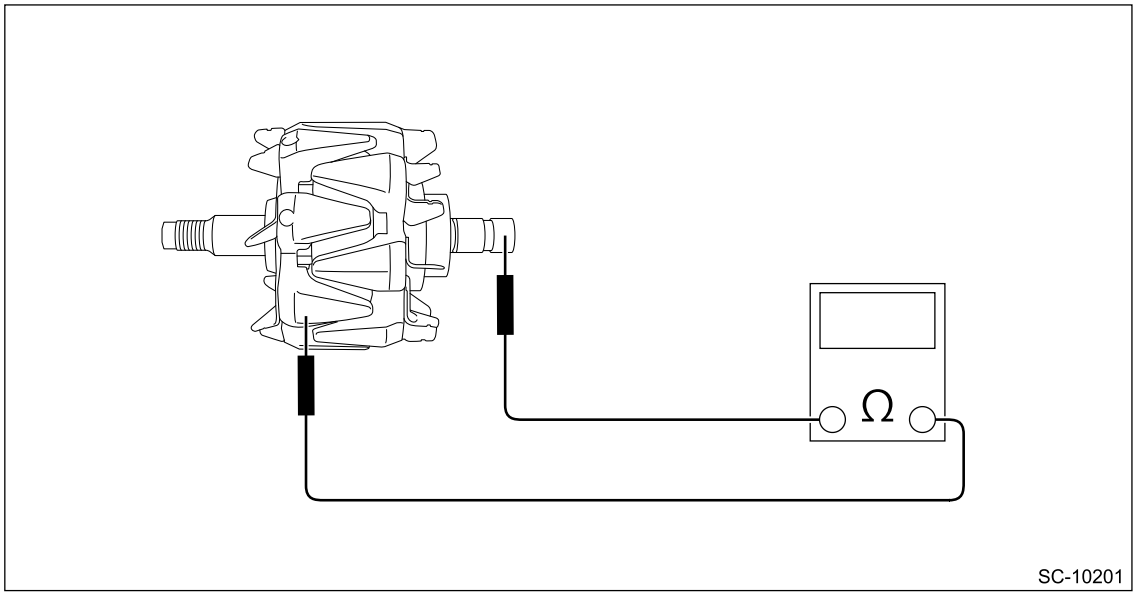
   14.0 mm (0.551 in)
3. Check the resistance between slip rings.

   Specification:

   Approx. 2.0 — 2.4 Ω



4. Check insulation between slip ring and rotor core or shaft. Replace the rotor assembly if continuity exists.

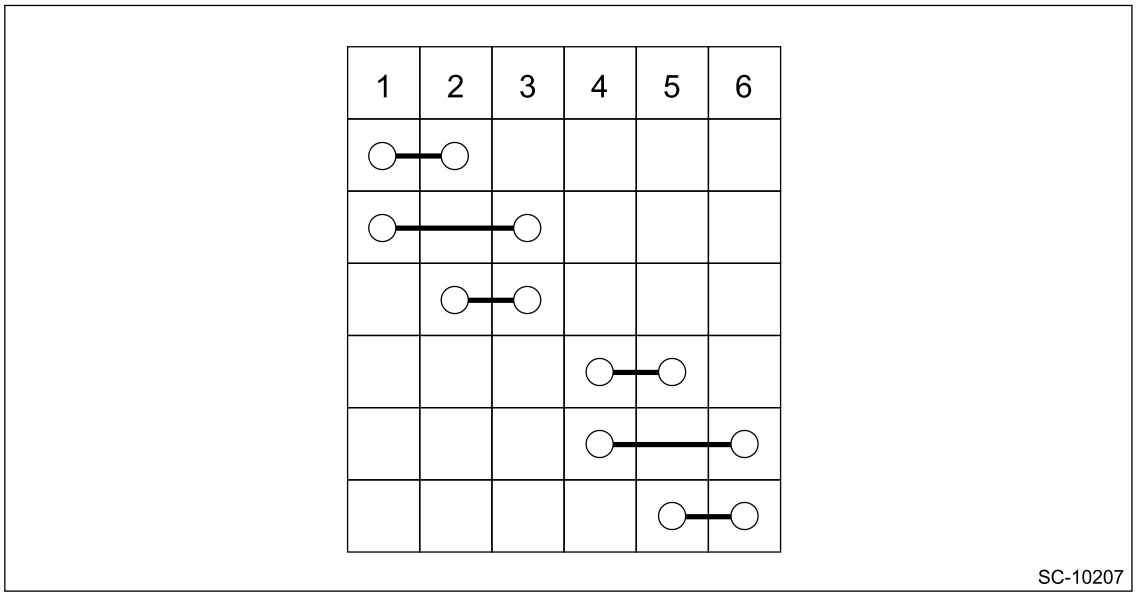


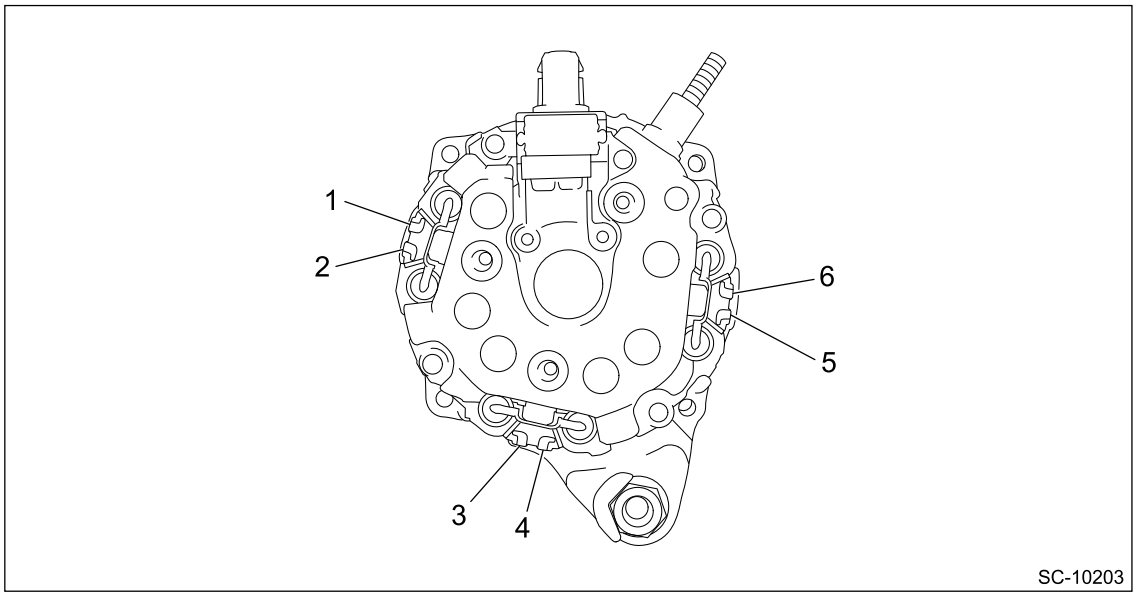
5. Check the ball bearings (rotor side). Check the following items and replace the rotor assembly if necessary.

- Check that there is no deformation, rust or other damages.
- Check that there is no resistance or looseness when rotating the ball bearings by hand.
- Check for grease leakage.

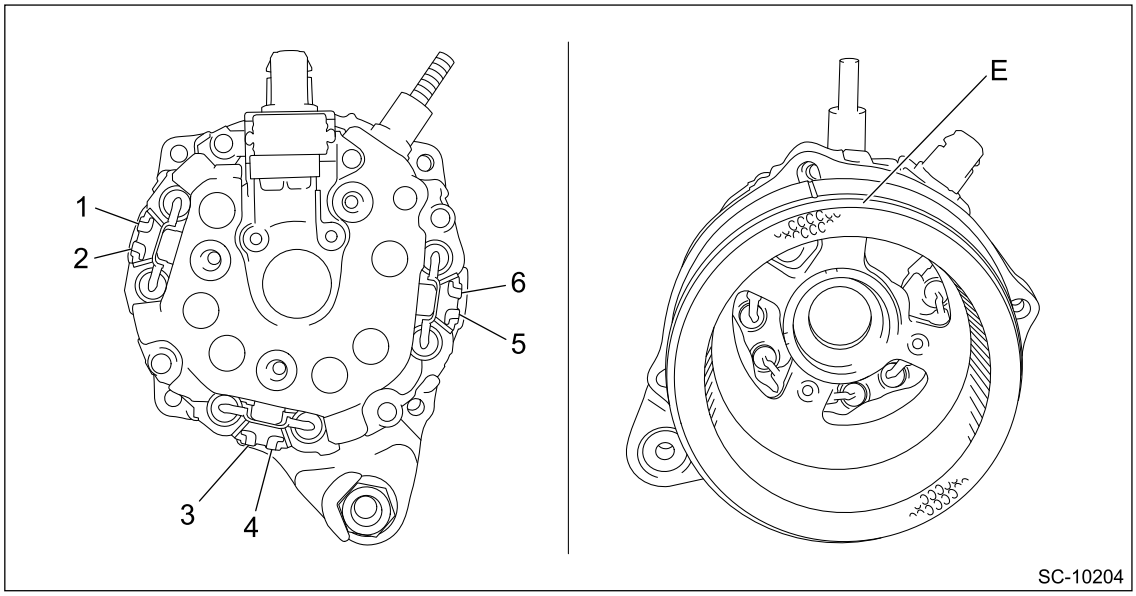
3. STATOR COIL ASSEMBLY

1. Inspect the continuity between the stator coil terminals. If continuity is not as shown in the table, replace the stator coil assembly.





2. Inspect insulation between the stator coil stator core and lead wire terminals. Replace the stator coil assembly if continuity exists.



4. BRUSH ASSEMBLY

1. Visually check the brush. If there is any abnormal wear or cracks, replace the brush assembly.
2. Check that the brush moves smoothly in the brush holder.

5. BALL BEARING (FRONT COVER SIDE)

Check the ball bearing (front cover side). Check the following items and replace the ball bearing if necessary.

- Check that there is no deformation, rust or other damages.
- Check that there is no resistance or looseness when rotating the ball bearings by hand.
- Check for grease leakage.

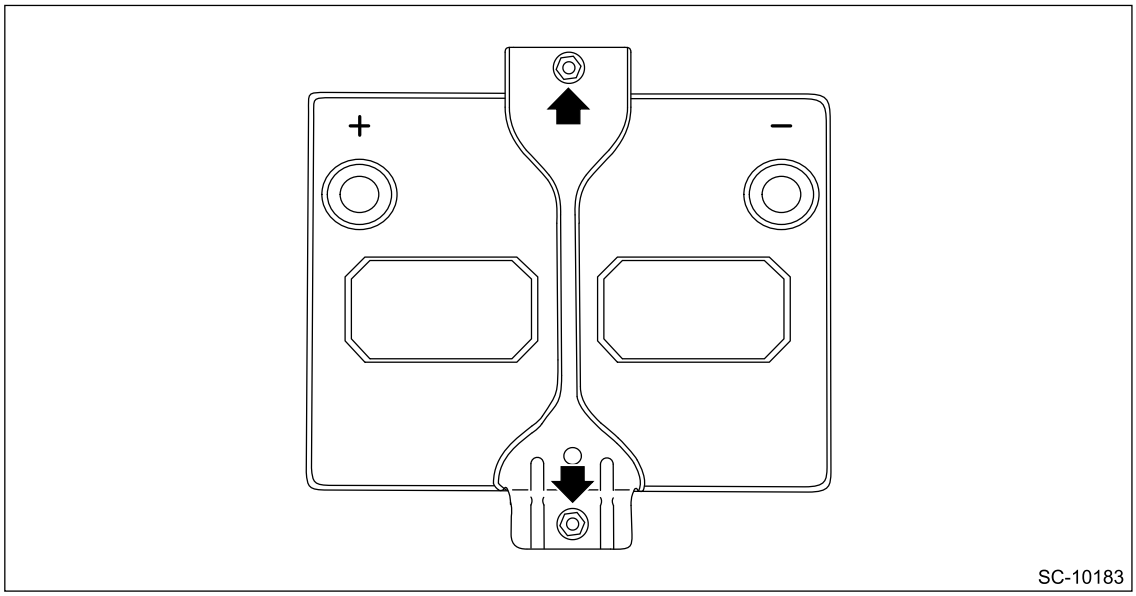
6. OTHER INSPECTIONS

- Check that there is no deformation, cracks or other damages.
- Check that no foreign substances are clogged.

STARTING/CHARGING SYSTEMS(H4DO) > Battery

REMOVAL

1. Disconnect the positive (+) terminal after disconnecting the negative (-) terminal of battery.
2. Remove the battery cable holder.
3. Remove the battery holder.



4. Remove the battery.

STARTING/CHARGING SYSTEMS(H4DO) > Battery

INSTALLATION

Caution:

Since the initial diagnosis of the electronic throttle control is conducted after the battery terminal is connected, wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.

1. Install the battery.
2. Install the battery holder.
   Tightening torque:
   3.5 N·m (0.4 kgf-m, 2.6 ft-lb)
3. Install the battery cable holder.
4. Connect the positive terminal and then connect the ground terminal to the battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   Clean the battery terminals and apply a thin coat of grease to prevent corrosion as necessary.
   Tightening torque:
   Positive terminal
   6 N·m (0.6 kgf-m, 4.4 ft-lb)
   Ground terminal
   6 N·m (0.6 kgf-m, 4.4 ft-lb)

STARTING/CHARGING SYSTEMS(H4DO) > Battery

INSPECTION

Warning:

- **As batteries produce flammable gases, be careful not to bring an open flame close to the batteries.**
- **Ventilate sufficiently when using or charging battery in enclosed space.**
- **Electrolyte is corrosive acid, and has toxicity; be careful of handling the fluid.**
- **For safety, in case an explosion does occur, wear eye protection or shield your eyes when working near any battery. In addition, never lean over the battery.**
- **Be careful that the electrode does not come into contact with skin, eyes or clothing. Especially at contact with eyes, flush with water for 15 minutes and get prompt medical attention.**
- **Be careful not to let the electrode contact with the coated parts.**
- **Before starting work, remove rings, metal watch-bands, and other metal jewelry.**
- **Be careful not to let the metal tools contact the positive battery terminal and anything connected to it. When the operation using a metal tool to the positive terminal or anything connected to it is required, disconnect the battery ground terminal before starting the operation.**

1. APPEARANCE

Check the battery case, top cover and terminals for dirt or cracks, and perform the following work as necessary.

- Clean the battery with water and wipe with a dry cloth.
- Apply a thin coat of grease on the terminals to prevent corrosion.

Check

- **Normal** → Go to the check item 2.
- **Abnormal** → Replace the battery.

2. ELECTROLYTE LEVEL

Check the electrolyte level in each cell.

Caution:

Do not fill beyond MAX level.

Note:

If the level is below the middle point between MIN level and MAX level, pour distilled water into the battery cell to bring the level to MAX.

Check

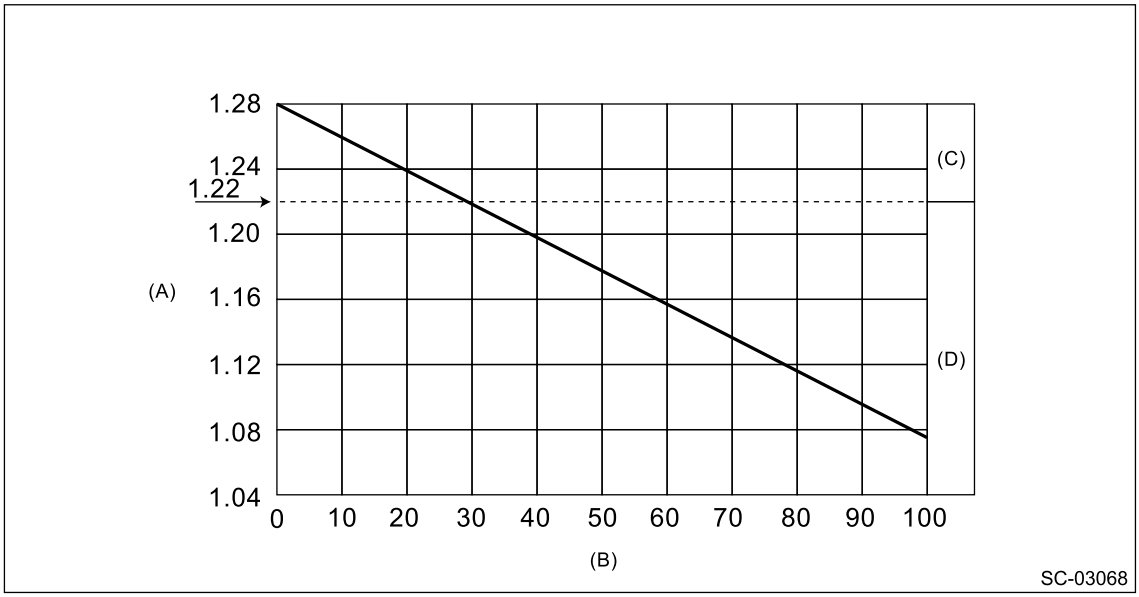
- **MAX level** → Go to the check item 3.
- **Below the middle point between MIN level and MAX level** → **Fill** → Go to the check item 3.

3. SPECIFIC GRAVITY OF ELECTROLYTE

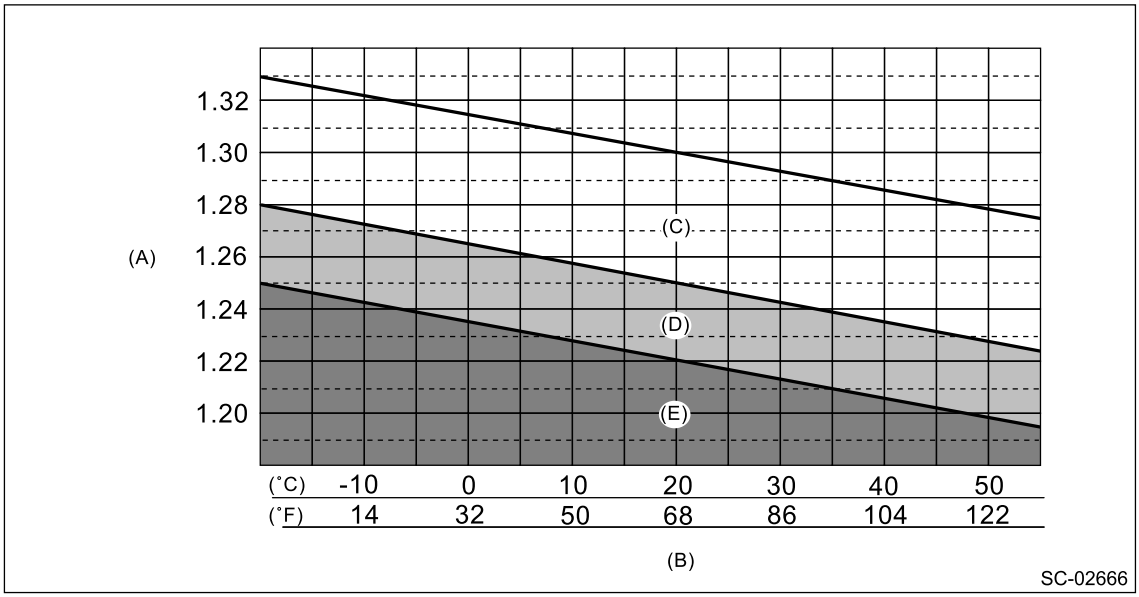
Check the specific gravity of the electrolyte using a hydrometer and a thermometer.

Note:

- **Specific gravity varies with temperature of electrolyte so that it must be corrected at 20°C (68°F) using the following calculation:**
  S_{20} = St +0.0007× (t − 20)
  S_{20}: Specific gravity corrected at electrolyte temperature of 20°C
  St: Measured specific gravity
  t: Measured temperature (°C)
- **When measuring in a simplified manner using the battery terminal voltage, calculate the specific gravity by the following formula.**
  Specific gravity = [0.187 × battery terminal voltage (V)] − 1.1
  Perform the steps 1) and 2) before measuring the voltage in order to stabilize the voltage.
  1) Turn the ignition switch to OFF and illuminate the headlight for 30 seconds.
  2) After turning off the headlight, leave the vehicle for one minute.
- **Measuring the specific gravity of the electrolyte in the battery will disclose the state of charge of the battery. The relation between specific gravity and state of charge is as shown in the figure.**



(A) Specific gravity [20°C (68°F)] (B) Amount of discharge (%) (C) Good
(D) Need to charge or replace



(A) Specific gravity [20°C (68°F)] (B) Electrolyte temperature (C) Good
(D) Caution (E) Need charging

Check

- **Specific gravity: 1.250 — 1.290, and difference between cells is 0.04 or less → Battery is normal**
- **Specific gravity: Less than 1.250, or difference between cells is 0.04 or more → Battery needs to be charged or replaced**

4. STANDBY CURRENT

1. Prepare the circuit tester which can measure down to 1 mA.

Note:

For model with keyless access function, the standby current changes regularly. Therefore, prepare the analog type circuit tester.

2. Using the circuit tester, check the standby current.

(1) Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION > APPEARANCE. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION > ELECTROLYTE LEVEL. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION > SPECIFIC GRAVITY OF ELECTROLYTE.

Note:

The standby current may be displayed lower than the actual value if the battery is weak, so charge or replace the battery as necessary.

(2) Check that the fuse is not blown out and is properly inserted.

(3) When non-genuine electrical parts (including parts sold in authorized workshops) are installed, remove all parts.

(4) Check that back-up fuse is inserted. Ref. to PRE-DELIVERY INSPECTION>PRE-DELIVERY INSPECTION (PDI) PROCEDURE > FUSE INSTALLATION.

(5) Start the engine, and set the switch positions for each system as shown in the following table.

Note:

Some of the listed systems are not equipped depending on the vehicle. Set only the systems equipped on the vehicle to the positions as shown.

System	Position
Headlight	ON or Auto
Fog light	ON

System	Position
Wiper (front and rear)	ON or Low speed
Audio and navigation system	ON
Rear defogger	ON
Room light	DOOR
Luggage light	DOOR
Map light	OFF
Auto A/C	ON (AUTO)
Manual A/C	ON (Speed 1)
Electronic parking brake	ON
Electrical parts other than listed above (electrical parts that users can confirm the operation with the key removed)	OFF

(6) Turn the ignition switch to OFF.

(7) Operate the front hood lock release lever to unlock the front hood.

(8) Close all the doors (including rear gate and trunk lid) and then lock the doors. (Security alarm is in set condition)

Note:

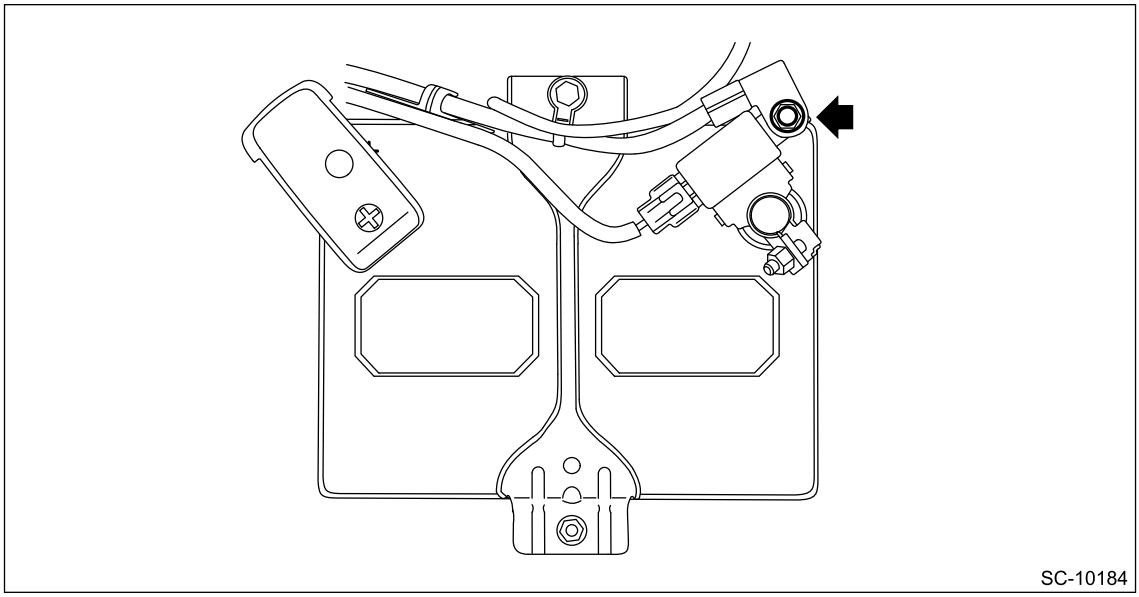
For model with keyless access function, take the access key 1.5 m or more away from the vehicle after the door lock. And do not put the access key close to the vehicle while measuring the standby current.

(9) Wait for 5 minutes after door lock until the standby current stabilizes.

(10) Loosen the nut which holds the ground terminal to the battery sensor.

Note:

Do not remove the ground terminal.



(11) Connect the circuit tester positive terminal to the ground terminal.

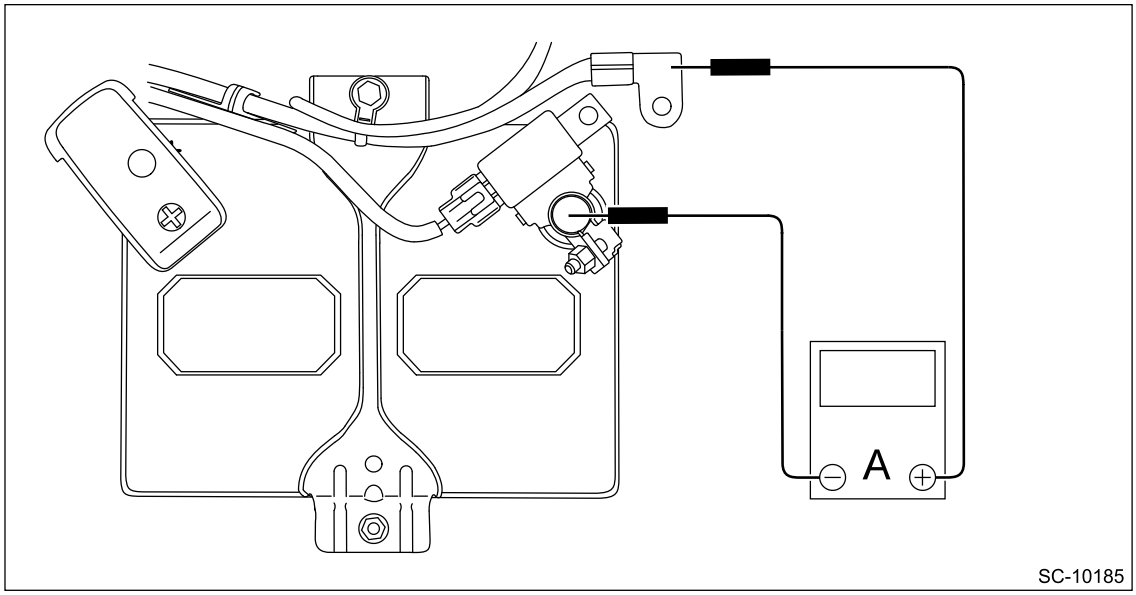
Note:

To prevent the damage to the circuit tester, set the circuit tester range to a large value first, then gradually change it to smaller values.

(12) Connect the circuit tester negative terminal to the ground terminal installation part of the battery sensor.

(13) While connecting the circuit tester positive terminal with the ground terminal as shown in the

figure, remove the ground terminal from the battery sensor.



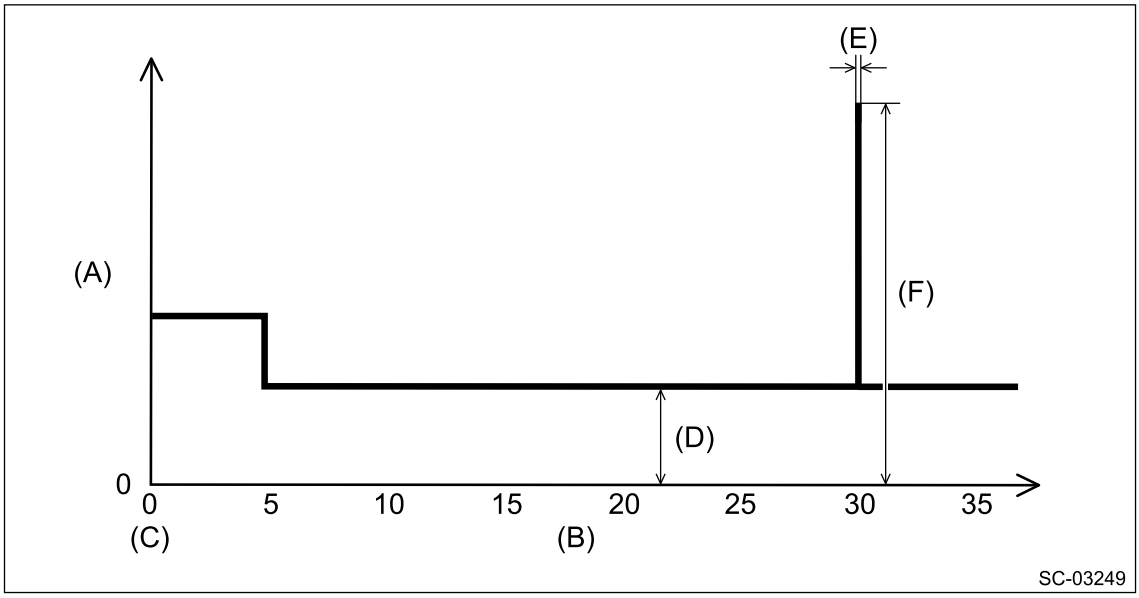
(14) Check the standby current.

Caution:

If the terminals and circuit tester are detached during standby current inspection, repeat the procedure from step (9).

Note:

- **For model with keyless access function, the standby current changes periodically because the keyless access system continuously searches the access key (polling).**
- **When measuring the standby current, the reading of the circuit tester oscillates. Therefore, read the average value (median value).**
- **The standby current may become large when the vehicle system (ELCM) is activated 5 times at 30-minute intervals or 5 hours after turning the ignition switch to OFF. Therefore, the measurement should be completed in 20 minutes. If it takes more than 20 minutes, start the engine once, stop the engine, then perform the inspection.**



(A) Current/mA
(B) Time/min
(C) Ignition OFF
(D) Less than 70 mA
(E) 5 seconds (system operation)
(F) 300 mA or more

Check

- **When the maximum measurement value is less than 70 mA → Standby current is normal.**
- **When the maximum measurement value is 70 mA or more → Go to step (15).**

(15) Remove all fuses one by one to identify which system changes the standby current value significantly. Ref. to WIRING SYSTEM>Power Supply Circuit.

(16) Check the related part, harness and connector of the system whose standby current has changed significantly.

STARTING/CHARGING SYSTEMS(H4DO) > Battery

CHARGE

Warning:

- **Do not bring an open flame close to the battery.**

Caution:

- **If the terminals are corroded, clean with a brush and common caustic soda solution.**
- **As batteries produce flammable gases while charging, be careful not to bring an open flame close to the batteries.**
- **Ventilate sufficiently when charging batteries.**
- **Observe instructions when handling the battery charger.**
- **Before charging the battery on the vehicle, disconnect the battery ground terminal to prevent damage of generator diodes or other electrical units.**

1. NORMAL CHARGE (CONSTANT CURRENT CHARGE)

Charge the battery with the current value specified by manufacturer or with approximately 1/10 of battery's rating capacity. (See the table below.)

Type	Charging current (A)	CCA (A)
75D23L	5.0 — 6.5	530

Caution:

- **The charge control feature and specifications for judgment of charge completion depend on the device. Follow the instruction manual of the charger used.**
- **Keep the electrolyte temperature at 45°C (113°F) or less while charging. Stop charging when the temperature exceeds this value.**

Note:

The characteristics of typical charging methods are as follows.

- **Constant current charging**
  This method makes it easy to charge to 100%, since the electrolyte is agitated by the gassing occurred at the end of charging. However, the time for charging is comparatively long because the current value is kept constant.
- **Constant voltage charging**
  This method completes charging in a short period of time due to the large current. However, it is difficult to charge to 100% because no gassing occurred at the end of charging and the electrolyte is not agitated. Therefore, the combined use with the constant current charging is preferable.
- **Quasi-constant voltage charging**
  This method is widely used for commercially available chargers.
  Compared to the constant voltage charging whose charging current at the beginning of charging becomes large, it reduces the charging current by lowering the voltage at the initial stage, resulting in battery load reduction. The time for charging is comparatively long. However, this type of chargers can be manufactured comparatively inexpensive due to the simple control circuit (or manual settings). After the initial stage of charging is completed, it gradually raises the charging voltage so that the charging current is within the specification, until the battery is fully charged.
- **Constant voltage/current charging**
  In addition to the constant voltage charging, this method controls the upper limit of the current.
  The constant current charging is applied at the beginning of charging, and the constant voltage charging is applied at the end. This makes battery charge comparatively efficient in a short period of time. Charging by generators is similar to this method.

Judgment of charge completion

1. Specific gravity of electrolyte should be held within the specific range of 1.250 — 1.290 for one hour or more.
2. Voltage while charging should be held within the specified range of 15.0 — 16.8 V for one hour or more.
3. Gas is actively generated in all cells.
4. The amount of charge reaches 1.2 — 1.5 times of the amount of discharge.

Note:

The amount of discharge/charge can be calculated by the following formula.

Amount of discharge (Ah) = remaining capacity calculated by specific gravity (%) × 5 hour rate capacity (Ah)

Amount of charge (Ah) = Charging current value (A) × Time for charging

2. QUICK CHARGING

Charge the battery in a short period of time with a relatively large current by using a quick charger. Charge the battery with the current value at approximately 1/2 of battery's rating capacity. (See the table below.)

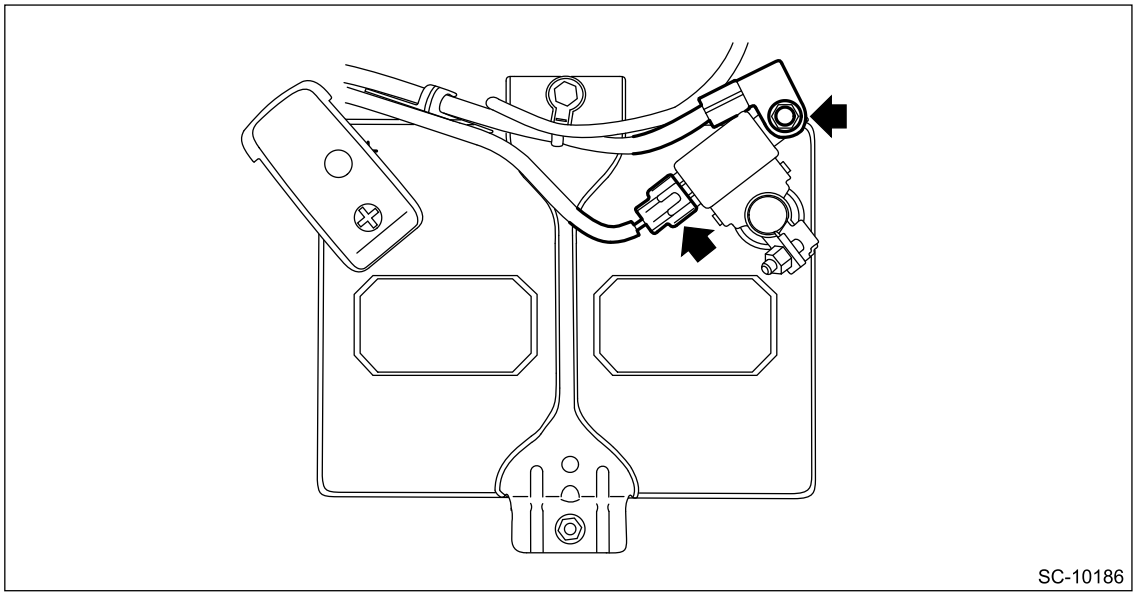
Caution:

- **Quick charging is accompanied by a large amount of heat generation. Charging should be completed in up to 30 minutes regardless of battery size.**
- **Quick charging is used to recover the battery until it can start the vehicle. For full charging, use the normal charging method.**
- **Keep the electrolyte temperature at 55°C (131°F) or less while quick charging. Stop charging when the temperature exceeds this value.**

Type	Charging current (A)	CCA (A)
75D23L	25.0 — 32.5	530

REMOVAL

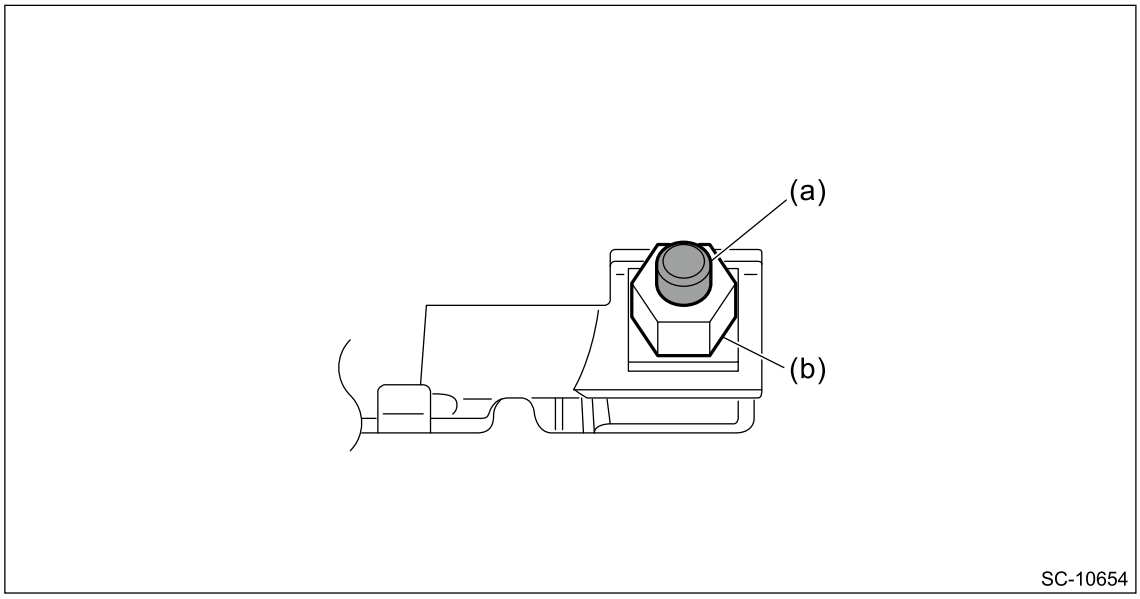
1. Disconnect the connector and ground terminal.

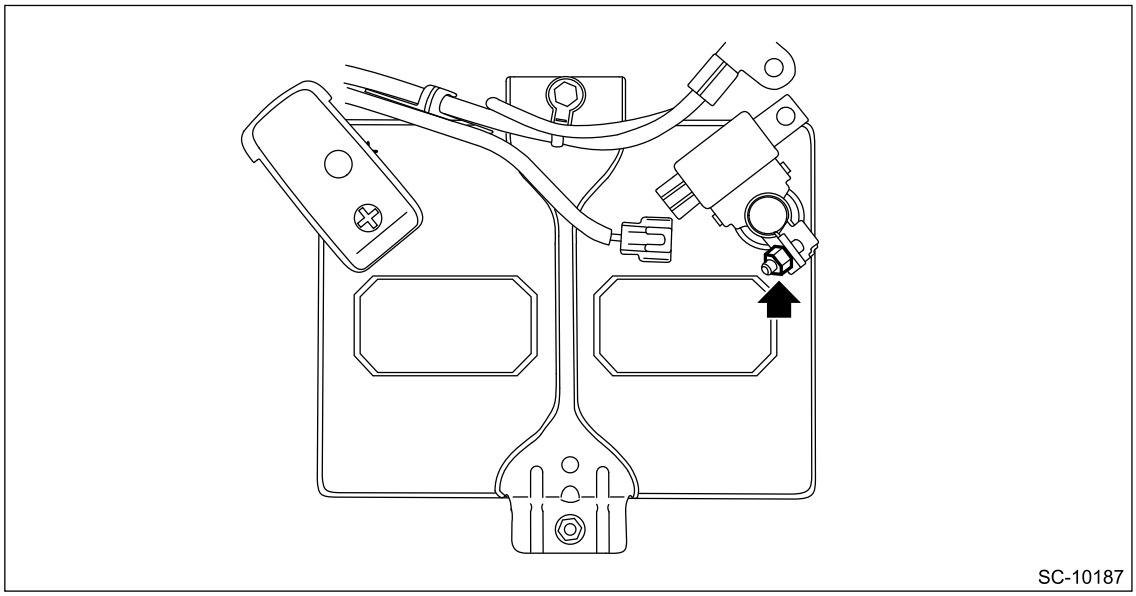


2. Remove the battery sensor.

Caution:

The end of the bolt (a) of the battery sensor is crimped. Therefore, do not loosen the nut (b) to the crimped portion.





STARTING/CHARGING SYSTEMS(H4DO) > Battery Sensor

INSTALLATION

Caution:

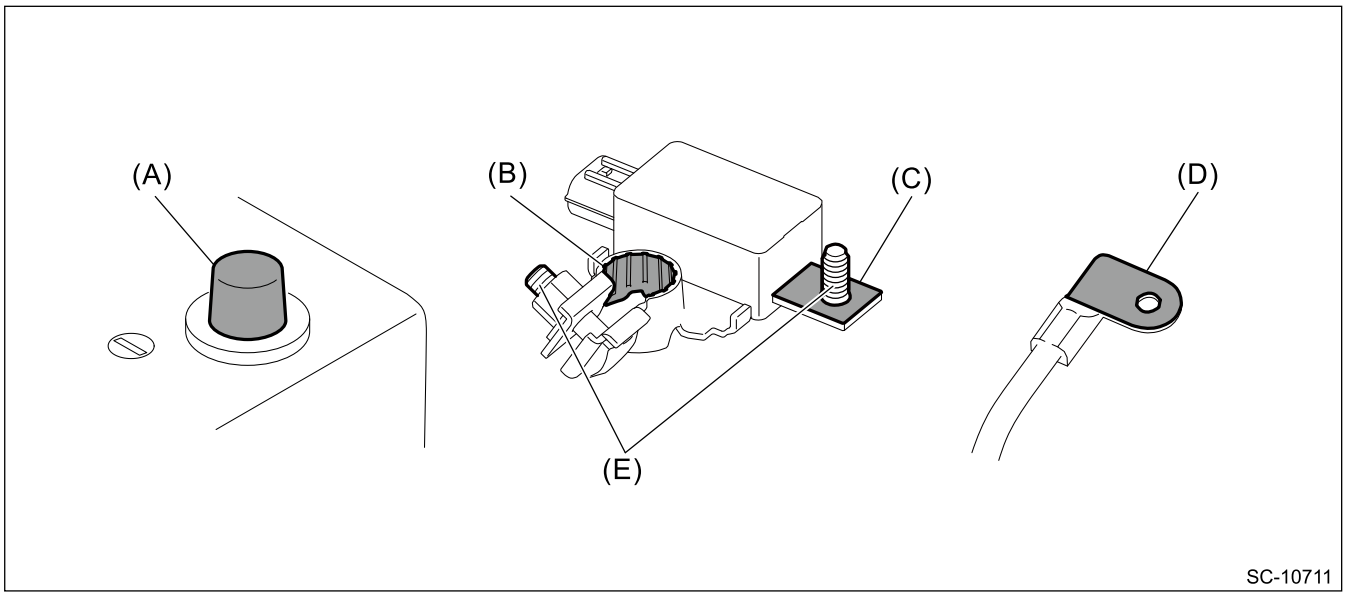
- **If the battery terminal is worn and the terminal section is loose, replace it with a new battery.**
- **After connecting the ground terminal to the battery sensor, the initial diagnosis of the electronic throttle control is conducted by the vehicle. Therefore, wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**

1. Install the battery sensor.

(1) Clean and degrease the battery terminal, inside of the battery sensor terminal, ground terminal connecting area, and ground terminal.

Caution:

As residual grease on the bolt thread may cause overtorque, clean and degrease the thread if grease remains on it. Also, be careful to avoid battery sensor deformation and intrusion of grease into the inside of the connector when wiping.



(A) Battery terminal (C) Ground terminal connecting area and ground (E) Bolt

terminal thread

(B) Inside of the battery sensor terminal (D) Ground terminal

(2) Loosen the battery sensor nut up to just before the crimp to make sure that the clamp is open.

Note:

This operation is required to firmly insert the battery sensor into the battery terminal.

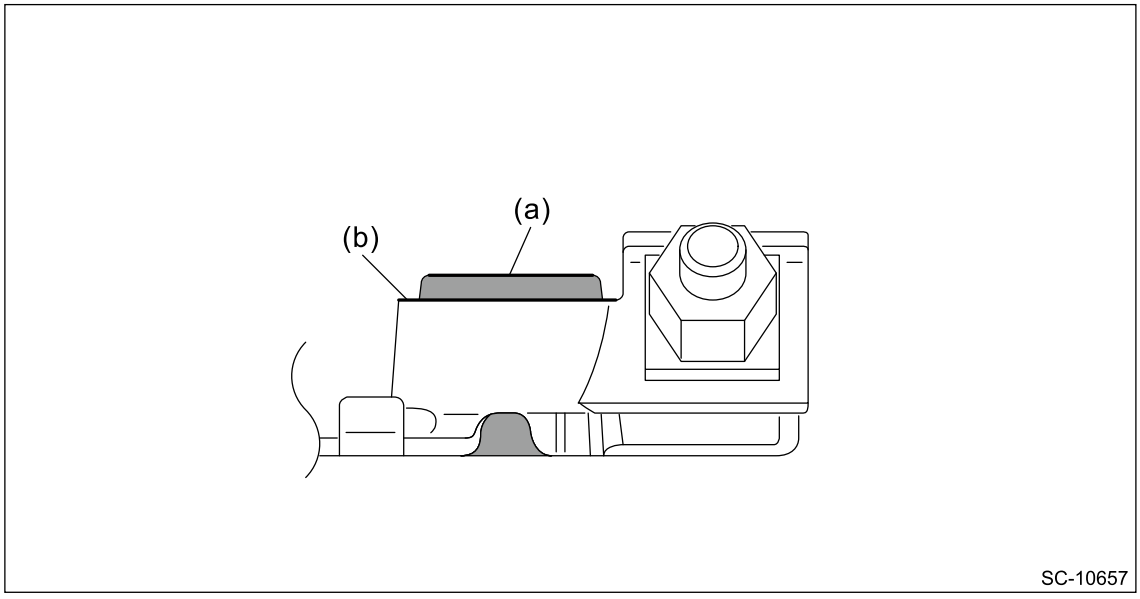
(3) Set the battery sensor to the battery terminal, and tighten the nut.

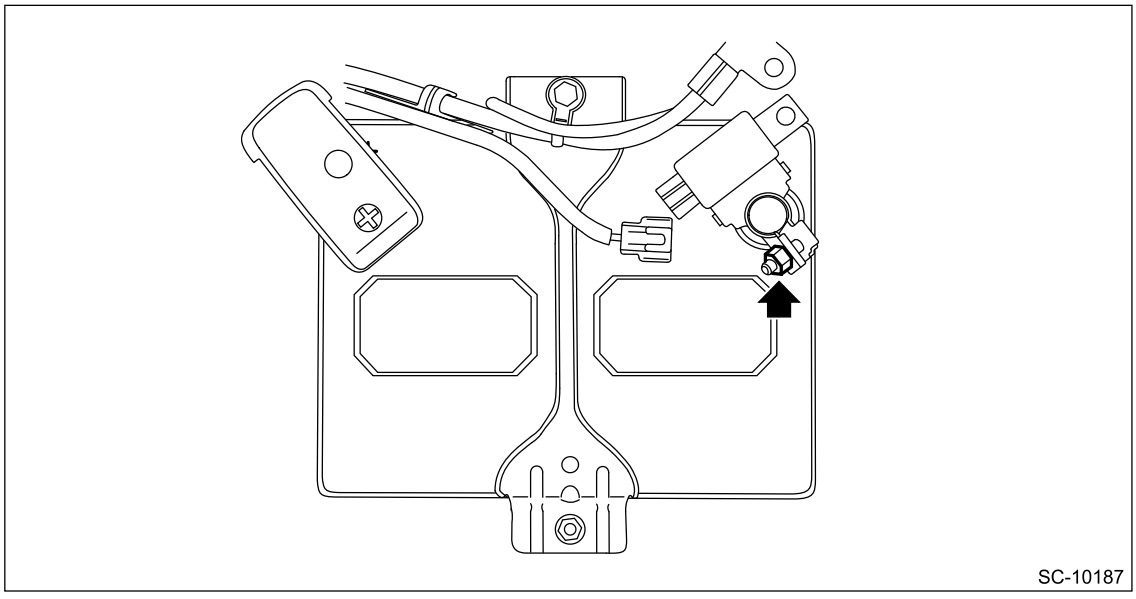
Caution:

Insert until the battery terminal upper end (a) exceeds the height of the battery sensor terminal upper end (b).

Tightening torque:

6 N·m (0.6 kgf-m, 4.4 ft-lb)

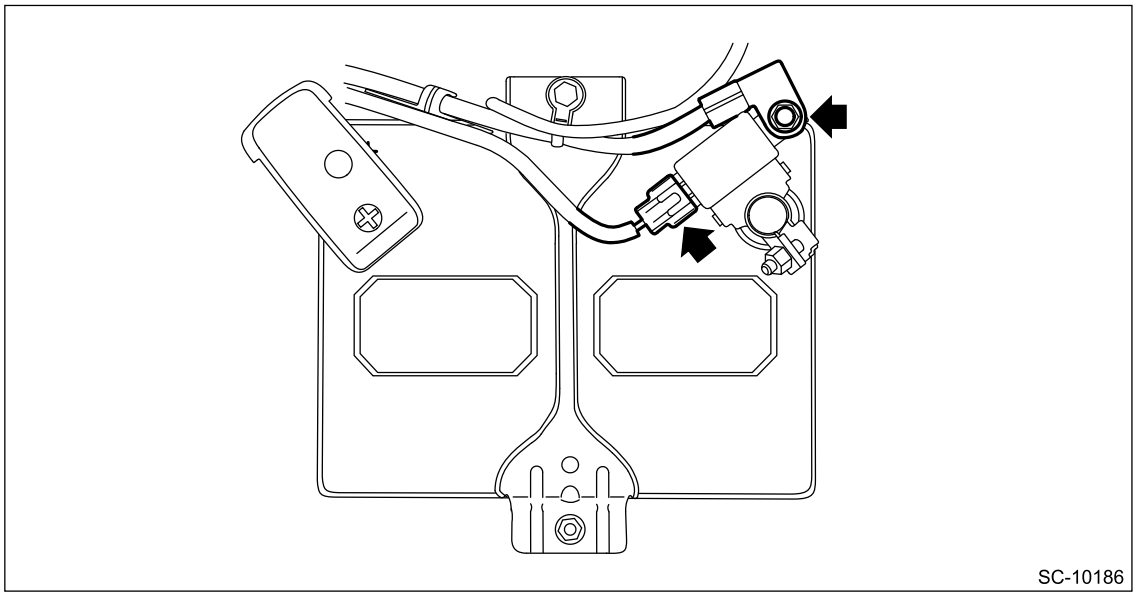




2. Connect the connector and ground terminal to the battery sensor.

Tightening torque:

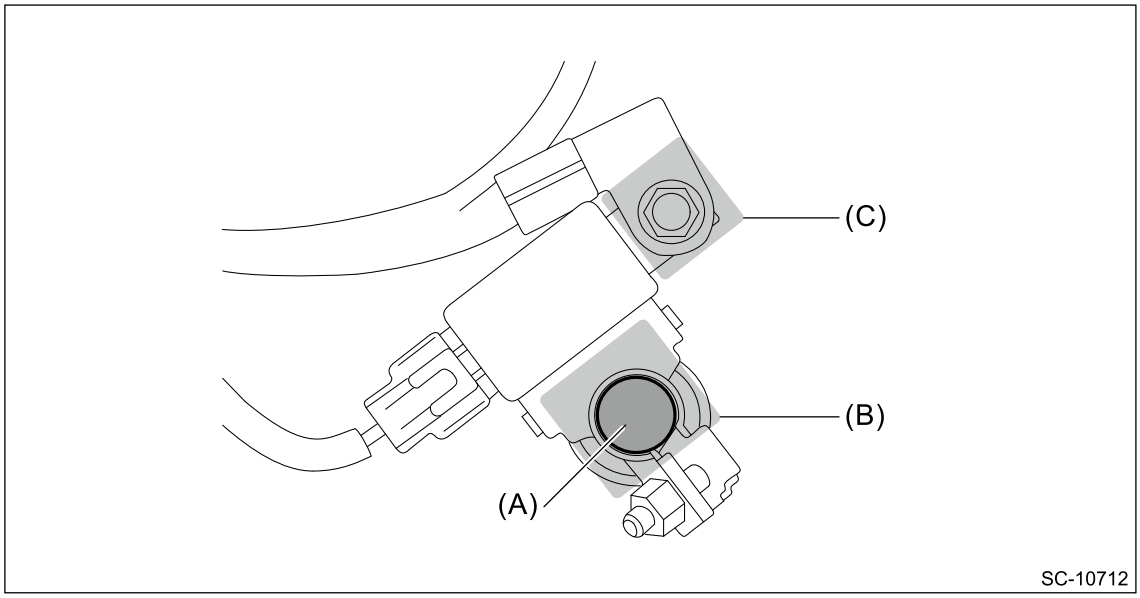
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



3. Apply a thin coat of grease to cover the battery terminal surface (A), connection between the battery terminal and the battery sensor (B), and connection between the ground terminal and the battery sensor (C).

Caution:

This procedure is required to prevent rust and suppress sulfation. Be careful to avoid overgreasing as it causes insulation.



STARTING/CHARGING SYSTEMS(H4DO) > Battery Sensor

INSPECTION

Check that there is no deformation, cracks or other damages.

FRONT SUSPENSION

FS

1. General Description
2. Wheel Alignment
3. Crossmember Support
4. Stabilizer
5. Ball Joint
6. Front Arm
7. Crossmember
8. Front Strut
9. General Diagnostic Table

SPECIFICATION

1. FRONT ALIGNMENT (INSPECTION VALUE)

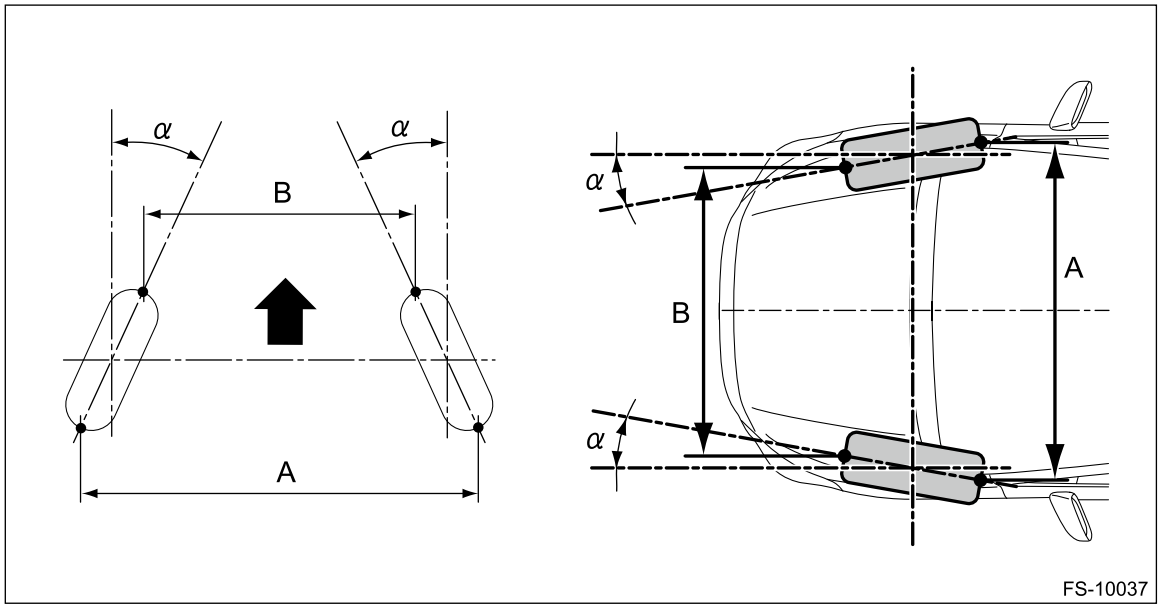
Suspension height (Tolerance: $^{+12\ mm}_{-24\ mm}$ ($^{+0.47\ in}_{-0.94\ in}$))	mm (in)	140 (5.51)
Camber (tolerance: ±0°30′ Differences between RH and LH: 35′ or less)		−0°30′
Caster (referential value)		5°55′
Steering angle (tolerance: ±1.5°)	Inner wheel	37.8°
	Outer wheel	32.9°
Toe-in	mm (in)	0±3 (0±0.12) Toe angle (sum of both wheels): 0° ±0°12′
Kingpin angle (referential value)		14°14′

2. REAR ALIGNMENT (INSPECTION VALUE)

Suspension height (Tolerance: $^{+12\ mm}_{-24\ mm}$ ($^{+0.47\ in}_{-0.94\ in}$))	mm (in)	−15 (−0.59)
Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less)		−1°20′
Toe-in	mm (in)	IN3±3 (IN0.12±0.12)
		Toe angle (sum of both wheels): IN0°15′±15′
Thrust angle (tolerance: 0°00±30′)		0°00′

Note:

- **Adjust with the value less than the inspection value, taking aging variation into consideration.**
- **Front toe-in, rear toe-in and front camber can be adjusted. Adjust if the value of toe-in or camber exceeds the tolerance range of the specification chart.**
- **Other items except for front toe-in, rear toe-in and front camber that are described in the specification chart cannot be adjusted.**
- **If other items exceed the tolerance range of the specification chart, check the suspension parts and connections for deformation. If defective, replace with new parts.**

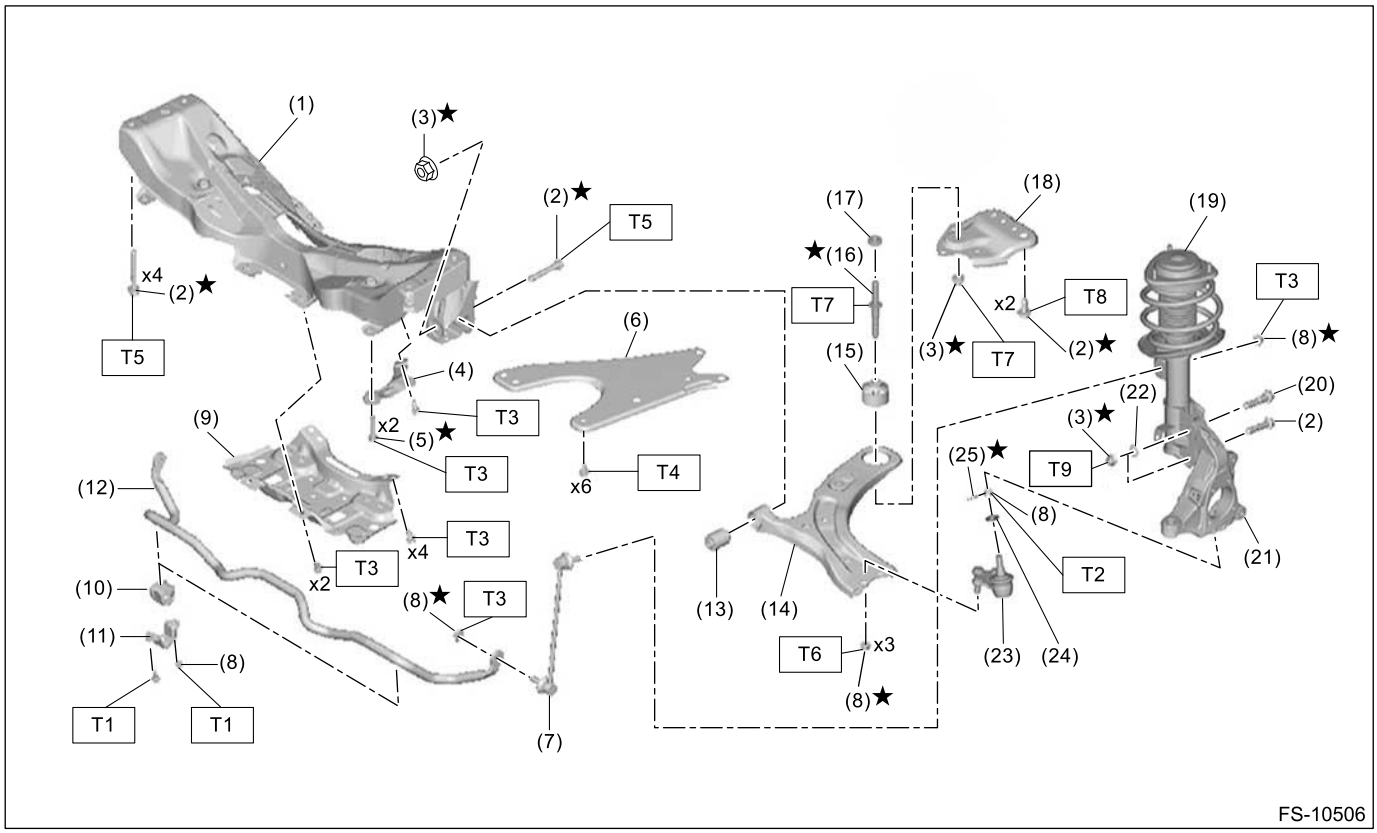


A − B = Positive: Toe-in, Negative: Toe-out
α = Individual toe angles

FRONT SUSPENSION > General Description

COMPONENT

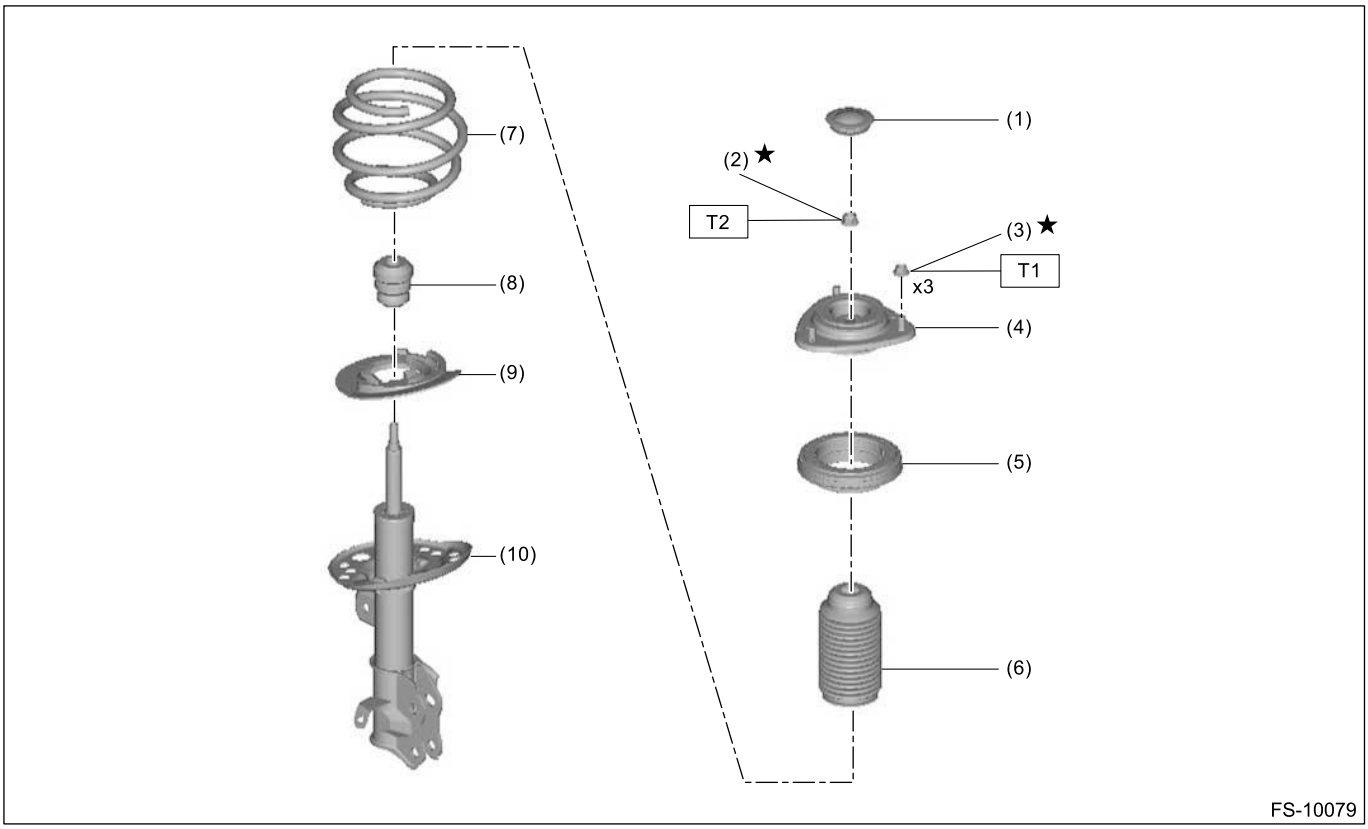
1. FRONT SUSPENSION



(1) Crossmember COMPL	(14) Front arm ASSY	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Flange bolt	(15) Bushing rear - front arm	***T1: 25 (2.5, 18.4)***
(3) Self-locking nut	(16) Stud bolt*	***T2: 51 (5.2, 37.6)***
(4) Stiffener	(17) Stopper arm front	***T3: 60 (6.1, 44.3)***
(5) Bolt	(18) Front arm rear plate	***T4: 70 (7.1, 51.6)***
(6) Crossmember support - rear	(19) Front strut ASSY	***T5: 95 (9.7, 70.1)***
(7) Stabilizer link	(20) Adjusting bolt	***T6: 100 (10.2, 73.8)***
(8) Flange nut	(21) Front axle housing	***T7: 110 (11.2, 81.1)***
(9) Crossmember support - front	(22) Adjusting washer	***T8: 150 (15.3, 110.6)***
(10) Bushing - stabilizer	(23) Ball joint	***T9: 155 (15.8, 114.3)***
(11) Clamp - stabilizer bushing	(24) Washer	
(12) Stabilizer	(25) Snap pin	
(13) Bushing front - front arm		

*: Do not reuse the stud bolt when it has been removed from the vehicle.

2. FRONT STRUT



(1)	Dust seal - front strut	(6)	Dust cover - front strut	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Self-locking nut	(7)	Coil spring - front	***T1: 32 (3.3, 23.6)***
(3)	Flange nut	(8)	Helper - front strut	***T2: 55 (5.6, 40.6)***
(4)	Strut mount - front	(9)	Rubber seat LWR	
(5)	Strut bearing - front	(10)	Strut COMPL - front	

FRONT SUSPENSION > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When disposing of strut COMPL - front, be sure to bleed the oil or gas out completely. Also, do not expose to flames or fire.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Do not secure a part in a vise directly. Place cushioning materials such as wood pieces, blocks, aluminum plates, or waste cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- When the suspension-related components have been removed, installed or replaced, perform the following adjustment.
  - Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
  - VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

- For parts which are not reusable, always use new parts. Other parts should be replaced with new parts as required.
- When handling oil or fuel, adhere to the following to prevent unexpected accident.
  - Be careful with fire.
  - Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.
  - Follow all government and local regulations concerning disposal of refuse when disposing.
- Be sure that the surface of brake disc or brake pad is free from grease or oil.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.

PREPARATION TOOL

1. SPECIAL TOOL

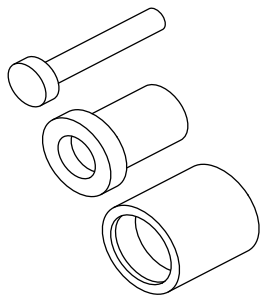
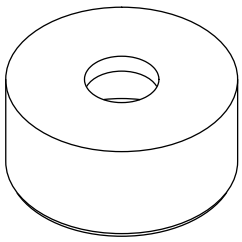
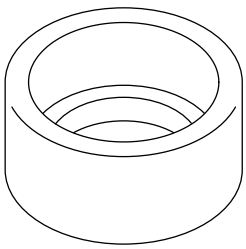
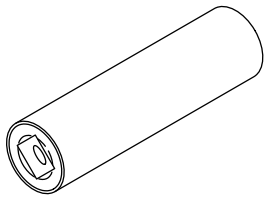
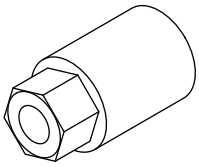
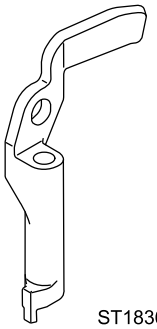
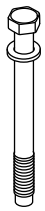
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-927680000	927680000	INSTALLER & REMOVER SET	Used for replacing the bushing front - front arm of front arm assembly.
 ST20299AG000	20299AG000	REMOVER	• Used for replacing the bushing rear - front arm of front arm assembly. • Used together with BASE (20299AG010).
 ST20299AG010	20299AG010	BASE	• Used for replacing the bushing rear - front arm of front arm assembly. • Used together with REMOVER (20299AG000).

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20299AG020	20299AG020	STUD BOLT SOCKET	Used for removing and installing the stud bolt for front arm assembly installing portion.
 ST-20399AG000	20399AG000	STRUT MOUNT SOCKET	• Used for disassembling and assembling strut assembly and shock absorber assembly. • Used for checking center nut torque of strut assembly and shock absorber assembly.
 ST18360AA040	18360AA040	HANGER	• Used for removing and installing engine. • Used for removing and installing rocker cover. • Used together with BOLT (18363AA050).
 ST18363AA050	18363AA050	BOLT	• Used for removing and installing engine. • Used for removing and installing rocker cover. • Used together with HANGER (18360AA040).
STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
DST-i	Used together with Subaru Select Monitor 4.
Alignment gauge	Used for measuring wheel alignment.
Alignment gauge adapter	Used for measuring wheel alignment.
Turning radius gauge	Used for measuring wheel alignment.
Toe-in gauge	Used for toe-in measurement.
Tie-rod ball joint puller	Used for disconnecting tie-rod end.
Dial gauge	Used for damper strut measurement.
Coil spring compressor	Used for disassembling and assembling strut assembly and shock absorber assembly.
Shackle	• Two units used for hanging power unit. • Attached to both end of chain sling and connected to engine hook. • Load capacity: 250 kg (551 lb) or more
Sling belt	• Used for removing and installing crossmembers. • Width: 35 — 40 mm (1.38 — 1.57 in) • Length: 2 m (6.6 ft) • Load capacity: 1 t (2205 lb) or more

INSPECTION

Check the following items before performing the wheel alignment measurement.

- Tire inflation pressure
- Uneven wear of RH and LH tires, or difference of sizes
- Tire runout
- Excessive play and wear of ball joint
- Excessive play and wear of tie-rod end
- Excessive play of wheel bearing
- Right and left wheel base imbalance
- Deformation and excessive play of steering link
- Deformation and excessive play of suspension parts

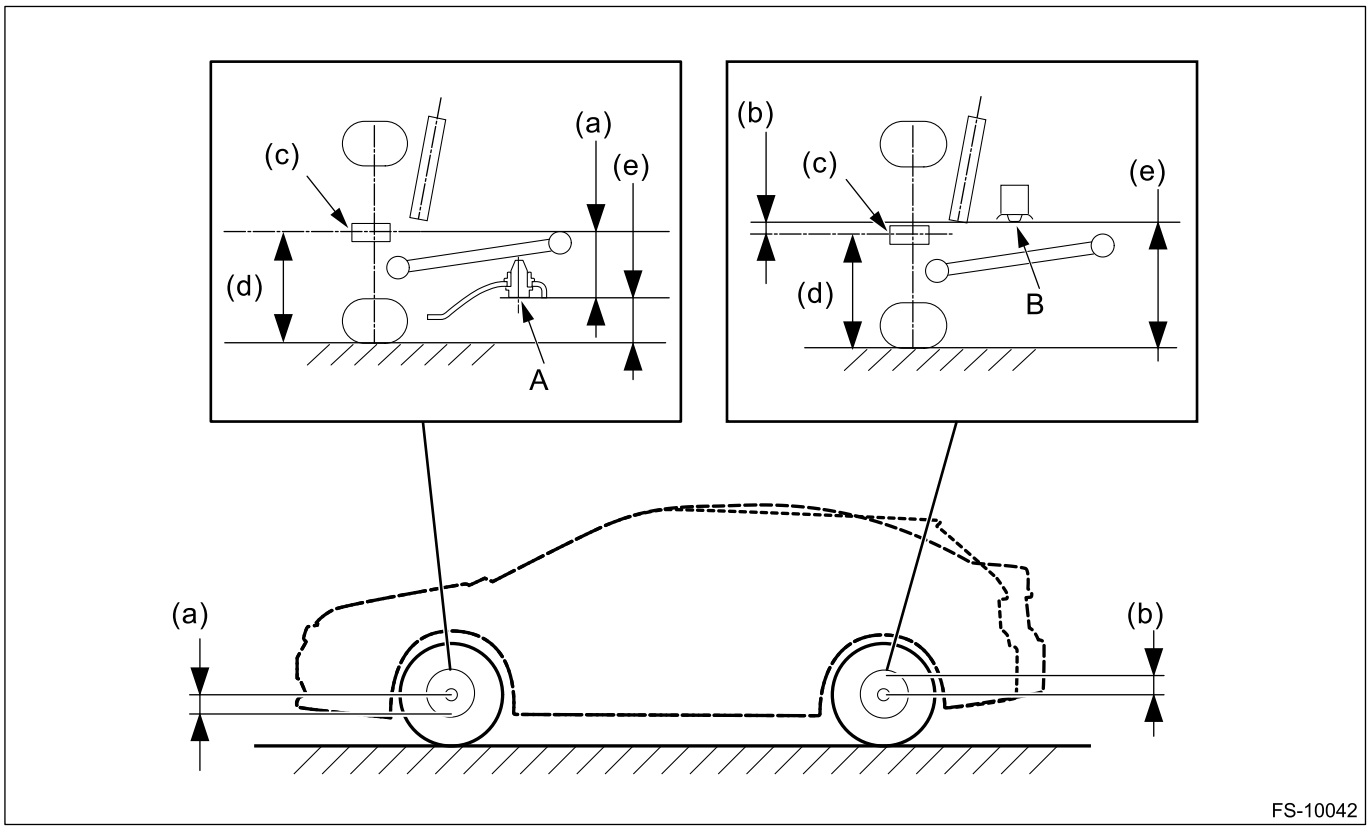
Check, adjust and measure the wheel alignment in accordance with the following procedures.

1	Suspension height (front and rear wheels)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > SUSPENSION HEIGHT.
	↓	
2	Camber (front and rear wheels)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CAMBER. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT CAMBER.
	↓	
3	Caster (front wheel)	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > CASTER.
	↓	
4	Adjustment of difference between right and left steering angles	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > STEERING ANGLE. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES.
	↓	
5	Front wheel toe-in	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > FRONT WHEEL TOE-IN. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT WHEEL TOE-IN.
	↓	
6	Rear wheel toe-in	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > REAR WHEEL TOE-IN.

		Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > REAR WHEEL TOE-IN.
↓		
7	Thrust angle	Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > THRUST ANGLE. Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > THRUST ANGLE.

1. SUSPENSION HEIGHT

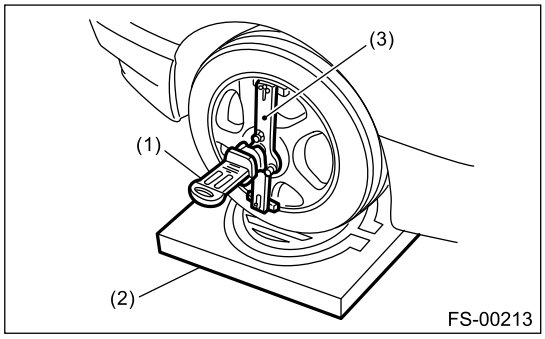
1. Park the vehicle on a level surface.
2. Empty the vehicle so that it is at "curb weight".
   Note:
   Empty the trunk or luggage room, load the spare tire, jack and service tools, and fill up the fuel tank.
3. Set the steering wheel in a straight-ahead position, and stabilize the suspension by moving the vehicle in a straight line for 5 m (16 ft) or more.
4. Measure the distance (d) from the spindle end (c) to the ground surface.
5. Measure the distance (e) from the bolt tip on the vehicle body (points "A" and "B" in the following figure) to the ground surface.
6. Calculate the suspension heights (a) and (b).



Suspension height specification mm (in) (Tolerance: $^{+12\ mm}_{-24\ mm}$ ($^{+0.47\ in}_{-0.94\ in}$))	
Front	**Rear**
140 (5.51)	−15 (−0.59)

2. CAMBER

1. Place the front wheel on the turning radius gauge.
   Note:
   Make sure the ground contact surfaces of the front and rear wheels are at the same height.
2. Set the adapter into the center of wheel, and then set the wheel alignment gauge.



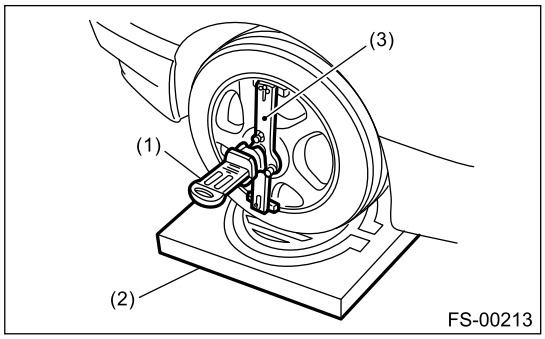
(1) Alignment gauge
(2) Turning radius gauge
(3) Adapter

3. Measure the camber angle in accordance with the operation manual for wheel alignment gauge.

Camber (difference between RH and LH 35′ or less)
−0°30′±0°30′

3. CASTER

1. Place the front wheel on the turning radius gauge. Make sure the ground contact surfaces of the front and rear wheels are at the same height.
2. Set the adapter into the center of wheel, and then set the wheel alignment gauge.



(1) Alignment gauge
(2) Turning radius gauge
(3) Adapter

3. Measure the caster angle in accordance with the operation manual for wheel alignment gauge.

Caster
5°56′

4. STEERING ANGLE

1. Place the vehicle on turning radius gauge.
2. While depressing the brake pedal, turn the steering wheel fully to the left and right.
3. With the steering wheel held at each fully turned position, measure both the inner and outer wheel steering angles.

Inner wheel	Outer wheel
37.8°±1.5°	32.9°±1.5°

5. FRONT WHEEL TOE-IN

Toe-in: Inspection value

0±3 mm (0±0.12 in)

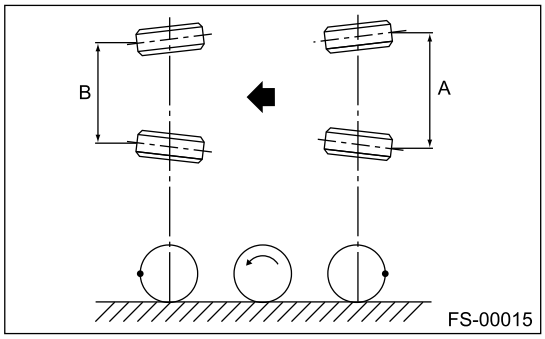
1. Set the toe-in gauge in the position at wheel axis center height behind the right and left front tires.
2. Place a mark at the center of both left and right tires, and measure distance "A" between the marks.
3. Move the vehicle forward to rotate the tires 180°.

   Note:

   Be sure to rotate the tires in the forward direction.
4. Measure the distance "B" between the left and right marks.

   Find toe-in using the following calculation:

   A − B = Toe-in



6. REAR WHEEL TOE-IN

Refer to the FRONT WHEEL TOE-IN for rear toe-in inspection procedures. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION > FRONT WHEEL TOE-IN.

Toe-in: Inspection value

3±3 mm (0.12±0.12 in)

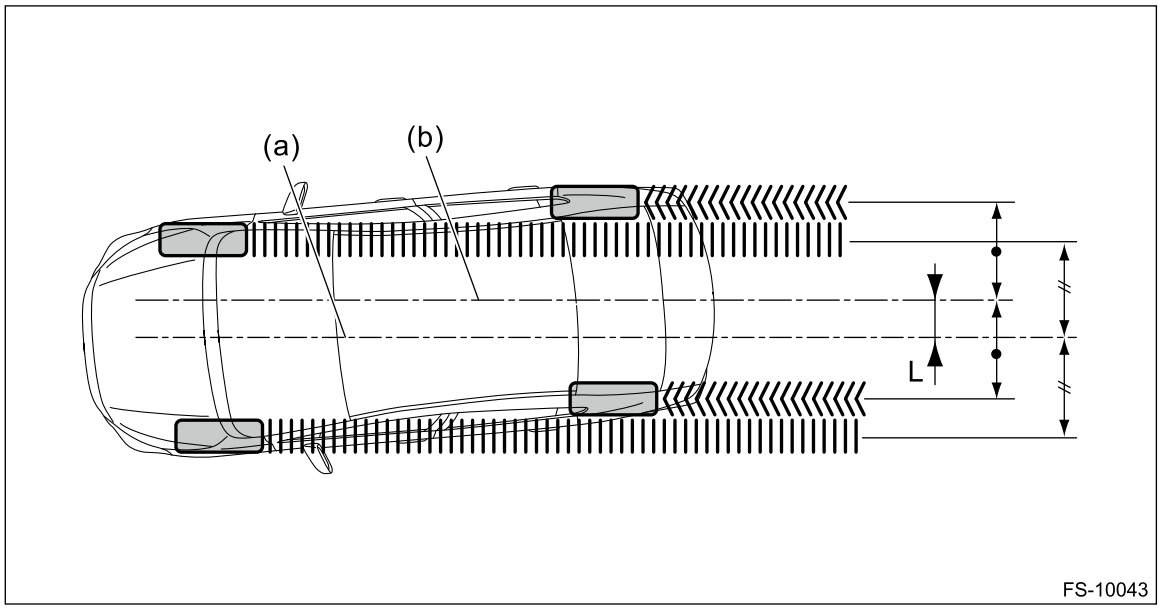
7. THRUST ANGLE

1. Park the vehicle on a level surface.
2. Move the vehicle 3 — 4 meters (10 — 13 ft) straight forward.
3. Draw the center of loci for both the front and rear axles.
4. Measure distance "L" between the center lines of the axle loci.

Thrust angle: Inspection value

0°±30′

Less than 30′ when "L" is 23 mm (0.9 in) or less.



(a) Center line of loci (front axle) (b) Center line of loci (rear axle)

FRONT SUSPENSION > Wheel Alignment

ADJUSTMENT

Caution:

When the wheel alignment has been adjusted, perform the following adjustment.

– Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

– VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

1. FRONT CAMBER

1. Adjust the camber angle to the following value.

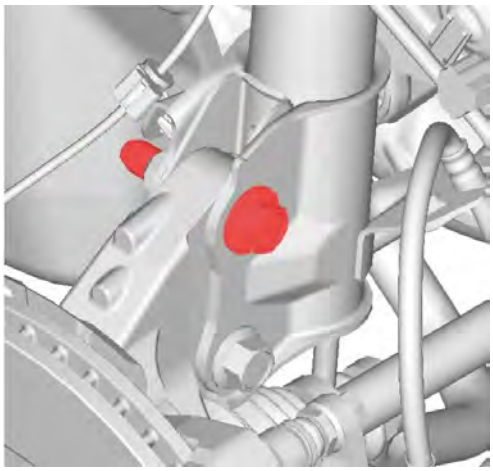
Camber (difference between RH and LH 35′ or less)
−0°30′±0°30′

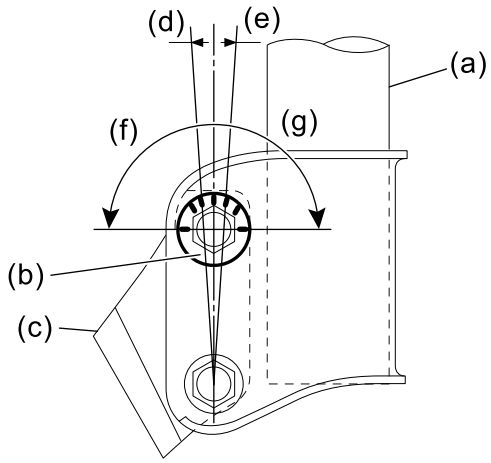
2. Loosen the two self-locking nuts while holding the strut bolts.

3. Turn the camber adjusting bolt so that the camber is set at specification.

Note:

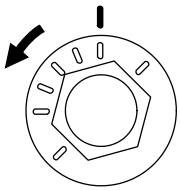
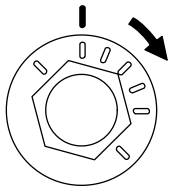
Moving the adjusting bolt by one scale changes the camber by approximately 0°10′.

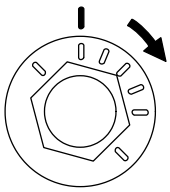
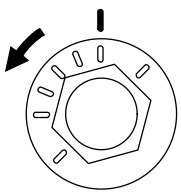




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(a) Strut ASSY
(b) Adjusting bolt
(c) Housing - front axle
(d) Outer direction
(e) Inner direction
(f) Camber is increased.
(g) Camber is decreased.

To increase camber.	
Rotate the left side counterclockwise.	Rotate the right side clockwise.
 FS-00352	 FS-00353

To decrease camber.	
Rotate the left side clockwise.	Rotate the right side counterclockwise.
 FS-00353	 FS-00352

4. Tighten two new self-locking nuts.

Tightening torque:

155 N·m (15.8 kgf-m, 114.3 ft-lb)

Note:

While holding the adjusting bolt side, tighten the nut side.

2. ADJUSTMENT OF DIFFERENCE BETWEEN RIGHT AND LEFT STEERING ANGLES

1. Operate the steering system from lock to lock and stop operating it at the center position from lock to lock, and then install the steering wheel in the straight-ahead position.
   Note:
   Using of the steering wheel angle sensor output values shown on Subaru Select Monitor will facilitate your work.
2. Before adjusting toe-in, be sure to adjust the steering wheel in the straight-ahead position (steering angle sensor output: 0 deg).

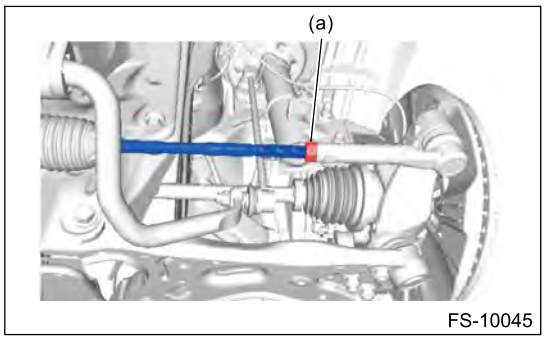
3. FRONT WHEEL TOE-IN

When adjusting the toe-in, adjust it to the following value.

Toe-in: Adjustment value

0±2 mm (0±0.08 in)

1. Check that the left and right wheel steering angles are within specification.
2. Loosen the left and right side steering tie-rod lock nuts (a).
3. Turn the left and right tie-rods by equal amounts until the toe-in is at the specification.
   Note:
   Both the left and right tie-rods are right-hand threaded. To increase toe-in, turn both tie-rods clockwise by equal amount (viewing from the inside of vehicle).
4. Tighten the tie-rod lock nut (a).



Tightening torque:

85 N·m (8.7 kgf-m, 62.7 ft-lb)

5. Check and correct the tie-rod boot if twisted.

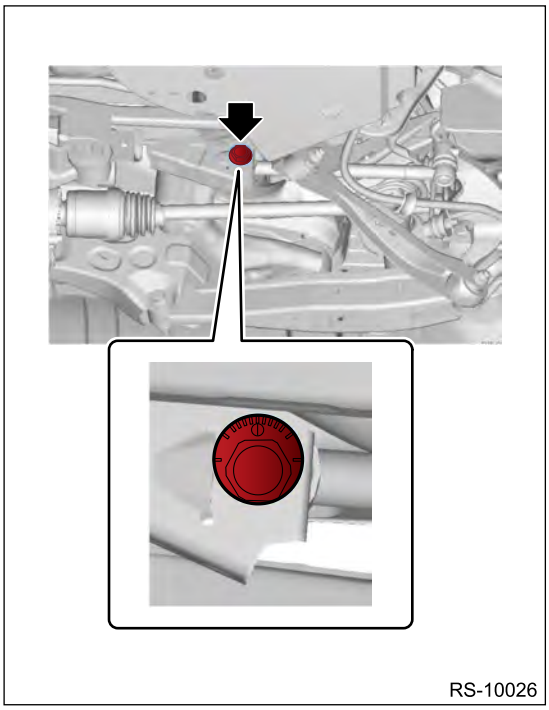
4. REAR WHEEL TOE-IN

When adjusting, adjust it to the following value.

Toe-in: Adjustment value

3±2 mm (0.12±0.08 in)

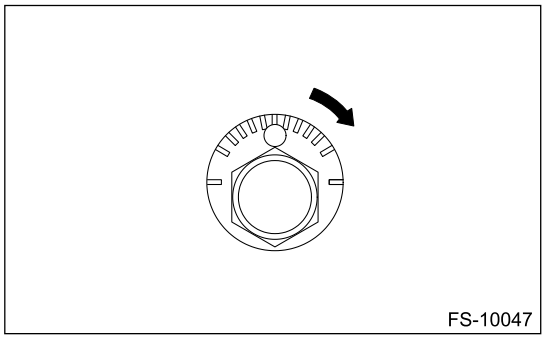
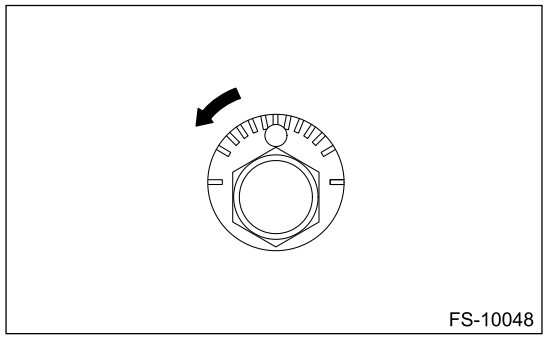
1. Loosen the self-locking nut after holding the bolt head section of lateral link assembly - front.

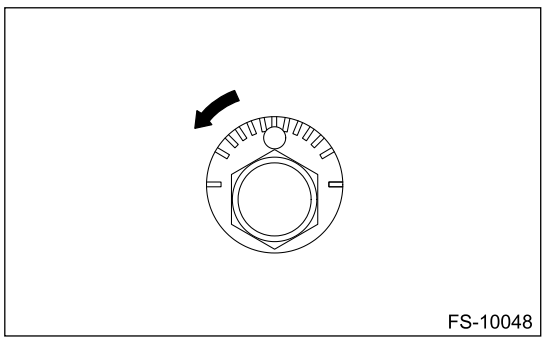
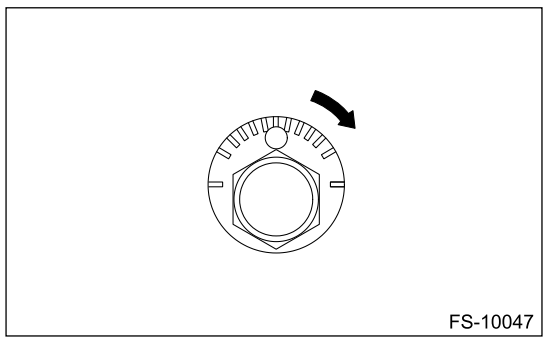


2. Turn the adjusting bolt until toe-in is within the specification.

Note:

When the toe-in of left and right wheels are adjusted at the same time, one graduation of the scale changes toe-in by approx. 6.0 mm (0.24 in).

To increase toe-in.	
Rotate the left side clockwise.	Rotate the right side counterclockwise.
	

To decrease toe-in.	
Rotate the left side counterclockwise.	Rotate the right side clockwise.
	

3. Attach and tighten a new self-locking nut.

Tightening torque:

100 N·m (10.2 kgf-m, 73.8 ft-lb)

Note:

While holding the adjusting bolt side, tighten the nut side.

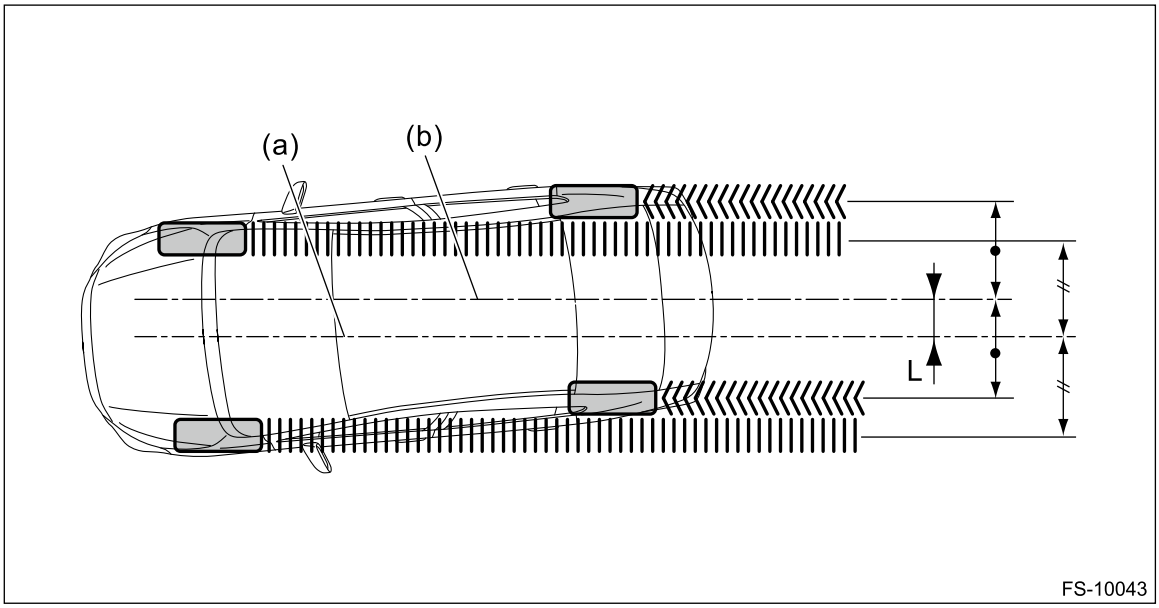
5. THRUST ANGLE

When adjusting, adjust it to the following value.

Thrust angle: Adjustment value

0°±30′

Less than 20′ when "L" is 15 mm (0.6 in) or less



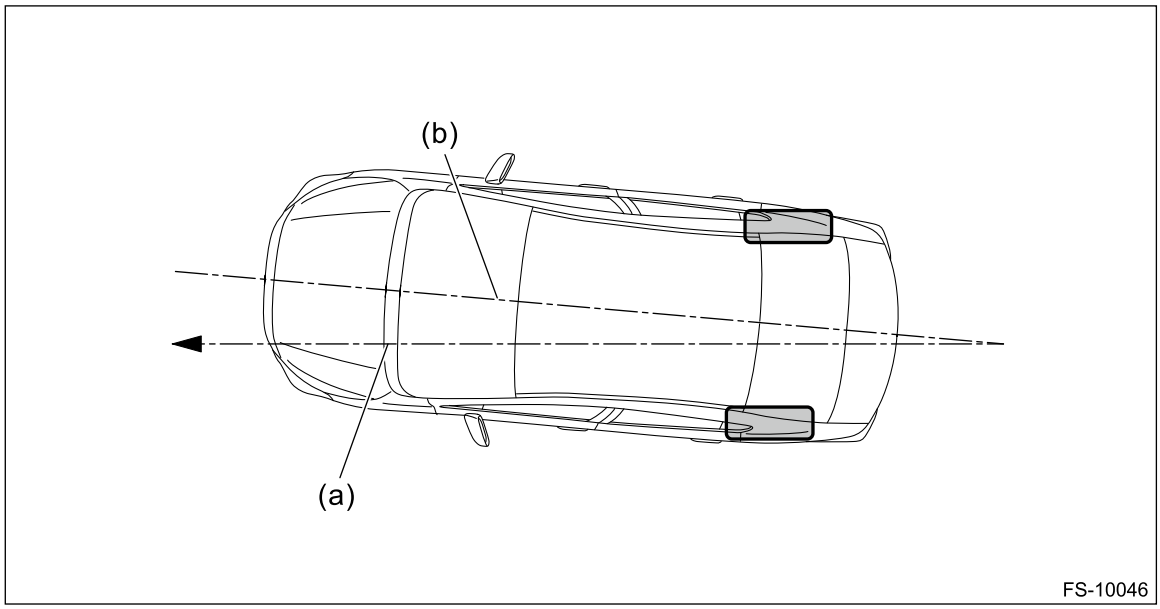
(a) Center line of loci (front axle) (b) Center line of loci (rear axle)

1. Make thrust angle adjustments by turning the toe-in adjusting bolts of the rear suspension equally in the same direction.
2. When one rear wheel is adjusted in a toe-in direction, adjust the other rear wheel equally in toe-out direction, in order to make the thrust angle adjustment.
3. When the left and right adjusting bolts are turned by one graduation, the thrust angle will change approx. 15′. ("L" is approx. 11 mm (0.43 in).)

Note:

Thrust angle is a mean value of left and right wheel toe angles in relation to the vehicle body center line.

Vehicle is driven straight in the thrust angle direction while slanting in the oblique direction depending on the degree of the mean thrust angle.



(a) Thrust angle (b) Body center line

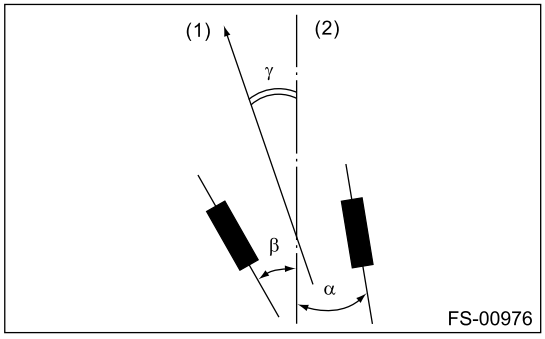
Thrust angle:

$\gamma = (\alpha - \beta)/2$

α: Rear RH wheel toe-in angle

β: Rear LH wheel toe-in angle

Substitute only the positive toe-in values from each wheel into α and β in the calculation.



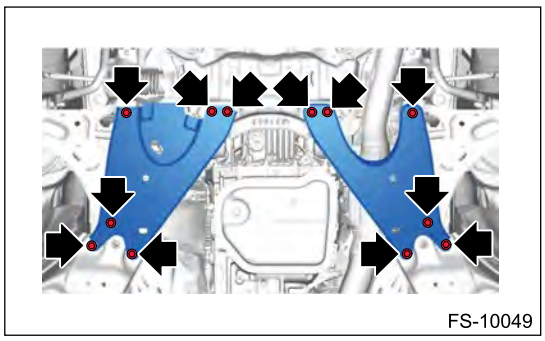
(1) Front

(2) Body center line

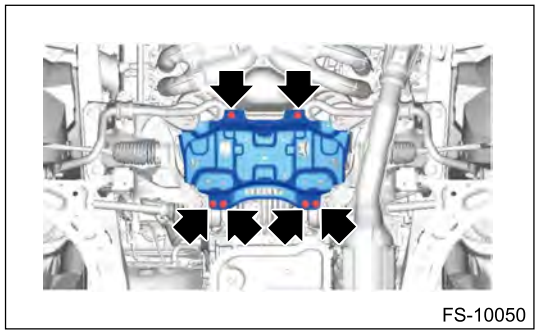
FRONT SUSPENSION > Crossmember Support

REMOVAL

1. Lift up the vehicle.
2. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the bolt, and remove the crossmember support - rear.



4. Remove the bolt, and remove the crossmember support - front.



FRONT SUSPENSION > Crossmember Support

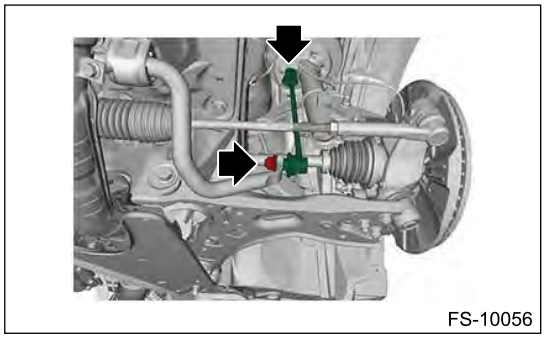
INSTALLATION

1. Install the crossmember support - front and the crossmember support - rear.
   Tightening torque:
   Crossmember support - front: 60N·m (6.1 kgf-m, 44.3 ft-lb)
   Crossmember support - rear: 70N·m (7.1 kgf-m, 51.6 ft-lb)
2. Install the under cover - front.
   Tightening torque:
   18N·m (1.8 kgf-m, 13.3 ft-lb)

REMOVAL

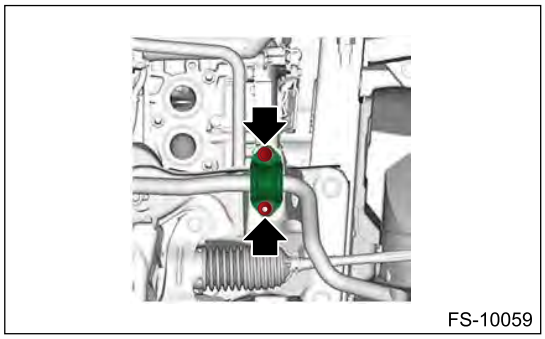
1. STABILIZER LINK

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the left and right stabilizer links.



2. STABILIZER BUSHING

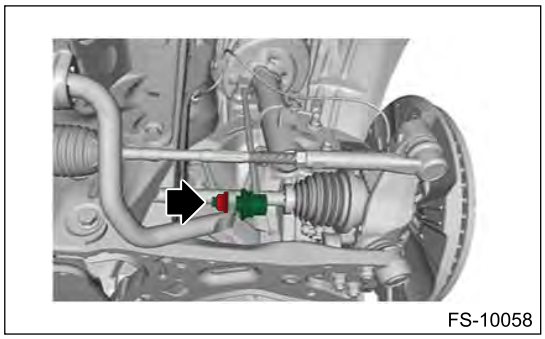
1. Lift up the vehicle.
2. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
4. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
5. Remove the clamp - stabilizer bushing on the left and right sides.



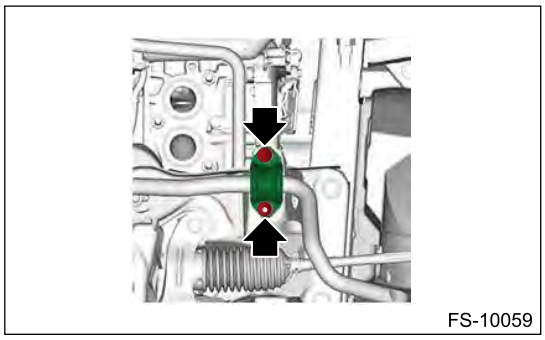
6. Remove the bushing - stabilizer.

3. STABILIZER

1. Lift up the vehicle.
2. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
4. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
5. Remove the left and right stabilizer links (bottom part).


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6. Remove the clamp - stabilizer bushing on the left and right sides.


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7. Remove the stabilizers.

FRONT SUSPENSION > Stabilizer

INSTALLATION

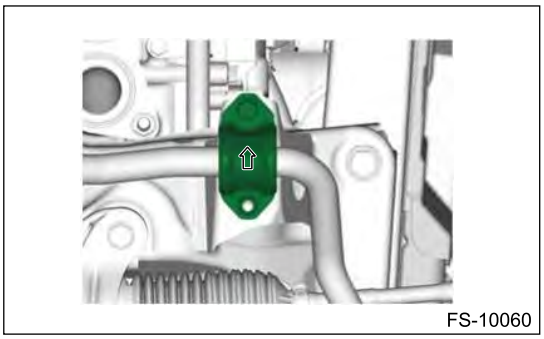
1. STABILIZER LINK

1. Before installation, inspect the following items and replace any faulty part with a new one.
   Check the stabilizer link for damage.
2. Install the stabilizer link.
   Tightening torque:
   60 N·m (6.1 kgf-m, 44.3 ft-lb)
3. Install the under cover - front.
   Tightening torque:
   18N·m (1.8 kgf-m, 13.3 ft-lb)
4. Lower the vehicle, and install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. STABILIZER BUSHING

1. Before installation, inspect the following items and replace any faulty part with a new one.
   Check the stabilizer bushing for abnormal cracks, fatigue or damage.
2. Install the bushing - stabilizer.
3. Install the clamp - stabilizer bushing.

Caution:
Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.

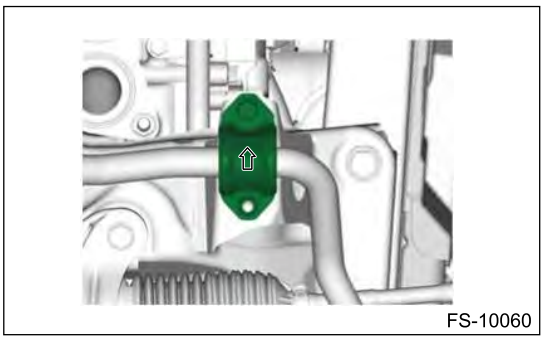


Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)

4. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
5. Install the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
6. Install the under cover - front.
Tightening torque:
18N·m (1.8 kgf-m, 13.3 ft-lb)

3. STABILIZER

1. Install the clamp - stabilizer bushing.
Caution:
Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.

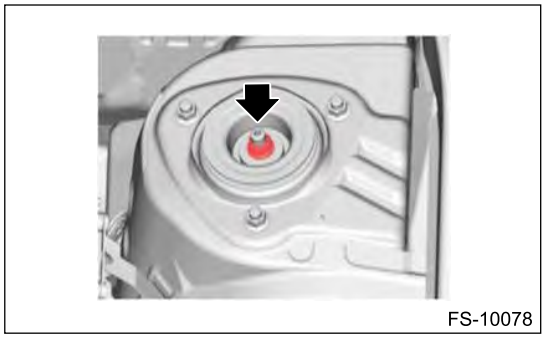


Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)

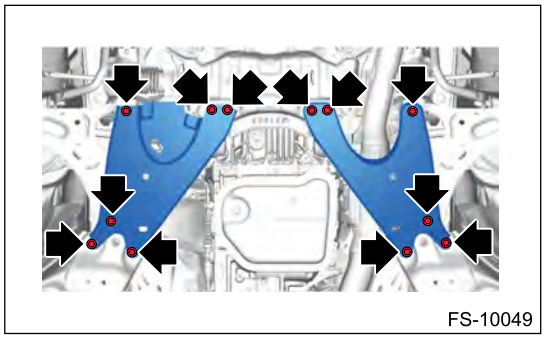
2. Install the stabilizer link (bottom part).
Tightening torque:
60 N·m (6.1 kgf-m, 44.3 ft-lb)
3. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
4. Install the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
5. Install the under cover - front.
Tightening torque:
18N·m (1.8 kgf-m, 13.3 ft-lb)

REMOVAL

1. Remove the strut mount protection cap.
2. Loosen the nut for a strut mount CTR by 2 turns.


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3. Lift up the vehicle, and then remove the front wheels.
4. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
5. Remove the bolt, and remove the crossmember support - rear.


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6. Disconnect the tie-rod end.

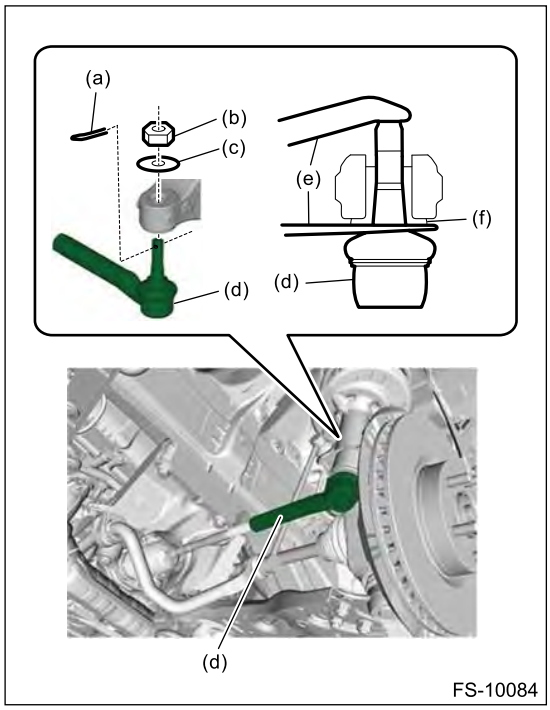
Note:

Securely hook the tie-rod ball joint puller (e) to the collar (f).

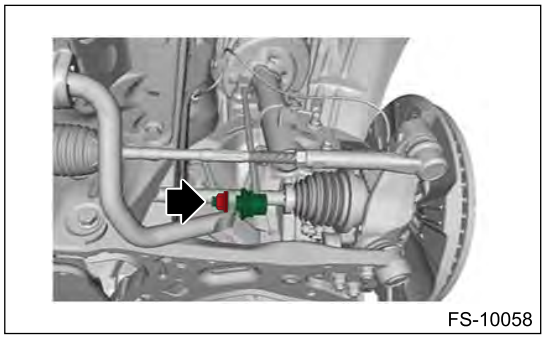
(1) Pull out the cotter pin (a).
(2) Remove the castle nut (b) and washer (c).
(3) Using a tie-rod ball joint puller (e), detach the tie-rod end (d).

Preparation tool:

Tie-rod ball joint puller



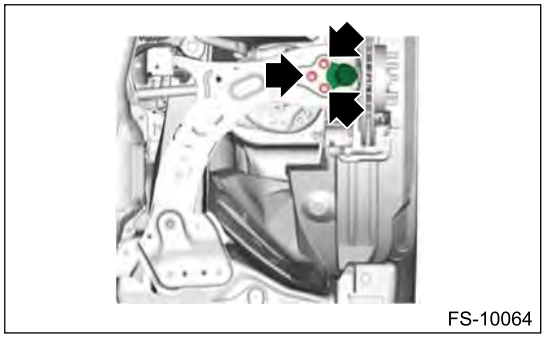
7. Remove the left and right stabilizer links (bottom part).



8. Remove the flange nut on the bottom of the ball joint.

Note:

- **To prevent damage of the front arm ball joint boot, place a wooden block, etc. between front arm and ball joint.**
- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**



9. Remove the drive shaft. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft>REMOVAL.

10. Remove the ball joint.

Note:

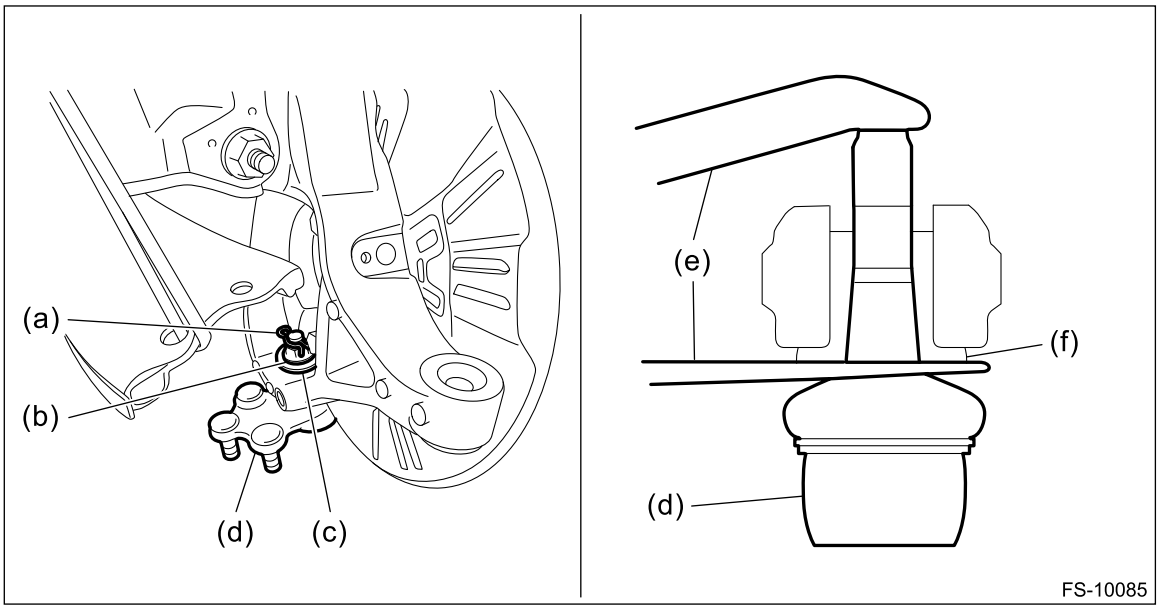
Securely hook the tie-rod ball joint puller (e) to the collar (f).

(1) Pull out the snap pin (a), and remove the flange nut (b) and washer (c).

(2) Use a tie-rod ball joint puller (e) to detach the ball joint (d).

Preparation tool:

Tie-rod ball joint puller



(3) Pull out the ball joint.

FRONT SUSPENSION > Ball Joint

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Do not apply grease to the tapered portion of ball stud.**
- **Make sure that there is no gap between the housing assembly - front axle and the collar.**
- **If the collar is removed from the housing assembly - front axle, replace the housing assembly - front axle with a new part.**

1. Install the ball joint into the housing - front axle.
   Tightening torque:
   51N·m (5.2 kgf-m, 37.6 ft-lb)
2. Insert the washer, and secure the flange nut.
3. Insert a new snap pin to secure the flange nut.
4. Install the drive shaft. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft>INSTALLATION.
5. Install the flange nut on the bottom of the ball joint.
   Tightening torque:
   100N·m (10.2 kgf-m, 73.8 ft-lb)
6. Install the stabilizer link (bottom part).
   Tightening torque:
   60N·m (6.1 kgf-m, 44.3 ft-lb)
7. Install the tie-rod end.
   Note:
   - **Do not forget to install the washer.**
   - **When tightening the castle nut, tighten the castle nut to the specified torque first, then tighten it further but within 60° until the hole in the ball stud is aligned with a slot in castle nut.**

Tightening torque:

27N·m (2.7 kgf-m, 19.9 ft-lb)

8. Insert a new cotter pin and secure the castle nut.
9. Install the crossmember support - rear.

   Tightening torque:

   70N·m (7.1 kgf-m, 51.6 ft-lb)
10. Install the under cover - front.

    Tightening torque:

    18N·m (1.8kgf-m, 13.3 ft-lb)
11. Lower the vehicle, and install the front wheels.

    Tightening torque:

    120N·m (12.2 kgf-m, 88.5 ft-lb)
12. Confirm that the wheels are in full contact with the ground, and tighten the nuts of the strut mount CTR.

    Caution:

    Be sure to use a new self-locking nut.

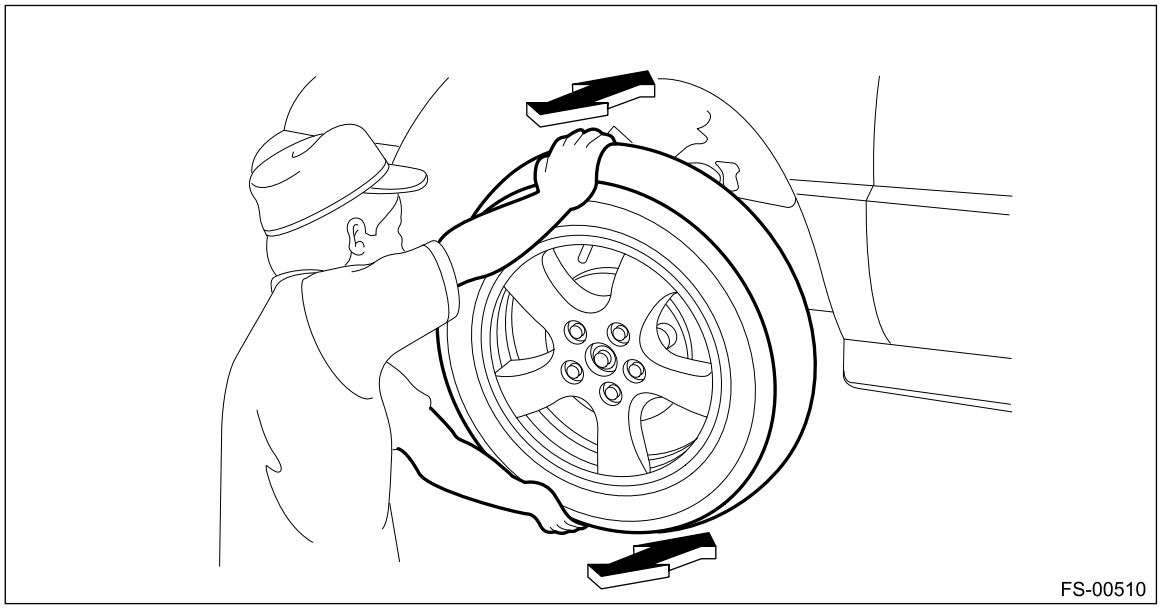
    Tightening torque:

    55N·m (5.6 kgf-m, 40.6 ft-lb)

FRONT SUSPENSION > Ball Joint

INSPECTION

1. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal depressed.



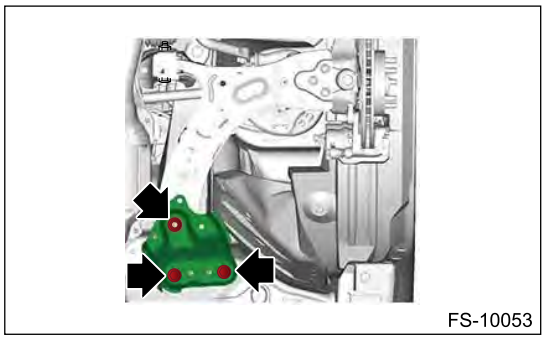
- **Looseness exists** → Replace the ball joint. Ref. to FRONT SUSPENSION>Ball Joint>REMOVAL.

2. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
3. Replace the ball joint if the dust cover is damaged when visually inspecting the dust cover.

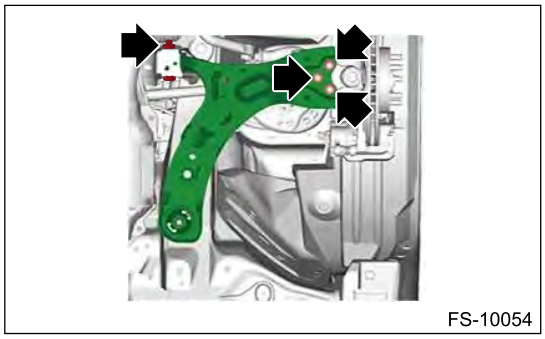
FRONT SUSPENSION > Front Arm

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
3. Remove the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
4. Remove the front arm rear plate.



5. Remove the front arm assembly.



FRONT SUSPENSION > Front Arm

INSTALLATION

Caution:
For parts which are not reusable, always use new parts.

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Check the front arm assembly for damage or cracks, and replace if defective.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
   - Visually check the dust cover on the ball joint for damage.
2. Using new self-locking nuts and flange bolts, temporarily tighten the front arm assembly to the crossmember COMPL.
3. Using new self-locking nuts, temporary tighten the front arm assembly to the body side.
4. Install the front arm rear plate.
   Tightening torque:
   150 N·m (15.3 kgf-m, 110.6 ft-lb)
5. Connect the front arm assembly to the ball joint.
   Tightening torque:
   100 N·m (10.2 kgf-m, 73.8 ft-lb)
6. Install the crossmember support - rear.

Tightening torque:
70 N·m (7.1 kgf-m, 51.6 ft-lb)

7. Install the under cover - front.
Tightening torque:
18N·m (1.8kgf-m, 13.3 ft-lb)

8. Install the front wheels.
Tightening torque:
120 N·m (12.2 kgf-m, 88.5 ft-lb)

9. Unload the vehicle from the lift, confirm that the wheels are in full contact with the ground and the vehicle is at curb weight, and tighten the bolt which secures the front arm assembly to the crossmember COMPL and the nut which secures the assembly to the body side.
Tightening torque:
Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.

10. Inspect the wheel alignment and adjust if necessary.
- Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
- Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

Caution:
When the wheel alignment has been adjusted, perform the following adjustment.
- **Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.**
- **VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

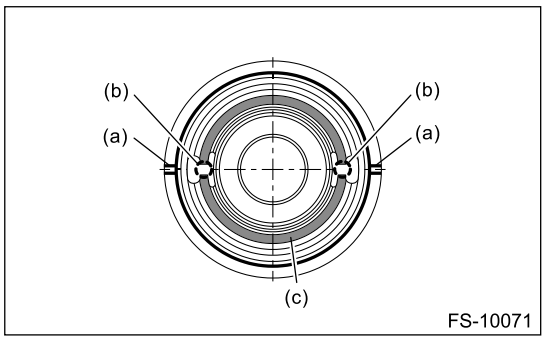
11. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

FRONT SUSPENSION > Front Arm

DISASSEMBLY

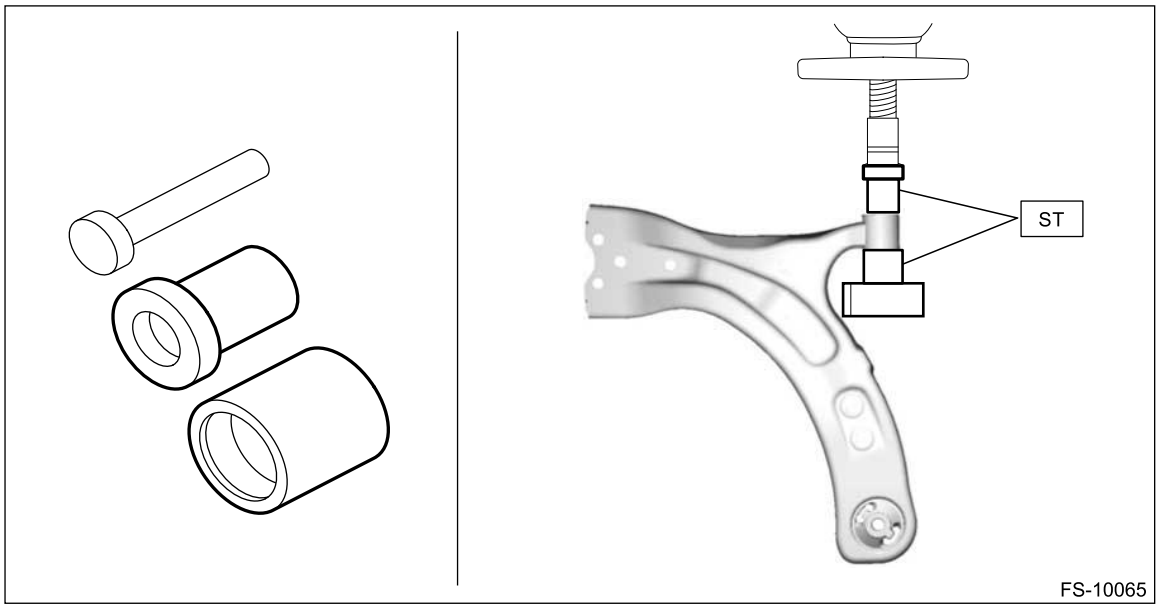
1. BUSHING FRONT - FRONT ARM

1. Put an alignment mark on the front arm assembly based on the split portion of the bushing intermediate plate of the busing front - front arm.
Caution:
Always put an alignment mark for aligning the position on bushing installation.



(a) Put an alignment mark. (b) Gap of bushing intermediate plate (c) Bushing intermediate plate

2. Using the ST and a press, remove the busing front - front arm.
Preparation tool:
ST: INSTALLER & REMOVER SET (927680000)



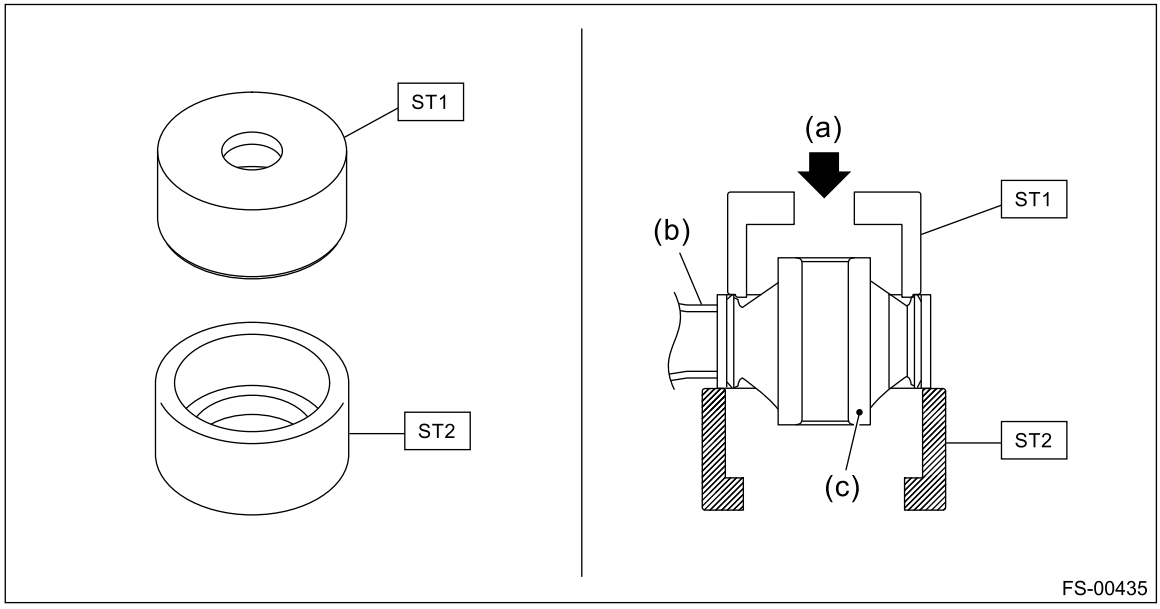
2. BUSHING REAR - FRONT ARM

1. Put an alignment mark on the front arm assembly based on the center of recess portion of the busing rear - front arm.
2. Using the ST and a press, remove the busing rear - front arm.

Preparation tool:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



(a) Press (b) Front arm (c) Rear bushing

FRONT SUSPENSION > Front Arm

ASSEMBLY

1. BUSHING FRONT - FRONT ARM

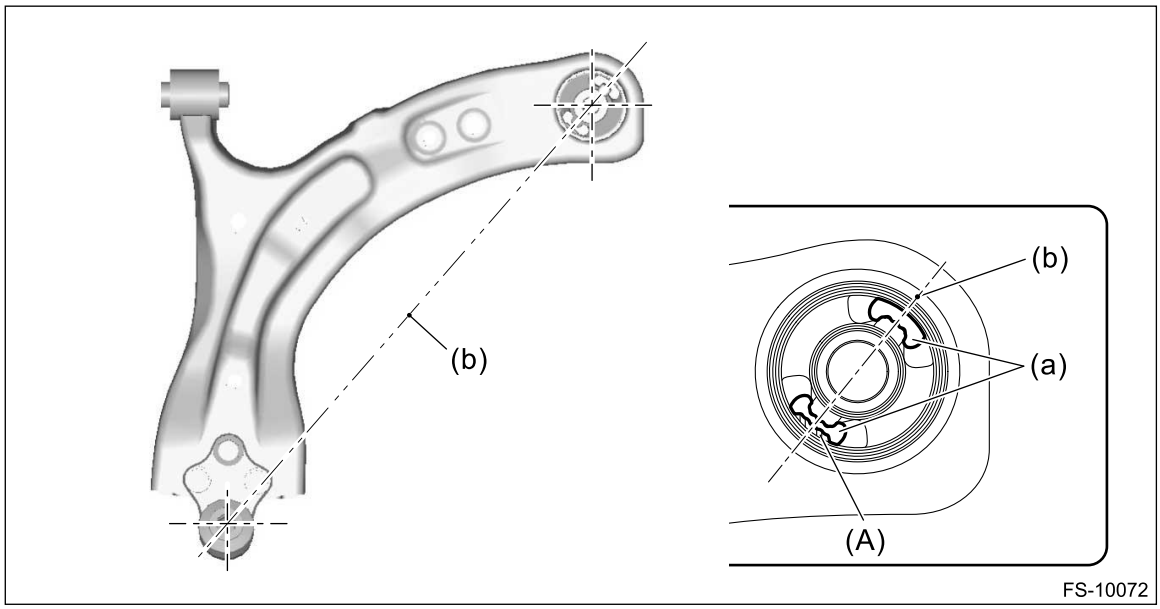
1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Check the front arm assembly for damage or cracks, and replace if defective.

- Visually check the bushing for abnormal cracks, fatigue or damage.
- Visually check the dust cover on the ball joint for damage.

2. Assemble each part in the reverse order of disassembly.

2. BUSHING REAR - FRONT ARM

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Check the front arm assembly for damage or cracks, and replace if defective.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
   - Visually check the dust cover on the ball joint for damage.
2. Align a line extending from the center of recess portion with the ball joint after placing the protrusion (A) of recess portion to the ball joint side of the front arm assembly.

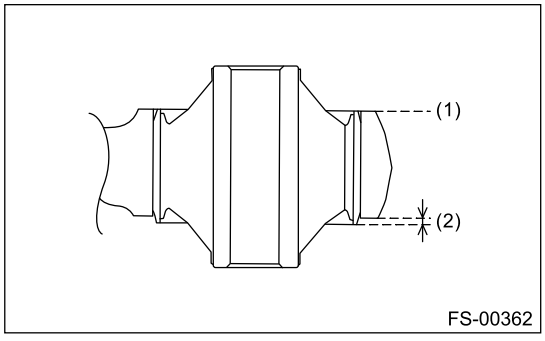


(a) Recess section (b) Center line of recess section

3. Using the ST and a press, install the busing rear - front arm.

Caution:

Align the upper face of front arm assembly and the end of bushing during installation.



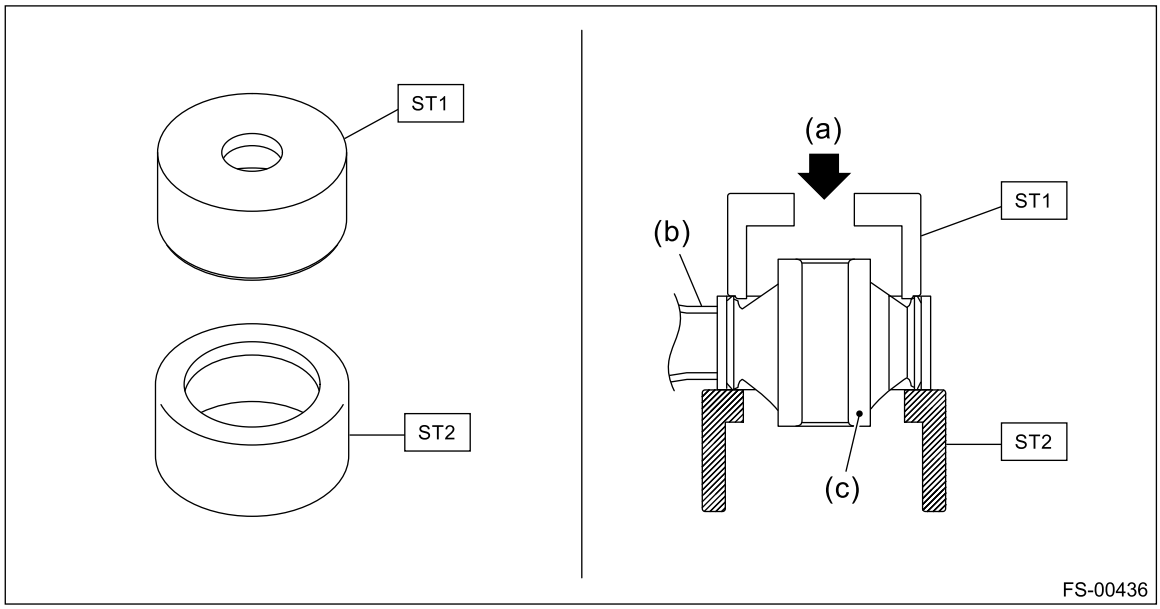
(1) Aligned

(2) Not aligned

Preparation tool:

ST1: REMOVER (20299AG000)

ST2: BASE (20299AG010)



(a) Press

(b) Front arm ASSY

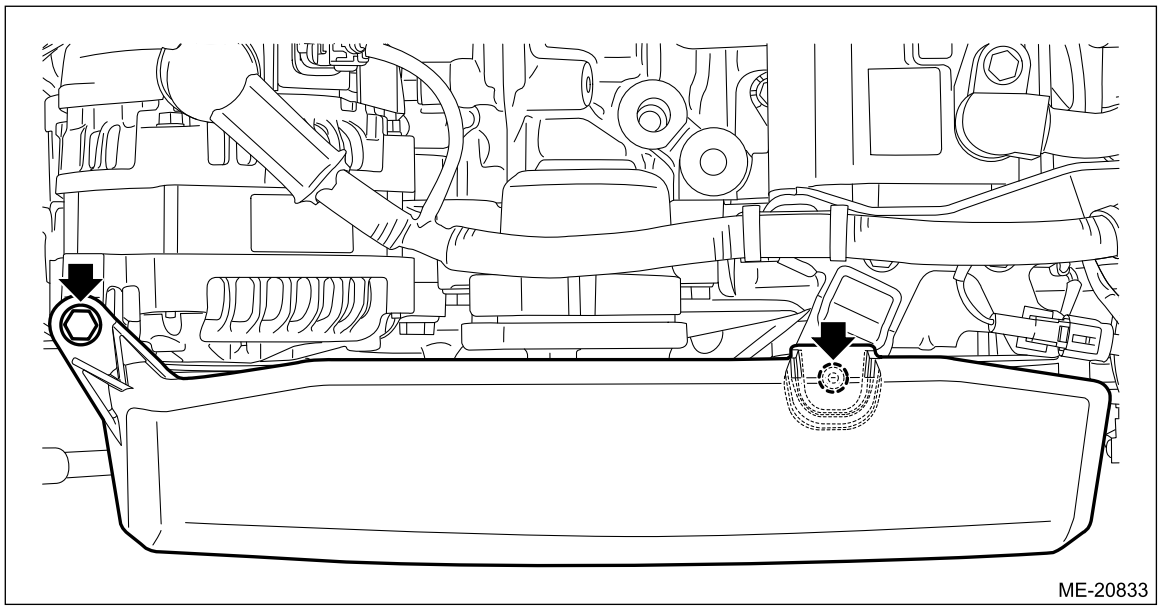
(c) Bushing rear - front arm

REMOVAL

Caution:

- **The power steering control module continues to operate after the engine stops and calculates the temperature in the control module. Therefore, before starting service of the power steering system which requires disconnection of the connector, stop the engine and allow approx. 30 minutes until the control module becomes cold.**
- **Be careful not to let any foreign matter (dust, water, oil, etc.) enter into the power steering control module connector when removing or installing. If a foreign matter enters, completely remove it.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the V-belt covers.



3. Using the ST1, install the ST2 to the engine unit.

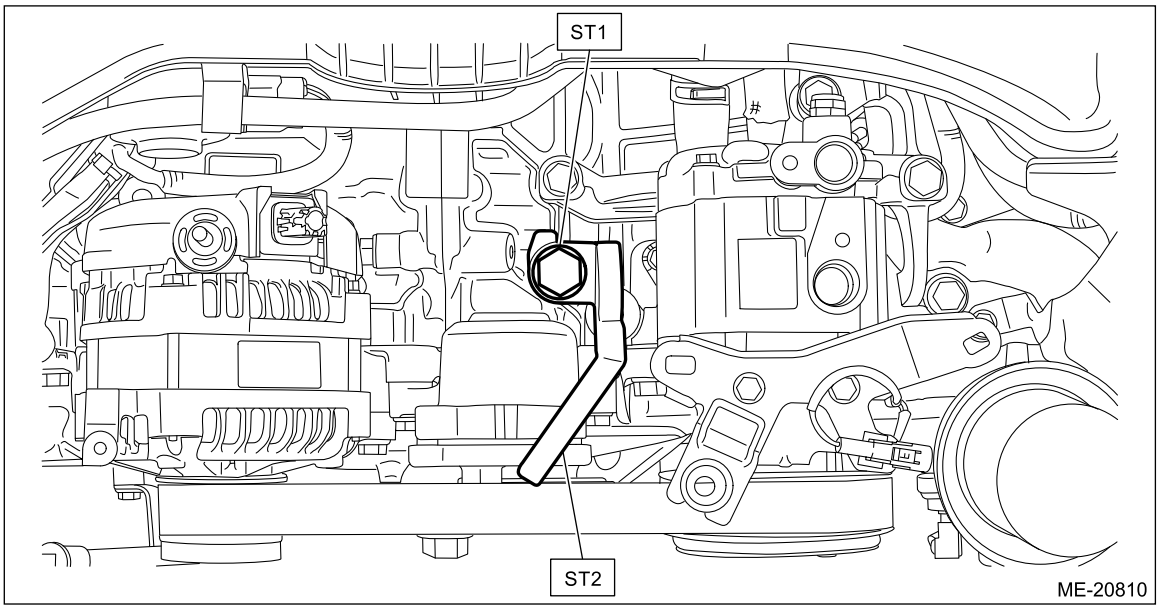
   Preparation tool:

   ST1: BOLT (18363AA050)

   ST2: HANGER (18360AA040)

   Tightening torque:

   43 N·m (4.4kgf-m, 31.7 ft-lb)

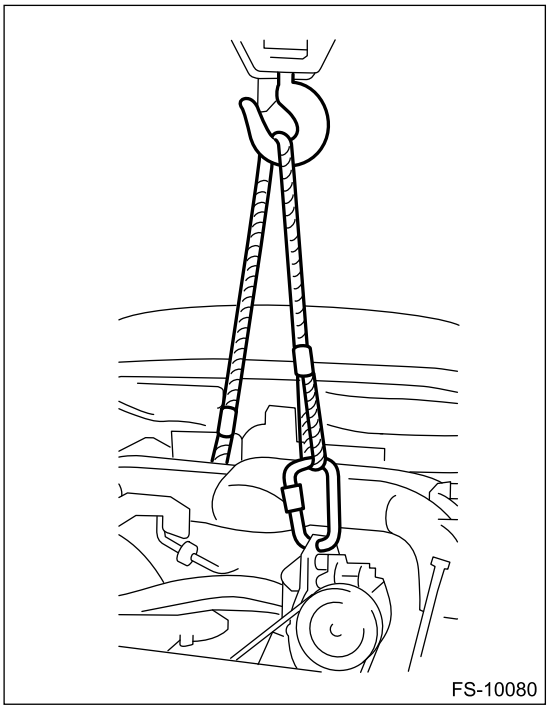


4. Support the engine with a lifting device and wire ropes.

(1) While lifting up the vehicle, also raise up the lifting device simultaneously.

Caution:

Be careful not to damage the vehicle with a lifting device or wire ropes.

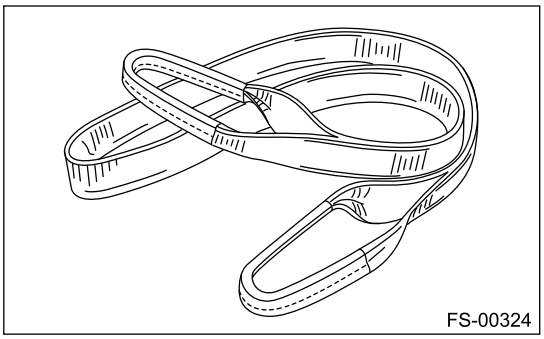


(2) Raise up the lifting device, and lift the engine body by approx. 10 mm (0.39 in).

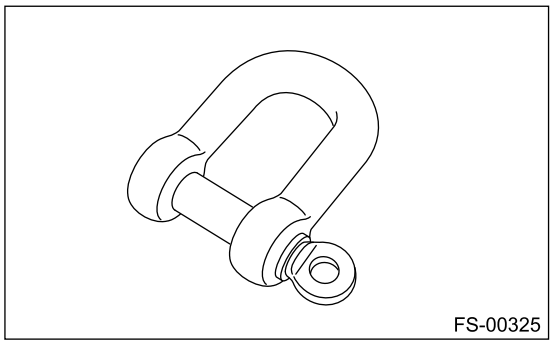
(3) Attach the sling belt so that it wraps around the both frames using the shackle.

Caution:

- **Be sure to attach the sling belt to ensure safety in operation.**
- **Use a sling belt with the length of 2 m (6.6 ft), the width of 35 — 40 mm (1.38 — 1.57 in) and the load capacity of 1 t (2205 lb) or more.**



- **Use a shackle with the load capacity of 0.5 t (1103 lb) or more.**



5. Lift up the vehicle, and then remove the front wheels.
6. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
7. Remove the crossmember support - rear and the crossmember support - front. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
8. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
9. Remove the stabilizers. Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL > STABILIZER.
10. Disconnect the tie-rod end.

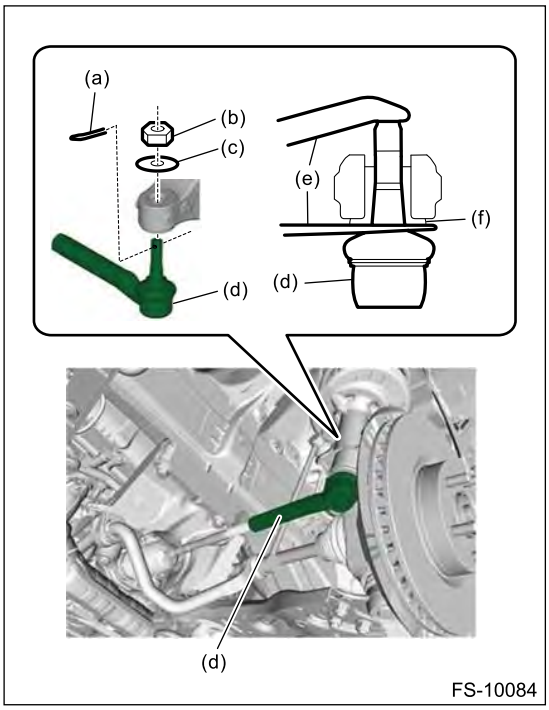
Note:

Securely hook the tie-rod ball joint puller (e) to the collar (f).

(1) Pull out the cotter pin (a).
(2) Remove the castle nut (b) and washer (c).
(3) Using a tie-rod ball joint puller (e), detach the tie-rod end (d).

Preparation tool:

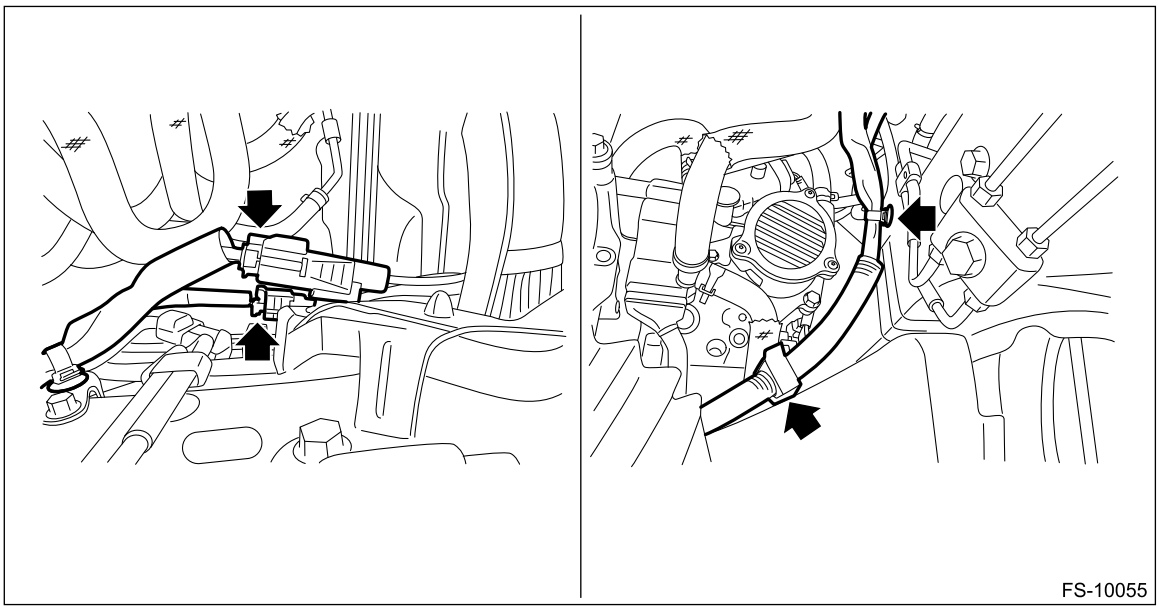
Tie-rod ball joint puller



11. Remove the front arm assembly. Ref. to FRONT SUSPENSION>Front Arm>REMOVAL.

12. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

13. Disconnect the power steering harness connector and harness clamp.



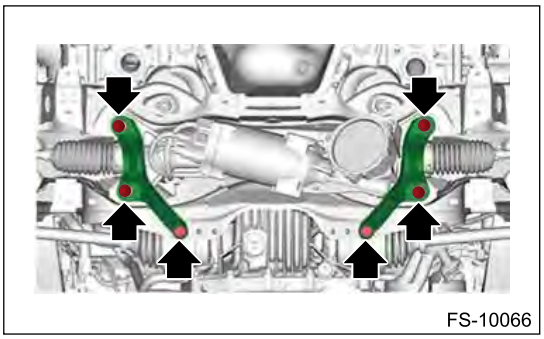
14. Remove the steering gearbox assembly from the crossmember COMPL.

Caution:

When lowering the transmission jack, make sure that the tie-rod end and the drive shaft boot do not interfere. The drive shaft boot may be damaged.

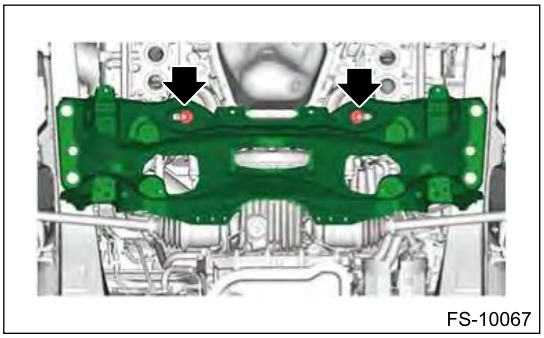
(1) Support the steering gearbox assembly from the bottom side using a transmission jack.

(2) Remove the bolts securing the steering gearbox assembly and stiffener to the crossmember COMPL.


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(3) Lower the transmission jack slowly, and lower the steering gearbox assembly.

15. Remove the nuts which secure the crossmember COMPL to the engine mounting.


FS-10067

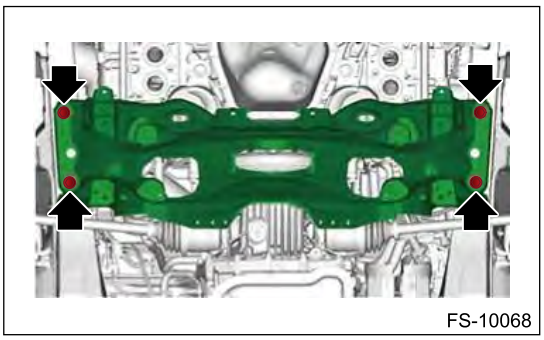
16. Remove the crossmember COMPL.

Caution:

The crossmember COMPL is heavy. Make sure that it is firmly supported so that it is level.

(1) Support the crossmember COMPL from the bottom side using a transmission jack.

(2) Remove the bolts which secure the crossmember COMPL to the body.


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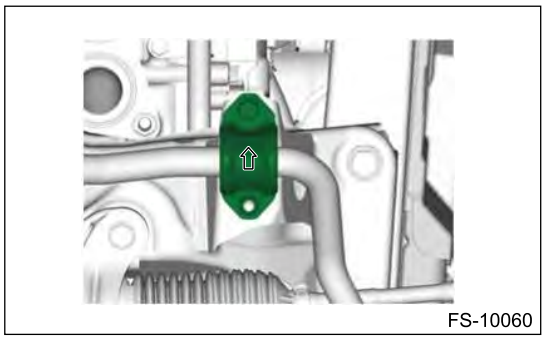
(3) Lower the transmission jack slowly, and lower the crossmember COMPL.

FRONT SUSPENSION > Crossmember

INSTALLATION

Caution:

- **When raising the transmission jack, make sure that the tie-rod end and the drive shaft boot do not interfere. The drive shaft boot may be damaged.**
- **The crossmember COMPL is heavy. Make sure that it is firmly supported so that it is level.**
- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**
- **Make sure that there is no gap between the housing assembly - front axle and the collar.**
- **If the collar is removed from the housing assembly - front axle, replace the housing assembly - front axle with a new part.**
- **Install the clamp - stabilizer bushing with the arrow mark facing the front of the vehicle.**



1. Install the crossmember COMPL.

   Note:

   Check the crossmember COMPL for damage or cracks, and correct or replace if defective.

   (1) Install the bolts which secure the crossmember COMPL to the body.

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.
2. Install the engine mounting and the crossmember COMPL with new nuts.

   Caution:

   Be careful not to damage the vehicle with a lifting device or wire ropes.

   Tightening torque:

   Engine mounting — crossmember COMPL: 90 N·m (9.2 kgf-m, 66.4 ft-lb)
3. Install the steering gearbox assembly and stiffener to the crossmember COMPL.

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.
4. Install the power steering harness connector and harness clamp.
5. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
6. Install the front arm assembly. Ref. to FRONT SUSPENSION>Front Arm>INSTALLATION.
7. Install the tie-rod end.

Note:

- **Do not forget to install the washer.**
- **When tightening the castle nut, tighten the castle nut to the specified torque first, then tighten it further but within 60° until the hole in the ball stud is aligned with a slot in castle nut.**

Tightening torque:

27 N·m (2.7 kgf-m, 19.9 ft-lb)

8. Insert a new cotter pin and secure the castle nut.
9. Install the stabilizer. Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER.
10. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
11. Install the crossmember support - front and the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
12. Install the under cover - front.

    Tightening torque:

    18N·m (1.8kgf-m, 13.3 ft-lb)
13. Install the front wheels and lower the vehicle.

    Tightening torque:

    120 N·m (12.2 kgf-m, 88.5 ft-lb)
14. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
15. Inspect the wheel alignment and adjust if necessary.
    - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
    - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

    Caution:

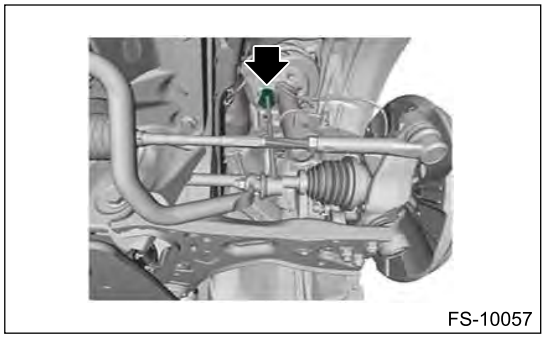
    When the wheel alignment has been adjusted, perform the following adjustment.

    – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

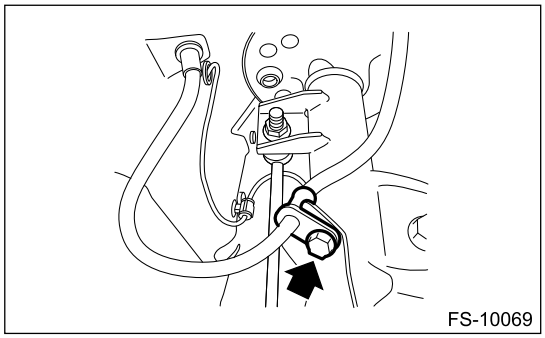
    – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
16. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

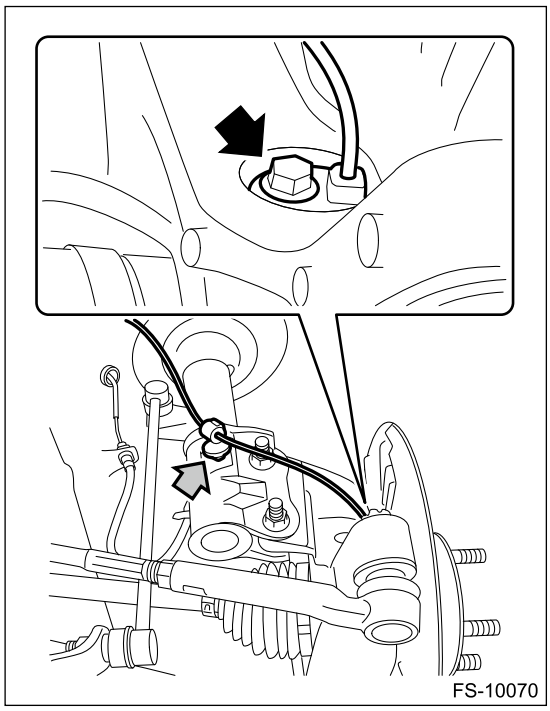
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the left and right stabilizer links (upper part).



3. Remove the brake hose bracket.



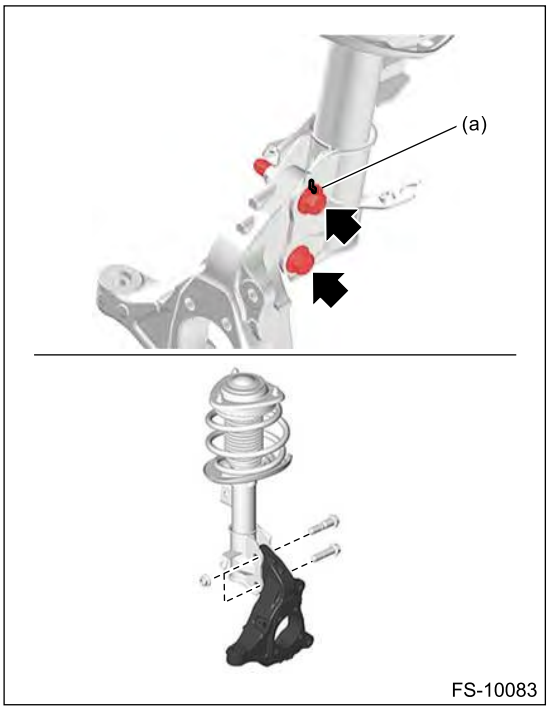
4. Remove the ABS wheel speed sensor.



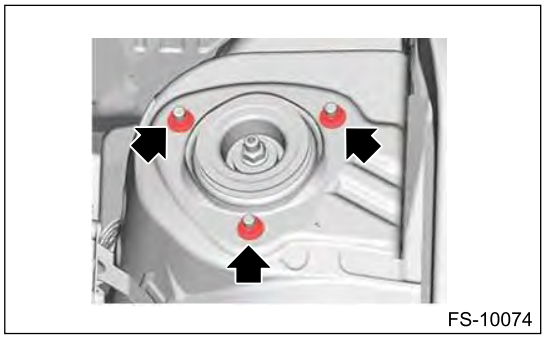
5. Remove the strut assembly.
   (1) Place an alignment mark (a) on the adjusting bolt and the strut.
   (2) Remove the adjusting bolts and flange bolts for the strut assembly.

Caution:

While holding the adjusting bolt side, tighten the nut side.



(3) Remove the three nuts securing strut mount to body.



FRONT SUSPENSION > Front Strut

INSTALLATION

Caution:

For parts which are not reusable, always use new parts.

1. Install the strut mount - front at the upper side of the strut to the vehicle body.
   Tightening torque:
   32 N·m (3.3 kgf-m, 23.6 ft-lb)
2. Align alignment marks on the camber adjusting bolt and strut, and install the strut to the housing - front axle.
   Note:
   While holding the bolt head of adjusting bolt, tighten the nut.
   Tightening torque:
   155 N·m (15.8 kgf-m, 114.3 ft-lb)
3. Install the ABS wheel speed sensor and harness bracket.
   Caution:
   During the installation, make sure that the marking of ABS wheel speed sensor harness does not twist.
   Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

4. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
5. Install the stabilizer link. Ref. to FRONT SUSPENSION>Stabilizer>INSTALLATION > STABILIZER LINK.
6. Lower the vehicle, and install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
7. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

   Caution:
   When the wheel alignment has been adjusted, perform the following adjustment.
   – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
   – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
8. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

FRONT SUSPENSION > Front Strut

DISASSEMBLY

1. Using a coil spring compressor, compress the coil spring.
2. Using a hexagon wrench to prevent strut rod from turning, remove the self-locking nut with ST.

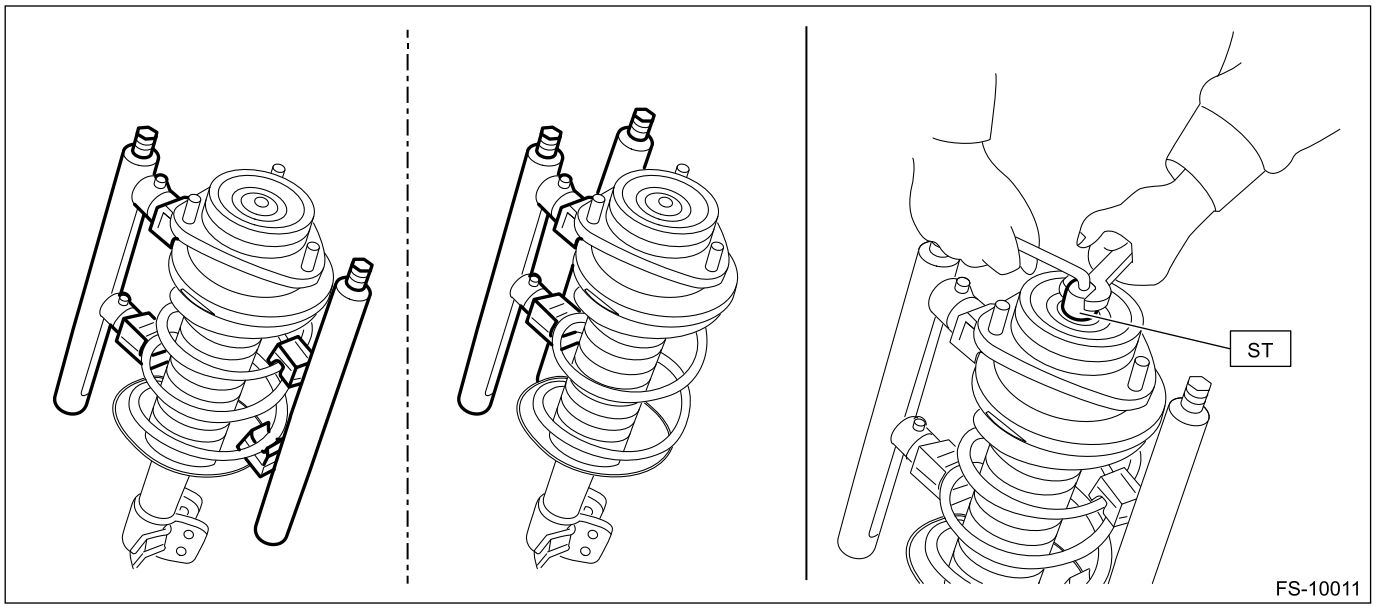
   Caution:
   When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

   Preparation tool:
   ST: STRUT MOUNT SOCKET (20399AG000)

Note:

<Example of coil spring compressor installation>

The installing position of coil spring compressor varies depending on the coil spring shape and winding number.



3. Remove the strut mount - front, the strut bearing - front and the dust cover - front strut from the strut COMPL.
4. Gradually decrease the compression force of compressor, and remove the coil spring.
5. Remove the helper - front strut.

FRONT SUSPENSION > Front Strut

ASSEMBLY

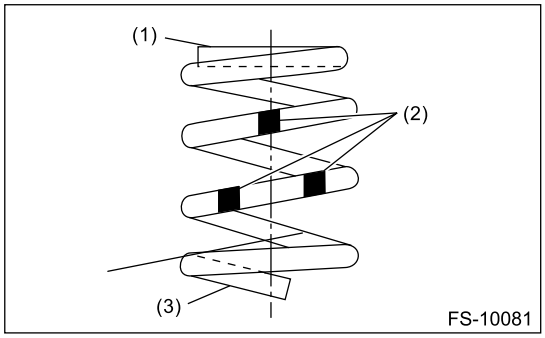
1. Before assembly, check each part. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
2. Using a coil spring compressor, compress the coil spring.

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

Note:

Make sure that the vertical install direction of the coil spring is as shown in the figure.



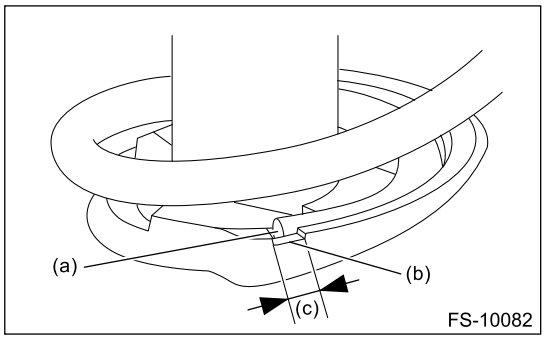
(1) Diameter is large (upper part)

(2) Identification paint

(3) Diameter is small (bottom part)

3. Install the rubber seat LWR to the strut COMPL.
4. Set the coil spring correctly so that the spring end face (a) fits within the area (c) of the cutout

portion (b) of rubber seat LWR as shown in the figure.



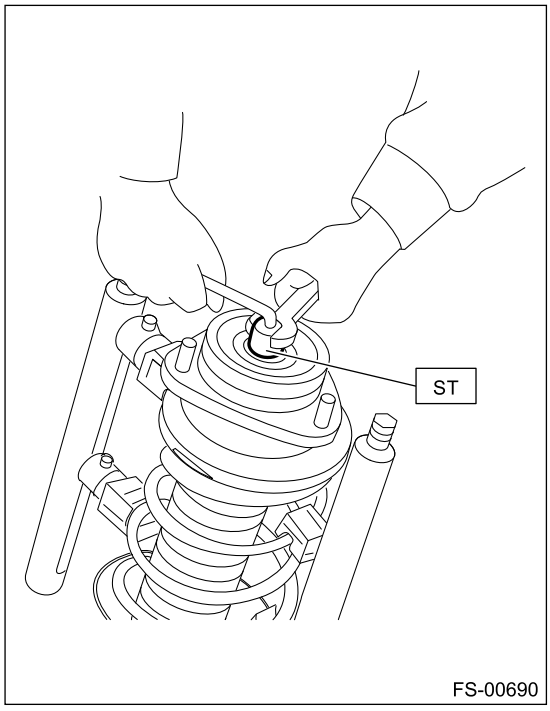
5. Install the helper - front strut to the piston rod.
6. Pull the piston rod fully upward, and install the dust cover - front strut.
7. Temporarily assemble the strut mount - front and the strut bearing - front, install it to the piston rod, and temporarily tighten a new self-locking nut.
8. Using a hexagon wrench to prevent strut rod from turning, tighten the new self-locking nut with ST.

Caution:

Make sure that the strut bearing - front turns smoothly after tightening.

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)



Tightening torque:

55 N·m (5.6 kgf-m, 40.6 ft-lb)

9. Loosen the coil spring compressor carefully.

FRONT SUSPENSION > Front Strut

INSPECTION

Check the removed part for wear, damage and cracks, and then repair or replace it if defective.

1. STRUT

1. Check for oil leaks.

2. Move the piston rod up and down to check that it operates smoothly without any hitch.
3. Check the piston rod runout.

Preparation tool:

Dial gauge

(1) Fix the outer shell.

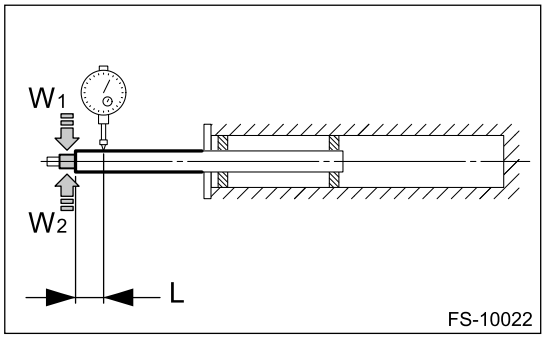
(2) Extend the piston rod until it stops retracting, and set the dial gauge at the L position from the end of the piston rod.

Measuring point:

L=10 mm (0.39 in)

(3) While applying a force of W [20 N (2 kgf, 4 lbf)] to the arrowed section, read the dial gauge indication P_1.

(4) While applying a force of W_2 20 N (2 kgf, 4 lbf) from the opposite side of W_1, read the dial gauge indication P_2.



Play limit (P_1+ P_2): 0.8 mm (0.031 in)

4. Replace the strut if faulty is found in the inspection or limit value is exceeded.

2. STRUT MOUNT - FRONT

Check the rubber part for deformation, cracks or deterioration, and then replace it with a new part if defective.

3. RUBBER SEAT LWR

If cracks or damage are found, replace it with a new part.

4. STRUT BEARING - FRONT

If abnormal cracks or any abnormality in rotation are found, replace it with a new part.

5. COIL SPRING - FRONT

If cracks, damage or deformation are found, replace it with a new part.

6. HELPER - FRONT STRUT

If major cracks or damage are found, replace it with a new part.

7. DUST COVER - FRONT

If major cracks or damage are found, replace it with a new part.

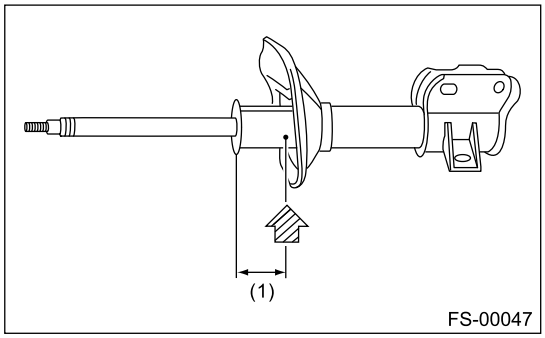
FRONT SUSPENSION > Front Strut

DISPOSAL

Caution:

- **Before handling the strut damper and shock absorber, be sure to wear goggles to protect eyes from gas, oil and cutting powder.**
- **Do not disassemble the strut damper and shock absorber or place them into a fire.**
- **When discarding gas filled strut dampers and shock absorbers, drill holes in them to purge the gas.**

1. Place the strut damper and shock absorber on a level surface with the piston rod fully expanded.
2. Make a hole of 30 mm (1.18 in) deep into the specified position shown in the figure, using a drill with 2 — 3 mm (0.08 — 0.12 in) diameter.



(1) 40 mm (1.57 in)

INSPECTION

1. IMPROPER VEHICLE POSTURE OR IMPROPER WHEEL ARCH HEIGHT

Possible cause	Corrective action
(1) Deformation or damage of suspension parts	Replace.
(2) Defective strut COMPL or shock absorber COMPL	Replace.
(3) Improper installation of strut assembly or shock absorber assembly	Replace with appropriate parts.
(4) Installation of the wrong coil spring	Replace with appropriate parts.

2. POOR RIDE COMFORT

1. Large rebound shock.
2. Rocking of the vehicle continues too long after running over bump and hump.
3. Excessive shock in bumping.

Possible cause	Corrective action
(1) Damaged coil spring	Replace.
(2) Overinflation of tires	Adjust.
(3) Improper wheel arch height	Replace the coil springs with new parts.
(4) Fault in operation of strut or shock absorber	Replace.
(5) Damage or deformation of strut mount or shock absorber mount	Replace.
(6) Unsuitable length (maximum or minimum) of strut or shock absorber	Replace with appropriate parts.
(7) Abnormal deformation or loss of bushing	Replace.
(8) Deformation or damage of helper in strut assembly or shock absorber	Replace.
(9) Oil leakage from the strut or shock absorber	Replace.

3. NOISE

Possible cause	Corrective action
(1) Wear or damage of strut or shock absorber component parts	Replace.
(2) Loosening of the suspension link installing bolt	Tighten to the specified torque.
(3) Abnormal deformation or loss of bushing	Replace.
(4) Unsuitable length (maximum or minimum) of strut or shock absorber	Replace with appropriate parts.
(5) Damaged coil spring	Replace.
(6) Wear or damage of the ball joint	Replace.
(7) Deformation of the clamp - stabilizer bushing	Replace.

REAR SUSPENSION

RS

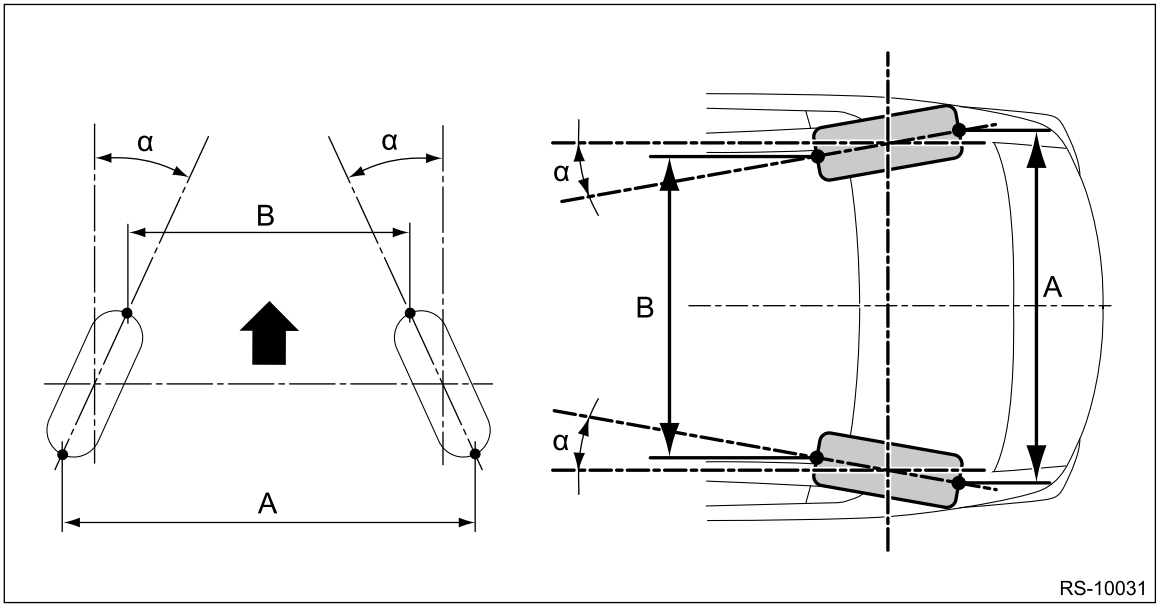
1. General Description
2. Wheel Alignment
3. Trailing Link
4. Rear Lateral Link (front)
5. Rear Lateral Link (rear)
6. Sub Frame
7. Stabilizer
8. Upper Arm
9. Rear Shock Absorber
10. General Diagnostic Table

SPECIFICATION

Suspension height (Tolerance: $^{+12\ mm}_{-24\ mm}(^{+0.47\ in}_{-0.94\ in})$)	mm (in)	−15 (−0.59)
Camber (tolerance: ±0°45′ Differences between RH and LH: 45′ or less)		−1°20′
Toe-in	mm (in)	IN3±3 (IN0.12±0.12)
		Toe angle (sum of both wheels): IN0°15′ ±15′
Thrust angle (tolerance: 0°00′±30′)		0°00′

Note:

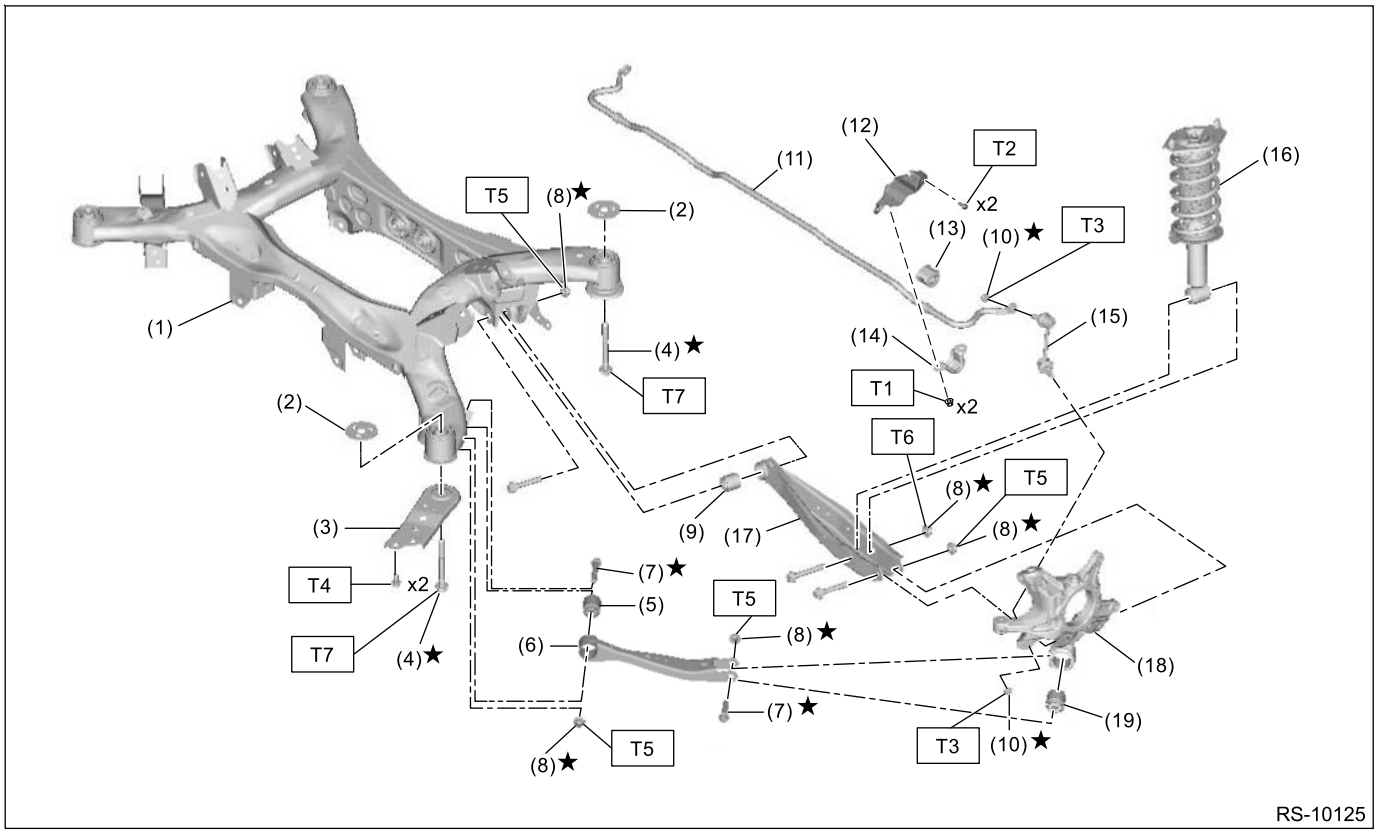
- **Adjust with the value less than the inspection value, taking aging variation into consideration.**
- **Front toe-in, rear toe-in and front camber can be adjusted. Adjust if the value of toe-in or camber exceeds the tolerance range of the specification chart.**
- **Other items except for front toe-in, rear toe-in and front camber that are described in the specification chart cannot be adjusted.**
- **If other items exceed the tolerance range of the specification chart, check the suspension parts and connections for deformation. If defective, replace with new parts.**



A − B = Positive: Toe-in, Negative: Toe-out
α = Individual toe angles

COMPONENT

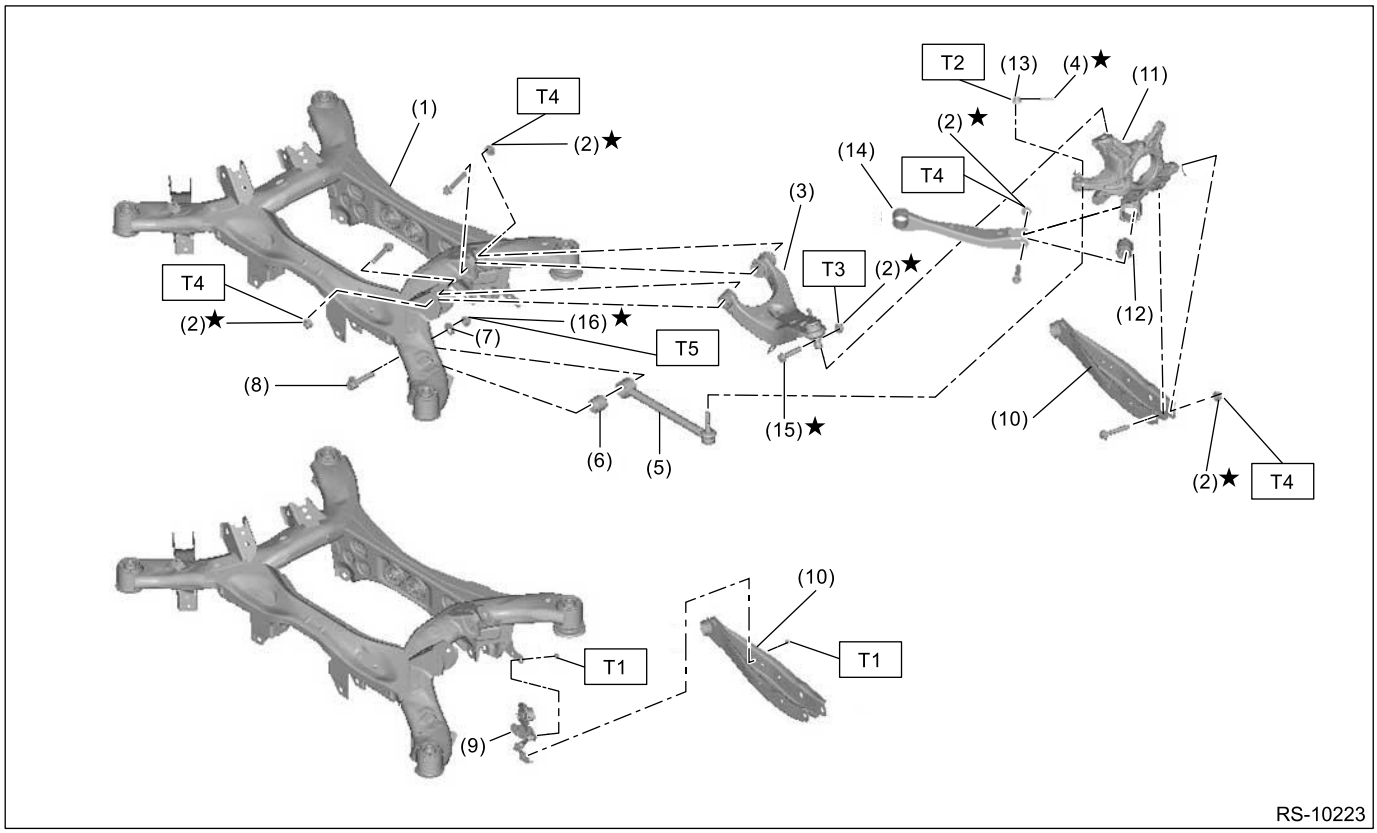
1. REAR SUSPENSION



(1) Sub frame ASSY
(2) Stopper UPR
(3) Support - sub frame
(4) Flange bolt A
(5) Bushing A - trailing link
(6) Trailing link
(7) Flange bolt B
(8) Self-locking nut
(9) Bushing C - lateral link rear
(10) Flange nut
(11) Stabilizer
(12) Bracket COMPL - stabilizer
(13) Bushing - stabilizer
(14) Clamp - stabilizer bushing
(15) Stabilizer link
(16) Rear shock absorber ASSY
(17) Rear lateral link ASSY - rear
(18) Housing ASSY - rear axle
(19) Bushing - trailing link

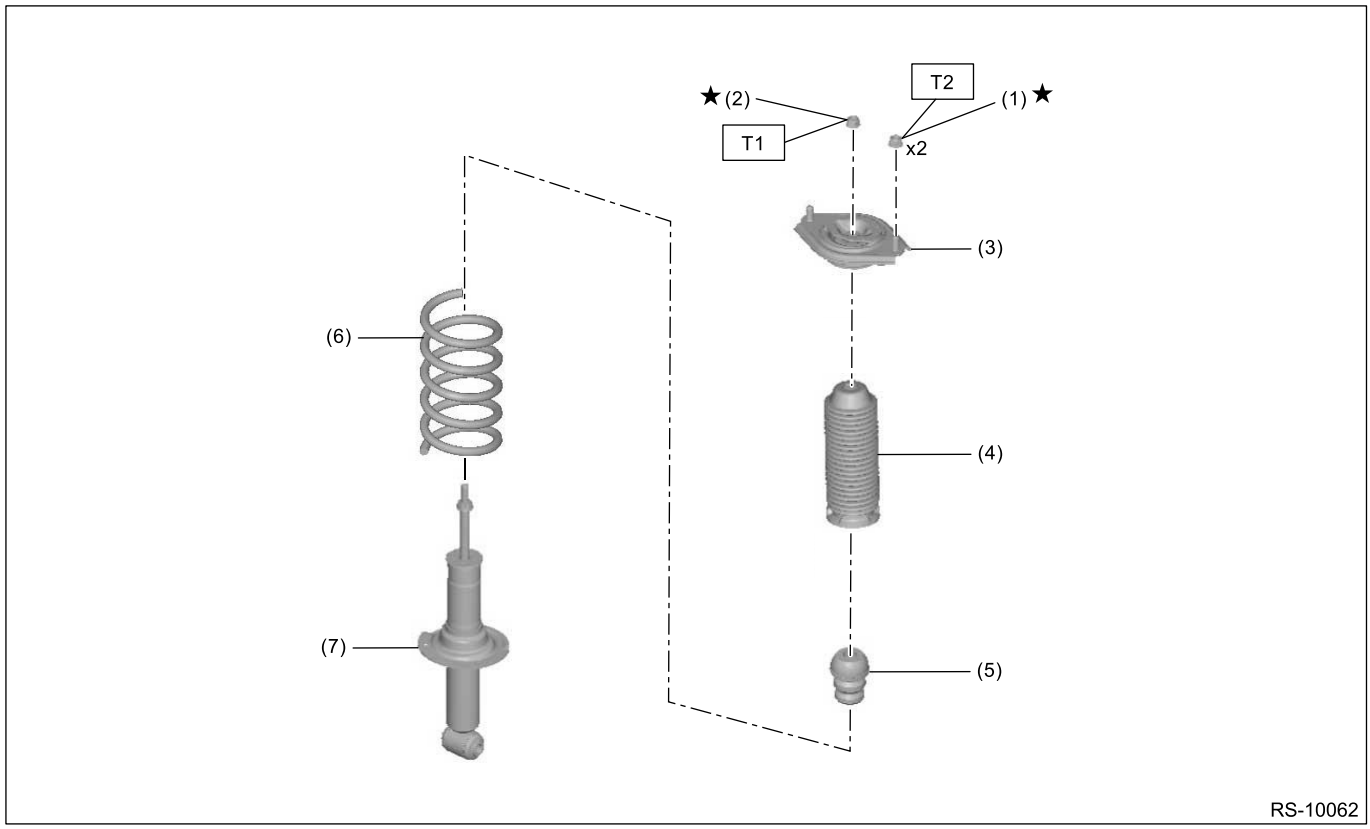
Tightening torque: N·m (kgf-m, ft-lb)

T1: 30 (3.1, 22.1)
T2: 35 (3.6, 25.8)
T3: 38 (3.9, 28)
T4: 70 (7.1, 51.6)
T5: 90 (9.2, 66.4)
T6: 120 (12.2, 88.5)
T7: 145 (14.8, 106.9)



(1)	Sub frame ASSY	(9)	Sensor ASSY - headlight beam leveler (models with auto headlight beam leveler only)	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Self-locking nut A	(10)	Rear lateral link ASSY - rear	***T1: 7.5 (0.8, 5.5)***
(3)	Rear upper arm ASSY	(11)	Housing ASSY - rear axle	***T2: 60 (6.1, 44.3)***
(4)	Snap pin	(12)	Bushing - trailing link	***T3: 80 (8.2, 59)***
(5)	Rear lateral link ASSY - front	(13)	Flange nut	***T4: 90 (9.2, 66.4)***
(6)	Bushing B - lateral link front	(14)	Trailing link	***T5: 120 (12.2, 88.5)***
(7)	Adjusting washer	(15)	Flange bolt	
(8)	Adjusting bolt	(16)	Self-locking nut B	

2. REAR SHOCK ABSORBER



(1)	Flange nut	(5)	Helper - rear	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Self-locking nut	(6)	Coil spring - rear	***T1: 25 (2.5, 18.4)***	
(3)	Shock mount - rear	(7)	Shock absorber COMPL - rear	***T2: 30 (3.1, 22.1)***	
(4)	Dust cover - rear shock				

REAR SUSPENSION > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When disposing of shock absorbers, be sure to bleed the oil or gas out completely. Also, do not expose to flames or fire.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- When the suspension-related components have been removed, installed or replaced, perform the following adjustment.
  - Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
  - VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

- For parts which are not reusable, always use new parts. Other parts should be replaced with new parts as required.
- When handling oil or fuel, adhere to the following to prevent unexpected accident.
  - Be careful with fire.
  - Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.
  - Follow all government and local regulations concerning disposal of refuse when disposing.
- Be sure that the surface of brake disc or brake pad is free from grease or oil.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.

PREPARATION TOOL

1. SPECIAL TOOL

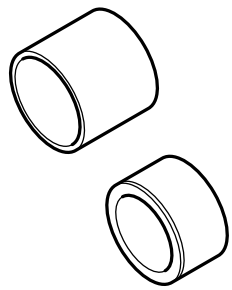
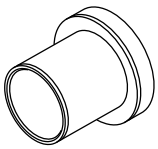
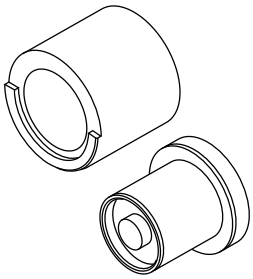
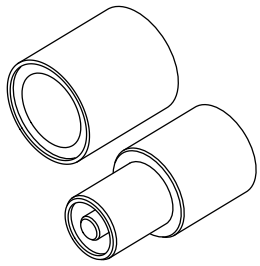
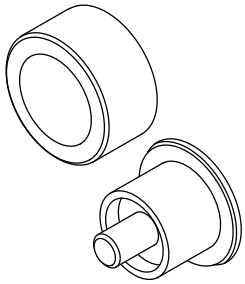
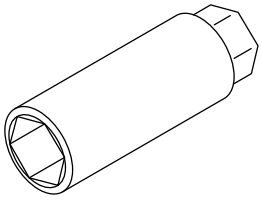
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20099PA010	20099PA010	INSTALLER & REMOVER	• Used for replacing the bushing A - trailing link of the housing assembly - rear axle. • Used together with BUSHING REMOVER (20099FG000).
 ST20099FG000	20099FG000	BUSHING REMOVER	• Used for replacing the bushing A - trailing link of the housing assembly - rear axle. • Used together with base part of INSTALLER & REMOVER (20099PA010).
 ST20099AE000	20099AE000	INSTALLER & REMOVER	Used for replacing the bushing B - lateral link.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20099AE010	20099AE010	INSTALLER & REMOVER	Used for replacing the bushing C - lateral link.
 ST20099AE040	20099AE040	INSTALLER & REMOVER	Used for replacing the bushing C - lateral link.
 ST20399FG000	20399FG000	STRUT MOUNT SOCKET	• Used for disassembling and assembling strut assembly and shock absorber assembly. • Used for checking center nut torque of strut assembly and shock absorber assembly.

2. GENERAL TOOL

TOOL NAME	REMARKS
Alignment tester	Used for measuring wheel alignment.
Toe-in gauge	Used for toe-in measurement.
Jack	Used for removing and installing suspension.
Bearing puller	Used for removing bushings.
Tie-rod ball joint puller	Used for disconnecting the rear lateral link assembly - front.
Coil spring compressor	Used for disassembling and assembling strut assembly and shock absorber assembly.

INSPECTION

Note:

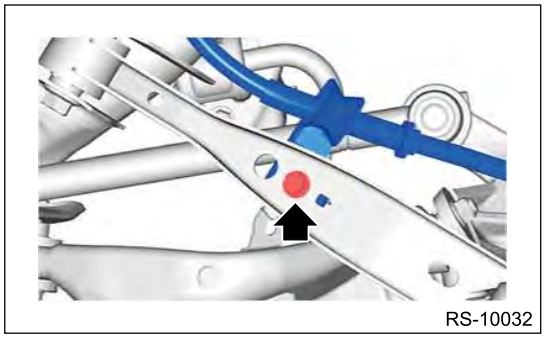
For wheel alignment, measure or adjust the front and rear wheels at a time. Refer to "Wheel Alignment" in "FRONT SUSPENSION" section for measurement and adjustment procedures of wheel alignment.

- **Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.**
- **Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.**

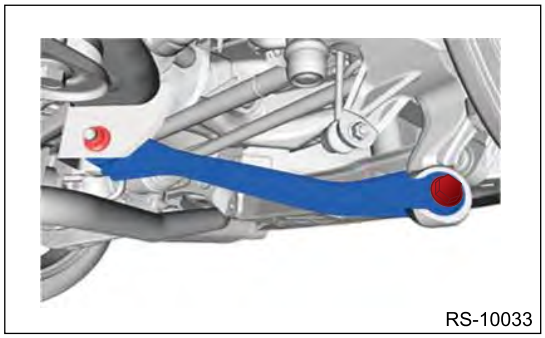
REAR SUSPENSION > Trailing Link

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Disconnect the cable assembly - parking brake.


RS-10032

3. Remove the bolts and nuts, and then remove the trailing link.


RS-10033

REAR SUSPENSION > Trailing Link

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

1. Install the trailing link.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
2. Install the cable assembly - parking brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
3. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

REAR SUSPENSION > Trailing Link

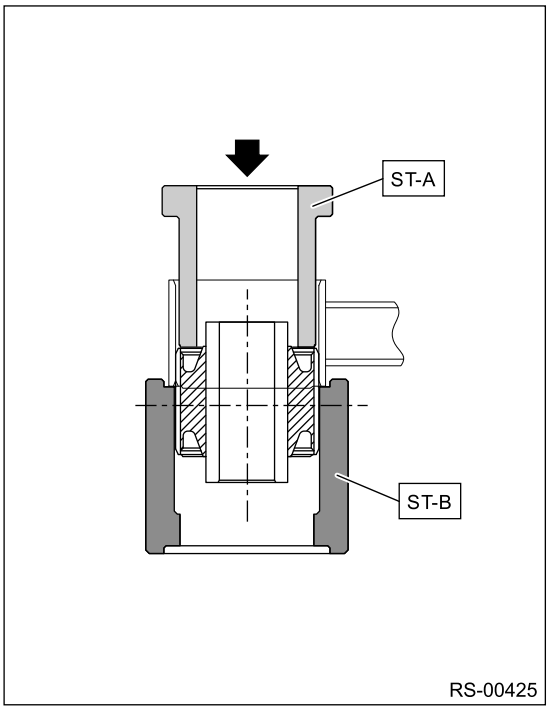
DISASSEMBLY

1. BUSHING A - TRAILING LINK

Using the ST, push out the bushing - A trailing link.

Preparation tool:

ST-A: BUSHING REMOVER (20099FG000)
ST-B: INSTALLER & REMOVER (20099PA010)



2. BUSHING - TRAILING LINK

For the removal procedure of bushing - trailing link, refer to “Rear Axle” in the “DRIVE SHAFT SYSTEM” section. Ref. to DRIVE SHAFT SYSTEM>Rear Axle>DISASSEMBLY > TRAILING LINK BUSHING.

REAR SUSPENSION > Trailing Link

ASSEMBLY

1. BUSHING A - TRAILING LINK

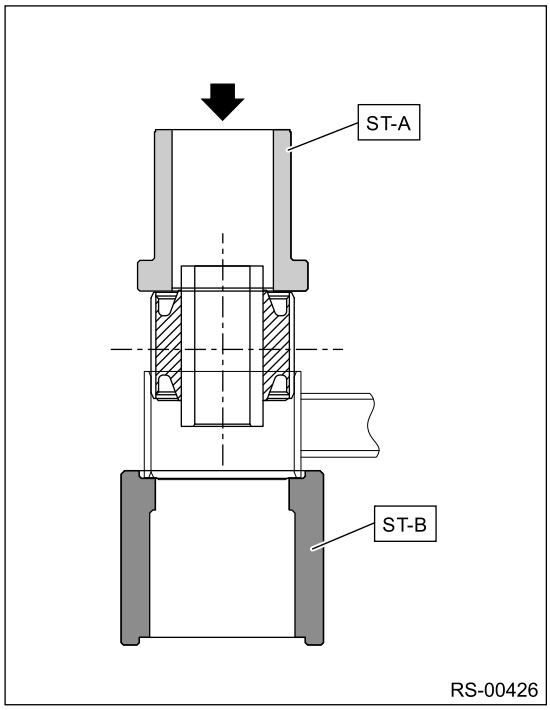
1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Perform visual check for damage or bend on the trailing link.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
2. Using the ST-A and ST-B, press-fit the bushing.

   Caution:

   Make sure to press the bushing straight in.

   Preparation tool:

   ST-A: BUSHING REMOVER (20099FG000)
   ST-B: INSTALLER & REMOVER (20099PA010)

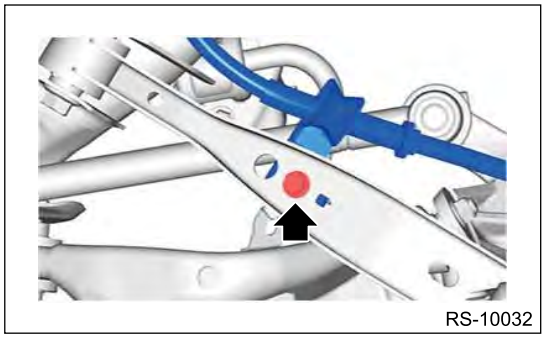


2. BUSHING - TRAILING LINK

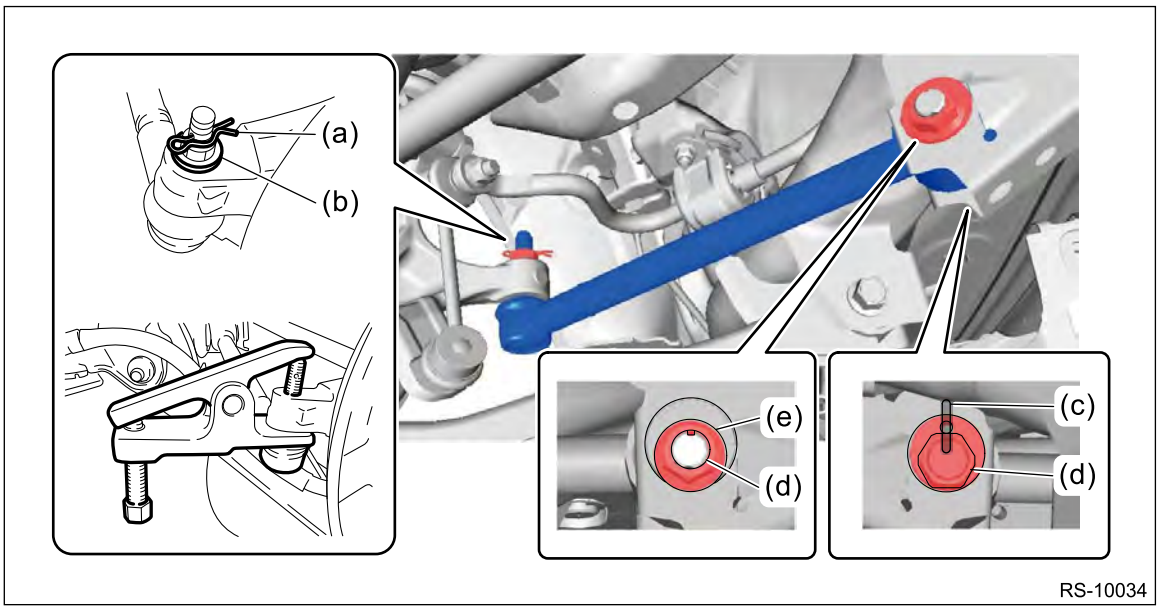
For the installation procedure of bushing - trailing link, refer to “Rear Axle” in the “DRIVE SHAFT SYSTEM” section. Ref. to DRIVE SHAFT SYSTEM>Rear Axle>ASSEMBLY > TRAILING LINK BUSHING.

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Disconnect the cable assembly - parking brake.


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3. Remove the trailing link. Ref. to REAR SUSPENSION>Trailing Link>REMOVAL.
4. Remove the rear lateral link assembly - front.
   (1) Remove the snap pin (a) and nut (b).
   (2) Remove the ball joint from the housing assembly - rear axle.
   Preparation tool:
   Tie-rod ball joint puller
   (3) Put alignment marks (c) on the adjusting bolt for the rear lateral link assembly - front and on the sub frame assembly.
   (4) Remove the adjusting bolt (d), and remove the rear lateral link assembly - front.
   Caution:
   When removing the adjusting bolt (d), make sure to fix the bolt head in place when loosening the nut (e).



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INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Visually check the rear lateral link assembly - front for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
   - Visually check the dust cover on the ball joint for abnormal cracks, fatigue or damage.
2. Install the rear lateral link assembly - front.
   Caution:
   - **When installing the adjusting bolt (d), make sure to fix the bolt head in place and tighten the nut side (e).**
   - **Align alignment marks (c) on the adjusting bolt for the rear lateral link assembly - front and on the sub frame assembly.**

   Tightening torque:
   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.
3. Install the trailing link.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
4. Install the cable assembly - parking brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
5. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
6. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

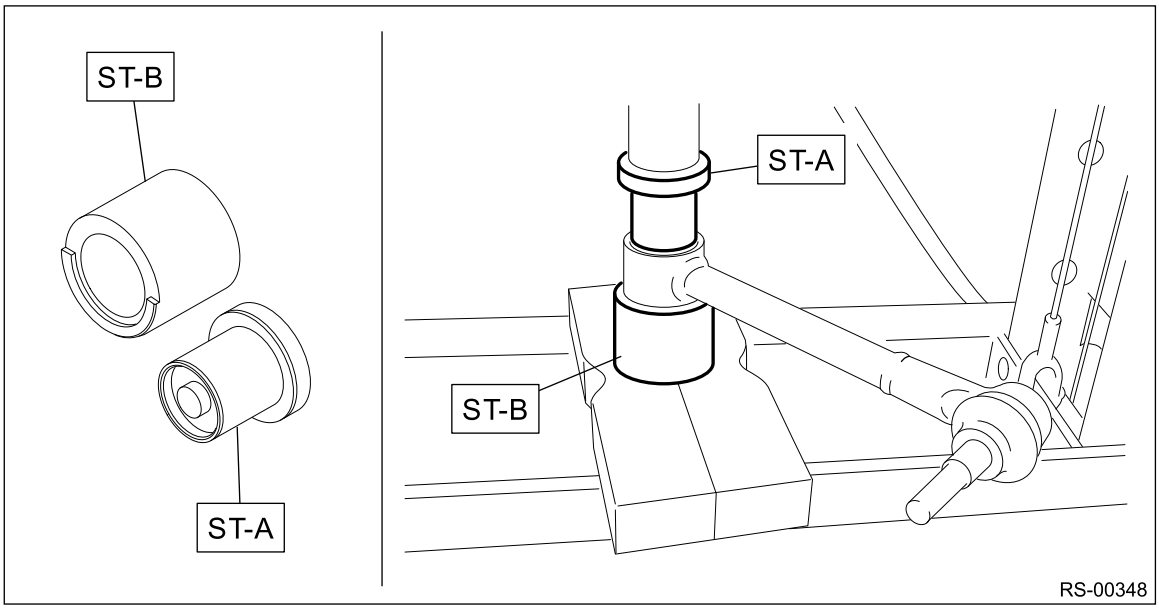
   Caution:
   When the wheel alignment has been adjusted, perform the following adjustment.
   – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
   – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

REAR SUSPENSION > Rear Lateral Link (front)

DISASSEMBLY

Using the ST, push out the bushing B - lateral link.

Preparation tool:
ST-A & ST-B: INSTALLER & REMOVER (20099AE000)



REAR SUSPENSION > Rear Lateral Link (front)

ASSEMBLY

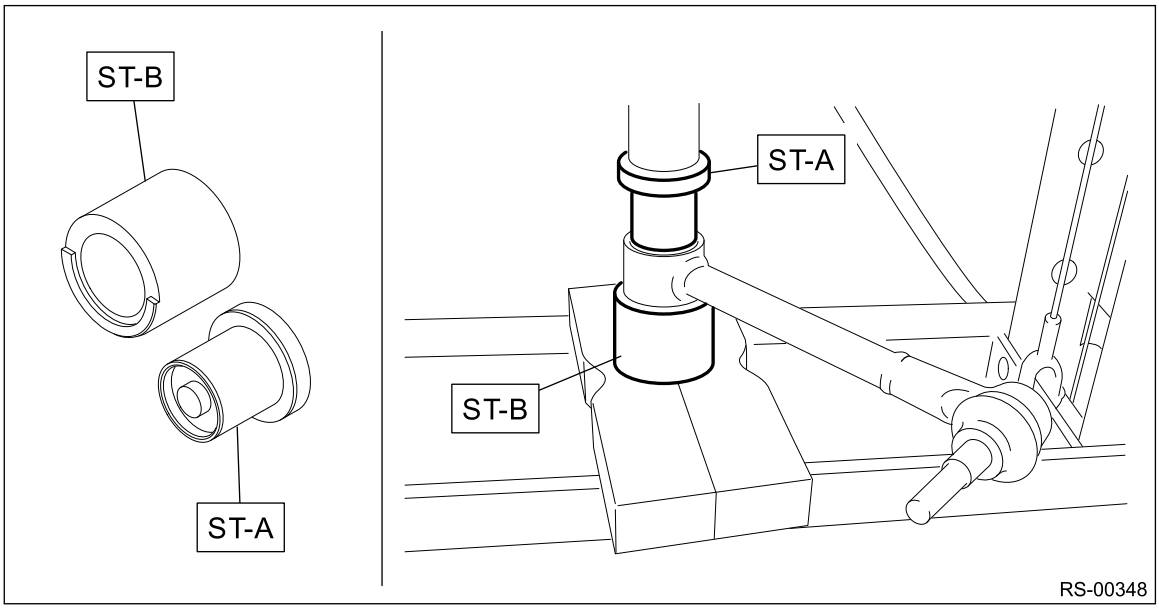
1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Visually check the rear lateral link assembly - front for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
   - Visually check the dust cover on the ball joint for damage.
2. Using the ST, press-fit the bushing B - lateral link.

   Caution:

   Make sure to press the bushing straight in.

   Preparation tool:

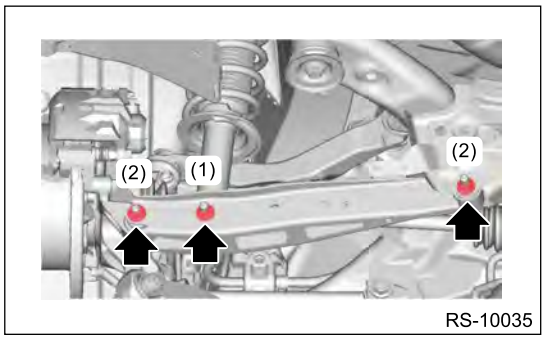
   ST-A & ST-B: INSTALLER & REMOVER (20099AE000)



REAR SUSPENSION > Rear Lateral Link (rear)

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.
4. Remove the rear lateral link assembly - rear.
   (1) Remove the bolts and nuts, and remove the lower side of rear shock absorber assembly.
   (2) Remove the bolts and nuts, and remove the rear lateral link assembly - rear.



REAR SUSPENSION > Rear Lateral Link (rear)

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Visually check the rear lateral link assembly - rear for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
2. Install the rear lateral link assembly - rear.
   Tightening torque:
   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.
3. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)
   Caution:
   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
6. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.

- Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

  Caution:

  When the wheel alignment has been adjusted, perform the following adjustment.

  – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

  – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

7. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.

REAR SUSPENSION > Rear Lateral Link (rear)

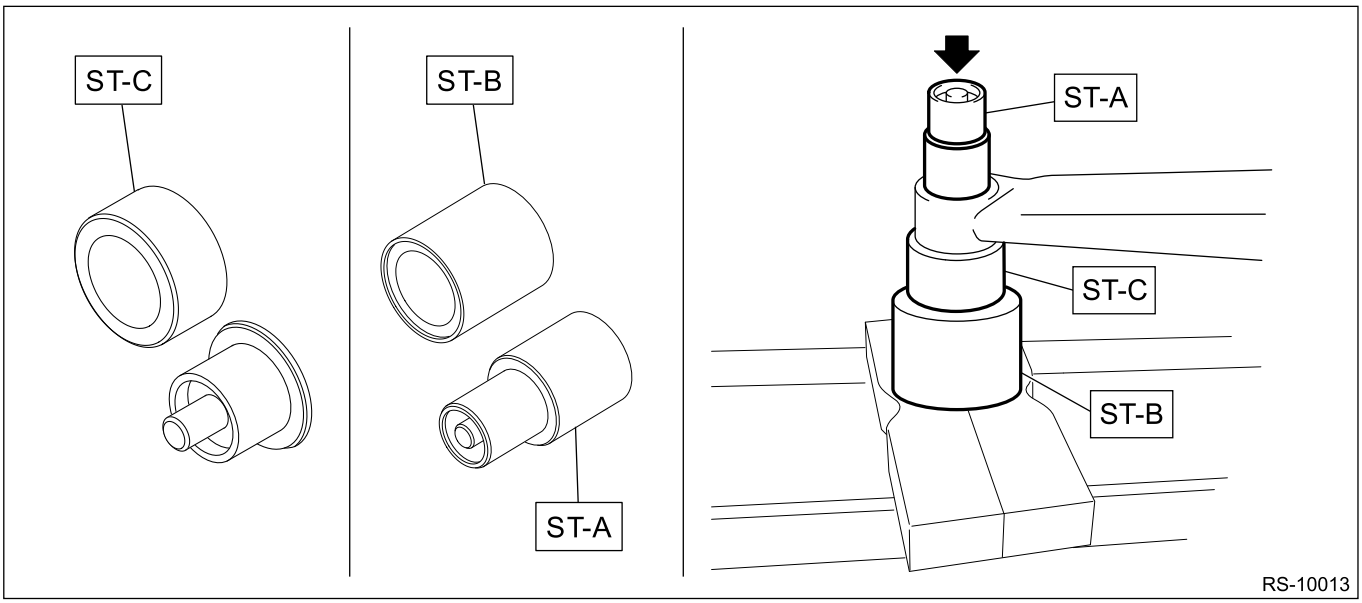
DISASSEMBLY

Using the ST, push out the bushing.

Preparation tool:

ST-A & ST-B: INSTALLER & REMOVER (20099AE010)

ST-C: INSTALLER & REMOVER (20099AE040)



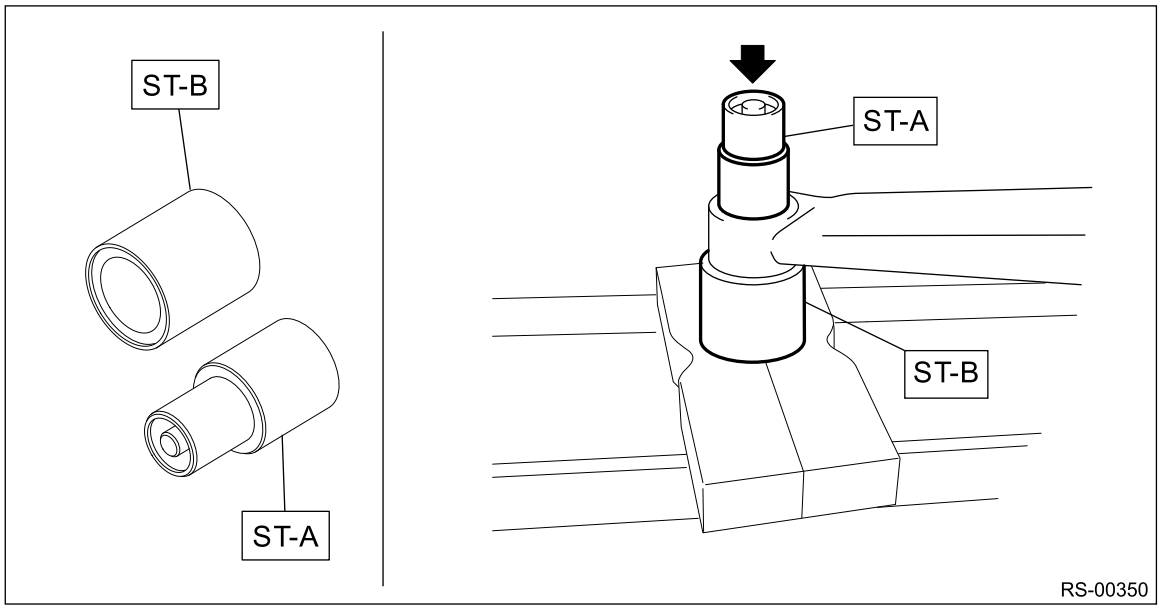
REAR SUSPENSION > Rear Lateral Link (rear)

ASSEMBLY

1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Visually check the rear lateral link assembly - rear for damage and deformation.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
2. Using the ST, press the bushing into place.

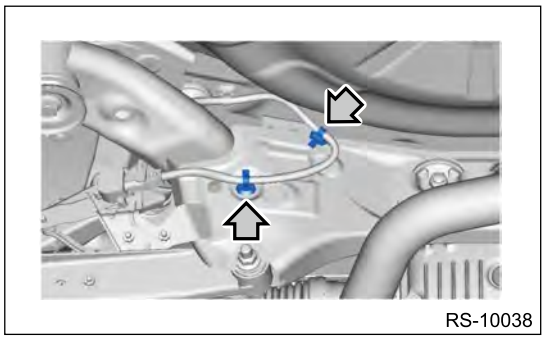
   Preparation tool:

   ST-A & ST-B: INSTALLER & REMOVER (20099AE010)

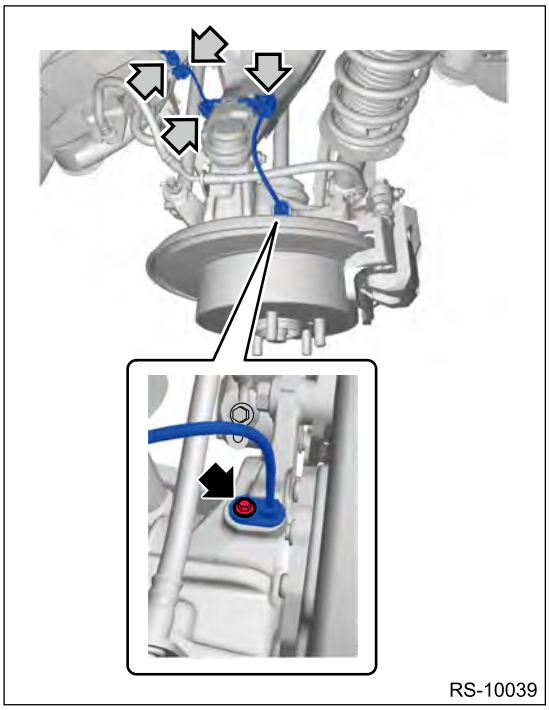

ST-B
ST-A
ST-A
ST-B
RS-00350

REMOVAL

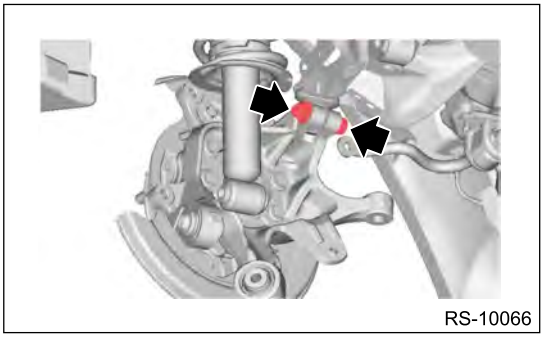
1. Release the parking brake.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Lift up the vehicle, and then remove the rear wheels.
4. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.
5. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
6. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
7. Remove the clamp of the sub rear harness.



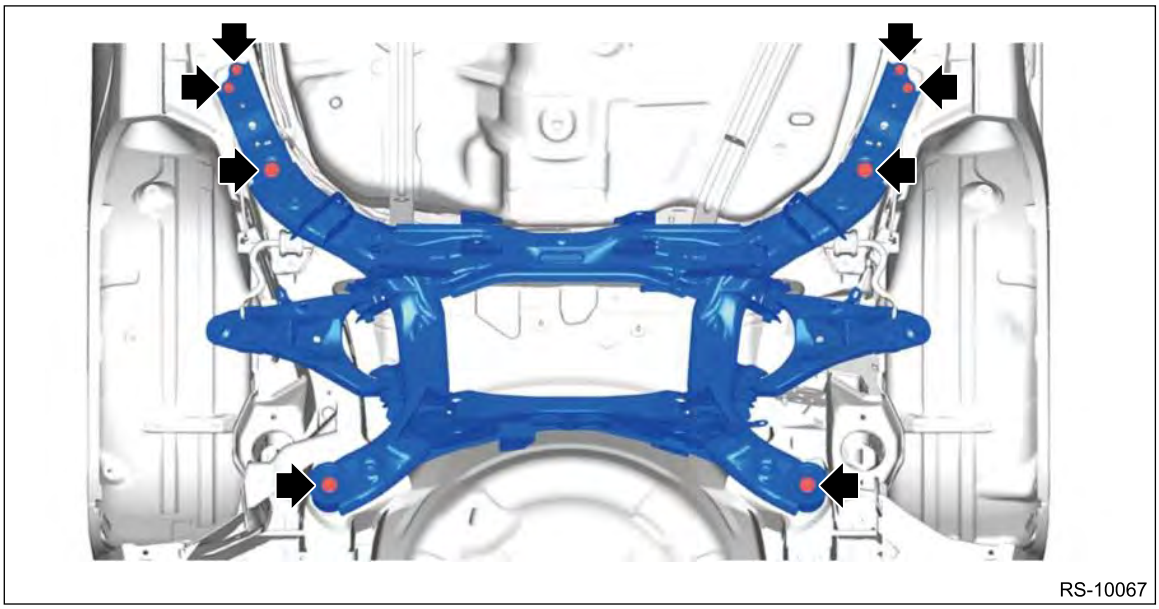
8. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.
9. Remove the trailing link. Ref. to REAR SUSPENSION>Trailing Link>REMOVAL.
10. Remove the rear lateral link assembly - front. Ref. to REAR SUSPENSION>Rear Lateral Link (front)>REMOVAL.
11. Remove the rear lateral link assembly - rear. Ref. to REAR SUSPENSION>Rear Lateral Link (rear)>REMOVAL.
12. Disconnect the stabilizer link (bottom part). (Model with stabilizer) Ref. to REAR SUSPENSION>Stabilizer>REMOVAL > STABILIZER LINK.
13. Remove the clip and bolt on the harness clamp, and remove the rear ABS wheel speed sensor.
    Caution:
    - **Be careful not to damage the sensor.**
    - **Do not apply excessive force to the sensor harness.**



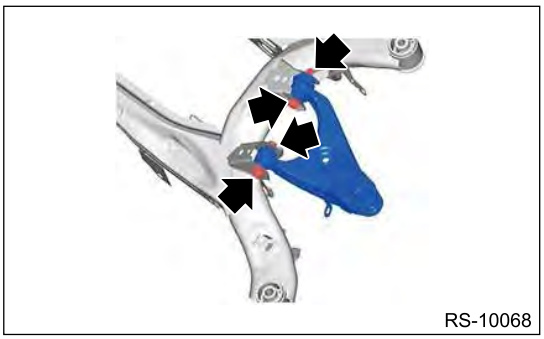
14. Remove the disc brake assembly - rear. Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.
15. Remove the cable assembly - parking brake and the parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.
16. Remove the drive shaft. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft>REMOVAL.
17. Remove the housing assembly - rear axle.



18. Remove the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL.
19. Remove the sub frame assembly.
    (1) Support the sub frame assembly using a transmission jack.
        Caution:
        The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.
    (2) Remove the bolt, and remove the left and right sub frame supports.
    (3) Remove the sub frame assembly.
        Caution:
        While checking there is no dragging of harness and wire, lower it slowly with a transmission jack.



20. Remove the upper arm from the sub frame assembly.



REAR SUSPENSION > Sub Frame

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**
- **During the installation, make sure that the marking of ABS wheel speed sensor harness does not twist.**

1. Check the removed parts for wear, damage and crack, and repair or replace them if faulty.

2. Install the upper arm to the sub frame assembly.

Tightening torque:

90 N·m (9.2 kgf-m, 66.4 ft-lb)

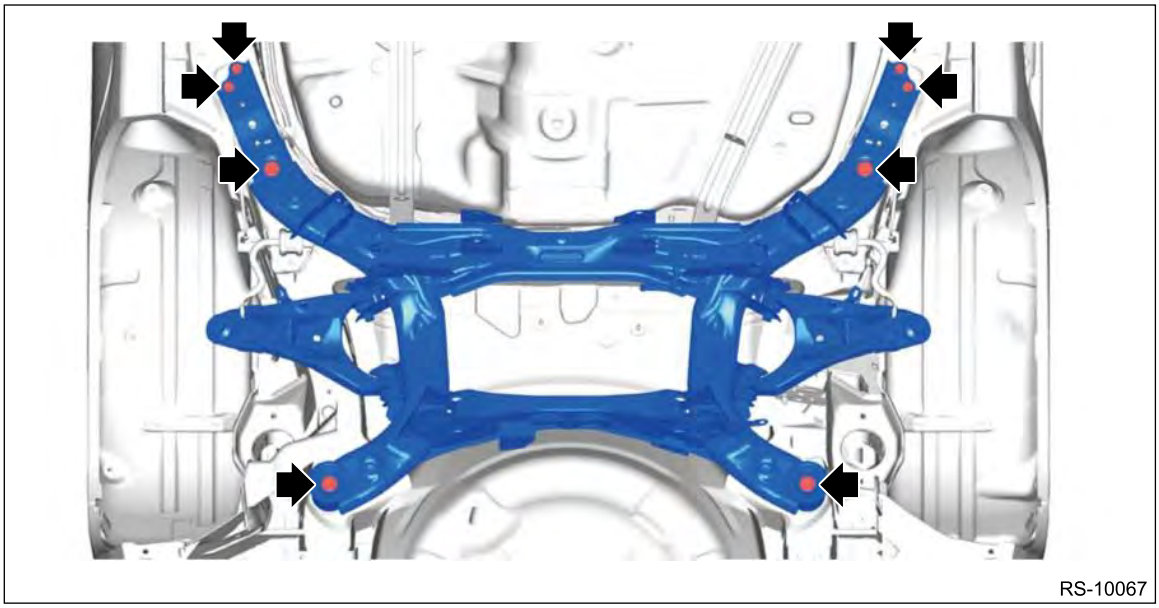
3. Install the sub frame assembly.

(1) Lift the sub frame assembly using a transmission jack.

(2) Install the right and left sub frame supports, and install the sub frame assembly.

Caution:

- **The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.**
- **While checking there is no dragging of harness and wire, raise it slowly with a transmission jack.**



Tightening torque:

Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.

4. Install the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION.
5. Install the housing assembly - rear axle.

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.
6. Install the drive shaft. Ref. to DRIVE SHAFT SYSTEM>Rear Drive Shaft>INSTALLATION.
7. Install the cable assembly - parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.
8. Install the brake hose bracket and the disc brake assembly - rear.

   Tightening torque:

   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)

   Disc brake assembly - rear: 66 N·m (6.7 kgf-m, 48.7 ft-lb)
9. Install the rear ABS wheel speed sensor.

   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
10. Install the stabilizer link (bottom part). (Model with stabilizer) Ref. to REAR SUSPENSION>Stabilizer>INSTALLATION > STABILIZER LINK.
11. Install the rear lateral link assembly - rear. Ref. to REAR SUSPENSION>Rear Lateral Link (rear)>INSTALLATION.
12. Install the rear lateral link assembly - front. Ref. to REAR SUSPENSION>Rear Lateral Link (front)>INSTALLATION.
13. Install the trailing link. Ref. to REAR SUSPENSION>Trailing Link>INSTALLATION.
14. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

Caution:

Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

15. Install the clamp of the sub rear harness.
16. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
17. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
18. Install the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
19. Install the rear wheels and lower the vehicle.

    Tightening torque:

    120 N·m (12.2 kgf-m, 88.5 ft-lb)
20. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
21. Inspect the wheel alignment and adjust if necessary.
    - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
    - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

    Caution:

    When the wheel alignment has been adjusted, perform the following adjustment.

    – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

    – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
22. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REAR SUSPENSION > Sub Frame

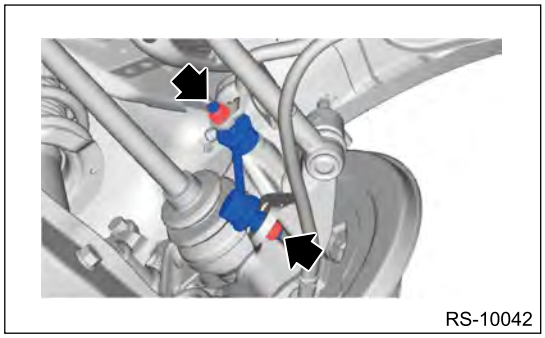
INSPECTION

Check the removed parts for wear, damage and crack, and repair or replace them if faulty.

REMOVAL

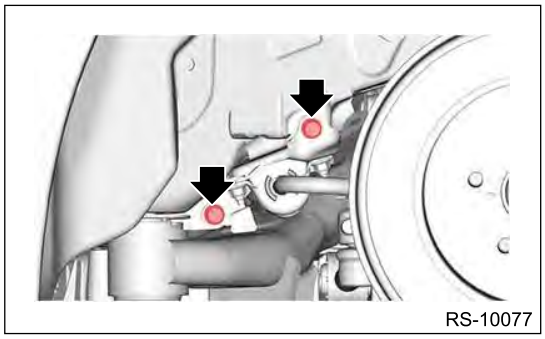
1. STABILIZER LINK

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the left and right stabilizer links.

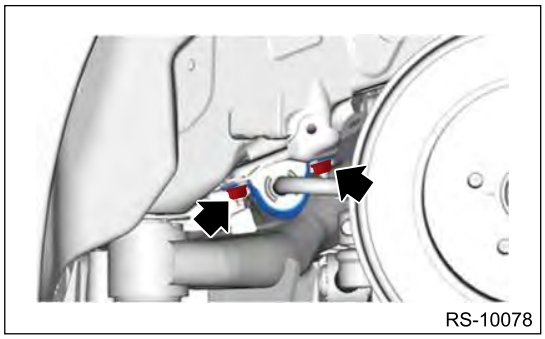


2. STABILIZER BUSHING

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the bolts holding the bracket COMPL - stabilizer on the left and right sides.



3. Remove the clamp - stabilizer bushing on the left and right sides.

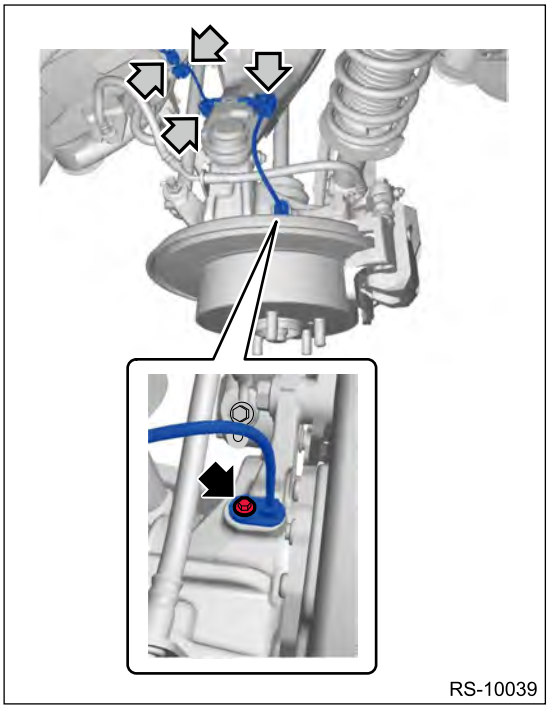


4. Remove the bushing - stabilizer.

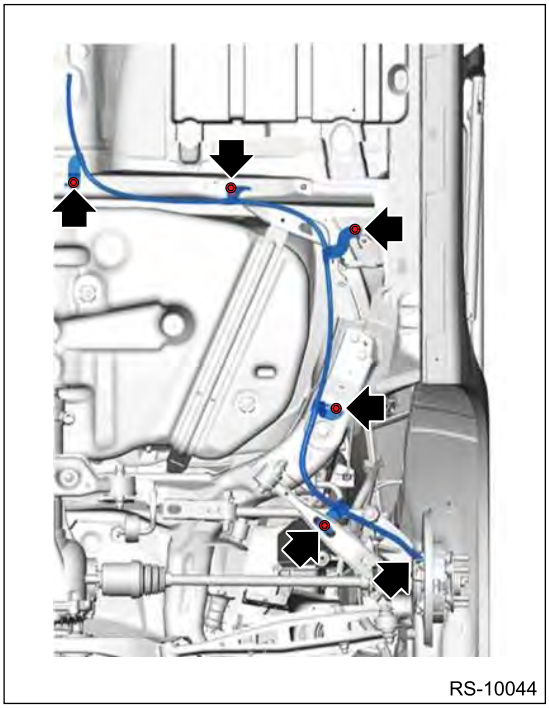
3. STABILIZER

1. Release the parking brake.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Lift up the vehicle, and then remove the rear wheels.
4. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.
5. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.

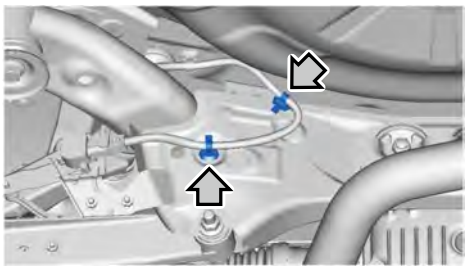
6. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
7. Remove the clip and bolt on the harness clamp, and remove the rear ABS wheel speed sensor.
   Caution:
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**



8. Remove the disc brake assembly - rear. Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.
9. Remove the cable assembly - parking brake and the parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.
10. Disconnect the cable assembly - parking brake.



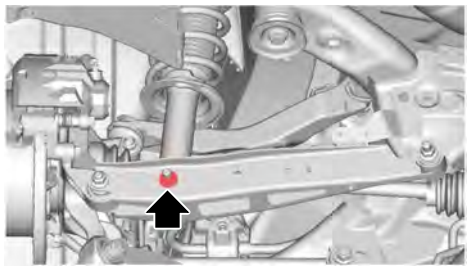
11. Remove the clamp of the sub rear harness.


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12. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.

13. Disconnect the stabilizer link (upper part). (Model with stabilizer) Ref. to REAR SUSPENSION>Stabilizer>REMOVAL > STABILIZER LINK.

14. Remove the bolts from the lower side of rear shock absorber assembly.


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15. Remove the sub frame assembly.

(1) Support the sub frame assembly using a transmission jack.

Caution:

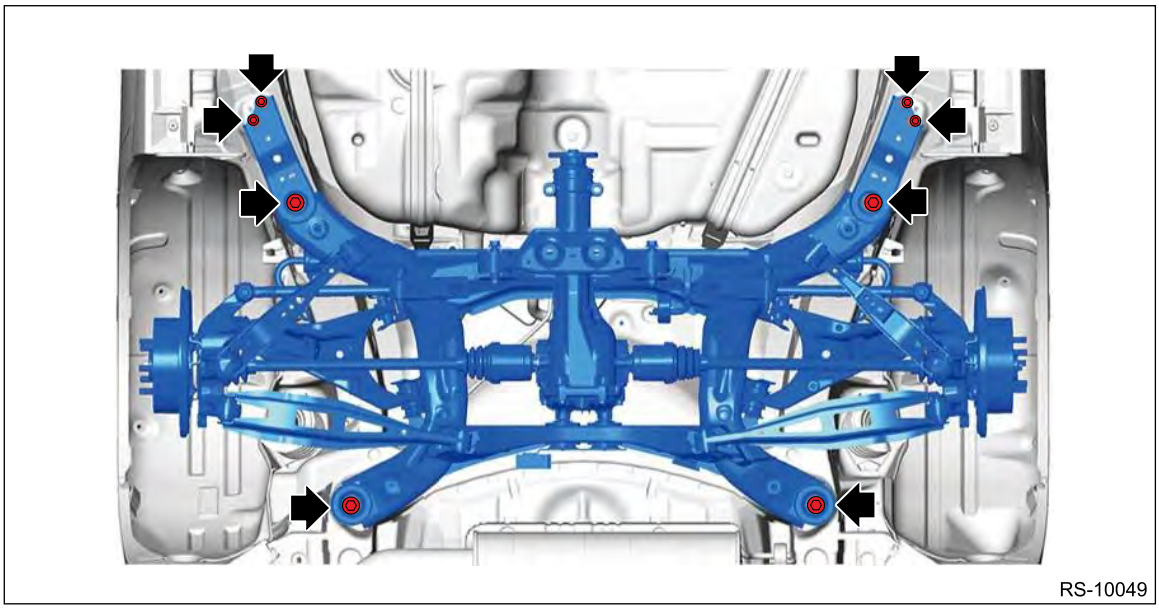
The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.

(2) Remove the bolt, and remove the left and right sub frame supports.

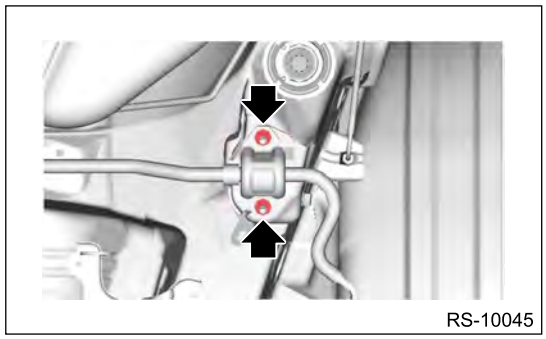
(3) Remove the sub frame assembly.

Caution:

While checking there is no dragging of harness and wire, lower it slowly with a transmission jack.


RS-10049

16. Remove the stabilizers.



REAR SUSPENSION > Stabilizer

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

1. STABILIZER LINK

1. Before installation, inspect the following items and replace any faulty part with a new one.
   Check the stabilizer link for damage.
2. Install the stabilizer link.
   Tightening torque:
   38 N·m (3.9 kgf-m, 28 ft-lb)
3. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

2. STABILIZER BUSHING

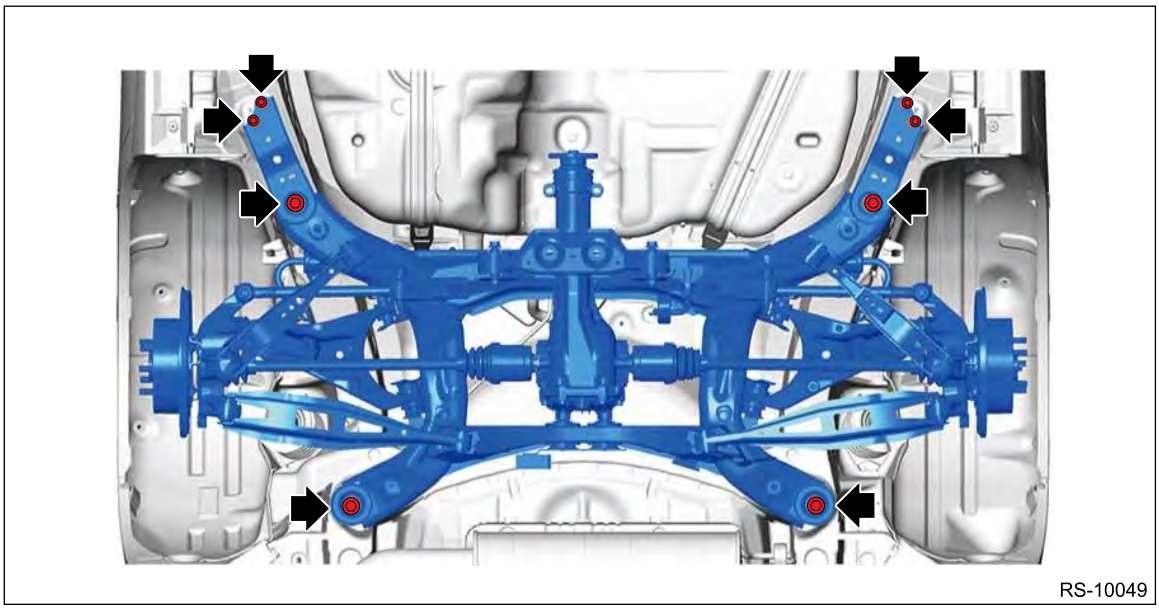
1. Before installation, inspect the following items and replace any faulty part with a new one.
   Check the bushing - stabilizer for abnormal cracks, fatigue or damage.
2. Install the bushing - stabilizer.
3. Install the clamp - stabilizer bushing.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
4. Install the bracket COMPL - stabilizer.
   Caution:
   To prevent damage to the vehicle body, place a cloth, etc. between the bracket COMPL - stabilizer and the vehicle body. After tightening nuts to specified torque, be sure to remove the cloth, etc.
   Tightening torque:
   35 N·m (3.6 kgf-m, 25.8 ft-lb)
5. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

3. STABILIZER

1. Before installation, inspect the following items and replace any faulty part with a new one.

- Check the bushing - stabilizer for abnormal cracks, fatigue or damage.
- Check the stabilizer link for damage.

2. Install the clamp - stabilizer bushing.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
3. Install the sub frame assembly.
   (1) Lift the sub frame assembly using a transmission jack.
   (2) Install the right and left sub frame supports, and install the sub frame assembly.
   Caution:
   - **The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.**
   - **While checking there is no dragging of harness and wire, raise it slowly with a transmission jack.**



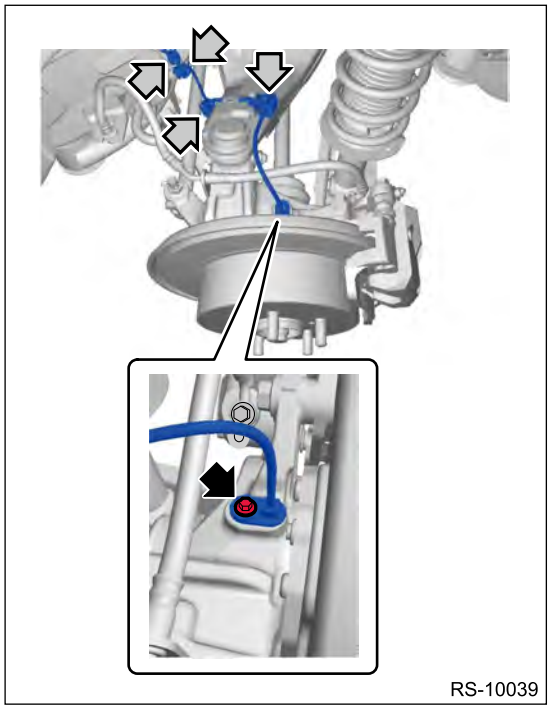
   Tightening torque:
   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.
4. Install the bolts on the lower side of rear shock absorber assembly.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
5. Install the stabilizer link (upper part). (Model with stabilizer)
   Tightening torque:
   38 N·m (3.9 kgf-m, 28 ft-lb)
6. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)
   Caution:
   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
7. Install the clamp of the sub rear harness.
8. Install the cable assembly - parking brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
9. Install the cable assembly - parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.

10. Install the brake hose bracket and the disc brake assembly - rear.
    Tightening torque:
    Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
    Disc brake assembly - rear: 66 N·m (6.7 kgf-m, 48.7 ft-lb)
11. Install the rear ABS wheel speed sensor.
    Tightening torque:
    7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
12. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
13. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
14. Install the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
15. Install the rear wheels and lower the vehicle.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
16. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
17. Inspect the wheel alignment and adjust if necessary.
    - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
    - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

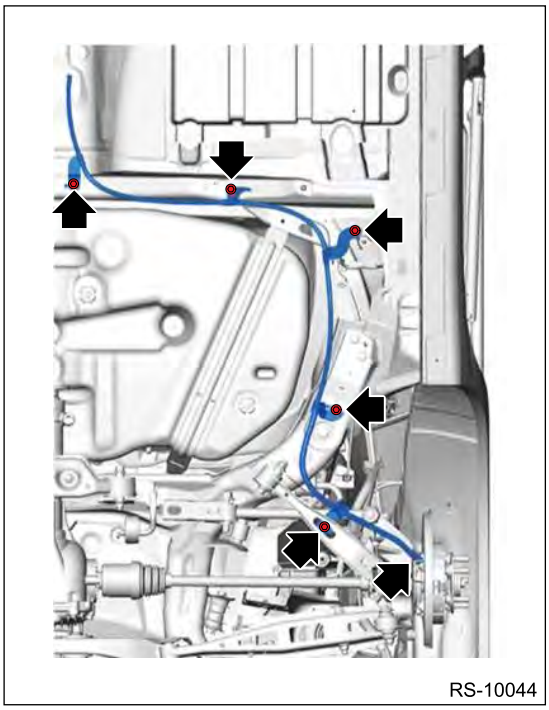
    Caution:
    When the wheel alignment has been adjusted, perform the following adjustment.
    – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
    – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
18. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

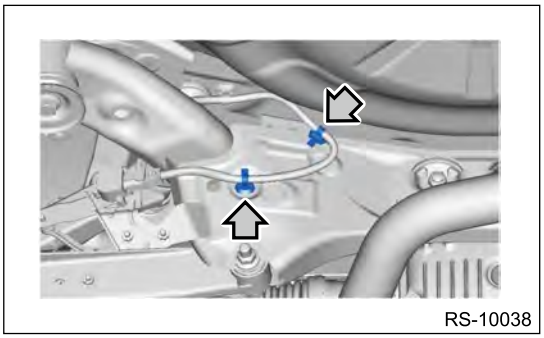
1. Release the parking brake.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Lift up the vehicle, and then remove the rear wheels.
4. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.
5. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
6. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
7. Remove the clip and bolt on the harness clamp, and remove the rear ABS wheel speed sensor.
   Caution:
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**



8. Remove the disc brake assembly - rear. Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.
9. Remove the cable assembly - parking brake and the parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.
10. Disconnect the cable assembly - parking brake.



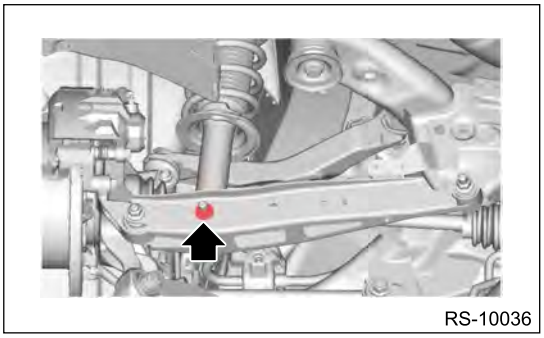
11. Remove the clamp of the sub rear harness.



12. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.

13. Disconnect the stabilizer link (upper part). (Model with stabilizer) Ref. to REAR SUSPENSION>Stabilizer>REMOVAL > STABILIZER LINK.

14. Remove the bolts from the lower side of rear shock absorber assembly.



15. Remove the sub frame assembly.

(1) Support the sub frame assembly using a transmission jack.

Caution:

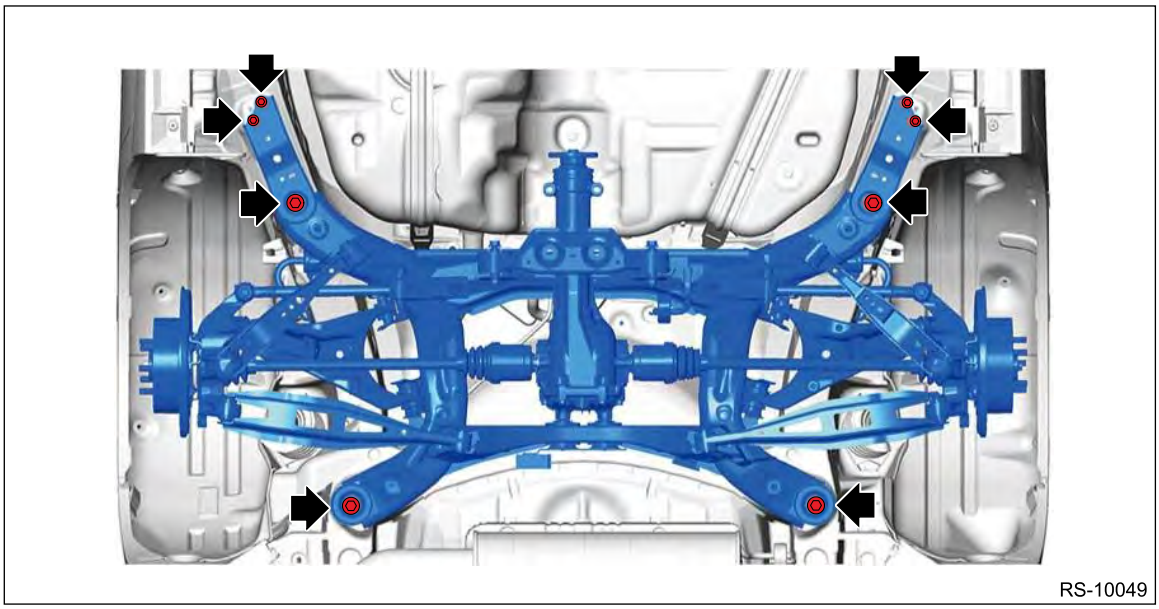
The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.

(2) Remove the bolt, and remove the left and right sub frame supports.

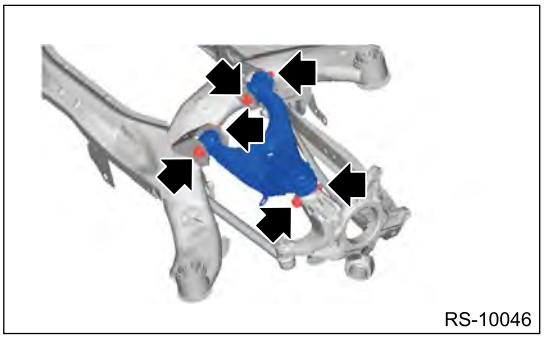
(3) Remove the sub frame assembly.

Caution:

While checking there is no dragging of harness and wire, lower it slowly with a transmission jack.



16. Remove the upper arm.



REAR SUSPENSION > Upper Arm

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing when the arm is positioned in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

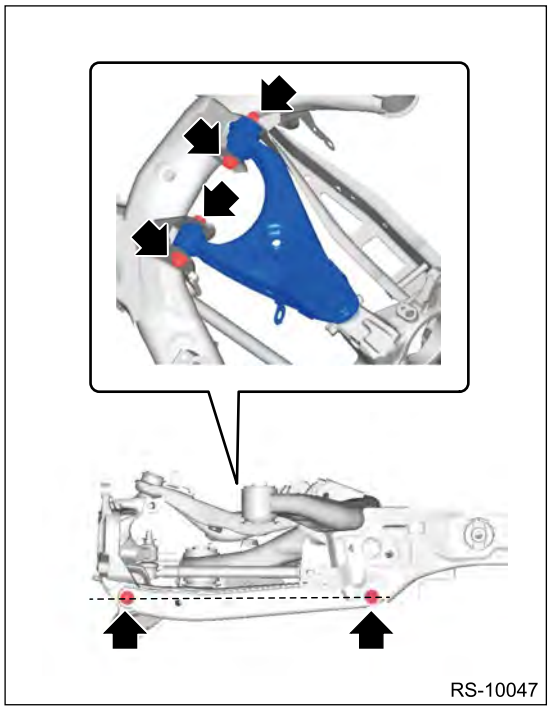
1. Before installation, inspect the following items and replace any faulty part with a new one.

- Visually check the upper arm assembly for damage and deformation.
- Visually check the bushing for abnormal cracks, fatigue or damage.
- Visually check the dust cover on the ball joint for abnormal cracks, fatigue or damage.

2. Install the upper arm assembly.

(1) Make the installation sections of the rear lateral link assembly - rear (the bolt on the housing assembly - rear axle side and the bolt on the sub frame assembly side) horizontal.

(2) Install the upper arm assembly to the sub frame assembly.



Tightening torque:

Upper arm assembly — sub frame assembly: 90 N·m (9.2 kgf-m, 66.4 ft-lb)

3. Connect the upper arm assembly and the housing assembly - rear axle.

Tightening torque:

Upper arm assembly — housing assembly - rear axle: 80 N·m (8.2 kgf-m, 59 ft-lb)

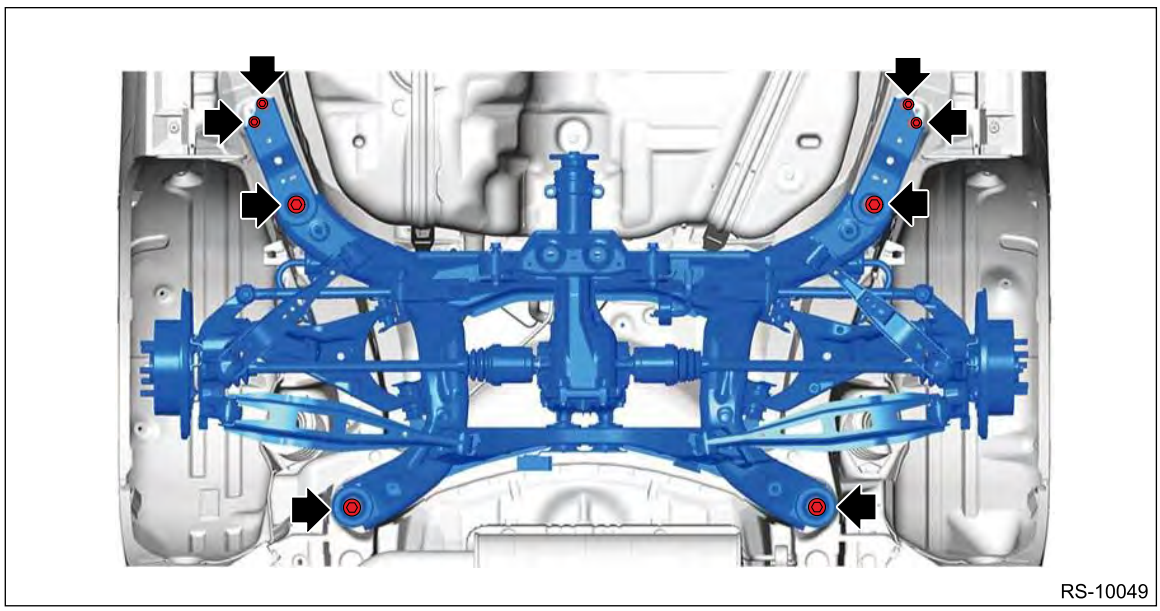
4. Install the sub frame assembly.

(1) Lift the sub frame assembly using a transmission jack.

(2) Install the right and left sub frame supports, and install the sub frame assembly.

Caution:

- **The sub frame assembly is heavy. Make sure that it is firmly supported so that it is level.**
- **While checking there is no dragging of harness and wire, raise it slowly with a transmission jack.**



Tightening torque:

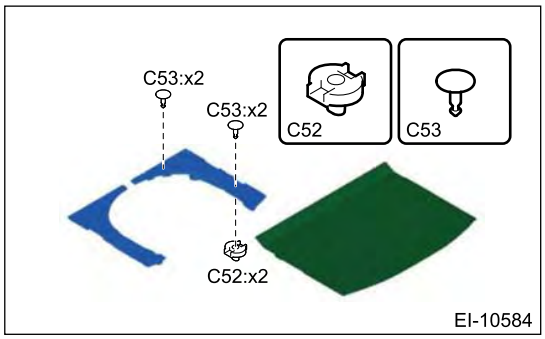
Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to REAR SUSPENSION>General Description>COMPONENT.

5. Install the bolts on the lower side of rear shock absorber assembly.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
6. Install the stabilizer link (upper part). (Model with stabilizer)
   Tightening torque:
   38 N·m (3.9 kgf-m, 28 ft-lb)
7. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)
   Caution:
   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the clamp of the sub rear harness.
9. Install the cable assembly - parking brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
10. Install the cable assembly - parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.
11. Install the brake hose bracket and the disc brake assembly - rear.
    Tightening torque:
    Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
    Disc brake assembly - rear: 66 N·m (6.7 kgf-m, 48.7 ft-lb)
12. Install the rear ABS wheel speed sensor.
    Tightening torque:
    7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
13. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
14. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
15. Install the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
16. Install the rear wheels and lower the vehicle.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
17. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
18. Inspect the wheel alignment and adjust if necessary.
    - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
    - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

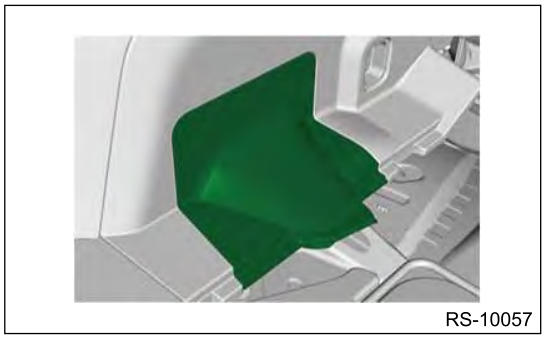
    Caution:
    When the wheel alignment has been adjusted, perform the following adjustment.
    – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
    – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.
19. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

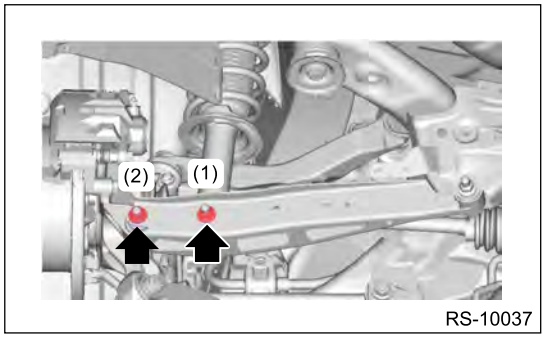
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trunk trim panel assembly - side (4 door model). Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the rear floor mat, the spacer - rear floor mat and the cap - rear suspension (5 door model).
   1. Remove the rear floor mat and the spacer - rear floor mat.



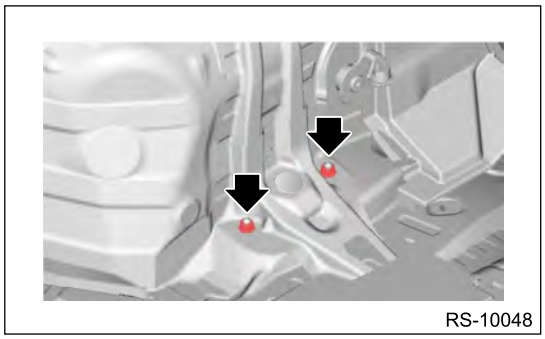
   2. Remove the cap - rear suspension.



4. Lift up the vehicle, and then remove the rear wheels.
5. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Rear Height Sensor>REMOVAL.
6. Remove the bolts and nuts, and lower the rear lateral link assembly - rear.
   (1) Remove the bolts from the lower side of rear shock absorber assembly.
   (2) Disconnect the housing assembly - rear axle from the rear lateral link assembly - rear.



7. Remove the nuts on the upper side of rear shock absorber assembly.



8. Lower the rear lateral link assembly - rear, and remove the rear shock absorber assembly.

REAR SUSPENSION > Rear Shock Absorber

INSTALLATION

Caution:

- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**

1. Install the rear shock absorber assembly.
   (1) Lower the rear lateral link assembly - rear, and place the rear shock absorber assembly inside.
   (2) Lower the rear lateral link assembly - rear, and install the upper side of rear shock absorber assembly.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
   (3) Install the bolts on the lower side of rear shock absorber assembly.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
   (4) Install the rear lateral link assembly - rear.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
   (5) Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)
   Caution:
   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the rear wheels and lower the vehicle.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Install the trunk trim panel assembly - side (4 door model) or rear floor mat (5 door model).
   - 4 door model: Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>INSTALLATION.
   - 5 door model: Install the rear floor mat and the spacer - rear floor mat.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
5. Inspect the wheel alignment and adjust if necessary.
   - Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
   - Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

Caution:

When the wheel alignment has been adjusted, perform the following adjustment.

- **Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.**
- **VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

6. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.

REAR SUSPENSION > Rear Shock Absorber

DISASSEMBLY

1. Using a coil spring compressor, compress the coil spring.
2. Using a hexagon wrench to prevent the shock absorber piston rod from turning, remove the self-locking nut with ST.

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

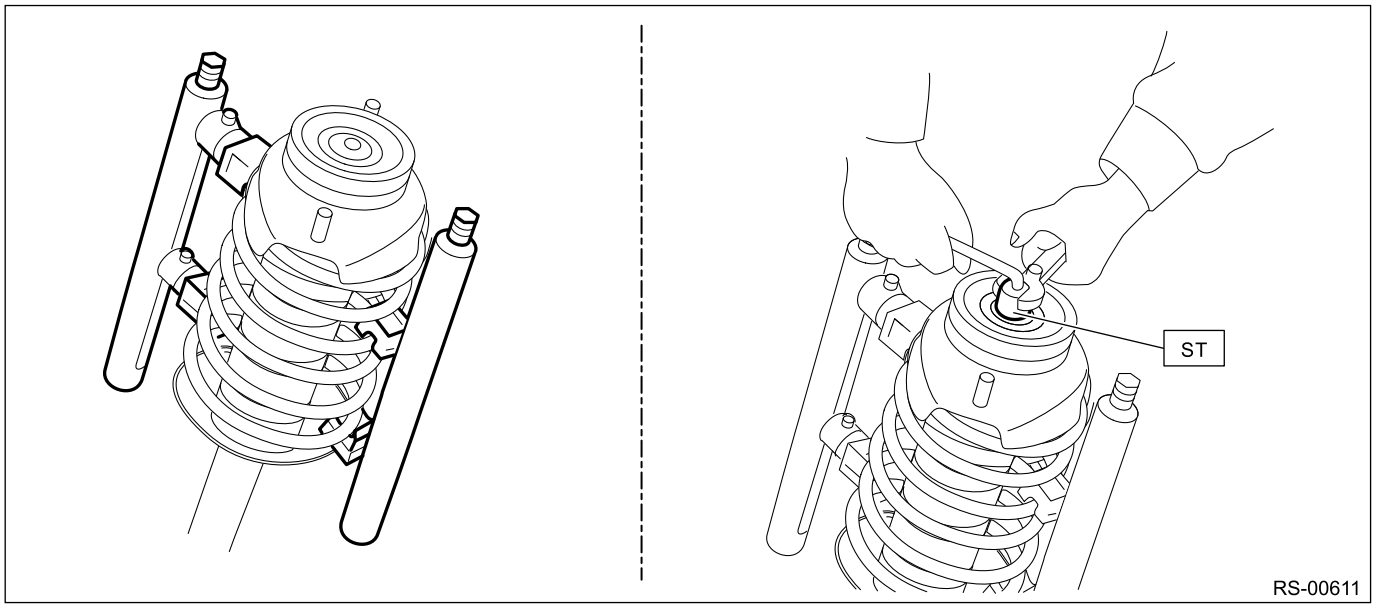
Preparation tool:

ST: STRUT MOUNT SOCKET (20399FG000)

Note:

<Example of coil spring compressor installation>

The installing position of coil spring compressor varies depending on the coil spring shape and winding number.



3. Remove the shock mount - rear from the shock absorber COMPL - rear.
4. Gradually decrease the compression pressure of compressor, and remove the coil spring - rear.
5. Remove the helper - rear and the dust cover - rear shock.

REAR SUSPENSION > Rear Shock Absorber

ASSEMBLY

1. Before assembly, check each part. Ref. to REAR SUSPENSION>Rear Shock

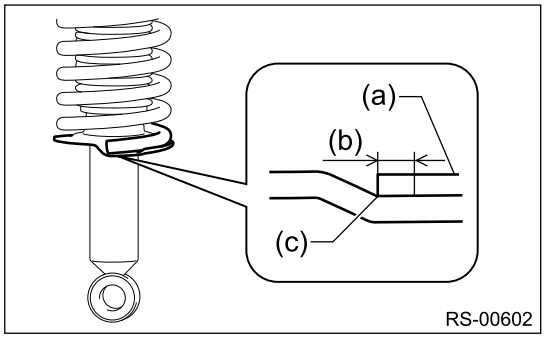
Absorber>INSPECTION.

2. Using a coil spring compressor, compress the coil spring - rear.

Caution:

When installing the coil spring compressor to the coil spring, follow the operation manual accompanied with the coil spring compressor during operation.

3. Install by aligning with the edge surface of the coil spring - rear and the stopper portion of the lower side spring seat.



(a) Coil spring - rear

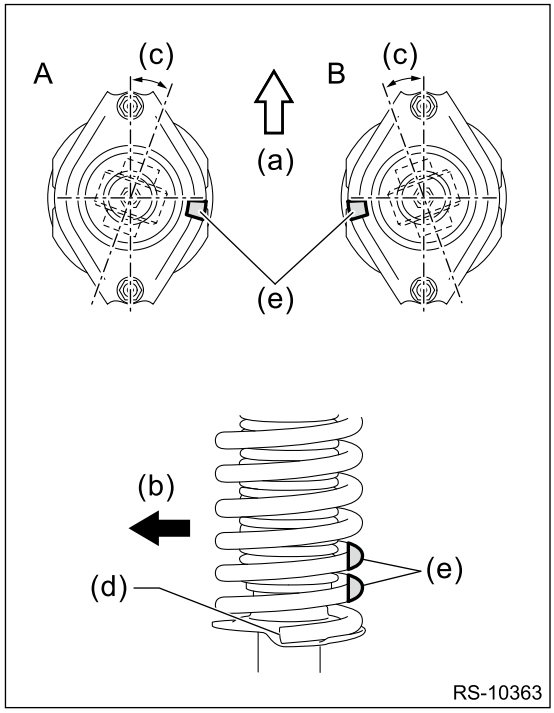
(b) 0+10 mm (0+0.4 in)

(c) Spring seat stopper portion

4. Install the helper - rear and the dust cover - rear shock to the piston rod.
5. Fully pull up the piston rod in the upward direction.
6. Temporarily tighten the rubber seat - shock UPR and the shock mount - rear with new self-locking nuts.

Note:

Position the shock mount - rear as shown in the figure.



A LH side

B RH side

(a) Front side of vehicle

(b) Vehicle outside

(c) 10°±5°

(d) End portion of coil spring - rear

(e) Identification paint (Install with the paint facing the vehicle inside.)

7. Using a hexagon wrench to prevent the shock absorber piston rod from turning, tighten the new self-locking nut with ST.

Preparation tool:

ST: STRUT MOUNT SOCKET (20399FG000)

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)

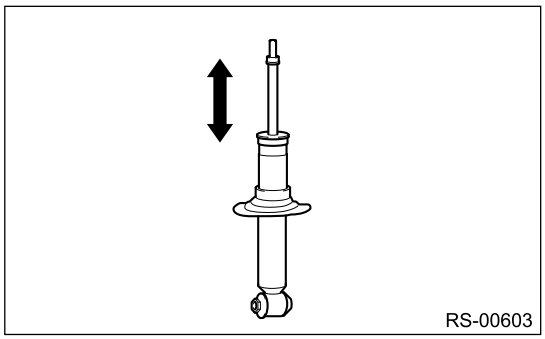
8. Loosen the coil spring compressor carefully.

REAR SUSPENSION > Rear Shock Absorber

INSPECTION

1. Check for oil leaks.

2. Move the piston rod up and down to check that it operates smoothly without any hitch.



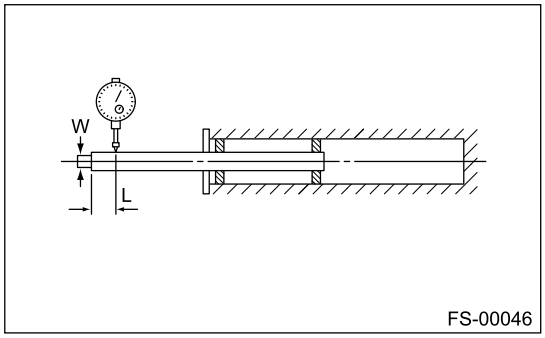
3. Check the piston rod for play as follows:

(1) Fix the outer shell in place and fully extend the rod.

(2) Set the dial gauge on the end of the rod L [10 mm (0.39 in)].

(3) While applying a force of W [20 N (2 kgf, 4 lbf)] to the threaded part, read the dial gauge indication P_1.

(4) Apply a force of 20 N (2 kgf, 4 lbf) from the opposite direction of "W", and then read the dial gauge indication P_2.



Play limit (P_1+ P_2): 0.8 mm (0.031 in)

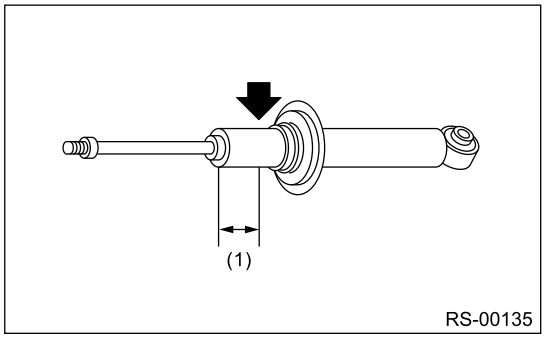
REAR SUSPENSION > Rear Shock Absorber

DISPOSAL

Caution:

- **Before discarding the strut COMPL and the shock absorber COMPL, be sure to wear goggles to protect eyes from gas, oil and cutting powder.**
- **Do not disassemble the strut COMPL and the shock absorber COMPL or throw them into flames.**
- **When discarding the strut COMPL and the shock absorber COMPL filled with gas, drill a hole on them to purge the gas.**

1. Place the shock absorber on a level surface with the piston rod fully expanded.
2. Make a hole of 30 mm (1.18 in) deep into the specified position shown in the figure, using a drill with 2 — 3 mm (0.08 — 0.12 in) diameter.



(1) 40 mm (1.57 in)

INSPECTION

1. IMPROPER VEHICLE POSTURE OR IMPROPER WHEEL ARCH HEIGHT

Possible cause	Corrective action
(1) Permanent distortion or damaged coil spring	Replace.
(2) Rough operation of shock absorber	Replace.
(3) Installation of the wrong shock absorber	Replace with proper parts.
(4) Installation of the wrong coil spring	Replace with proper parts.

2. POOR RIDE COMFORT

1. Large rebound shock
2. Rocking of the vehicle continues too long after running over bump and hump.
3. Excessive shock in bumping

Possible cause	Corrective action
(1) Damaged coil spring	Replace.
(2) Overinflation of tires	Adjust.
(3) Improper wheel arch height	Replace the coil springs with new parts.
(4) Defective operation of shock absorber	Replace.
(5) Damage or deformation of shock absorber mount	Replace.
(6) Unsuitable length (maximum or minimum) of shock absorber	Replace with appropriate parts.
(7) Deformation or loss of bushing	Replace.
(8) Deformation or damage of helper in shock absorber	Replace.
(9) Oil leakage from the shock absorber	Replace.

3. NOISE

Possible cause	Corrective action
(1) Wear or damage of shock absorber component parts	Replace.
(2) Loosening of the suspension link or arm installing bolt	Tighten to the specified torque.
(3) Deformation or loss of bushing	Replace.
(4) Unsuitable length (maximum or minimum) of shock absorber	Replace with appropriate parts.
(5) Damaged coil spring	Replace.
(6) Wear or damage of the ball joint	Replace.
(7) Deformation of the clamp - stabilizer bushing	Replace.

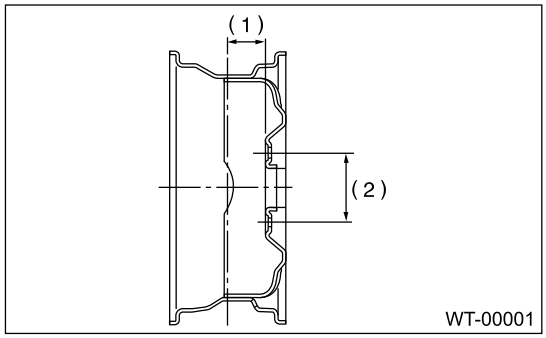
WHEEL AND TIRE SYSTEM

WT

1. General Description
2. Tire and Wheel
3. Full Wheel Cap
4. Temporary Tire
5. Tire Pressure Monitoring System
6. General Diagnostic Table

SPECIFICATION

1. NOTE



(1) Inset

(2) P.C.D.

Note:

Size and inflation pressure of the standard equipment tire, temporary tire and appropriate tire for equipment are described on the "Tire inflation pressure" label attached to the body side of the driver's door.

2. STANDARD EQUIPMENT TIRE & WHEEL

- 4 door model

Tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
P205/55R16 89V	16 × 6^1/$_2$ J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)
205/50R17 89V	17 × 7 J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)
P225/40R18 88V	18 × 7^1/$_2$ J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)

- 5 door model

Tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
P205/55R16 89V	16 × 6^1/$_2$ J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)
205/50R17 89V	17 × 7 J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)
P225/40R18 88V	18 × 7^1/$_2$ J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)

3. TEMPORARY TIRE & WHEEL

Tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
T135/80D16 101M	16 × 4T	20 (0.79)	100 (3.94)	Not used	420 (4.2, 60)
205/50R17 88V	17 × 7 J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)
P205/55R16 89V	16 × 6$^1/_2$ J	55 (2.17)	100 (3.94)	230 (2.3, 33)	220 (2.2, 32)

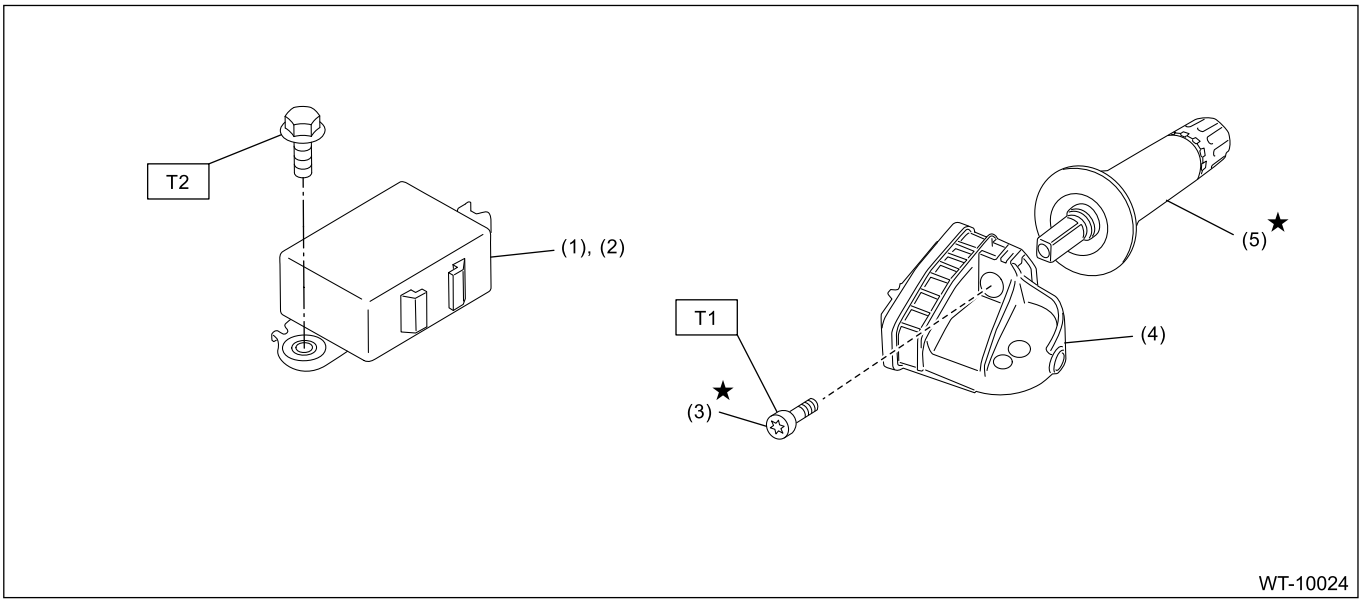
4. SERVICE DATA

Part	Axial runout	Radial runout
Steel wheel	1.5 mm (0.059 in)	
Aluminum wheel	1 mm (0.039 in)	

Wheel balancing	Standard	Service limit
Dynamic unbalance	5 g (0.18 oz) or less	

WHEEL AND TIRE SYSTEM > General Description

COMPONENT

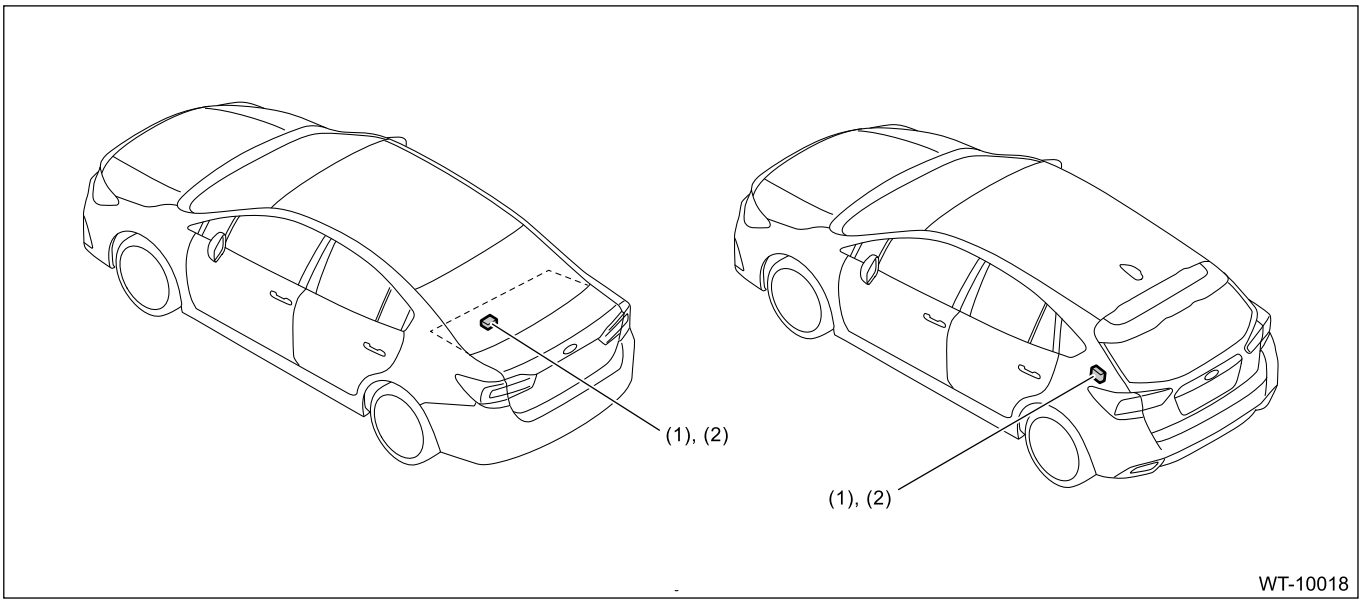


(1) TPMS & keyless entry control module (model without keyless access with push button start)
(2) TPMS CM (model with keyless access with push button start)
(3) Screw
(4) Transmitter (snap in type)
(5) Valve

Tightening torque: N·m (kgf-m, ft-lb)

T1: 1.4 (0.1, 1)

T2: 7.5 (0.8, 5.5)



(1) TPMS & keyless entry control module (model without keyless access with push button start)

(2) TPMS CM (model with keyless access with push button start)

WHEEL AND TIRE SYSTEM > General Description

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Air pressure gauge	Used for measuring tire air pressure.
Dial gauge	Used for measuring wheel runout.
Wheel balancer	Used for adjusting wheel balance.
Circuit tester	Used for measuring resistance, voltage and current.

REMOVAL

1. Remove the hubcap. (Model with full hubcap) Ref. to WHEEL AND TIRE SYSTEM>Full Wheel Cap>REMOVAL.
2. Lift up the vehicle.
3. Remove the wheel nut.
4. Remove the wheels.

Caution:

When removing the wheels, be careful not to damage the bolt - hub.

INSTALLATION

1. Install the wheels to vehicle.
2. Tighten the wheel nuts to the specified torque.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

INSPECTION

1. TIRES

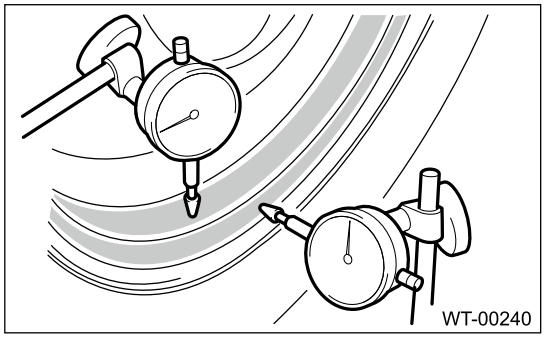
Caution:

When replacing a tire, make sure to use tires of the same size, construction and load range as originally installed.

1. Tire size and tire inflation pressure check Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.
2. Cracks, damage and wear check
3. Tire runout check

(1) Lift up the vehicle.

(2) Slowly rotate the wheel to check rim “runout” using a dial gauge.



- Aluminum wheel

  Service limit:

  Axial and longitudinal runout: 1 mm (0.04 in)
- Steel wheel

  Service limit:

  Axial and longitudinal runout: 1.5 mm (0.06 in)

(3) If the rim runout exceeds service limit, replace the wheel.

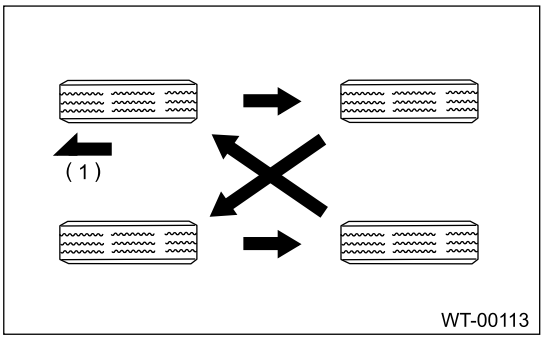
2. TIRE ROTATION

Note:

Rotate tires periodically (9,600 km/6,000 miles) in order to prolong life and to prevent uneven wear.

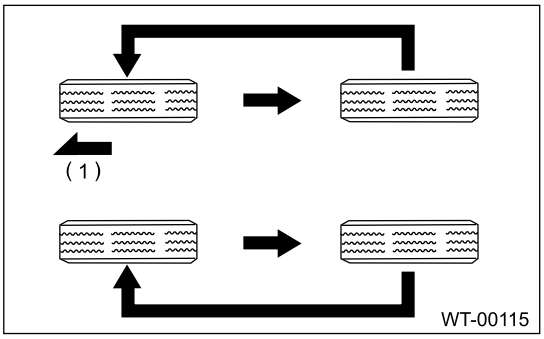
Rotate tires as shown in the figure depending on whether or not the direction of the tire rotation is specified.

- When the direction of tire rotation is not specified



(1) Front side of vehicle

- When the direction of tire rotation is specified



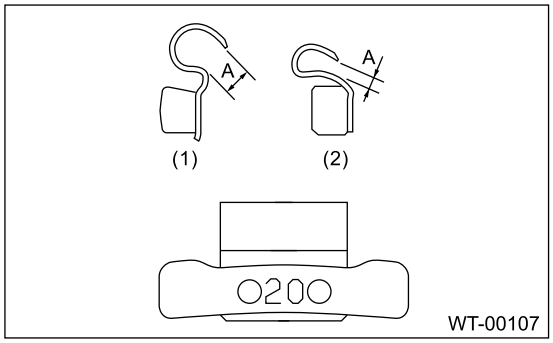
(1) Front side of vehicle

3. WHEEL BALANCING

1. Using the wheel balancer, measure wheel balance.
2. Adjust the wheel balancing.

Note:

- **Unbalance after adjusting the wheel balancing should be 5 g (0.18 oz) or less.**
- **When using the adhesive type weight, degrease the surface where the adhesive type weight will be applied securely.**
- **After applying the adhesive type weight, apply a force to the weight and attain full adhesion.**
- **Using the knock-on type weight, check the size of the knock-on part.**



(1) Knock-on type weight for aluminum wheel

(2) Knock-on type weight for steel wheel

Service limit A:

Knock-on type weight for steel wheel: 2 mm (0.08 in)

Knock-on type weight for aluminum wheel: 5 mm (0.2 in)

WHEEL AND TIRE SYSTEM > Full Wheel Cap

REMOVAL

Remove the full hubcap using your hands protected with gloves or the like.

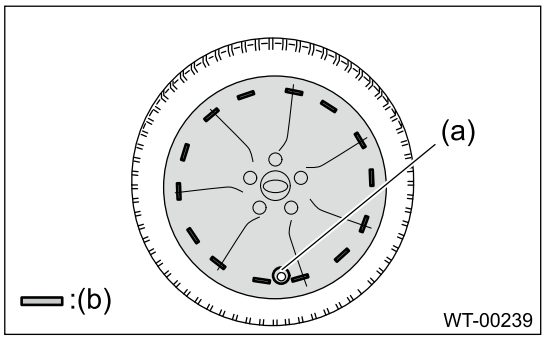
Note:

The wheels may be damaged while removing the hubcaps, but the performance will not be impaired.

WHEEL AND TIRE SYSTEM > Full Wheel Cap

INSTALLATION

1. Align the valve with the valve hole (a) in the hubcap.
2. Install the hubcap by lightly tapping the claw (b).



WHEEL AND TIRE SYSTEM > Full Wheel Cap

INSPECTION

Check for damage on the hubcap.

WHEEL AND TIRE SYSTEM > Temporary Tire

NOTE

"T-type" or "Temporary" tire for temporary use is equipped as a temporary tire.

Caution:

- **The "T-type" or "Temporary" tire is only for temporary use. Replace with a standard equipment sized tire as soon as possible.**
- **Do not use standard sized tire chains for "T-type" or "Temporary" tires. Because tire size is small, tire chains can not be installed properly and will damage the vehicle and tires if they are detached while driving.**
- **Do not drive at a speed greater than 80 km/h (50 MPH).**
- **Drive the vehicle as slowly as possible and avoid bumps on the road.**

WHEEL AND TIRE SYSTEM > Temporary Tire

REPLACEMENT

Refer to "Tire and Wheel" for removal and installation of the "T-type" or "Temporary" tire. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel.

WHEEL AND TIRE SYSTEM > Temporary Tire

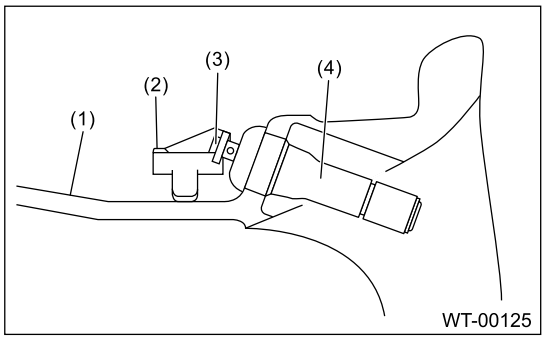
INSPECTION

For inspection of the "T-type" or "Temporary" tire, refer to "Inspection" for standard equipment tire. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > TIRES.

REMOVAL

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

1. Remove the wheels from the vehicle. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the tires from wheels.
   Caution:
   Use a tire changer when removing the tire from the wheel.
3. Loosen the screw to remove the transmitter from the valve stem.
   Caution:
   Do not reuse the valve and screw.
   Replace the valve and screw with a new part even when reusing transmitter.



(1) Wheel
(2) Transmitter
(3) Screw
(4) Valve

4. Remove the valve from the wheel.

2. TPMS & KEYLESS CONTROL MODULE

Note:

- **TPMS CM for keyless entry model is integrated with the keyless entry control module.**
- **For removal procedures, refer to "SECURITY AND LOCKS" section. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module>REMOVAL.**

3. TPMS CM

Note:

For removal procedures of the TPMS CM for models with keyless access with push button start, refer to the "SECURITY AND LOCKS" section. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module>REMOVAL.

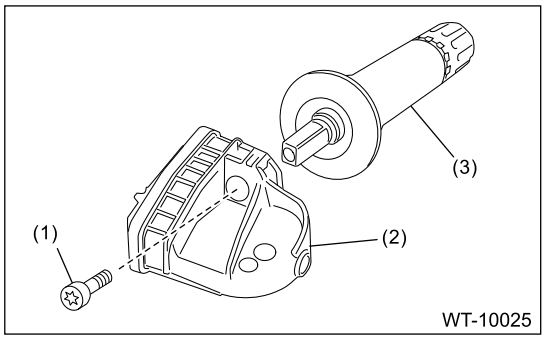
INSTALLATION

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

Caution:

Use the new transmitter assembly or replace the new valve and screw, when installing.

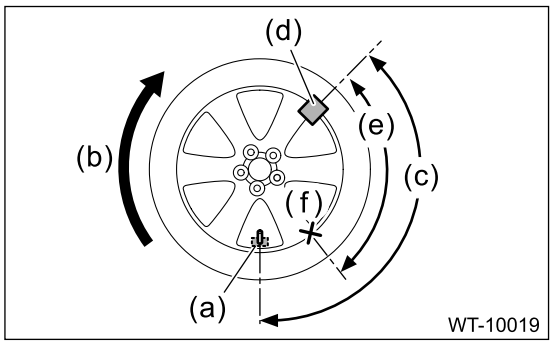
1. Replace the valve and screw with a new part when reusing transmitter.



(1) Screw
(2) Transmitter
(3) Valve

Tightening torque:
1.4 N·m (0.1 kgf-m, 1 ft-lb)

2. Install the transmitter to the wheel by aligning it with valve hole.
Note:
When using the jig that pulls the valve cap by hooking its neck part, use another short-type cap.
3. Install the tires to wheels.
Caution:
- **Use a tire changer when installing tire to wheel.**
- **To prevent damaging the transmitter, set the tire changer boom in the position as shown in the figure.**



(a) Transmitter
(b) Direction of turn table rotation
(c) 135°
(d) Tire changer boom
(e) 90°
(f) Starting point for fitting the bead to the rim

4. Install the wheels to vehicle. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
5. Register the transmitter ID when the transmitter has been replaced. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).

2. TPMS & KEYLESS CONTROL MODULE

Note:

- **TPMS CM for keyless entry model is integrated with the keyless entry control module. When the keyless entry control module has been replaced, re-register the TPMS transmitter. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).**
- **For installation procedures, refer to "SECURITY AND LOCKS" section. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module>INSTALLATION.**

3. TPMS CM

Note:

For installation procedures of the TPMS CM for models with keyless access with push button start, refer to the "SECURITY AND LOCKS" section. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module>INSTALLATION.

1. Install the trim panel - trunk side LH.
2. Install the trim panel - trunk rear.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

Symptoms	Possible cause	Corrective action
Vehicle is unstable.	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to “Abnormal tire wear” in this table, carry out the procedure and replace the tire.
	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Front strut	Check the front strut. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
	Rear shock absorber	Check the rear shock absorber. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.
	Housing assembly - front axle	Check the housing assembly - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - front axle	Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - rear axle	Check the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
Vehicle is abnormally out of balance.	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to “Abnormal tire wear” in this table, carry out the procedure and replace the tire.
	Stabilizer	Inspect the stabilizer.

Symptoms	Possible cause	Corrective action
	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
Abnormal wheel vibration	Improperly inflated tire	Adjust the tire pressure.
	Uneven wear	Check the tire referring to “Abnormal tire wear” in this table, carry out the procedure and replace the tire.
	Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Housing assembly - front axle	Check the housing assembly - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - front axle	Check the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Hub unit COMPL - rear axle	Check the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
Abnormal tire wear	Improperly inflated tire	Adjust the tire pressure.
	Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

Symptoms	Possible cause	Corrective action
	Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

DIFFERENTIALS

DI

1. General Description
2. Differential Gear Oil
3. Front Differential Assembly
4. Rear Differential (T-type)
5. Rear Differential (VA-type)
6. Rear Differential Front Oil Seal
7. Rear Differential Side Oil Seal
8. Rear Differential Front Member
9. Rear Differential Mount Bushing
10. Rear Differential Inspection Mode
11. General Diagnostic Table

SPECIFICATION

1. REAR DIFFERENTIAL

When replacing a rear differential assembly, select the correct one according to the following table.

Note:

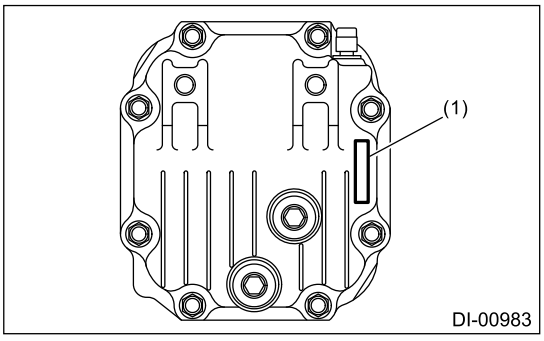
- **Using a different rear differential assembly will cause the drive train and tires to drag or emit abnormal noise.**
- **For option code, refer to "IDENTIFICATION" section.** **Ref. to IDENTIFICATION.**

Model	2.0 L	
	CVT	5MT
Rear differential type	VA1-type	T-type
Identification	42	T2
LSD type	—	
Type of gear	Hypoid gear	
Gear ratio (number of gear teeth)	3.700 (37/10)	4.111 (37/9)
Oil capacity	0.8 L (0.8 US qt, 0.7 Imp qt)	
Rear differential gear oil	SUBARU GEAR OIL EXTRA MT (75W-80)	GL-5 (75W-90)

2. IDENTIFICATION

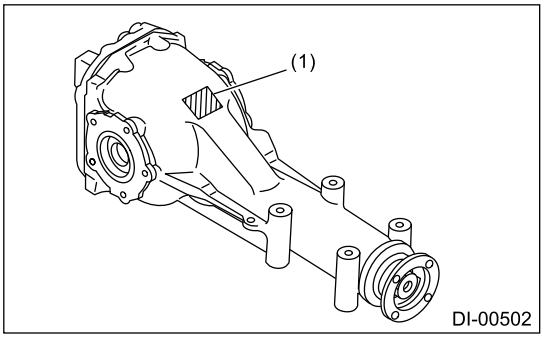
Identification positions are shown in the following figures. For details concerning identification, refer to the "IDENTIFICATION" section.

- VA1-type



(1) Identification

- T-type

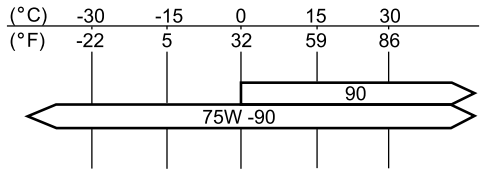


(1) Identification

3. REAR DIFFERENTIAL GEAR OIL

Caution:
Each oil manufacturer has its base oil and additives. Thus, do not mix two or more brands.

- VA1-type
  Recommended gear oil:
  SUBARU GEAR OIL EXTRA MT (75W-80)
- T-type
  Recommended gear oil:
  GL-5 (75W-90) or equivalent

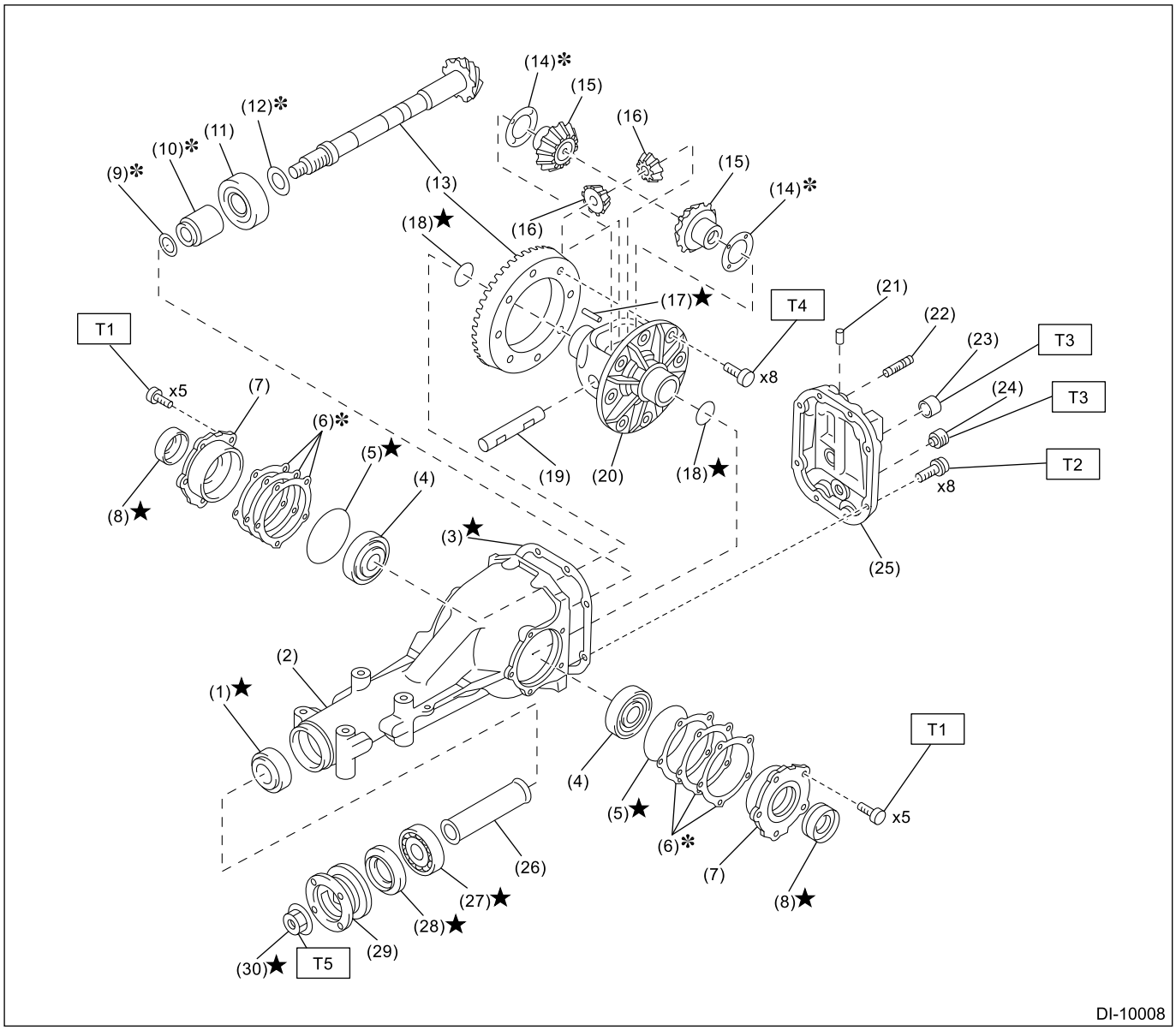
API classification	GL-5
SAE viscosity No. and applicable temperature	 DI-10007

4. SERVICE DATA

Drive pinion bearing preload (for new bearing)	Measured with spring measurement (measured from the companion flange bolt)	N (kgf, lbf)	T-type	18.1 — 38.8 (1.8 — 4.0, 4.1 — 8.7)
			VA1-type	12.7 — 32.2 (1.3 — 3.3, 2.9 — 7.2)
	Measured with torque wrench	N·m (kgf-m, ft-lb)	T-type	0.69 — 1.47 (0.07 — 0.15, 0.51 — 1.08)
			VA1-type	0.48 — 1.22 (0.05 — 0.12, 0.35 — 0.90)
Side gear backlash		mm (in)	T-type	0.10 — 0.20 (0.004 — 0.008)
			VA1-type	0.05 — 0.15 (0.002 — 0.006)
Hypoid driven gear backlash		mm (in)	T-type	0.10 — 0.20 (0.004 — 0.008)
			VA1-type	0.10 — 0.15 (0.004 — 0.006)
Hypoid driven gear runout on its back surface		mm (in)	T-type	0.05 (0.002)
Total preload (measured from the companion flange bolt hole)		N (kgf, lbf)	T-type	20.7 — 54.4 (2.1 — 5.5, 4.7 — 12.2)
Companion flange mating surface runout			mm (in)	0.08 (0.003)
Companion flange runout on its inner side			mm (in)	0.08 (0.003)

COMPONENT

1. REAR DIFFERENTIAL (T-TYPE)

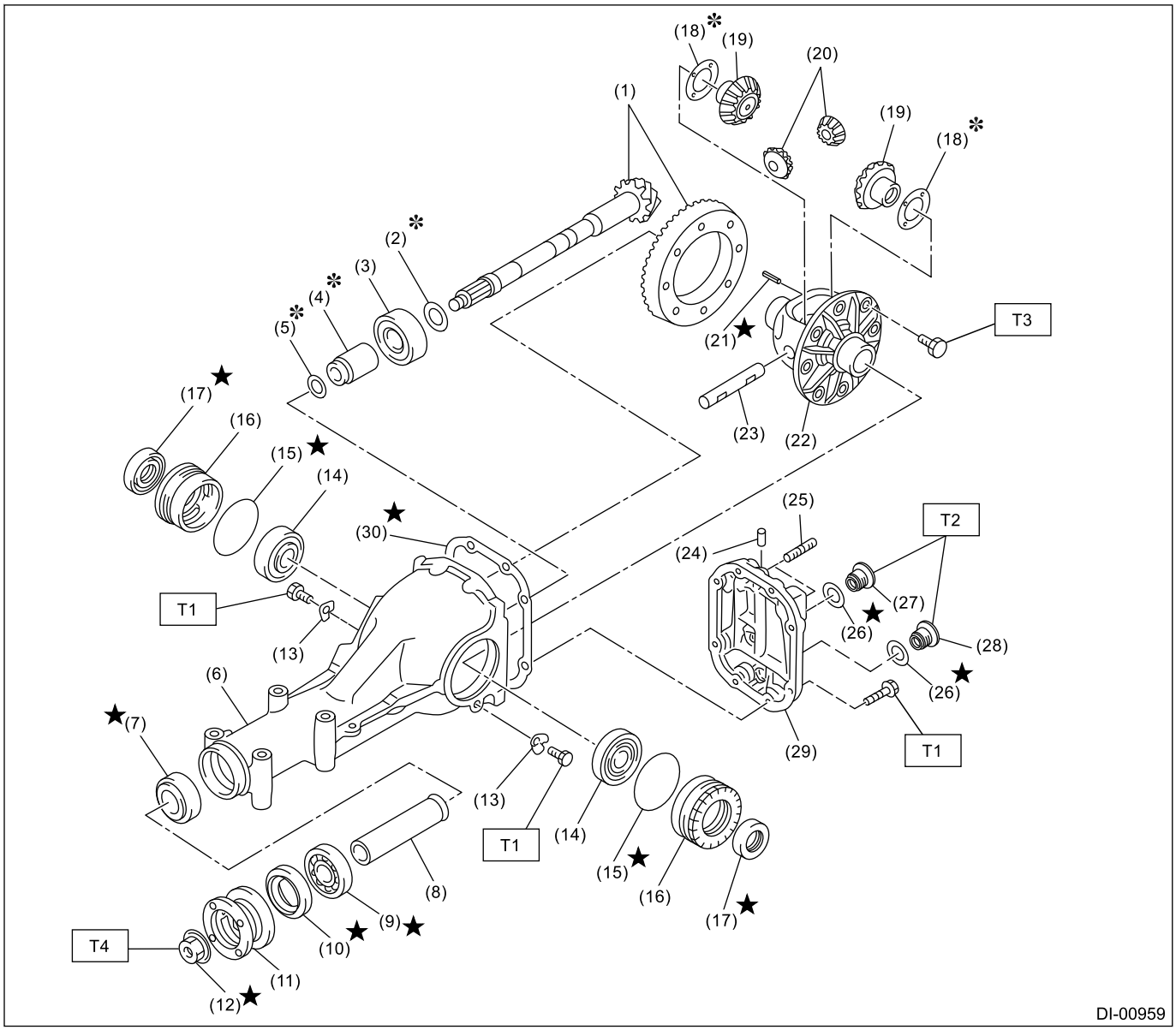


(1) Front bearing
(2) Differential carrier
(3) Gasket
(4) Side bearing
(5) O-ring
(6) Side retainer shim
(7) Side retainer
(8) Side oil seal
(9) Preload adjusting washer
(10) Preload adjusting spacer
(11) Rear bearing
(12) Pinion height adjusting washer
(13) Hypoid driven gear and drive pinion set
(14) Side gear thrust washer
(15) Side gear
(16) Pinion mate gear
(17) Pinion shaft lock pin
(18) Circlip
(19) Pinion mate shaft
(20) Differential case
(21) Air breather cap
(22) Stud bolt
(23) Filler plug
(24) Drain plug
(25) Rear cover
(26) Spacer
(27) Pilot bearing
(28) Front oil seal
(29) Companion flange
(30) Self-locking nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 10.5 (1.1, 7.7)
T2: 29.5 (3.0, 21.8)
T3: 49 (5.0, 36.1)
T4: 103 (10.5, 76.0)
T5: 181.5 (18.5, 133.9)

2. REAR DIFFERENTIAL (VA1-TYPE)

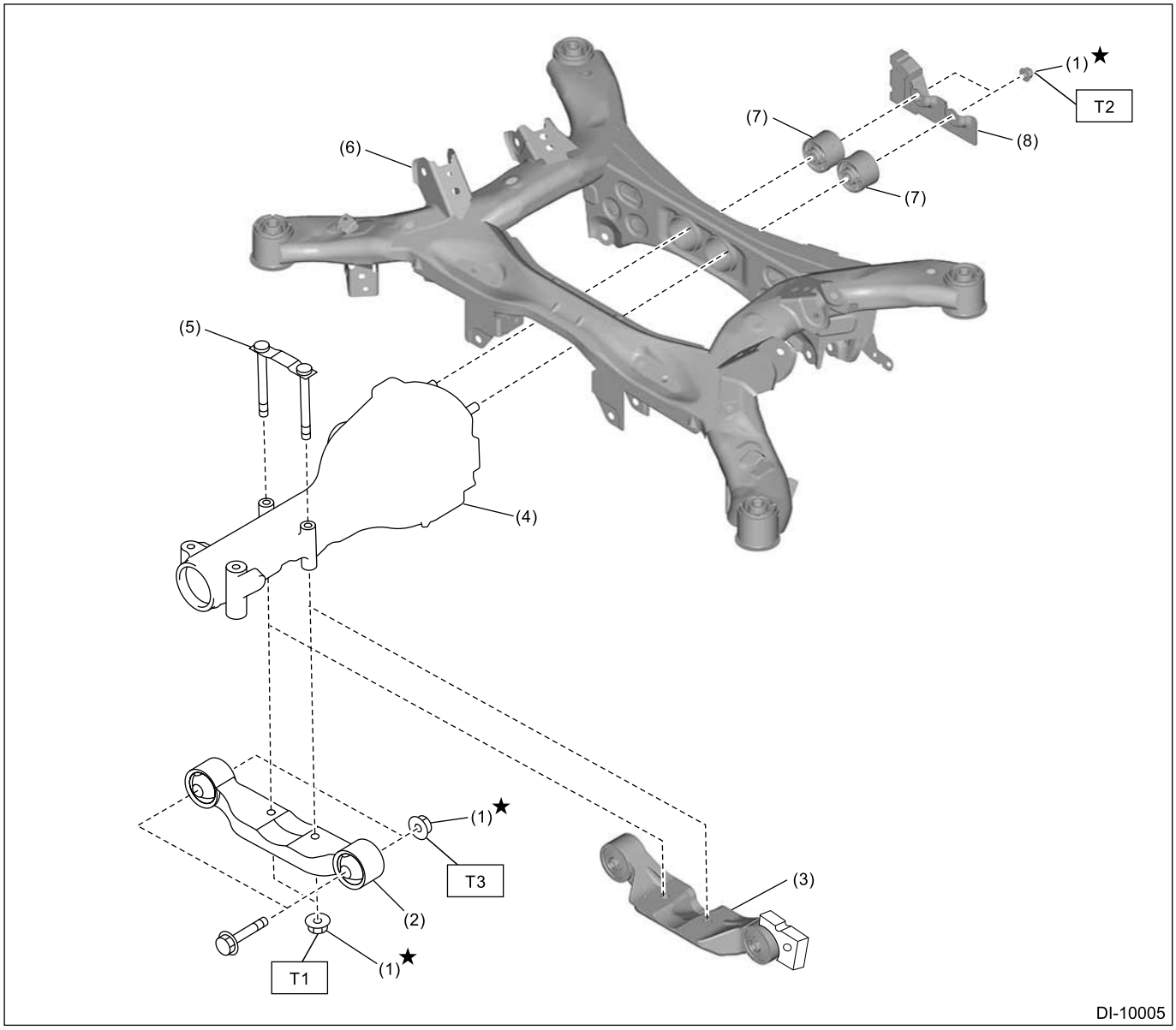


(1) Hypoid driven gear and drive pinion set
(2) Pinion height adjusting washer
(3) Rear bearing
(4) Preload adjusting spacer
(5) Preload adjusting washer
(6) Differential carrier
(7) Front bearing
(8) Spacer
(9) Pilot bearing
(10) Front oil seal
(11) Companion flange
(12) Self-locking nut
(13) Lock plate
(14) Side bearing
(15) O-ring
(16) Side retainer
(17) Side oil seal
(18) Side gear thrust washer
(19) Side gear
(20) Pinion mate gear
(21) Spring pin
(22) Differential case
(23) Pinion mate shaft
(24) Air breather cap
(25) Stud bolt
(26) Gasket
(27) Filler plug
(28) Drain plug
(29) Rear cover
(30) Gasket

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.5, 18.4)
T2: 50 (5.1, 36.9)
T3: Ref. to DIFFERENTIALS>Rear Differential (VA-type)>ASSEMBLY.
T4: 191 (19.5, 140.9)

3. REAR DIFFERENTIAL MOUNTING SYSTEM



(1)	Self-locking nut	(5)	Rear differential member plate	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Rear differential front member (T type)	(6)	Sub frame	***T1: 50 (5.1, 36.9)***
(3)	Rear differential front member (VA1 type)	(7)	Rear differential mount bushing	***T2: 70 (7.1, 51.6)***
(4)	Rear differential ASSY	(8)	Mass damper	***T3: 110 (11.2, 81.1)***

DIFFERENTIALS > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the disassembled parts in order and protect them from dust and dirt.

- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix up grease etc. of different grades or manufacturers.
- Do not secure a part in a vise directly. Place cushioning materials such as wood pieces, blocks, aluminum plates, or waste cloth between the part and the vise.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Before installing the O-ring or snap ring, apply a sufficient amount of gear oil to avoid damage and deformation.
- Avoid damaging the mating surface of the case.
- For parts which are not reusable, always use new parts. Other parts should be replaced with new parts as required.
- When handling oil or fuel, adhere to the following to prevent unexpected accident.
  - Be careful with fire.
  - Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.
  - Follow all government and local regulations concerning disposal of refuse when disposing.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.

PREPARATION TOOL

1. SPECIAL TOOL

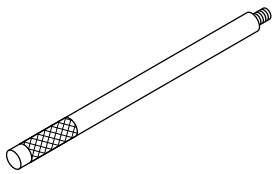
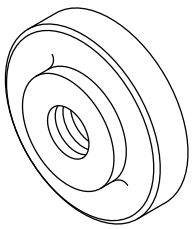
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398477701	398477701	HANDLE	• Used for installing the rear bearing race. • Used for installing the front bearing race.
 ST-398477702	398477702	DRIFT	• Used for installing the front bearing race. (T-type) • Used for installing the rear bearing race. (VA1-type) • Used for installing side bearing race. (VA1-type)

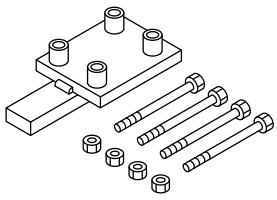
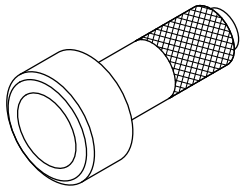
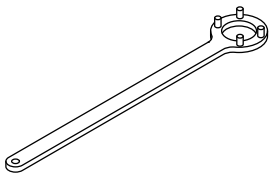
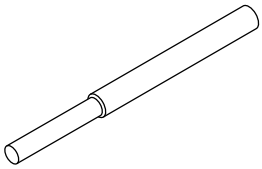
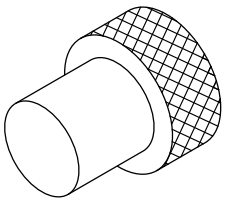
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398217700	398217700	ATTACHMENT SET	Stand for rear differential carrier disassembly and assembly.
 ST-498447120	498447120	INSTALLER	Used for installing the front oil seal.
 ST-498427200	498427200	FLANGE WRENCH	Used for stopping rotation of companion flange when removing and tightening self-lock nut.
 ST-398467700	398467700	DRIFT	Used for removing drive pinion shaft, pilot bearing and front bearing cone.
 ST-399780104	399780104	WEIGHT	• Used for installing the front bearing cone and the companion flange. • Used for installing the pilot bearing.

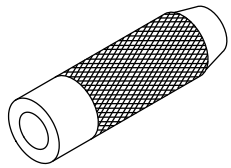
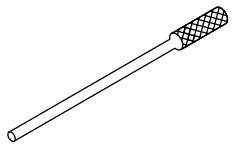
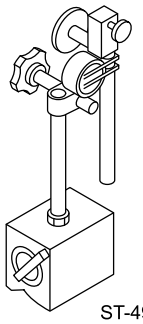
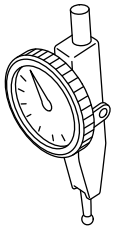
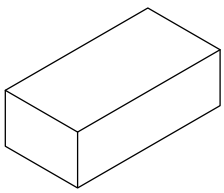
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899580100	899580100	INSTALLER	Used for installing the front bearing cone and the pilot bearing.
 ST-899904100	899904100	STRAIGHT PIN REMOVER	• Used for removing and installing the pinion mate shaft lock pin. (T-type) • Used for removing and installing the pinion mate shaft spring pin. (VA1-type)
 ST-498247001	498247001	MAGNET BASE	• Used for measuring backlash between side gear and pinion, and hypoid gear. • Used together with DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	• Used for measuring backlash between side gear and pinion, and hypoid gear. • Used together with MAGNET BASE (498247001).
 ST-398507704	398507704	BLOCK	Used for adjusting pinion height and preload.

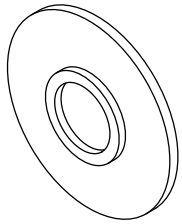
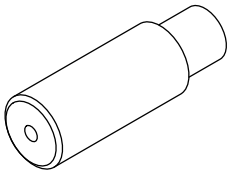
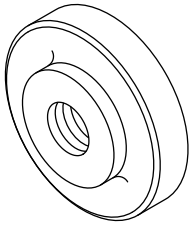
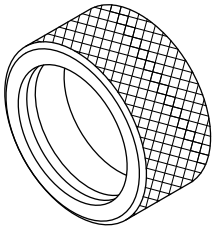
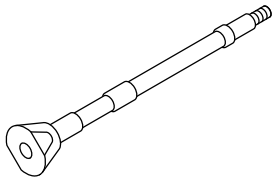
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398177700	398177700	INSTALLER	Used for installing the rear bearing cone. (T-type)
 ST-398457700	398457700	ATTACHMENT	Used for removing the side retainer. (T-type)
 ST-398477703	398477703	DRIFT 2	Used for installing the rear bearing race. (T-type)
 ST-398437700	398437700	OIL SEAL INSTALLER	Used for installing the side oil seal. (T-type)
 ST-398507702	398507702	DUMMY SHAFT	Used for adjusting pinion height and preload. (T-type)

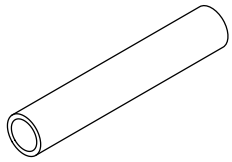
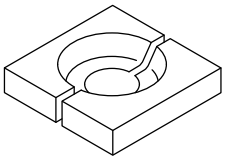
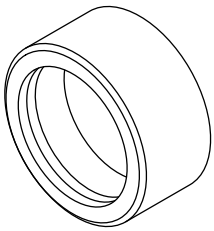
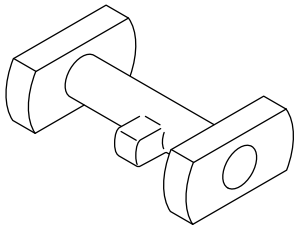
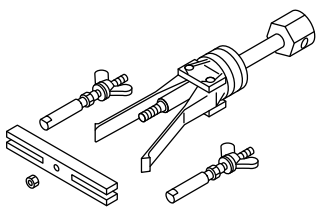
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 ST-398507703	398507703	DUMMY COLLAR	• Used for adjusting pinion height and preload. (T-type) • Used for installing the front bearing cone. (T-type)
 ST-398517700	398517700	REPLACER	Used for removing rear bearing cone. (T-type)
 ST-398487700	398487700	DRIFT	Used for installing side bearing cone. (T-type)
 ST-398507701	398507701	DIFFERENTIAL CARRIER GAUGE	Used for adjusting pinion height. (T-type)
 ST-398527700	398527700	PULLER ASSY	• Used for removing front oil seal. • Used for removing the side bearing race. (T-type) • Used for removing side oil seal.

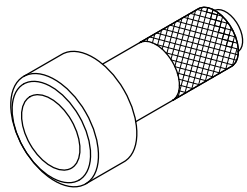
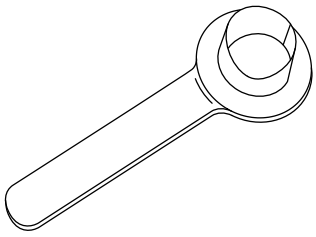
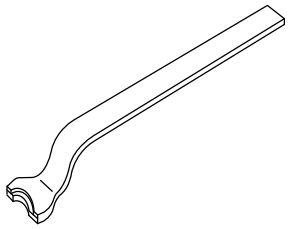
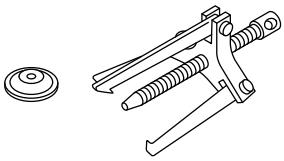
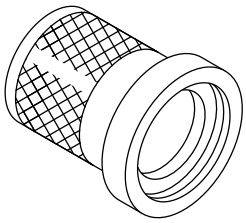
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-398417700	398417700	DRIFT	Used for installing side bearing race. (T-type)
 ST28099PA090	28099PA090	OIL SEAL PROTECTOR	Used for installing the rear drive shaft to the rear differential. (For oil seal protection)
 ST28099PA100	28099PA100	DRIVE SHAFT REMOVER	Used for removing the rear drive shaft from rear differential. (T-type)
 ST-399703600	399703600	PULLER ASSY	Used for removing companion flange.
 ST-899874100	899874100	INSTALLER	Used for installing the companion flange.

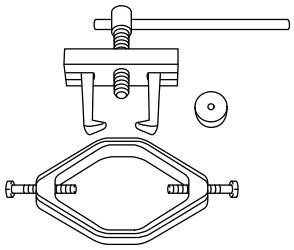
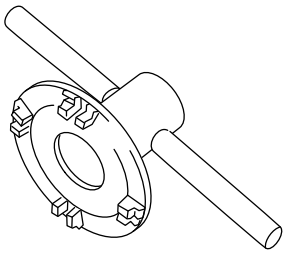
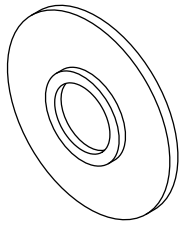
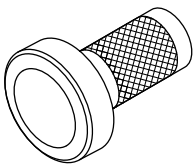
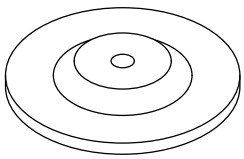
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 ST18759AA000	18759AA000	PULLER ASSY	Used for removing the side bearing cone. (T-type)
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	• Used for removing and installing the side retainer. (VA1-type) • WRENCH ASSY (499787000) can also be used.
 ST-498175500	498175500	INSTALLER	Used for installing the rear bearing cone. (VA1-type)
 ST498447100	498447100	INSTALLER	Used for installing the side oil seal. (VA1-type)
 ST-399520105	399520105	SEAT	• Used for removing the side bearing cone. (VA1-type) • Used together with PULLER SET (899524100). (VA1-type)

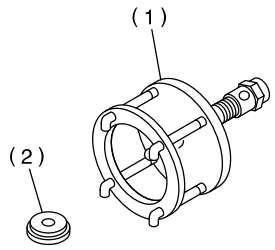
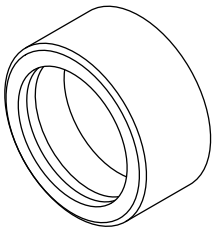
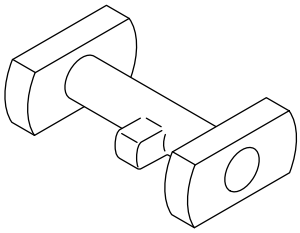
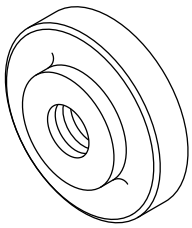
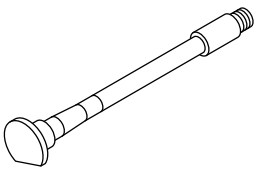
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899524100	899524100	PULLER SET	• Used for removing the side bearing cone. (VA1-type) • Used together with SEAT (399520105). (1) Puller (2) Cap
 ST-498485400	498485400	DRIFT	Used for installing side bearing cone. (VA1-type)
 ST-498505501	498505501	DIFFERENTIAL CARRIER GAUGE	Used for adjusting pinion height. (VA1-type)
 ST-498447110	498447110	DRIFT	Used for installing the front bearing race. (VA1-type)
 ST-498447150	498447150	DUMMY SHAFT	Used for adjusting pinion height and preload. (VA1-type)

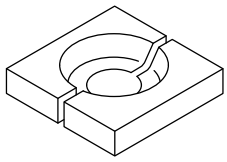
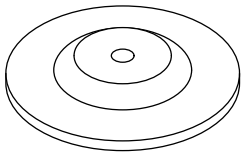
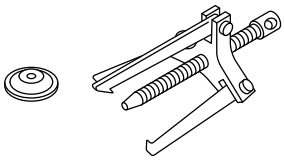
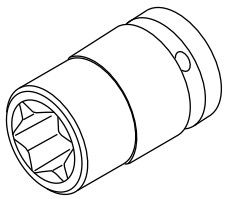
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498515500	498515500	REMOVER	Used for removing rear bearing cone. (VA1-type)
 ST-499705404	499705404	SEAT	• Used for removing the side bearing race. (VA1-type) • Used together with PULLER ASSY (499705401).
 ST-499705401	499705401	PULLER ASSY	• Used for removing the side bearing race. (VA1-type) • Used together with SEAT (499705404).
 ST18270KA020	18270KA020	SOCKET (E20)	Used for removing and installing the hypoid driven gear. (VA1-type)

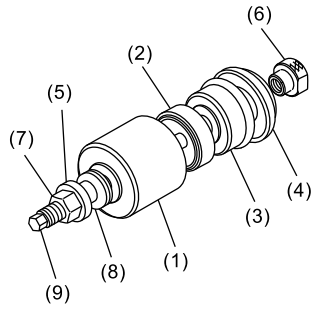
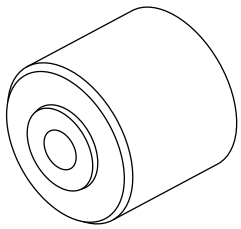
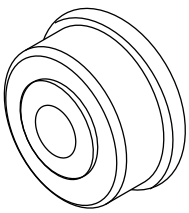
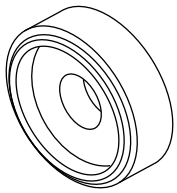
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41399FG001	41399FG001	SPECIAL TOOL ASSY	• Used for removing and installing the rear differential mount bushing. • Use (1), (2), (5), (6), (7), (8) and (9) for removal. • Use (3), (4), (5), (6), (7), (8) and (9) for installation. (1) SPECIAL TOOL A (41399FG010) (2) SPECIAL TOOL C (41399FG031) (3) SPECIAL TOOL B (41399FG020) (4) SPECIAL TOOL D (41399FG041) (5) SPECIAL TOOL SLEEVE (41399FG050) (6) SPECIAL TOOL RING (41399FG061) (7) SPECIAL TOOL NUT (41399FG070) (8) SPECIAL TOOL BEARING (41399FG080) (9) SPECIAL TOOL SHAFT (41399FG091)
 ST41399FG010	41399FG010	SPECIAL TOOL A	• Used for removing the rear differential mount bushing. • For combination of tools for removal, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG020	41399FG020	SPECIAL TOOL B	• Used for installing the rear differential mount bushing. • For combination of tools for installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG031	41399FG031	SPECIAL TOOL C	• Used for removing the rear differential mount bushing. • For combination of tools for removal, refer to “SPECIAL TOOL ASSY (41399FG001)”.

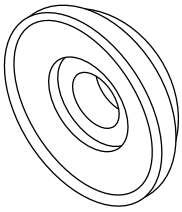
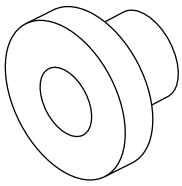
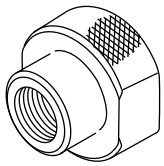
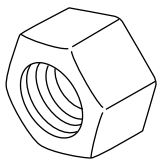
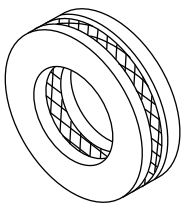
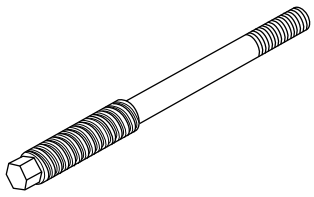
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41399FG041	41399FG041	SPECIAL TOOL D	• Used for installing the rear differential mount bushing. • For combination of tools for installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG050	41399FG050	SPECIAL TOOL SLEEVE	• Used for removing and installing the rear differential mount bushing. • For combination of tools for removal and installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG061	41399FG061	SPECIAL TOOL RING	• Used for removing and installing the rear differential mount bushing. • For combination of tools for removal and installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG070	41399FG070	SPECIAL TOOL NUT	• Used for removing and installing the rear differential mount bushing. • For combination of tools for removal and installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.
 ST41399FG080	41399FG080	SPECIAL TOOL BEARING	• Used for removing and installing the rear differential mount bushing. • For combination of tools for removal and installation, refer to “SPECIAL TOOL ASSY (41399FG001)”.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41399FG091	41399FG091	SPECIAL TOOL SHAFT	• Used for removing and installing the rear differential mount bushing. • For combination of tools for removal and installation, refer to "SPECIAL TOOL ASSY (41399FG001)".
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Transmission jack	Used for removing and installing the rear differential.
Puller	Used for removing the side bearing retainer.
Thickness gauge	Used for measuring clearance.
Hexagon wrench	Used for installing and removing the filler plug and drain plug.
Tire lever	Used for removing the rear drive shaft. (VA1-type)
Angle gauge	Used for installing the hypoid driven gear. (VA1-type)
DST-i	Used together with Subaru Select Monitor 4.

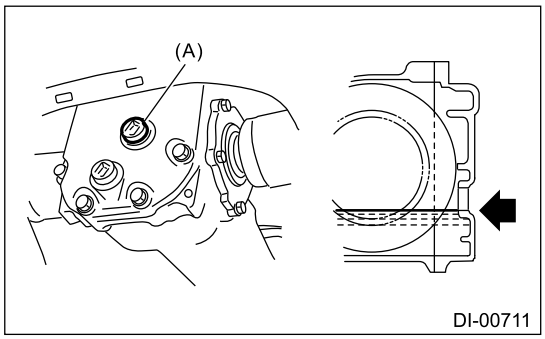
INSPECTION

1. Lift up the vehicle.
2. Remove the filler plug, and then check the gear oil. Replace the gear oil if it is contaminated, deteriorated or cloudy. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.
3. Check that the gear oil level is within −5 mm (−0.2 in) from the bottom of the filler plug hole. If the level is low, make sure that there is no oil leakage and refill up to the bottom of filler plug hole.

   Note:

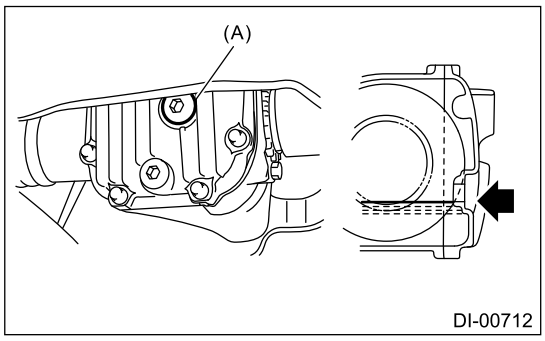
   On VA1-types at factory settings, the oil level may be within −14 mm (−0.6 in) from the bottom of the filler plug. This is at normal level, requiring no oil refill.

   - T-type



(A) Filler plug

   - VA1-type



(A) Filler plug

4. Install the filler plug.

   Caution:

   For VA1 type, use a new gasket.

   Note:

   For the T-type, degrease the thread portion sufficiently and apply liquid gasket to the filler plug.

   Liquid gasket:

   THREE BOND 1105 (Part No. 004403010) or equivalent

   Tightening torque:

   T-type:

   49 N·m (5.0 kgf-m, 36.1 ft-lb)

   VA1-type:

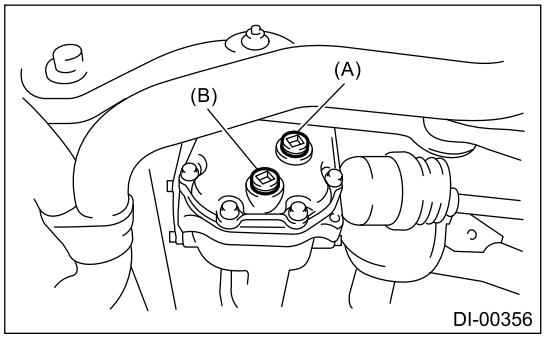
   50 N·m (5.1 kgf-m, 36.9 ft-lb)

REPLACEMENT

Caution:

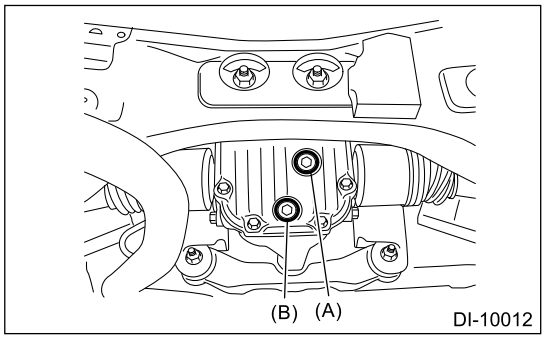
- **Gear oil is extremely hot just after driving. Be wary of receiving burns.**
- **Be careful not to spill the differential gear oil on exhaust pipe. If gear oil is spilled, wipe it off completely.**

1. Lift up the vehicle.
2. Remove the drain plug and filler plug, and drain the gear oil.
   - T-type



(A) Filler plug
(B) Drain plug

   - VA1-type



(A) Filler plug
(B) Drain plug

3. Install the drain plug.

Caution:

For VA1 type, use a new gasket.

Note:

For the T-type, degrease the thread portion sufficiently and apply liquid gasket to the drain plug.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

T-type:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

VA1-type:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

4. Fill the differential carrier with gear oil to the bottom of filler plug.

Caution:

Carefully refill gear oil while watching the level. Excessive or insufficient oil must be avoided.

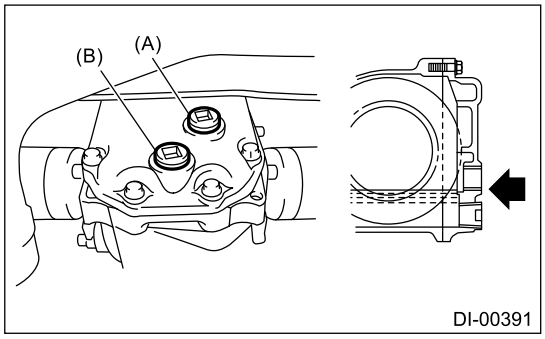
Recommended gear oil:

Ref. to DIFFERENTIALS>General Description>SPECIFICATION.

Oil capacity:

0.8 L (0.8 US qt, 0.7 Imp qt)

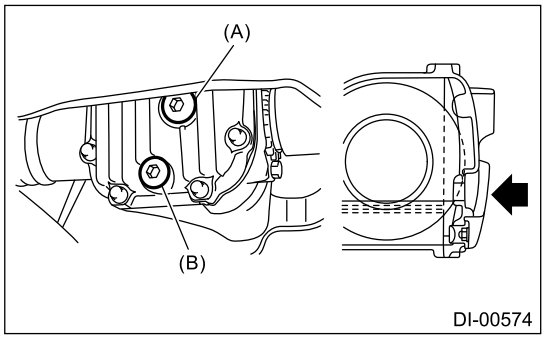
- T-type



(A) Filler plug

(B) Drain plug

- VA1-type



(A) Filler plug

(B) Drain plug

5. Install the filler plug.

Caution:

For VA1 type, use a new gasket.

Note:

For the T-type, degrease the thread portion sufficiently and apply liquid gasket to the filler plug.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

T-type:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

VA1-type:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

NOTE

1. CVT MODEL

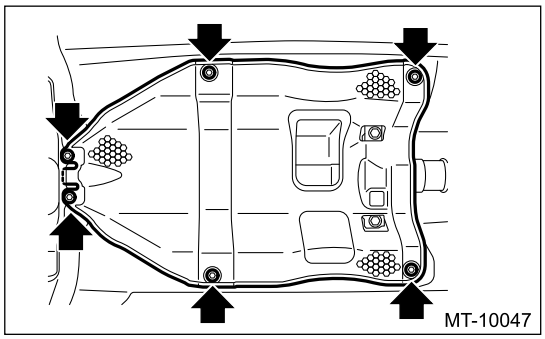
For the front differential, refer to the “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section.
Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly.

2. MT model

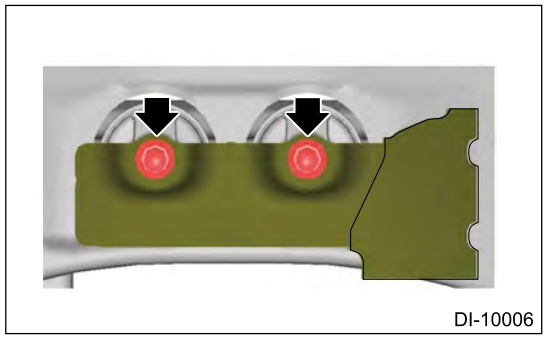
For the front differential, refer to the “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section.
Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly.

REMOVAL

1. Shift the select lever or gear shift lever to neutral.
2. Release the parking brake.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Lift up the vehicle.
5. Remove the rear tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
6. Drain differential gear oil. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.
7. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
8. Remove the center exhaust cover.



9. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
10. Loosen the self-lock nuts which hold the rear differential to the sub frame.



11. Remove the DOJ of the rear drive shaft using the ST or a tire lever.

Caution:

When removing the DOJ, fit the tire lever or ST to the bolts as shown in the figure so as not to damage the side retainer.

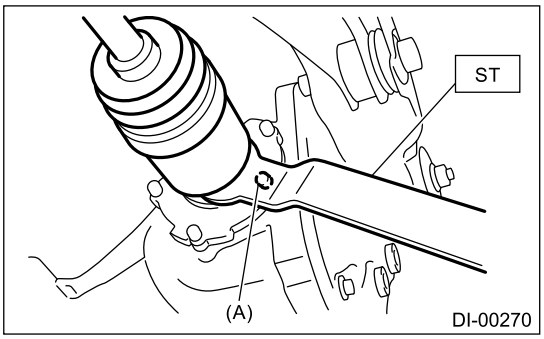
Note:

- **For the T-type, use the ST.**
- **For the VA-type, use the tire lever.**

T-type

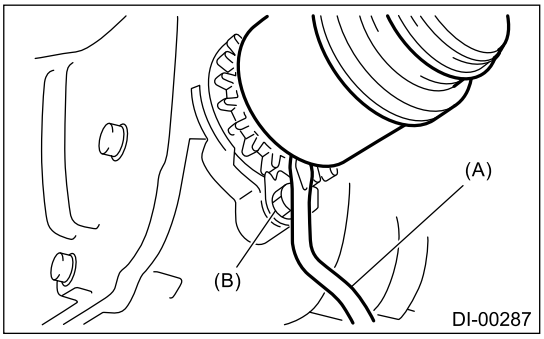
Special Tool:

ST: 28099PA100 DRIVE SHAFT REMOVER



(A) Bolt

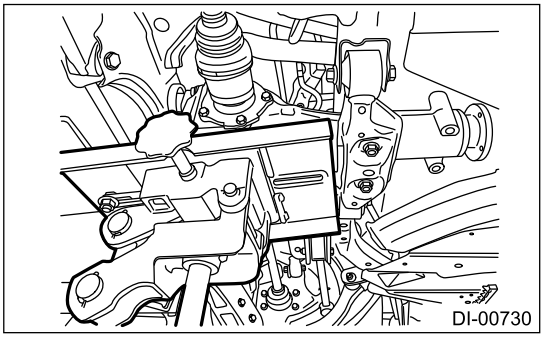
VA1-type



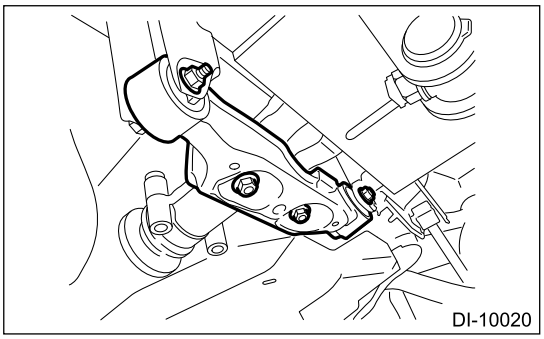
(A) Tire lever

(B) Bolt

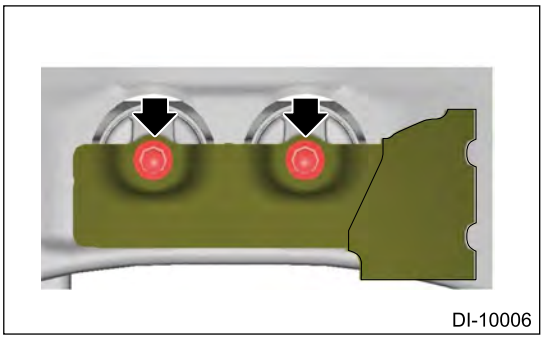
12. Set the transmission jack.



13. Remove the rear differential front member.



14. Remove the self-lock nuts which hold the rear differential to the sub frame.

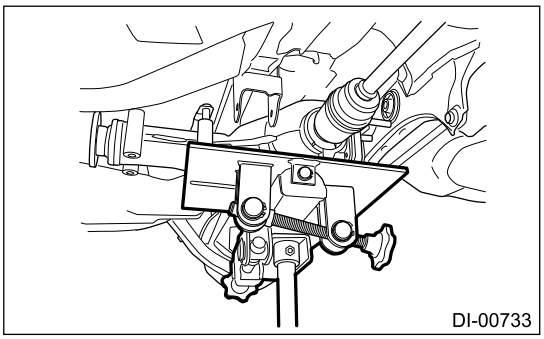


15. Remove the mass damper.

16. Pull out the rear differential stud bolt from rear differential mount bushing.

Note:

When pulling out the stud bolt from the rear differential mount bushing, carefully adjust the angle and location of transmission jack and jack stand, if necessary.

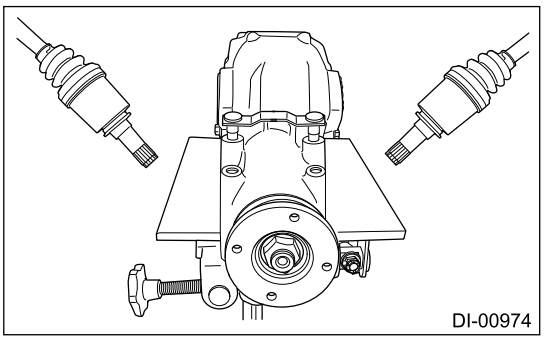


17. Lower the transmission jack.

18. Pull out the rear drive shaft.

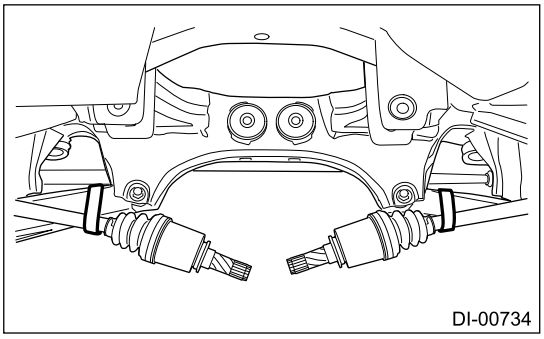
Note:

If it is difficult to pull out the rear drive shaft, use the DRIVE SHAFT REMOVER (28099PA100) for T-type and the tire lever for VA1-type.

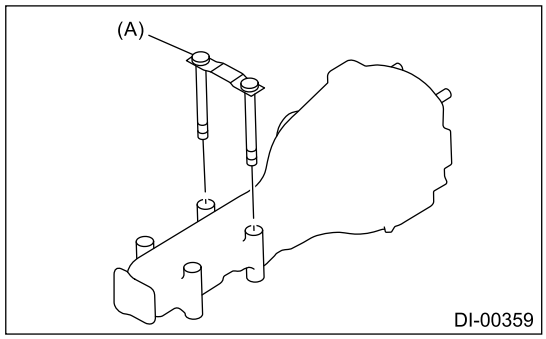


19. Lower the transmission jack.

20. Secure the rear drive shaft using a wire.



21. Remove the rear differential member plate.

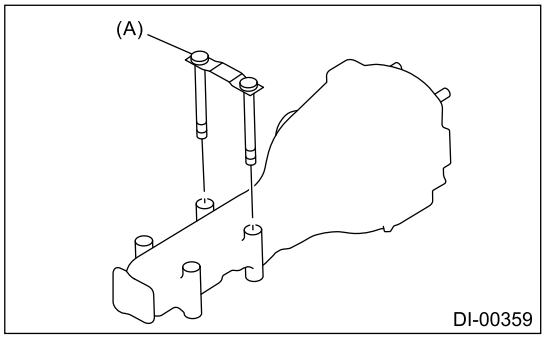


(A) Rear differential member plate

DIFFERENTIALS > Rear Differential (T-type)

INSTALLATION

1. Install the rear differential member plate.

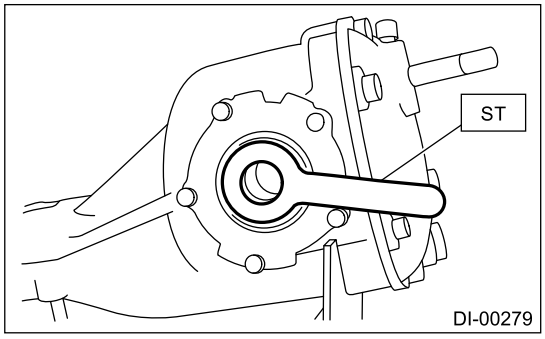


(A) Rear differential member plate

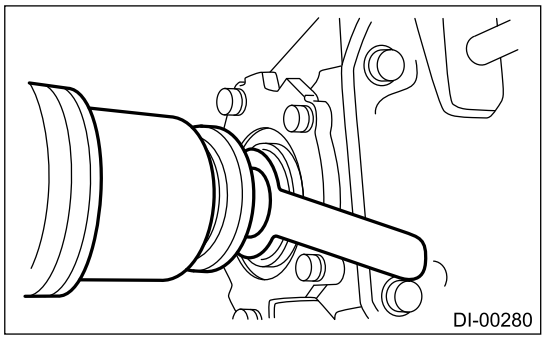
2. Set the rear differential to transmission jack.
3. Set the ST to the rear differential.

Special Tool:

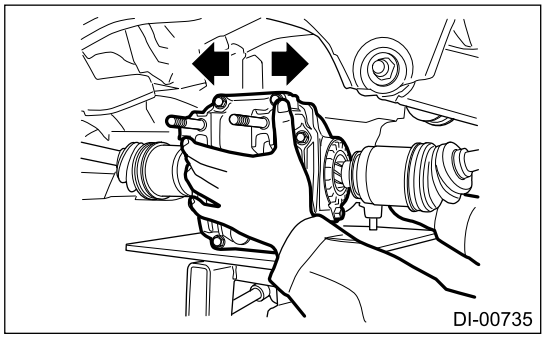
ST: 28099PA090 OIL SEAL PROTECTOR



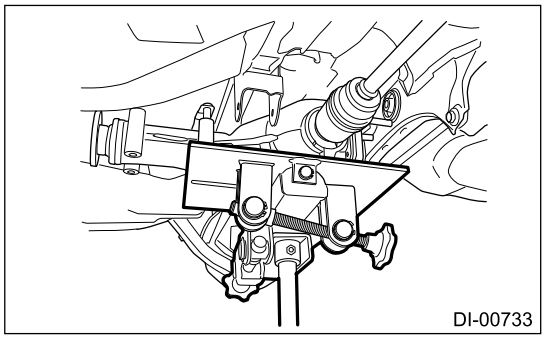
4. Insert the rear drive shaft until the spline portion of the rear drive shaft exceeds the side oil seal.



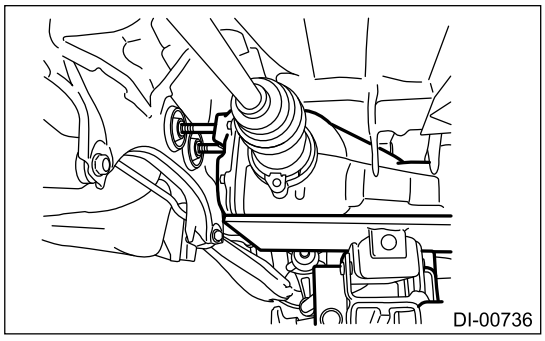
5. Remove the OIL SEAL PROTECTOR (28099PA090) from rear differential.
6. Push the rear differential from side to side to insert the DOJ completely.



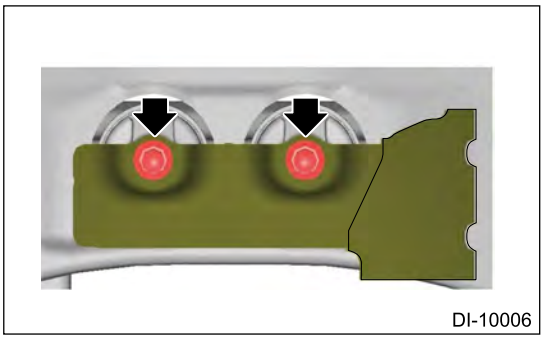
7. Adjust the transmission jack, if necessary, and insert the rear differential stud bolt into the rear differential mount bushing.



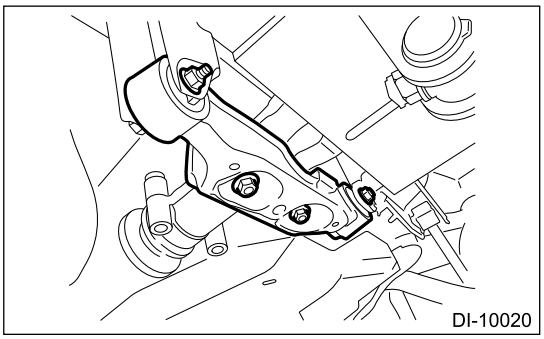
8. Raise the transmission jack, and adjust the height to the rear differential mounting position.



9. Install the mass damper.
10. Tighten a new self-locking nut temporarily to the rear differential stud bolt.



11. Install the rear differential front member, and temporarily attach and tighten a new self-locking nut.



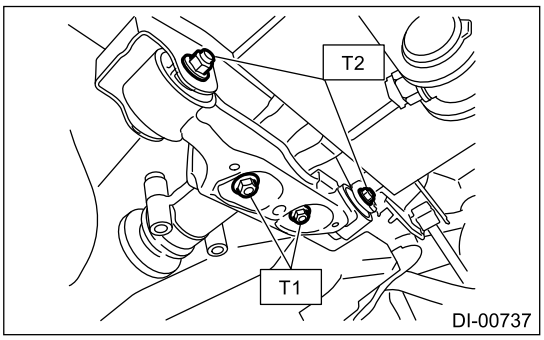
12. Remove the transmission jack.

13. Tighten the self-locking nut.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

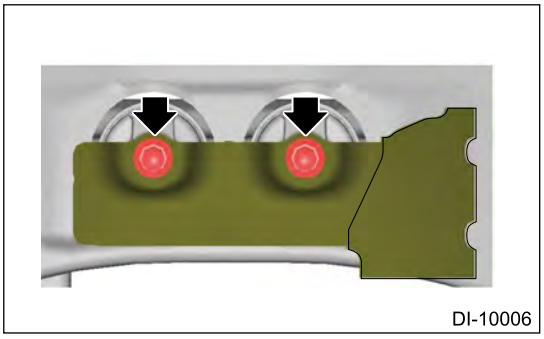
T2: 110 N·m (11.2 kgf-m, 81.1 ft-lb)



14. Tighten the self-locking nut.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)

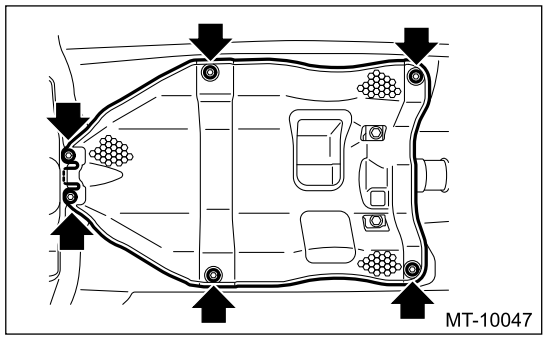


15. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

16. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



17. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
18. Fill differential gear oil. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.
19. Lower the vehicle.
20. Install the rear tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.
21. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
22. Perform "Rear differential inspection mode" using the Subaru Select Monitor. (CVT model) Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.

Caution:

Be sure to perform rear differential inspection mode when the following work has been performed.

- **Replacement of rear differential**
- **Replacement of rear differential hypoid gear set**
- **Replacement of transmission assembly**
- **Replacement of front differential hypoid gear set**

DIFFERENTIALS > Rear Differential (T-type)

DISASSEMBLY

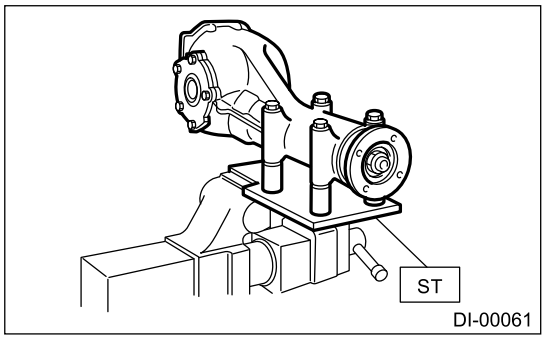
To detect the real cause of trouble, inspect the following items before disassembling.

- Tooth contact and backlash between hypoid driven gear and drive pinion
- Hypoid driven gear runout on its back surface
- Total preload of drive pinion

1. Set the ST on a vise, and install the differential assembly to the ST.

Special Tool:

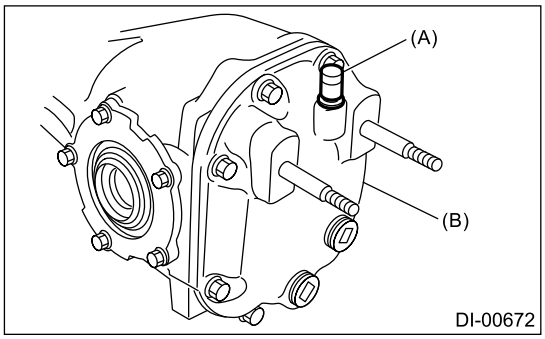
ST: 398217700 ATTACHMENT SET



2. Remove the drain plug and filler plug.
3. Remove the air breather cap.

Caution:

- **Do not attempt to remove the air breather cap unless necessary.**
- **Whenever the air breather cap is removed, replace it with a new part.**



(A) Air breather cap

(B) Rear cover

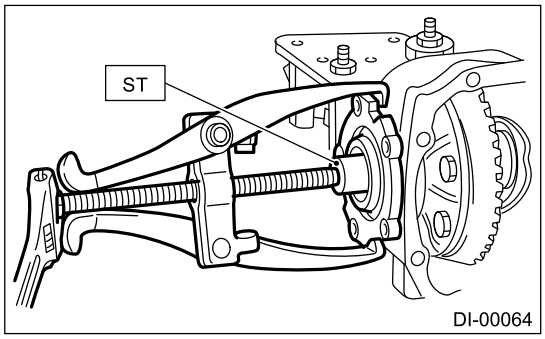
4. Remove the bolts, and then remove the rear cover.
5. Remove the stud bolts from rear cover if necessary.
6. Remove the side retainer attachment bolts, set the ST to the differential case, and remove the side retainer with a puller.

Note:

- **Side retainer shim of each side should be kept together with its mating retainer.**
- **Keep the side retainers separate by attaching tags or in similar ways to make it possible to identify RH and LH sides during reassembly.**

Special Tool:

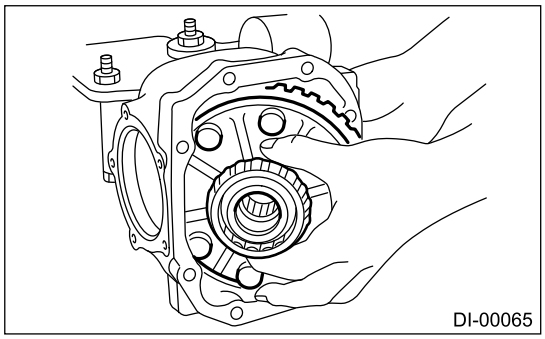
ST: 398457700 ATTACHMENT



7. Remove the side oil seal and O-ring from the side retainer.
8. Remove the differential case assembly.

Caution:

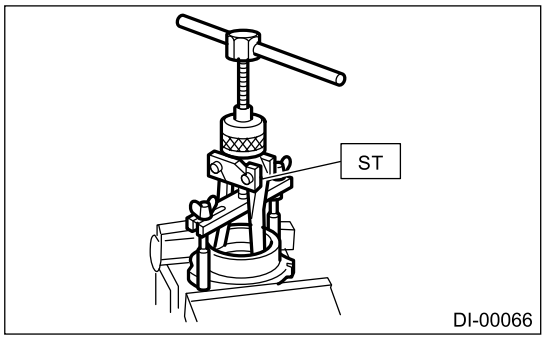
Be careful not to hit the teeth of hypoid driven gear against the differential carrier.



9. When replacing the side bearing, remove the side bearing race from the side retainer using the ST.

Special Tool:

ST: 398527700 PULLER ASSY



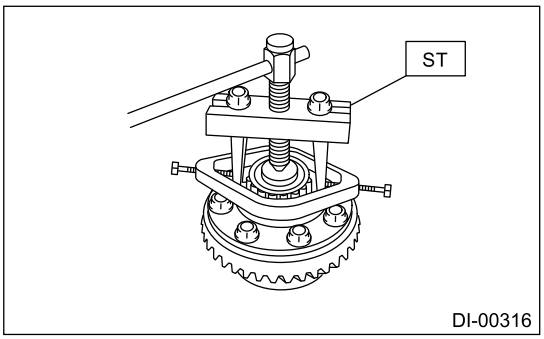
10. Remove the side bearing cone using the ST.

Note:

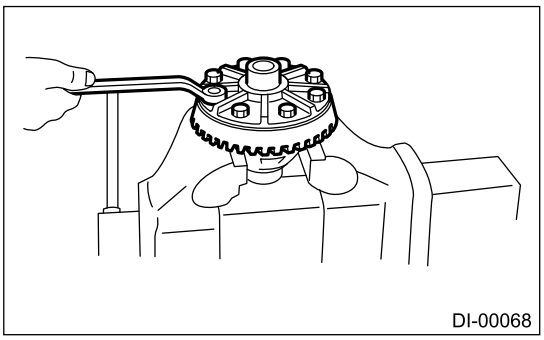
- **Do not attempt to disassemble the parts unless necessary.**
- **Set the ST so that its claws catch the edge of the side bearing cone.**
- **Never mix up the RH and LH side bearing races and cones.**

Special Tool:

ST: 18759AA000 PULLER ASSY



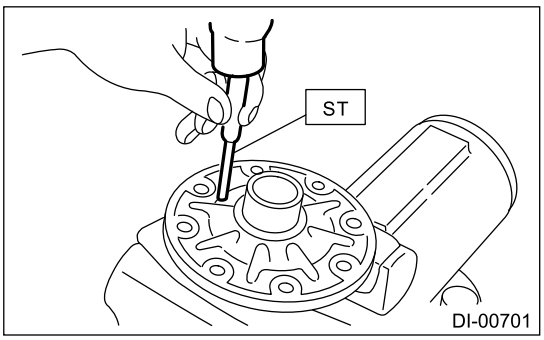
11. Remove the hypoid driven gear by loosening hypoid driven gear bolts.



12. Remove the pinion shaft lock pin from hypoid driven gear side using the ST.

Special Tool:

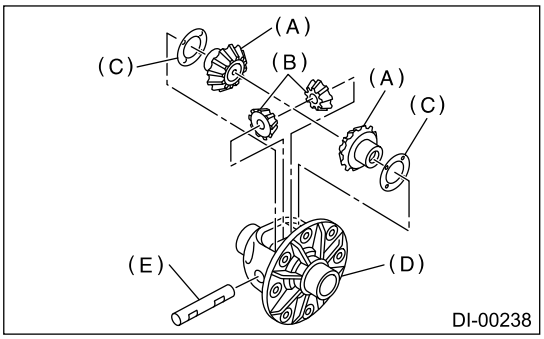
ST: 899904100 STRAIGHT PIN REMOVER



13. Draw out the pinion mate shaft and remove pinion mate gears, side gears and side gear thrust washers.

Note:

The gears and washers should be marked with front or rear, RH or LH, or kept separately.



(A) Side gear

(B) Pinion mate gear

(C) Side gear thrust washer

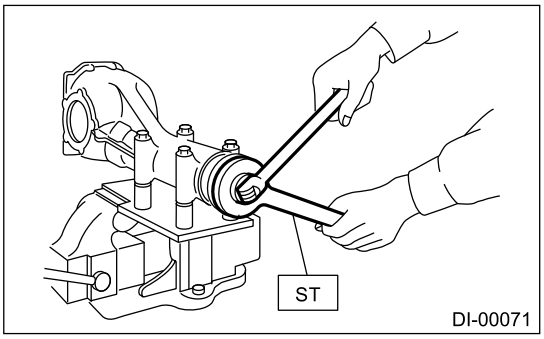
(D) Differential case

(E) Pinion mate shaft

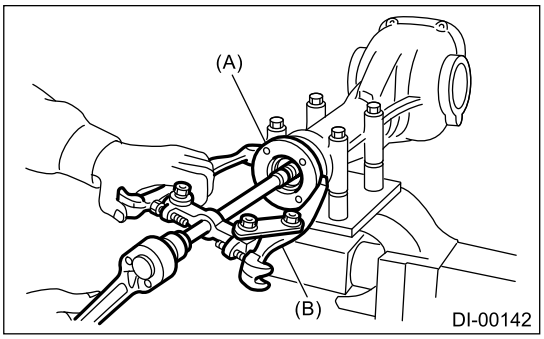
14. Remove the self-locking nut while securing the companion flange with the ST.

Special Tool:

ST: 498427200 FLANGE WRENCH



15. Extract the companion flange with a puller.



(A) Companion flange

(B) Puller

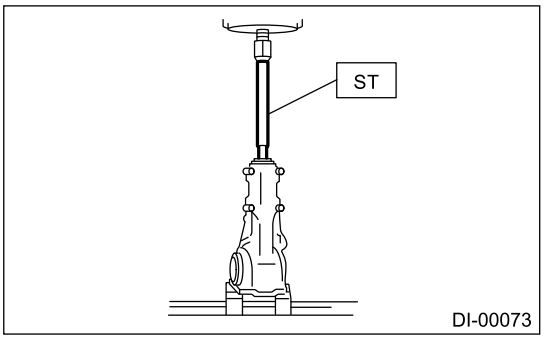
16. Press the end of drive pinion shaft using the ST and remove the rear bearing cone, pinion height adjusting washer, preload adjusting spacer and washer.

Caution:

Hold the drive pinion so as not to drop it.

Special Tool:

ST: 398467700 DRIFT



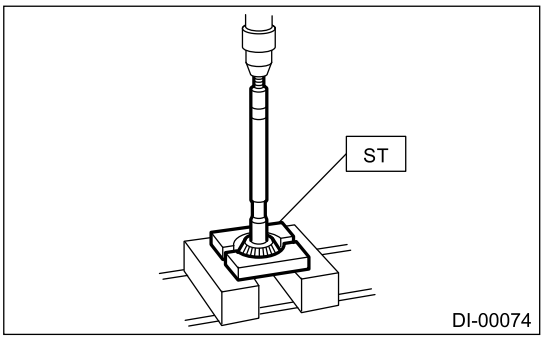
17. Support the rear bearing cone with the ST, and remove it from the drive pinion.

Note:

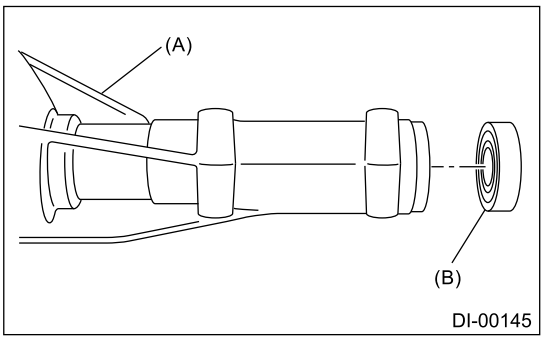
Place the replacer so that its center-recessed side faces the bearing cone.

Special Tool:

ST: 398517700 REPLACER



18. Remove the front oil seal using the PULLER ASSY (398527700).



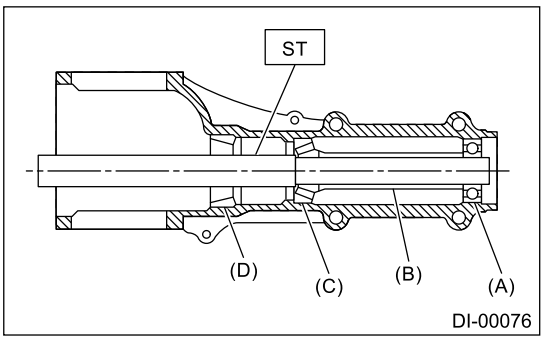
(A) Differential carrier

(B) Front oil seal

19. Remove the pilot bearing together with the front bearing cone and spacer using the ST.

Special Tool:

ST: 398467700 DRIFT



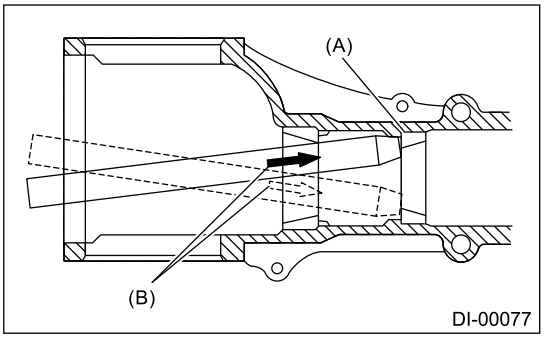
(A) Pilot bearing

(B) Spacer

(C) Front bearing

(D) Rear bearing race

20. When replacing the bearings, tap out and remove the front bearing race and rear bearing race in this order using a brass bar.



(A) 2 cutout portions along diagonal lines

(B) Tap alternately with brass bar.

DIFFERENTIALS > Rear Differential (T-type)

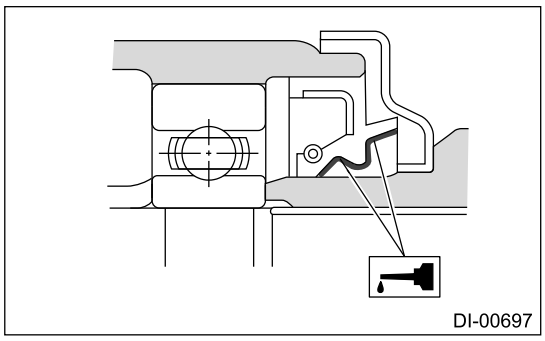
ASSEMBLY

Caution:

- **Keep the shims and washers in order, so that they are not improperly installed.**
- **Be careful not to mix up the side bearing race RH and LH.**
- **Be careful not to mix up the side oil seal RH and LH.**

Note:

- **Check and adjust each part during assembly.**
- **Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.**
- **Apply differential gear oil when installing the bearings and thrust washers.**
- **Apply differential gear oil to the lips when installing the oil seal.**



1. Adjusting preload for front and rear bearings

Note:

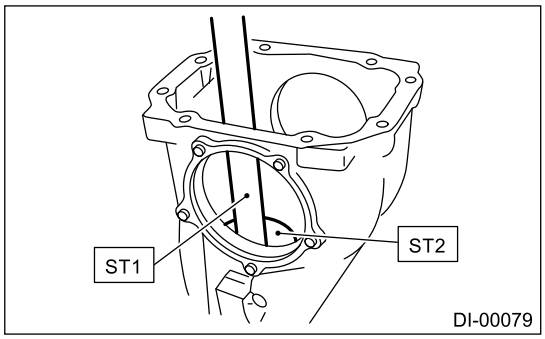
Adjust the bearing preload between front and rear bearings with preload adjusting spacer and washer. Pinion height adjusting washer is not affected by this adjustment. The adjustment must not be carried out with oil seal inserted.

(1) Install the rear bearing race using the ST1 and ST2.

Special Tool:

ST1: 398477701 HANDLE

ST2: 398477703 DRIFT 2



(2) Using the HANDLE (398477701) and DRIFT (398477702), install a new front bearing race to the differential carrier.

(3) Insert the ST1 into the differential carrier with the pinion height adjusting washer and rear bearing cone fitted onto it.

Note:

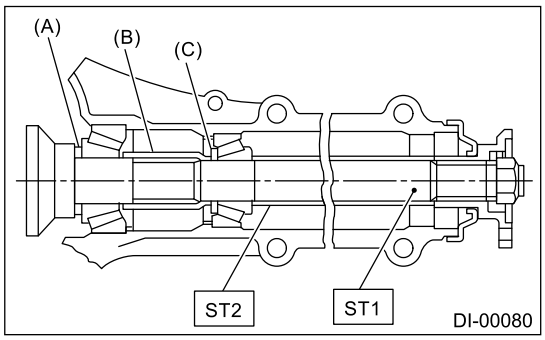
- **At this time, install a provisionally selected or previously used pinion height adjusting washer. Measure and record the thickness.**
- **If tooth contact (drive pinion, hypoid driven gear) is normal in the inspection before disassembling, verify that the washer is not deformed, and then re-use the used washer.**

(4) Install the preload adjusting spacer and washer, new front bearing cone, ST2, companion flange and self-locking nut.

Special Tool:

ST1: 398507702 DUMMY SHAFT

ST2: 398507703 DUMMY COLLAR



(A) Pinion height adjusting washer

(B) Preload adjusting spacer

(C) Preload adjusting washer

(5) Turn the ST1 by hand to smooth the bearing, and tighten a new self-locking nut while measuring the initial load or initial torque with a spring scale or torque wrench. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.

Caution:

Be careful not to give excessive preload.

Note:

- **Measure the preload in direction of tangent to the flange.**
- **When tightening the self-locking nut, lock the ST1 with the ST2 as shown in the figure.**

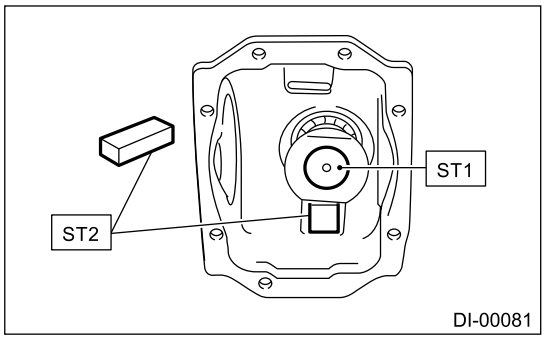
Special Tool:

ST1: 398507702 DUMMY SHAFT

ST2: 398507704 BLOCK

Tightening torque:

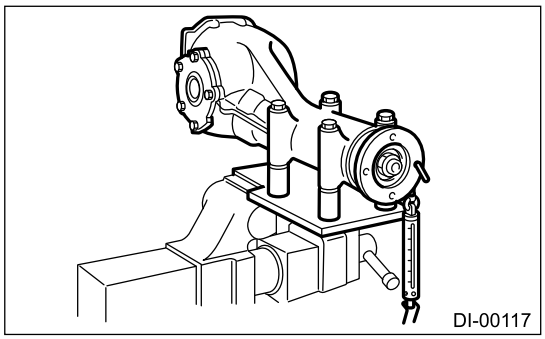
181.5 N·m (18.5 kgf-m, 133.9 ft-lb)



Specification:

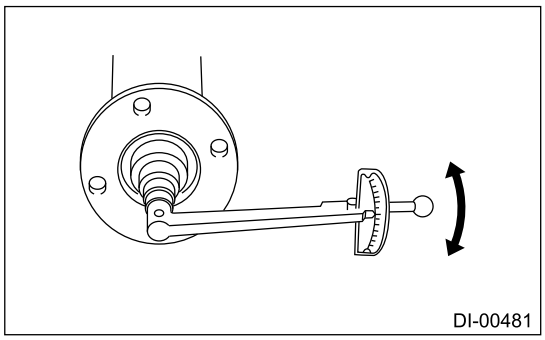
Initial load:

18.1 — 38.8 N (1.8 — 4.0 kgf, 4.1 — 8.7 lbf)



Initial torque:

0.69 — 1.47 N·m (0.07 — 0.15 kgf-m, 0.51 — 1.08 ft-lb)

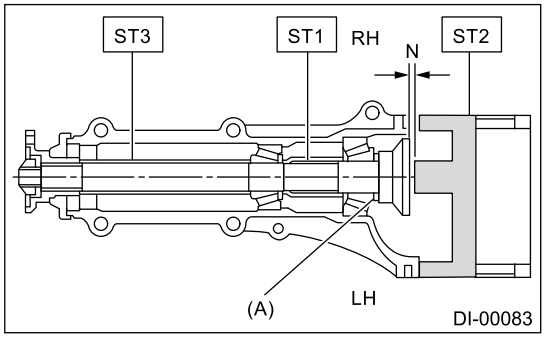


Preload adjusting washer	
Part No.	**Thickness mm (in)**
383705200	2.59 (0.1020)
383715200	2.57 (0.1012)
383725200	2.55 (0.1004)
383735200	2.53 (0.0996)
383745200	2.51 (0.0988)
383755200	2.49 (0.0980)
383765200	2.47 (0.0972)
383775200	2.45 (0.0965)
383785200	2.43 (0.0957)

Preload adjusting washer	
Part No.	**Thickness mm (in)**
383795200	2.41 (0.0949)
383805200	2.39 (0.0941)
383815200	2.37 (0.0933)
383825200	2.35 (0.0925)
383835200	2.33 (0.0917)
383845200	2.31 (0.0909)

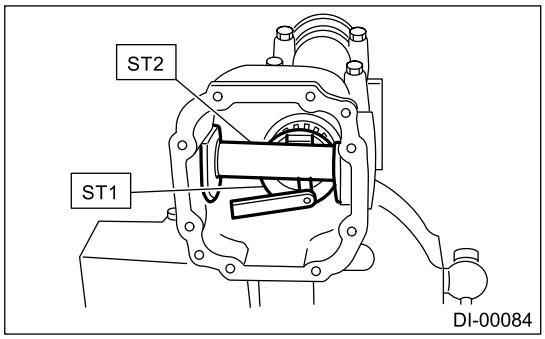
Preload adjusting spacer	
Part No.	**Length mm (in)**
383695201	56.2 (2.213)
383695202	56.4 (2.220)
383695203	56.6 (2.228)
383695204	56.8 (2.236)
383695205	57.0 (2.244)
383695206	57.2 (2.252)

2. Adjusting drive pinion height:
Adjust the drive pinion height with pinion height adjusting washer installed between the rear bearing cone and the back of pinion gear.
(1) Install the ST2.
Special Tool:
ST1: 398507702 DUMMY SHAFT
ST2: 398507701 DIFFERENTIAL CARRIER GAUGE
ST3: 398507703 DUMMY COLLAR



(A) Pinion height adjusting washer

(2) Measure the clearance “N” between the end of ST2 and the end surface of ST1 by using a thickness gauge.
Note:
Make sure there is no clearance between the differential carrier and ST2.
Special Tool:
ST1: 398507702 DUMMY SHAFT
ST2: 398507701 DIFFERENTIAL CARRIER GAUGE



(3) Obtain the thickness of pinion height adjusting washer to be inserted from the following formula, and replace the temporarily installed washer with this one.
T = To + N − (H × 0.01) − 0.20 mm (0.0079 in)

T	Thickness of pinion height adjusting washer mm (in)	
To	Thickness of washer temporarily inserted mm (in)	
N	Clearance of thickness gauge mm (in)	
H	Figure marked on drive pinion head	
Memo:		

(Example of calculation)
To = 3.39 mm (0.1335 in)
N = 0.24 mm (0.0094 in)
H = + 1
T = 3.39 mm (0.1335 in) + 0.24 mm (0.0094 in) − 0.01 mm (0.0004 in) − 0.20 mm (0.0079 in) = 3.42 mm (0.1346 in)
Result: Thickness = 3.42 mm (0.1346 in)
Therefore use washer 383605200.

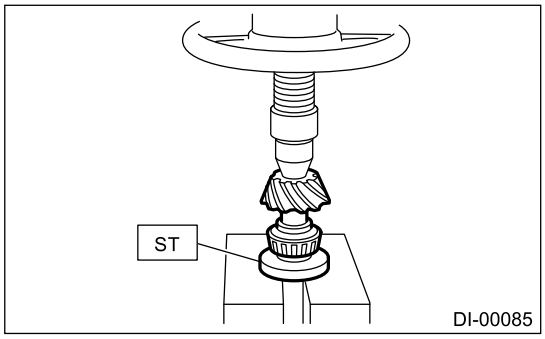
Pinion height adjusting washer	
Part No.	**Thickness mm (in)**
383495200	3.09 (0.1217)
383505200	3.12 (0.1228)
383515200	3.15 (0.1240)
383525200	3.18 (0.1252)
383535200	3.21 (0.1264)
383545200	3.24 (0.1276)
383555200	3.27 (0.1287)
383565200	3.30 (0.1299)
383575200	3.33 (0.1311)
383585200	3.36 (0.1323)
383595200	3.39 (0.1335)
383605200	3.42 (0.1346)

Pinion height adjusting washer	
Part No.	**Thickness mm (in)**
383615200	3.45 (0.1358)
383625200	3.48 (0.1370)
383635200	3.51 (0.1382)
383645200	3.54 (0.1394)
383655200	3.57 (0.1406)
383665200	3.60 (0.1417)
383675200	3.63 (0.1429)
383685200	3.66 (0.1441)

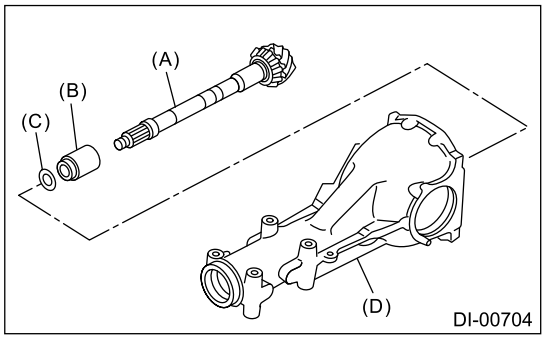
3. Install the selected pinion height adjusting washer on drive pinion, and press-in the rear bearing cone with the ST.

Special Tool:

ST: 398177700 INSTALLER



4. Insert the drive pinion, and install the preselected preload adjusting spacer and washer.



(A) Drive pinion

(B) Preload adjusting spacer

(C) Preload adjusting washer

(D) Differential carrier

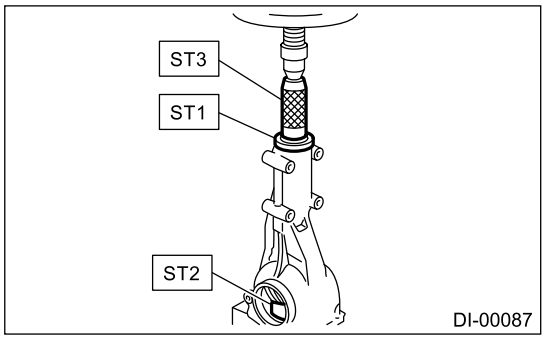
5. Press-fit a new front bearing cone with the ST1, ST2 and ST3.

Special Tool:

ST1: 398507703 DUMMY COLLAR

ST2: 399780104 WEIGHT

ST3: 899580100 INSTALLER

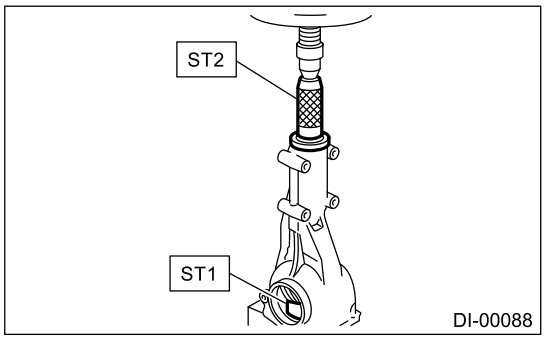


6. Insert the spacer, then press-fit a new pilot bearing with the ST1 and ST2.

Special Tool:

ST1: 399780104 WEIGHT

ST2: 899580100 INSTALLER



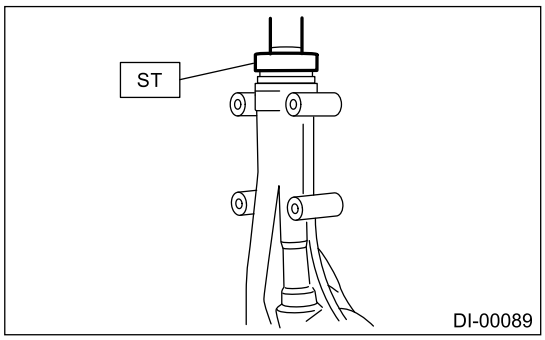
7. Using the ST, install a new front oil seal.

Note:

- **Press-fit until the oil seal end comes 1 mm (0.04 in) inward from end of carrier.**
- **Apply differential gear oil to the oil seal lips.**

Special Tool:

ST: 498447120 INSTALLER



8. Press-fit the companion flange with the ST1 and ST2.

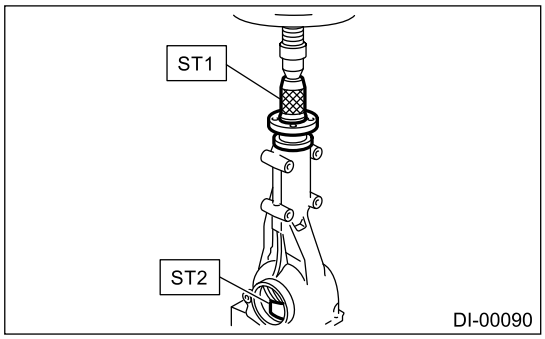
Caution:

Be careful not to damage the pilot bearing.

Special Tool:

ST1: 899874100 INSTALLER

ST2: 399780104 WEIGHT



9. Apply seal material on the drive pinion shaft thread and new self-locking nut seat.

Seal material:

THREE BOND 1324 (Part No. 004403042) or equivalent

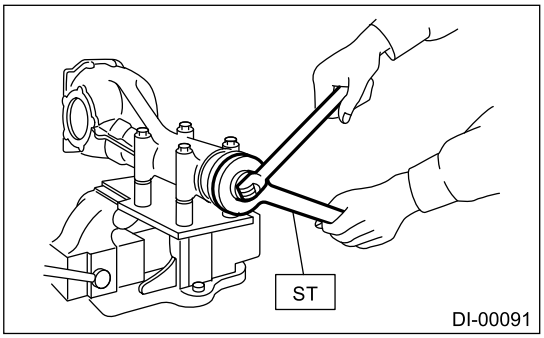
10. Tighten a new self-locking nut while securing the companion flange with the ST.

Tightening torque:

181.5 N·m (18.5 kgf-m, 133.9 ft-lb)

Special Tool:

ST: 498427200 FLANGE WRENCH

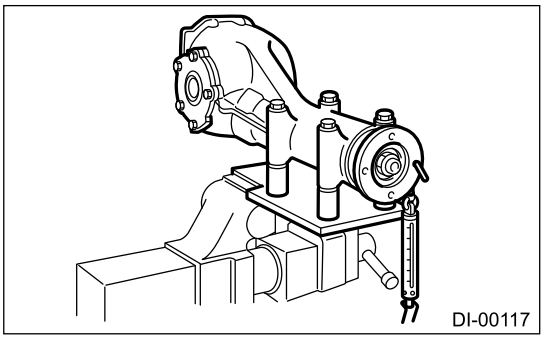


11. Check the initial torque or initial load.

Specification:

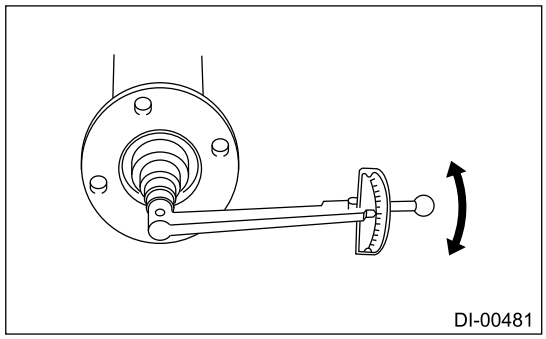
Initial load:

18.1 — 38.8 N (1.8 — 4.0 kgf, 4.1 — 8.7 lbf)



Initial torque:

0.69 — 1.47 N·m (0.07 — 0.15 kgf-m, 0.51 — 1.08 ft-lb)

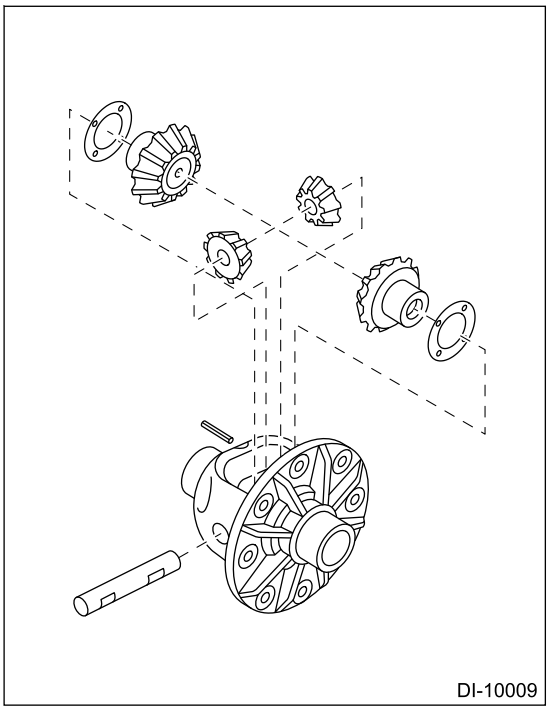


12. Assembling differential case

(1) Install the side gears and pinion mate gears together with the side gear thrust washers and pinion mate shaft.

Note:

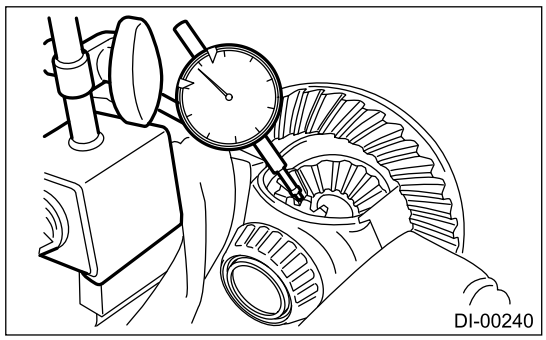
- **Apply gear oil on both sides of the washer and on the pinion mate shaft before installing.**
- **Insert the pinion mate shaft into the differential case by aligning the pin holes.**



(2) Measure the side gear backlash.

Specification:

0.10 — 0.20 mm (0.004 — 0.008 in)



(3) Adjust the side gear backlash within the specified value by selecting the side gear thrust washer.

Side gear thrust washer

Side gear thrust washer Thickness mm (in)	
Part No.	**Thickness mm (in)**
383445201	0.75 — 0.80 (0.0295 — 0.0315)
383445202	0.80 — 0.85 (0.0315 — 0.0335)
383445203	0.85 — 0.90 (0.0335 — 0.0354)

(4) Check the condition of rotation after applying oil to the gear tooth surfaces and washer surfaces.

(5) Using the STRAIGHT PIN REMOVER (899904100), drive a new pinion shaft lock pin into the differential case.

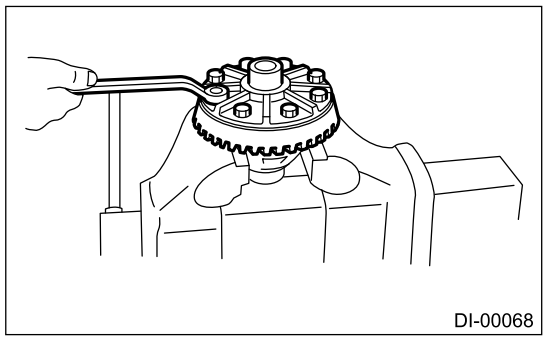
13. Install the hypoid driven gear to differential case.

Note:

- **Before installing bolts, apply seal material to bolt threads.**
  Seal material:
  THREE BOND 1324 (Part No. 004403042) or equivalent
- **Make sure there is no clearance between the differential case and driven gear.**
- **Tighten opposing bolts in order.**

Tightening torque:

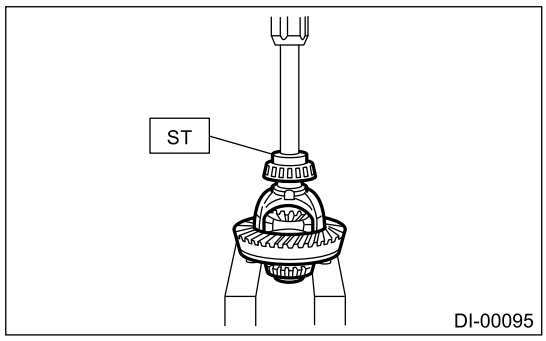
103 N·m (10.5 kgf-m, 76.0 ft-lb)



14. Press-fit the side bearing cone using the ST.

Special Tool:

ST: 398487700 DRIFT



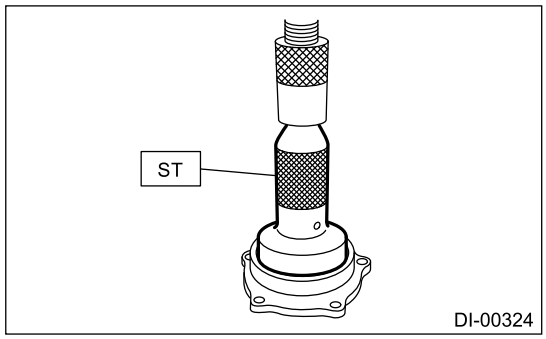
15. Using the ST, press-fit the side bearing race to the side retainer.

Caution:

Make sure that bearing races and cones are properly assembled.

Special Tool:

ST: 398417700 DRIFT



16. Side retainer shim adjustment

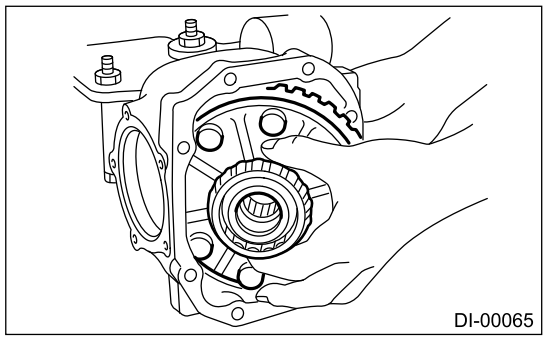
Note:

The hypoid driven gear backlash and side bearing preload can be adjusted by the side retainer shim thickness.

(1) Install the differential case assembly.

Caution:

Be careful not to hit the teeth of hypoid driven gear against the differential carrier.



(2) Install the side retainer shim.

Caution:

- **Be careful not to mix up the side retainer shim RH and LH.**
- **If the side retainer shim is broken or corroded, replace with a new part.**

Side retainer shim	
Part No.	**Thickness mm (in)**
383475201	0.20 (0.0079)
383475202	0.25 (0.0098)
383475203	0.30 (0.0118)
383475204	0.40 (0.0157)
383475205	0.50 (0.0197)

(3) Align the arrow mark on the differential carrier with the arrow mark on the side retainer when installing the side retainer.

Caution:

Be careful that side bearing race is not damaged by the bearing roller.

代替画像1

この画像は代替画像です

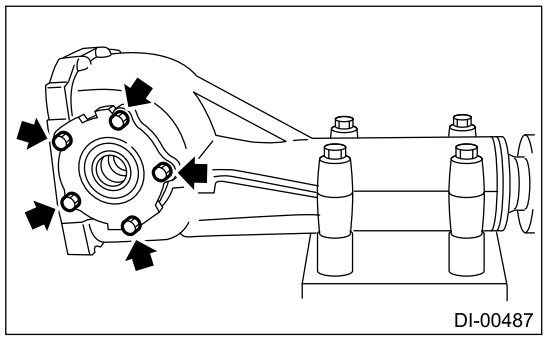
(A) Arrow mark (on the side retainer)

(B) Arrow mark (on the differential carrier)

(4) Tighten the side retainer bolts.

Tightening torque:

10.5 N·m (1.1 kgf-m, 7.7 ft-lb)



(5) Measure the hypoid driven gear to drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with tooth face of hypoid driven gear, and move hypoid driven gear while holding drive pinion still. Read the value indicated on dial gauge. If it is outside the standard value, adjust the side retainer shim by the following method.

- **When backlash is less than 0.1 mm (0.004 in):**

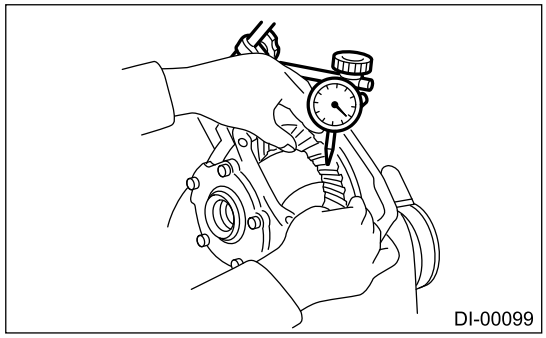
Reduce the thickness of shim on the back side of the hypoid driven gear and increase the thickness of shims on the teeth side of the hypoid driven gear.

- **When backlash exceeds 0.2 mm (0.008 in):**

Increase the thickness of shim on the back side of the hypoid driven gear and reduce the thickness of shims on the teeth side of the hypoid driven gear.

Specification:

0.10 — 0.20 mm (0.004 — 0.008 in)



(6) Measure the total preload of the drive pinion. If it is outside the standard value, adjust the thickness of side retainer shims, increasing/reducing both shims by an even amount at a time.

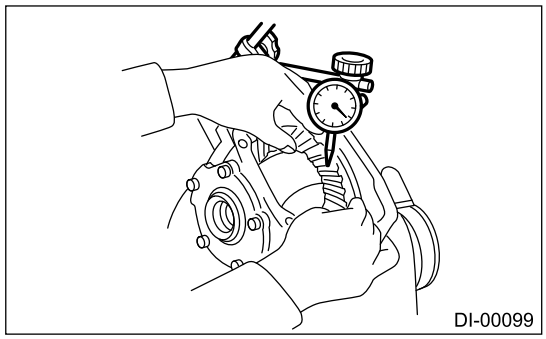
Specification:

20.7 — 54.4 N (2.1 — 5.5 kgf, 4.7 — 12.2 lbf)

17. Recheck the hypoid driven gear to drive pinion backlash.

Specification:

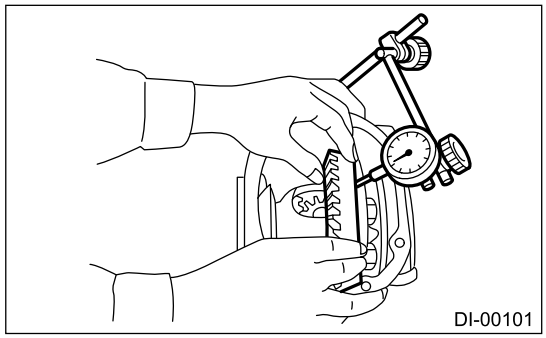
0.10 — 0.20 mm (0.004 — 0.008 in)



18. Check pinion and hypoid driven gears rotate smoothly and make sure of the hypoid driven gear runout on its back surface. If it exceeds the limit value, check for any foreign objects between the hypoid driven gear and differential case, and for any deformation of the differential case or hypoid driven gear.

Service limit:

0.05 mm (0.002 in)



19. Check and adjustment of the tooth contact of hypoid driven gear and drive pinion

(1) Apply lead-free red dye evenly on the both sides of three to four teeth of the hypoid driven gear. Check the contact pattern after rotating the hypoid driven gear several revolutions back and forth until a definite contact pattern appears on the hypoid driven gear.

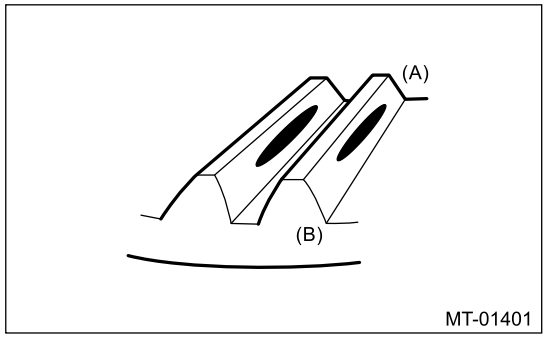
(2) When the contact pattern is not correct, readjust.

Note:

Be sure to wipe off the lead-free red dye completely after the adjustment is completed.

- Correct tooth contact

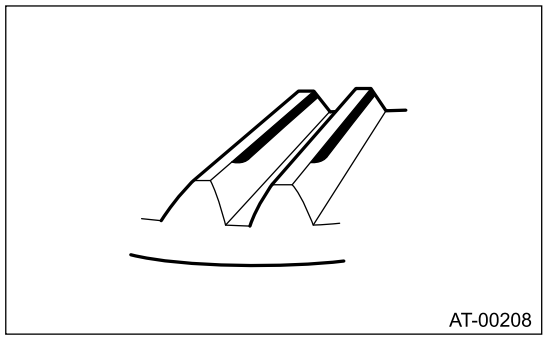
  Check item: Tooth contact pattern is slightly shifted toward toe side under no-load rotation. (When driving, it moves towards the heel side.)



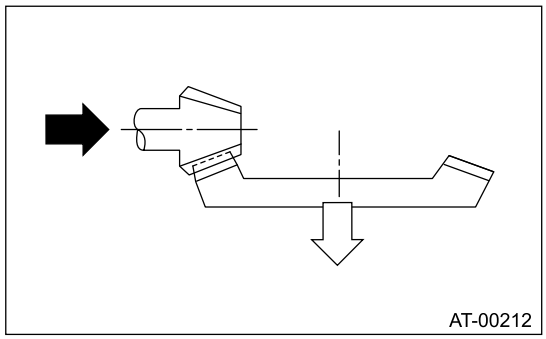
(A) Toe side

(B) Heel side

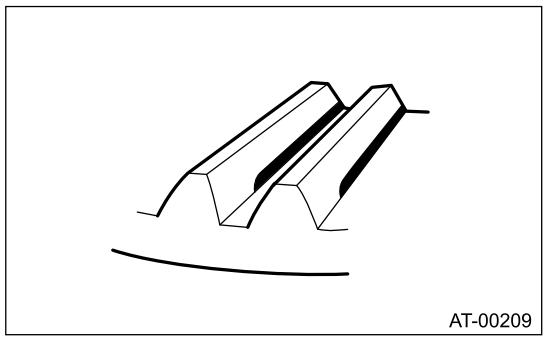
- Face contact
  Check item: Backlash is too large.
  Contact pattern



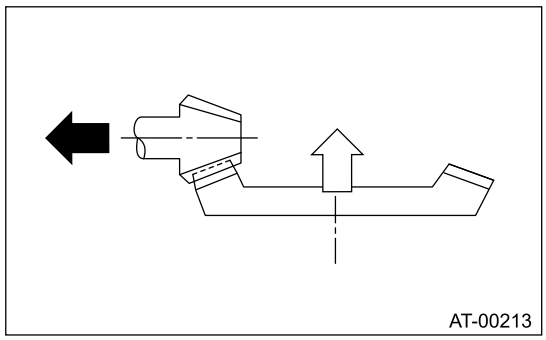
  Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.



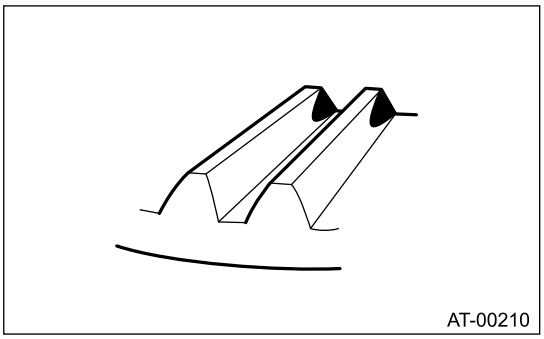
- Flank contact
  Check item: Backlash is too small.
  Contact pattern



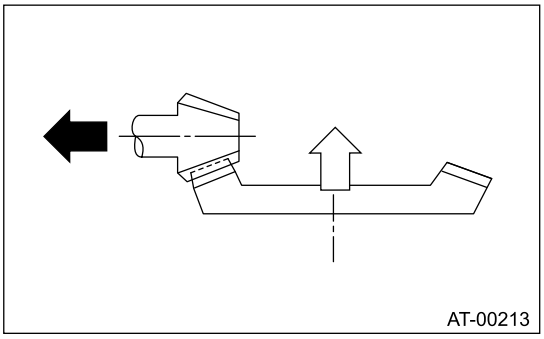
  Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



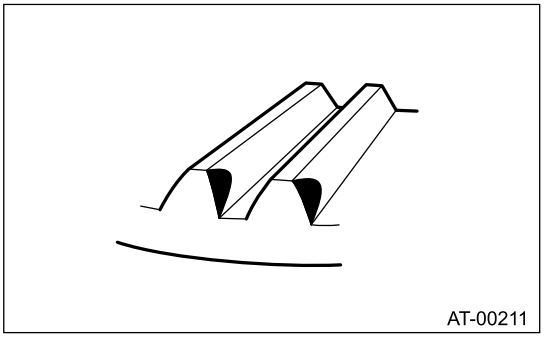
- Toe contact (inside contact)
  Check item: Teeth contact area is too small.
  Contact pattern



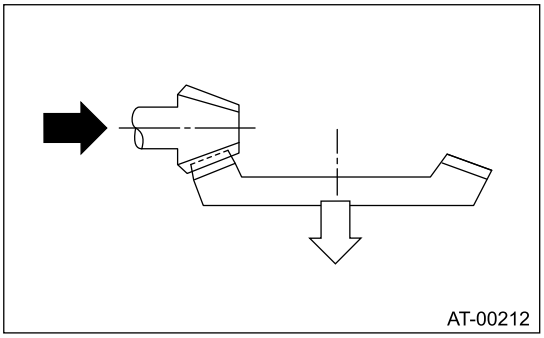
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



- Heel contact (outside end contact)
  Check item: Teeth contact area is too small.
  Contact pattern



Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.



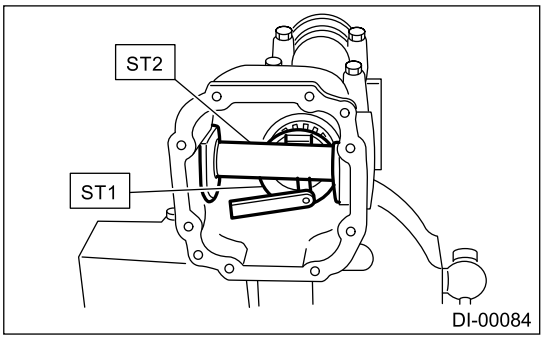
20. If proper tooth contact is not obtained, readjust the drive pinion height by changing the RH and LH side retainer shims and the hypoid driven gear backlash.

(1) Drive pinion height

Special Tool:

ST1: 398507702 DUMMY SHAFT

ST2: 398507701 DIFFERENTIAL CARRIER GAUGE



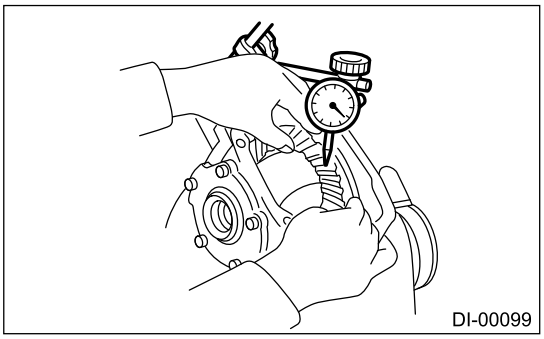
T = To + N − (H × 0.01) − 0.20 mm (0.0079 in)

T	Thickness of pinion height adjusting washer mm (in)	
To	Thickness of washer temporarily inserted mm (in)	
N	Clearance of thickness gauge mm (in)	
H	Figure marked on drive pinion head	
Memo:		

(2) Hypoid driven gear backlash

Specification:

0.10 — 0.20 mm (0.004 — 0.008 in)

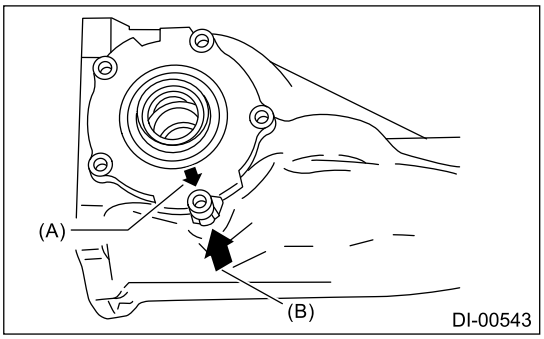


21. Remove the side retainer.

22. Install a new O-ring to the side retainer.

23. Install a new side oil seal to the side retainer. Ref. to DIFFERENTIALS>Rear Differential Side Oil Seal>REPLACEMENT.

24. Align the arrow mark on the differential carrier with the arrow mark on the side retainer when installing the side retainer.



(A) Arrow mark (on the side retainer)

(B) Arrow mark (on the differential carrier)

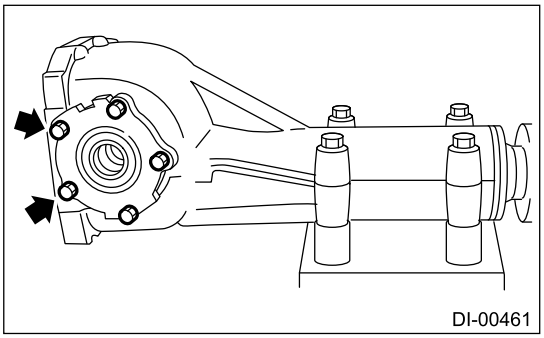
25. Apply liquid gasket to the bolts indicated by arrows, and tighten the bolts.

Liquid gasket:

THREE BOND 1110F, THREE BOND 1110B or equivalent

Tightening torque:

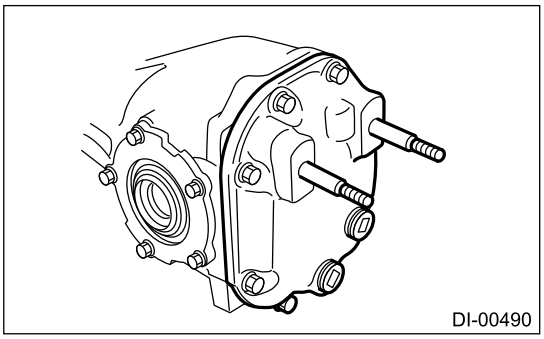
10.5 N·m (1.1 kgf-m, 7.7 ft-lb)



26. Replace the gasket with a new part and install the rear cover.

Tightening torque:

29.5 N·m (3.0 kgf-m, 21.8 ft-lb)



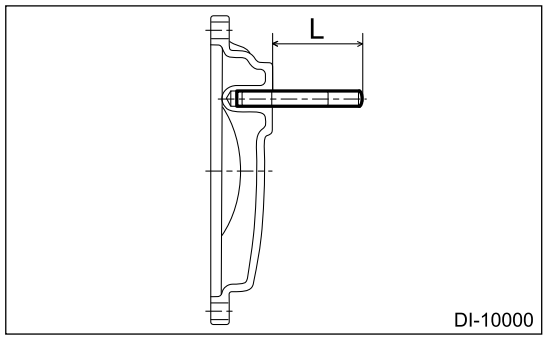
27. When the stud bolts are removed from the rear cover, install the stud bolts so that the exposed length of stud bolt is within the range of "L".

Caution:

- **Do not tighten forcibly if the exposed length of stud bolt does not fall within the specified range. Remove the stud bolt, and check for contamination of foreign matter and any defects in the screw hole.**
- **Do not tighten with a tightening torque of 49 N·m (5.0 kgf-m, 36.1 ft-lb) (reference value) or more.**

Exposed length L of stud bolt:

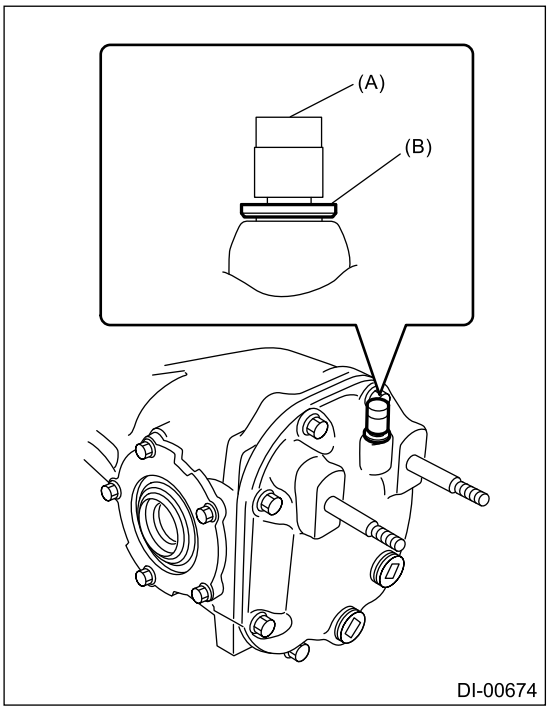
59.0 — 61.0 mm (2.32 — 2.40 in)



28. Install the air breather cap.

Caution:

When installing the air breather cap, do not tap section (A). Be sure to tap section (B) to install.



29. Install the drain plug.

Note:

Apply liquid gasket to the drain plug.

Liquid gasket:

THREE BOND 1105 (Part No. 004403010) or equivalent

Tightening torque:

49 N·m (5.0 kgf-m, 36.1 ft-lb)

30. Install the filler plug.

Note:

After installing the rear differential assembly to the vehicle, fill the gear oil, then apply liquid gasket, and tighten to the specified torque. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.

DIFFERENTIALS > Rear Differential (T-type)

INSPECTION

Wash all the disassembled parts clean, and examine them for wear, damage and other defects. Repair or replace the defective parts as necessary.

1. Hypoid driven gear and drive pinion
   - If there is evidently an abnormal tooth contact, find out the cause and adjust until the teeth contact correctly. Replace the gear if there is an excessive worn or an incapable adjustment.
   - If crack, cutout or seizure is found, replace the parts as a set. Slight damage of some teeth can be corrected by oil stone or the like.
2. Side gear and pinion mate gear
   - Replace if cracks, scoring or other defects are evident on the tooth surface.
   - Replace if thrust washer contact surface is worn or scored. Slight damages of the surface can be corrected by oil stones or equivalent.
3. Bearing
   Replace if seizure, peeling, wear, rust, dragging during rotation, noise or other defect is evident.
4. Side gear thrust washer
   Replace if seized, flawed, abnormally worn or having other defects.
5. Oil seal
   Replace if deformed or damaged, and at every disassembling.
6. Differential carrier
   Replace if the bearing bores are worn or damaged.
7. Differential case
   Replace if sliding surfaces are abnormally worn, burned, or cracked.
8. Companion flange
   Replace if the oil seal lip contact surface shows cracking.

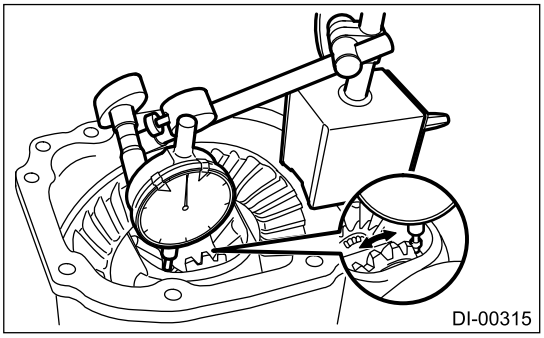
1. SIDE GEAR BACKLASH

Using a dial gauge, check the backlash of side gear.

Specification:

0.10 — 0.20 mm (0.004 — 0.008 in)

If it is outside the standard value, adjust the side gear backlash by selecting side gear thrust washer.



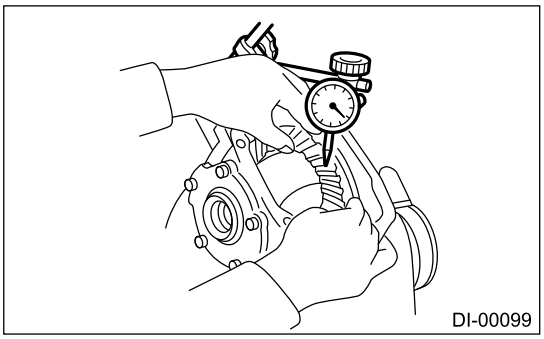
2. HYPOID DRIVEN GEAR BACKLASH

Using a dial gauge, check the backlash of hypoid driven gear.

Specification:

0.10 — 0.20 mm (0.004 — 0.008 in)

If it is outside the standard value, adjust the side bearing preload and repair if necessary.



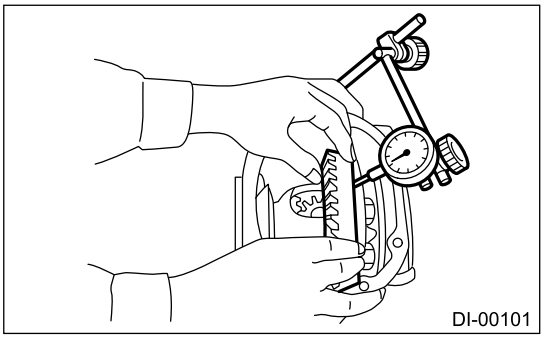
3. HYPOID DRIVEN GEAR RUNOUT ON ITS BACK SURFACE

Using a dial gauge, check the hypoid driven gear back surface runout.

Service limit:

0.05 mm (0.002 in)

If it exceeds the limit value, replace the hypoid driven gear.



4. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Inspect the tooth contact between the hypoid driven gear and drive pinion. Ref. to DIFFERENTIALS>Rear Differential (T-type)>ASSEMBLY.

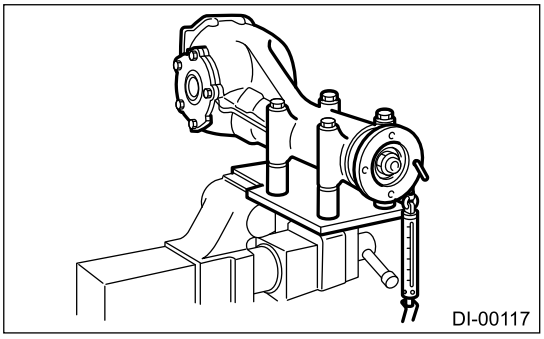
5. TOTAL PRELOAD

Using a spring scale, check the total preload.

Specification:

20.7 — 54.4 N (2.1 — 5.5 kgf, 4.7 — 12.2 lb)

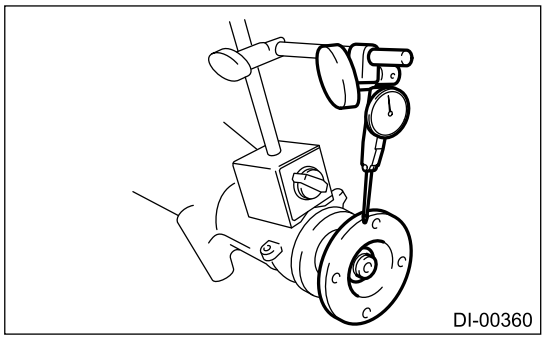
If it is outside the standard value, adjust the side retainer shim.



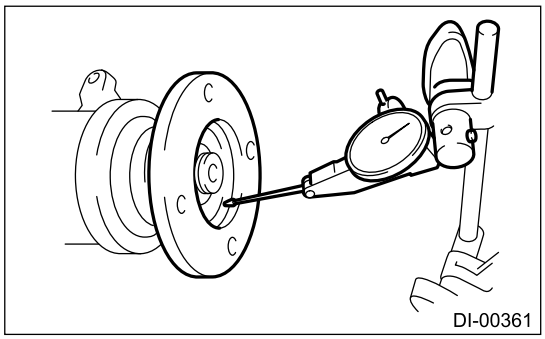
6. COMPANION FLANGE

1. If rust or dirt is attached to the companion flange, remove them.
2. Set a dial gauge at a companion flange surface (mating surface of propeller shaft and companion flange), and then measure the companion flange runout.

Service limit:
0.08 mm (0.003 in)



3. Set the dial gauge inside of the companion flange, and measure the runout.
Service limit:
0.08 mm (0.003 in)



4. If either runout exceeds the limit, move the phase of companion flange and drive pinion 90° each, and find the point where the runout is within the limit.
5. If the runout exceeds the limit after changing the phase, replace the companion flange and recheck the runout.
6. If the runout exceeds the limit after replacing the companion flange, the drive pinion may be assembled incorrectly or bearing is faulty.

DIFFERENTIALS > Rear Differential (T-type)

ADJUSTMENT

1. SIDE GEAR BACKLASH

Adjust the side gear backlash. Ref. to DIFFERENTIALS>Rear Differential (T-type)>ASSEMBLY.

2. HYPOID DRIVEN GEAR BACKLASH

Adjust hypoid driven gear backlash. Ref. to DIFFERENTIALS>Rear Differential (T-type)>ASSEMBLY.

3. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Adjust the tooth contact between hypoid driven gear and drive pinion gear. Ref. to DIFFERENTIALS>Rear Differential (T-type)>ASSEMBLY.

4. TOTAL PRELOAD

Adjust the side retainer shim. Ref. to DIFFERENTIALS>Rear Differential (T-type)>ASSEMBLY.

DIFFERENTIALS > Rear Differential (VA-type)

REMOVAL

The removal procedure for VA1-type is included in “REMOVAL” for T-type. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL.

DIFFERENTIALS > Rear Differential (VA-type)

INSTALLATION

The installation procedure for VA1-type is included in “INSTALLATION” for T-type. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION.

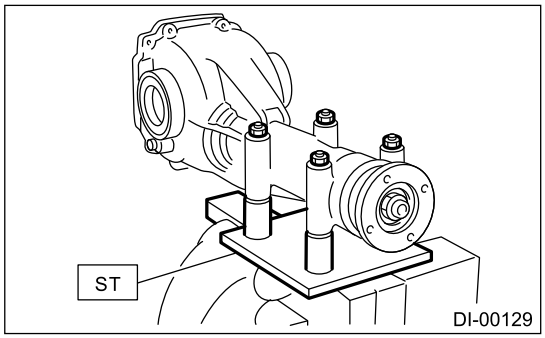
DIFFERENTIALS > Rear Differential (VA-type)

DISASSEMBLY

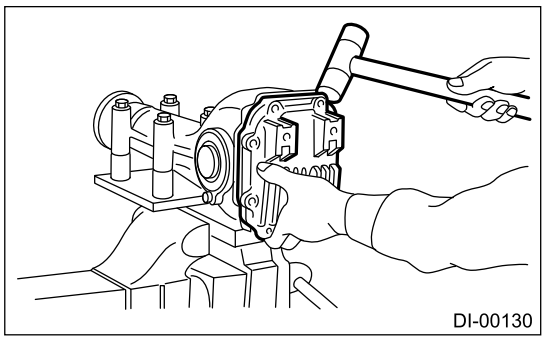
To detect the real cause of trouble, inspect the following items before disassembling.

- Tooth contact and backlash between hypoid driven gear and drive pinion

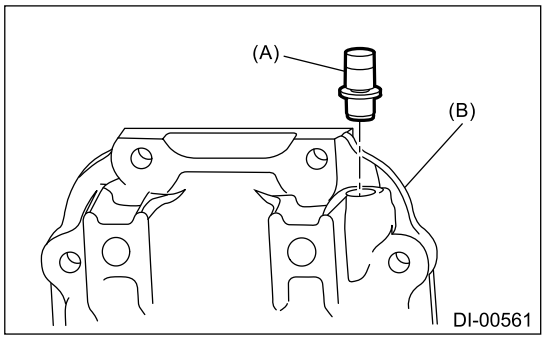
1. Set the ST on a vise, and install the differential assembly to the ST.
   Special Tool:
   ST: 398217700 ATTACHMENT SET



2. Remove the drain plug and filler plug.
3. Remove the bolts, and remove the rear cover while lightly tapping with a plastic hammer.



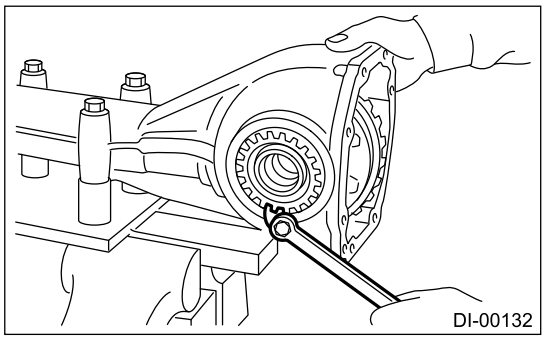
4. Remove the stud bolts from rear cover if necessary.
5. Remove the air breather cap.
   Caution:
   - **Do not attempt to remove the air breather cap unless necessary.**
   - **Whenever the air breather cap is removed, replace it with a new part.**



(A) Air breather cap

(B) Rear cover

6. Remove the lock plate.



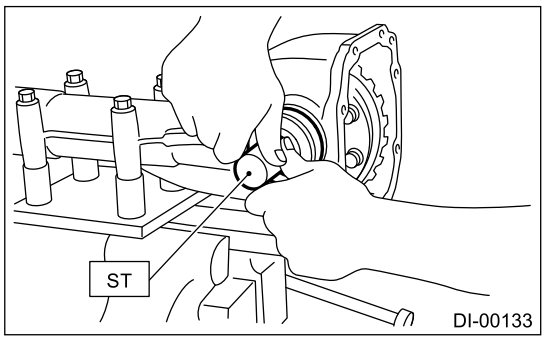
7. Remove the side retainer using the ST.

Note:

When keeping the side retainers aside, use labels etc. to avoid confusing the left and right.

Special Tool:

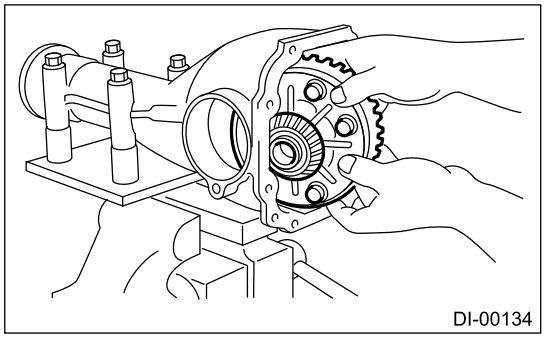
ST: 18630AA010 WRENCH COMPL RETAINER



8. Remove the differential case assembly.

Caution:

Be careful not to hit the teeth of hypoid driven gear against the differential carrier.

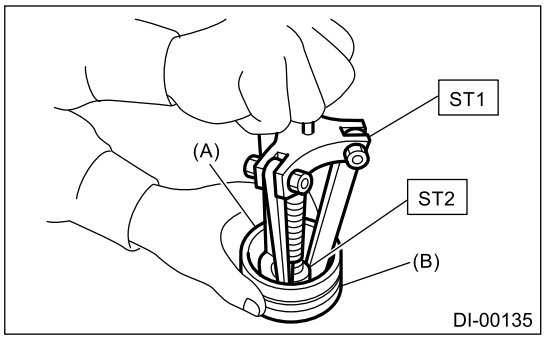


9. Remove the side bearing race using the ST1 and ST2.

Special Tool:

ST1: 499705401 PULLER ASSY

ST2: 499705404 SEAT



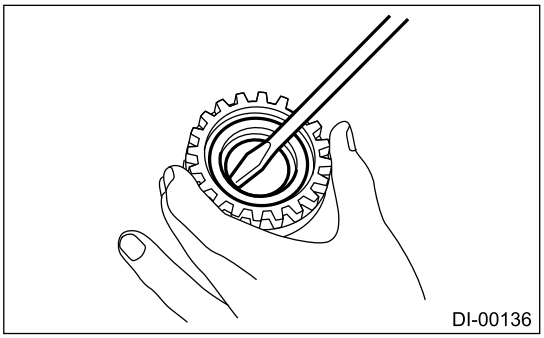
(A) Side bearing race

(B) Side retainer

10. Remove the side oil seal from the side retainer.

Note:

Perform this operation only when changing oil seal.



11. Remove the O-rings.

12. Remove the side bearing cone using the ST1 and ST2.

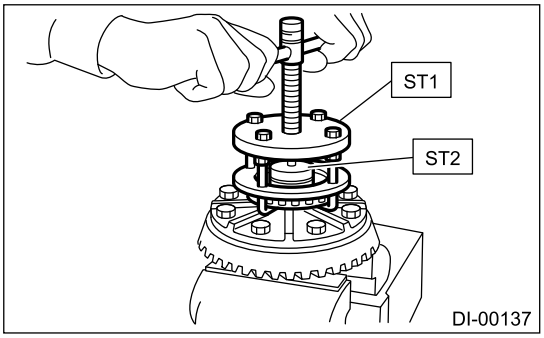
Note:

- **Do not attempt to disassemble the parts unless necessary.**
- **Set the puller so that its claws catch the edge of the bearing cone.**
- **Store so that the right and left side bearing races and cones are not mixed together.**

Special Tool:

ST1: 899524100 PULLER SET

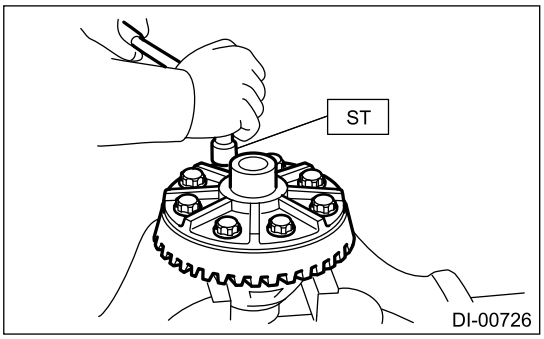
ST2: 399520105 SEAT



13. Using the ST, loosen the hypoid driven gear bolt and remove the hypoid driven gear.

Special Tool:

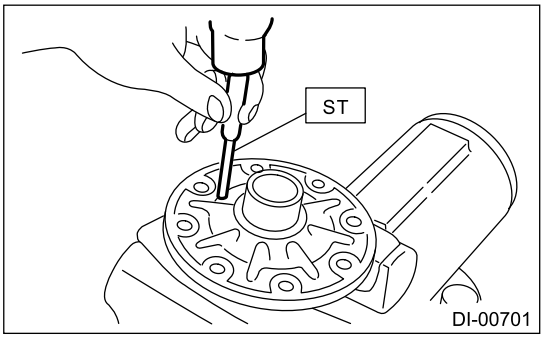
ST: 18270KA020 SOCKET (E20)



14. Remove the spring pin from hypoid driven gear side using the ST.

Special Tool:

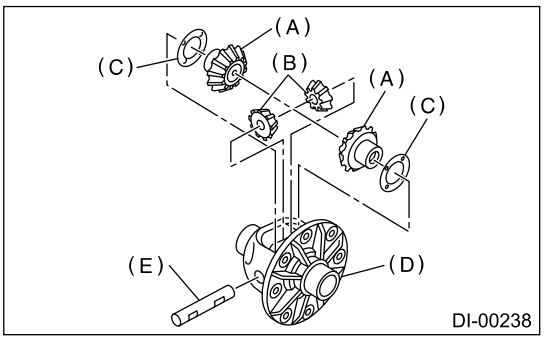
ST: 899904100 STRAIGHT PIN REMOVER



15. Draw out the pinion mate shaft and remove pinion mate gears, side gears and side gear thrust washers.

Note:

The gears and washers should be marked with front or rear, RH or LH, or kept separately.



(A) Side gear

(B) Pinion mate gear

(C) Side gear thrust washer

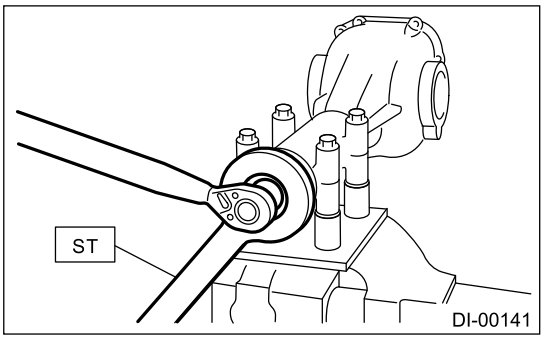
(D) Differential case

(E) Pinion mate shaft

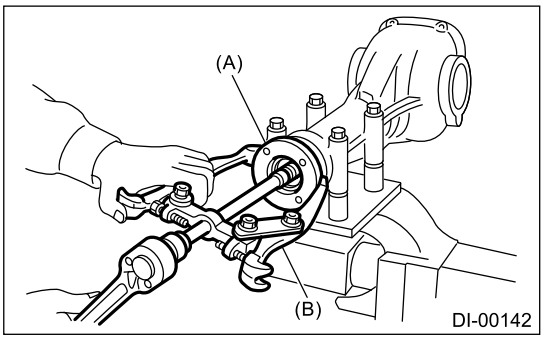
16. Remove the self-locking nut while securing the companion flange with the ST.

Special Tool:

ST: 498427200 FLANGE WRENCH



17. Extract the companion flange with a puller.



(A) Companion flange

(B) Puller

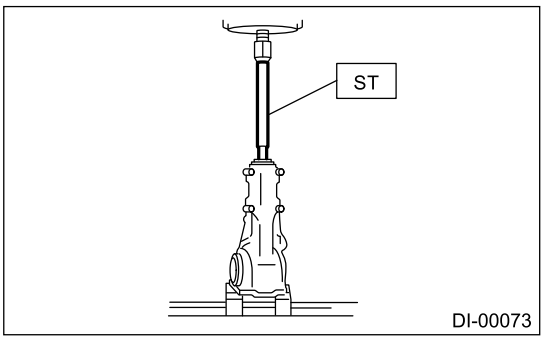
18. Press the end of drive pinion shaft using the ST and remove the rear bearing cone, pinion height adjusting washer, preload adjusting spacer and washer.

Caution:

Hold the drive pinion so as not to drop it.

Special Tool:

ST: 398467700 DRIFT



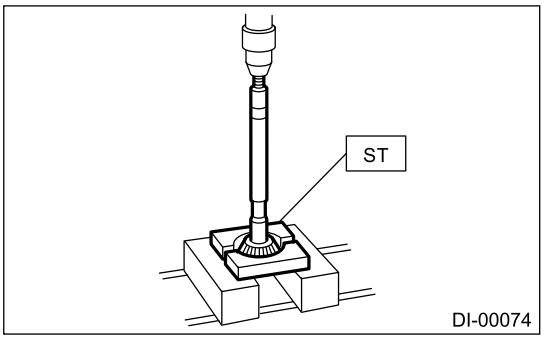
19. Support the rear bearing cone with the ST, and remove it from the drive pinion.

Note:

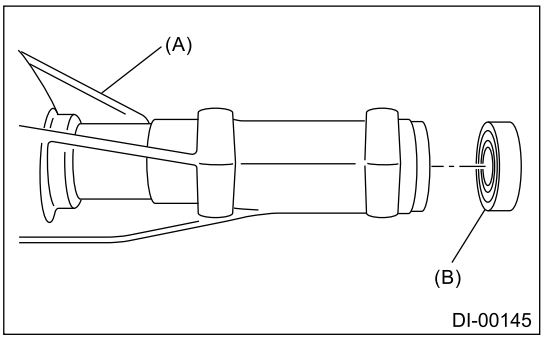
Place the remover so that its center-recessed side faces the bearing cone.

Special Tool:

ST: 498515500 REMOVER



20. Remove the front oil seal using the PULLER ASSY (398527700).



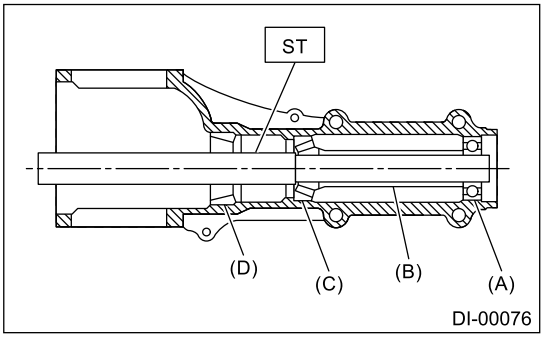
(A) Differential carrier

(B) Front oil seal

21. Remove the pilot bearing together with the front bearing cone and spacer using the ST.

Special Tool:

ST: 398467700 DRIFT



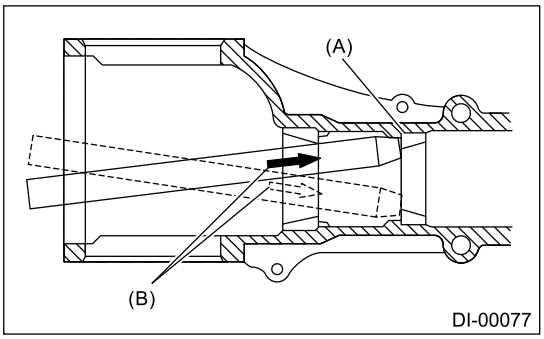
(A) Pilot bearing

(B) Spacer

(C) Front bearing

(D) Rear bearing race

22. When replacing the bearings, tap out and remove the front bearing race and rear bearing race in this order using a brass bar.



(A) 2 cutout portions along diagonal lines

(B) Tap alternately with brass bar.

DIFFERENTIALS > Rear Differential (VA-type)

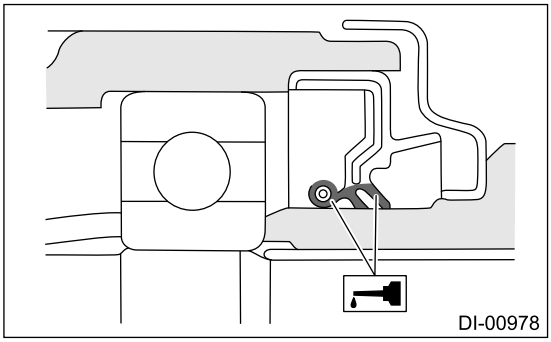
ASSEMBLY

Caution:

- **Keep the shims and washers in order, so that they are not improperly installed.**
- **Be careful not to mix up the side bearing race RH and LH.**
- **Be careful not to mix up the side oil seal RH and LH.**

Note:

- **Check and adjust each part during assembly.**
- **Thoroughly clean the surfaces on which the shims, washers and bearings are to be installed.**
- **Apply differential gear oil when installing the bearings and thrust washers.**
- **Apply differential gear oil to the lips when installing the oil seal.**



1. Adjusting preload for front and rear bearings

Note:

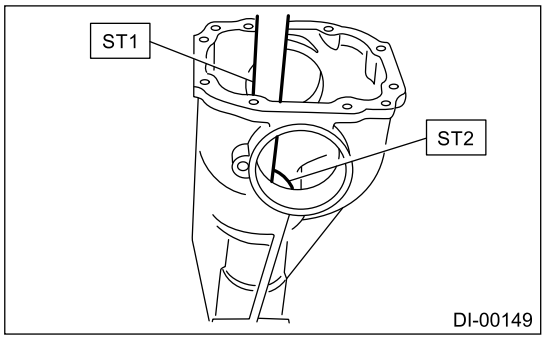
Adjust the bearing preload between front and rear bearings with preload adjusting spacer and washer. Pinion height adjusting washer is not affected by this adjustment. The adjustment must be carried out with oil seal removed.

(1) Install the rear bearing race using the ST1 and ST2.

Special Tool:

ST1: 398477701 HANDLE

ST2: 398477702 DRIFT



(2) Using the HANDLE (398477701) and DRIFT (498447110), install a new front bearing race to the differential carrier.
(3) Insert a new front bearing cone.
(4) Measure and record the thickness of the pinion height adjusting washer.

Note:

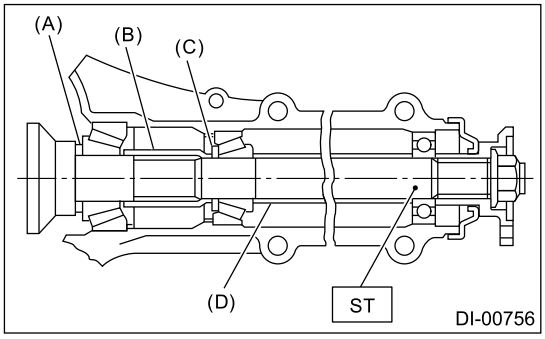
- **At this time, install a provisionally selected or previously used pinion height adjusting washer.**
- **If tooth contact (drive pinion and hypoid driven gear) is normal in the inspection before disassembling, verify that the washer is not deformed, and then reuse the used washer.**

(5) Insert the ST into the differential carrier with the pinion height adjusting washer and rear bearing cone fitted onto it.
(6) Install the preload adjusting spacer, washer, spacer, new pilot bearing, companion flange, and self-locking nut.

Special Tool:

ST: 498447150 DUMMY SHAFT

Part No. 32285AA000 Spacer



(A) Pinion height adjusting washer
(B) Preload adjusting spacer
(C) Preload adjusting washer
(D) Spacer (SUBARU genuine parts)

(7) Turn the ST1 by hand to smooth the bearing, and tighten a new self-locking nut while measuring the initial load or initial torque with a spring scale or torque wrench. Select the preload adjusting washer and spacer so that the specified preload is obtained when nut is tightened to the specified torque.

Caution:

Be careful not to give excessive preload.

Note:

- **Measure the preload in direction of tangent to the flange.**
- **When tightening the self-locking nut, lock the ST1 with the ST2 as shown in the figure.**

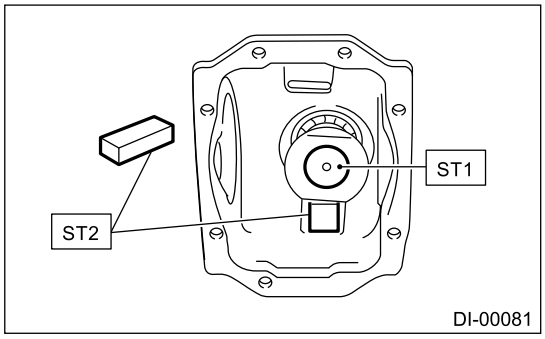
Special Tool:

ST1: 498447150 DUMMY SHAFT

ST2: 398507704 BLOCK

Tightening torque:

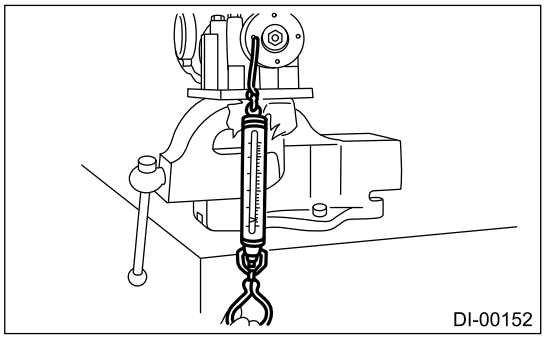
191 N·m (19.5 kgf-m, 140.9 ft-lb)



Specification:

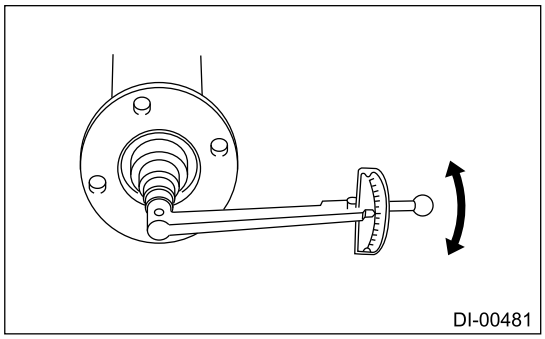
Initial load:

12.7 — 32.2 N (1.3 — 3.3 kgf, 2.9 — 7.2 lbf)



Initial torque:

0.48 — 1.22 N·m (0.05 — 0.12 kgf-m, 0.35 — 0.90 ft-lb)



Preload adjusting washer	
Part No.	**Thickness mm (in)**
38336AA000	1.500 (0.0591)
38336AA120	1.513 (0.0596)
38336AA010	1.525 (0.0600)
38336AA130	1.538 (0.0606)
38336AA020	1.550 (0.0610)

Preload adjusting washer	
Part No.	**Thickness mm (in)**
38336AA140	1.563 (0.0615)
38336AA030	1.575 (0.0620)
38336AA150	1.588 (0.0625)
38336AA040	1.600 (0.0630)
38336AA160	1.613 (0.0635)
38336AA050	1.625 (0.0640)
38336AA170	1.638 (0.0645)
38336AA060	1.650 (0.0650)
38336AA180	1.663 (0.0655)
38336AA070	1.675 (0.0659)
38336AA190	1.688 (0.0665)
38336AA080	1.700 (0.0669)
38336AA200	1.713 (0.0674)
38336AA090	1.725 (0.0679)
38336AA210	1.738 (0.0684)
38336AA100	1.750 (0.0689)
38336AA220	1.763 (0.0694)
38336AA110	1.775 (0.0699)

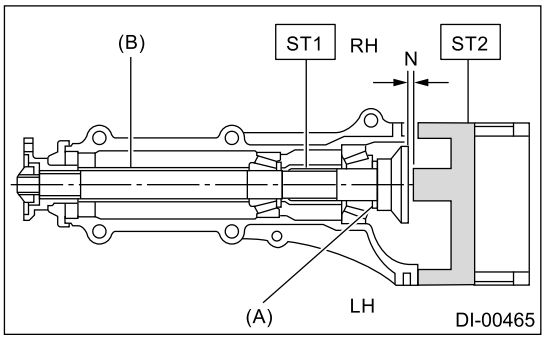
Preload adjusting spacer	
Part No.	**Length mm (in)**
32288AA040	52.3 (2.059)
32288AA050	52.5 (2.067)
31454AA100	52.6 (2.071)
32288AA060	52.7 (2.075)
31454AA110	52.8 (2.079)
32288AA070	52.9 (2.083)
31454AA120	53.0 (2.087)
32288AA080	53.1 (2.091)
32288AA090	53.3 (2.098)

2. Adjusting drive pinion height:
Adjust the drive pinion height with pinion height adjusting washer installed between the rear bearing cone and the back of pinion gear.
(1) Install the ST2.

Special Tool:

ST1: 498447150 DUMMY SHAFT
ST2: 498505501 DIFFERENTIAL CARRIER GAUGE

Part No. 32285AA000 Spacer



(A) Pinion height adjusting washer
(B) Spacer (SUBARU genuine parts)

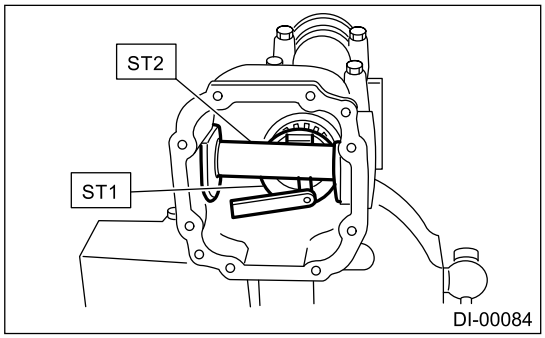
(2) Measure the clearance "N" between the end of ST2 and the end surface of ST1 by using a thickness gauge.

Note:

Make sure there is no clearance between the differential carrier and ST2.

Special Tool:

ST1: 498447150 DUMMY SHAFT
ST2: 498505501 DIFFERENTIAL CARRIER GAUGE



(3) Obtain the thickness of pinion height adjusting washer to be inserted from the following formula, and replace the temporarily installed washer with this one.

Note:

Adjust it using the 1 — 3 washers.

T = To + N − 0.05 mm (0.0020 in)

T	Thickness of pinion height adjusting washer mm (in)	
To	Thickness of washer temporarily inserted mm (in)	
N	Clearance of thickness gauge mm (in)	
Memo:		

(Example of calculation)
To = 0.15 mm (0.0059 in)
N = 0.1 mm (0.0039 in)
T = 0.15+ 0.1− 0.05 = 0.2 mm (0.0079 in)
Result: Thickness = 0.2 mm (0.0079 in)

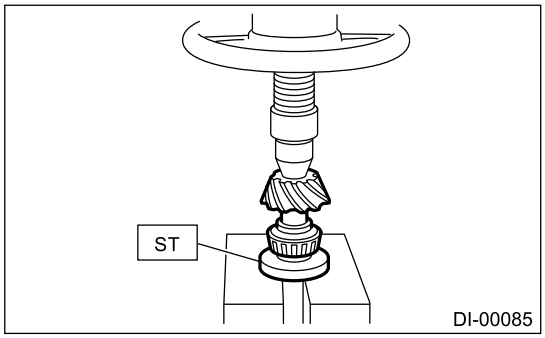
Therefore use part number 32295AA220.

Pinion height adjusting washer	
Part No.	**Thickness mm (in)**
32295AA200	0.150 (0.0059)
32295AA210	0.175 (0.0069)
32295AA220	0.200 (0.0079)
32295AA230	0.225 (0.0089)
32295AA240	0.250 (0.0098)
32295AA250	0.275 (0.0108)

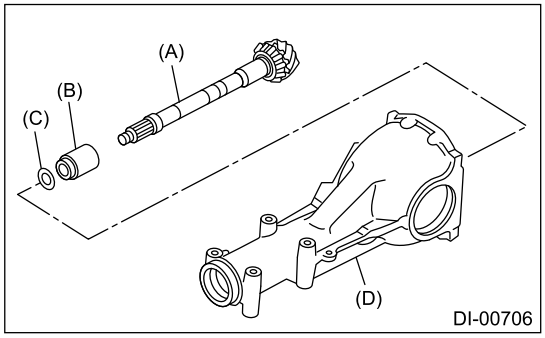
3. Install the selected pinion height adjusting washer on drive pinion, and press-in the rear bearing cone with the ST.

Special Tool:

ST: 498175500 INSTALLER



4. Insert the drive pinion, and install the preselected preload adjusting spacer and washer.



(A) Drive pinion

(B) Preload adjusting spacer

(C) Preload adjusting washer

(D) Differential carrier

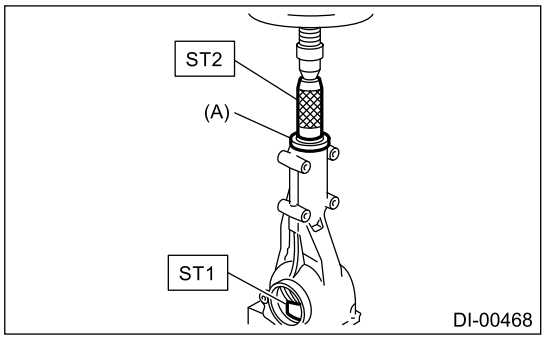
5. Press-fit a new front bearing cone with the ST1, ST2 and spacer.

Special Tool:

ST1: 399780104 WEIGHT

ST2: 899580100 INSTALLER

Part No. 32285AA000 Spacer



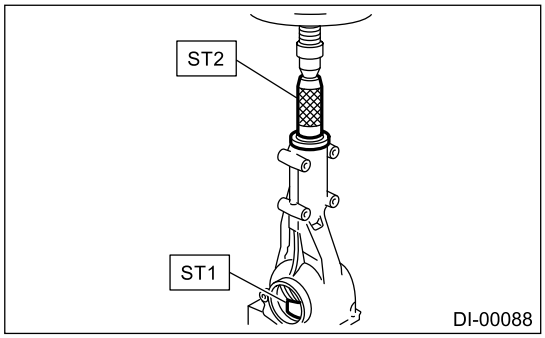
(A) Spacer (SUBARU genuine parts)

6. Insert the spacer, then press-fit a new pilot bearing with the ST1 and ST2.

Special Tool:

ST1: 399780104 WEIGHT

ST2: 899580100 INSTALLER



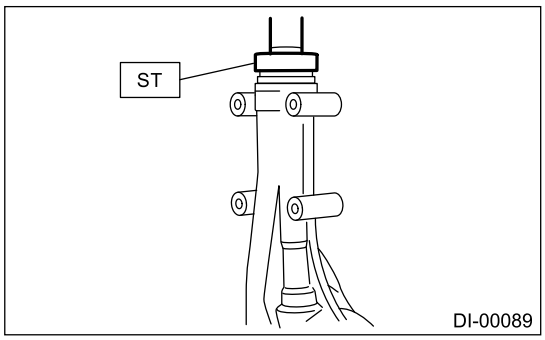
7. Using the ST, install a new front oil seal.

Note:

- **Press-fit until the oil seal end comes 1 mm (0.04 in) inward from end of carrier.**
- **Apply differential gear oil to the oil seal lips.**

Special Tool:

ST: 498447120 INSTALLER



8. Press-fit the companion flange with the ST1 and ST2.

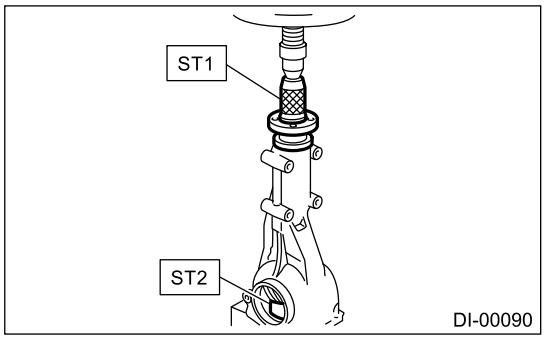
Caution:

Be careful not to damage the pilot bearing.

Special Tool:

ST1: 899874100 INSTALLER

ST2: 399780104 WEIGHT



9. Apply seal material on the drive pinion shaft thread and new self-locking nut seat.

Seal material:

THREE BOND 1324 (Part No. 004403042) or equivalent

10. Tighten a new self-locking nut while securing the companion flange with the ST.

Tightening torque:

191 N·m (19.5 kgf-m, 140.9 ft-lb)

Special Tool:

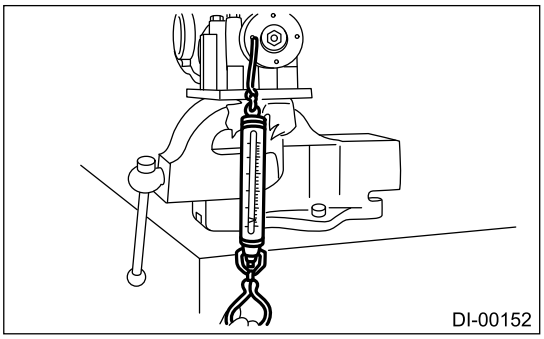
ST: 498427200 FLANGE WRENCH

11. Check the initial torque or initial load.

Specification:

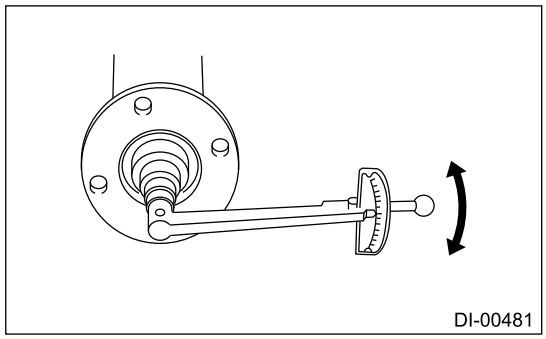
Initial load:

12.7 — 32.2 N (1.3 — 3.3 kgf, 2.9 — 7.2 lbf)



Initial torque:

0.48 — 1.22 N·m (0.05 — 0.12 kgf-m, 0.35 — 0.90 ft-lb)

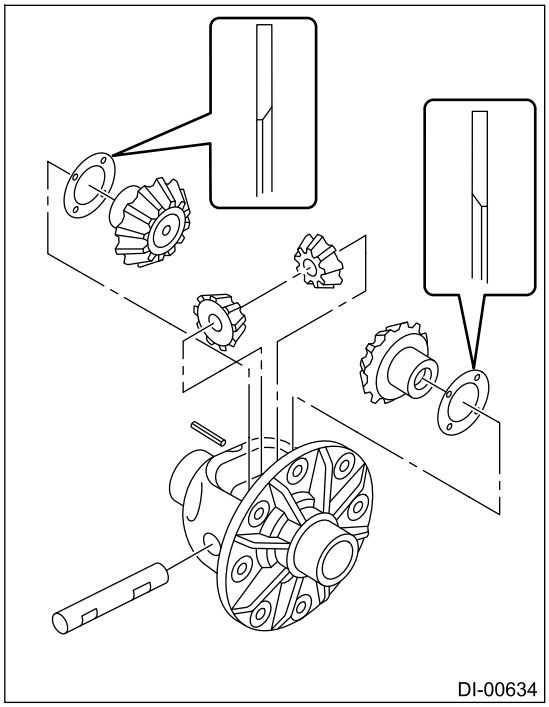


12. Assembling differential case

(1) Install the side gears and pinion mate gears together with the side gear thrust washers and pinion mate shaft.

Note:

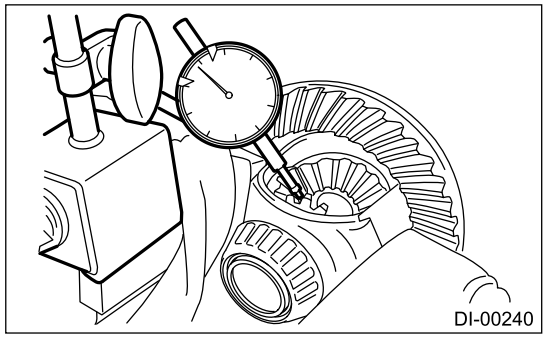
- **Apply gear oil on both sides of the washer and on the side gear shaft before installing.**
- **Insert the pinion mate shaft into the differential case by aligning the pin holes.**
- **The side gear thrust washer inner surface has a chamfered side. Install the washer with the chamfered side facing toward the side gear.**



(2) Measure the side gear backlash.

Specification:

0.05 — 0.15 mm (0.002 — 0.006 in)



(3) Adjust the side gear backlash within the specified value by selecting the side gear thrust

washer.

Side gear thrust washer	
Part No.	**Thickness mm (in)**
803135011	0.925 — 0.950 (0.0364 — 0.0374)
803135012	0.950 — 0.975 (0.0374 — 0.0384)
803135013	0.975 — 1.000 (0.0384 — 0.0394)
803135014	1.000 — 1.025 (0.0394 — 0.0404)
803135015	1.025 — 1.050 (0.0404 — 0.0413)

(4) Check the condition of rotation after applying oil to the gear tooth surfaces and washer surfaces.

(5) Using the STRAIGHT PIN REMOVER (899904100), drive a new spring pin into the differential case.

13. Install the hypoid driven gear to differential case.

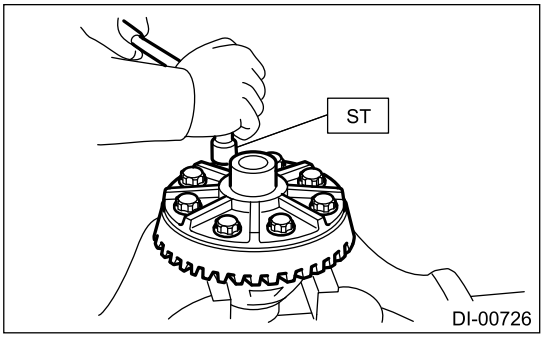
Note:

- **Before installing bolts, apply seal material to bolt threads.**
  Seal material:
  THREE BOND 1324 (Part No. 004403042) or equivalent
- **Make sure there is no clearance between the differential case and driven gear.**
- **Tighten opposing bolts in order.**

(1) Tighten the hypoid driven gear mounting bolts to the specified torque using the ST.

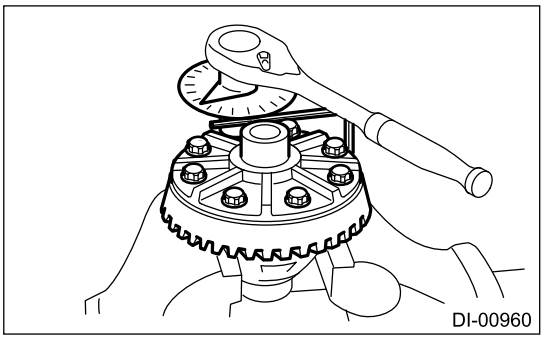
Special Tool:
ST: 18270KA020 SOCKET (E20)

Tightening torque:
20 N·m (2.0 kgf-m, 14.8 ft-lb)



(2) While checking the tightening angle with the angle gauge, further tighten the hypoid driven gear mounting bolts.

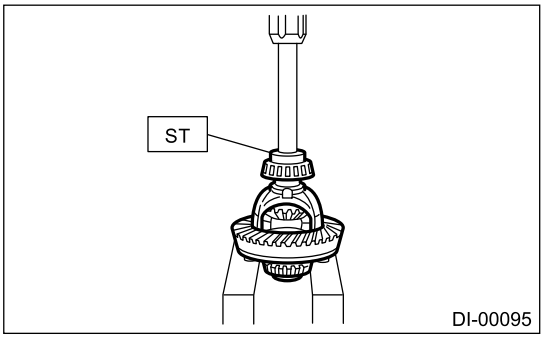
Tightening angle:
35° ± 2°



14. Press-fit the side bearing cone using the ST.

Special Tool:

ST: 498485400 DRIFT



15. Assemble the side retainer.

(1) Install a new side oil seal to the side retainer.

Caution:

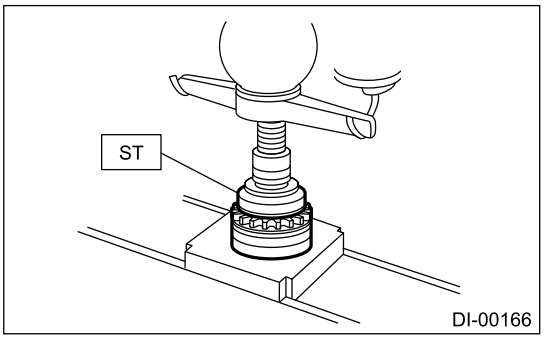
Pay attention to the left and right of the oil seal.

Note:

Apply differential gear oil to the oil seal lip.

Special Tool:

ST: 498447100 INSTALLER



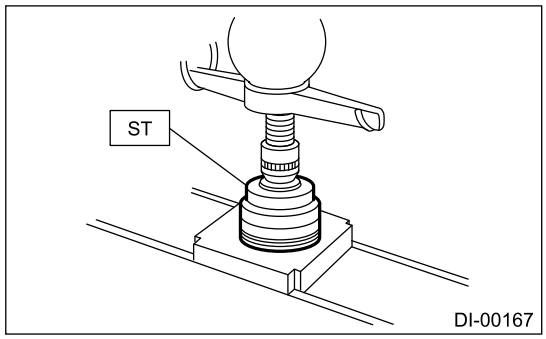
(2) Install the side bearing race into the side retainer.

Caution:

Make sure that bearing races and cones are properly assembled.

Special Tool:

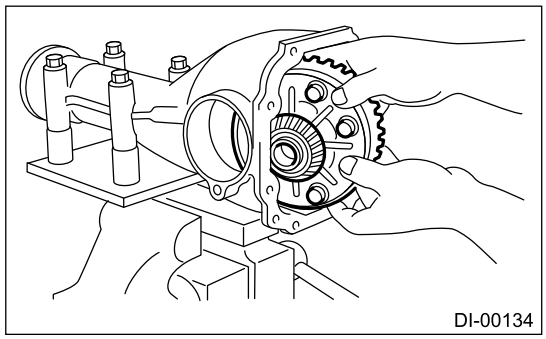
ST: 398477702 DRIFT



(3) Install the differential case assembly.

Caution:

Be careful not to hit the teeth of hypoid driven gear against the differential carrier.



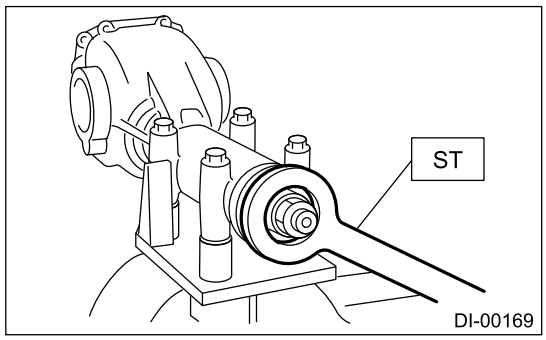
(4) Lightly tighten the side retainer in the differential carrier.

16. Perform the backlash adjustment between the hypoid driven gear and drive pinion, and side bearing preload adjustment.

(1) Turn the drive pinion with the ST to seat the side bearing securely.

Special Tool:

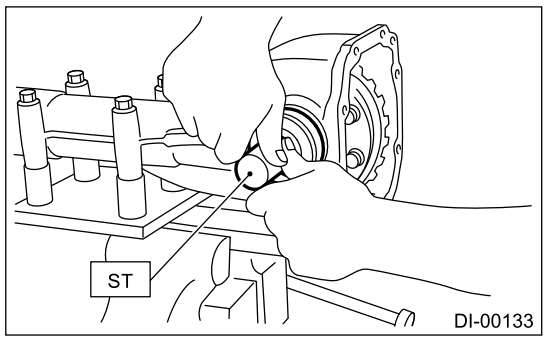
ST: 498427200 FLANGE WRENCH



(2) Using the ST, tighten the side retainer RH, and then tighten the side retainer LH until there is no backlash.

Special Tool:

ST: 18630AA010 WRENCH COMPL RETAINER

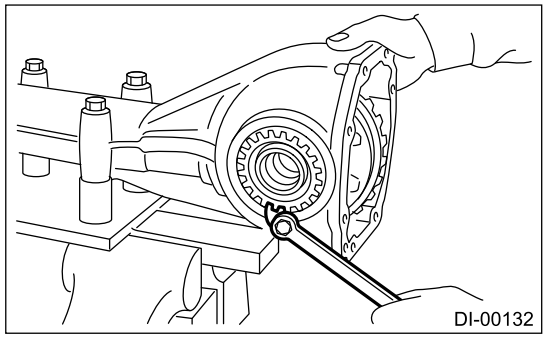


(3) Loosen the side retainer LH by approx. 1.5 teeth, and tighten the side retainer RH by approx. 2 teeth [amount that the side retainer LH is turned back (approx. 1.5 teeth) + approx. 0.5 teeth]. Difference between [amount that the side retainer LH is turned back (approx. 1.5 teeth)] and [amount that the side retainer RH is tightened (approx. 2 teeth)] gives preload.

(4) Temporarily tighten the lock plate.

Note:

Turn over the lock plate to shift the holder by 0.5 teeth.



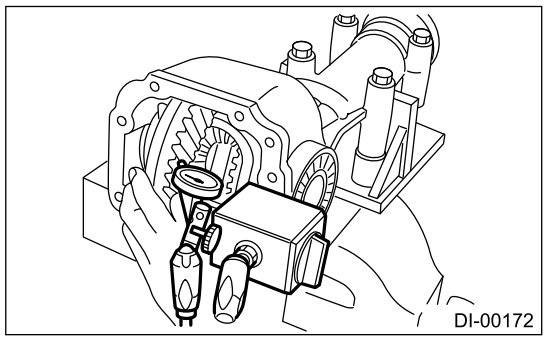
(5) Measure the hypoid driven gear-to-drive pinion backlash. Set the magnet base on differential carrier. Align the contact point of dial gauge with tooth face of hypoid driven gear, and move hypoid driven gear while holding drive pinion still. Read the value indicated on dial gauge.

Note:

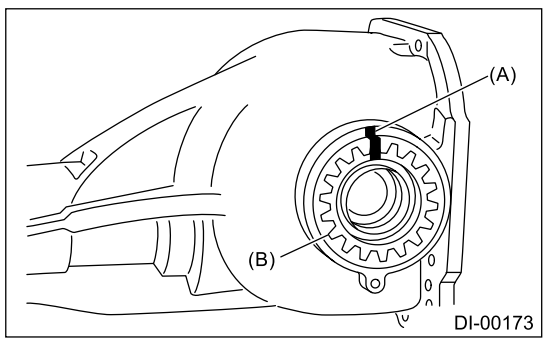
If it is outside the standard value, repeat the procedures for the backlash adjustment between hypoid driven gear and drive pinion, and the side bearing preload adjustment.

Specification:

0.10 — 0.15 mm (0.004 — 0.006 in)



17. Put alignment marks on both the differential carrier and side retainer. Remove the side retainers one side at a time. After installing a new O-ring and applying oil to the threaded portion, restore them to the original position.



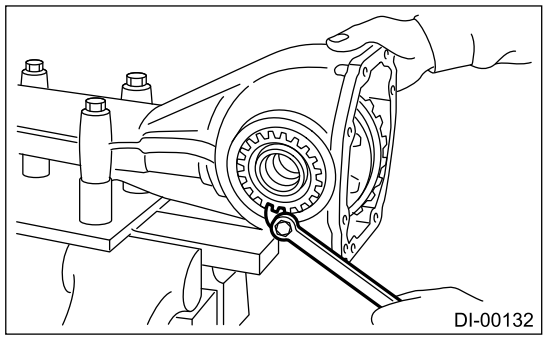
(A) Alignment mark

(B) Side retainer

18. Install the lock plate.

Tightening torque:

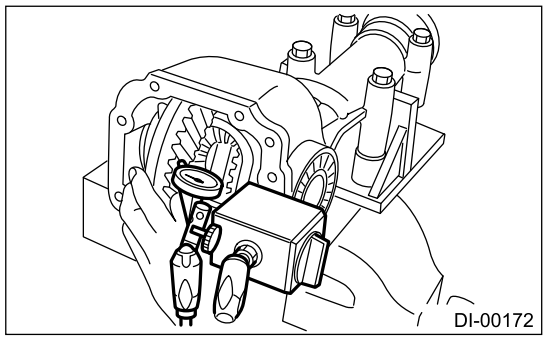
25 N·m (2.5 kgf-m, 18.4 ft-lb)



19. Recheck the backlash between hypoid driven gear and drive pinion.

Specification:

0.10 — 0.15 mm (0.004 — 0.006 in)



20. Checking and adjusting the tooth contact of hypoid driven gear

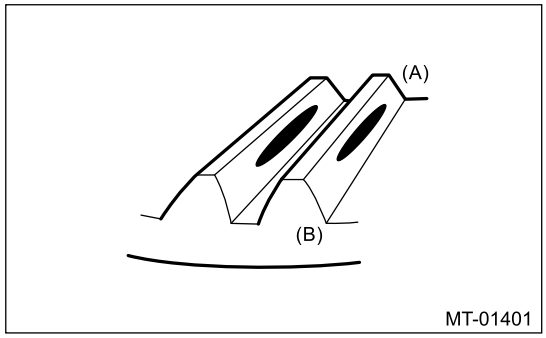
(1) Apply lead-free red dye evenly on the both sides of three to four teeth of the hypoid driven gear. Check the contact pattern after rotating the hypoid driven gear several revolutions back and forth until a definite contact pattern appears on the hypoid driven gear.

(2) When the contact pattern is not correct, readjust.

Note:

Be sure to wipe off the lead-free red dye completely after the adjustment is completed.

- Correct tooth contact
  Check item: Tooth contact pattern is slightly shifted toward toe side under no-load rotation. (When driving, it moves towards the heel side.)

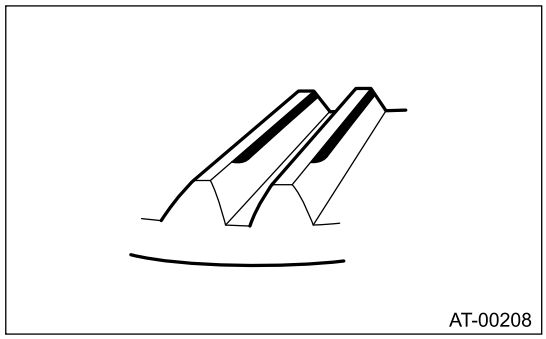


(A) Toe side

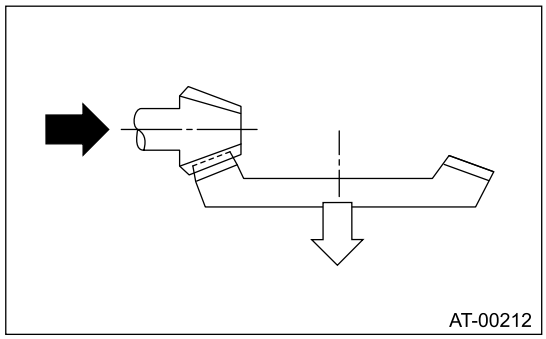
(B) Heel side

- Face contact
  Check item: Backlash is too large.

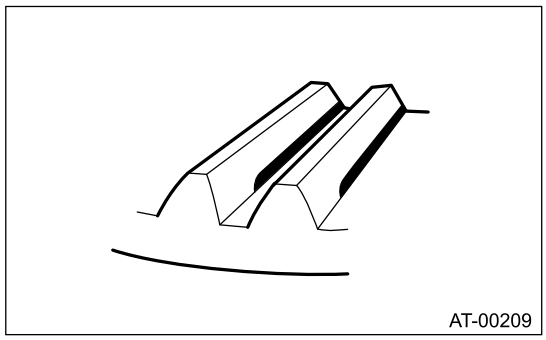
Contact pattern



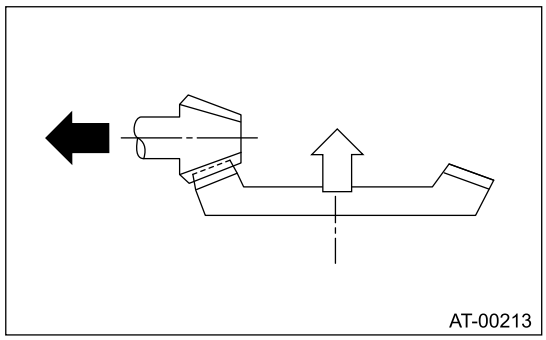
Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.



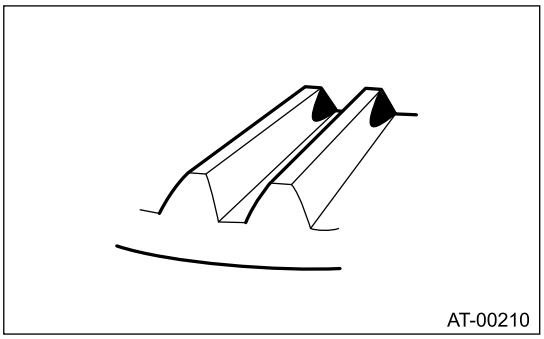
- Flank contact
  Check item: Backlash is too small.
  Contact pattern



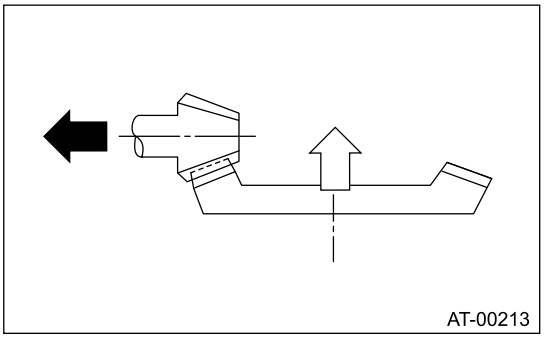
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear.



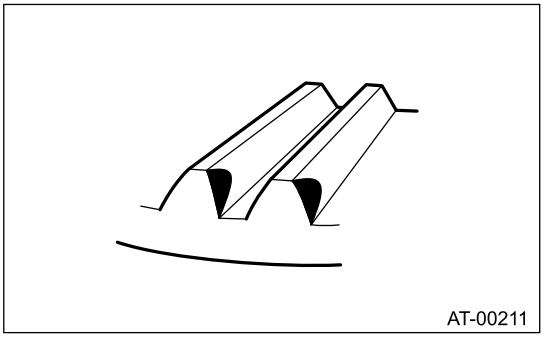
- Toe contact (inside contact)
  Check item: Teeth contact area is too small.
  Contact pattern



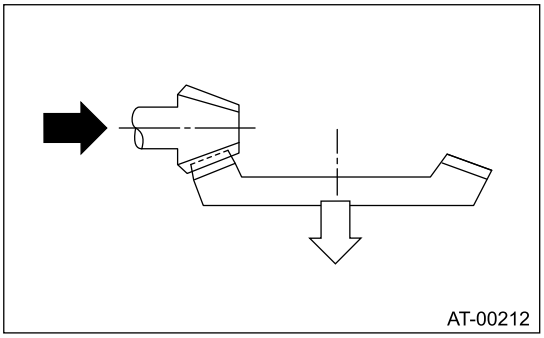
Corrective action: Reduce the thickness of pinion height adjusting washer according to the procedure for bringing drive pinion away from hypoid driven gear side.



- Heel contact (outside end contact)
  Check item: Teeth contact area is too small.
  Contact pattern



Corrective action: Increase thickness of pinion height adjusting washer according to the procedure for bringing drive pinion close to hypoid driven gear side.

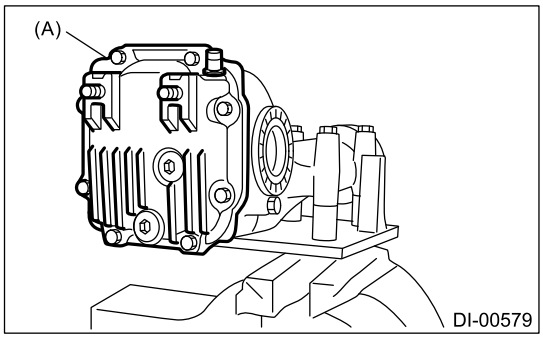


21. If proper tooth contact is not obtained, readjust the drive pinion height, side bearing preload (previously described) and the hypoid driven gear backlash.

22. Replace the gasket with a new part and install the rear cover.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



(A) Rear cover

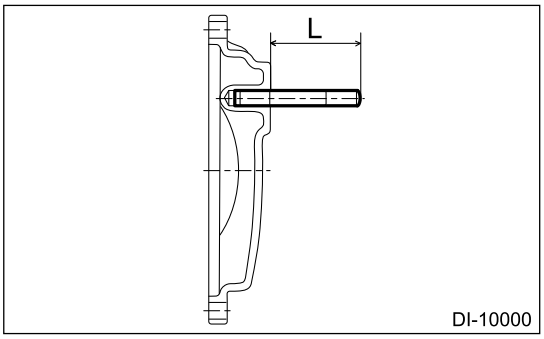
23. When the stud bolts are removed from the rear cover, install the stud bolts so that the exposed length of stud bolt is within the range of "L".

Caution:

- **Do not tighten forcibly if the exposed length of stud bolt does not fall within the specified range. Remove the stud bolt, and check for contamination of foreign matter and any defects in the screw hole.**
- **Do not tighten with a tightening torque of 55 N·m (5.6 kg-m, 40.6 ft-lb) (reference value) or more.**

Exposed length L of stud bolt:

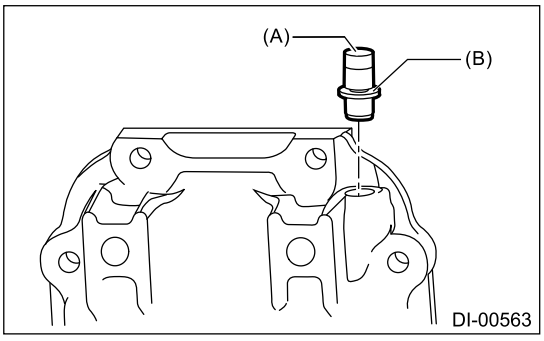
59.0 — 61.0 mm (2.32 — 2.40 in)



24. Install the air breather cap.

Caution:

When installing the air breather cap, do not tap section (A). Be sure to tap section (B) to install.



25. Replace the gasket with a new part, and install the drain plug.

Tightening torque:

50 N·m (5.1 kg-m, 36.9 ft-lb)

26. Install the filler plug.

Note:
After installing the rear differential assembly to the vehicle, fill the gear oil, then use a new gasket, and tighten to the specified torque. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.

DIFFERENTIALS > Rear Differential (VA-type)

INSPECTION

Wash all the disassembled parts clean, and examine them for wear, damage or other defects. Repair or replace the defective parts as necessary.

1. Hypoid driven gear and drive pinion
   - If there is evidently an abnormal tooth contact, find out the cause and adjust until the teeth contact correctly. Replace the gear if there is an excessive worn or an incapable adjustment.
   - If crack, cutout or seizure is found, replace the parts as a set. Slight damage of some teeth can be corrected by oil stone or the like.
2. Side gear and pinion mate gear
   - Replace if cracks, scoring or other defects are evident on the tooth surface.
   - Replace if thrust washer contact surface is worn or seized. Slight damages of the surface can be corrected by oil stones or equivalent.
3. Bearing
   Replace if seizure, peeling, wear, rust, dragging during rotation, noise or other defect is evident.
4. Side gear thrust washer
   Replace if seized, flawed, abnormally worn or having other defects.
5. Oil seal
   Replace if deformed or damaged, and at every disassembling.
6. Differential carrier
   Replace if the bearing bores are worn or damaged.
7. Differential case
   Replace if its sliding surfaces are abnormally worn, burned, or cracked.
8. Companion flange
   Replace if the oil seal lip contact surface shows cracking.

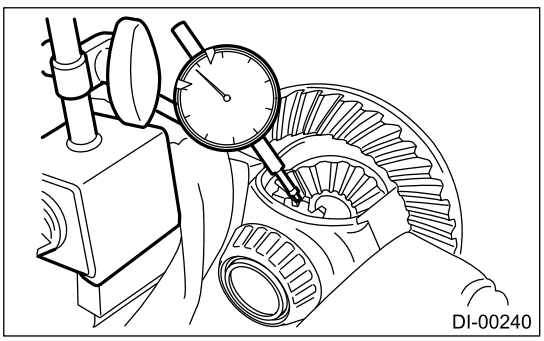
1. SIDE GEAR BACKLASH

Using a dial gauge, check the backlash of side gear.

Specification:

0.05 — 0.15 mm (0.002 — 0.006 in)

If it is outside the standard value, adjust the side gear backlash by selecting side gear thrust washer.



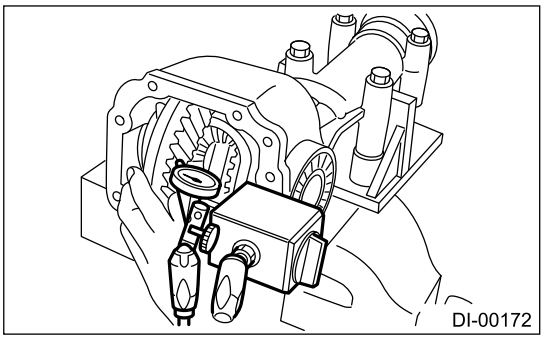
2. HYPOID DRIVEN GEAR BACKLASH

Using a dial gauge, check the backlash of hypoid driven gear.

Specification:

0.10 — 0.15 mm (0.004 — 0.006 in)

If it is outside the standard value, adjust the side bearing preload and repair if necessary.



3. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

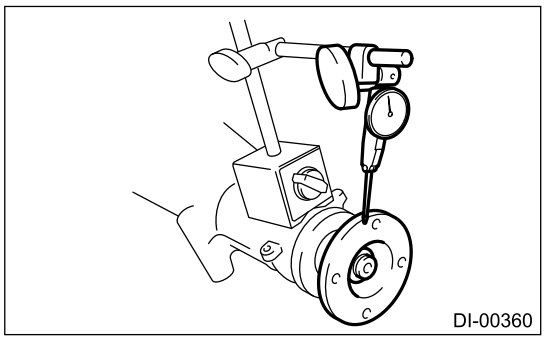
Inspect the tooth contact between the hypoid driven gear and drive pinion. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>ASSEMBLY.

4. COMPANION FLANGE

1. If rust or dirt is attached to the companion flange, remove them.
2. Set a dial gauge at a companion flange surface (mating surface of propeller shaft and companion flange), and then measure the companion flange runout.

   Service limit:

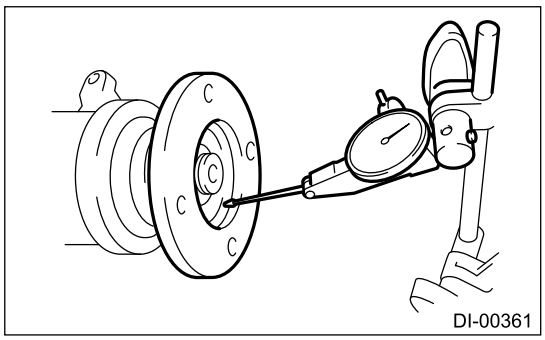
   0.08 mm (0.003 in)



3. Set the dial gauge inside of the companion flange, and measure the runout.

   Service limit:

   0.08 mm (0.003 in)



4. If either runout exceeds the limit, move the phase of companion flange and drive pinion 90° each, and find the point where the runout is within the limit.
5. If the runout exceeds the limit after changing the phase, replace the companion flange and recheck the runout.
6. If the runout exceeds the limit after replacing the companion flange, the drive pinion may be

assembled incorrectly or bearing is faulty.

ADJUSTMENT

1. SIDE GEAR BACKLASH

Adjust the side gear backlash. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>ASSEMBLY.

2. HYPOID DRIVEN GEAR BACKLASH

Adjust hypoid driven gear backlash. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>ASSEMBLY.

3. TOOTH CONTACT BETWEEN HYPOID DRIVEN GEAR AND DRIVE PINION

Adjust the tooth contact between hypoid driven gear and drive pinion gear. Ref. to DIFFERENTIALS>Rear Differential (VA-type)>ASSEMBLY.

DIFFERENTIALS > Rear Differential Front Oil Seal

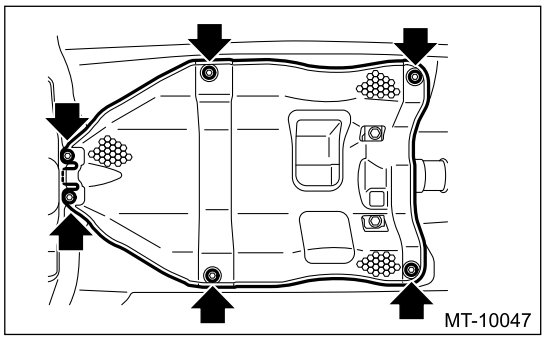
INSPECTION

Check that there is no oil leaking from the oil seal. If there is oil leakage, replace with the new part and check the propeller shaft.

DIFFERENTIALS > Rear Differential Front Oil Seal

REPLACEMENT

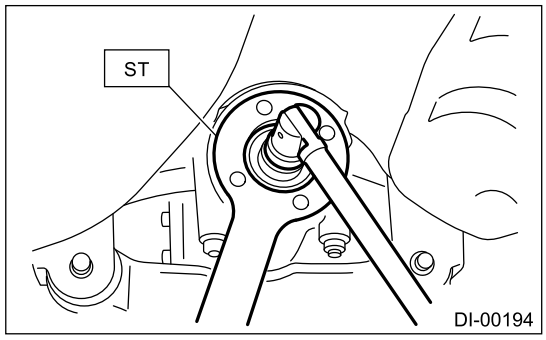
1. Shift the select lever or gear shift lever to neutral.
2. Release the parking brake.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Lift up the vehicle.
5. Drain differential gear oil. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.
6. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
7. Remove the center exhaust cover.



8. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
9. Check the initial torque and write it down.
10. Remove the self-locking nut while securing the companion flange with the ST.

Special Tool:

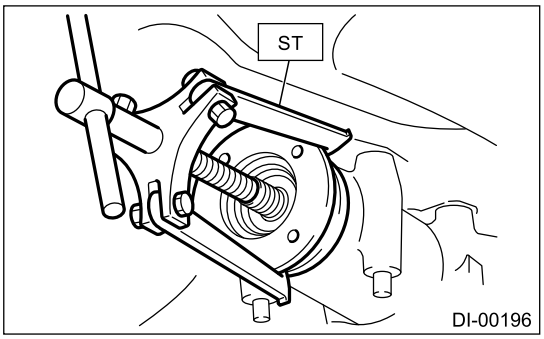
ST: 498427200 FLANGE WRENCH



11. Extract the companion flange using the ST.

Special Tool:

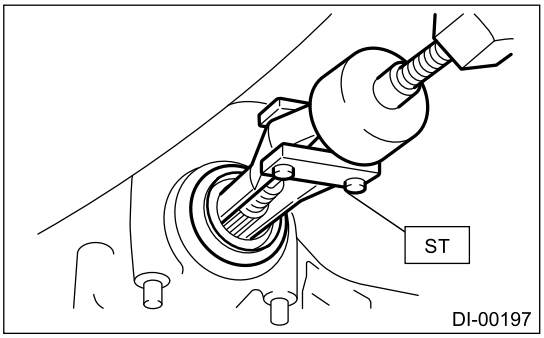
ST: 399703600 PULLER ASSY



12. Remove the oil seal using the ST or a screwdriver.

Special Tool:

ST: 398527700 PULLER ASSY



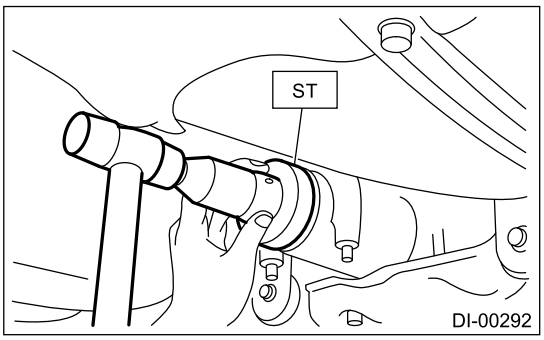
13. Using the ST, install a new front oil seal.

Note:

Apply differential gear oil to the oil seal lips.

Special Tool:

ST: 498447120 INSTALLER



14. Use a plastic hammer to install companion flange.

15. Apply seal material on the drive pinion shaft thread and new self-locking nut seat.

Seal material:

THREE BOND 1324 (Part No. 004403042) or equivalent

16. Tighten a new self-locking nut to the specified torque while securing the companion flange with the ST.

Caution:

Tighten it so that the initial torque of companion flange becomes the same as that of before oil seal replacement.

Tightening torque:

T-type:

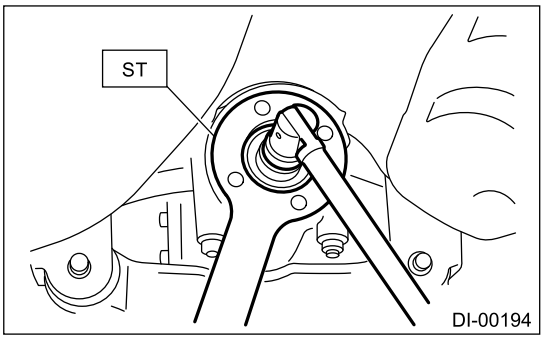
167 — 196 N·m (17.0 — 20.0 kgf-m, 123.2 — 144.6 ft-lb)

VA1-type:

162 — 220 N·m (16.5 — 22.5 kgf-m, 119.5 — 162.3 ft-lb)

Special Tool:

ST: 498427200 FLANGE WRENCH

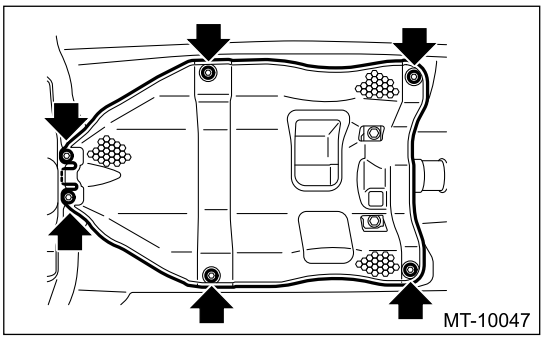


17. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

18. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



19. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.

20. Fill differential gear oil. Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.

21. Lower the vehicle.

22. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

DIFFERENTIALS > Rear Differential Side Oil Seal

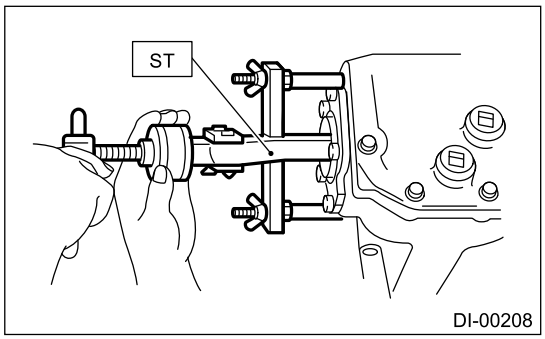
INSPECTION

Inspect for oil leakage from the oil seal. If there is an oil leak, replace with a new one.

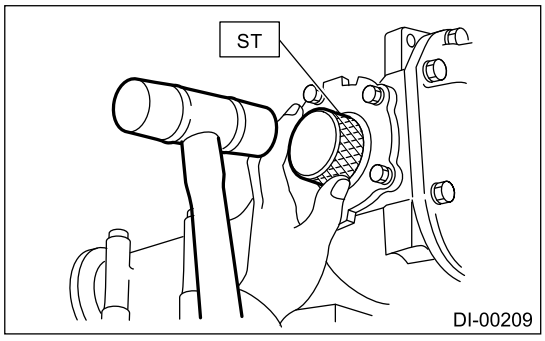
DIFFERENTIALS > Rear Differential Side Oil Seal

REPLACEMENT

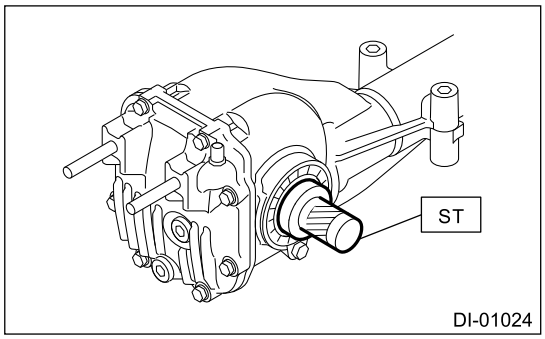
1. Remove the rear differential.
   - T-type:
     Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL.
   - VA1-type:
     Ref. to DIFFERENTIALS>Rear Differential (VA-type)>REMOVAL.
2. Remove the side oil seal using the ST or a screwdriver wrapped with vinyl tape to prevent side retainer damage.
   Special Tool:
   ST: 398527700 PULLER ASSY



3. Using the ST, install a new side oil seal.
   Caution:
   Pay attention to the left and right of the oil seal.
   Note:
   Apply differential gear oil to the oil seal lips.
   - T-type
     Special Tool:
     ST: 398437700 OIL SEAL INSTALLER



   - VA1-type
     Special Tool:
     ST: 498447100 INSTALLER



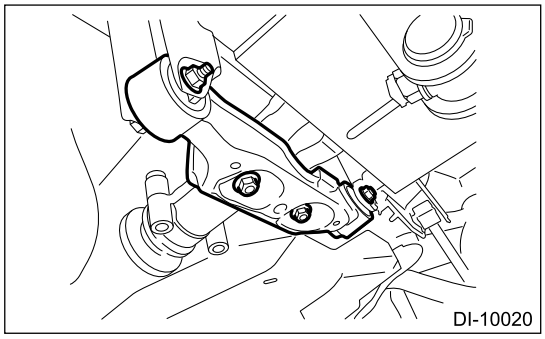
4. Install the rear differential.

- T-type:
  Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION.
- VA1-type:
  Ref. to DIFFERENTIALS>Rear Differential (VA-type)>INSTALLATION.

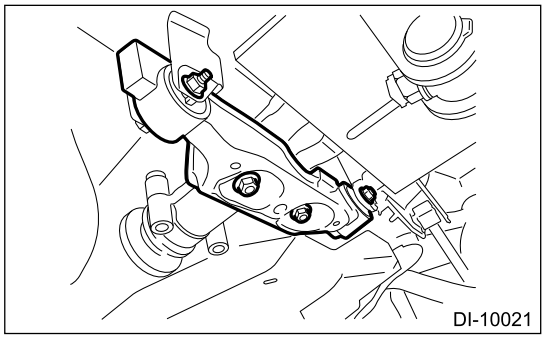
DIFFERENTIALS > Rear Differential Front Member

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Set the transmission jack.
4. Remove the rear differential front member.
   - T-type



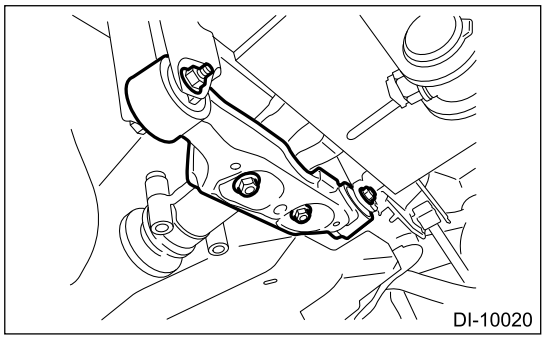
   - VA1-type



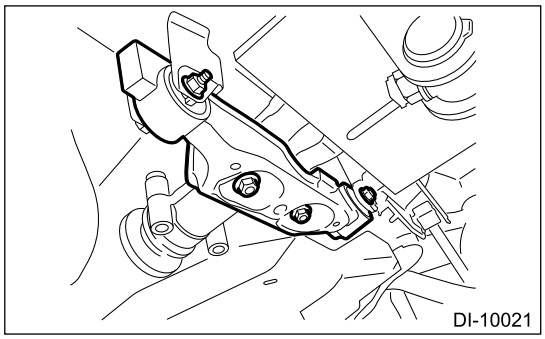
DIFFERENTIALS > Rear Differential Front Member

INSTALLATION

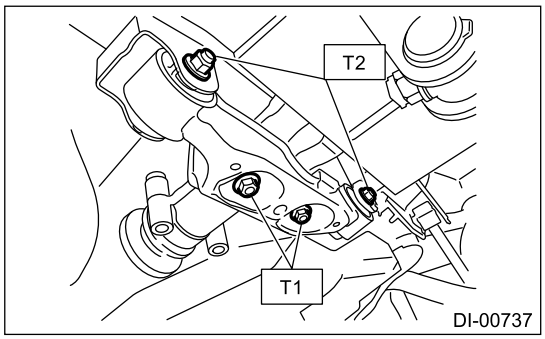
1. Install the rear differential front member, and temporarily attach and tighten a new self-locking nut.
   - T-type



   - VA1-type



2. Remove the transmission jack.
3. Tighten the self-locking nut.
   Tightening torque:
   T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)
   T2: 110 N·m (11.2 kgf-m, 81.1 ft-lb)



4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

DIFFERENTIALS > Rear Differential Front Member

INSPECTION

1. Check the rear differential front member for damage, bend and corrosion.
   If damage, bend or corrosion is excessive, replace the rear differential front member.
2. Check the bushings of rear differential front member for cracking, hardening and damage.
   If cracking, hardening or damage is excessive, replace rear differential front member.

DIFFERENTIALS > Rear Differential Mount Bushing

INSPECTION

Check the rear differential mount bushing for cracks, hardening or damage. Replace if cracking, hardening or damage is excessive.

DIFFERENTIALS > Rear Differential Mount Bushing

REPLACEMENT

Caution:

- **If there was so much rust in the rear differential mount bushing, remove the rust before starting work.**
- **Apply the molybdenum grease on the square thread of the ST (shaft and nut) before use.**

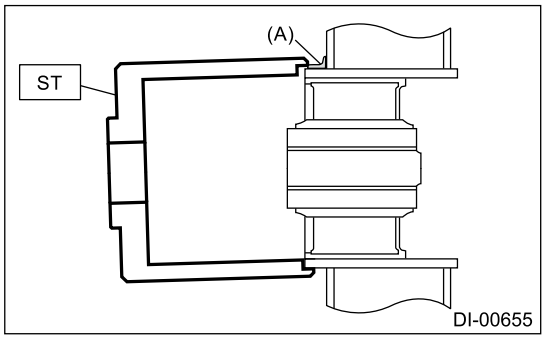
1. Remove the rear differential.
   - T-type:
     Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL.
   - VA1-type:
     Ref. to DIFFERENTIALS>Rear Differential (VA-type)>REMOVAL.
2. Fit the ST to the periphery of the sub frame cylinder, and make sure that the ST does not contact with welded spots or spatters.

   Caution:

   If the ST rises on the welded spots or spatters, the ST may be damaged during the operation. To avoid this, remove the excessive welds or spatters with a sander or equivalent so that the ST contacts the cylinder peripheral part.

   Special Tool:

   ST: 41399FG010 SPECIAL TOOL A

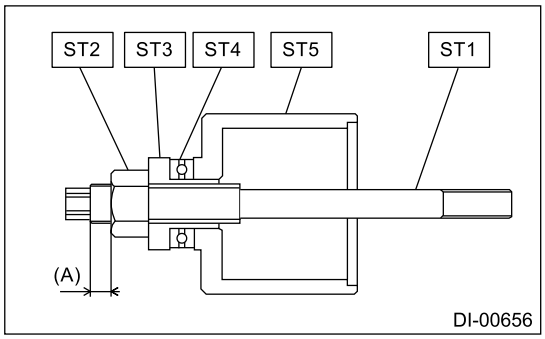


(A) Welded spot

3. Set the ST1, ST2, ST3, ST4 and ST5 as shown in the figure.

   Special Tool:

   ST1: 41399FG091 SPECIAL TOOL SHAFT
   ST2: 41399FG070 SPECIAL TOOL NUT
   ST3: 41399FG050 SPECIAL TOOL SLEEVE
   ST4: 41399FG080 SPECIAL TOOL BEARING
   ST5: 41399FG010 SPECIAL TOOL A



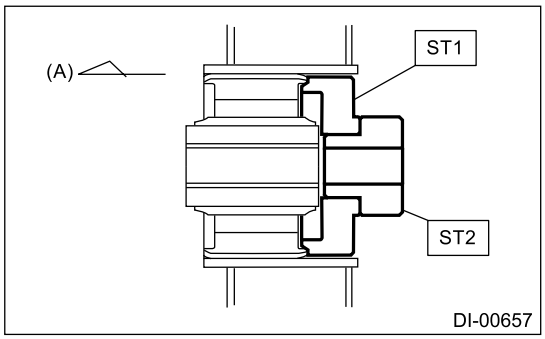
(A) 5 mm (0.2 in) or less

4. Fit and hold the ST1 and ST2 to the rear differential mount bushing from the rear side of vehicle.

Special Tool:

ST1: 41399FG031 SPECIAL TOOL C

ST2: 41399FG061 SPECIAL TOOL RING



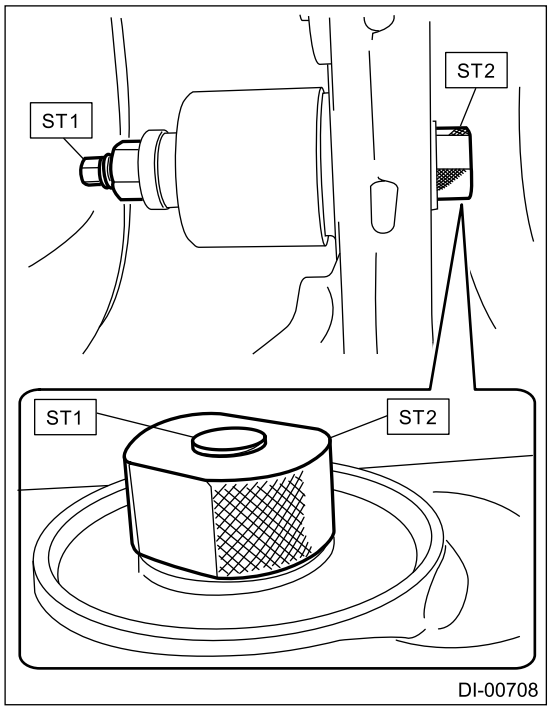
(A) Front side of vehicle

5. Insert the ST set in the step 3) through the rear differential mount bushing hole from the front side of vehicle, and screw-in the ST1 by hand until the front end of ST1 comes out slightly from the rear end of ST2.

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT

ST2: 41399FG061 SPECIAL TOOL RING



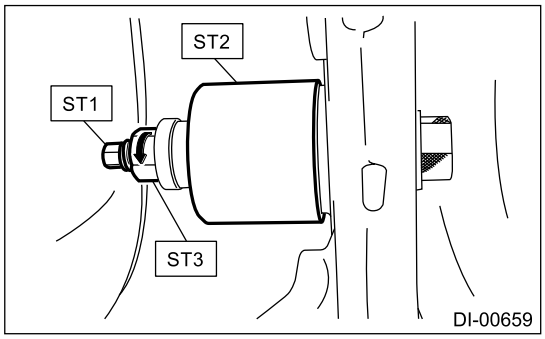
6. Hold the ST1 to prevent it from rotating, and screw-in the ST3 by hand until there is no loose fit on the ST2.

Caution:

When setting the ST to the vehicle, always make sure that the ST2 fits the periphery of the sub frame cylinder and is not tilted.

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT
ST2: 41399FG010 SPECIAL TOOL A
ST3: 41399FG070 SPECIAL TOOL NUT



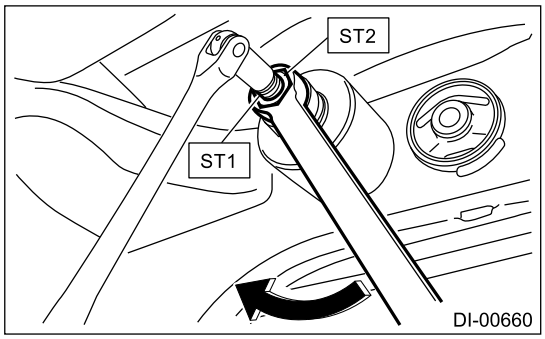
7. Hold the ST1 with a tool to prevent it from rotating, and screw-in the ST2 to remove the rear differential mount bushing.

Caution:

- **Rotation of ST1 will damage the screw at the rear end of rear differential mount bushing. Never rotate the ST1.**
- **If the ST starts to tilt while removing the rear differential mount bushing, stop the work and set the ST again.**

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT
ST2: 41399FG070 SPECIAL TOOL NUT



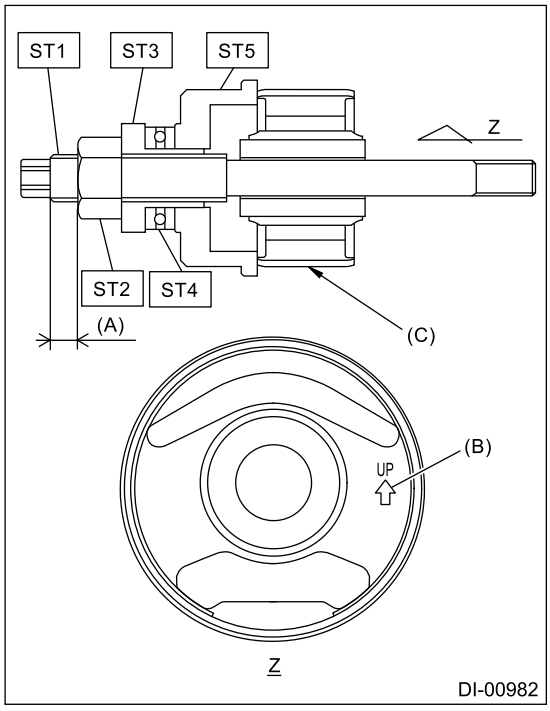
8. Set the ST1, ST2, ST3, ST4, ST5 and rear differential mount bushing as shown in the figure.

Note:

- **Set the ST2 nut near to the end of ST1 screw.**
- **Hold the rear differential mount bushing with the arrow marked side facing toward the rear of the vehicle, and set the ST so that the arrow mark faces upward.**
- **Mark the bottom end of rear differential mount bushing to identify the installing direction.**

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT
ST2: 41399FG070 SPECIAL TOOL NUT
ST3: 41399FG050 SPECIAL TOOL SLEEVE
ST4: 41399FG080 SPECIAL TOOL BEARING
ST5: 41399FG020 SPECIAL TOOL B



(A) 8 mm (0.31 in) or more
(B) Arrow mark
(C) Marked position

9. Attach the ST1 to the ST2, and fit and hold the STs as a unit to the sub frame from the rear side of vehicle.

Special Tool:

ST1: 41399FG061 SPECIAL TOOL RING
ST2: 41399FG041 SPECIAL TOOL D

代替画像1

この画像は代替画像です

10. Insert the ST and rear differential mount bushing, that have been set in step 8), into the sub frame from the front side of vehicle. Then, screw-in the ST1 by hand until the front end of ST1 comes out slightly from the rear end of ST2.

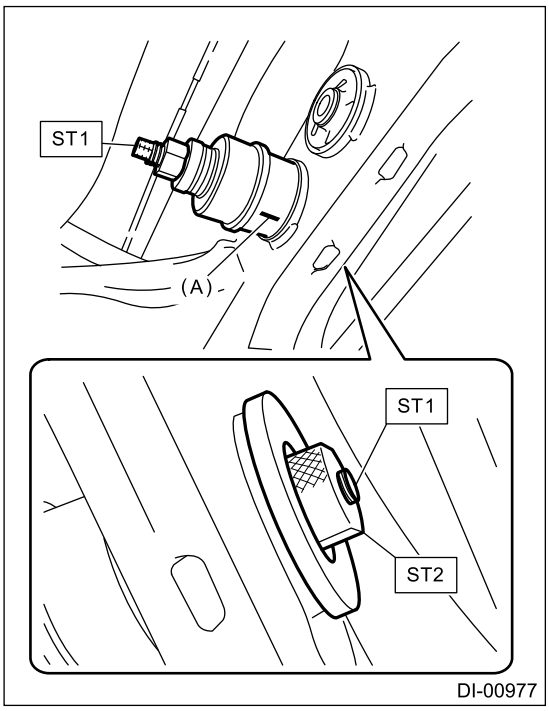
Caution:

Set the rear differential mount bushing with its mark facing the bottom end direction.

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT

ST2: 41399FG061 SPECIAL TOOL RING



(A) Mark

11. Hold the ST1 to prevent it from rotating, and screw-in the ST2 by hand until there is no loose fit on the ST and the rear differential mount bushing.

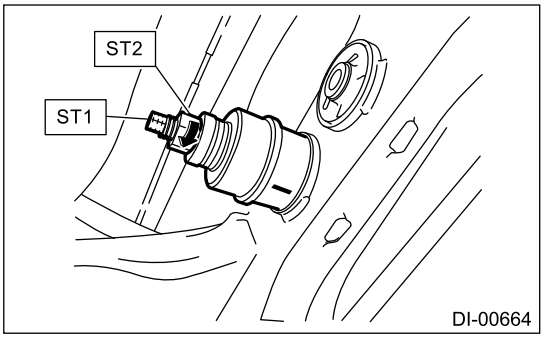
Caution:

Make sure that the ST and rear differential mount bushing are not tilted.

Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT

ST2: 41399FG070 SPECIAL TOOL NUT

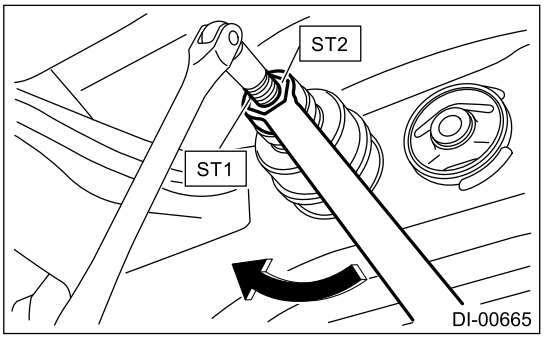


12. Screw-in the ST2 while holding the ST1 with a tool to prevent it from rotating, and press-fit the rear differential mount bushing to the front end of sub frame cylinder.

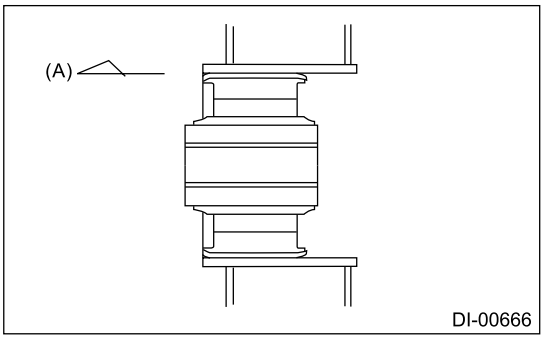
Special Tool:

ST1: 41399FG091 SPECIAL TOOL SHAFT

ST2: 41399FG070 SPECIAL TOOL NUT



13. Make sure that the rear differential mount bushing is inserted to the front end of sub frame cylinder.



(A) Front side of vehicle

14. Install the rear differential.

- T-type:
  Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION.
- VA1-type:
  Ref. to DIFFERENTIALS>Rear Differential (VA-type)>INSTALLATION.

GENERAL DESCRIPTION

Caution:
Be sure to perform rear differential inspection mode.

- Follow the messages displayed on the Subaru Select Monitor when working.
- "Rear differential inspection mode" using the Subaru Select Monitor is available only for the CVT model.
- Perform rear differential inspection mode when the following work has been performed.
  Transmission assembly replacement/Replacement of rear differential/Replacement of front differential hypoid gear set/Replacement of rear differential hypoid gear set

PROCEDURE

Caution:
Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.

1. Shift the select lever to "P" range.
2. Apply the parking brake.
3. Lift up the vehicle.
   Warning:
   Lift up the vehicle until the tire bottom is 30 cm or more above the ground.
4. Connect the Subaru Select Monitor to data link connector.
5. Turn the ignition switch to ON. (For model with push button start, press the push button ignition switch twice without depressing brake pedal.)
6. Select «Diagnosis» in the «Start» screen of Subaru Select Monitor.
7. On «Vehicle selection» display, input the vehicle information and select «Confirmed».
8. On «Main Menu» display, select «Each System».
9. On «Select System» display, select «Transmission Control System».
10. On «Select Function» display, select «Work Support».
11. On «Work Support» display, select «Rear differential inspection mode».
12. Follow the messages displayed on the Subaru Select Monitor screen when working.
13. The results of the rear differential inspection mode are displayed on the Subaru Select Monitor screen.
    - When ended normally:
      «The rear differential has been replaced normally.»
    - When ended abnormally:
      «A rear differential abnormality has been detected. Reinspect the items at the time of rear differential installation.»
    - When interrupted:
      «Inspection is stopped. Restart this inspection mode from the beginning.»
14. After the message «Inspection has been completed. Set the ignition switch to OFF.» appears, the rear differential inspection mode completes.

Note:

- **When the rear differential inspection mode is completed properly, the following warning lights may illuminate. But this is not a malfunction. If warning light illuminates, clear the memory.**
  VDC/ABS, engine, power steering, EyeSight
- **For detailed operation procedures, refer to "Application help".**
- **If the rear differential inspection mode does not end normally, repeat the mode until it ends normally.**
- **When the inspection mode does not end normally, the AWD warning light will start blinking at 2 Hz.**
- **When the rear differential inspection mode ends abnormally, the front differential and rear differential may be different from the specifications for the vehicle.**
- **When the rear differential inspection mode is interrupted, the following reasons are possible.**

Message	Main reasons for abnormal termination	Action to take
• «Inspection is stopped.» • «Inspection is stopped. Restart this inspection mode from the beginning.»	TCM has detected a failure.	Perform the diagnosis for TCM. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.
	VDC has a failure.	Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.
	Brake is applied after start during automatic running.	—
	Too delayed operation to the instructions displayed on the Subaru Select Monitor.	—
«TCM incompatible. Rear differential inspection mode is stopped.»	The model does not support the rear differential inspection mode.	Check the specifications.
«The TCM has detected a fault. Inspect following the manual.»	TCM has detected a failure.	Perform the diagnosis for TCM. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

INSPECTION

Symptom or trouble	Possible cause	Remedy
1. Oil leakage	(1) Worn, scratched, or incorrectly seated front or side oil seal. Scored, battered or excessively worn sliding surface of companion flange.	Repair or replace.
	(2) Clogged or damaged air breather cap.	Clean, repair or replace.
	(3) Loose bolts on the side retainer, or incorrectly fitted O-ring.	Tighten the bolts to specified torque. Replace the O-ring.
	(4) Loose rear cover attachment bolts or damaged gasket.	Replace the gasket, and tighten the bolts to specified torque.
	(5) Loose filler plug or drain plug.	• Apply liquid gasket, and tighten to the specified torque. (T-type) • Replace the gasket, and tighten to the specified torque. (VA1-type)
	(6) Wear, damage or incorrect fitting of drive shaft, side retainer or oil seal.	Repair or replace.
2. Seizure **Note:** **Seized or damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.**	(1) Insufficient backlash for hypoid gear.	Readjust or replace.
	(2) Excessive preload for side, rear or front bearing.	Readjust or replace.
	(3) Insufficient or improper oil used.	Add recommended oil to the specified level.
3. Damage **Note:** **Damaged parts should be replaced, and also other parts should be thoroughly checked for any defect and should be repaired or replaced as required.**	(1) Improper backlash for hypoid gear.	Readjust or replace.
	(2) Insufficient or excessive preload for side, rear or front bearing.	Readjust or replace.
	(3) Excessive backlash for differential gear.	Replace gear or thrust washer.
	(4) Loose bolts and nuts such as hypoid driven gear bolt.	Retighten.
	(5) Damage due to overloading.	Replace.
4. Noises when starting or shifting gears	(1) Improper tooth contact of hypoid driven gear and drive pinion.	Readjust. (Drive pinion adjustment and backlash adjustment)

Symptom or trouble	Possible cause	Remedy
Note: **Noises may be caused by differential assembly, universal joint, wheel bearing, etc. Find out what is actually making noise before disassembling.**	(2) Excessive backlash for hypoid driven gear.	Replace the gear or the pinion height adjusting washer.
	(3) Excessive backlash for side gear.	Replace gear or thrust washer.
	(4) Insufficient preload for front or rear bearing.	Readjust.
	(5) Loose drive pinion nut.	Tighten to the specified torque.
	(6) Loose bolts and nuts such as side retainer attachment bolt.	Tighten to the specified torque.
5. Noises when cornering	(1) Damaged differential gear.	Replace.
	(2) Excessive wear or damage of thrust washer.	Replace.
	(3) Broken pinion mate shaft.	Replace.
	(4) Stuck or damaged side bearing.	Replace.
6. Gear Noise **Note:** **Since noises from engine, muffler, transmission, propeller shaft, wheel bearings, tires, and body are sometimes mistaken for noises from differential assembly, be careful in checking them. Inspection methods to locate noises include coasting, accelerating, cruising, and lifting-up all four wheels. Perform these inspections according to the condition of trouble. When listening to noises, shift the gear into four-wheel drive and fourth speed position, trying to pick up only differential noise.**	(1) Improper tooth contact of hypoid driven gear and drive pinion.	Readjust or replace the hypoid gear set.
	(2) Improper backlash of the hypoid driven gear.	Readjust.
	(3) Scored or chipped teeth of hypoid gear.	Replace hypoid gear set.
	(4) Scuffed hypoid gear.	Replace hypoid gear set.
	(5) Improper preload for front or rear bearings.	Readjust.
	(6) Stuck, scored or chipped teeth of front or rear bearing.	Replace.
	(7) Stuck, scored or chipped teeth of side bearing.	Replace.
	(8) Vibrating differential gear.	Replace the differential gear.

DRIVE SHAFT SYSTEM

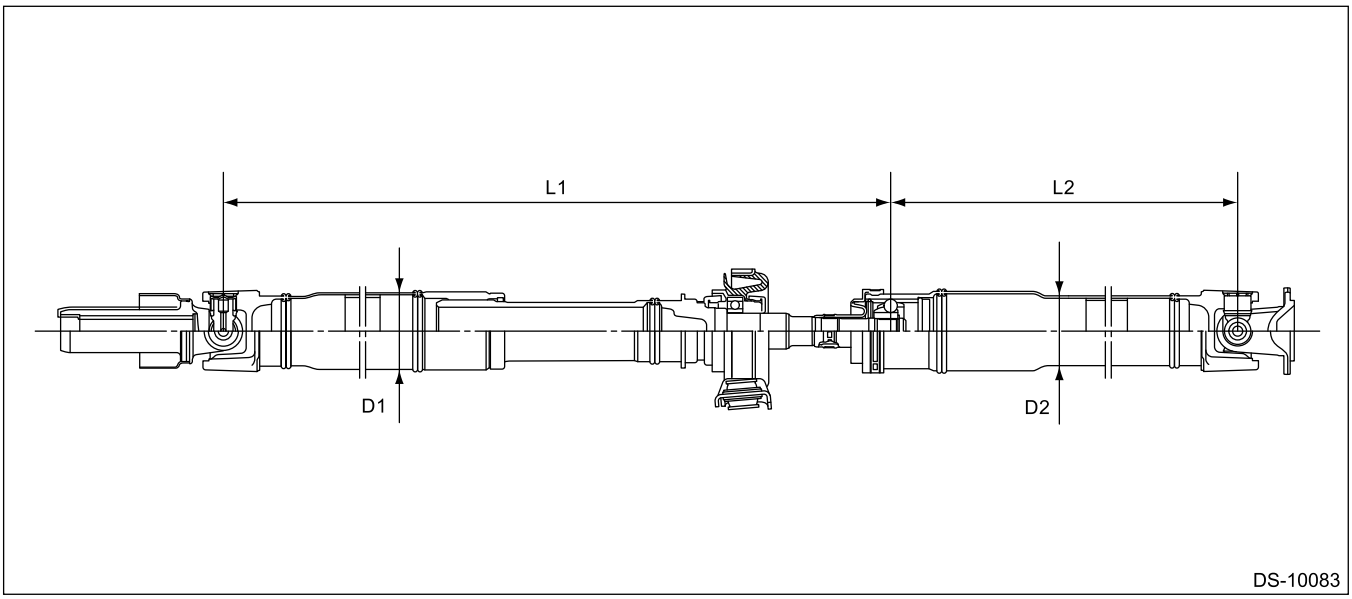
DS

1. General Description
2. Propeller Shaft
3. Front Axle
4. Front Hub Unit Bearing
5. Rear Axle
6. Rear Hub Unit Bearing
7. Front Drive Shaft
8. Rear Drive Shaft
9. General Diagnostic Table

SPECIFICATION

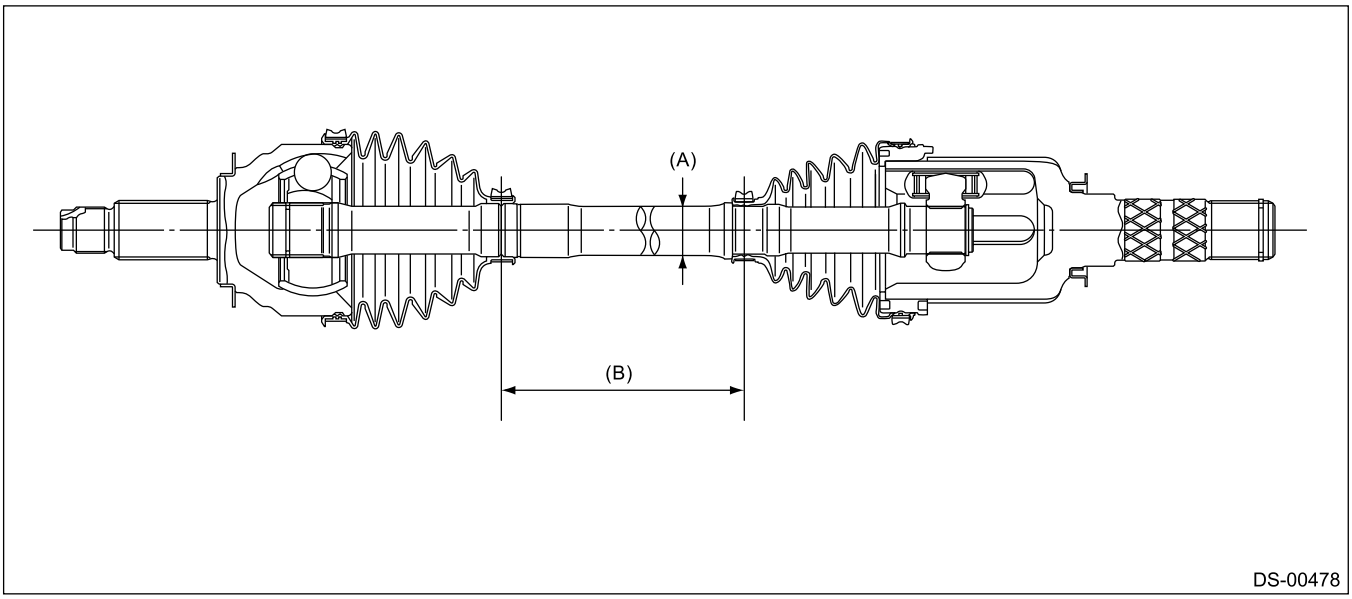
1. PROPELLER SHAFT

Propeller shaft type		EDJ
Front propeller shaft joint-to-joint length: L_1	CVT	675.5 mm (26.59 in)
	MT	735.5 mm (28.96 in)
Rear propeller shaft joint-to-joint length: L_2		747 mm (29.41 in)
Outer diameter of tube:	D_1	63.5 mm (2.50 in)
	D_2	57.5 mm (2.26 in)



2. FRONT DRIVE SHAFT ASSEMBLY

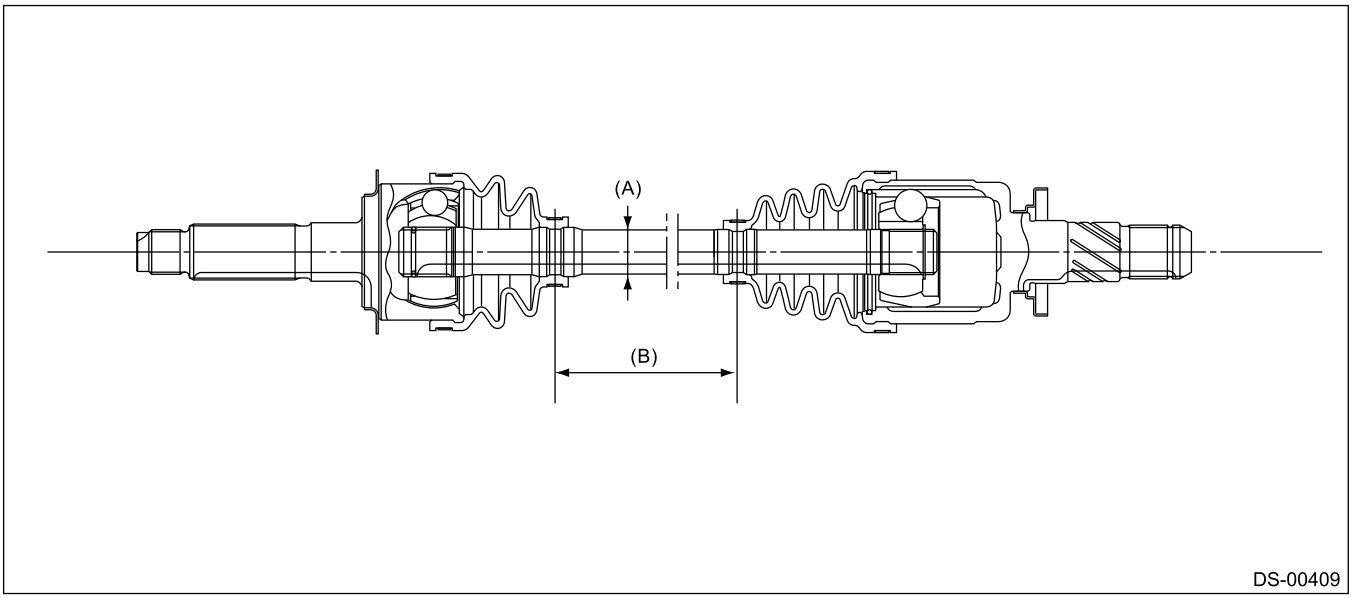
Type of drive shaft	Axle diameter ⌀ mm (in)	Axle length mm (in)
EBJ + PTJ	22 (0.87)	356.7 (14.04)



(A) Axle diameter (B) Axle length

3. REAR DRIVE SHAFT ASSEMBLY

Model	Type of drive shaft	Axle diameter ⌀ mm (in)	Axle length mm (in)
CVT model	EBJ + DOJ	22 (0.87)	410.8 (16.17)
MT model	EBJ + DOJ	22 (0.87)	394.6 (15.53)

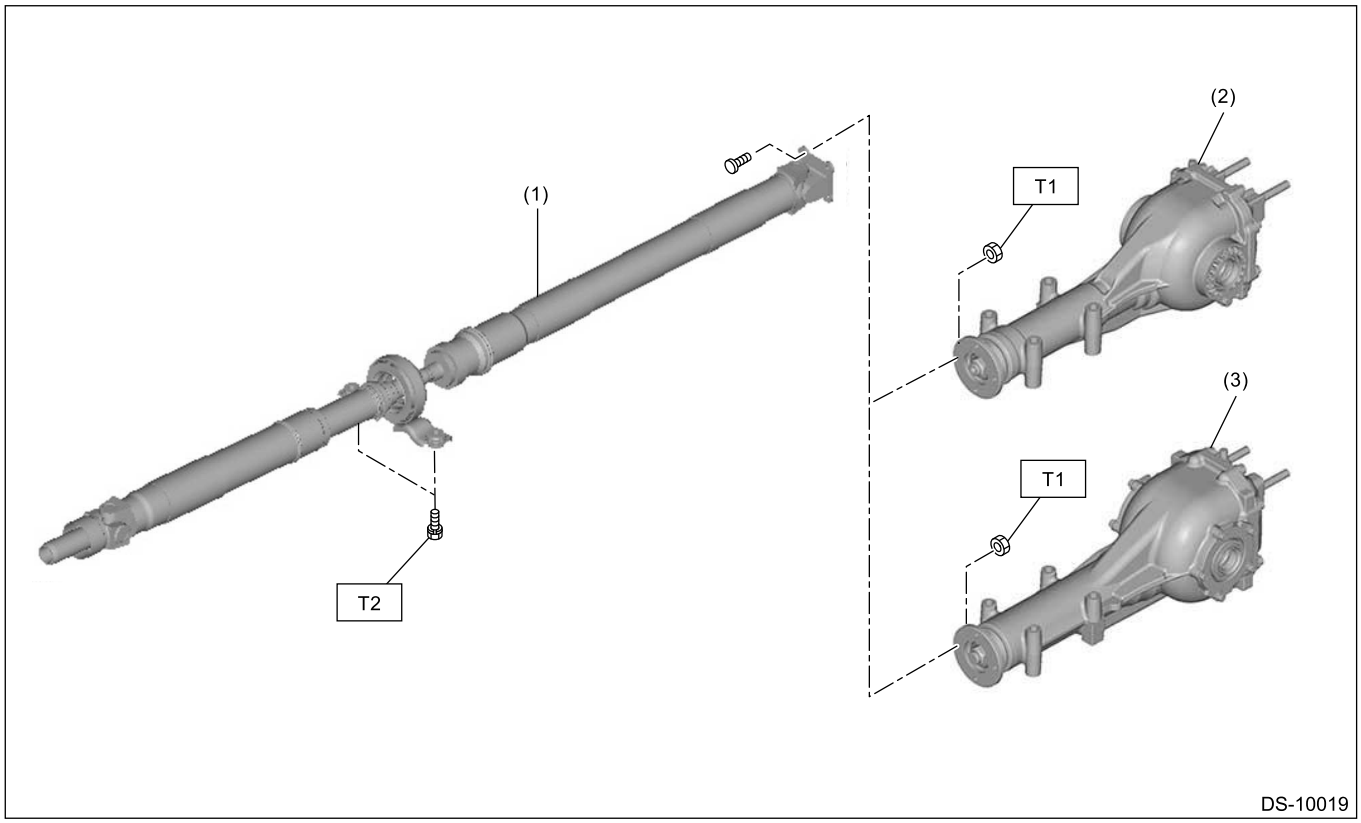


(A) Axle diameter (B) Axle length

DRIVE SHAFT SYSTEM > General Description

COMPONENT

1. PROPELLER SHAFT



(1) Propeller shaft

(2) Rear differential (VA1-type)

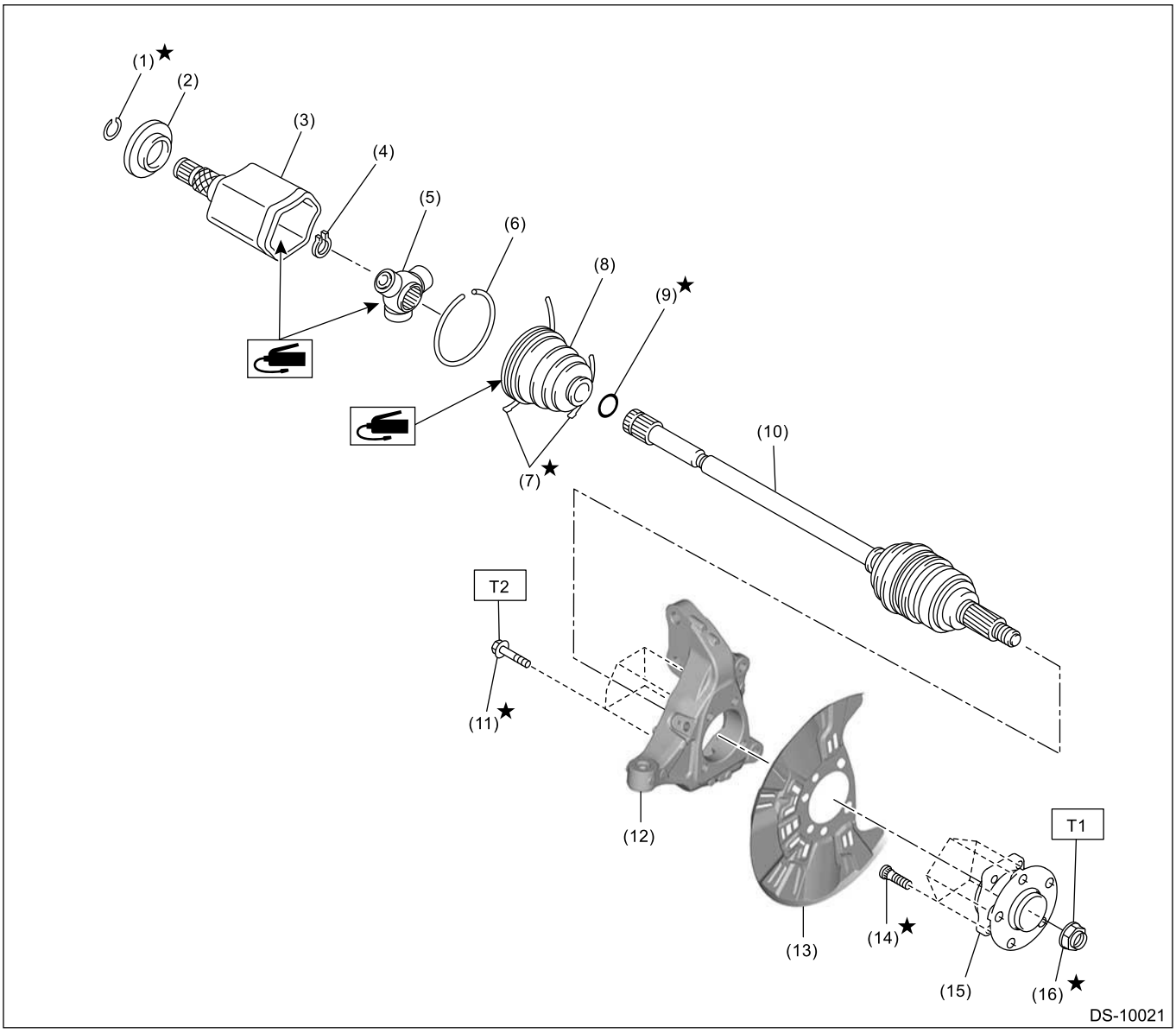
(3) Rear differential (T-type)

Tightening torque: N·m (kgf-m, ft-lb)

T1: 31 (3.2, 22.9)

T2: 52 (5.3, 38.4)

2. FRONT AXLE

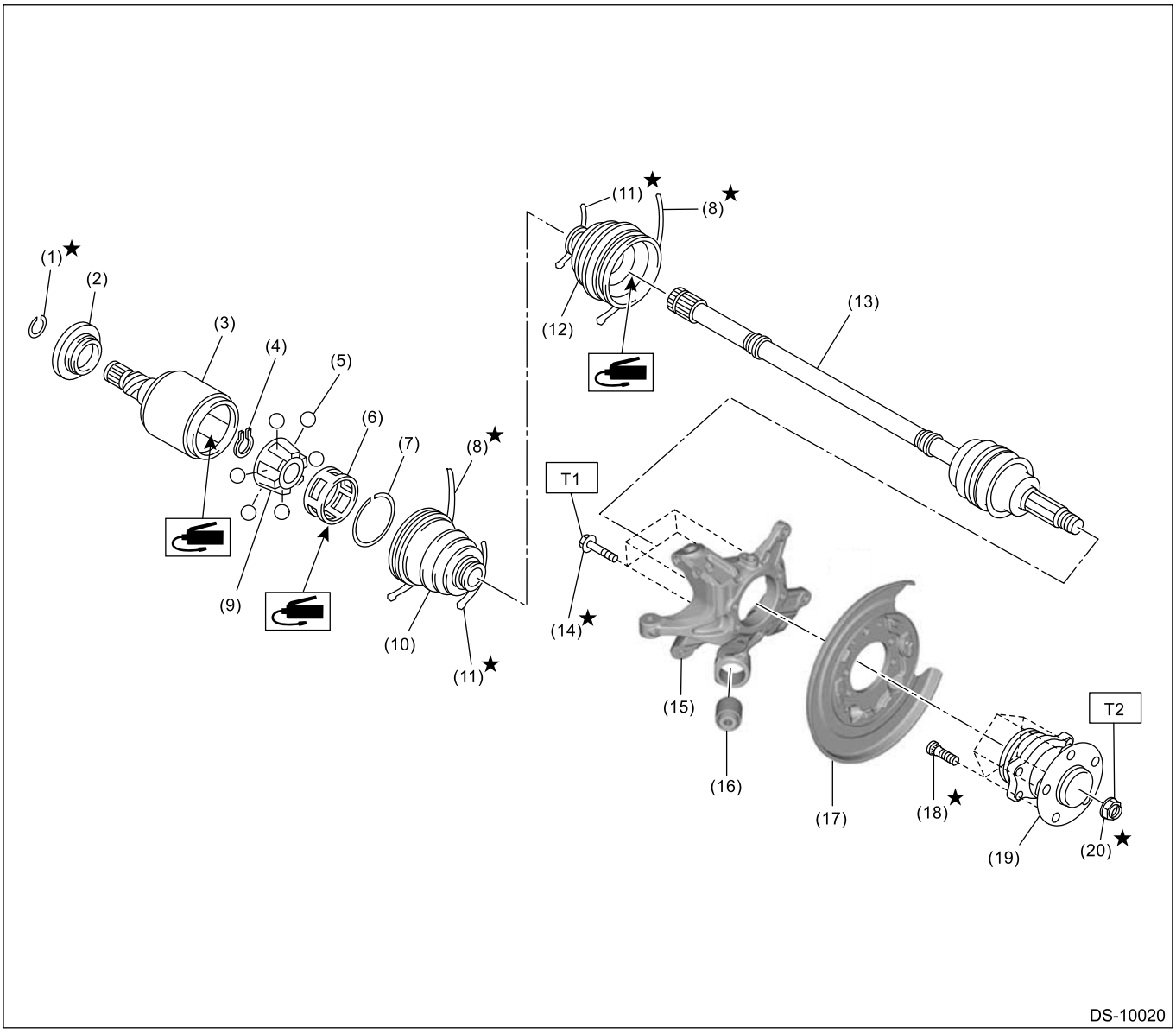


(1) Circlip
(2) Baffle plate
(3) Outer race (PTJ)
(4) Snap ring
(5) Trunnion
(6) Snap ring
(7) Boot band
(8) Boot (PTJ)
(9) O-ring
(10) Shaft ASSY (EBJ)
(11) Bolt
(12) Front axle housing
(13) Front brake back plate
(14) Hub bolt
(15) Front hub unit bearing
(16) Axle nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 220 (22.4, 162.3)
T2: 85 (8.7, 62.7)

3. REAR AXLE



(1) Circlip (CVT model)	(9) Inner race	(17) Rear brake back plate
(2) Baffle plate	(10) Boot (DOJ)	(18) Hub bolt
(3) Outer race (DOJ)	(11) Boot band	(19) Rear hub unit bearing
(4) Snap ring	(12) Boot (EBJ)	(20) Axle nut
(5) Ball	(13) Shaft ASSY (EBJ)	
(6) Cage	(14) Bolt	***Tightening torque: N·m (kgf-m, ft-lb)***
(7) Snap ring	(15) Rear axle housing ASSY	***T1: 65 (6.6, 47.9)***
(8) Boot band	(16) Trailing link bushing	***T2: 240 (24.5, 177)***

DRIVE SHAFT SYSTEM > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.

- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Be sure that the surface of brake disc, brake pad or brake shoe is free from grease or oil.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- When the suspension-related components have been removed, installed or replaced, perform the following adjustment.
  - Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
  - VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

DRIVE SHAFT SYSTEM > General Description

PREPARATION TOOL

1. SPECIAL TOOL

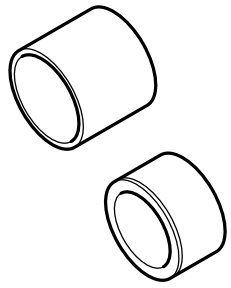
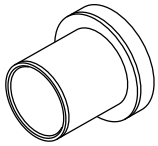
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20099PA010	20099PA010	INSTALLER & REMOVER	• Used for replacing the trailing link bushing of rear axle housing assembly. • Used together with BUSHING REMOVER (20099FG000).
 ST20099FG000	20099FG000	BUSHING REMOVER	• Used for replacing the trailing link bushing of rear axle housing assembly. • Used together with base part of INSTALLER & REMOVER (20099PA010).

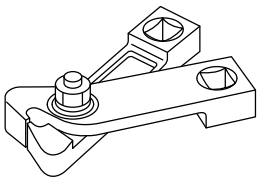
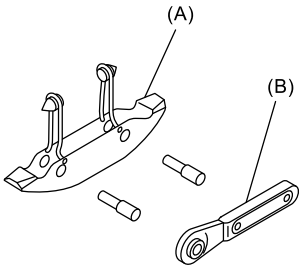
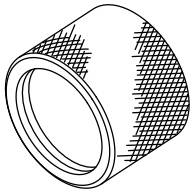
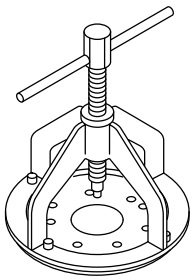
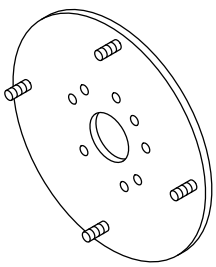
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28099AC000	28099AC000	BOOT BAND PLIER	Used for tightening the boot band. (For front drive shaft)
 ST-925091000	925091000	BAND TIGHTENING TOOL	Used for tightening the boot band. (A) Jig for the band (B) Ratchet wrench
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-926470000	926470000	AXLE SHAFT PULLER	• Used for removing the drive shaft. • Used together with AXLE SHAFT PULLER PLATE (28099PA110).
 ST28099PA110	28099PA110	AXLE SHAFT PULLER PLATE	Exchange with the plate of the AXLE SHAFT PULLER (926470000) to use.

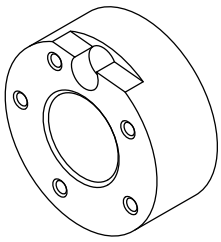
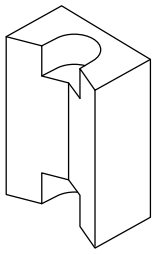
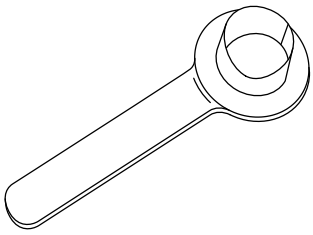
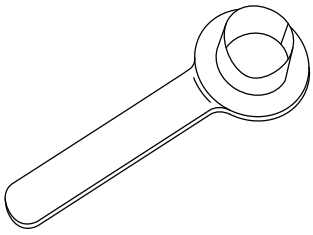
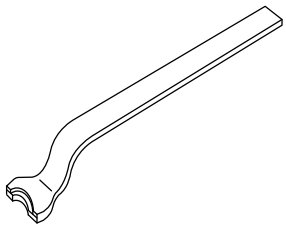
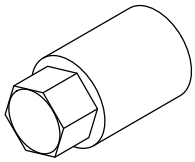
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-927080000	927080000	HUB STAND	Used for assembling hub bolt in hub.
 ST28399AG000	28399AG000	HUB STAND	Used for extracting hub bolt.
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	• Used for installing front drive shaft into front differential. • For protecting the oil seal.
 ST28099PA090	28099PA090	OIL SEAL PROTECTOR	• Used for installing the rear drive shaft to the rear differential. • For protecting the oil seal.
 ST28099PA100	28099PA100	DRIVE SHAFT REMOVER	Used for removing the rear drive shaft from rear differential. (T-type)

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST20399AG000	20399AG000	STRUT MOUNT SOCKET	Used for disassembling and assembling strut mount.

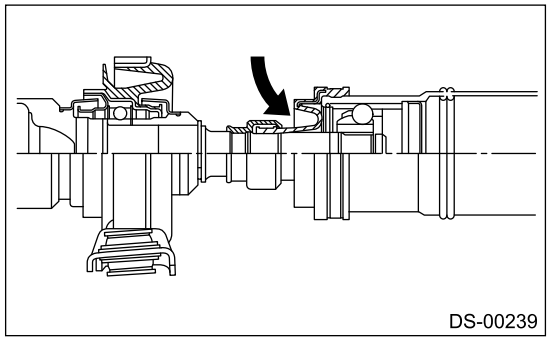
2. GENERAL TOOL

TOOL NAME	REMARKS
Tie-rod ball joint puller	Used for disconnecting joints.
DIAL GAUGE	Used for inspecting the propeller shaft run-out.
Extension cap	Used for preventing leakage of gear oil or CVTF.
Crowbar	Used for extracting drive shaft.
Needle nose pliers	Used for tightening the boot band of the rear drive shaft. • Snap-on 96BCP Or equivalent.

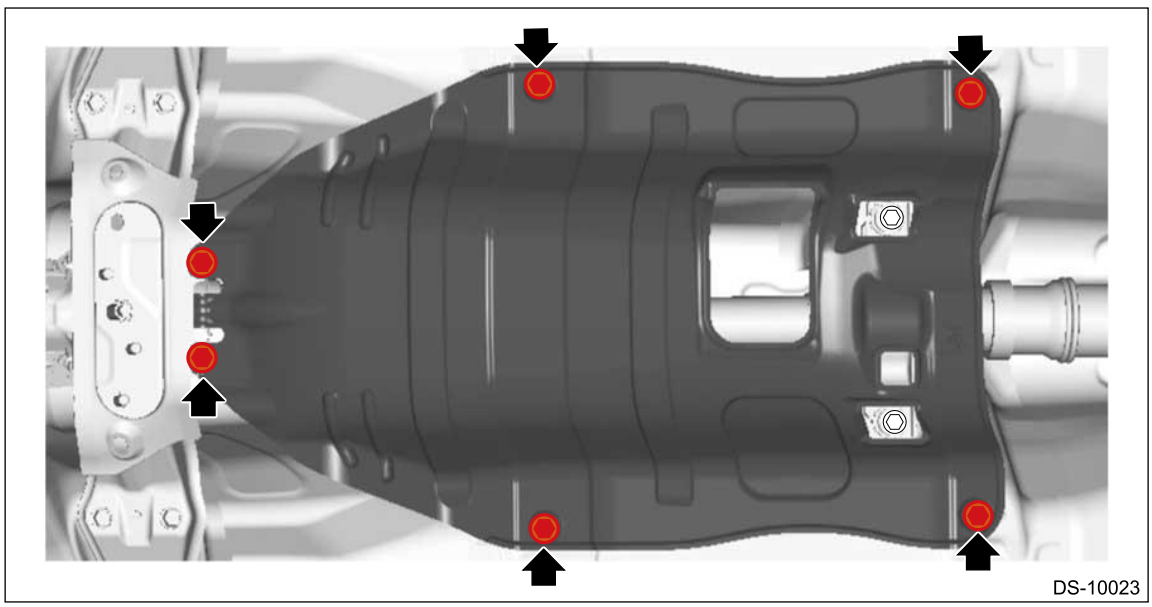
REMOVAL

Caution:

- **Before removing propeller shaft, wrap metal parts with a cloth or rubber material.**
- **Do not disassemble the center EDJ of the propeller shaft.**
- **Before removing propeller shaft, wrap the metal parts attached to the rubber boot of center EDJ with a cloth or rubber material, as shown in the figure. The rubber boot may be damaged due to interference with adjacent metal parts while bending the EDJ during removal.**



1. Shift the select lever or gear shift lever to neutral.
2. Release the parking brake.
3. Lift up the vehicle.
4. Remove the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL. Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.
5. Remove the bolts, and then remove the center exhaust cover.



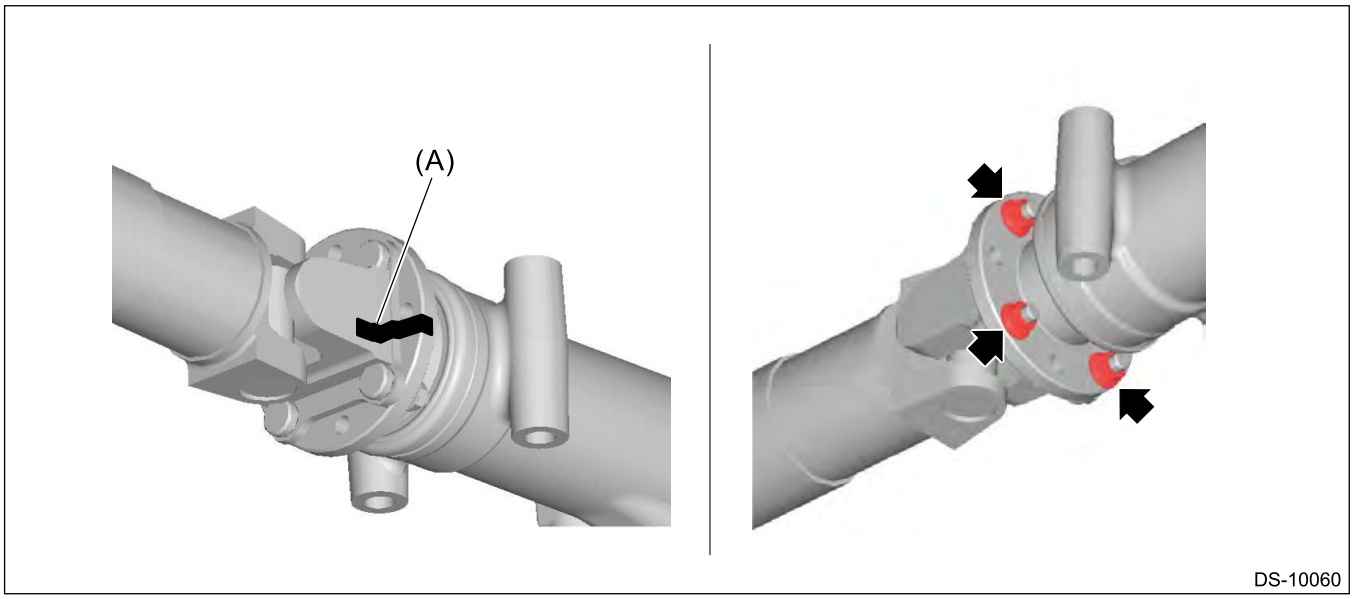
6. Remove the propeller shaft assembly.

   Caution:

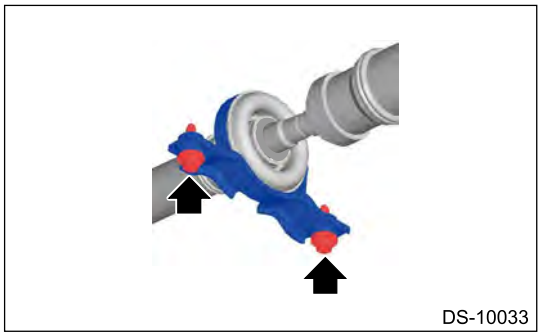
   Do not disassemble the propeller shaft.

   (1) Place alignment marks (A) on the flange yoke and rear differential.

   (2) Remove the four nuts holding the propeller shaft to the rear differential, and remove the four bolts.



(3) Remove the center bearing.



(4) Remove the propeller shaft from transmission.

Caution:

Be careful not to damage oil seals and contact surface of the sleeve yoke.

Note:

- **Use a container to catch CVTF or oil flowing from propeller shaft.**
- **To prevent CVTF from leaking, install extension cap etc. to the transmission.**

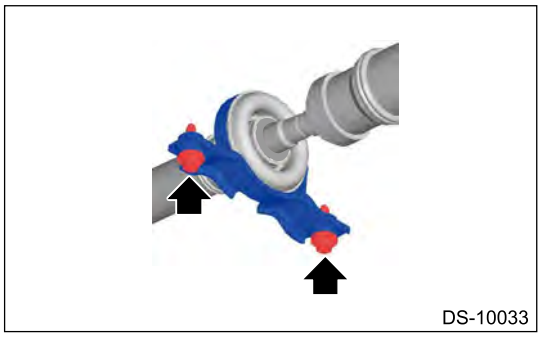
DRIVE SHAFT SYSTEM > Propeller Shaft

INSTALLATION

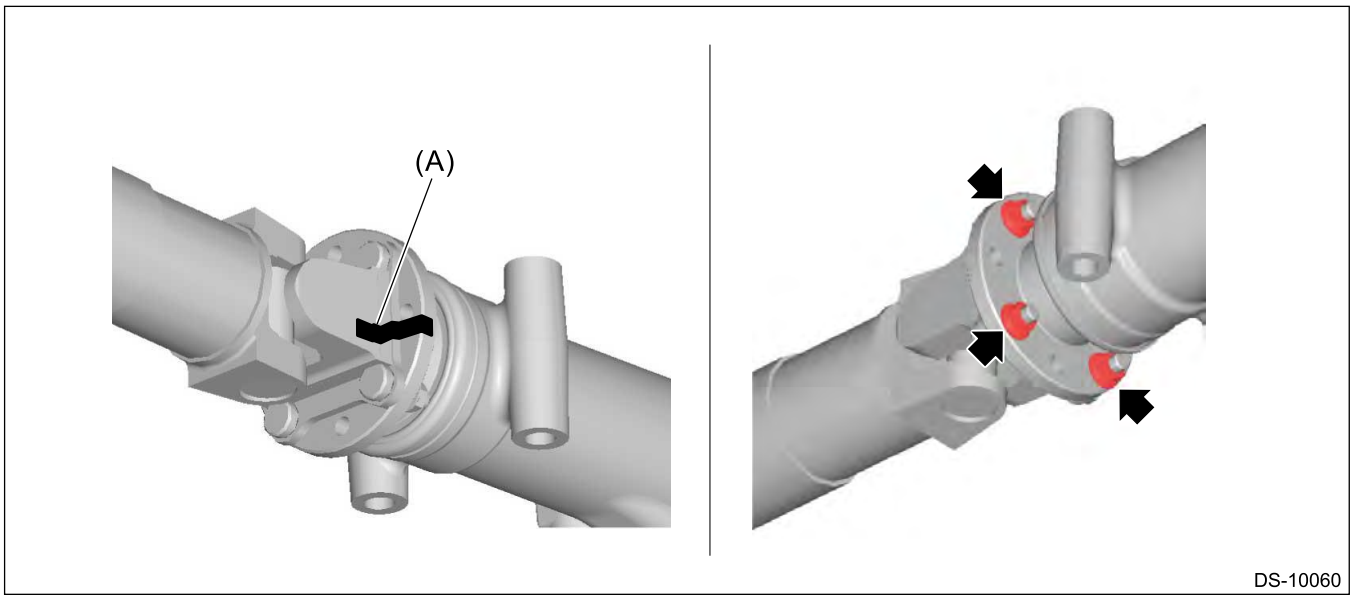
1. Before installation, check the following items, and replace the propeller shaft assembly as necessary.
   - Dents or cracks on the tube surface
   - Splines for deformation or abnormal wear
   - Unsmooth joint operation or abnormal noise
   - Center bearing for looseness, unsmooth operation or noise.
   - Oil seals for abnormal wear or damage
   - Damaged center bearing
2. Apply fluid or gear oil to the oil seal lip and the propeller shaft. Ref. to RECOMMENDED MATERIALS > FLUID.
3. Insert the sleeve yoke into the transmission and attach center bearing to body.

   Tightening torque:

   52 N·m (5.3 kgf-m, 38.4 ft-lb)



4. Align the alignment marks (A), and connect the yoke flange and rear differential.
5. Install the four bolts and nuts.
   Tightening torque:
   31 N·m (3.2 kgf-m, 22.9 ft-lb)



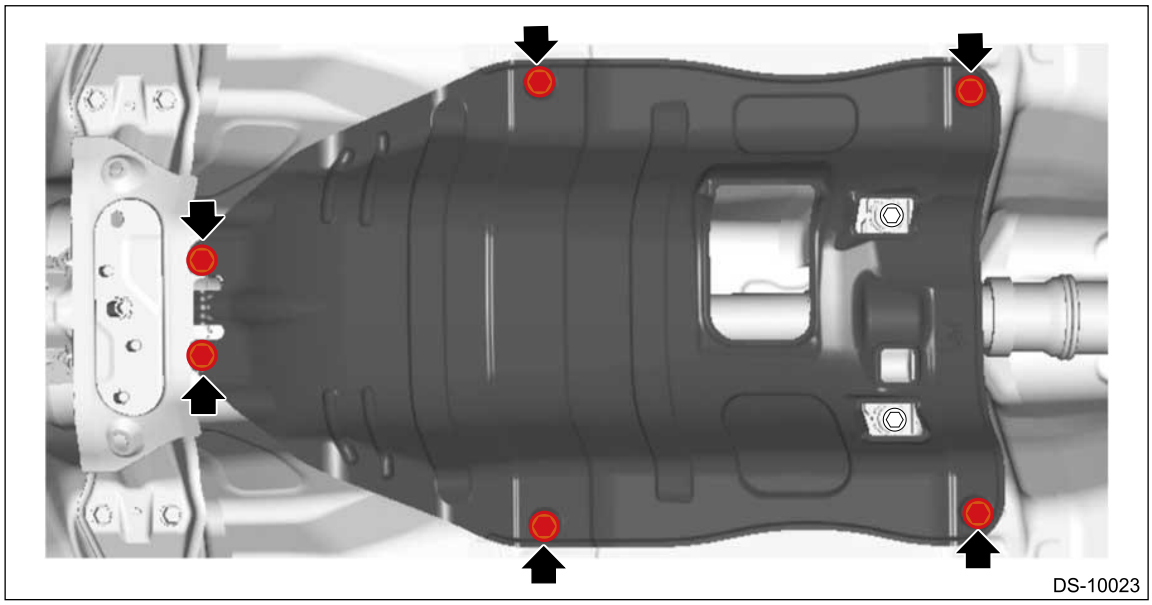
6. Check the propeller shaft with the propeller shaft installed to the vehicle. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSPECTION.
7. Install the center exhaust cover.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
8. Install the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION. Ref. to EXHAUST(H4DO)>Muffler>INSTALLATION.
9. Lower the vehicle.

DRIVE SHAFT SYSTEM > Propeller Shaft

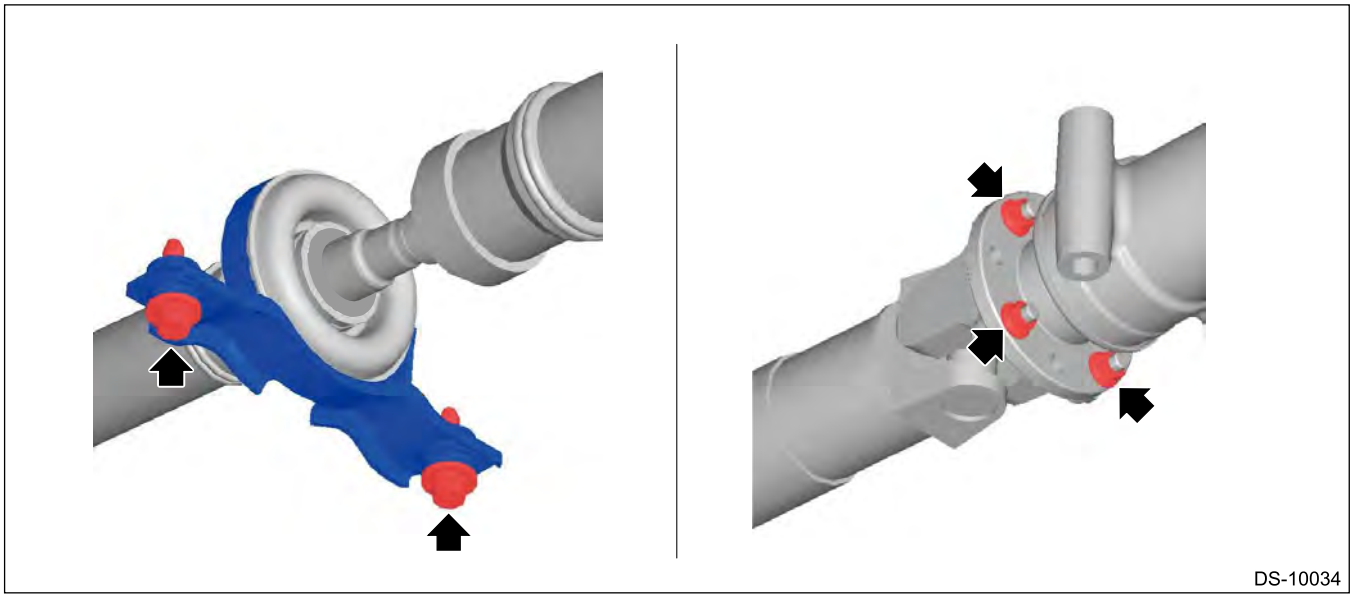
INSPECTION

Check the propeller shaft with the propeller shaft installed to the vehicle.

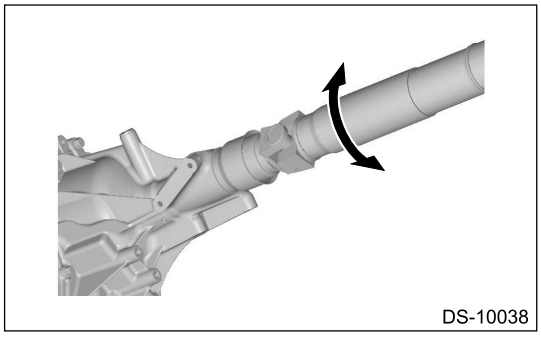
1. Remove the rear exhaust pipe and muffler. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL. Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.
2. Remove the bolts, and then remove the center exhaust cover.



3. Check the propeller shaft mounting bolt for looseness.
(1) Yoke flange mounting bolts and nuts which connect to the rear differential
(2) Center bearing bracket mounting bolts



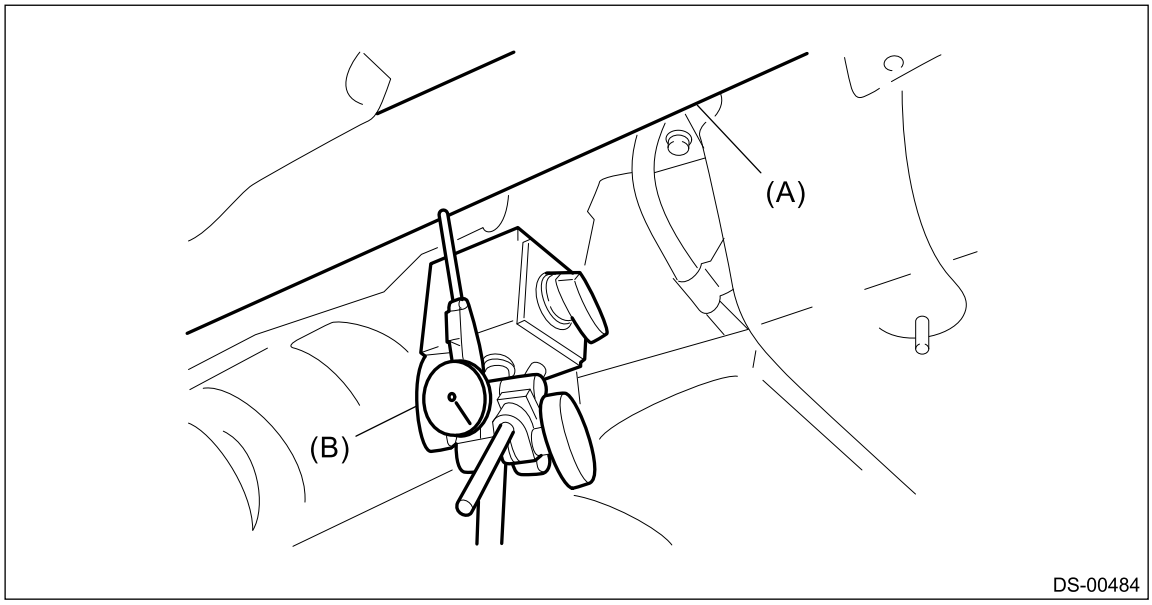
4. Check the spline and bearing for the propeller shaft.
(1) Turn the propeller shaft by hand to check if abnormal looseness exists at splines.
(2) Also move yokes to check if abnormal looseness exists at spiders and bearings.



5. Measure the deflection of the propeller shaft.
(1) Set the dial gauge (B) with its indicator stem at the center of the propeller shaft (A).
(2) Turn the propeller shaft (A) slowly by hands to check for runout of the propeller shaft.

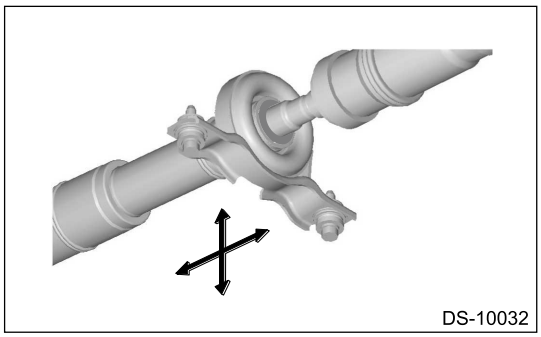
Runout:

Limit: 0.6 mm (0.024 in)



6. Check the center bearing for rattling.

Move the propeller shaft near the center bearing up, down, left, right by hand, to check for any abnormal free play of the bearings.



7. Replace the propeller shaft assembly if faulty is found in the inspection.

REMOVAL

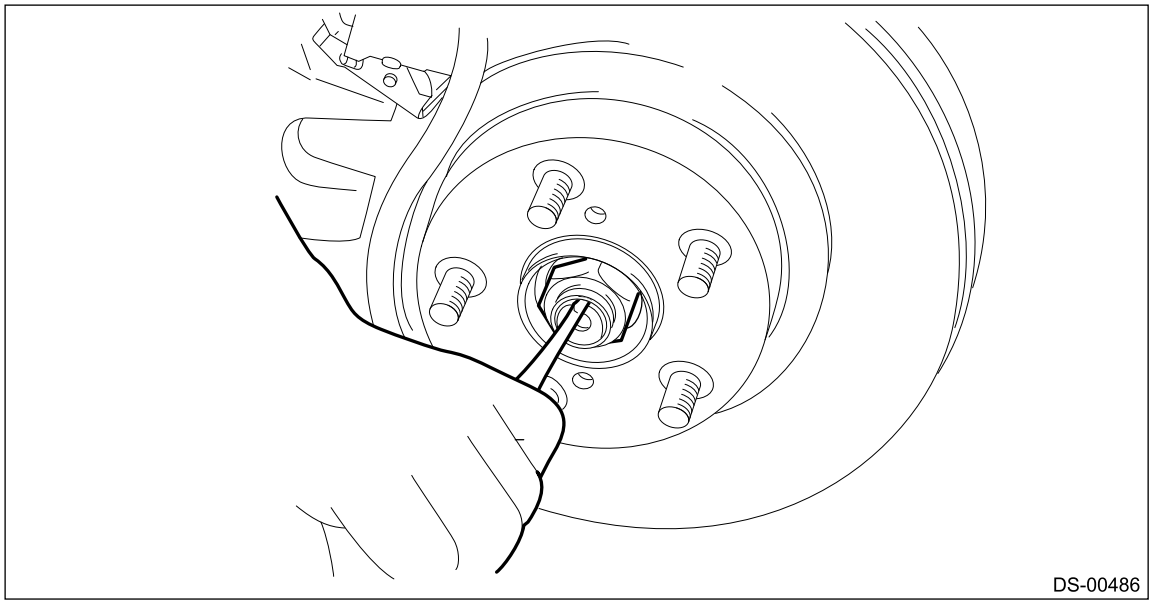
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the front axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

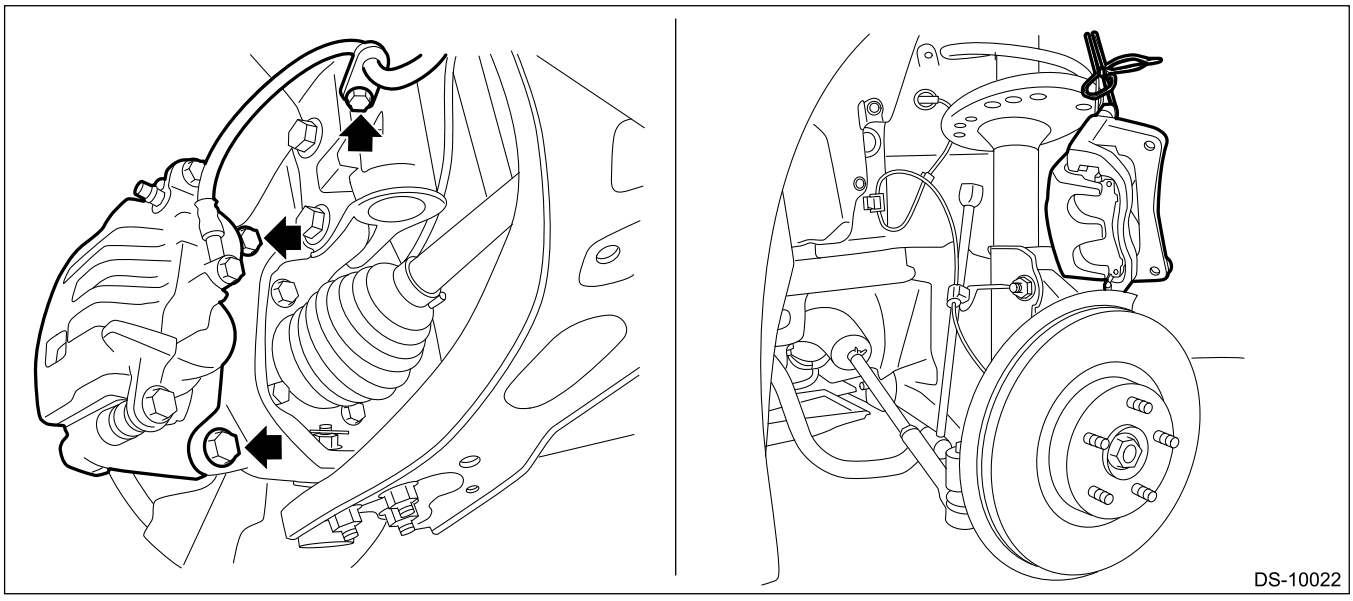
   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.



3. Remove the caliper body assembly from the front axle housing.

   (1) Remove the mounting bolts and the brake hose bracket, and remove the caliper body assembly.

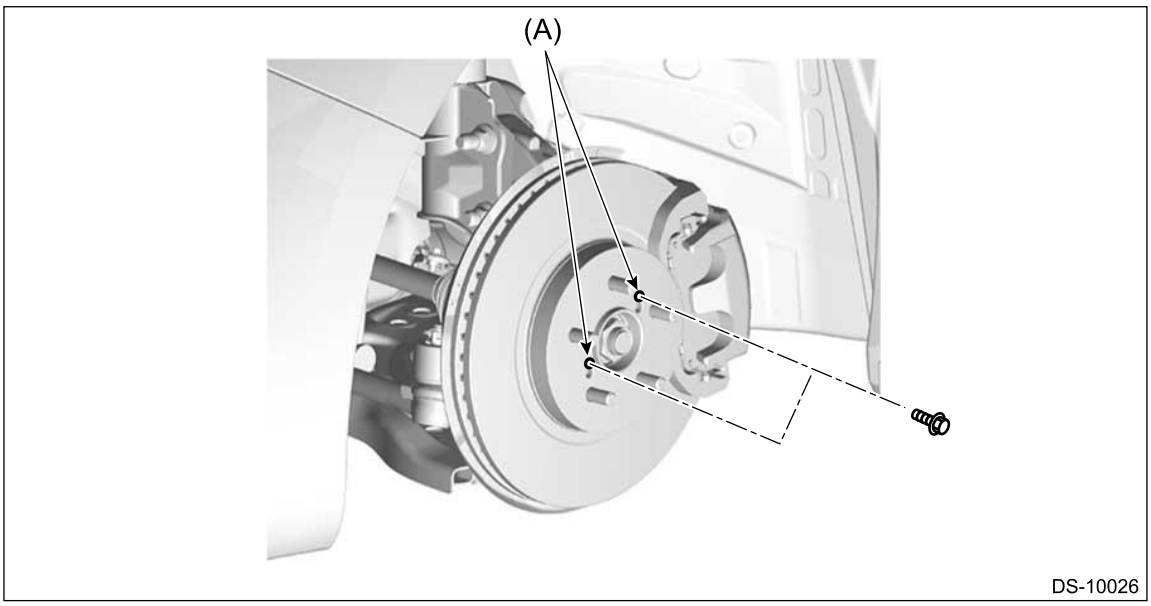
   (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



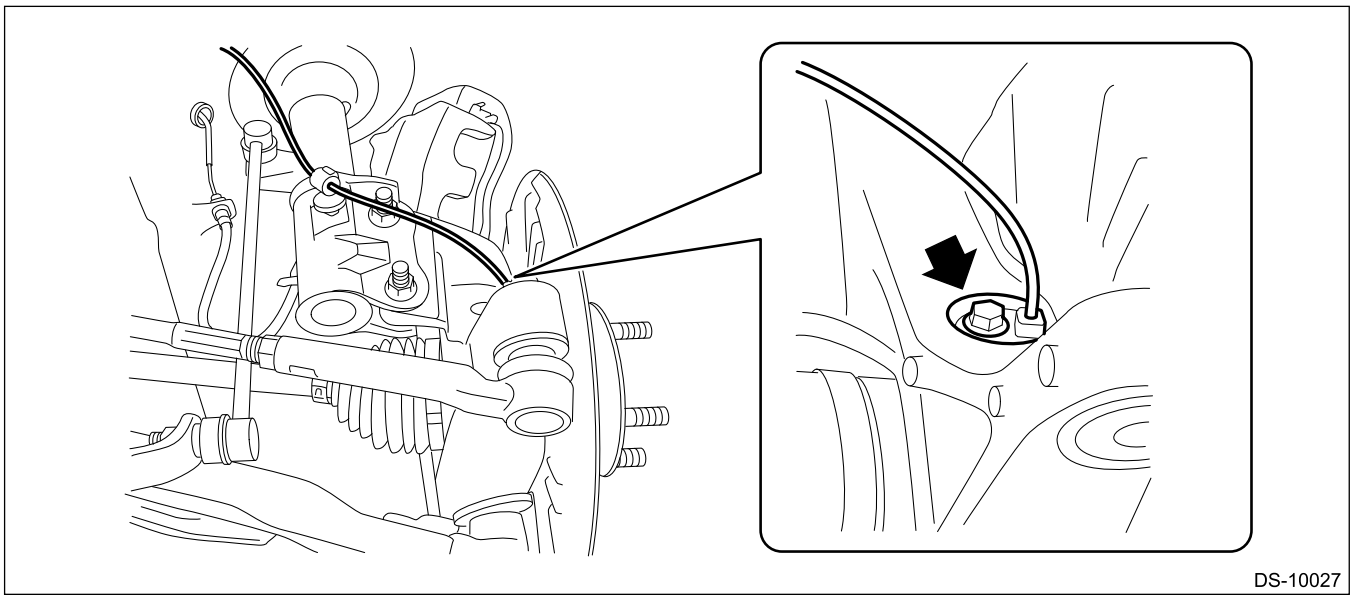
4. Remove the disc rotor.

Note:

When the disc rotor is difficult to be removed from the front hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



5. Remove the bolts, and remove the front ABS wheel speed sensor and clips.



6. Disconnect the tie-rod end.

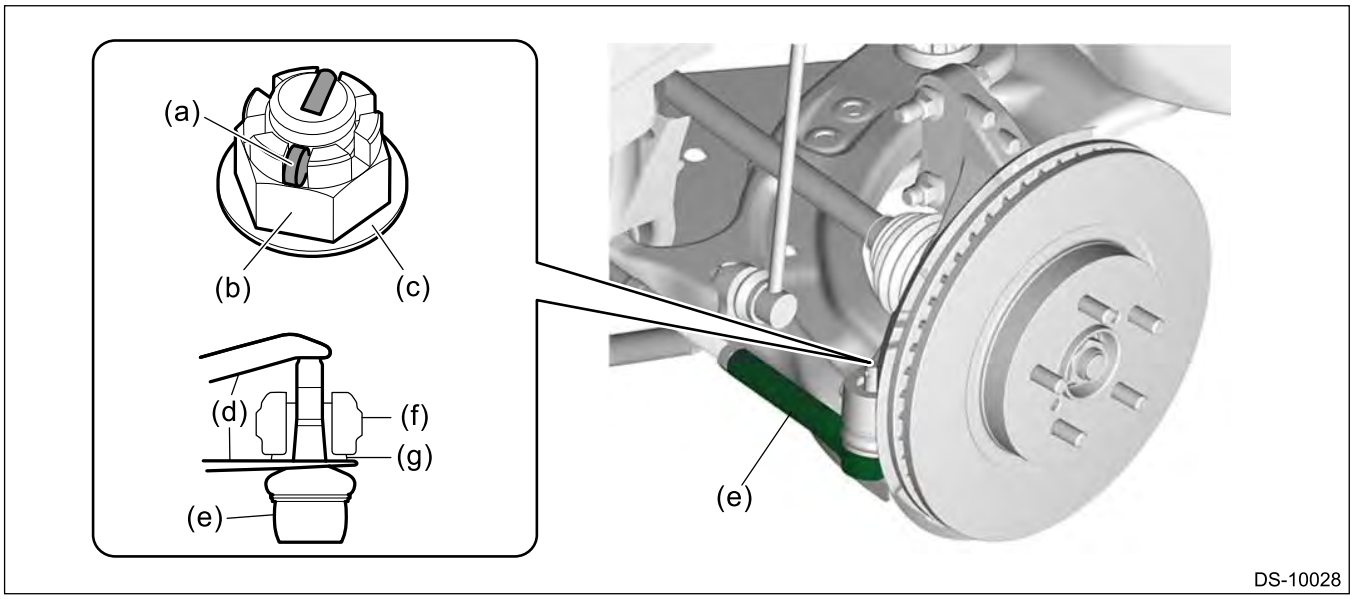
(1) Pull out the cotter pin (a).

(2) Remove the castle nut (b) and washer (c).

(3) Using the tie-rod ball joint puller (d), detach the tie-rod end (e) from the housing (f).

Caution:

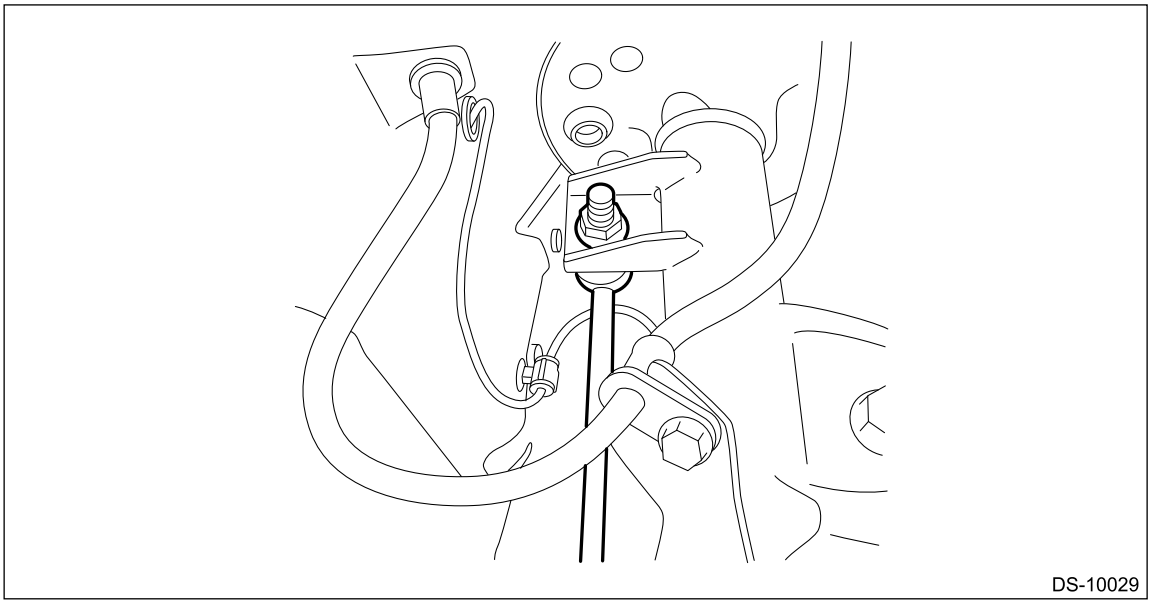
- **Be careful not to damage the boot of the joint.**
- **Securely place the tie-rod ball joint puller (d) on the steel collar (g).**



7. Remove the stabilizer link.

Caution:

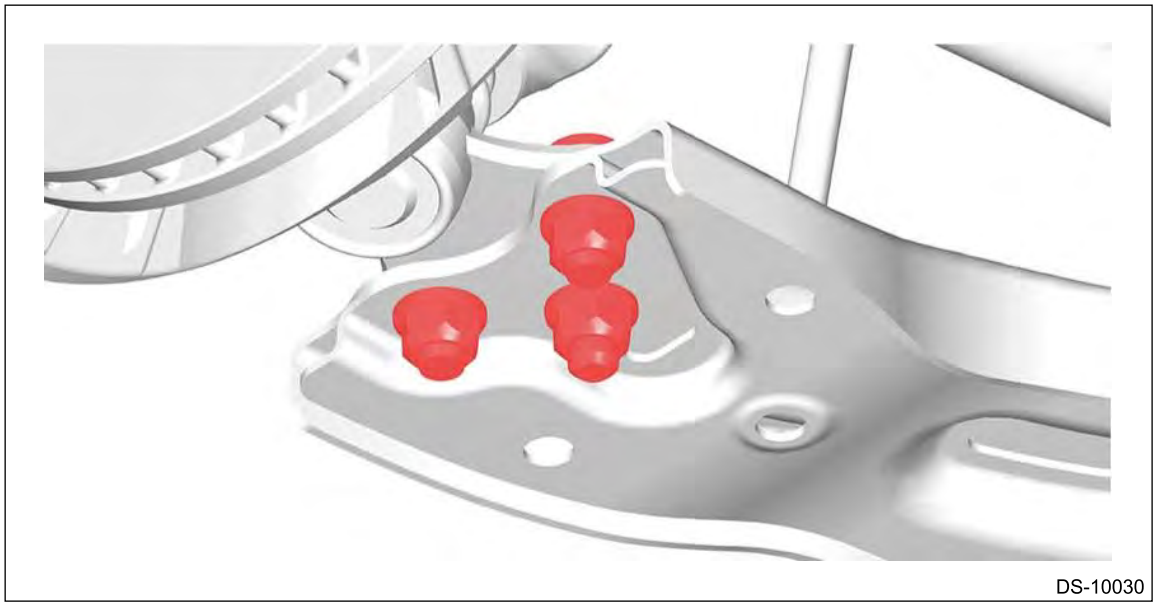
Be careful not to damage the boot of the joint.



8. Remove the three nuts of the ball joint, and disconnect the front lower arm assembly from the front axle housing.

Note:

- **To prevent damage of the front arm ball joint boot, place a wooden block, etc. between front arm and ball joint.**
- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**



9. Remove the front drive shaft assembly from the front hub unit bearing.

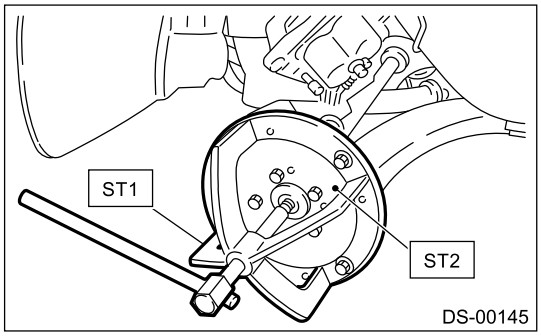
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



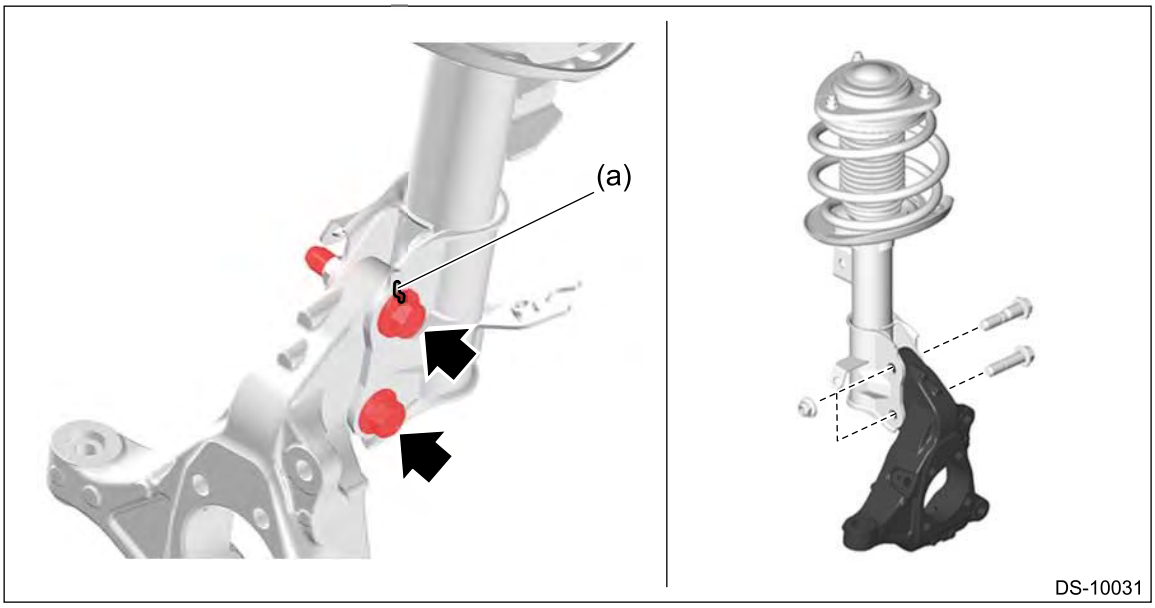
10. Remove the front axle housing.

(1) Place an alignment mark (a) on the adjusting bolt and the strut.

(2) Remove the adjusting bolts and flange bolts for the strut assembly, and then remove the front axle housing.

Caution:

- **While holding the head of the adjusting bolt, loosen the flange nut.**
- **Be careful of the weight of front axle housing.**
- **Be careful not to damage the spline portion of the drive shaft.**



11. Remove the front ball joint from the front axle housing. Ref. to FRONT SUSPENSION>Ball Joint>REMOVAL.
12. Refer to "Front Hub Unit Bearing" for removal of the front hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>REMOVAL.

DRIVE SHAFT SYSTEM > Front Axle

INSTALLATION

1. Install the ball joint to the front axle housing, and insert the snap pin.
   Caution:
   - **Securely install the washer.**
   - **Make sure there is no clearance between steel collar and housing.**
   - **If the steel collar is removed, replace the housing with a new part.**

   Tightening torque:
   51 N·m (5.2 kgf-m, 37.6 ft-lb)
2. Install the front axle housing.
   (1) Install the adjusting bolts and flange bolts.
   Caution:
   (a) Align alignment marks.
   Tightening torque:
   155 N·m (15.3 kgf-m, 110.6 ft-lb)
3. Install the ball joint to the front lower arm.
   Tightening torque:
   100 N·m (10.2 kgf-m, 73.8 ft-lb)
4. Install the front drive shaft assembly.
   Caution:
   - **Use new axle nuts.**
   - **Be careful not to damage the spline portion of the drive shaft.**
   - **Be careful not to damage the magnetic encoder.**

   (1) Insert the drive shaft assembly into the hub spline, and pull it into the specified position.
   (2) Tighten the axle nut temporarily.
5. Install the front ABS wheel speed sensor and clips.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

6. Install the disc rotor.
7. Install the caliper body assembly.

Caution:

Use a new bolt.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

8. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

9. Install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

10. Connect the tie-rod ends.

(1) Connect the tie-rod ends (d) to the front axle housing.

(2) Install the washer (c), and tighten the castle nuts (b) to the specified torque.

Caution:

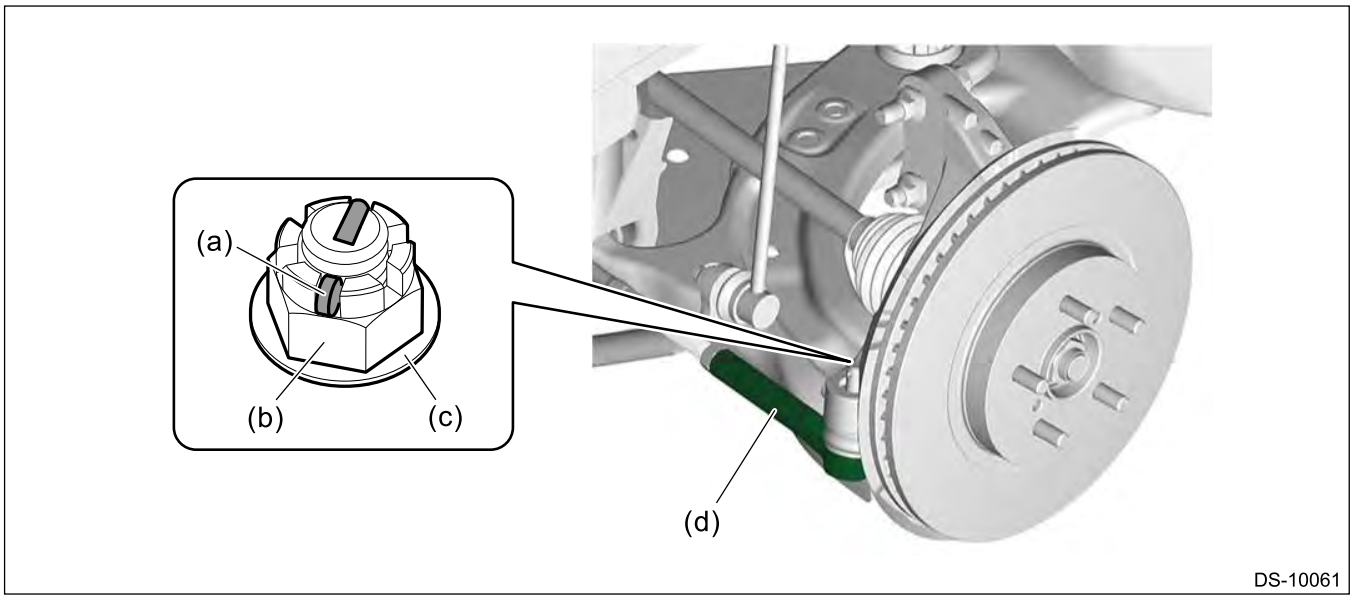
- **Securely install the washer.**
- **Make sure there is no clearance between steel collar and housing.**
- **If the steel collar is removed, replace the housing with a new part.**
- **When connecting the tie-rod, do not hit the cap at bottom of tie-rod end with a hammer.**

Tightening torque:

27 N·m (2.8 kgf-m, 19.9 ft-lb)

(3) Tighten the castle nut (b) within the range of 60° so that the cotter pin (a) mounting hole and cutout portion of the castle nut (b) are aligned.

(4) Insert the cotter pin (a), and bend the tip of the pin to fix it.



11. While depressing the brake pedal, tighten a new axle nut to the specified torque and lock it securely.

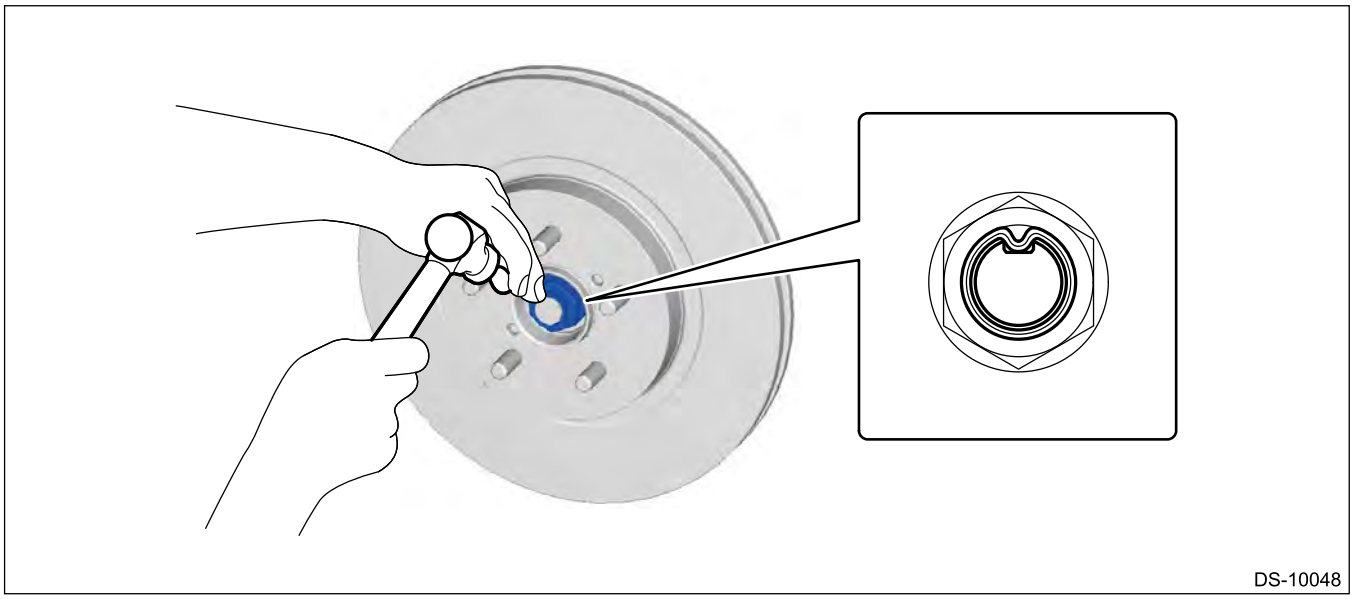
Caution:

Do not load the front axle before tightening the axle nut. Doing so may damage the hub unit bearing.

Tightening torque:

220 N·m (22.4 kgf-m, 162.3 ft-lb)

12. After tightening the axle nut, lock it securely.

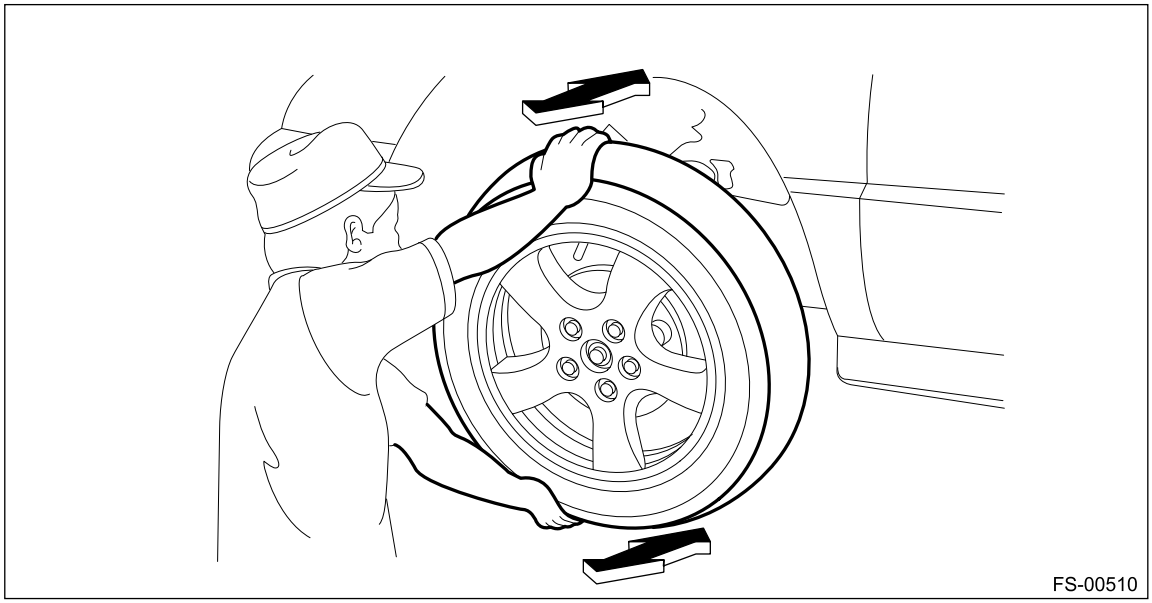


13. Install the front wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the front hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.



3. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal depressed.
   - **Looseness exists** → Replace the ball joint assembly. Ref. to FRONT SUSPENSION>Ball Joint>REMOVAL.

14. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

Caution:

When the wheel alignment has been adjusted, perform the following adjustment.

- **Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.**
- **VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

15. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

REMOVAL

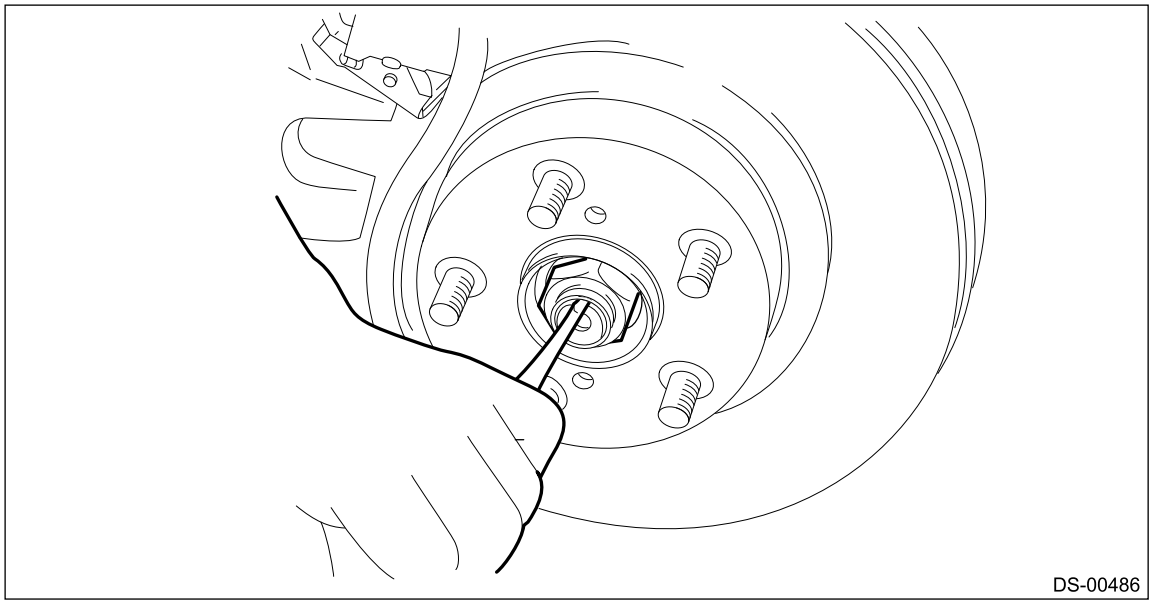
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the front axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

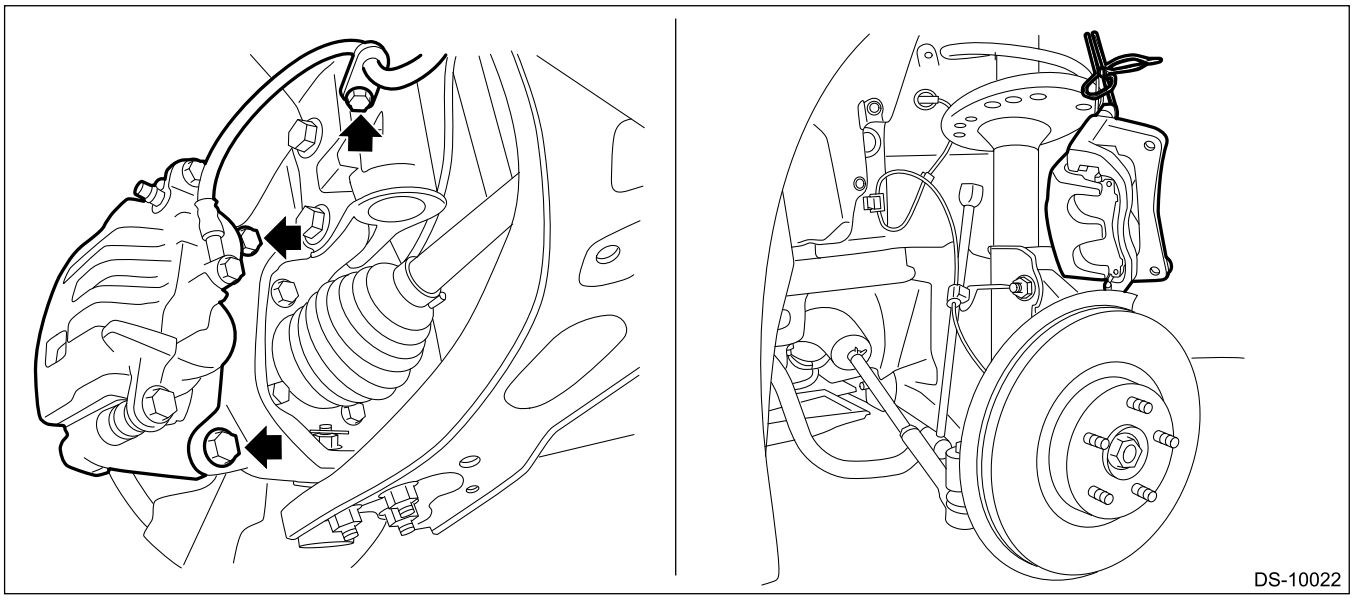
   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.



3. Remove the caliper body assembly from the front axle housing.

   (1) Remove the mounting bolts and the brake hose bracket, and remove the caliper body assembly.

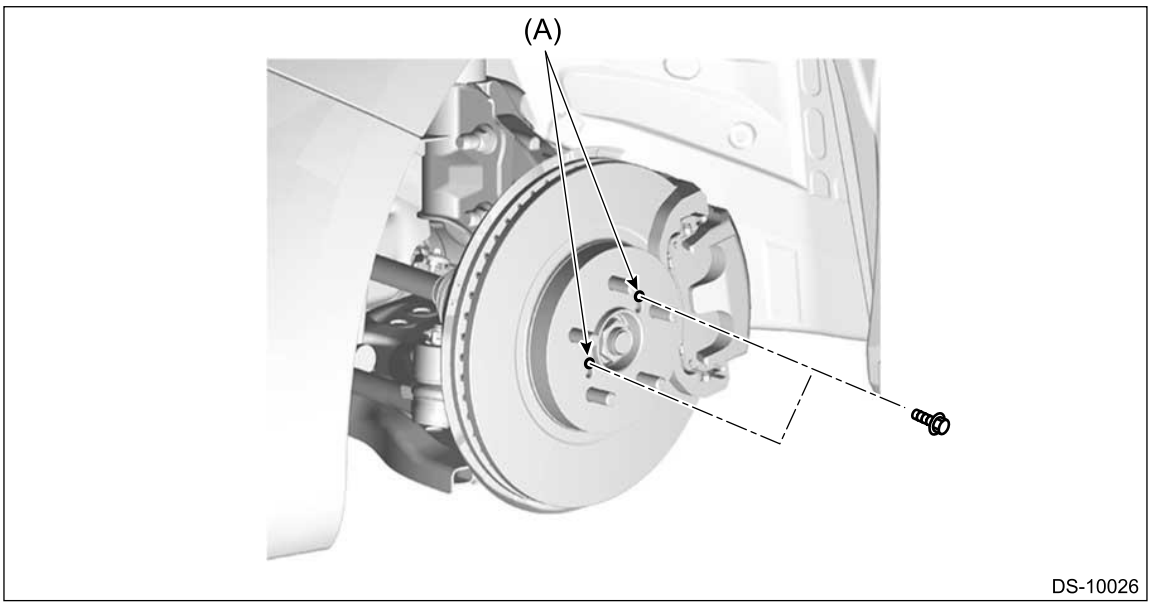
   (2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the strut assembly.



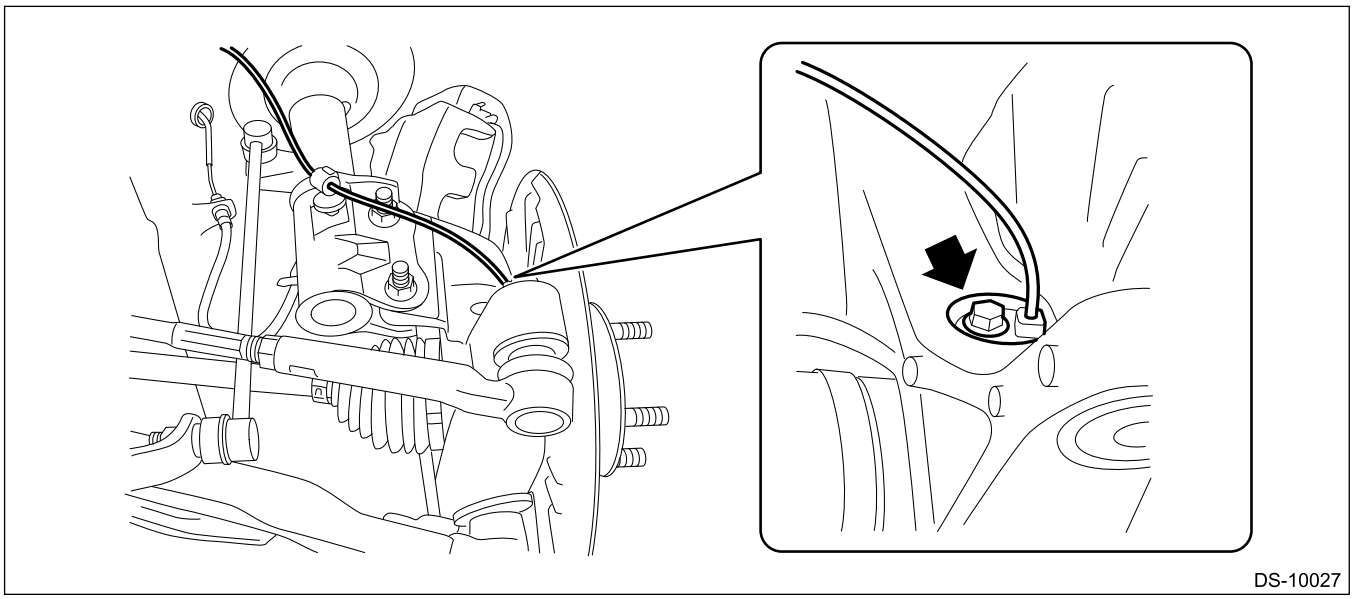
4. Remove the disc rotor.

Note:

When the disc rotor is difficult to be removed from the front hub unit bearing, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



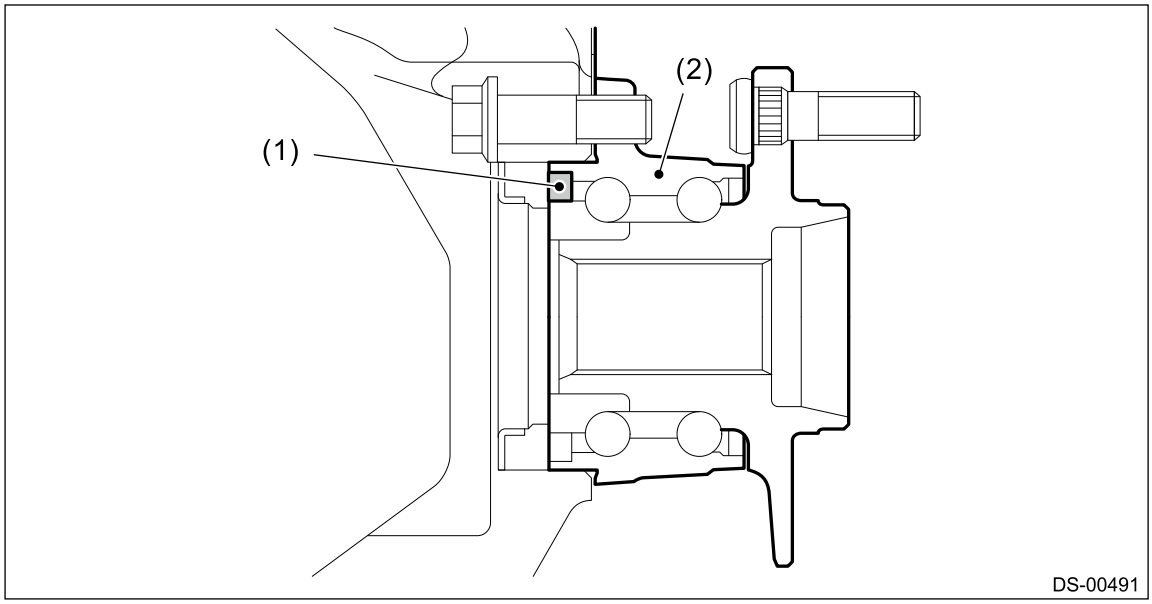
5. Remove the bolts, and remove the front ABS wheel speed sensor and clips.



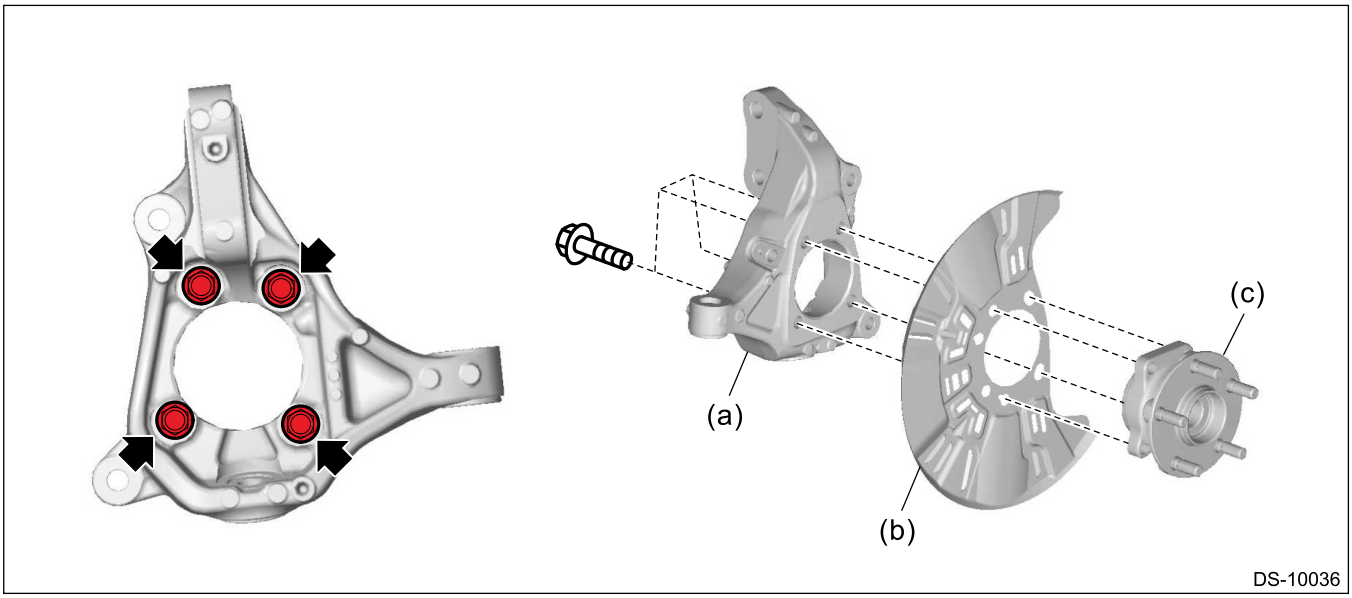
6. Remove the bolt from the front axle housing, and remove the front hub unit bearing.

Caution:

- **Do not get closer the tool which charged magnetism to magnetic encoder.**
- **Be careful not to damage the magnetic encoder.**



(1) Magnetic encoder (2) Front hub unit bearing



(a) Front axle housing (b) Front brake back plate (c) Front hub unit bearing

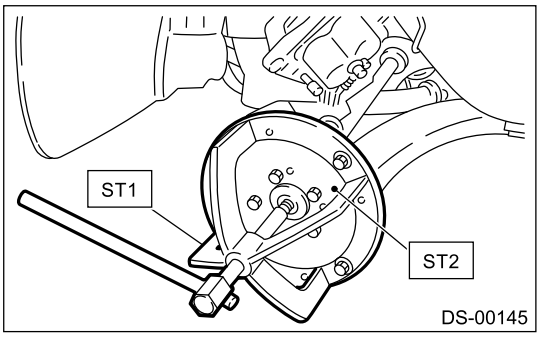
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)

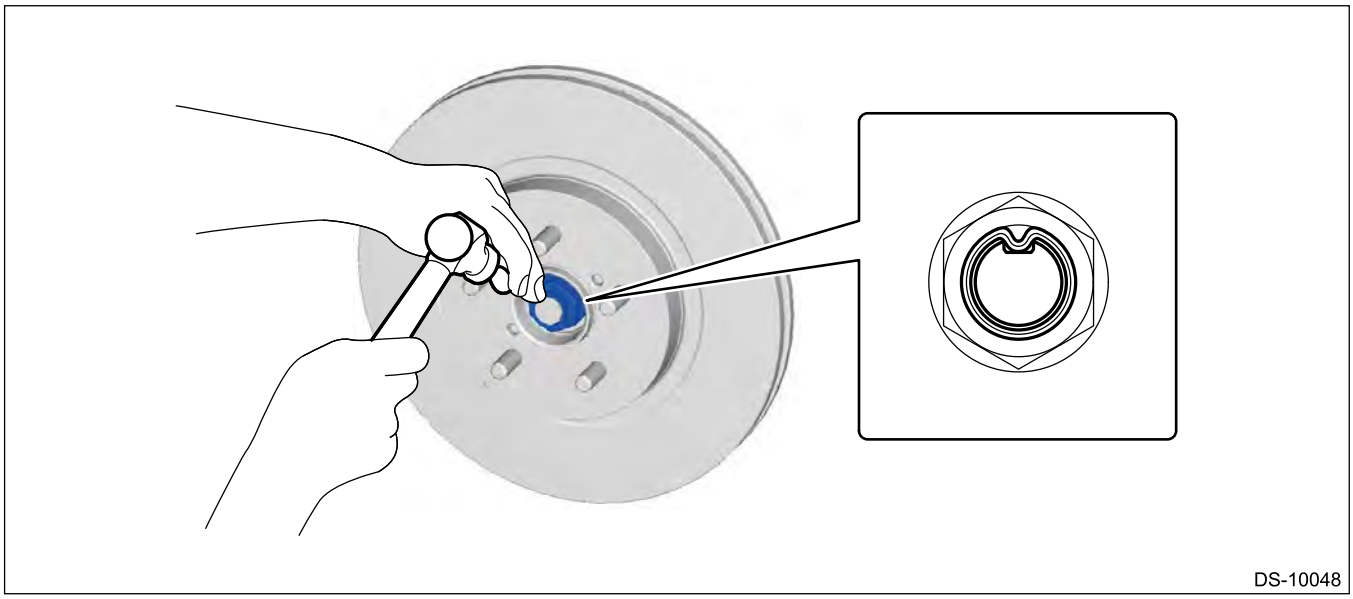


INSTALLATION

1. Place the front brake back plate between the front axle housing and the front hub unit bearing, and tighten the bolt.
   Caution:
   - **Do not get closer the tool which charged magnetism to magnetic encoder.**
   - **Be careful not to damage the magnetic encoder.**
   - **Use a new bolt.**

   Tightening torque:
   85 N·m (8.67 kgf-m, 62.7 ft-lb)
2. Install the front drive shaft assembly.
   Caution:
   - **Use new axle nuts.**
   - **Be careful not to damage the spline portion of the drive shaft.**
   - **Be careful not to damage the magnetic encoder.**

   (1) Insert the drive shaft assembly into the hub spline, and pull it into the specified position.
   (2) Tighten the axle nut temporarily.
3. Install the front ABS wheel speed sensor and clips.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the disc rotor.
5. Install the caliper body assembly.
   Caution:
   Use a new bolt.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
6. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
7. While depressing the brake pedal, tighten a new axle nut to the specified torque and lock it securely.
   Caution:
   Do not load the front axle before tightening the axle nut. Doing so may damage the hub unit bearing.
   Tightening torque:
   220 N·m (22.4 kgf-m, 162.3 ft-lb)
8. After tightening the axle nut, lock it securely.

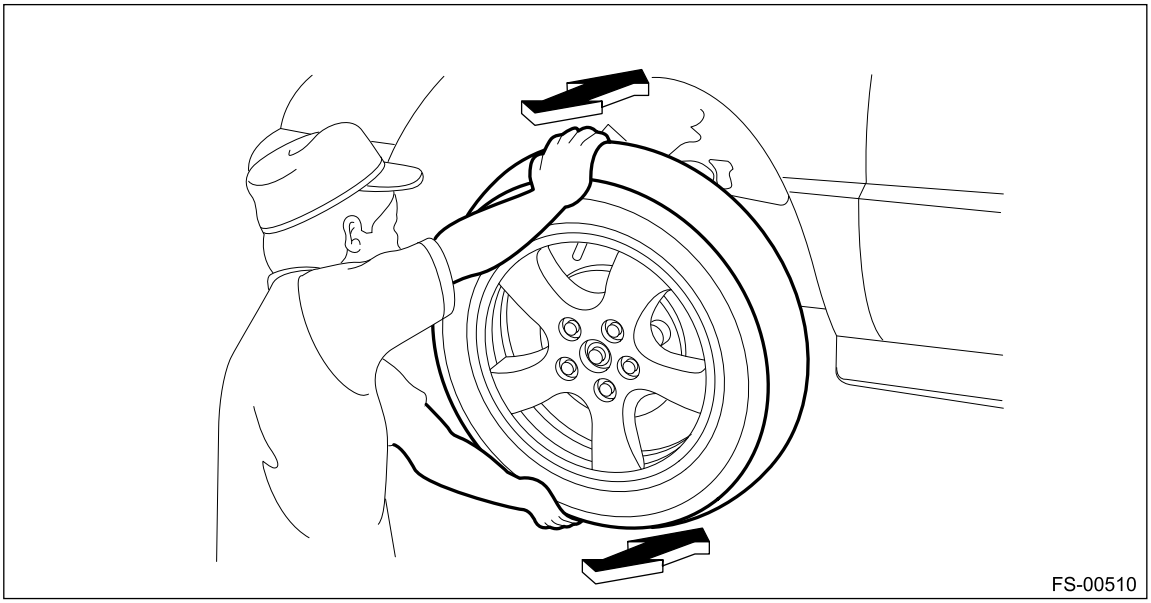


9. Install the front wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the front hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.



3. Check that there is no looseness by moving the upper and lower portions of front tire in an axial direction with the brake pedal depressed.
   - **Looseness exists** → Replace the ball joint assembly. Ref. to FRONT SUSPENSION>Ball Joint>REMOVAL.

DRIVE SHAFT SYSTEM > Front Hub Unit Bearing

DISASSEMBLY

Using the ST or a hydraulic press, push out the hub bolt (b) from the front hub unit bearing (a).

Caution:

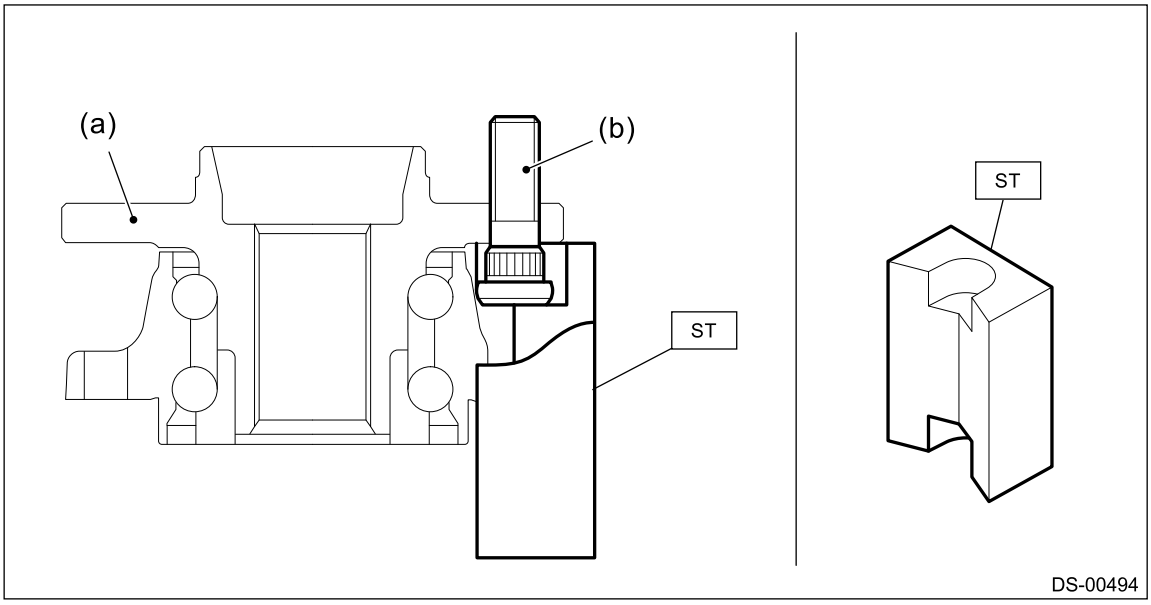
- **Be careful not to hammer the hub bolts. This may deform the hub unit bearing.**
- **Do not reuse the hub bolt.**

Note:

Since the hub unit bearing can not be disassembled, only hub bolts can be removed.

Preparation tool:

ST: HUB STAND (28399AG000)



DRIVE SHAFT SYSTEM > Front Hub Unit Bearing

ASSEMBLY

1. Install the front hub unit bearing to the ST securely.

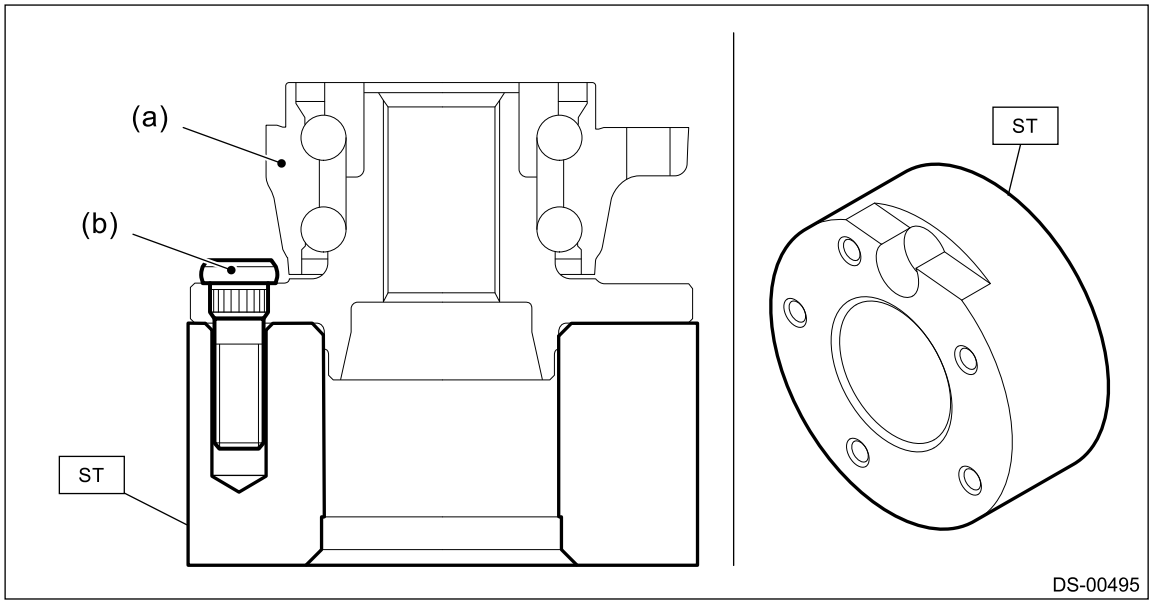
   Preparation tool:

   ST: HUB STAND (927080000)

2. Using a press, press the new hub bolts (b) until their seating surfaces contact the hub unit bearing (a).

   Note:

   Use the 12 mm (0.47 in) dia. holes in the HUB STAND to prevent bolts from tilting.

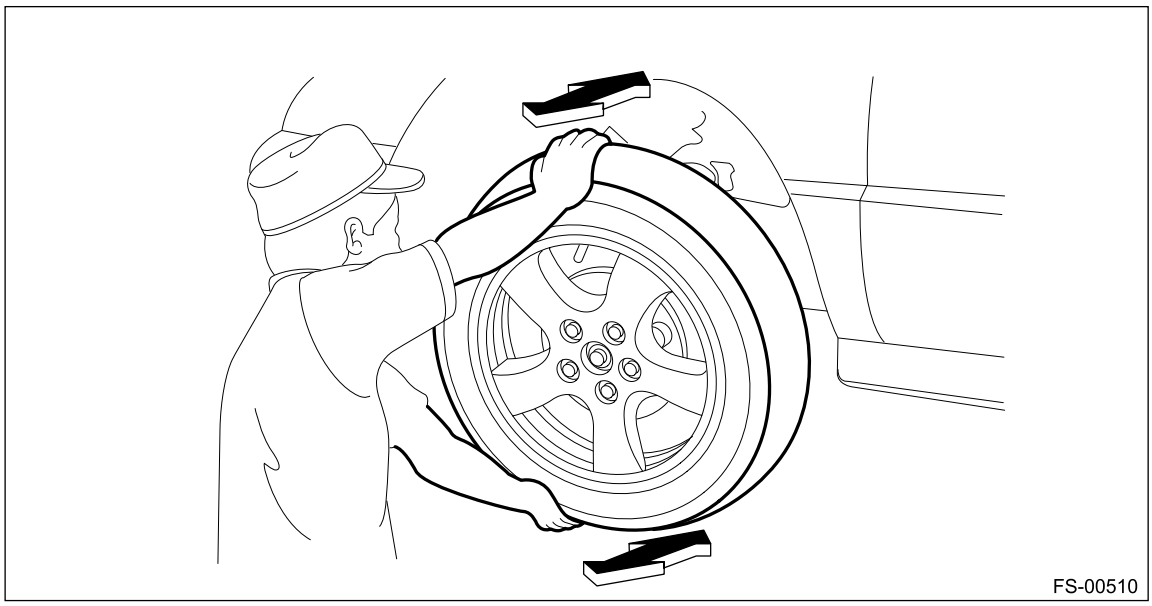


INSPECTION

1. Moving the front tire up and down by hand, check there is no looseness in bearing, and check the wheel rotates smoothly.

   Caution:

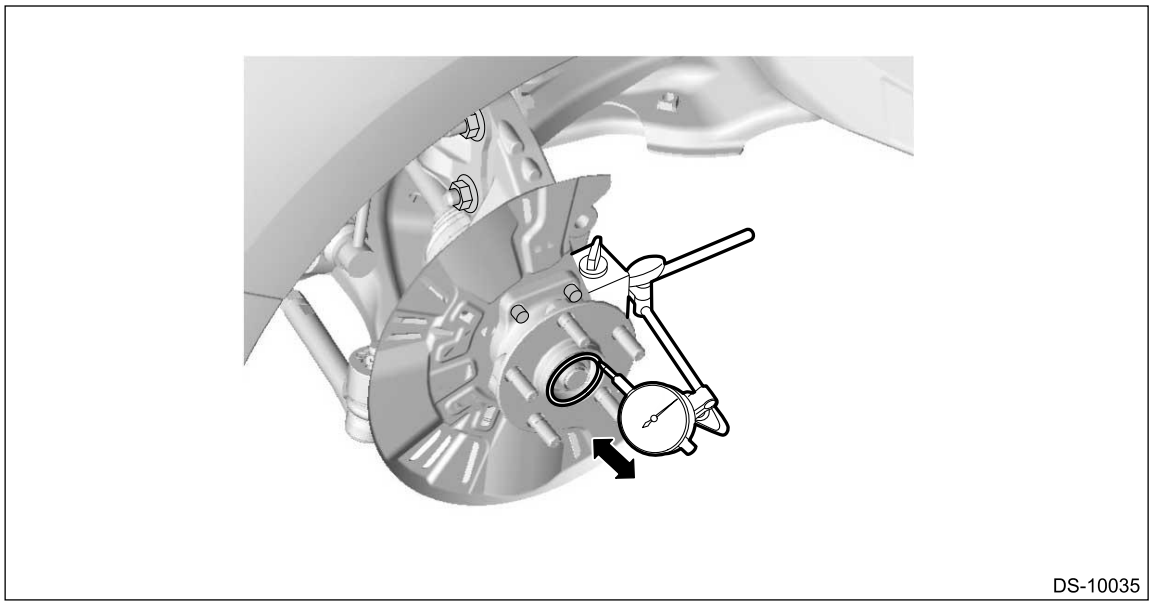
   If there is unsmooth sliding operation or abnormal noise in the bearing, replace the hub unit bearing.



2. Inspect the hub unit bearing for axial looseness.
   1. Remove the tire and disc rotor.
   2. Using a dial gauge, check the axial looseness. Replace the hub unit bearing if looseness exceeds the limit.

   Service limit:

   Maximum: 0.05 mm (0.0020 in)



REMOVAL

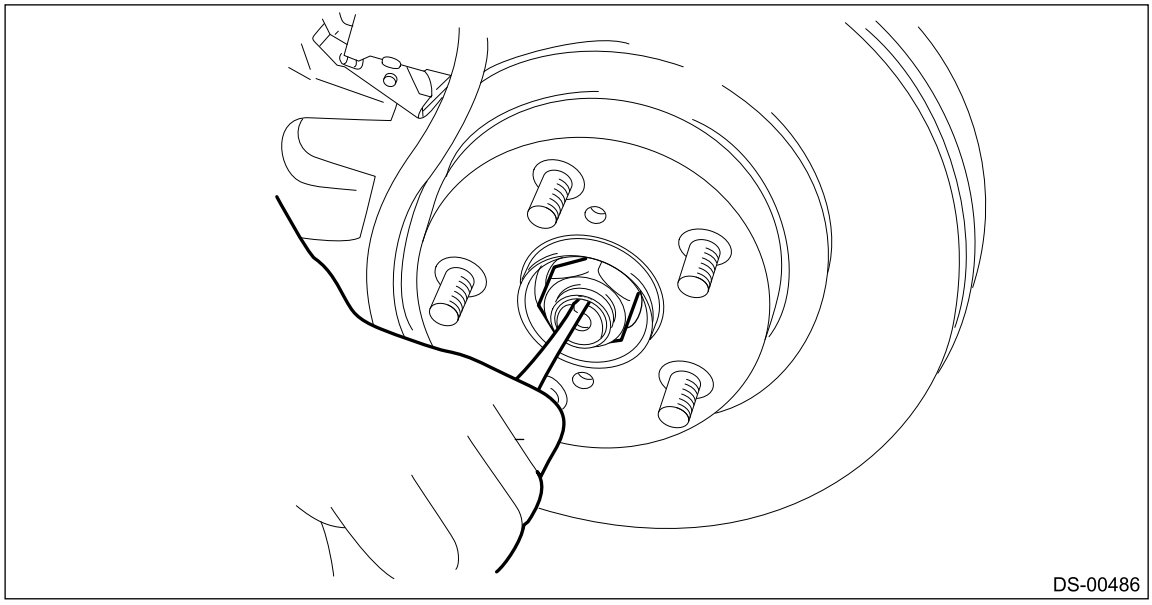
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the rear axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.



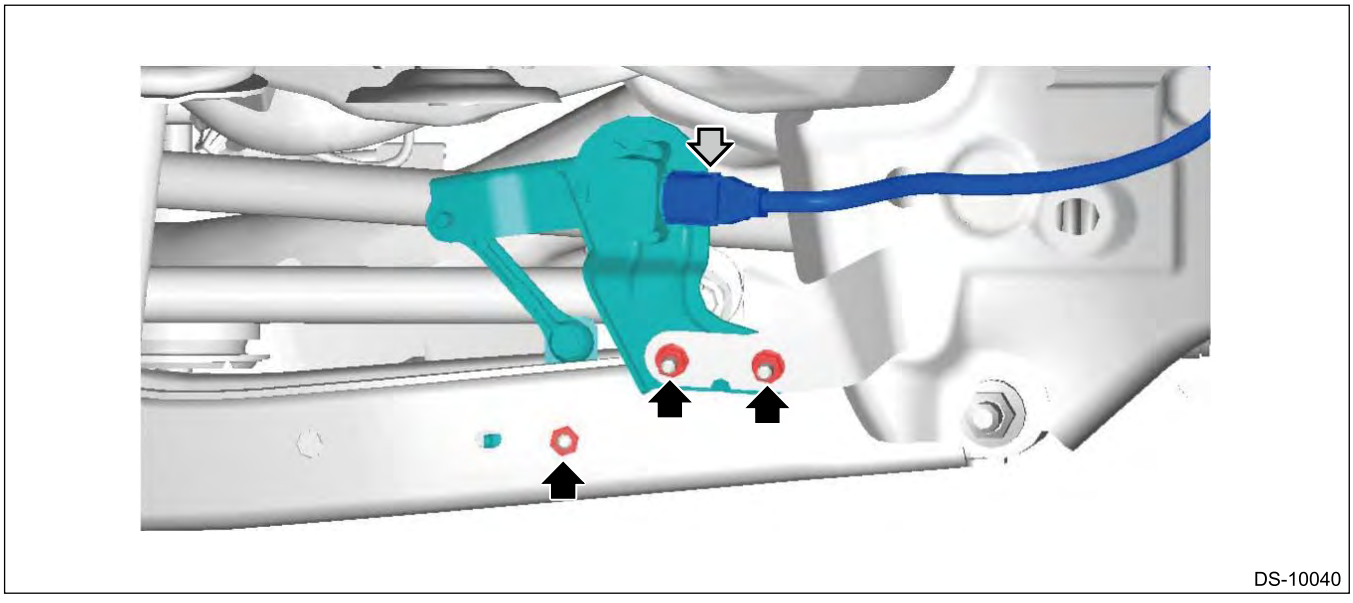
4. Disconnect the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

   Caution:

   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

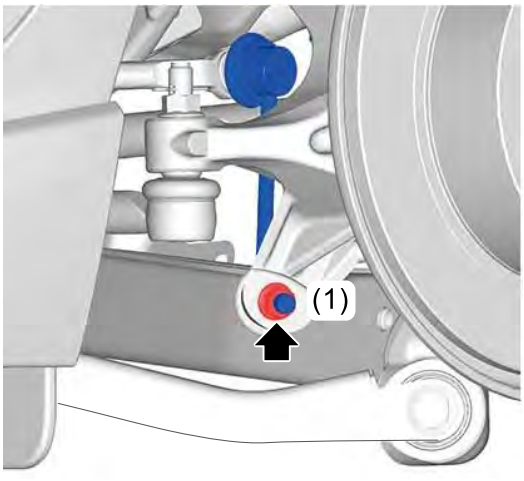
   (1) Disconnect the connector of the sensor assembly - headlight beam leveler.

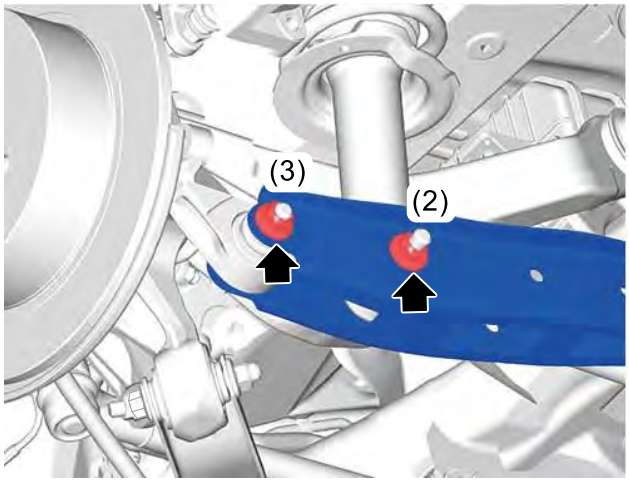
   (2) Remove the bolts and nuts, and remove the sensor assembly - headlight beam leveler.



5. Remove the bolts and nuts and lower the rear lateral link.

(1) Remove the nut and disconnect the rear stabilizer link. (Model with rear stabilizer)
(2) Remove the bolts from the lower side of rear shock absorber assembly.
(3) Disconnect the rear axle housing assembly from the rear lateral link.



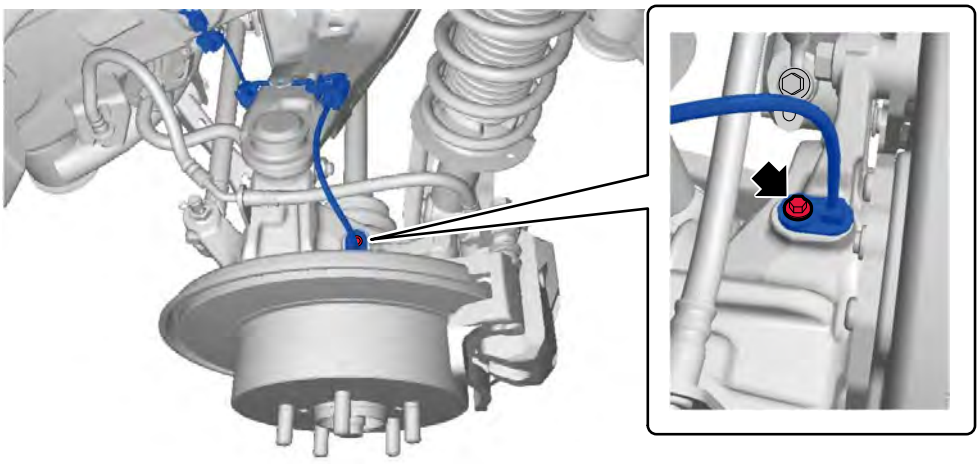


DS-10041

6. Remove the rear ABS wheel speed sensor from the rear axle housing assembly.
(1) Remove the bolts, and remove the ABS wheel speed sensor.

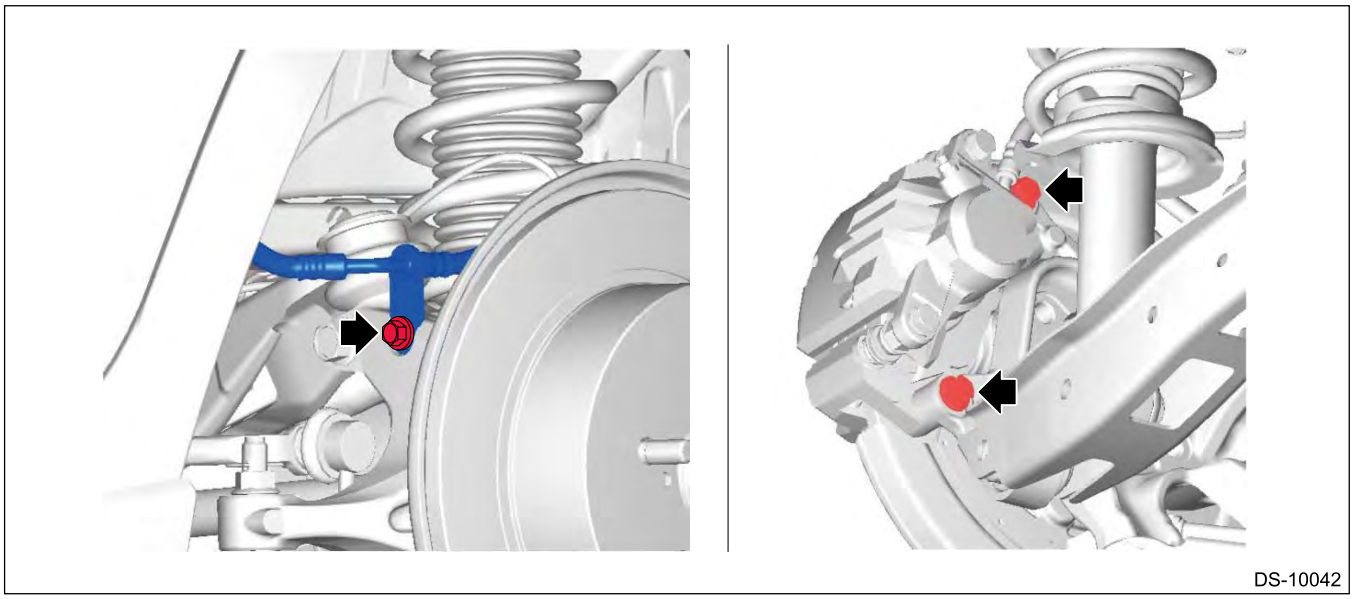
Caution:

- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**



DS-10039

7. Remove the caliper body assembly from the rear axle housing assembly.
(1) Remove the bolts and then remove the brake hose bracket and caliper body assembly.



(2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the shock absorber assembly with the harnesses.

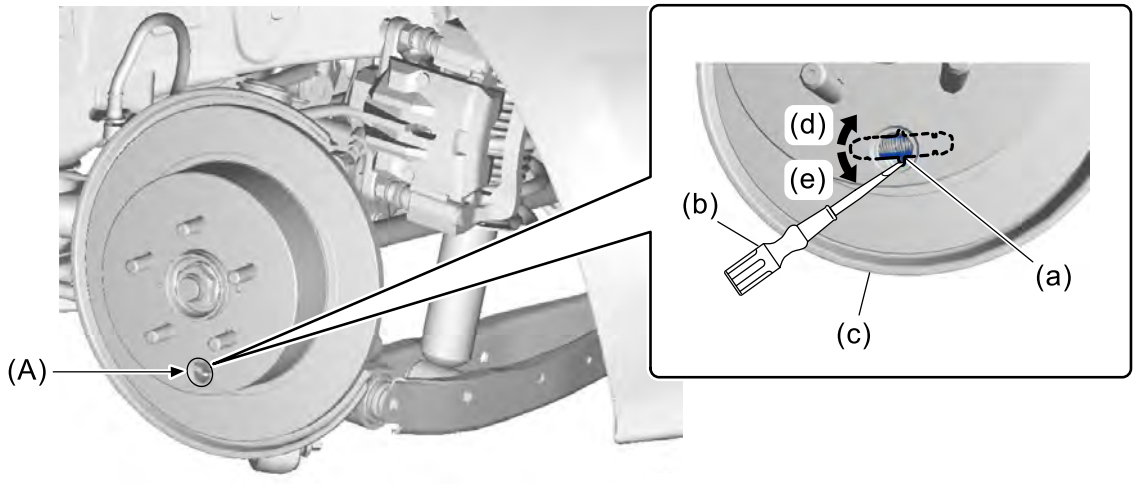


8. Remove the rear disc rotor.

Note:

If it is difficult to remove the rear disc rotor, perform the following two methods in order.

1. Remove the adjusting hole cover (A), insert the flat tip screwdriver, and rotate the adjuster assembly - rear brake until the brake shoe moves far enough to remove the disc rotor.



DS-10044

(a) Adjuster ASSY - rear brake

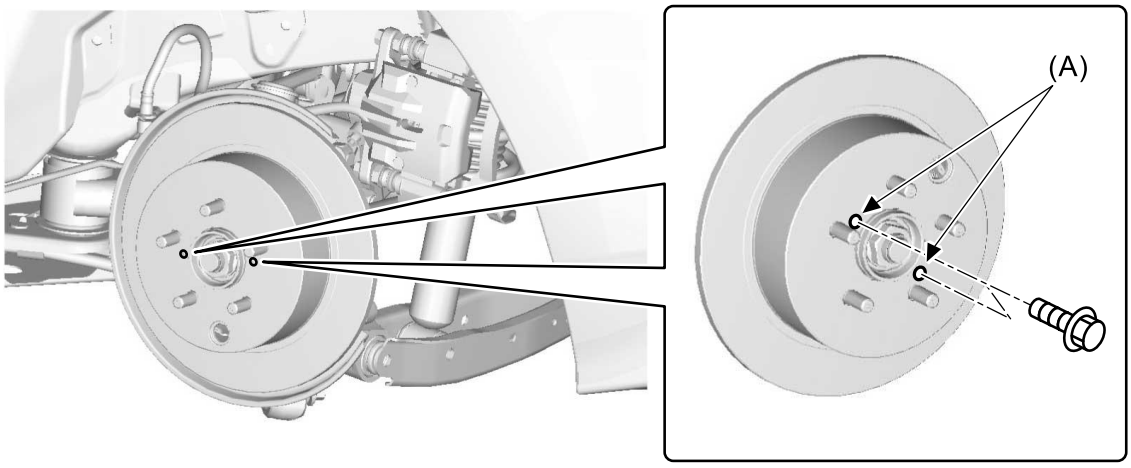
(b) Flat tip screwdriver

(c) Disc rotor

(d) Extend the adjuster ASSY - rear brake

(e) Shorten the adjuster ASSY - rear brake

2. If the disc rotor is not removed after performing above step, screw in an 8 mm (0.31 in) bolt to the threaded part (A) of the disc rotor, and remove the disc rotor.



DS-10045

9. Remove the rear drive shaft assembly from the rear hub unit bearing.

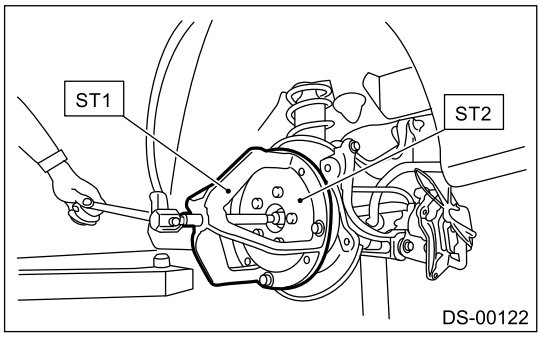
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



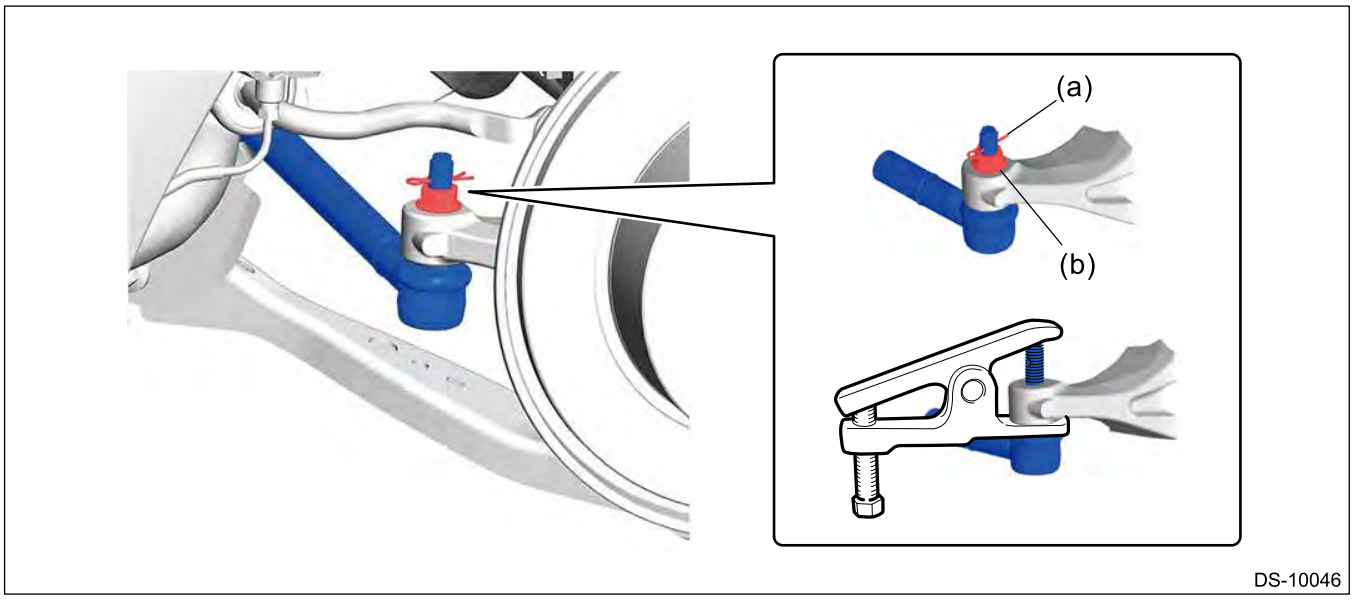
10. Remove the front lateral link.

(1) Remove the snap pin (a) and nut (b).

(2) Remove the ball joint from the rear axle housing assembly using the tie-rod ball joint puller.

Caution:

Be careful not to damage the boot of the joint.

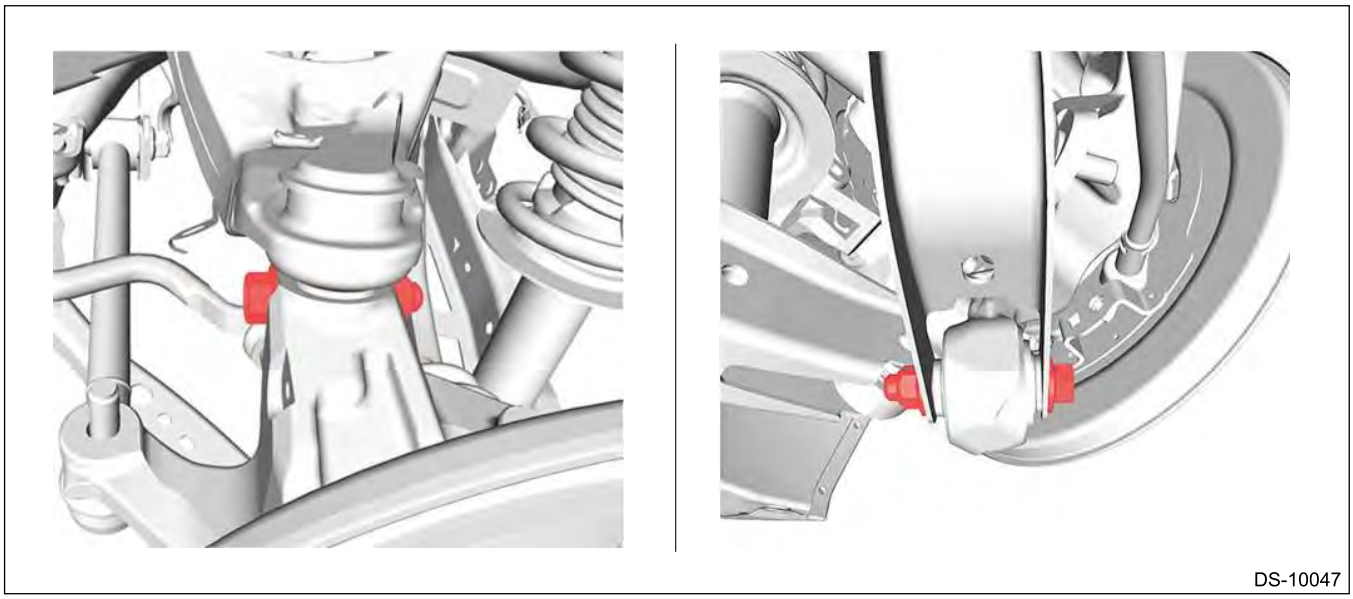


11. Remove the rear axle housing assembly.

(1) Separate the rear axle housing assembly by removing the bolts of the upper arm and trailing link.

Caution:

Be careful not to damage the boot of the joint.



(2) Remove the rear axle housing assembly.

Caution:

- **Be careful of the weight of rear axle housing assembly.**
- **Be careful not to damage the spline portion of the drive shaft.**

12. Refer to "Rear Hub Unit Bearing" for removal of the rear hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>REMOVAL.

DRIVE SHAFT SYSTEM > Rear Axle

INSTALLATION

1. Temporarily tighten the rear axle housing assembly to the upper arm assembly.

2. Install the rear drive shaft assembly.

Caution:

- **Use new axle nuts.**
- **Be careful not to damage the spline portion of the drive shaft.**
- **Be careful not to damage the magnetic encoder.**

(1) Insert the drive shaft assembly into the hub spline, and pull it into the specified position.

(2) Tighten the axle nut temporarily.

3. Tighten the rear shock absorber assembly, rear stabilizer link and other links to the specified torque.

Tightening torque:

Rear suspension: Ref. to REAR SUSPENSION>General Description>COMPONENT > REAR SUSPENSION.

Rear shock absorber: Ref. to REAR SUSPENSION>General Description>COMPONENT > REAR SHOCK ABSORBER.

4. Install the rear disc rotor.

5. Install the caliper body assembly.

Tightening torque:

66 N·m (6.7 kgf-m, 48.7 ft-lb)

6. Install the brake hose bracket and rear ABS wheel speed sensor.

Tightening torque:

Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)

Rear ABS wheel speed sensor: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

7. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

8. While pressing the brake pedal, tighten the new axle nuts to the specified torque.

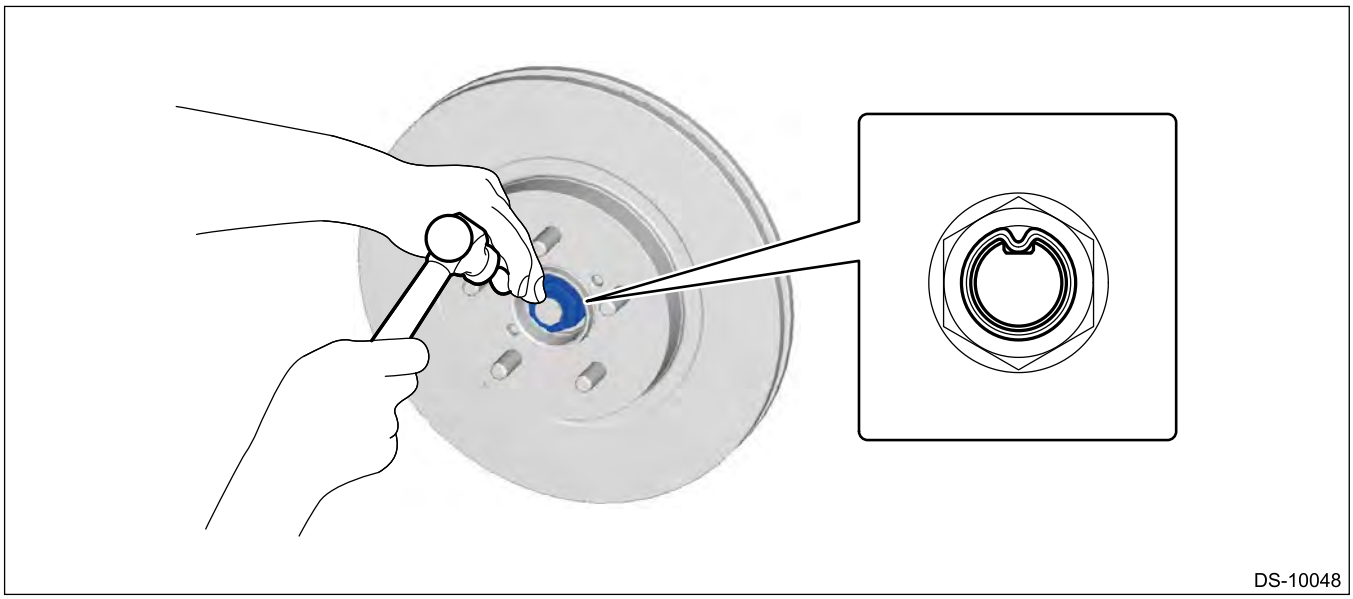
Caution:

Do not load the rear axle before tightening the axle nut. Doing so may damage the hub unit bearing.

Tightening torque:

240 N·m (24.5 kgf-m, 177 ft-lb)

9. After tightening the axle nut, lock it securely.



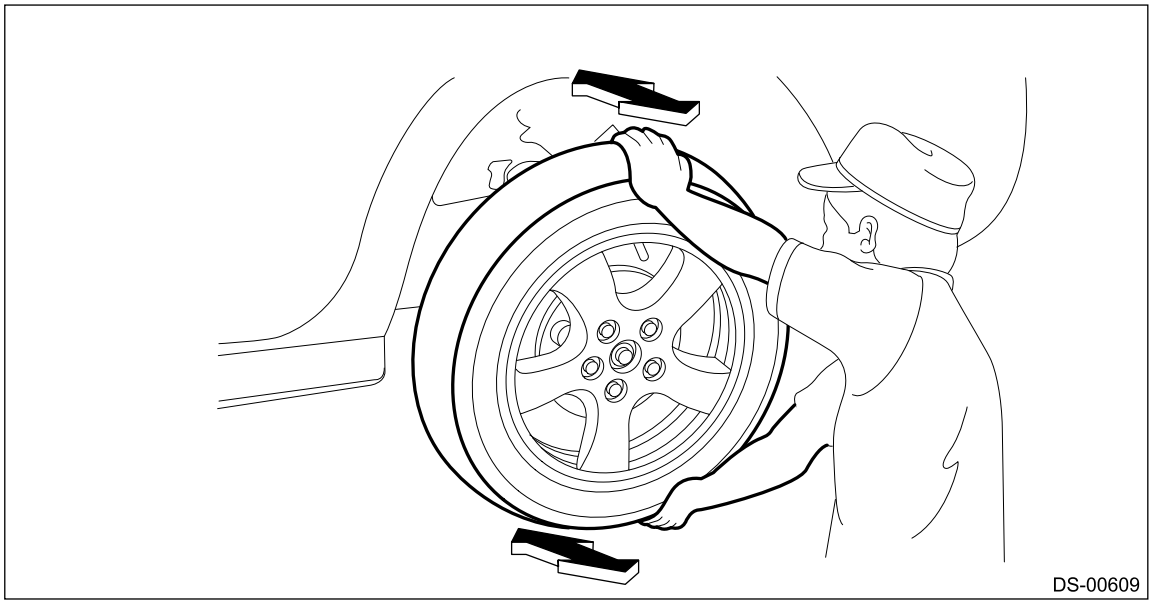
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

11. Install the rear wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no looseness by moving the upper and lower portions of rear tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the rear hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.



12. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
Caution:
When the wheel alignment has been adjusted, perform the following adjustment.
- **Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.**
- **VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

13. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

DRIVE SHAFT SYSTEM > Rear Axle

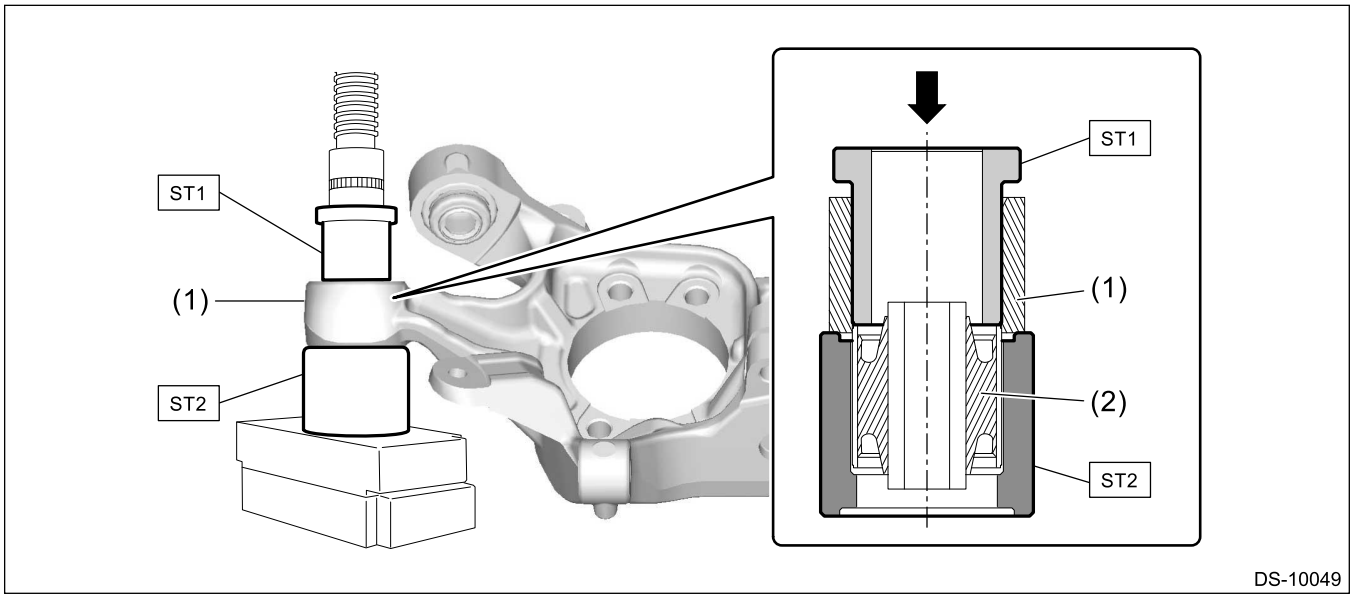
DISASSEMBLY

1. PILLOW BALL BUSHING

Do not remove the pillow ball bushing from the rear axle housing assembly, because it cannot be replaced. If removed, replace the rear axle housing assembly.

2. TRAILING LINK BUSHING

1. Remove the rear axle housing assembly. Ref. to DRIVE SHAFT SYSTEM>Rear Axle>REMOVAL.
2. Using the ST and a hydraulic press, push out the bushing.
Preparation tool:
ST1: BUSHING REMOVER (20099FG000)
ST2: INSTALLER & REMOVER (BASE) (20099PA010)



(1) Rear axle housing ASSY (2) Trailing link bushing

DRIVE SHAFT SYSTEM > Rear Axle

ASSEMBLY

1. PILLOW BALL BUSHING

Do not remove the pillow ball bushing from the rear axle housing assembly, because it cannot be replaced. If removed, replace the rear axle housing assembly.

2. TRAILING LINK BUSHING

1. Before assembly, inspect the following items and replace any faulty part with a new one.
   - Perform visual check for damage or bend on the trailing link.
   - Visually check the bushing for abnormal cracks, fatigue or damage.
2. Press-fit the bushing using ST and the hydraulic press.

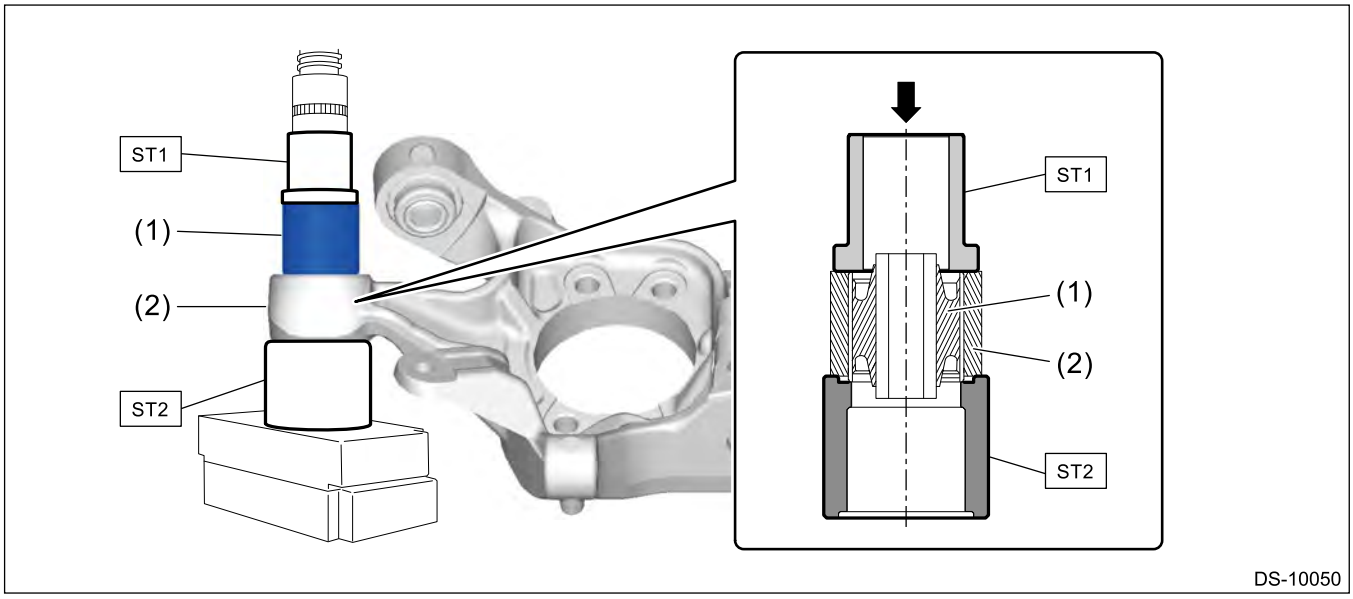
Caution:

Make sure to press the bushing straight in.

Preparation tool:

ST1: BUSHING REMOVER (20099FG000)

ST2: INSTALLER & REMOVER (BASE) (20099PA010)



(1) Trailing link bushing (2) Rear axle housing ASSY

REMOVAL

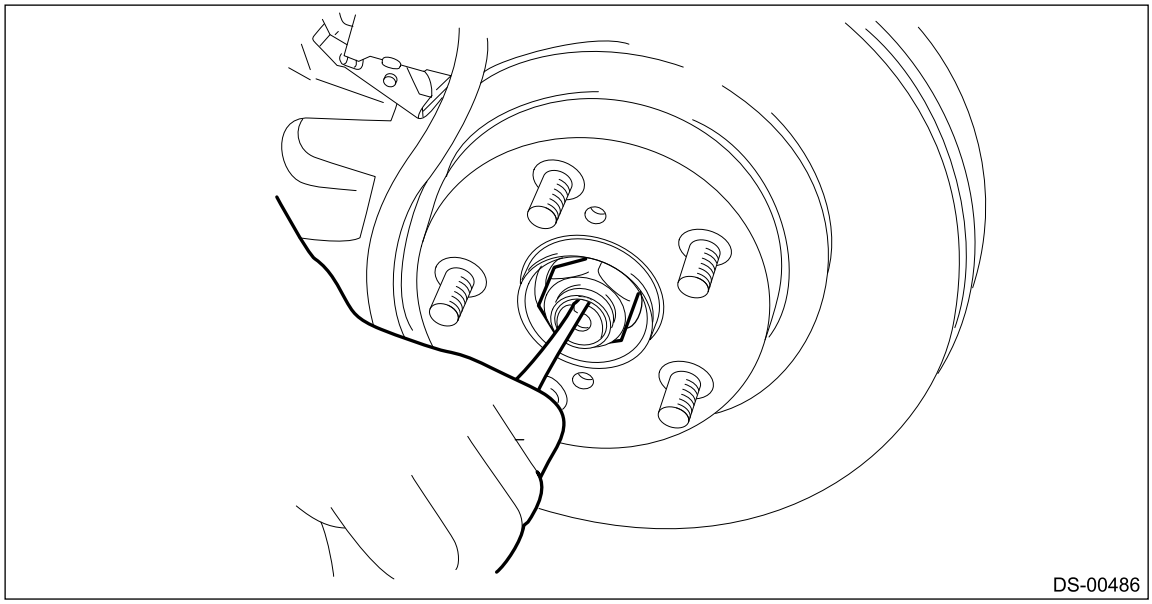
1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the rear axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.

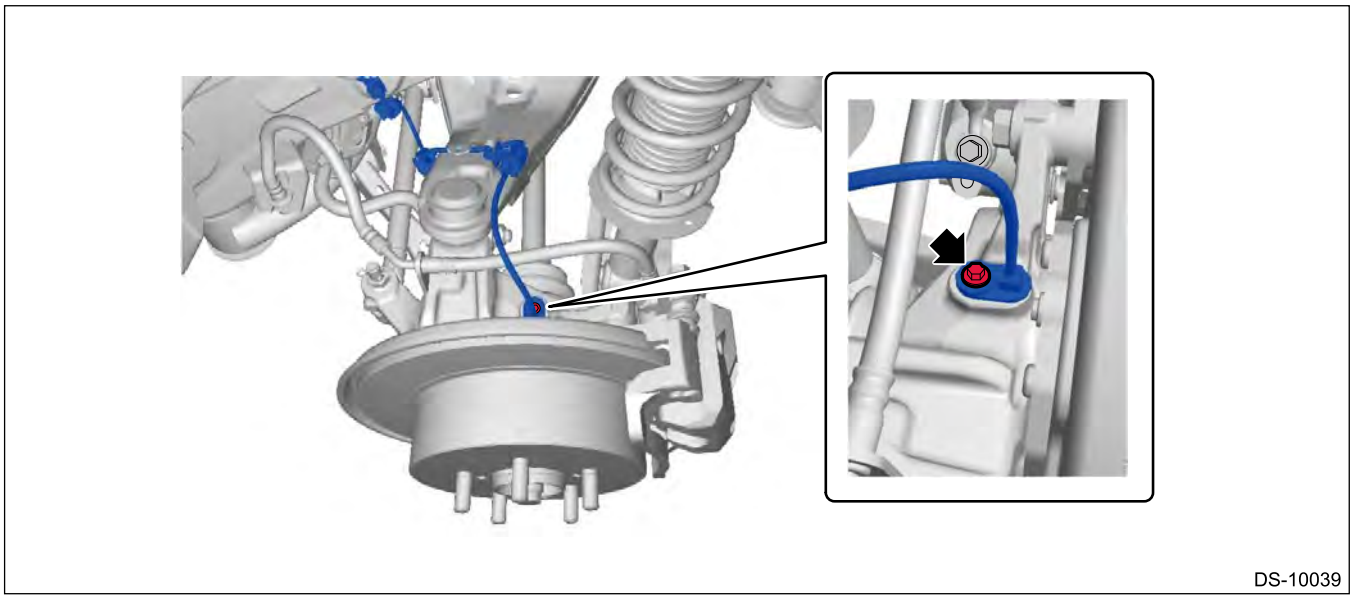


3. Remove the rear ABS wheel speed sensor from the rear axle housing assembly.

   (1) Remove the bolts, and remove the ABS wheel speed sensor.

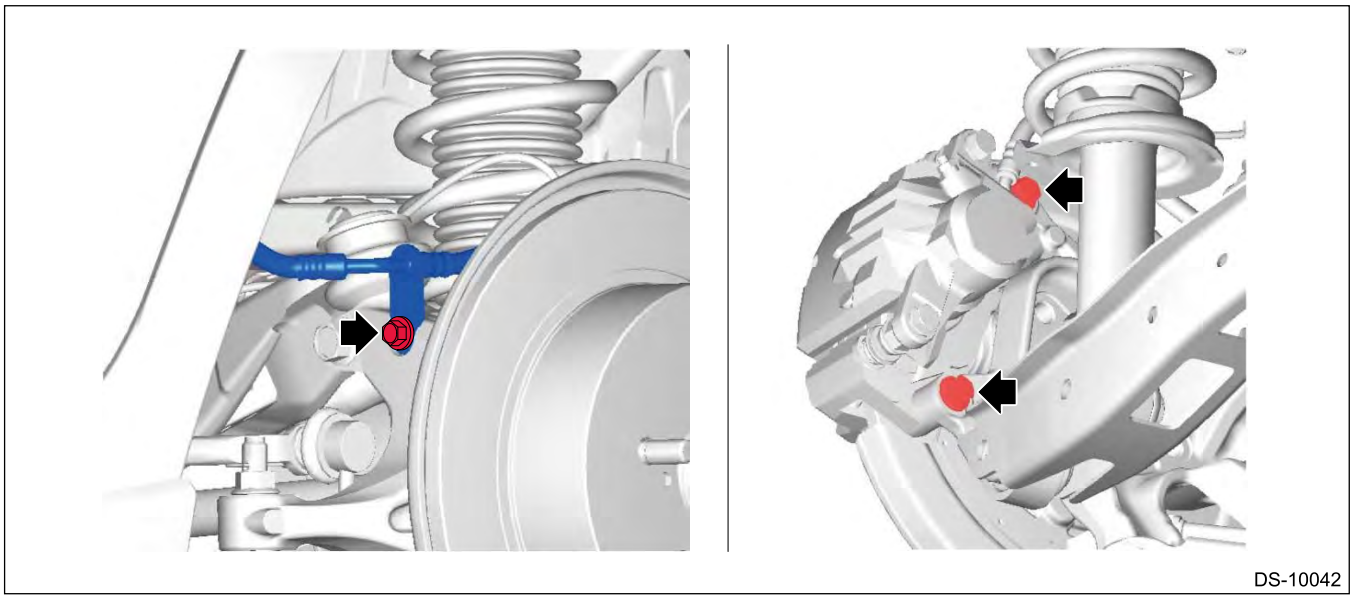
   Caution:

   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**



4. Remove the caliper body assembly from the rear axle housing assembly.

   (1) Remove the bolts and then remove the brake hose bracket and caliper body assembly.



(2) Prepare wiring harnesses etc. to be discarded, and suspend the caliper body assembly from the shock absorber assembly with the harnesses.

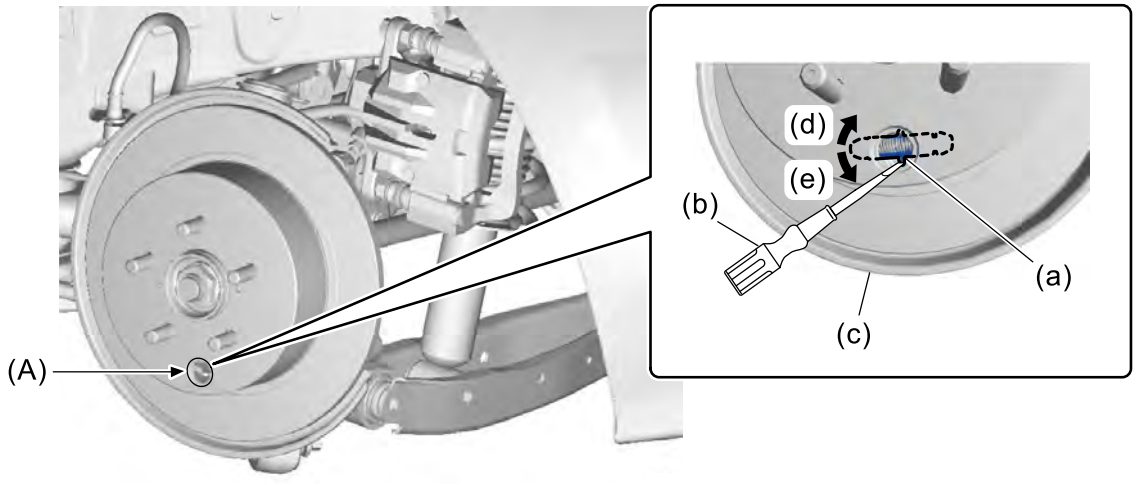


5. Remove the rear disc rotor.

Note:

If it is difficult to remove the rear disc rotor, perform the following two methods in order.

1. Remove the adjusting hole cover (A), insert the flat tip screwdriver, and rotate the adjuster assembly - rear brake until the brake shoe moves far enough to remove the disc rotor.



DS-10044

(a) Adjuster ASSY - rear brake

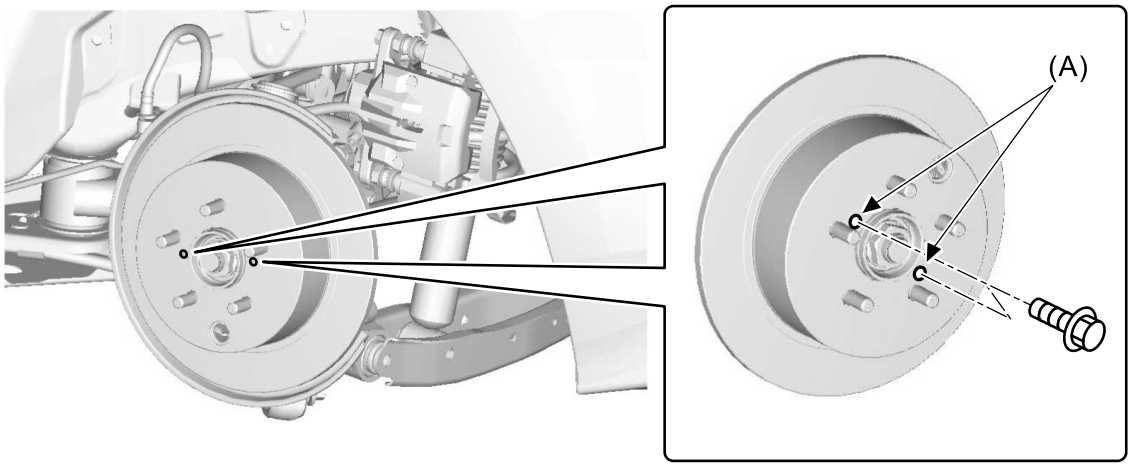
(b) Flat tip screwdriver

(c) Disc rotor

(d) Extend the adjuster ASSY - rear brake

(e) Shorten the adjuster ASSY - rear brake

2. If the disc rotor is not removed after performing above step, screw in an 8 mm (0.31 in) bolt to the threaded part (A) of the disc rotor, and remove the disc rotor.

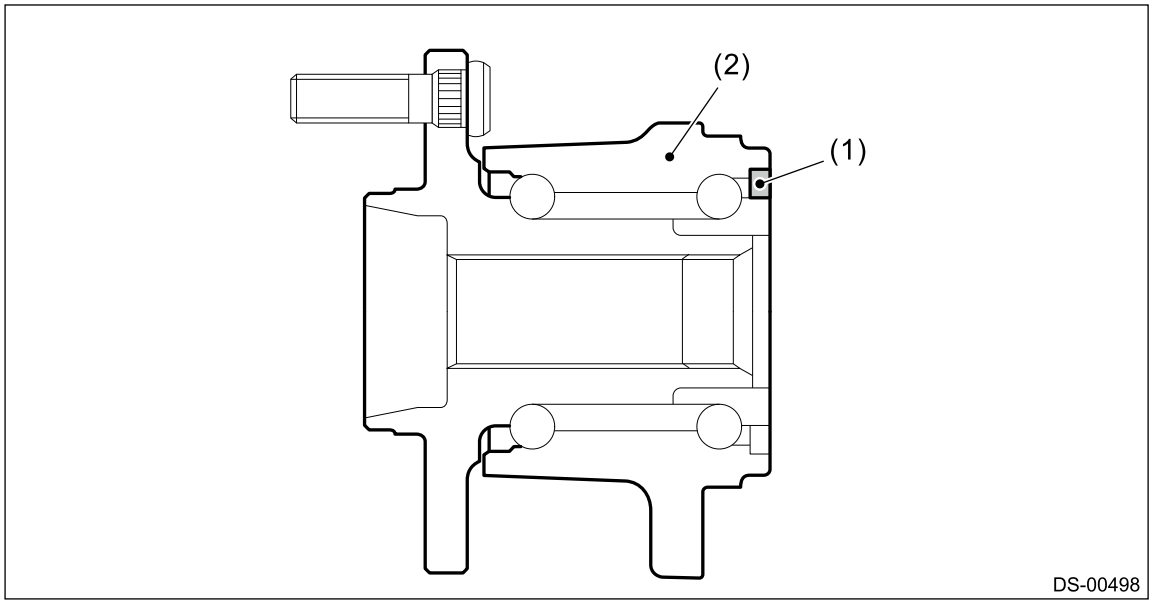


DS-10045

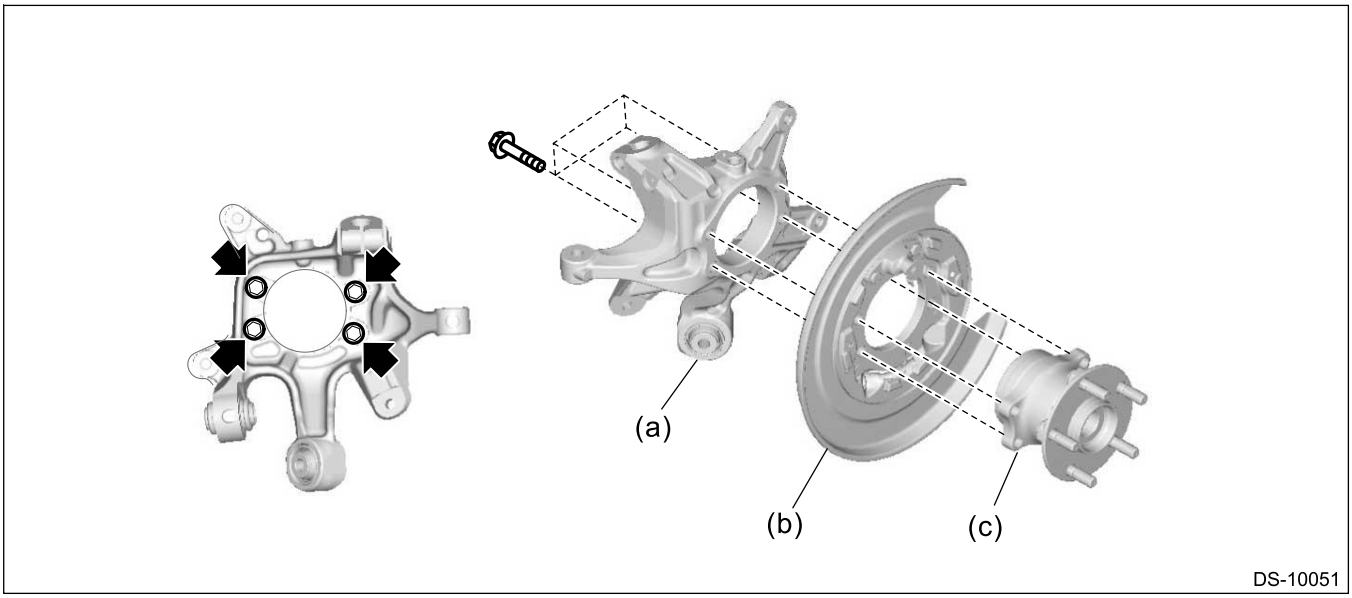
6. Remove the bolt from the rear axle housing assembly, and remove the rear hub unit bearing.

Caution:

- **Be careful not to damage the magnetic encoder.**
- **Do not get closer the tool which charged magnetism to magnetic encoder.**



(1) Magnetic encoder (2) Rear hub unit bearing



(a) Rear axle housing ASSY (b) Rear brake back plate (c) Rear hub unit bearing

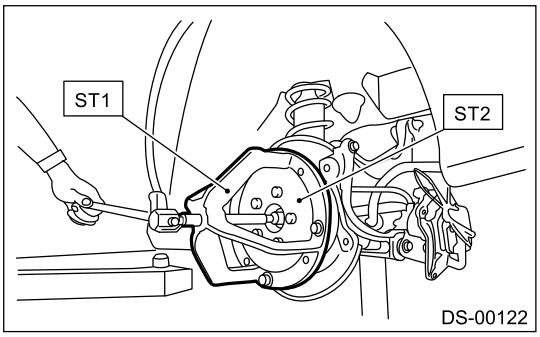
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)

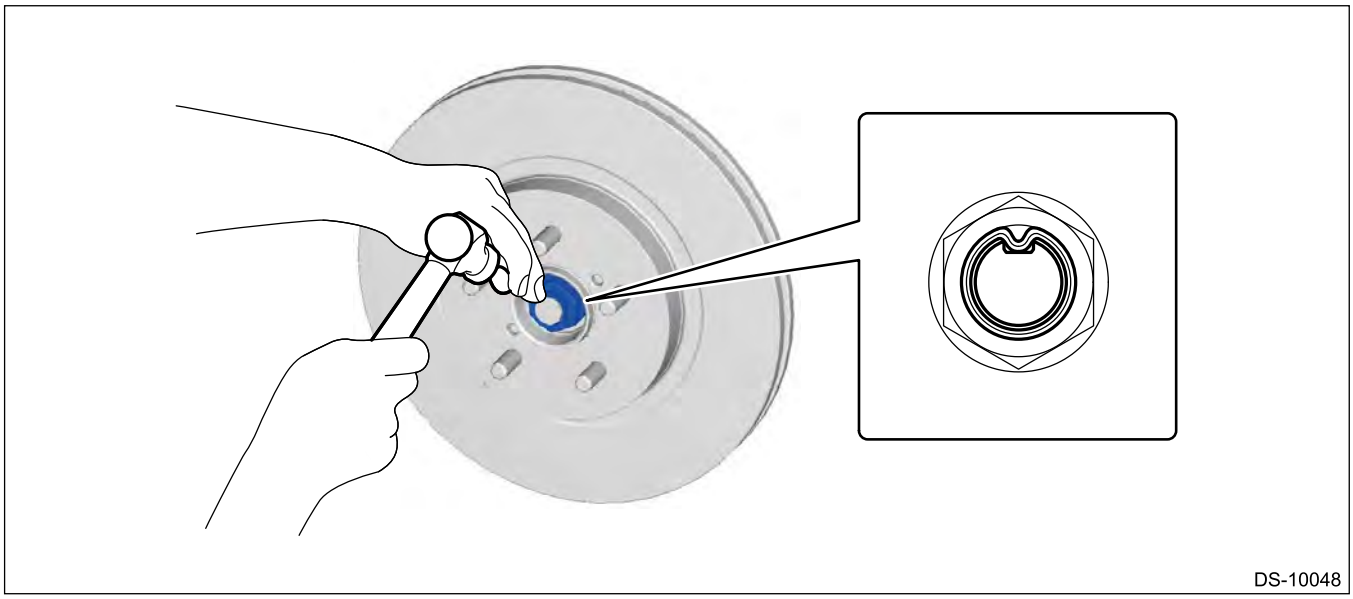


INSTALLATION

1. Place the rear brake back plate between the rear axle housing assembly and the rear hub unit bearing, and tighten the bolt.
   Caution:
   - **Be careful not to damage the magnetic encoder.**
   - **Do not get closer the tool which charged magnetism to magnetic encoder.**
   - **Use a new bolt.**

   Tightening torque:
   65 N·m (6.6 kgf-m, 47.9 ft-lb)
2. Install the rear drive shaft assembly.
   Caution:
   - **Use new axle nuts.**
   - **Be careful not to damage the spline portion of the drive shaft.**
   - **Be careful not to damage the magnetic encoder.**

   (1) Insert the drive shaft assembly into the hub spline, and pull it into the specified position.
   (2) Tighten the axle nut temporarily.
3. Install the rear disc rotor.
4. Install the caliper body assembly.
   Tightening torque:
   66 N·m (6.7 kgf-m, 48.7 ft-lb)
5. Install the brake hose bracket and rear ABS wheel speed sensor.
   Tightening torque:
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
   Rear ABS wheel speed sensor: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
6. While pressing the brake pedal, tighten the new axle nuts to the specified torque.
   Caution:
   Do not load the rear axle before tightening the axle nut. Doing so may damage the hub unit bearing.
   Tightening torque:
   240 N·m (24.5 kgf-m, 177 ft-lb)
7. After tightening the axle nut, lock it securely.

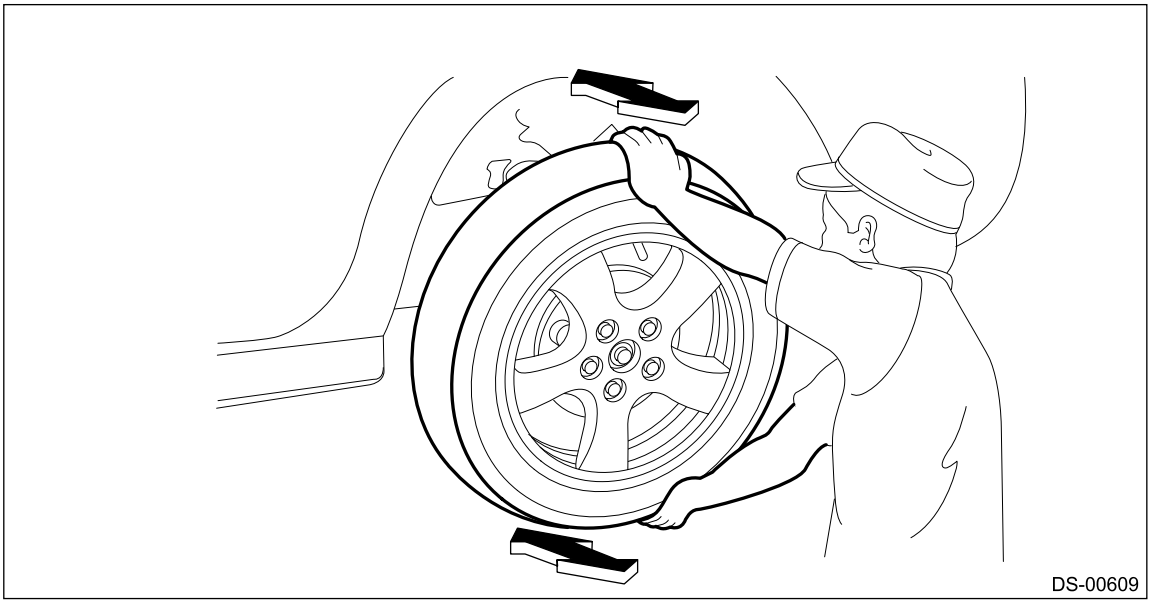


8. Install the rear wheels, and perform the following inspections.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

1. Check the wheels for smooth rotation.
2. Check that there is no looseness by moving the upper and lower portions of rear tire in an axial direction with the brake pedal released.
   - **Looseness exists** → Check the rear hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.



DRIVE SHAFT SYSTEM > Rear Hub Unit Bearing

DISASSEMBLY

Using the ST or a hydraulic press, push out the hub bolt (b) from the rear hub unit bearing (a).

Caution:

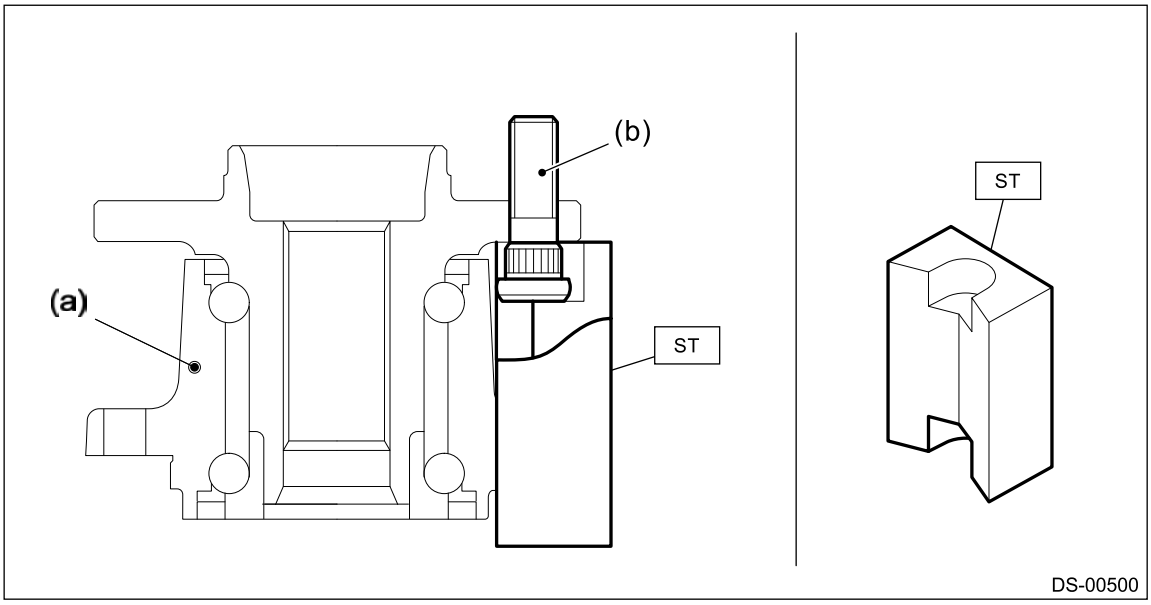
- **Be careful not to hammer the hub bolts. This may deform the hub unit bearing.**
- **Do not reuse the hub bolt.**

Note:

Since the rear hub unit bearing can not be disassembled, only hub bolts can be removed.

Preparation tool:

ST: HUB STAND (28399AG000)



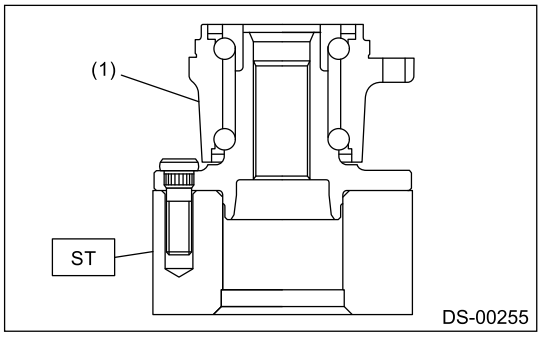
DRIVE SHAFT SYSTEM > Rear Hub Unit Bearing

ASSEMBLY

1. Install the rear hub unit bearing to the ST securely.

   Preparation tool:

   ST: HUB STAND (927080000)

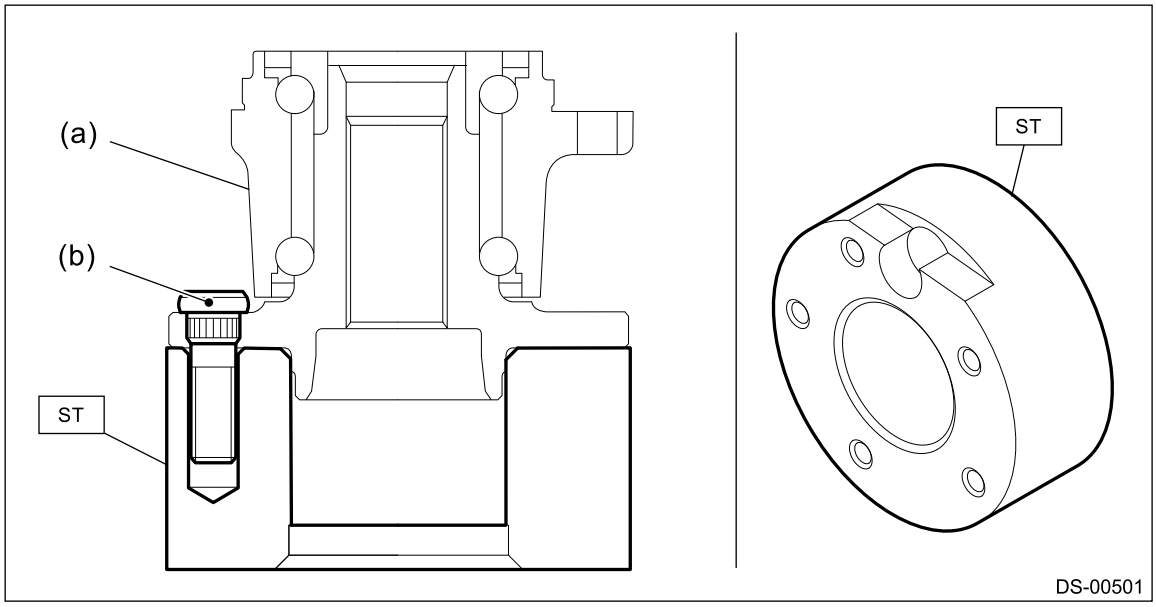


   (1) Rear hub unit bearing

2. Using a press, press new hub bolts (b) until their seating surfaces contact the rear hub unit bearing (a).

   Note:

   Use the 12 mm (0.47 in) dia. holes in the HUB STAND to prevent bolts from tilting.

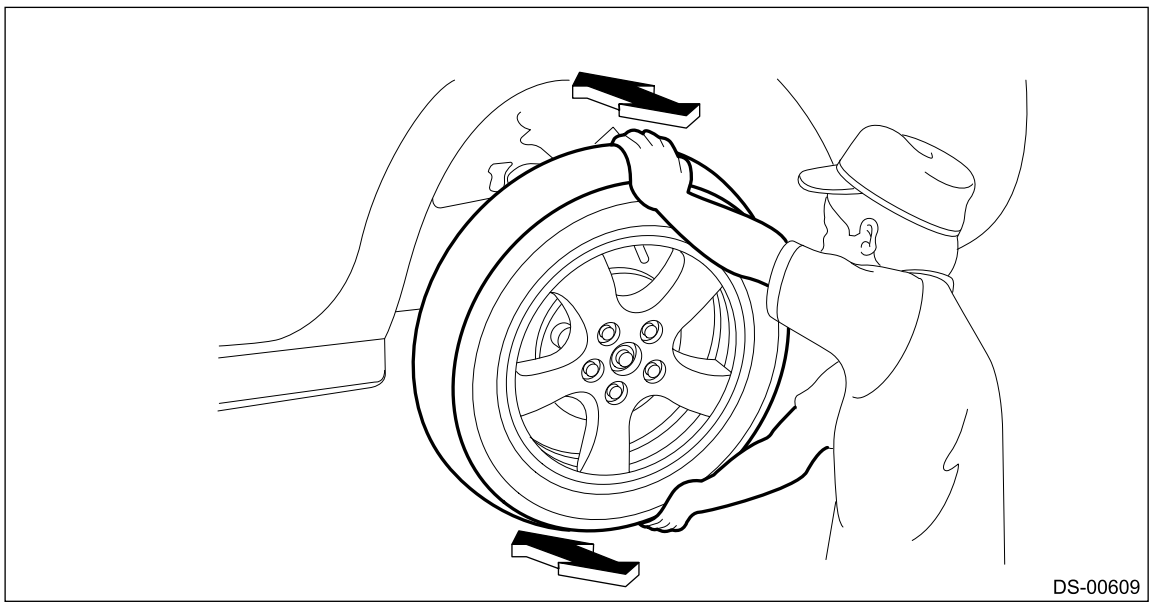


INSPECTION

1. Moving the rear tire up and down by hand, check there is no looseness in bearing, and check the wheel rotates smoothly.

   Caution:

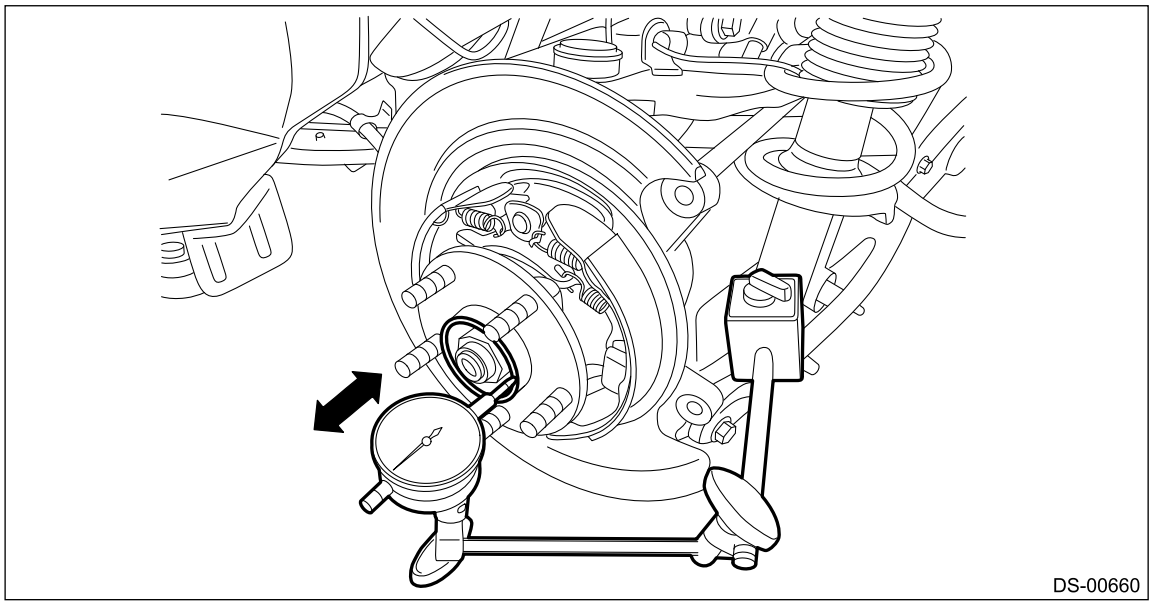
   If there is unsmooth sliding operation or abnormal noise in the bearing, replace the rear hub unit bearing.



2. Inspect the hub unit bearing for axial looseness.
   1. Remove the tire and disc rotor.
   2. Using a dial gauge, check the axial looseness. Replace the hub unit bearing if looseness exceeds the limit.

   Service limit:

   Maximum: 0.05 mm (0.0020 in)

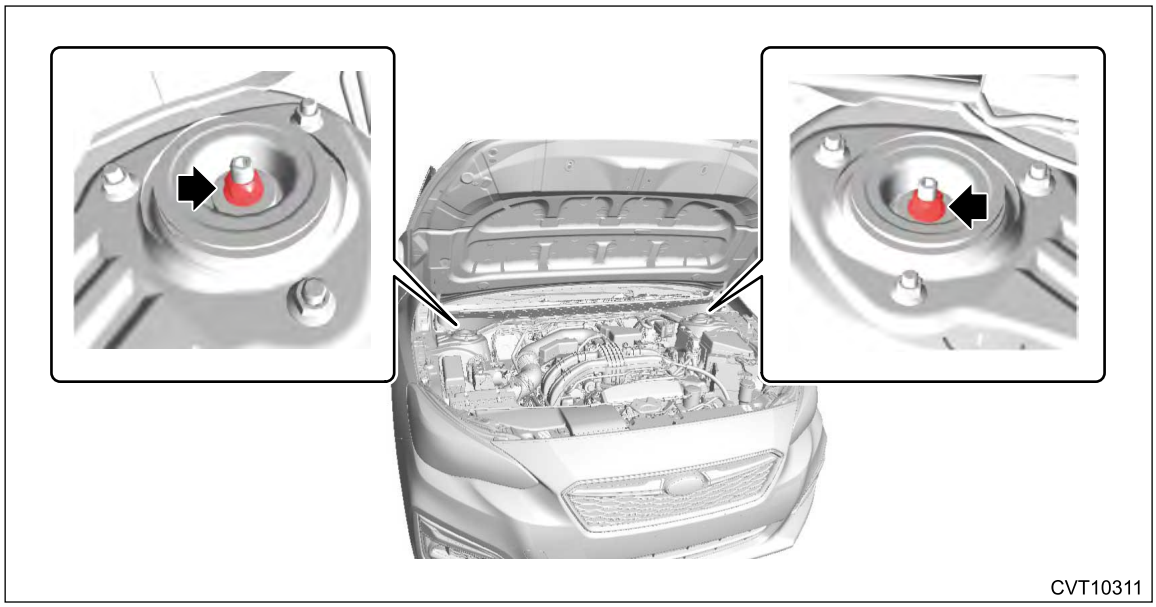

DS-00660

REMOVAL

1. Remove the strut mount protection cap.
2. Loosen the self-locking nut of the strut mount CTR by two turns.

   Note:

   Loosen the self-locking nut only on the removal side if only one side of the front drive shaft is removed.



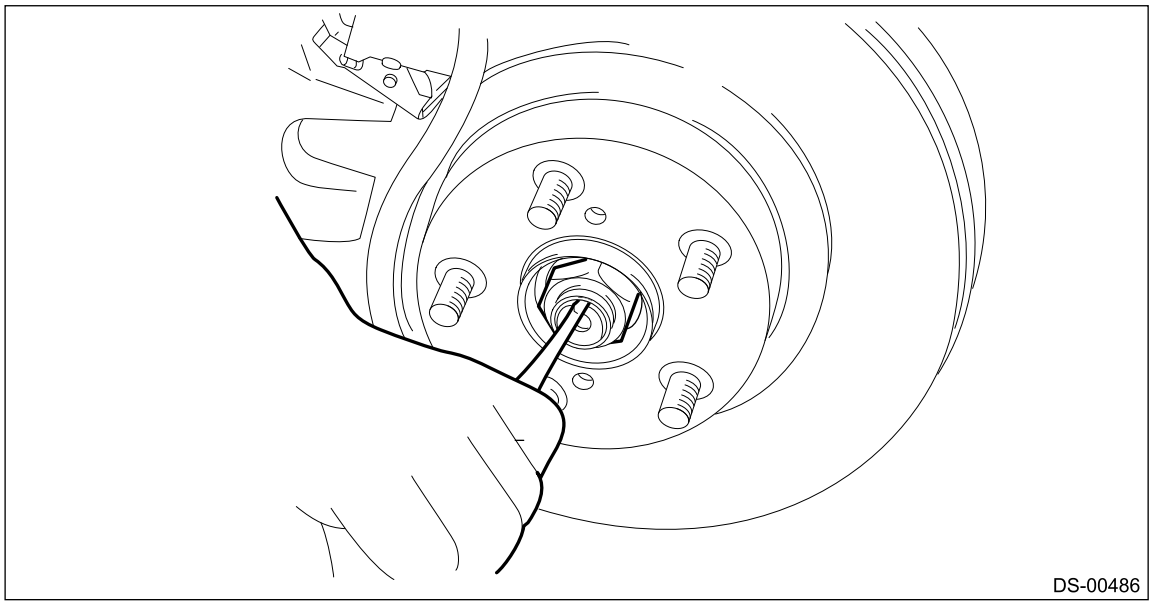
3. Lift up the vehicle, and then remove the front wheels.
4. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the front axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

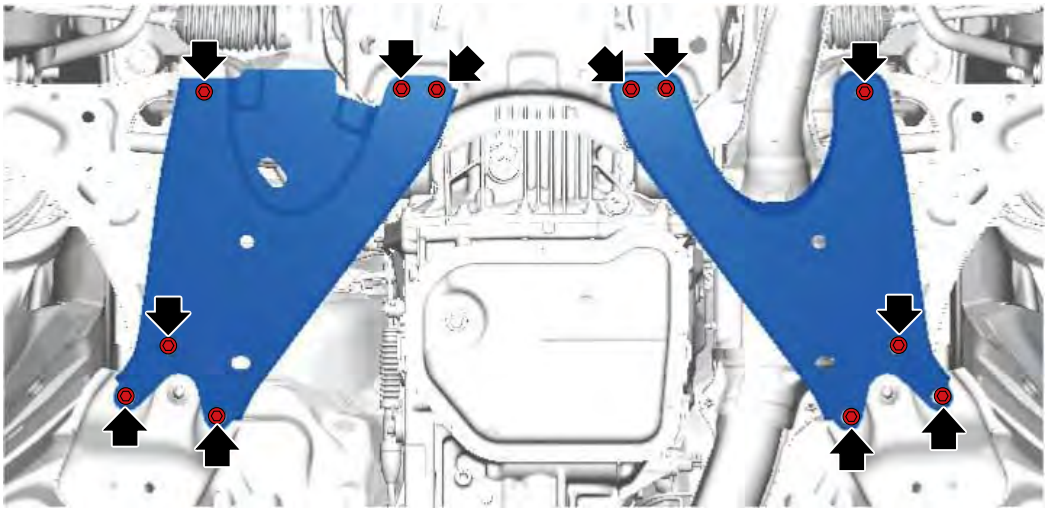
   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.



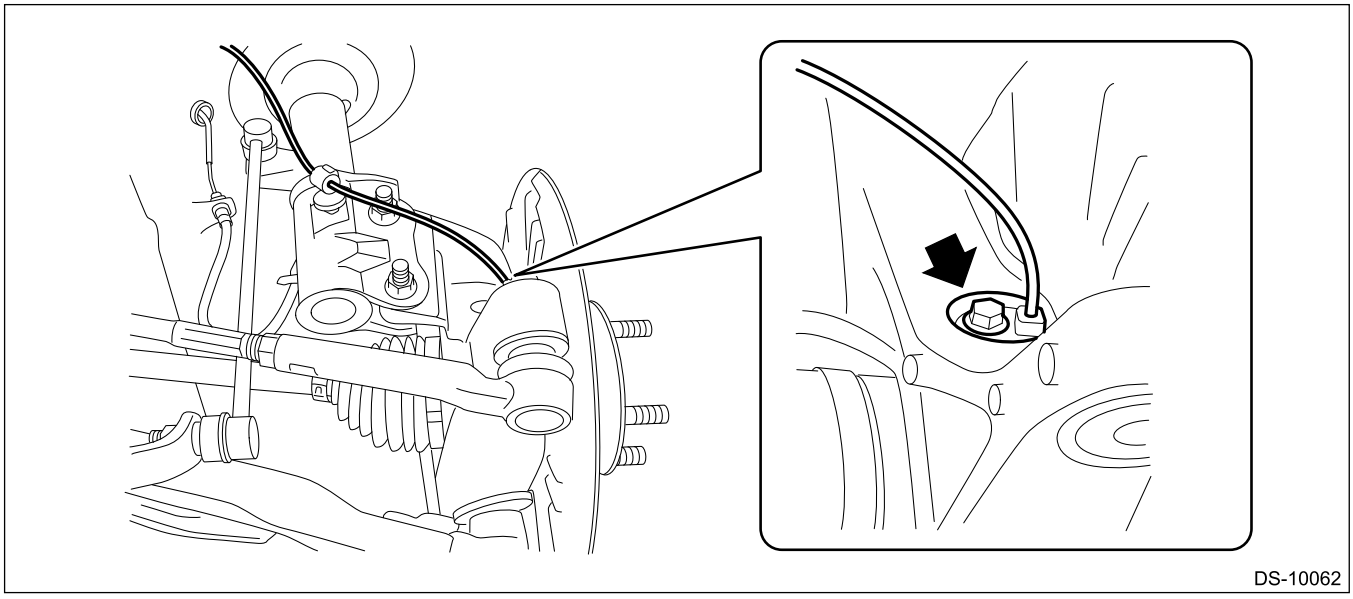
5. Remove the support crossmember rear.

Note:

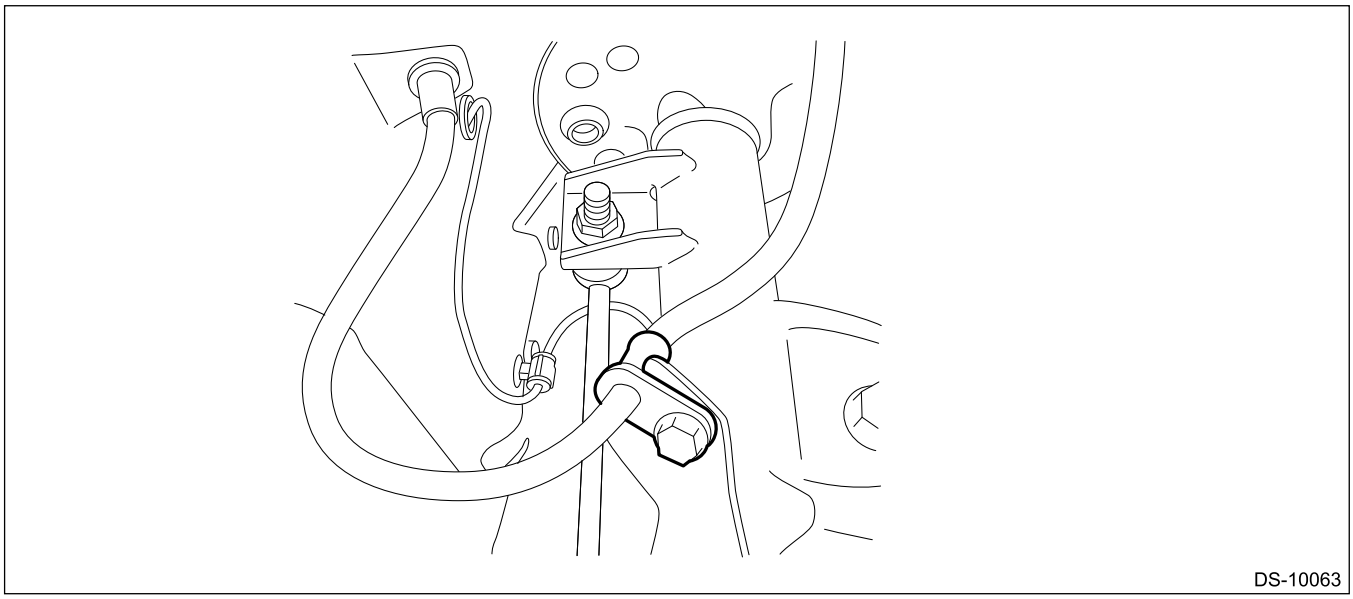
Remove the support crossmember rear only on the removal side if only one side of the front drive shaft is removed.



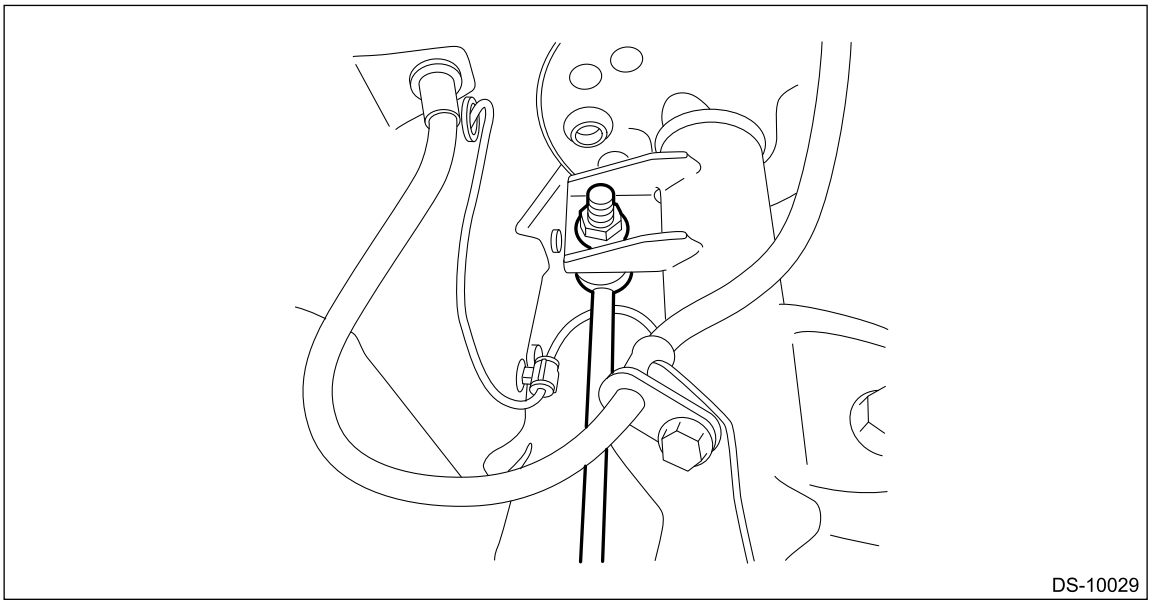
6. Remove the front ABS wheel speed sensor and clips.



7. Remove the brake hose bracket.



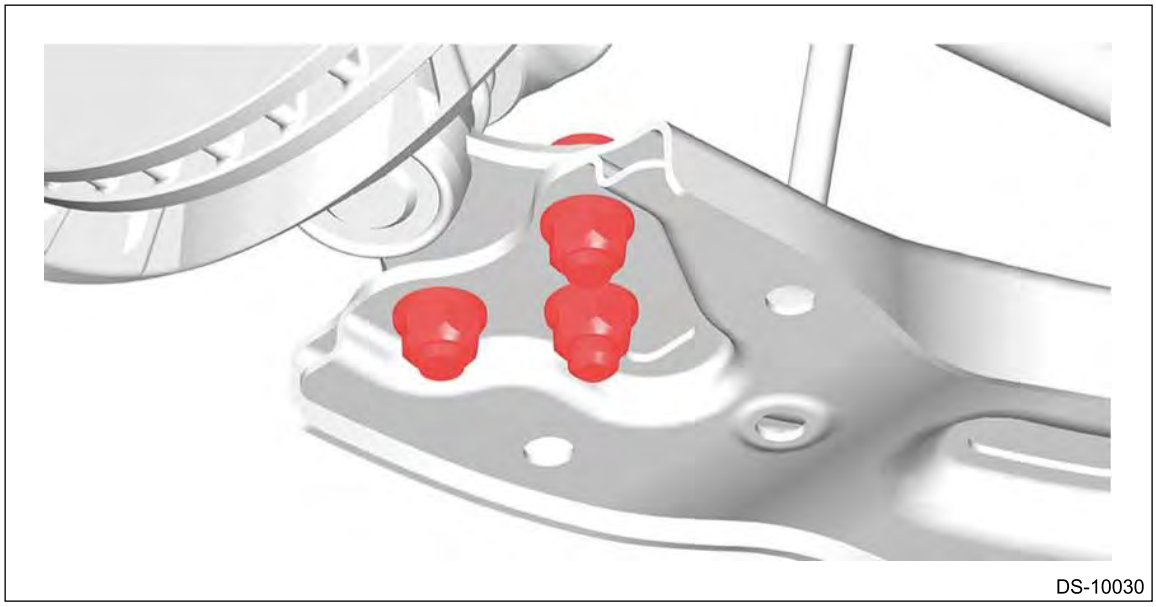
8. Disconnect the stabilizer link.



9. Remove the three nuts of the ball joint, and disconnect the front lower arm assembly from the front axle housing.

Note:

- **To prevent damage of the front arm ball joint boot, place a wooden block, etc. between front arm and ball joint.**
- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**



10. Remove the front drive shaft assembly from the front axle housing.

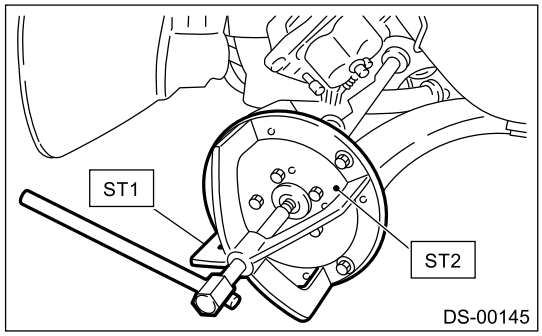
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



11. Using a bar, remove the front drive shaft assembly from transmission.

Caution:

Be careful not to allow the bar to damage holder area.

DRIVE SHAFT SYSTEM > Front Drive Shaft

INSTALLATION

1. Before installation, check the drive shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft>INSPECTION.

2. Replace the differential side retainer oil seal with a new part.

- MT model: Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Differential Side Retainer Oil Seal>REPLACEMENT.
- CVT model: Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal>REPLACEMENT.

Caution:

- **After pulling out the drive shaft assembly, be sure to replace with a new oil seal.**
- **Replace the circlip with a new part.**

3. Insert the drive shaft assembly into the hub spline, and pull it into the specified position.

Caution:

- **Be careful not to damage the spline portion of the drive shaft.**
- **Be careful not to damage the magnetic encoder.**

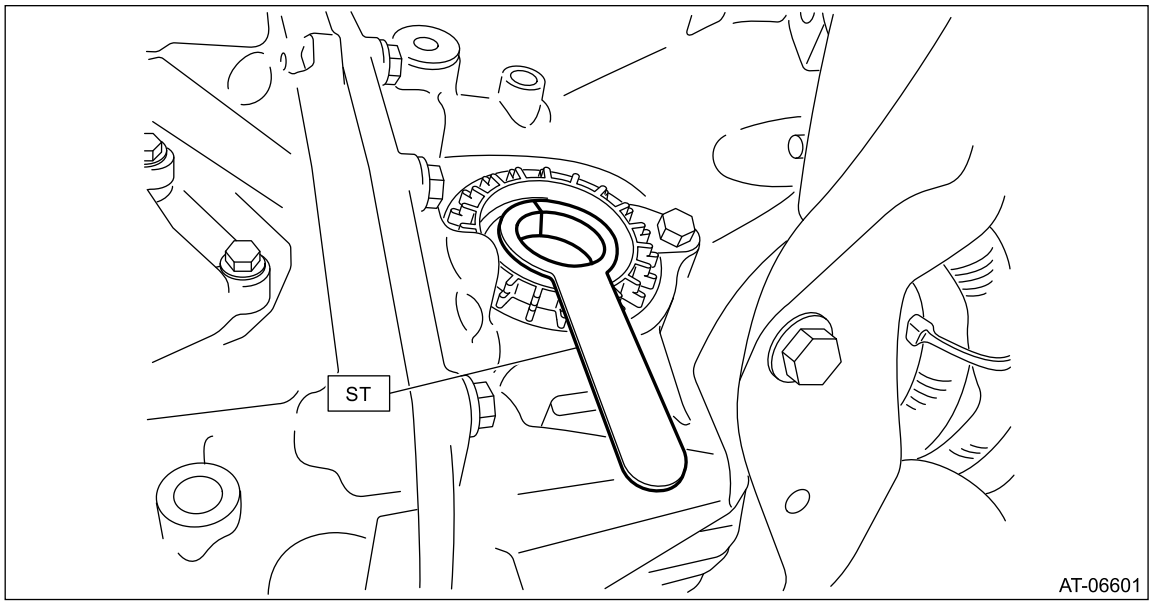
4. Using the ST, install the front drive shaft assembly to the transmission.

Caution:

- **To prevent the front lower arm assembly from damaging the ball joint dust cover, place the ball joint on the upper side of the front lower arm assembly before starting the operation.**
- **Be careful not to damage the front lower arm assembly and ball joint by covering the upper side of the front lower arm assembly with a cloth.**

Preparation tool:

ST: OIL SEAL PROTECTOR (28399SA010)



5. Install the front axle housing to the front lower arm assembly.

Tightening torque:

100 N·m (10.2 kgf-m, 73.8 ft-lb)

6. Tighten the axle nut temporarily.

Caution:

Use new axle nuts.

7. Install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

8. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

9. Install the front ABS wheel speed sensor and clips.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

10. Install the support crossmember rear.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)

11. While pressing the brake pedal, tighten the new axle nuts to the specified torque.

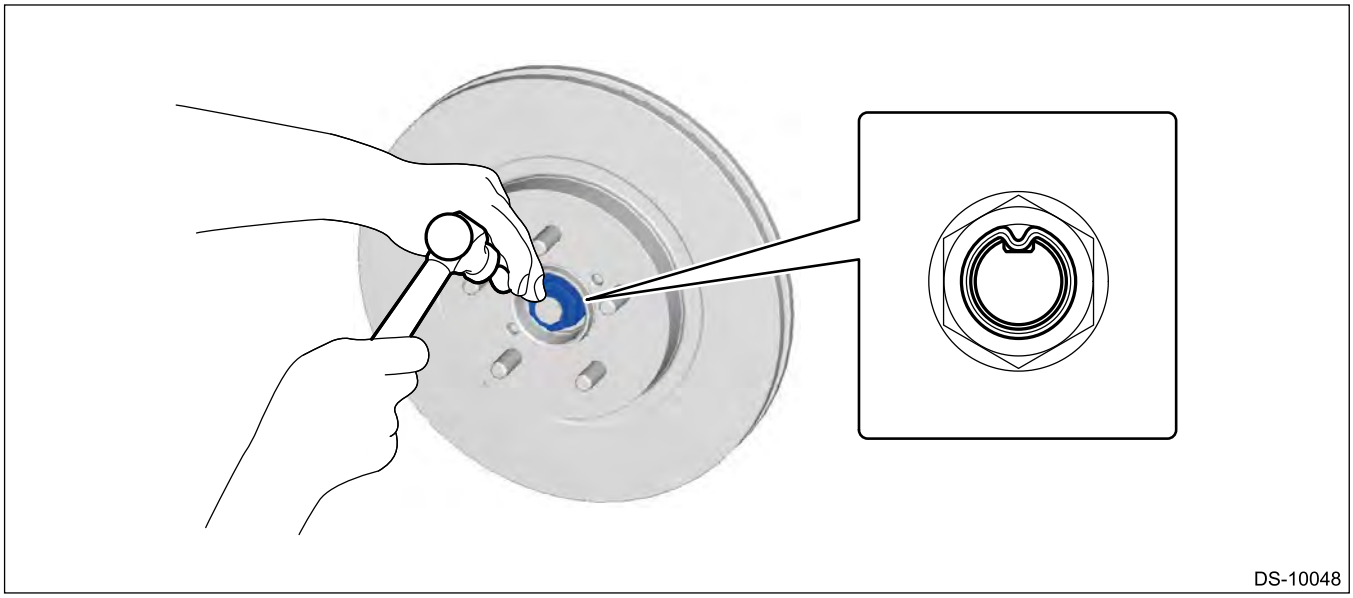
Caution:

Do not load the front axle before tightening the axle nut. Doing so may damage the hub unit bearing.

Tightening torque:

220 N·m (22.4 kgf-m, 162.3 ft-lb)

12. After tightening axle nut, lock it securely.



13. Install the front wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

14. Lower the vehicle.

15. Replace the strut mount CTR self-locking nut, and tighten it using the ST.

Caution:

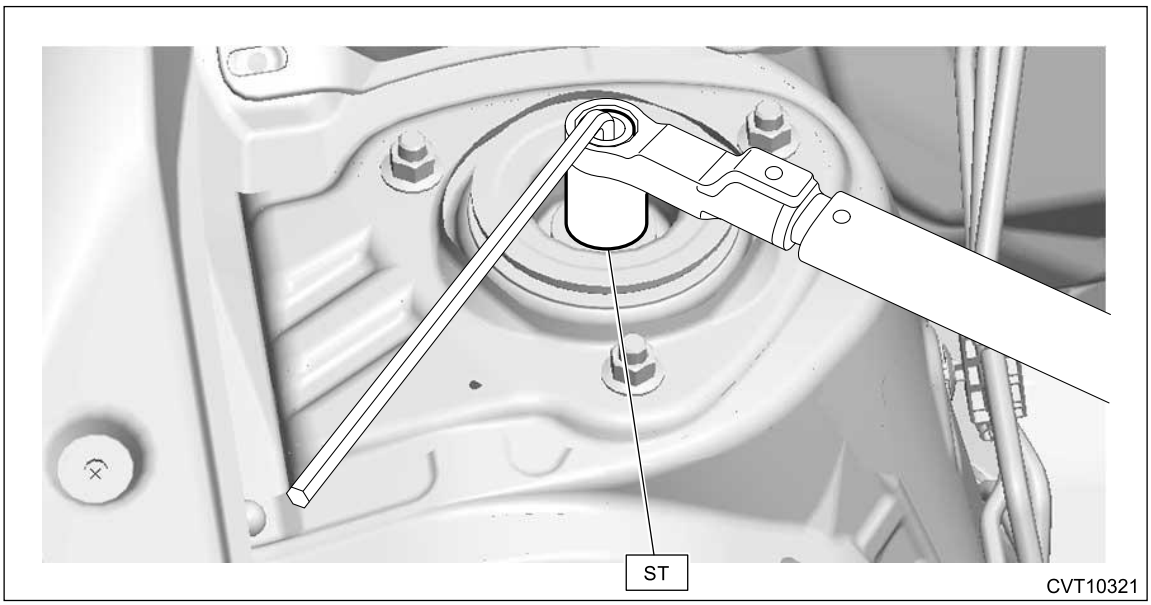
- **Always replace the self-locking nut in the state where the wheels are in full contact with the ground.**
- **Use a new self-locking nut.**

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)

Tightening torque:

55 N·m (5.6 kgf-m, 40.6 ft-lb)



16. Install the strut mount protection cap.

17. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel

Alignment>INSPECTION. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

Caution:

When the wheel alignment has been adjusted, perform the following adjustment.

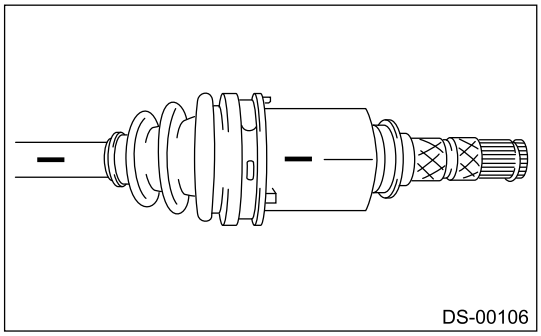
- **Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.**
- **VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.**

18. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

DRIVE SHAFT SYSTEM > Front Drive Shaft

DISASSEMBLY

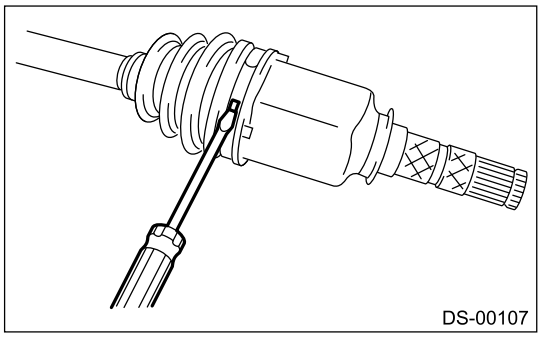
1. Place alignment marks on the shaft and outer race (PTJ).



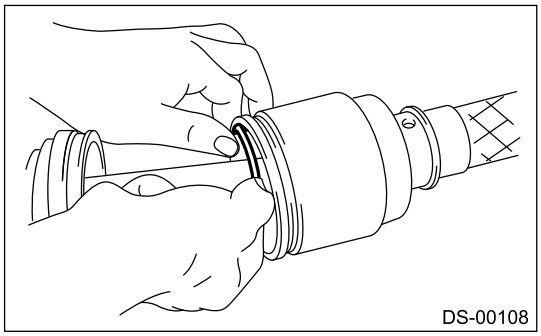
2. Remove the boot band and boot (PTJ).

Caution:

Be careful not to damage the boot.



3. Remove the snap ring from outer race (PTJ).



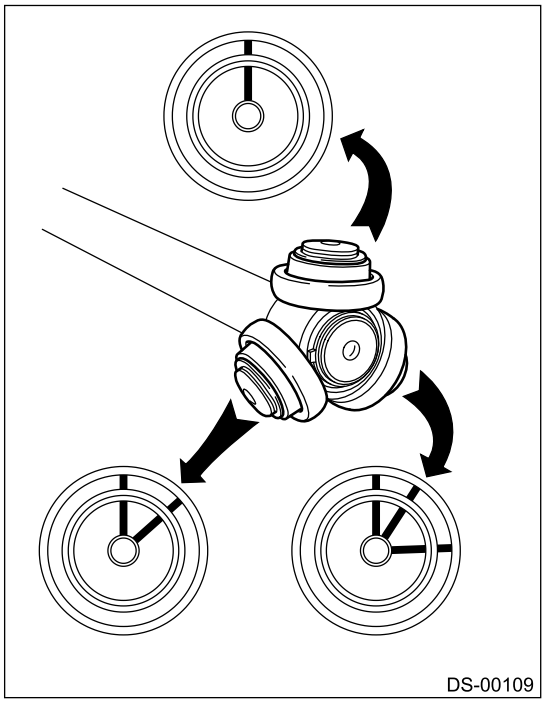
4. Remove the outer race (PTJ) from shaft assembly.

5. Wipe off grease.

Caution:

The grease is a special type of grease. Do not mix with other grease.

6. Place alignment marks on the roller kit and trunnion.

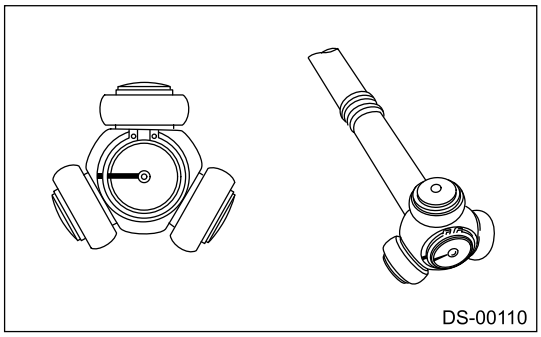


7. Remove the roller kit from trunnion.

Caution:

Be careful with the roller kit position.

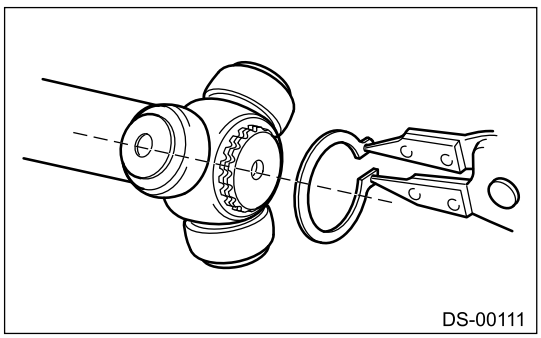
8. Place alignment marks on the trunnion and shaft.



9. Remove the snap ring and trunnion.

Caution:

Be sure to wrap shaft splines with vinyl tape to protect the boot from scratches.



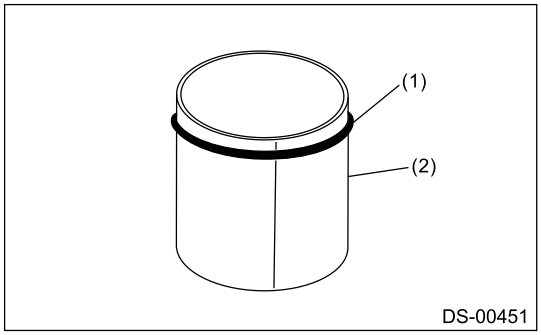
10. Remove the boot (PTJ).
11. Remove the O-ring from the groove of the shaft.

Note:

The EBJ is a non-disassembly part, so the axle disassembly stops here.

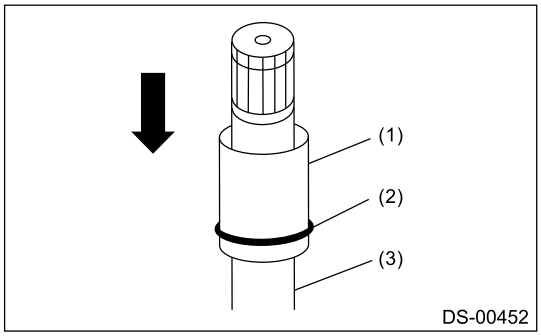
ASSEMBLY

1. Roll up a thick piece of paper to a size where the shaft can pass through, and affix with tape to form a cylinder.
2. Attach a new O-ring on this cylinder.
   Caution:
   - **Always use a new O-ring.**
   - **Be careful that the O-ring does not become scratched and that there are no foreign objects attached to it.**
   - **Make sure to install the O-ring so that it does not twist as much as possible.**
   - **Do not stretch the O-ring to 30 mm (1.18 in) or more in an inner diameter.**



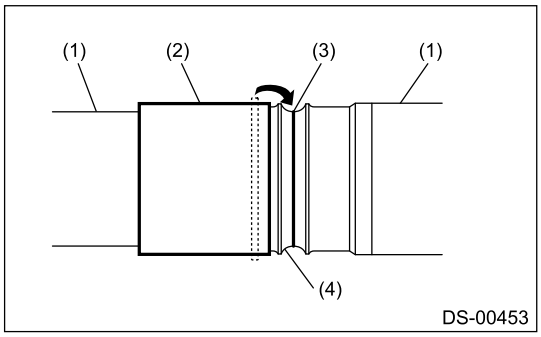
(1) O-ring
(2) Cylinder made with thick paper, etc.

3. Pass the cylinder material onto the shaft, and slide in the direction of the shaft axis.



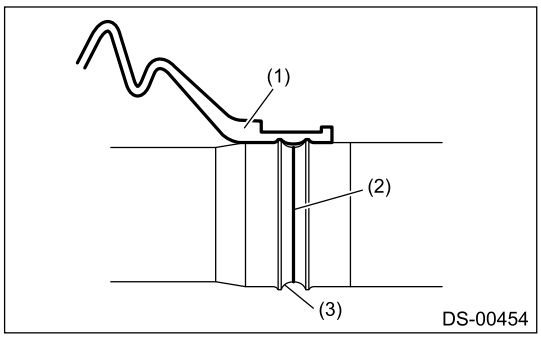
(1) Cylinder material
(2) O-ring
(3) Shaft

4. Clean the shaft boot groove, and wipe off the grease.
5. Slide the cylinder material near the shaft boot groove, and move the O-ring from the cylinder material onto the shaft boot groove.
   Caution:
   - **Attach the O-ring to the shaft boot groove center.**
   - **Be careful that the O-ring does not become scratched and that there are no foreign objects attached to it.**
   - **Make sure to install the O-ring so that it does not twist as much as possible.**
   - **With the O-ring attached, do not wash with kerosene, gasoline, etc.**



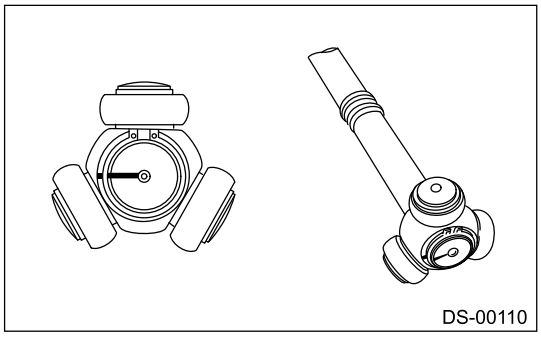
(1) Shaft
(2) Cylinder material
(3) O-ring
(4) Boot groove

6. Pass the small diameter boot band through the shaft.
7. Wrap vinyl tape around the splines of the shaft.
   Caution:
   To prevent damage to the boots, make sure to always wrap with vinyl tape for protection.
8. Install a new boot (PTJ).
   Caution:
   Make sure to fit securely on the boot groove of the shaft.



(1) Boot (PTJ)
(2) O-ring
(3) Boot groove

9. Match the alignment marks, and attach the trunnion onto the shaft.



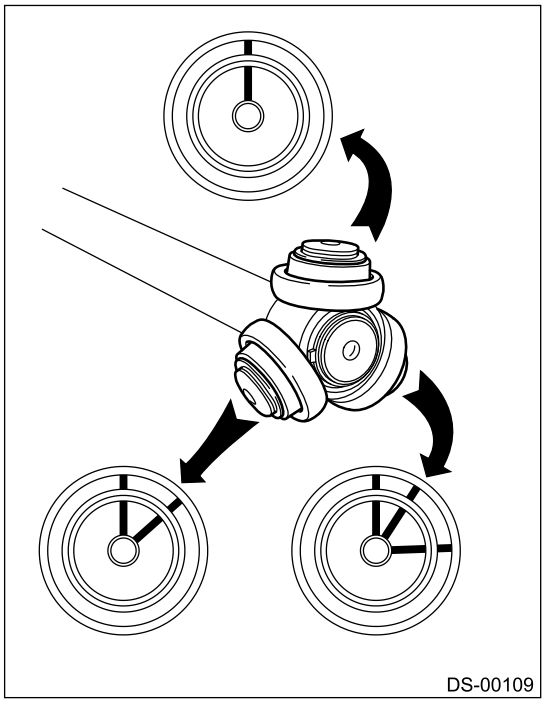
10. Attach the snap ring to the shaft.
    Caution:
    Confirm that the snap ring is completely fitted in the shaft groove.
11. Fill 100 — 110 g (3.53 — 3.88 oz) of specified grease into the interior of the outer race (PTJ).

Grease: Ref. to RECOMMENDED MATERIALS > GREASE.

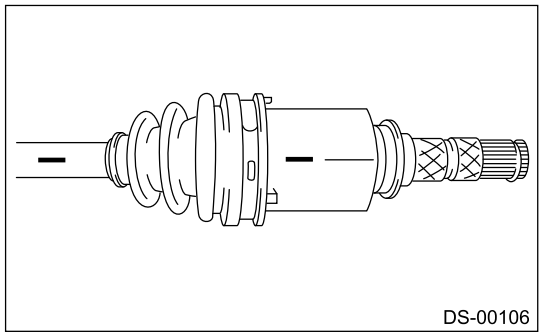
12. Apply a thin coat of specified grease to the roller kit and trunnion.
13. Match the alignment marks of the roller kit and trunnion, and attach the roller kit.

Caution:

Be careful with the roller kit position.



14. Match the alignment marks of the shaft and outer race (PTJ), and attach the outer race (PTJ).



15. Install the snap ring in the groove of the outer race (PTJ).

Caution:

Pull the shaft lightly and make sure that the snap ring is completely fitted in the groove.

16. Apply an even coat of the specified grease at an amount of 30 — 40 g (1.06 — 1.41 oz) on the entire inner surface of boot (PTJ).
17. Attach the boot (PTJ) taking care not to twist it.

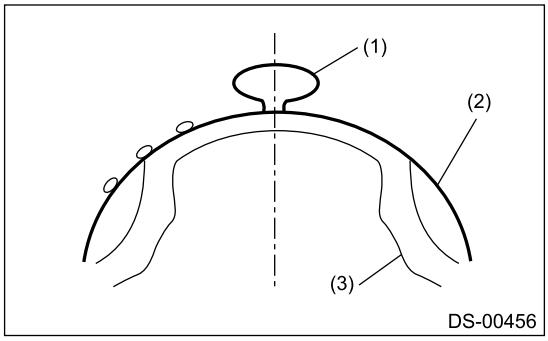
Caution:

- **Clean the large end of boot (PTJ) and the boot groove well, and remove the grease and other substances.**
- **When installing the boot (PTJ), position the outer race (PTJ) at center of the stroke.**

18. Set the new boot band at the specified position.
19. Tighten the boot bands using ST, torque wrench and socket flex handle.

Caution:

The large boot band is to be tightened so that the omega shaped part is at the position indicated in the figure below.



(1) Omega shaped part

(2) Boot band

(3) Outer race (PTJ)

Tightening torque:

Large boot band

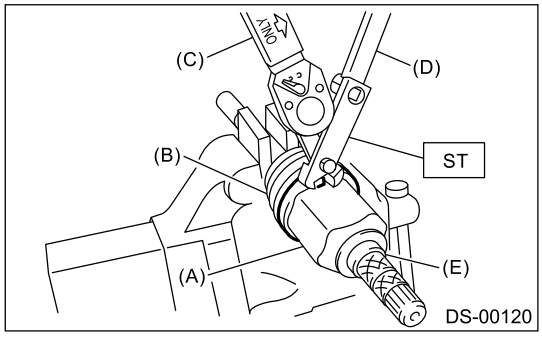
178 N·m (18.2 kgf-m, 131.3 ft-lb)

Small boot band

145 N·m (14.8 kgf-m, 106.9 ft-lb)

Preparation tool:

ST: BOOT BAND PLIER (28099AC000)



(A) Large boot band

(B) Boot (PTJ)

(C) TORQUE WRENCH

(D) Socket flex handle

(E) Outer race (PTJ)

20. Extend and retract the PTJ repeatedly so that grease is spread evenly.

DRIVE SHAFT SYSTEM > Front Drive Shaft

INSPECTION

Check the removed parts for damage, wear, corrosion etc. If faulty, repair or replace.

- **PTJ (pillow tripod joint)**
  Check for seizure, corrosion, damage, wear and excessive play.
- **EBJ (high-efficiency compact ball fixed joint)**
  Check for seizure, corrosion, damage and excessive play.
- **Shaft:**

Check for excessive bending, twisting, damage and wear.

- **Boot:**
  Check for wear, warping, breakage and scratches.
- **Grease:**
  Check for discoloration and fluidity.

REMOVAL

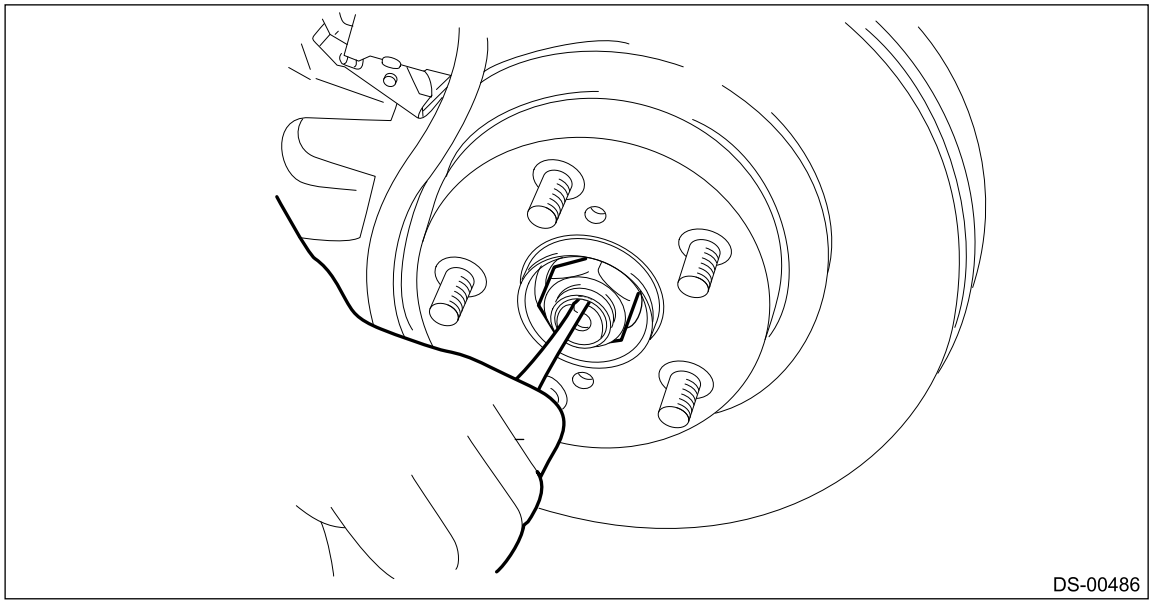
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the axle nut.

   Caution:

   Do not loosen the axle nut while the rear axle is loaded. Doing so may damage the hub unit bearing.

   (1) Lift the crimped section of axle nut.

   (2) Remove the axle nut using a socket wrench while depressing the brake pedal.



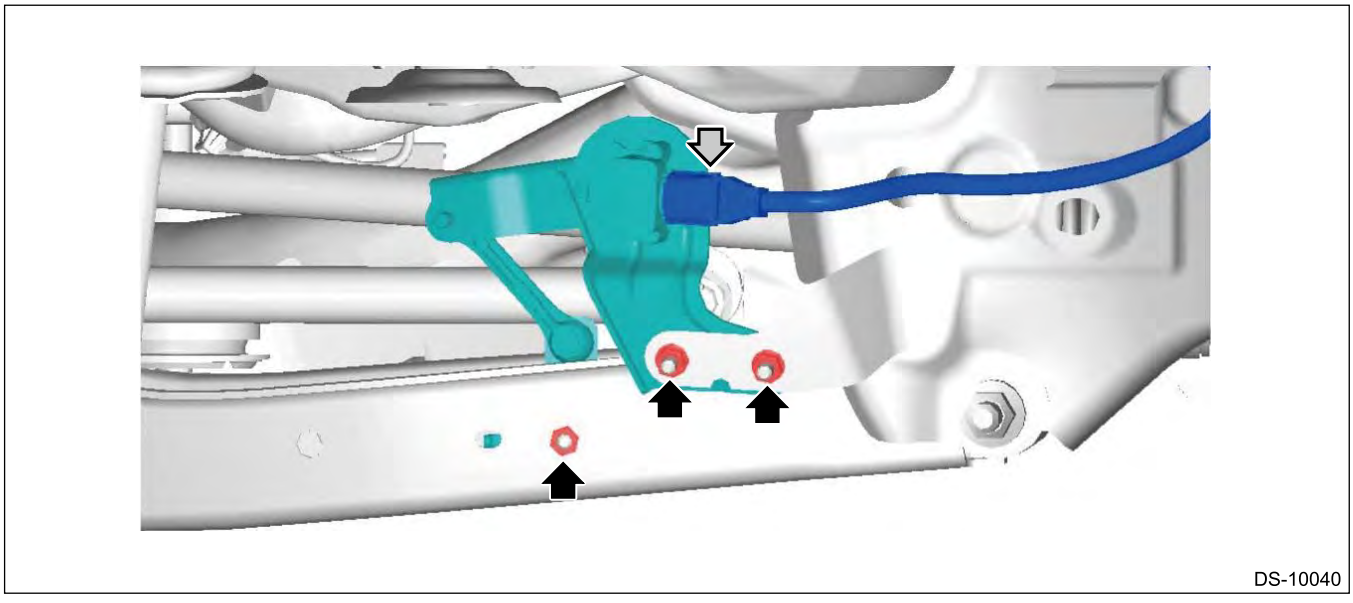
4. Remove the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

   Caution:

   Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

   (1) Disconnect the connector of the sensor assembly - headlight beam leveler.

   (2) Remove the nuts, and remove the sensor assembly - headlight beam leveler.



5. Drain differential gear oil.

6. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.

7. Loosen the joint of rear differential assembly and rear drive shaft assembly.

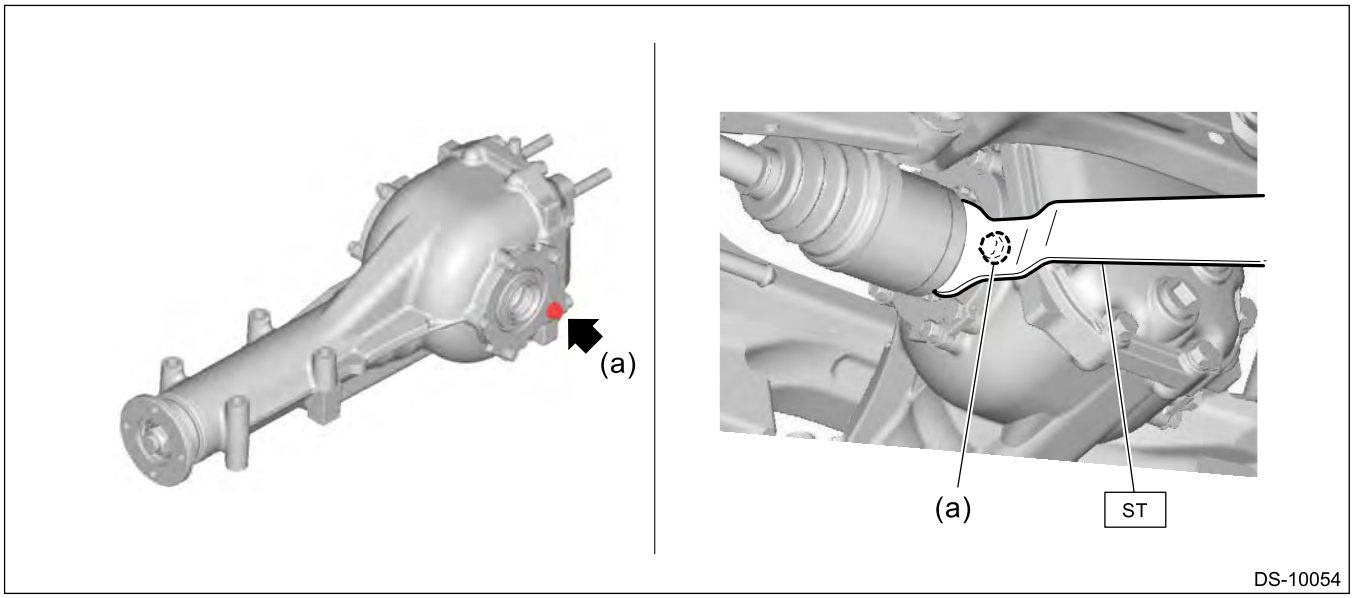
- T type: Pull out the rear drive shaft assembly by fitting the ST to the bolt (a) as shown in the figure.

  Caution:

  Fit the ST to the bolts as shown in the figure to prevent damage of the side bearing retainer.

  Preparation tool:

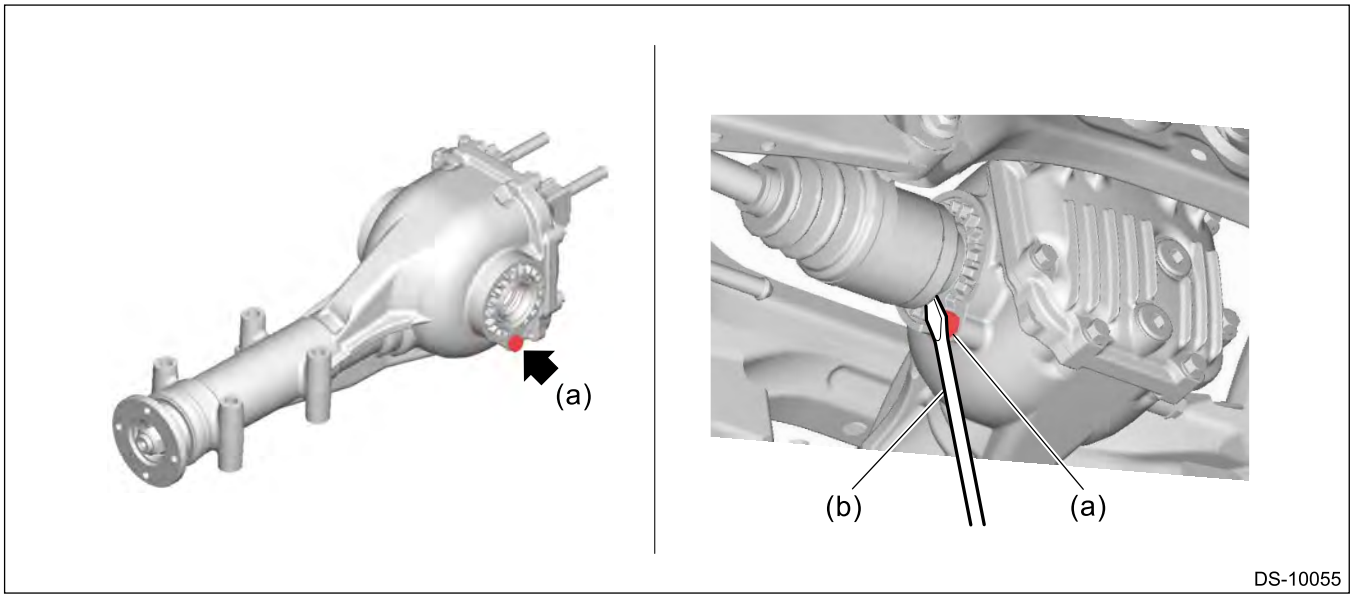
  ST: DRIVE SHAFT REMOVER (28099PA100)



- VA1 type: Pull out the rear drive shaft assembly by fitting the tire lever (b) to the bolt (a) as shown in the figure.

  Caution:

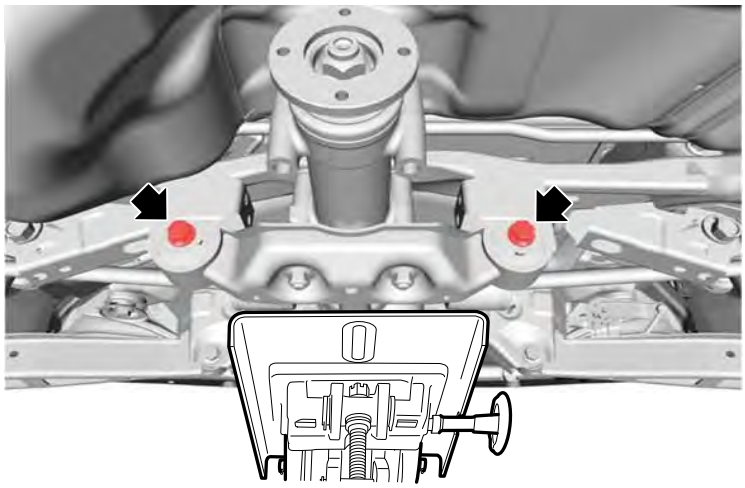
  To prevent damage to the side bearing retainer, use by placing the tire lever against the bolt as shown in the figure.



8. Remove the rear differential assembly.

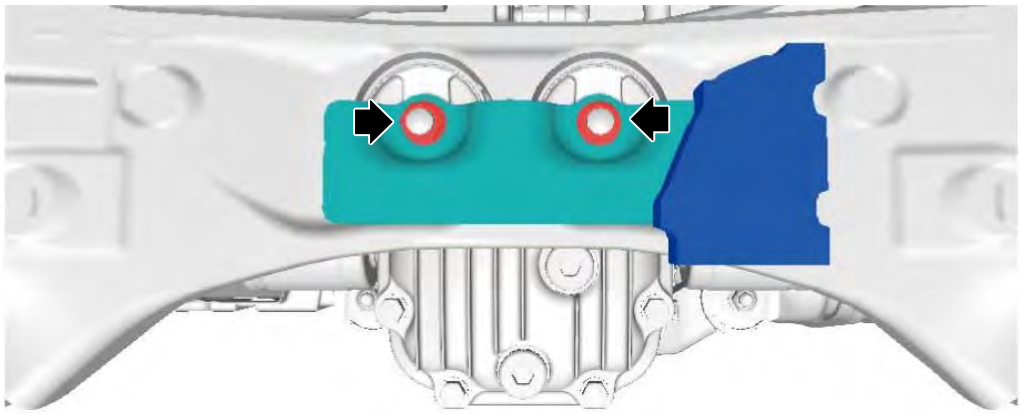
(1) Support the rear differential assembly with a transmission jack.

(2) Remove the bolts which hold the rear differential front member from the rear sub frame assembly.



DS-10056

(3) Remove the self-locking nuts which hold the rear differential to the rear sub frame assembly, and remove the mass damper.

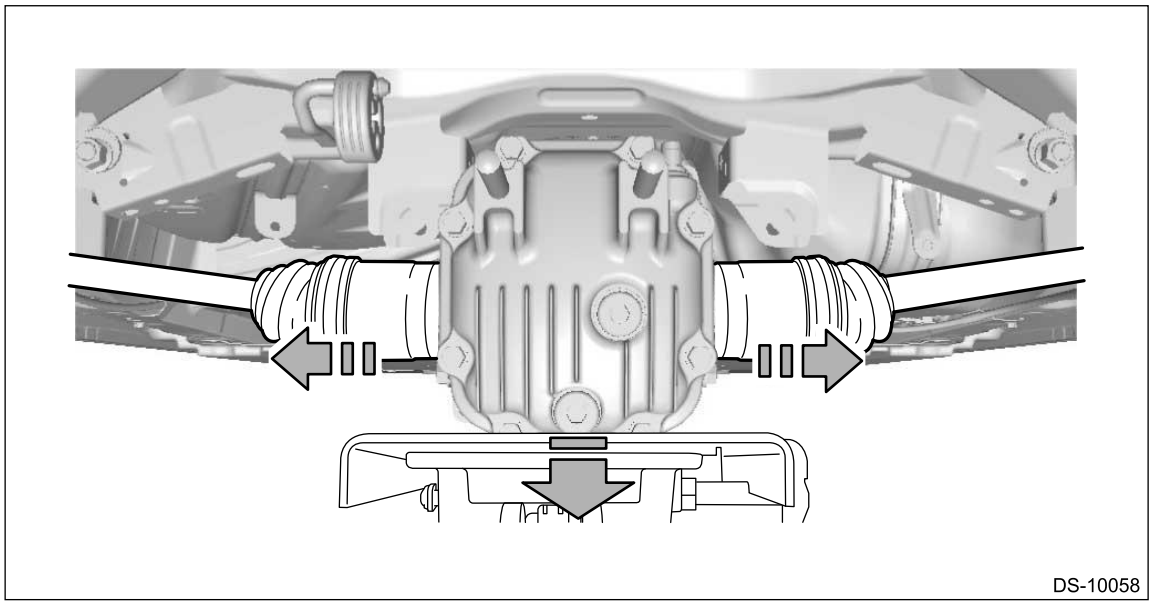


DS-10057

9. Completely pull out the rear drive shaft assembly while lowering the rear differential.

Caution:

Pay attention to avoid damaging the boot of drive shaft.



10. Remove the rear drive shaft assembly from the rear axle housing assembly.

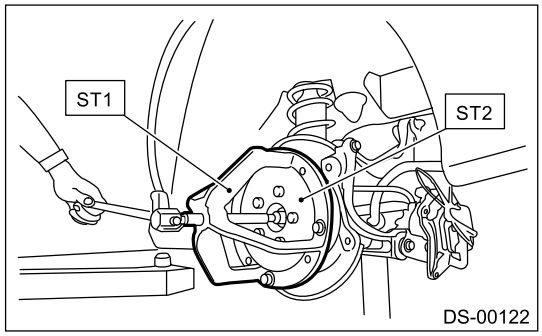
Note:

If it is hard to remove, use the ST.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



DRIVE SHAFT SYSTEM > Rear Drive Shaft

INSTALLATION

1. Replace the rear differential side oil seal. Ref. to DIFFERENTIALS>Rear Differential Side Oil Seal>REPLACEMENT.

Caution:

After pulling out the drive shaft assembly, be sure to replace with a new oil seal.

2. Insert the drive shaft assembly into the rear hub spline, and pull it into the specified position.

Caution:

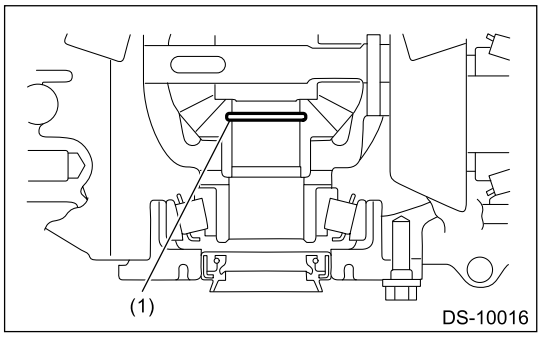
- **Be careful not to damage the spline portion of the drive shaft.**
- **Be careful not to damage the magnetic encoder.**

3. Tighten the axle nut temporarily.

Caution:

Use new axle nuts.

4. Check that circlip is placed on the groove of side gear. (MT model)

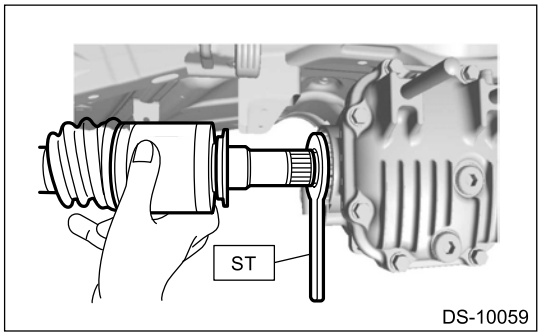


(1) Circlip

5. Using the ST, install the rear drive shaft assembly to the rear differential.

Preparation tool:

ST: OIL SEAL PROTECTOR (28099PA090)

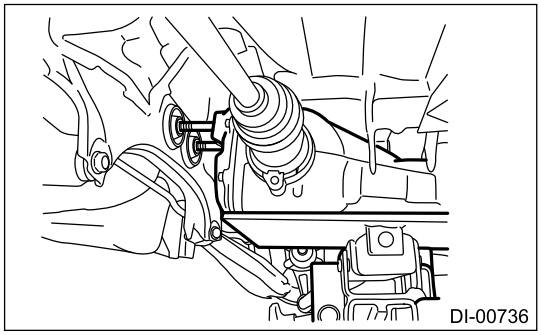


6. Install the rear differential assembly.

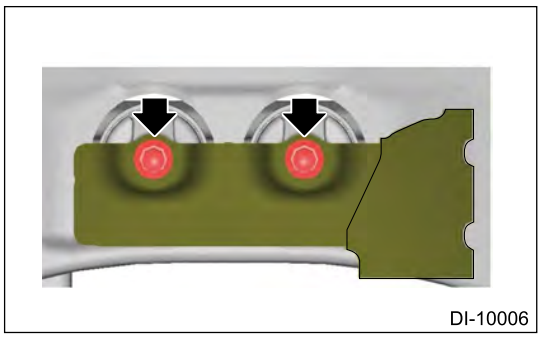
Caution:

Use a new self-locking nut.

(1) Raise the transmission jack and insert the rear differential stud bolt into rear differential mount bushing.

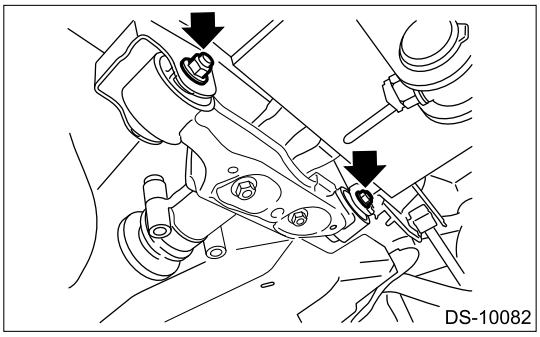


(2) Install the mass damper to the rear differential stud bolt, and temporarily tighten a new self-locking nut.



(3) Install the rear differential front member, and temporarily attach and tighten a new self-locking

nut.



(4) Remove the transmission jack.

(5) Tighten new self-locking nuts.

Tightening torque:

Differential assembly — bushing - differential: 70 N·m (7.1 kgf-m, 51.6 ft-lb)

Differential assembly — rear sub frame assembly: 110 N·m (11.2 kgf-m, 81.1 ft-lb)

7. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

8. Install the sensor assembly - headlight beam leveler. (Model with auto headlight beam leveler)

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

9. While pressing the brake pedal, tighten the new axle nuts to the specified torque.

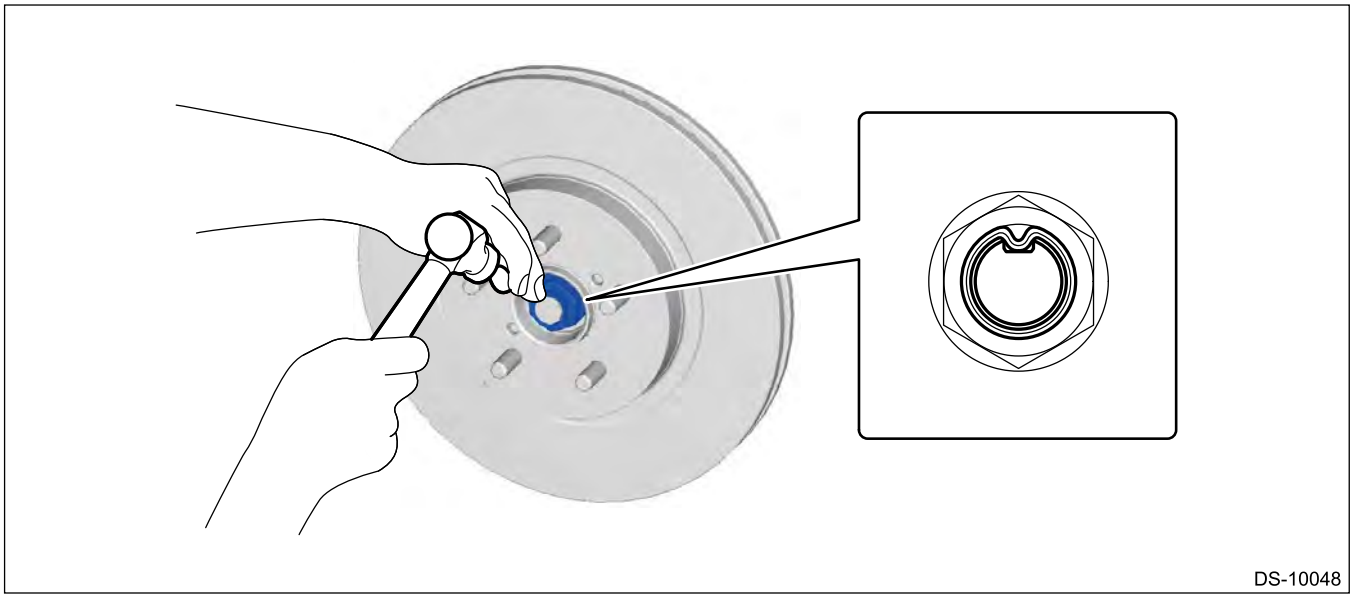
Caution:

Do not load the rear axle before tightening the axle nut. Doing so may damage the hub unit bearing.

Tightening torque:

240 N·m (24.5 kgf-m, 177 ft-lb)

10. Lock the axle nut securely.



11. Fill differential gear oil.

12. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

13. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

14. Perform reinitialization of the auto headlight beam leveler system. (Model with auto headlight beam leveler) Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

DISASSEMBLY

1. Take out the outer race (DOJ) from the shaft assembly.

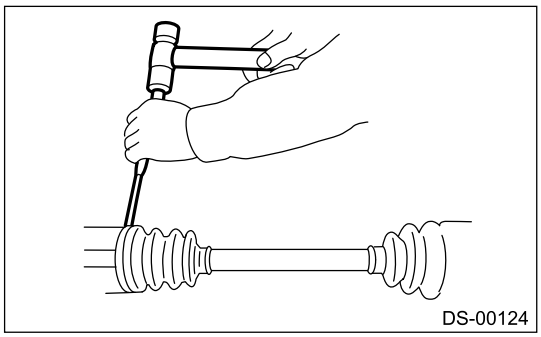
Caution:

Be careful not to damage the boot.

(1) Using a flat tip screwdriver or pliers, loosen the boot band on the large end of boot (DOJ).

Caution:

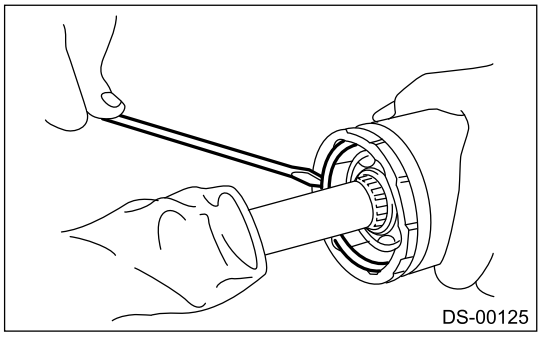
Be careful not to damage the boot.



(2) Remove the boot band on the small end of boot (DOJ) in the same manner.

(3) Remove the large end of boot (DOJ) from outer race (DOJ).

(4) Remove the round snap ring at the neck of outer race (DOJ) with a flat tip screwdriver.



(5) Take out the outer race (DOJ) from the shaft assembly.

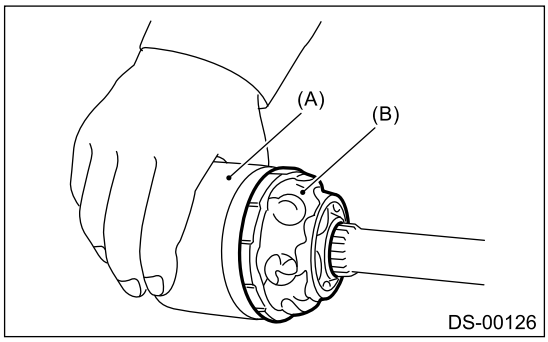
(6) Wipe off the grease and take out the ball bearings.

Caution:

The grease is a special grease (grease for constant velocity joints). Do not mix with other greases.

Note:

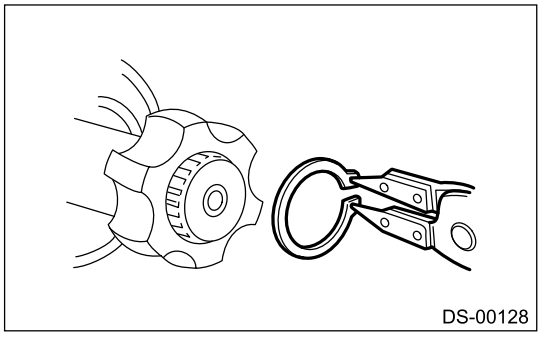
Disassemble the parts taking care not to lose balls.



(A) Outer race (DOJ)

(B) Grease

2. Remove the cage from the inner race.
   (1) Turn the cage by a half pitch to the track groove of inner race and shift the cage.
   (2) Using pliers, remove the snap ring fixing the inner race to the shaft.



   (3) Take out the inner race.
   (4) Take off the cage from shaft and remove the boot (DOJ).

Caution:
Wrap shaft splines with vinyl tape to protect the boot from scratches.

3. Remove the boot (EBJ) using the same procedures as for the boot (DOJ).

Note:
The EBJ is a non-disassembly part, so the drive shaft disassembly stops here.

DRIVE SHAFT SYSTEM > Rear Drive Shaft

ASSEMBLY

1. MT model

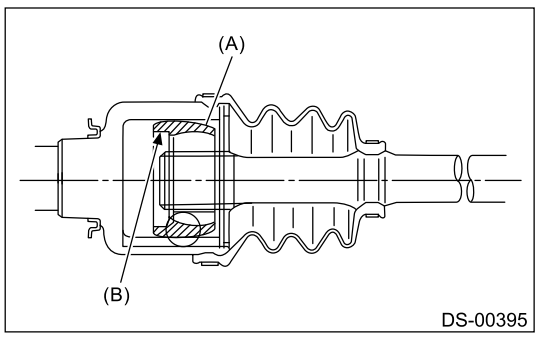
Caution:
Wrap shaft splines with vinyl tape to protect the boot from scratches.

Note:
Use specified grease.

Grease: **Ref. to RECOMMENDED MATERIALS > GREASE.**

1. Install the inner race to the shaft.
   (1) Install the boot (EBJ) to the specified position, and fill it with 50 — 60 g (1.76 — 2.12 oz) of specified grease.
   (2) Place the boot (DOJ) at the center of shaft.
   (3) Insert the cage onto shaft.

Note:
Insert the cage with the cutout portion facing the shaft end, since the cage has an orientation.

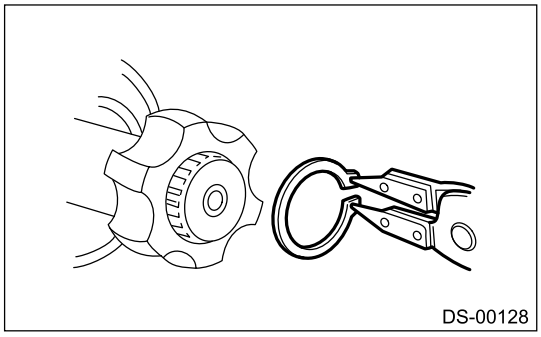


(A) Cage
(B) Cutout portion

(4) Install the inner race on shaft and fix the snap ring in place with pliers.

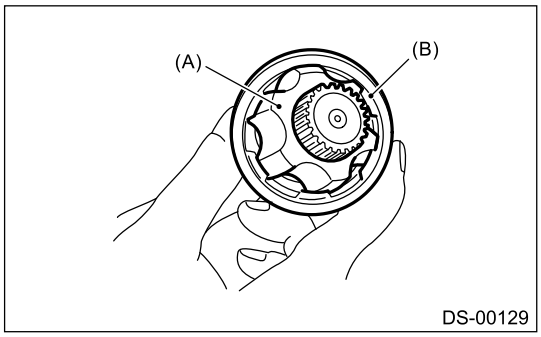
Note:

Confirm that the snap ring is completely fitted in the shaft groove.



2. Install the cage to the inner race.

(1) Install the cage (B) with the protruding section aligned with the track on the inner race (A), and turn by a half pitch.



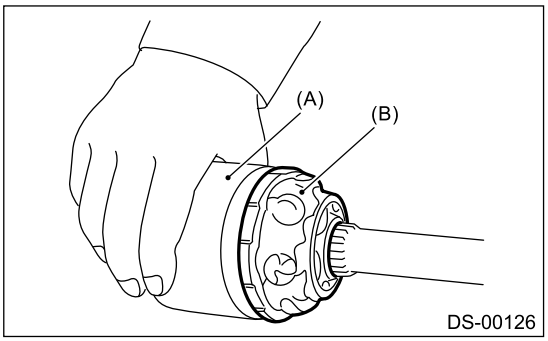
(2) Fill 80 — 90 g (2.82 — 3.17 oz) of specified grease into the interior of the outer race (DOJ).

(3) Apply a thin coat of specified grease to the cage pocket and ball.

(4) Insert the ball bearings into the cage pocket.

3. Connect the shaft assembly to the outer race (DOJ).

(1) Align the outer race (DOJ) track and ball positions, and place the shaft, inner race, cage and balls in the original positions, and then fix outer race (DOJ) in place.



(A) Outer race (DOJ)

(B) Grease

(2) Install the snap ring in the groove on the outer race (DOJ).

Caution:

Be careful of the following items during installation:

- **Make sure that the balls, cage and inner race are completely fitted in the outer race (DOJ).**
- **Use care not to place the matched position of snap ring in the ball groove of outer race (DOJ).**
- **Pull the shaft lightly and assure that the circlip is completely fitted in the groove.**

(3) Apply an even coat of the specified grease at an amount of [20 — 30 g (0.71 — 1.06 oz)] on the entire inner surface of boot (DOJ). Also apply grease to the shaft.

(4) Install the boot (DOJ) taking care not to twist it.

Note:

- **The inside of the large end of boot (DOJ) and the boot groove shall be cleaned so as to be free from grease and other substances.**
- **When installing the boot (DOJ), position the outer race (DOJ) at center of the stroke.**

(5) Put a new boot band through the clip and wind twice in the band groove of the boot (DOJ).

(6) Pinch the end of boot band with pliers. Hold the clip and tighten securely.

Note:

When tightening boot, use care so that the air within the boot is appropriate.

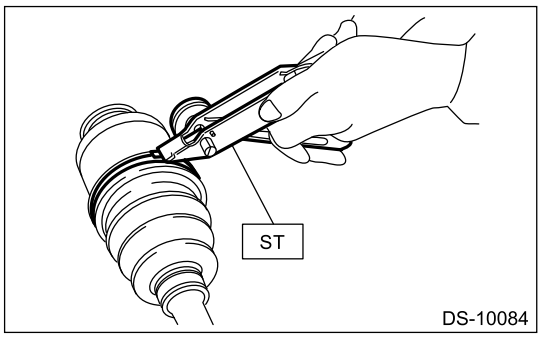
(7) Tighten the boot band using the ST.

Note:

Tighten the boot band until it cannot be moved by hand.

Preparation tool:

ST: BAND TIGHTENING TOOL (925091000)



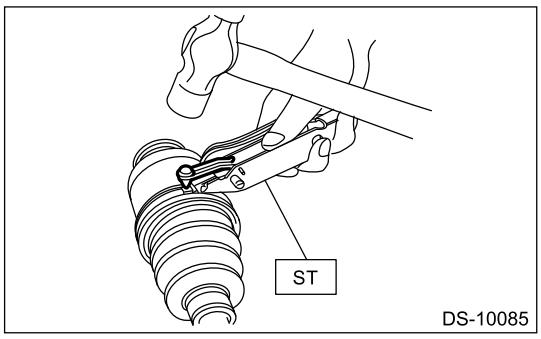
(8) Tap the clip with the punch provided at the end of the ST.

Note:

Tap to an extent that the boot underneath is not damaged.

Preparation tool:

ST: BAND TIGHTENING TOOL (925091000)



(9) Cut off the band with an allowance of about 10 mm (0.39 in) left from the clip and bend this allowance over the clip.

Caution:

Make sure that the end of the boot band is in close contact with clip.

4. Install the boot band to the boot (EBJ) using the same procedures as for the boot (DOJ).
5. Extend and retract the DOJ repeatedly to provide an equal coating of grease.

2. CVT MODEL

Caution:

Wrap shaft splines with vinyl tape to protect the boot from scratches.

Note:

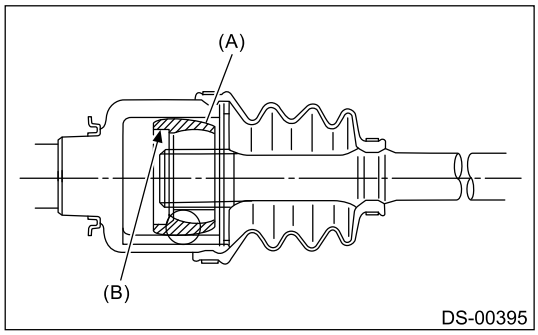
Use specified grease.

Grease: **Ref. to RECOMMENDED MATERIALS > GREASE.**

1. Install the inner race to the shaft.
   (1) Install the boot (EBJ) to the specified position, and fill it with 50 — 60 g (1.76 — 2.12 oz) of specified grease.
   (2) Place the boot (DOJ) at the center of shaft.
   (3) Insert the cage onto shaft.

   Note:

   Insert the cage with the cutout portion facing the shaft end, since the cage has an orientation.

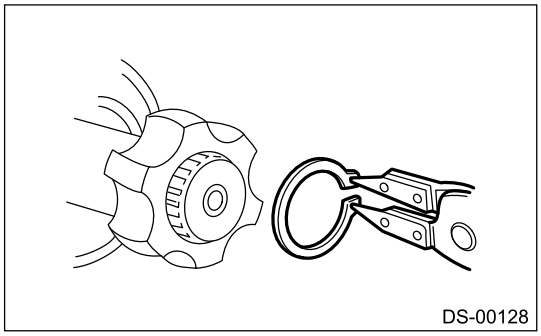


(A) Cage
(B) Cutout portion

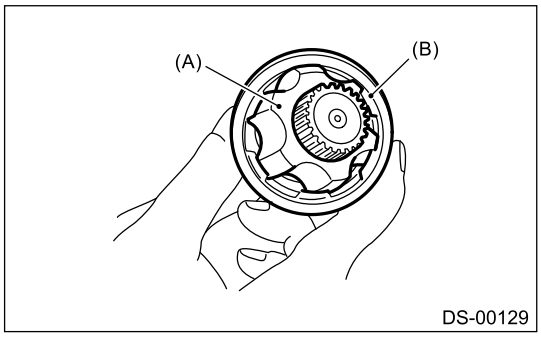
   (4) Install the inner race on shaft and fix the snap ring in place with pliers.

   Note:

   Confirm that the snap ring is completely fitted in the shaft groove.



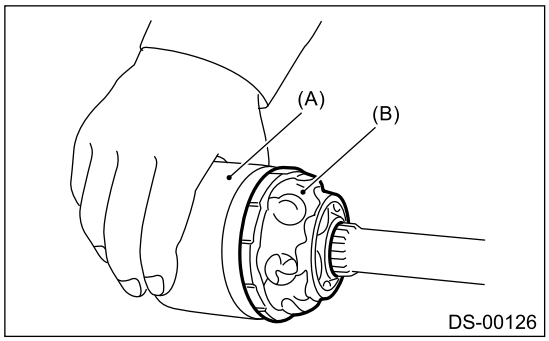
2. Install the cage to the inner race.
   (1) Install the cage (B) with the protruding section aligned with the track on the inner race (A), and turn by a half pitch.



(2) Fill 80 — 90 g (2.82 — 3.17 oz) of specified grease into the interior of the outer race (DOJ).
(3) Apply a thin coat of specified grease to the cage pocket and ball.
(4) Insert the ball bearings into the cage pocket.

3. Connect the shaft assembly to the outer race (DOJ).

(1) Align the outer race (DOJ) track and ball positions, and place the shaft, inner race, cage and balls in the original positions, and then fix outer race (DOJ) in place.



(A) Outer race (DOJ)
(B) Grease

(2) Install the snap ring in the groove on the outer race (DOJ).

Caution:

Be careful of the following items during installation:

- **Make sure that the balls, cage and inner race are completely fitted in the outer race (DOJ).**
- **Use care not to place the matched position of snap ring in the ball groove of outer race (DOJ).**
- **Pull the shaft lightly and assure that the circlip is completely fitted in the groove.**

(3) Apply an even coat of the specified grease at an amount of [20 — 30 g (0.71 — 1.06 oz)] on the entire inner surface of boot (DOJ). Also apply grease to the shaft.

(4) Install the boot (DOJ) taking care not to twist it.

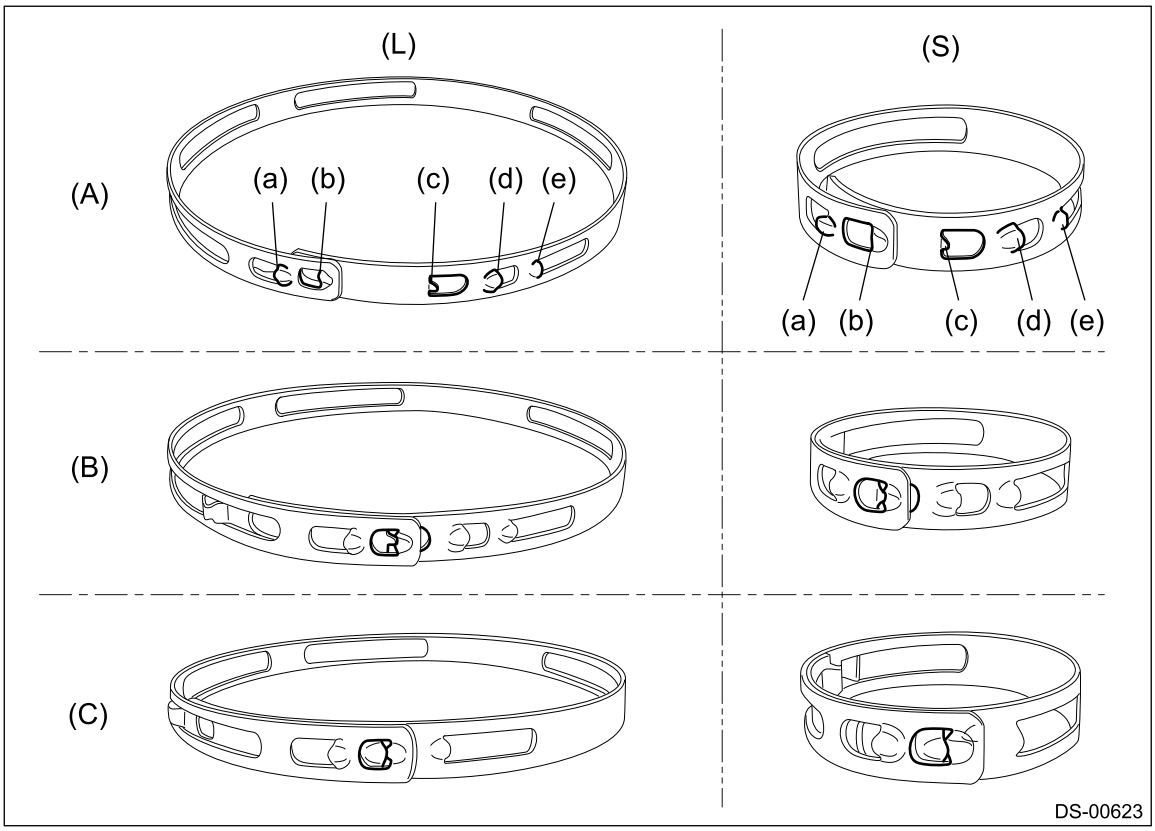
Note:

- **The inside of the large end of boot (DOJ) and the boot groove shall be cleaned so as to be free from grease and other substances.**
- **When installing the boot (DOJ), position the outer race (DOJ) at center of the stroke.**

(5)Prepare a new boot band, pinch (a) and (e) of the boot band with needle nose pliers, and align it with the groove of the boot (DOJ).

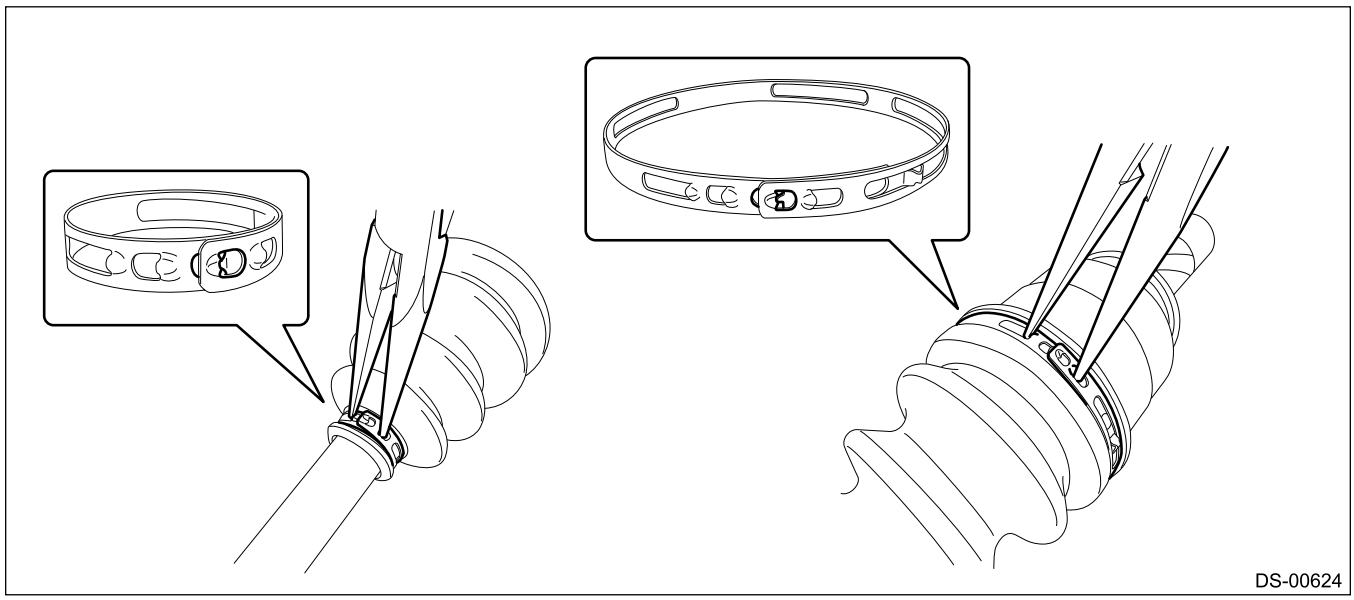
Caution:

- **Be careful not to damage the boot.**
- **When tightening boot, use care so that the air within the boot is appropriate.**



(L) Boot band for large diameter
(S) Boot band for small diameter
(A) Free position
(B) Temporarily tightening position
(C) Fully tightening position
(a) Holding portion using pliers
(c) Convex claw for temporarily tightening position
(e) Holding portion using pliers
(b) Concave claw
(d) Convex claw

(6) Pinch (a) and (e) of the boot band with needle nose pliers, and align the concave claw (b) with the convex claw (c) for temporarily tightening position.



(7) Check the positions of the boot (DOJ) and boot band, align the concave claw (b) with the convex claw (d), and tighten the boot band.

4. Install the boot band to the boot (EBJ) using the same procedures as for the boot (DOJ).

5. Extend and retract the DOJ repeatedly to provide an equal coating of grease.

INSPECTION

Check the removed parts for damage, wear, corrosion etc. Repair or replace if defective.

- **DOJ (Double Offset Joint):**
  Check for seizure, corrosion, damage, wear and excessive play.
- **EBJ (High-Efficiency Compact Ball Fixed Joint):**
  Check for seizure, corrosion, damage and excessive play.
- **Shaft:**
  Check for excessive bending, twisting, damage and wear.
- **Boot:**
  Check for wear, warping, breakage and scratches.
- **Grease:**
  Check for discoloration and fluidity.

INSPECTION

Note:

Vibration while cruising may be caused by an unbalanced tire, improper tire inflation pressure, improper wheel alignment, etc.

Symptoms	Possible cause	Corrective action
Noise or vibration from propeller shaft	• Center bearing • Runout of propeller shaft • Loose or gap at connections	Inspect the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSPECTION.
Abnormal wheel vibration	Wheel is out of balance.	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Front wheel alignment	Check the front wheel alignment. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.
	Rear wheel alignment	Check the rear wheel alignment. Ref. to REAR SUSPENSION>Wheel Alignment>INSPECTION.
	Front strut	Check the front strut. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
	Rear shock absorber	Check the rear shock absorber. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.
	Front drive shaft	Check the front drive shaft. Ref. to DRIVE SHAFT SYSTEM>Front Drive Shaft>INSPECTION.
	Rear drive shaft	Check the rear drive shaft. Ref. to DRIVE SHAFT SYSTEM>Rear Drive Shaft>INSPECTION.
	Front hub unit bearing	Check the front hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
	Rear hub unit bearing	Check the rear hub unit bearing. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
Noise from the underbody	Wheel is out of balance.	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	Front wheel alignment	Check the front wheel alignment. Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.

Symptoms	Possible cause	Corrective action
	Rear wheel alignment	Check the rear wheel alignment. Ref. to REAR SUSPENSION>Wheel Alignment>INSPECTION.
	Front strut	Check the front strut. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
	Rear shock absorber	Check the rear shock absorber. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.

TRANSFER CASE

TC

1. General Description
2. Transfer Case and Extension Case Assembly
3. Transfer Clutch
4. Extension Case
5. Oil Seal
6. Transfer Drive Gear
7. Transfer Driven Gear
8. Reduction Drive Gear
9. Reduction Driven Gear
10. Center Differential
11. Transfer Clutch Pressure Test

NOTE

For general description, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section or “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section.
Model with continuously variable transmission (TR580):
Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description.
Model with manual transmission and differential (5MT):
Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>General Description.

NOTE

For removal, installation and inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section or “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section.
Model with continuously variable transmission (TR580):
Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case Oil Seal.
Model with manual transmission and differential (5MT):
Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Oil Seal.

NOTE

For removal, installation and inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Drive Gear.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section or “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section.
Model with continuously variable transmission (TR580):
Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear.
Model with manual transmission and differential (5MT):
Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Driven Gear.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear.

NOTE

For removal, installation and inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear.

NOTE

For removal, installation and inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL (5MT)” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Center Differential.

NOTE

For inspection, refer to “CONTINUOUSLY VARIABLE TRANSMISSION (TR580)” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch Pressure Test.

BRAKE

BR

1. General Description
2. Front Brake Pad
3. Front Disc Rotor
4. Front Disc Brake Assembly
5. Rear Brake Pad
6. Rear Disc Rotor
7. Rear Disc Brake Assembly
8. Master Cylinder
9. Brake Booster
10. Brake Fluid
11. Air Bleeding
12. Brake Hose
13. Brake Pipe
14. Brake Pedal
15. Stop Light Switch
16. Brake Vacuum Pump
17. General Diagnostic Table

SPECIFICATION

Note:

Refer to "PARKING BRAKE" for parking brake specifications. Ref. to PARKING BRAKE>General Description>SPECIFICATION.

1. FRONT DISC BRAKE

Item			Specification	
Size			15-inch type	16-inch
Type			Floating 2-POT piston type Ventilated disc	
Effective cylinder diameter	mm (in)		40.4× 2 (1.591 × 0.079)	
Pad dimension (Length × Width × Thickness)	mm (in)		117.8 × 50.5× 11 (4.638 × 1.988 × 0.433)	
Pad thickness	mm (in)	Standard	11 (0.43)	
		Limit	1.5 (0.059)	
Effective disc diameter	mm (in)		228 (8.98)	244 (9.61)
Rotor dimension (O.D. × Thickness)	mm (in)		24 × 277 (0.9 × 10.91)	24 × 294 (0.9 × 11.57)
Disc thickness	mm (in)	Standard	24 (0.94)	
		Limit	22 (0.87)	
Disc runout	mm (in)	Standard	–	
		Limit	0.05 (0.002)	
Clearance adjustment			Automatic adjustment	

2. REAR DISC BRAKE

Item			Specification
Size			15-inch type
Type			Floating 1-POT piston type Solid disc
Effective cylinder diameter	mm (in)		38.1 (1.5)
Pad dimension (Length × Width × Thickness)	mm (in)		92 × 33 × 9 (3.622 × 1.299 × 0.354)
Pad thickness	mm (in)	Standard	9 (0.354)
		Limit	1.5 (0.059)
Effective disc diameter	mm (in)		238 (9.37)
Rotor dimension (O.D. × Thickness)	mm (in)		274 × 10 (10.79 × 0.39)
Disc thickness	mm (in)	Standard	10 (0.39)
		Limit	8.5 (0.335)
Disc runout	mm (in)	Standard	–
		Limit	0.05 (0.002)
Clearance adjustment			Automatic adjustment

3. MASTER CYLINDER

Item		Specification
Type		Tandem
Effective diameter	mm (in)	23.8 (0.94)
Reservoir type		Sealed type
Brake fluid reservoir capacity	cm^3 (cu in)	250 (15.26)

4. BRAKE BOOSTER

Item	Specification
Type	Vacuum suspended

Item		Specification	
Effective diameter	mm (in)	215 + 227 (8.46+8.93)	
Brake fluid pressure		Brake pedal force N (kgf, lbf)	Fluid pressure kPa (kgf/cm^2, psi)
When engine is stopped		147 (15, 33)	512 (5.23, 74.38)
		294 (30, 66)	1,530 (15.6, 222)
When engine is running and vacuum pressure is at 93 kPa (697 mmHg, 27.47 inHg)		147 (15, 33)	7,468 (76.1, 1,082)
		294 (30, 66)	14,808 (151, 2,148)

5. BRAKE LINE, BRAKE PEDAL AND BRAKE FLUID

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **When refilling brake fluid, do not allow dirt or dust to get into the reservoir tank.**
- **Always use new SUBARU genuine brake fluid when replacing or refilling the fluid. Do not reuse drained brake fluid.**

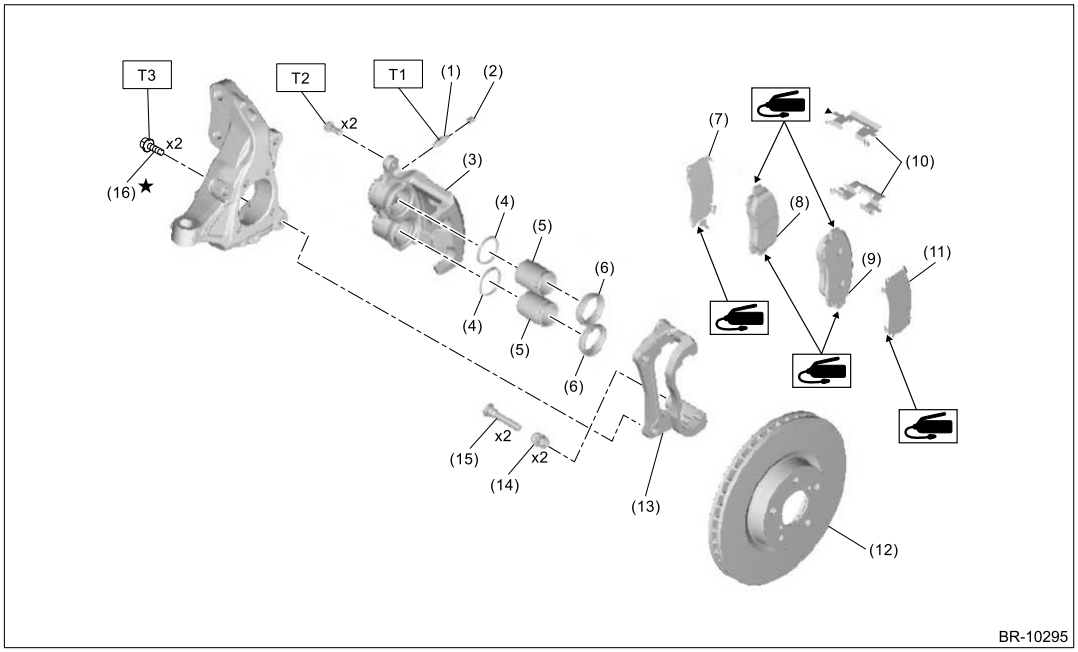
Item		Specification
Brake line		Dual circuit system
Brake pedal	Type	Suspended type
	Free play mm (in)	0.5 — 2.7 (0.02 — 0.11) [When pulling the brake pedal upward with a force of less than 10 N (1 kgf, 2 lbf)]
Brake fluid		FMVSS No. 116, DOT3 or DOT4

BRAKE > General Description

COMPONENT

1. FRONT DISC BRAKE

- 15-inch model



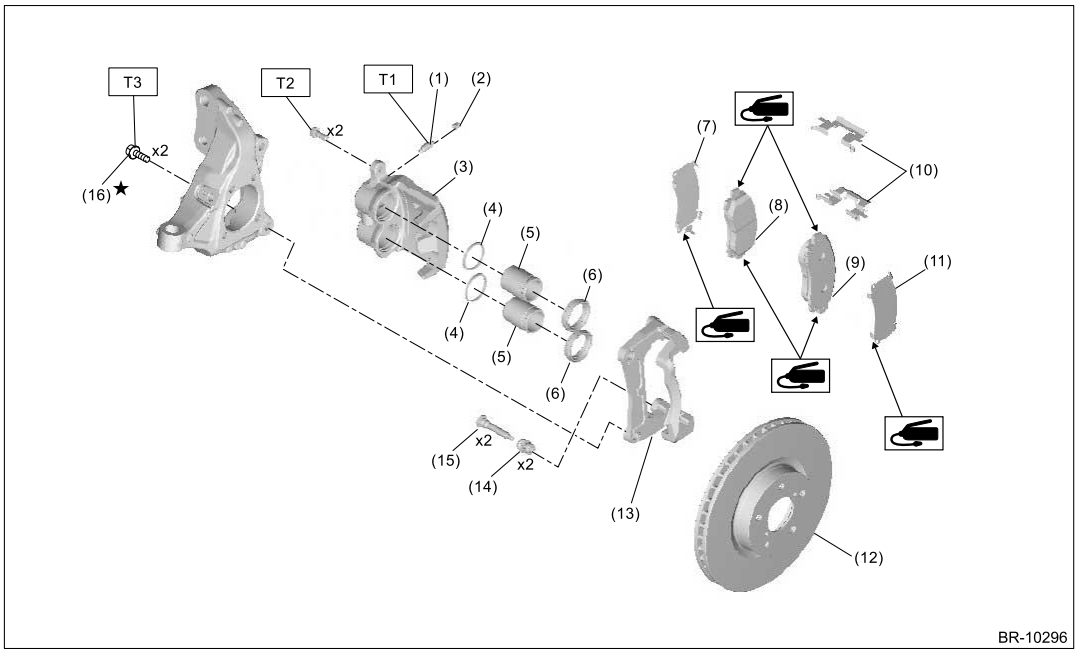
(1) Bleeder - screw
(2) Cap - bleeder
(3) Caliper body
(4) Piston seal
(5) Piston - disc brake
(6) Piston boot
(8) Pad - disc brake front inner
(9) Pad - disc brake front outer
(10) Pad clip - front brake
(11) Shim - disc brake front outer
(12) Disc rotor (ventilated type)
(13) Support - front disc brake
(15) Guide pin - front brake
(16) Mounting bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 27 (2.8, 19.9)

(7) Shim - disc brake front inner (14) Pin boot ***T3: 120 (12.2, 88.5)***

- 16-inch model

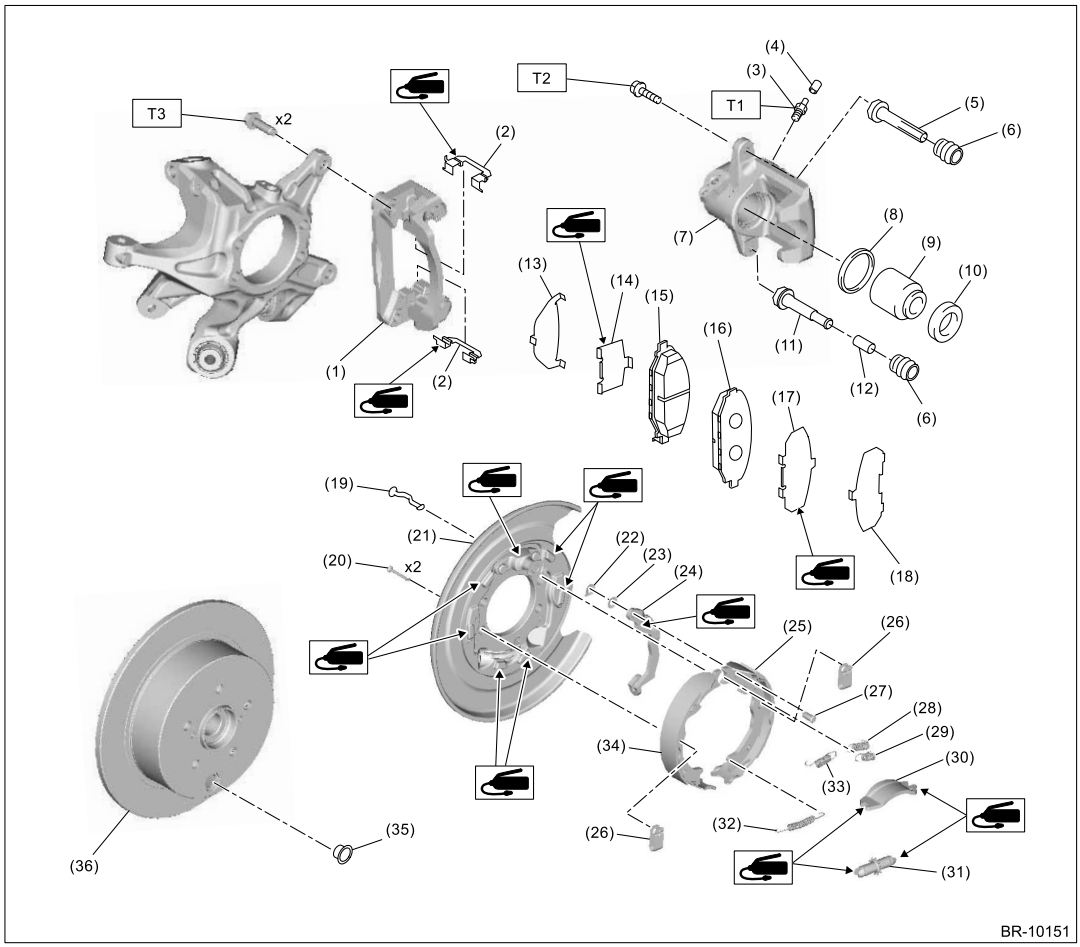


(1) Bleeder - screw
(2) Cap - bleeder
(3) Caliper body
(4) Piston seal
(5) Piston - disc brake
(6) Piston boot
(7) Shim - disc brake front inner
(8) Pad - disc brake front inner
(9) Pad - disc brake front outer
(10) Pad clip - front brake
(11) Shim - disc brake front outer
(12) Disc rotor (ventilated type)
(13) Support - front disc brake
(14) Pin boot
(15) Guide pin - front brake
(16) Mounting bolt

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8 (0.8, 5.9)
T2: 27 (2.8, 19.9)
T3: 120 (12.2, 88.5)

2. REAR DISC BRAKE

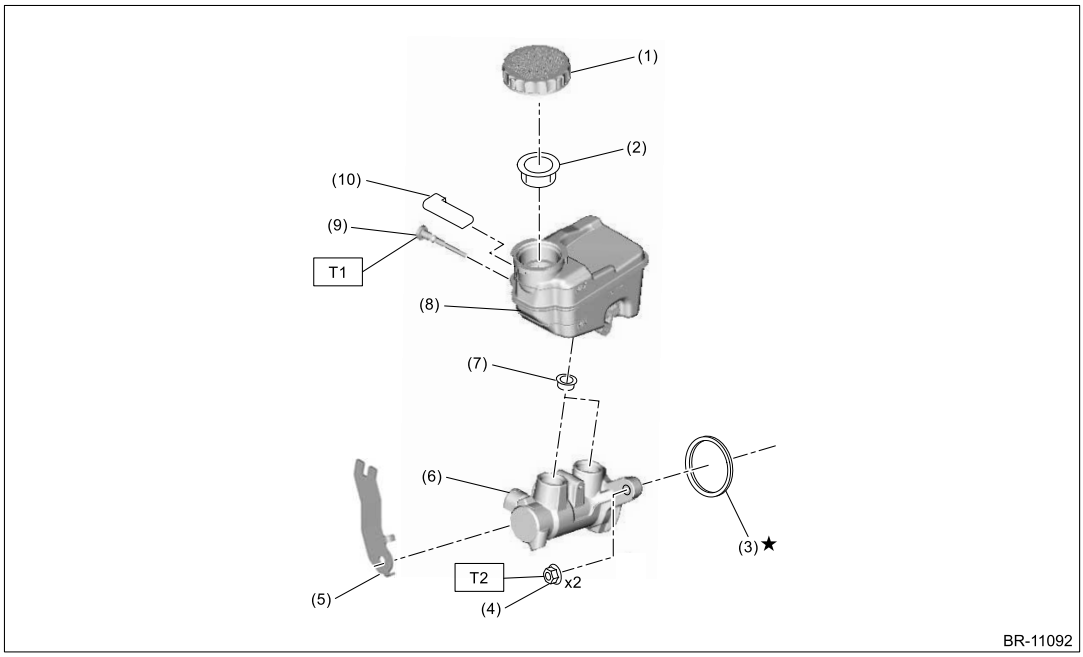


(1) Support - rear disc brake
(2) Pad clip - rear brake
(3) Bleeder - screw
(4) Cap - bleeder
(5) Guide pin - rear brake (black)
(6) Pin boot
(7) Caliper body
(8) Piston seal
(9) Piston - disc brake
(10) Piston boot
(11) Lock pin - rear brake (silver)
(12) Lock pin - bushing
(13) Shim - disc brake rear outer
(14) Shim - disc brake rear inner
(15) Pad - disc brake rear inner
(16) Pad - disc brake rear outer
(17) Shim - disc brake rear inner
(18) Shim - disc brake rear outer
(19) Pin - secondary shoe hold-down
(20) Pin - primary shoe hold-down
(21) Back plate - rear brake
(22) Retainer - rear brake
(23) Spring washer - rear brake
(24) Parking lever - rear
(25) Parking brake shoe (secondary)
(26) Cup - shoe hold-down
(27) Pin - parking lever
(28) Spring - secondary shoe return
(29) Spring - strut
(30) Strut - brake
(31) Adjuster ASSY - rear brake
(32) Spring - adjuster
(33) Spring - primary shoe return
(34) Parking brake shoe (primary)
(35) Adjusting hole cover
(36) Disc rotor (solid type)

Tightening torque: N·m (kgf-m, ft-lb)

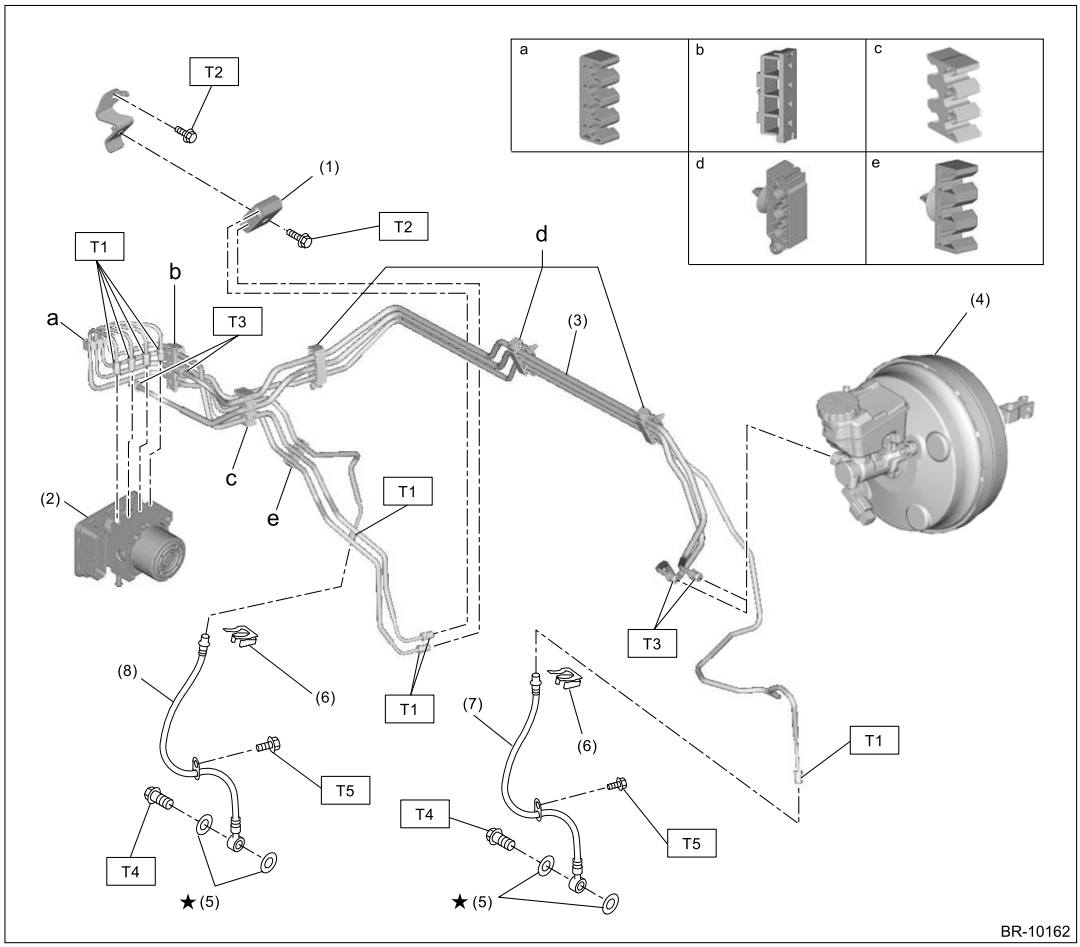
T1: 8 (0.8, 5.9)
T2: 27 (2.8, 19.9)
T3: 66 (6.7, 48.7)

3. MASTER CYLINDER



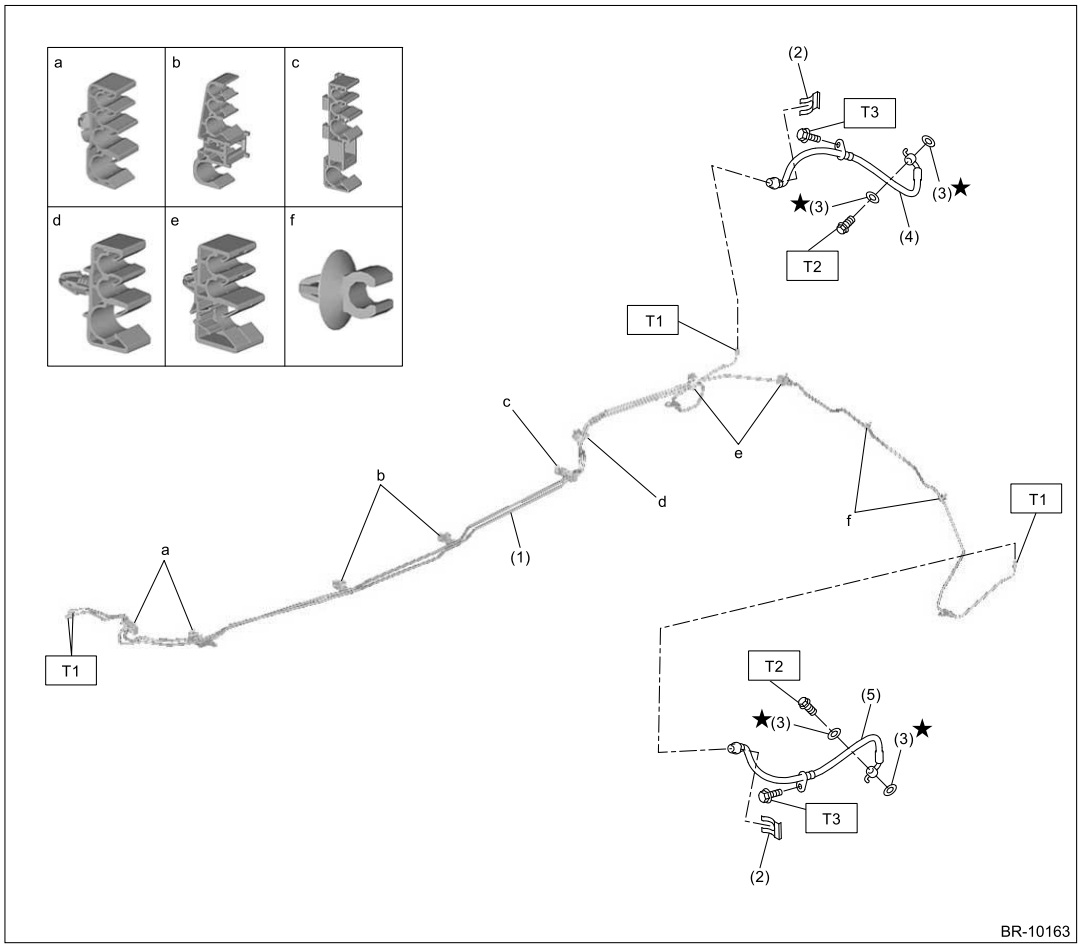
(1) Cap - reservoir tank	(6) Cylinder body ASSY	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Filter - master cylinder	(7) Seal	***T1: 5.5 (0.6, 4.1)***
(3) Ring seal	(8) Reservoir tank	***T2: 25 (2.5, 18.4)***
(4) Nut	(9) Pin	
(5) Bracket - master cylinder	(10) Level - indicator	

4. FRONT BRAKE PIPES AND HOSES



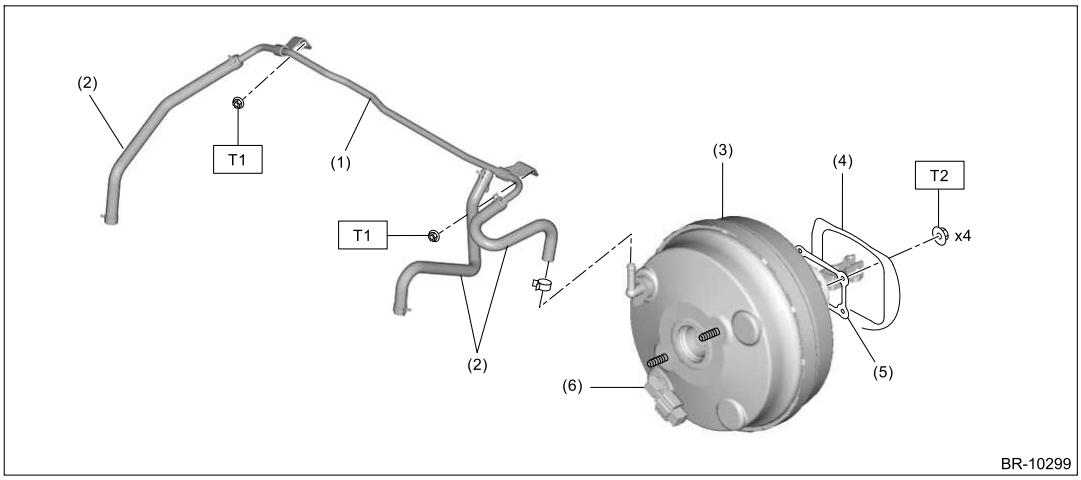
(1)	Connector - two-way	(5)	Gasket	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	VDC control module and hydraulic control unit (VDCCM&H/U)	(6)	Clamp	***T1: 15 (1.5, 11.1)***
(3)	Front brake pipe ASSY	(7)	Front brake hose LH	***T2: 18 (1.8, 13.3)***
(4)	Master cylinder ASSY	(8)	Front brake hose RH	***T3: 19 (1.9, 14)***
				T4: 26 (2.7, 19.2)
				T5: 33 (3.4, 24.3)

5. CENTER AND REAR BRAKE PIPES AND HOSES



(1) Center brake pipe ASSY	(4) Rear brake hose RH	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Clamp	(5) Rear brake hose LH	***T1: 15 (1.5, 11.1)***
(3) Gasket		***T2: 26 (2.7, 19.2)***
		T3: 33 (3.4, 24.3)

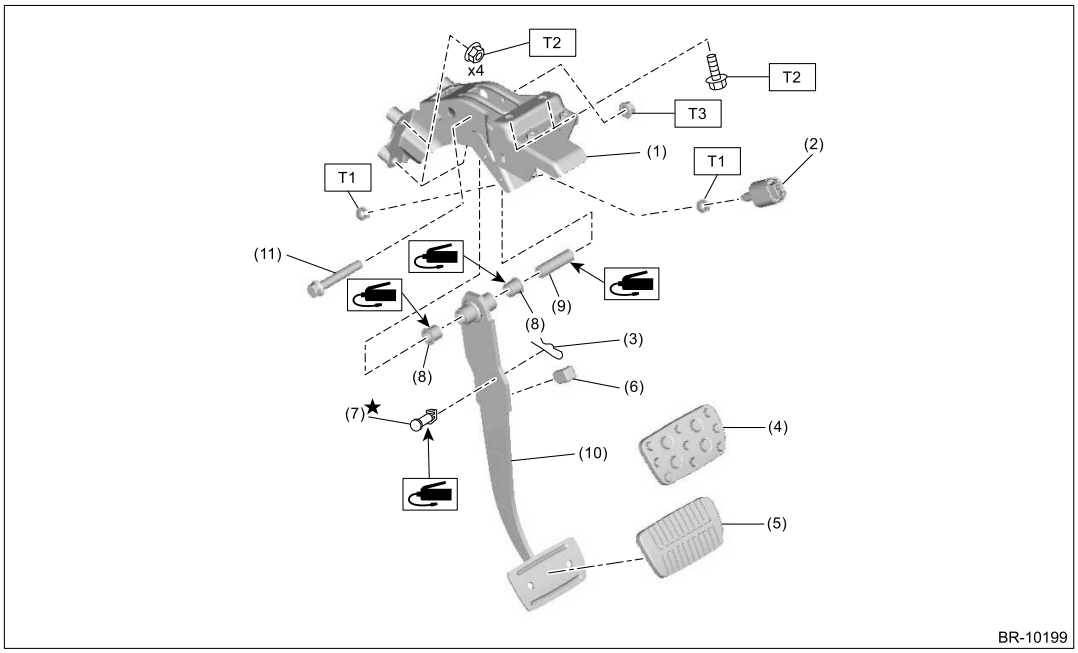
6. BRAKE BOOSTER



(1) Vacuum pipe	(4) Damping seat (model with EyeSight)	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Vacuum hose	(5) Gasket	***T1: 7.5 (0.8, 5.5)***
(3) Vacuum booster ASSY	(6) Vacuum sensor	***T2: 18 (1.8, 13.3)***

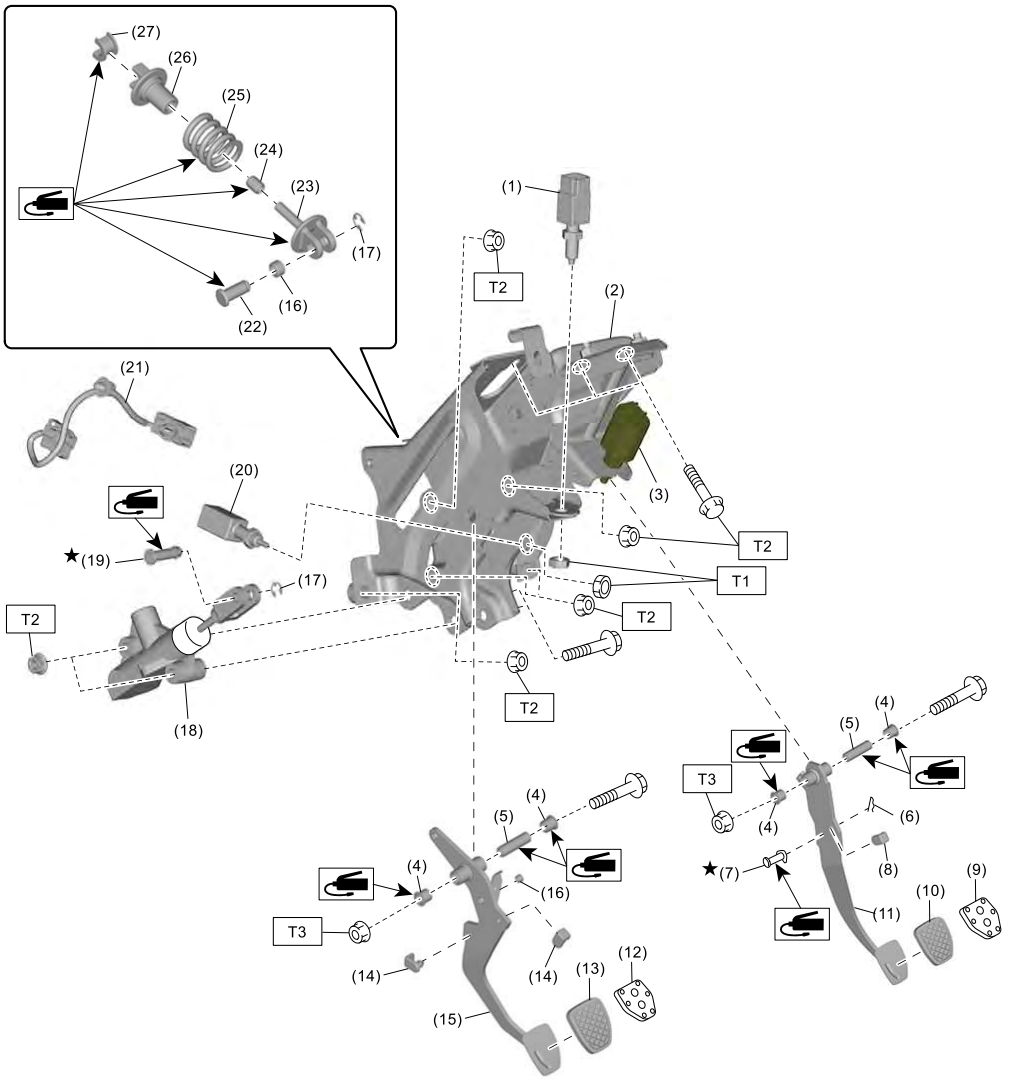
7. BRAKE PEDAL

- CVT model



(1) Pedal bracket	(7) Clevis pin	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Stop light switch	(8) Bushing - pedal	***T1: 8 (0.8, 5.9)***
(3) Snap pin	(9) Spacer - pedal	***T2: 18 (1.8, 13.3)***
(4) Pad - brake pedal (sport type)	(10) Pedal - brake	***T3: 30 (3.1, 22.1)***
(5) Pad - brake pedal (normal type)	(11) Bolt - pedal	
(6) Stopper - pedal		

- MT model



CL-10014

(1) Clutch switch	(12) Clutch pedal pad (sport type)	(23) Assist rod A
(2) Pedal bracket	(13) Clutch pedal pad (normal type)	(24) Assist bushing A
(3) Stop light switch	(14) Clutch pedal stopper	(25) Assist spring
(4) Pedal bushing	(15) Clutch pedal	(26) Assist rod B
(5) Spacer	(16) Bushing A	(27) Assist bushing B
(6) Snap pin	(17) Clip	
(7) Clevis pin	(18) Master cylinder ASSY	***Tightening torque: N·m (kgf-m, ft-lb)***
(8) Brake pedal stopper	(19) Clevis pin	***T1: 8 (0.8, 5.9)***
(9) Brake pedal pad (sport type)	(20) Clutch start switch	***T2: 18 (1.8, 13.3)***
(10) Brake pedal pad (normal type)	(21) Harness connector	***T3: 30 (3.1, 22.1)***
(11) Brake pedal	(22) Assist pin	

BRAKE > General Description

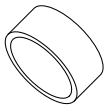
CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.

- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Be sure that the surface of brake disc, brake pad or brake shoe is free from grease or oil.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**
 ST99099AL000	99099AL000	PISTON BOOT INSTALLER	Used for installing the piston boot.

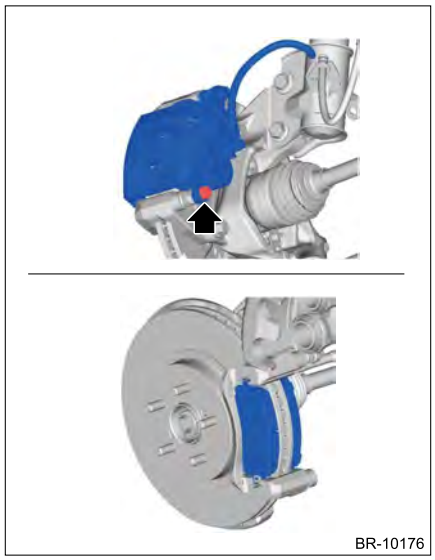
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Pressure gauge	Used for measuring the operation and airtightness of the brake booster.
Vacuum gauge	Used for measuring the operation and airtightness of the brake booster.
Dial gauge	Used for measuring brake disc rotor run-out.
Cap	Used for brake hose installing portion of brake disc caliper.

BRAKE > Front Brake Pad

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the pad - disc brake front.
   (1) Remove the caliper bolt on the lower side.
   (2) Raise the caliper body assembly and remove the pad - disc brake front.
   Note:
   Do not disconnect the brake hose from the caliper body assembly.

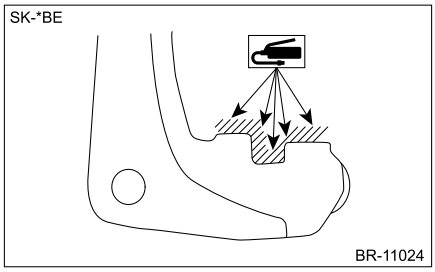


BRAKE > Front Brake Pad

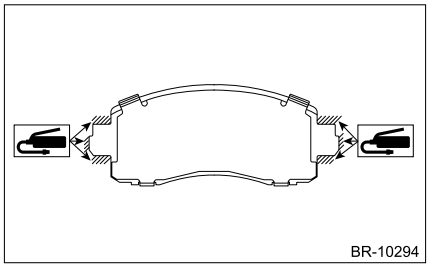
INSTALLATION

Note:
Before installation, remove the pad clip - front brake and remove mud, foreign matter and rust from the caliper body assembly and the support - front disc brake.

1. Apply a thin coat of grease to the support - front disc brake.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent



2. Check the brake pad. Ref. to BRAKE>Front Brake Pad>INSPECTION.
3. Apply a thin coat of grease to the pad - disc brake front.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent



4. Install the pad clip - front brake.
5. Press back the piston - disc brake with a tool as needed.

Caution:

When pressing back the piston - disc brake, the clearance between pad - disc brake and brake disc becomes large, which makes the brake pedal effort softer. After the installation of front wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.

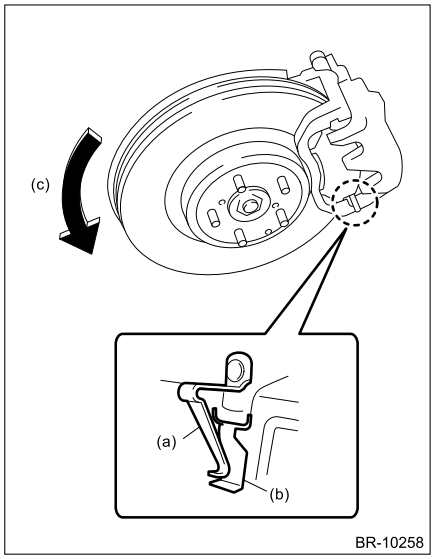
Preparation tool:

Disc brake piston tool

6. Install the pad - disc brake front.

Caution:

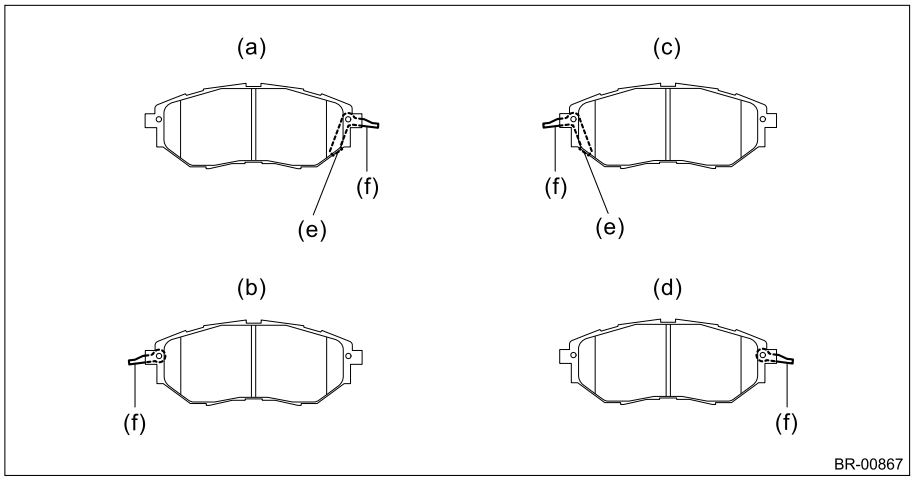
- **Be sure to install so that the pad return spring faces the input side of the direction of brake rotor rotation, as shown in the figure.**
- **Correctly install the pad return spring to the supporting surface of the pad clip as shown in the figure.**
- **If the pad return spring is deformed or damaged, replace the pad - disc brake front with a new part.**



(a) Pad return spring (b) Supporting surface of pad clip (c) Direction of brake rotor rotation

Note:

Install the pad indicator in proper direction.



(a) LH — IN (c) RH — IN (e) Pad indicator

(b) LH — OUT (d) RH — OUT (f) Pad return spring

7. Install the caliper body assembly.

Tightening torque:

27 N·m (2.8 kgf-m, 19.9 ft-lb)

8. Install the front wheels.

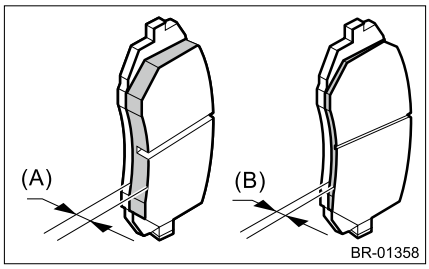
Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Front Brake Pad

INSPECTION

1. Check the thickness (A) of the pad - disc brake front.
   Note:
   - **Always replace the pads of both wheels and both sides as a set.**
   - **Replace pad clips if they are twisted or worn.**
   - **Replace the pad if there is oil or grease on it.**
   - **Wear indicators are installed on the pad - disc brake front inner and the pad - disc brake front outer, and a squeaking sound is heard if the pad is worn to the limit.**



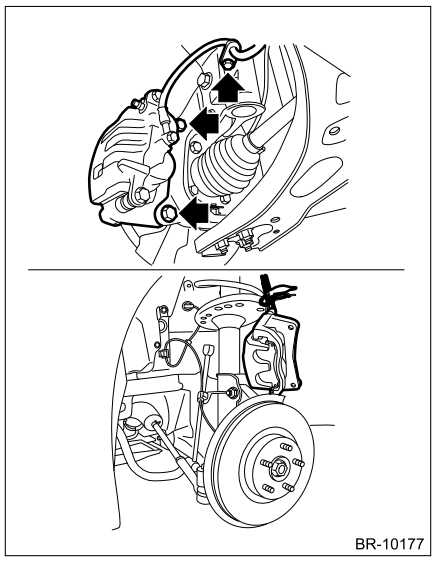
	Brake pad type	Standard (A)	Wear limit (B)
Pad thickness	15-inch type	11 mm (0.43 in)	1.5 mm (0.059 in)
	16-inch type		

2. If the wear limit is exceeded in the inspection, replace the pad - disc brake front.

BRAKE > Front Disc Rotor

REMOVAL

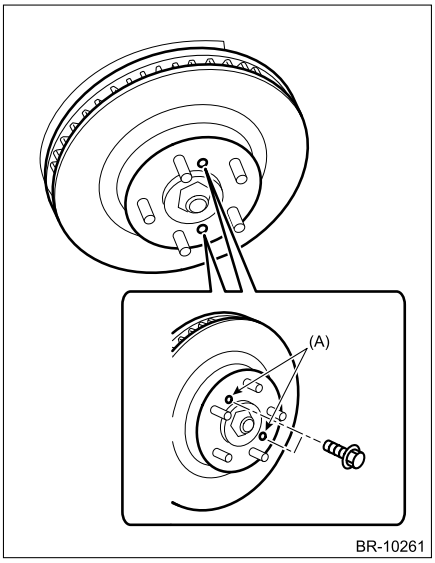
1. Lift up the vehicle, and then remove the front wheels.
2. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the strut assembly.



3. Remove the disc rotor.

Note:

When the disc rotor is difficult to be removed, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



BRAKE > Front Disc Rotor

INSTALLATION

Note:

Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the front disc rotor. Ref. to BRAKE>Front Disc Rotor>INSPECTION.
2. Install the disc rotor.
3. Install the disc brake assembly.

Caution:

Use a new mounting bolt.

Tightening torque:

Mounting bolt: 120 N·m (12.2 kgf-m, 88.5 ft-lb)

Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)

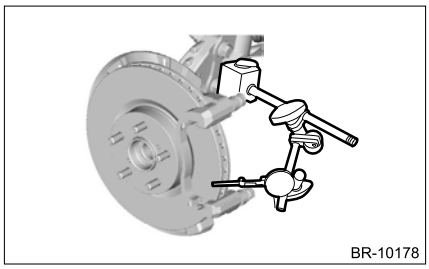
4. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Front Disc Rotor

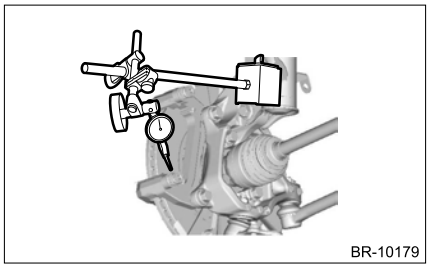
INSPECTION

1. DISC ROTOR RUNOUT CHECK

1. Check the hub unit COMPL - front axle for free play and runout before the inspection of disc rotor runout limit. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSPECTION.
2. Check the disc rotor runout.
   (1) Remove the caliper body assembly. Ref. to BRAKE>Front Disc Rotor>REMOVAL.
   (2) Secure the disc rotor by tightening the five wheel nuts.
   (3) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the outer disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit
   0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



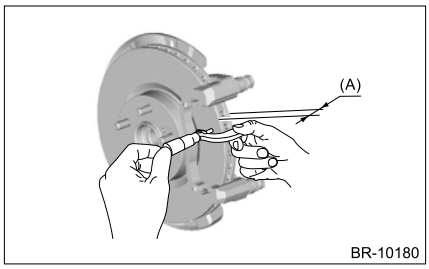
   (4) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the inner disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit
   0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



3. If the disc rotor runout exceeds service limit, grind the disc rotor.
4. Check the disc rotor thickness after grinding. Ref. to BRAKE>Front Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.

2. DISC ROTOR THICKNESS CHECK

1. Set a micrometer 10 mm (0.39 in) inward from the disc rotor outer perimeter, and then measure the disc rotor thickness (A).



	Size	Standard	Wear limit	Disc rotor outer diameter
Disc rotor thickness (A)	15-inch	24 mm (0.94 in)	22 mm (0.87 in)	277 mm (10.91 in)
	16-inch			294 mm (11.57 in)

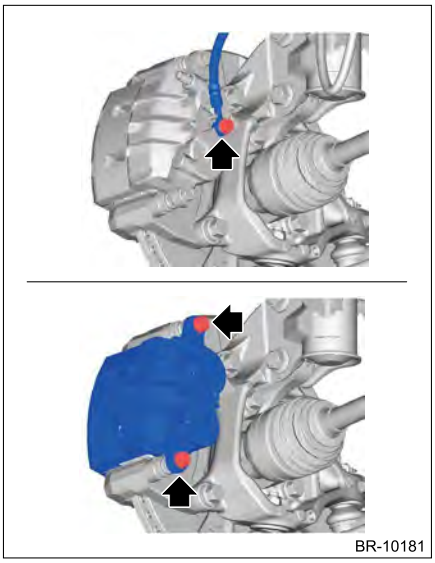
2. If the wear limit is exceeded in the inspection, replace the disc rotor.

BRAKE > Front Disc Brake Assembly

REMOVAL

1. Lift up the vehicle, and then remove the front wheels.
2. Remove the union bolt and the caliper bolt, and remove the caliper body assembly.

   Caution:
   - **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

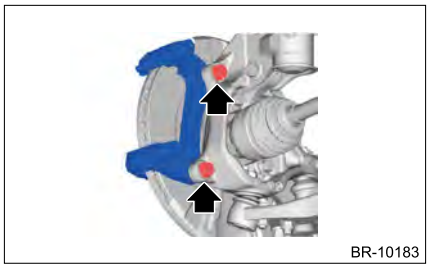


3. Remove the support - front disc brake.

   (1) Remove the pad - disc brake front.



   (2) Remove the mounting bolts, and then remove the support - front disc brake.



BRAKE > Front Disc Brake Assembly

INSTALLATION

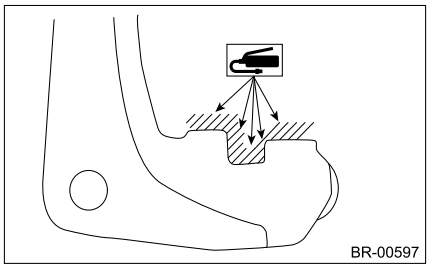
Note:

Before installation, remove the pad clip - front brake and remove mud, foreign matter and rust from the caliper body assembly and the support - front disc brake.

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Apply a thin coat of grease to the support - front disc brake.

   Preparation items:

   Grease: An item contained in the pad kit, Molykote M7439 or equivalent



3. Install the pad clip - front brake.
4. Install the support - front disc brake.

Caution:

Use a new mounting bolt.

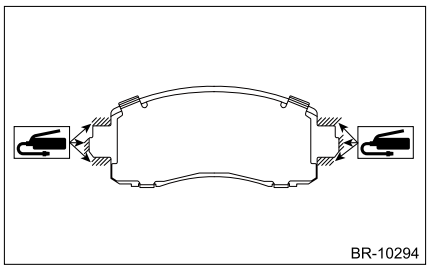
Tightening torque:

Mounting bolt: 120 N·m (12.2 kgf-m, 88.5 ft-lb)

5. Apply a thin coat of grease to the pad - disc brake front.

Preparation items:

Grease: An item contained in the pad kit, Molykote M7439 or equivalent



6. Press back the piston - disc brake with a tool as needed.

Caution:

When pressing back the piston - disc brake, the clearance between pad - disc brake and brake disc becomes large, which makes the brake pedal effort softer. After the installation of front wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.

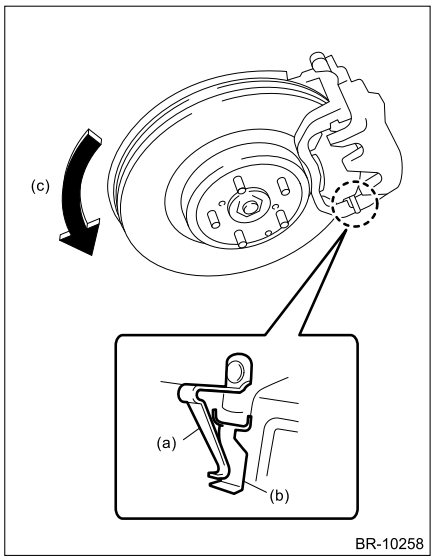
Preparation tool:

Disc brake piston tool

7. Install the brake pad.

Caution:

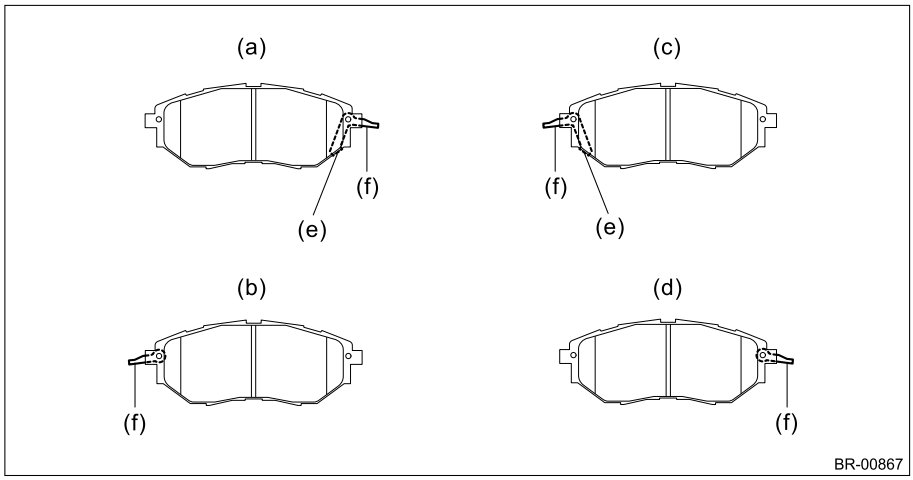
- **Be sure to install so that the pad return spring faces the input side of the direction of brake rotor rotation, as shown in the figure.**
- **Correctly install the pad return spring to the supporting surface of the pad clip as shown in the figure.**
- **If the pad return spring is deformed or damaged, replace the brake pad with a new part.**



(a) Pad return spring (b) Supporting surface of pad clip (c) Direction of brake rotor rotation

Note:

Install the brake pad indicator in proper direction.



(a) LH — IN	(c) RH — IN	(e) Pad indicator
(b) LH — OUT	(d) RH — OUT	(f) Pad return spring

8. Install the caliper body assembly.

Tightening torque:

27 N·m (2.8 kgf-m, 19.9 ft-lb)

9. Connect the brake hose using a new brake hose gasket.

Tightening torque:

26 N·m (2.7 kgf-m, 19.2 ft-lb)

10. Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

11. Install the front wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Front Disc Brake Assembly

DISASSEMBLY

Caution:

Be careful not to allow foreign matter to enter the brake hose connector.

1. Remove mud and foreign matter from the caliper body assembly.

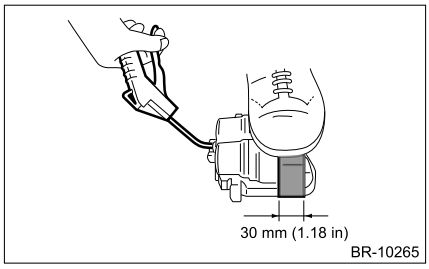
2. Remove the piston - disc brake.

(1) Place a wooden block in the caliper body as shown in the figure to prevent the piston - disc brake from jumping out and being damaged.

(2) Using an air gun, gradually apply compressed air via the brake hose installation hole to push out the piston - disc brake.

Note:

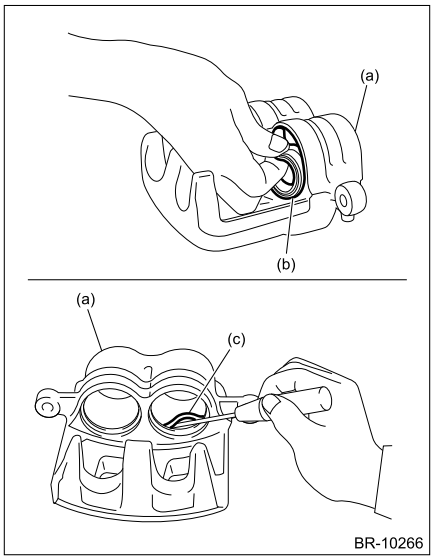
Instead of removing the pistons one by one, remove all pistons at once after adjusting the amount of protrusion evenly using a wooden block.



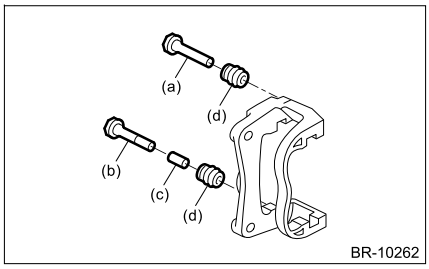
3. Remove the piston boot (b) and piston seal (c) from the caliper body cylinder (a).

Caution:

Do not damage the cylinder and piston seal groove.



4. Remove each part from support - front disc brake.

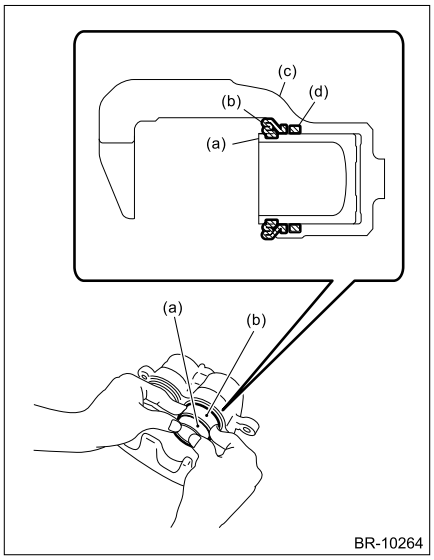


(a) Guide pin - front brake
(b) Lock pin - front brake
(c) Lock pin - sleeve
(d) Pin boot

BRAKE > Front Disc Brake Assembly

ASSEMBLY

1. Check each part. Ref. to BRAKE>Front Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
3. Install the piston seal and the piston - disc brake.
   (1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.
   (2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.
   Preparation items:
   Brake fluid: FMVSS No. 116, DOT3 or DOT4
   (3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.
   Preparation items:
   Grease: An item contained in the piston seal kit or Nippon Grease NIGLUBE RX-2
   (4) Install the piston - disc brake to the caliper body.
   Caution:
   Do not force the piston - disc brake into the sliding part of caliper body.



(a) Piston - disc brake
(b) Piston boot
(c) Caliper body ASSY
(d) Piston seal

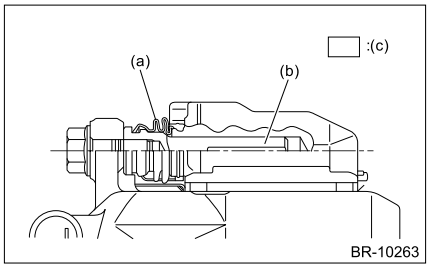
4. Apply grease to the following locations.
   - Lock pin - front brake
   - Periphery of the guide pin - front brake
   - Support - front disc brake pin sliding section, and grooves of pin boot

   Preparation items:

   Brake grease: An item contained in the piston seal kit or Nippon Grease NIGLUBE RX-2
5. Install the pin boot to the lock pin - front brake and the guide pin - front brake, and insert them into the support - front disc brake.

   Caution:

   Insert the lock pin - front brake and guide pin - front brake into specified position, and make sure that they slide and seat properly.



(a) Pin boot
(b) Lock pin - front brake or guide pin - front brake
(c) Grease applied area

BRAKE > Front Disc Brake Assembly

INSPECTION

1. Check the piston sliding part of caliper body and the piston for uneven wear, damage or rust.
2. Check the rubber parts for damage or deterioration.
3. If faulty is found in the inspection, replace the relevant part.

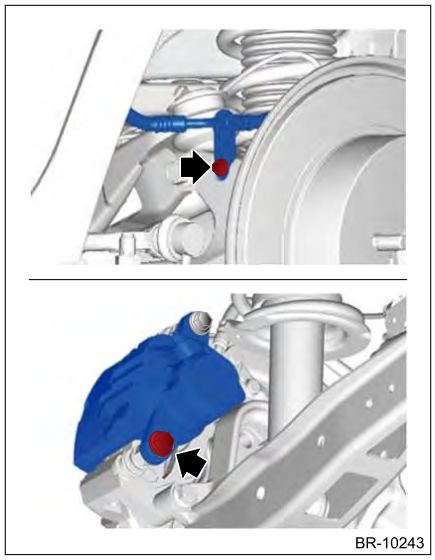
BRAKE > Rear Brake Pad

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the pad - disc brake rear.
   (1) Remove the brake hose bracket.
   (2) Remove the caliper bolt on the lower side.
   (3) Raise the caliper body assembly and remove the pad - disc brake rear.

Note:

Do not disconnect the brake hose from the caliper body assembly.



BRAKE > Rear Brake Pad

INSTALLATION

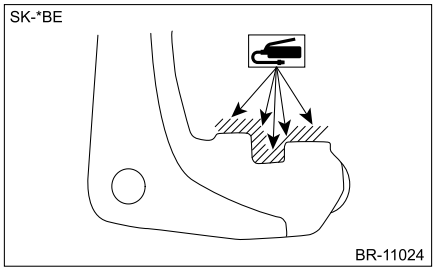
Note:

Before installation, remove the pad clip - rear brake and remove mud, foreign matter and rust from the caliper body assembly and the support - rear disc brake.

1. Apply a thin coat of grease to the support - rear disc brake.

Preparation items:

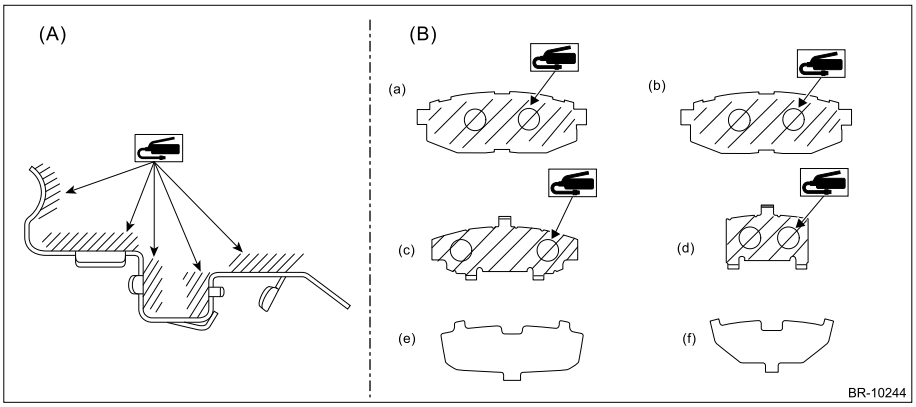
Grease: An item contained in the pad kit, Molykote M7439 or equivalent



2. Check the brake pad. Ref. to BRAKE>Rear Brake Pad>INSPECTION.
3. Apply a thin coat of grease to the pad clip, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.

Preparation items:

Grease (pad side (A)): An item contained in the pad kit, Molykote M7439 or equivalent
Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N



(A) Pad clip - rear brake

(B) Pad - disc brake rear and the shim - disc brake rear

(a) Pad - disc brake rear outer

(b) Pad - disc brake rear inner

(c) Shim - disc brake rear inner

(d) Shim - disc brake rear inner

(e) Shim - disc brake rear outer

(f) Shim - disc brake rear outer

4. Install the pad clip - rear brake.
5. Press back the piston - disc brake with a tool as needed.

Caution:

When pressing back the piston - disc brake, the clearance between pad - disc brake and disc rotor becomes large, which makes the brake pedal effort softer. After the installation of rear wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.

Preparation tool:

Disc brake piston tool

6. Install the pad - disc brake rear.

Note:

Install the pad indicator in proper direction.

7. Install the caliper body assembly.

Tightening torque:

27 N·m (2.8 kgf-m, 19.9 ft-lb)

8. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

9. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

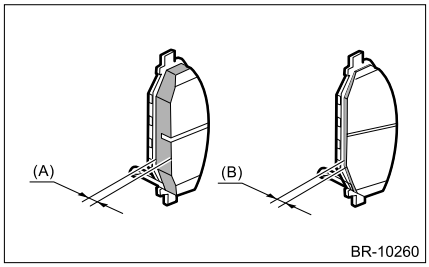
BRAKE > Rear Brake Pad

INSPECTION

1. Check the thickness of the pad - disc brake rear.

Note:

- **Always replace the pads of both wheels and both sides as a set.**
- **Replace pad clips if they are twisted or worn.**
- **Replace the pad if there is oil or grease on it.**
- **Wear indicators are installed on the pad - disc brake rear inner, and a squeaking sound is heard if the pad is worn to the limit.**

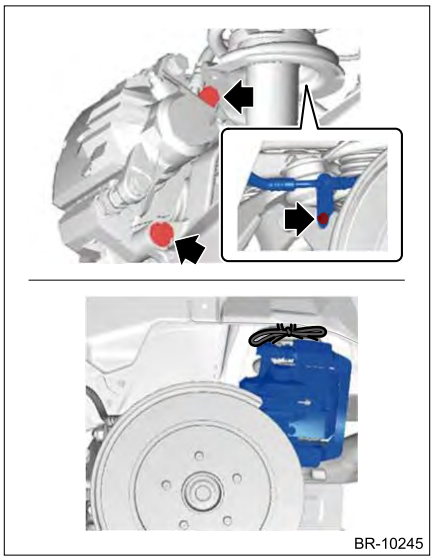


	Standard (A)	Wear limit (B)
Pad thickness	9 mm (0.354 in)	1.5 mm (0.059 in)

2. If the wear limit is exceeded in the inspection, replace the brake pad.

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Release the lever assembly - hand brake.
3. Remove the disc brake assembly.
   (1) Remove the brake hose bracket.
   (2) Remove the mounting bolt, and remove the disc brake assembly.
   (3) Prepare wiring harnesses etc. to be discarded, and suspend the disc brake assembly from the shock absorber assembly.

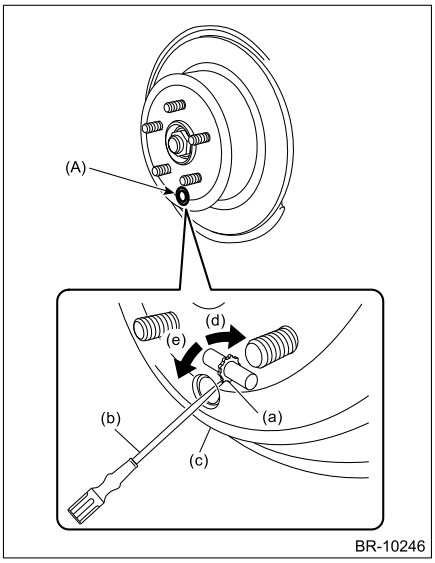


4. Remove the disc rotor.

Note:

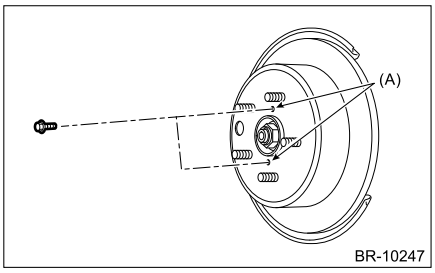
If it is difficult to remove the disc rotor, perform the following two methods in order.

1. Remove the adjusting hole cover (A), and loosen the adjuster assembly - rear brake by inserting a flat tip screwdriver.



(a)	Adjuster ASSY - rear brake	(c)	Disc rotor	(e)	Shorten the adjuster ASSY - rear brake
(b)	Flat tip screwdriver	(d)	Extend the adjuster ASSY - rear brake		

2. When the disc rotor is difficult to be removed from the hub unit COMPL - rear axle, screw in 8 mm (0.31 in) bolt to the threaded part of the disc rotor (A), and remove the disc rotor.



BRAKE > Rear Disc Rotor

INSTALLATION

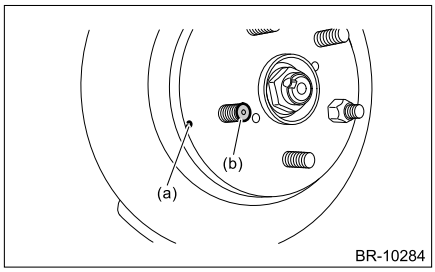
Note:

Before installation, remove mud and foreign matter from the disc brake assembly.

1. Check the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.
2. Install the disc rotor.

   Note:

   When installing the rear disc rotor, match the alignment mark (a) of the rear disc rotor and the alignment mark (b) of the bolt - hub.



3. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
4. Install the disc brake assembly.

   Tightening torque:

   Mounting bolt: 66 N·m (6.7 kgf-m, 48.7 ft-lb)

Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)

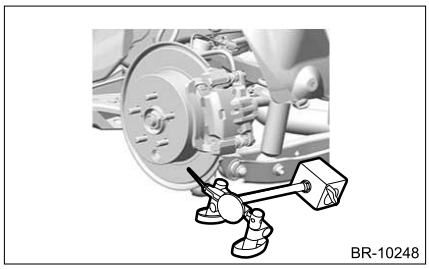
5. Install the rear wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)

BRAKE > Rear Disc Rotor

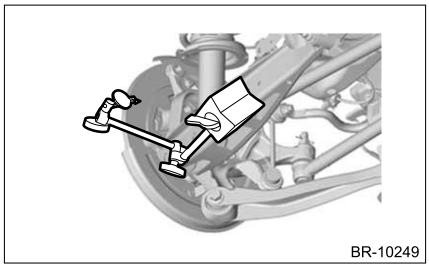
INSPECTION

1. DISC ROTOR RUNOUT CHECK

1. Check the hub unit COMPL - rear axle for free play and runout before the inspection of disc rotor runout limit. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSPECTION.
2. Check the disc rotor runout.
   (1) Remove the caliper body assembly. Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.
   (2) Secure the disc rotor by tightening the five wheel nuts.
   (3) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the outer disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit:
   0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



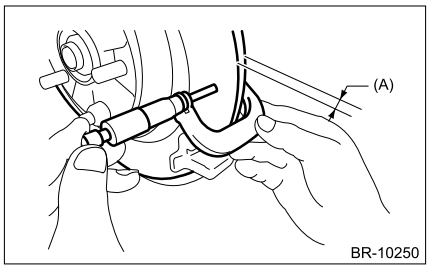
   (4) Set a dial gauge 10 mm (0.39 in) inward from the disc rotor outer circumference, and check the inner disc rotor runout while rotating the disc rotor.
   Disc rotor runout limit:
   0.05 mm (0.002 in)
   Note:
   <Example of magnet stand and dial gauge installation>
   The location where the magnet stand is installed varies to stabilize the magnet stand.



3. If the disc rotor runout exceeds service limit, grind the disc rotor.
4. Check the disc rotor thickness after grinding. Ref. to BRAKE>Rear Disc Rotor>INSPECTION > DISC ROTOR THICKNESS CHECK.

2. DISC ROTOR THICKNESS CHECK

1. Set a micrometer 10 mm (0.39 in) inward from the disc rotor outer perimeter, and then measure the disc rotor thickness (A).



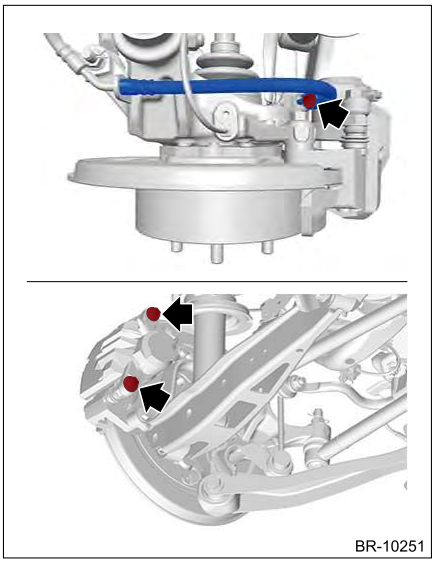
	Standard	Wear limit	Disc rotor outer diameter
Disc rotor thickness (A)	10 mm (0.39 in)	8.5 mm (0.335 in)	274 mm (10.79 in)

2. If the wear limit is exceeded in the inspection, replace the disc rotor.

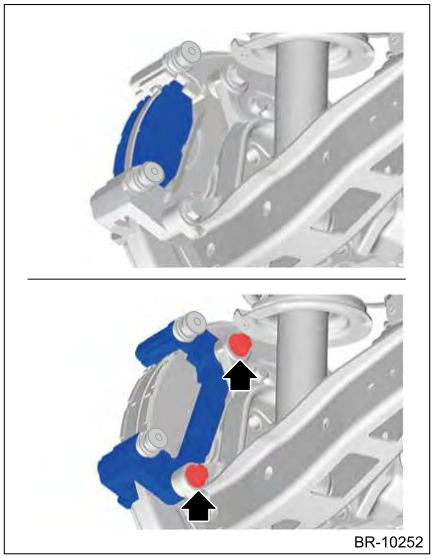
BRAKE > Rear Disc Brake Assembly

REMOVAL

1. Lift up the vehicle, and then remove the rear wheels.
2. Remove the union bolt and the caliper bolt, and remove the caliper body assembly.
   Caution:
   - **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
   - **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**



3. Remove the support - rear disc brake.
   (1) Remove the pad - disc brake rear.
   (2) Remove the mounting bolts, and then remove the support - rear disc brake.

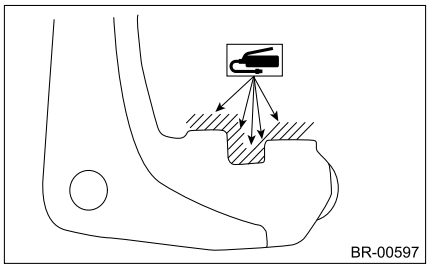


BRAKE > Rear Disc Brake Assembly

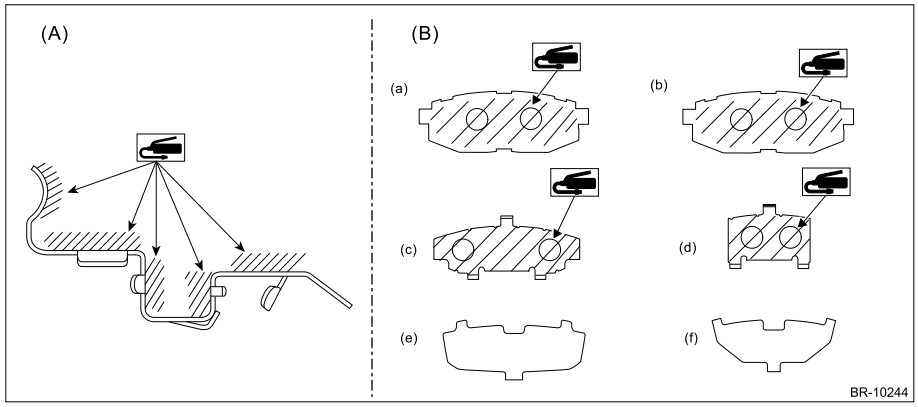
INSTALLATION

Note:
Before installation, remove the pad clip - rear brake and remove mud, foreign matter and rust from the caliper body assembly and the support - rear disc brake.

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Apply a thin coat of grease to the support - rear disc brake.
   Preparation items:
   Grease: An item contained in the pad kit, Molykote M7439 or equivalent



3. Install the support - rear disc brake to the housing assembly - rear axle.
   Tightening torque:
   66 N·m (6.7 kgf-m, 48.7 ft-lb)
4. Apply a thin coat of grease to the pad clip, both sides of the shim - disc brake rear inner and the shim mounting surface of the pad - disc brake rear.
   Preparation items:
   Grease (pad clip (A)): An item contained in the pad kit, Molykote M7439 or equivalent
   Grease (shim and pad (B)): An item contained in the pad kit or Dow Corning Molykote AS880N



(A) Pad clip - rear brake
(B) Pad - disc brake rear and the shim - disc brake rear

(a) Pad - disc brake rear outer
(b) Pad - disc brake rear inner
(c) Shim - disc brake rear inner
(d) Shim - disc brake rear inner
(e) Shim - disc brake rear outer
(f) Shim - disc brake rear outer

5. Install the pad clip - rear brake.
6. Press back the piston - disc brake with a tool as needed.
   Caution:
   When pressing back the piston - disc brake, the clearance between pad - disc brake and disc rotor becomes large, which makes the brake pedal effort softer. After the installation of rear wheel, be sure to perform the adjustment of the clearance and the pedal effort by depressing the brake pedal several times.
   Preparation tool:
   Disc brake piston tool
7. Install the pad - disc brake rear.

Note:
Install the pad indicator in proper direction.

8. Install the caliper body assembly.
   Tightening torque:
   27 N·m (2.8 kgf-m, 19.9 ft-lb)
9. Install the brake hose bracket.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
10. Connect the brake hose using a new brake hose gasket.
    Tightening torque:
    26 N·m (2.7 kgf-m, 19.2 ft-lb)
11. Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
12. Install the rear wheels.
    Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

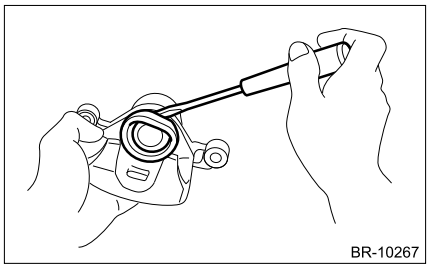
BRAKE > Rear Disc Brake Assembly

DISASSEMBLY

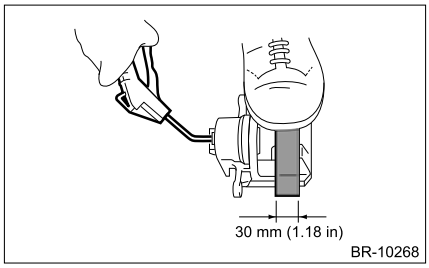
Caution:

Be careful not to allow foreign matter to enter the brake hose connector.

1. Remove mud and foreign matter from the caliper body assembly.
2. Remove the piston boot.



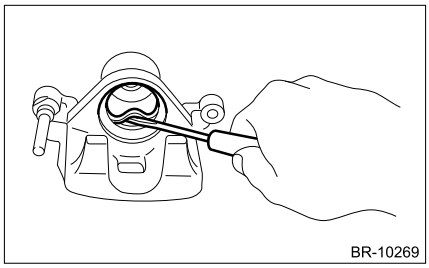
3. Remove the piston - disc brake.
   (1) Place a wooden block in the caliper body assembly as shown in the figure to prevent the piston - disc brake from jumping out and being damaged.
   (2) Using an air gun, gradually apply compressed air via the brake hose installation hole to push out the piston - disc brake.



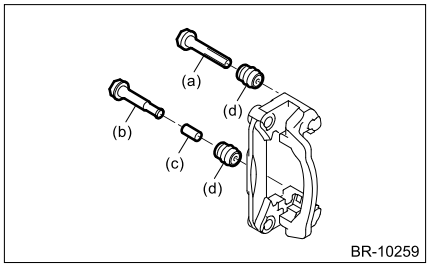
4. Remove the piston seal.

   Caution:

   Do not damage the piston sliding part and the piston seal groove.



5. Remove each part from support - rear disc brake.



(a) Guide pin - rear brake (black)
(b) Lock pin - rear brake (silver)
(c) Lock pin - bushing
(d) Pin boot

BRAKE > Rear Disc Brake Assembly

ASSEMBLY

1. Check each part. Ref. to BRAKE>Rear Disc Brake Assembly>INSPECTION.
2. Clean the inside of the caliper body using brake fluid.

Preparation items:

Brake fluid: FMVSS No. 116, DOT3 or DOT4

3. Install the piston seal and the piston - disc brake.

(1) Apply a coat of brake fluid to piston seal and install the piston seal to the groove inside caliper body.

(2) Apply a coat of brake fluid to the piston sliding part of caliper body and the entire outer surface of the piston - disc brake.

Preparation items:

Brake fluid: FMVSS No. 116, DOT3 or DOT4

(3) Apply a coat of grease to the piston boot and fit to the groove on the ends of piston - disc brake.

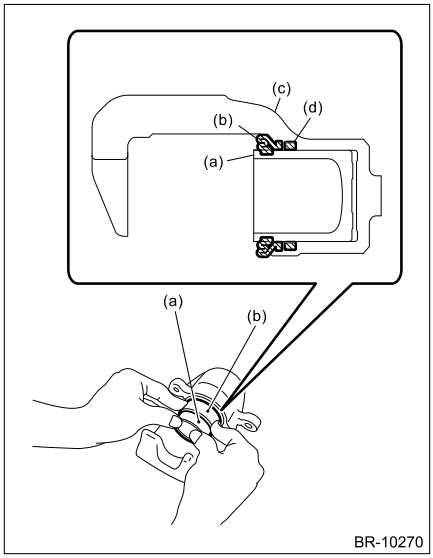
Preparation items:

Grease: An item contained in the pad kit or Nippon Grease NIGLUBE RX-2

(4) Install the piston - disc brake to the caliper body.

Caution:

Do not force the piston - disc brake into the sliding part of caliper body.



(a) Piston - disc brake
(c) Caliper body
(d) Piston seal
(b) Piston boot

4. Apply grease to the following locations.

- Lock pin - rear brake
- Periphery of the guide pin - rear brake
- Support - front disc brake pin sliding section, and grooves of pin boot

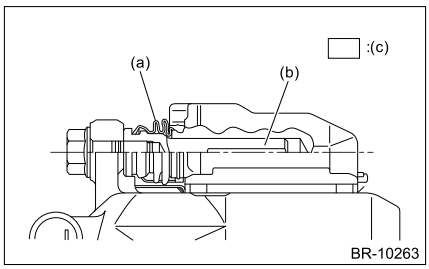
Preparation items:

Grease: An item contained in the piston seal kit or Nippon Grease NIGLUBE RX-2

5. Install the pin boot to the lock pin - rear brake and guide pin - rear brake, and insert them into the support - rear disc brake.

Caution:

Insert the lock pin - rear brake and guide pin - rear brake into specified position, and make sure that they slide and seat properly.



(a) Pin boot
(b) Lock pin - rear brake or guide pin - rear brake
(c) Grease applied area

BRAKE > Rear Disc Brake Assembly

INSPECTION

1. Check the piston sliding part of caliper body and the piston - disc brake for uneven wear, damage or rust.
2. Check the rubber parts for damage or deterioration.
3. If faulty is found in the inspection, replace the relevant part.

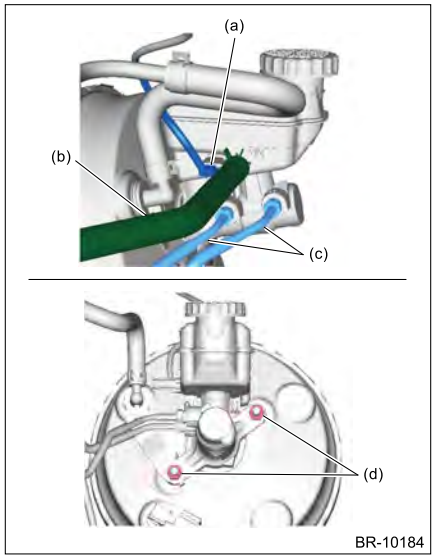
BRAKE > Master Cylinder

REMOVAL

Caution:

- **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
- **Prepare a container to catch grease or oil, etc. If any grease or oil spills, wipe it off and clean immediately to prevent from penetrating into floor or flowing outside.**

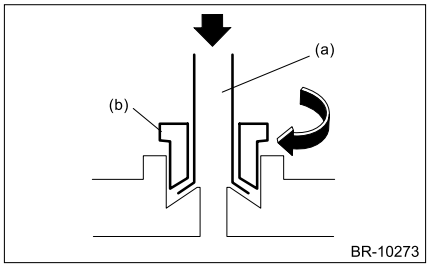
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Drain brake fluid from the reservoir tank completely.
3. Remove the master cylinder assembly.
   (1) Disconnect the fluid level gauge connector (a).
   (2) Disconnect the clutch hose (b). (MT model)
   (3) Disconnect the brake pipe (c).
   (4) Remove the nut (d), and slowly remove the master cylinder assembly from the vacuum booster assembly.



BRAKE > Master Cylinder

INSTALLATION

1. Replace the ring seal of the master cylinder assembly with a new part.
2. Install the master cylinder assembly.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
3. Turn and tighten the flare nut (b) by hand while pressing the brake pipe (a) toward the master cylinder assembly side.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   19 N·m (1.9 kgf-m, 14 ft-lb)

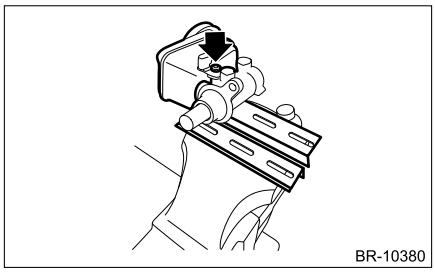


4. Bleed air from the brake system and clutch system (MT model). Ref. to BRAKE>Air Bleeding>PROCEDURE.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

BRAKE > Master Cylinder

DISASSEMBLY

1. Remove the reservoir tank.
   Caution:
   Be careful not to tighten a vise excessively.
   (1) Place the master cylinder assembly between aluminum plates and fix it on a vise.
   (2) Turn and pull off the pin using a driver to remove the reservoir tank.



2. Remove the seal from the cylinder body assembly.

ASSEMBLY

1. Install the seal to the cylinder body assembly.
2. Install the reservoir tank.
   Caution:
   Be careful not to tighten a vise excessively.
   (1) Place the master cylinder assembly between aluminum plates and fix it on a vise.
   (2) Tighten the pin using a driver to install the reservoir tank.
   Tightening torque:
   5.5 N·m (0.6 kgf-m, 4.1 ft-lb)

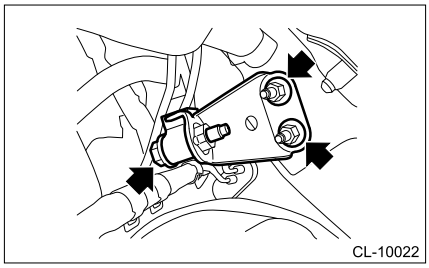
REMOVAL

1. BRAKE BOOSTER

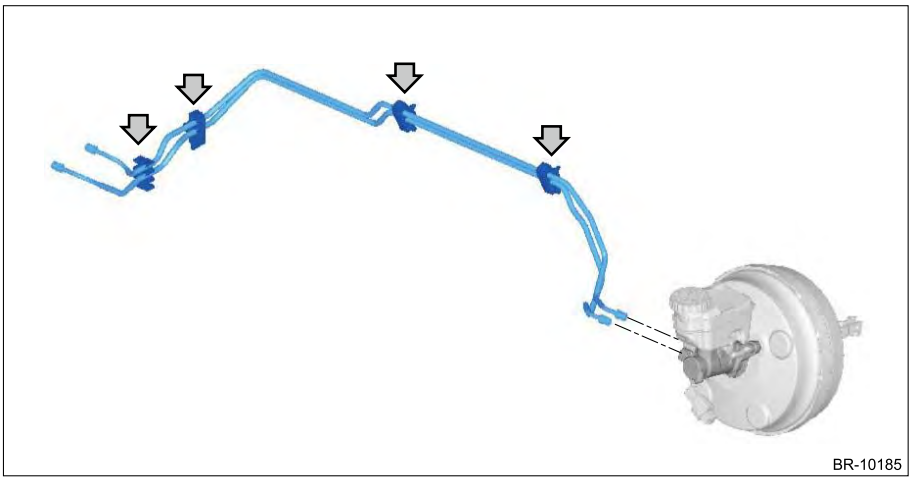
Caution:

- **Do not allow brake fluid to come in contact with the painted surface of the vehicle body. If it does, wash off with water and wipe away completely.**
- **Before performing service on the airbag module, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the vacuum hose. Ref. to BRAKE>Brake Booster>REMOVAL > BRAKE VACUUM HOSE.
3. Remove the nuts, and then remove the clutch connector bracket. (MT model)



4. Remove the engine control module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
5. Remove the master cylinder assembly. Ref. to BRAKE>Master Cylinder>REMOVAL.
6. Remove the brake pipe assembly from the pipe clip.



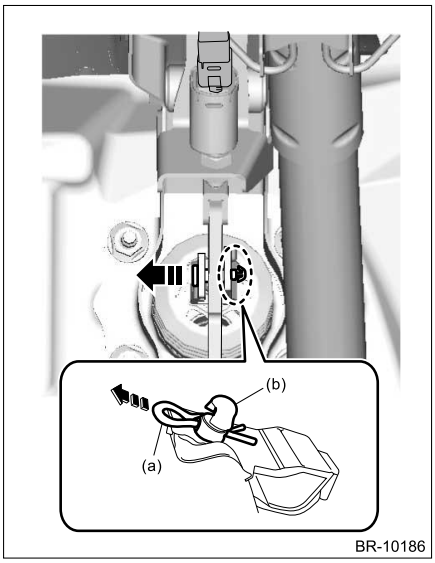
7. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
8. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > KNEE AIRBAG MODULE AND PASSENGER'S LAP SEAT BELT PRETENSIONER.
9. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

   Caution:

   To prevent damage to the universal joint assembly - steering and improper steering effort, make sure to remove the universal joint assembly - steering.
10. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
11. Remove the snap pin (a) and clevis pin (b), and remove the operating rod from the brake pedal.

    Caution:

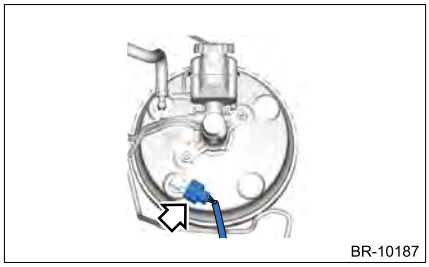
    - **Be careful not to apply excessive force to the operating rod when handling the operating rod. The angle may change by ±3°, and it may result in damage to power piston cylinder.**
    - **Do not change the push rod length.**



12. Disconnect the vacuum sensor connector.

Caution:

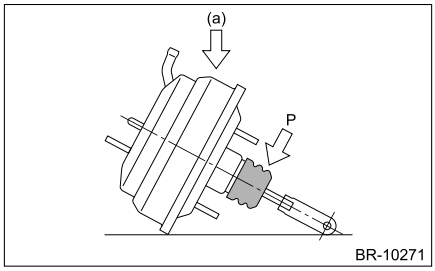
- **Do not remove the vacuum sensor. If removed, replace the vacuum booster assembly with a new part.**
- **Do not rotate the vacuum sensor when disconnecting the connector of vacuum sensor. Otherwise the grommet on the mounting location of the vacuum sensor may be damaged.**



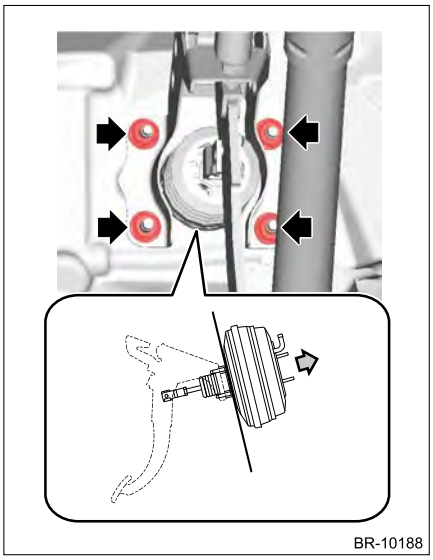
13. Remove the vacuum booster assembly.

Caution:

- **Do not disassemble the vacuum booster assembly.**
- **Make sure that the booster shell and vacuum pipe are not subject to strong impacts.**
- **Be careful not to drop the vacuum booster assembly. If the vacuum booster assembly is dropped accidentally, replace it.**
- **Be careful when placing the vacuum booster assembly on floor.**
- **If external force (a) is applied from above when the vacuum booster assembly is placed in this position, the resin portion as indicated by "P" may become damaged.**



(1) Remove the nuts, and then remove the vacuum booster assembly.



2. BRAKE VACUUM HOSE

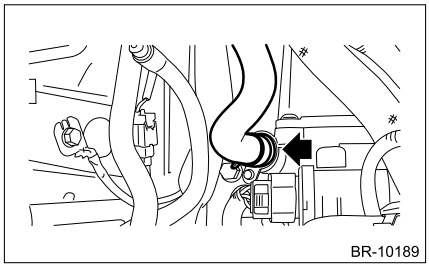
1. Remove the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.

Note:

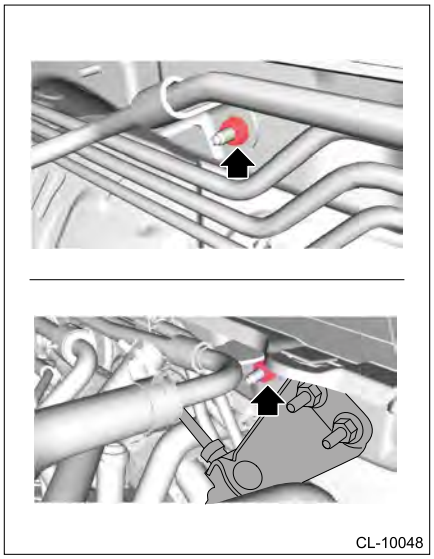
With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body.

2. Remove the vacuum hose.

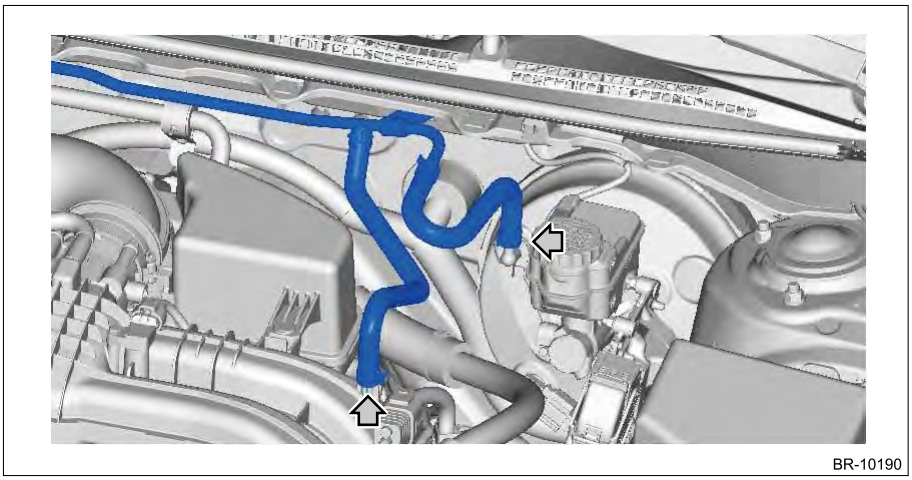
(1) Disconnect the vacuum hose from the vacuum pump.



(2) Disconnect the hose clamp from the bulkhead.



(3) Disconnect the vacuum hose from the intake manifold assembly and the vacuum booster assembly.

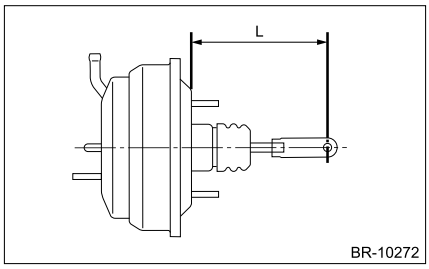


BRAKE > Brake Booster

INSTALLATION

1. BRAKE BOOSTER

1. Check and adjust the operating rod of the vacuum booster assembly.
   (1) Measure the length between the vacuum booster assembly mounting surface and clevis pin hole.
   (2) If it is not within the specification, loosen the lock nut, rotate the vacuum booster assembly operating rod to adjust the rod length.
   Specification L:
   136.3 mm (5.37 in)



2. Install the vacuum booster assembly.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
   Caution:
   - **Apply grease to the snap pin to prevent the operating rod from wear.**
   - **Replace the clevis pin with a new part, and apply a thin coat of grease to the clevis pin.**
     Preparation items:
     Grease: Shell Gadus S2 V220 or equivalent
   - **When installing the master cylinder assembly, replace the ring seal with a new part, and install it to the vacuum booster assembly.**
3. Install the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
4. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
   Caution:
   - **Always install the universal joint assembly - steering after installing the steering column to avoid damage to the universal joint assembly - steering.**
   - **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
   - **Always place the tilt lever to the lock position after the steering column is adjusted.**
5. Install the knee airbag module.
   Tightening torque:
   7.5N·m (0.8 kgf-m, 5.5 ft-lb)
6. Install the cover assembly - instrument panel LWR driver.
7. Install the master cylinder assembly. Ref. to BRAKE>Master Cylinder>INSTALLATION.

8. Install the engine control module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSTALLATION.
9. Install the clutch connector bracket. (MT model)
   Tightening torque:
   7.5N·m (0.8 kgf-m, 5.5 ft-lb)
10. Install the vacuum hose. Ref. to BRAKE>Brake Booster>INSTALLATION > BRAKE VACUUM HOSE.
11. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.
12. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
13. Perform a road test to make sure the brakes do not drag.

2. BRAKE VACUUM HOSE

1. Install the vacuum hose.
   (1) Connect the vacuum hose to the intake manifold assembly and the vacuum booster assembly.
   (2) Install the vacuum hose to the vacuum pump.
   (3) Install the hose clamp to the bulkhead.
   Tightening torque:
   7.5N·m (0.8 kgf-m, 5.5 ft-lb)

BRAKE > Brake Booster

INSPECTION

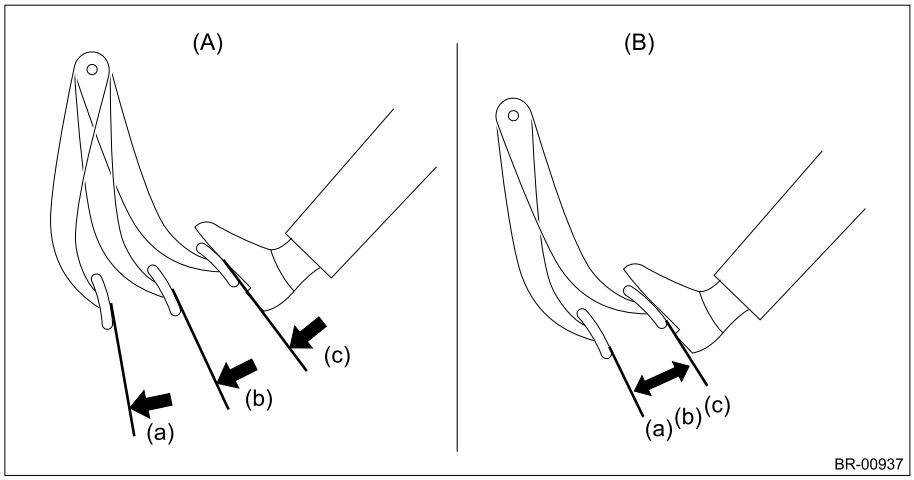
1. OPERATION CHECK WHEN NOT USING MEASURING DEVICES

Caution:
When checking operation, be sure to apply the parking brake securely.

When an operation check is performed with no measuring devices, a faulty part cannot be identified correctly. But it is possible to identify the outline of the defect by performing the check according to the following procedures.

AIR TIGHTNESS CHECK

1. Start the engine, and idle it for 1 to 2 minutes, then turn it OFF.
2. Depress the brake pedal several times applying the normal pedal force.
   Note:
   The pedal stroke should be the longest at the 1st depression, and it should become shorter at each successive depression.
3. If no change occurs in the pedal height when pressed, the vacuum booster assembly is faulty.



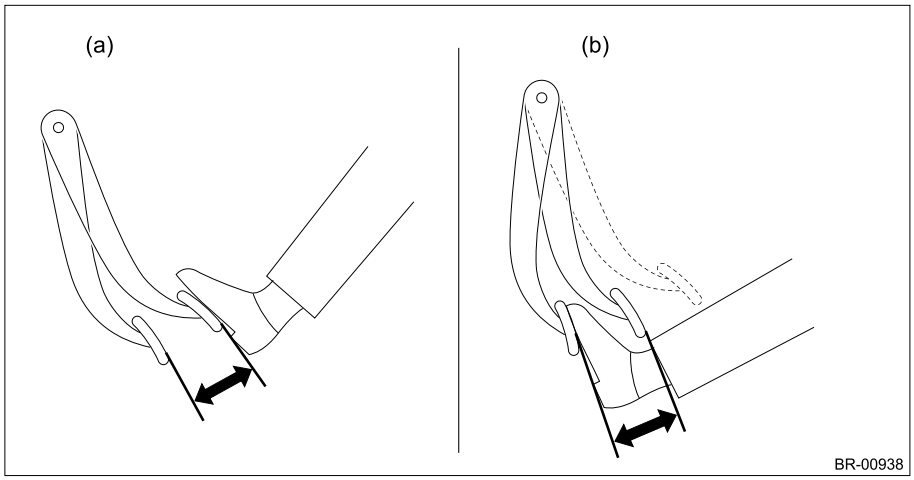
(A) Normal (B) Not OK

(a) 1st (b) 2nd (c) 3rd

Note:
- **In case of defective operation, inspect the condition of the check valve and vacuum hose as well.**
- **Replace them if faulty, and perform the test again.**
- **If no improvement is observed, check precisely with gauges.**

CHECK OPERATION

1. While the engine is OFF, depress the brake pedal several times applying the same pedal force, to check for a change in pedal height.



(a) When engine is stopped (b) When engine is started

2. With the brake pedal depressed, start the engine.
3. As the engine starts, the brake pedal should move slowly toward the floor. If the pedal height does not change, the vacuum booster assembly is faulty.

Note:

If a faulty part is detected after inspection, check precisely with measuring devices.

LOADED AIR TIGHTNESS CHECK

Depress the brake pedal while the engine is running, and turn the engine to OFF while the pedal is depressed.
Keep the pedal depressed for 30 seconds. If the pedal height does not change, the function of vacuum booster assembly is normal. If the pedal height increases, it is faulty.

Note:

If a faulty part is detected after inspection, check precisely with measuring devices.

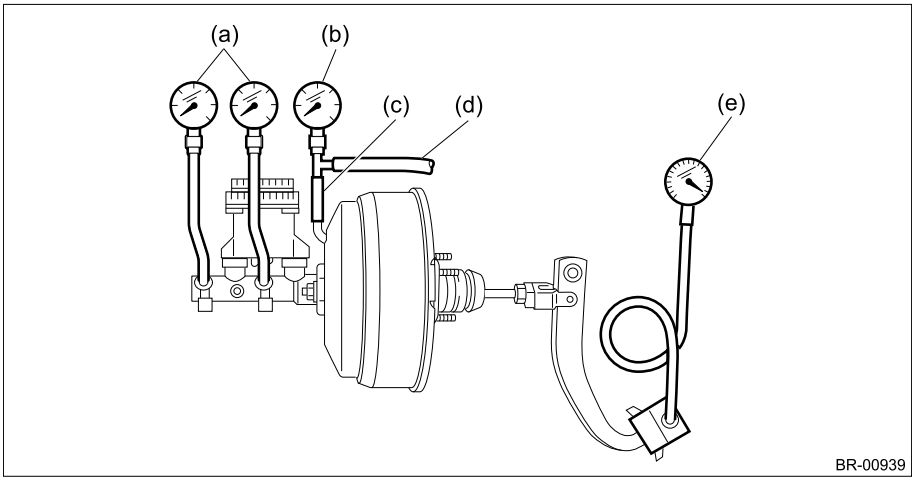
2. OPERATION CHECK WHEN USING MEASURING DEVICES

Caution:

When checking operation, be sure to apply the parking brake securely.

CHECK WITH MEASURING DEVICES

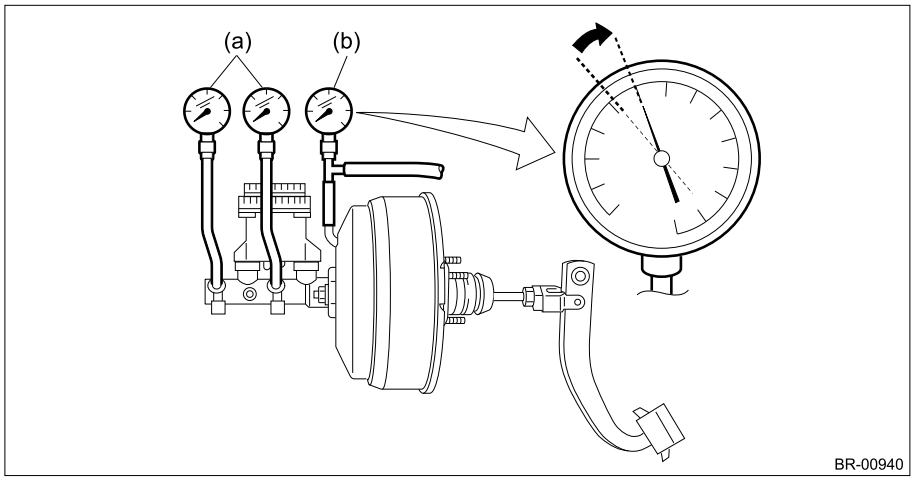
Connect a measuring device as shown in the figure. After bleeding air from the pressure gauge, perform each check.



(a) Pressure gauge
(b) Vacuum gauge
(c) Adapter hose
(d) Vacuum hose
(e) Pedal force gauge

AIR TIGHTNESS CHECK

1. Start the engine and keep it running at idle until vacuum pressure indicates 66.7 kPa (500 mmHg, 19.69 inHg) while the brake pedal is not depressed.

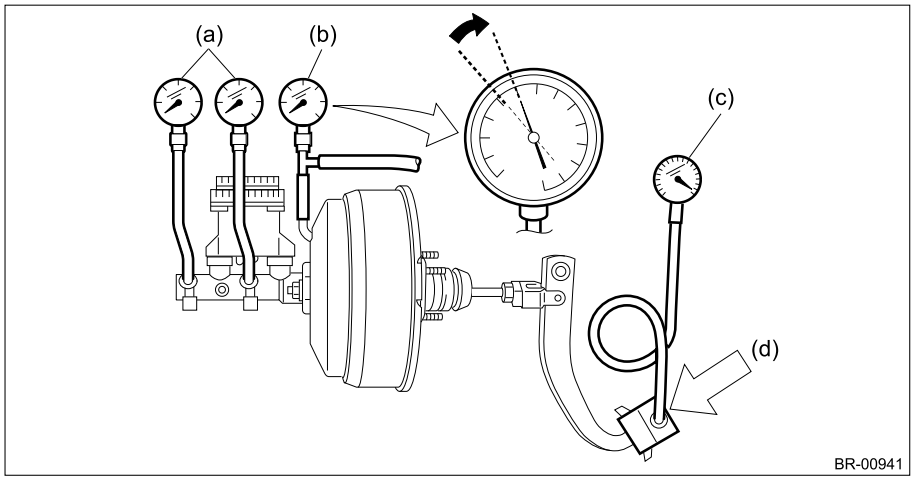


(a) Pressure gauge (b) Vacuum gauge

2. Stop the engine and check the vacuum pressure.
   If the value matches the following standard, the vacuum booster assembly function is normal.
   Vacuum pressure: standard
   The range of vacuum pressure drop within 15 seconds after stopping the engine is 3.3 kPa (25 mmHg, 0.98 inHg) or less
   If a faulty part is detected after inspection, it may results from one of the following causes.
   - Check valve malfunction
   - Leak from vacuum hose
   - Leak from shell joint section or stud bolt welded section
   - Damaged diaphragm
   - Leak from valve body seal and bearing section
   - Leak from plate and seal assembly section
   - Leak from poppet valve assembly section

LOADED AIR TIGHTNESS CHECK

1. Start the engine and depress the brake pedal with a pedal force of 196 N (20 kgf, 44 lbf).
2. Keep the engine running at idle and the pedal depressed until vacuum pressure of the vacuum gauge indicates 66.7 kPa (500 mmHg, 19.69 inHg).



(a) Pressure gauge (c) Pedal force gauge (d) Depressed
(b) Vacuum gauge

3. Stop the engine and check the vacuum gauge.
   If the value matches the following standard, the vacuum booster function is normal.
   Vacuum pressure: standard
   The range of vacuum pressure drop within 15 seconds after stopping the engine is 3.3 kPa (25 mmHg, 0.98 inHg) or less
   If a faulty part is detected after inspection, refer to "AIR TIGHTNESS CHECK".
   Ref. to BRAKE>Brake Booster>INSPECTION.
4. If the vacuum booster assembly is faulty, replace it with a new part.

LACK OF BOOST ACTION CHECK

1. Turn the engine OFF, and set the value of the vacuum gauge to "0".
2. Check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the specification listed.

Brake pedal force: N (kgf, lbf)	147 (15, 33)	294 (30, 66)
Fluid pressure: kPa (kgf/cm^2, psi)	512 (5.23, 74.38)	1,530 (15.6, 222)

BOOSTING ACTION CHECK

1. Set the vacuum gauge reading to 93 kPa (697 mmHg, 27.47 inHg) with the engine running.
2. Check the fluid pressure when the brake pedal is depressed. The pressure must be greater than the specification listed.

Brake pedal force: N (kgf, lbf)	147 (15, 33)	294 (30, 66)
Fluid pressure: kPa (kgf/cm^2, psi)	7,468 (76.1, 1,082)	14,808 (151, 2,148)

3. BRAKE VACUUM HOSE

Check to see that air only flows in one direction, when air is blown into or sucked from the hose.

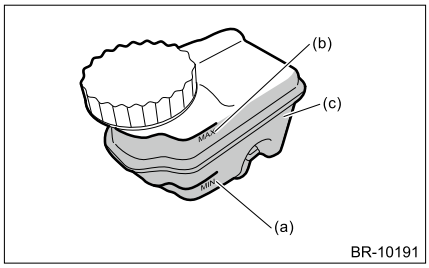
BRAKE > Brake Fluid

INSPECTION

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not allow dirt or dust to get into the reservoir tank.**

1. Check the fluid for discoloration.
2. Check that the amount of brake fluid is between the lines of "MIN" and "MAX" from the front view or from the forward right and left within 90°.
   Caution:
   Always check the level using the specified direction because there is a partition in the reservoir tank.



(a) MIN. level
(b) MAX. level
(c) Brake fluid

3. If the brake fluid level is close to "MIN", check the brake pipe or brake hose for any leak first. Then, check that the brake fluid level is reduced due to brake pad wear.
4. If the fluid is extremely discolored or the fluid level is less than the specified value after inspection, replenish or replace with the new fluid.

BRAKE > Brake Fluid

REPLACEMENT

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not allow dirt or dust to get into the reservoir tank.**

Note:

- **During the operation, keep the reservoir tank filled with brake fluid to prevent entry of air.**
- **Operate the brake pedal slowly and depress it fully.**
- **For convenience and safety, perform the work with 2 people.**
- **The required amount of brake fluid is approximately 500 mL (16.9 US fl oz, 17.6 Imp fl oz) for the entire brake system.**

1. Lift up the vehicle.
2. Remove both the front and rear wheels.
3. Drain brake fluid from the reservoir tank.
4. Replenish the reservoir tank with the recommended brake fluid, and perform the same procedure as for bleeding the brake line on each brake caliper. Ref. to BRAKE>Air Bleeding>PROCEDURE.
   Preparation items:
   Recommended brake fluid: FMVSS No. 116, DOT3 or DOT4
   Note:
   Repeat the full stroke depressing operation of the brake pedal slowly, until new brake fluid comes out from a transparent vinyl tube. (On each brake caliper, 20 times or more of pedal operations is necessary in order for new brake fluid from the master cylinder to come out from the bleeder - screw.)

PROCEDURE

Caution:

- **Do not let brake fluid come into contact with the painted surface of the vehicle body. Wash away with water immediately and wipe off if it is spilled by accident.**
- **Avoid mixing brake fluid of different brands or different grades even from the same brand to prevent fluid performance from degrading.**
- **Do not reuse drained brake fluid. When refilling brake fluid, always refill new brake fluid.**
- **Do not allow dirt or dust to get into the reservoir tank.**
- **For convenience and safety, perform the work with 2 people.**
- **During the operation, keep the reservoir tank filled with brake fluid at MIN level or higher to prevent entry of air.**
- **After air bleeding operation, wipe off fluid around each bleeder - screw and the reservoir tank.**

For air bleed procedure of each part, refer to the following.

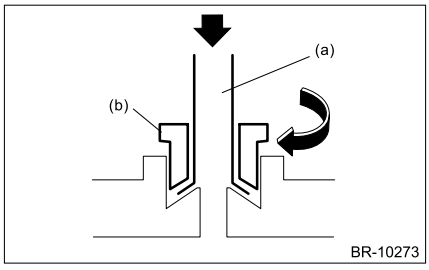
- Master cylinder: Ref. to BRAKE>Air Bleeding>PROCEDURE > MASTER CYLINDER.
- Brake line: Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.
- Hydraulic control unit: Ref. to BRAKE>Air Bleeding>PROCEDURE > HYDRAULIC CONTROL UNIT.
- Caliper: Ref. to BRAKE>Air Bleeding>PROCEDURE > CALIPER.

1. MASTER CYLINDER

Note:

- **When the master cylinder assembly is replaced or the reservoir tank is empty, bleed the brake master cylinder and the clutch master cylinder (MT model).**
  For air bleed procedure of the clutch fluid, refer to "CLUTCH SYSTEM" section. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding>PROCEDURE.
- **If bleeding of the master cylinder assembly is not necessary, omit the following procedures, and perform bleeding of the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.**

1. Install the brake pipe to the master cylinder assembly.
   (1) Screw and tighten the flare nut (b) so that the end of the nut contacts the back side of the brake pipe flare, while pressing the brake pipe (a) toward the master cylinder assembly side.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   Brake pipe flare nut: 19 N·m (1.9 kgf-m,14 ft-lb)



2. Fill the reservoir tank of the master cylinder assembly with brake fluid.
   Note:
   - **Replenish brake fluid to the MAX level.**
   - **During the operation, keep the reservoir tank filled with brake fluid at MIN level or higher to prevent entry of air.**
3. Attach a transparent vinyl tube to the bleeder - screw of the right front caliper body assembly that is the closest from the VDC control module & hydraulic control unit, and the other end of the vinyl tube to a collection container.
4. Loosen the bleeder - screw, depress the brake pedal slowly and hold it.
5. Tighten the bleeder - screw, and release the brake pedal quickly.
6. Repeat steps 4) and 5) until there are no more air bubbles in the brake fluid in the vinyl tube.
   Note:
   Air bubbles are removed after repeating the procedures six to seven times.
7. Attach a transparent vinyl tube to the bleeder - screw of the left front caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
8. Repeat steps 4) and 5) until there are no more air bubbles in the brake fluid in the vinyl tube.

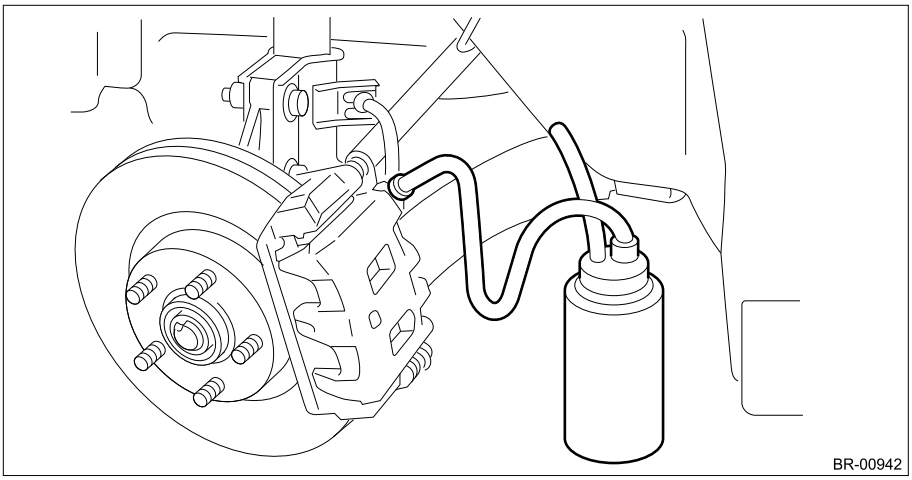
Note:

- **Air bubbles are removed after repeating the procedures seven to eight times.**
- **With the procedures so far, bleed is completed for the air that entered in the master cylinder, front brake piping hose passages and front caliper.**
  Next, perform the following procedures to bleed air that entered in the rear brake piping hose passages and rear caliper from the hydraulic unit.

9. Attach a transparent vinyl tube to the bleeder - screw of the left rear caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
10. Loosen the bleeder - screw, and repeat the full stroke depressing operation of the brake pedal slowly, until the brake fluid in the transparent vinyl tube has no more air bubbles, then tighten the bleeder - screw.
    Note:
    By repeating the procedures 15 times or more, air that entered in the rear brake pipe passages from the VDC control module & hydraulic control unit reaches the bleeder - screw of the left rear caliper body assembly and is discharged.
11. Attach a transparent vinyl tube to the bleeder - screw of the right rear caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
12. Perform step 10).
    Note:
    - **By repeating the procedures 10 times or more, air that entered in the rear brake pipe passages from the VDC control module & hydraulic control unit reaches the bleeder - screw of the right rear caliper body assembly and is discharged.**
    - **With the procedures so far, bleed is completed for the air that entered in the rear brake piping hose passages and rear caliper from the hydraulic unit.**
      Lastly, perform the following procedures to bleed air that may remain in areas where the brake fluid flow stands.
13. Attach a transparent vinyl tube to the bleeder - screw of the right front caliper body assembly, and the other end of the vinyl tube to a brake fluid collection container.
14. After repeating firmly depressing of the brake pedal quickly five or six times, depress and hold the pedal.
15. Loosen the bleeder - screw to drain brake fluid. When the brake pedal reaches the full stroke position, tighten the bleeder - screw quickly, and release the brake pedal.
16. Repeat steps 14) and 15) until there are no more air bubbles in the transparent vinyl tube.
    Note:
    Repeat the procedures approximately four to five times.
17. Repeat steps 14) to 16) above for each brake caliper.
    Note:
    Bleed air in the order starting from the front RH → front LH → rear LH → rear RH.
18. Tighten the bleeder - screw to the specified torque.
    Tightening torque:
    Bleeder - screw: 8 N·m (0.8 kgf-m, 5.9 ft-lb)
19. Install the cap - bleeder to each bleeder - screw.

2. BRAKE LINE

1. When the master cylinder assembly is replaced or the reservoir tank is empty, bleed the master cylinder assembly before bleeding the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > MASTER CYLINDER.
2. Fill the reservoir tank of the master cylinder assembly with brake fluid.
   Note:
   While bleeding air, keep the reservoir tank filled with brake fluid to prevent entry of air.
3. Attach one end of a transparent vinyl tube to the bleeder - screw, and the other end to a brake fluid collection container.



4. Loosen the bleeder - screw, and then repeat the full stroke depressing operation of the brake pedal, until brake fluid in the transparent vinyl tube has no more air bubbles.
   Note:
   Air bubbles are removed after repeating the depressing operation 15 times or more for the front caliper, and 20 times or more for the rear caliper.
5. Perform the steps 2) to 4) above on each brake caliper.
   Note:
   Perform in the order starting from the front RH → front LH → rear LH → rear RH.
6. Tighten the loosened bleeder - screw, repeat firmly depressing of the brake pedal 5 to 6 times, and then depress and hold the brake pedal.
7. Loosen the bleeder - screw to drain the brake fluid. When the brake pedal reaches the full stroke position, immediately tighten the bleeder - screw and return the brake pedal.
8. Repeat steps 6) and 7) until there are no more air bubbles in the transparent vinyl tube.
9. Perform the steps 6) to 8) above on each brake caliper.
   Note:
   Perform in the order starting from the front RH → front LH → rear LH → rear RH.
10. Operate the hydraulic control unit in the sequence control mode for both ABS and VDC systems.
    Caution:
    - **If there is a possibility that air enters the pressure control section in the hydraulic control unit, perform steps 11) to 16).**
    - **For normal air bleeding operation, do not operate the sequence control for the hydraulic control unit. (Operating the sequence control may let air in the normal air bleeding passages move to the pressure control section.)**

    Note:
    - **Normal air bleeding operation does not help bleed air that enters the pressure control section in the hydraulic control unit.**
    - **If there is a possibility that air enters the pressure control section in the hydraulic control unit (if VDC or ABS operates with air contained in the normal air bleeding passage), perform the sequence control mode for both of the ABS and VDC systems.**
11. Perform the ABS sequence control mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
    Caution:
    Be sure to perform the ABS sequence control mode first.
12. Perform the air bleeding operation of steps 3) and 4) for the bleeder - screw on each caliper.
    Note:
    - **Perform in the order starting from the front RH → front LH → rear LH → rear RH.**
    - **As a reference, the number of the full stroke depressing operation is six times.**
13. Perform the VDC sequence control mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
14. Perform the air bleeding operation of steps 3) and 4) for the bleeder - screw on each caliper.
15. Repeat from steps 11) to 14) for three cycles.
16. In case air still remains at step 15), repeat steps 11) to 14) again until all air is removed.
17. Fill the reservoir tank with brake fluid up to the “MAX” level.
18. Tighten the bleeder - screw to the specified torque.
    Tightening torque:
    Bleeder - screw: 8 N·m (0.8 kgf-m, 5.9 ft-lb)
19. Install the cap - bleeder to each bleeder - screw.
20. Check that there are no brake fluid leaks at the flare nut portion or in the entire brake system.
21. After inspection, wipe off fluid around each bleeder - screw and the reservoir tank.

22. Perform a road test and ensure that the brakes operate normally.

3. HYDRAULIC CONTROL UNIT

1. Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

   Note:

   If there is a possibility that air enters the pressure control section in the hydraulic control unit, perform the sequence control mode for both of the ABS and VDC systems. (Refer to steps 10) to 16) for brake lining.)

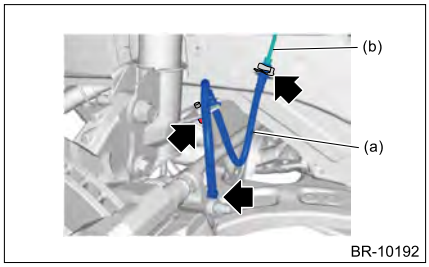
4. CALIPER

1. Bleed air from the brake line. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

REMOVAL

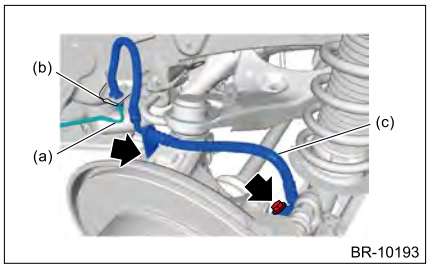
1. FRONT BRAKE HOSE

1. Remove the front brake hose.
   1. Disconnect the brake hose (a) and the brake pipe (b).
      Preparation tool:
      Flare nut wrench
   2. Remove the clamp, strut mounting bolt and union bolt, and remove the front brake hose.



2. REAR BRAKE HOSE

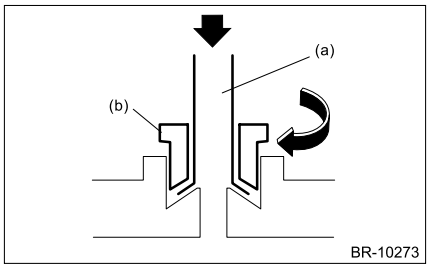
1. Remove the rear brake hose.
   1. Remove the brake hose bracket bolt and union bolt.
   2. Disconnect the brake pipe (a).
      Preparation tool:
      Flare nut wrench
   3. Remove the brake hose clamp (b), and remove the rear brake hose (c).



INSTALLATION

1. FRONT BRAKE HOSE

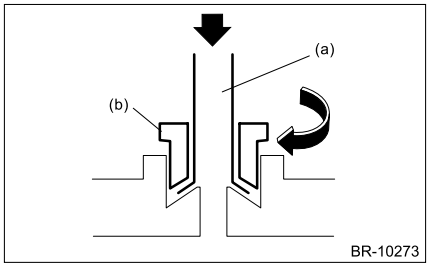
1. Secure the brake hose to the brake hose mount part of strut COMPL.
   Tightening torque:
   Brake hose: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
2. Connect the brake hose to the caliper body assembly using a new gasket.
   Tightening torque:
   Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)
3. Position the disc in straight position and route the brake hose through the hole in the bracket on the wheel apron side.
   Caution:
   Do not twist the brake hose.
4. Connect the brake pipe and the hose, then temporarily tighten the flare nut.
5. Secure the brake hose to wheel apron bracket with clamp.
6. Turn and tighten the flare nut (b) by hand while pushing the brake pipe (a) away from yourself.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   Brake pipe flare nut: 15 N·m (1.5 kgf-m, 11.1 ft-lb)



7. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

2. REAR BRAKE HOSE

1. Route the brake hose through the hole of bracket, and lightly tighten the flare nut to connect brake pipe.
2. Insert the clamp to secure brake hose.
   Tightening torque:
   Brake hose bracket: 33 N·m (3.4 kgf-m, 24.3 ft-lb)
3. Install the brake hose to rear caliper body using a new gasket.
   Tightening torque:
   Union bolt: 26 N·m (2.7 kgf-m, 19.2 ft-lb)
4. Turn and tighten the flare nut (b) by hand while pushing the brake pipe (a) away from yourself.
   Caution:
   Be careful not to make scratches or other damage to the inside surface of the brake pipe flare.
   Tightening torque:
   Brake pipe flare nut: 15 N·m (1.5 kgf-m, 11.1 ft-lb)



5. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.

BRAKE > Brake Hose

INSPECTION

Check the hose for crack, interference with other parts, damage, and fluid leakage on connecting sections. If any faulty is found, repair or replace the relevant part.

REMOVAL

Caution:

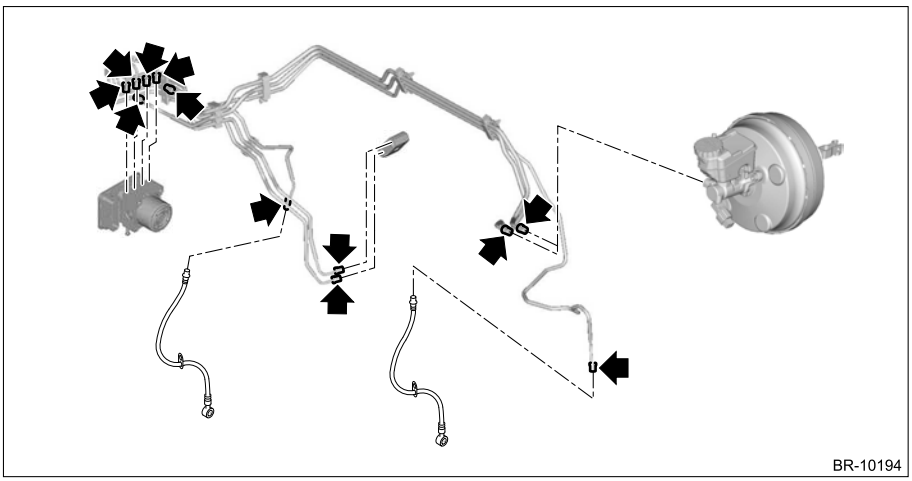
- **Be careful of the following items. Failure to do so may cause the airbag system malfunction.**
  - **Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
  - **Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.**
- **Be careful not to damage the airbag system wiring harness when servicing the center brake pipe.**
- **When removing the brake pipe, do not bend.**

Note:

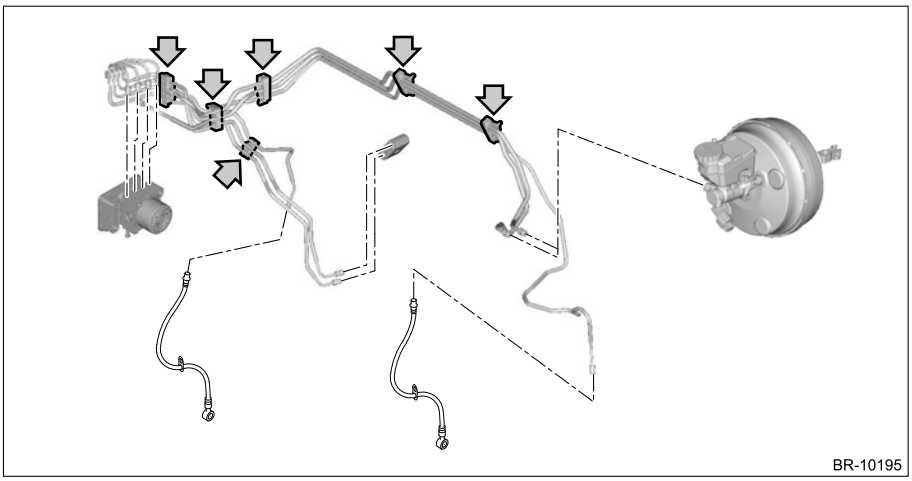
The airbag system wiring harness is routed near the center brake pipe.

1. FRONT BRAKE PIPE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the front wheels.
3. Remove the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
4. Remove the vacuum booster assembly. Ref. to BRAKE>Brake Booster>REMOVAL > BRAKE BOOSTER.
5. Remove the brake pipe.
   (1) Separate each brake pipe using a flare nut wrench.



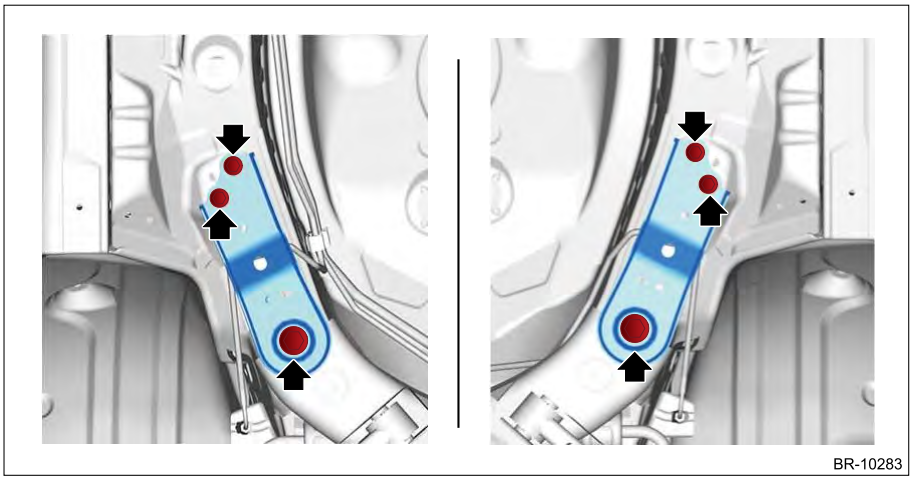
(2) Remove the brake pipe from the pipe clip.



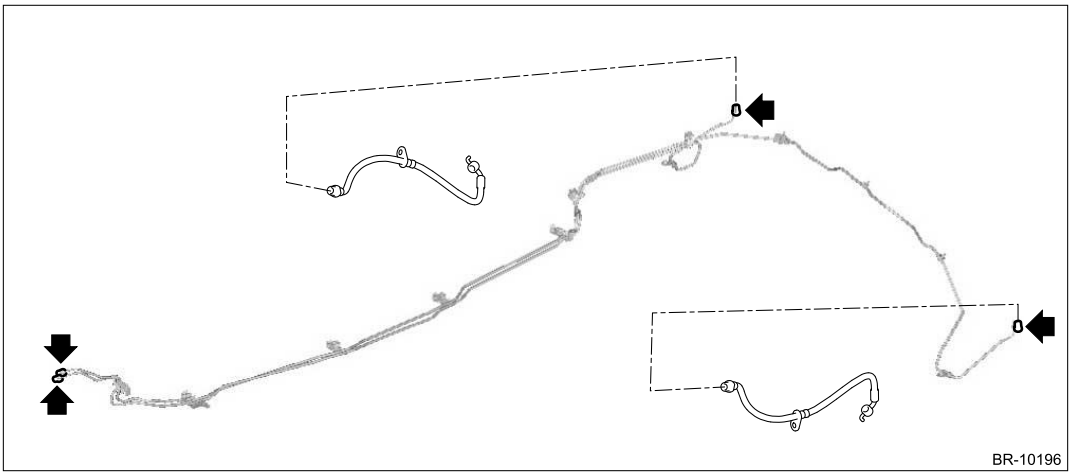
2. CENTER AND REAR BRAKE PIPE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
4. Remove the fuel tank protector RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.

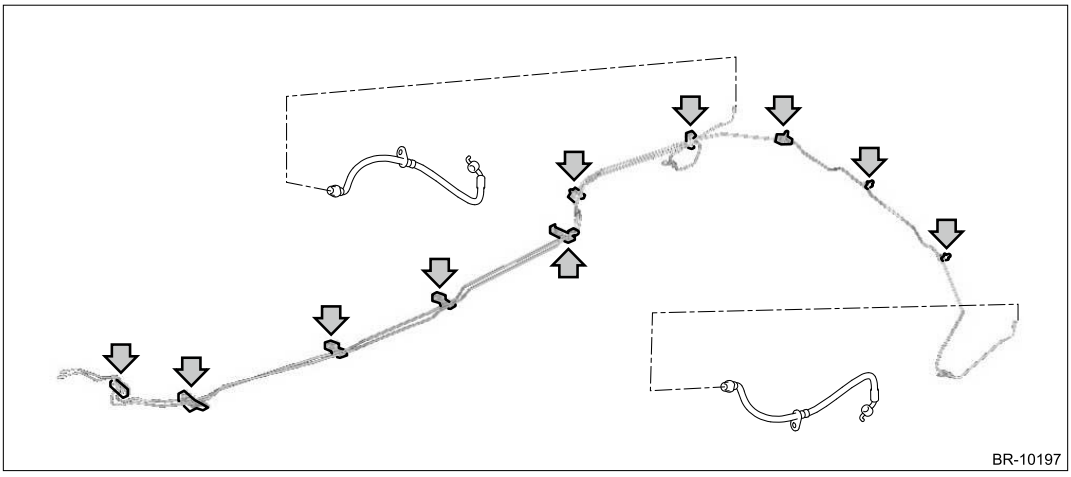
5. Remove the floor under protector RH. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>REMOVAL.
6. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
7. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
8. Remove the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>REMOVAL.
9. Remove the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank>REMOVAL.
10. Remove the support - sub frame.



11. Remove the brake pipe.
    (1) Separate each brake pipe using a flare nut wrench.



    (2) Remove the brake pipe from the pipe clip and the rear floor.



BRAKE > Brake Pipe

INSTALLATION

Caution:

- **Be careful of the following items. Failure to do so may cause the airbag system malfunction.**
  - **Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
  - **Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.**
- **Be careful not to damage the airbag system wiring harness when servicing the center brake pipe.**
- **When installing the brake pipe, do not bend.**
- **After installing the brake pipe and hose, perform air bleed.**
- **After installing the brake hoses, make sure that they do not contact the tires or suspension assembly, etc.**

Note:

The airbag system wiring harness is routed near the center brake pipe.

1. FRONT BRAKE PIPE

1. Install the brake pipe.
   (1) Install the brake pipe to the pipe clip.
   (2) Install each brake pipe using a flare nut wrench.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to BRAKE>General Description>COMPONENT > FRONT BRAKE PIPES AND HOSES.
2. Install the vacuum booster assembly. Ref. to BRAKE>Brake Booster>INSTALLATION > BRAKE BOOSTER.
3. Install the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
4. Install the front wheels.
   Tightening torque:
   120 N·m (12.2 kgf-m, 88.5 ft-lb)
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. CENTER AND REAR BRAKE PIPE

1. Install the brake pipe.
   (1) Install the brake pipe to the pipe clip and the rear floor.
   (2) Install each brake pipe using a flare nut wrench.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to BRAKE>General Description>COMPONENT > CENTER AND REAR BRAKE PIPES AND HOSES.
2. Install the support - sub frame.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to REAR SUSPENSION>General Description>COMPONENT > REAR SUSPENSION.
3. Install the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank>INSTALLATION.
4. Install the rear differential. Ref. to DIFFERENTIALS>Rear Differential (T-type)>INSTALLATION.
5. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
6. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
7. Install the floor under protector RH. Ref. to EXTERIOR/INTERIOR TRIM>Floor Under Protector>INSTALLATION.
8. Install the fuel tank protector RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
9. Install the crossmember support - rear RH. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
10. Install the rear wheels.
    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

BRAKE > Brake Pipe

INSPECTION

Check the pipe for crack and damage, and also check the connection for fluid leakage. If any faulty is found, repair or replace the relevant part.

Note:

Use a mirror when inspecting back sides and other locations which are hard to see.

REMOVAL

1. CVT MODEL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

   Caution:

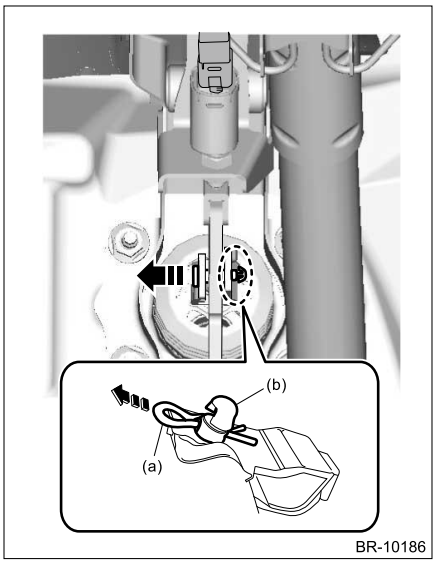
   To prevent damage to the universal joint assembly - steering and improper steering effort, make sure to remove the universal joint assembly - steering.
5. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
6. Remove the brake pedal assembly.

   (1) Disconnect the stop light switch connector.

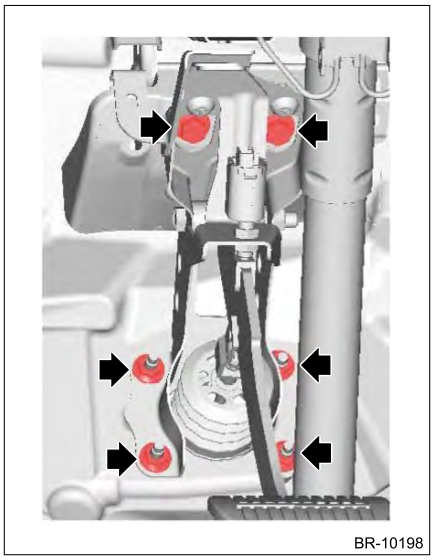
   (2) Remove the snap pin (a) and clevis pin (b), and remove the operating rod from the brake pedal.

   Caution:

   - **Be careful not to apply excessive force to the operating rod when handling the operating rod. The angle may change by ±3°, and it may result in damage to power piston cylinder.**
   - **Do not change the push rod length.**



(3) Remove the bolt and nut, and then detach the brake pedal assembly.



2. MT model

Note:

Brake pedal is integrated with the clutch pedal.

For removal procedures of the brake pedal, refer to Clutch section. Ref. to CLUTCH SYSTEM>Clutch Pedal>REMOVAL.

BRAKE > Brake Pedal

INSTALLATION

1. CVT MODEL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the brake pedal assembly.
   Caution:
   - **Apply grease to the snap pin to prevent the operating rod from wear.**
   - **Replace the clevis pin with a new part, and apply a thin coat of grease to the clevis pin.**

   Preparation items:
   Grease: Shell Gadus S2 V220 or equivalent

   Tightening torque:
   Brake pedal: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
3. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
   Caution:
   - **Always install the universal joint assembly - steering after installing the steering column to avoid damage to the universal joint assembly - steering.**
   - **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
   - **Always place the tilt lever to the lock position after the steering column is adjusted.**
4. Install the knee airbag module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
5. Install the cover assembly - instrument panel LWR driver.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
7. Check that the brake light operate properly.
8. Check the brake pedal after installation. Ref. to BRAKE>Brake Pedal>INSPECTION.

2. MT model

Note:

Brake pedal is integrated with the clutch pedal.

For installation procedure of the brake pedal, refer to Clutch section. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSTALLATION.

BRAKE > Brake Pedal

INSPECTION

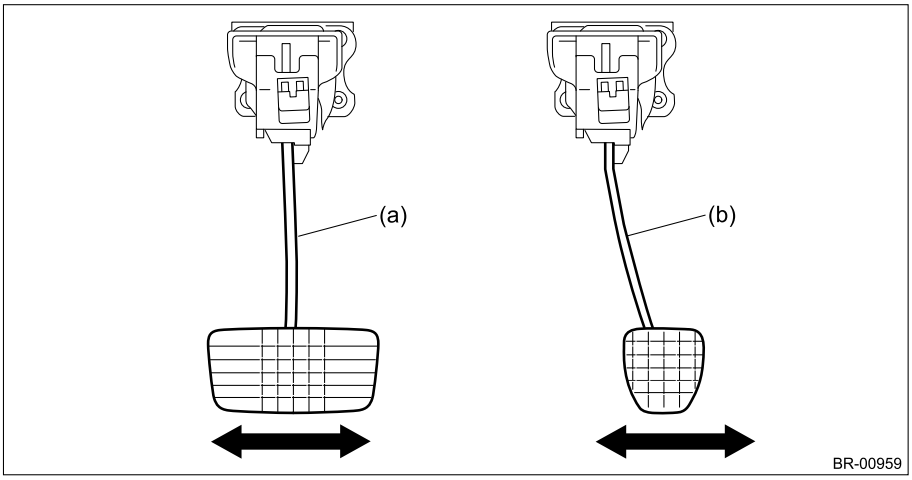
1. Move the pad - brake pedal in a horizontal direction with a force of approx. 10 N (1 kgf, 2 lbf), and check that the pedal deflection is in the range of specifications.

   Caution:

   If excessive deflection is noted, replace with a new bushing.

   Deflection of brake pedal:

   Service limit: 5.0 mm (0.197 in) or less



(a) Brake pedal (CVT model) (b) Brake pedal (MT model)

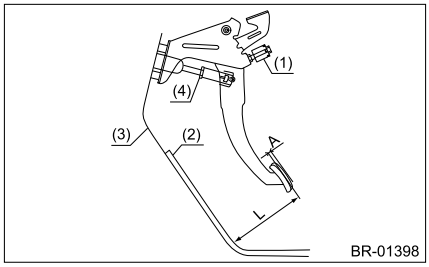
2. Check the position of the pedal pad.

   Pedal height L:

   143 — 153 mm (5.63 — 6.02 in)

   Brake pedal free play A:

   0.5 — 2.7 mm (0.02 — 0.11 in) [When pulling the brake pedal upward with a force of less than 10 N (1 kgf, 2 lbf)]



(1) Stop light switch (3) Toe board (4) Brake booster operating rod

(2) Mat

3. If it is not within the specification, loosen the lock nuts of vacuum booster operating rod, and rotate the rod to adjust the pedal height L within the specification.
4. Tighten the lock nut.

   Tightening torque:

   Operating lock nut: 22 N·m (2.2 kgf-m, 16.2 ft-lb)

   Note:

   Check the brake pedal height. When adjusting, also adjust the stop light switch.

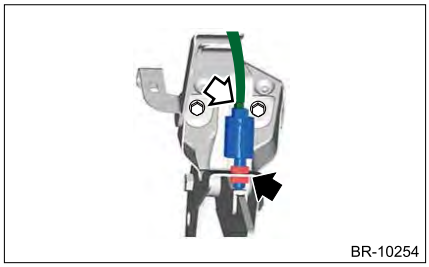
BRAKE > Stop Light Switch

REMOVAL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the stop light switch.
   (1) Disconnect the stop light switch connector.
   (2) Remove the nut, and remove the stop light switch.



BRAKE > Stop Light Switch

INSTALLATION

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

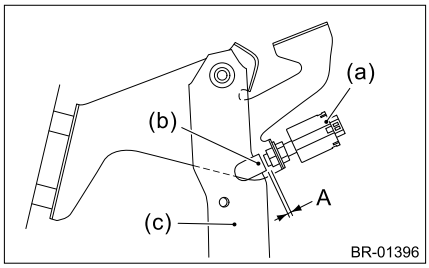
1. Install the stop light switch onto the bracket with screws and position it with the nut.
2. Adjust the stop light switch position, and then tighten the nut. Ref. to BRAKE>Stop Light Switch>ADJUSTMENT > CLEARANCE ADJUSTMENT.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
3. Install the knee airbag module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the cover assembly - instrument panel LWR driver.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

BRAKE > Stop Light Switch

INSPECTION

1. INSPECT THE SPECIFIED POSITION

1. Measure the clearance between the end of the stop light switch and the stopper.
   Caution:
   Be careful not to rotate the stop light switch.
   Stop light switch clearance A:
   1.5 mm (0.06 in)

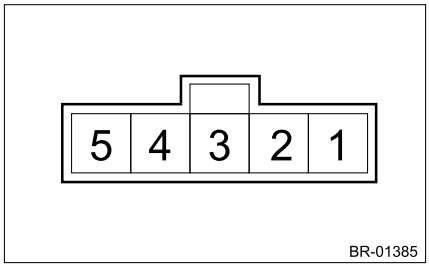


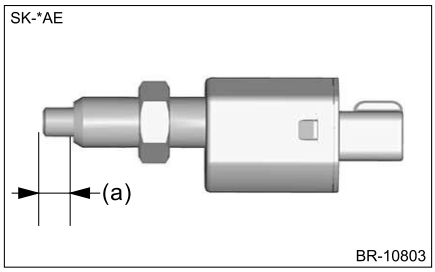
(a) Stop light switch
(b) Stopper
(c) Brake pedal

2. Adjust the position of the stop light switch if the inspection result is not within the standard value. Ref. to BRAKE>Stop Light Switch>ADJUSTMENT > CLEARANCE ADJUSTMENT.
3. If the stop light switch does not operate properly or it is not secured at the specified position after adjustment, replace with a new part.

2. CHECK OUTPUT

1. Check the voltage between connector terminals.
Preparation tool:
Circuit tester





Terminal No.	Inspection conditions	Standard
2 — 3	Apply battery voltage between terminals 1 (+) — 3 (−). When pressing-in the end of the stop light switch to make the length (a) 3.6 mm (0.14 in) (the actual length will be a little shorter than 3.6 mm (0.14 in)), output voltage turns OFF.	0.5 V or less
	Apply battery voltage between terminals 1 (+) — 3 (−). When returning the end of the stop light switch to make the length (a) 3.6 mm (0.14 in) (the actual length will be a little longer than 3.6 mm (0.14 in)), output voltage turns ON.	12 V
4 — 3	Apply battery voltage between terminals 5 (+) — 3 (−). When pressing-in the end of the stop light switch to make the length (a) 4.5 mm (0.18 in) (the actual length will be a little shorter than 4.5 mm (0.18 in)), output voltage turns ON.	12 V
	Apply battery voltage between terminals 5 (+) — 3 (−). When returning the end of the stop light switch to make the length (a) 4.5 mm (0.18 in) (the actual length will be a little longer than 4.5 mm (0.18 in)), output voltage turns OFF.	0.5 V or less

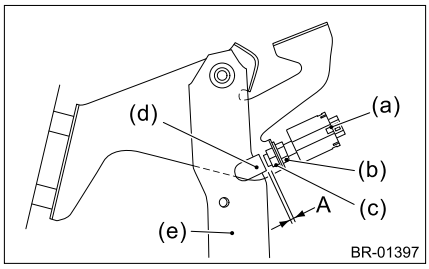
2. Replace the stop light switch if the inspection result is not within the standard value.

BRAKE > Stop Light Switch

ADJUSTMENT

1. CLEARANCE ADJUSTMENT

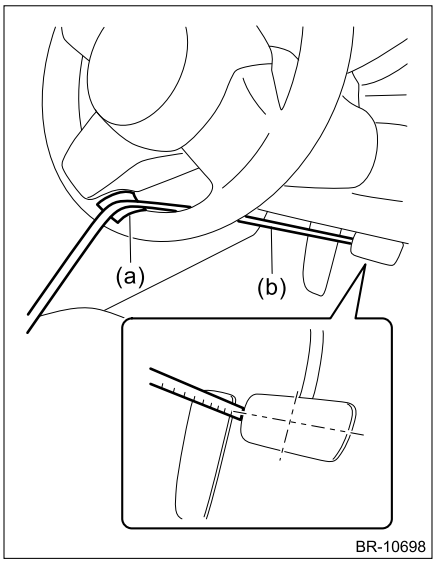
1. Loosen the lock nut, and adjust the stop light switch position until the clearance (A) between the threaded end of the stop light switch and the stopper becomes 1.5 mm (0.06 in). Then, tighten the lock nut.
Tightening torque:
8 N·m (0.8 kgf-m, 5.9 ft-lb)



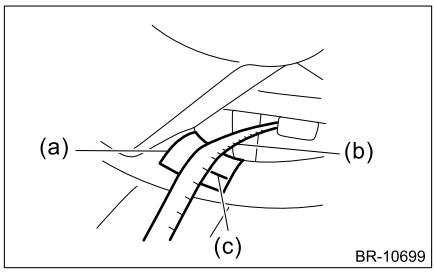
(a) Stop light switch
(b) Lock nut A
(c) Lock nut B
(d) Stopper
(e) Brake pedal

2. ADJUSTMENT WHEN VDC WARNING LIGHT OR EyeSight WARNING LIGHT IS ILLUMINATING

1. Measure the brake pedal stroke which turns on the stop light switch.
(1) Release the steering wheel lock, tilt the steering column to the lowest end and fully retract the column by the telescopic system.
(2) Affix the masking tape (a) to protect the steering wheel from damage, pass the measure (b) through the steering wheel and fix it to the vertical center position of the brake pedal.
Caution:
If the measure (b) interferes with the knee airbag module, remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.



(3) Set the measure (b) so that it becomes straight from the brake pedal, and add a marking (c) on the masking tape (a).



(4) Operate the brake pedal, and read the position where the stop light illuminates (the amount of the pedal stroke) using the marking added in the previous step.
Caution:
If the pedal stroke is less than 3 mm (0.12 in), it may lead to an incorrect light illumination by vibrations, etc.

2. If the stop light illuminating position is not within the adjustment value, readjust the stop light switch position.
Note:
Turning the lock nut B by 90° changes the amount of pedal stroke by approx. 1 mm (0.04 in).
Adjustment value (amount of pedal stroke):

4 mm (0.16 in) or more, 6 mm (0.24 in) or less

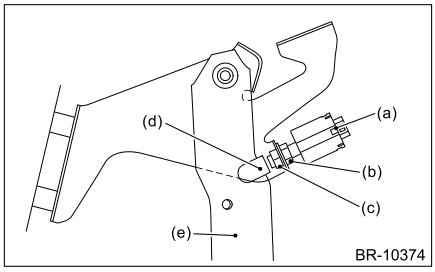
(1) Loosen the lock nut A.

(2) Turn the lock nut B to adjust the stop light switch position so that the stop light illuminating position is within the adjustment value.

(3) After adjustment, tighten the lock nut A.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



(a) Stop light switch

(b) Lock nut A

(c) Lock nut B

(d) Stopper

(e) Brake pedal

(4) After the lock nut is tightened, check again that the stop light illuminating position is within the adjustment value. If it's not within the adjustment value, perform the adjustment procedure again.

Caution:

If the stop light illuminating position is less than 3 mm (0.12 in), it may lead to an incorrect stop light illumination by vibrations etc. even when the brake pedal is not operated while driving.

BRAKE > Brake Vacuum Pump

REMOVAL

For removal procedures of the brake vacuum pump, refer to the “MECHANICAL” section. Ref. to MECHANICAL(H4DO)>Vacuum Pump>REMOVAL.

BRAKE > Brake Vacuum Pump

INSTALLATION

For installation procedures of the brake vacuum pump, refer to the “MECHANICAL” section. Ref. to MECHANICAL(H4DO)>Vacuum Pump>INSTALLATION.

BRAKE > Brake Vacuum Pump

INSPECTION

Refer to “MECHANICAL” section for brake vacuum pump inspection. Ref. to MECHANICAL(H4DO)>Vacuum Pump>INSPECTION.

INSPECTION

	Trouble and possible cause	Corrective action
1. Insufficient braking	(1) Fluid leakage from the hydraulic mechanism	Repair or replace. (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose)
	(2) Entry of air into the hydraulic mechanism	Bleed air.
	(3) Wear, deteriorated surface material, water or fluid on lining	Replace, grind or clean.
	(4) Improper operation of master cylinder assembly, disc caliper, vacuum booster assembly or check valve	Repair or replace.
2. Unstable or uneven braking	(1) Fluid on lining or rotor	Correct the cause of fluid leakage, and clean or replace.
	(2) Rotor defective	Repair or replace the rotor.
	(3) Improper lining contact, deteriorated surface, deteriorated or worn lining material	Repair by grinding, or replace.
	(4) Deformed back plate	Repair or replace.
	(5) Overinflation of tires	Adjust the air pressure.
	(6) Defective wheel alignment	Adjust alignment.
	(7) Loose back plate or support installation bolt	Tighten to the specified torque.
	(8) Defective hub unit COMPL	Replace.
	(9) Defective hydraulic system	Replace the cylinder, brake pipe or hose.
	(10) Unstable performance of the parking brake	Check, adjust or replace the rear brake and cable system.
3. Excessive pedal stroke	(1) Entry of air into the hydraulic mechanism	Bleed air.
	(2) Excessive play in the master cylinder push rod	Adjust.
	(3) Fluid leakage from the hydraulic mechanism	Repair or replace. (cup, piston seal, piston boot, master cylinder piston kit, pipe or hose)
	(4) Improper lining contact or worn lining	Repair or replace.
4. Brake dragging or improper brake return	(1) Insufficient pedal play	Adjust play.
	(2) Improper master cylinder return	Clean or replace the cylinder.
	(3) Clogged hydraulic system	Replace.
	(4) Improper return or adjustment of parking brake	Repair or adjust.
	(5) Weakened spring tension or breakage of shoe return spring	Replace the spring.
	(6) Improper disc caliper operation	Repair or replace.
	(7) Faulty wheel bearing	Replace.
5. Brake noise (1) (creaking sound)	(1) Hardened or deteriorated brake pad	Replace the pad.
	(2) Worn brake pad	Replace the pad.
	(3) Loose back plate or support installation bolt	Tighten to the specified torque.
	(4) Loose hub unit COMPL	Tighten to the specified torque.
	(5) Dirty rotor	Clean the rotor, or clean and replace brake assembly.
6. Brake noise (2) (hissing sound)	(1) Worn brake pad	Replace the pad.
	(2) Improperly installed pad	Correct or replace the pad.
	(3) Loose or bent rotor	Retighten or replace.
7. Brake noise (3) (click sound)	Excessively worn pad or support	Replace the pad or the support.

	Trouble and possible cause	Corrective action
8. VDC warning light or EyeSight warning light illuminating	Stop light switch adjustment malfunction	Adjust the stop light switch. Ref. to BRAKE>Stop Light Switch>ADJUSTMENT > ADJUSTMENT WHEN VDC WARNING LIGHT OR EyeSight WARNING LIGHT IS ILLUMINATING.
9. Stop light illuminating due to vibrations, etc. during driving (brake operation not performed)	Stop light switch adjustment malfunction	Adjust the stop light switch. Ref. to BRAKE>Stop Light Switch>ADJUSTMENT > ADJUSTMENT WHEN VDC WARNING LIGHT OR EyeSight WARNING LIGHT IS ILLUMINATING.

PARKING BRAKE

PB

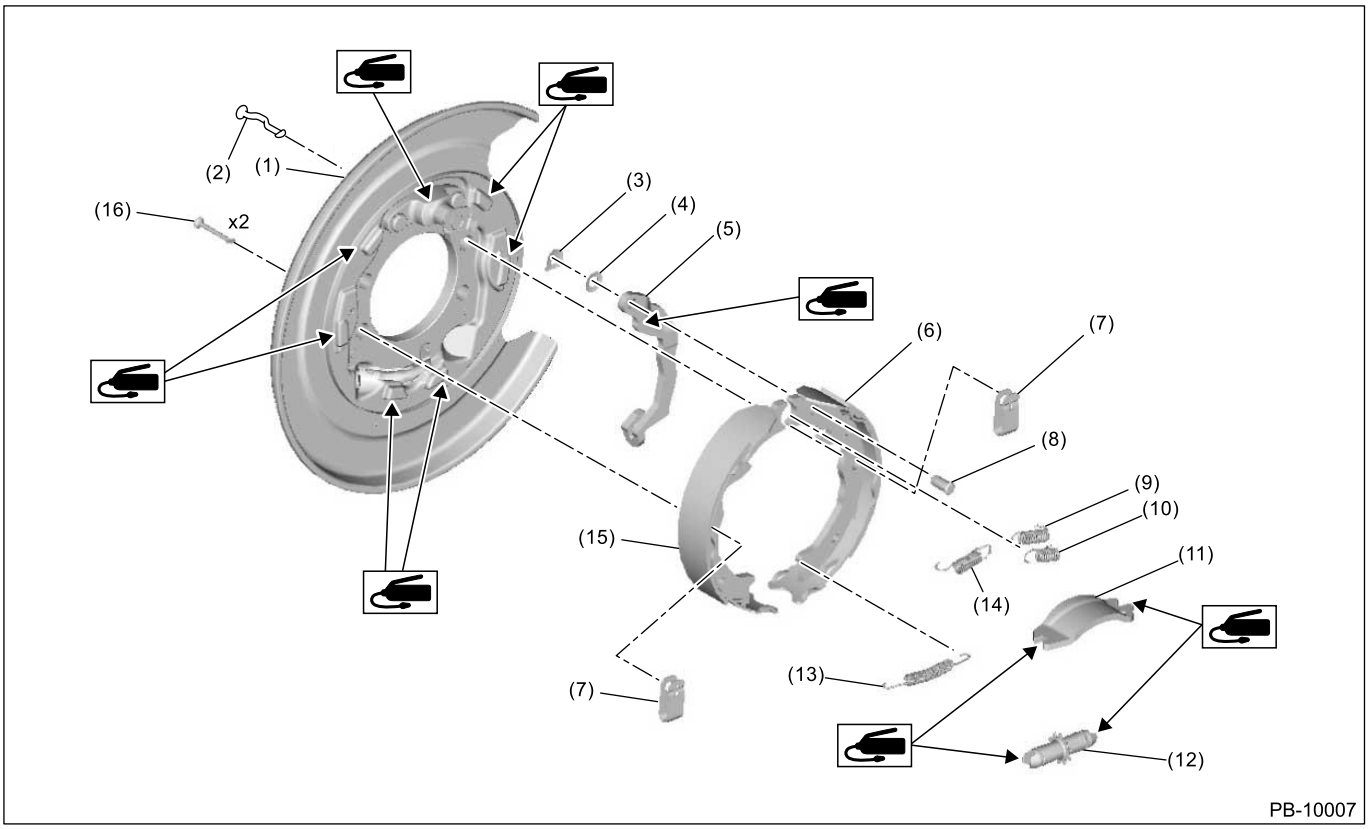
1. General Description
2. Parking Brake Lever
3. Parking Brake Cable
4. Parking Brake Assembly (Rear Disc Brake)
5. General Diagnostic Table

SPECIFICATION

Item		Specification	
Type		Drum in disc duo servo type	
Effective drum diameter mm (in)		170 (6.69)	
Lining dimensions (Length × Width × Thickness) mm (in)		147.7 × 30 × 3.5 (5.81 × 1.181 × 0.14)	
Inside diameter mm (in)		Standard	170 (6.69)
		Limit	171 (6.73)
Lining thickness mm (in)		Standard	3.5 (0.14)
		Limit	1.5 (0.059)
Clearance adjustment		Manual adjustment	
Free play adjusting method		Auto adjuster	
Operation method		Manual lever type	
Lever stroke	Notches/N (kgf, lbf)	7 — 8/200 (20.4, 45)	

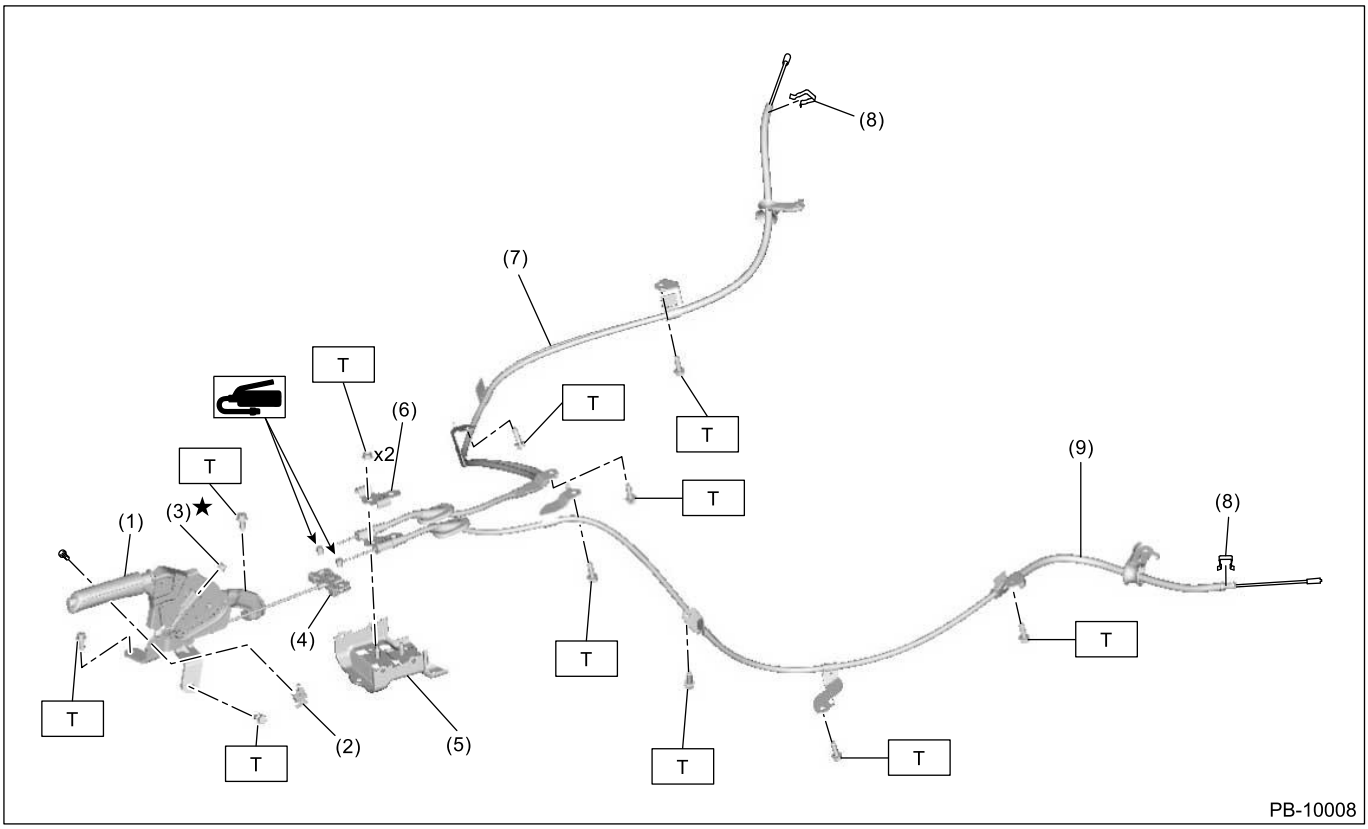
COMPONENT

1. PARKING BRAKE



(1) Back plate - rear brake
(2) Pin - secondary shoe hold-down
(3) Retainer - rear brake
(4) Spring washer - rear brake
(5) Parking lever - rear
(6) Parking brake shoe (secondary)
(7) Cup - shoe hold-down
(8) Pin - parking brake
(9) Spring - secondary shoe return
(10) Spring - strut
(11) Strut - brake
(12) Adjuster ASSY - rear brake
(13) Spring - adjuster
(14) Spring - primary shoe return
(15) Parking brake shoe (primary)
(16) Pin - primary shoe hold-down

2. PARKING BRAKE LEVER & CABLE



(1) Lever ASSY - hand brake
(2) Switch ASSY - hand brake
(3) Adjusting nut (self-locking nut)
(4) Equalizer
(5) Bracket
(6) Clamp A - hand brake cable
(7) Cable ASSY - parking brake RH
(8) Clamp B - hand brake cable
(9) Cable ASSY - parking brake LH

Tightening torque: N·m (kgf-m, ft-lb)
T: 18 (1.8, 13.3)

PARKING BRAKE > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Apply grease onto sliding or revolving surfaces before installation.
- Be sure that the surface of brake disc, brake pad or brake shoe is free from grease or oil.

PARKING BRAKE > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

REMOVAL

1. Set the wheel stoppers to tires.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

   Note:

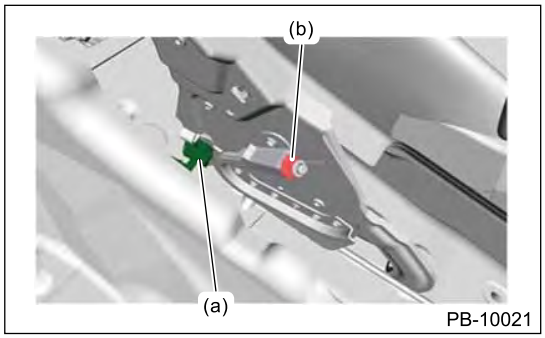
   On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.
3. Remove the driver's seat. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
5. Remove the lever assembly - hand brake.

   (1) Disconnect the connector (a) of the switch assembly - hand brake.

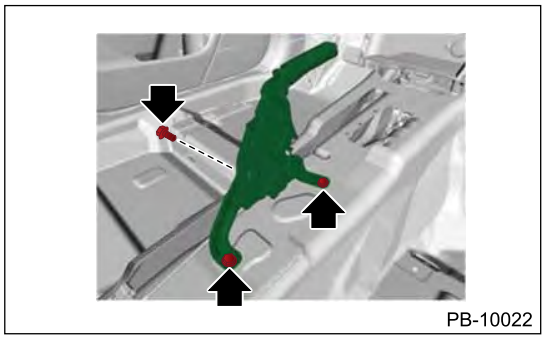
   (2) Remove the adjusting nut (b).

   Caution:

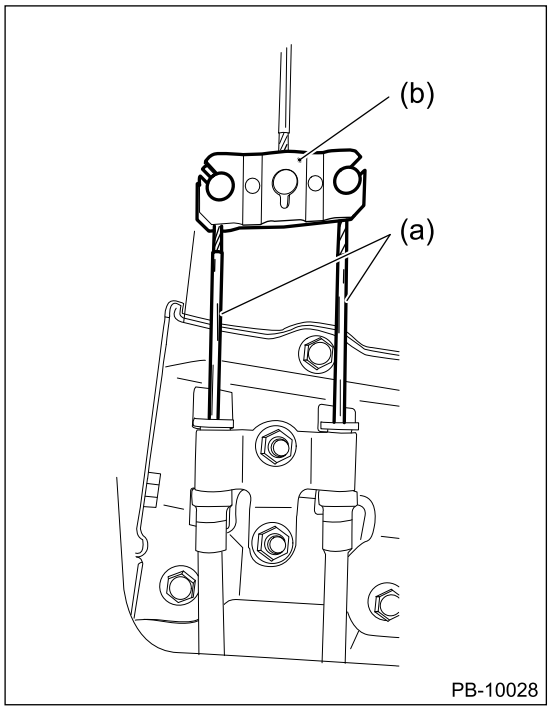
   A self-locking nut is used for the adjusting nut of parking cable. Therefore, replace the self-locking nut with a new one when disassembling.



   (3) Remove the bolt, and then remove the lever assembly - hand brake.



6. Remove the inner cable end (a) from the equalizer (b).



PARKING BRAKE > Parking Brake Lever

INSTALLATION

1. Install the inner cable end to equalizer.
2. Install the lever assembly - hand brake.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
   Caution:
   Do not reuse the adjusting nut (self locking nut). Always replace with a new part.
3. Be sure to adjust the lever stroke. Ref. to PARKING BRAKE>Parking Brake Lever>ADJUSTMENT.
4. Install the console box assembly.
   Tightening torque:
   6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
5. Install the driver's seat. Ref. to SEATS>Front Seat>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
   Note:
   For CVT models, after connecting the battery ground terminal, place the select lever in the P position.

PARKING BRAKE > Parking Brake Lever

INSPECTION

1. LEVER ASSEMBLY

1. Operate the lever assembly - hand brake 3 to 4 times and fully return the lever assembly - hand brake.
2. While slowly pulling up the lever assembly - hand brake, count the notches.
   Lever stroke:

7 to 8 notches when pulled with a force of 200 N (20.4 kgf, 45 lbf)

If it is not within the specified value, adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

PARKING BRAKE > Parking Brake Lever

ADJUSTMENT

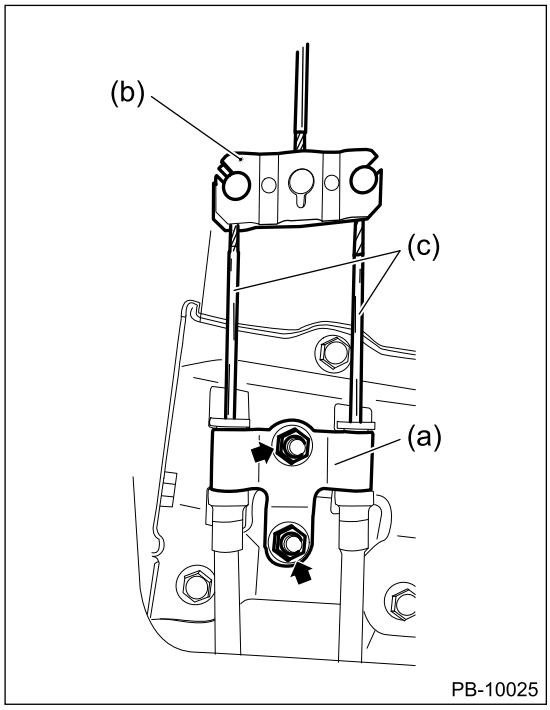
Adjust the parking lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > LEVER STROKE.

REMOVAL

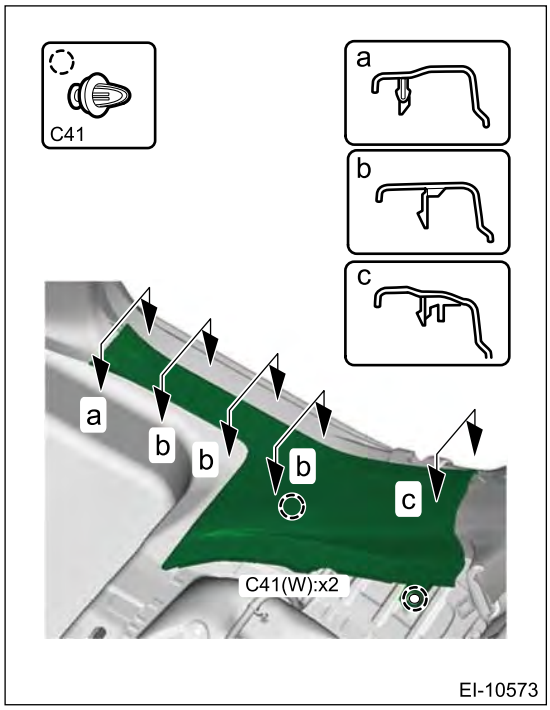
Caution:

Airbag system satellite safing sensor is located in the lower of the rear seat cushion center. Before removing the rear seat, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

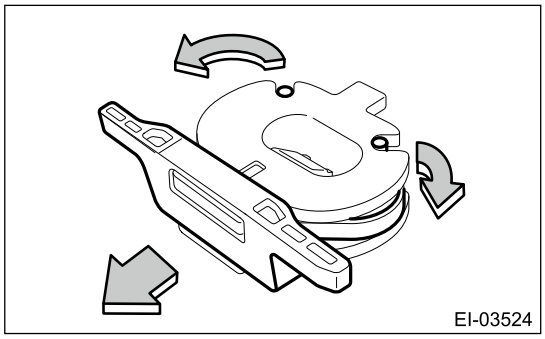
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For the power seat, move the seat to the front-most position before removing the battery ground terminal.**
2. Remove the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the lever assembly - hand brake. Ref. to PARKING BRAKE>Parking Brake Lever>REMOVAL.
4. Remove the nut and remove the clamp A - hand brake cable (a).
5. Remove the inner cable end (c) from the equalizer (b).



6. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
7. Release the clips and claws, and remove the side sill covers - rear INN on the left and right sides.
   Caution:
   Do not pull with excessive force. Doing so may damage the claws of the side sill cover - rear INN.



8. Remove the clips and knobs of the hook - seat cushion rear.



9. Turn over the floor carpet and remove the grommet of the cable assembly - parking brake from the rear floor.

10. Lift up the vehicle, and then remove the rear wheels.

11. Remove the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>REMOVAL.

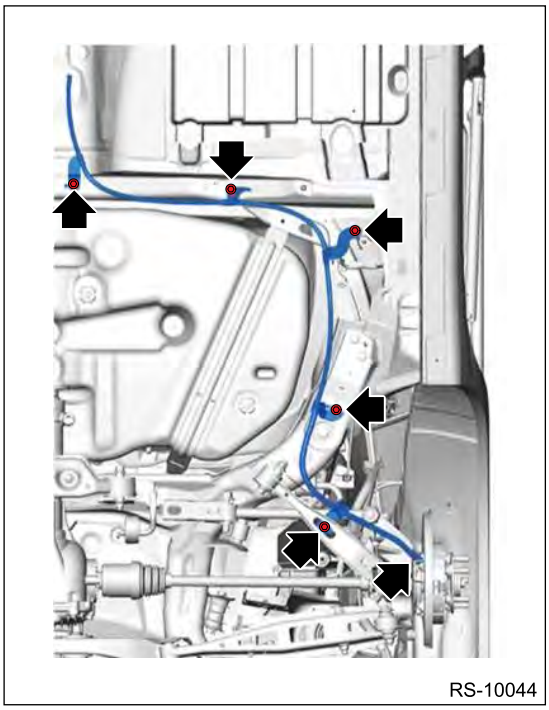
12. Remove the rear exhaust pipe and muffler.

- Rear exhaust pipe: Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
- Muffler: Ref. to EXHAUST(H4DO)>Muffler>REMOVAL.

13. Remove the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.

14. Remove the cable assembly - parking brake from the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>REMOVAL.

15. Remove the cable assembly - parking brake.



PARKING BRAKE > Parking Brake Cable

INSTALLATION

Caution:

- **After installing the backrest assembly, make sure that each seat belt operates normally.**
- **Make sure that they are properly secured on each hook on the vehicle side.**

1. Install the cable assembly - parking brake.
   Tightening torque:
   Cable clamp: 18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the cable assembly - parking brake to the lever section of parking brake shoe. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.
3. Install the grommet to the rear floor.
4. Install the propeller shaft assembly. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
5. Install the rear exhaust pipe and muffler.
   - Rear exhaust pipe: Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
   - Muffler: Ref. to EXHAUST(H4DO)>Muffler>INSTALLATION.
6. Install the fuel tank protector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank Protector>INSTALLATION.
7. Place the floor mat to the original position, and then attach the clip and the knob of the hook - seat cushion rear.
8. Install the side sill covers - rear INN on the right and left side.
9. Install the rear seat cushion assembly.
10. Install the inner cable end to equalizer, and install the clamp A - hand brake cable.
11. Install the lever assembly - hand brake.
    Tightening torque:
    18 N·m (1.8 kgf-m, 13.3 ft-lb)
12. Install the console box assembly.
    Tightening torque:

6.5 N·m (0.7 kgf-m, 4.8 ft-lb)

13. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

14. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

Note:

For CVT models, after connecting the battery ground terminal, place the select lever in the P position.

PARKING BRAKE > Parking Brake Cable

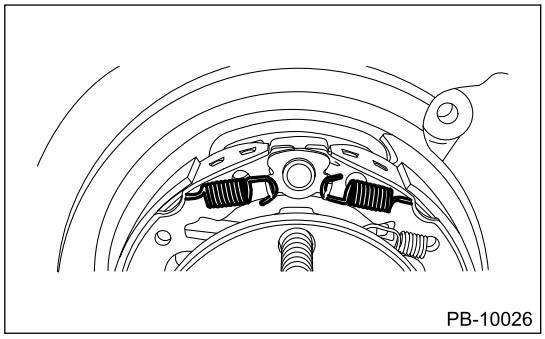
INSPECTION

Check the removed cable and replace if damaged, rusty or malfunctioning.

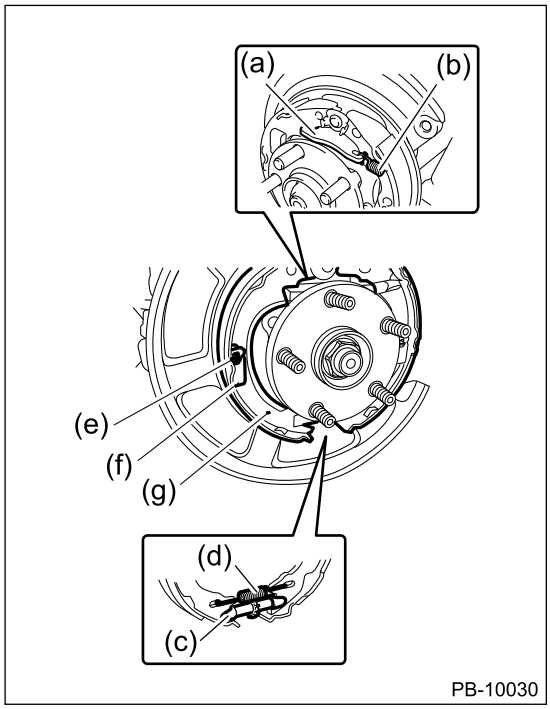
1. Check the cable for smooth operation.
2. Check the inner cable for damage and rust.
3. Check the outer cable for damage, bends and cracks.

REMOVAL

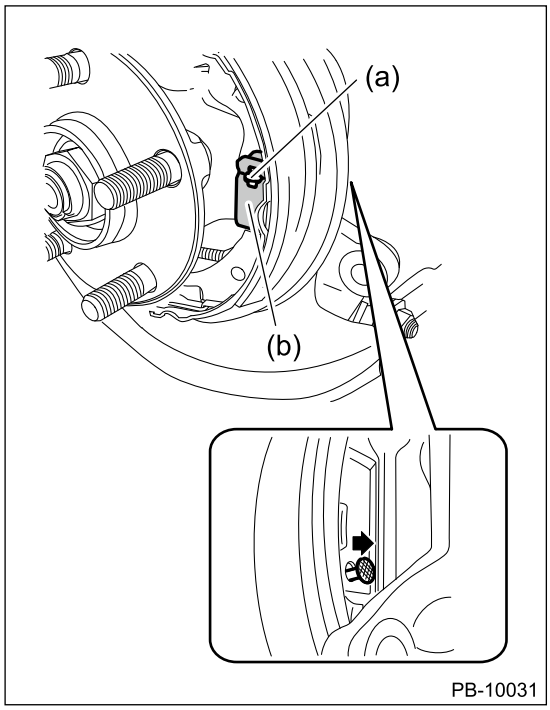
1. Release the parking brake.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the rear disc rotor. Ref. to BRAKE>Rear Disc Rotor>REMOVAL.
4. Remove the spring - primary shoe return and the spring - secondary shoe return.



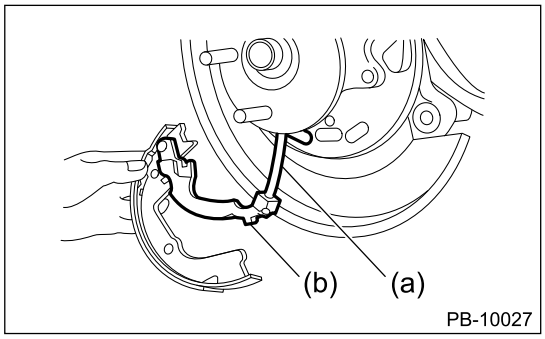
5. Remove the parking brake shoe on the primary side.
   (1) Remove the strut - brake (a) and the spring - strut (b).
   (2) Remove the adjuster assembly - rear brake (c) and the spring - adjuster (d).
   (3) Remove the pin - shoe hold-down (e) and the spring - shoe clamp (f), and remove the parking brake shoe (g).



6. Remove the pin - shoe hold-down (a) and the spring - shoe clamp (b), and remove the secondary side parking brake shoe.



7. Remove the cable assembly - hand brake cable (a) from the parking lever - rear (b).



8. Remove the retainer - rear brake and the spring washer - rear brake, and remove the parking lever - rear and the brake shoe.

PARKING BRAKE > Parking Brake Assembly (Rear Disc Brake)

INSTALLATION

Caution:

Be sure the lining surface is free from brake fluid and grease.

1. Apply brake grease to the following locations.

Preparation items:

Brake grease: Dow Corning Molykote 44MA or equivalent

- Six contact surfaces of the parking brake shoe rim and back plate - rear brake
- Contact surface of the parking brake shoe and the anchor pin
- Contact surface of the parking lever assembly - rear and the strut - brake
- Contact surface of the parking brake shoe and the adjuster assembly - rear brake
- Contact surface of the parking brake shoe and the strut - brake
- Contact surface of the parking lever - rear and the parking brake shoe

2. Install the parking lever - rear to the secondary side parking brake shoe.

Note:

Install the pin - parking lever and spring washer - rear brake to the parking lever - rear, and swage the retainer - rear brake to secure.

3. Install the cable assembly - parking brake to the parking lever - rear.

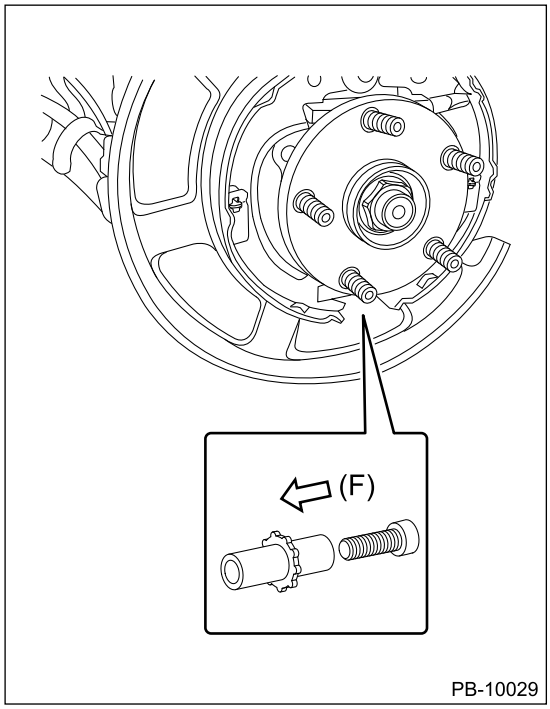
Note:

Check that the cable assembly - parking brake does not fall from the cable guide.

4. Attach the adjuster assembly - rear brake and the spring - adjuster to the primary side and the secondary side parking brake shoes.

Note:

Install the adjuster assembly - rear brake with the screw section facing to the direction shown in the figure below.



(F) Left wheel: front side of vehicle, right wheel: rear side of vehicle

5. Install the parking brake shoes to the back plate - rear brake with the pins - shoe hold-down and the springs - shoe clamp.
6. Install the strut - brake and the spring - strut to the parking brake shoes.

Note:

Install the spring - strut so that it comes towards the front side of the vehicle.

7. Install the return springs on the primary side first, and then the secondary side.
8. Install the disc rotor and the disc brake assembly - rear.

Tightening torque:

66 N·m (6.7 kgf-m, 48.7 ft-lb)

9. Adjust the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.
10. Install the rear wheels.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

11. If new parking brake shoes are replaced, drive the vehicle to break-in the parking brake lining.
(1) Drive the vehicle at approximately 35 km/h (22 MPH) or more.

(2) While pressing the button of the lever assembly - hand brake, pull the lever assembly - hand brake with a force of 150 N (15.3 kgf, 33.7 lbf).
(3) Drive the vehicle for about 200 m (0.12 mile) in this condition.
(4) Wait 5 to 10 minutes for the parking brake to cool down. Repeat steps (1) through (3) again.
(5) After breaking-in, re-adjust the parking brakes. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT.

PARKING BRAKE > Parking Brake Assembly (Rear Disc Brake)

INSPECTION

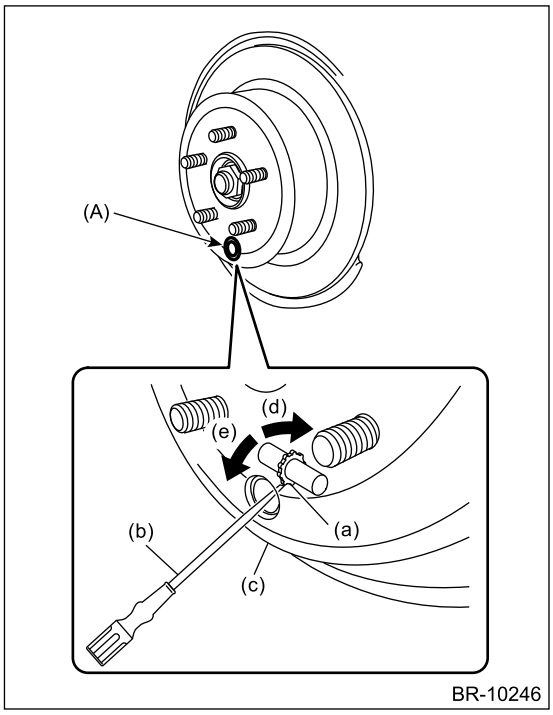
1. Measure the inner diameter of the rear disc rotor. If scoring or worn is found on the disc, replace the rear disc rotor.
   Disc rotor inner diameter:
   Specification: 170 mm (6.69 in)
   Service limit: 171 mm (6.73 in)
2. Measure the lining thickness. If it exceeds the limit, replace the brake shoe.
   Lining thickness:
   Standard: 3.5 mm (0.14 in)
   Service limit: 1.5 mm (0.059 in)
   Note:
   Replace the right and left parking brake shoe as a set.

PARKING BRAKE > Parking Brake Assembly (Rear Disc Brake)

ADJUSTMENT

1. SHOE CLEARANCE

1. Return the lever assembly - hand brake completely.
2. Loosen the adjusting nut, and make the cable free.
3. Remove the adjusting hole cover (A).
4. Remove the adjusting hole cover (A), and loosen the adjuster assembly - rear brake by inserting a flat tip screwdriver.



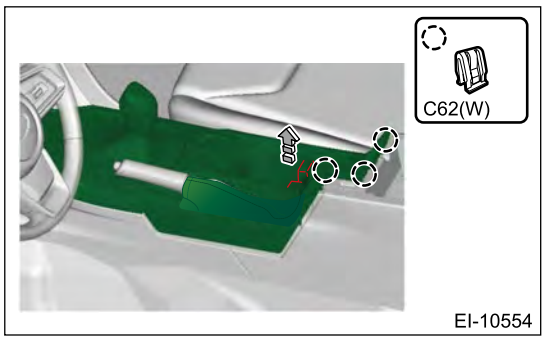
(a) Adjuster ASSY - rear brake
(c) Disc rotor
(e) Shorten the adjuster ASSY - rear brake
(b) Flat tip screwdriver
(d) Extend the adjuster ASSY - rear brake

5. Loosen the adjuster assembly - rear brake by 10 notches in the direction of the arrow (e).
Caution:
- **Check there is no brake drag.**
- **Make sure that the adjuster assembly - rear brake is loosened by 10 notches. If it is not loosened sufficiently, dragging may occur.**

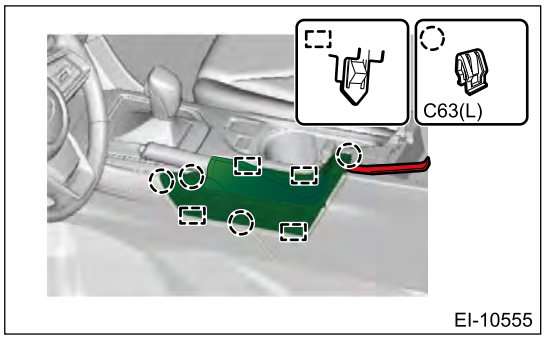
6. Install the adjusting hole cover to the disc rotor.
7. Adjust the parking lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > LEVER STROKE.

2. LEVER STROKE

1. Adjust the shoe clearance before adjusting lever stroke. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>ADJUSTMENT > SHOE CLEARANCE.
2. Remove the boot - hand brake.
(1) Pull up the cup holder, and release the engagement of the clip at the end of the cover assembly - front.



(2) Release the engagement of claws and clips, and then remove the boot - hand brake.

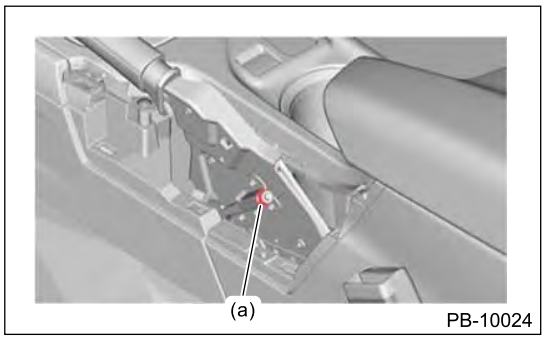


(3) Pull the lever assembly - hand brake hard 3 to 5 times.

(4) Turn the adjusting nut (a) until the lever stroke is at the specified value.

Lever stroke:

7 to 8 notches when pulled with a force of 200 N (20.4 kgf, 45 lbf)



3. Check there is no parking brake drag.

4. Check that the brake warning light illuminates when the lever assembly - hand brake is operated.

Note:

The light must illuminate when the first notch is reached after pulling the lever.

5. Install the boot - parking brake.

INSPECTION

Symptoms	Possible cause	Corrective action
Brake drag	Lever assembly - hand brake is maladjusted.	Adjust.
	Parking brake cable does not move.	Repair or replace.
	Parking brake shoe clearance is maladjusted.	Adjust.
	Spring - shoe return is faulty.	Replace.
Noise from brake	Spring - shoe return is faulty.	Replace.
	Spring - shoe clamp is faulty.	Replace.

VEHICLE DYNAMICS CONTROL (VDC)

VDC

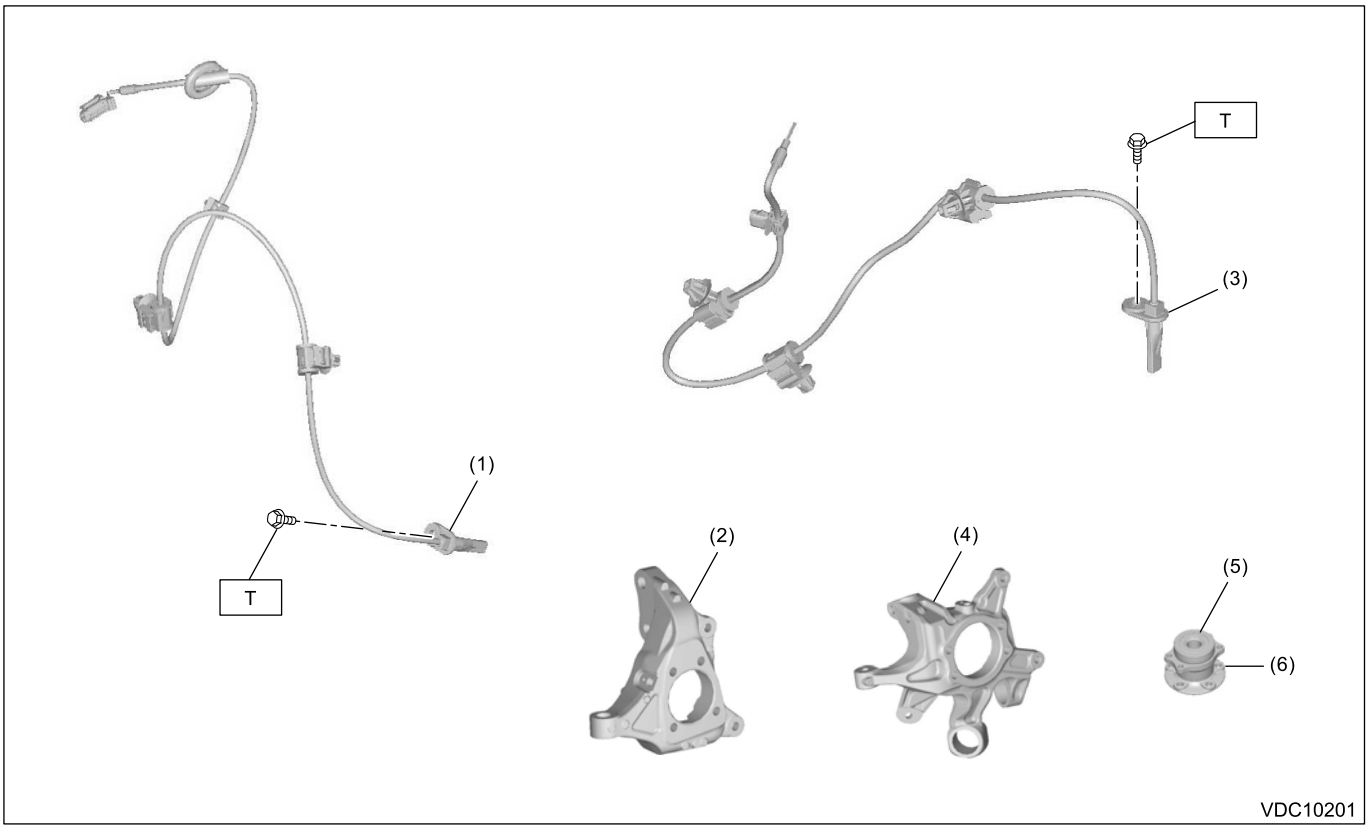
1. General Description
2. Relay and Fuse
3. Vehicle Dynamics Control System
4. VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)
5. ABS Sequence Control
6. VDC Sequence Control
7. Brake Lamp Relay
8. Yaw Rate and G Sensor
9. Steering Angle Sensor
10. Front ABS Wheel Speed Sensor
11. Rear ABS Wheel Speed Sensor
12. Front Magnetic Encoder
13. Rear Magnetic Encoder
14. VDC OFF Switch
15. General Diagnostic Table

SPECIFICATION

Item				Specification or identification
ABS wheel speed sensor	ABS wheel speed sensor gap (for reference)	Front		0.61 — 1.59 mm (0.02 — 0.06 in)
		Rear		0.56 — 1.24 mm (0.02 — 0.05 in)
	Identifications of harness (symbol)	Front	RH	K1
			LH	K2
		Rear	RH	K5
			LH	K6
VDCCM&H/U identification		Models without EyeSight		D8
		Models with EyeSight		D9

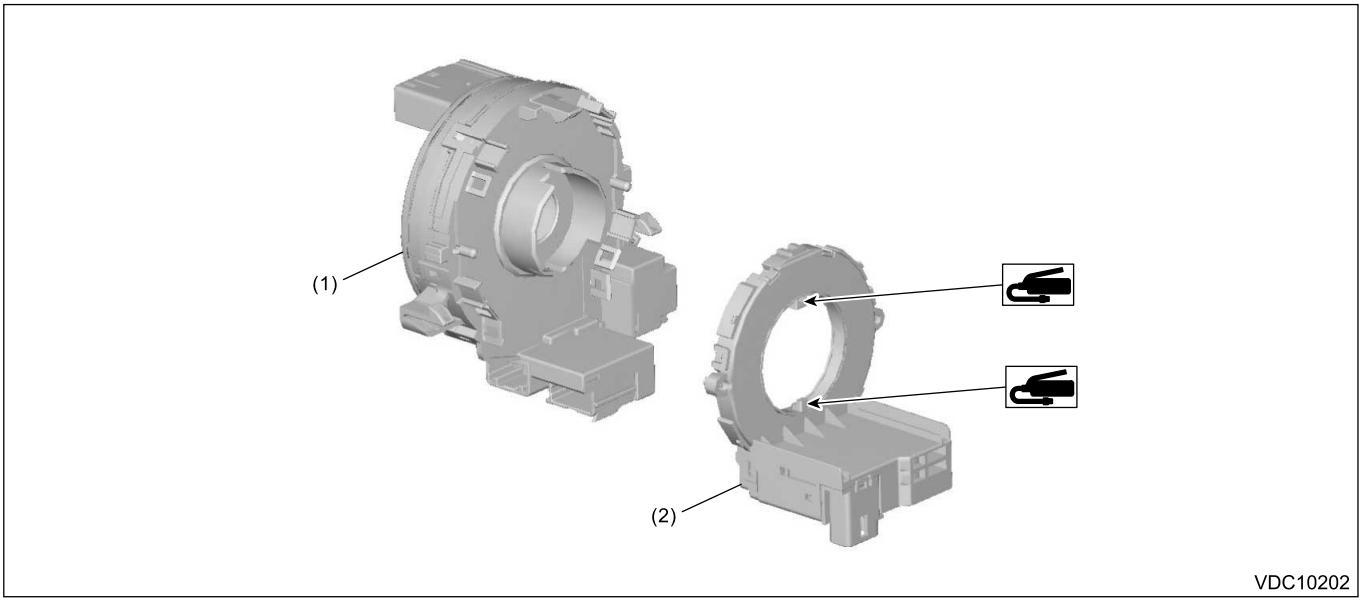
COMPONENT

1. ABS WHEEL SPEED SENSOR



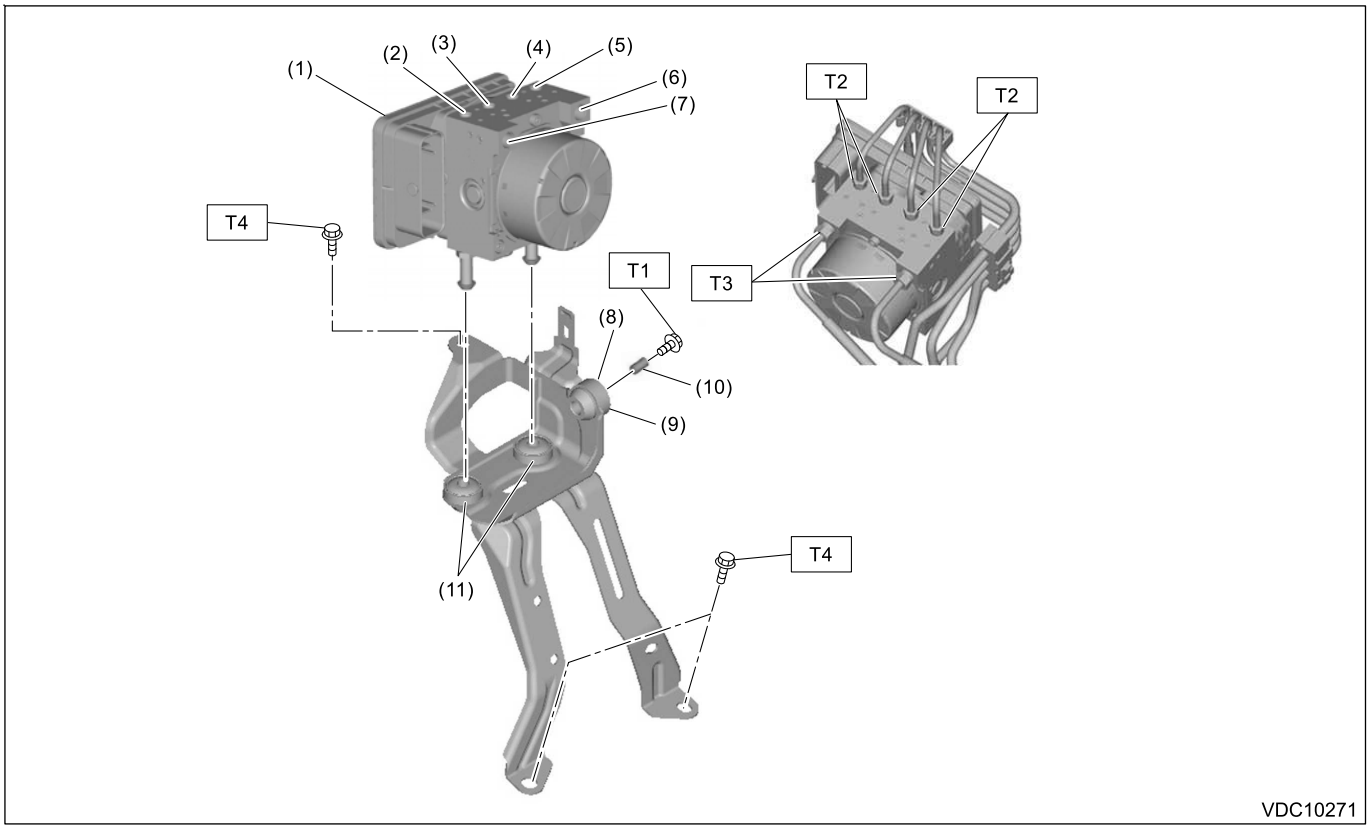
(1)	Front ABS wheel speed sensor	(4)	Housing ASSY - rear axle	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Housing ASSY - front axle	(5)	Magnetic encoder	***T: 7.5 (0.8, 5.5)***
(3)	Rear ABS wheel speed sensor	(6)	Hub unit COMPL	

2. STEERING ANGLE SENSOR



(1)	Steering roll connector	(2)	Steering angle sensor

3. VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U)



(1)	VDC control module and hydraulic control unit (VDCCM&H/U)	(7)	Secondary inlet	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Rear RH outlet	(8)	Damper - hydraulic unit	***T1: 7.5 (0.8, 5.5)***
(3)	Front LH outlet	(9)	Bracket - hydraulic unit	***T2: 15 (1.5, 11.1)***
(4)	Front RH outlet	(10)	Spacer	***T3: 19 (1.9, 14)***
(5)	Rear LH outlet	(11)	Damper - hydraulic unit	***T4: 33 (3.4, 24.3)***
(6)	Primary inlet			

VEHICLE DYNAMICS CONTROL (VDC) > General Description

CAUTION

- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- Remove contamination including dirt and corrosion before removal, installation, disassembly or assembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

PREPARATION TOOL

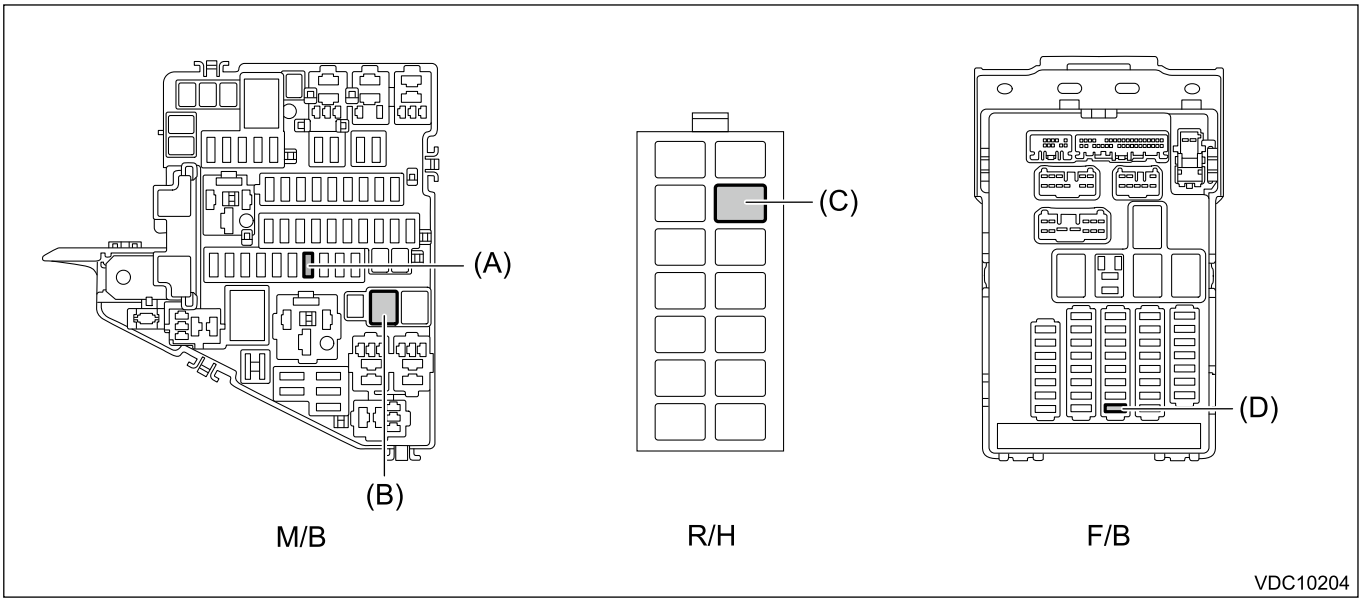
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Pressure gauge	Used for measuring oil pressure.
Oscilloscope	Used for measuring the sensor.
Steering wheel puller	Used for removing the steering wheel.

LOCATION



Main fuse box (M/B)	Fuse 30 A (VDC CM&H/U)	(A)
	Fuse 40A (VDC CM&H/U)	(B)
Relay holder (R/H)	Brake light relay	(C)
Fuse & relay box (F/B)	Fuse 7.5 A (VDC CM&H/U)	(D)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

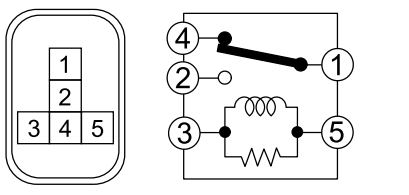
INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

2. CHECK RELAY

1. Measure the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	
1 — 4	Always	Less than 1 Ω	
1 — 2	Apply battery voltage between terminals 3 and 5.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

WIRING DIAGRAM

Refer to “Vehicle Dynamics Control” in the wiring diagram. Ref. to WIRING SYSTEM>Vehicle Dynamics Control System>WIRING DIAGRAM.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

ELECTRICAL SPECIFICATION

For the electrical specification, refer to “Control Module I/O Signal” of “BRAKE CONTROL (DIAGNOSTICS)” section. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Control Module I/O Signal.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “BRAKE CONTROL (DIAGNOSTICS)” section. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

VEHICLE DYNAMICS CONTROL (VDC) > Vehicle Dynamics Control System

NOTE

For operation procedures of each component of the vehicle dynamics control system, refer to the respective section.

- VDC control module & hydraulic control unit (VDCCM&H/U): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
- Yaw rate & G sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Yaw Rate and G Sensor.
- Steering angle sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.
- Front ABS wheel speed sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor.
- Rear ABS wheel speed sensor: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor.
- Front magnetic encoder: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front Magnetic Encoder.
- Rear magnetic encoder: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear Magnetic Encoder.
- VDC OFF switch: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC OFF Switch.

REMOVAL

Caution:

- **Avoid unnecessary removal of parts in order to prevent fluid leakage.**
- **When the VDCCM&H/U components are removed, be sure to perform the installation according to the installation procedures. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>INSTALLATION.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Move the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.

   Note:

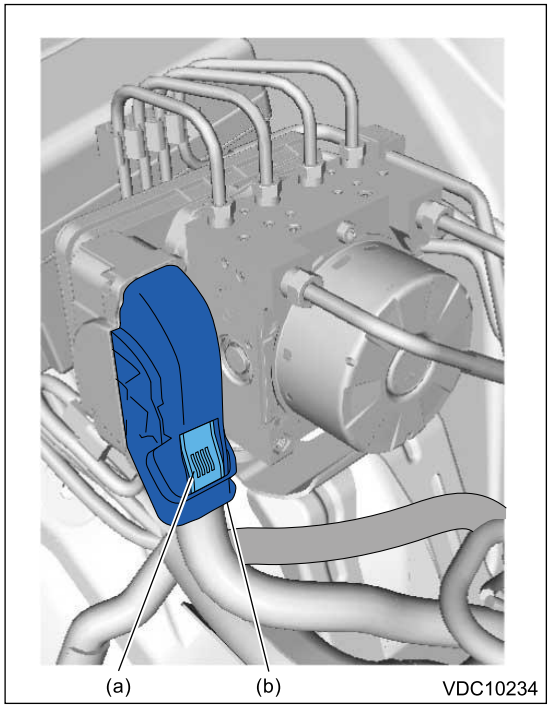
   With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body.
3. Remove the VDC control module & hydraulic control unit (VDCCM&H/U).

   Caution:

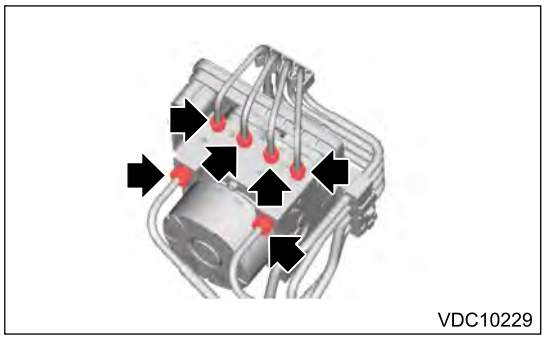
   - **Do not pull on the harness when disconnecting the connector.**
   - **Wrap the brake pipe with a vinyl bag so as not to spill the brake fluid on the painted surface of the vehicle body.**
   - **If brake fluid is spilled on the painted surface of the vehicle body, wash it off immediately with water and wipe clean.**

   (1) Remove any dirt from around the VDCCM&H/U.

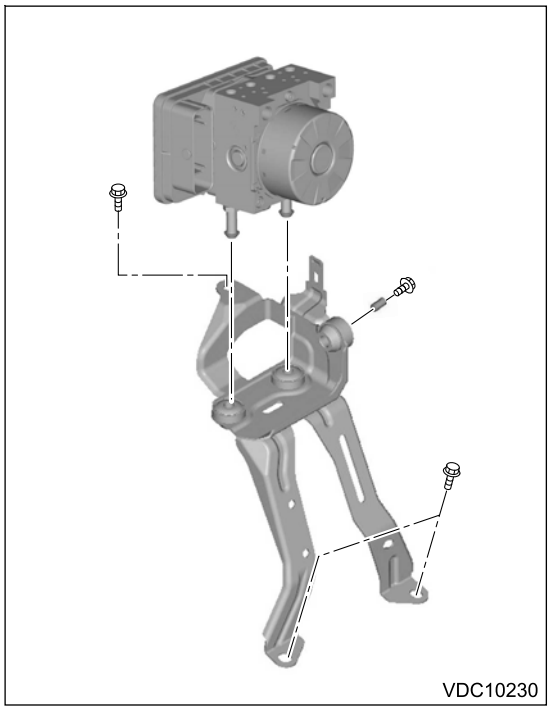
   (2) Pull up the lock lever (b) while pressing the lock button (a) and disconnect the VDCCM&H/U connector.



(3) Separate each brake pipe using a flare nut wrench.



(4) Remove the bolts and remove the bracket - hydraulic unit and VDCCM&H/U.



VEHICLE DYNAMICS CONTROL (VDC) > VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)

INSTALLATION

Caution:

- **When installing the VDCCM&H/U to the bracket - hydraulic unit, make sure that there is no oil adhered to the bolts and the threads of VDCCM&H/U. If the oil is adhered, degrease it carefully before tightening.**
- **Connect the VDCCM&H/U connector securely.**

1. Install the bracket - hydraulic unit and the VDCCM&H/U.

(1) Attach the bracket - hydraulic unit.

Tightening torque:

33 N·m (3.4 kgf-m, 23.8 ft-lb)

(2) Install the VDCCM&H/U to the bracket - hydraulic unit.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

(3) Connect the VDCCM&H/U connector.

(4) Install each brake pipe using a flare nut wrench.

Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U).

2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
4. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE.
5. Perform parameter confirmation, selection, and registration.
   Note:
   - **When the VDCCM&H/U is replaced with a new part, be sure to perform the selection • registration operation.**
   - **When the registration has not been performed, the DTC code [Parameter selection error] is detected together with the ABS/EBD/VDC warning light illumination.**

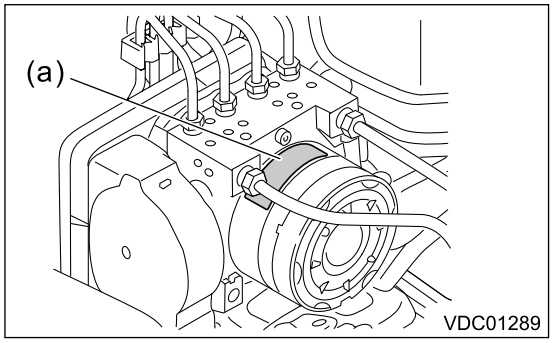
   (1) Check that the applied model and grade of the relevant vehicle are included. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

   (2) If the applied model and grade of the target vehicle are not included, perform parameter selection and registration. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.
6. Perform "VDC sensor midpoint setting mode". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

VEHICLE DYNAMICS CONTROL (VDC) > VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)

INSPECTION

1. Check the identification (a) of the VDC control module & hydraulic control unit (VDCCM&H/U).
   Note:
   For the identification, refer to "SPECIFICATION" in "General Description". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.



2. Check the condition of connection and settlement of connector, and correct or replace if defective.

1. CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE

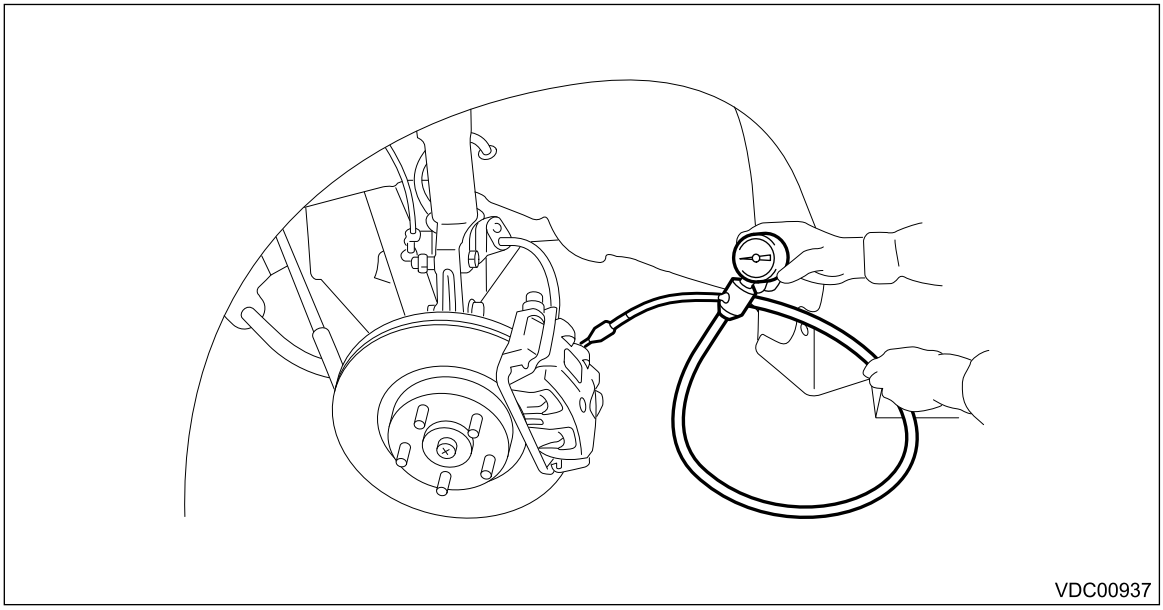
1. Lift up the vehicle, and then remove the wheel.
2. Remove the bleeder - screws from the front LH and front RH caliper bodies.
3. Connect two pressure gauges to front LH and front RH caliper bodies.

Caution:

- **Use a pressure gauge used exclusively for brake fluid measurement.**
- **Do not use the pressure gauge used for the measurement of transmission oil. Doing so will cause the piston seal to expand and deform.**

Note:

Wrap sealing tape around the pressure gauge.



4. Bleed air from the pressure gauges and the front LH and front RH caliper bodies.
5. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.

   Note:

   When the hydraulic unit begins to work, first the front LH side performs decompression, hold and compression, and then the front RH side performs decompression, hold and compression.
6. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets the standard values. Depress the brake pedal and check that the kick-back is normal, and tightness is normal.

Inspection conditions	Front wheel	Rear wheel
Initial value	3,500 kPa (36 kgf/cm^2, 511 psi)	3,500 kPa (36 kgf/cm^2, 511 psi)
When depressurized	500 kPa (5 kgf/cm^2, 73 psi) or less	500 kPa (5 kgf/cm^2, 73 psi) or less
When pressurized	3,500 kPa (36 kgf/cm^2, 511 psi) or more	3,500 kPa (36 kgf/cm^2, 511 psi) or more

7. Remove the pressure gauge from the front LH and front RH caliper bodies.
8. Install the bleeder - screws of the front LH and front RH caliper bodies.
9. Remove the bleeder - screws from the rear LH and rear RH caliper bodies.
10. Connect two pressure gauges to rear LH and rear RH caliper bodies.
11. Bleed air from the pressure gauges and the rear LH and rear RH caliper bodies.
12. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence

Control.

Note:

When the hydraulic unit begins to work, first the rear LH side performs decompression, hold and compression, and then the rear RH side performs decompression, hold and compression.

13. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets specification. Depress the brake pedal and check that the kick-back is normal, and tightness is normal.
14. Remove the pressure gauge from the rear LH and rear RH caliper bodies.
15. Install the bleeder - screws of the rear LH and rear RH caliper bodies.
16. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding.

2. CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH THE BRAKE TESTER

1. Set wheels other than the one to measure on free rollers.
2. Prepare for the ABS sequence control operation. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
3. Set the front wheels or rear wheels on the brake tester and set the gear to neutral.
4. Operate the brake tester.

   Note:

   When any wheel speed reaches 10 km/h (6 MPH), the ABS sequence control stops and ABS operation is returned to the normal control mode.
5. Perform ABS sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
6. When the hydraulic unit begins to work, check the following work sequence.
   (1) The front LH wheel performs decompression, hold and compression in sequence, and subsequently the front RH wheel repeats the same cycle.
   (2) The rear RH wheel performs decompression, hold and compression in sequence, and subsequently the rear LH wheel repeats the same cycle.
7. Read values indicated on the brake tester and check if the fluctuation of the values between decompression and compression meets specification.

Inspection conditions	Front wheel	Rear wheel
Initial value	1,000 N (102 kgf, 225 lb)	1,000 N (102 kgf, 225 lb)
When depressurized	500 N (51 kgf, 112 lb) or less	500 N (51 kgf, 112 lb) or less
When pressurized	1,000 N (102 kgf, 225 lb) or more	1,000 N (102 kgf, 225 lb) or more

8. After the inspection, depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

3. CHECKING THE HYDRAULIC UNIT VDC OPERATION USING A PRESSURE GAUGE

1. Lift up the vehicle, and then remove the wheel.
2. Remove the bleeder - screws from the front LH and front RH caliper bodies.

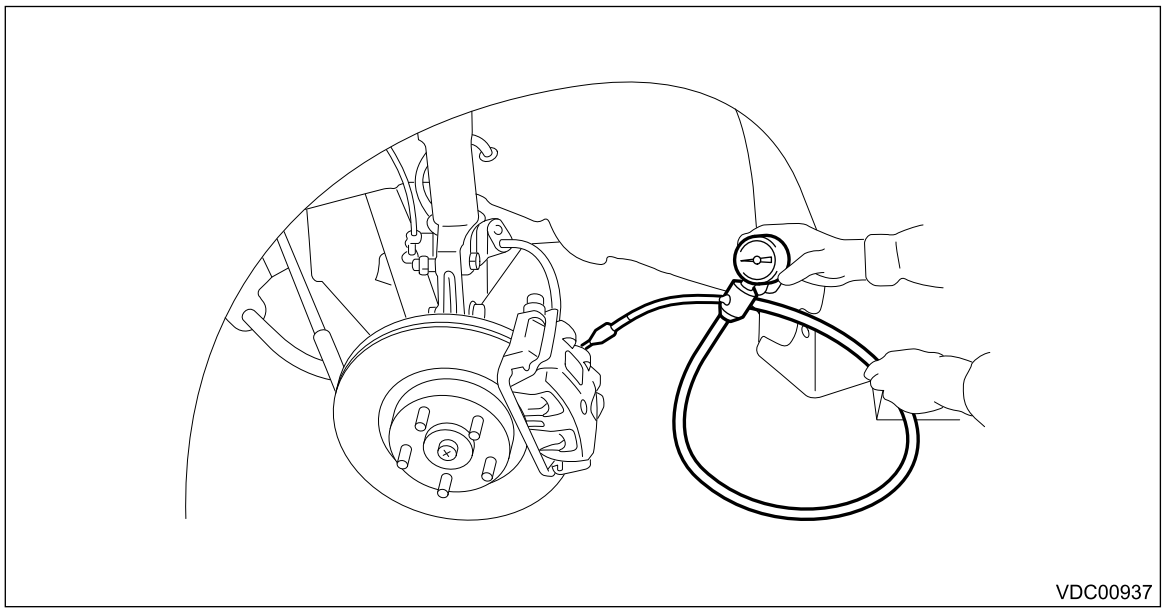
3. Connect two pressure gauges to front LH and front RH caliper bodies.

Caution:

- **Use a pressure gauge used exclusively for brake fluid measurement.**
- **Do not use a pressure gauge used for the measuring transmission oil pressure, as the piston seal may expand and deform.**

Note:

Wrap sealing tape around the pressure gauge.



4. Bleed air from the pressure gauge.
5. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.

Note:

When the hydraulic unit begins to work, first the front LH side performs compression, hold and decompression, and then the front RH side performs compression, hold and decompression.

6. Read values indicated on the pressure gauge and check if the fluctuation of the values between decompression and compression meets specification. Depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

Inspection conditions	Front wheel	Rear wheel
When pressurized	3,000 kPa (31 kgf/cm^2, 441 psi) or more	3,000 kPa (31 kgf/cm^2, 441 psi) or more
When depressurized	500 kPa (5 kgf/cm^2, 73 psi) or less	500 kPa (5 kgf/cm^2, 73 psi) or less

7. Remove the pressure gauge from the front LH and front RH caliper bodies.
8. Install the bleeder - screws of the front LH and front RH caliper bodies.
9. Remove the bleeder - screws from the rear LH and rear RH caliper bodies.
10. Connect two pressure gauges to rear LH and rear RH caliper bodies.
11. Bleed air from the pressure gauges and the rear LH and rear RH caliper bodies.
12. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.

Note:

When the hydraulic unit begins to work, first the rear RH side performs compression, hold and decompression, and then the rear LH side performs compression, hold and decompression.

13. Read the values indicated on the pressure gauges and check if it is within specification. Depress the brake pedal and check that it is not abnormally hard, and tightness is normal.
14. Remove the pressure gauge from the rear LH and rear RH caliper bodies.
15. Install the bleeder - screws of the rear LH and rear RH caliper bodies.
16. Bleed air from the brake system. Ref. to BRAKE>Air Bleeding.

4. CHECK HYDRAULIC UNIT VDC OPERATION WITH BRAKE TESTER

1. Set wheels other than the one to measure on free rollers.
2. Prepare to operate the VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
3. Set the front wheels or rear wheels on the brake tester and set the gear to neutral.
4. Operate the brake tester.

   Note:

   When any wheel speed reaches 10 km/h (6 MPH), the VDC sequence control stops and VDC operation is returned to the normal control mode.
5. Perform VDC sequence control. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
6. When the hydraulic unit begins to work, check the following work sequence.
   (1) The front LH wheel performs compression, hold and decompression in sequence, and subsequently the front RH wheel repeats the same cycle.
   (2) The rear RH wheel performs compression, hold and decompression in sequence, and subsequently the rear LH wheel repeats the same cycle.
7. Read values indicated on the brake tester and check if the fluctuation of the values between decompression and compression meets specification.

Inspection conditions	Front wheel	Rear wheel
When pressurized	2,000 N (204 kgf, 450 lbf) or more	2,000 N (204 kgf, 450 lbf) or more
When depressurized	500 N (51 kgf, 112 lbf) or less	500 N (51 kgf, 112 lbf) or less

8. After the inspection, depress the brake pedal and check that it is not abnormally hard, and tightness is normal.

VEHICLE DYNAMICS CONTROL (VDC) > VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)

ADJUSTMENT

1. VDC SENSOR MIDPOINT SETTING MODE

After installing, replacing or adjusting the following parts, perform the VDC sensor midpoint setting mode.

- Steering angle sensor

- Steering wheel
- Suspension parts
- Wheel alignment
- VDCCM&H/U
- VDCCM&H/U bracket

1. Park the vehicle on a level surface, and set the steering wheel to the neutral position.
2. Perform the VDC sensor 0 point setting mode.
   (1) Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (2) Turn the ignition switch to ON.
   (3) On [Start] display, select [Diagnosis].
   (4) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (5) On [Main Menu] display, select [Each System].
   (6) On [Select System] display, select [Brake Control], and then select [Enter].
   (7) On [Select Function] display, select [Data monitor].
   (8) From the data monitor item list, select [Steering Angle Sensor], [Longitudinal G Sensor] and [Abnormal Lateral G Sensor output].
   (9) Check that the steering angle sensor output value is within the range of following values.
   - Model without EyeSight: −10 — 10 deg
   - Model with EyeSight: −2 — 2 deg

   Note:
   If the output value is different from the standard value, check the steering wheel.
   (10) Check that output values for the longitudinal G sensor and lateral G sensor are −2 — 2 m/s^2.
   Note:
   If the output value is not at the standard value, check the installing condition of the VDCCM&H/U and VDCCM&H/U bracket.
   (11) On [Select Function] display, select [Work Support].
   (12) From the work support item list, select [VSC(VDC) Centering Mode], and perform the setting according to the procedure displayed on the Subaru Select Monitor screen.
3. Drive the vehicle for 10 minutes, and check that there is no system malfunction or the warning light illumination while driving.
4. Make sure that the DTC is not stored.

VEHICLE DYNAMICS CONTROL (VDC) > VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)

MAINTENANCE MODE

1. VDCCM PARAMETER READING

1. Perform reading of parameter.
   (1) Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (2) Turn the ignition switch to ON.
   (3) On [Start] display, select [Diagnosis].
   (4) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (5) On [Main Menu] display, select [Each System].
   (6) On [Select System] display, select [Brake Control], and then select [Enter].

(7) On [Select Function] display, select [Work Support].
(8) On [Work Support] display, select [Reading of parameter: ECM to SSM].

2. Save and close the file.

2. VDCCM PARAMETER WRITING

1. Perform writing of parameter.
(1) Connect the Subaru Select Monitor.
Note:
For detailed operation procedures, refer to "Application help".
(2) Turn the ignition switch to ON.
(3) On [Start] display, select [Diagnosis].
(4) On [Select Vehicle] display, input the target vehicle information and select [Set].
(5) On [Main Menu] display, select [Each System].
(6) On [Select System] display, select [Brake Control], and then select [Enter].
(7) On [Select Function] display, select [Work Support].
(8) On [Work Support] display, select [Writing of parameter: SSM to ECM].
2. Open the file saved in the [Reading of parameter: ECM to SSM].
3. When the confirmation screen indicating the vehicle information appears, check that the correct applied model and grade are displayed and click the [OK] button.

3. VDCCM PARAMETER SELECTION

Note:

- **When the VDCCM&H/U is replaced with a replacement part, be sure to perform the parameter selection/registration to the VDCCM&H/U using this function.**
- **To check the applied model, refer to the "Model number plate" attached to the vehicle.** **Ref. to IDENTIFICATION.**
- **If you entered a wrong applied model, you can re-write it.**
- **When the registration has not been performed, the DTC code "Parameter" is detected together with the ABS/EBD/VDC warning light illumination.**
- **This function can be used for the replacement part of VDCCM&H/U.**

1. Perform selection of parameter.
(1) Connect the Subaru Select Monitor.
Note:
For detailed operation procedures, refer to "Application help".
(2) Turn the ignition switch to ON.
(3) On [Start] display, select [Diagnosis].
(4) On [Select Vehicle] display, input the target vehicle information and select [Set].
(5) On [Main Menu] display, select [Each System].
(6) On [Select System] display, select [Brake Control], and then select [Enter].
(7) On [Select Function] display, select [Work Support].
(8) On [Work Support] display, select [Selection of Parameter].
2. Check the applied model and option code indicated on the "Model number plate". Ref. to IDENTIFICATION.
3. Enter the applied model of 7-digit alphanumeric characters and click the [OK] button.
4. When the option code input screen appears after entering the applied model, enter the option code consisting of 4-digit alphanumeric characters, and click the [OK] button. When the option code is 3 digits, add "0" (zero) in front and enter the code as 4 digits.
5. When the confirmation screen indicating the vehicle information appears, check that the correct

applied model and grade are displayed and click the [OK] button.

Note:

When the displayed applied model and grade are different from those of the vehicle, click the [OK] button and then perform the registration operation again.

6. Execute the Clear Memory Mode after parameter selection and registration operations because the DTC for "Parameter selection error" is memorized. Ref. to COMMON (DIAGNOSTICS)>Clear memory.

4. VDCCM PARAMETER CHECK

Note:

The parameter data registered in the VDCCM is shown on the display.

1. Perform confirming on parameter.
   (1) Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (2) Turn the ignition switch to ON.
   (3) On [Start] display, select [Diagnosis].
   (4) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (5) On [Main Menu] display, select [Each System].
   (6) On [Select System] display, select [Brake Control], and then select [Enter].
   (7) On [Select Function] display, select [Work Support].
   (8) On [Work Support] display, select [Confirm on parameter].
2. Check that the applied model and grade of the target vehicle are included, and click the [OK] button.
3. If the applied model and grade of the target vehicle are not included, perform "parameter selection and registration". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.

OPERATION

1. While the ABS sequence control is being performed, the operation of the hydraulic unit can be checked using the brake tester or pressure gauge after the hydraulic unit solenoid valve operation.
2. ABS sequence control can be started by the Subaru Select Monitor.

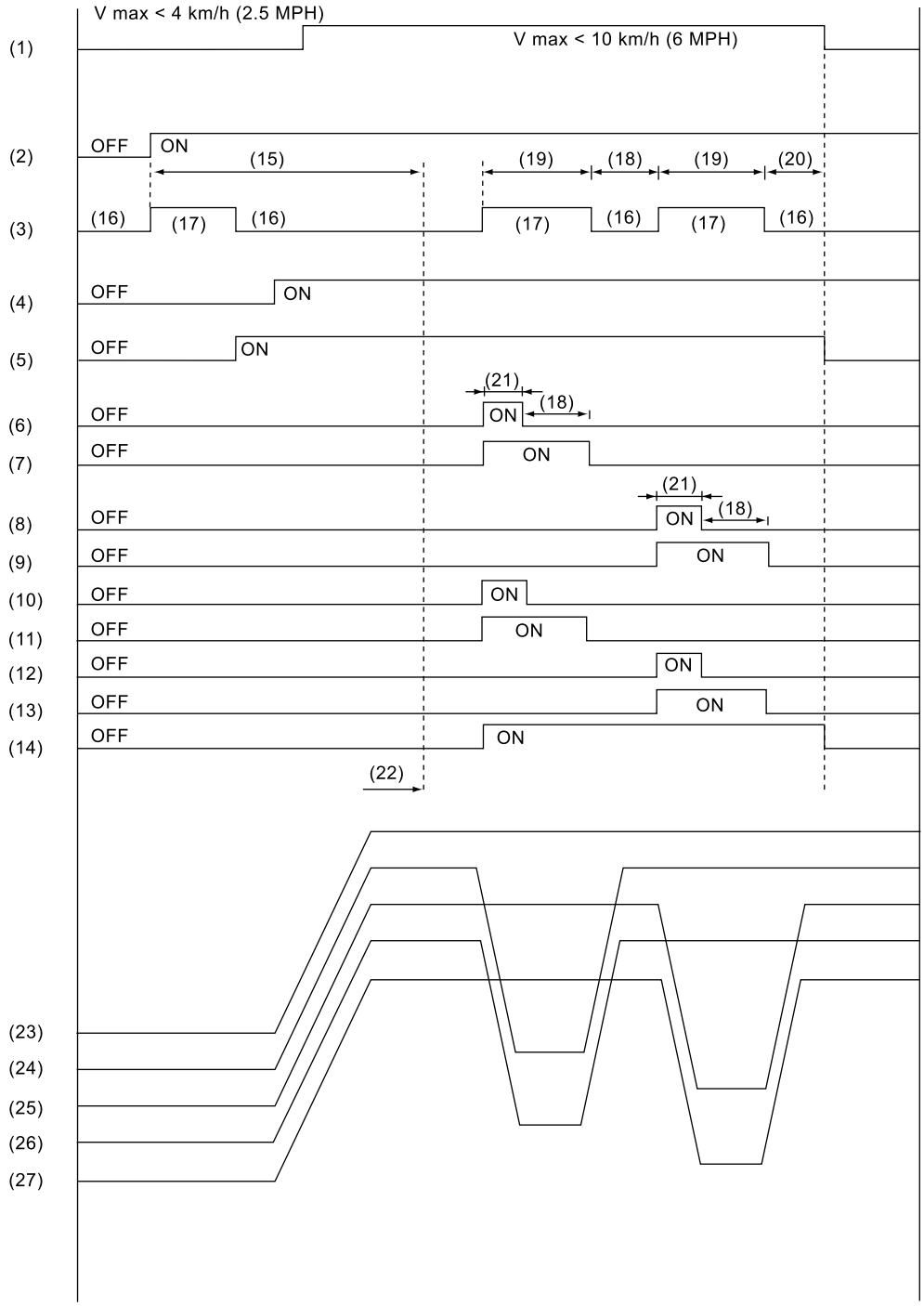
1. ABS SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

Note:
In the event of any trouble, the ABS sequence control will not operate.

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) Turn the ignition switch to ON.
   (2) On [Start] display, select [Diagnosis].
   (3) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (4) On [Main Menu] display, select [Each System].
   (5) On [Select System] display, select [Brake Control], and then select [Enter].
   (6) On [Select Function] display, select [Work Support].
   (7) On the work support item list, select [ABS Sequence Control Mode].
2. Follow the procedures displayed in the Subaru Select Monitor to execute the following.
   (1) When using a brake tester, depress the brake pedal with a force of 100 N (10.2 kgf, 22.5 lbf).
   (2) When using a pressure gauge, press the brake pedal so that the pressure gauge indicates 3,500 kPa (36 kgf/cm^2, 511 psi).
3. The brake system being operated is displayed on the Subaru Select Monitor.

2. CONDITIONS FOR ABS SEQUENCE CONTROL

Note:
The control operation starts at point A.



VDC01320

(1) All wheel speed
(2) Ignition key
(3) ABS warning light
(4) Switch - stop light
(5) Valve relay
(6) Front LH decompression valve
(7) Front LH compression valve
(11) Rear RH compression valve
(12) Rear LH decompression valve
(13) Rear LH compression valve
(14) Pump motor
(15) A few seconds
(16) Light OFF
(17) Light ON
(20) 0.6 sec.
(21) 0.4 sec.
(22) Point A
(23) Master cylinder pressure
(24) Front LH wheel cylinder pressure
(25) Front RH wheel cylinder pressure
(26) Rear RH wheel cylinder pressure

(8) Front RH decompression valve
(9) Front RH compression valve
(10) Rear RH decompression valve
(18) 1.0 sec.
(19) 1.4 sec.
(27) Rear LH wheel cylinder pressure

VEHICLE DYNAMICS CONTROL (VDC) > ABS Sequence Control

SPECIFICATION

1. CONDITIONS FOR COMPLETION OF ABS SEQUENCE CONTROL

When the following conditions develop, the ABS sequence control stops and ABS operation is returned to the normal control mode.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- When the brake pedal is released during ABS sequence control and the switch - stop light becomes OFF.
- After completion of ABS sequence control.
- When a malfunction is detected.

OPERATION

1. While the VDC sequence control is performed, the operation of the hydraulic unit can be checked using the brake tester or pressure gauge after the hydraulic unit solenoid valve is operated.
2. VDC sequence control can be started by Subaru Select Monitor.

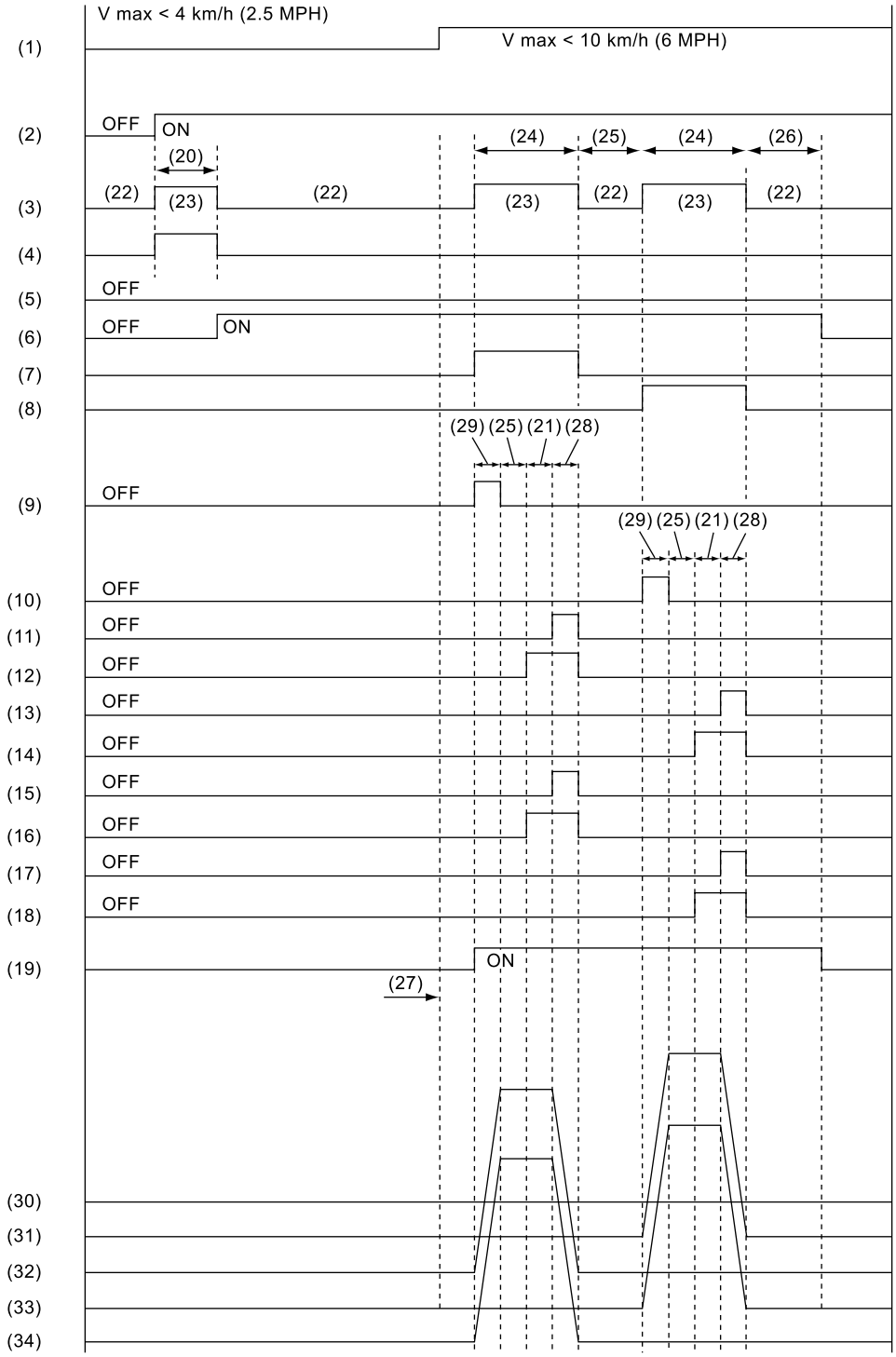
1. VDC SEQUENCE CONTROL WITH SUBARU SELECT MONITOR

Note:
In the event of any trouble, sequence control will not operate.

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) Turn the ignition switch to ON.
   (2) On [Start] display, select [Diagnosis].
   (3) On [Select Vehicle] display, input the target vehicle information and select [OK].
   (4) On [Main Menu] display, select [Each System].
   (5) On [Select System] display, select [Brake Control], and then select [Enter].
   (6) On [Select Function] display, select [Work Support].
   (7) On the work support item list, select [VDC Check Mode].
2. Operate according to the procedures displayed in the Subaru Select Monitor.
3. The brake system being operated is displayed on the Subaru Select Monitor.

2. CONDITIONS FOR VDC SEQUENCE CONTROL

Note:
The control operation starts at point A.



VDC01434

(1) All wheel speed
(2) Ignition key
(3) ABS warning light
(4) VDC warning light
(5) Switch - stop light
(6) Valve relay
(7) VDC switching valve 1 front LH
(8) VDC switching valve 1 front RH
(13) Front RH decompression valve
(14) Front RH compression valve
(15) Rear RH decompression valve
(16) Rear RH compression valve
(17) Rear LH decompression valve
(18) Rear LH compression valve
(19) Pump motor
(20) A few seconds
(25) 1 second
(26) 1.6 sec.
(27) Point A
(28) 0.4 sec.
(29) 0.8 sec.
(30) Master cylinder pressure
(31) Front RH wheel cylinder pressure
(32) Front LH wheel cylinder pressure

(9) VDC switching valve 2 front LH
(10) VDC switching valve 2 front RH
(11) Front LH decompression valve
(12) Front LH compression valve
(21) 1.2 sec.
(22) Light OFF
(23) Light ON
(24) 3.4 sec.
(33) Rear LH wheel cylinder pressure
(34) Rear RH wheel cylinder pressure

VEHICLE DYNAMICS CONTROL (VDC) > VDC Sequence Control

SPECIFICATION

1. CONDITIONS FOR COMPLETION OF VDC SEQUENCE CONTROL

When the following conditions develop, the VDC sequence control stops and VDC operation is returned to the normal control mode.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- After completion of VDC sequence control.
- When a malfunction is detected.

NOTE

For brake light relay, refer to "Relay and Fuse". Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

OPERATION

1. BRAKE LAMP LIGHTING OPERATION MODE BY SUBARU SELECT MONITOR

Caution:
For models with EyeSight, performing brake light relay compulsory operation may cause the EyeSight warning light to illuminate. If the brake light relay compulsory operation is performed, refer to "Basic Diagnostic Procedure" of "EyeSight (DIAGNOSTICS)" and check DTCs and then clear memory. **Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.**

1. Connect the Subaru Select Monitor.
   Note:
   - **In the event of any trouble, brake lamp lighting operation mode will not function.**
   - **For detailed operation procedures, refer to "Application help".**

   (1) On [Start] display, select [Diagnosis].
   (2) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (3) On [Main Menu] display, select [Each System].
   (4) On [Select System] display, select [Brake Control], and then select [Enter].
   (5) On [Select Function] display, select [Work Support].
   (6) From the work support item list, select Brake Lamp Lighting Operation mode.
2. Operate according to the procedures displayed in the Subaru Select Monitor.

SPECIFICATION

1. CONDITIONS TO COMPLETE BRAKE LAMP LIGHTING OPERATION MODE

When the following conditions develop, the brake lamp lighting operation mode stops and the normal control mode is restored.

- When the speed of at least one wheel reaches 10 km/h (6 MPH).
- When brake lamp lighting operation mode ends.
- When a malfunction is detected.

NOTE

Yaw rate & longitudinal G and lateral G sensor are integrated with the VDC control module & hydraulic control unit (VDCCM&H/U).

INSPECTION

1. YAW RATE & LONGITUDINAL G AND LATERAL G SENSOR SIGNAL

1. CHECK YAW RATE & G SENSOR.

1. Check the installation condition of the VDC control module & hydraulic control module (VDCCM&H/U).
2. Using Subaru Select Monitor, display [Data monitor].
3. Read the output of [Yaw Rate Sensor], [Longitudinal G Sensor] and [Lateral G Sensor].

When the vehicle is placed horizontally, are the displayed values −1.5 — 1.5 m/s^2 for longitudinal G and lateral G sensor, and −4 — 4 deg/s for yaw rate sensor?

Yes — Go to 2.

No — Replace the VDC control module & hydraulic control unit (VDCCM&H/U).

2. PERFORM DRIVING TEST.

Drive for approximately 10 minutes, and check that there is no system malfunction or the warning light illumination while driving.

Is there any abnormal movement or the warning light illumination while driving?

Yes — Perform the diagnosis according to DTCs for the VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

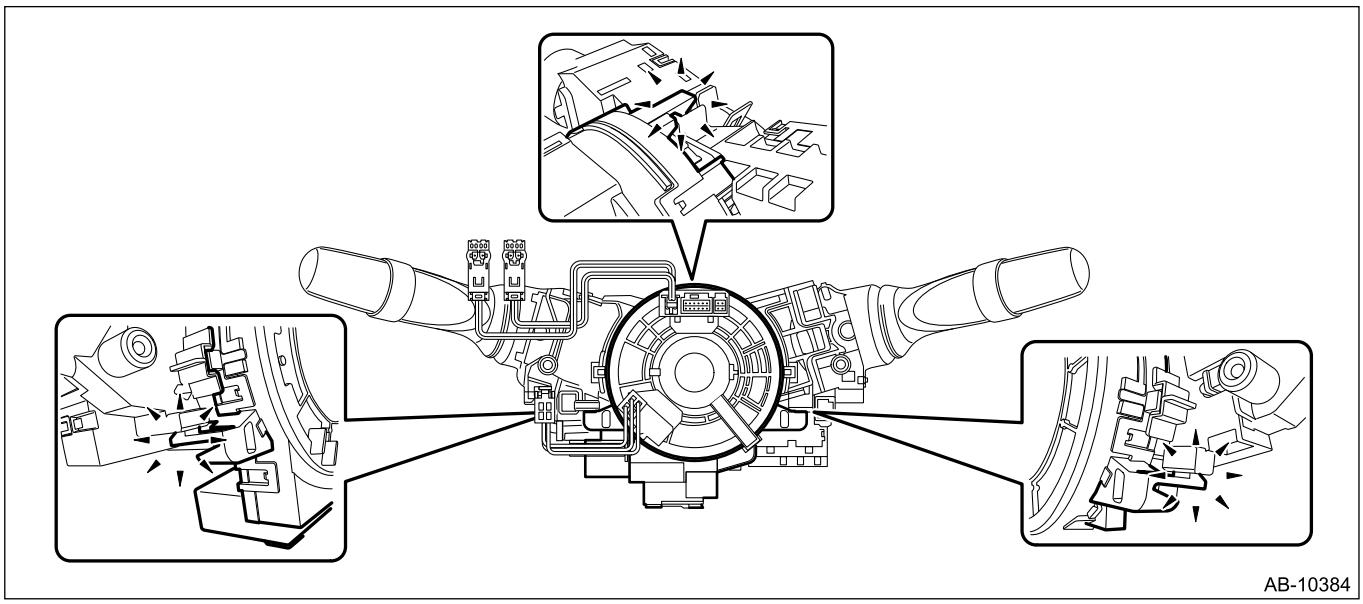
No — G sensor is normal.

REMOVAL

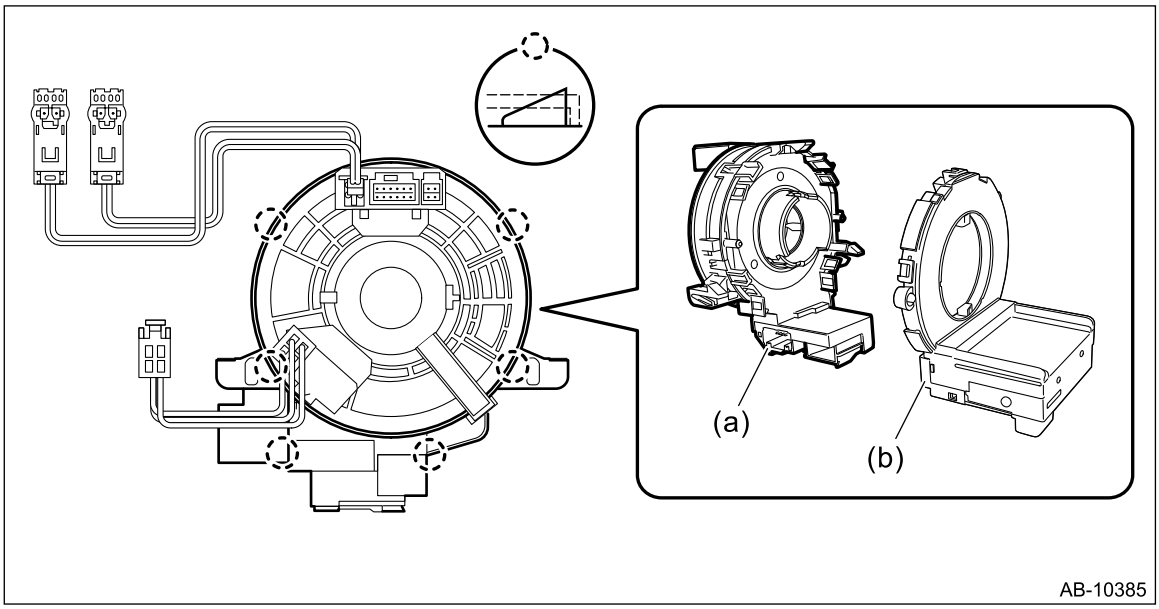
Caution:

- **If the steering wheel and steering angle sensor are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Always use the steering wheel puller for removal to avoid deforming the steering wheel.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**

1. Position the front wheels straight ahead.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the cover assembly - column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
6. Remove the steering roll connector.
   Caution:
   Make sure that the steering roll connector is not turned from the original position.
   (1) Disconnect the connector under the steering roll connector.
   (2) Release the claws and remove the steering roll connector.



7. Remove the steering angle sensor.
   (1) Release the claws and remove the steering angle sensor (b) from the steering roll connector (a).



VEHICLE DYNAMICS CONTROL (VDC) > Steering Angle Sensor

INSTALLATION

Caution:

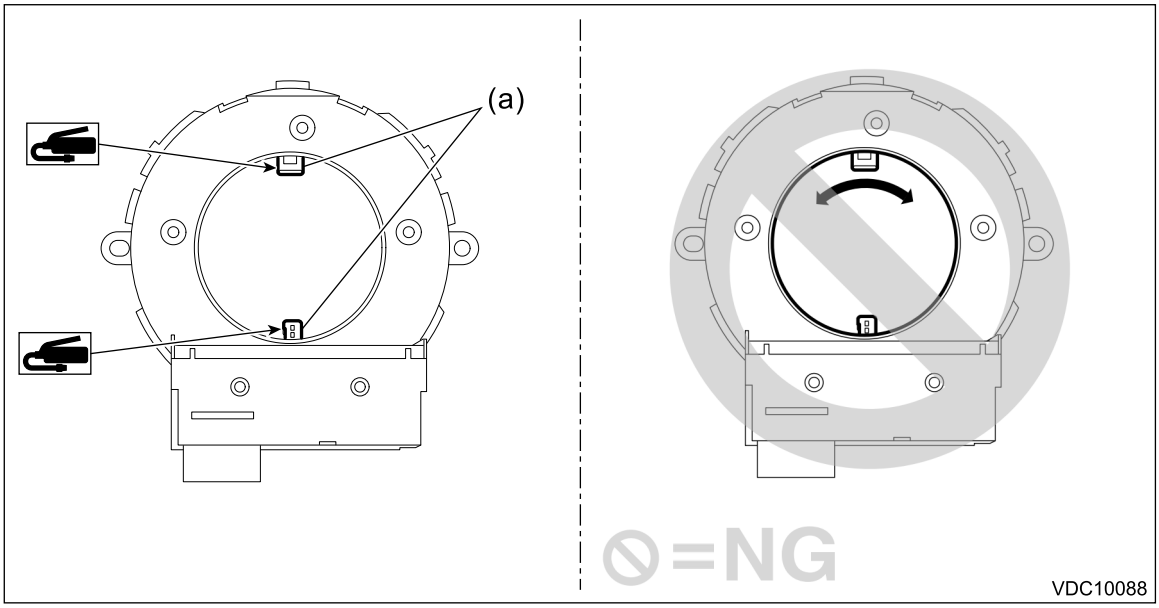
- **When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the steering angle sensor.

(1) Apply grease to the protrusion (a) of the new steering angle sensor.

Caution:

Do not rotate the steering angle sensor protrusion.



(2) Align the center of steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>INSTALLATION.

(3) Align the position of the protrusion and install the steering angle sensor to the steering roll connector.

2. Install the cover assembly - column.
3. Install the steering wheel.

Tightening torque:

Steering wheel: 39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
6. Perform the neutral position setting of the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

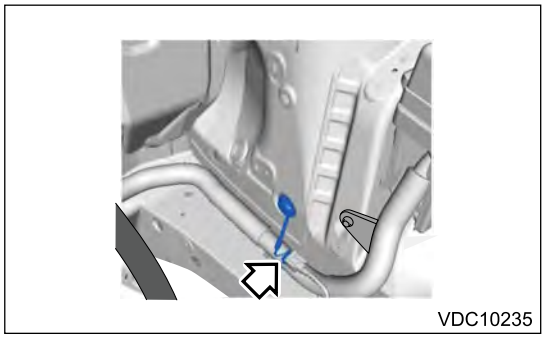
VEHICLE DYNAMICS CONTROL (VDC) > Front ABS Wheel Speed Sensor

REMOVAL

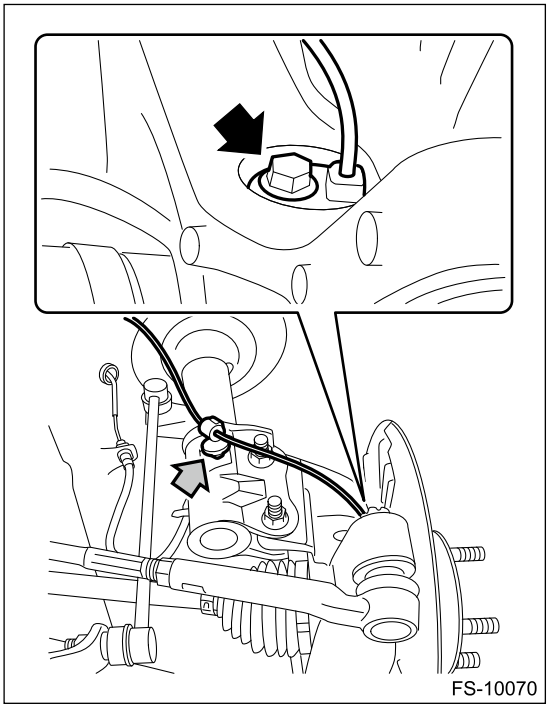
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the front wheels.
3. Remove the front ABS wheel speed sensor.

   Caution:
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**
   - **Leave the sensor harness clamp on the vehicle side.**

   (1) Disconnect the connector of the front ABS wheel speed sensor in the engine compartment.



   (2) Remove each harness clip and grommet.
   (3) Remove the front ABS wheel speed sensor from the housing assembly - front axle.



VEHICLE DYNAMICS CONTROL (VDC) > Front ABS Wheel Speed Sensor

INSTALLATION

Caution:
- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**

1. Install the front ABS wheel speed sensor.
   Tightening torque:
   Front ABS wheel speed sensor: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the front wheels.
   Tightening torque:
   Front wheel: 120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Lower the vehicle.
   Note:
   Check if the harness is not pulled and does not come in contact with the suspension or body while operating the steering.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

VEHICLE DYNAMICS CONTROL (VDC) > Front ABS Wheel Speed Sensor

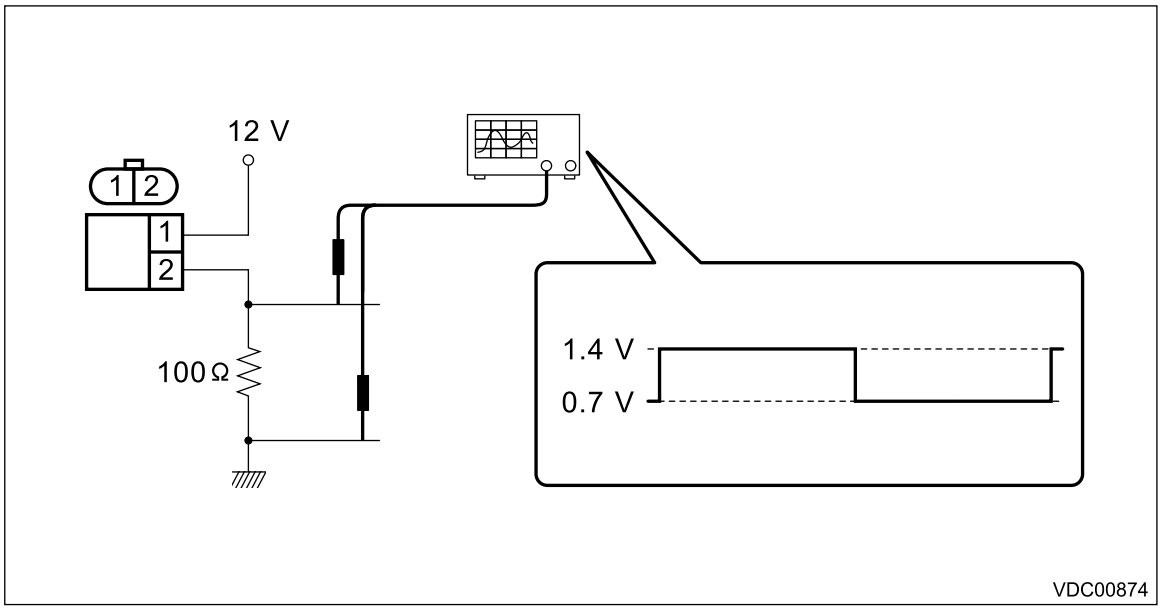
INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) On [Start] display, select [Diagnosis].
   (2) On [Select Vehicle] display, input the target vehicle information and select [Set].
   (3) On [Main Menu] display, select [Each System].
   (4) On [Select System] display, select [Brake Control], and then select [Enter].
   (5) On [Select Function] display, select [Data monitor].
   (6) From the data monitor item list, select [FR Wheel Speed] and [FL Wheel Speed].
2. Check if the speed indicated on the display changes in the same manner as the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position.
3. If the speed indicated on the display does not change in the inspection, check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

2. CHECK ABS WHEEL SPEED SENSOR UNIT

1. Visually check the tip of the ABS wheel speed sensor for foreign particles or damage. If necessary, clean the tip or replace the ABS wheel speed sensor.
2. Disconnect the ABS wheel speed sensor connector.
3. Check the ABS wheel speed sensor cable for discontinuity. If defective, replace the ABS wheel speed sensor.
4. Connect a 12 V power supply to No. 1 terminal of ABS wheel speed sensor connector, then attach resistance to the No. 2 terminal. Rotate the wheel at about 2.75 km/h (2 MPH), and measure the voltage using an oscilloscope.
   Standard value of output voltage:
   0.7 — 1.4 V



5. Replace the ABS wheel speed sensor if the inspection result is not within the standard value.

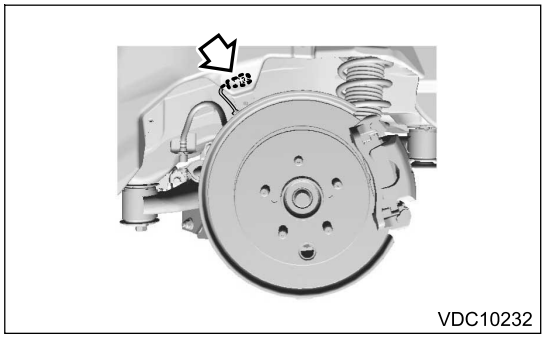
VEHICLE DYNAMICS CONTROL (VDC) > Rear ABS Wheel Speed Sensor

REMOVAL

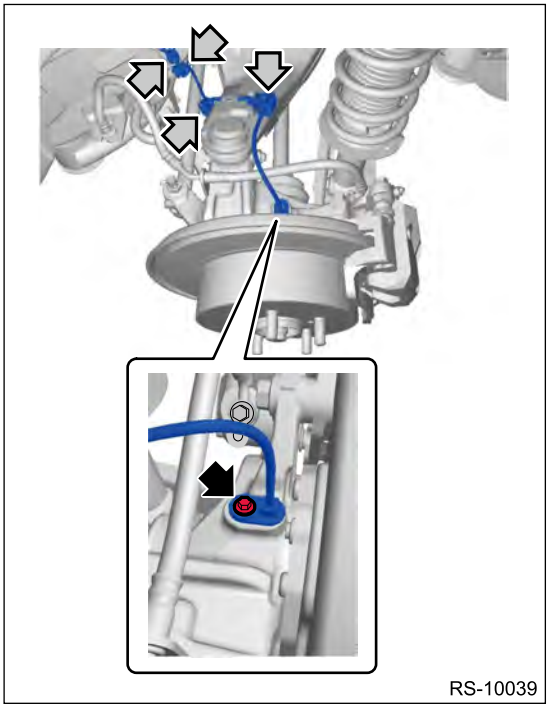
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the rear wheels.
3. Remove the rear ABS wheel speed sensor.

   Caution:
   - **Be careful not to damage the sensor.**
   - **Do not apply excessive force to the sensor harness.**
   - **Leave the sensor harness clamp on the vehicle side.**

   (1) Disconnect the connector from the rear ABS wheel speed sensor.



   (2) Remove the harness clamp and bolts, and remove the rear ABS wheel speed sensor from the rear axle housing.



VEHICLE DYNAMICS CONTROL (VDC) > Rear ABS Wheel Speed Sensor

INSTALLATION

Caution:
- **Be careful not to damage the sensor.**
- **Do not apply excessive force to the sensor harness.**

1. Install the rear ABS wheel speed sensor.
   Note:
   Check the identification (mark) on the harness to make sure there is no warpage. **Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.**
   Tightening torque:
   Rear ABS wheel speed sensor: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the rear wheels.
   Tightening torque:
   Rear wheel: 120N·m (12.2 kgf-m, 88.5 ft-lb)
3. Lower the vehicle.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

VEHICLE DYNAMICS CONTROL (VDC) > Rear ABS Wheel Speed Sensor

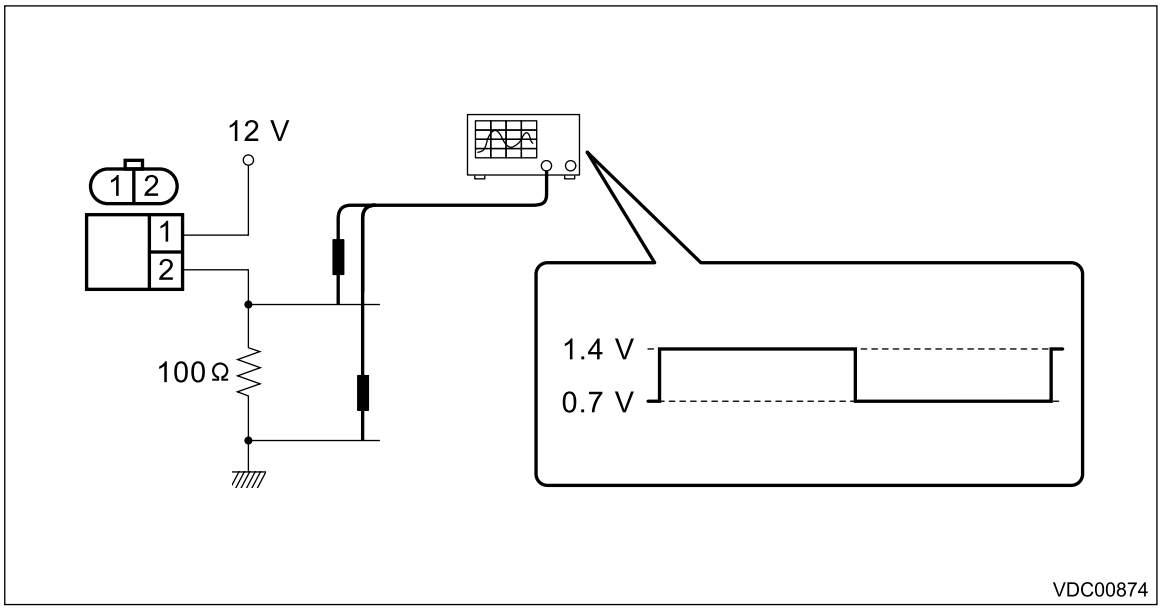
INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) On [Start] display, select [Diagnosis].
   (2) On [Vehicle selection] display, input the target vehicle information and select [OK].
   (3) On [Main Menu] display, select [Each System].
   (4) On [Select System] display, select [Brake Control], and then select [Enter].
   (5) On [Select Function] display, select [Data monitor].
   (6) From the data monitor item list, select [RR Wheel Speed] and [RL Wheel Speed].
2. Check if the speed indicated on the display changes in the same manner as the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position.
3. If the speed indicated on the display does not change in the inspection, check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

2. CHECK ABS WHEEL SPEED SENSOR UNIT

1. Visually check the tip of the ABS wheel speed sensor for foreign particles or damage. If necessary, clean the tip or replace the ABS wheel speed sensor.
2. Disconnect the ABS wheel speed sensor connector.
3. Check the ABS wheel speed sensor cable for discontinuity. If defective, replace the ABS wheel speed sensor.
4. Connect a 12 V power supply to No. 1 terminal of ABS wheel speed sensor connector, then attach resistance to the No. 2 terminal. Rotate the wheel at about 2.75 km/h (2 MPH), and measure the voltage using an oscilloscope.
   Standard value of output voltage:
   0.7 — 1.4 V



5. Replace the ABS wheel speed sensor if the inspection result is not within the standard value.

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

REMOVAL

Refer to “Front Hub Unit Bearing” for removal, because the front magnetic encoder is integrated with the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>REMOVAL.

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

INSTALLATION

Refer to “Front Hub Unit Bearing” for installation, because the front magnetic encoder is integrated with the hub unit COMPL - front axle. Ref. to DRIVE SHAFT SYSTEM>Front Hub Unit Bearing>INSTALLATION.

VEHICLE DYNAMICS CONTROL (VDC) > Front Magnetic Encoder

INSPECTION

Visually check the magnetic encoder for any damage. If necessary, replace with a new hub unit COMPL - front axle.

Note:

Because the magnetic encoder is integrated with hub unit COMPL, replace the hub unit COMPL with a new part if there is any defect found on the magnetic encoder.

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

REMOVAL

Refer to “Rear Hub Unit Bearing” for removal, because the rear magnetic encoder is integrated with the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>REMOVAL.

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

INSTALLATION

Refer to “Rear Hub Unit Bearing” for installation, because the rear magnetic encoder is integrated with the hub unit COMPL - rear axle. Ref. to DRIVE SHAFT SYSTEM>Rear Hub Unit Bearing>INSTALLATION.

VEHICLE DYNAMICS CONTROL (VDC) > Rear Magnetic Encoder

INSPECTION

Visually check the magnetic encoder parts for any damage. If necessary, replace with a new hub unit COMPL - rear axle.

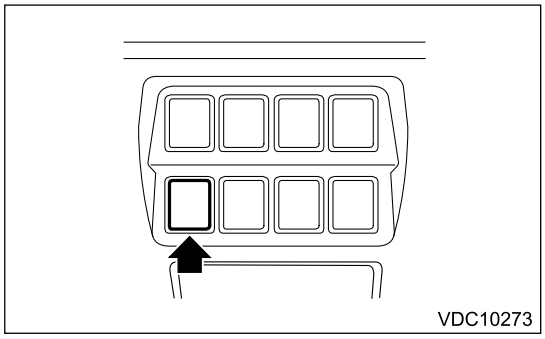
Note:

Because the magnetic encoder is integrated with hub unit COMPL, replace the hub unit COMPL with a new part if there is any defect found on the magnetic encoder.

VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

REMOVAL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the cover assembly - instrument panel LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Release the claws and remove the VDC OFF switch.



VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

INSTALLATION

1. Install the VDC OFF switch.
2. Install the cover assembly - instrument panel LWR driver OUT.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

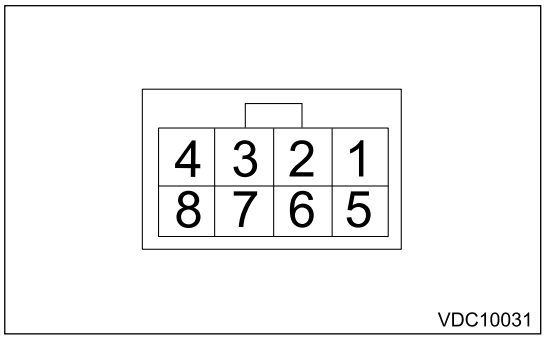
VEHICLE DYNAMICS CONTROL (VDC) > VDC OFF Switch

INSPECTION

1. Measure the resistance between the VDC OFF switch terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
6 — 8	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

2. Replace the VDC OFF switch if the inspection result is not within the standard value.

INSPECTION

For general diagnostic table, refer to “General Diagnostic Table” of “BRAKE CONTROL (DIAGNOSTICS)” section. Ref. to BRAKE CONTROL (DIAGNOSTICS)>General Diagnostic Table>INSPECTION.

CLUTCH SYSTEM

CL

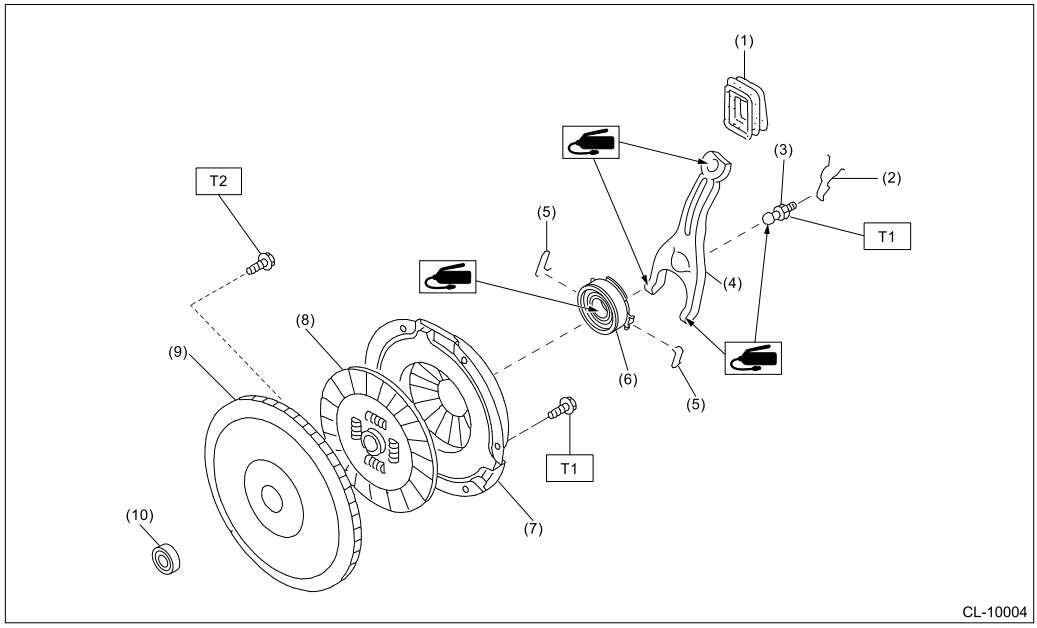
1. General Description
2. Clutch Disc and Cover
3. Flywheel
4. Release Bearing and Lever
5. Operating Cylinder
6. Master Cylinder
7. Clutch Pipe and Hose
8. Clutch Fluid
9. Clutch Fluid Air Bleeding
10. Clutch Pedal
11. Clutch Switch
12. General Diagnostic Table

SPECIFICATION

Model			2.0 L
Transmission type			5MT
Clutch cover	Type		Push type
	Diaphragm set load N (kgf, lbf)		5,688 (580, 1,279)
Clutch disc	Facing material		Woven (non-asbestos)
	O.D. × I.D. × Thickness mm (in)	Flywheel side	225 × 150 × 3.2 (8.86 × 5.9 × 0.126)
		Clutch cover side	225 × 150 × 3.5 (8.86 × 5.9 × 0.138)
	Spline outer diameter mm (in)		25.2 (0.992), (number of teeth: 24)
	Depth of rivet head mm (in)	Flywheel side	1.35 — 1.95 (0.053 — 0.077)
		Clutch cover side	1.65 — 2.25 (0.065 — 0.089)
		Limit of sinking	0.8 (0.031)
	Deflection limit mm (in)		0.7 (0.028) at R = 110 (4.33)
Clutch release lever ratio			1.6
Release bearing			Grease-packed self-aligning
Clutch pedal	Full stroke mm (in)		130 — 135 (5.12 — 5.31)
	Free play mm (in)		4 — 11 (0.16 — 0.43)
Flywheel	Type		Flexible

COMPONENT

1. CLUTCH ASSEMBLY



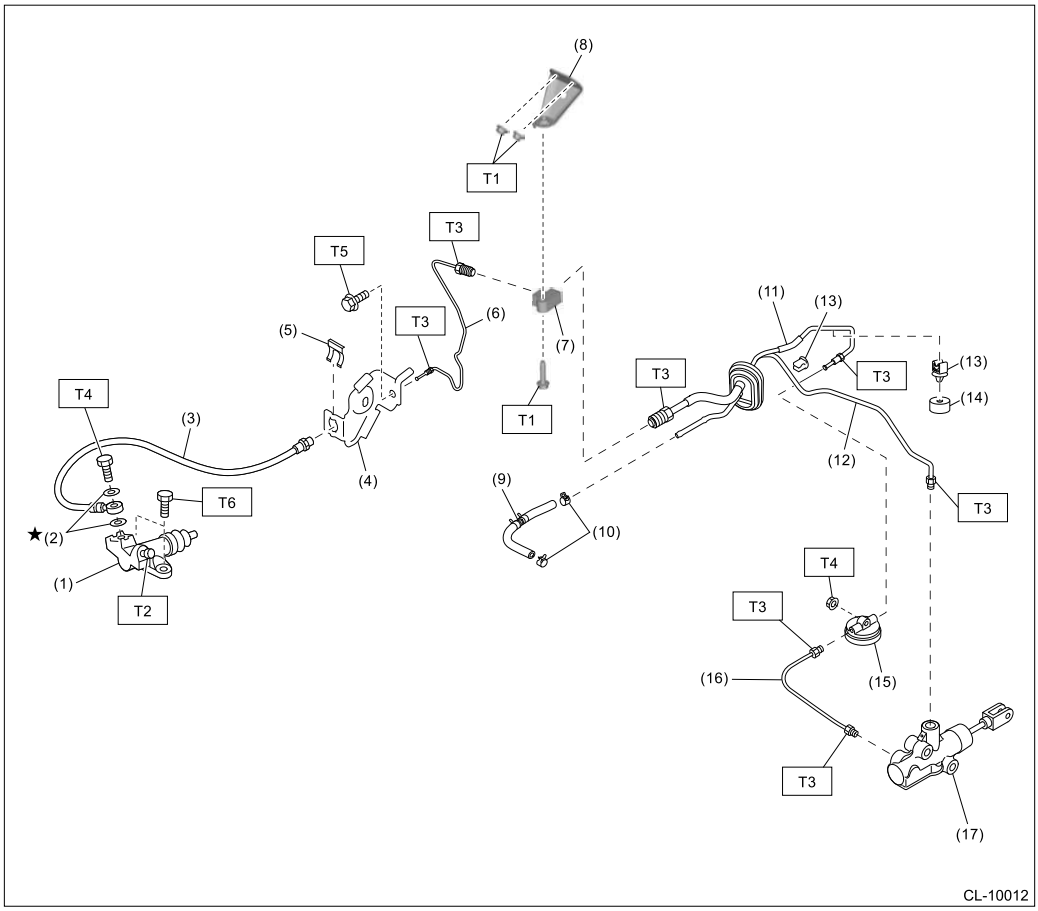
(1) Dust cover
(2) Lever spring
(3) Pivot
(4) Release lever
(5) Clip
(6) Release bearing
(7) Clutch cover
(8) Clutch disc
(9) Flexible flywheel
(10) Pilot bearing

Tightening torque: N·m (kgf-m, ft-lb)

T1: 16 (1.6, 11.8)

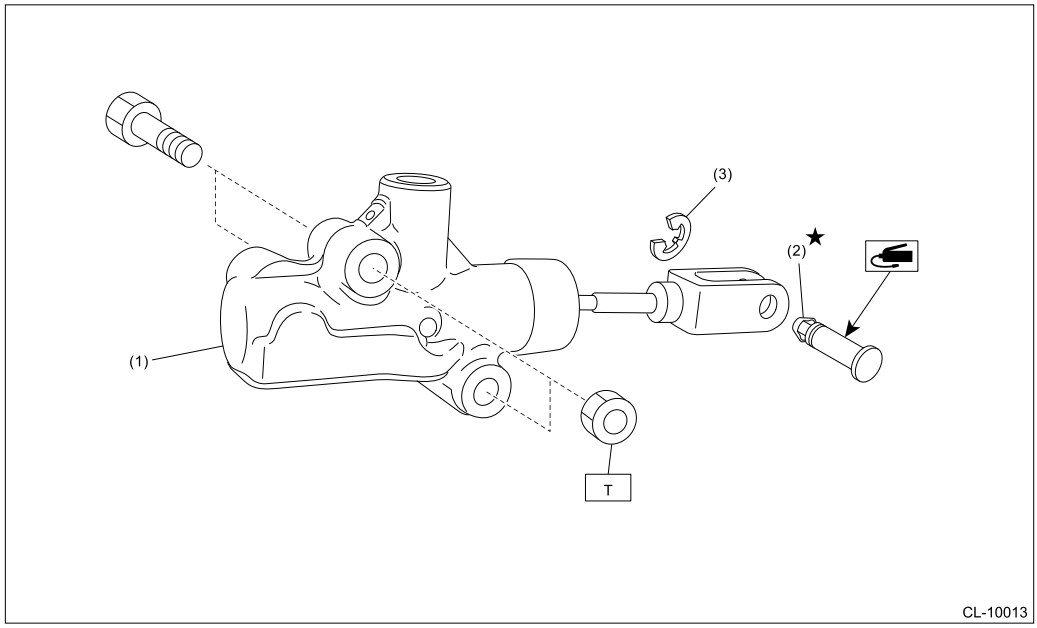
T2: Ref. to CLUTCH SYSTEM>Flywheel>INSTALLATION.

2. CLUTCH PIPE AND HOSE



(1) Operating cylinder	(10) Clamp	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Gasket	(11) Clutch pipe	***T1: 7.5 (0.8, 5.5)***
(3) Clutch hose	(12) Clutch pipe	***T2: 7.8 (0.8, 5.8)***
(4) Clutch hose bracket	(13) Clamp	***T3: 15 (1.5, 11.1)***
(5) Clamp	(14) Mass damper	***T4: 18 (1.8, 13.3)***
(6) Clutch pipe	(15) Clutch damper	***T5: 25 (2.5, 18.4)***
(7) Two-way connector	(16) Clutch pipe	***T6: 37 (3.8, 27.3)***
(8) Clutch connector bracket	(17) Master cylinder ASSY	
(9) Tank hose		

3. MASTER CYLINDER

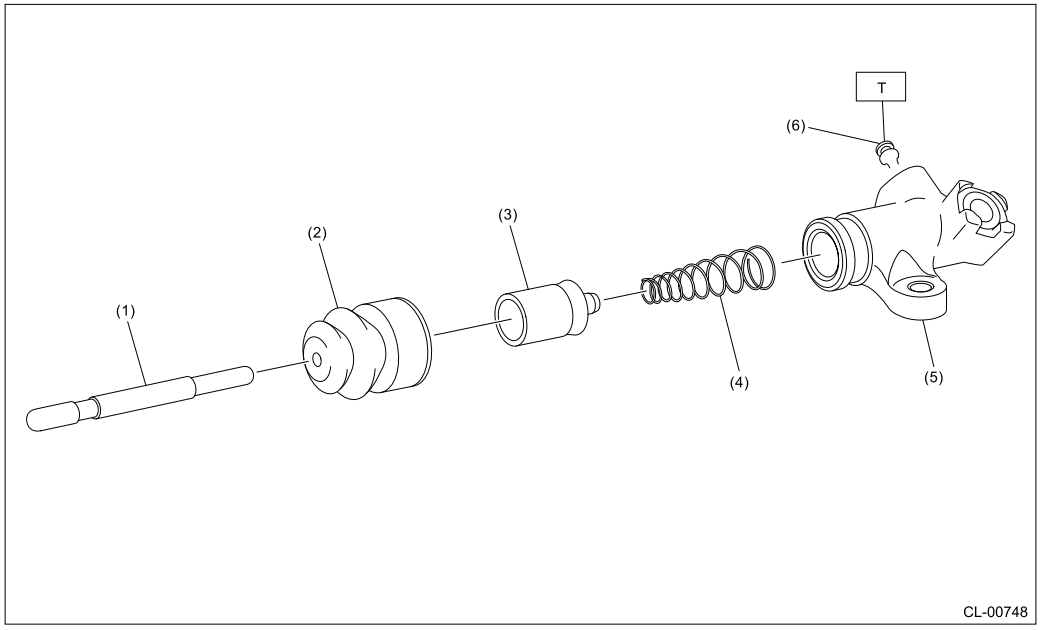


(1) Master cylinder ASSY
(2) Clevis pin
(3) Clip

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.8, 13.3)

4. OPERATING CYLINDER

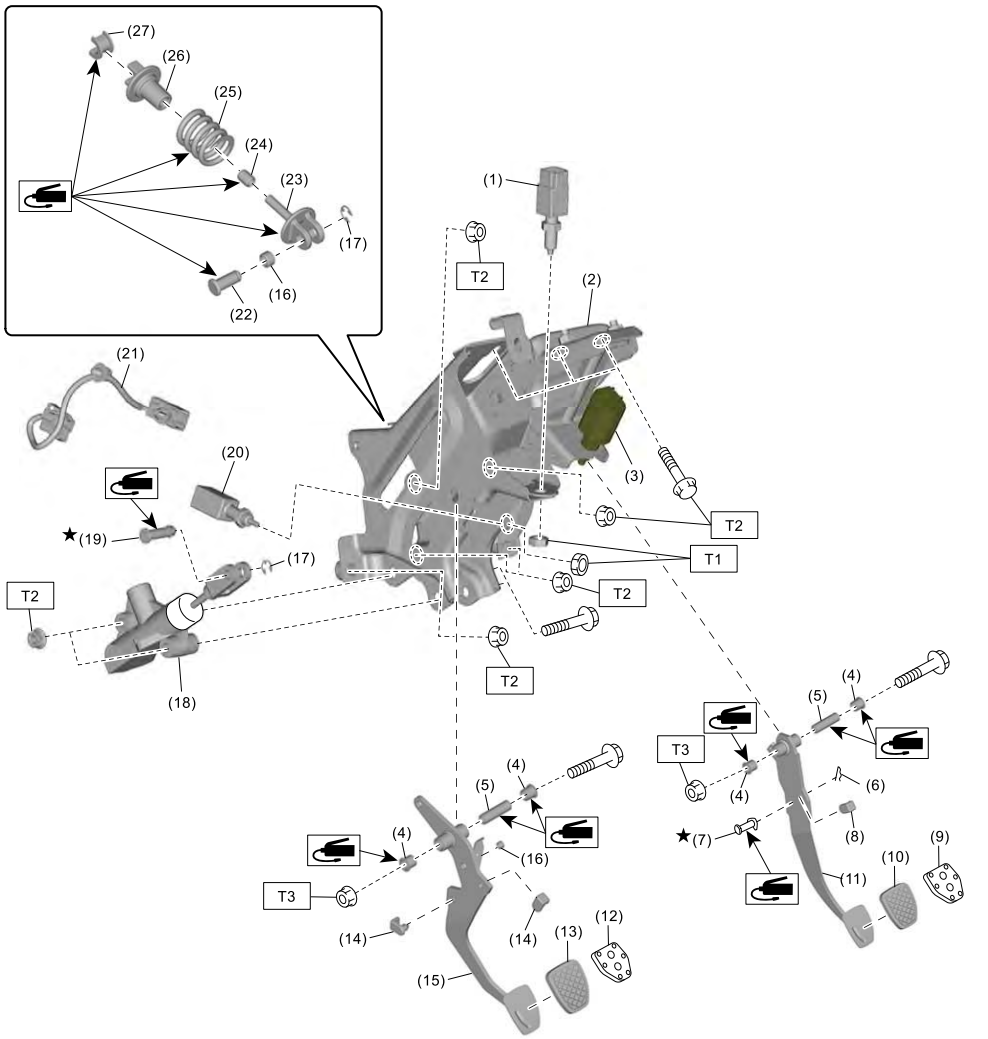


(1) Push rod
(2) Boot
(3) Piston
(4) Piston spring
(5) Operating cylinder
(6) Bleeder screw

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.8 (0.8, 5.8)

5. CLUTCH PEDAL ASSEMBLY



(1)	Clutch switch	(12)	Clutch pedal pad (sport type)	(23)	Assist rod A
(2)	Pedal bracket	(13)	Clutch pedal pad (normal type)	(24)	Assist bushing A
(3)	Stop light switch	(14)	Clutch pedal stopper	(25)	Assist spring
(4)	Pedal bushing	(15)	Clutch pedal	(26)	Assist rod B
(5)	Spacer	(16)	Bushing A	(27)	Assist bushing B
(6)	Snap pin	(17)	Clip		
(7)	Clevis pin	(18)	Master cylinder ASSY	***Tightening torque: N·m (kgf-m, ft-lb)***	
(8)	Brake pedal stopper	(19)	Clevis pin	***T1: 8 (0.8, 5.9)***	
(9)	Brake pedal pad (sport type)	(20)	Clutch start switch	***T2: 18 (1.8, 13.3)***	
(10)	Brake pedal pad (normal type)	(21)	Harness connector	***T3: 30 (3.1, 22.1)***	
(11)	Brake pedal	(22)	Assist pin		

CLUTCH SYSTEM > General Description

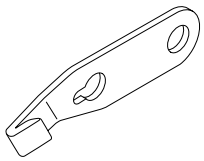
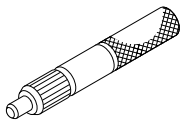
CAUTION

- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine fluid, grease etc. or equivalent. Do not mix fluid, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Apply grease onto sliding or revolving surfaces before installation.

- Before installing O-rings or snap rings, apply sufficient amount of fluid to avoid damage and deformation.
- Before securing a part in a vise, place cushioning material such as wood blocks, aluminum plate or cloth between the part and the vise.
- Keep fluid away from the vehicle body. If contaminated with fluid, immediately wash the contaminated area using water.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498497100	498497100	CRANKSHAFT STOPPER	Used for stopping rotation of the flywheel.
 ST-499747100	499747100	CLUTCH DISC GUIDE	• Used for removing and installing the clutch disc. • Used for measuring deflection on facing.

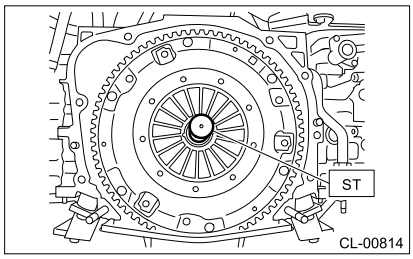
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Dial gauge	Used for measuring clutch disc run-out.
Depth gauge	Used for measuring clutch disc wear.
Angle gauge	Used for installing the flywheel.

CLUTCH SYSTEM > Clutch Disc and Cover

REMOVAL

1. Remove the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Install the ST to the flywheel.
   Special tool:
   ST: 499747100 CLUTCH DISC GUIDE

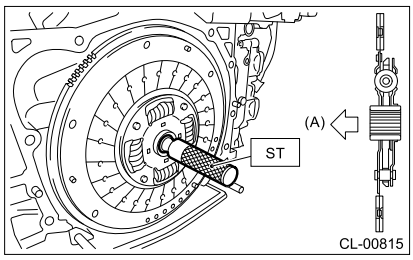


3. Remove the clutch cover and clutch disc.
   Caution:
   - **Take care not to allow oil to adhere to the clutch disc face.**
   - **Do not disassemble the clutch cover or clutch disc.**

CLUTCH SYSTEM > Clutch Disc and Cover

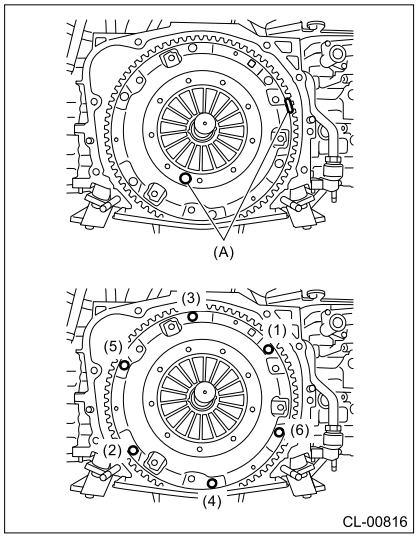
INSTALLATION

1. Insert the CLUTCH DISC GUIDE (499747100) into the clutch disc.
2. Install it by inserting the end of the ST to the pilot bearing.
   Caution:
   Pay attention to the orientation of the clutch disc.
   Special tool:
   ST: 499747100 CLUTCH DISC GUIDE



(A) Flywheel side

3. Install the clutch cover and tighten the bolts to specified torque.
   Note:
   - **When installing a clutch cover, position the clutch cover so that the spacing between the unbalance marks (paint mark) on the flywheel and clutch cover is 120° or more apart. (The unbalance mark indicates the direction of residual unbalance.)**
   - **Temporarily tighten each bolt by hand, and tighten them to the specified torque in a crisscross order.**
   Tightening torque:
   16 N·m (1.6 kgf-m, 11.8 ft-lb)



(A) Unbalance mark (paint)

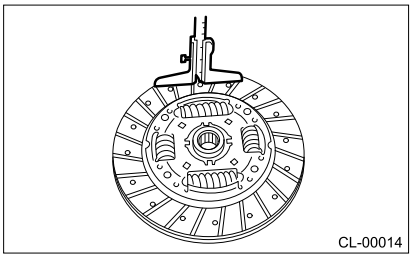
4. Remove the CLUTCH DISC GUIDE (499747100).
5. Install the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

CLUTCH SYSTEM > Clutch Disc and Cover

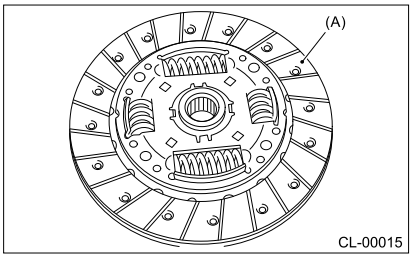
INSPECTION

1. CLUTCH DISC

1. Facing wear
   Measure the depth from the facing surface to the rivet head. Replace if the surface is partially worn or worn down to less than the specified value.
   Caution:
   Do not wash the clutch disc with cleaning fluid.
   Service limit:
   0.8 mm (0.031 in)



2. Hardened facing
   Replace the clutch disc.
3. Oil soakage on facing
   Replace the clutch disc and inspect the transmission front oil seal, transmission case mating surface, engine rear oil seal and other locations for oil leakage.

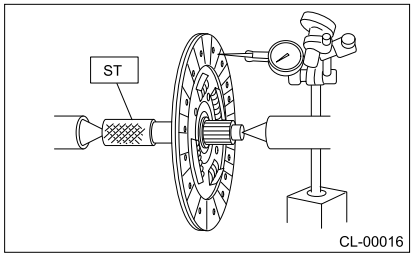


(A) Clutch facing

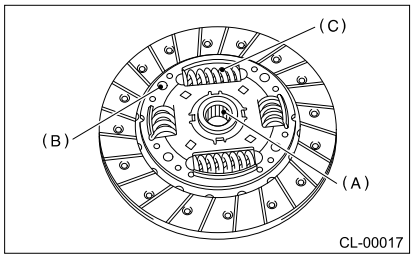
4. Deflection on facing
   If deflection exceeds the limit value at the outer circumference of the facing, replace the clutch disc.
   Special tool:
   ST: 499747100 CLUTCH DISC GUIDE

Service limit:

0.7 mm (0.028 in) at R = 110 mm (4.33 in)



5. If there is spline wear, loose rivets, failed damper springs, etc., replace the clutch disc.



(A) Spline

(B) Rivet

(C) Damper spring

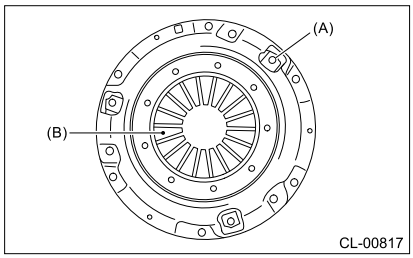
2. CLUTCH COVER

Note:

Visually check the following items without disassembling, and replace or repair if defective.

1. Loose thrust rivet

2. Damaged or worn bearing contact area at the center of diaphragm spring



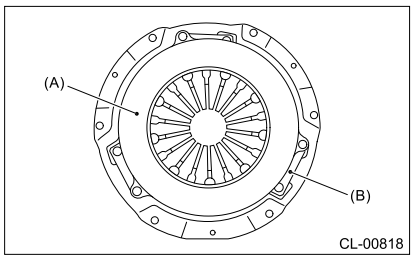
(A) Thrust rivet

(B) Diaphragm spring

3. Damaged or worn disc contact surface of the pressure plate

4. Loose strap plate installation area

5. Worn diaphragm sliding area



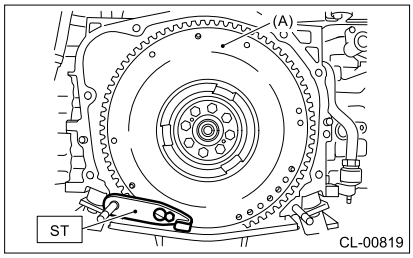
(A) Pressure plate

(B) Strap plate

CLUTCH SYSTEM > Flywheel

REMOVAL

1. Remove the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the clutch cover and clutch disc. Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>REMOVAL.
3. Install the ST.
   Special tool:
   ST: 498497100 CRANKSHAFT STOPPER



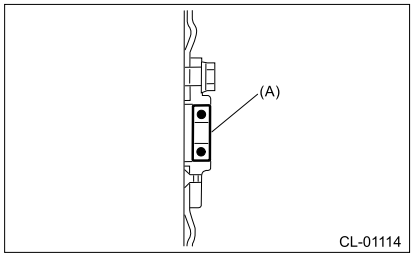
(A) Flywheel

4. Remove the flywheel and crankshaft position sensor plate.
5. Drive out the pilot bearing from the flywheel.

CLUTCH SYSTEM > Flywheel

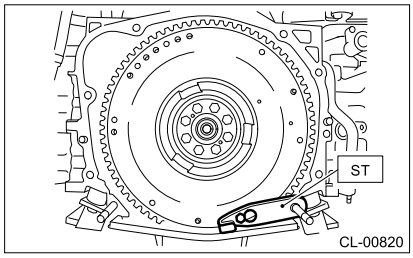
INSTALLATION

1. Press in a new pilot bearing to the position where it is flush with the flywheel surface or up to 0.4 mm (0.016 in) deeper than that.
   Caution:
   Do not press the bearing inner ring.

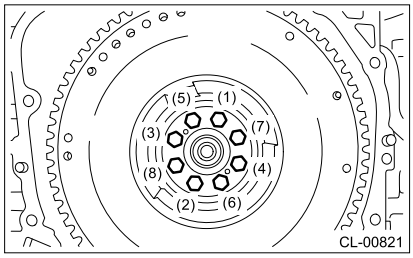


(A) Pilot bearing

2. Temporarily install the crankshaft position sensor plate and flywheel.
   Note:
   Align the knock pin hole of the crankshaft position sensor plate to the knock pin of the crankshaft to secure the knock pin.
3. Install the ST.
   Special tool:
   ST: 498497100 CRANKSHAFT STOPPER



4. Tighten the flywheel mounting bolts in two stages.
   (1) Tighten the flywheel attachment bolts.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)



(2) While checking the tightening angle with the angle gauge, further tighten the flywheel mounting bolts.

Tightening angle:

30° — 35°

5. Install the clutch disc and clutch cover. Ref. to CLUTCH SYSTEM>Clutch Disc and Cover>INSTALLATION.
6. Install the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

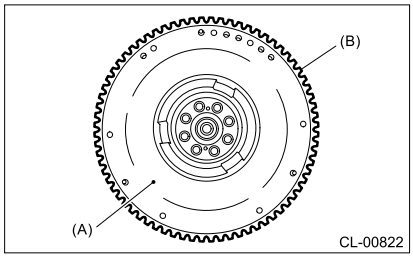
CLUTCH SYSTEM > Flywheel

INSPECTION

Caution:

Because the center pilot bearing is grease-sealed and is a non-lubrication type, do not wash with gasoline or solvents.

1. If there is damage or defectiveness in the facing sliding surface or ring gear, replace the flywheel.



(A) Flywheel

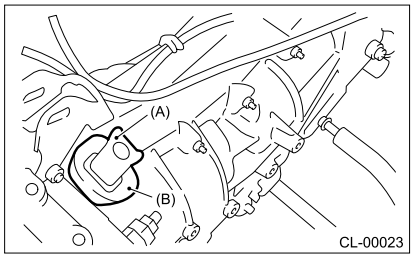
(B) Ring gear

2. Smoothness of rotation
   Rotate the ball bearing while applying pressure in the thrust direction.
3. If any noise or excessive play is noted, replace the pilot bearing.

CLUTCH SYSTEM > Release Bearing and Lever

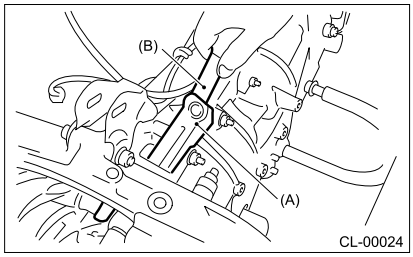
REMOVAL

1. Remove the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the two clips from the release lever and remove the release bearing.
   Caution:
   Be careful not to deform the clips.
3. Remove the dust cover.



(A) Release lever
(B) Dust cover

4. Remove the attachment point of lever spring by inserting a screwdriver through the clutch housing release lever hole. Then remove the release lever.



(A) Release lever
(B) Screwdriver

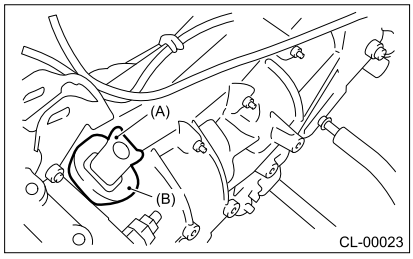
CLUTCH SYSTEM > Release Bearing and Lever

INSTALLATION

Note:
Apply the specified grease to lubricate to the following points before installation.
- **Contact surface of lever and pivot**
- **Contact surface of lever and bearing**
- **Transmission main shaft spline**
- **Contact surface of release bearing and transmission case**

Grease
NICHIMOLY N-130 or equivalent

1. While pushing the release lever to the pivot and twisting it to both sides, fit the lever spring onto the raised portion of the pivot.
   Caution:
   Observing from the main case hole, check that the lever spring is installed securely.
2. Install the release bearing and fasten it with two clips.
3. Install the dust cover.



(A) Release lever
(B) Dust cover

4. Operate the release lever and check if the release bearing moves smoothly.
5. Apply grease to the contact point of the release lever and operating cylinder.
   Grease
   NICHIMOLY N-130 or equivalent
6. Install the manual transmission assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

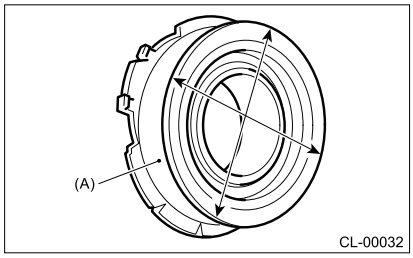
CLUTCH SYSTEM > Release Bearing and Lever

INSPECTION

1. RELEASE BEARING

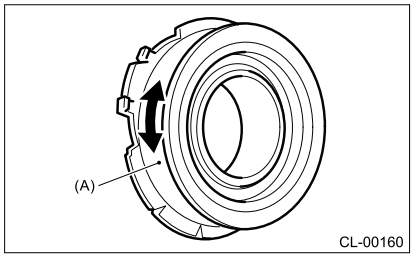
Caution:
Since this bearing is grease-sealed and is a non-lubrication type, do not wash with gasoline or any other solvent when servicing the clutch.

1. Check the bearing play by applying force to the bearing in the radial direction.
   Specification:
   1.4 mm (0.055 in) or more



(A) Bearing case

2. While applying force to the bearing in the rotational direction, check the bearing for smooth rotation.

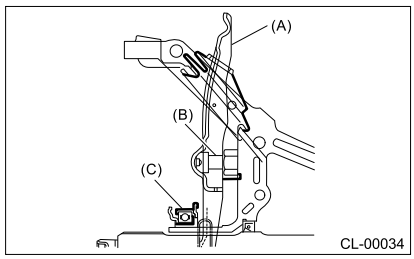


(A) Bearing case

3. Check for wear and damage at the bearing case surface in contact with the lever.

2. RELEASE LEVER

Check the pivot portion of the lever and the contact area with the release bearing case for wear.

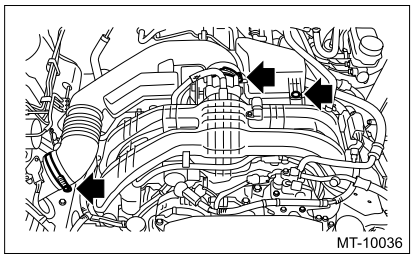


(A) Release lever
(B) Pivot
(C) Release bearing

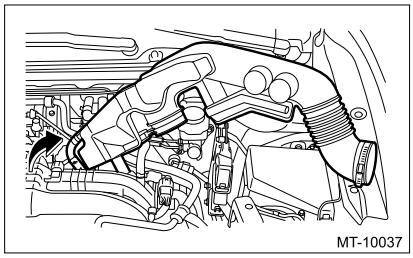
REMOVAL

Caution:
Brake fluid spilled on the vehicle body will harm the paint surface; therefore, wash it off with water and wipe clean quickly if spilled.

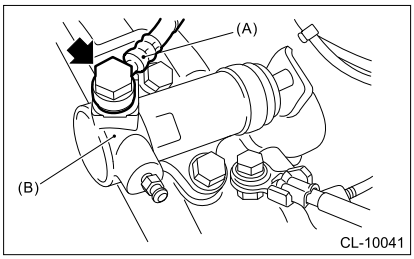
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.

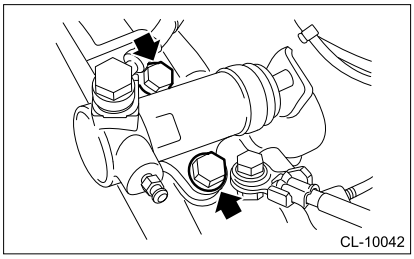


4. Disconnect the clutch hose.
   Caution:
   Cover the hose joint to prevent the brake fluid from flowing out.



(A) Clutch hose
(B) Operating cylinder

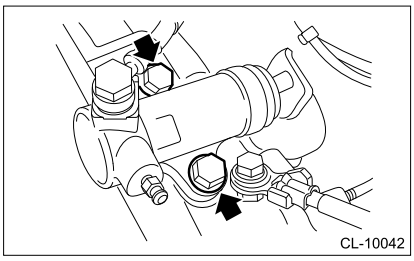
5. Remove the operating cylinder.



INSTALLATION

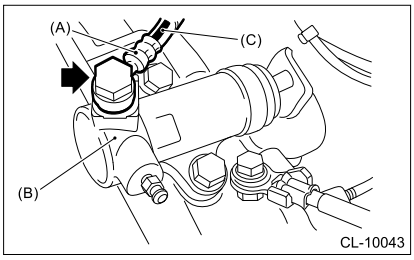
1. Install the operating cylinder.
   Note:
   Before installing, apply grease to the contact point of the release lever and operating cylinder.
   Grease
   NICHIMOLY N-130 or equivalent
   Tightening torque:

37 N·m (3.8 kgf-m, 27.3 ft-lb)



2. Replace the gasket with a new part,and install the clutch hose.
   Caution:
   - **Be sure to install with the mark side facing upward.**
   - **Do not twist the parts during installation.**

   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)



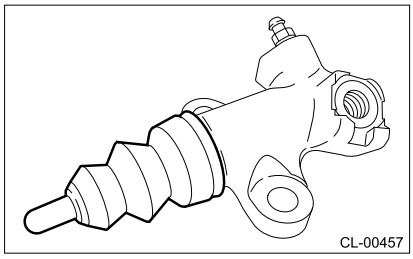
(A) Clutch hose
(B) Operating cylinder
(C) Mark

3. After bleeding air from the operating cylinder, ensure that the clutch operates properly. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding>PROCEDURE.
4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

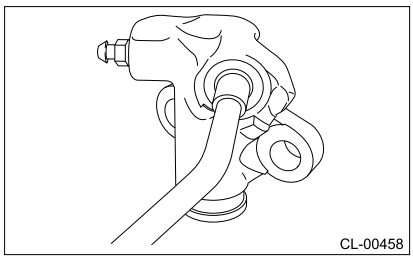
CLUTCH SYSTEM > Operating Cylinder

DISASSEMBLY

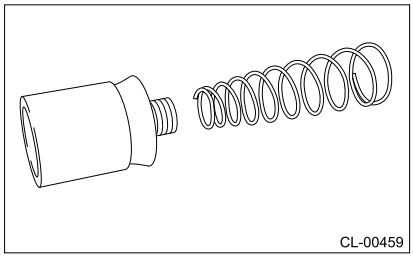
1. Remove the boot and push rod.



2. Apply compressed air through clutch hose attachment hole.
   Note:
   Face the piston hole down and place a piece of wood underneath to prevent the piston from popping out.



3. Separate the piston and piston spring.



CLUTCH SYSTEM > Operating Cylinder

ASSEMBLY

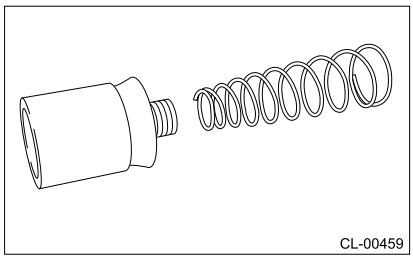
Note:

During assembly, apply hydraulic oil to all parts.

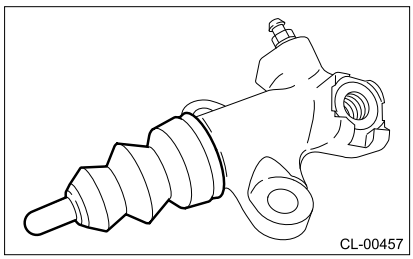
Recommended brake fluid:

New FMVSS No. 116 DOT3 or DOT4

1. Install the piston spring.



2. Insert piston into the operating cylinder.
3. Install push rod to the boot.
4. Install the boot and push rod.



CLUTCH SYSTEM > Operating Cylinder

INSPECTION

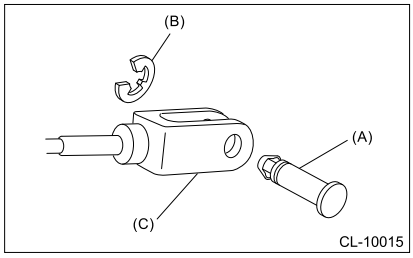
1. Check that the operating cylinder is not damaged. Replace the operating cylinder if it is damaged.
2. Check the operating cylinder for brake fluid leakage or damage on the boot.
   Replace the operating cylinder if brake fluid leaks or damages on the boot are noted.

REMOVAL

Caution:

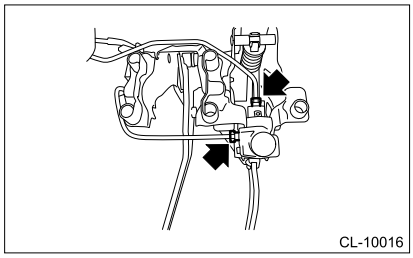
- **Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Drain the brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
4. Remove the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
5. Remove the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
6. Remove the clutch pedal assembly. Ref. to CLUTCH SYSTEM>Clutch Pedal>REMOVAL.
7. Remove the clip and clevis pin, and then remove the push rod of the master cylinder.

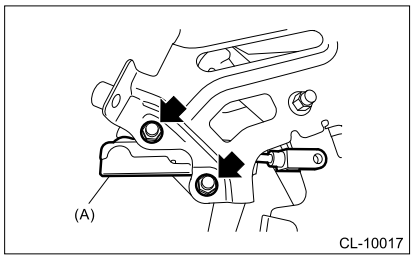


(A) Clevis pin
(B) Clip
(C) Push rod

8. Disconnect the clutch pipe.



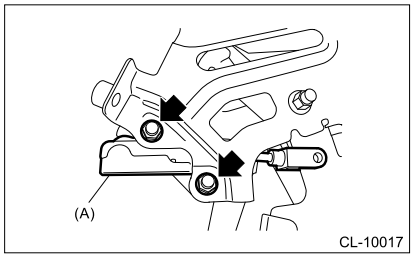
9. Remove the master cylinder.



(A) Master cylinder

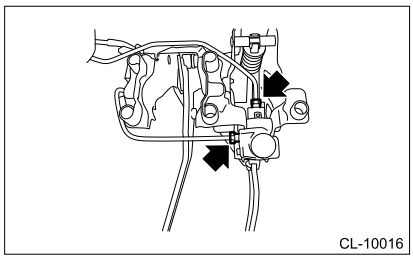
INSTALLATION

1. Install the master cylinder.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)

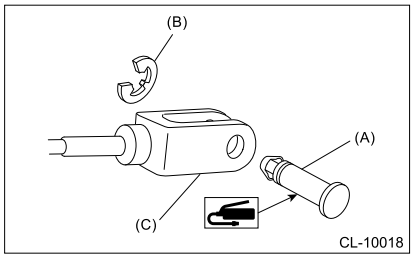


(A) Master cylinder

2. Tighten the clutch pipe.
   Tightening torque:
   15 N·m (1.5 kgf-m, 11.1 ft-lb)



3. Install the push rod of the master cylinder, and install the clevis pin and clip.
   Caution:
   Always use a new clevis pin.
   Note:
   Apply grease to the clevis pin.



(A) Clevis pin
(B) Clip
(C) Push rod

4. Install the clutch pedal assembly. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSTALLATION.
5. Install the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
6. Fill the recommended brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
7. After bleeding air from the clutch system, ensure that no fluid leaks and the clutch operates properly. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding.
8. Install the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CLUTCH SYSTEM > Master Cylinder

INSPECTION

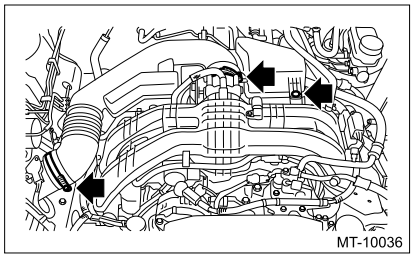
If any damage, deformation, wear, swelling, rust or other faults are found on the master cylinder assembly, reservoir tank, clutch damper, clutch pipe and clutch hose, replace the faulty part.

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". **Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

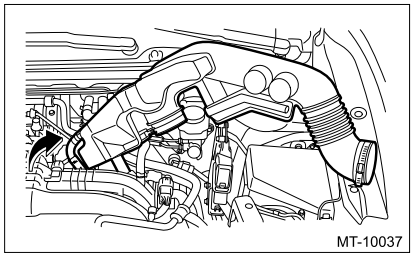
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the clip from the air intake boot, and loosen the clamp.



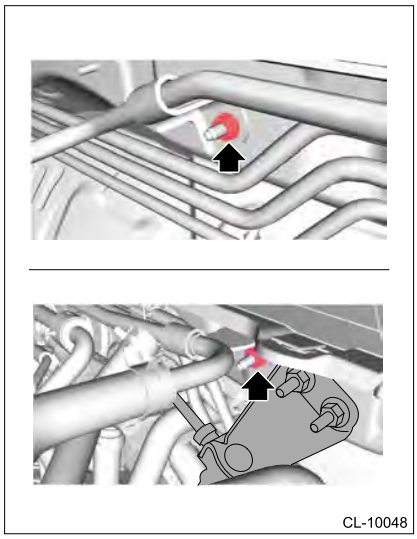
4. Remove the air intake boot, and place it aside so that it does not interfere with the work.

   Caution:

   Be careful not to pull out the PCV hose.



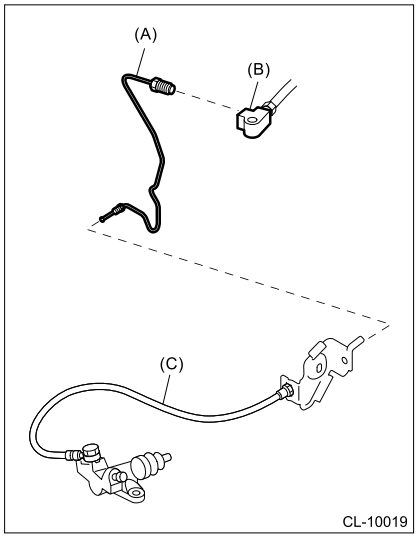
5. Drain the brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
6. Disconnect the vacuum pipe & hose assembly.



7. Remove the clutch pipe.

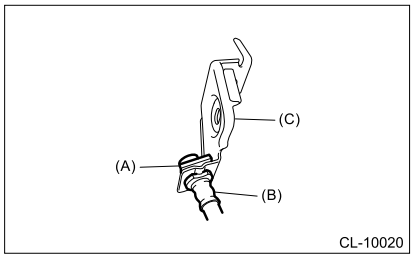
   Caution:

   Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.



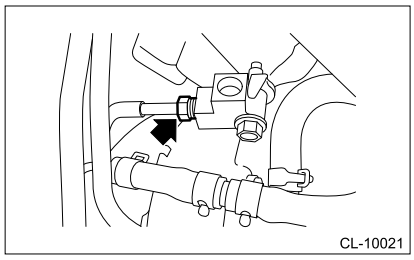
(A) Clutch pipe
(B) Two-way connector
(C) Clutch hose

8. Remove the clutch hose bracket.
9. Remove the clamp, and then remove the clutch hose.

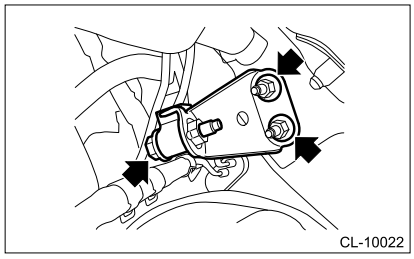


(A) Clamp
(B) Clutch hose
(C) Clutch hose bracket

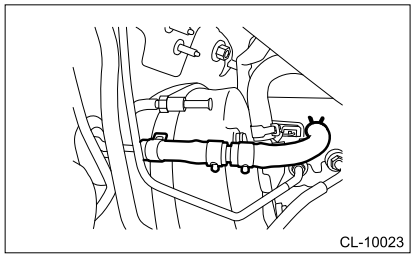
10. Remove the clutch hose from operating cylinder.
11. Disconnect the clutch pipe.



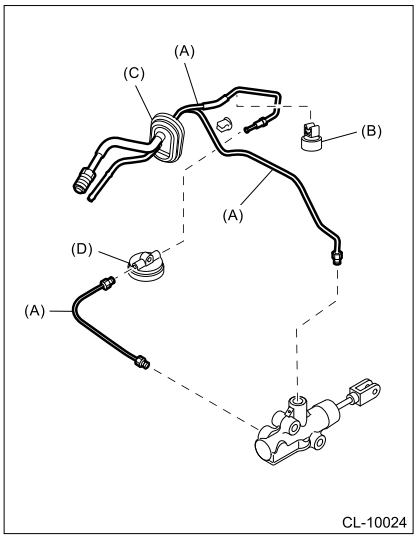
12. Remove the two-way connector and the clutch connector bracket.



13. Remove the tank hose.



14. Remove the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
15. Remove the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
16. Remove the clutch pedal assembly. Ref. to CLUTCH SYSTEM>Clutch Pedal>REMOVAL.
17. Remove the clutch pipe from the mass damper, clutch damper, master cylinder and clutch pipe grommet.



(A) Clutch pipe
(B) Mass damper
(C) Grommet
(D) Clutch damper

CLUTCH SYSTEM > Clutch Pipe and Hose

INSTALLATION

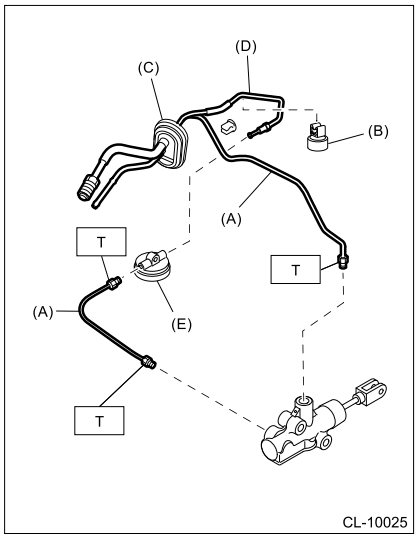
1. Install the clutch pipe to the mass damper, clutch damper, master cylinder and pipe grommet.

Caution:

Be sure to tighten the clutch pipe (D) temporarily.

Tightening torque:

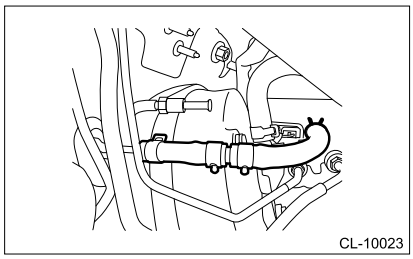
T: 15 N·m (1.5 kgf-m, 11.1 ft-lb)



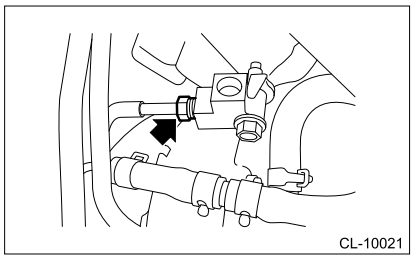
(A) Clutch pipe

(B) Mass damper
(C) Grommet
(D) Clutch pipe
(E) Clutch damper

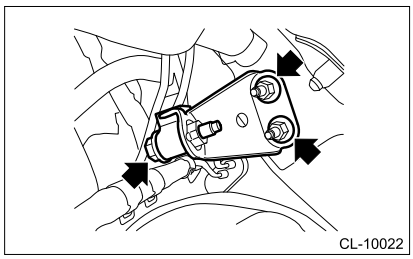
2. Install the clutch pedal assembly. Ref. to CLUTCH SYSTEM>Clutch Pedal>INSTALLATION.
3. Install the tank hose.
Caution:
Be sure to install so that the side with the triangle mark faces upward.



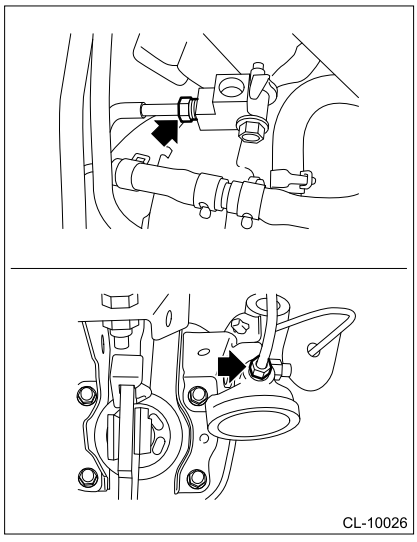
4. Temporarily install the two-way connector and the clutch connector bracket, and engage the clutch pipe.



5. Install the two-way connector and the clutch connector bracket.
Tightening torque:
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



6. Tighten the clutch pipe.
Tightening torque:
15 N·m (1.5 kgf-m, 11.1 ft-lb)



7. Install the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
8. Replace the gasket with a new part,and install the clutch hose to the operating cylinder.
Caution:
Be sure to install with the marking side facing upward.

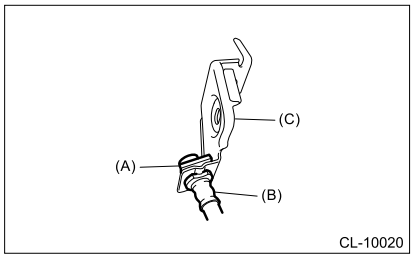
Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

9. Connect the clutch hose, and install the clamp.

Caution:

- **Be sure to install the clutch hose with the marking side facing upward.**
- **Install the clutch hoses while making sure that there is no twisting.**



(A) Clamp

(B) Clutch hose

(C) Clutch hose bracket

10. Install the clutch hose bracket.

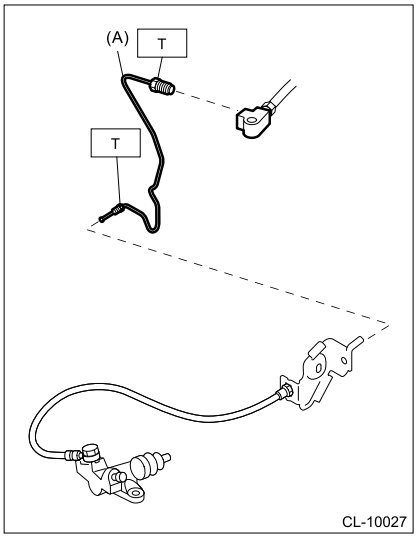
Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)

11. Install the clutch pipe.

Tightening torque:

T: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

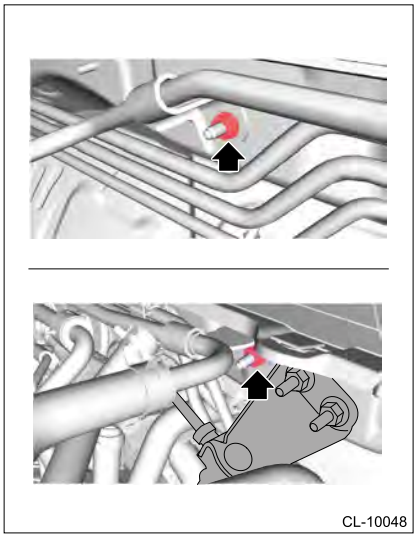


(A) Clutch pipe

12. Install the vacuum pipe & hose assembly.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



13. Fill the recommended brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
14. Bleed air from the clutch system, and ensure that no fluid leaks. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding>PROCEDURE.
15. Adjust the clutch pedal. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.
16. Install the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
17. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
18. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CLUTCH SYSTEM > Clutch Pipe and Hose

INSPECTION

Check the clutch pipe, tank hose and clutch hose for breaks and damage. Check the joint for brake fluid leakage.
If crack, breakage or damage is found, repair or replace the faulty clutch pipe, tank hose or clutch hose.

CLUTCH SYSTEM > Clutch Fluid

INSPECTION

Caution:

Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

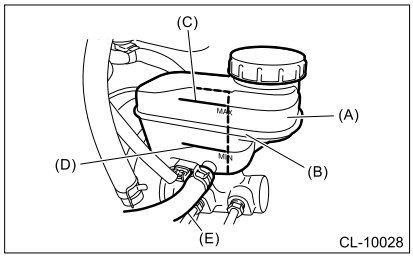
1. Park the vehicle on a level surface.
2. Check the brake fluid level using the scale on the outside of the reservoir tank. If the level is below "MIN", add fluid to bring it up to "MAX", and also inspect for leakage.

   Caution:

   This reservoir tank has the brake fluid chamber and the clutch fluid chamber. When checking the fluid level, always check the fluid from the clutch fluid chamber side where the tank hose is connected.

   Recommended brake fluid:

   New FMVSS No. 116 DOT3 or DOT4



(A) Reservoir tank
(B) Clutch fluid chamber
(C) MAX. level
(D) MIN. level
(E) Tank hose

CLUTCH SYSTEM > Clutch Fluid

REPLACEMENT

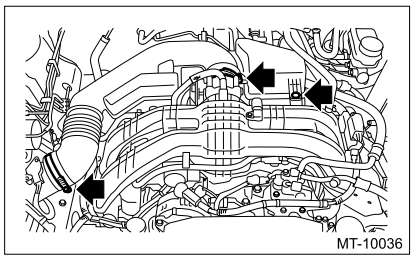
Caution:

- **Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.**
- **Use new FMVSS No. 116 DOT3 or DOT4.**
- **Cover the air bleeder with cloth to prevent brake fluid from being splashed on surrounding parts when loosening the bleeder.**
- **Avoid mixing brake fluid of different brands to prevent fluid performance from degrading.**
- **Be careful not to allow dirt or dust to enter the reservoir tank.**

Note:

- **During the bleeding operation, keep the reservoir tank filled with brake fluid to prevent entry of air.**
- **Clutch pedal must be operated very slowly.**
- **Bleed air from the oil line with help of a co-worker.**
- **The required amount of brake fluid is approximately 190 mL (6.4 US fl oz, 6.7 Imp fl oz) for total clutch system.**

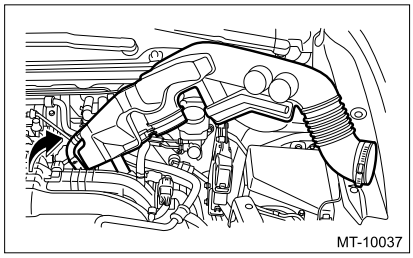
1. Remove the clip from the air intake boot, and loosen the clamp.



2. Remove the air intake boot, and place it aside so that it does not interfere with the work.

   Caution:

   Be careful not to pull out the PCV hose.



3. Drain the brake fluid from the air bleeder of the operating cylinder.
4. Refill the reservoir tank with recommended brake fluid.
   Recommended brake fluid:
   New FMVSS No. 116 DOT3 or DOT4
5. Bleed air from brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding.
6. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

PROCEDURE

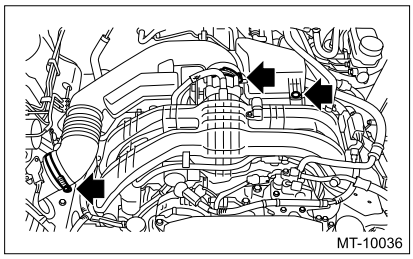
Caution:

Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

Note:

Bleed air from the oil line with help of a co-worker.

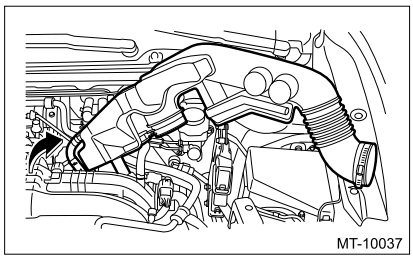
1. Remove the clip from the air intake boot, and loosen the clamp.



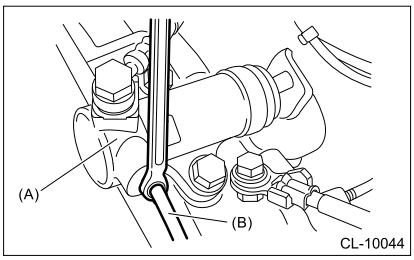
2. Remove the air intake boot, and place it aside so that it does not interfere with the work.

   Caution:

   Be careful not to pull out the PCV hose.



3. Fit one end of a vinyl tube into the air bleeder of the operating cylinder, and put the other end into a container.



(A) Operating cylinder

(B) Vinyl tube

4. Slowly depress the clutch pedal several times and keep it depressed. Open the air bleeder for 1 — 2 seconds to discharge air together with the brake fluid. Next, close the air bleeder, and slowly release the clutch pedal.

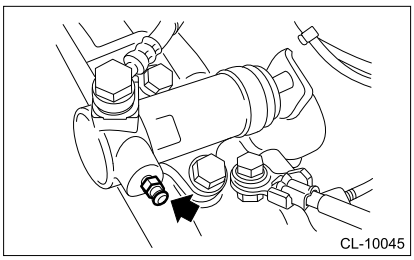
   Caution:

   Cover the air bleeder with cloth to prevent brake fluid from being splashed on surrounding parts when loosening the bleeder.

5. Repeat procedure 4), until there are no more air bubbles appearing from the air bleeder.
6. Tighten the air bleeder.

   Tightening torque:

   7.8 N·m (0.8 kgf-m, 5.8 ft-lb)



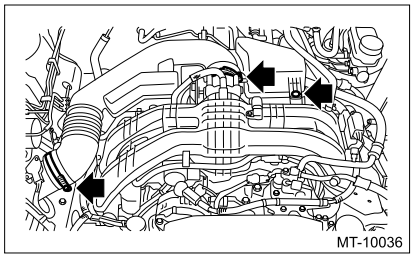
7. After stepping on the clutch pedal, make sure that there are no leaks evident in the entire clutch system.
8. After bleeding the air from clutch system, ensure that the clutch operates properly.
9. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". **Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

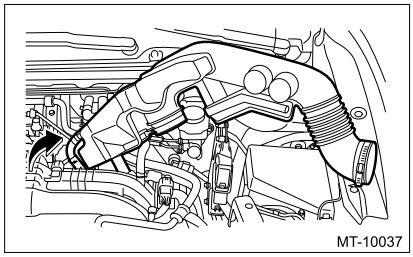
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the clip from the air intake boot, and loosen the clamp.



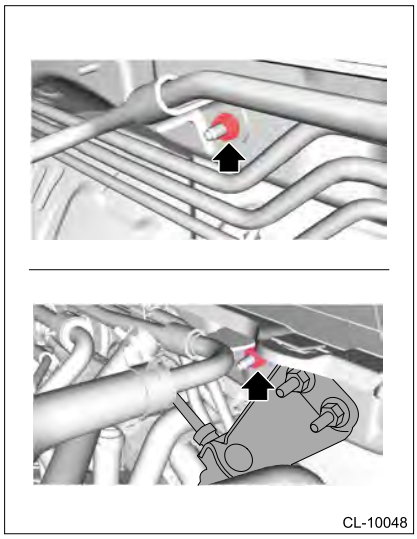
4. Remove the air intake boot, and place it aside so that it does not interfere with the work.

   Caution:

   Be careful not to pull out the PCV hose.



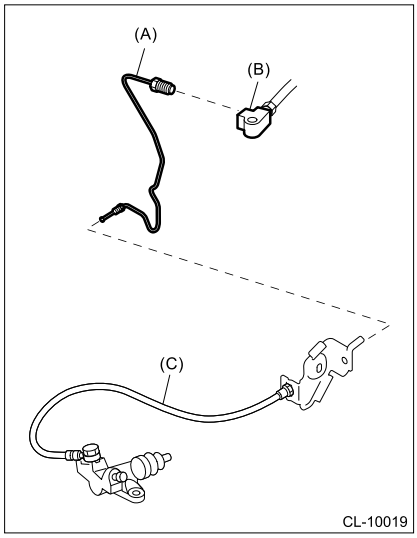
5. Drain the brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
6. Disconnect the vacuum pipe & hose assembly.



7. Remove the clutch pipe.

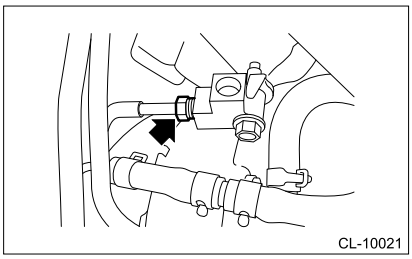
   Caution:

   Be careful not to spill the brake fluid. Brake fluid spilled on the vehicle body will harm the paint surface; wash it off with water and wipe clean quickly if spilled.

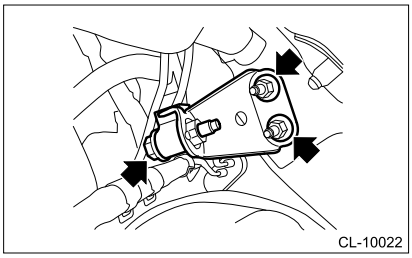


(A) Clutch pipe
(B) Two-way connector
(C) Clutch hose

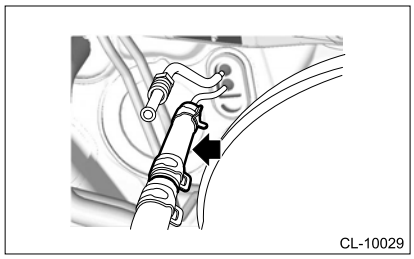
8. Disconnect the clutch pipe.



9. Remove the two-way connector and the clutch connector bracket.



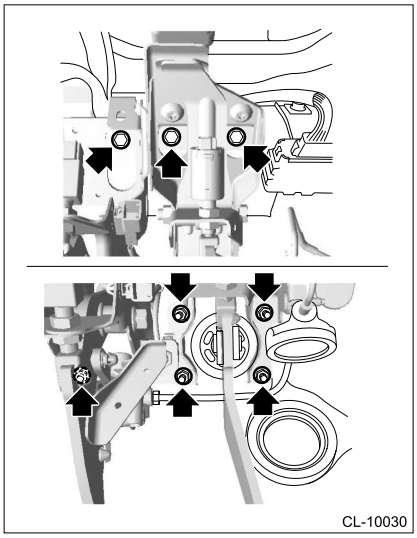
10. Disconnect the tank hose from the clutch pipe.



11. Remove the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
12. Remove the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
13. Remove the duct - foot driver. Ref. to AIR CONDITIONER>Heater Duct>REMOVAL>FOOT>LH SIDE.
14. Disconnect the connector from the clutch switch and clutch start switch.
15. Disconnect the connector from stop light switch.
16. Remove the snap pin and clevis pin connecting the operating rod and brake pedal.
17. Remove the clutch pedal assembly.

Caution:

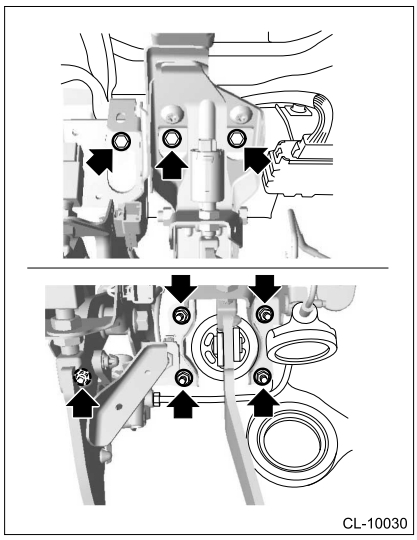
Place vinyl, etc. in order not to drop the brake fluid to the floor carpet.



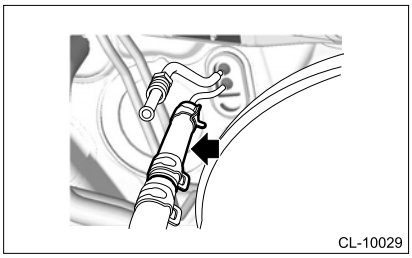
CLUTCH SYSTEM > Clutch Pedal

INSTALLATION

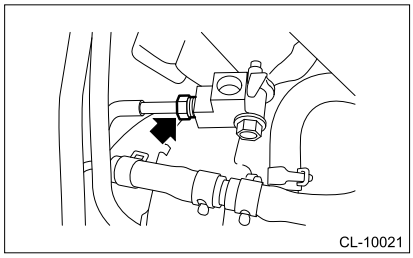
1. Install the clutch pedal assembly.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)



2. Install the snap pin and clevis pin connecting the operating rod and brake pedal.
   Caution:
   Always use a new clevis pin.
   Note:
   Apply grease to the clevis pin.
3. Connect the connector to the stop light switch.
4. Connect the connector to the clutch switch and clutch start switch.
5. Install the duct - foot driver. Ref. to AIR CONDITIONER>Heater Duct>INSTALLATION>FOOT>LH SIDE.
6. Install the steering column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
7. Connect the tank hose.



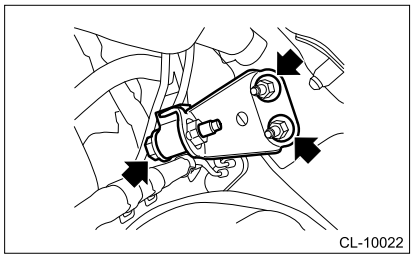
8. Temporarily install the two-way connector and the clutch connector bracket, and engage the clutch pipe.



9. Install the two-way connector and the clutch connector bracket.

Tightening torque:

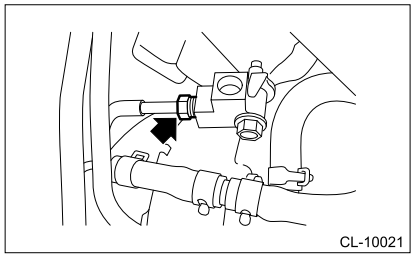
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



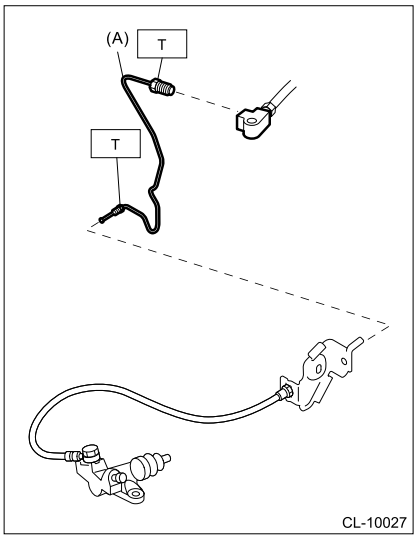
10. Tighten the clutch pipe.

Tightening torque:

15 N·m (1.5 kgf-m, 11.1 ft-lb)



11. Install the clutch pipe.

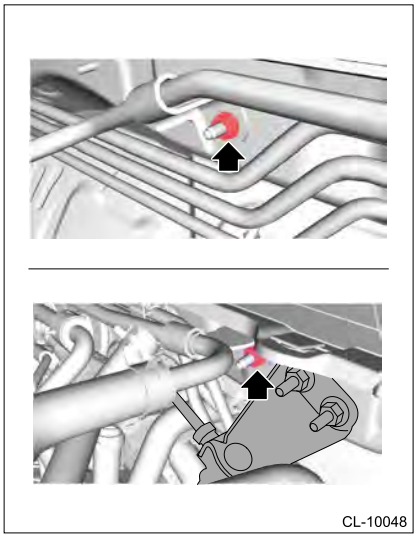


(A) Clutch pipe

12. Install the vacuum pipe & hose assembly.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

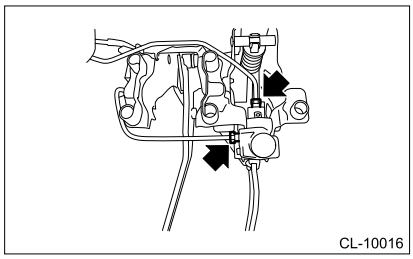


13. Fill the recommended brake fluid. Ref. to CLUTCH SYSTEM>Clutch Fluid.
14. After bleeding air from the clutch system, ensure that no fluid leaks and the clutch operates properly. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding>PROCEDURE.
15. Adjust the clutch pedal. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.
16. Install the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
17. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
18. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
19. Check the clutch start system.

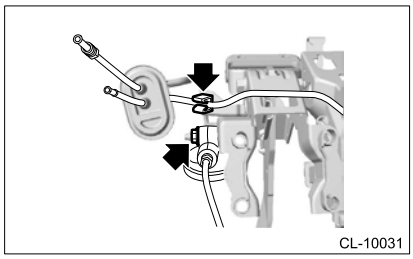
CLUTCH SYSTEM > Clutch Pedal

DISASSEMBLY

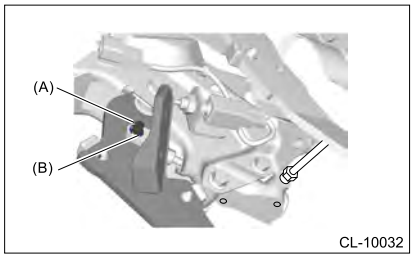
1. Disconnect the clutch pipe.



2. Remove the clutch damper mounting nut, and disconnect the clutch pipe from the clamp.



3. Remove the clutch switches.
4. Remove the clip and pull out the clevis pin.

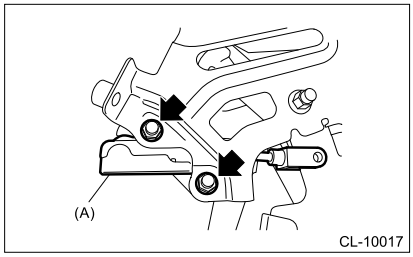


(A) Clevis pin
(B) Clip

5. Remove the master cylinder.

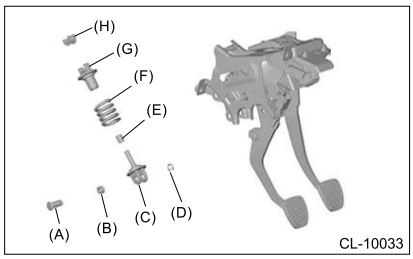
Note:

Secure the push rod with a tape etc. to prevent it from falling off.



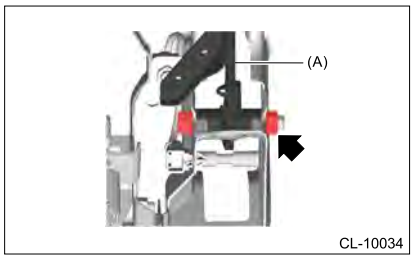
(A) Master cylinder

6. Remove the assist pin, bushing A, assist rod A, clip, assist bushing A, assist spring, assist rod B and assist bushing B.



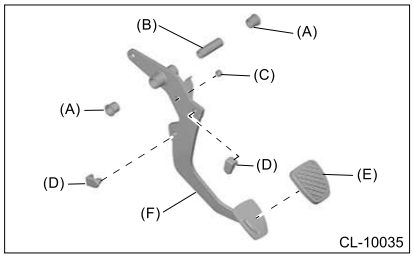
(A) Assist pin
(B) Bushing A
(C) Assist rod A
(D) Clip
(E) Assist bushing A
(F) Assist spring
(G) Assist rod B
(H) Assist bushing B

7. Remove the clutch pedal.



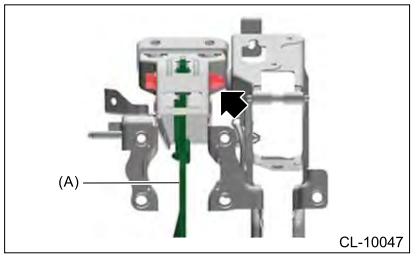
(A) Clutch pedal

8. Remove the pedal bushing, spacer, bushing A, clutch pedal stopper and clutch pedal pad.



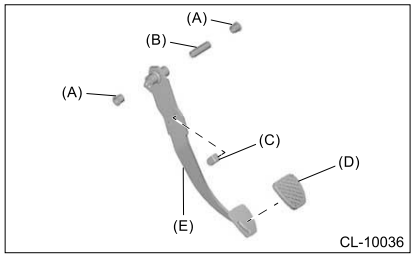
(A) Pedal bushing
(B) Spacer
(C) Bushing A
(D) Clutch pedal stopper
(E) Clutch pedal pad
(F) Clutch pedal

9. Remove the brake pedal.



(A) Brake pedal

10. Remove the pedal bushing, spacer, brake pedal stopper and brake pedal pad.



(A) Pedal bushing
(B) Spacer
(C) Brake pedal stopper
(D) Brake pedal pad
(E) Brake pedal

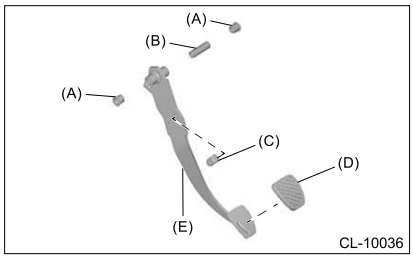
CLUTCH SYSTEM > Clutch Pedal

ASSEMBLY

1. Attach the brake pedal pad, brake pedal stopper, spacer and pedal bushing.

Caution:

Before installing the pedal bushing and spacer, clean the sliding surface and apply grease.

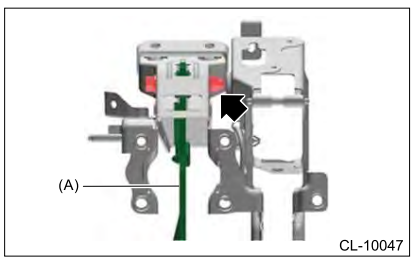


(A) Pedal bushing
(B) Spacer
(C) Brake pedal stopper
(D) Brake pedal pad
(E) Brake pedal

2. Install the brake pedal.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)

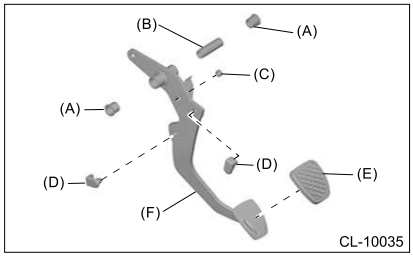


(A) Clutch pedal

3. Install the clutch pedal pad, clutch pedal stopper, bushing A, spacer and pedal bushing.

Caution:

Before installing the pedal bushing and spacer, clean the sliding surface and apply grease.

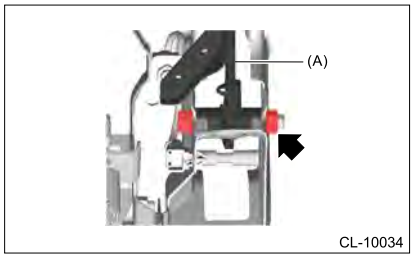


(A) Pedal bushing
(B) Spacer
(C) Bushing A
(D) Clutch pedal stopper
(E) Clutch pedal pad
(F) Clutch pedal

4. Install the clutch pedal.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)

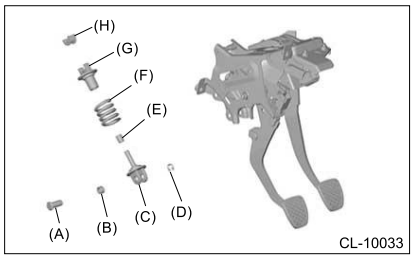


(A) Clutch pedal

5. Install the assist bushing B, assist rod B, assist spring, assist bushing A, clip, assist rod A, bushing A and assist pin.

Note:

Apply grease to the assist bushing B, assist rod B, assist spring seating surface, assist bushing A, assist rod A, and bushing A.



(A) Assist pin
(B) Bushing A
(C) Assist rod A
(D) Clip
(E) Assist bushing A
(F) Assist spring
(G) Assist rod B
(H) Assist bushing B

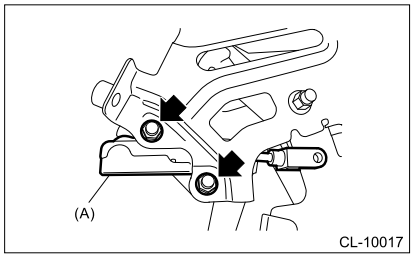
6. Install the master cylinder.

Note:

Secure the push rod with a tape etc. to prevent it from falling off.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



(A) Master cylinder

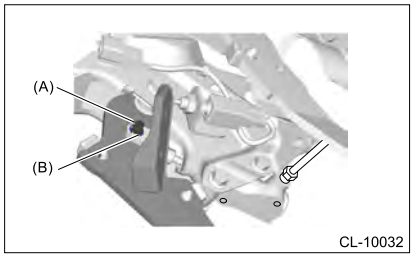
7. Secure the clevis pin with mounting clip.

Caution:

Always use a new clevis pin.

Note:

Before installing the clevis pin, apply grease.



(A) Clevis pin

(B) Clip

8. Install the clutch switch.

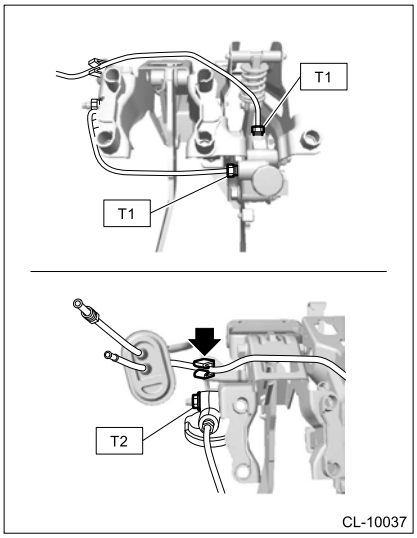
9. Install the clutch pipe to the clamp.

10. Install the clutch damper, and install the clutch pipe to the master cylinder.

Tightening torque:

T1: 15 N·m (1.5 kgf-m, 11.1 ft-lb)

T2: 18 N·m (1.8 kgf-m, 13.3 ft-lb)



CLUTCH SYSTEM > Clutch Pedal

INSPECTION

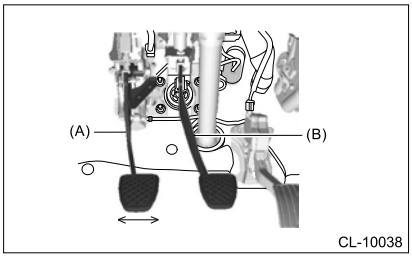
Move the clutch pedal pads in the lateral direction with a force of approximately 10 N (1 kgf, 2 lbf) to check that the clutch pedal deflection is within the limit.

Caution:

If the deflection exceeds the limit, replace the clutch pedal assembly with a new part.

Service limit:

4.0 mm (0.157 in) or less

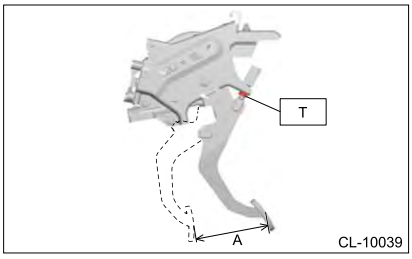


(A) Clutch pedal
(B) Brake pedal

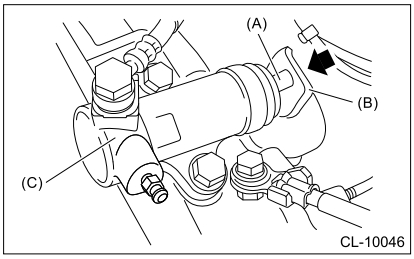
CLUTCH SYSTEM > Clutch Pedal

ADJUSTMENT

1. If the full stroke A of the clutch pedal is not within the specified value, loosen the lock nuts of the clutch switch and adjust the full stroke A of the clutch pedal with the clutch switch.
   Caution:
   When adjusting the full stroke A of the clutch pedal, do not turn the clutch switch.
   Specification:
   130 — 135 mm (5.12 — 5.31 in)
   Tightening torque:
   T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)



2. Depress and release the clutch pedal two or three times to ensure that the clutch pedal and release lever operate smoothly.
   If the clutch pedal and release lever do not operate smoothly, bleed air from the clutch hydraulic system. Ref. to CLUTCH SYSTEM>Clutch Fluid Air Bleeding.
3. Measure the clutch pedal full stroke length again to ensure that it is within the standard value. If it is not within the standard value, repeat adjustment procedures from the beginning.
   Specification:
   130 — 135 mm (5.12 — 5.31 in)
4. Push the release lever until the operating cylinder push rod retracts. Check that the brake fluid level in the reservoir tank increases.



(A) Push rod
(B) Release lever
(C) Operating cylinder

5. If the brake fluid level increases, hydraulic clutch play is correct.
6. If the brake fluid level does not increase or push rod does not retract, readjust the clutch pedal.
7. Check the brake fluid level using the scale on the outside of reservoir tank. Ref. to CLUTCH SYSTEM>Clutch Fluid>INSPECTION.

CLUTCH SYSTEM > Clutch Switch

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
5. Disconnect the connector from the clutch switch and clutch start switch.
6. Remove the clutch switch and clutch start switch.

CLUTCH SYSTEM > Clutch Switch

INSTALLATION

1. CLUTCH SWITCH

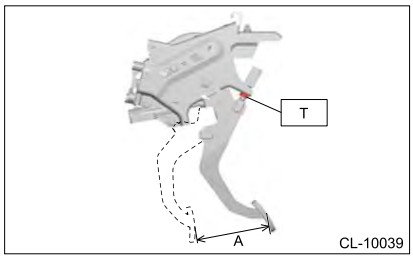
1. Install the clutch switch.
2. Move the clevis pin of push rod to left and right, retain it at the position where it moves smoothly, and measure the clutch pedal full stroke A.

   Specification:

   130 — 135 mm (5.12 — 5.31 in)

   Tightening torque:

   T: 8 N·m (0.8 kgf-m, 5.9 ft-lb)



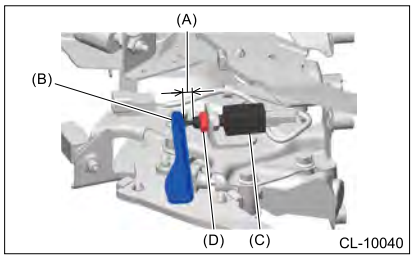
3. If the clutch pedal full stroke is out of the standard value, adjust it. Ref. to CLUTCH SYSTEM>Clutch Pedal>ADJUSTMENT.
4. Connect the connector to the clutch switch.
5. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
6. Install the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. CLUTCH START SWITCH

1. Install the clutch start switch.
2. Fully depress the clutch pedal and hold it.
3. Install so that the gap (A) between the clutch pedal plate and the clutch start switch becomes 7.3 mm (0.29 in), and tighten the lock nut.

   Tightening torque:

   8 N·m (0.8 kgf-m, 5.9 ft-lb)



(A) 7.3 mm (0.29 in)
(B) Clutch pedal plate
(C) Clutch start switch
(D) Lock nut

4. Connect the connector to the clutch start switch.
5. Check the clutch start system.

6. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
7. Install the instrument panel lower cover. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

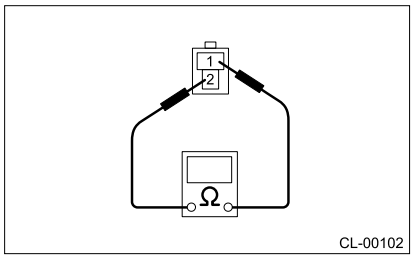
CLUTCH SYSTEM > Clutch Switch

INSPECTION

1. CLUTCH START SWITCH

1. Perform inspections for the clutch start system, and if it does not operate normally, adjust the clutch start switch and check it again. Ref. to CLUTCH SYSTEM>Clutch Switch>ADJUSTMENT.
2. When the clutch start switch does not operate normally even if it is adjusted, check the clutch start switch for continuity.
   (1) Remove the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>REMOVAL.
   (2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not within the standard value, replace the switch.

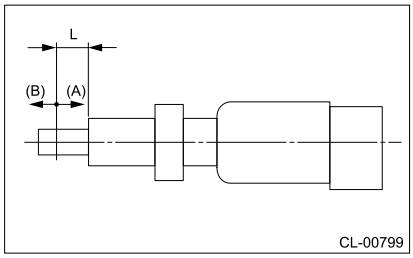
Condition	Terminal No.	Standard
ON	No. 1 — No. 2	Less than 1 Ω
OFF	No. 1 — No. 2	1 MΩ or more



(3) Check that the switch is turned on and off in dimension L.

Dimension L:

9 — 10 mm (0.35 — 0.39 in)



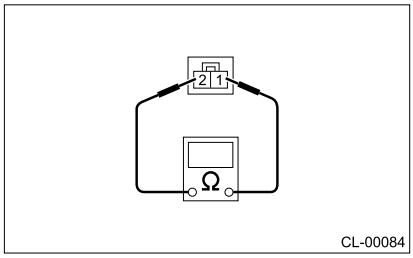
(A) ON
(B) OFF

(4) Install the clutch start switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION > CLUTCH START SWITCH.

2. CLUTCH SWITCH

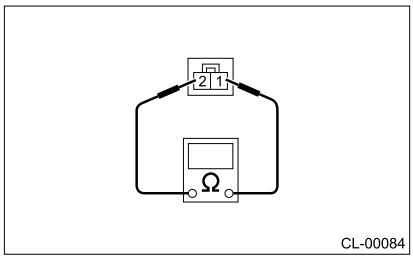
1. Check the clutch switch for continuity.
   (1) Disconnect the connector of clutch switch.
   (2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not within the standard value, check the clutch stroke and installation condition, and check again.

Condition	Terminal No.	Standard
When clutch pedal is depressed	No. 1 — No. 2	1 MΩ or more
When the clutch pedal is not depressed	No. 1 — No. 2	Less than 1 Ω

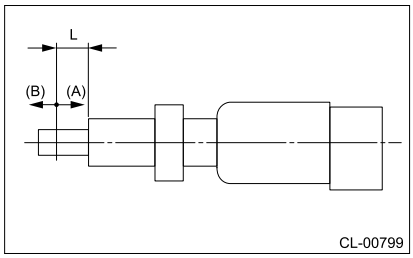


2. When the clutch switch does not operate normally even if the clutch stroke and installation condition are normal, check the clutch switch for continuity.
   (1) Remove the clutch switches. Ref. to CLUTCH SYSTEM>Clutch Switch>REMOVAL.
   (2) Measure the resistance between terminal 1 and 2 of the switch. If the resistance is not within the standard value, replace the switch.

Condition	Terminal No.	Standard
ON	No. 1 — No. 2	Less than 1 Ω
OFF	No. 1 — No. 2	1 MΩ or more



   (3) Check that the switch is turned on and off in dimension L.
   Dimension L:
   5 — 6.5 mm (0.2 — 0.26 in)



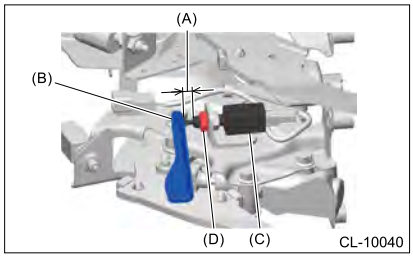
   (A) ON
   (B) OFF

   (4) Install the clutch switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION > CLUTCH SWITCH.

CLUTCH SYSTEM > Clutch Switch

ADJUSTMENT

1. Loosen the lock nut of the clutch start switch.
2. Fully depress the clutch pedal and hold it.
3. Adjust the gap (A) between the clutch pedal plate and the clutch start switch to be 7.3 mm (0.29 in).



(A) 7.3 mm (0.29 in)
(B) Clutch pedal plate
(C) Clutch start switch

(D) Lock nut

4. Tighten the lock nut.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)

INSPECTION

1. CLUTCH

Symptoms	Possible cause	Corrective action
1. Clutch slippage It is hard to perceive clutch slippage in the early stage, but pay attention to the following symptoms. • Engine temporarily speeds up when the accelerator ON immediately after shifting. • High-speed driving is not possible; especially rapid acceleration is not possible and vehicle speed does not increase in proportion to the increase in engine speed. • Power drops particularly when ascending a slope, and there is a burning smell of the clutch plate. • Method of testing: Park the vehicle and fully apply the parking brake. Disengage the clutch and shift the transmission gear into the 1st. Gradually increase the engine speed while gradually allowing the clutch to engage. The clutch function is satisfactory if the engine stalls. However, the clutch is slipping if the vehicle does not move forward and the engine does not stall.	(a) Oil on the clutch face	Replace.
	(b) Worn clutch face	Replace.
	(c) Deteriorated diaphragm spring	Replace.
	(d) Warped pressure plate or flywheel	Repair or replace.
	(e) Defective release bearing holder	Repair or replace.
2. Clutch drags. As a symptom of this trouble, a harsh scratching noise occurs and control becomes difficult when shifting gears. The symptom becomes more apparent when shifting into the 1st gear. However, because most trouble of this sort is due to a defective synchronization mechanism, perform the following tests. • Method of testing: Ref. to CLUTCH SYSTEM>General Diagnostic Table>INSPECTION > DIAGNOSTIC DIAGRAM OF CLUTCH DRAG. The problem is caused by insufficient disengagement of the clutch if an abnormal noise occurs during this test.	(a) Worn or rusty clutch disc hub spline	Replace the clutch disc.
	(b) Excessive deflection of clutch disc face	Repair or replace.
	(c) Crankshaft pilot needle bearing sticking	Replace.
	(d) Cracked clutch disc face	Replace.
	(e) Stuck clutch disc (smeared by oil or water)	Replace.
3. Clutch chatters. Clutch chattering is an unpleasant vibration to the whole vehicle when the vehicle	(a) Adhesion of oil on the clutch face	Replace the clutch disc.
	(b) Weak or broken damper spring	Replace the clutch disc.

Symptoms	Possible cause	Corrective action
is just started with clutch partially engaged.	(c) Poor contact of the disc surface or excessively worn disc	Replace the faulty clutch disc.
	(d) Warped pressure plate or flywheel	Repair or replace.
	(e) Loose disc rivets	Replace the clutch disc.
	(f) Loose engine mounting	Retighten or replace mounting.
	(g) Loose pitching stopper	Retighten the pitching stopper. Or replace it.
4. Noisy clutch Noise occurs when the clutch is disengaged, engaged, or partially engaged.	(a) Broken, worn or insufficiently lubricated release bearing	Replace the release bearing.
	(b) Insufficient lubrication of the pilot bearing	Replace the pilot bearing.
	(c) Loose clutch disc hub	Replace the clutch disc.
	(d) Loose damper spring retainer	Replace the clutch disc.
	(e) Deteriorated or broken damper spring	Replace the clutch disc.
5. Clutch grabs suddenly. When starting the vehicle with the clutch partially engaged, the clutch engages suddenly and the vehicle jumps instead of making a smooth start.	(a) Grease or oil on facing	Replace the clutch disc.
	(b) Deteriorated cushioning spring	Replace the clutch disc.
	(c) Worn or rusted spline of clutch disc or main shaft	Take off rust, apply grease or replace clutch disc or main shaft.
	(d) Deteriorated or broken damper spring	Replace the clutch disc.
	(e) Loose engine mounting	Retighten or replace mounting.
	(f) Deteriorated diaphragm spring	Replace.

2. CLUTCH PEDAL

Symptoms	Corrective action
Insufficient clutch pedal free play	Adjust the free play of the pedal.
Excessively worn and damaged pedal shaft and/or bushing	Replace the bushing or shaft with a new part.

3. DIAGNOSTIC DIAGRAM OF CLUTCH DRAG

1. CHECK GEAR NOISE.

1. Start the engine.
2. While idling the engine, step on the clutch pedal and quickly shift from neutral to reverse.

Is there any abnormal noise from the transmission gear?

Yes — Go to 2.

No — Clutch is normal.

2. CHECK GEAR NOISE.

Depress the clutch pedal at idle, and shift from neutral to reverse within 0.5 — 1.0 second.

Is there any abnormal noise from the transmission gear?

Yes	Go to 3.
No	Inspect defective transmission or excessive clutch drag torque, pilot bearing, clutch disc, transmission and clutch disc hub spline.

3. CHECK GEAR NOISE.

1. Depress the clutch pedal at idle, and shift from neutral to reverse within 0.5 — 1.0 second.
2. While stepping on the clutch pedal, shift from neutral to reverse, reverse to neutral several times.

Is there any abnormal noise from the transmission gear?

Yes	Inadequate clutch disengage. Inspect the clutch disc, clutch cover, clutch release, and clutch pedal free play.
No	Clutch and flywheel seizure. Inspect the clutch disc and the spline of the clutch disc hub.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580)

CVT(TR580)

1. General Description
2. CVTF
3. Differential Gear Oil
4. AWD ON/OFF Switching Mode
5. Road Test
6. Stall Test
7. Time Lag Test
8. Secondary Pressure (Line Pressure) Test
9. Transfer Clutch Pressure Test
10. Automatic Transmission Assembly
11. Transmission Mounting System
12. Extension Case Oil Seal
13. Differential Side Retainer Oil Seal
14. Inhibitor Switch
15. Turbine Speed Sensor
16. Secondary Speed Sensor
17. Primary Speed Sensor
18. Secondary Pressure Sensor
19. Oil Pan and Strainer
20. Control Valve Body
21. Transmission Harness
22. Transmission Control Module (TCM)
23. Relay and Fuse
24. CVTF Cooler (With Warmer Function)
25. Air Breather Hose
26. Drive Plate
27. Torque Converter Assembly
28. Preparation for Overhaul
29. Extension Case
30. Transfer Clutch
31. Transfer Driven Gear
32. Parking Pawl
33. Reduction Driven Gear
34. Transmission Control Device
35. Transmission Case
36. CVTF Filter
37. Reduction Drive Gear

38. Primary Pulley and Secondary Pulley
39. Variator Chain
40. Reverse Brake Assembly
41. Forward Clutch Assembly
42. Drive Pinion Shaft Assembly
43. Front Differential Assembly
44. Oil Pump Chain
45. Oil Pump
46. Converter Case
47. Diagnostics with Phenomenon

SPECIFICATION

1. TORQUE CONVERTER

Model	DOHC non-turbo
Type	Symmetric, 3-element, single stage, 2-phase torque converter
Stall torque ratio	2.32
Nominal mm (in)	215 (8.46)
Stall speed (at sea level) r/min	2,150 — 3,050 (D range) 2,050 — 2,950 (R range)
One-way clutch	Sprag type one-way clutch

2. OIL PUMP

Type		Internal gear pump
Driving method		Driven by chain
Number of teeth	Inner rotor	8
	Outer rotor	9

3. TRANSMISSION CONTROL ELEMENT

Type	Forward continuously variable speed change, 1 reverse, planetary gear
Multi-plate clutch	1 sets
Multi-plate brake	1 sets

4. TRANSMISSION GEAR RATIO

Forward	3.439 — 0.489
Rev	3.522

5. PLATE

Number of forward clutch drive plates	3
Number of reverse brake drive plates	4

6. SELECTOR POSITION

P (Park)	Transmission neutral, output shaft locked, engine start enabled
R (Reverse)	Rev
N (Neutral)	Transmission neutral, engine start enabled
D (Drive)	Forward continuously variable speed change
M (Manual mode) (paddle shift +side)	Manual gear change 1st → 2nd → 3rd → 4th → 5th → 6th → 7th
M (Manual mode) (paddle shift −side)	Manual gear change 1st ← 2nd ← 3rd ← 4th ← 5th ← 6th ← 7th
L (Low)	Forward continuously variable speed change

	(engine brake)

7. HYDRAULIC CONTROL AND LUBRICATION

Type	Electronic hydraulic control (gear ratio is changed by signals of vehicle speed and accelerator opening angle.)
Fluid	Specified fluid: SUBARU CVT FLUID LINEARTRONIC II **Caution:** **Always use specified CVTF. Using other fluid will cause malfunction.**
Fluid capacity L (US qt, Imp qt)	10.48 — 10.98 (11.1 — 11.6, 9.2 — 9.7)
Lubrication system	Forced feed lubrication with oil pump

8. COOLING AND HARNESS

Cooling system		CVTF cooler (with warmer feature)
Transmission harness	Power supply circuit, CAN communication, paddle shift circuit, back-up light circuit, starter circuit, etc.	30 poles

9. TRANSFER

Transfer type	Multi-plate transfer (MP-T)
Number of transfer clutch drives & driven plates	4
Control method	Electronic hydraulic type
Reduction gear ratio	1.000 (43/43)

10. REDUCTION GEAR RATIO

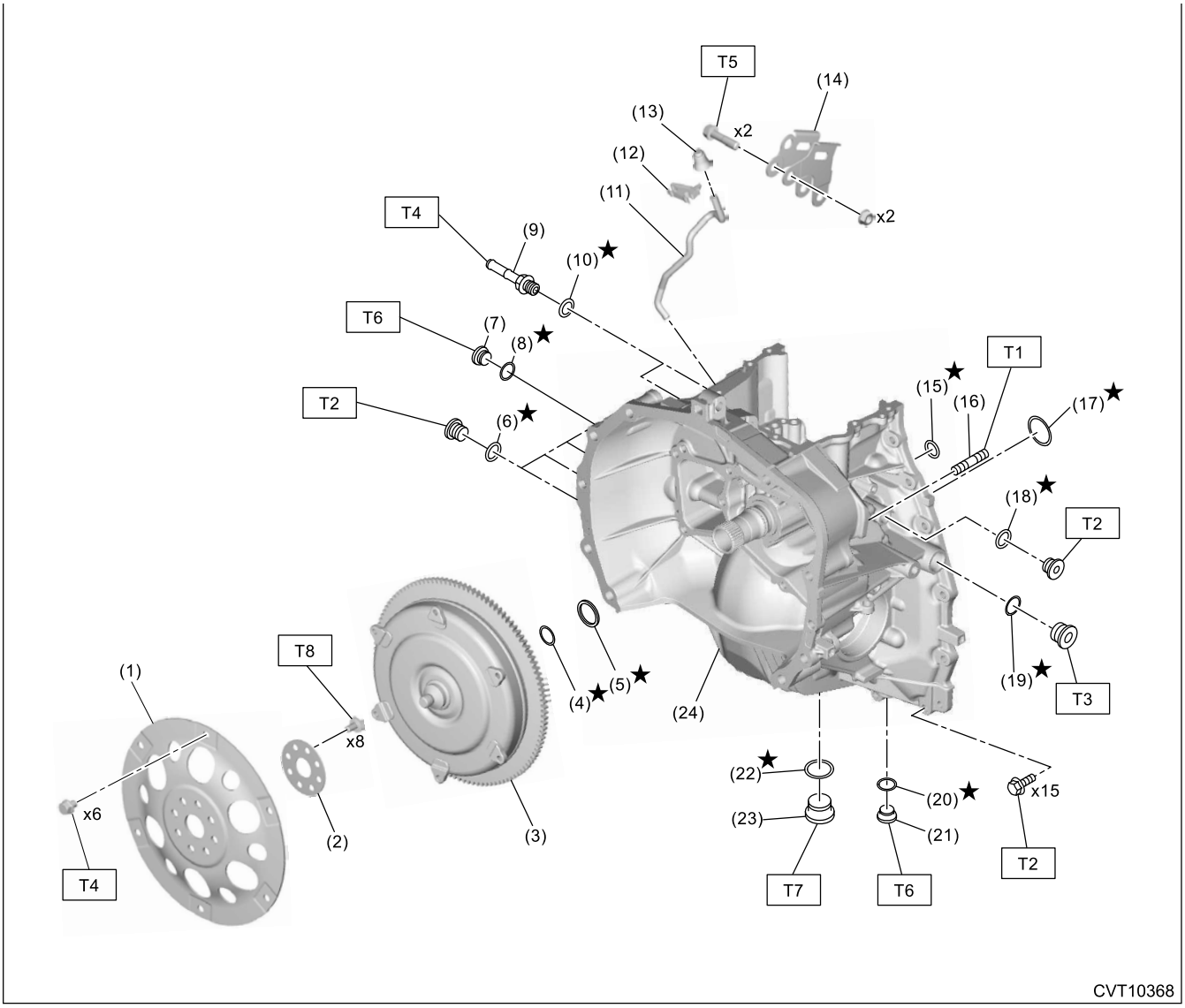
Front final reduction gear ratio	3.700

11. RECOMMENDED GEAR OIL

Lubrication oil	SUBARU GEAR OIL EXTRA MT or equivalent
Front differential oil capacity L (US qt, Imp qt)	1.21 — 1.31 (1.3 — 1.4, 1.1 — 1.2)

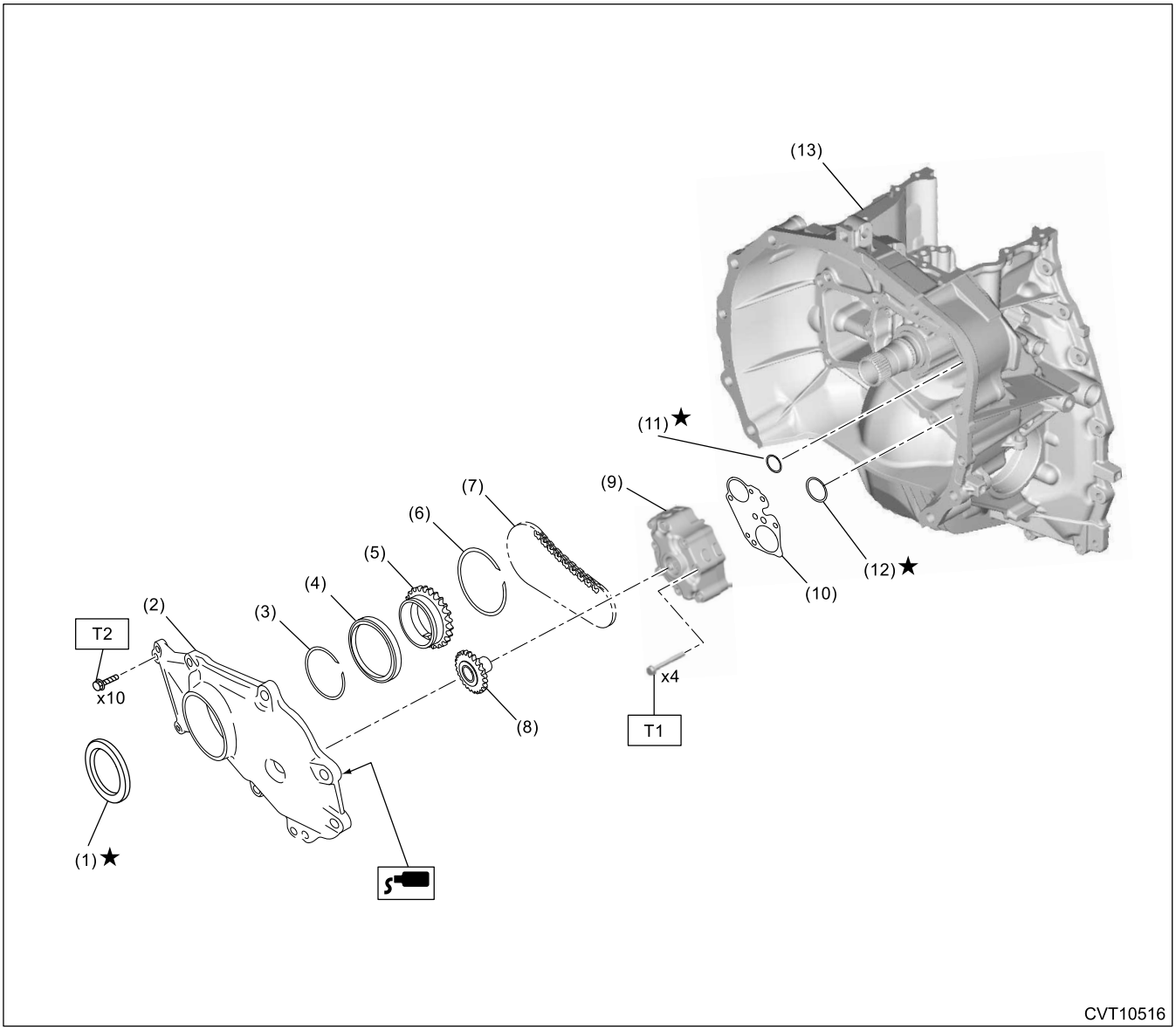
COMPONENT

1. TORQUE CONVERTER ASSEMBLY AND CONVERTER CASE



(1) Drive plate	(13) Air breather cap	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Reinforcement drive plate	(14) Pitching stopper bracket	***T1: 18 (1.8, 13.3)***
(3) Torque converter ASSY	(15) O-ring	***T2: 22 (2.2, 16.2)***
(4) O-ring	(16) Stud bolt	***T3: 22.5 (2.3, 16.6)***
(5) Seal ring	(17) O-ring	***T4: 25 (2.5, 18.4)***
(6) O-ring	(18) O-ring	***T5: 41 (4.2, 30.2)***
(7) Front differential gear oil filler plug	(19) O-ring	***T6: 50 (5.1, 36.9)***
(8) O-ring	(20) Gasket	***T7: 70 (7.1, 51.6)***
(9) Oil cooler pipe	(21) Overflow drain plug	***T8: Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Plate>INSTALLATION.***
(10) O-ring	(22) Gasket	
(11) Air breather hose	(23) Front differential gear oil drain plug	
(12) Air breather bracket	(24) Converter case	

2. OIL PUMP ASSY

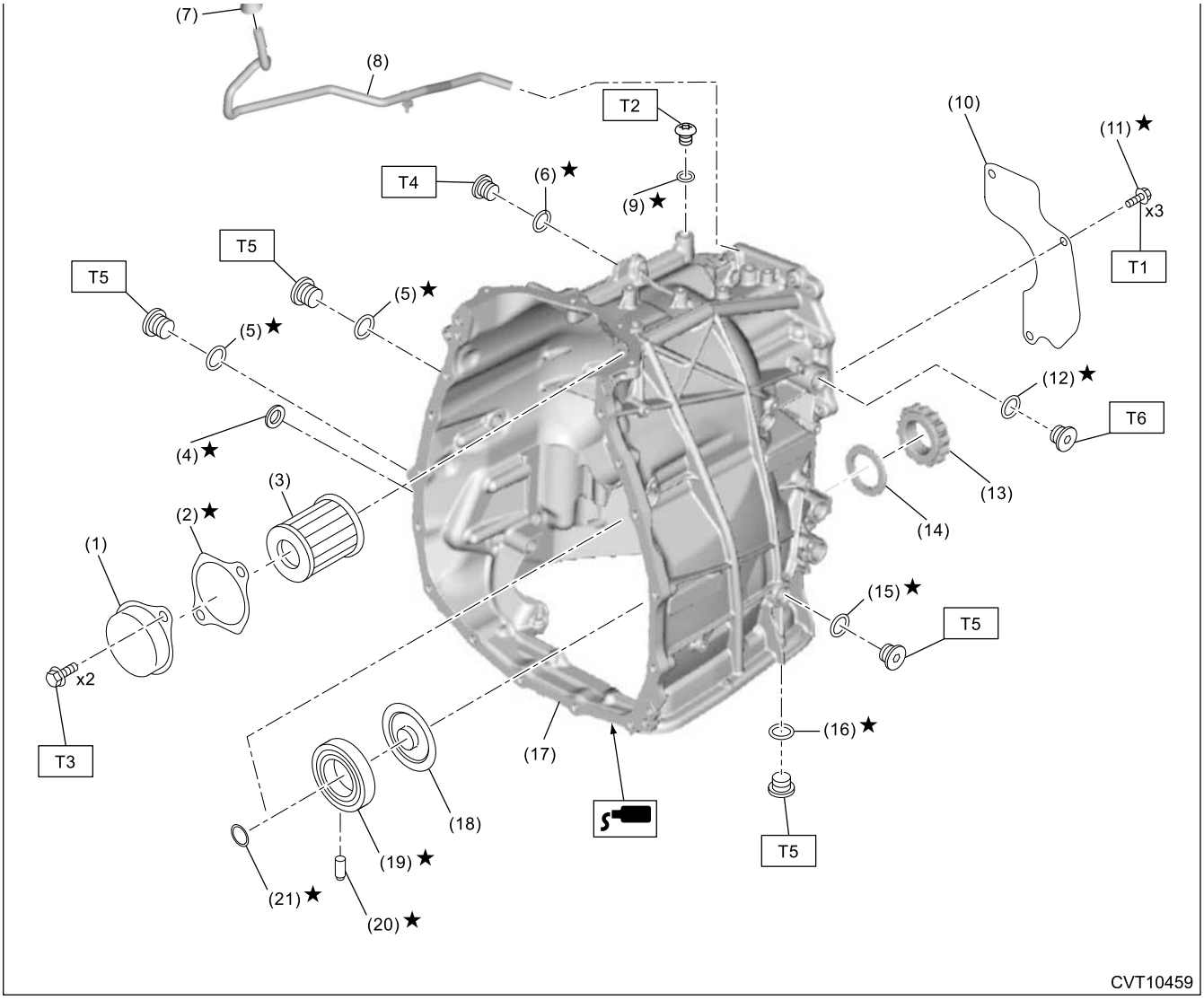


(1) Oil seal
(2) Oil pump chain cover
(3) Snap ring
(4) Ball bearing
(5) Drive sprocket
(6) Snap ring
(7) Oil pump chain
(8) Driven sprocket
(9) Oil pump ASSY
(10) Plate
(11) O-ring (small)
(12) O-ring (large)
(13) Converter case

Tightening torque: N·m (kgf-m, ft-lb)

T1: 8.5 (0.9, 6.3)
T2: 21 (2.1, 15.5)

3. TRANSMISSION CASE

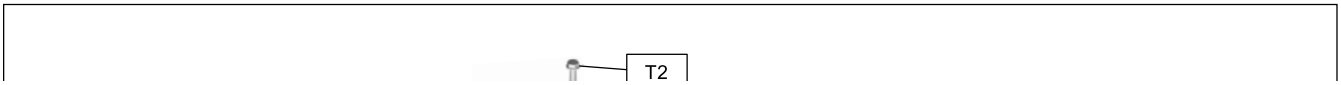


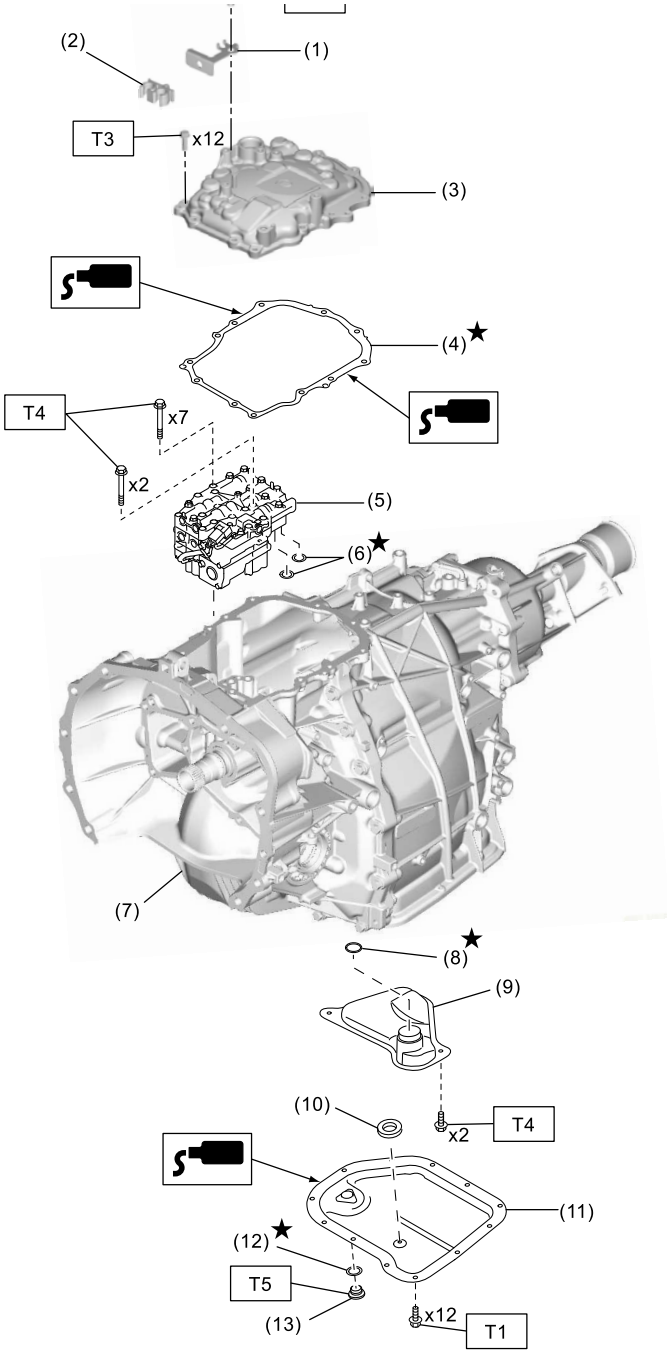
(1) CVTF filter cover
(2) Gasket
(3) CVTF filter
(4) Oil seal
(5) Gasket
(6) O-ring
(7) Air breather cap
(8) Air breather hose
(9) O-ring
(10) Oil stopper plate
(11) Micro-encapsulated bolt
(12) O-ring
(13) Roller bearing
(14) Thrust bearing
(15) Gasket
(16) O-ring
(17) Transmission case
(18) Oil guide
(19) Ball bearing
(20) Roll pin
(21) Seal ring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 9 (0.9, 6.6)
T2: 13 (1.3, 9.6)
T3: 17 (1.7, 12.5)
T4: 22 (2.2, 16.2)
T5: 50 (5.1, 25.8)

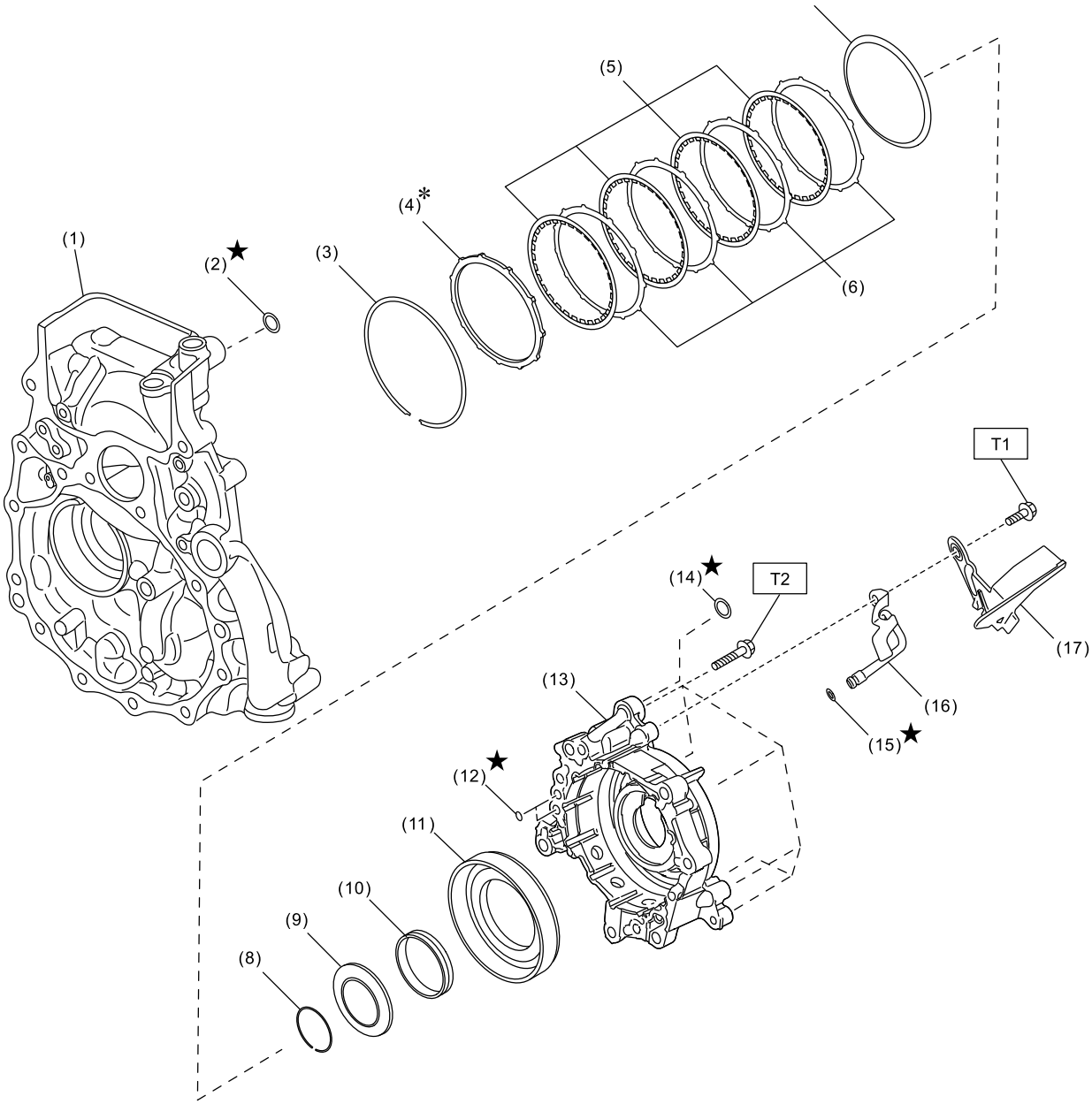
4. CONTROL VALVE BODY





(1) Air breather stay	(8) O-ring	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Air breather bracket	(9) Oil strainer	***T1: 5 (0.5, 3.7)***
(3) Valve cover	(10) Magnet	***T2: 7 (0.7, 5.2)***
(4) Gasket	(11) Oil pan	***T3: 8 (0.8, 5.9)***
(5) Control valve body	(12) Gasket	***T4: 9 (0.9, 6.6)***
(6) O-ring	(13) CVTF drain plug	***T5: 31 (3.2, 22.9)***
(7) Transmission ASSY		

5. REVERSE BRAKE ASSEMBLY



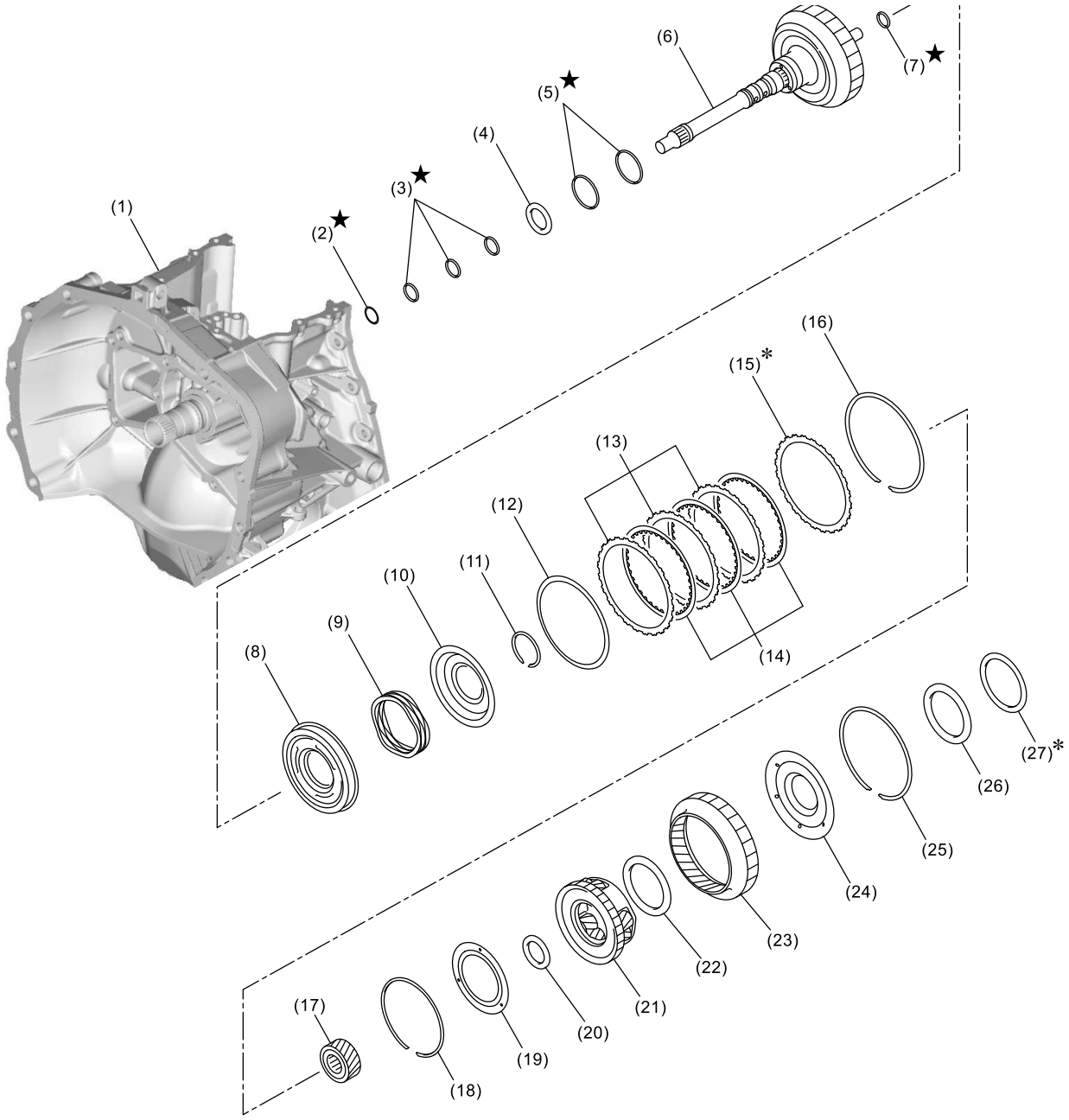
CVT00661

(1) Drive pinion retainer
(2) O-ring
(3) Snap ring
(4) Retaining plate
(5) Drive plate
(6) Driven plate
(7) Dish plate
(8) Snap ring
(9) Spring retainer
(10) Return spring
(11) Reverse brake piston
(12) O-ring
(13) Reverse brake housing
(14) O-ring
(15) O-ring
(16) Lubrication pipe
(17) Oil guide

Tightening torque: N·m (kgf-m, ft-lb)

T1: 16 (1.6, 11.8)
T2: 37 (3.8, 27.3)

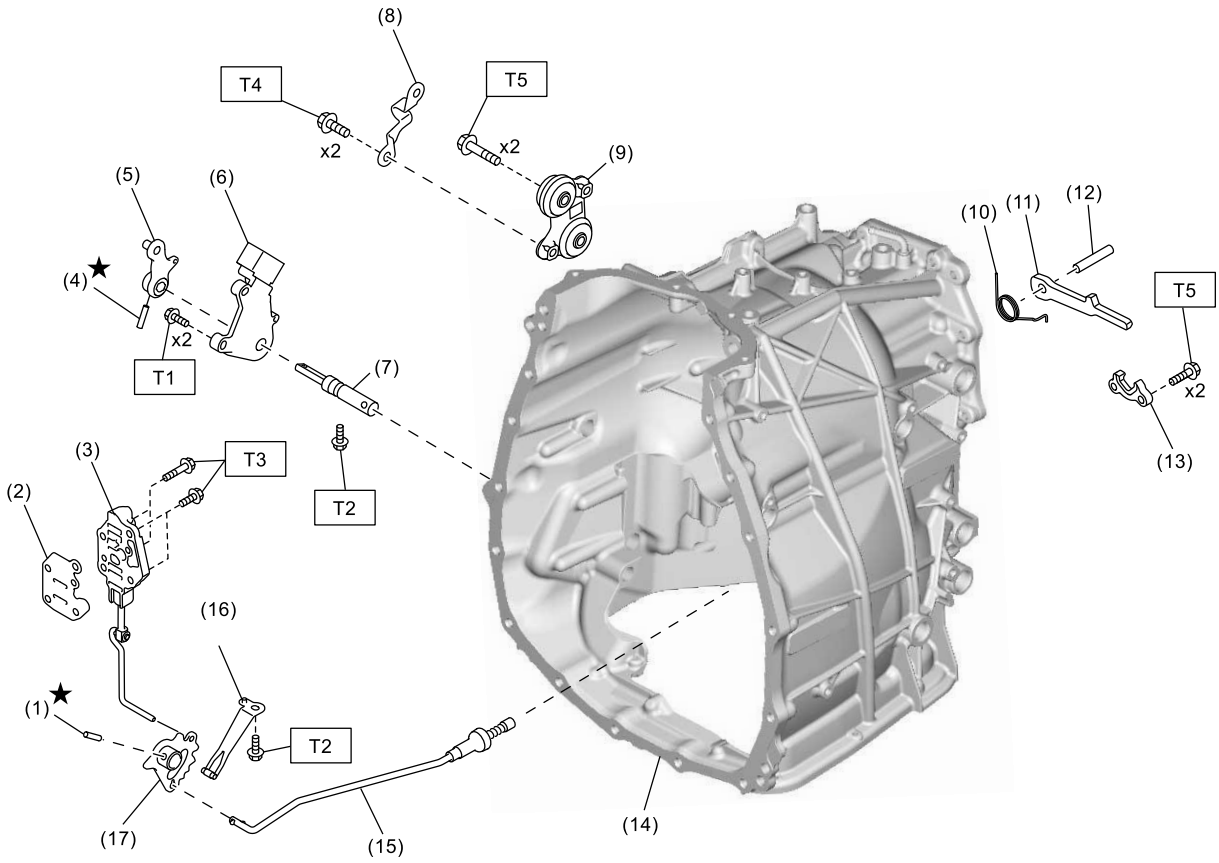
6. FORWARD CLUTCH ASSEMBLY



CVT10376

(1) Converter case
(2) O-ring
(3) Seal ring
(4) Thrust bearing
(5) Seal ring
(6) Forward clutch drum ASSY
(7) Seal ring
(8) Forward clutch piston
(9) Return spring
(10) Chamber COMPL
(11) Snap ring
(12) Dish plate
(13) Driven plate
(14) Drive plate
(15) Retaining plate
(16) Snap ring
(17) Sun gear
(18) Snap ring
(19) Balance oil guide
(20) Thrust bearing
(21) Planetary carrier ASSY
(22) Thrust bearing
(23) Internal gear
(24) Thrust gear plate
(25) Snap ring
(26) Thrust bearing
(27) Washer

7. TRANSMISSION CONTROL DEVICE

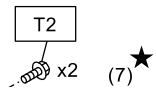


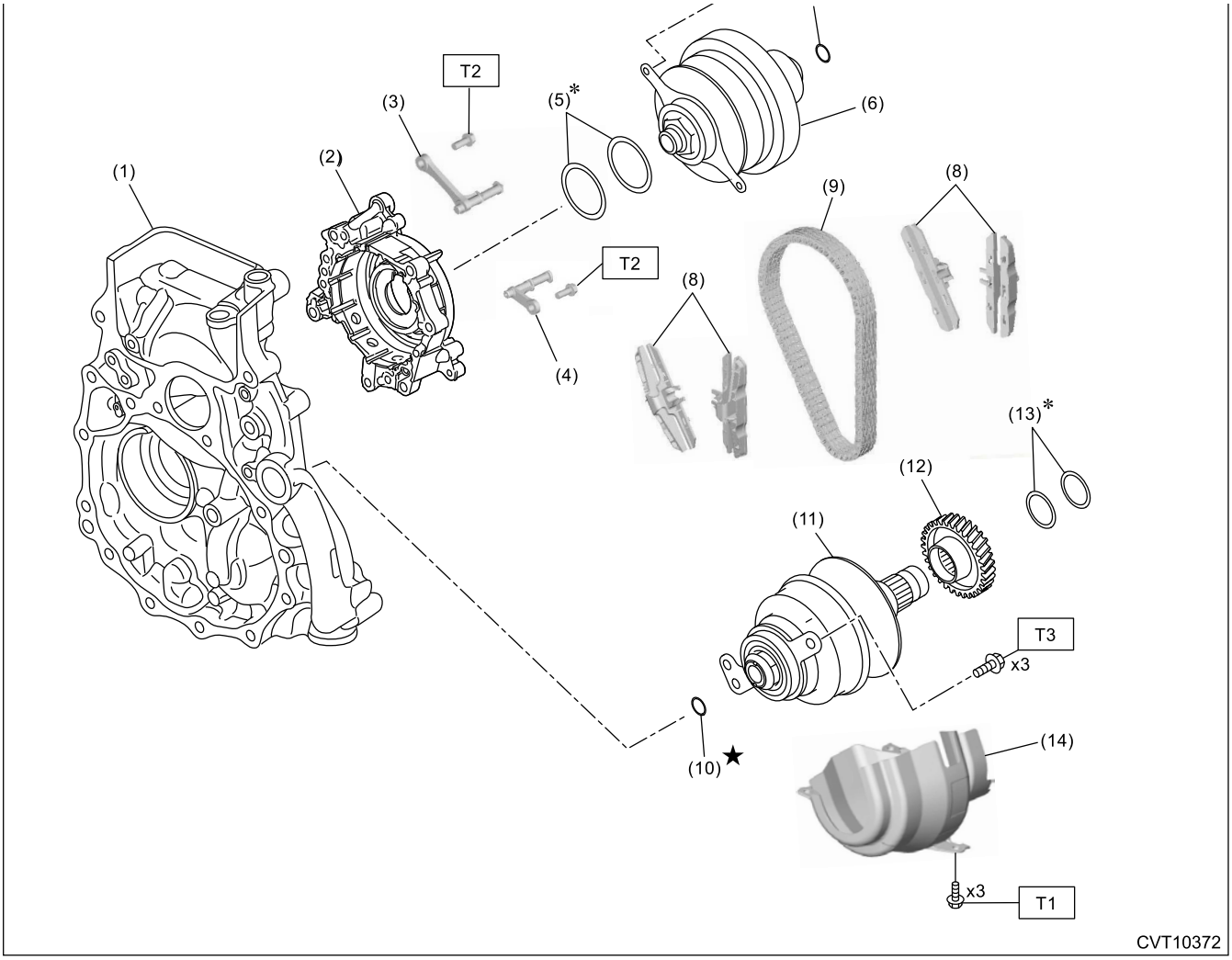
(1) Spring pin
(2) Separator plate
(3) Manual valve ASSY
(4) Spring pin
(5) Shifter arm
(6) Inhibitor switch
(7) Shifter arm shaft
(8) Cable bracket
(9) Plate ASSY
(10) Return spring
(11) Parking pawl
(12) Shaft
(13) Parking support
(14) Transmission case
(15) Parking rod
(16) Detent spring
(17) Manual plate

Tightening torque: N·m (kgf-m, ft-lb)

T1: 5 (0.5, 3.7)
T2: 7 (0.7, 5.2)
T3: 9 (0.9, 6.6)
T4: 18 (1.8, 13.3)
T5: 25 (2.5, 18.4)

8. PRIMARY PULLEY, SECONDARY PULLEY & VARIATOR CHAIN AND REDUCTION DRIVE GEAR

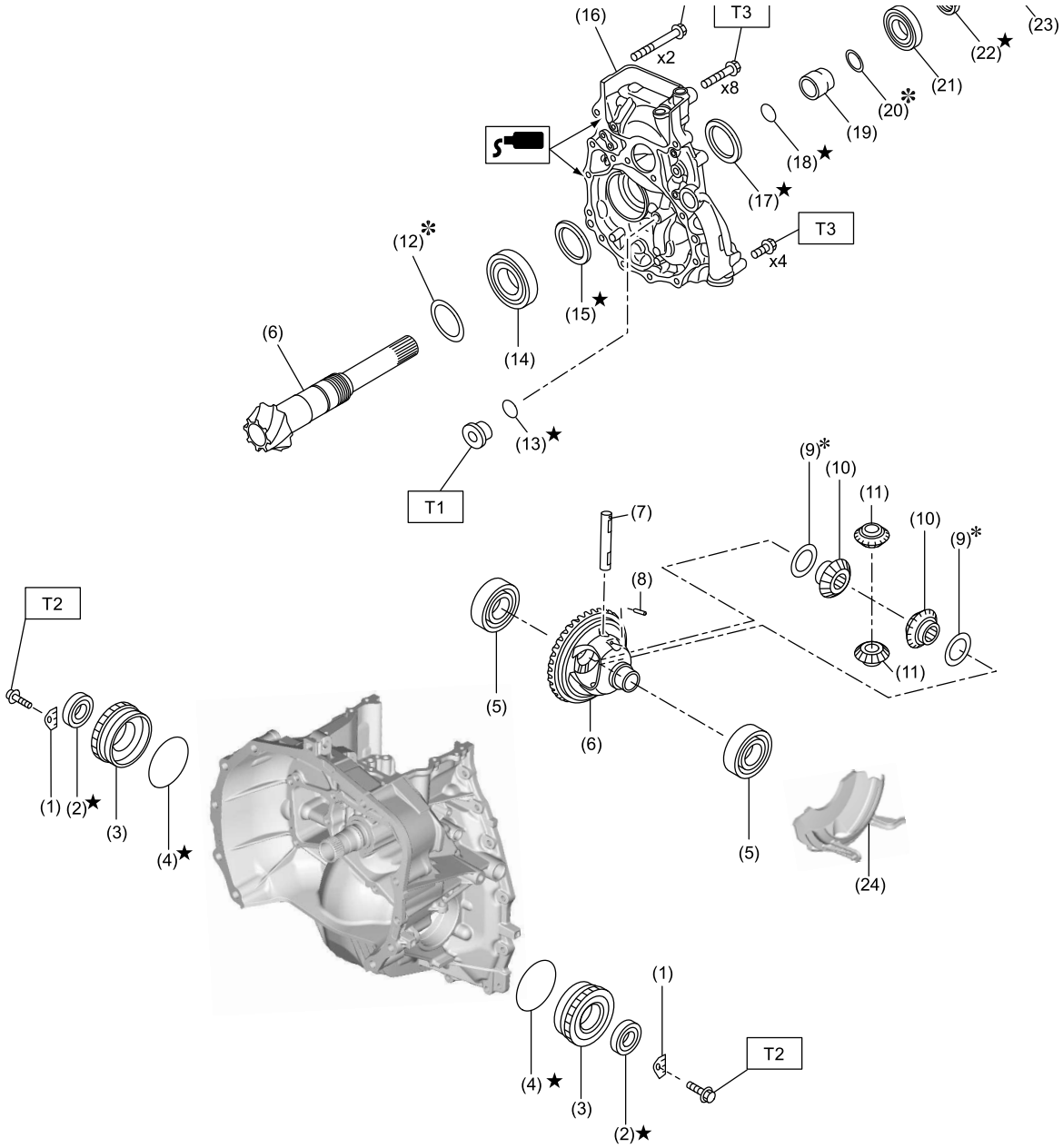




(1) Drive pinion retainer	(8) Chain guide	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Reverse brake housing	(9) Variator chain	***T1: 16 (1.6, 11.8)***
(3) Support rod	(10) Seal ring	***T2: 21 (2.1, 15.5)***
(4) Lubrication pipe	(11) Secondary pulley ASSY	***T3: 67.5 (6.9, 49.8)***
(5) Primary pulley shim	(12) Reduction drive gear	
(6) Primary pulley ASSY	(13) Reduction gear shim	
(7) Seal ring	(14) Oil baffle	

9. FRONT DIFFERENTIAL GEAR





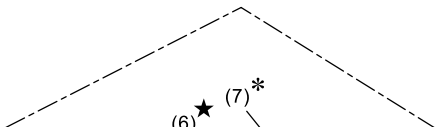
CVT10377

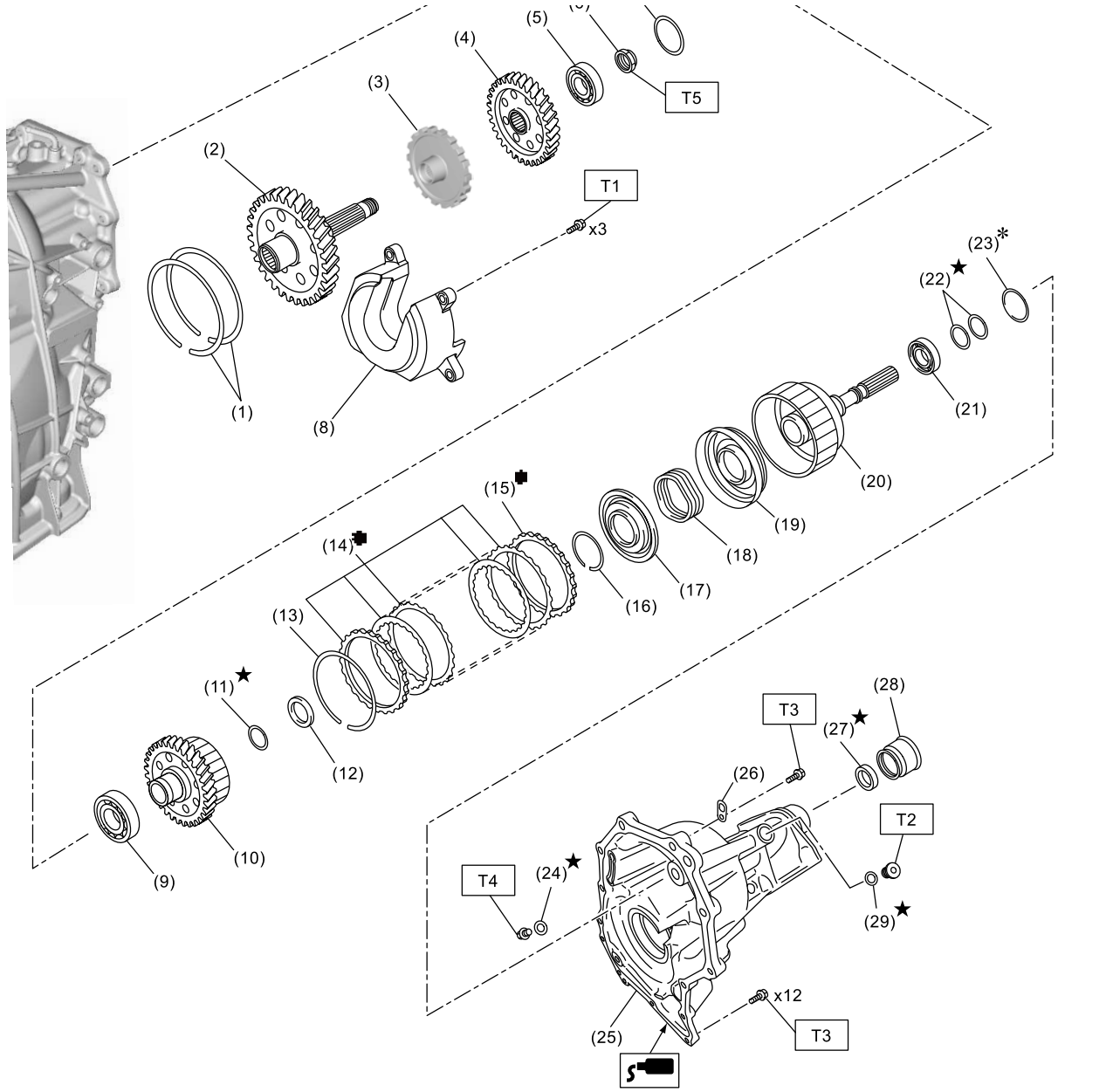
(1) Lock plate
(2) Oil seal
(3) Differential side retainer
(4) O-ring
(5) Taper roller bearing
(6) Drive pinion gear set
(7) Pinion shaft
(8) Spring pin
(9) Washer
(10) Differential bevel gear
(11) Differential bevel pinion
(12) Drive pinion shim
(13) O-ring
(14) Taper roller bearing
(15) Oil seal
(16) Drive pinion retainer
(17) Oil seal
(18) O-ring
(19) Drive pinion spacer
(20) Drive pinion washer
(21) Taper roller bearing
(22) Lock nut
(23) Plug
(24) Oil baffle

Tightening torque: N·m (kgf-m, ft-lb)

T1: 22 (2.2, 16.2)
T2: 25 (2.5, 18.4)
T3: 43 (4.4, 31.7)
T4: Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ASSEMBLY.

10. TRANSFER AND EXTENSION CASE





CVT10378

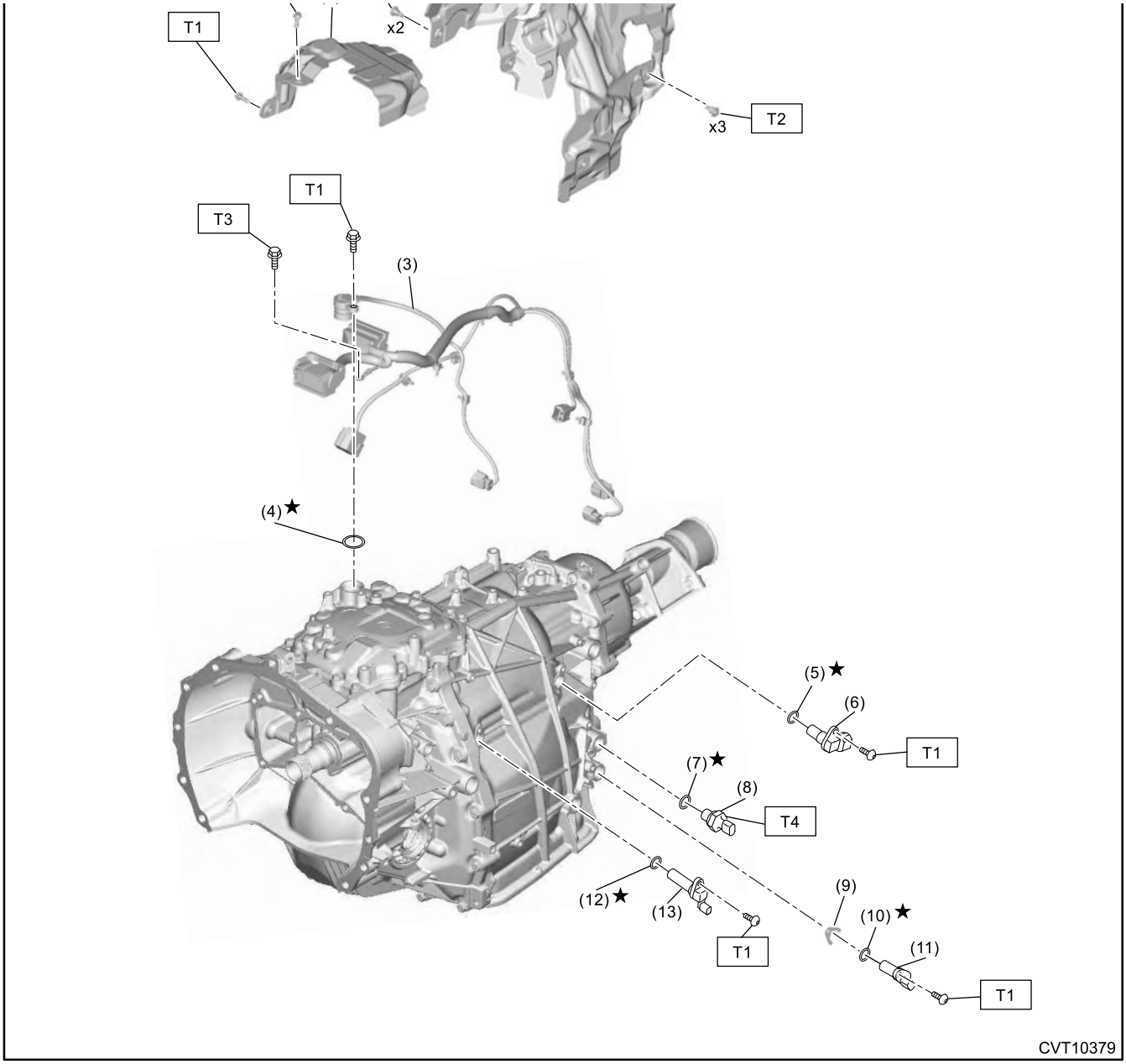
(1) Snap ring
(2) Reduction driven gear COMPL
(3) Parking gear
(4) Transfer drive gear
(5) Ball bearing
(6) Lock nut
(7) Transfer drive gear shim
(8) Spacer oil
(9) Ball bearing
(10) Transfer driven gear
(11) Seal ring
(12) Thrust bearing
(13) Snap ring
(14) Transfer clutch plate set
(15) Pressure plate
(16) Snap ring
(17) Transfer clutch piston seal
(18) Transfer clutch piston return spring
(19) Transfer clutch piston
(20) Rear drive shaft
(21) Ball bearing
(22) Seal ring
(23) Transfer driven gear shim
(24) Gasket
(25) Extension case
(26) Transmission hanger
(27) Oil seal
(28) Dust cover
(29) O-ring

Tightening torque: N·m (kgf-m, ft-lb)

T1: 17 (1.7, 12.5)
T2: 22 (2.2, 16.2)
T3: 25 (2.5, 18.4)
T4: 35 (3.6, 25.8)
T5: 95 (9.7, 70.1)

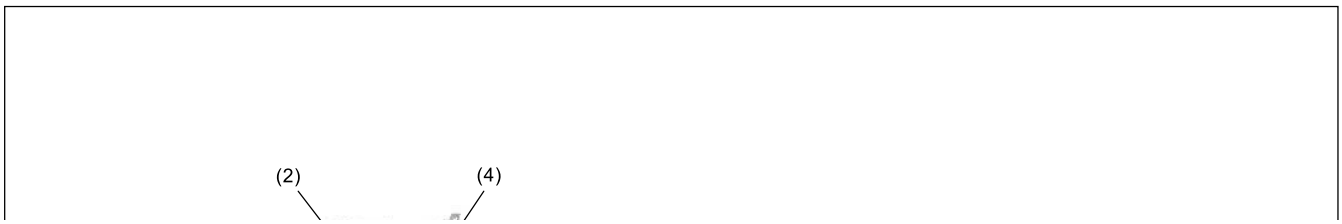
11. TRANSMISSION HARNESS AND SENSOR

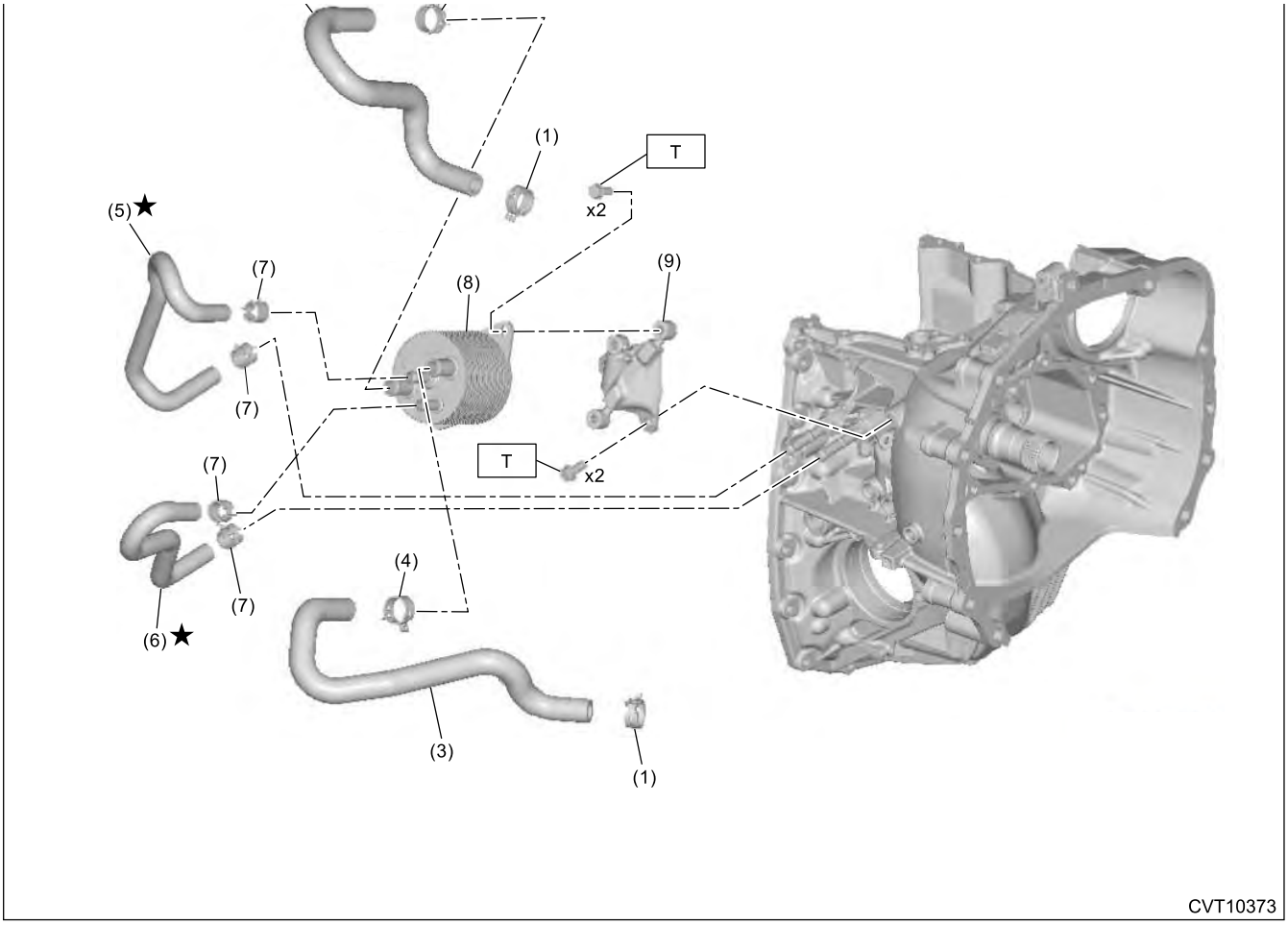

T1
T2
(1)
(2)



(1)	Transmission case cover (small)	(8)	Secondary pressure sensor	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Transmission case cover (large)	(9)	Spacer	***T1: 7 (0.7, 3.7)***
(3)	Transmission harness	(10)	O-ring	***T2: 8 (0.8, 5.9)***
(4)	O-ring	(11)	Secondary speed sensor	***T3: 14 (1.4, 10.3)***
(5)	O-ring	(12)	O-ring	***T4: 39 (4.0, 28.8)***
(6)	Primary speed sensor	(13)	Turbine speed sensor	
(7)	O-ring			

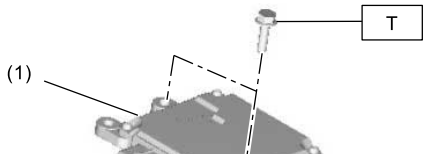
12. CVTF COOLER (WITH WARMER FEATURE)

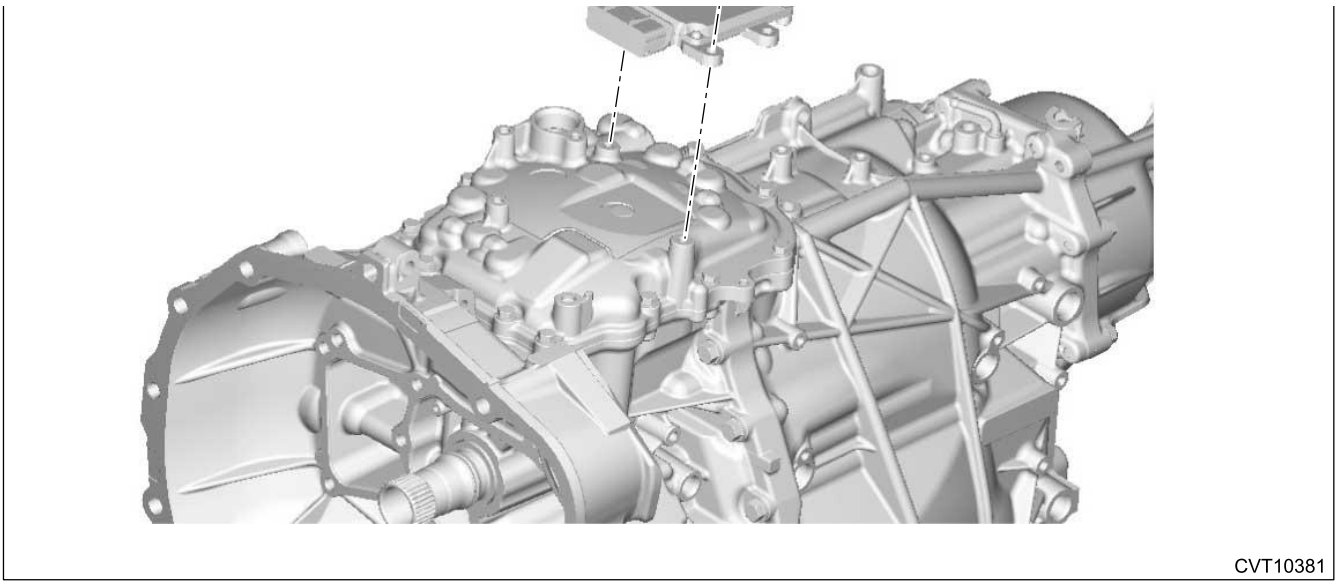




(1)	Hose clamp	(6)	CVTF cooler outlet hose	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Water hose (outlet)	(7)	Hose clamp	***T: 23 (2.3, 17.0)***
(3)	Water hose (inlet)	(8)	CVTF cooler (with warmer feature)	
(4)	Hose clamp	(9)	CVTF cooler bracket	
(5)	CVTF cooler inlet hose	(10)	Converter case	

13. TRANSMISSION CONTROL MODULE





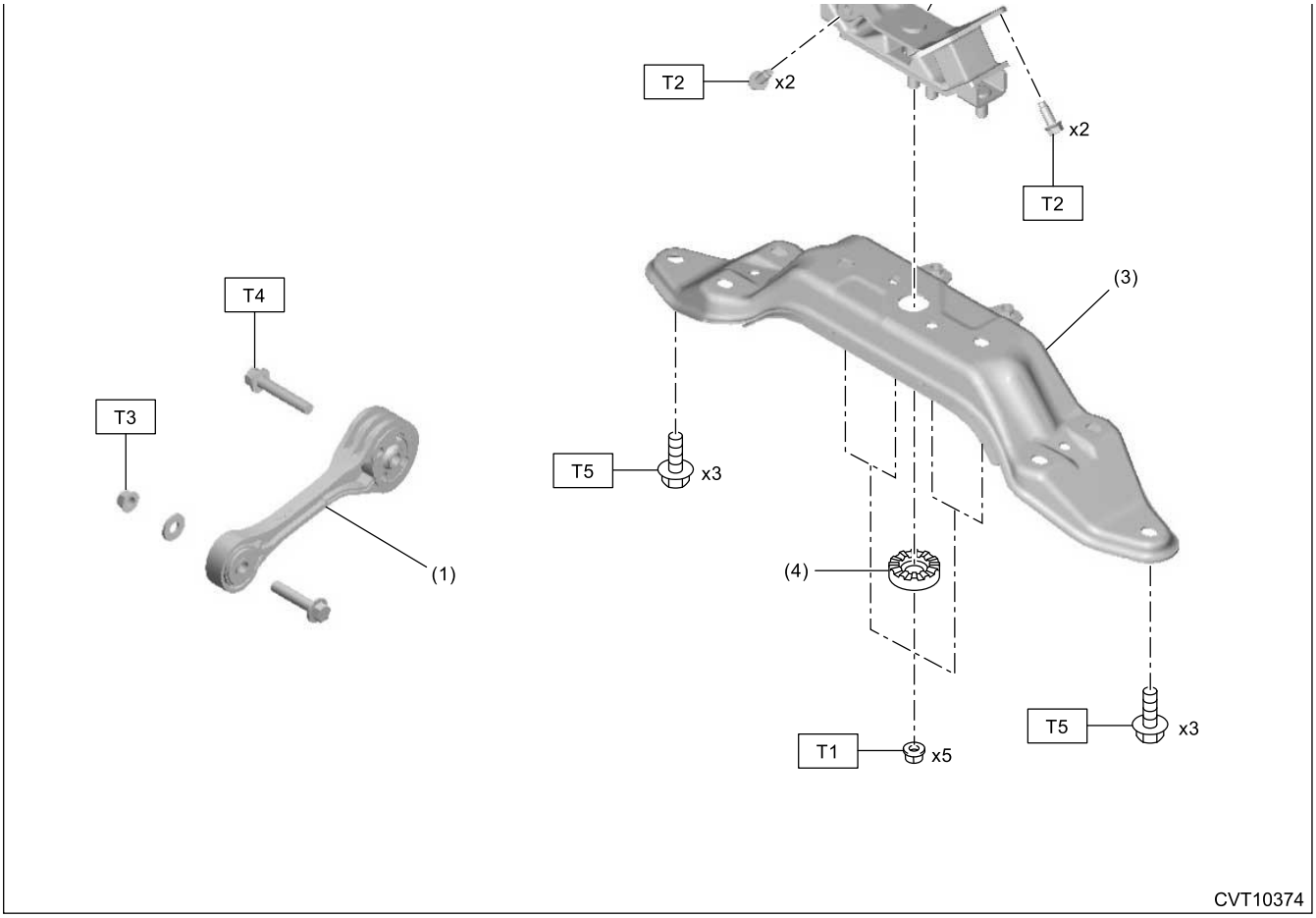
(1) Transmission control module (TCM)

Tightening torque: N·m (kgf-m, ft-lb)

T: 7 (0.7, 5.3)

14. TRANSMISSION MOUNTING





(1) Pitching stopper
(2) Rear cushion rubber
(3) Transmission rear crossmember
(4) Stopper

Tightening torque: N·m (kgf-m, ft-lb)

T1: 35 (3.6, 25.8)
T2: 40 (4.1, 29.5)
T3: 50 (5.1, 36.9)
T4: 58 (5.9, 42.8)
T5: 75 (7.6, 55.3)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > General Description

CAUTION

- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Do not place the valve cover with its inner side facing up until it is installed, to prevent intrusion of foreign matter into the control valve body.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, use a plastic hammer to force it apart. Do not pry apart with screwdrivers or other tools.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine CVTF and recommended grease. Do not mix CVTF, grease etc. of different grades or manufacturers.
- Be sure to tighten bolts and nuts to the specified torque.
- Apply CVTF onto sliding or revolving surfaces before installation.
- Replace deformed or damaged snap rings with new parts.
- Before installing O-rings or oil seals, apply sufficient amount of CVTF or gear oil to appropriate

locations in order to avoid damage and deformation.

- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove and clean the old liquid gasket.
- After removing the sensors, breather hose and plugs, plug the holes to avoid foreign materials intruding as necessary.
- During disassembly or assembly, be sure to use nylon gloves or paper towels. Do not use cloth gloves or waste cloth.
- Be careful of handling the oil seal, O-ring and gasket. If the contact surface of them is damaged, oil leakage may occur.
- When replacing the taper roller bearing, replace the outer race and inner race as a set.
- When replacing the hypoid gear, replace the hypoid gear and drive pinion shaft as a set.
- Replace the bolts if the seating surface or the thread surface is excessively rusted.

PREPARATION TOOL

1. SPECIAL TOOL

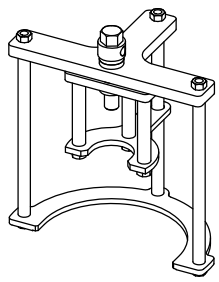
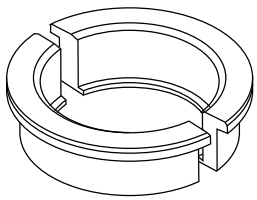
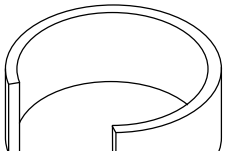
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18769AA010	18769AA010	EXPANDER PULLEY	Used for removing and installing the secondary pulley assembly.
 ST18767AA010	18767AA010	BEARING REMOVER	Used for removing the ball bearing of transfer clutch assembly.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18762AA010	COMPRESSOR SPECIAL TOOL	Used for removing and installing snap ring of forward clutch assembly.

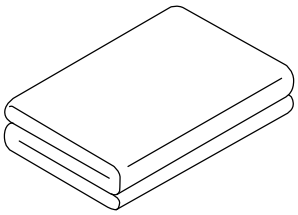
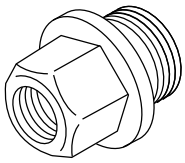
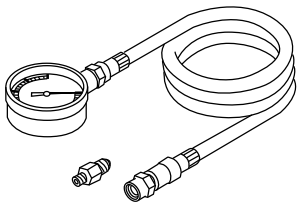
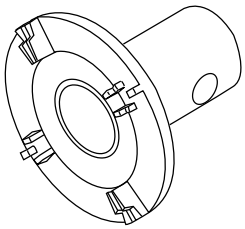
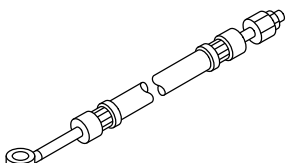
 ST18762AA010			
 ST18761AA010	18761AA010	SHEET SPECIAL TOOL	• Used for removing and installing control valve body. • Used for removing and installing valve cover. • Used for removing and installing transmission harness.
 ST18681AA010	18681AA010	PRESSURE GAUGE ADAPTER	Used for measuring the secondary pressure (line pressure). **Note:** **Used together with the genuine O-ring (part No. 806916050).**
 ST18801AA000	18801AA000	OIL PRESSURE GAUGE ASSY	Used for measuring the secondary pressure (line pressure).
 ST18658AA020	18658AA020	WRENCH COMPL RETAINER	Used for removing and installing the differential side retainer.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	34099AC020	ADAPTER HOSE B	Used for measuring the transfer clutch hydraulic pressure. **Note:** **Used with genuine union screw (Part No. 801914010) and gasket (Part No. 803914060).**

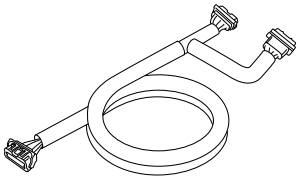
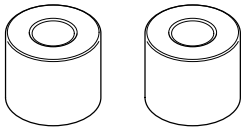
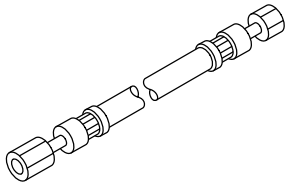
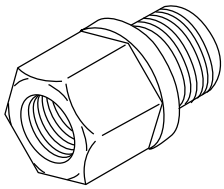
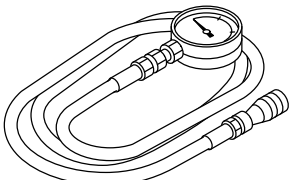
ST34099AC020			
 ST18460AA040	18460AA040	CHECK BOARD	Used for measuring voltage and resistance of TCM terminals.
 ST18362AA020	18362AA020	ADAPTER	Used for measuring the transfer clutch hydraulic pressure.
 ST34099AC010	34099AC010	ADAPTER HOSE A	Used for measuring the transfer clutch hydraulic pressure.
 ST18681AA000	18681AA000	PRESSURE GAUGE ADAPTER	Used for measuring the transfer clutch hydraulic pressure. **Note:** **Used together with the genuine O-ring (part No. 806911080).**

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	498575400	OIL PRESSURE GAUGE ASSY	Used for measuring the transfer clutch hydraulic pressure.

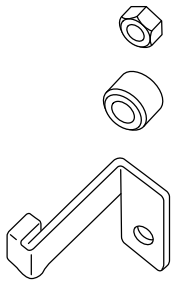
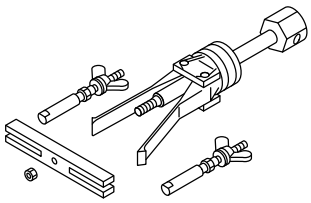
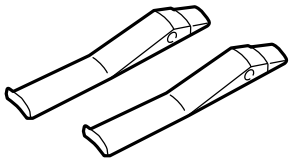
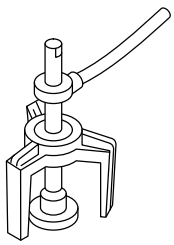
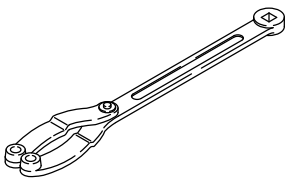
ST-498575400			
 ST-498277200	498277200	STOPPER SET	• Used for removing and installing transmission assembly to engine. • Used for preventing the torque converter from dropping off.
 ST-398527700	398527700	PULLER ASSY	• Used for removing the extension case oil seal. • Used for removing the bearing outer race of the drive pinion shaft. • Used for removing the bearing of transmission case.
 ST18760AA000	18760AA000	CLAW	• Used for removing the bearing of transmission case. • Used together with PULLER ASSY (398527700).
 ST-398673600	398673600	COMPRESSOR	Used for removing and installing snap ring of forward clutch assembly.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18355AA000	PULLEY WRENCH	• Used for removing and installing the lock nut of reduction driven gear. • Used together with PIN SET (18334AA000).

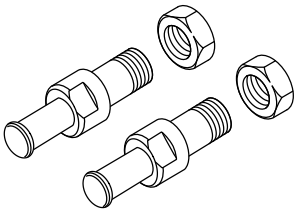
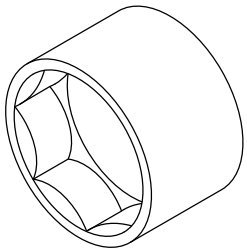
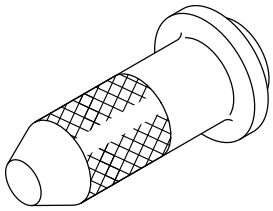
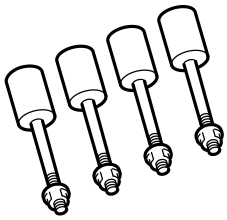
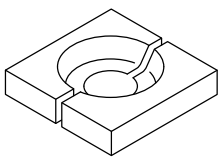
ST18355AA000			
 ST18334AA000	18334AA000	PULLEY WRENCH PIN SET	• Used for removing and installing the lock nut of reduction driven gear. • Used together with PULLEY WRENCH (18355AA000).
 ST-499987003	499987003	SOCKET WRENCH (35)	Used for removing and installing the lock nut of reduction driven gear.
 ST-498057300	498057300	INSTALLER	Used for installing the extension case oil seal.
 ST18632AA000	18632AA000	STAND ASSY	Used for disassembling and assembling the transmission.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	498515500	REMOVER	Used for removing the bearing inner race of the drive pinion shaft.

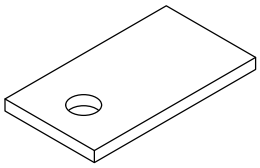
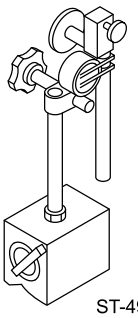
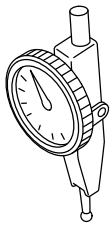
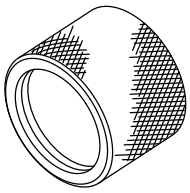
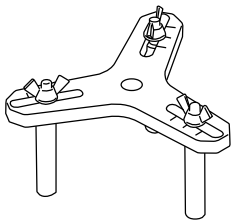
ST-498515500			
 ST-498255400	498255400	PLATE	Used for measuring the backlash of hypoid gear.
 ST-498247001	498247001	MAGNET BASE	• Used for measuring the backlash of differential bevel pinion gear. • Used for measuring the backlash of hypoid gear. • Used together with DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	• Used for measuring the backlash of differential bevel pinion gear. • Used for measuring the backlash of hypoid gear. • Used together with MAGNET BASE (498247001).
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	18762AA001	COMPRESSOR SPECIAL TOOL	• Used for disassembling and installing the multi-plate clutch piston. • COMPRESSOR SPECIAL TOOL (18762AA000) can also be used.

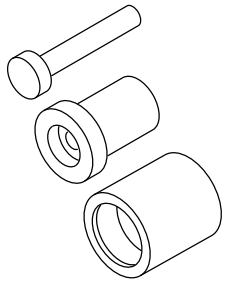
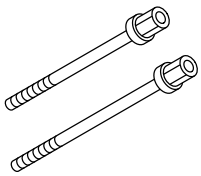
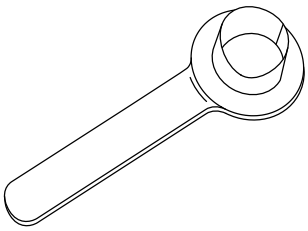
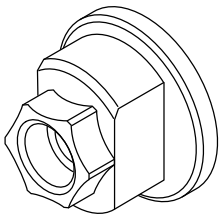
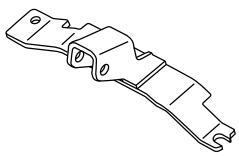
ST18762AA001			
 ST-927720000	927720000	HOUSING BUSHING INSTALLER AND REMOVER	• Used for installing the oil seal. • Use BUSHING SHAFT (927880000).
 ST18763AA000	18763AA000	COMPRESSOR SHAFT	Used for measuring the backlash of hypoid gear.
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for protecting oil seal when installing front drive shaft.
 ST-498937110	498937110	HOLDER	• Used for removing and installing the drive pinion lock nut. • Used as a holder to rotate gear when checking tooth contact.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	41099AA012	ENGINE SUPPORT BRACKET	Used for supporting the engine.

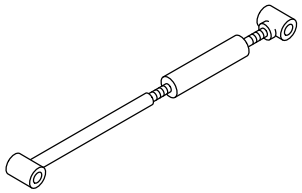
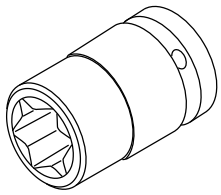
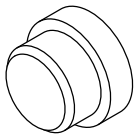
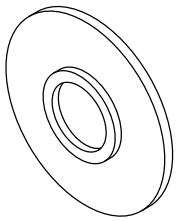
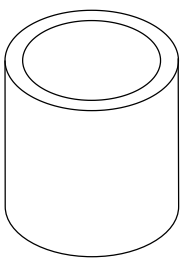
ST41099AA012			
 ST41099AA020	41099AA020	ENGINE SUPPORT	Used for supporting the engine.
 ST18270KA020	18270KA020	SOCKET (E20)	• Used for removing and installing the hypoid driven gear. • Used for removing and installing the drive pinion shaft retainer.
 ST-398497701	398497701	SEAT	Used for removing and installing the bearing.
 ST-398177700	398177700	INSTALLER	• Used for installing the ball bearing. • Used for installing the parking gear. • Used for installing the bearing outer race. • Used for installing the plug.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28499TC010	28499TC010	PRESS SNAP RING	Used for installing the bearing outer race of drive pinion shaft.

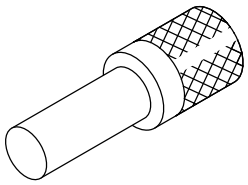
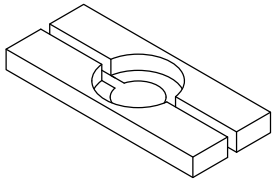
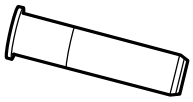
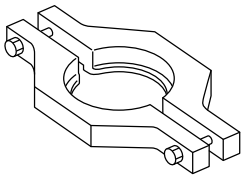
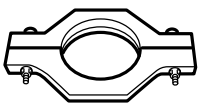
 ST-899864100	899864100	REMOVER	• Used for removing and installing the ball bearing. • Used for removing the parking gear and transfer drive gear. • Used for removing the bearing inner race of the front differential.
 ST-498077000	498077000	REMOVER	Used for removing the bearing inner race of the front differential.
 ST18657AA010	18657AA010	INSTALLER	Used for installing the oil seal at shifter arm shaft portion.
 ST-498077600	498077600	REMOVER	Used for removing the ball bearing of drive sprocket.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18720AA000	18723AA000	REMOVER	Used for removing the ball bearing of transfer clutch assembly.

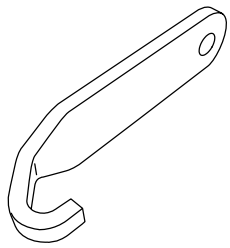
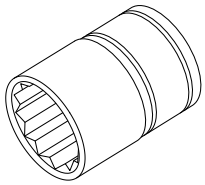
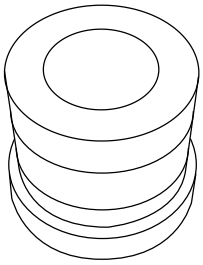
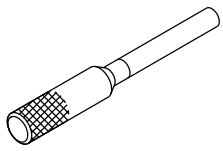
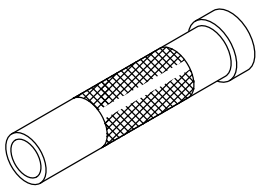
 ST-498497300	498497300	CRANKSHAFT STOPPER	Used for stopping the drive plate rotation when removing and installing the drive plate.
 ST18270AA050	18270AA050 (Newly adopted tool)	SOCKET	Used for installing the drive plate mounting bolt. **Note:** • **This tool is made by KYOTO TOOL Co., Ltd. (KTC). Item number: B3-14W** • **To make it easier to obtain, it has been specified as a special tool.**
 ST-399513600	399513600	INSTALLER	Used for removing the ball bearing of drive sprocket.
 ST-499267300	499267300	STOPPER PIN	Used for adjusting the inhibitor switch.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499277100	499277100	BUSHING 1-2 INSTALLER	• Used for installing the ball bearing of the transmission case. • Used for installing the bearing inner race.

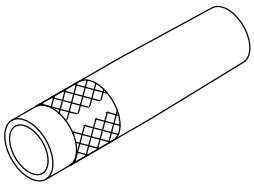
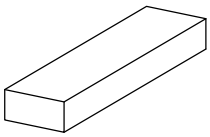
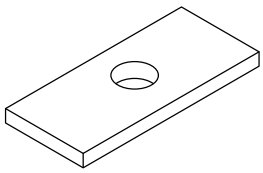
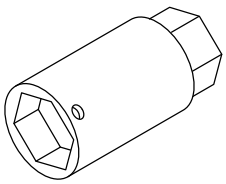
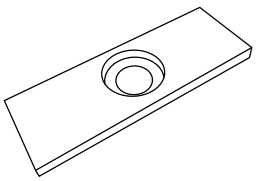
 ST-499277200	499277200	INSTALLER	Used for installing the ball bearing of the transfer clutch assembly.
 ST-499575400	499575400	GAUGE	Used for measuring height of end play.
 ST-499575500	499575500	GAUGE	Used for measuring height of end play.
 ST-499787500	499787500	ADAPTER	• Used for removing and installing the drive pinion shaft lock nut. • Used for measuring the preload of the drive pinion shaft. • Used for measuring the backlash of hypoid gear.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499575600	499575600	GAUGE	Used for measuring height of end play.

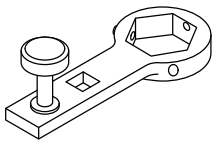
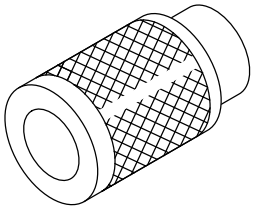
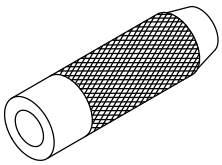
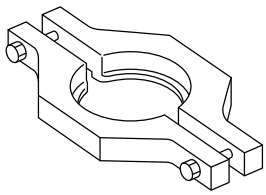
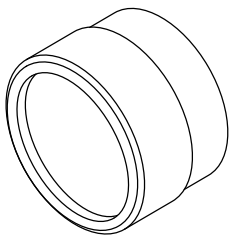
 ST-499787700	499787700	WRENCH	• Used for removing and installing the drive pinion shaft lock nut. • Used for measuring the preload of the drive pinion shaft. • Used for measuring the backlash of hypoid gear.
 ST-499757002	499757002	INSTALLER	• Used for removing the bearing of reduction driven gear. • Used for installing the parking gear. • Used for installing the transfer drive gear.
 ST-899580100	899580100	INSTALLER	• Used for installing the collar of reduction driven gear. • Used for installing the ball bearing of the transfer driven gear. • Used for installing the bearing inner race of drive pinion shaft.
 ST-498077300	498077300	REMOVER	Used for installing the ball bearing of reduction driven gear.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499755502	499755502	PRESS SNAP RING	Used for installing the drive sprocket ball bearing.
	499755602	PRESS SNAP	• Used for installing the oil seal

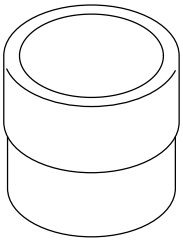
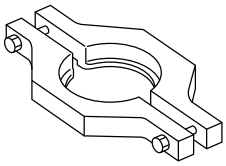
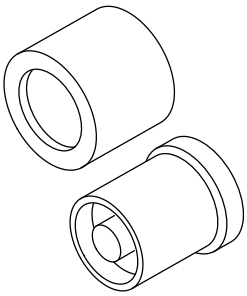
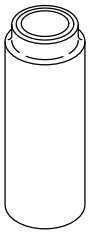
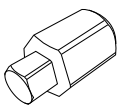
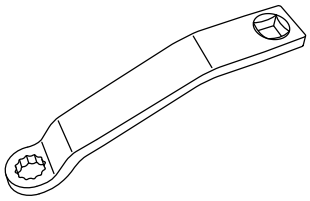
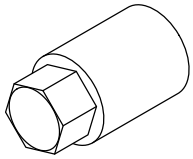
 ST-499755602	499755602	PRESS SNAP RING	• Used for installing the oil seal. • Used for installing the plug.
 ST-498077400	498077400	REMOVER	Used for removing the ball bearing of transfer driven gear.
 ST-20099AE020	20099AE020	INSTALLER	Used for installing the bearing outer race of drive pinion shaft.
 ST-927130000	927130000	EXTENSION DRIVE SHAFT	Used for installing the bearing inner race of drive pinion shaft.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST18270AA040	18270AA040	SOCKET	Used for removing and installing the transfer clutch pressure test plug.
	73099SG000	SPECIAL TOOL	Used for installing the transfer clutch

 ST73099SG000		CONDENSER	pressure test plug.
 ST20399AG000	20399AG000	STRUT MOUNT SOCKET	Used for tightening the strut mount self-locking nut.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Thickness gauge	Used for measuring the clearance in reverse brake, forward clutch and transfer clutch.
Caliper	Used for measuring the dimension.
Spring scale	Used for measuring the starting torque of the drive pinion.

TOOL NAME	REMARKS
TORX® bit T70	Used for removing and installing differential gear oil drain plug.
Straight pin remover	Used for removing and installing the straight pin and spring pin.
Push/pull gauge	Used for measuring clutch clearance.
Angle gauge	Used for installing the drive plate.
DST-i	Used together with Subaru Select Monitor 4.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF

INSPECTION

Check for leakage of CVTF from transmission.

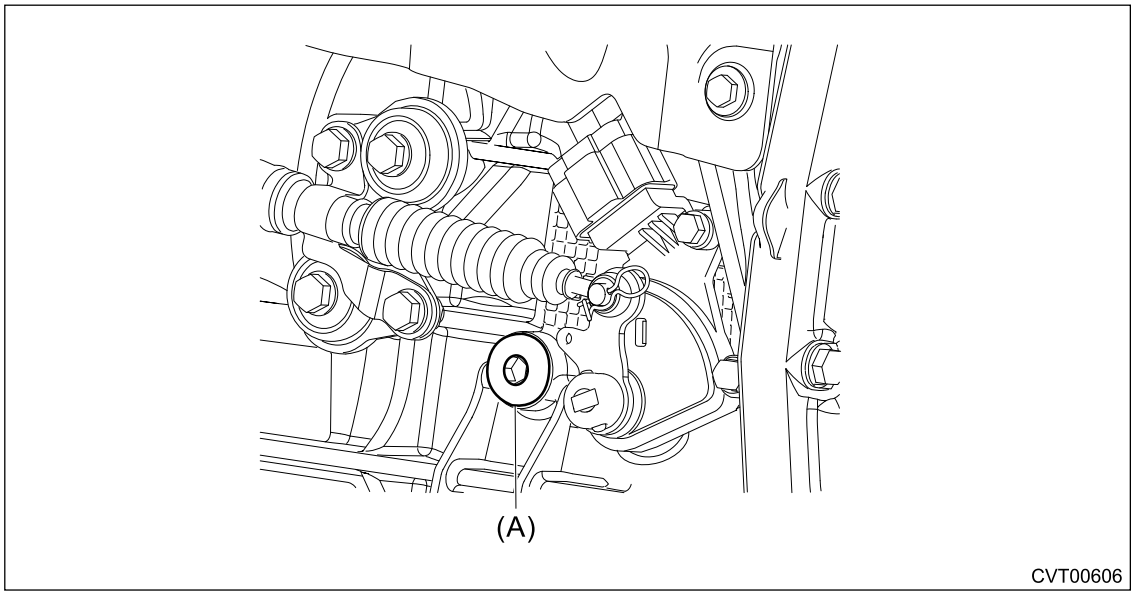
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF

ADJUSTMENT

Caution:

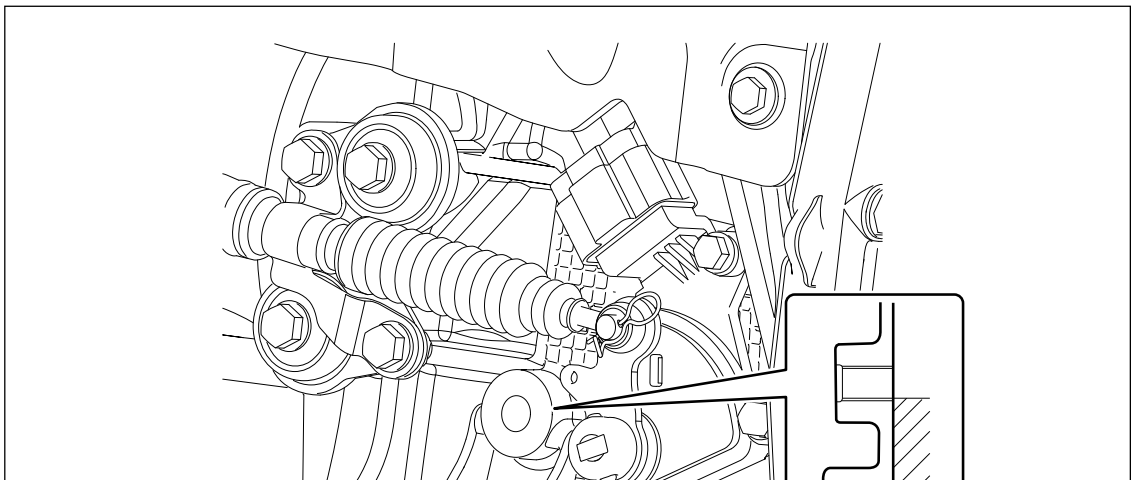
- **CVTF level changes along with CVTF temperature. When inspecting CVTF level, observe the specified CVTF temperature.**
- **Always use specified CVTF. Using other fluid will cause malfunction.**

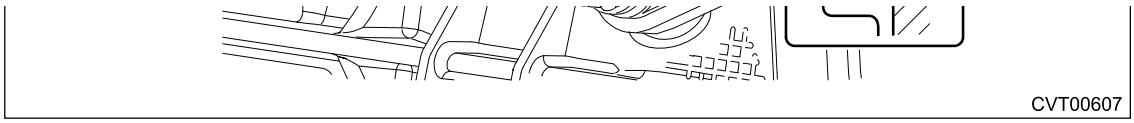
1. Start the engine to raise CVTF temperature to 35 — 45°C (95 — 113°F) on Subaru Select Monitor.
   Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor>OPERATION.
2. Operate the select lever in P → R → N → D and D → N → R → P to circulate CVTF with the engine idling.
3. With the engine running, lift up the vehicle and remove the filler plug.
   Caution:
   Pay special attention to the following operations as the engine is at idle.
   Note:
   CVTF is at the specified level when it is up to the filler plug hole lower section.



(A) Filler plug

4. When there is no CVTF leakage from the transmission, add the specified fluid up to the filler plug hole lower section.
   Specified fluid:
   Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > HYDRAULIC CONTROL AND LUBRICATION.
   Caution:
   Note that when CVTF is added up to the lower section of filler plug while the transmission is in cold condition, overfilling of CVTF occurs, causing the oil to spill out.




CVT00607

5. Install the filler plug.
   Note:
   Use a new gasket.
   Tightening torque:
   50 N·m (5.1 kgf-m, 36.9 ft-lb)

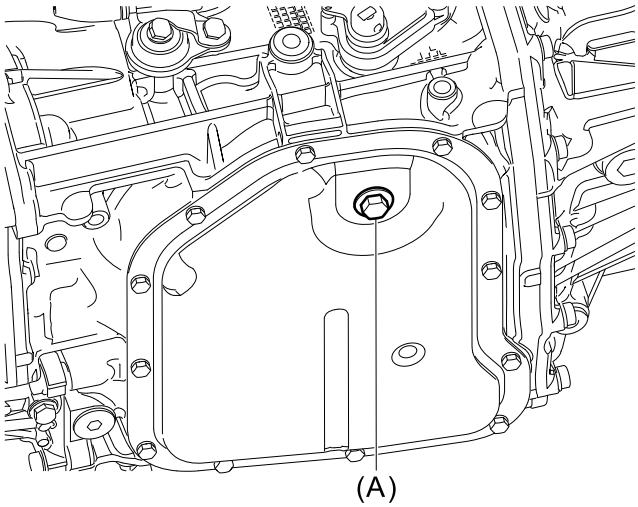
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF

REPLACEMENT

Caution:

- **Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.**
- **Be careful not to spill the CVTF on exhaust pipe to prevent it from emitting smoke or causing fires. If CVTF adheres, wipe it off completely.**
- **Always use specified CVTF. Using other fluid will cause malfunction.**

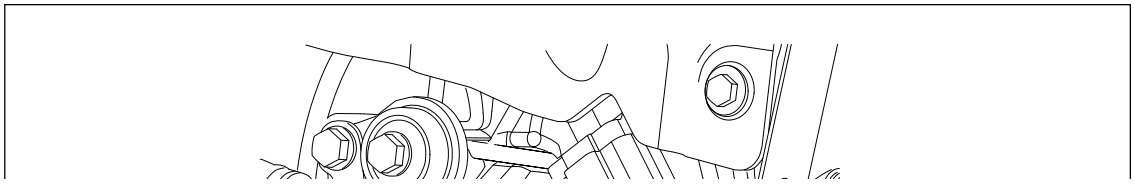
1. Lift up the vehicle, and remove the CVTF drain plug.

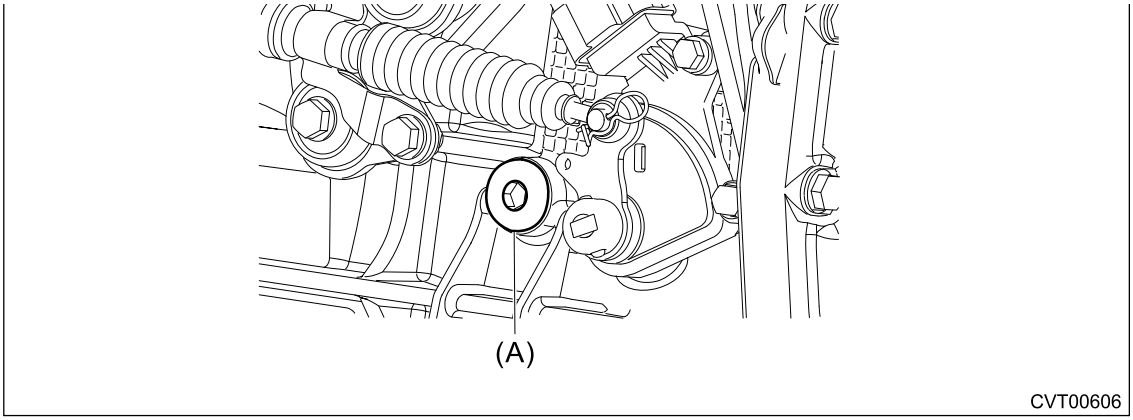


CVT00608

(A) CVTF drain plug

2. Check the CVTF condition. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.
3. Install the CVTF drain plug and gasket.
   Note:
   Use a new gasket.
   Tightening torque:
   31 N·m (3.2 kgf-m, 22.9 ft-lb)
4. Remove the filler plug.





(A) Filler plug

5. Add the specified fluid up to the filler plug hole lower section.
   Specified fluid:
   Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > HYDRAULIC CONTROL AND LUBRICATION.
6. Temporarily tighten the filler plug.
7. Idle the engine to raise CVTF temperature to 35 — 45°C (95 — 113°F) on Subaru Select Monitor.
8. Operate the select lever in P → R → N → D and D → N → R → P to circulate CVTF with the engine idling.
   Caution:
   Pay special attention to the following operations as the engine is at idle.
9. With the select lever shifted to "P" range and the engine started, lift up the vehicle. Adjust the CVTF level and check for leakage. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.
10. Replace with a new gasket, and attach the filler plug.
    Tightening torque:
    50 N·m (5.1 kgf-m, 36.9 ft-lb)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF

CONDITION CHECK

Note:
When replacing CVTF, determine the condition inside the transmission body by inspecting the drained CVTF.

Fluid condition	Trouble and possible cause	Corrective action

Fluid condition	Trouble and possible cause	Corrective action
Metal particles.	Excessive wear of the internal of the transmission body.	Replace CVTF and check if CVT operates correctly.
Thick and varnish-form fluid.	Burnt clutches	Replace CVTF and check the CVT body or vehicle for faulty.
Clouded CVTF or bubbles.	Water mixed in fluid.	Replace CVTF and check the water entering point.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Differential Gear Oil

INSPECTION

Check that there is no leakage of differential gear oil from the converter case.

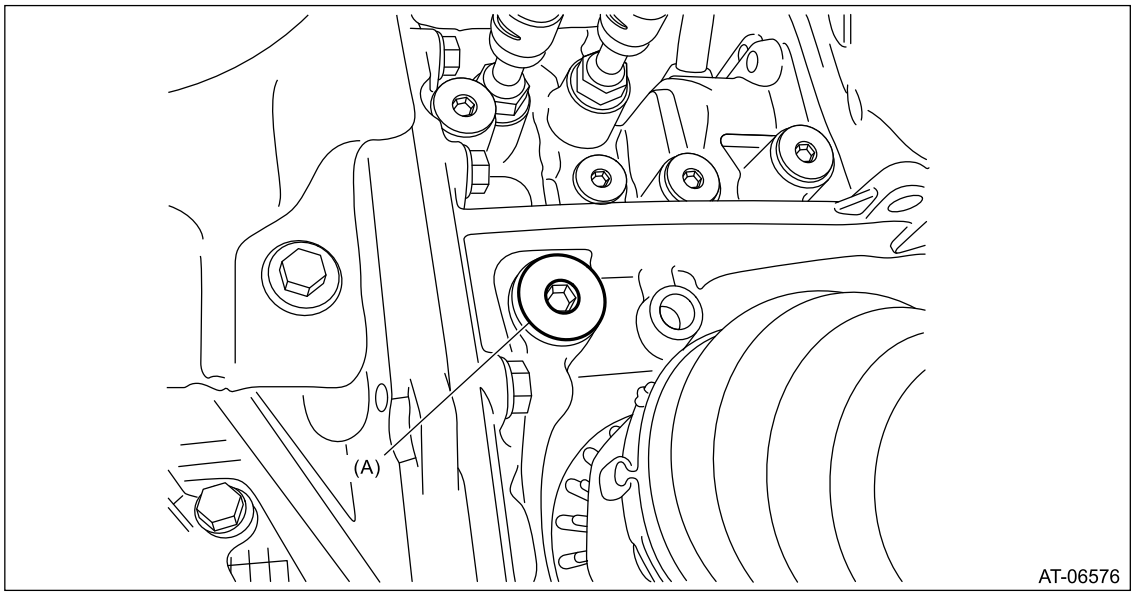
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Differential Gear Oil

ADJUSTMENT

Note:

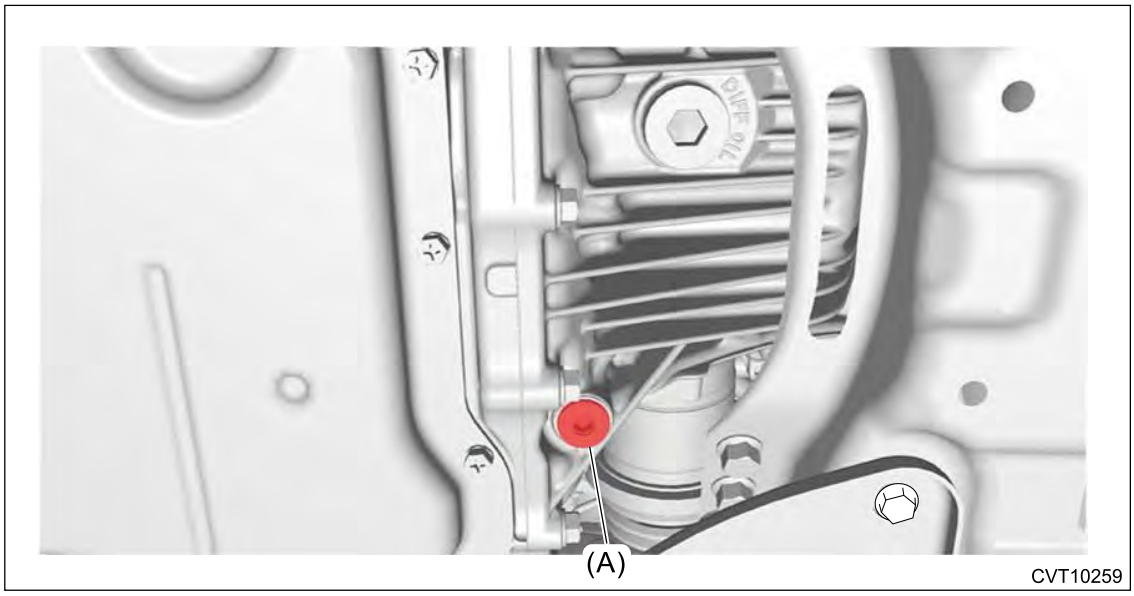
Immediately after removing the overflow drain plug, remaining gear oil (approx. 8 cc) may come out of the overflow pipe. This is not included in the specified amount. When removing the overflow drain plug, make sure the gear oil flows out of the overflow drain plug hole by filling with gear oil.

1. Lift up the vehicle.
2. Remove the filler plug.



(A) Filler plug

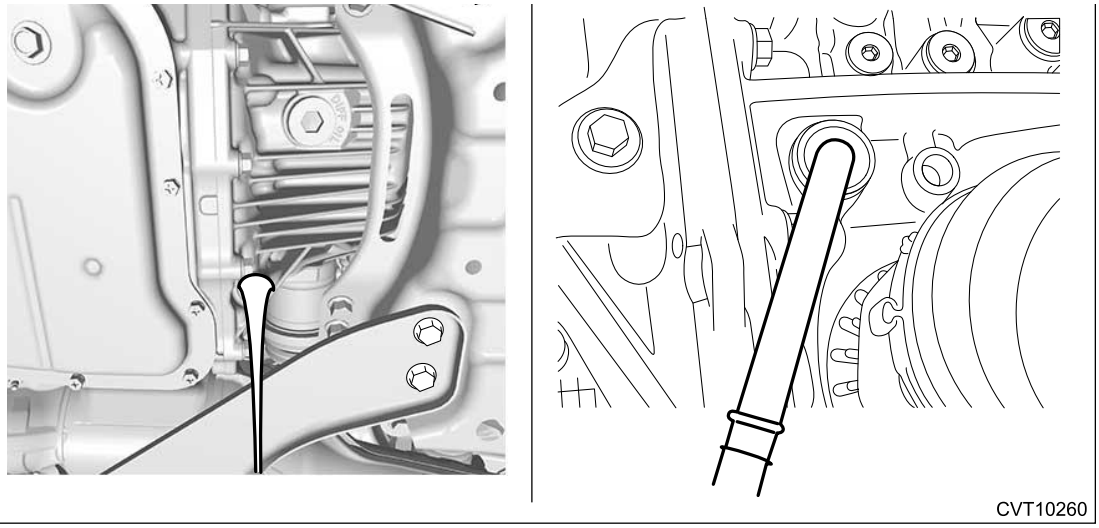
3. Remove the overflow drain plug.



(A) Overflow drain plug

4. Fill in the differential gear oil through the filler plug hole up to where the oil flows out of the overflow drain plug.
   Recommended gear oil:
   Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > RECOMMENDED GEAR OIL.
5. When the flow of the differential gear oil turns into a narrow stream, install the overflow drain plug.
   Note:
   Use a new gasket.
   Tightening torque:
   50 N·m (5.1 kgf-m, 36.9 ft-lb)





6. Install the filler plug.
   Note:
   Use a new gasket.
   Tightening torque:
   50 N·m (5.1 kgf-m, 36.9 ft-lb)

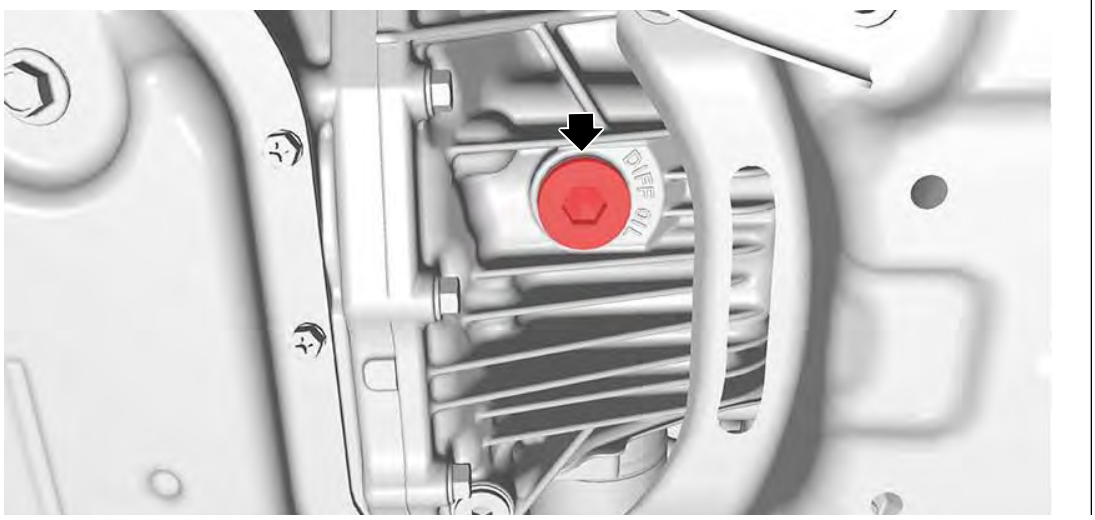
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Differential Gear Oil

REPLACEMENT

Caution:

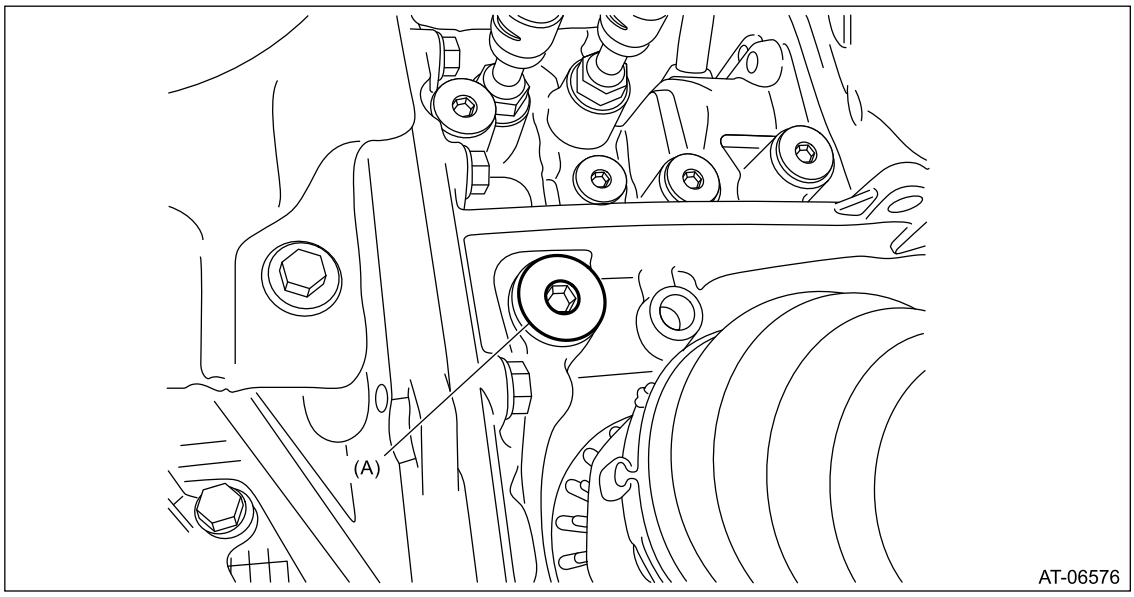
- **Immediately after the vehicle has been running or after idling for a long time, the differential gear oil will be hot. Be careful not to burn yourself.**
- **Be careful not to spill differential gear oil on the exhaust pipe to prevent it from emitting smoke or causing a fire. If gear oil adheres, wipe it off completely.**

1. Lift up the vehicle.
2. Remove the differential gear oil drain plug using TORX® bit T70. Drain differential gear oil.
3. Install the differential gear oil drain plug using TORX® bit T70.
   Note:
   Use a new gasket.
   Tightening torque:
   70 N·m (7.1 kgf-m, 51.6 ft-lb)





4. Remove the filler plug.



(A) Filler plug

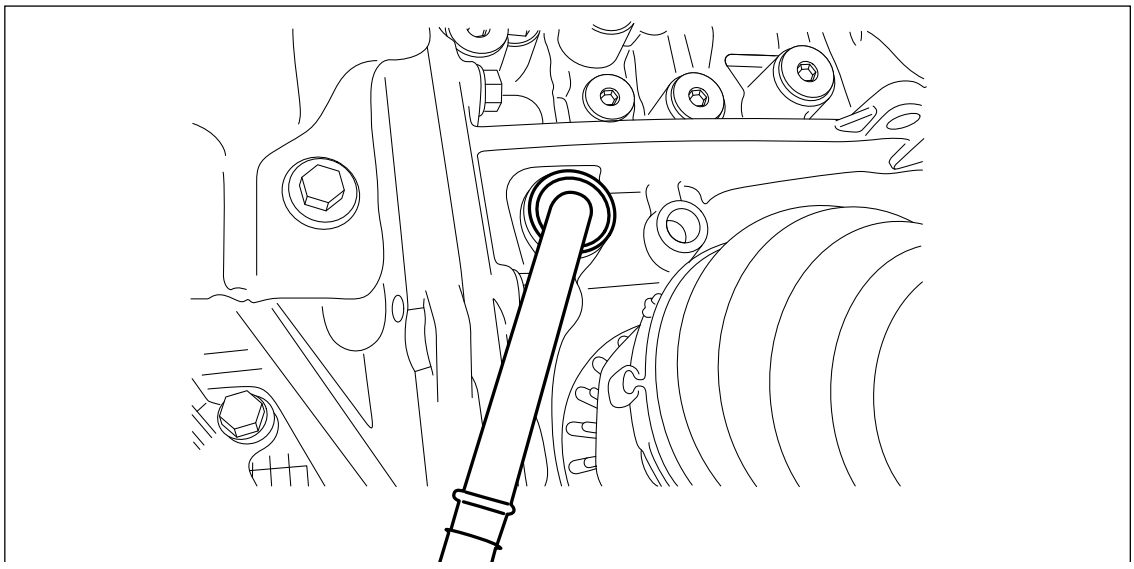
5. Pour gear oil into the filler plug hole.

Recommended gear oil:

Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > RECOMMENDED GEAR OIL.

Gear oil capacity:

Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > RECOMMENDED GEAR OIL.



6. Adjust the level of differential gear oil. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > AWD ON/OFF Switching Mode

GENERAL DESCRIPTION

- Follow the messages displayed on the Subaru Select Monitor when working.
- Perform as necessary in FWD mode.
- When switched to FWD, AWD light illuminates.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > AWD ON/OFF Switching Mode

PROCEDURE

Caution:

- **Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.**
- **On completing the work in FWD, switch back in AWD.**

1. Shift the select lever to the "P" range.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON.
4. Turn off all switches causing an electrical load, such as headlights, A/C, seat heater and rear defogger.
5. Select [Diagnosis] on [Start] display of Subaru Select Monitor.
6. On [Vehicle selection] display, enter vehicle information and select [OK].
7. On [Main Menu] display, select [Each System].
8. On [Select System] display, select [Transmission].
9. On [Select Function] display, select [Work Support].
10. On [Work Support] display, select [AWD ON/OFF switching mode].
11. Follow the messages displayed on the Subaru Select Monitor screen when working.
    Switching completes successfully if any of the following messages is displayed.
    - When switching from AWD to FWD: [Switched to FF. To return to AWD, perform basic mode again.]
    - When switching from FWD to AWD: [Switched to AWD. To return to FF, perform basic mode again.]

    Note:
    - **If communication error occurs during switching mode, start in the [AWD ON/OFF switching mode] again.**
    - **If operation is interrupted before the successful end message is displayed, perform the [AWD ON/OFF switching mode] from the beginning until confirming the operation is successfully ended. If this mode fails to complete successfully, the cause is as follows.**
      - **Select lever is not in "P" range.**
      - **Engine is running.**
    - **For detailed operation procedures, refer to "Application help".**

INSPECTION

1. GENERAL PRECAUTION

Road tests should be conducted to properly diagnose the condition of CVT.

Caution:

Always observe the local traffic laws when performing the test.

2. D RANGE SHIFT FUNCTION

Make sure that the engine speed is 1,100 — 1,400 r/min while driving on the level road at 50 km/h (31 MPH) after accelerating from halting up to 1/4 of accelerator opening angle. Then stop the vehicle. Check normal gear change has occurred while the vehicle speed changes from a constant speed to zero.

3. KICK-DOWN FUNCTION

3. KICK-DOWN FUNCTION

Check if engine speed will rise by operating the accelerator opening angle to the full from a constant speed of 50 km/h (31 MPH) or more.

4. ENGINE BRAKE OPERATION

- **MODEL WITH MANUAL MODE**
  - Drive in “7th speed of manual mode” [110 — 120 km/h (69 — 75 MPH)], and shift down from 7th to 6th. Check if the indicator of combination meter switches “7” → “6”. At the same time, check engine braking in 6th gear.
  - Drive in “6th speed of manual mode” [80 — 90 km/h (50 — 56 MPH)], and shift down from 6th to 5th. Check if the indicator of combination meter switches “6” → “5”. At the same time, check the engine brake in 5th gear.
  - Drive in “5th speed of manual mode” [60 — 70 km/h (37 — 43 MPH)], and shift down from 5th to 4th. Check if the indicator of combination meter switches “5” → “4”. At the same time, check the engine brake in 4th gear.
  - Drive in “4th speed of manual mode” [50 — 60 km/h (31 — 37 MPH)], and shift down from 4th to 3rd. Check if the indicator of combination meter switches “4” → “3”. At the same time, check the engine brake in 3rd gear.
  - Drive in “3rd speed of manual mode” [40 — 50 km/h (25 — 31 MPH)], and shift down from 3rd to 2nd. Check if the indicator of combination meter switches “3” → “2”. At the same time, check the engine brake in 2nd gear.
  - Drive in “2nd speed of manual mode” [20 — 30 km/h (12 — 19 MPH)], and shift down from 2nd to 1st. Check if the indicator of combination meter switches “2” → “1”. At the same time, check the engine brake in 1st gear.
- **MODEL WITHOUT MANUAL MODE**
  Drive in D range at [50 — 60 km/h (31 — 37 MPH)], and shift to “L” range. Check if the indicator of combination meter switches “D” → “L”. At the same time, check the engine brake in L range.

5. LOCK-UP FUNCTION

When the accelerator is lightly depressed while driving on a flat road in “D” range, check that rpm does not change abruptly.

6. P RANGE OPERATION

Stop the vehicle on an uphill grade of 5% or more and shift to the “P” range and apply the parking brake. Check that the vehicle does not move when the parking brake is released.

7. NOISE AND VIBRATION

Check for noise and vibration during a constant driving, accelerating, decelerating and manual shift operation.

8. OIL LEAKAGE

After the driving test, inspect for leakage of CVTF and differential gear oil from the transmission body.

INSPECTION

Caution:

Make sure no other person is around the vehicle during stall test measurement.

Note:

Stall test is extremely important in diagnosing the condition of CVT and engine. The test is necessary to measure the engine stall speeds in "R" and "D" range.

Purposes of the stall test:

- **Operational check of forward clutch and reverse brake**
- **Operational check of the torque converter assembly**
- **Engine performance check**

1. Place wheel chocks at the front and rear of all wheels and engage the parking brake.
2. Turn the A/C OFF.
3. Using the Subaru Select Monitor, check if the throttle valve operates when you depress the

accelerator pedal. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor>LIST.

4. Check the engine oil level. Ref. to LUBRICATION(H4DO)>Engine Oil.
5. Check the coolant level. Ref. to COOLING(H4DO)>Engine Coolant.
6. Adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.
7. Increase the CVTF temperature to 60 — 80°C (140 — 176°F) with the engine running and the select lever shifted to "N" or "P" range.
8. Hold down the pre-collision brake OFF switch to turn OFF the pre-collision brake function. (With EyeSight)
9. Shift the select lever to the "D" range.
10. Depress the accelerator pedal to the full while fully depressing the foot brake pedal with your left foot.
11. When the engine speed stabilizes, quickly record the engine speed and release accelerator pedal. Shift the select lever to the "N" range. Let the engine idle for one minute or more to cool it down.
12. Shift to "R" range and perform the same stall test.

Note:

- **Do not perform a stall test for over 5 seconds at a time. (From closed throttle, fully open throttle to stall speed reading.) Failure to follow this instruction will cause the engine oil and CVTF to deteriorate and the clutch and brake to be adversely affected.**
- **Be sure to cool down the engine for at least one minute after each stall test with the select lever set in the "P" or "N" range and with the idle speed of 1,200 r/min or less.**
- **If the stall speed is higher than the specified range, attempt to finish the stall test in as short a time as possible, in order to prevent the CVT from sustaining damage.**

Stall speed standard:

D range: 2,150—3,050 r/min
R range: 2,050—2,950 r/min

Stall test judgment

Stall speed (at sea level)	Range	Probable cause
Lower than standard value	D, R	• Insufficient engine output • Torque converter malfunction
Higher than standard value	D	• Forward clutch slippage • Secondary pressure (line pressure) is low. • Variator chain malfunction
	R	• Reverse brake slippage • Secondary pressure (line pressure) is low. • Variator chain malfunction
	D, R	• Torque converter malfunction • Control valve body malfunction • TCM malfunction • Damaged harness and harness connector

INSPECTION

Note:

When the select lever is shifted while the engine is idling, there will be a certain time elapse or lag before shock is felt. This symptom helps to check the condition of forward clutch and reverse brake.

- **Perform the test at normal operation CVTF temperature of 60 — 80°C (140 — 176°F).**
- **Be sure to allow one minute or more interval between tests.**
- **Make three measurements and take the average value.**

1. Apply the parking brake.
2. Start the engine. Check the idle speed. (A/C OFF)
3. Shift the select lever from "N" to "D" range. Using a stop watch, measure the time elapsed from shifting the lever until the shock is felt.

   Time lag standard:

   1.5 seconds or less

If "N" → "D" time lag is longer than specified:

- Secondary pressure (line pressure) is too low.
- Forward clutch worn
- Forward clutch piston malfunction
- Control valve body malfunction
- Learning incomplete

4. In the same manner, measure the time lag when shifting from "N" range to "R" range.

Time lag standard:

1.5 seconds or less

If "N" → "R" time lag is longer than specified:

- Secondary pressure (line pressure) is too low.
- Reverse brake worn
- Reverse brake piston malfunction
- Control valve body malfunction
- Learning incomplete

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Pressure (Line Pressure) Test

INSPECTION

Caution:

- **Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.**
- **Make sure no other person is around the vehicle during secondary pressure (line pressure) test measurement.**
- **After performing the secondary pressure (line pressure) test measurement, adjust the CVTF level.**

Note:

- **If the pulley and variator chain, clutch or brake show signs of slipping or shift feel is not correct, check the secondary pressure (line pressure).**
- **Connect Subaru Select Monitor to vehicle so as to measure the engine speed and actual secondary pressure (secondary pressure (line pressure)).**
- **In many cases, slippage or inability to operate the vehicle may be due to insufficient oil**

pressure for the operation of clutch, brake or control valve.

1. Lift up the vehicle.
2. Remove the secondary pressure (line pressure) test plug, and install ST1 and ST2.

Caution:

Removal of the test plug and installation of the ST shall be both performed quickly.

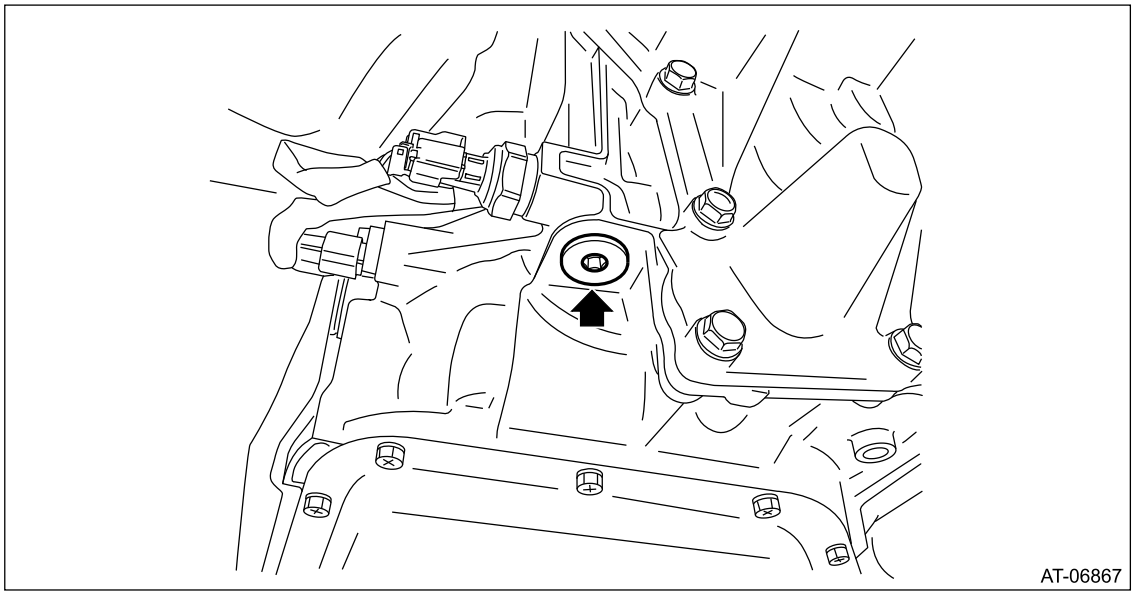
Note:

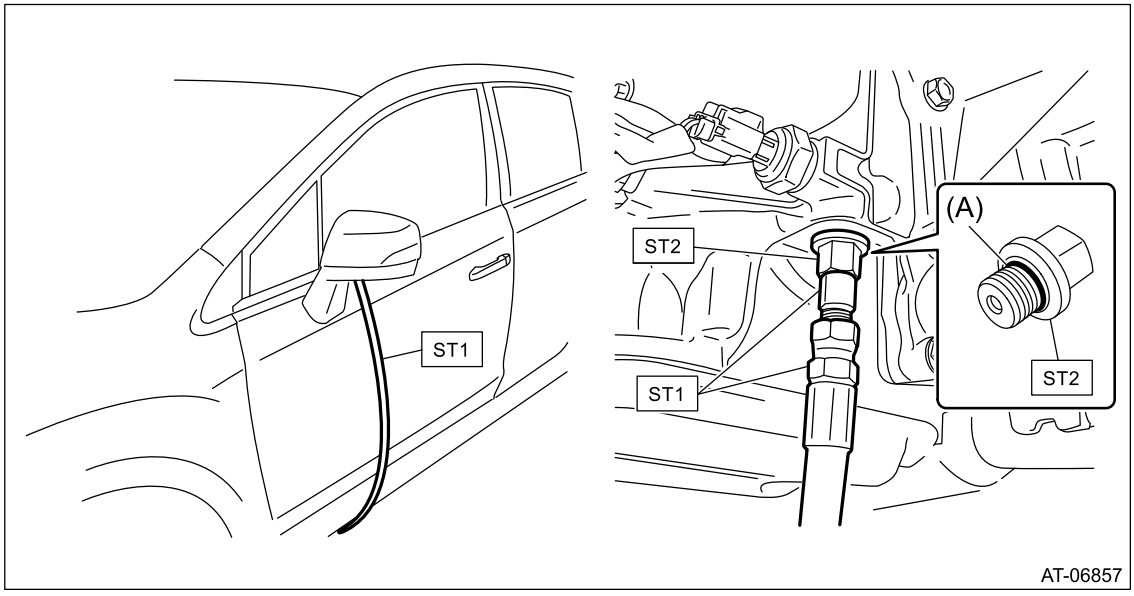
Use the ST2 with genuine O-ring (part No. 806916050) attached.

Preparation tool:

ST1: OIL PRESSURE GAUGE ASSY (18801AA000)

ST2: PRESSURE GAUGE ADAPTER (18681AA010)





(A) O-ring (genuine part)

3. Lower the vehicle.
4. Set the gauge so that it can be seen from the driver's seat.
5. Using the Subaru Select Monitor, check if the throttle valve operates when you depress the accelerator pedal. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
6. Check the engine oil level. Ref. to LUBRICATION(H4DO)>Engine Oil.
7. Check the coolant level. Ref. to COOLING(H4DO)>Engine Coolant.
8. Adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.
9. Increase the CVTF temperature to 60 — 80°C (140 — 176°F) with the engine running and the select lever shifted to "N" or "P" range.
10. Hold down the pre-collision brake OFF switch to turn OFF the pre-collision brake function. (With EyeSight)
11. While depressing the foot brake pedal, shift the select lever to "D" range.
12. Depress the accelerator pedal to the full while fully depressing the foot brake pedal with your left foot.
13. Immediately after the engine speed becomes steady, record the reading of the secondary pressure (line pressure), engine speed and actual secondary pressure on Subaru Select Monitor. And then release the accelerator pedal. Shift the select lever to the "N" range. Let the engine idle for one minute or more to cool it down.

Note:

- **Do not continue the stall test for 5 seconds or more at a time (from fully closed throttle, fully open throttle to secondary pressure (line pressure) reading). Failure to follow this instruction will cause the engine oil and CVTF to deteriorate and the clutch and brake to be adversely affected.**
- **After performing the secondary pressure (line pressure) test, be sure to cool down the engine for at least one minute with the select lever set in "P" or "N" range and with the idle speed at 1,200 r/min or less.**
- **Under each condition, check that the measured pressure matches almost totally with actual secondary pressure.**
- **When both measured pressure and actual secondary pressure are out of specification, judge as control valve malfunction.**
- **The value at stall is for reference because the pressure changes under different conditions or circumstances.**
- **The value at idling is steady because it is not affected by any condition or circumstance.**
- **When the engine is started with the select lever in the "P" range and the secondary pressure at idling is measured without shifting the select lever, the value may be**

higher than the standard. Shift the select lever to the "D" or "R" range, then measure the value.

Secondary pressure (line pressure) standard				
	Range	**Throttle**	**Brake**	**Secondary pressure (line pressure) (MPa (kgf/cm^2, psi))**
Stall	D, R	Full open	ON	4.5 — 6.0 (45.9 — 61.2, 652 — 870)
Idling	P, N	Full closed	OFF	0.5 — 1.5 (5.1 — 15.3, 72 — 218)

14. Remove the ST and install the plug after measurement.

Caution:

Removal of the ST and installation of the test plug shall be both performed quickly.

Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

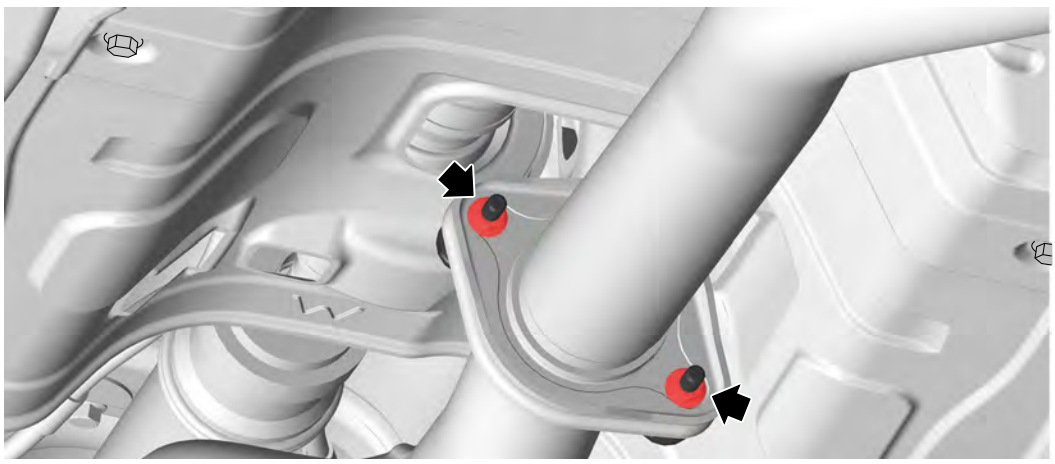
15. Adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch Pressure Test

INSPECTION

1. Lift up the vehicle.

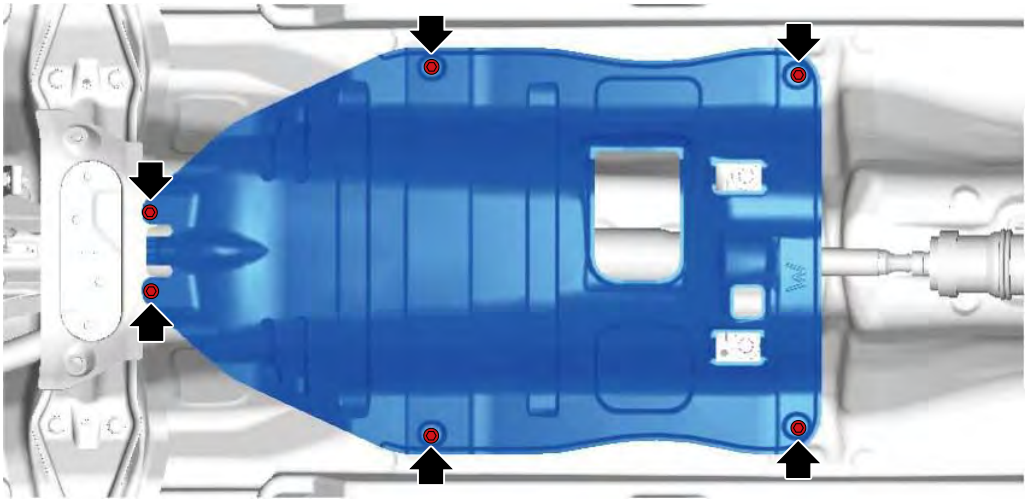
2. Disconnect the rear exhaust pipe from the front exhaust pipe.





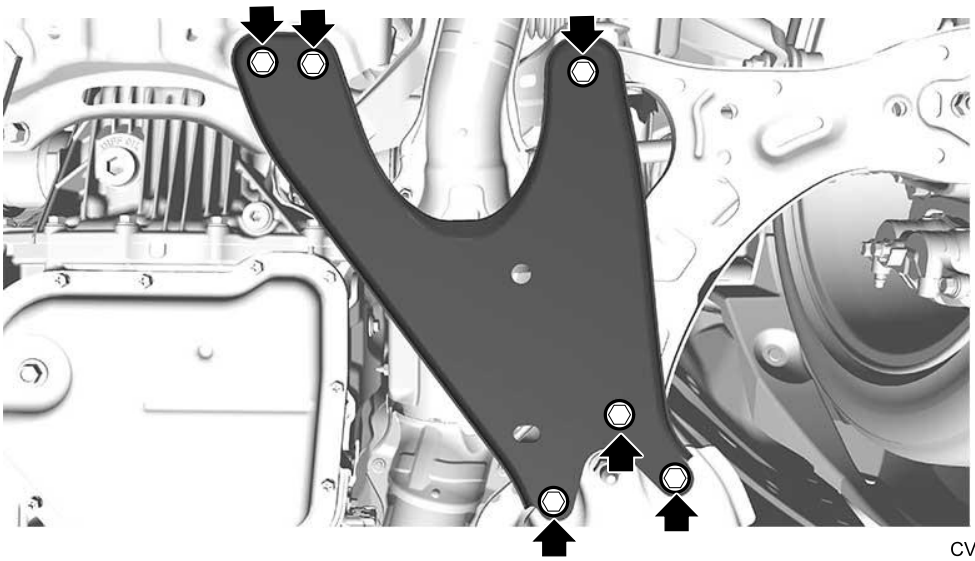
EX-10058

3. Remove the center exhaust cover.



CVT10310

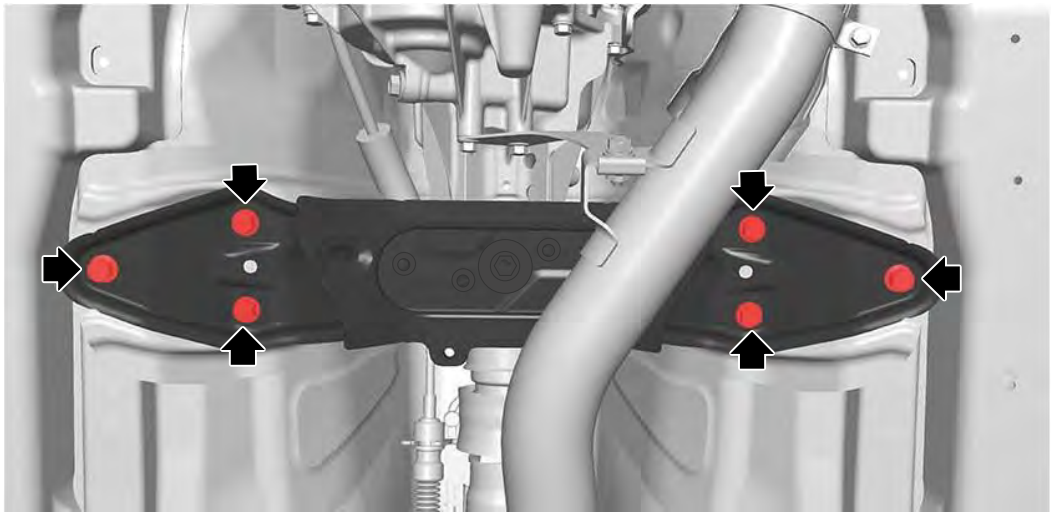
4. Remove the crossmember support - rear LH.



CVT10263

5. Set the transmission jack under the transmission.

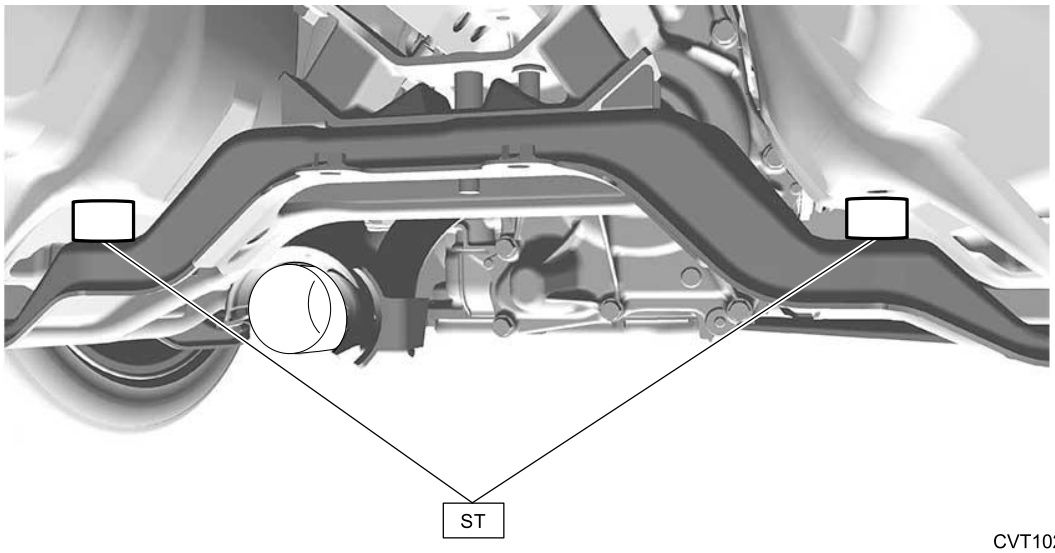
6. Remove the mounting bolt of rear crossmember.


CVT10262

7. Lower the rear side of the transmission, and set the ST at four positions in the rear crossmember.

Preparation tool:

ST: ADAPTER (18362AA020)



CVT10264

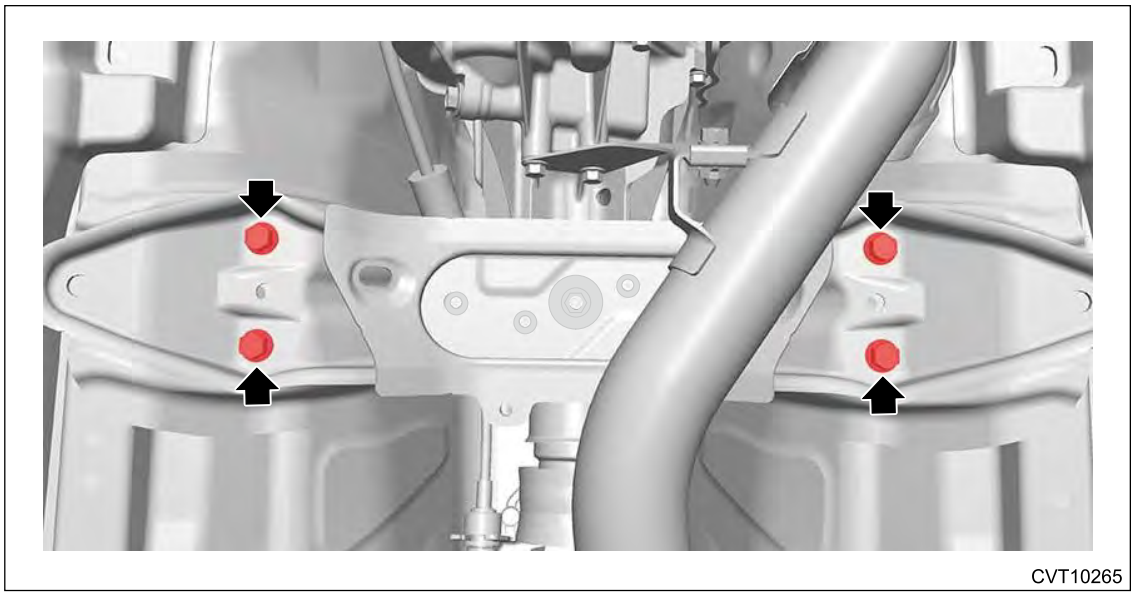
8. Install the rear crossmember with M10 × 30 mm bolts.

Caution:

Be careful not to use longer bolts than the specified length. Those bolts may interfere

with the floor panel.

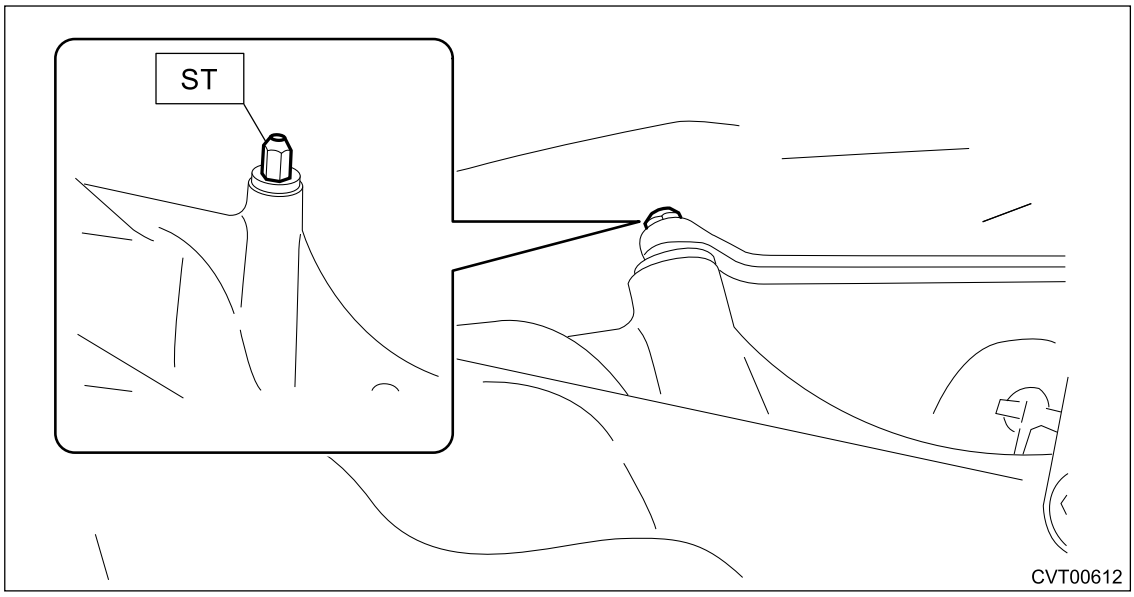
Part No. (reference) 10510307



9. Using the ST, remove the transfer clutch pressure test plug.

Preparation tool:

ST: SOCKET (18270AA040)



10. Set the ST1 and ST2 to the transmission.

Note:

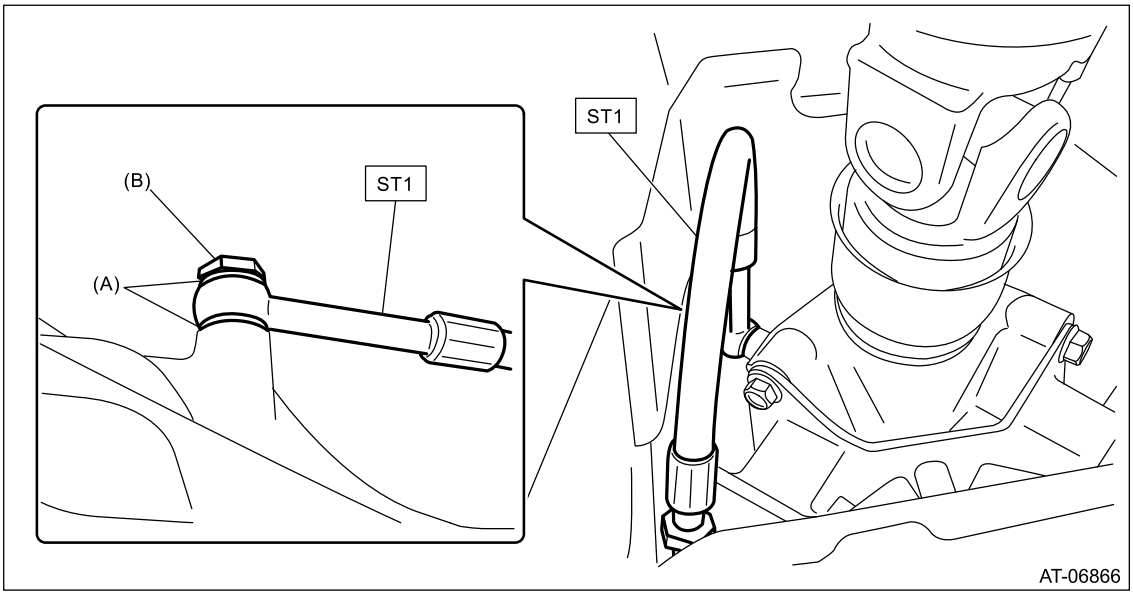
Use ST1 with genuine union screw (Part No. 801914010) and gasket (Part No.

803914060) attached.

Preparation tool:

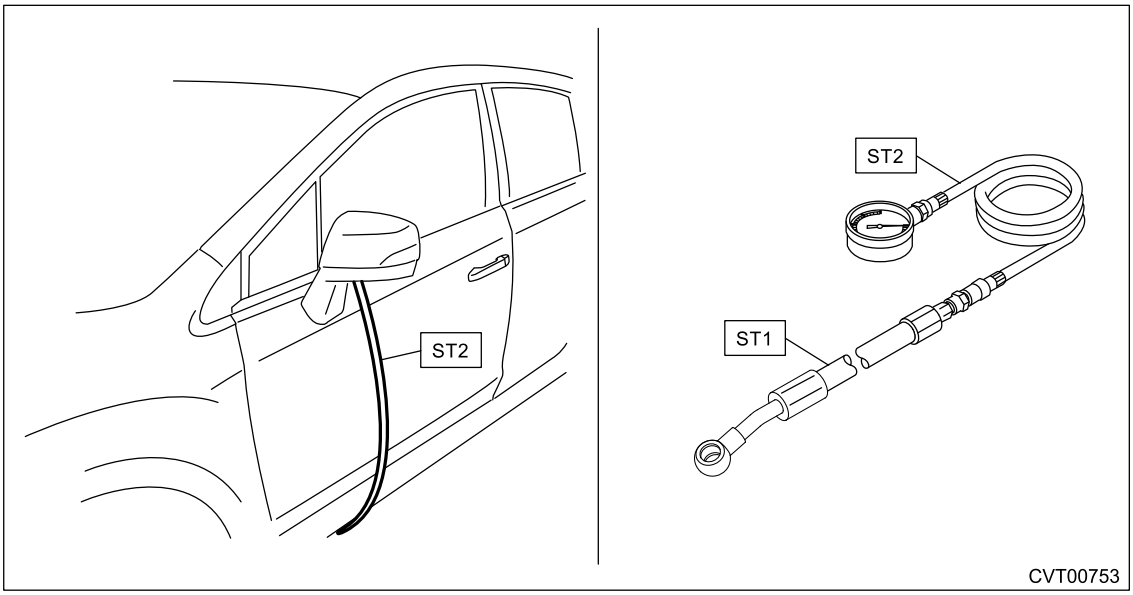
ST1: ADAPTER PRESSURE GAUGE (18681AA050)

ST2: OIL PRESSURE GAUGE ASSY (498575400)



(A) Gasket (genuine part)

(B) Union screw (genuine part)



11. Temporarily tighten the front exhaust pipe and rear exhaust pipe.





12. Lower the vehicle.
13. Connect the Subaru Select Monitor to the data link connector and read the current data.
14. Check the transfer clutch pressure as in secondary pressure (line pressure) test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure (Line Pressure) Test.

Note:

- **Use Subaru Select Monitor for switching to FWD mode. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>AWD ON/OFF Switching Mode.**
- **If no oil pressure is produced, if it does not change in AWD mode or if oil pressure is produced in FWD mode, there may be a problem in the control valve body.**

Range position	ON Duty ratio (%)	Accelerator pedal opening angle (%)	Standard transfer clutch pressure kPa (kgf/cm^2, psi)	
			AWD mode	FWD mode
D	95 — 100	Fully opened (100)	1,000 — 1,200 (10.2 — 12.2, 145 — 174)	—

Range position	ON Duty ratio (%)	Accelerator pedal opening angle (%)	Standard transfer clutch pressure kPa (kgf/cm^2, psi)	
			AWD mode	FWD mode
	60	Adjust ON Duty ratio to 60%.	400 — 700 (4.1 — 7.1, 58 — 102)	—
	0	Fully closed (0)	—	0 (0, 0)
N or P	0	Fully closed (0)	0	—

15. Lift up the vehicle.
16. Remove the ST.
17. Install the test plug using ST1 and ST2.

Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**
- **Tighten the test plug while directly aligning ST2 and torque wrench.**

Preparation tool:

ST1: SOCKET (18270AA040)

ST2: SPECIAL TOOL CONDENSER (73099SG000)

ST2: SPECIAL TOOL CONDENSER (75099SG000)

Tightening torque:

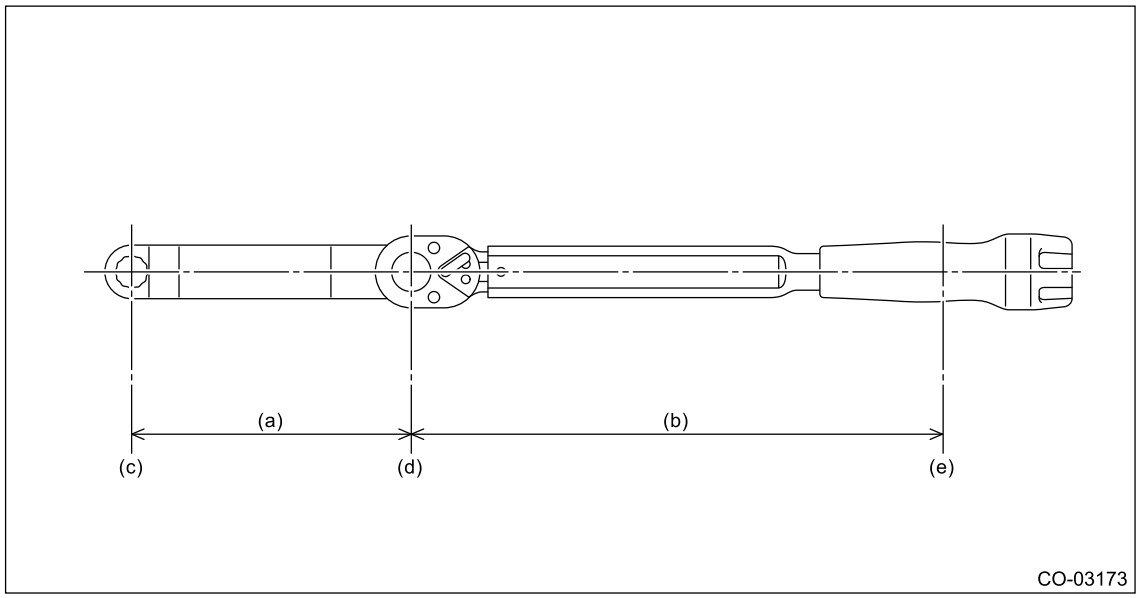
Calculation formula
T = L/ (100 mm (3.94in) +L) × 22N·m (2.2kgf-m, 16.2ft-lb)

T: Tightening torque

L: Effective length of torque wrench

Note:

If the effective length of the torque wrench used is unknown, consult the manufacturer of the torque wrench.



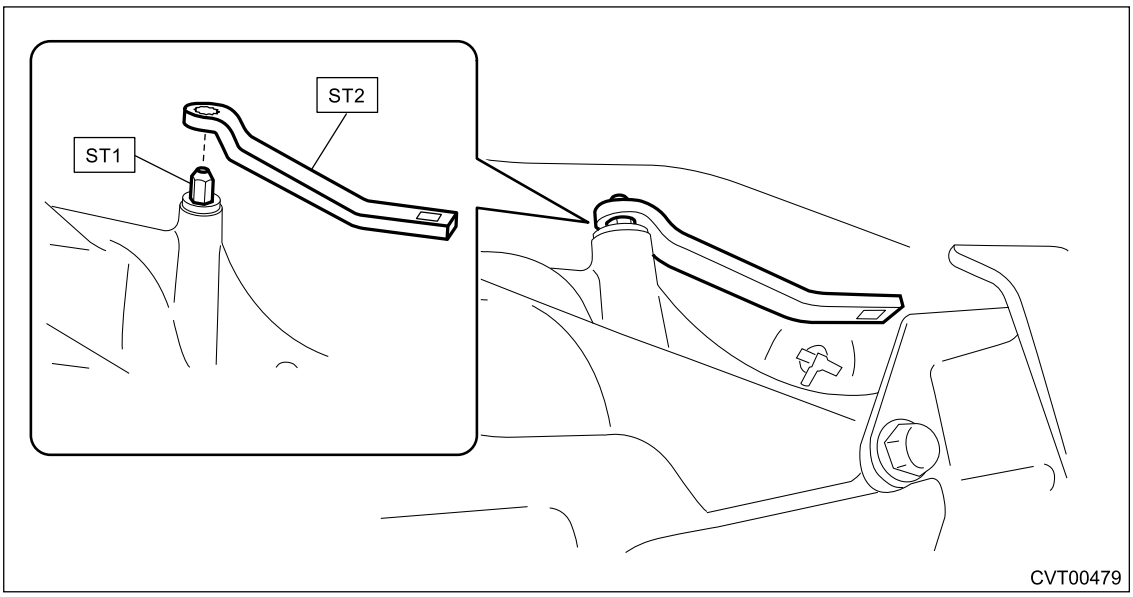
(a) Effective length of the ST2

(b) Effective length of the torque wrench

(c) Center of drive angle of the ST2

(d) Center of drive angle of the torque wrench

(e) Center of the position where a force is applied by hand



18. Set the transmission jack under the transmission.

19. Remove the ST (ADAPTER) and M10 × 30 mm bolts from the rear crossmember.

20. Raise the transmission assembly, and install the rear crossmember.

Tightening torque:

75 N·m (7.6 kgf-m, 55.3 ft-lb)

75 N·m (7.6 kgf-m, 55.3 ft-lb)

21. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

22. Install the rear exhaust pipe to the front exhaust pipe.

Note:

Use a new gasket.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

23. Install the crossmember support - rear LH.

Tightening torque:

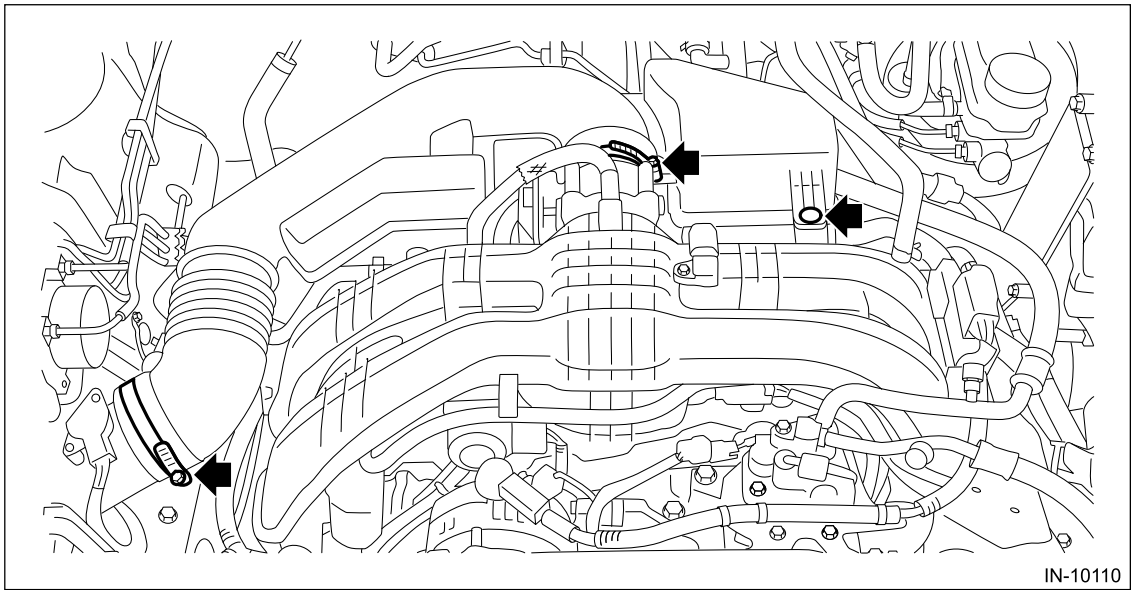
70 N·m (7.1 kgf-m, 51.6 ft-lb)

24. Lower the vehicle.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Automatic Transmission Assembly

REMOVAL

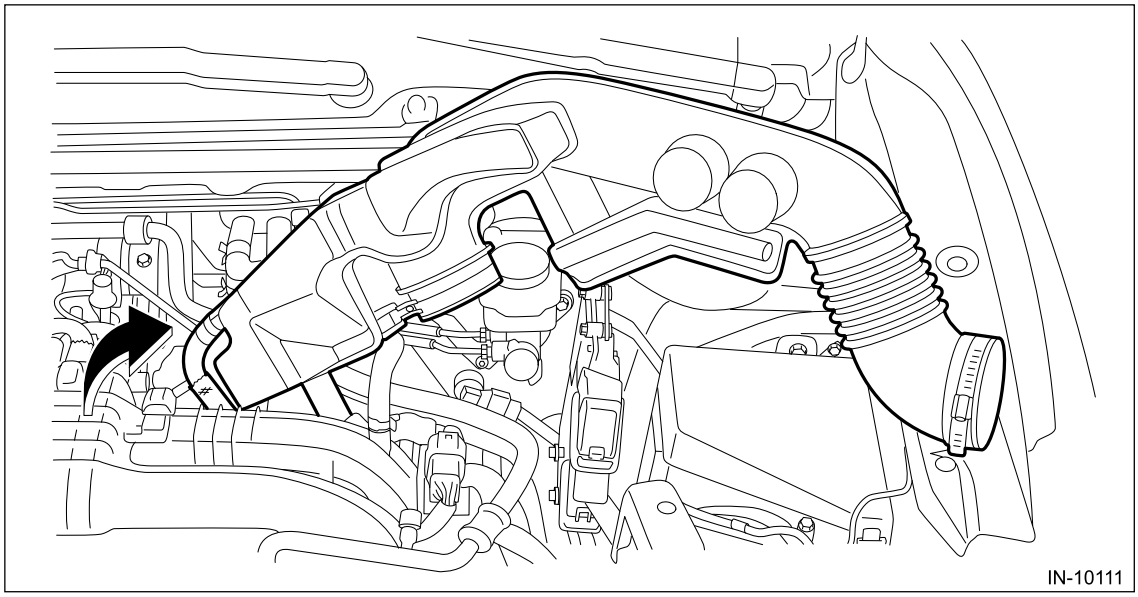
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.



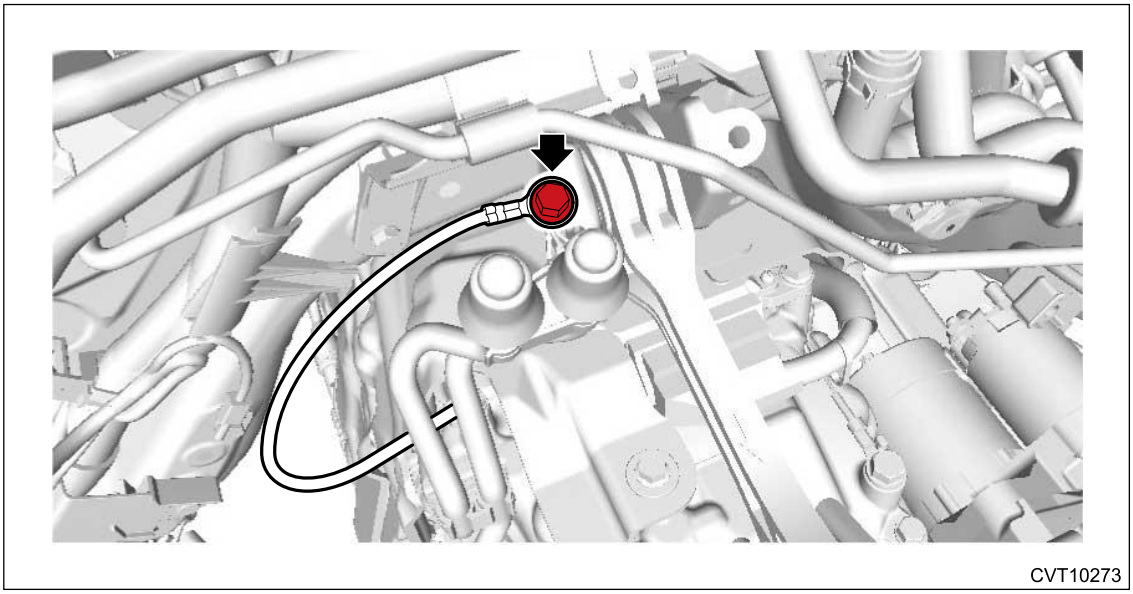
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.

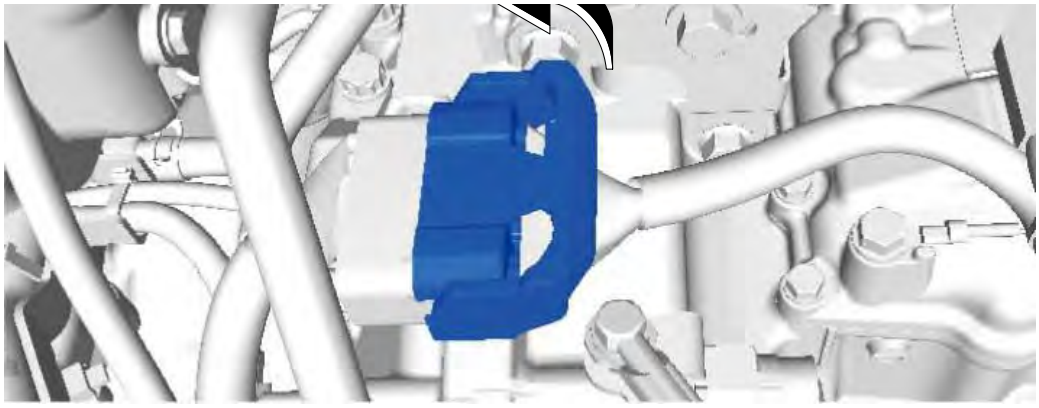


4. Remove the transmission radio ground terminal.



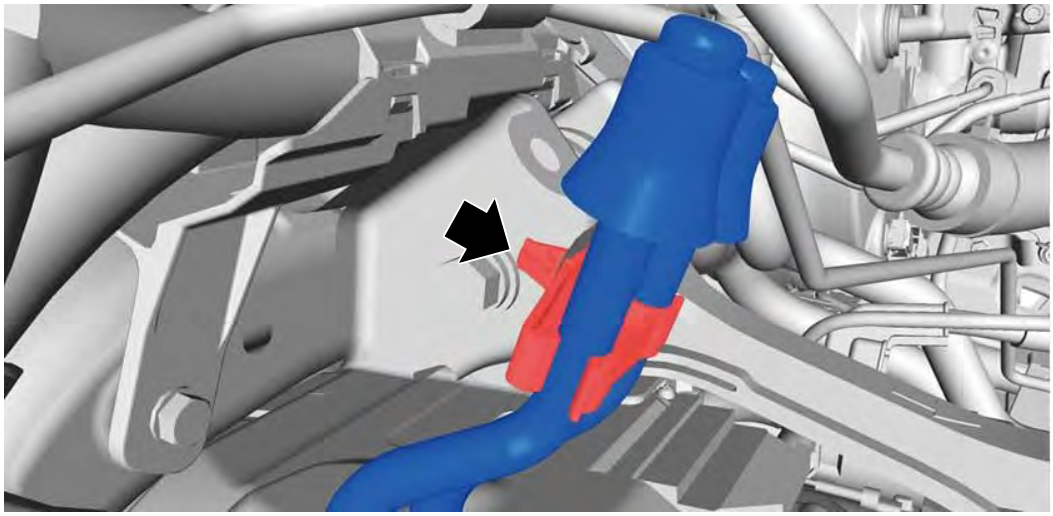
5. Disconnect the transmission harness connector.





CVT10266

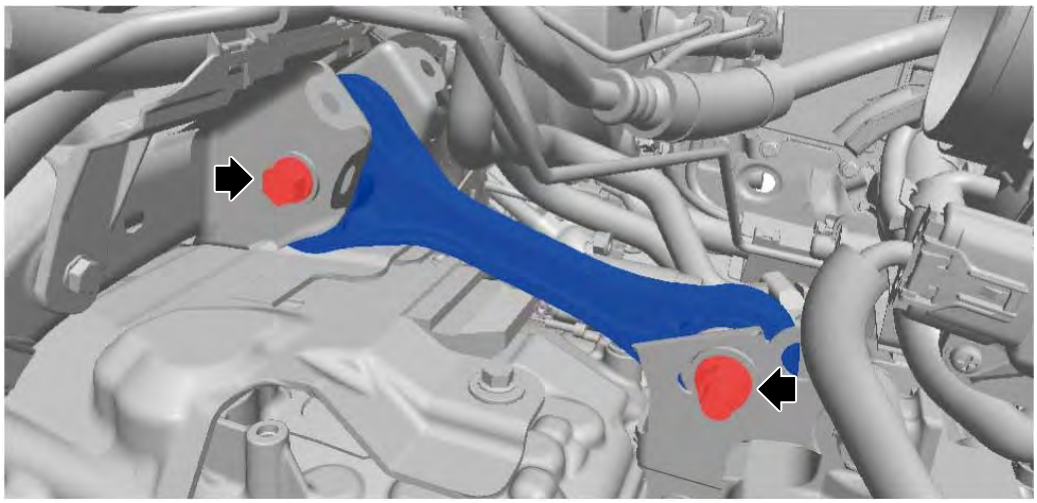
6. Remove the air breather hose together with the bracket.



CVT10439

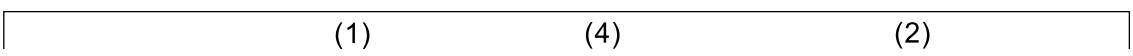
7. Remove the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>REMOVAL.

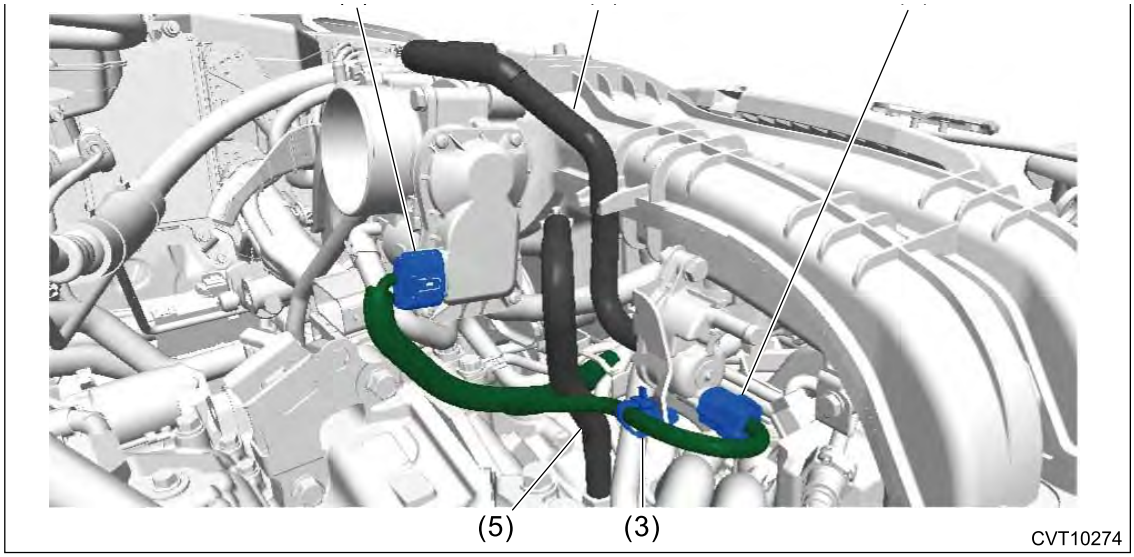
8. Remove the pitching stopper.



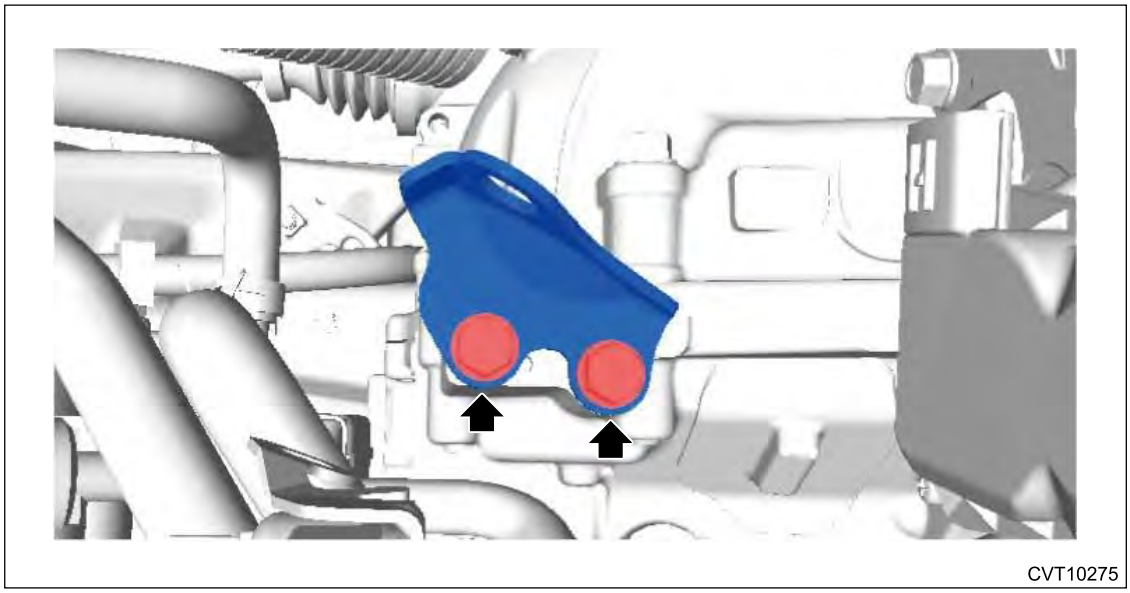
CVT10272

9. Remove the throttle position sensor harness connector (1), purge control solenoid valve harness connector (2), harness clip (3), vacuum hose (4) and PCV hose (5).



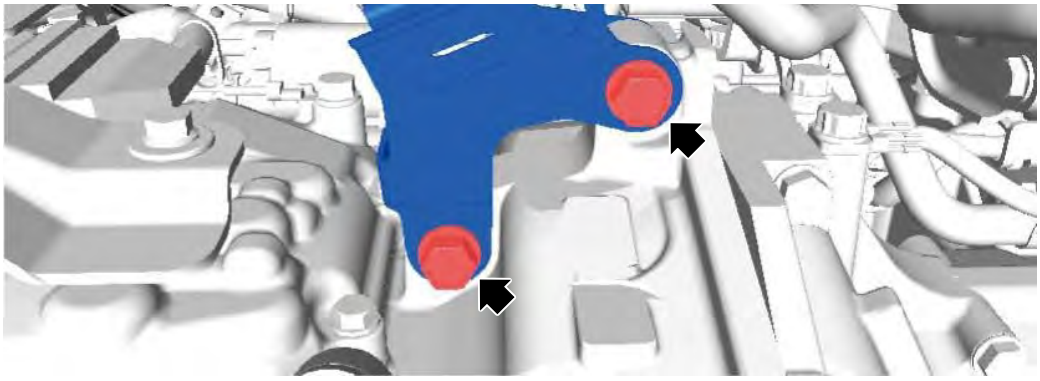


10. Remove the engine hanger rear.



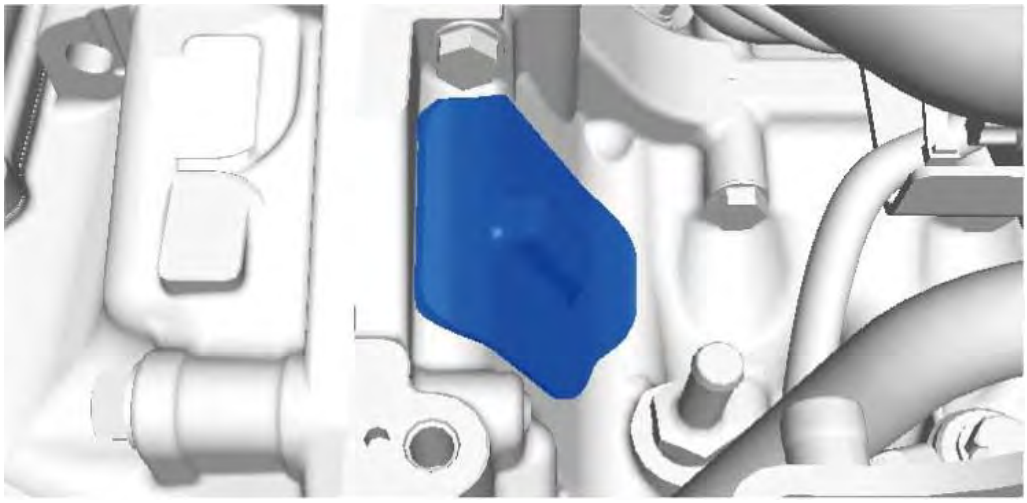
11. Remove the pitching stopper bracket.





CVT10276

12. Remove the service hole plug.

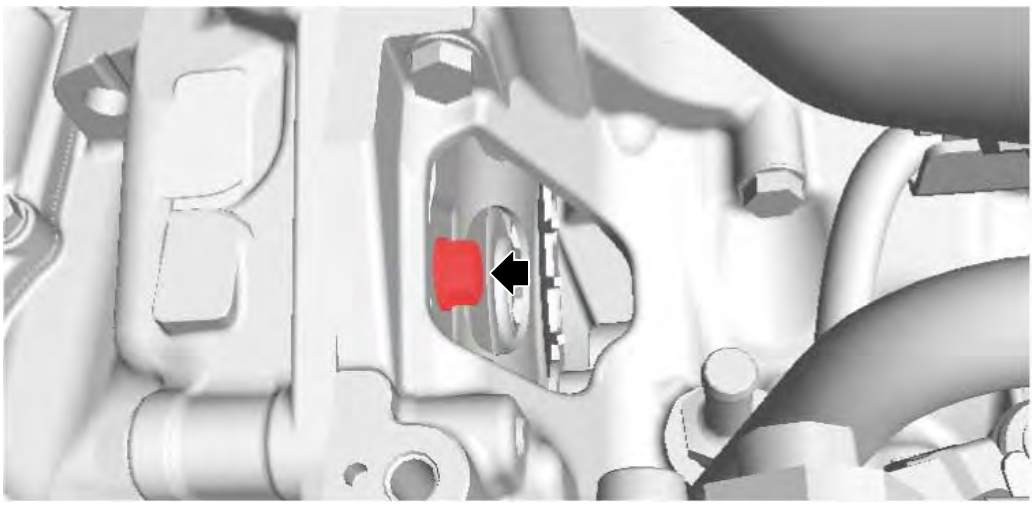


CVT10278

13. Remove the six bolts combining the torque converter and drive plate while rotating the crank pulley a little at a time in the same direction as engine revolution.

Caution:

- **Be careful not to drop bolts into the converter housing.**
- **Be careful not to damage the mounting bolts.**



CVT10279

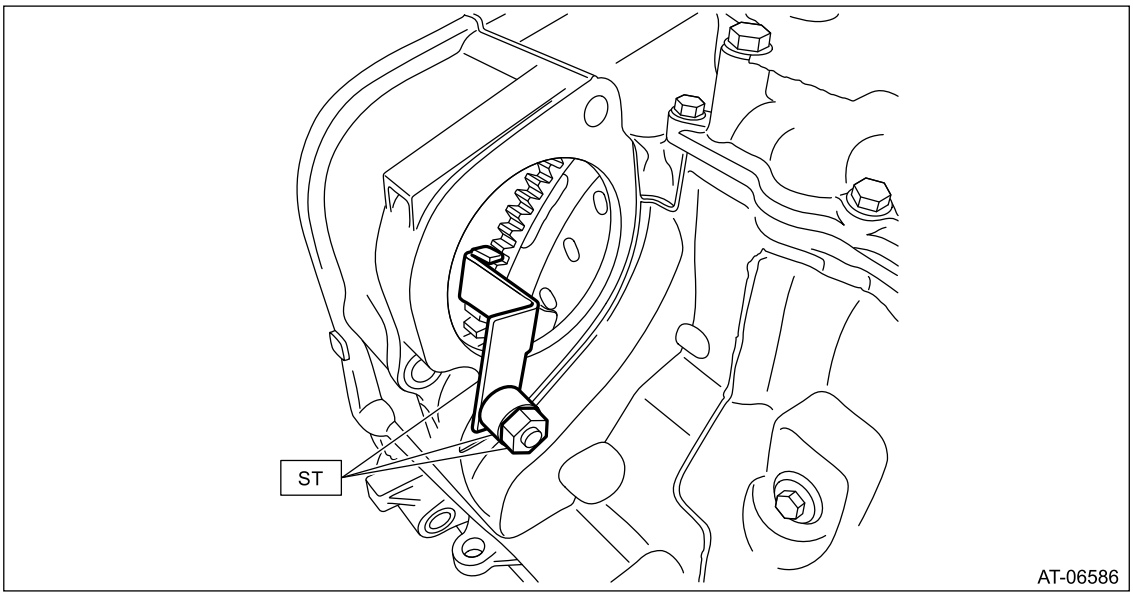
14. Make sure the torque converter moves freely by rotating with finger through the starter installation

hole.

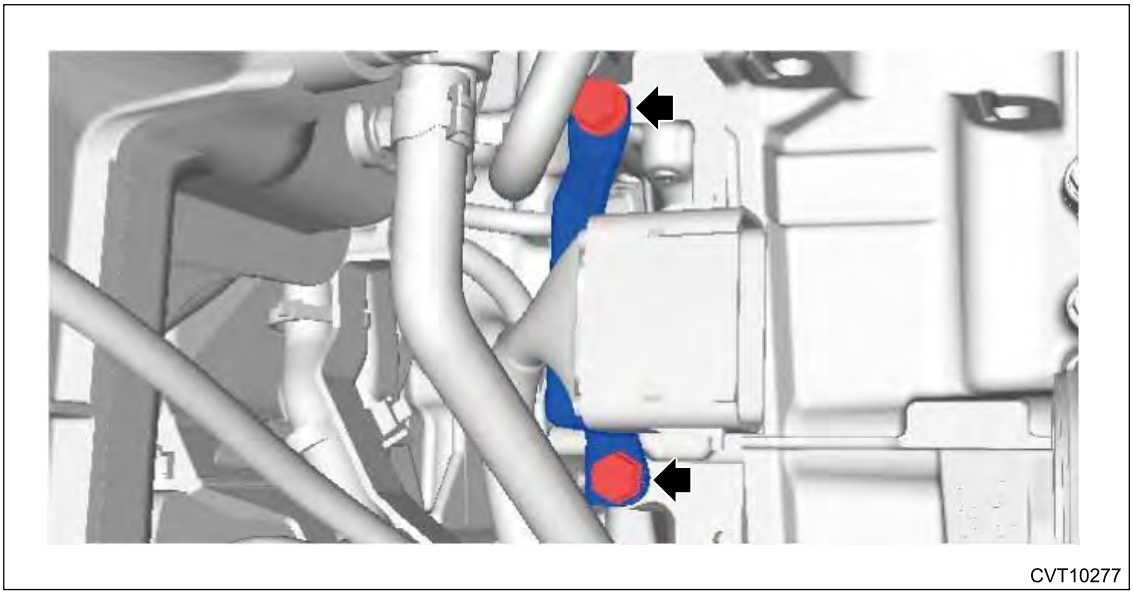
15. Attach the ST to the converter case.

Preparation tool:

ST: STOPPER SET (498277200)

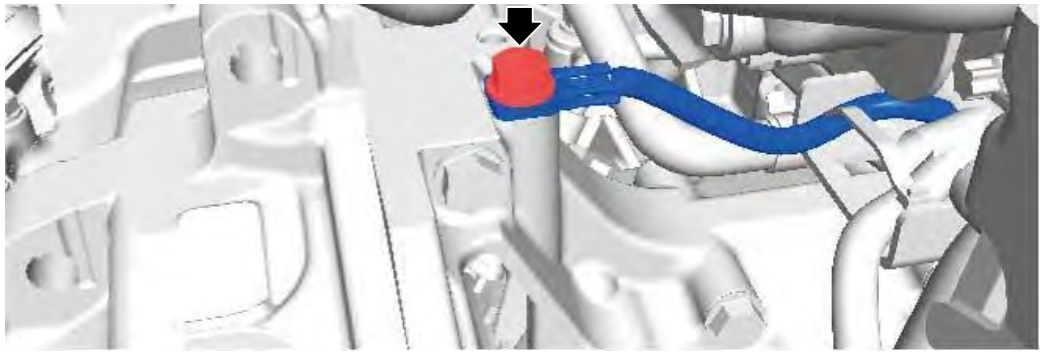


16. Remove the engine harness connector bracket.



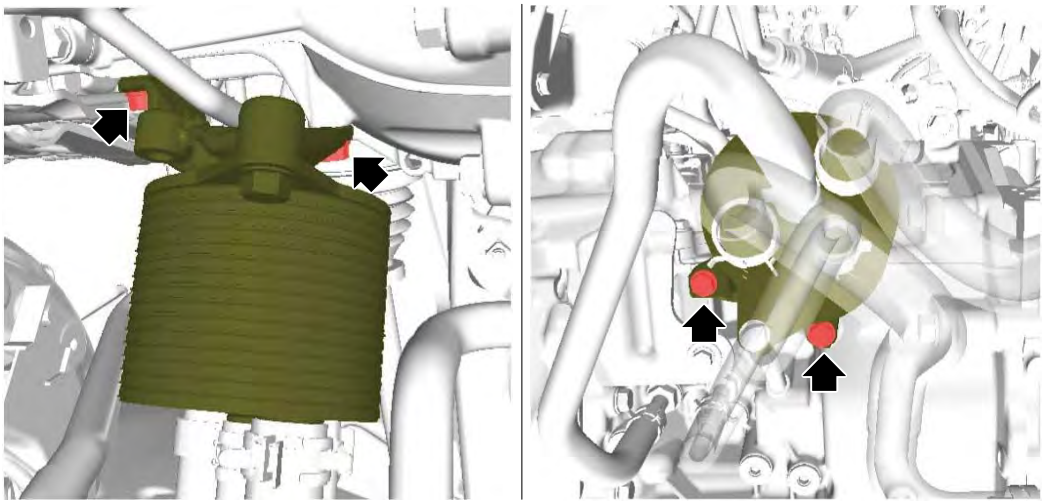
17. Remove the engine ground terminal.





CVT10280

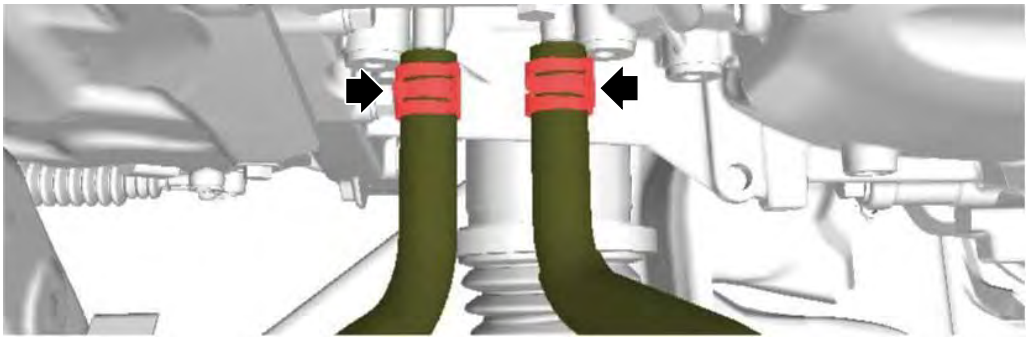
18. Remove the CVTF cooler (with warmer feature) from the transmission, and using a piece of wire, affix to a location of the body where it will not interfere with the removal/installation of the transmission.



CVT10281

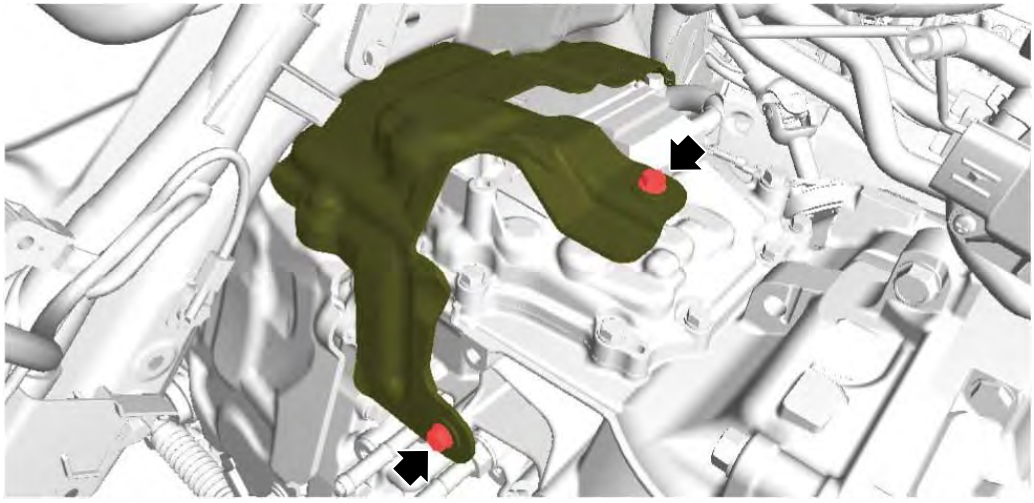
19. Remove the CVTF inlet hose and outlet hose from the pipe.





CVT10282

20. Remove the transmission case cover (small).



CVT10283

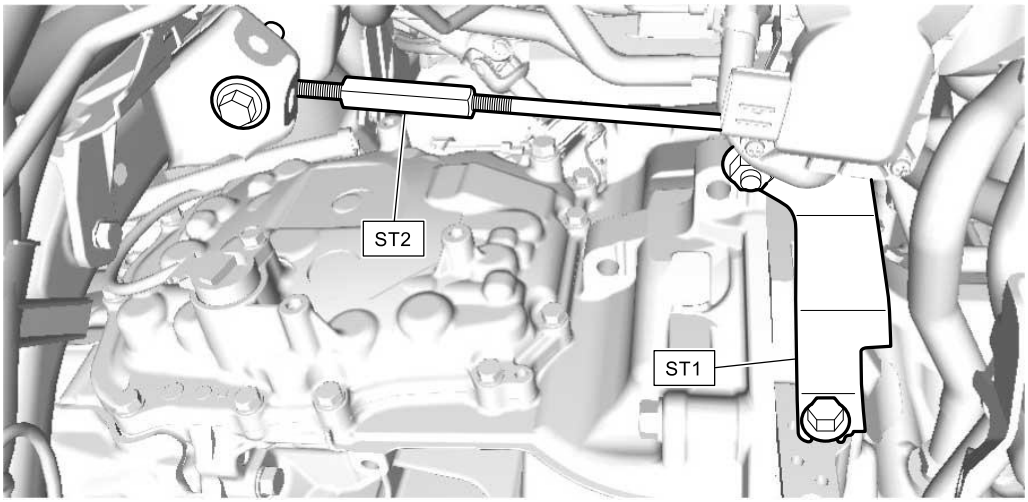
21. Remove the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>REMOVAL.

22. Set the ST1 and ST2.

Preparation tool:

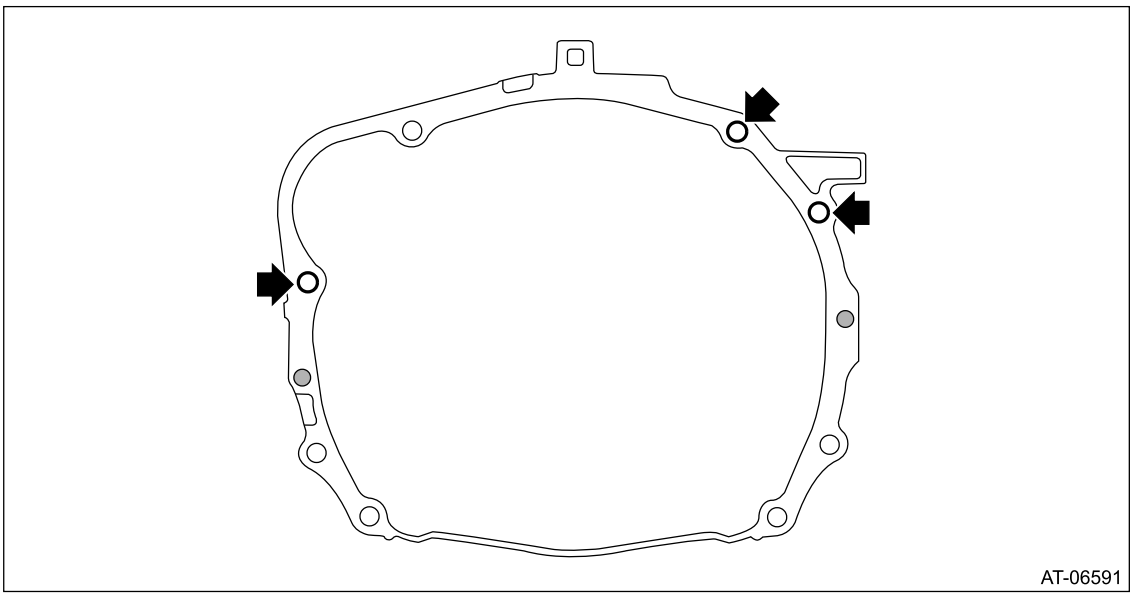
ST1: ENGINE SUPPORT BRACKET (41099AA012)

ST2: ENGINE SUPPORT (41099AA020)

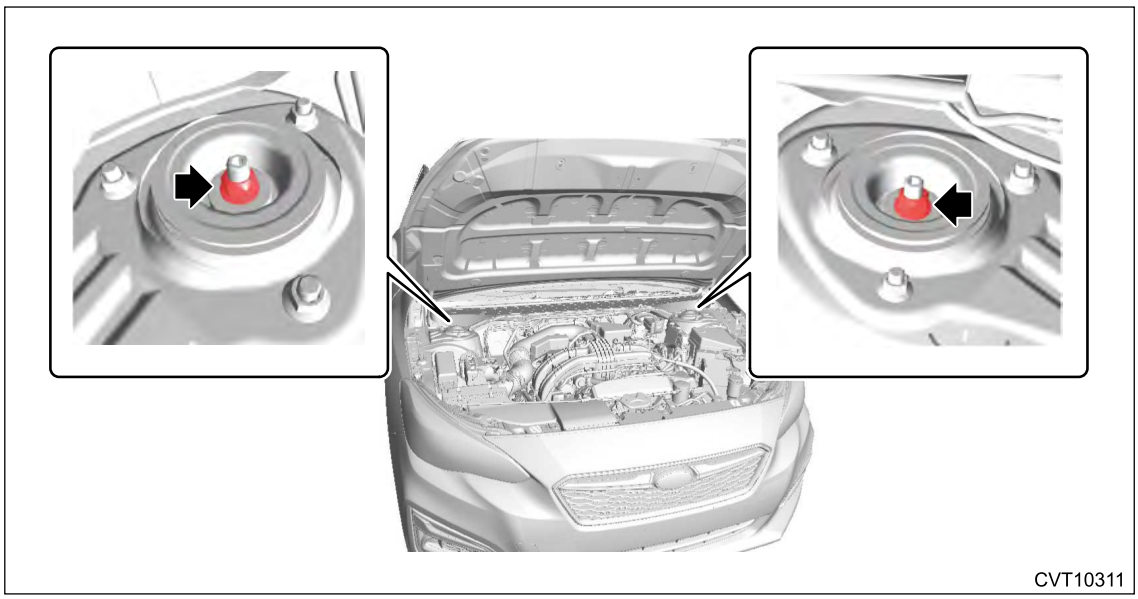


CVT10286

23. Remove the three transmission connecting bolts.

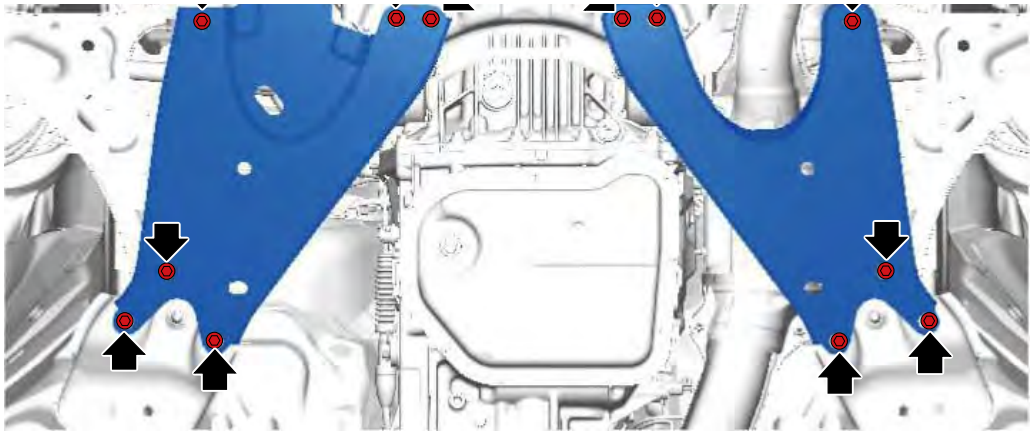


24. Loosen the nut of the front suspension strut mount by two turns.



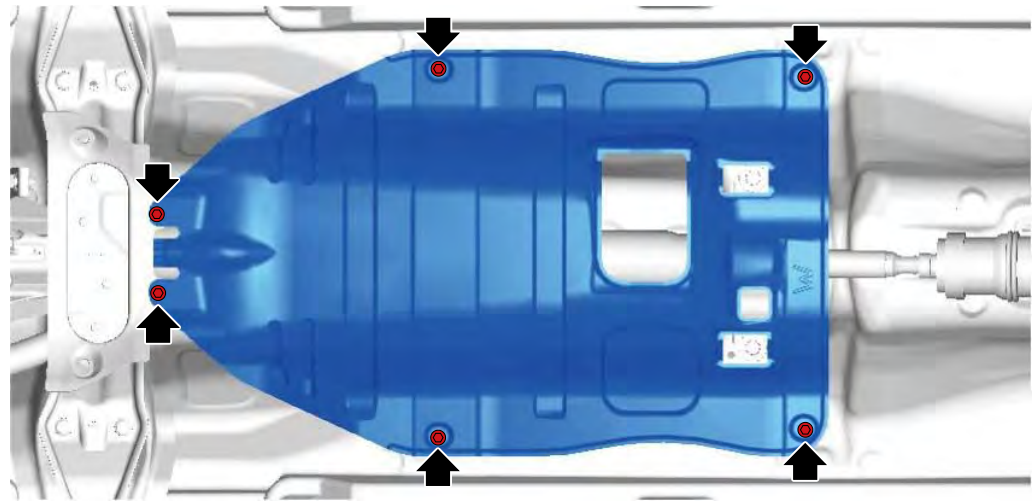
25. Lift up the vehicle.
26. Remove the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
27. Remove the under cover.
28. Remove the crossmember support - rear.



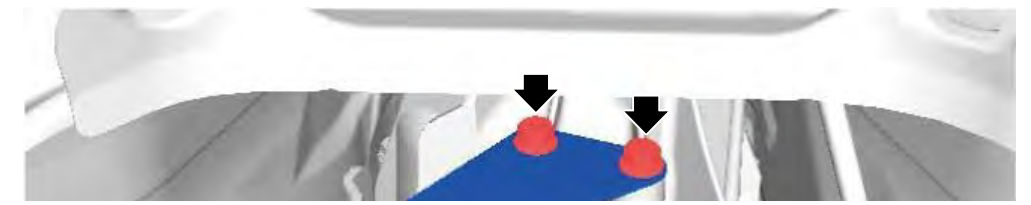

CVT10313

29. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

30. Remove the center exhaust cover.


CVT10310

31. Remove the exhaust hanger bracket.





CVT10312

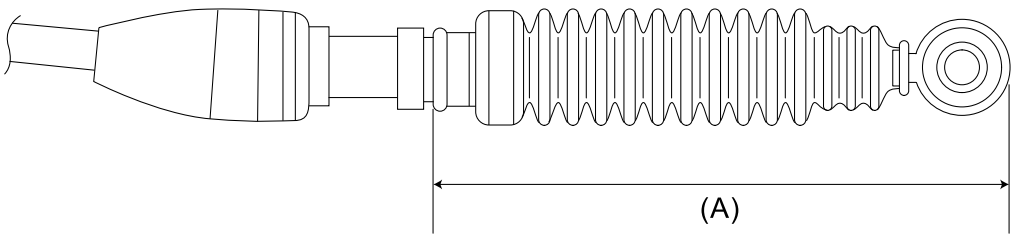
32. Remove the CVTF drain plug to drain CVTF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>REPLACEMENT.

33. Drain differential gear oil. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>REPLACEMENT.

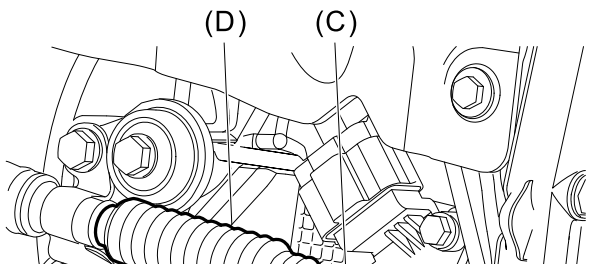
34. Remove the snap pin and washer from shifter arm and remove the select cable from shifter arm.

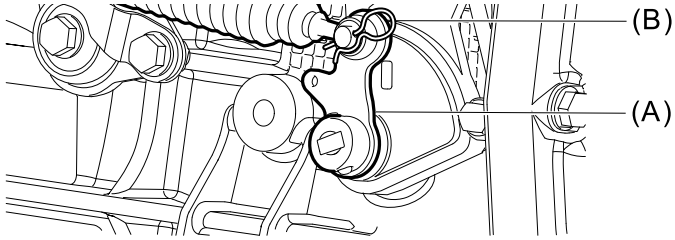
Caution:

Do not apply excessive load while holding the part (A).



CVT10415

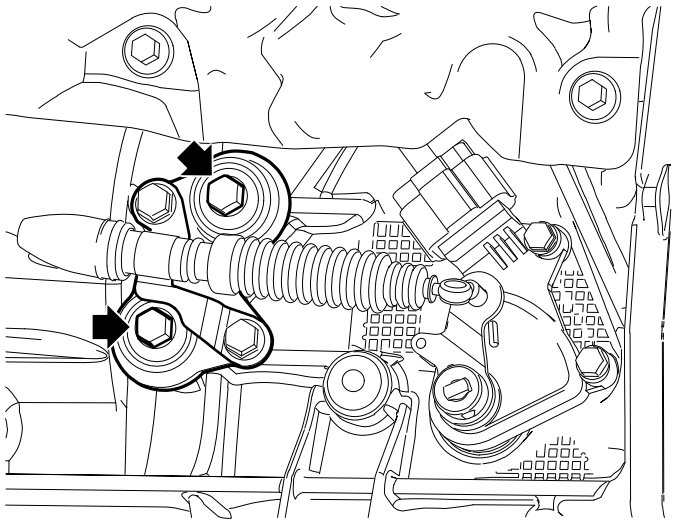




CVT00621

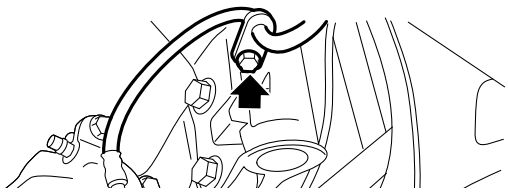
(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

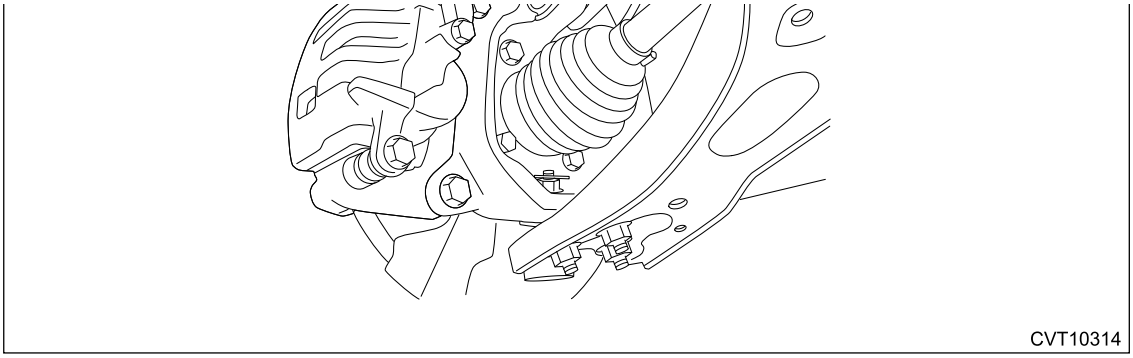
35. Remove the plate assembly from the transmission case.


CVT00622

36. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.

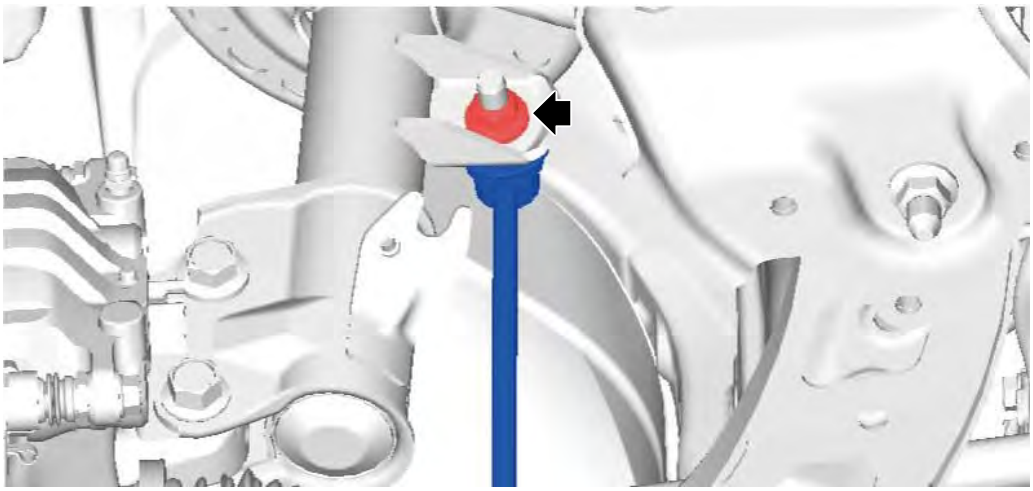
37. Remove the brake hose bracket.




CVT10314

38. Remove the front ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>REMOVAL.

39. Remove the stabilizer link.

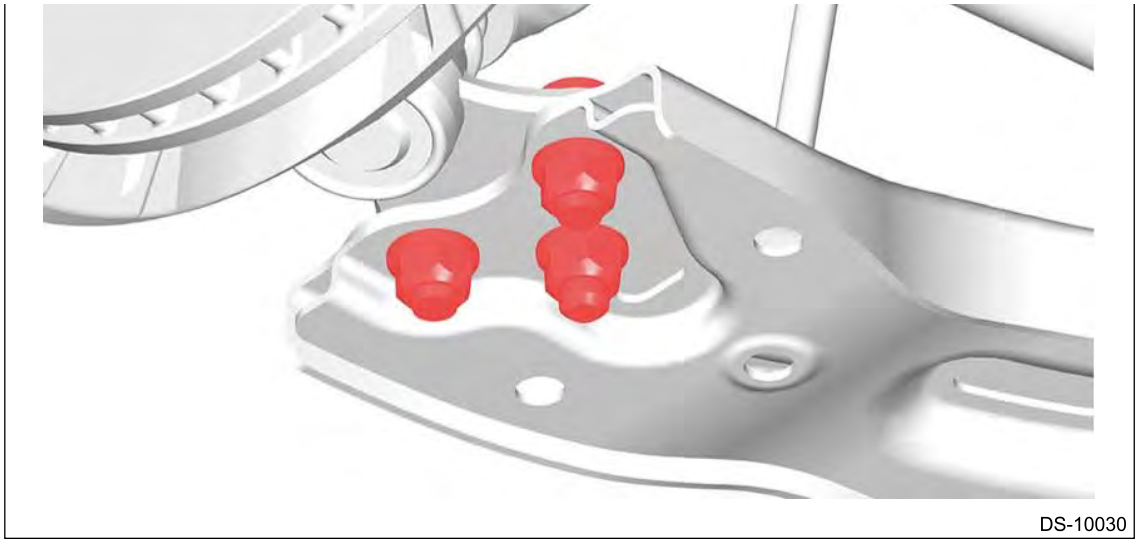

CVT10315

40. Separate the front arm assembly from the ball joint.

Note:

- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**
- **To prevent damage of the front arm assembly ball joint boot, place a wooden block, etc. between front arm assembly and ball joint.**





41. Using a tire lever or a crow bar, etc., pull out until the front drive shaft transmission side joint slides move smoothly.

Note:

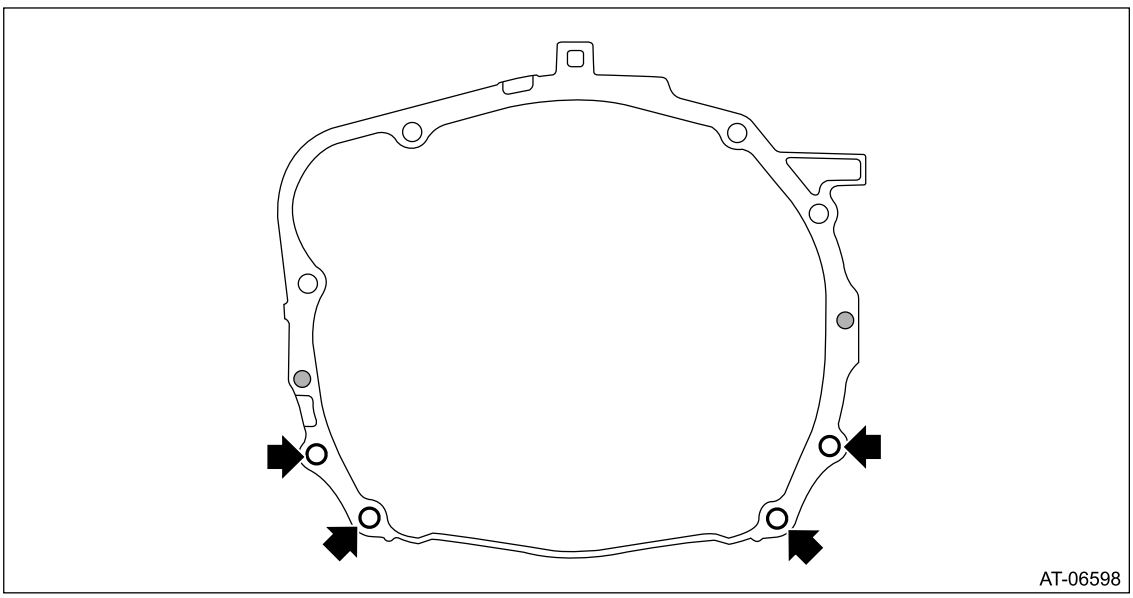
Place cloth between the tire lever or bar and the transmission in order to avoid damaging the transmission side retainer.

42. Hold the transmission side joint of the front drive shaft by hand and extract the housing from the transmission while pressing the housing outward, so as not to stretch the boot.

Note:

- **Before pulling the RH front drive shaft from transmission, turn the steering wheel to the right hand at full lock.**
- **Before pulling the LH front drive shaft from transmission, turn the steering wheel to the left hand at full lock.**

43. Remove the two transmission connecting bolts and two nuts (lower side).

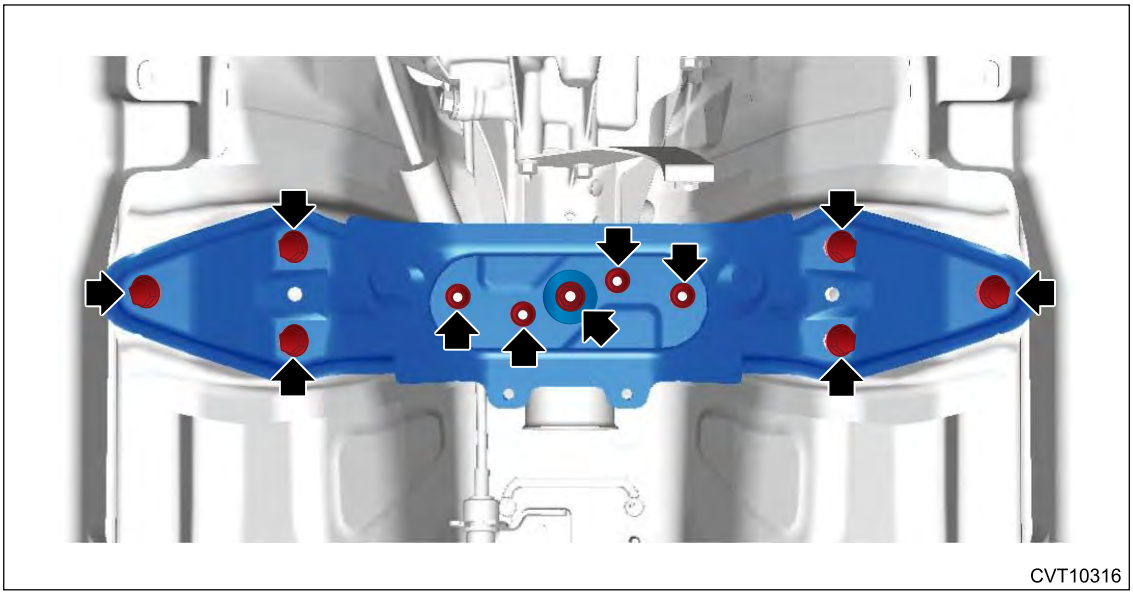


44. Set the transmission jack under the transmission.

Note:

Make sure that the support plates of transmission jack do not touch the oil pan.

45. Remove the hanger bracket.
46. Remove the transmission rear crossmember from the vehicle.

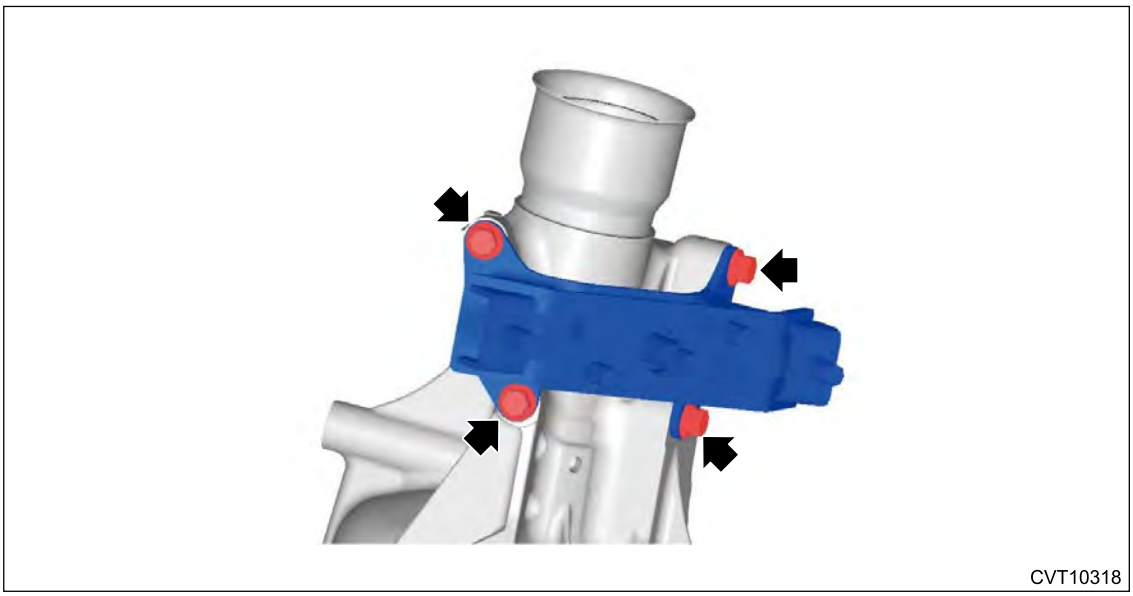


47. While lowering the transmission jack gradually, fully retract the engine support, and then tilt the engine rearward.
48. Remove the transmission assembly.

Note:

Remove it while moving the transmission jack up and down so that the engine and transmission remain directly aligned.

49. Remove the rear cushion rubber.



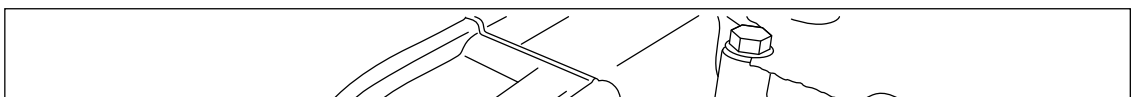
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Automatic Transmission Assembly

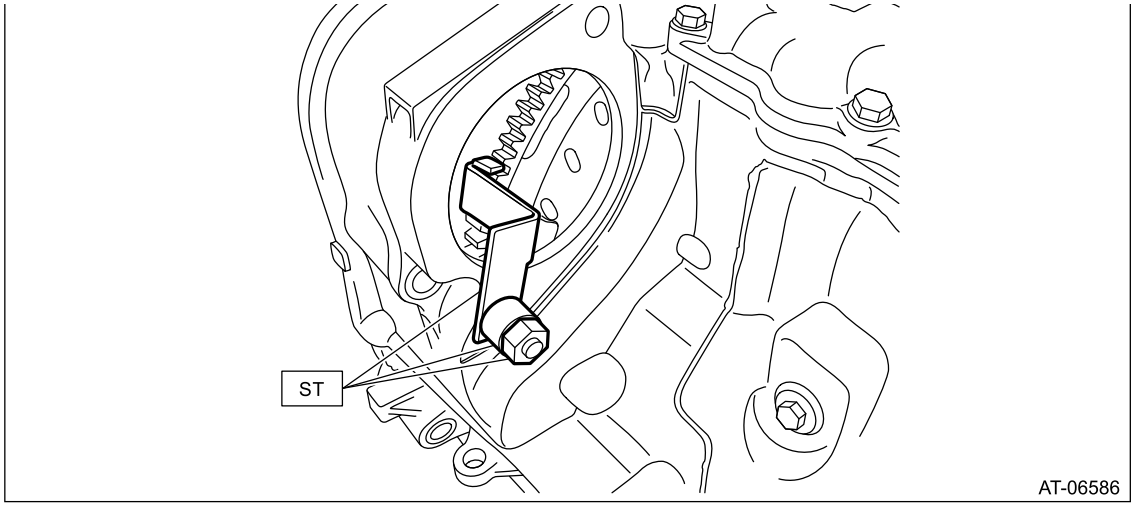
INSTALLATION

1. Attach the ST to converter case.

Preparation tool:

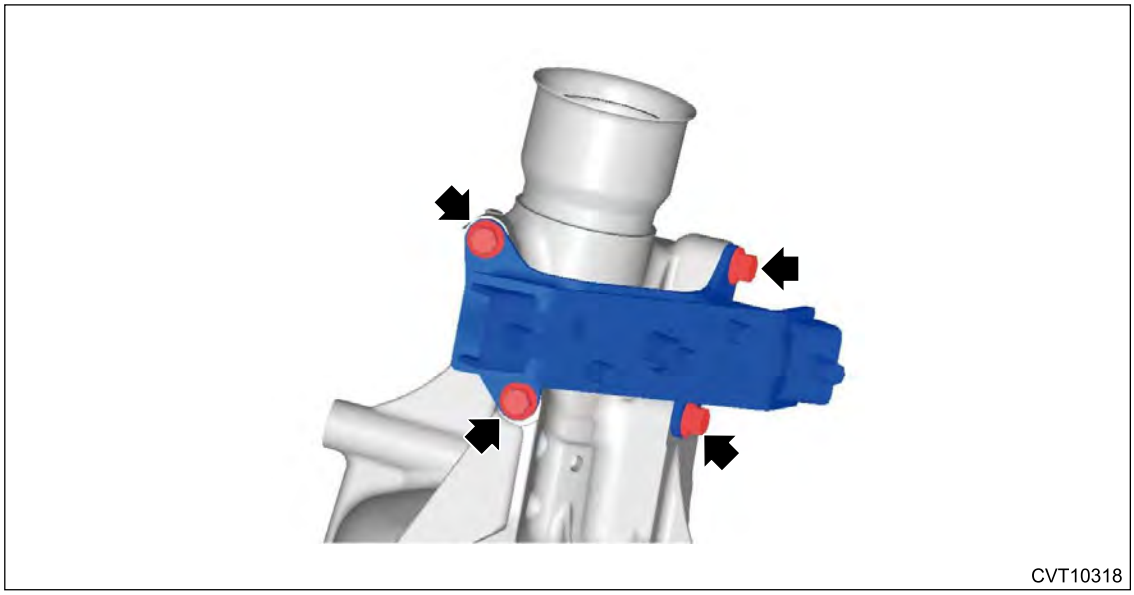
ST: STOPPER SET (498277200)



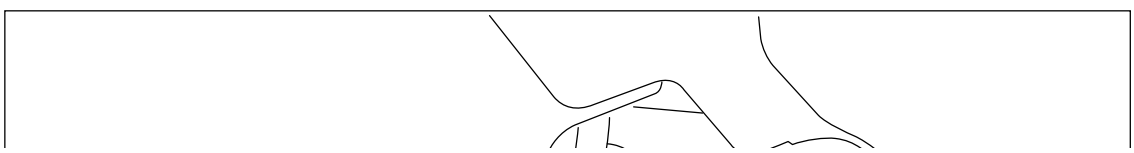


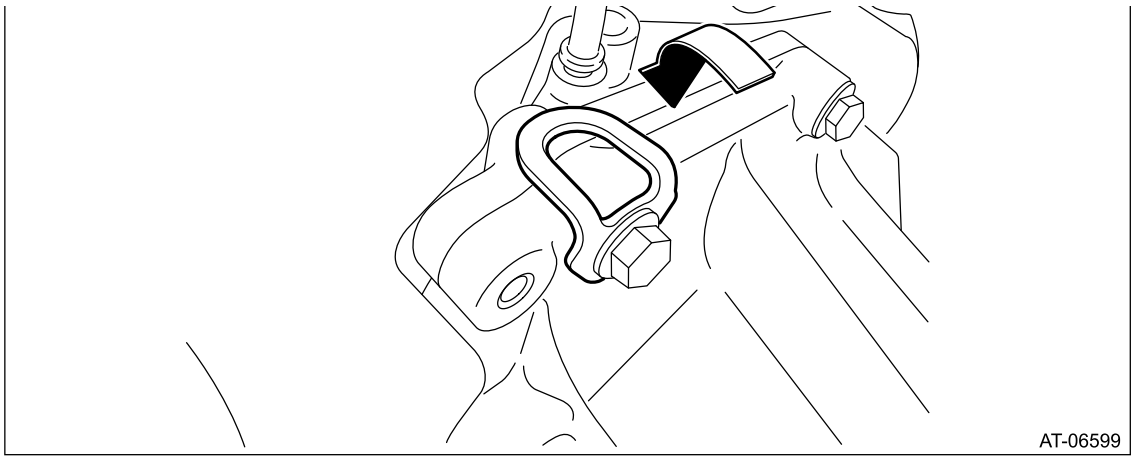
2. When completely overhauling the transmission, refill CVTF through the transmission right side plug. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Preparation for Overhaul.
3. Replace the front differential side retainer oil seal. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal>REPLACEMENT.
   Note:
   - **Be sure to replace the differential side retainer oil seal with a new part whenever the front drive shaft is removed from the transmission.**
   - **When a new differential side retainer oil seal has been installed, replacement is not required.**
4. Install the rear cushion rubber on the transmission.
   Tightening torque:

   40 N·m (4.1 kgf-m, 29.5 ft-lb)



5. Mount the transmission onto the transmission jack.
6. Strike and bend the transmission hanger of transmission rear with a rubber hammer etc. so that it gets in contact with the transmission case.
   Caution:
   Do not apply extra overload or impact to the transmission case.





7. Remove the pitching stopper bracket, if mounted.

8. Install the transmission onto the engine.

Note:

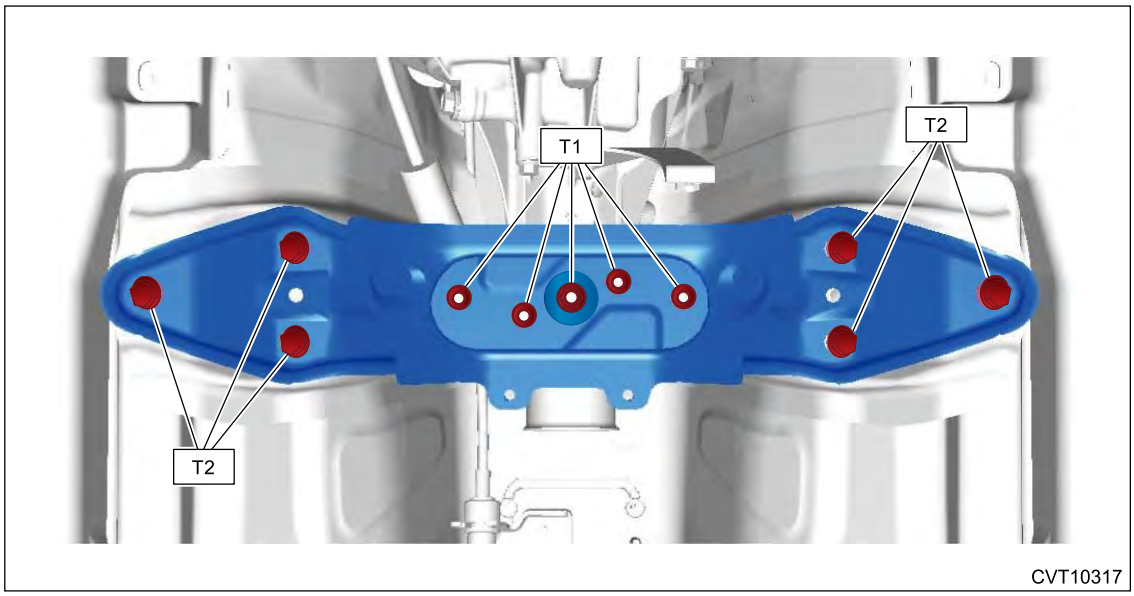
- **While raising the transmission jack gradually, turn the screw of engine support, then tilt the engine forward.**
- **Temporarily attach the two engine connecting bolts and two nuts (lower side).**

9. Install the transmission rear crossmember.

Tightening torque:

T1: 35 N·m (3.6 kgf-m, 25.8 ft-lb)

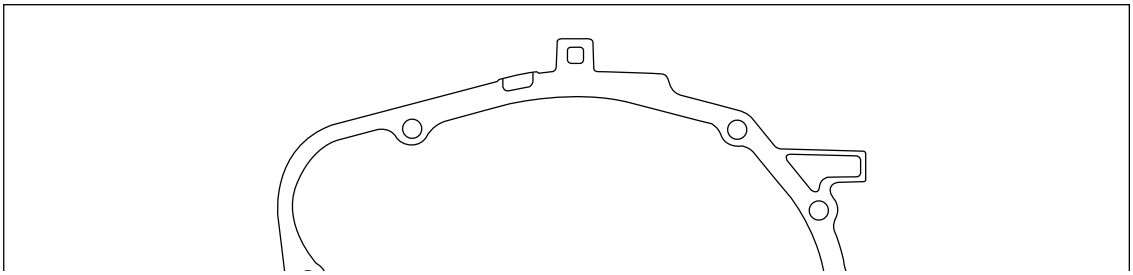
T2: 75 N·m (7.6kgf-m, 55.3 ft-lb)

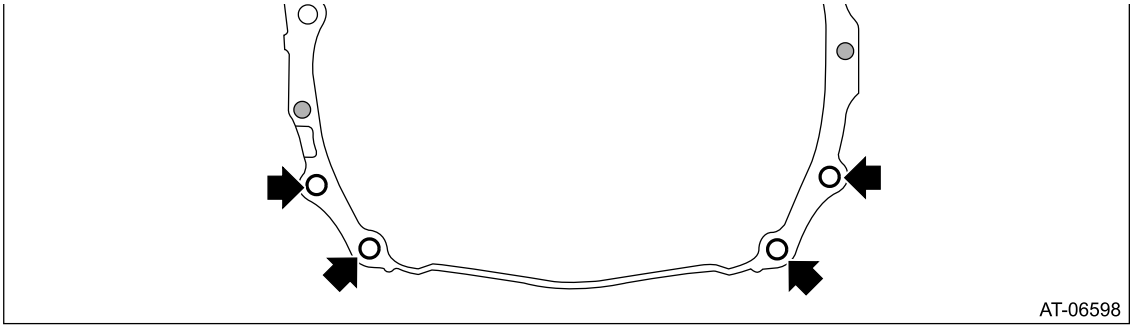


10. Tighten the two engine connecting bolts and two nuts (lower side).

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)

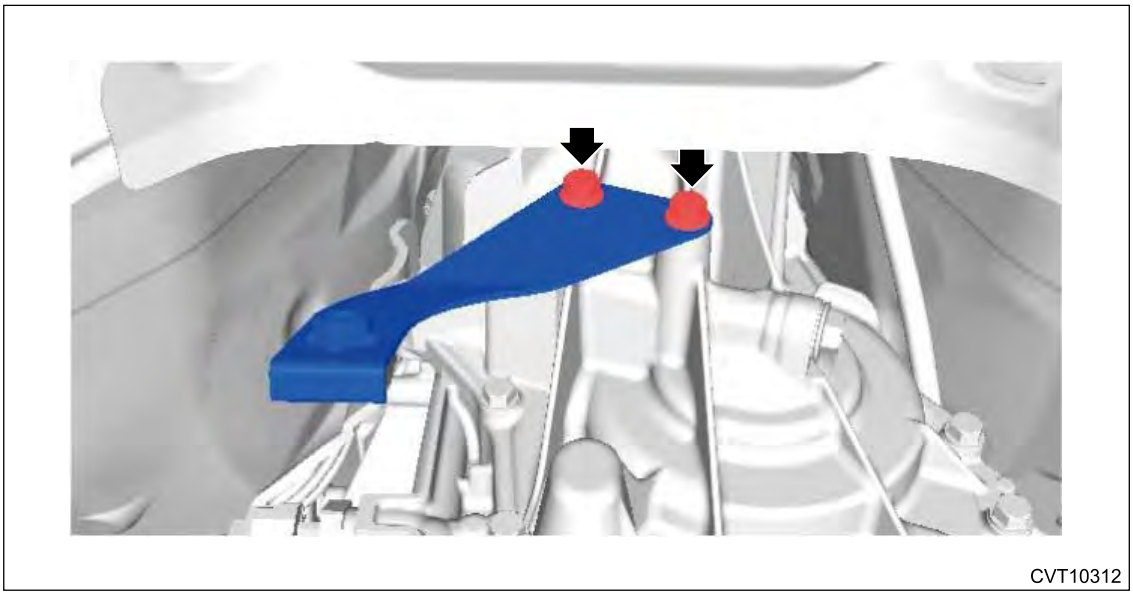




11. Install the exhaust hanger bracket.

Tightening torque:

23 N·m (2.3 kgf-m, 17.0 ft-lb)



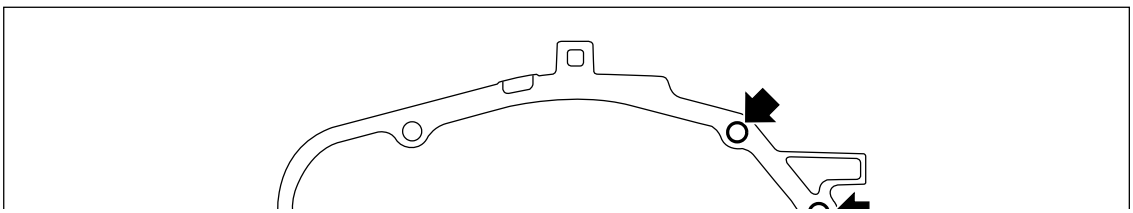
12. Remove the transmission jack.

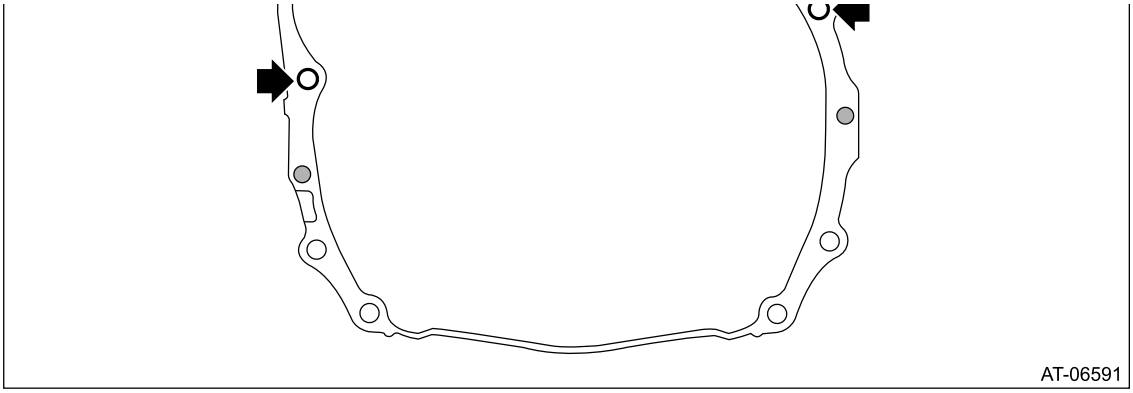
13. Lower the vehicle.

14. Install the three engine mounting bolts (upper side).

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)



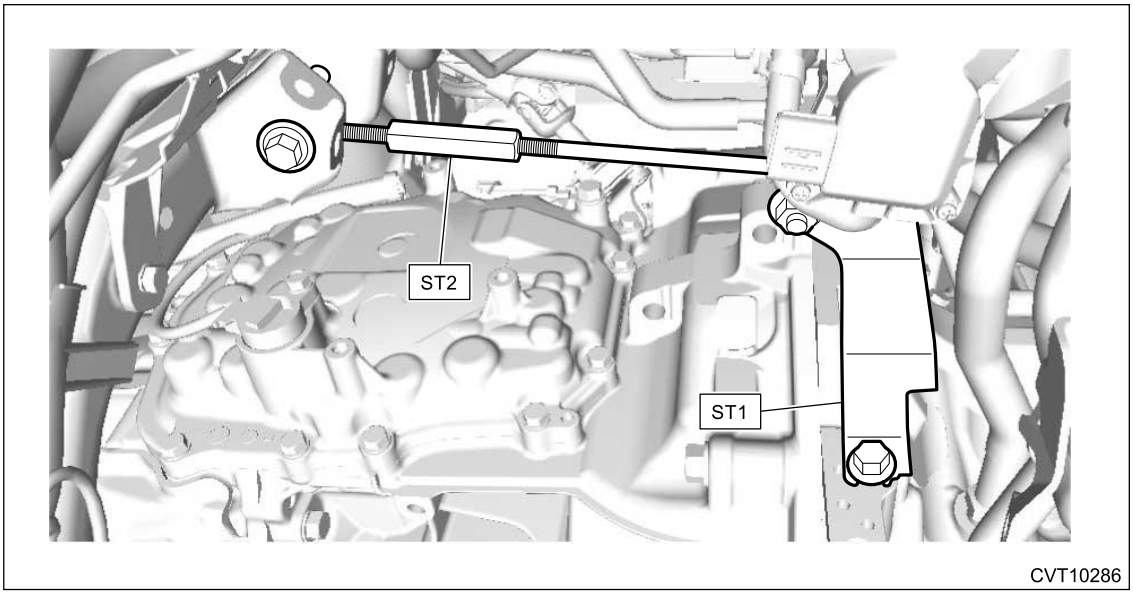


15. Remove the ST1 and ST2.

Preparation tool:

ST1: ENGINE SUPPORT BRACKET (41099AA012)

ST2: ENGINE SUPPORT (41099AA020)



16. Install the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>INSTALLATION.

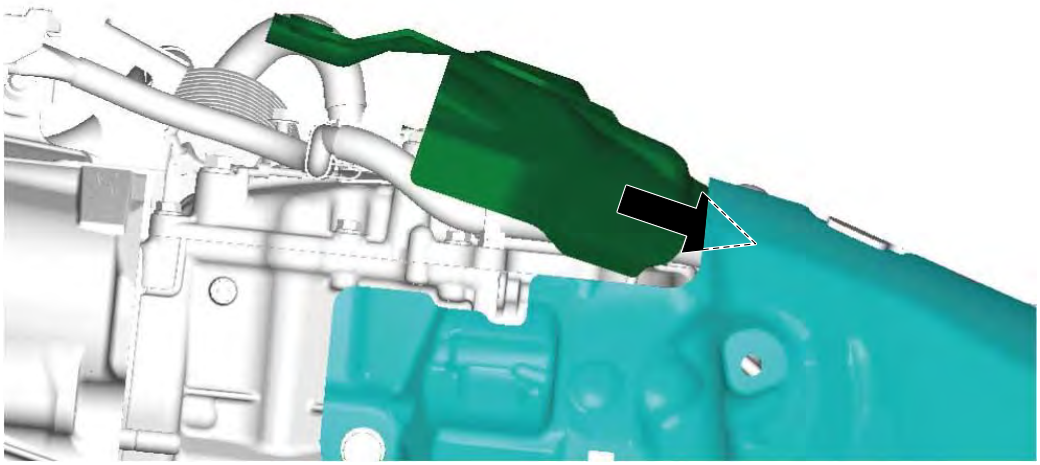
17. Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

Caution:

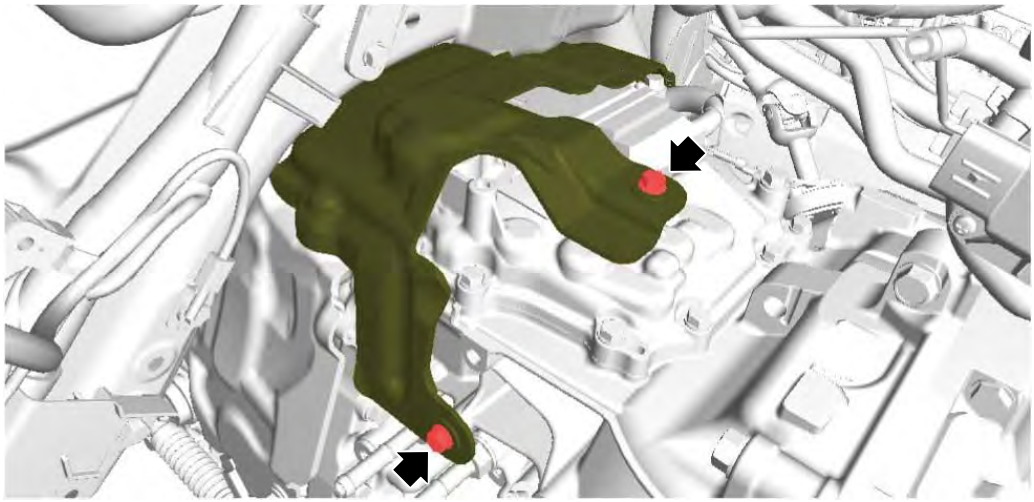
When inserting, be careful that the insulator inside transmission case cover is not turned over.

Tightening torque:

7 N·m (0.7kgf-m, 5.3 ft-lb)



CVT10293



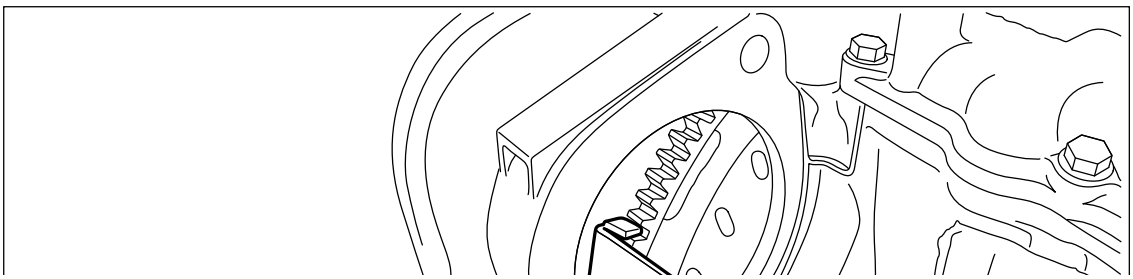
CVT10283

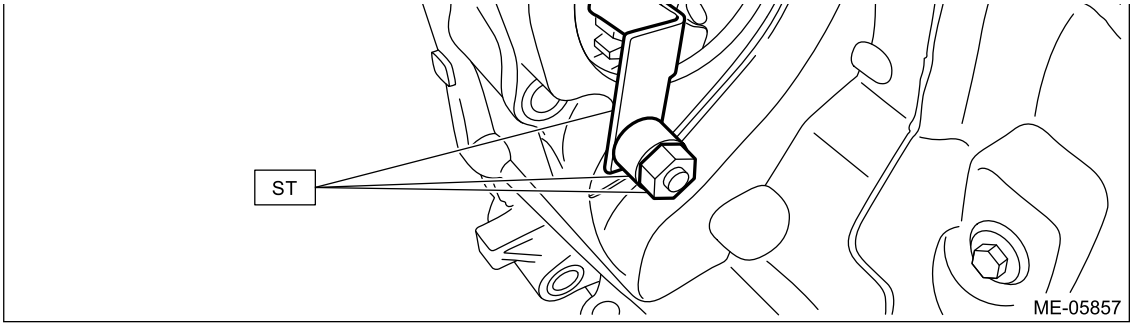
18. Install the torque converter assembly to the drive plate.

(1) Remove the ST from converter case.

Note:

Be careful not to drop the ST into the converter case when removing the ST.



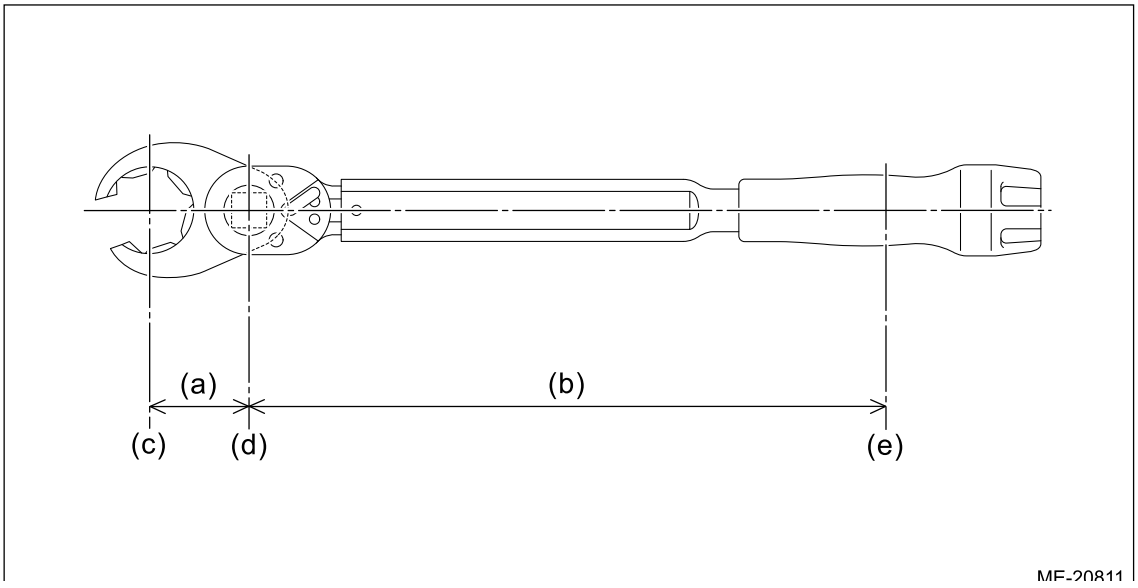


(2)Insert the wrench into the crank pulley bolt, and rotate the crank pulley to install the bolts which hold the torque converter assembly to the drive plate using the ST.

Note:

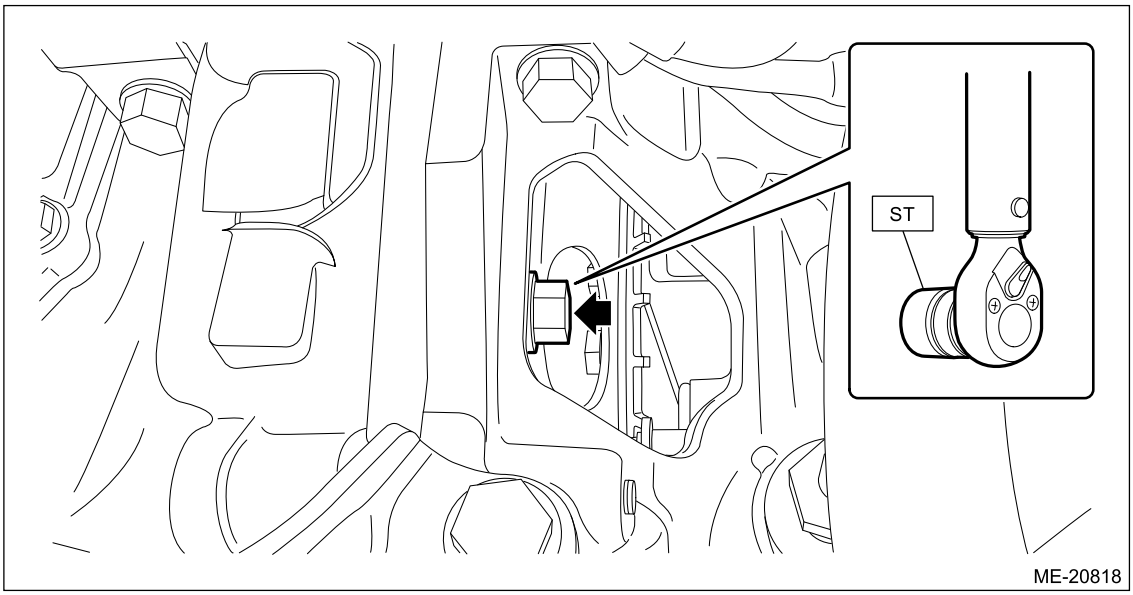
- **Be careful not to drop bolts into the converter housing.**
- **When not using the ST, use a crowfoot wrench for tightening.**
- **Use the following formula to calculate the reading of a torque wrench when tightening with a crowfoot wrench.**

Calculation formula
T = 25 N·m (2.5kgf-m, 18.4ft-lb) × L1/ (L1+L2)
T: Reading of the torque wrench L1: Effective length of the torque wrench L2: Effective length of the crowfoot wrench **Note:** **If the effective length of the tool used is unknown, consult the manufacturer of the tool.**



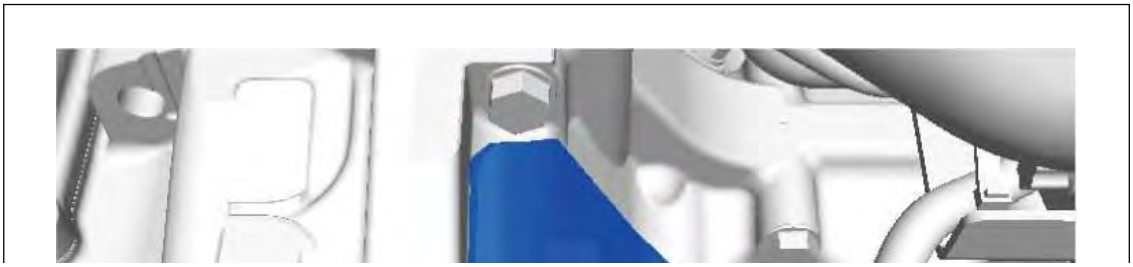
(a) Effective length of the crowfoot wrench
(b) Effective length of the torque wrench
(c) Center of the open end of crowfoot wrench
(d) Center of drive angle of the torque wrench
(e) Center of the position where a force is applied by hand

Preparation tool:
ST: SOCKET (18270AA050)
Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)



19. Install the remaining five bolts by rotating the crank pulley a little at a time in the same direction as engine revolution.
Tightening torque:
25 N·m (2.5 kgf-m, 18.4 ft-lb)

20. Install the service hole plug.



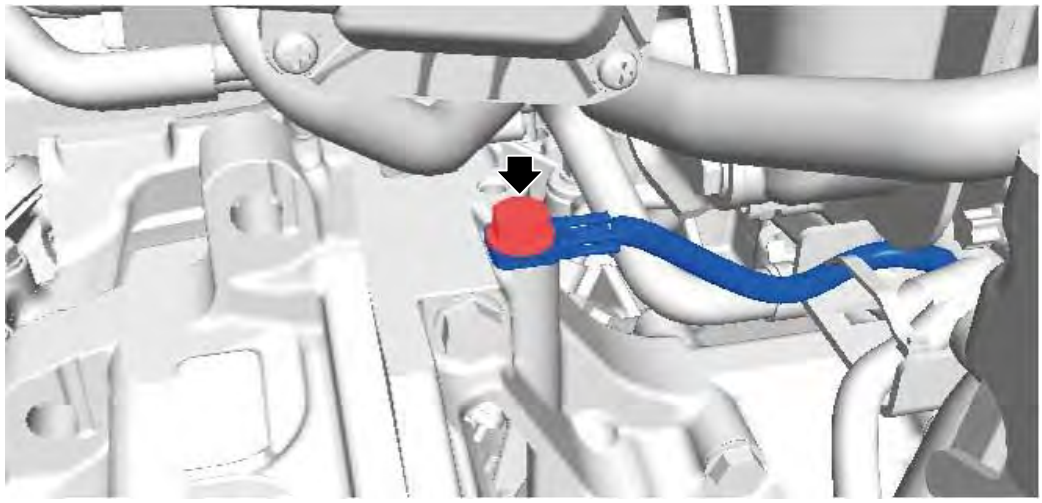


CVT10278

21. Install the engine ground terminals.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)

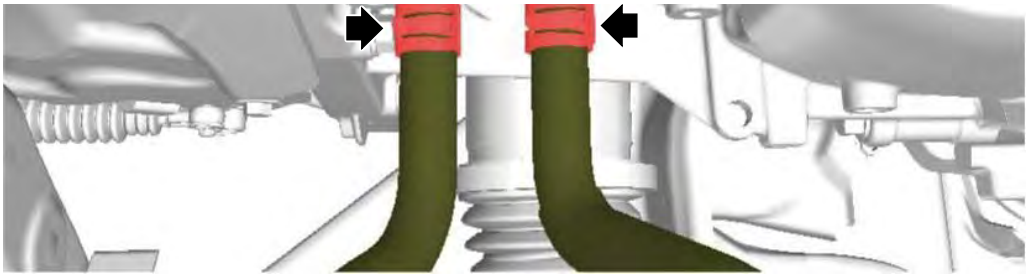


CVT10280

22. Replace the CVTF inlet hose and CVTF outlet hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF Cooler (With Warmer Function)>REMOVAL. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF Cooler (With Warmer Function)>INSTALLATION.

23. Install the CVTF inlet hose and CVTF outlet hose to transmission.



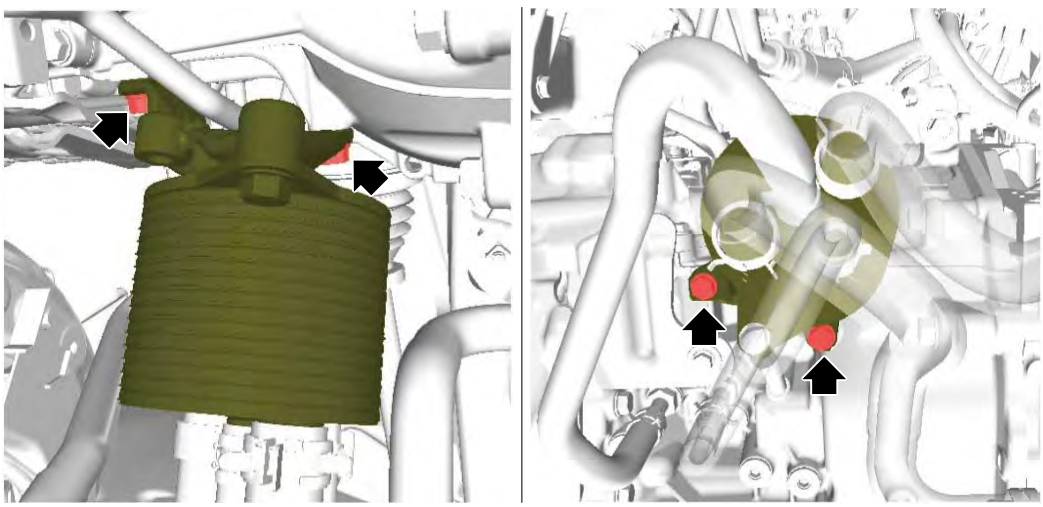


CVT10282

24. Install the CVTF cooler (with warmer feature) to the transmission.

Tightening torque:

23 N·m (2.3 kgf-m, 17.0 ft-lb)



CVT10281

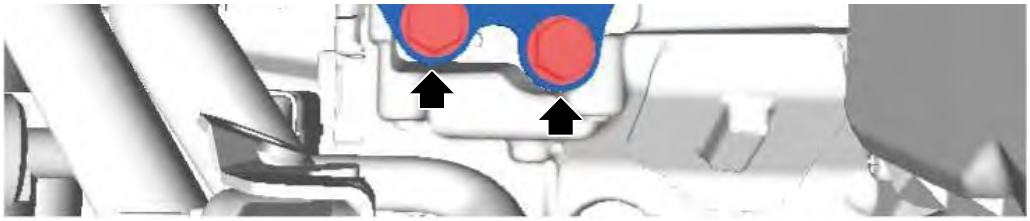
25. Install the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSTALLATION.

26. Install the engine hanger rear.

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)



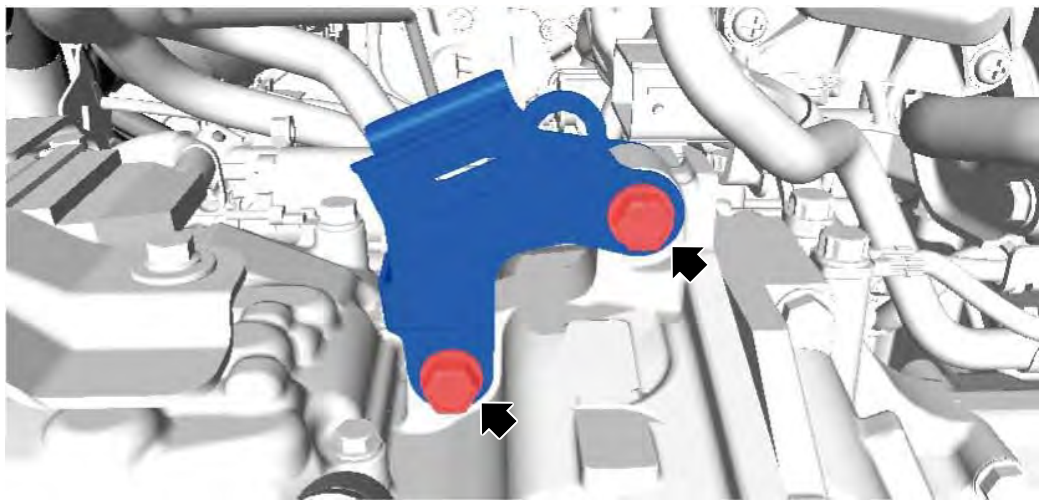


CVT10275

27. Install the pitching stopper bracket.

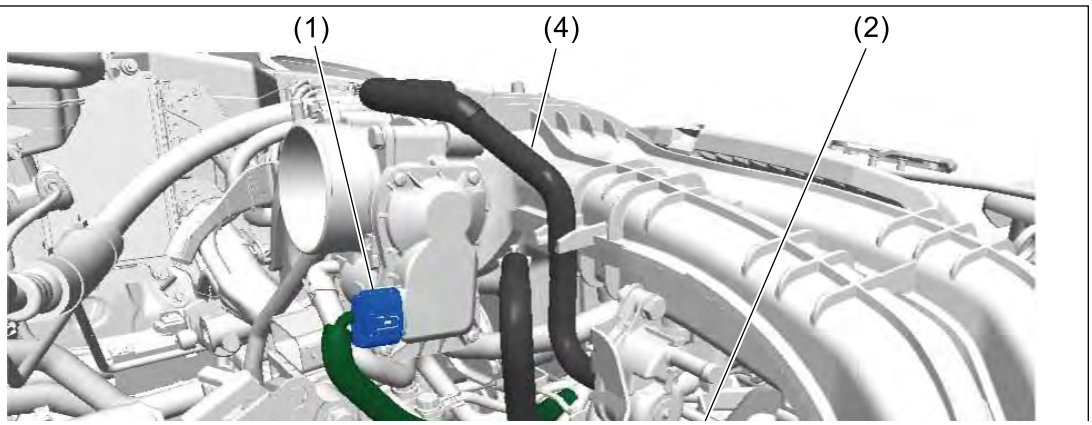
Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)



CVT10276

28. Connect the throttle position sensor harness connector (1), purge control solenoid valve harness connector (2), harness clip (3), vacuum hose (4) and PCV hose (5).





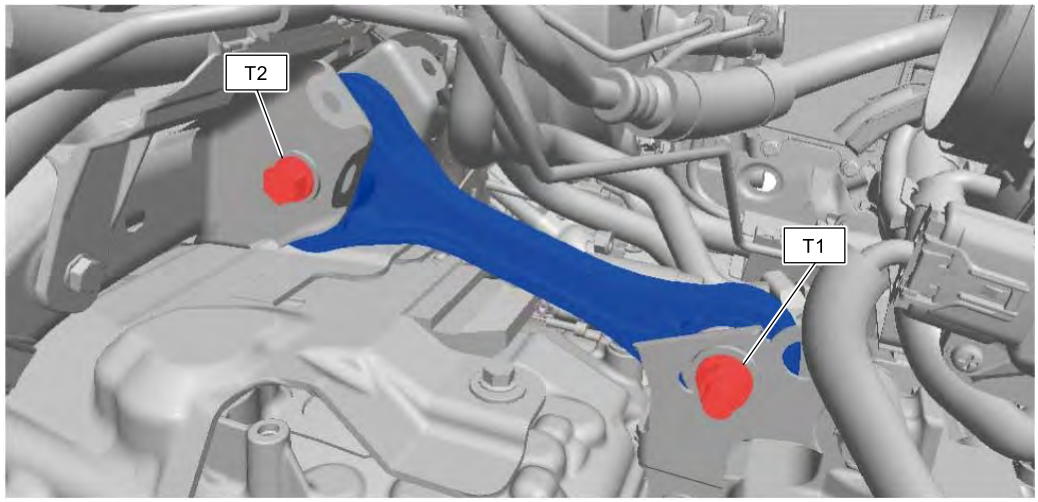
CVT10274

29. Install the pitching stopper.

Tightening torque:

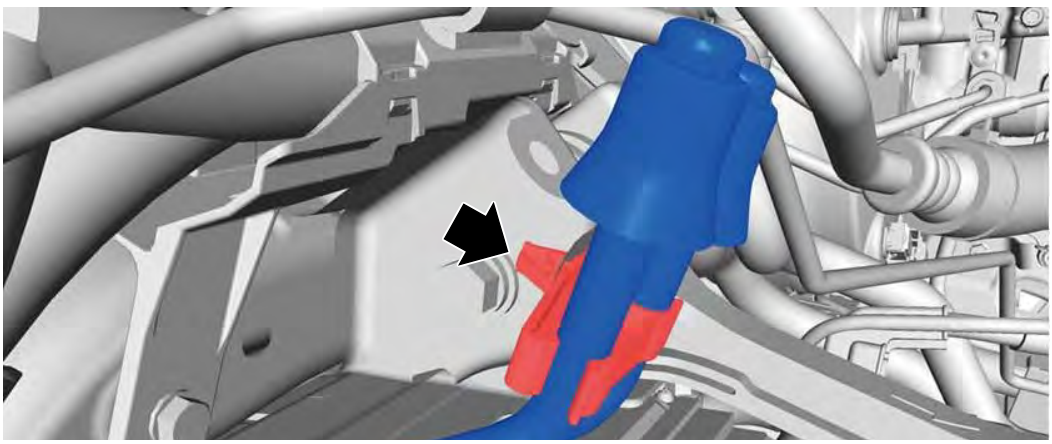
T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



CVT10319

30. Install the air breather hose and air breather hose bracket.



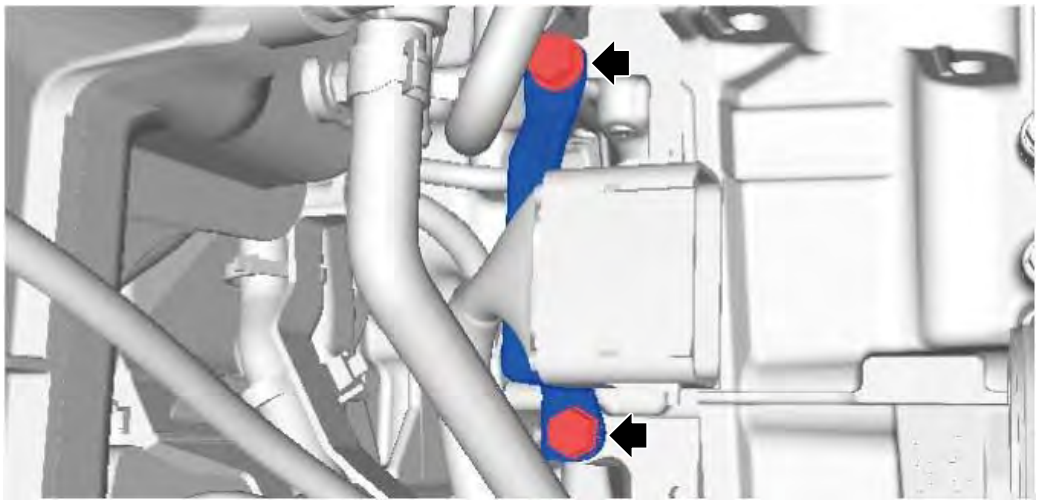


CVT10439

31. Install the engine harness connector bracket.

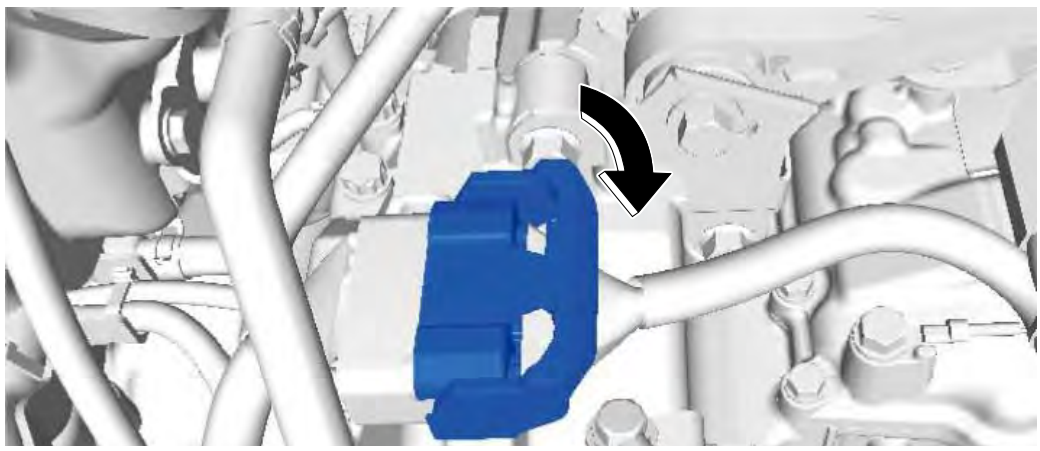
Tightening torque:

19 N·m (1.9 kgf-m, 14 ft-lb)



CVT10277

32. Connect the transmission harness connector.



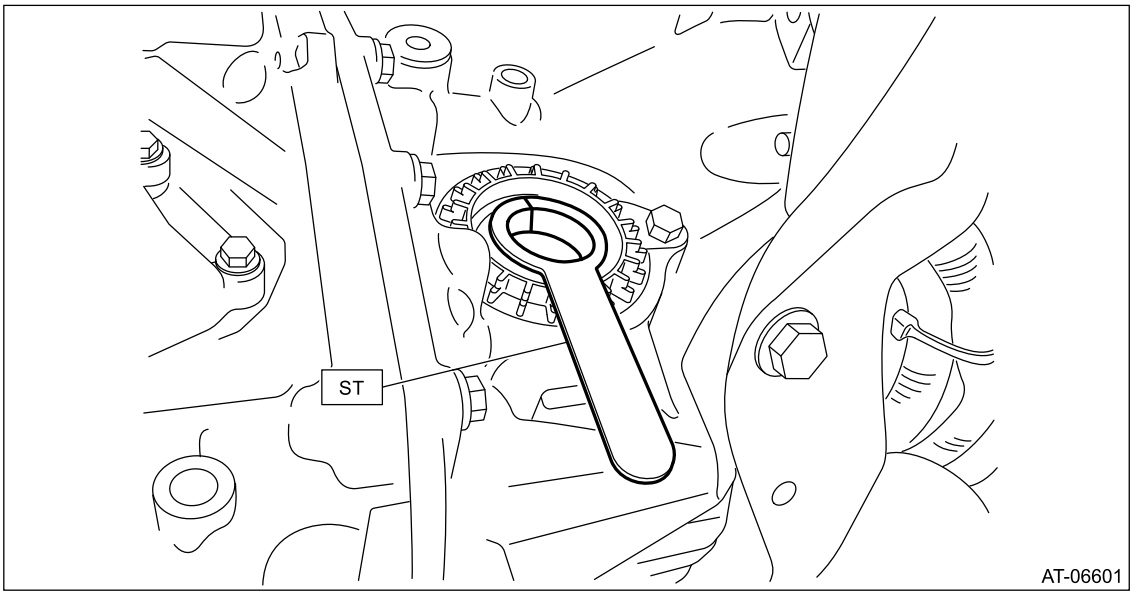

CVT10438

33. Lift up the vehicle.

34. Set the ST to the side retainer.

Preparation tool:

ST: OIL SEAL PROTECTOR (28399SA010)



AT-06601

35. Replace the circlip of the drive shaft with a new part.

36. Insert the front drive shaft spline section into transmission and remove the ST (OIL SEAL PROTECTOR).

Note:

- **Before inserting the RH front drive shaft into transmission, turn the steering wheel to the right hand at full lock.**
- **Before inserting the LH front drive shaft into transmission, turn the steering wheel to the left hand at full lock.**

37. Insert the drive shaft into the transmission securely by pressing the housing from outside of the vehicle.

Caution:

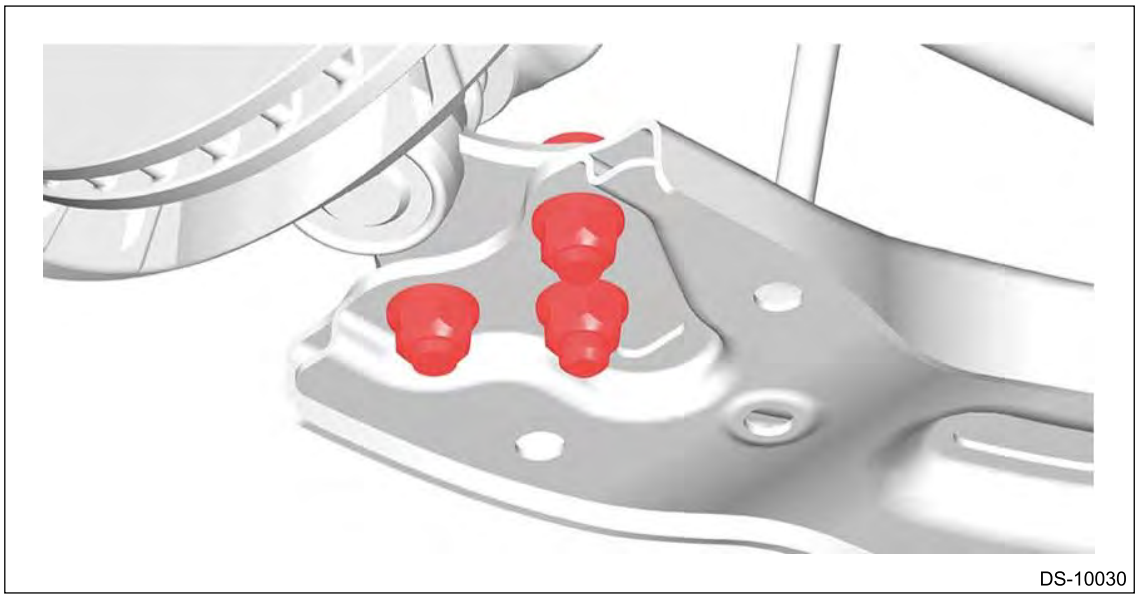
- **To prevent the front lower arm assembly from damaging the ball joint dust cover, place the ball joint on the upper side of the front lower arm assembly before starting the operation.**

- **Be careful not to damage the front lower arm assembly and ball joint by covering the upper side of the front lower arm assembly with a cloth.**

38. Insert the ball joint into the front arm assembly, and fix with nuts.

Tightening torque:

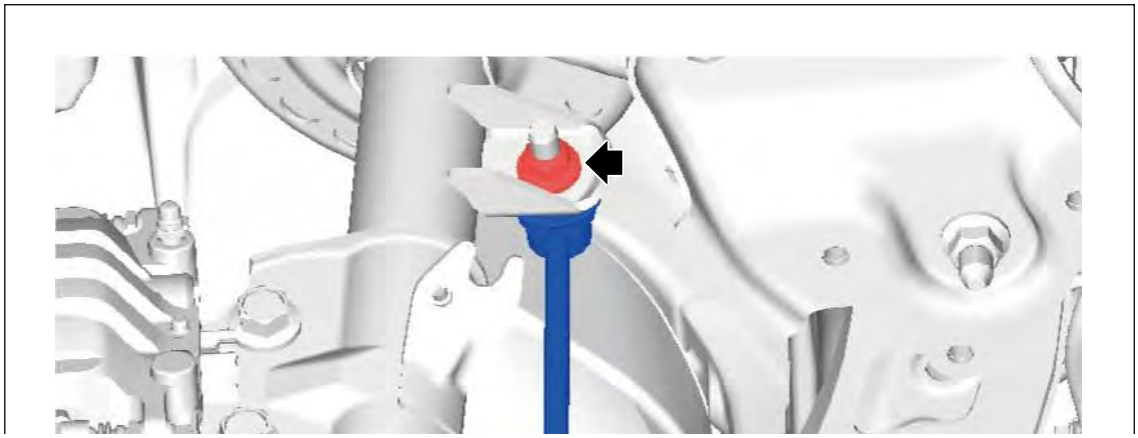
100 N·m (10.2kgf-m, 73.8 ft-lb)



39. Install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)





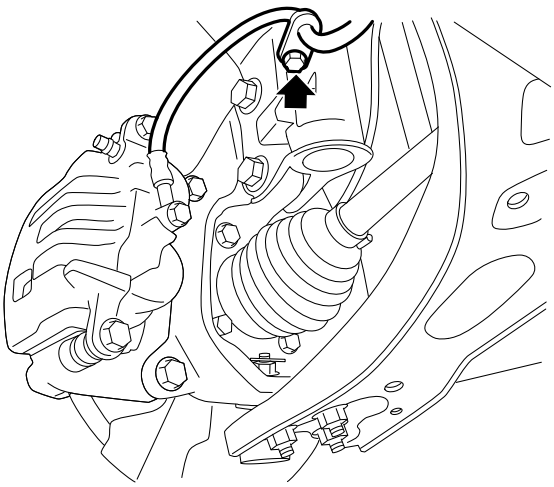
CVT10315

40. Install the front ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSTALLATION.

41. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4kgf-m, 24.3 ft-lb)

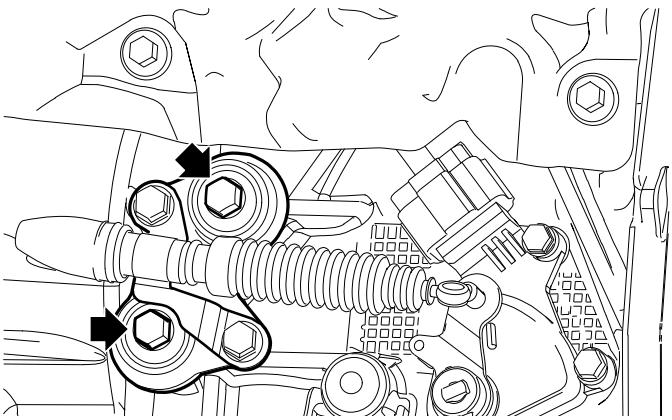


CVT10314

42. Install the plate assembly to transmission.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



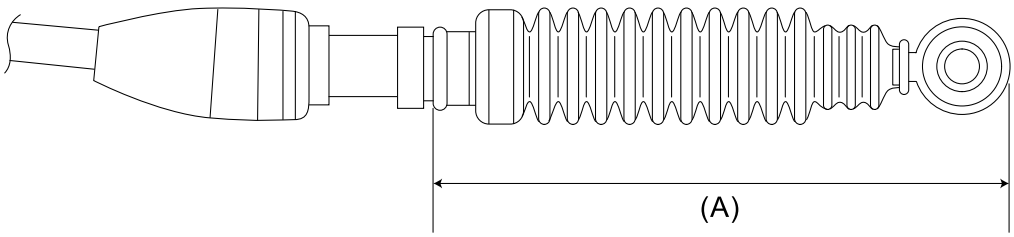


CVT00622

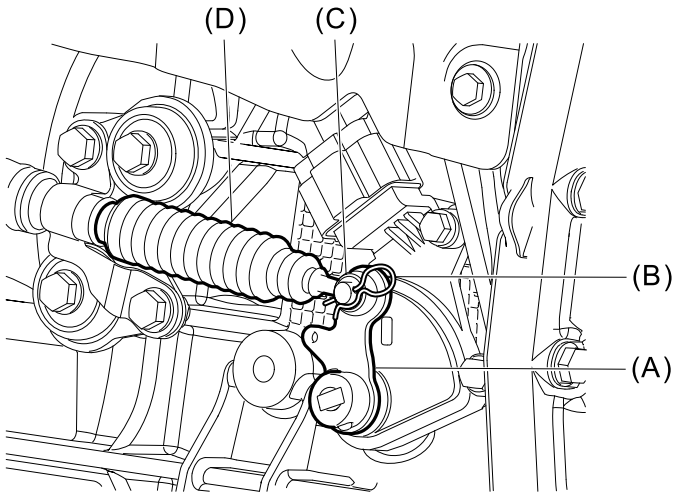
43. Install the washer and snap pin to the shifter arm.

Caution:

Do not apply excessive load while holding the part (A).



CVT10415



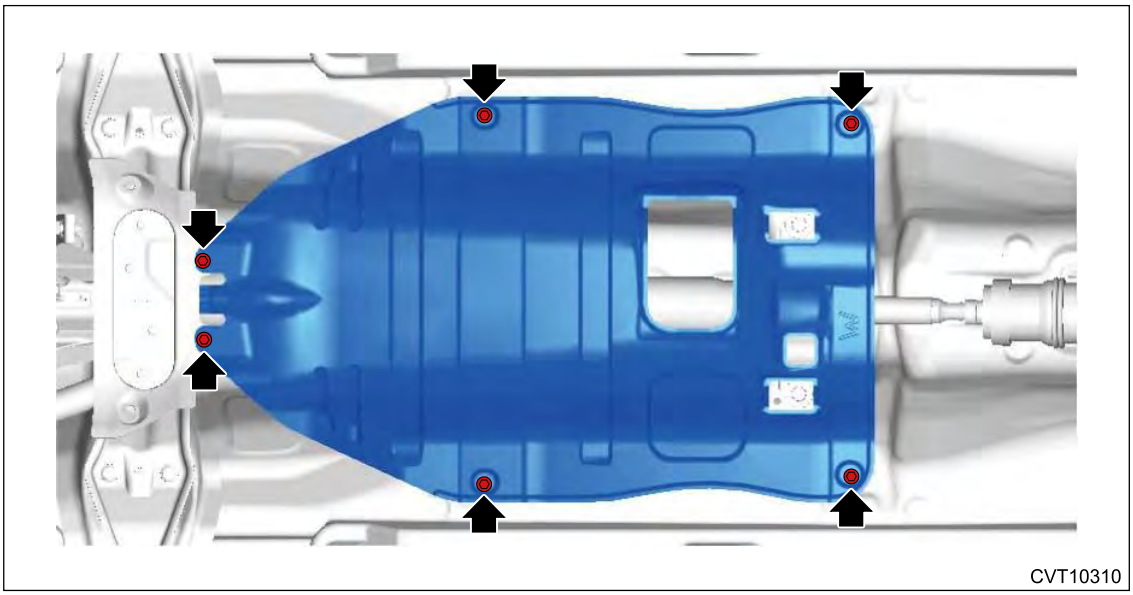
CVT00621

(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

44. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

45. Install the center exhaust cover.

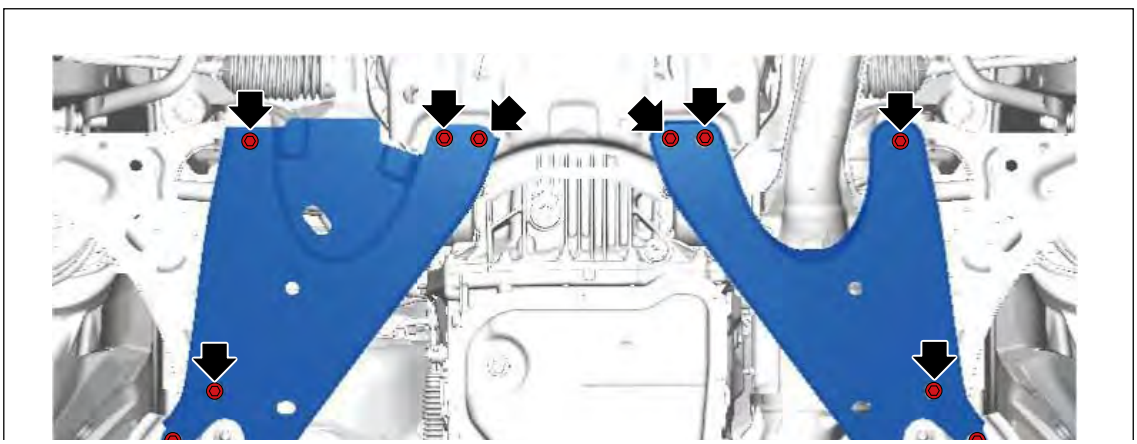
Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)

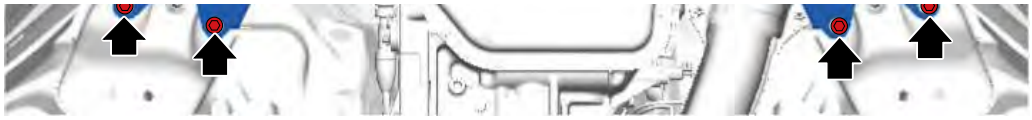


46. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

47. Install the crossmember support - rear.

Tightening torque:
70 N·m (7.1kgf-m, 51.6ft-lb)





CVT10313

48. Install the under cover.

49. Lower the vehicle.

50. Using the ST, tighten the self-locking nut of the front suspension strut mount.

Caution:

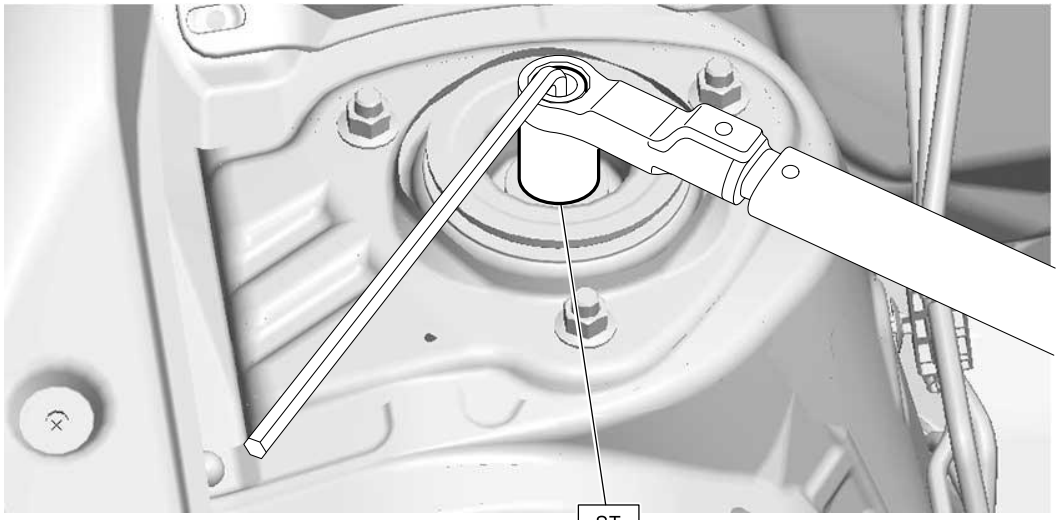
- **Use a new self-lock nut.**
- **Tighten in the state where the wheels are in full contact with the ground.**

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)

Tightening torque:

55 N·m (5.6kgf-m, 40.6ft-lb)

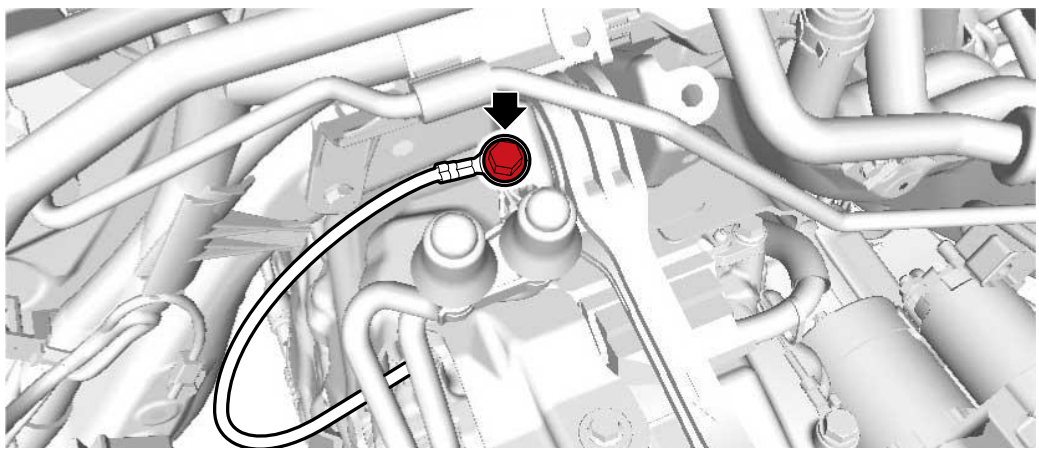


CVT10321

51. Connect the transmission radio ground terminal.

Tightening torque:

32.3 N·m (3.3 kgf-m, 23.8 ft-lb)




CVT10273

52. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

53. Install the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

54. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

55. Refill differential gear oil to adjust the differential gear oil amount. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>ADJUSTMENT.

56. Refill CVTF to adjust the CVTF amount. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

57. Using the Subaru Select Monitor, perform [Clear AT learning value] on [Work Support], and perform [AT learning mode]. Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control>PROCEDURE.

58. Execute the rear differential inspection mode. Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.

Caution:

Always execute the rear differential inspection mode at the replacement of the following.

- **Replacement of transmission assembly**
- **Replacement of front differential hypoid gear set**

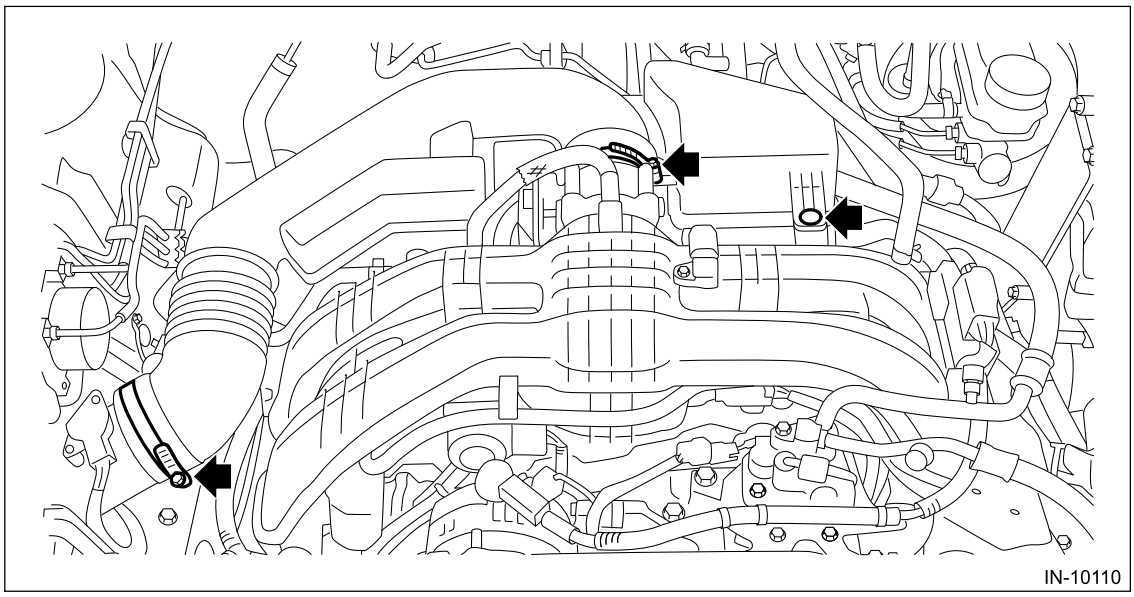
59. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

60. Perform the road test to make sure there is no fault. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Road Test>INSPECTION.

REMOVAL

1. PITCHING STOPPER

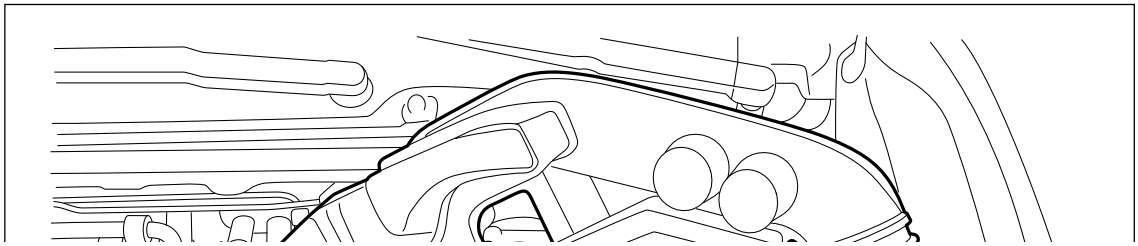
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.

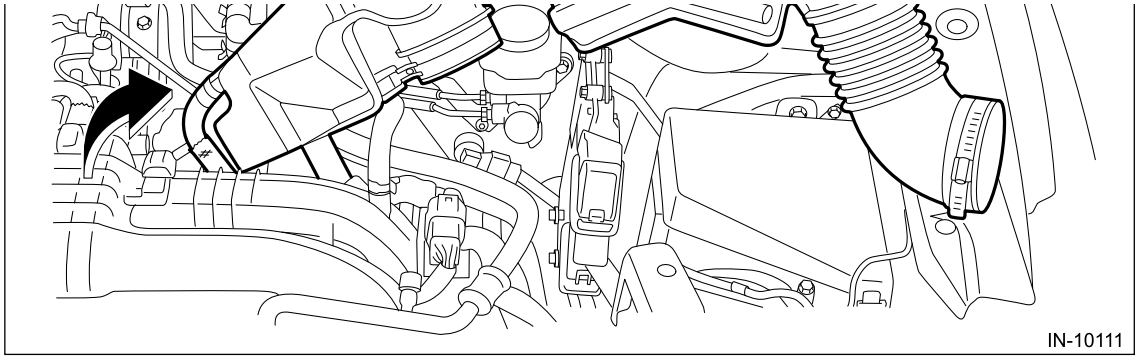


3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

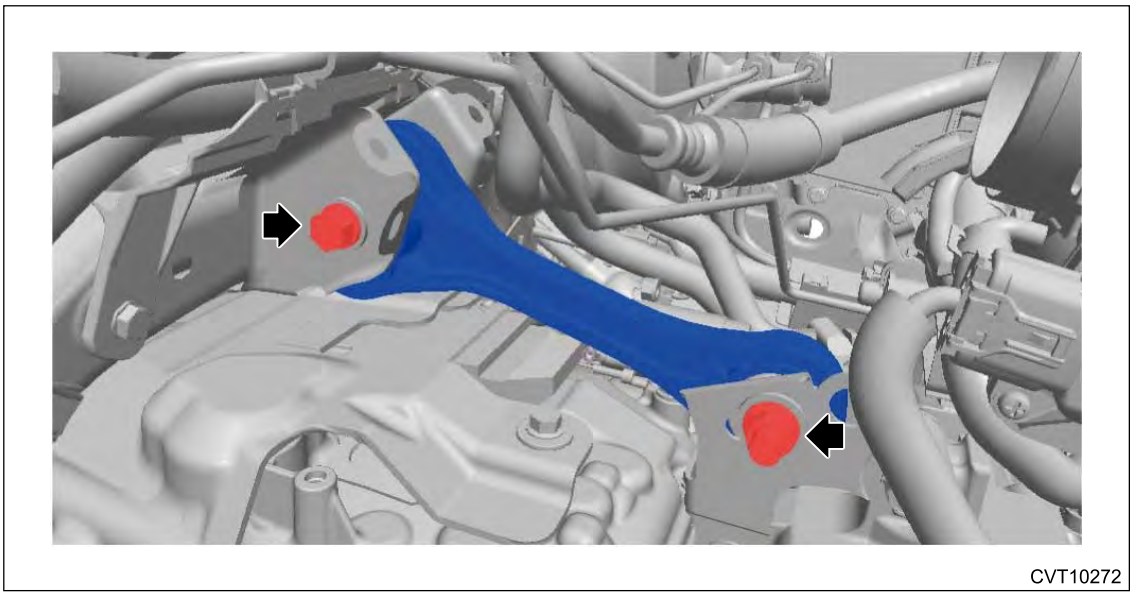
Note:

Be careful not to pull out the PCV hose.



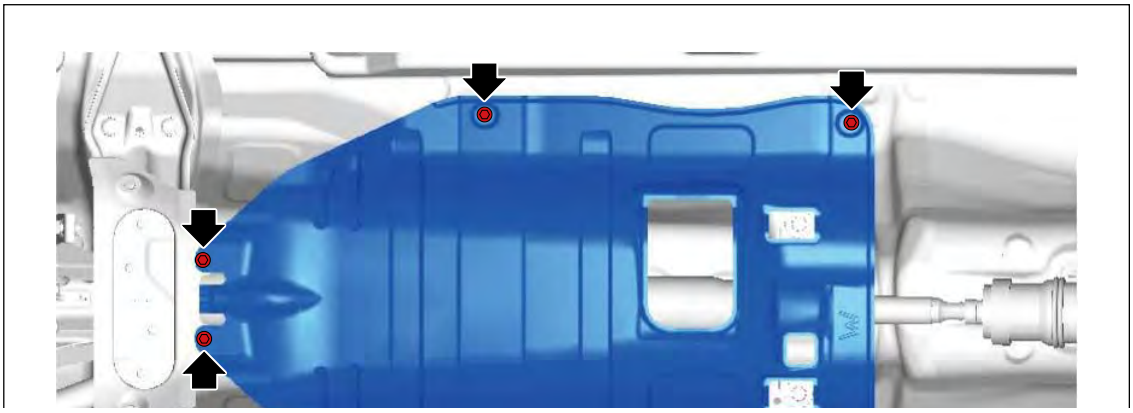


4. Remove the pitching stopper.



2. TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER

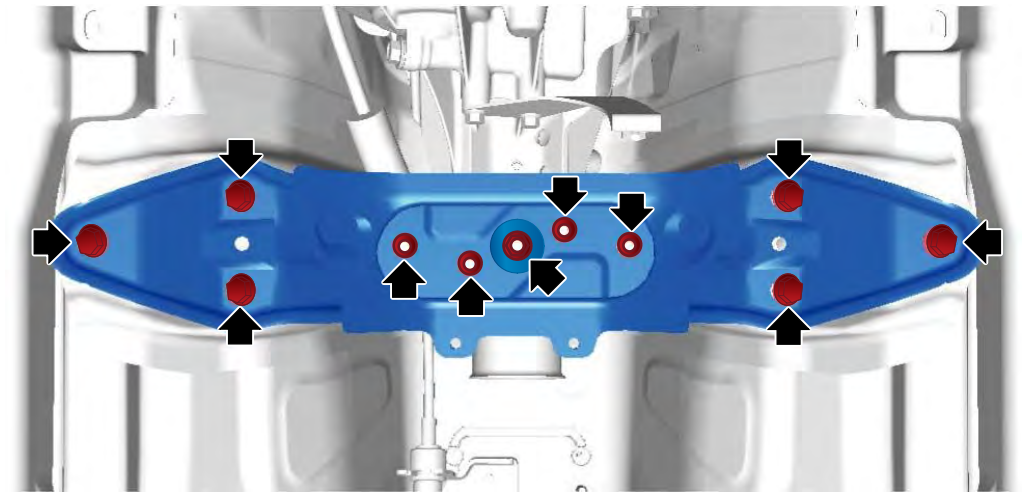
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Lift up the vehicle.
3. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
4. Remove the center exhaust cover.





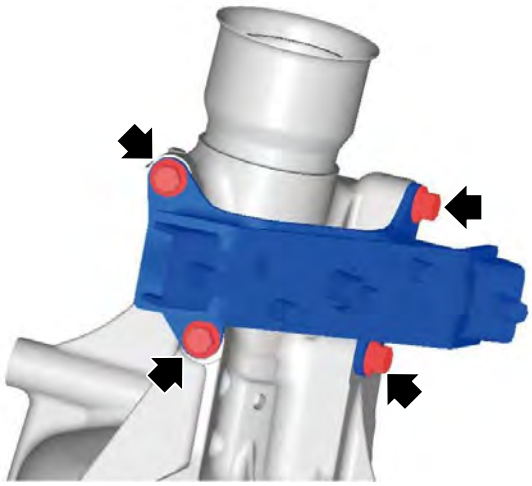
CVT10310

5. Set the transmission jack under the transmission. Make sure that the support plate of transmission jack does not touch the oil pan.
6. Remove the transmission rear crossmember.



CVT10316

7. Remove the rear cushion rubber.

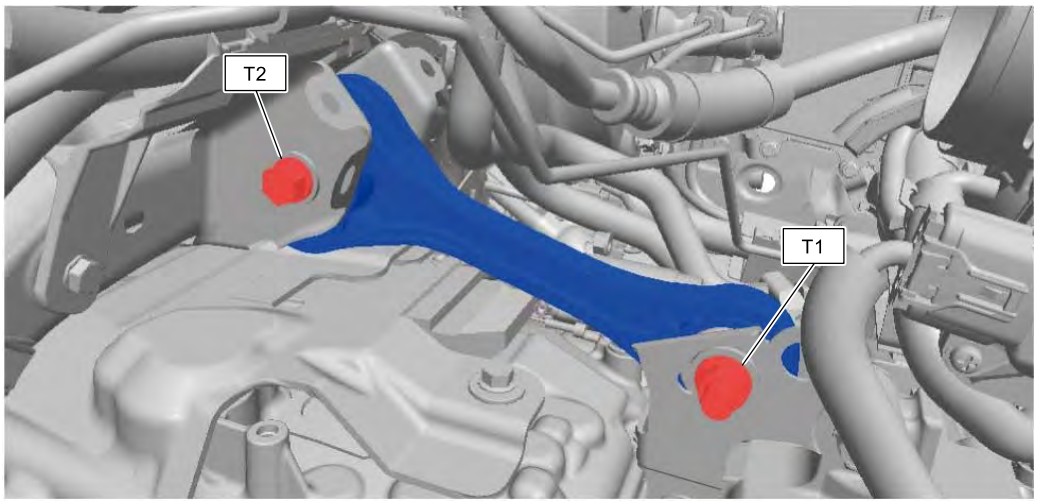


CVT10318

INSTALLATION

1. PITCHING STOPPER

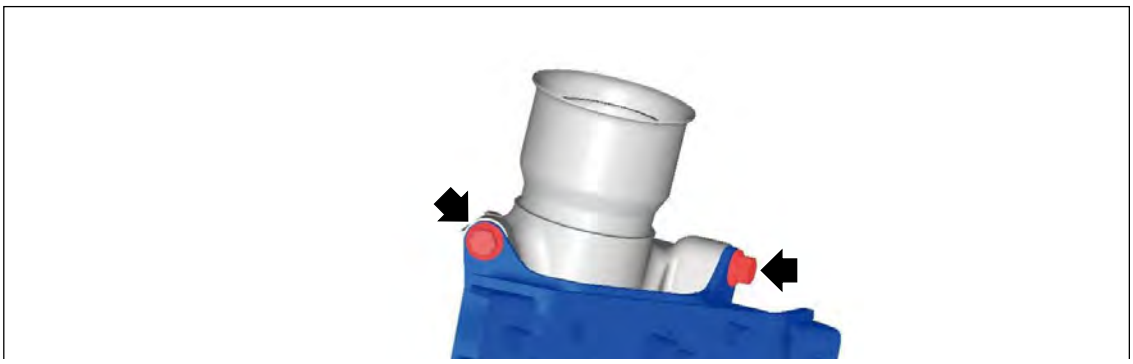
1. Install the pitching stopper.
   Tightening torque:
   T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)
   T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)

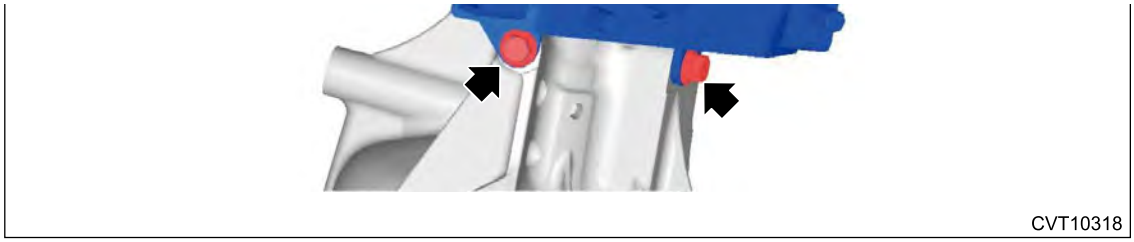


2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

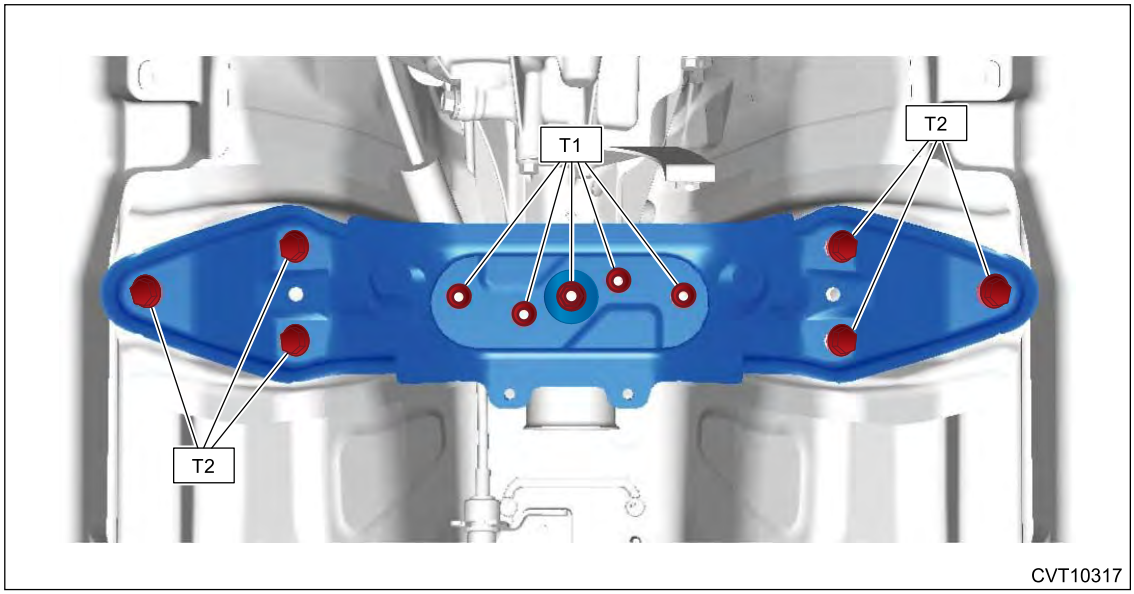
2. TRANSMISSION REAR CROSSMEMBER AND REAR CUSHION RUBBER

1. Attach the rear cushion rubber to the transmission.
   Tightening torque:
   40 N·m (4.1 kgf-m, 29.5 ft-lb)





2. Install the transmission rear crossmember.
   Tightening torque:
   T1: 35 N·m (3.6 kgf-m, 25.8 ft-lb)
   T2: 75 N·m (7.6 kgf-m, 55.3 ft-lb)



3. Remove the transmission jack.
4. Install the center exhaust cover.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
5. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Mounting System

INSPECTION

- Check the crossmember for bends or damage.
- Check that the cushion rubber is not stiff, cracked or otherwise damaged.
- Check the pitching stopper for bends or damage.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case Oil Seal

INSPECTION

Check for leakage of CVTF from the joint section of transmission and propeller shaft. If a leak is found, inspect the propeller shaft and replace the oil seal.

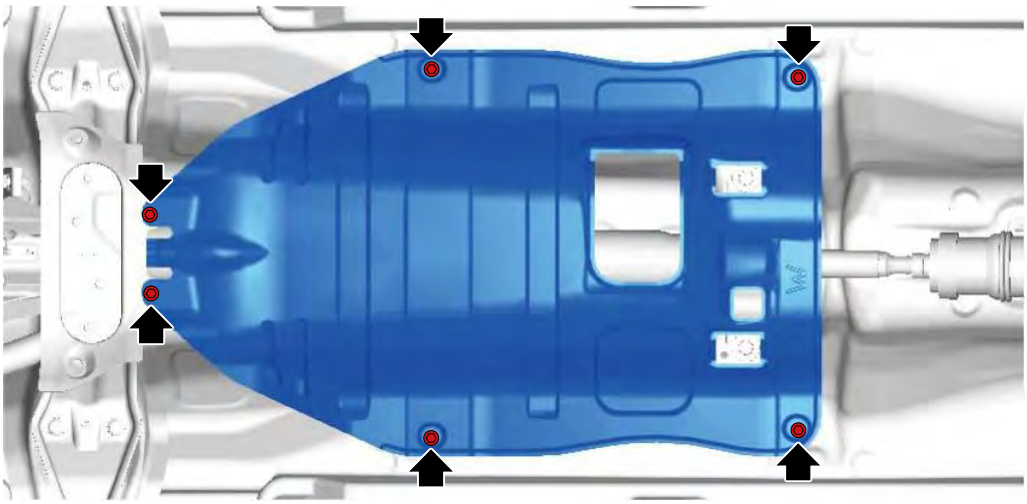
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case Oil Seal

REPLACEMENT

Caution:

Immediately after the vehicle has been running or after idling for a long time, the CVTF will be hot. Be careful not to burn yourself.

1. Lift up the vehicle.
2. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
3. Remove the center exhaust cover.



4. Clean the transmission exterior.
5. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
6. Using a screwdriver or ST, remove the oil seal trying not to damage the extension case.

6. Using a screwdriver or ST, remove the oil seal trying not to damage the extension case.
   Preparation tool:
   ST: PULLER ASSY (398527700)
7. Using the ST, install the oil seal.
   Note:
   - **Use a new oil seal.**
   - **Apply CVTF to the oil seal lip and press-fitting surface.**

   Preparation tool:
   ST: INSTALLER (498057300)
8. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.
9. Install the center exhaust cover.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
10. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
11. Adjust the CVTF level and check there is no leakage. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Differential Side Retainer Oil Seal

INSPECTION

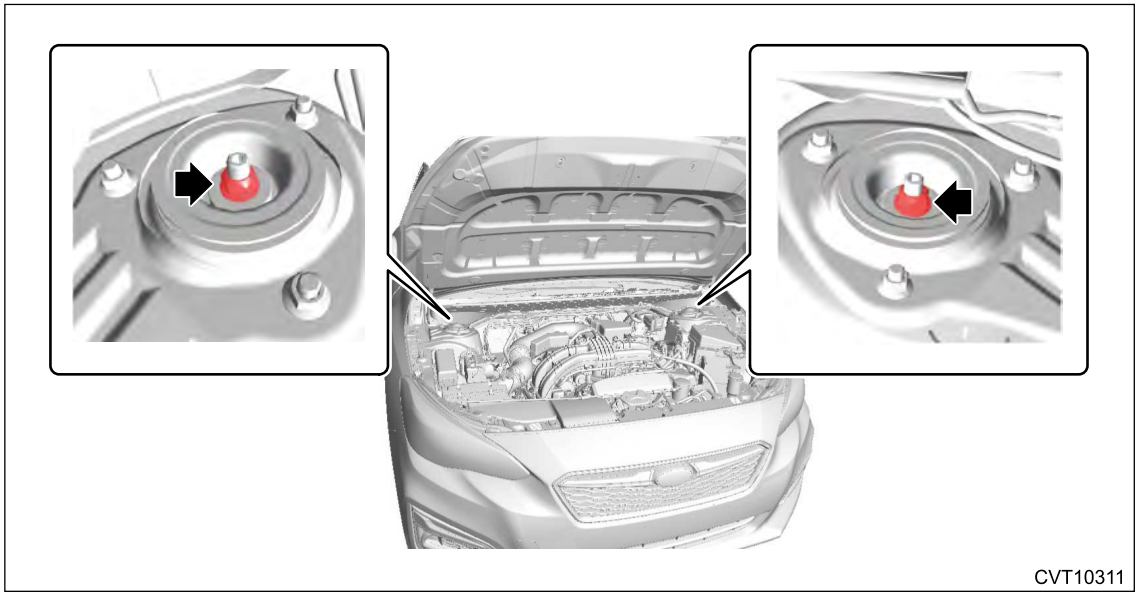
Check for leakage of gear oil from differential side retainer oil seal part. If there is an oil leak, inspect the front drive shaft and replace the oil seal.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Differential Side Retainer Oil Seal

REPLACEMENT

Caution:
- **Immediately after the vehicle has been running or after idling for a long time, the differential gear oil will be hot. Be careful not to burn yourself.**
- **Be careful not to spill the differential gear oil on exhaust pipe to prevent it from emitting smoke or fire. If differential gear oil is spilled on the exhaust pipe, wipe it off completely.**

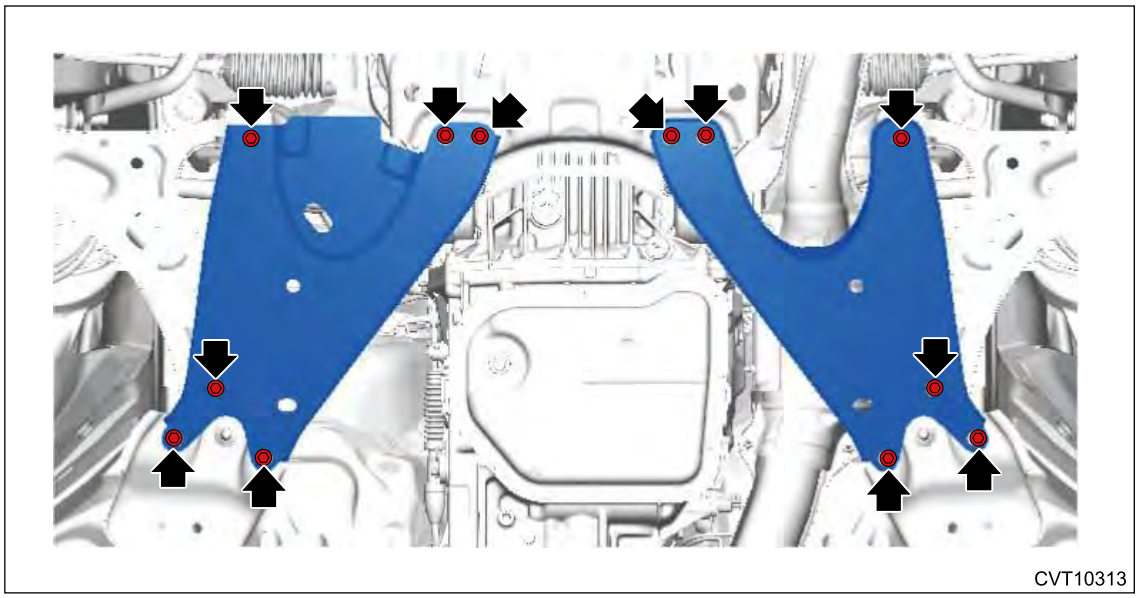
1. Loosen the self-locking nut of the front suspension strut mount by two turns.
   Note:
   Loosen the self-locking nut only on the removal side if only one side of the differential side retainer oil seal is replaced.



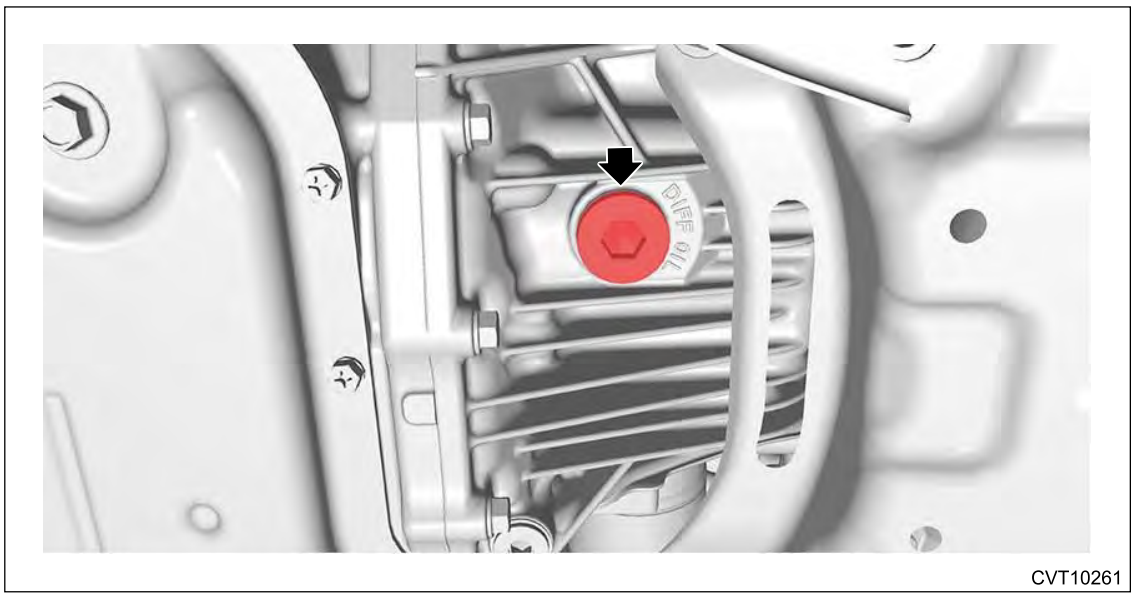
2. Lift up the vehicle.
3. Remove the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
4. Remove the crossmember support - rear.

Note:

Remove the crossmember support - rear only on the removal side if only one side of the differential side retainer oil seal is replaced.



5. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
6. Remove the differential gear oil drain plug using TORX® bit T70, and then drain differential gear oil.



7. Tighten the differential gear oil drain plug.

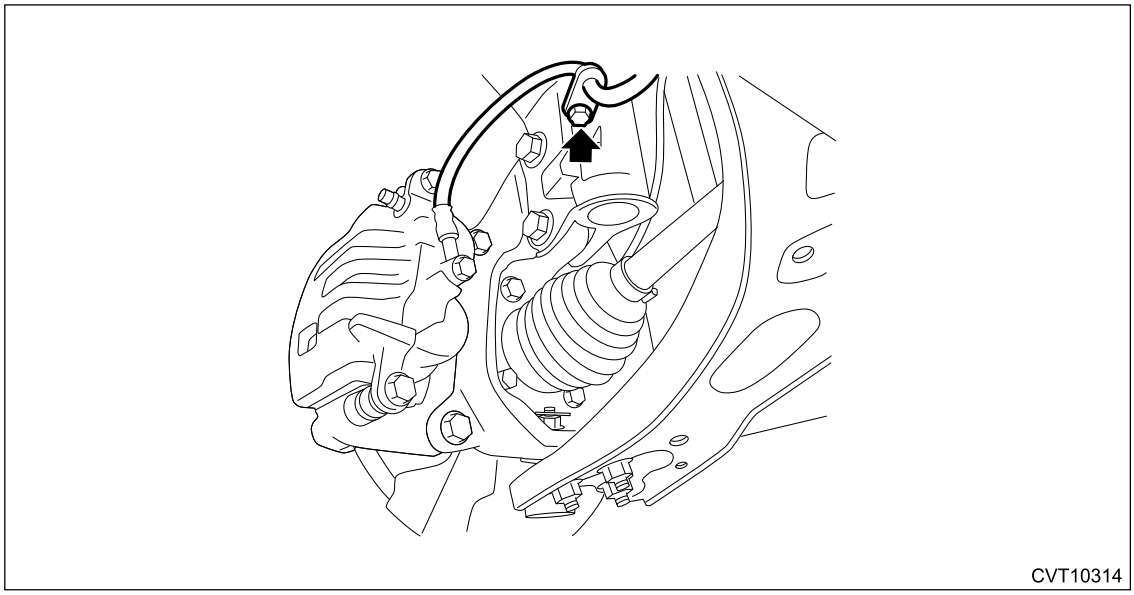
Note:

Use a new gasket.

Tightening torque:

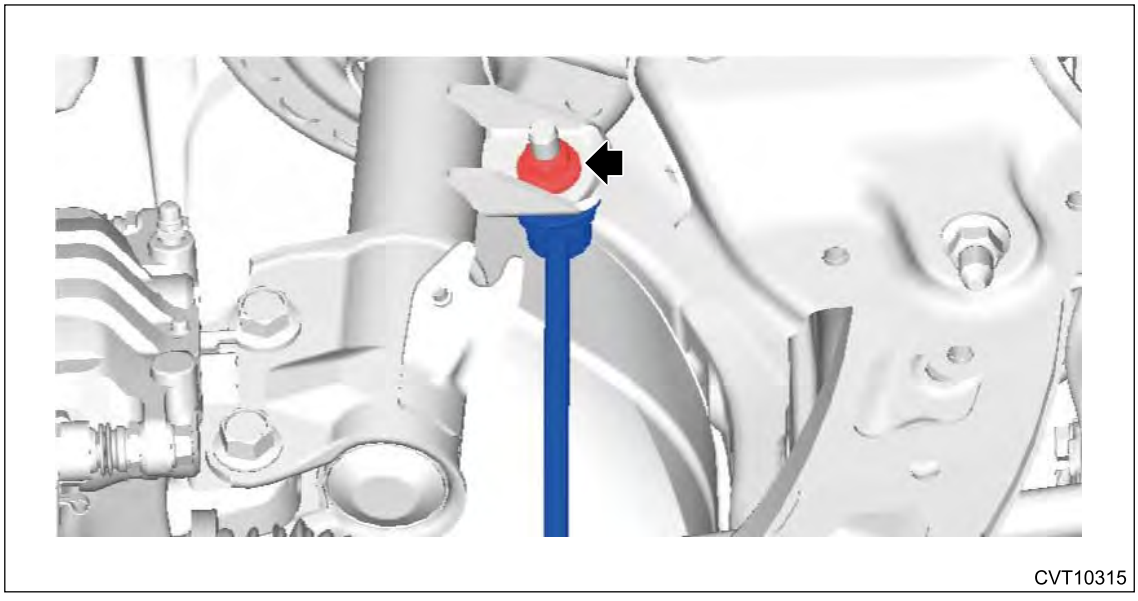
70 N·m (7.1 kgf-m, 51.6 ft-lb)

8. Remove the brake hose bracket.



9. Remove the front ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>REMOVAL.

10. Remove the stabilizer link.

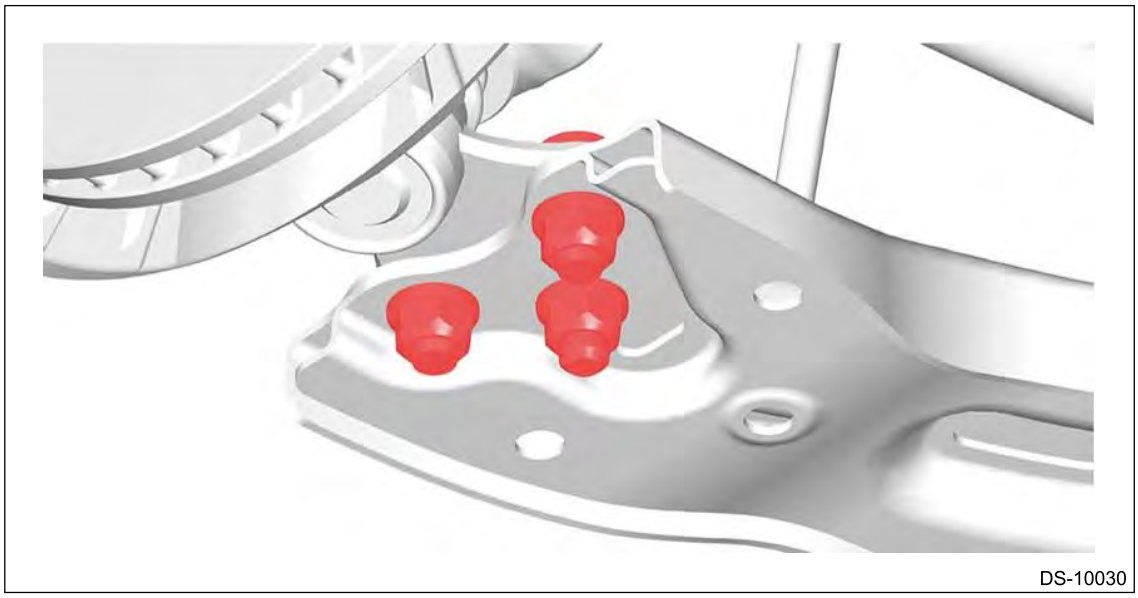


11. Separate the front arm assembly from the ball joint.

11. Separate the front arm assembly from the ball joint.

Note:

- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**
- **To prevent damage of the front arm assembly ball joint boot, place a wooden block, etc. between front arm assembly and ball joint.**



12. Using a crowbar, etc., pull out until the front drive shaft transmission side joint slides move smoothly.

Note:

Place cloth between the crowbar and the transmission in order to avoid damaging the transmission side retainer.

13. Hold the transmission side joint of the front drive shaft by hand and extract the housing from the transmission while pressing the housing outward, so as not to stretch the boot.

Note:

- **Before pulling the RH front drive shaft from transmission, turn the steering wheel to the right hand at full lock.**
- **Before pulling the LH front drive shaft from transmission, turn the steering wheel to the left hand at full lock.**

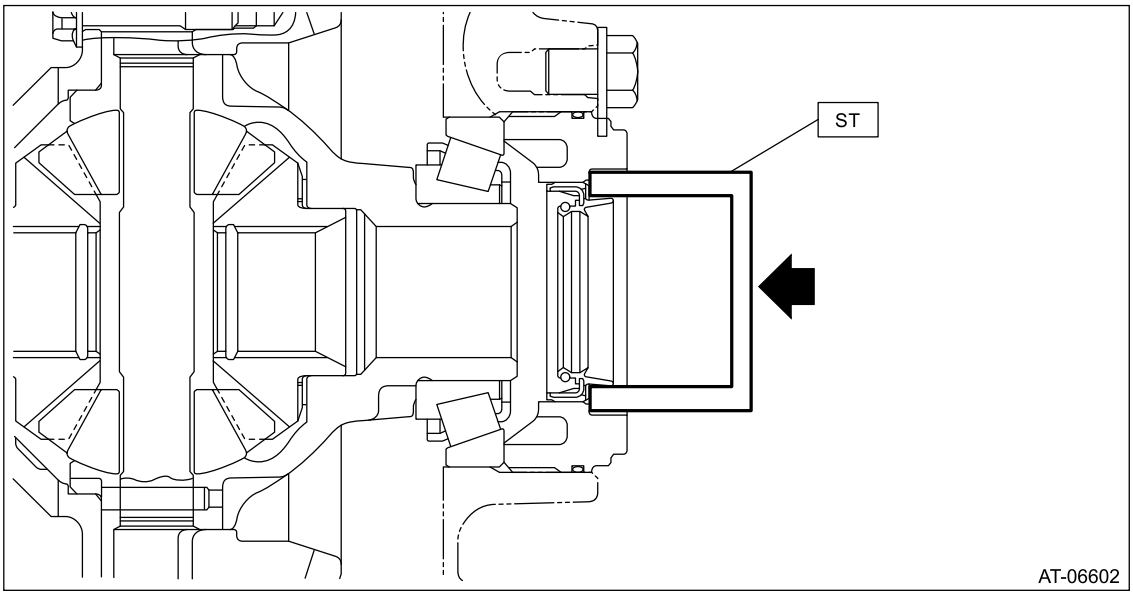
14. Remove the differential side retainer oil seal using driver wrapped with vinyl tape etc.
15. Using the ST, install the differential side retainer oil seal by lightly tapping with a hammer.

Note:

- **Apply differential gear oil to the lip surface, so that the oil seal lip is not deformed.**
- **Apply differential gear oil to the press-fitting surface of oil seal and the differential side retainer.**
- **Oil seal has an identification mark (R, L). When installing oil seals, do not confuse the left and right.**

Preparation tool:

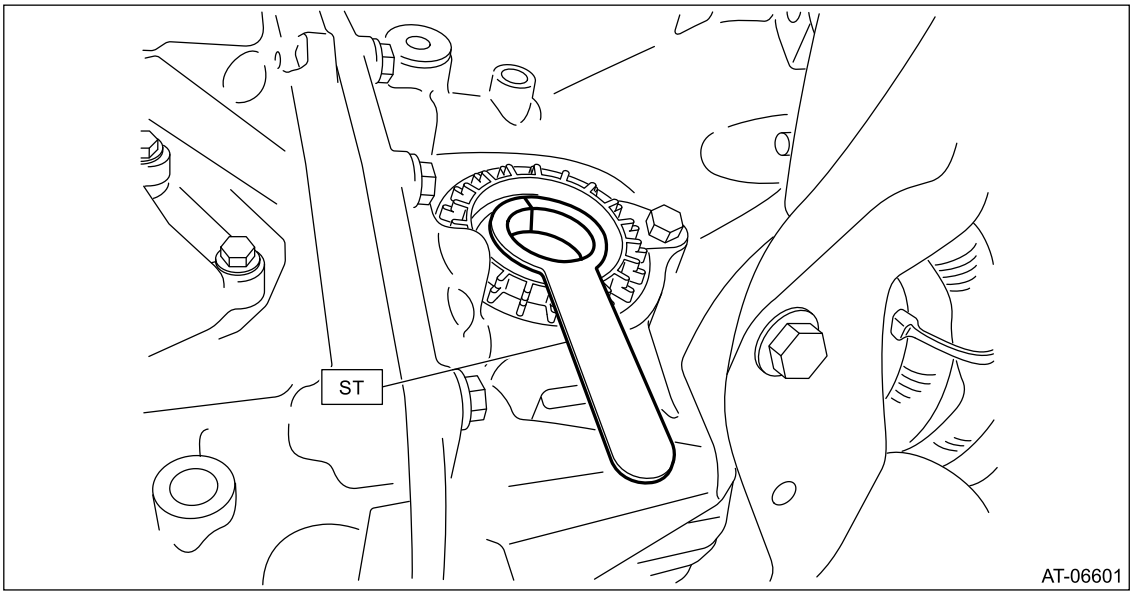
ST: DIFFERENTIAL SIDE OIL SEAL INSTALLER (18675AA000)



16. Set the ST to the side retainer.

Preparation tool:

ST: OIL SEAL PROTECTOR (28399SA010)



17. Replace the circlip of the drive shaft with a new part.

18. Insert the front drive shaft spline section into transmission and remove the ST (DIFFERENTIAL SIDE OIL SEAL INSTALLER).

Note:

- **Before inserting the RH front drive shaft into transmission, turn the steering wheel to the right hand at full lock.**
- **Before inserting the LH front drive shaft into transmission, turn the steering wheel to the left hand at full lock.**

19. Insert the drive shaft into the transmission securely by pressing the housing from outside of the vehicle.

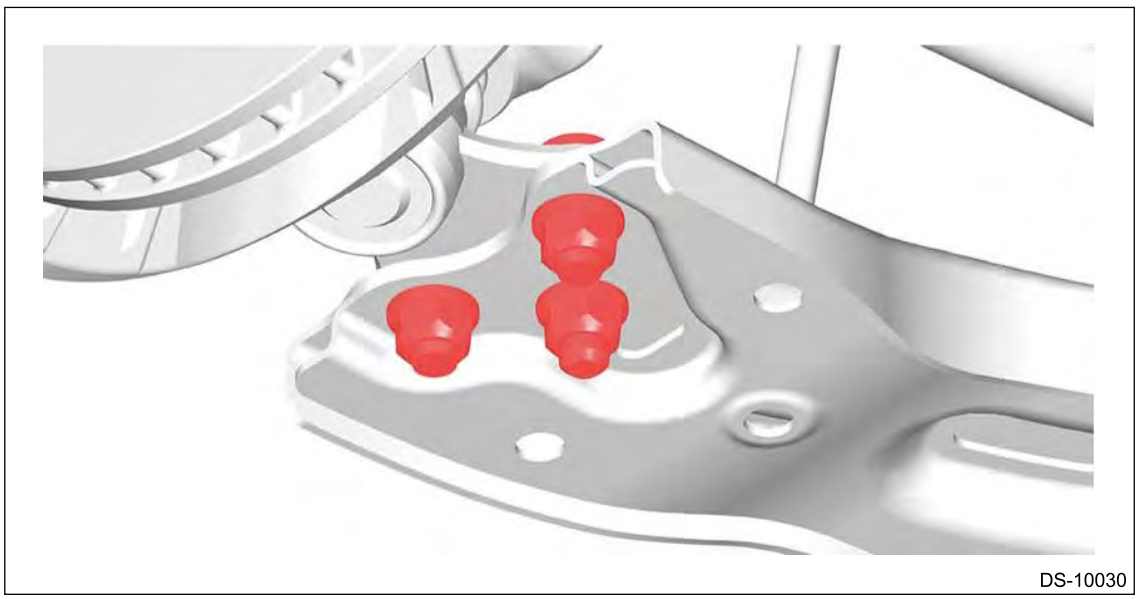
Caution:

- **To prevent the front lower arm assembly from damaging the ball joint dust cover, place the ball joint on the upper side of the front lower arm assembly before starting the operation.**
- **Be careful not to damage the front lower arm assembly and ball joint by covering the upper side of the front lower arm assembly with a cloth.**

20. Insert the ball joint into the front arm assembly, and fix with nuts.

Tightening torque:

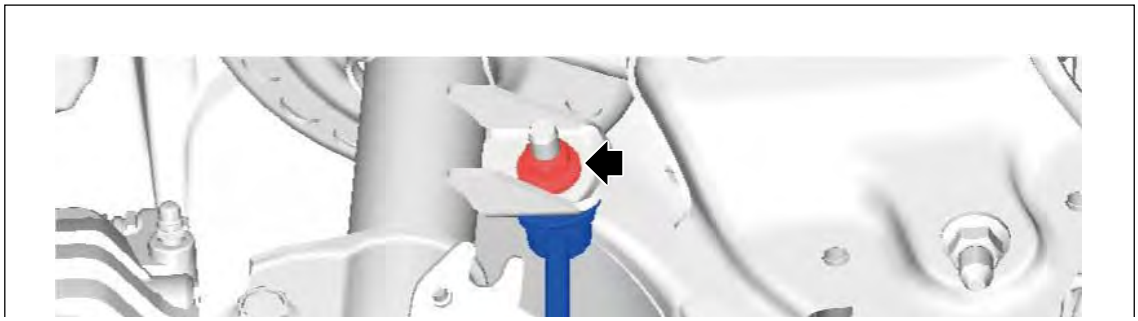
100 N·m (10.2 kgf-m, 73.8 ft-lb)



21. Install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)



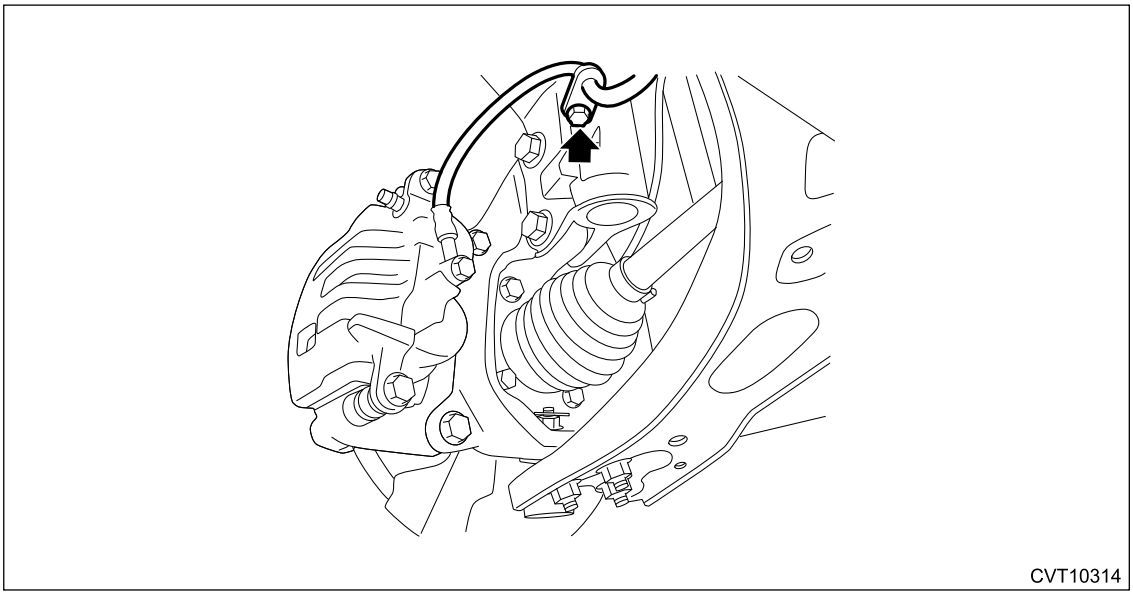

CVT10315

22. Install the front ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSTALLATION.

23. Install the brake hose bracket.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

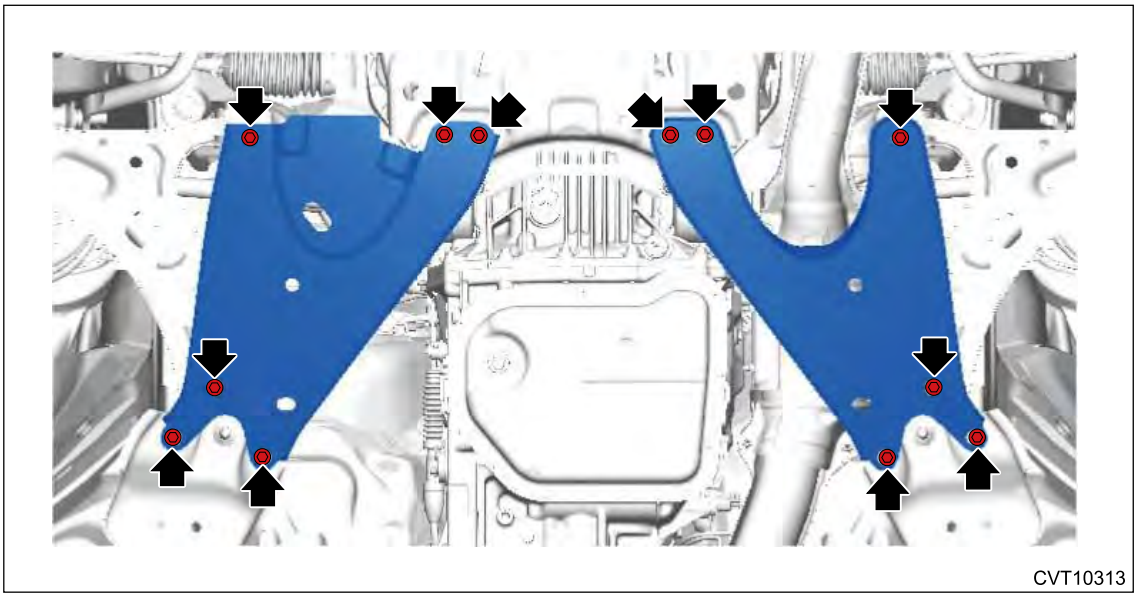

CVT10314

24. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

25. Install the crossmember support - rear.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)


CVT10313

26. Refill differential gear oil to adjust the differential gear oil amount. Ref. to CONTINUOUSLY

VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>ADJUSTMENT.

27. Install the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

28. Using the ST, tighten the self-locking nut of the front suspension strut mount.

Caution:

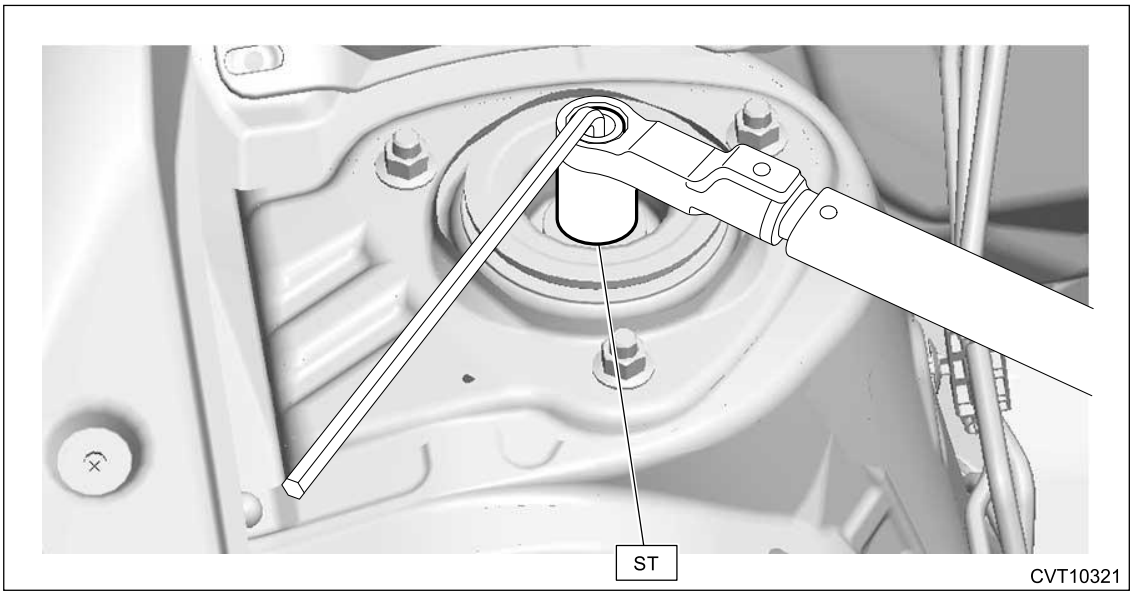
- **Use a new self-lock nut.**
- **Tighten in the state where the wheels are in full contact with the ground.**

Preparation tool:

ST: STRUT MOUNT SOCKET (20399AG000)

Tightening torque:

55 N·m (5.6 kgf-m, 40.6 ft-lb)

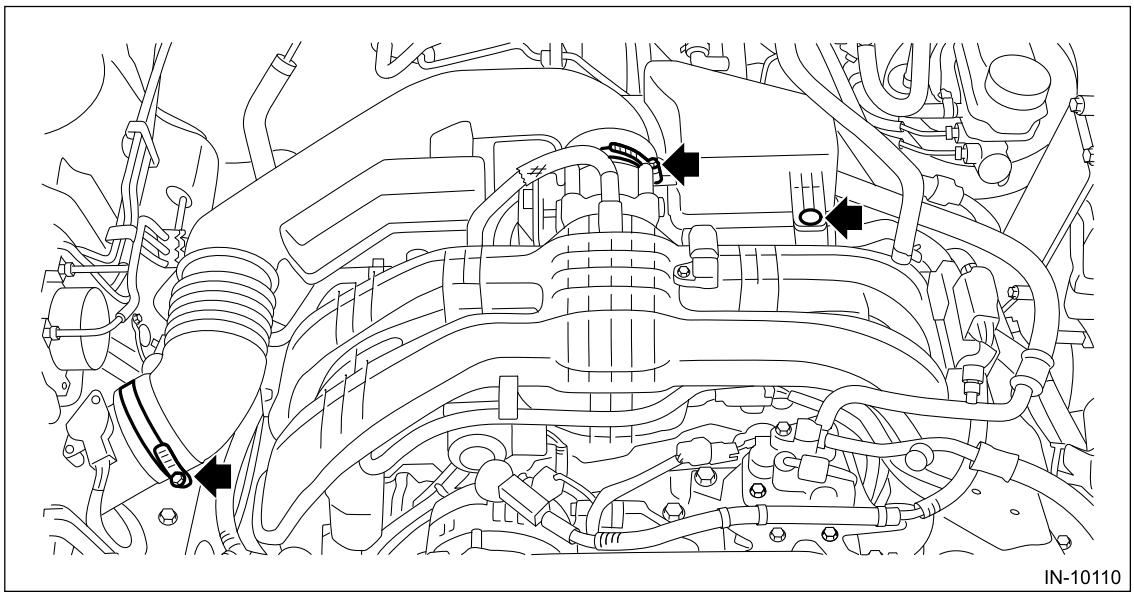


29. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.

INSPECTION

When the driving condition or starter motor operation is improper, first check the shift linkage for improper operation. If the shift linkage is functioning properly, check the inhibitor switch.

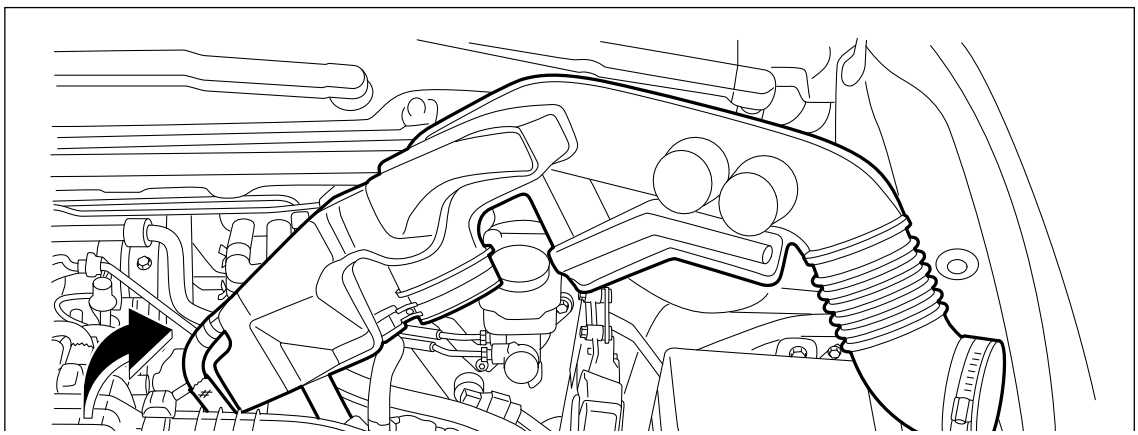
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.

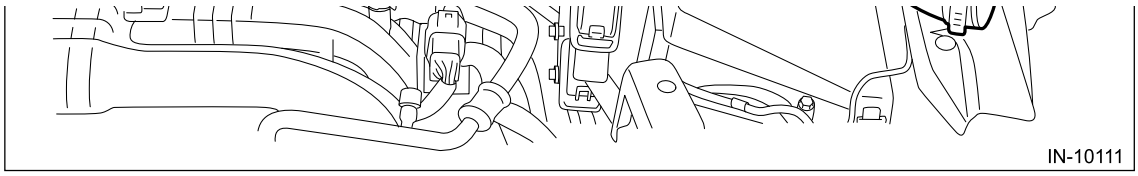


3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

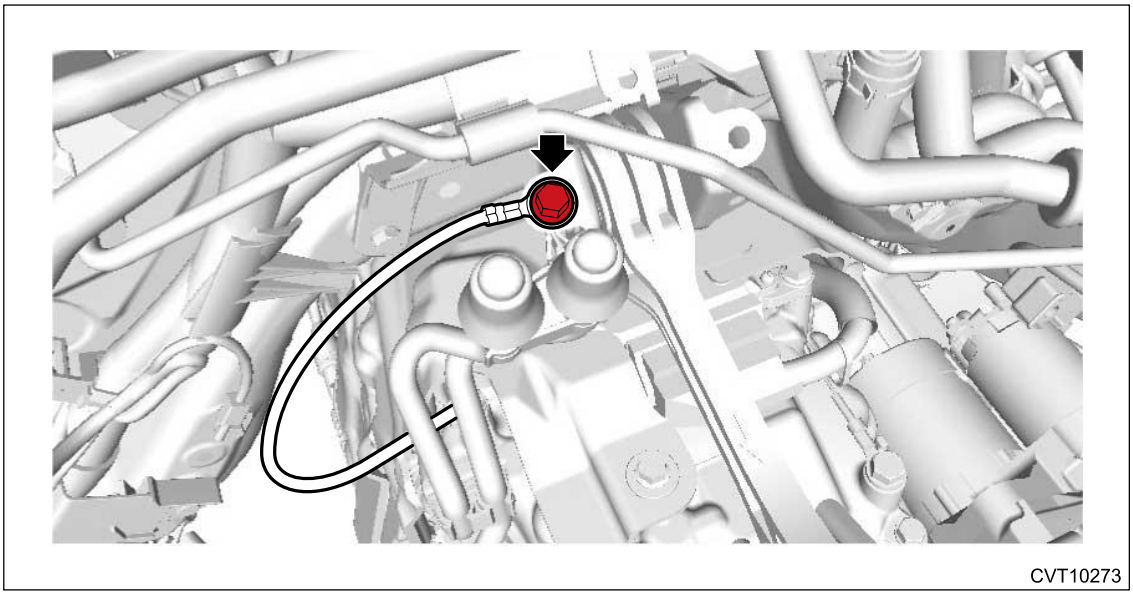
Note:

Be careful not to pull out the PCV hose.

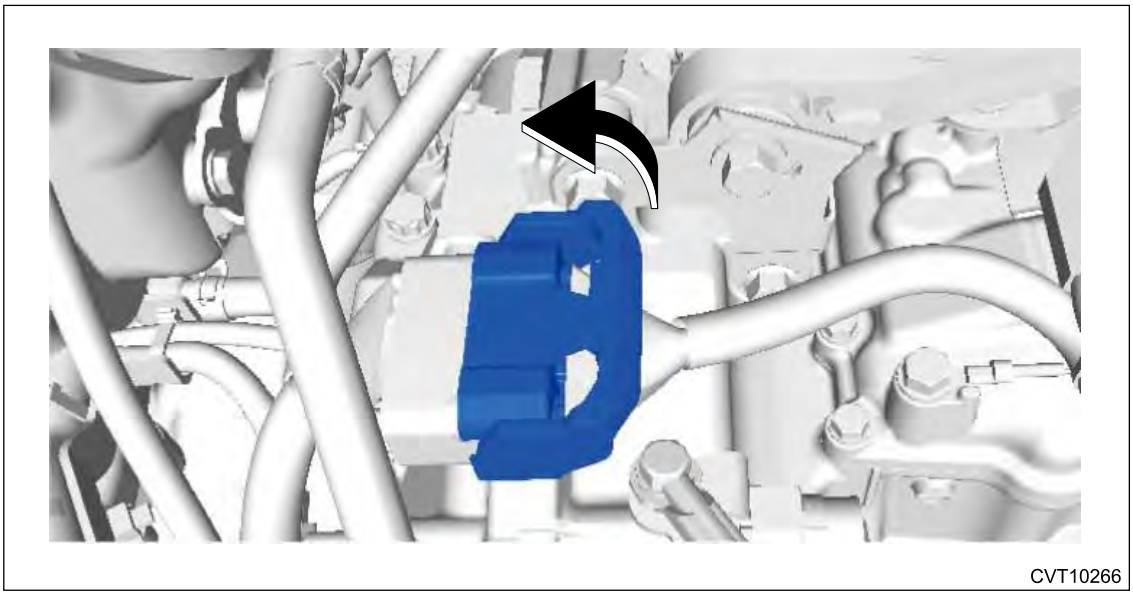




4. Remove the transmission radio ground terminal.

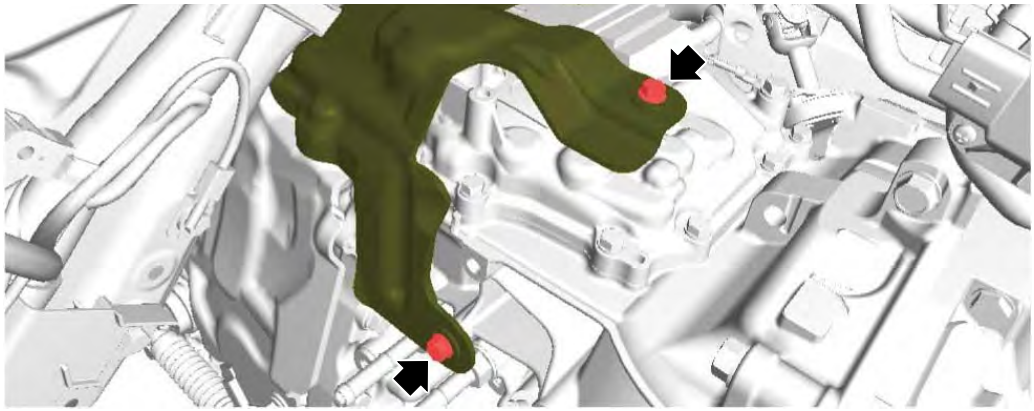


5. Disconnect the transmission harness connector.

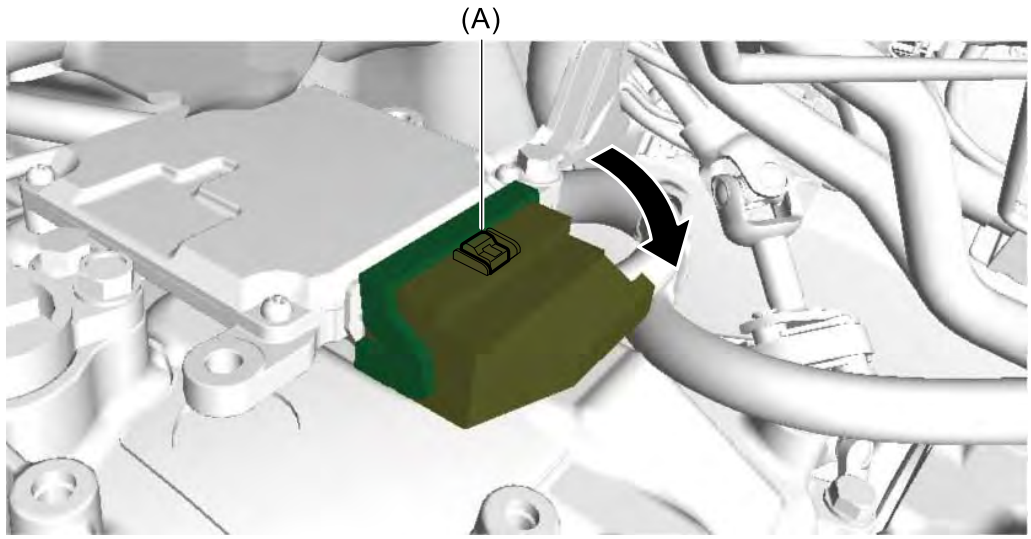


6. Remove the transmission case cover (small).





7. Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

8. Set the ST between the TCM and transmission harness. Ref. to TRANSMISSION (DIAGNOSTICS)>General Description>CAUTION.

Preparation tool:

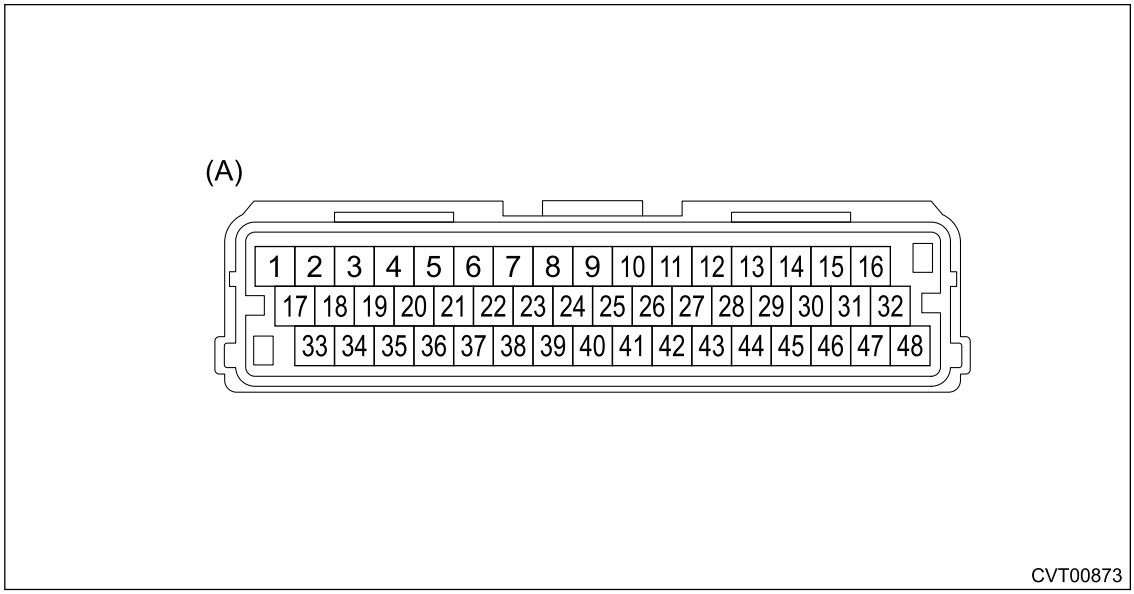
ST: CHECK BOARD (18460AA040)

9. Check for continuity in inhibitor switch circuit by shifting the select lever in "P", "R", "N" and "D" respectively.

Note:

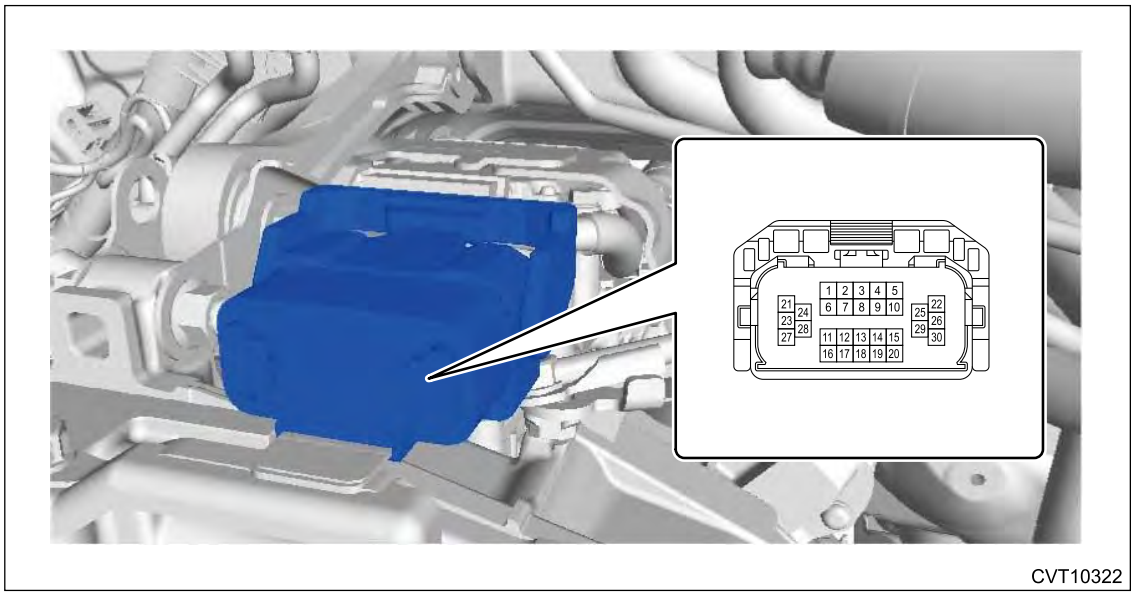
- **Check that there is no continuity in the starter circuit when the select lever is in the "R" and "D" ranges.**
- **When inhibitor switch is normal, check there is no poor contact in vehicle side connector and no open circuit in harness.**

	Range	Terminal No.	Standard
Signal sent to TCM	P	38 — 42	Less than 1 Ω
	R	37 — 42	
	N	36 — 42	
	D	35 — 42	



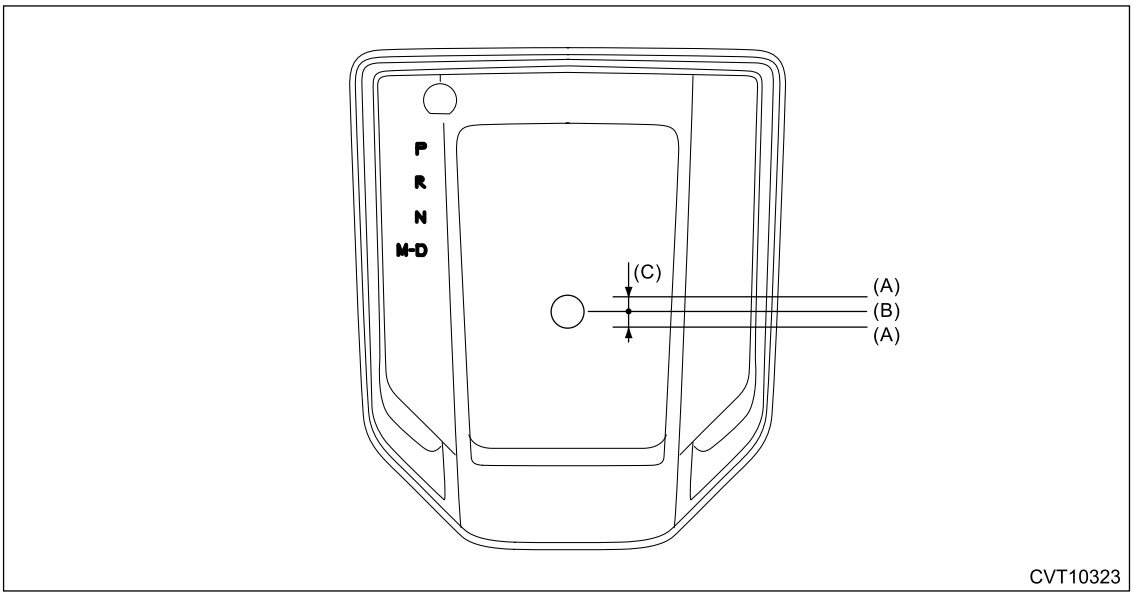
(A) Check board connector

	Range	Terminal No.	Standard
Starter circuit	P / N	1 — 5	Less than 1 Ω
Back-up light circuit	R	22 — 26	



10 Check that there is continuity at equal points when the select lever is moved 1.5° in both directions

10. Check that there is continuity at equal points when the select lever is moved 1.5° in both directions from the "N" range.
If there is continuity in only one direction or in other points, adjust the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>ADJUSTMENT.



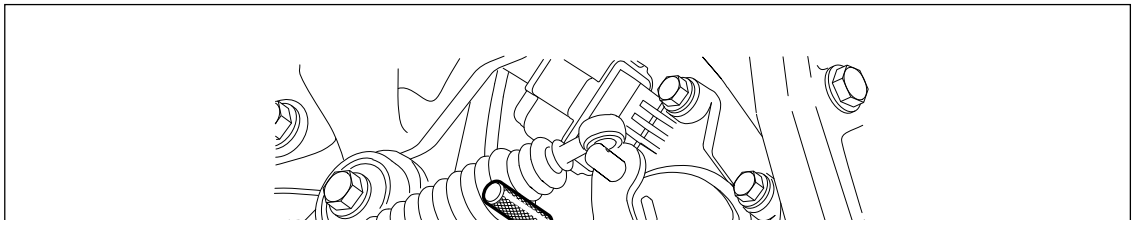
(A) Continuity does not exist.
(B) Continuity exists.
(C) 1.5°

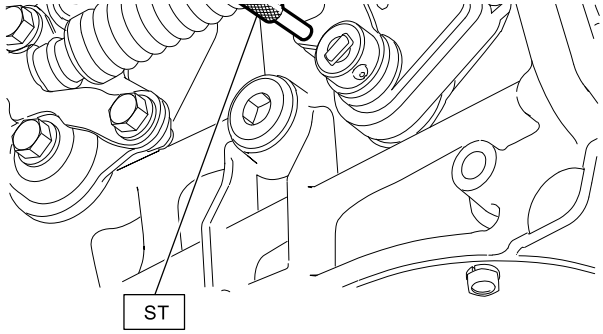
11. Repeat the above inspection in other gear ranges. If there is fault, adjust the inhibitor switch and select cable. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>ADJUSTMENT. Ref. to CONTROL SYSTEMS>Select Cable>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Inhibitor Switch

ADJUSTMENT

1. Shift the select lever to "N" range.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Loosen the two bolts holding the inhibitor switch.
4. Insert the ST vertically into the holes of the shifter arm and switch body.
Preparation tool:
ST: STOPPER PIN (499267300)





CVT00756

5. Tighten the two bolts holding the inhibitor switch.

Tightening torque:

5 N·m (0.5 kgf-m, 3.7 ft-lb)

6. Repeat the inspection of the inhibitor switch. If the inhibitor switch is determined to be “faulty”, replace it.

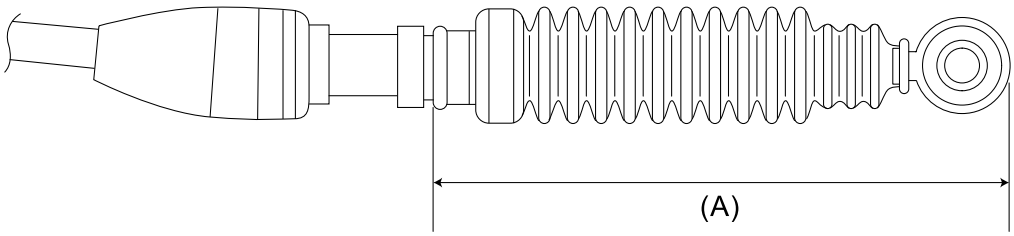
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Inhibitor Switch

REMOVAL

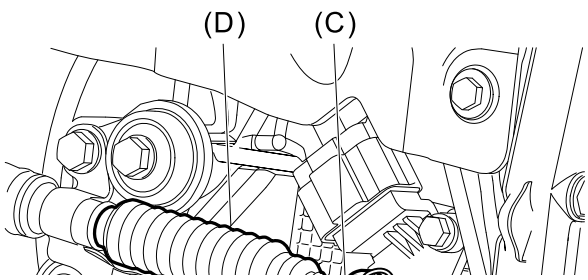
1. Shift the select lever to the “N” range.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Lift up the vehicle.
4. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
5. Remove the snap pin and washer from the shifter arm.

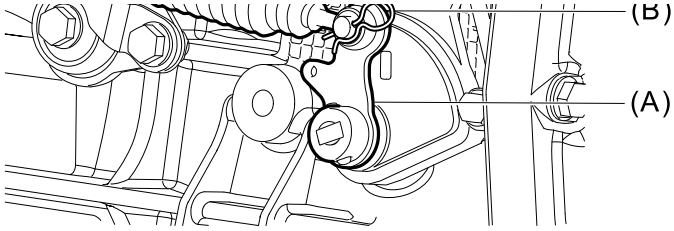
Caution:

Do not apply excessive load while holding the part (A).



CVT10415

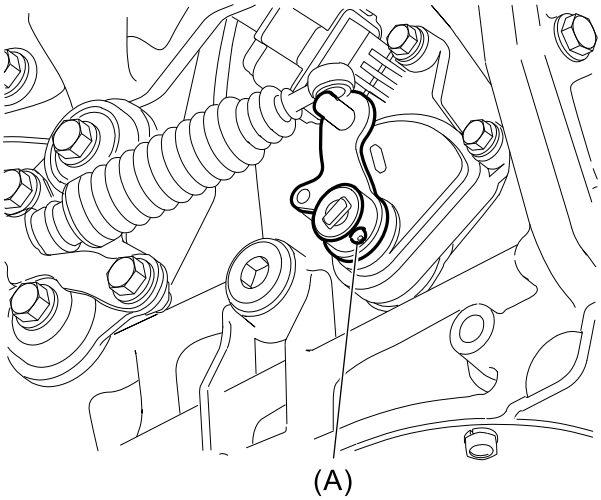




CVT00621

(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

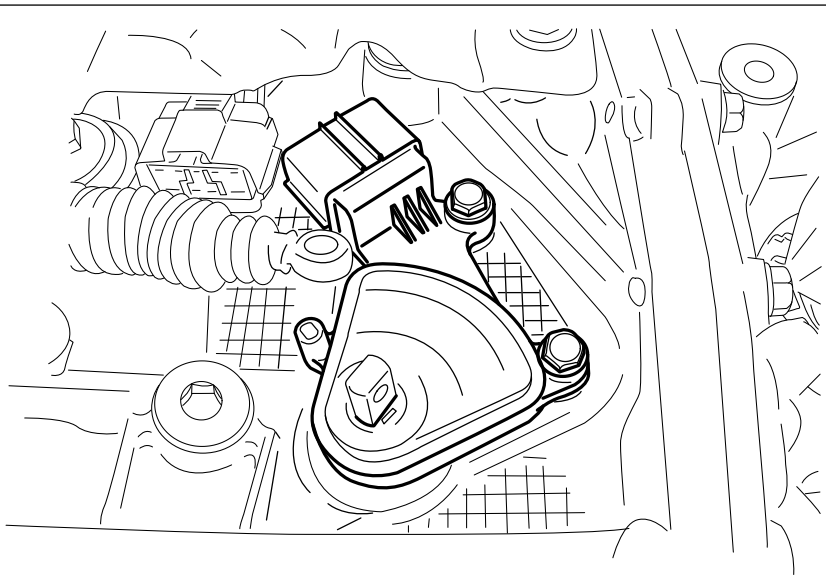
6. Remove the spring pin and shifter arm.



CVT00757

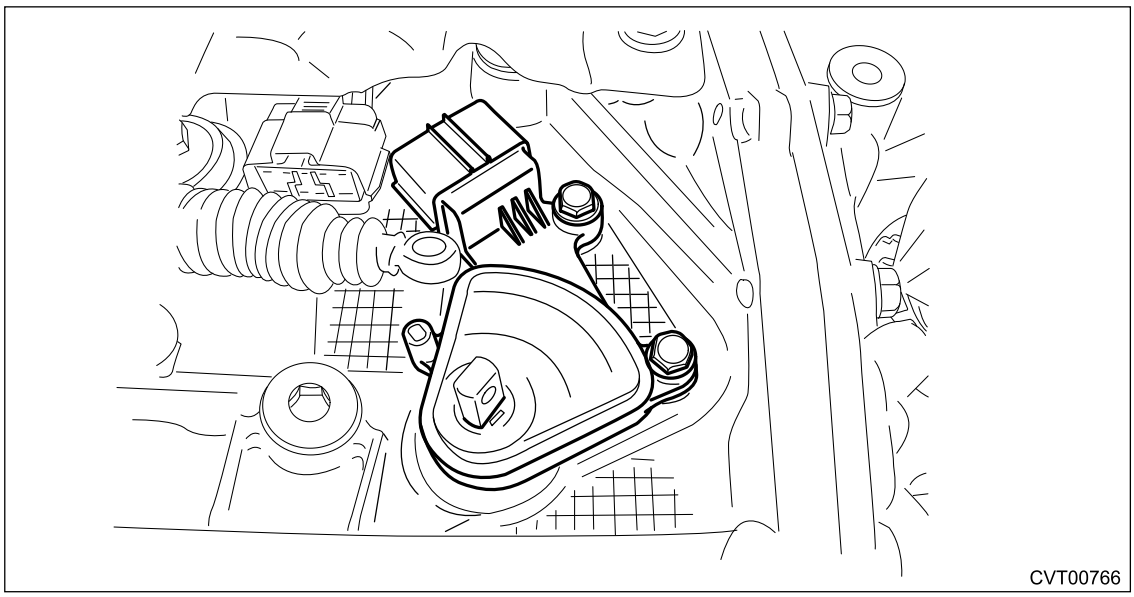
(A) Spring pin

7. Disconnect the inhibitor harness connector.
8. Remove the inhibitor switch.


CVT00766

INSTALLATION

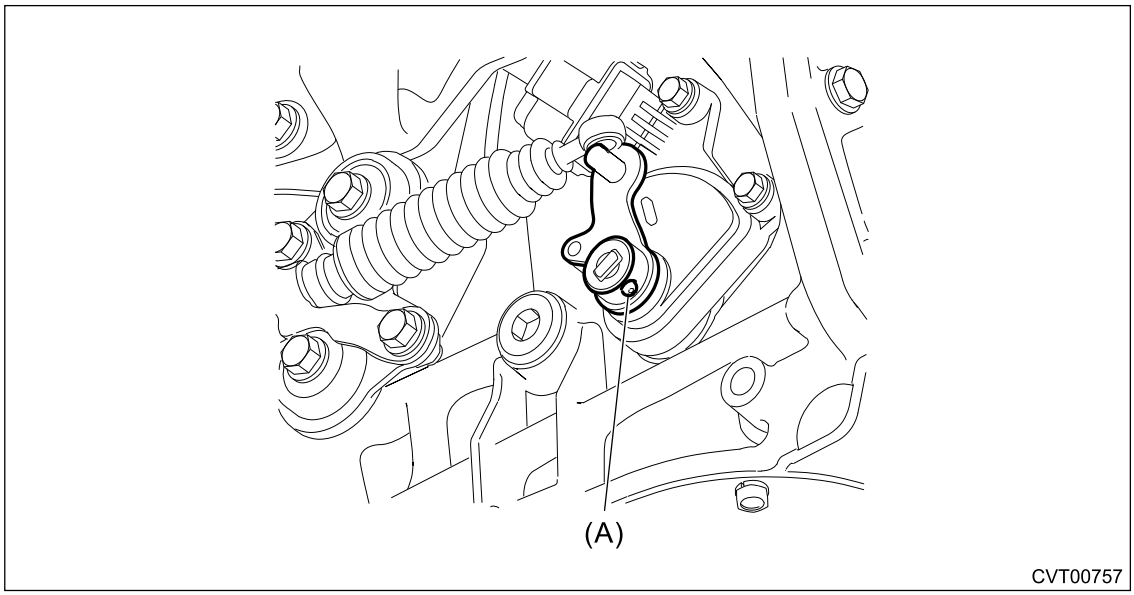
1. Install the inhibitor switch to the transmission case temporarily.



2. Connect the inhibitor harness connector.
3. Install the shifter arm and fix with the spring pin.

Note:

Use new spring pin.

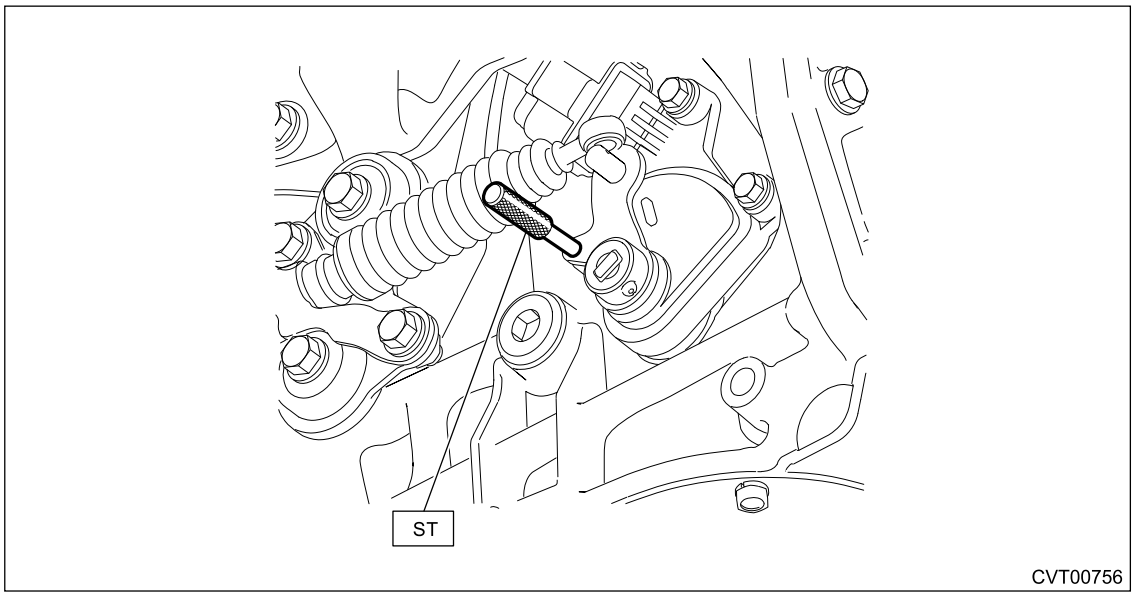


(A) Spring pin

4. Shift the shifter arm to "N" range.
5. Install the ST vertically in the cutout of shifter arm and the hole of switch body.

Preparation tool:

ST: STOPPER PIN (499267300)



6. Tighten the two bolts holding the inhibitor switch.

Tightening torque:

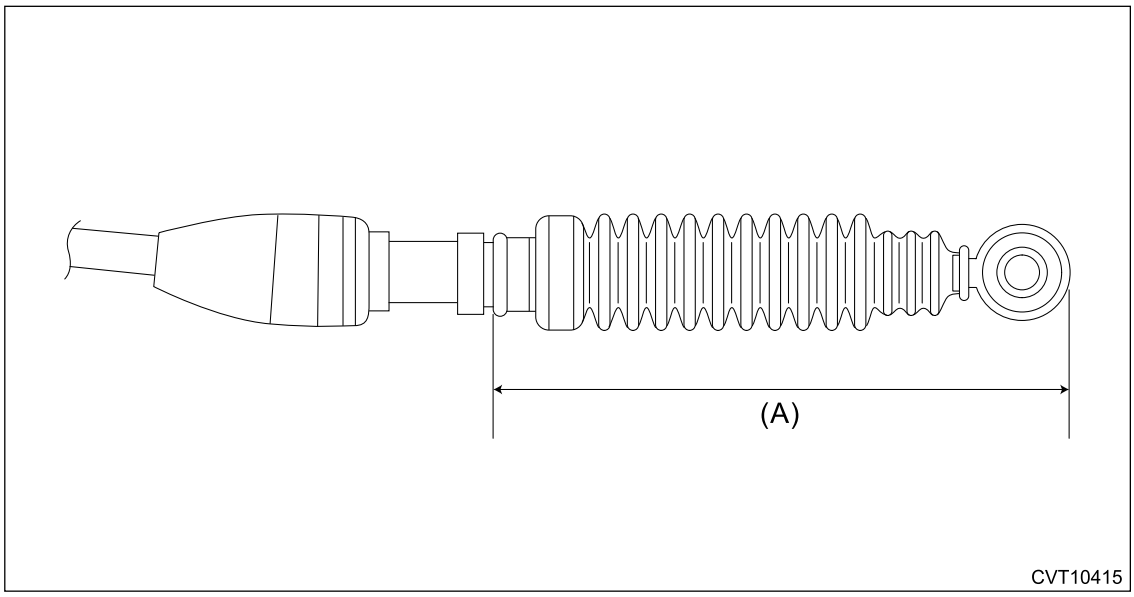
5 N·m (0.5 kgf-m, 3.7 ft-lb)

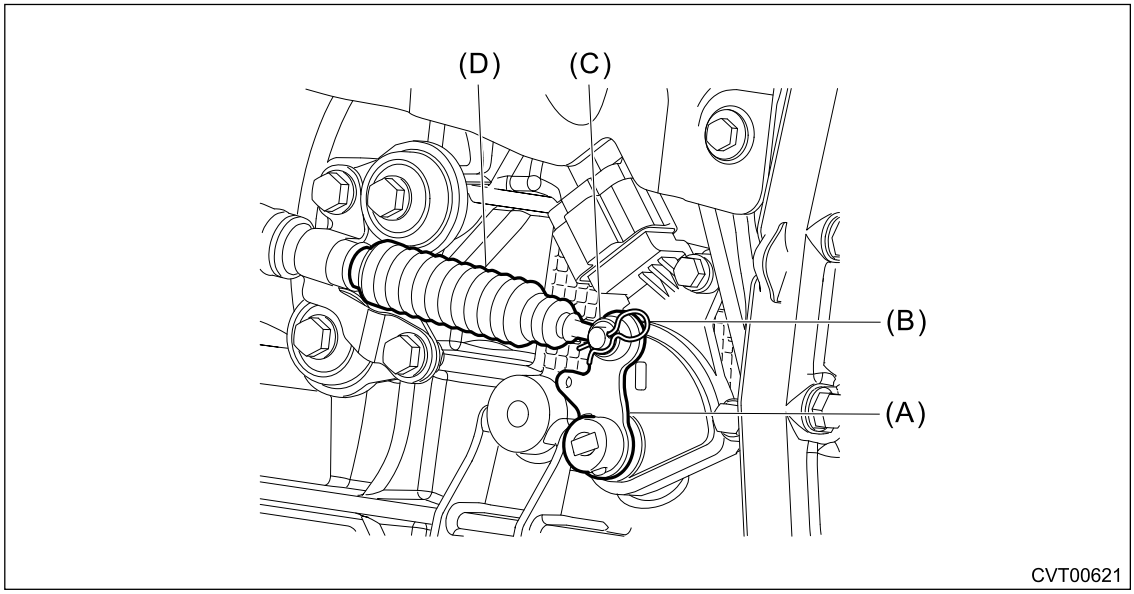
7. Install the select cable to the shifter arm.

8. Install the select cable, washer and snap pin.

Caution:

Do not apply excessive load while holding the part (A).





(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

9. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
10. Lower the vehicle.
11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
12. Check the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSPECTION.

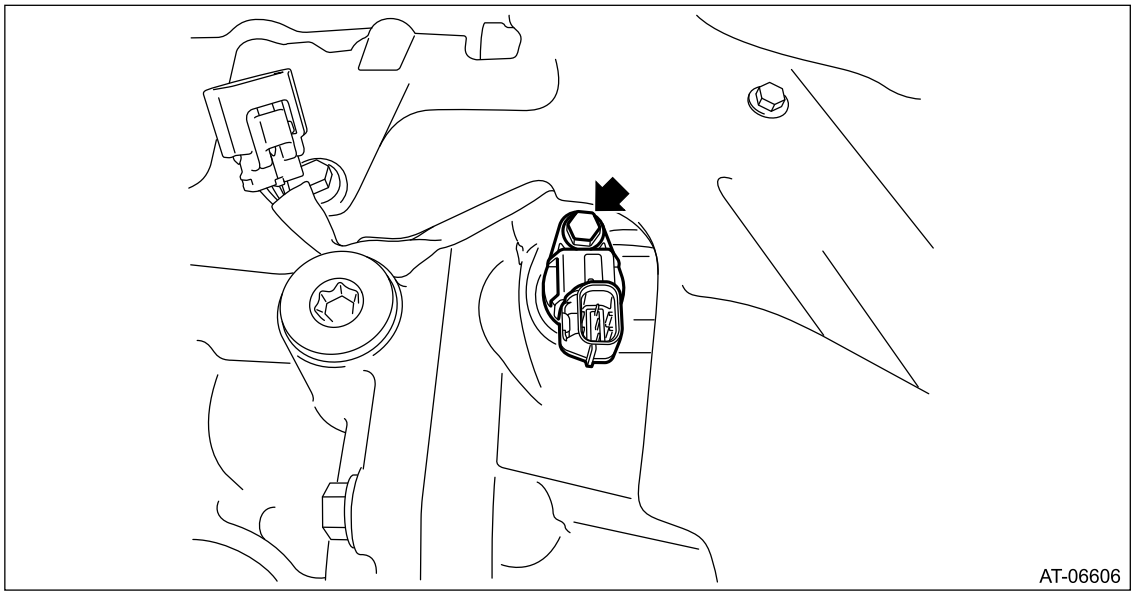
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Turbine Speed Sensor

REMOVAL

Caution:

Be sure to prevent water or oil from contacting the connector terminal of turbine speed sensor. If adhesion occurs, replace with a new part.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Lift up the vehicle.
3. Remove the harness connector from turbine speed sensor.
4. Remove the turbine speed sensor.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Turbine Speed Sensor

INSTALLATION

Caution:

Be sure to prevent water or oil from contacting the connector terminal of turbine speed sensor. If adhesion occurs, replace with a new part.

1. Install the turbine speed sensor.

   Note:

   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

   Tightening torque:

   7 N·m (0.7 kgf-m, 5.2 ft-lb)

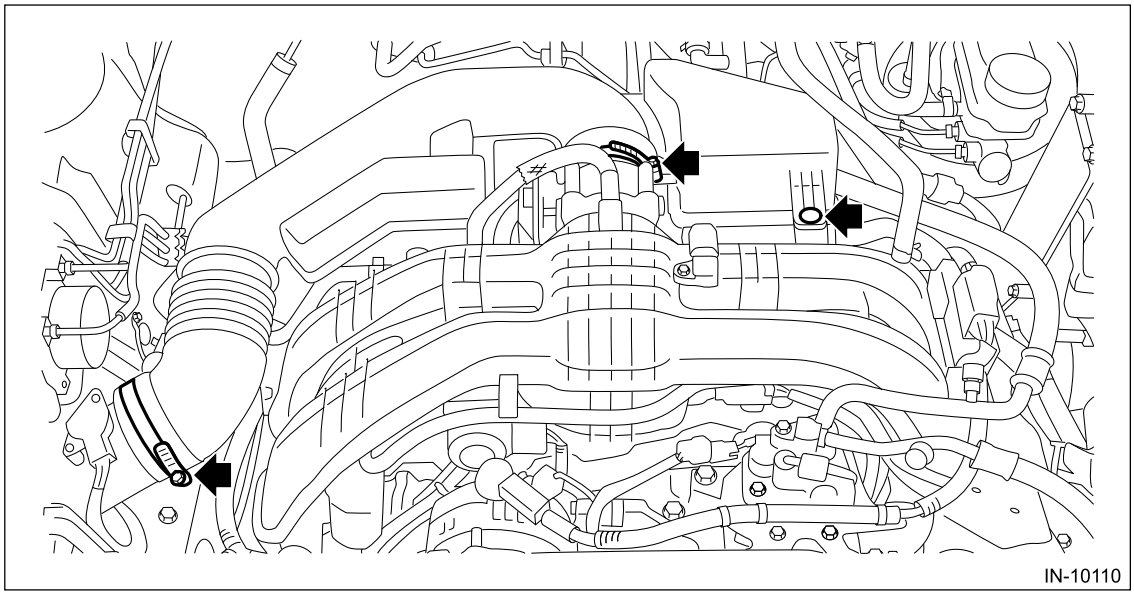
2. Connect the harness connector

2. Connect the harness connector.
3. Lower the vehicle.
4. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

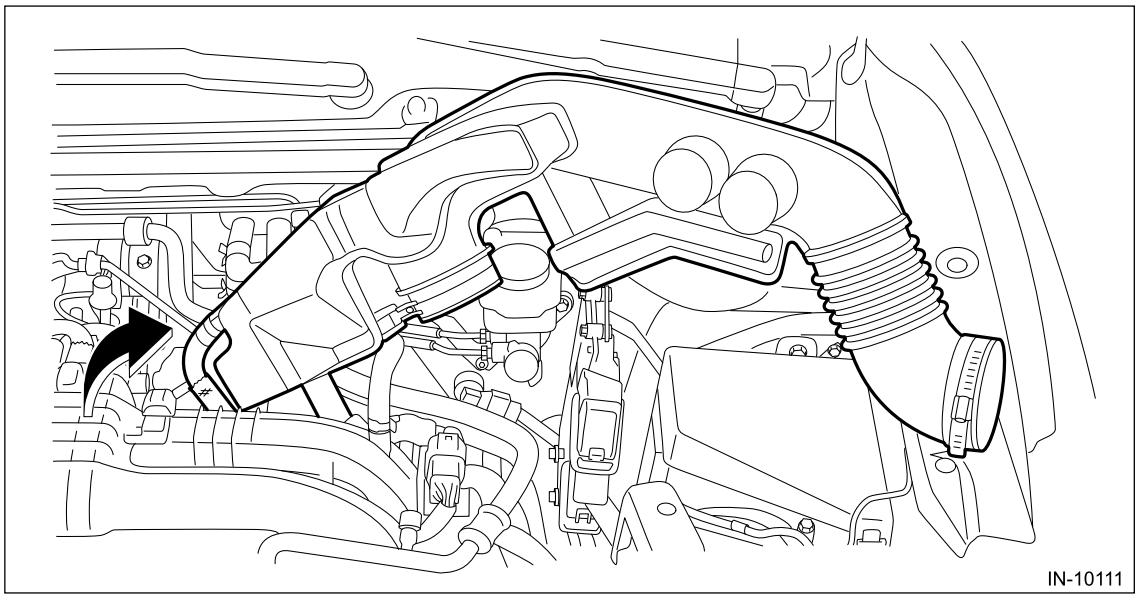
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Turbine Speed Sensor

INSPECTION

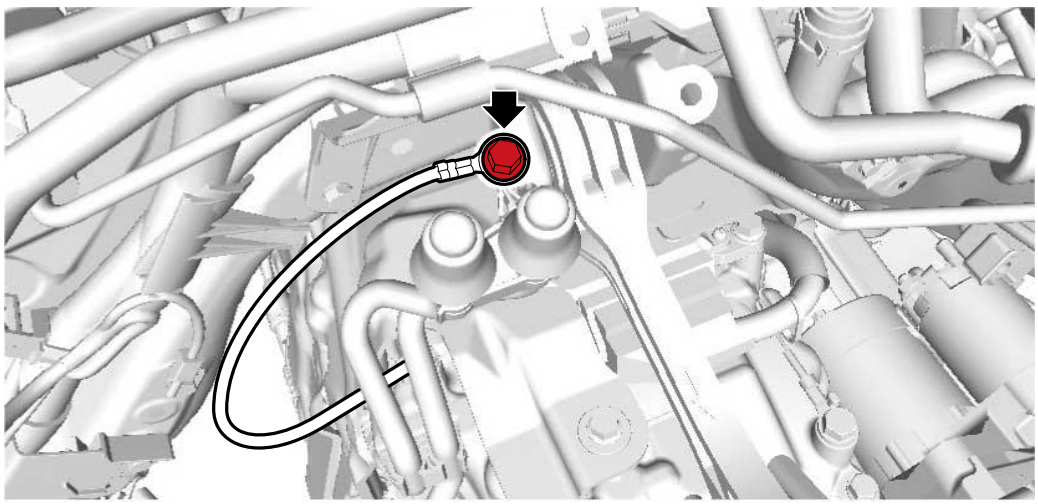
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.



3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Note:
   Be careful not to pull out the PCV hose.

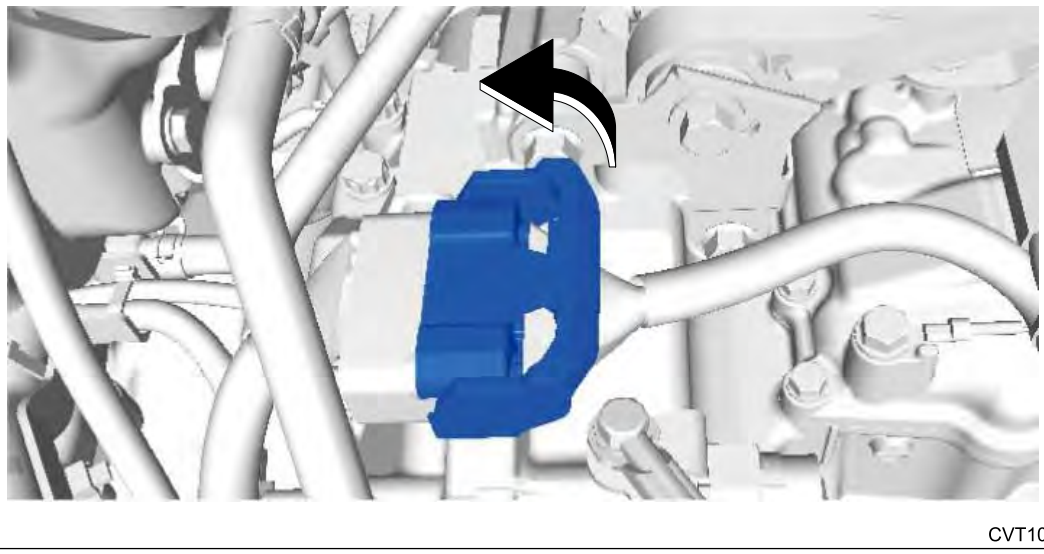


4. Remove the transmission radio ground terminal.



CVT10273

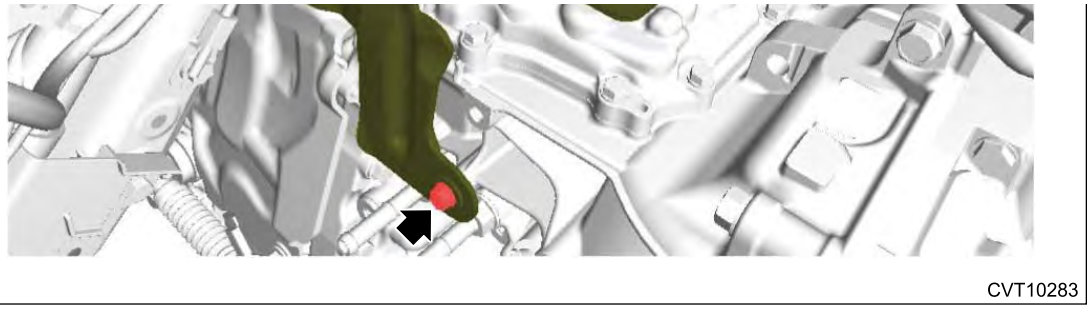
5. Disconnect the transmission harness connector.



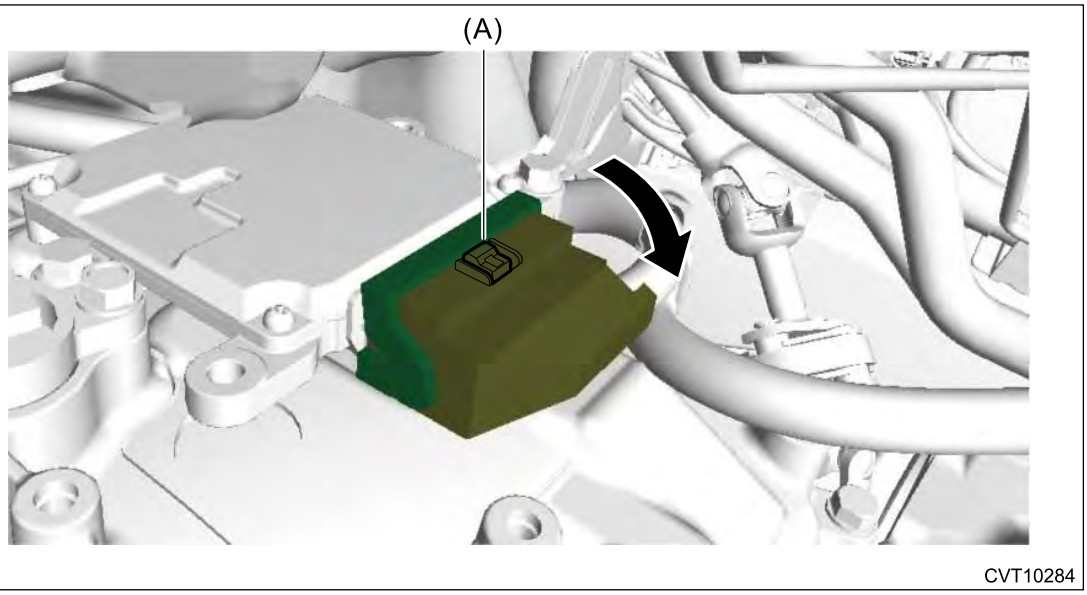
CVT10266

6. Remove the transmission case cover (small).





7. Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



(A) Lock button

8. Set the ST between the TCM and transmission harness. Ref. to TRANSMISSION (DIAGNOSTICS)>General Description>CAUTION.

Preparation tool:

ST: CHECK BOARD (18460AA040)

9. Connect the transmission radio ground terminal and transmission harness connector.

Tightening torque:

32.3 N·m (3.3 kgf-m, 23.8 ft-lb)

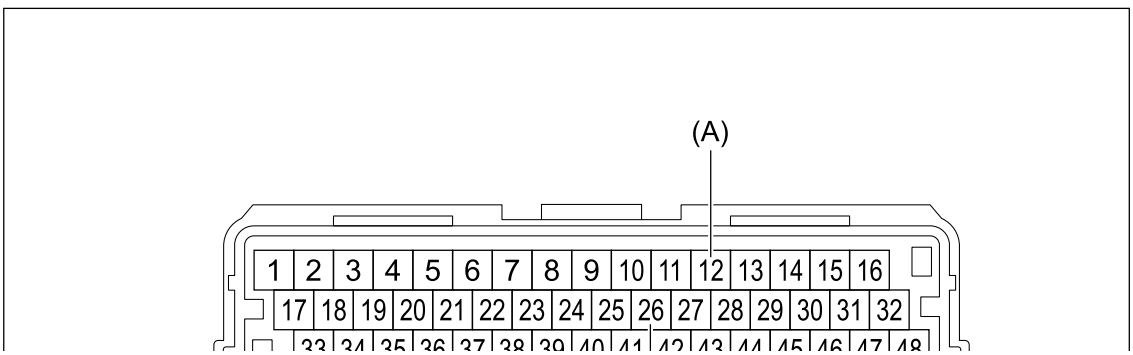
10. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

12. Set the probe of oscilloscope to the check board connector.

Connector & terminal

(B54)No. 12 (+) — No. 26 (−):





(A) + probe

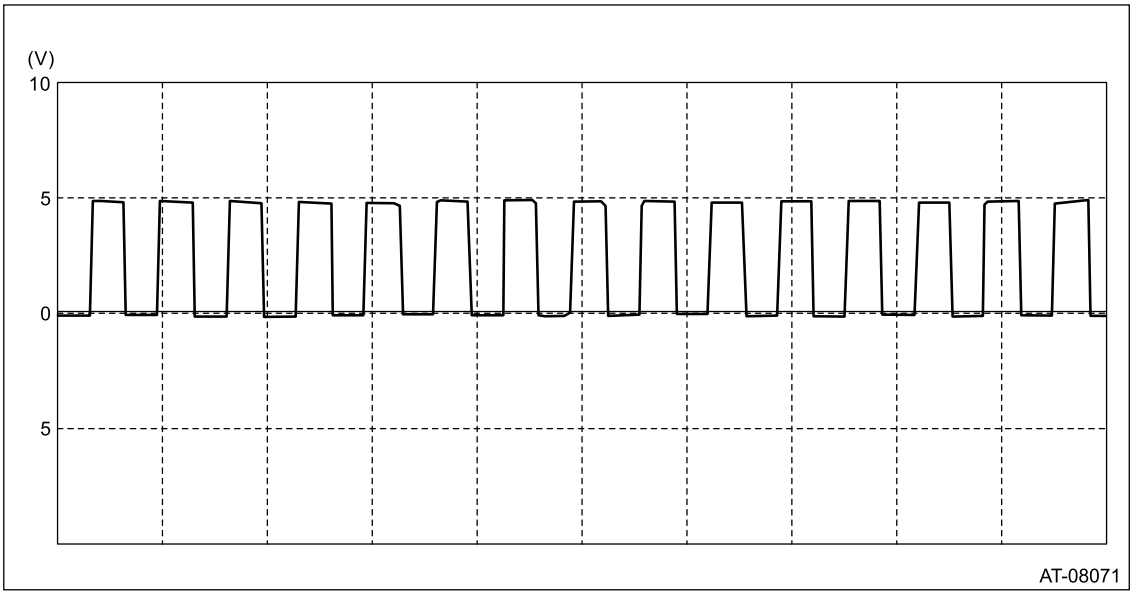
(B) − probe

13. Start and warm up the engine.

14. Check the waveform and output voltage of the turbine speed sensor with engine idling.

Note:

The waveform cycle changes as the speed changes.



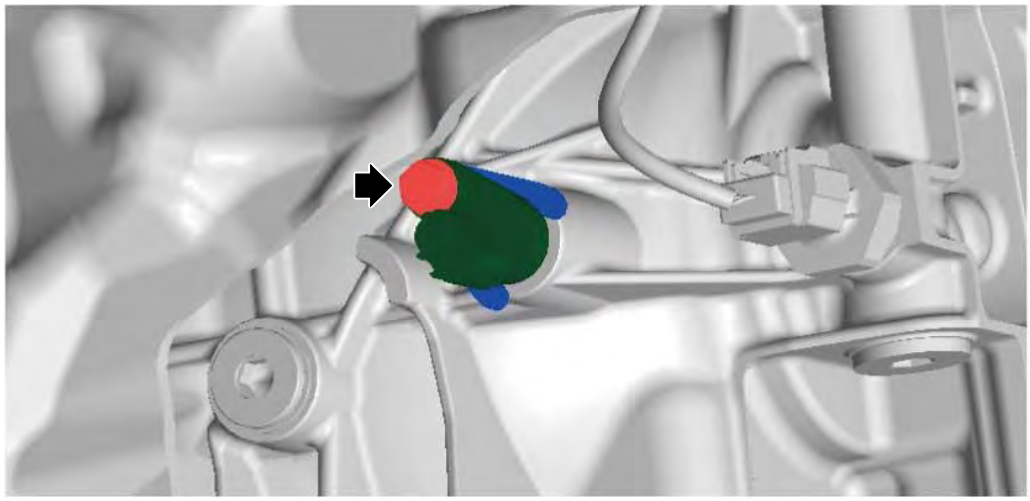
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Speed Sensor

REMOVAL

Caution:

- **Be sure to prevent water or oil from contacting the connector terminal of secondary speed sensor. If adhesion occurs, replace with a new part.**
- **When secondary speed sensor is removed, CVTF leaks. After installing the secondary speed sensor, adjust the CVTF level.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Lift up the vehicle.
3. Remove the harness connector from secondary speed sensor.
4. Remove the secondary speed sensor and spacer.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Speed Sensor

INSTALLATION

Caution:

- **Be sure to prevent water or oil from contacting the connector terminal of secondary speed sensor. If adhesion occurs, replace with a new part.**
- **After installing the secondary speed sensor, adjust the CVTF level.**

1. Install the secondary speed sensor and spacer.
   Note:
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**
   Tightening torque:

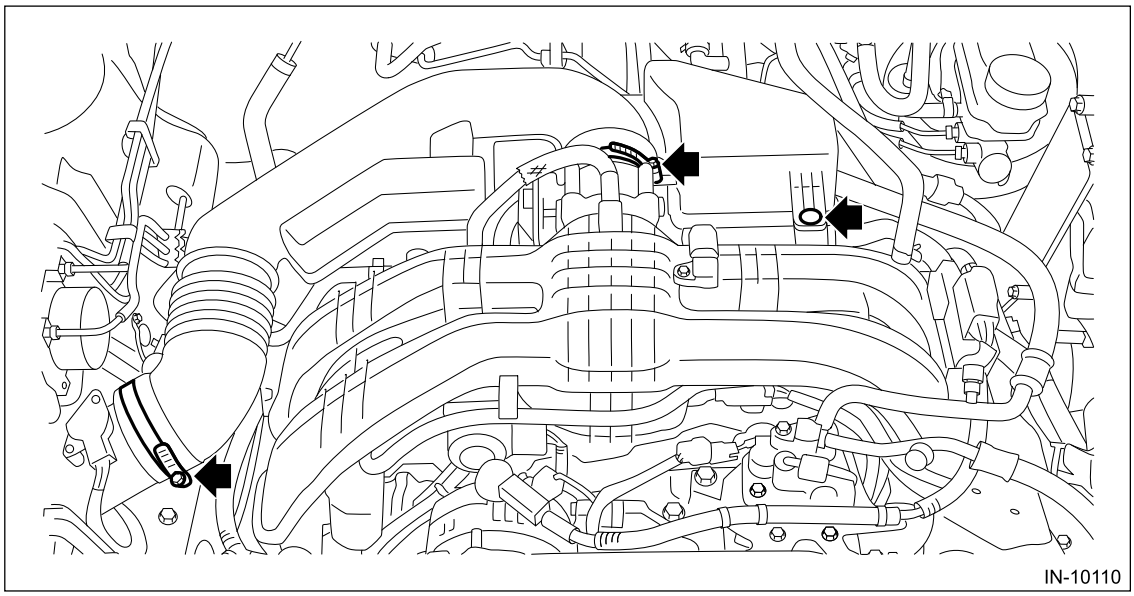
7 N·m (0.7 kgf-m, 5.2 ft-lb)

2. Connect the harness connector.
3. Lower the vehicle.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
5. Refill CVTF to adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Speed Sensor

INSPECTION

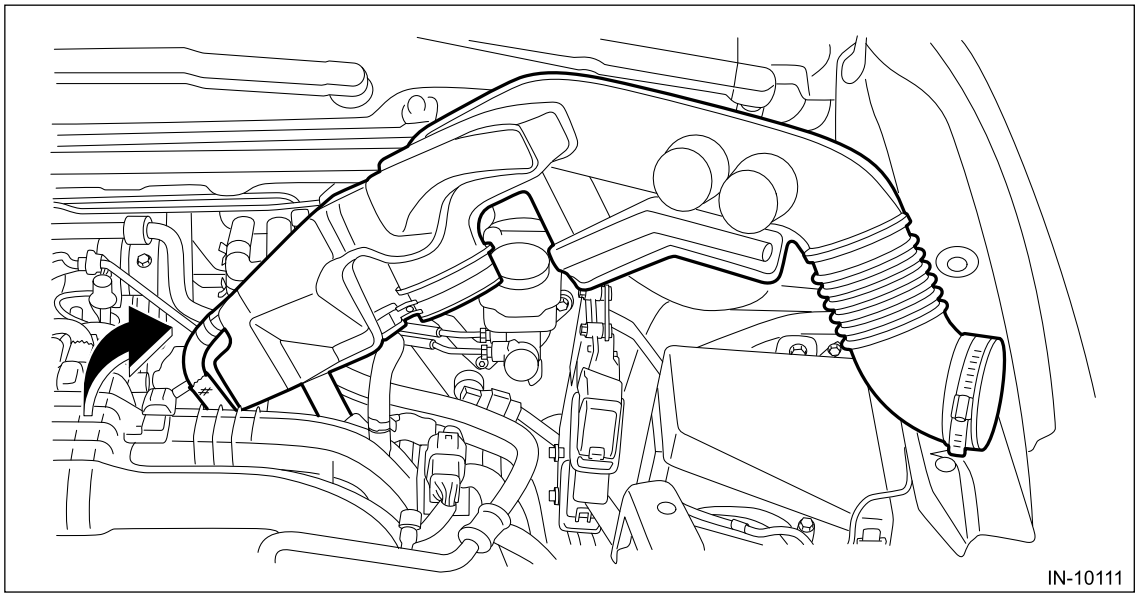
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.



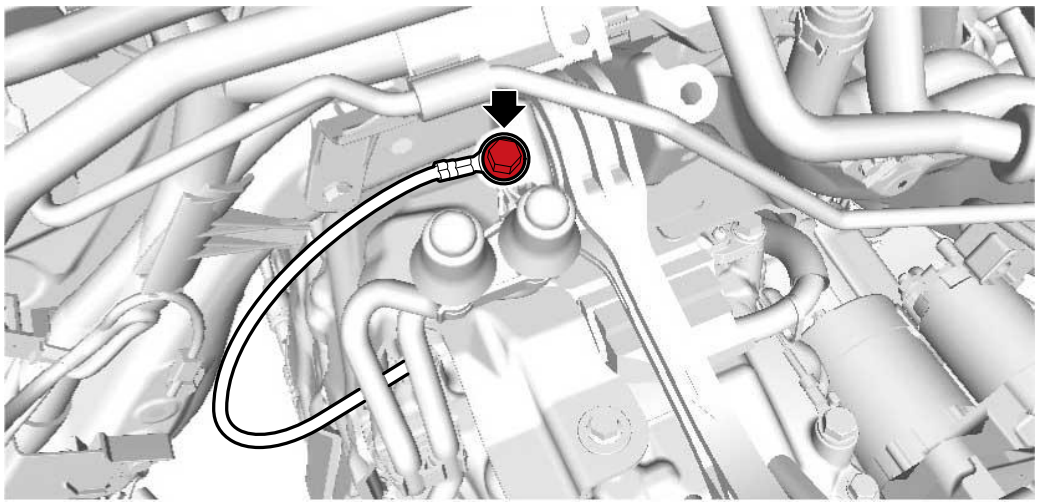
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Note:

Be careful not to pull out the PCV hose.

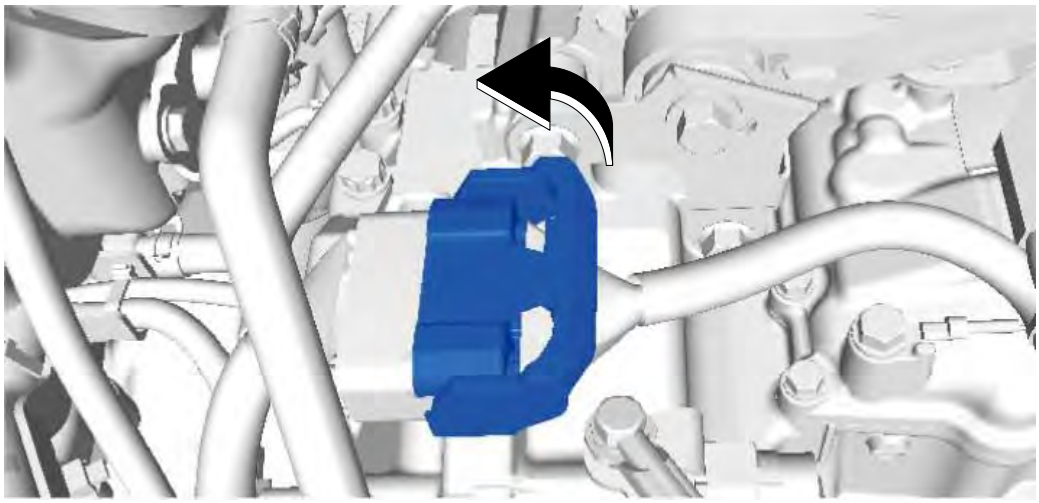


4. Remove the transmission radio ground terminal.



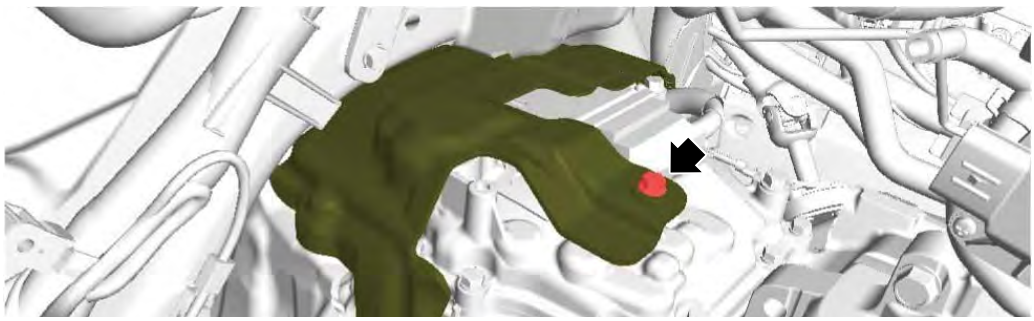
CVT10273

5. Disconnect the transmission harness connector.



CVT10266

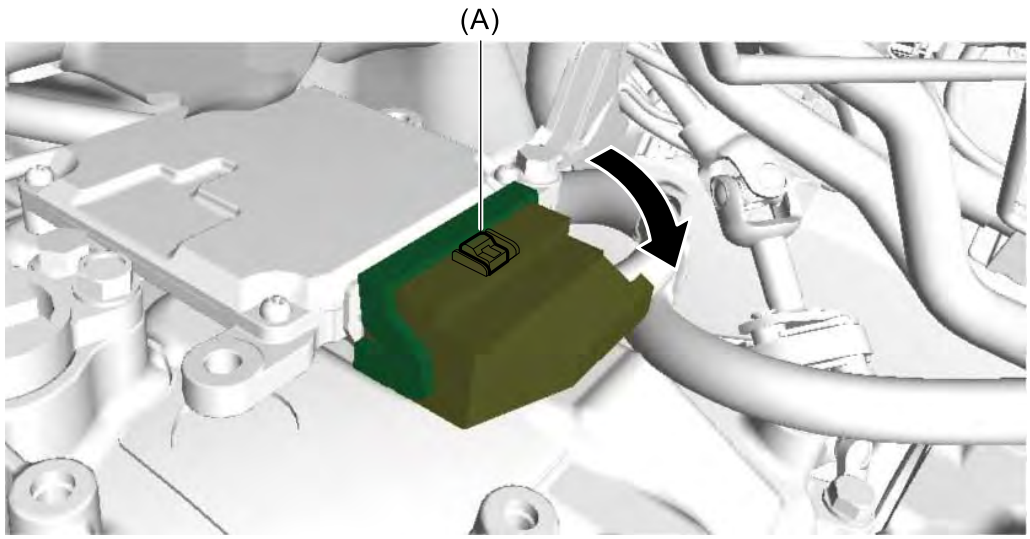
6. Remove the transmission case cover (small).





CVT10283

7. Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



CVT10284

(A) Lock button

8. Set the ST between TCM and transmission harness. Ref. to TRANSMISSION (DIAGNOSTICS)>General Description>CAUTION.

Preparation tool:

ST: CHECK BOARD (18460AA040)

9. Connect the transmission radio ground terminal and transmission harness connector.

Tightening torque:

32.3 N·m (3.3 kgf-m, 23.8 ft-lb)

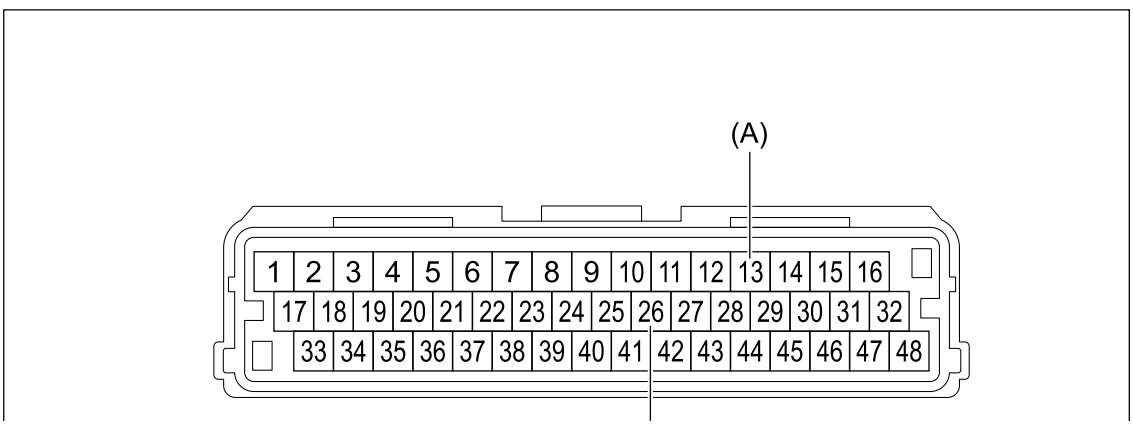
10. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

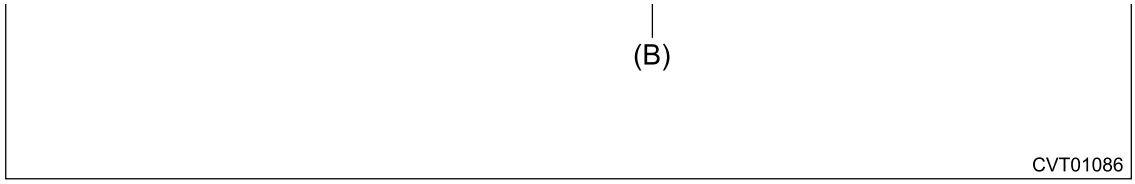
11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

12. Set the probe of oscilloscope to the check board connector.

Connector & terminal

(B54)No. 13 (+) — No. 26 (−):





(A) + probe

(B) – probe

13. Start and warm up the engine.

14. Lift up the vehicle.

Caution:

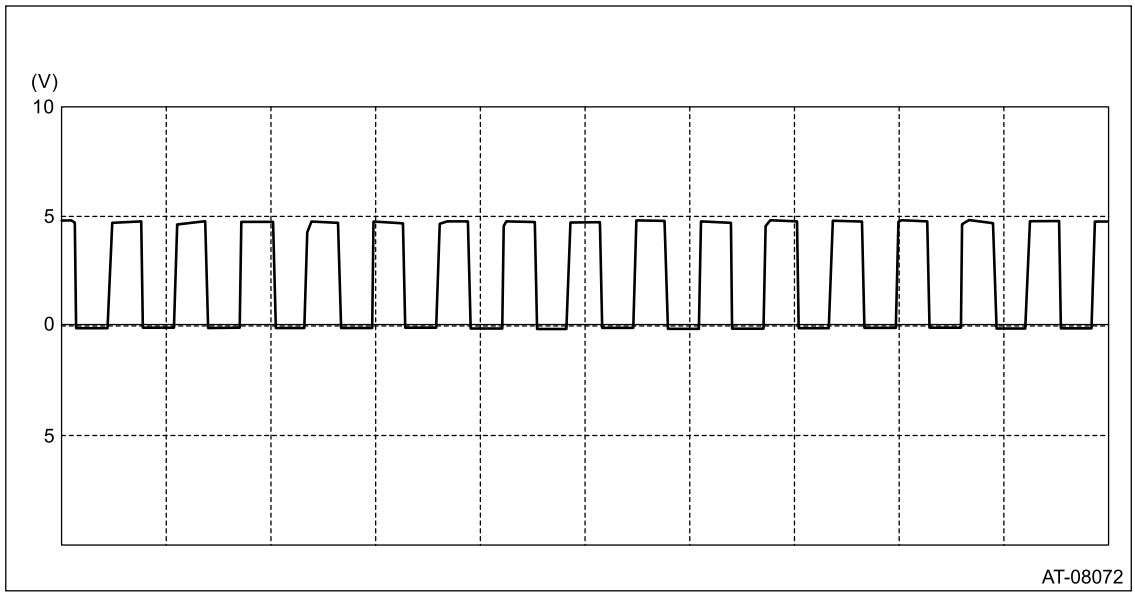
Lift up the vehicle until the tire bottom is 0.3 m (0.98 ft) or more above the ground.

15. Shift the select lever to the “D” range.

16. Check the waveform and output voltage of the secondary speed sensor with engine idling.

Note:

The waveform cycle changes as the speed changes.



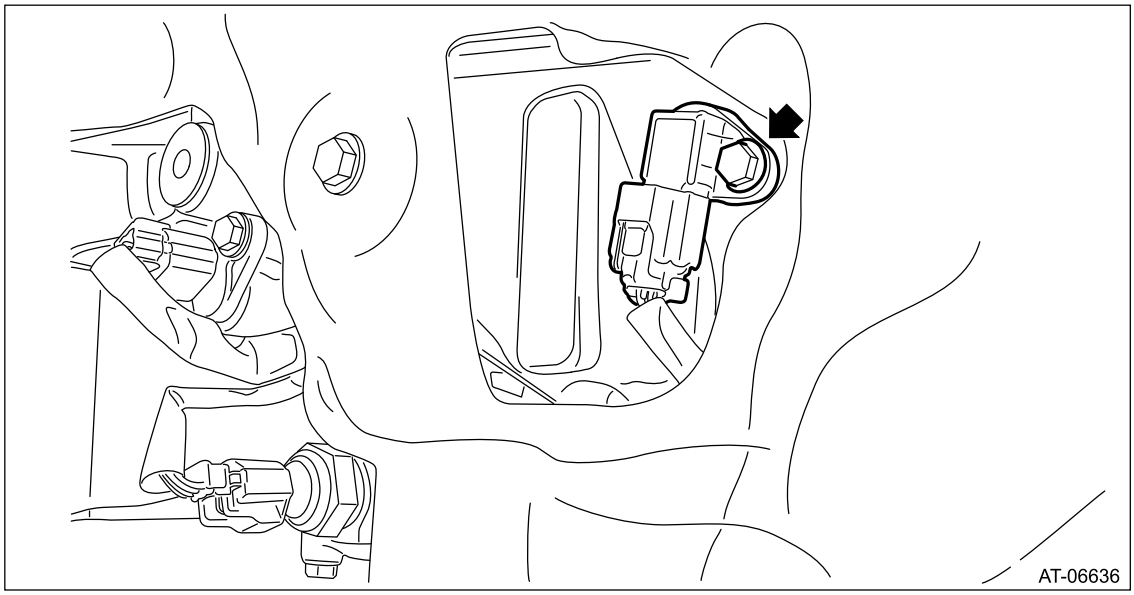
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Speed Sensor

REMOVAL

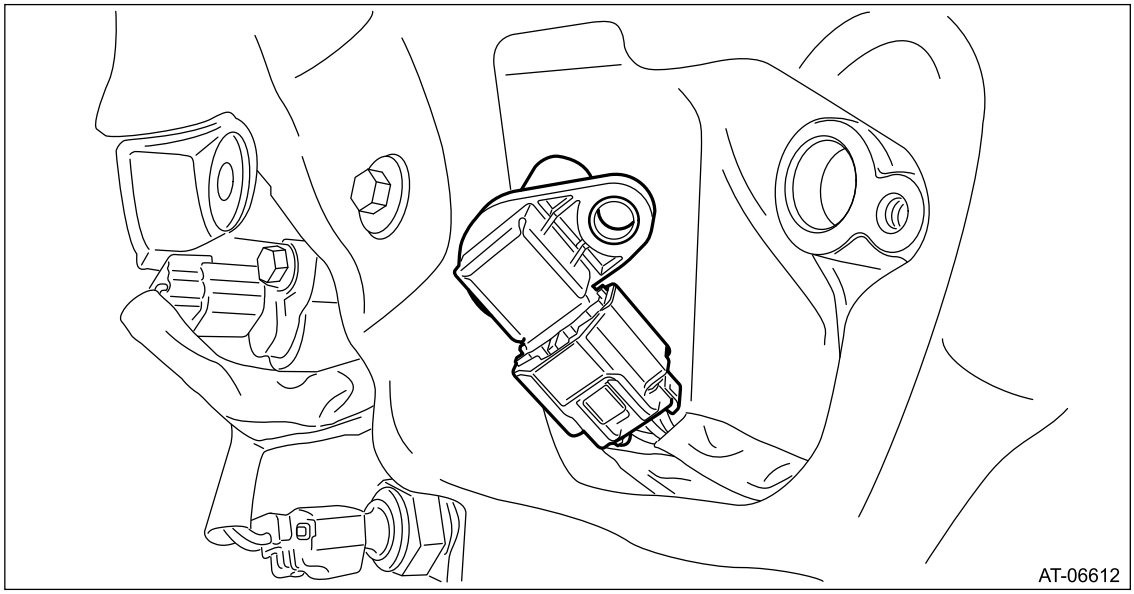
Caution:

Be sure to prevent water or oil from contacting the connector terminal of primary speed sensor. If adhesion occurs, replace with a new part.

1. Remove the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the primary speed sensor.



3. Remove the harness connector from primary speed sensor.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Speed Sensor

INSTALLATION

Caution:

Be sure to prevent water or oil from contacting the connector terminal of primary speed sensor. If adhesion occurs, replace with a new part.

1. Connect the harness connector.
2. Install the primary speed sensor.

   Note:

   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

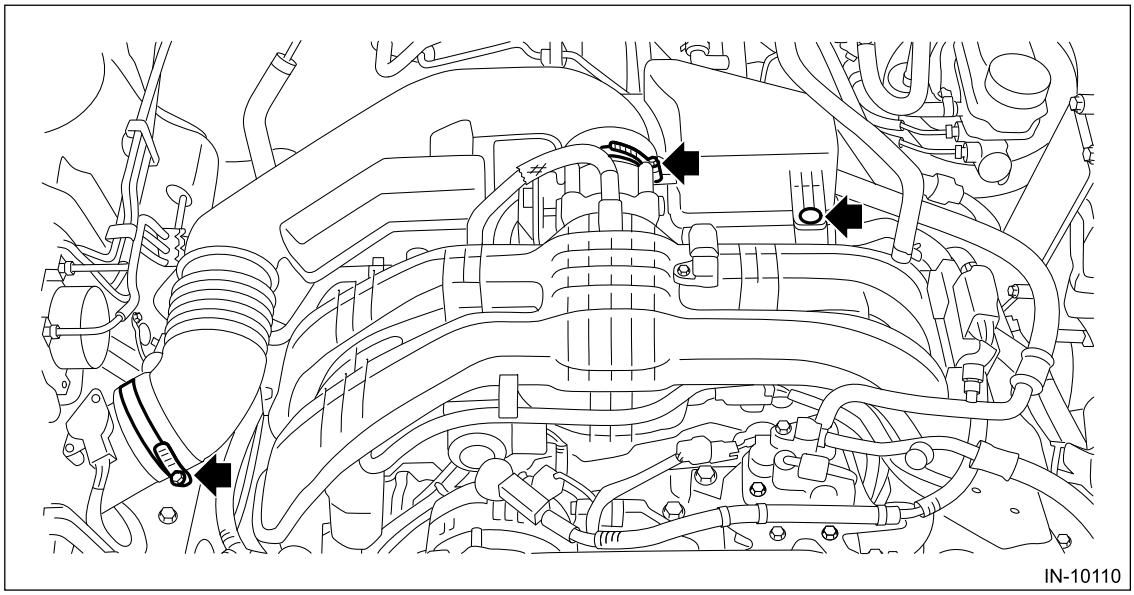
   Tightening torque:

   7 N·m (0.7 kgf-m, 5.2 ft-lb)
3. Install the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Speed Sensor

INSPECTION

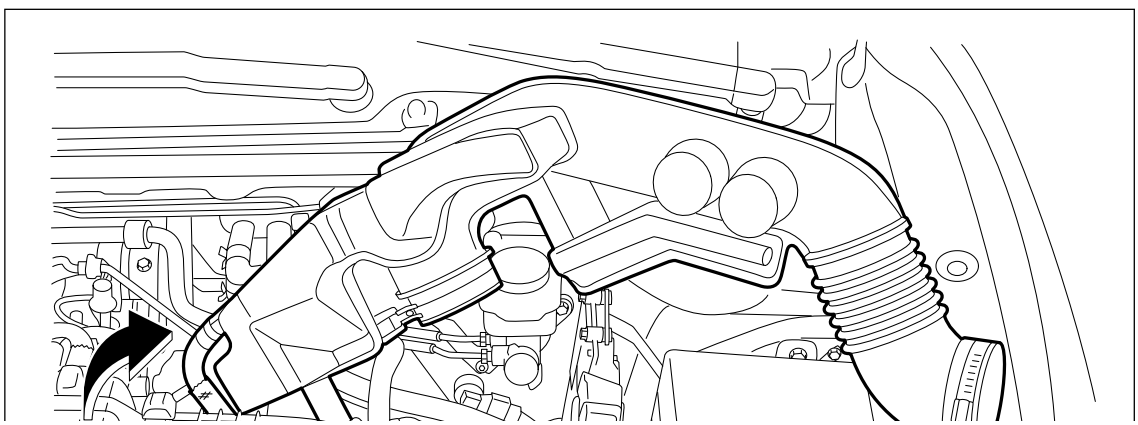
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.

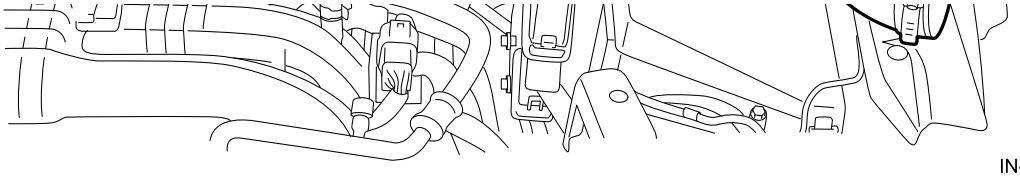


3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

   Note:

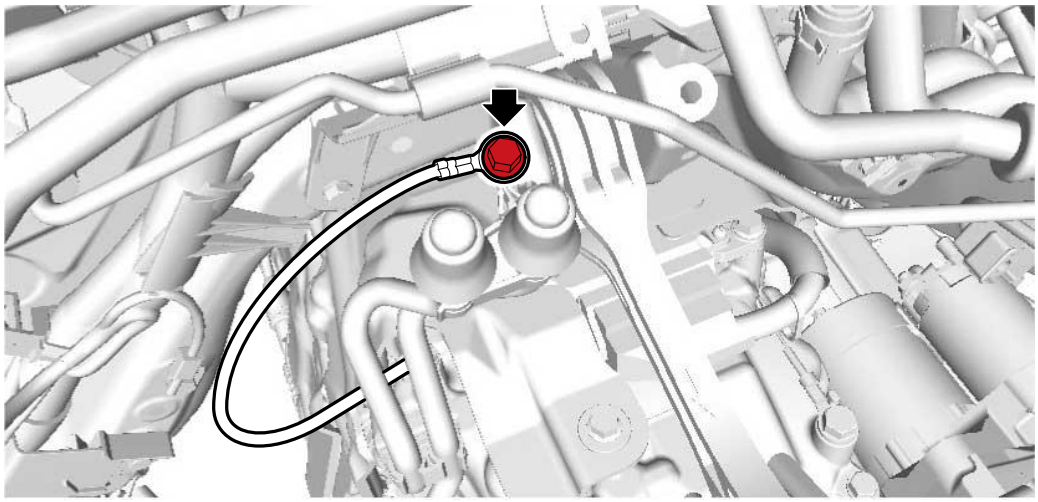
   Be careful not to pull out the PCV hose.





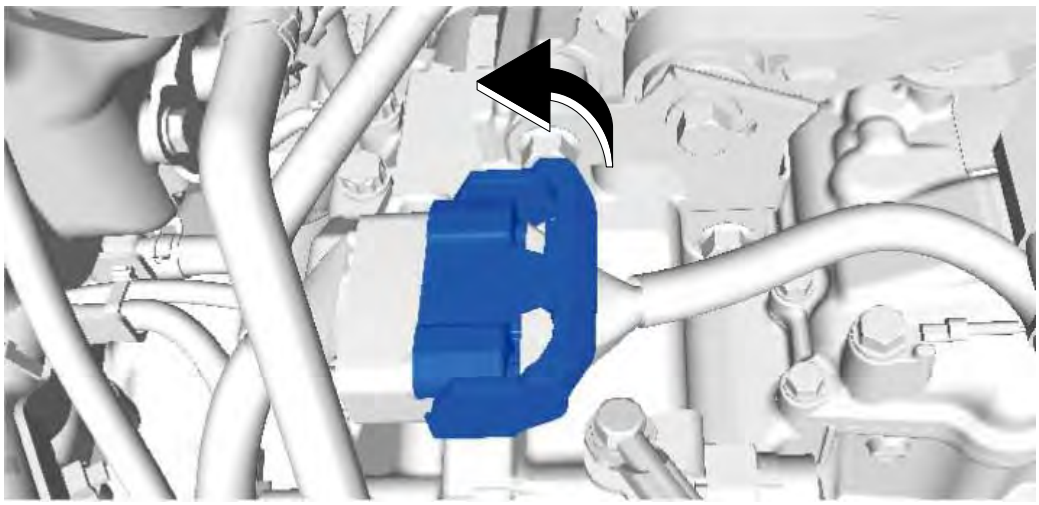
IN-10111

4. Remove the transmission radio ground terminal.



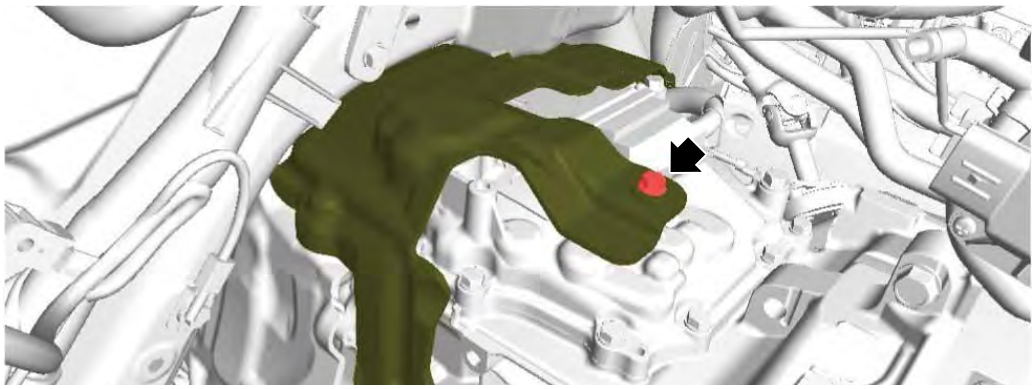
CVT10273

5. Disconnect the transmission harness connector.



CVT10266

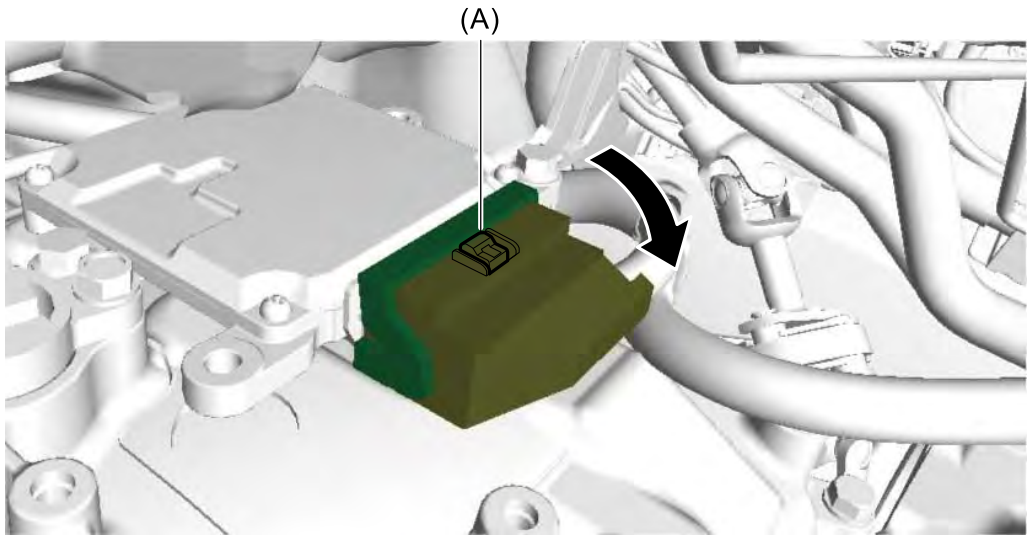
6. Remove the transmission case cover (small).





CVT10283

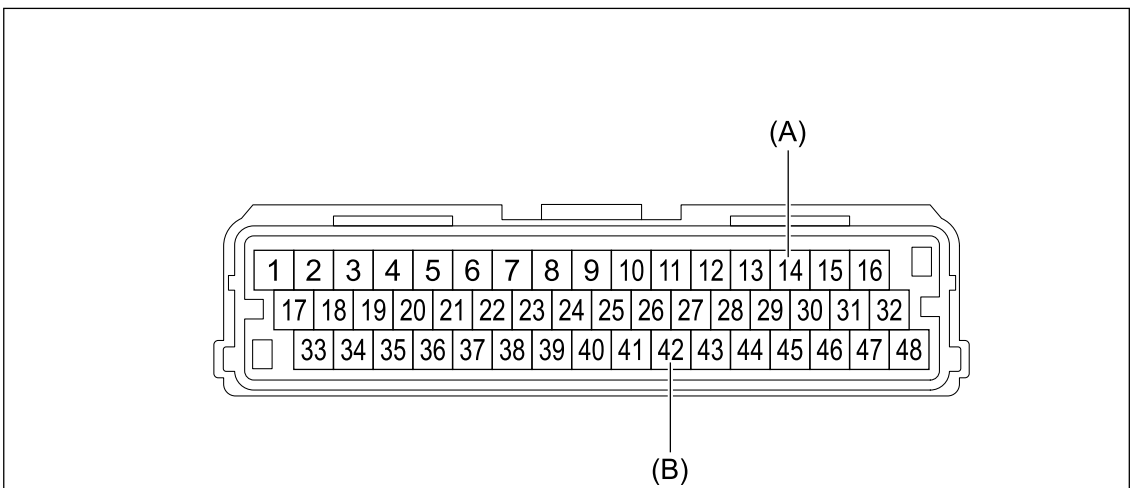
7. Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.



CVT10284

(A) Lock button

8. Set the ST between TCM and transmission harness. Ref. to TRANSMISSION (DIAGNOSTICS)>General Description>CAUTION.
   Preparation tool:
   ST: CHECK BOARD (18460AA040)
9. Connect the transmission radio ground terminal and transmission harness connector.
   Tightening torque:
   32.3 N·m (3.3 kgf-m, 23.8 ft-lb)
10. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
12. Set the probe of oscilloscope to the check board connector.
    Connector & terminal
    (B54)No. 14 (+) — No. 42 (−):



CVT00717

(A) + probe

(B) – probe

13. Start and warm up the engine.

14. Lift up the vehicle.

Caution:

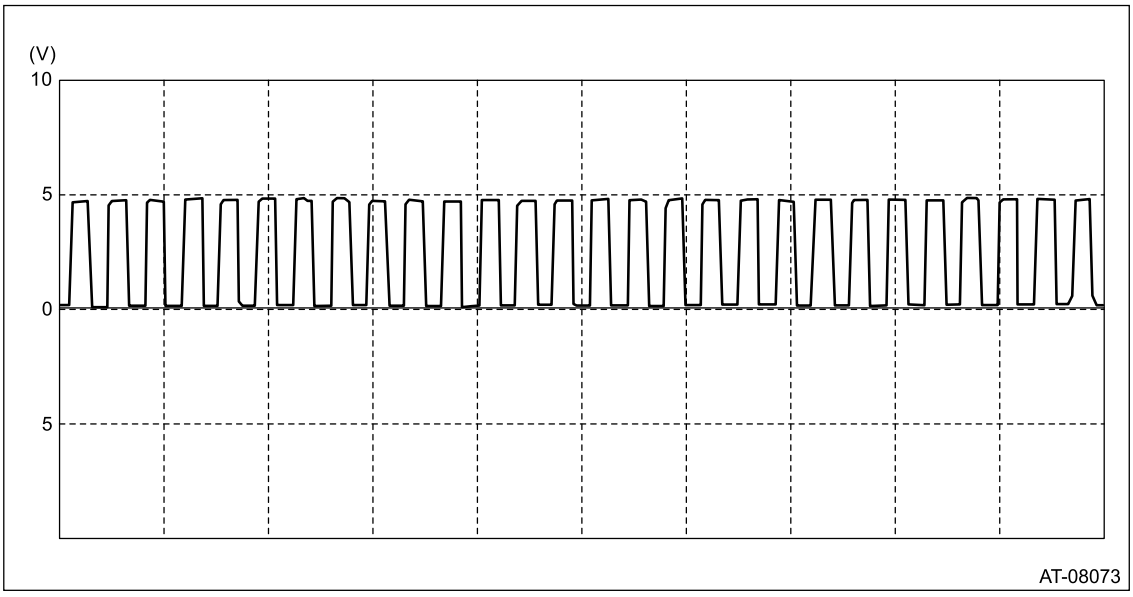
Lift up the vehicle until the tire bottom is 0.3 m (0.98 ft) or more above the ground.

15. Shift the select lever to the "D" range.

16. Check the waveform and output voltage of the primary speed sensor with engine idling.

Note:

The waveform cycle changes as the speed changes.



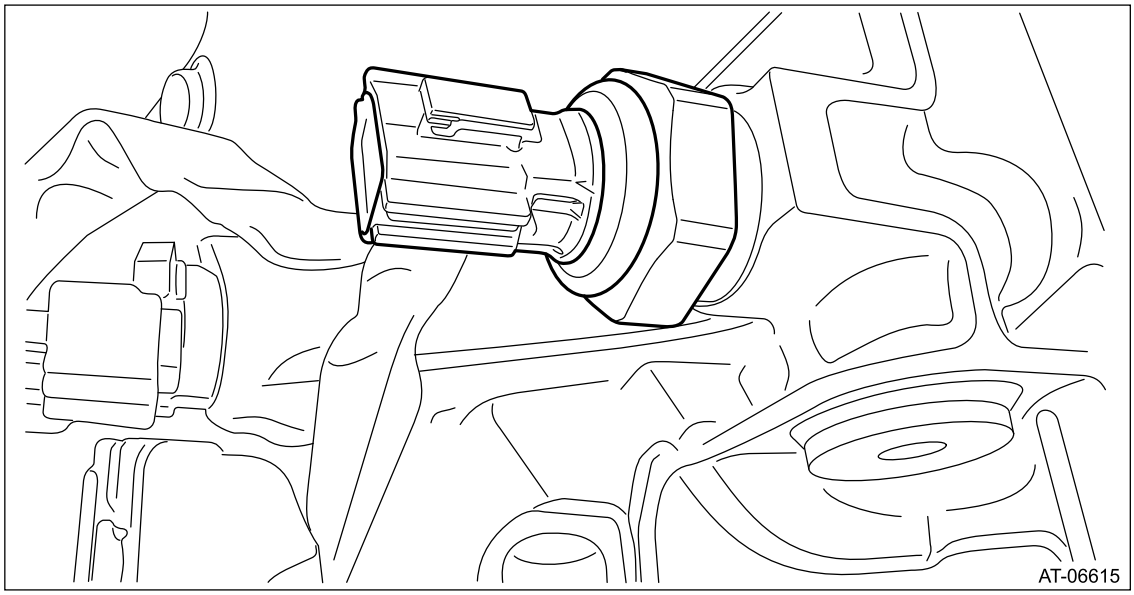
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Pressure Sensor

REMOVAL

Caution:

- **Be sure to prevent water or oil from contacting the connector terminal of secondary pressure sensor. If adhesion occurs, replace with a new part.**
- **When secondary pressure sensor is removed, CVTF leaks. After installing the secondary pressure sensor, adjust the CVTF level.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Lift up the vehicle.
3. Remove the secondary pressure sensor connector.
4. Remove the secondary pressure sensor.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Pressure Sensor

INSTALLATION

Caution:

- **Be sure to prevent water or oil from contacting the connector terminal of secondary pressure sensor. If adhesion occurs, replace with a new part.**
- **After installing the secondary pressure sensor, adjust the CVTF level.**

Install in the reverse order of removal.

Note:

Use new O-rings.

Tightening torque:

39 N·m (4.0 kgf-m, 28.8 ft-lb)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Secondary Pressure Sensor

INSPECTION

1. Start and warm up the engine

1. ~~Start and warm up the engine.~~
2. Depress the brake pedal, and shift the select lever to “D” range.
3. Shift the select lever to “P” or “N” range.
4. Depress the brake pedal and hold it.
5. Check «secondary pressure sensor voltage» by using Subaru Select Monitor while the engine is idling. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor>OPERATION.
   Standard
   Approx. 0.8 V
6. Check «secondary pressure sensor voltage» by using Subaru Select Monitor while the engine is stopped and the ignition switch is turned on. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor>OPERATION.
   Specification:
   Approx. 0.5 V

REMOVAL

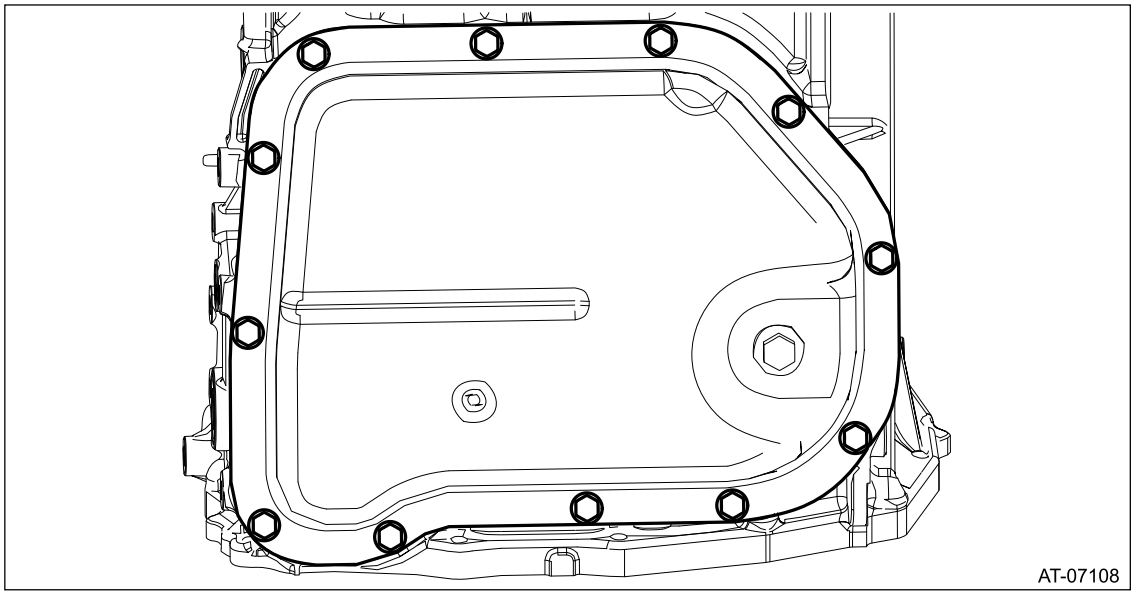
Caution:

- **Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.**
- **Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.**

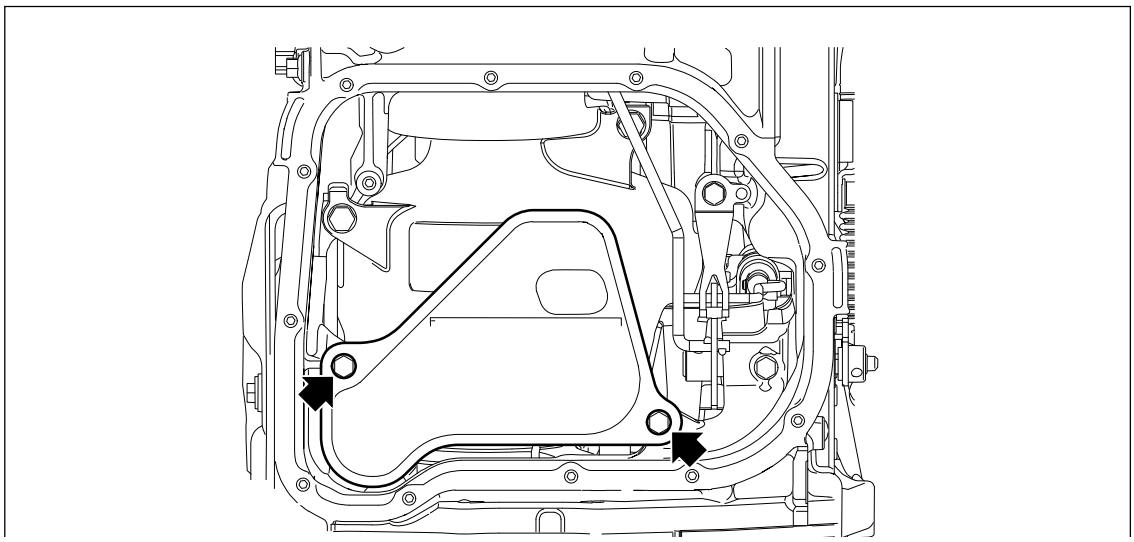
1. Lift up the vehicle.
2. Clean the transmission exterior.
3. Remove the CVTF drain plug to drain CVTF.
4. Remove the oil pan.

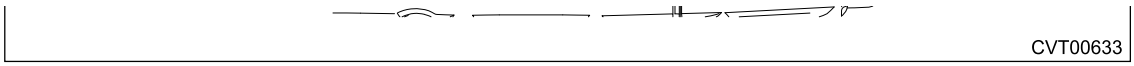
   Caution:

   Be careful not to allow foreign matter such as dust or dirt to enter the oil pan.

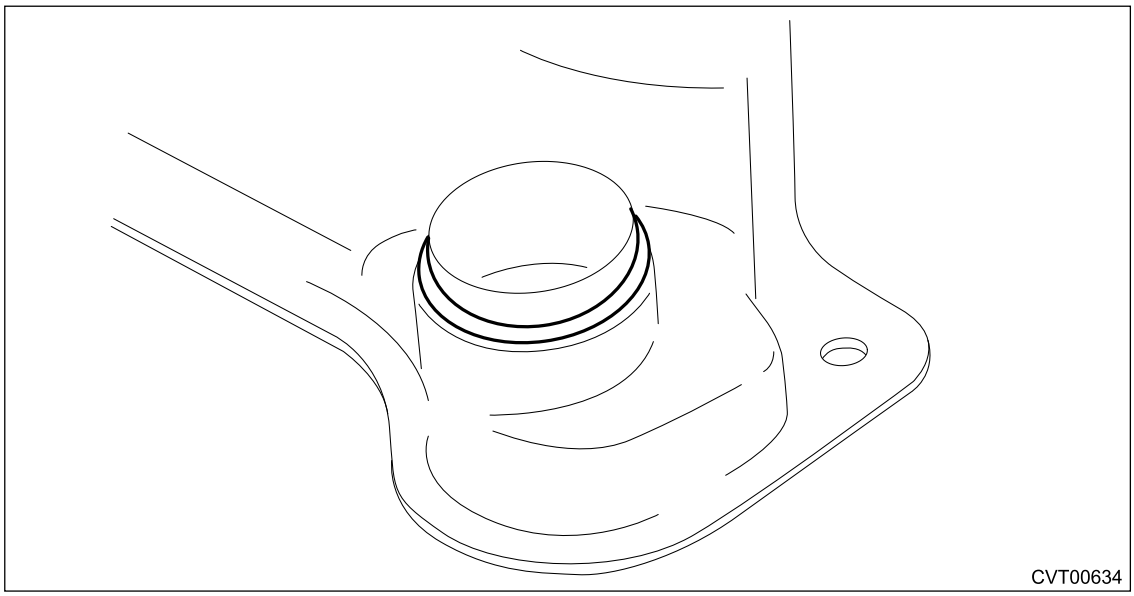


5. Remove the magnet.
6. Remove the oil strainer.




CVT00633

7. Remove the O-ring from oil strainer.


CVT00634

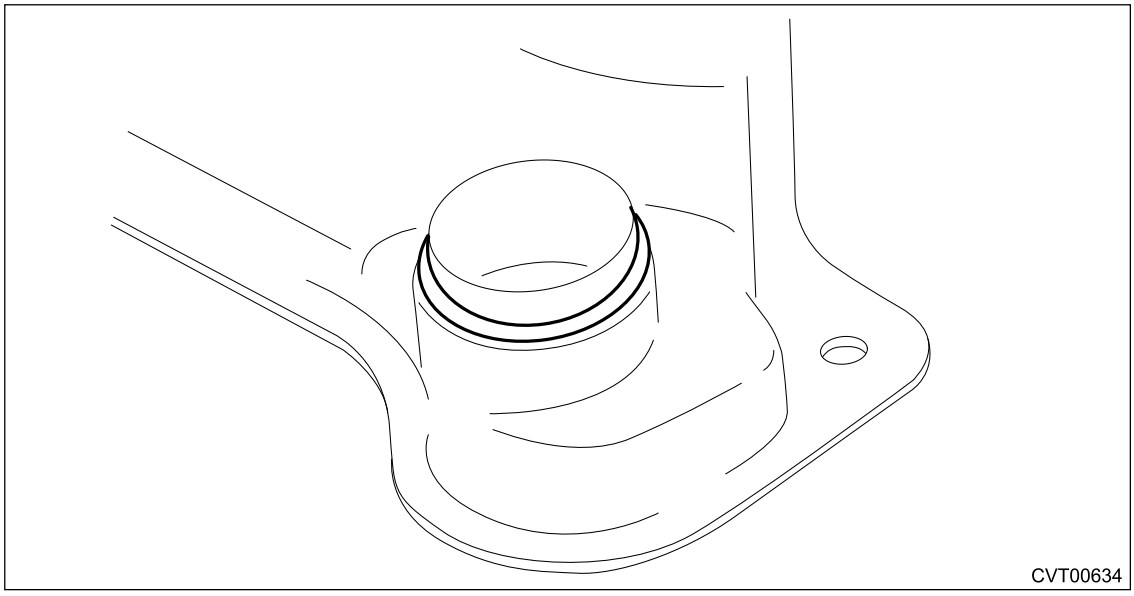
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pan and Strainer

INSTALLATION

1. Clean the mating surface of oil pan and transmission case.
2. Install the O-ring to the oil strainer.

   Note:

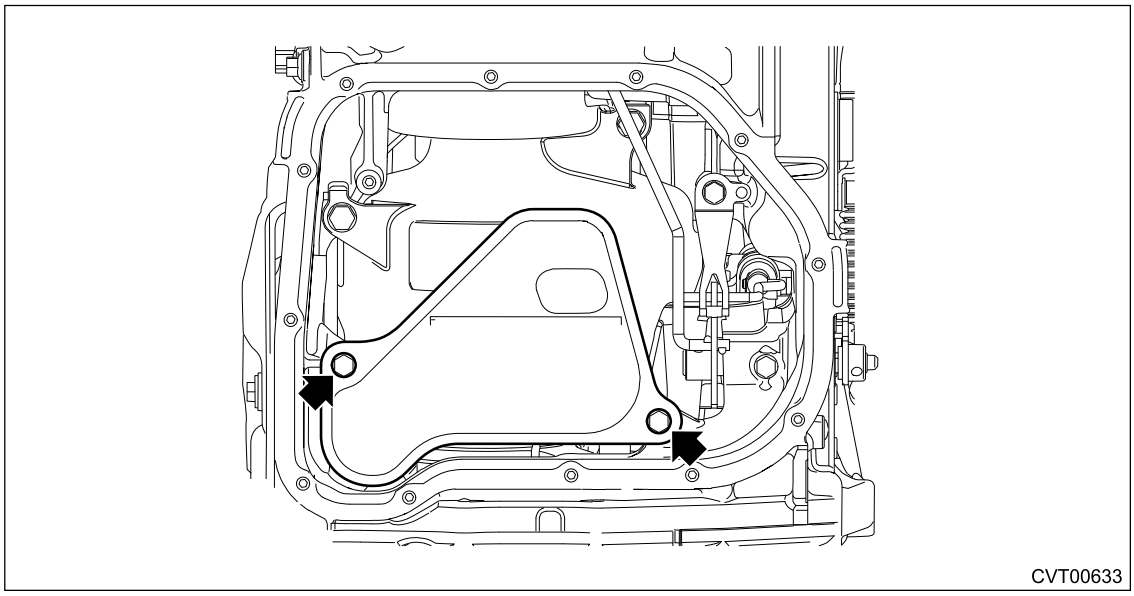
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**


CVT00634

3. Install the oil strainer.

   Tightening torque:

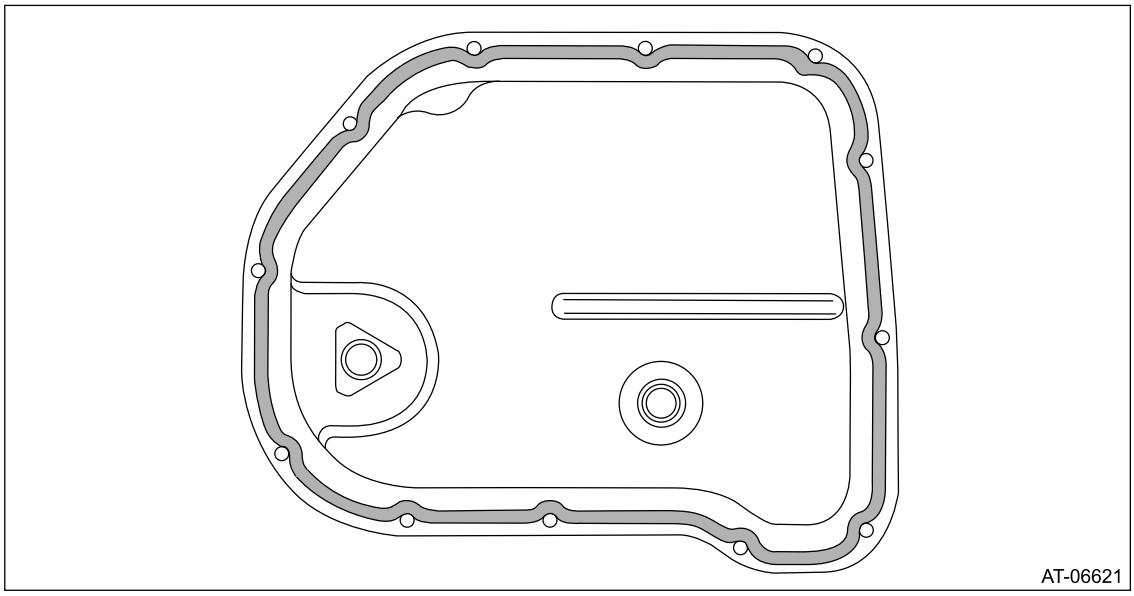
   9 N·m (0.9 kgf-m, 6.6 ft-lb)



4. Clean the magnet.
5. Attach the magnet at the specified position of the oil pan.
6. Apply liquid gasket all around the oil pan mating surface seamlessly.

Liquid gasket:

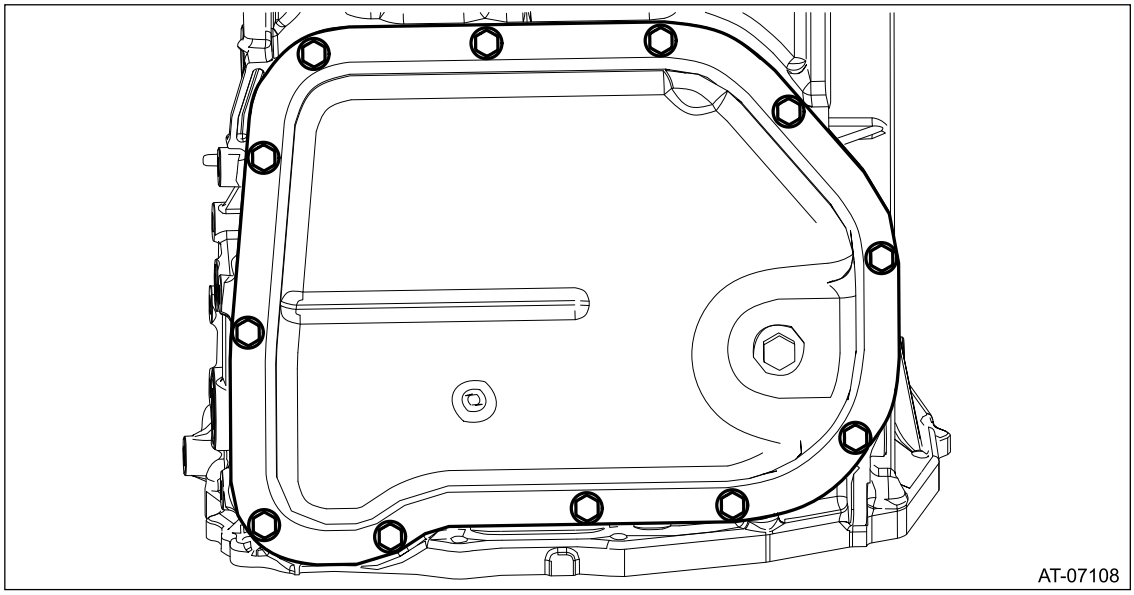
THREE BOND 1217B (Part No. K0877YA020) or equivalent



7. Install the oil pan by equally tightening the bolts.

Tightening torque:

5 N·m (0.5 kgf-m, 3.7 ft-lb)



8. Refill CVTF and adjust the level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>REPLACEMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pan and Strainer

INSPECTION

- Check each part for damage or dust.
- Check oil strainer for clogging.

REMOVAL

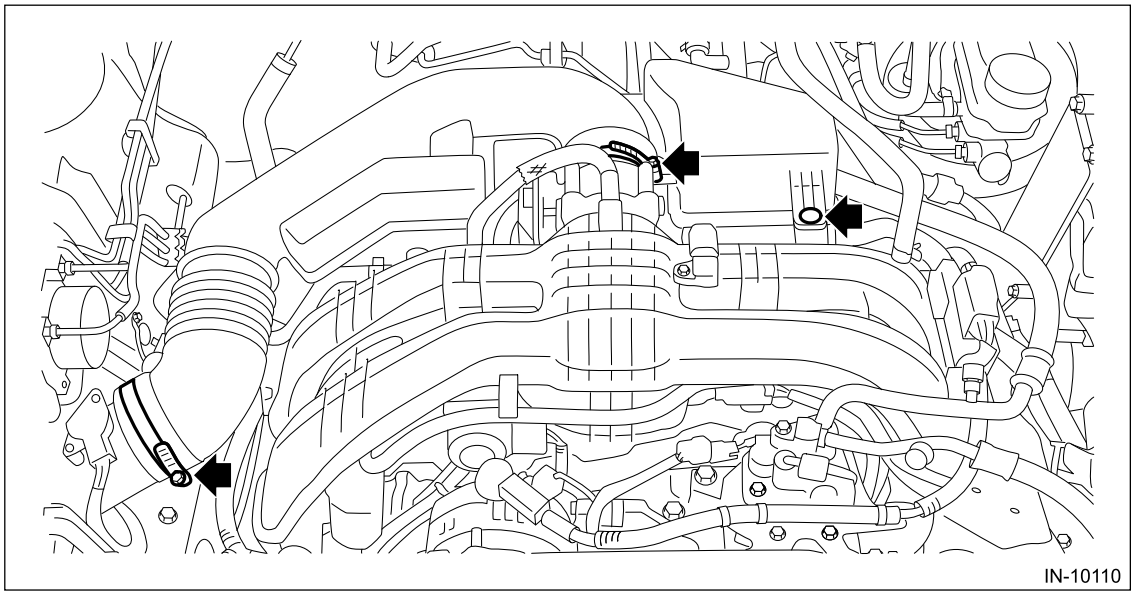
Caution:

- **Directly after the vehicle has been running or the engine has been idling for a long time, the CVTF is hot. Be careful not to burn yourself.**
- **Be careful not to spill CVTF on the exhaust pipe to prevent it from emitting smoke or causing a fire. If the CVTF adheres, wipe it off completely.**
- **Always clean the engine compartment before removal.**

Note:

The control valve body is replaced as an assembly only, because it is a non-disassembly part.

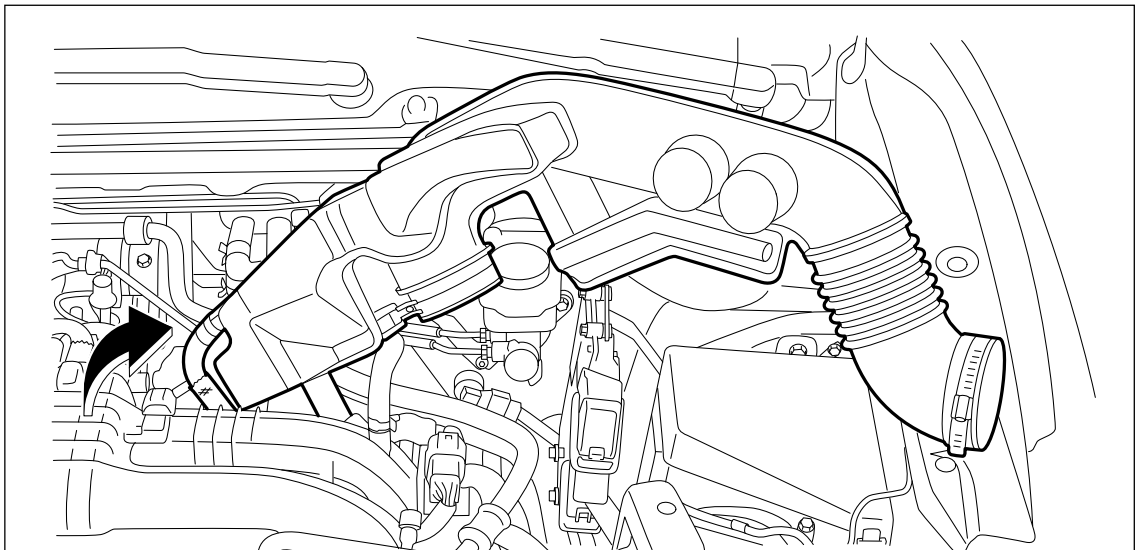
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.



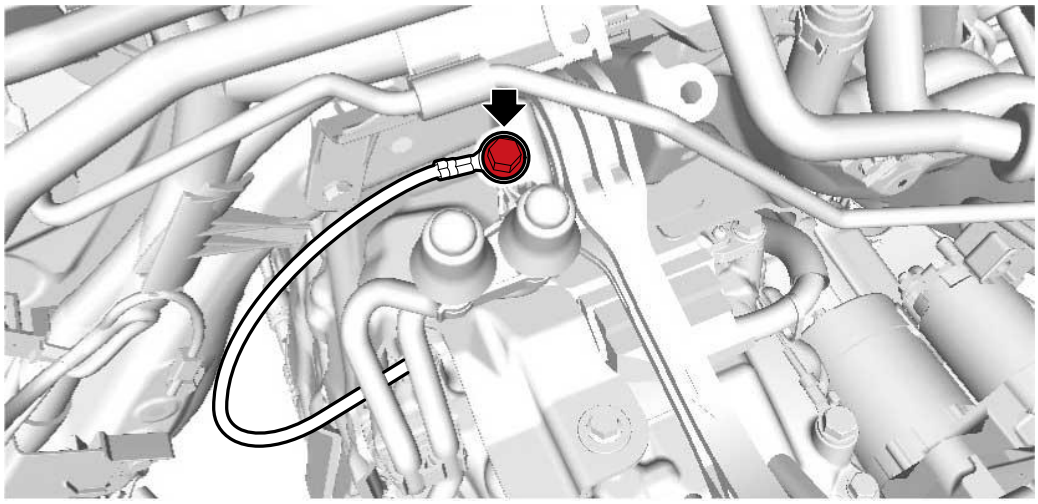
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Note:

Be careful not to pull out the PCV hose.

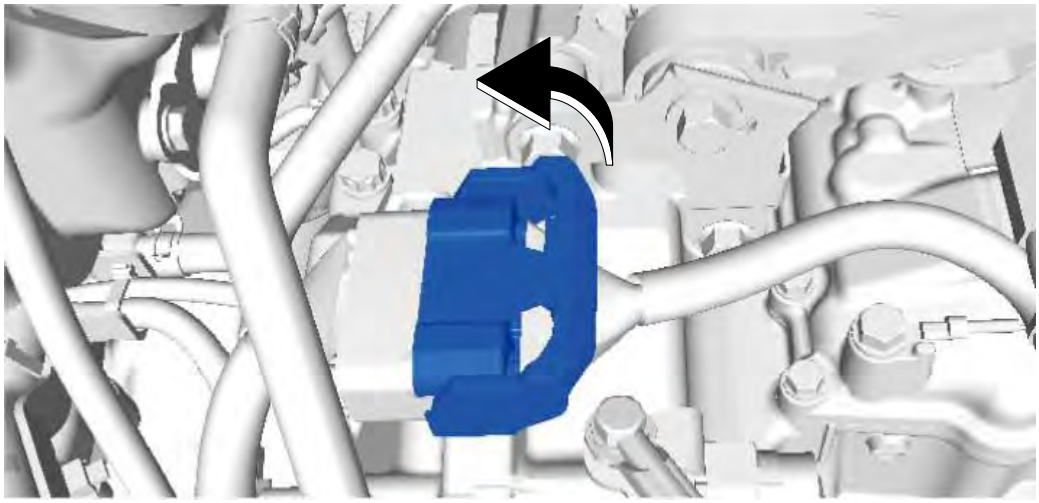


4. Remove the transmission radio ground terminal.



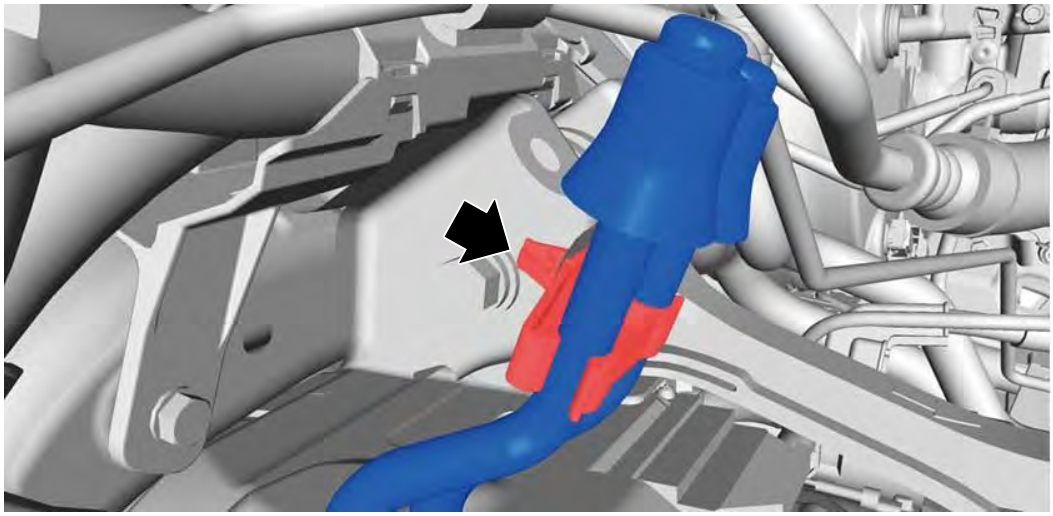
CVT10273

5. Disconnect the transmission harness connector.



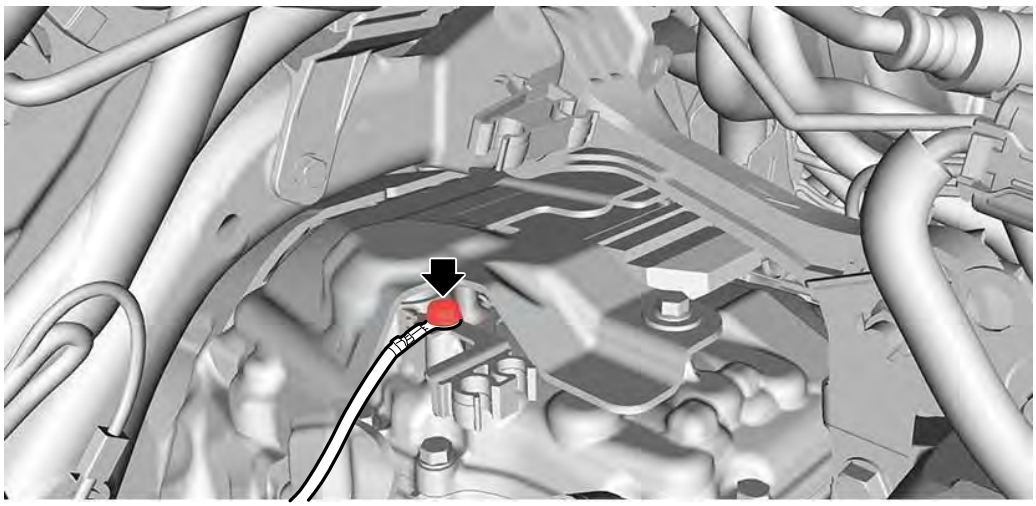
CVT10266

6. Remove the air breather hose together with the bracket.



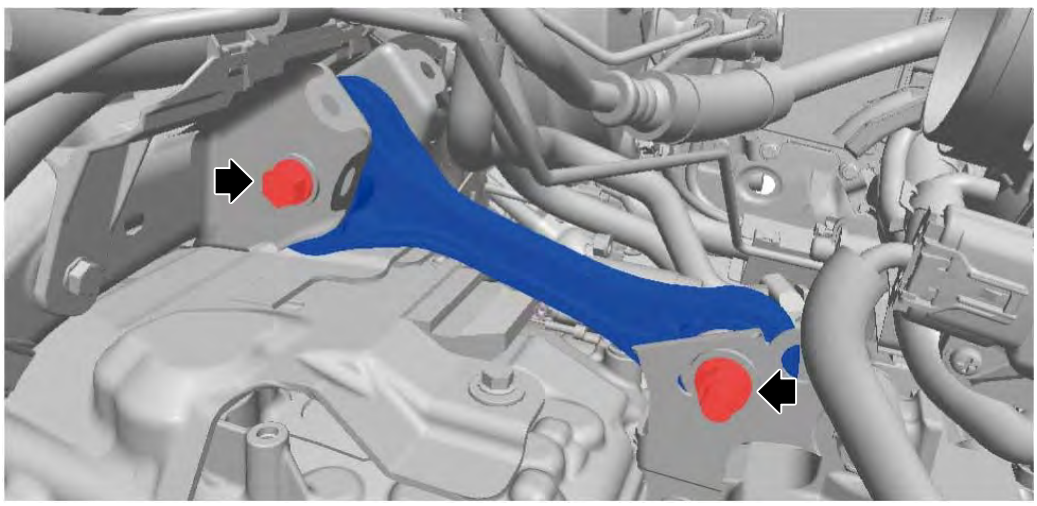
CVT10439

7. Remove the transmission radio ground cord.



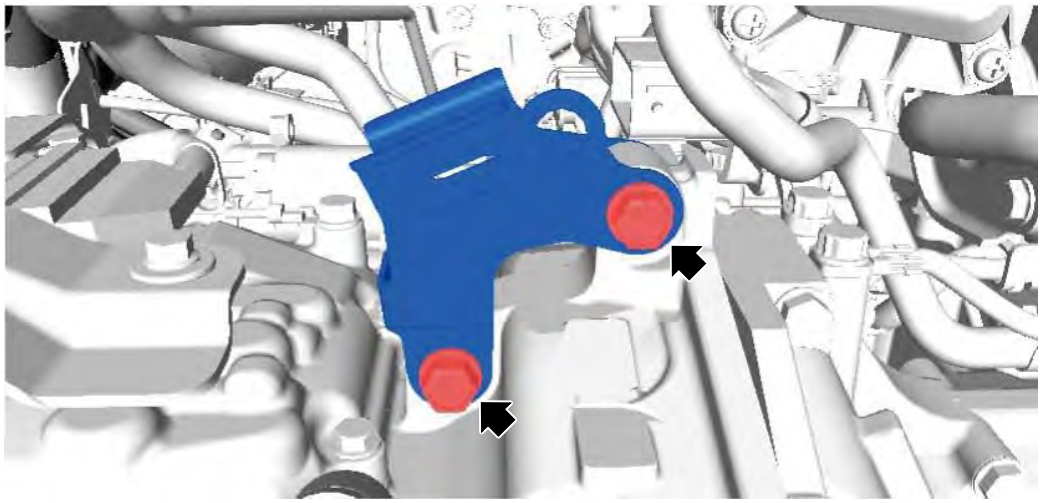
CVT10268

8. Remove the pitching stopper.

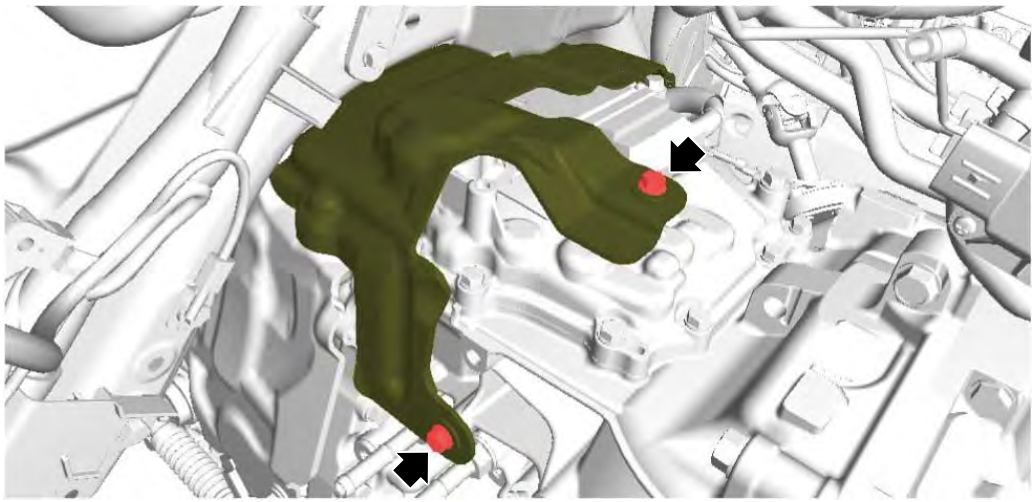


CVT10272

9. Remove the pitching stopper bracket.

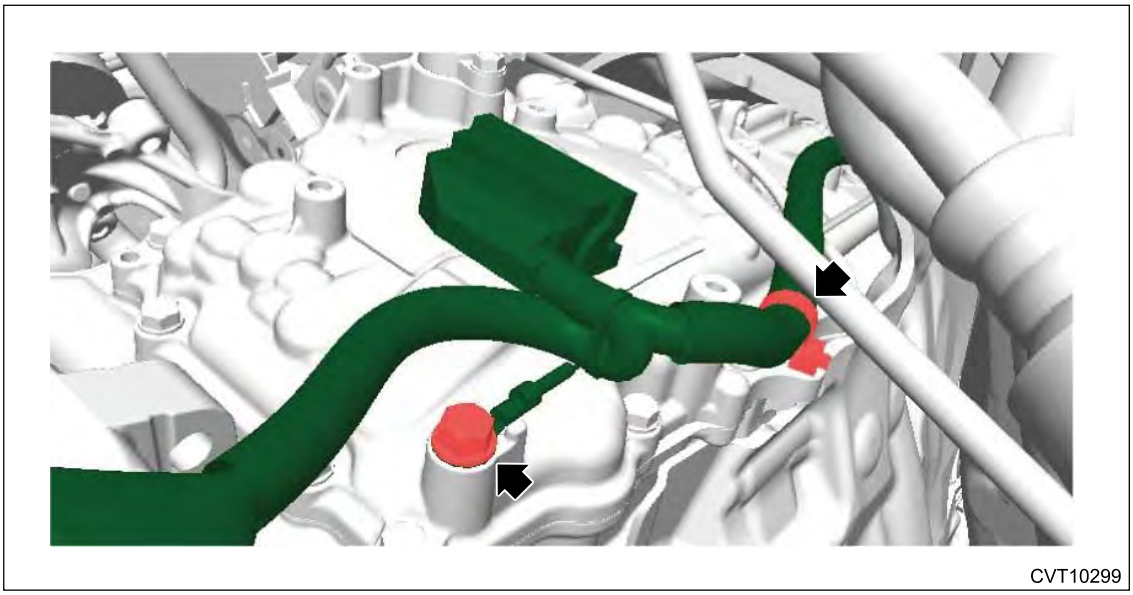

CVT10276

10. Remove the transmission case cover (small).


CVT10283

11. Remove the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>REMOVAL.

12. Remove the transmission harness clip and ground terminal.



13. Remove the throttle body, and move it aside so that it will not interfere with the removal of the control valve. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>REMOVAL.

Note:

Do not remove the preheater hose.

14. Clean the transmission exterior.

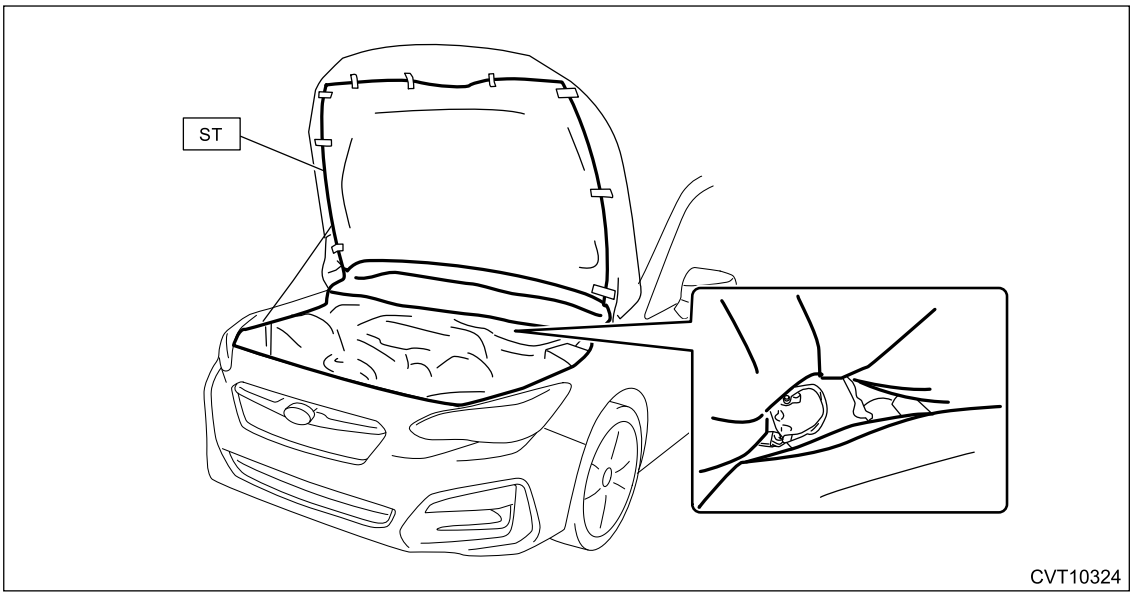
15. Fix the ST with tape, and set the ST to the vehicle.

Note:

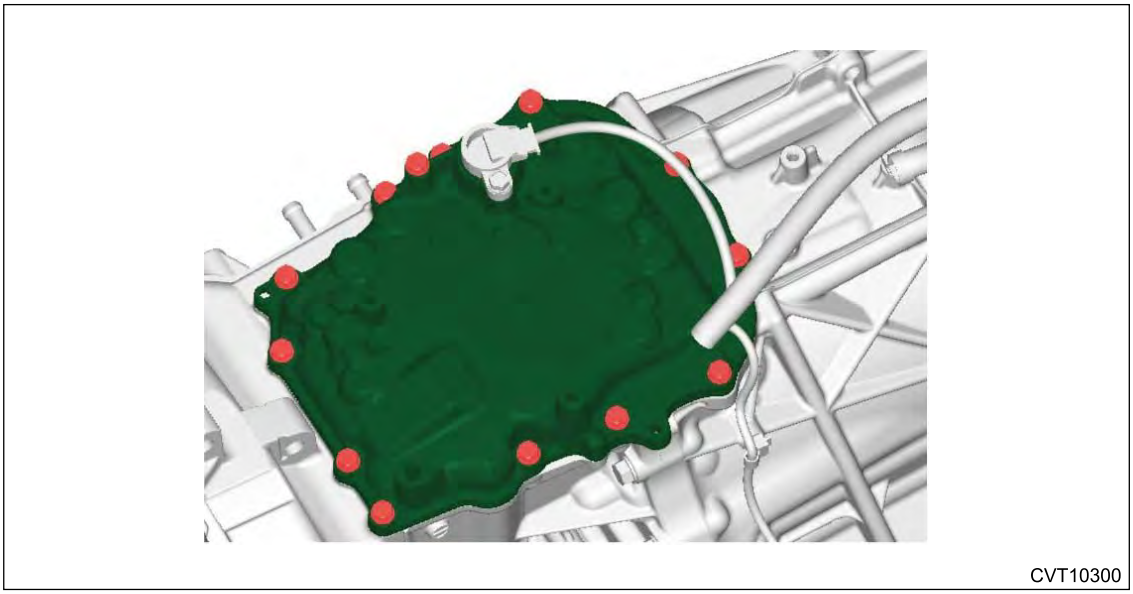
When replacing the control valve body, the sheet is included in the control valve body for repairs.

Preparation tool:

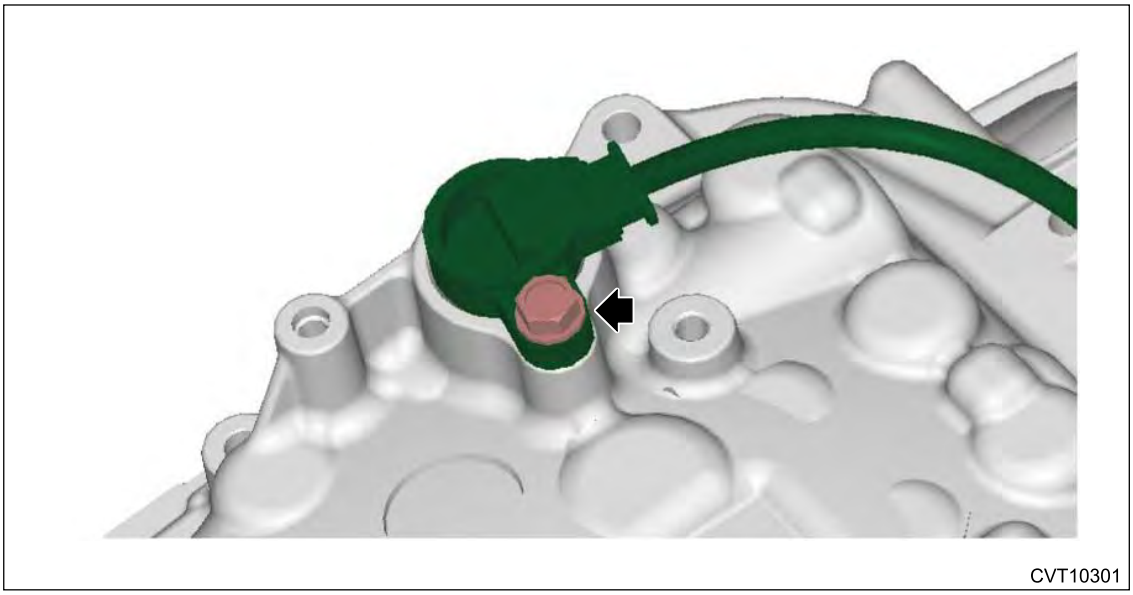
ST: SHEET SPECIAL TOOL (18761AA010)



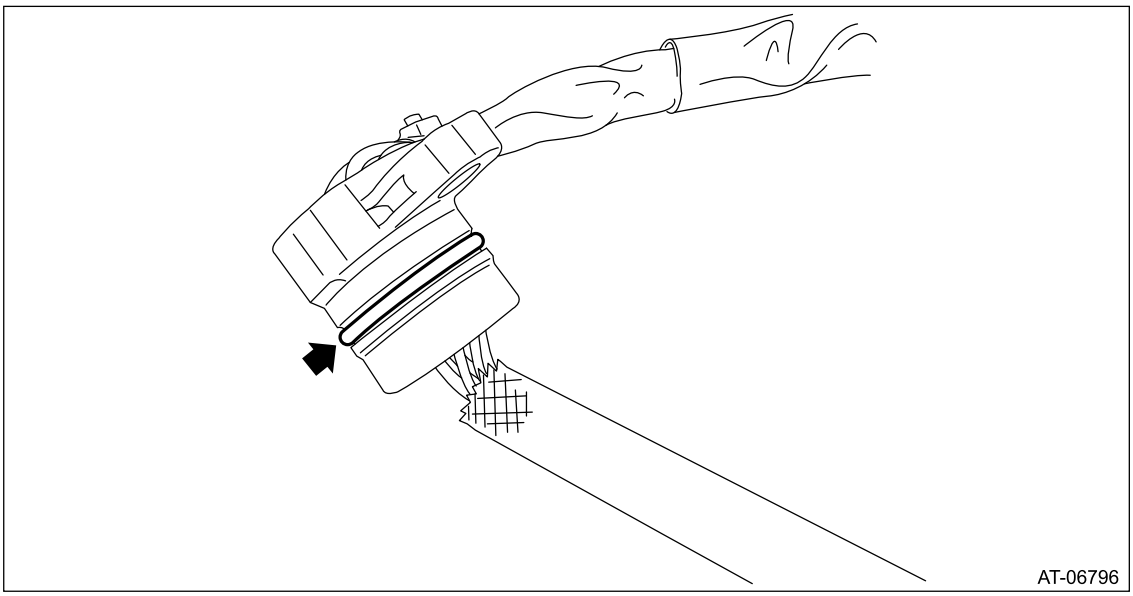
16. Remove the valve cover and gasket.



17. Remove the transmission harness from the valve cover.

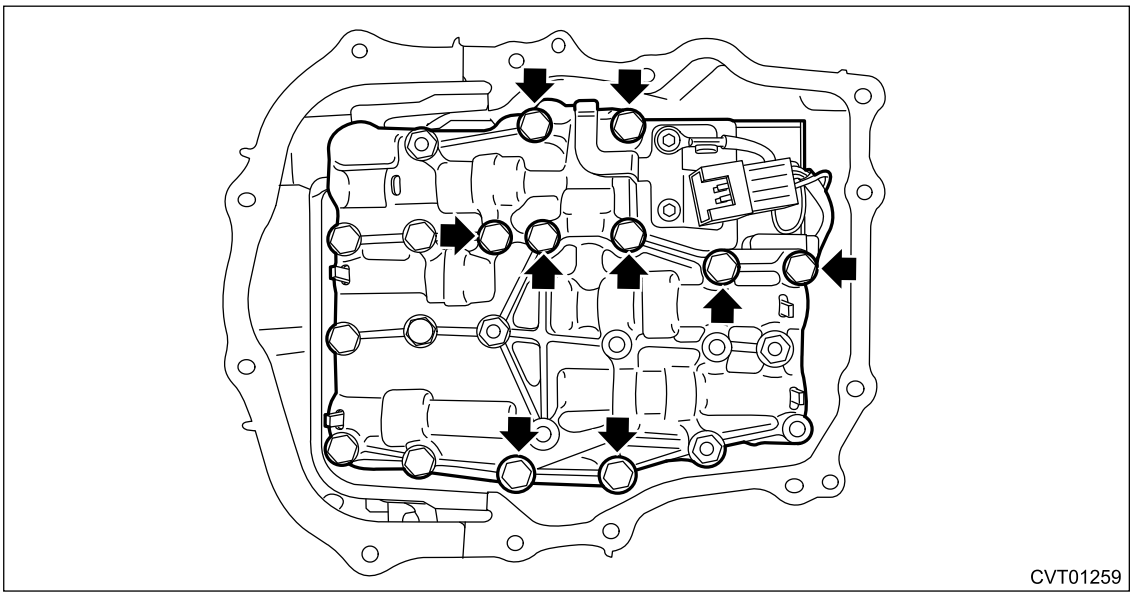


18. Remove the O-ring from the transmission harness.

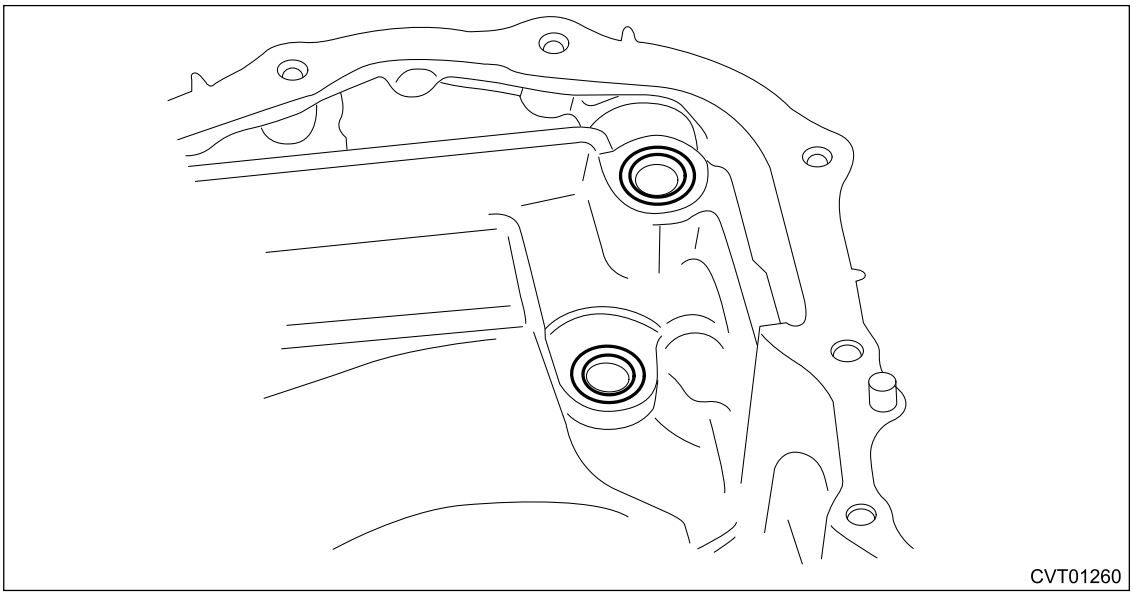


19. Disconnect the harness connector from the control valve body.

20. Remove the control valve body.



21. Remove the O-ring from the transmission.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Control Valve Body

INSTALLATION

1. Clean the mating surface of valve cover and transmission side.

Caution:

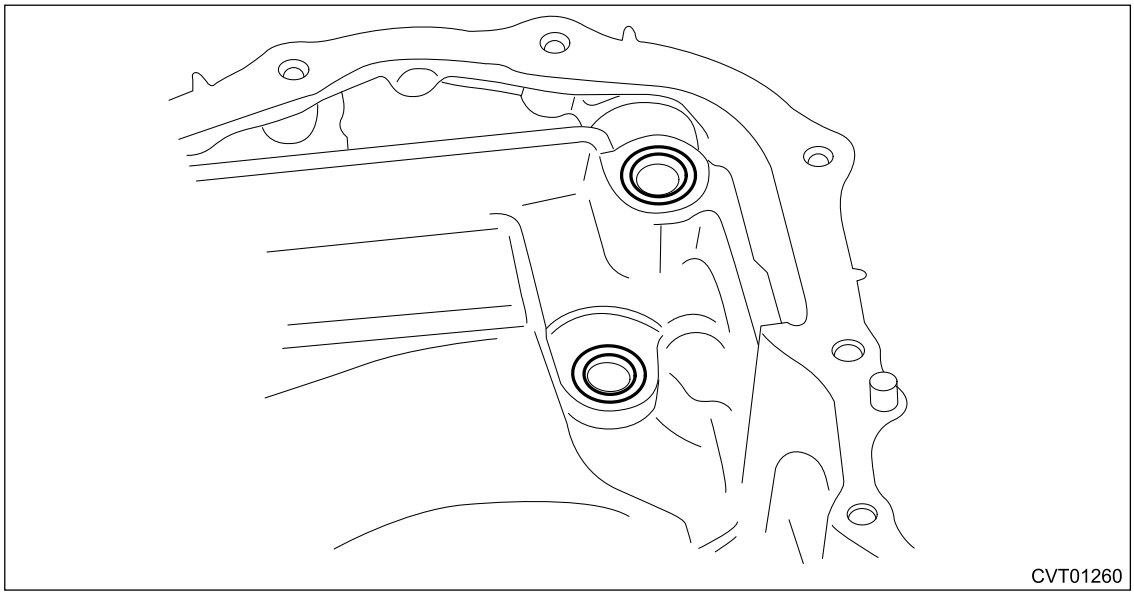
When cleaning the mating surface of the transmission side, be careful not to allow any dust, foreign matter and used liquid gasket to enter the transmission.

2. Check the control valve body for dust and other foreign matter.

3. Install the O-rings.

Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**



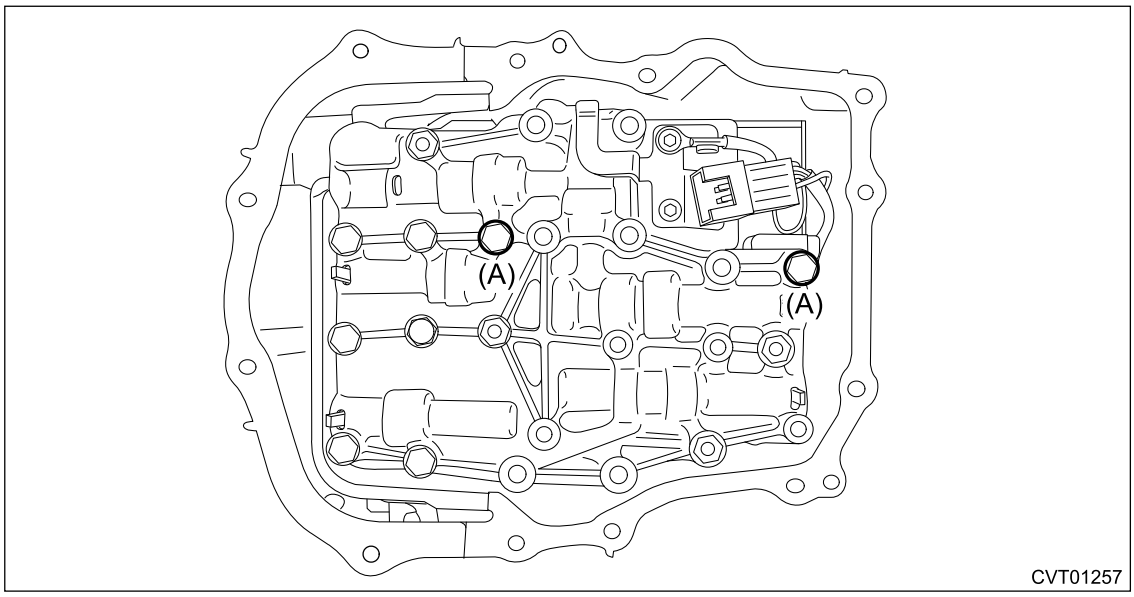
4. Install the control valve body.

(1) Install the control valve body to the transmission.

Caution:

- **Do not damage the O-ring.**
- **Perform installation so that the O-ring is not displaced.**

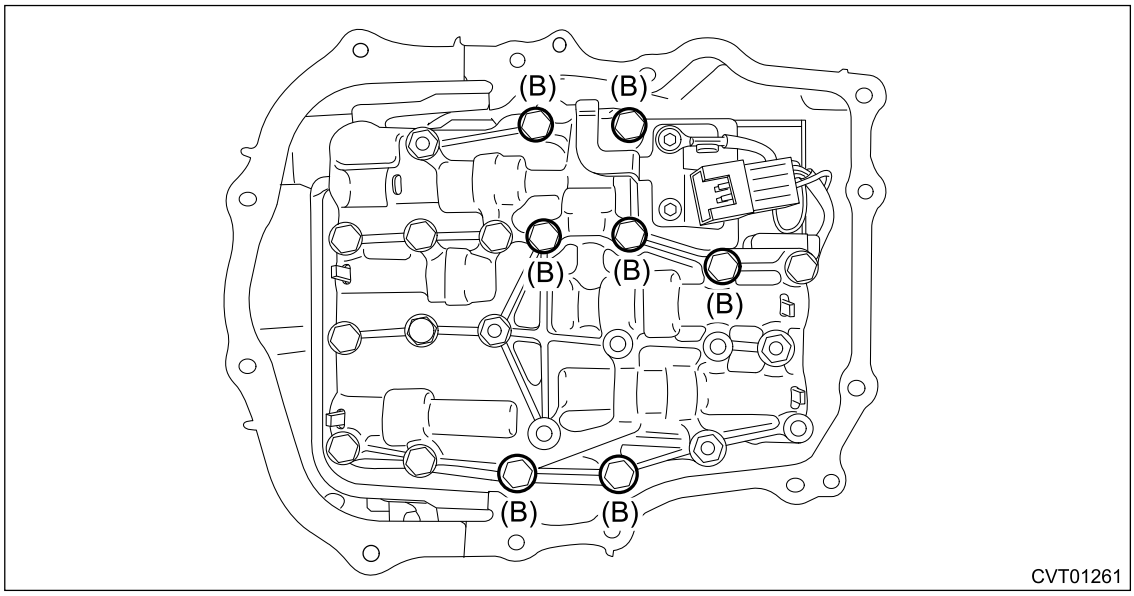
(2) Temporarily tighten the bolt (A: silver).



(3) Attach the bolt (B).

Tightening torque:

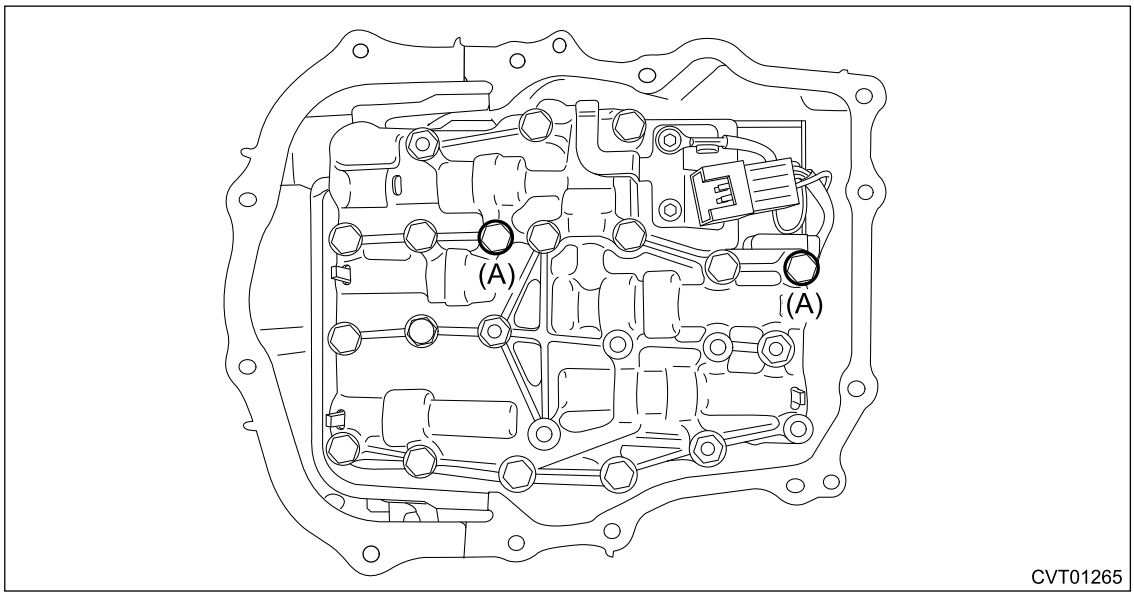
9 N·m (0.9 kgf-m, 6.6 ft-lb)



(4) Tighten the bolt (A: silver).

Tightening torque:

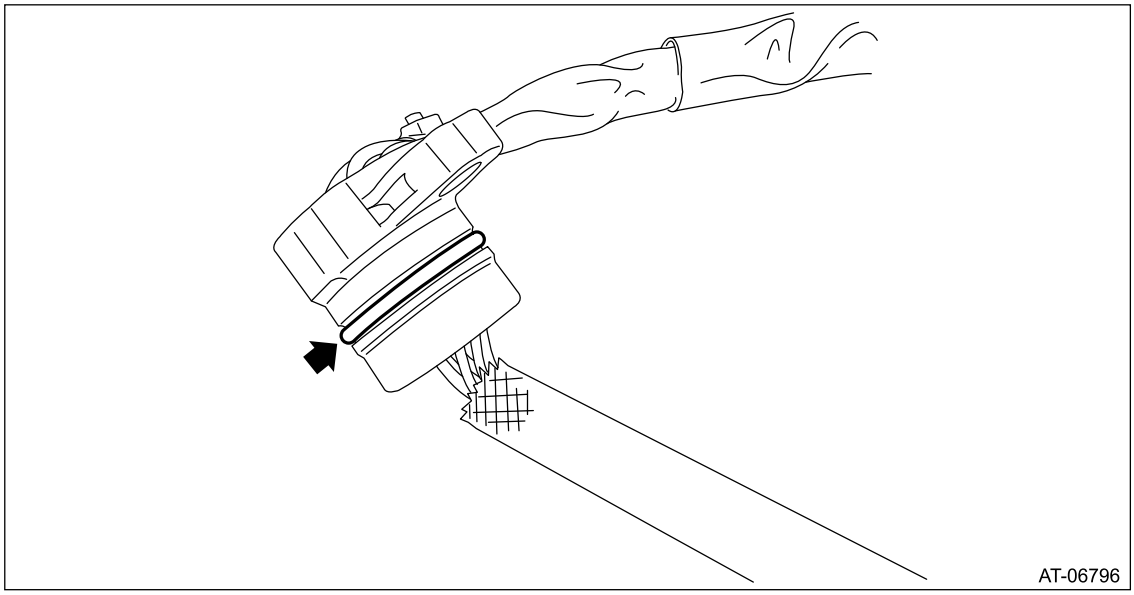
9 N·m (0.9 kgf-m, 6.6 ft-lb)



5. Install the O-ring to the transmission harness.

Note:

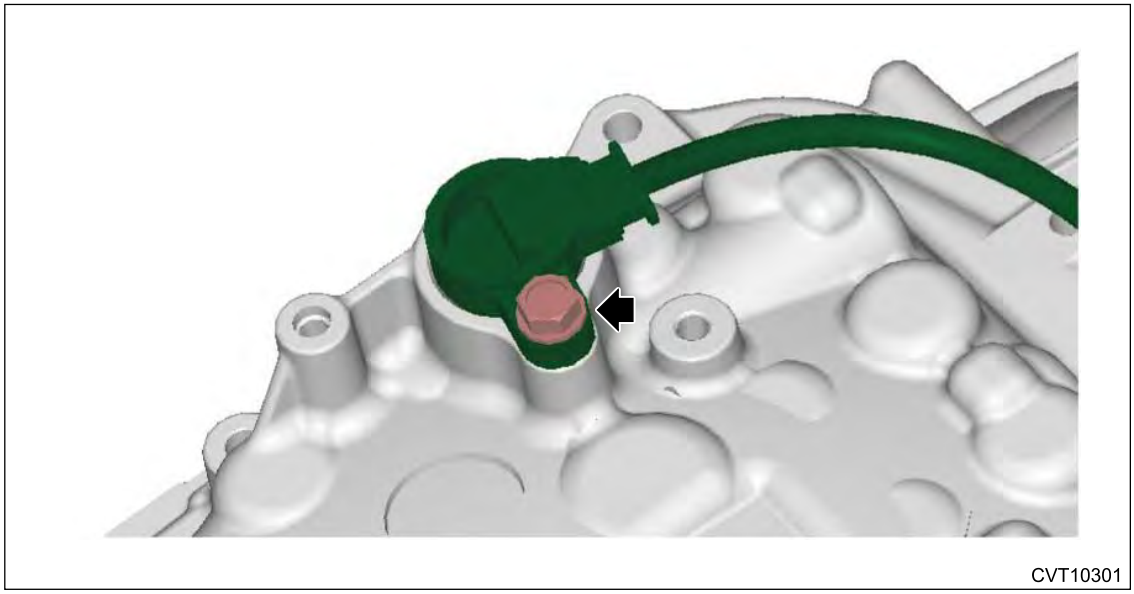
- **Use new O-rings.**
- **Apply CVTF to the O-rings.**



6. Install the transmission harness to the valve cover.

Tightening torque:

7 N·m (0.7 kgf-m, 5.2 ft-lb)



7. Install the gasket to the transmission.

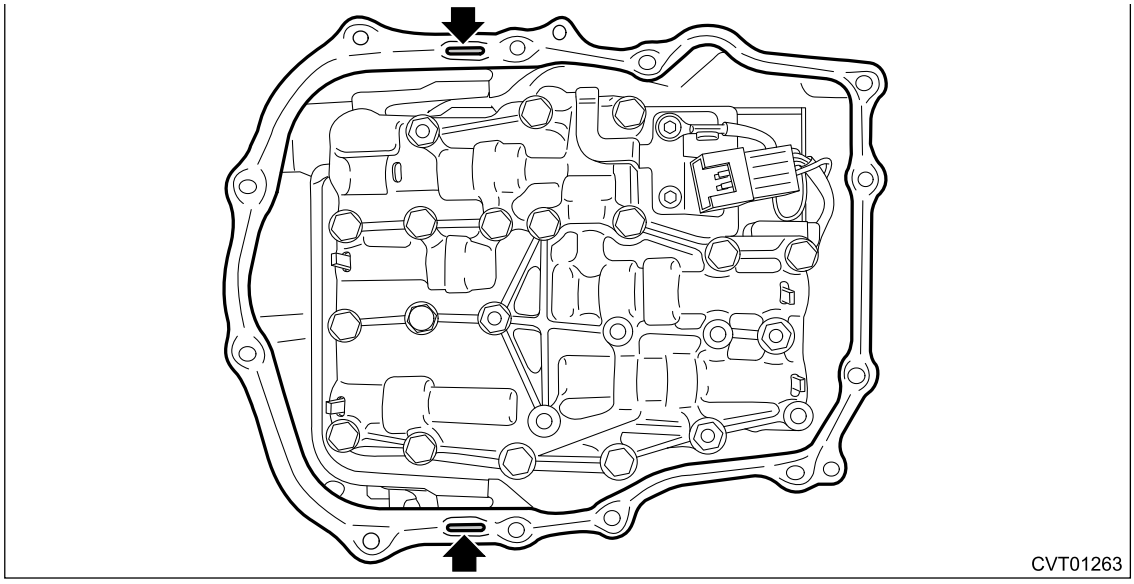
Note:

Use a new gasket.

8. Apply liquid gasket to the oval hole of gasket.

Liquid gasket:

THREE BOND 1215B or equivalent



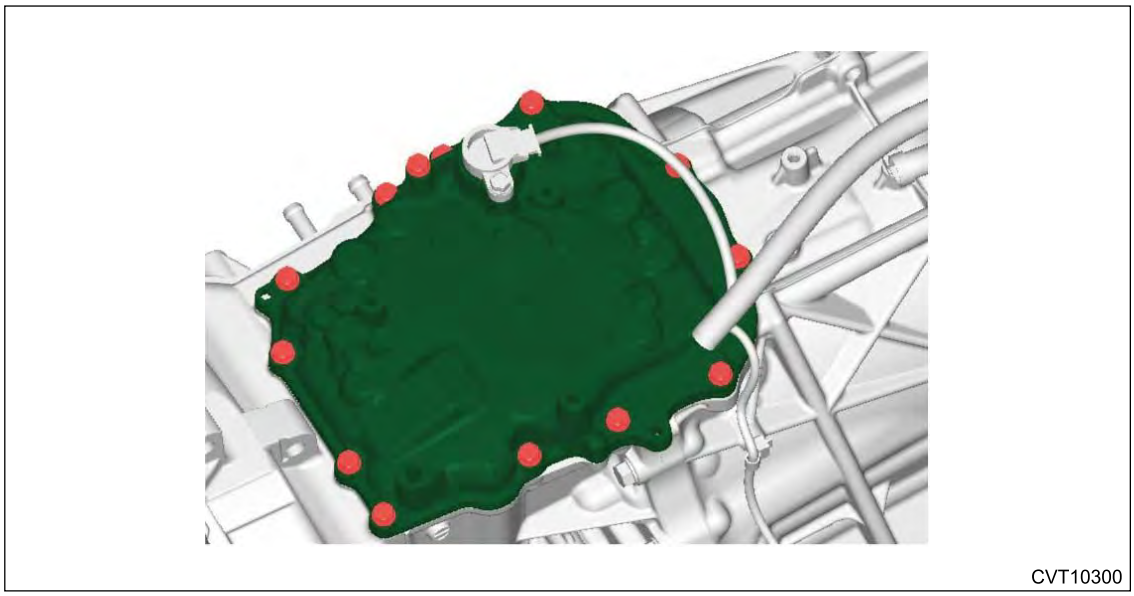
9. Install the valve cover.

Caution:

Be careful not to catch the sheet of the ST.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



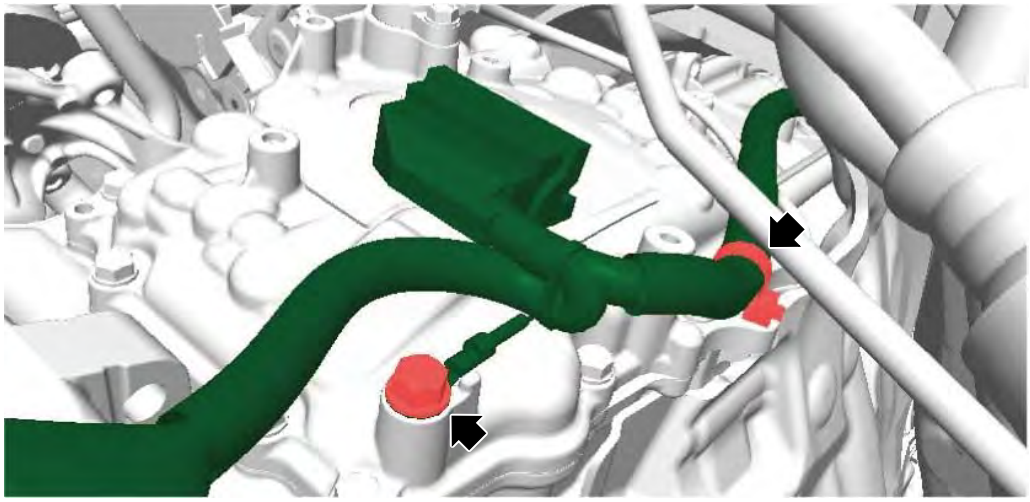
10. Remove the ST (SHEET SPECIAL TOOL).

11. Install the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSTALLATION.

12. Install the transmission harness clip and transmission ground terminal.

Tightening torque:

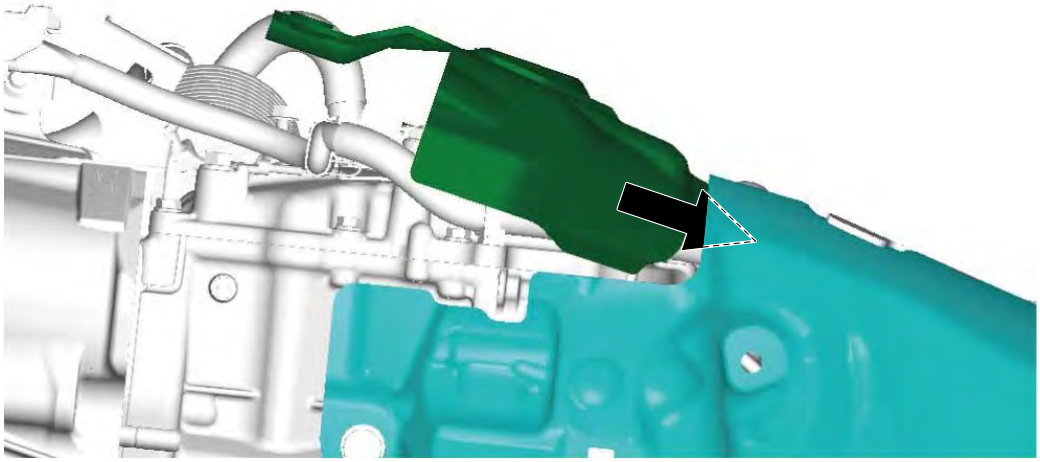
14 N·m (1.4 kgf-m, 10.3 ft-lb)

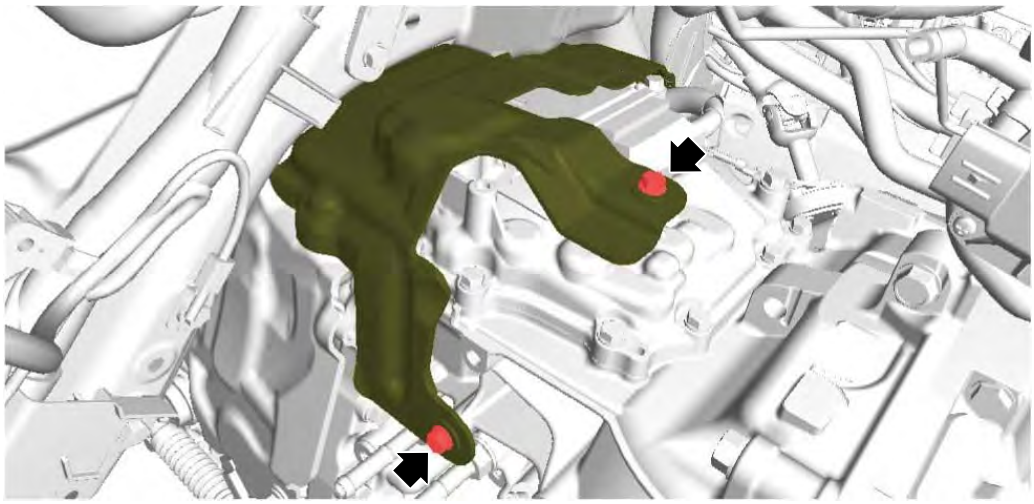

CVT10299

13. Install the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM)>INSTALLATION.
14. Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

Tightening torque:

Cover (small): 7 N·m (0.7 kgf-m, 3.7 ft-lb)
Cover (large): 8 N·m (0.8 kgf-m, 5.9 ft-lb)


CVT10293

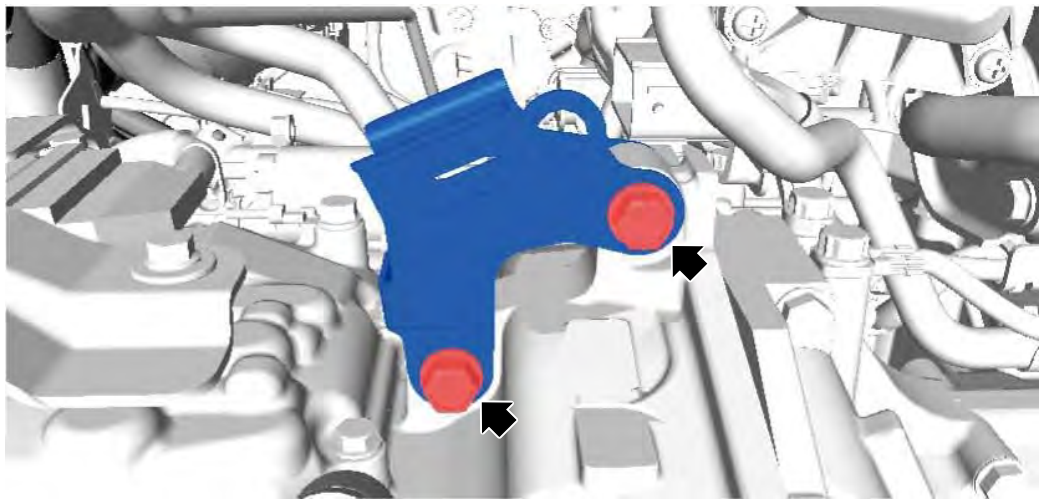


CVT10283

15. Install the pitching stopper bracket.

Tightening torque:

41 N·m (4.2 kgf-m, 30.2 ft-lb)



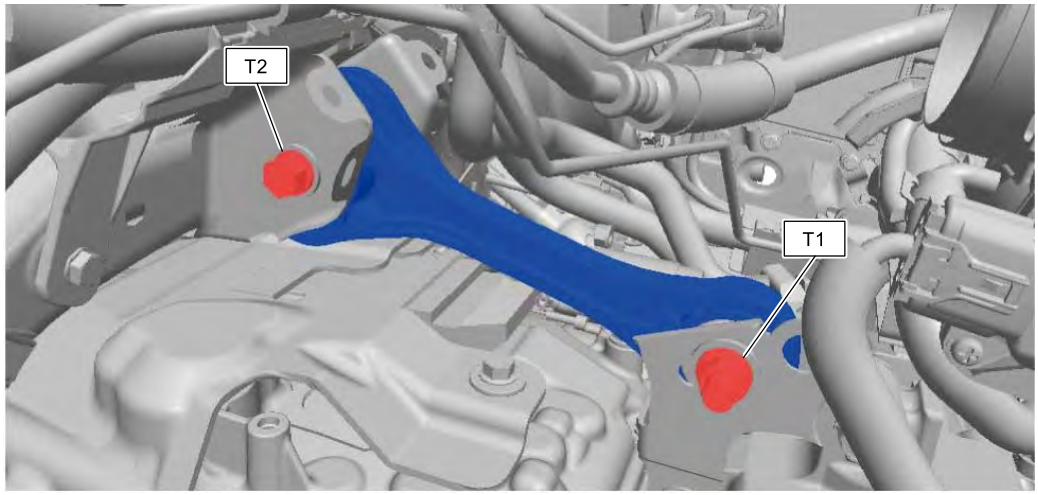
CVT10276

16. Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)

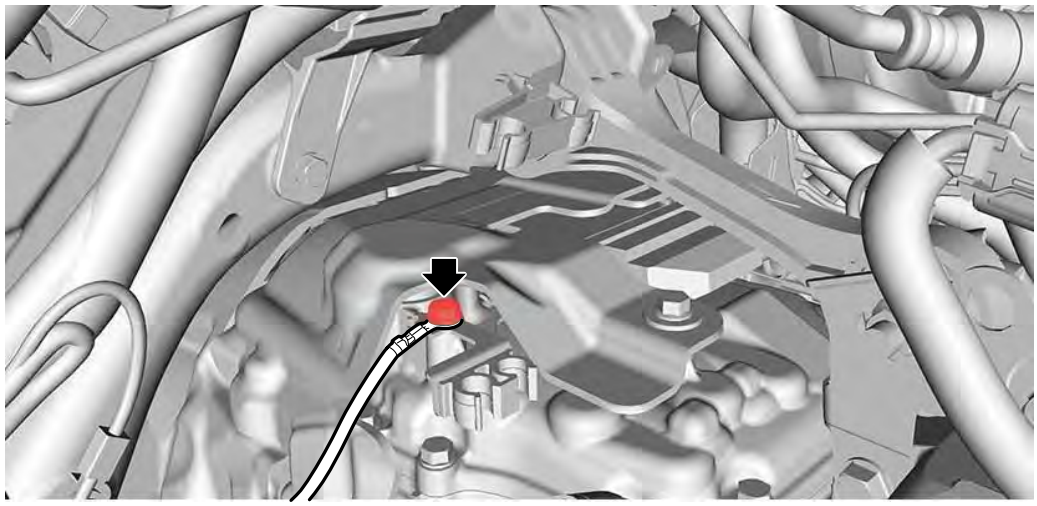


CVT10319

17. Install the transmission radio ground cord.

Tightening torque:

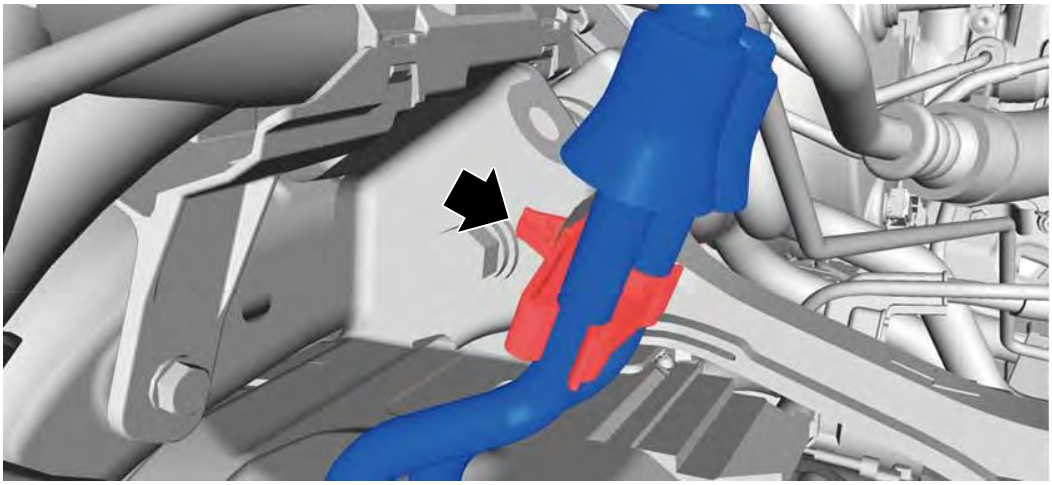
7 N·m (0.7 kgf-m, 5.2 ft-lb)



CVT10268

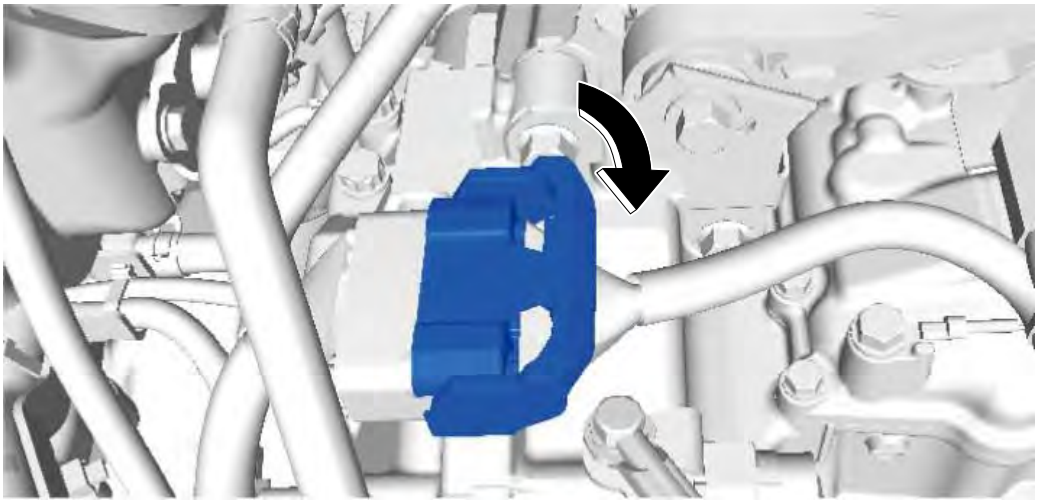
18. Install the air breather hose and air breather hose bracket.





CVT10439

19. Connect the transmission harness connector.



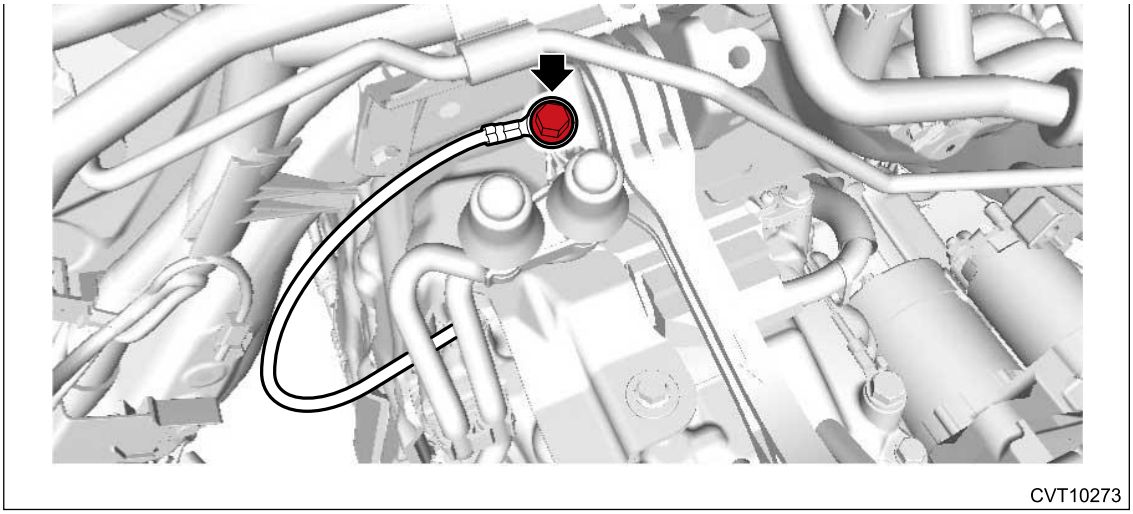
CVT10438

20. Connect the transmission radio ground terminal.

Tightening torque:

32.3 N·m (3.3 kgf-m, 23.8 ft-lb)





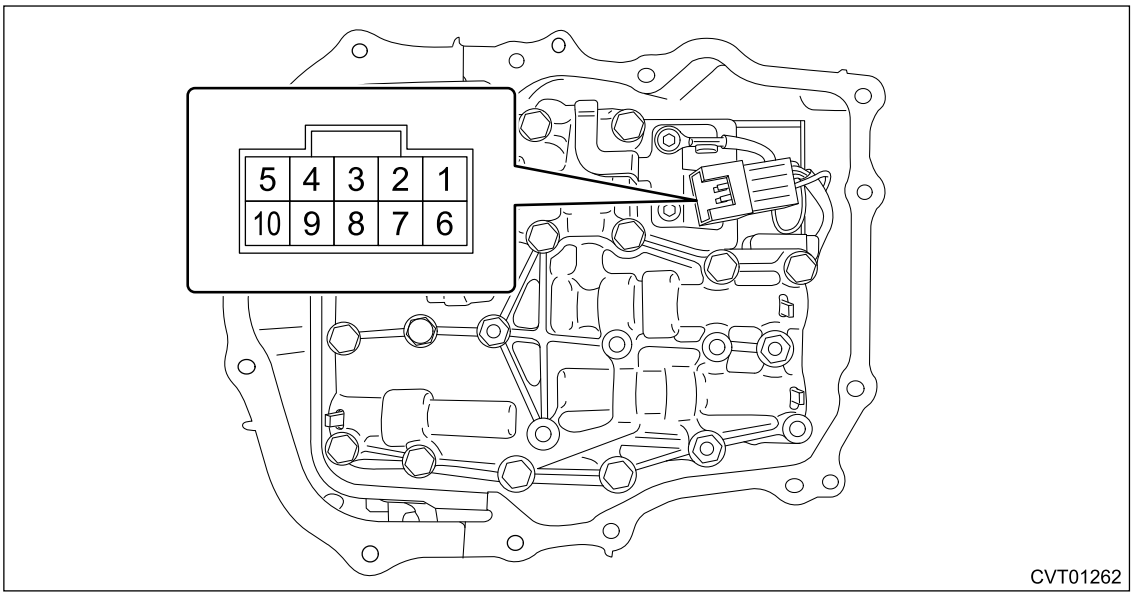
21. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
22. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
23. Adjust the amount of CVTF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.
24. Using the Subaru Select Monitor, perform [Clear AT learning value] on [Work Support], and perform [AT learning mode]. Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control>PROCEDURE.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Control Valve Body

INSPECTION

- Check each part for damage or dust.
- Measure the resistance of each solenoid, sensor and ground wire.

Note:
Measurement should be performed at a temperature of 20°C (68°F).



- **Solenoid**

Solenoid	Terminal No.	Standard
Primary UP solenoid	No. 2 — Control valve body	Approx. 10 — 13.5Ω

Solenoid	Terminal No.	Standard
Secondary solenoid	No. 3 — Control valve body	Approx. 5 — 7 Ω
F&R clutch solenoid	No. 4 — Control valve body	Approx. 4 — 6 Ω

F&R clutch solenoid	No. 4 — Control valve body	Approx. 4 — 6 Ω
Primary DOWN solenoid	No. 7 — Control valve body	Approx. 10 — 13.5Ω
Lock-up duty solenoid	No. 9 — Control valve body	Approx. 10 — 13.5Ω
AWD solenoid	No. 10 — Control valve body	Approx. 2 — 4.5Ω

- **Oil temperature sensor**

Sensor	Terminal No.	Standard At 20°C (68°F)
Oil temperature sensor	No. 1 — No. 6	Approx. 2.5 kΩ

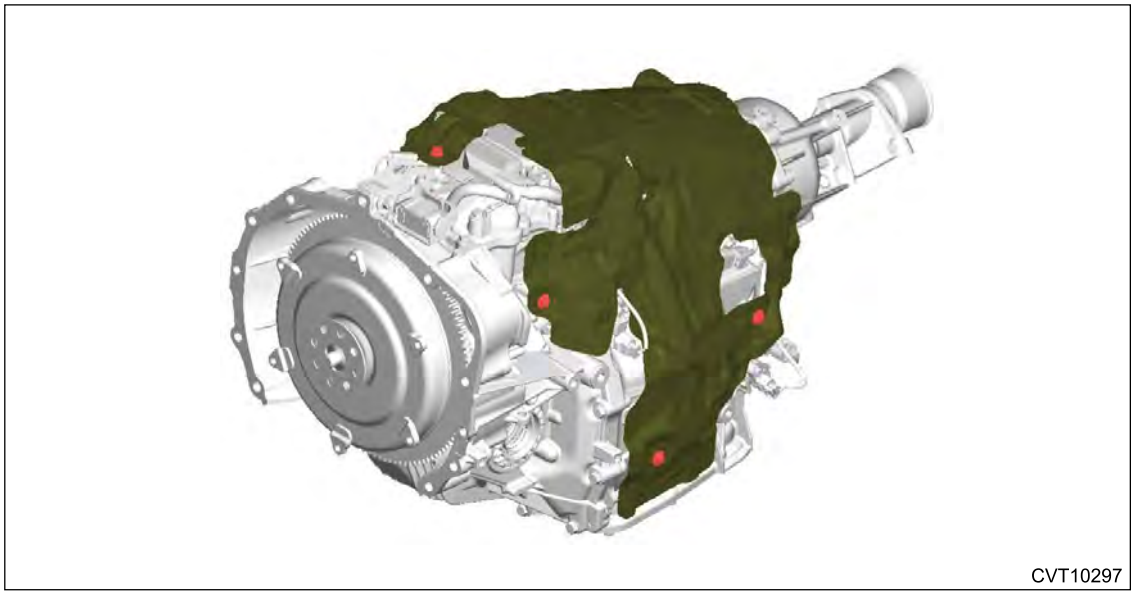
- **Transmission ground**

Terminal No.	Standard
No. 8 — Control valve body	Less than 1 Ω

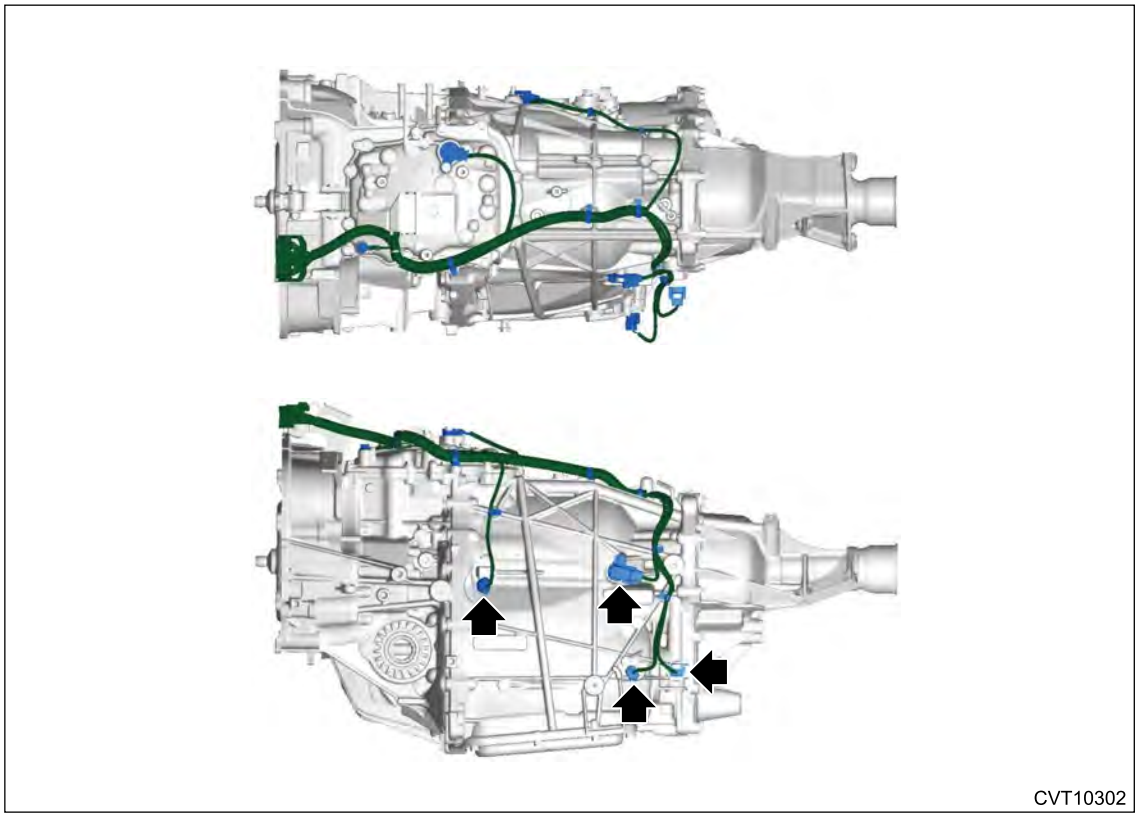
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Harness

REMOVAL

1. Remove the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the transmission case cover.

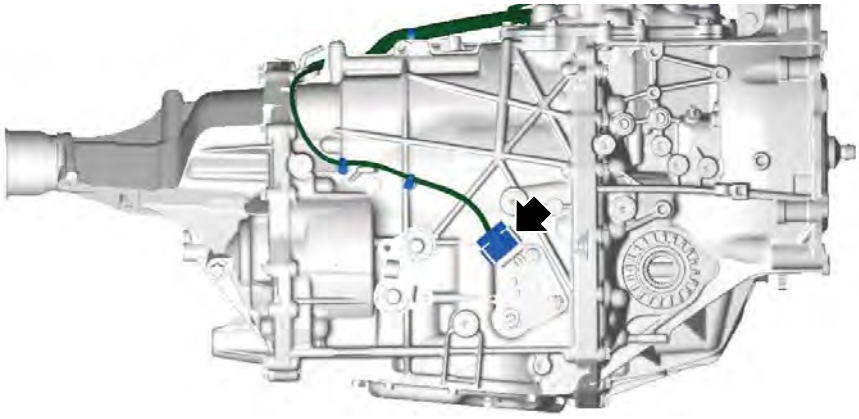


3. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
4. Disconnect the harness connector from the turbine speed sensor, primary speed sensor, secondary speed sensor and secondary pressure sensor.



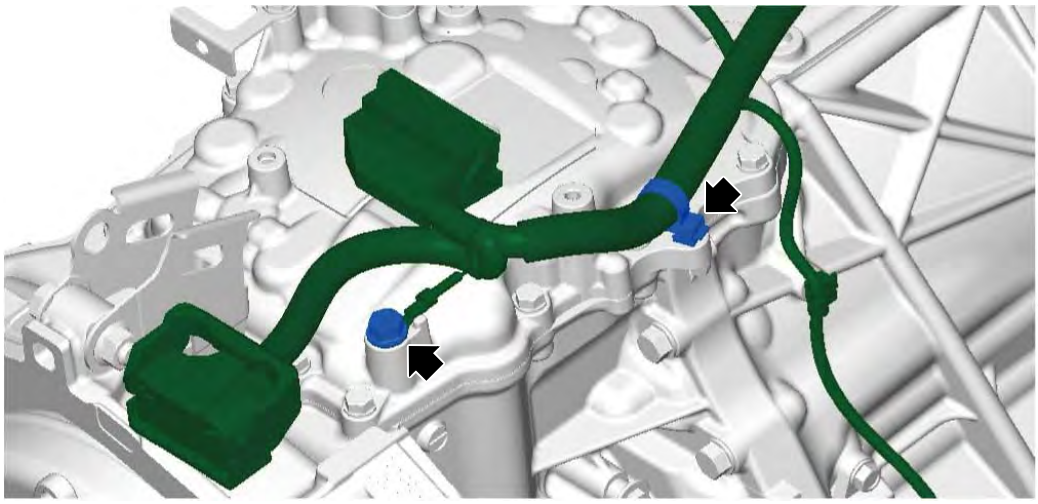
5. Disconnect the harness connector from the inhibitor switch.





CVT10303

6. Disconnect the ground terminal and remove the harness clip.

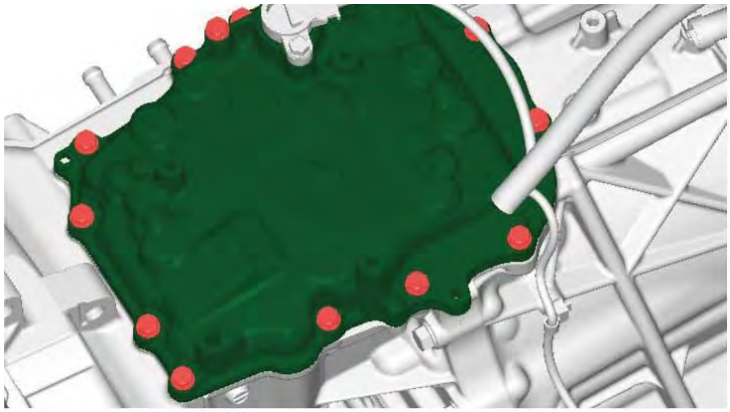


CVT10304

7. Clean the transmission exterior.

8. Remove the valve cover and gasket.

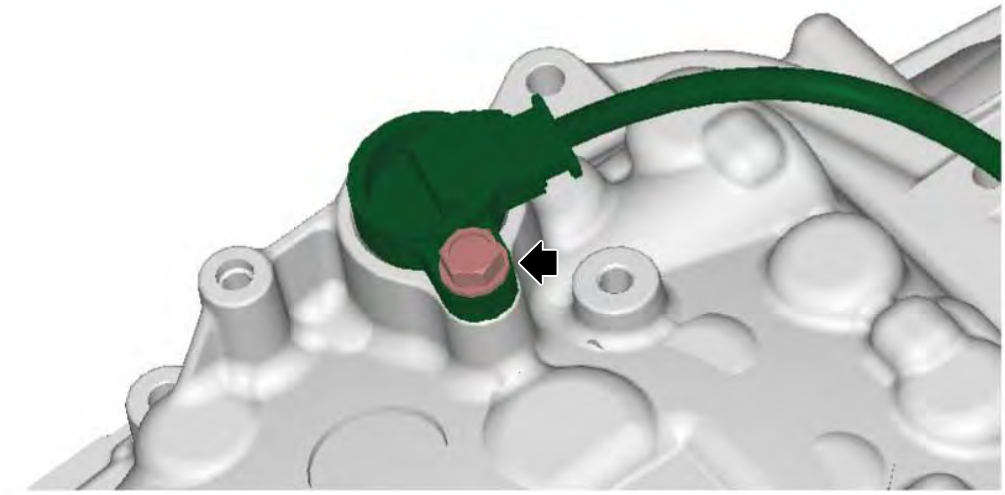




CVT10300

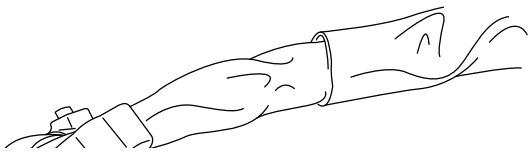
9. Disconnect the harness connector from the control valve body.

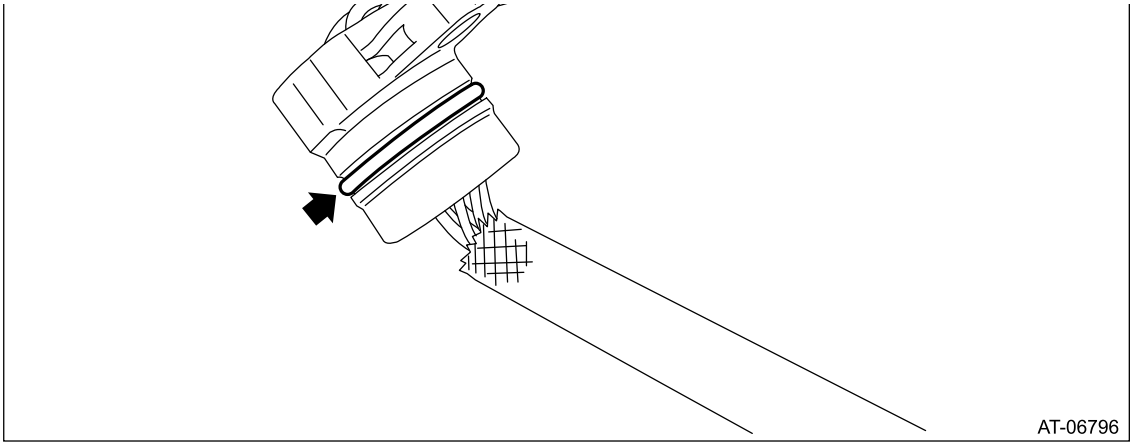
10. Remove the transmission harness.



CVT10301

11. Remove the O-rings.





12. Remove the harness clip from the transmission, and remove the transmission harness.

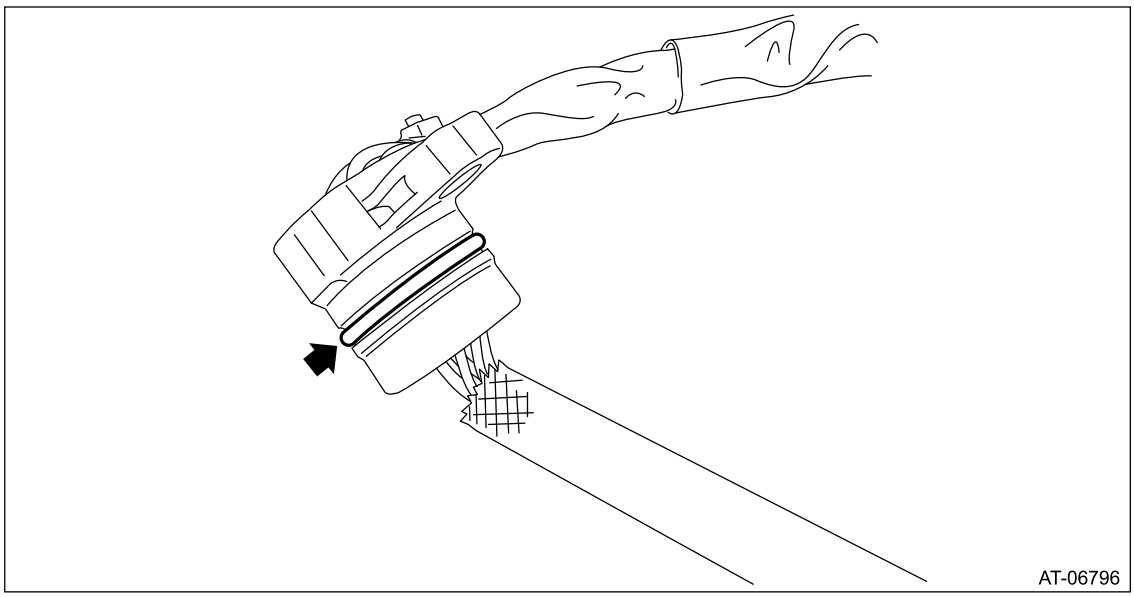
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Harness

INSTALLATION

1. Clean the mating surface of valve cover and transmission side.
2. Check the control valve body for dust and other foreign matter.
3. Install the O-rings.

   Note:

   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

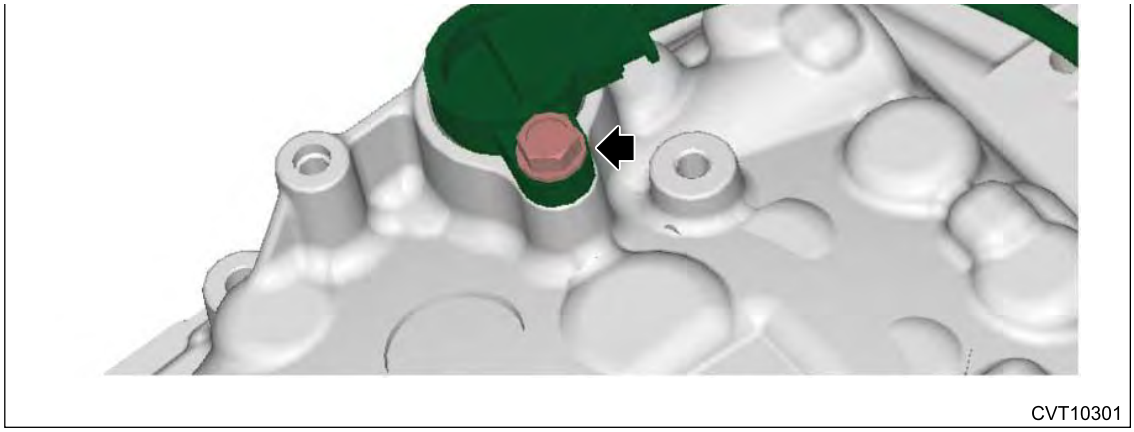


4. Install the transmission harness.

   Tightening torque:

   7 N·m (0.7 kgf-m, 5.2 ft-lb)





5. Attach the gasket.

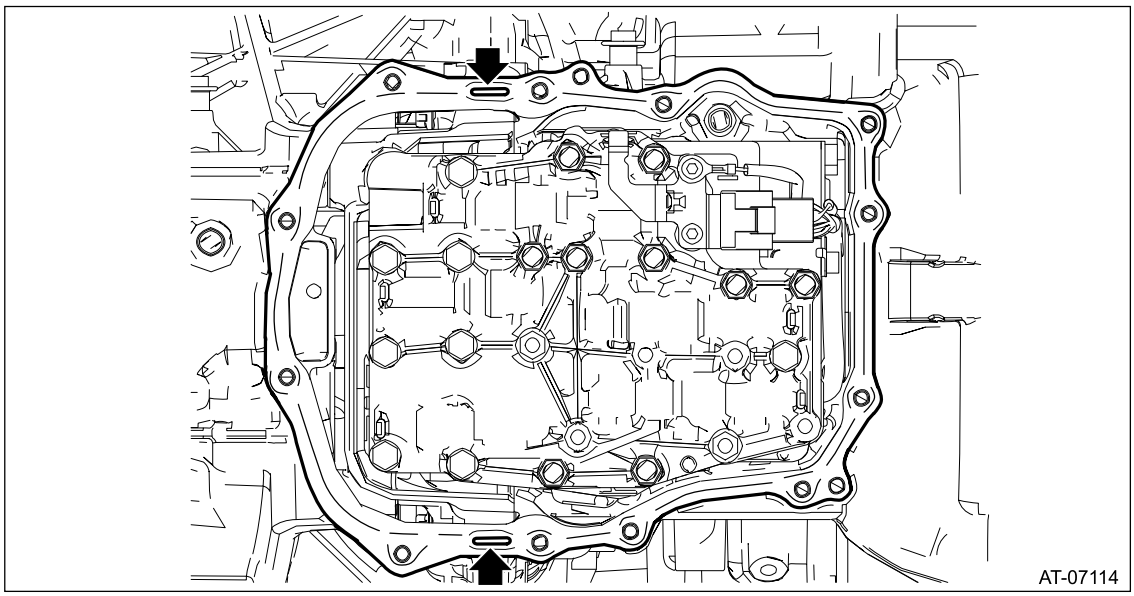
Note:

Use a new gasket.

6. Apply liquid gasket to the oval hole of gasket.

Liquid gasket:

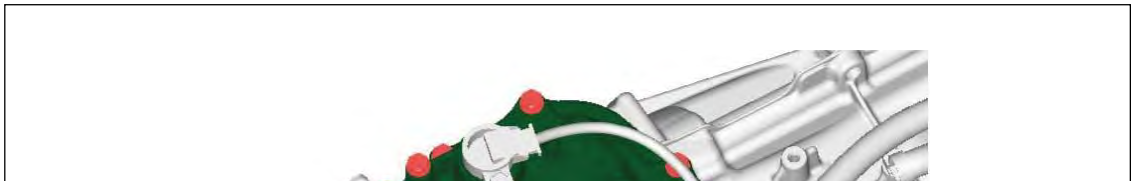
THREE BOND 1215B or equivalent

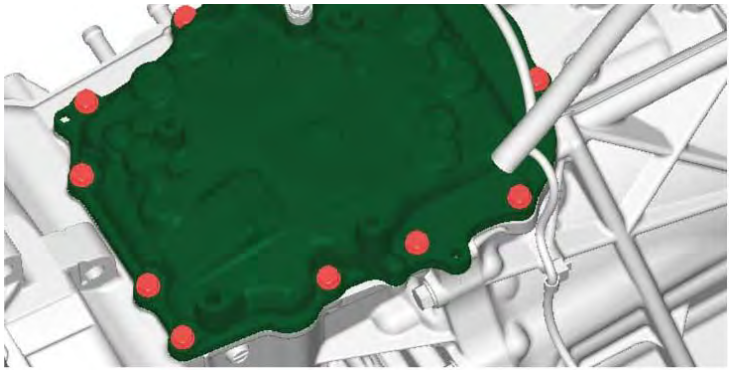


7. Connect the transmission harness connector to the control valve body, and install the valve cover.

Tightening torque:

8 N·m (0.8 kgf-m, 5.9 ft-lb)



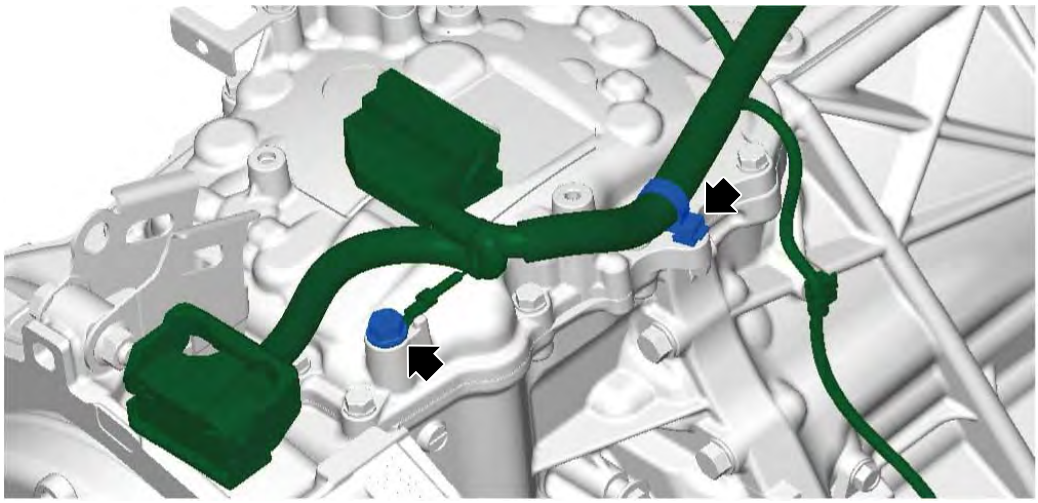


CVT10300

8. Install the transmission ground terminal and harness clip.

Tightening torque:

14 N·m (1.4 kgf-m, 10.3 ft-lb)

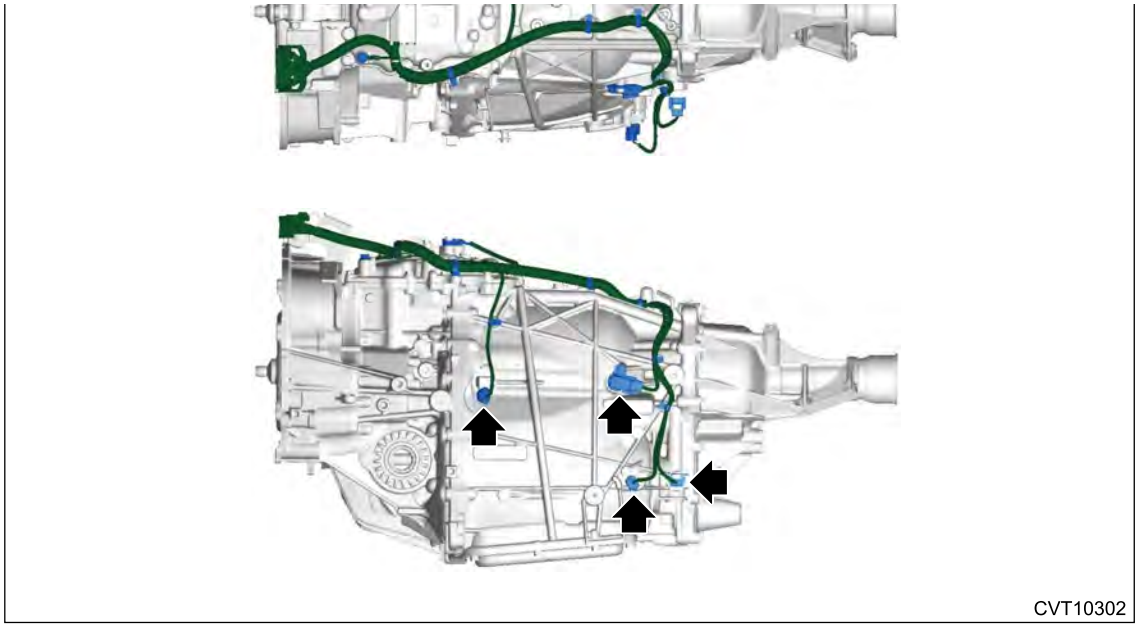


CVT10304

9. Connect the harness connector to the inhibitor switch.

10. Connect the harness connector to the turbine speed sensor, primary speed sensor, secondary speed sensor and secondary pressure sensor.





11. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
12. Install the transmission case cover (large).
    Tightening torque:
    8 N·m (0.8 kgf-m, 5.9 ft-lb)
13. Install the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.
14. Adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Harness

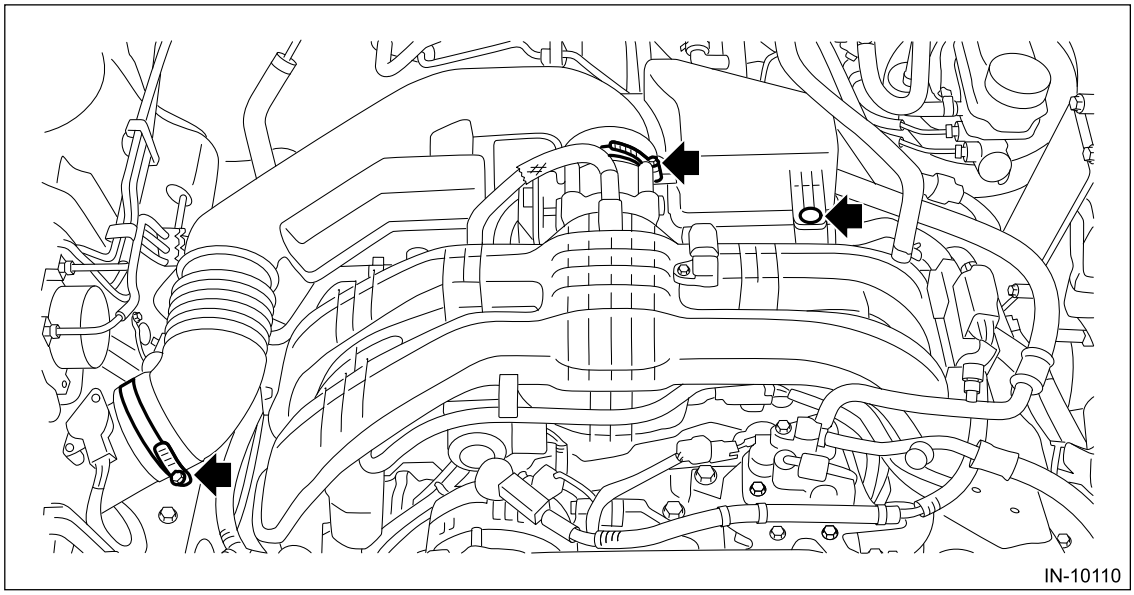
INSPECTION

1. Visually check the harness and connector for damage or crack.
2. Check the harness terminal for rust, disconnection or poor contact.
3. Check the continuity between harness terminals.
   Note:
   For details of transmission harness circuit, refer to wiring diagram. Ref. to WIRING SYSTEM>CVT Control System>WIRING DIAGRAM.
   Harness continuity standard
   Less than 1 Ω

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Control Module (TCM)

REMOVAL

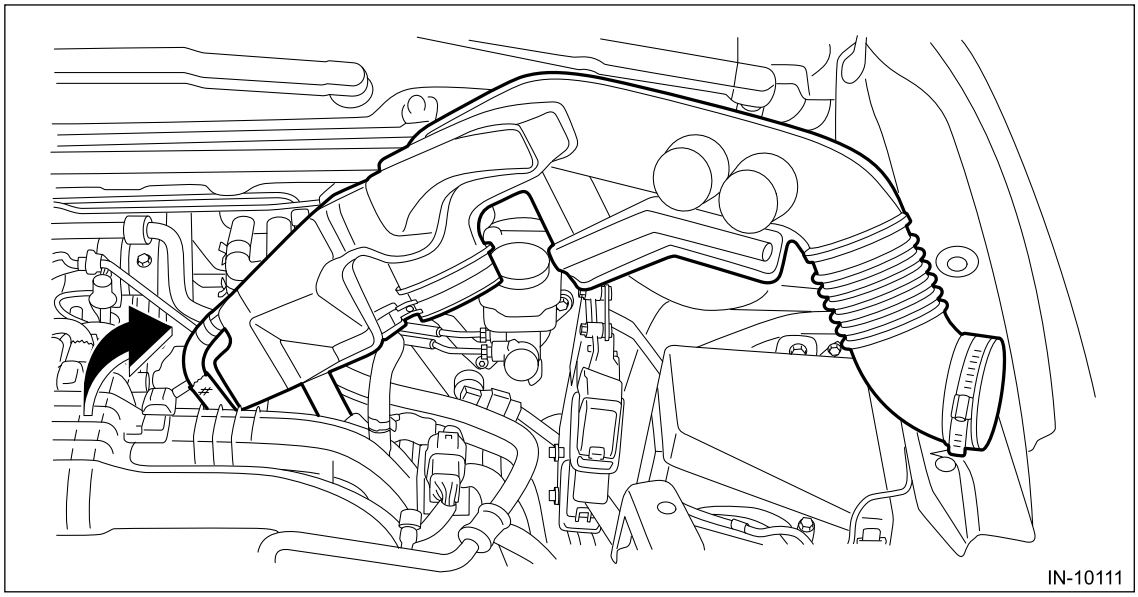
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.



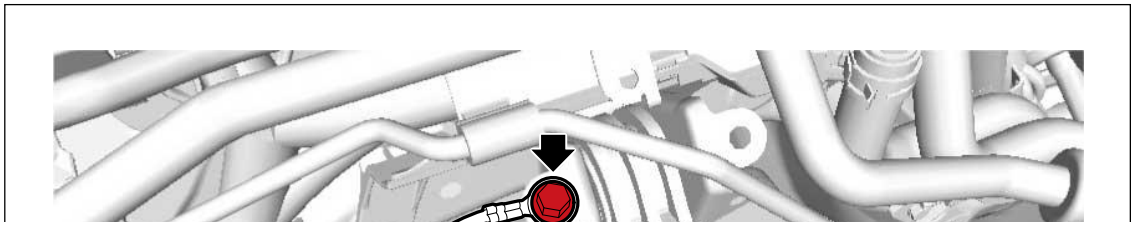
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

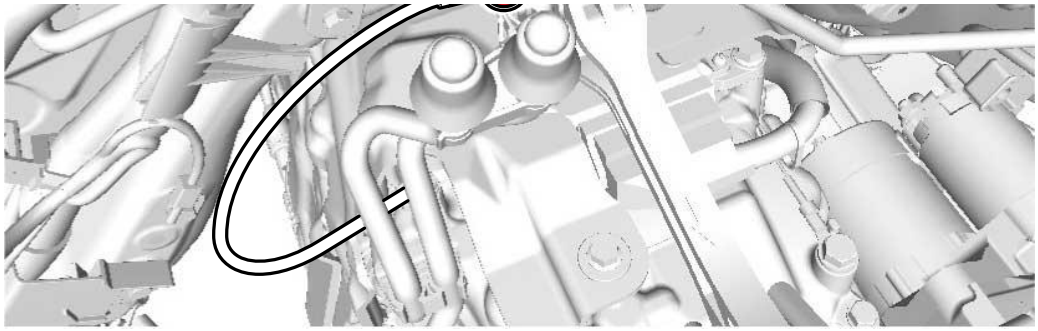
Caution:

Be careful not to pull out the PCV hose.



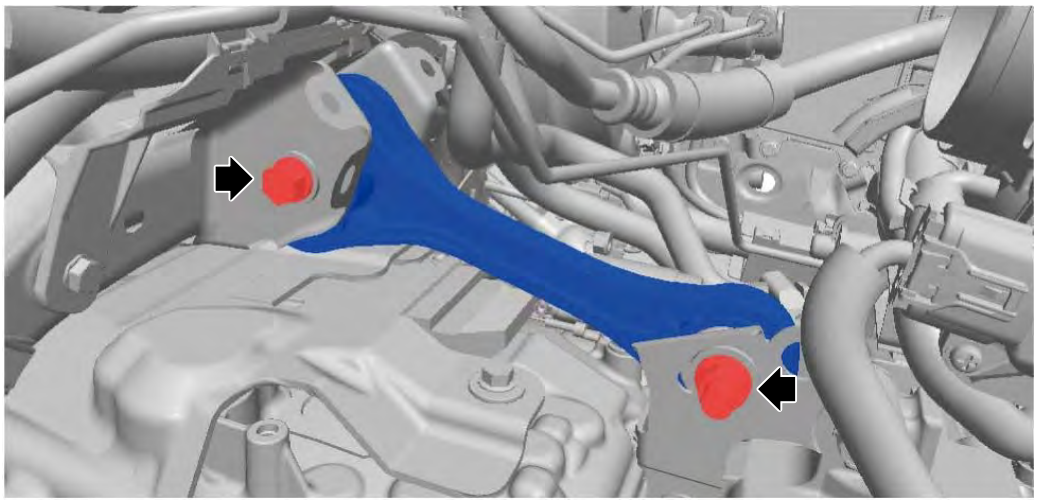
4. Remove the transmission radio ground terminal.





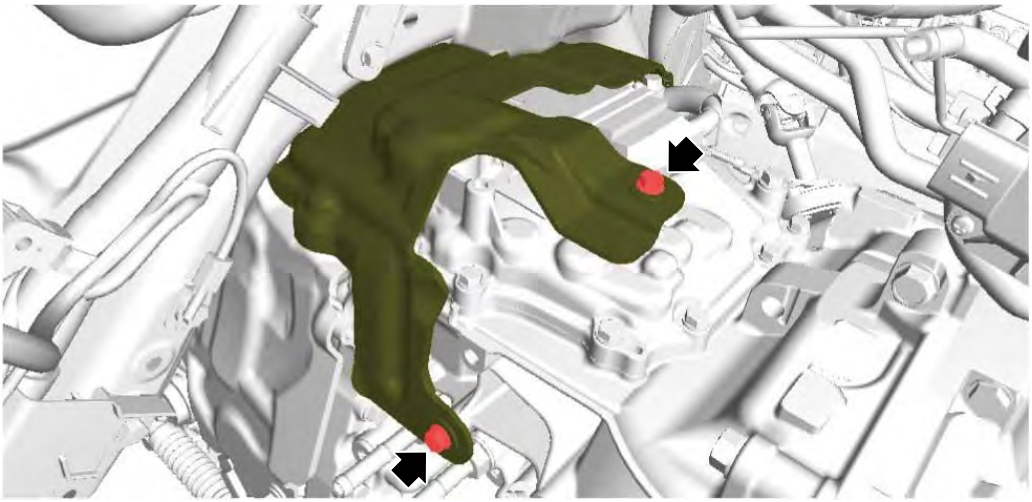
CVT10273

5. Remove the pitching stopper.



CVT10272

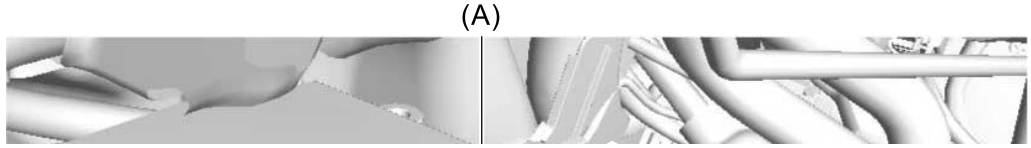
6. Remove the transmission case cover (small).

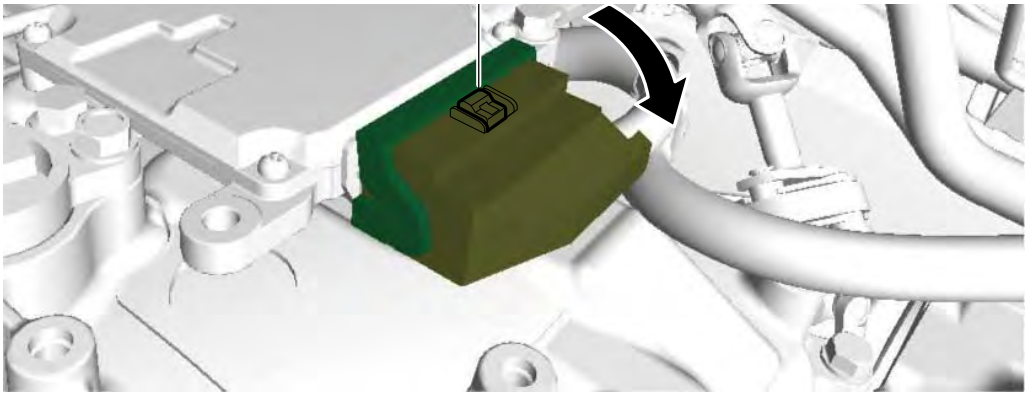


CVT10283

7. Move the lock lever in the arrow direction while pressing the lock button, and disconnect the connector.

(A)

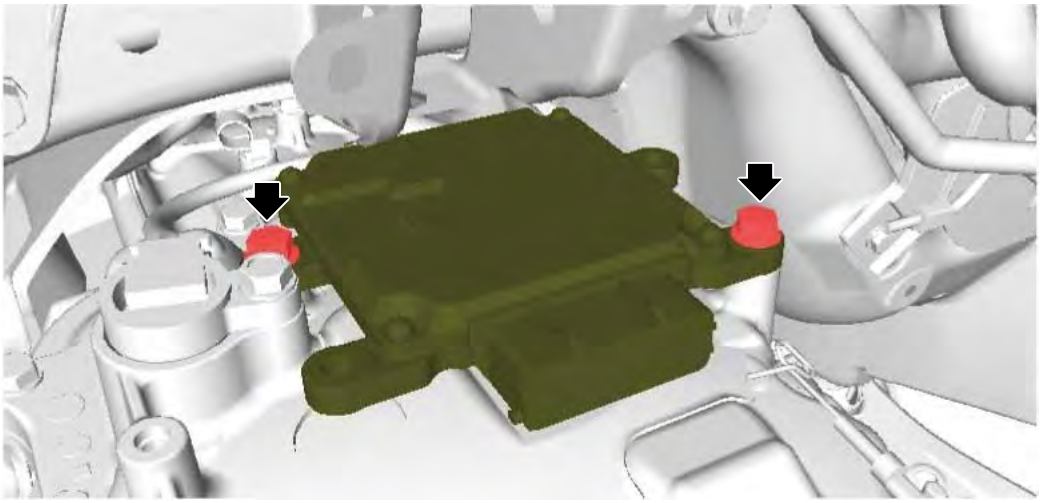




CVT10284

(A) Lock button

8. Remove the TCM.



CVT10285

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Control Module (TCM)

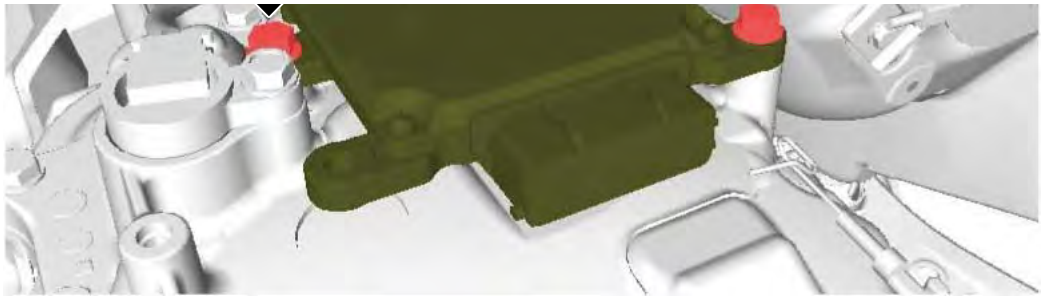
INSTALLATION

1. Attach the TCM.

Tightening torque:

7 N·m (0.7kgf-m, 5.2 ft-lb)



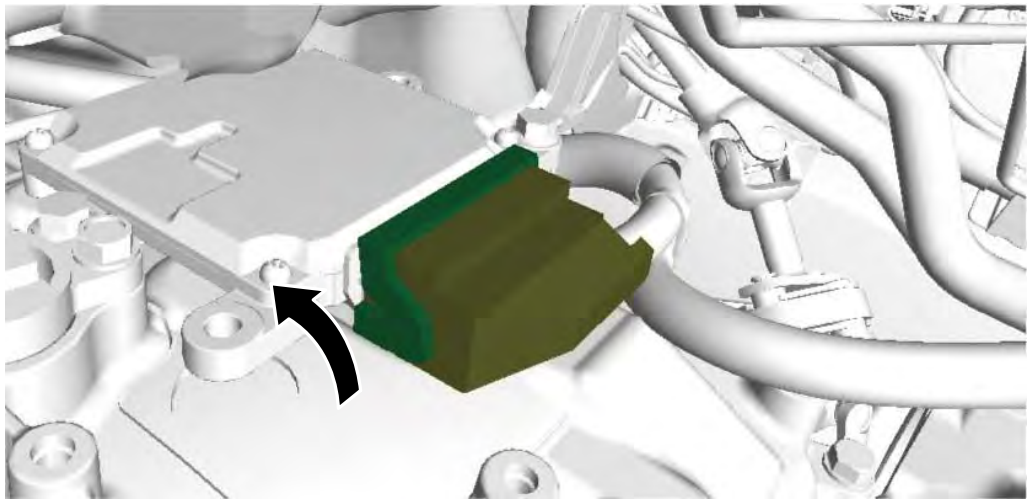


CVT10285

2. Attach the harness connector to the TCM.

Note:

Move the lock lever in the arrow direction, and confirm that a clicking sound is heard.



CVT10292

3. Insert the transmission case cover (small) between transmission case cover (large) and transmission to install.

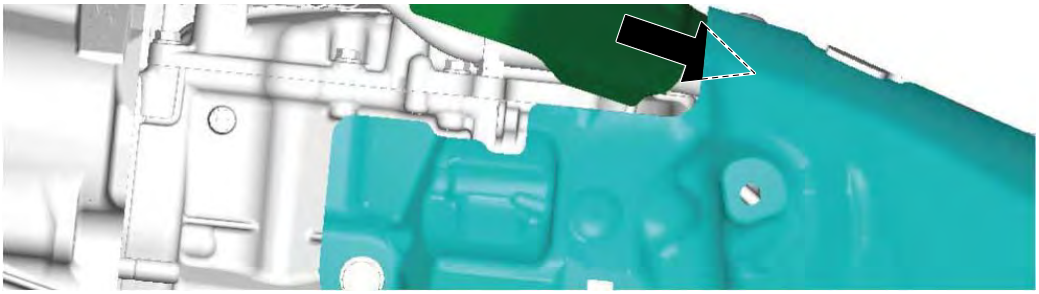
Caution:

When inserting, be careful that the insulator inside transmission case cover is not turned over.

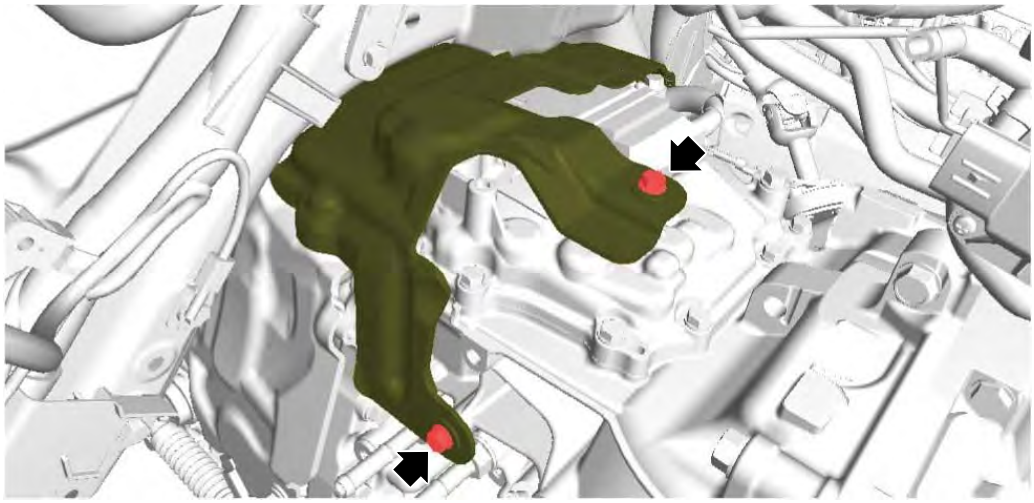
Tightening torque:

7 N·m (0.7kgf-m, 5.2 ft-lb)





CVT10293



CVT10283

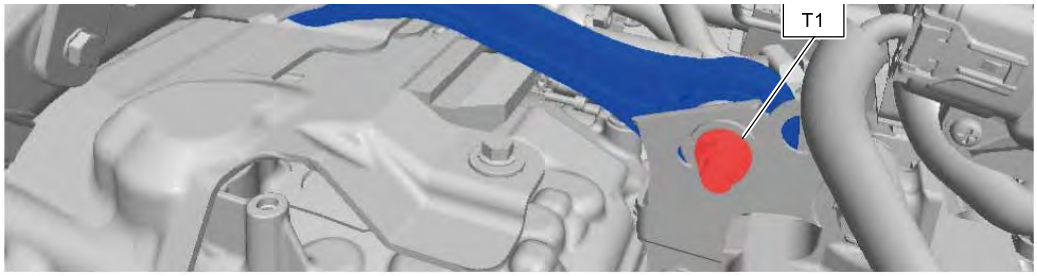
4. Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)

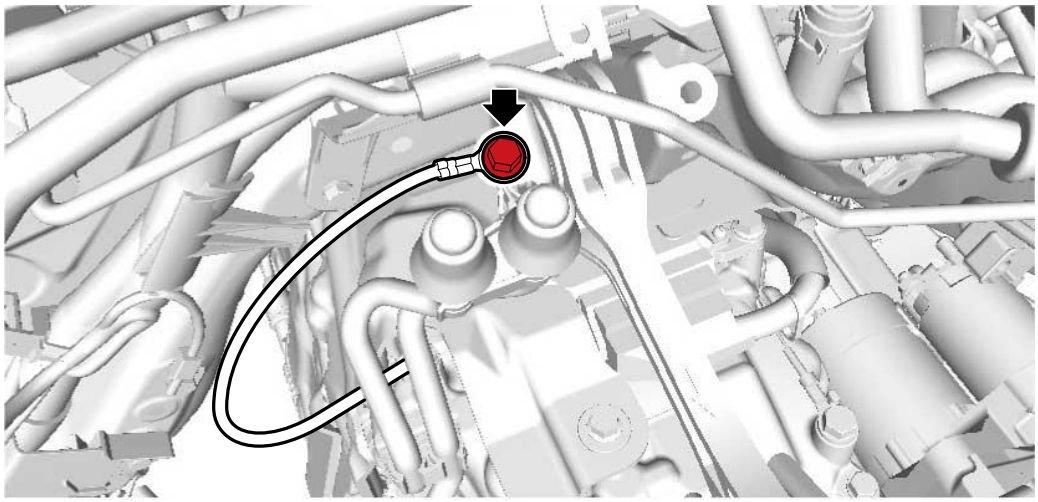
T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)





CVT10319

5. Connect the transmission radio ground terminal.
   Tightening torque:
   32.3 N·m (3.3 kgf-m, 23.8 ft-lb)

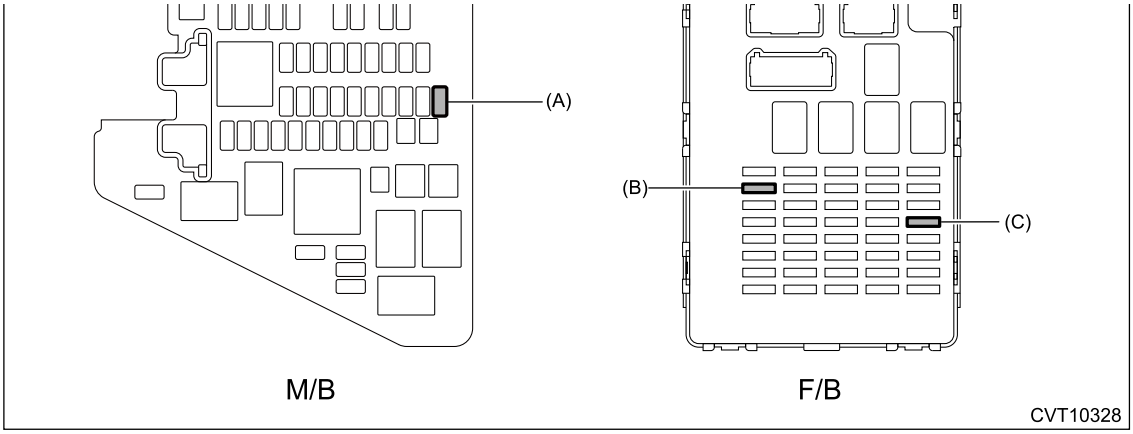

CVT10273

6. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
8. Using the Subaru Select Monitor, perform [Clear AT learning value] on [Work Support], and perform [AT learning mode]. Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control>PROCEDURE.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Relay and Fuse

LOCATION





Main fuse box	Fuse 20 A	(A)
Relay & fuse box	Fuse 15 A	(B)
Relay & fuse box	Fuse 10 A	(C)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Relay and Fuse

INSPECTION

1. CHECK FUSE

Remove the fuse and inspect visually. If the fuse is blown out, replace the fuse.

Note:

If the fuse is blown again, check the system.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Cooler (With Warmer Function)

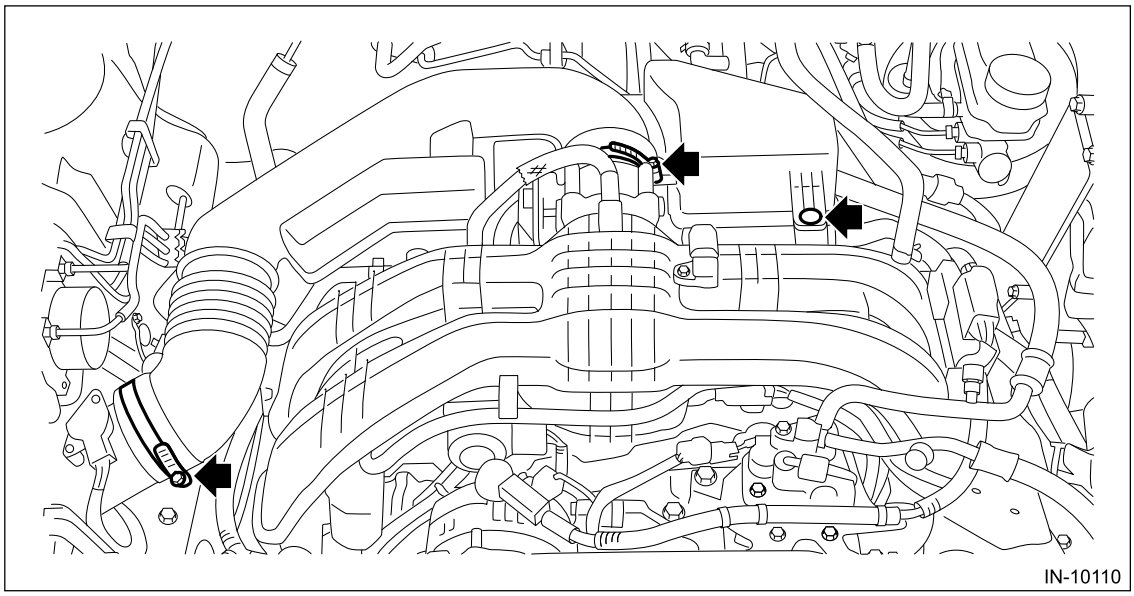
REMOVAL

Caution:

If the CVTF and engine coolant is spilt over exhaust pipe, wipe it off with cloth to avoid emitting smoke or causing a fire.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

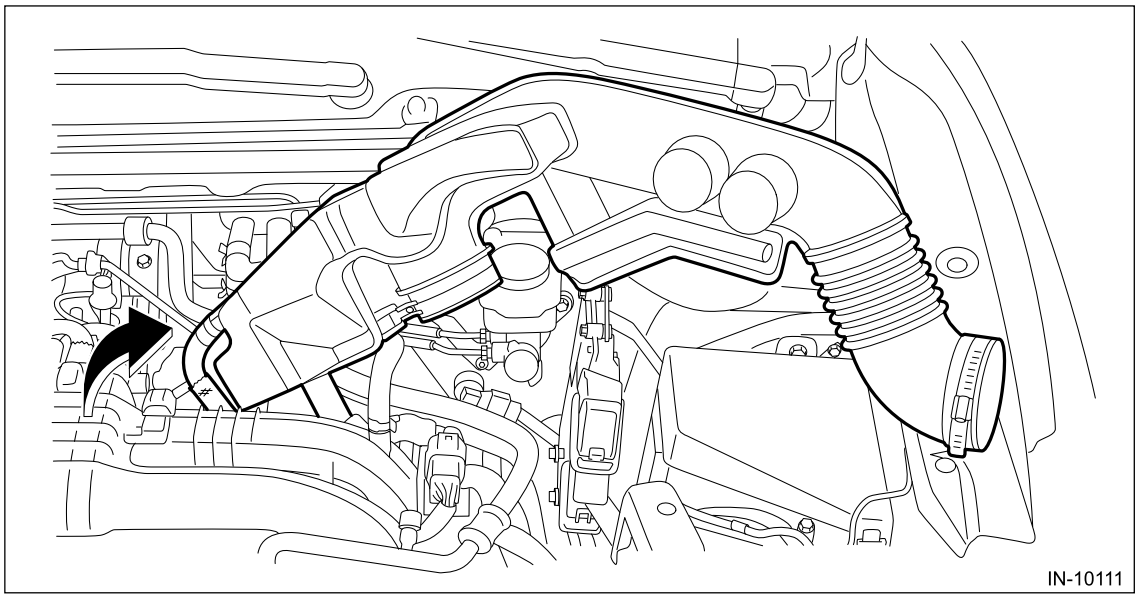
2. Drain engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.
3. Remove the clip from the air intake boot, and loosen the clamp.



4. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.



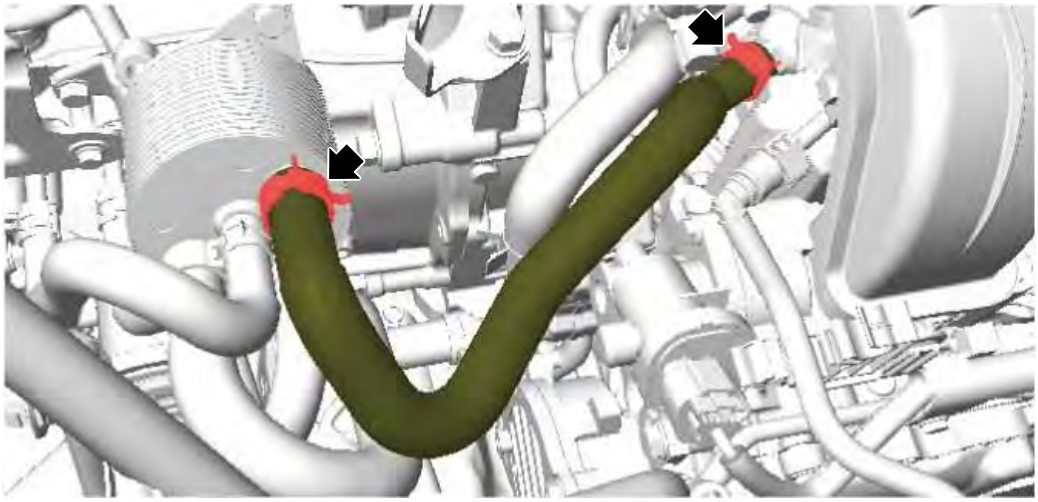
5. Remove the purge hose, purge control solenoid valve harness connector and harness clip.





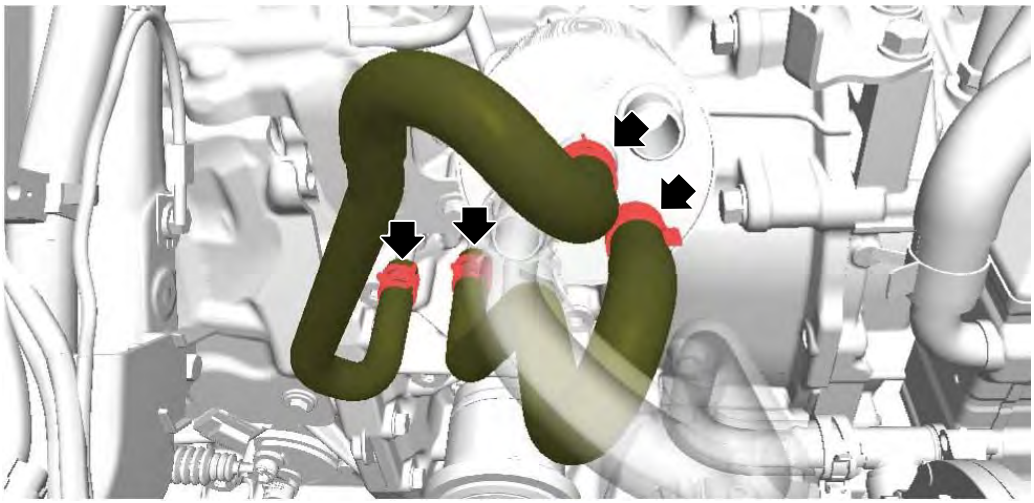
CVT10287

6. Remove the water hose (outlet).



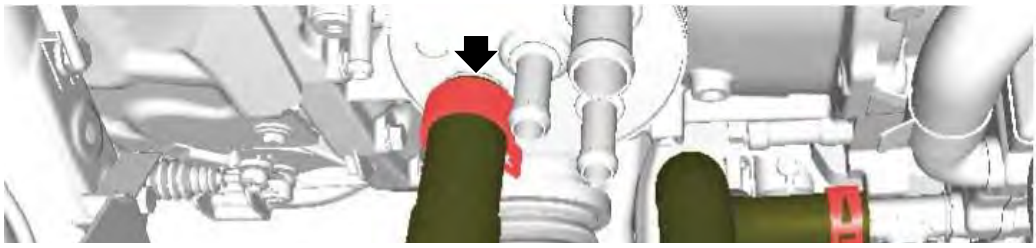
CVT10288

7. Remove the CVTF inlet hose and outlet hose.



CVT10289

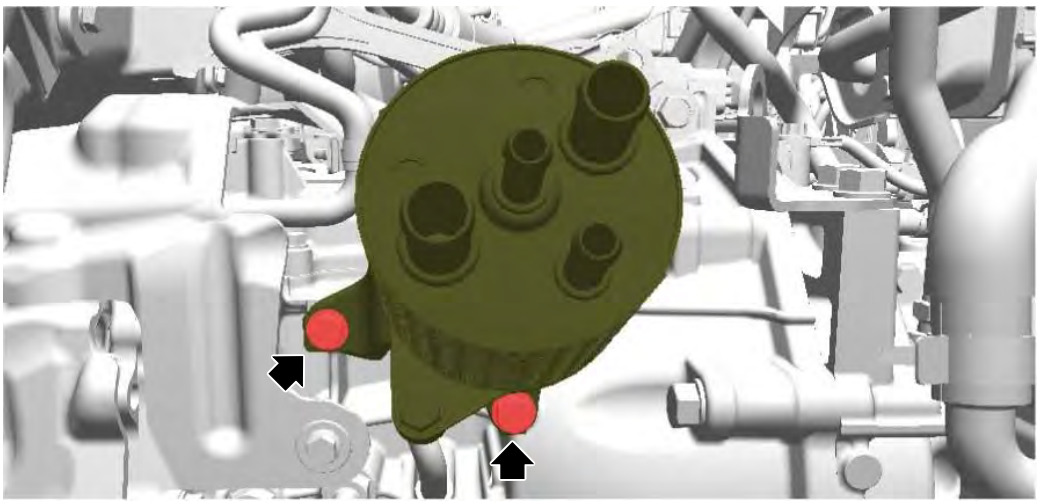
8. Remove the water hose (inlet).





CVT10290

9. Remove the CVTF cooler (with warmer feature) from the transmission.



CVT10291

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Cooler (With Warmer Function)

INSTALLATION

1. Install the CVTF cooler (with warmer feature) to the transmission.

Tightening torque:

23 N·m (2.3 kgf-m, 17.0 ft-lb)



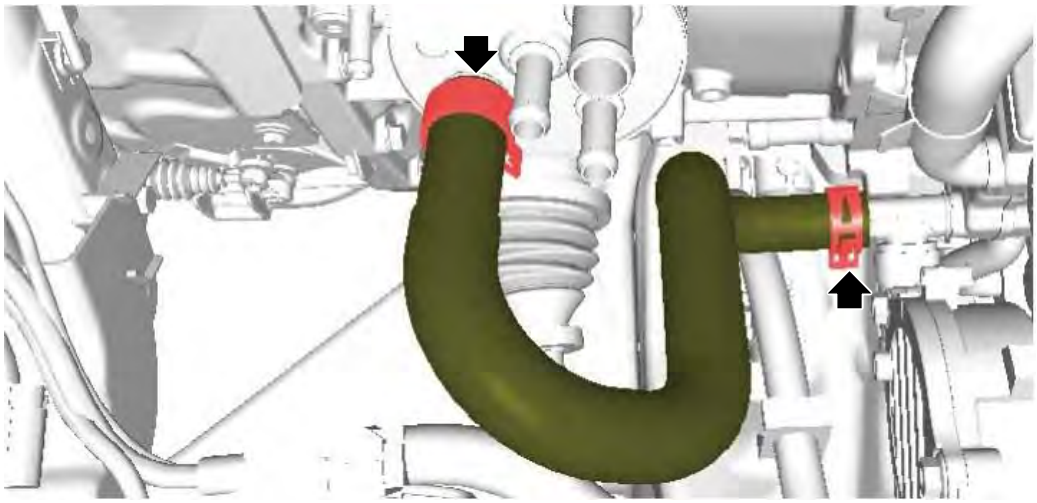


CVT10291

2. Install the water hose (inlet).

Note:

With the paint on the water hose (inlet) facing the vehicle outside, install it to the EGR cooler.

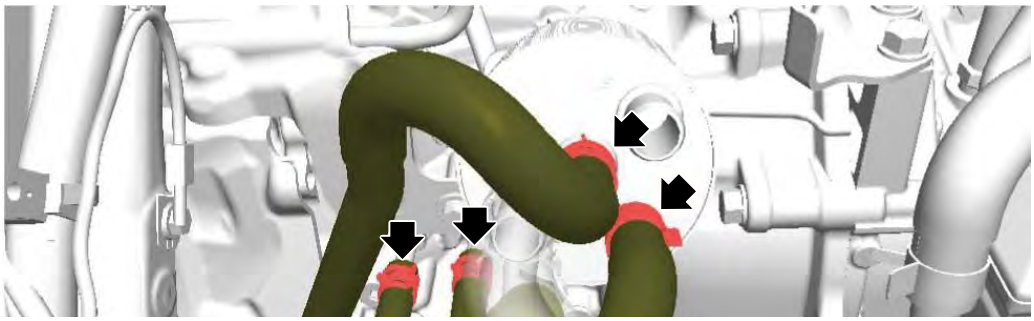


CVT10290

3. Install the CVTF inlet hose and CVTF outlet hose to transmission.

Note:

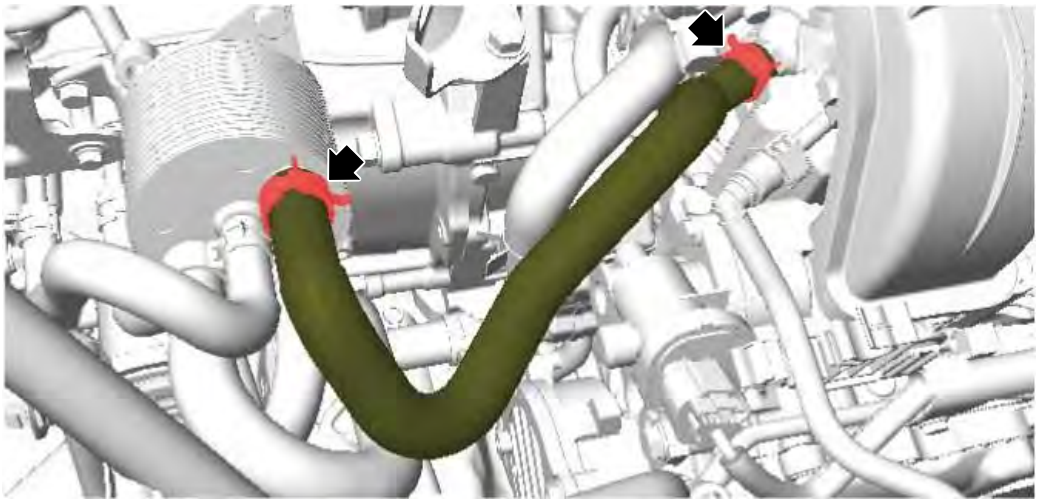
Use the new CVTF inlet hose and CVTF outlet hose.





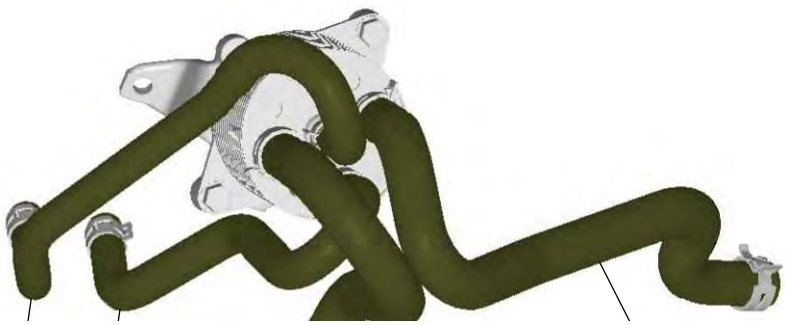
CVT10289

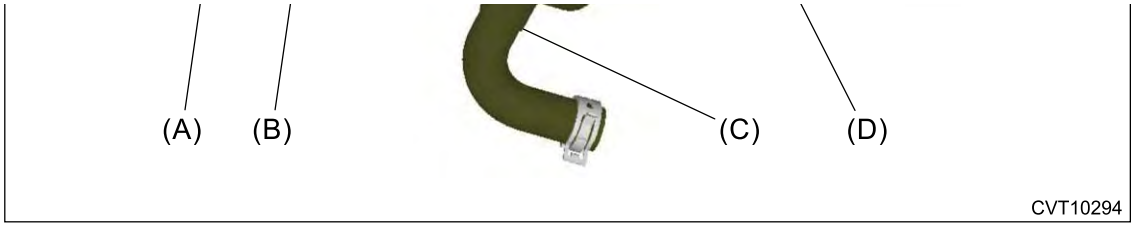
4. Connect the water hose (outlet).



CVT10288

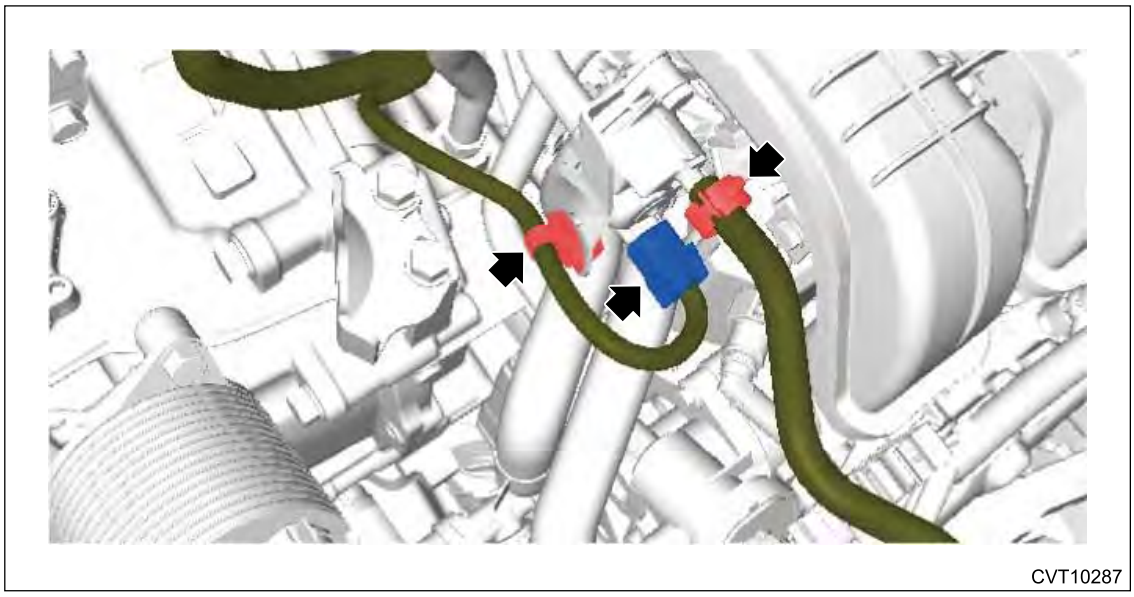
5. Check installation condition of each hose.
   - Make sure the hoses do not interfere with each other or with other components.
   - Check each hose for bent, excess curve, and twisting conditions.





(A) CVTF cooler inlet hose
(B) CVTF cooler outlet hose
(C) Water hose (inlet)
(D) Water hose (outlet)

6. Install the purge hose, purge control solenoid valve harness connector and harness clip.

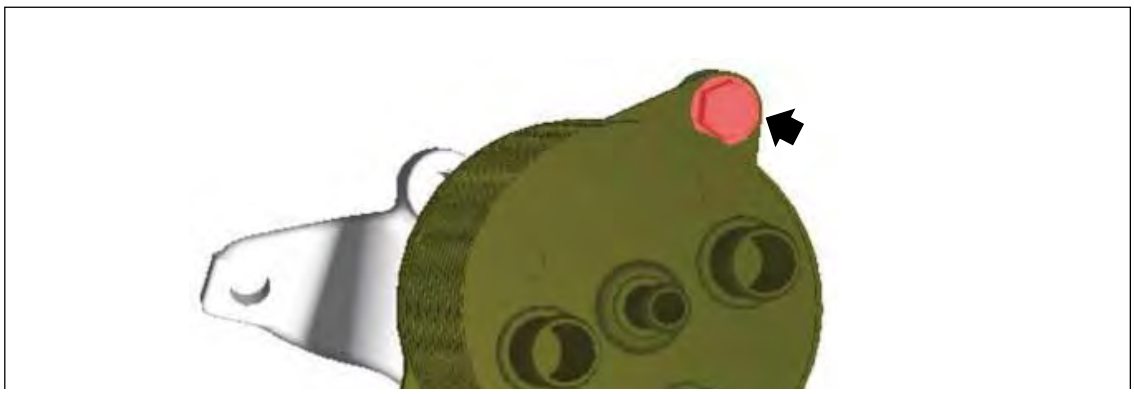


7. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
9. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.
10. Adjust the CVTF level. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Cooler (With Warmer Function)

DISASSEMBLY

1. Remove the bracket from the CVTF cooler (with warmer feature).

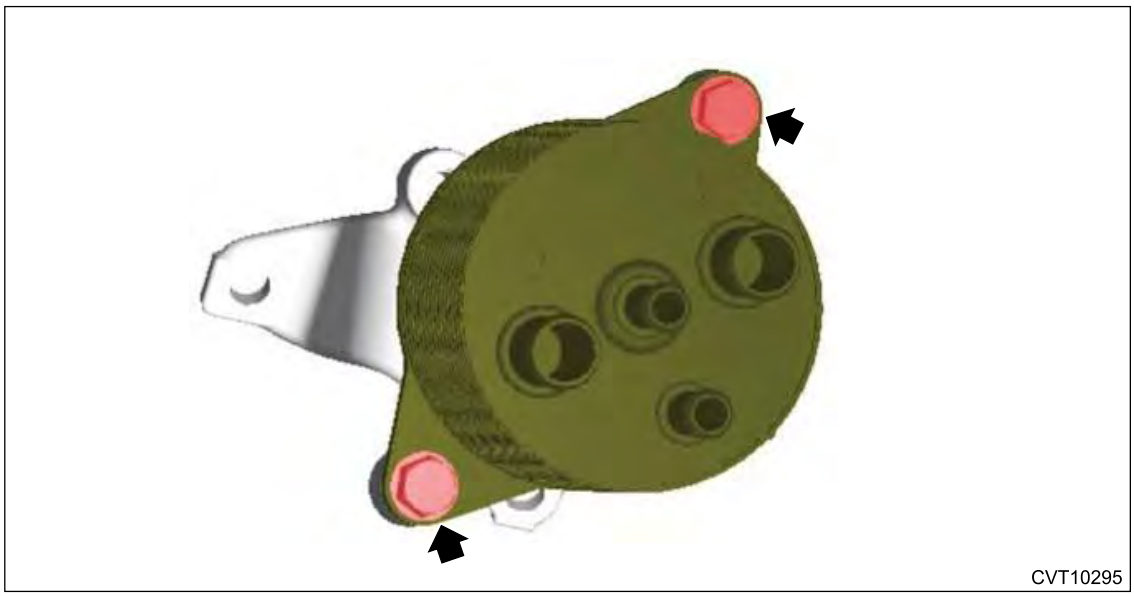




CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Cooler (With Warmer Function)

ASSEMBLY

1. Attach the bracket.
   Tightening torque:
   23 N·m (2.3 kgf-m, 17.0 ft-lb)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Cooler (With Warmer Function)

INSPECTION

Replace any faulty CVTF cooler hoses, CVTF cooler pipes and clamps found in the inspection below.

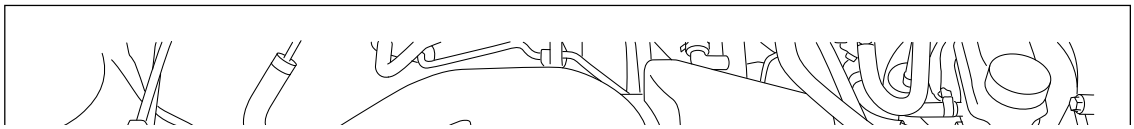
1. Check that there are no CVTF or engine coolant leaks from the connections.
2. Check the clamp for deformation.
3. Lightly bend the CVTF cooler hose and check for cracks in the surface or other damages.
4. Pinch the CVTF cooler hose with your fingers and check for poor elasticity. Also check for poor elasticity in the parts where the clamp was installed by pressing with your fingernail.
5. Check for peeling, cracks, and deformation at the tip of the hose.
6. Check the CVTF cooler (with warmer feature) for any damage.

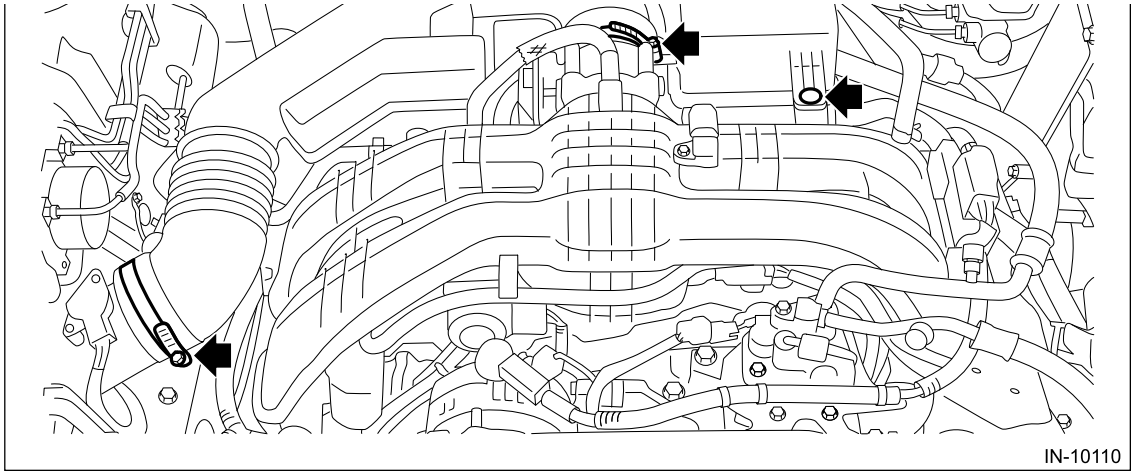
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Air Breather Hose

REMOVAL

1. FRONT DIFFERENTIAL SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the clip from the air intake boot, and loosen the clamp.

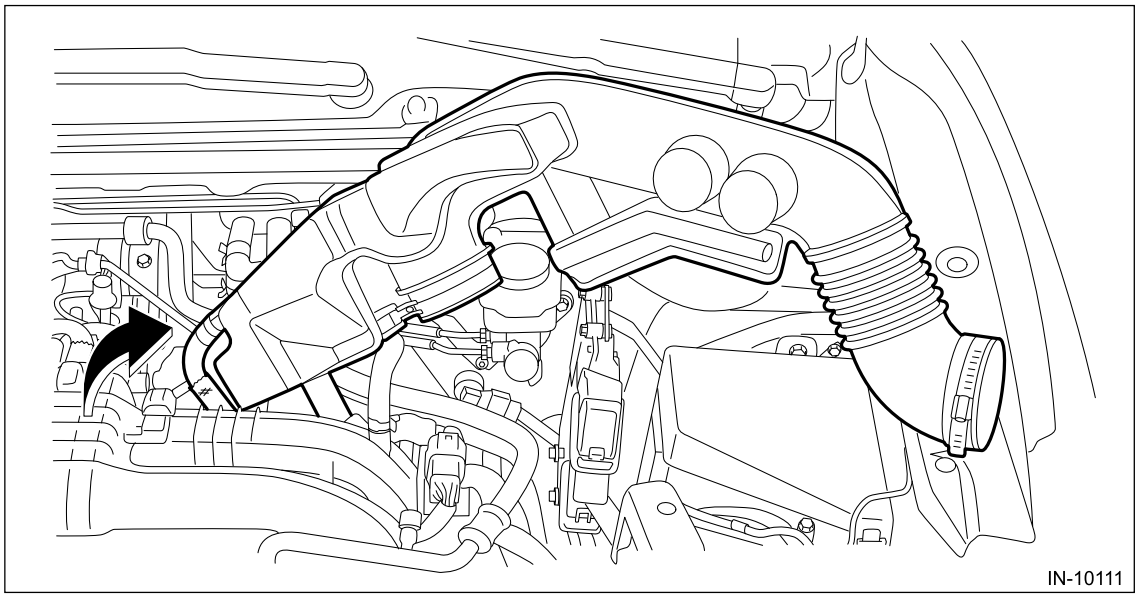




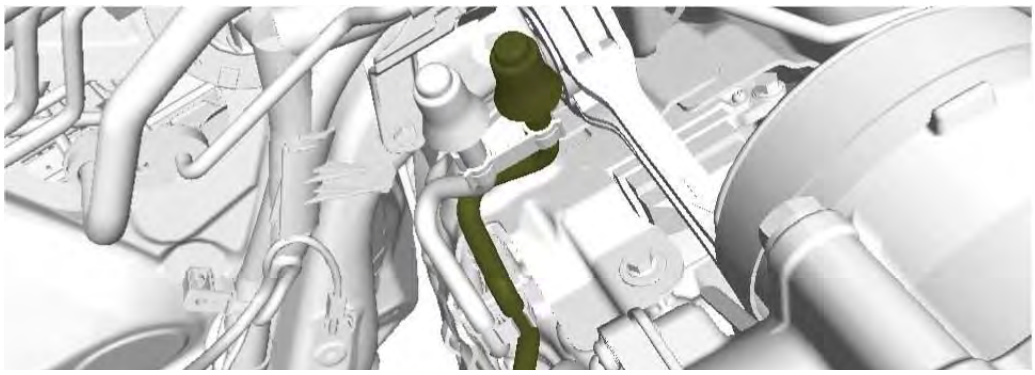
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

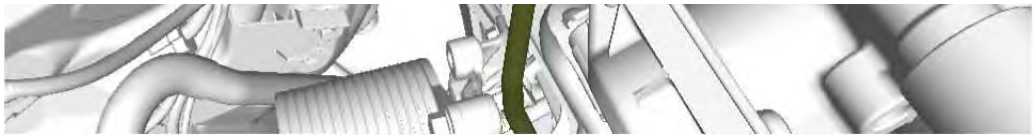
Caution:

Be careful not to pull out the PCV hose.



4. Remove the air breather hose.



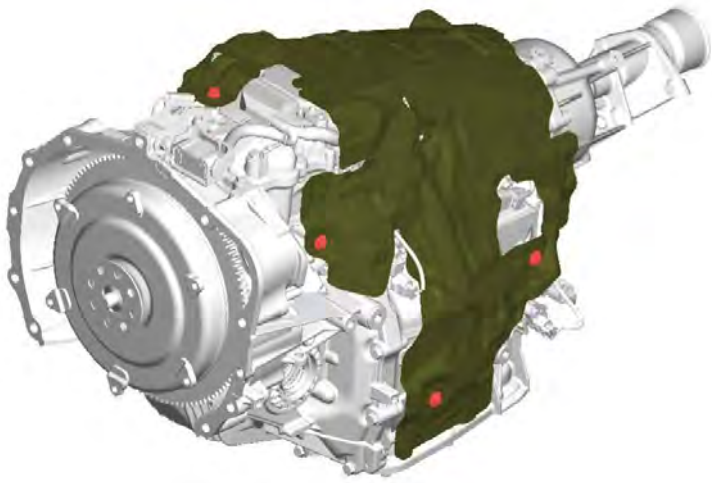


CVT10296

5. Remove the air breather cap.

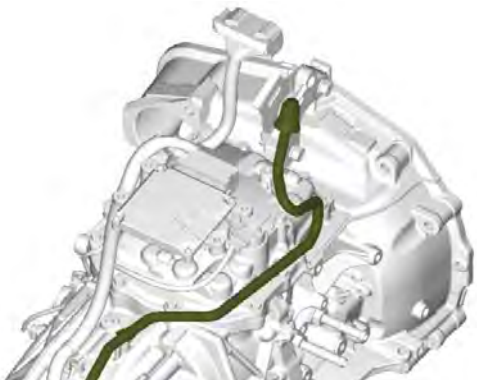
2. TRANSMISSION CASE SIDE

1. Remove the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the transmission case cover.



CVT10297

3. Remove the air breather hose.





CVT10298

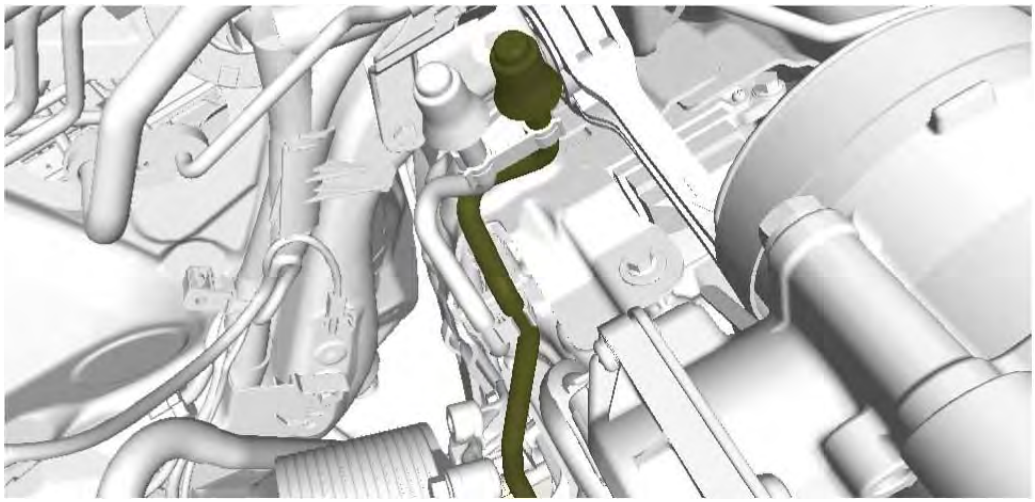
4. Remove the air breather cap.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Air Breather Hose

INSTALLATION

1. FRONT DIFFERENTIAL SIDE

1. Install the air breather cap.
2. Install the air breather hose.

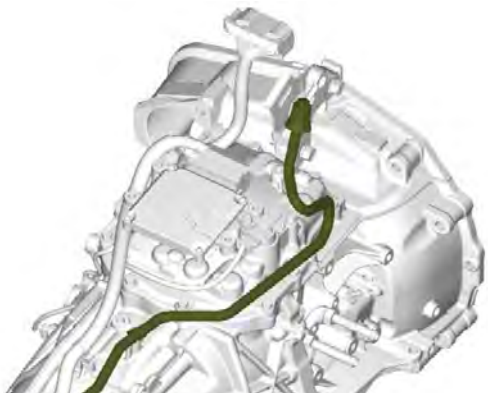


CVT10296

3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

2. TRANSMISSION CASE SIDE

1. Install the air breather cap.
2. Install the air breather hose.





CVT10298

3. Install the transmission case cover.

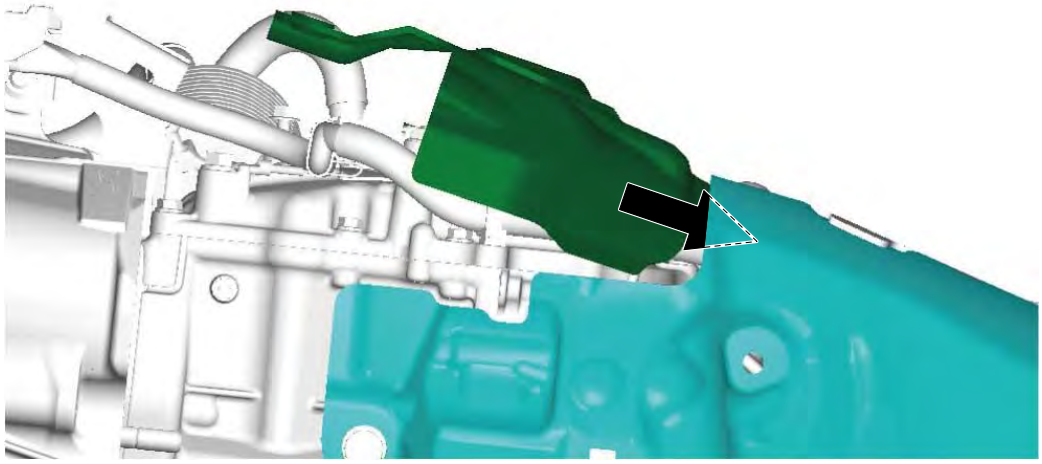
Tightening torque:

Cover (small): 7 N·m (0.7 kgf-m, 3.7 ft-lb)

Cover (large): 8 N·m (0.8 kgf-m, 5.9 ft-lb)

Note:

First install the transmission case cover (large), then insert the transmission case cover (small) between the transmission case cover (large) and the transmission to install.

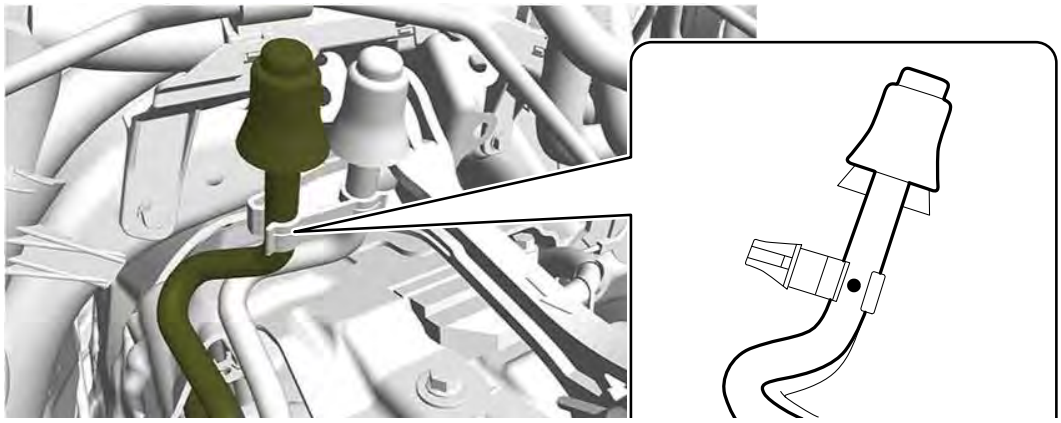


CVT10293

4. Install the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.
5. Install the air breather hose to the bracket.

Note:

Assemble the hose with the marked position facing in the direction shown in the figure.





CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Air Breather Hose

INSPECTION

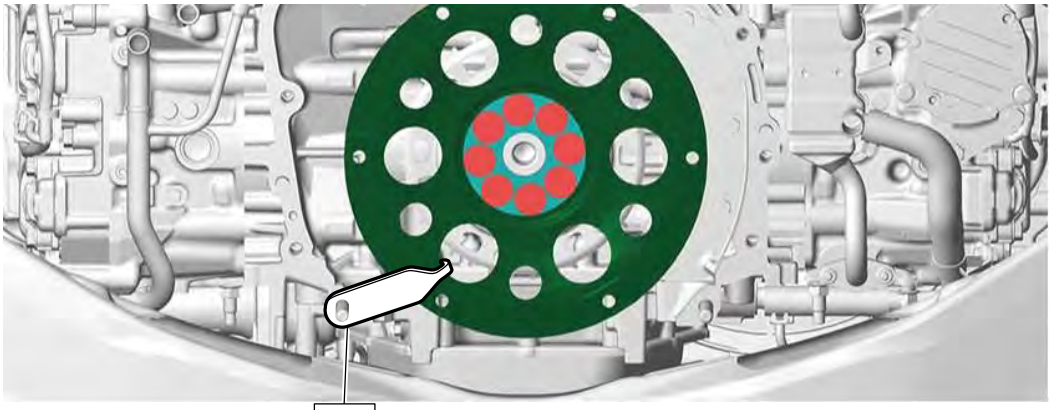
Check the hose for peeling, crack or clogging.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Plate

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Set the ST.
   Preparation tool:
   ST: CRANKSHAFT STOPPER (498497300)





3. Remove the drive plate and reinforcement drive plate.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Plate

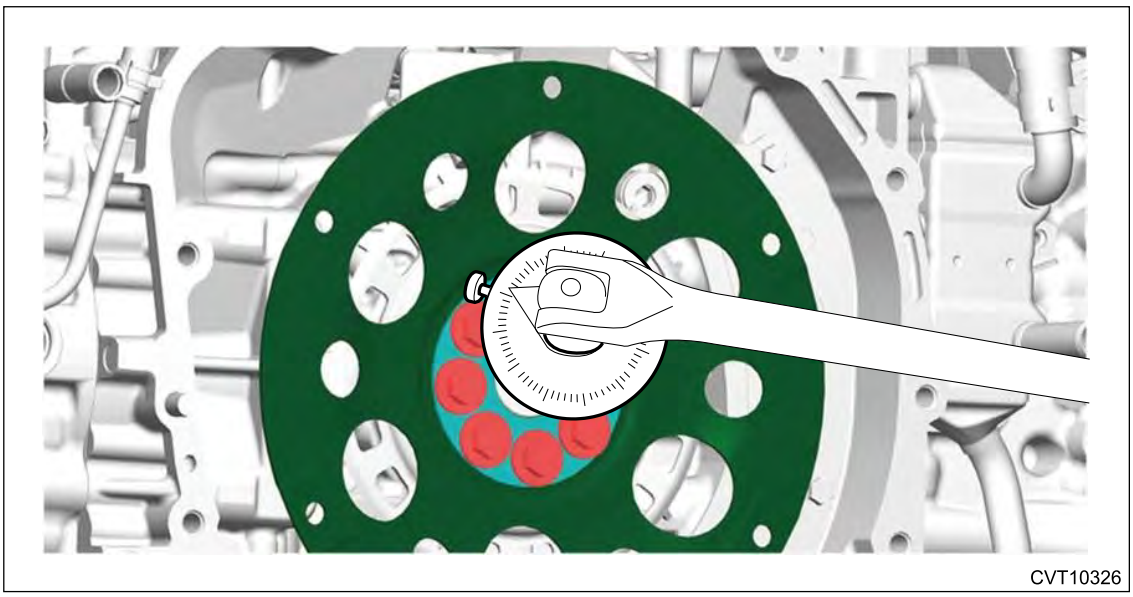
INSTALLATION

1. Temporarily install the drive plate and reinforcement drive plate.
   Note:
   Align the knock pin hole of the crankshaft position sensor plate to the knock pin of the crankshaft to secure the knock pin.
2. Set the ST.
   Preparation tool:
   ST: CRANKSHAFT STOPPER (498497300)





3. Tighten the drive plate mounting bolt in two stages.
   (1) Tighten the drive plate mounting bolt.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
   (2) While checking the tightening angle with the angle gauge, tighten the drive plate mounting bolts to the specified angle.
   Tightening angle:
   30° — 35°



4. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Plate

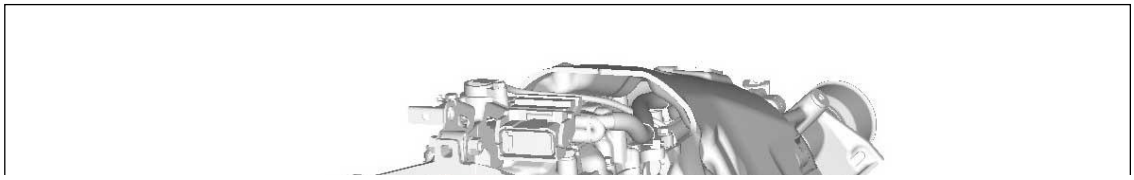
INSPECTION

Check the drive cable for damage.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Torque Converter Assembly

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Pull out the torque converter assembly horizontally.
   Caution:
   Do not scratch the inside of engaging parts.



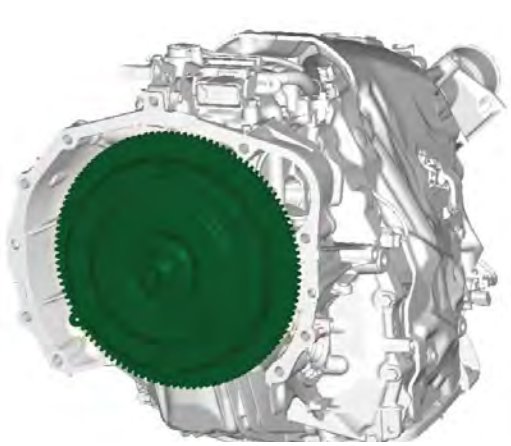
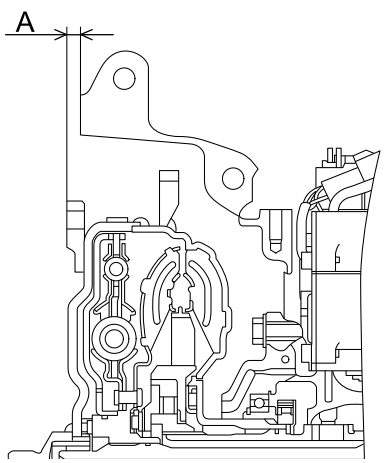

CVT10306

3. Remove the O-ring from the input shaft.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Torque Converter Assembly

INSTALLATION

1. Install the O-ring to the input shaft.
   Note:
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**
2. While holding the torque converter assembly by hand, carefully install it into the torque converter case.
   Note:
   - **Apply CVTF to the oil seal lip.**
   - **Do not damage the oil seal and O-ring.**
3. Engage the splines while gently rotating the torque converter assembly by hand, and securely insert the assembly.
4. Measure depth “A”, from converter case end surface to drive plate contacting surface.
   Standard (reference):
   6.8 mm (0.268 in) or less



5. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Torque Converter Assembly

INSPECTION

- Check the protrusion of torque converter assembly center (front boss) is not deformed or damaged.
- Check the ring gear and exterior for break or damage.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Preparation for Overhaul

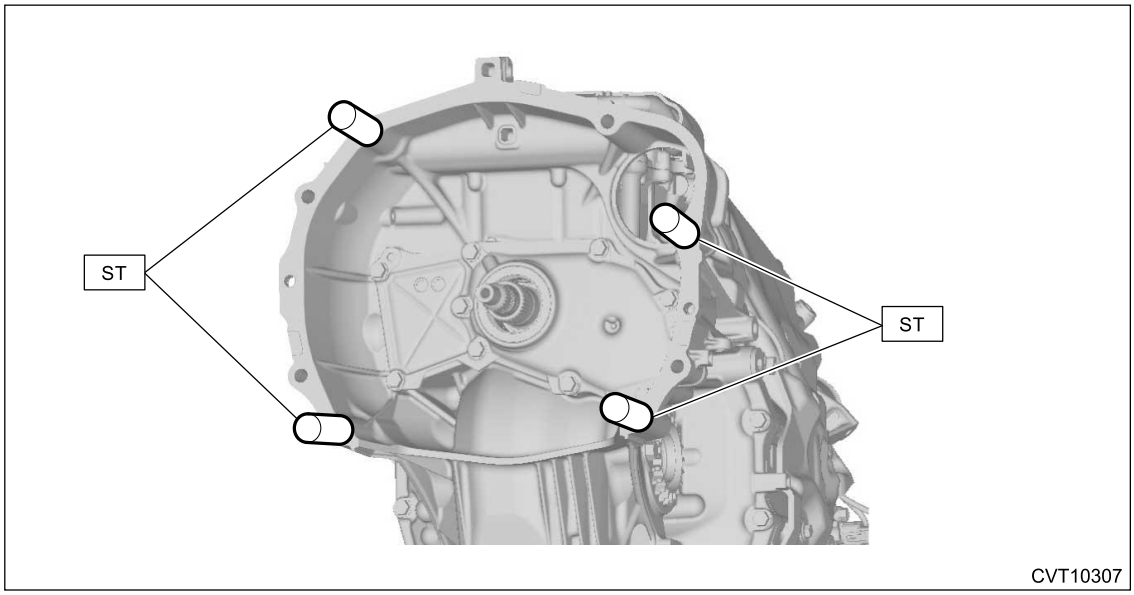
GENERAL DESCRIPTION

Before disassembling and assembling the transmission, follow the following procedures to prepare.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Preparation for Overhaul

PROCEDURE

1. Clean the transmission exterior.
2. Remove the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly.
3. Attach the ST to the transmission.
   Preparation tool:
   ST: STAND ASSY (18632AA000)



4. Remove the transmission case cover on the transmission upper side.

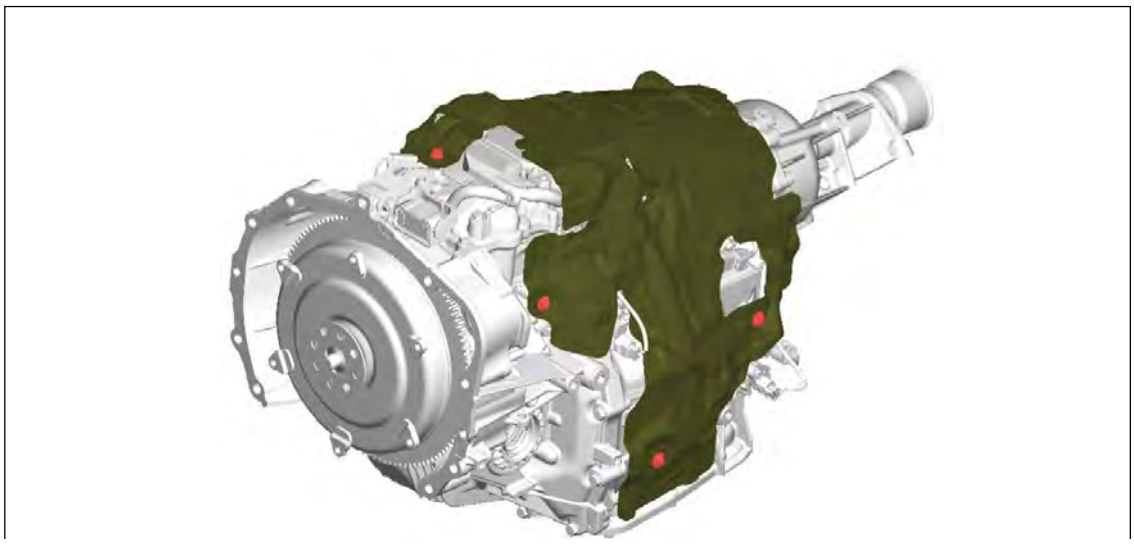
Note:

For installation, first install the transmission case cover (large), then insert the transmission case cover (small) between the transmission case cover (large) and the transmission to install.

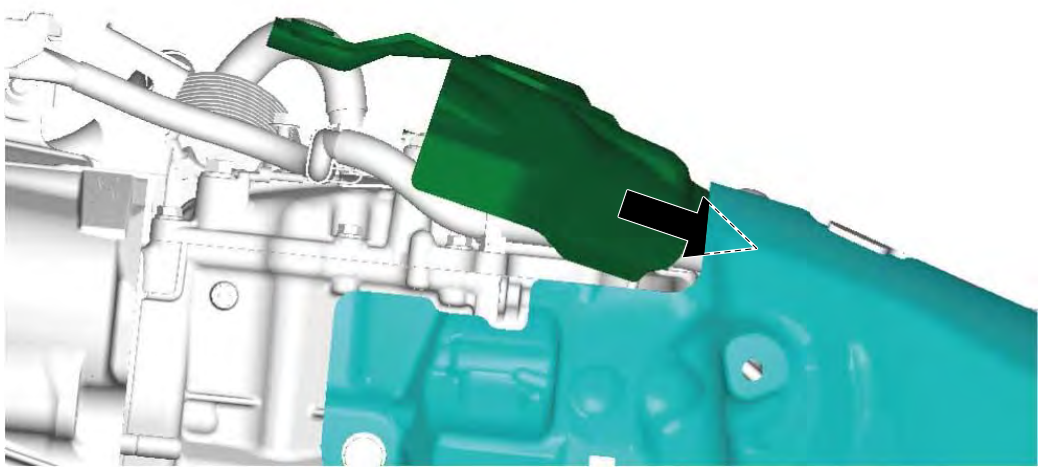
Tightening torque:

Cover (small): 7 N·m (0.7 kgf-m, 5.2 ft-lb)

Cover (large): 8 N·m (0.8 kgf-m, 5.9 ft-lb)



CVT10297



CVT10293

5. Place the transmission assembly on end.
6. When completely overhauling the transmission, refill approx. 10 L (2.6 US qt, 8.8 Imp qt) of CVTF through the transmission right side plug, and install the plug. Finally, install the transmission case cover.

Caution:

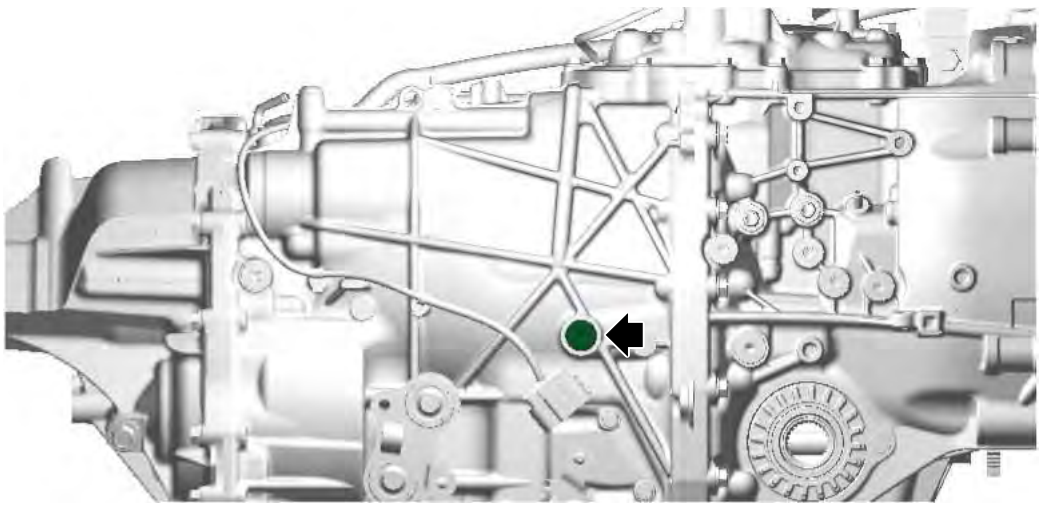
Always use specified CVTF. Using other fluid will cause malfunction. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description>SPECIFICATION > HYDRAULIC CONTROL AND LUBRICATION.

Note:

Use a new gasket.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)



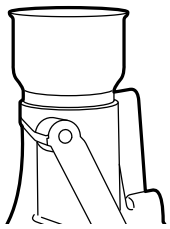
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

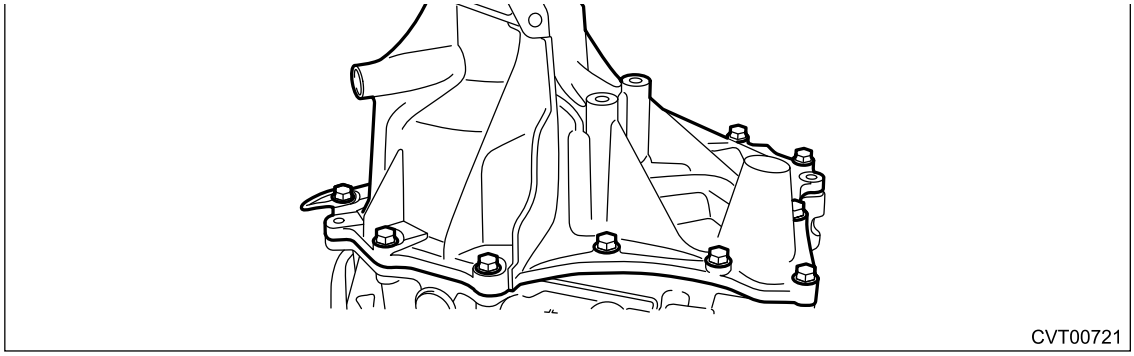
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the extension case and transmission hanger.

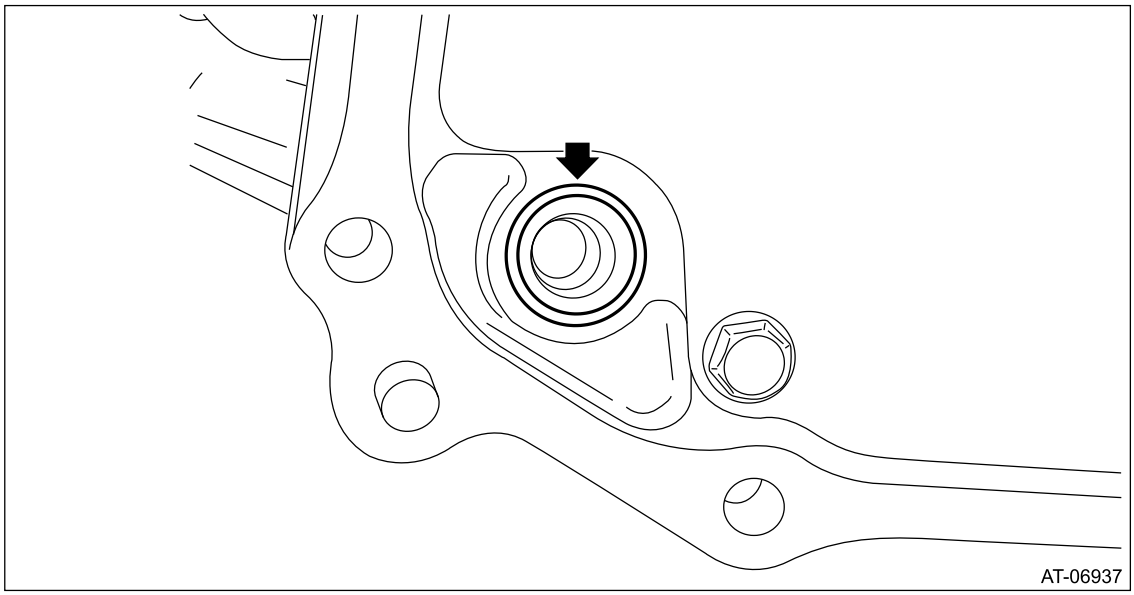
   Note:

   The total number of extension case mounting bolts is 13.





3. Remove the O-rings.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

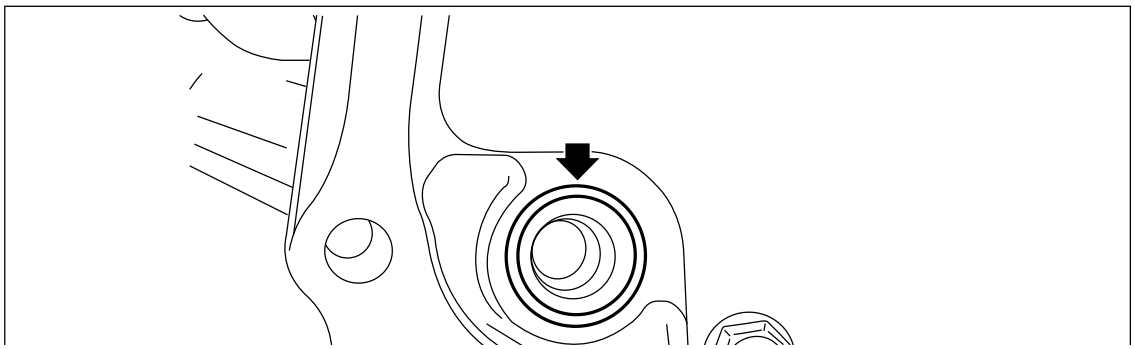
INSTALLATION

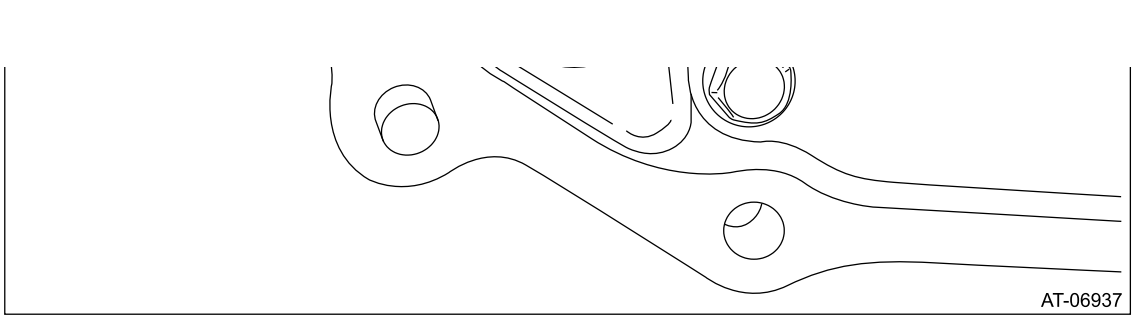
1. Clean the mating surface of extension case and transmission case.
2. Select the transfer drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.
3. Select the transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.

4. Attach the selected transfer drive gear shim to extension case with vaseline.
5. Attach the selected transfer driven gear shim to extension case with vaseline.
6. Install the O-ring to the transmission case.

Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**

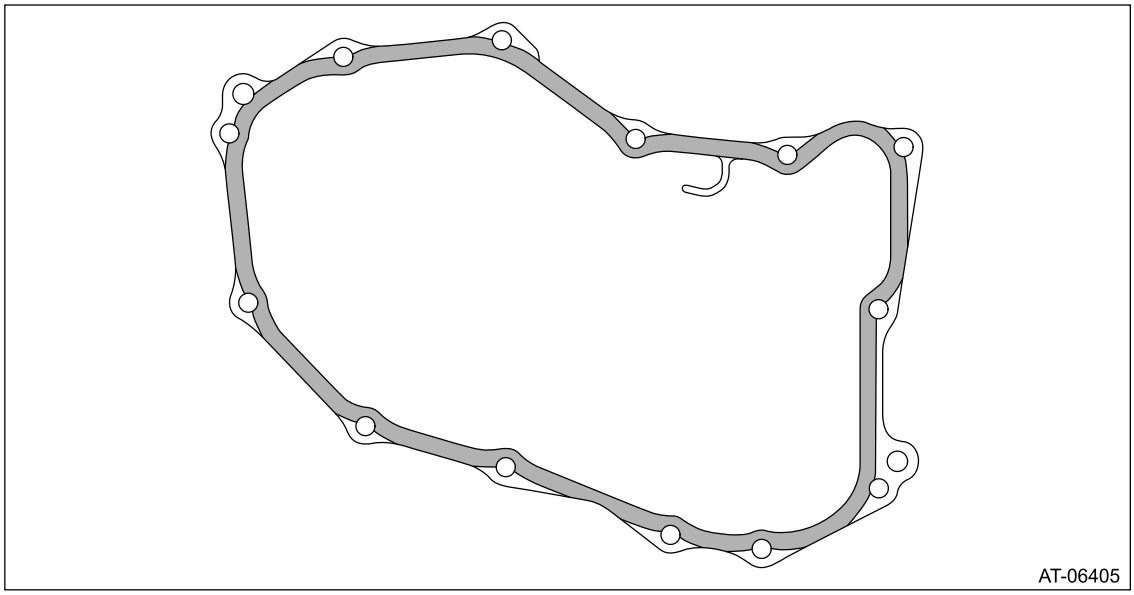




7. Apply liquid gasket to extension case seamlessly.

Liquid gasket:

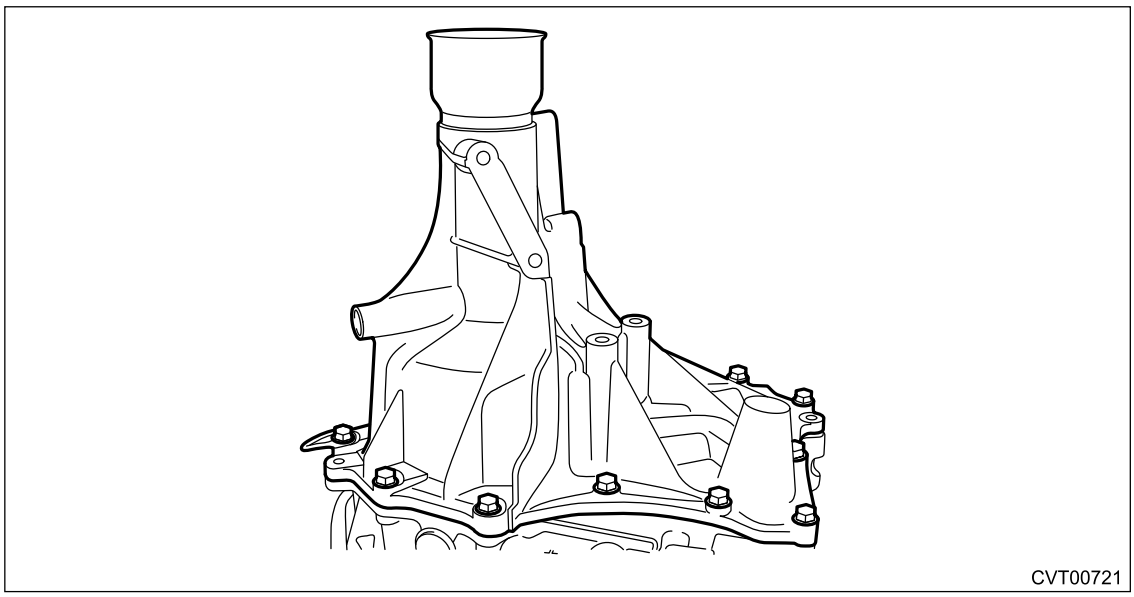
THREE BOND 1215B or equivalent



8. Install the extension case to transmission hanger.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)



9. Install the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

DISASSEMBLY

1. Remove the dust cover from extension case.
2. Remove the extension case oil seal from the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal>REPLACEMENT.
3. Remove all plugs.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

ASSEMBLY

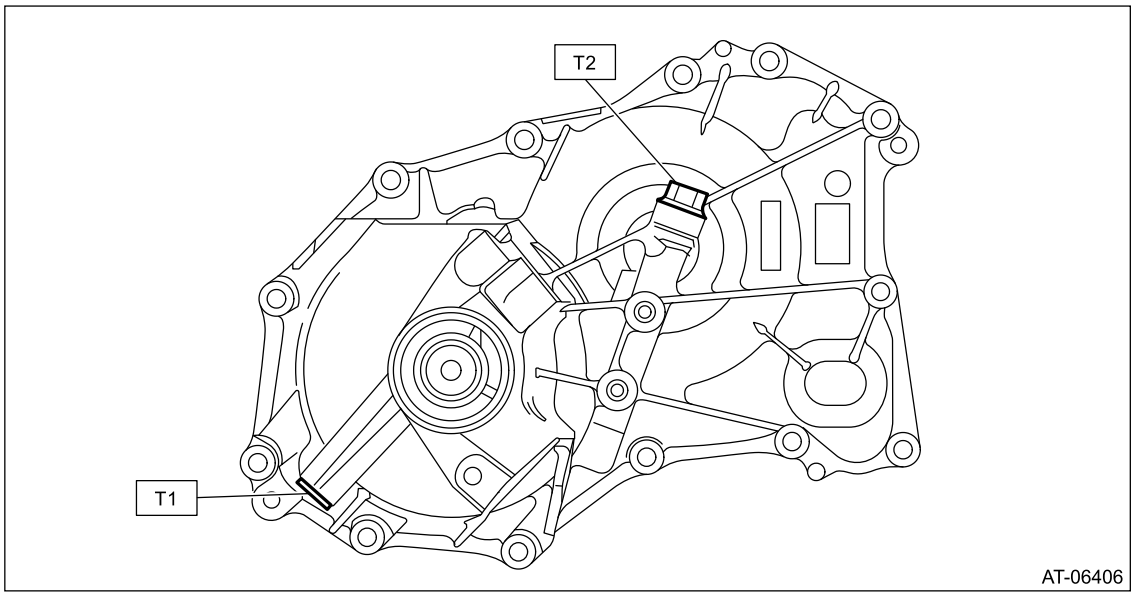
1. Press-fit the dust cover into extension case.
2. Install the extension case oil seal to extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal>REPLACEMENT.
3. Install all plugs.

Note:

- **Use a new O-ring or a gasket.**
- **Apply CVTF to the O-rings.**

Tightening torque:

T1: 22 N·m (2.2 kgf-m, 16.2 ft-lb)
T2: 35 N·m (3.6 kgf-m, 25.8 ft-lb)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

INSPECTION

- Check there is no leak of CVTF from the joint between extension case and transmission case.
- Check there is no damage or cracks on the extension case and other parts.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Extension Case

ADJUSTMENT

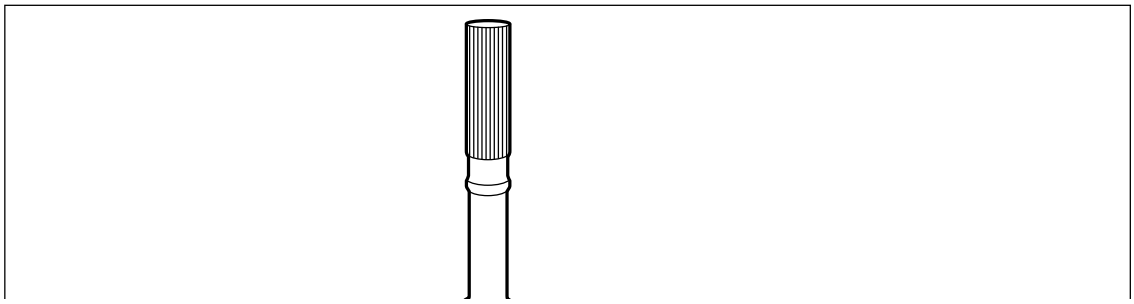
Note:

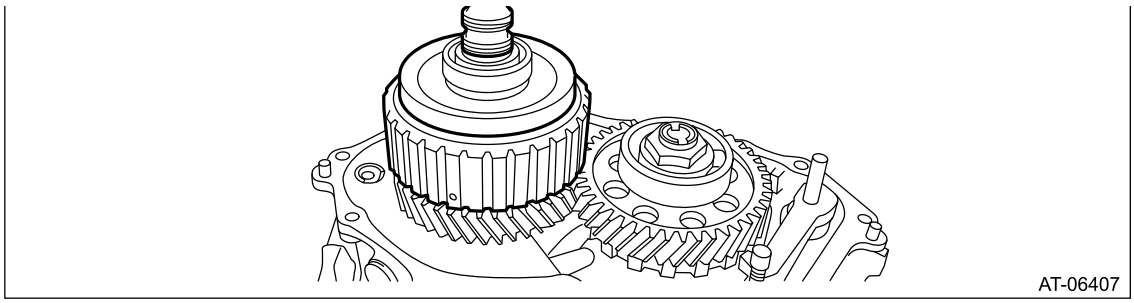
When replacing the extension case, select the transfer drive gear shim and transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch

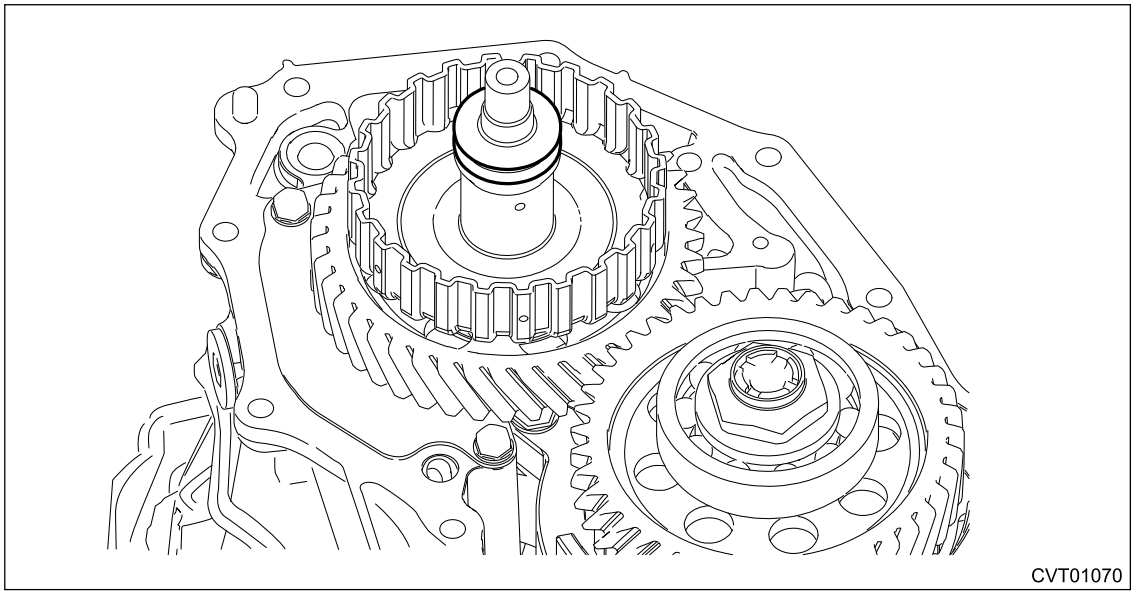
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
3. Remove the transfer clutch assembly.

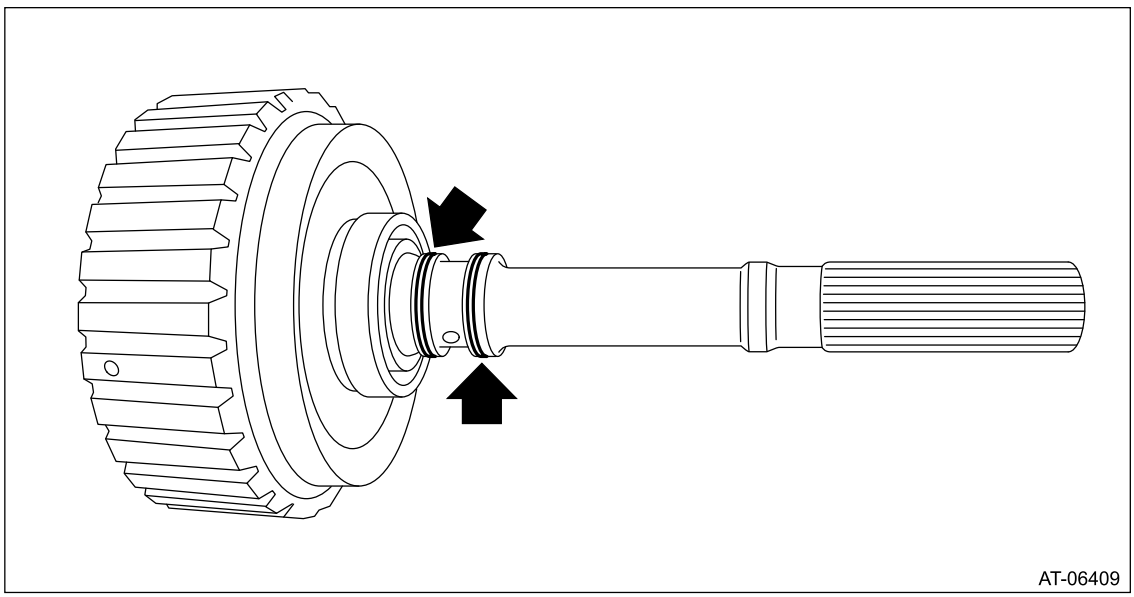




4. Remove the thrust bearing.

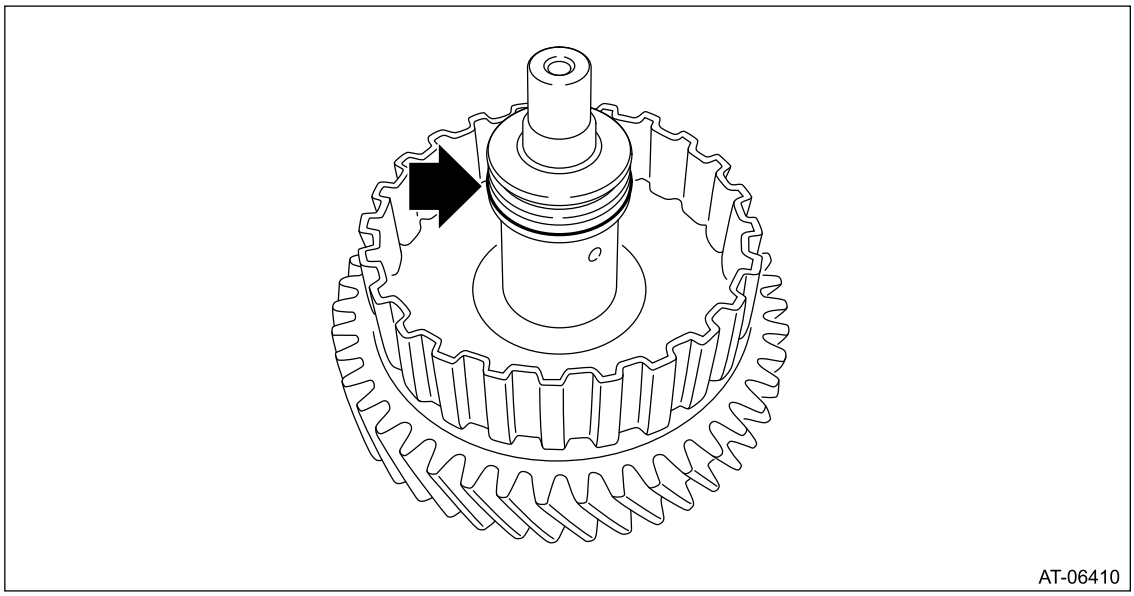


5. Remove the seal ring from transfer clutch assembly.



6. Remove the seal ring from the transfer driven gear assembly.

6. Remove the seal ring from the transfer driven gear assembly.



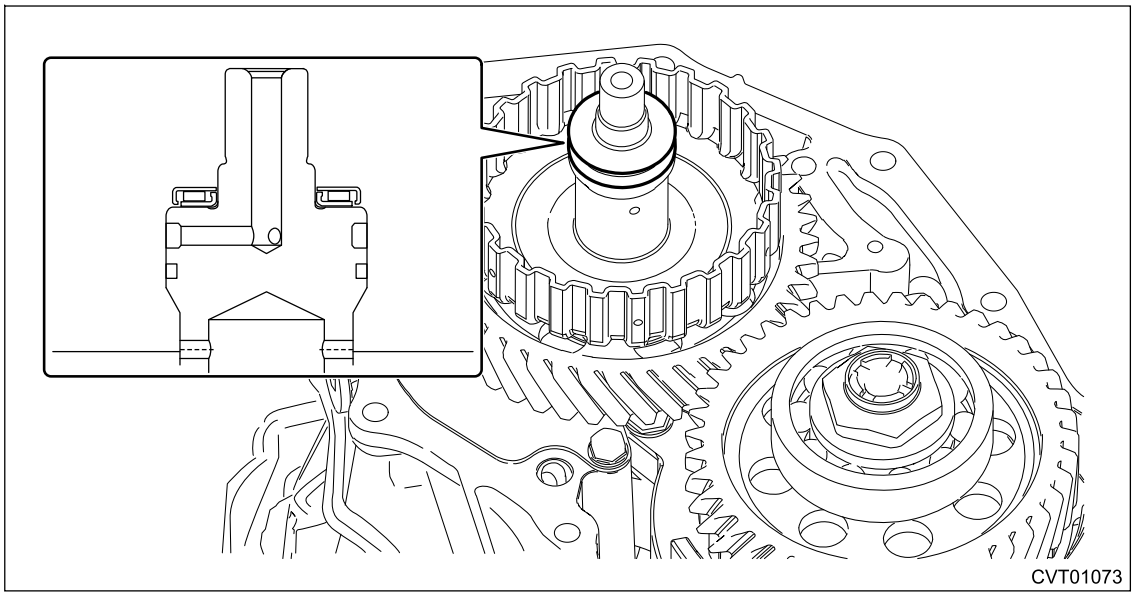
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch

INSTALLATION

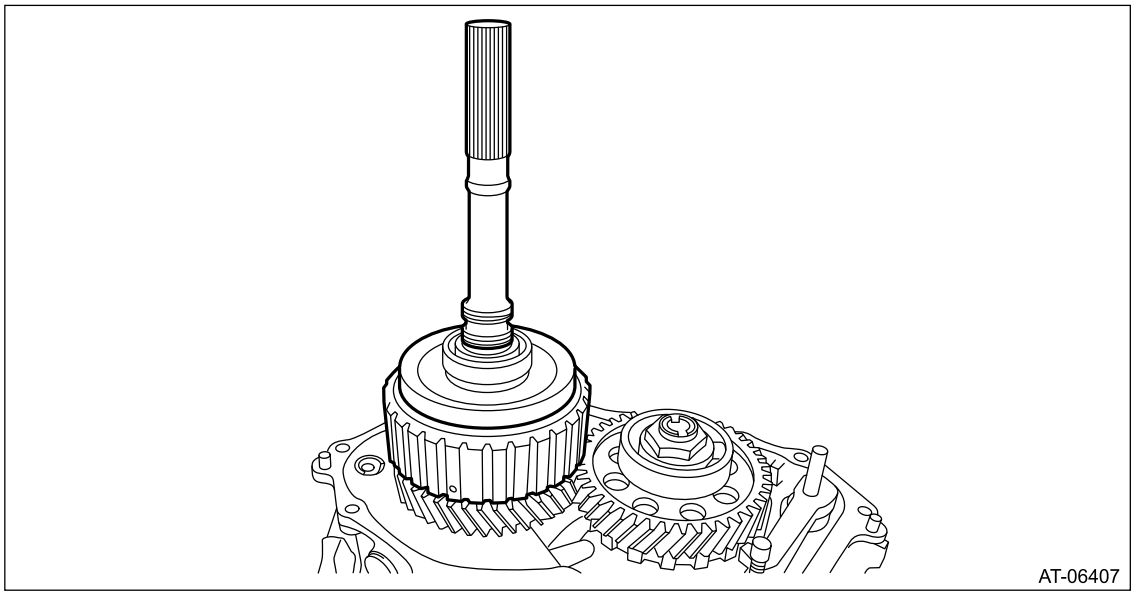
1. Install the thrust bearing.

   Note:

   Make sure to install in the right direction.



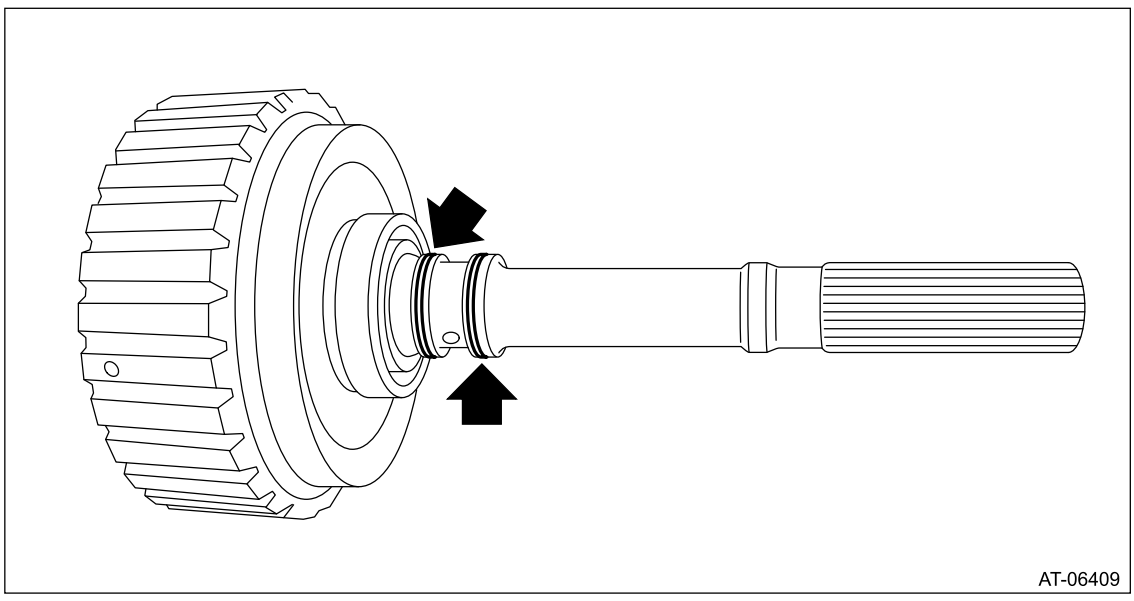
2. Install the transfer clutch assembly.



3. Select the transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.
4. Attach the selected transfer driven gear shim to extension case with vaseline.
5. Remove the transfer clutch assembly.
6. Install the seal ring to the transfer clutch assembly.

Note:

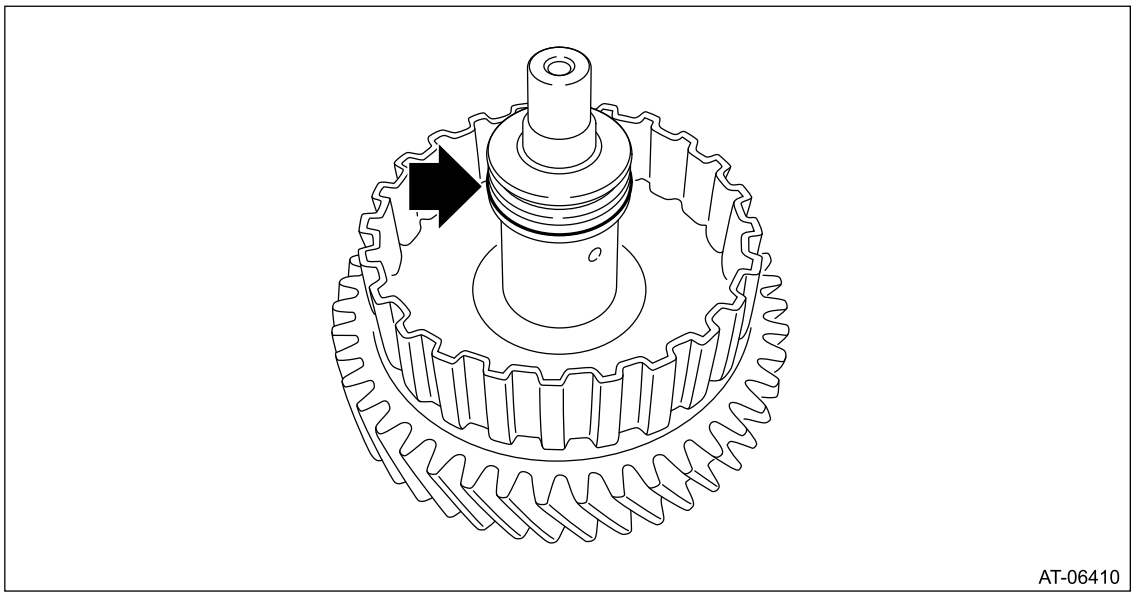
- **Use new seal rings.**
- **When installing the seal rings, do not expand the seal rings too much.**
- **Apply CVTF to the seal rings.**



7. Install the seal ring to the transfer driven gear assembly.

Note:

- **Use new seal rings.**
- **When installing the seal rings, do not expand the seal rings too much.**
- **Apply CVTF to the seal rings.**

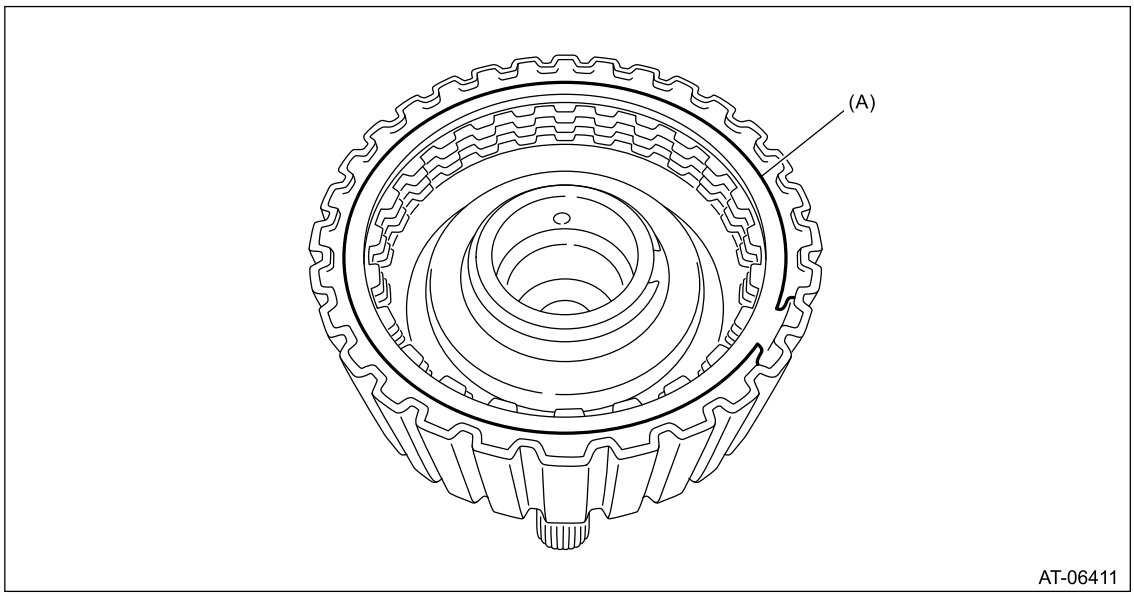


8. Install the transfer clutch assembly.
9. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
10. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch

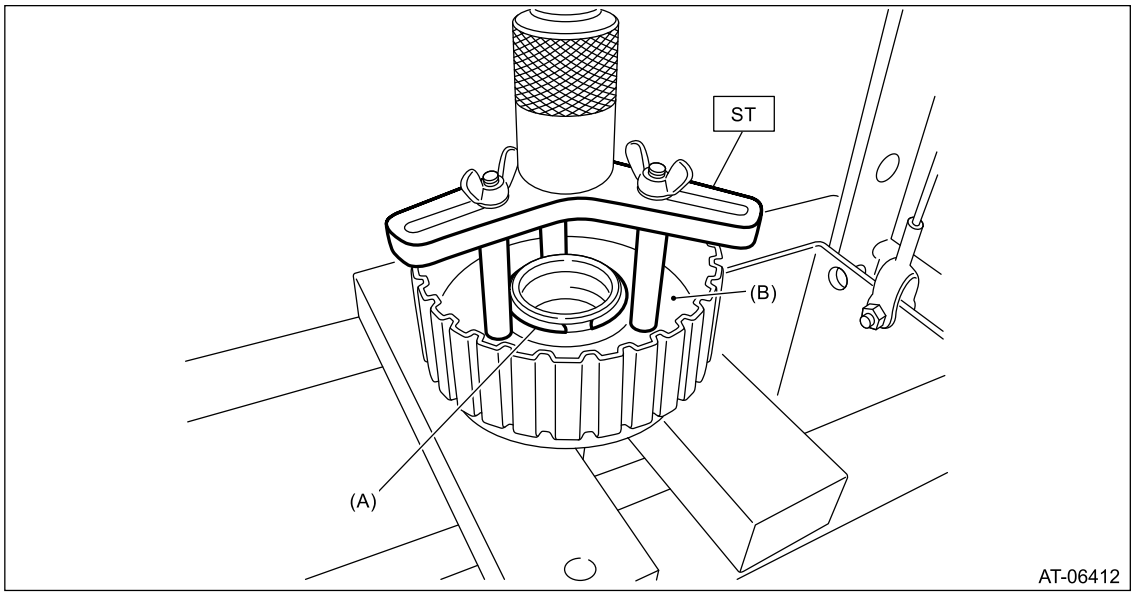
DISASSEMBLY

1. Remove the snap ring, and then remove the pressure plate, drive plate and driven plate.



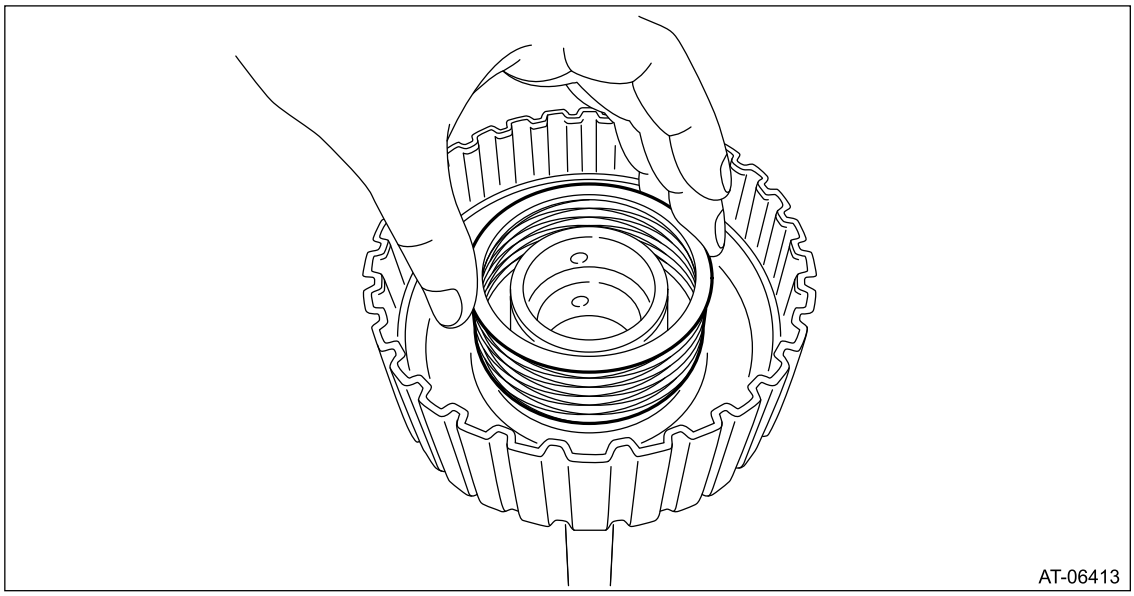
(A) Snap ring

2. Using the ST, compress the return spring with a press and remove the snap ring.
Preparation tool:
ST: COMPRESSOR SPECIAL TOOL (18762AA001)



(A) Snap ring
(B) Transfer clutch piston seal

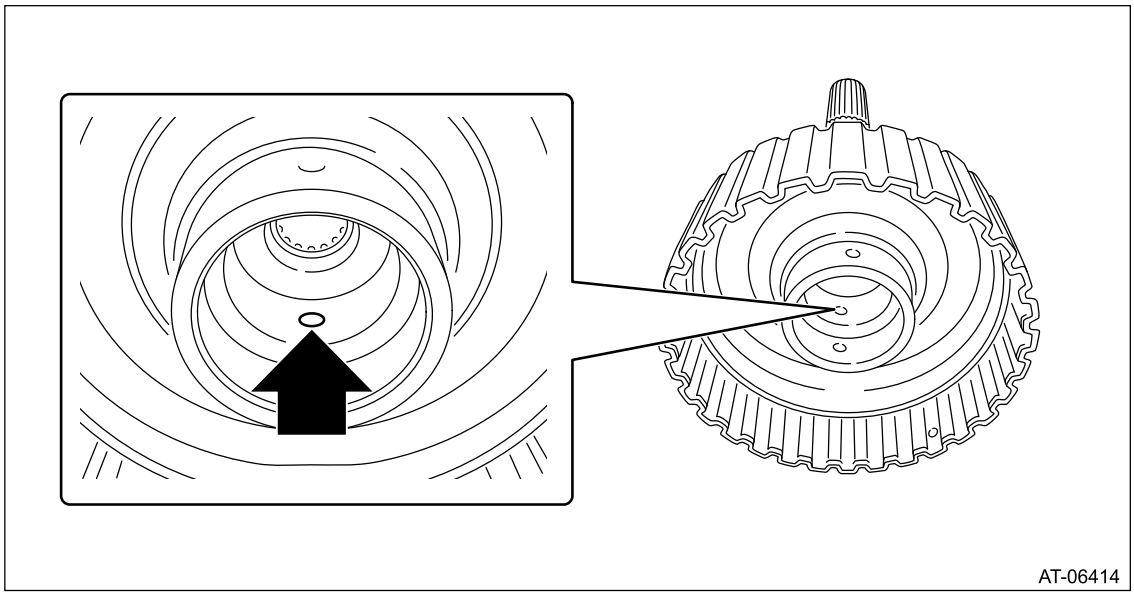
3. Remove the transfer clutch piston seal.
4. Remove the return spring.



5. Remove the transfer clutch piston by blowing compressed air through transfer clutch assembly hole.

Note:

Plug the holes through which the compressed air is not blown.

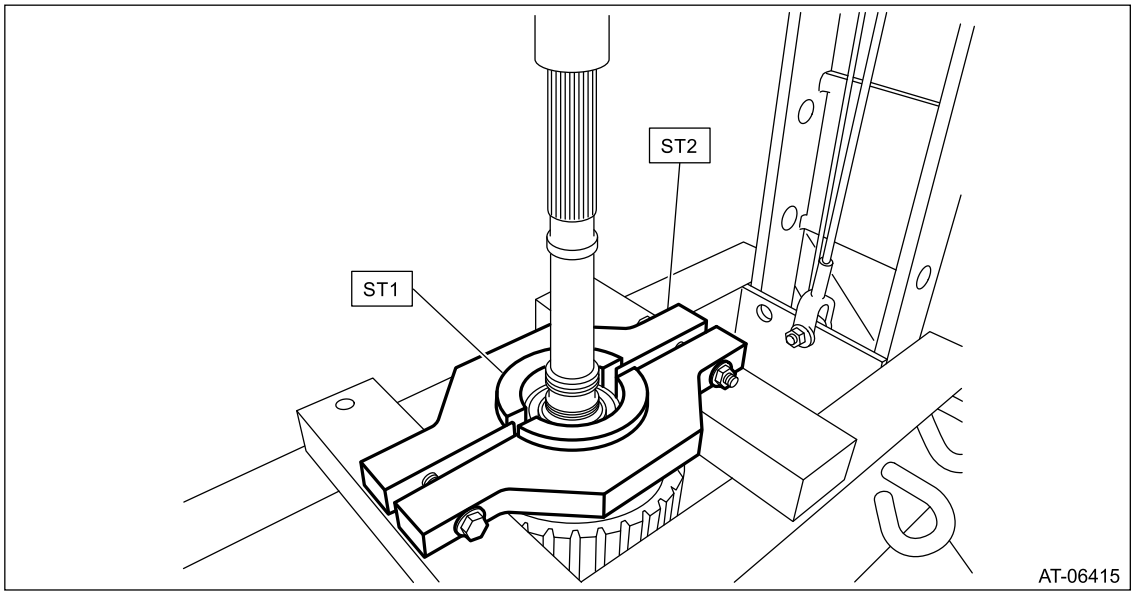


6. Remove the ball bearing using the ST1 and ST2.

Preparation tool:

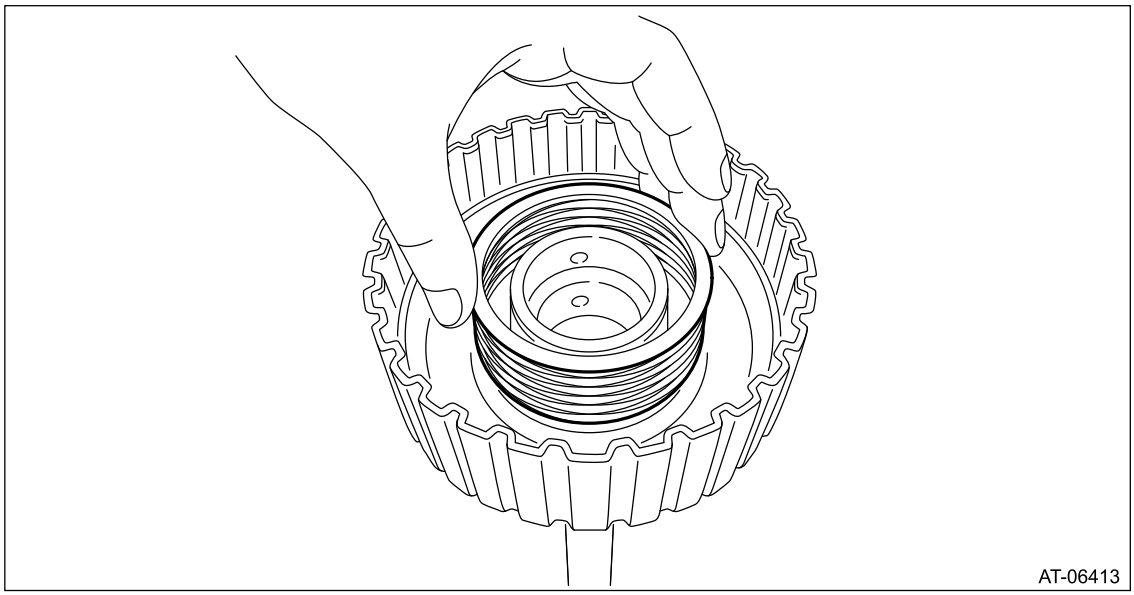
ST1: BEARING REMOVER (18767AA010)

ST2: REMOVER (18723AA000)

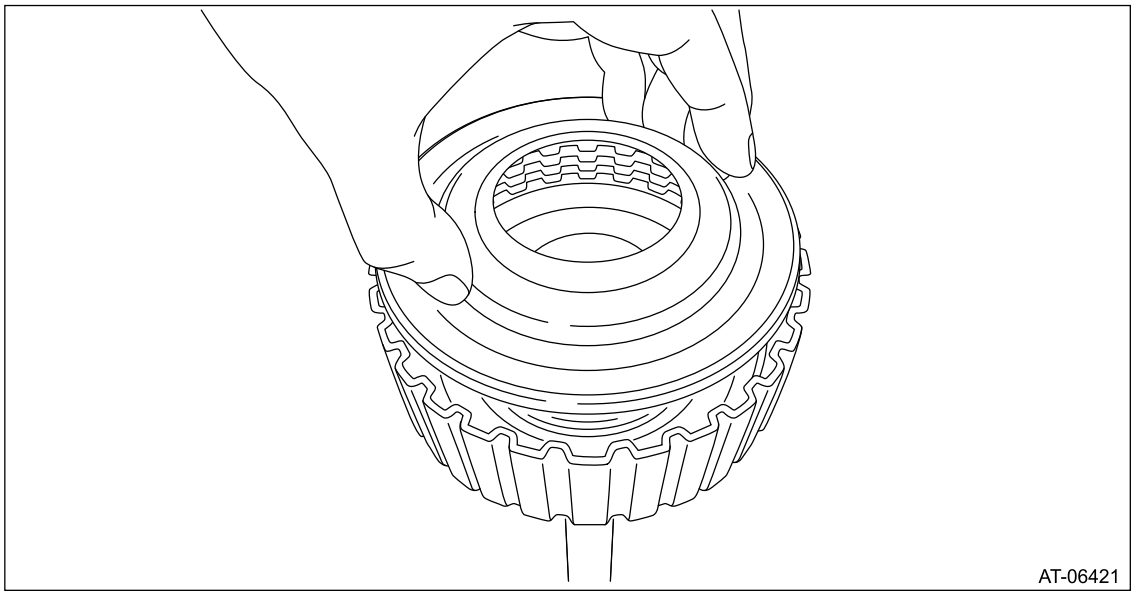


ASSEMBLY

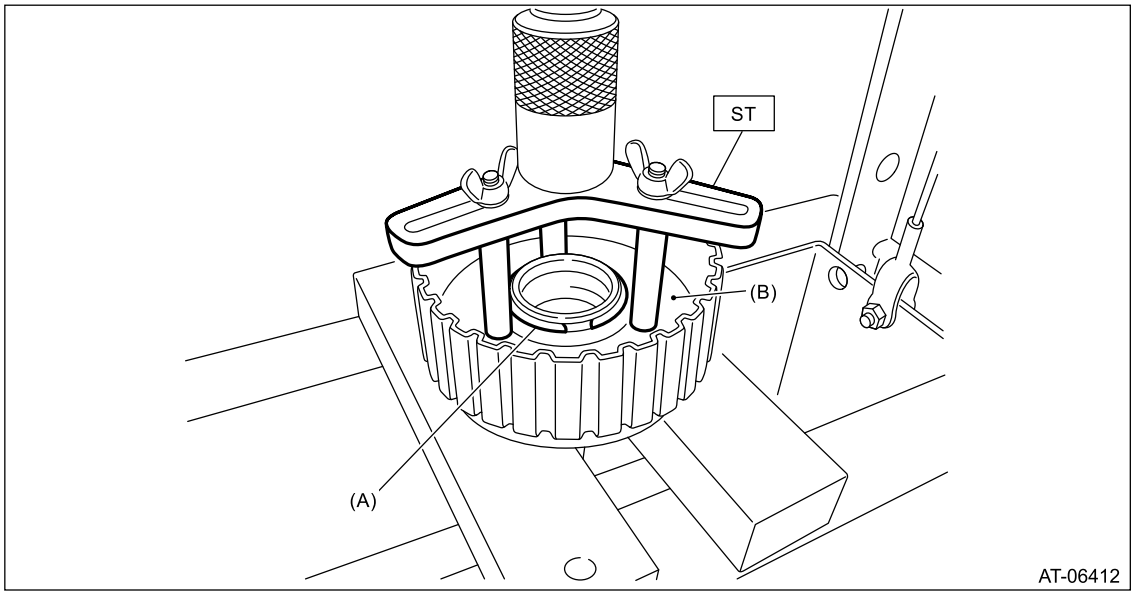
1. Install the transfer clutch piston.
   Note:
   Apply CVTF to the transfer clutch piston lip.
2. Install the return spring.



3. Install the transfer clutch piston seal.
   Note:
   Apply CVTF to the lip section of transfer clutch piston seal.



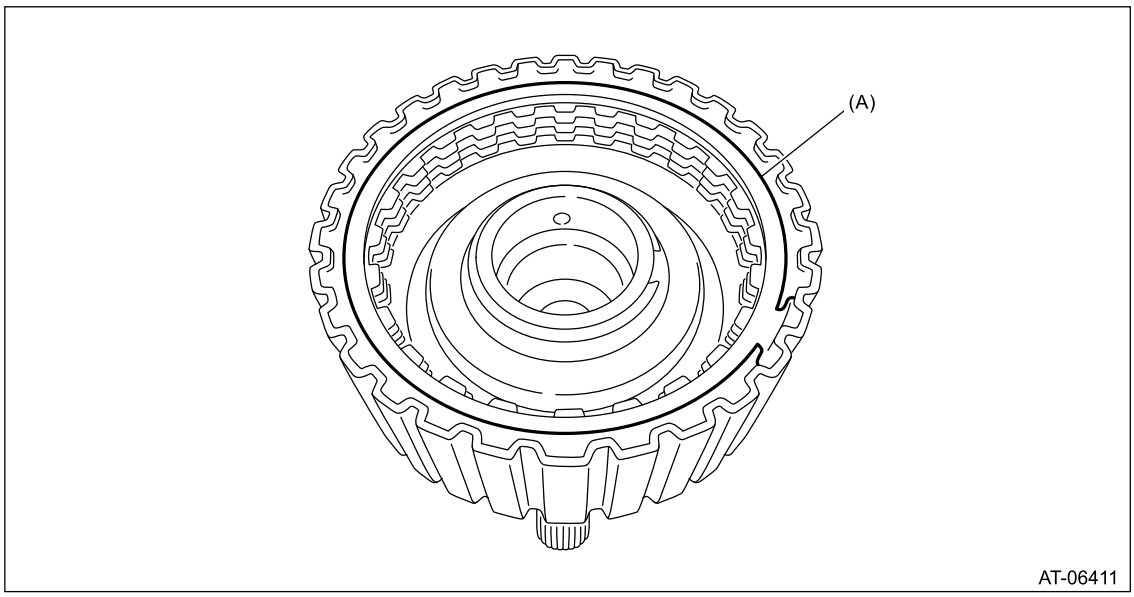
4. Using the ST, compress the return spring with a press and install the snap ring.
   Preparation tool:
   ST: COMPRESSOR SPECIAL TOOL (18762AA001)



(A) Snap ring

(B) Transfer clutch piston seal

5. Install the pressure plate, driven plate, drive plate and snap ring.



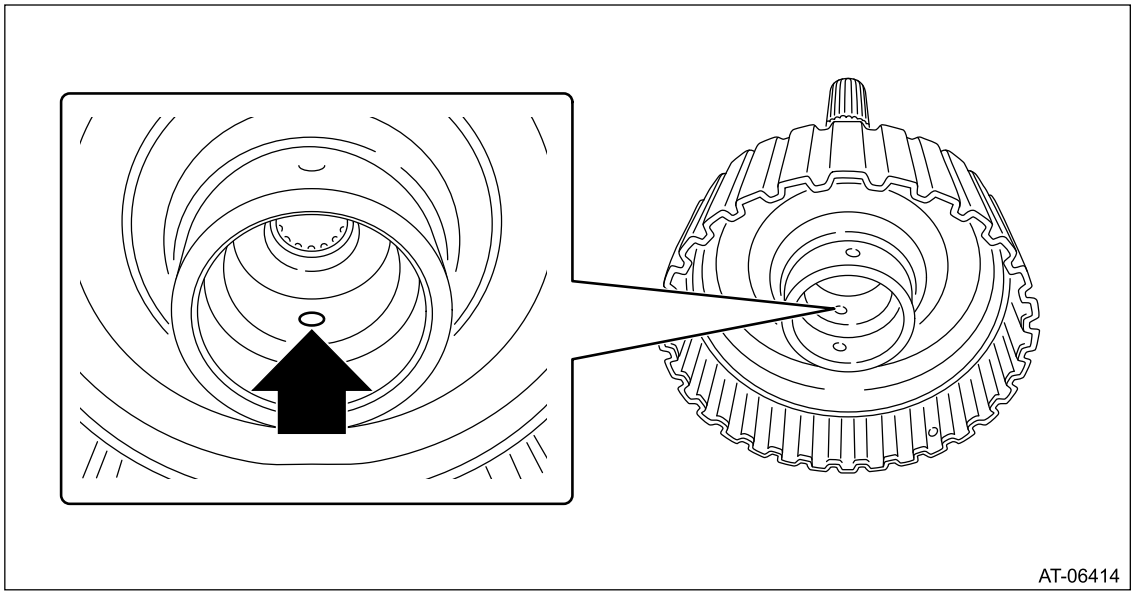
(A) Snap ring

6. Blow compressed air through transfer clutch assembly hole, and check the transfer clutch piston

operation.

Note:

Plug the holes through which the compressed air is not blown.



7. Before measuring clearance "A", place same thickness shims on both sides to prevent the plate from tilting.

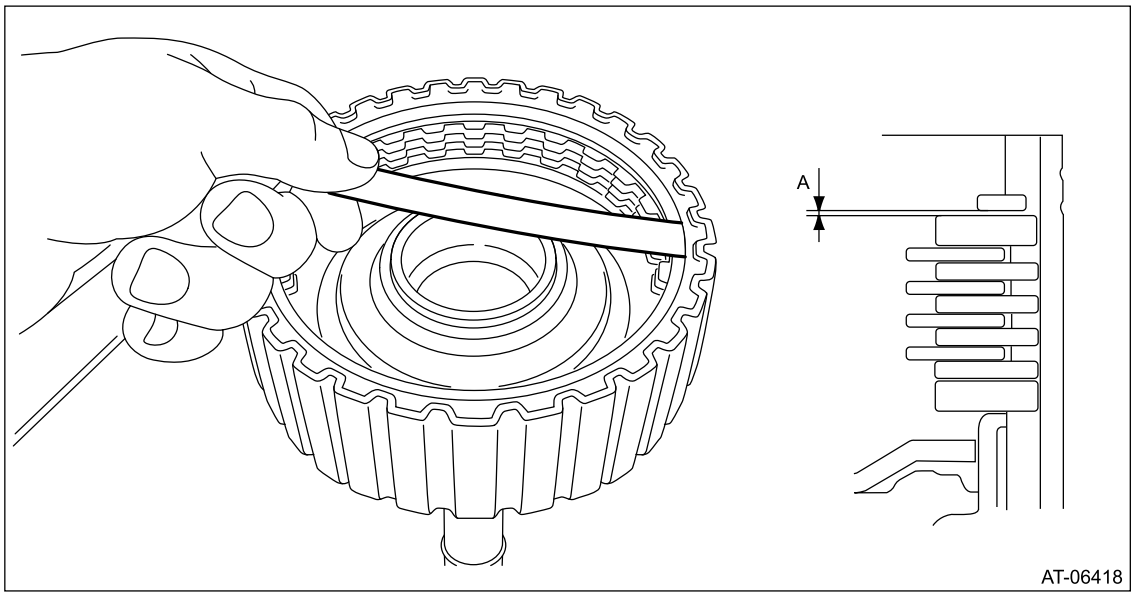
8. When the clearance "A" exceeds the limit for use, select the transfer clutch plate set and pressure plate, and adjust the clearance "A" within the initial specified value.

Initial standard:

0.7 — 1.1 mm (0.028 — 0.043 in)

Limit thickness:

1.3 mm (0.051 in)



(1) Measure the thickness of the pressure plate for the transfer clutch plate set that has been used before replacement.

(2) Select the transfer clutch plate set that uses the pressure plate of which the value is close to the measured value in (1), and check the clearance "A".

measured value in (1), and check the clearance "A".

Transfer clutch plate set	
Part No.	**Pressure plate thickness mm (in)**
31523AA370	3.3 (0.130)
31523AA380	3.7 (0.146)
31523AA390	4.1 (0.161)
31523AA400	4.5 (0.177)

(3) When the clearance "A" exceeds the limit for use in step (2), replace the pressure plate installed on the lower side of the transfer clutch plate set, and check the clearance "A" again.

Pressure plate	
Part No.	**Thickness mm (in)**
31593AA151	3.3 (0.130)
31593AA161	3.7 (0.146)

(4) When the clearance "A" exceeds the limit for use in step (3), select the transfer clutch plate set that was not used in step (2), and adjust the clearance "A" again.

9. Check the clearance between snap ring and pressure plate. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSPECTION.

10. Install the ball bearing using the ST1 and ST2.

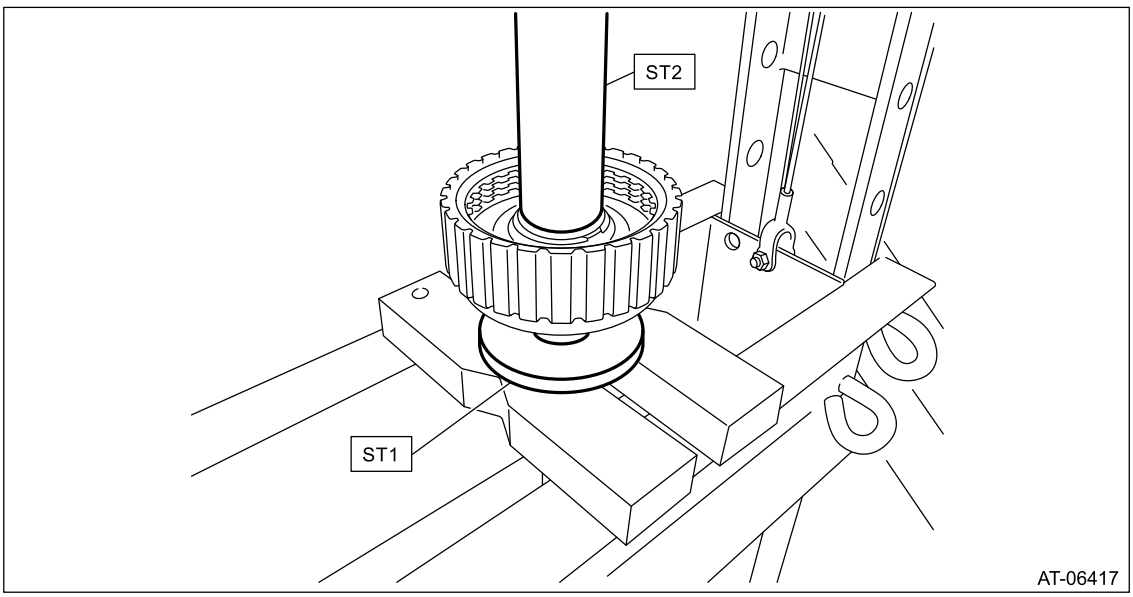
Note:

Use a new ball bearing.

Preparation tool:

ST1: INSTALLER (398177700)

ST2: INSTALLER (499277000)

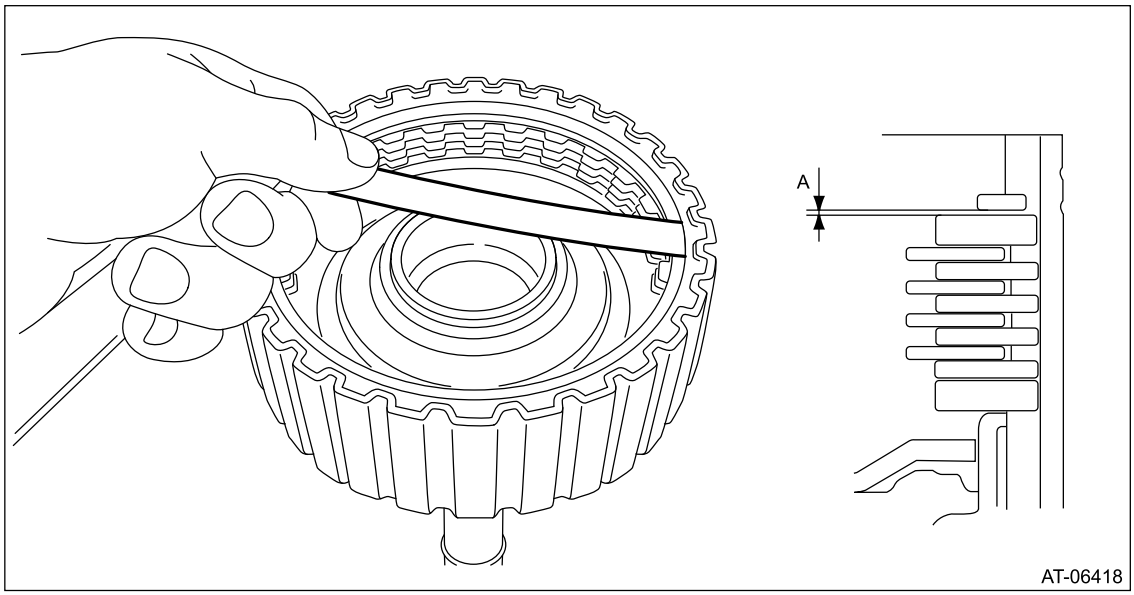


CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch

INSPECTION

- Inspect the drive plate facing for wear and damage.
- Driven plate for discoloration (burnt color)
- Make sure the snap ring is not worn and the return spring has no permanent distortion, damage, or deformation.
- Check the lip seal for damage.
- Inspect the extension end play, and adjust it to within the standard value. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.

1. Before measuring clearance "A" between snap ring and driven plate, place same thickness shims on both sides to prevent the plate from tilting.
2. When clearance "A" exceeds the limit for use, replace the drive plate and driven plate as a set, and select the pressure plate within the initial specified value.
   Initial standard:
   0.7 — 1.1 mm (0.028 — 0.043 in)
   Limit thickness:
   1.3 mm (0.051 in)



3. Check for tight corner braking phenomenon when the vehicle is moved forward with the steering fully turned. If tight corner braking occurs, perform the following procedures.
   (1) With the steering wheel held at fully turned position, drive the vehicle in "D" range and with vehicle speed at approx. 5 km/h (3 MPH) in both clockwise and counterclockwise directions for

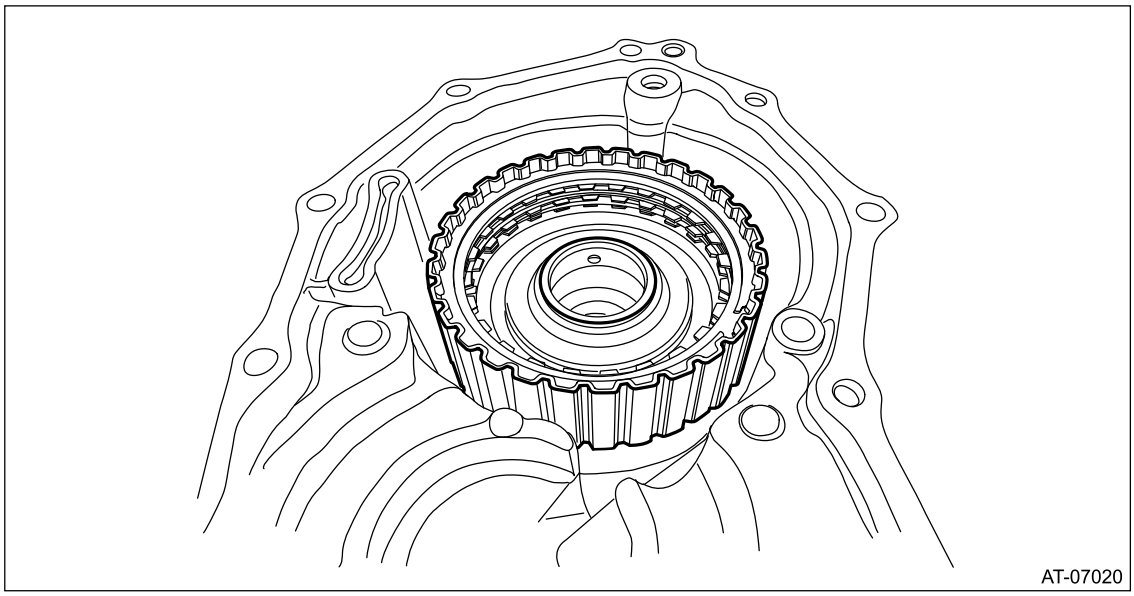
approx. ten times each, while repeating acceleration and braking intermittently.

(2) If the tight corner braking phenomenon still persists, drive the vehicle again in a circle for several laps.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Clutch

ADJUSTMENT

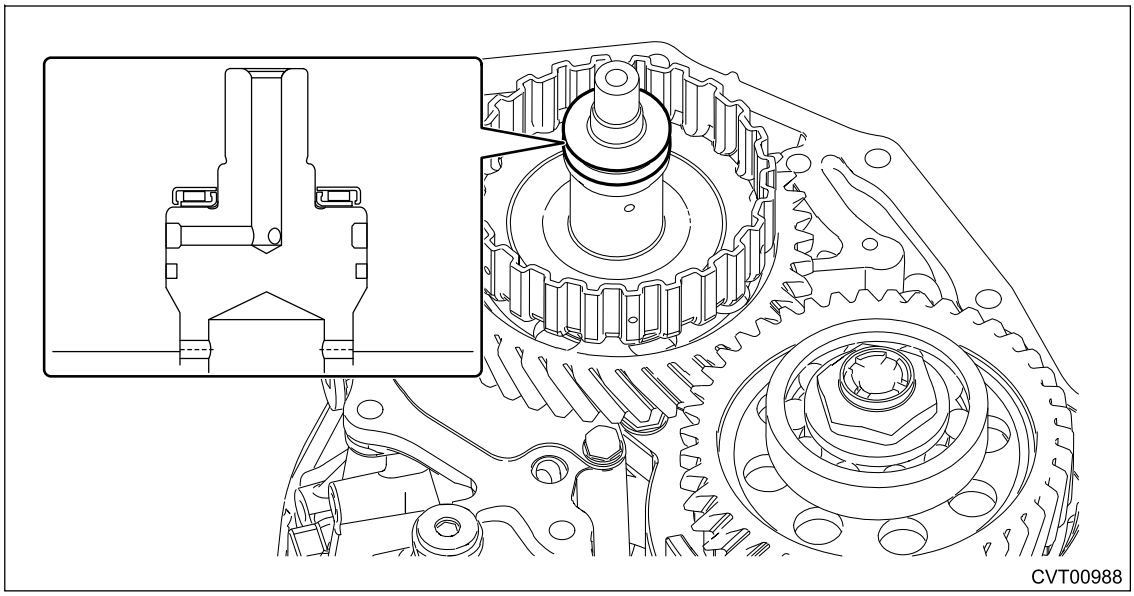
1. Install the transfer clutch assembly to the extension case with the transfer driven gear shims and thrust bearings removed.



2. Install the thrust bearing to the transfer driven gear.

Note:

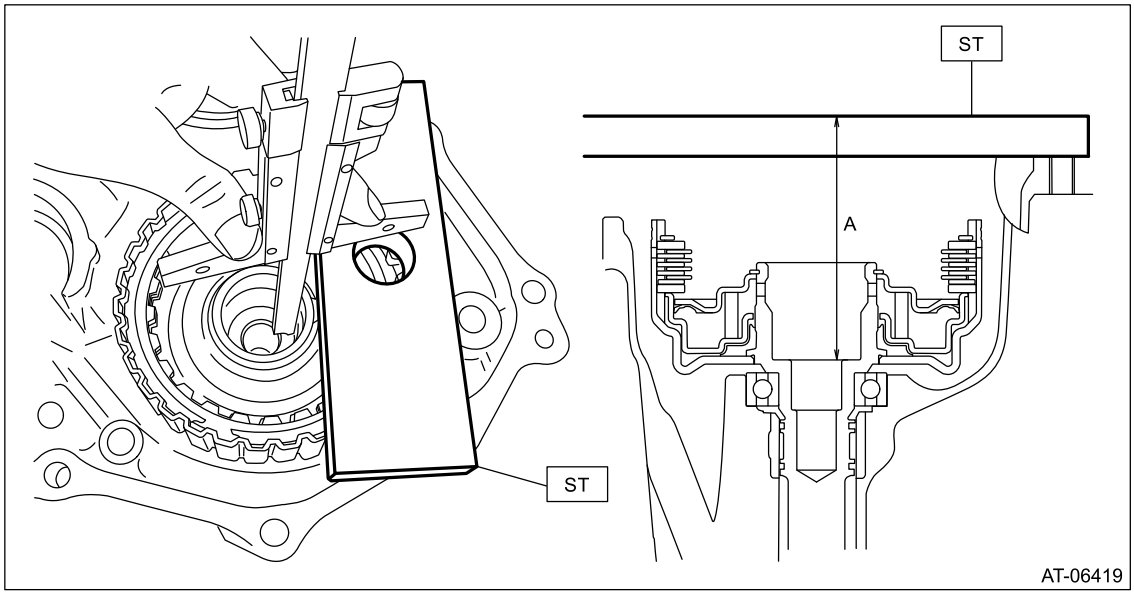
Make sure to install in the right direction.



3. Using the ST, measure the height "A" from the ST end face to the thrust bearing catch surface of the transfer clutch assembly.

Preparation tool:

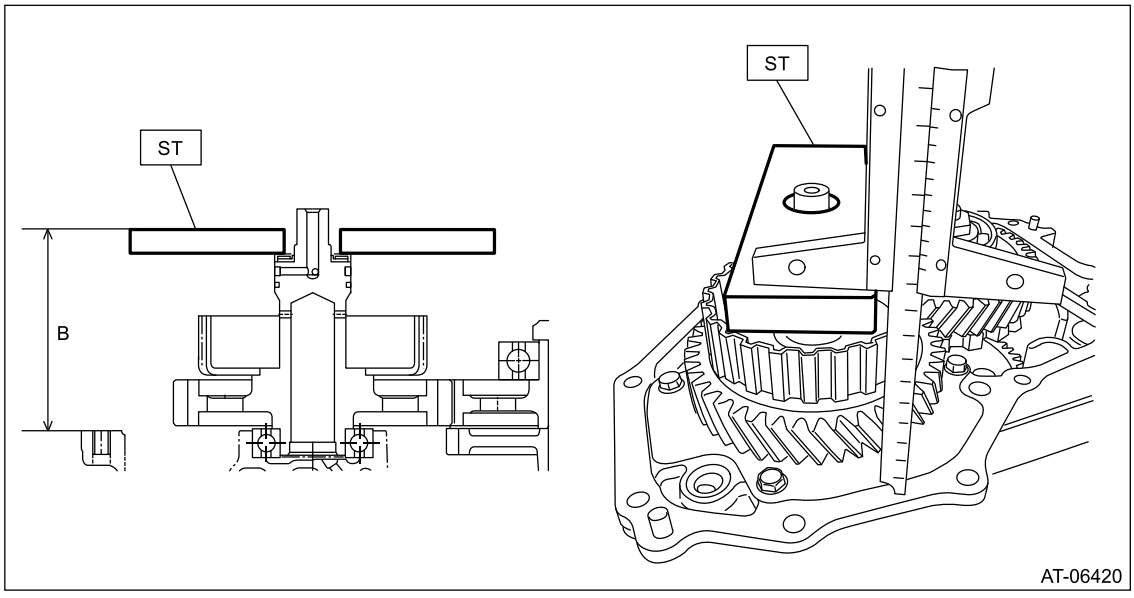
ST: GAUGE (499575500)



4. Using the ST, measure the height "B" from the transmission case mating surface to the end of ST.

Preparation tool:

ST: GAUGE (499575500)



5. Obtain the thickness of transfer driven gear shim using the following formula to select one to three transfer driven gear shims.

T mm = A − B − (0.05 — 0.25)

[T in = A − B − (0.002 — 0.01)]

T: Transfer driven gear shim thickness

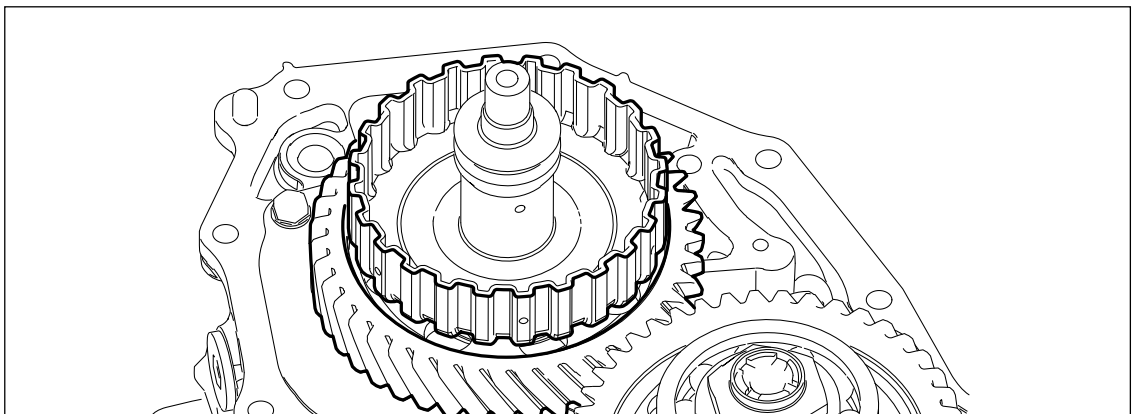
A: Height from the ST end face to the transfer clutch assembly thrust bearing catch surface
B: Height from the mating surface of the transmission case to the end of the ST
0.05 — 0.25 mm (0.002 — 0.01 in): Clearance

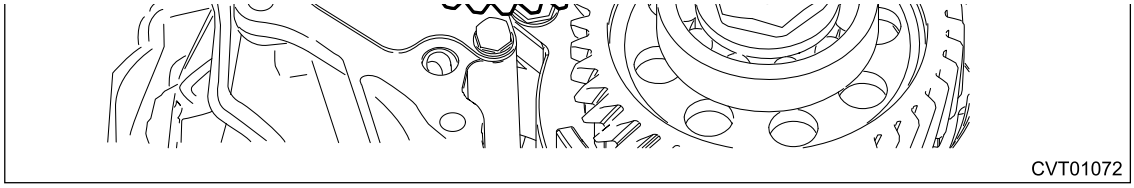
Transfer driven gear shim	
Part No.	**Thickness mm (in)**
33280AA030	0.3 (0.012)
33280AA040	0.4 (0.016)
33280AA050	0.5 (0.020)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

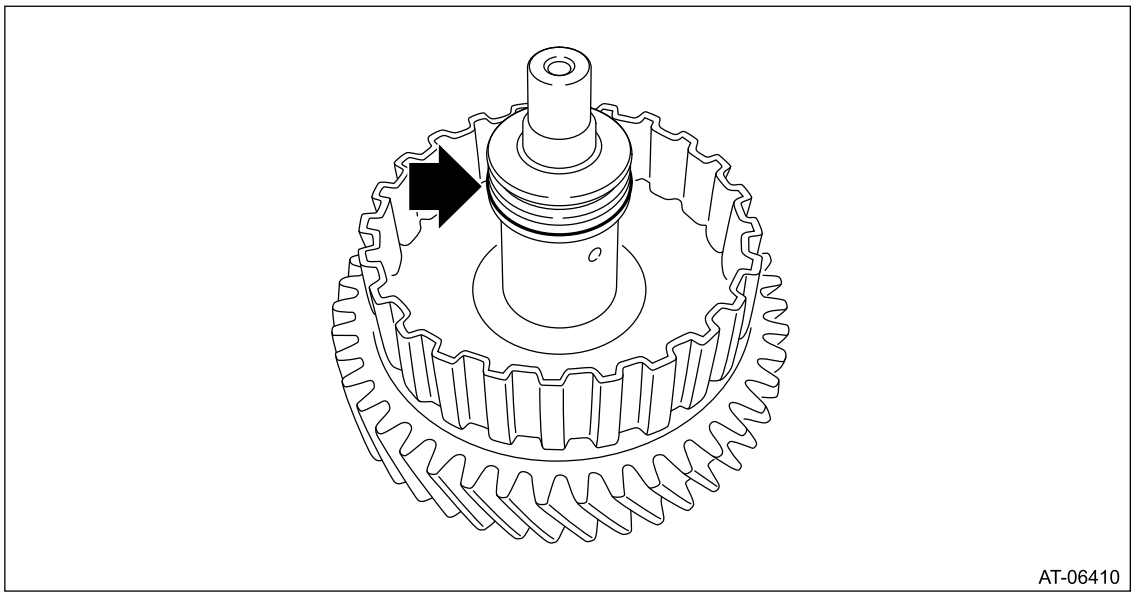
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
3. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
4. Remove the transfer driven gear assembly.





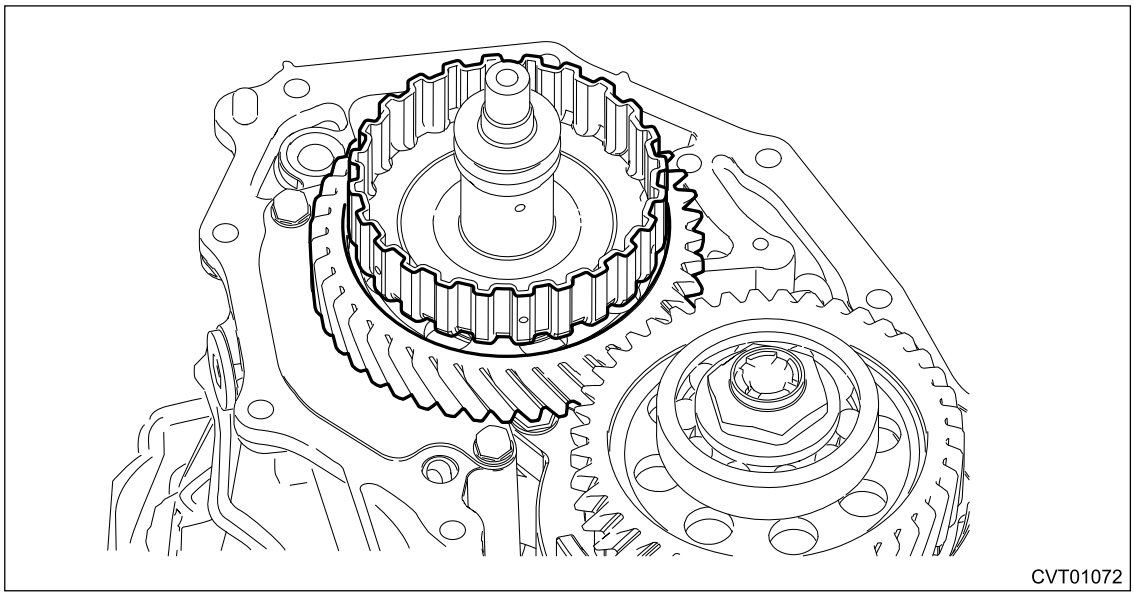
5. Remove the seal ring from the transfer driven gear assembly.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

INSTALLATION

1. Install the transfer driven gear assembly.



2. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
3. Select the transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.
4. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION

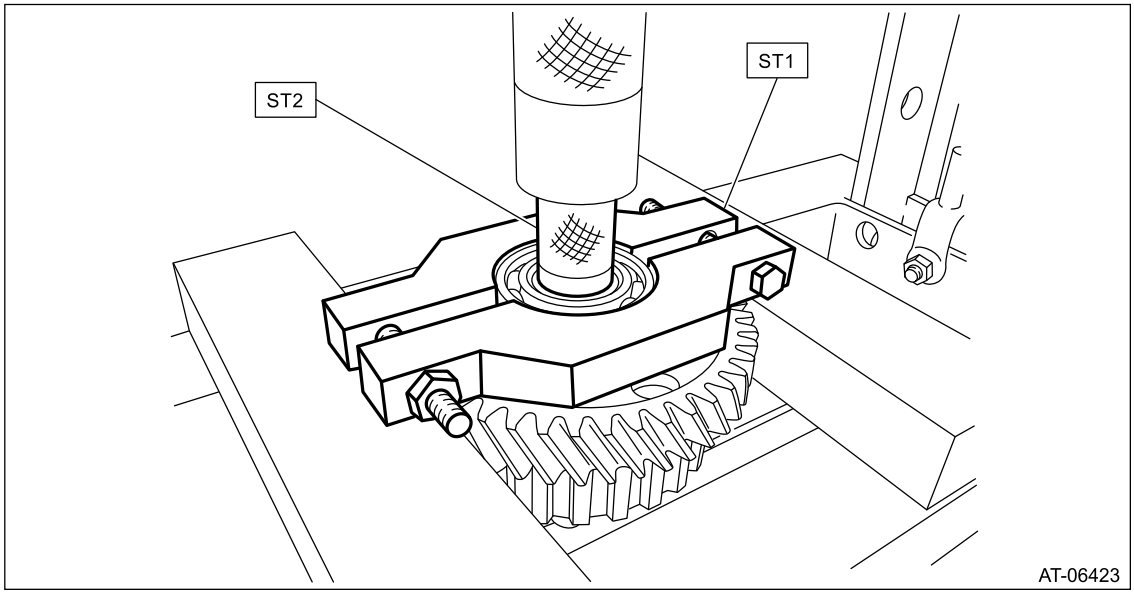
TRANSMISSION(TR580)>Extension Case>INSTALLATION.

5. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

DISASSEMBLY

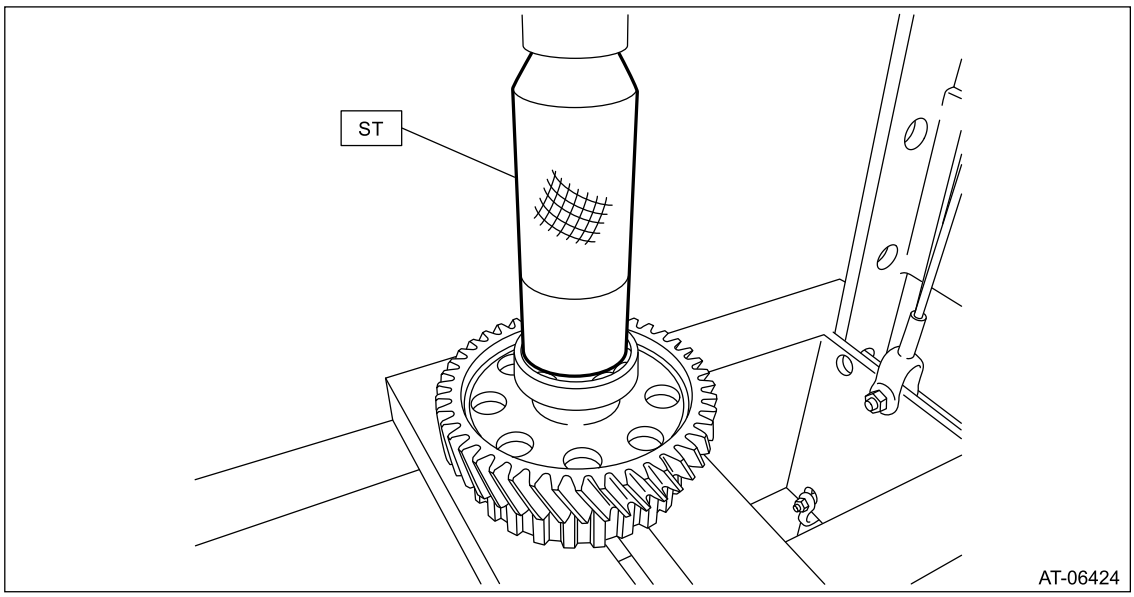
1. Remove the ball bearing using the ST1 and ST2.
   Preparation tool:
   ST1: REMOVER (498077400)
   ST2: REMOVER (899864100)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

ASSEMBLY

1. Using the ST, install the ball bearing.
   Preparation tool:
   ST: INSTALLER (899580100)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

INSPECTION

- Check the ball bearing for smooth rotation.
- Check the ball bearing for excessive looseness.
- Check the transfer driven gear for breakage or damage.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transfer Driven Gear

ADJUSTMENT

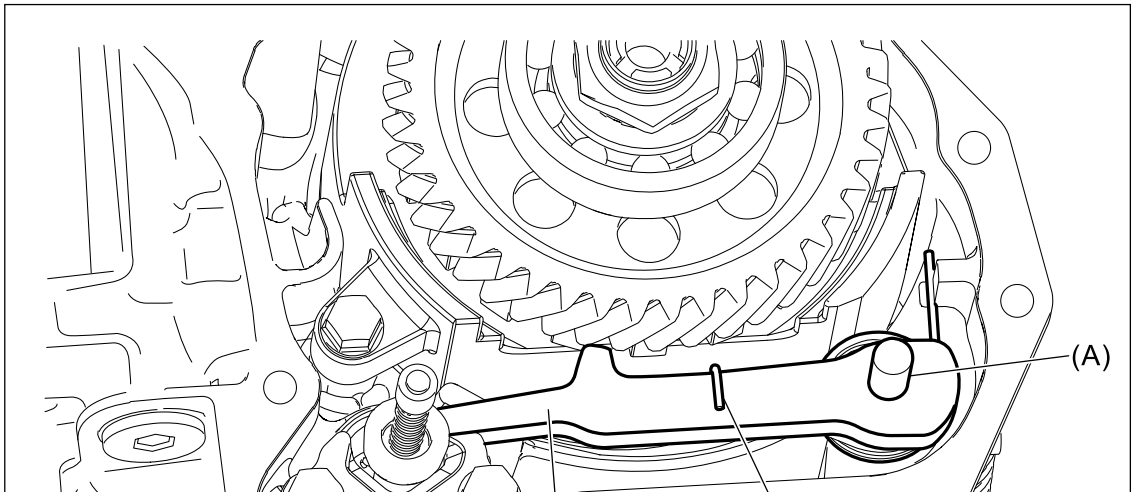
Note:

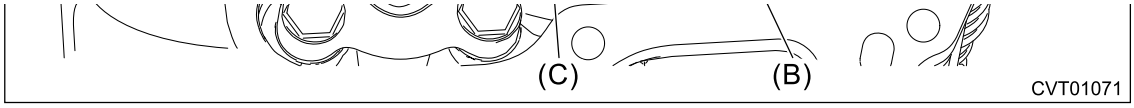
When the transfer driven gear or bearing is replaced, select the transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Parking Pawl

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Shift the range select lever to “N” range.
3. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
4. Remove the parking pawl shaft, return spring and parking pawl.



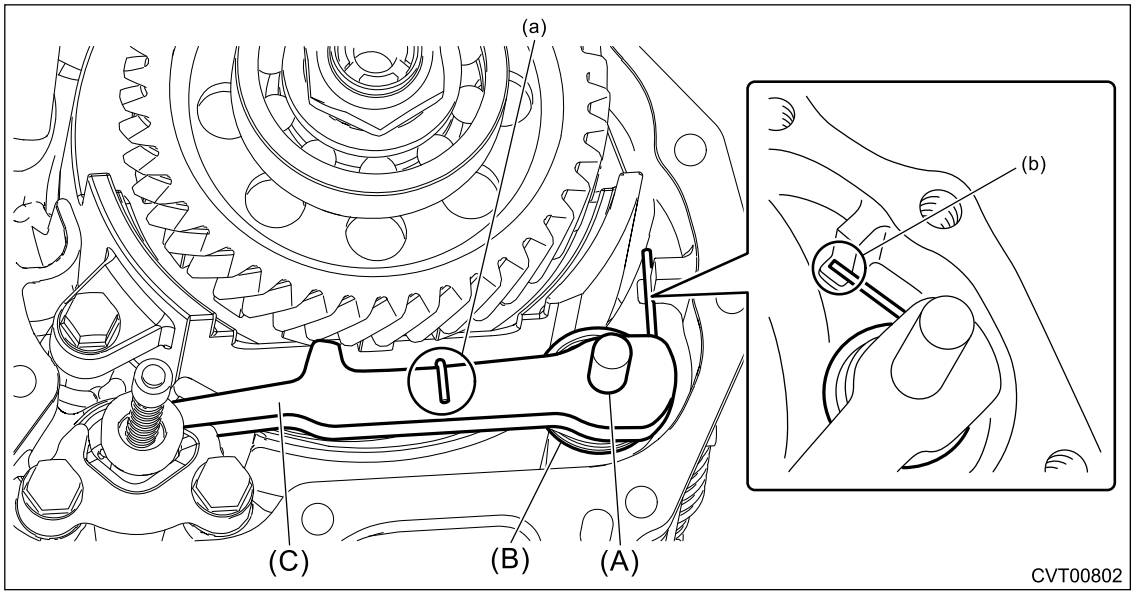


(A) Parking pawl shaft
(B) Return spring
(C) Parking pawl

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Parking Pawl

INSTALLATION

1. Set the range select lever to the "N" range.
2. Install the parking pawl shaft, return spring and parking pawl.
   Note:
   Make sure that the end of return spring sticks out of parking pawl as shown in (a).
   Make sure that the other end contacts the rib of transmission case as shown in (b).



(A) Parking pawl shaft
(B) Return spring
(C) Parking pawl

3. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
4. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE

4. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Parking Pawl

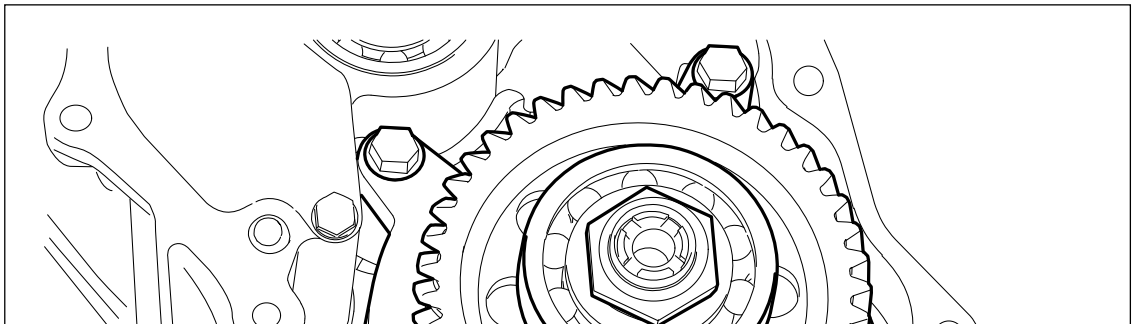
INSPECTION

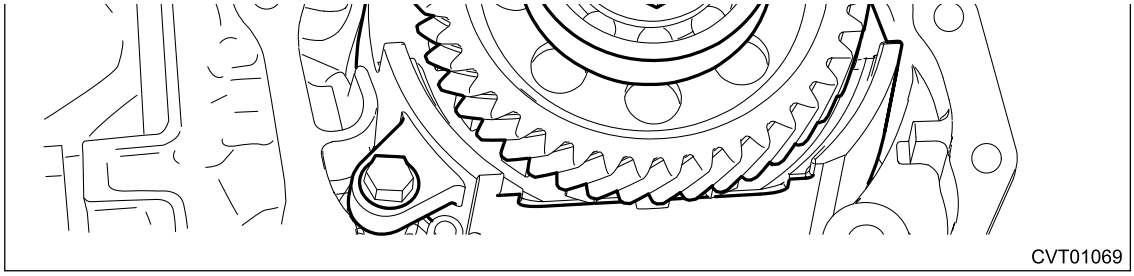
- Check the parking pawl for breakage or damage.
- Check for worn, broken and/or damaged return spring.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
3. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
4. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
5. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
6. Remove the reduction driven gear assembly and spacer oil.

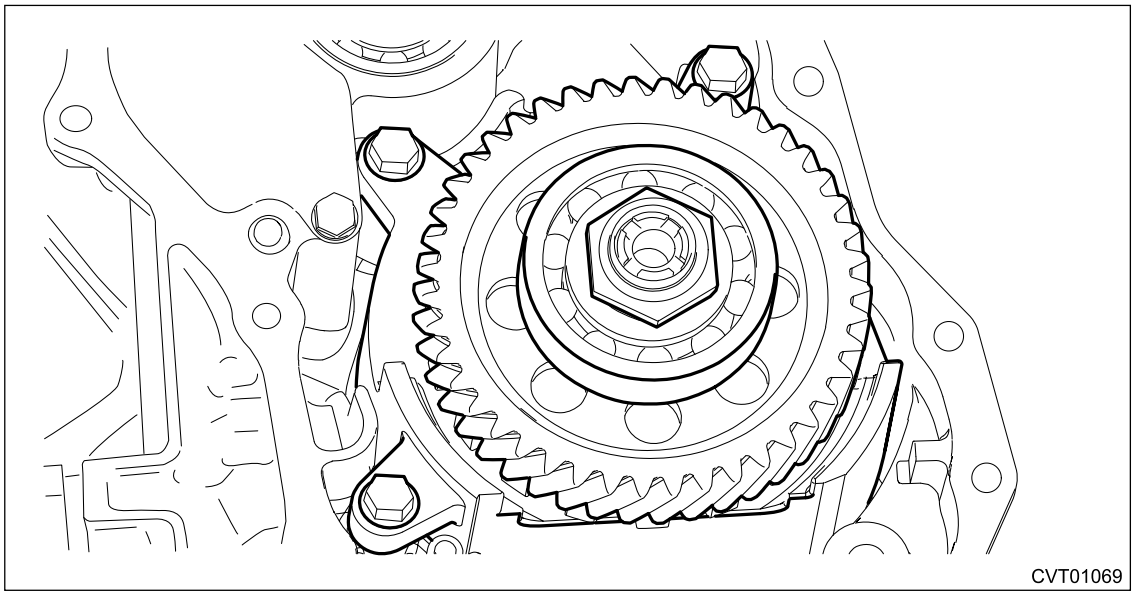




CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

INSTALLATION

1. Install the reduction driven gear assembly and spacer oil.
   Tightening torque:
   17 N·m (1.7 kgf-m, 12.5 ft-lb)



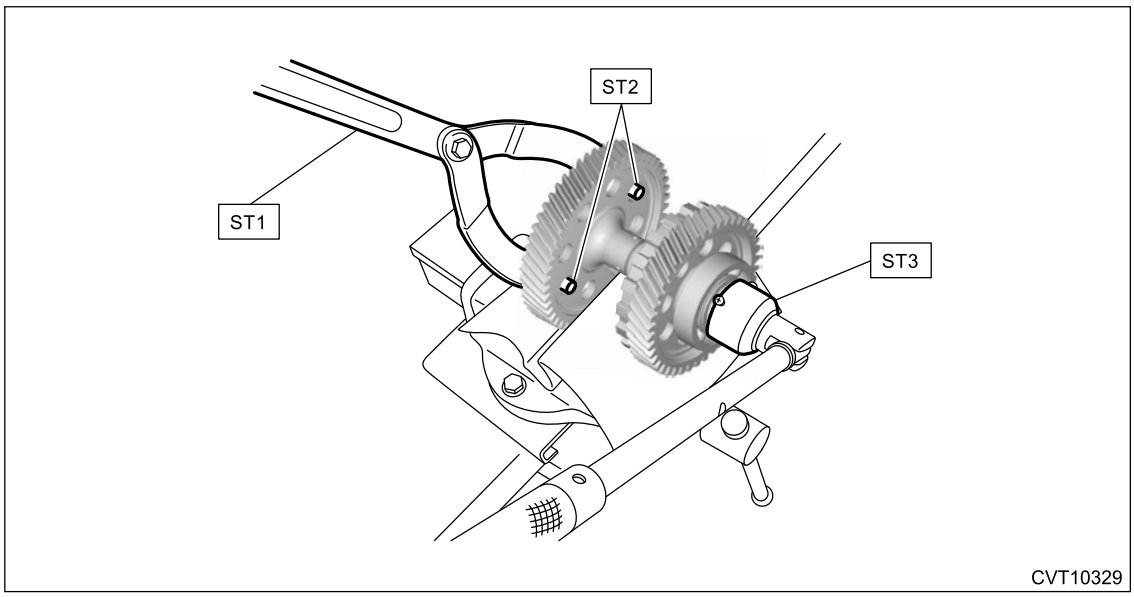
2. Select the transfer drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.
3. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
4. Attach the selected transfer drive gear shim to extension case with vaseline.
5. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.

6. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
7. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
8. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

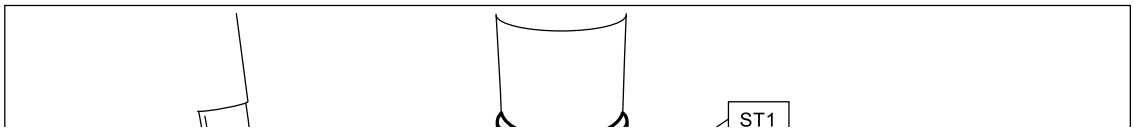
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

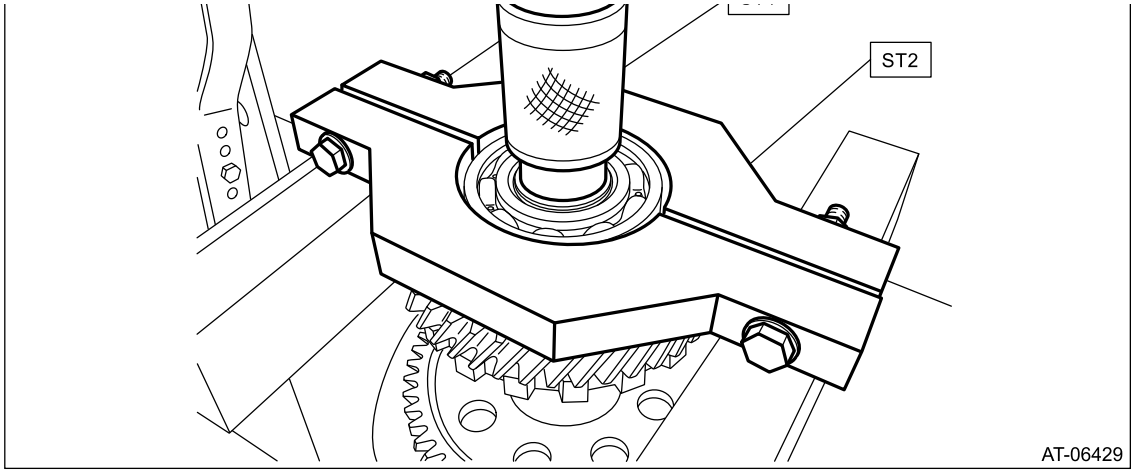
DISASSEMBLY

1. Flatten the tab of the lock nut.
2. Using the ST1, ST2 and ST3, counter the rotation of the reduction driven gear assembly, and remove the lock nut.
   Preparation tool:
   ST1: PULLEY WRENCH (18355AA000)
   ST2: PULLEY WRENCH PIN SET (18334AA000)
   ST3: SOCKET WRENCH (35) (499987003)

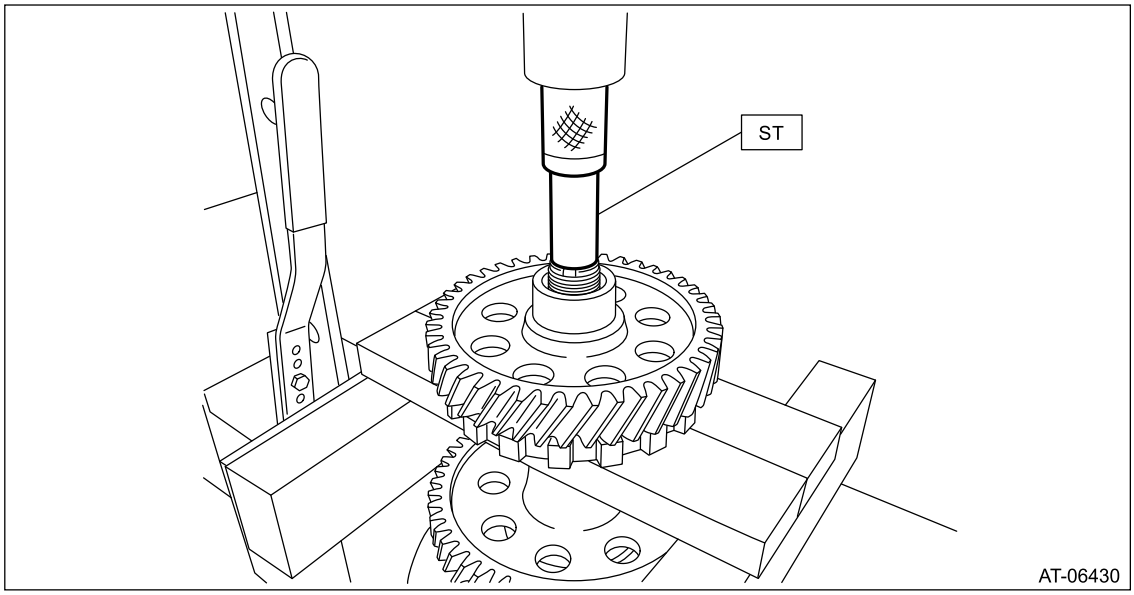


3. Remove the ball bearing using the ST1 and ST2.
   Preparation tool:
   ST1: INSTALLER (499757002)
   ST2: REMOVER (498077300)





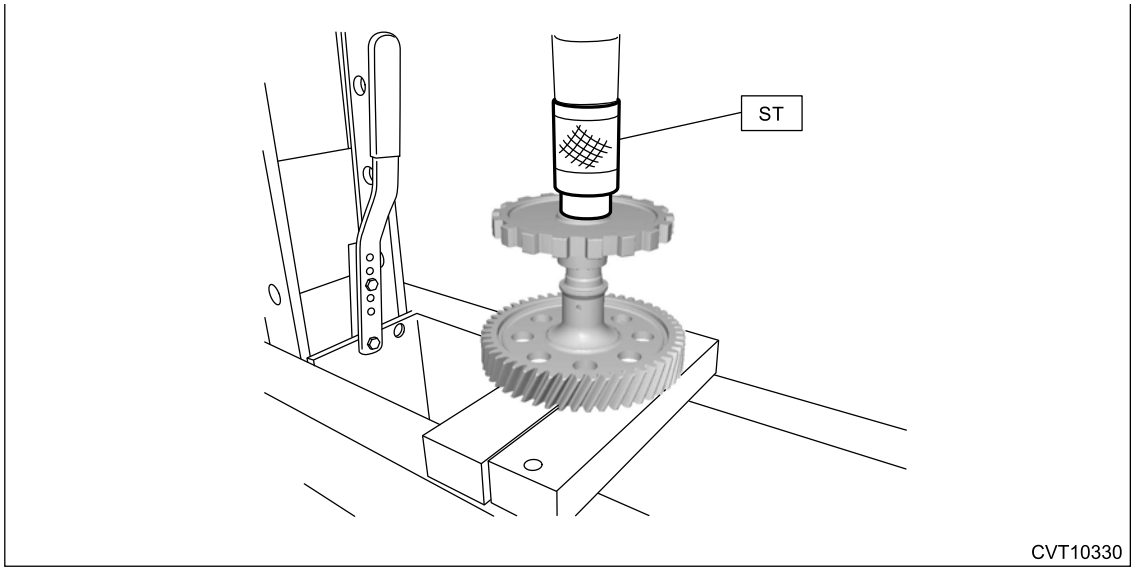
4. Using the ST, remove the parking gear and transfer drive gear.
Preparation tool:
ST: REMOVER (899864100)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

ASSEMBLY

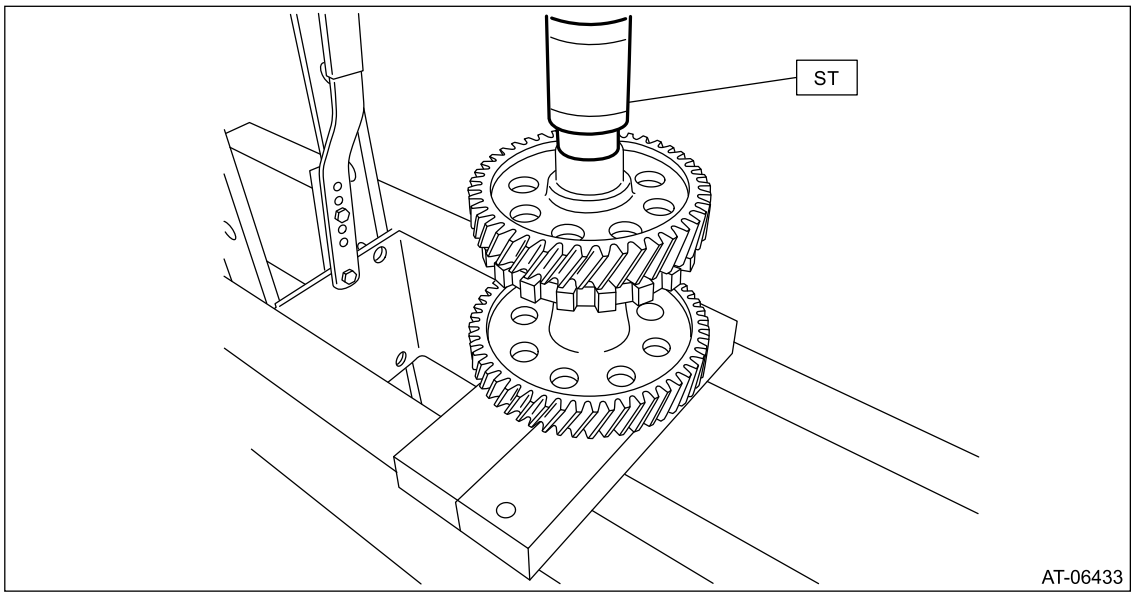
1. Using the ST, install the parking gear.
Preparation tool:
ST: INSTALLER (499757002)



2. Using the ST, install the transfer drive gear.

Preparation tool:

ST: INSTALLER (499757002)



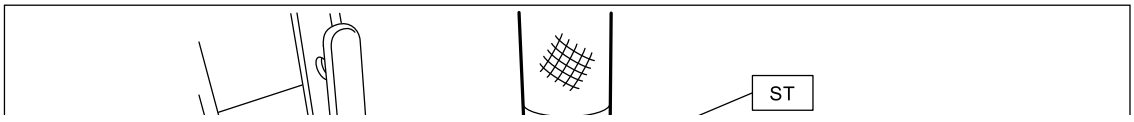
3. Using the ST, install the ball bearing.

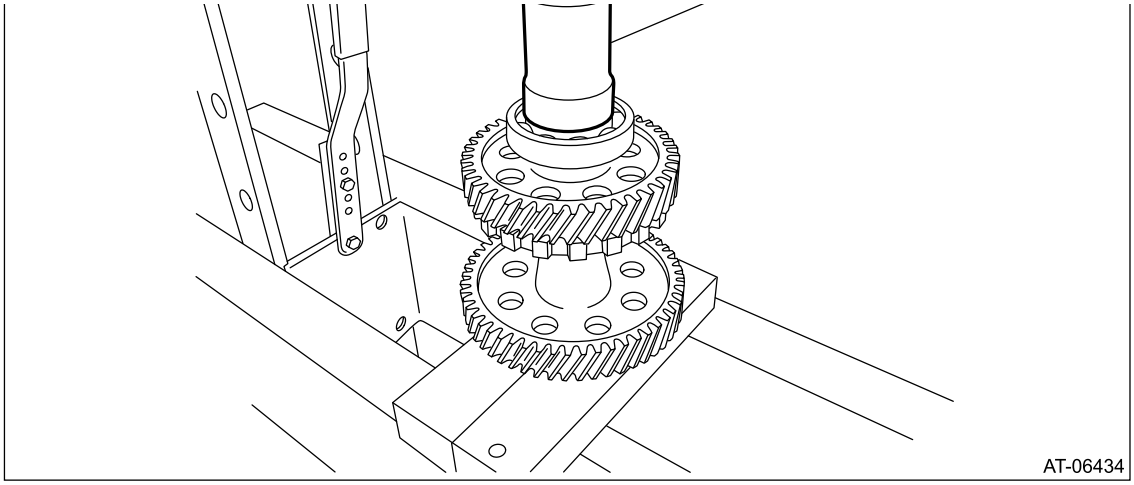
Note:

Use a new ball bearing.

Preparation tool:

ST: BUSHING 1-2 INSTALLER (499277100)





4. Using the ST1, ST2 and ST3, counter the rotation of the reduction driven gear assembly, and install the lock nut.

Note:

Use a new lock nut.

Preparation tool:

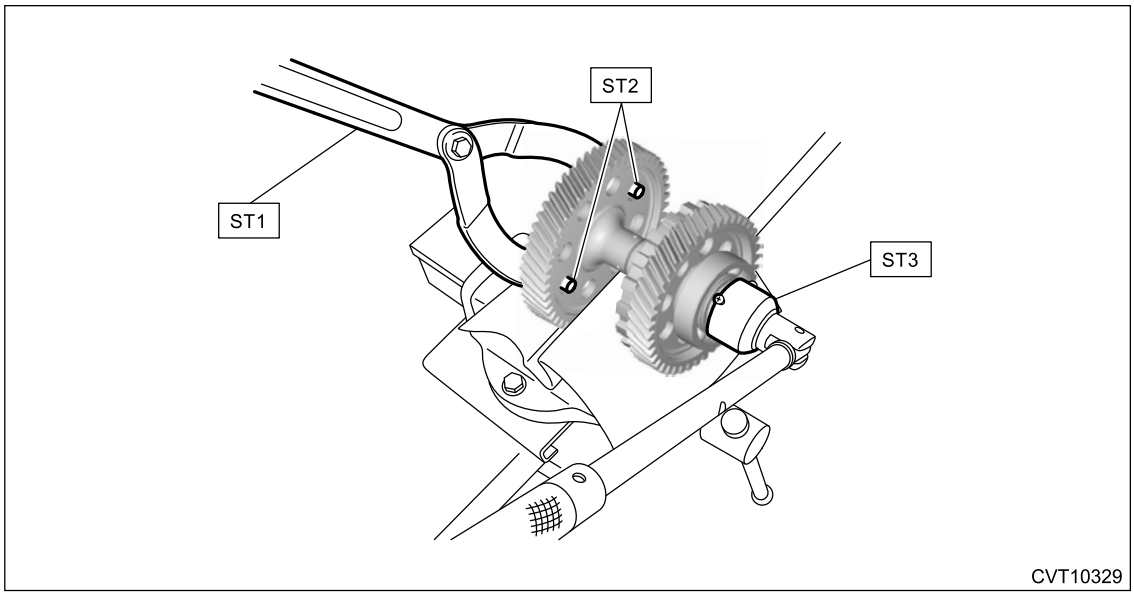
ST1: PULLEY WRENCH (18355AA000)

ST2: PULLEY WRENCH PIN SET (18334AA000)

ST3: SOCKET WRENCH (35) (499987003)

Tightening torque:

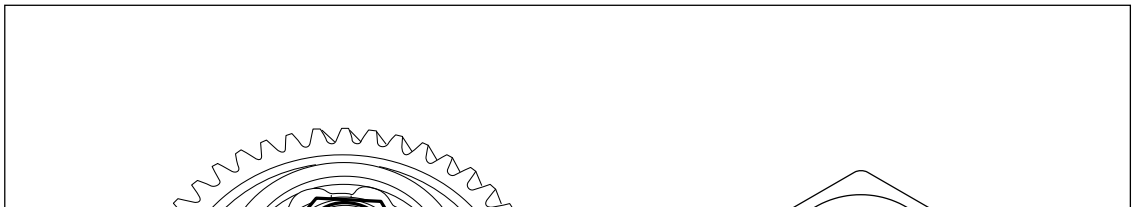
95 N·m (9.7 kgf-m, 70.1 ft-lb)

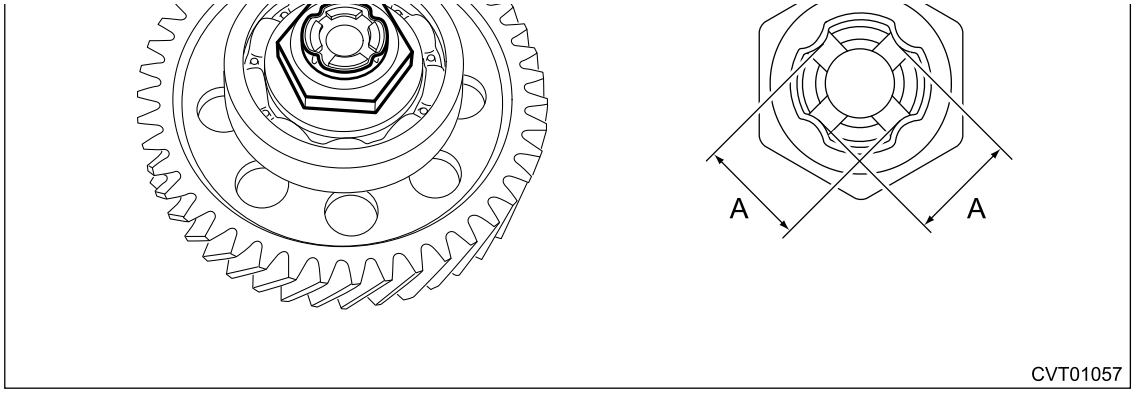


5. Crimp the lock nut at four locations so that the dimension of A becomes 18.9 mm (0.74 in) or less.

Caution:

Do not allow the lock nut to be cracked during crimping operation.





CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

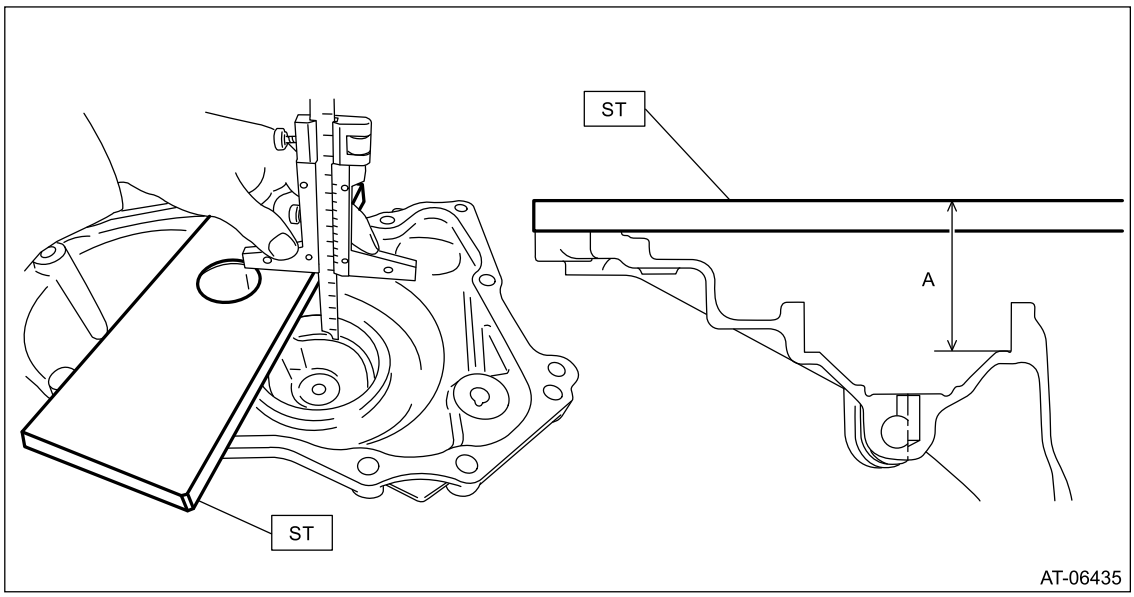
INSPECTION

- Check the ball bearing for smooth rotation.
- Check the ball bearing for excessive looseness.
- Make sure each gear is not broken or damaged.

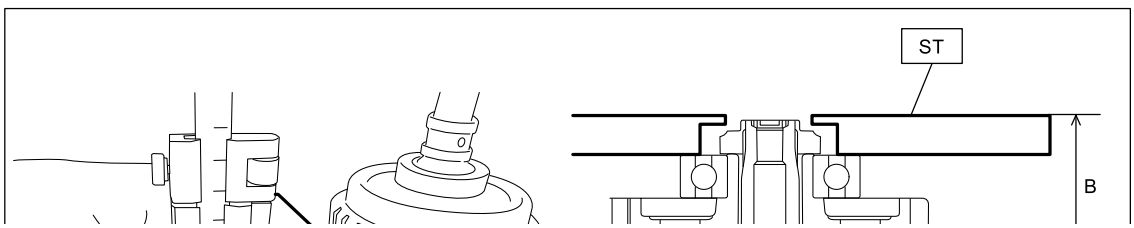
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Driven Gear

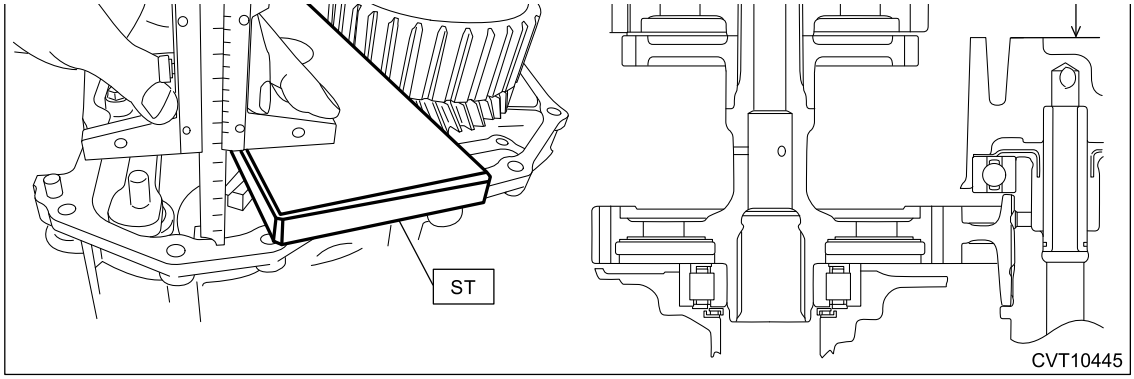
ADJUSTMENT

1. Measure the height "A" from the ST upper face to the ball bearing catch surface.
   Preparation tool:
   ST: GAUGE (499575600)



2. Measure the height "B" from the ST to the mating surface of the transmission case.
   Preparation tool:
   ST: GAUGE (499575600)





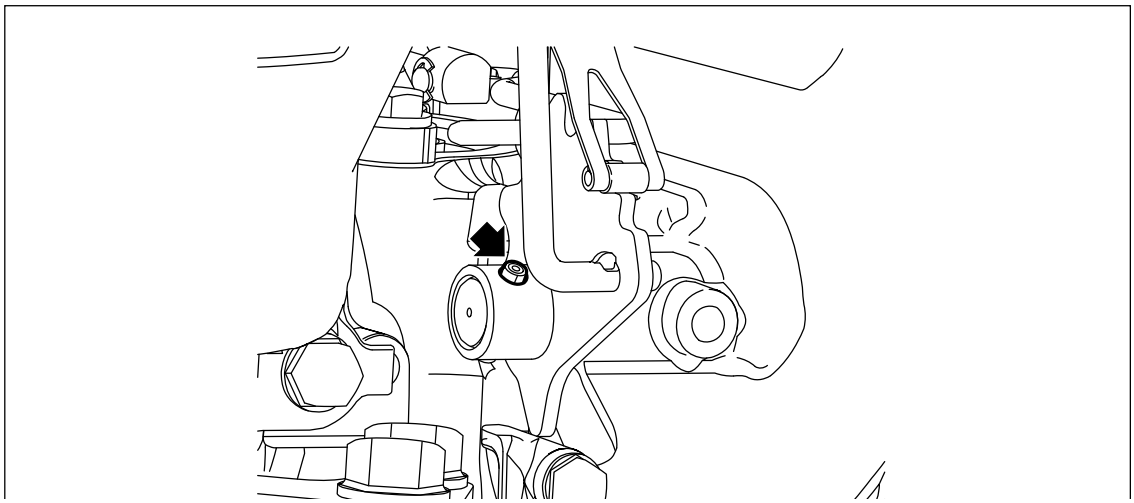
3. Obtain the thickness of transfer drive gear shim using the following formula to select one to three transfer drive gear shims.
   T mm = A − B − (0.05 — 0.25)
   [T in = A − B − (0.002 — 0.01)]
   T: Shim thickness
   A: Height from the ST upper face to the ball bearing catch surface
   B: Height from ST to transmission case mating surface
   0.05 — 0.25 mm (0.002 — 0.01 in): Clearance

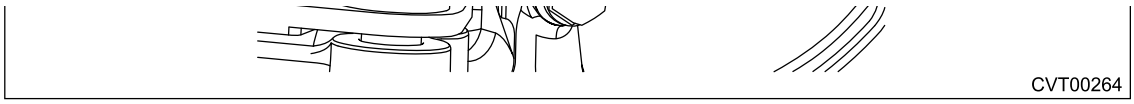
Transfer drive gear shim	
Part No.	**Thickness mm (in)**
33279AA090	0.3 (0.012)
33279AA100	0.4 (0.016)
33279AA110	0.5 (0.020)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Control Device

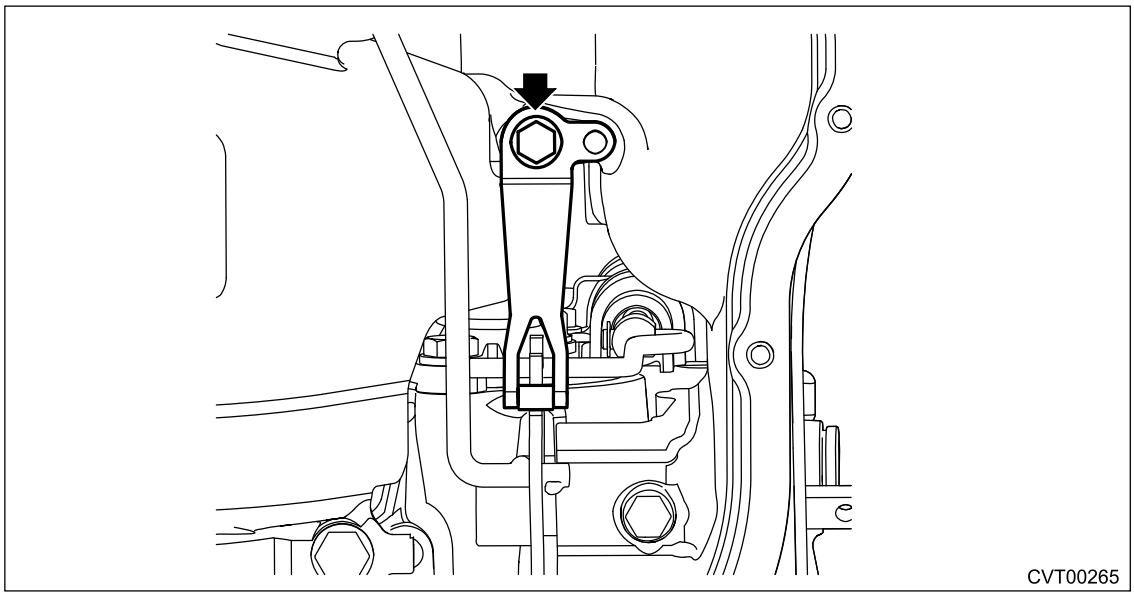
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
3. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
4. Shift the manual plate to “N” range, and remove the spring pin.
   Note:
   Prevent the spring pin from dropping in the transmission using paper towel etc.





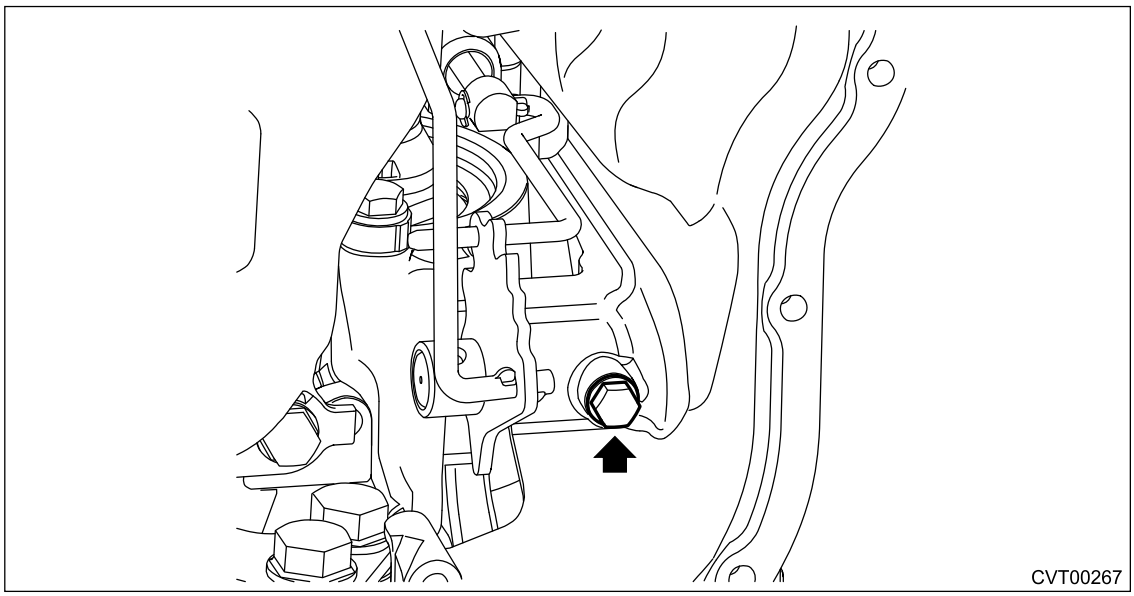
5. Remove the detent spring.



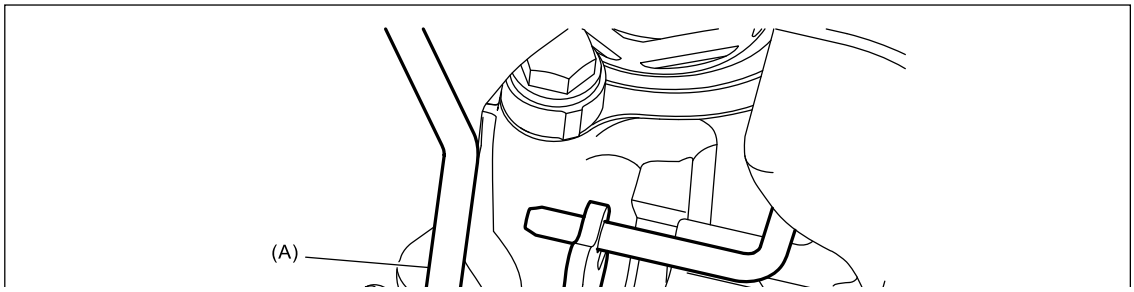
6. Remove the bolt, and remove the shifter arm shaft.

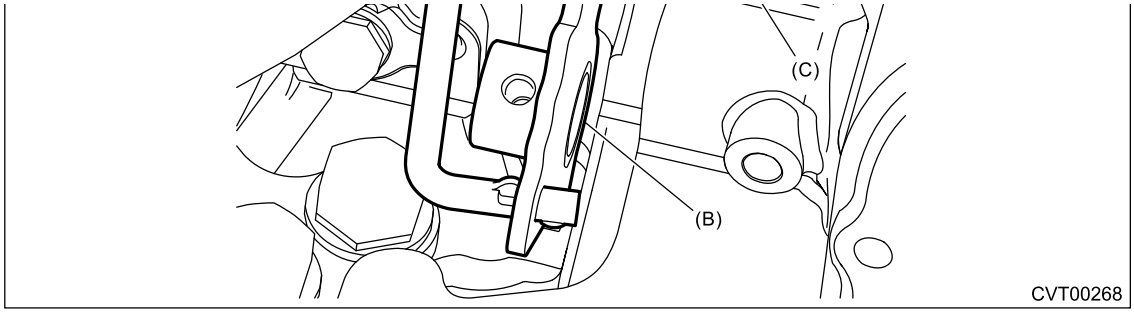
Note:

Do not damage the lip of oil seal press-fitted in the case.



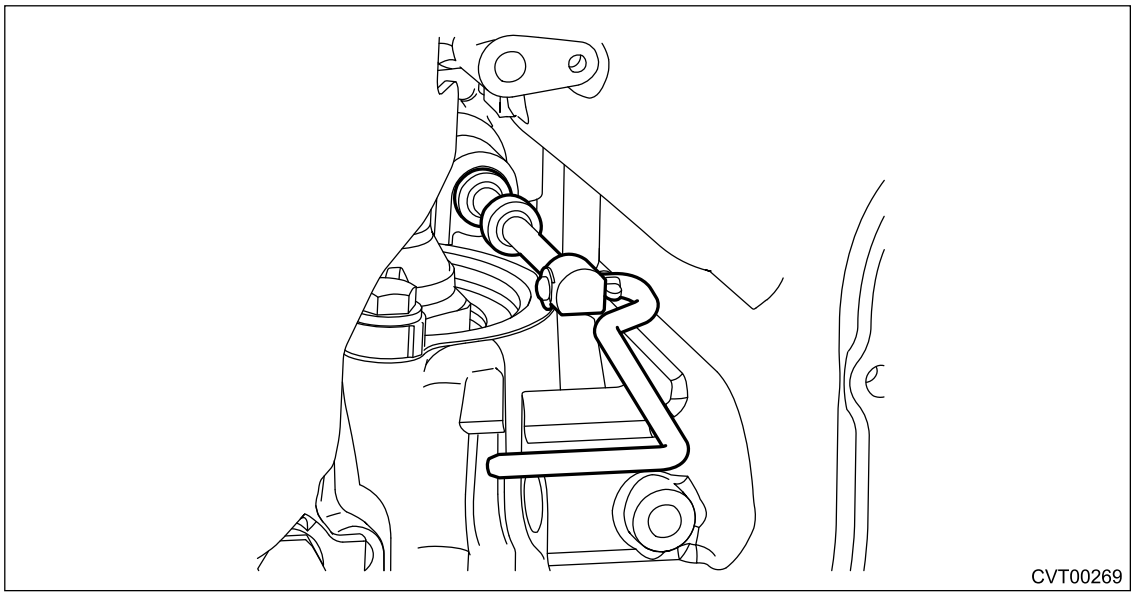
7. Remove the manual plate from the shifter arm shaft, and remove the shift connecting rod of the manual valve.





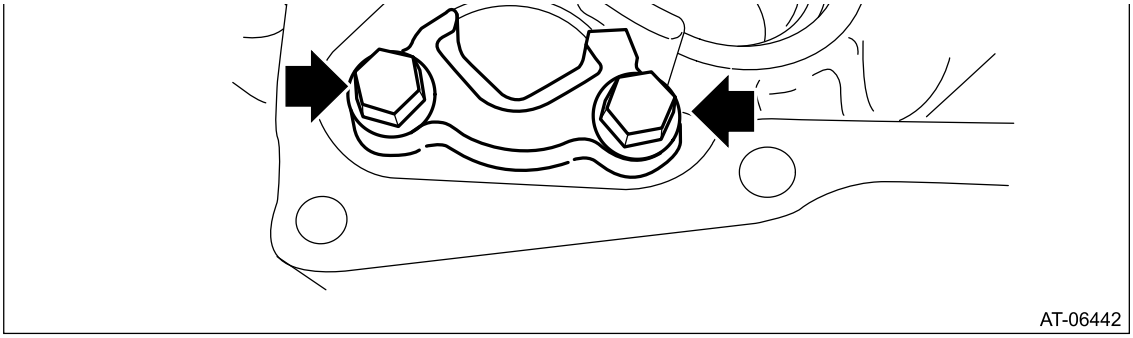
(A) Parking rod
(B) Manual plate
(C) Shift connecting rod

8. Remove the manual plate and parking rod.
9. Remove the manual valve.



10. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
11. Remove the parking support.

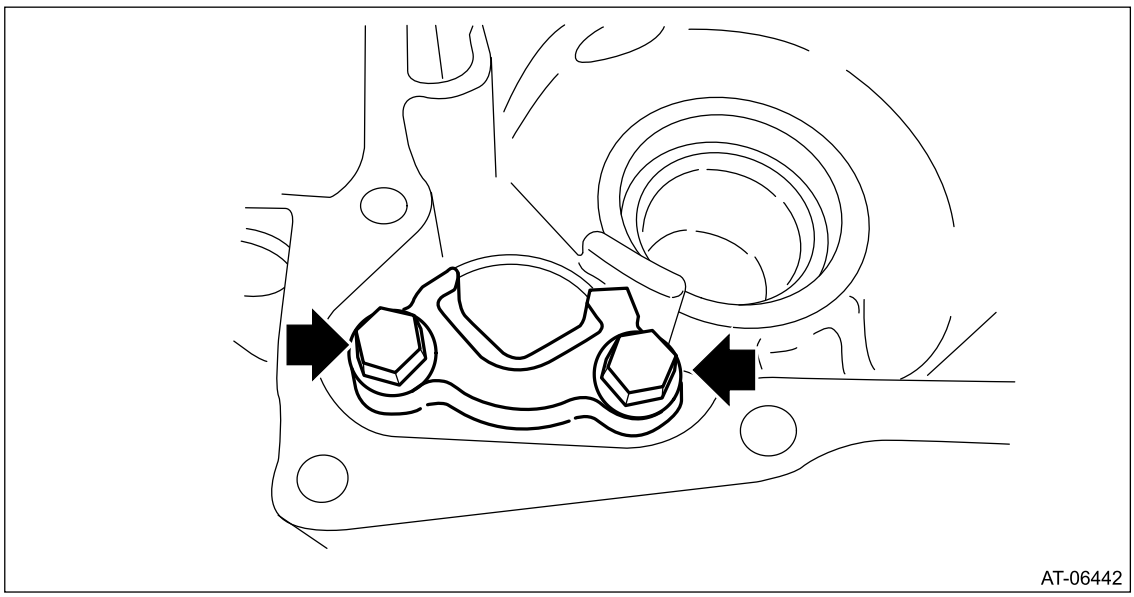




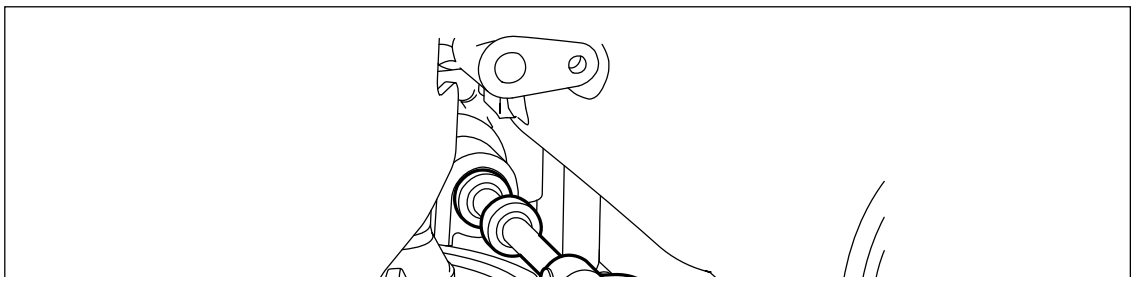
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Control Device

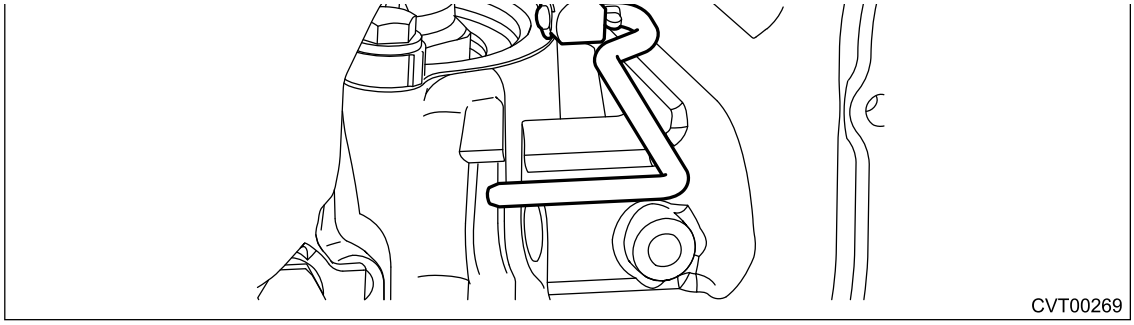
INSTALLATION

1. Install the parking support.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)

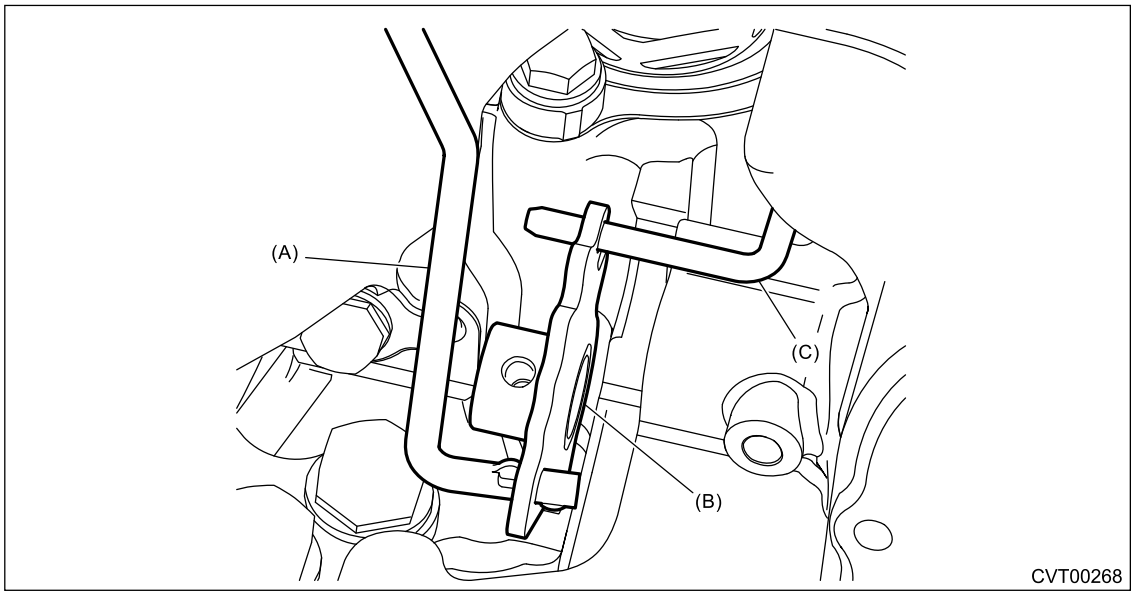


2. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
3. Install the manual valve.





4. Install the parking rod to the manual plate.
5. Insert the parking rod into the transmission case, and install the shift connecting rod of the manual valve to the manual plate.



(A) Parking rod
(B) Manual plate
(C) Shift connecting rod

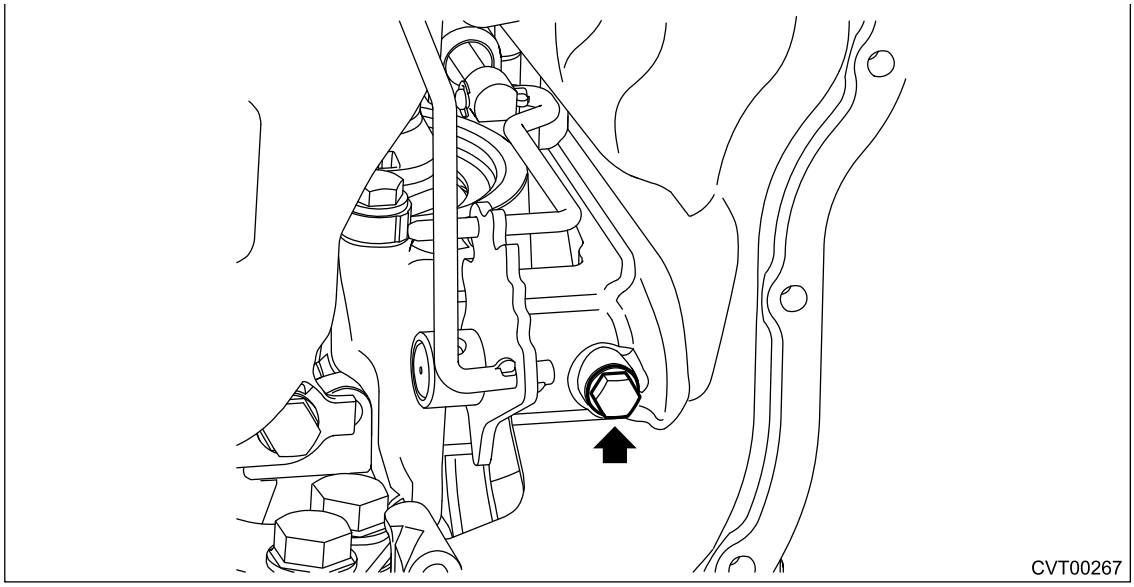
6. Insert the shifter arm shaft to the transmission assembly, install the manual plate to the shifter arm shaft, and secure the shifter arm shaft with a bolt.

Note:

Do not damage the lip of oil seal press-fitted in the case.

Tightening torque:

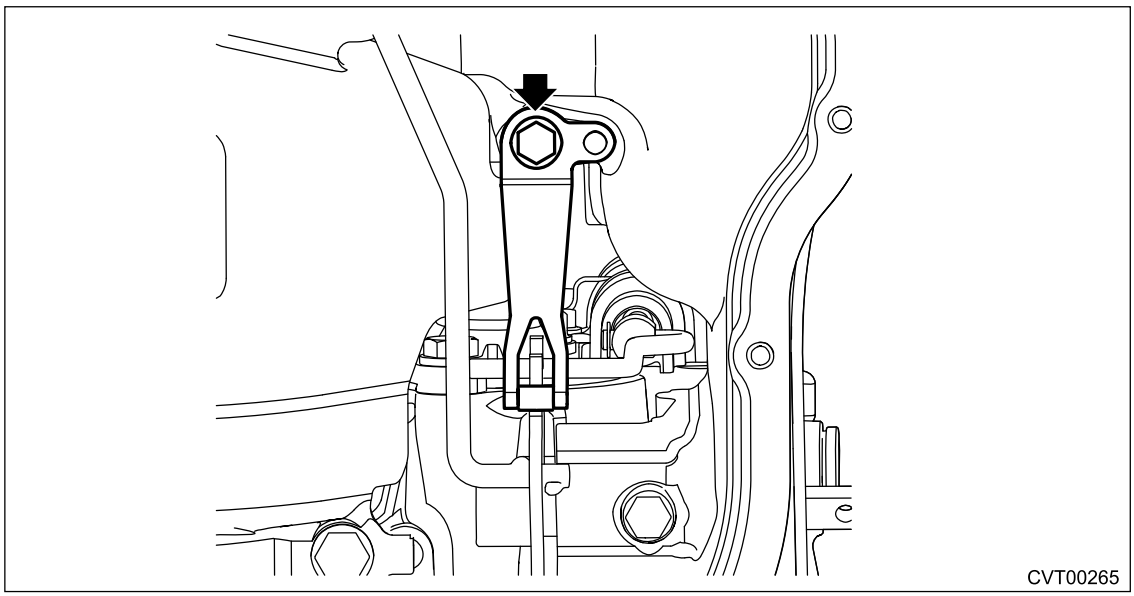
7 N·m (0.7 kgf-m, 5.2 ft-lb)



7. Install the detent spring.

Tightening torque:

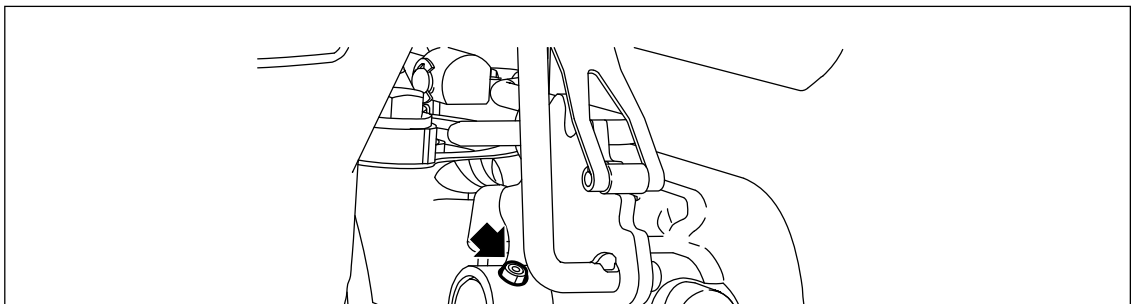
7 N·m (0.7 kgf-m, 5.2 ft-lb)

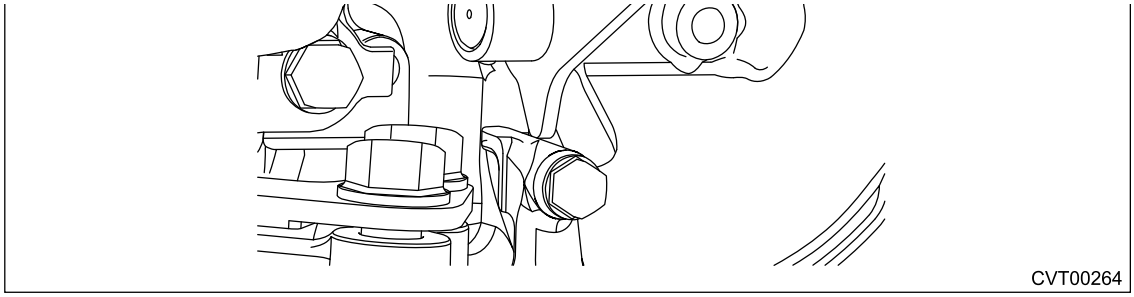


8. Install the spring pin.

Note:

Use new spring pin.





9. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
10. Adjust the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>ADJUSTMENT.
11. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
12. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Control Device

INSPECTION

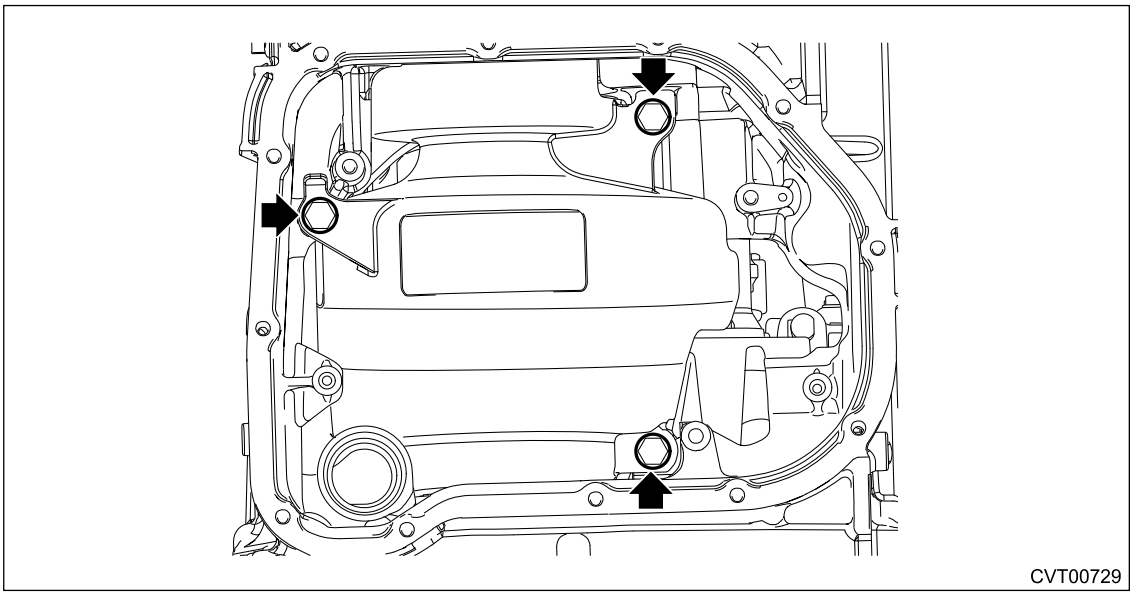
Make sure that the manual plate and detent spring are not worn or otherwise damaged.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Case

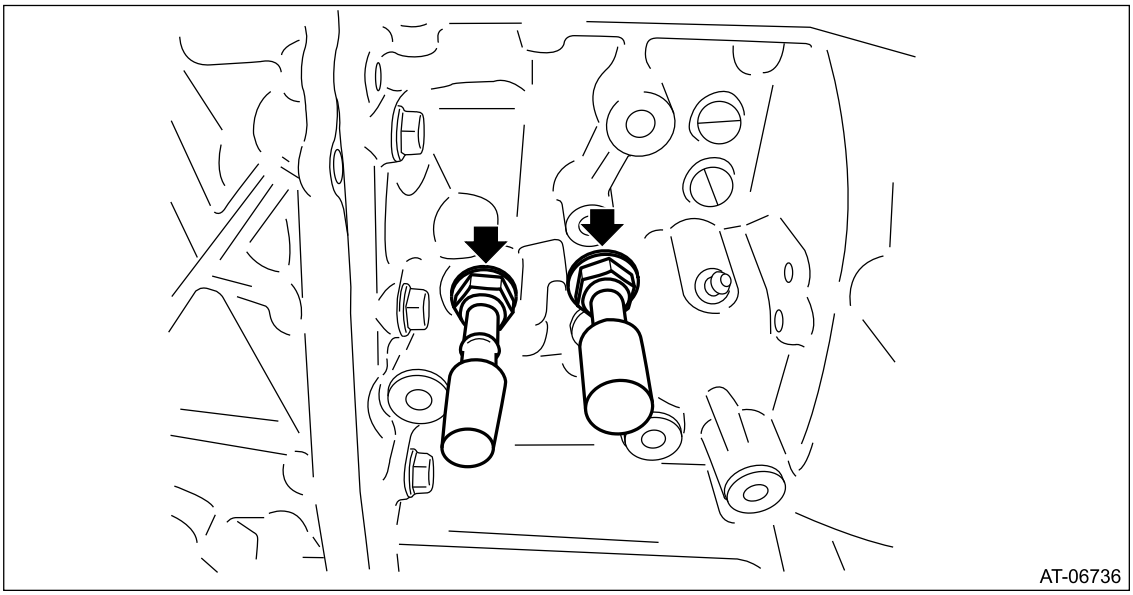
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.

13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the oil baffle securing bolt.



17. Remove the oil cooler pipe.

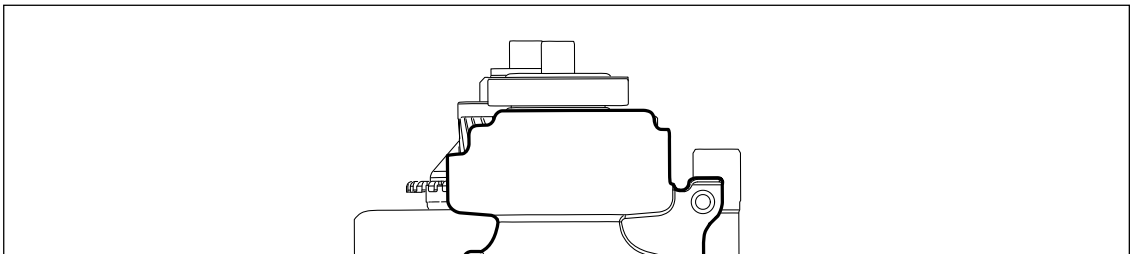


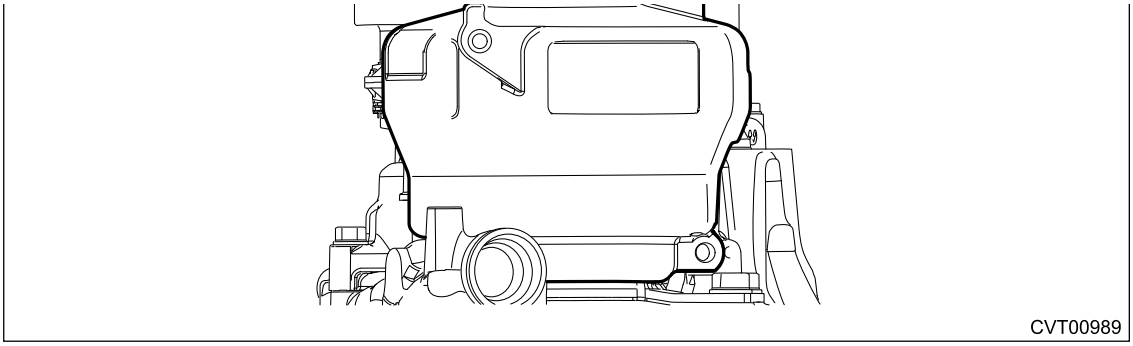
18. Remove the transmission case.

Note:

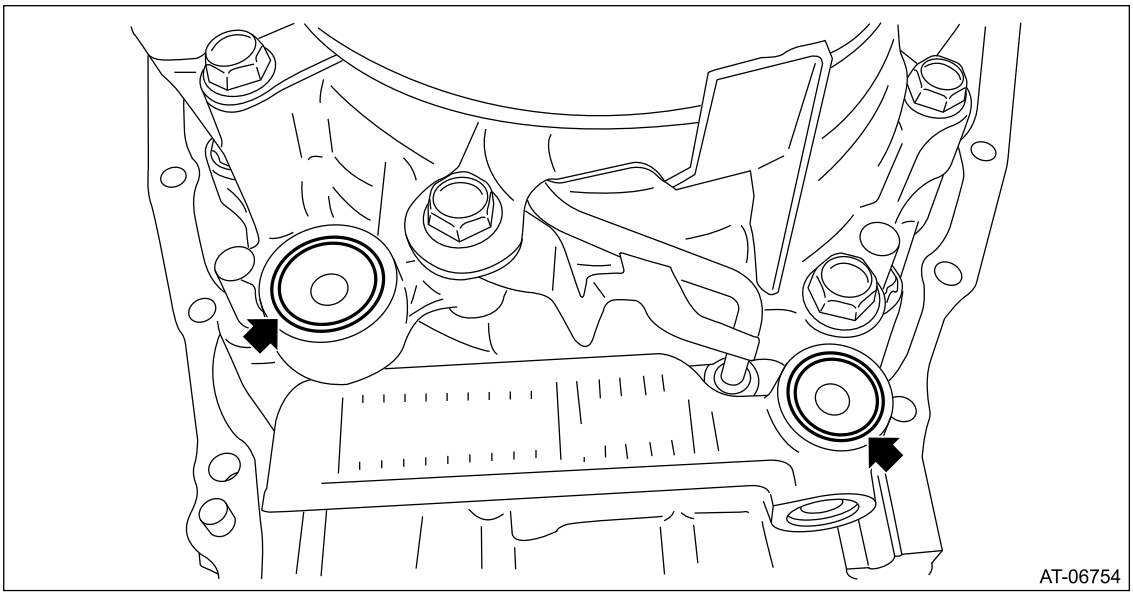
The total number of transmission case mounting bolts is 15.

19. Remove the oil baffle.

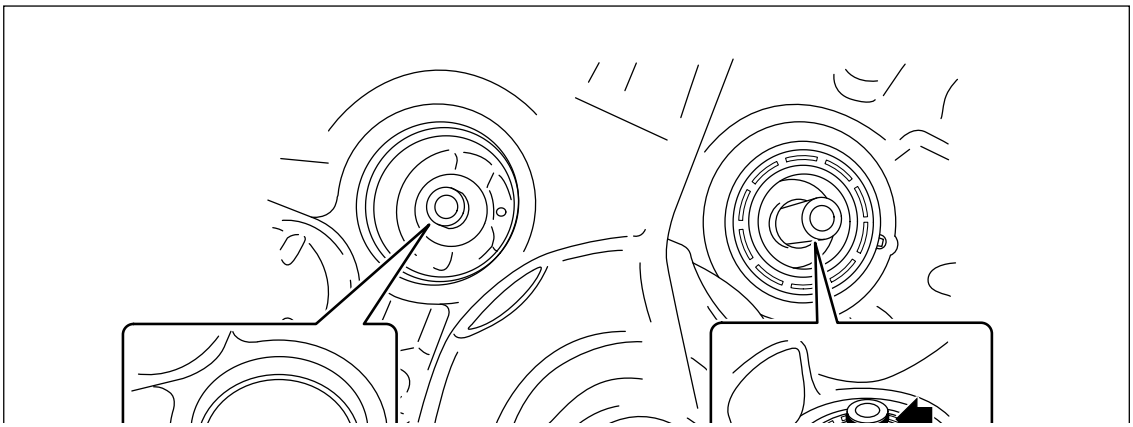


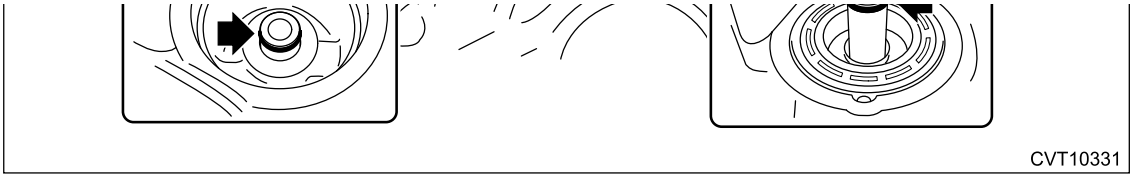


20. Remove the O-rings.



21. Remove the seal ring from the transmission case.

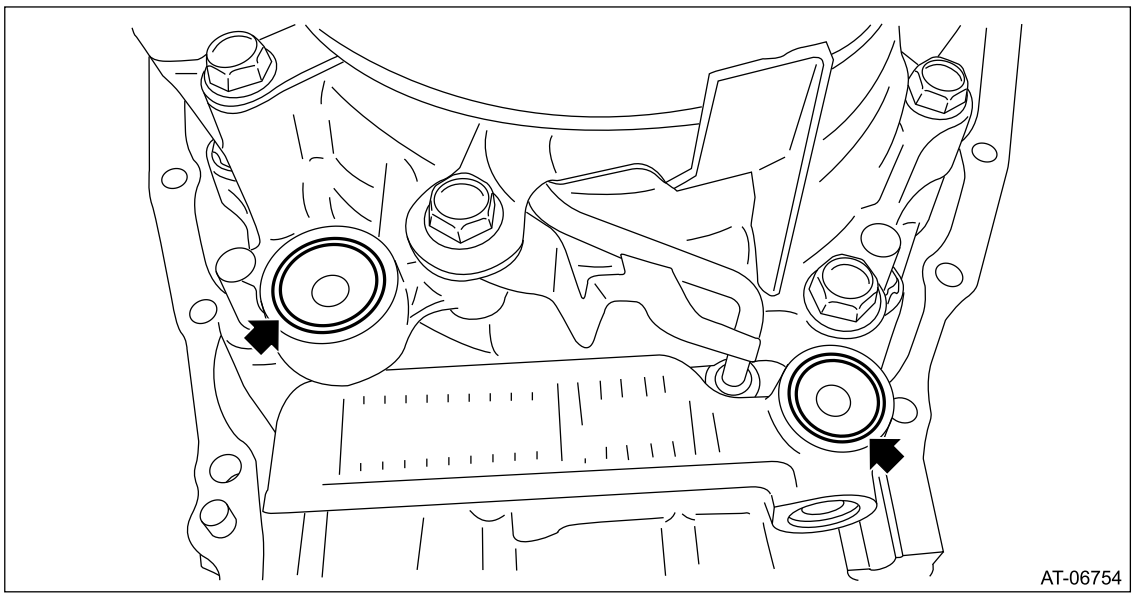




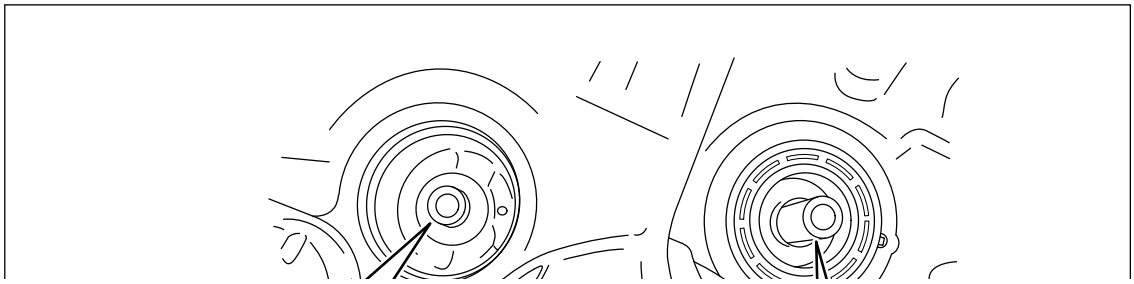
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Case

INSTALLATION

1. Clean the mating surface of transmission case and converter case.
2. Select the reduction gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.
3. Remove the transmission case, and install the selected reduction gear shim to the reduction drive gear.
4. Install the O-rings to the reverse clutch housing and drive pinion retainer.
   Note:
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

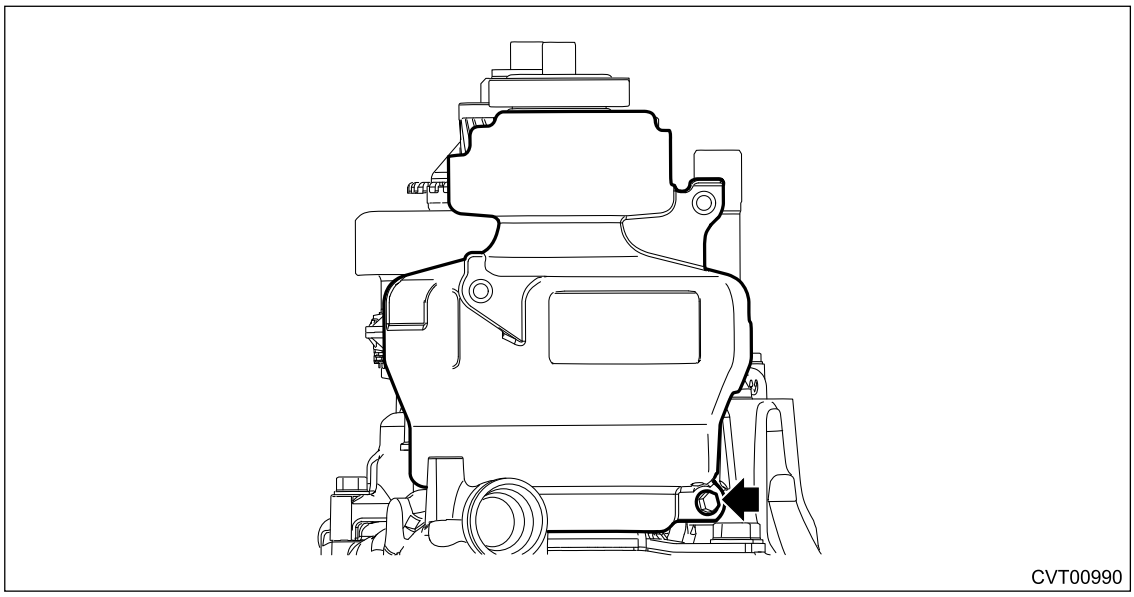


5. Install the seal ring to the transmission case.
   Note:
   - **Use new seal rings.**
   - **When installing the seal rings, do not expand the seal rings too much.**
   - **Apply CVTF to the seal rings.**




CVT10331

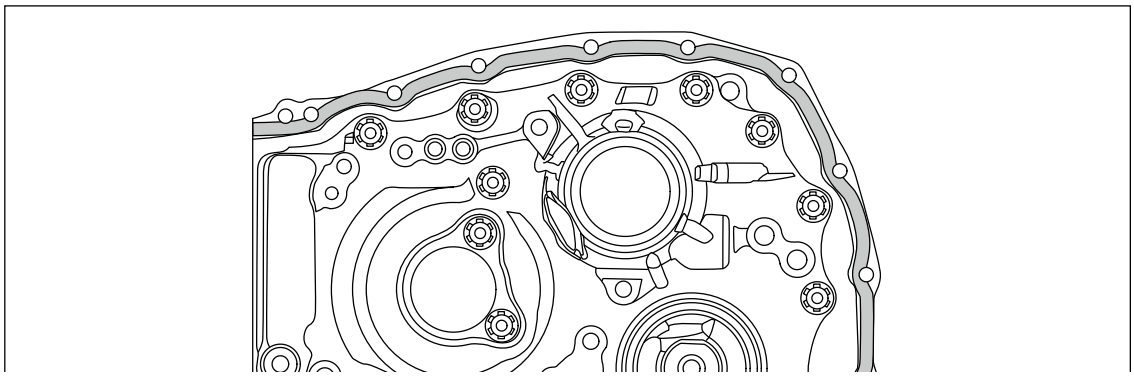
6. Cover the secondary pulley with the oil baffle, and temporarily install it with bolts.

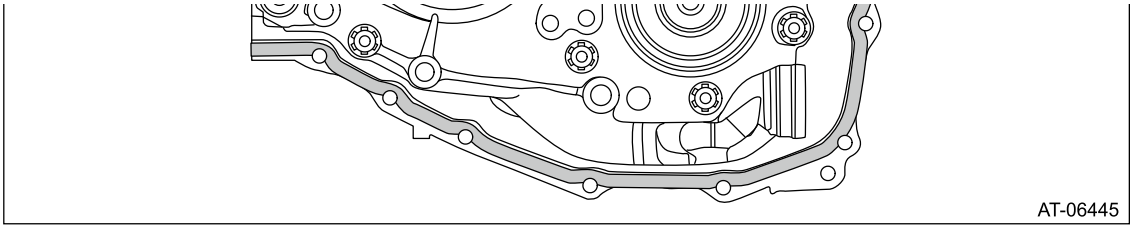

CVT00990

7. Apply liquid gasket seamlessly to the mating surface of transmission case.

Liquid gasket:

THREE BOND 1215B or equivalent





8. Install the transmission case.

Note:

The total number of transmission case mounting bolts is 15.

Tightening torque:

22 N·m (2.2 kgf-m, 16.2 ft-lb)

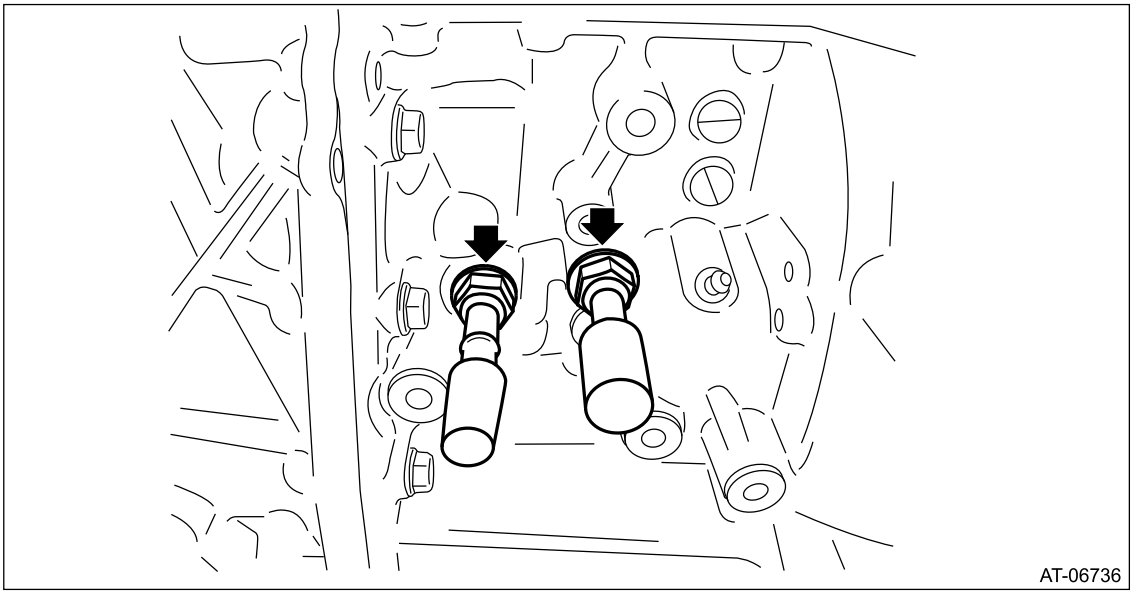
9. Install the oil cooler pipe.

Note:

Use new O-rings.

Tightening torque:

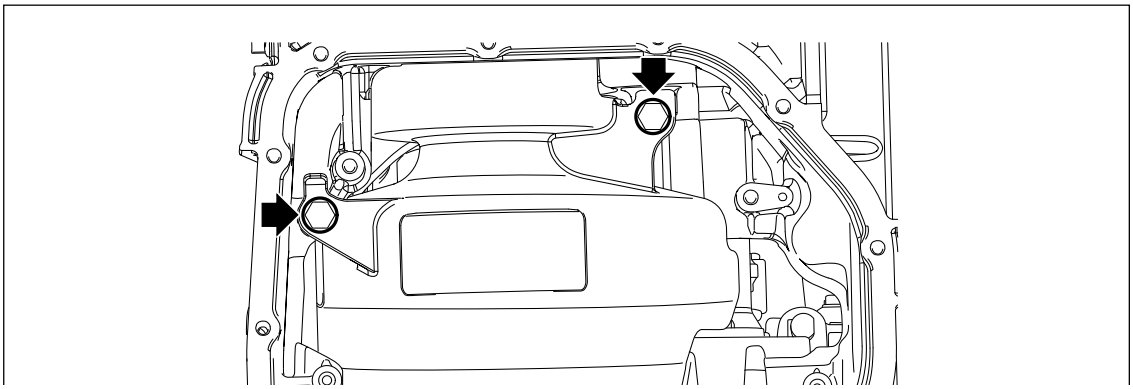
25 N·m (2.5 kgf-m, 18.4 ft-lb)

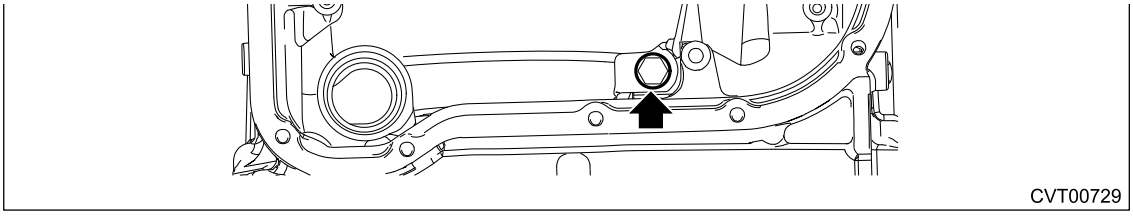


10. Install the oil baffle securing bolt.

Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



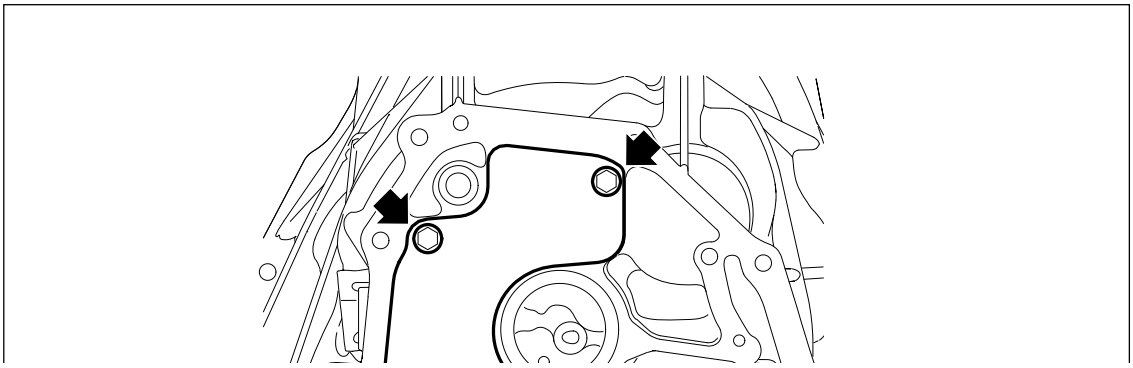


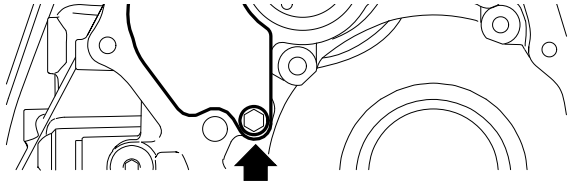
11. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.
12. Install the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
13. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
14. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
15. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
16. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
17. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
18. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
19. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
20. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
21. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
22. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
23. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
24. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
25. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Case

DISASSEMBLY

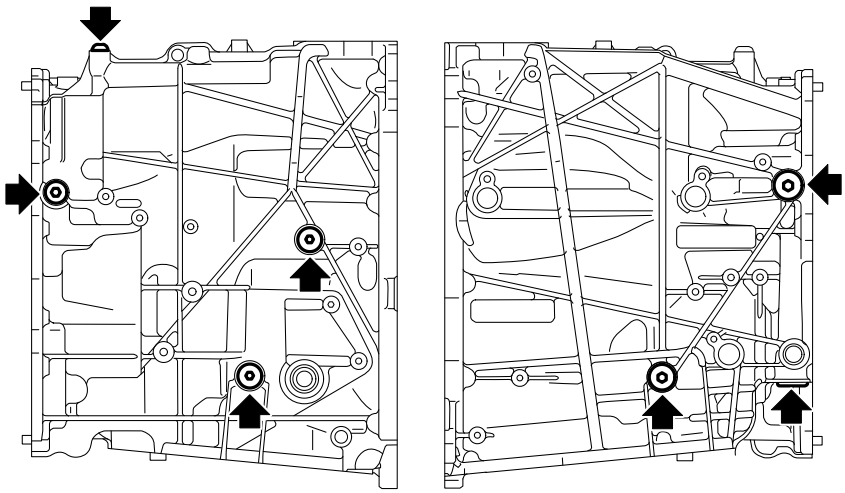
1. Remove the oil stopper plate.





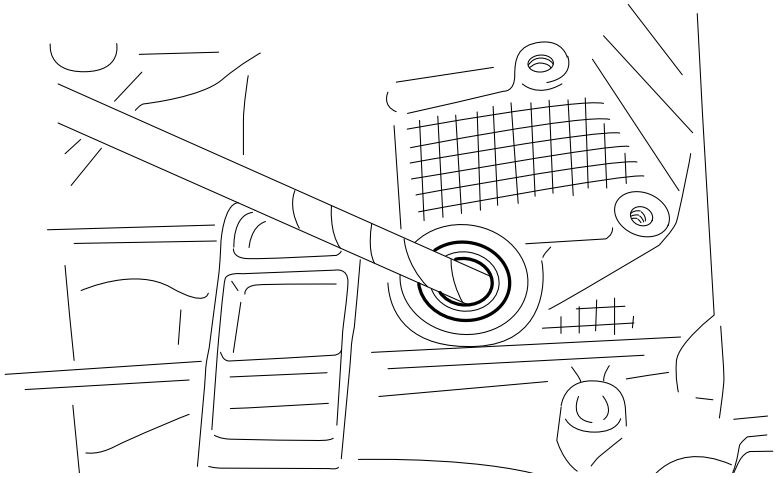
CVT00728

2. Remove all plugs from the transmission case.



CVT10364

3. Remove the oil seal using a screwdriver wrapped with cloth etc.





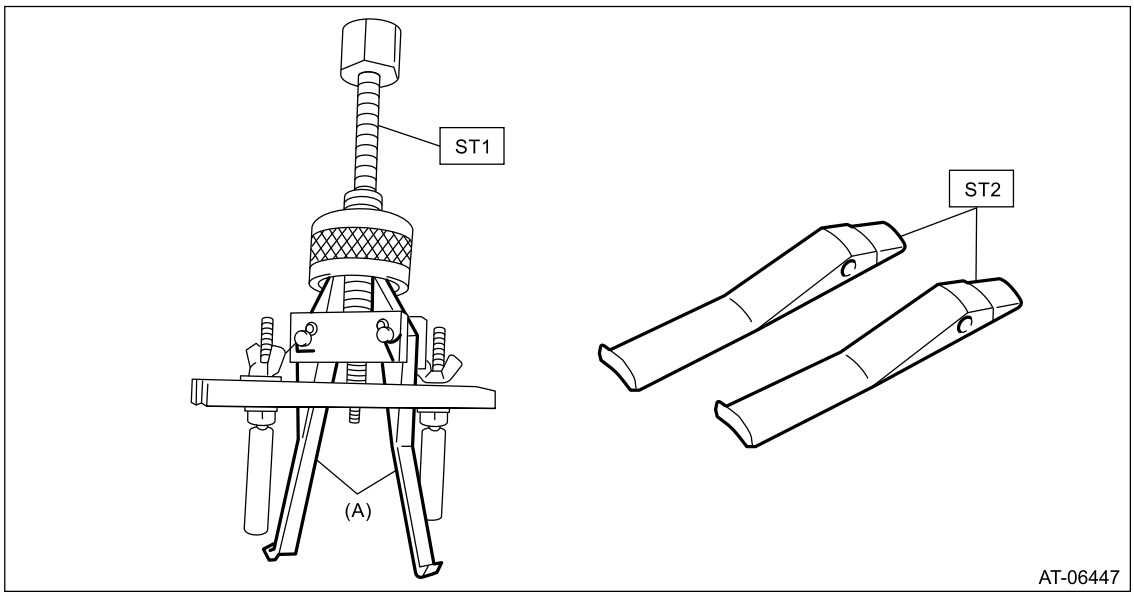
4. Remove the ball bearing of the secondary pulley using the ST1 and ST2.

(1) Remove the claw of ST1, and attach the claw of ST2.

Preparation tool:

ST1: PULLER ASSY (398527700)

ST2: CLAW (18760AA000)



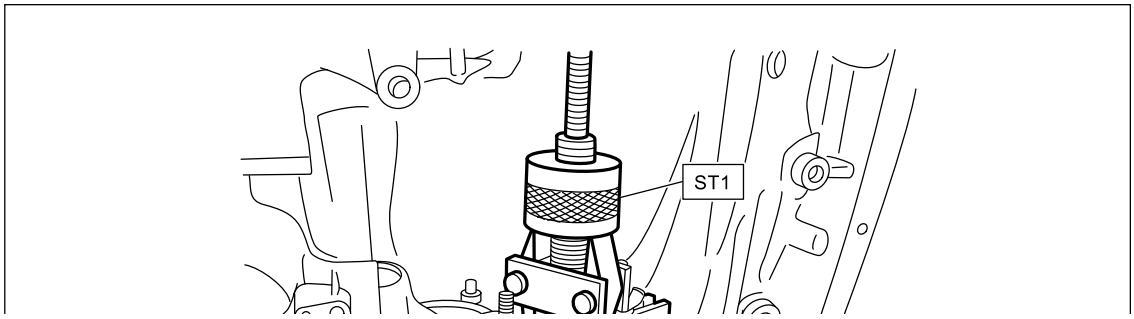
(A) Claw

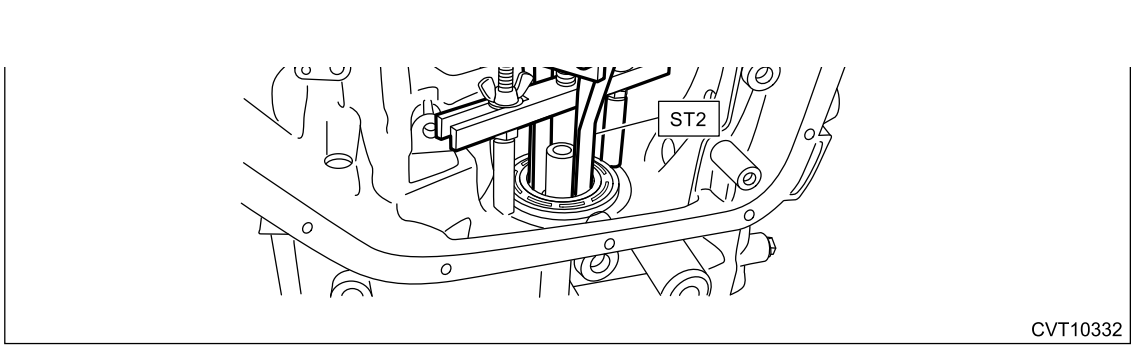
(2) Remove the ball bearing of the secondary pulley using the ST1 and ST2.

Preparation tool:

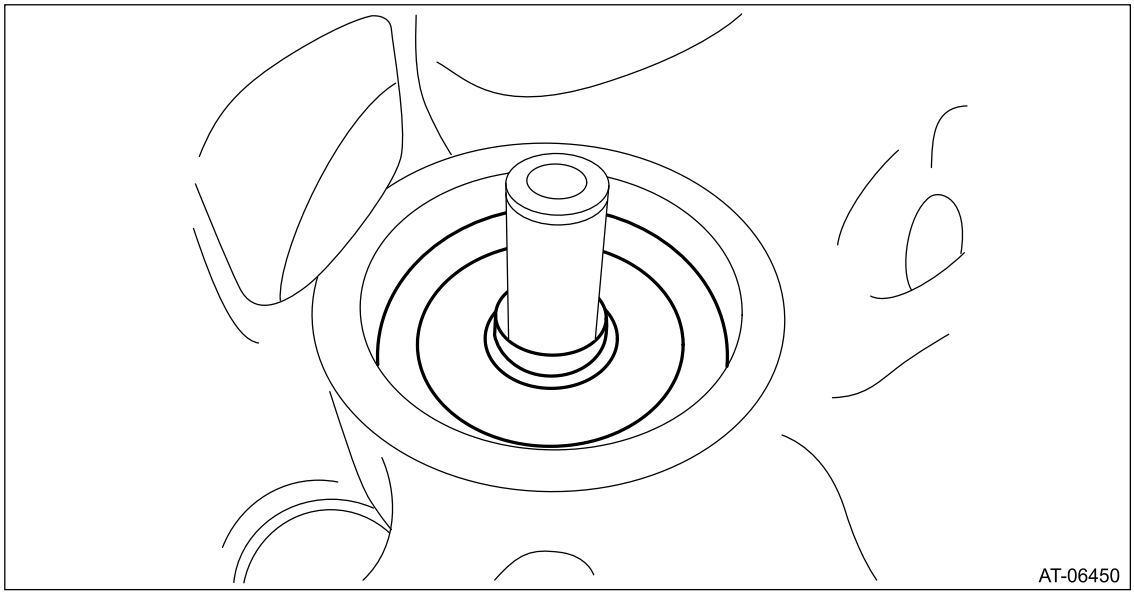
ST1: PULLER ASSY (398527700)

ST2: CLAW (18760AA000)

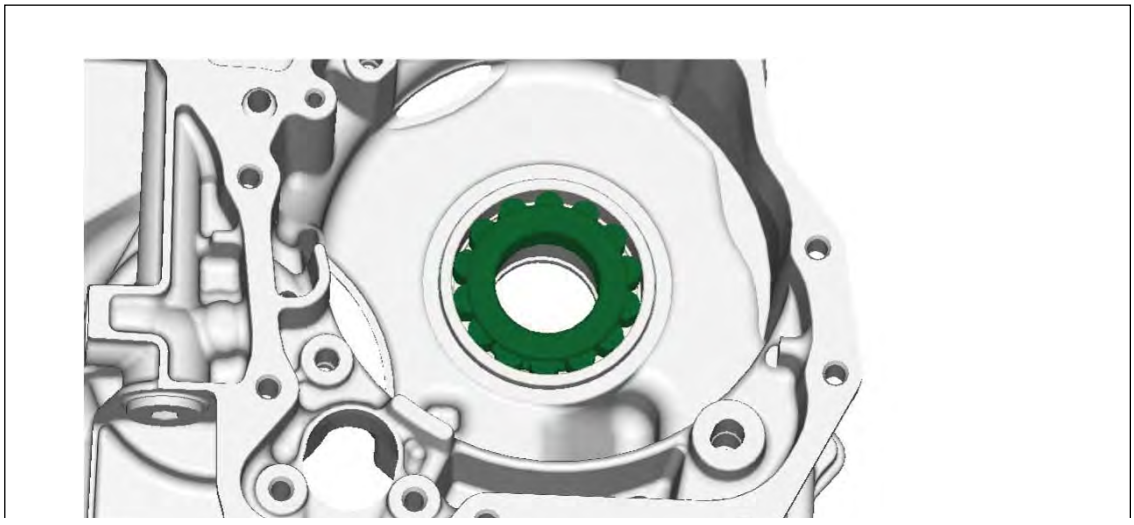




5. Remove the oil guide.



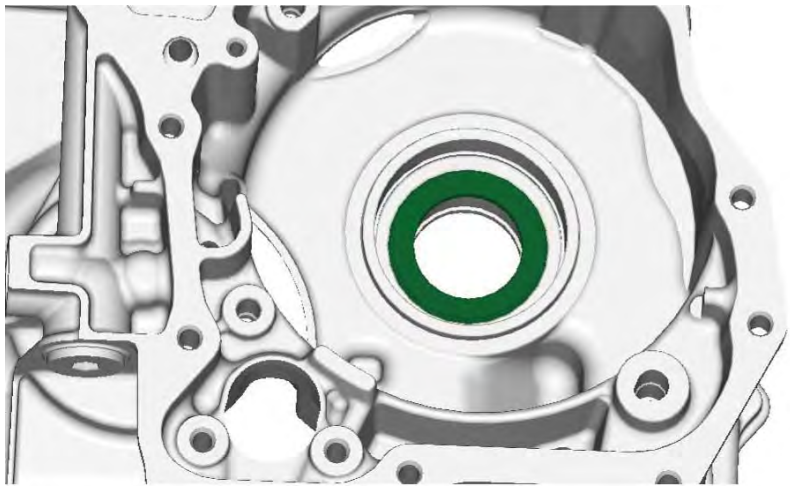
6. Remove the roller bearing of the reduction driven gear.





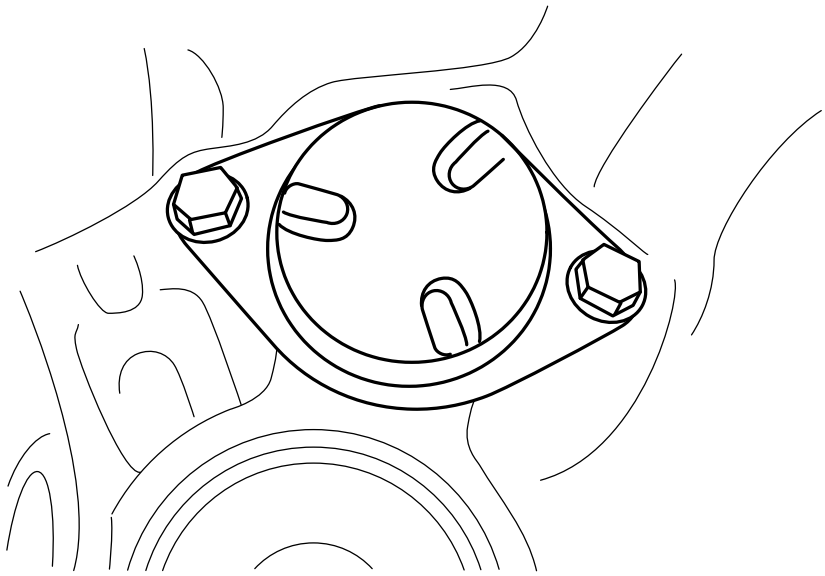
CVT10396

7. Remove the thrust bearing.



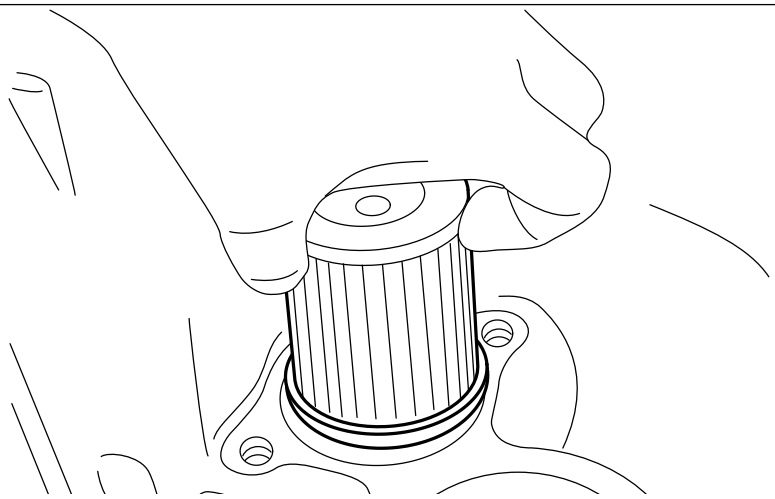
CVT10397

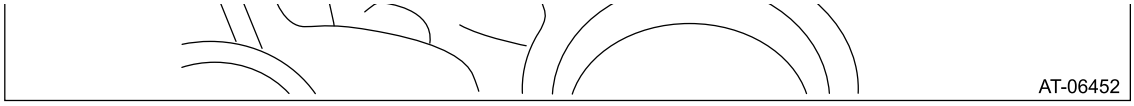
8. Remove the CVTF filter cover and gasket.



AT-06451

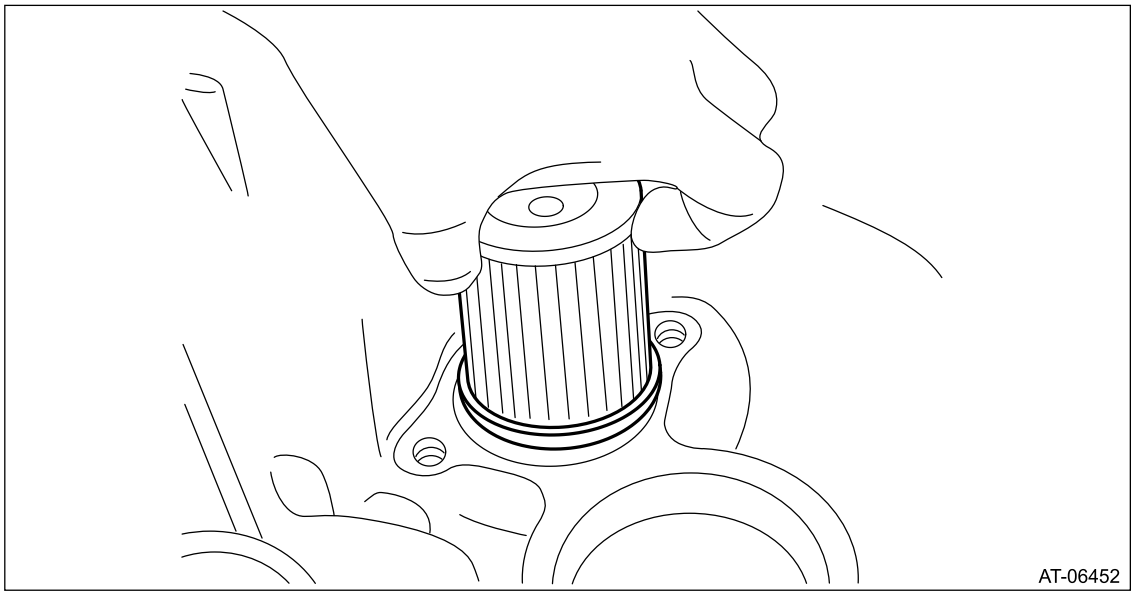
9. Remove the CVTF filter.



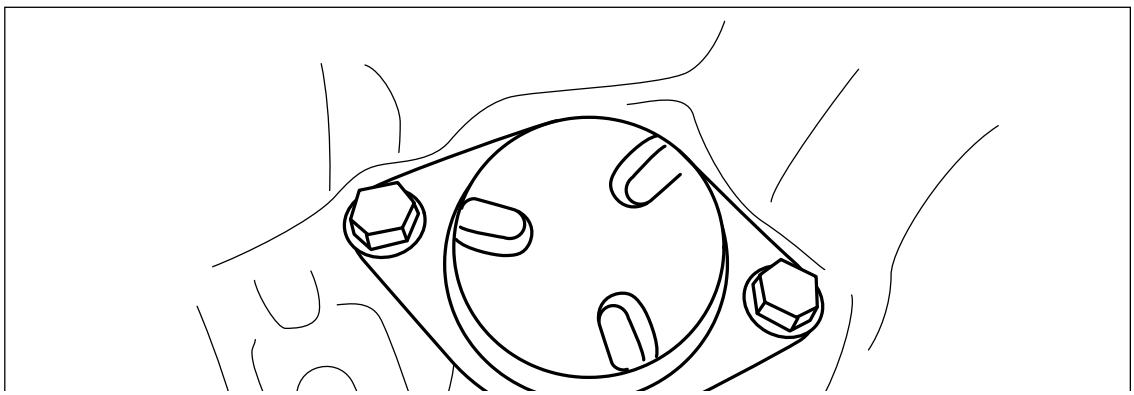


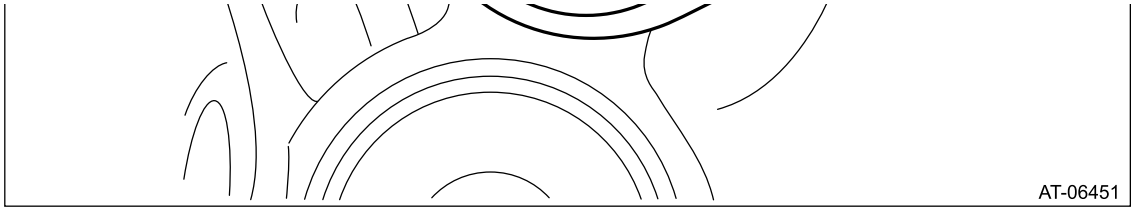
ASSEMBLY

1. Face the O-ring side of the CVTF filter to the transmission case side, and install the CVTF filter.
   Note:
   Apply CVTF to the O-ring of CVTF filter.



2. Install the CVTF filter cover and gasket.
   Note:
   Use a new gasket.
   Tightening torque:
   17 N·m (1.7 kgf-m, 12.5 ft-lb)





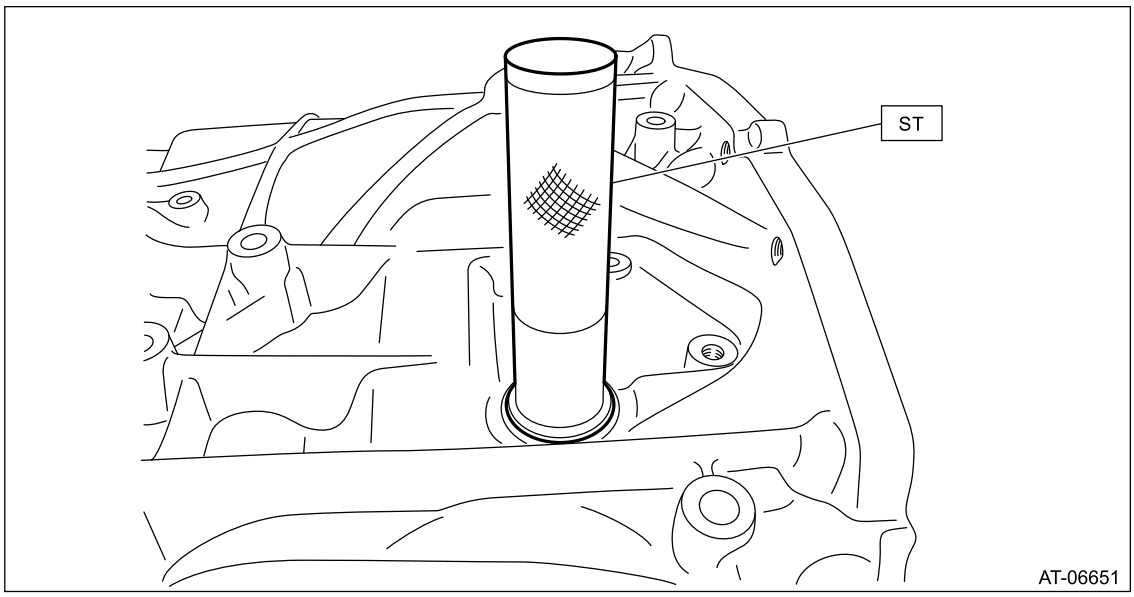
3. Using the ST, install the oil seal.

Note:

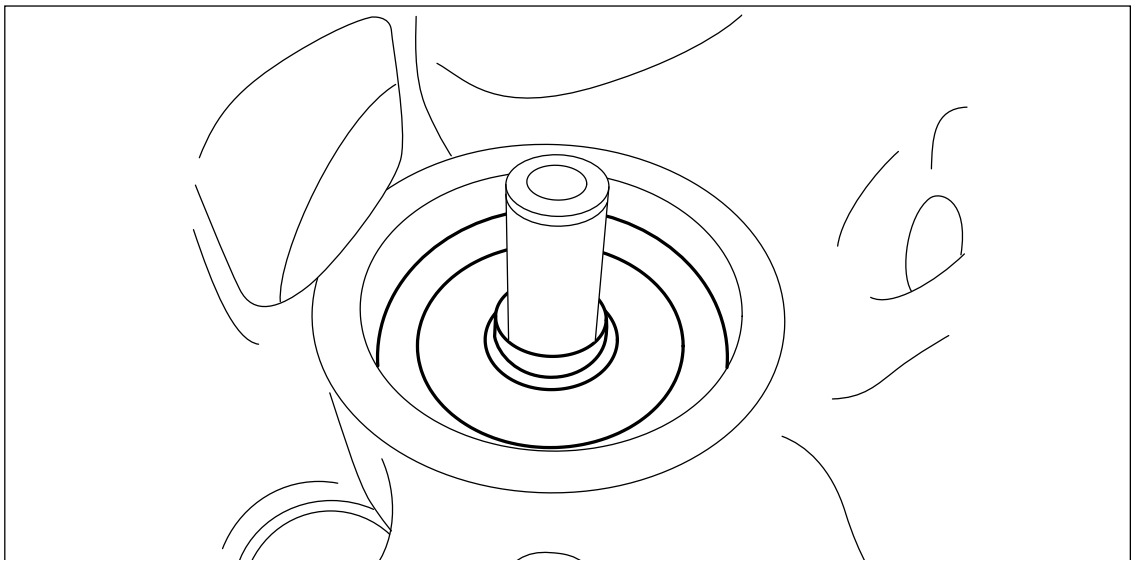
- **Use a new oil seal.**
- **Apply CVTF to the oil seal lip and press-fitting surface.**

Preparation tool:

ST: INSTALLER (18657AA000)



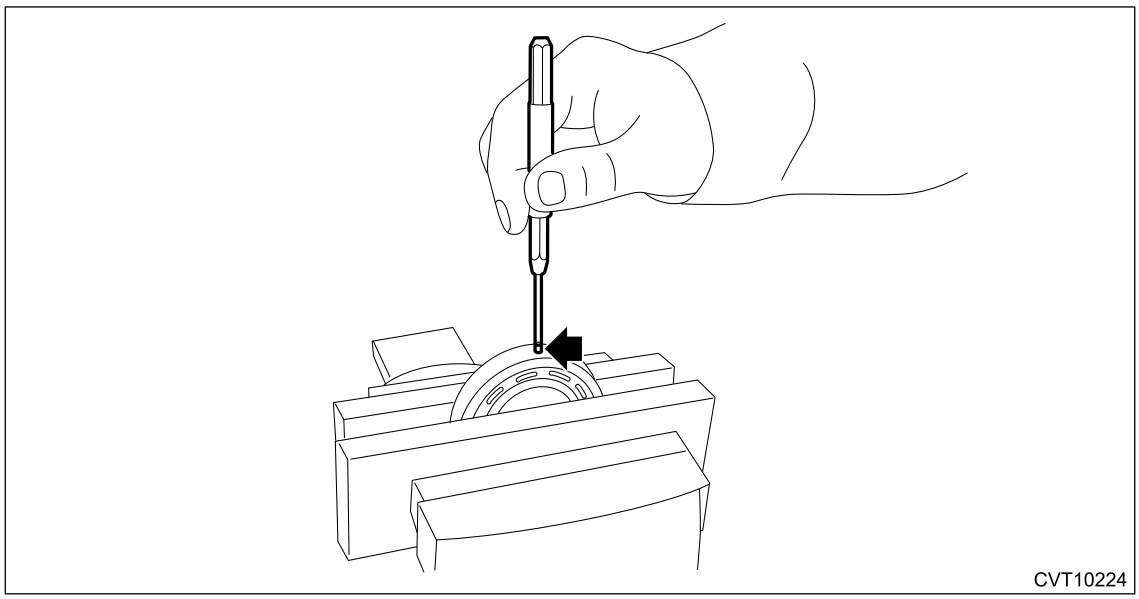
4. Install the oil guide.



5. Press-fit the roll pin into the ball bearing on the secondary pulley side.
(1) Hold the roll pin with a knock pin punch or the like, and press-fit with a hammer.

Note:

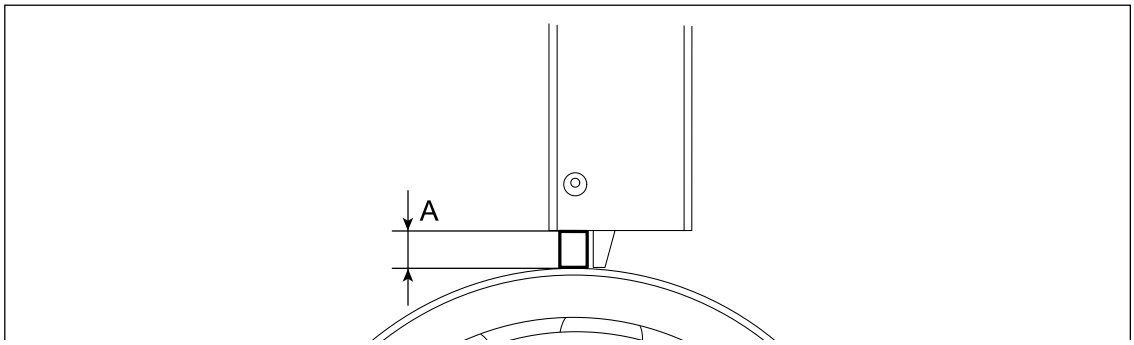
- **Use a new ball bearing.**
- **When securing the ball bearing with a vise, place a wood piece therebetween to avoid scratching the bearing race.**

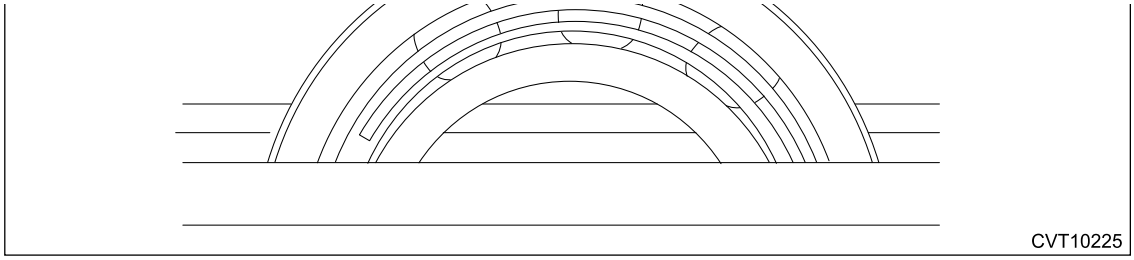


(2) Measure the height "A" of the roll pin.

Specification:

4.4 mm (0.173 in) or less





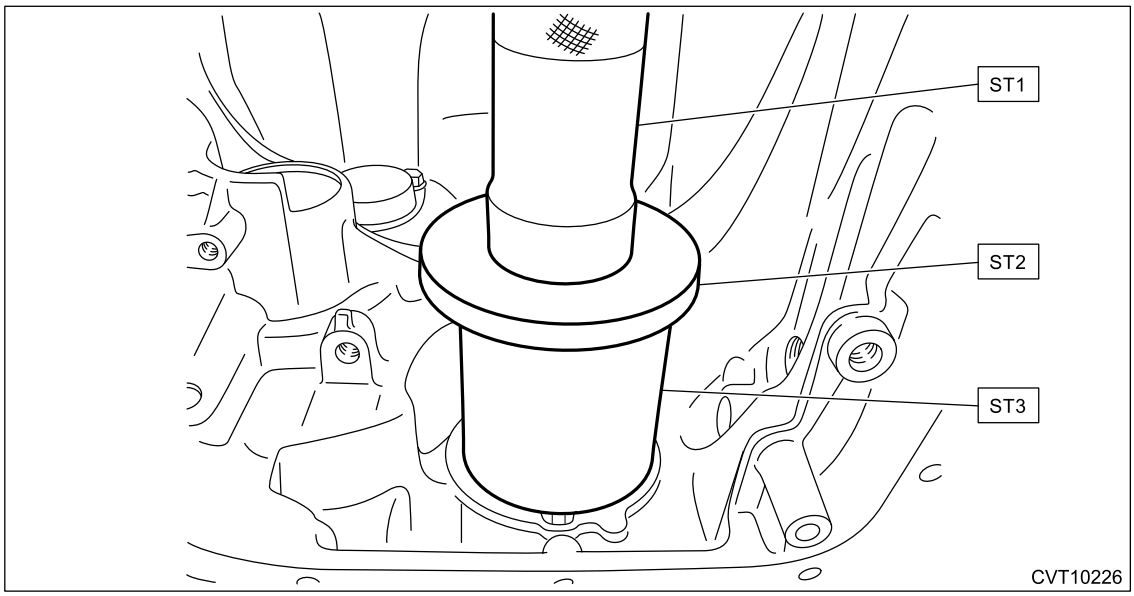
6. Using ST1, ST2 and ST3, install the ball bearing on the secondary pulley side.

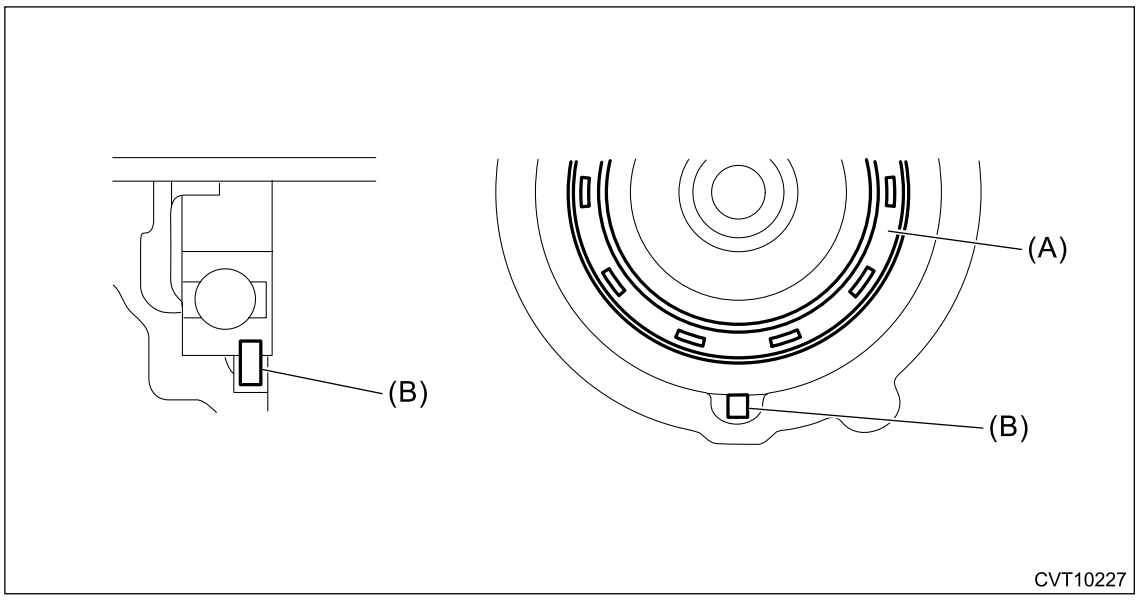
Note:

- **Align the roll pin to the cutout of the transmission case.**
- **Press-fit the pin so that it is positioned on near side (the retainer should be seen on your side).**

Preparation tool:

ST1: BUSHING 1-2 INSTALLER (499277100)
ST2: INSTALLER (398177700)
ST3: PRESS SNAP RING (28499TC010)





(A) Retainer

(A) Retainer

(B) Roll pin

7. Install all plugs.

Note:

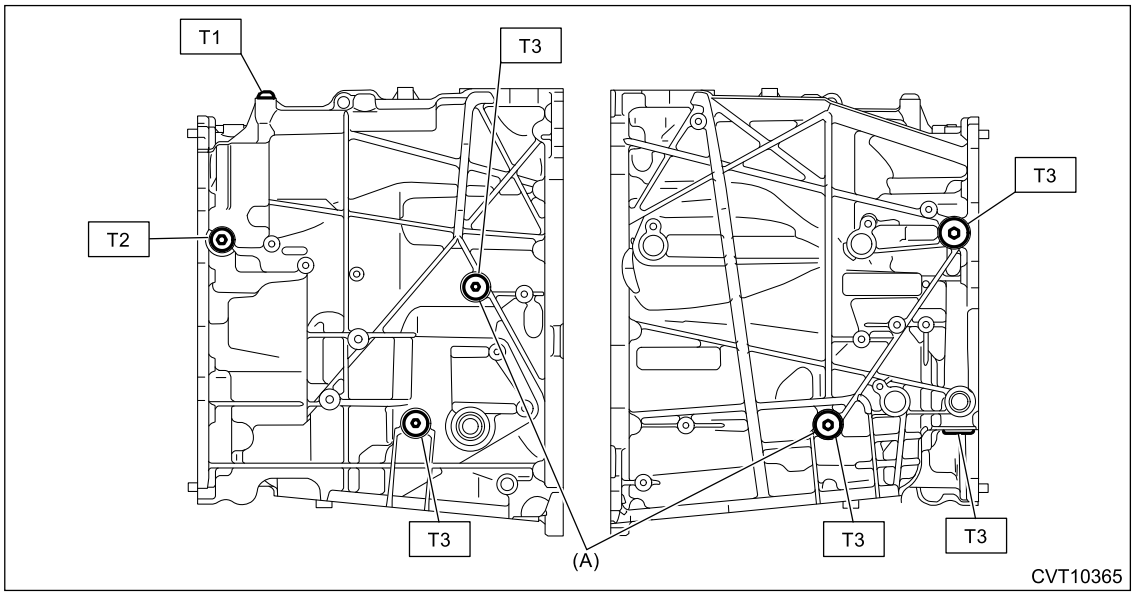
- **Use new O-rings.**
- **Apply CVTF to the O-rings.**
- **For the plug (A), fill the CVTF, and then tighten the plug using a new gasket.**

Tightening torque:

T1: 13 N·m (1.3 kgf-m, 9.6 ft-lb)

T2: 22 N·m (2.2 kgf-m, 16.2 ft-lb)

T3: 50 N·m (5.1 kgf-m, 36.9 ft-lb)



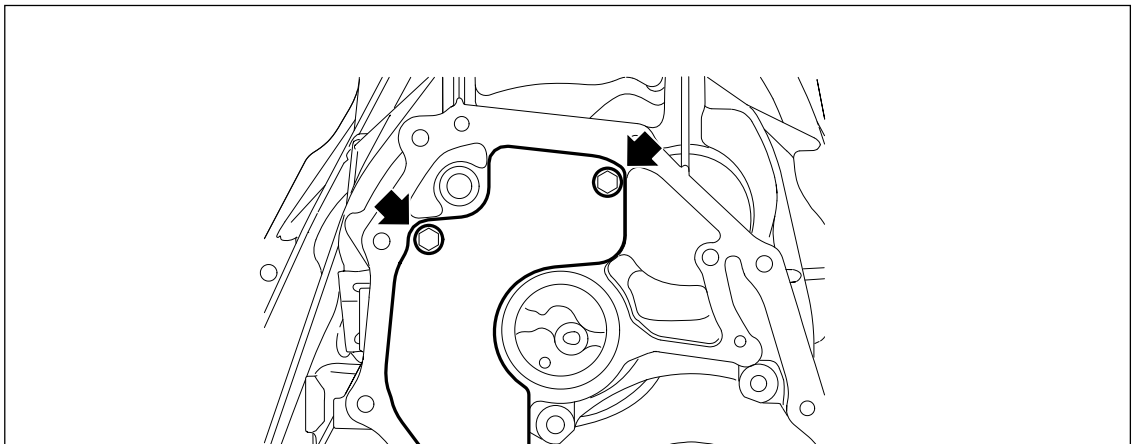
8. Install the oil stopper plate.

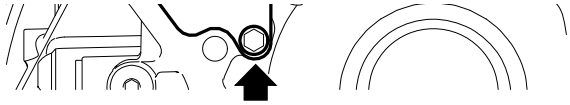
Note:

Use a new bolt.

Tightening torque:

9 N·m (0.9 kgf-m, 6.6 ft-lb)



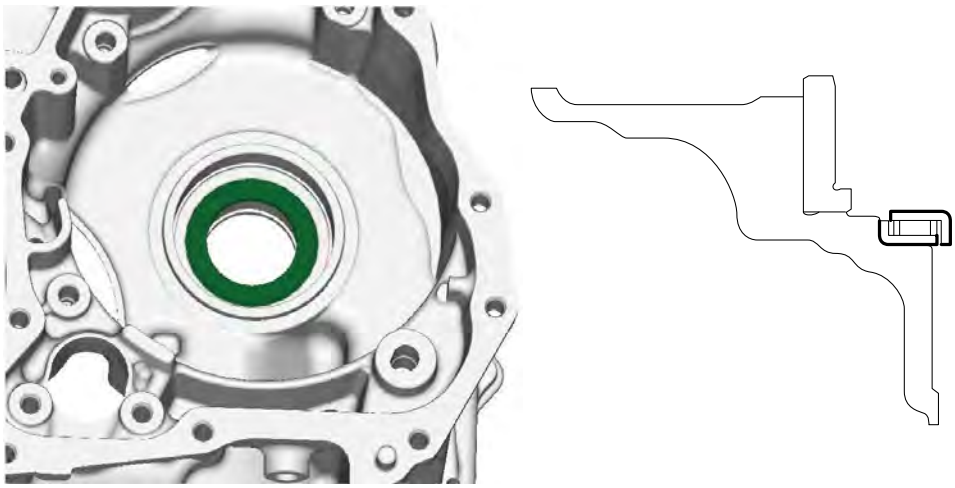


CVT00728

9. Install the thrust bearing to the transmission case.

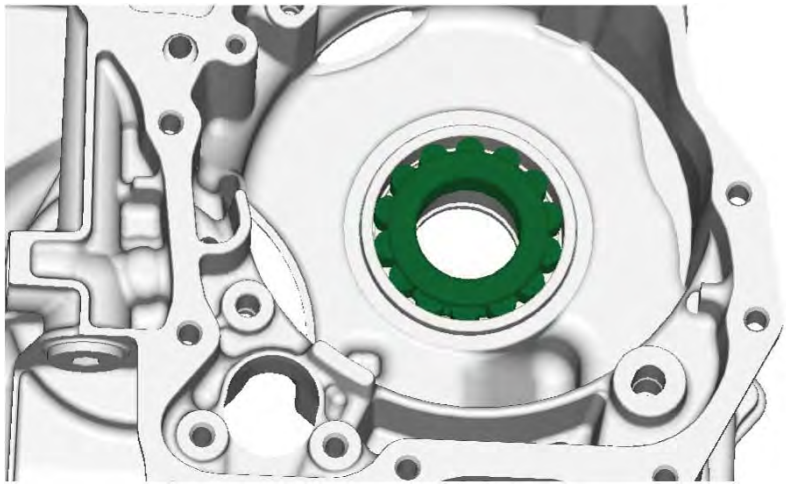
Note:

Face the temper color surface to the transmission side.



CVT10390

10. Install the roller bearing of the reduction driven gear.



CVT10396

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Case

INSPECTION

- Check the transmission case for damage.
- Check for leakage of CVTF from the connection between converter case and transmission case.
- Check the bearing for smooth operation.
- Check the bearing for seizure or wear.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Transmission Case

ADJUSTMENT

Note:

When replacing the transmission case with a new part, perform the following check and adjustment for the selection.

- Select the transfer driven gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>ADJUSTMENT.

- Select the transfer drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>ADJUSTMENT.
- Select the reduction drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Filter

REMOVAL

Note:

- **Although CVTF filter is a maintenance-free part, replace it if a large quantity of wear debris and metal particles are found in CVTF and CVTF filter.**
- **For removal of CVTF filter, refer to "Transmission Case". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>DISASSEMBLY.**

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Filter

INSTALLATION

Note:

For installation of CVTF filter, refer to "Transmission Case". Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>ASSEMBLY. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > CVTF Filter

INSPECTION

- Check if a large quantity of wear debris or metal particles are in CVTF and CVTF filter.
- Check for broken part or damaged O-ring.

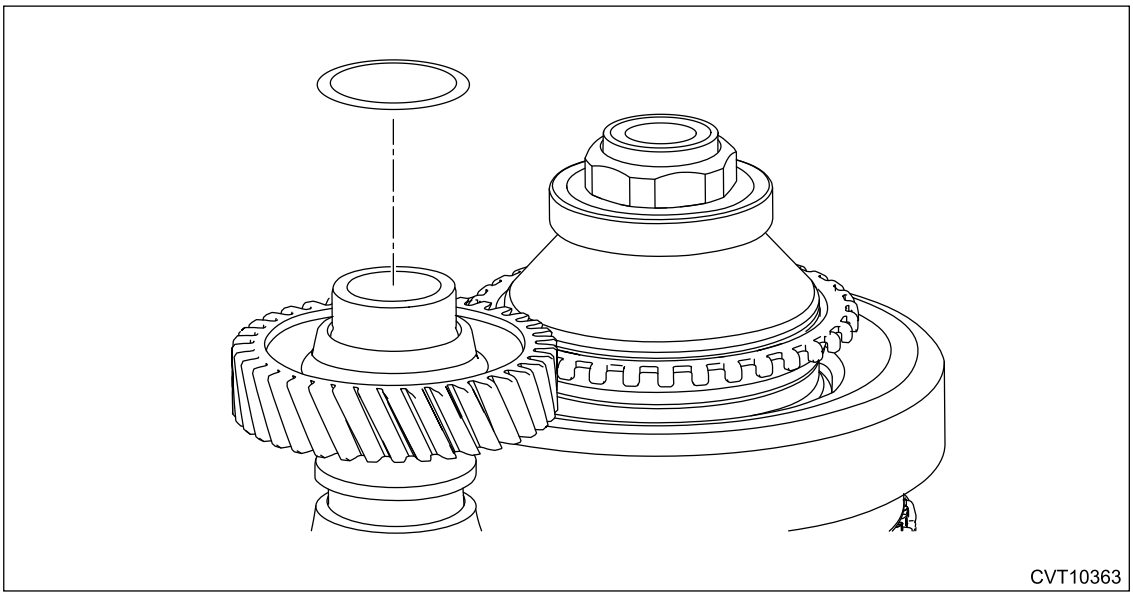
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Drive Gear

REMOVAL

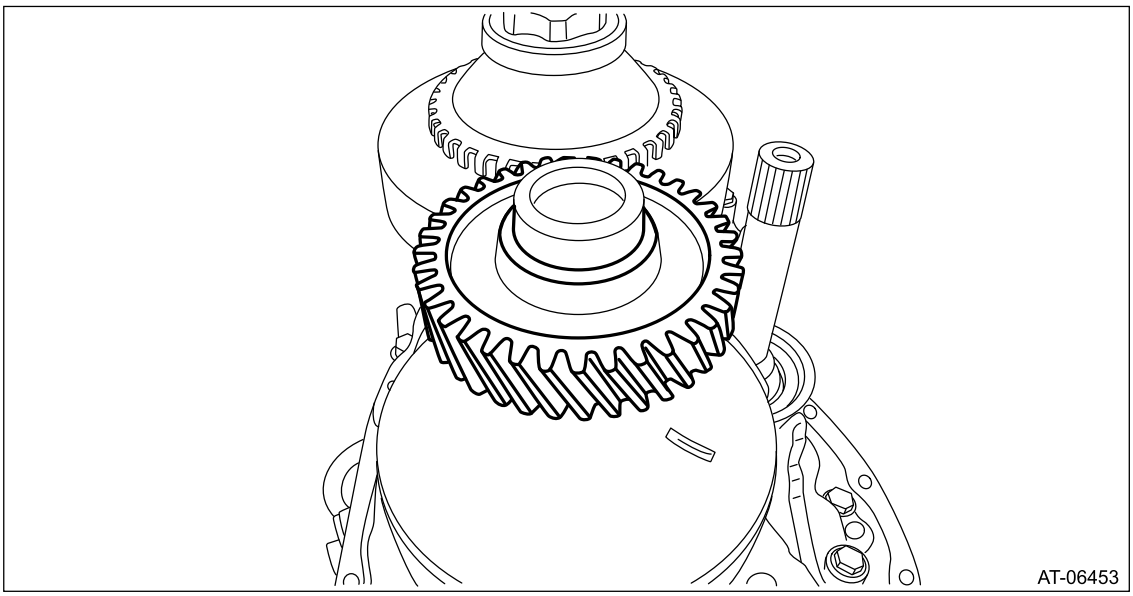
1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Transmission Case>REMOVAL.

17. Remove the reduction drive gear shim.

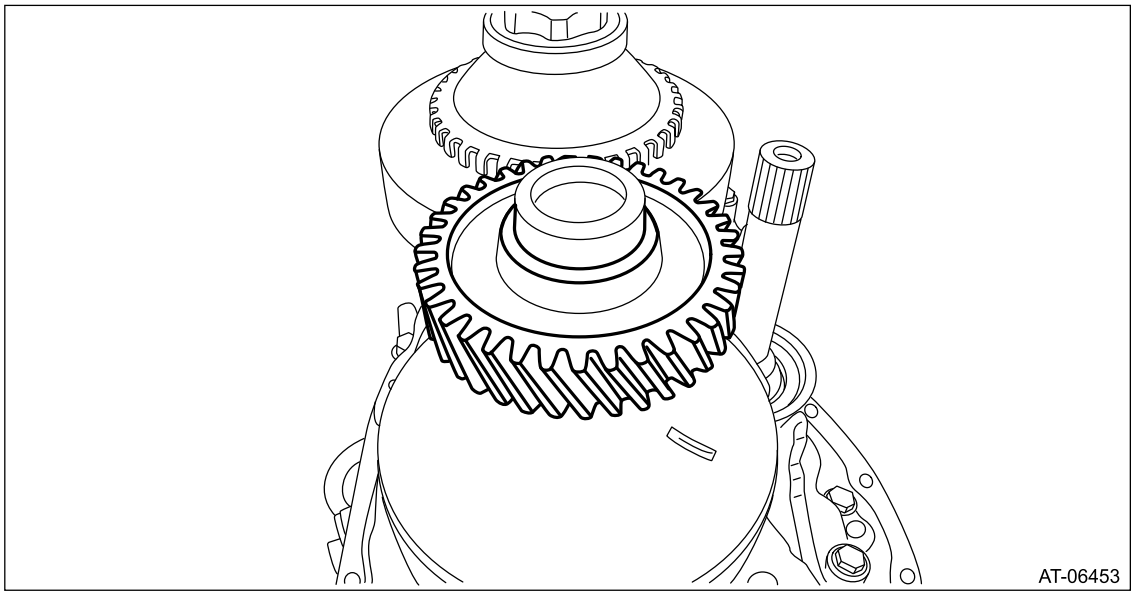


18. Remove the reduction drive gear.



INSTALLATION

1. Install the reduction drive gear to secondary pulley.



2. Select the reduction drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.
3. Install the selected reduction drive gear shim.
4. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.
5. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.
6. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
7. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
8. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
9. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
10. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
11. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.

12. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
13. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
14. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
15. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
16. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
17. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
18. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
19. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Drive Gear

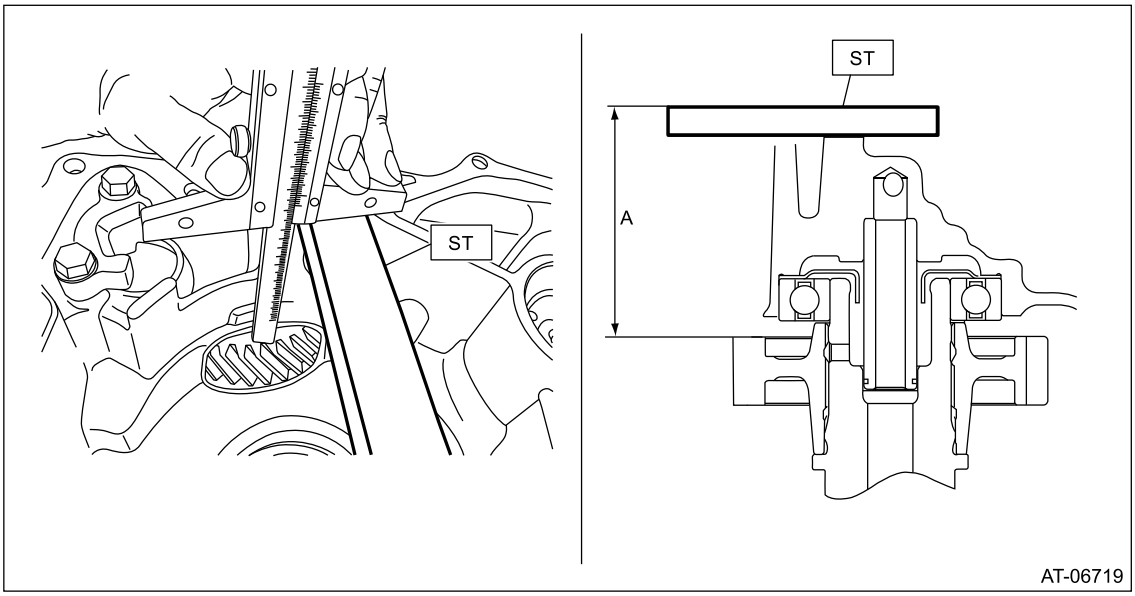
INSPECTION

Check the reduction drive gear for breakage or damage.

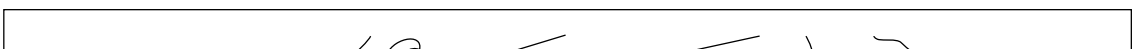
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reduction Drive Gear

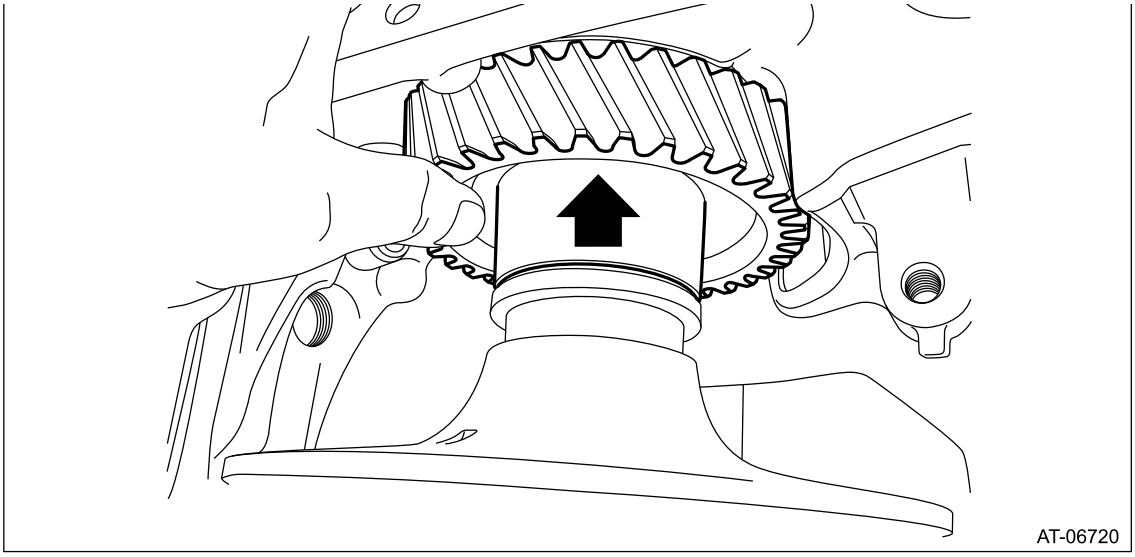
ADJUSTMENT

1. Remove the reduction drive gear shim.
2. Install the transmission case, and secure it with four or five bolts.
   Tightening torque:
   22 N·m (2.2 kgf-m, 16.2 ft-lb)
3. Measure depth “A” from the ST upper face to the reduction drive gear end face.
   Preparation tool:
   ST: GAUGE (499575400)



4. Raise and hold the reduction drive gear.

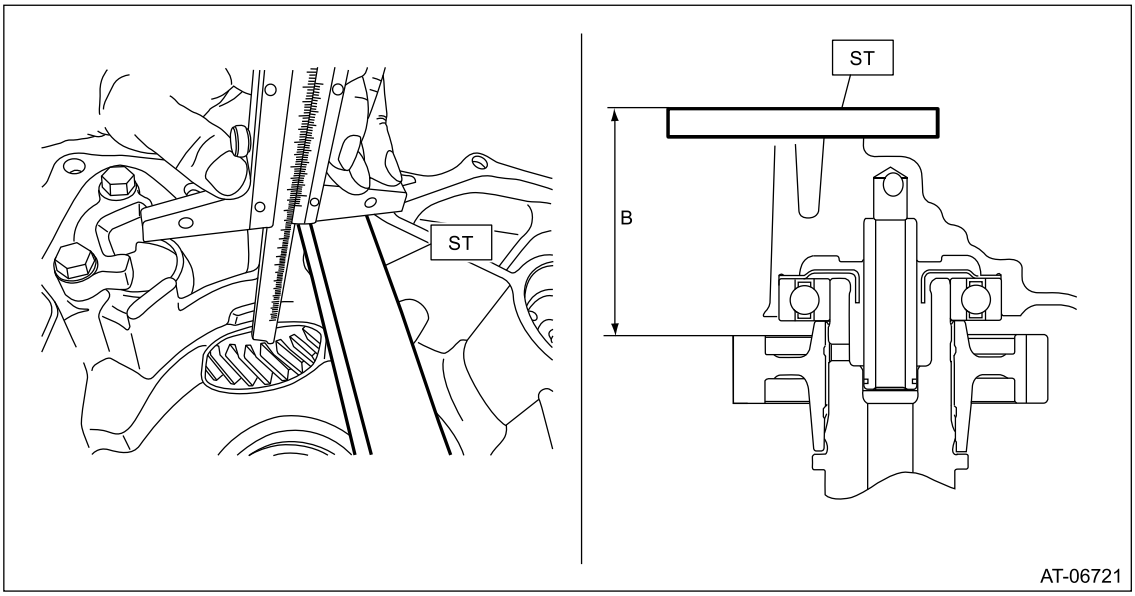




5. Measure depth "B" from the ST upper face to the reduction drive gear end face.

Preparation tool:

ST: GAUGE (499575400)



6. Calculate the following formula.

T mm = A − B

[T in = A − B]

T: Moving distance of reduction drive gear shim

A: Depth from the ST upper face to the reduction drive gear end surface

B: Depth from the ST upper face to the reduction drive gear end surface

Moving distance of transfer drive gear [T]	Total shim thickness mm (in)
0.420 — 0.519 (0.0165 — 0.0204)	0.3 (0.012)
0.520 — 0.619 (0.0205 — 0.0242)	0.4 (0.016)
0.620 — 0.719 (0.0244 — 0.0283)	0.5 (0.020)
0.720 — 0.819 (0.0283 — 0.0322)	0.6 (0.024)
0.820 — 0.919 (0.0323 — 0.0362)	0.7 (0.028)
0.920 — 1.019 (0.0362 — 0.0401)	0.8 (0.031)
1.020 — 1.119 (0.0402 — 0.0441)	0.9 (0.035)
1.120 — 1.219 (0.0441 — 0.0480)	1.0 (0.039)
1.220 — 1.319 (0.0480 — 0.0519)	1.1 (0.043)

1.320 — 1.419 (0.0520 — 0.0559)	1.2 (0.047)
1.420 — 1.519 (0.0559 — 0.0598)	1.3 (0.051)
1.520 — 1.619 (0.0598 — 0.0637)	1.4 (0.055)
1.620 — 1.719 (0.0638 — 0.0677)	1.5 (0.059)
1.720 — 1.819 (0.0677 — 0.0716)	1.6 (0.063)
1.820 — 1.920 (0.0717 — 0.0756)	1.7 (0.067)

7. Select one to three reduction drive gear shims so that the total thickness meets the value obtained from step 6).

Part No.	Reduction drive gear shim thickness mm (in)
31288AA261	0.3 (0.012)
31288AA271	0.4 (0.016)

Part No.	Reduction drive gear shim thickness mm (in)
31288AA281	0.5 (0.020)
31288AA291	0.6 (0.024)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Pulley and Secondary Pulley

REMOVAL

Note:
Always replace primary pulley and secondary pulley as an assembly because they are non-disassembled parts.

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.

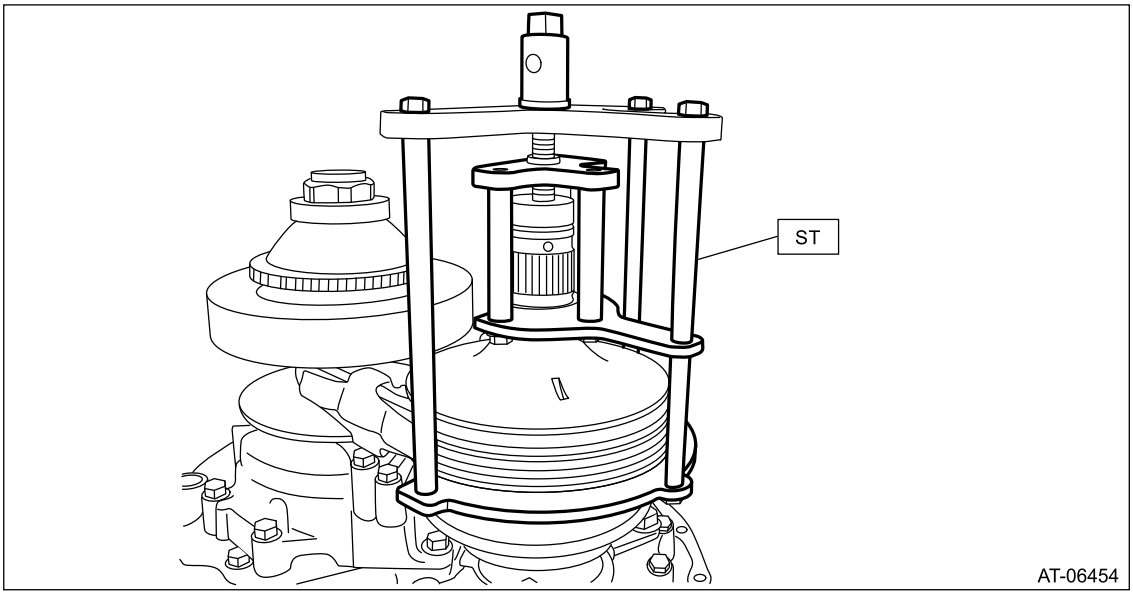
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.

17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.

18. Set the ST to secondary pulley, expand the V groove of pulley, and then completely loosen the variator chain.

Preparation tool:

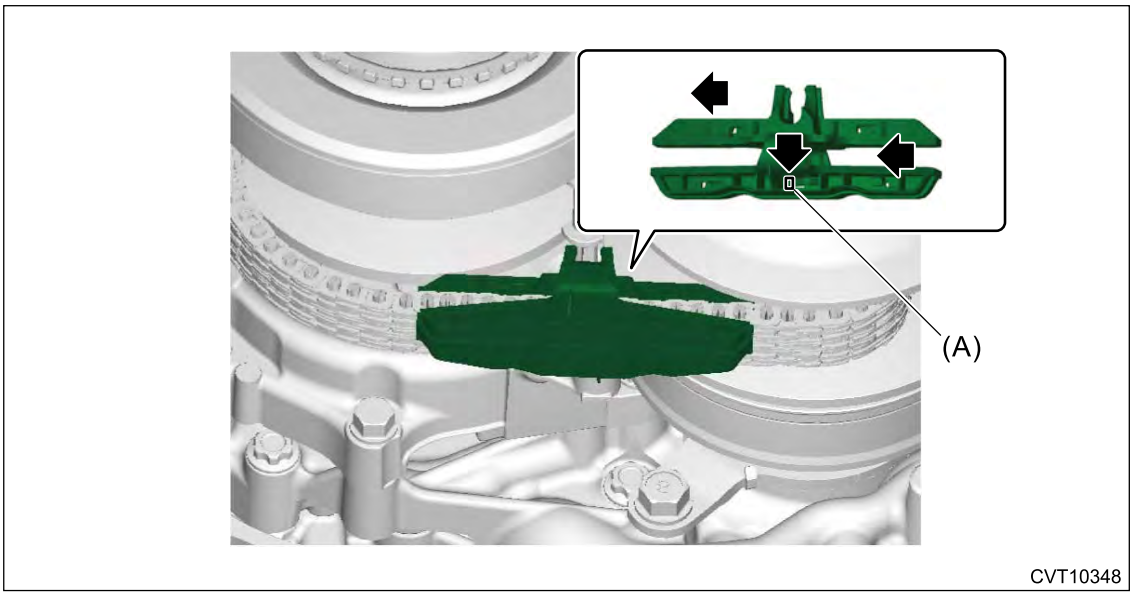
ST: EXPANDER PULLEY (18769AA010)



19. Remove the chain guide.

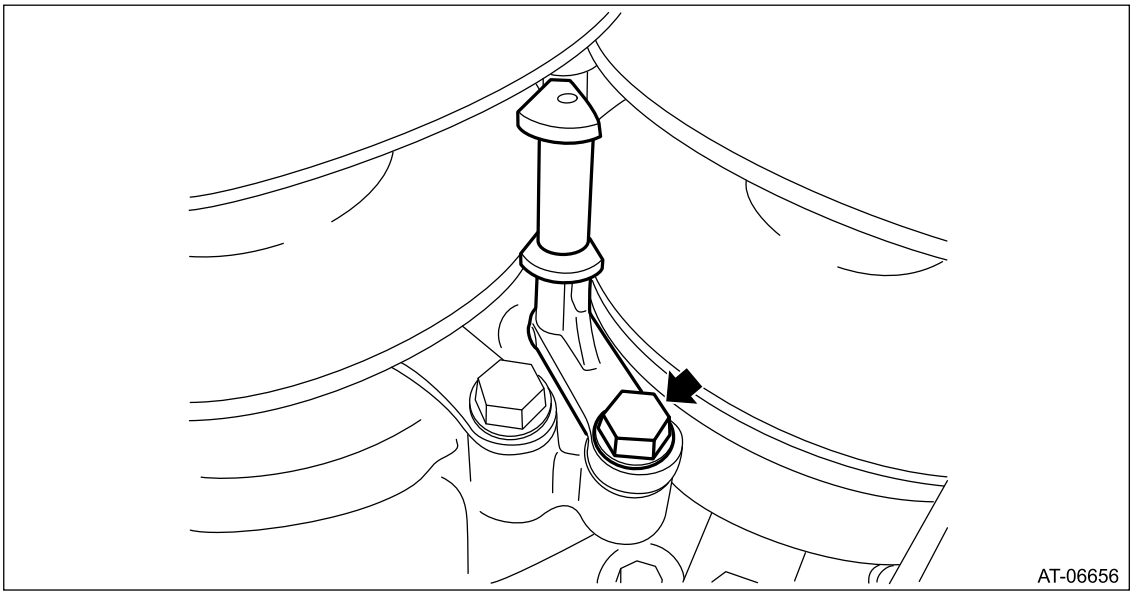
(1) Remove the chain guide from lubrication pipe.

(2) While pushing the claw (A) down, slide the upper chain guide to the direction of the arrow and remove the chain guide.

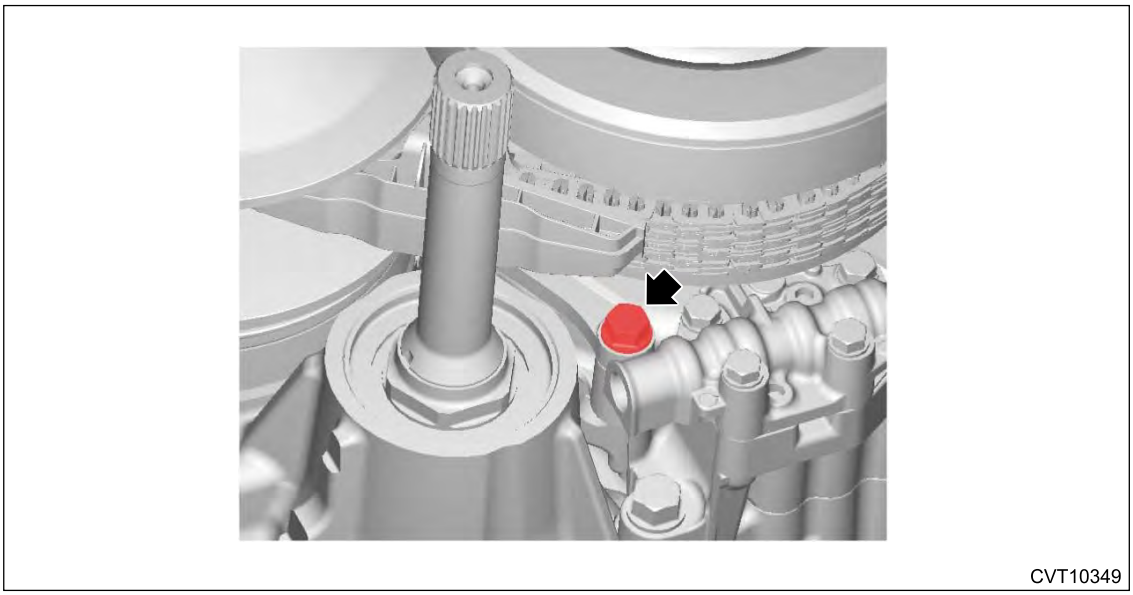


(3) Remove the lubrication pipe.

(3) Remove the lubrication pipe.



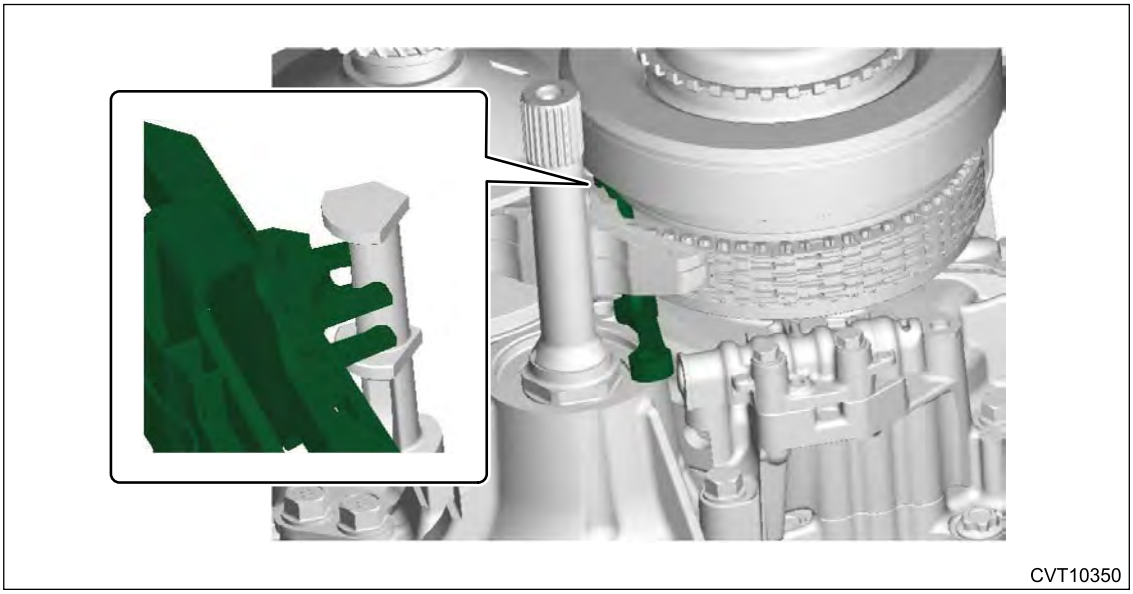
(4) Remove the support rod mounting bolts.



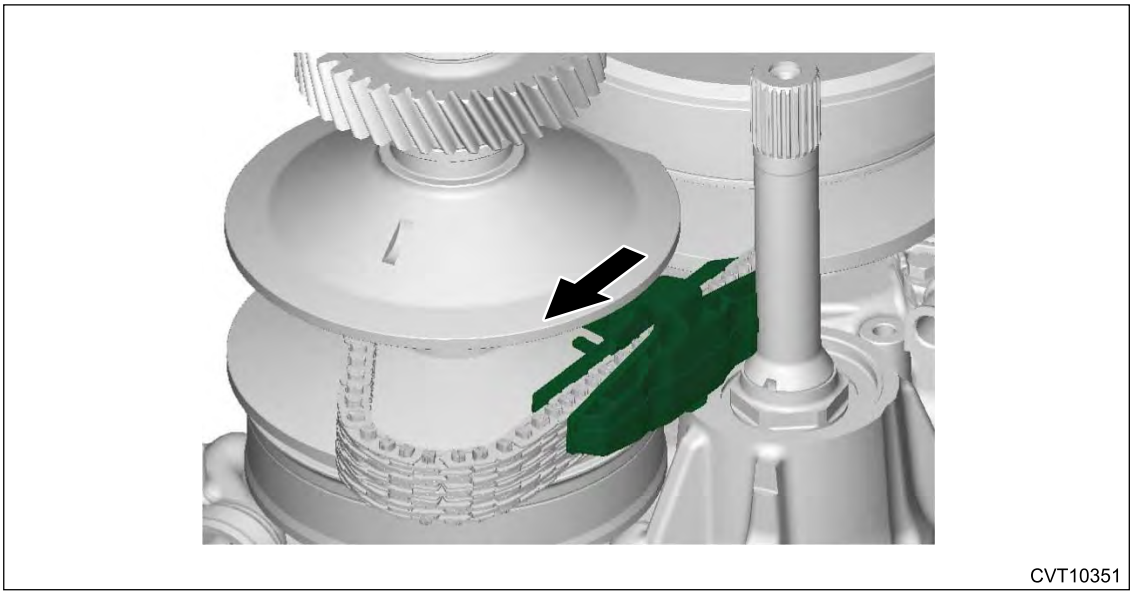
(5) Raise the support rod, and remove the chain guide from the support rod. Then, remove the support rod.

Caution:

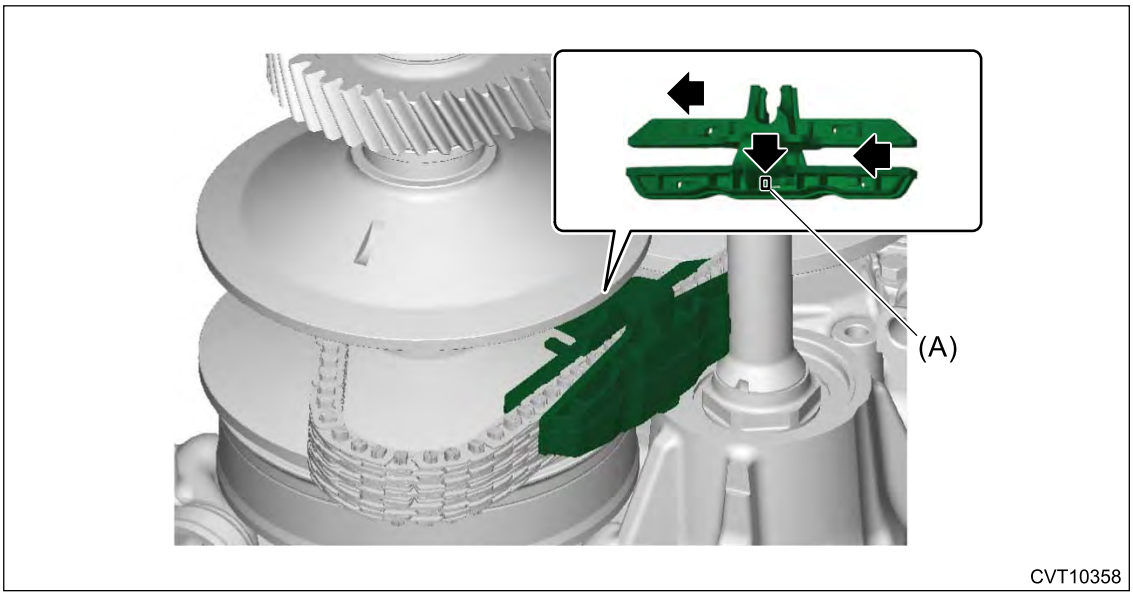
Protect the both pulleys and variator chain from scratching.


CVT10350

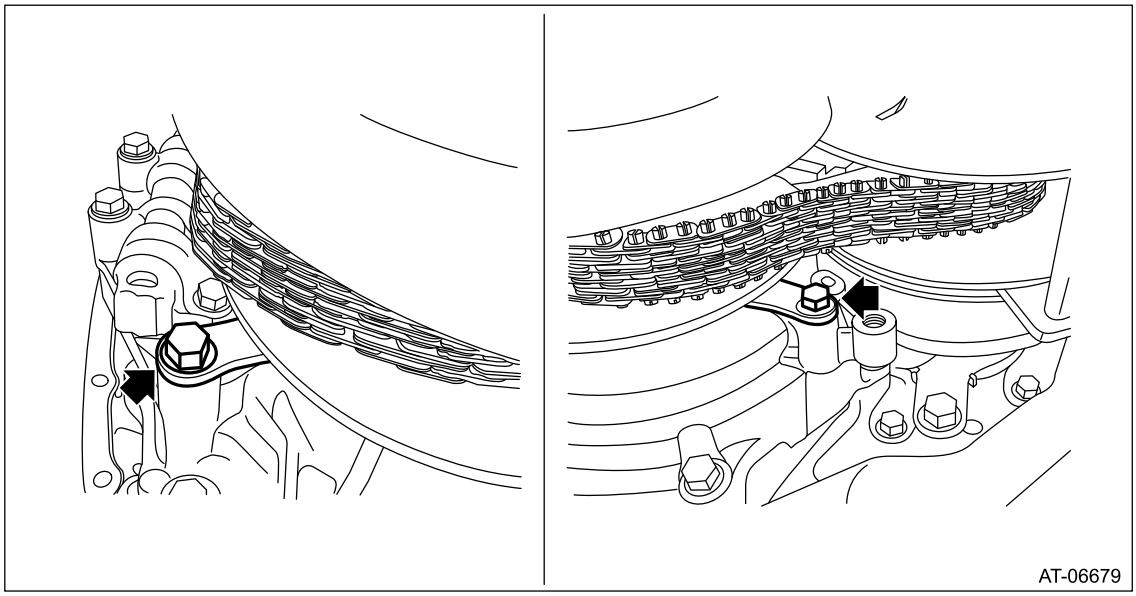
(6) Move the chain guide to the secondary pulley side.


CVT10351

(7) While pushing the claw (A) down, slide the upper chain guide to the direction of the arrow and remove the chain guide.



20. Remove the primary pulley mounting bolt.

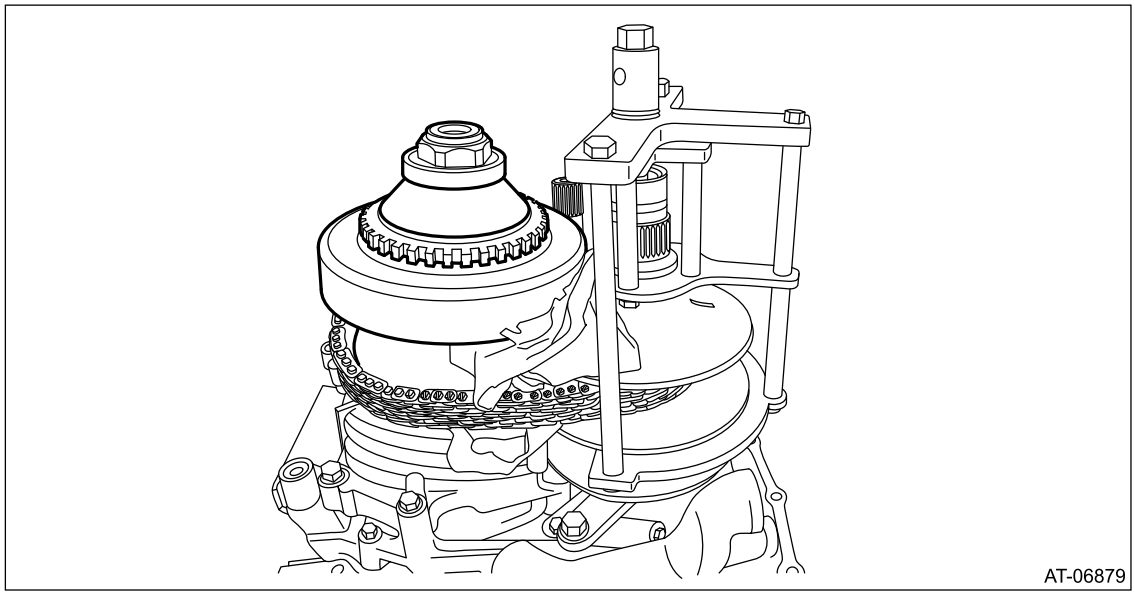


21. Remove the primary pulley from the reverse brake housing and intersect the V groove of secondary pulley and the V groove of primary pulley. Remove the variator chain from primary pulley, and remove the primary pulley.

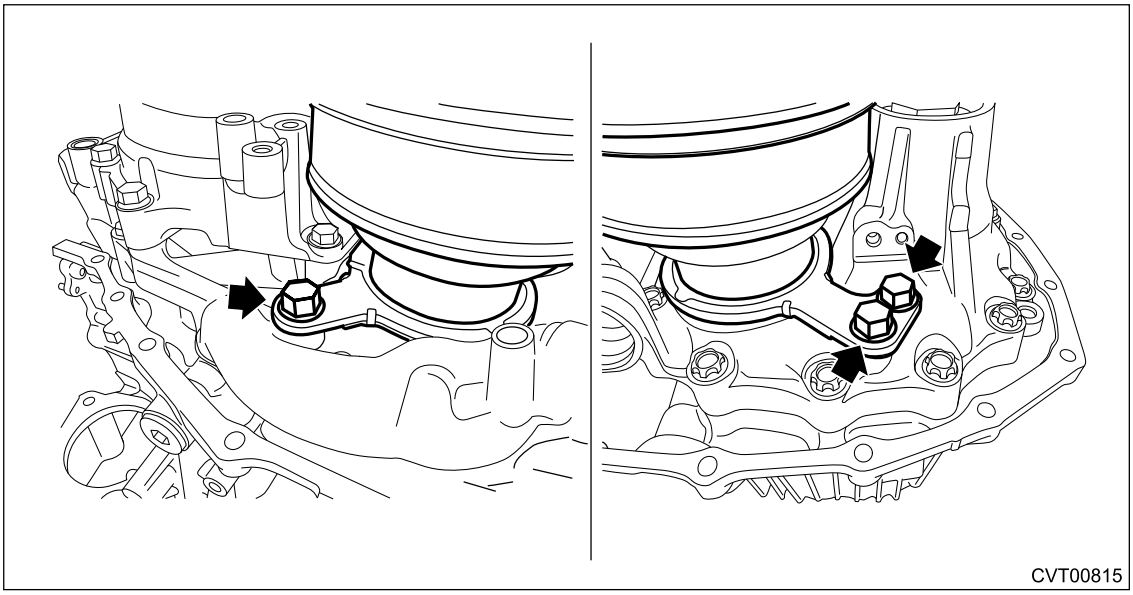
Caution:

Cover the V grooves of secondary pulley and primary pulley with cloth to protect the

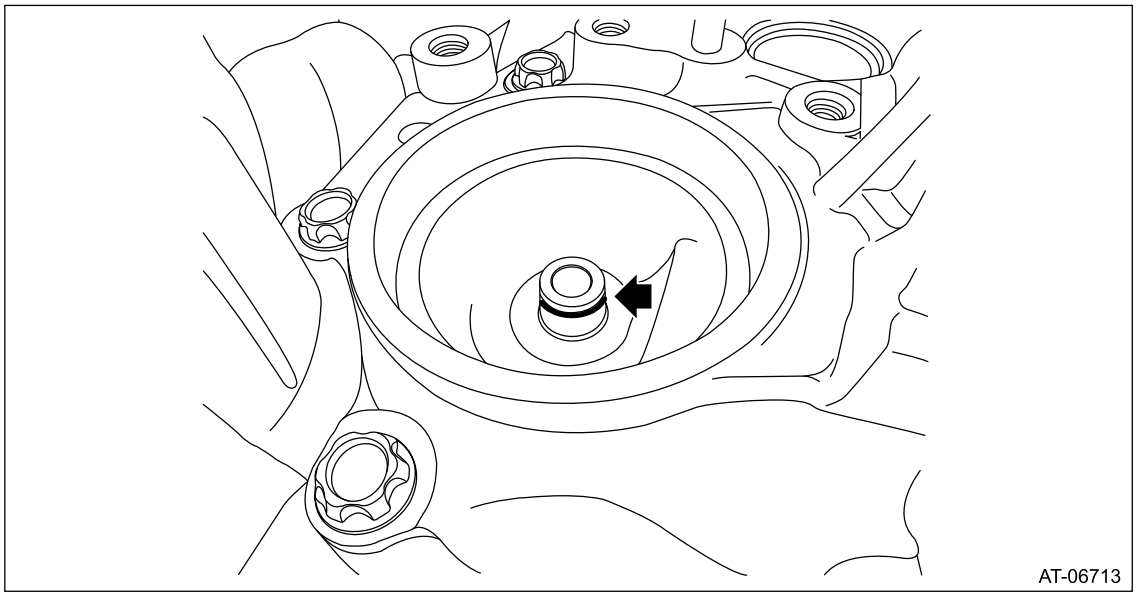
both pulleys and variator chain from scratching.



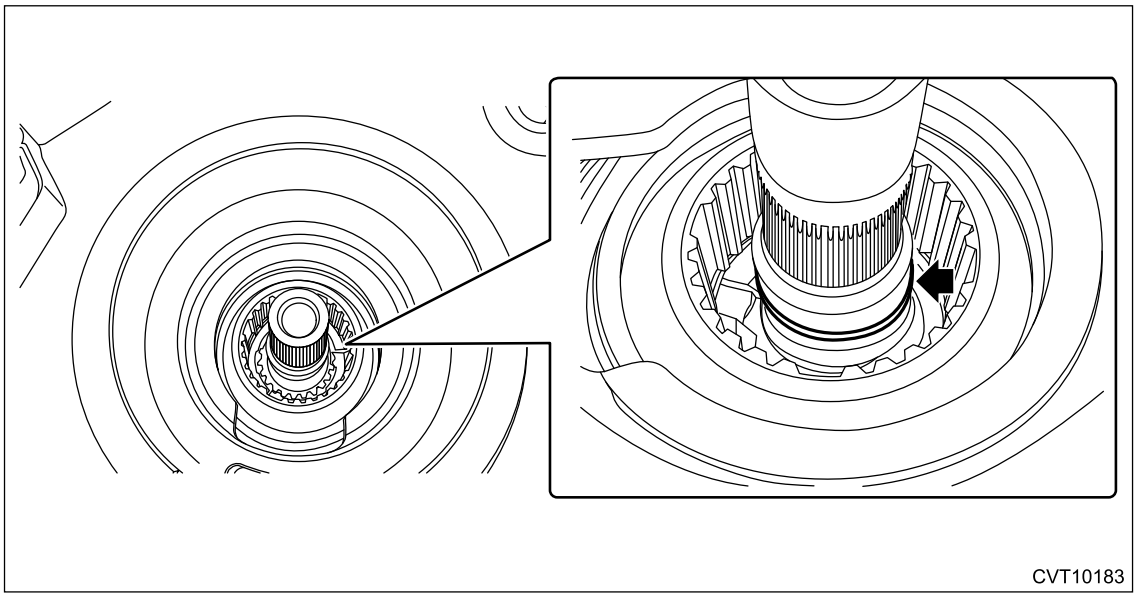
22. Remove the ST (EXPANDER PULLEY) from the secondary pulley.
23. Remove the variator chain from secondary pulley.
24. Remove the secondary pulley mounting bolts, and remove the secondary pulley.



25. Remove the seal ring from drive pinion retainer.



26. Remove the seal ring from the input shaft.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Pulley and Secondary Pulley

INSTALLATION

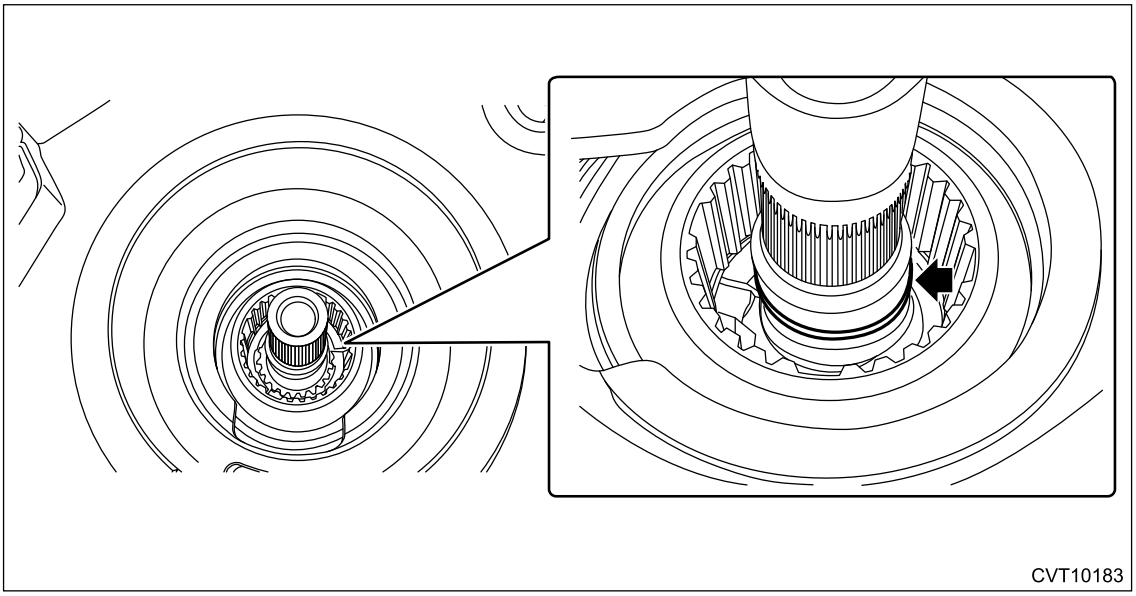
1. Select shims for pulley alignment. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>ADJUSTMENT

TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>ADJUSTMENT:

2. Install the seal ring to the input shaft.

Note:

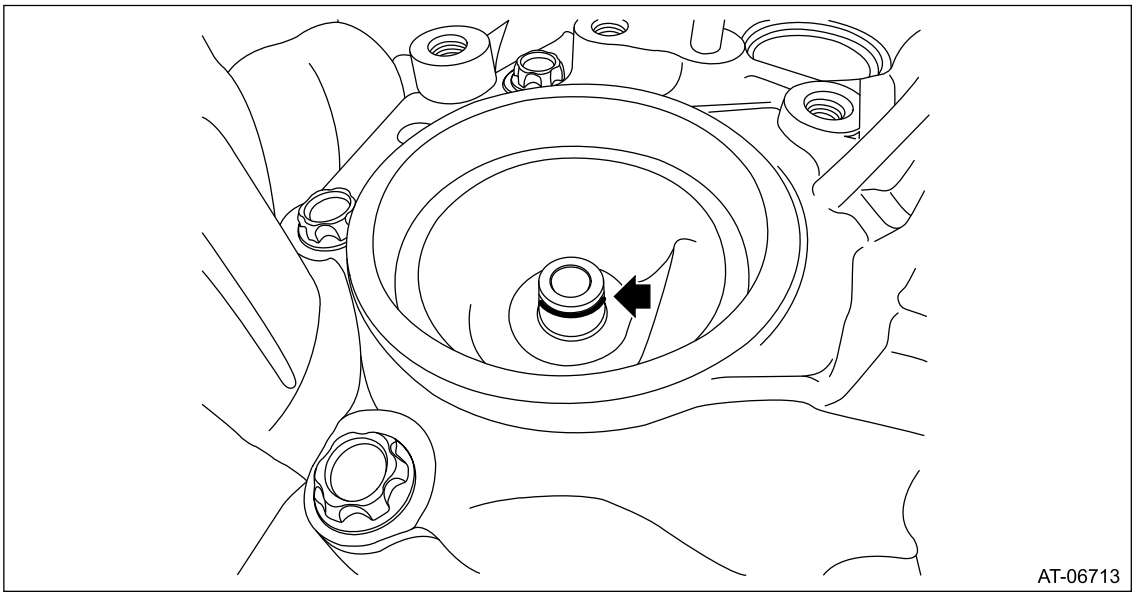
- **Use new seal rings.**
- **When installing the seal rings, do not expand the seal rings too much.**
- **Apply CVTF to the seal rings.**



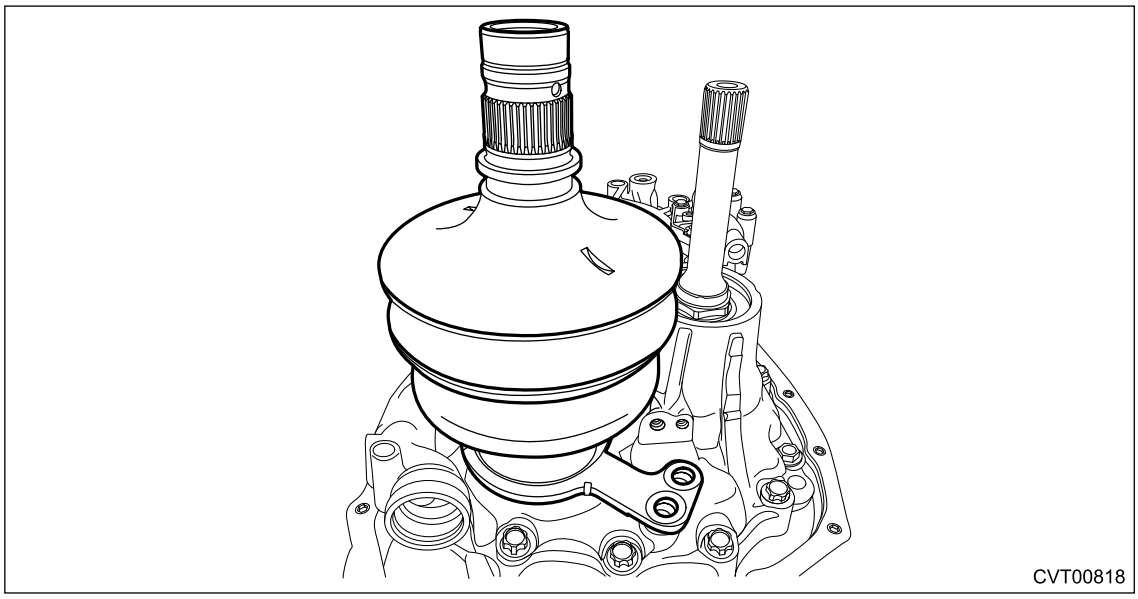
3. Install the seal ring to drive pinion retainer.

Note:

- **Use new seal rings.**
- **Apply CVTF to the seal rings.**



4. Install the selected shims to the primary pulley bearing catch surface.
5. Install the secondary pulley to the drive pinion retainer.

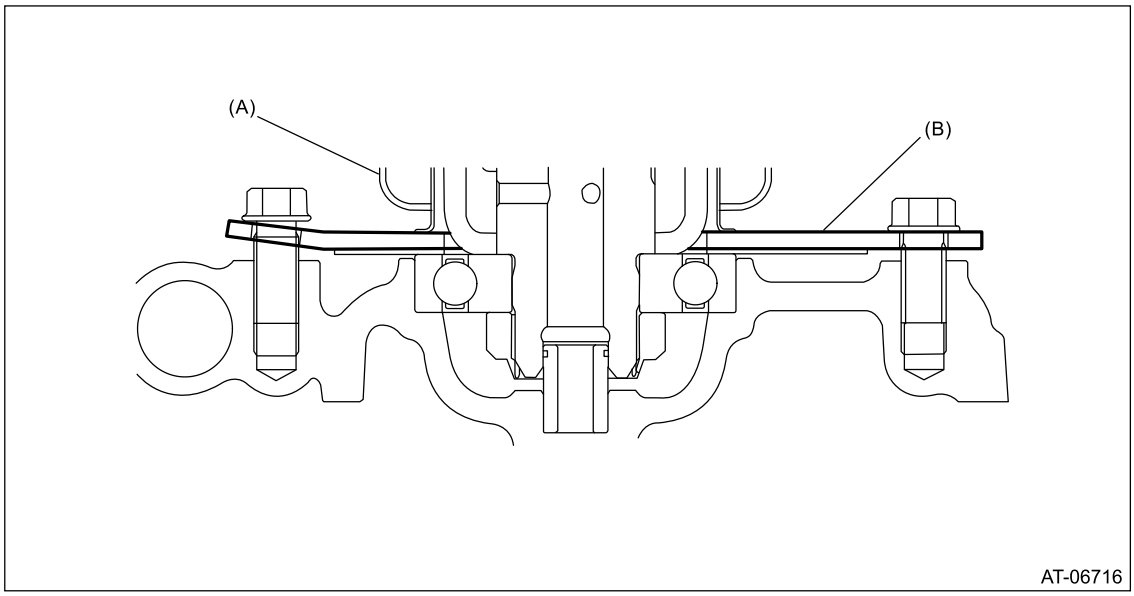


6. Install and tighten the secondary pulley securing bolts.

(1) Tighten the three bolts until the seating surfaces contact the bearing retainer.

Note:

- **Be careful not to tilt the bearing retainer of the secondary pulley.**
- **Apply CVTF to the bolt.**



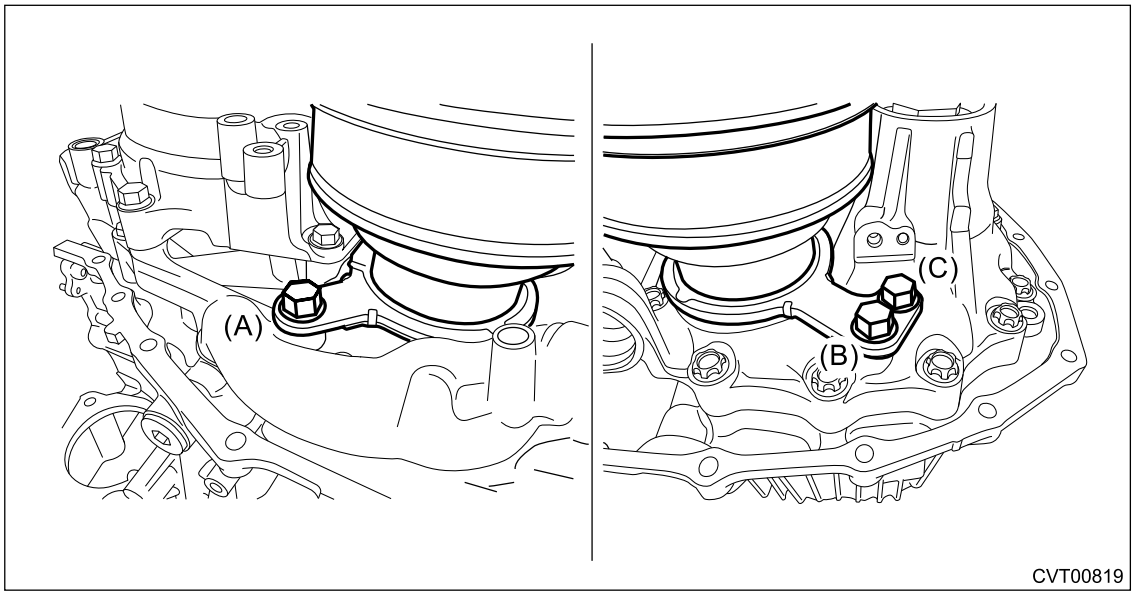
(A) Secondary pulley

(B) Bearing retainer

(2) Tighten the bolts in the order of (A) → (B) → (C) → (B).

Tightening torque:

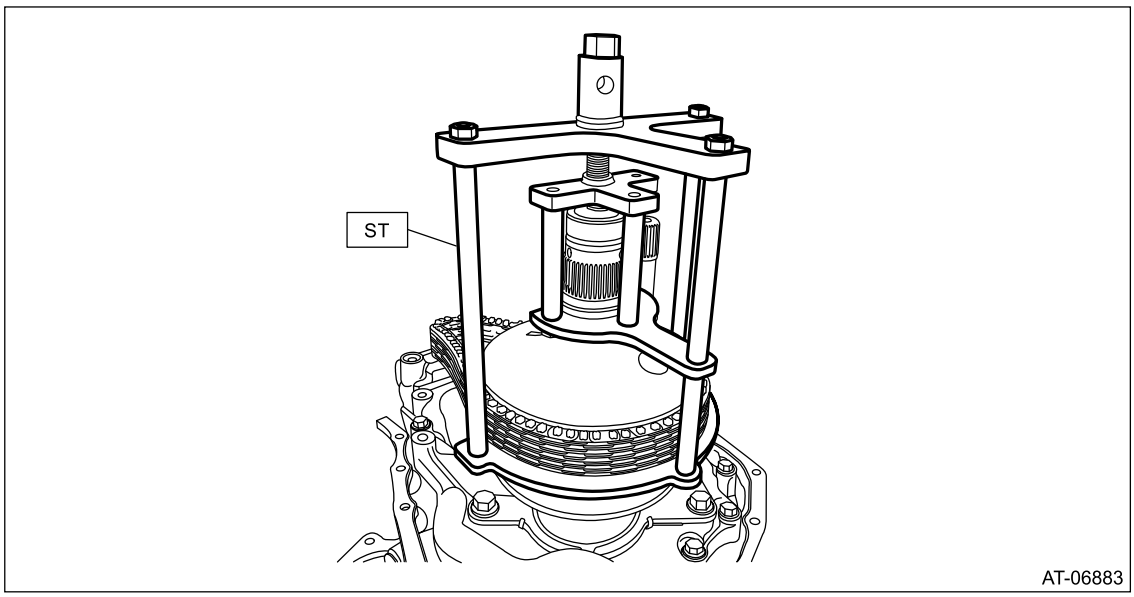
67.5 N·m (6.9 kgf-m, 49.8 ft-lb)



7. Place the variator chain on the V groove of the secondary pulley, and set the ST.

Preparation tool:

ST: EXPANDER PULLEY (18769AA010)



8. Expand the V groove of the secondary pulley.

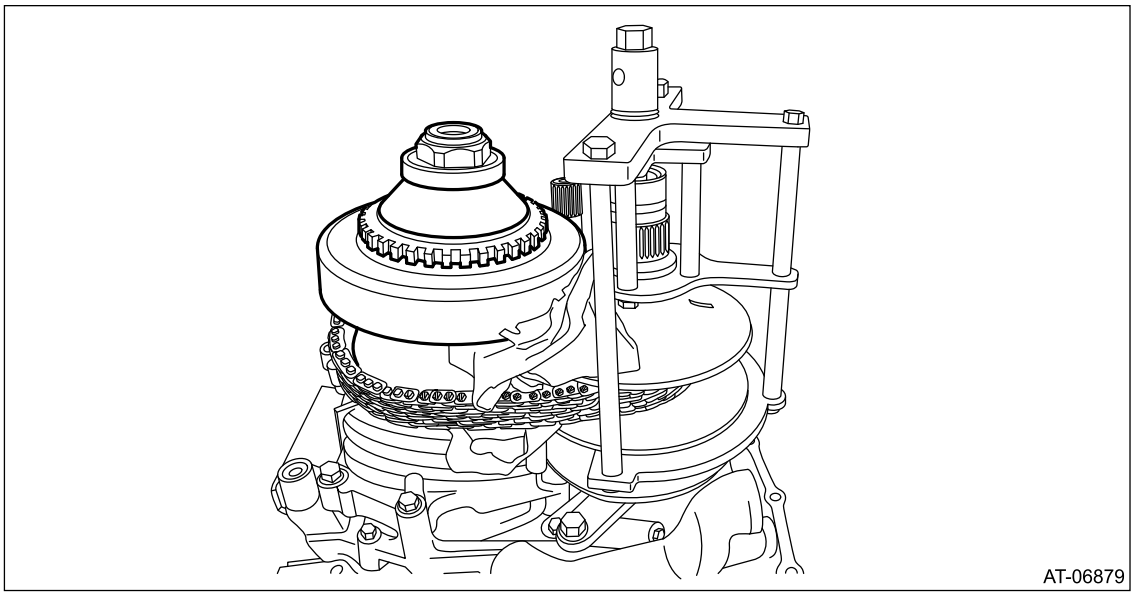
9. Install the primary pulley to the reverse brake housing together with the variator chain.

Caution:

Cover the V grooves of primary pulley and secondary pulley with cloth to protect the both pulleys and variator chain from scratching.

both pulleys and variator chain from scratching.

(1) Intersect the V groove of primary pulley and the V groove of secondary pulley and install the secondary pulley while placing the variator chain on secondary pulley.

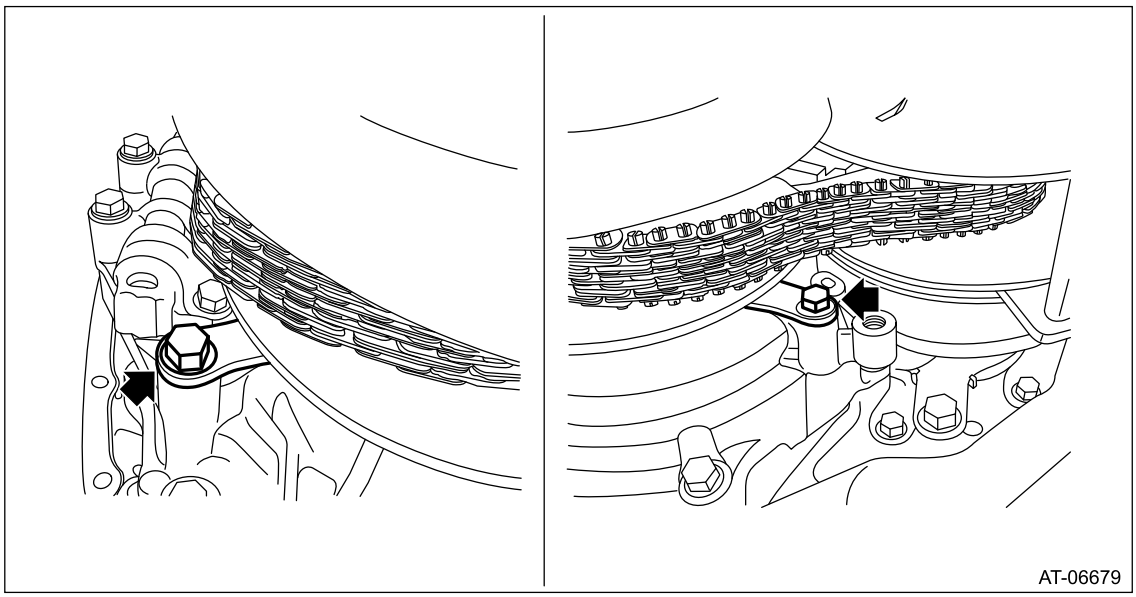


(2) Install the primary pulley to the reverse brake housing so that the bolt hole of primary bearing retainer and the bolt hole of reverse brake housing are aligned.

10. Install the primary pulley bolt.

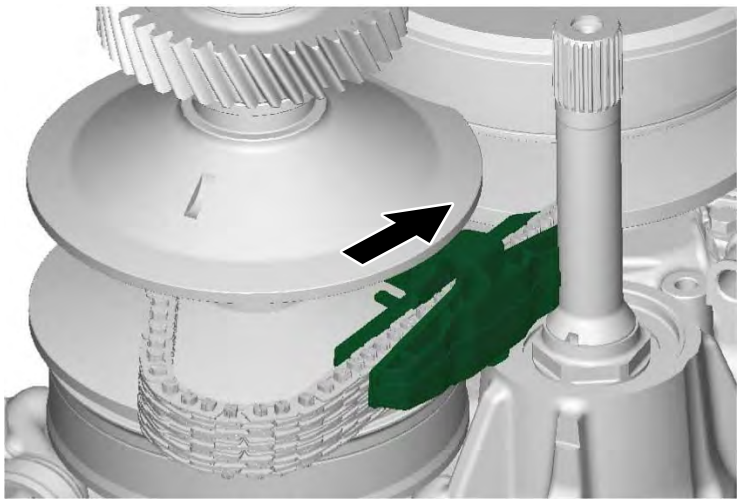
Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)



11. Install the chain guide.

(1) Install the chain guide to the variator chain, and move it to the primary pulley side.



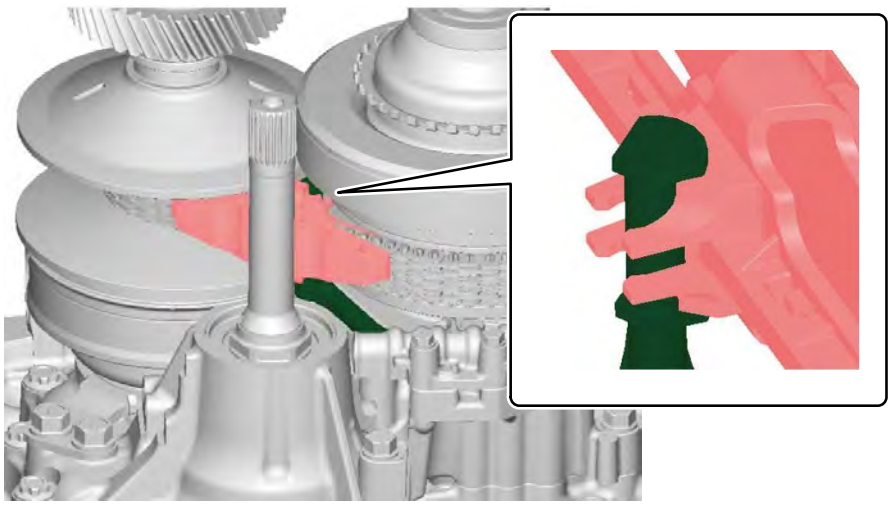
CVT10367

(2) Place the support rod inside of the variator chain.

Caution:

Protect the both pulleys and variator chain from scratching.

(3) While holding the support rod, press the chain guide so that the support rod runs through between the protrusions of chain guide and install the chain guide to the support rod.

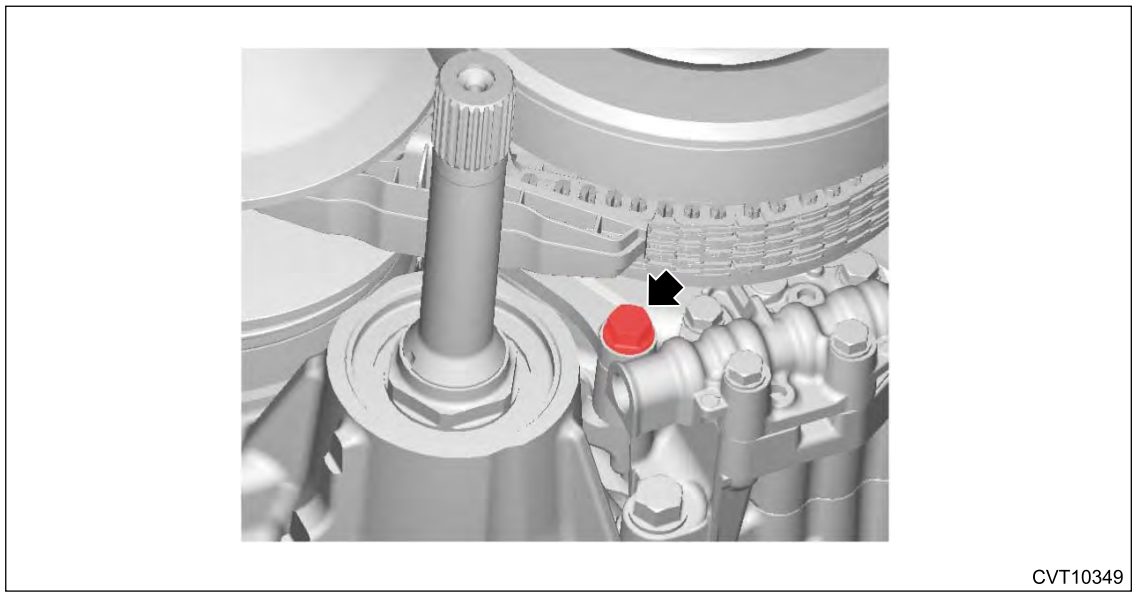


CVT10352

(4) Install the support rod.

Tightening torque:

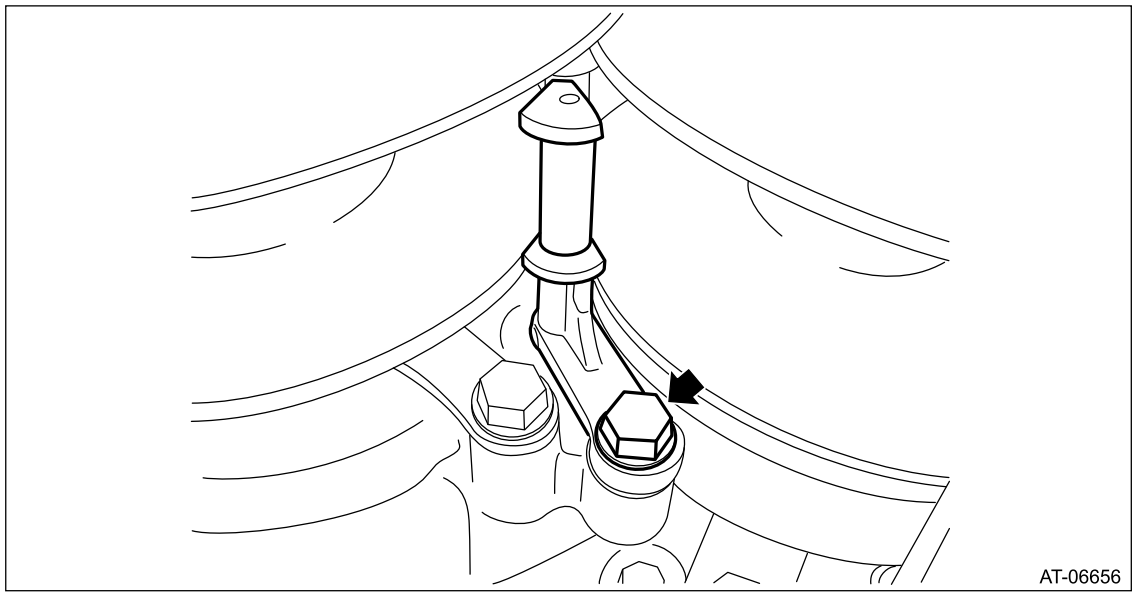
21 N·m (2.1 kgf-m, 15.5 ft-lb)



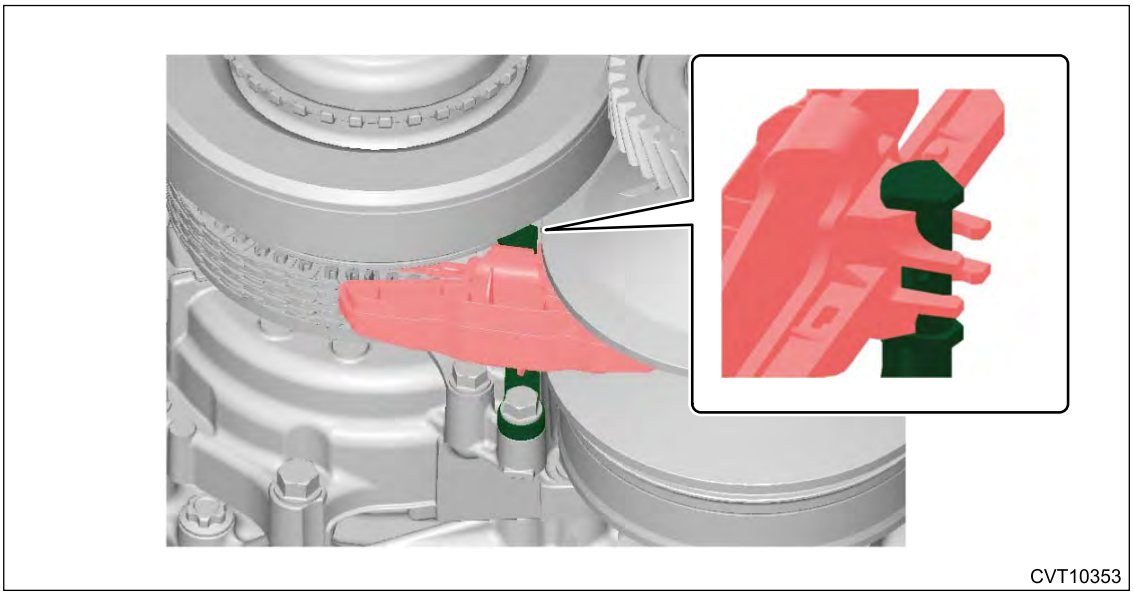
(5) Install the lubrication pipe.

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)



(6) Install the chain guide so that the lubrication pipe runs through between the protrusions of each chain guide. Then remove the ST (PULLEY EXPANDER).



12. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.
13. Select the reduction drive gear shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>ADJUSTMENT.
14. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.
15. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.
16. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
17. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
18. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
19. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
20. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
21. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
22. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
23. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
24. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.

25. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
26. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
27. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
28. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
29. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Pulley and Secondary Pulley

INSPECTION

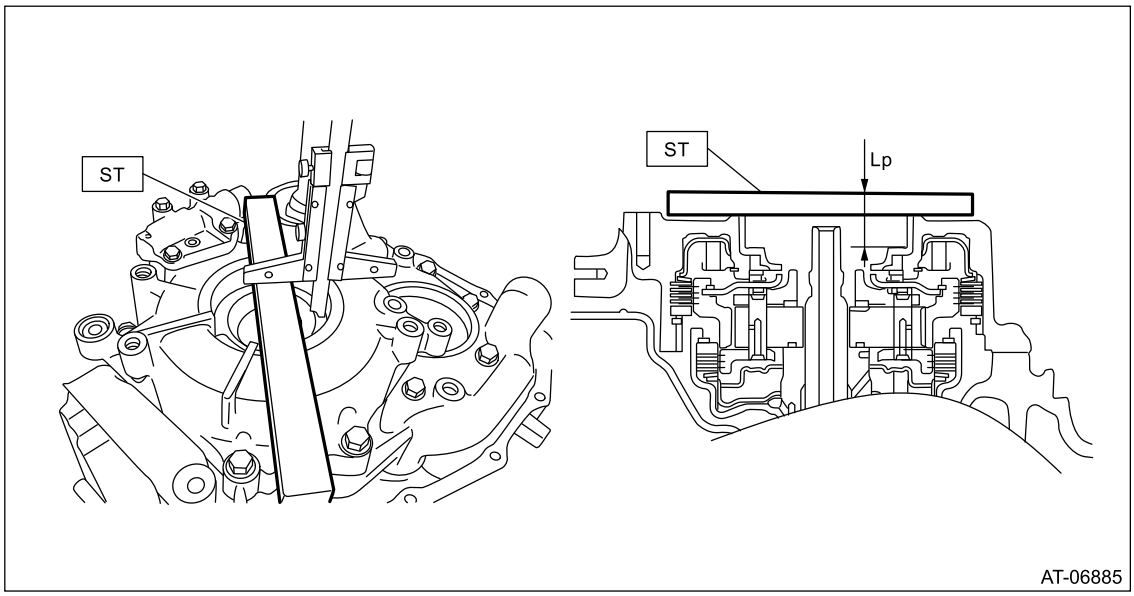
- Check the surface of primary and secondary pulley cones for damage or wear.
- Check the primary and secondary pulley for damage.
- Check the bearing for seizure or wear.
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Primary Pulley and Secondary Pulley

ADJUSTMENT

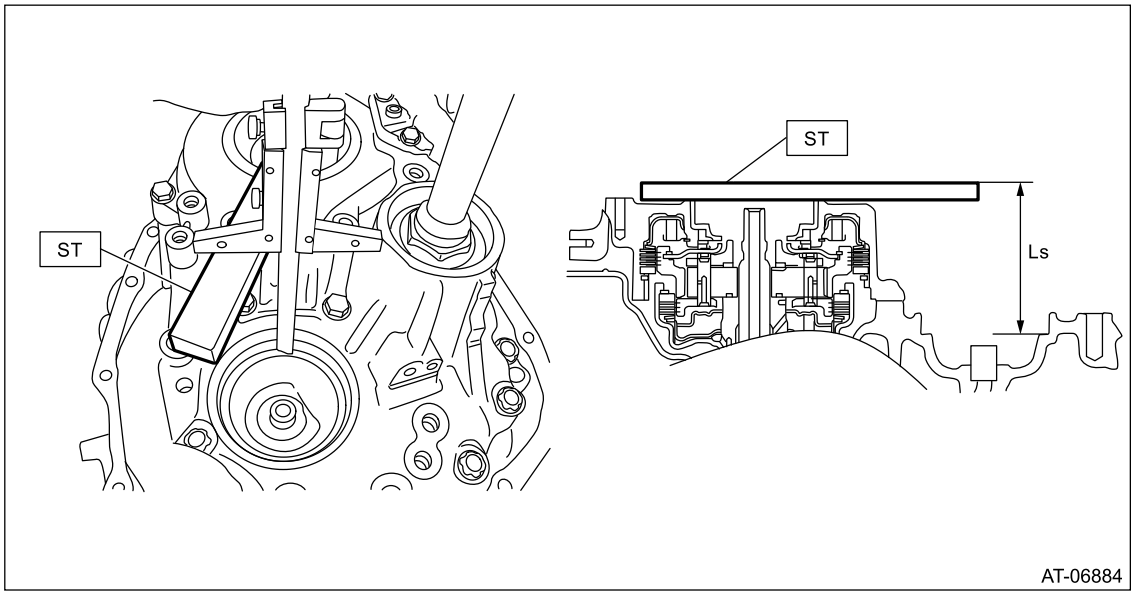
1. PROCEDURE IN REPLACEMENT OF PRIMARY AND SECONDARY PULLEY, OR IN REPLACEMENT OF PRIMARY PULLEY, SECONDARY PULLEY AND VARIATOR CHAIN

1. Measure depth “Lp” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.
   Preparation tool:
   ST: GAUGE (499575400)



2. Measure the depth “Ls” from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.
   Preparation tool:
   ST: GAUGE (499575400)

ST: GAUGE (499575400)



3. Calculate the following formula.
Calculation formula:
T (mm) = B − A + Lp − Ls −31.079
[T (in) = B − A + Lp − Ls −1.224]
T: Pulley alignment
A: Specified primary pulley dimension
B: Specified secondary pulley dimension
Lp: Depth from the ST upper face to the primary pulley bearing catch surface
Ls: Depth from the ST upper face to the secondary pulley bearing catch surface
31.079 mm (1.224 in): Constant

Pulley alignment T mm (in)	**Thickness of shim mm (in)**
-0.05 — 0.049 (-0.002 — 0.002)	No shims
0.050 — 0.149 (0.002 — 0.006)	0.1 (0.004)
0.150 — 0.249 (0.006 — 0.010)	0.2 (0.008)
0.250 — 0.349 (0.010 — 0.014)	0.3 (0.012)
0.350 — 0.449 (0.014 — 0.018)	0.4 (0.016)
0.450 — 0.549 (0.018 — 0.022)	0.5 (0.020)
0.550 — 0.649 (0.022 — 0.026)	0.6 (0.024)
0.650 — 0.749 (0.026 — 0.029)	0.7 (0.028)
0.750 — 0.849 (0.029 — 0.033)	0.8 (0.031)
0.850 — 0.949 (0.033 — 0.037)	0.9 (0.035)
0.950 — 1.049 (0.037 — 0.041)	1.0 (0.039)
1.050 — 1.149 (0.041 — 0.045)	1.1 (0.043)

1.050 1.149 (0.041 0.045)	1.1 (0.043)

4. Select one to two shims so that the total thickness meets the value obtained from step 3).

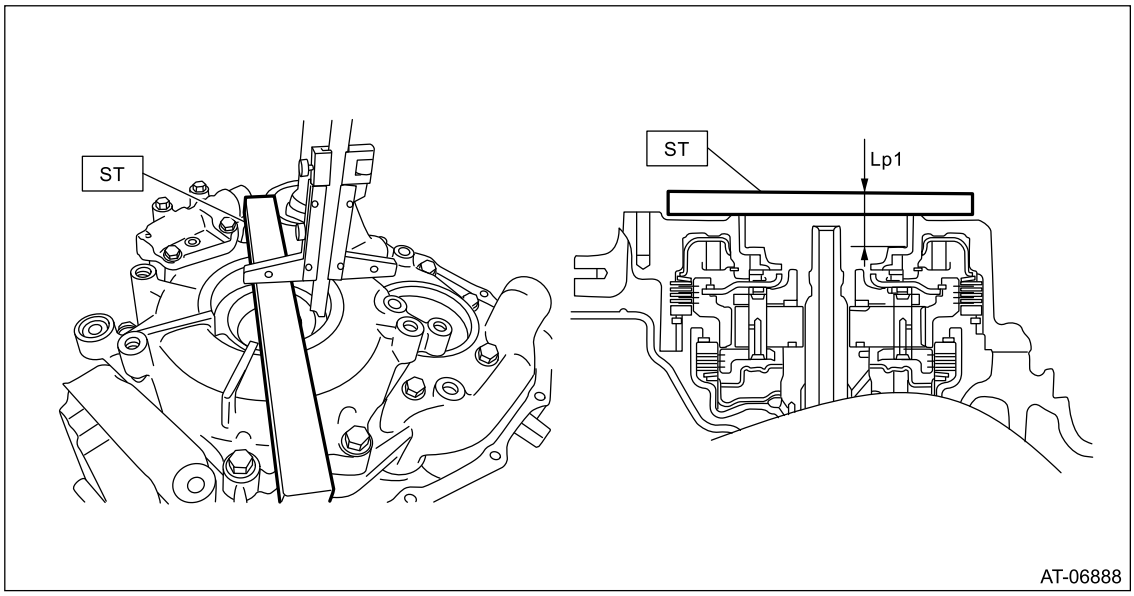
Part No.	Shim thickness mm (in)
32451AA050	0.1 (0.004)
32451AA060	0.2 (0.008)
32451AA070	0.3 (0.012)
32451AA080	0.4 (0.016)
32451AA090	0.5 (0.020)
Part No.	**Shim thickness mm (in)**
32451AA100	0.6 (0.024)

2. PROCEDURE WHEN REPLACING ONLY DRIVE PINION RETAINER OR REVERSE BRAKE HOUSING

1. Clean the mating surface of current drive pinion retainer and converter case.
2. Measure and record the shim thickness that is attached on the current reverse brake housing.
3. Using the current drive pinion retainer, measure depth “Lp1” from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.

   Preparation tool:

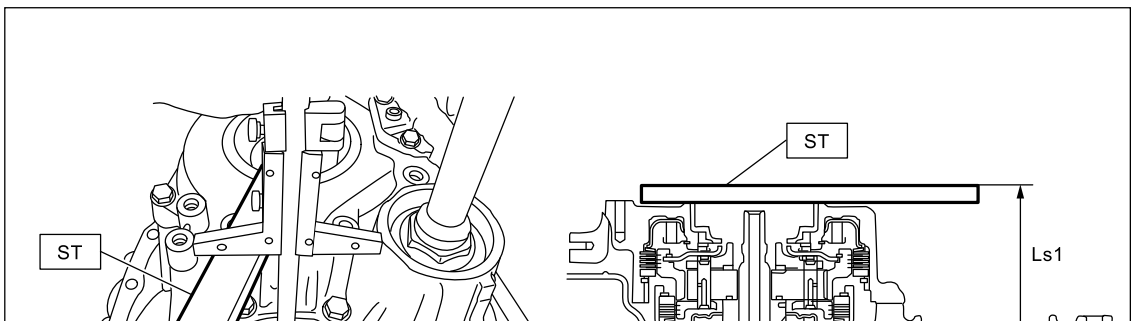
   ST: GAUGE (499575400)

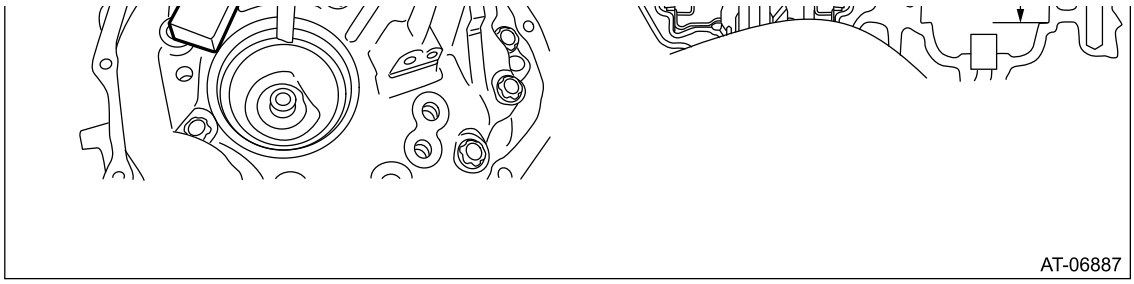


4. Using the current drive pinion retainer or current reverse brake housing, measure the depth “Ls1” from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.

   Preparation tool:

   ST: GAUGE (499575400)





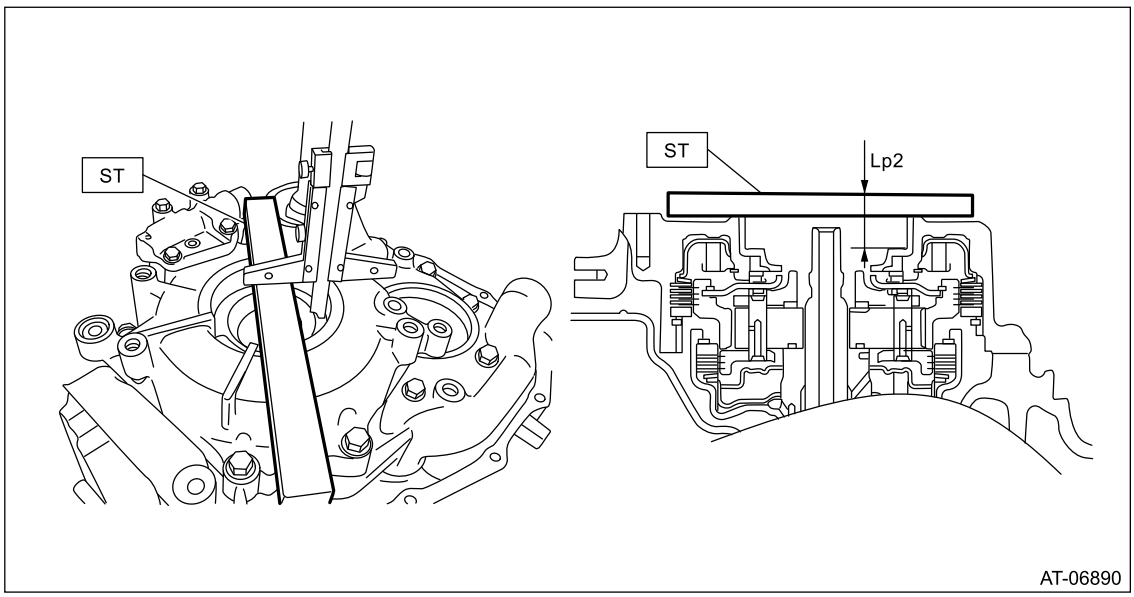
5. Calculate the "LD1" using the following formula and record it.

Calculation formula:
LD1 mm (in) = Ls1 − Lp1
LD1: Height from the primary pulley bearing catch surface to the secondary pulley bearing catch surface
Lp1: Depth from the ST upper face to the primary pulley bearing catch surface
Ls1: Depth from the ST upper face to the secondary pulley bearing catch surface

6. Using the new drive pinion retainer or new reverse brake housing, measure the depth "Lp2" from the ST upper face to the primary pulley bearing catch surface at several points and calculate the average.

Preparation tool:

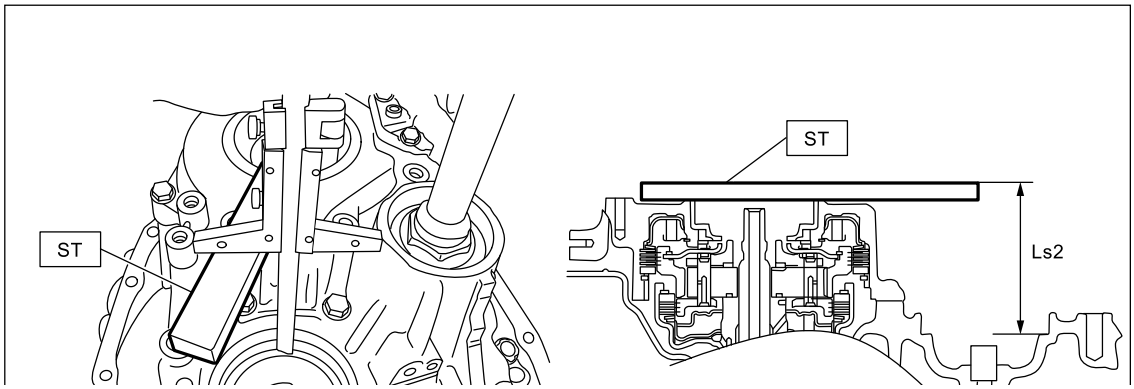
ST: GAUGE (499575400)

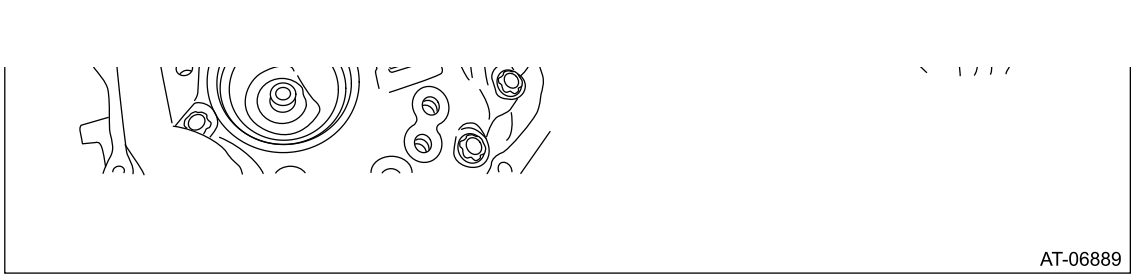


7. Using the new drive pinion retainer or new reverse brake housing, measure depth "Ls2" from the ST upper face to the secondary pulley bearing catch surface at several points and calculate the average.

Preparation tool:

ST: GAUGE (499575400)





8. Calculate the "LD2" using the following formula and record it.
   Calculation formula:

   LD2 mm (in) = Ls2 − Lp2
   LD2: Height from the primary pulley bearing catch surface to the secondary pulley bearing catch surface
   Lp2: Depth from the ST upper face to the primary pulley bearing catch surface
   Ls2: Depth from the ST upper face to the secondary pulley bearing catch surface
9. Calculate the recorded values of "LD1" and "LD2" to obtain the positive number to select the shims.
   Calculation formula: T1 mm (in) = LD1 − LD2 or T2 mm (in) = LD2 − LD1
   T1, T2: Difference between new drive pinion retainer or new reverse brake housing and current drive pinion retainer or current reverse brake housing
   LD1: Calculated value of current drive pinion retainer or current reverse brake housing
   LD2: Calculated value of new drive pinion retainer or new reverse brake housing

Difference of the case (T1) mm (in)	Shim selection procedure
0 — 0.050 (0 — 0.00197)	Select a new shim of the same thickness with the shim that is used on the primary pulley side of the current reverse brake housing.
0.051 — 0.150 (0.00201 — 0.00591)	Select a shim which is 0.1 mm (0.004 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.151 — 0.250 (0.00594 — 0.00984)	Select a shim which is 0.2 mm (0.008 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.251 — 0.350 (0.00988 — 0.01378)	Select a shim which is 0.3 mm (0.012 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.351 — 0.450 (0.01382 — 0.01772)	Select a shim which is 0.4 mm (0.016 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.451 — 0.550 (0.01776 — 0.02165)	Select a shim which is 0.5 mm (0.020 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.
0.551 — 0.600 (0.02169 — 0.02362)	Select a shim which is 0.6 mm (0.024 in) thicker than the shim that is used on the primary pulley side of the current reverse brake housing.

Difference of the case (T2) mm (in)	Shim selection procedure
0 — 0.050 (0 — 0.00197)	Select a new shim of the same thickness with the shim that is used on the primary pulley side of the current reverse brake housing.
0.051 — 0.150 (0.00201 — 0.00591)	Select a shim which is 0.1 mm (0.004 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.151 — 0.250 (0.00594 — 0.00984)	Select a shim which is 0.2 mm (0.008 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.251 — 0.350 (0.00988 — 0.01378)	Select a shim which is 0.3 mm (0.012 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.351 — 0.450 (0.01382 — 0.01772)	Select a shim which is 0.4 mm (0.016 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.451 — 0.550 (0.01776	Select a shim which is 0.5 mm (0.020 in) thinner than the shim that is

0.451 — 0.550 (0.01776 — 0.02165)	Select a shim which is 0.5 mm (0.020 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.
0.551 — 0.600 (0.02169 — 0.02362)	Select a shim which is 0.6 mm (0.024 in) thinner than the shim that is used on the primary pulley side of the current reverse brake housing.

Part No.	Shim thickness mm (in)
32451AA050	0.1 (0.004)
32451AA060	0.2 (0.008)

Part No.	Shim thickness mm (in)
32451AA070	0.3 (0.012)
32451AA080	0.4 (0.016)
32451AA090	0.5 (0.020)
32451AA100	0.6 (0.024)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Variator Chain

REMOVAL

For removal of variator chain, refer to “Primary Pulley and Secondary Pulley”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Variator Chain

INSTALLATION

For installation of variator chain, refer to “Primary Pulley and Secondary Pulley”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Variator Chain

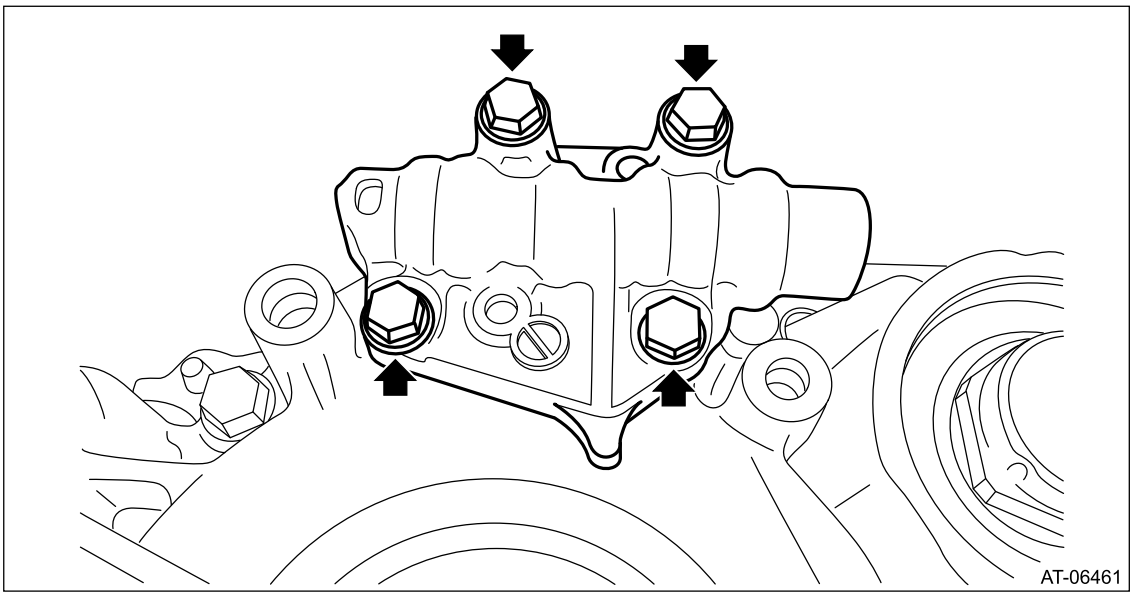
INSPECTION

Check the variator chain for damage and wear.

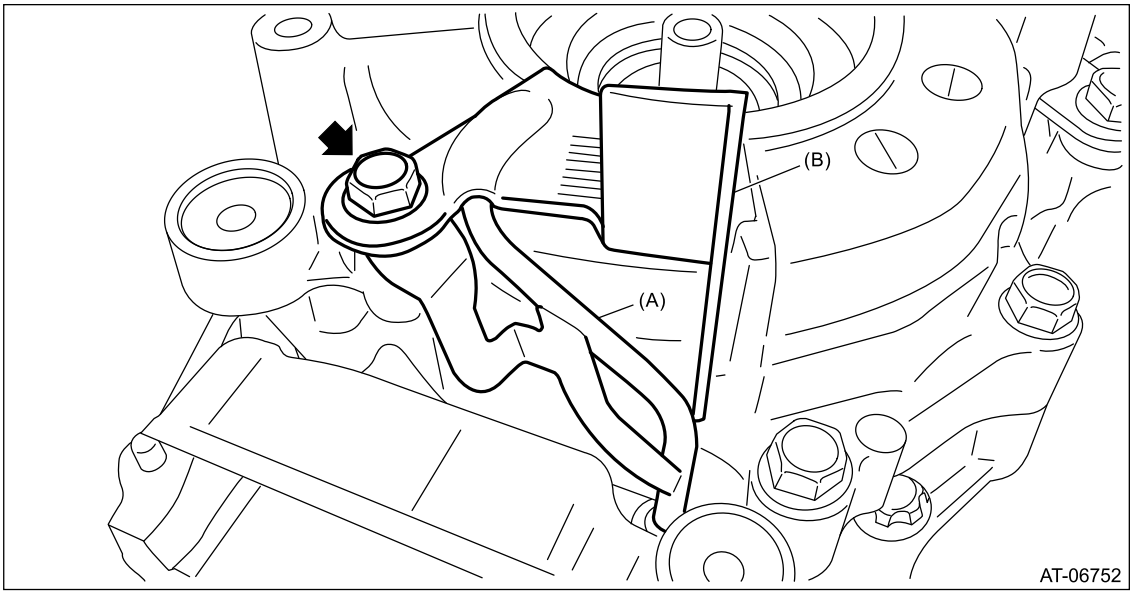
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reverse Brake Assembly

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.
17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.
18. Remove the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.
19. Remove the manual valve assembly.



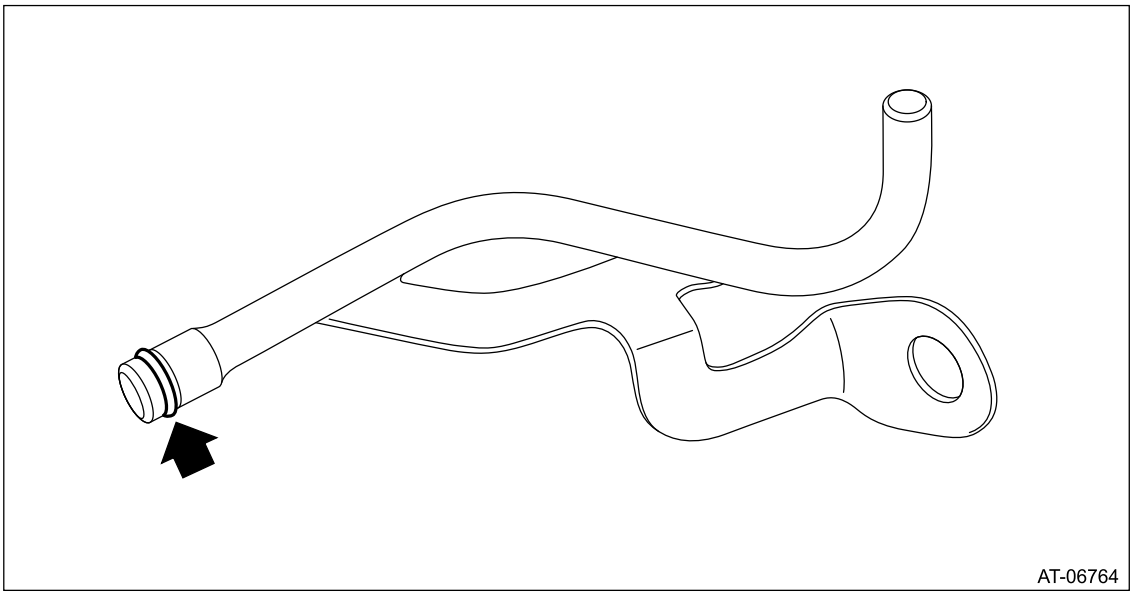
20. Remove the oil guide and lubrication pipe.



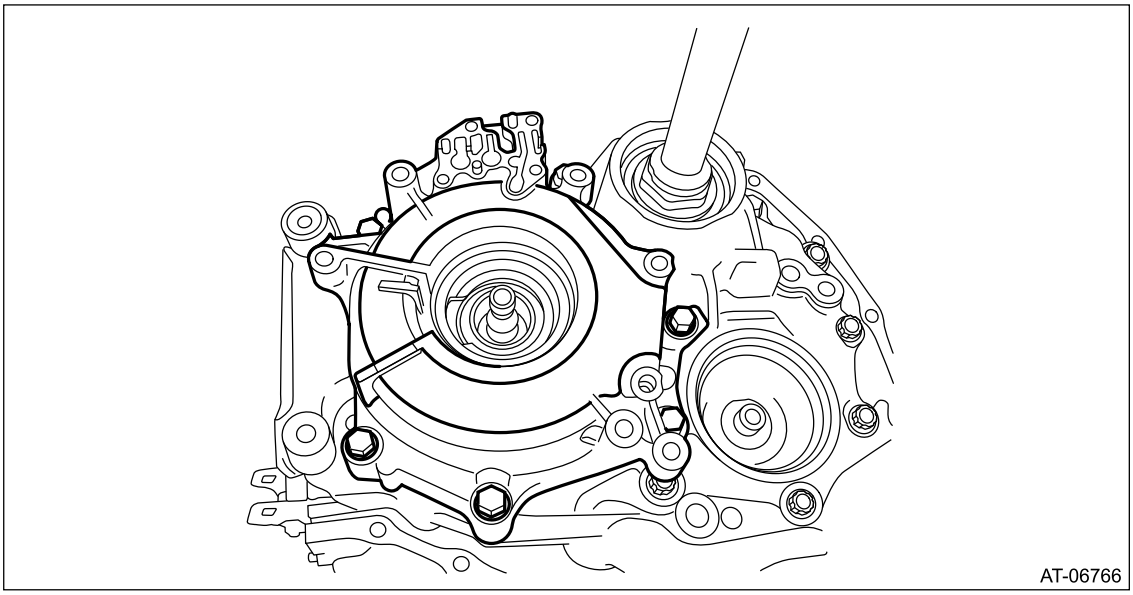
(A) Lubrication pipe

(B) Oil guide

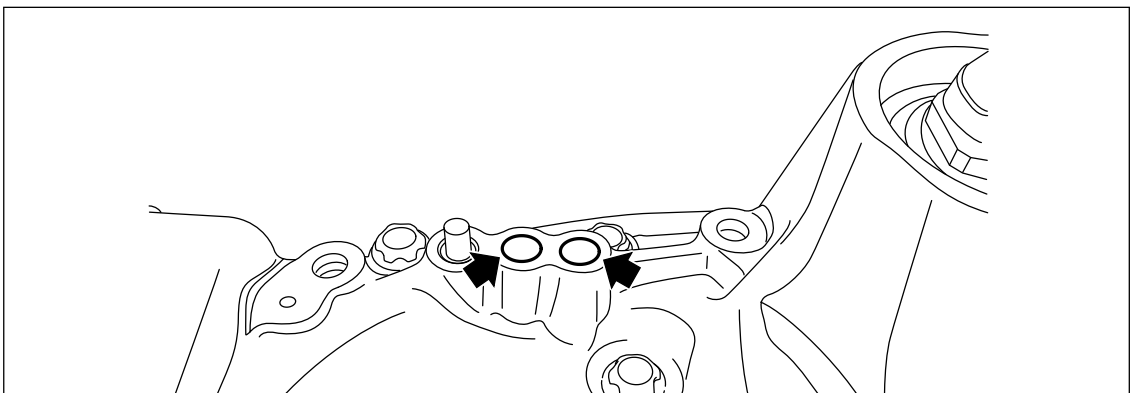
21. Remove the O-ring from lubrication pipe.

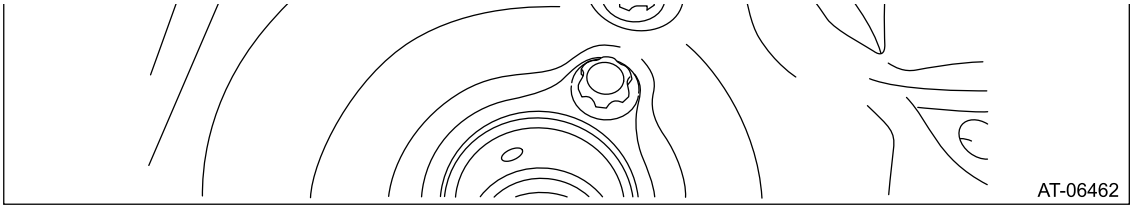


22. Remove the reverse brake assembly.



23. Remove the O-rings.

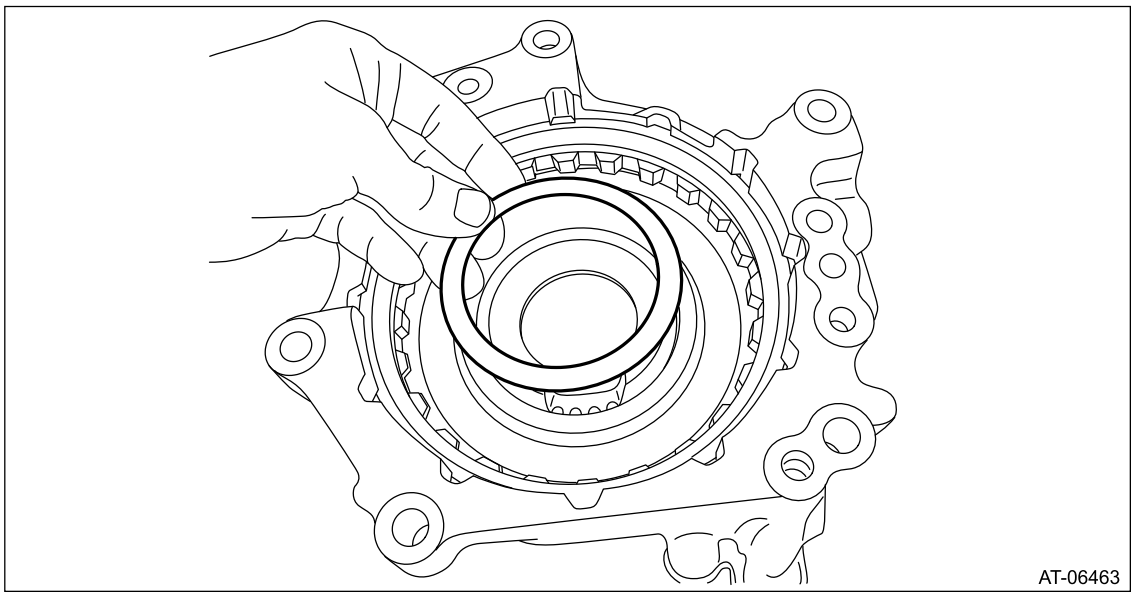




CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reverse Brake Assembly

INSTALLATION

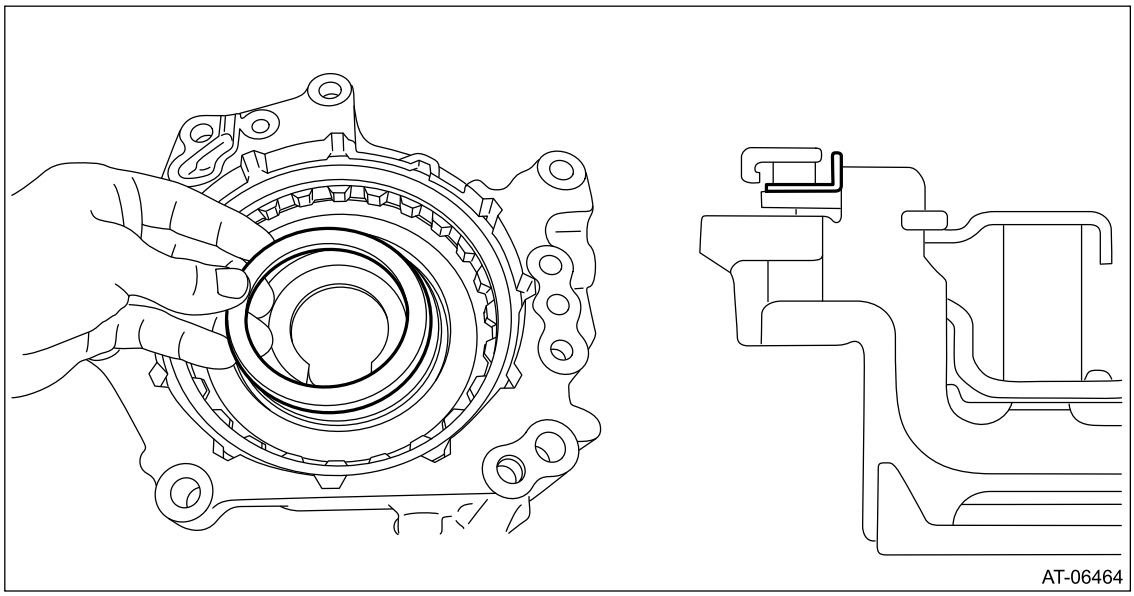
1. Select a washer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>ADJUSTMENT.
2. Install the selected washer to the reverse brake housing.



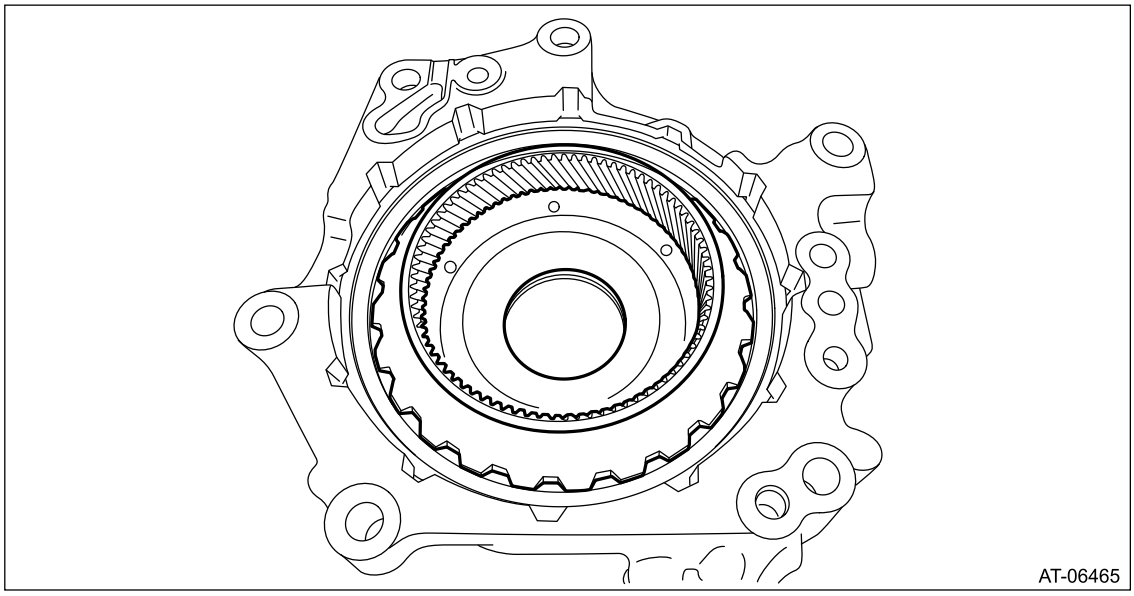
3. Install the thrust bearing to the reverse brake housing.

Note:

Face the temper color surface to the reverse brake side.



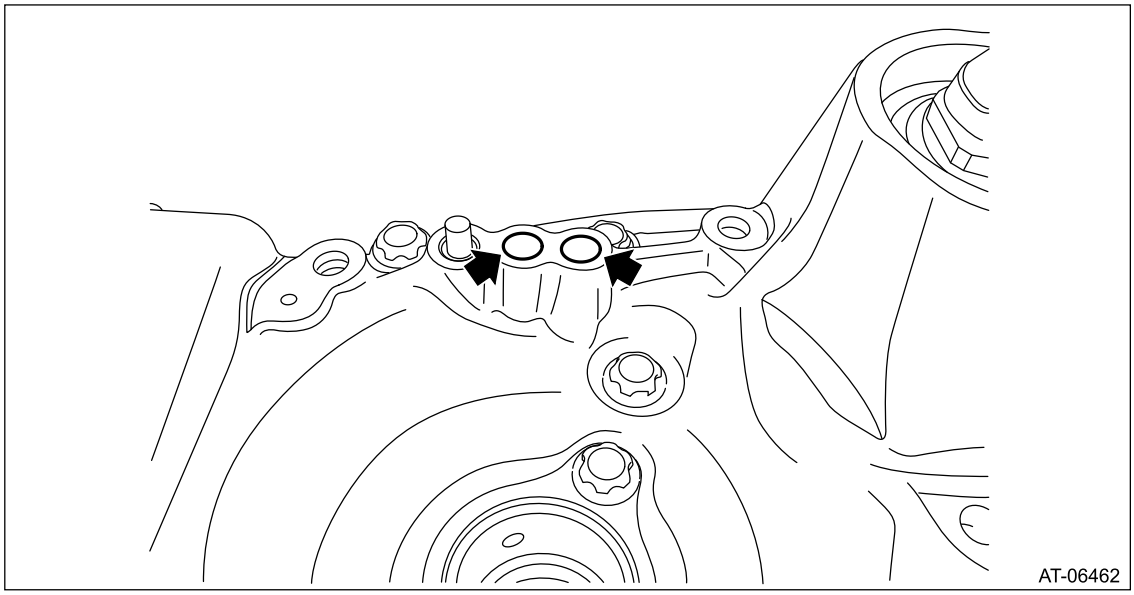
4. Remove the internal gear from the forward clutch assembly, and install it to the reverse brake housing.



5. Install the O-rings.

Note:

- **Install a new O-ring.**
- **Apply CVTF to the O-rings.**



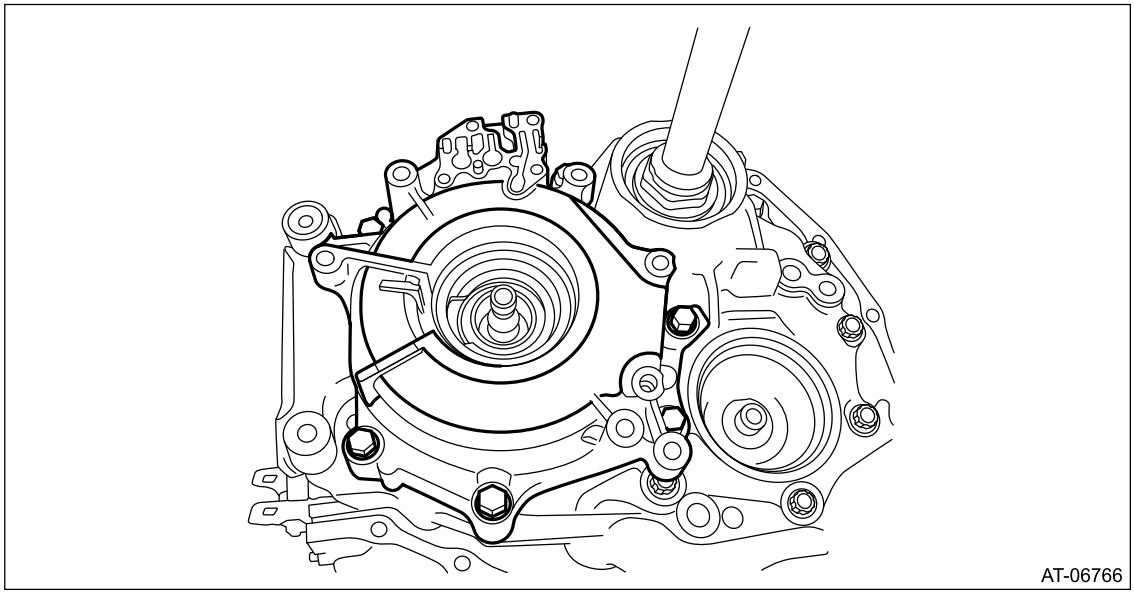
6. Install the reverse brake assembly and internal gear as a unit to the drive pinion retainer.

Note:

Slowly rotate the input shaft by hand to engage the internal gear and pinion gear of planetary carrier.

Tightening torque:

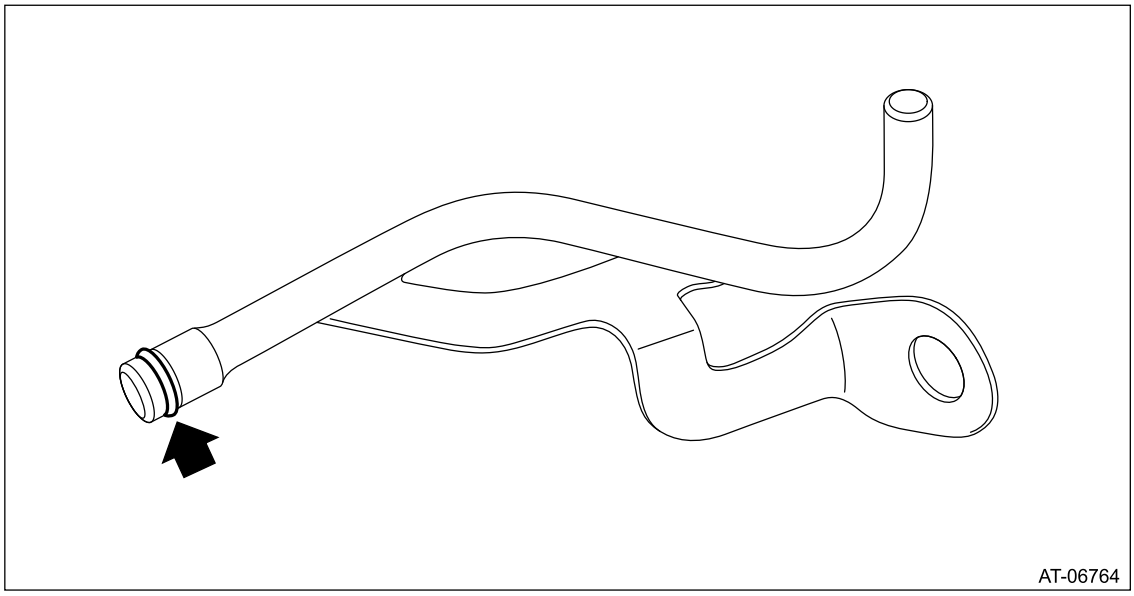
37 N·m (3.8 kgf-m, 27.3 ft-lb)



7. Install the O-ring to the lubrication pipe.

Note:

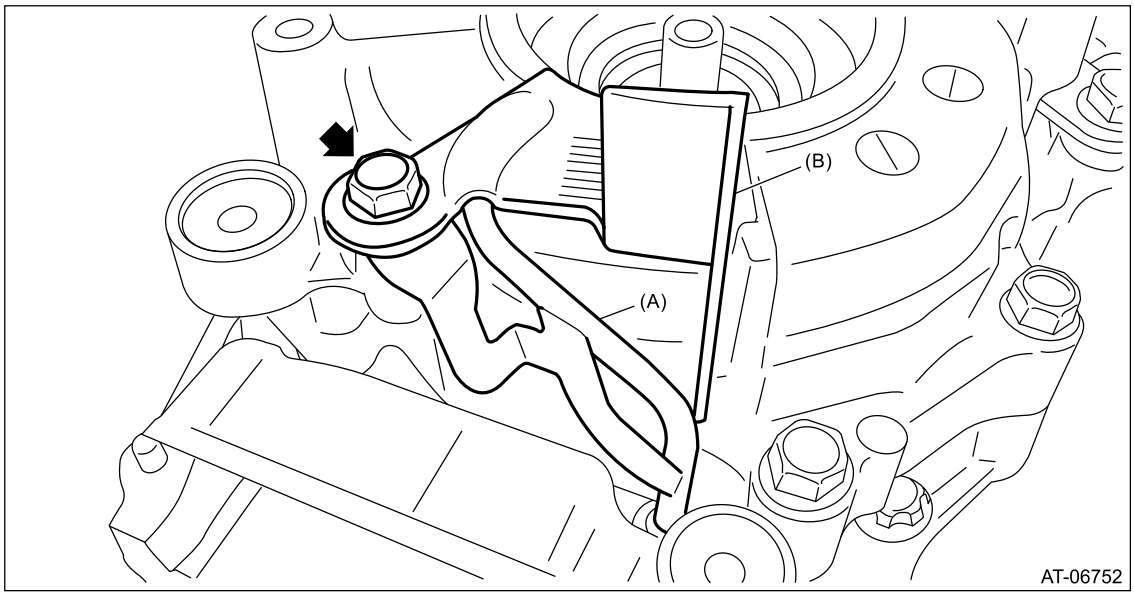
- **Install a new O-ring.**
- **Apply CVTF to the O-rings.**



8. Install the lubrication pipe and oil guide.

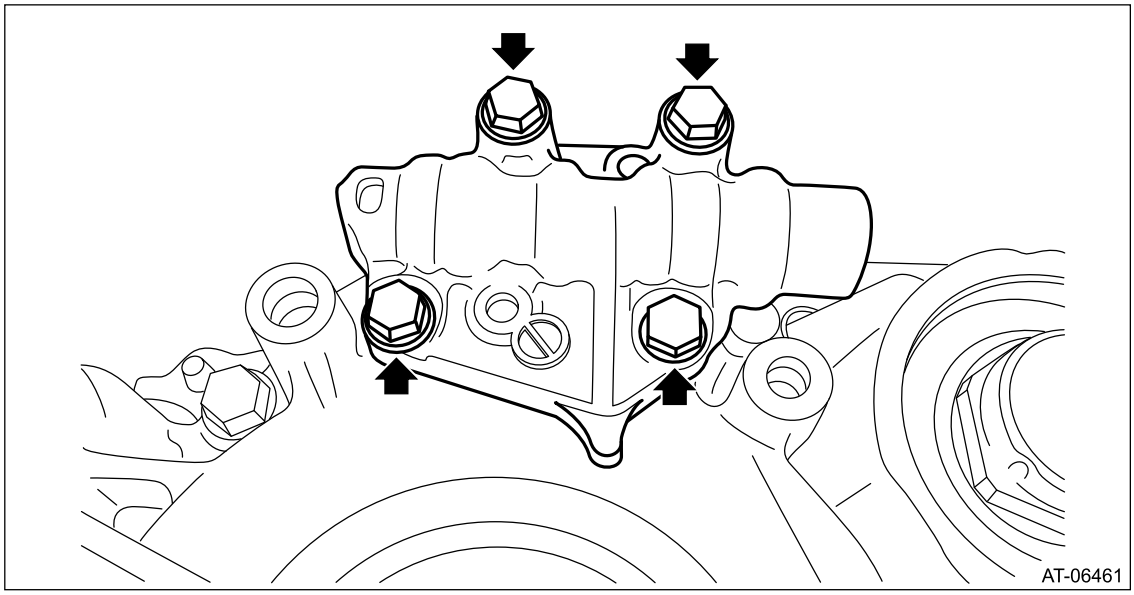
Tightening torque:

16 N·m (1.6 kgf-m, 11.8 ft-lb)



(A) Lubrication pipe
(B) Oil guide

9. Install the manual valve assembly and separator plate.
Tightening torque:
9 N·m (0.9 kgf-m, 6.6 ft-lb)



10. Install the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.
11. Select shims for pulley alignment. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>ADJUSTMENT.
12. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.
13. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.

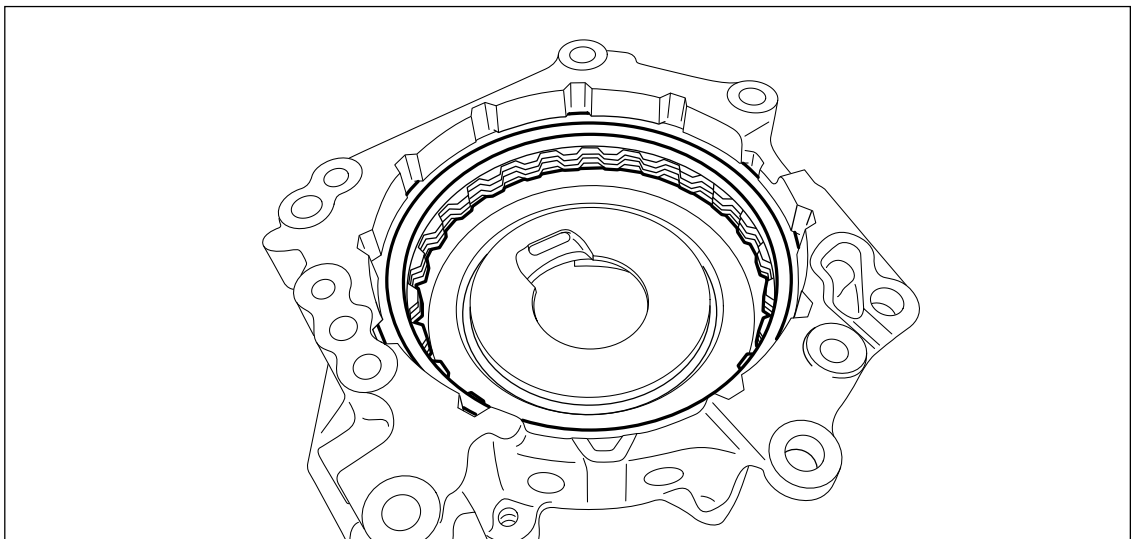
14. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.
15. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.

16. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
17. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
18. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
19. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
20. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
21. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
22. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
23. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
24. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
25. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
26. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
27. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
28. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reverse Brake Assembly

DISASSEMBLY

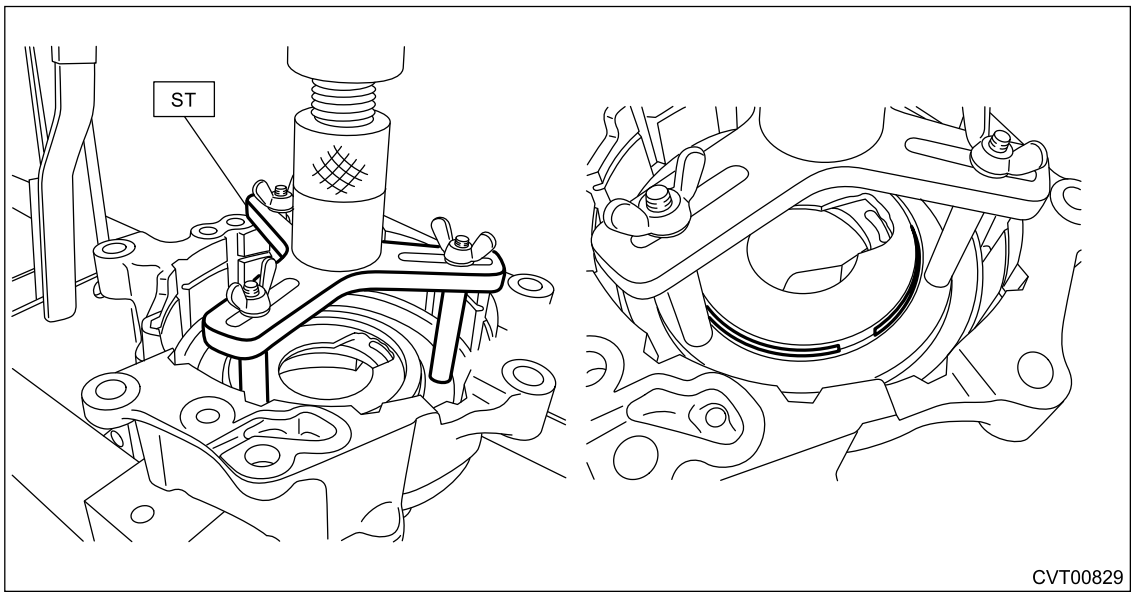
1. Remove the snap ring.
2. Remove the retaining plate, drive plate, driven plate and dish plate.



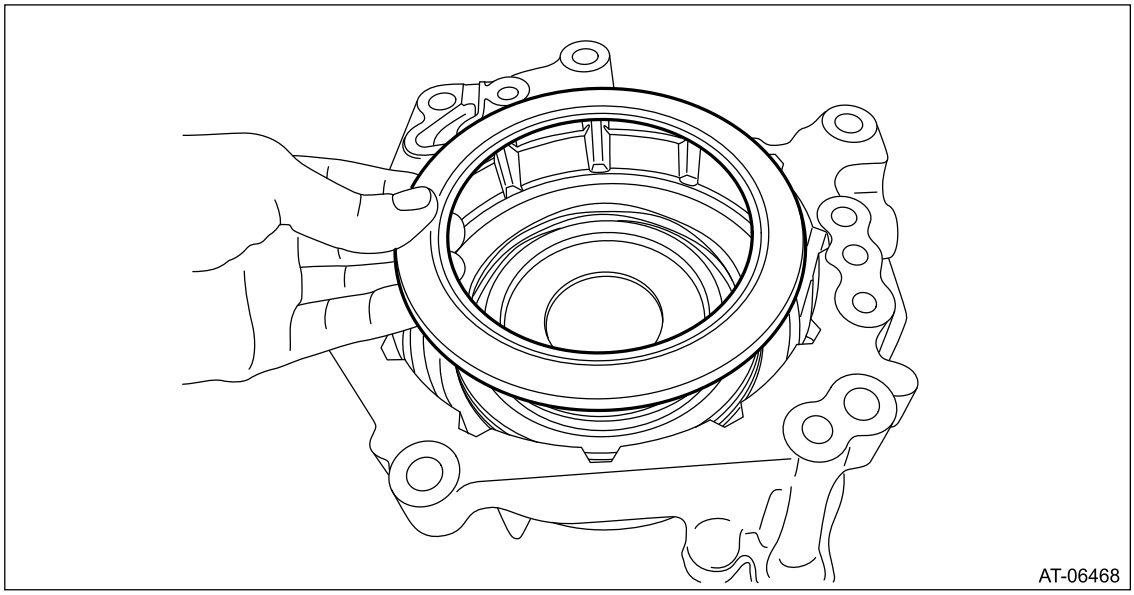


3. Compress the return spring using the ST to remove the snap ring.
Preparation tool:

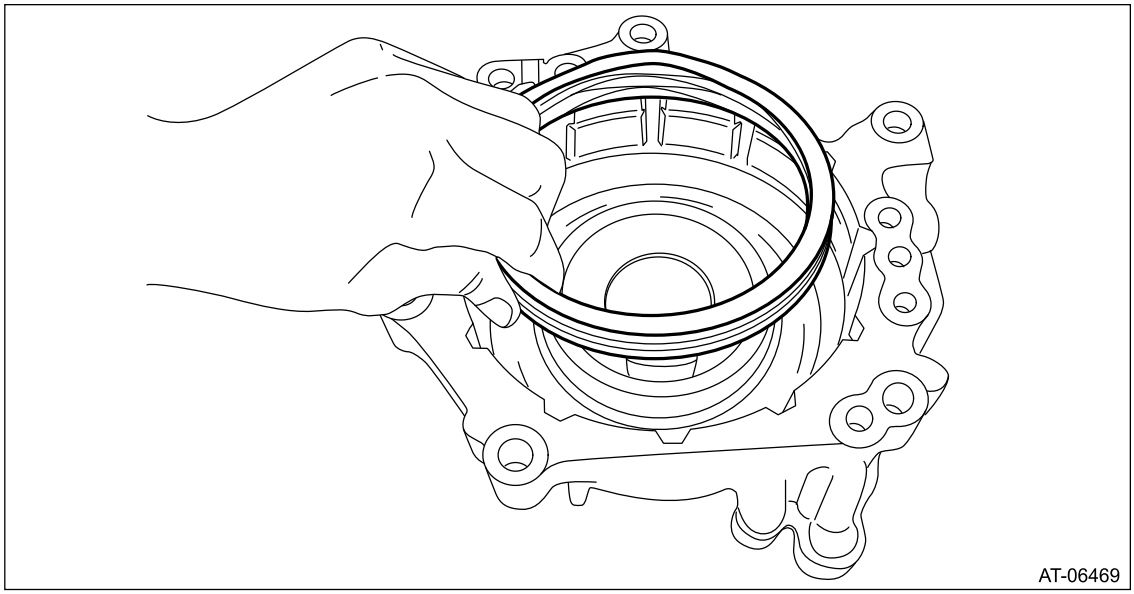
ST: COMPRESSOR SPECIAL TOOL (18762AA001)



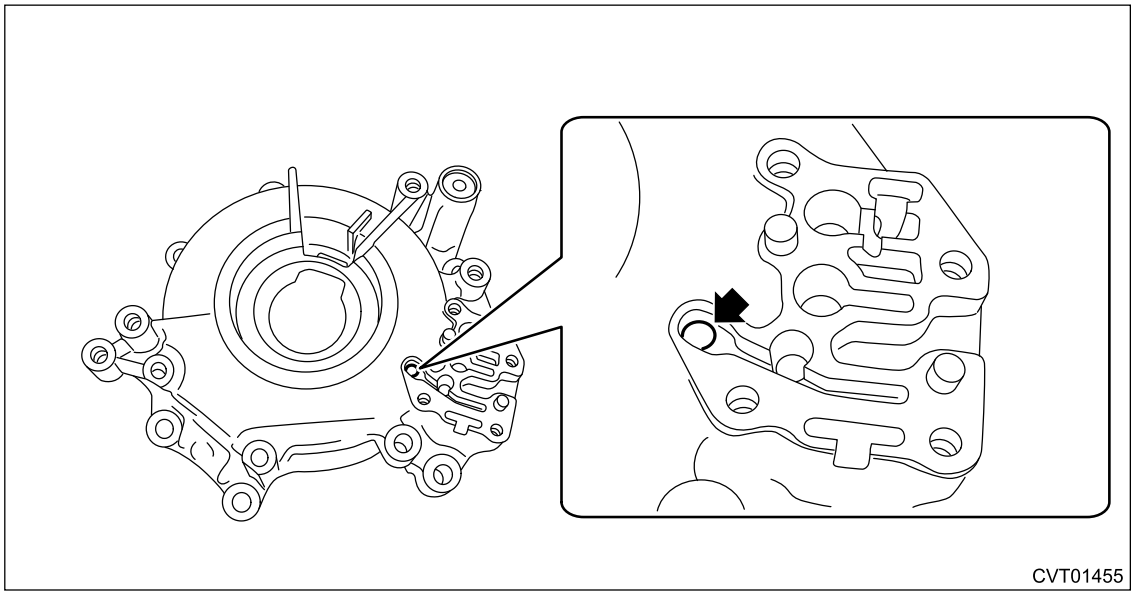
4. Using the ST, remove the snap ring and spring retainer.



5. Remove the return spring.



6. Remove the reverse brake piston by blowing compressed air intermittently from reverse brake housing hole.



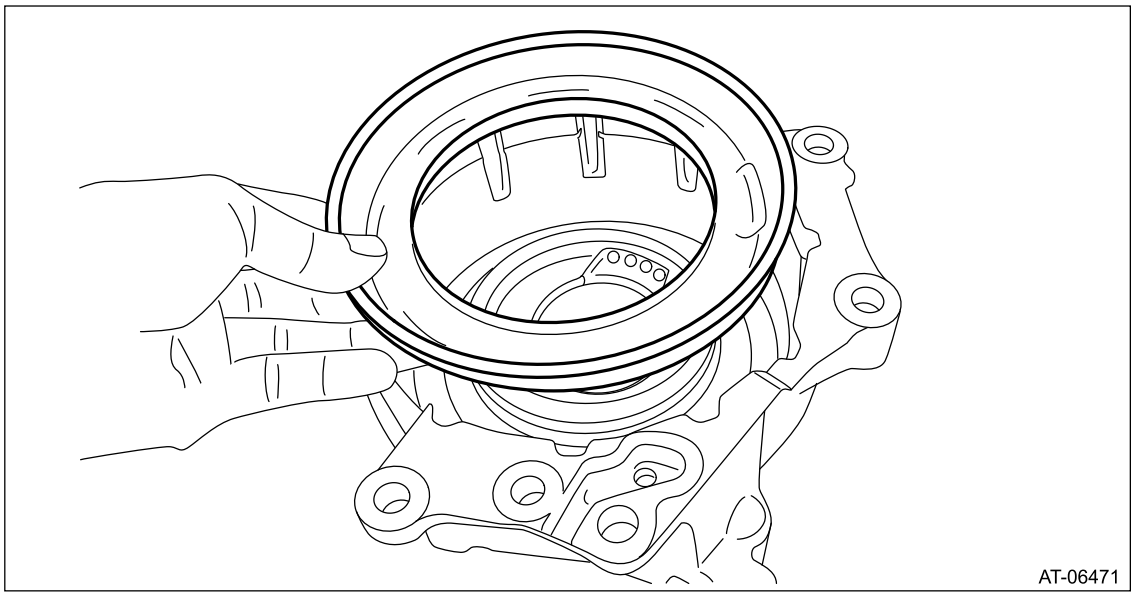
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reverse Brake Assembly

ASSEMBLY

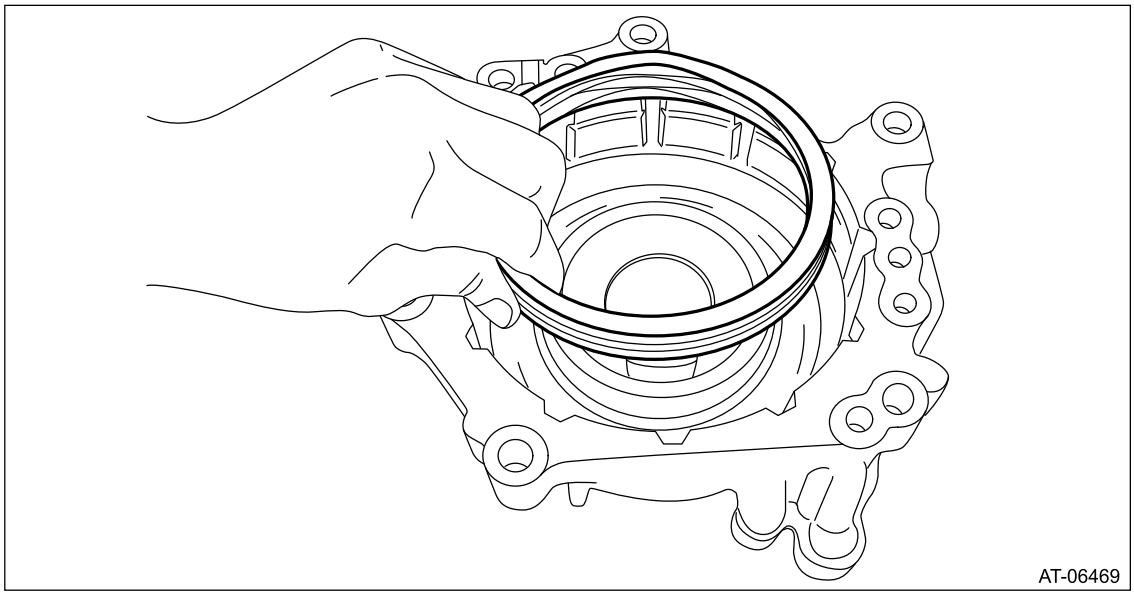
1. Install the reverse brake piston.

Note:

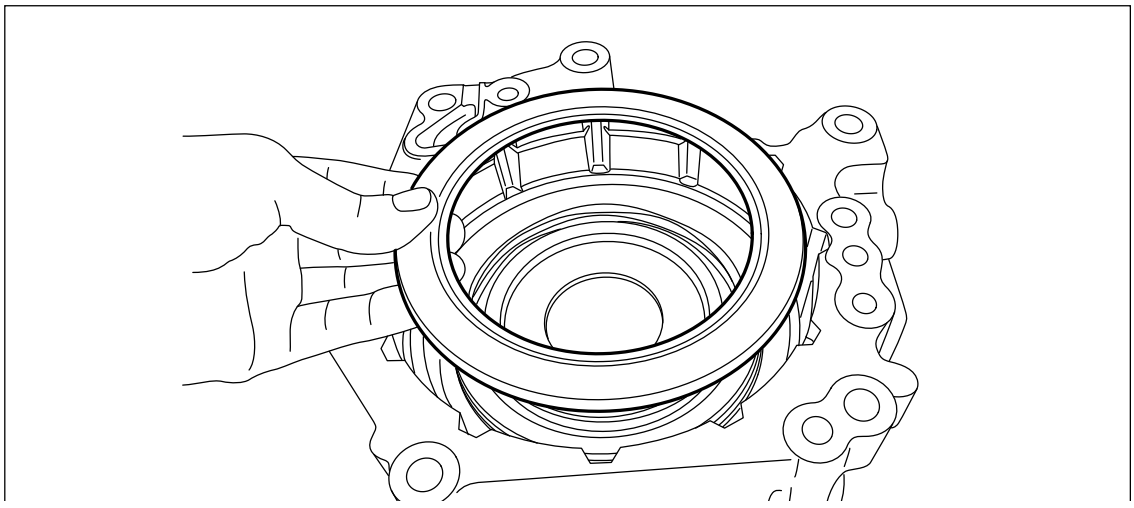
Apply CVTF to the sealing area of reverse brake piston.

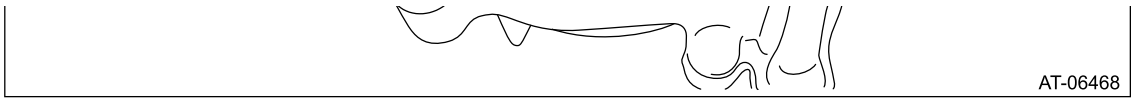


2. Install the return spring.

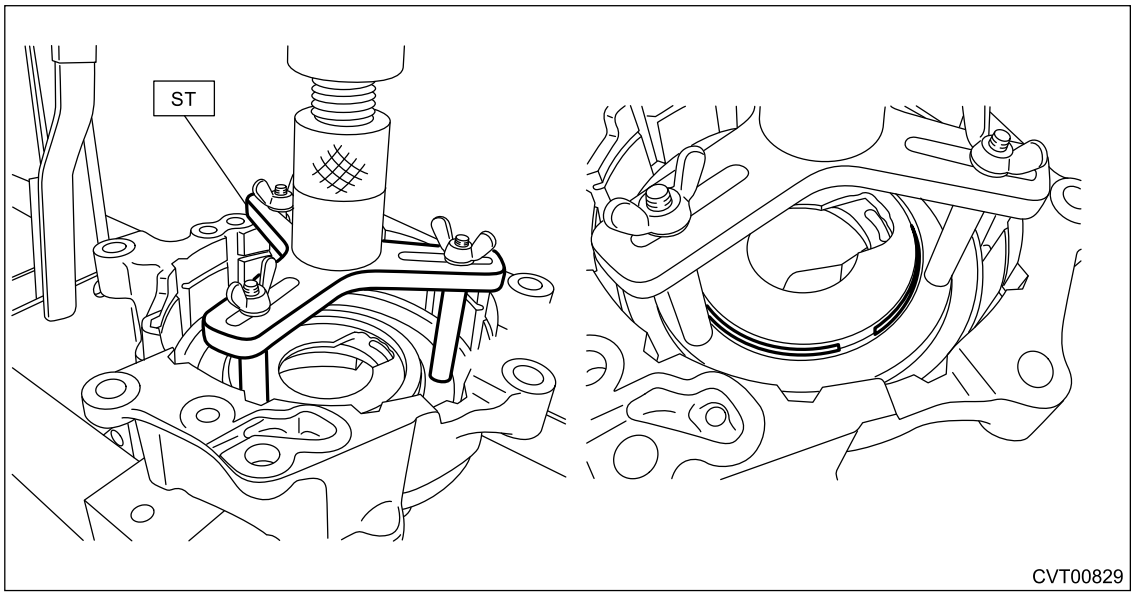


3. Install the spring retainer.

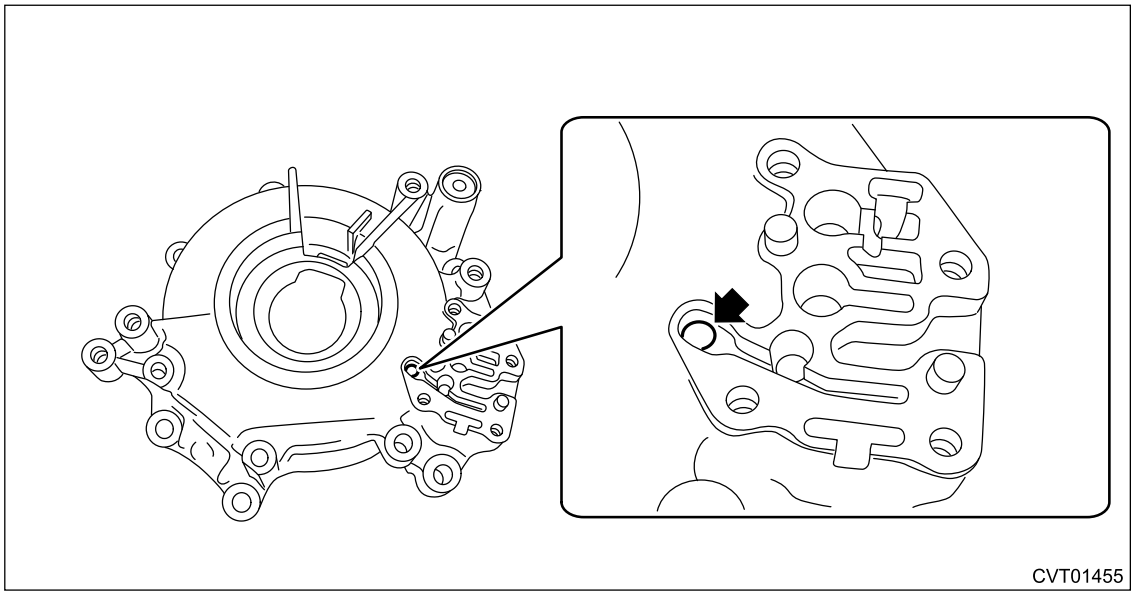




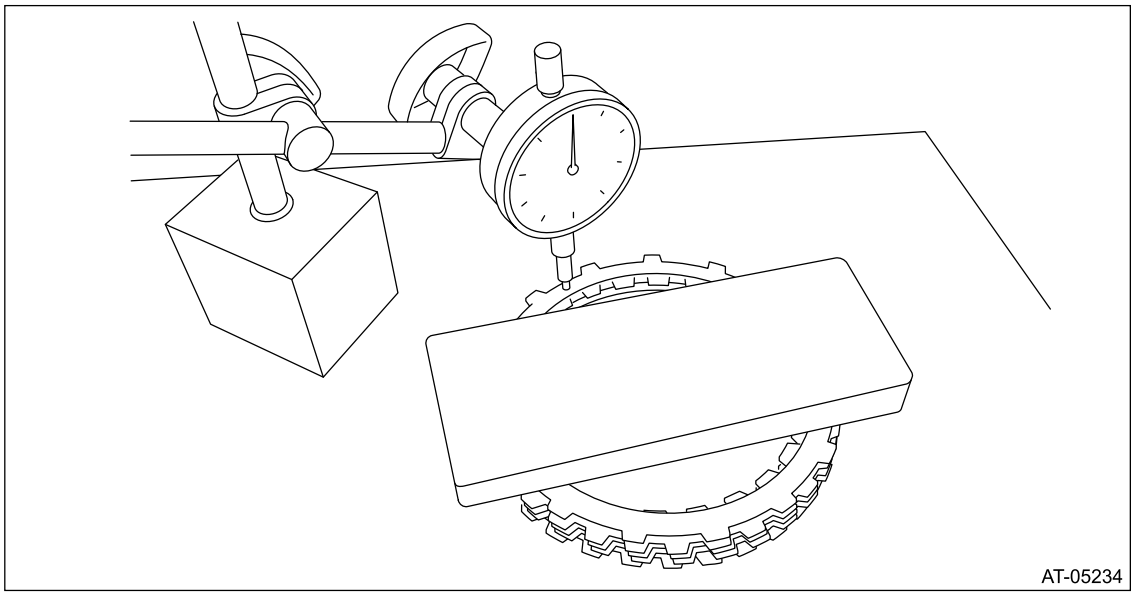
4. Compress the return spring using the ST to install the snap ring.
   Preparation tool:
   ST: COMPRESSOR SPECIAL TOOL (18762AA001)



5. Check the operation of reverse brake piston by blowing compressed air intermittently from reverse brake housing hole.



6. Place the driven plate, drive plate and retaining plate neatly in this order on surface table.
7. Set the dial gauge to retaining plate, and read its scale.
   Note:
   The value, which is read in the gauge at this time, is zero point.
8. Scale and record the weight "Z" of a flat board which will be put on retaining plate.
   Note:
   - **Use a stiff board which does not bend against load as a flat board to be put on retaining plate.**
   - **Use a flat board weighing less than 29 N (3.0 kgf, 6.5 lb).**
9. Put the flat board on retaining plate.



10. Using the following formula, read the push/pull gauge and calculate “N”.

N = 29 N (3.0 kgf, 6.5 lb) - Z

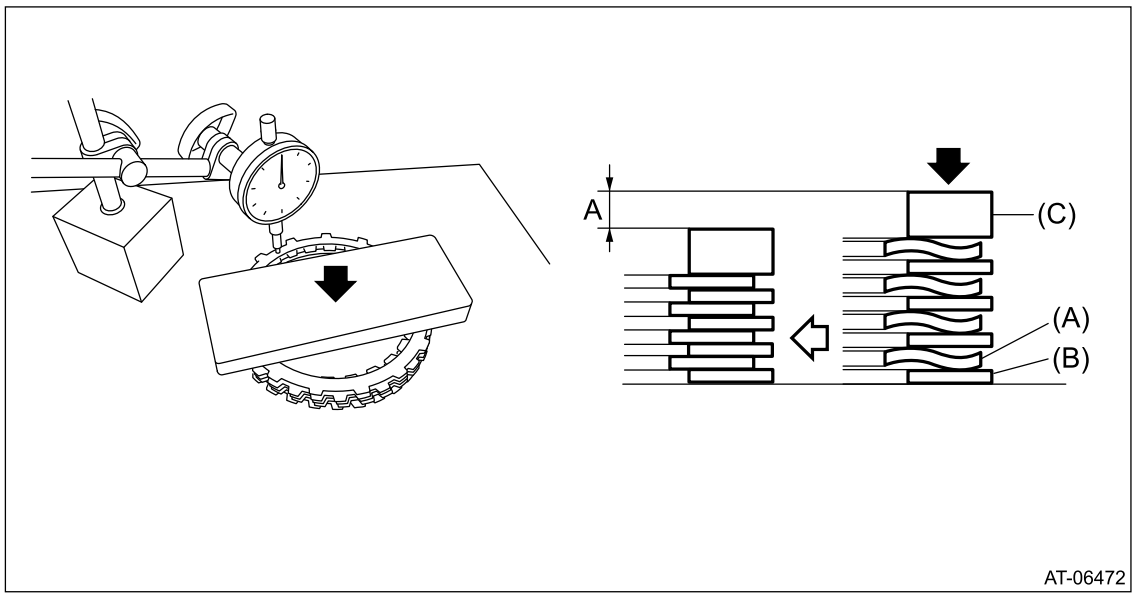
29 N (3.0 kgf, 6.5 lb): Load applied to clutch plate

Z: Flat board weight

11. Press the center of retaining plate by applying a force of “N” using push/pull gauge, and then measure and record the compression amount “A”.

Note:

Measure at four points with a 90° interval and calculate the average.



(A) Drive plate

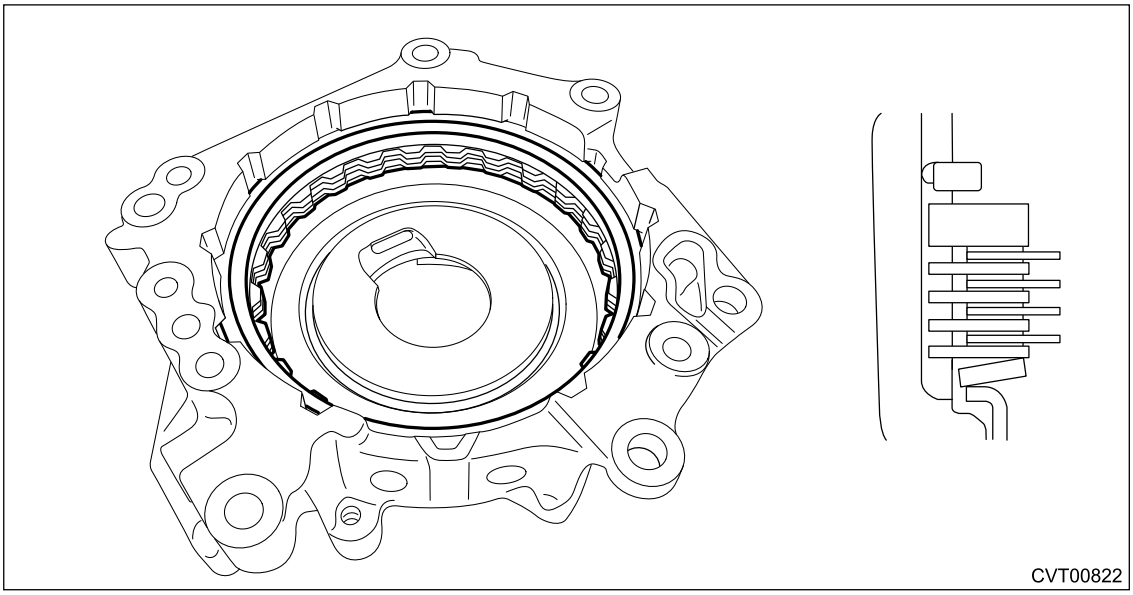
(B) Driven plate

(C) Retaining plate

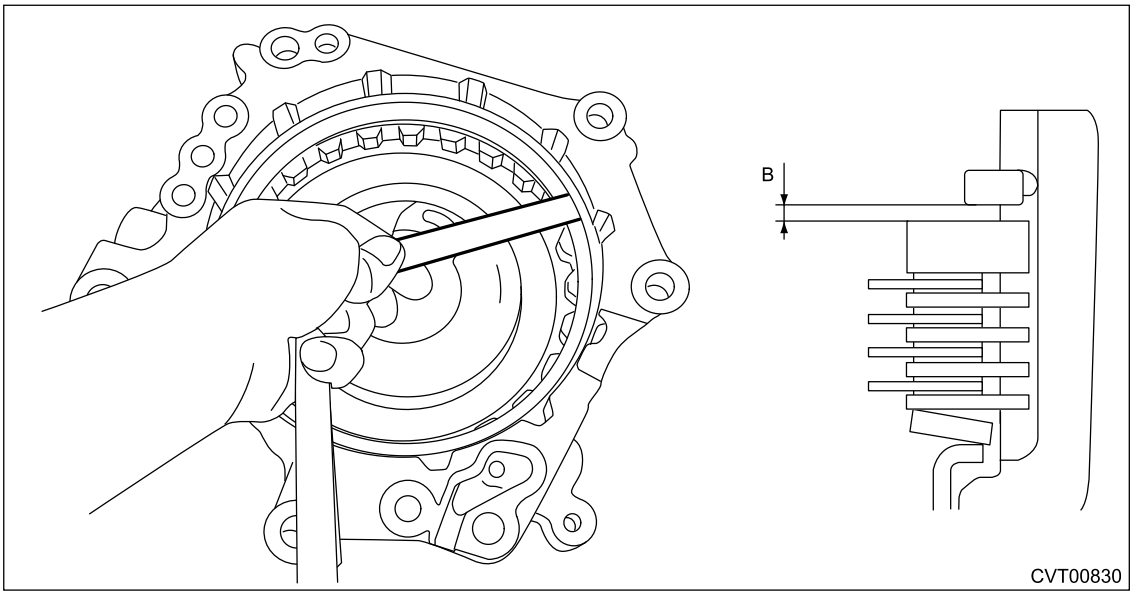
12. Install the dish plate, drive plate, driven plate, retaining plate and snap ring to the reverse brake housing.

Note:

Install the dish plate in the correct direction.



13. Measure and record the clearance "B" between the retaining plate and snap ring.



14. Piston stroke calculation

Calculate with A and B dimensions recorded before. If it exceeds the limit, replace with a new drive plate and adjust within the initial standard value.

S mm (in) = A + B

S: Piston stroke

A: Compression amount of drive plate and dish plate

B: Clearance between retaining plate and snap ring

Initial standard:

1.8 — 2.2 mm (0.071 — 0.087 in)

Limit thickness:

2.4 mm (0.094 in)

Retaining plate	
Part No.	**Thickness mm (in)**
31567AB750	4.2 (0.165)
31567AB800	4.4 (0.173)

31567AB810	4.6 (0.181)

Retaining plate	
Part No.	**Thickness mm (in)**
31567AB820	4.8 (0.189)

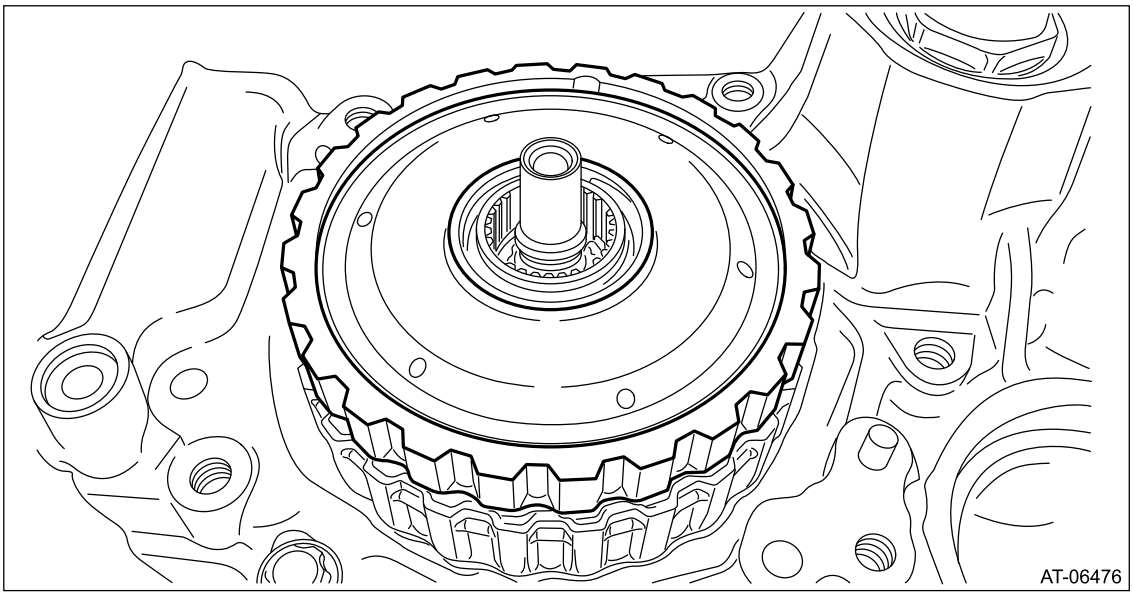
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Reverse Brake Assembly

INSPECTION

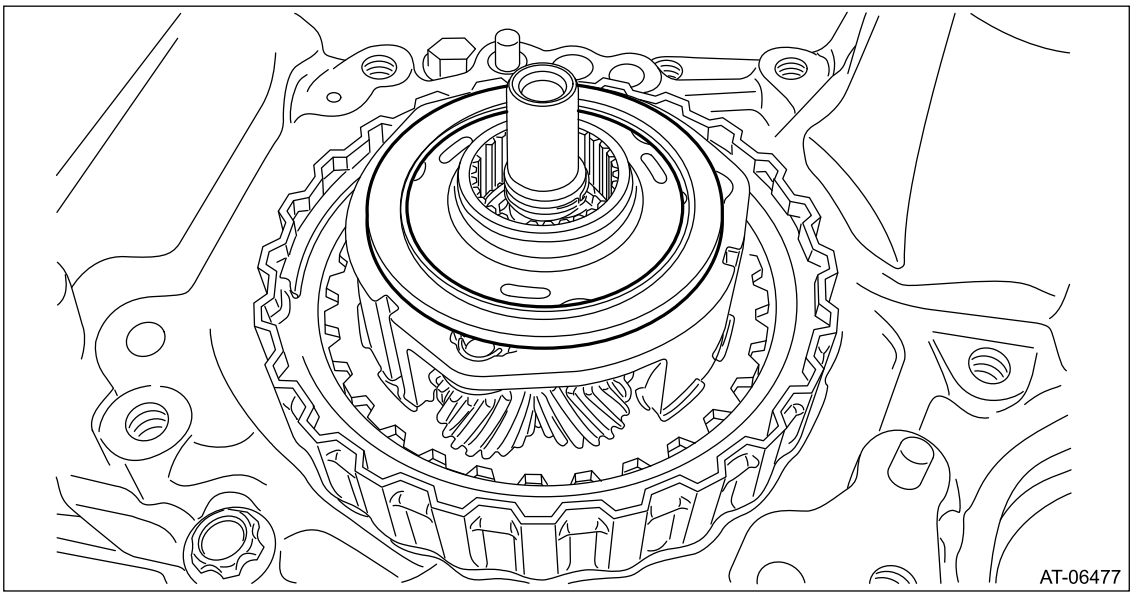
- Inspect the drive plate facing for wear and damage.
- Check the driven plate for discoloration (burnt color).
- Check for worn snap ring, fatigue or damaged return spring or deformed spring retainer.
- Make sure the clearance between retaining plate and snap ring of reverse brake is within the limit. If it exceeds the limit, replace with a new drive plate and select and adjust the retaining plate within the initial standard value. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>ASSEMBLY.

REMOVAL

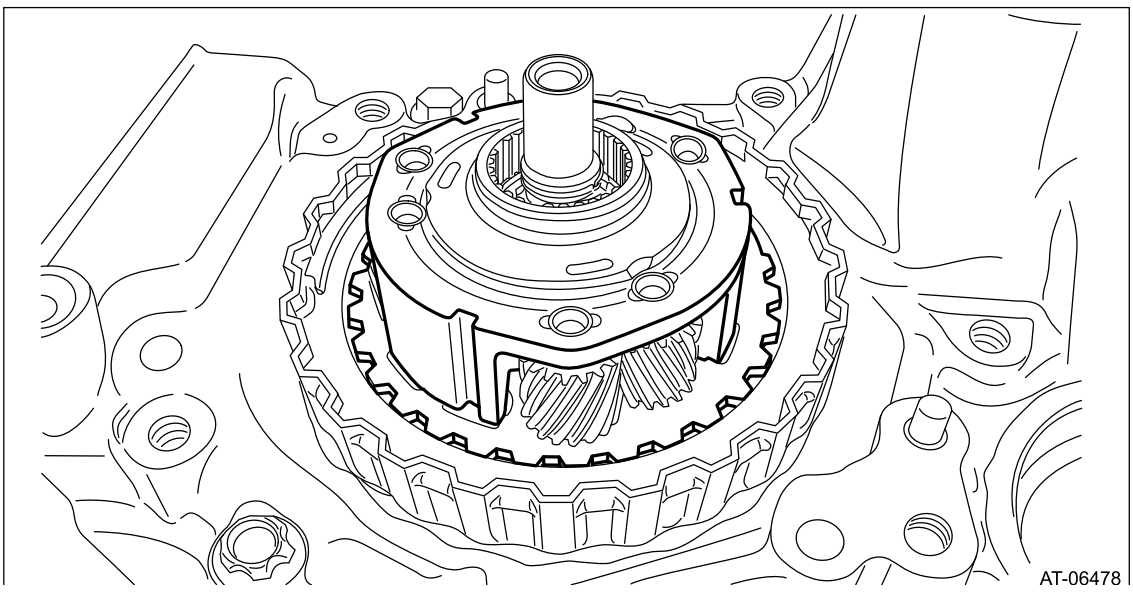
1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.
17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.
18. Remove the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.
19. Remove the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>REMOVAL.
20. Remove the internal gear.



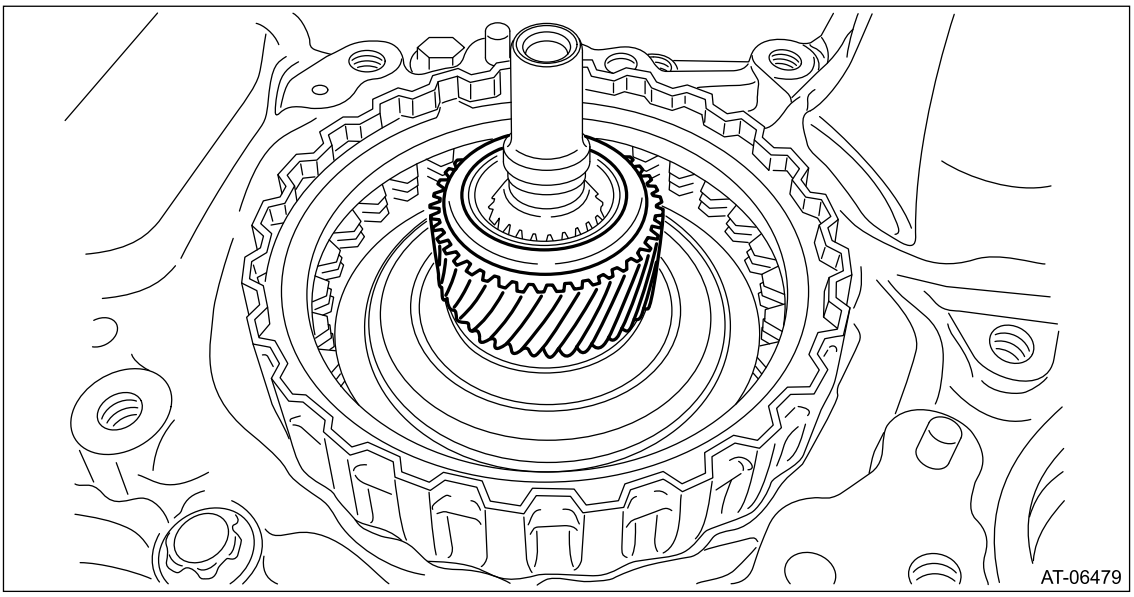
21. Remove the thrust bearing.



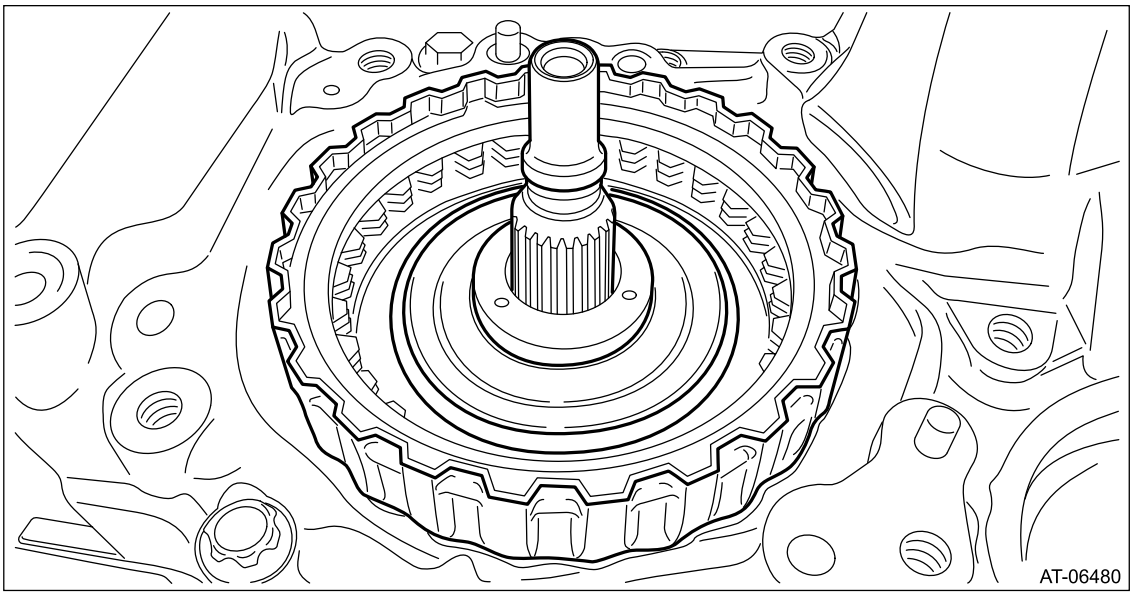
22. Remove the planetary carrier.



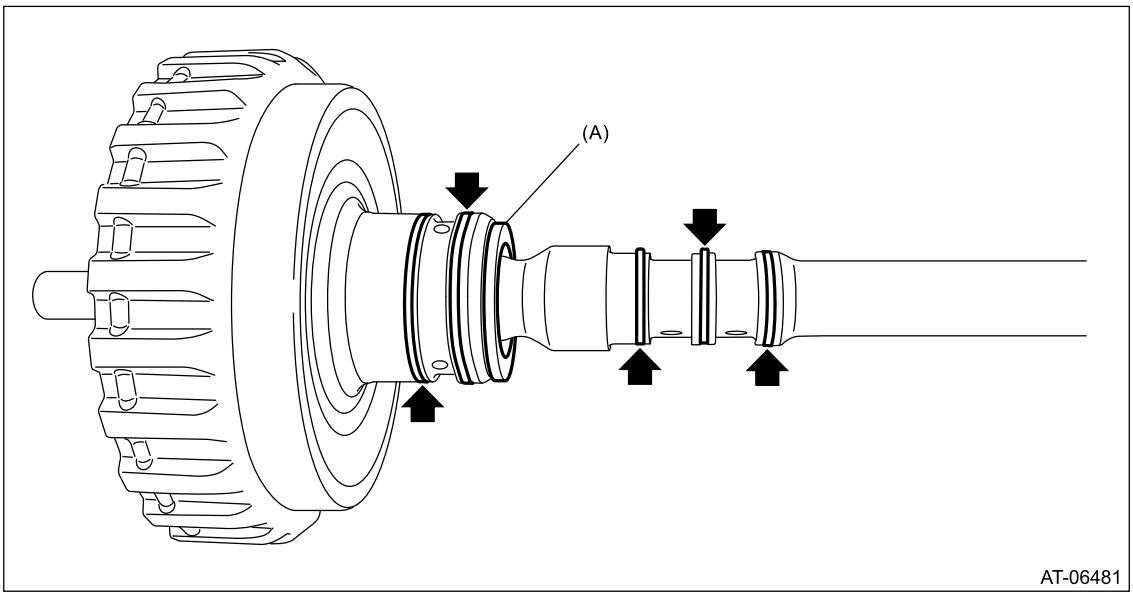
23. Remove the thrust bearing and sun gear.



24. Remove the forward clutch assembly.



25. Remove the thrust bearing and seal ring.



(A) Thrust bearing

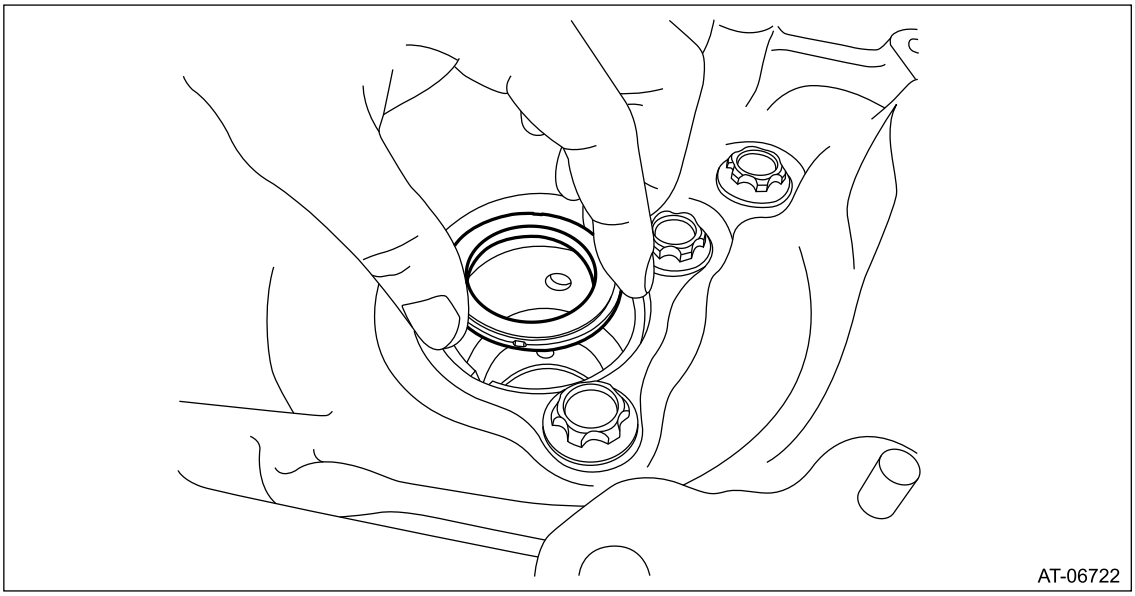
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Forward Clutch Assembly

INSTALLATION

1. Install the thrust bearing to the converter case.

   Note:

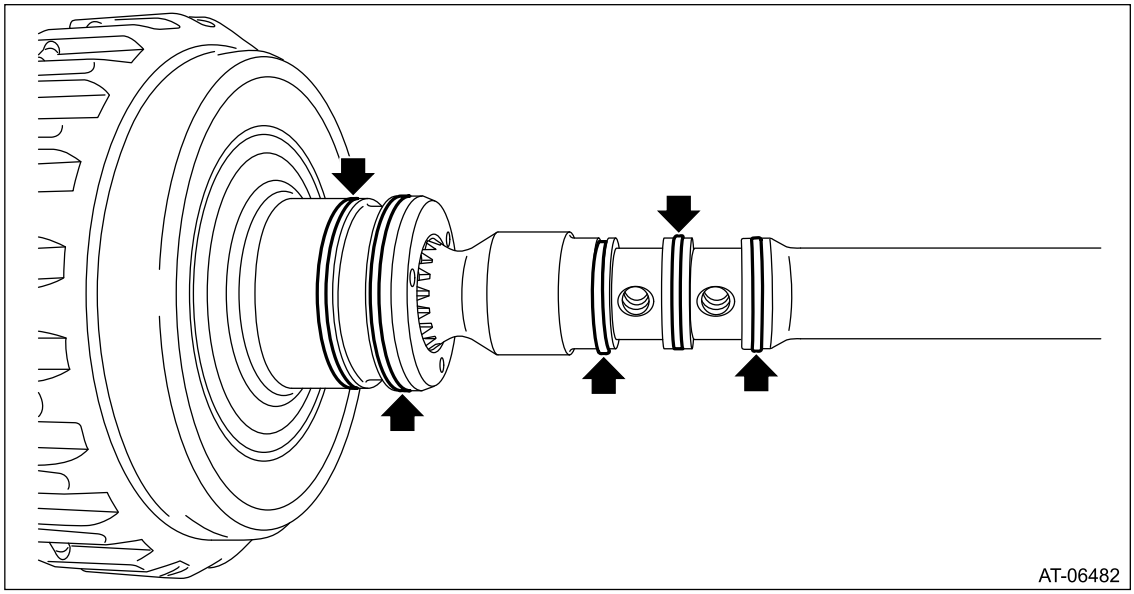
   Face the temper color surface to the converter case side.



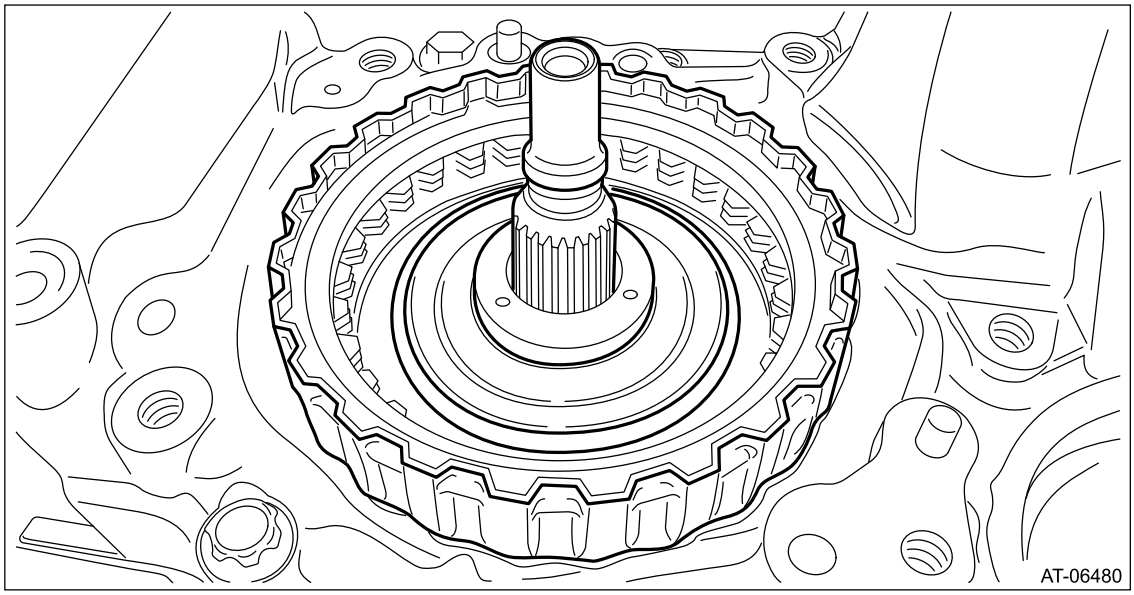
2. Install the seal ring to the input shaft.

   Note:

   - **Use new seal rings.**
   - **When installing the seal rings, do not expand the seal rings too much.**
   - **Apply CVTF to the seal rings.**



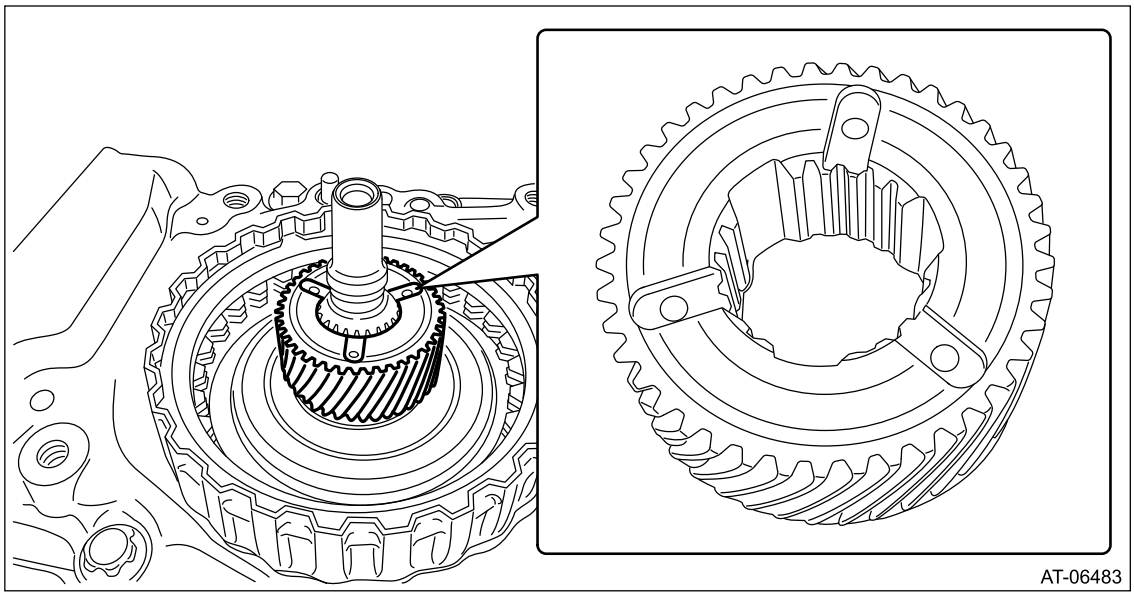
3. Install the forward clutch assembly to the converter case.



4. Install the sun gear.

Note:

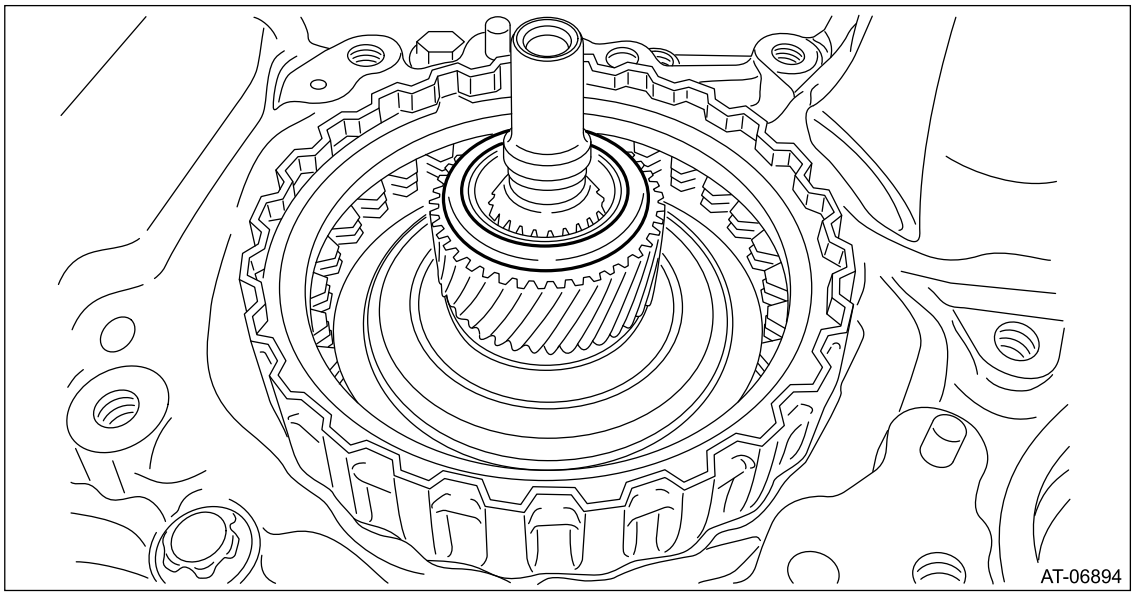
Face the end face of the sun gear to the reverse brake side as shown in the figure.



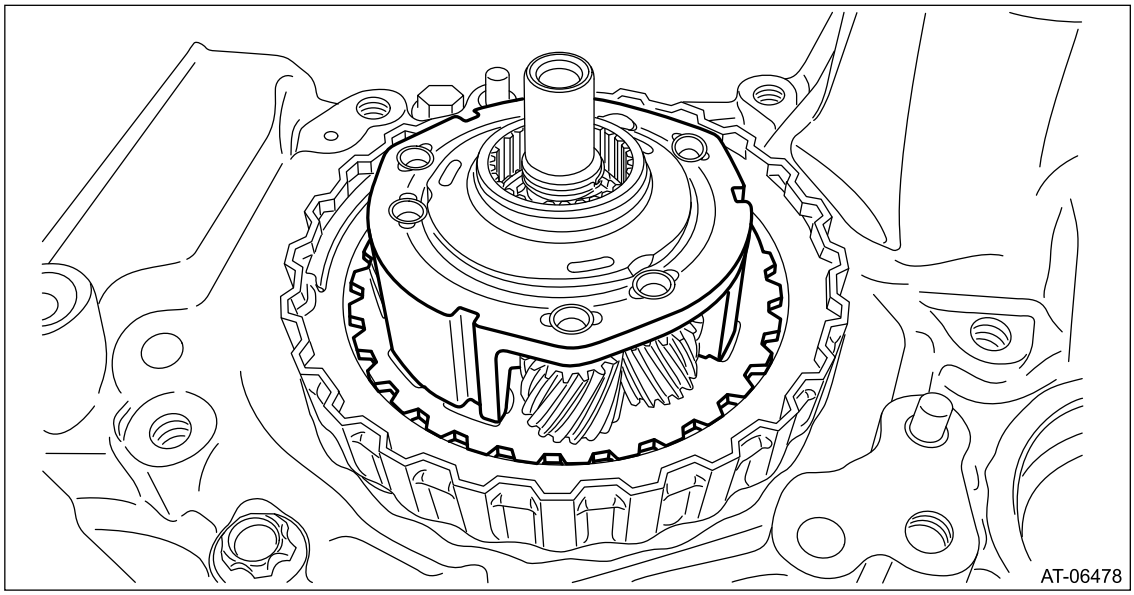
5. Install the thrust bearing to the sun gear.

Note:

Face the temper color surface to the reverse brake side.



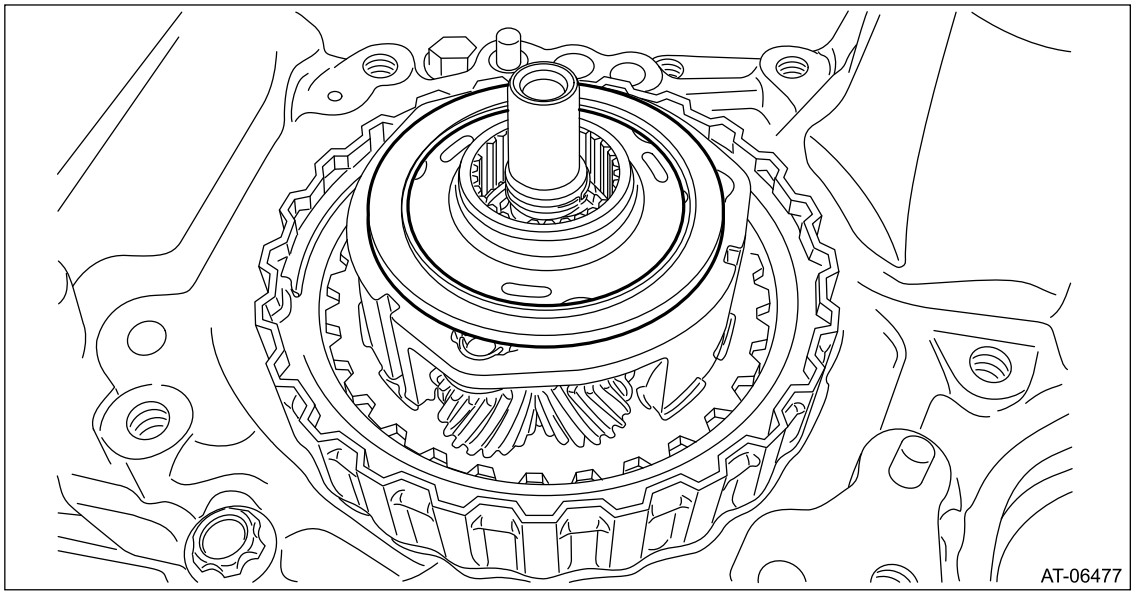
6. Install the planetary carrier.



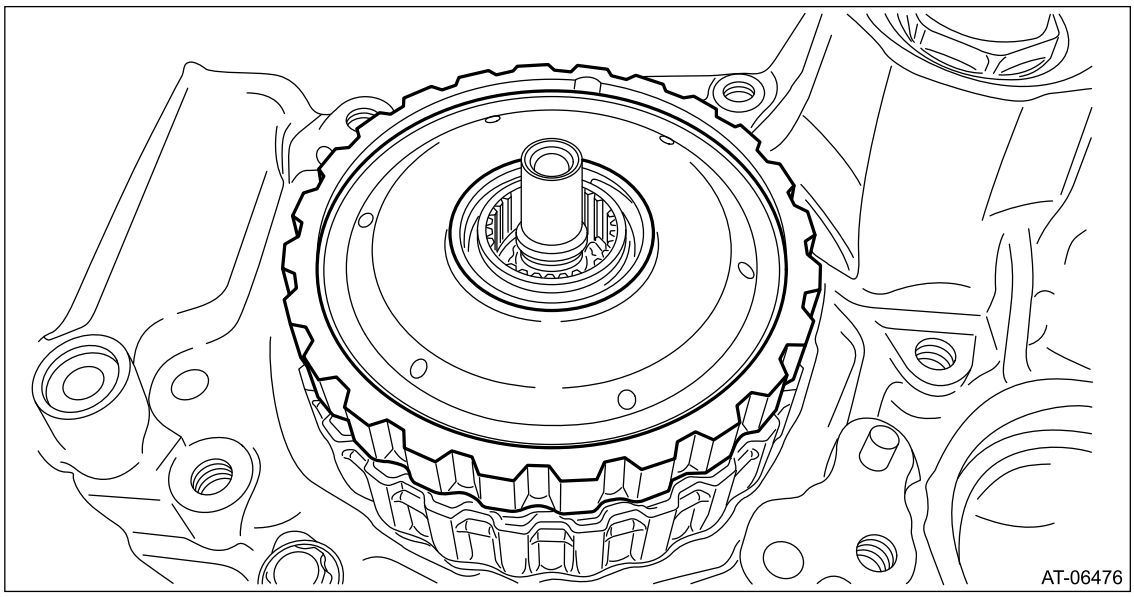
7. Install the thrust bearing.

Note:

Face the temper color surface to the reverse brake side.



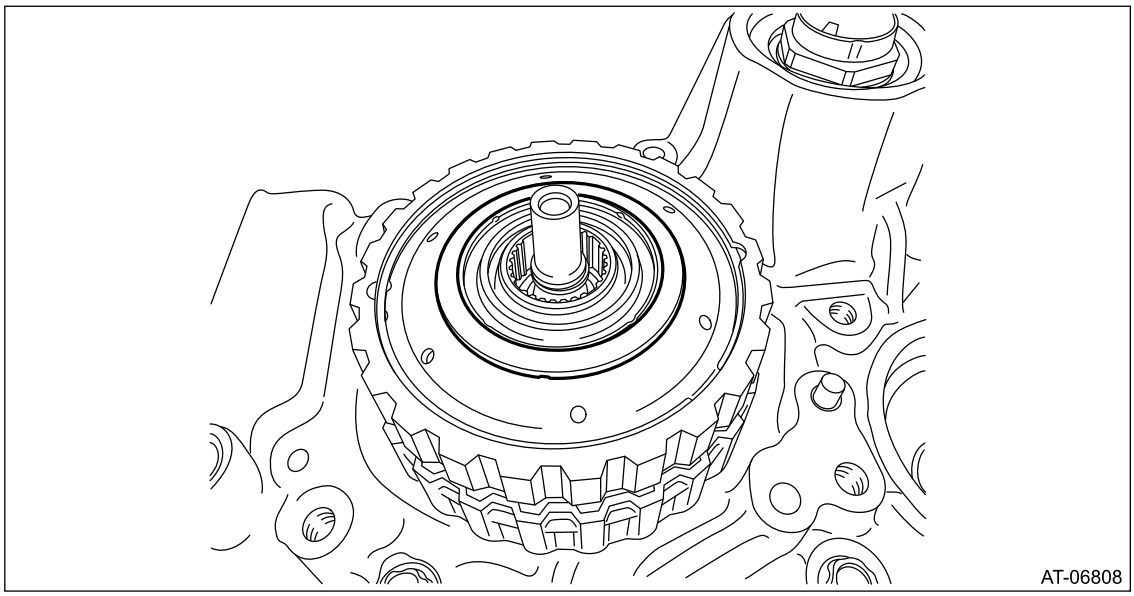
8. Install the internal gear.



9. Install the thrust bearing to the internal gear.

Note:

Face the temper color surface to the reverse brake side.



10. Select a washer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>ADJUSTMENT.

11. Install the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>INSTALLATION.

12. Install the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.

13. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.

14. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.

15. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.

16. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.

17. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION

TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.

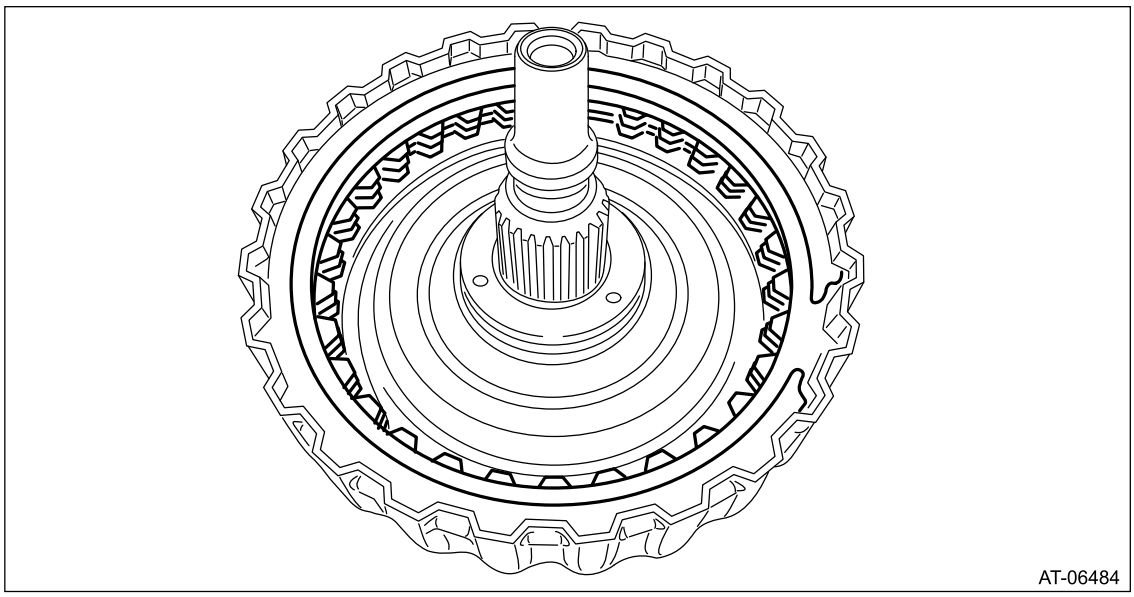
18. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
19. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
20. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
21. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
22. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
23. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
24. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
25. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
26. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
27. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
28. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
29. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Forward Clutch Assembly

DISASSEMBLY

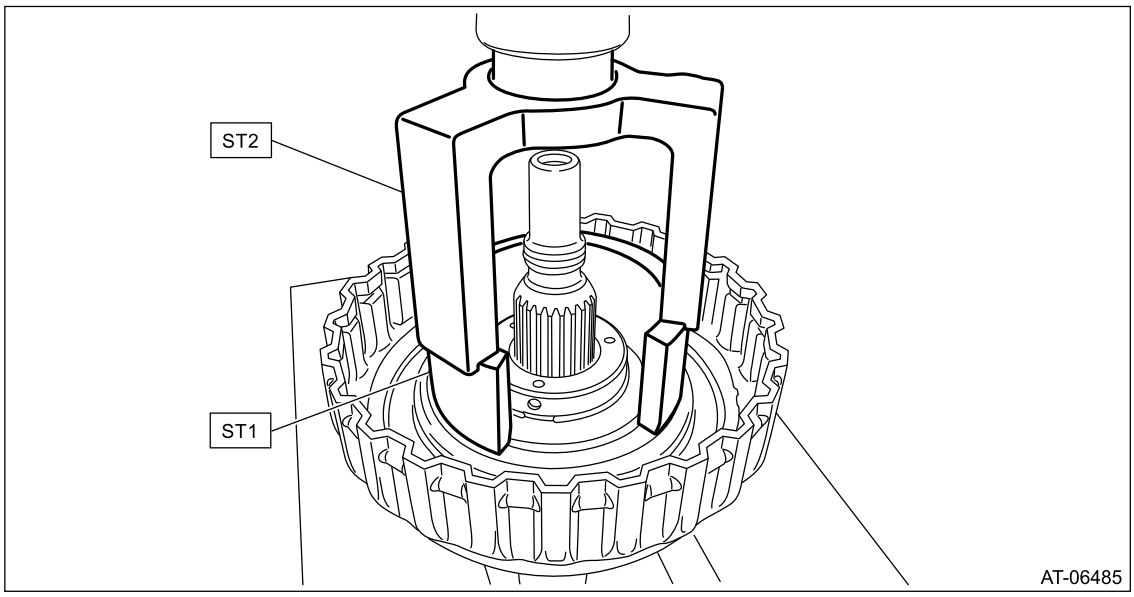
1. FORWARD CLUTCH ASSEMBLY

1. Remove the snap ring.
2. Remove the retaining plate, drive plate, driven plate and dish plate.

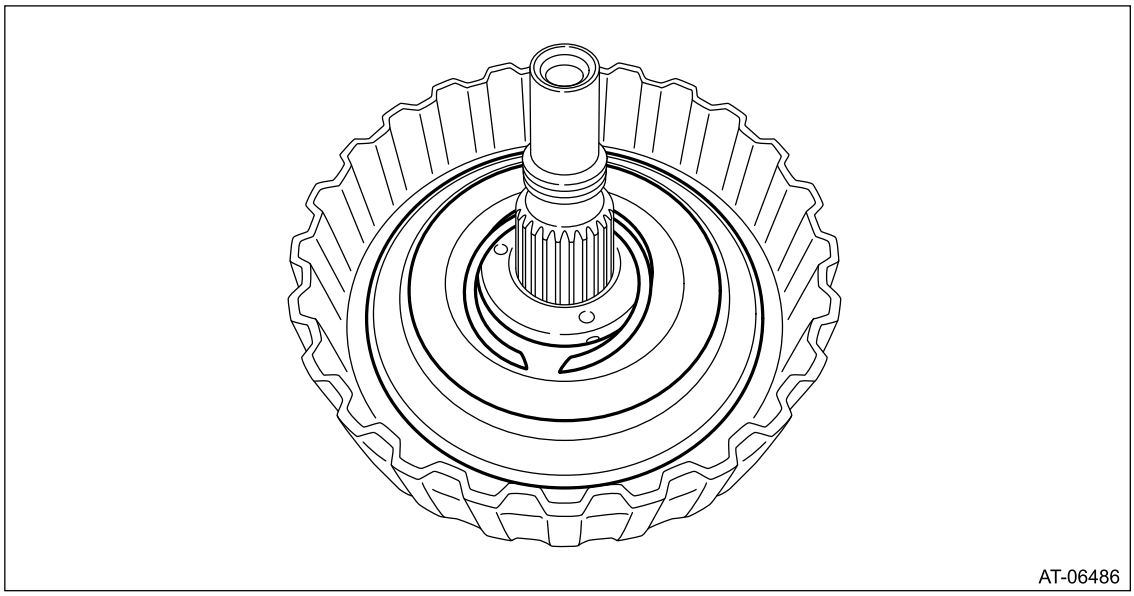


3. Compress the return spring using the ST1 and ST2 to remove the snap ring.
   Preparation tool:
   ST1: COMPRESSOR SPECIAL TOOL (18762AA010)

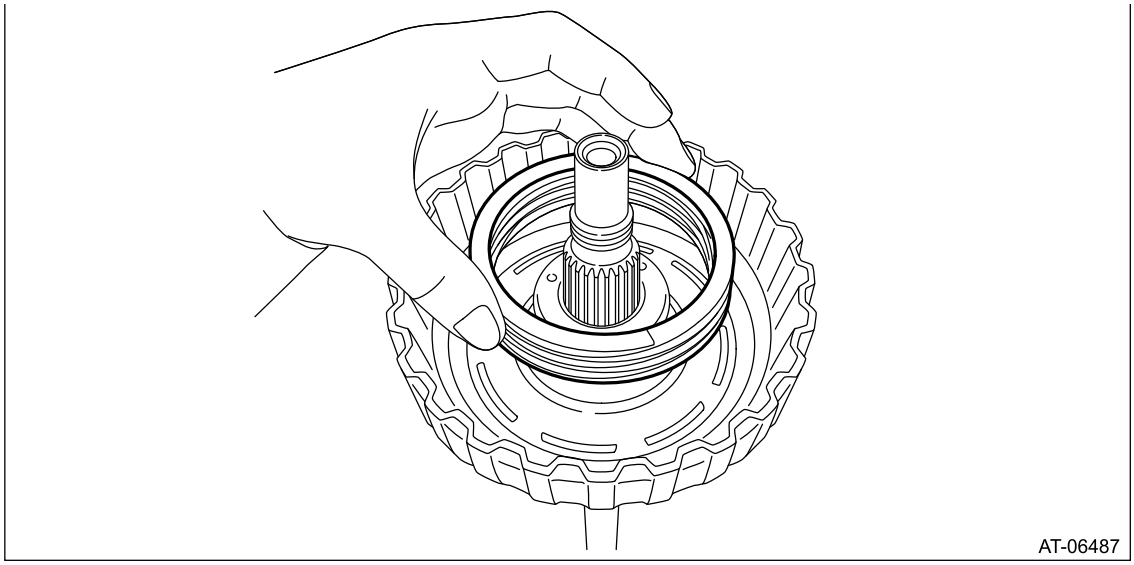
ST2: COMPRESSOR (398673600)



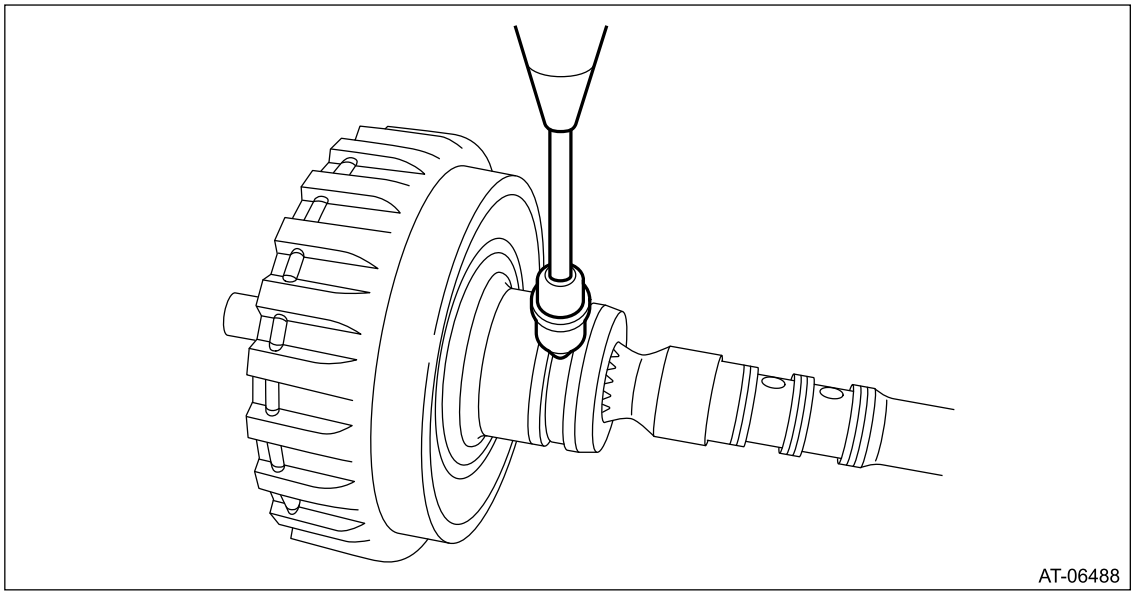
4. Remove the chamber COMPL and snap ring.



5. Remove the return spring.



6. Remove the forward clutch piston by blowing compressed air intermittently from the forward clutch carrier hole.

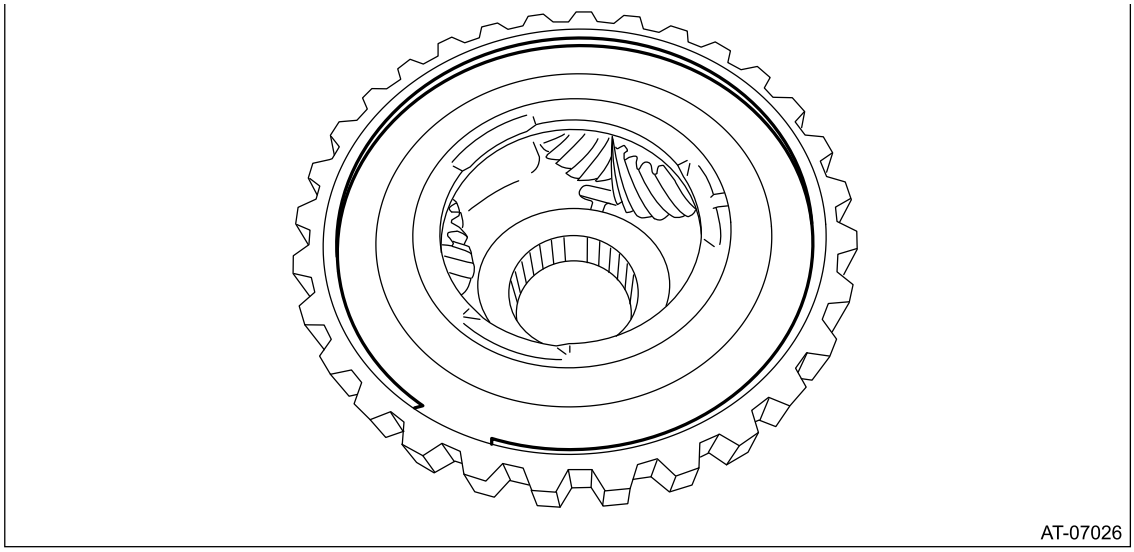


2. PLANETARY CARRIER ASSEMBLY

Note:

Disassemble the balance oil guide only.

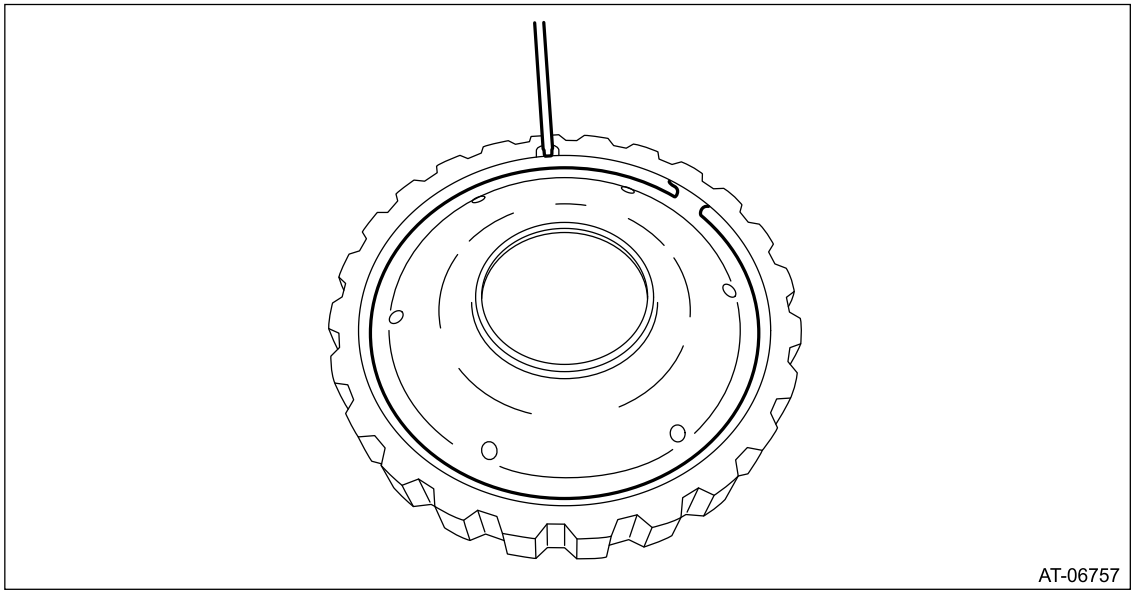
1. Remove the snap ring.



2. Remove the balance oil guide.

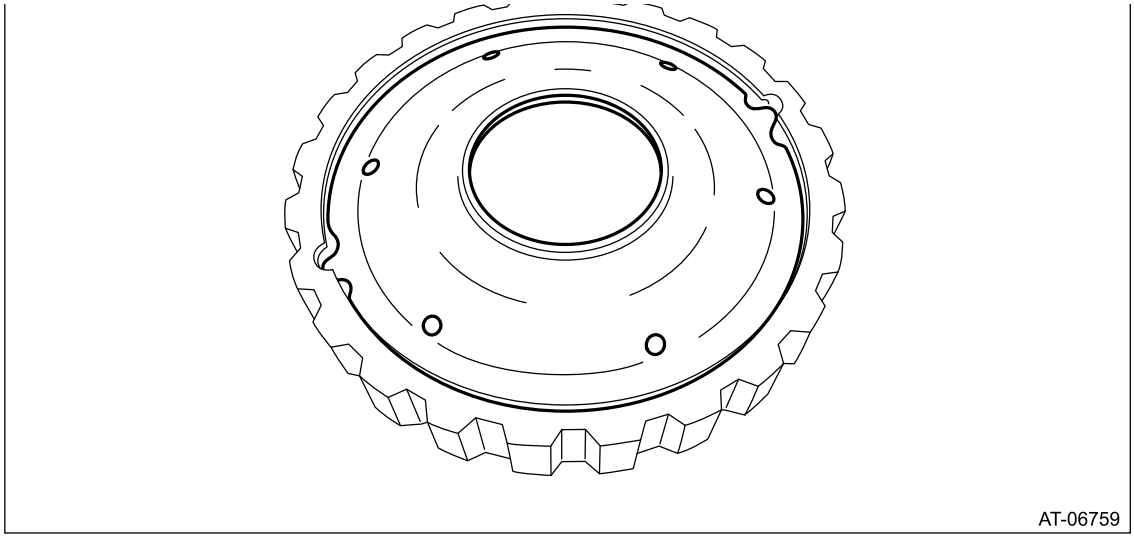
3. INTERNAL GEAR

1. Remove the snap ring.



2. Remove the thrust gear plate.

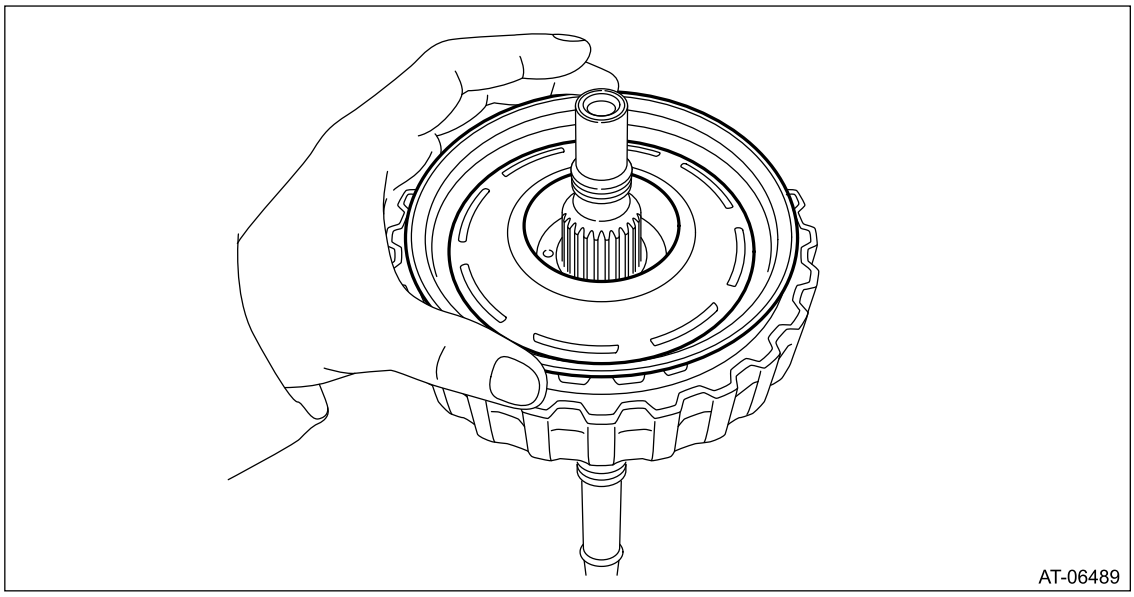




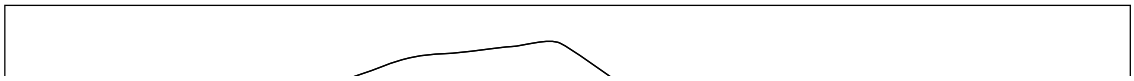
ASSEMBLY

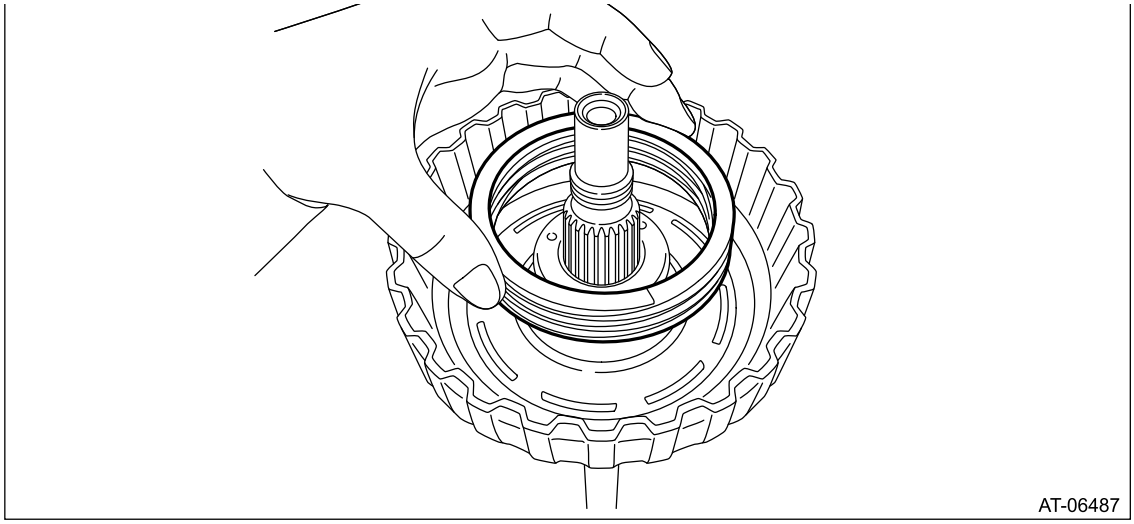
1. FORWARD CLUTCH ASSEMBLY

1. Install the forward clutch piston to forward clutch drum.
   Note:
   - **Apply CVTF to the seal of forward clutch piston.**
   - **Insert it all the way to the end.**



2. Install the return spring.

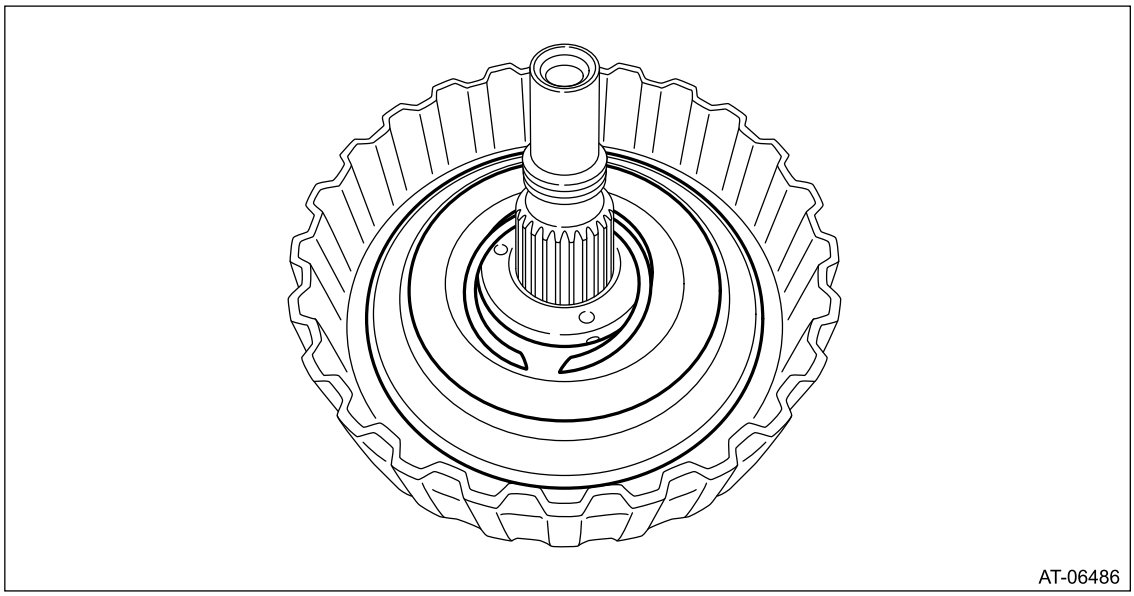




3. Install the chamber COMPL.

Note:

Apply CVTF to the sealing area of chamber COMPL.

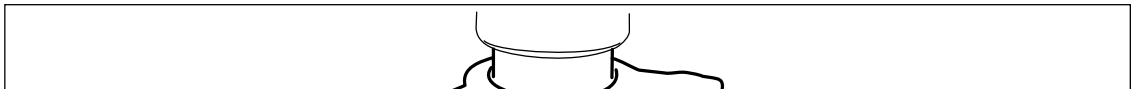


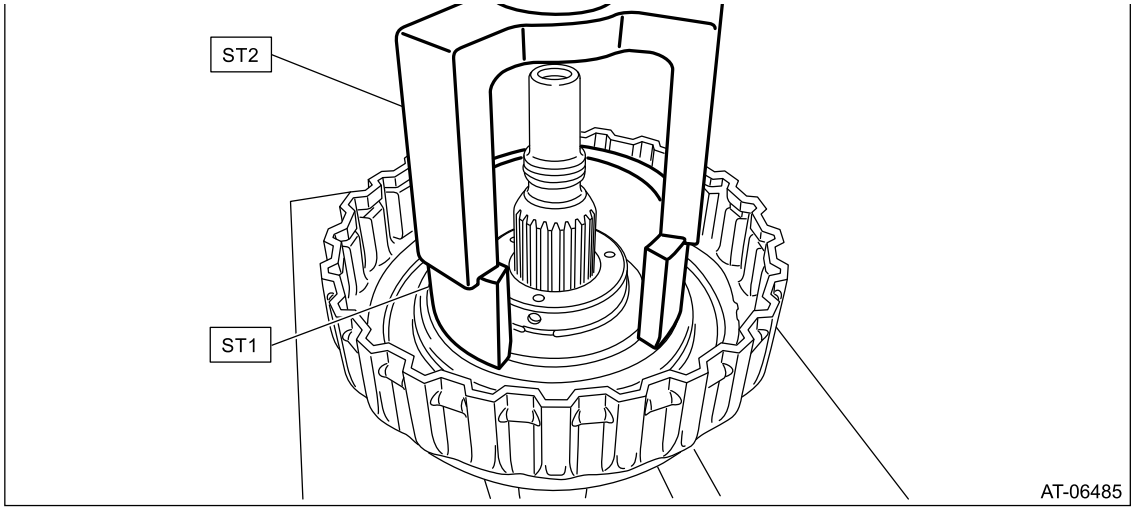
4. Using the ST1 and ST2, compress the return spring with a press and install the snap ring.

Preparation tool:

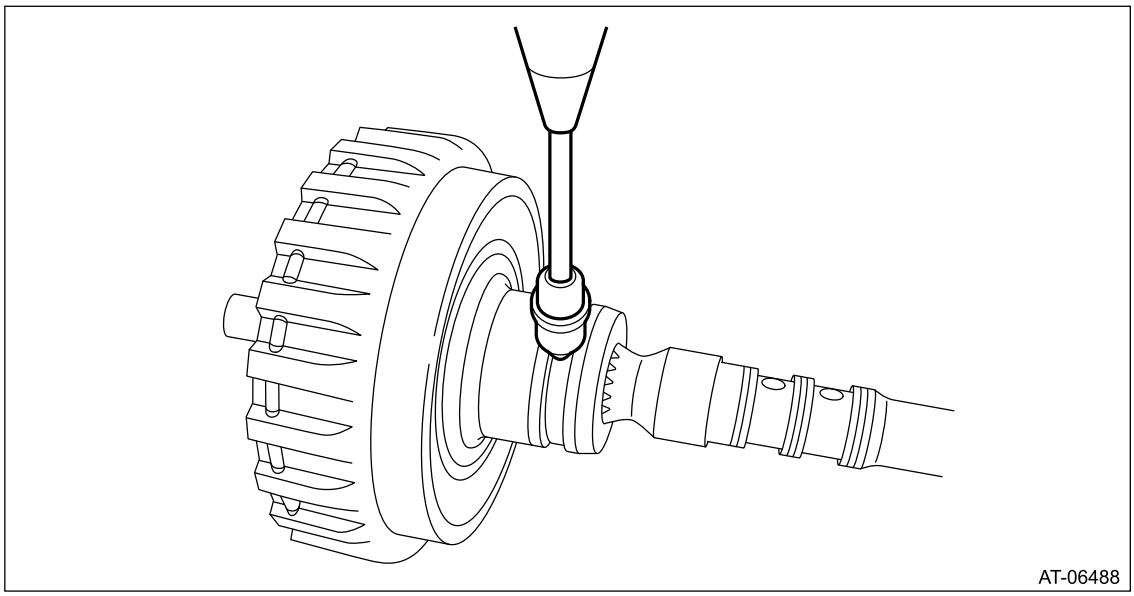
ST1: COMPRESSOR SPECIAL TOOL (18762AA010)

ST2: COMPRESSOR (398673600)



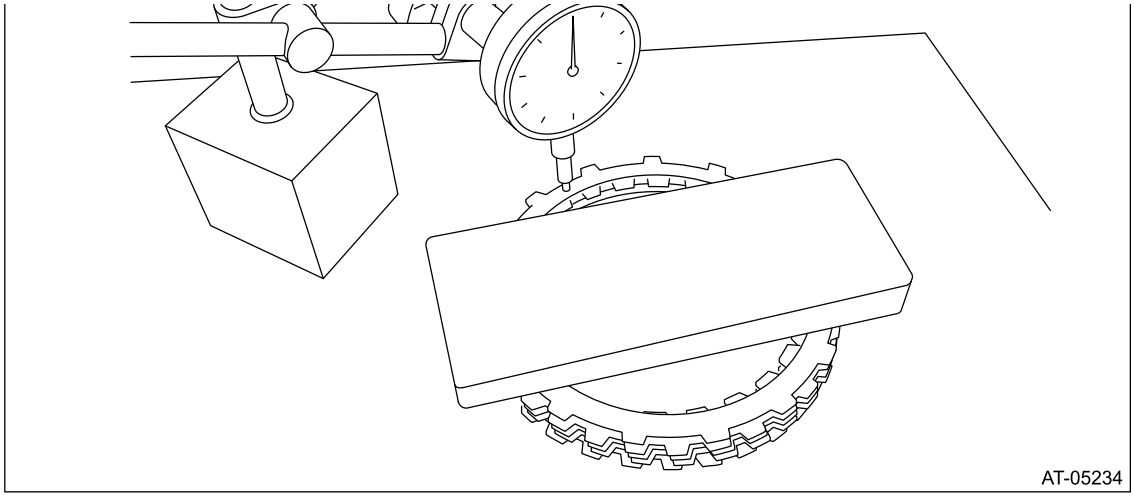


5. Check the operation of forward clutch piston by blowing compressed air intermittently from forward clutch carrier hole.



6. Place the driven plate, drive plate and retaining plate neatly in this order on surface table.
7. Set the dial gauge to retaining plate, and read its scale.
   Note:
   The value, which is read in the gauge at this time, is zero point.
8. Scale and record the weight "Z" of a flat board which will be put on retaining plate.
   Note:
   - **Use a stiff board which does not bend against load as a flat board to be put on retaining plate.**
   - **Use a flat board weighing less than 52 N (5.3 kgf, 11.7 lb).**
9. Put the flat board on retaining plate.





10. Using the following formula, read the push/pull gauge and calculate “N”.

N = 52 N (5.3 kgf, 11.7 lb) − Z

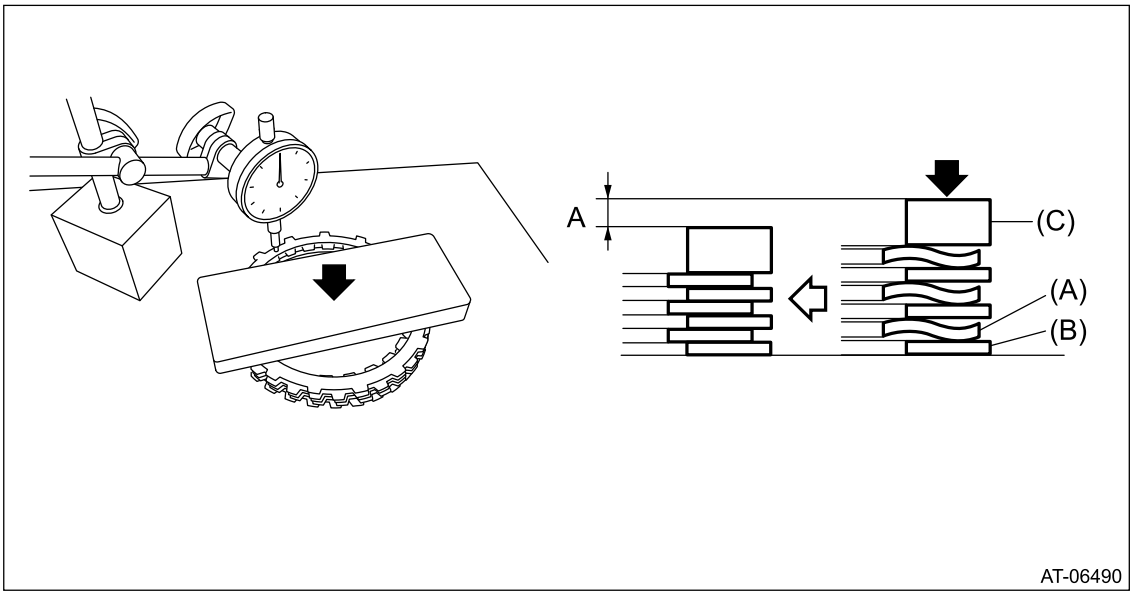
52 N (5.3 kgf, 11.7 lb): Load applied to clutch plate

Z: Flat board weight

11. Press the center of retaining plate by applying a force of “N” using push/pull gauge, and then measure and record the compression amount “A”.

Note:

Measure at four points with a 90° interval and calculate the average.



(A) Driven plate

(B) Drive plate

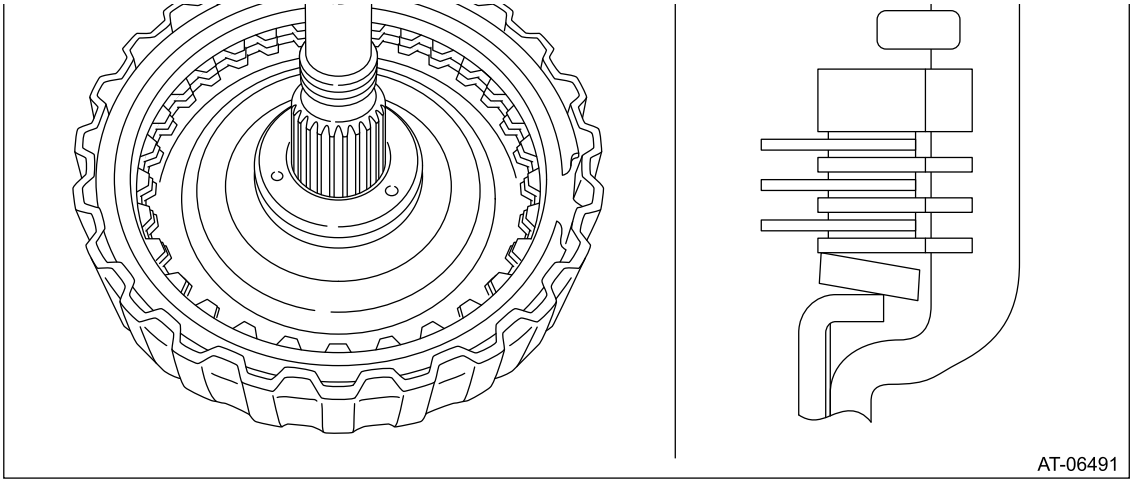
(C) Retaining plate

12. Install the dish plate, drive plate, driven plate, retaining plate and snap ring to the forward clutch carrier.

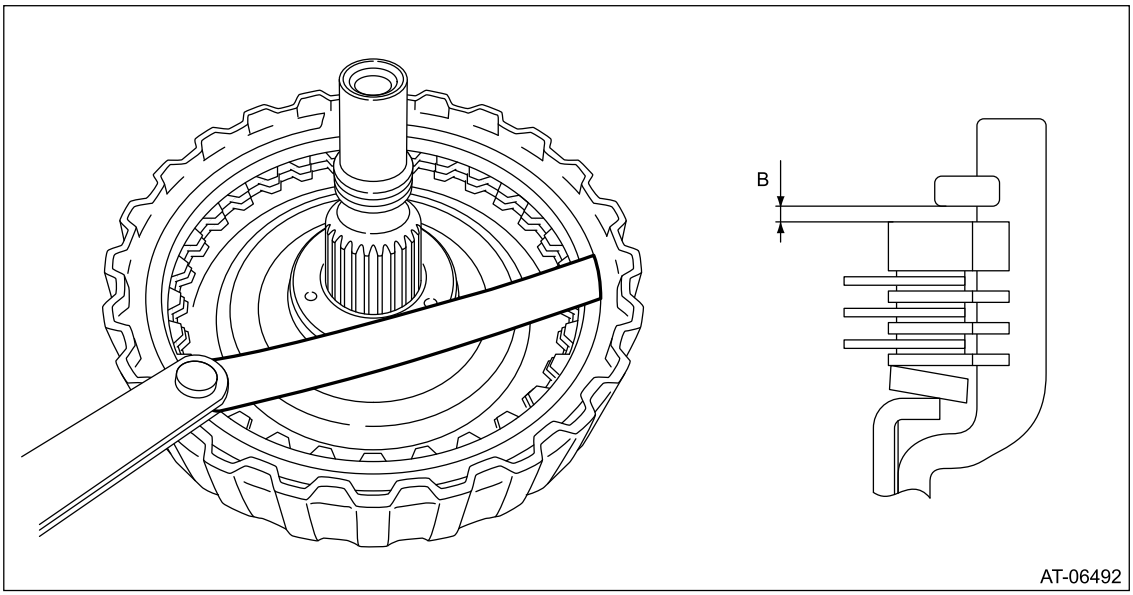
Note:

Install the dish plate in the correct direction.





13. Measure and record the clearance "B" between the retaining plate and snap ring.



14. Piston stroke calculation

Calculate with A and B dimensions recorded before.

If it exceeds the limit, replace with a new drive plate and adjust within the initial standard value.

S mm (in) = A + B

S: Piston stroke

A: Compression amount of drive plate and dish plate

B: Clearance between retaining plate and snap ring

Initial standard:

1.0 — 1.4 mm (0.040 — 0.055 in)

Limit thickness:

1.6 mm (0.063 in)

Retaining plate	
Item number	**Thickness mm (in)**
31567AB760	4.2 (0.165)
31567AB770	4.4 (0.173)
31567AB780	4.6 (0.181)

Retaining plate	
Item number	**Thickness mm (in)**
31567AB790	4.8 (0.189)

31567AB830	5.0 (0.197)

2. PLANETARY CARRIER ASSEMBLY

Note:
Assemble in the reverse order of disassembly.

3. INTERNAL GEAR

Note:
Assemble in the reverse order of disassembly.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Forward Clutch Assembly

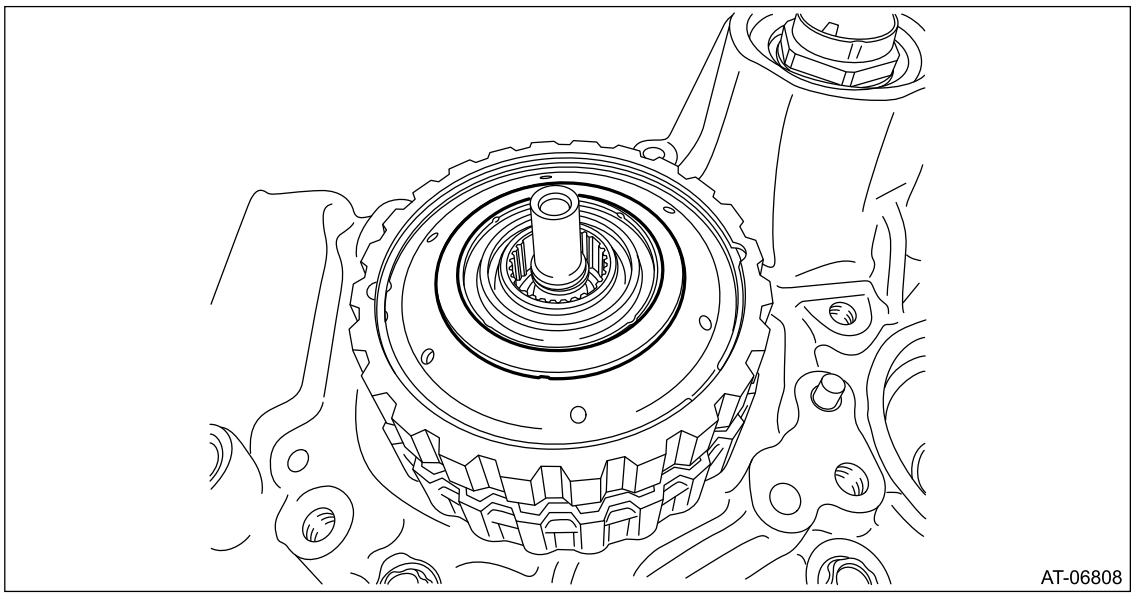
INSPECTION

- Check the forward clutch drum, internal gear, sun gear and forward clutch piston lip for wear or damage.
- Inspect the drive plate facing for wear and damage.
- Check the driven plate for discoloration (burnt color).
- Check for worn snap ring, fatigue or damaged return spring or deformed spring retainer.
- Make sure the clearance between retaining plate and internal gear of forward clutch is within the limit. If it exceeds the standard, replace the forward clutch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>ASSEMBLY.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Forward Clutch Assembly

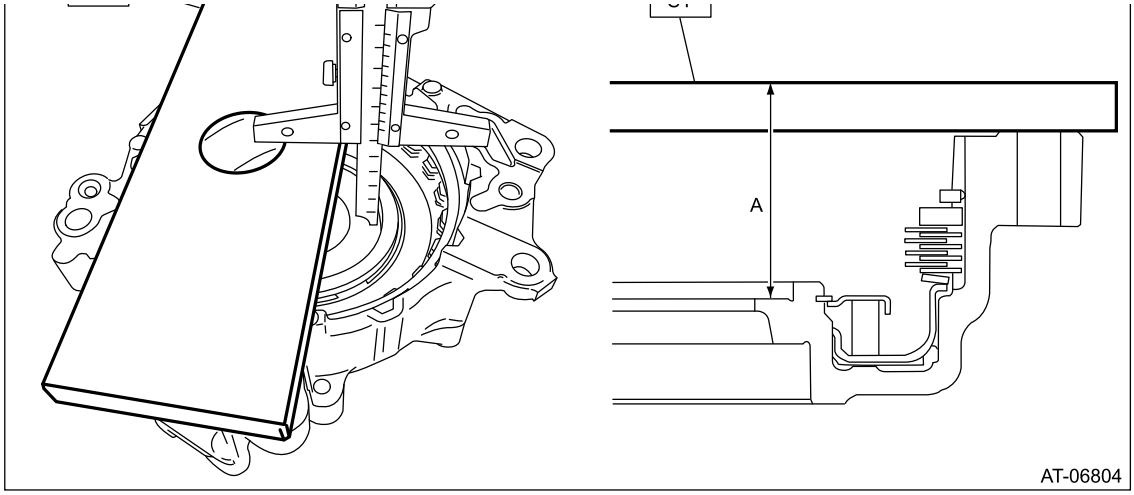
ADJUSTMENT

1. Install the thrust bearing to the internal gear.
Note:
Face the temper color surface to the reverse brake side.



2. Measure depth “A” from the ST upper face to the washer mounting surface.
Preparation tool:
ST: GAUGE (499575600)

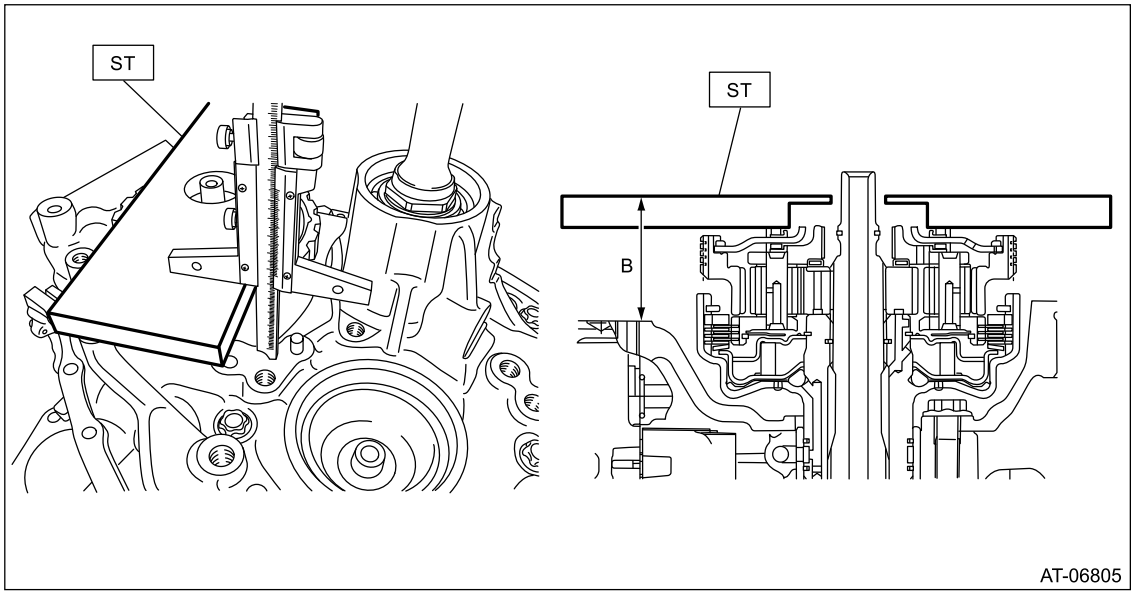




3. Measure the height "B" from the ST upper face to the mating surface of the drive pinion retainer.

Preparation tool:

ST: GAUGE (499575600)



4. Obtain the thickness of washer using the following formula to select the washer.

T mm = A − B − (0.35 — 0.70)

[Tin = A − B − (0.014 — 0.028)]

T: Shim thickness

A: Depth from the ST upper face to the washer mounting surface

B: Height from ST upper face to the drive pinion retainer mating surface

0.35 — 0.70 mm (0.014 — 0.028 in): Clearance

Washer	
Part No.	**Thickness mm (in)**
803064020	1.3 (0.051)
803064021	1.55 (0.061)
803064022	1.8 (0.071)
803064023	2.05 (0.081)

Washer	
Part No.	**Thickness mm (in)**
803064024	2.3 (0.091)
803064025	2.55 (0.100)

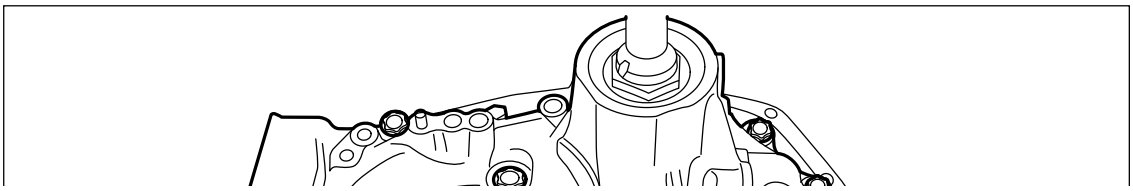
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Pinion Shaft Assembly

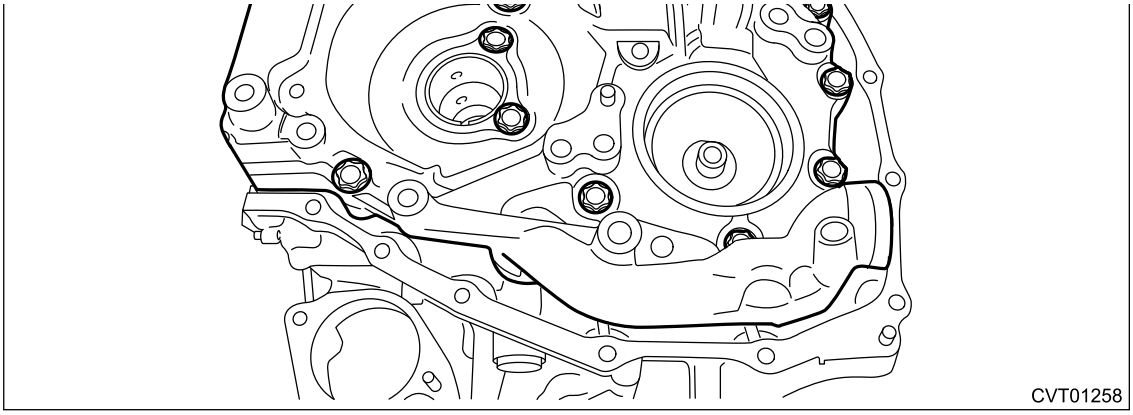
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL

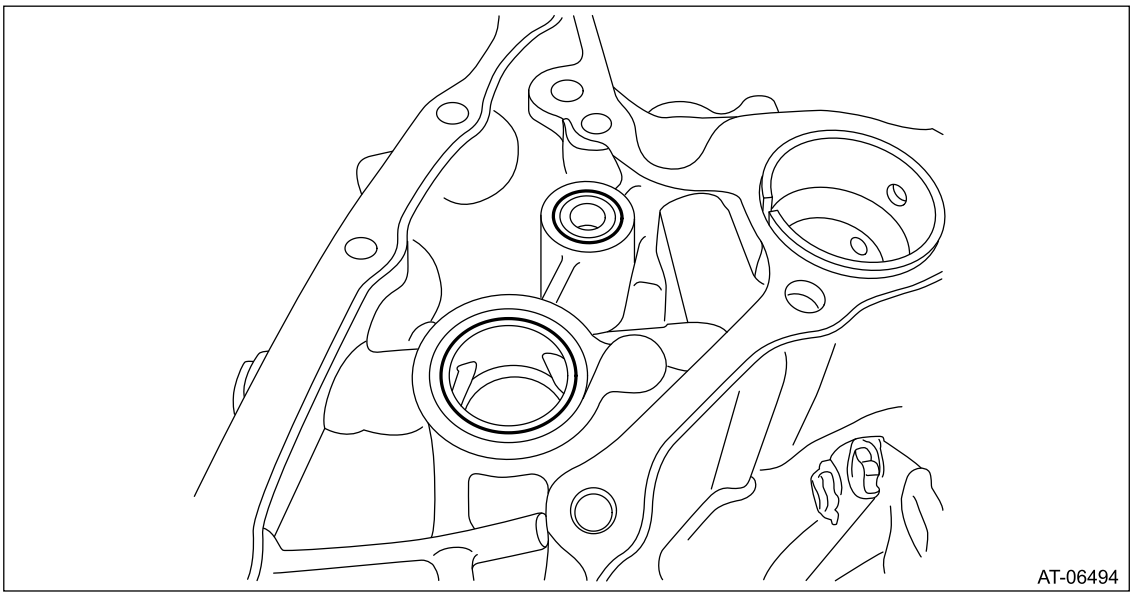
TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.

2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.
17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.
18. Remove the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.
19. Remove the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>REMOVAL.
20. Remove the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>REMOVAL.
21. Using the ST, remove the drive pinion retainer.
    Preparation tool:
    ST: SOCKET (E20) (18270KA020)





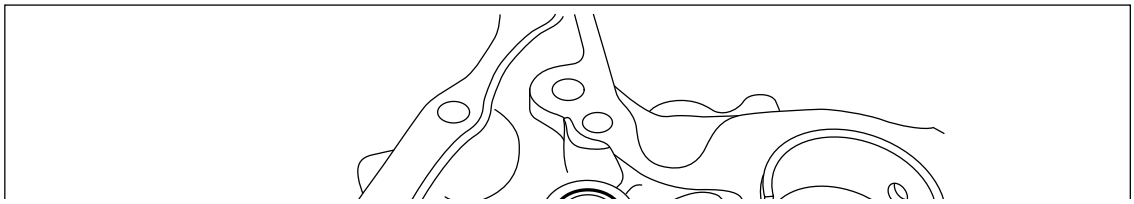
22. Remove the O-rings.

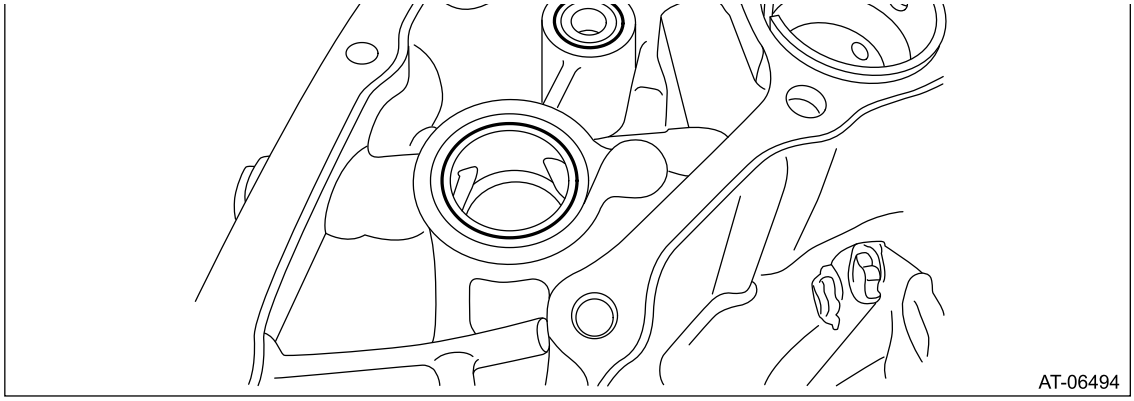


CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Pinion Shaft Assembly

INSTALLATION

1. Clean the mating surface of drive pinion retainer and converter case.
2. Adjust the backlash and tooth contact between drive pinion shaft assembly and the front differential side gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ADJUSTMENT.
3. Install O-rings in two locations to the converter case.
   Note:
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

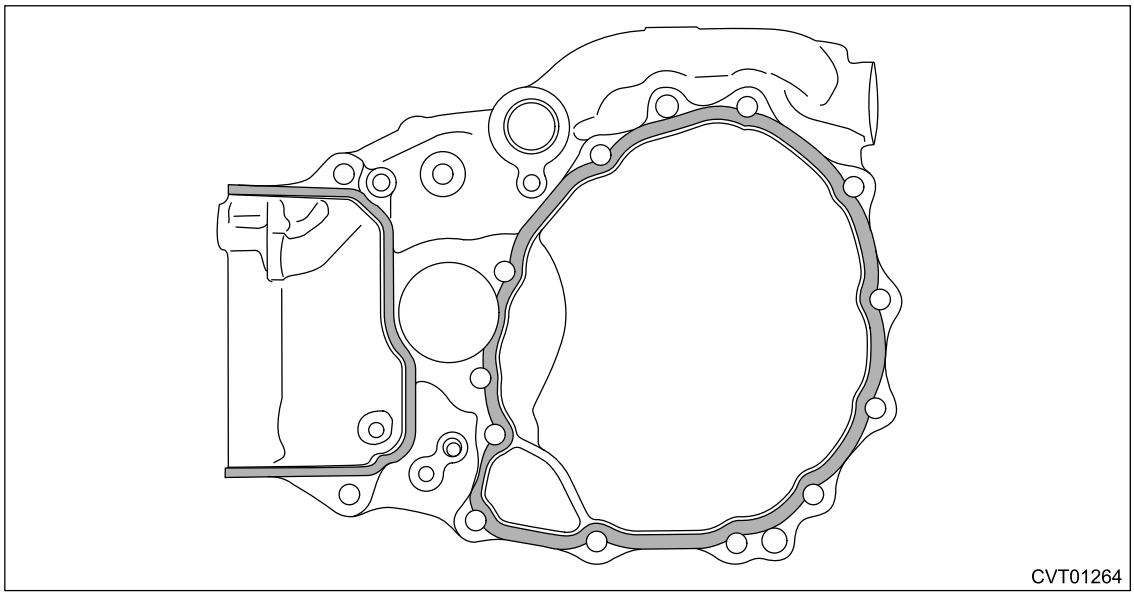




4. Apply liquid gasket seamlessly to the mating surface of drive pinion retainer.

Liquid gasket:

THREE BOND 1215B or equivalent



5. Install the drive pinion retainer to converter case, and tighten the bolt using the ST.

Preparation tool:

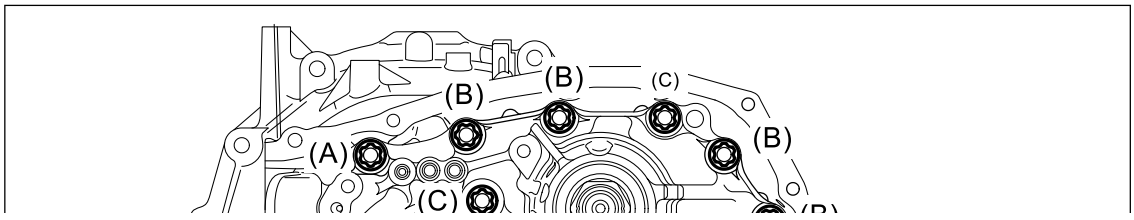
ST: SOCKET (E20) (18270KA020)

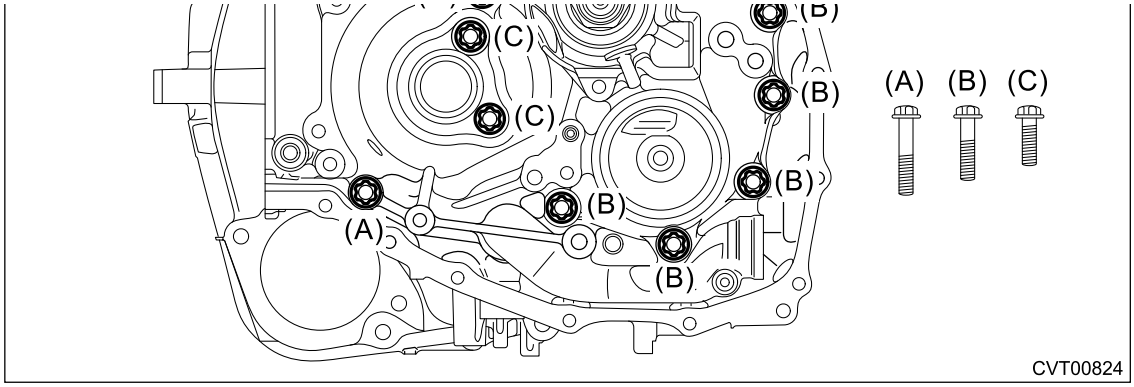
Note:

Do not confuse the three different-length bolts when installing.

Tightening torque:

43 N·m (4.4 kgf-m, 31.7 ft-lb)

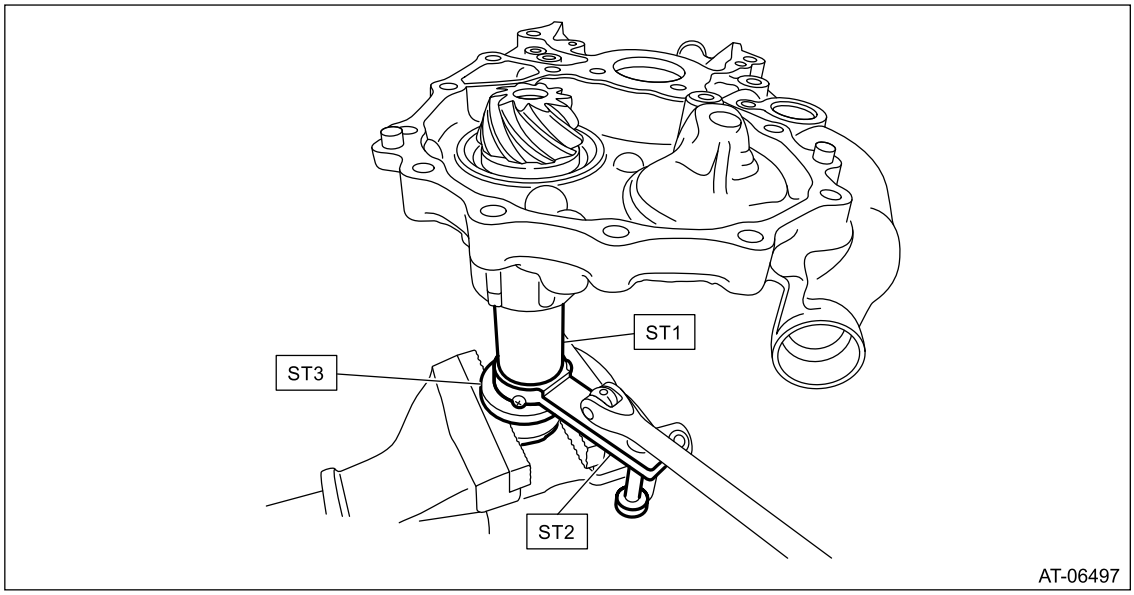




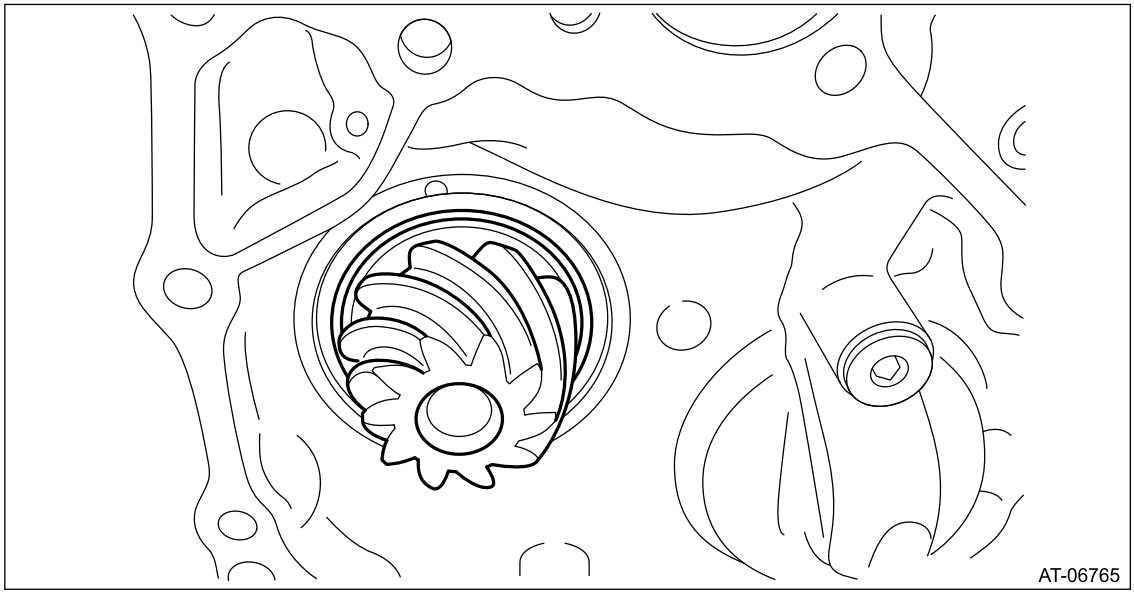
6. Install the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>INSTALLATION.
7. Install the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>INSTALLATION.
8. Install the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.
9. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.
10. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.
11. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.
12. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
13. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
14. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
15. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
16. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
17. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
18. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
19. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
20. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
21. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
22. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
23. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
24. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
25. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

DISASSEMBLY

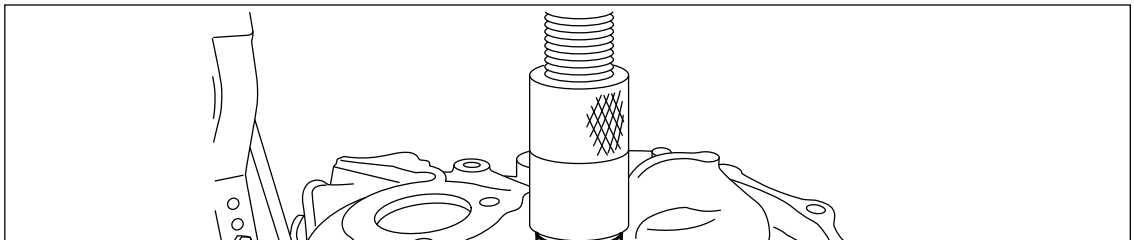
1. Flatten the tab of the lock nut.
2. Using ST1, ST2 and ST3, fix at the spline portion of drive pinion shaft to remove the lock nut.
   Preparation tool:
   ST1: ADAPTER (499787500)
   ST2: WRENCH (499787700)
   ST3: HOLDER (498937110)

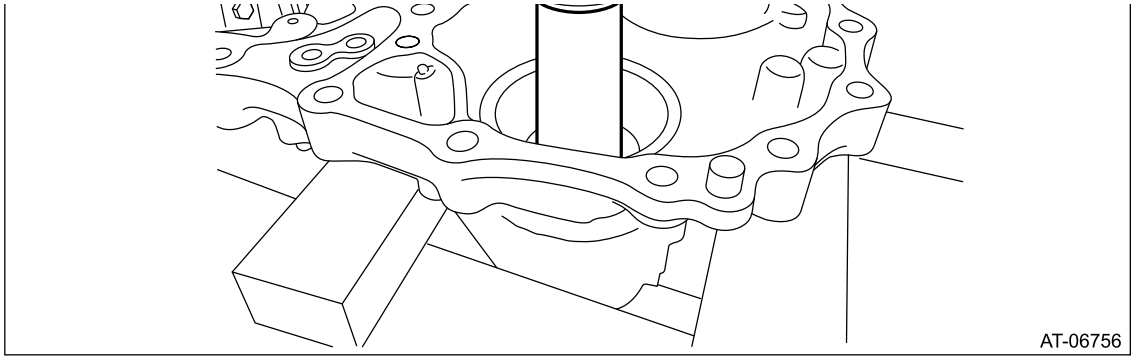


3. Remove the drive pinion shaft from the drive pinion retainer.



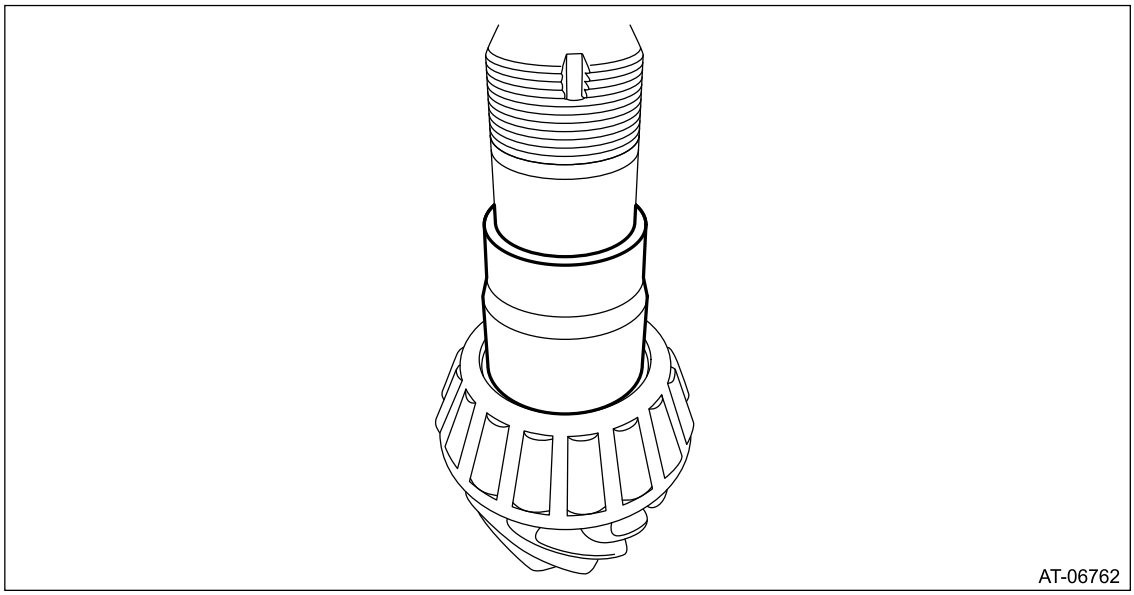
4. Using the round bar with diameter of 36 mm (1.42 in) or 37 mm (1.46 in), remove the bearing inner race and plug.



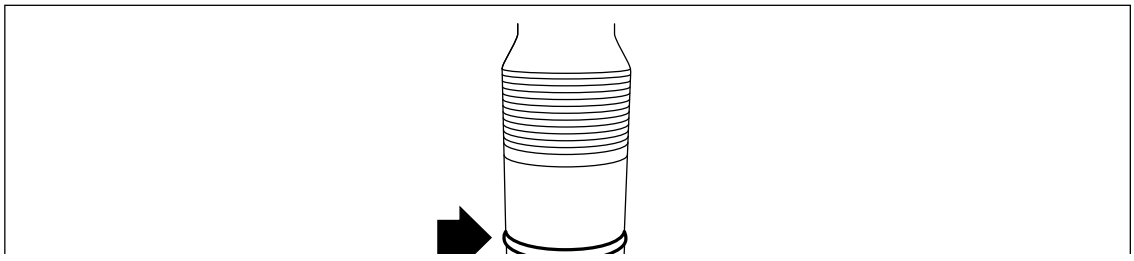


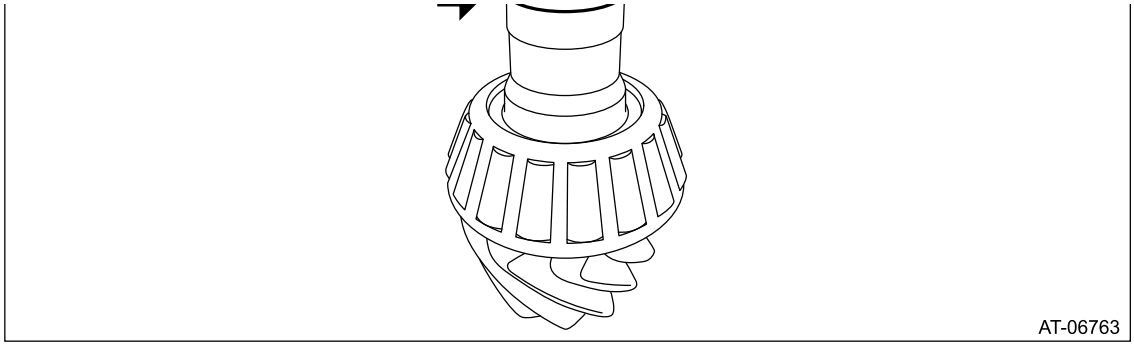
5. Remove the drive pinion washer.

6. Remove the drive pinion spacer.



7. Remove the O-rings.

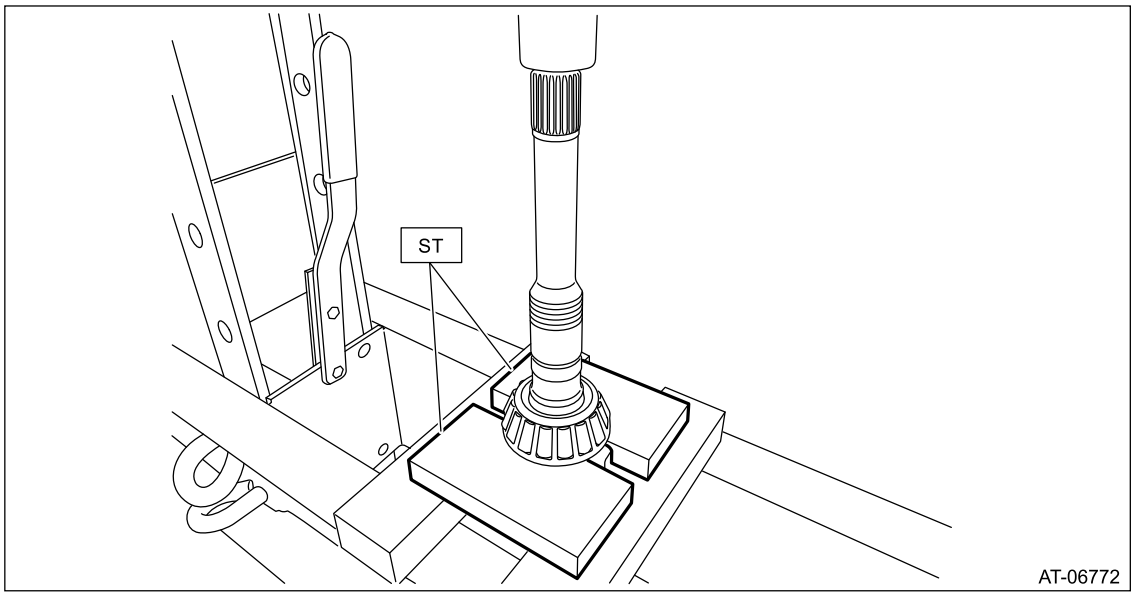




8. Remove the inner race and drive pinion shim from drive pinion shaft using ST.

Preparation tool:

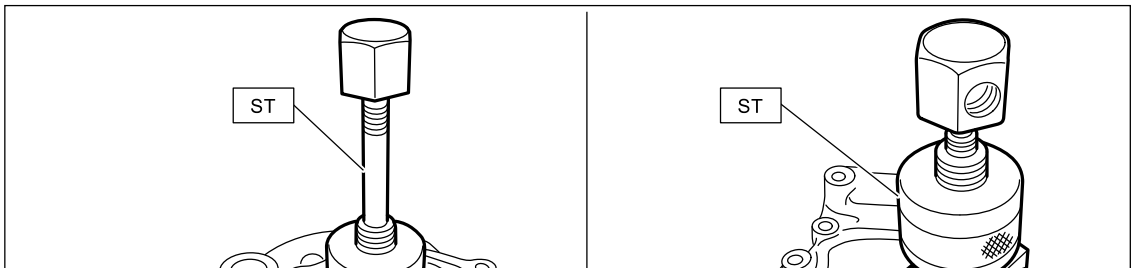
ST: REMOVER (498515500)

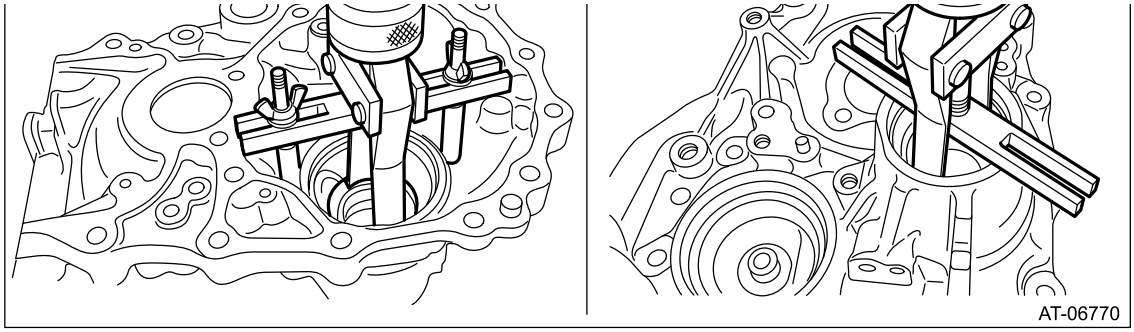


9. Using the ST, remove the outer race.

Preparation tool:

ST: PULLER ASSY (398527700)

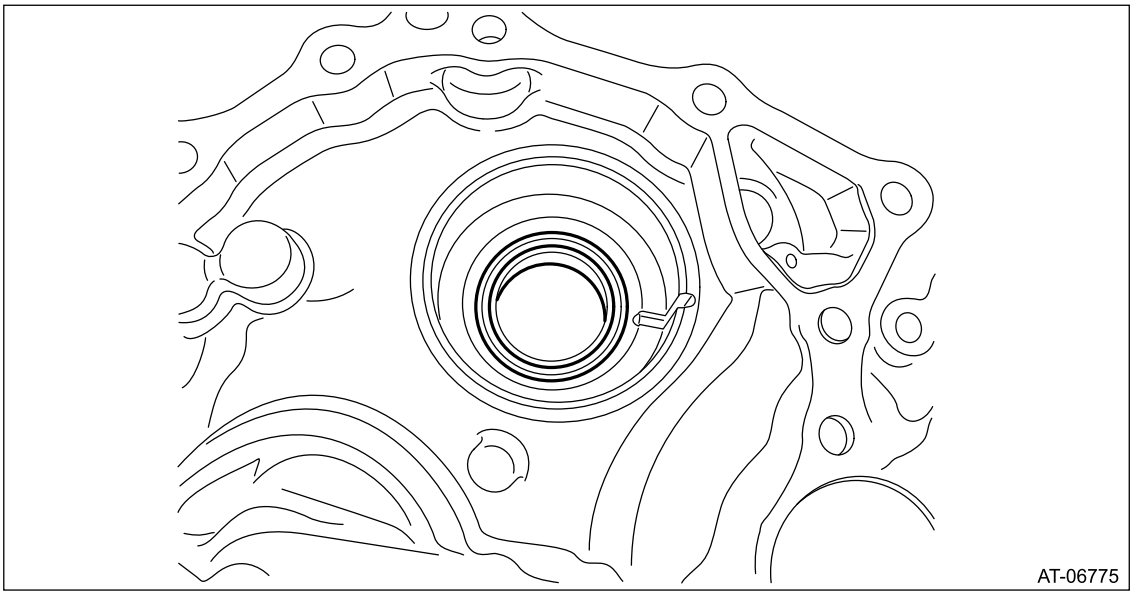




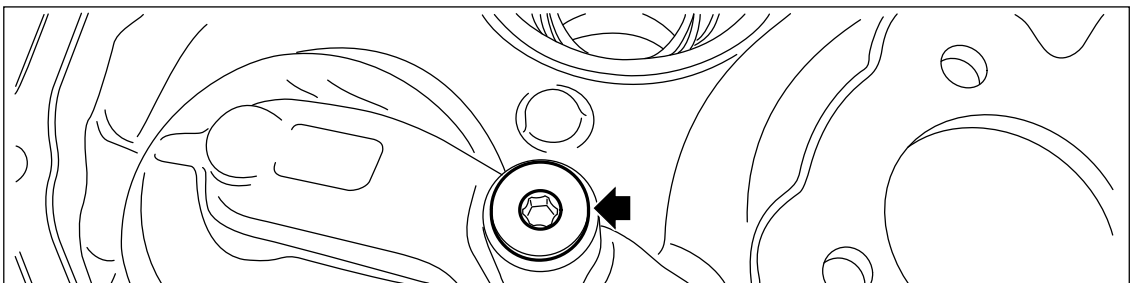
10. Remove the two oil seals using a screwdriver wrapped with cloth, etc.

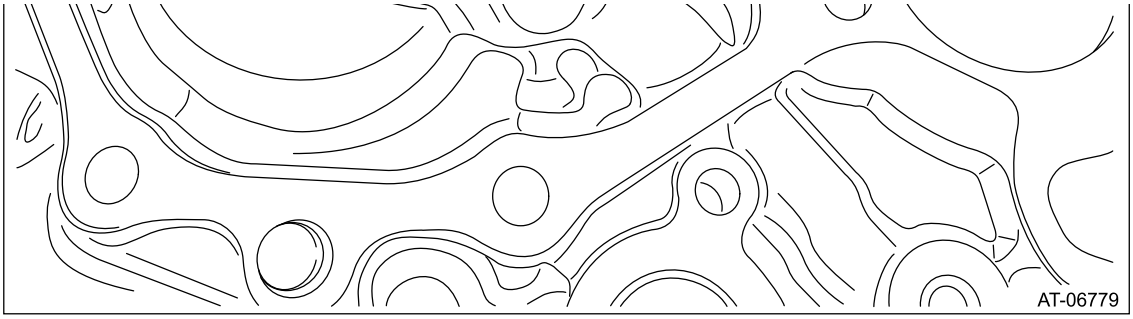
Caution:

Do not damage the fitting surface of oil seal.



11. Remove the plug from drive pinion retainer.



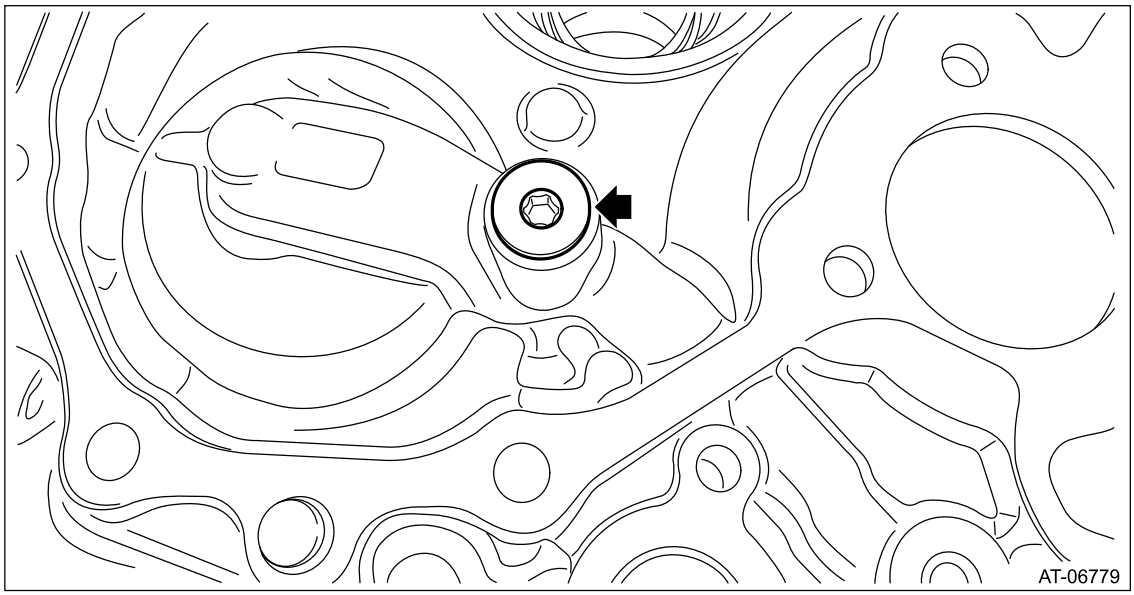


ASSEMBLY

1. Install the plug to drive pinion retainer.

   Note:
   - **Use new O-rings.**
   - **Apply CVTF to the O-rings.**

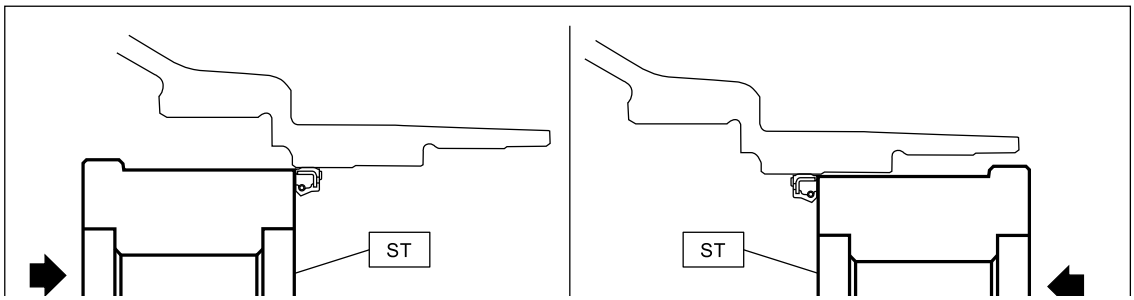
   Tightening torque:
   22 N·m (2.2 kgf-m, 16.2 ft-lb)

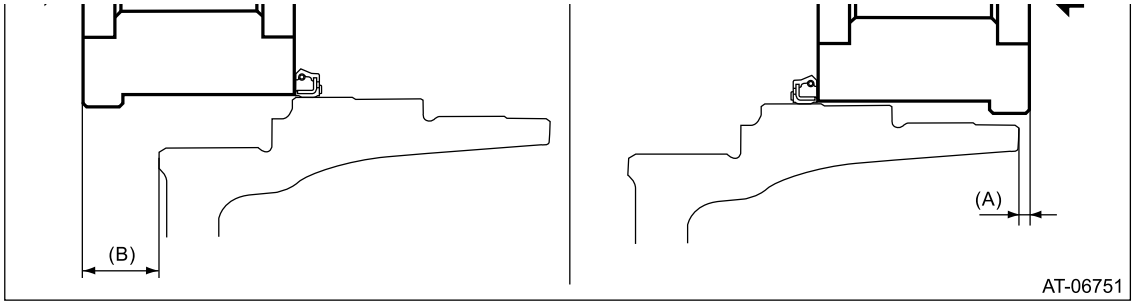


2. Using the ST, install the oil seal to drive pinion retainer.

   Note:
   - **Apply CVTF to the oil seal press-fitting surface and lip.**
   - **Install the oil seal in the correct direction.**

   Preparation tool:
   ST: HOUSING BUSHING INSTALLER AND REMOVER (927720000)



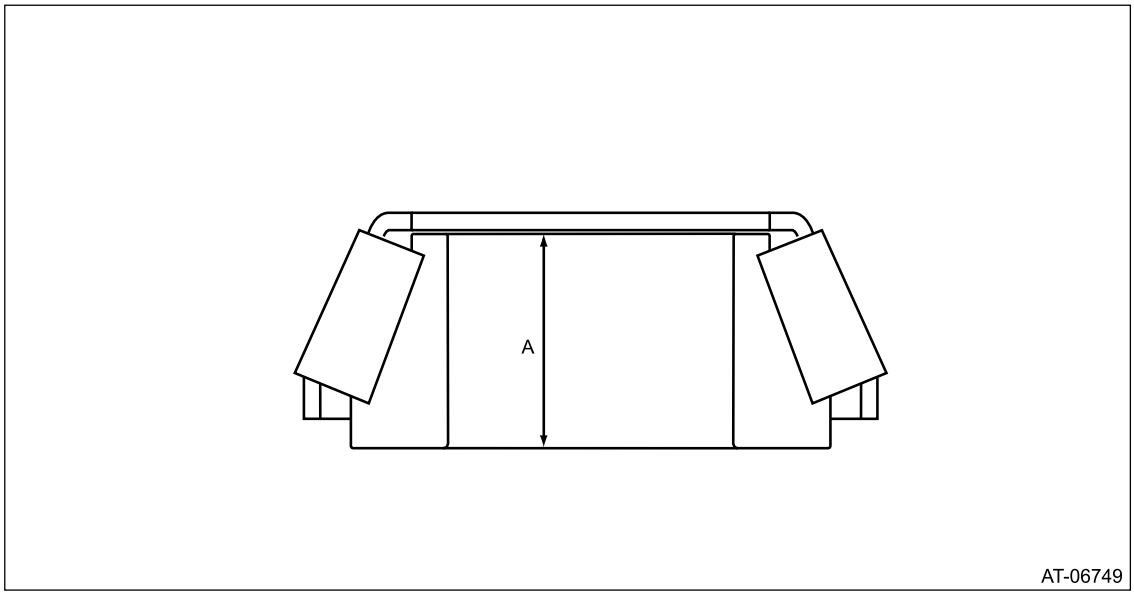


(A) 2.8 mm (0.11 in)

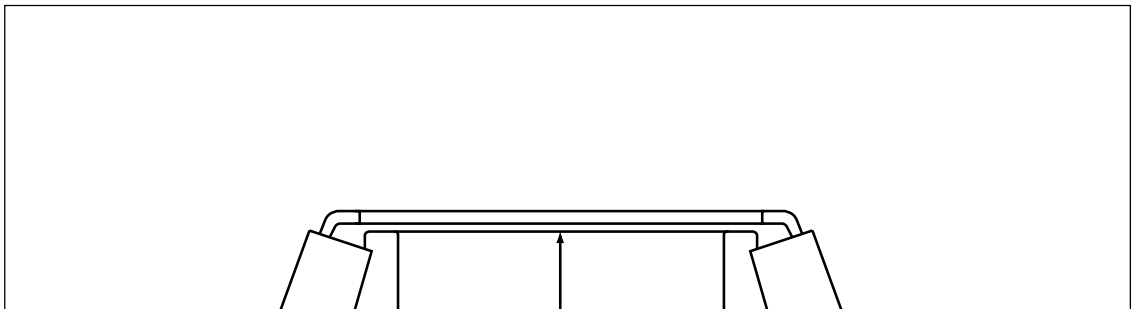
(B) 18.7 mm (0.74 in)

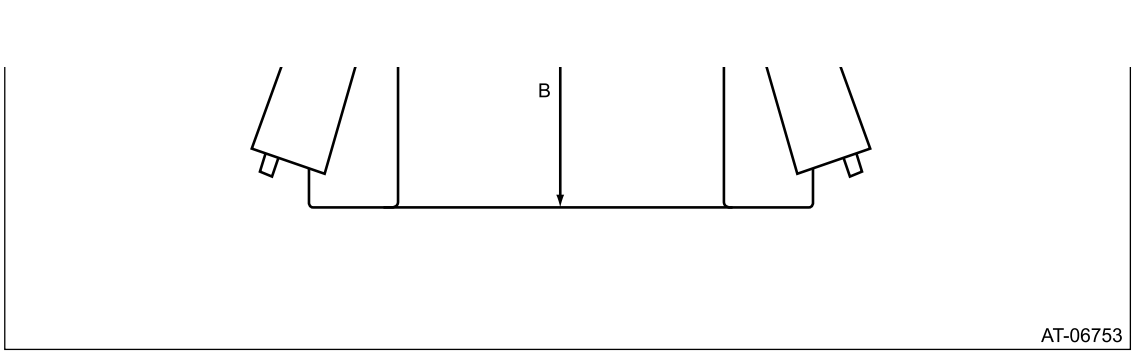
3. Select the drive pinion washer.

(1) Measure the roller bearing inner race width “A” on the front side.

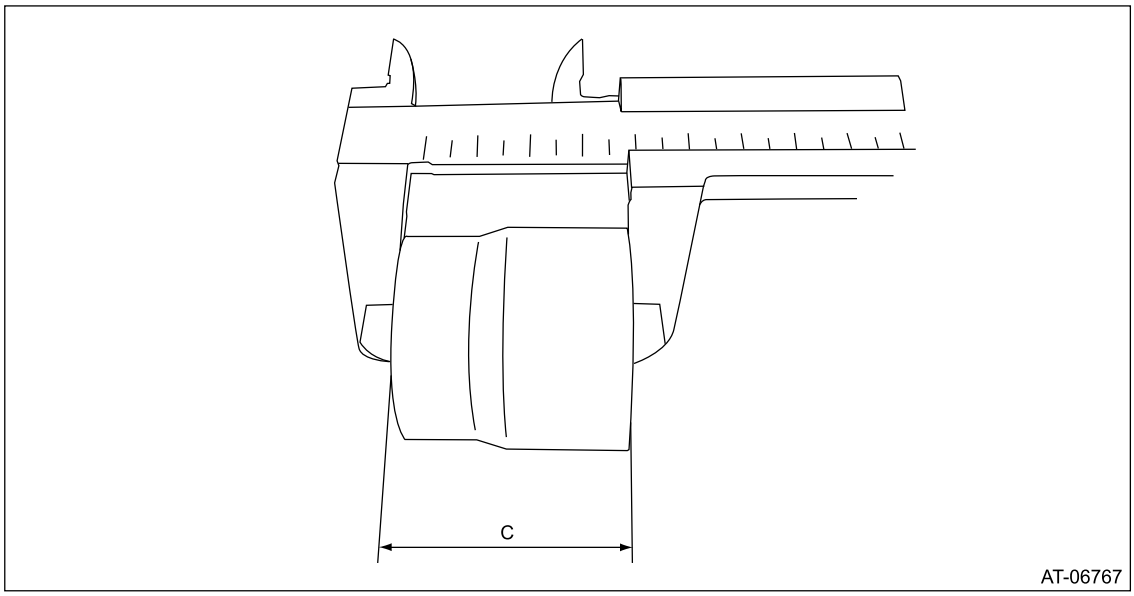


(2) Measure the roller bearing inner race width “B” on the rear side.





(3) Measure the spacer width “C”.

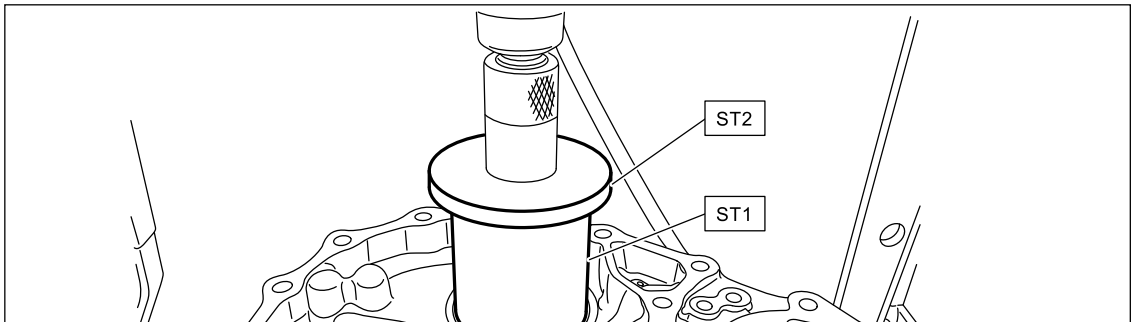


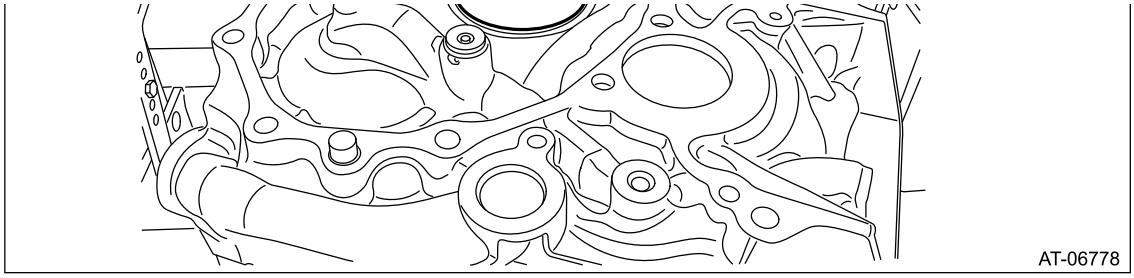
(4) Using the ST1 and ST2, install the front roller bearing outer race to the drive pinion retainer.

Preparation tool:

ST1: PRESS SNAP RING (28499TC010)

ST2: INSTALLER (398177700)

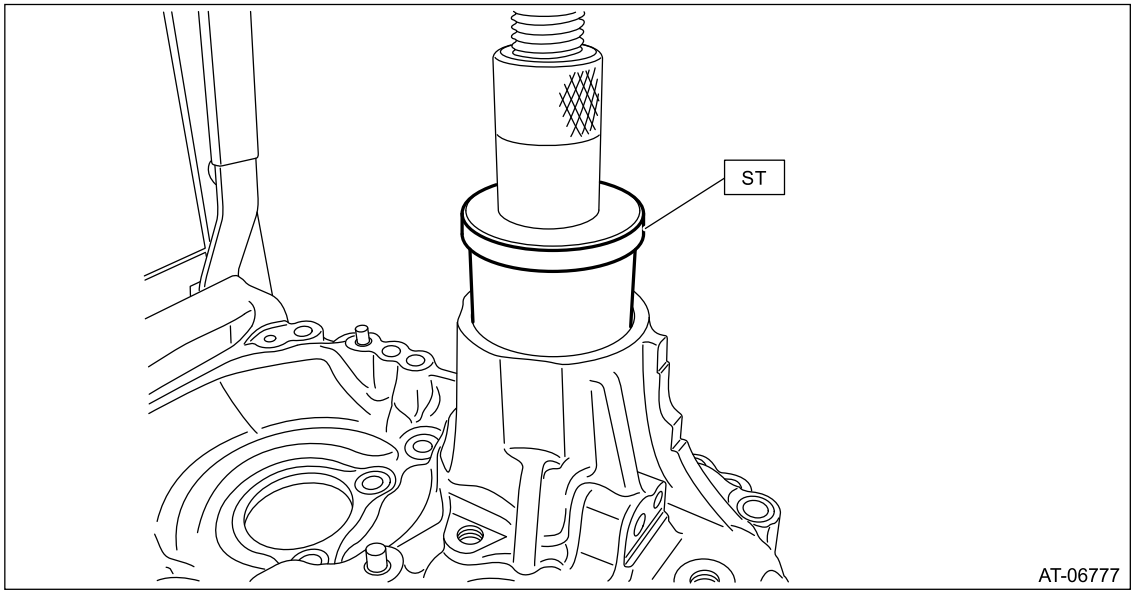




(5) Using the ST, install the rear roller bearing outer race to the drive pinion retainer.

Preparation tool:

ST: INSTALLER (20099AE020)

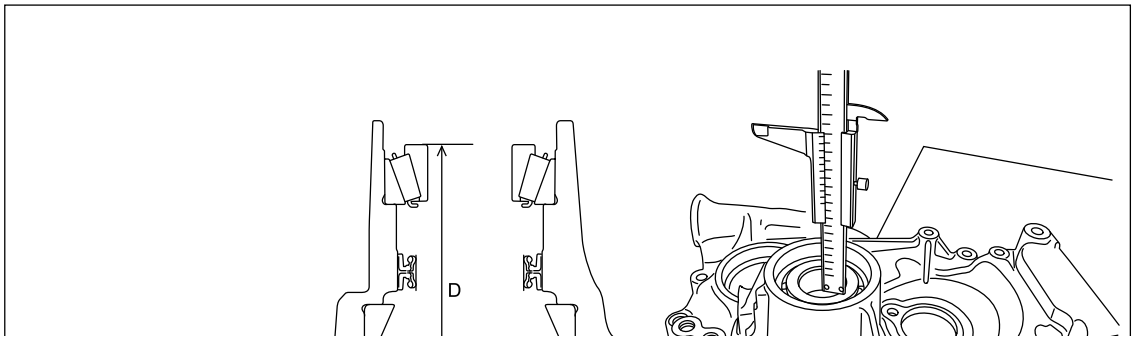


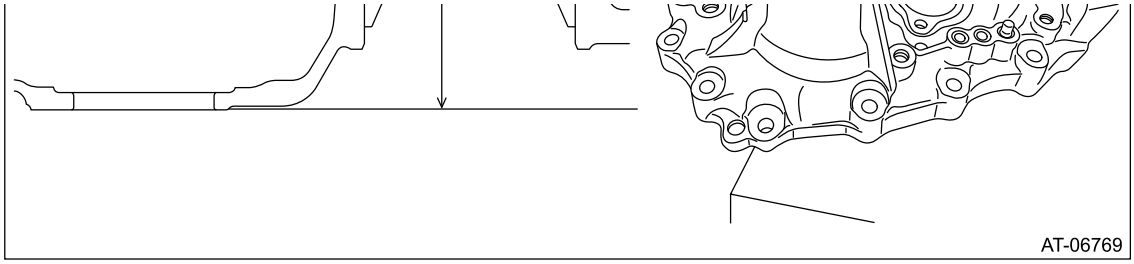
(6) Place the drive pinion retainer on the surface plate, and install the inner race to the rear roller bearing outer race.

Note:

Place the drive pinion retainer so that the mating surface of the drive pinion retainer (mating surface with the converter case) contacts the surface plate.

(7) Measure the height "D" from the end face of the rear roller bearing inner race to the surface plate.



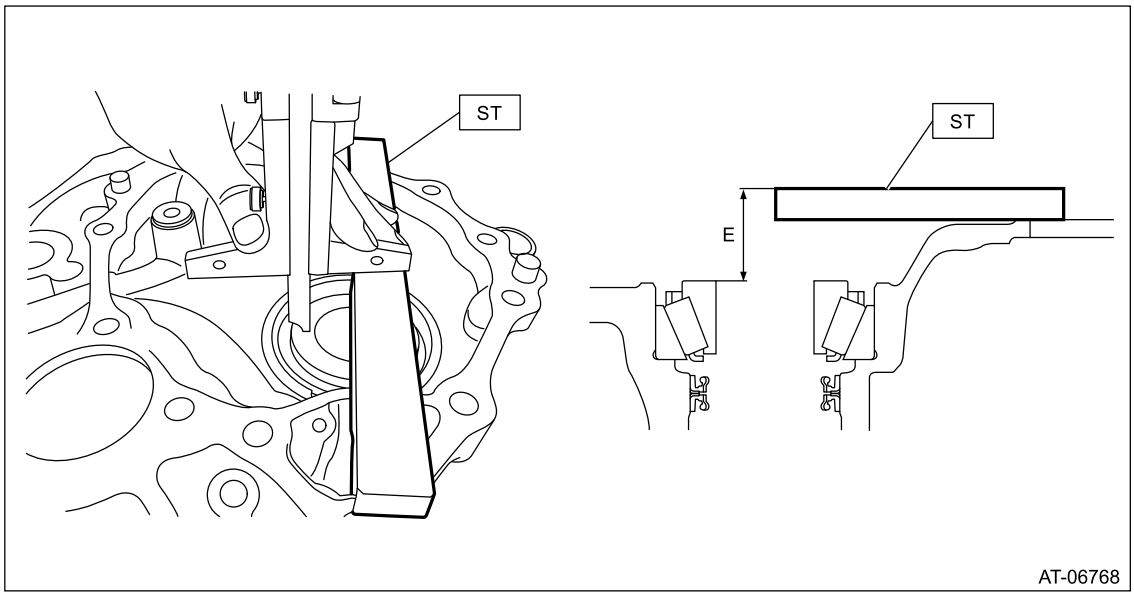


(8) Install the inner race to the front roller bearing outer race.

(9) Measure the depth "E" from the end face of the front roller bearing inner race to the end face of the ST.

Preparation tool:

ST: GAUGE (499575400)



(10) Using following formula, select one to three drive pinion washers.

T mm = D − (A + B + C + E − 15) − (0±0.0125)

[Tin = D − (A + B + C + E −0.591) − (0±0.0005)]

A: Front roller bearing width

B: Rear roller bearing width

C: Spacer width

D: Height from end face of rear roller bearing inner race to surface plate

E: Depth from end face of front roller bearing inner race to end face of ST

15 mm (0.591 in): Thickness of ST

T: Drive pinion washer thickness

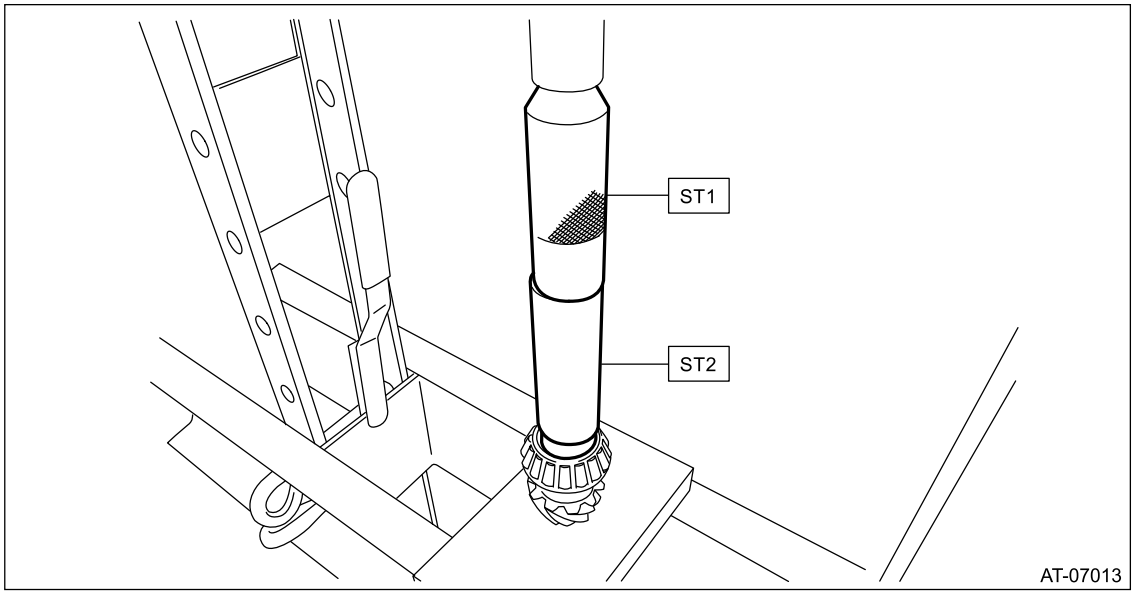
0±0.0125 mm (0±0.0005 in): Clearance

Drive pinion washer	
Part No.	**Thickness mm (in)**

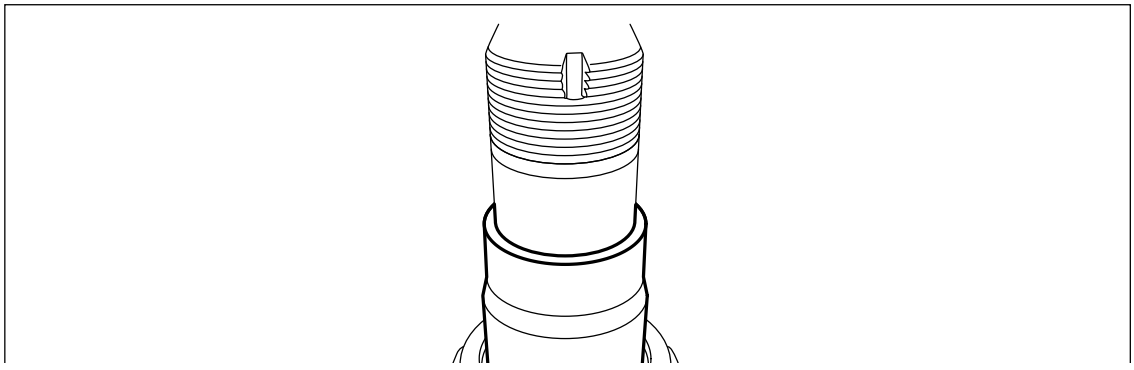
Drive pinion washer	
Part No.	**Thickness mm (in)**
38336AA750	0.150 (0.0059)
38336AA760	0.175 (0.0069)
38336AA770	0.200 (0.0079)
38336AA780	0.225 (0.0089)
38336AA790	0.250 (0.0098)
38336AA800	0.275 (0.0108)

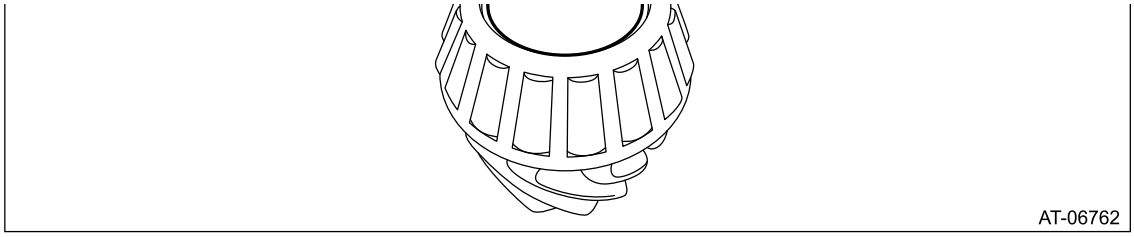
38336AA810	0.300 (0.0118)
38336AA820	0.400 (0.0157)

4. Measure and record the drive pinion shim thickness to be reused.
5. Install the drive pinion shim that is reused for the drive pinion shaft.
6. Using the ST1 and ST2, press-fit the inner race to the drive pinion shaft.
   Preparation tool:
   ST1: INSTALLER (899580100)
   ST2: EXTENSION DRIVE SHAFT (927130000)

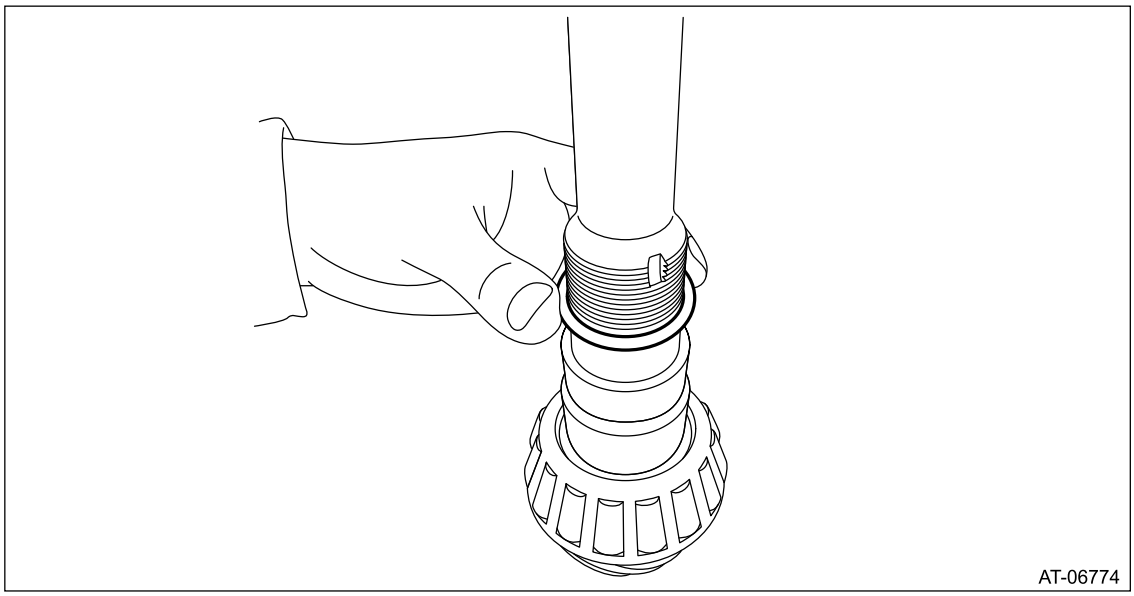


7. Install the drive pinion spacer.
   Note:
   Replace the O-ring with a new part after tooth contact inspection.





8. Install the selected drive pinion washer.



9. Insert the drive pinion shaft into the drive pinion retainer.

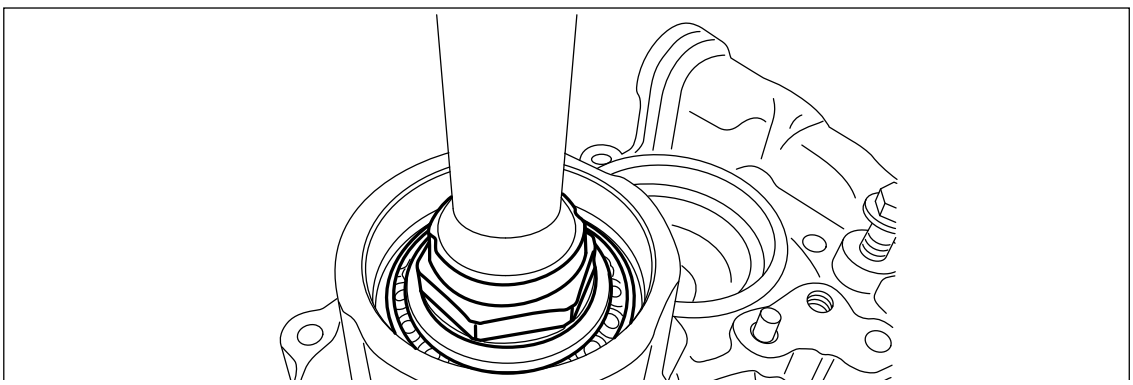
Caution:

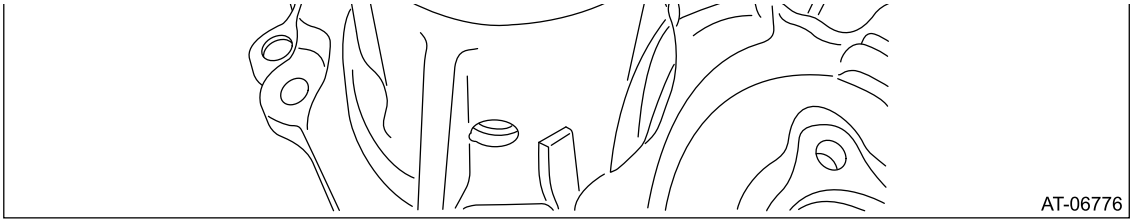
Be careful not to damage the oil seal.

10. Install the inner bearing and lock nut.

Note:

- **Use a new lock nut.**
- **Apply differential gear oil to the threaded portion of the drive pinion shaft.**





11. Using the ST1, ST2 and ST3, tighten the lock nut to the specified torque so that the starting torque of the drive pinion shaft is within the specified range.

Caution:

Before inspecting the starting torque, apply differential gear oil to roller of bearing and rotate the bearing several times.

Note:

- **Tighten the lock nut while directly aligning ST2 and torque wrench.**
- **If the starting torque is not within the specified range, select the drive pinion washer, and repeat the step until the starting torque is within the specified range.**
- **When a thicker drive pinion washer is selected, the starting torque decreases. When a thinner drive pinion washer is selected, the starting torque increases.**

Starting torque:

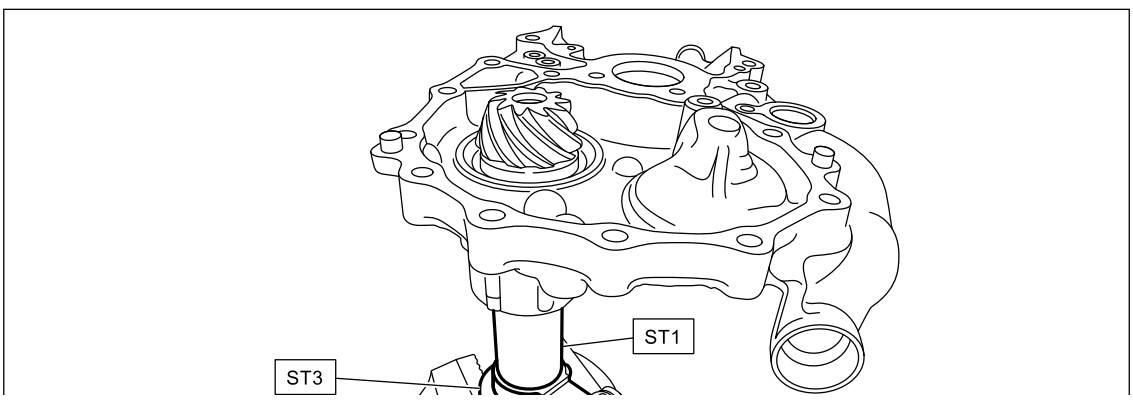
5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)

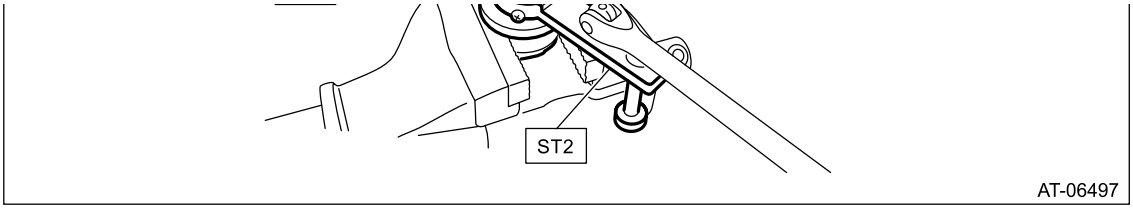
Preparation tool:

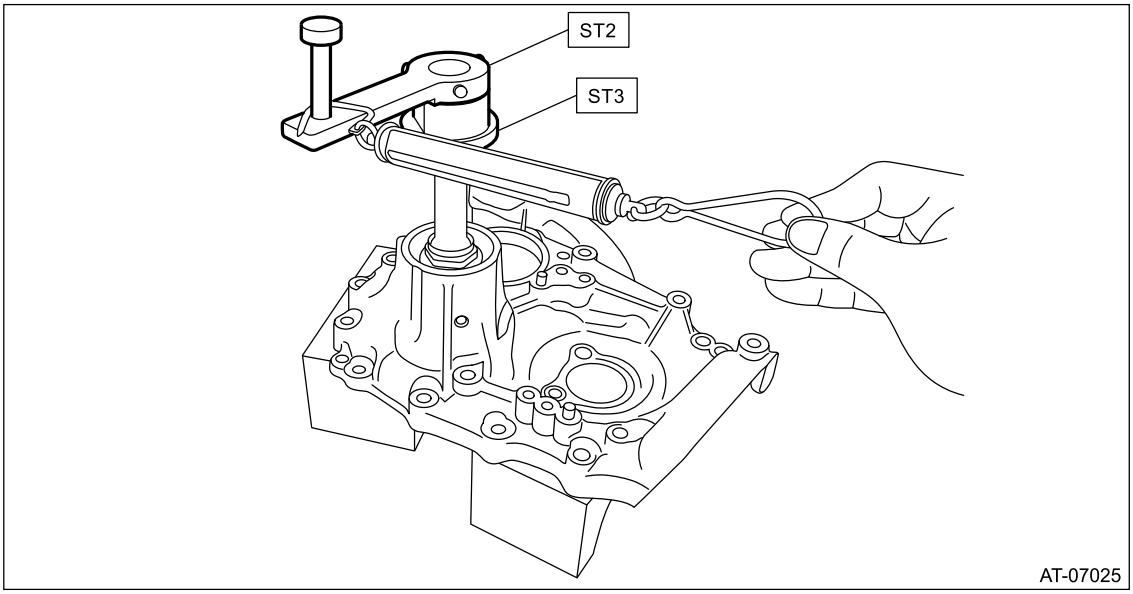
ST1: ADAPTER (499787500)
ST2: WRENCH (499787700)
ST3: HOLDER (498937110)

Using the following formula, calculate the tightening torque for a torque wrench.
T2 = L2/(L1 + L2) × T1
T1: 170 — 250 N·m (17.3 — 25.5 kgf-m, 125.4 — 184.4 ft-lb) [Specified tightening torque range]
T2: Tightening torque
L1: ST1 length 0.072 m (2.83 in)
L2: Torque wrench length
Example:

Torque wrench length m (in)	Tightening torque N·m (kgf-m, ft-lb)
0.4 (15.75)	144 — 211 (14.7 — 21.5, 106.2 — 155.6)
0.45 (17.72)	147 — 215 (15.0 — 21.9, 108.4 — 158.6)
0.5 (19.69)	149 — 218 (15.2 — 22.2, 109.9 — 160.8)
0.55 (21.65)	150 — 221 (15.3 — 22.5, 110.6 — 163.0)







12. Install the drive pinion retainer to the converter case, and check the backlash and tooth contact. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ADJUSTMENT. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>ADJUSTMENT.

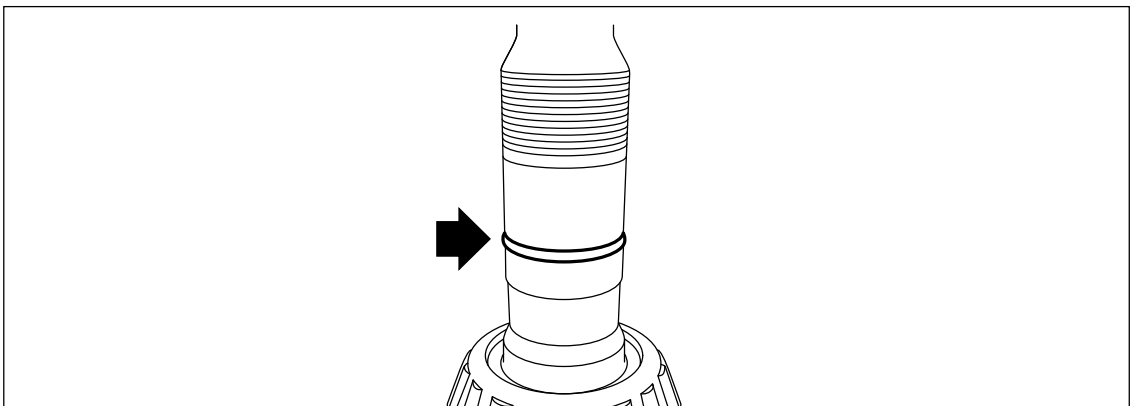
13. Remove the drive pinion retainer from converter case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>REMOVAL.

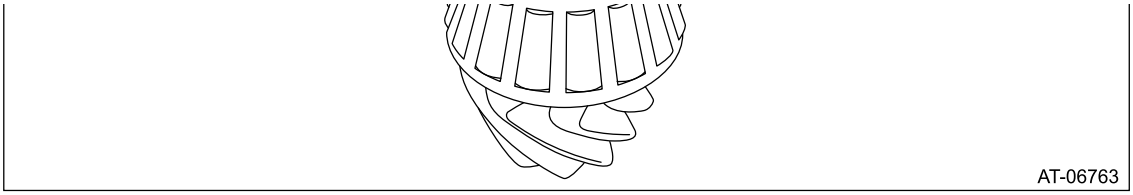
14. Remove the drive pinion spacer from the drive pinion shaft. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>DISASSEMBLY.

15. Install the O-ring to the drive pinion shaft.

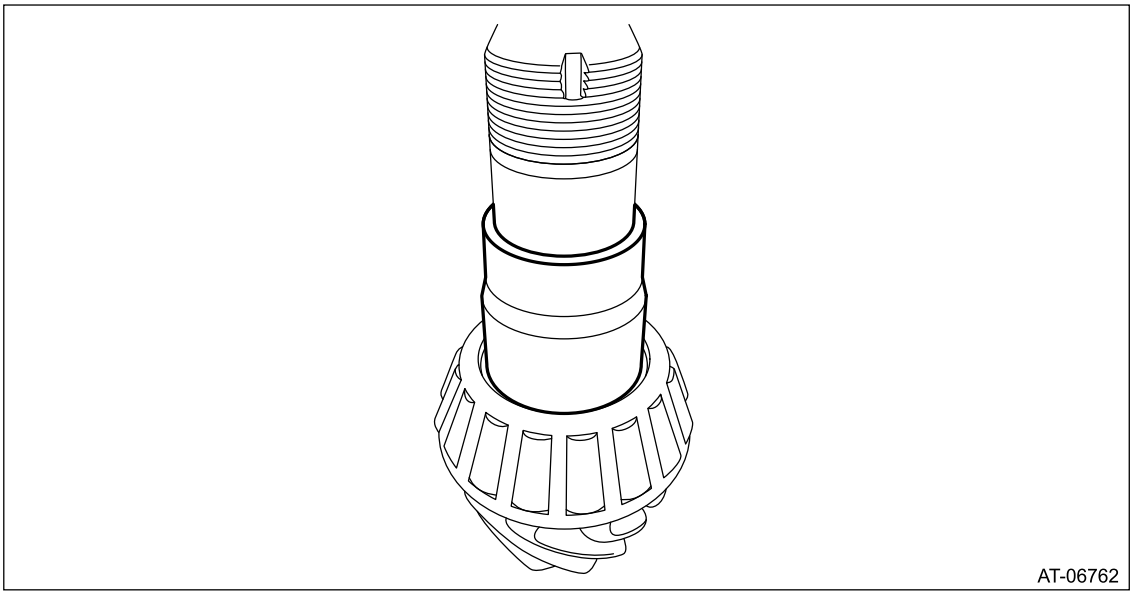
Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**

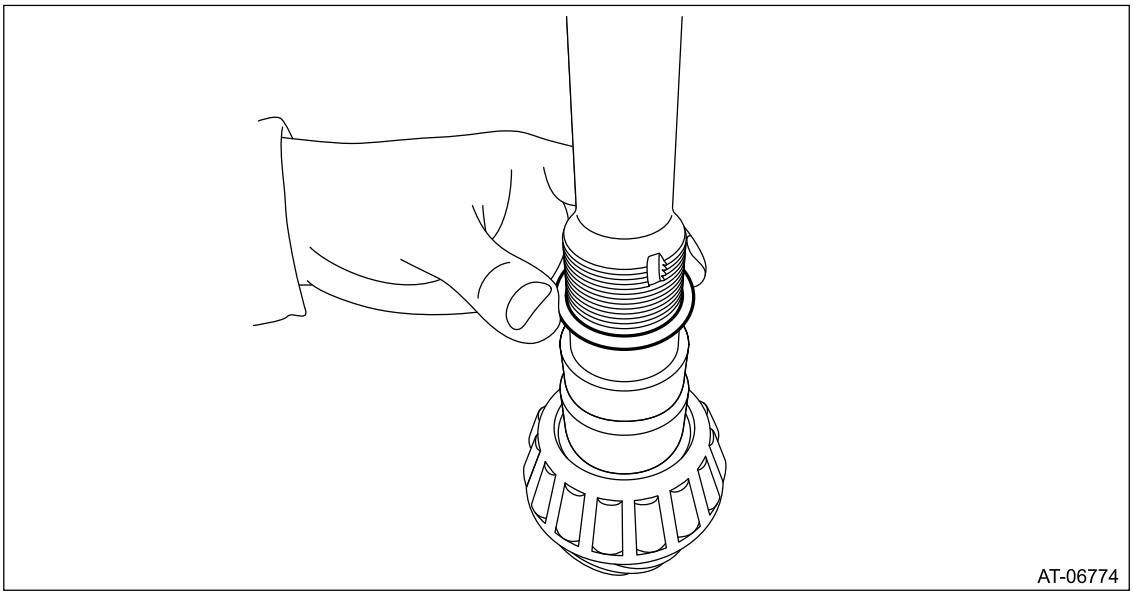




16. Install the drive pinion spacer to the drive pinion shaft.



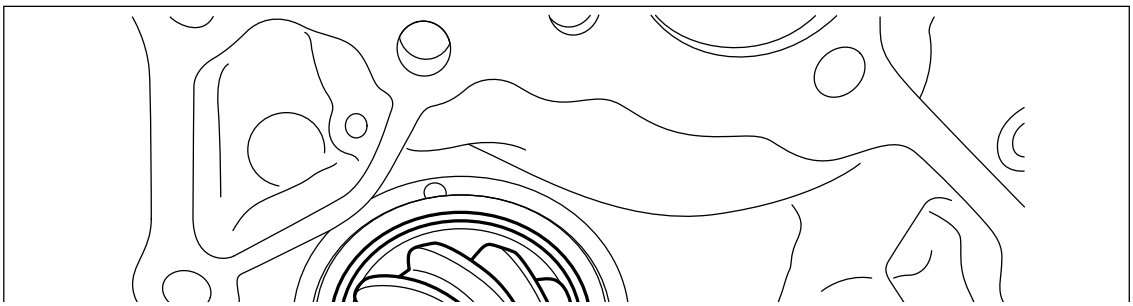
17. Install the drive pinion washer.

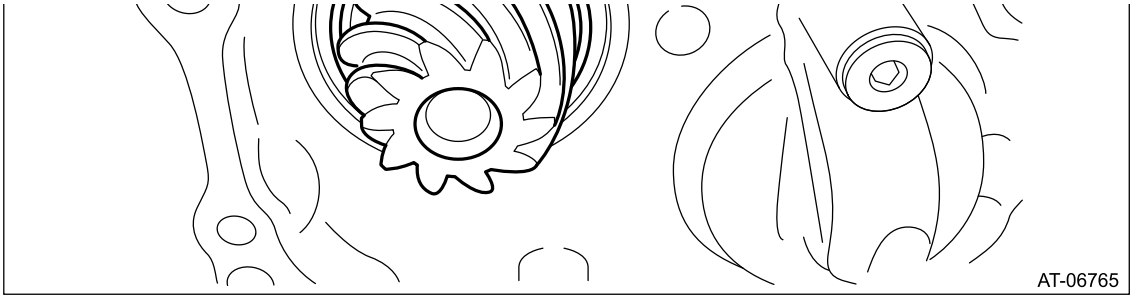


18. Insert the drive pinion shaft into the drive pinion retainer.

Caution:

Be careful not to damage the oil seal.

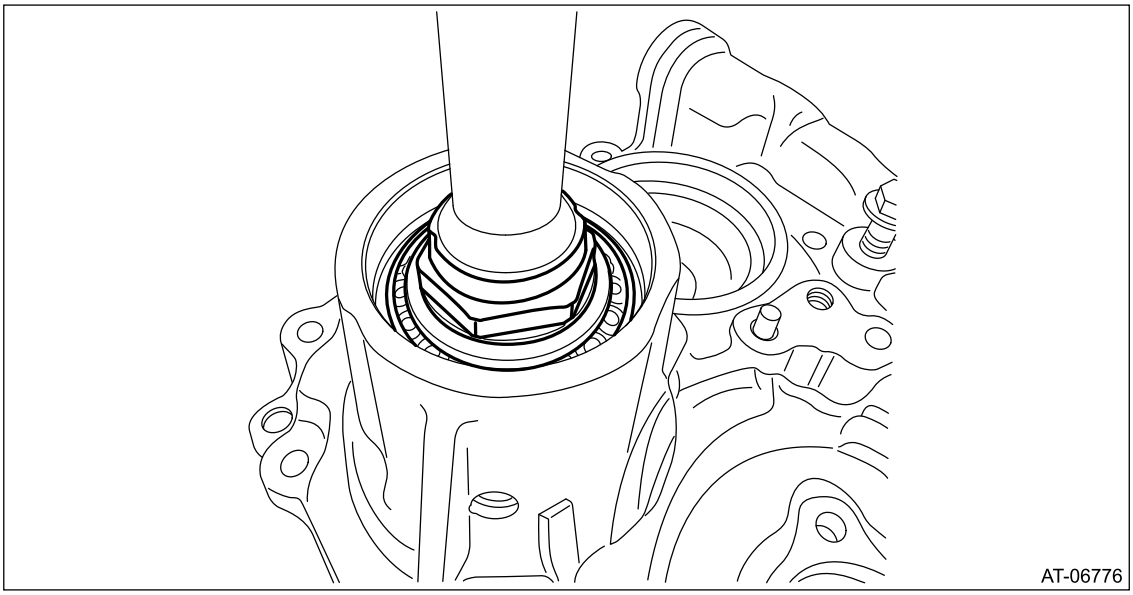




19. Install the inner bearing and lock nut.

Note:

Apply differential gear oil to the threaded portion of the drive pinion shaft.



20. Using the ST1, ST2 and ST3, tighten the lock nut to the specified torque so that the starting torque of the drive pinion shaft is within the specified range.

Caution:

Before inspecting the starting torque, apply differential gear oil to roller of bearing and rotate the bearing several times.

Note:

- **Tighten the lock nut while directly aligning ST2 and torque wrench.**
- **If the starting torque is not within the specified range, select the drive pinion washer, and repeat the step until the starting torque is within the specified range.**
- **When a thicker drive pinion washer is selected, the starting torque decreases. When a thinner drive pinion washer is selected, the starting torque increases.**

Starting torque:

5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)

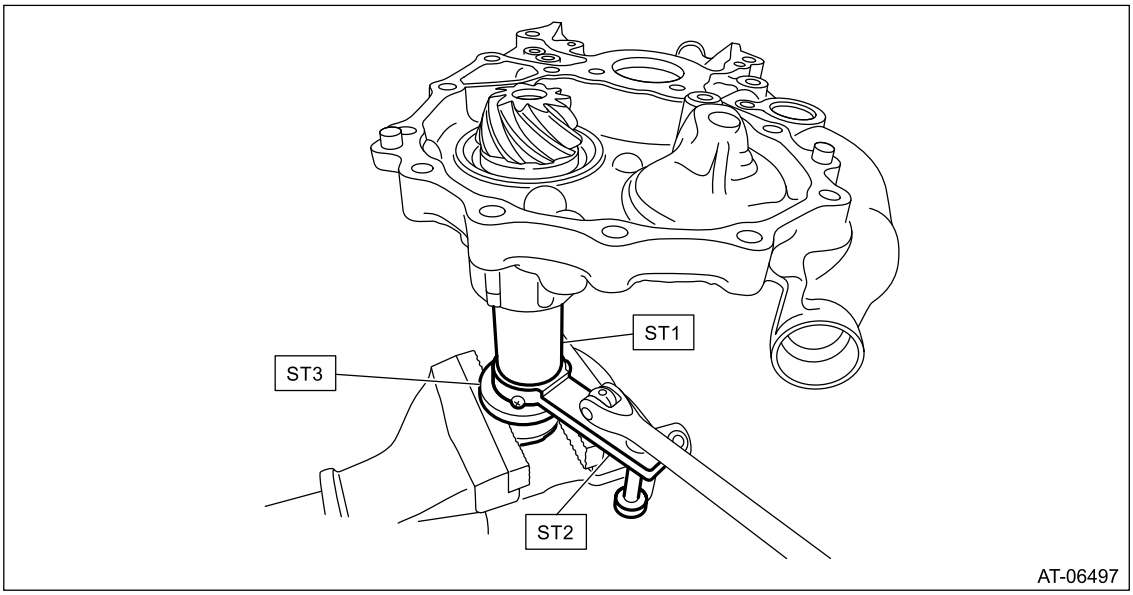
Preparation tool:

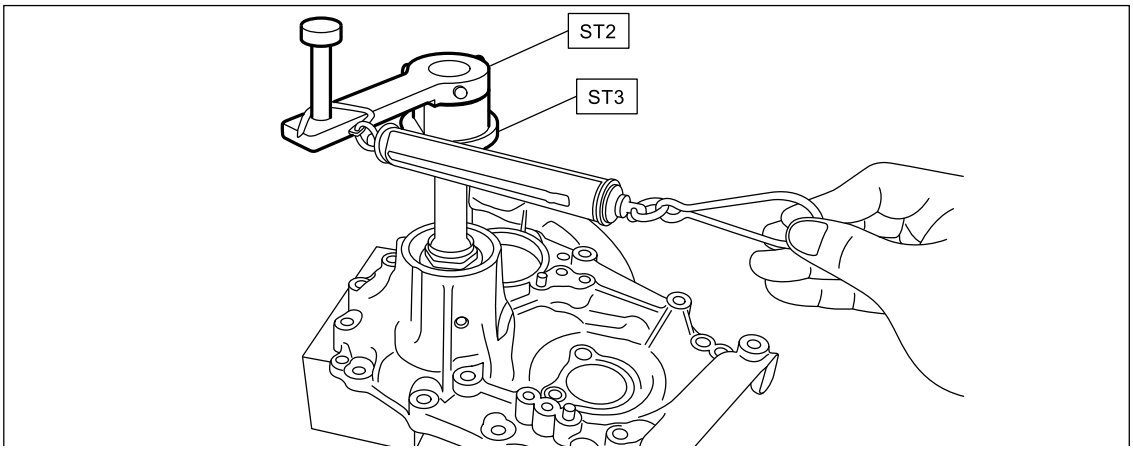
ST1: ADAPTER (499787500)
ST2: WRENCH (499787700)
ST3: HOLDER (498937110)

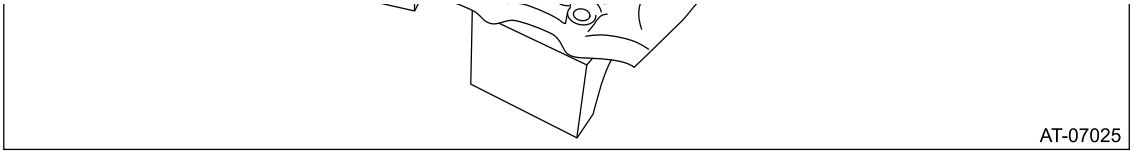
Using the following formula, calculate the tightening torque for a torque wrench.
$T2 = L2/(L1 + L2) \times T1$
T1: 170 — 250 N·m (17.3 — 25.5 kgf-m, 125.4 — 184.4 ft-lb) [Specified tightening torque range]
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L2: Torque wrench length
Example:

Example:

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0.45 (17.72)	147 — 215 (15.0 — 21.9, 108.4 — 158.6)
0.5 (19.69)	149 — 218 (15.2 — 22.2, 109.9 — 160.8)
0.55 (21.65)	150 — 221 (15.3 — 22.5, 110.6 — 163.0)







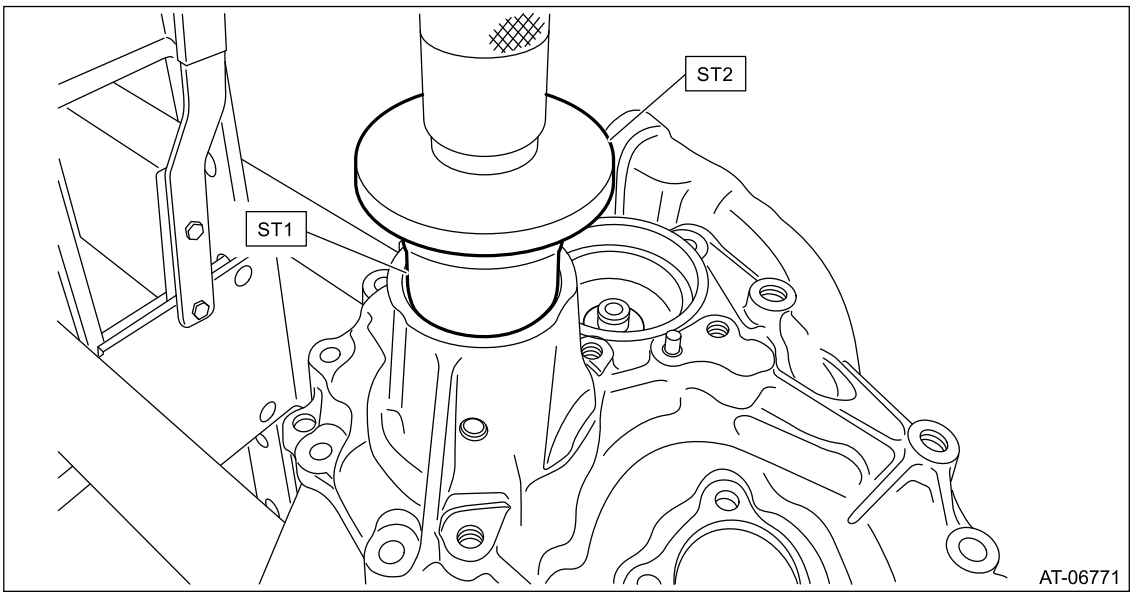
21. Crimp the lock nut in 2 locations.

22. Install the plug using ST1 and ST2.

Preparation tool:

ST1: PRESS SNAP RING (499755602)

ST2: INSTALLER (398177700)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Pinion Shaft Assembly

INSPECTION

- Make sure that all component parts are free of scratches, holes and other faults.
- Check the tooth contact. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ADJUSTMENT.
- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.
- Check the starting torque of drive pinion shaft.

Caution:

Before measuring, apply differential gear oil to roller of bearing and rotate the bearing several times.

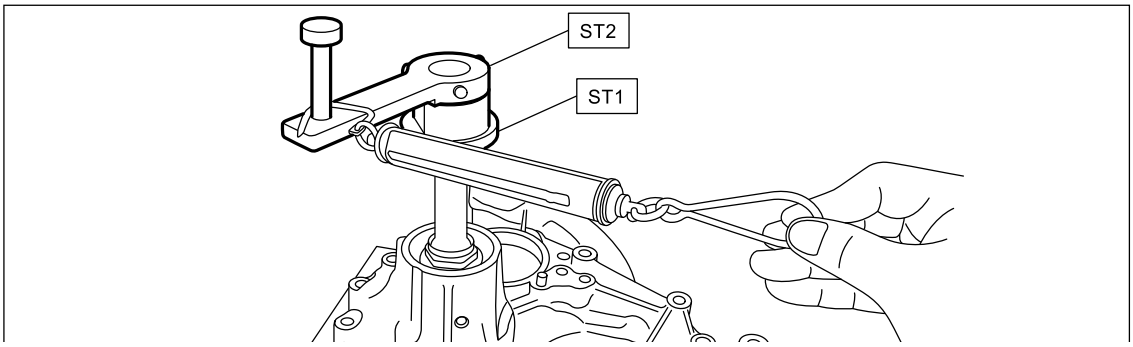
Preparation tool:

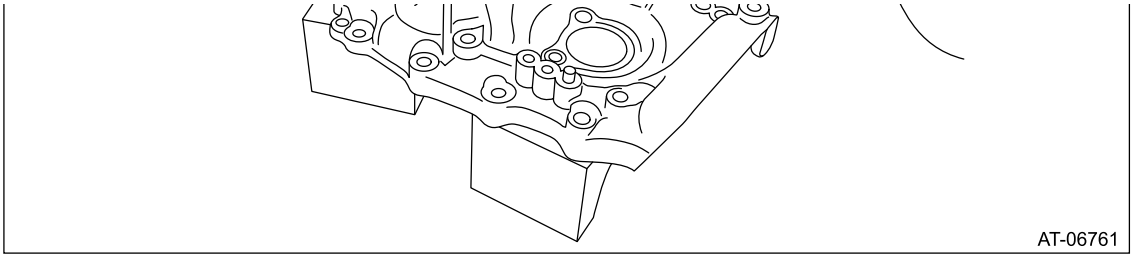
ST1: HOLDER (498937110)

ST2: WRENCH (499787700)

Starting torque:

5.1 — 17.1 N (0.5 — 1.7 kgf, 1.1 — 3.8 lbf)





CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Drive Pinion Shaft Assembly

ADJUSTMENT

1. Remove the liquid gasket from the mating surface completely.
2. Using the ST, install the drive pinion retainer to converter case.

Preparation tool:

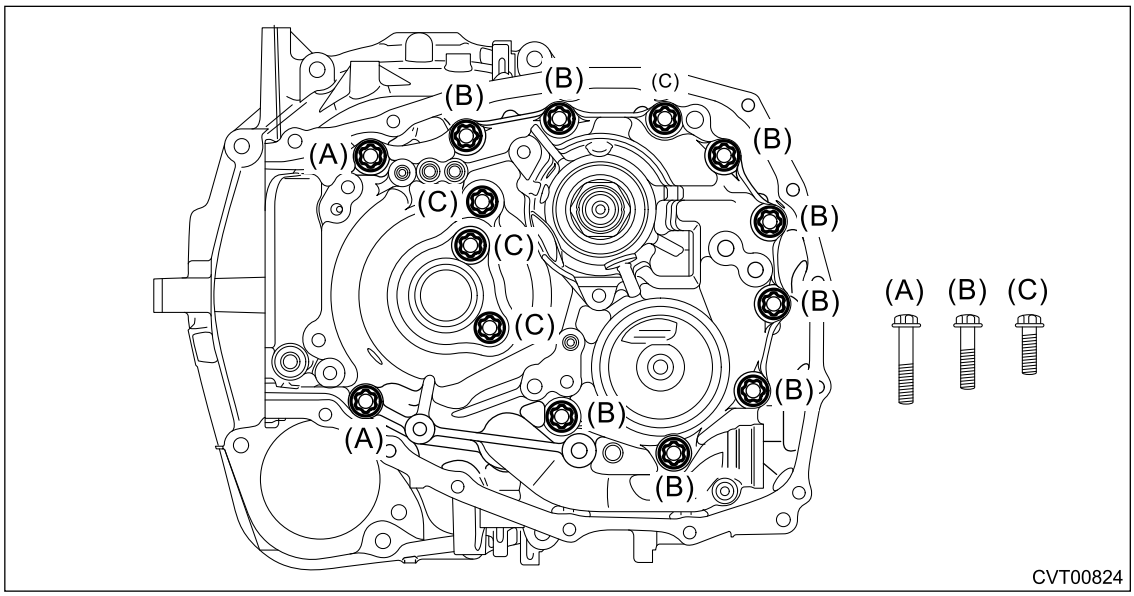
ST: SOCKET (E20) (18270KA020)

Note:

Do not confuse the three different-length bolts when installing.

Tightening torque:

43 N·m (4.4 kgf-m, 31.7 ft-lb)

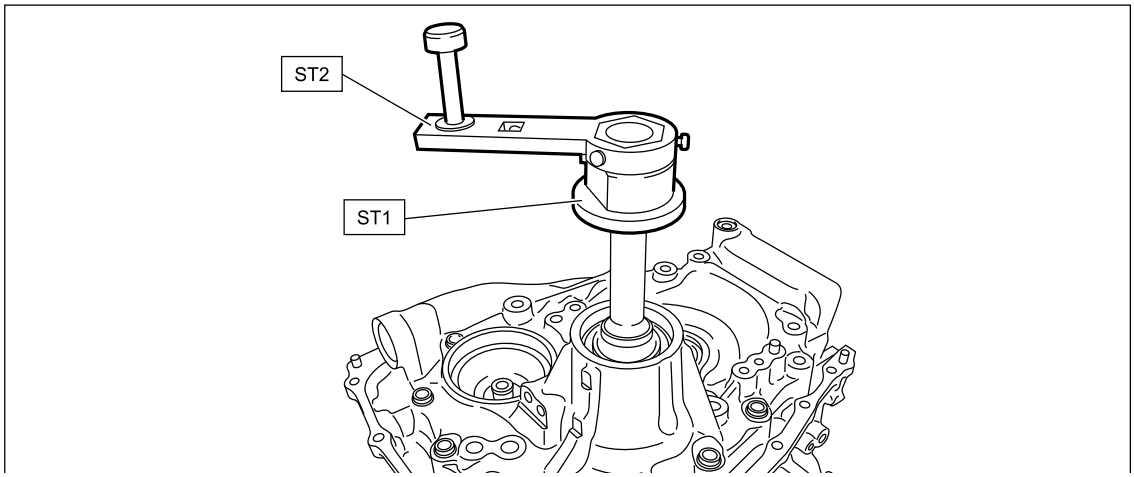


3. Rotate the drive pinion several times using ST1 and ST2.

Preparation tool:

ST1: HOLDER (498937110)

ST2: WRENCH (499787700)

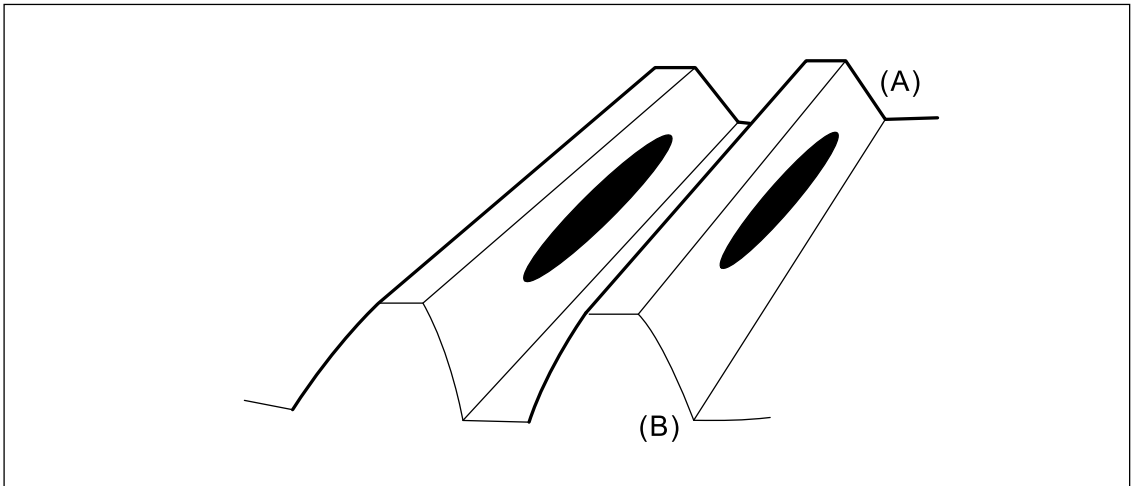


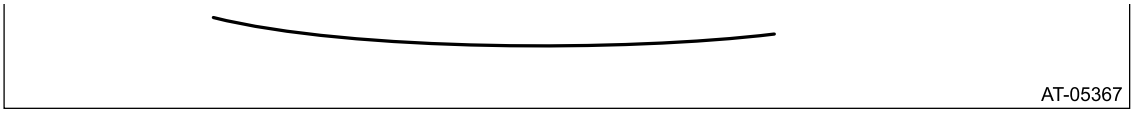


4. Adjust the drive pinion and hypoid driven gear backlash. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>ADJUSTMENT.
5. Using the ST, remove the drive pinion retainer from converter case.
   Preparation tool:
   ST: SOCKET (E20) (18270KA020)
6. Apply lead-free red dye evenly on the both sides of three to four teeth of the hypoid driven gear. Then install the drive pinion retainer and rotate the drive pinion in both directions several times. Remove the drive pinion retainer and check the tooth contact pattern.
   If the teeth contact is inappropriate, adjust the backlash or thickness of the shim. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>ADJUSTMENT.
   Note:
   After correction, wipe off the lead-free red dye.

Drive pinion shim	
Part No.	**Thickness mm (in)**
31451AA320	0.150 (0.0059)
31451AA330	0.175 (0.0069)
31451AA340	0.200 (0.0079)
31451AA350	0.225 (0.0089)
31451AA360	0.250 (0.0098)
31451AA370	0.275 (0.0108)

- Correct tooth contact
  Check item: Tooth contact surface is slightly shifted toward the toe side under a no-load condition. (When driving, it moves towards the heel side.)

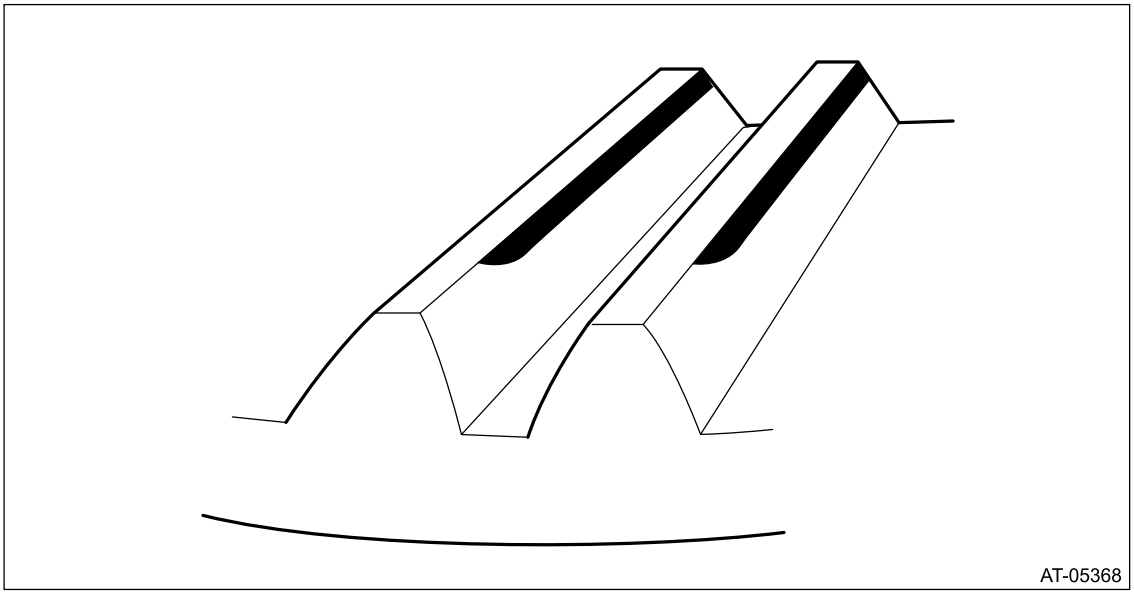




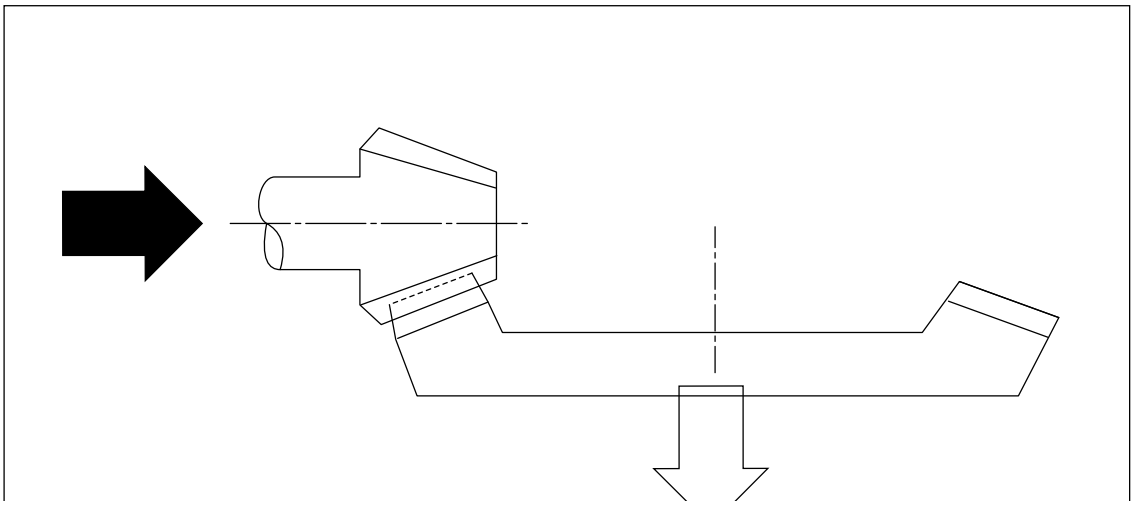
(A) Toe side

(B) Heel side

- Face contact
  Check item: Backlash is too large.
  Contact pattern

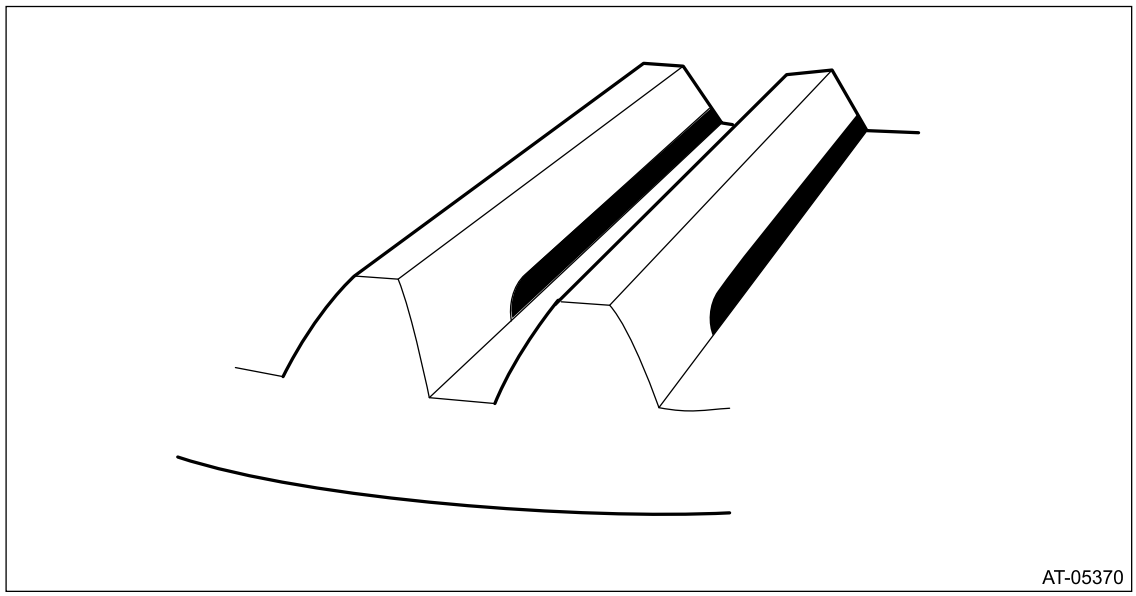


Corrective action: Increase thickness of drive pinion shim according to the procedures for moving the drive pinion close to hypoid driven gear.

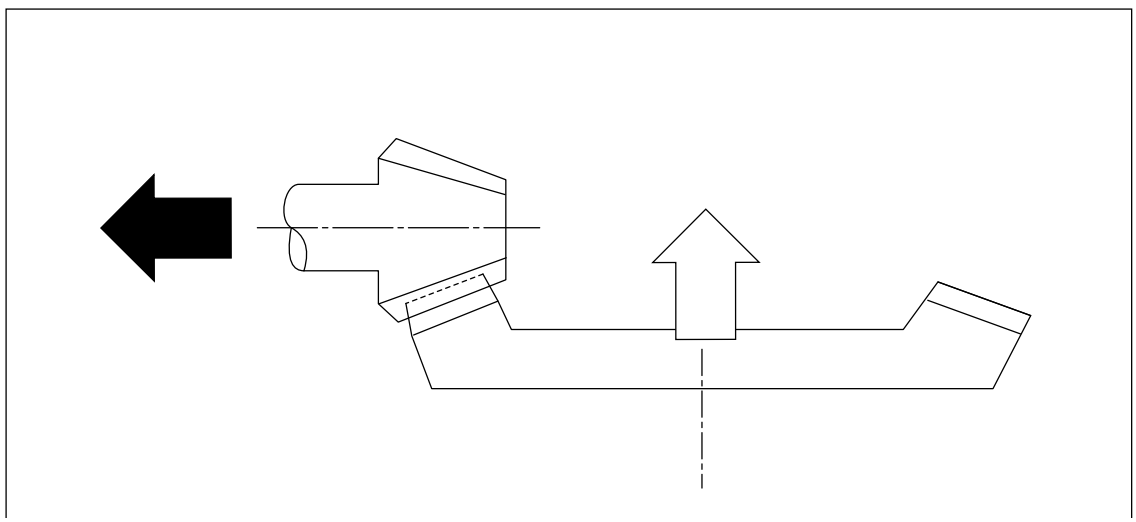




- Flank contact
  Check item: Backlash is too small.
  Contact pattern

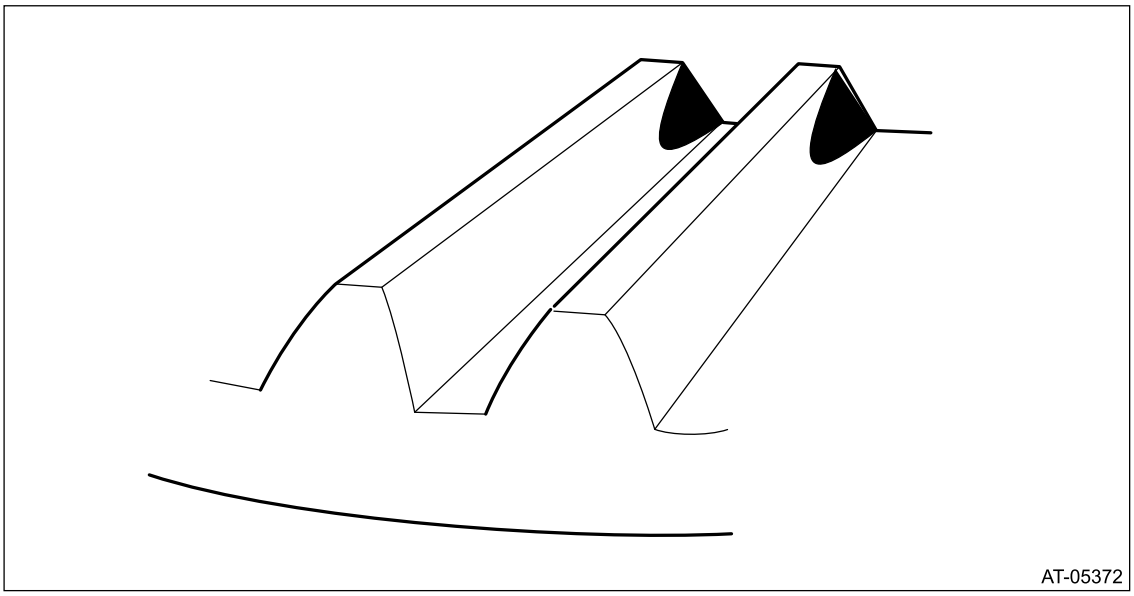


Corrective action: Reduce the thickness of the drive pinion shim according to the procedures for moving the drive pinion away from the hypoid driven gear.



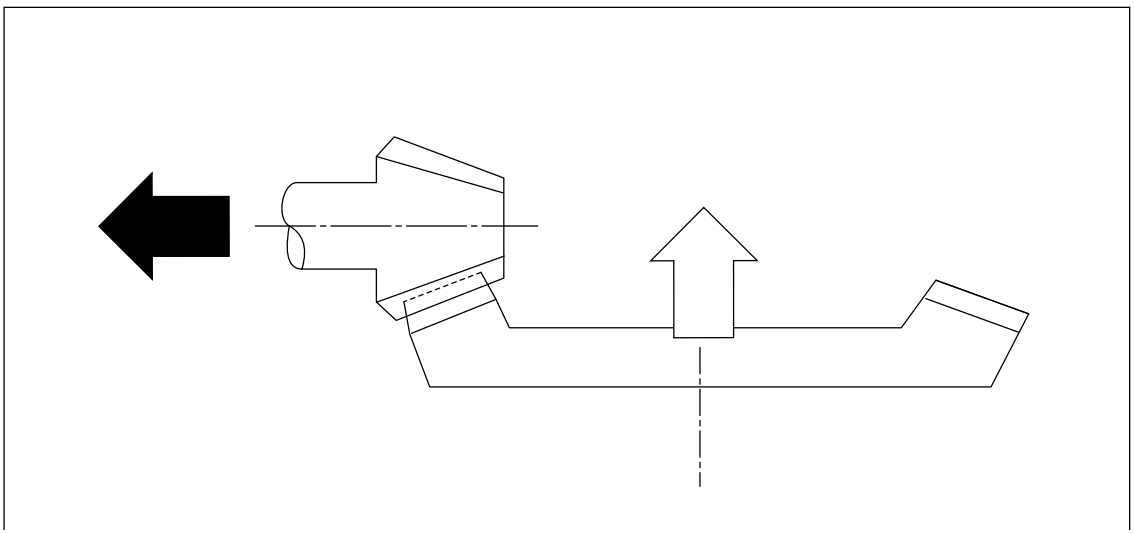
AT-05371

- Toe contact (inside contact)
  Check item: Teeth contact area is too small.
  Contact pattern



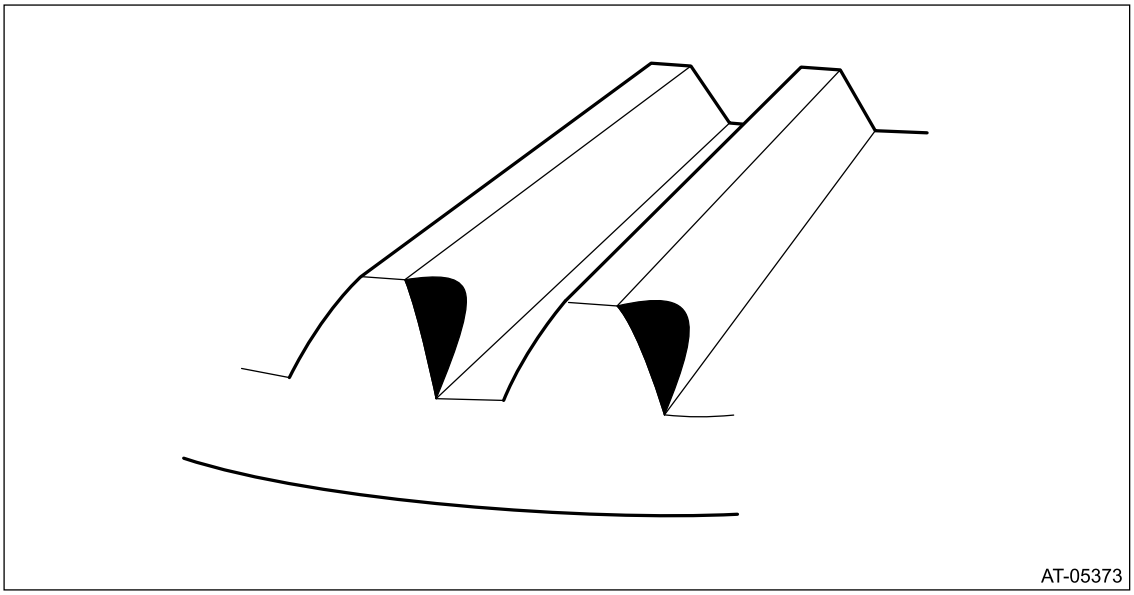
AT-05372

Corrective action: Reduce the thickness of the drive pinion shim according to the procedures for moving the drive pinion away from the hypoid driven gear side.



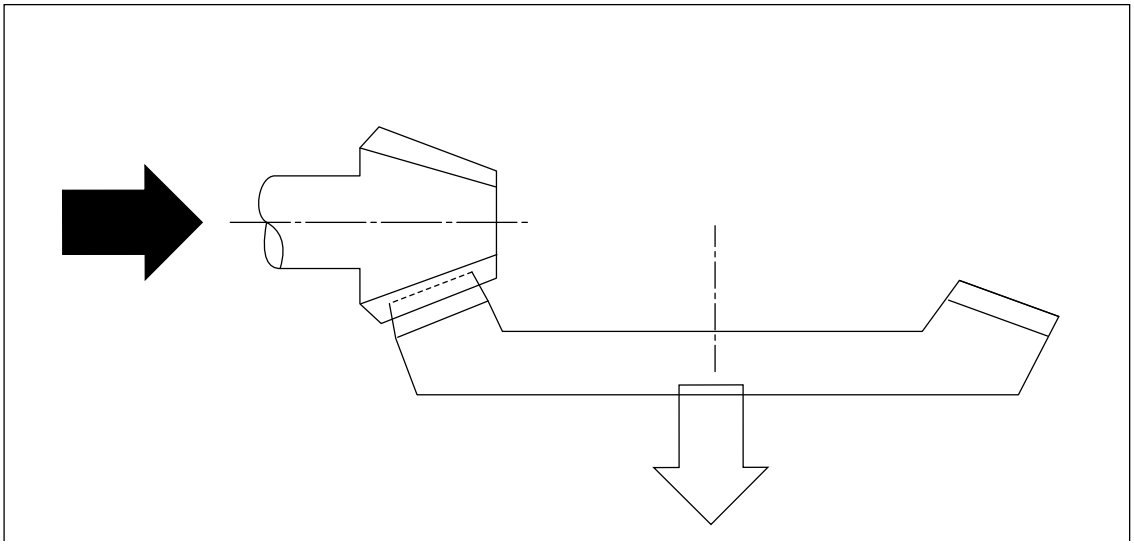
AT-05371

- Heel contact (outside end contact)
  Check item: Teeth contact area is too small.
  Contact pattern



AT-05373

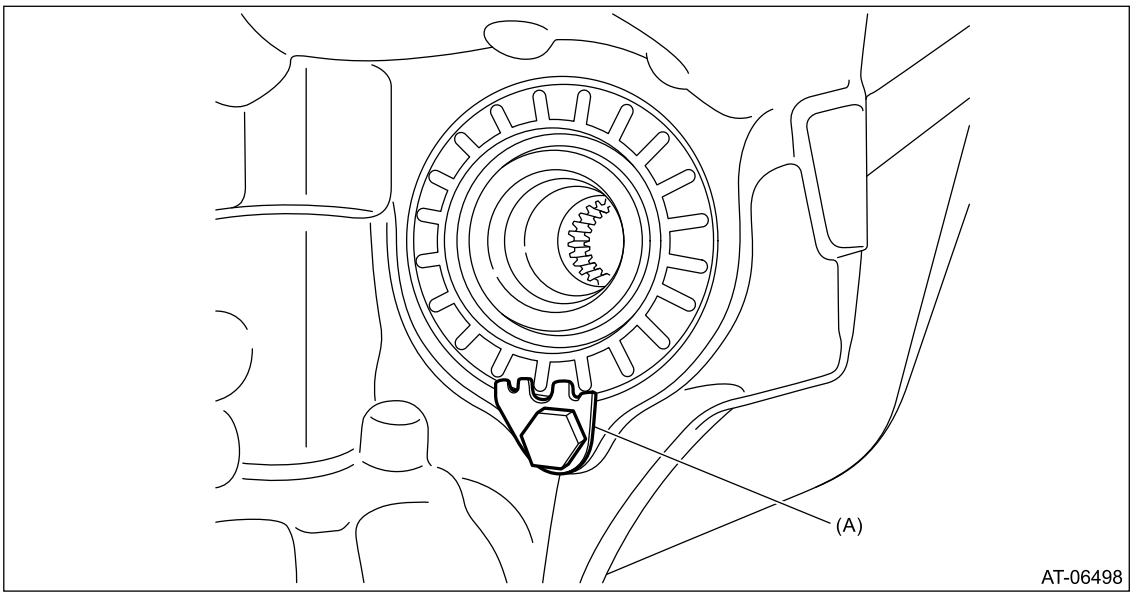
Corrective action: Increase the thickness of the drive pinion shim according to the procedures for moving the drive pinion closer to the hypoid driven gear.



AT-05369

7. Using the ST, loosen the differential side retainer until the mounting groove of the O-ring appears, and then install the O-ring.
   Note:
   - **When loosening the differential side retainer, record the number of the turns made.**
   - **Perform this for both left and right differential side retainers.**
   - **Use new O-rings.**
   - **Apply the differential gear oil to O-ring.**

   Preparation tool:
   ST: WRENCH COMPL RETAINER (18658AA020)
8. Using the ST, tighten the retainer to the position before it is loosened.
   Preparation tool:
   ST: WRENCH COMPL RETAINER (18658AA020)
9. Replace the differential side retainer oil seal with a new part. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal.
10. Install the lock plate.
    Tightening torque:
    25 N·m (2.5 kgf-m, 18.4 ft-lb)



(A) Lock plate

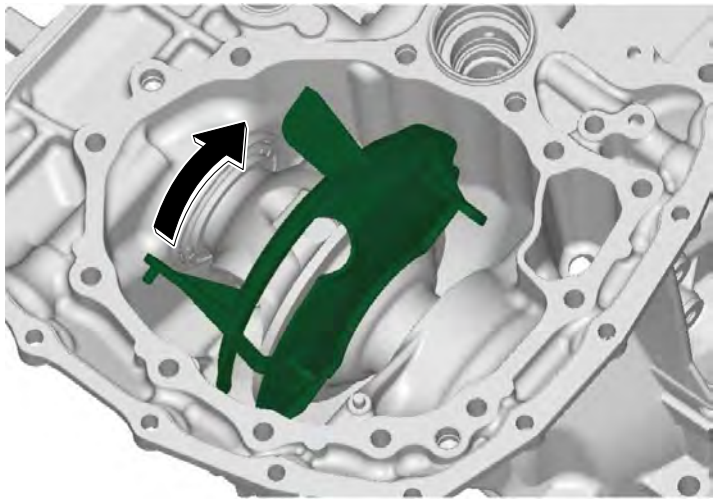
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Front Differential Assembly

REMOVAL

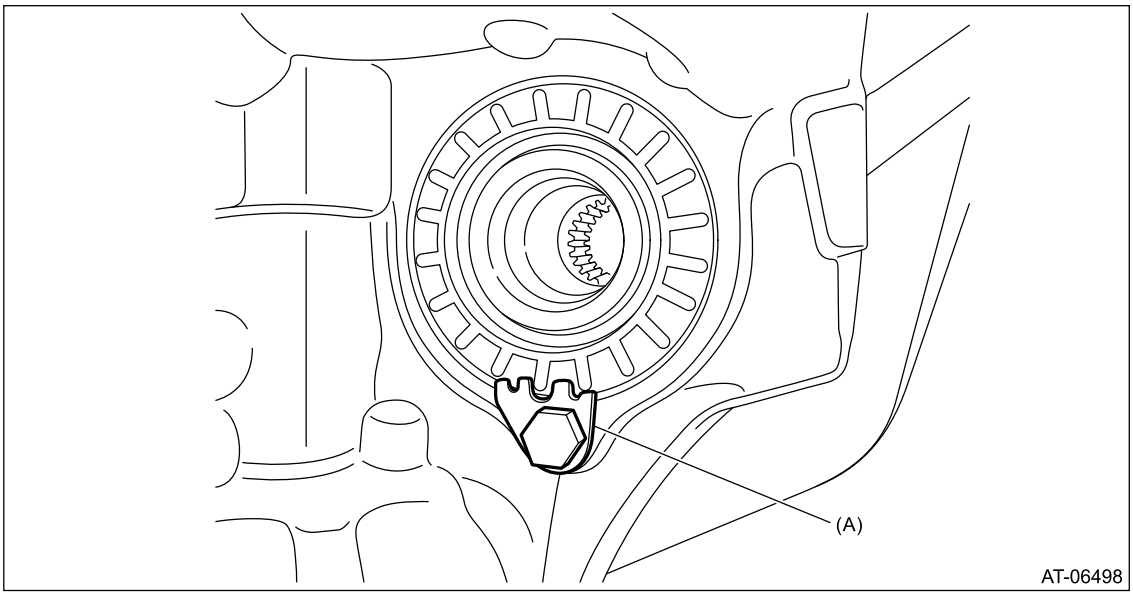
1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.

7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.
12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.
17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.
18. Remove the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.
19. Remove the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>REMOVAL.
20. Remove the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>REMOVAL.
21. Remove the drive pinion shaft assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>REMOVAL.
22. Remove the oil baffle.



23. Remove the lock plates on both sides.



(A) Lock plate

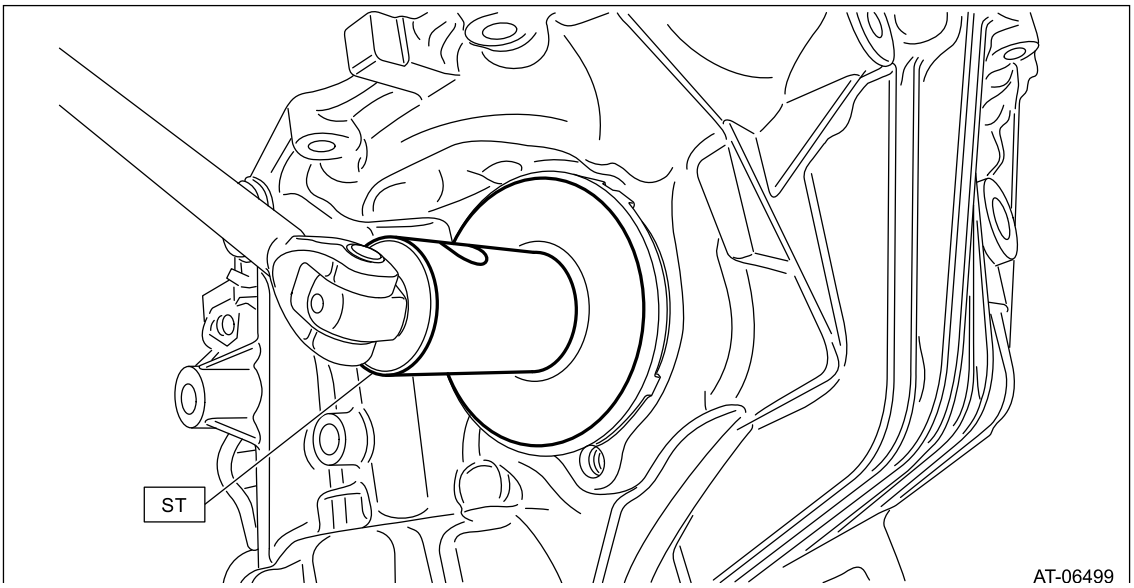
24. Remove the differential side retainers using ST.

Note:

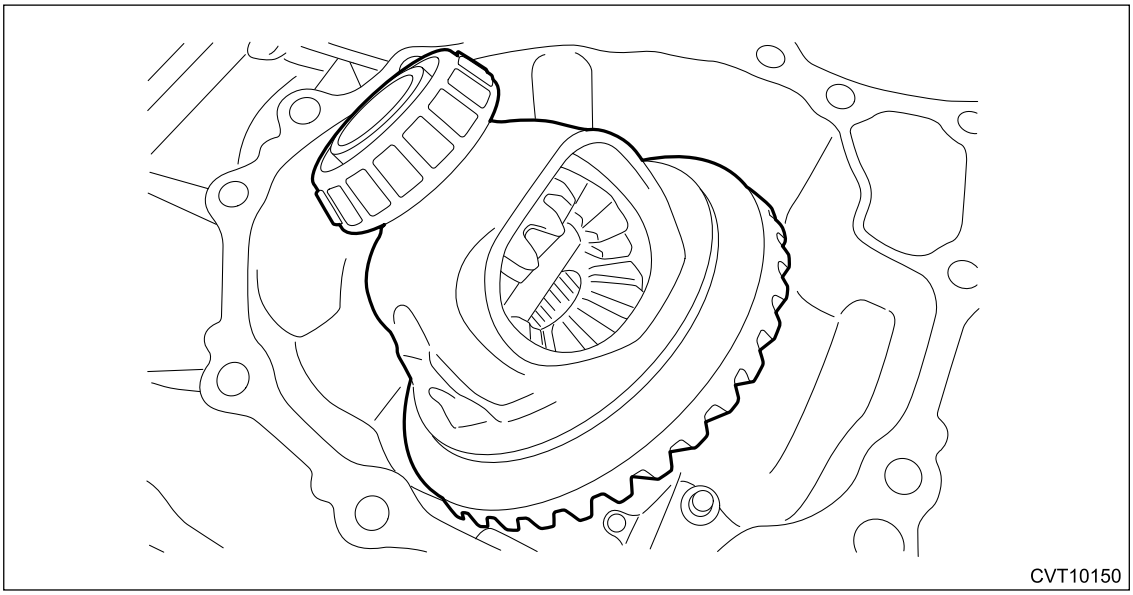
- **When the wrench COMPL retainer interferes with the converter case, align the cutout portion with the interference part.**
- **Support the differential case assembly by hand to avoid damaging the retainer mounting hole of the converter case.**
- **Keep the left and right differential side retainers and left and right bearing outer races by attaching tags or in similar ways to make it possible to identify RH and LH sides.**

Preparation tool:

ST: WRENCH COMPL RETAINER (18658AA020)



25. Remove the front differential assembly while being careful not to damage the attachment part of the retainer.



26. Remove the oil seals and O-rings from both differential side retainers. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>DISASSEMBLY > SIDE RETAINER.

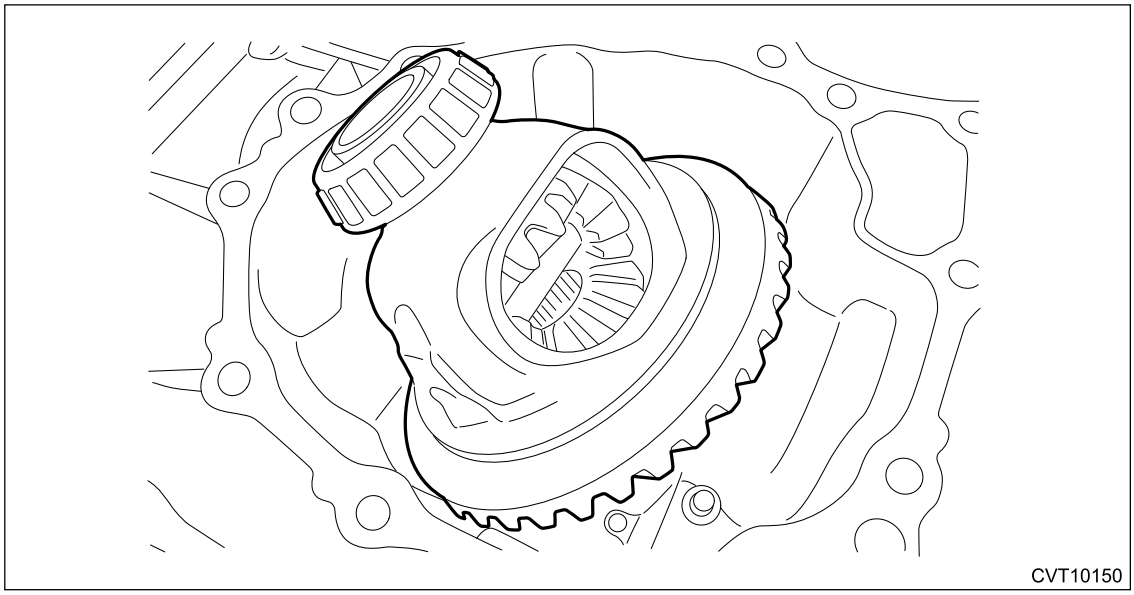
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Front Differential Assembly

INSTALLATION

1. Install the front differential assembly to the converter case.

Note:

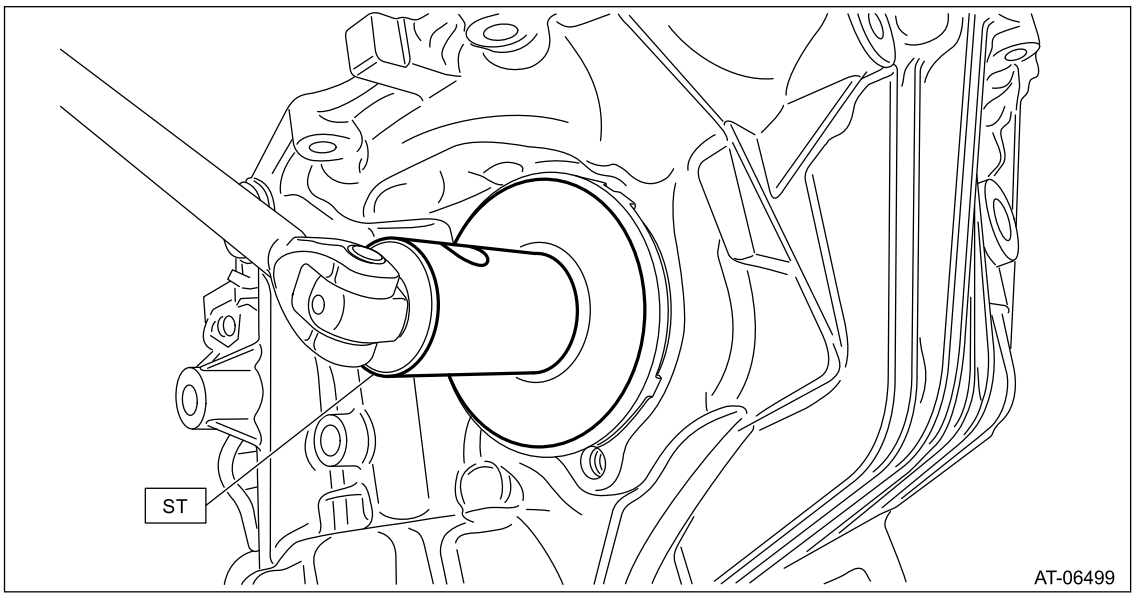
Be careful not to damage the inside of the case (especially the mounting surface of the differential side retainers).



2. Install the bearing outer race.
3. Temporarily install the differential side retainers using ST.

Preparation tool:

ST: WRENCH COMPL RETAINER (18658AA020)



4. Adjust the backlash of the front differential. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>ADJUSTMENT.
5. Inspect and adjust the tooth contact. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ADJUSTMENT.
6. Using the ST, loosen the differential side retainer until the mounting groove of the O-ring appears, and then install the O-ring.

Note:

- **When loosening the differential side retainer, record the number of the turns made.**
- **Perform this for both left and right differential side retainers.**
- **Use new O-rings.**
- **Apply the differential gear oil to O-ring.**

Preparation tool:

ST: WRENCH COMPL RETAINER (18658AA020)

7. Using the ST, tighten the retainer to the position before it is loosened.

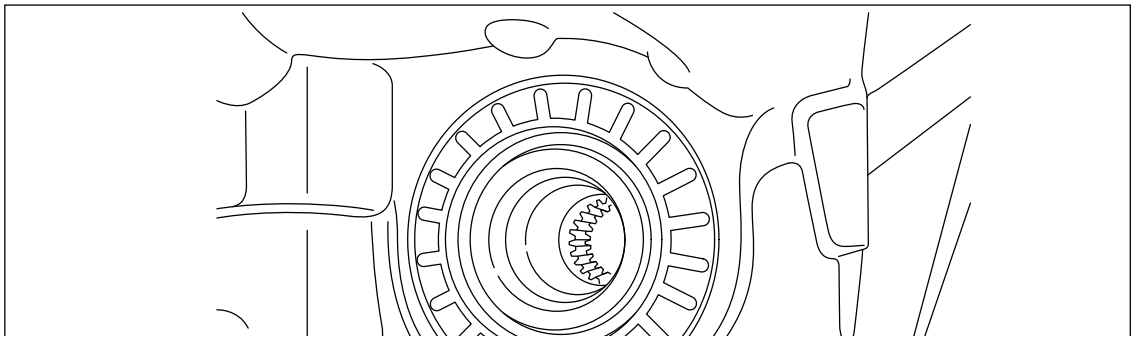
Preparation tool:

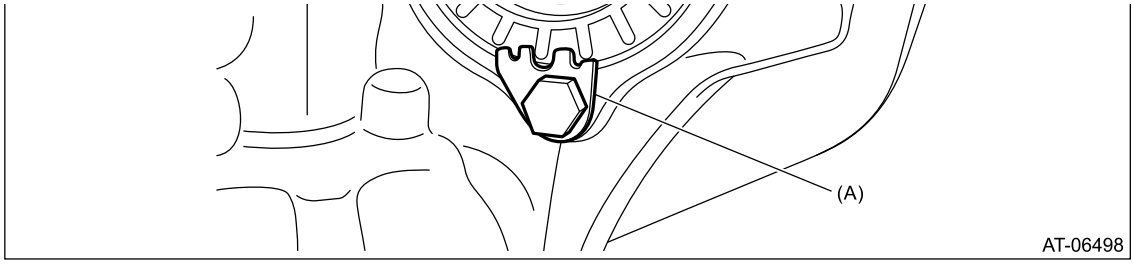
ST: WRENCH COMPL RETAINER (18658AA020)

8. Install the oil seal to the differential side retainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Side Retainer Oil Seal.
9. Install the lock plate.

Tightening torque:

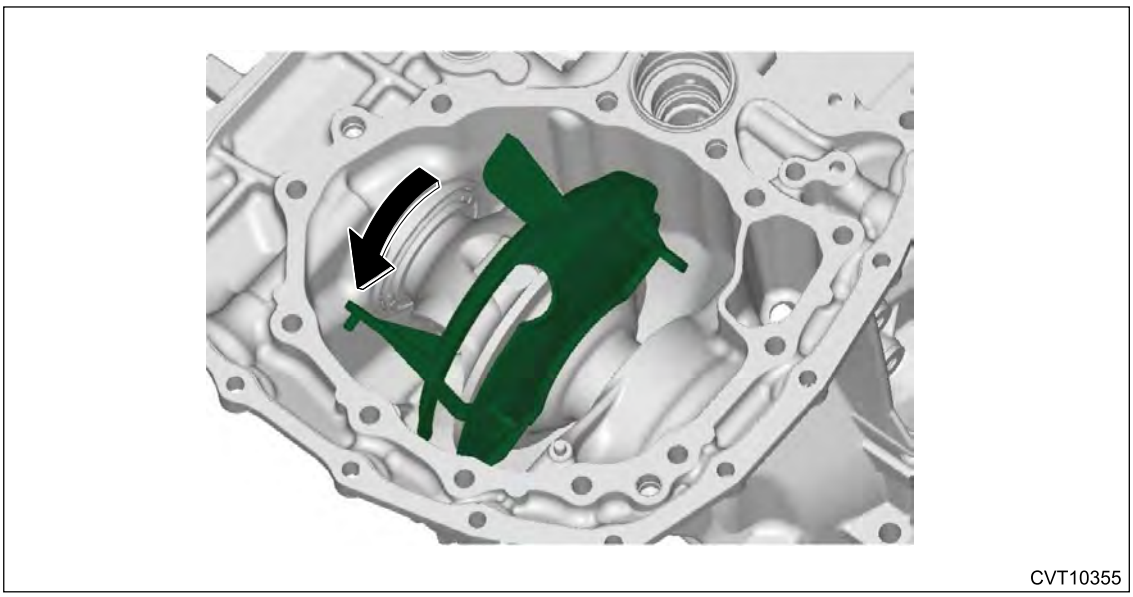
25 N·m (2.5 kgf-m, 18.4 ft-lb)





(A) Lock plate

10. Install the oil baffle.



11. Install the drive pinion shaft assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>INSTALLATION.

12. Install the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>INSTALLATION.

13. Install the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>INSTALLATION.

14. Install the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.

15. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.

16. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.

17. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.

18. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.

19. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.

20. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.

21. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.

22. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.

23. Install the extension case. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Extension Case>INSTALLATION.

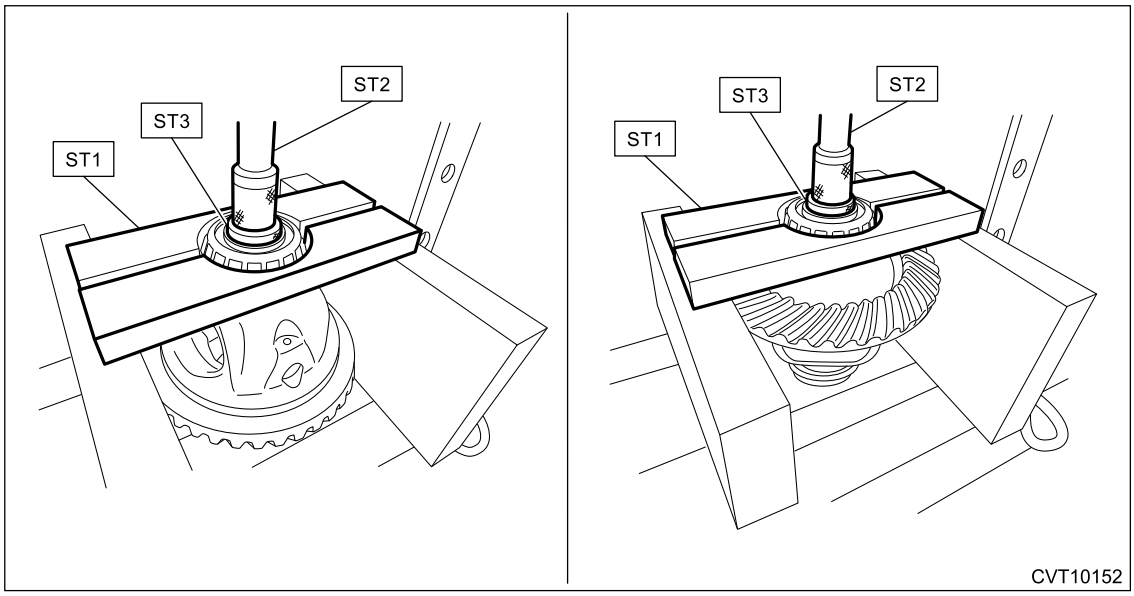
24. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
25. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
26. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
27. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
28. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
29. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
30. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
31. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Front Differential Assembly

DISASSEMBLY

1. DIFFERENTIAL CASE ASSEMBLY

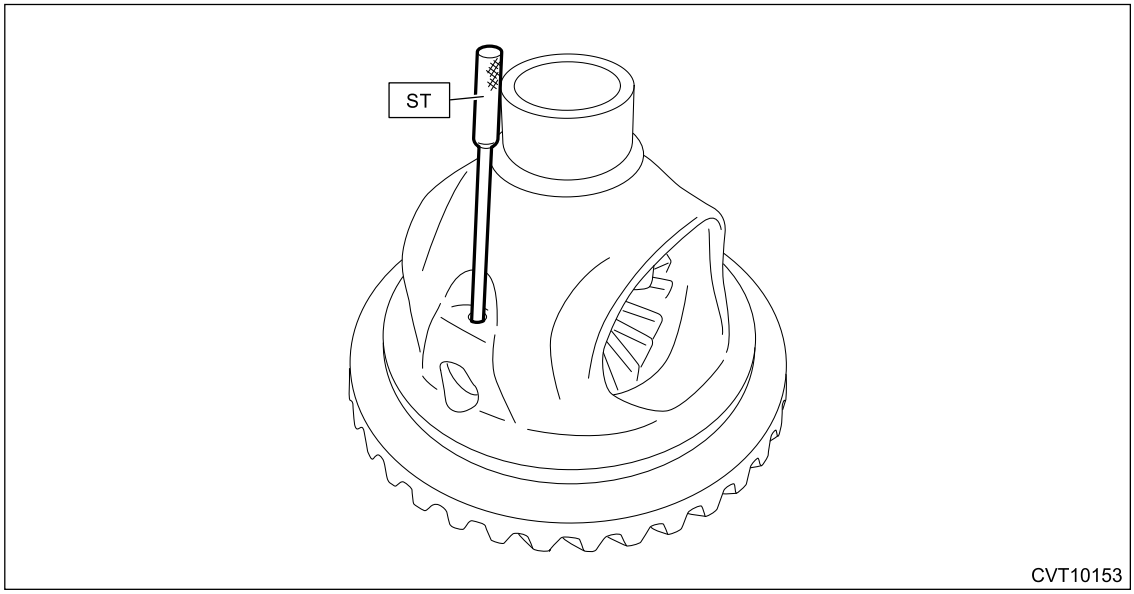
1. Remove the taper roller bearing using ST1, ST2 and ST3.
   Preparation tool:
   ST1: REMOVER (498077000)
   ST2: REMOVER (899864100)
   ST3: SEAT (398497701)



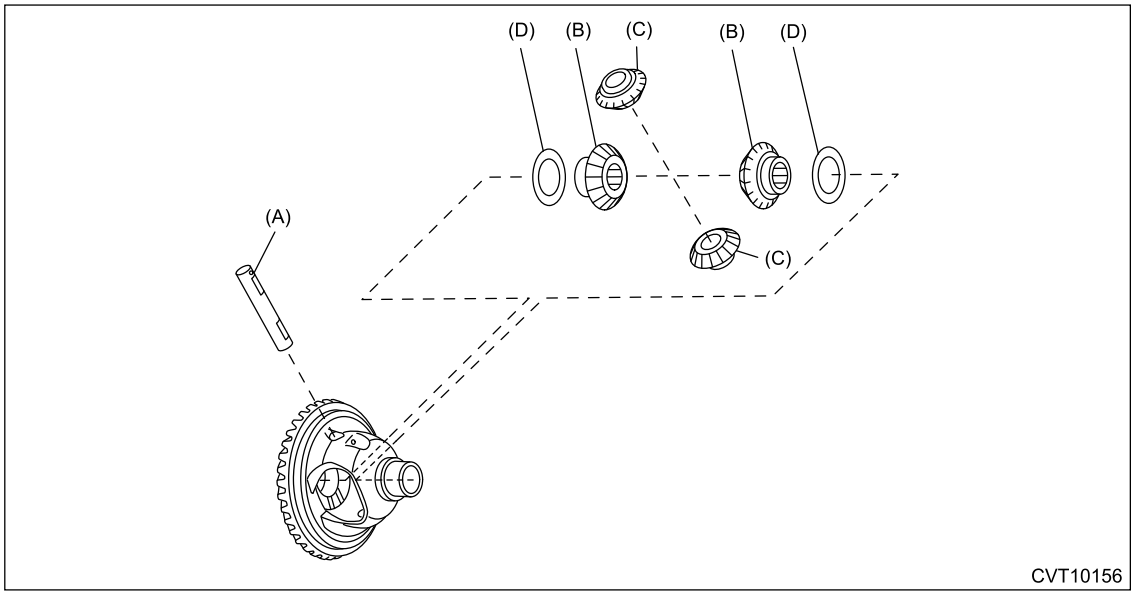
2. Using the ST, remove the spring pin.

Preparation tool:

ST: STRAIGHT PIN REMOVER (899904100)



3. Remove the pinion shaft, and remove the differential bevel pinion, differential bevel gear and washer.



(A) Pinion shaft

(B) Differential bevel gear

(C) Differential bevel pinion

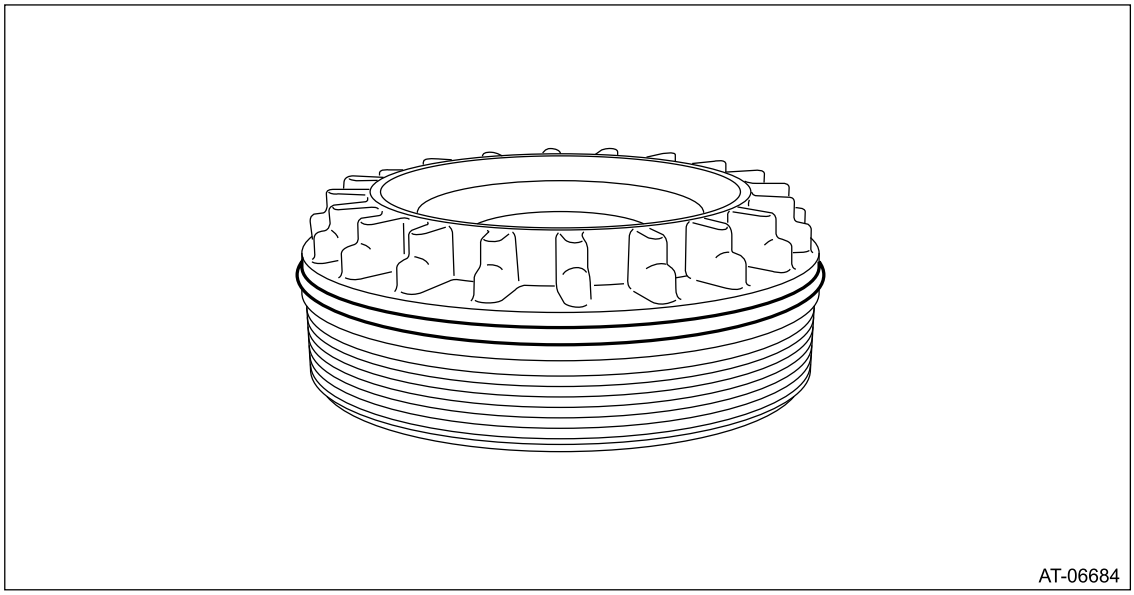
(D) Washer

2. SIDE RETAINER

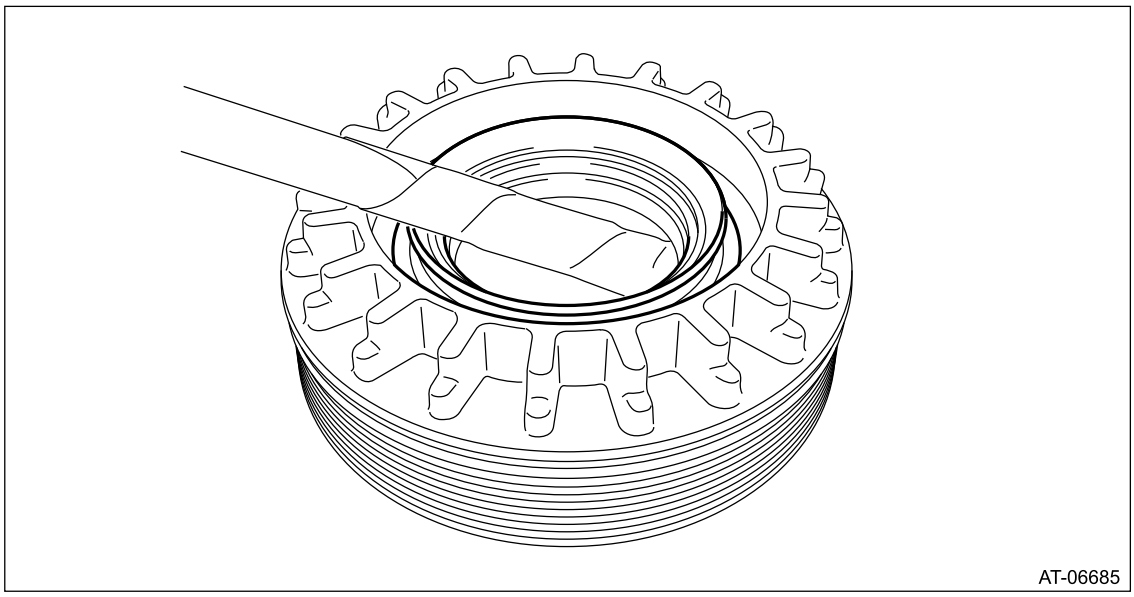
Note:

After adjusting the drive pinion backlash and tooth contact, replace the oil seal and O-ring with new parts.

1. Remove the O-rings.



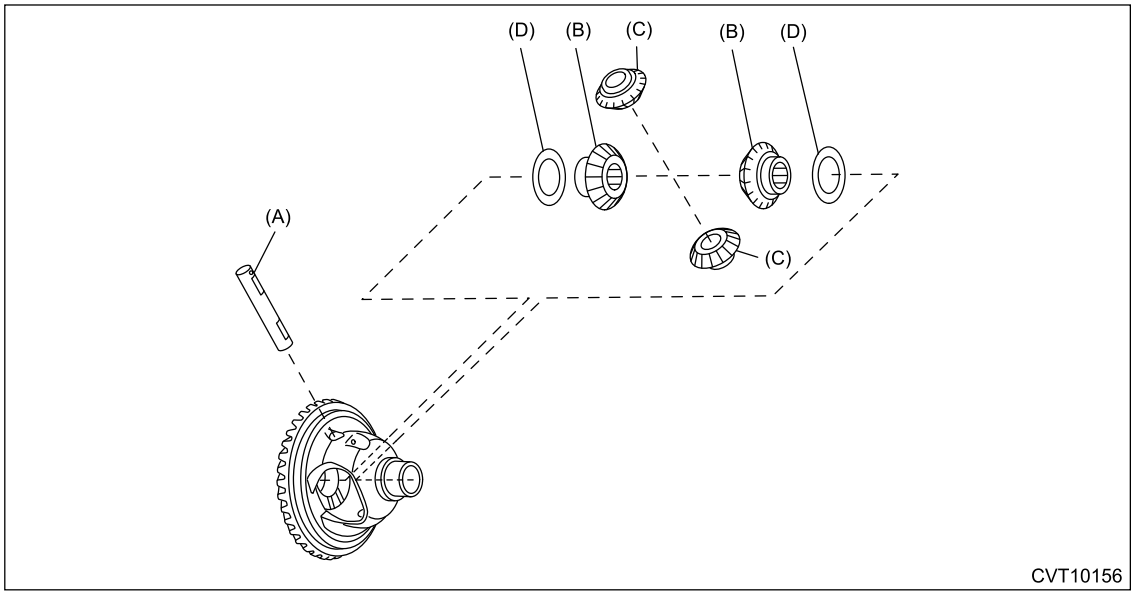
2. Remove the oil seal.



ASSEMBLY

1. DIFFERENTIAL CASE ASSEMBLY

1. Install the differential bevel gear and differential bevel pinion together with washer, and install the pinion shaft.



(A) Pinion shaft
(B) Differential bevel gear
(C) Differential bevel pinion
(D) Washer

2. Measure the backlash, and select the washer.
(1) Install the SUBARU genuine axle shaft to differential case.

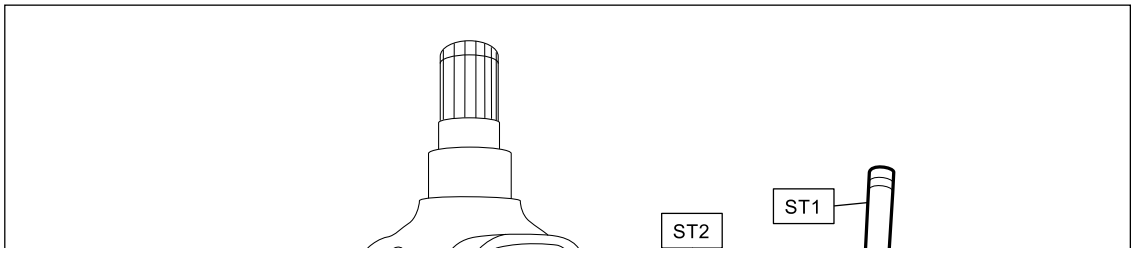
Part No. 38415AA070 AXLE SHAFT

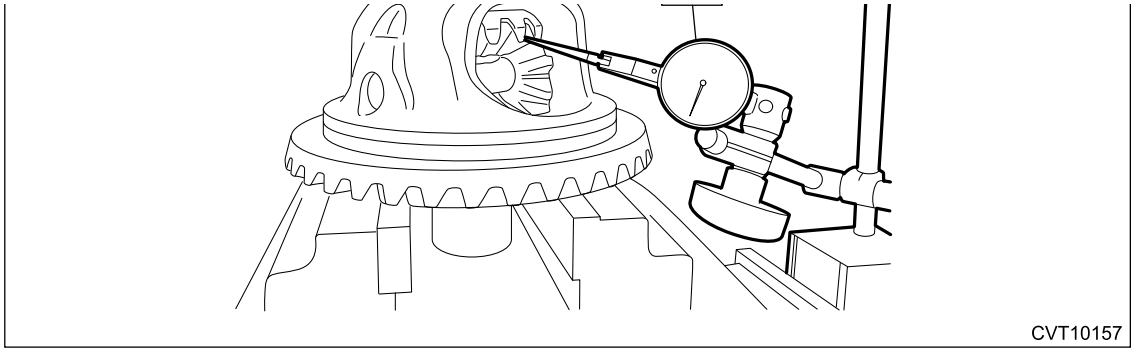
(2) Using ST1 and ST2, insert the ST2 through the window of differential case. Measure the backlash of the gear.

Note:
- **Measure the backlash by applying a differential bevel pinion tooth between two differential bevel gear teeth.**
- **When measuring, fix the differential bevel pinion in place with a screwdriver covered with cloth, or a similar tool.**

Preparation tool:
ST1: MAGNET BASE (498247001)
ST2: DIAL GAUGE (498247100)

Specification:
0.13 — 0.18 mm (0.0051 — 0.0071 in)





(3) If the backlash is not within specification, select a washer from the table below and replace.

Washer	
Part No.	**Thickness mm (in)**
803038021	0.95 (0.037)
803038022	1.00 (0.039)
803038023	1.05 (0.041)

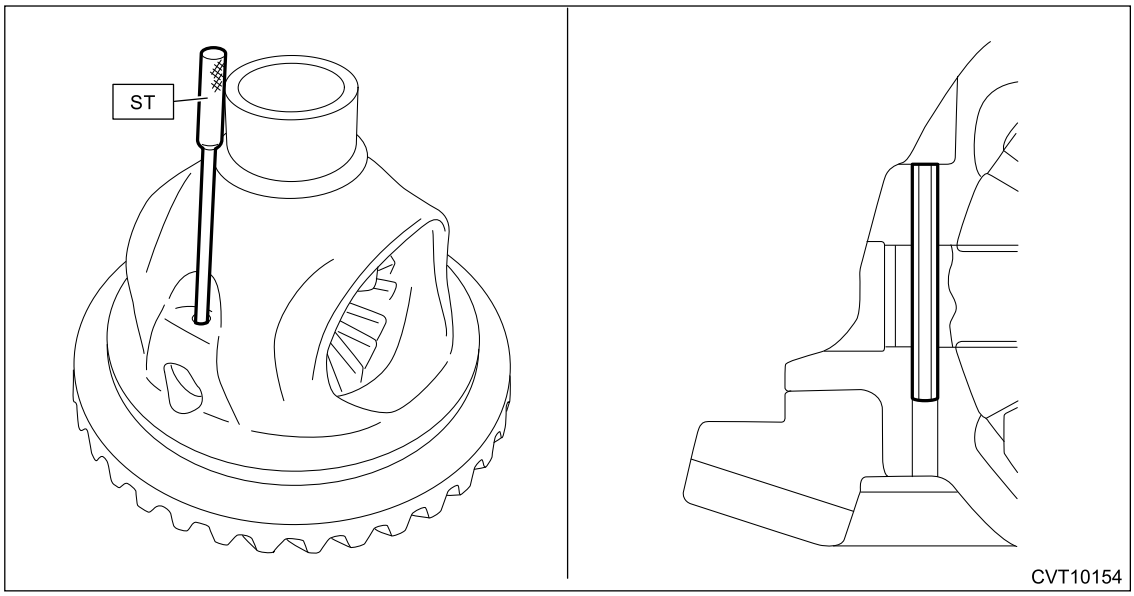
3. Align the pinion shaft and differential case holes, and install the spring pin to the holes from the hypoid driven gear side using the ST.

Note:

Use new spring pin.

Preparation tool:

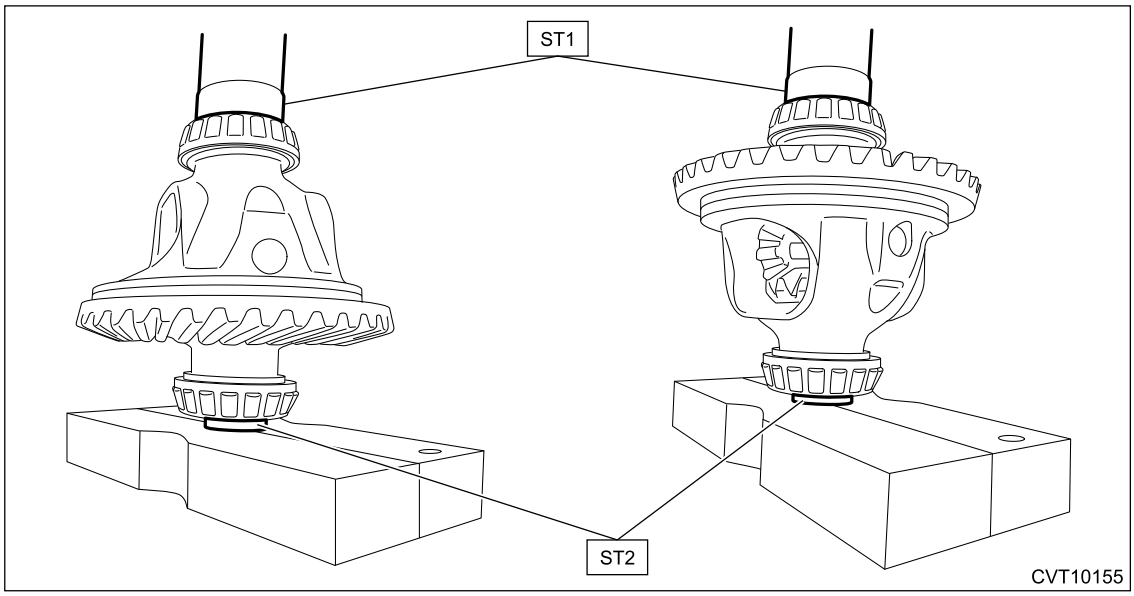
ST: STRAIGHT PIN REMOVER (899904100)



4. Using the ST1 and ST2, install the left and right taper roller bearings.

Preparation tool:

ST1: BUSHING 1-2 INSTALLER (499277100)
ST2: SEAT (398497701)



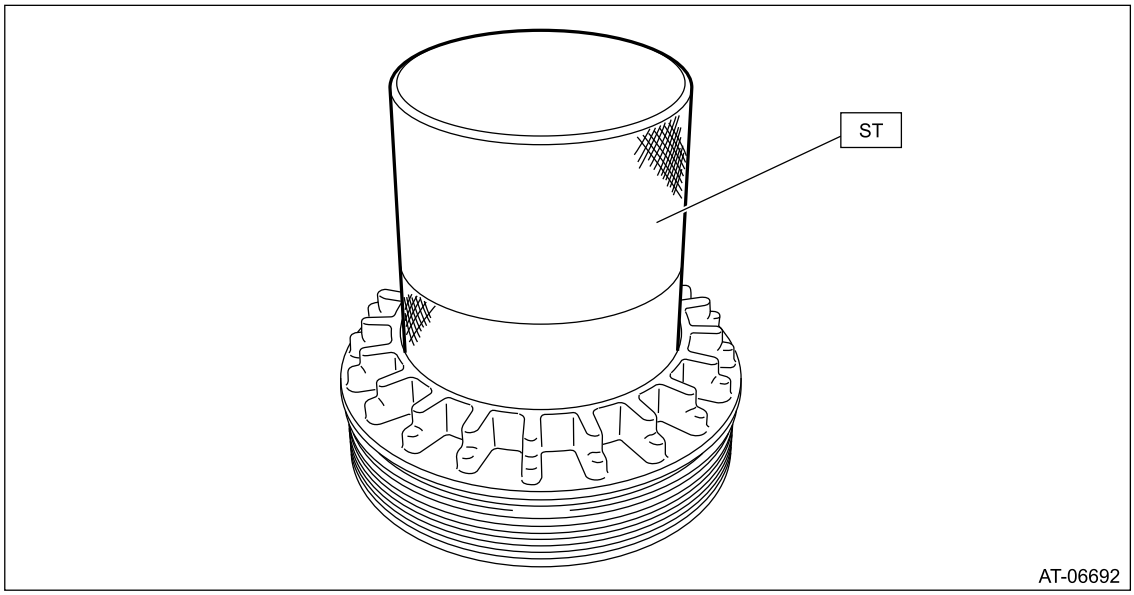
2. SIDE RETAINER

Note:
After adjusting the backlash and tooth contact, replace the oil seal and O-ring of side retainer with new parts.

1. Using the ST, install the oil seal.

Note:
- **Use a new oil seal.**
- **Apply differential gear oil to the oil seal lip and press-fitting surface.**
- **Oil seal has an identification mark (R, L). When installing oil seals, do not confuse the left and right.**

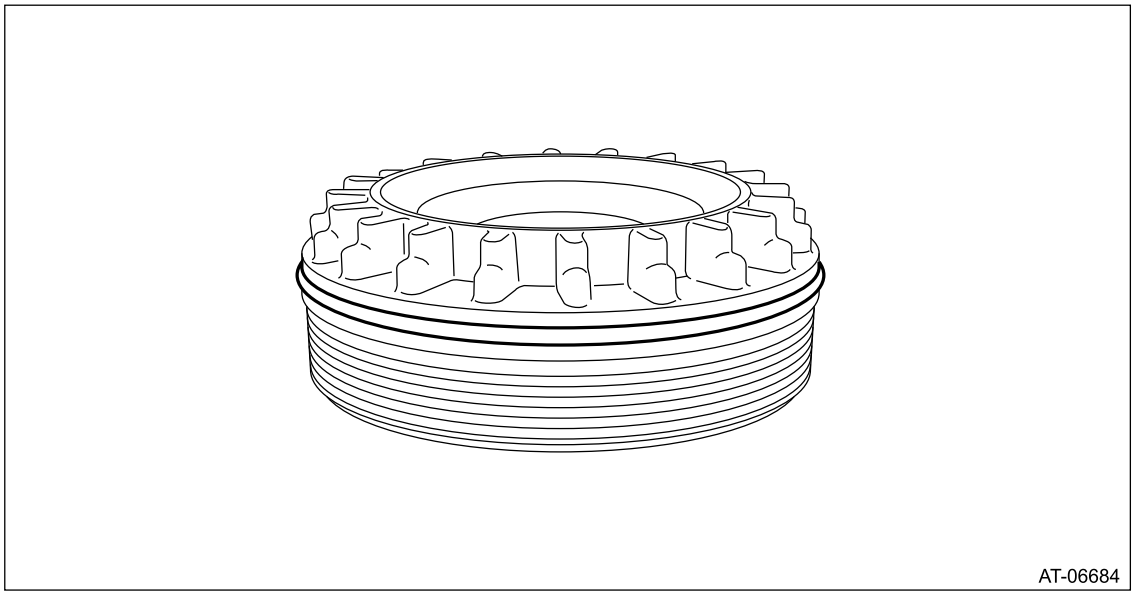
Preparation tool:
ST: DIFFERENTIAL SIDE OIL SEAL INSTALLER (18675AA000)



2. Install the O-rings.

Note:
- **Use new O-rings**

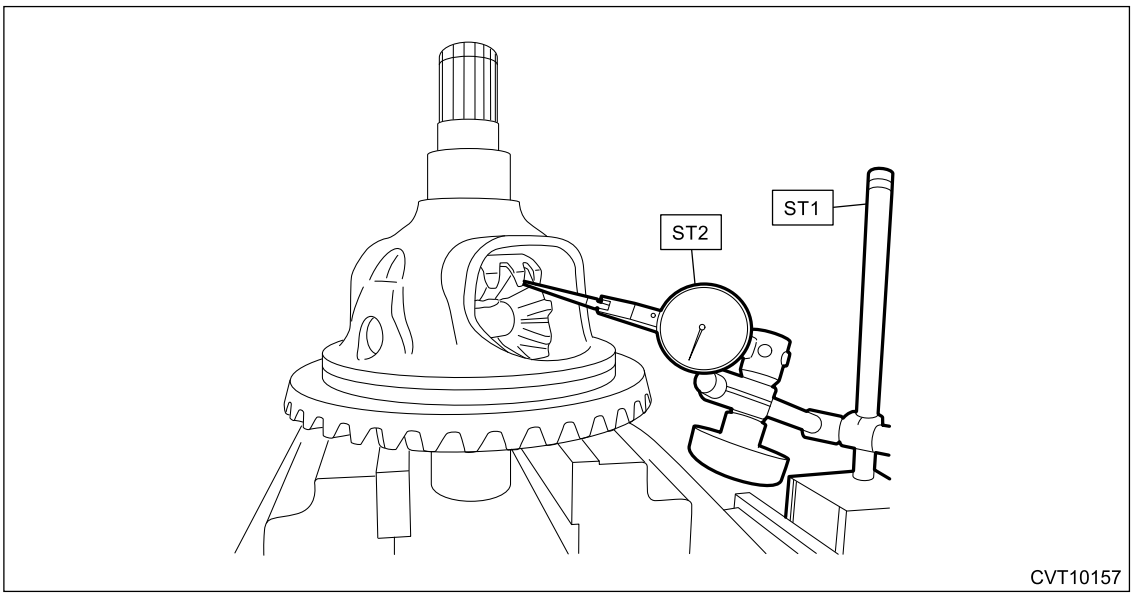
- **Use new O-rings.**
- **Apply the differential gear oil to O-ring.**



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Front Differential Assembly

INSPECTION

- Check each component for scratches, damage or other faults.
- Check the pinion gear backlash with ST1 and ST2.
  Preparation tool:
  ST1: MAGNET BASE (498247001)
  ST2: DIAL GAUGE (498247100)
  Specification:
  0.13 — 0.18 mm (0.0051 — 0.0071 in)



- Measure the hypoid gear backlash, and then adjust it to be within specification. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>ADJUSTMENT.

ADJUSTMENT

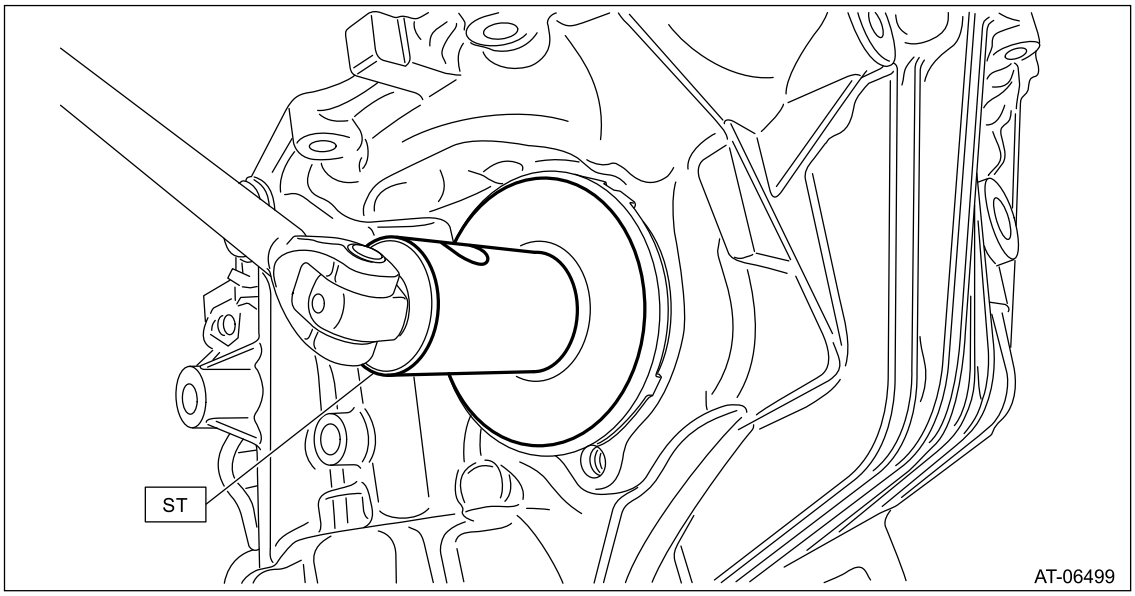
1. Using the ST, screw-in the retainer until resistance is felt.

   Note:

   RH side should be screwed-in more than LH side.

   Preparation tool:

   ST: WRENCH COMPL RETAINER (18658AA020)



2. Remove the remaining liquid gasket from the mating surface completely.
3. Using the ST, install the drive pinion assembly to converter case.

   Preparation tool:

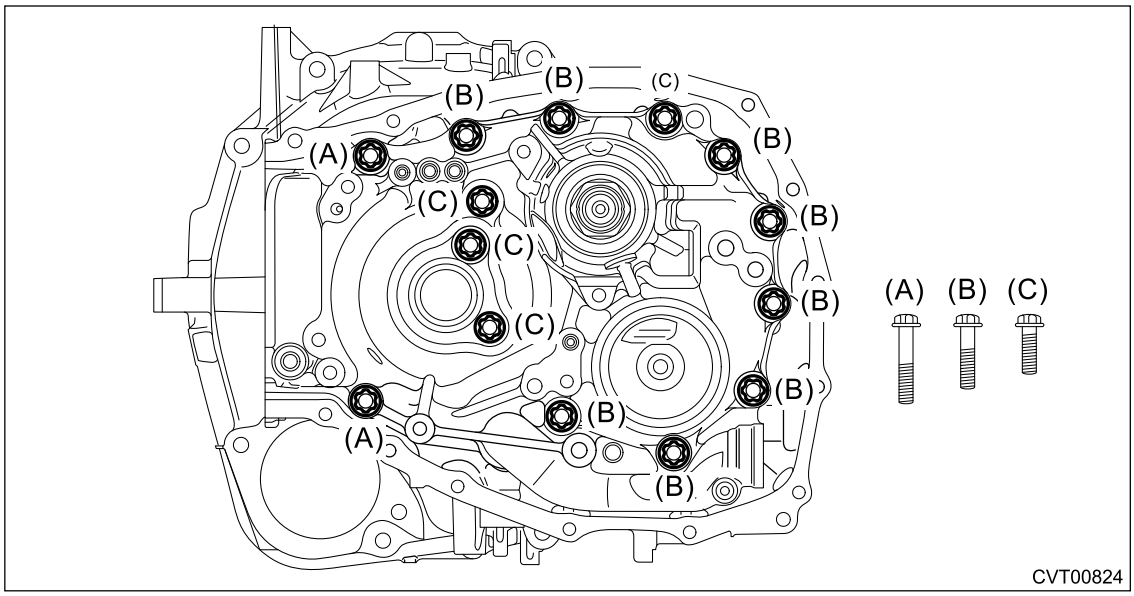
   ST: SOCKET (E20) (18270KA020)

   Note:

   Do not confuse the three different-length bolts when installing.

   Tightening torque:

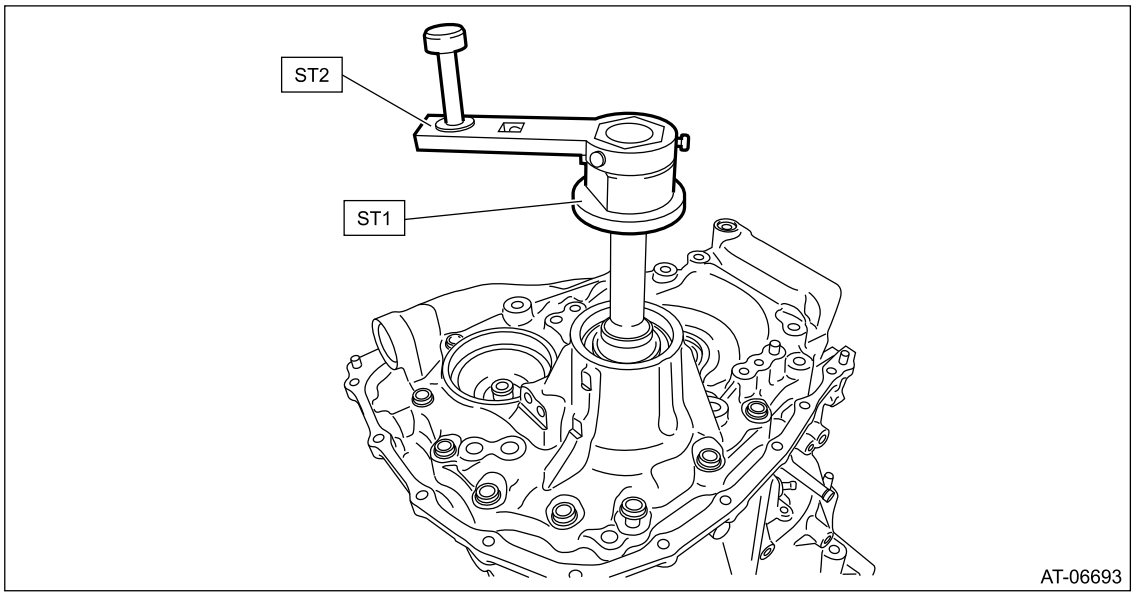
   43 N·m (4.4 kgf-m, 31.7 ft-lb)



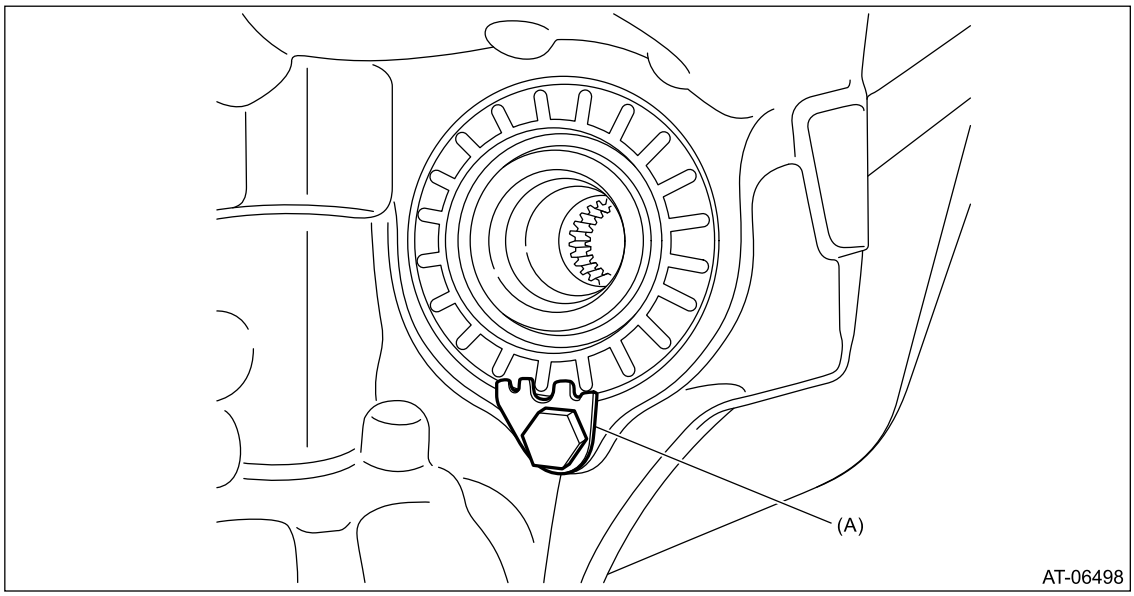
4. Rotate the drive pinion shaft ten times or more using ST1 and ST2.

   Preparation tool:

ST1: HOLDER (18667AA010)
ST2: WRENCH (499787700)



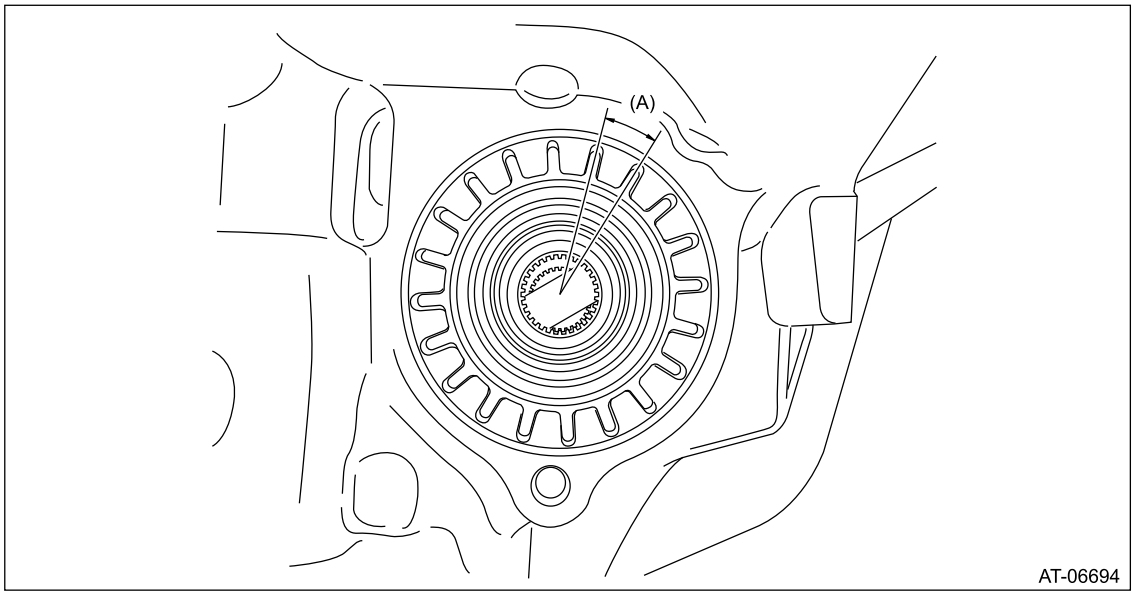
5. While rotating the pinion shaft, tighten the retainer LH and loosen the retainer RH until the shaft can't be turned anymore. The backlash is "zero" when the pinion shaft comes to the point where it doesn't rotate.
6. After the "zero" state is established, loosen the retainer LH by 3 notches and secure it with the lock plate. Retighten the retainer RH until it stops. Rotate the drive pinion 2 or 3 times. Tighten the retainer RH further 1-3/4 notches. This sets the preload. Finally, secure the retainer with its lock plate.



(A) Lock plate

Note:
Turning the retainer by every one tooth changes the backlash approx. 0.05 mm

(0.0020 in).

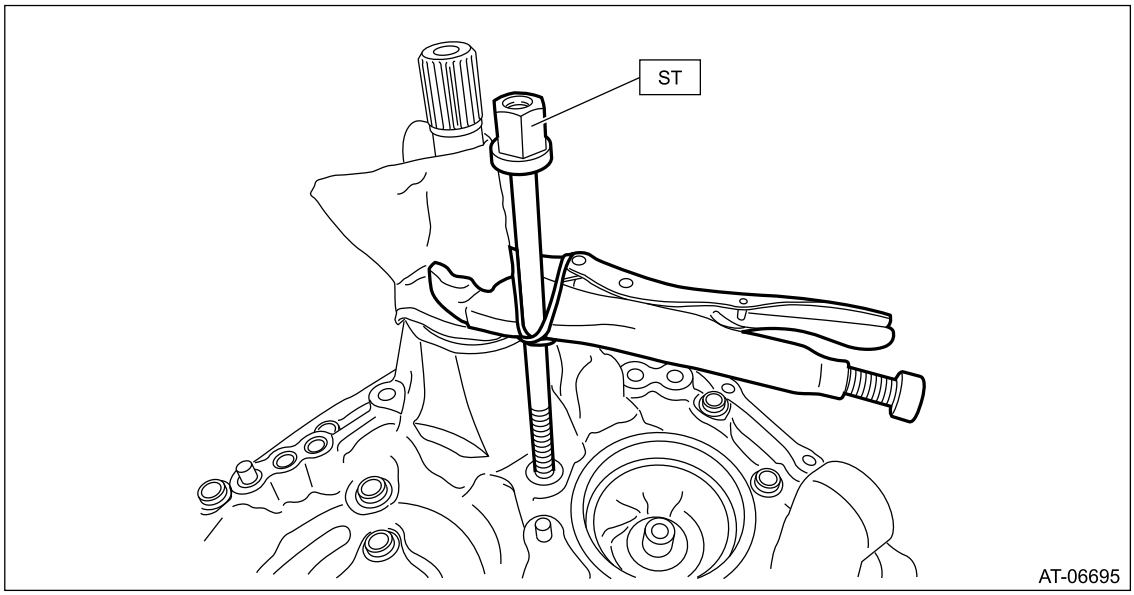


(A) 1 tooth

7. Insert the two SUBARU genuine axle shafts into differential case.

Part No. 38415AA070 Axle shaft

8. Install the ST to the drive pinion retainer, and wrap the drive pinion shaft with cloth and pinch with vise pliers. Using a tie-wrap or a wire, fix the vise pliers to the ST.
Make sure the drive pinion shaft does not move.
Preparation tool:
ST: COMPRESSOR SHAFT (18763AA000)

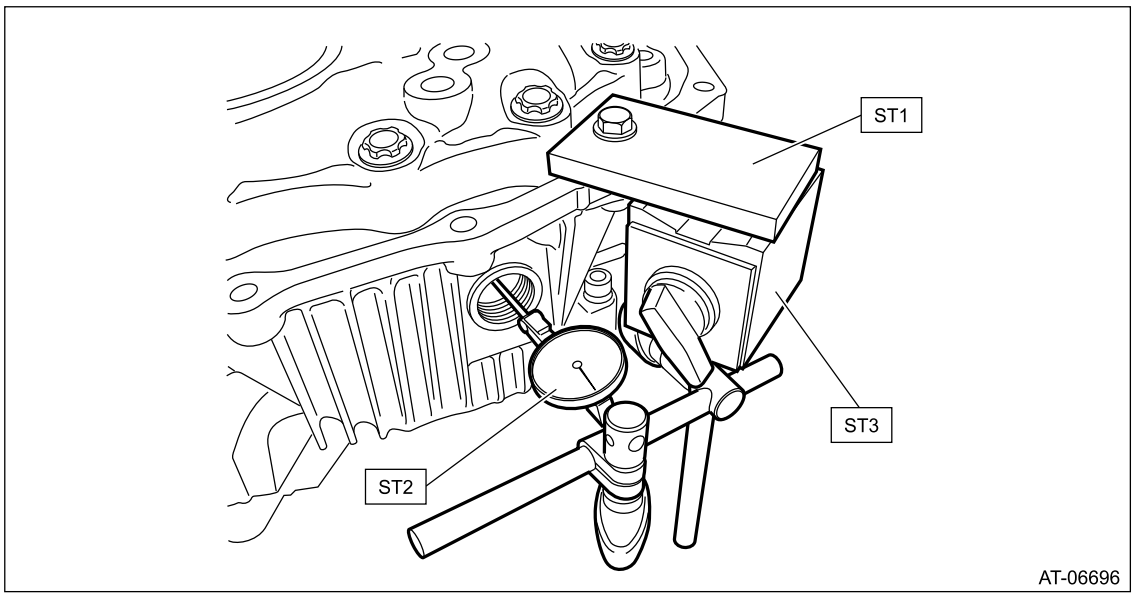


9. Check the backlash is within specification using ST1, ST2 and ST3.
Preparation tool:
ST1: PLATE (498255400)
ST2: DIAL GAUGE (498247100)

ST3: MAGNET BASE (498247001)

Backlash:

0.13 — 0.18 mm (0.005 — 0.007 in)



10. Adjust the teeth contact of the front differential and drive shaft. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>ADJUSTMENT.

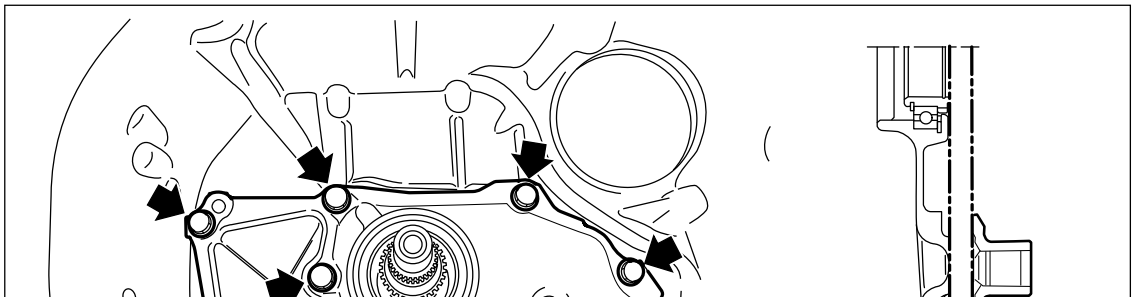
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump Chain

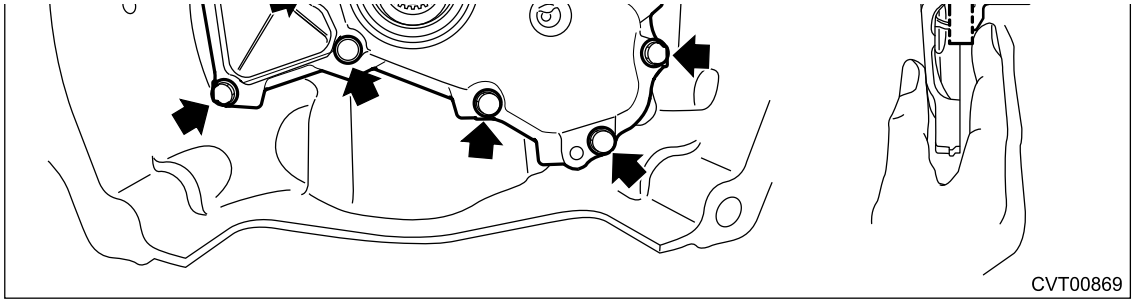
REMOVAL

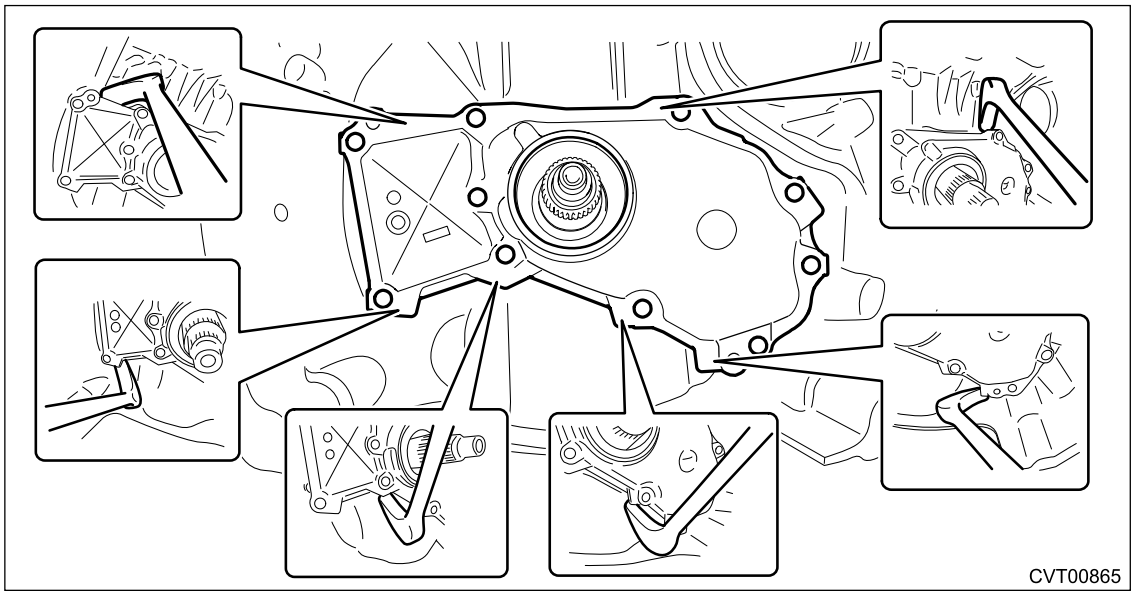
1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly>REMOVAL.
3. Remove the oil pump chain, oil pump sprocket, driven sprocket and oil pump chain cover.

Note:

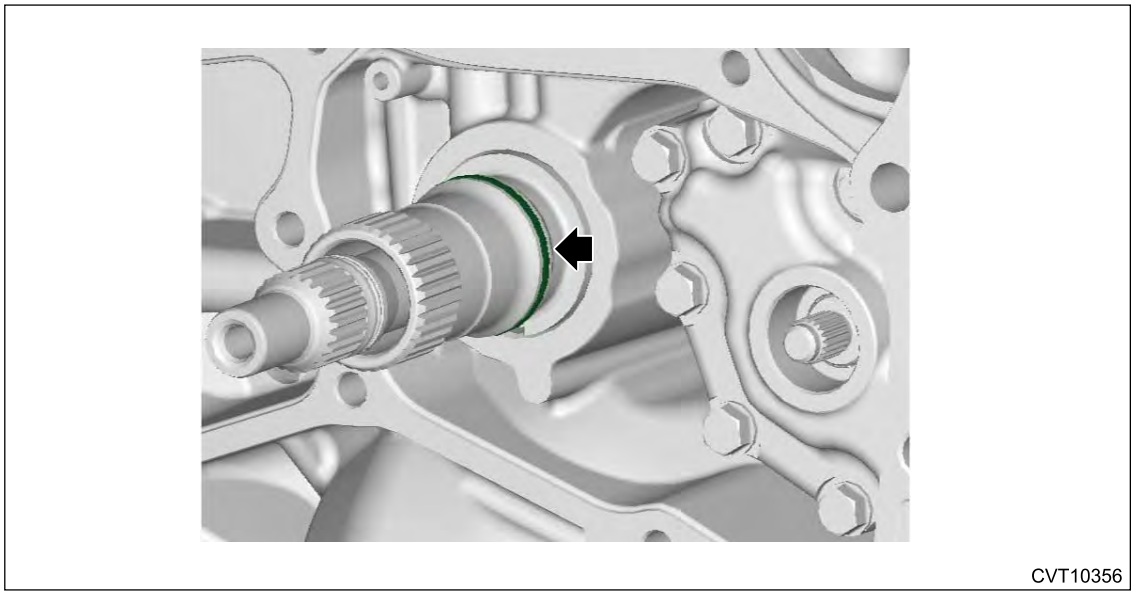
Oil pump chain cover may be hard to remove because the driven sprocket is installed to the shaft side of the oil pump. Do not remove it forcibly. Remove it while holding the driven sprocket by hand.







4. Remove the seal rings.

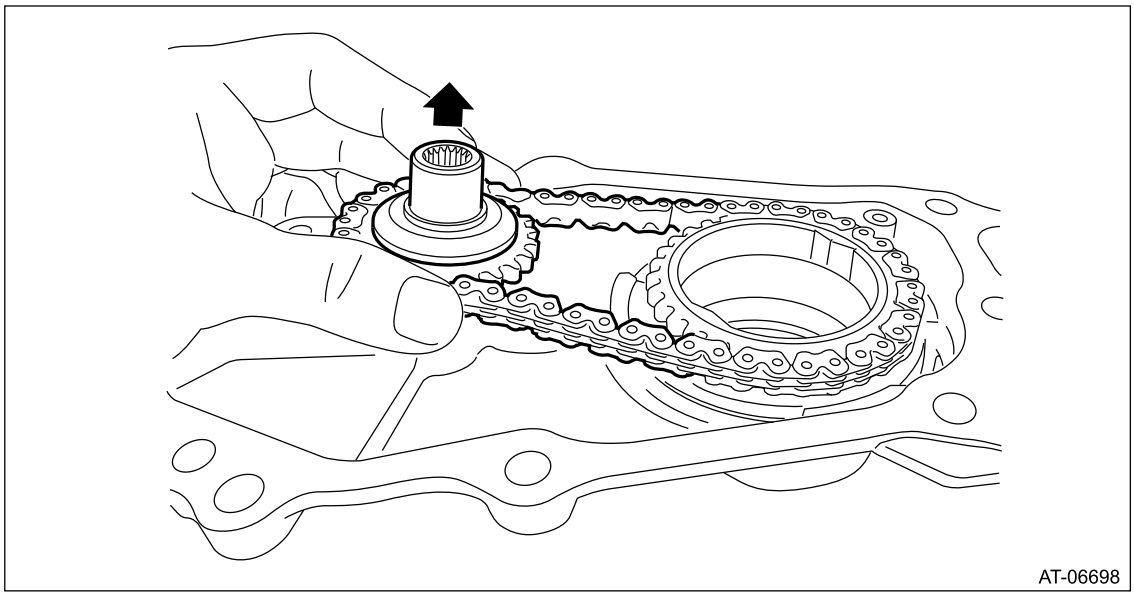


5. Remove the driven sprocket from oil pump chain cover to remove the oil pump chain.

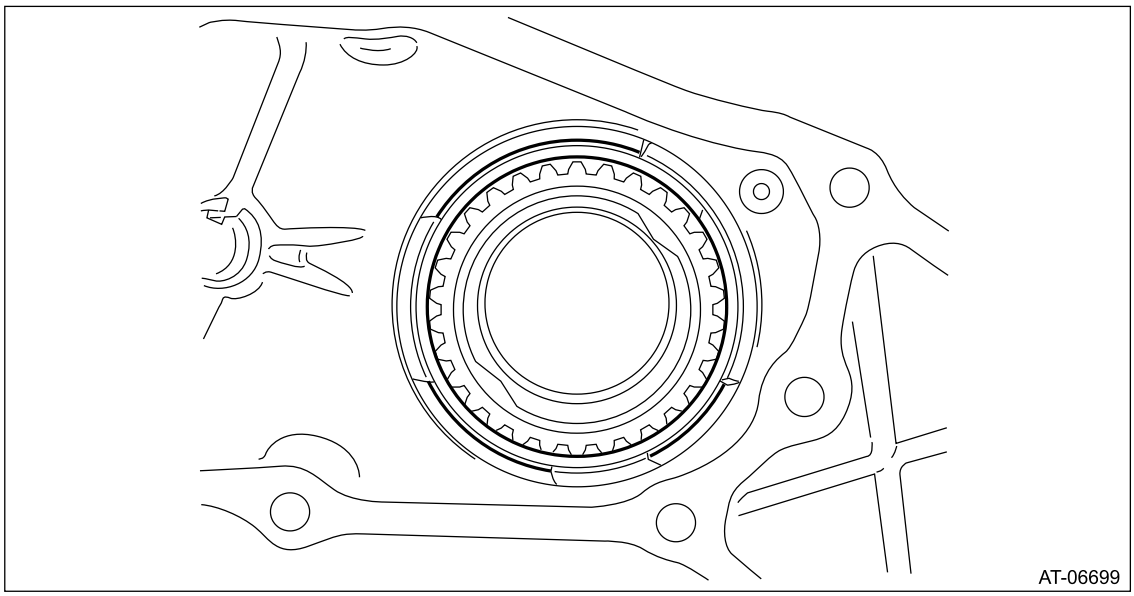
Note:

- **The driven sprocket is replaced as an assembly only, because it is a non-disassembly part.**
- **If the ball bearing is removed from the driven sprocket, replace with a new part**

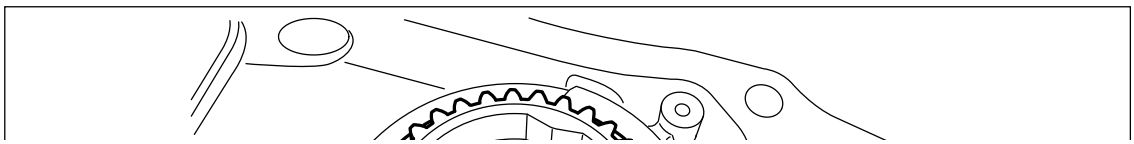
- If the ball bearing is removed from the driven sprocket, replace with a new part.

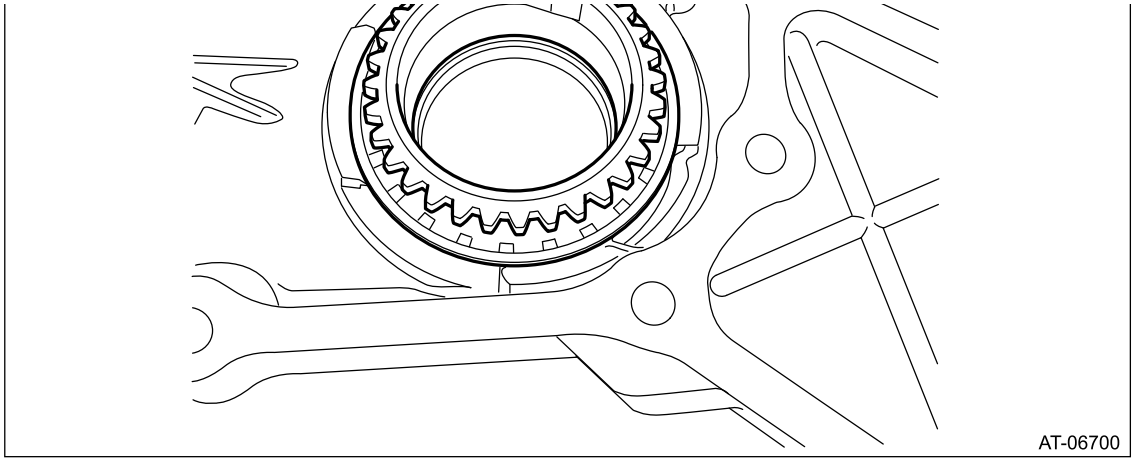


6. Remove the snap ring.

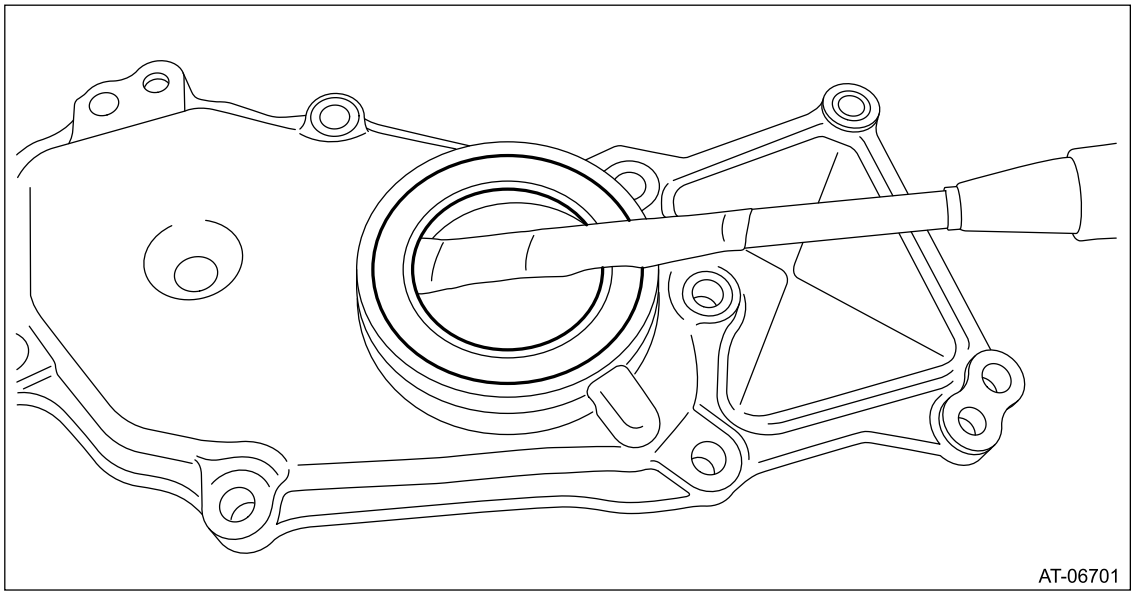


7. Remove the drive sprocket.





8. Remove the oil seal from the oil pump chain cover.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump Chain

INSTALLATION

1. Clean the mating surface of oil pump chain cover and converter case.

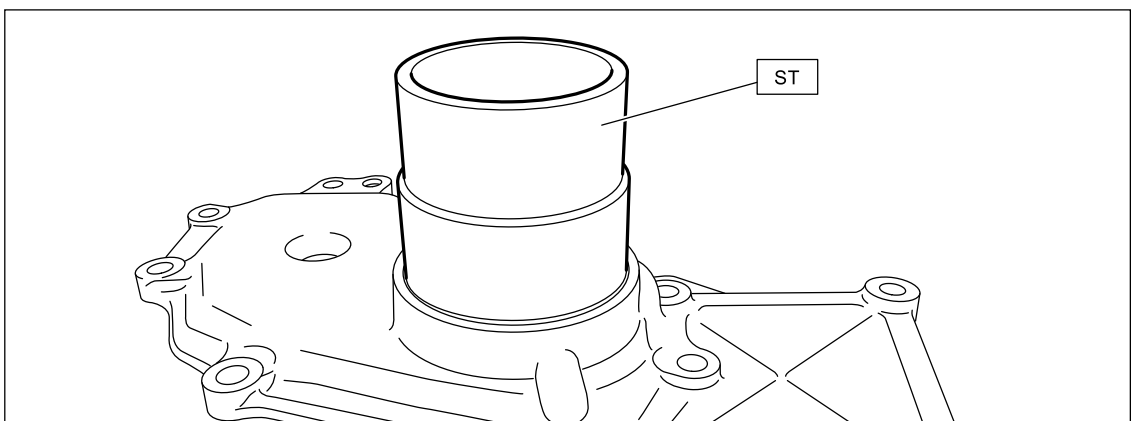
2. Using the ST, install the oil seal.

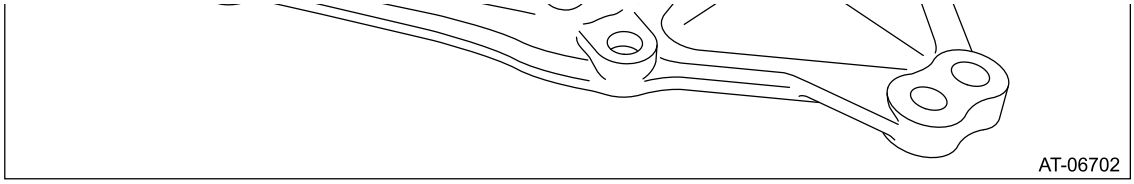
Note:

- **Use a new oil seal.**
- **Apply CVTF to the oil seal lip and press-fitting surface.**

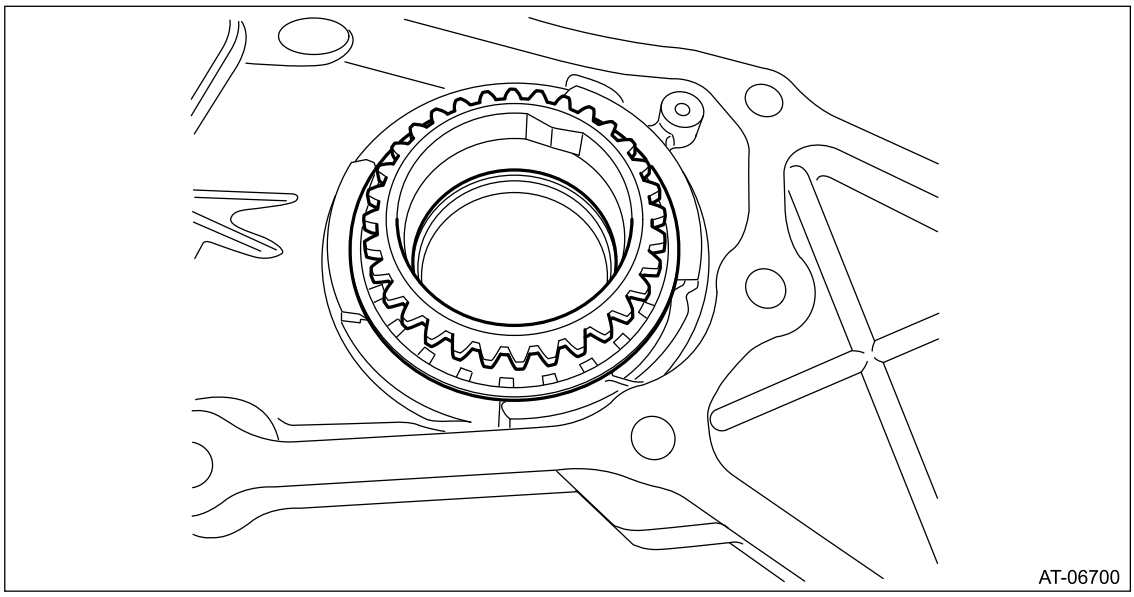
Preparation tool:

ST: PRESS SNAP RING (499755602)

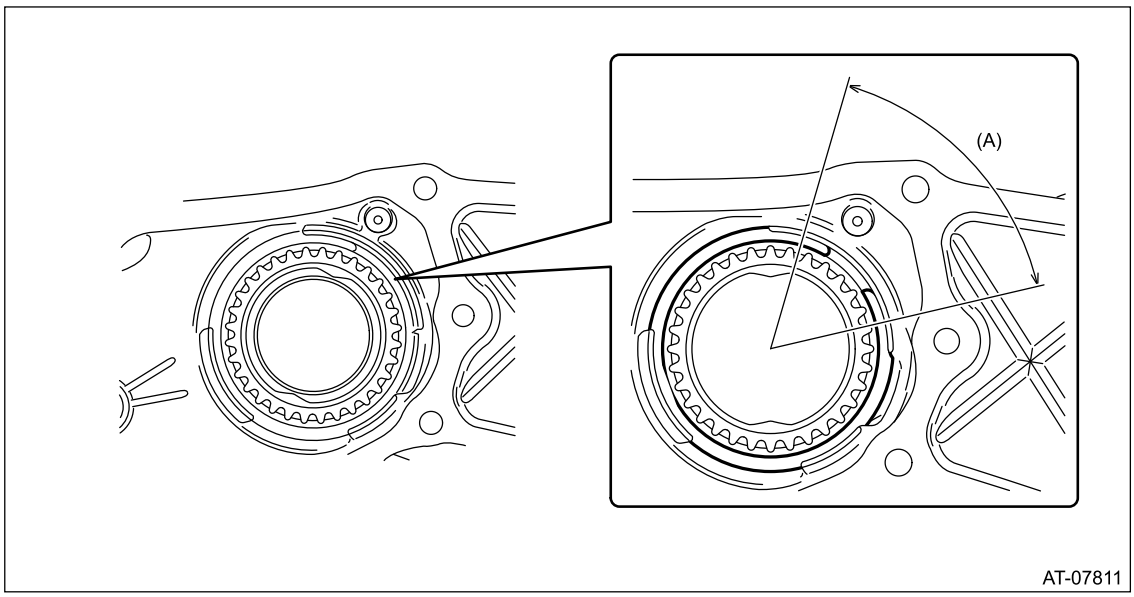




3. Install the drive sprocket.



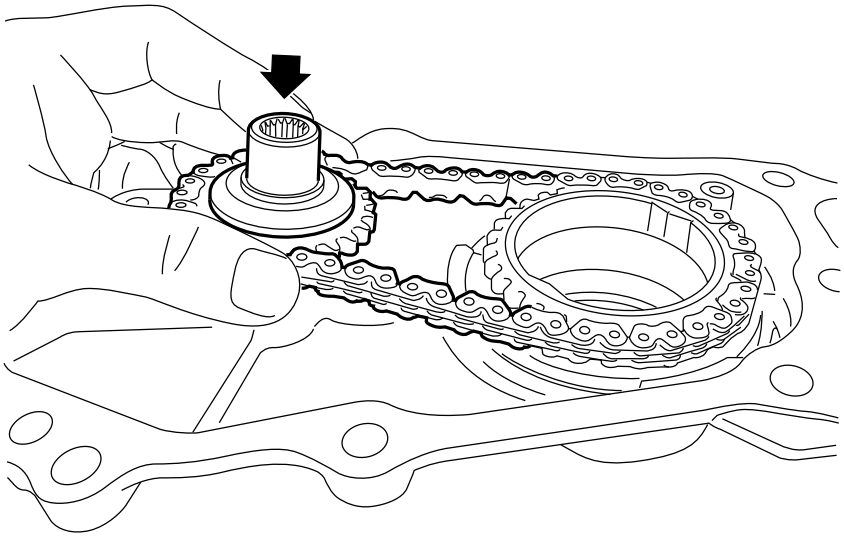
4. Install the snap ring so that its cutout portion is securely fitted into the snap ring groove of the oil pump chain cover.



(A) Installation range of cutout portion for snap ring

5. Place the oil pump chain on drive sprocket.

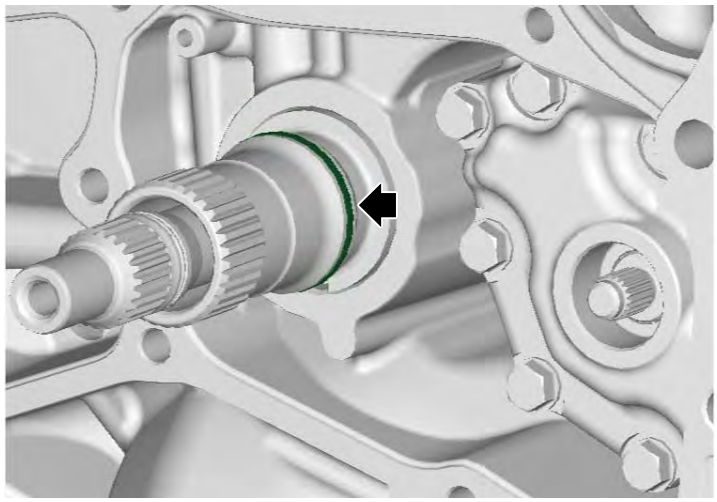
6. Place the oil pump chain on driven sprocket and install the driven sprocket to oil pump chain cover.


AT-06704

7. Install the seal rings.

Note:

- **Use new seal rings.**
- **Apply CVTF to the seal rings.**
- **When installing the seal rings, do not expand the seal rings too much.**


CVT10356

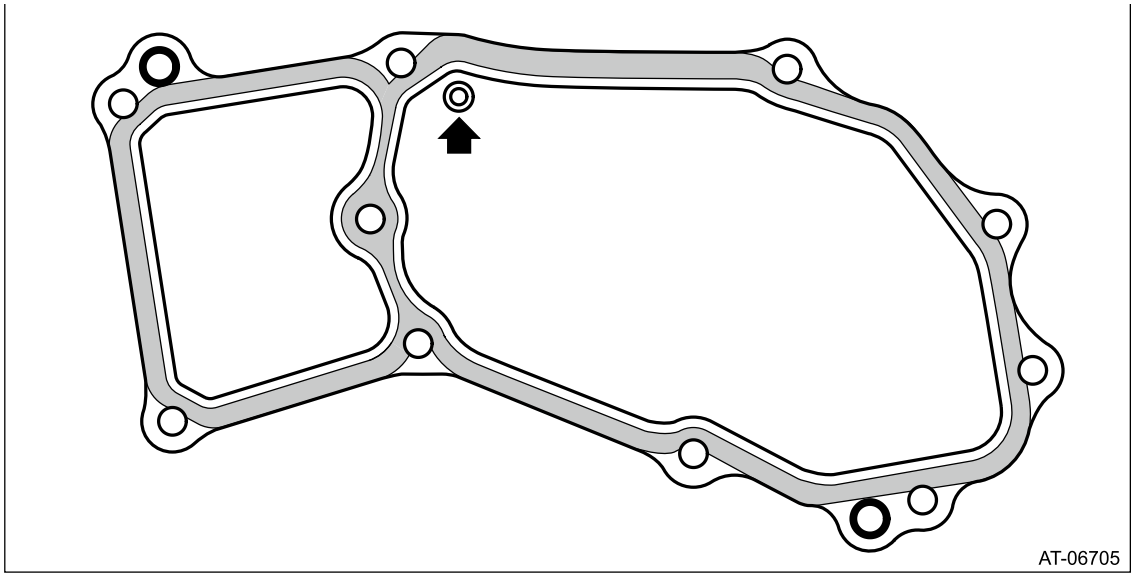
8. Apply liquid gasket seamlessly to the mating surface of oil pump chain cover.

Caution:

Do not apply liquid gasket at the arrowed hole.

Liquid gasket:

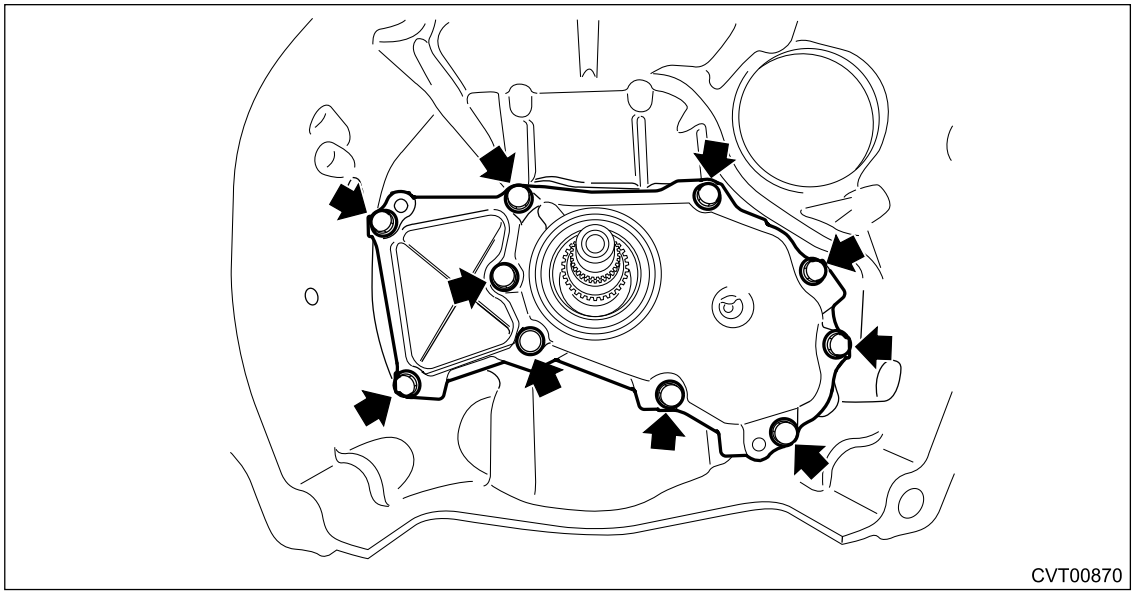
THREE BOND 1215B or equivalent



9. Install the oil pump chain cover.

Tightening torque:

21 N·m (2.1 kgf-m, 15.5 ft-lb)



10. Install the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly>INSTALLATION.

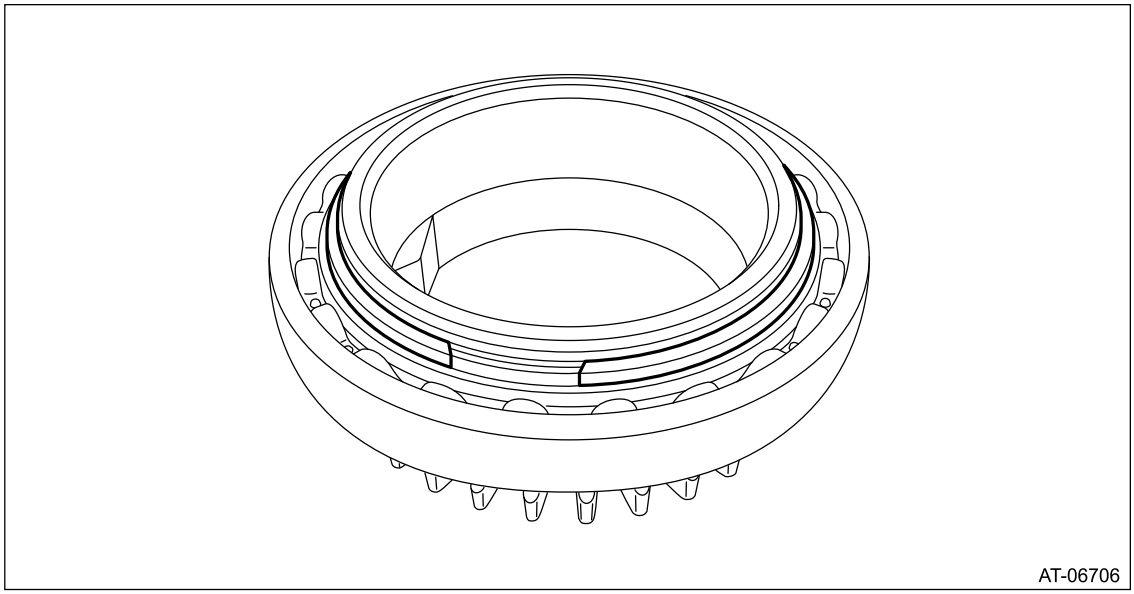
11. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump Chain

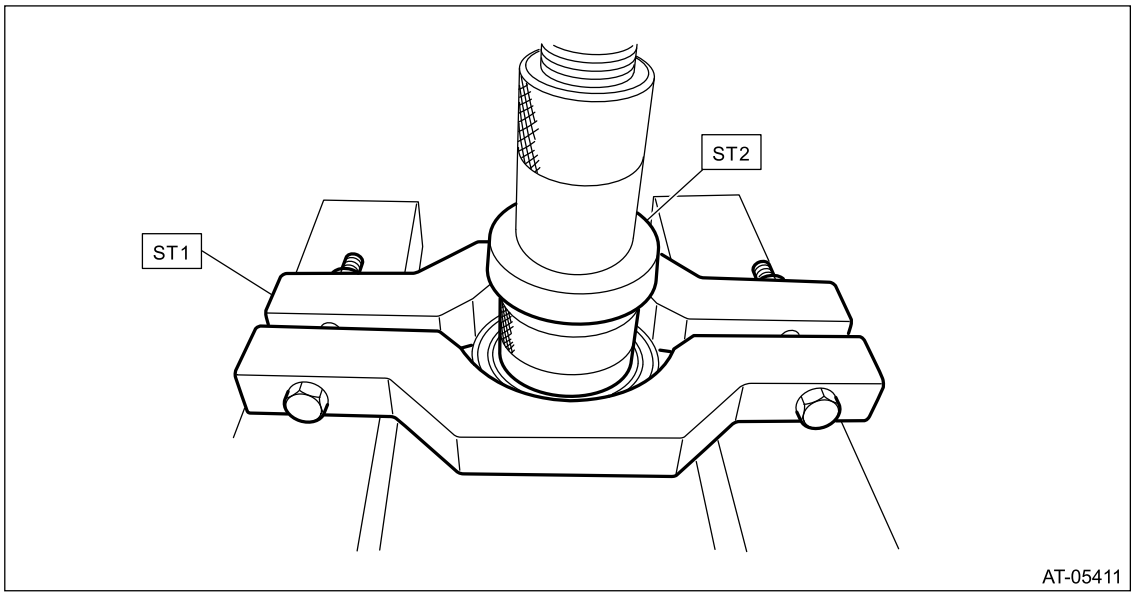
DISASSEMBLY

1. DRIVE SPROCKET

1. Remove the snap ring.



2. Remove the ball bearing using the ST1 and ST2.
   Preparation tool:
   ST1: REMOVER (498077600)
   ST2: INSTALLER (399513600)



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump Chain

ASSEMBLY

1. DRIVE SPROCKET

1. Using the ST, install the ball bearing.

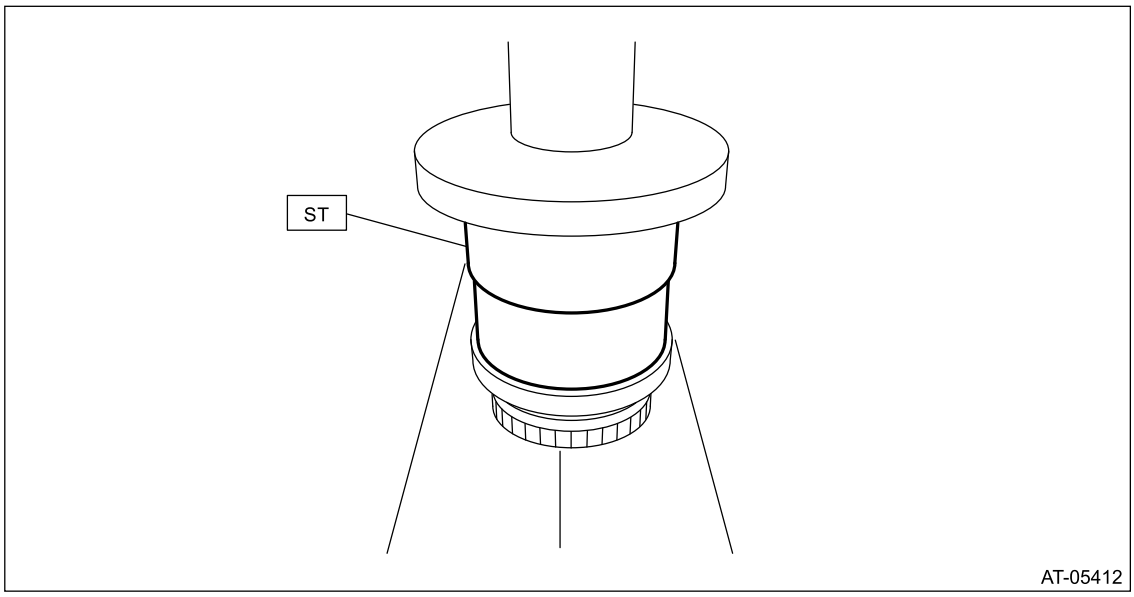
Note:

Use a new ball bearing.

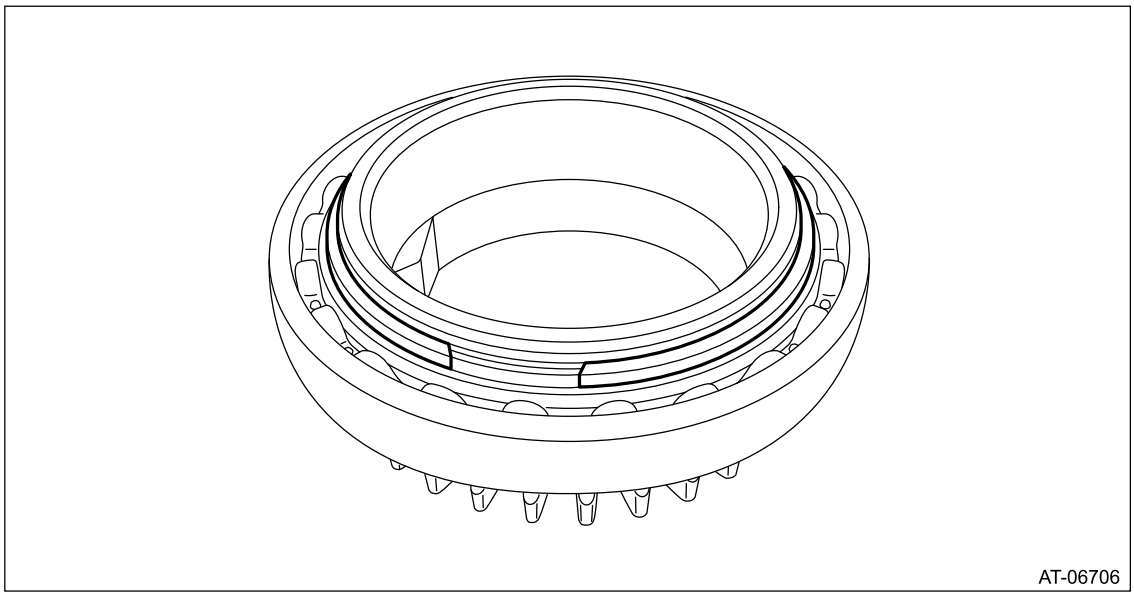
Preparation tool:

ST: PRESS SNAP RING (499755502)

ST 499755502 PRESS SNAP RING



2. Install the snap ring.



CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump Chain

INSPECTION

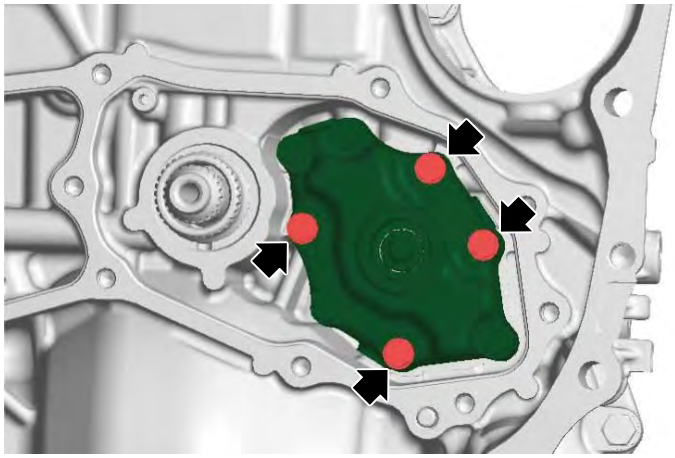
- Check the oil pump chain for damage.
- Replace if gear teeth are broken, damaged, sharpen or excessively worn.
- Check the bearing for seizure or wear.

- Apply CVTF to bearing and rotate the bearing to check for noise or dragging etc.
- Check the oil pump chain cover for damage.
- Check for leakage of CVTF from the mating surface of oil pump chain cover.
- Check the oil seal for damage.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump

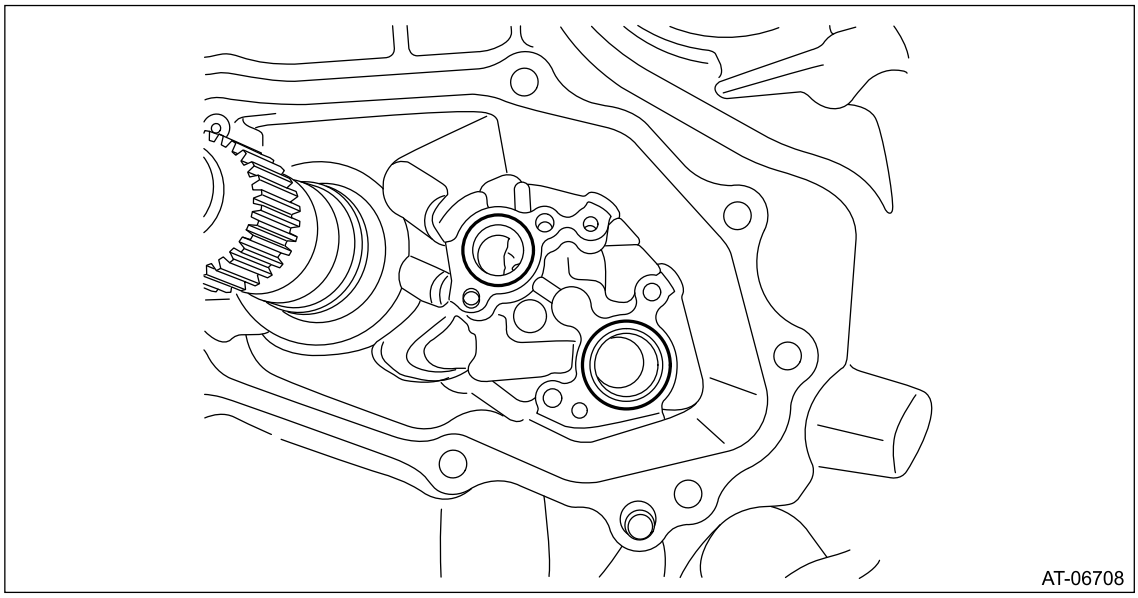
REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly>REMOVAL.
3. Remove the oil pump chain cover. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump Chain>REMOVAL.
4. Remove the oil pump and the plate.




CVT10357

5. Remove the O-rings.


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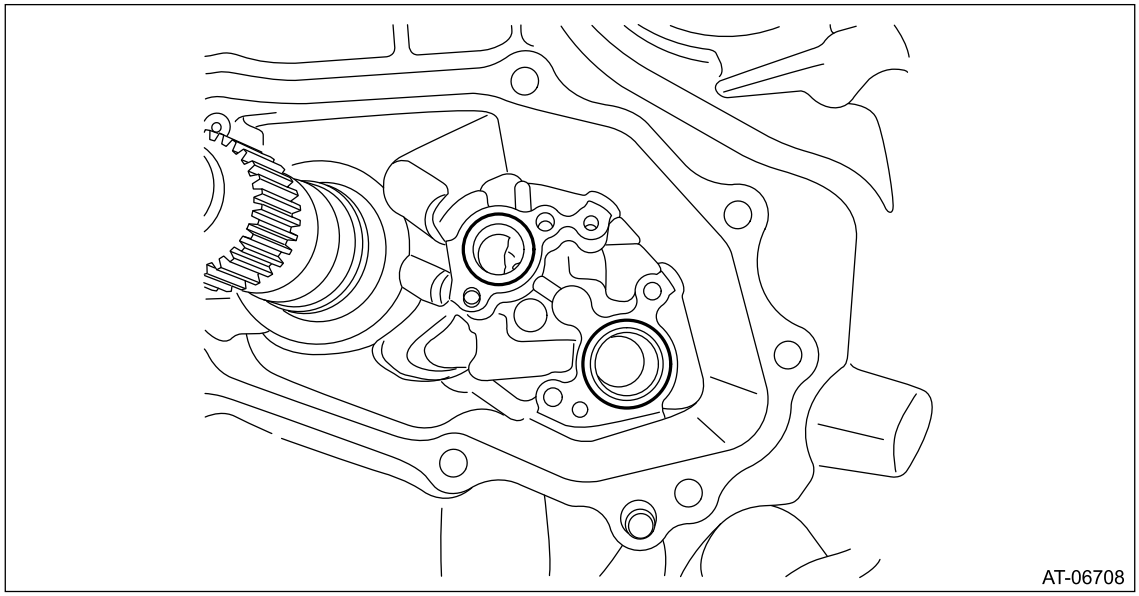
CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump

INSTALLATION

1. Install the O-rings.

Note:

- **Use new O-rings.**
- **Apply CVTF to the O-rings.**


AT-06708

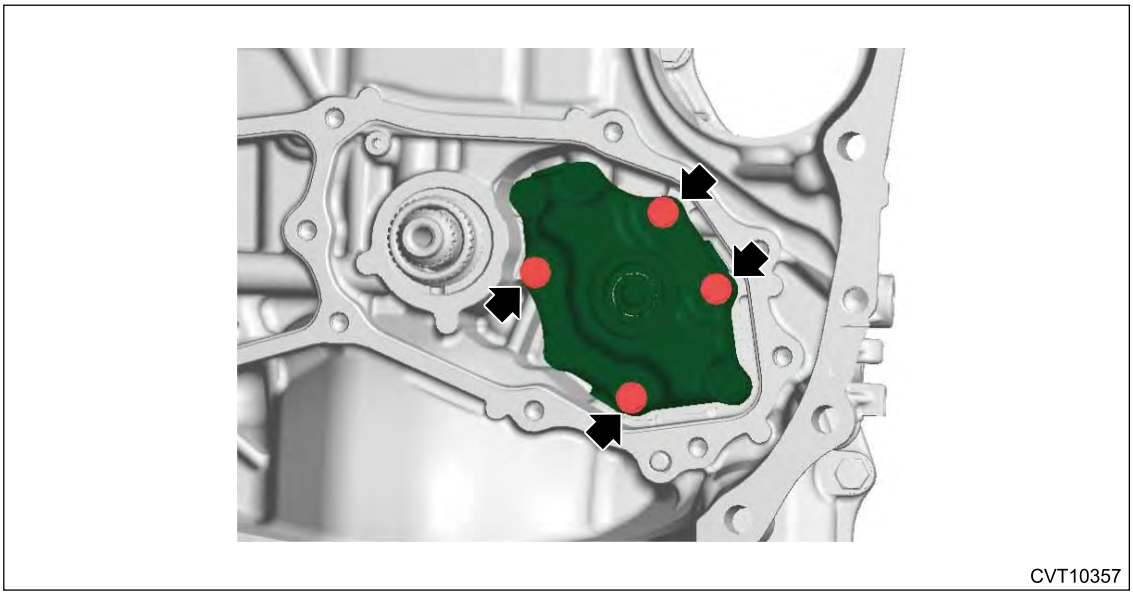
2. Install the plate and the oil pump.

Note:

Apply CVTF to the bolt.

Tightening torque:

8.5 N·m (0.9 kgf-m, 6.3 ft-lb)



3. Install the oil pump chain cover. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump Chain>INSTALLATION.
4. Install the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly>INSTALLATION.
5. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Oil Pump

INSPECTION

Check the following items.

- Check the oil pump for damage and wear.
- Rotate the oil pump by hand, and check that it rotates smoothly.

1. Measure the secondary pressure. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure (Line Pressure) Test>INSPECTION.
2. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
3. Check oil strainer for clogging.
   When oil strainer has no clogging, replace the oil pump.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Converter Case

REMOVAL

1. Remove the transmission assembly from the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>REMOVAL.
2. Remove the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>REMOVAL.
3. Remove the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>REMOVAL.
4. Remove the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>REMOVAL.
5. Remove the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>REMOVAL.
6. Remove the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>REMOVAL.
7. Remove the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>REMOVAL.
8. Remove the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>REMOVAL.
9. Remove the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>REMOVAL.
10. Remove the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>REMOVAL.
11. Remove the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE

TRANSMISSION(TR580)>Transfer Driven Gear>REMOVAL.

12. Remove the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>REMOVAL.
13. Remove the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>REMOVAL.
14. Remove the oil pan and oil strainer. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>REMOVAL.
15. Remove the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>REMOVAL.
16. Remove the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>REMOVAL.
17. Remove the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>REMOVAL.
18. Remove the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>REMOVAL.
19. Remove the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>REMOVAL.
20. Remove the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>REMOVAL.
21. Remove the drive pinion shaft assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>REMOVAL.
22. Remove the front differential assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>REMOVAL.
23. Remove the oil pump chain cover. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump Chain>REMOVAL.
24. Remove the oil pump. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump>REMOVAL.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Converter Case

INSTALLATION

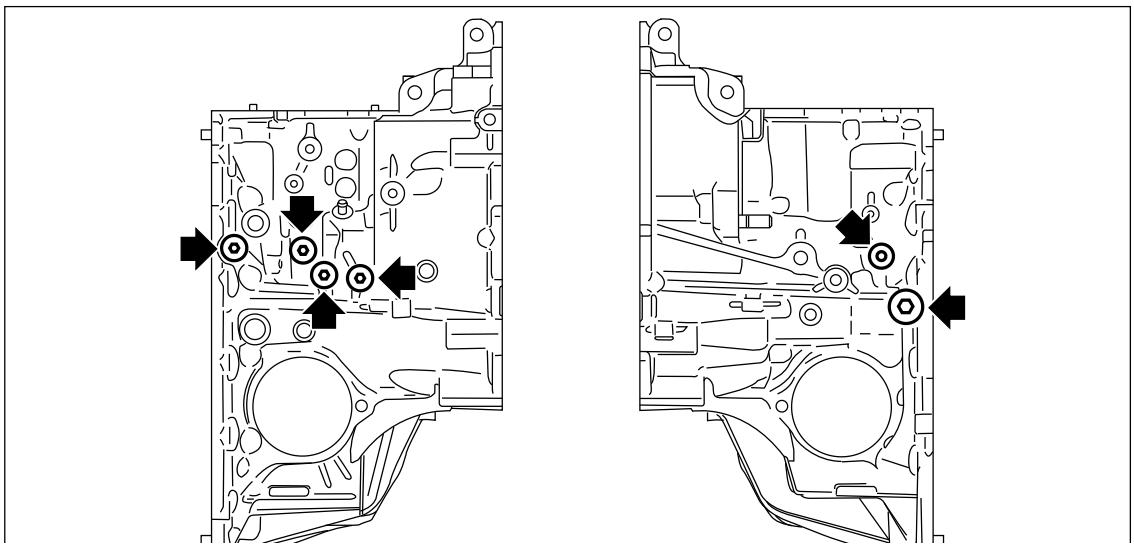
1. Install the oil pump. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump>INSTALLATION.
2. Install the oil pump chain cover. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pump Chain>INSTALLATION.
3. Install the front differential assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Front Differential Assembly>INSTALLATION.
4. Install the drive pinion shaft assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Drive Pinion Shaft Assembly>INSTALLATION.
5. Install the forward clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Forward Clutch Assembly>INSTALLATION.
6. Install the reverse brake assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reverse Brake Assembly>INSTALLATION.
7. Install the primary pulley, secondary pulley and variator chain. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Pulley and Secondary Pulley>INSTALLATION.
8. Install the reduction drive gear. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Drive Gear>INSTALLATION.
9. Install the transmission case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Case>INSTALLATION.
10. Install the transmission control device. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Device>INSTALLATION.

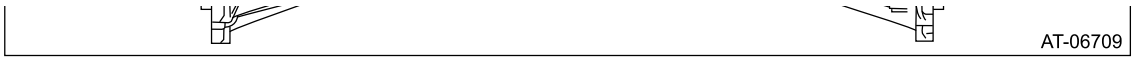
11. Install the oil strainer and oil pan. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Oil Pan and Strainer>INSTALLATION.
12. Install the reduction driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Reduction Driven Gear>INSTALLATION.
13. Install the transfer driven gear assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Driven Gear>INSTALLATION.
14. Install the transfer clutch assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch>INSTALLATION.
15. Install the parking pawl. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Parking Pawl>INSTALLATION.
16. Install the extension case. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Extension Case>INSTALLATION.
17. Install the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSTALLATION.
18. Install the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor>INSTALLATION.
19. Install the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor>INSTALLATION.
20. Install the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor>INSTALLATION.
21. Install the transmission harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Harness>INSTALLATION.
22. Install the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body>INSTALLATION.
23. Install the air breather hose. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Air Breather Hose>INSTALLATION.
24. Install the transmission assembly to the vehicle. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly>INSTALLATION.

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Converter Case

DISASSEMBLY

1. Remove the pitching stopper bracket.
2. Remove the filler plug, oil drain plug and overflow drain plug. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Differential Gear Oil>REPLACEMENT.
3. Remove all plugs.

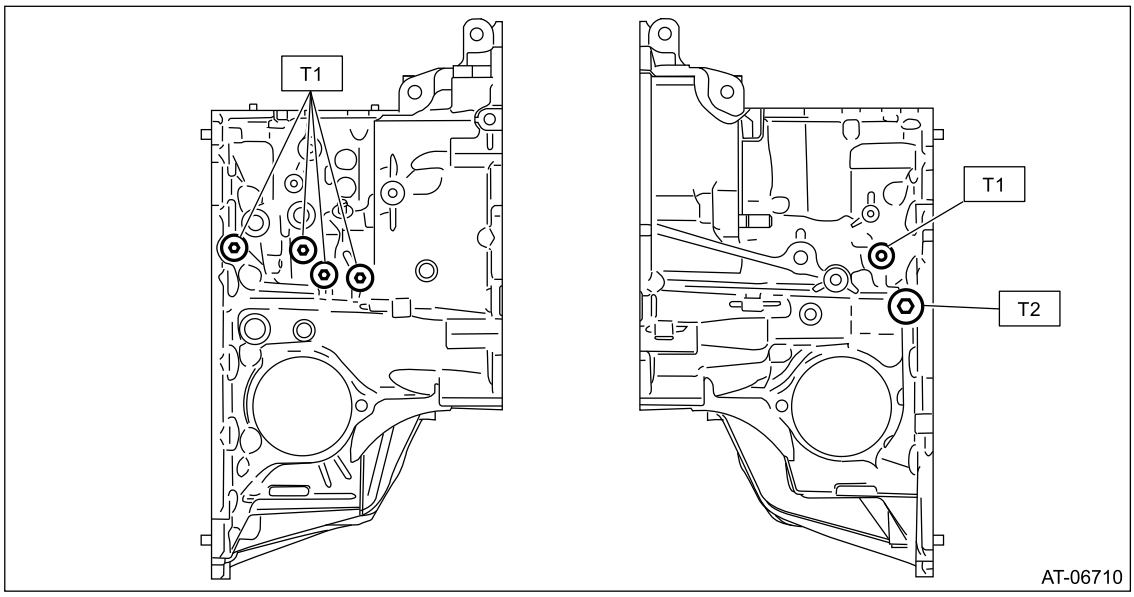




CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Converter Case

ASSEMBLY

1. Install the oil drain plug.
   Tightening torque:
   70 N·m (7.1 kgf-m, 51.6 ft-lb)
2. Install the overflow drain plug.
   Note:
   Overflow plug of differential gear oil is temporarily attached.
3. Install all plugs.
   Note:
   Use new O-rings.
   Tightening torque:
   T1: 22 N·m (2.2 kgf-m, 16.2 ft-lb)
   T2: 22.5 N·m (2.3 kgf-m, 16.6 ft-lb)



4. Install the pitching stopper bracket.
   Tightening torque:
   41 N·m (4.2 kgf-m, 30.2 ft-lb)

CONTINUOUSLY VARIABLE TRANSMISSION(TR580) > Converter Case

INSPECTION

- Check for leakage of CVTF from the connection between converter case and transmission case.
- Check there is no damage or cracks on the converter case.

INSPECTION

Symptoms	Faulty parts
Stall speed is low after warming-up, with select lever in “D” or “R” range.	Engine control system
Vehicle does not move despite engine speed rising up, with select lever in “D” or “R” range.	• Engine control system • Select cable • CVTF • Secondary pressure circuit • Pulley, gear and variator chain • Forward/reverse changeover section • TCM • Control valve body • Inhibitor switch
Vehicle does not move by engine stall, with select lever in “D” or “R” range.	• Parking mechanism • Select cable • Bearing • Forward/reverse changeover section
Excessive shock occurs at starting, with select lever in “D” or “R” range.	• Secondary pressure circuit • Pulley, gear and variator chain
Acceleration speed from standstill is insufficient, with select lever in “D” or “R” range.	• Control valve body • Forward/reverse changeover section
Engine speed suddenly rises up during driving,	• Control valve body • Secondary pressure circuit

with select lever in “D” or “R” range.	• Secondary pressure circuit • Primary pressure circuit
Vibration occurs during driving, with select lever in “D” or “R” range.	• Secondary pressure circuit • Primary pressure circuit • Forward/reverse changeover section • Pulley and variator chain • Torque converter assembly • Hydraulic pressure circuit to torque converter • Control valve body
Sudden braking occurs during driving, with select lever in “D” or “R” range.	• Secondary pressure circuit • Primary pressure circuit • Control valve body
During deceleration, lockup clutch does not disengage until just before halting, with select lever in “D” or “R” range.	• Control valve body • Torque converter assembly
Engine stalls with vehicle at a standstill, with select lever in “D” or “R” range.	• Engine control system • Control valve body
Excessive lockup shock occurs during driving, with select lever in “D” range.	Control valve body
Slipping occurs at lockup, or lockup does not occur during driving, with select lever in “D” range.	• Control valve body • Lockup hydraulic line • Torque converter assembly

Symptoms	Faulty parts
Excessive shift shock occurs when shifting the select lever from “N” range to “D” range, or from “N” range to “R” range.	• Inhibitor switch • Control valve body • Forward/reverse changeover section
Vehicle does not keep at standstill with select lever in “P” range, or parking cannot be released when shifting from “P” range to another range.	• Select cable • Parking mechanism
Select lever does not shift smoothly.	• Select cable • Inhibitor switch • Detent spring • Manual plate

CONTROL SYSTEMS

CS

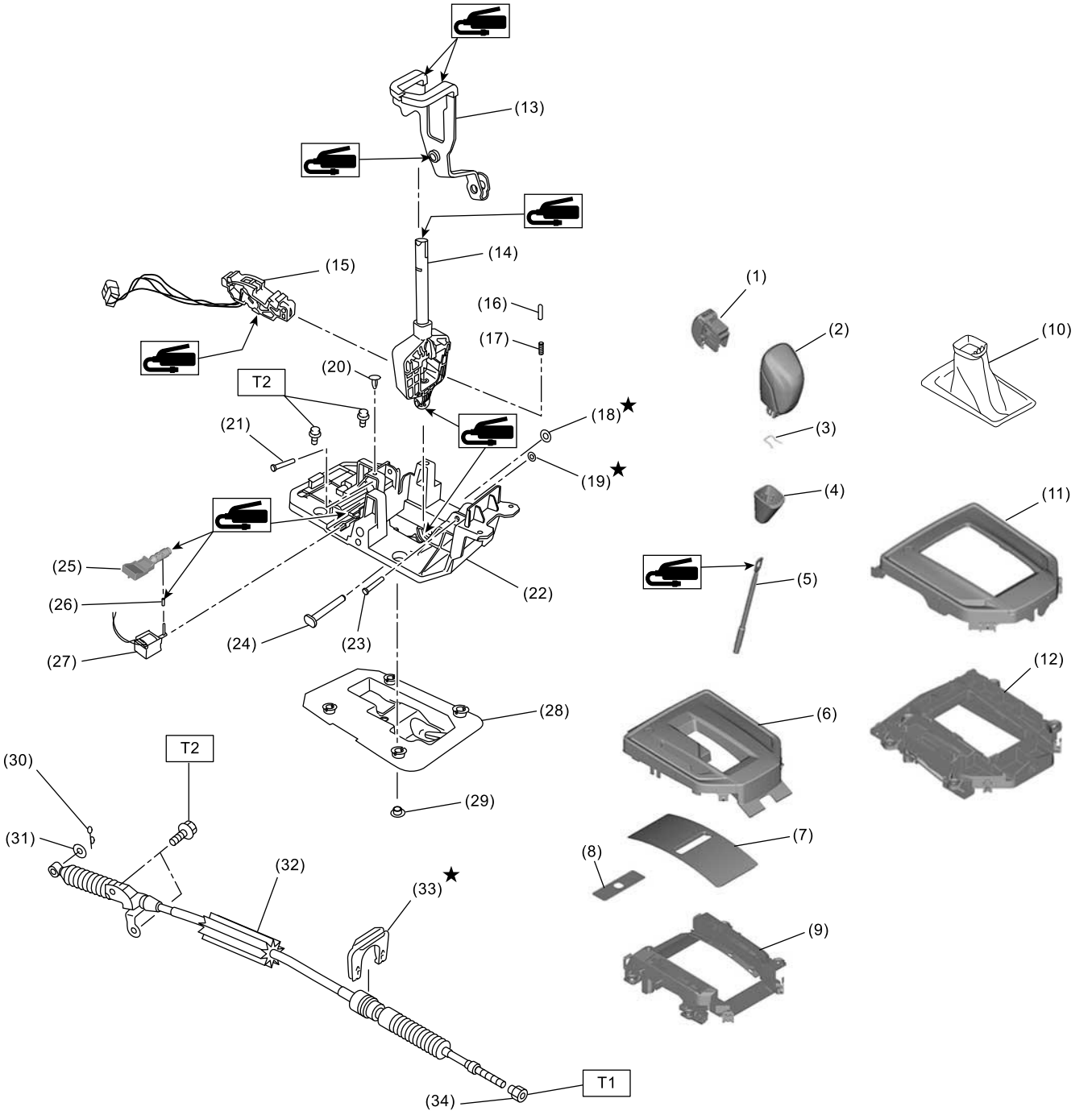
1. General Description
2. AT Shift Lock Control System
3. Select Lever
4. Select Cable
5. AT Shift Lock Solenoid and “P” Range Switch
6. Body Integrated Unit
7. MT Gear Shift Lever
8. General Diagnostic Table

SPECIFICATION

Item		Specifications
Swing torque of rod against lever	N (kgf, lb)	3.7 (0.38, 0.83) or less

COMPONENT

1. AT SELECT LEVER



CS-10056

(1) Button ASSY-AT
(2) Grip sub ASSY
(3) Clamp grip pin
(4) Cover grip AT (model with gate shifter)
(5) Rod COMPL
(6) Indicator cover (model with gate shifter)
(7) Blind A (model with gate shifter)
(14) Selector lever COMPL
(15) Plate guide
(16) Rod detent
(17) Detent spring
(18) Clamp push nut
(19) Clamp push nut
(20) Clamp pin
(27) Solenoid unit
(28) Gasket
(29) Spacer plate
(30) Snap pin
(31) Washer
(32) Select cable
(33) Clamp

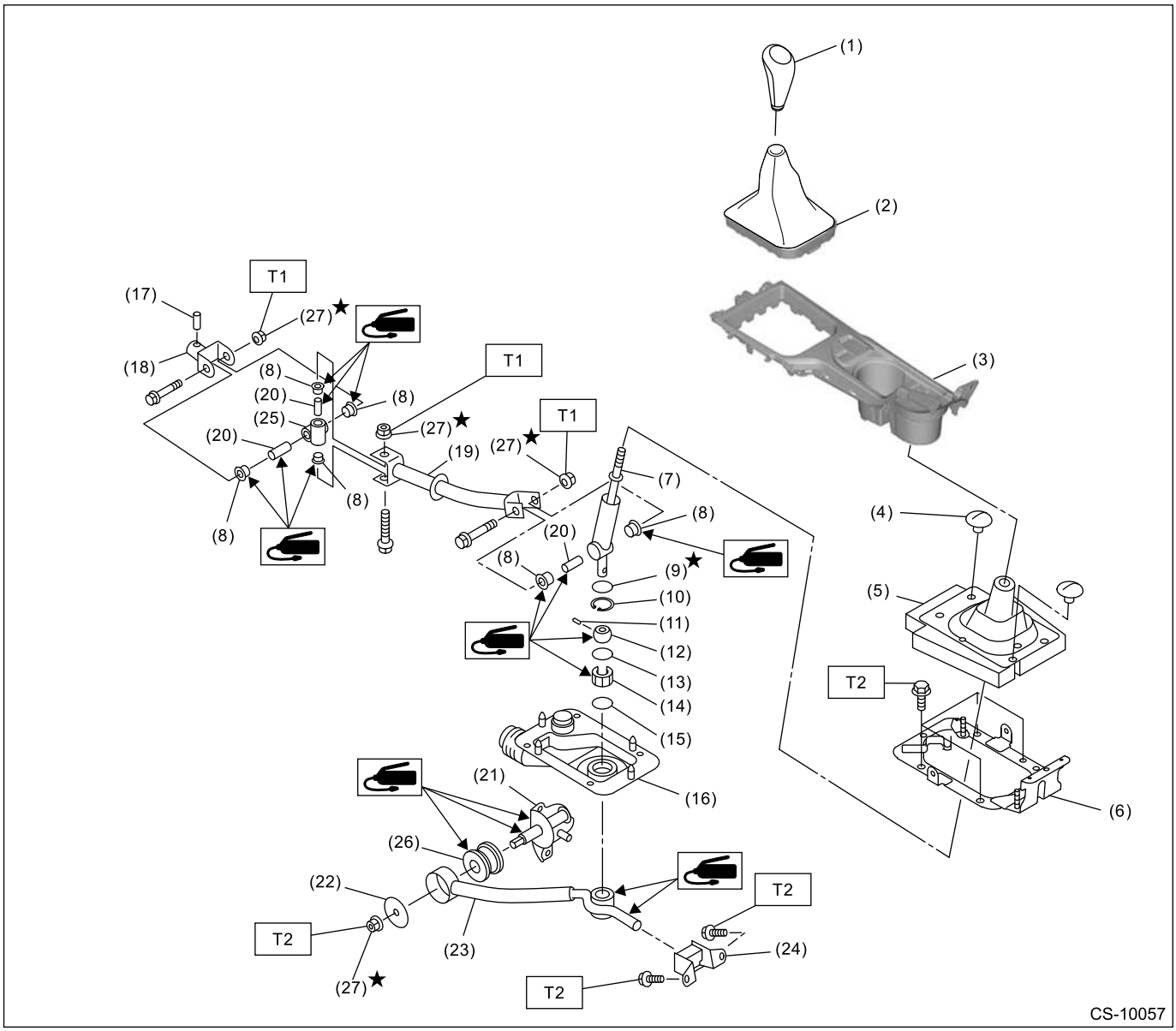
(8) Blind B (model with gate shifter)
(9) Housing (model with gate shifter)
(10) Boot ASSY (model with boot shifter)
(11) Indicator ASSY (model with boot shifter)
(12) Housing (model with boot shifter)
(13) Arm COMPL
(21) Spacer pin guide
(22) Plate COMPL
(23) Spacer pin guide
(24) Shaft control
(25) Rod shift lock
(26) Cushion solenoid
(34) Nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.8, 5.5)

T2: 18 (1.8, 13.3)

2. 5MT GEAR SHIFT LEVER



(1) Gear shift knob
(2) Shift boot
(3) Console front cover ASSY
(4) Clamp
(5) Boot and insulator ASSY
(6) Plate COMPL
(7) Lever
(8) Bushing
(9) Lock wire
(10) Snap ring
(11) Spring pin
(12) O-ring
(13) Spring pin
(14) Bushing B
(15) O-ring
(16) Boot
(17) Spring pin
(18) Joint
(19) Rod
(20) Spacer
(21) Shift bracket
(22) Plate
(23) Stay
(24) Cushion rubber
(25) Boss
(26) Bushing
(27) Self-locking nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 12 (1.2, 8.9)
T2: 18 (1.8, 13.3)

CONTROL SYSTEMS > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

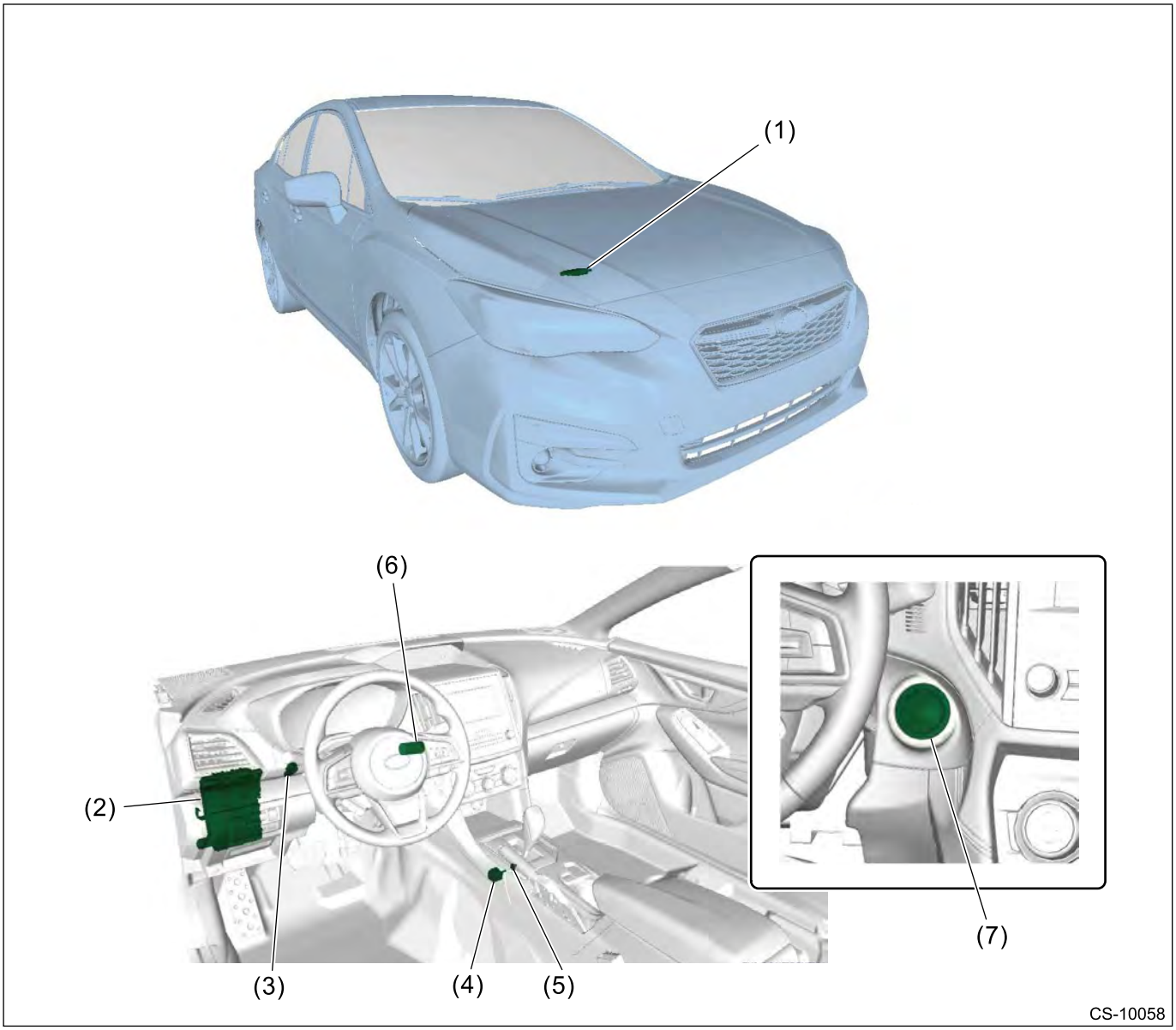
TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

CONTROL SYSTEMS > General Description

CAUTION

- Wear appropriate work clothing, including a cap, protective goggles and protective shoes when performing any work.
- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- Use SUBARU genuine fluid, grease etc. or equivalent. Do not mix fluid, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply grease onto sliding or revolving surfaces before installation.
- Before installing O-rings or snap rings, apply sufficient amount of fluid to avoid damage and deformation.
- Before securing a part in a vise, place cushioning material such as wood blocks, aluminum plate or cloth between the part and the vise.
- Before disconnecting electrical connectors, be sure to disconnect the negative terminal from battery.

LOCATION



(1) TCM (“P” range)

(2) Body integrated unit

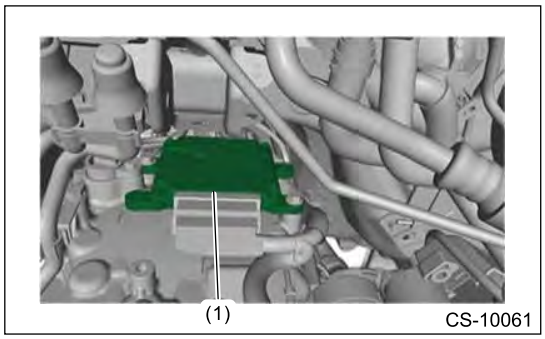
(3) Stop light and brake switch

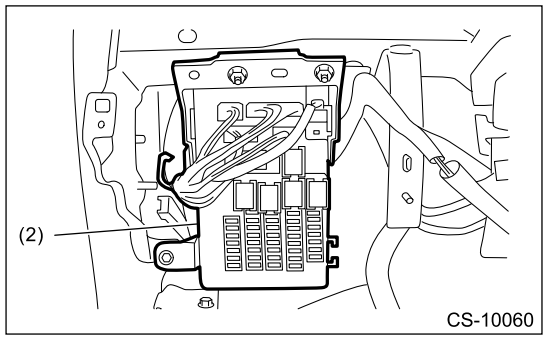
(4) Solenoid unit

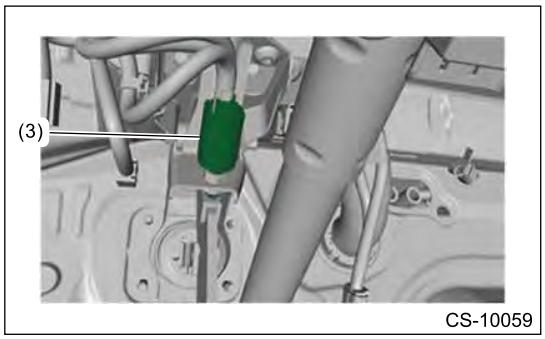
(5) “P” range switch

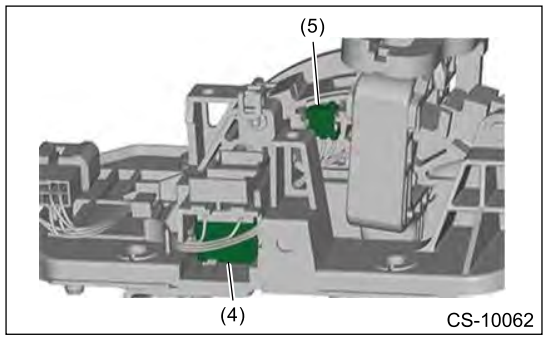
(6) Key lock solenoid (model without push button ignition switch)

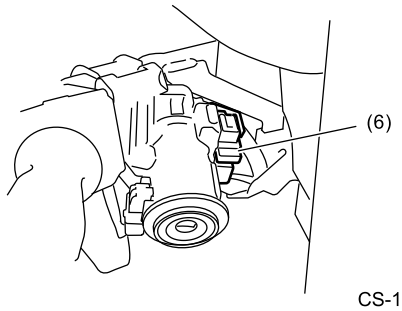
(7) Push button ignition switch (model with push button ignition switch)





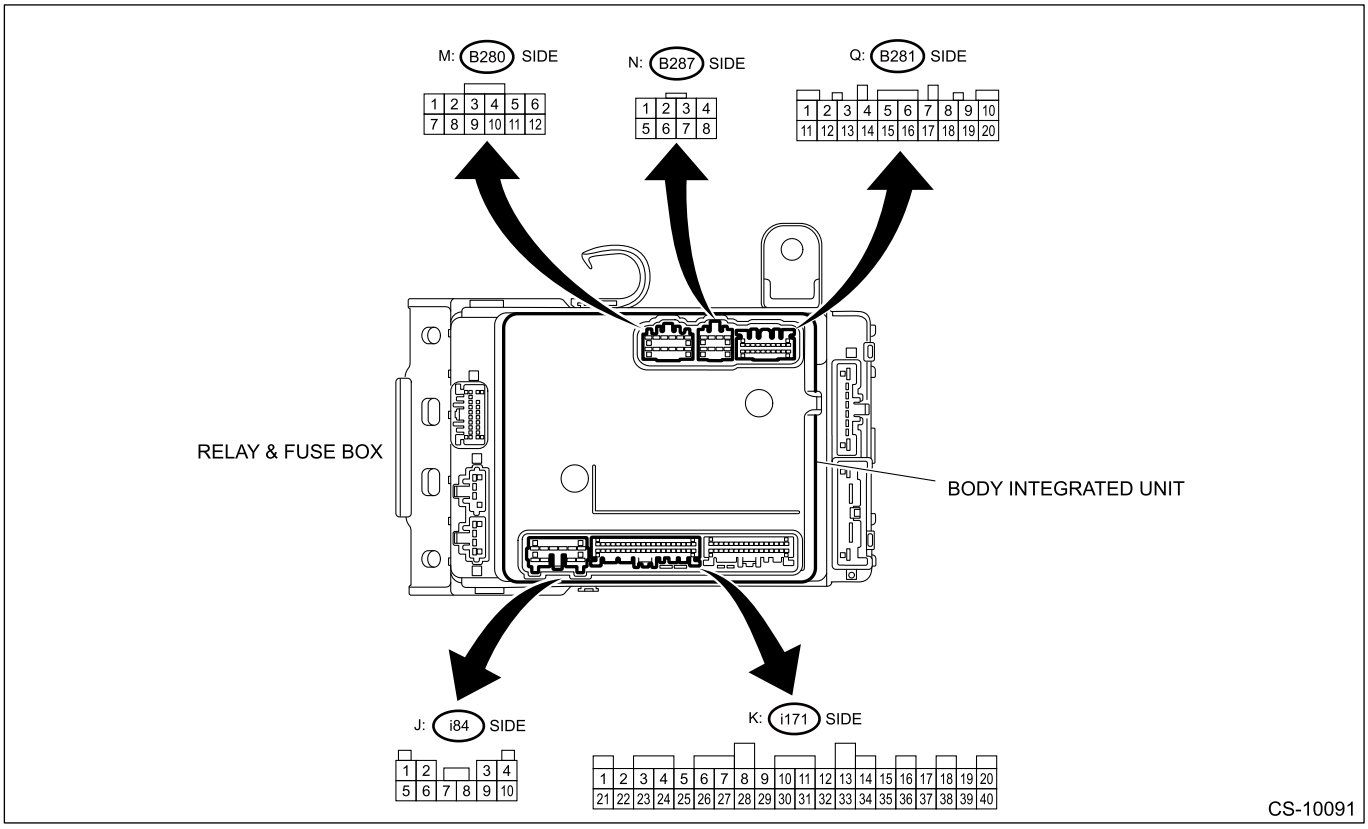






CONTROL SYSTEMS > AT Shift Lock Control System

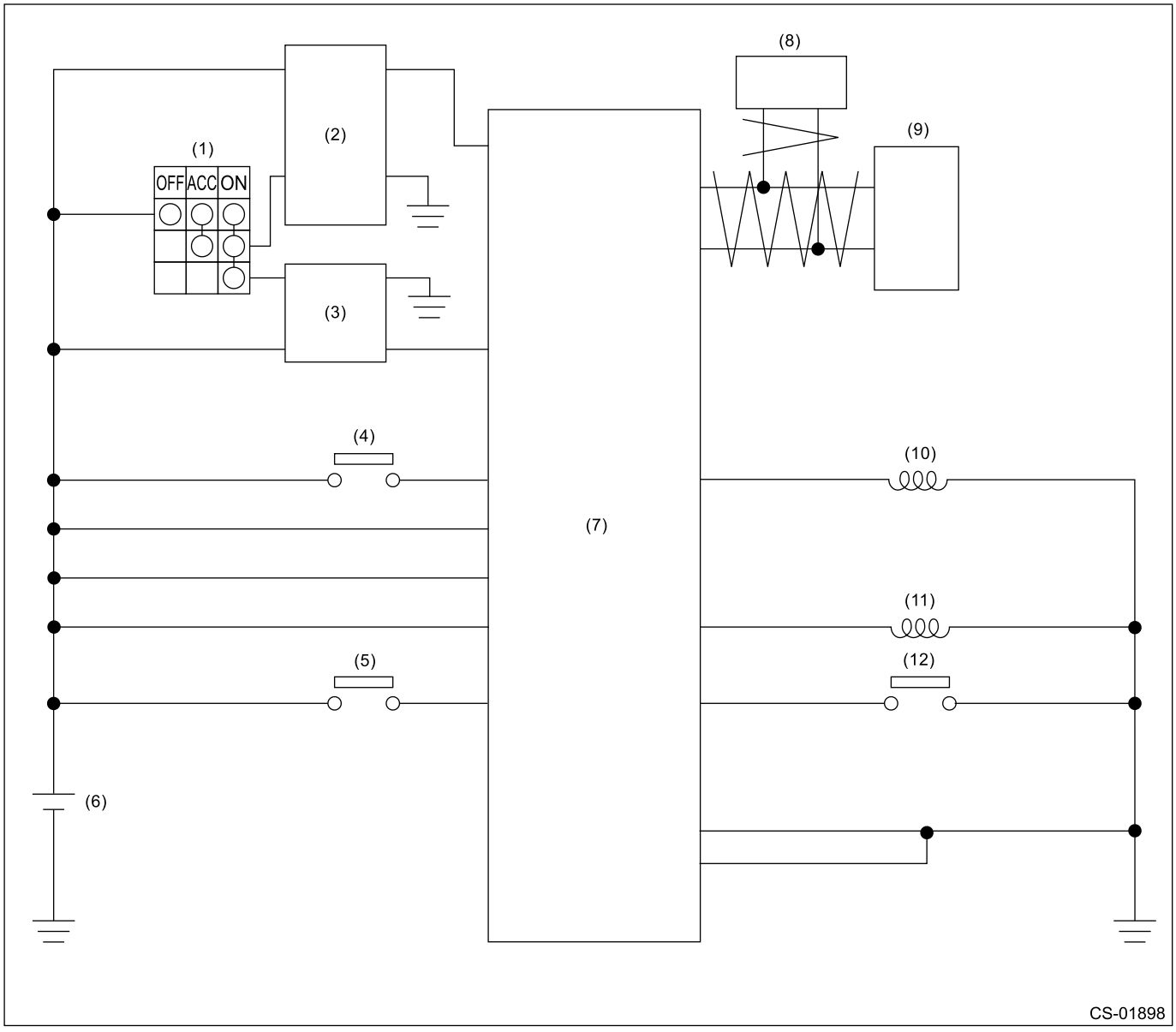
ELECTRICAL SPECIFICATION



Item	Connector No.	Terminal No.	Input/Output signal Measured value and measuring conditions
Battery power supply	B280	1	9 — 16 V
	B281	7	
	B287	4	
TCM (“P” range)	B281	17	Pulse signal (CAN communication)
	B281	19	
Stop light switch	B281	16	9 — 16 V when stop light switch is ON 1 V when stop light switch is OFF
“P” range switch	i171	40	Less than 1 V when select lever is in “P” range 9 — 16 V when select lever is in other positions than “P” range
Solenoid unit output	i84	3	9 — 16 V when shift lock is released Less than 1 V when shift lock is operating
Key warning switch signal (Model without push button ignition switch)	i84	1	9 — 16 V when key is inserted Less than 1 V when key is removed
Key lock solenoid signal (Model without push button ignition switch)	B280	12	9 — 16 V when the key is inserted with the select lever shifted in positions other than “P” range Less than 1 V at other conditions than above
Ground	i84	4	Less than 1 V
	B287	1	

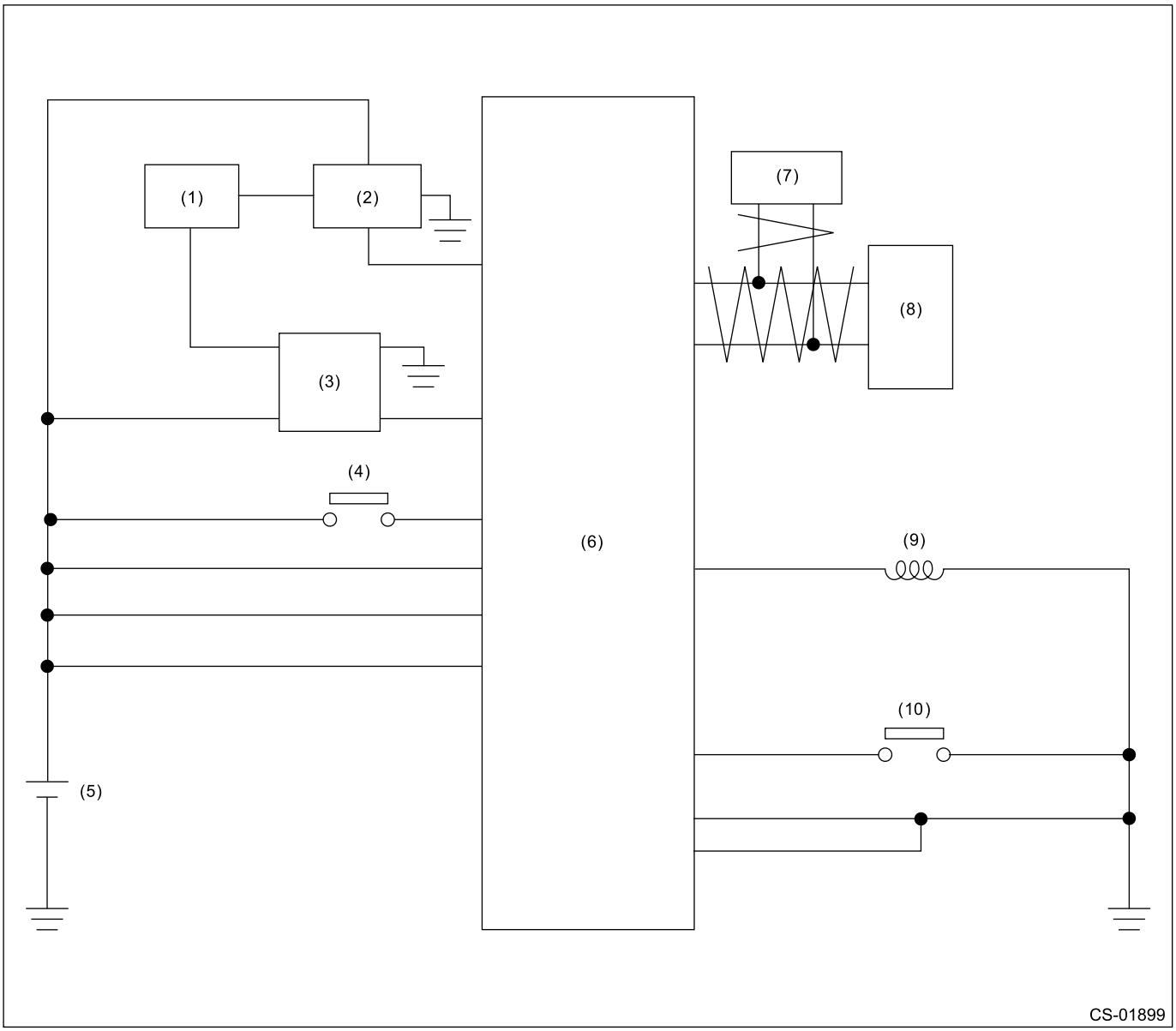
WIRING DIAGRAM

1. MODEL WITHOUT PUSH BUTTON IGNITION SWITCH



(1) Ignition switch
(2) Accessory 1 relay
(3) IG2 relay
(4) Stop light switch
(5) Key warning switch
(6) Battery
(7) Body integrated unit
(8) VDC CM (vehicle speed information)
(9) TCM (shift range information)
(10) Key lock solenoid
(11) Shift lock solenoid
(12) "P" range switch

2. MODEL WITH PUSH BUTTON IGNITION SWITCH



(1) Keyless access CM
(2) IG2 relay
(3) Accessory 1 relay
(4) Stop light switch
(5) Battery
(6) Body integrated unit
(7) VDC CM (vehicle speed information)
(8) TCM (shift range information)
(9) Shift lock solenoid
(10) "P" range switch

INSPECTION

1. SHIFT LOCK OPERATION

- Model without push button ignition switch

1. CHECK COMMUNICATION OF SUBARU SELECT MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether communication to all systems can be executed normally.

Is the system name displayed?

Yes — Go to 2.

No — For diagnostic procedures, refer to the LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK SHIFT LOCK.

1. Turn the ignition switch to ON.
2. Shift the select lever to “P” range.

While brake pedal is not depressed, is it possible to move the select lever from the “P” range to other ranges?

Yes — Perform the inspection of “SELECT LEVER CANNOT BE LOCKED OR RELEASED”. Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

No — Go to 3.

3. CHECK SHIFT LOCK.

While brake pedal is depressed, is it possible to move the select lever from the “P” range to other ranges?

Yes — Go to 4.

No — Perform the inspection of “SELECT LEVER CANNOT BE LOCKED OR RELEASED”. Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

4. CHECK SHIFT LOCK.

Shift the select lever to “N” range.

Is it possible to move the select lever from the “N” range to the “P” range?

Yes — Go to 5.

No — Perform the inspection of “SELECT LEVER CANNOT BE LOCKED OR RELEASED”.
Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

5. CHECK SHIFT LOCK.

1. Shift the select lever to “N” range.
2. Turn the ignition switch to ACC.

While brake pedal is depressed, is it possible to move the select lever from the “N” range to the “P” range?

Yes — Go to 6.

No — Perform the inspection of “SELECT LEVER CANNOT BE LOCKED OR RELEASED”.
Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

6. CHECK KEY INTERLOCK.

1. Shift the select lever to other than “P” range.
2. Turn the ignition switch to OFF.

Can the ignition key be removed?

Yes — Perform the inspection of “KEY INTERLOCK CANNOT BE LOCKED OR RELEASED”.
Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > KEY INTERLOCK CANNOT BE LOCKED OR RELEASED.

No — Go to 7.

7. CHECK KEY INTERLOCK.

Shift the select lever to "P" range.

Can the ignition key be removed?

Yes	AT shift lock system is normal.
No	Perform the inspection of "KEY INTERLOCK CANNOT BE LOCKED OR RELEASED". Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > KEY INTERLOCK CANNOT BE LOCKED OR RELEASED.

- Model with push button ignition switch

1. CHECK COMMUNICATION OF SUBARU SELECT MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether communication to all systems can be executed normally.

Is the system name displayed?

Yes	Go to 2.
No	For diagnostic procedures, refer to the LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK SHIFT LOCK.

1. Turn the ignition switch to ON.
2. Shift the select lever to "P" range.

While brake pedal is not depressed, is it possible to move the select lever from the "P" range to other ranges?

Yes	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.
No	Go to 3.

3. CHECK SHIFT LOCK.

While brake pedal is depressed, is it possible to move the select lever from the "P" range to other ranges?

Yes	Go to 4.
No	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

4. CHECK SHIFT LOCK.

Shift the select lever to "N" range.

Is it possible to move the select lever from the "N" range to the "P" range?

Yes	Go to 5.
No	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

5. CHECK SHIFT LOCK.

1. Shift the select lever to "N" range.
2. Turn the ignition switch to ACC.

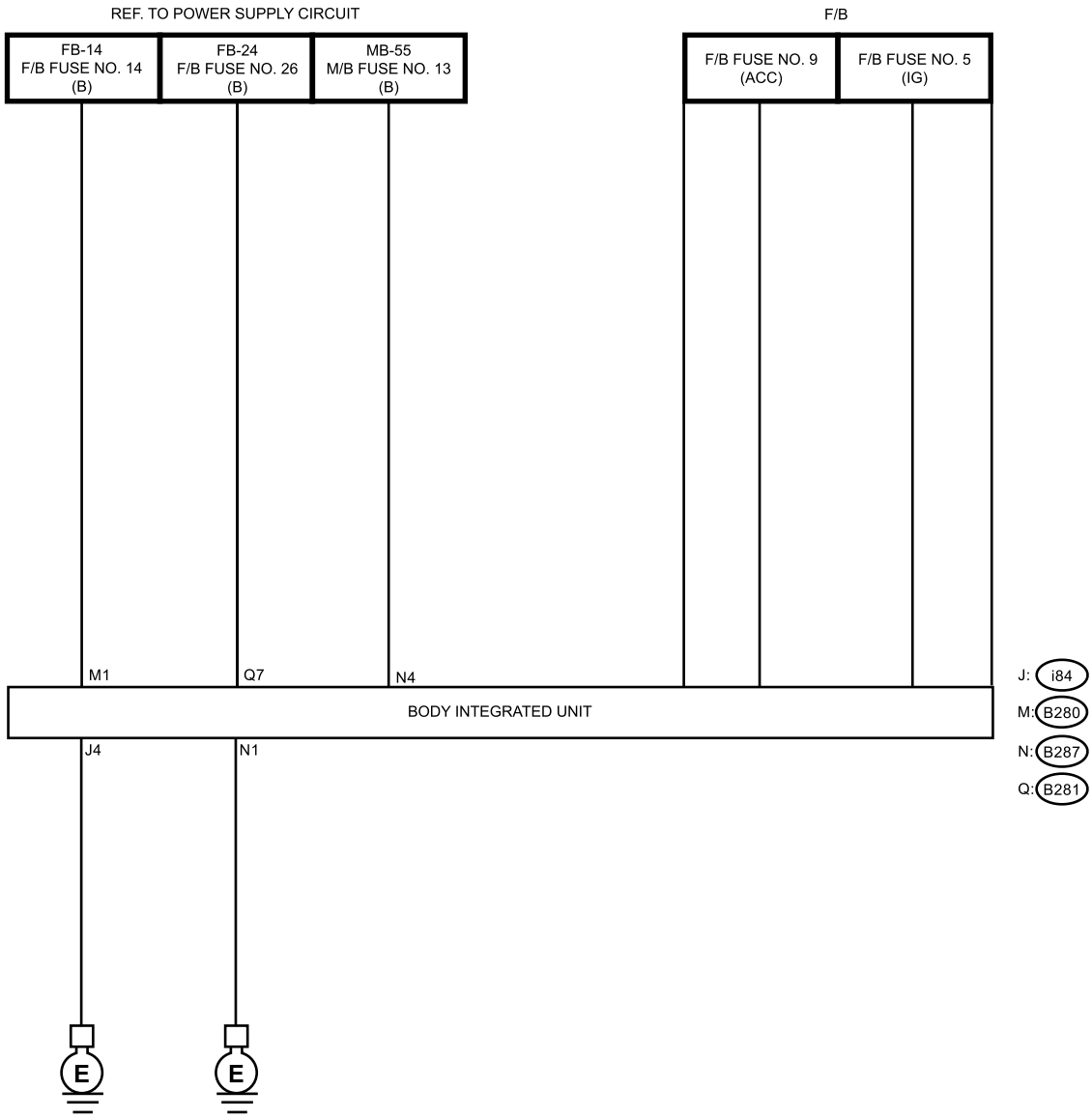
While brake pedal is depressed, is it possible to move the select lever from the "N" range to the "P" range?

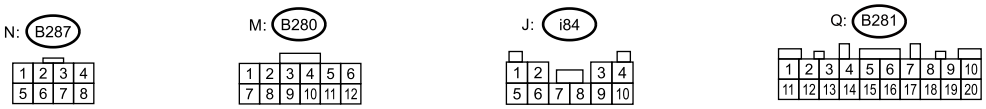
Yes	AT shift lock system is normal.
No	Perform the inspection of "SELECT LEVER CANNOT BE LOCKED OR RELEASED". Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SELECT LEVER CANNOT BE LOCKED OR RELEASED.

2. BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT

Note:

For the DC power supply circuit, refer to "WIRING DIAGRAMS". Ref. to WIRING SYSTEM>Power Supply Circuit.


REF. TO POWER SUPPLY CIRCUIT
F/B
FB-14
F/B FUSE NO. 14
(B)
FB-24
F/B FUSE NO. 26
(B)
MB-55
M/B FUSE NO. 13
(B)
F/B FUSE NO. 9
(ACC)
F/B FUSE NO. 5
(IG)
M1
Q7
N4
BODY INTEGRATED UNIT
J4
N1
J: i84
M: B280
N: B287
Q: B281
E
E


N: B287
1 2 3 4
5 6 7 8
M: B280
1 2 3 4 5 6
7 8 9 10 11 12
J: i84
1 2 3 4
5 6 7 8 9 10
Q: B281
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20

CS-10094

1. CHECK DTC OF BODY INTEGRATED UNIT.

Check DTC of body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

Is the DTC of power line displayed on body integrated unit?

Yes — Repair or replace it according to the DTC.

No — Go to 2.

2. CHECK CURRENT DATA.

Check the current data «BATT voltage (control)» display of body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is the display 10 — 15 V?

Yes — Go to 4.

No — Go to 3.

3. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND BATTERY.

1. Turn the ignition switch to ON.
2. Measure the voltage between body integrated unit and chassis ground.
   Connector & terminal
   (B280) No. 1 (+) — Chassis ground (−):
   (B281) No. 7 (+) — Chassis ground (−):
   (B287) No. 4 (+) — Chassis ground (−):

Is the voltage 9 — 16 V?

Yes — Go to 4.

No — Check harness for open circuit between the body integrated unit and the battery or a blown fuse.

4. CHECK BODY INTEGRATED UNIT IGN POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between F/B fuse No. 5 and chassis ground.
   Connector & terminal
   F/B fuse No. 5 (+) — Chassis ground (−):

Is the display 10 V or more?

Yes — Go to 5.

No — Repair the open circuit of the harness between body integrated unit and ignition switch.

5. CHECK BODY INTEGRATED UNIT AND ACC VOLTAGE SUPPLY CIRCUIT.

1. Turn the ignition switch to ACC.
2. Measure the voltage between F/B fuse No. 9 and chassis ground.
   Connector & terminal
   F/B fuse No. 9 (+) — Chassis ground (−):

Is the display 10 V or more?

Yes — Go to 6.

No — Repair the open circuit of the harness between body integrated unit and ignition switch.

6. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Measure the harness resistance between the body integrated unit and chassis ground.
   Connector & terminal
   (i84) No. 4 — Chassis ground:
   (B287) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes — Go to 7.

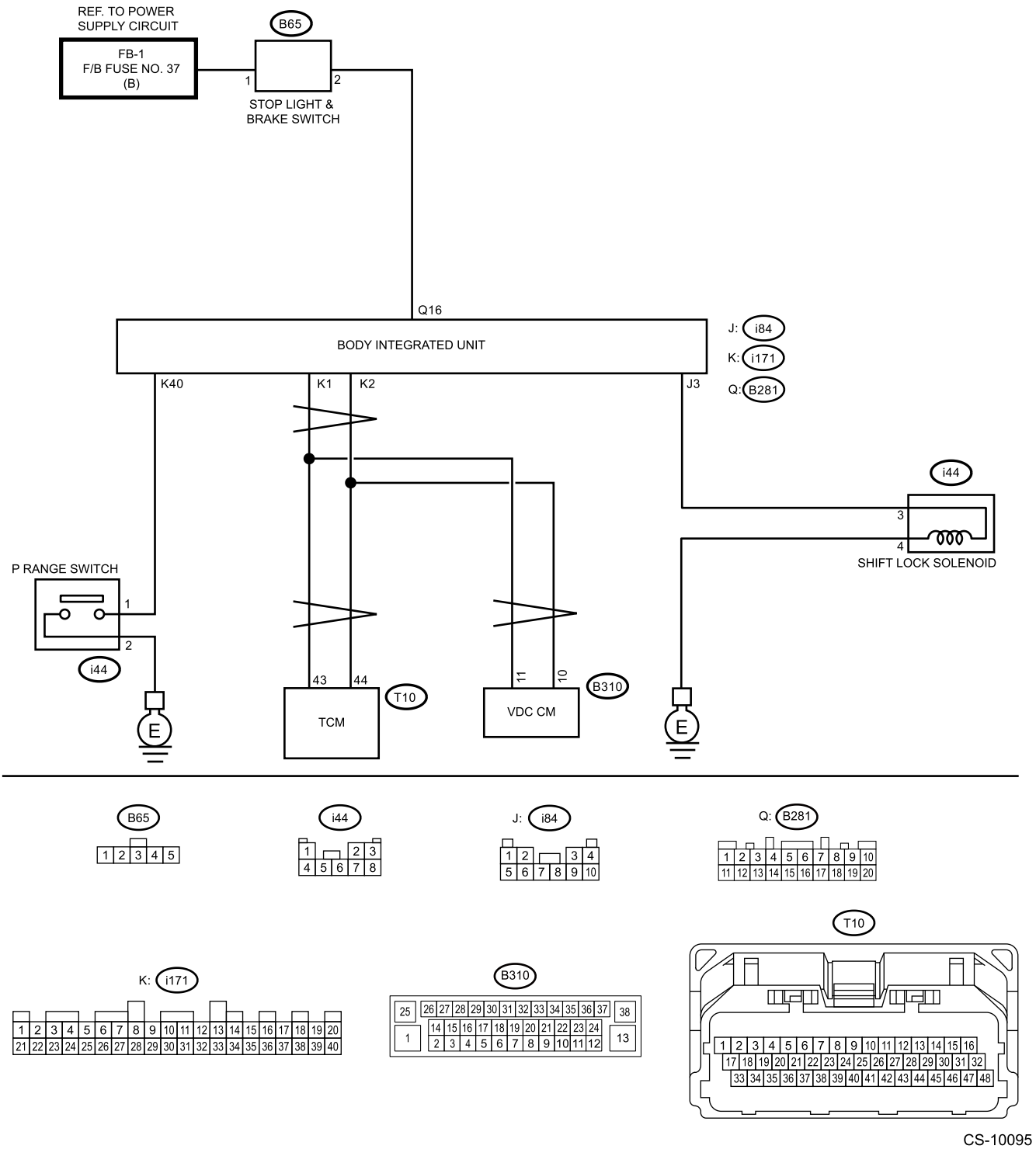
No — Repair the open circuit of harness between the body integrated unit and chassis ground.

7. CHECK FOR POOR CONTACT.

Is there poor contact of connector?

Yes	Repair the poor contact.
No	End.

3. SELECT LEVER CANNOT BE LOCKED OR RELEASED



CS-10095

1. CHECK BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.

Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.

Is there any fault?

Yes — Follow the procedures to perform inspection and repair.

No — Go to 2.

2. CHECK CURRENT DATA.

1. Connect the Subaru Select Monitor.
2. Shift the select lever to "P" range.
3. Turn the ignition switch to ON.
4. Select the current data display and display «P SW». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is the display "ON" in the P range and "OFF" in ranges other than P?

Yes — Go to 3.

No — Go to 8.

3. CHECK CURRENT DATA.

Select the current data display and display «Stop Light Switch». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is "ON" displayed when the brake pedal is depressed and "OFF" displayed when the brake pedal is released?

Yes — Go to 4.

No — Go to 11.

4. CHECK BODY INTEGRATED UNIT DTC.

Check the DTC of the body integrated unit when the brake pedal is pressed and when it is released.
(Hold each condition for 5 seconds or more.)

Is there a DTC of a current malfunction?

Yes — Follow the DTC to perform inspection and repair.

No — Go to 5.

5. CHECK CURRENT DATA.

Select the current data display and display «Shift lock solenoid output». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is “ON” displayed when the brake pedal is depressed and “OFF” displayed when the brake pedal is released?

Yes — Go to 6.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

6. CHECK CURRENT DATA.

Select the current data display and display «Shift Position». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is the display “7” in the “P” range and other than “7” in ranges other than “P”?

Yes — Go to 7.

No — Check the following items.

- Inhibitor switch
- Harness between inhibitor switch and TCM
- TCM input signal
- TCM CAN communication
- Body integrated unit CAN receive

7. CHECK CURRENT DATA.

1. Select the current data display and display «Front Wheel Speed». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.
2. Start the engine.
3. Raise vehicle speed gradually up to approximately 20 km/h (12 MPH).

Is a figure equivalent to the speedometer being indicated?

Yes — Go to 12.

No — Check the following items.
- Wheel speed sensor
- VDC CM CAN communication
- Body integrated unit CAN receive

Replace the wheel speed sensor, VDC CM or body integrated unit, or both.

8. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND "P" RANGE SWITCH.

1. Disconnect the connector from body integrated unit.
2. Disconnect the connector of "P" range switch.
3. Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and "P" range switch.

Connector & terminal

(i171) No. 40 — (i44) No. 1:

Is there any fault in the harness?

Yes — Repair or replace the harness between the body integrated unit and the "P" range switch.

No — Go to 9.

9. CHECK HARNESS BETWEEN "P" RANGE SWITCH AND CHASSIS GROUND.

Measure the resistance of harness between "P" range switch and chassis ground.

Connector & terminal

(i44) No. 2 — Chassis ground:

Is it less than 10 Ω?

Yes — Go to 10.

No — Measure the resistance of harness between "P" range switch and chassis ground.

10. CHECK "P" RANGE SWITCH.

Measure the resistance between "P" range switch connector terminals.

Terminals

No. 2 — No. 1:

Is it less than 10 Ω in the "P" range, and 1 MΩ or more in ranges other than "P"?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the AT select lever COMPL. Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.

11. CHECK STOP LIGHT SWITCH INPUT SIGNAL.

1. Disconnect the connector from body integrated unit.
2. Measure the voltage between the body integrated unit connector terminal and chassis ground.

   Connector & terminal

   (B281) No. 16 (+) — Chassis ground (−):

Is the voltage 9 — 16 V when the brake pedal is depressed, and less than 1.5 V when not pressed?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Check the stop light system.

12. CHECK SOLENOID UNIT OPERATION.

Connect the battery to the solenoid unit connector terminal, and operate the solenoid unit.

Terminals

No. 3 (+) — No. 4 (−):

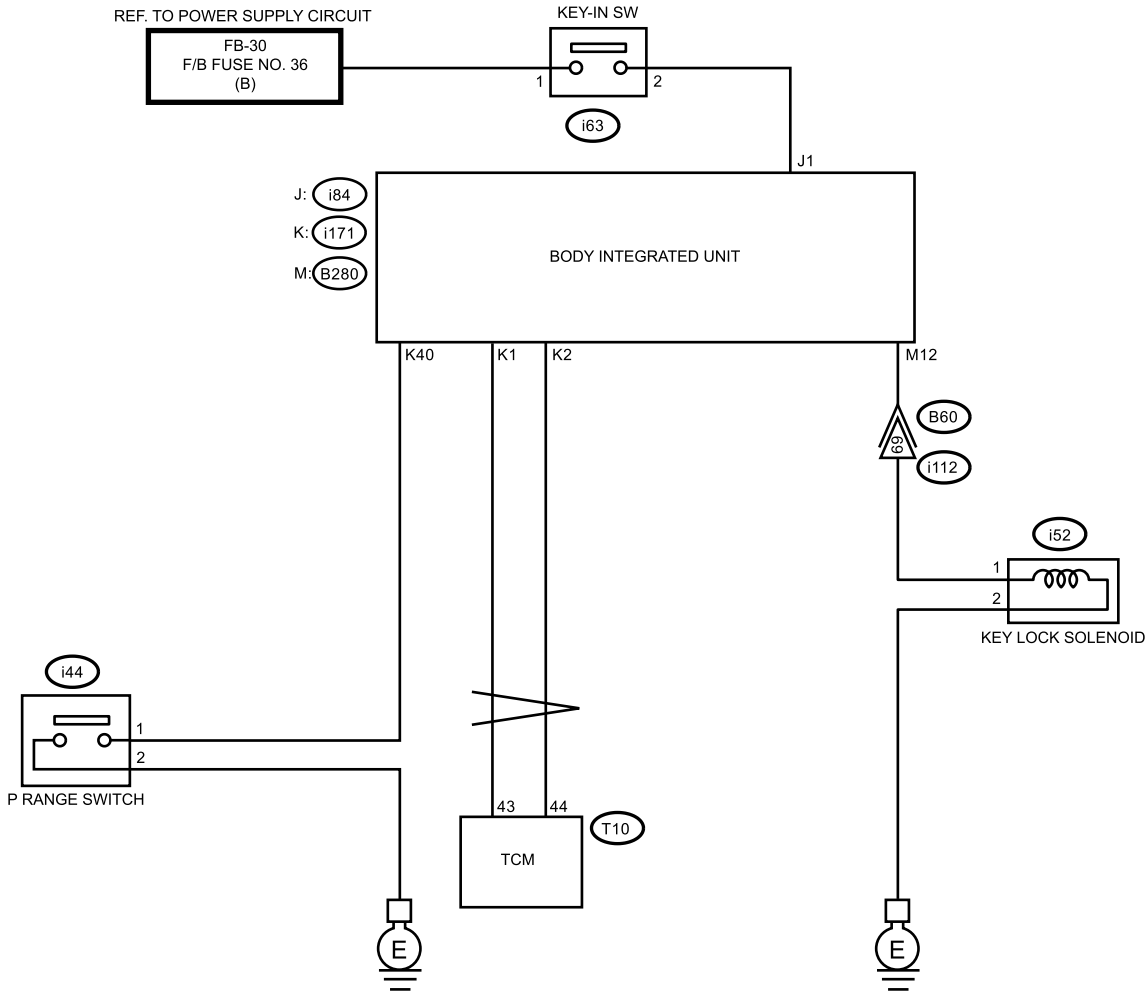
Does the solenoid unit operate normally?

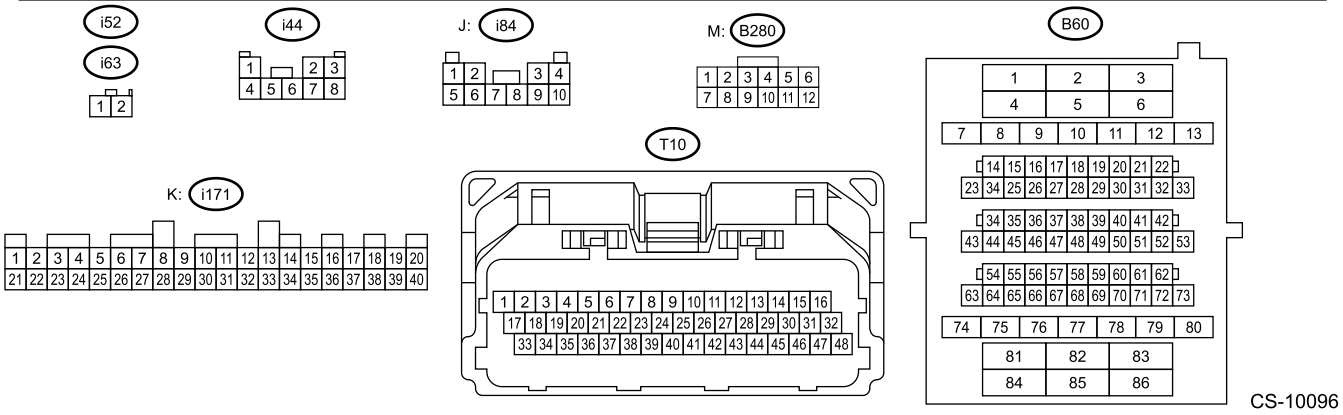
Yes	Check the lock mechanism of the select lever body.
No	Replace the solenoid unit. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch.

4. KEY INTERLOCK CANNOT BE LOCKED OR RELEASED

Note:

Check of this item only applies to models without a push button ignition switch.





1. CHECK BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.

Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > BODY INTEGRATED UNIT POWER SUPPLY AND GROUND CIRCUIT.

Is there any fault?

Yes — Follow the procedures to inspect and repair.

No — Go to 2.

2. CHECK CURRENT DATA.

1. Connect the Subaru Select Monitor.
2. Shift the select lever to "P" range.
3. Turn the ignition switch to ON.
4. Select the current data display and display «P SW». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is the display "ON" in the P range and "OFF" in ranges other than P?

Yes — Go to 3.

No — Go to 5.

3. CHECK CURRENT DATA.

1. Select the current data display and display the «key-lock warning SW». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.
2. Turn the ignition switch to OFF.

Does the display change as "ON" ←→ "OFF" when the key is inserted and removed?

Yes — Go to 4.

No — Go to 8.

4. CHECK CURRENT DATA.

1. Turn the ignition switch to OFF.
2. Select the current data display and display «Key lock solenoid output». Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Is the display “Unlock” in the “P” range and “Lock” in ranges other than “P”?

Yes — Go to 9.

No — Go to 5.

5. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND “P” RANGE SWITCH.

1. Disconnect the connector from body integrated unit.
2. Disconnect the connector of “P” range switch.
3. Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and “P” range switch.

Connector & terminal

(i171) No. 40 — (i44) No. 1:

Is there any fault in the harness?

Yes — Repair or replace the harness between the body integrated unit and the “P” range switch.

No — Go to 6.

6. CHECK HARNESS BETWEEN “P” RANGE SWITCH AND CHASSIS GROUND.

Measure the resistance of harness between “P” range switch and chassis ground.

Connector & terminal

(i44) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 7.

No — Repair or replace the harness between the “P” range switch and chassis ground.

7. CHECK “P” RANGE SWITCH.

Measure the resistance between “P” range switch connector terminals.

Terminals

No. 2 — No. 1:

Is it less than 10 Ω in the “P” range, and 1 MΩ or more in ranges other than “P”?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the AT select lever COMPL. Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.

8. CHECK HARNESS BETWEEN BATTERY AND KEY-IN SWITCH AND BODY INTEGRATED UNIT.

1. Disconnect the connector from body integrated unit.
2. Measure the voltage between body integrated unit and chassis ground.

Connector & terminal

(i84) No. 1 (+) — Chassis ground (−):

Is the display 9 — 16 V when the key is inserted, and less than 1.5 V with the key removed?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Check the following items.

- Key-in switch
- Harness/fuse
- Ignition circuit

9. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND KEY LOCK SOLENOID.

1. Disconnect the connector from body integrated unit.
2. Disconnect the connector of key lock solenoid.
3. Check for open circuit of harness, short circuit to battery or short circuit to ground between the body integrated unit and key lock solenoid.
   Connector & terminal
   (B280) No. 12 — (i52) No. 1:

Is there any fault in the harness?

Yes — Repair or replace the harness between the body integrated unit and the key lock solenoid.

No — Go to 10.

10. CHECK HARNESS BETWEEN KEY LOCK SOLENOID AND CHASSIS GROUND.

Measure the resistance of harness between key lock solenoid and chassis ground.
Connector & terminal
(i52) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 11.

No — Repair or replace the harness between the key lock solenoid and chassis ground.

11. CHECK KEY LOCK SOLENOID OPERATION.

Connect the battery to the key lock solenoid connector terminal, and operate the solenoid.
Terminals
No. 1 (+) — No. 2 (−):

Does the key lock solenoid operate normally?

Yes — Go to 12.

No — Replace the key lock solenoid.

12. CHECK OUTPUT OF BODY INTEGRATED UNIT.

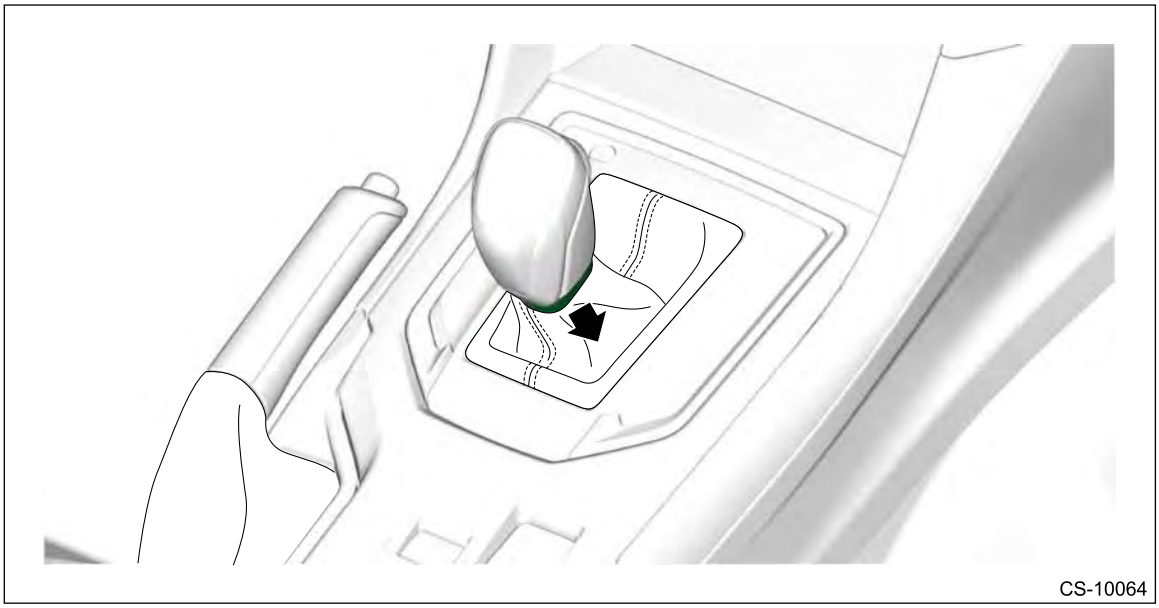
1. Connect all connectors.
2. Insert the key.
3. Measure the voltage between body integrated unit and chassis ground.
   Connector & terminal
   (B280) No. 12 — Chassis ground:

Is it 7.5 to 16 V in ranges other than “P”, and 0 V in the “P” range?

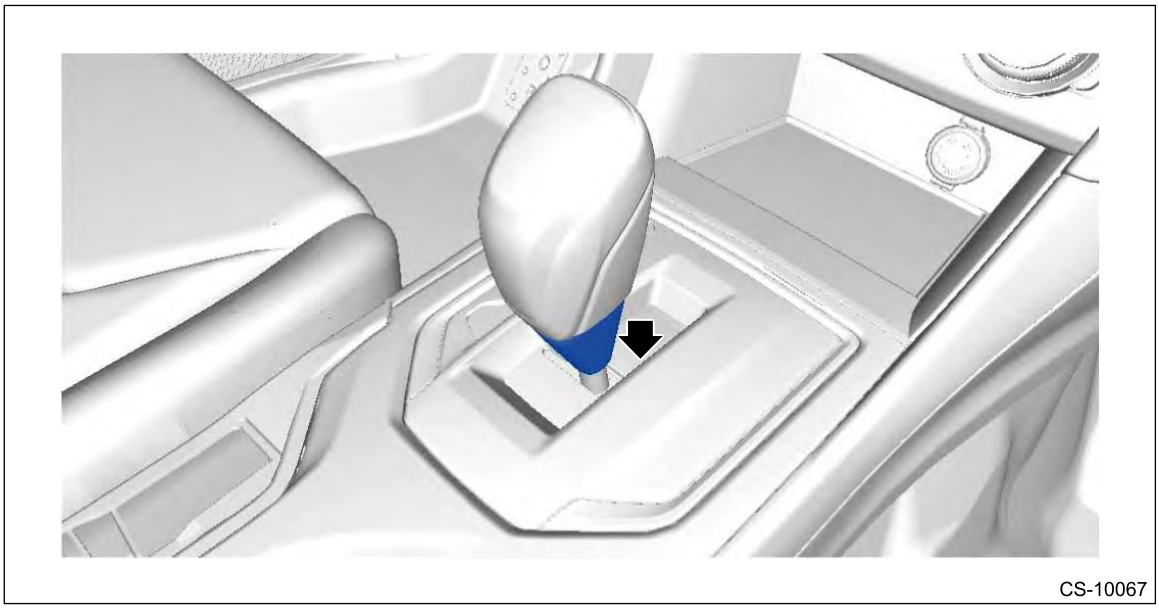
Yes	Check the lock mechanism of the steering lock body.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

REMOVAL

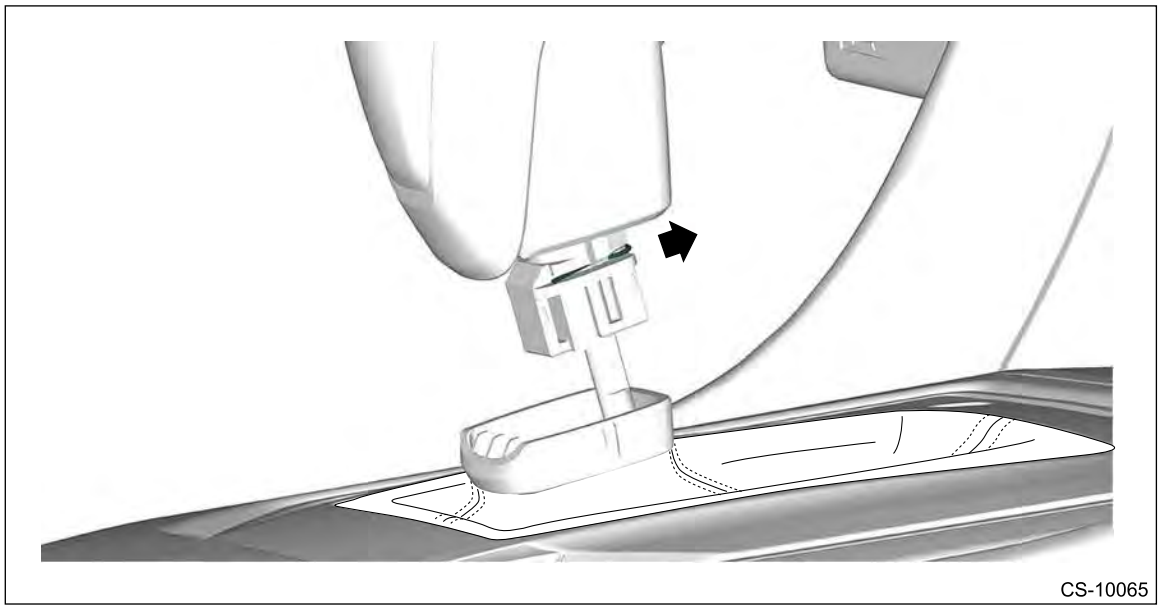
1. Shift the select lever to "N" range.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Lower the boot assembly vertically toward the lever. (Model with boot shifter)



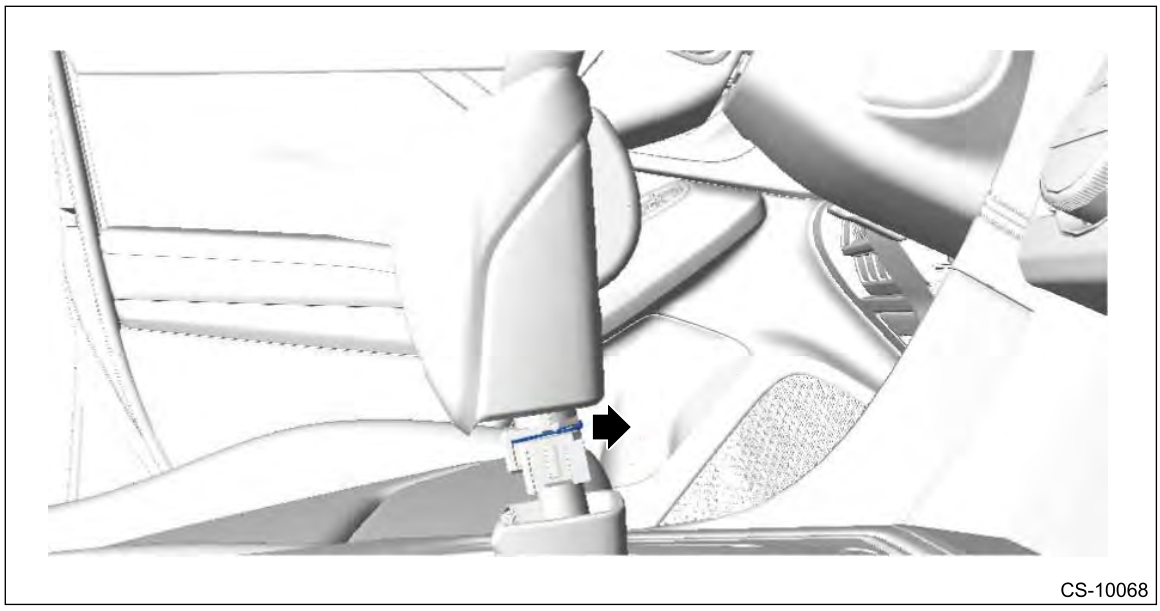
4. Lower the cover grip AT vertically toward the lever. (Model with gate shifter)



5. Remove the clamp grip pin.
   - Model with boot shifter

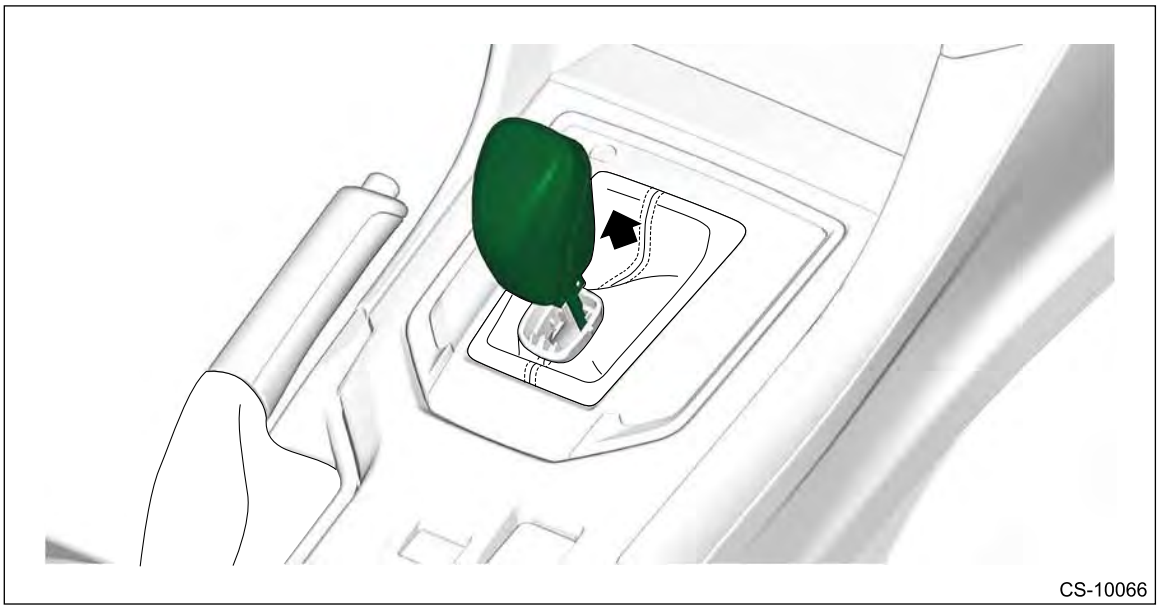


- Model with gate shifter

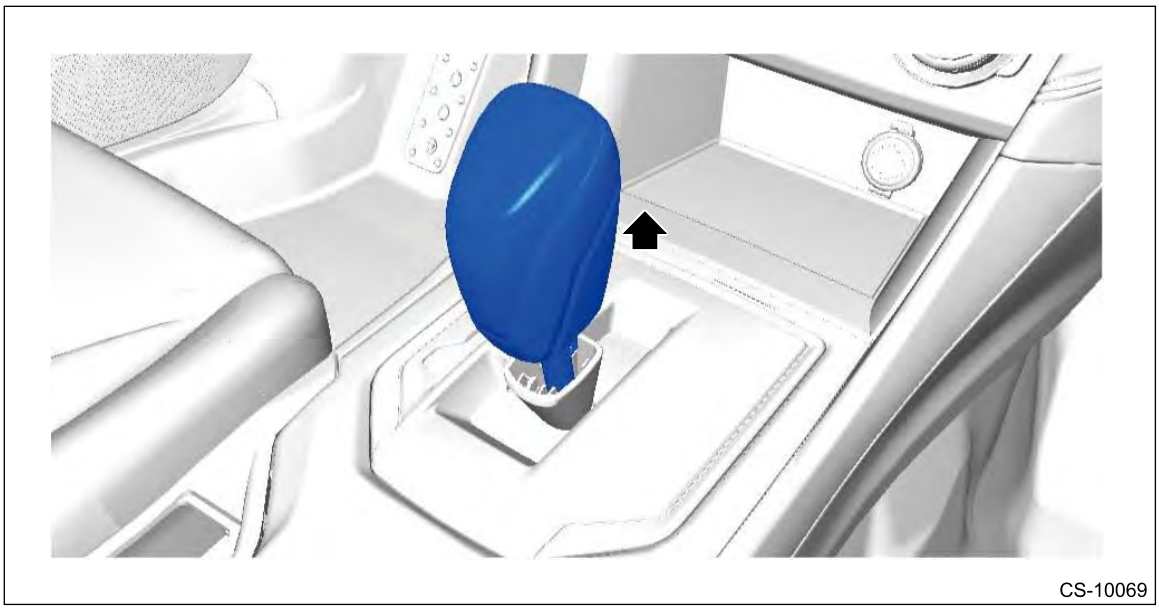


6. Remove the grip assembly.

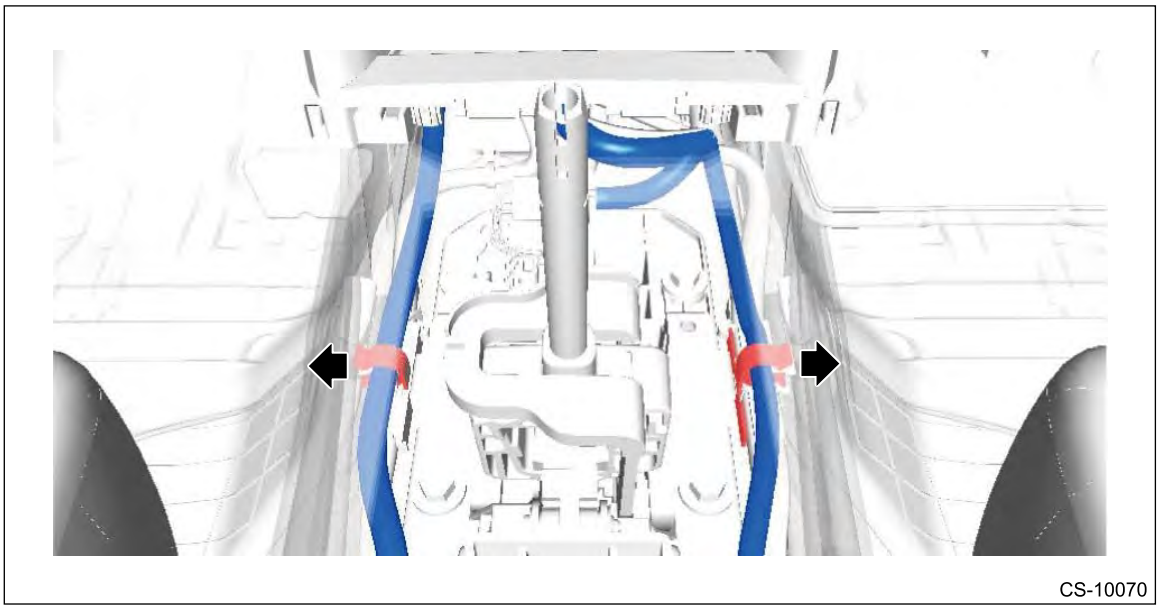
- Model with boot shifter



- Model with gate shifter

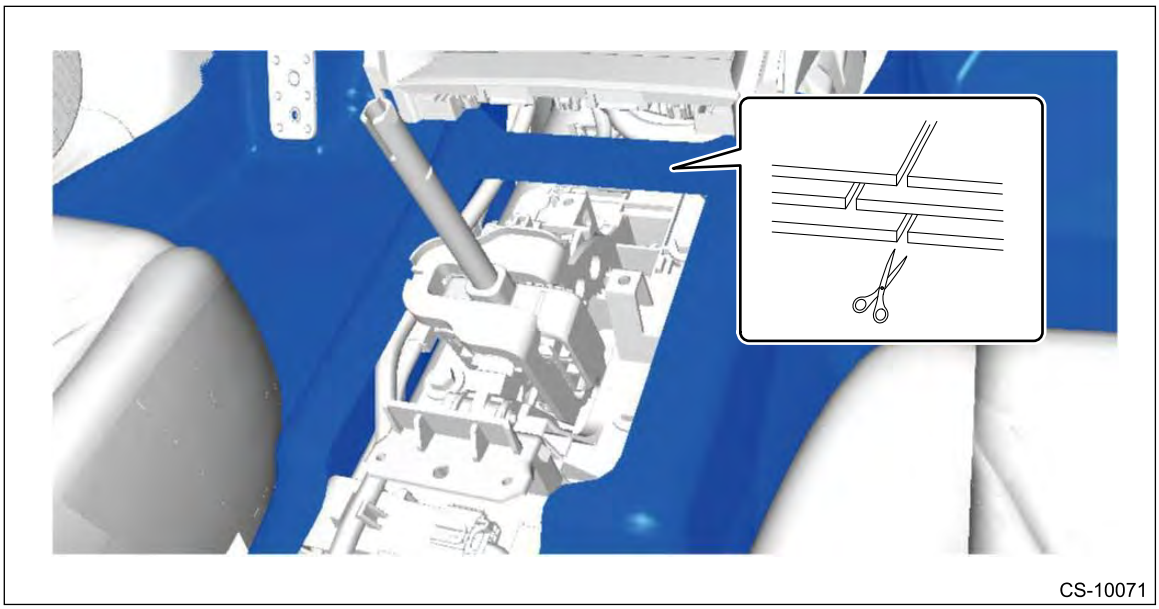


7. Remove the front console panel. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
8. Remove the panel center LWR LH and RH. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
9. Remove the harness clip from the select lever assembly.



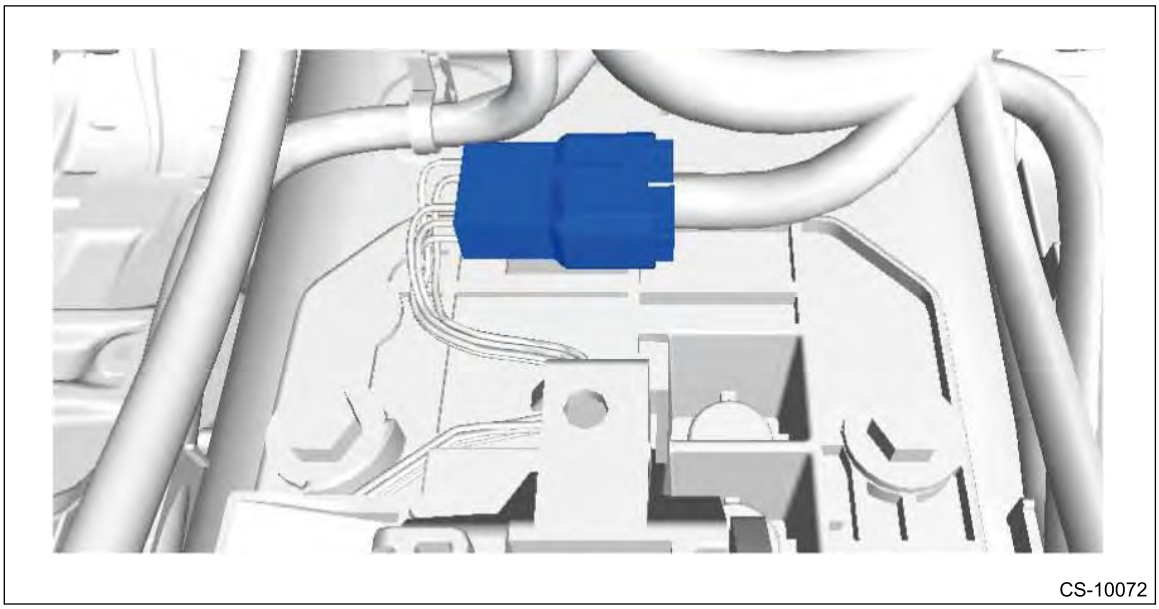
CS-10070

10. Separate the floor carpet to three layers, and cut them while staggering their cut position as shown in the figure.

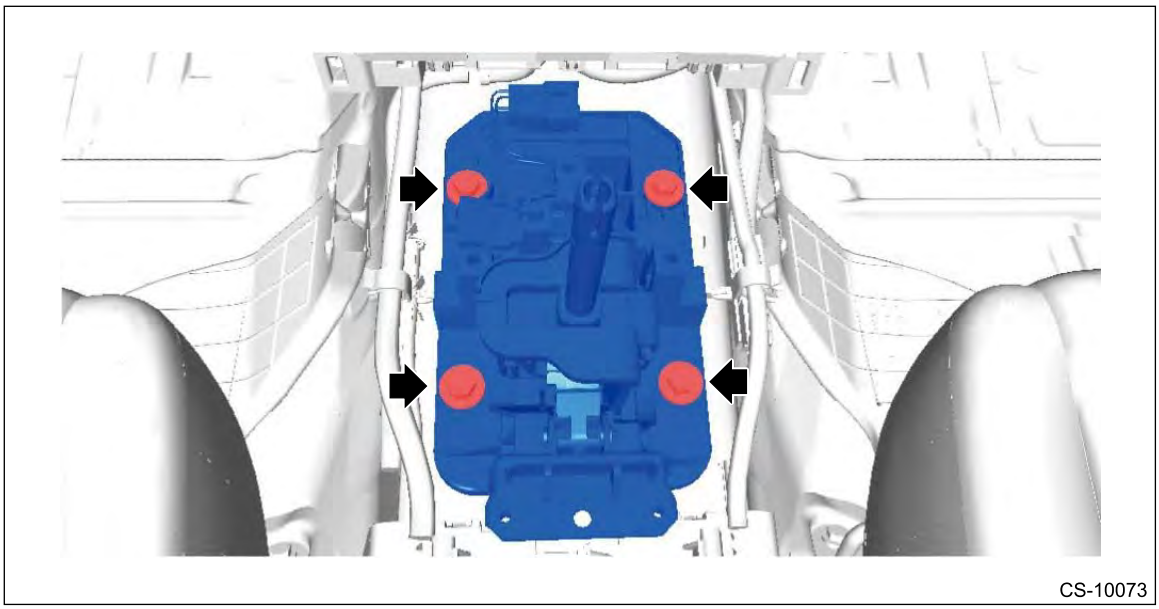


CS-10071

11. Disconnect the harness connector.

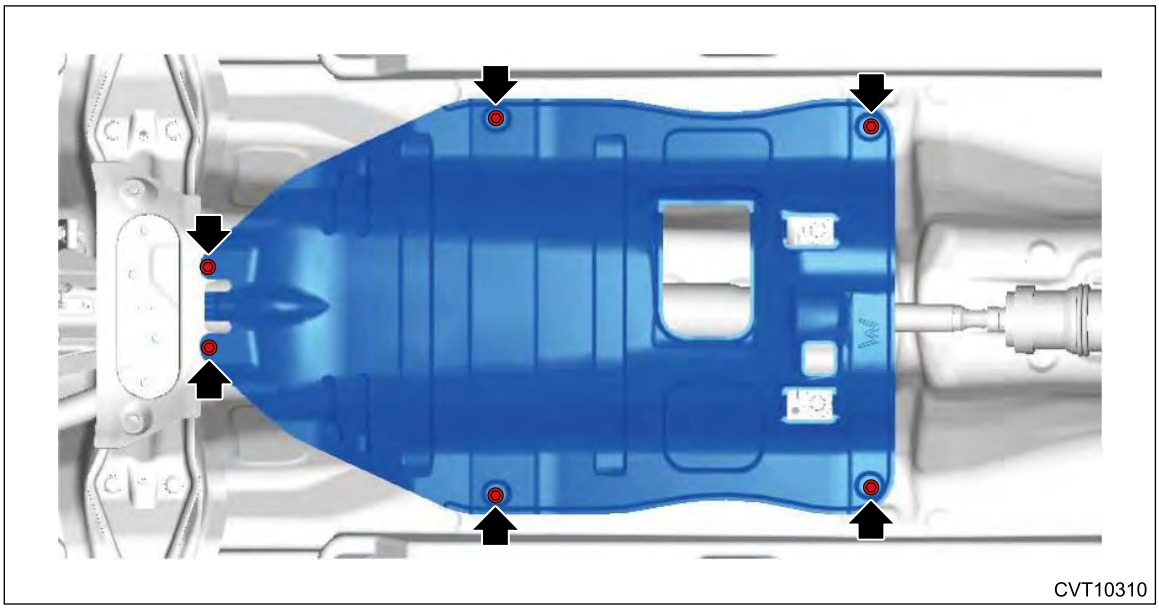

CS-10072

12. Remove four bolts.


CS-10073

13. Lift up the vehicle.

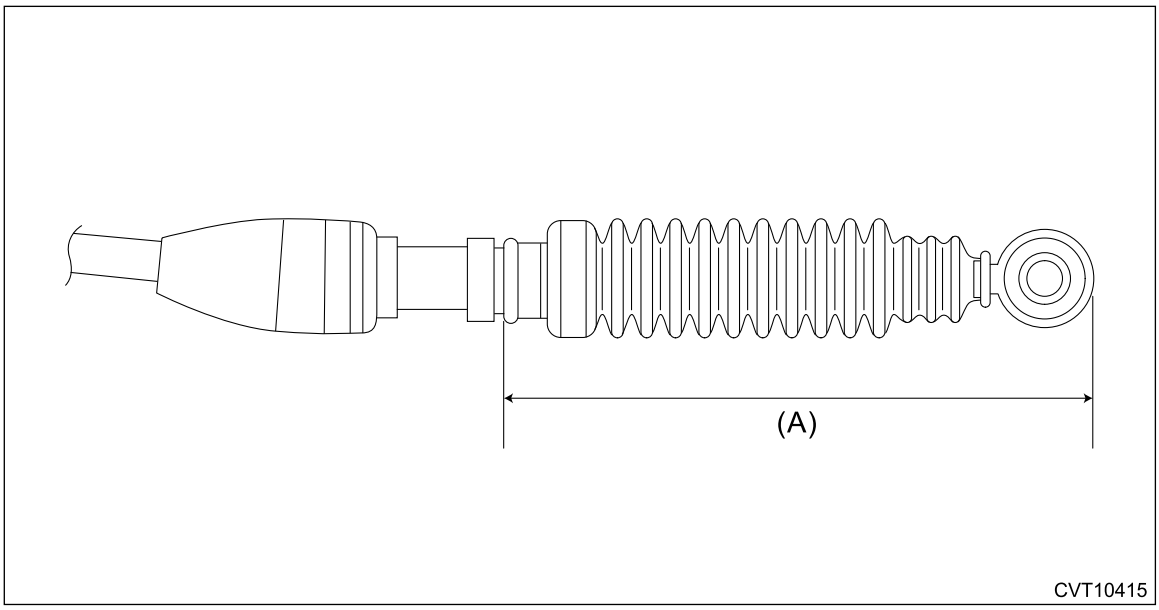
14. Remove the center exhaust cover.

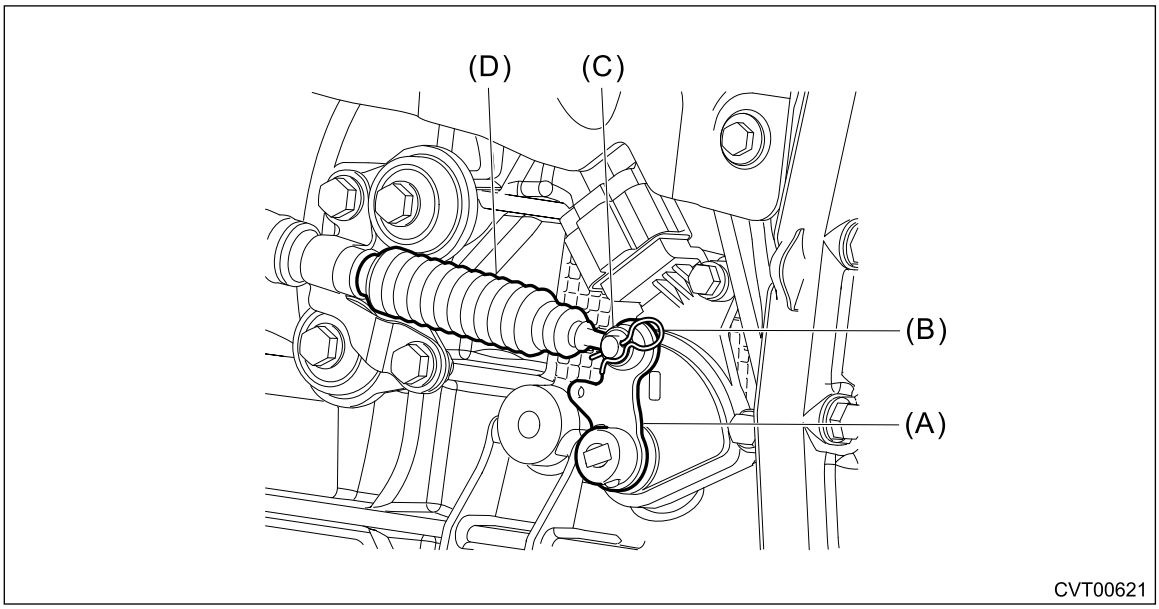


15. Remove the snap pin and washer from the shifter arm.

Caution:

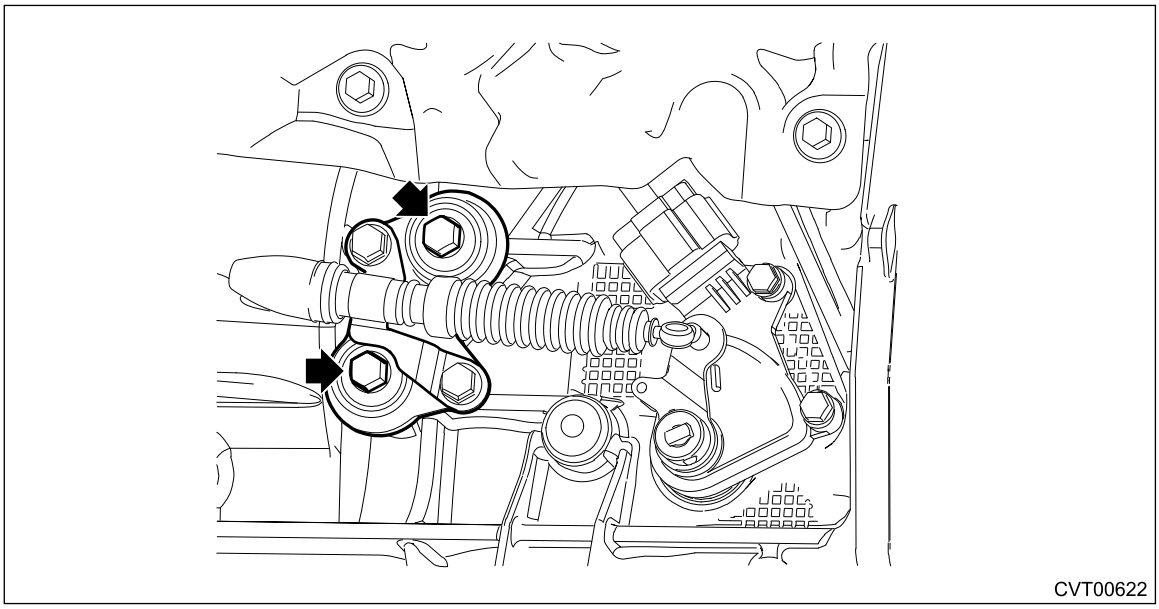
Do not apply excessive load while holding the part (A).





(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

16. Remove the plate assembly from the transmission case.



17. Lower the vehicle, and remove the select lever assembly from the room side.

Note:

Pass the select cable from the underside of the vehicle to the room side.

CONTROL SYSTEMS > Select Lever

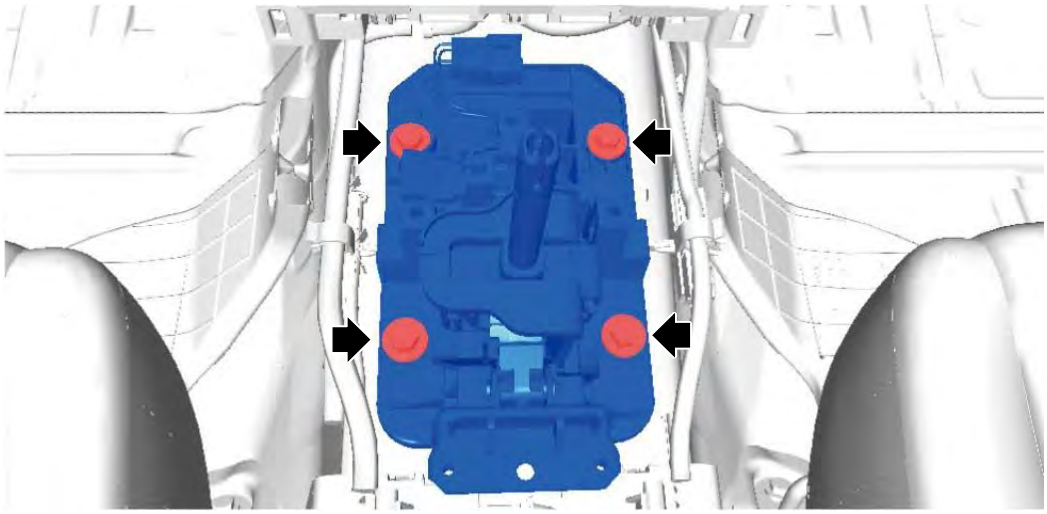
INSTALLATION

1. Set the select lever assembly to the vehicle body.

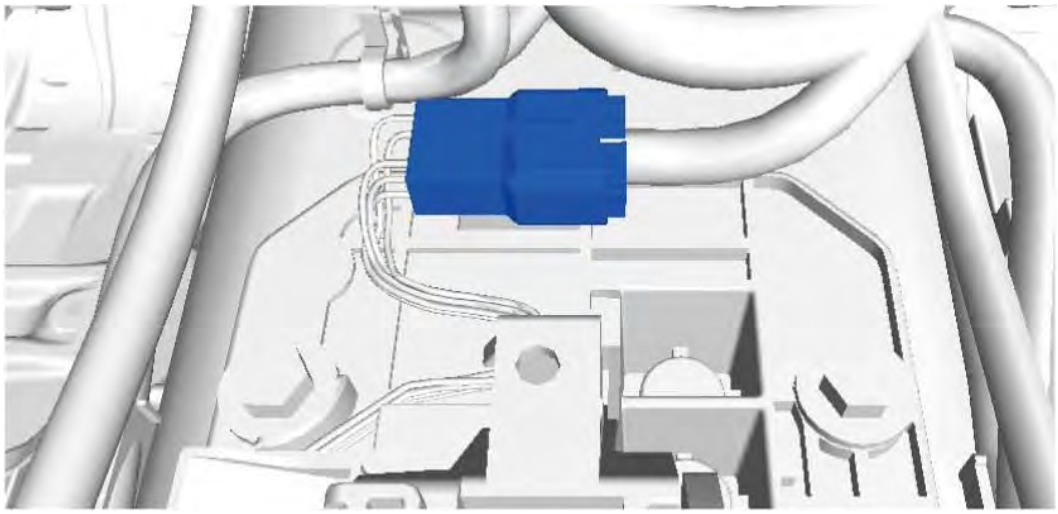
2. Tighten the four mounting bolts to attach the select lever assembly to the vehicle body.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)


CS-10073

3. Connect the harness connector.


CS-10072

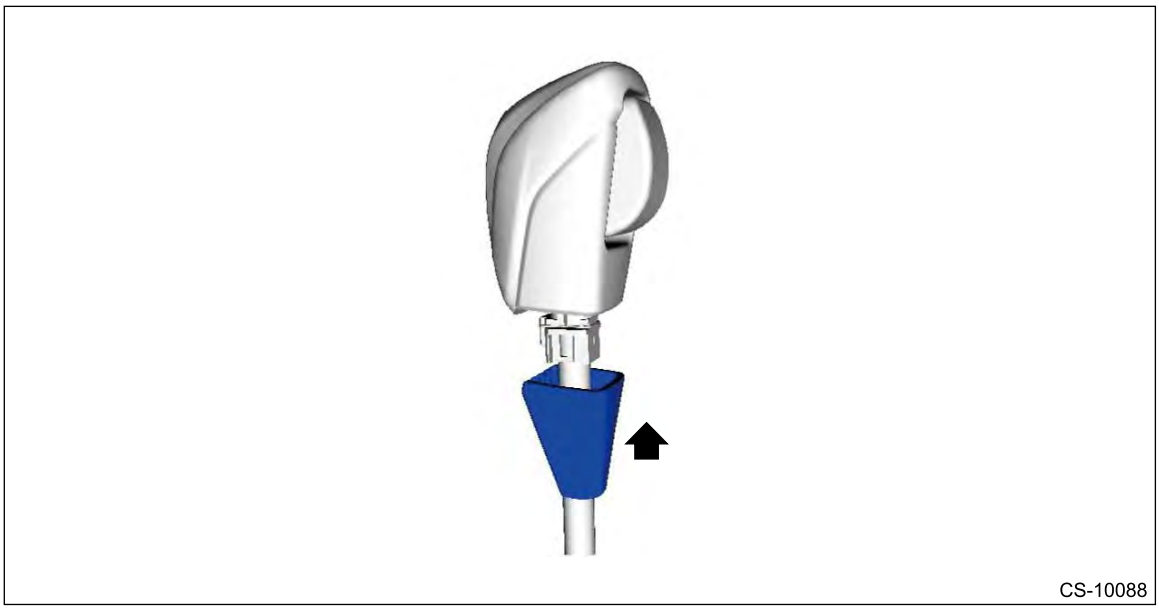
4. Adhere the cut carpet with double sided tape etc.
5. Install the harness clip to the select lever assembly.
6. Shift the select lever to “N” range.
7. Install the panel center LWR LH and RH. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
8. Install the front console panel. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
9. Accessing from the button side of the grip, attach the clamp grip pin.



10. Install the cover grip AT securely. (Model with gate shifter)

Note:

After installation, check that the cover grip AT cannot be detached.

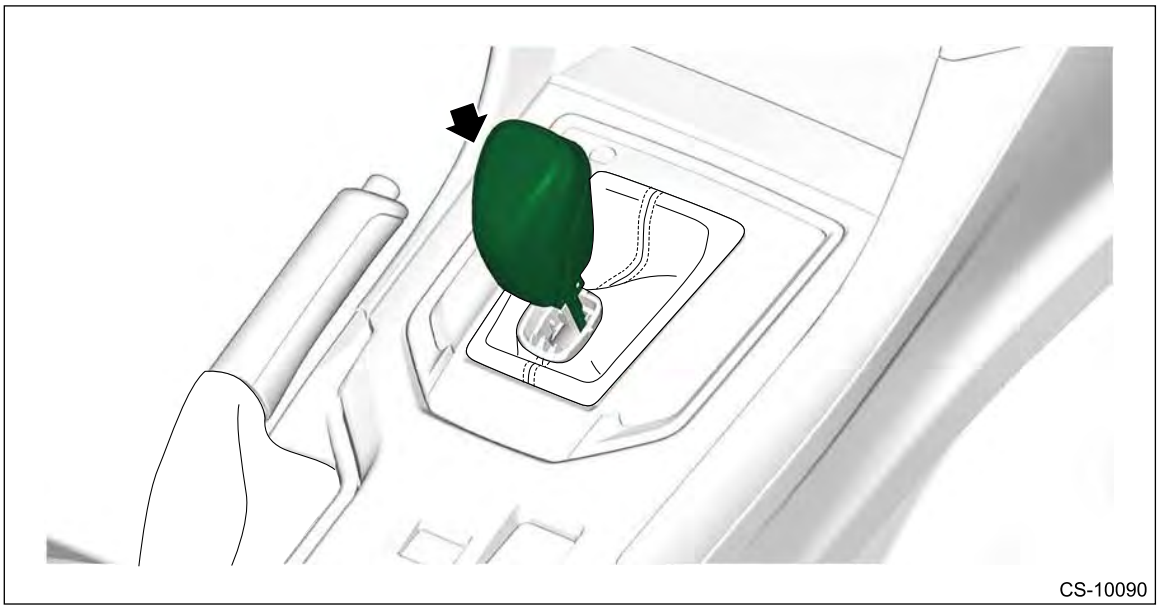


11. Insert the grip assembly to the select lever and press it down until a click is heard.

Note:

For the model with boot shifter, insert the grip assembly while holding with your fingers so that the clamp grip pin does not come out.

- Model with boot shifter



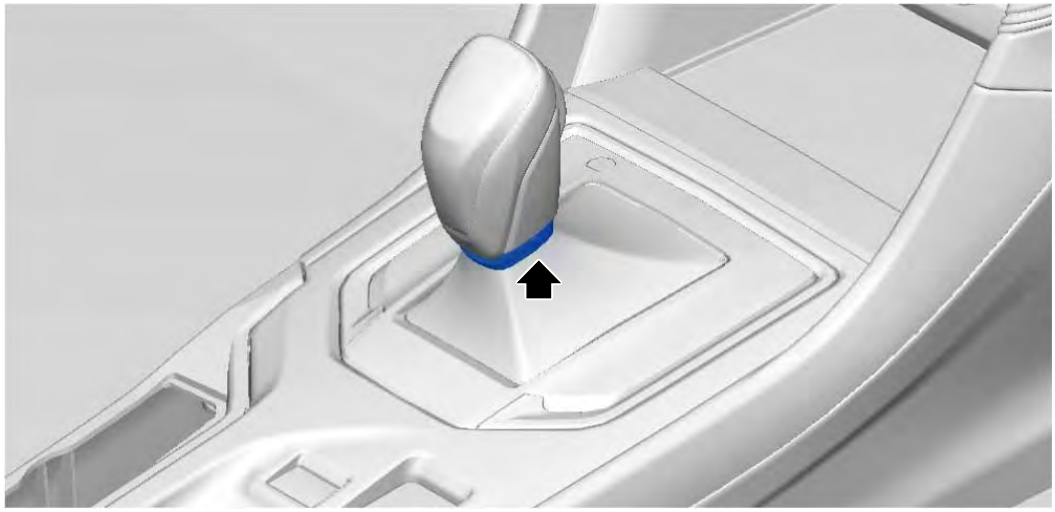
- Model with gate shifter



12. Securely install the boot assembly. (Model with boot shifter)

Note:

After installation, check that the boot assembly does not come off.



13. After installation of grip, check the following points.

- The grip will not come off.
- The button on the grip operates normally.

14. Install the console box. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.

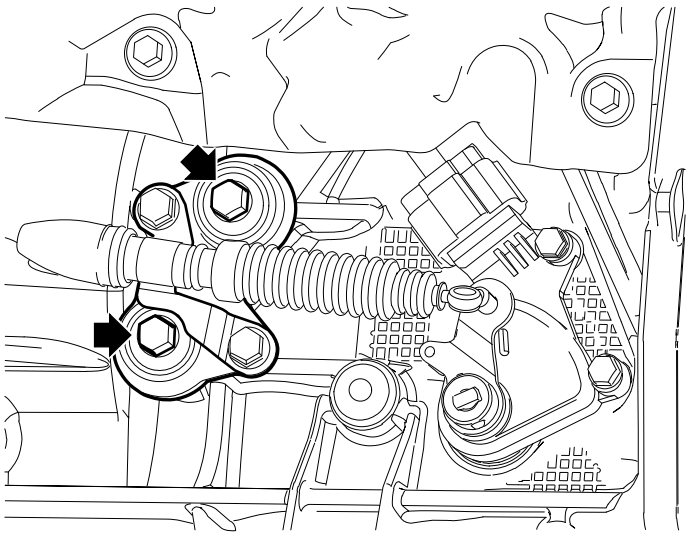
15. Shift the select lever to “N” range.

16. Lift up the vehicle.

17. Install the plate assembly to transmission.

Tightening torque:

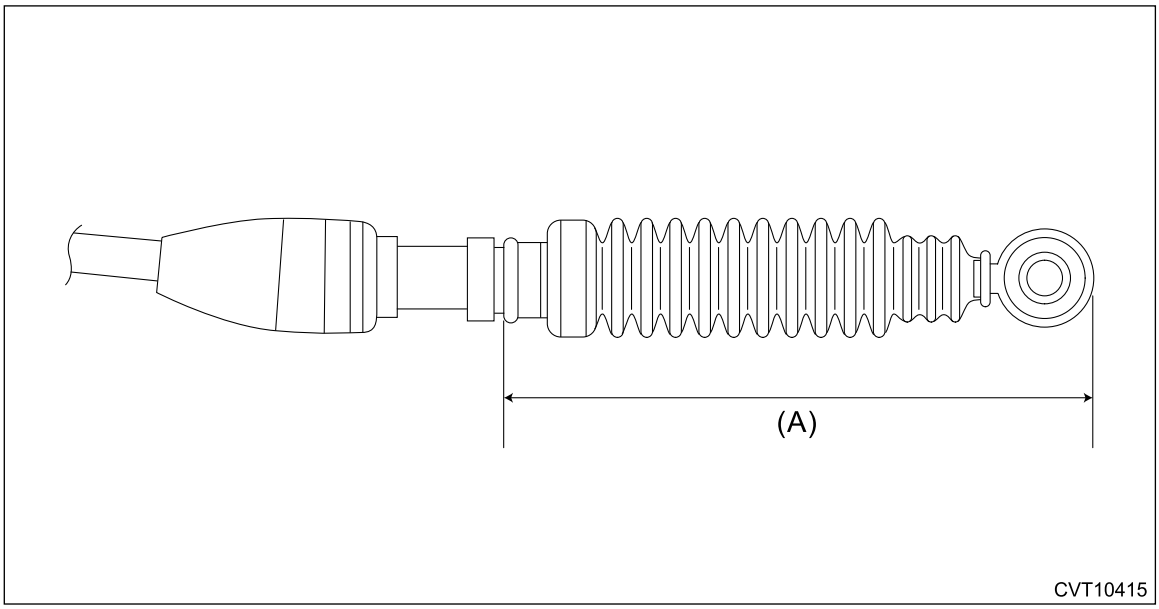
T: 25 N·m (2.5 kgf-m, 18.4 ft-lb)

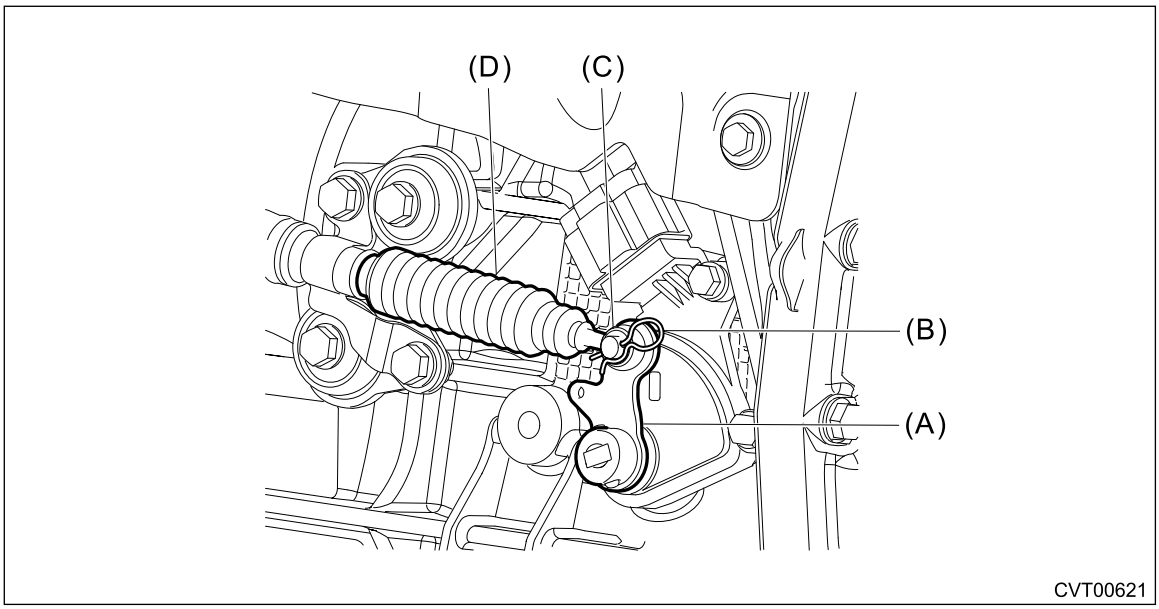


18. Install the washer and snap pin to the shifter arm.

Caution:

Do not apply excessive load while holding the part (A).





(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

19. Adjust the select cable position. Ref. to CONTROL SYSTEMS>Select Cable>ADJUSTMENT.
20. After adjustment, confirm that the select lever operates properly at all range positions using the shift lock release button.
21. Install the center exhaust cover.
Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)
22. Lower the vehicle.
23. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
24. Inspect the following items. If a malfunction is found in the inspection, adjust the select cable or inhibitor switch.
(1) The shift lock operates normally. Ref. to CONTROL SYSTEMS>AT Shift Lock Control System>INSPECTION > SHIFT LOCK OPERATION.

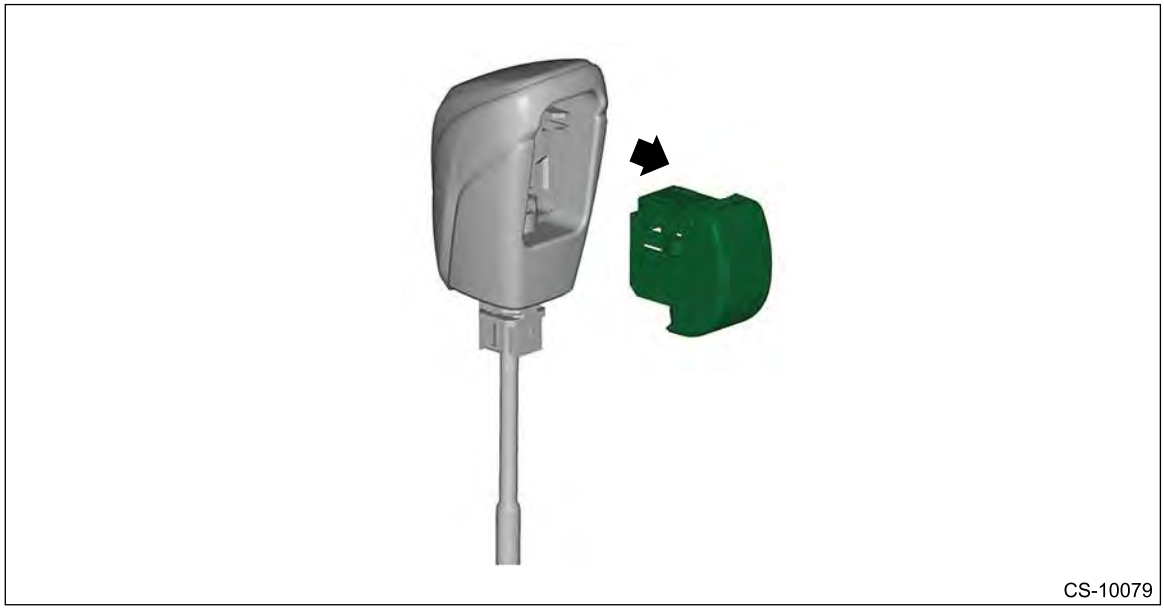
(2) Engine starts when the select lever is in “P” or “N” range, but not in other ranges.
(3) Back-up light illuminates when the select lever is in the “R” range, but not in other ranges.
(4) Select lever and indicator positions are matched.

CONTROL SYSTEMS > Select Lever

DISASSEMBLY

1. GRIP ASSEMBLY

1. Remove the button assembly _ AT.

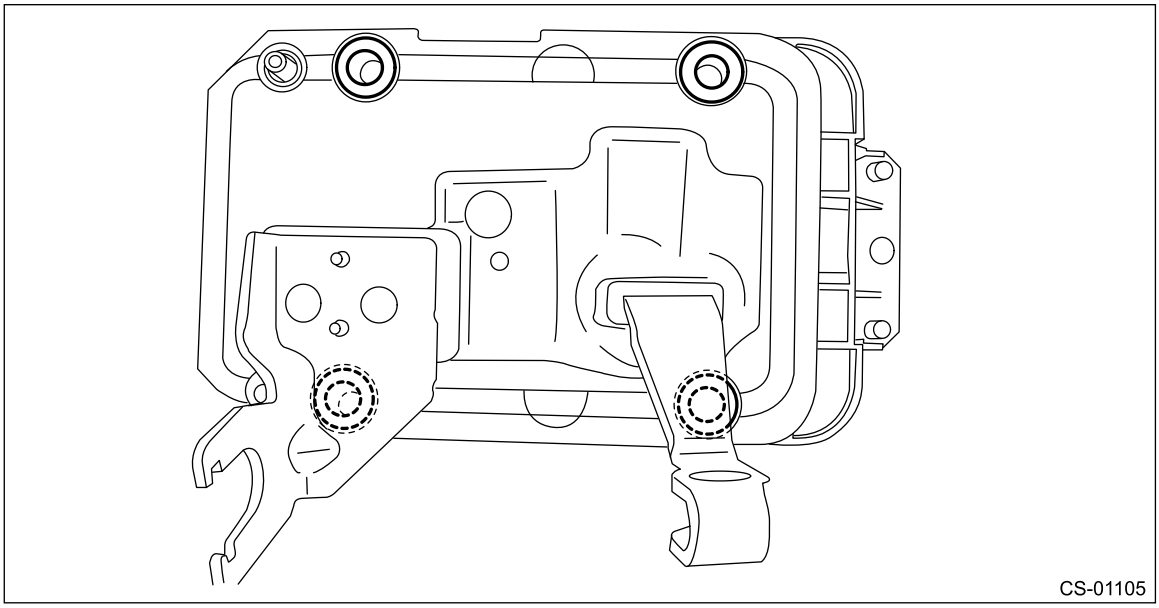


(A) Claw

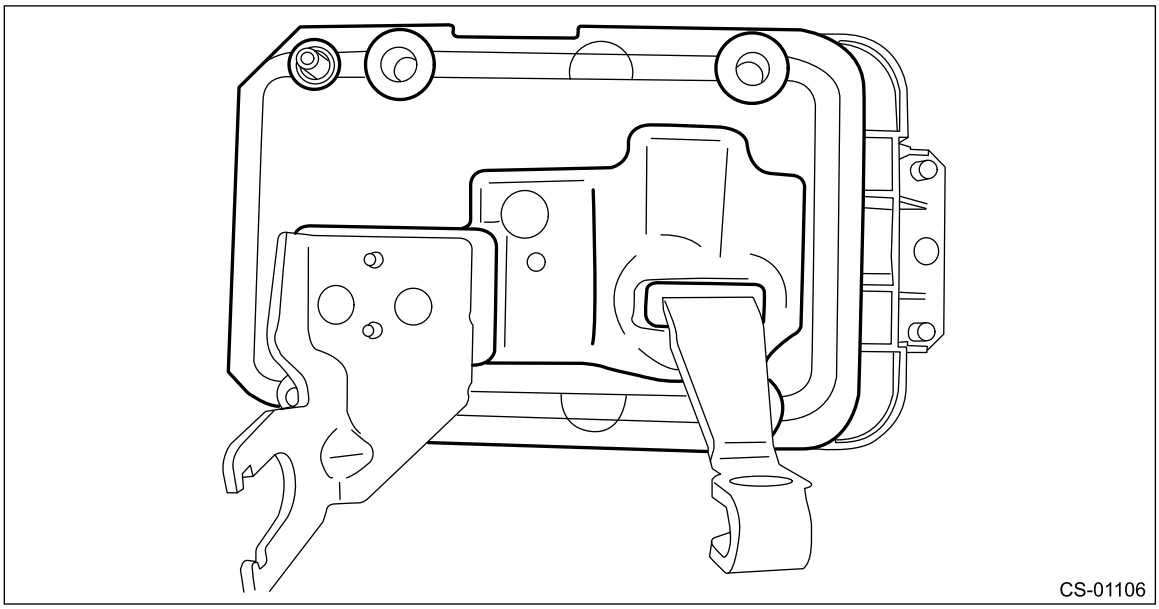
2. Remove the rod COMPL.

2. AT SELECT LEVER ASSEMBLY

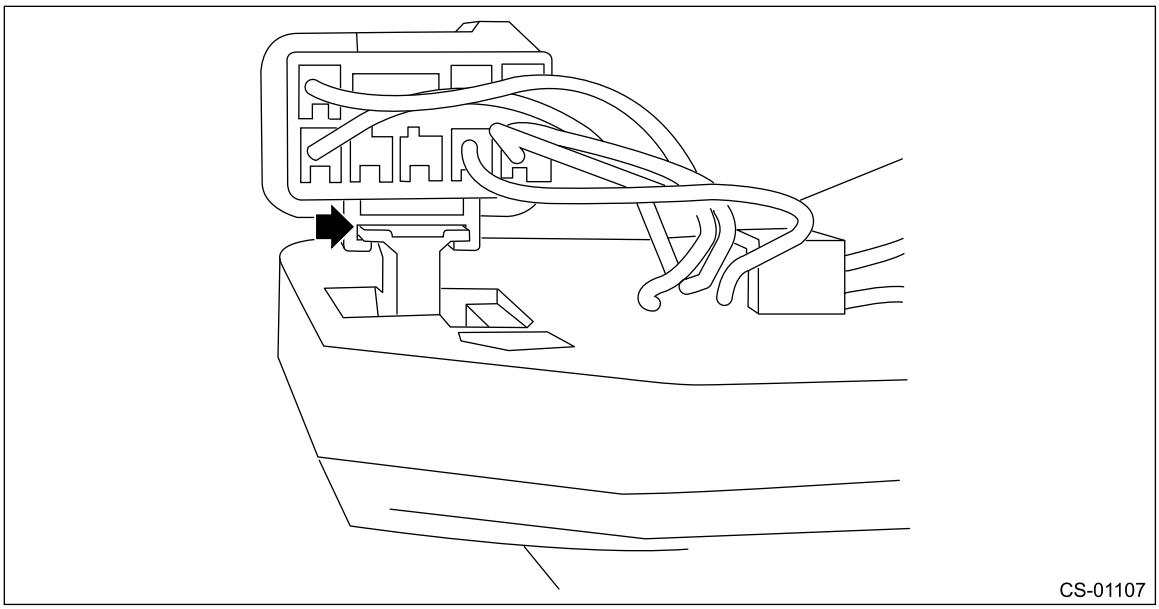
1. Remove the spacer plate.



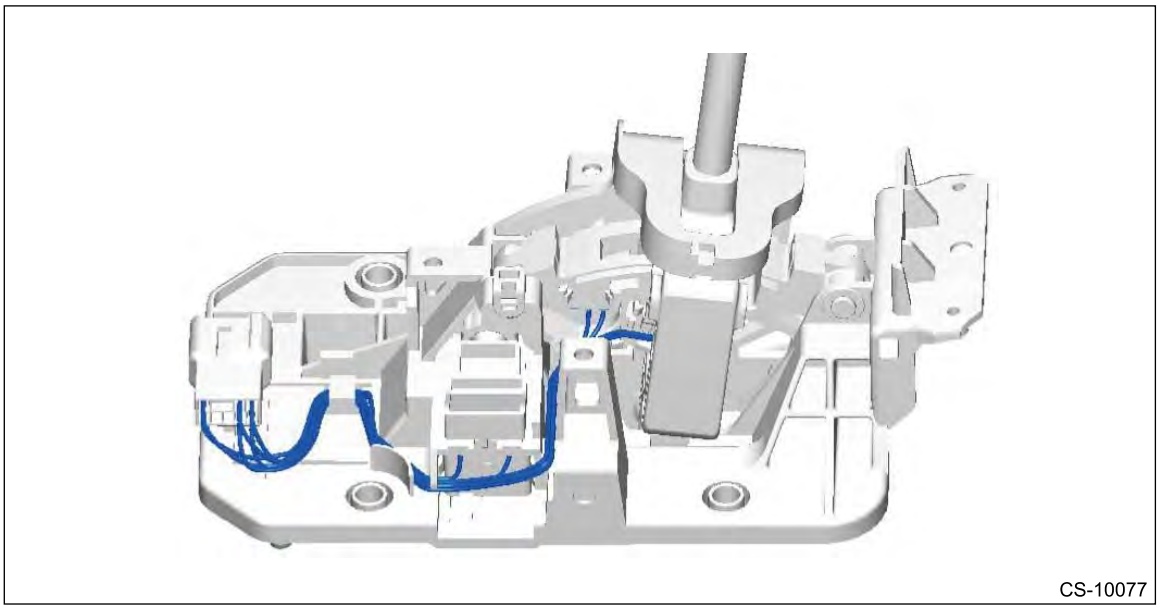
2. Remove the gasket.



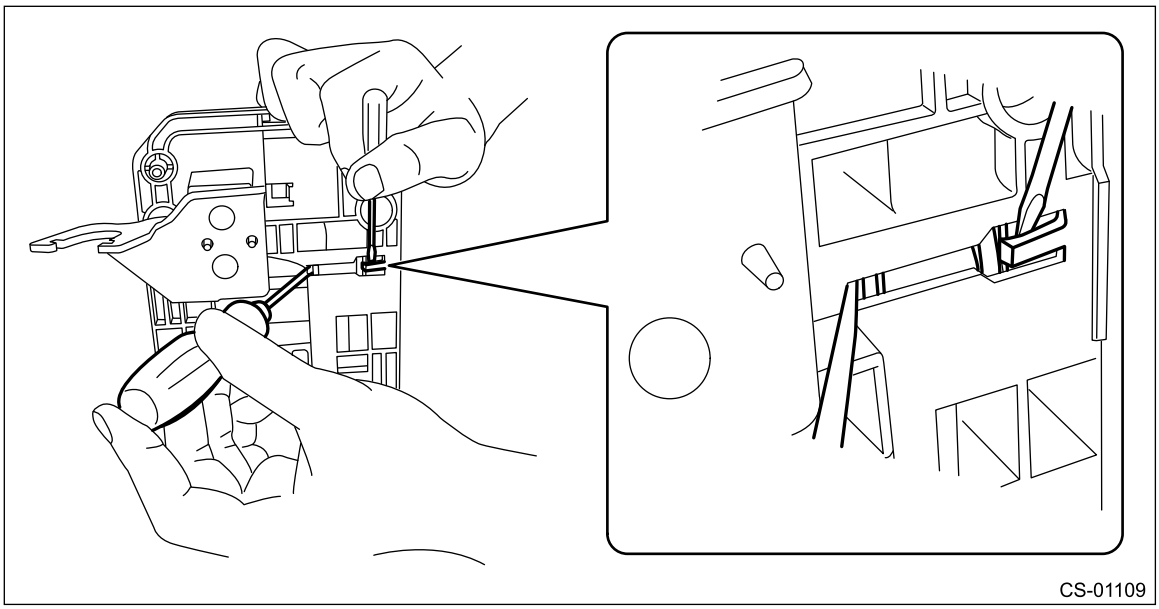
3. Insert a flat tip screwdriver with a thin tip under the connector and disconnect the harness connector from the plate COMPL.



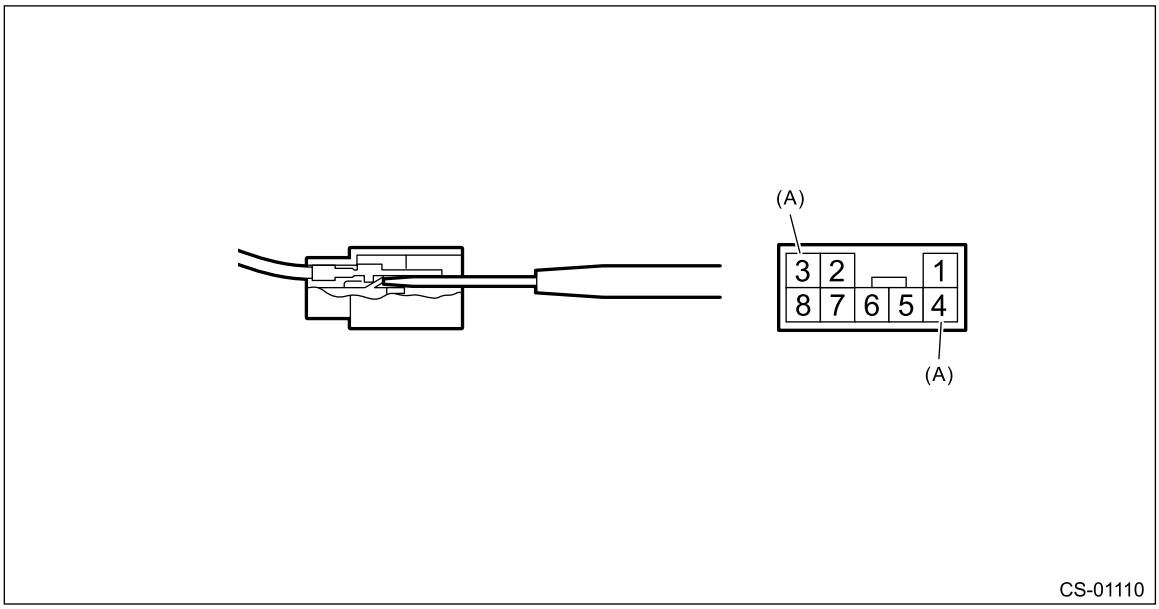
4. Remove the harness from the plate COMPL.



5. Raise the claw with a flat tip screwdriver with a thin tip and remove the solenoid unit.



6. Remove the terminal of the solenoid unit using a flat tip precision screwdriver with a tip width of 1.3 mm (0.05 in) or less, KTC connector terminal tool ECC-1T or equivalent.

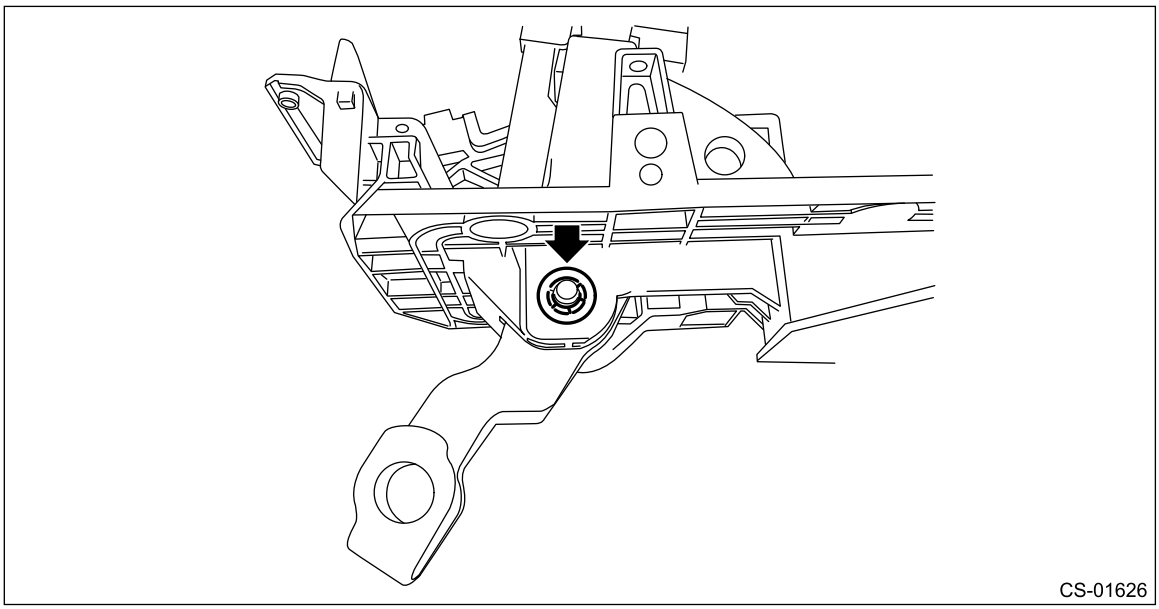


(A) Solenoid unit terminals

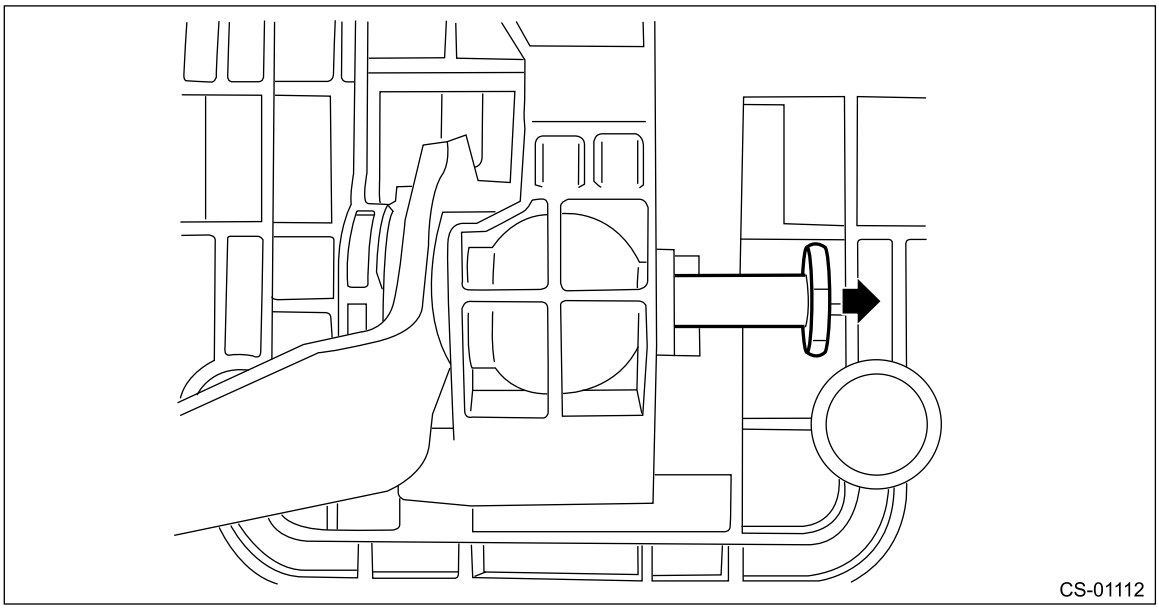
7. Remove the clamp push nut.

Note:

Replace the clamp push nut with a new part.



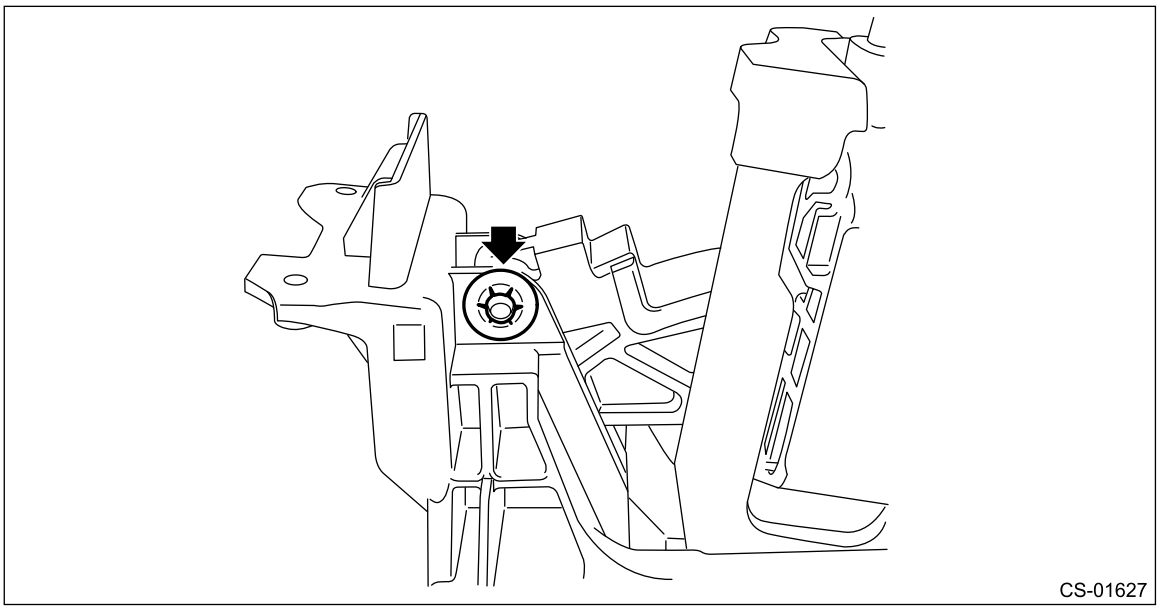
8. Pull out shaft control.



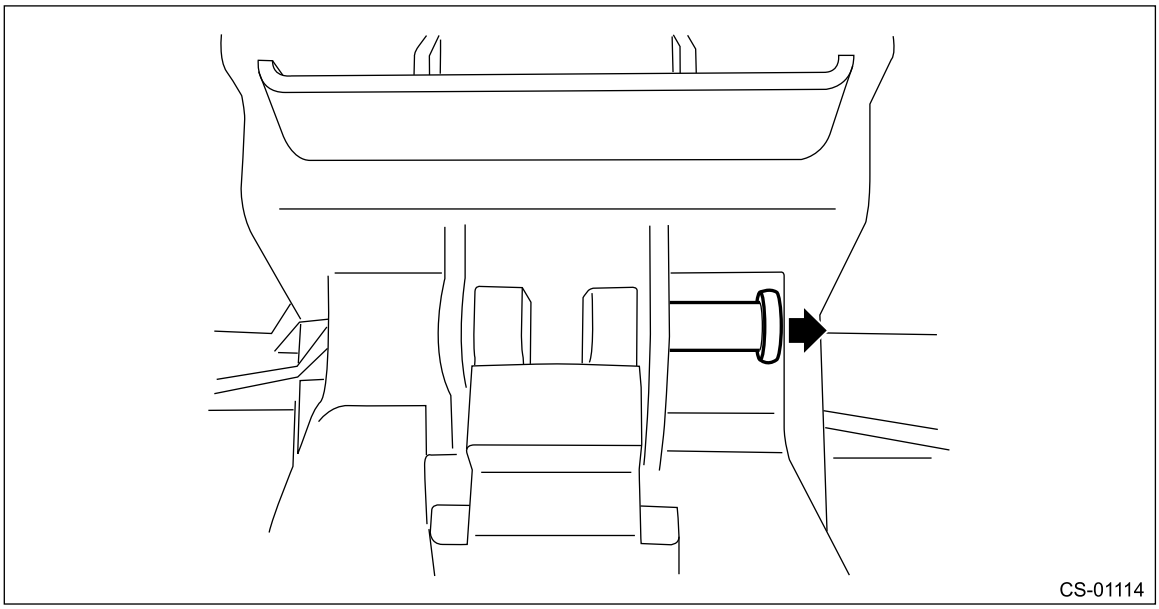
9. Remove the clamp push nut.

Note:

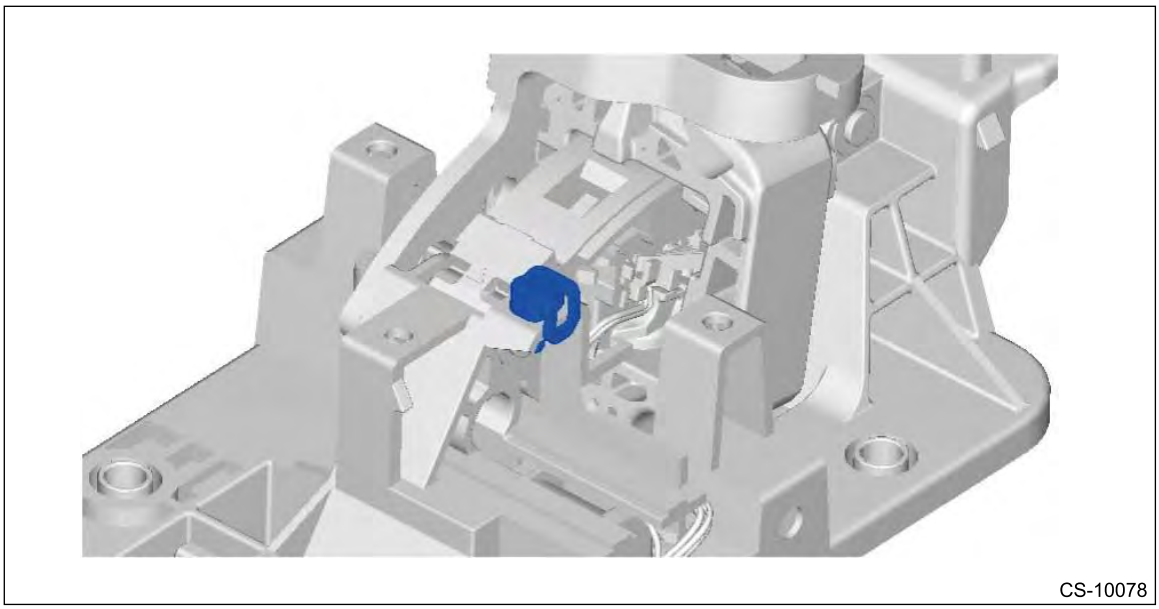
Replace the clamp push nut with a new part.



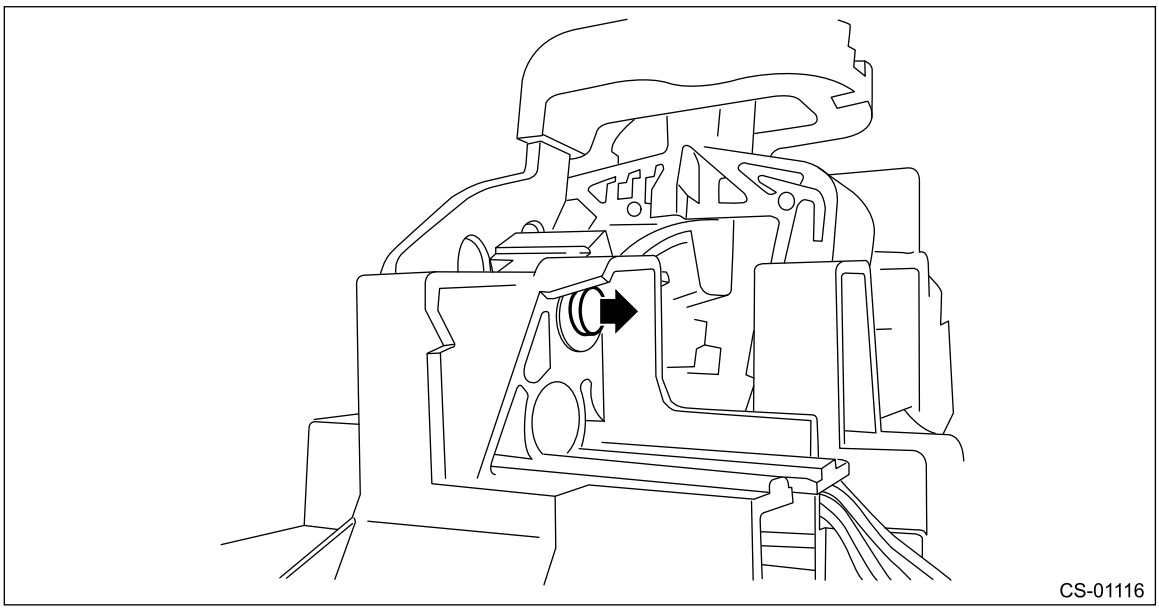
10. Pull out spacer pin guide.



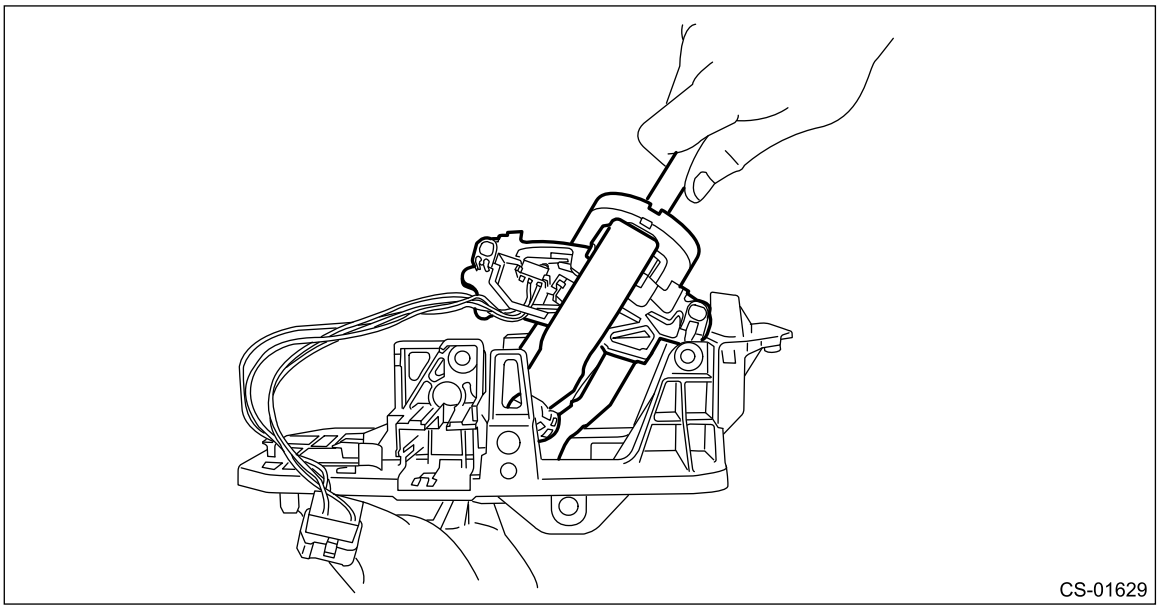
11. Remove the clamp pin.



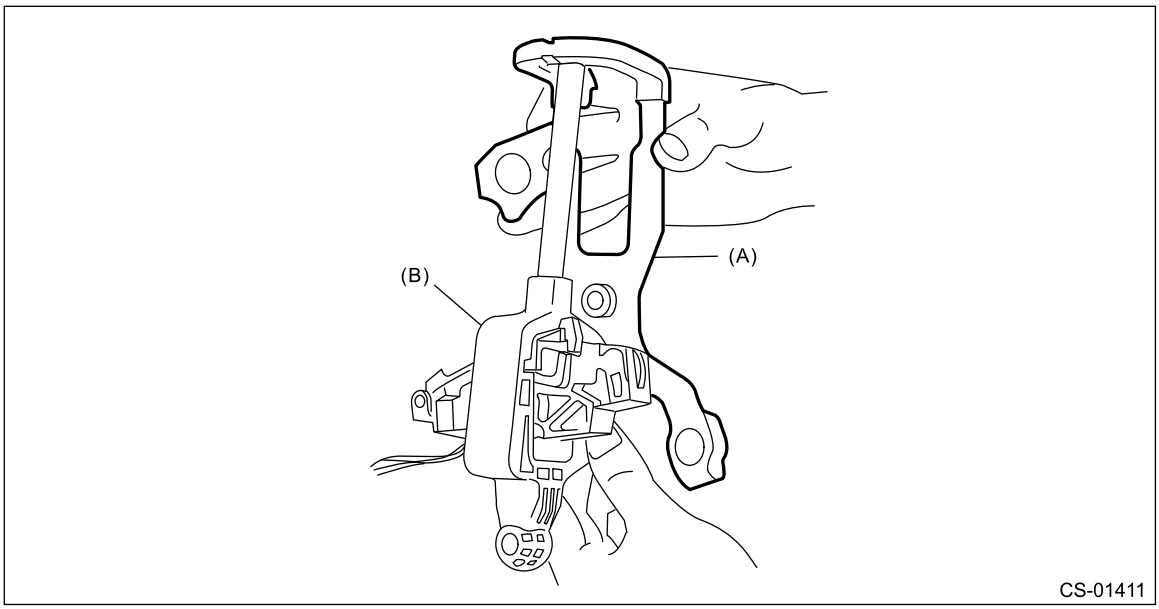
12. Remove the spacer pin guide.



13. Remove the select lever COMPL from the plate COMPL.



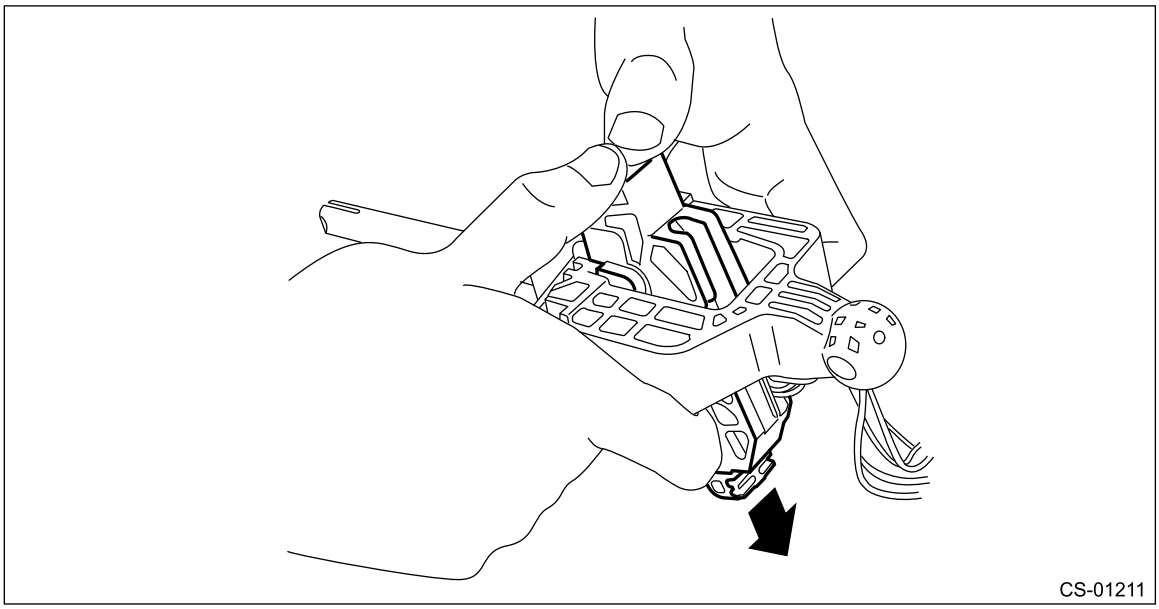
14. Remove the arm COMPL.



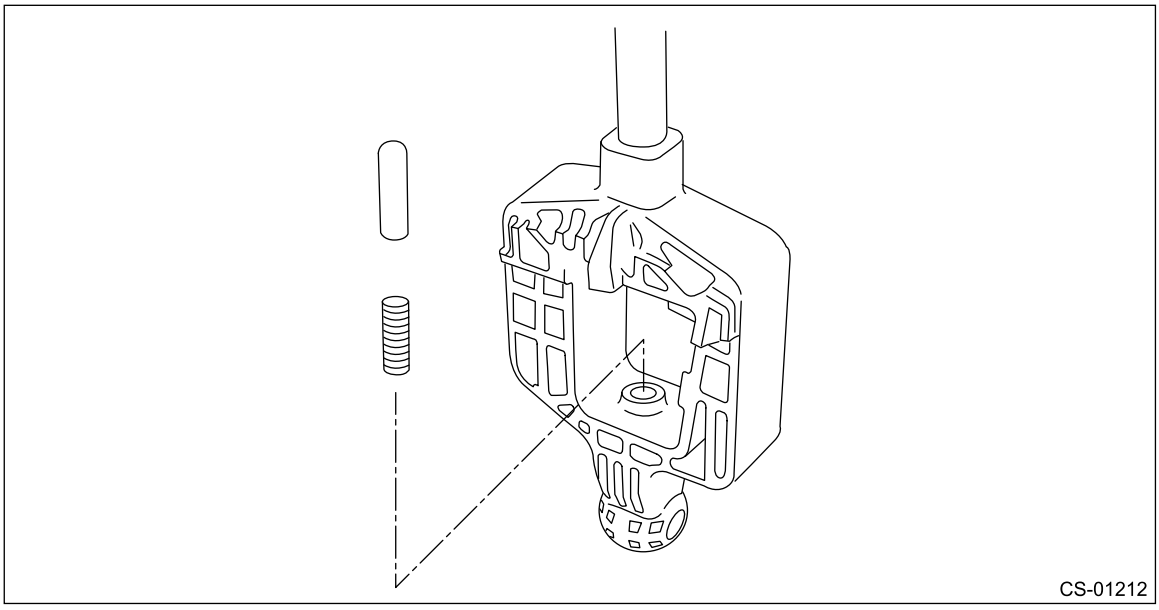
(A) Arm COMPL

(B) Selector lever COMPL

15. Remove the plate guide from the select lever COMPL.



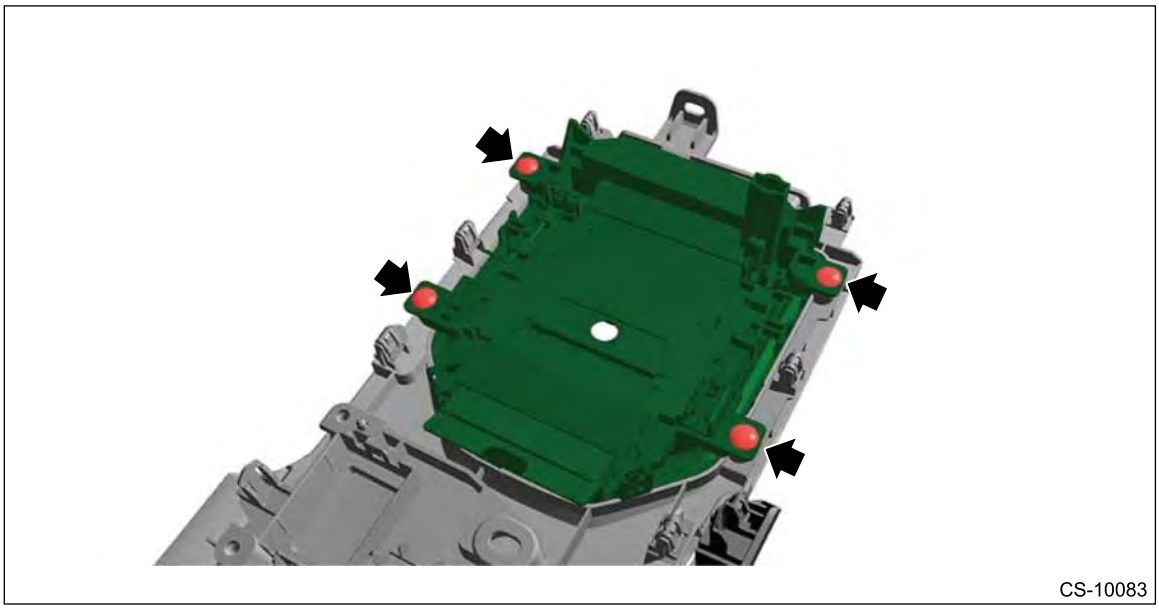
16. Remove the rod detent and detent spring from the select lever COMPL.



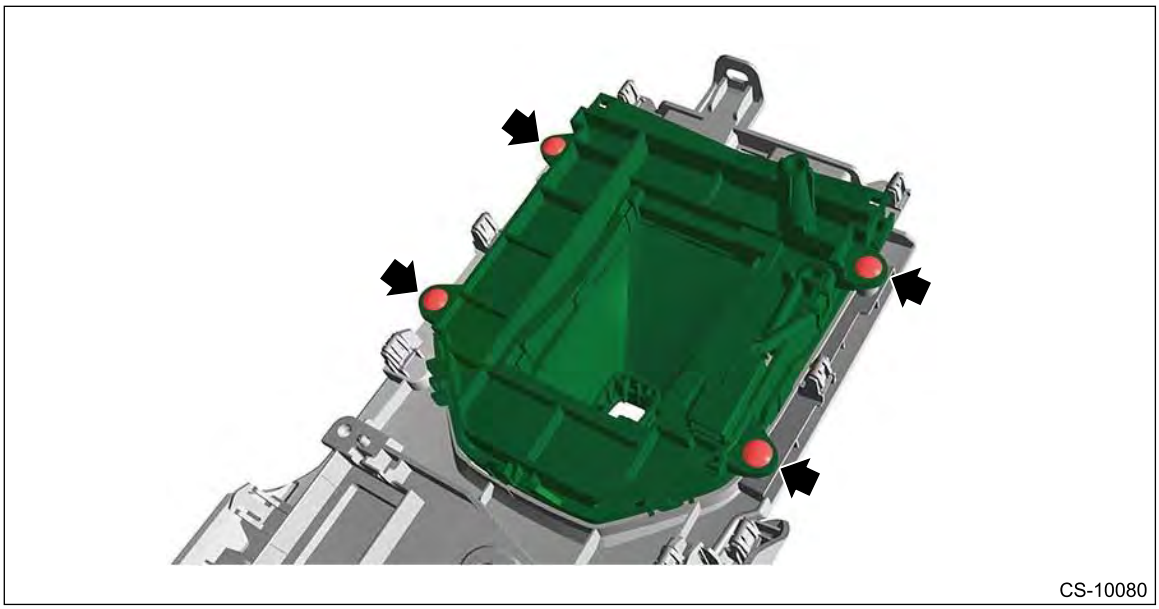
3. INDICATOR ASSEMBLY

1. Disconnect the harness connector from the console front cover assembly, and remove the indicator assembly.

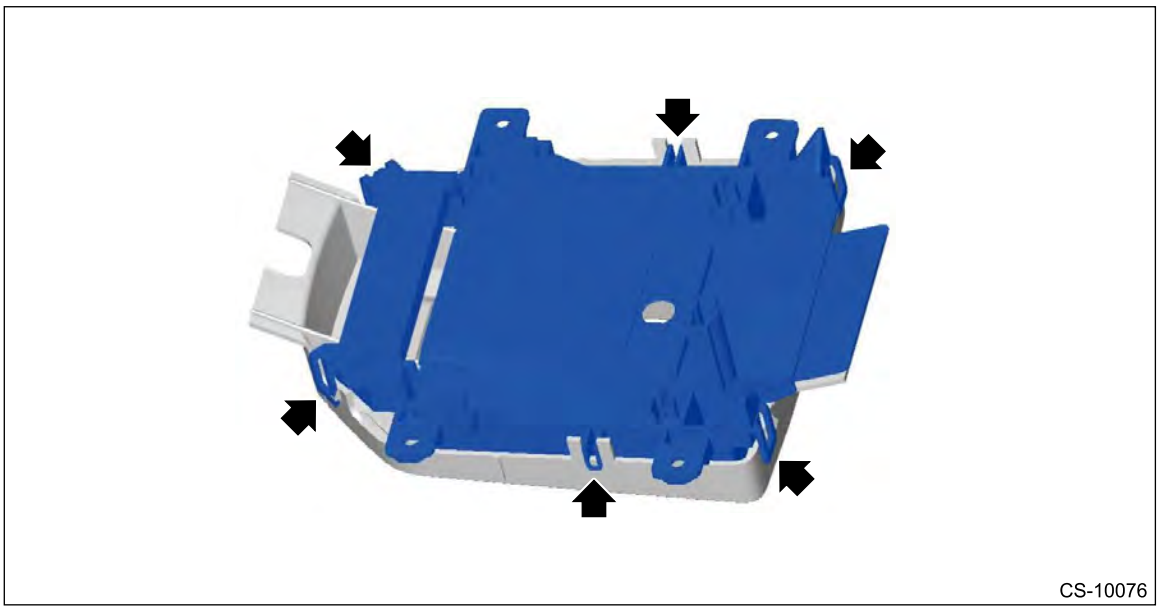
- Model with gate shifter



- Model with boot shifter



2. Remove the housing from the indicator assembly. (Model with gate shifter)



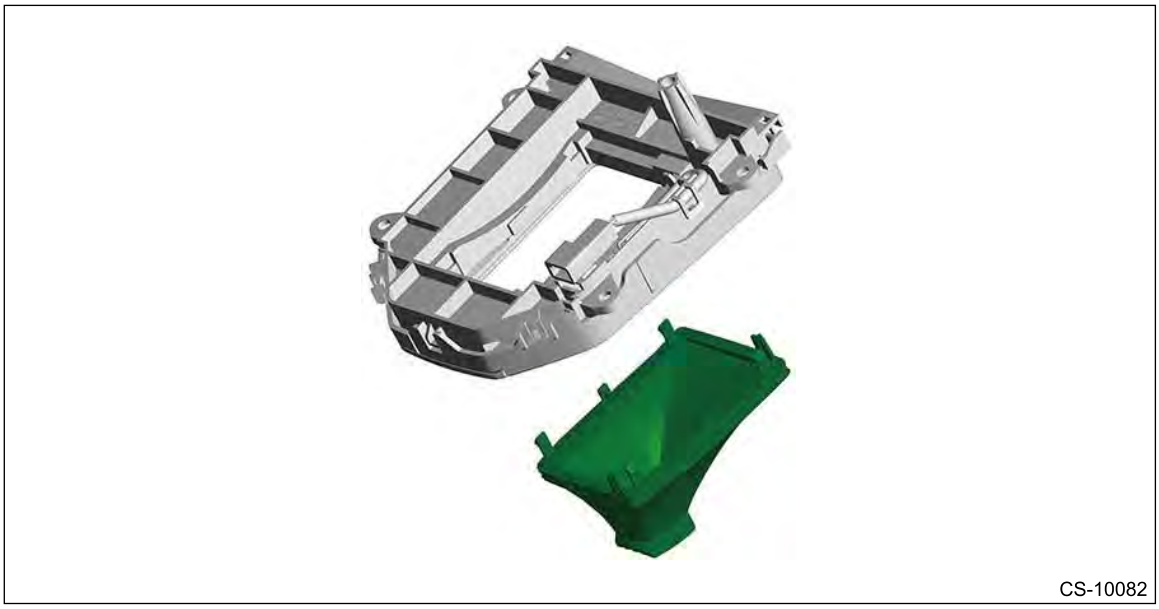
3. Remove the boot assembly from the indicator assembly. (Model with boot shifter)

Caution:

When removing the boot assembly, be careful not to damage the boot assembly claws and adjacent parts.

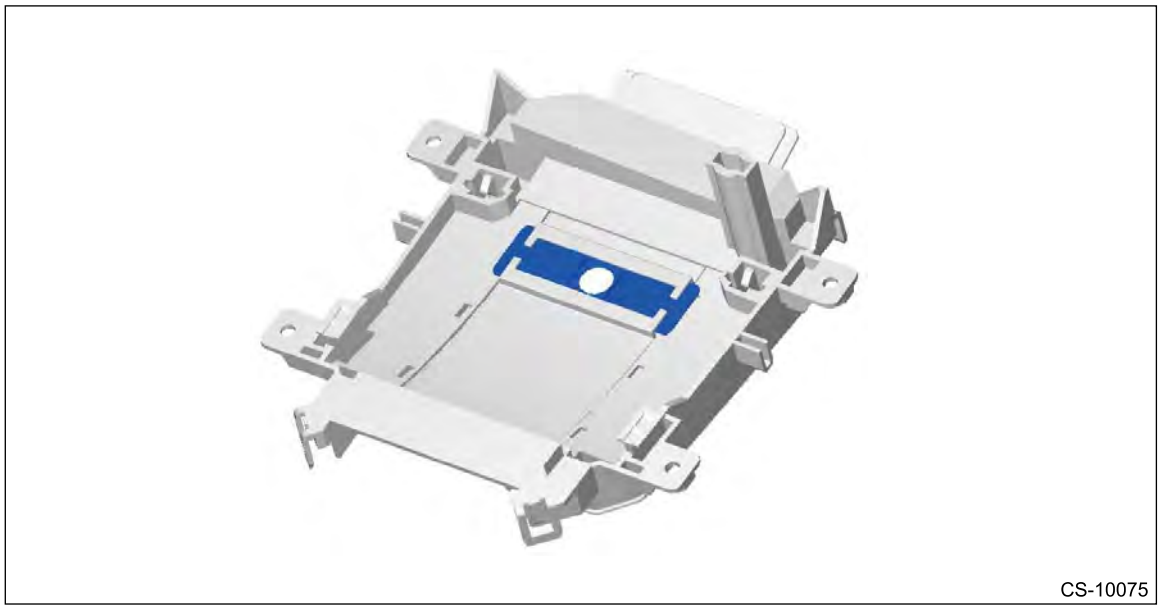


CS-10081

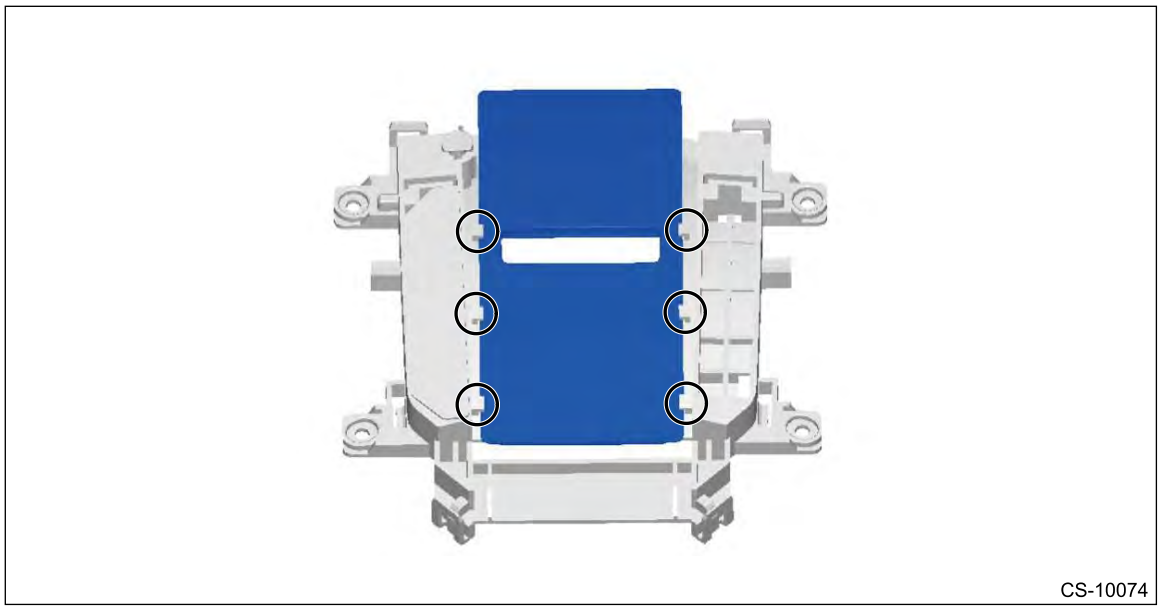


CS-10082

4. Remove the blind B. (Model with gate shifter)



5. Remove the blind A from the housing. (Model with gate shifter)



ASSEMBLY

1. CLIP ASSEMBLY

1. Install the rod COMPL.
2. Install the button assembly - AT.

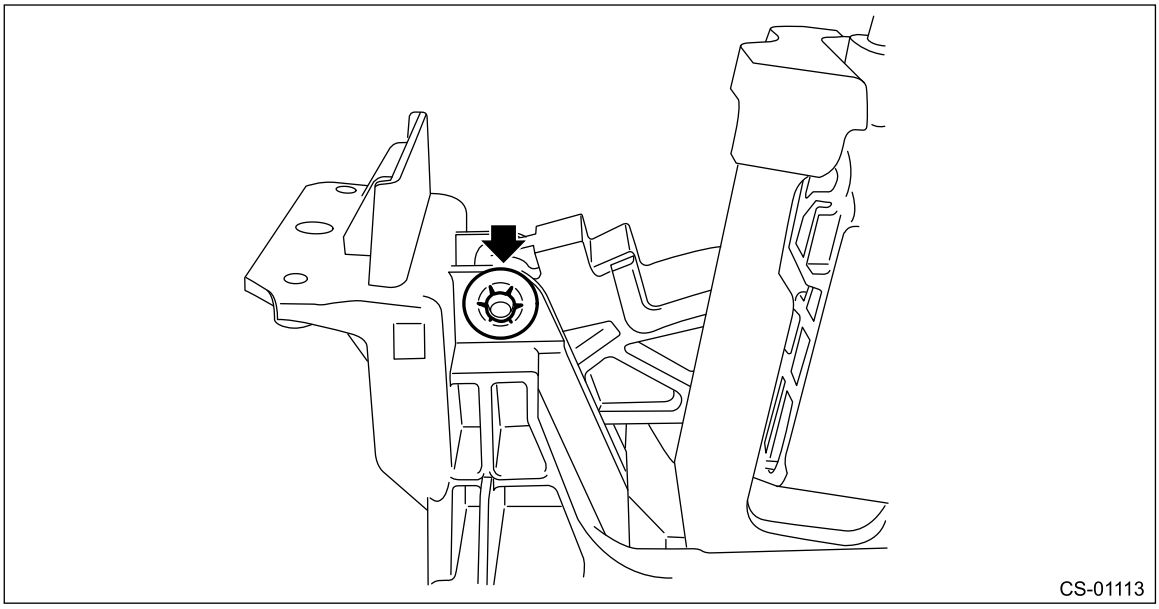
2. AT SELECT LEVER ASSEMBLY

1. Clean all the parts before assembly.
2. Apply Multemp D No. 2 or equivalent to the sliding portion of each part.
3. Install the rod detent and detent spring to the select lever COMPL.
4. Install the plate guide to the select lever COMPL.
5. Install the arm assembly.
6. Install the select lever COMPL to the plate COMPL.
7. Install the spacer pin.

8. Install the clamp pin.
9. Install the spacer pin guide.
10. Install the clamp push nut.

Note:

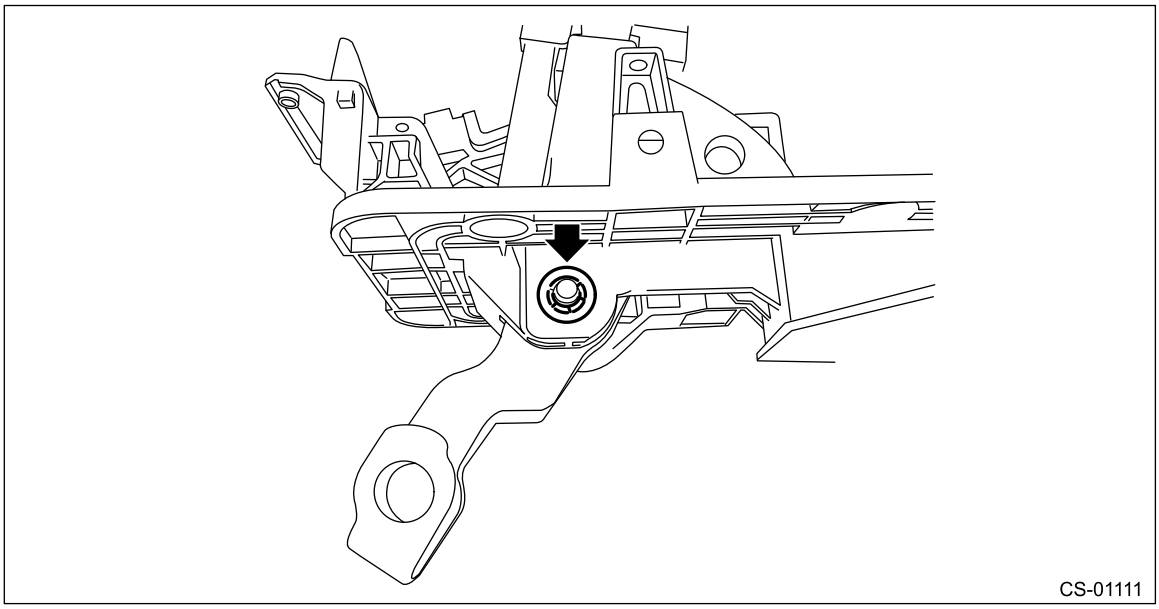
Replace the clamp push nut with a new part.



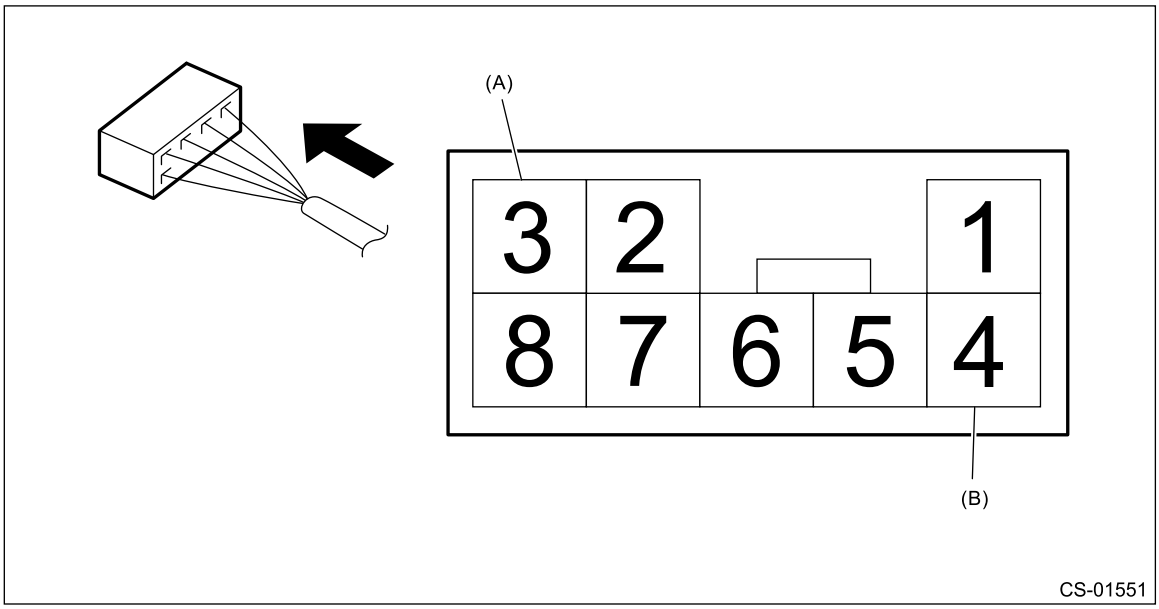
11. Install the shaft control.
12. Install the clamp push nut.

Note:

Replace the clamp push nut with a new part.



13. Insert the solenoid unit terminals to the harness connector.



(A) Solenoid unit (color code: blue)

(B) Solenoid unit (color code: black)

14. Install the solenoid unit.

15. Install the harness to the plate COMPL.

16. Install the harness connector to the plate COMPL.

17. Install the gasket.

18. Install the spacer plate.

19. After installation, check the following points.

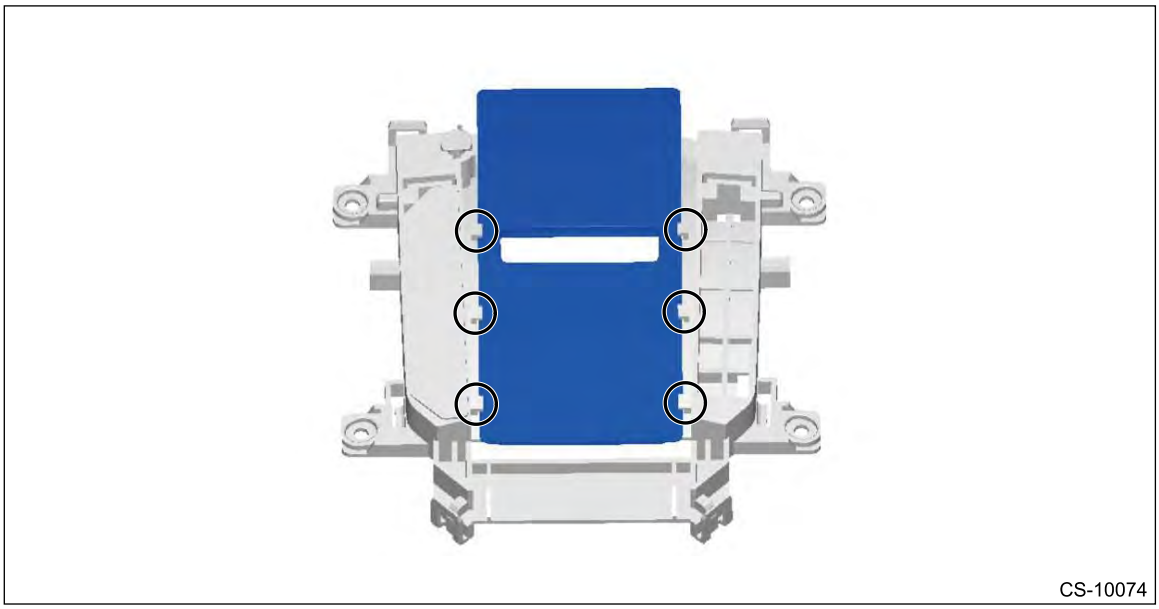
- The select indicator matches the select lever position when the select lever is changed from “P” range to “D” range.
- The select lever position and the position mark match each other.
- Operating force to move the select lever from “P” to “D” range

3. INDICATOR ASSEMBLY

1. Install the blind A to the housing. (Model with gate shifter)

Note:

The blind A should be installed so that it is securely caught inside the tab of the housing.



2. Install the blind B behind the blind A. (Model with gate shifter)
3. Install the boot assembly. (Model with boot shifter)
4. Install the housing to the indicator assembly. (Model with gate shifter)
5. Install the harness connector to the front console cover, and install the indicator assembly.

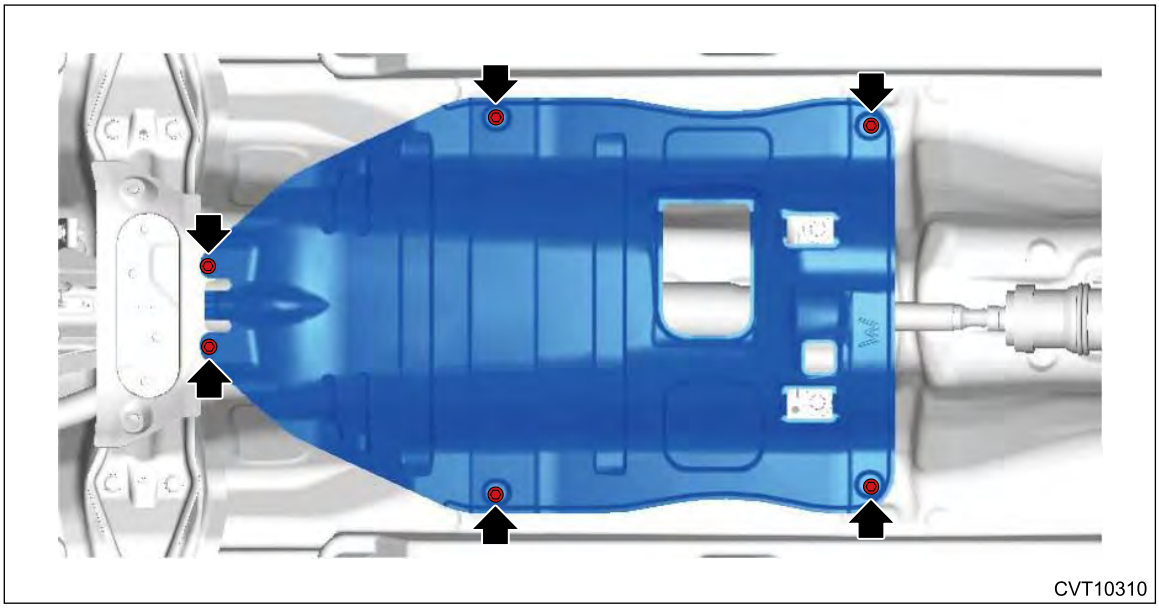
CONTROL SYSTEMS > Select Lever

INSPECTION

1. Inspect the removed parts by comparing with new parts for deformation, damage and wear. Repair or replace if defective.
2. Inspect the select lever assembly operating condition before assembly. Normal if it operates smoothly.

REMOVAL

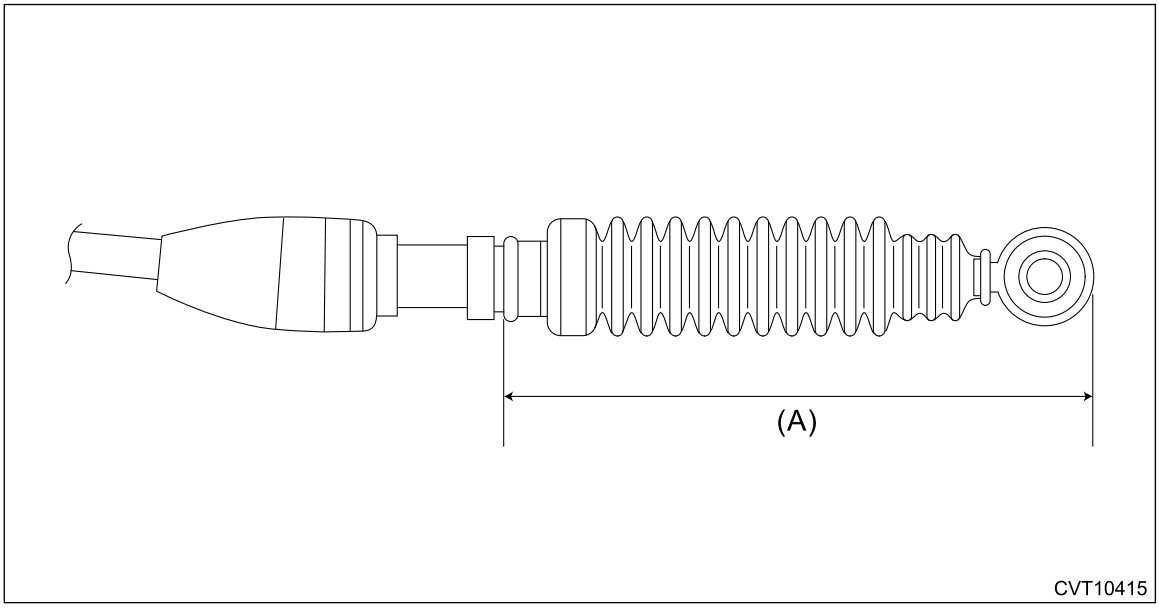
1. Shift the select lever to “N” range.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Lift up the vehicle.
4. Remove the center exhaust cover.

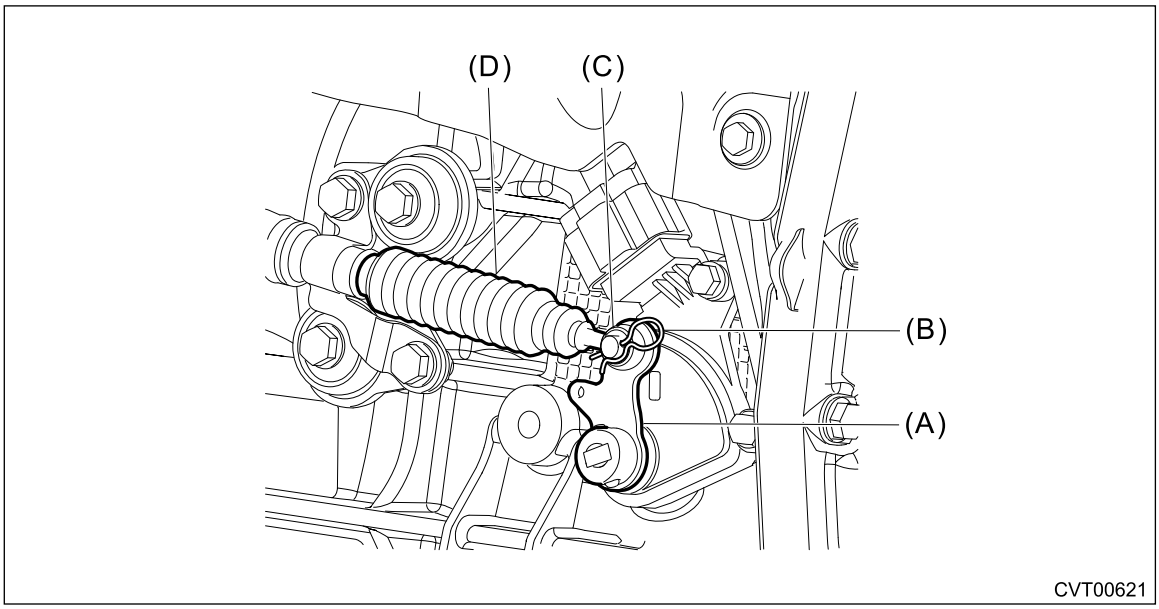


5. Remove the snap pin and washer from the shifter arm.

Caution:

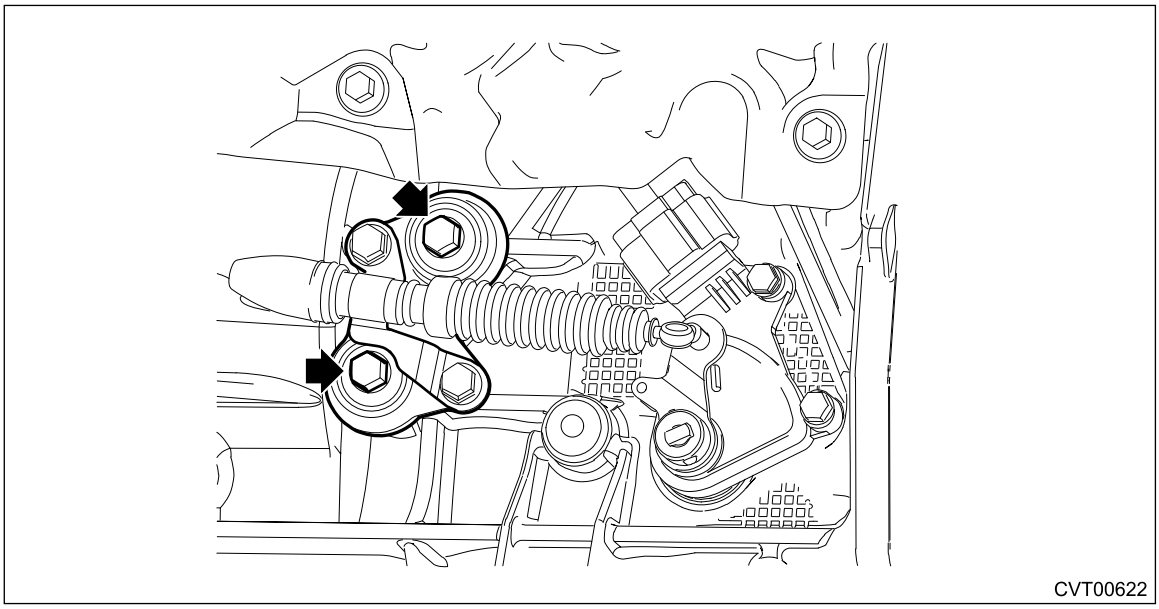
Do not apply excessive load while holding the part (A).





(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

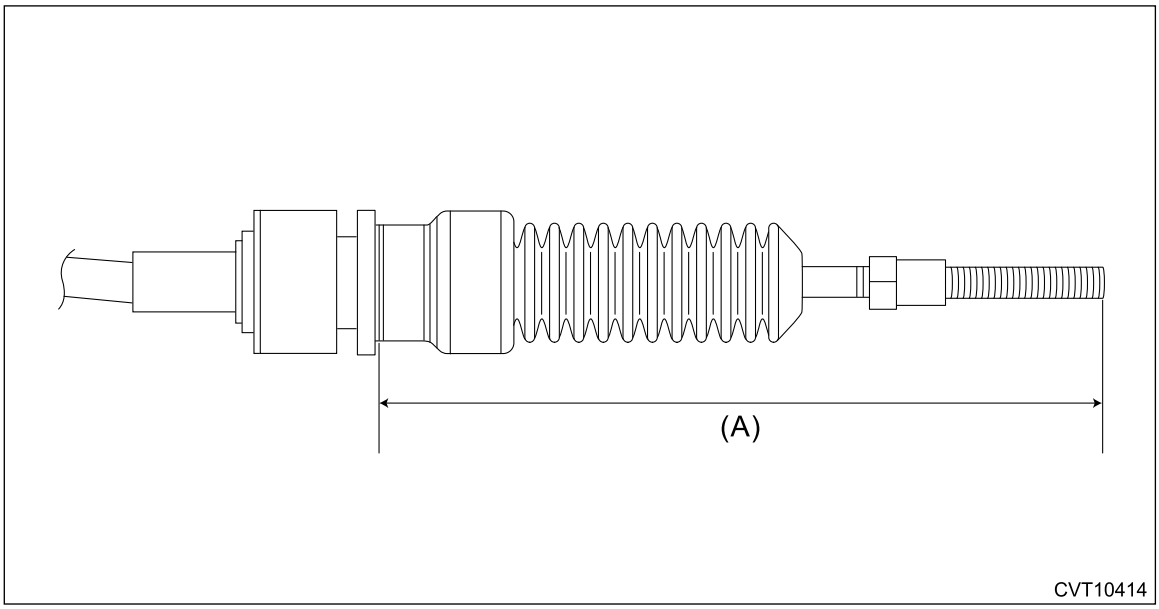
6. Remove the plate assembly from the transmission case.

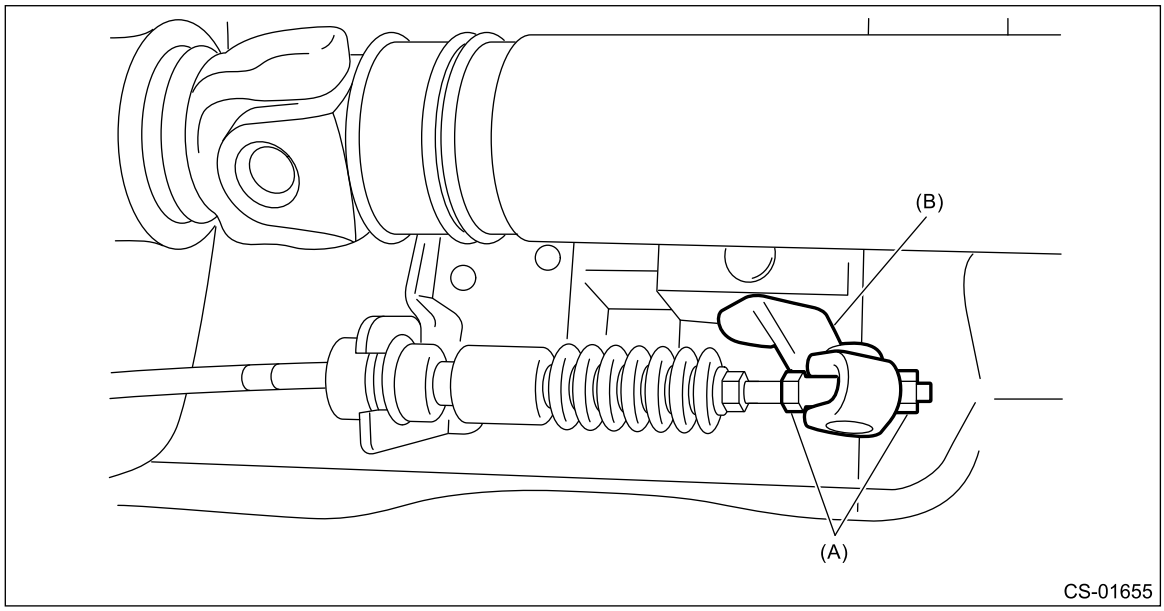


7. Disconnect the cable from arm COMPL.

Caution:

Do not apply excessive load while holding the part (A).

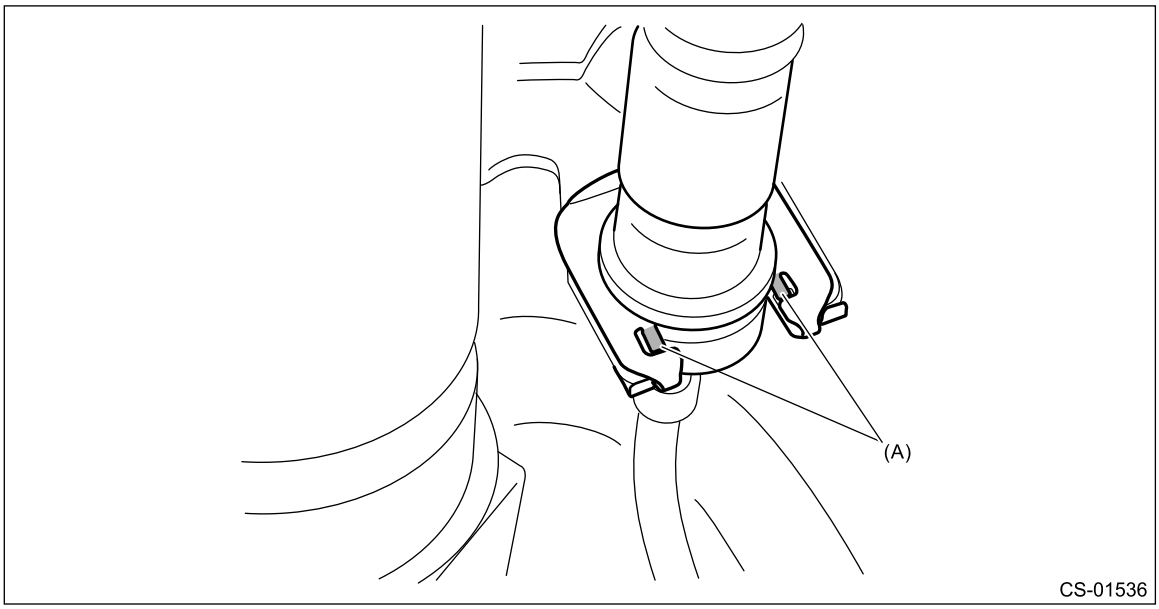




(A) Adjusting nut

(B) Arm COMPL

8. Raise the claw of clamp to remove the cable from bracket.



(A) Claw

9. Remove the select cable from plate assembly.

CONTROL SYSTEMS > Select Cable

INSTALLATION

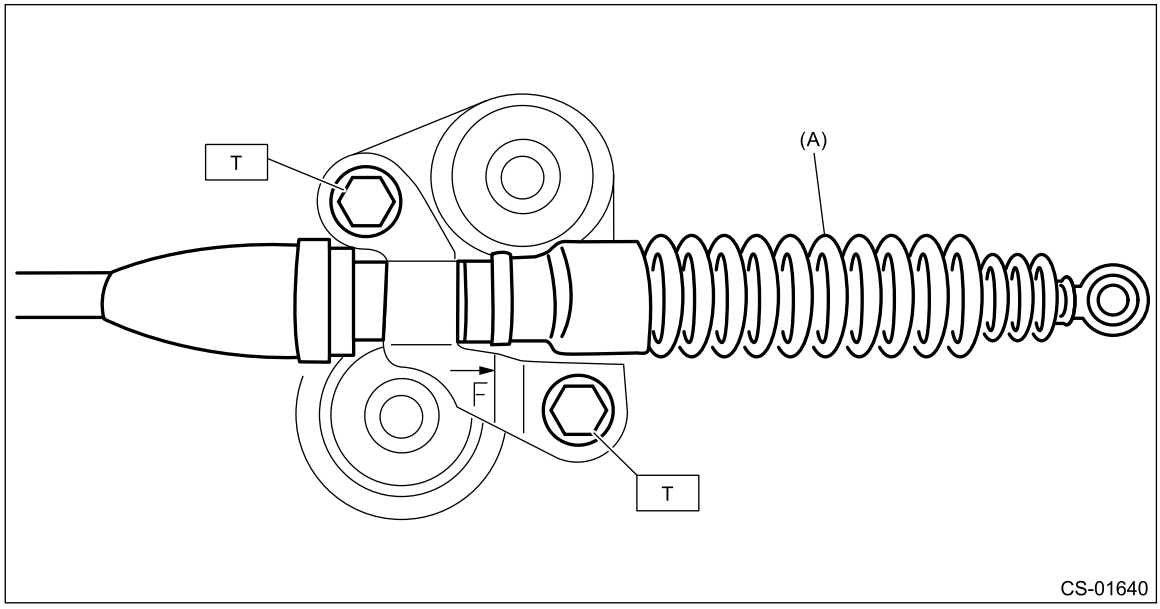
1. Position the select cable as shown in the figure, and install it to the plate assembly.

Caution:

- **If the cable is installed in the wrong direction, loosen the bracket bolts, and then reinstall the cable in the correct direction.**
- **Do not adjust the cable end direction by turning it forcibly to prevent the boot from being twisted.**

Tightening torque:

T: 18 N·m (1.8 kgf-m, 13.3 ft-lb)



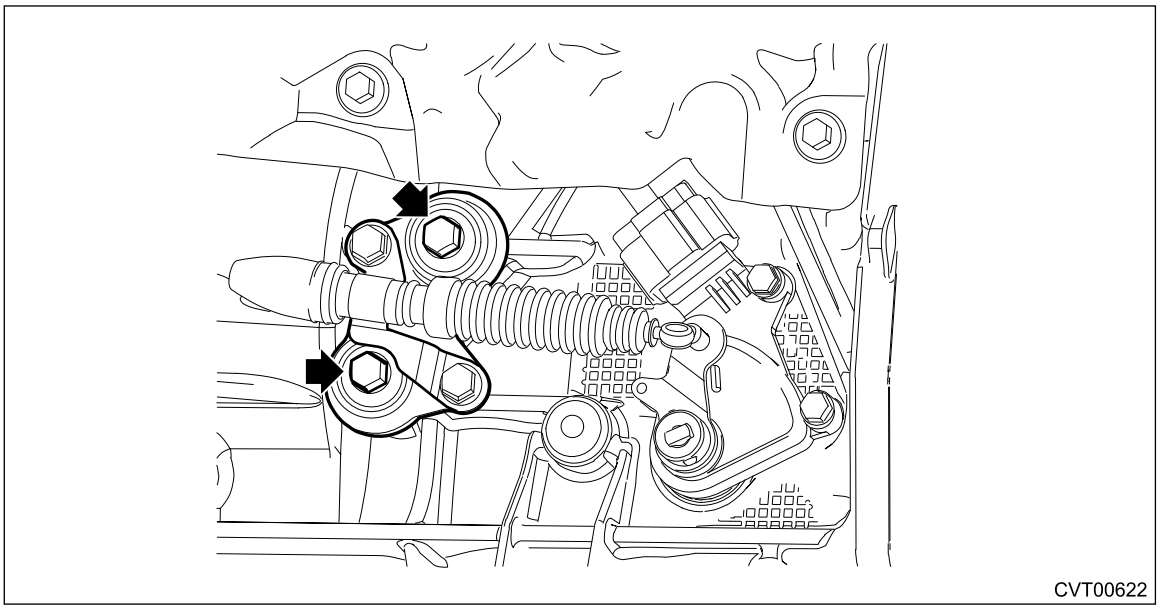
(A) Select cable

2. Install the select cable to the shifter arm.

3. Install the plate assembly to transmission.

Tightening torque:

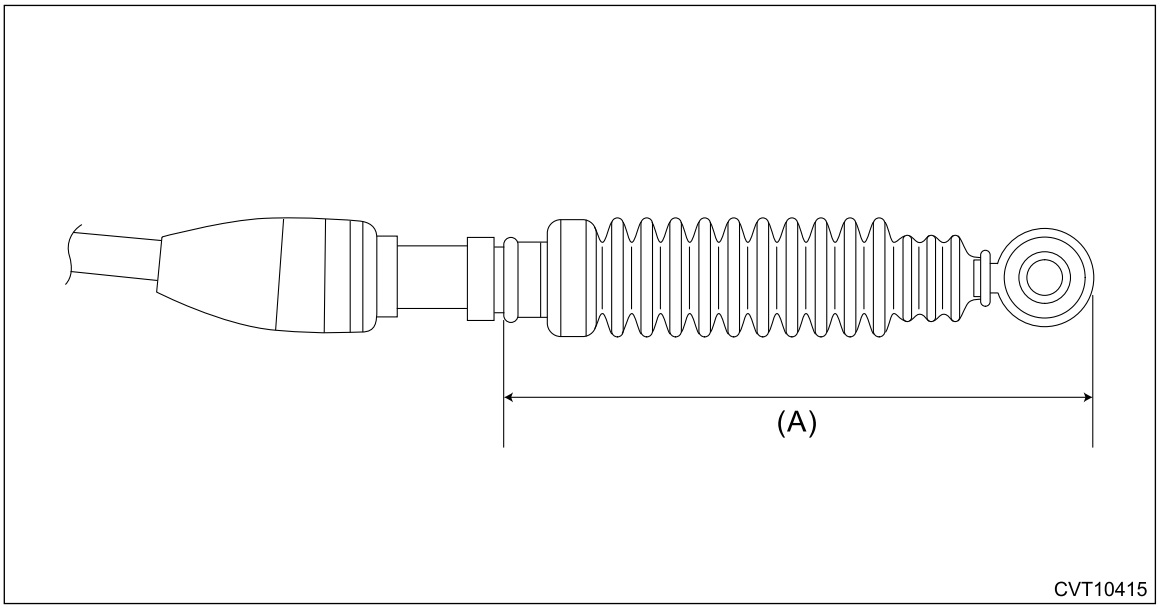
25 N·m (2.5 kgf-m, 18.4 ft-lb)

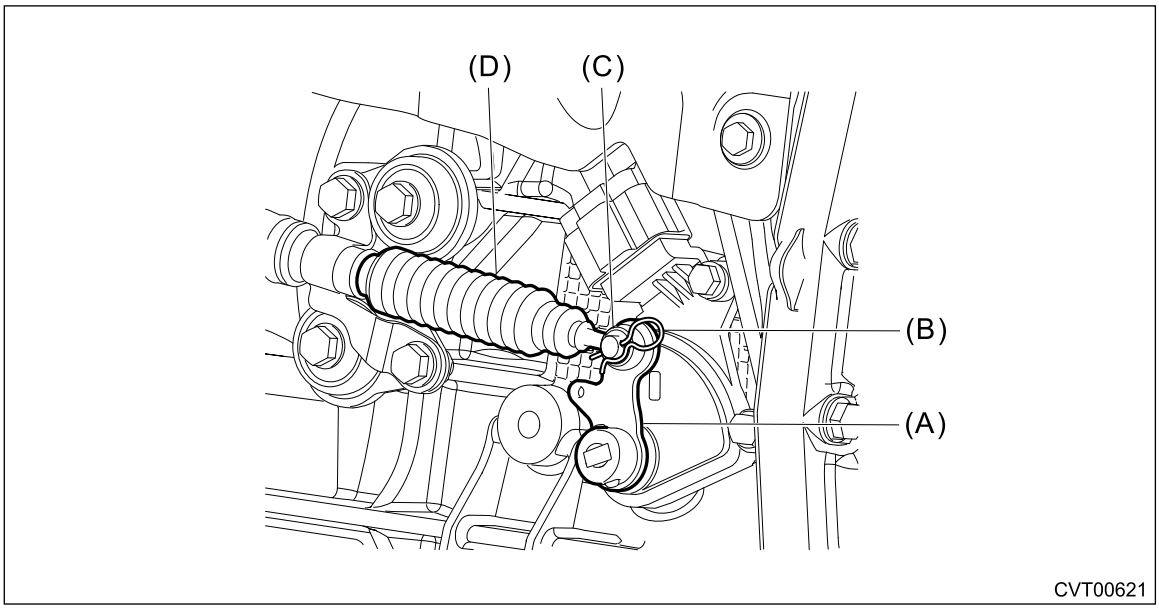


4. Install the washer and snap pin to the shifter arm.

Caution:

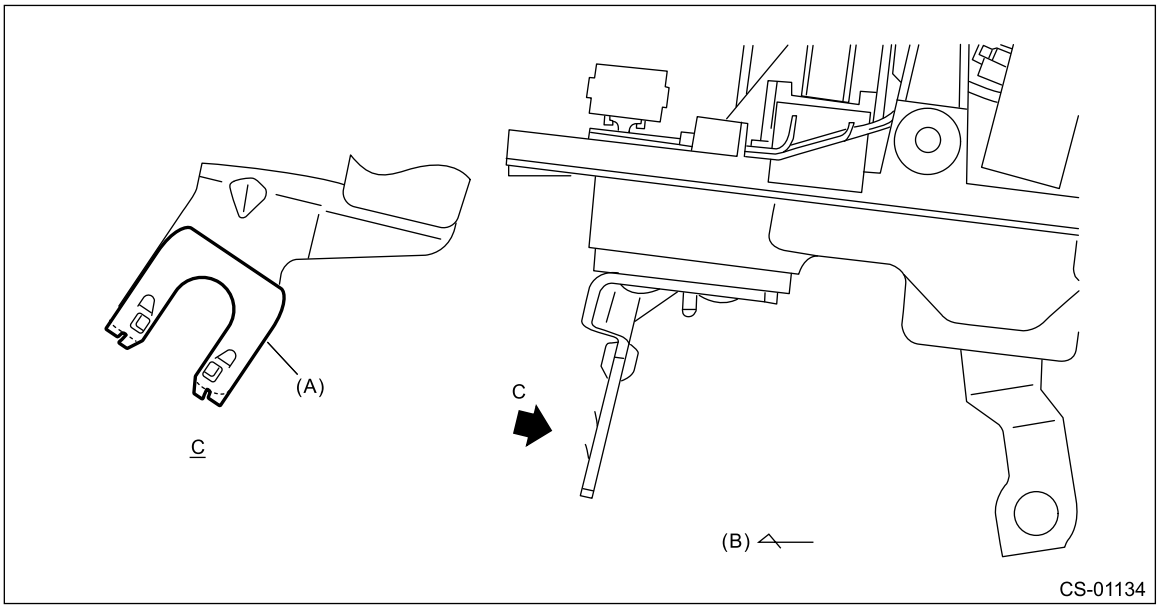
Do not apply excessive load while holding the part (A).





(A) Shifter arm
(B) Snap pin
(C) Washer
(D) Select cable

5. Install new clamp paying attention to the installing direction.

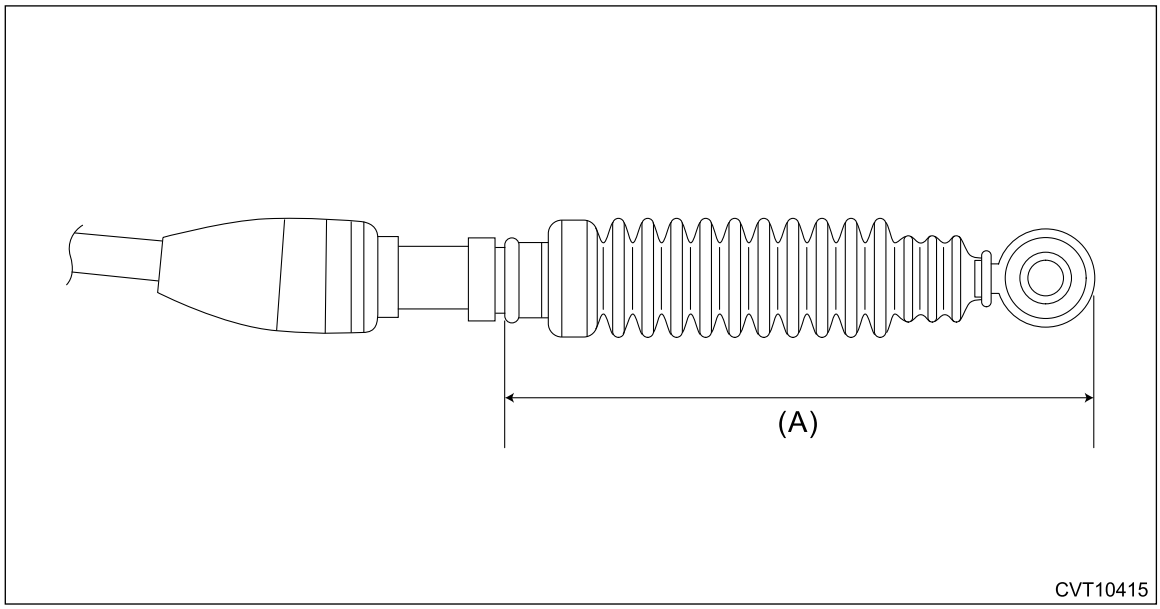


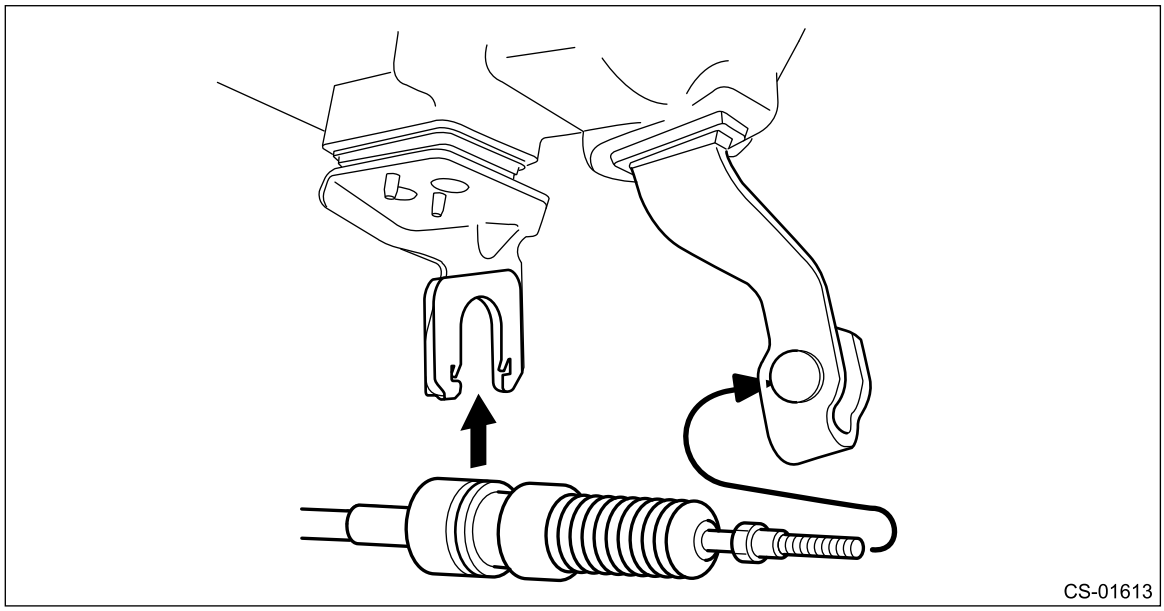
(A) Clamp
(B) Forward

6. Insert the tip of inner cable into connector hole of select lever, and fix the cable to bracket.

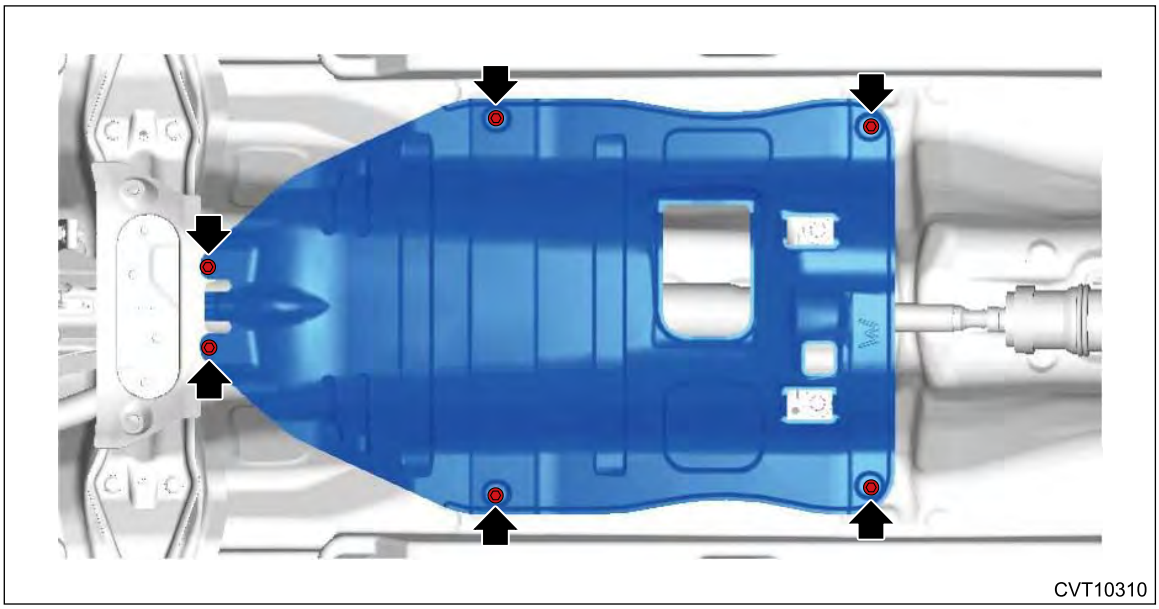
Caution:

Do not apply excessive load while holding the part (A).





7. Shift the select lever to the “N” range, and then adjust the select cable position. Ref. to CONTROL SYSTEMS>Select Cable>ADJUSTMENT.
8. Install the center exhaust cover.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)



9. Lower the vehicle.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CONTROL SYSTEMS > Select Cable

INSPECTION

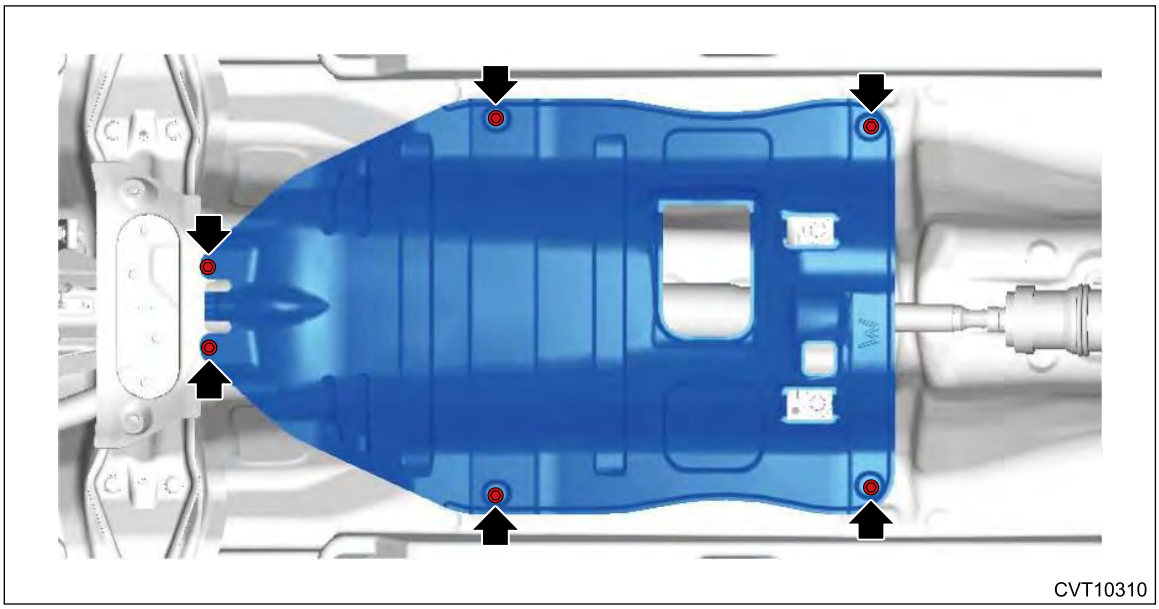
Check the removed cable and replace or adjust if damaged, rusty or malfunctioning.

1. Check the cable for smooth operation.
2. Check the inner cable for damage and rust.
3. Check the outer cable for damage, bends and cracks.
4. Check the boot for damage, cracks and deterioration.
5. Move the select lever from “P” to “D” range. Check the existence of feel to contact the detents in each range. If the detents cannot be felt or the position pointer is improperly aligned, adjust the cable.
6. Check if the starter motor rotates when the select lever is set to “P” range.
7. Check the back-up light illumination when the select lever is in “R” range.
8. Check the parking lock operation when the select lever is in “P” range.

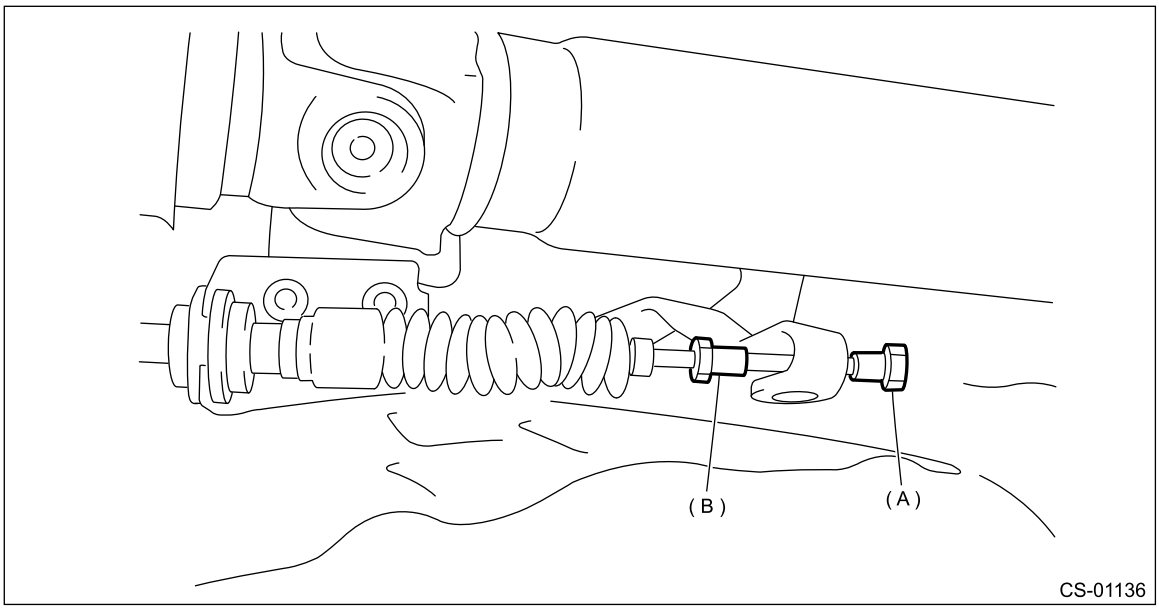
CONTROL SYSTEMS > Select Cable

ADJUSTMENT

1. Shift the select lever to “N” range.
2. Lift up the vehicle.
3. Remove the center exhaust cover.



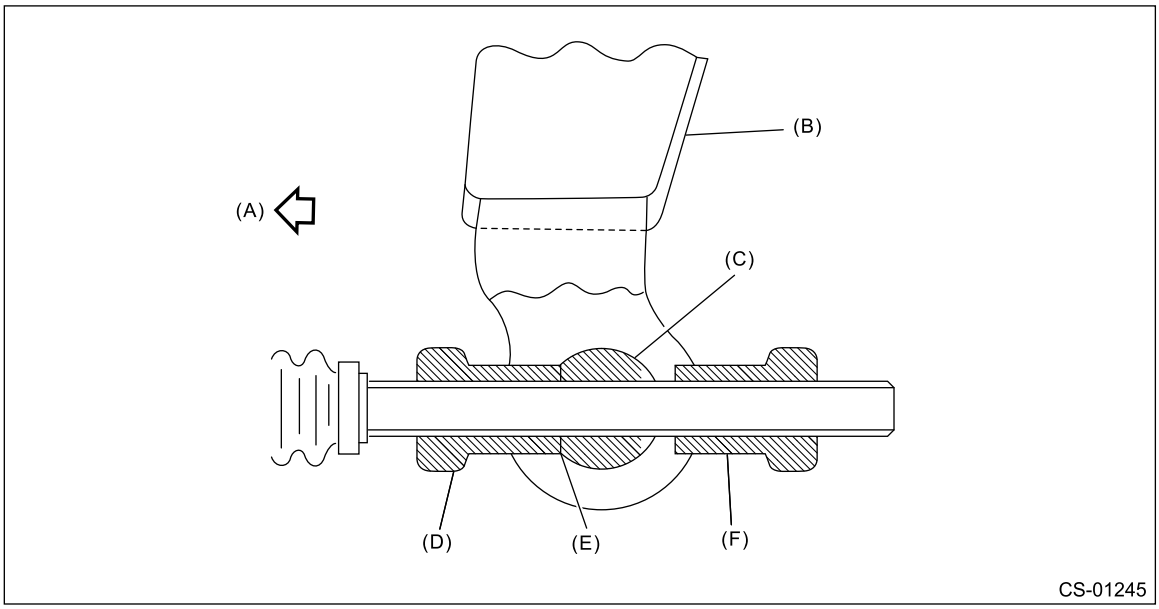
4. Loosen the adjusting nuts on both sides.



(A) Adjusting nut A

(B) Adjusting nut B

5. Turn adjusting nut B until it lightly touches the connector.

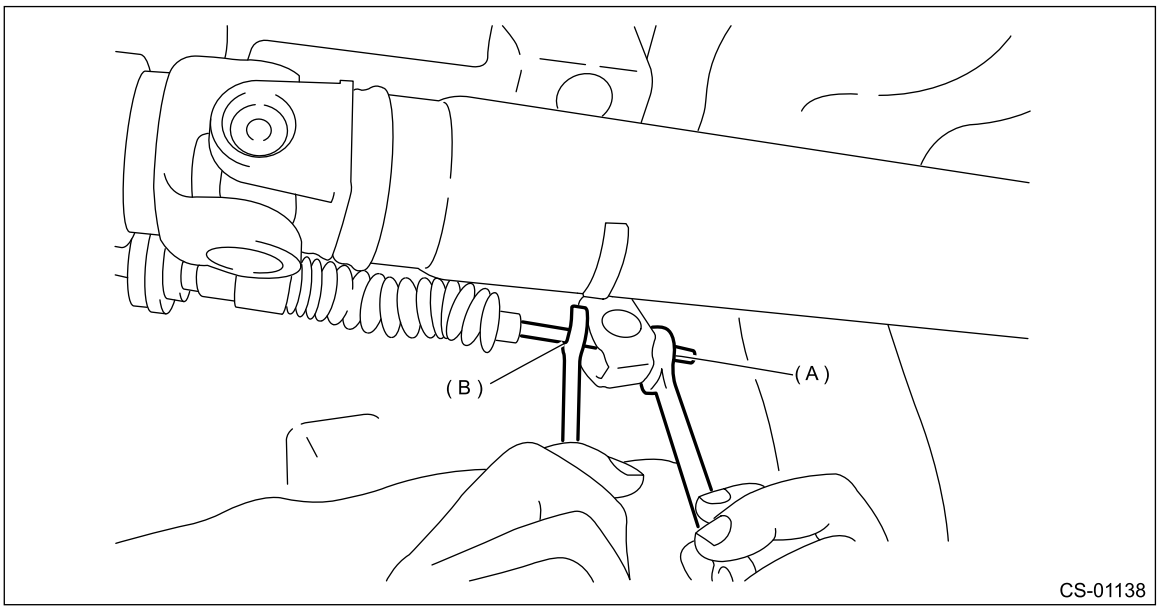


(A) Forward side
(B) Select lever
(C) Connector
(D) Adjusting nut B
(E) Contact point
(F) Adjusting nut A

6. Set a spanner wrench to adjusting nut B so that it does not rotate, and then tighten the adjusting nut A.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)



(A) Adjusting nut A
(B) Adjusting nut B

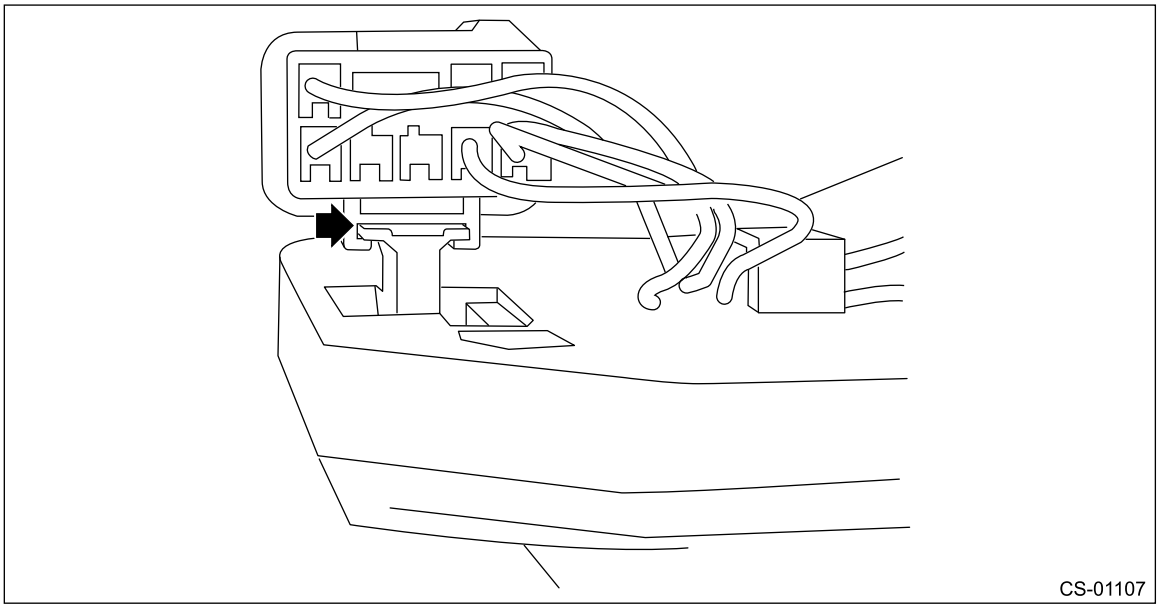
7. After the completion of adjustment, confirm that the select lever operates normally at all ranges.

8. Install in the reverse order of removal.

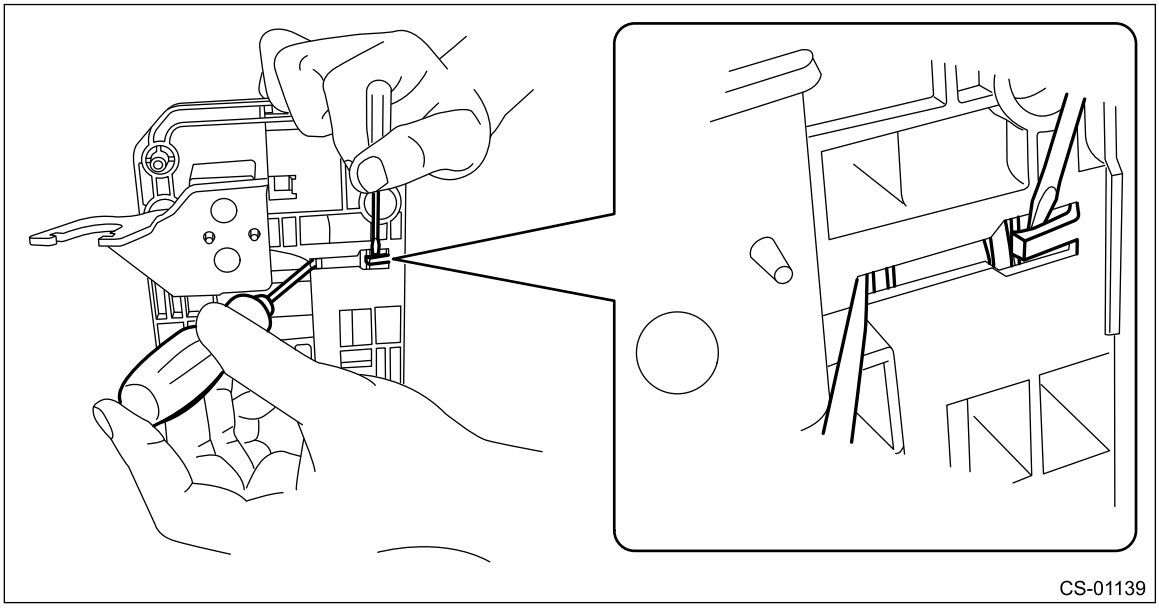
REMOVAL

1. SOLENOID UNIT

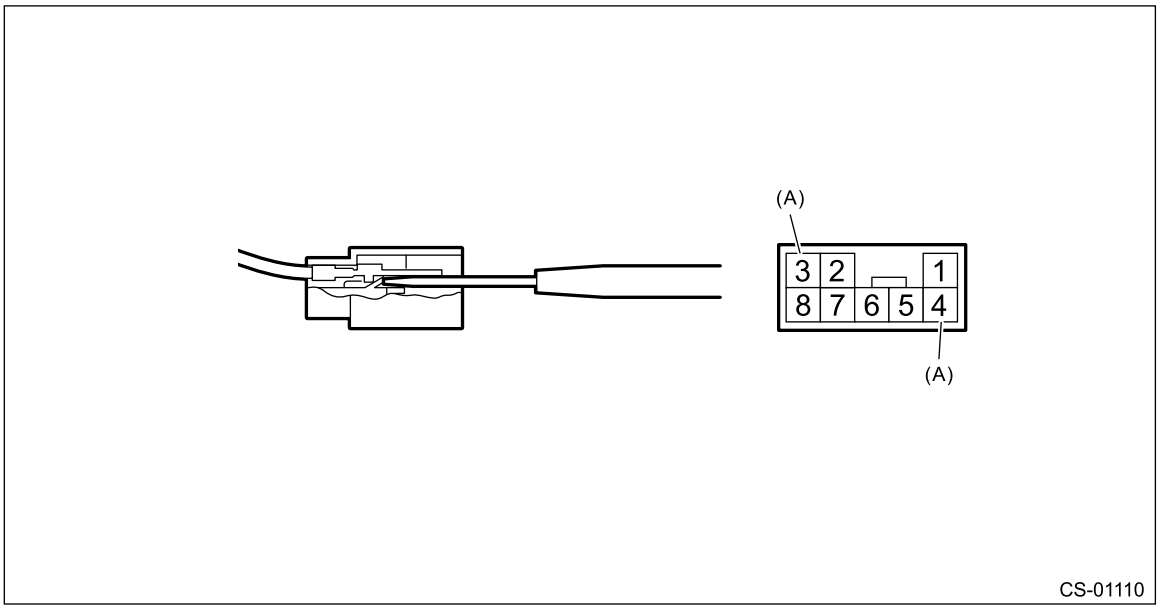
1. Remove the AT select lever. Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.
2. Remove the spacer and gasket. Ref. to CONTROL SYSTEMS>Select Lever>DISASSEMBLY.
3. Using a flat tip screwdriver with a thin tip, remove the harness connector from the plate COMPL.



4. Raise the claw using a flat tip screwdriver with a thin tip, and remove the solenoid unit from the plate COMPL.



5. Remove the terminal of the solenoid unit using a flat tip precision screwdriver with a tip width of 1.3 mm (0.05 in) or less, KTC connector terminal tool ECC-1T or equivalent.



(A) Solenoid unit terminals

2. “P” RANGE SWITCH

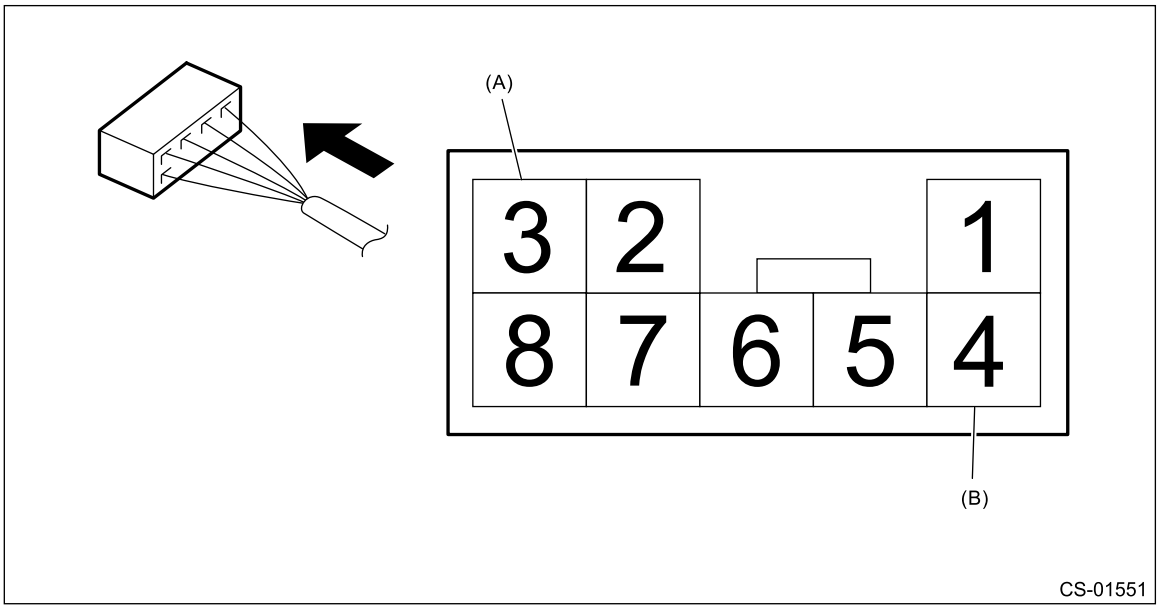
For the removal of “P” range switch, refer to the procedure for AT select lever. Ref. to CONTROL SYSTEMS>Select Lever>DISASSEMBLY.

CONTROL SYSTEMS > AT Shift Lock Solenoid and “P” Range Switch

INSTALLATION

1. SOLENOID UNIT

1. Clean all the parts before assembly.
2. Insert the solenoid unit terminals to the harness connector.



(A) Solenoid unit (color code: blue)

(B) Solenoid unit (color code: black)

3. Install the solenoid unit.

4. Install the harness connector to the plate COMPL.
5. Install the spacer plate and the gasket. Ref. to CONTROL SYSTEMS>Select Lever>ASSEMBLY > CLIP ASSEMBLY.
6. Install the select lever. Ref. to CONTROL SYSTEMS>Select Lever>INSTALLATION.

2. "P" RANGE SWITCH

For the installation of "P" range switch, refer to the procedure for AT select lever. Ref. to CONTROL SYSTEMS>Select Lever>ASSEMBLY > CLIP ASSEMBLY.

INSPECTION

1. CHECK SOLENOID UNIT.

Measure the resistance of solenoid unit connector terminals.

Terminals

No. 4 — No. 3:

Is the resistance 27.6 — 30.5 Ω?

Yes — Go to 2.

No — Replace the solenoid unit. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and “P” Range Switch.

2. CHECK SOLENOID UNIT.

Connect the battery to the solenoid unit connector terminals, and then operate the solenoid.

Terminals

No. 3 (+) — No. 4 (−):

Does the solenoid unit operate normally?

Yes — Go to 3.

No — Replace the solenoid unit. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and “P” Range Switch.

3. CHECK “P” RANGE SWITCH.

1. Shift the select lever to “P” range.
2. Measure the resistance between “P” range switch connector terminals.

Terminals

No. 1 — No. 2:

Is the resistance less than 1 Ω?

Yes — Go to 4.

No — Replace the “P” range switch. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and “P” Range Switch.

4. CHECK “P” RANGE SWITCH.

1. Set the select lever to other than “P” range.
2. Measure the resistance between “P” range switch connector terminals.

Terminals

No. 1 — No. 2:

Is the resistance 1 MΩ or more?

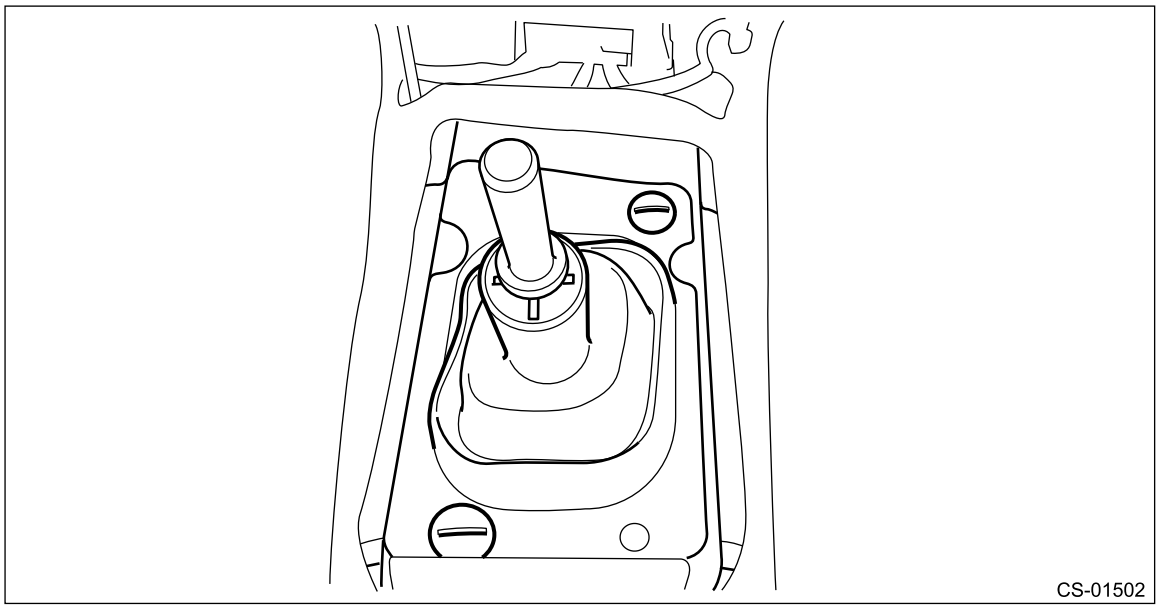
Yes	Normal.
No	Replace the “P” range switch. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and “P” Range Switch.

NOTE

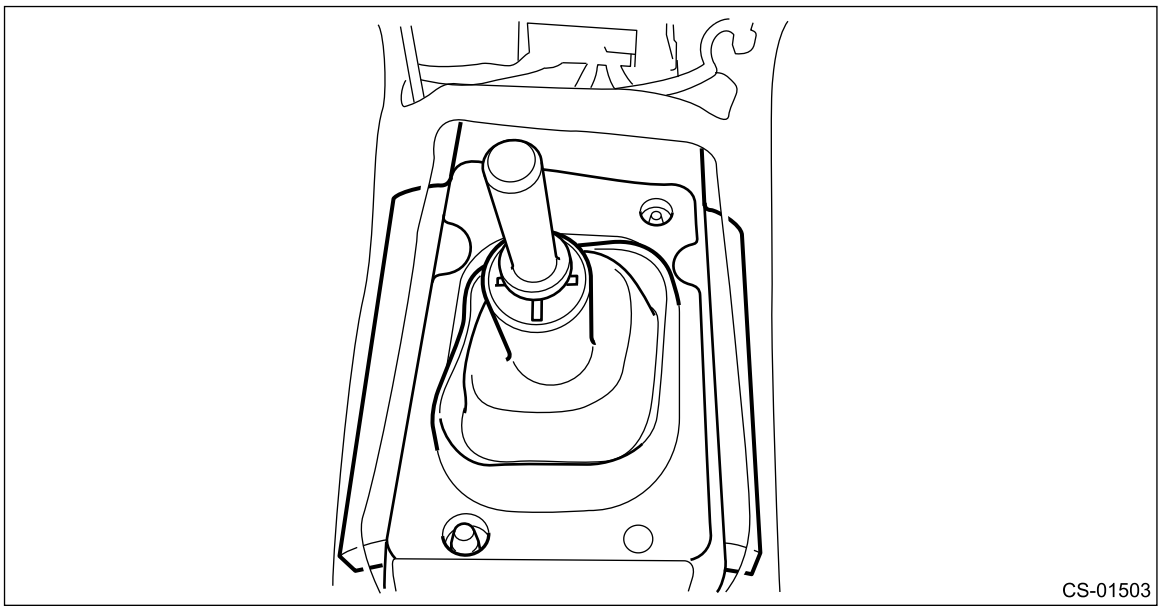
Refer to “Body Integrated Unit” for removal and installation procedure. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

REMOVAL

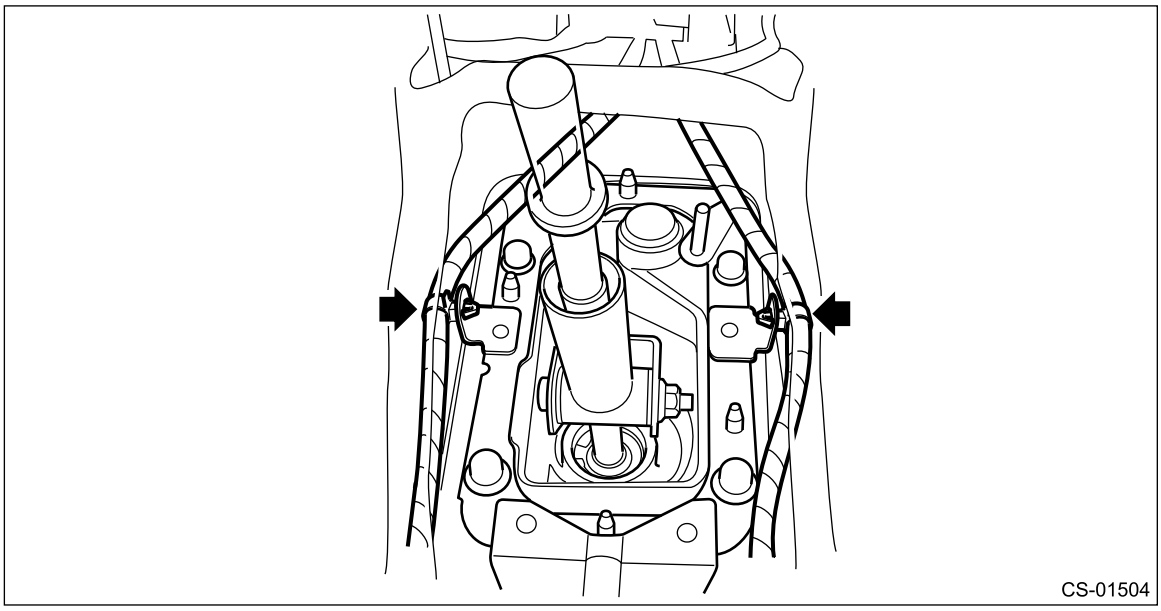
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the gear shift knob by turning it counterclockwise.
3. Remove the front console panel. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
4. Remove the panel center LWR LH and RH. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
5. Remove the clamp.



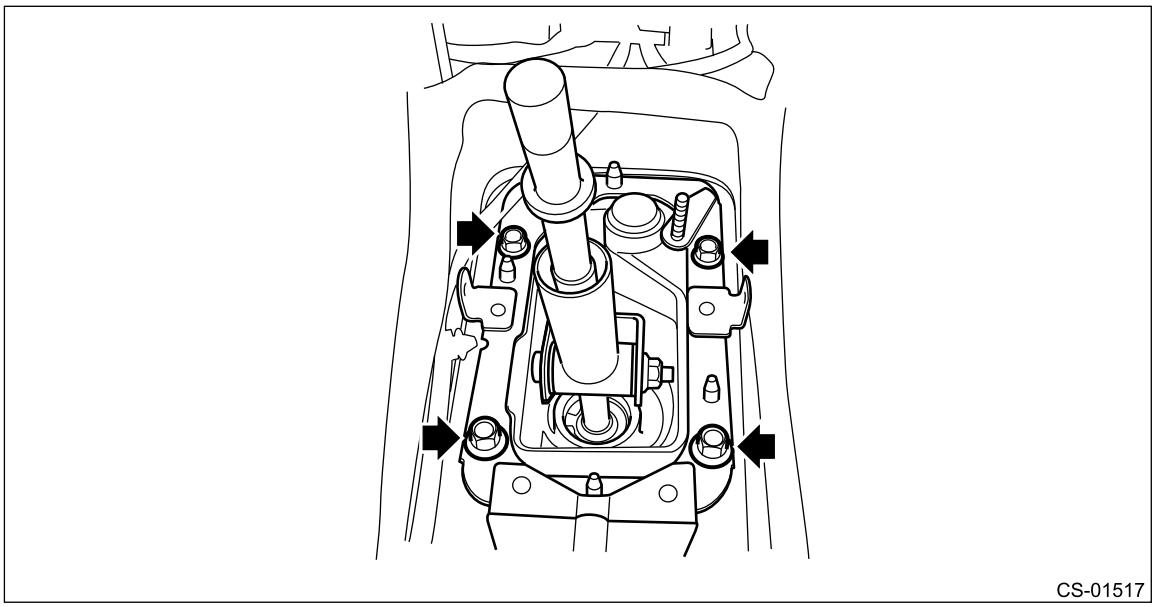
6. Remove the boot and insulator assembly.



7. Remove the harness clamp from the plate COMPL.

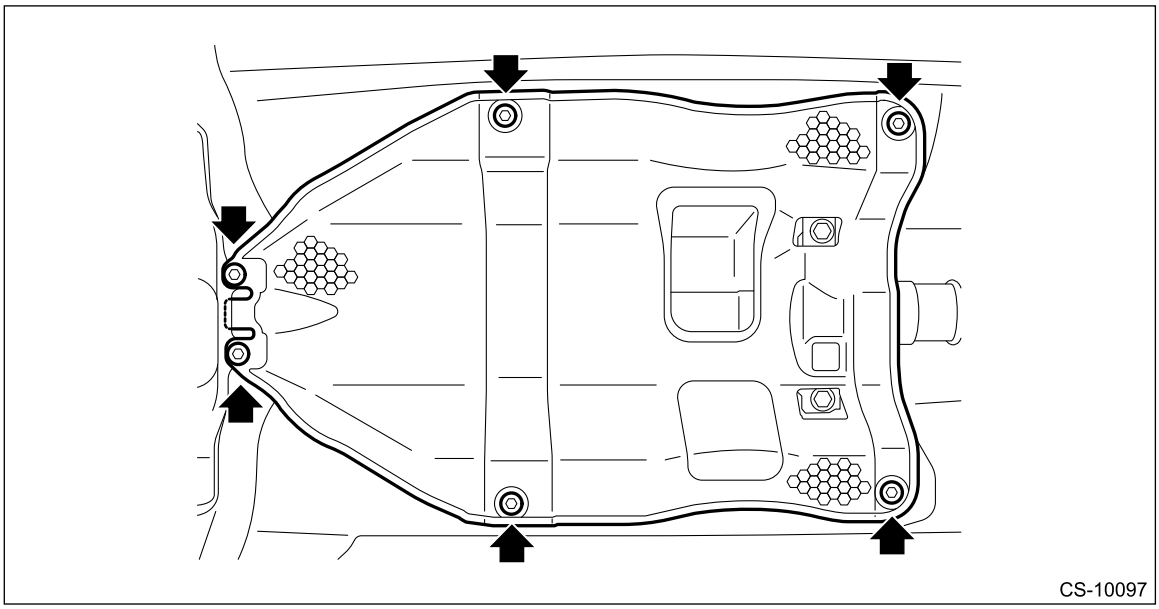


8. Remove the plate COMPL from the vehicle body.

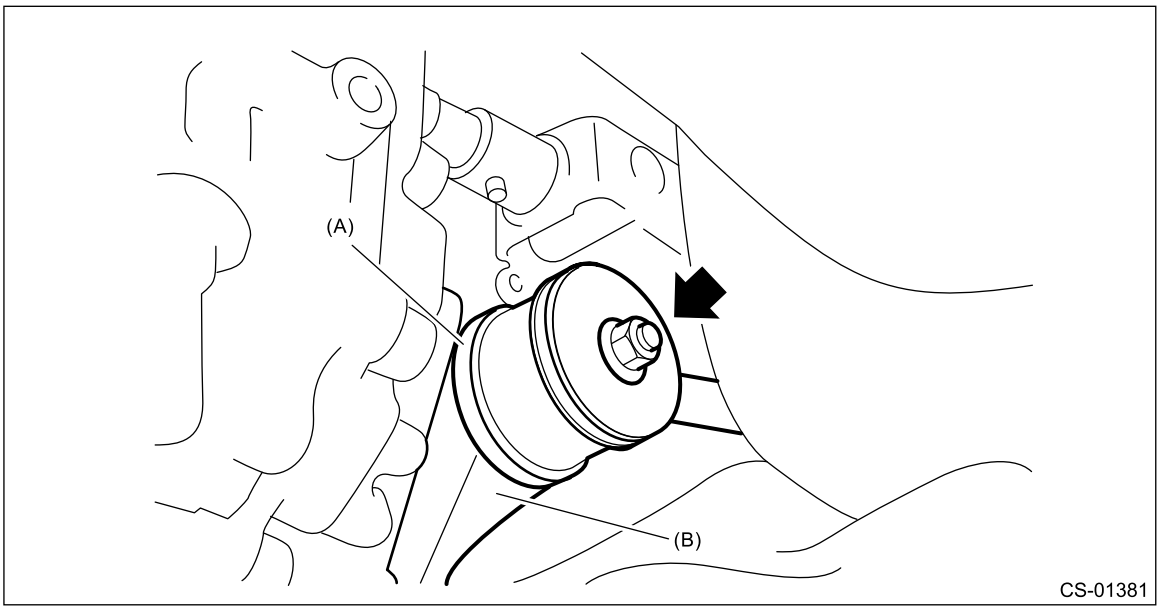


9. Lift up the vehicle.

10. Remove the center exhaust cover.

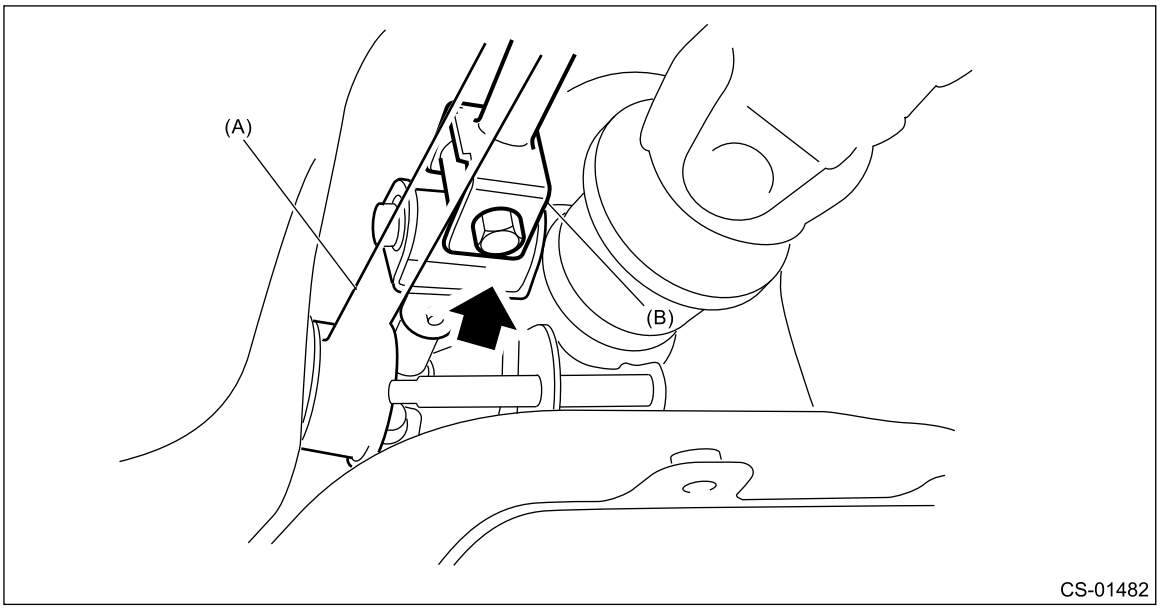


11. Remove the stay from the shift bracket.



(A) Stay
(B) Shift bracket

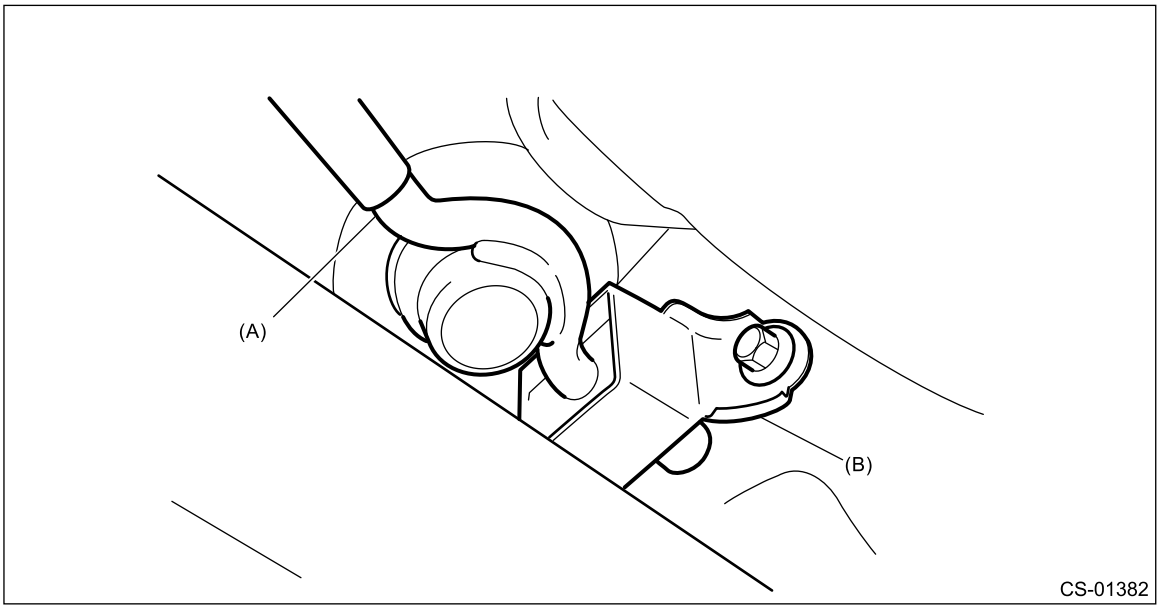
12. Remove the rod from joint.



(A) Stay

(B) Rod

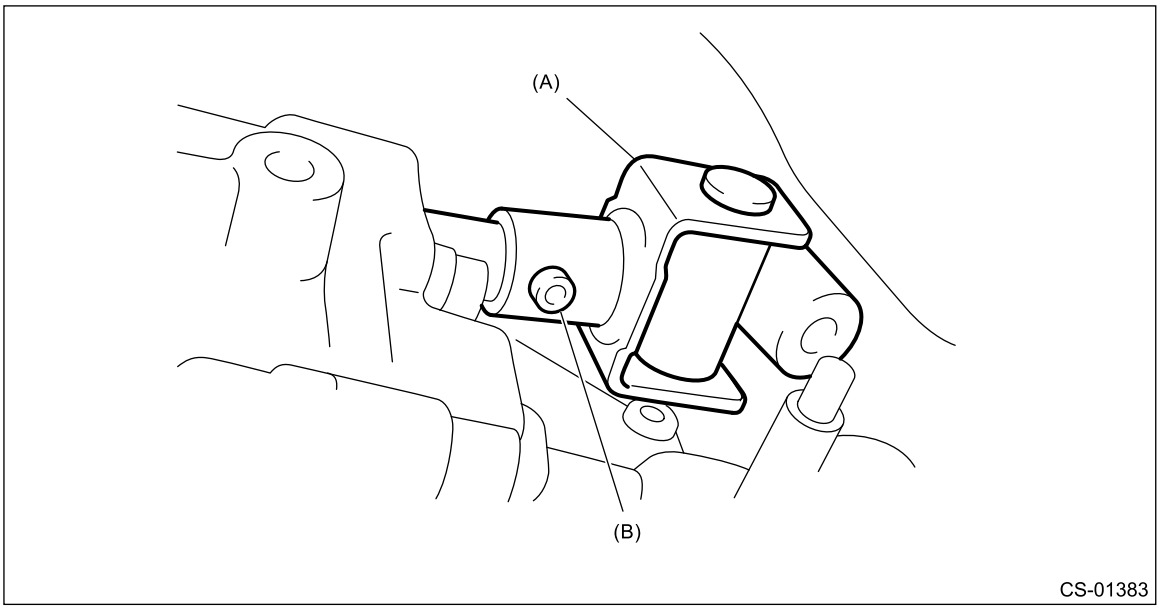
13. Remove the cushion rubber from the vehicle body.



(A) Stay

(B) Cushion rubber

14. Extract the spring pin and remove the joint.



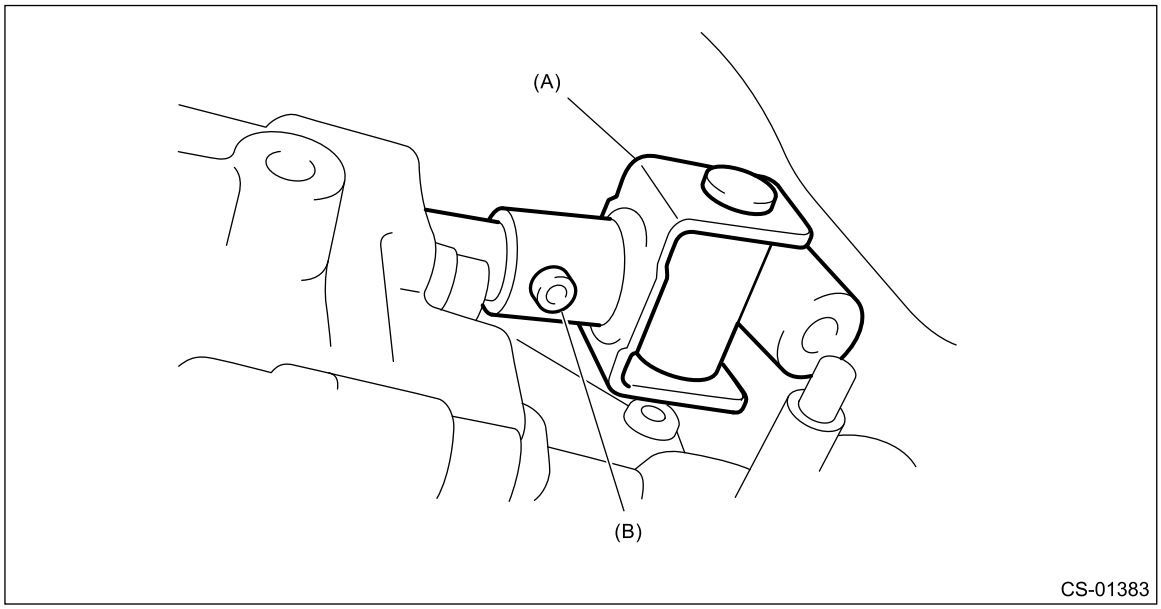
(A) Joint
(B) Spring pin

15. Remove the gear shift lever from the bottom of the vehicle.

CONTROL SYSTEMS > MT Gear Shift Lever

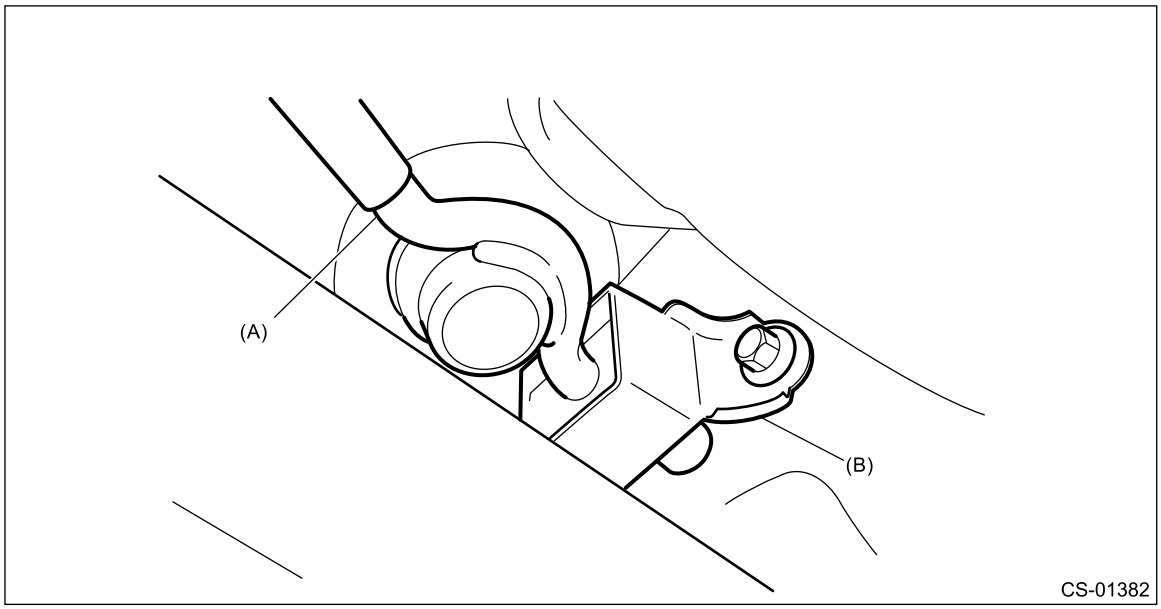
INSTALLATION

1. Insert the gear shift lever from the underside of the vehicle.
2. Install the joint to the transmission and secure with a spring pin.



(A) Joint
(B) Spring pin

3. Mount the cushion rubber on the vehicle body.
Tightening torque:
18 N·m (1.8 kgf-m, 13.3 ft-lb)



(A) Stay

(B) Cushion rubber

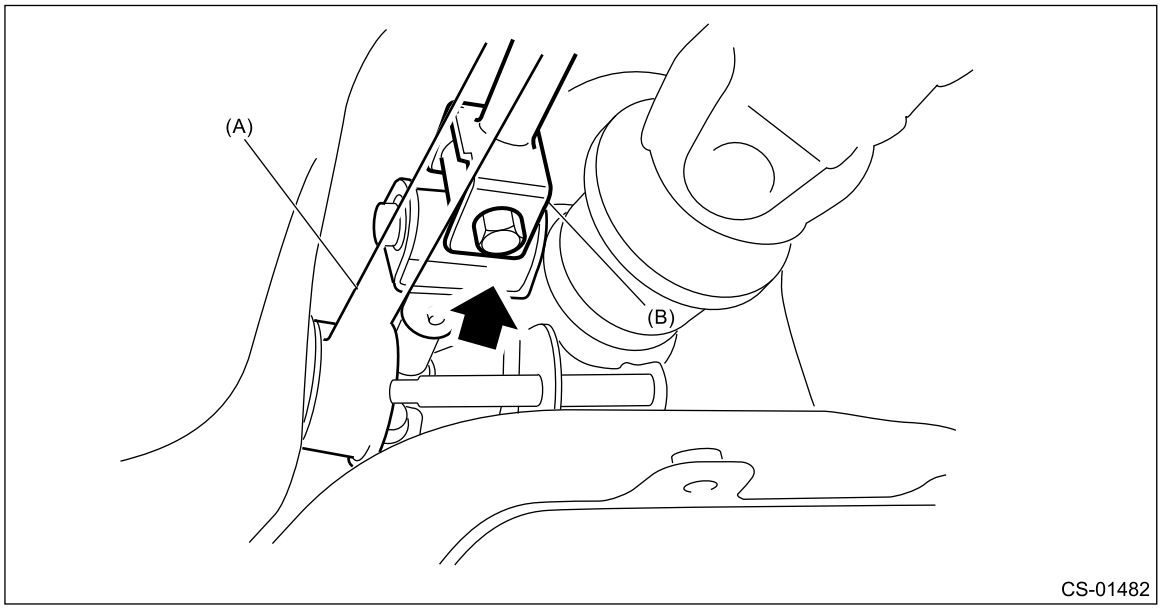
4. Connect the rod to the joint.

Note:

Use a new self-locking nut.

Tightening torque:

12 N·m (1.2 kgf-m, 8.9 ft-lb)



(A) Stay

(B) Rod

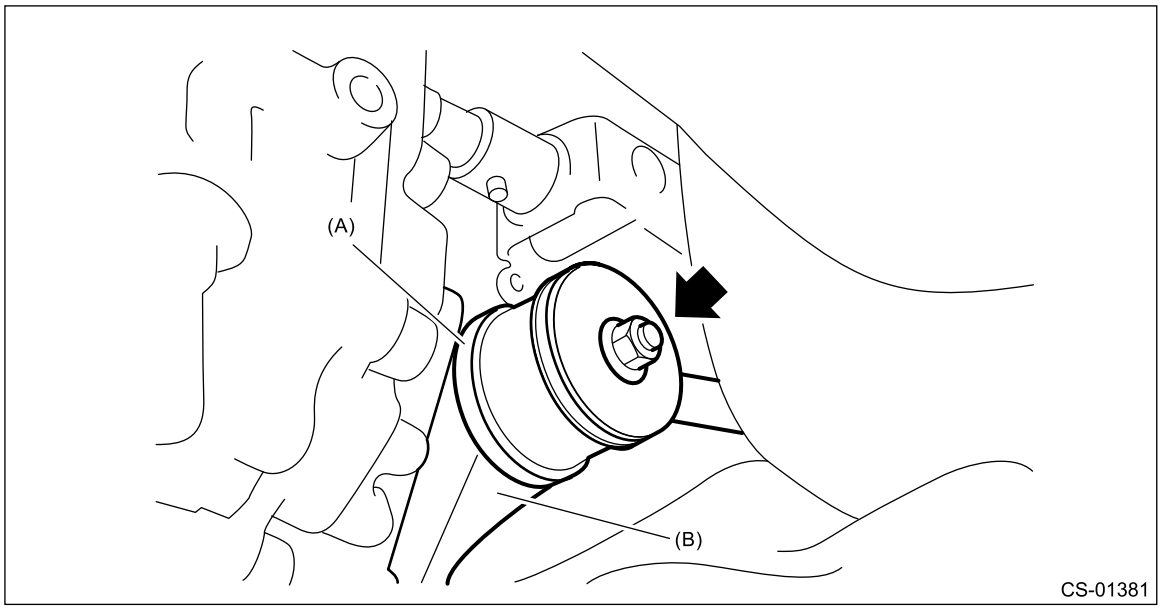
5. Connect the stay to the shift bracket, and tighten the self-locking nut.

Note:

Use a new self-locking nut.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



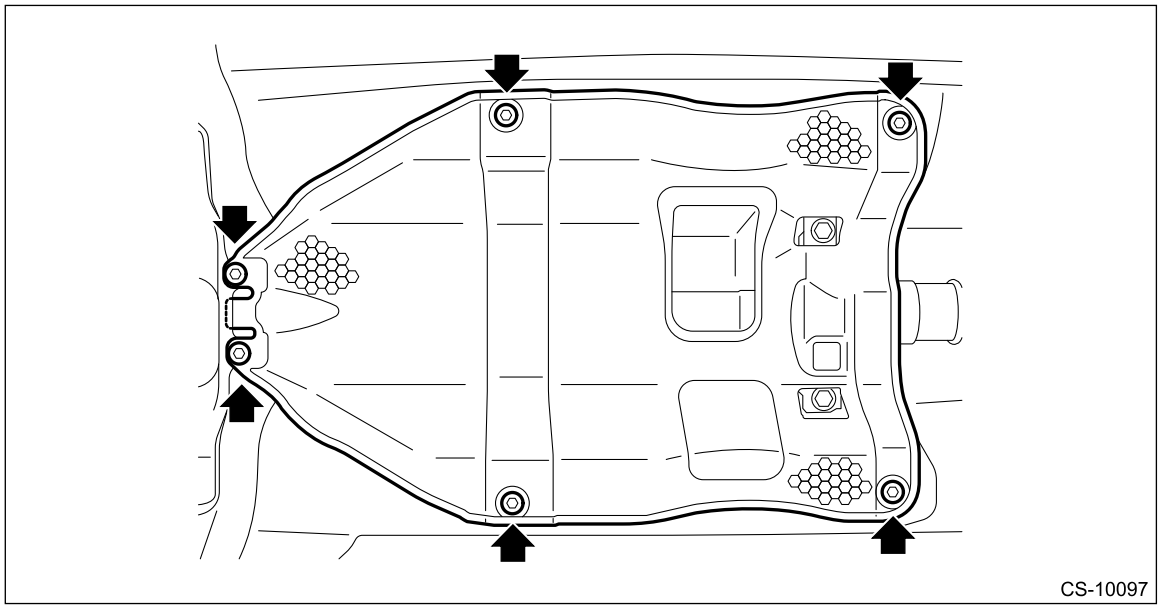
(A) Stay

(B) Shift bracket

6. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



7. Lower the vehicle.

8. Install the plate COMPL to the body.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

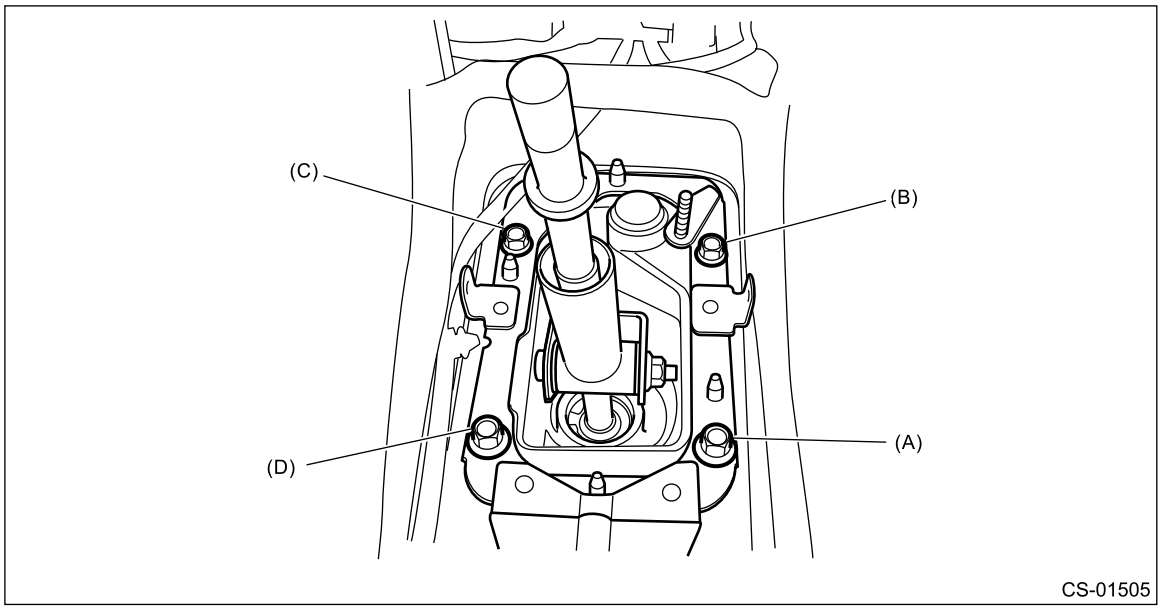
(1) Set the plate COMPL to the vehicle.

(2) Temporarily tighten the bolt (A).

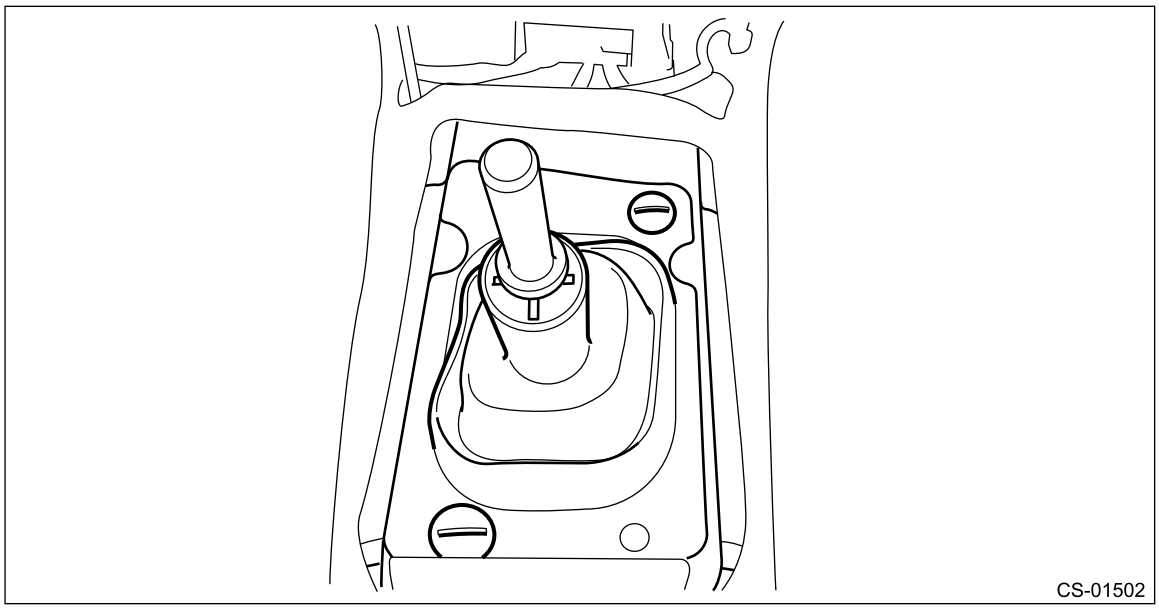
(3) Tighten the bolt (B).

(4) Tighten the bolt (A).

(5) Tighten the bolts (C) and (D).



9. Install the harness clamp to the plate.
10. Install the boot and insulator assembly, and secure with a clamp.

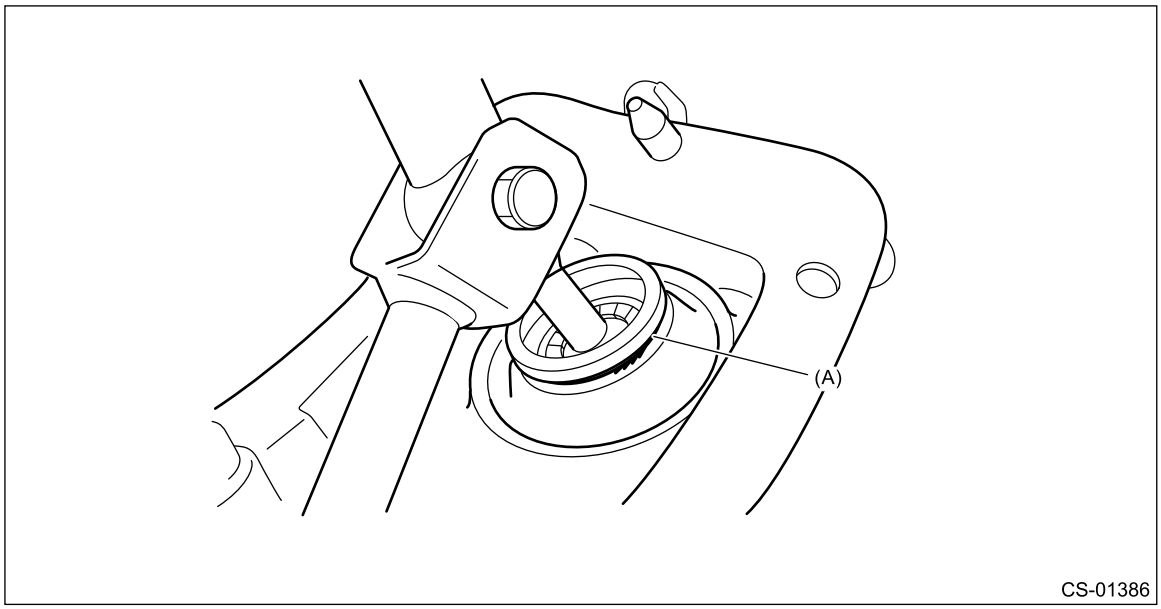


11. Install the panel center LWR LH and RH. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
12. Install the front console panel. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
13. Install the gear shift knob by turning it clockwise.
14. Make sure the gears can be shifted accurately into each gear.
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

CONTROL SYSTEMS > MT Gear Shift Lever

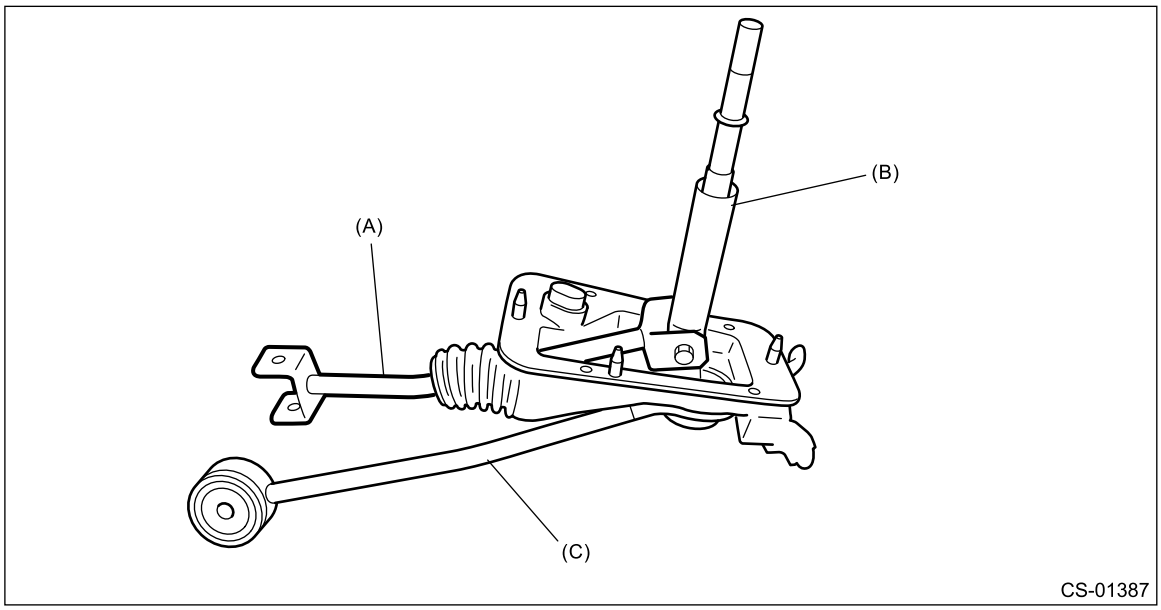
DISASSEMBLY

1. Remove the lock wires.



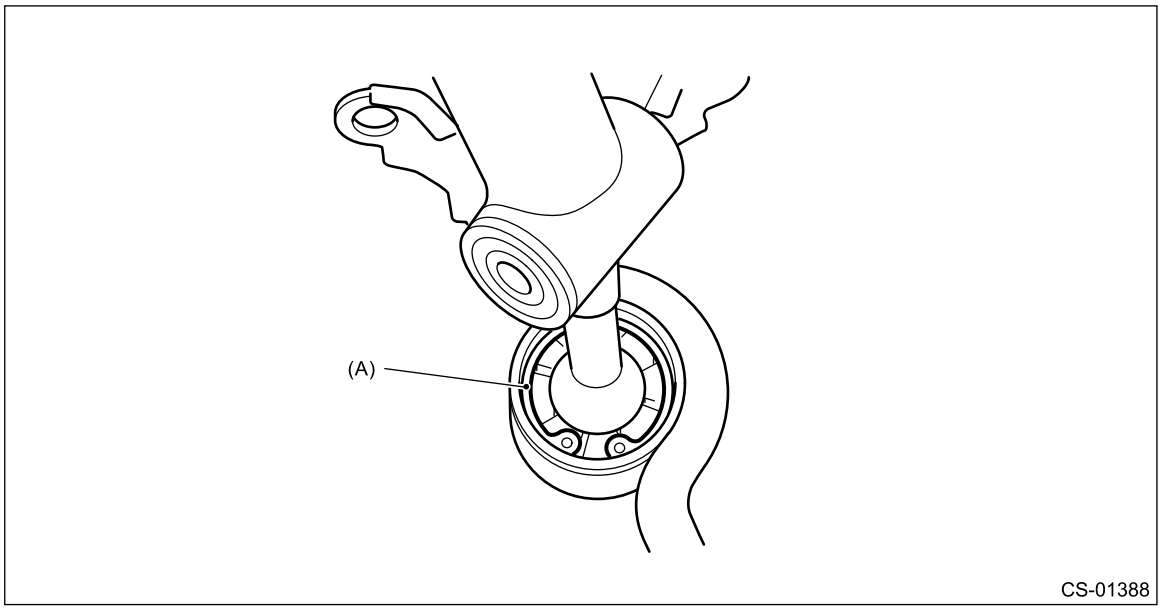
(A) Lock wire

2. Remove the rod from gear shift lever.



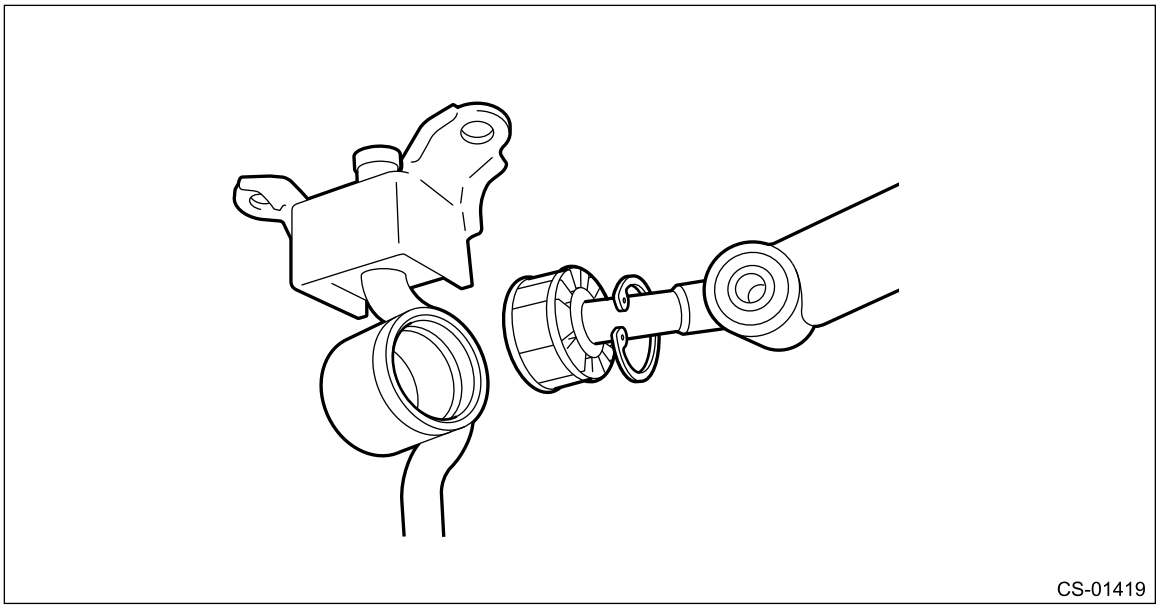
(A) Rod
(B) Lever
(C) Stay

3. Separate the rod and inner boot.
4. Remove the snap ring from the stay.

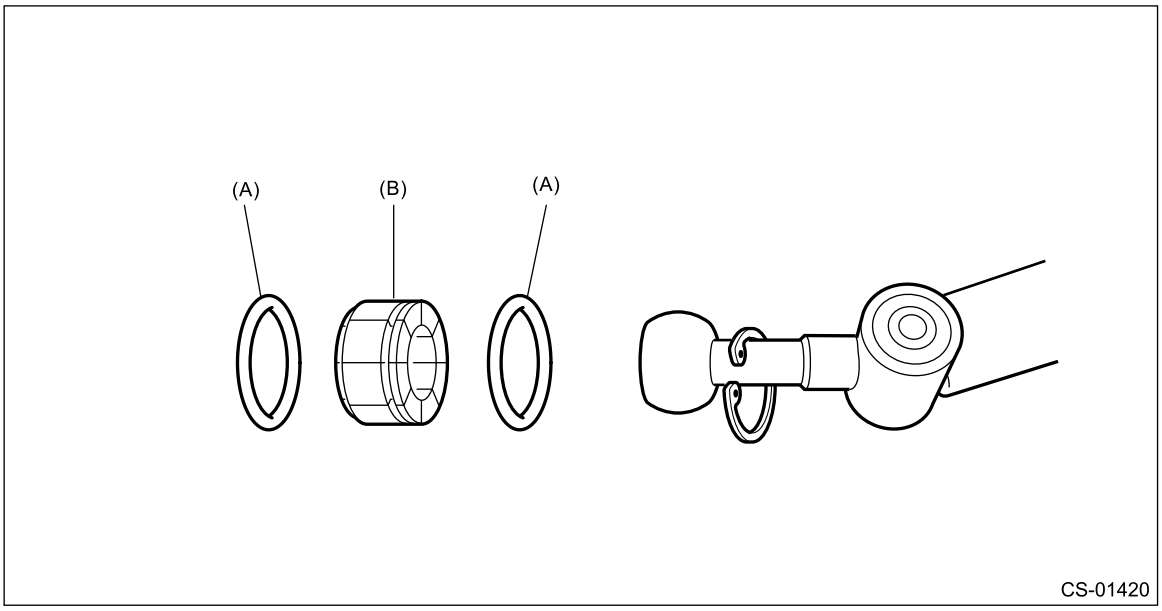


(A) Snap ring

5. Separate the gear shift lever and the stay.



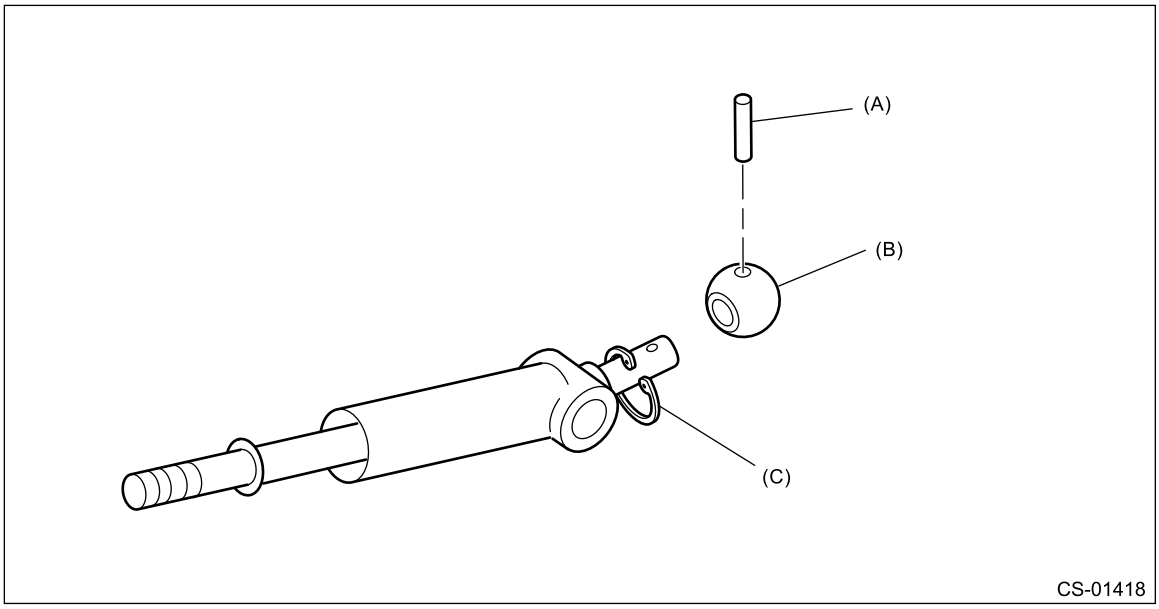
6. Remove the boot and bushing from the gear shift lever.



(A) O-ring

(B) Bushing

7. Remove the spring pin, and then remove the bushing and snap ring.

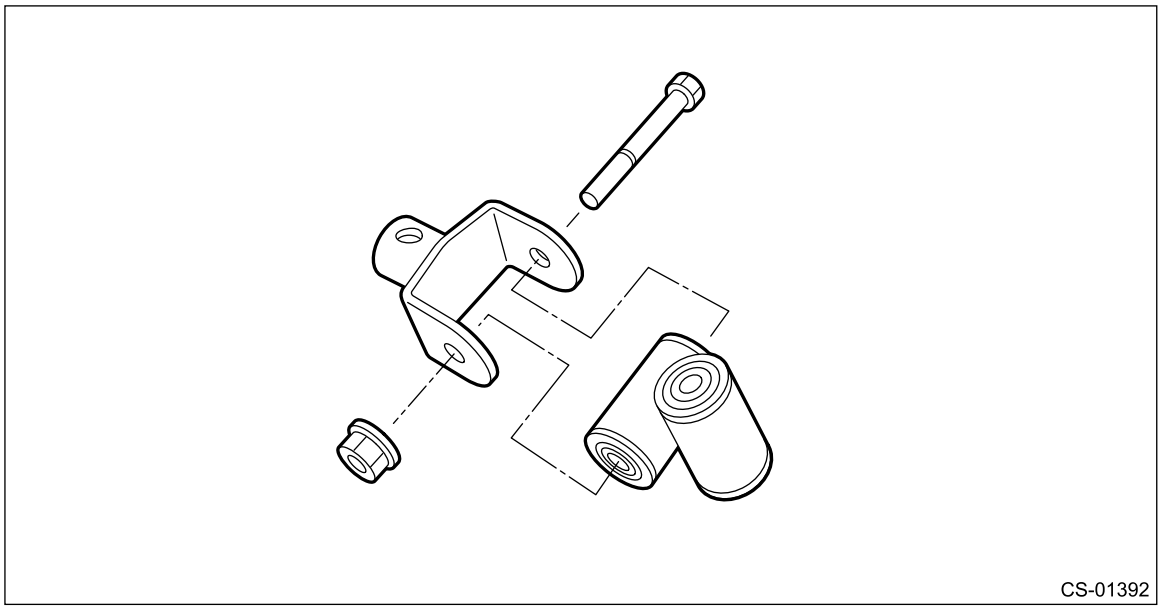


(A) Spring pin

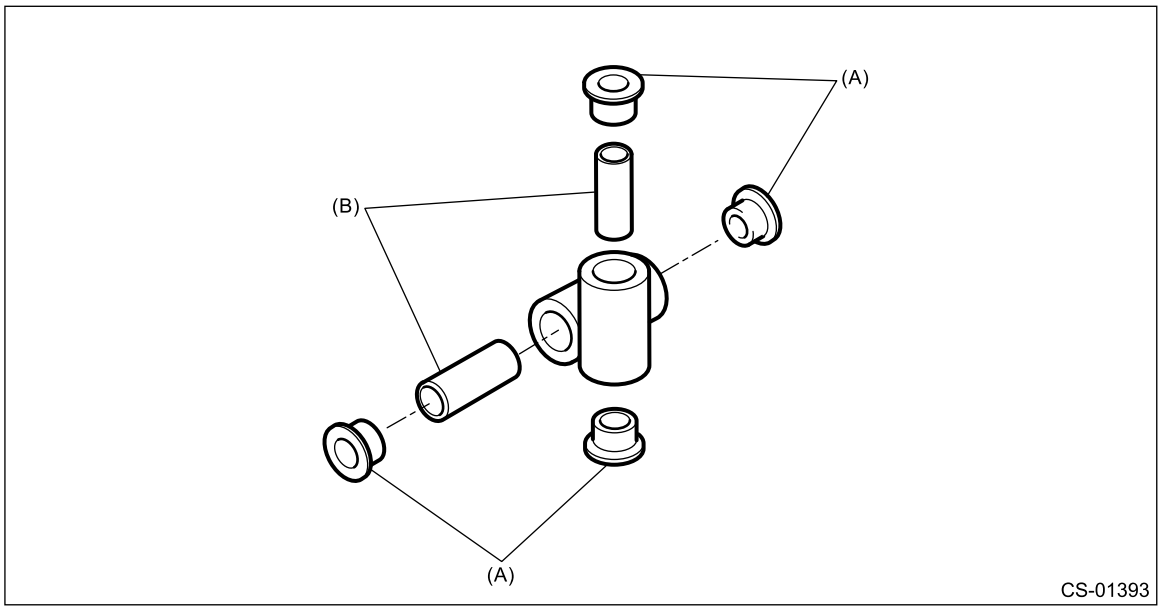
(B) Bushing

(C) Snap ring

8. Remove the boss from the joint.



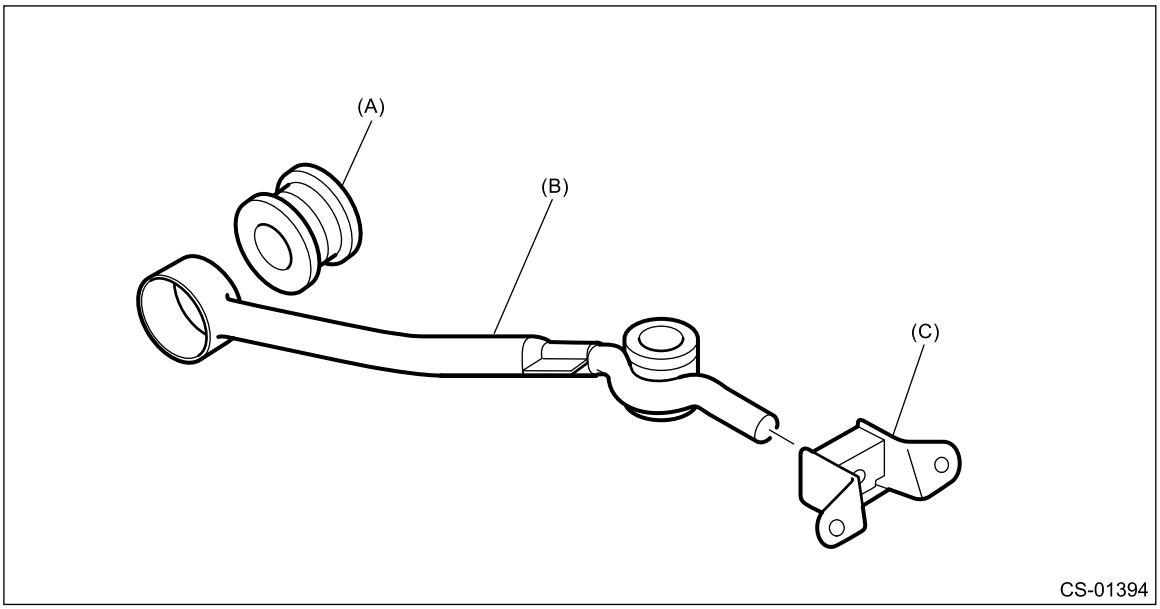
9. Remove the bushing and spacer from the boss.



(A) Bushing

(B) Spacer

10. Remove the bushing and cushion rubber from the stay.



(A) Bushing B
(B) Stay
(C) Cushion rubber

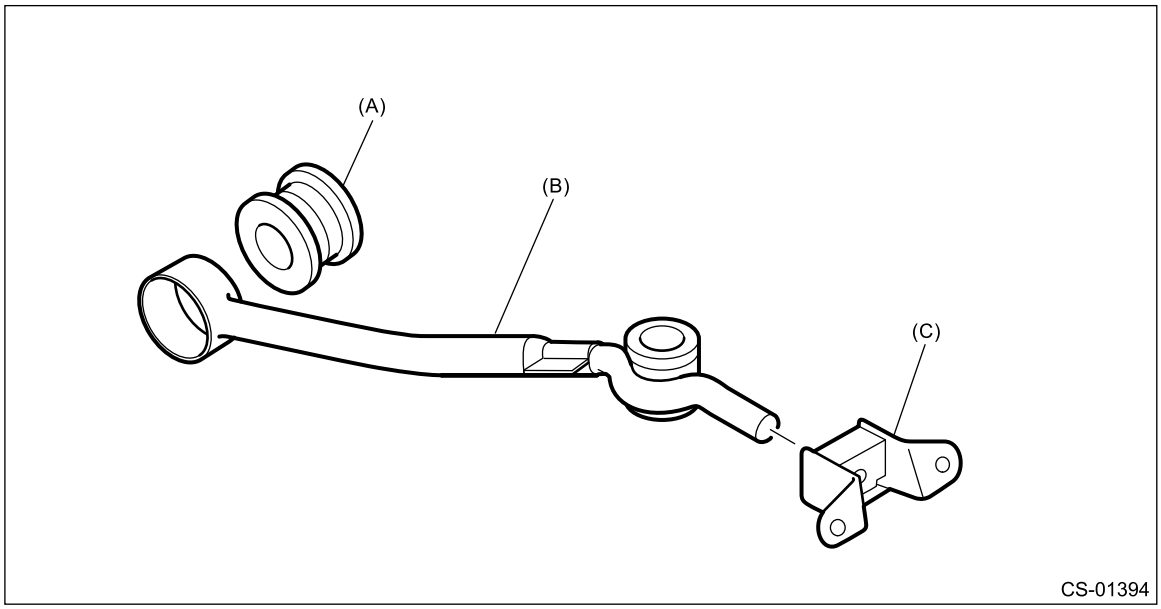
CONTROL SYSTEMS > MT Gear Shift Lever

ASSEMBLY

Note:

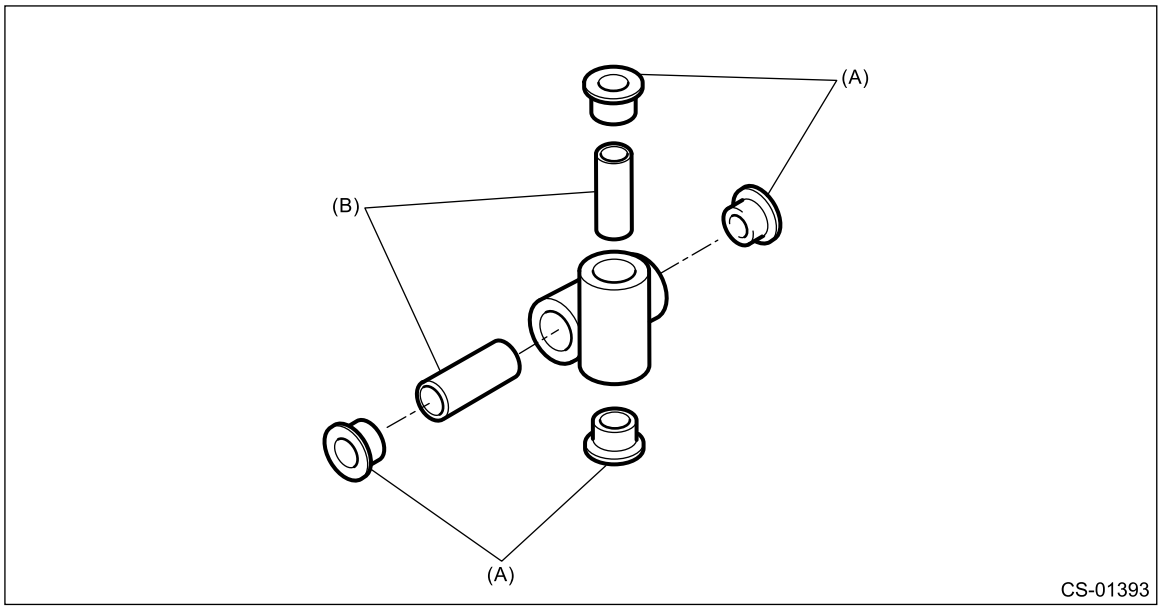
- **Clean all the parts before assembly.**
- **Apply NIGTIGHT LYW No. 2 grease or equivalent to each part. Ref. to CONTROL SYSTEMS>General Description>COMPONENT > 5MT GEAR SHIFT LEVER.**

1. Mount the bushing and cushion rubber to the stay.



(A) Bushing
(B) Stay
(C) Cushion rubber

2. Install the bushing and spacer to boss.



(A) Bushing

(B) Spacer

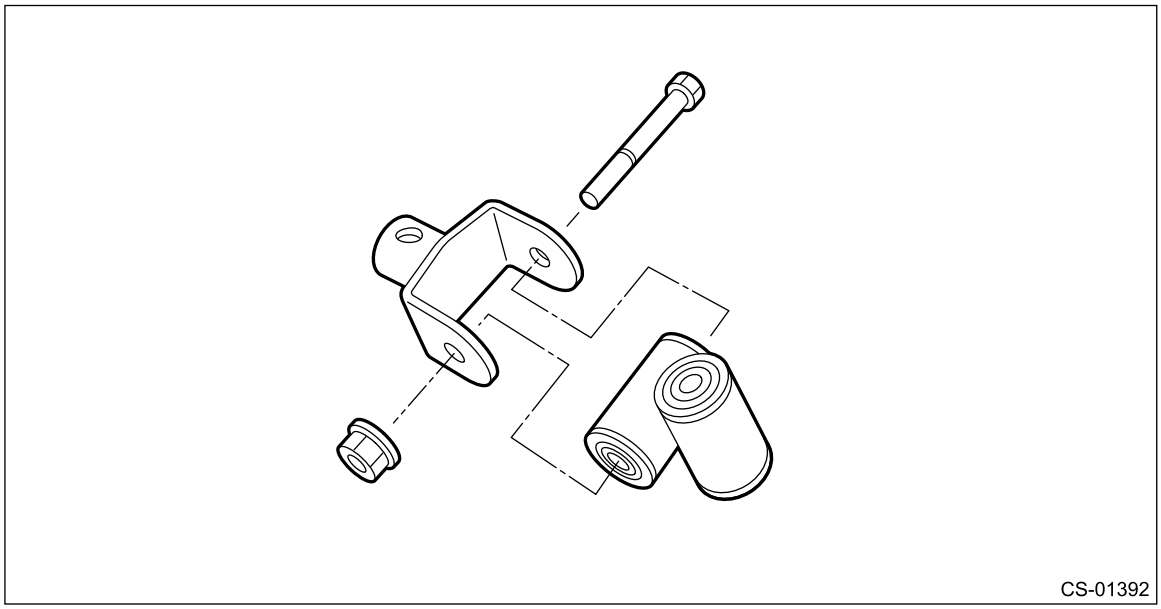
3. Install the boss to the joint.

Note:

Use a new self-locking nut.

Tightening torque:

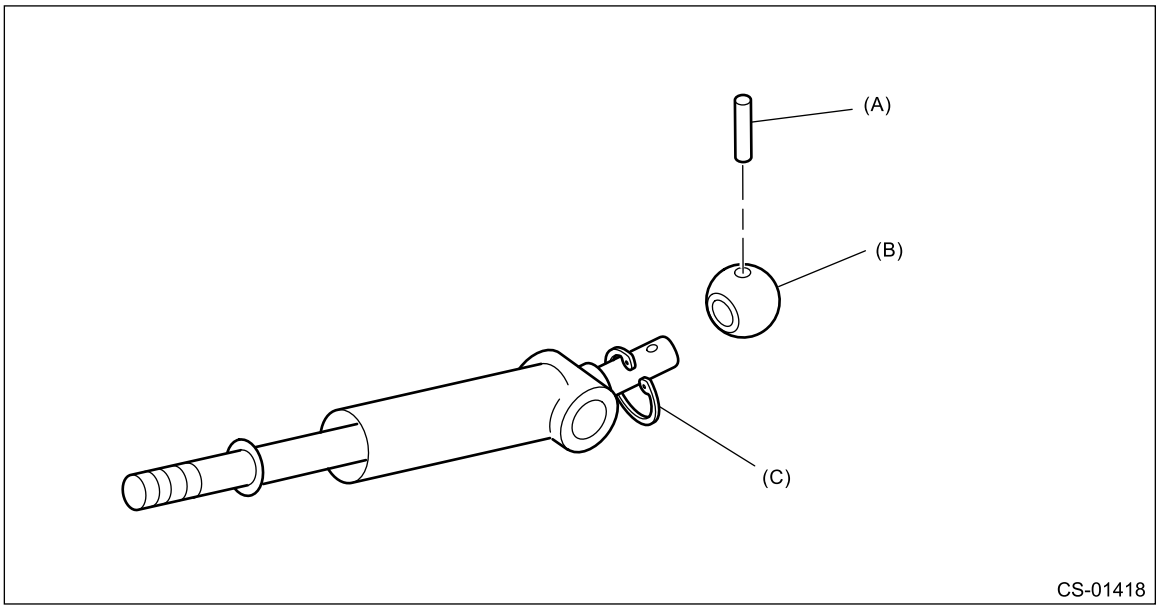
12 N·m (1.2 kgf-m, 8.9 ft-lb)



4. Install the snap ring to gear shift lever and install the bushing.

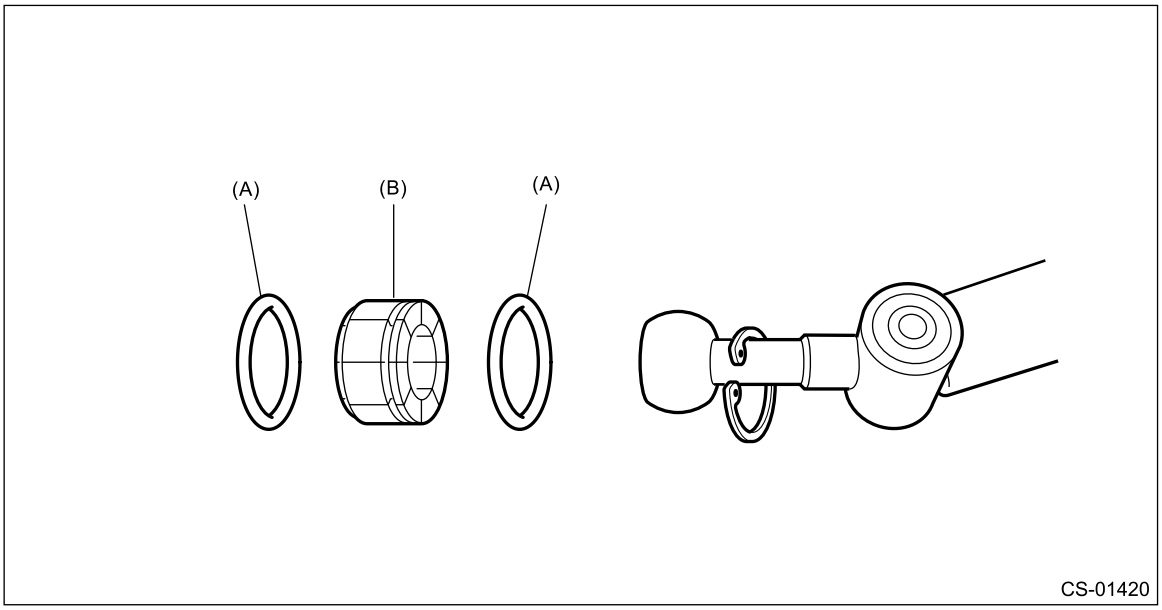
Note:

Apply grease to the bushing.



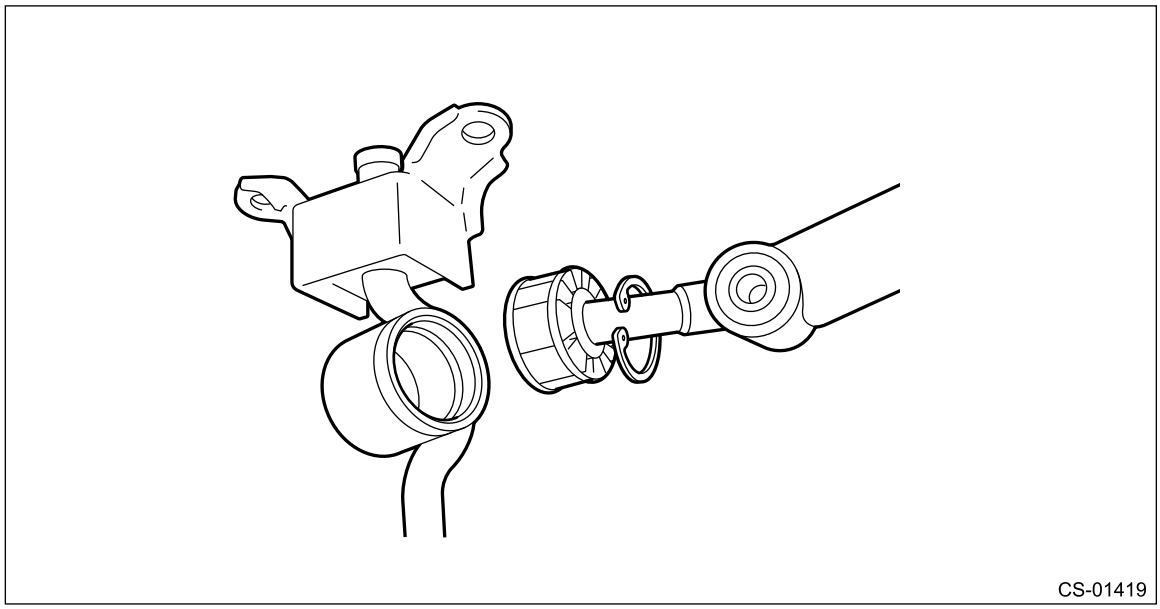
(A) Spring pin
(B) Bushing
(C) Snap ring

5. Apply grease to the bushing and O-ring, and then install to gear shift lever.

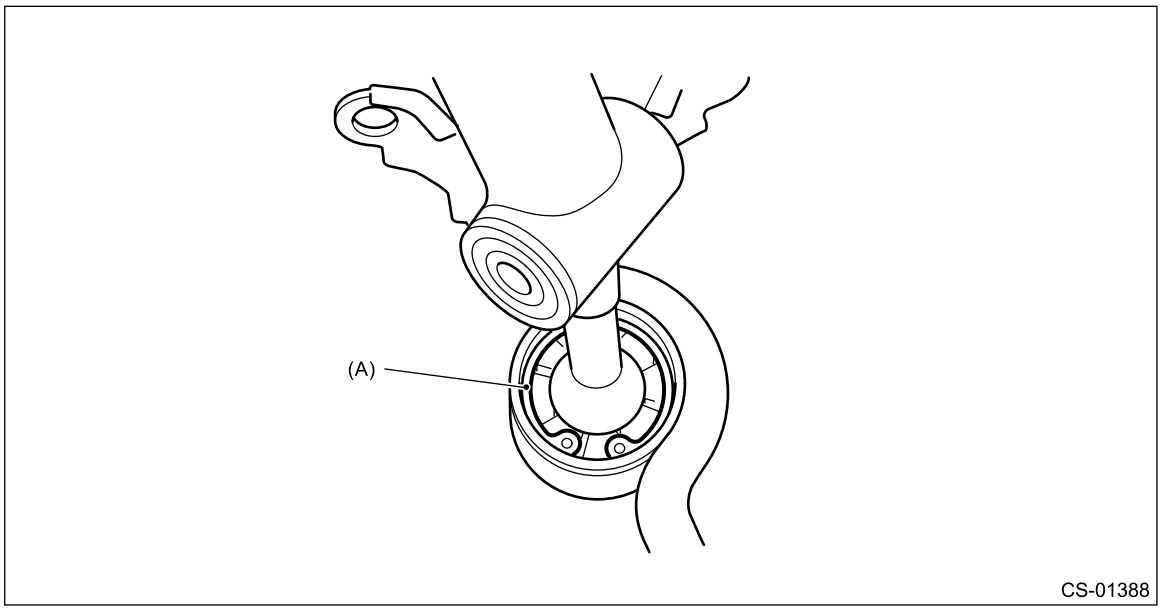


(A) O-ring
(B) Bushing

6. Apply sufficient grease into boss, and then install the gear shift lever to the stay.



7. Install the snap ring.



(A) Snap ring

8. Insert the gear shift lever and rod into boot hole.

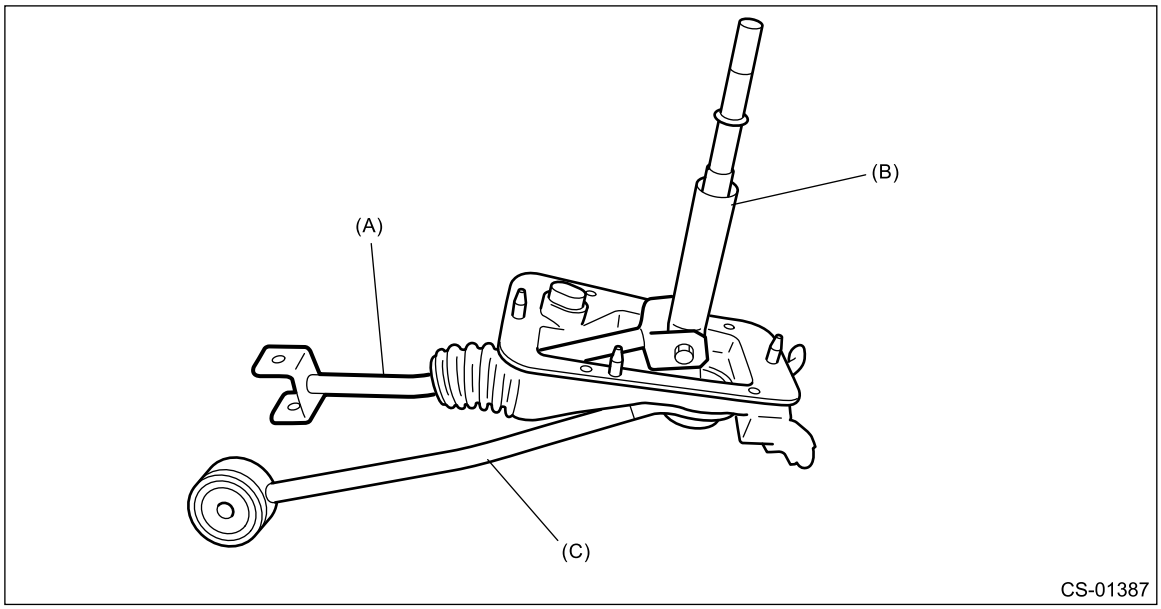
9. Install the rod.

Note:

Use a new self-locking nut.

Tightening torque:

12 N·m (1.2 kgf-m, 8.9 ft-lb)



(A) Rod

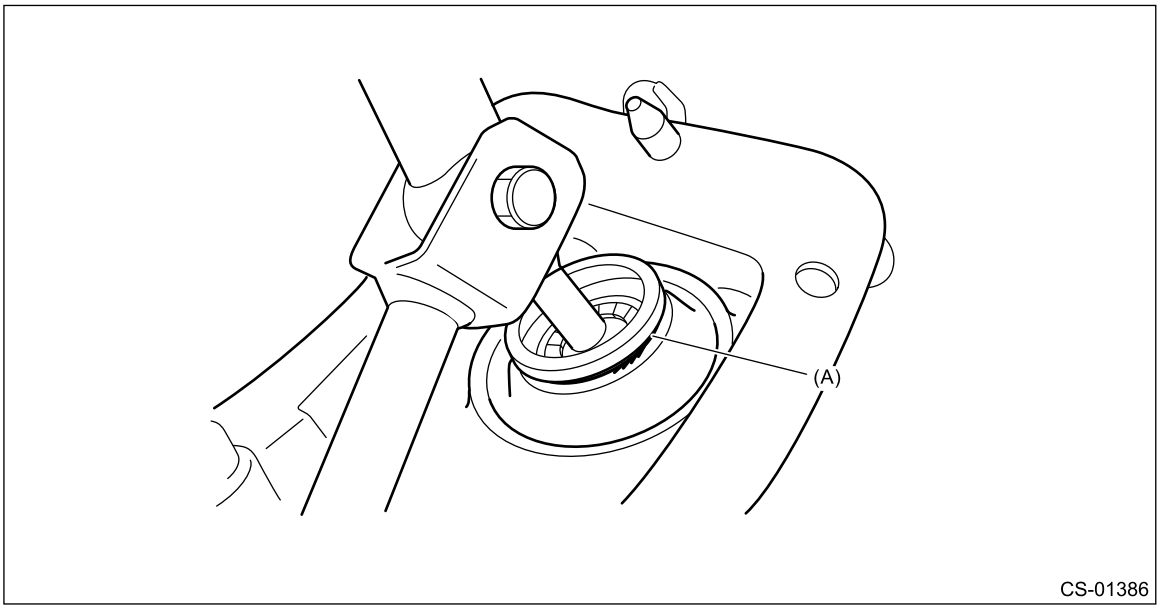
(B) Lever

(C) Stay

10. Install the lock wire.

Note:

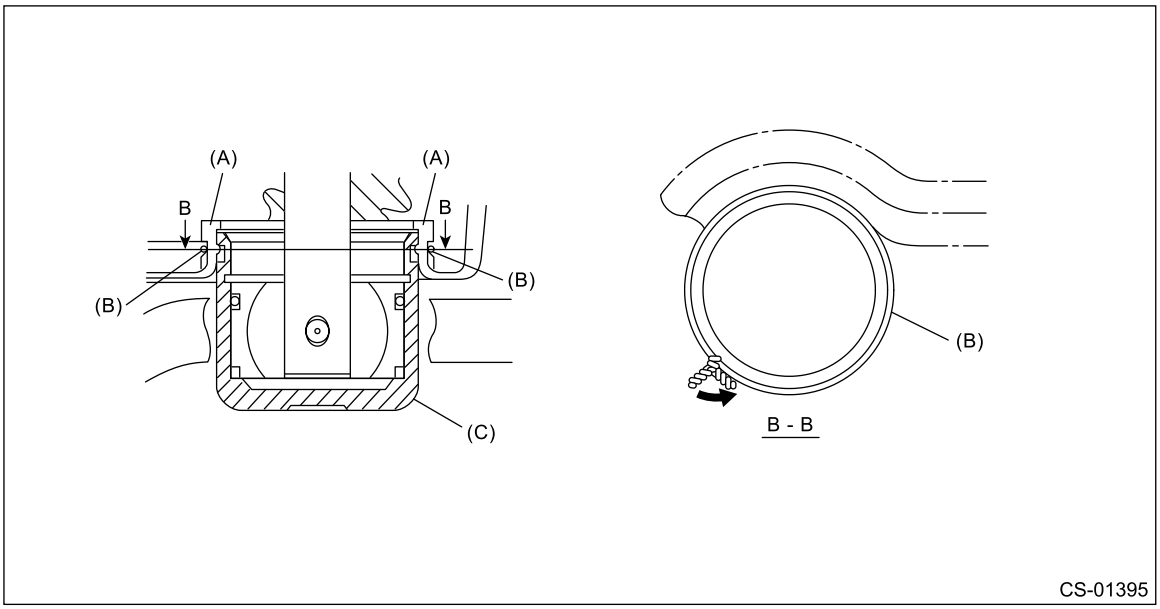
Use a new lock wire.



(A) Lock wire

Note:

- **Install the lock wire to the stay groove.**
- **Bend the extra wire to the same direction of lock wire winding.**



(A) Inner boot

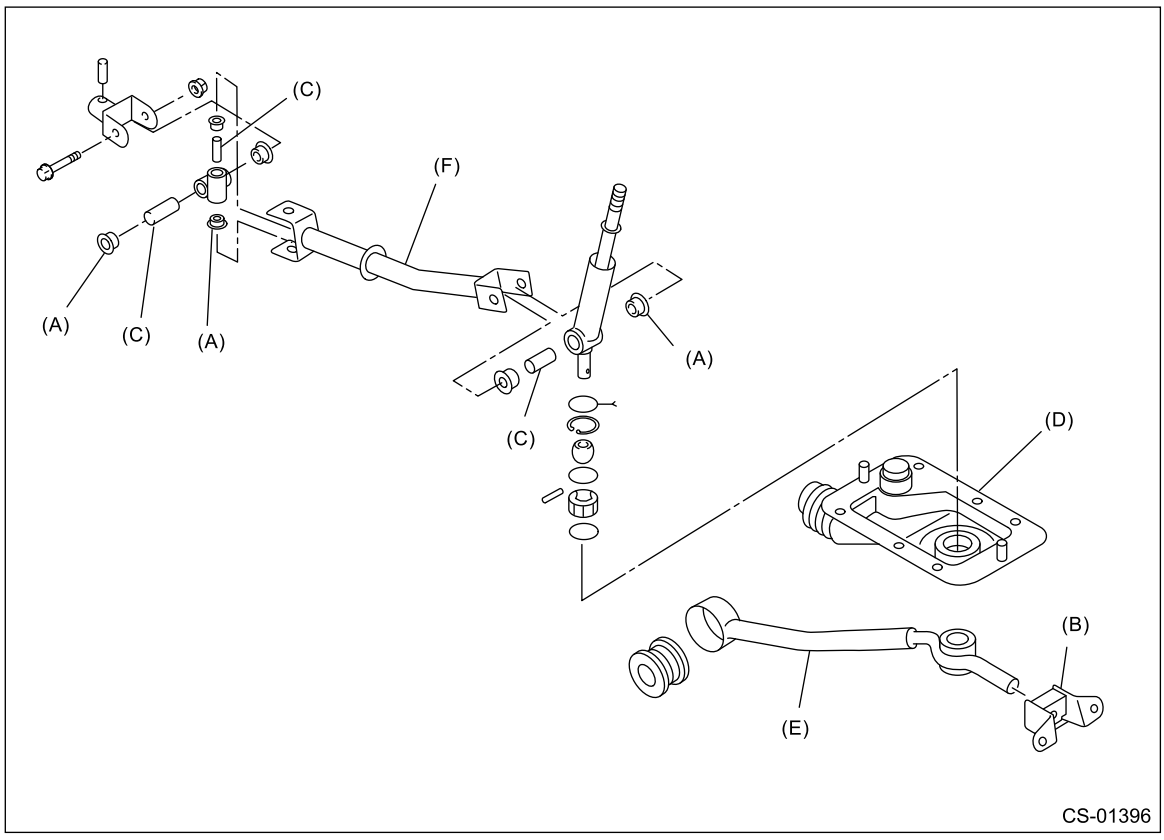
(B) Lock wire

(C) Stay

CONTROL SYSTEMS > MT Gear Shift Lever

INSPECTION

1. Check the parts (bushing, cushion rubber, spacer, boot, stay and rod, etc.) for deformation, damage and wear. If necessary, correct or replace faulty parts. Compare the removed parts with new parts to judge if there are damages or not.



(A) Bushing

(B) Cushion rubber

(C) Spacer

(D) Boot

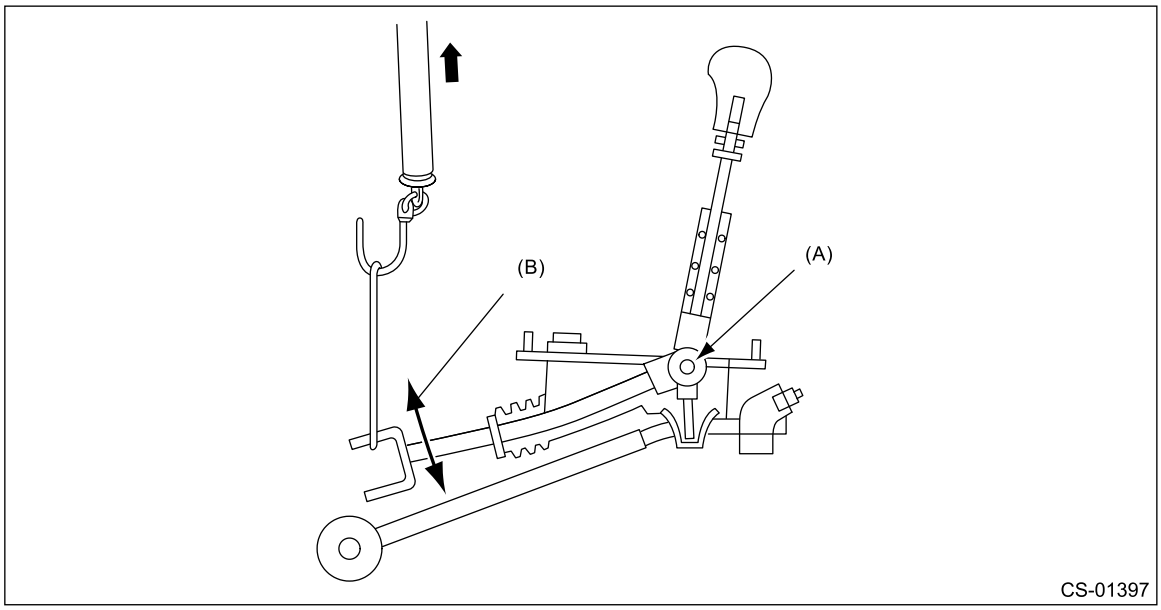
(E) Stay

(F) Rod

2. Check the swing torque of rod linked with the gear shift lever. If the torque exceeds the specifications, replace the bushing or retighten nuts.

Swing torque:

3.7 N (0.38 kgf, 0.83 lbf) or less



(A) Pivot

(B) Swing torque

INSPECTION

Symptoms	Possible cause	Corrective action
Select lever	Starter does not run.	Adjust the select cable and inhibitor switch, or inspect the circuit.
	Back-up light does not illuminate.	Adjust the select cable and inhibitor switch, or inspect the circuit.
	AT shift lock system does not operate normally.	Adjust the select cable and inhibitor switch, or inspect the circuit.
	Manual mode can not be set.	Inspect the mode switch and select lever, or inspect the circuit.
	Up-shift is not engaged at manual mode.	Check the shift-up switch and circuit.
	Down-shift is not engaged at manual mode.	Check the shift-down switch and circuit.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)

5MT

1. General Description
2. Transmission Gear Oil
3. Manual Transmission Assembly
4. Transmission Mounting System
5. Oil Seal
6. Differential Side Retainer Oil Seal
7. Switches and Harness
8. Air Breather Hose
9. Preparation for Overhaul
10. Transfer Case and Extension Case Assembly
11. Transfer Drive Gear
12. Transfer Driven Gear
13. Center Differential
14. Reverse Check Sleeve
15. Transmission Case
16. Main Shaft Assembly
17. Drive Pinion Shaft Assembly
18. Front Differential Assembly
19. Reverse Idler Gear
20. Shifter Fork and Rod
21. General Diagnostic Table

SPECIFICATION

1. MANUAL TRANSMISSION AND DIFFERENTIAL

Model			2.0 L
Type			5-forward speeds and 1-reverse (all stage with synchromesh)
Transmission gear ratio		1st	3.454
		2nd	1.888
		3rd	1.296
		4th	0.972
		5th	0.738
		Rev.	3.333
Front reduction gear	Final	Type of gear	Hypoid
		Gear ratio	4.111
Rear reduction gear	Transfer	Type of gear	Helical
		Gear ratio	1.000
Front differential	Type and number of gear		Straight bevel gear (bevel pinion: 2, bevel gear: 2)
Center differential	Type and number of gear		Straight bevel gear (bevel pinion: 2, bevel gear: 2 and viscous coupling)
Transmission gear oil			SUBARU GEAR OIL EXTRA MT or equivalent
Transmission gear oil capacity			3.5 L (3.7 US qt, 3.1 Imp qt)

2. TRANSMISSION GEAR OIL

Caution:

If an alternative gear oil is used, you may not have expected functionality and performance.

Recommended oil:

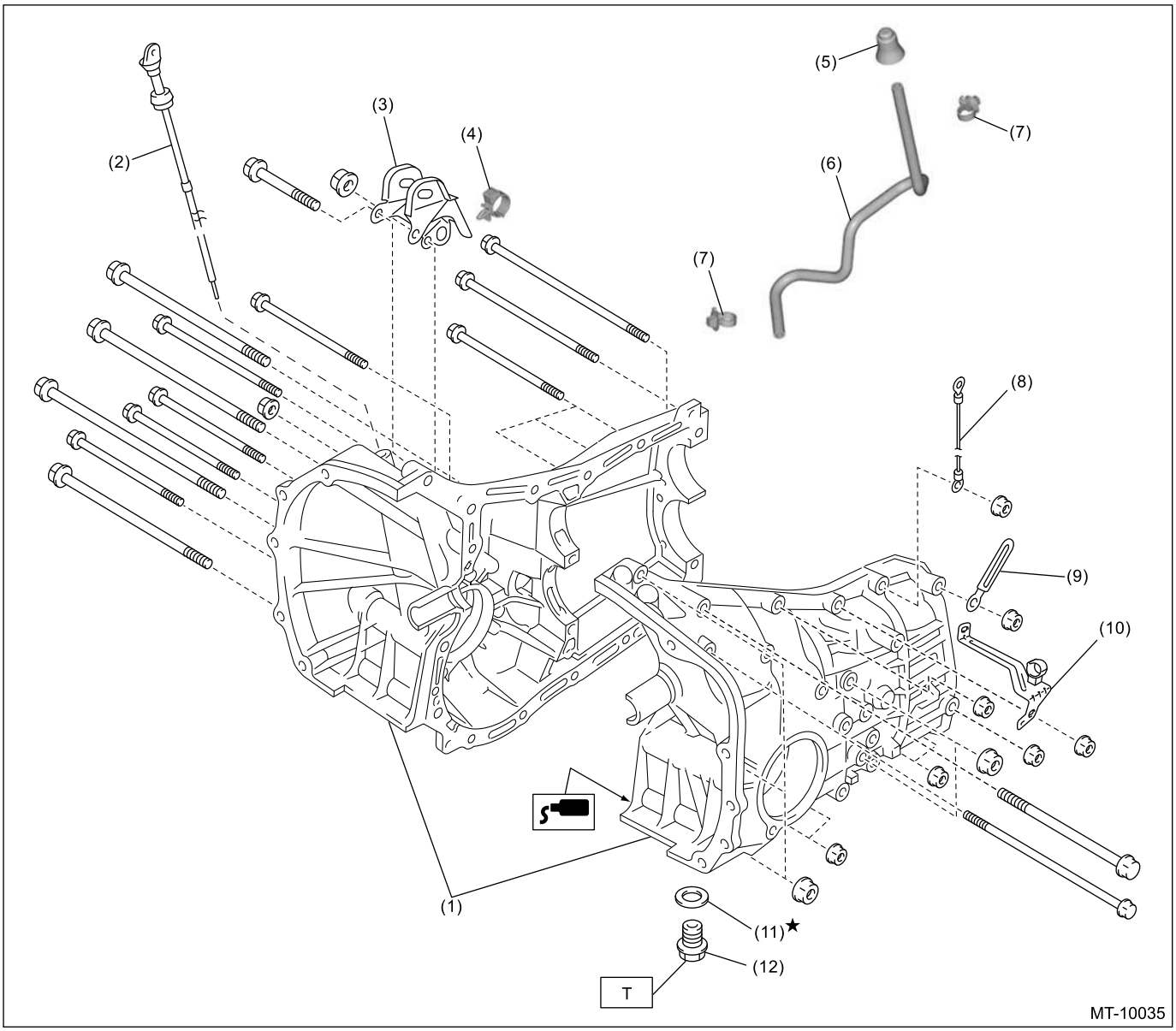
SUBARU GEAR OIL EXTRA MT

Alternative:

GL-5 (75W-90)

COMPONENT

1. TRANSMISSION CASE

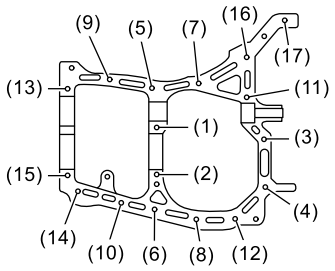


(1) Transmission case ASSY
(2) Oil level gauge
(3) Pitching stopper bracket
(4) Clamp
(5) Air breather cap
(6) Air breather hose
(7) Clip
(8) Transmission radio ground cord
(9) Harness clip
(10) Harness bracket
(11) Gasket
(12) Drain plug

Tightening torque: N·m (kgf-m, ft-lb)

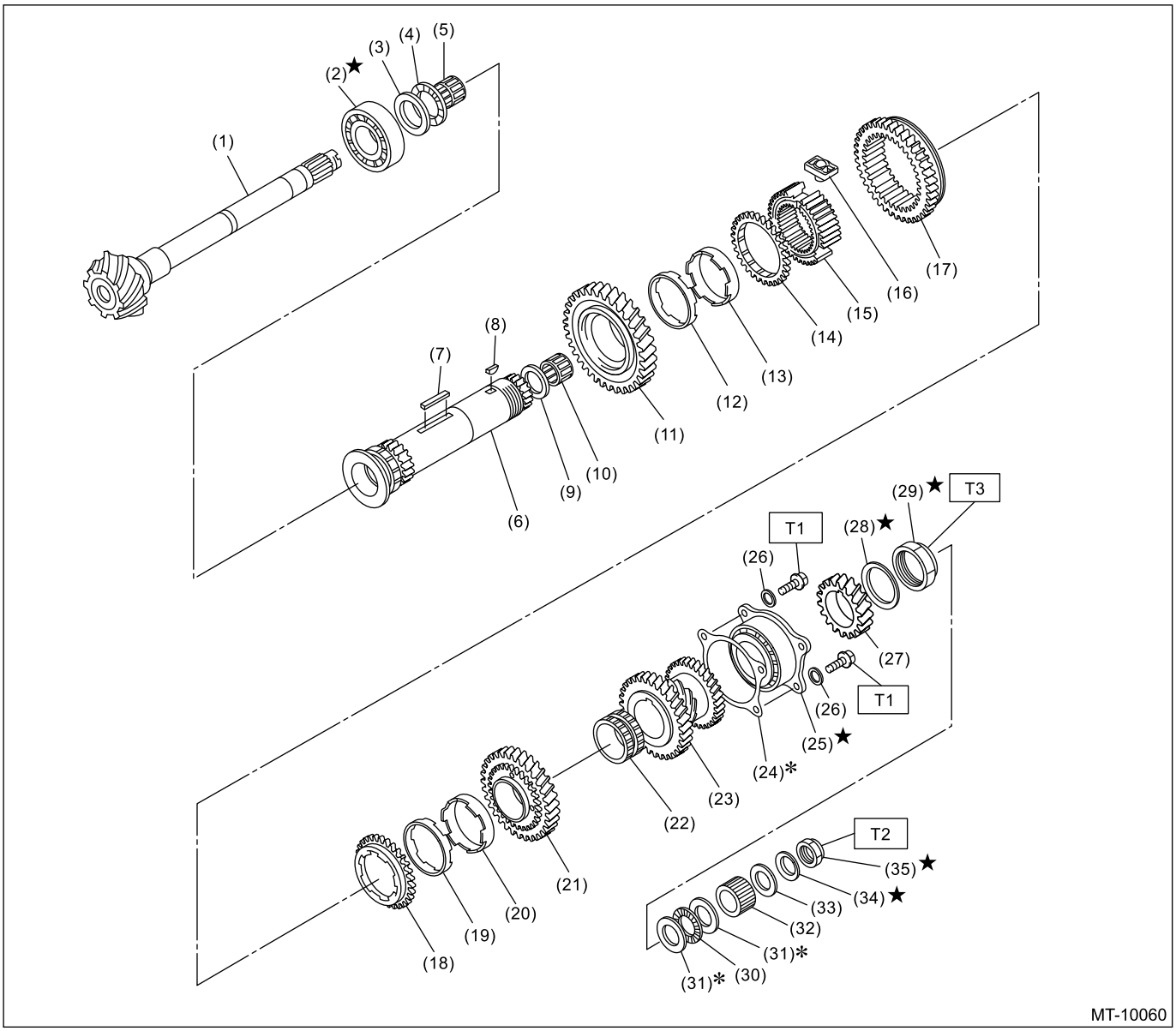
T: 44 (4.5, 32.5) (aluminum gasket, silver)
70 (7.1, 51.6) (copper gasket, brown)
70 (7.1, 51.6) (metal gasket, black)

Transmission case tightening torque



Bolt No.	Bolt size mm	Tightening torque: N·m (kgf-m, ft-lb)
(5) — (15)	8	25 (2.5, 18.4)
(1) — (4) (16), (17)	10	39 (4.0, 28.8)

2. DRIVE PINION SHAFT ASSEMBLY

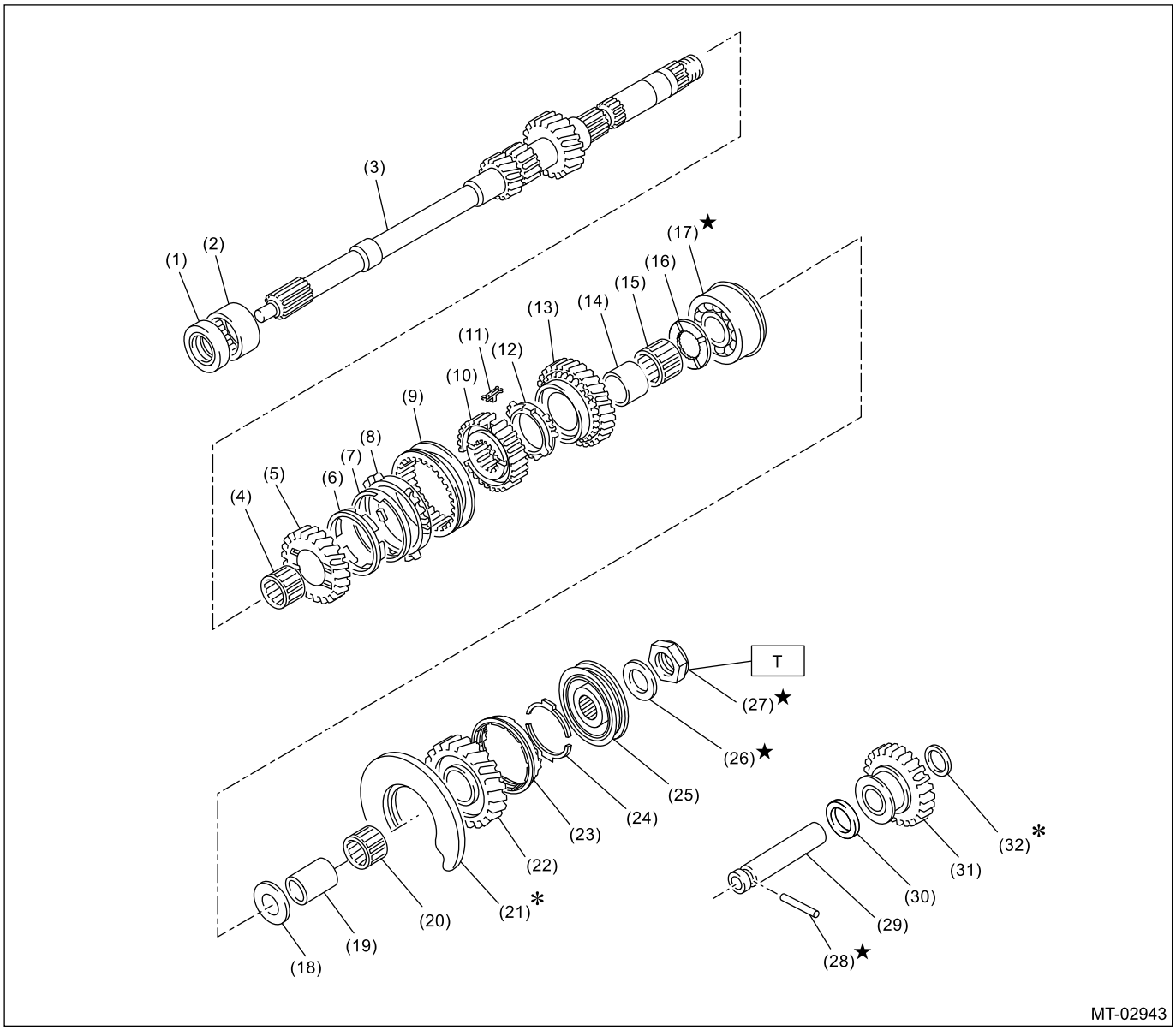


(1) Drive pinion shaft
(2) Roller bearing
(3) Washer
(4) Thrust bearing
(5) Needle bearing
(6) Driven shaft
(7) Key
(8) Woodruff key
(9) Drive pinion collar
(10) Needle bearing
(11) 1st driven gear
(12) Inner baulk ring
(13) Synchro cone
(14) Outer baulk ring
(15) 1st-2nd synchronizer hub
(16) 1st-2nd shifting insert
(17) Reverse driven gear
(18) Outer baulk ring
(19) Synchro cone
(20) Inner baulk ring
(21) 2nd driven gear
(22) 2nd driven gear bushing
(23) 3rd-4th driven gear
(24) Drive pinion shim
(25) Double taper roller bearing
(26) Spring washer
(27) 5th driven gear
(28) Lock washer
(29) Lock nut
(30) Thrust bearing
(31) Adjusting washer
(32) Differential bevel gear sleeve
(33) Washer
(34) Lock washer
(35) Lock nut

Tightening torque: N·m (kgf-m, ft-lb)

T1: 30 (3.1, 22.1)
T2: 120 (12.2, 88.5)
T3: 260 (26.5, 191.8)

3. MAIN SHAFT ASSEMBLY

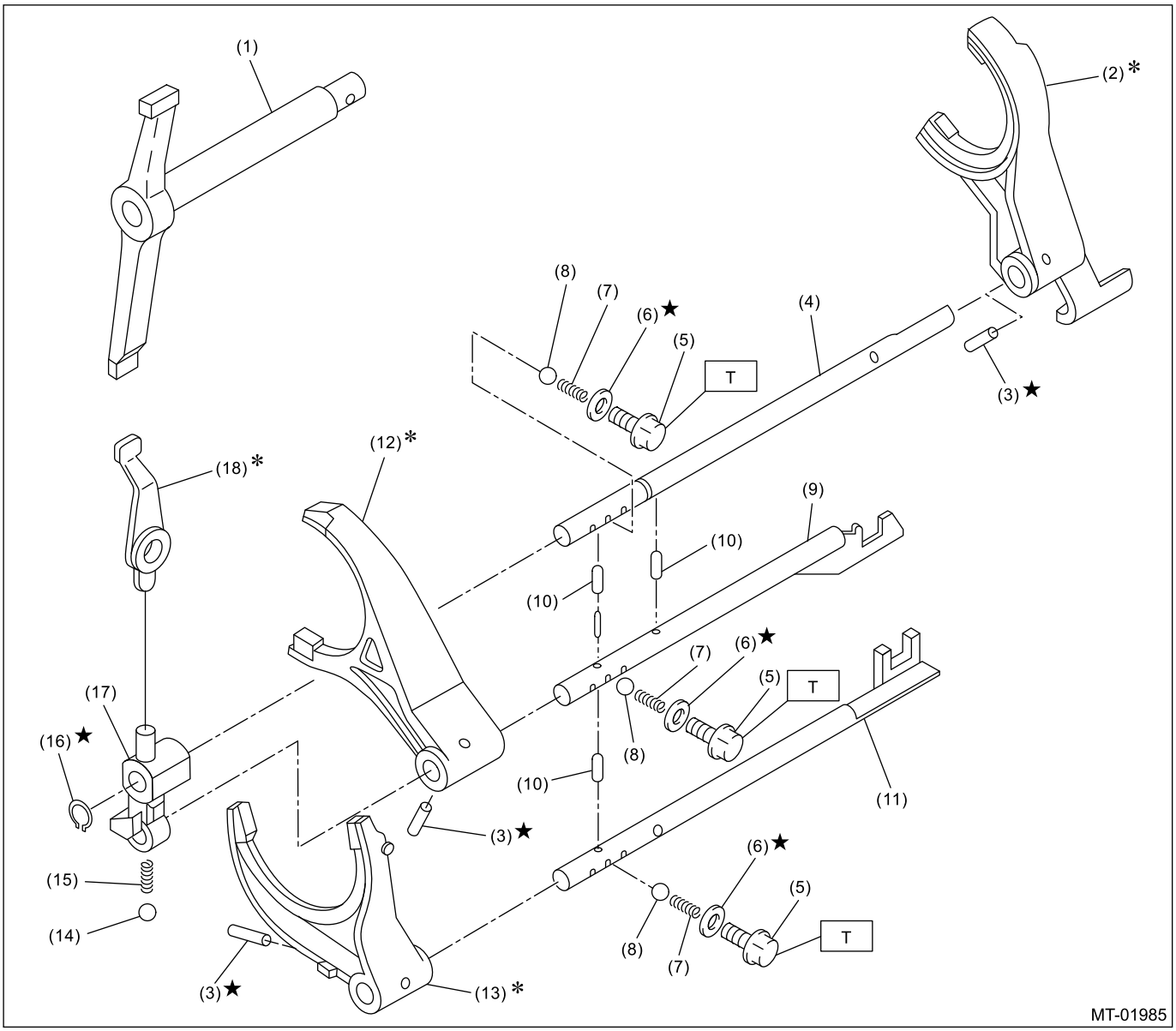


(1) Oil seal
(2) Needle bearing
(3) Main shaft
(4) 3rd needle bearing
(5) 3rd drive gear
(6) Inner baulk ring
(7) 3rd synchro cone
(8) Outer baulk ring
(9) 3rd-4th coupling sleeve
(10) 3rd-4th synchronizer hub
(11) 3rd-4th shifting insert
(12) 4th baulk ring
(13) 4th drive gear
(14) 4th needle bearing race
(15) 4th needle bearing
(16) 4th gear thrust washer
(17) Double ball bearing
(18) 5th gear thrust washer
(19) 5th needle bearing race
(20) 5th needle bearing
(21) Main shaft rear plate
(22) 5th drive gear
(23) 5th baulk ring
(24) Baulk lever
(25) 5th hub & sleeve No. 2
(26) Lock washer
(27) Lock nut
(28) Straight pin
(29) Reverse idler gear shaft
(30) Reverse idler gear washer
(31) Reverse idler gear
(32) Adjusting washer

Tightening torque: N·m (kgf-m, ft-lb)

T: 120 (12.2, 88.5)

4. SHIFTER FORK AND SHIFTER ROD

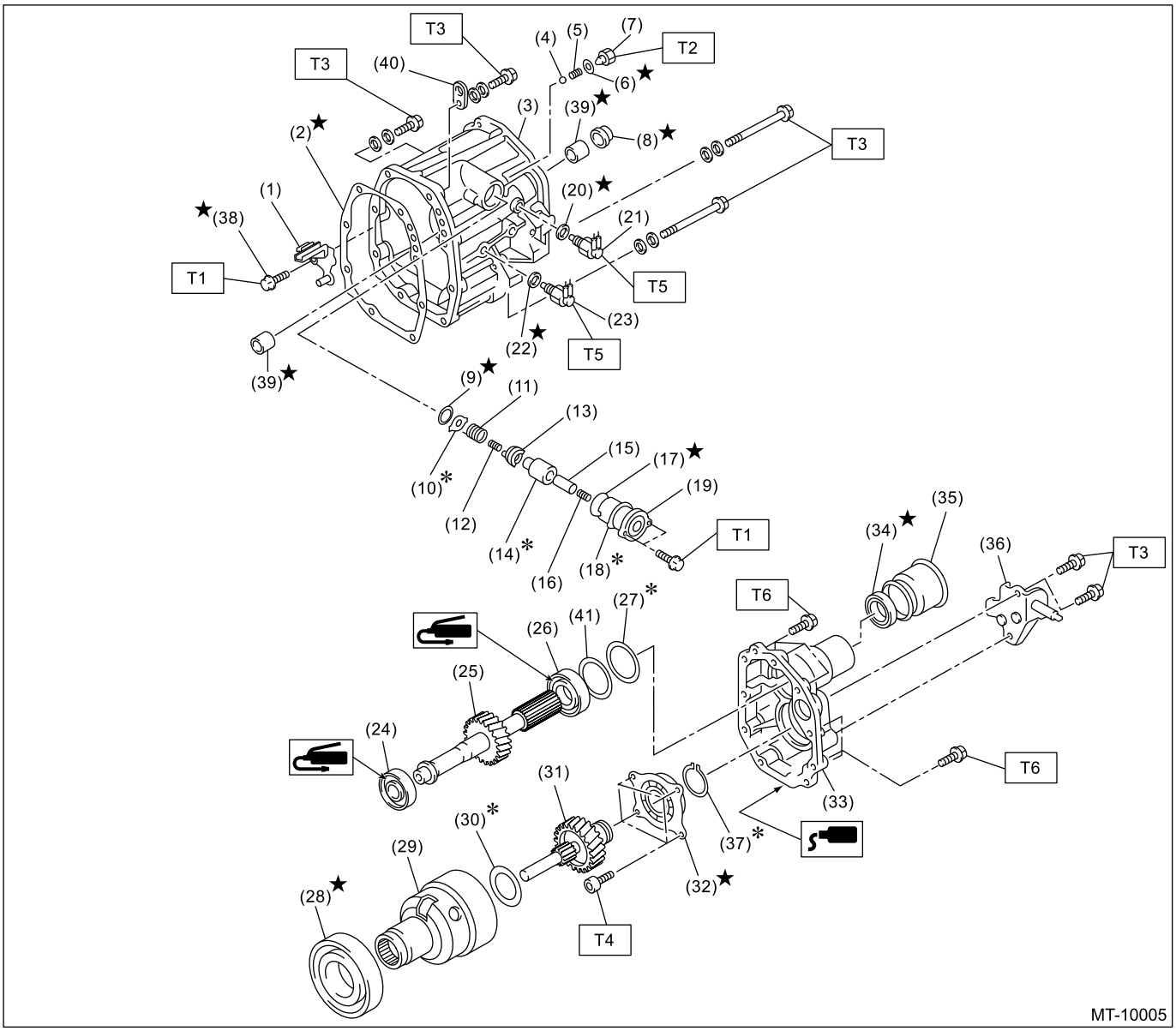


(1) Shifter arm
(2) 5th shifter fork
(3) Straight pin
(4) Reverse fork rod
(5) Checking ball plug
(6) Gasket
(7) Checking ball spring
(8) Check ball
(9) 3rd-4th fork rod
(10) Interlock plunger
(11) 1st-2nd fork rod
(12) 3rd-4th shifter fork
(13) 1st-2nd shifter fork
(14) Check ball
(15) Checking ball spring
(16) Snap ring (outer)
(17) Reverse fork rod arm
(18) Reverse shifter lever

Tightening torque: N·m (kgf-m, ft-lb)

T: 20 (2.0, 14.8)

5. TRANSFER CASE AND EXTENSION



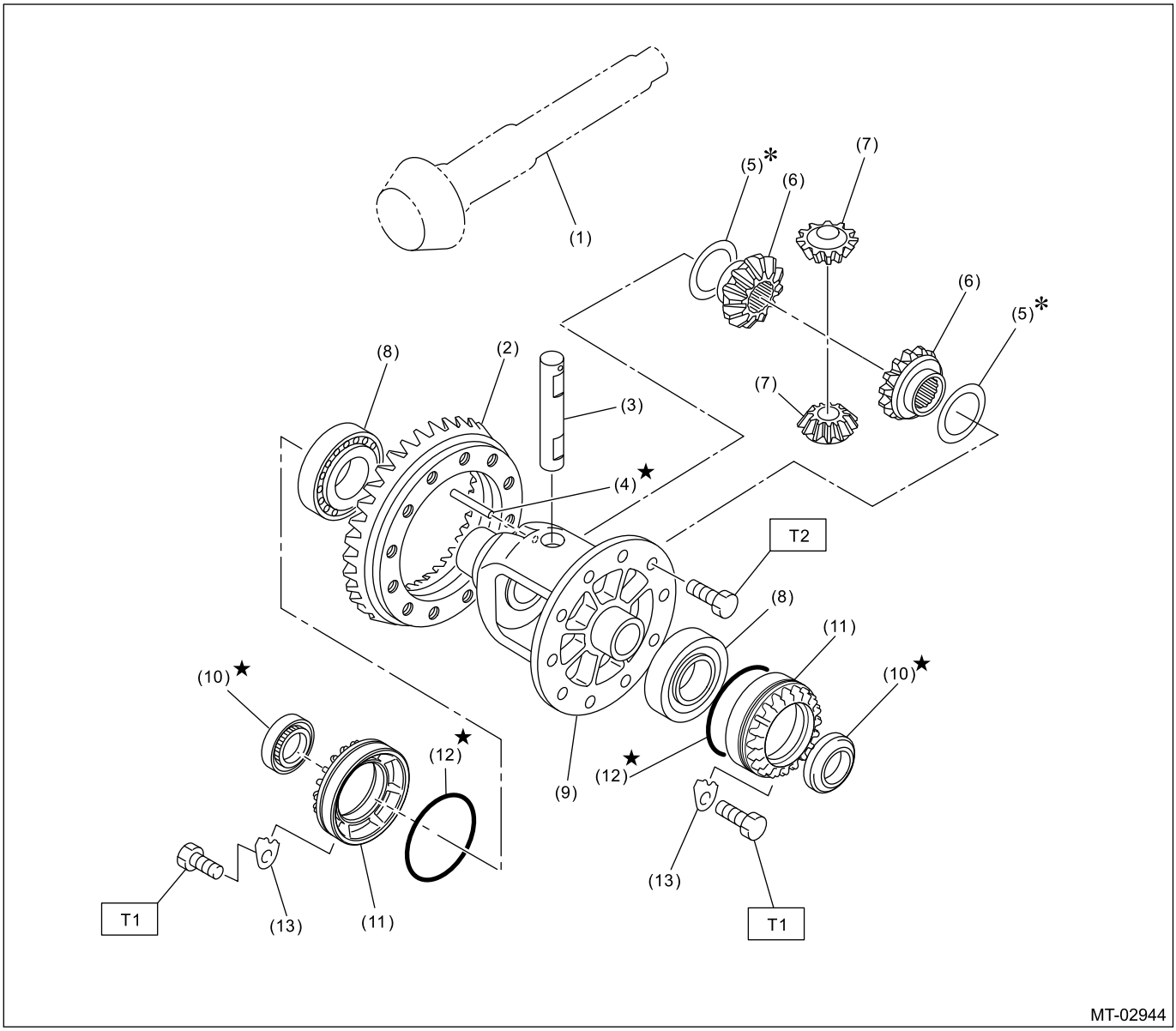
(1) Oil guide
(2) Gasket
(3) Transfer case
(4) Ball
(5) Reverse accent spring
(6) Gasket
(7) Plug
(8) Oil seal
(9) Snap ring (inner)
(10) Reverse check plate
(11) Reverse check spring
(12) Reverse return spring
(13) Reverse check cam
(14) Reverse accent shaft
(15) Return spring cap
(18) Adjusting select shim
(19) Reverse check sleeve
(20) Gasket
(21) Neutral position switch
(22) Gasket
(23) Back-up light switch
(24) Taper roller bearing (transfer case side)
(25) Transfer driven gear
(26) Taper roller bearing (extension case side)
(27) Adjusting washer
(28) Ball bearing
(29) Center differential
(30) Adjusting washer
(31) Transfer drive gear
(32) Ball bearing
(35) Dust cover
(36) Shift bracket
(37) Snap ring
(38) Precoat bolt
(39) Roller bearing
(40) Transmission hanger
(41) Dish plate

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6.4 (0.7, 4.7)
T2: 9.75 (1.0, 7.2)
T3: 24.5 (2.5, 18.1)
T4: 26 (2.7, 19.2)
T5: 32.3 (3.3, 23.8)
T6: 40 (4.1, 29.5)

(16) Return spring
(17) O-ring
(33) Extension case
(34) Oil seal

6. FRONT DIFFERENTIAL

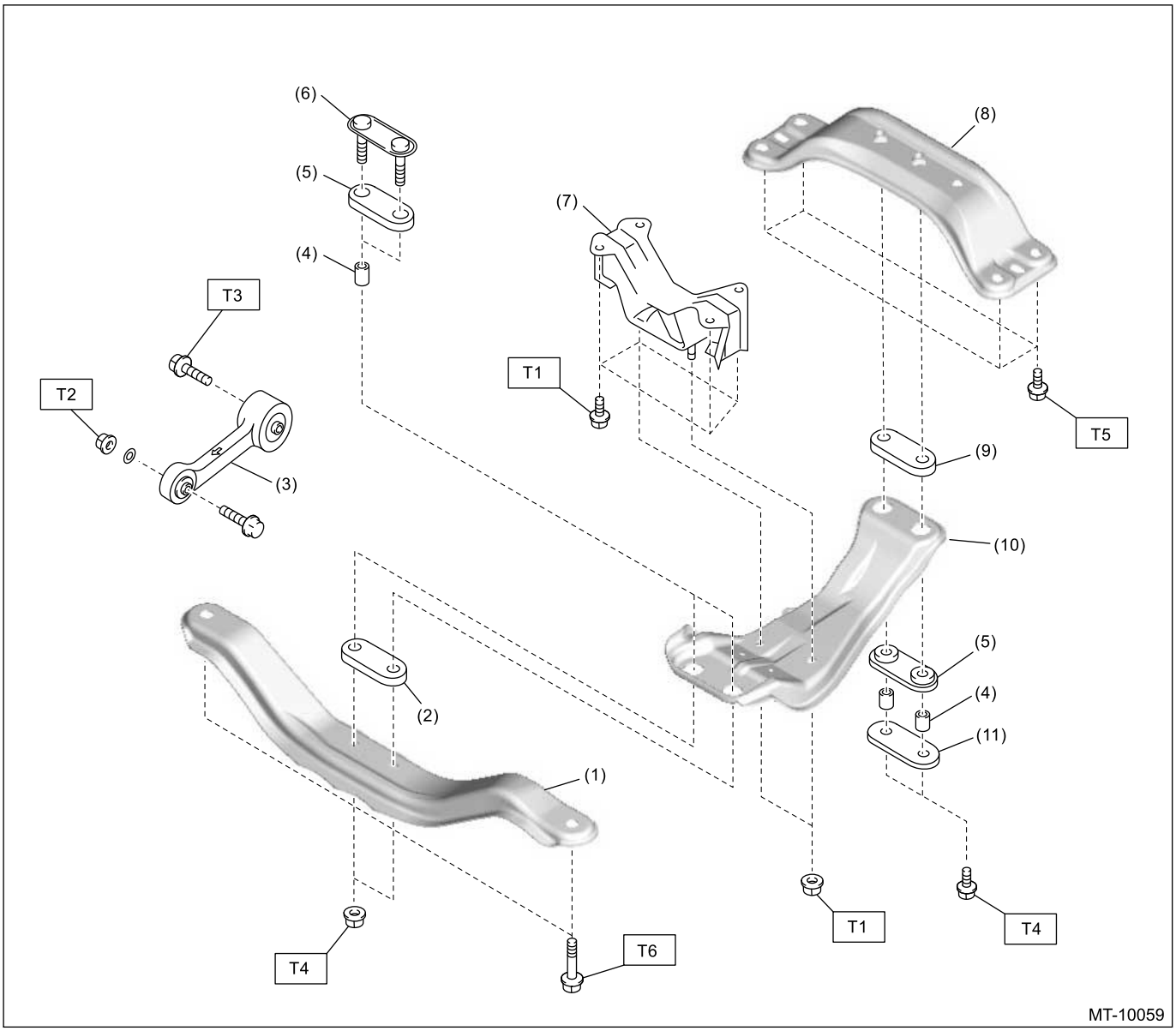


(1) Drive pinion shaft
(2) Hypoid driven gear
(3) Pinion shaft
(4) Straight pin
(5) Adjusting washer
(6) Differential bevel gear
(7) Differential bevel pinion
(8) Taper roller bearing
(9) Differential case
(10) Oil seal
(11) Differential side retainer
(12) O-ring
(13) Retainer lock plate

Tightening torque: N·m (kgf-m, ft-lb)

T1: 25 (2.5, 18.4)
T2: 62 (6.3, 45.7)

7. TRANSMISSION MOUNTING



(1) Front crossmember
(2) Front cushion rubber
(3) Pitching stopper
(4) Spacer
(5) Rear cushion rubber
(6) Front plate
(7) Transmission cushion rubber
(8) Rear crossmember
(9) Rear cushion rubber
(10) Center crossmember
(11) Rear plate

Tightening torque: N·m (kgf-m, ft-lb)

T1: 35 (3.6, 25.8)
T2: 50 (5.1, 36.9)
T3: 58 (5.9, 42.8)
T4: 70 (7.1, 51.6)
T5: 75 (7.6, 55.3)
T6: 140 (14.3, 103.3)

CAUTION

- Remove contamination including dirt and corrosion before removal, installation or disassembly.
- Keep the disassembled parts in order and protect them from dust and dirt.
- Before removal, installation or disassembly, be sure to clarify the failure. Avoid unnecessary removal, installation, disassembly and replacement.
- When disassembling the case and other light alloy parts, disassemble by using a plastic hammer. Do not pry apart with screwdrivers or other tools.
- Vehicle components are extremely hot after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine gear oil, grease or equivalent. Do not mix gear oil, grease, etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Place shop jacks or rigid racks at the specified points.
- Apply gear oil onto sliding or revolving surfaces before installation.
- Replace deformed or damaged snap rings with new parts.
- Before installing O-rings or oil seals, apply sufficient amount of gear oil to avoid damage and deformation.
- Be careful not to incorrectly install or fail to install O-rings, snap rings and other such parts.
- Before securing a part on a vise, place cushioning material such as wood blocks, aluminum plate, or cloth between the part and the vise.
- Avoid damaging the mating surface of the case.
- Before applying liquid gasket, completely remove and clean the old liquid gasket.
- Be careful of handling the oil seal, O-ring and gasket. If the contact surface of them is damaged, oil leakage may occur.
- When pressing-in the oil seal, make sure that the oil seal lip portion and outer surface are not damaged or tilted.
- When replacing the taper roller bearing, replace the outer race and inner race as a set.
- When replacing the hypoid gear, replace the hypoid driven gear and drive pinion shaft as a set.
- Replace the bolts if the seating surface or the thread surface is excessively rusted.

PREPARATION TOOL

1. SPECIAL TOOL

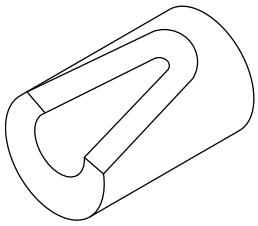
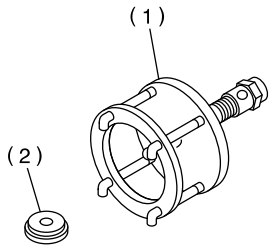
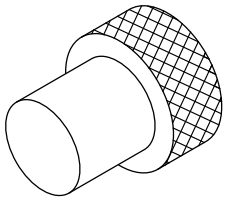
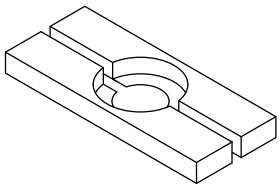
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-399411700	399411700	ACCENT BALL INSTALLER	Used for installing reverse fork rod arm.
 ST-899524100	899524100	PULLER SET	Used for removing the front differential taper roller bearing. (1) Puller (2) Cap
 ST-399780104	399780104	WEIGHT	Used for adjusting preload on the front differential taper roller bearing.
 ST-498077000	498077000	REMOVER	• Used for removing the roller bearing of the drive pinion shaft assembly. • Used for removing the taper roller bearing of transfer driven gear.

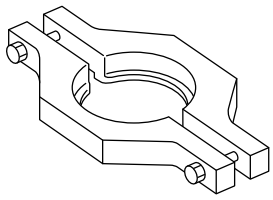
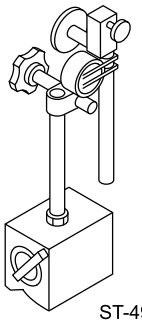
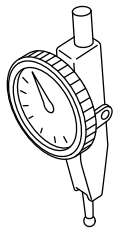
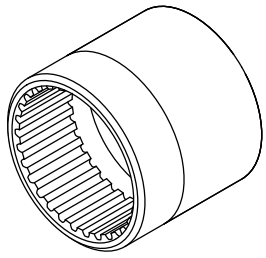
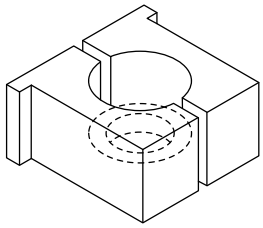
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498077300	498077300	REMOVER	Used for removing the center differential ball bearing.
 ST-498247001	498247001	MAGNET BASE	• Used for measuring the backlash of differential bevel pinion gear and hypoid driven gear. • Used together with DIAL GAUGE (498247100).
 ST-498247100	498247100	DIAL GAUGE	• Used for measuring the backlash of differential bevel pinion gear and hypoid driven gear. • Used together with MAGNET BASE (498247001).
 ST-498427100	498427100	STOPPER	• Used for removing and installing the drive pinion shaft assembly lock nut. • Used for measuring the backlash of hypoid driven gear. • Used for adjusting preload on the front differential taper roller bearing.
 ST-498937000	498937000	TRANSMISSION HOLDER	Used for removing and installing the main shaft assembly lock nut.

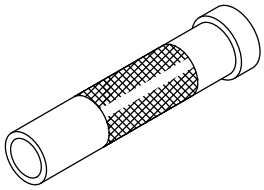
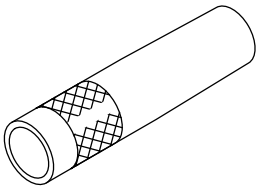
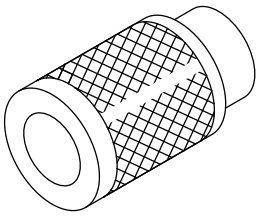
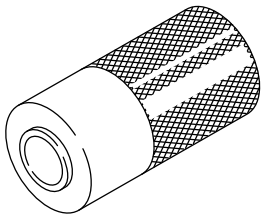
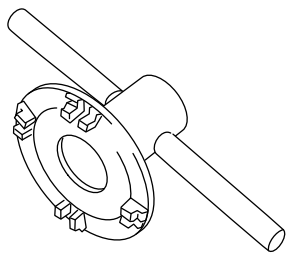
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499277100	499277100	BUSHING 1-2 INSTALLER	• Used for installing the drive pinion shaft assembly washer. • Used for installing the front differential taper roller bearing inner race.
 ST-499277200	499277200	INSTALLER	• Used for installing the drive pinion shaft assembly washer. • Used for installing the 2nd driven gear bushing, 3rd-4th driven gear, double taper roller bearing and 5th driven gear.
 ST-499757002	499757002	INSTALLER	Used for removing the double taper roller bearing and driven gear of the drive pinion shaft assembly.
 ST-927640000	927640000	INSTALLER	Used for installing the taper roller bearing (transfer case side) of transfer driven gear.
 ST18630AA010	18630AA010	WRENCH COMPL RETAINER	• Used for removing and installing the differential side retainer. • Used for adjusting preload on the front differential taper roller bearing. • Used for adjusting the backlash of hypoid driven gear. • WRENCH ASSY (499787000) can also be used.

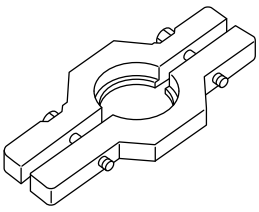
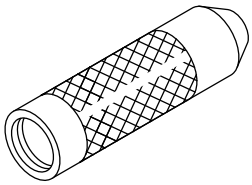
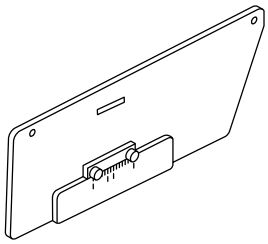
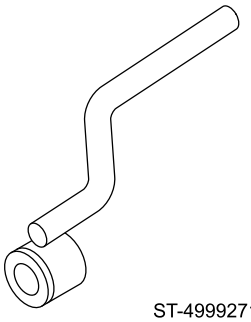
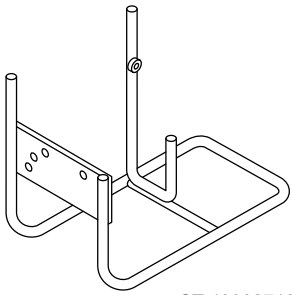
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499857000	499857000	5TH DRIVEN GEAR REMOVER	Used for removing the 5th driven gear.
 ST-499877000	499877000	RACE 4-5 INSTALLER	• Used for installing the 4th needle bearing race. • Used together with REMOVER (899714110). • Used for installing the double ball bearing of the main shaft assembly. • Used for installing the 5th gear thrust washer and needle bearing race.
 ST-499917500	499917500	DRIVE PINION GAUGE ASSY	Used for adjusting the drive pinion shaft assembly shim.
 ST-499927100	499927100	HANDLE	Used for backlash adjustment of the front differential hypoid driven gear and preload adjustment of the taper roller bearing.
 ST-499937100	499937100	TRANSMISSION STAND	Used for disassembling and assembling the transmission.

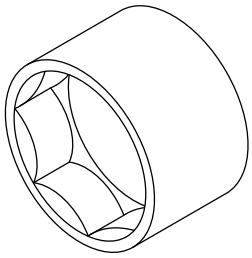
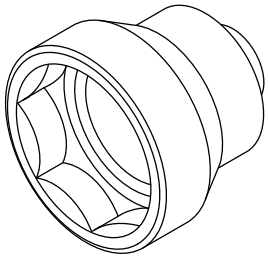
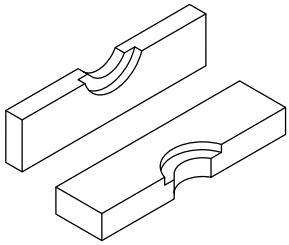
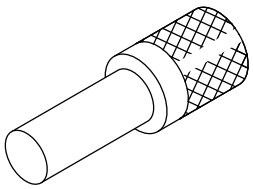
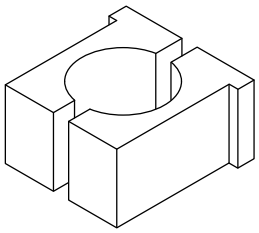
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499987003	499987003	SOCKET WRENCH (35)	Used for removing and installing the main shaft assembly lock nut.
 ST-499987300	499987300	SOCKET WRENCH (50)	Used for removing and installing the driven shaft lock nut.
 ST-899714110	899714110	REMOVER	Used for removing and installing the parts of main shaft assembly and driven shaft.
 ST-899864100	899864100	REMOVER	• Used for removing the parts of the main shaft assembly. • Used for installing the transfer case roller bearing. • Used for removing the transfer driven gear taper roller bearing (transfer case side). • Used for installing the transfer driven gear taper roller bearing (extension case side).
 ST-899884100	899884100	HOLDER	• Used for removing and installing the drive pinion shaft assembly lock nut. • Used for removing and installing the driven shaft lock nut. • Used for measuring the starting torque of the drive pinion shaft assembly.

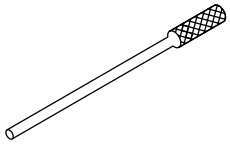
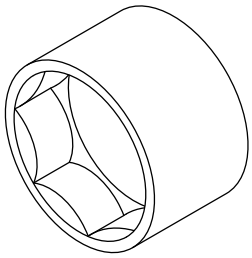
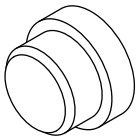
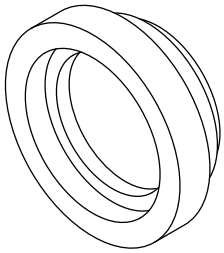
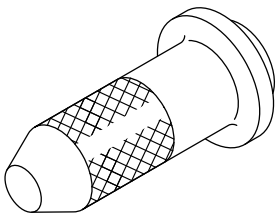
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-899904100	899904100	STRAIGHT PIN REMOVER	Used for removing and installing the straight pin.
 ST-899988608	899988608	SOCKET WRENCH (27)	• Used for removing and installing the drive pinion shaft assembly lock nut. • Used for measuring the starting torque of the drive pinion shaft assembly.
 ST-398497701	398497701	SEAT	• Used for installing the front differential taper roller bearing. • Used together with BUSHING 1-2 INSTALLER (499277100).
 ST-499587000	499587000	INSTALLER	Used for installing the driven shaft parts.
 ST-498057300	498057300	INSTALLER	Used for installing the oil seal of extension case.

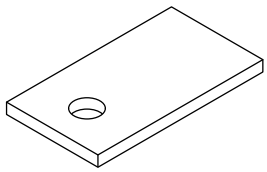
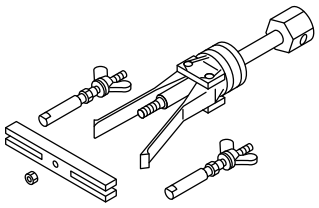
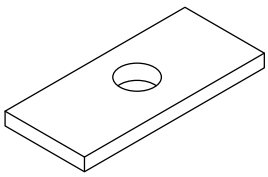
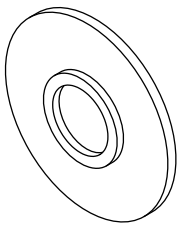
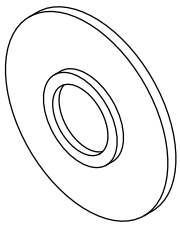
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-498255400	498255400	PLATE	Used for measuring the hypoid driven gear backlash.
 ST-398527700	398527700	PULLER ASSY	• Used for removing the oil seal of extension case. • Used for removing the taper roller bearing outer race of front differential. • Used for removing the oil seal of differential side retainer.
 ST-398643600	398643600	GAUGE	Used for adjusting the extension end play.
 ST-398177700	398177700	INSTALLER	Used for installing the ball bearing of the transfer drive gear.
 ST-498175500	498175500	INSTALLER	Used for installing the taper roller bearing of transfer driven gear (extension case side).

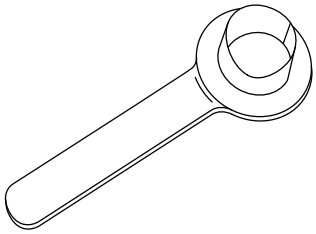
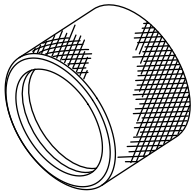
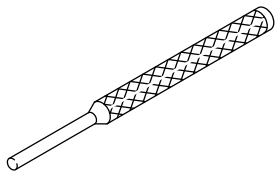
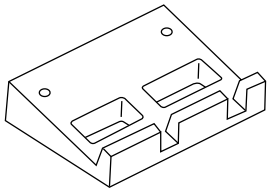
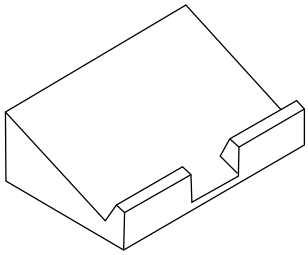
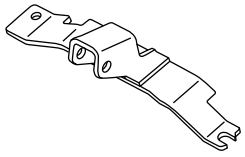
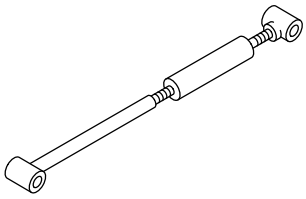
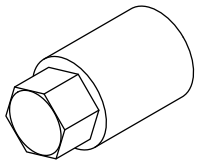
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28399SA010	28399SA010	OIL SEAL PROTECTOR	Used for protecting the oil seal from damage when inserting the front drive shaft.
 ST18675AA000	18675AA000	DIFFERENTIAL SIDE OIL SEAL INSTALLER	Used for installing the differential side retainer oil seal.
 ST-398791700	398791700	REMOVER	Used for removing and installing the straight pin.
 ST-498267200	498267200	CYLINDER HEAD TABLE	Used for removing and installing the roller bearing of the transfer case.
 ST-498267300	498267300	CYLINDER HEAD TABLE	Used for removing and installing the roller bearing of the transfer case.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST41099AA012	41099AA012	ENGINE SUPPORT BRACKET	• Used for supporting engine. • Used together with ENGINE SUPPORT (41099AA020). • ENGINE SUPPORT BRACKET (41099AA010) or ENGINE SUPPORT BRACKET (41099AA011) can also be used.
 ST41099AA020	41099AA020	ENGINE SUPPORT	• Used for supporting engine. • Used together with ENGINE SUPPORT BRACKET (41099AA012).
 ST20399AG000	20399AG000	STRUT MOUNT SOCKET	Used for tightening the strut mount self-locking nut.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
TORX® bit T70	Used for removing and installing the drain plug.

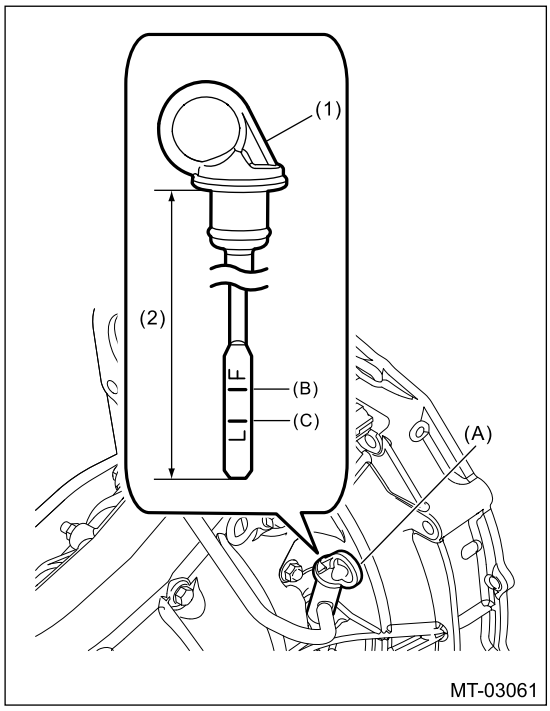
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Gear Oil

INSPECTION

1. Park the vehicle on a level surface.
2. Turn the ignition switch to OFF, and wait until the engine cools.
3. Remove the oil level gauge and wipe it clean.
4. Reinsert the oil level gauge all the way. Be sure that the oil level gauge is correctly inserted in the proper direction.
5. Pull out the oil level gauge again, and check the oil level. If it is below the lower level, check for oil leakage and add oil through the oil level gauge hole to bring the level up to the upper level.

Caution:

Since the length of the oil level gauge varies depending on models and destinations, make sure to use the appropriate oil level gauge.



(A) Oil level gauge
(B) Upper level
(C) Lower level
(1) Gray
(2) 195.9 mm (7.71 in)

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Gear Oil

REPLACEMENT

1. Pull out the oil level gauge.
2. Lift up the vehicle.
3. Using the TORX® bit T70, remove the drain plug, and drain the gear oil completely.

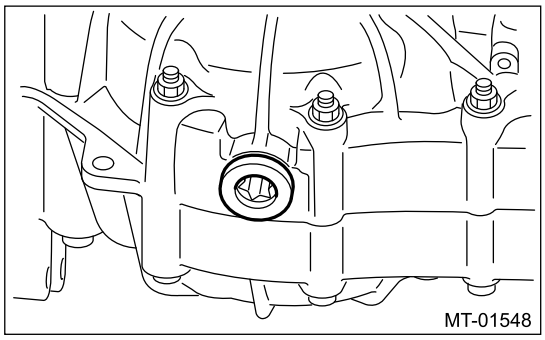
Caution:

- **Immediately after the vehicle has been running or after idling for a long time, the gear oil will be hot. Be careful not to receive burns.**
- **Be careful not to spill the gear oil on the exhaust pipe, to prevent emission of smoke or causing a fire. If gear oil is spilled, wipe it off completely.**

4. Replace the gasket with a new part and install the drain plug using the TORX® bit T70.

Tightening torque:

44 N·m (4.5 kgf-m, 32.5 ft-lb) (aluminum gasket, silver)
70 N·m (7.1 kgf-m, 51.6 ft-lb) (copper gasket, brown)
70 N·m (7.1 kgf-m, 51.6 ft-lb) (metal gasket, black)



5. Lower the vehicle.
6. Pour gear oil through the oil level gauge hole.

Caution:

Note that you may experience poor functionality and performance if an alternative gear oil is used.

Recommended gear oil:

SUBARU GEAR OIL EXTRA MT

Alternative:

GL-5 (75W-90)

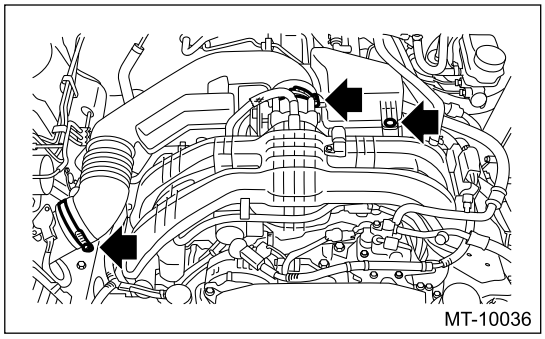
Gear oil capacity:

3.5 L (3.7 US qt, 3.1 Imp qt)

7. Check the gear oil amount, and confirm that it is within the specification.

REMOVAL

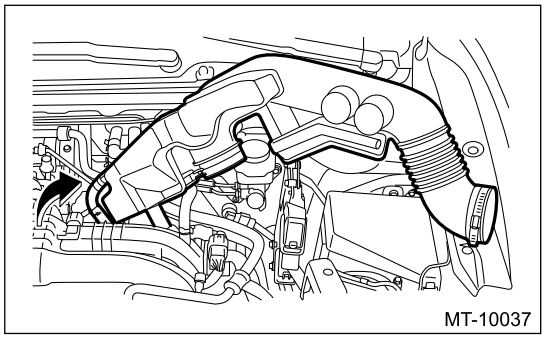
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



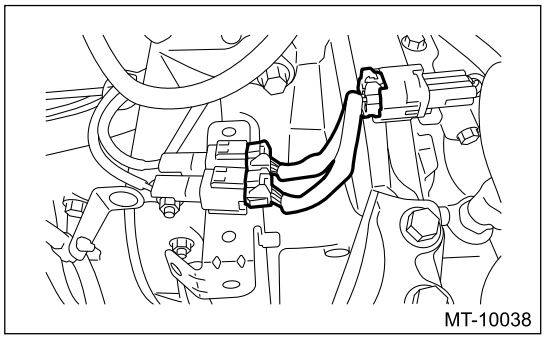
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

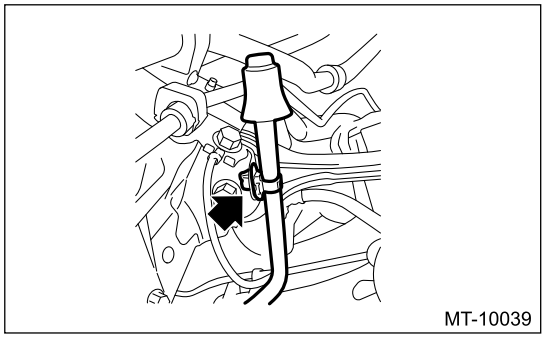
Be careful not to pull out the PCV hose.



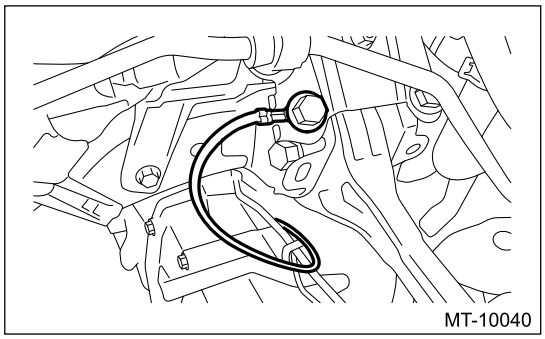
4. Remove the coupling harness.



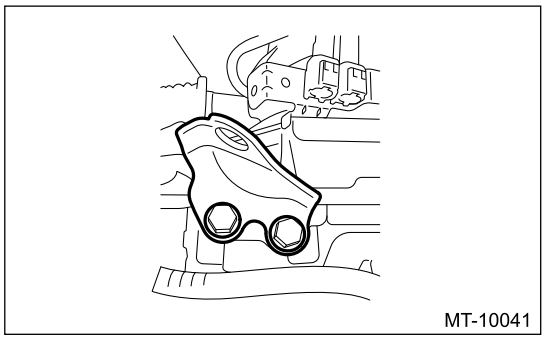
5. Remove the clips and remove the air breather hose.



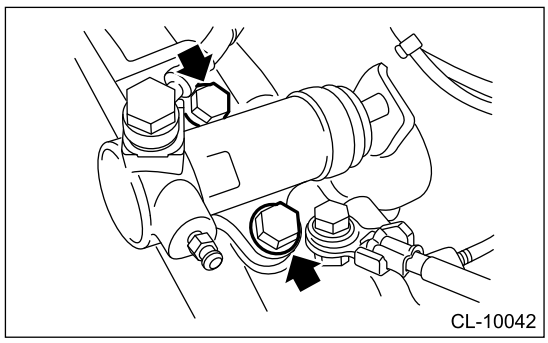
6. Disconnect the transmission radio ground cord terminal.



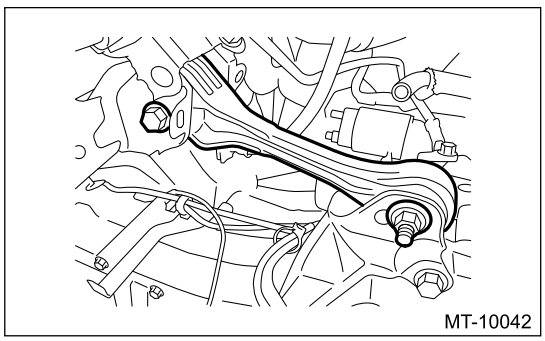
7. Remove the engine hanger rear.



8. Remove the operating cylinder and suspend on a wire.

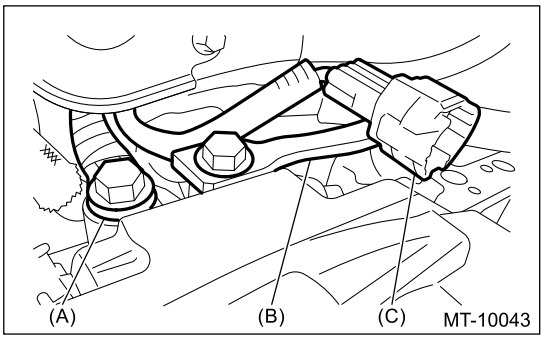


9. Remove the pitching stopper.



10. Disconnect the engine ground terminal.

11. Remove the engine harness stay and MT docking connector together as a unit.

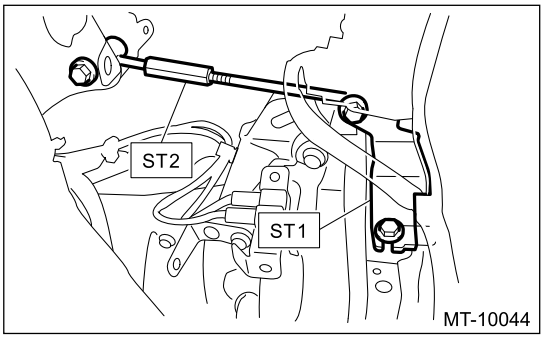


(A) Engine ground terminal
(B) Engine harness stay
(C) MT docking connector

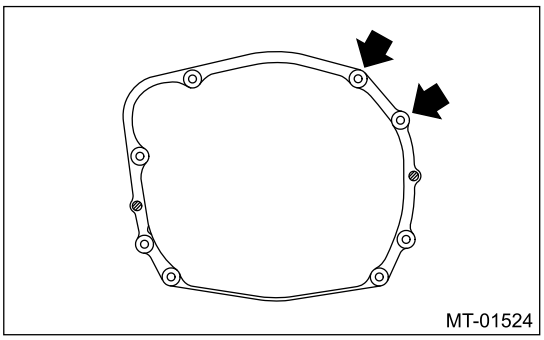
12. Set the ST.

Special Tool:

ST1: 41099AA012 ENGINE SUPPORT BRACKET
ST2: 41099AA020 ENGINE SUPPORT

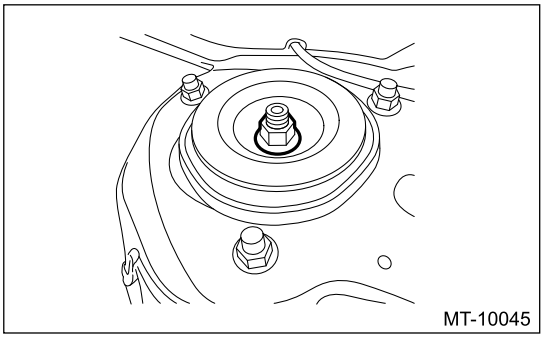


13. Remove the bolts which hold upper side of transmission to engine.



14. Remove the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>REMOVAL.

15. Loosen the self-locking nut of the strut mount by three turns.



16. Remove the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.

17. Lift up the vehicle.

18. Remove the crossmember support - rear.

代替画像1

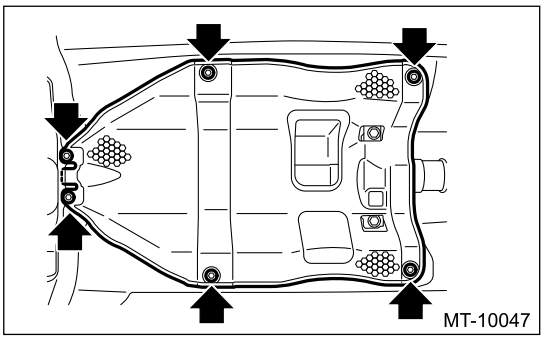
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19. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

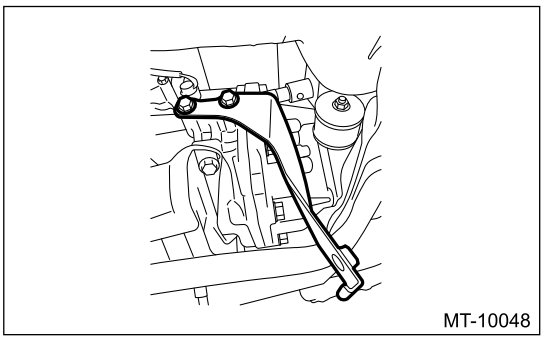
20. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.

21. Drain transmission gear oil completely. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>REPLACEMENT.

22. Remove the center exhaust cover.



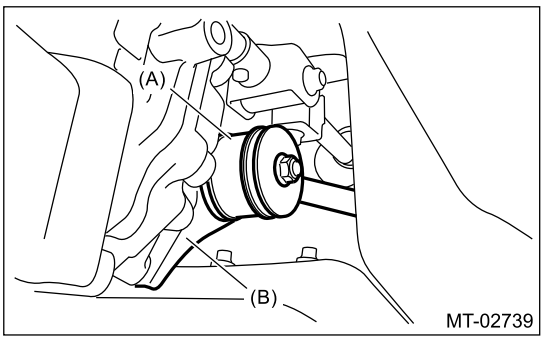
23. Remove the hanger bracket.



24. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.

25. Remove the gear shift rod and stay.

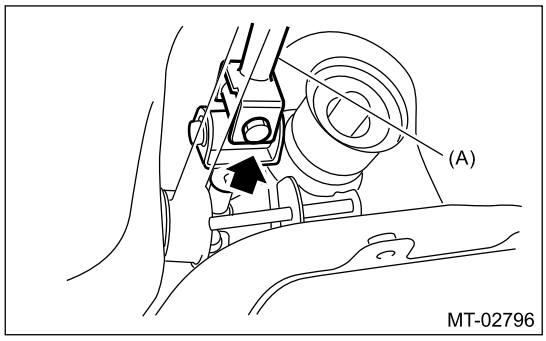
(1) Remove the stay.



(A) Stay

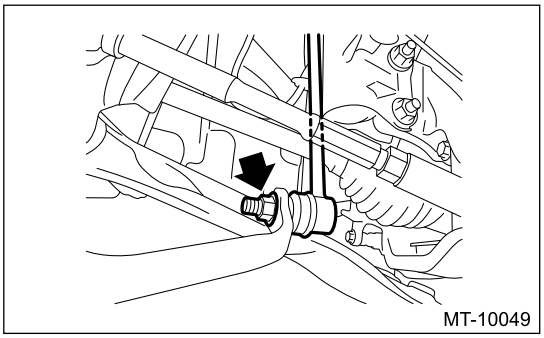
(B) Shift bracket

(2) Remove the gear shift rod.



(A) Gear shift rod

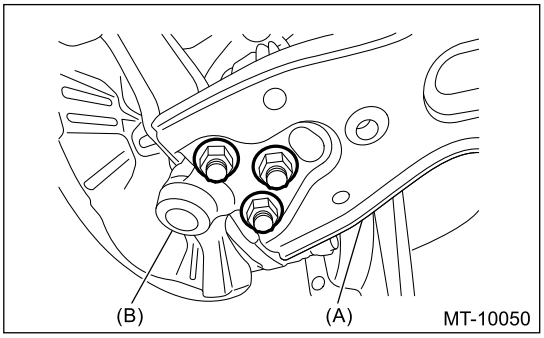
26. Disconnect the stabilizer link.



27. Remove the nuts at 3 places, and separate the front arm from the ball joint.

Note:

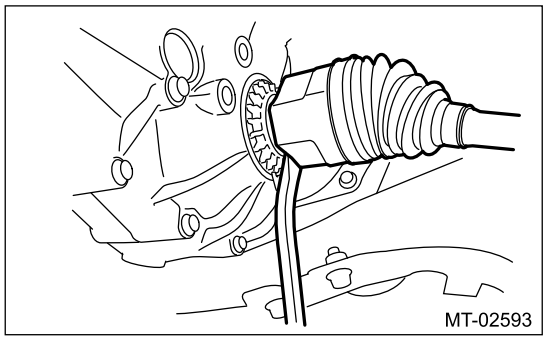
- **To prevent damage of the front arm ball joint boot, place a wooden block, etc. between front arm and ball joint.**
- **Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**



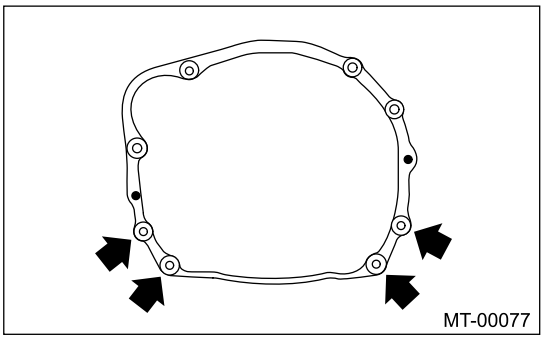
(A) Front arm

(B) Ball joint

28. Using a crowbar, separate the front drive shaft.



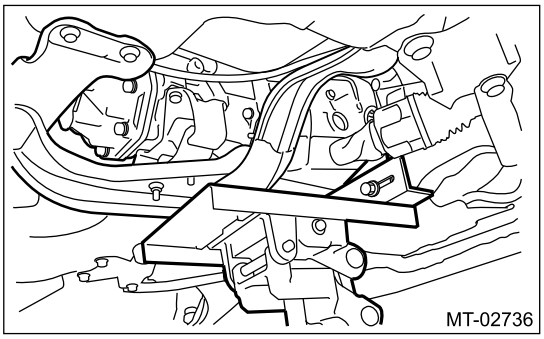
29. Remove the bolts and nuts which hold lower side of transmission to engine.



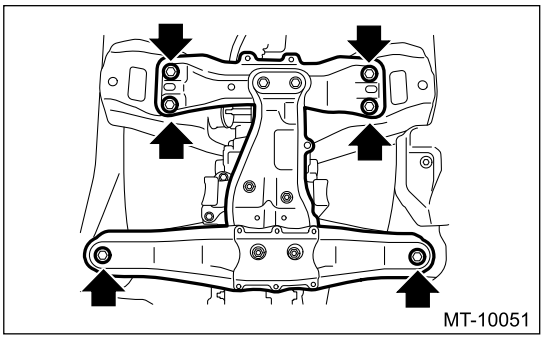
30. Set the transmission jack.

Caution:

Always support the transmission case with a transmission jack.



31. Remove the front crossmember and the rear crossmember.



32. While lowering the transmission jack, tighten the turnbuckle of the ENGINE SUPPORT (41099AA020), and incline the engine unit rearward.

33. Remove the transmission assembly.

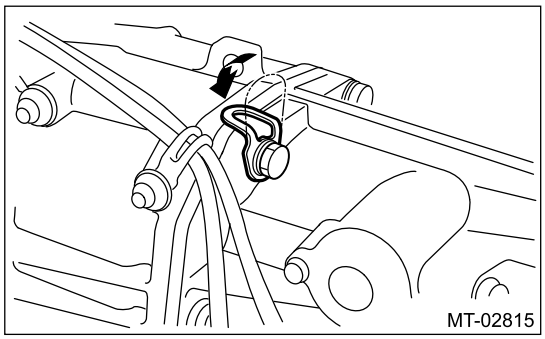
Caution:

Move the transmission jack towards the rear until the main shaft is withdrawn from the clutch cover.

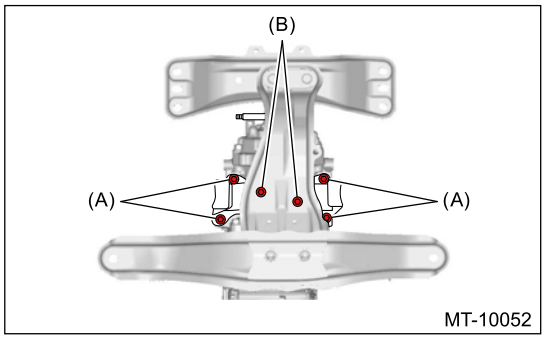
34. Remove the transmission cushion rubber.

INSTALLATION

1. Replace the differential side retainer oil seal with a new part. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Differential Side Retainer Oil Seal>REPLACEMENT.
   Caution:
   Be sure to replace the oil seal after removing the front drive shaft.
   Note:
   When a new oil seal has been installed, replacement is not required.
2. Strike and bend the transmission hanger of transmission rear with a rubber hammer etc. so that it gets in contact with the transmission case.
   Caution:
   Do not apply excessive load or impact to the transmission case.

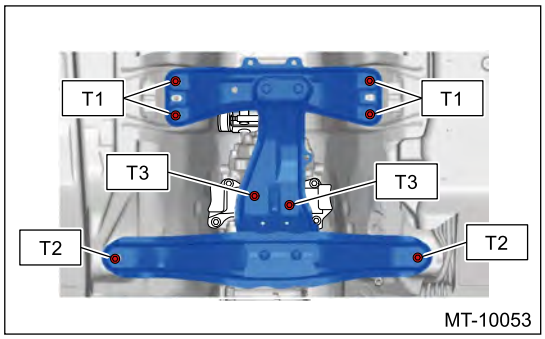


3. Install the transmission cushion rubber to the transmission, and tighten the bolt (A).
4. Install the transmission cushion rubber to the center crossmember, and temporarily tighten the nut (B).
   Tightening torque:
   Bolt (A)
   35 N·m (3.6 kgf-m, 25.8 ft-lb)



5. Install the transmission assembly onto the engine.
   (1) Lift up the transmission gradually using a transmission jack.
   (2) Engage at the spline section.
   Caution:
   Be careful not to hit the main shaft against the clutch cover.
6. While raising the transmission jack, loosen the turnbuckle of the ENGINE SUPPORT (41099AA020), and set the engine unit to the original position.
7. Install the front crossmember and rear crossmember.
8. Tighten the transmission cushion rubber mounting nut.
   Tightening torque:
   T1: 75 N·m (7.6 kgf-m, 55.3 ft-lb)
   T2: 140 N·m (14.3 kgf-m, 103.3 ft-lb)

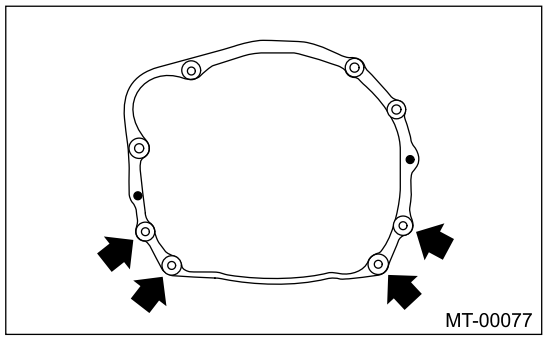
T3: 35 N·m (3.6 kgf-m, 25.8 ft-lb)



9. Take out the transmission jack.
10. Tighten the bolts and nuts which hold the lower side of transmission to the engine.

Tightening torque:

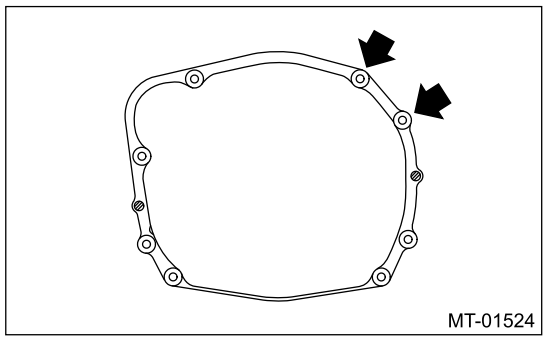
50 N·m (5.1 kgf-m, 36.9 ft-lb)



11. Lower the vehicle.
12. Install the starter. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSTALLATION.
13. Tighten the bolts which hold the upper side of the transmission to the engine.

Tightening torque:

50 N·m (5.1 kgf-m, 36.9 ft-lb)



14. Remove the ENGINE SUPPORT BRACKET (41099AA012) and ENGINE SUPPORT (41099AA020).
15. Install the engine ground terminals.

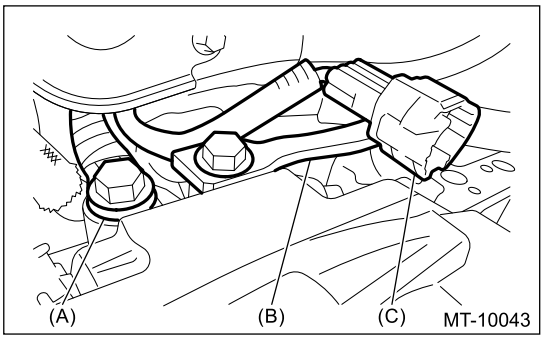
Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)

16. Install the engine harness stay and MT docking connector together as a unit.

Tightening torque:

19 N·m (1.9 kgf-m, 14.0 ft-lb)

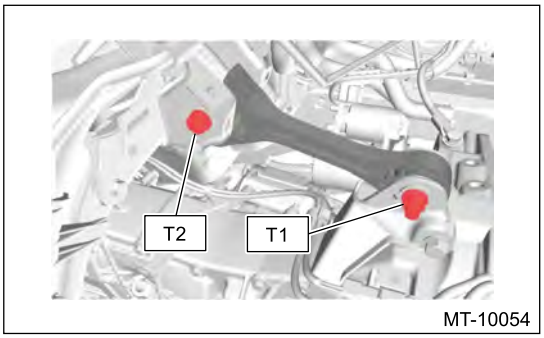


(A) Engine ground terminal
(B) Engine harness stay
(C) MT docking connector

17. Install the pitching stopper.

Tightening torque:

T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)
T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



18. Lift up the vehicle.

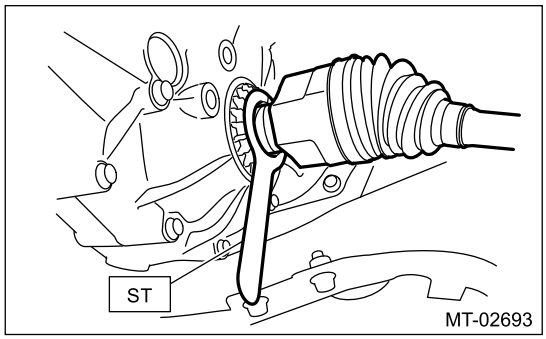
19. Set the OIL SEAL PROTECTOR (28399SA010) to differential side retainer.

20. Replace the circlip of the front drive shaft with a new part.

21. Install the front drive shaft and remove the ST.

Special Tool:

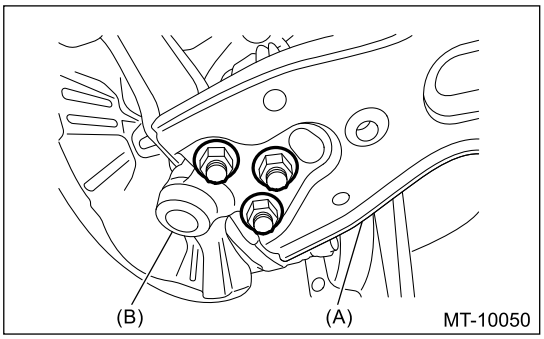
ST: 28399SA010 OIL SEAL PROTECTOR



22. Connect the front arm to the ball joint, and tighten the nuts at three places.

Tightening torque:

100 N·m (10.2 kgf-m, 73.8 ft-lb)



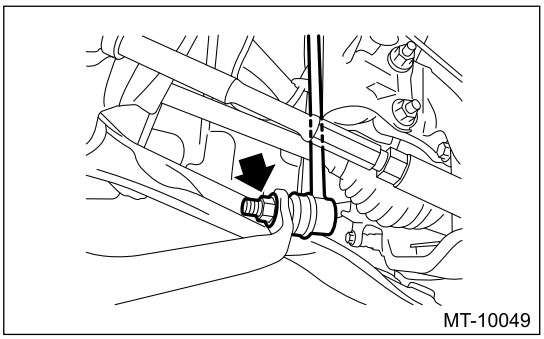
(A) Front arm

(B) Ball joint

23. Replace the flange nut with a new part, and install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

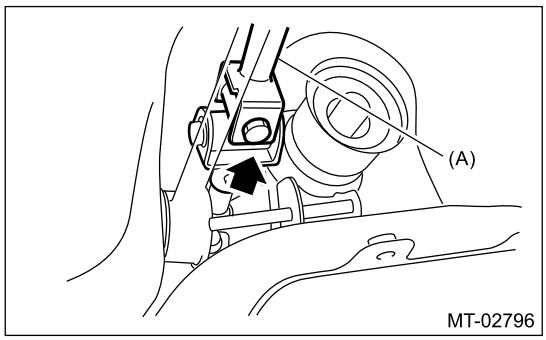


24. Attach the gear shift rod and stay.

(1) Replace the self-locking nut with a new part, and install the gear shift rod.

Tightening torque:

12 N·m (1.2 kgf-m, 8.9 ft-lb)

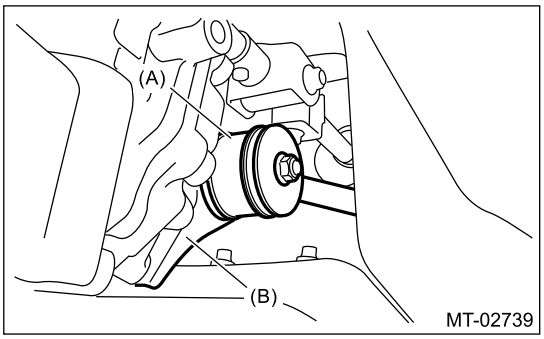


(A) Gear shift rod

(2) Replace the self-locking nut with a new part, and install the stay.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



(A) Stay

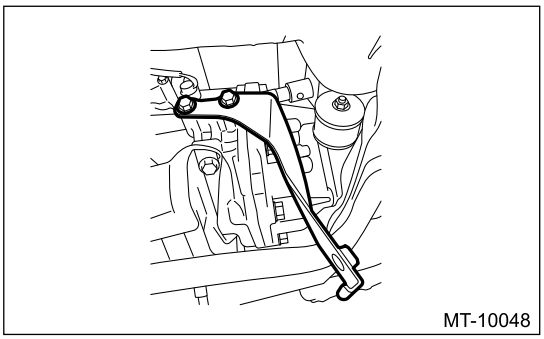
(B) Shift bracket

25. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

26. Install the hanger bracket.

Tightening torque:

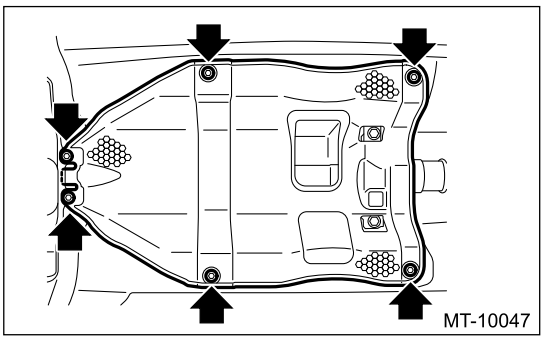
23 N·m (2.3 kgf-m, 17.0 ft-lb)



27. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



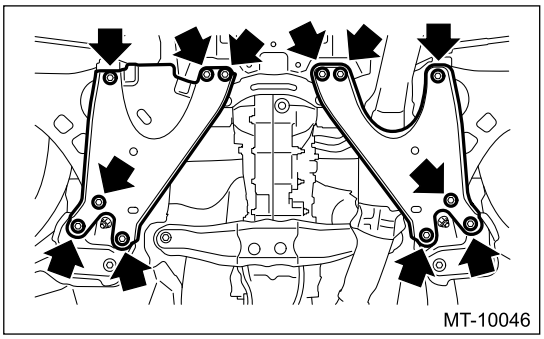
28. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.

29. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

30. Install the crossmember support - rear.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)



31. Lower the vehicle.

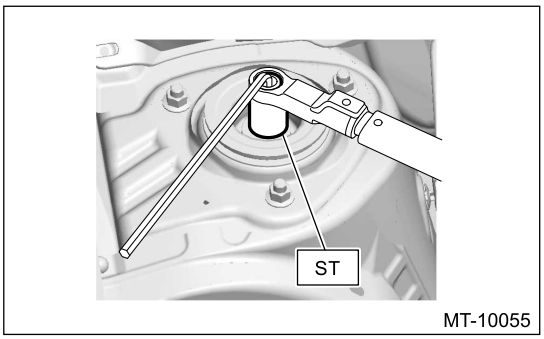
32. Using the ST, tighten the strut mount self-locking nut.

Special Tool:

ST: 20399AG000 STRUT MOUNT SOCKET

Tightening torque:

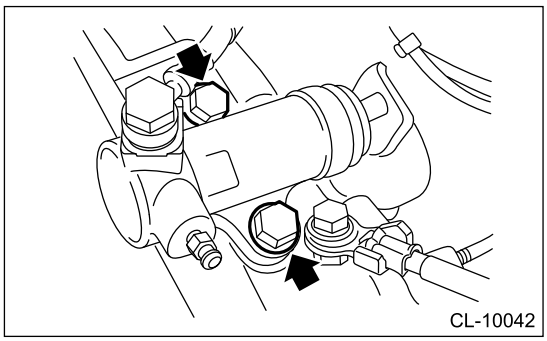
55 N·m (5.6 kgf-m, 40.6 ft-lb)



33. Install the operating cylinder.

Tightening torque:

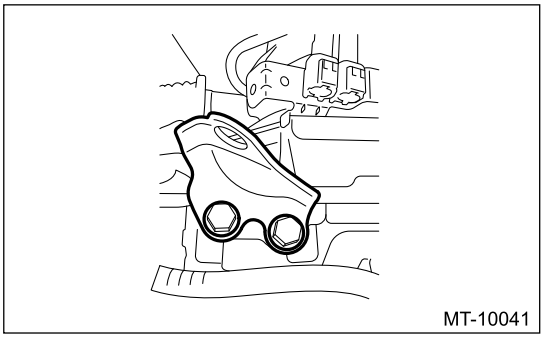
37 N·m (3.8 kgf-m, 27.3 ft-lb)



34. Install the engine hanger rear.

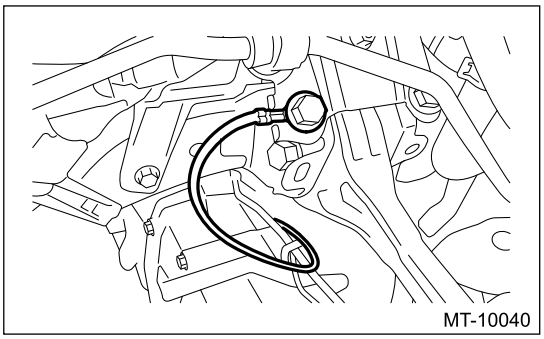
Tightening torque:

36 N·m (3.7 kgf-m, 26.6 ft-lb)

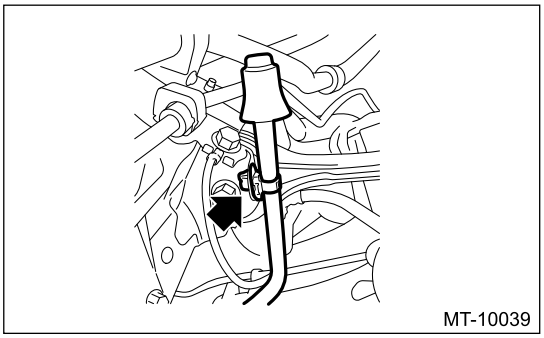


35. Install the transmission radio ground cord terminal.

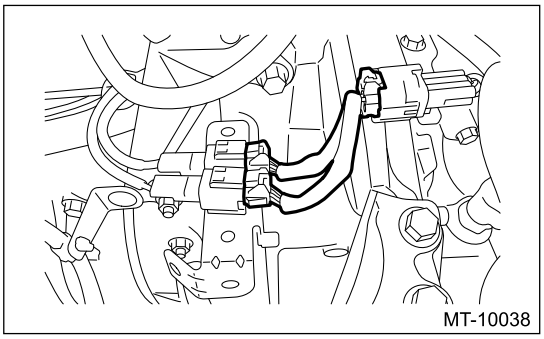
Tightening torque:
32.3 N·m (3.3 kgf-m, 23.8 ft-lb)



36. Install the air breather hose.



37. Install the coupling harness.



38. Pour in transmission gear oil and check the oil level. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil.

39. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.

40. Install the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

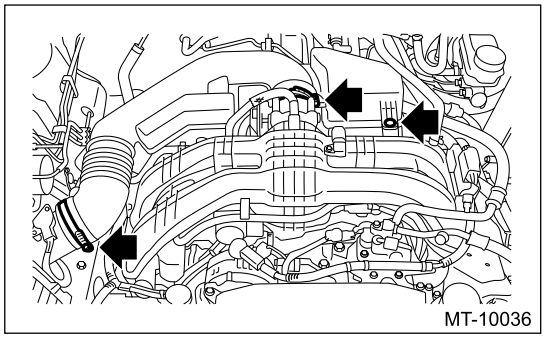
41. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

42. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment.

REMOVAL

1. PITCHING STOPPER

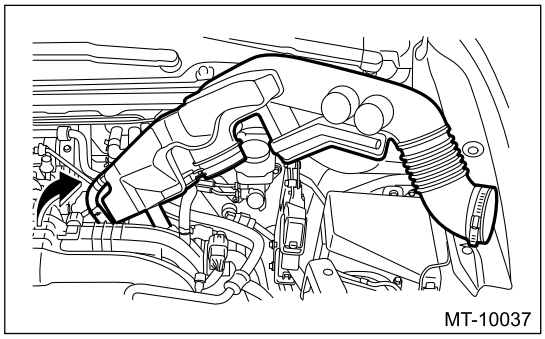
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



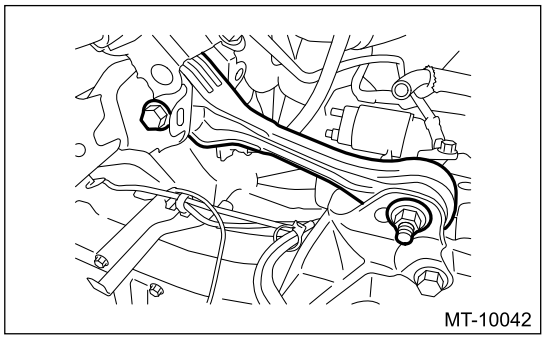
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.

Caution:

Be careful not to pull out the PCV hose.

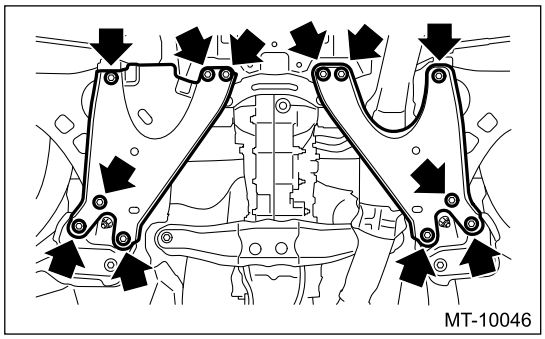


4. Remove the pitching stopper.

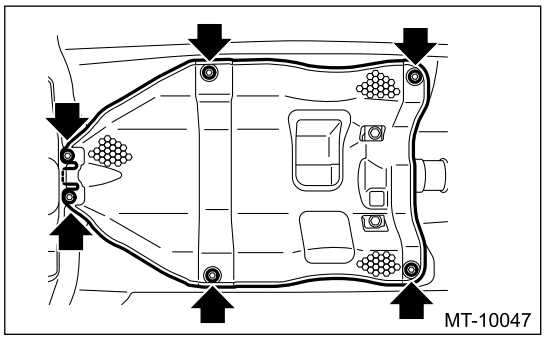


2. CROSSMEMBER AND CUSHION RUBBER

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the crossmember support - rear.



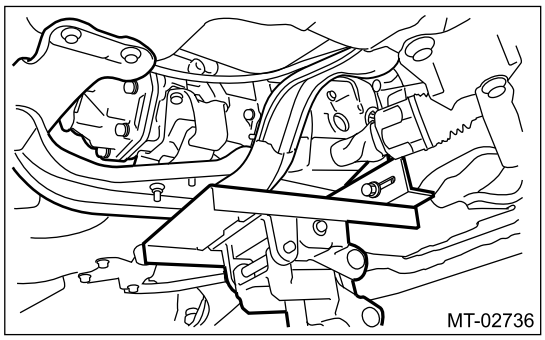
4. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
5. Remove the center exhaust cover.



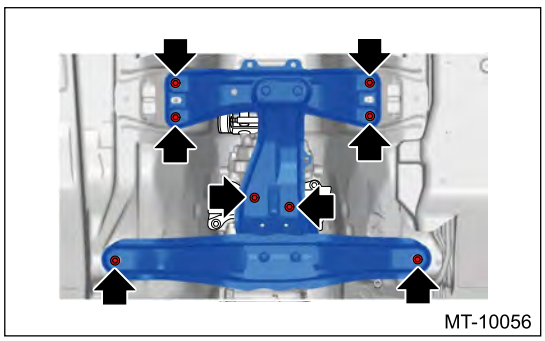
6. Set the transmission jack.

Caution:

Always support the transmission case with a transmission jack.



7. Remove the front crossmember and the rear crossmember.



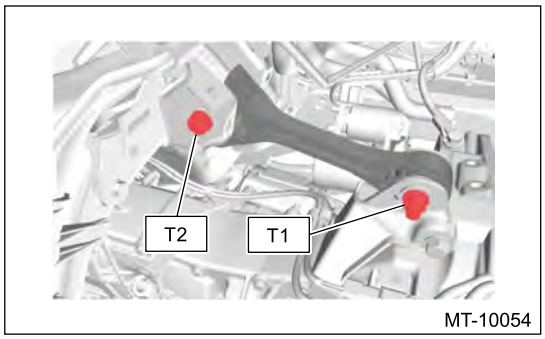
8. Remove the transmission cushion rubber.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Mounting System

INSTALLATION

1. PITCHING STOPPER

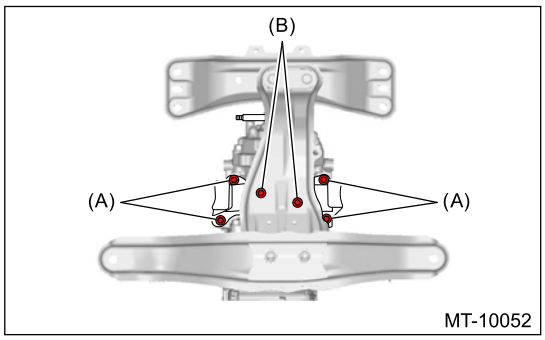
1. Install the pitching stopper.
   Tightening torque:
   T1: 50 N·m (5.1 kgf-m, 36.9 ft-lb)
   T2: 58 N·m (5.9 kgf-m, 42.8 ft-lb)



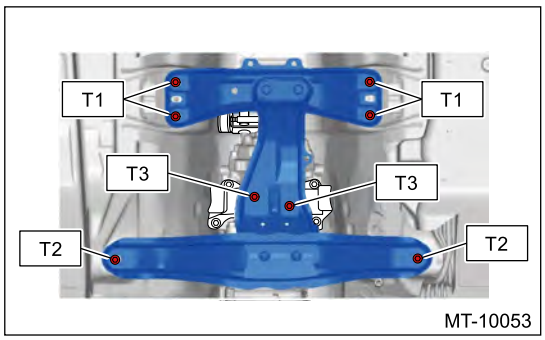
2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. CROSSMEMBER AND CUSHION RUBBER

1. Install the transmission cushion rubber to the transmission, and tighten the bolt (A).
2. Install the transmission cushion rubber to the center crossmember, and temporarily tighten the nut (B).
   Tightening torque:
   Bolt (A)
   35 N·m (3.6 kgf-m, 25.8 ft-lb)

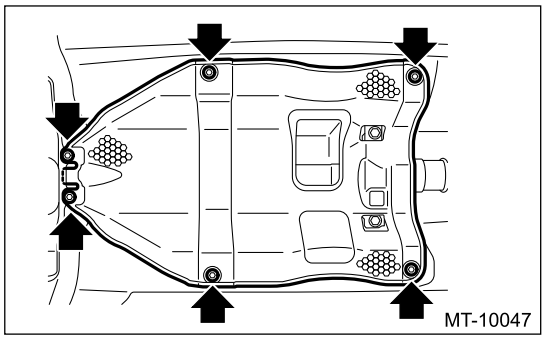


3. Install the front crossmember and rear crossmember.
4. Tighten the transmission cushion rubber mounting nut.
   Tightening torque:
   T1: 75 N·m (7.6 kgf-m, 55.3 ft-lb)
   T2: 140 N·m (14.3 kgf-m, 103.3 ft-lb)
   T3: 35 N·m (3.6 kgf-m, 25.8 ft-lb)

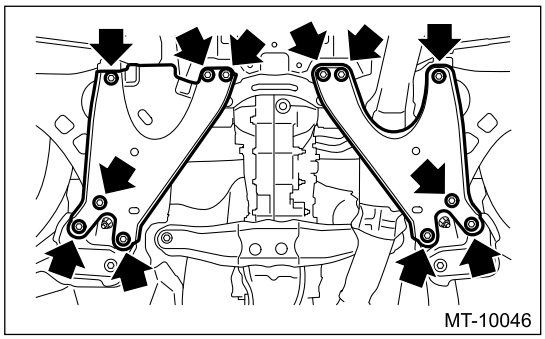


5. Take out the transmission jack.

6. Install the center exhaust cover.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)



7. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
8. Install the crossmember support - rear.
   Tightening torque:
   70 N·m (7.1 kgf-m, 51.6 ft-lb)



9. Lower the vehicle.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Mounting System

INSPECTION

Check the following; repair or replace the faulty parts.

1. PITCHING STOPPER

Check the pitching stopper for bends or damage. Check that the rubber is not stiff, cracked or otherwise damaged.

2. CROSSMEMBER AND CUSHION RUBBER

Check the crossmember for bending or damage. Check that the cushion rubber does not have hardening, cracks or other damages.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Oil Seal

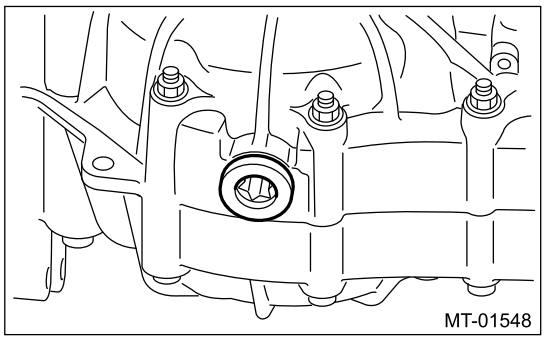
INSPECTION

Check for leakage of transmission gear oil from the oil seal. If there is oil leakage, replace the oil seal with the new part and check the propeller shaft.

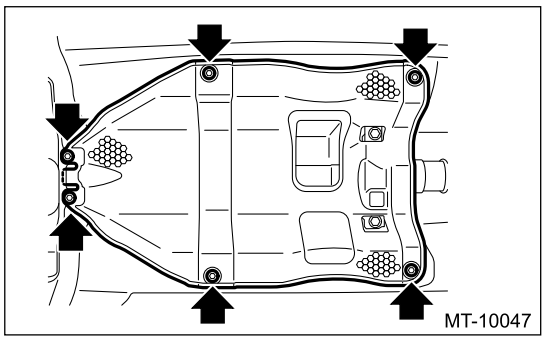
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Oil Seal

REPLACEMENT

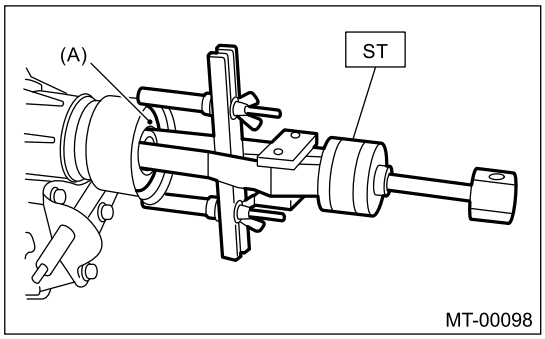
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Clean the transmission exterior.
4. Using the TORX® bit T70, remove the drain plug, and drain the transmission gear oil completely.
   Caution:
   - **Immediately after the vehicle has been running or after idling for a long time, the gear oil will be hot. Be careful not to receive burns.**
   - **Be careful not to spill the gear oil on the exhaust pipe, to prevent emission of smoke or causing a fire. If gear oil is spilled, wipe it off completely.**
5. Replace the gasket with a new part and install the drain plug using the TORX® bit T70.
   Tightening torque:
   44 N·m (4.5 kgf-m, 32.5 ft-lb) (aluminum gasket, silver)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (copper gasket, brown)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (metal gasket, black)



6. Remove the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>REMOVAL.
7. Remove the center exhaust cover.



8. Remove the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>REMOVAL.
9. Using the ST, remove the oil seal.
   Special Tool:
   ST: 398527700 PULLER ASSY



(A) Oil seal

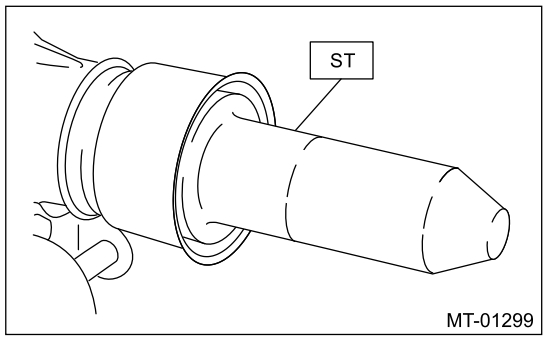
10. Using the ST, install a new oil seal.

Note:

When grease is not applied to the oil seal lips, apply the transmission gear oil to the oil seal lips.

Special Tool:

ST: 498057300 INSTALLER

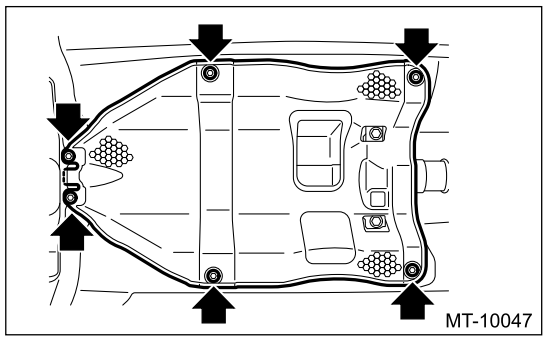


11. Install the propeller shaft. Ref. to DRIVE SHAFT SYSTEM>Propeller Shaft>INSTALLATION.

12. Install the center exhaust cover.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)



13. Install the rear exhaust pipe. Ref. to EXHAUST(H4DO)>Rear Exhaust Pipe>INSTALLATION.

14. Lower the vehicle.

15. Pour in transmission gear oil and check the oil level. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil.

16. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Differential Side Retainer Oil Seal

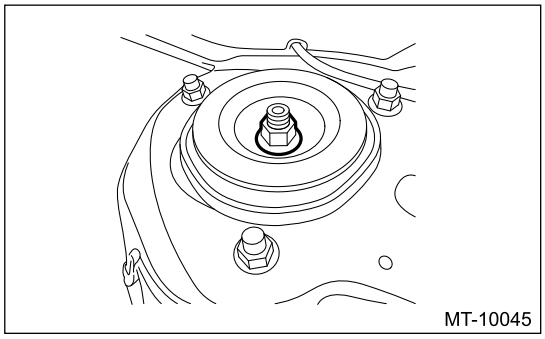
INSPECTION

Check for transmission gear oil leaks at differential side retainer oil seal area. If there is oil leakage, replace the oil seal with the new part and check the drive shaft.

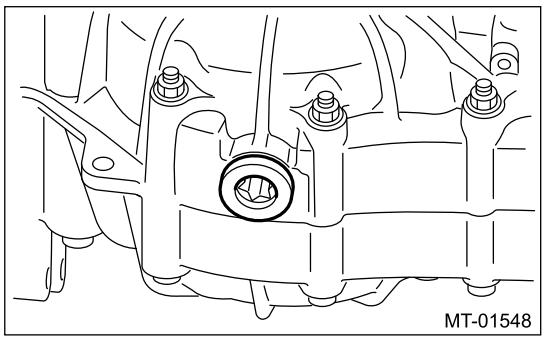
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Differential Side Retainer Oil Seal

REPLACEMENT

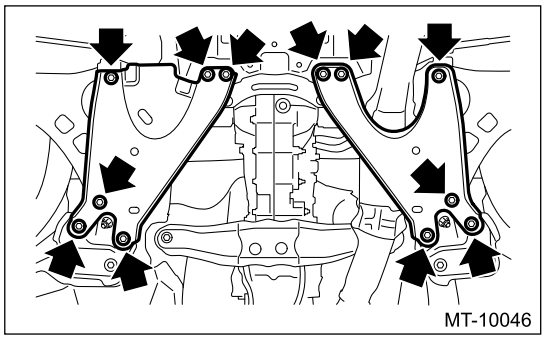
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Loosen the self-locking nut of the strut mount by three turns.



3. Remove the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
4. Lift up the vehicle.
5. Using the TORX® bit T70, remove the drain plug, and drain the transmission gear oil completely.
   Caution:
   - **Immediately after the vehicle has been running or after idling for a long time, the gear oil will be hot. Be careful not to receive burns.**
   - **Be careful not to spill the gear oil on the exhaust pipe, to prevent emission of smoke or causing a fire. If gear oil is spilled, wipe it off completely.**
6. Replace the gasket with a new part and install the drain plug using the TORX® bit T70.
   Tightening torque:
   44 N·m (4.5 kgf-m, 32.5 ft-lb) (aluminum gasket, silver)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (copper gasket, brown)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (metal gasket, black)

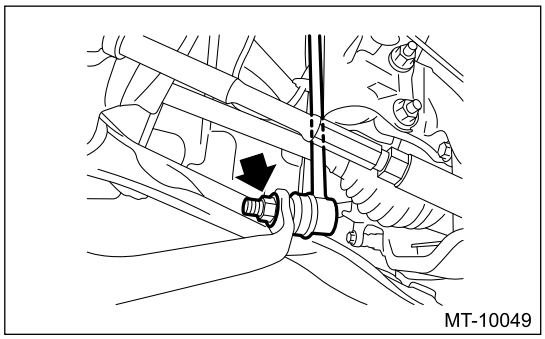


7. Remove the crossmember support - rear.



8. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.

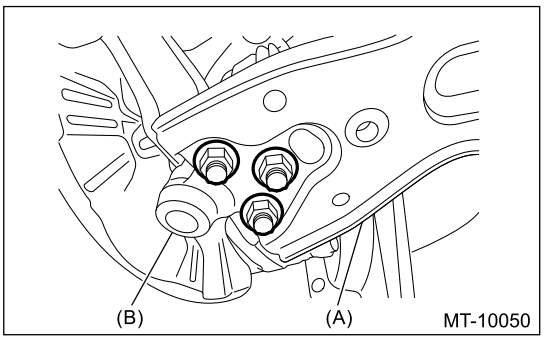
9. Disconnect the stabilizer link.



10. Remove the nuts at 3 places, and separate the front arm from the ball joint.

Note:

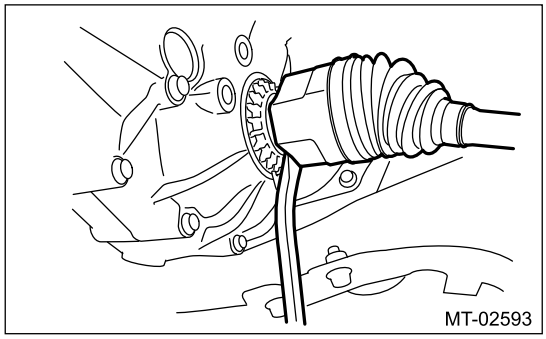
- **● To prevent damage of the front arm ball joint boot, place a wooden block, etc. between front arm and ball joint.**
- **● Mark the engaging position of the ball joint and front arm assembly before loosening the flange nuts. Doing so will facilitate aligning the position when assembling and lessen adjusting allowance for wheel alignment.**



(A) Front arm

(B) Ball joint

11. Using a crowbar, separate the front drive shaft.



12. Using the PULLER ASSY (398527700), remove the differential side retainer oil seal.

Caution:

If removing the oil seal with a flat tip screwdriver, be careful not to scratch the differential side retainer.

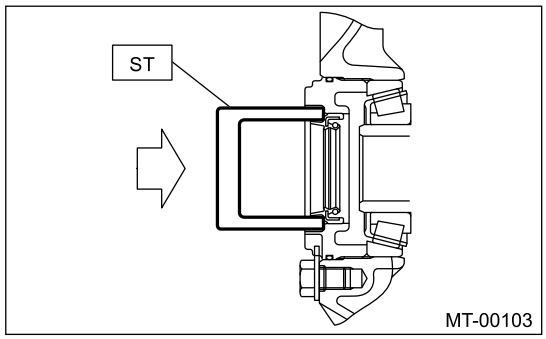
13. Using the ST, install a new differential side retainer oil seal by lightly tapping with a plastic hammer.

Caution:

- **Apply transmission gear oil to the oil seal lips, and install the oil seal while being careful not to deform the lip.**
- **Check the identification marks (R, L) during the installation so as not to mix up the oil seal RH and LH.**

Special Tool:

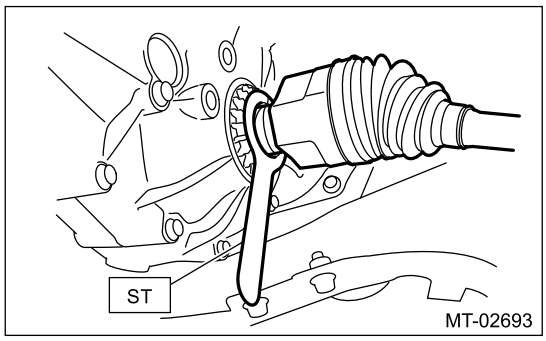
ST: 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER



14. Set the OIL SEAL PROTECTOR (28399SA010) to differential side retainer.
15. Replace the circlip of the front drive shaft with a new part.
16. Install the front drive shaft and remove the ST.

Special Tool:

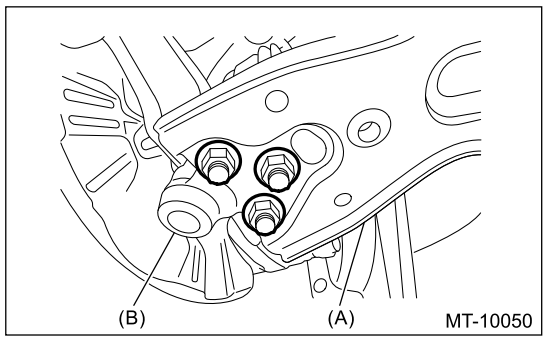
ST: 28399SA010 OIL SEAL PROTECTOR



17. Connect the front arm to the ball joint, and tighten the nuts at three places.

Tightening torque:

100 N·m (10.2 kgf-m, 73.8 ft-lb)



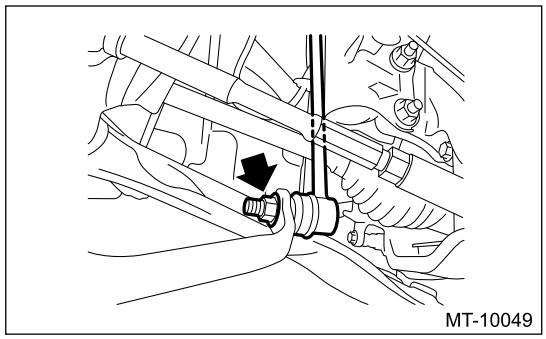
(A) Front arm

(B) Ball joint

18. Replace the flange nut with a new part, and install the stabilizer link.

Tightening torque:

60 N·m (6.1 kgf-m, 44.3 ft-lb)

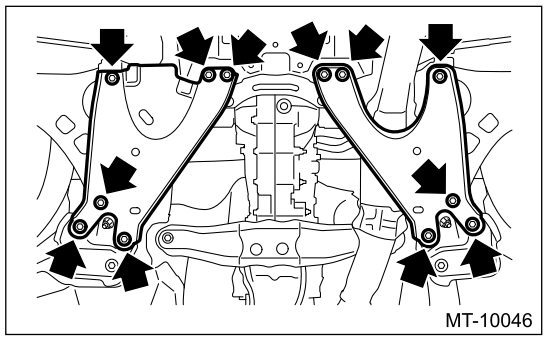


19. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.

20. Install the crossmember support - rear.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)



21. Lower the vehicle.

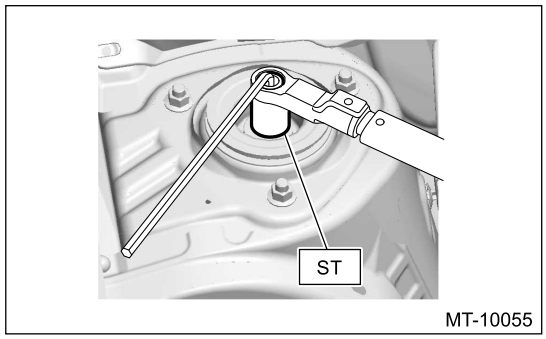
22. Using the ST, tighten the strut mount self-locking nut.

Special Tool:

ST: 20399AG000 STRUT MOUNT SOCKET

Tightening torque:

55 N·m (5.6 kgf-m, 40.6 ft-lb)



23. Pour in transmission gear oil and check the oil level. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Gear Oil>REPLACEMENT.

24. Install the front tires. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

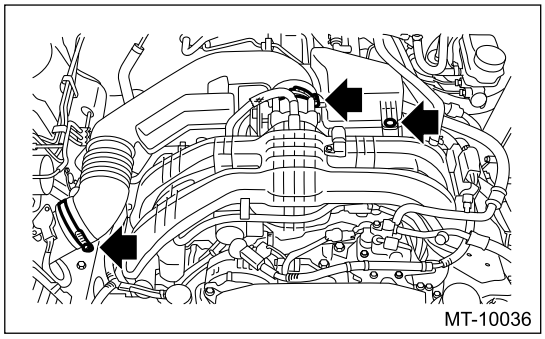
25. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

26. Inspect the wheel alignment and adjust if necessary. Ref. to FRONT SUSPENSION>Wheel Alignment.

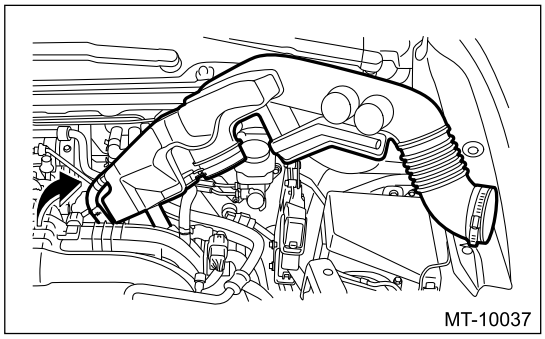
REMOVAL

1. BACK-UP LIGHT AND NEUTRAL POSITION SWITCH

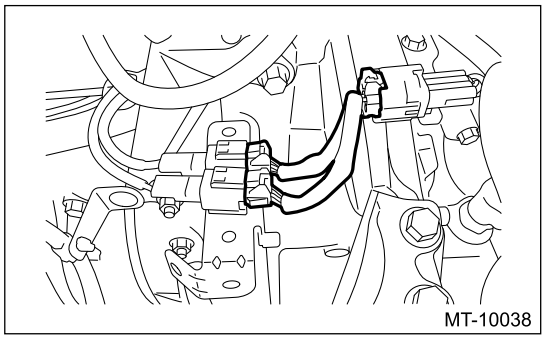
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



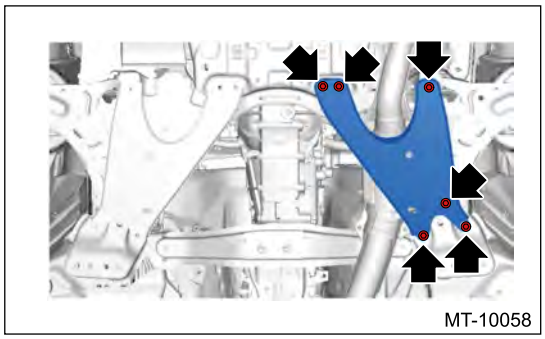
3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



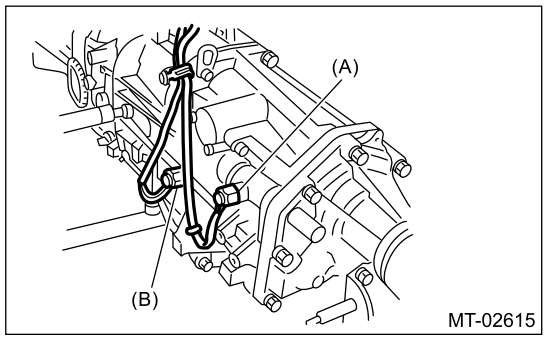
4. Remove the coupling harness.



5. Remove the harness connector from bracket.
6. Lift up the vehicle.
7. Remove the crossmember support - rear LH.



8. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
9. Remove the harness from each clip.
10. Remove the back-up light switch & neutral position switch with the harness.



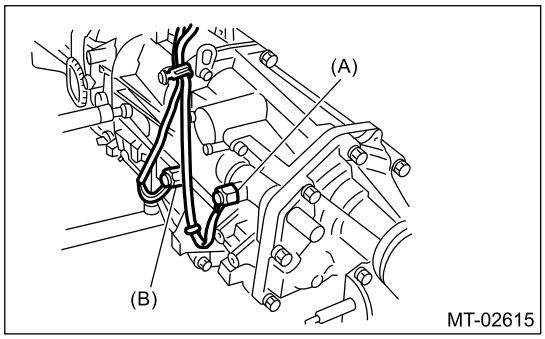
(A) Neutral position switch
(B) Back-up light switch

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Switches and Harness

INSTALLATION

1. BACK-UP LIGHT AND NEUTRAL POSITION SWITCH

1. Replace the gasket with a new part, and install the back-up light switch & neutral position switch together with the harness.
   Tightening torque:
   32.3 N·m (3.3 kgf-m, 23.8 ft-lb)

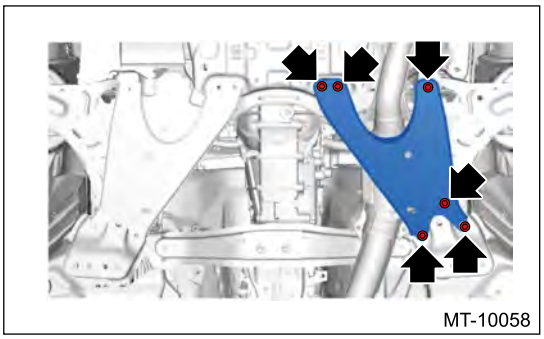


(A) Neutral position switch
(B) Back-up light switch

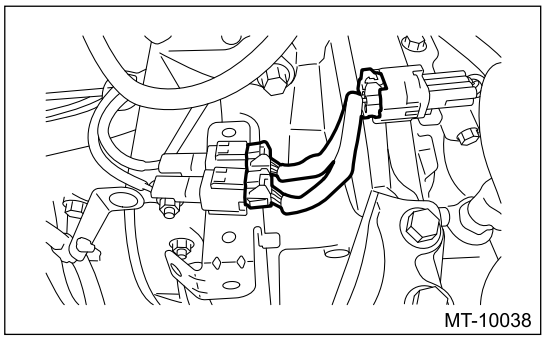
2. Secure the harness on each clip.
3. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
4. Install the crossmember support - rear LH.

Tightening torque:

70 N·m (7.1 kgf-m, 51.6 ft-lb)



5. Lower the vehicle.
6. Secure the harness connector to the bracket.
7. Install the coupling harness.



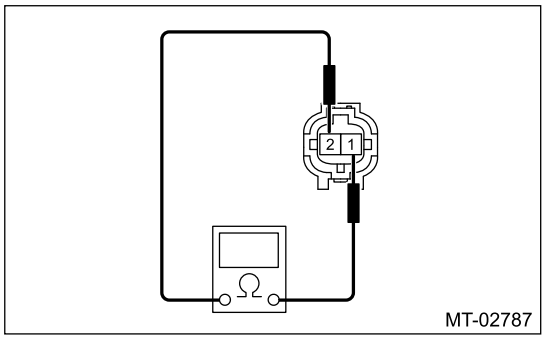
8. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Switches and Harness

INSPECTION

1. BACK-UP LIGHT SWITCH

1. Turn the ignition switch to OFF.
2. Disconnect the back light switch connector.
3. Measure the resistance between the back-up light switch terminals.

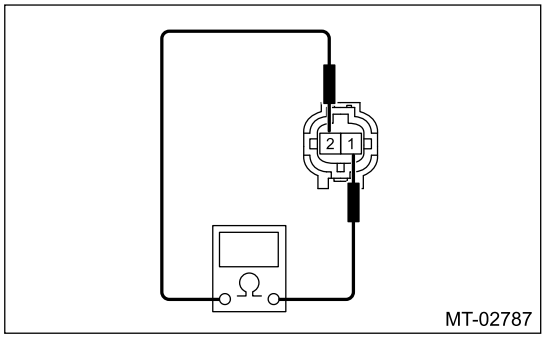


Gear shift position	Terminal No.	Standard
Reverse position	1 and 2	Less than 1 Ω
Other positions		1 MΩ or more

4. Replace faulty parts.

2. NEUTRAL POSITION SWITCH

1. Turn the ignition switch to OFF.
2. Disconnect the connector of neutral position switch.
3. Measure the resistance between neutral position switch terminals.



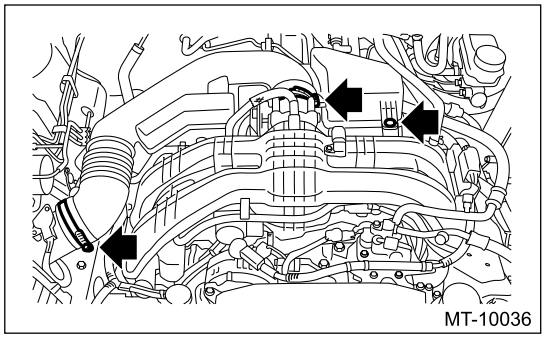
Gear shift position	Terminal No.	Standard
Neutral position	1 and 2	Less than 1 Ω
Other positions		1 MΩ or more

4. Replace faulty parts.

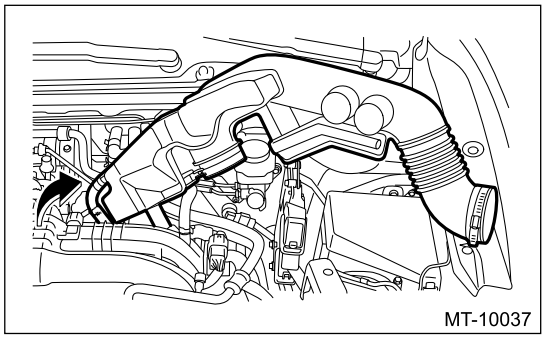
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Air Breather Hose

REMOVAL

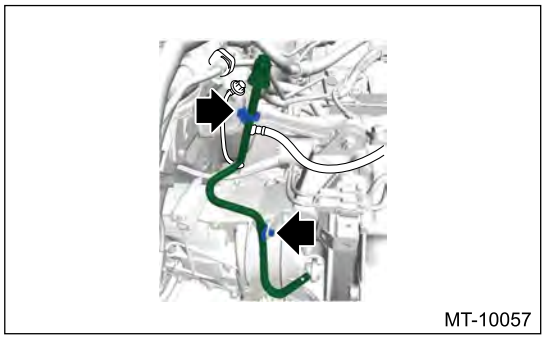
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clip from the air intake boot, and loosen the clamp.



3. Remove the air intake boot, and place it aside so that it does not interfere with the work.
   Caution:
   Be careful not to pull out the PCV hose.



4. Remove the clips and remove the air breather hose.

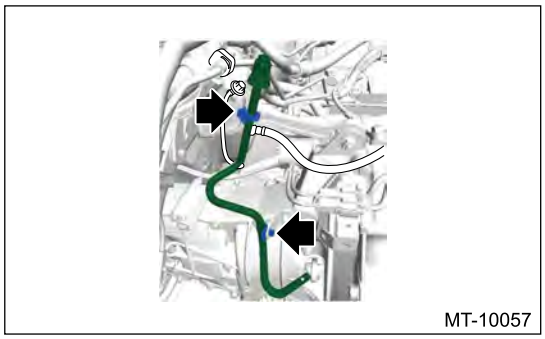


5. Remove the air breather cap.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Air Breather Hose

INSTALLATION

1. Install the air breather cap.
2. Install the air breather hose.



3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

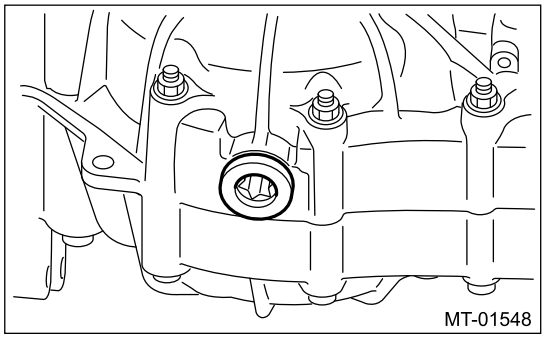
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Air Breather Hose

INSPECTION

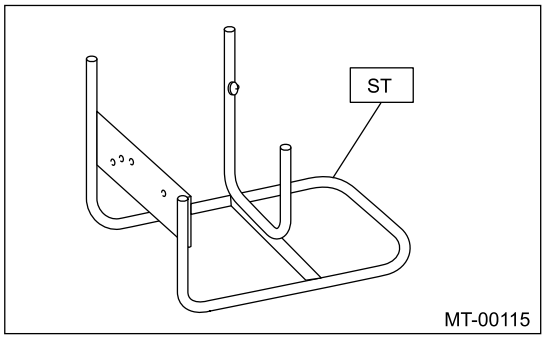
Check the hose for peeling, crack or clogging.

PROCEDURE

1. Clean oil, grease, dirt and dust from the transmission.
2. When transmission gear oil remains in the transmission, using the TORX® bit T70 to remove the drain plug, and drain the gear oil completely.
3. Replace the gasket with a new part and install the drain plug using the TORX® bit T70.
   Tightening torque:
   44 N·m (4.5 kgf-m, 32.5 ft-lb) (aluminum gasket, silver)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (copper gasket, brown)
   70 N·m (7.1 kgf-m, 51.6 ft-lb) (metal gasket, black)



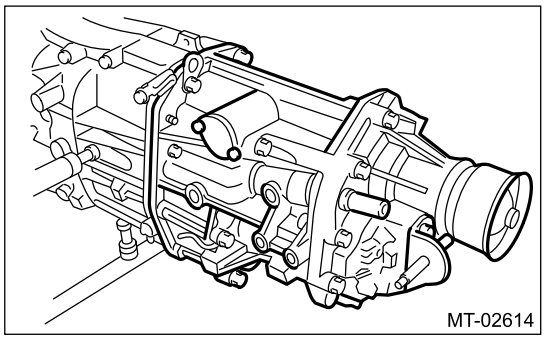
4. Install the transmission to the ST.
   Special Tool:
   ST: 499937100 TRANSMISSION STAND



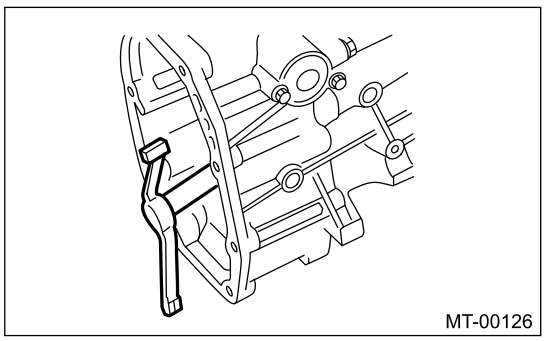
5. Apply transmission gear oil to rotating parts before assembly.
6. All disassembled parts, if to be reused, should be reinstalled in the original positions.
7. Gaskets, lock washers and lock nuts must be replaced with new ones.
8. Apply liquid gasket to the specified areas to prevent leakage.

REMOVAL

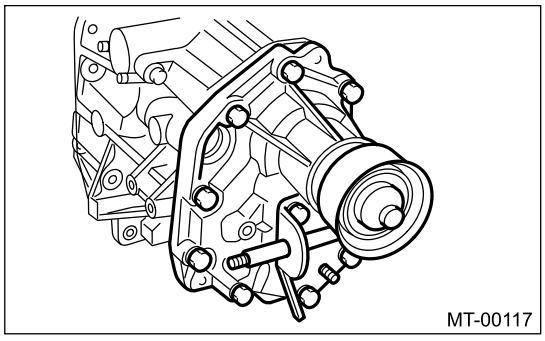
1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly.



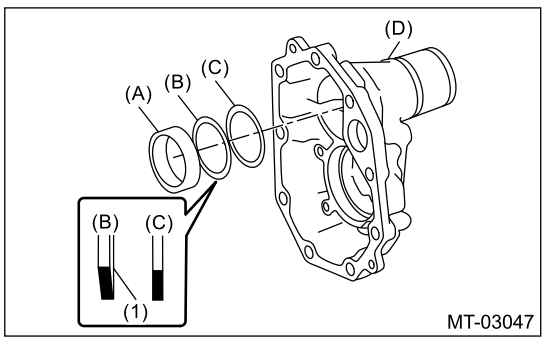
4. Remove the gasket.
5. Remove the shifter arm.



6. Remove the extension case assembly.

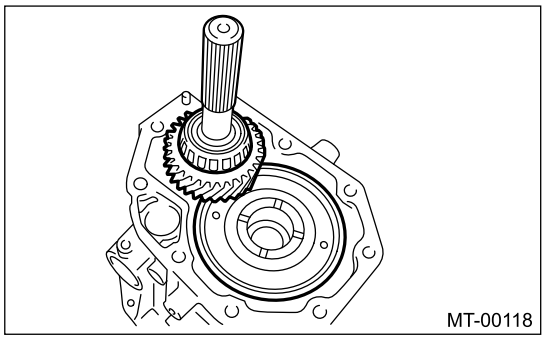


7. Remove the taper roller bearing (extension case side) outer race, dish plate and adjusting washer.



(A) Taper roller bearing (extension case side) outer race
(B) Dish plate
(C) Adjusting washer
(D) Extension case
(1) Paint side

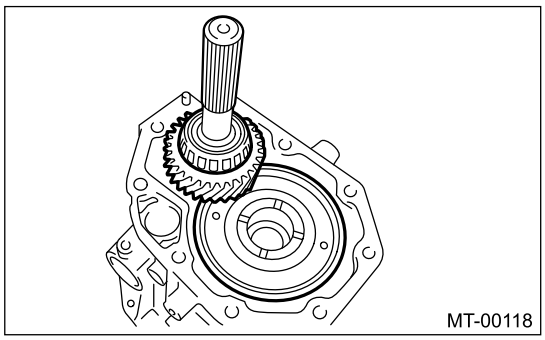
8. Remove the center differential and transfer driven gear.



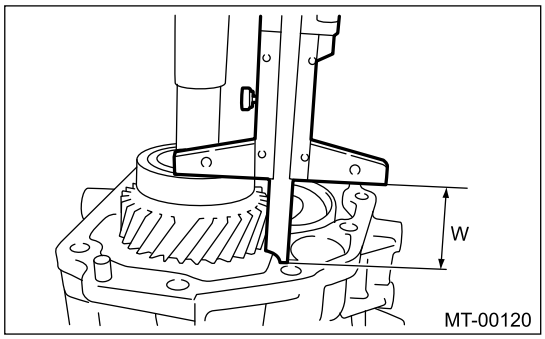
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Case and Extension Case Assembly

INSTALLATION

1. Clean the mating surfaces of the transmission case, transfer case and extension case.
2. Apply a coat of grease to the taper roller bearing (transfer case side) of transfer driven gear and the roller rolling surface of the taper roller bearing (extension case side).
   Grease:
   NICHIMOLY N-130 or equivalent
3. Install the center differential and the transfer driven gear.



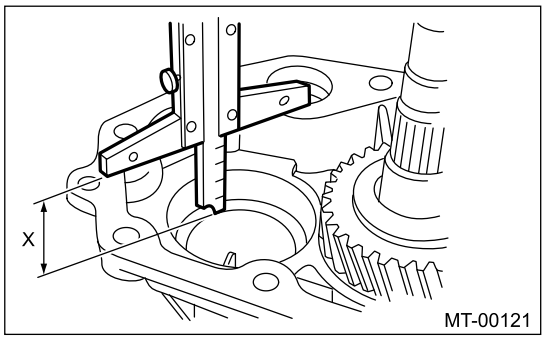
4. Install the taper roller bearing (extension case side) outer race to the transfer driven gear.
5. While pressing the taper roller bearing (extension case side) outer race horizontally, rotate the transfer driven gear for ten turns.
6. Measure the height “W” between transfer case and taper roller bearing (transfer case side) on the transfer driven gear.



7. Measure the depth “X” of taper roller bearing insertion part of the extension case.

Note:

Measure while the taper roller bearing (extension case side) outer race, dish plate and adjusting washer are removed.



8. Calculate the adjusting washer thickness “T” using the following calculation.

T = X − W − (1.715 — 1.765 mm (0.686 — 0.706 in))

X: Depth of taper roller bearing insertion part of extension case

W: Height between transfer case and taper roller bearing (transfer case side) on transfer driven gear

9. Select the adjusting washer with the nearest value in the following table.

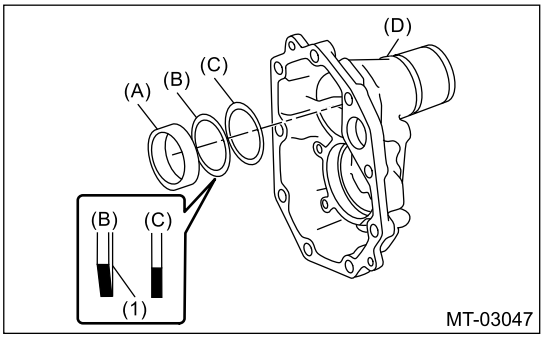
Adjusting washer (61 × 50 × T)	
Part No.	**Thickness mm (in)**
803050060	0.50 (0.0197)
803050061	0.55 (0.0217)
803050062	0.60 (0.0236)
803050063	0.65 (0.0256)
803050064	0.70 (0.0276)
803050065	0.75 (0.0295)
803050066	0.80 (0.0315)
803050067	0.85 (0.0335)
803050068	0.90 (0.0354)
803050069	0.95 (0.0374)
803050070	1.00 (0.0394)
803050071	1.05 (0.0413)
803050072	1.10 (0.0433)
803050073	1.15 (0.0453)
803050074	1.20 (0.0472)
803050075	1.25 (0.0492)

Adjusting washer (61 × 50 × T)	
Part No.	**Thickness mm (in)**
803050076	1.30 (0.0512)
803050077	1.35 (0.0531)
803050078	1.40 (0.0551)
803050079	1.45 (0.0571)

10. Install the selected adjusting washer, dish plate and taper roller bearing (extension case side) outer race.

Caution:

Pay attention to the orientation of the dish plate.

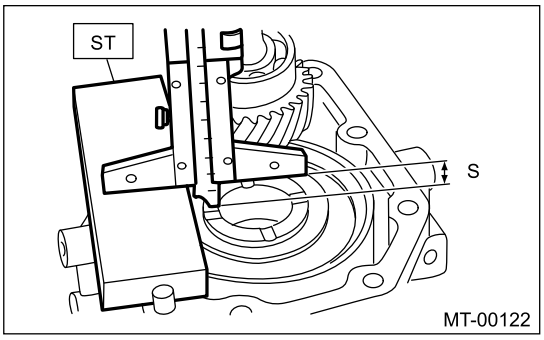


(A) Taper roller bearing (extension case side) outer race
(B) Dish plate
(C) Adjusting washer
(D) Extension case
(1) Paint side

11. Measure the depth "S" between transfer case + ST and center differential.

Special Tool:

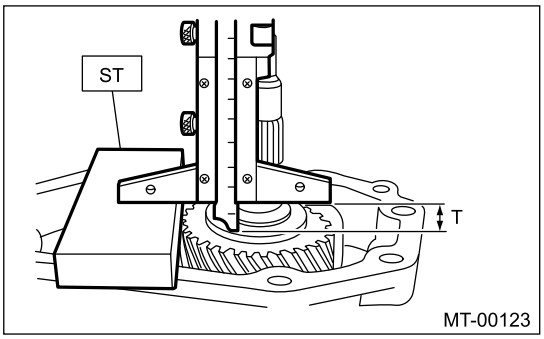
ST: 398643600 GAUGE



12. Measure the height "T" between the extension case + ST and transfer drive gear.

Special Tool:

ST: 398643600 GAUGE



13. Calculate the adjusting washer thickness "U" using the following calculation.
U = S + T − 30 mm (1.18 in) − (0.15 — 0.35 mm (0.0059 — 0.0138 in))
S: Depth between transfer case + ST and center differential
T: Height between the extension case + ST and transfer drive gear
30 mm (1.18 in): Thickness of ST (× 2 pieces)
0.15 — 0.35 mm (0.0059 — 0.0138 in): Clearance

14. Select a suitable adjusting washer in the following table.

Specification:

Clearance:

0.15 — 0.35 mm (0.0059 — 0.0138 in)

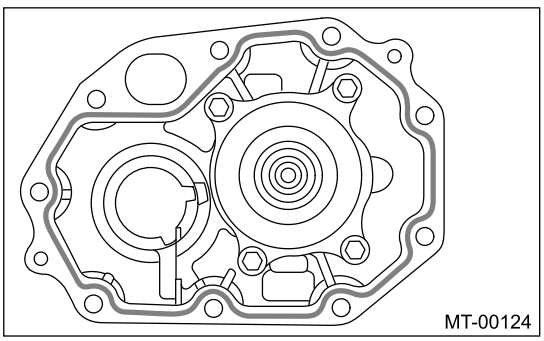
Adjusting washer	
Part No.	**Thickness mm (in)**
803036050	0.9 (0.035)
803036054	1.0 (0.039)
803036051	1.1 (0.043)
803036055	1.2 (0.047)
803036052	1.3 (0.051)
803036056	1.4 (0.055)
803036053	1.5 (0.059)
803036057	1.6 (0.063)
803036058	1.7 (0.067)
803036080	1.8 (0.071)
803036081	1.9 (0.075)

15. Install the adjusting washer to center differential.

16. Apply an appropriate amount of liquid gasket.

Liquid gasket:

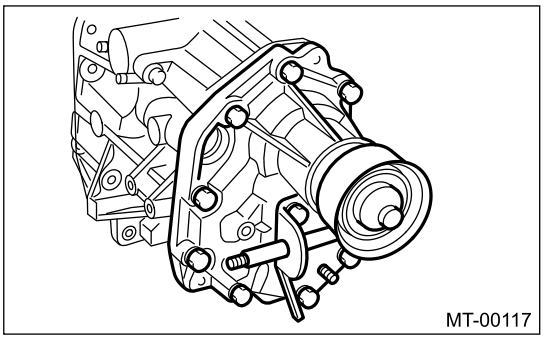
THREE BOND 1215B or equivalent



17. Install the extension case assembly.

Tightening torque:

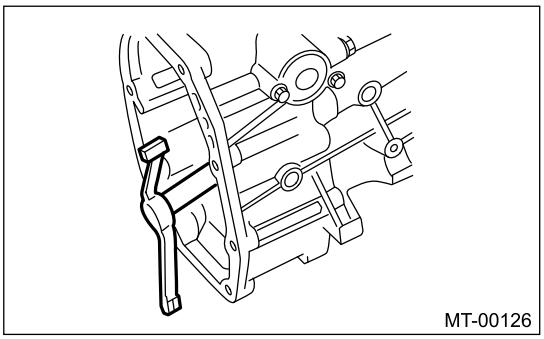
40 N·m (4.1 kgf-m, 29.5 ft-lb)



18. Install the shifter arm.

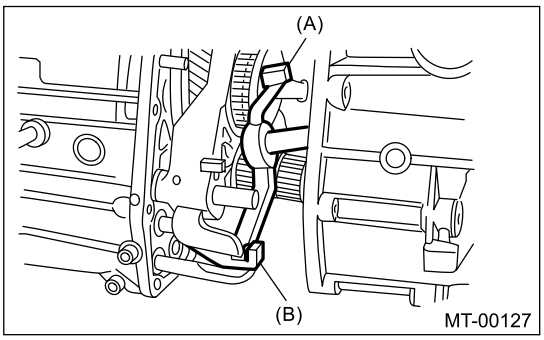
Note:

Apply transmission gear oil to the oil seal lips.



19. Install a new gasket.

20. Hook the shifter arm.



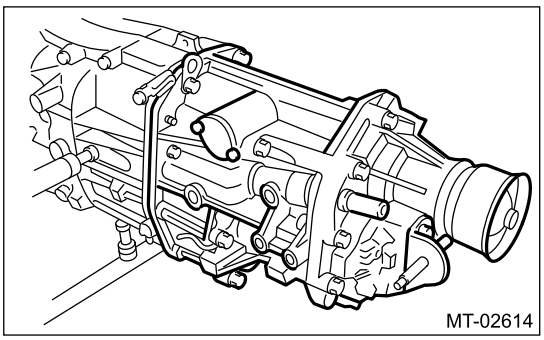
(A) Shifter arm

(B) 3rd-4th fork rod

21. Install the transfer case together with the extension case assembly.

Tightening torque:

24.5 N·m (2.5 kgf-m, 18.1 ft-lb)



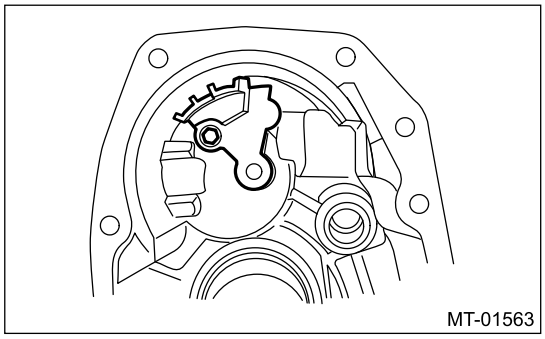
22. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
23. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Case and Extension Case Assembly

DISASSEMBLY

1. TRANSFER CASE

1. Remove the reverse check sleeve assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Check Sleeve>REMOVAL.
2. Remove the oil guide.



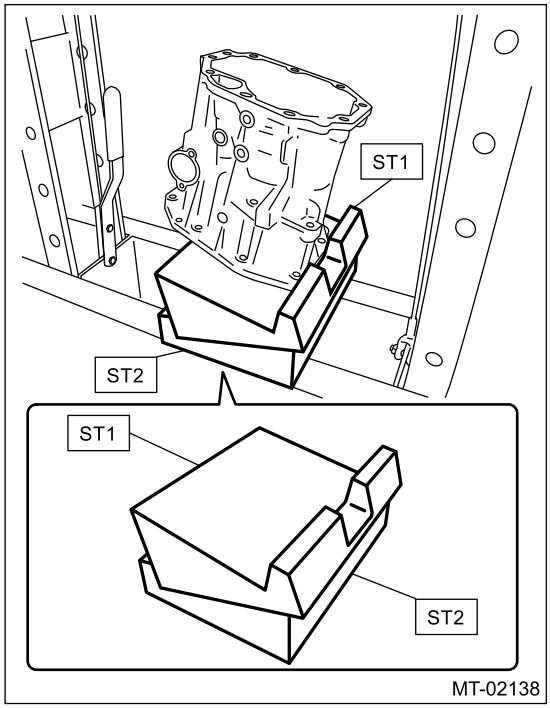
3. Remove the oil seal.
4. Set the ST1, ST2 and transfer case to the press.

Note:

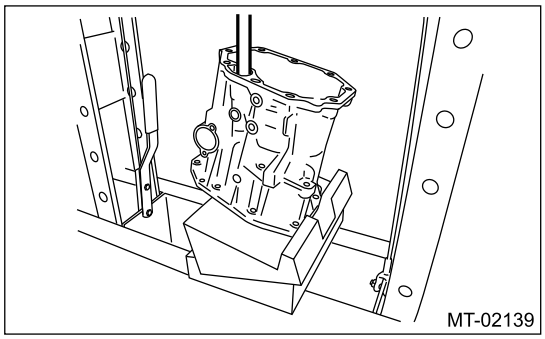
- **Set the ST2 under the ST1.**
- **Set the transfer case so that the hole for shifter arm is positioned vertically.**

Special Tool:

ST1: 498267300 CYLINDER HEAD TABLE
ST2: 498267200 CYLINDER HEAD TABLE

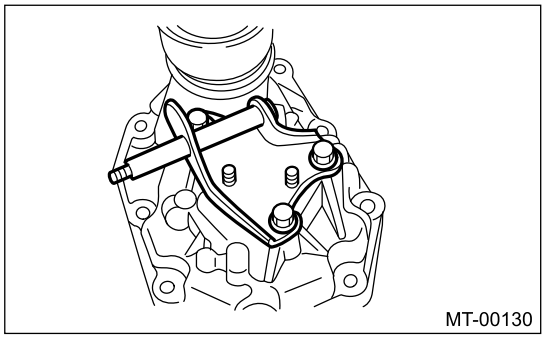


5. Remove the roller bearing by using a round bar of 22 mm (0.87 in) or 23 mm (0.91 in).



2. EXTENSION CASE

1. Remove the transfer drive gear assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Drive Gear>REMOVAL.
2. Remove the shift bracket.



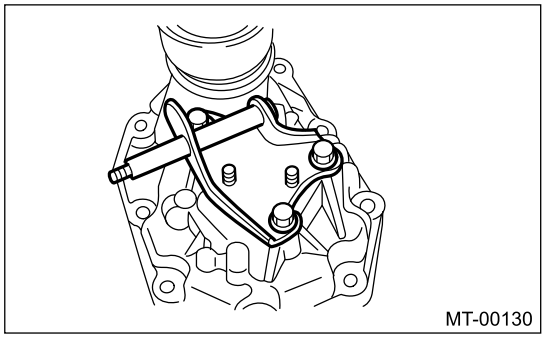
3. Remove the oil seal from the extension case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Oil Seal>REPLACEMENT.
4. Remove the dust cover.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Case and Extension Case Assembly

ASSEMBLY

1. EXTENSION CASE

1. Install a new oil seal to the extension case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Oil Seal>REPLACEMENT.
2. Install the dust cover.
3. Install the shift bracket.
   Tightening torque:
   24.5 N·m (2.5 kgf-m, 18.1 ft-lb)



4. Install the transfer drive gear to the extension case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Drive Gear>INSTALLATION.

2. TRANSFER CASE

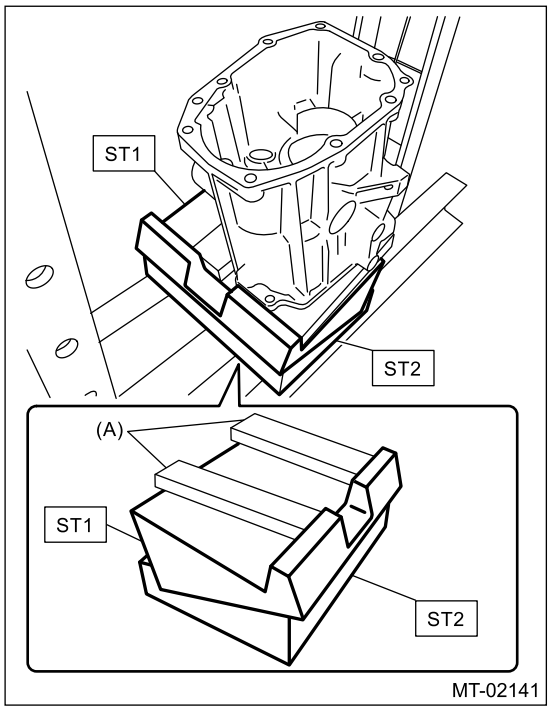
1. Set the ST1, ST2, steel plate and transfer case to the press.

Note:

- **Set the ST2 under the ST1.**
- **Set the transfer case so that the hole for shifter arm is positioned vertically.**
- **Insert the steel plate, which is thicker than the exposed length of the transfer case knock pin, between the ST and transfer case.**
- **Set the iron plate so that the transfer case knock pin does not ride on the iron plate.**

Special Tool:

ST1: 498267300 CYLINDER HEAD TABLE
ST2: 498267200 CYLINDER HEAD TABLE



(A) Iron plate

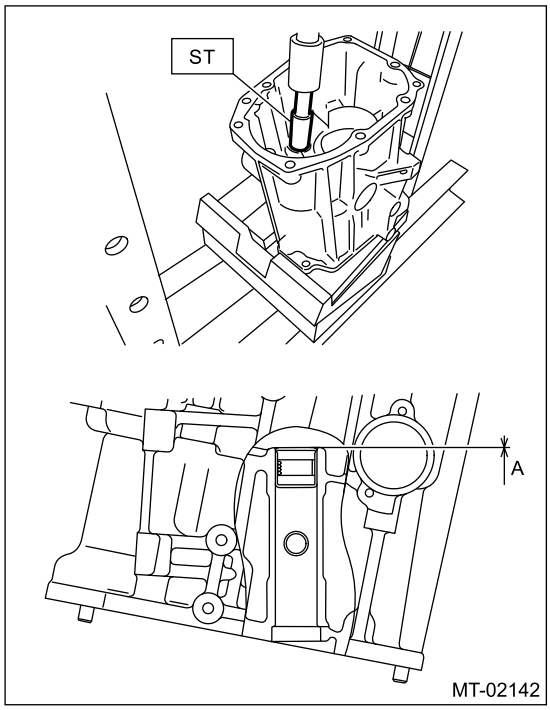
2. Press-fit the roller bearing using the ST.

Press-fit depth:

A: 0±0.2 mm (0±0.01 in) from the end of transfer case

Special Tool:

ST: 899864100 REMOVER



3. Remove the iron plate, and turn over the transfer case.

Note:

Set the transfer case so that the hole for shifter arm is positioned vertically.

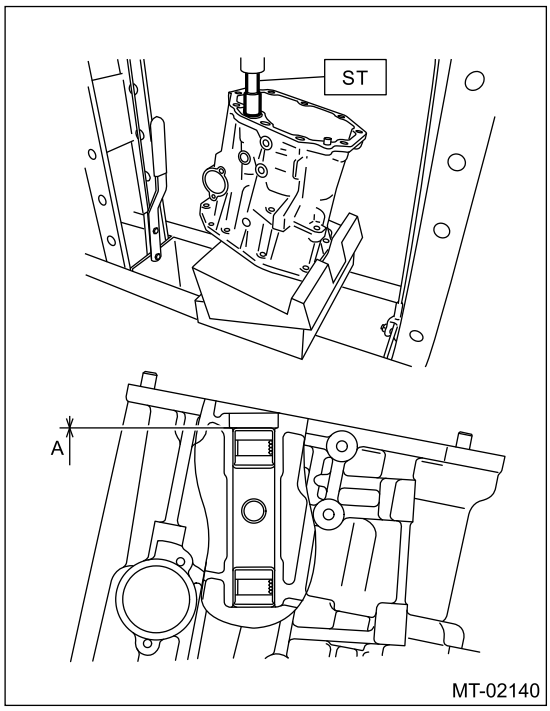
4. Press-fit the roller bearing using the ST.

Press-fit depth:

A: 0±0.2 mm (0±0.01 in) from the end of transfer case

Special Tool:

ST: 899864100 REMOVER

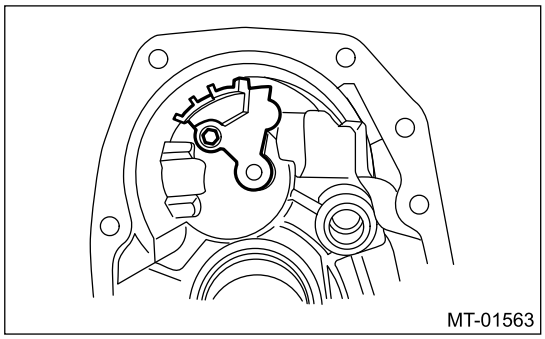


5. Install the shifter arm to the transfer case, and make sure that the shift arm moves smoothly.

6. Replace the precoat bolt with a new part, and Install the oil guide.

Tightening torque:

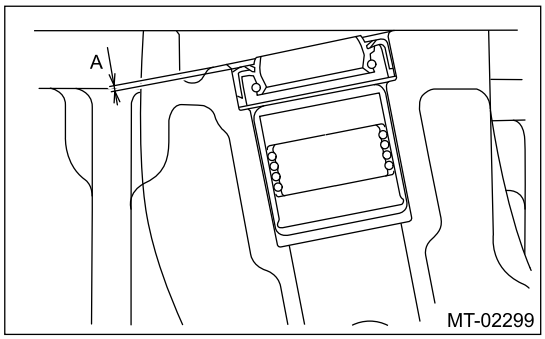
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



7. Install the reverse check sleeve assembly to the transfer case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Check Sleeve>INSTALLATION.
8. Install a new oil seal.

Press-fit depth:

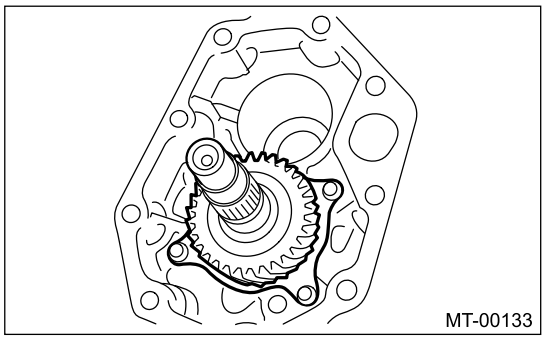
A: 1±0.2 mm (0.04±0.01 in) from the end of transfer case



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Drive Gear

REMOVAL

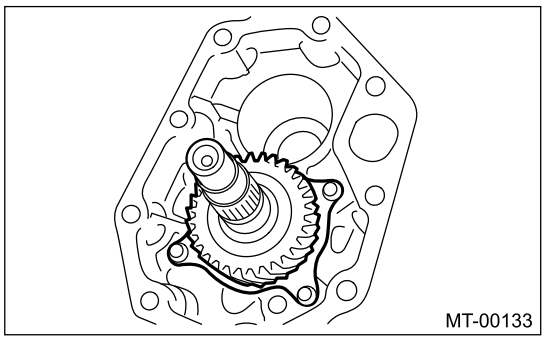
1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the extension case assembly.
5. Remove the transfer driven gear.
6. Remove the transfer drive gear.



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Drive Gear

INSTALLATION

1. Install the transfer drive gear.
   Tightening torque:
   26 N·m (2.7 kgf-m, 19.2 ft-lb)

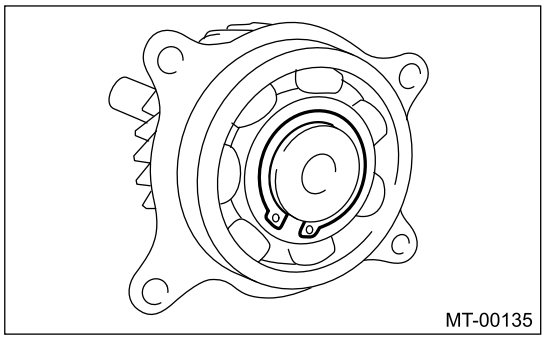


2. Select the adjusting washer. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
3. Install the transfer driven gear.
4. Install the transfer case and the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
5. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
6. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

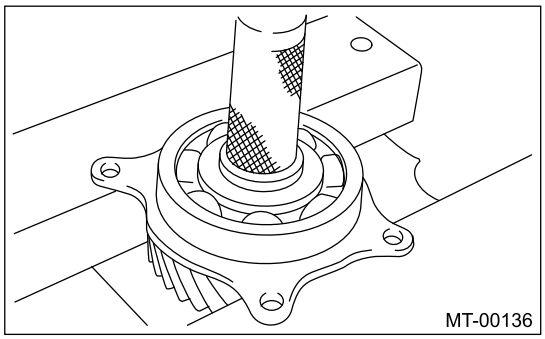
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Drive Gear

DISASSEMBLY

1. Remove the snap ring.



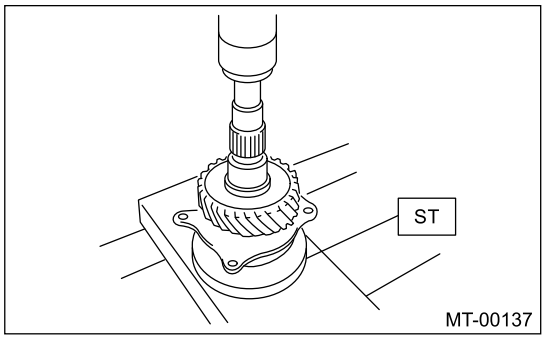
2. Remove the ball bearing.



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Drive Gear

ASSEMBLY

1. Set the ST against the inner race of a new ball bearing, and install the transfer drive gear.
   Caution:
   Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).
   Special Tool:
   ST: 398177700 INSTALLER



2. Install the snap ring on the transfer drive gear.
3. Inspect the clearance between the snap ring and the ball bearing. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Drive Gear>INSPECTION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Drive Gear

INSPECTION

1. Ball bearing
   Replace the bearings in the following cases.

- In case of broken or rusty bearings
- In case of worn or damaged bearings
- When the bearings fail to turn smoothly or emit noise in rotation after transmission gear oil has been applied.

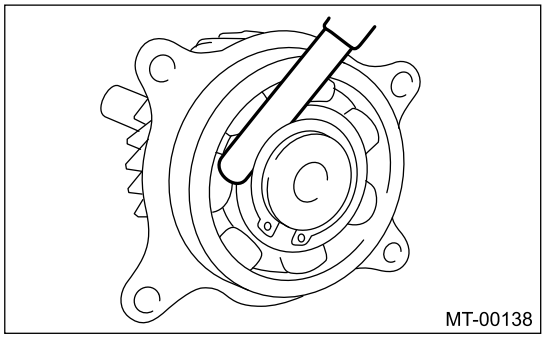
2. Transfer drive gear

If the drive gear tooth surface and shaft are excessively broken or damaged, replace the drive gear.

3. Measure the clearance between snap ring and inner race of ball bearing with a thickness gauge.

Specification:

0.01 — 0.15 mm (0.0004 — 0.0059 in)



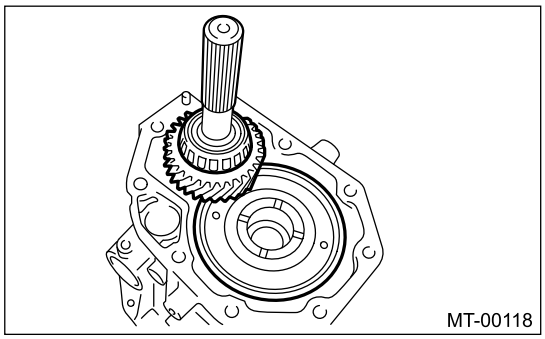
If the measurement is not within specification, select a suitable snap ring and replace it.

Snap ring (outer-30)	
Part No.	**Thickness mm (in)**
805030041	1.53 (0.0602)
805030042	1.65 (0.0650)
805030043	1.77 (0.0697)

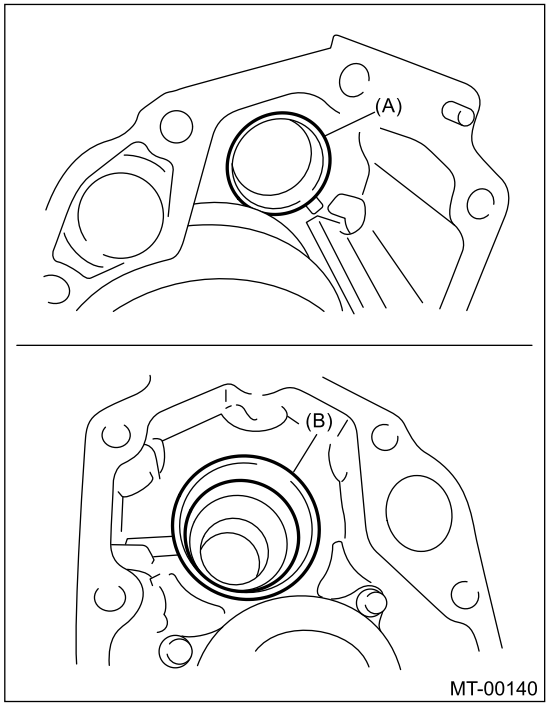
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Driven Gear

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the extension case assembly.
5. Remove the transfer driven gear.



6. Remove the taper roller bearing outer race.

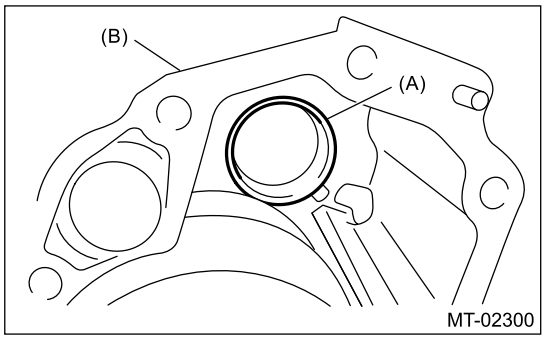


(A) Taper roller bearing (transfer case side) outer race
(B) Taper roller bearing (extension case side) outer race

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Driven Gear

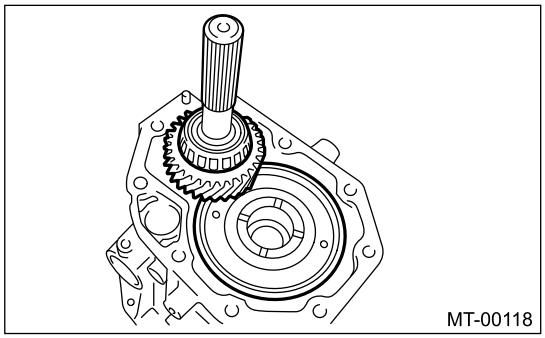
INSTALLATION

1. Install the taper roller bearing (transfer case side) outer race.



(A) Taper roller bearing (transfer case side) outer race
(B) Transfer case

2. Apply a coat of grease to the taper roller bearing (transfer case side) of transfer driven gear and the roller rolling surface of the taper roller bearing (extension case side).
Grease:
NICHIMOLY N-130 or equivalent
3. Install the transfer driven gear.

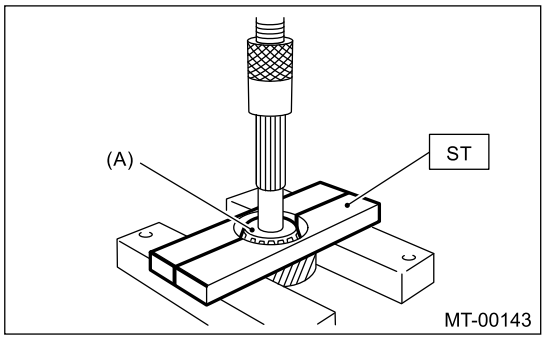


4. Select the adjusting washer. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
5. Install the transfer case and the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
6. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
7. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Driven Gear

DISASSEMBLY

1. Using the ST, remove the taper roller bearing (extension case side).
Special Tool:
ST: 498077000 REMOVER



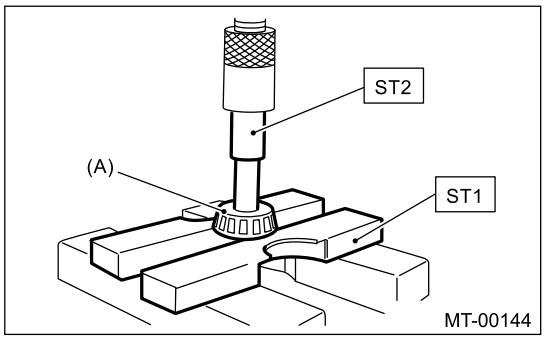
(A) Taper roller bearing (extension case side)

2. Using ST1 and ST2, remove the taper roller bearing (transfer case side).

Special Tool:

ST1: 498077000 REMOVER

ST2: 899864100 REMOVER



(A) Taper roller bearing (transfer case side)

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Driven Gear

ASSEMBLY

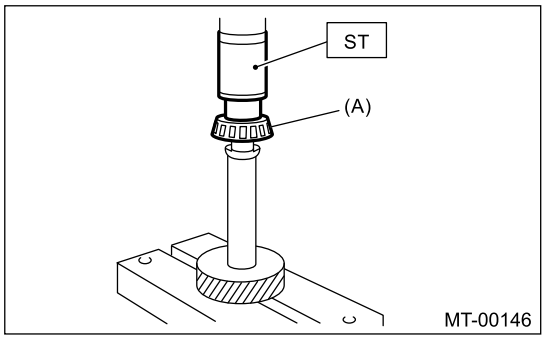
1. Using the ST, install the taper roller bearing (transfer case side).

Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Be careful when handling, because the outer race and inner race of the taper roller bearing are used as a set.**

Special Tool:

ST: 927640000 INSTALLER



(A) Taper roller bearing (transfer case side)

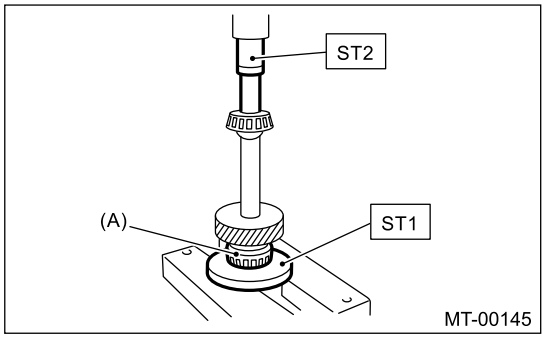
2. Using the ST, install the taper roller bearing (extension case side).

Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Be careful when handling, because the outer race and inner race of the taper roller bearing are used as a set.**

Special Tool:

ST1: 498175500 INSTALLER
ST2: 899864100 REMOVER



(A) Taper roller bearing (extension case side)

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transfer Driven Gear

INSPECTION

1. Taper roller bearing
   Replace the bearings in the following cases.
   - In case of broken or rusty bearings
   - In case of worn or damaged bearings
   - When the bearings fail to turn smoothly or emit noise in rotation after transmission gear oil has been applied.
2. Transfer driven gear
   If the tooth face of driven gear and the shaft are excessively broken or damaged, replace the driven gear.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Center Differential

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the extension case assembly.
5. Remove the transfer driven gear. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Driven Gear>REMOVAL.
6. Remove the center differential.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Center Differential

INSTALLATION

1. Attach the center differential to transfer case.
2. Install the transfer driven gear. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Driven Gear>INSTALLATION.
3. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
4. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
5. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Center Differential

DISASSEMBLY

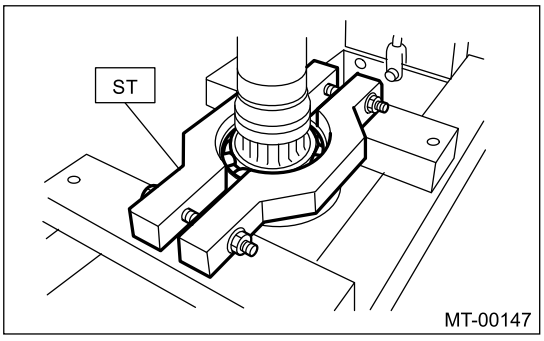
Remove the ball bearing using the ST.

Caution:

Center differential is a non-disassembled part which should not be disassembled.

Special Tool:

ST: 498077300 REMOVER



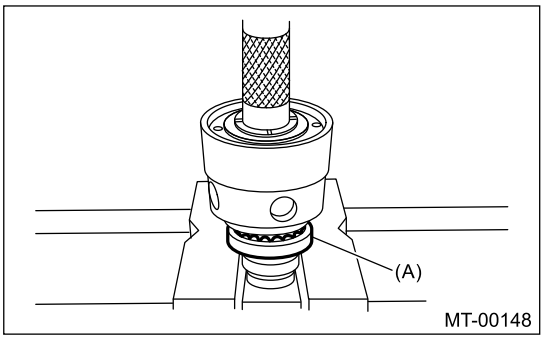
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Center Differential

ASSEMBLY

Install new ball bearings.

Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).



(A) Ball bearing

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Center Differential

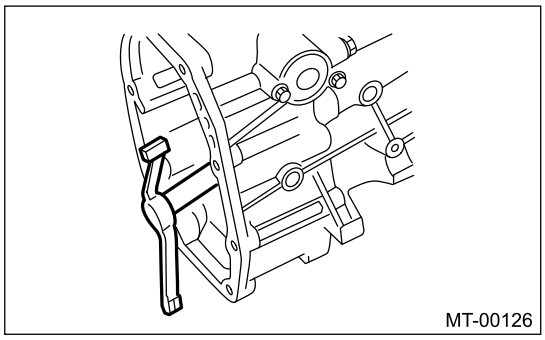
INSPECTION

1. Ball bearing
   Replace the bearings in the following cases.
   - In case of broken or rusty bearings
   - In case of worn or damaged bearings
   - When the bearings fail to turn smoothly or emit noise in rotation after transmission gear oil has been applied.
   - When bearing has other defects.
2. Center differential
   If there is wear or damage, replace the center differential assembly.

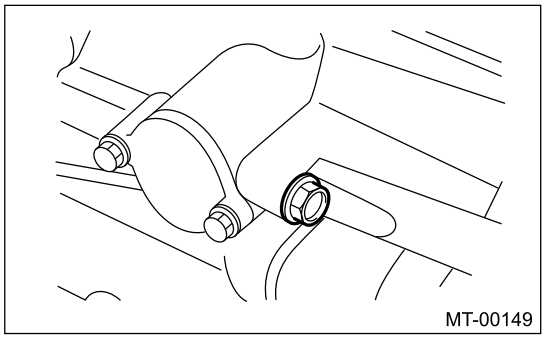
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Check Sleeve

REMOVAL

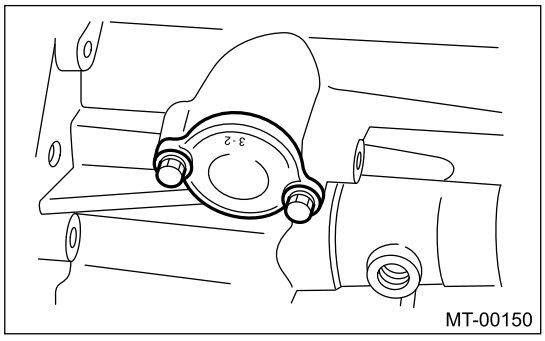
1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
3. Remove the shifter arm.



4. Remove the plug, gasket, reverse accent spring, and reverse check ball.



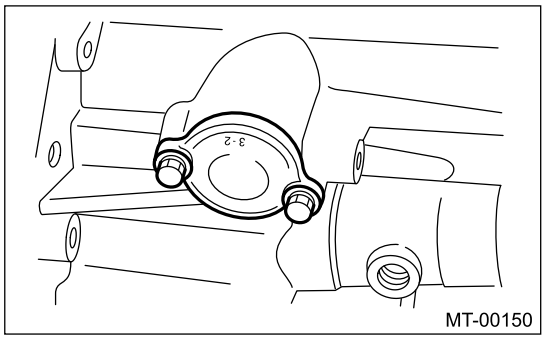
5. Remove the reverse check sleeve.



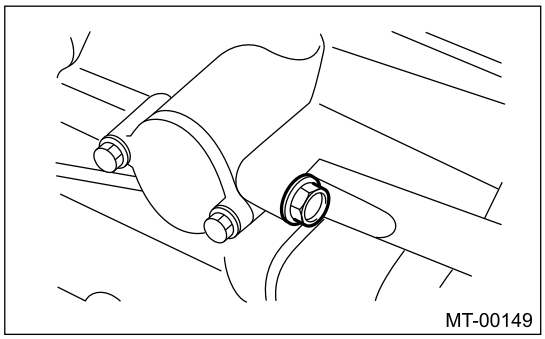
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Check Sleeve

INSTALLATION

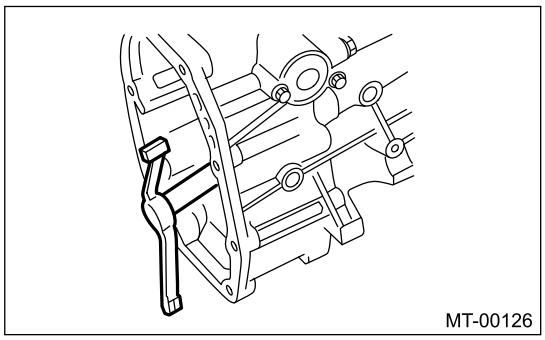
1. Install the reverse check sleeve.
   Tightening torque:
   6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



2. Install the reverse check ball, reverse accent spring, new gasket, and plug.
   Tightening torque:
   9.75 N·m (1.0 kgf-m, 7.2 ft-lb)



3. Install the shifter arm.
   Note:
   Apply transmission gear oil to the oil seal lips.

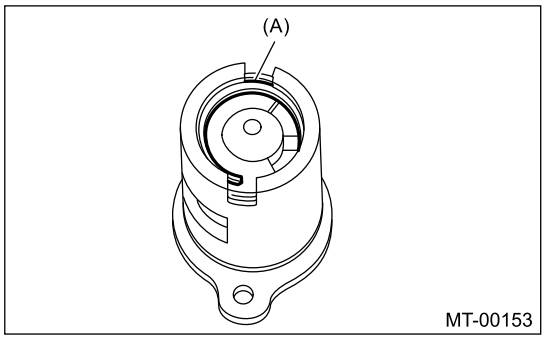


4. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
5. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Check Sleeve

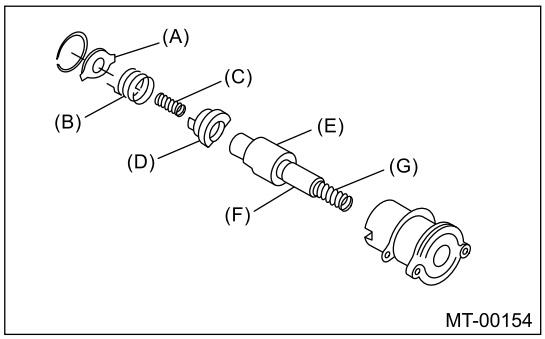
DISASSEMBLY

1. Cover the reverse check sleeve with cloth, and remove the snap ring by using screwdriver.
   Note:
   If the snap ring is deformed or the spring repulsive force is not enough, replace with a new snap ring.



(A) Snap ring

2. Remove the reverse check plate, reverse check spring, reverse check cam, return spring (5th-Reverse), reverse accent shaft, return spring cap, and return spring (1st-2nd).



(A) Reverse check plate
(B) Reverse check spring
(C) Return spring (5th-Reverse)
(D) Reverse check cam
(E) Reverse accent shaft
(F) Return spring cap
(G) Return spring (1st-2nd)

3. Remove the O-rings.

Caution:

Be careful not to damage the adjusting select shim between reverse check sleeve assembly and case.

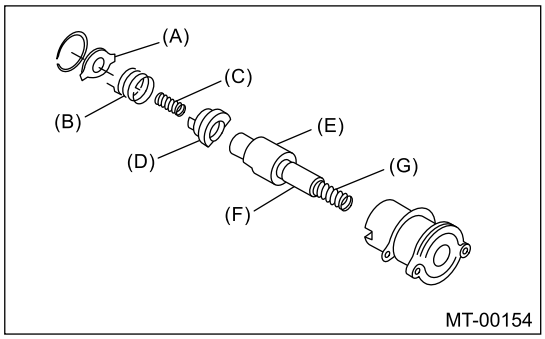
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Check Sleeve

ASSEMBLY

1. Install the return spring (1st-2nd), return spring cap, reverse accent shaft, reverse check cam, return spring (5th-Reverse) and reverse check spring.

Caution:

Be sure to insert the curved part of reverse check spring into the check cam groove.



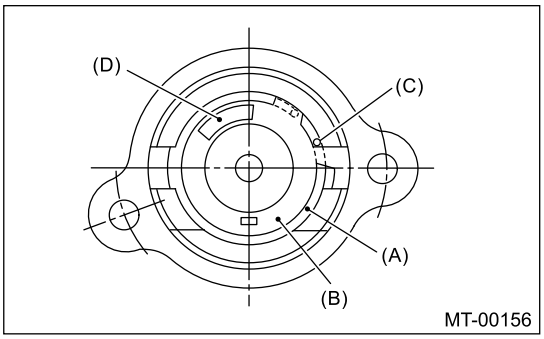
(A) Reverse check plate
(B) Reverse check spring
(C) Return spring (5th-Reverse)
(D) Reverse check cam
(E) Reverse accent shaft
(F) Return spring cap
(G) Return spring (1st-2nd)

2. Hook the curved part of reverse check spring onto the reverse check plate.
3. Rotate the cam so that the protrusion on the reverse check cam is located at the plate opening.
4. While fixing the cam to that position, attach the reverse check plate to the reverse check sleeve, and secure with snap ring.
5. Replace the O-ring with a new part, and insert it into the sleeve groove.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Check Sleeve

INSPECTION

- Make sure the cutout of the reverse accent shaft is aligned with the opening in the reverse check sleeve.
- Turn the cam by hand to check for smooth rotation.
- Move the cam and shaft all the way toward the plate, and make sure it releases.
  If the cam does not return properly, replace the reverse check spring. If the shaft does not return, check for scratches on the inner surface of sleeve. If the sleeve is in good order, replace the spring.



(A) Snap ring
(B) Reverse check plate
(C) Reverse check spring
(D) Reverse check cam

- Select a suitable reverse accent shaft and reverse check plate. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Check Sleeve>ADJUSTMENT.

ADJUSTMENT

1. NEUTRAL POSITION ADJUSTMENT

1. Shift the gear into 3rd gear position.
2. Because of the return spring, until the arm contacts the stopper the shifter arm will feel lighter moving towards 1st/2nd gear and heavier towards the reverse gear.
3. Make adjustment so that the heavy stroke (reverse side) is a little heavier than the lighter stroke (1st/2nd side).
4. To adjust, remove the bolts holding the reverse check sleeve assembly to the case, and move the sleeve assembly outward, then place an adjustment shim between the sleeve assembly and the case to adjust the clearance.

Caution:

Be careful not to damage the O-ring when placing shims.

Note:

- **When the shim is removed, the neutral position will move closer to reverse; when the shim is added, the neutral position will move closer to 1st gear.**
- **If it is not possible to adjust the clearance with only shims, replace the reverse accent shaft and re-adjust.**

Adjusting shim	
Part No.	**Thickness mm (in)**
32190AA000	0.15 (0.0059)
32190AA010	0.30 (0.0118)

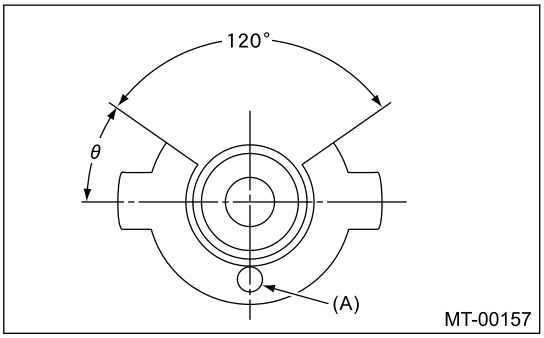
Reverse accent shaft		
Part No.	**Mark**	**Content**
32188AA130	S	Neutral position is closer to 1st gear.
32188AA140	T	Specification
32188AA150	U	Neutral position is closer to reverse gear.

2. REVERSE CHECK PLATE ADJUSTMENT

1. Shift the shifter arm to “5th” and then to reverse to see if the reverse check mechanism operates properly.
2. Also check to see if the arm returns to neutral when released from the reverse position. If the arm does not return properly, replace the reverse check plate.

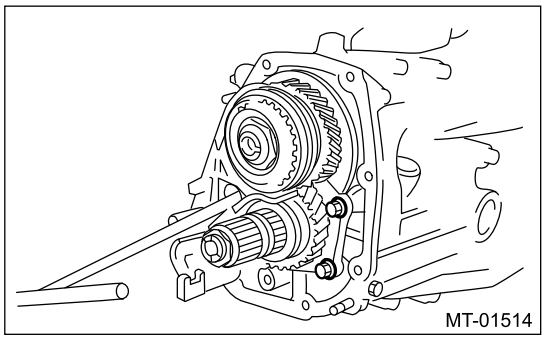
Reverse check plate			
Part No.	**(A): No.**	**Angleθ**	**Content**
32189AA001	0	28°	Arm stops closer to 5th gear.
32189AA011	1	31°	Arm stops closer to 5th gear.

Reverse check plate			
Part No.	**(A): No.**	**Angle θ**	**Content**
32189AA021	2	34°	Arm stops in the center.
32189AA031	3	37°	Arm stops closer to reverse gear.
32189AA041	4	40°	Arm stops closer to reverse gear.

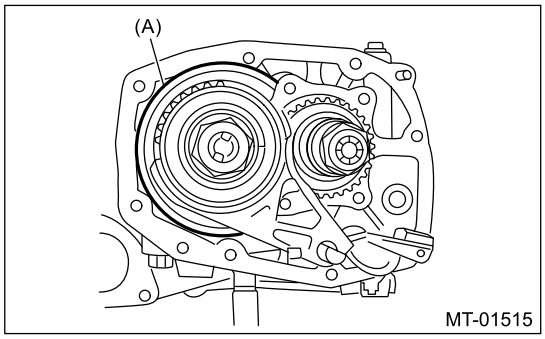


REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the clutch release lever and the release bearing. Ref. to CLUTCH SYSTEM>Release Bearing and Lever>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the bearing mounting bolt.

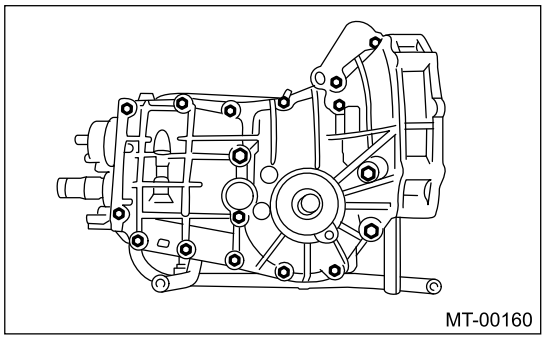


5. Remove the main shaft rear plate.



(A) Main shaft rear plate

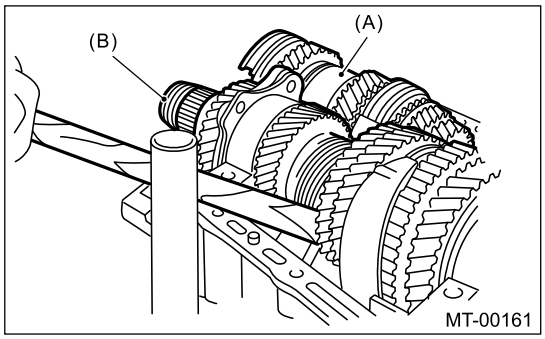
6. Remove the bolts and nuts, and separate the transmission case.



7. Remove the drive pinion shaft assembly.

Note:

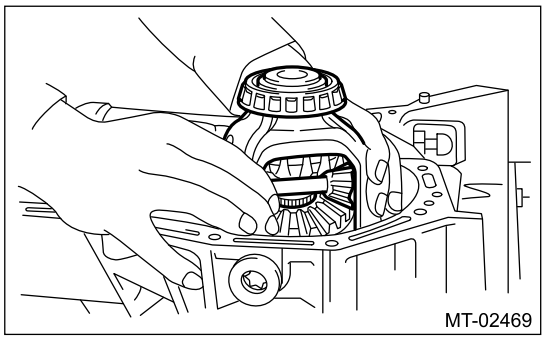
Use a hammer handle, etc. to remove if too tight.



(A) Main shaft ASSY

(B) Drive pinion shaft ASSY

8. Remove the main shaft assembly.
9. Remove the front differential assembly.



10. Remove the differential side retainers and taper roller bearing outer races. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>REMOVAL.

Caution:

Do not confuse the right and left taper roller bearing outer races.

11. Remove the reverse idler gear. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Idler Gear>REMOVAL.
12. Remove the shifter fork and rod. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>REMOVAL.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Case

INSTALLATION

1. Wipe off grease, oil and dust on the mating surfaces of transmission cases with cleaning solvent.
2. Install the reverse idler gear. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Idler Gear>INSTALLATION.
3. Install the shifter fork and rod. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>INSTALLATION.
4. Select the drive pinion shim. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>INSTALLATION.
5. Install the taper roller bearing outer race to the transmission case LH side, and install the differential side retainer with the O-ring removed.
6. Install the front differential assembly.
7. Install the main shaft assembly.

Note:

Align the needle bearing knock pin hole to the transmission case knock pin.

8. Install the selected drive pinion shims and drive pinion shaft assembly.

Note:

Align the roller bearing knock pin hole to the transmission case knock pin.

9. Align the transmission cases with each other, and tighten them with 17 mounting bolts.

Caution:

- **Insert bolts (11) and (16) from the LH side of the transmission case.**
- **Match the cases together so that the drive pinion shims are not caught between the cases.**

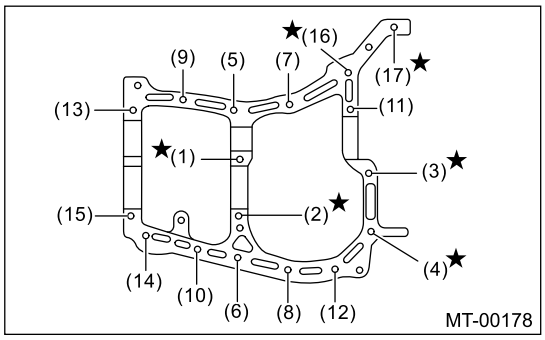
Tightening torque:

8 mm bolt

25 N·m (2.5 kgf-m, 18.4 ft-lb)

★ **10 mm bolt**

39 N·m (4.0 kgf-m, 28.8 ft-lb)

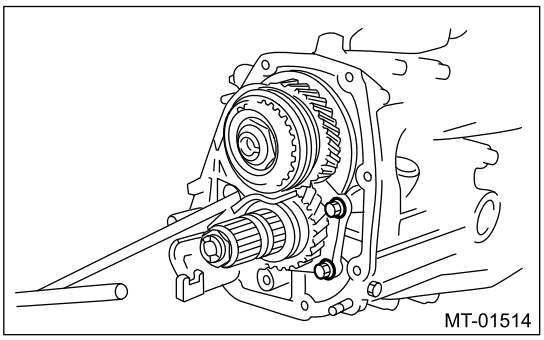


10. Install the taper roller bearing outer race to the RH side of the transmission case.

11. Tighten the bearing mounting bolts.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)

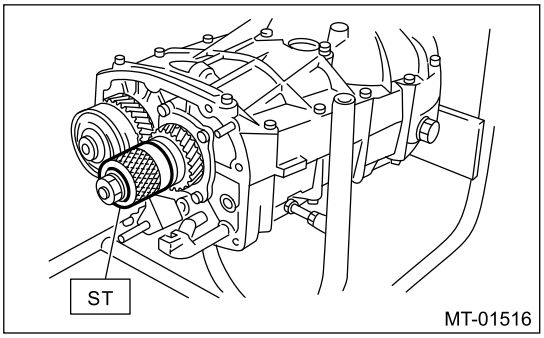


12. Adjust the backlash of the hypoid driven gear and the preload of the taper roller bearing.

(1) Install the ST to the drive pinion shaft assembly.

Special Tool:

ST: 498427100 STOPPER

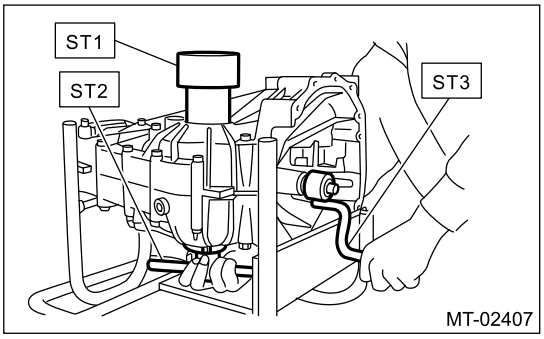


(2) Place the transmission case with the LH side facing downward, and put ST1 on the taper roller bearing outer race.

(3) Screw-in the differential side retainer from the bottom into LH side case using ST2. Fit the ST3 on the main shaft. Shift the gear into 4th or 5th, and turn the shaft several times. Screw in the side retainer while rotating the ST3 until a slight resistance is felt on ST2.
This is the contact point of the hypoid driven gear and the drive pinion shaft. Repeat the above sequence several times to ensure the contact point.

Special Tool:

ST1: 399780104 WEIGHT
ST2: 18630AA010 WRENCH COMPL RETAINER
ST3: 499927100 HANDLE



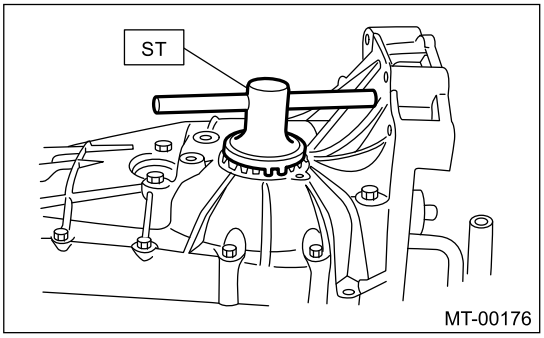
(4) Remove the WEIGHT, and screw in the differential side retainer without the O-ring into the RH side of the transmission case, and stop at the point where a slight resistance is felt.

Note:

In this condition, the backlash between hypoid driven gear and drive pinion shaft is zero.

Special Tool:

ST: 18630AA010 WRENCH COMPL RETAINER



(5) Loosen the differential side retainer on the LH side of the transmission case by 3 notches, and turn the side retainer on the RH side of the transmission case by 3 notches in order to apply backlash.

(6) Screw in the differential side retainer of the RH side of the transmission case additionally by 1 notch in order to apply preload on taper roller bearing.

(7) Temporarily tighten the retainer lock plates LH and RH, and put marks on both the differential side retainer and lock plate for later readjustment.

Note:

If it is hard to install the lock plates, reverse the sides and install them.

(8) Turn the main shaft several times while tapping around the differential side retainer lightly with a plastic hammer.

13. Inspect and adjust backlash and tooth contact of the hypoid driven gear. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>INSPECTION.

14. Separate the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.

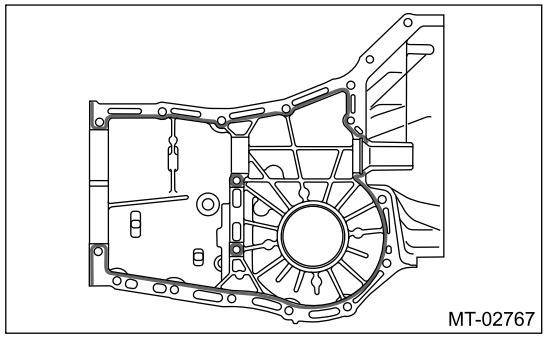
15. Check each shifter fork. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>INSPECTION.

16. Select a main shaft rear plate. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>ADJUSTMENT.

17. Apply liquid gasket, then join the transmission cases with each other.

Liquid gasket:

THREE BOND 1215B or equivalent



18. Tighten 17 bolts with brackets and clips as shown in the figure.

Caution:

- **Insert bolts (11) and (16) from the LH side of the transmission case.**
- **Match the cases together so that the drive pinion shims are not caught between the cases.**

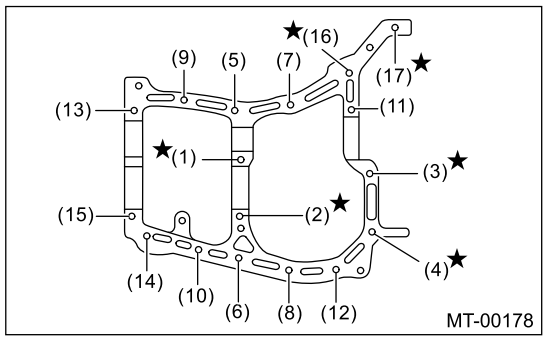
Tightening torque:

8 mm bolt

25 N·m (2.5 kgf-m, 18.4 ft-lb)

★ **10 mm bolt**

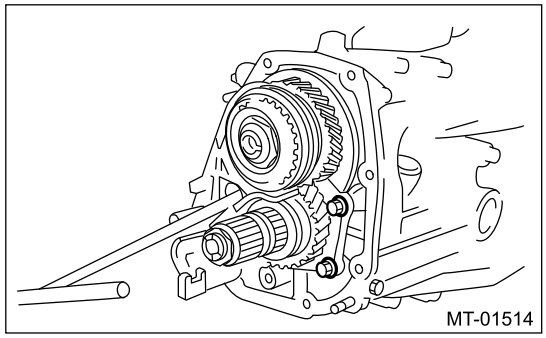
39 N·m (4.0 kgf-m, 28.8 ft-lb)



19. Tighten the bearing mounting bolts.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)



20. Remove the retainer lock plate, and loosen the differential side retainer until the groove of the O-ring appears. Fit a new O-ring into the groove and tighten the side retainer into the position

where it was not loosened.

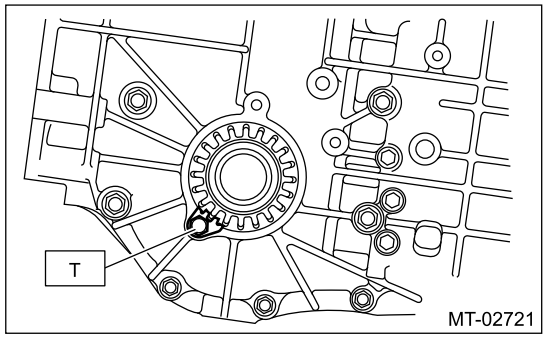
Note:

- **When loosening the side retainer, record the number of the turns made.**
- **Perform this for both left and right side retainers.**
- **Apply transmission gear oil to O-ring.**

21. Install the retainer lock plate.

Tightening torque:

T: 25 N·m (2.5 kgf-m, 18.4 ft-lb)



22. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.

23. Install the clutch release lever and release bearing. Ref. to CLUTCH SYSTEM>Release Bearing and Lever>INSTALLATION.

24. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Transmission Case

INSPECTION

Check the transmission case for cracks, damage, or oil leaks.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

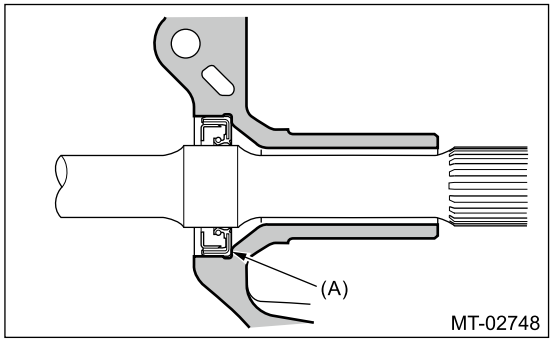
REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
3. Remove the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.
4. Remove the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>REMOVAL.
5. Remove the main shaft assembly.

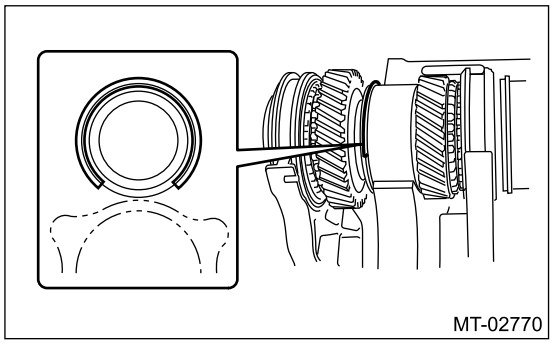
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

INSTALLATION

1. Attach the needle bearing and new oil seal to the front of the main shaft assembly.
   Note:
   - **Wrap the clutch splined section with vinyl tape to prevent damage to the oil seal.**
   - **Apply NICHIMOLY N-130 or the equivalent to the sealing lip of the oil seal.**
2. Fit the knock pin hole of the needle bearing outer race to the transmission case knock pin, and install the main shaft assembly.
   Note:
   - **Align the end face of the seal with surface (A) when installing the oil seal.**



   - **Face the cutout portion of the snap ring for the ball bearing to the drive pinion shaft assembly.**



3. Install the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>INSTALLATION.
4. Check each shifter fork. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>INSPECTION.

5. Select a main shaft rear plate. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>ADJUSTMENT.
6. Install the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>INSTALLATION.
7. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
8. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

DISASSEMBLY

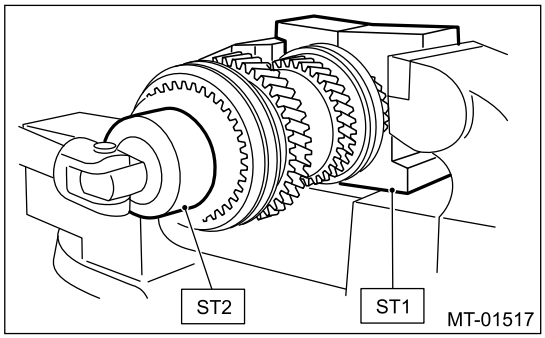
1. Put vinyl tape around main shaft spline to protect the oil seal from damage. Then pull out the oil seal and needle bearing by hand.
2. Remove the lock nut and lock washer.

Note:

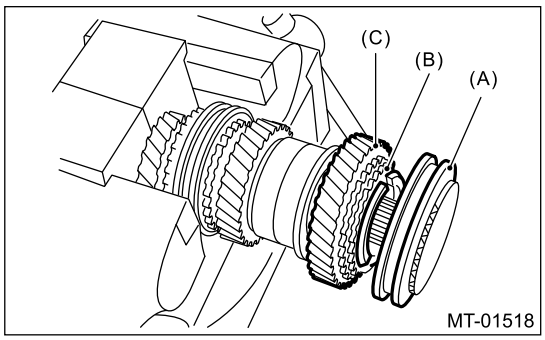
Flatten the lock nut tab before removing the lock nut.

Special Tool:

ST1: 498937000 TRANSMISSION HOLDER
ST2: 499987003 SOCKET WRENCH (35)



3. Remove the 5th hub & sleeve No. 2, baulk lever, 5th baulk ring, and 5th drive gear & needle bearing.



(A) 5th hub & sleeve No. 2
(B) 5th baulk ring
(C) 5th drive gear

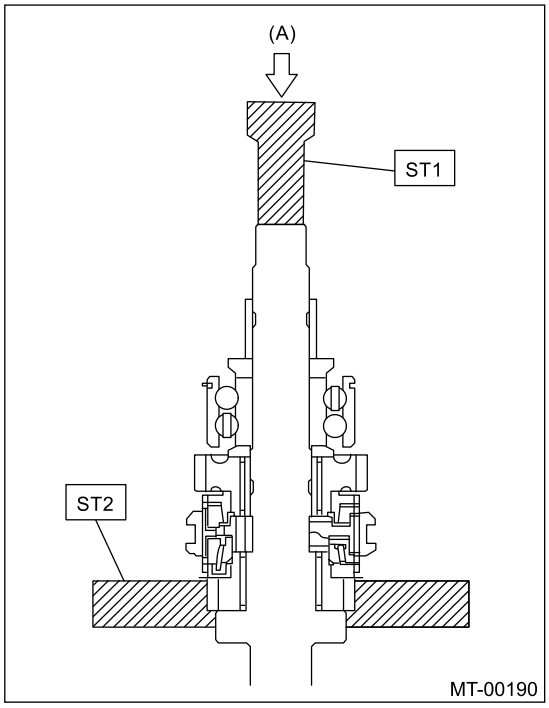
4. Using ST1 and ST2, remove the rest of the parts.

Caution:

- **When replacing the sleeve & hub, replace them as a set.**
- **Do not disassemble the sleeve & hub; the engaging point is pre-determined.**
- **If it is necessary to disassemble, mark the engaging points on the splines beforehand.**

Special Tool:

ST1: 899864100 REMOVER
ST2: 899714110 REMOVER



(A) Press

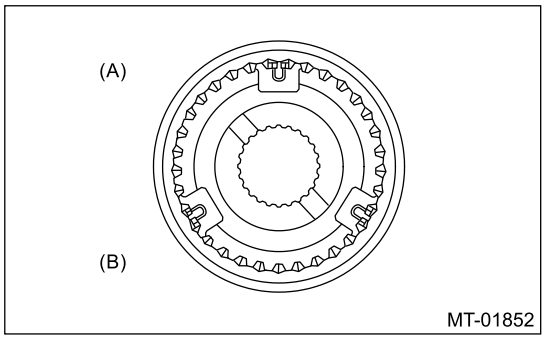
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

ASSEMBLY

1. When the sleeve & hub assemblies have been disassembled, reassemble by aligning the alignment marks.

Note:

Position the open ends of the spring 120° apart.



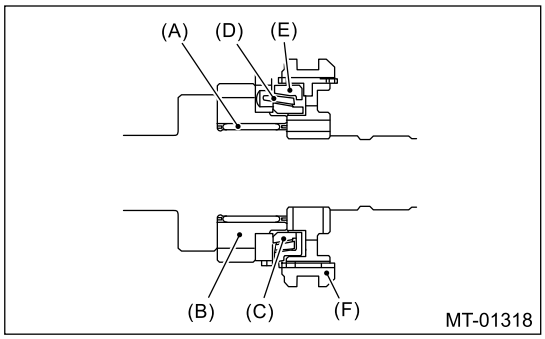
(A) 3rd-4th coupling sleeve & synchronizer hub ASSY

(B) 3rd gear side

2. Install the 3rd drive gear, outer baulk ring, 3rd synchro cone, inner baulk ring, 3rd needle bearing, and sleeve & hub assembly.

Note:

Align the groove of the baulk ring with the 3rd-4th shifting insert.



(A) 3rd needle bearing
(B) 3rd drive gear
(C) Inner baulk ring
(D) 3rd synchro cone
(E) Outer baulk ring
(F) Sleeve & hub ASSY

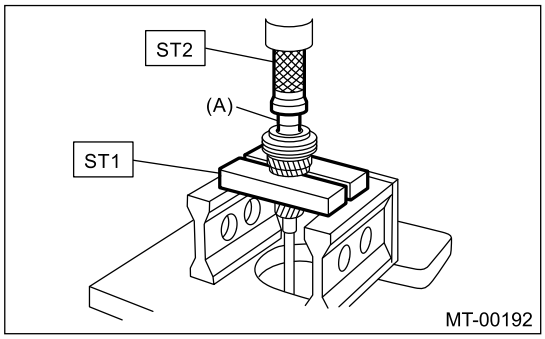
3. Install the 4th needle bearing race using ST1, ST2 and a press.

Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

Special Tool:

ST1: 899714110 REMOVER
ST2: 499877000 RACE 4-5 INSTALLER



(A) 4th needle bearing race

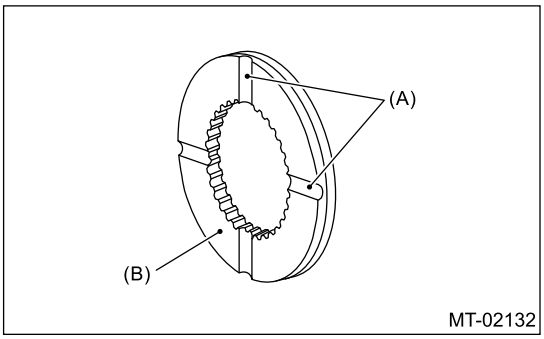
4. Install the 4th baulk ring, 4th needle bearing, 4th drive gear, and 4th gear thrust washer to the main shaft.

Caution:

Make sure the thrust washer is facing the correct direction.

Note:

Align the 4th baulk ring and hub & sleeve assembly with the key groove.



(A) Groove

(B) Face this surface to the 4th gear side.

5. Press-fit a new double ball bearing using the ST1, ST2 and a press.

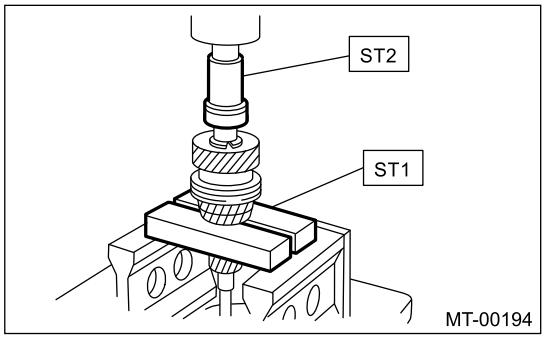
Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Install the snap ring side of the double ball bearing facing the 5th drive gear side.**

Special Tool:

ST1: 899714110 REMOVER

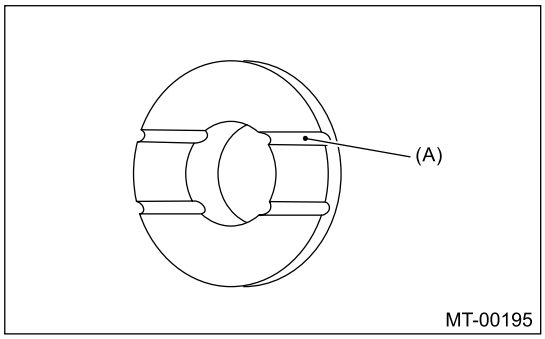
ST2: 499877000 RACE 4-5 INSTALLER



6. Using the REMOVER (899714110) and RACE 4-5 INSTALLER (499877000), install the 5th gear thrust washer and 5th needle bearing race onto the rear section of the main shaft.

Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Make sure the thrust washer is facing the correct direction.**

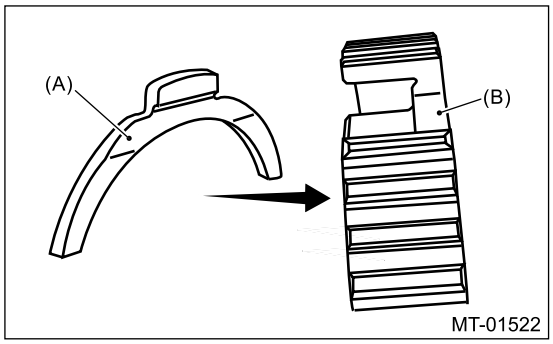


(A) Face this surface to the 5th gear side.

7. Install the rest of the parts to the rear section of the main shaft.

Caution:

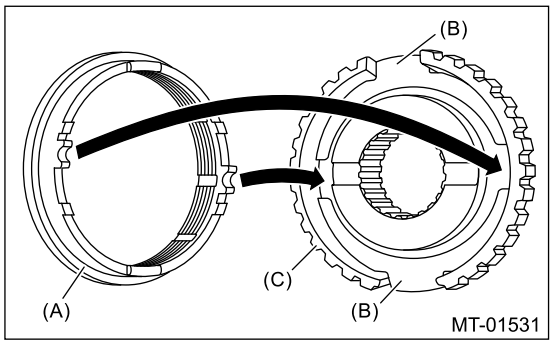
- **Install the baulk lever so that the concave side faces toward the 5th hub.**



(A) Baulk lever

(B) 5th hub

- **Align the protruded section of the 5th baulk ring between the baulk levers.**



(A) 5th baulk ring

(B) Baulk lever

(C) 5th hub

8. Install a new lock washer.

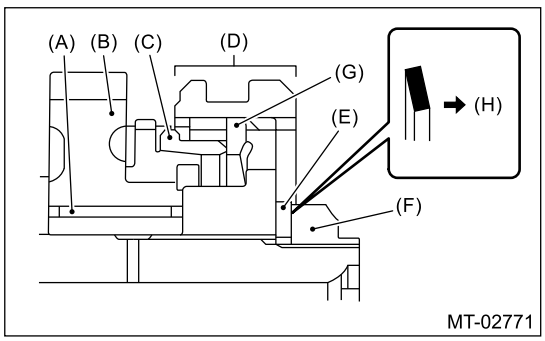
Caution:

Make sure the lock washer is facing the correct direction.

9. Tighten a new lock nut using the SOCKET WRENCH (35) (499987003) and TRANSMISSION HOLDER (498937000).

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)



(A) 5th needle bearing

(B) 5th drive gear

(C) 5th baulk ring

(D) 5th hub & sleeve No. 2

(E) Lock washer

(F) Lock nut

(G) Baulk lever

(H) Nut side

10. Crimp lock nuts in two locations after tightening.

Caution:

When crimping the lock nut, be careful not to crack it.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

INSPECTION

Disassembled parts should be washed with cleaning solvent first, then inspected carefully.

1. Bearing

Replace the bearings in the following cases.

- When the bearing balls, outer races and inner races are broken or rusty.
- When the bearing is worn.
- When the bearings fail to turn smoothly or emit noise in rotation after transmission gear oil has been applied.
- When bearing has other defects.

2. Bushing (each gear)

Replace the bushing in following cases.

- When the sliding surface is damaged or abnormally worn.
- When the inner wall is abnormally worn.

3. Gear

Replace gears in the following cases.

- Replace the gear with new part if its tooth surfaces are broken, damaged or excessively worn.
- Correct or replace if the cone that contacts the baulk ring is rough or damaged.
- Correct or replace if the inner surface or end face is damaged.

4. Baulk ring, synchro cone

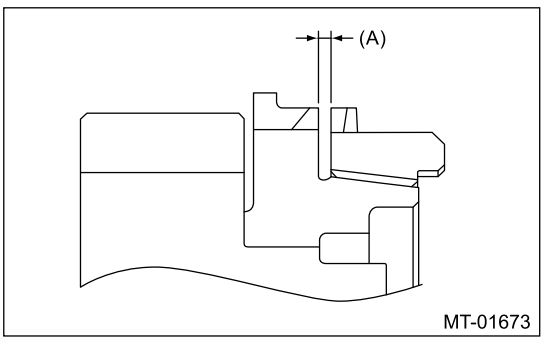
Replace the baulk ring and synchro cone in the following cases.

- When the inner surface and end face are damaged.
- When the baulk ring inner surface is abnormally or partially worn down.
- When the contact surface of the baulk ring insert section is cracked or abnormally worn.
- If the gap between the end faces of the baulk ring and the gear splined part is excessively small, check the clearance (A) while pressing the ring against the cone.

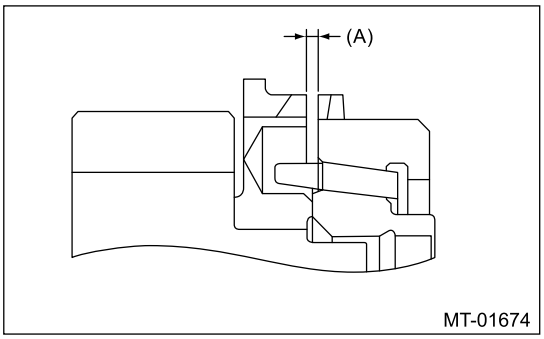
Specification:

0.5 mm (0.020 in) or more

Single cone



Double cone



- Apply transmission gear oil to the cone of the gear and while press-fitting the baulk ring, check there is no rotation in the circumferential direction.

5. Shifting insert
Replace the shifting insert if deformed, excessively worn or defective in any way.

6. Coupling sleeve and synchronizer hub
- Check the slipping condition of the coupling sleeve.
- Check the splines on the coupling sleeve and synchronizer hub for wear.

7. Oil seal
Replace the oil seal if the lip is deformed, hardened, worn or defective in any way.

8. Gearshift mechanism
Repair or replace the gearshift mechanism if excessively worn, bent or defective in any way.

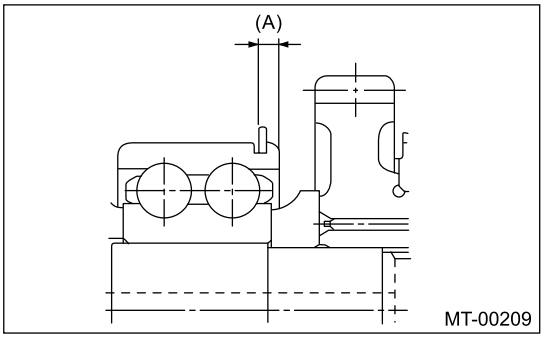
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Main Shaft Assembly

ADJUSTMENT

Selection of main shaft rear plate:
Measure the protrusion amount (A) of ball bearing from transmission main case surface, and select a suitable plate in the following table.

Note:
Before measuring, tap the end of main shaft with a plastic hammer lightly in order to make the clearance zero between the main case surface and moving flange of bearing.

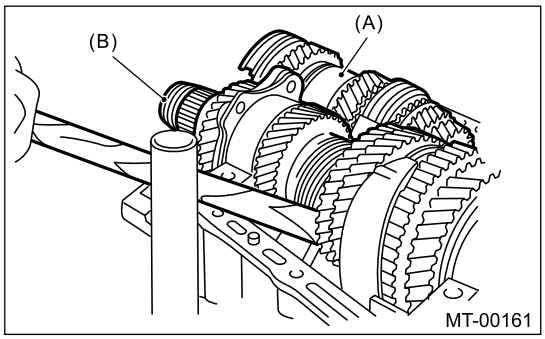
Dimension (A) mm (in)	Part No.	Mark
4.00 — 4.13 (0.1575 — 0.1626)	32294AA041	1
3.87 — 4.00 (0.1524 — 0.1575)	32294AA051	2



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Drive Pinion Shaft Assembly

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
3. Remove the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.
4. Remove the drive pinion shaft assembly.
   Note:
   Use a hammer handle, etc. to remove if too tight.



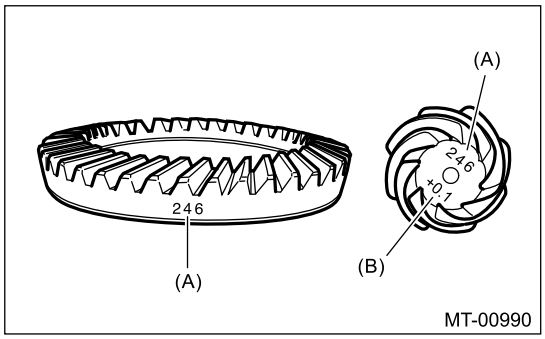
(A) Main shaft ASSY
(B) Drive pinion shaft ASSY

5. Remove the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>REMOVAL.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Drive Pinion Shaft Assembly

INSTALLATION

1. Remove the front differential assembly.
2. Hypoid gear set match mark/No.: The number (A) on top of the drive pinion, and the number on the hypoid driven gear are set numbers for the two gears. Use a pair having the same numbers. The figure (B) below shows a number for shim adjustment. If no number is shown, the value is zero.

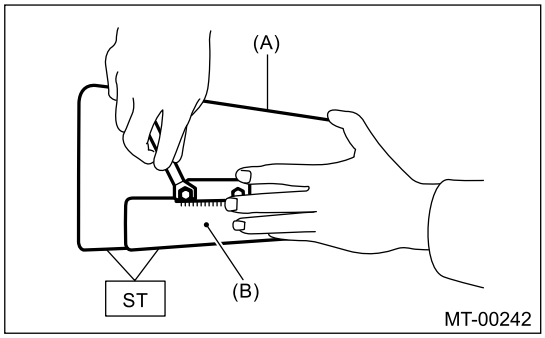


(A) Set number
(B) Number for shim adjustment

3. Place the drive pinion shaft assembly on transmission main case RH without shim and tighten the

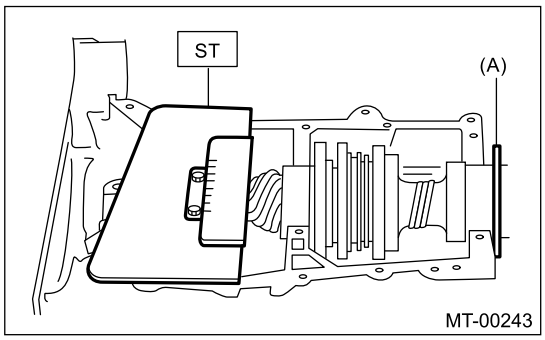
bearing mounting bolts.

4. Adjust the ST.
   (1) Loosen the two bolts and adjust so that the scale indicates 0.5 correctly when the plate end and the scale end are on the same level.
   Special Tool:
   ST: 499917500 DRIVE PINION GAUGE ASSY



   (A) Plate
   (B) Scale

   (2) Tighten the two bolts.
5. Position by inserting the knock pin of DRIVE PINION GAUGE ASSY (499917500) into the knock hole of transmission case.
6. Slide the drive pinion gauge scale with finger tip and read the value at the point where it matches with the end face of drive pinion.
   Special Tool:
   ST: 499917500 DRIVE PINION GAUGE ASSY



   (A) Adjust the clearance to zero without drive pinion shims.

7. The thickness of drive pinion shims shall be determined by adding the value indicated on drive pinion to the value indicated on the DRIVE PINION GAUGE ASSY (499917500). (Add if the number on drive pinion is prefixed by +, and subtract if the number is prefixed by −.)
8. Select one to three drive pinion shim(s) from the following table for the value determined as described above, and take the shim(s) whose thickness is closest to the said value.

Drive pinion shim	
Part No.	**Thickness mm (in)**
32295AA031	0.150 (0.0059)
32295AA041	0.175 (0.0069)
32295AA051	0.200 (0.0079)
32295AA061	0.225 (0.0089)

Drive pinion shim	
Part No.	**Thickness mm (in)**
32295AA071	0.250 (0.0098)
32295AA081	0.275 (0.0108)
32295AA091	0.300 (0.0118)
32295AA101	0.500 (0.0197)

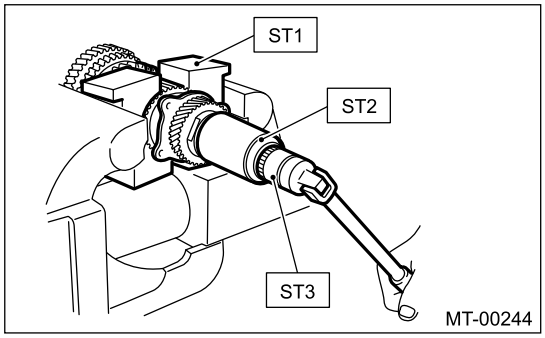
9. Install the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>INSTALLATION.
10. Fit the transmission case knock pin to the knock pin hole of the roller bearing and install the drive pinion shaft assembly.
11. Install the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>INSTALLATION.
12. Check each shifter fork. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>INSPECTION.
13. Install the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>INSTALLATION.
14. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
15. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Drive Pinion Shaft Assembly

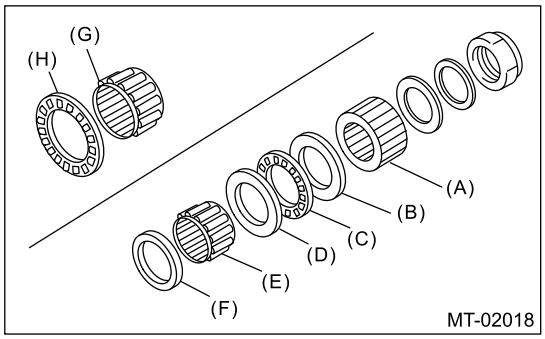
DISASSEMBLY

Note:
Attach a cloth to the end of driven shaft (on the frictional side of the thrust needle bearing) to prevent damage during disassembly or reassembly.

1. Flatten the tab of the lock nut. Remove the lock nut using the ST1, ST2 and ST3.
   Special Tool:
   ST1: 899884100 HOLDER
   ST2: 498427100 STOPPER
   ST3: 899988608 SOCKET WRENCH (27)

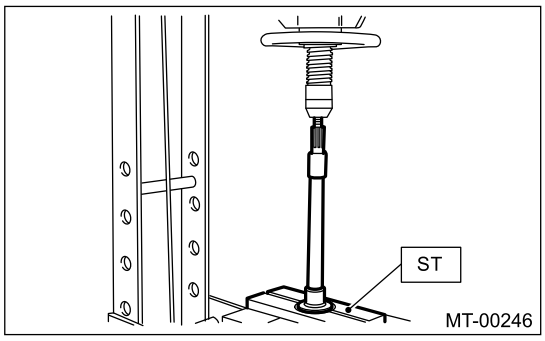


2. Remove the lock washer, washer, differential bevel gear sleeve, adjusting washers No. 1, No. 2 and thrust bearing.
3. Pull out the drive pinion shaft, and remove the needle bearing and drive pinion collar from driven shaft.
4. Remove the needle bearing and thrust bearing from drive pinion shaft.

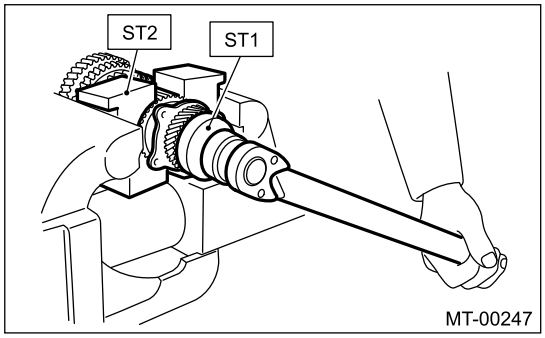


(A) Differential bevel gear sleeve
(B) Adjusting washer No. 1 (25 × 37.5 × t)
(C) Thrust bearing (25 × 37.5 × 3)
(D) Adjusting washer No. 2 (25 × 37.5 × t)
(E) Needle bearing (25 × 30 × 20)
(F) Drive pinion collar
(G) Needle bearing (30 × 37 × 23)
(H) Thrust bearing (33 × 50 × 3)

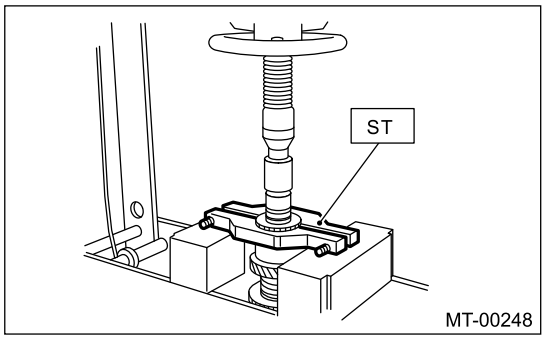
5. Remove the roller bearing and washer using ST and a press.
Special Tool:
ST: 498077000 REMOVER



6. Flatten the tab of the lock nut. Remove the lock nut and lock washer using ST1 and ST2.
Special Tool:
ST1: 499987300 SOCKET WRENCH (50)
ST2: 899884100 HOLDER



7. Remove the 5th driven gear using ST.
Special Tool:
ST: 499857000 5TH DRIVEN GEAR REMOVER



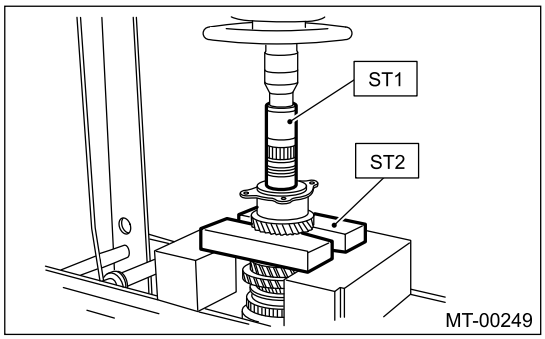
8. Remove the woodruff key.

9. Remove the double taper roller bearing and 3rd-4th driven gear using ST1 and ST2.

Special Tool:

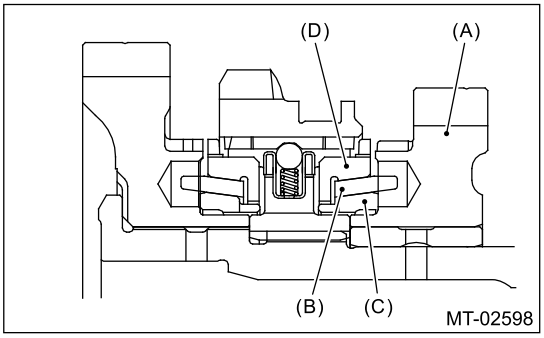
ST1: 499757002 INSTALLER

ST2: 899714110 REMOVER



10. Remove the key.

11. Remove the 2nd driven gear, inner baulk ring, synchro cone and outer baulk ring.



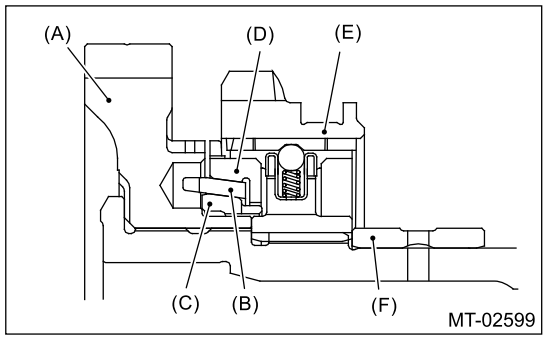
(A) 2nd driven gear

(B) Synchro cone

(C) Inner baulk ring

(D) Outer baulk ring

12. Remove the 1st driven gear, inner baulk ring, synchro cone, outer baulk ring, 2nd driven gear bushing, and gear & hub assembly using ST1 and ST2.



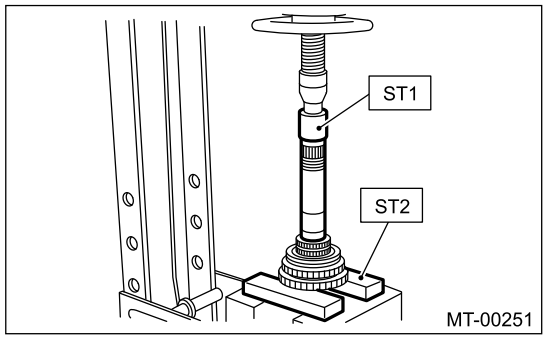
(A) 1st driven gear
(B) Synchro cone
(C) Inner baulk ring
(D) Outer baulk ring
(E) Gear & hub
(F) 2nd driven gear bushing

Caution:

- **If gears or hubs are necessary to replace, replace with a new gear & hub assembly as a set.**
- **Since the gear & hub assembly must engage at the specified position, avoid disassembly as much as possible.**
- **If it is necessary to disassemble, mark the engaging points on the splines beforehand.**

Special Tool:

ST1: 499757002 INSTALLER
ST2: 899714110 REMOVER



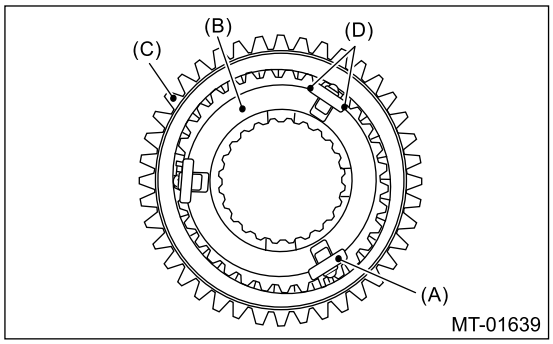
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Drive Pinion Shaft Assembly

ASSEMBLY

1. Install the sleeve and the gear and hub assembly by matching the alignment marks.

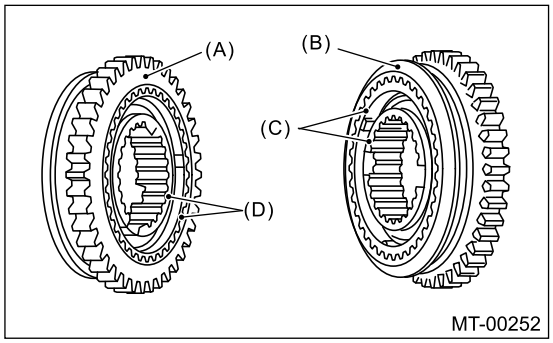
Note:

- **Make sure that there is no large clearance at both sides of the 1st-2nd shifting insert after assembly.**



(A) 1st-2nd shifting insert
(B) 1st-2nd synchronizer hub
(C) Reverse driven gear
(D) There is no large clearance at this part.

- **Use the new gear & hub assembly, if replacing the gear or hub.**



(A) 1st gear side
(B) 2nd gear side
(C) Flush surface
(D) Stepped surface

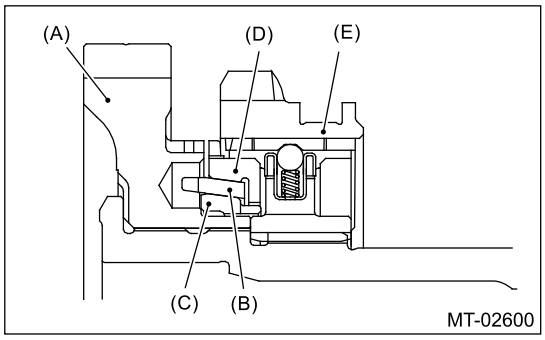
2. Install the 1st driven gear, inner baulk ring, synchro cone, outer baulk ring, and gear & hub assembly.

Caution:

Make sure the gear & hub assembly is facing the correct direction.

Note:

Align the baulk ring and gear & hub assembly with the key groove.



(A) 1st driven gear
(B) Synchro cone

(C) Inner baulk ring

(D) Outer baulk ring

(E) Gear & hub

3. Install the 2nd driven gear bushing using the ST1, ST2 and a press.

Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

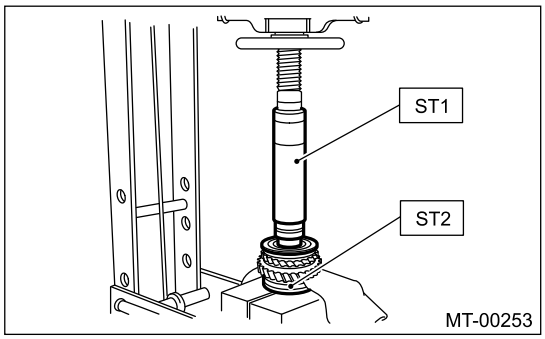
Note:

- **Attach a cloth to the end of the driven shaft to prevent damage.**
- **When press fitting, align the oil holes of the shaft and bushing.**

Special Tool:

ST1: 499277200 INSTALLER

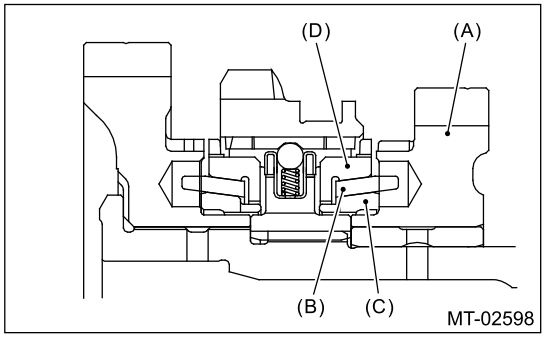
ST2: 499587000 INSTALLER



4. Attach and insert the 2nd driven gear, inner baulk ring, synchro cone and outer baulk ring.

Note:

Align the groove of the baulk ring with the 1st-2nd shifting insert.



(A) 2nd driven gear

(B) Synchro cone

(C) Inner baulk ring

(D) Outer baulk ring

5. After installing key on driven shaft, install the 3rd-4th driven gear using the ST1, ST2 and a press.

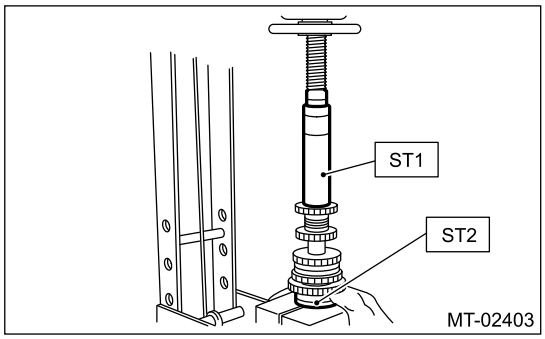
Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

Special Tool:

ST1: 499277200 INSTALLER

ST2: 499587000 INSTALLER



6. Install a new double taper roller bearing using the ST1, ST2 and a press.

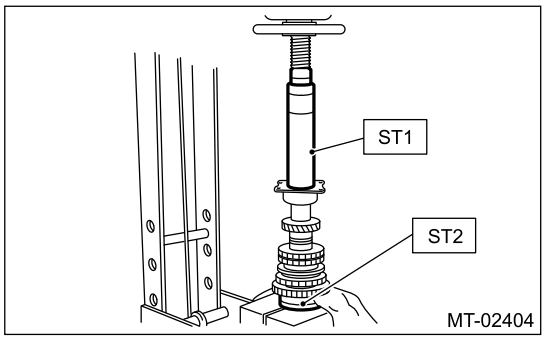
Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

Special Tool:

ST1: 499277200 INSTALLER

ST2: 499587000 INSTALLER



7. Position the woodruff key in groove of the rear of driven shaft. Install the 5th driven gear using the ST1, ST2 and a press.

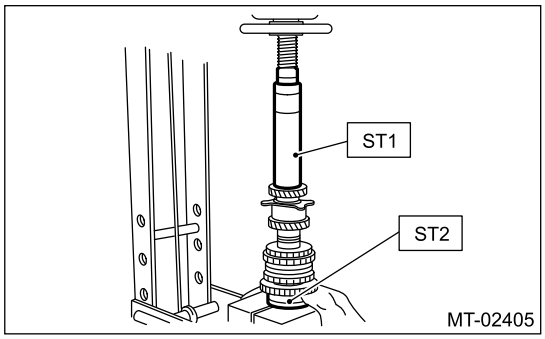
Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Face the groove for identification of the 5th driven gear toward the nut.**

Special Tool:

ST1: 499277200 INSTALLER

ST2: 499587000 INSTALLER



8. Install a new lock washer.

Caution:

Make sure the lock washer is facing the correct direction.

9. Tighten a new lock nut using the ST1 and ST2.

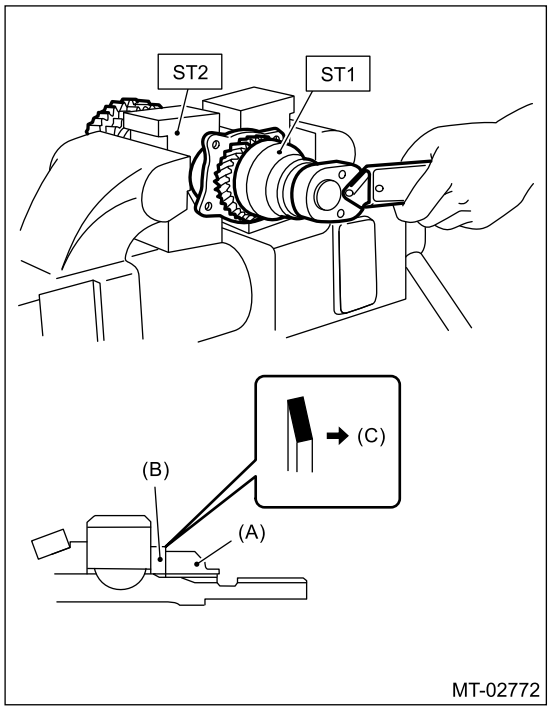
Tightening torque:

260 N·m (26.5 kgf-m, 191.8 ft-lb)

Special Tool:

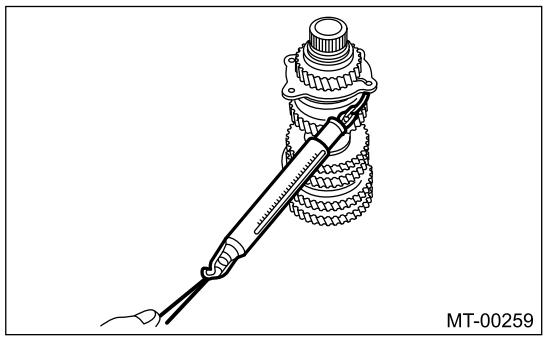
ST1: 499987300 SOCKET WRENCH (50)

ST2: 899884100 HOLDER



(A) Lock nut
(B) Lock washer
(C) Nut side

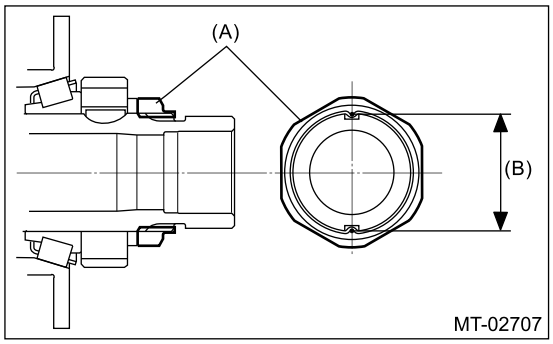
10. Using a spring scale, check that the starting torque of the double taper roller bearing is 0.1 — 1.5 N (0.01 — 0.15 kgf, 0.02 — 0.34 lbf).



11. Crimp the lock nut at two locations so that the dimension of (B) becomes 41.1 mm (1.62 in) or less.

Caution:

When crimping the lock nut, be careful not to crack it.



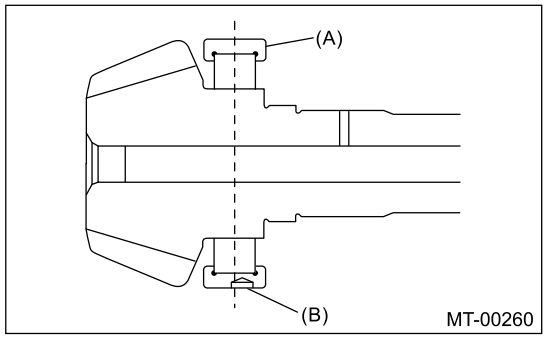
(A) Lock nut

(B) Outer dimension after crimping

12. Install a new roller bearing.

Note:

Install with the knock pin hole of the roller bearing outer race facing the rear side.



(A) Roller bearing

(B) Knock pin hole

13. Install the washer using the ST1, ST2 and a press.

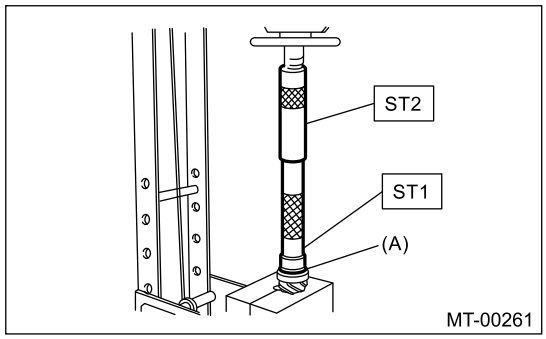
Caution:

Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).

Special Tool:

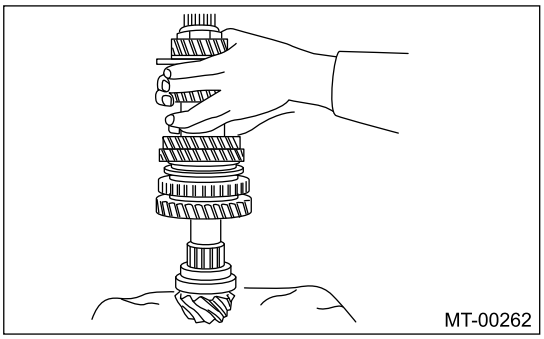
ST1: 499277100 BUSHING 1-2 INSTALLER

ST2: 499277200 INSTALLER

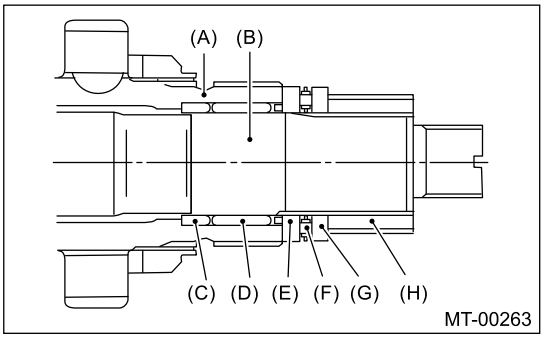


(A) Washer

14. Install the thrust bearing and needle bearing and install the driven shaft assembly.



15. Install the drive pinion collar, needle bearing, adjusting washer No. 2, thrust bearing, adjusting washer No. 1 and differential bevel gear sleeve in this order.



(A) Driven shaft
(B) Drive pinion shaft
(C) Drive pinion collar
(D) Needle bearing (25 × 30 × 20)
(E) Adjusting washer No. 2 (25 × 36 × t)
(F) Thrust bearing (25 × 37.5 × 3)
(G) Adjusting washer No. 1 (25 × 36 × t)
(H) Differential bevel gear sleeve

16. Adjust the thrust bearing preload. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>ADJUSTMENT > THRUST BEARING PRELOAD.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Drive Pinion Shaft Assembly

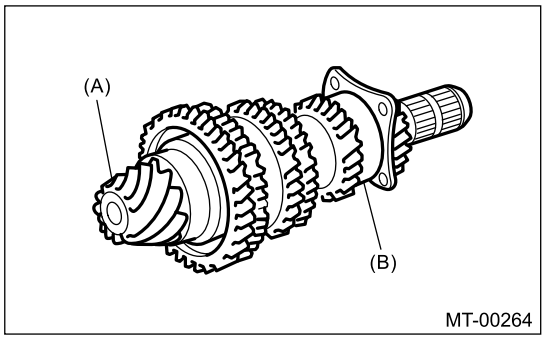
INSPECTION

Disassembled parts should be washed with cleaning solvent first, then inspected carefully.

1. Bearing

Replace the bearings in the following cases.

- When the bearing balls, outer races and inner races are broken or rusty.
- When the bearing is worn.
- When the bearings fail to turn smoothly or emit noise in rotation after transmission gear oil has been applied.
- The double taper roller bearing on the rear side of the drive pinion shaft should be checked for smooth rotation before the drive pinion shaft assembly is disassembled. In this case, because a preload is working on the bearing, its rotation feels like it is slightly dragging unlike other bearings.



(A) Drive pinion shaft

(B) Double taper roller bearing

- When bearing has other defects.

2. Bushing (each gear)

Replace the bushing in following cases.

- When the sliding surface is damaged or abnormally worn.
- When the inner wall is abnormally worn.

3. Gear

Replace gears in the following cases.

- Replace the gear with new part if its tooth surfaces are broken, damaged or excessively worn.
- Correct or replace if the cone that contacts the baulk ring is rough or damaged.
- Correct or replace if the inner surface or end face is damaged.

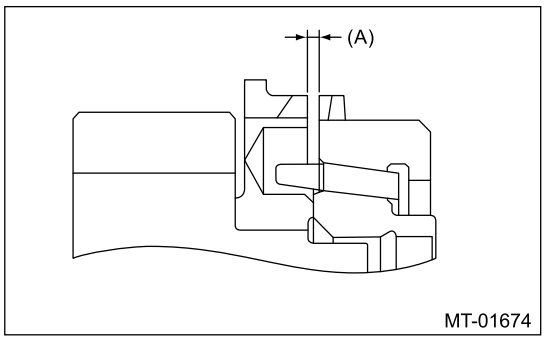
4. Baulk ring, synchro cone

Replace the baulk ring and synchro cone in the following cases.

- When the inner surface and end face are damaged.
- When the baulk ring inner surface is abnormally or partially worn down.
- When the contact surface of the baulk ring insert section is cracked or abnormally worn.
- If the gap between the end faces of the baulk ring and the gear splined part is excessively small, check the clearance (A) while pressing the ring against the cone.

  Specification:

  0.5 mm (0.020 in) or more



- Apply transmission gear oil to the cone of the gear and while press-fitting the baulk ring, check there is no rotation in the circumferential direction.

5. Coupling sleeve and synchronizer hub

- Check the slipping condition of the coupling sleeve.
- Check the splines on the coupling sleeve and synchronizer hub for wear.

6. Shifting insert

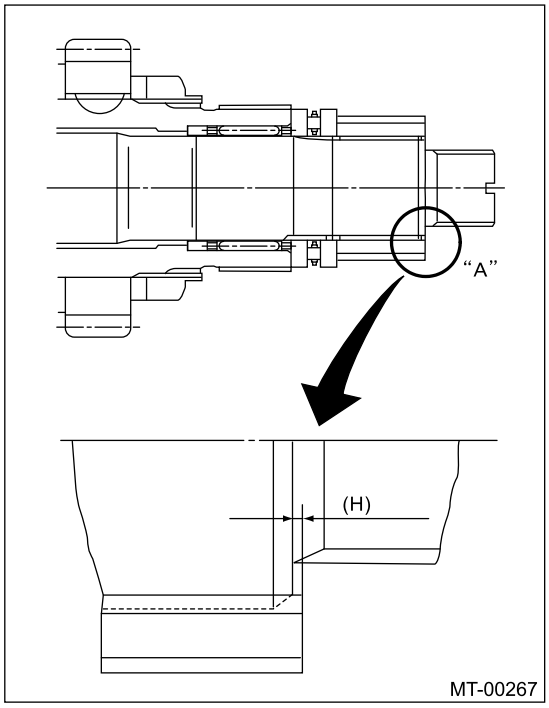
Replace the shifting insert if deformed, excessively worn or defective in any way.

1. THRUST BEARING PRELOAD

1. Select a suitable adjusting washer No. 1 so that dimension (H) will be zero in a visual check. Position the washer (18.3× 30 × t) and a new lock washer (18 × 30 × 2).

Caution:

Make sure the lock washer is facing the correct direction.



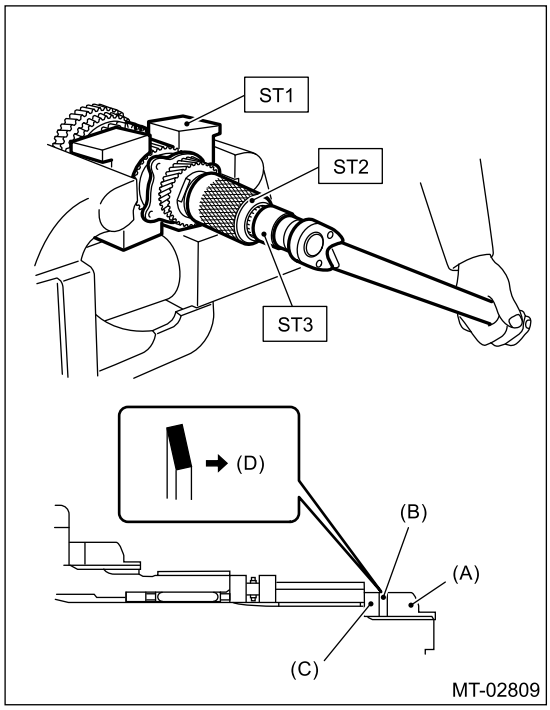
2. Tighten a new lock nut using the ST1, ST2 and ST3.

Tightening torque:

120 N·m (12.2 kgf-m, 88.5 ft-lb)

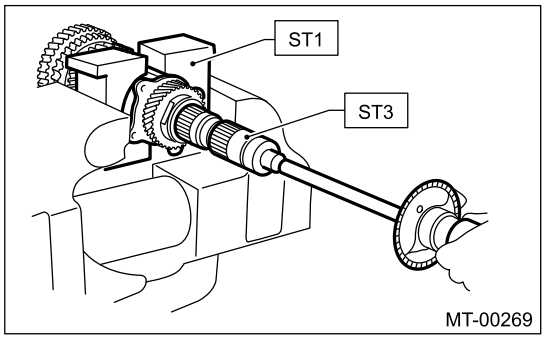
Special Tool:

ST1: 899884100 HOLDER
ST2: 498427100 STOPPER
ST3: 899988608 SOCKET WRENCH (27)

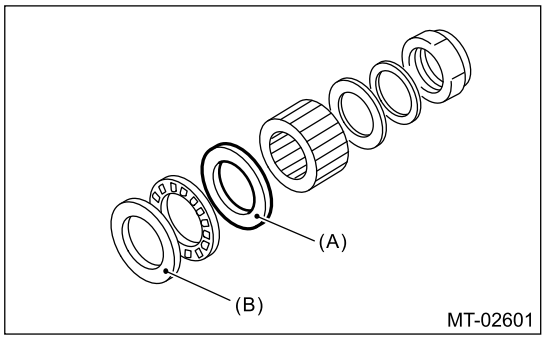


(A) Lock nut
(B) Lock washer
(C) Washer
(D) Nut side

3. After removing the ST2, measure the starting torque using torque driver.
Specification:
0.3 — 0.8 N·m (0.03 — 0.08 kgf-m, 0.22 — 0.59 ft-lb)
Special Tool:
ST1: 899884100 HOLDER
ST3: 899988608 SOCKET WRENCH (27)



4. If the starting torque is not within the standard value, select new adjusting washer No. 1 and recheck starting torque.

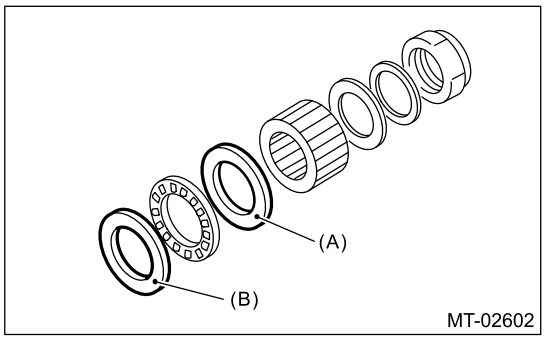


(A) Adjusting washer No. 1

(B) Adjusting washer No. 2

Adjusting washer No. 1	
Part No.	**Thickness mm (in)**
803025051	3.925 (0.1545)
803025052	3.950 (0.1555)
803025053	3.975 (0.1565)
803025054	4.000 (0.1575)
803025055	4.025 (0.1585)
803025056	4.050 (0.1594)
803025057	4.075 (0.1604)

5. If the specified starting torque cannot be obtained by the selection of adjusting washer No. 1, select adjusting washer No. 2 from the list below. Repeat steps 1) through 4) to adjust starting torque.



(A) Adjusting washer No. 1

(B) Adjusting washer No. 2

Starting torque	**Dimension H**	**Adjusting washer No. 2**
Low	Small	Select thicker one.
High	Large	Select thinner one.

Adjusting washer No. 2	
Part No.	**Thickness mm (in)**
803025059	3.850 (0.1516)
803025054	4.000 (0.1575)
803025058	4.150 (0.1634)

6. Recheck that the starting torque is within the specified range, then crimp the lock nut at four positions.

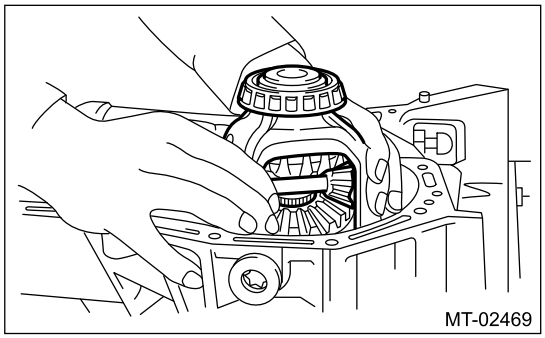
Caution:

When crimping the lock nut, be careful not to crack it.

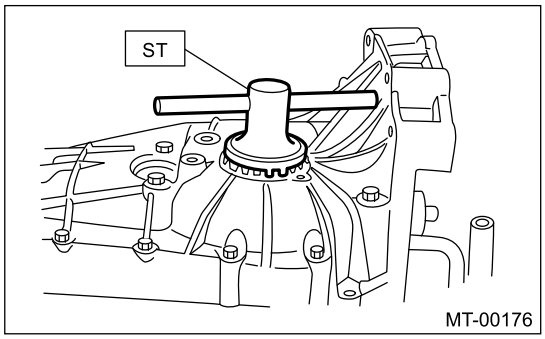
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Front Differential Assembly

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
3. Remove the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.
4. Remove the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>REMOVAL.
5. Remove the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>REMOVAL.
6. Remove the front differential assembly.
   Caution:
   - **Do not confuse the right and left taper roller bearing outer races.**
   - **Be careful not to damage the oil seal of differential side retainer.**



7. Remove the differential side retainers using the ST.
   Special Tool:
   ST: 18630AA010 WRENCH COMPL RETAINER



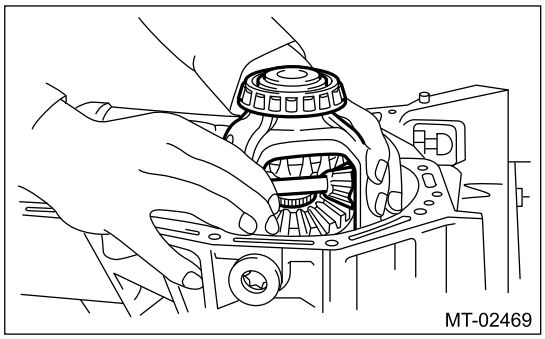
8. Remove the taper roller bearing outer race from the transmission case using the PULLER ASSY (398527700).

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Front Differential Assembly

INSTALLATION

1. Install the differential side retainers using the WRENCH COMPL RETAINER (18630AA010).
2. Install the taper roller bearing outer race to the transmission case.
3. Install the front differential assembly.

Caution:
Be careful not to bend the seal lips of oil seal.



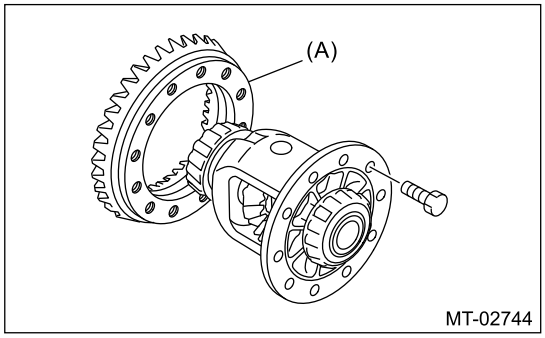
4. Install the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>INSTALLATION.
5. Install the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>INSTALLATION.
6. Install the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>INSTALLATION.
7. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
8. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Front Differential Assembly

DISASSEMBLY

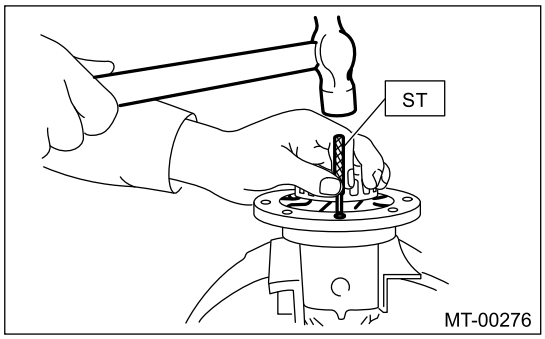
1. DIFFERENTIAL CASE ASSEMBLY

1. Remove the twelve bolts and remove hypoid driven gear.

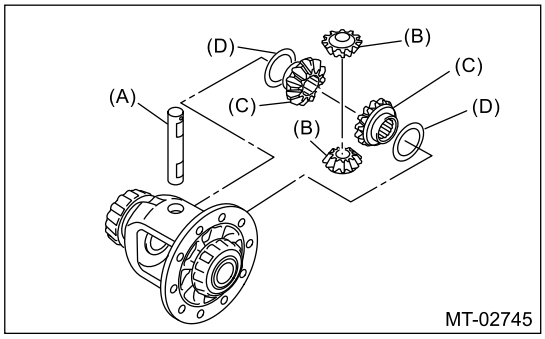


(A) Hypoid driven gear

2. Drive out the straight pin from differential assembly toward hypoid driven gear side.
Special Tool:
ST: 899904100 STRAIGHT PIN REMOVER



3. Pull out the pinion shaft, and remove the differential bevel pinion, differential bevel gear and adjusting washer.

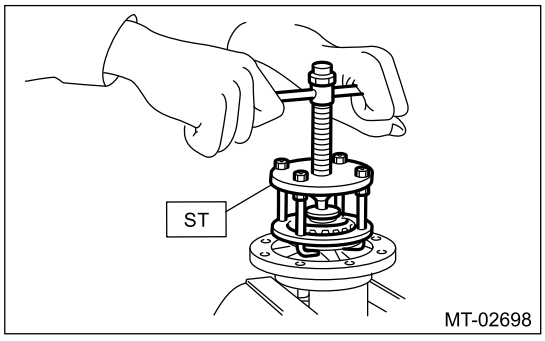


(A) Pinion shaft
(B) Differential bevel pinion
(C) Differential bevel gear
(D) Adjusting washer

4. Using the ST, remove the taper roller bearing.

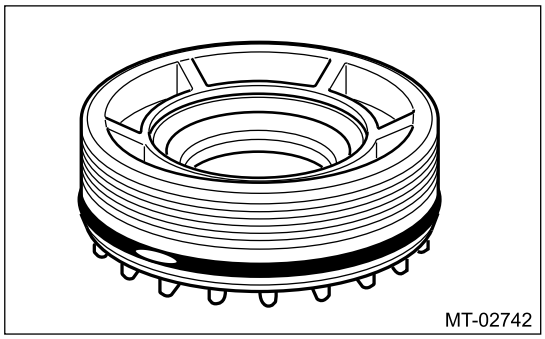
Special Tool:

ST: 899524100 PULLER SET



2. DIFFERENTIAL SIDE RETAINER

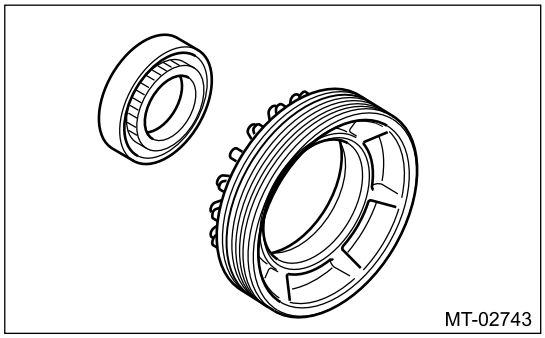
1. Remove the O-rings.



2. Remove the oil seal.

Note:

Remove it using a flat tip screwdriver wrapped with cloth or tape, etc.



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Front Differential Assembly

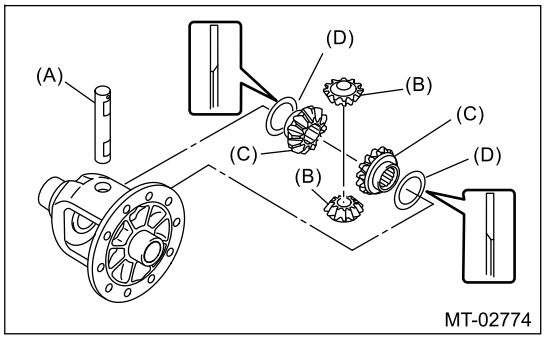
ASSEMBLY

1. DIFFERENTIAL CASE ASSEMBLY

1. Install the differential bevel gear and differential bevel pinion together with adjusting washer, and insert the pinion shaft.

Caution:

Face the chamfered side of adjusting washer toward bevel gear.



(A) Pinion shaft
(B) Differential bevel pinion
(C) Differential bevel gear
(D) Adjusting washer

2. Measure the backlash between the differential bevel gear and differential bevel pinion. Adjust the backlash if not within specified limit. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>ADJUSTMENT > DIFFERENTIAL BEVEL PINION GEAR BACKLASH.

Note:

Be sure the bevel pinion gear teeth contact adjacent gear teeth during measurement.

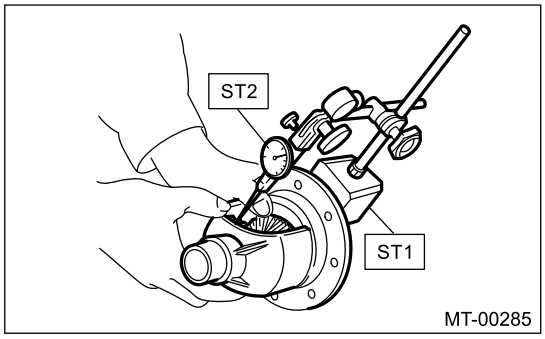
Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Special Tool:

ST1: 498247001 MAGNET BASE

ST2: 498247100 DIAL GAUGE



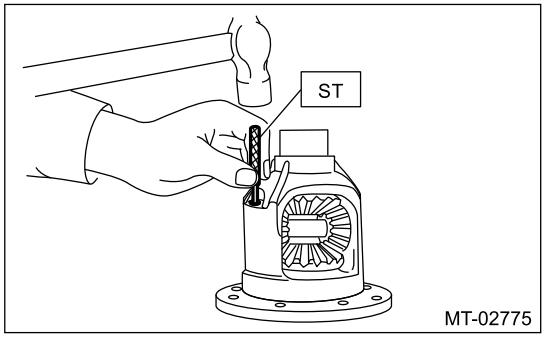
3. Align the pinion shaft and differential case with each hole, and drive a new straight pin into the holes from the hypoid driven gear side using the ST.

Caution:

After driving, crimp the area around the hole, and make sure that the straight pin will not come out.

Special Tool:

ST: 899904100 STRAIGHT PIN REMOVER



4. Install the taper roller bearing.

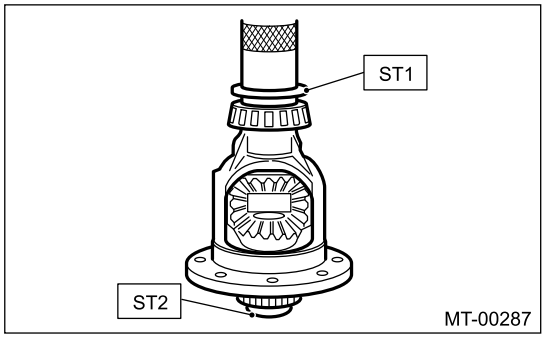
Caution:

- **Do not apply a load in excess of 10 kN (1 ton, 1.1 US ton, 1.0 Imp ton).**
- **Be careful when handling because the taper roller bearing and the outer race are used as a set.**

Special Tool:

ST1: 499277100 BUSHING 1-2 INSTALLER

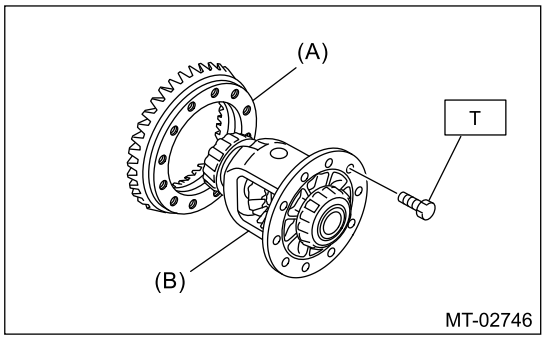
ST2: 398497701 SEAT



5. Install the hypoid driven gear using twelve bolts.

Tightening torque:

T: 62 N·m (6.3 kgf-m, 45.7 ft-lb)



(A) Hypoid driven gear

(B) Differential case

2. DIFFERENTIAL SIDE RETAINER

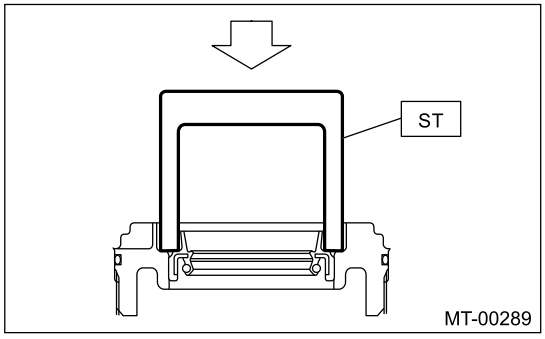
1. Using the ST, install a new oil seal by lightly tapping with a plastic hammer.

Caution:

- **Apply transmission gear oil to the oil seal lips, and install the oil seal while being careful not to deform the lip.**
- **Check the identification marks (R, L), and attach the oil seal RH and LH.**

Special Tool:

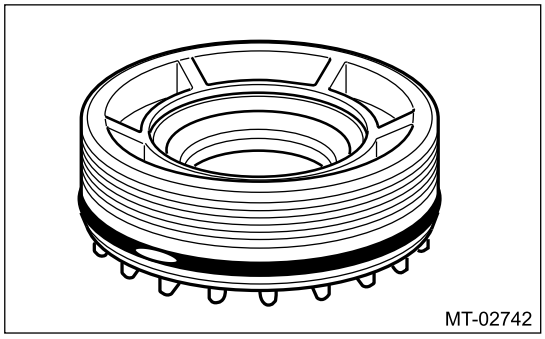
ST: 18675AA000 DIFFERENTIAL SIDE OIL SEAL INSTALLER



2. Install a new O-ring.

Note:

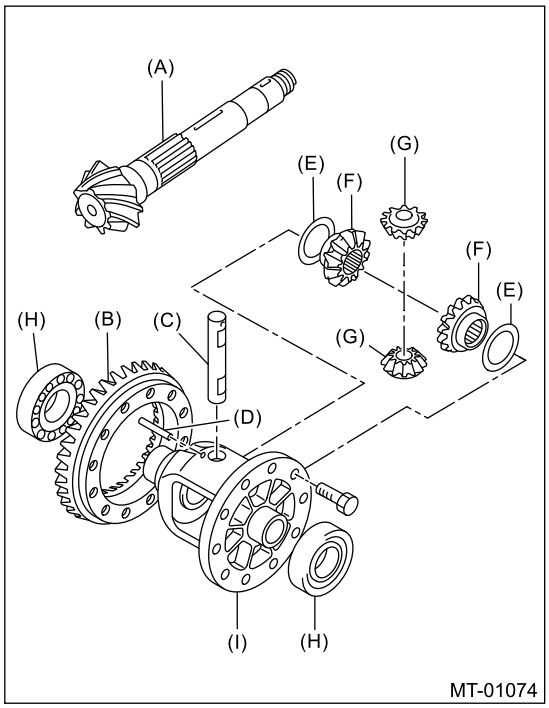
- **Apply transmission gear oil to O-ring.**
- **Do not stretch or damage the O-ring.**
- **Install the O-ring after adjusting the backlash of the hypoid driven gear and the preload of the taper roller bearing.**



INSPECTION

Repair or replace the differential gear in the following cases:

- When the hypoid driven gear and drive pinion shaft tooth surfaces are damaged, excessively worn, or seized.
- When the roller bearing on the drive pinion shaft has a worn or damaged roller path.
- When there is damage, wear or seizure of the differential bevel pinion, differential bevel gear, adjusting washer, pinion shaft or straight pin.
- When the differential case sliding surfaces are worn or damaged.



(A) Drive pinion shaft
(B) Hypoid driven gear
(C) Pinion shaft
(D) Straight pin
(E) Adjusting washer
(F) Differential bevel gear
(G) Differential bevel pinion
(H) Taper roller bearing
(I) Differential case

1. DIFFERENTIAL BEVEL PINION GEAR BACKLASH

Measure the backlash between the differential bevel gear and differential bevel pinion. Adjust the backlash if not within specified limit. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>ADJUSTMENT.

Note:

Be sure the bevel pinion gear teeth contact adjacent gear teeth during measurement.

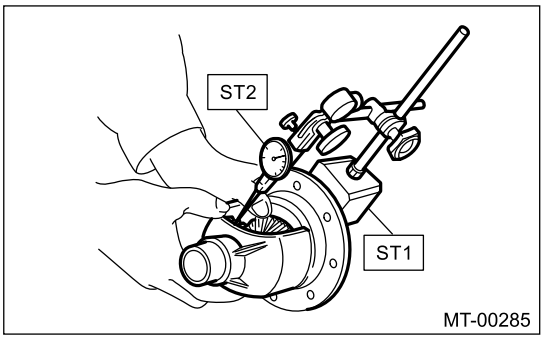
Specification:

0.13 — 0.18 mm (0.0051 — 0.0071 in)

Special Tool:

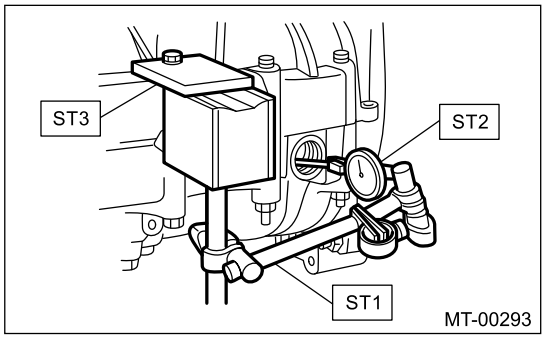
ST1: 498247001 MAGNET BASE

ST2: 498247100 DIAL GAUGE



2. HYPOID DRIVEN GEAR BACKLASH

1. Set the ST1, ST2 and ST3. Insert the needle through drain plug hole so that the needle comes in contact with the tooth surface on the right corner, and check the backlash.
   Special Tool:
   ST1: 498247001 MAGNET BASE
   ST2: 498247100 DIAL GAUGE
   ST3: 498255400 PLATE



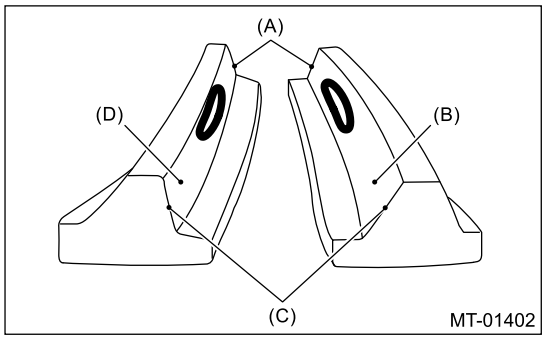
2. Install SUBARU genuine axle shafts to both sides, rotate in the inversion direction so that the gauge contacts the tooth surface, and read the dial gauge.
   Note:
   If the backlash is outside the specified range, adjust it by turning the differential side retainer RH.
   Specification:
   0.13 — 0.18 mm (0.0051 — 0.0071 in)

Part No. 38415AA100 Axle shaft

3. TOOTH CONTACT OF HYPOID DRIVEN GEAR

Check tooth contact of hypoid driven gear as follows: Apply a thin uniform coat of red lead on both teeth surfaces on 3 or 4 teeth of the driven gear. Rotate the main shaft to move the driven gear back and forth until a definite contact pattern is developed on the driven gear, and judge whether face contact is correct. When the contact pattern is not correct, adjust. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>ADJUSTMENT.

- Tooth contact is correct.



(A) Toe
(B) Coast side
(C) Heel
(D) Drive side

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Front Differential Assembly

ADJUSTMENT

1. DIFFERENTIAL BEVEL PINION GEAR BACKLASH

1. Disassemble the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>DISASSEMBLY.
2. Select the adjusting washer from the table and install.

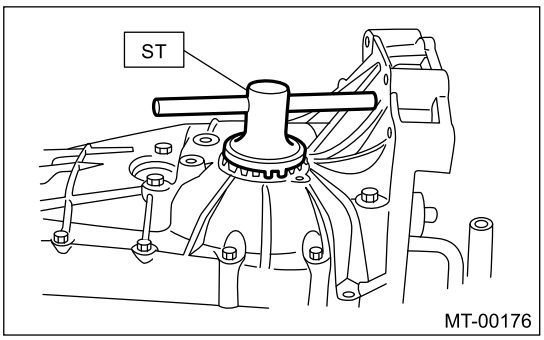
Adjusting washer	
Part No.	**Thickness mm (in)**
803038021	0.925 — 0.950 (0.0364 — 0.0374)
803038022	0.975 — 1.000 (0.0384 — 0.0394)
803038023	1.025 — 1.050 (0.0404 — 0.0413)

3. Adjust until the standard value is obtained.
   Specification:
   0.13 — 0.18 mm (0.0051 — 0.0071 in)

2. HYPOID DRIVEN GEAR BACKLASH

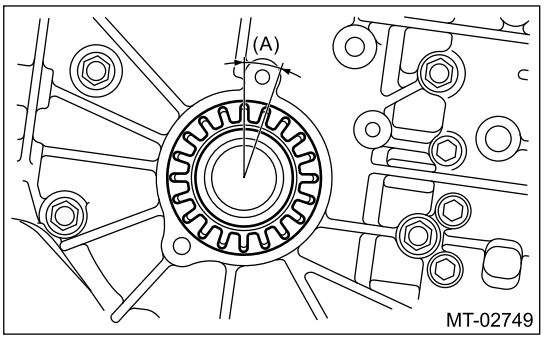
Adjust by turning the differential side retainer RH.

Special Tool:
ST: 18630AA010 WRENCH COMPL RETAINER



Note:

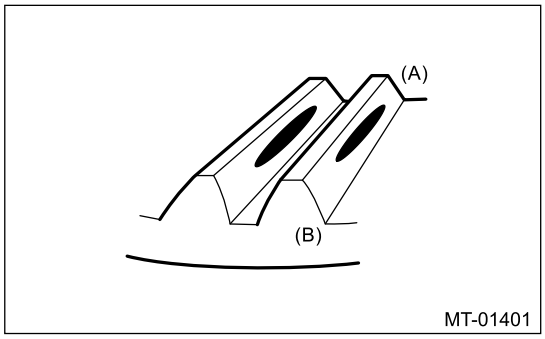
Each time the side retainer rotates by one notch (A), the backlash changes by 0.05 mm (0.020 in).



3. TOOTH CONTACT OF HYPOID DRIVEN GEAR

1. Adjust until correct teeth contact is obtained.
2. Check tooth contact, and perform the adjustment as follows.
   - Correct tooth contact

     Check item: Tooth contact surface is slightly shifted toward the toe side under a no-load condition. (When driving, it moves towards the heel side.)



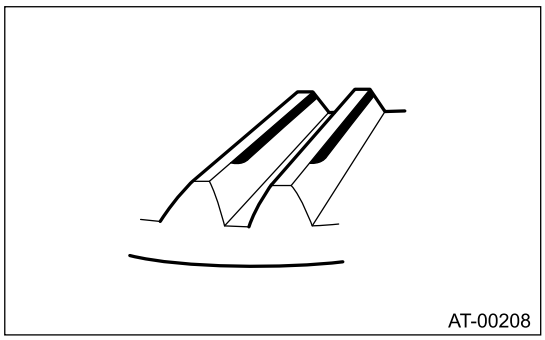
(A) Toe side

(B) Heel side

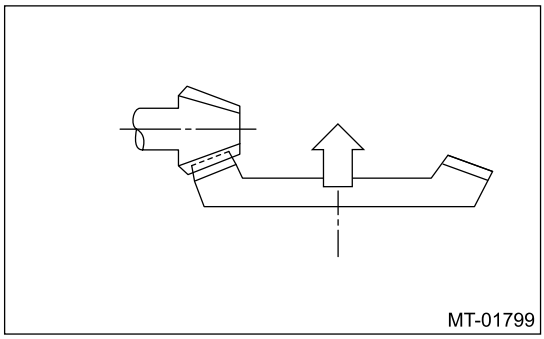
   - Face contact

     Check item: Backlash is too large.

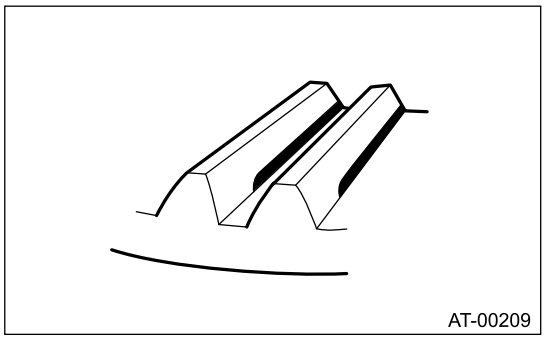
     Contact pattern



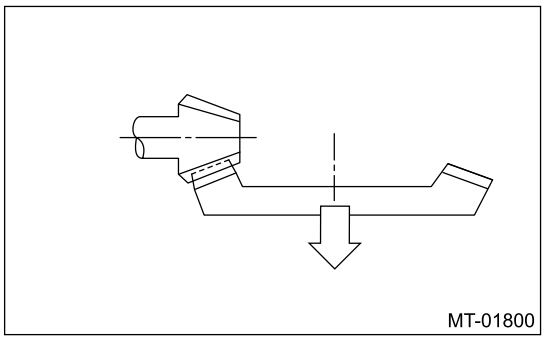
Corrective action: Tighten the differential side retainer to move the driven gear closer to the drive pinion shaft.



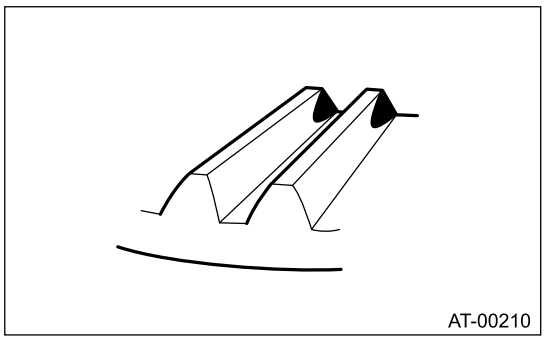
- Flank contact
  Check item: Backlash is too small.
  Contact pattern



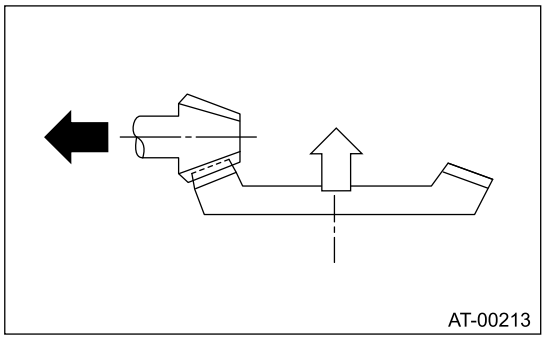
  Corrective action: Loosen the differential side retainer to move the driven gear away from the drive pinion shaft.



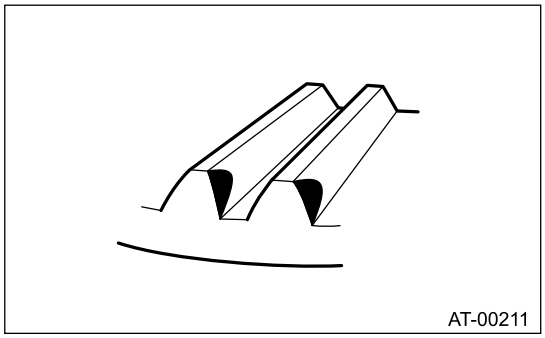
- Toe contact (inside contact)
  Check item: Teeth contact area is too small.
  Contact pattern



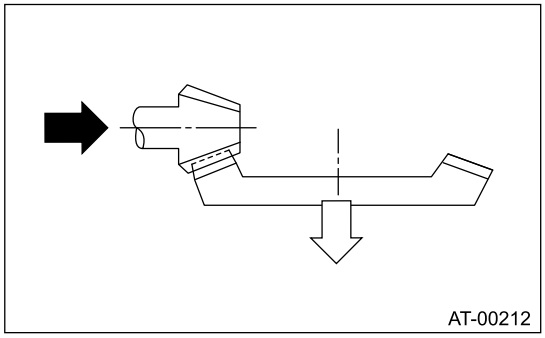
  Corrective action: Increase the thickness of drive pinion shim and tighten the differential side retainer to move the driven gear closer to the drive pinion shaft according to the procedure for bringing drive pinion shaft away from driven gear.



- Heel contact (outside end contact)
  Check item: Teeth contact area is too small.
  Contact pattern



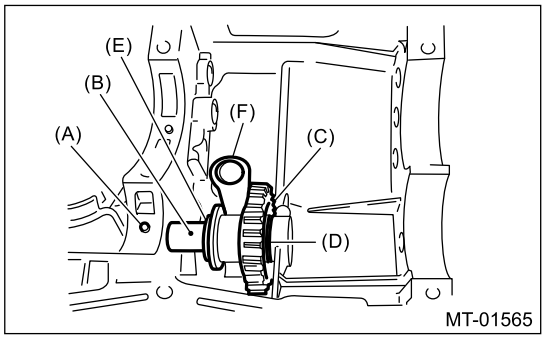
Corrective action: Reduce thickness of the drive pinion shim according to the procedures for moving the drive pinion shaft closer to driven gear. Also loosen the differential side retainer to move the driven gear away from the drive pinion shaft.



MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Idler Gear

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.
5. Remove the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>REMOVAL.
6. Remove the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>REMOVAL.
7. Remove the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>REMOVAL.
8. Remove the shifter forks and rods. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>REMOVAL.
9. Pull out the straight pin, and remove the reverse idler gear shaft, adjusting washer, reverse idler gear and washer.



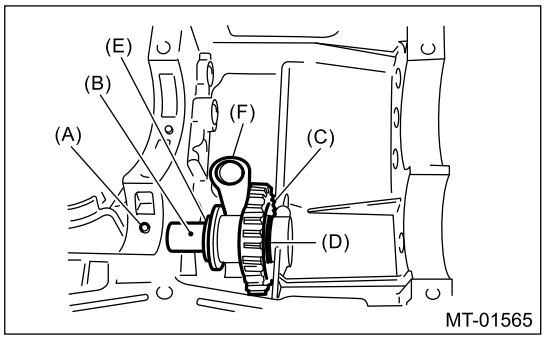
(A) Straight pin
(B) Reverse idler gear shaft
(C) Reverse idler gear
(D) Adjusting washer
(E) Reverse idler gear washer
(F) Reverse shifter lever

10. Remove the reverse shifter lever.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Idler Gear

INSTALLATION

1. Install the reverse shifter lever, adjusting washer, reverse idler gear, reverse idler gear shaft and washer, and secure them with a new straight pin.
   Caution:
   Be sure to install the reverse idler gear shaft from rear side.



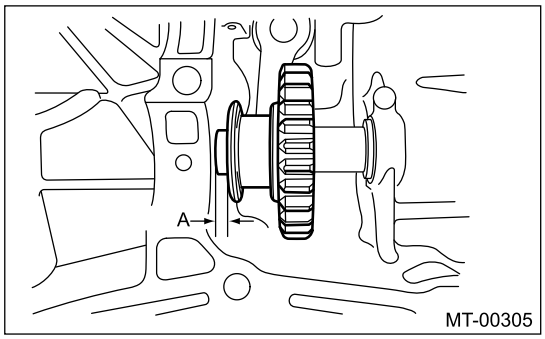
(A) Straight pin
(B) Reverse idler gear shaft
(C) Reverse idler gear
(D) Adjusting washer
(E) Reverse idler gear washer
(F) Reverse shifter lever

2. Check and adjust clearance between the reverse idler gear and the timing case wall surface. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Idler Gear>INSPECTION.
3. Install the shifter forks and rods. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Shifter Fork and Rod>INSTALLATION.
4. Install the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>INSTALLATION.
5. Install the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>INSTALLATION.
6. Install the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>INSTALLATION.
7. Install the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>INSTALLATION.
8. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
9. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
10. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

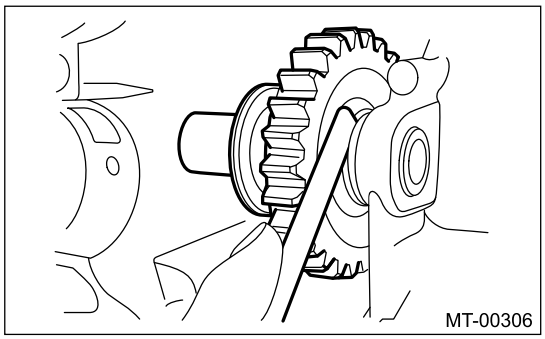
MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Idler Gear

INSPECTION

1. Move the reverse shifter rod toward the reverse side. Check the clearance A between the reverse idler gear and the transmission case wall surfaces.
   If the value is out of specification, select the appropriate reverse shifter lever and adjust. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Idler Gear>ADJUSTMENT.
   Specification:
   6.0 — 7.5 mm (0.236 — 0.295 in)



2. After installing a suitable reverse shifter lever, shift into neutral. Check the clearance between the reverse idler gear and the transmission case wall surfaces.
   If the value is out of specification, select the appropriate adjusting washer and adjust. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Reverse Idler Gear>ADJUSTMENT.
   Specification:
   0 — 0.5 mm (0 — 0.020 in)

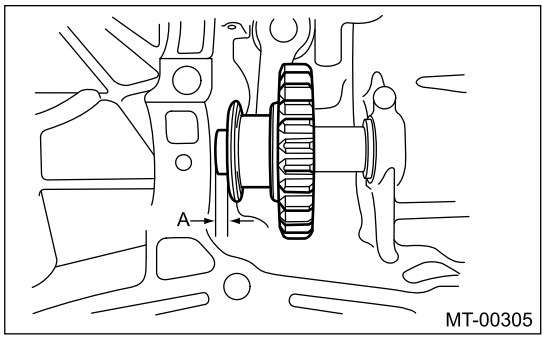


3. Check the reverse idler gear and shaft for damage. Replace if it is damaged.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Reverse Idler Gear

ADJUSTMENT

1. Select the appropriate reverse shifter lever from the table below, and adjust the clearance A between the reverse idler gear and transmission case wall.
   Specification:
   6.0 — 7.5 mm (0.236 — 0.295 in)



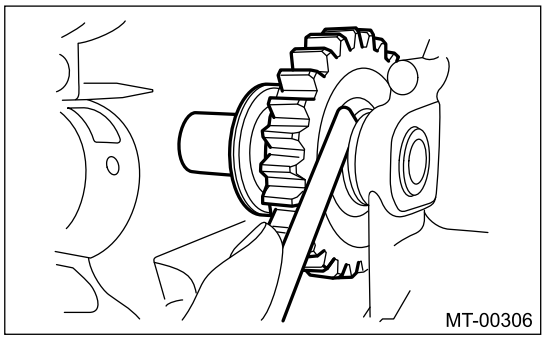
Reverse shifter lever		
Part No.	**Mark**	**Content**
32820AA070	7	Far from case wall
32820AA080	8	Specification

Reverse shifter lever		
Part No.	**Mark**	**Content**
32820AA090	9	Closer to case wall

2. Select the appropriate adjusting washer from the table below, and adjust the clearance between the reverse idler gear and transmission case wall.

Specification:

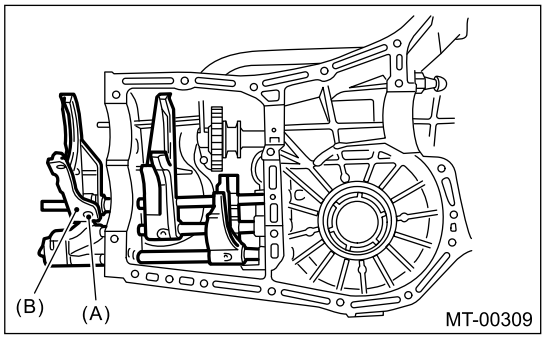
0 — 0.5 mm (0 — 0.020 in)



Adjusting washer	
Part No.	**Thickness mm (in)**
803020151	0.4 (0.016)
803020152	1.1 (0.043)
803020153	1.5 (0.059)
803020154	1.9 (0.075)
803020155	2.3 (0.091)

REMOVAL

1. Remove the manual transmission assembly from the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>REMOVAL.
2. Remove the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
3. Remove the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>REMOVAL.
4. Remove the transmission case. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transmission Case>REMOVAL.
5. Remove the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>REMOVAL.
6. Remove the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>REMOVAL.
7. Remove the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>REMOVAL.
8. Drive out the straight pin by tapping it with the REMOVER (398791700), and remove the 5th shifter fork.

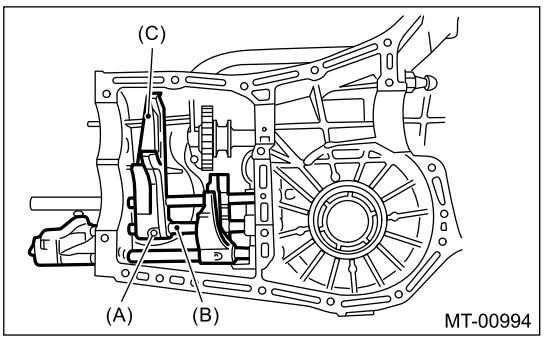


(A) Straight pin
(B) 5th shifter fork

9. Remove the check ball plugs, check ball springs and check balls.
10. Drive out the straight pin by tapping with the REMOVER (398791700), and remove the 3rd-4th fork rod and 3rd-4th shifter fork.

Caution:

- **When removing the 3rd-4th fork rod, keep other fork rods in neutral.**
- **When driving out the straight pin, remove it toward the inside of case so that it does not hit against the case.**



(A) Straight pin

(B) 3rd-4th fork rod

(C) 3rd-4th shifter fork

11. Drive out the straight pin by tapping with the REMOVER (398791700), and pull out the 1st-2nd fork rod and 1st-2nd shifter fork.
12. Remove the snap ring (outer), and pull out the reverse fork rod from the reverse fork rod arm. Then take out the check ball, check ball spring, and interlock plunger from the reverse fork rod arm. And then remove the reverse fork rod.

    Caution:

    When pulling out the reverse fork rod arm, be careful not to let the ball pop out of arm.
13. Remove the reverse shifter lever.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Shifter Fork and Rod

INSTALLATION

1. Install the check ball spring and check ball to the reverse fork rod arm, and press-in the ACCENT BALL INSTALLER (399411700).
2. Install the reverse fork rod through the hole on the rear of the transmission case. Press out the ACCENT BALL INSTALLER (399411700) using the reverse fork rod, and fix with outer snap ring.
3. Install the interlock plunger to reverse fork rod arm.

    Note:

    Apply grease to plunger to prevent it from falling.
4. Position the check balls, check ball springs and new gaskets in the reverse fork rod hole on the left side of transmission case, and tighten the check ball plugs.

    Tightening torque:

    20 N·m (2.0 kgf-m, 14.8 ft-lb)
5. Install the 1st-2nd fork rod to the 1st-2nd shifter fork through the hole on the rear of the transmission case.

    Caution:

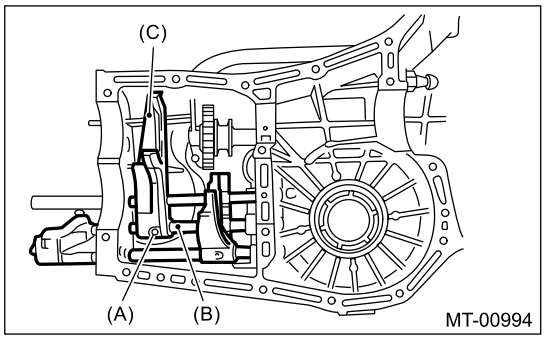
    - **Set the reverse fork rod to neutral.**
    - **Check that the positions of interlock plunger is correct.**
6. Align the holes in the 1st-2nd fork rod and the 1st-2nd shifter fork, and drive a new straight pin into these holes using the REMOVER (398791700).
7. Install the interlock plunger (thin) onto the 3rd-4th fork rod.

    Note:

    Apply grease to plunger to prevent it from falling.
8. Install the 3rd-4th fork rod to the 3rd-4th shifter fork and reverse fork rod arm through the hole on the rear of the transmission case.
9. Align the holes in the 3rd-4th fork rod and the 3rd-4th shifter fork, and drive a new straight pin into these holes using the REMOVER (398791700).

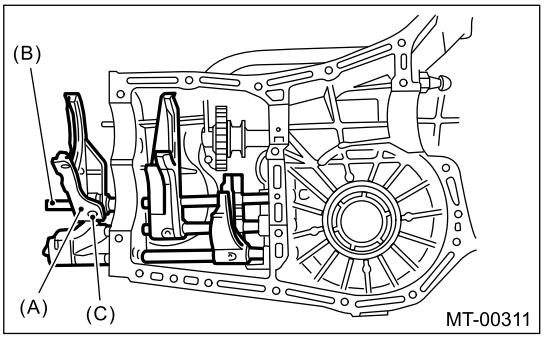
    Caution:

    - **Set the reverse fork rod and the 1st-2nd fork rod to neutral.**
    - **Check that the positions of interlock plunger is correct.**



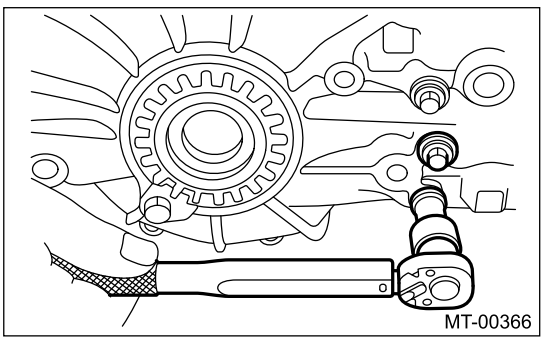
(A) Straight pin
(B) 3rd-4th fork rod
(C) 3rd-4th shifter fork

10. Install the 5th shifter fork onto the rear of reverse fork rod.
11. Align the holes in the 5th shifter fork and the reverse fork rod, and drive a new straight pin using the REMOVER (398791700).



(A) 5th shifter fork
(B) Reverse fork rod
(C) Straight pin

12. Position the check balls, check ball springs and new gaskets to the 3rd-4th fork rod and 1st-2nd fork rod holes, and install the check ball plugs.
Tightening torque:
20 N·m (2.0 kgf-m, 14.8 ft-lb)



13. Install the front differential assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Front Differential Assembly>INSTALLATION.
14. Install the main shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Main Shaft Assembly>INSTALLATION.
15. Install the drive pinion shaft assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Drive Pinion Shaft Assembly>INSTALLATION.
16. Install the transmission case. Ref. to MANUAL TRANSMISSION AND

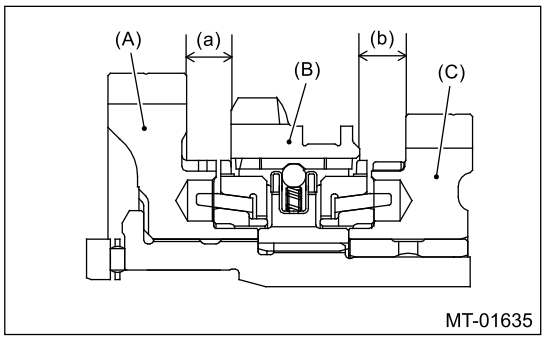
DIFFERENTIAL(5MT)>Transmission Case>INSTALLATION.

17. Install the transfer case together with the extension case assembly. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Transfer Case and Extension Case Assembly>INSTALLATION.
18. Install the back-up light switch and the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSTALLATION.
19. Install the manual transmission assembly to the vehicle. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Manual Transmission Assembly>INSTALLATION.

MANUAL TRANSMISSION AND DIFFERENTIAL(5MT) > Shifter Fork and Rod

INSPECTION

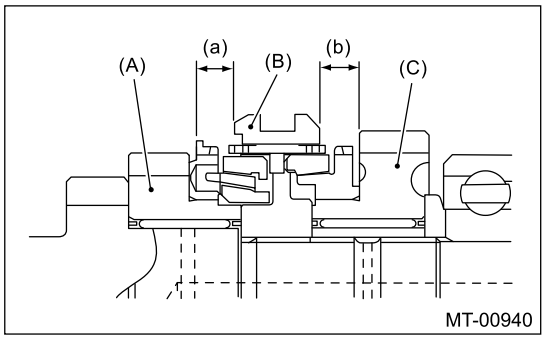
1. Check the shifter fork and fork rod for damage. Replace if it is damaged.
2. Gearshift mechanism
   Repair or replace the gearshift mechanism if excessively worn, bent or defective in any way.
3. Inspect the clearances (a) and (b) between 1st, 2nd driven gear and reverse driven gear. If it is outside the standard value, replace the shifter fork as required.
   Specification:
   9.5 mm (0.374 in)



(A) 1st driven gear
(B) Reverse driven gear
(C) 2nd driven gear

1st-2nd shifter fork		
Part No.	**Mark**	**Content**
32804AA060	1	Approaches 1st gear by 0.2 mm (0.008 in).
32804AA070	No mark	Specification
32804AA080	3	Approaches 2nd gear by 0.2 mm (0.008 in).

4. Inspect the clearances (a) and (b) between the 3rd, 4th drive gear and the coupling sleeve. If it is outside the standard value, replace the shifter fork as required.
   Specification:
   9.3 mm (0.366 in)



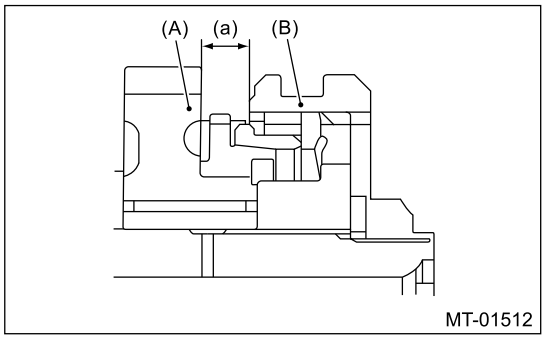
(A) 3rd drive gear
(B) Coupling sleeve
(C) 4th drive gear

3rd-4th shifter fork		
Part No.	**Mark**	**Content**
32810AA061	1	Approaches 4th gear by 0.2 mm (0.008 in).
32810AA071	No mark	Specification
32810AA101	3	Approaches 3rd gear by 0.2 mm (0.008 in).

5. Inspect the clearance (a) between 5th drive gear and coupling sleeve. If it is outside the standard value, replace the shifter fork as required.

Specification:

9.3 mm (0.366 in)



(A) 5th drive gear
(B) Coupling sleeve

5th shifter fork		
Part No.	**Mark**	**Content**
32812AA201	7	Approaches 5th gear by 0.2 mm (0.008 in).
32812AA211	No mark	Specification
32812AA221	9	Moves from the 5th gear by 0.2 mm (0.008 in).

6. Inspect the rod end clearances (A) and (B). If it is outside the standard value, replace the fork rod or shifter fork as required.

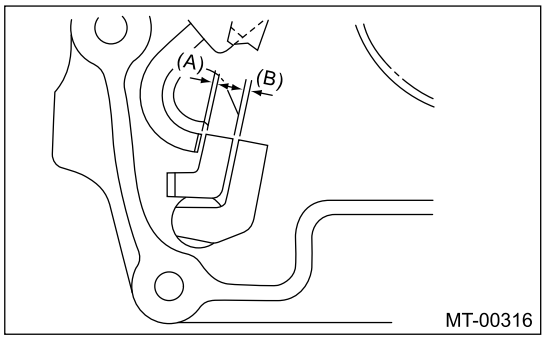
Specification:

Clearance (A):

0.5 — 1.3 mm (0.020 — 0.051 in)

Clearance (B):

0.4 — 1.4 mm (0.016 — 0.055 in)



(A) 3rd-4th — 5th

(B) 1st-2nd — 3rd-4th

INSPECTION

1. MANUAL TRANSMISSION

Symptoms	Possible cause	Corrective action
1. Gears are difficult to intermesh. **Note:** **The cause for difficulty in shifting gears can be classified into two types: One is a defective gear shift system and the other is defective transmission. However, if the operation is heavy and engagement of the gears is difficult, a defective clutch disengagement may also be responsible. Check whether the clutch is correctly functioning, before checking the gear shift system and transmission.**	(a) Worn, damaged or burred chamfer at internal spline of the sleeve and reverse driven gear	Replace.
	(b) Worn, damaged or burred chamfer of gear spline	Replace.
	(c) Worn or scratched bushings	Replace.
	(d) Incorrect contact or wear between baulk ring and gear cone	Repair or replace.
2. Gear slip-out • Gear slips out when coasting on rough road. • Gear slips out during acceleration.	(a) Defective pitching stopper adjustment	Replace.
	(b) Loose engine mounting bolts	Tighten.
	(c) Worn shifter fork or broken shifter check ball spring	Replace.
	(d) Worn or damaged ball bearing	Replace.
	(e) Excessive clearance between splines of synchronizer hub and synchronizer sleeve	Replace.
	(f) Synchronizer hub tooth step wear	Replace.
	(g) Worn 1st driven gear and driven shaft	Replace.
	(h) Worn 2nd driven gear and bushing	Replace.
	(i) Worn 3rd drive gear and needle bearing	Replace.
	(j) Worn 4th drive gear and needle bearing	Replace.

Symptoms	Possible cause	Corrective action
	(k) Worn 5th drive gear and needle bearing	Replace.
	(l) Worn reverse idler gear and bushing	Replace.
3. Noise emitted from transmission **Note:** **If a noise is heard when the vehicle is parked with its engine idling and if a noise ceases when the clutch is disengaged, it may be considered that the noise is coming from the transmission.**	(a) Insufficient or improper lubrication	Lubricate with specified oil or replace.
	(b) Worn or damaged gears and bearings **Note:** **If the trouble is only wear of the gear teeth surfaces, only a high whirring noise will occur at high speeds, but if any part is broken, rhythmical clicking sounds will be heard even at low speeds.**	Replace.

2. DIFFERENTIAL

Symptoms	Possible cause	Corrective action
1. Broken differential (case, gear, bearing, etc.) **Note:** **Noise will occur, and eventually the differential will not be able to operate due to broken pieces obstructing the gear revolution.**	(a) Insufficient or improper oil	Disassemble the differential and replace broken components. At the same time check other components for any trouble, and replace if necessary.
	(b) Use of vehicle under severe conditions such as excessive load and improper use of the clutch	Readjust the preload and backlash of the bearing, and the contact surface of gear.
	(c) Improper adjustment of taper roller bearing	Adjust.
	(d) Improper adjustment of the drive pinion and the hypoid driven gear	Adjust.
	(e) Excessive backlash of a vehicle under severe operating conditions due to worn differential side gear, adjusting washer or differential pinion	Add recommended oil to the specified level. Do not use vehicle under severe operating conditions.
	(f) Loose hypoid driven gear clamping bolts	Tighten.
2. Differential and hypoid gear noises Troubles of the differential and hypoid gear always appear as noise problems. Therefore noise	(a) Insufficient oil	Replenish or replace with the specified amount of recommended oil.

Symptoms	Possible cause	Corrective action
is the first indication of trouble. However, noises from the engine, muffler, tire, exhaust gas, bearing, body, etc. are easily mistaken for the differential noise. Pay special attention to the hypoid gear noise because it is easily confused with other gear noises. There are the following four kinds of noises. • Gear noise when driving: If noise increases as the vehicle speed increases, it may be due to insufficient gear oil, incorrect gear engagement, damaged gears, etc. • Gear noise when coasting: Damaged gears due to misadjusted bearings and incorrect shim adjustment • Bearing noise when driving or coasting: Cracked, broken or damaged bearings • Noise mainly when turning: Noise from differential side gear, differential pinion or differential pinion shaft, etc.	(b) Improper adjustment of hypoid driven gear and drive pinion	Check the tooth contact.
	(c) Worn teeth of hypoid driven gear and drive pinion	Replace as a set. Readjust the bearing preload.
	(d) Loose roller bearing	Readjust the backlash of the hypoid driven gear to drive pinion, and check the tooth contact.
	(e) Distorted hypoid driven gear or differential case	Replace.
	(f) Worn adjusting washer and differential pinion shaft	Replace.

POWER ASSISTED SYSTEM (POWER STEERING)

PS

1. General Description
2. Relay and Fuse
3. Power Steering System
4. Steering Wheel
5. Steering Heater System
6. Universal Joint
7. Steering Column
8. Electric Power Steering Gearbox
9. Power Steering Control Module
10. General Diagnostic Table

SPECIFICATION

Whole system	Minimum turning radius:	m (ft)	5.4 (17.72)
	Steering angle	Inner wheel	37.8°±1.5°
		Outer wheel	32.9°±1.5°
	Steering wheel diameter:	mm (in)	370 (14.57)
	Lock-to-lock revolution number		2.5
Gearbox	Type		Rack & pinion type
	Backlash		0 (automatic adjusting)
Motor (Temperature 20°C (68°F))	Rated voltage:	V	12
	Rated torque:	N·m (kgf-m, ft-lb)	5.07 (0.52 , 3.74)
	Rated revolution speed:	r/min	790
	Rated current:	A	85
	Rated output:	W	419

Steering wheel

Free play:	mm (in)	17 (0.67) or less

Column assembly & steering

Clearance: Between steering wheel and cover assembly - column	mm (in)	4 — 6 (0.16 — 0.24) or less

Steering gearbox

Sliding resistance:	N (kgf, lbf)	360 (37, 81) or less Difference between right and left sliding resistance: 20% or less
Rack shaft play in radial direction: mm (in)	Right-turn steering	Both amplitudes: 0.6 (0.024) or less
	Left-turn steering	Both amplitudes: 0.6 (0.024) or less
Input shaft play: mm (in)	In radial direction	Both amplitudes: 0.6 (0.024) or less
	In axial direction	0.27 (0.0106) or less
Rotational resistance:	N (kgf, lbf)	Maximum allowable value: 20 (2, 4.5) or less Difference between right and left sliding resistance: 20% or less

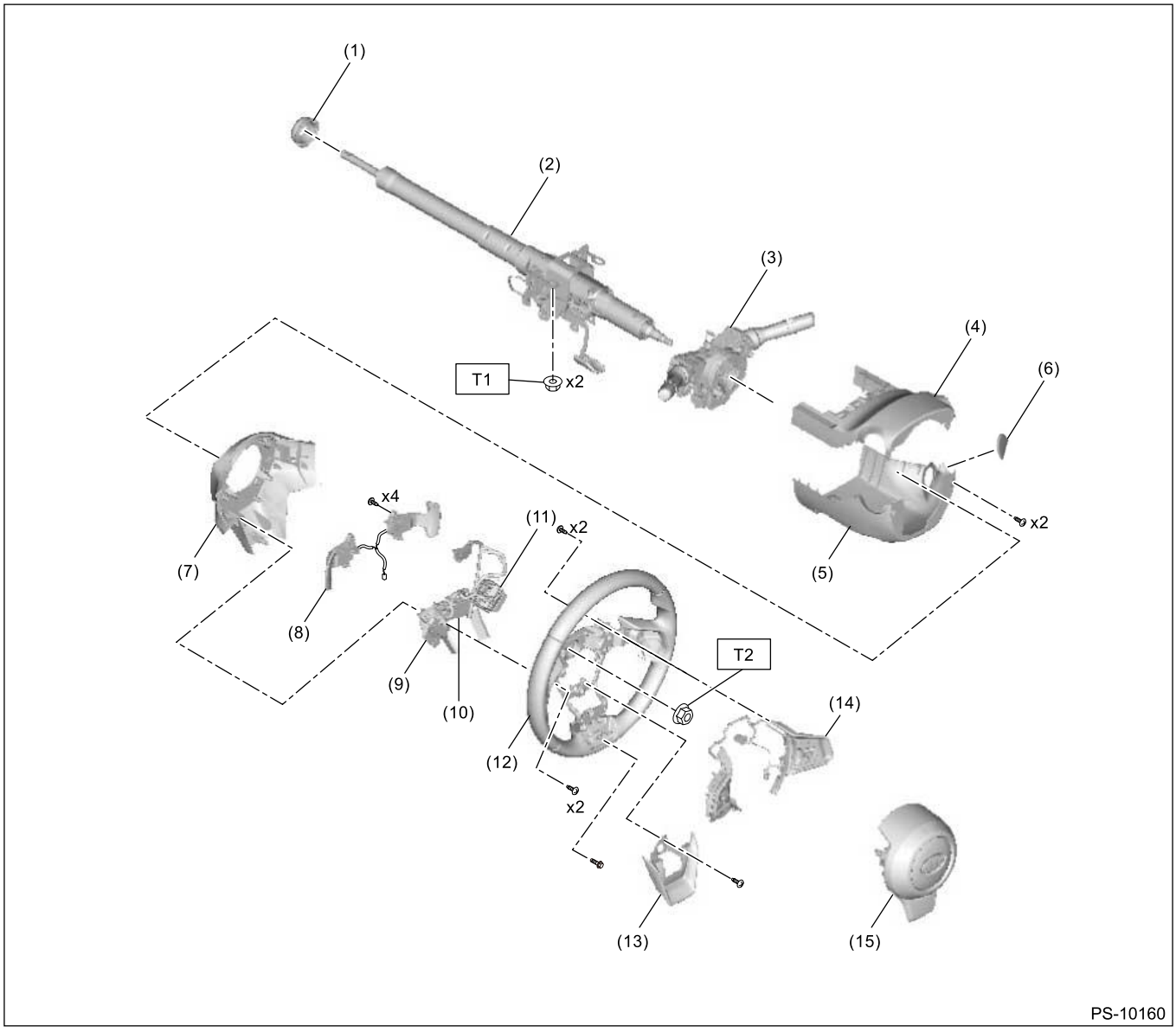
Steering effort (with power steering assist)

At standstill on paved road with engine idling:	N (kgf, lbf)	31 (3.2, 7) or less

At standstill on paved road with engine stalled:	N (kgf, lbf)	294.2 (30, 66.2) or less

COMPONENT

1. STEERING WHEEL AND COLUMN



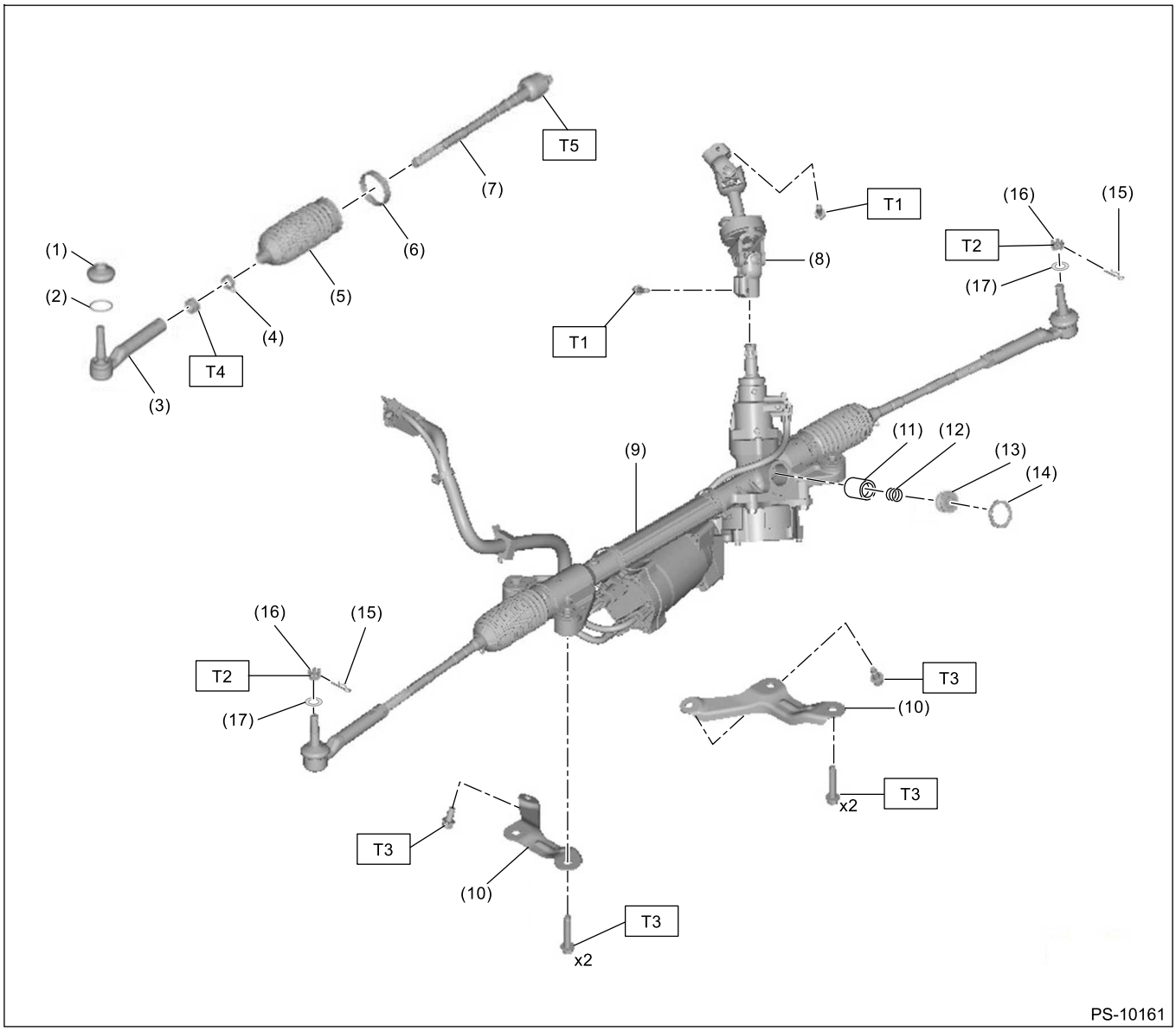
(1) Bushing
(2) Column ASSY - steering
(3) Switch ASSY - combination
(4) Cover ASSY - column UPR
(5) Cover ASSY - column LWR
(6) Cap - key cylinder (model with keyless access with push button start)
(7) Cover - steering wheel LWR
(8) Paddle shift
(9) MID switch (multi information display switch)
(10) Steering heater unit (model with steering heater)
(11) Steering heater switch (model with steering heater)
(12) Steering wheel
(13) Cover - spoke
(14) Satellite switch
(15) Airbag module

Tightening torque: N·m (kgf-m, ft-lb)

T1: 20 (2, 14.8)

T2: 39 (4, 28.8)

2. STEERING GEARBOX



(1)	Dust seal	(9)	Steering gearbox ASSY	(17)	Washer
(2)	Clip - boot tie-rod end	(10)	Stiffener		
(3)	Tie-rod end	(11)	Pad - pressure	***Tightening torque: N·m (kgf-m, ft-lb)***	
(4)	Clip - boot tie-rod	(12)	Spring - gear box	***T1: 24 (2.4, 17.7)***	
(5)	Boot - steering gear box	(13)	Adjusting screw	***T2: 27 (2.8, 19.9)***	
(6)	Band - boot	(14)	Lock nut	***T3: 60 (6.1, 44.3)***	
(7)	Tie-rod	(15)	Cotter pin	***T4: 85 (8.7, 62.7)***	
(8)	Universal joint assembly - steering	(16)	Lock nut	***T5: 90 (9.2, 66.4)***	

POWER ASSISTED SYSTEM (POWER STEERING) > General Description

CAUTION

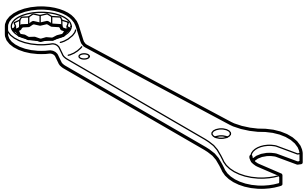
- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.

- When performing a repair, identify the cause of trouble and avoid unnecessary removal, disassembly and replacement.
- Some vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- Use SUBARU genuine grease, the recommended or equivalent. Do not mix grease etc. of different grades or manufacturers.
- Be sure to tighten fasteners including bolts and nuts to the specified torque.
- Always use the jack-up point when the shop jacks or rigid racks are used to support the vehicle.
- Do not secure a part in a vise directly. Place cushioning materials such as wood blocks, aluminum plates, or waste cloth between the part and the vise.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.
- When the wheel alignment has been adjusted, perform the following adjustment.
  - Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.
  - VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

POWER ASSISTED SYSTEM (POWER STEERING) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST34099PA100	34099PA100	SPANNER	Used when measuring the rotational resistance of gearbox assembly.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

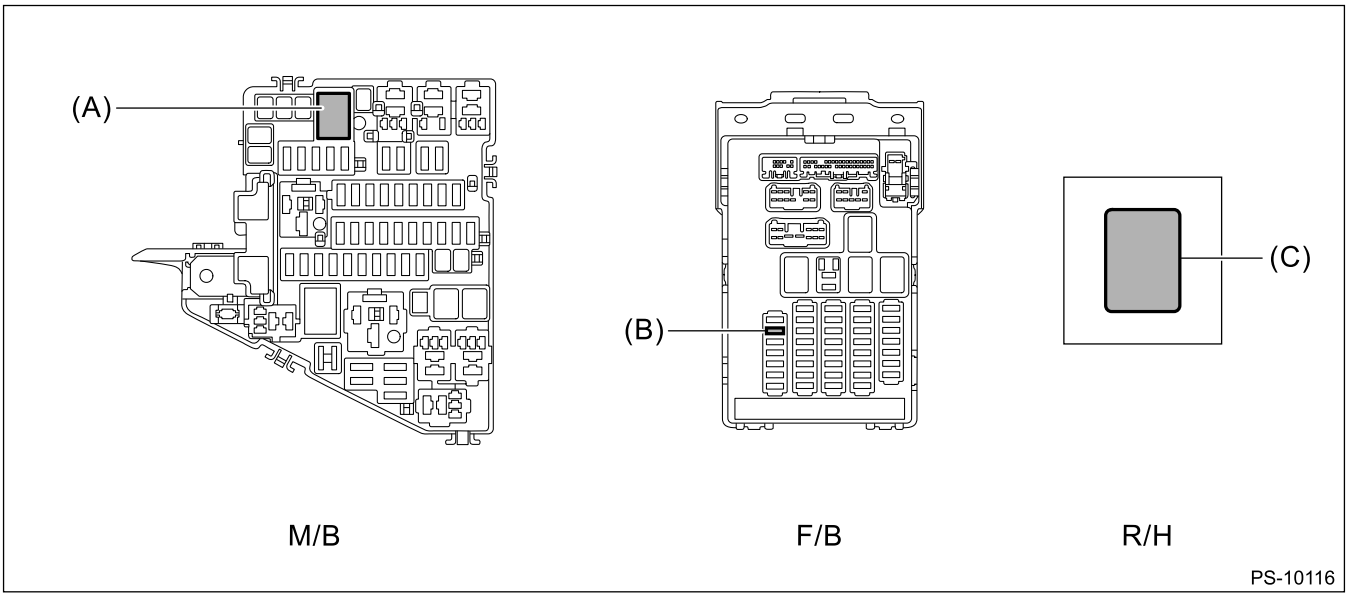
2. GENERAL TOOL

TOOL NAME	REMARKS
Steering wheel puller	Used for removing the steering wheel.

TOOL NAME	REMARKS
Circuit tester	Used for measuring voltage, resistance and current.
DST-i	Used together with Subaru Select Monitor 4.
C-clamp	Used when inspecting steering gearbox assembly.

POWER ASSISTED SYSTEM (POWER STEERING) > Relay and Fuse

LOCATION



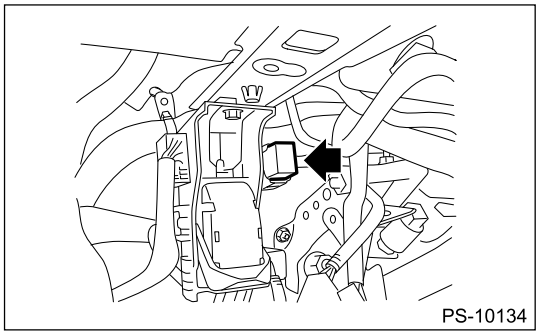
Main fuse box (M/B)	SBF fuse 80 A (power steering CM)	(A)
Fuse & relay box (F/B)	Fuse 7.5 A (power steering CM)	(B)
Relay holder (R/H)	Steering heater relay	(C)

POWER ASSISTED SYSTEM (POWER STEERING) > Relay and Fuse

REMOVAL

1. STEERING HEATER RELAY

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.
5. Remove the steering heater relay.



POWER ASSISTED SYSTEM (POWER STEERING) > Relay and Fuse

INSTALLATION

1. STEERING HEATER RELAY

1. Install the steering heater relay. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Install the body integrated unit (fuse & relay box).
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
4. Install the cover assembly - instrument panel LWR driver.
5. Connect the battery ground terminal.

INSPECTION

1. CHECK FUSE

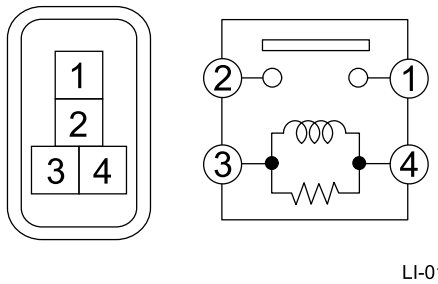
1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

Note:

If the fuse is blown again, check the system wiring harness.

2. CHECK RELAY

1. Check the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 LI-01273
1 — 2	Apply battery voltage between terminals 4 and 3.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

WIRING DIAGRAM

Refer to “Electric Power Steering System” in the wiring diagram. Ref. to WIRING SYSTEM>Electric Power Steering System.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

ELECTRICAL SPECIFICATION

Refer to Control Module I/O Signal of “POWER STEERING (DIAGNOSTICS)”. Ref. to POWER STEERING (DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

INSPECTION

Refer to “POWER STEERING (DIAGNOSTICS)”. Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering System

NOTE

For procedure of each component in the power steering system, refer to the respective section.

- Steering wheel: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel.
- Universal joint assembly - steering: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint.
- Steering column: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column.
- Electric power steering gearbox: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
- Power steering control module (with built-in gearbox): Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.

REMOVAL

Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the tire to the straight-ahead position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel.

   Caution:

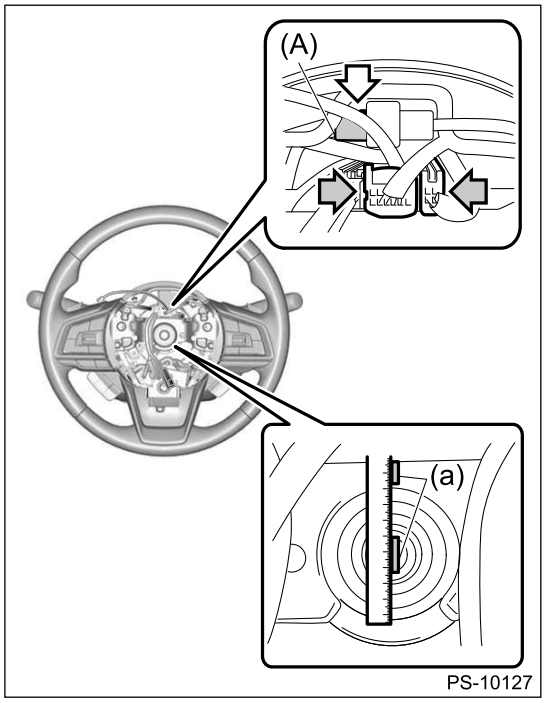
   - **Always use the steering wheel puller for removal to avoid deforming the steering wheel.**
   - **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**

   Preparation tool:

   Steering wheel puller

   (1) Disconnect the connector and remove the nut.

   (2) Put an alignment mark (a) using a ruler as shown in the figure, and remove the steering wheel.



(A) Model with steering heater

INSTALLATION

Caution:

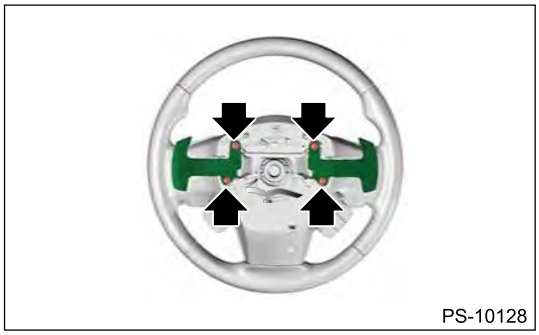
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**
- **If the steering wheel and steering angle sensor are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**

1. Align the center position of the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
2. Install the steering wheel.
   Tightening torque:
   Steering wheel: 39 N·m (4 kgf-m, 28.8 ft-lb)
   Clearance:
   Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)
3. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Wheel

DISASSEMBLY

1. Remove the screws on the back of the steering wheel.
   - Model without paddle shift: upper side two locations
   - Model with paddle shift: four locations



2. Disconnect the connector and remove the paddle shift switch. (Model with paddle shift)
3. Release the claws and remove the screws, then detach the cover - spoke.



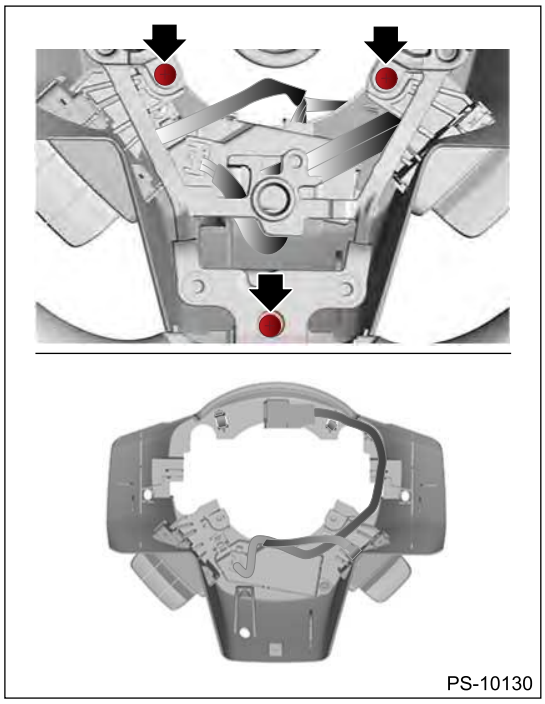
4. Remove the cover - steering wheel LWR.

Caution:

Carefully remove the cover - steering wheel LWR and the steering wheel. Do not pull with excessive force. Otherwise, heat wire between cover - steering wheel LWR and steering wheel may be damaged. (Model with steering heater)

(1) Remove the connectors and screws. (Model with MID switch and model with steering heater switch)

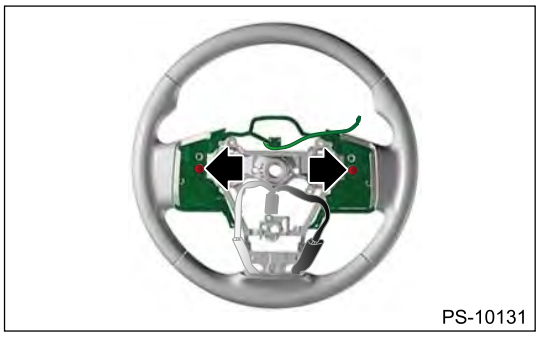
(2) Release the claws and harness clips, and detach the cover - steering wheel LWR.



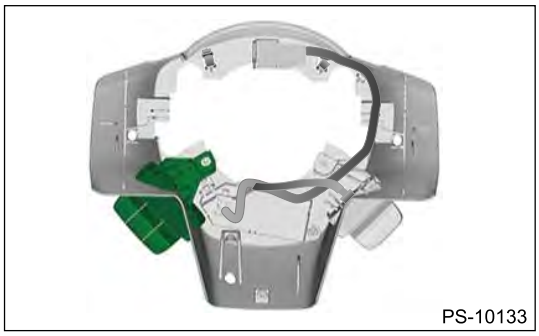
Note:

For model with steering heater, disconnect the connector with the cover - steering wheel LWR removed from steering wheel, and remove the steering heater unit. Also, remove the heater elements RH and LH secured with double-sided tape from the cover - steering wheel LWR.

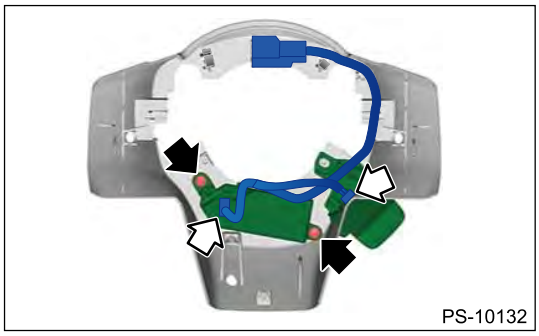
5. Release the claws and remove the screws, then detach the satellite switch.



6. Release the claws, and then remove the MID switch. (Model with MID switch)



7. Release the connector, screws and claws, and remove the steering heater switch and steering heater unit. (Model with steering heater)



ASSEMBLY

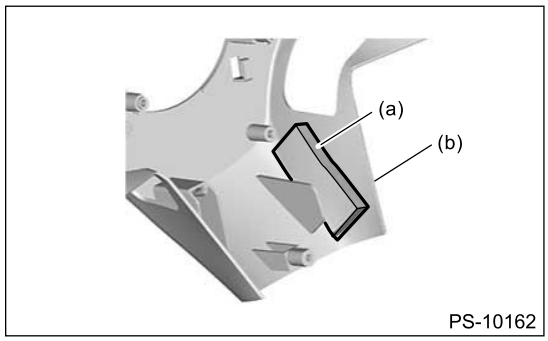
Caution:

- **Securely install the switch and the cover - steering wheel LWR. Improper insertion of the pins or claws of the switch and the cover - steering wheel LWR may cause improper installation.**
- **When installing the heater steering wheel and the cover - steering wheel LWR for models with steering heater, be careful of the following:**
  - **– Attach the heater element to the cover - steering wheel LWR so that it is not twisted or does not interfere with switches.**
  - **– Be careful not to allow the heater element to be caught in steering frame, unit and cover - steering wheel LWR.**

1. Install the MID switch.
2. Install the steering heater switch and steering heater unit to the cover - steering wheel LWR. (Model with steering heater)
3. Install the satellite switch.
4. Install the cover - steering wheel LWR.

Note:

Secure the heater element on the cover - steering wheel LWR using double-sided tape. Refer to the figure below to attach the heater element and double-sided tape symmetrically.



(a) Heater element and double-sided tape

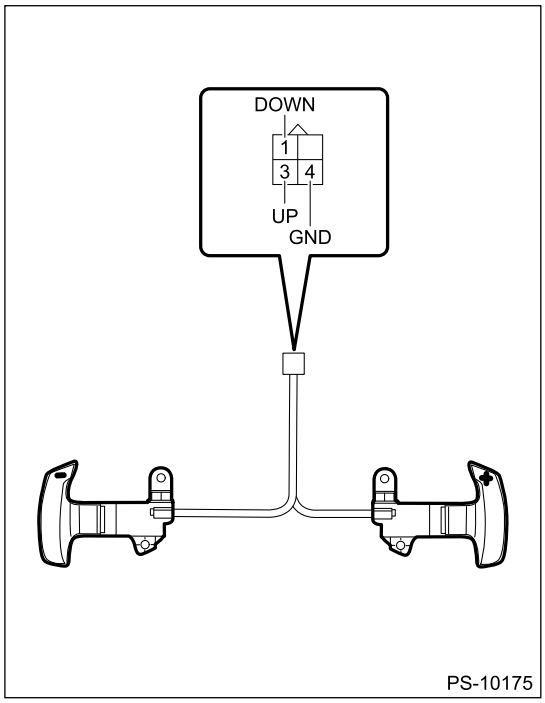
(b) Cover - steering wheel LWR

5. Install the cover - spoke.
6. Install the paddle shift switch. (Model with paddle shift)
7. Install the screws at two locations on upper back side of the steering wheel. (Model without paddle shift)

INSPECTION

1. PADDLE SHIFT SWITCH

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions	Standard
3 — 4	Operate the + side of paddle shift assembly and hold it.	Less than 10 Ω
1 — 4	Operate the − side of paddle shift assembly and hold it.	Less than 10 Ω
1 — 4 3 — 4	Do not operate the paddle shift assembly.	Is the resistance 1 MΩ or more?

2. Replace the paddle shift switch if the inspection result is not within the standard value.

2. SATELLITE SWITCH ASSEMBLY

- Audio (navigation) switch: Ref. to ENTERTAINMENT & MONITORING>Switches and Harness>INSPECTION > SATELLITE SWITCH ASSEMBLY.
- EyeSight steering switch: Ref. to EyeSight>Switches and Harness>INSPECTION > EYESIGHT STEERING SWITCH.
- Cruise control command switch: Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch>INSPECTION.

3. SWITCH ASSEMBLY - STEERING

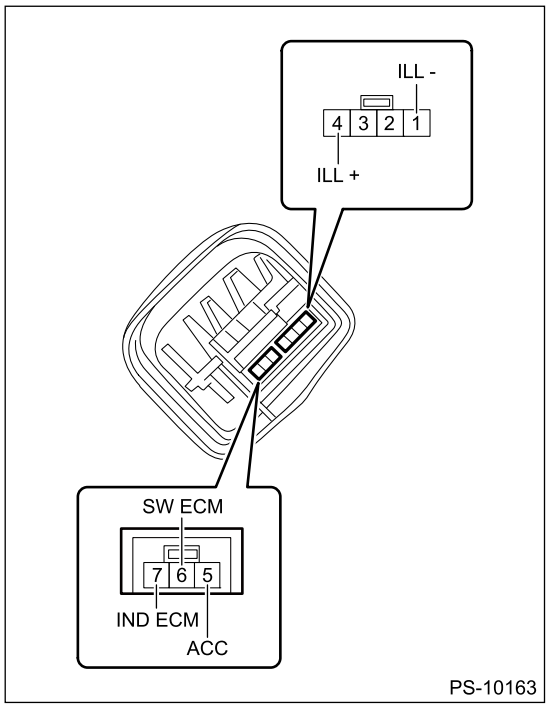
Refer to “Multi information display switch” of “INSTRUMENTATION/DRIVER INFO” section. Ref. to INSTRUMENTATION/DRIVER INFO>Switches and Harness>INSPECTION > MULTI-FUNCTION DISPLAY SWITCH.

4. STEERING HEATER SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
5 — 6	Operate the switch and hold it.	Less than 1 Ω
	Do not operate the switch.	1 MΩ or more

2. Apply battery voltage between the connector terminals to check lighting condition of illumination and indicator inside the switch.

Terminal No.	Inspection conditions	Standard
4 (+) — 1 (−)	Apply battery voltage.	Illumination (mark) turns on.
5 (+) — 7 (−)		Indicator turns on.
4 (+) — 1 (−) 5 (+) — 7 (−)	Apply battery voltage simultaneously.	Illumination (mark) and indicator turn on in dimmed condition at one level.

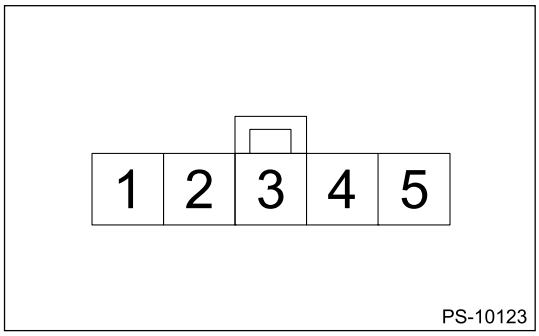
3. Replace the steering heater switch if the inspection result is not within the standard value.

5. STEERING WHEEL HEATER

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
Thermistor: 2 — 3	Outside temperature: 10 — 30°C	8.13 — 18.43 kΩ
Thermostat: 5 — 1		1.8 — 2.4 Ω

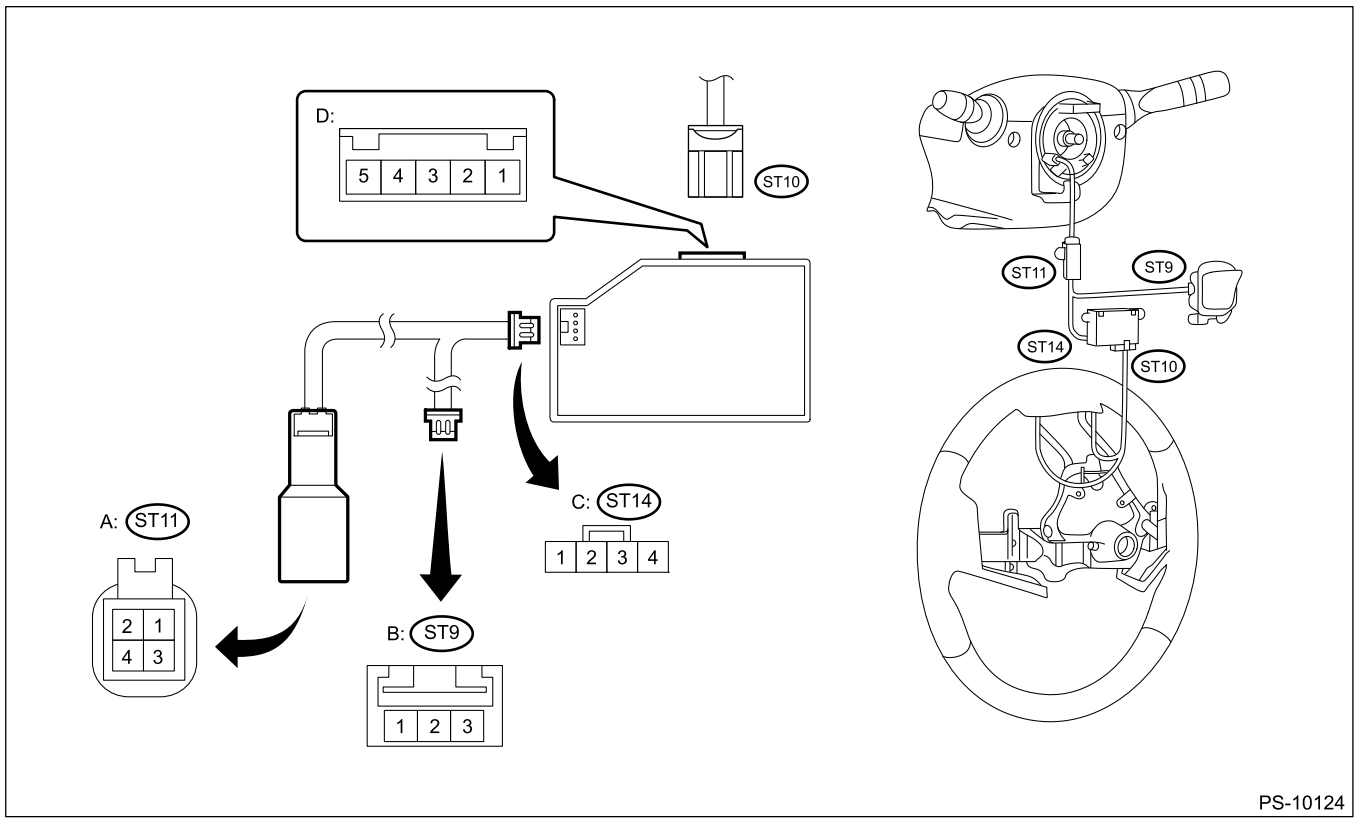
2. Replace the steering wheel if the inspection result is not within the standard value.

WIRING DIAGRAM

Refer to "STEERING HEATER SYSTEM" in the wiring diagram. Ref. to WIRING SYSTEM>Steering Heater System>WIRING DIAGRAM.

ELECTRICAL SPECIFICATION

1. STEERING HEATER UNIT



Terminal No.	Contents	Measuring condition	Standard
A No. 1	Not used	—	—
A No. 2	Not used	—	—
A No. 3 ←→ Chassis ground	Heater unit GND	Always	Less than 1 Ω
A No. 4 ←→ Chassis ground	Heater unit power supply input	Ignition switch ON	10 — 14 V
B No. 1 ←→ Chassis ground	Heater switch power supply input	Ignition switch ON	10 — 14 V
B No. 2 ←→ Chassis ground	Heater switch input	Turn the ignition switch to ON, and press and hold the heater switch.	9 — 14 V
B No. 3	Indicator light output	—	*
D No. 1 ←→ Chassis ground	Heater GND	Ignition switch ON, heater switch ON	Less than 1 V

Terminal No.	Contents	Measuring condition	Standard
D No. 2 ←→ Chassis ground	Thermistor input	Ignition switch ON, heater switch ON	1.5 — 4.5 V
D No. 3 ←→ Chassis ground	Thermistor GND	Ignition switch ON, heater switch ON	Less than 1 V
D No. 5 ←→ Chassis ground	Heater output	Ignition switch ON, heater switch ON	9 — 14 V

*: Illuminates when the ignition switch and heater switch are turned to ON.

Note:

Connect the each connector of the unit before checking.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Heater System

INSPECTION

1. CHECK STEERING HEATER SYSTEM

Symptoms	Reference
The steering heater does not operate.	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Heater System>INSPECTION > THE STEERING HEATER DOES NOT OPERATE.
The temperature of steering heater increases excessively.	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSPECTION > STEERING WHEEL HEATER.
The steering heater does not stop.	Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSPECTION > STEERING HEATER SWITCH.

2. THE STEERING HEATER DOES NOT OPERATE

1. CHECK POWER SUPPLY INPUT.

1. Disconnect the battery ground terminal, and wait for 60 seconds or more.
2. Disconnect the connector between steering roll connector and steering heater unit.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Measure the steering roll connector voltage.

   Connector & terminal

   (ST12) No. 4 (+) — No. 3 (−)

Is the voltage 10 — 14 V?

Yes — Go to 2.

No — Go to 5.

2. CHECK STEERING HEATER SWITCH.

Check the steering heater switch. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSPECTION > STEERING HEATER SWITCH.

Is the steering heater switch OK?

Yes	Go to 3.
No	Replace the steering heater switch. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

3. CHECK STEERING HEATER UNIT.

Check the steering heater unit. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Heater System>ELECTRICAL SPECIFICATION > STEERING HEATER UNIT.

Is the steering heater unit OK?

Yes	Go to 4.
No	Replace the steering heater unit. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

4. CHECK STEERING WHEEL.

Check the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSPECTION > STEERING WHEEL HEATER.

Is the steering wheel OK?

Yes	It is possible that temporary poor contact occurs. Restore the parts and check it again.
No	Replace the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel.

5. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse No. 33 in the fuse & relay box.

Is the fuse OK?

Yes — Go to 6.

No — Replace the fuse.

6. CHECK RELAY.

Check the steering heater relay. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Relay and Fuse.

Is the steering heater relay OK?

Yes — Go to 7.

No — Replace the steering heater relay.

7. CHECK BATTERY VOLTAGE.

Measure the battery voltage.

Is the battery OK?

Yes — Go to 8.

No — Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

8. CHECK ROLL CONNECTOR (HEATER).

Measure the resistance between steering roll connectors (heater part). Ref. to COMMUNICATION SYSTEM>Horn Switch>INSPECTION > CHECK STEERING ROLL CONNECTOR.

Is the steering roll connector OK?

Yes	It is possible that temporary poor contact occurs. Restore the parts and check it again.
No	Replace the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Heater System

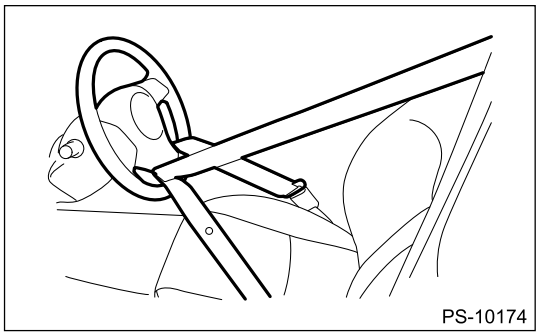
NOTE

For procedure of each component in the steering heater system, refer to the respective section.

- Steering wheel
  - Removal: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
  - Installation: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSTALLATION.
- Steering heater switch
  - Disassembly: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.
  - Assembly: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>ASSEMBLY.

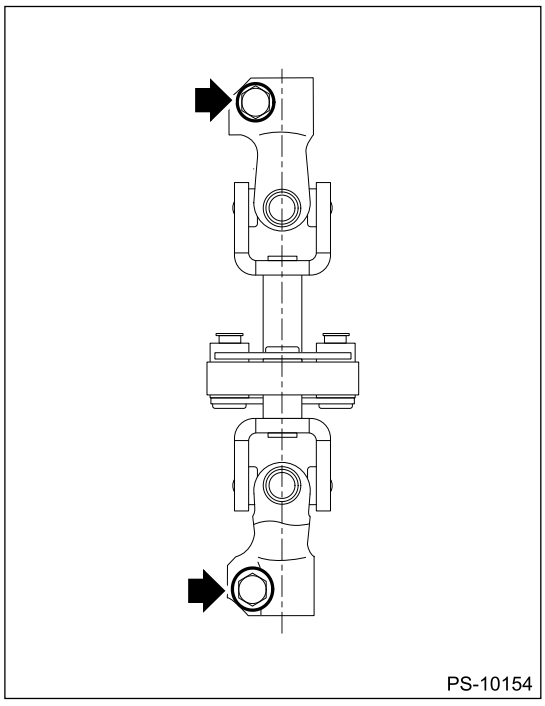
REMOVAL

1. Set the steering wheel to the straight-ahead position.
2. Adjust the tilt position of the steering column to the neutral position.
   Caution:
   Always place the tilt lever to the lock position after the steering column is adjusted.
3. Prevent the steering wheel from turning using the seat belt.



4. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
5. Remove the universal joint assembly - steering.
   (1) Place alignment marks on the universal joint assembly - steering.
   Note:
   Place alignment marks on the following positions.
   - **Between the column assembly - steering and the universal joint assembly - steering**
   - **Between the steering gearbox assembly and the universal joint assembly - steering (only when the guide is not installed)**

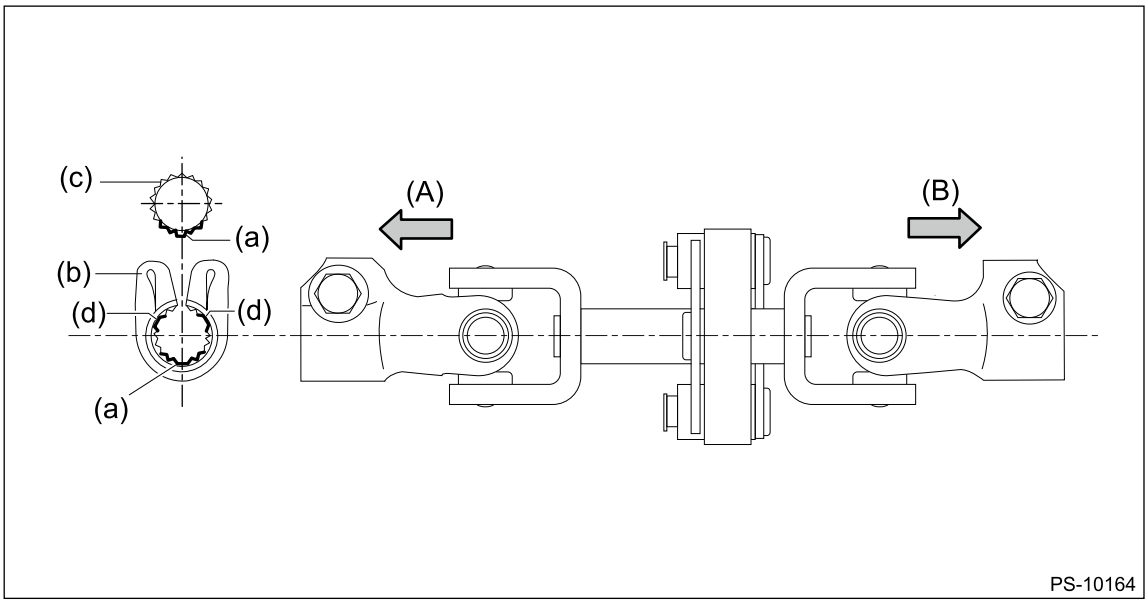
   (2) Remove the bolt, and remove the universal joint assembly - steering.
   Caution:
   Do not remove the guide camera.



INSTALLATION

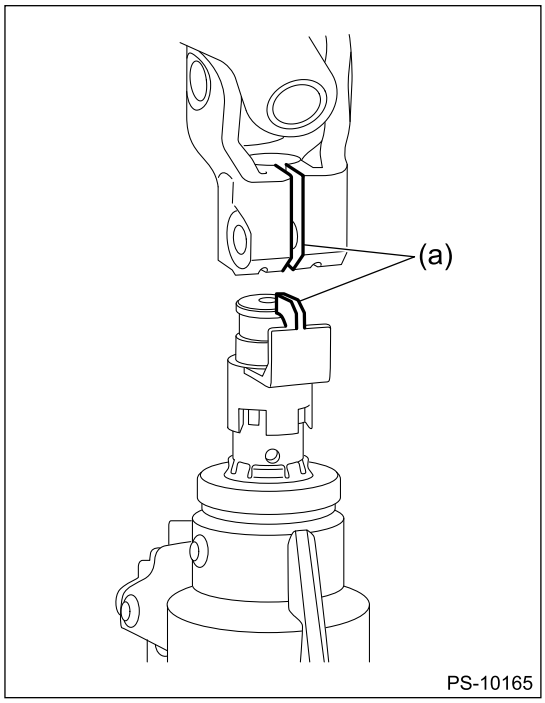
1. Before installation, check the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
2. Adjust the tilt position of the steering column to the neutral position.
   Caution:
   Always place the tilt lever to the lock position after the steering column is adjusted.
3. Install the universal joint assembly - steering.
   Caution:
   - **Be sure to align the protrusion section (a) of the column shaft side with the cutout (a) of the serration. If another cutout portions (d) are used for alignment, the bolt of the universal joint assembly - steering cannot be assembled.**
   - **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
   - **When tightening the mounting bolts of the universal joint assembly - steering, always tighten the gearbox side bolts first.**
   - **Always place the tilt lever to the lock position after the steering column is adjusted.**

   (1) Match the alignment marks that have been marked when removing with the column shaft (c) and the cutout portion (a) at the serrations of the yoke (b).
   (2)Connect the universal joint assembly - steering with the column shaft.



(A) Column shaft side (B) Gearbox side

(3) Install the universal joint assembly - steering to the serrations of the gearbox assembly by matching the guide (a) cutout portion or the alignment marks that have been marked when removing.



(4) Tighten the bolts on the gearbox side first, and then the column shaft side.

Tightening torque:

24 N·m (2.4 kgf-m, 17.7 ft-lb)

Clearance:

Universal joint assembly - steering coupling to adjacent parts: 15 mm (0.59 in) or more

4. Unfasten the seat belt and make the steering wheel turn freely.
5. Install the under cover - front.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

POWER ASSISTED SYSTEM (POWER STEERING) > Universal Joint

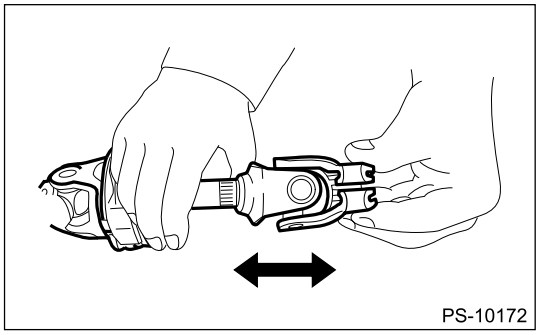
INSPECTION

Check for wear, damage or any other faults.

1. Check the universal joint assembly - steering for excessive looseness.

Service limit:

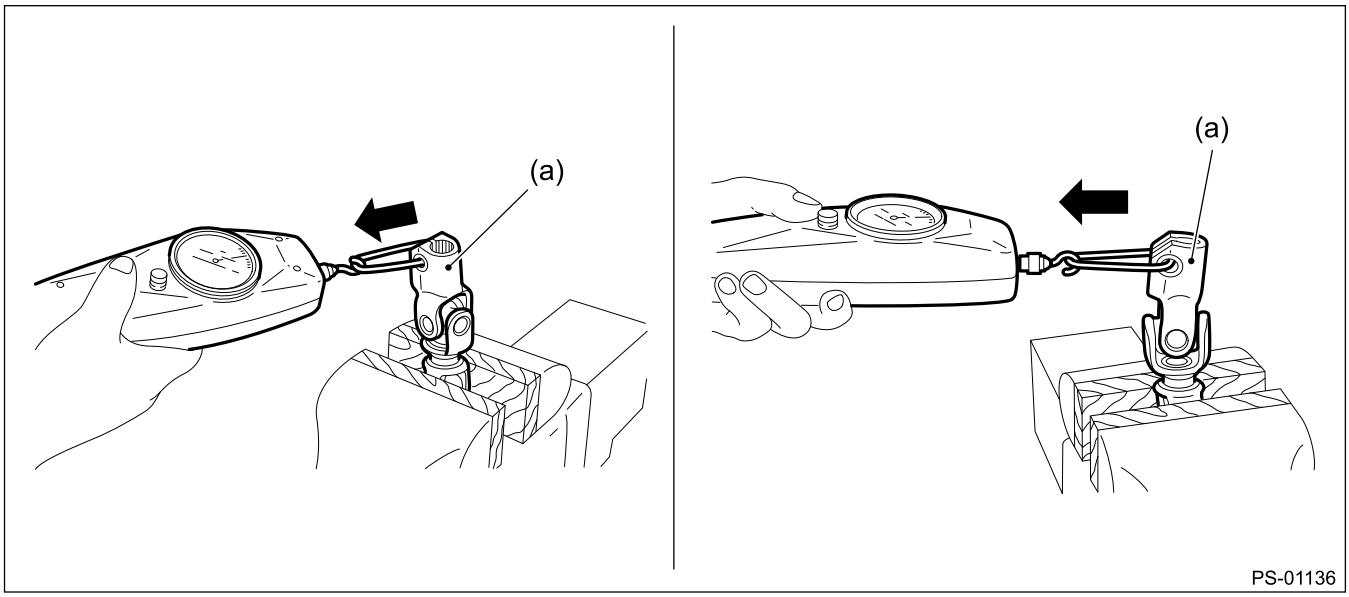
Play of the universal joint assembly - steering: 0 mm (0 in)



2. Measure the swing load of the universal joint assembly - steering.

(1) Place the universal joint assembly - steering between wooden blocks and fix it on a vise.

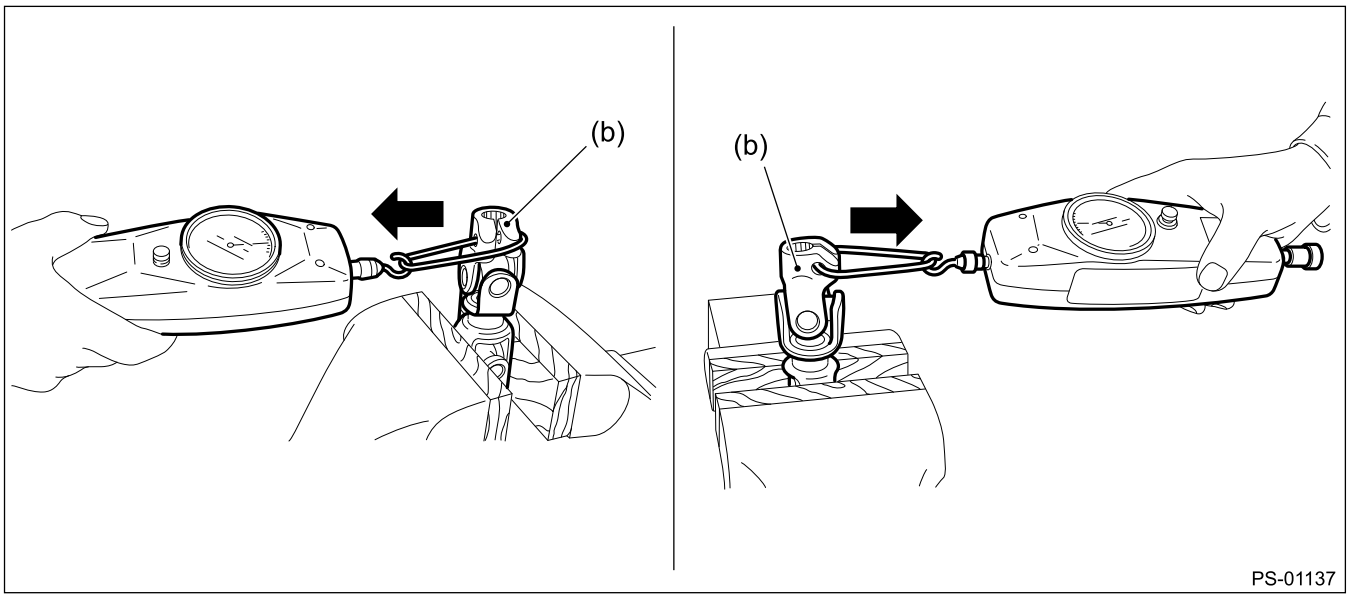
(2) With the yoke (a) of gearbox side facing up, measure the swing load in two directions.



Service limit:

Maximum load: 4.5 N (0.46 kgf, 1.01 lbf) or less

(3) With the yoke (b) of the column assembly - steering side facing up, measure the swing load in two directions.



Service limit:

Maximum load: 5.4 N (0.55 kgf, 1.21 lbf) or less

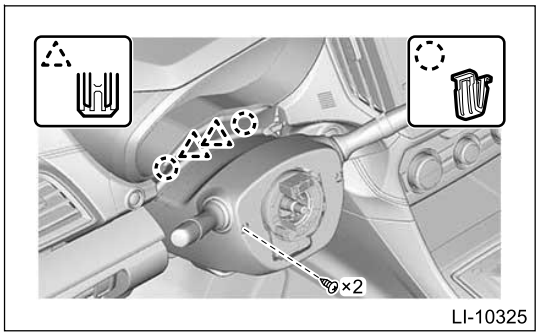
(4) Replace as necessary, if it is found defective.

REMOVAL

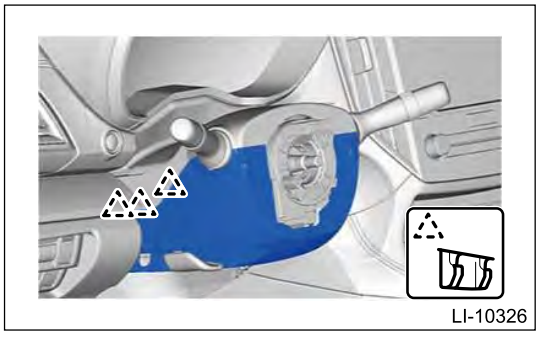
Caution:

Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Adjust the tilt position of the steering column to the neutral position and the telescopic position to the longest position.
   Caution:
   Always place the tilt lever to the lock position after the steering column is adjusted.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
5. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
6. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
7. Remove the cover assembly - column.
   (1) Release the clips, and remove the cover assembly - steering UPR.
   (2) Remove the screws.



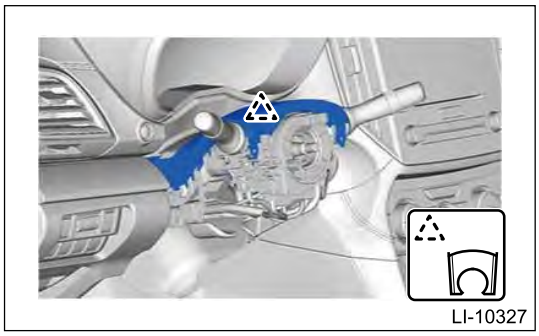
(3) Release the claw, and remove the cover assembly - column LWR as shown in the figure.



Note:

- **Release the claws on RH side in the same procedure as on the LH side.**
- **For model with keyless access with push button start, remove the cap - key cylinder.**

(4) Release the claw, and remove the cover assembly - column UPR as shown in the figure.



8. Remove the switch assembly - combination turn dimmer.

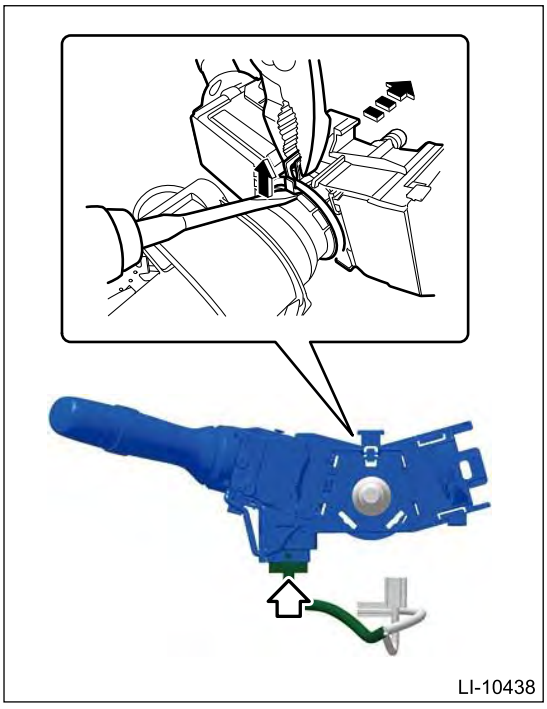
(1) Disconnect the connector.

(2) Using pliers, loosen the clamp.

(3) With the clamp loosened, release the claw using a flat tip screwdriver wrapped with a protection tape, and remove the switch assembly - combination turn dimmer.

Caution:

Do not pry off forcibly. Otherwise, the claws may be damaged.



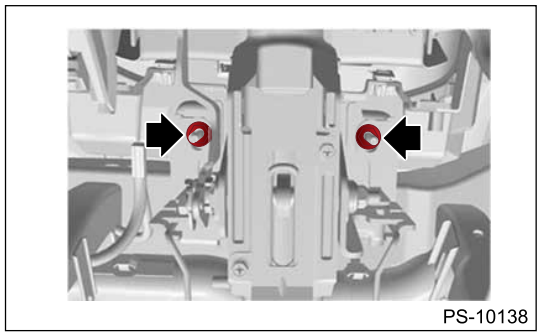
9. Remove all connectors from the column assembly - steering.

10. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

Caution:

To prevent damage to the universal joint assembly - steering and improper steering effort, make sure to remove the universal joint assembly - steering.

11. Remove the nut under the beam COMPL - steering securing the column assembly - steering.



12. Pull out the column assembly - steering from the hole on toe board.

Caution:

Do not loosen the tilt lever when the column assembly - steering is not secured to the vehicle.

13. Remove the ignition key lock. Ref. to SECURITY AND LOCKS>Ignition Key Lock>REPLACEMENT.

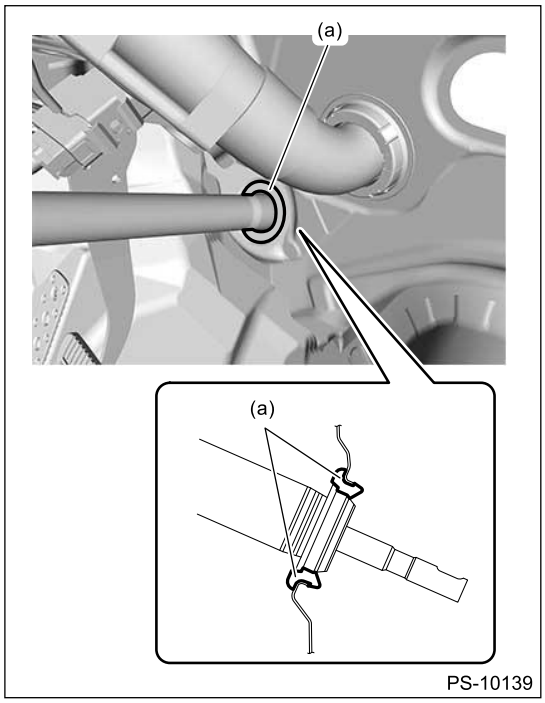
POWER ASSISTED SYSTEM (POWER STEERING) > Steering Column

INSTALLATION

Caution:

- **When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Before handling the airbag system components, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the bushing (a) to the toe board from the passenger compartment side.



2. Insert the end of the column assembly - steering into the toe board bushing.

3. Tighten the column assembly - steering installation nut located under the beam COMPL - steering

with the tilt lever fixed.

Tightening torque:

20 N·m (2 kgf-m, 14.8 ft-lb)

4. Install the ignition key lock. Ref. to SECURITY AND LOCKS>Ignition Key Lock>REPLACEMENT.
5. Install the switch assembly - combination.
6. Connect all the connectors under the instrument panel.
7. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.

Caution:

- **Always install the universal joint assembly - steering after installing the steering column to avoid damage to the universal joint assembly - steering.**
- **Be sure to follow the tightening order and tightening torque of the universal joint assembly - steering to avoid the steering effort from becoming heavy. After confirming that the steering column position is in the neutral position, tighten the universal joint assembly - steering.**
- **Always place the tilt lever to the lock position after the steering column is adjusted.**

8. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
9. Install the cover assembly - instrument panel LWR driver.
10. Install the cover assembly - column.
11. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
12. Install the steering wheel.

Tightening torque:

Steering wheel: 39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

13. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
14. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

POWER ASSISTED SYSTEM (POWER STEERING) > Steering Column

INSPECTION

1. UNIT INSPECTION

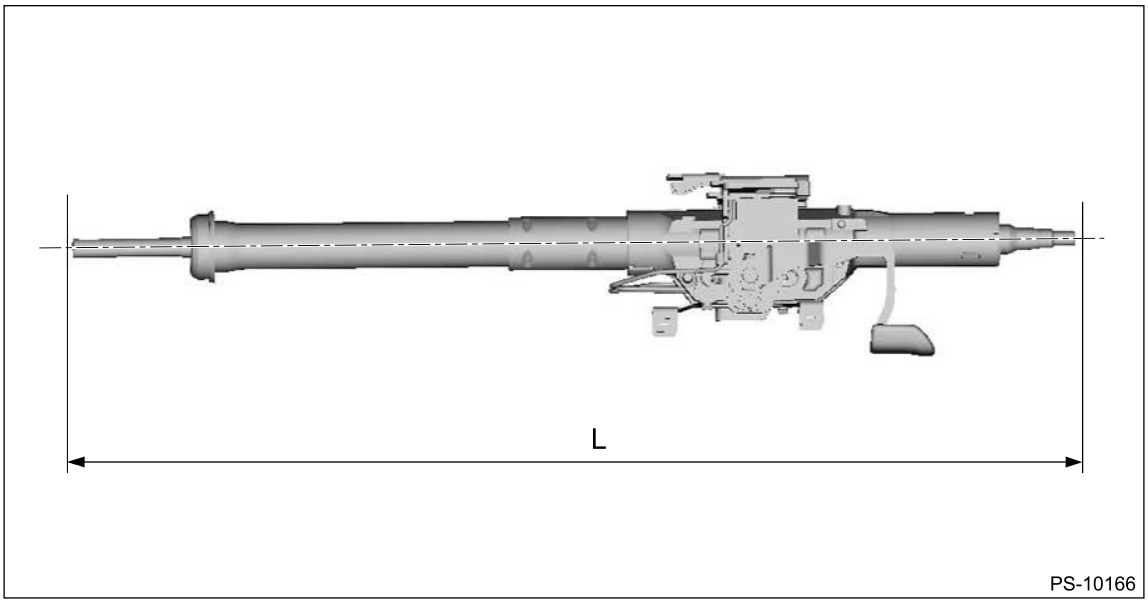
Check the following items, and if there is anything out of standard value, it is considered to be damaged. If so, replace it with a new part.

- Measure the whole length of the column assembly - steering.

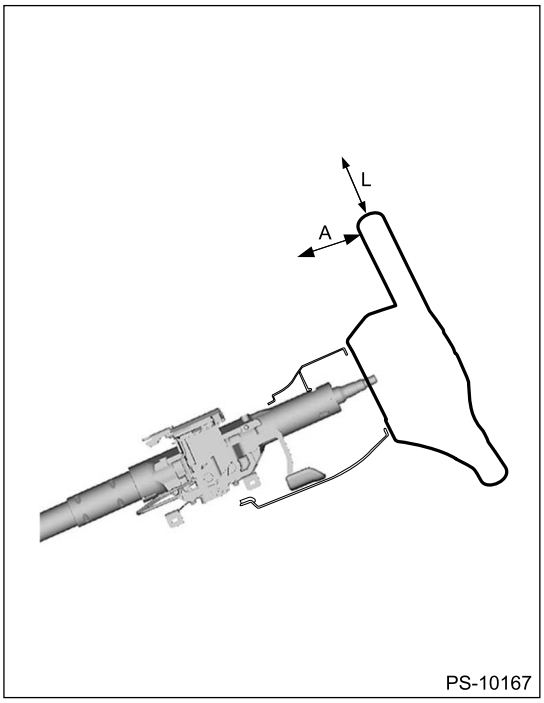
Standard: Overall length L

Tilt and telescopic column (measure while minimized)

$806.5^{+1.5}_{-1.5}$ mm ($31.75^{+0.059}_{-0.059}$ in)



- Check the steering wheel deflection in axial and vertical directions.
  Specification:
  Axial deflection A (deflection of steering wheel)
  Less than 6 mm (0.24 in)
  Vertical deflection L (runout of steering wheel)
  Less than 17 mm (0.68 in)



2. INSPECTION OF AIRBAG SYSTEM

Refer to “AIRBAG SYSTEM” section for airbag inspection procedure. Ref. to AIRBAG SYSTEM>Driver’s Airbag Module>INSTALLATION.

REMOVAL

Caution:

- **The power steering control module continues to operate after the engine stops and calculates the temperature in the control module. Therefore, before starting service of the power steering system which requires disconnection of the connector, stop the engine and allow approx. 30 minutes until the control module becomes cold.**
- **Be careful not to let any foreign matter (dust, water, oil, etc.) enter into the power steering control module connector when removing or installing. If a foreign matter enters, completely remove it.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Lift up the vehicle, and then remove the front wheels.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the crossmember support - rear and the crossmember support - front. Ref. to FRONT SUSPENSION>Crossmember Support>REMOVAL.
5. Remove the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>REMOVAL.
6. Remove the stabilizers. Ref. to FRONT SUSPENSION>Stabilizer>REMOVAL > STABILIZER.
7. Disconnect the tie-rod end.

   Note:

   Securely hook the tie-rod ball joint puller (e) to the collar (f).

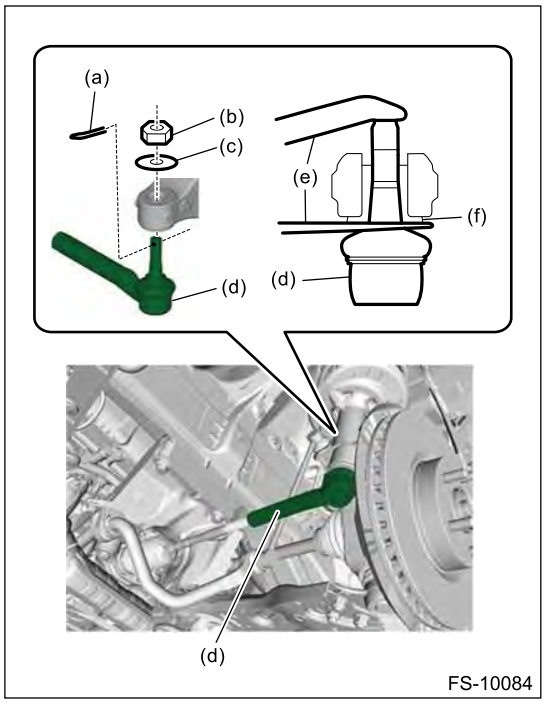
   (1) Pull out the cotter pin (a).

   (2) Remove the castle nut (b) and washer (c).

   (3) Using a tie-rod ball joint puller (e), detach the tie-rod end (d).

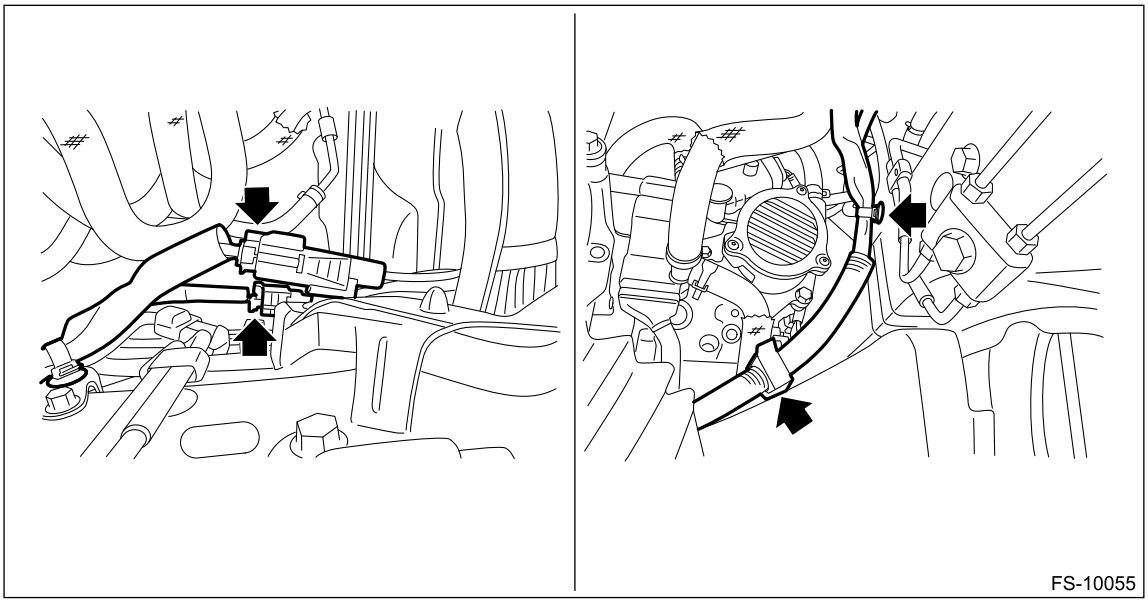
   Preparation tool:

   Tie-rod ball joint puller



8. Remove the front arm assembly. Ref. to FRONT SUSPENSION>Front Arm>REMOVAL.
9. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

10. Disconnect the power steering harness connector and harness clamp.



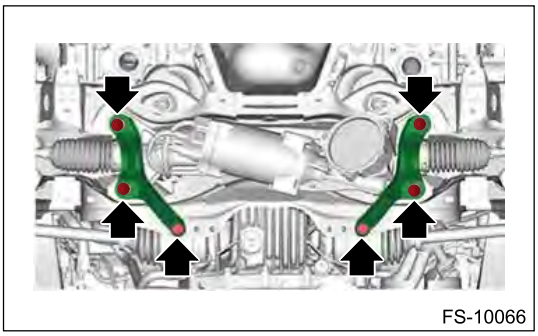
11. Remove the steering gearbox assembly from the crossmember COMPL.

Caution:

When lowering the transmission jack, make sure that the tie-rod end and the drive shaft boot do not interfere. The drive shaft boot may be damaged.

(1) Support the steering gearbox assembly from the bottom side using a transmission jack.

(2) Remove the bolts securing the steering gearbox assembly and stiffener to the crossmember COMPL.



(3) Lower the transmission jack slowly, and lower the steering gearbox assembly.

POWER ASSISTED SYSTEM (POWER STEERING) > Electric Power Steering Gearbox

INSTALLATION

Caution:

- **When raising the transmission jack, make sure that the tie-rod end and the drive shaft boot do not interfere. The drive shaft boot may be damaged.**
- **For parts which are not reusable, always use new parts.**
- **Always tighten the bushing in the state where the vehicle is at curb weight and the wheels are in full contact with the ground.**
- **Make sure that there is no gap between the housing assembly - front axle and the collar.**
- **If the collar is removed from the housing assembly - front axle, replace the housing assembly - front axle with a new part.**

1. Install the steering gearbox assembly and stiffener to the crossmember COMPL.

Tightening torque:

Refer to “COMPONENT” of “General Description” for the tightening torque. Ref. to FRONT SUSPENSION>General Description>COMPONENT > FRONT SUSPENSION.

2. Install the connector and harness clamp of the power steering control module.
3. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
4. Install the front arm assembly. Ref. to FRONT SUSPENSION>Front Arm>INSTALLATION.
5. Install the tie-rod end.

   Note:
   - **Do not forget to install the washer.**
   - **When tightening the castle nut, tighten the castle nut to the specified torque first, then tighten it further but within 60° until the hole in the ball stud is aligned with a slot in castle nut.**

   Tightening torque:
   27 N·m (2.7 kgf-m, 19.9 ft-lb)
6. Insert a new cotter pin and secure the castle nut.
7. Install the stabilizer. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
8. Install the front exhaust pipe. Ref. to EXHAUST(H4DO)>Front Exhaust Pipe>INSTALLATION.
9. Install the crossmember support - front and the crossmember support - rear. Ref. to FRONT SUSPENSION>Crossmember Support>INSTALLATION.
10. Install the under cover - front.

    Tightening torque:
    18 N·m (1.8 kgf-m, 13.3 ft-lb)
11. Install the front wheels and lower the vehicle.

    Tightening torque:
    120 N·m (12.2 kgf-m, 88.5 ft-lb)
12. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
13. After adjusting toe-in and steering angle, tighten the lock nut on tie-rod end.

    Caution:

    When the wheel alignment has been adjusted, perform the following adjustment.

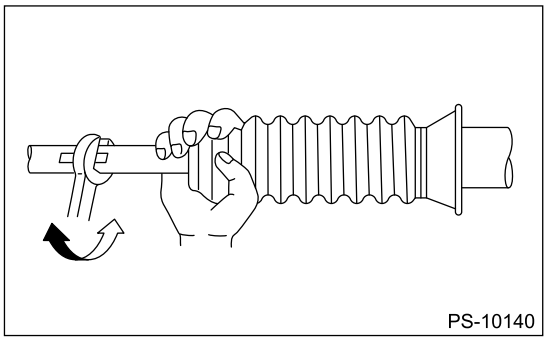
    – Lane keep assist learning value clear (model with EyeSight): Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

    – VDC sensor midpoint setting mode: Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

    Tightening torque:
    85 N·m (8.7 kgf-m, 62.7 ft-lb)

    Note:

    When adjusting toe-in, hold the boot - steering gearbox as shown to prevent it from being rotated or twisted. If it becomes twisted, straighten it.

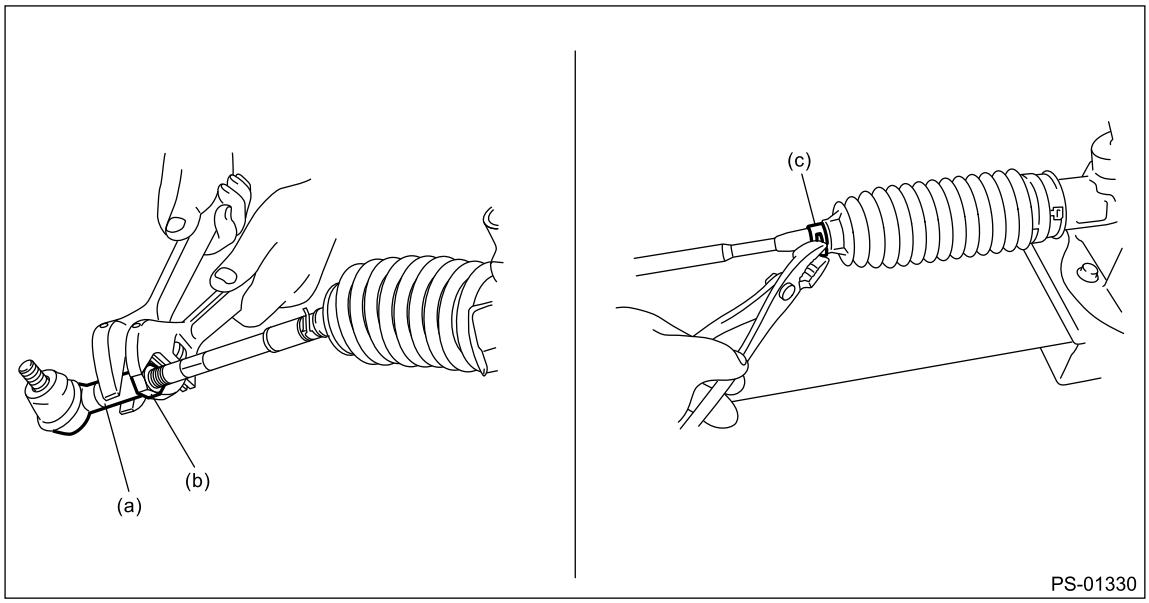


DISASSEMBLY

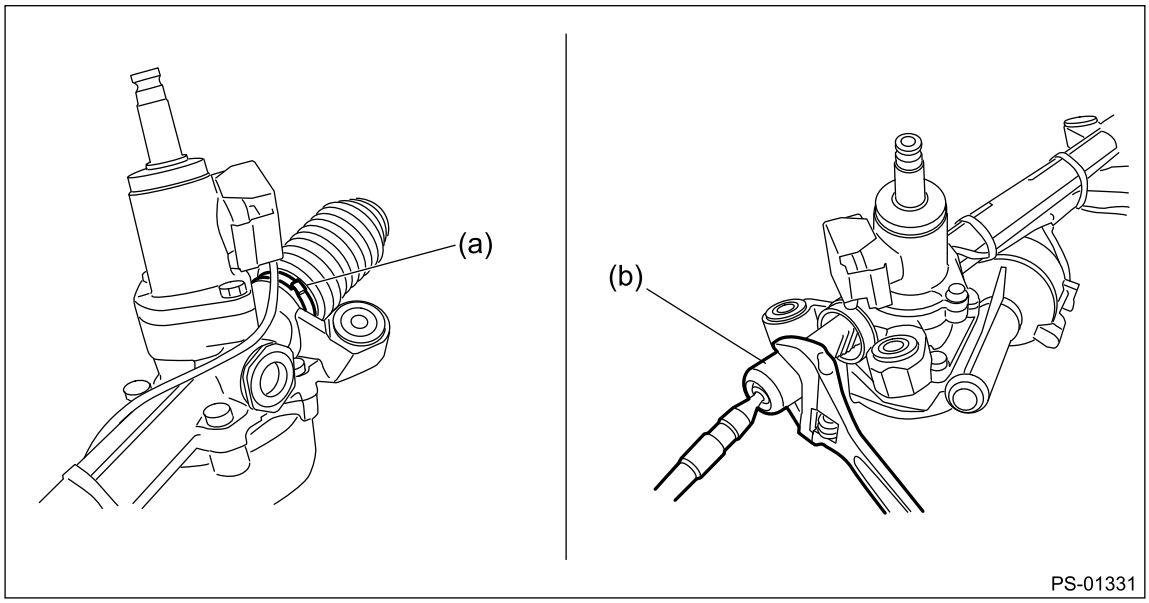
Caution:

- **Nut for fixing the rack is on the driver's side only. When removing the tie-rod on the passenger's side, turn over the boot - steering gearbox on the driver's side, and fix the rack during operation.**
- **When fixing the steering gearbox assembly in a vise, apply a wooden piece on the flange portion.**

1. Remove the tie-rod end (a) and lock nut (b) from the steering gearbox assembly.
2. Remove the clip - boot tie-rod (c) located outside the boot - steering gearbox using the pliers, and then slide the boot - steering gearbox to the tie-rod end side.



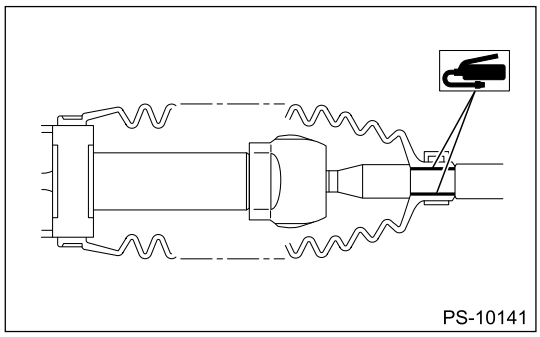
3. Remove the tie-rod (b) from the gearbox assembly.
   (1) Using a flat tip screwdriver, remove the band - boot (a) from the boot - steering gearbox.
   Note:
   Replace the boot - steering gearbox or the band - boot (a) if there is damage, cracks or deterioration.
   (2) Remove the tie-rod (b).



POWER ASSISTED SYSTEM (POWER STEERING) > Electric Power Steering Gearbox

ASSEMBLY

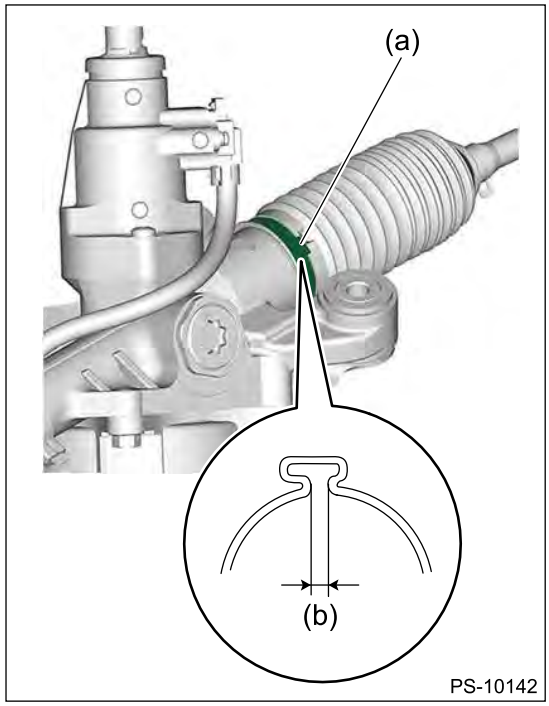
1. Install the tie-rod into rack.
   Tightening torque:
   90 N·m (9.2 kgf-m, 66.4 ft-lb)
   Note:
   Check the mating face of rack and tie-rod for foreign matter such as dust etc.
2. Apply a coat of grease to the tie-rod groove, and then install the boot - steering gearbox to the housing.
   Caution:
   Assemble the small end of the boot - steering gearbox in the tie-rod groove first, and then assemble the large end of the boot - steering gearbox in the housing.
   Note:
   Make sure that the boot - steering gearbox is installed without unusual inflation or deflation.



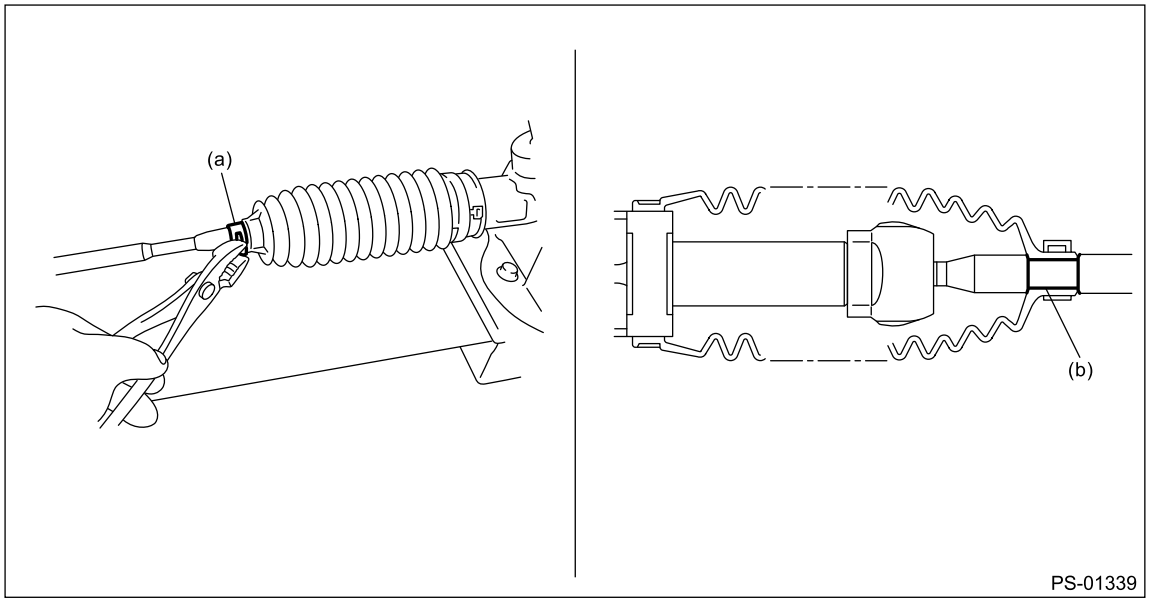
3. Using the boot clamp pliers, crimp the boot so that the clearance (b) of the band - boot (a) crimp portion becomes 2 mm (0.08 in) or less.

Note:

Use a new band - boot.



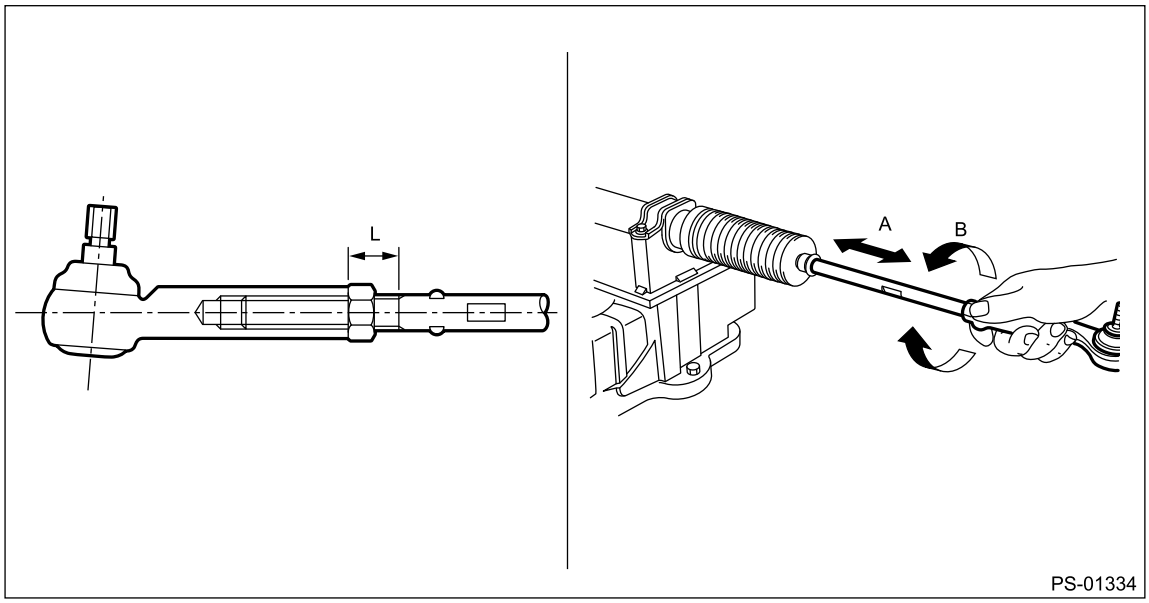
4. Fix the end of the boot - steering gearbox with clip - boot tie-rod (a).
5. After installation, check that the end of the boot - steering gearbox is installed to the groove (b) of the tie-rod.



6. If the tie-rod end has been removed, screw in lock nut and tie-rod end to the threaded portion of tie-rod, and tighten the lock nut temporarily in a position as shown in the figure.

   Installed tie-rod length L:

   17 mm (0.67 in)
7. Inspect the steering gearbox assembly as follows:
   1. "A" Holding the tie-rod end, repeat lock to lock several times as quickly as possible.
   2. "B" Holding the tie-rod end, turn it slowly at a radius several times as large as possible.
   3. Finally, make sure that the boot - steering gearbox is installed in the specified position without inflating.



8. Remove the steering gearbox assembly from ST.

POWER ASSISTED SYSTEM (POWER STEERING) > Electric Power Steering Gearbox

INSPECTION

1. UNIT INSPECTION

Check components for wear, damage or other faults. Adjust or replace if necessary.

2. LIMIT

Make a measurements as follows. If it exceeds the specified service limits, adjust or replace.

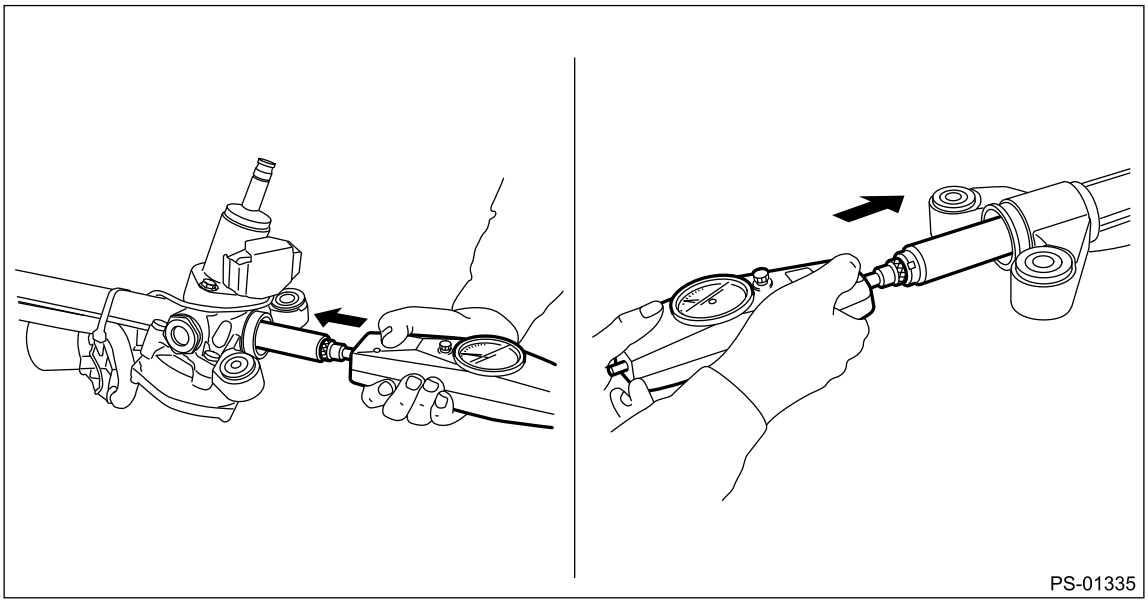
Note:

When fixing the steering gearbox assembly in a vise, apply a wooden piece on the flange portion.

Rack shaft sliding resistance:

Limit: 360 N (37 kgf, 81 lbf) or less

Difference between right and left sliding resistance: 20% or less



3. RACK SHAFT PLAY IN THE RADIAL DIRECTION

Note:

- **When fixing the steering gearbox assembly in a vise, apply a wooden piece on the flange portion.**
- **When fixing the magnet stand in the steering gearbox assembly, perform the following procedure.**
  - **– Fix the iron plate on the flange portion using a c-clamp, and place the magnet stand on the iron plate.**
  - **– Use bolts and nuts to fix directly on the flange portion of the steering gearbox assembly. (Secure the gauge firmly on the gearbox body. (Avoid the input shaft and the rack shaft.))**

Right-turn steering:

Service limit:

Both amplitudes: 0.6 mm (0.024 in) or less

Left-turn steering:

Service limit:

Both amplitudes: 0.6 mm (0.024 in) or less

Condition:

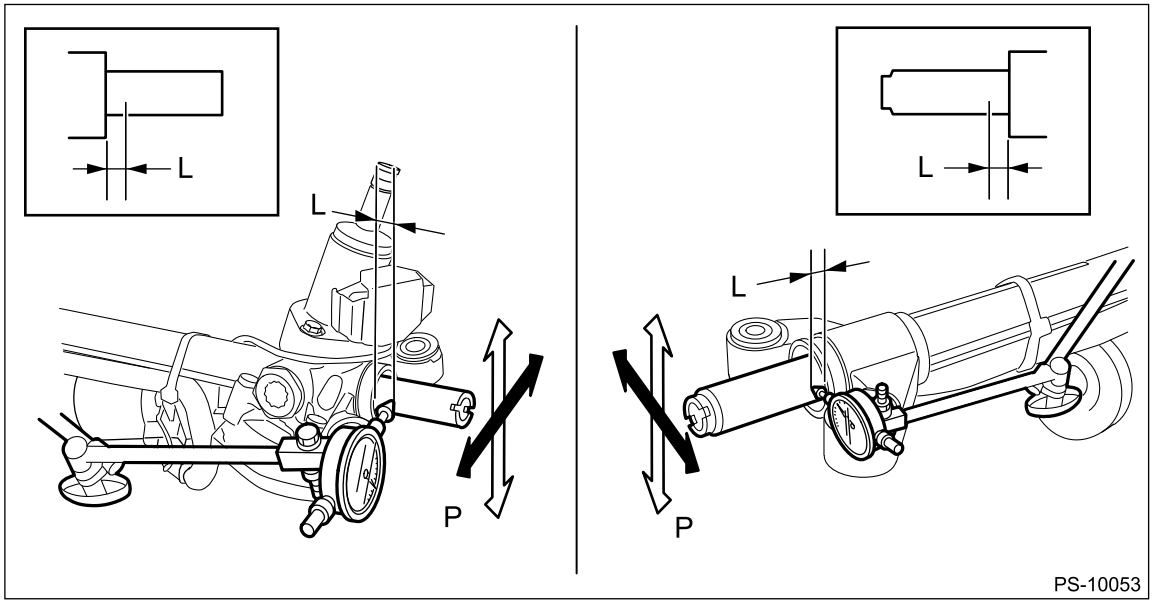
L: 5 mm (0.2 in)

Rack shaft end P: 98 N (10 kgf, 22 lbf)

Note:

<Example of magnet stand and dial gauge installation>

The location where the magnet stand is installed varies to stabilize the magnet stand.



4. INPUT SHAFT PLAY

Note:

- **When fixing the steering gearbox assembly in a vise, apply a wooden piece on the flange portion.**
- **When fixing the magnet stand in the steering gearbox assembly, perform the following procedure.**
  - **– Fix the iron plate on the flange portion using a c-clamp, and place the magnet stand on the iron plate.**
  - **– Use bolts and nuts to fix directly on the flange portion of the steering gearbox assembly. (Secure the gauge firmly on the gearbox body. (Avoid the input shaft and the rack shaft.))**

In radial direction:

Limit of both amplitudes: 0.6 mm (0.024 in) or less

Condition: Input shaft tip P = 98 N (10 kgf, 22 lbf)

L: 5 mm (0.2 in) from dust cover

In axial direction:

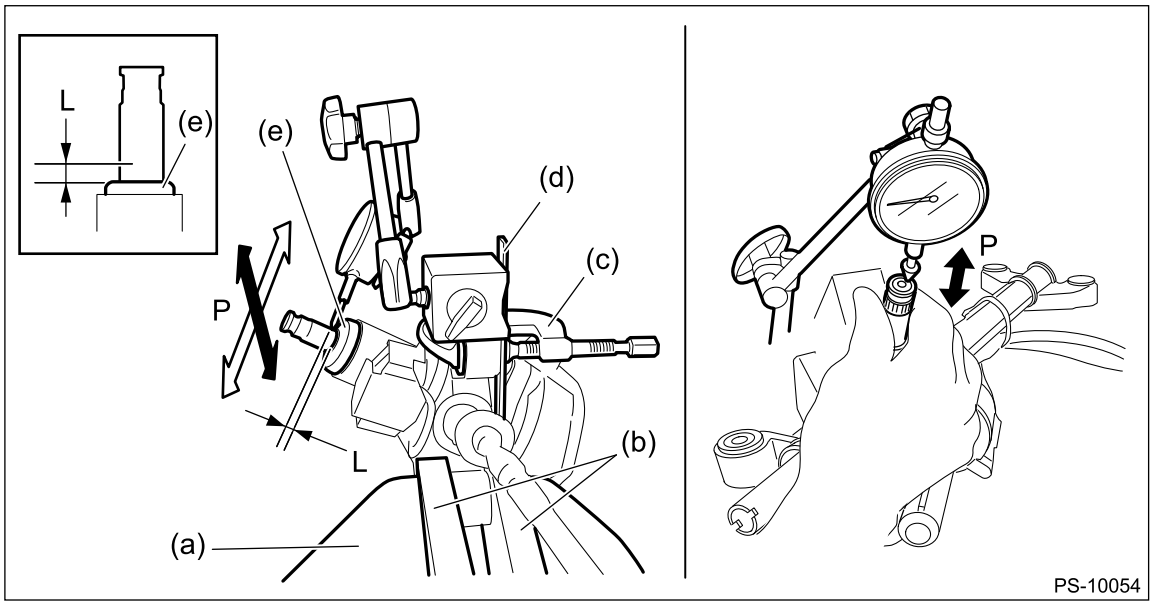
Service limit: 0.27 mm (0.0106 in) or less

Condition: Input shaft tip P = 20 — 49 N (2 — 5 kgf, 4 — 11 lbf)

Note:

<Example of magnet stand and dial gauge installation>

The location where the magnet stand is installed varies to stabilize the magnet stand.



(a) Vise

(b) Wooden block

(c) C-clamp

(d) Iron plate

(e) Dust cover

5. ROTATIONAL RESISTANCE OF GEARBOX

1. Using the ST, measure the rotational resistance of the steering gearbox assembly.

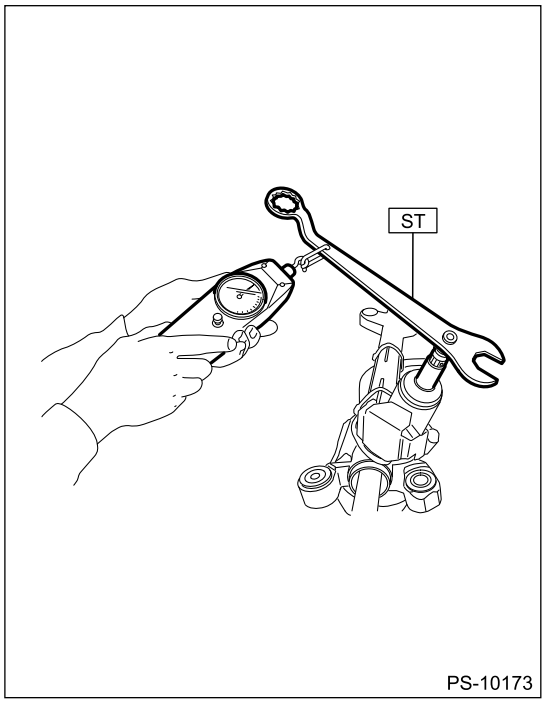
Preparation tool:

ST: SPANNER (34099PA100)

Service limit:

Maximum allowable resistance: 20 N (2 kgf, 4.5 lbf) or less

Difference between right and left rotational resistance: 20% or less

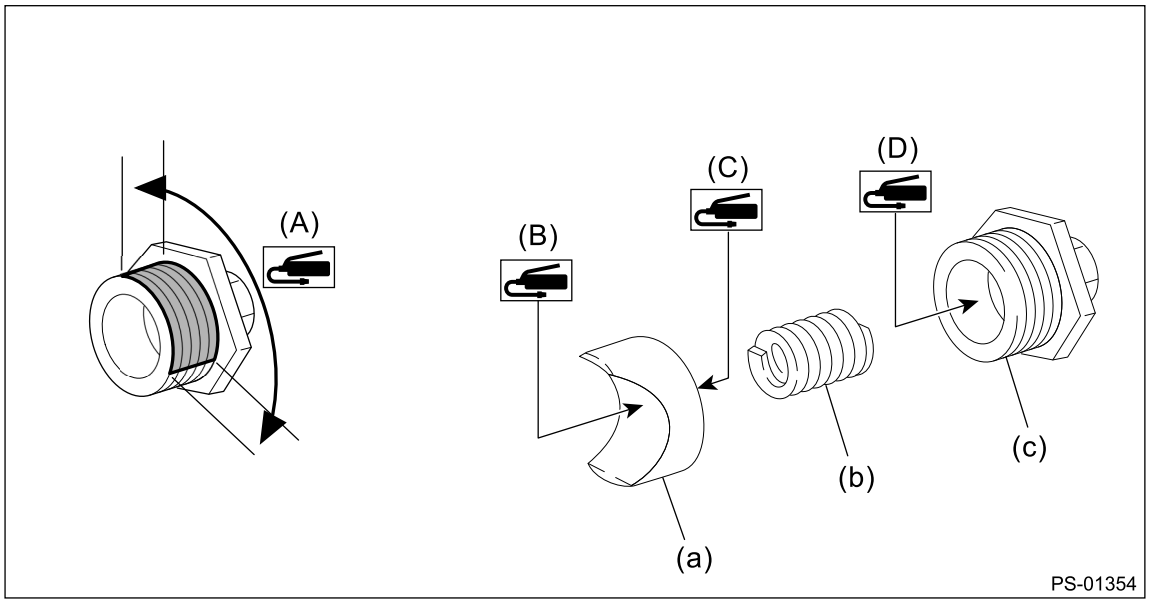


POWER ASSISTED SYSTEM (POWER STEERING) > Electric Power Steering Gearbox

ADJUSTMENT

1. GEARBOX BACKLASH ADJUSTMENT

1. Remove the steering gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox>REMOVAL.
2. Loosen the lock nut and adjusting screw.
3. Apply a coat of grease to the sliding surface (B) of the pad - pressure (a) and seating surface (C) of spring - gearbox (b), and then insert the pad - pressure (a) into steering body.
4. Charge the adjusting screw (c) with grease (D), and then insert the spring - gearbox (b) into adjusting screw. Then install on the steering body.
   Grease:
   Multemp AC-P
5. Apply liquid gasket to 1/3 or more (A) of entire perimeter of adjusting screw thread (c).
   Liquid gasket:
   THREE BOND 1324G



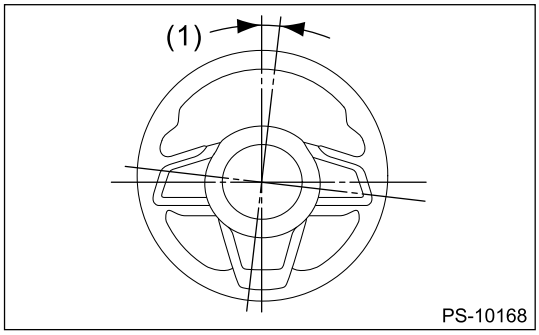
6. Tighten the adjusting screw to 35 N·m(3.6 kgf-m, 25.8 ft-lb), then loosen it.
7. Tighten the adjusting screw to 6 N·m(0.6 kgf-m, 4.4 ft-lb).
8. Loosen the adjusting screw by 20°.
9. While fixing the adjusting screw, tighten the lock nuts.
   Tightening torque:
   49.4 N·m(5.04 kgf-m, 36.4 ft-lb)

2. FRONT WHEEL ALIGNMENT ADJUSTMENT

1. Adjust the front toe. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT > FRONT WHEEL TOE-IN.
2. Check the steering angle of the wheels.
   Standard of steering angle:

Inner wheel	***37.8°±1.5°***
Outer wheel	***32.9°±1.5°***

3. When the steering wheel is in the following condition, perform the steering wheel installation over again.
   - When wheels are set in the straight ahead position, the steering wheel spokes are not horizontal.
   - Error is more than 5° on the periphery of the steering wheel.



(1) Within 5°

4. If the steering wheel spokes are not horizontal with vehicle set in the straight ahead position after this adjustment, correct it by turning the right and left tie-rods in the opposite direction from each other by the same angle. Also check that there are no abnormal steering effort, failure of the steering wheel to return or other faults.

5. Perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering Control Module

REMOVAL

Note:

Power steering control module is integrated with the electric power steering gearbox.
Since the power steering control module is a non-disassemble part, it cannot be removed.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering Control Module

INSTALLATION

Note:

Power steering control module is integrated with the electric power steering gearbox.
The power steering control module is a non-disassemble part.

POWER ASSISTED SYSTEM (POWER STEERING) > Power Steering Control Module

INSPECTION

Note:

Power steering control module is integrated with the electric power steering gearbox.
Refer to "POWER STEERING (DIAGNOSTICS)" for inspection. **Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.**

INSPECTION

Trouble	Possible cause	Corrective action
• Steering effort is heavy in all ranges. • Steering effort is heavy at stand still. • Steering wheel vibrates when turning.	1. Tire and wheel • Improper tire out of specifications • Improper wheel out of specification • Tires not properly inflated	Replace or reinflate the tire and wheel.
	2. Measure the steering wheel effort. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>General Diagnostic Table>INSPECTION > MEASUREMENT OF STEERING EFFORT.	Adjust or replace the faulty parts.
• Vehicle leads to one side or the other. • Returning force of steering wheel to center is poor. • Steering wheel vibrates when turning.	1. Tire and wheel • Flat tire • Mixed use of different tires • Mixed use of different wheels • Abnormal wear of tire • Unequal tread remaining • Unequal pressure of tire	Adjust, repair or replace the tire and wheel.
	2. Front wheel alignment • Improper or unequal caster • Improper or unequal toe-in • Loose suspension connections	Adjust or retighten.
	3. Measure the steering wheel effort. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>General Diagnostic Table>INSPECTION > MEASUREMENT OF STEERING EFFORT.	Adjust or replace the faulty parts.

Note:

When performing repeated steering operation with the vehicle at standstill, the steering effort may be temporarily heavy because the heat generated in the system activates the power steering protection control. This is not a malfunction caused by the steering system. After a while, it will return to normal steering effort. (In this case, the steering warning light will not come on and there will be no DTC.)

1. NOISE AND VIBRATION

Note:

- **When turning the steering wheel with the brake applied when the vehicle is parked, a screeching noise may be generated by the brake disc and pads. This is not a fault in the steering system.**
- **There may be a small vibration around the steering devices when turning the steering wheel at standstill, even though the component parts are operating properly.**

Trouble	Possible cause	Corrective action
Rattling noise (intermittent) While engine is running.	Interference with adjacent parts	Check the clearance. Correct if necessary.

Trouble	Possible cause	Corrective action
	Looseness of linkage, play of steering, improper tightening (looseness) of suspension joint or steering column	Retighten or replace.
	Noise emitted from inside of the gearbox	Replace the gearbox assembly.
Knocking When turning steering wheel in both directions with small angle repeatedly at engine ON or OFF.	Excessive backlash Loosened lock nut for adjusting backlash	Adjust the backlash. When the noise remains after adjustment, replace the gearbox assembly.
	Insufficient tightening or play in the tie-rod or tie-rod end	Retighten or replace.
Grinding noise (intermittent) While engine is running. (While operating the steering.)	Fault inside of gearbox	Replace the gearbox assembly.
	Faulty bearing of the column assembly - steering	Apply grease or replace.
	Occurs when turning the steering wheel with brakes (service or parking) applied.	If the noise goes off when brake is released, it is normal.
Vibration While engine is running. (with/without steering turned)	Excessive play in steering, looseness of suspension parts	Retighten.

2. MEASUREMENT OF STEERING EFFORT

1. CHECK STEERING WARNING LIGHT.

Does the steering warning light illuminate?

Yes — Using Subaru Select Monitor, read the DTC and inspect according to it. For detailed operation procedures, refer to “Application help”.

No — Go to 2.

2. CHECK STEERING WARNING LIGHT.

1. Using Subaru Select Monitor, display the data of [EPS operating condition].
2. Connect the Subaru Select Monitor, and turn the steering wheel. (One lock to lock)

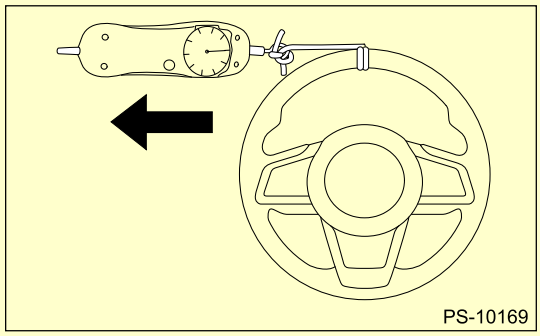
Is the [EPS operating condition] normal without displaying any DTC code?

Yes — Go to 3.

No — If the [EPS operating condition] is “Assist limitation”, stop the engine for approx. 30 minutes and perform the procedures from step 1 again.

3. CHECK STEERING EFFORT.

1. Stop the vehicle on paved road.
2. Set the tire air pressure to the specification.
3. Start the engine.
4. Run the engine at idle.
5. Install a spring scale on the steering wheel tangent.
6. Pull the spring scale at a right angle to the steering wheel, and measure both right and left steering wheel efforts.



Is the steering effort less than 31 N (3.2 kgf, 7.0 lbf)?

Yes — Go to 4.

No — Go to 8.

4. CHECK STEERING EFFORT.

1. Stop the engine.
2. Pull the spring scale at a right angle to the steering wheel, and measure both right and left steering wheel efforts.

Is the steering effort less than 294.2 N (30 kgf, 66.2 lbf)?

Yes — Go to 5.

No — Perform the inspection or adjustment around the suspension part.

5. CHECK TORQUE SENSOR OUTPUT VALUE.

1. Display the data of [Torque sensor main output] and [Torque sensor sub output] using Subaru Select Monitor.
2. Read the value of torque sensor.
   Note:
   When measuring, place the steering wheel at the center position.

Is the torque value ±0.75 N·m(0.08 kgf-m,0.05 ft-lb)?

Yes — Go to 6.

No — Replace the gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

6. CHECK TORQUE SENSOR OUTPUT VALUE.

1. Remove the universal joint assembly - steering.
2. Display the data of [Torque sensor main output] and [Torque sensor sub output] using Subaru Select Monitor.
3. Read the value of torque sensor.

Is the torque value ±0.75 N·m(0.08 kgf-m,0.05 ft-lb)?

Yes — Go to 7.

No — Replace the gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

7. CHECK TORQUE SENSOR OUTPUT VALUE.

1. Remove the universal joint assembly - steering.
   Note:
   Check that the universal joint assembly - steering moves up and down smoothly without installing the bolt. Then tighten the bolts first on the gearbox side and then on the column shaft side.
2. Display the data of [Torque sensor main output] and [Torque sensor sub output] using Subaru Select Monitor.
3. Read the value of torque sensor.

Is the torque value ±0.75 N·m(0.08 kgf-m,0.05 ft-lb)?

Yes — Go to 8.

No — Check the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

8. CHECK STEERING WHEEL EFFORT.

1. Remove the universal joint assembly - steering.
2. Measure the steering wheel effort.

Is the steering effort less than 2.26 N (0.23 kgf, 0.51 lbf)?

Yes — Go to 9.

No — Replace the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

9. CHECK STEERING WHEEL EFFORT.

Measure the steering wheel effort.

Is the difference of steering effort between right and left less than 20%?

Yes — Go to 10.

No — Replace the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column.

10. CHECK UNIVERSAL JOINT ASSEMBLY - STEERING.

Measure the swing torque of joint. (Yoke of column assembly - steering side) Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.

Is the swing torque of the universal joint assembly - steering less than 5.4 N (0.55 kgf, 1.21 lbf)?

Yes — Go to 11.

No — Replace the universal joint assembly - steering with a new part. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint.

11. CHECK UNIVERSAL JOINT ASSEMBLY - STEERING.

Measure the swing torque of joint. (Yoke of gearbox side) Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.

Is the swing torque of the universal joint assembly - steering less than 4.5 N (0.46 kgf, 1.01 lbf)?

Yes — Go to 12.

No — Replace the universal joint assembly - steering with a new part. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint.

12. CHECK FRONT WHEEL.

Check the front wheels.

Does the front wheels have unsteady revolution or rattling, or does the brake drag?

Yes — Inspect, readjust and replace if necessary.

No — Go to 13.

13. CHECK TIE-ROD ENDS.

Remove the tie-rod ends.

Does the tie-rod ends of suspension have unsteady revolution or rattling?

Yes — Inspect and replace if necessary.

No — Go to 14.

14. CHECK BALL JOINT.

Remove the ball joint.

Does the ball joints of suspension have unsteady revolution or rattling?

Yes — Inspect and replace if necessary.

No — Go to 15.

15. CHECK GEARBOX.

Measure the rotating of gearbox.
Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox>INSPECTION > LIMIT.

Is the rotational resistance of the steering gearbox less than 20 N (2 kgf, 4.5 lbf)? Is the difference between the right and left rotational resistances less than 20%?

Yes — Go to 16.

No — Replace the gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

16. CHECK GEARBOX.

Measure the sliding of gearbox.

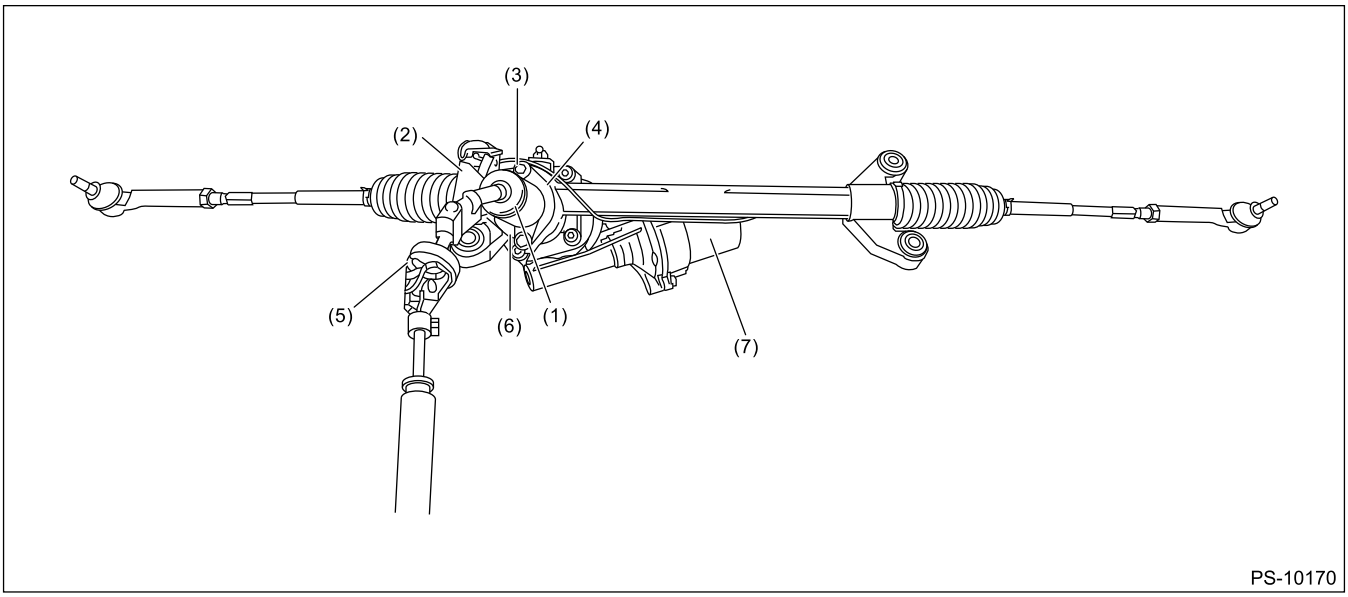
Is the sliding resistance of the steering gearbox less than 360 N (36.7 kgf, 80.9 lbf)? Is the difference between the right and left sliding resistances less than 20%?

Yes	Steering effort is normal.
No	Replace the gearbox assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

3. INSPECTION OF CLEARANCE

This table lists various clearances that must be correctly adjusted to ensure the normal vehicle driving without interfering noise, or any other faults.

Location	Minimum allowance mm (in)
(1) Stub housing to DOJ (MT model)	15 (0.59)
(2) Torque sensor to Crossmember	5 (0.2)
(3) Worm wheel housing to Crossmember	There must be no contact
(4) Stub housing to Engine mount	10 (0.39)
(5) Universal joint column side yoke to master cylinder (closest point of approach when the universal joint turns by 360°)	5 (0.2)
(6) Wheel housing to Exhaust pipe	13 (0.51)
(7) Cylinder to Crossmember	There must be no contact



AIR CONDITIONER

AC

1. General Description
2. Air Conditioning System
3. Refrigerant Pressure with Manifold Gauge Set
4. Refrigerant Recovery Procedure
5. Refrigerant Charging Procedure
6. Refrigerant Leak Check
7. Relay and Fuse
8. Compressor Oil
9. Blower Motor Unit Assembly
10. Blower Motor
11. Power Transistor
12. Heater Core
13. Control Panel
14. Compressor
15. Condenser
16. Heater and Cooling Unit
17. Evaporator
18. Expansion Valve
19. Hose and Pipe
20. Pressure Switch (Triple Pressure Switch)
21. Pressure Sensor
22. Ambient Sensor
23. Sunload Sensor (Auto A/C Model)
24. In-Vehicle Sensor (Auto A/C Model)
25. Evaporator Sensor
26. FRESH/RECIRC Door Actuator
27. Mode Door Actuator
28. Air Mix Door Actuator
29. Air Vent Grille
30. Heater Duct
31. Heater Vent Duct
32. A/C Filter
33. Diagnostics with Phenomenon

SPECIFICATION

1. HEATER SYSTEM

Item		Specifications	Condition
Heating capacity		5 kW (4,299 kcal/h, 17,059 BTU/h) or more	• Air flow control switch: FOOT • Temperature control dial: HI (MAX HOT) • Temperature difference between hot water and inlet air: 65°C (149°F) • Hot water flow rate: 360 L (95.1 US gal, 79.2 Imp gal)/h
Air flow rate		300 m^3 (10,596 cu ft)/h or more	FOOT mode (FRESH), MAX HOT at 12.5 V
Max air flow rate		480 m^3 (16,954 cu ft)/h or more	• Temperature control dial: LO (MAX COOL) • Fan dial: HI (MAX) • FRESH/RECIRC switch: RECIRC
Heater core	Size (width × height × thickness)	263.9× 120 × 27 mm (10.39 × 4.72 × 1.06 in)	—
Blower motor	Motor type	Magnet	—
	Power consumption	260 W or less	12 V
	Fan type	Sirocco fan	—
	Size (diameter × height)	137 × 60 mm (5.39 × 2.36 in)	—

2. A/C SYSTEM

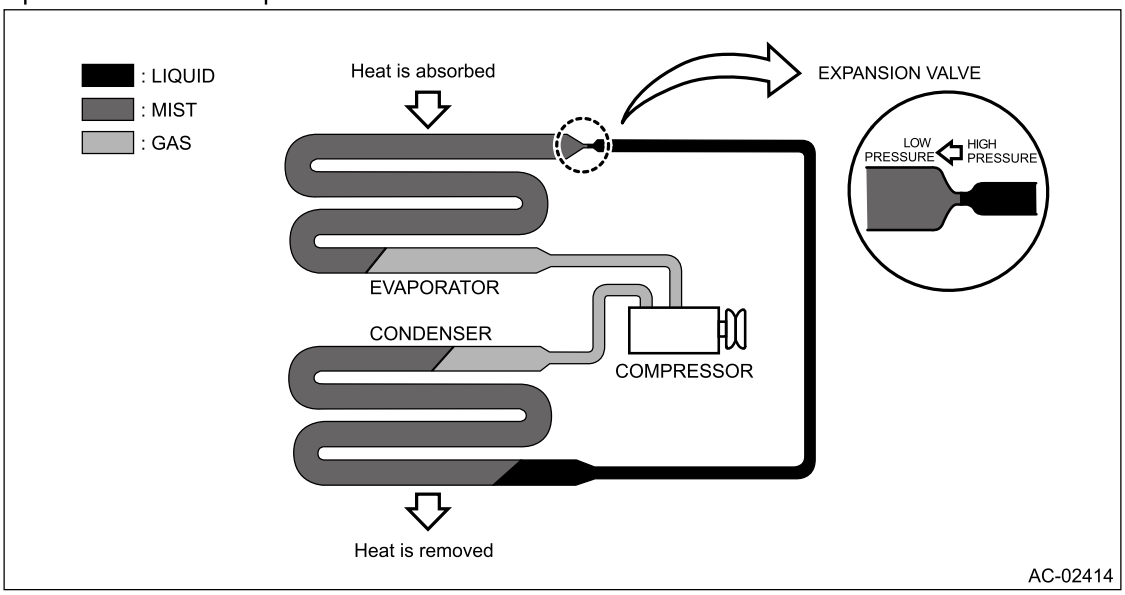
Item		Specifications
Type of air conditioner		Reheat air-mix type
Cooling capacity		5 kW (4,299 kcal/h, 17,059 BTU/h) or more
Refrigerant		HFC-134a (CH_2 FCF_3) [0.475±0.025 kg (1.05±0.06 lb)]
Compressor	Type	Manual A/C model: Scroll, constant volume (SCSA08H) Auto A/C model: Swash plate, variable volume (TSE14F)
	Discharge	Manual A/C model: 74.5 cc (4.55 cu in)/rev Auto A/C model: 140.6 cc (8.58 cu in)/rev
	Max. permissible speed	Manual A/C model: 9,000 r/min Auto A/C model: 6,000 r/min
Magnet clutch (manual A/C model only)	Type	Dry, single-disc type
	Power consumption	35 W

Item			Specifications
Pulley		Type of belt	V-belt 6 PK
		Pulley dia. (effective dia.)	Manual A/C model: 100 mm (3.94 in) Auto A/C model: 110 mm (4.33 in)
		Pulley ratio	Manual A/C model: 1.43 Auto A/C model: 1.3
Condenser		Type	Corrugated fin (sub cool type)
		Core face area	0.214 m^2 (2.304 sq ft)
		Core thickness	11.5 mm (0.45 in)
		Radiation area	4.694 m^2 (50.53 sq ft)
Receiver drier		Effective inner capacity	220 cm^3 (13.42 cu in)
Expansion valve		Type	Block type
Evaporator		Type	Double tank
		Size (width × height × thickness)	279.7× 191 × 38 mm (11.01 × 7.52 × 1.5 in)
Blower fan		Fan type	Sirocco fan
		Size (outer diameter × height)	137 × 60 mm (5.39 × 2.36 in)
		Power consumption	260 W or less
Condenser fan (sub fan)		Motor type	Magnet
		Power consumption	120 W
		Fan outer diameter	300 mm (11.8 in)
Radiator fan (main fan)		Motor type	Magnet
		Power consumption	120 W
		Fan outer diameter	300 mm (11.8 in)
Idle speed	MPFI model	No load	CVT model: 775±100 r/min MT model: 700±100 r/min
		A/C ON	800 — 900±50 r/min
Pressure Switch (Triple Pressure Switch) (manual A/C model only)	Low-pressure switch operating pressure	ON → OFF	196±20 kPa (2±0.2 kgf/cm^2, 28.4±2.9 psi)
		OFF → ON	225^{+25}_{-29} kPa ($2.29^{+0.25}_{-0.3}$ kgf/cm^2, $32.6^{+3.6}_{-4.2}$ psi)
	High-pressure switch operating pressure	ON → OFF	$3{,}140^{+50}_{-200}$ kPa ($32.02^{+0.51}_{-2.04}$ kgf/cm^2, $455.4^{+7.25}_{-29}$ psi)
		OFF → ON	2,475±325 kPa (25.24±3.31 kgf/cm^2, 358.87±47.12 psi)
	Middle-pressure switch operating pressure	ON → OFF	1,370±120 kPa (13.97±1.22 kgf/cm^2, 198.6±17.4 psi)

	Item		Specifications
		OFF → ON	1,770±80 kPa (18.05±0.82 kgf/cm^2, 256.6±11.6 psi)

3. BASIC OPERATION

The cooling system cools down the compartment by using the pipes connecting parts and cycling the evaporable liquid (refrigerant) within the sealed system in a repeated process of "vaporization — liquefaction — re-vaporization".



Item	Operation
Compressor	Sucks and pressurizes the low temperature, low pressure refrigerant gas that was vaporized at the evaporator by absorbing heat from the compartment, and sends the high temperature, high pressure refrigerant gas to the condenser.
Condenser	Cools the high temperature, high pressure refrigerant gas sent from the compressor for condense and liquefaction.
Expansion valve	• Sprays the high temperature, high pressure liquid refrigerant from the small hole in order to let the refrigerant expand rapidly to turn it into low temperature, low pressure mist. • The refrigerant amount is adjusted according to the refrigerant vaporization condition in the evaporator.
Evaporator	The evaporator turns into a low temperature condition when the mist refrigerant that was turned into a low temperature, low pressure condition at the expansion valve is vaporized in large quantity in the evaporator. Passing air flow through the low temperature evaporator emits cold air.

AIR CONDITIONER > General Description

LOCATION

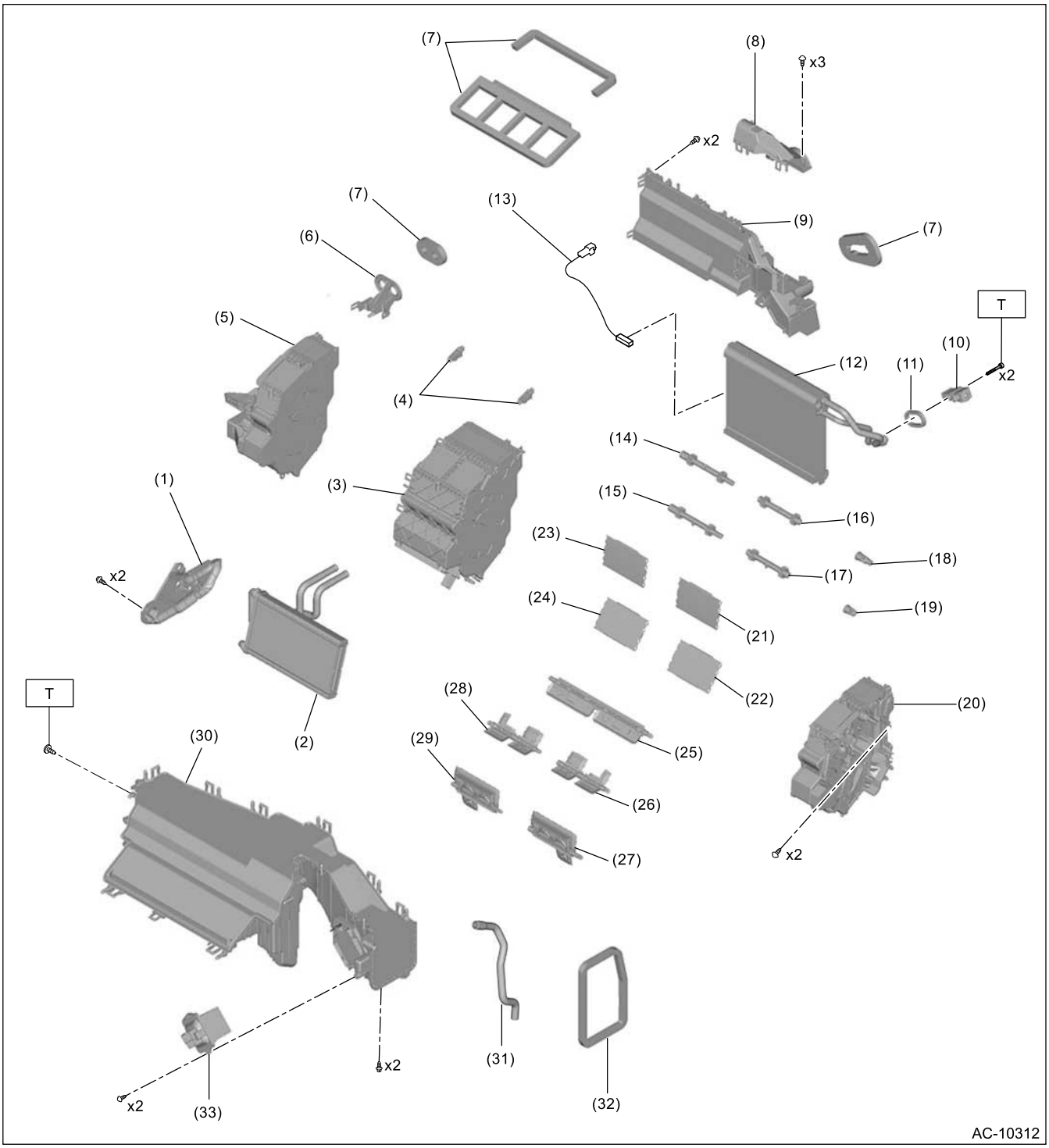
For location, refer to "Electrical Component Location" for "AIR CONDITIONER (DIAGNOSTICS)" section.
Ref. to AIR CONDITIONER(DIAGNOSTICS)>Electrical Component Location.

AIR CONDITIONER > General Description

COMPONENT

1. HEATER COOLING UNIT

• MANUAL A/C MODEL

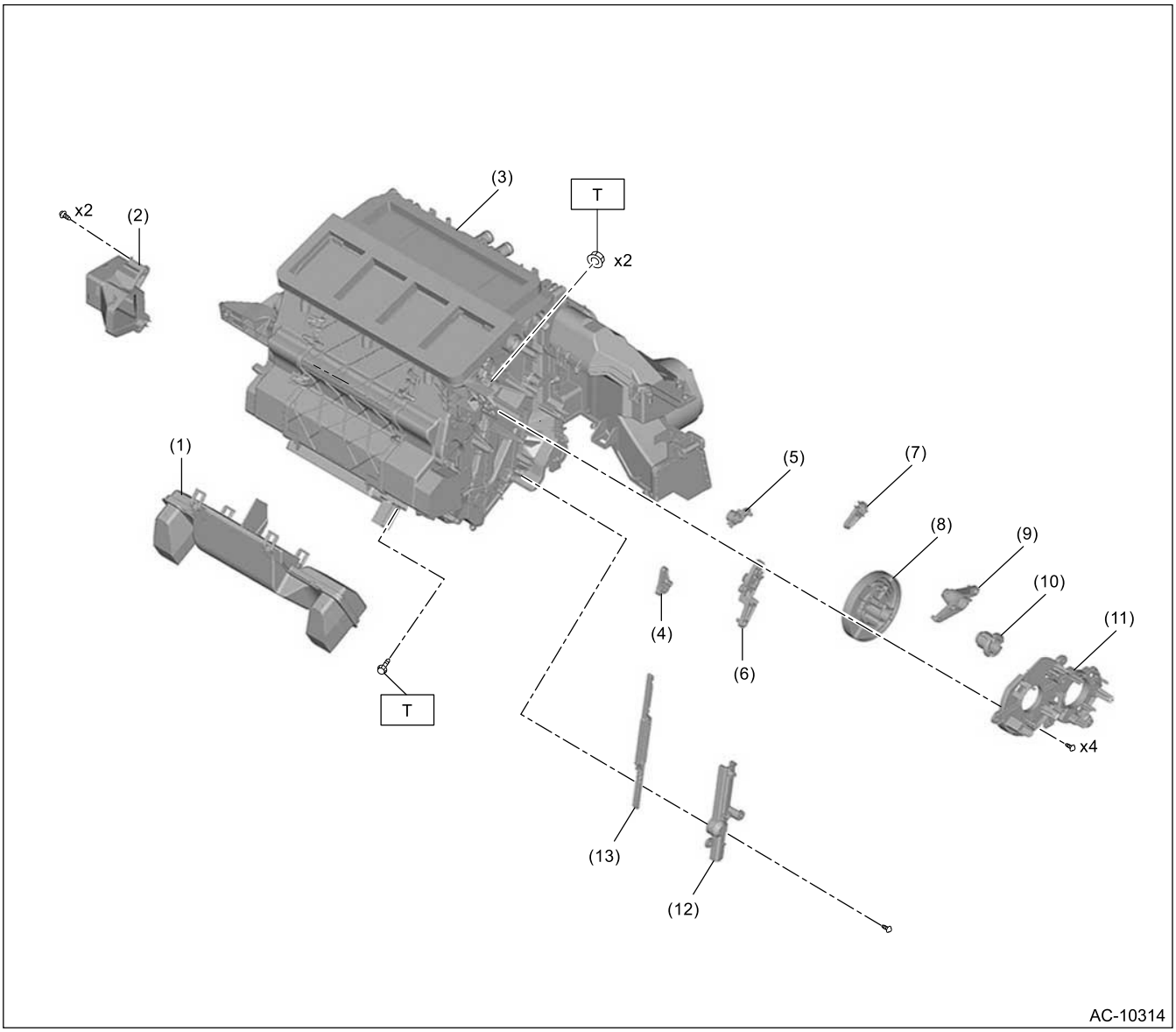


(1)	Cover - heater pipe	(13)	Evaporator sensor	(25)	Shutter - defroster
(2)	Heater core	(14)	Shaft - mix LH UPR	(26)	Shutter - vent RH
(3)	Case - heater unit CTR	(15)	Shaft - mix LH LWR	(27)	Shutter - foot RH
(4)	Plate	(16)	Shaft - mix RH UPR	(28)	Shutter - vent LH
(5)	Case - heater unit LH	(17)	Shaft - mix RH LWR	(29)	Shutter - foot LH
(6)	Clamp - heater pipe	(18)	Shaft - mix joint UPR	(30)	Case - heater LWR
(7)	Packing	(19)	Shaft - mix joint LWR	(31)	Hose - drain
(8)	Cover - evaporator	(20)	Case - heater unit RH	(32)	Packing - blower

(9) Case - heater UPR
(10) Expansion valve - cooling
(11) Seal
(12) Evaporator ASSY - cooling
(21) Shutter - mix RH UPR
(22) Shutter - mix RH LWR
(23) Shutter - mix LH UPR
(24) Shutter - mix LH LWR
(33) Power transistor

Tightening torque: N·m (kgf-m, ft-lb)

T: 3.5 (0.4, 2.6)

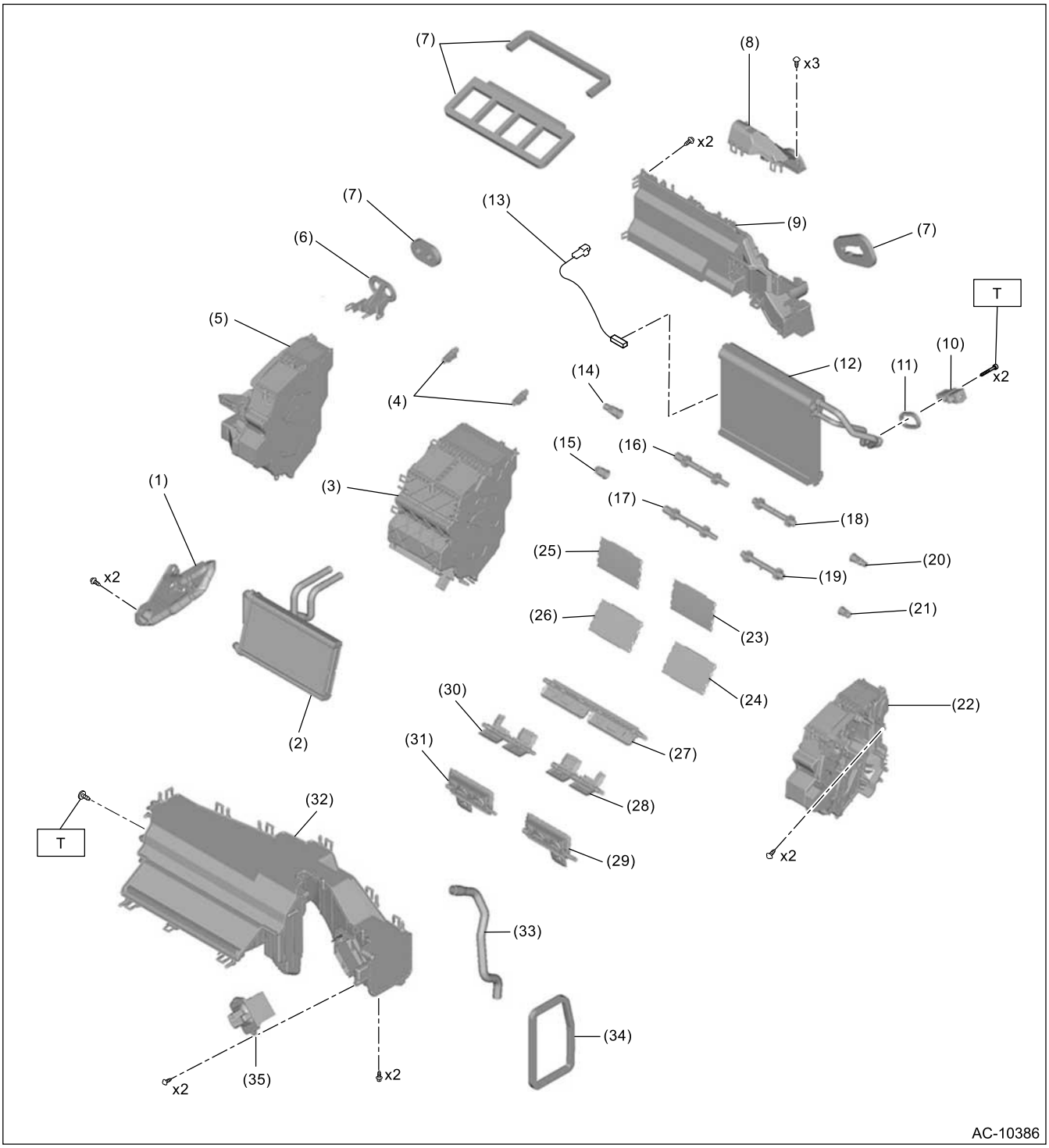


(1) Duct - sub ASSY
(2) Spacer - foot
(3) Case ASSY - heater unit
(4) Lever - foot door
(5) Lever - vent
(6) Lever - foot
(7) Lever - defroster
(8) Link - mode
(9) Lever
(10) Lever - mix gear
(11) Bracket - heater cable
(12) Cover - mix
(13) Shaft - mix

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

- **AUTO A/C MODEL**



(1) Cover - heater pipe
(2) Heater core
(3) Case - heater unit CTR
(4) Plate
(5) Case - heater unit LH
(6) Clamp - heater pipe
(7) Packing
(8) Cover - evaporator
(9) Case - heater UPR
(10) Expansion valve - cooling
(11) Seal
(14) Shaft - mix joint LH UPR*1
(15) Shaft - mix joint LH LWR*1
(16) Shaft - mix LH UPR
(17) Shaft - mix LH LWR
(18) Shaft - mix RH UPR
(19) Shaft - mix RH LWR
(20) Shaft - mix joint RH UPR
(21) Shaft - mix joint RH LWR
(22) Case - heater unit RH
(23) Shutter - mix RH UPR
(24) Shutter - mix RH LWR
(27) Shutter - defroster
(28) Shutter - vent RH
(29) Shutter - foot RH
(30) Shutter - vent LH
(31) Shutter - foot LH
(32) Case - heater LWR
(33) Hose - drain
(34) Packing - blower
(35) Power transistor

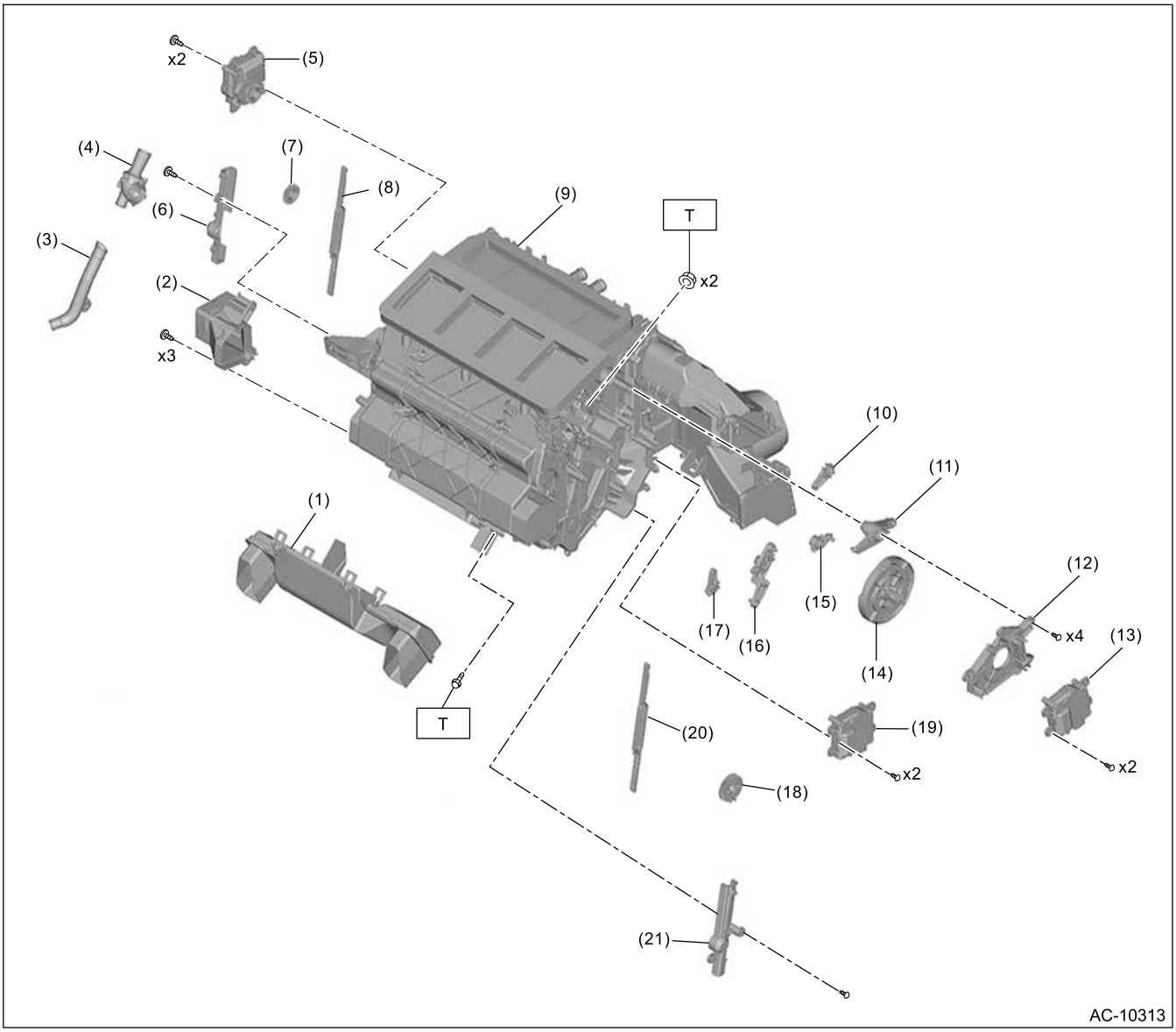
Tightening torque: N·m (kgf-m,

ft-lb)

(12) Evaporator ASSY - cooling
(13) Evaporator sensor
(25) Shutter - mix LH UPR
(26) Shutter - mix LH LWR

T: 3.5 (0.4, 2.6)

∗1: For models with left/right independent air conditioning function only



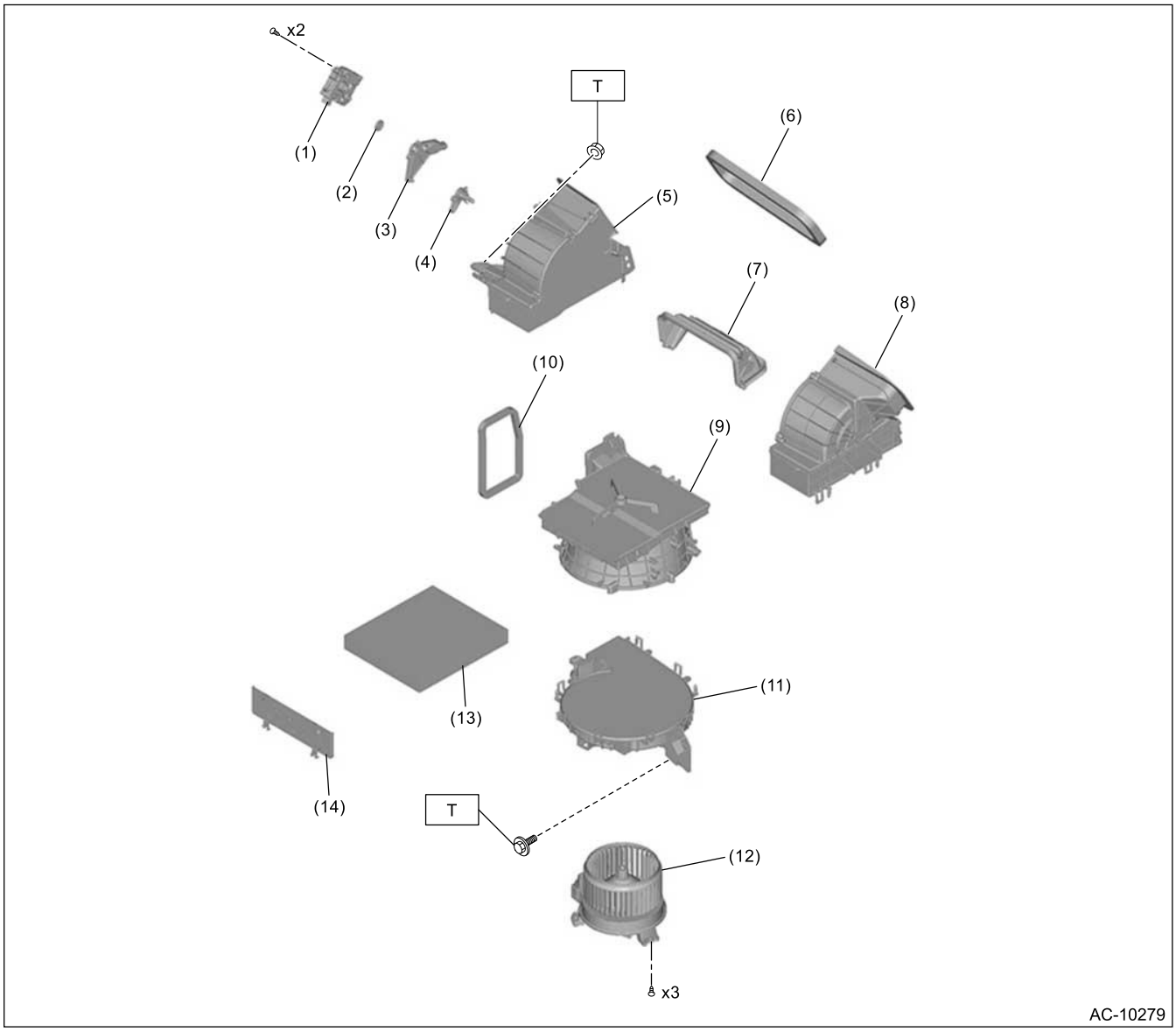
(1) Duct - sub ASSY
(2) Spacer - foot
(3) Aspirator hose
(4) Aspirator
(5) Motor - actuator mix LH∗1
(6) Cover - mix LH∗1
(7) Gear - mix LH∗1
(8) Shaft - mix LH∗1
(9) Case ASSY - heater unit
(10) Lever - defroster
(11) Lever - defroster sub
(12) Bracket - actuator mode
(13) Motor - actuator mode
(14) Link - mode
(15) Lever - vent
(16) Lever - foot
(17) Lever - foot door
(18) Gear - mix RH
(19) Motor - actuator mix RH
(20) Shaft - mix RH
(21) Cover - mix RH

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

∗1: For models with left/right independent air conditioning function only

2. BLOWER MOTOR UNIT

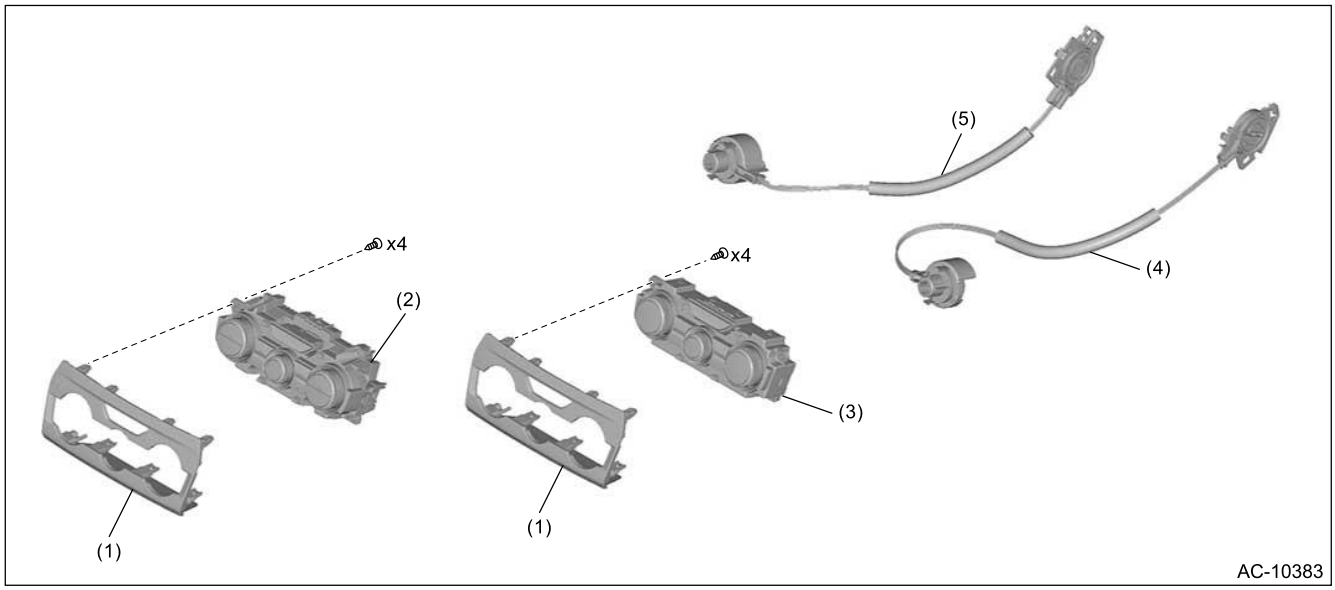


(1) Motor - actuator intake
(2) Tapping screw ASSY
(3) Link plate
(4) Link lever
(5) Case - blower intake LH
(6) Packing
(7) Shutter - blower
(8) Case - blower intake RH
(9) Case upper - blower
(10) Packing - blower
(11) Case lower - blower
(12) Blower motor ASSY
(13) Filter
(14) Filter cover

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

3. CONTROL PANEL



(1) Panel ASSY - heater

(2) Heater control ASSY (auto A/C model)

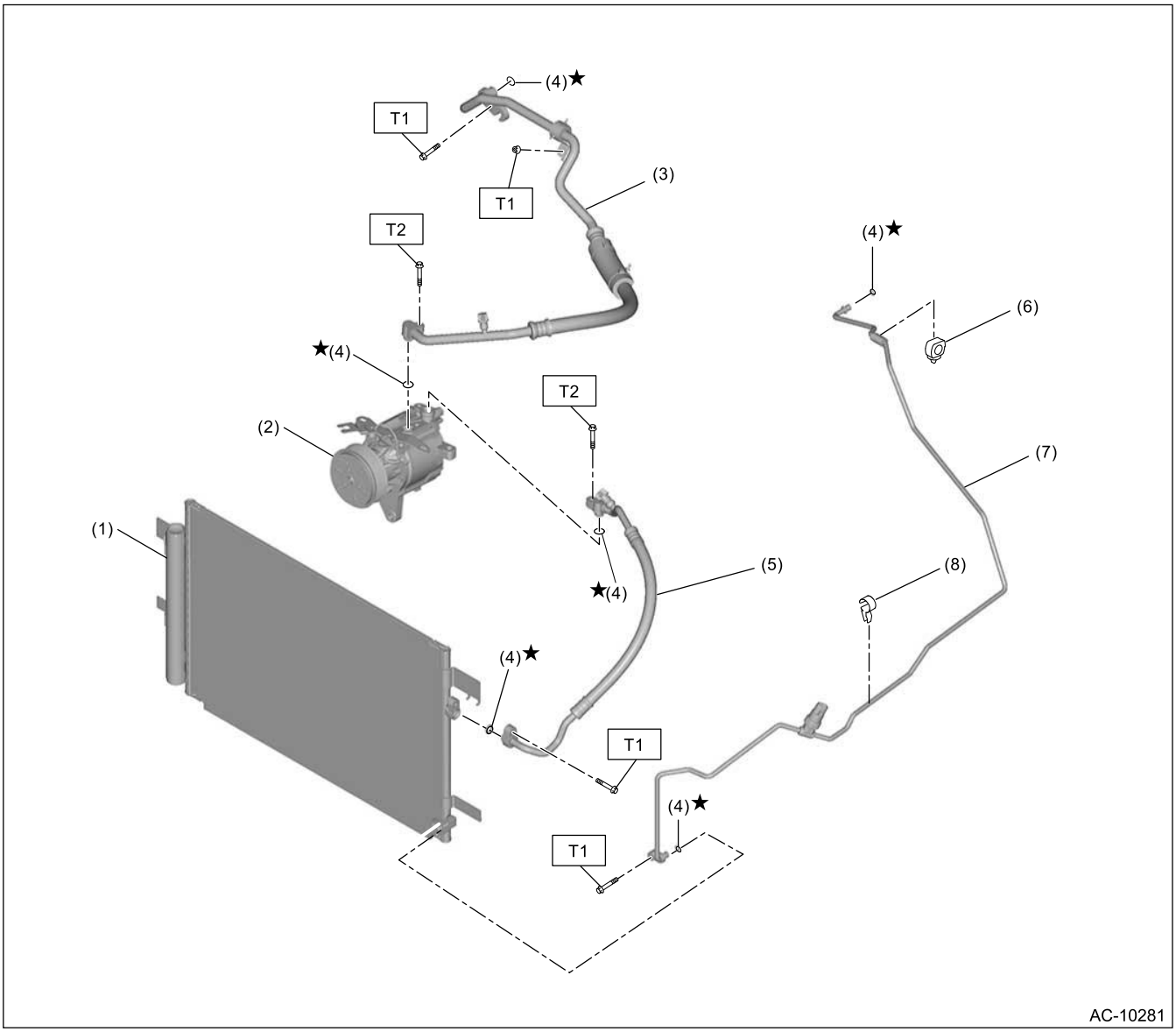
(3) Heater control ASSY (manual A/C model)

(4) Cable - temperature

(5) Cable - mode

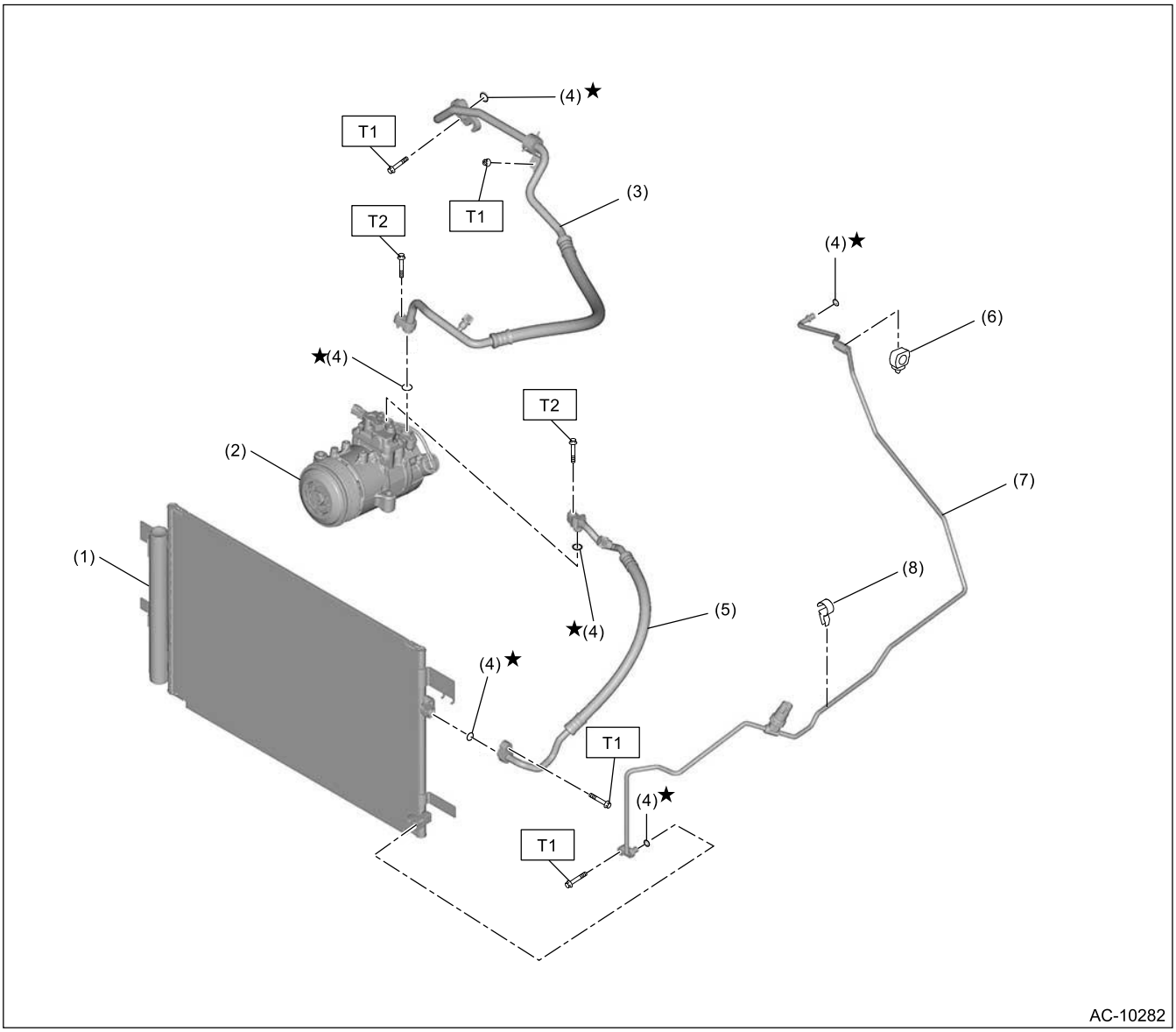
4. AIR CONDITIONING UNIT

- **MANUAL A/C MODEL**



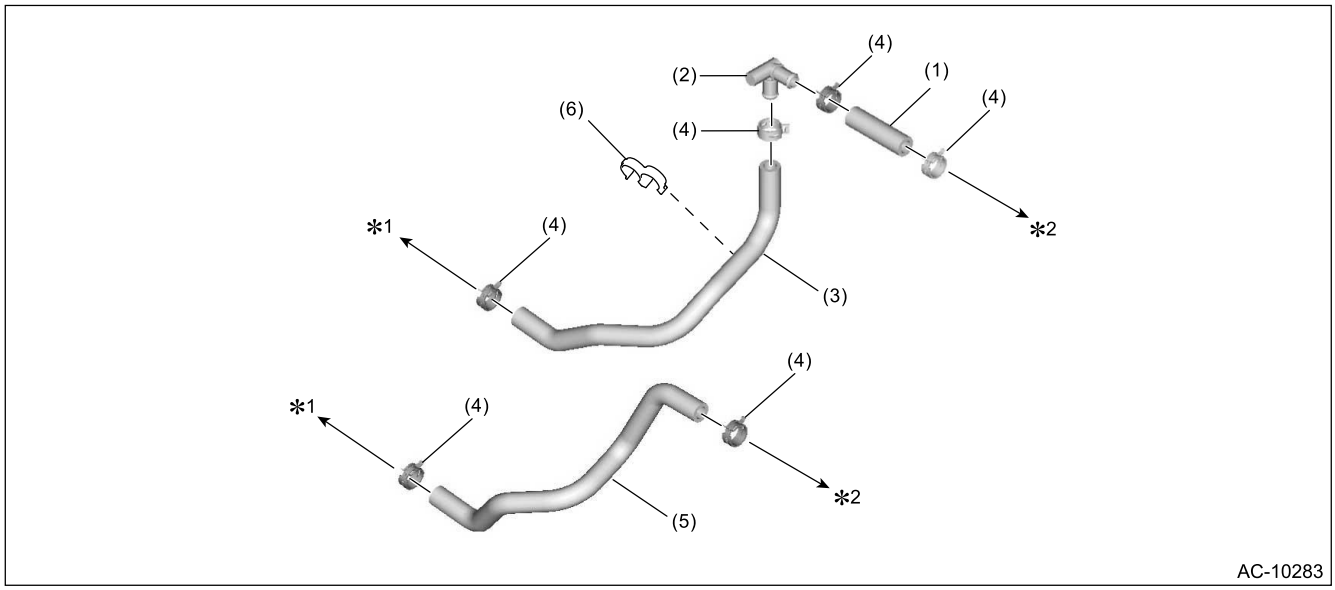
(1)	Condenser ASSY - air conditioner	(5)	Hose - pressure discharge	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Compressor ASSY	(6)	Clip	***T1: 7.5 (0.8, 5.5)***	
(3)	Hose - pressure suction	(7)	Pipe - evaporator cooling	***T2: 10 (1, 7.4)***	
(4)	Seal O-ring	(8)	Clip - pipe		

- **AUTO A/C MODEL**



(1)	Condenser ASSY - air conditioner	(5)	Hose - pressure discharge	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Compressor ASSY	(6)	Clip	***T1: 7.5 (0.8, 5.5)***
(3)	Hose - pressure suction	(7)	Pipe - evaporator cooling	***T2: 10 (1, 7.4)***
(4)	Seal O-ring	(8)	Clip - pipe	

5. HEATER HOSE

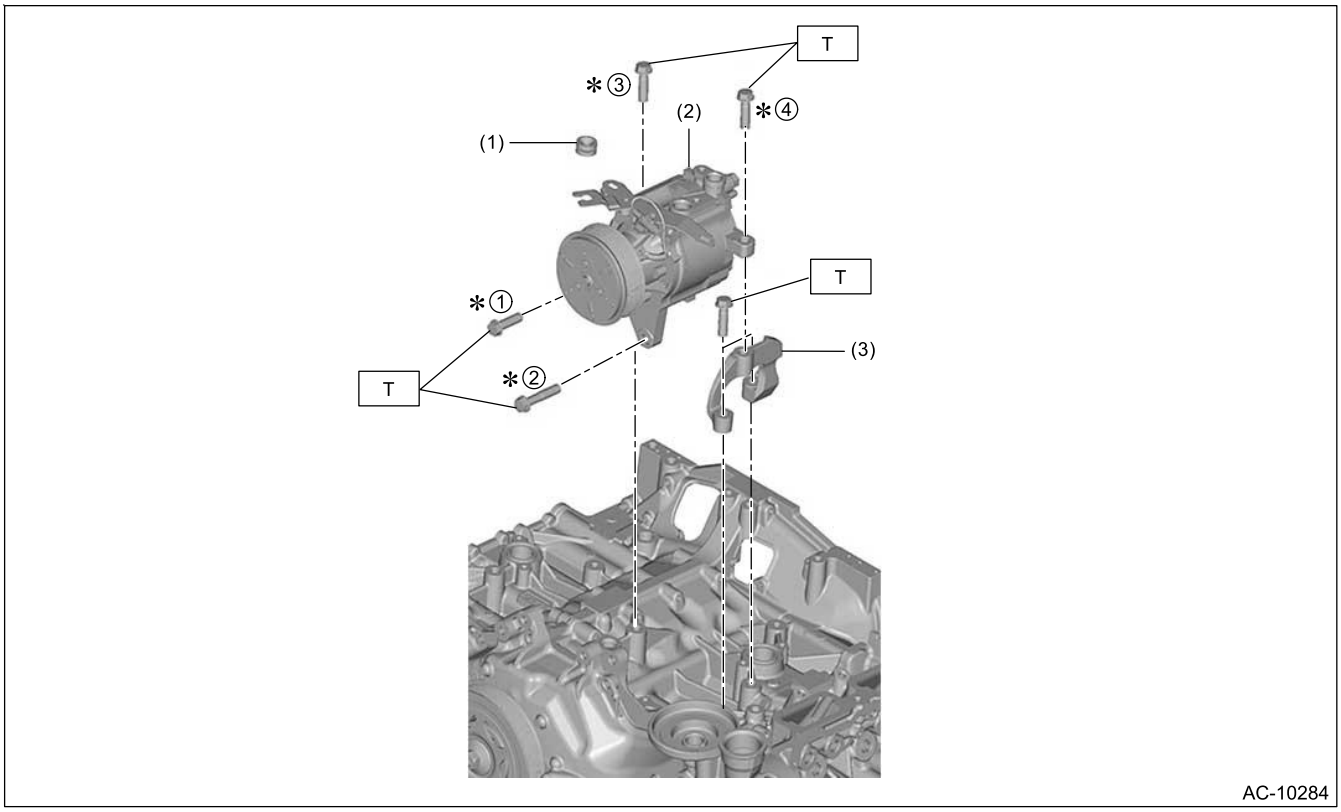


(1) Hose - heater outlet A
(2) Hose - heater drain
(3) Hose - heater outlet B
(4) Clamp
(5) Hose - heater inlet
(6) Clip

*1: Engine side
*2: Heater core side

6. COMPRESSOR

- **MANUAL A/C MODEL**



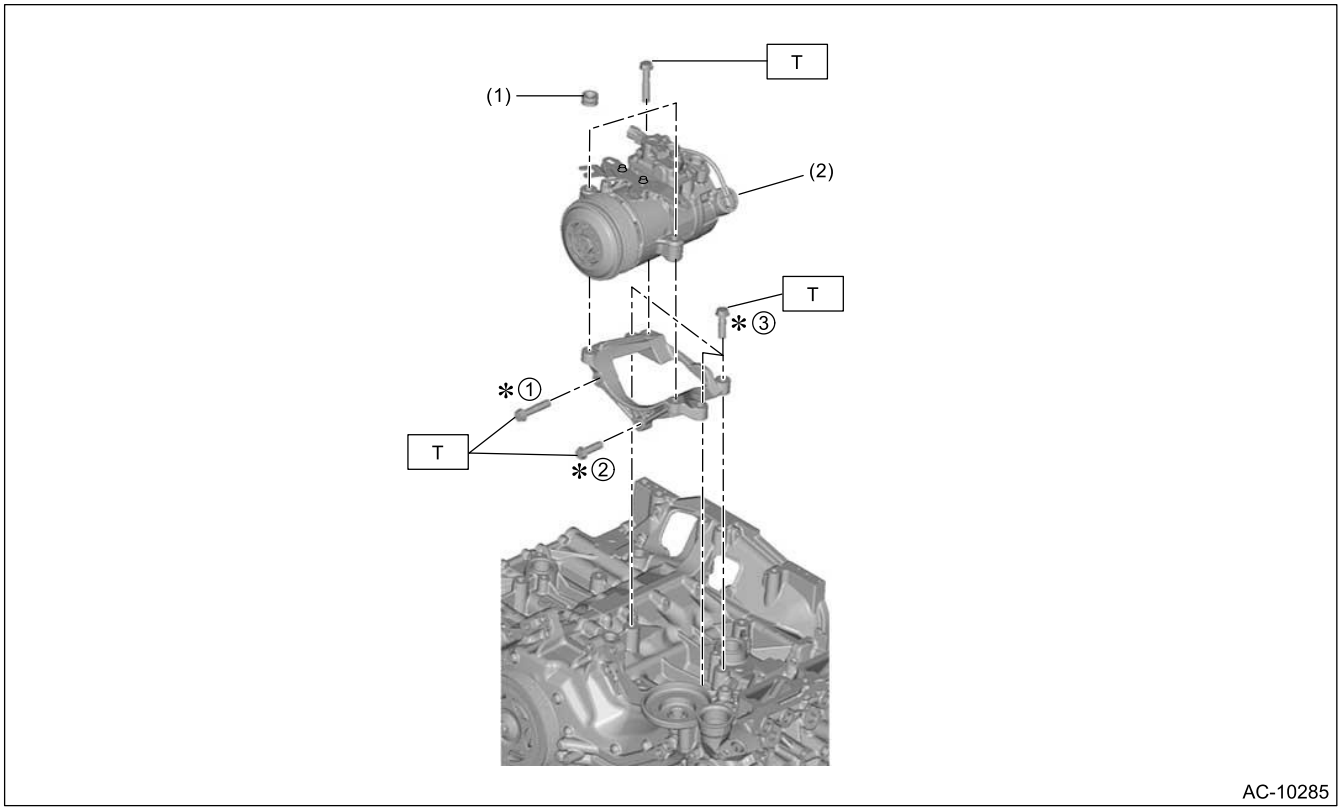
(1) Grommet
(2) Compressor ASSY
(3) Bracket - air conditioner

Tightening torque: N·m (kgf-m, ft-lb)

T: 36 (3.7, 26.6)

*: Tighten the compressor assembly in the numerical order as shown in the figure.

● **AUTO A/C MODEL**



(1) Grommet

(2) Compressor ASSY

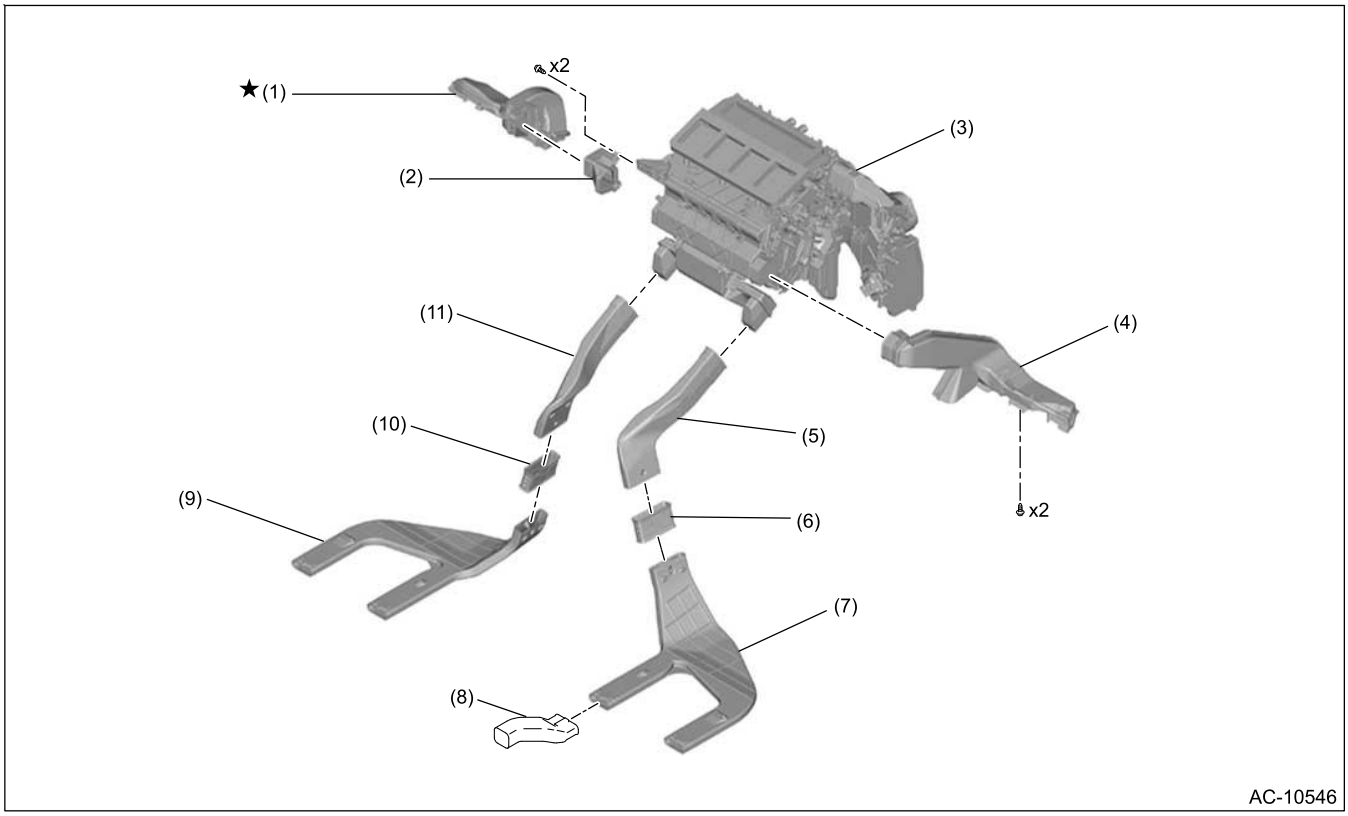
(3) Bracket - air conditioner

Tightening torque: N·m (kgf-m, ft-lb)

T: 36 (3.7, 26.6)

*: Tighten the bracket - air conditioner in the numerical order as shown in the figure.

7. HEATER DUCT



(1) Duct - foot driver
(2) Spacer - foot
(3) Heater unit ASSY
(4) Duct - foot passenger
(5) Duct - rear heater front RH
(6) Duct - joint RH
(7) Duct - rear heater rear RH
(8) Duct - extension*1
(9) Duct - rear heater rear LH
(10) Duct - joint LH
(11) Duct - rear heater front LH

*1: Model with power amplifier

8. HEATER VENT DUCT AND GRILLE

Note:

For exploded view of the heater vent duct and air vent grille that are secured on the instrument panel, refer to "Instrument Panel" of "EXTERIOR/INTERIOR TRIM" section.
Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > INSTRUMENT PANEL.

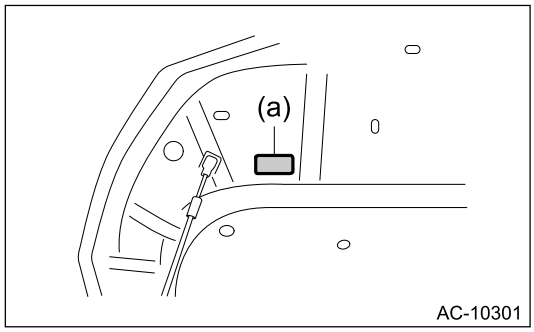
AIR CONDITIONER > General Description

CAUTION

Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the electrical parts provided with memory functions that store contents specified by a customer, record the memory contents before disconnecting the battery ground cable.

1. HFC-134A A/C SYSTEM

- Since the components are different from those for the conventional CFC-12 system, use refrigerant oil, compressor oil, etc. dedicated to the HFC-134a system.
- Before maintenance, check A/C system identification using the label (a) which is installed to the vehicle.



2. COMPRESSOR OIL

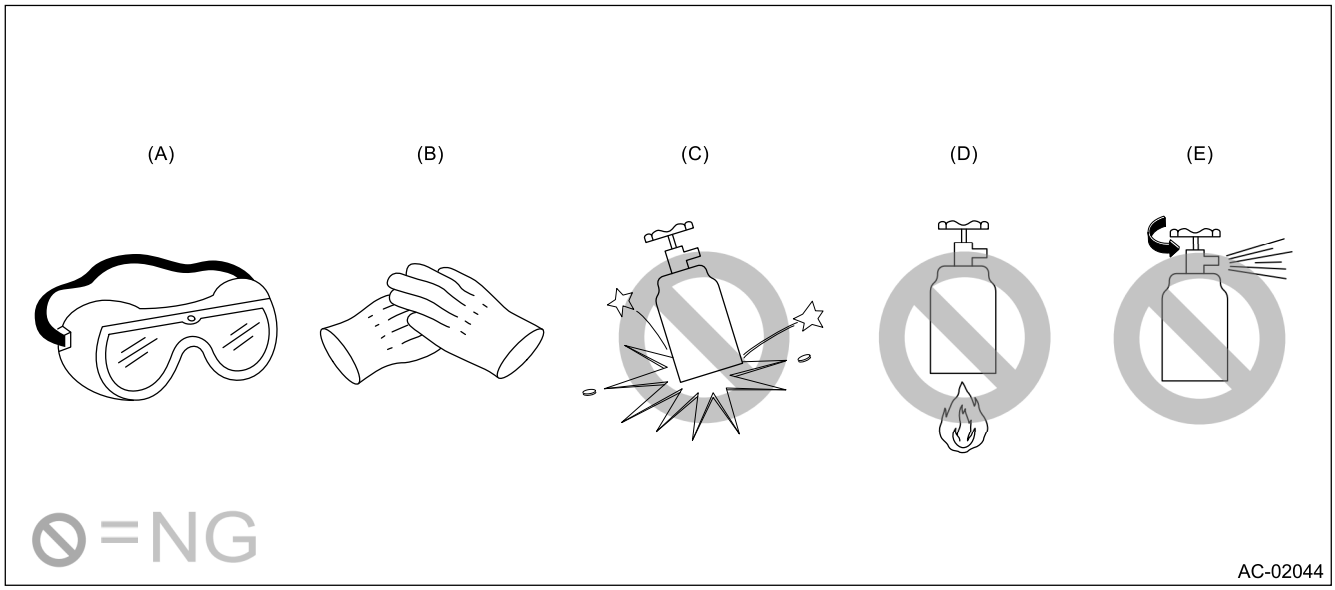
- HFC-134a compressor oil has no compatibility with that of CFC-12 system.
- Use only the manufacturer-authorized compressor oil for the HFC-134a system; only use DH-PR (ZXL200PG).
- Do not mix multiple compressor oils.
  If CFC-12 compressor oil is used in the HFC-134a A/C system, the compressor may become stuck due to poor lubrication, or the refrigerant may leak due to swelling of rubber parts.
  On the other hand, if HFC-134a compressor oil is used in a CFC-12 A/C system, the durability of the A/C system will be lowered.
- Compressor oil is very hygroscopic. When replacing or installing/removing A/C parts, immediately isolate the oil from atmosphere using a plug or tape. In order to avoid moisture, store the oil in a container with its cap tightly closed.

3. REFRIGERANT

- CFC-12 refrigerant cannot be used in a HFC-134a A/C system. HFC-134a refrigerant, also cannot be used in a CFC-12 A/C system.
- If an incorrect or no refrigerant is used, it will result in poor lubrication and the compressor itself may be damaged.

4. HANDLING OF REFRIGERANT

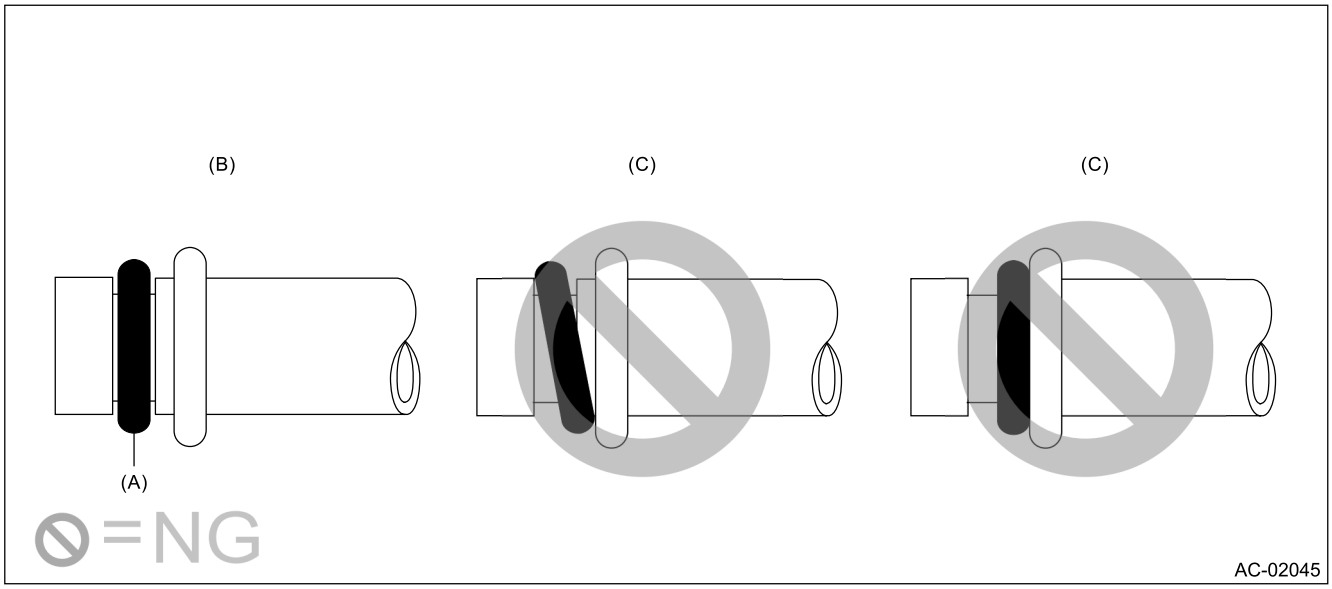
- The refrigerant boils at approx. −30°C (−22°F). When handling it, be sure to wear protective goggles and protective gloves. Direct contact of the refrigerant with skin may cause frostbite.
  If the refrigerant gets into your eye, avoid rubbing your eyes with your hands. Wash your eyes with plenty of water, and receive medical treatment from an eye doctor.
- Do not heat a service can. If a service can is directly heated, or put into boiling water, the inside pressure will become extremely high. This may cause the can to explode. If a service can must be warmed up, use warm water of 40°C (104°F) or less.
- Do not drop or impact a service can. (Observe the precautions and operation procedure described on the refrigerant container.)
- When the engine is running, do not open the high-pressure valve of manifold gauge. The high-pressure gas will back-flow resulting in an explosion of the can.
- Provide good ventilation and do not work in a closed area.
- In order to prevent global warming, avoid releasing refrigerant into the atmosphere. Using a refrigerant recovery system, discharge and recycle the gas.



(A) Goggles
(B) Gloves
(C) Do not apply impact.
(D) No direct heat on container
(E) Do not discharge

5. O-RING CONNECTIONS

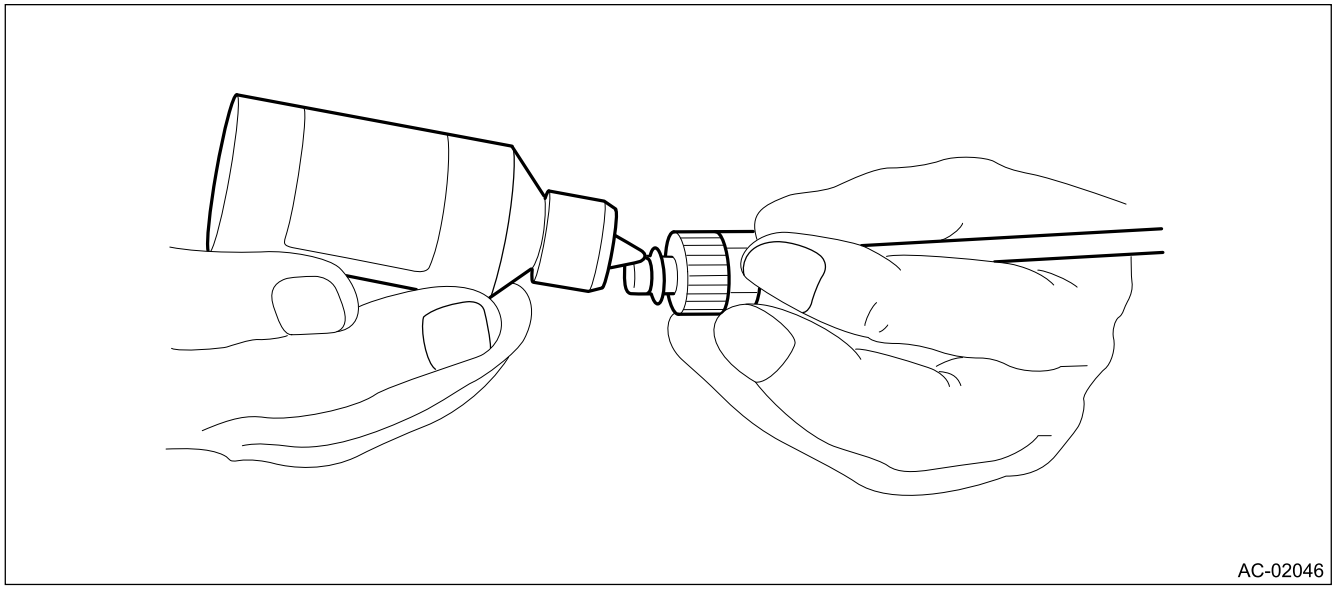
- Always use a new O-ring.
- In order to keep the O-rings free of lint which will cause a refrigerant gas leak, perform work without using gloves or waste cloths.
- Apply compressor oil to O-rings to avoid sticking, before installation.
- Use a torque wrench to tighten the O-ring fittings. Over-tightening will result in damage of the O-ring and deformation of the pipe end.
- If the work is interrupted before completing pipe connections, recap the pipes, components and fittings with a plug or tape to prevent foreign matter from entering.
- Visually check the surfaces and mating surfaces of O-rings, threads and connecting points. If a failure is found, replace the applicable parts.
- Install the O-rings straight against the pipe groove.



(A) O-ring
(B) OK
(C) NG

- Use compressor oil specified in the service manual to lubricate the O-rings.
  Apply oil to the top and sides of O-rings before installation.

Apply compressor oil to the pipe grooves.



- After tightening, use a clean cloth to remove excess compressor oil from the connections and any oil which may have run on the vehicle body or other parts.
- If any leakage is suspected after tightening, do not tighten the connections further, but disconnect the connections, remove the O-rings, and check the O-rings, threads, and connections.

AIR CONDITIONER > General Description

PREPARATION TOOL

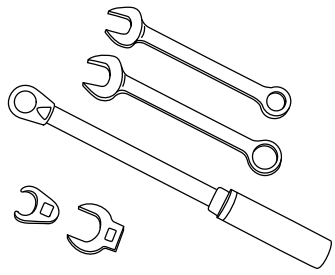
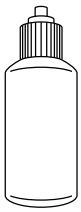
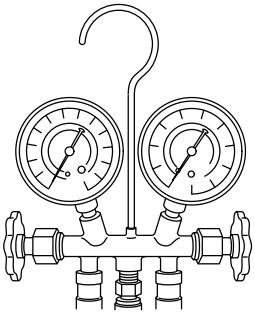
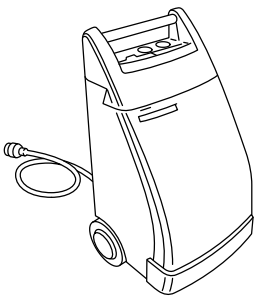
1. SPECIAL TOOL

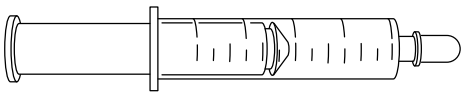
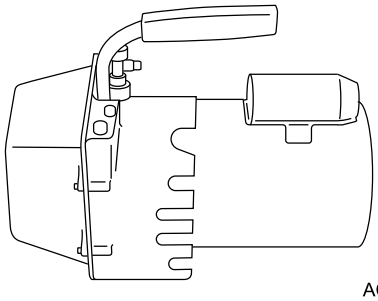
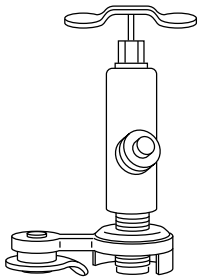
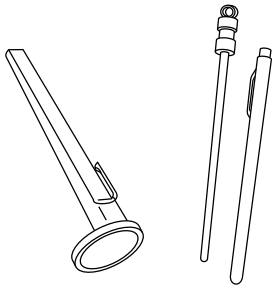
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

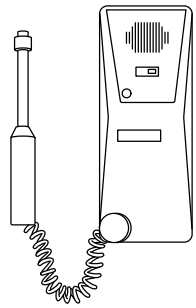
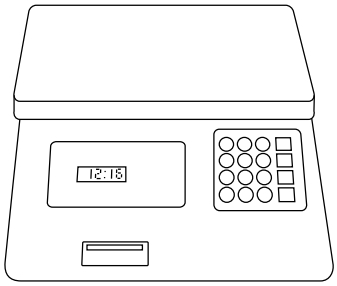
2. GENERAL TOOL

Caution:
When working on vehicles with a HFC-134a system, only use HFC-134a specified tools and parts. Do not mix CFC-12 tools and parts. If HFC-134a and CFC-12 refrigerant or compressor oil is mixed, it will result in poor lubrication and the compressor itself may be damaged.
In order to prevent the mixture of HFC-134a and CFC-12 parts and liquid, the type of tool and screw, and the replacement valves used are different. The gas leak detectors for the HFC-134a and CFC-12 system must also not be interchanged.

	HFC-134a	CFC-12
Tool and screw type	Millimeter size	Inch size
Valve type	Quick joint type	Screw-in type

TOOL NAME/ILLUSTRATION	REMARKS
Circuit tester	Used for measuring resistance and voltage.
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.
Wrench  AC-00213	Various **WRENCHES** will be required to service any A/C system. 7 — 40 N·m (0.7 — 4.1 kgf-m, 5 — 30 ft-lb) torque wrench and various crowfoot wrenches will be needed. Open end or flare nut wrenches will be needed to affix the pipe and hose fittings.
Applicator bottle  AC-00012	A small **APPLICATOR BOTTLE** is recommended to apply compressor oil to the various parts. It can be available at a hardware store.
Manifold gauge set  AC-00013	A **MANIFOLD GAUGE SET** (with hoses) is available at either a refrigerant supplier or an automotive equipment supplier.
Refrigerant recovery system  AC-00014	A **REFRIGERANT RECOVERY SYSTEM** is used for the recovery and recycling of A/C system refrigerant after contaminants and moisture have been removed from the refrigerant.

TOOL NAME/ILLUSTRATION	REMARKS
Syringe  AC-00015	A graduated plastic **SYRINGE** will be needed to add oil into the system again. A syringe can be available at a pharmacy or drug store.
Vacuum pump  AC-00016	A **VACUUM PUMP** is necessary (for a good working condition), and may be available at either a refrigerant supplier or an automotive equipment supplier.
Can tap  AC-00017	A **CAN TAP** for refrigerant cans is available at an automotive equipment supplier.
Thermometer/hygrometer  AC-00018	A Pocket **THERMOMETER/HYGROMETER** is available at either a industrial hardware store or a refrigerant supplier.

TOOL NAME/ILLUSTRATION	REMARKS
Electronic leak detector  AC-00019	An **ELECTRONIC LEAK DETECTOR** can be available at either a specialty tool supplier or an A/C equipment supplier.
Weight scale  AC-00020	A **WEIGHT SCALE** such as an electronic charging scale or a bathroom scale with digital display will be needed, if a 13.6 kg (30 lb) refrigerant container is used.

AIR CONDITIONER > Air Conditioning System

WIRING DIAGRAM

Refer to “Air Conditioning System” in the wiring diagram.

- Manual A/C model: Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM > MANUAL A/C.
- Auto A/C model: Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM > AUTO A/C.

AIR CONDITIONER > Air Conditioning System

ELECTRICAL SPECIFICATION

For the specification (electrical component), refer to “Control Module I/O Signal” of “AIR CONDITIONER (DIAGNOSTICS)” section. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

AIR CONDITIONER > Air Conditioning System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “AIR CONDITIONER (DIAGNOSTICS)” section. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Basic Diagnostic Procedure.

AIR CONDITIONER > Air Conditioning System

NOTE

For procedure of each component in the air conditioning system, refer to the respective section.

- Blower motor unit assembly: Ref. to AIR CONDITIONER>Blower Motor Unit Assembly.
- Blower motor: Ref. to AIR CONDITIONER>Blower Motor.
- Power transistor: Ref. to AIR CONDITIONER>Power Transistor.
- Control panel: Ref. to AIR CONDITIONER>Control Panel.
- Compressor: Ref. to AIR CONDITIONER>Compressor.
- Condenser: Ref. to AIR CONDITIONER>Condenser.
- Heater and cooling unit: Ref. to AIR CONDITIONER>Heater and Cooling Unit.
- Evaporator: Ref. to AIR CONDITIONER>Evaporator.
- Expansion valve: Ref. to AIR CONDITIONER>Expansion Valve.
- Hose & pipe: Ref. to AIR CONDITIONER>Hose and Pipe.
- Pressure switch (triple pressure switch): Ref. to AIR CONDITIONER>Pressure Switch (Triple Pressure Switch).
- Pressure sensor: Ref. to AIR CONDITIONER>Pressure Sensor.
- Ambient sensor: Ref. to AIR CONDITIONER>Ambient Sensor.
- Sunload sensor (auto A/C model): Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
- In-vehicle sensor (auto A/C model): Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).
- Evaporator sensor: Ref. to AIR CONDITIONER>Evaporator Sensor.
- Intake door actuator: Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.
- Mode door actuator: Ref. to AIR CONDITIONER>Mode Door Actuator.
- Air mix door actuator: Ref. to AIR CONDITIONER>Air Mix Door Actuator.

PROCEDURE

1. CHECK REFRIGERANT GAS PRESSURE

1. Prepare the vehicle.

   Note:

   Check that the ambient temperature is 25 — 40°C (77 — 104°F) and that the humidity is 30% — 80%.

   - Place the vehicle in the shade and windless condition, and open the front hood.
   - Open the front windows and close all doors.

2. Check the refrigerant pressure.

   Preparation tool:

   Manifold gauge set

   (1) Connect the manifold gauge set, and start the engine.

   (2) Set the vehicle to the following conditions.

Item	Condition
Engine	Warmed up (Engine coolant temperature indicator light: OFF)
Air vent grille	Shutter is fully open.
A/C switch	ON
Temperature adjustment dial	LO (MAX COOL)
FRESH/RECIRC switch	RECIRC
Air flow control dial or switch	VENT
Fan dial	5/7 level

   (3) In the condition of step (2), idle the engine for 30 minutes.

   (4) Read the gauge values on both high pressure side and low pressure side of the manifold gauge.

3. Measure the air vent grille outlet opening temperature, ambient temperature and humidity.

   Preparation tool:

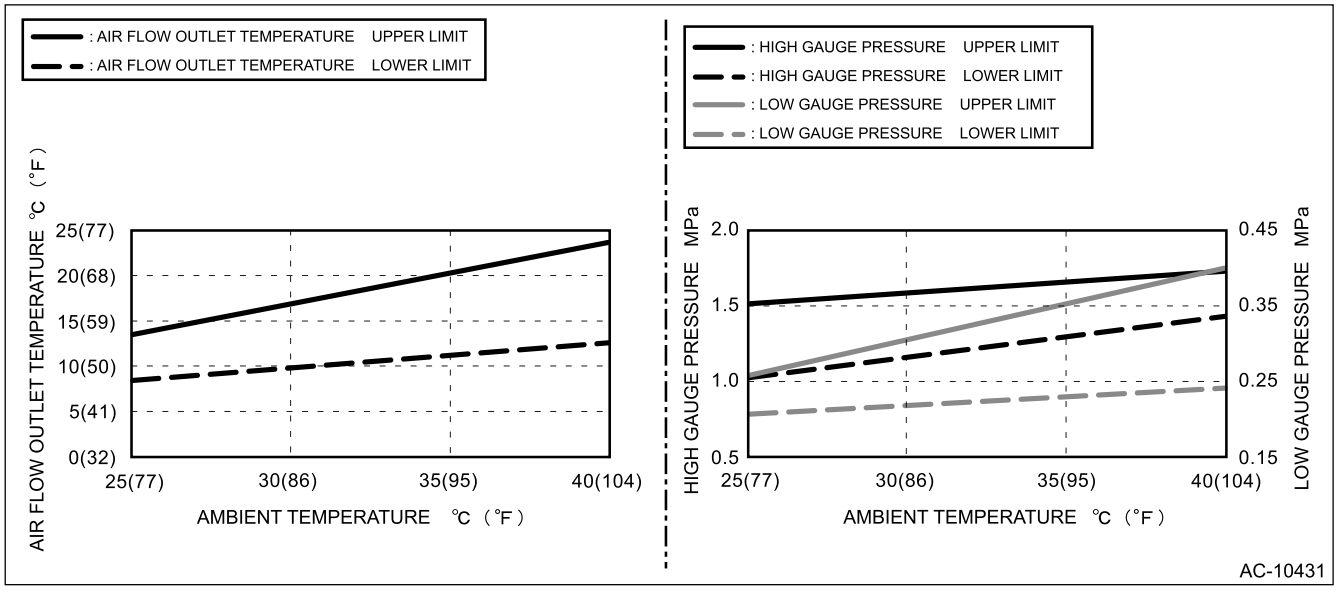
   Thermometer and hygrometer

   Note:

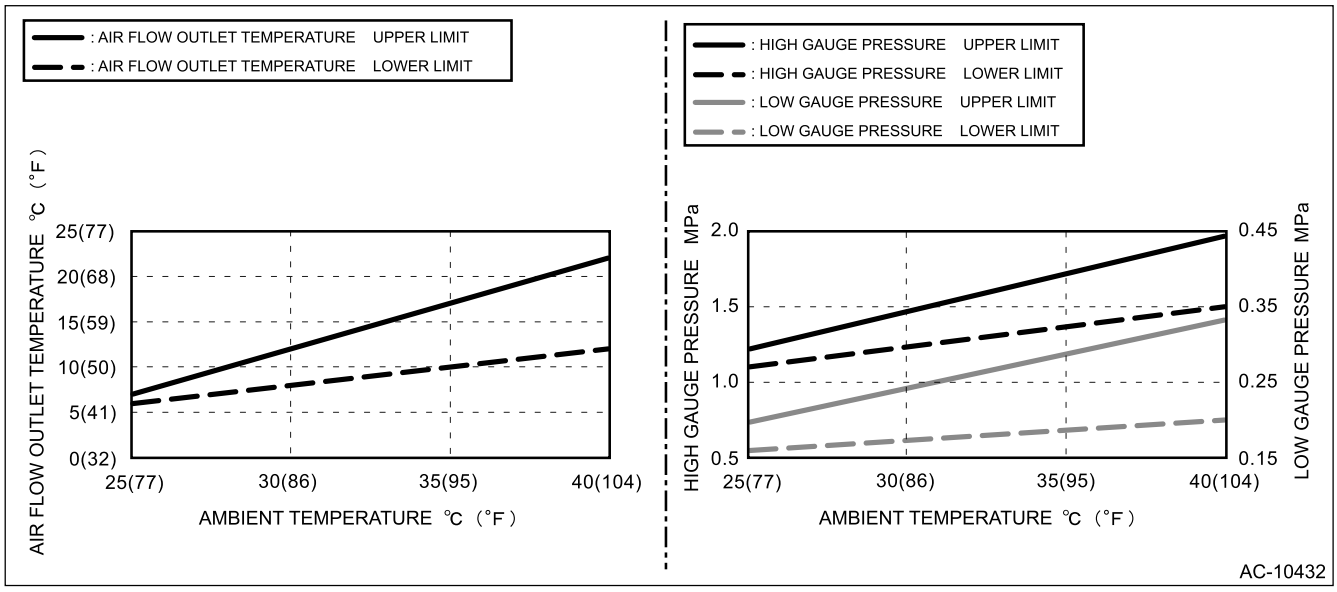
   For outlet opening temperature, measure the average temperature of center grille assembly and side grille assembly.

4. Check that the high and low pressures and outlet opening temperature for ambient temperature and humidity is within the standard value described in the chart below.

   - Manual A/C model



- Auto A/C model



5. Refer to "DIAGNOSIS WITH SYMPTOM" if the inspection result is not within the standard value. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > INSPECTION WITH PRESSURE SYMPTOM.

AIR CONDITIONER > Refrigerant Pressure with Manifold Gauge Set

INSPECTION

1. INSPECTION WITH PRESSURE SYMPTOM

Symptoms	Reference
Both high and low pressure sides are low	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > BOTH HIGH AND LOW PRESSURE SIDES ARE LOW.
Both high and low pressure sides are high	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > BOTH HIGH AND LOW PRESSURE SIDES ARE HIGH.

Symptoms	Reference
High and low pressure sides are equal, high-pressure side is low	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > HIGH AND LOW PRESSURE SIDES ARE EQUAL, OR HIGH-PRESSURE SIDE IS LOW.
High-pressure side is high	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > HIGH-PRESSURE SIDE IS HIGH.
Low-pressure side is low	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > LOW-PRESSURE SIDE IS LOW.
Low-pressure side is high	Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > LOW-PRESSURE SIDE IS HIGH.

2. BOTH HIGH AND LOW PRESSURE SIDES ARE LOW

1. CHECK REFRIGERANT LEAKS.

Check the refrigerant for leaks. Ref. to AIR CONDITIONER>Refrigerant Leak Check>INSPECTION.

Note:

When high-pressure side is less than 0.69 MPa: Go to step 2.

Are there refrigerant leaks?

Yes — Repair the refrigerant leaking points.

No — Go to 2.

2. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes — Refrigerant pressure is normal.

No — Perform corresponding “INSPECTION WITH PRESSURE SYMPTOM”.

3. BOTH HIGH AND LOW PRESSURE SIDES ARE HIGH

1. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Perform corresponding “INSPECTION WITH PRESSURE SYMPTOM”.

4. HIGH AND LOW PRESSURE SIDES ARE EQUAL, OR HIGH-PRESSURE SIDE IS LOW

1. CHECK REFRIGERANT LEAKS.

Check the refrigerant for leaks. Ref. to AIR CONDITIONER>Refrigerant Leak Check>INSPECTION.

Note:

When high-pressure side is less than 0.69 MPa: Go to step 2.

Are there refrigerant leaks?

Yes	Repair the refrigerant leaking points.
No	Go to 2.

2. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Inspect the compressor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE)).

5. HIGH-PRESSURE SIDE IS HIGH

1. CHECK CONDENSER.

Check the condenser. Ref. to AIR CONDITIONER>Condenser>INSPECTION.

Is condenser OK?

Yes	Go to 2.
No	Clean or replace the condenser.

2. CHECK RADIATOR FAN.

Check the radiator fan system. Ref. to COOLING(H4DO)>Radiator Fan System.

Is radiator fan system normal?

Yes	Go to 3.
No	Repair the radiator fan system or replace the faulty parts.

3. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Check the high-pressure hose and condenser for kinks or clogging, and replace if defective.

6. LOW-PRESSURE SIDE IS LOW

1. CHECK REFRIGERANT LEAKS.

Check the refrigerant for leaks. Ref. to AIR CONDITIONER>Refrigerant Leak Check>INSPECTION.

Note:

When high-pressure side is less than 0.69 MPa: Go to step 2.

Are there refrigerant leaks?

Yes	Repair the refrigerant leaking points.
No	Go to 2.

2. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Go to 3.

3. REPLACE EXPANSION VALVE.

Replace the expansion valve. Ref. to AIR CONDITIONER>Expansion Valve>REMOVAL.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Inspect the compressor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE)).

7. LOW-PRESSURE SIDE IS HIGH

1. FILL PROPER AMOUNT OF REFRIGERANT.

Drain all refrigerant, and refill proper amount of refrigerant.

- Recovery: Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
- Fill: Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Go to 2.

2. REPLACE EXPANSION VALVE.

Replace the expansion valve. Ref. to AIR CONDITIONER>Expansion Valve>REMOVAL.

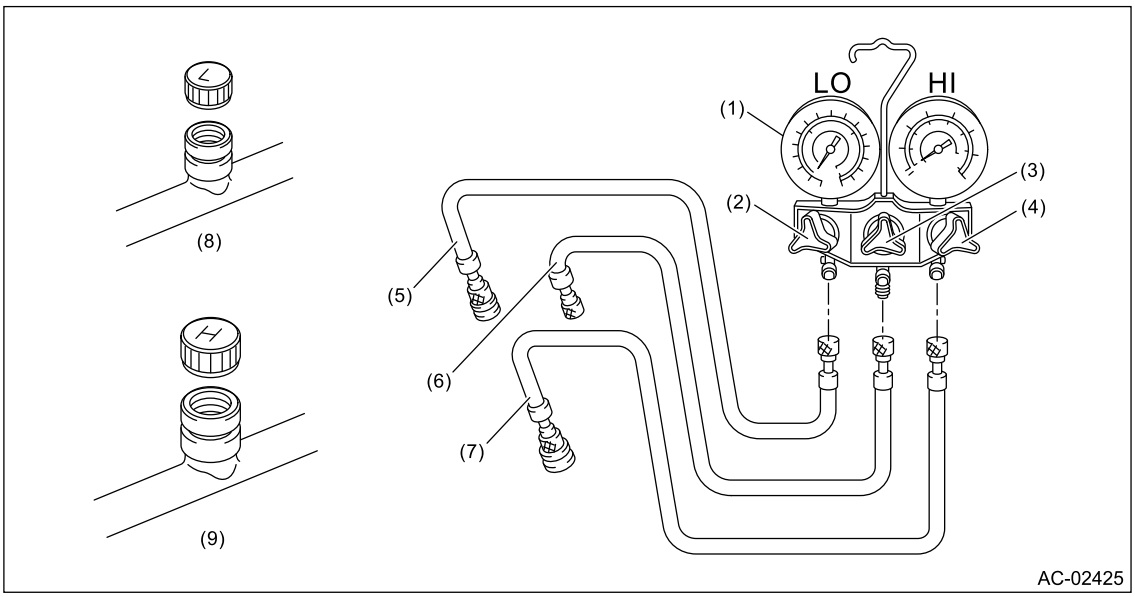
Is refrigerant pressure within the standard value?

Yes	Refrigerant pressure is normal.
No	Replace the evaporator. Ref. to AIR CONDITIONER>Evaporator>REMOVAL.

PROCEDURE

Caution:

- **During operation, be sure to wear protective goggles and protective gloves.**
- **Connect the refrigerant recovery system with the manifold gauge set to discharge the refrigerant from the A/C system and recycle the gas.**
- **When recycling the discharged refrigerant, keep service cans on hand. Because the recovery rate with the recovery system is approx. 90%, service cans are necessary to charge the refrigerant.**
- **Follow the detailed operation procedure described in the operation manual attached to the refrigerant recovery system.**



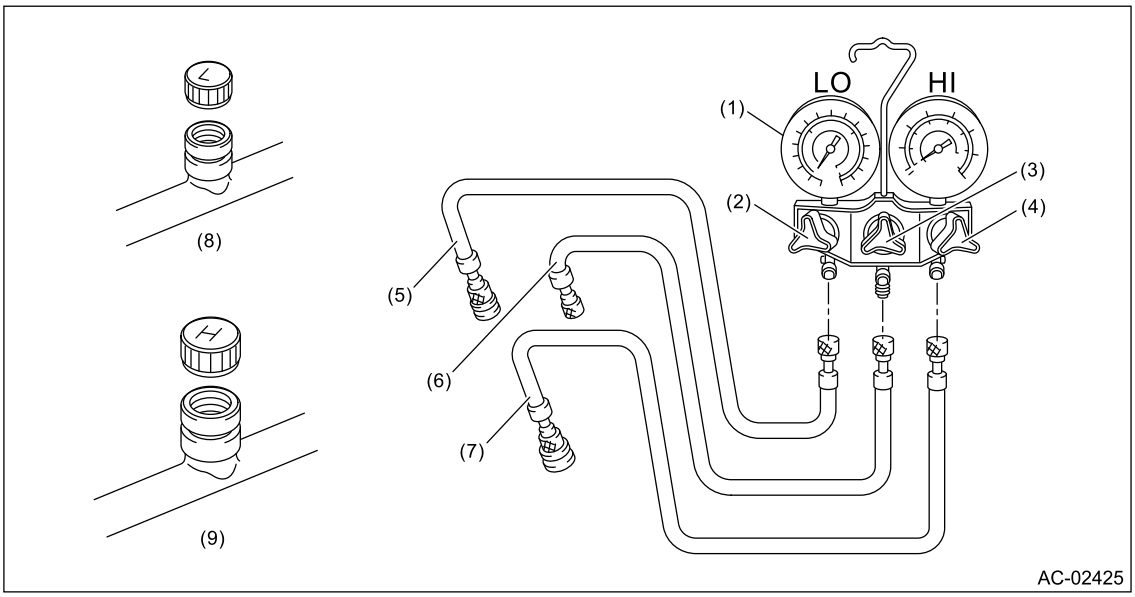
(1) Manifold gauge
(2) Low pressure valve
(3) Center valve
(4) High pressure valve
(5) Low-pressure hose
(6) Center manifold hose (vacuum pump and charge)
(7) High-pressure hose
(8) Low-pressure side service port
(9) High-pressure side service port

1. Perform compressor oil return operation. Ref. to AIR CONDITIONER>Compressor Oil>PROCEDURE.
2. Turn the ignition switch to OFF.
3. Attach the manifold gauge set.
   Preparation tool:
   Manifold gauge set
   (1) Check that all valves are fully closed.
   (2) Install the low/high pressure hoses to the service ports on the low/high pressure sides of the vehicle respectively.
   Caution:
   Confirm that the connections are secure.
   (3) Connect the center hose to the refrigerant recovery system.
   Preparation tool:
   Refrigerant recovery system
4. Follow the operation manual attached to the refrigerant recovery system to collect the refrigerant.

PROCEDURE

Caution:

- **While working, be sure to wear protective goggles and protective gloves.**
- **Air in the cycle can cause insufficient air conditioning, and water in the cycle can cause clogging in the cycle (icing) and rust. To remove this air and water content, use a vacuum pump to perform evacuation before filling with refrigerant. By making the inside of the cycle a vacuum, the water content will evaporate even at normal temperatures, and can be removed.**



(1) Manifold gauge
(2) Low pressure valve
(3) Center valve
(4) High pressure valve
(5) Low-pressure hose
(6) Center manifold hose (vacuum pump and charge)
(7) High-pressure hose
(8) Low-pressure side service port
(9) High-pressure side service port

1. Attach the manifold gauge set.

Preparation tool:

Manifold gauge set

(1) Check that all valves are fully closed.

(2) Install the low/high pressure hoses to the service ports on the low/high pressure sides of the vehicle respectively.

Caution:

Confirm that the connections are secure.

(3) Connect the center manifold hose of the manifold gauge to the vacuum pump.

Preparation tool:

Vacuum pump

2. Perform evacuation.

Caution:

Make sure to perform evacuation using a vacuum pump.

(1) Open the low-pressure side valve, high-pressure side valve and center valve.

(2) Operate the vacuum pump.

(3) Perform evacuation for 5 minutes or more, and when the low pressure gauge needle reaches −0.1 MPa (−1 kgf/cm^2, −14 psi), close the center manifold hose valve, and stop the vacuum pump.

(4) Leave alone for 5 to 10 minutes after closing the low pressure valve and high pressure valve, and check whether there is any change in the low pressure gauge needle indication.
If the needle position changes, this indicates a leak. Check the pipe and hose connections, and repair the location with the problem.
After repair, retry charging the refrigerant from the step 1).

(5) If there is no leakage, continue evacuation for additional 20 — 30 minutes, close all valves and then stop the vacuum pump.

3. Charge refrigerant.

(1) Follow the can tap operation manual to attach it to the refrigerant can.

Preparation tool:

Can tap

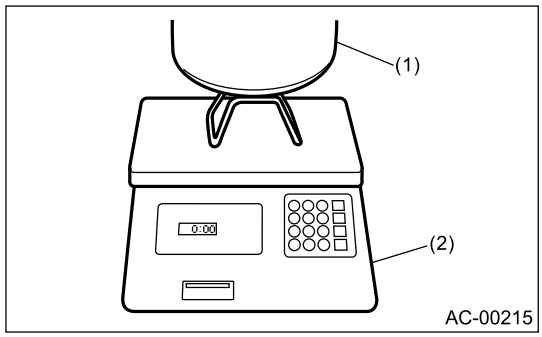
(2) Disconnect the center manifold hose from the vacuum pump, and connect the hose to the tap valve.

Preparation tool:

Weight scale

Note:

When 13.6 kg (30 lb) refrigerant container (1) is used, measure the amount of refrigerant with a refrigerant charging scale (2), and connect with the center manifold hose.



(3) Open the tap valve of the supply container (refrigerant can or refrigerant container).

(4) Loosen the center manifold hose connection on the manifold gauge for a few seconds (if there is a purge valve on the manifold gauge, push this instead) to allow the air in the center manifold hose to be bled by the refrigerant pressure.

(5) Open the low pressure valve and high pressure valve of the manifold gauge to fill with refrigerant.

Note:

If the supply container is empty, close all manifold gauge valves and the tap valve of the supply container, and replace the empty supply container with a new one. After replacing with a new supply container, perform air purge, and resume the filling operation.

(6) If the low pressure gauge indicates approximately 0.2 MPa (2 kgf/cm^2, 29 psi) or refrigerant filling efficiency drops, close the low pressure and high pressure valves.

(7) Check that the low pressure valve and high pressure valve are closed, turn off the A/C switch and start the engine.

Caution:

- **When filling operation is performed with the engine running, do not open the high pressure valve. Always fill from the low pressure valve.**
- **Except for the magnet clutch type, do not start the engine before charging refrigerant.**

(8) To prevent damage to the compressor, push the A/C switch ON-OFF quickly a few times.

(9) Set the vehicle to the following conditions.

Item	Condition
Engine speed	1,500 r/min
A/C switch	ON
Temperature adjustment dial	LO (MAX COOL)
Fan dial	HI (MAX)
FRESH/RECIRC switch	RECIRC
Air flow control dial or switch	VENT
Window	OPEN

(10) Open the low pressure valve, check the refrigerant pressure with a manifold gauge and fill with refrigerant up to the specified amount. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set>INSPECTION > INSPECTION WITH PRESSURE SYMPTOM.

4. Using an electronic leak detector (leak tester), check for refrigerant leaks in the system. Ref. to AIR CONDITIONER>Refrigerant Leak Check>INSPECTION.
5. After filling with refrigerant, close all valves and remove the manifold gauge set.
6. Attach cap to the service port of the low pressure side and high pressure side.

INSPECTION

1. Attach the manifold gauge set.

   Preparation tool:

   Manifold gauge set

   (1) Check that all valves are fully closed.

   (2) Install the low/high pressure hoses to the service ports on the low/high pressure sides of the vehicle respectively.

   Caution:

   Confirm that the connections are secure.

   (3) Start the engine, operate the A/C system for approx. 10 minutes, and check that the high-pressure side indicates 0.69 MPa (7 kgf/cm^2, 100 psi) or more.

2. Stop the engine to start the leak test.

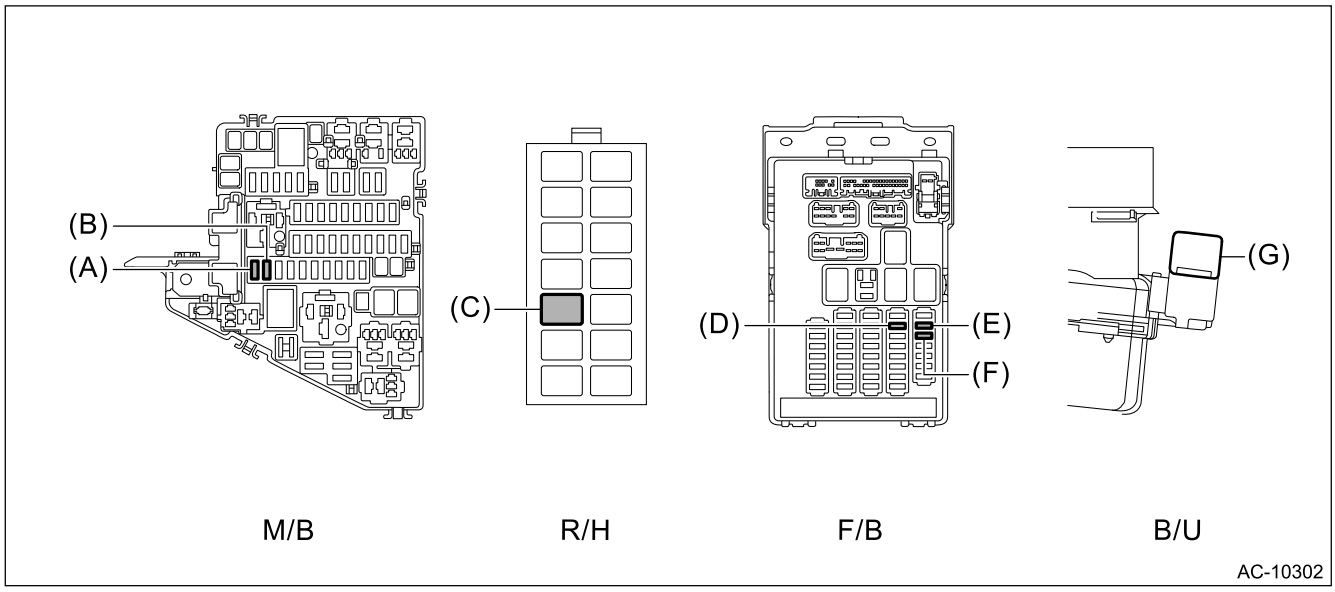
   Preparation tool:

   Electronic leak detector (leak tester)

Items	Condition	Corrective action
Pipe	Check the connections of pipe and expansion valve.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
	Check the connection between pressure switch or pressure sensor and high-pressure pipe.	Replace the pressure switch or pressure sensor.
	Check the connection between pipe and condenser.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
Condenser	Check the welded part of condenser and core.	Replace the condenser.
Hose (high-pressure)	Check the connection between hose (high-pressure) and compressor.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
	Check the connection between hose (high-pressure) and condenser.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
	Check the rubber part of the flexible hose and pipe seam. **Caution:** **Carefully check the external surface of flexible hoses and pipes at approx. 25 mm (0.98 in) per second.**	Replace the hose (high pressure).
	Check the valve and cap in the service port.	Check the rubber seal of the valve and cap. If necessary, replace valve or cap.

Items	Condition	Corrective action
Compressor	Check the compressor pulley and vicinity of shaft seal. **Caution:** **Some shaft seals will show a slight amount of leakage, about 3 g (0.1 oz) per year. This is not a problem.**	Replace the compressor.
Hose (low-pressure)	Check the connection between hose (low pressure) and expansion valve.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
	Check the connection between hose (low pressure) and compressor.	Check the O-ring at connection and tightening torque. If necessary, replace each part.
	Check the rubber part of the flexible hose and pipe seam. **Caution:** **Carefully check the external surface of flexible hoses and pipes at approx. 25 mm (0.98 in) per second.**	Replace the hose (low pressure).
	Check the valve and cap in the service port.	Check the rubber seal of the valve and cap. If necessary, replace valve or cap.
Evaporator	Remove the drain hose from the heater case, and check the end part for 10 seconds or more.	Replace the evaporator.
	Check the air vent grille. **Note:** **Turn the ignition switch to ON, and run the blower at high speed for approx. 1 minute. Stop the blower to check the air vent grille on the instrument panel. While moving the tester closer to the grille, run the blower for 1 or 2 seconds, then stop it. Check the grille at that position for at least 10 seconds.**	Replace the evaporator.

LOCATION



Main fuse box (M/B)	Fuse 15 A (blower motor relay)	(A)
	Fuse 15 A (blower motor relay)	(B)
Relay holder (R/H)	A/C relay	(C)
Relay & fuse box (F/B)	Fuse 15 A (blower motor relay)	(D)
	Fuse 7.5 A (A/C control panel)	(E)
	Fuse 7.5 A (A/C control panel)	(F)
Blower motor unit (B/U)	Blower motor relay	(G)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

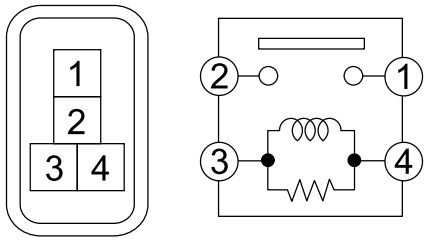
Note:

If the fuse is blown again, check the system wiring harness.

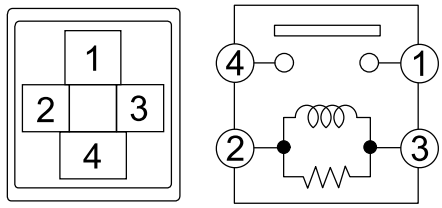
2. CHECK RELAY

1. Measure the resistance between relay terminals.
   - A/C relay

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	

Terminal No.	Inspection conditions	Standard	Circuit
	Apply battery voltage between terminals 3 and 4.	Less than 1 Ω	 LI-01273

- Blower motor relay

Terminal No.	Inspection conditions	Standard	Circuit
1 — 4	Always	1 MΩ or more	 AC-02796
	Apply battery voltage between terminals 2 and 3.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

PROCEDURE

Note:

Before making repairs, perform the oil return operation to return the compressor oil in circulation with the refrigerant to the compressor.

1. Increase the engine speed to 1,500 r/min.
2. Turn the A/C switch to ON.
3. Turn the temperature control dial to LO (MAX COOL).
4. Turn the FRESH/RECIRC switch to RECIRC position.
5. Turn the fan dial to HI (MAX).
6. Leave in this condition for 10 minutes.

ADJUSTMENT

- If a component has been replaced, add an appropriate amount of compressor oil (same as the amount of remaining oil in removed component).
- When replacing the compressor, the new compressor will already have the specified amount of oil in it. Adjust the oil amount (so that the amount remains the same as that of the removed compressor) and install the new compressor.

Note:

Since the hygroscopicity of compressor oil is high, perform this series of works quickly.

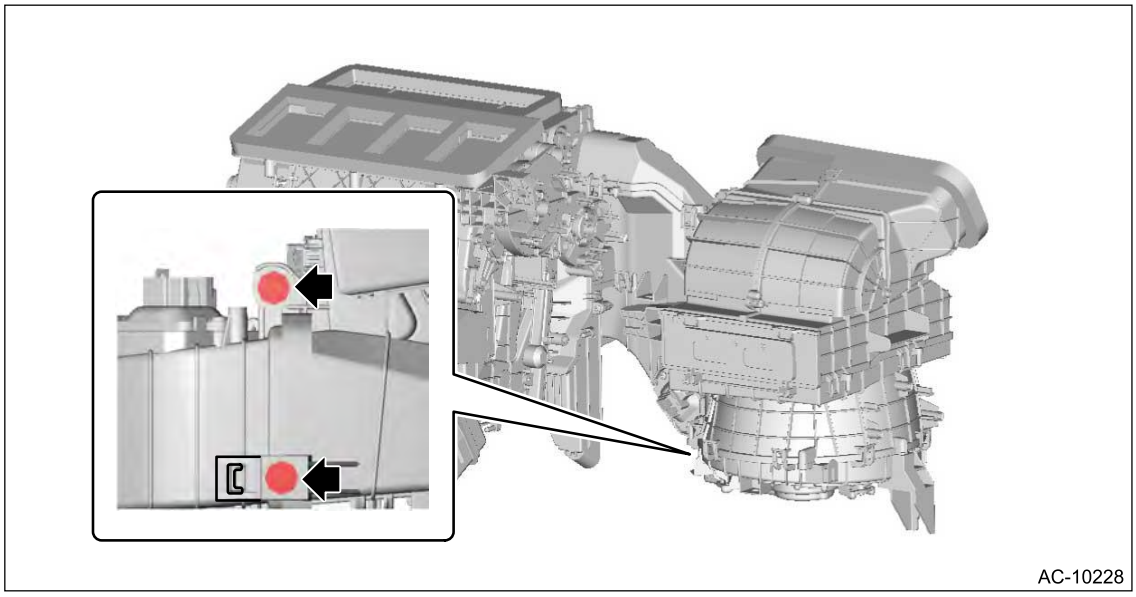
AIR CONDITIONER > Blower Motor Unit Assembly

REMOVAL

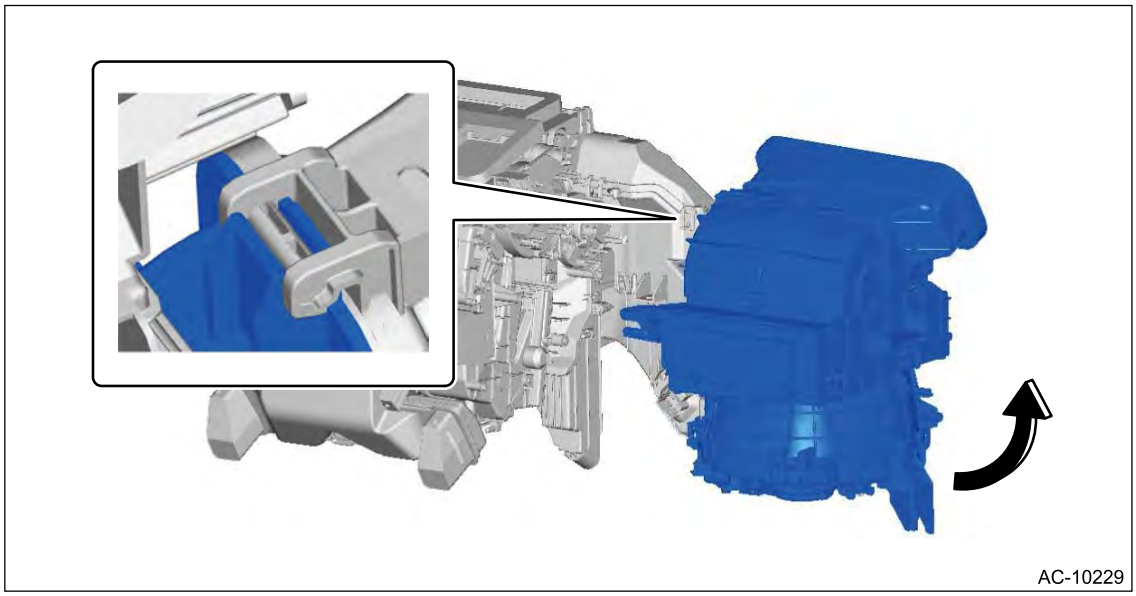
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>REMOVAL.
3. Remove the blower motor unit assembly.
   (1) Release the claws and remove the screws.



(2) Release the guide, and remove the blower motor unit assembly as shown in the figure.



AIR CONDITIONER > Blower Motor Unit Assembly

INSTALLATION

Caution:

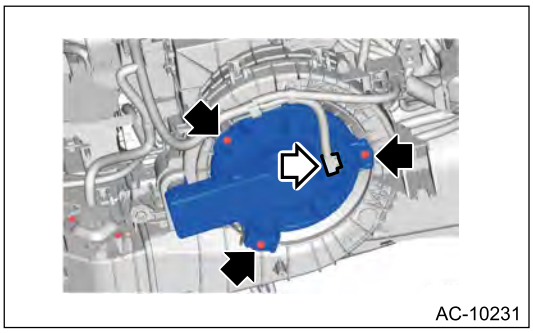
- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the blower motor unit assembly.
2. Install the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Blower Motor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the duct - foot passenger. Ref. to AIR CONDITIONER>Heater Duct>REMOVAL.
4. Remove the blower motor assembly.
   (1) Disconnect the connector.
   (2) Remove the screws and detach the blower motor assembly.



AIR CONDITIONER > Blower Motor

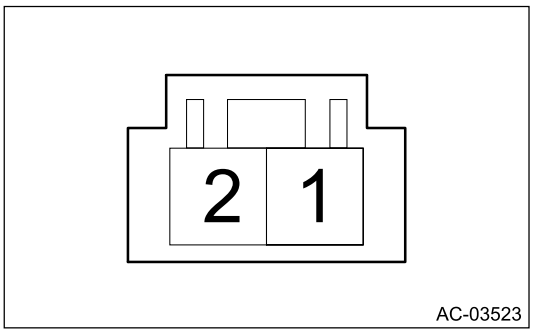
INSTALLATION

1. Install the blower motor assembly.
2. Install the duct - foot passenger.
3. Install the pocket assembly and the back panel - pocket.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Blower Motor

INSPECTION

1. Check the motor operation when battery voltage is applied between the connector terminals.



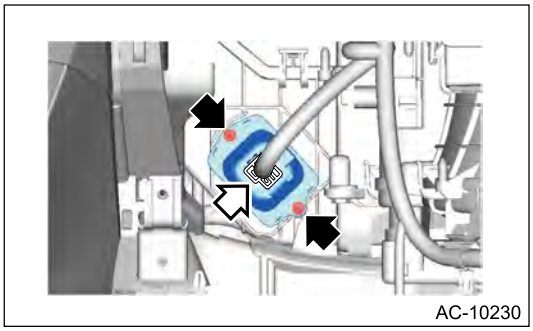
Terminal No.	Inspection conditions	Specification
2 (+) — 1 (−)	Apply battery voltage.	Rotation

2. If the blower motor does not operate normally, replace the blower motor assembly.

AIR CONDITIONER > Power Transistor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the power transistor.
   (1) Disconnect the connector.
   (2) Remove the screws and remove the power transistor.



AIR CONDITIONER > Power Transistor

INSTALLATION

1. Install the power transistor.
2. Install the pocket assembly and the back panel - pocket.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

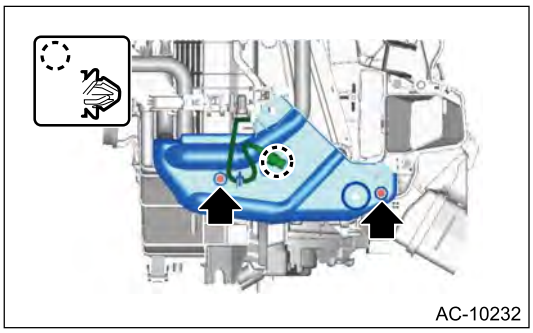
AIR CONDITIONER > Heater Core

REMOVAL

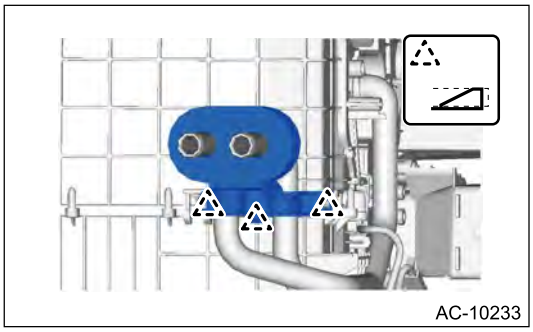
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the battery ground cable and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>REMOVAL.
3. Remove the cover - heater pipe.
   (1) Remove the screws.
   (2) Remove connector clamp and harness, and remove the cover - heater pipe.


AC-10232

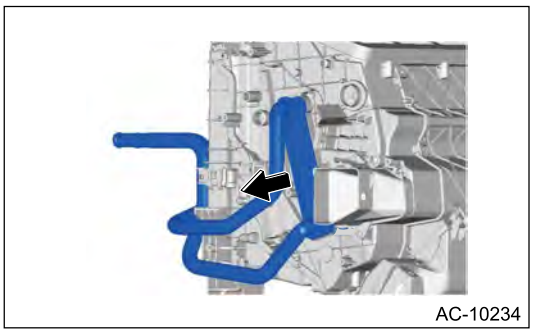
4. Remove the clamp - heater pipe.
   (1) Release the claws, and remove the clamp - heater pipe.


AC-10233

Note:

Do not remove the packing.

5. Remove the heater core as shown in the figure.


AC-10234

AIR CONDITIONER > Heater Core

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Attach the heater core.
2. Install the clamp - heater pipe.
3. Install the cover - heater pipe.
4. Install the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

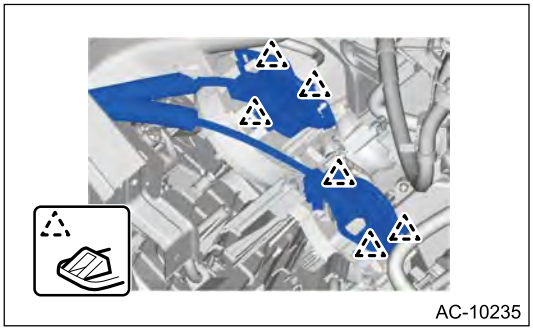
REMOVAL

1. MANUAL A/C MODEL

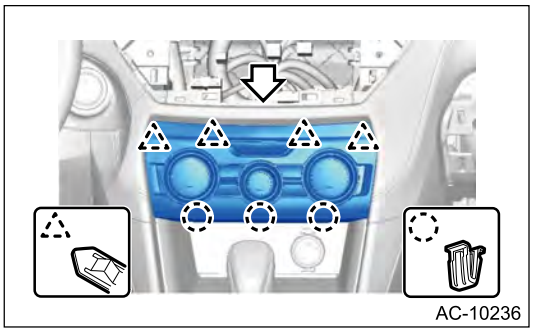
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
5. Remove the heater control assembly.
   (1) Release the claw, and disconnect the cable - mode and the cable - temperature.

   Caution:

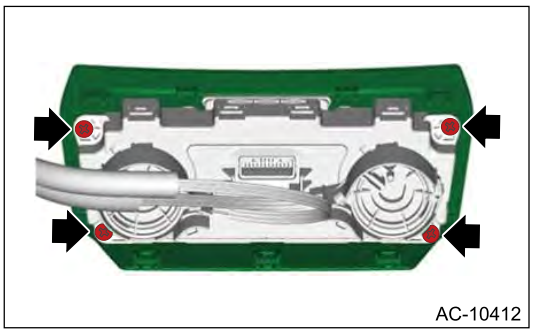
   Check the dial position before disconnecting the cable.



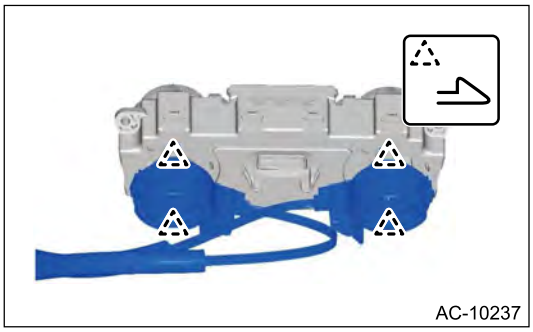
   (2) Disconnect the connector.
   (3) Press the heater control assembly from behind to release the clips and claws, and then remove the heater control assembly.



   (4) Remove the screws and remove the panel assembly - heater.

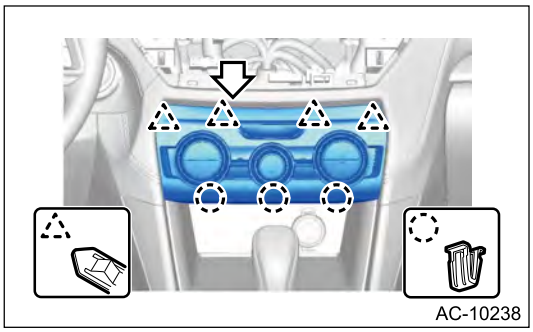


6. Remove the cable - mode and the cable - temperature.
   (1) Release the claw, and disconnect the cable - mode and the cable - temperature.

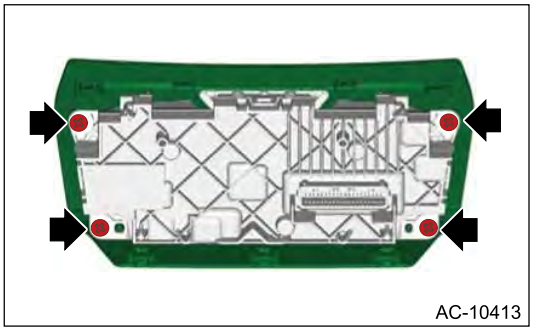


2. AUTO A/C MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the heater control assembly.
   (1) Disconnect the connector.
   (2) Press the heater control assembly from behind to release the clips and claws, and then remove the heater control assembly.



(3) Remove the screws and remove the panel assembly - heater.



AIR CONDITIONER > Control Panel

INSTALLATION

1. MANUAL A/C MODEL

1. Install the cable - mode and the cable - temperature.
2. Install the panel assembly - heater.
3. Install the heater control assembly.

Caution:

Install the heater control assembly so that each cable position and heater control assembly dial position are the same.

4. Install the pocket assembly and the back panel - pocket.
5. Install the audio assembly or navigation assembly.
6. Install the grille assembly - CTR ventilation.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. AUTO A/C MODEL

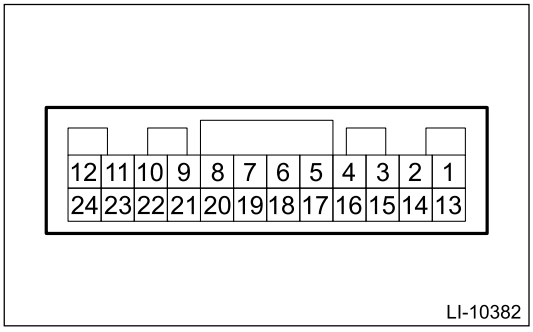
1. Install the panel assembly - heater.
2. Install the heater control assembly.
3. Install the audio assembly or navigation assembly.
4. Install the grille assembly - CTR ventilation.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Control Panel

INSPECTION

1. MANUAL A/C MODEL

1. Check the illumination operation when battery voltage is applied between the connector terminals.

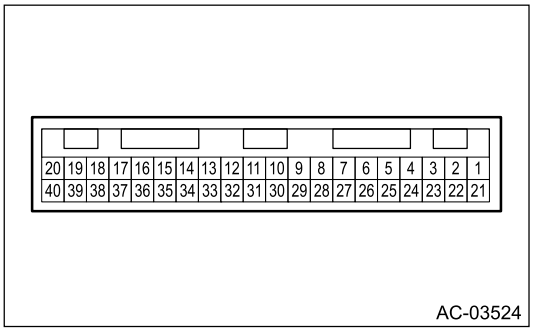


Terminal No.	Inspection conditions	Specification
4 (+) — 5 (−)	Apply battery voltage.	Light ON

2. If it does not operate normally, replace the heater control assembly.

2. AUTO A/C MODEL

1. Check the illumination operation when battery voltage is applied between the connector terminals.



Terminal No.	Inspection conditions	Specification
39 (+) — 29 (−)	Apply battery voltage.	Light ON

2. If it does not operate normally, replace the heater control assembly.

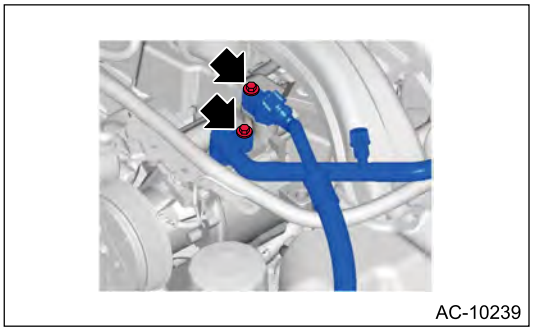
REMOVAL

1. MANUAL A/C MODEL

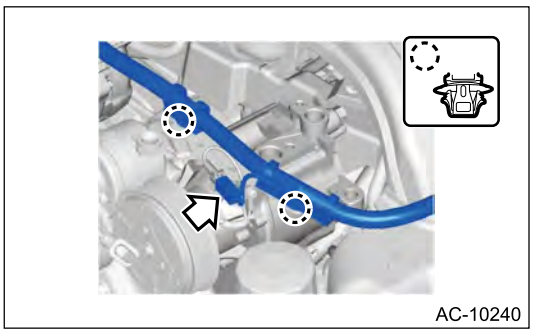
1. Perform compressor oil return operation. Ref. to AIR CONDITIONER>Compressor Oil>PROCEDURE.
2. Turn the A/C switch to OFF and stop the engine.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
5. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL.
6. Detach the hose - pressure suction and the hose - pressure discharge.
   (1) Remove the bolts and detach the hose - pressure suction.
   (2) Remove the bolts and remove the hose - pressure discharge.

   Caution:

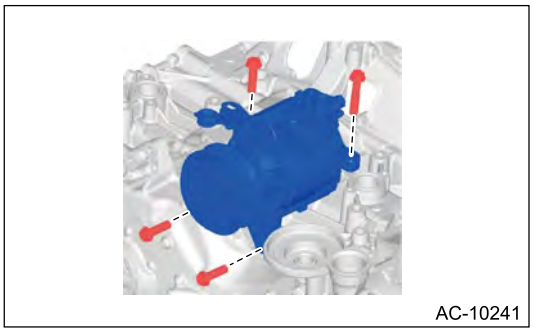
   Seal the disconnected hose and engaging part of compressor with a plug or vinyl tape to prevent foreign matter from entering.


AC-10239

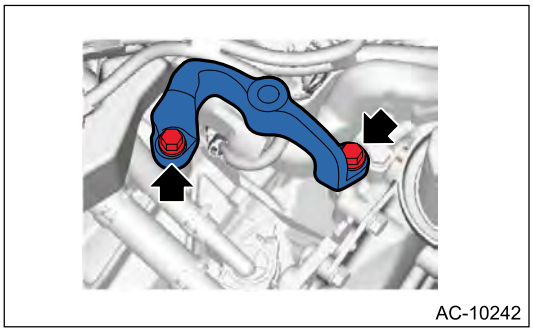
7. Remove the compressor assembly.
   (1) Remove the harness clip and connector.


AC-10240

   (2) Remove the bolts and remove the compressor assembly.


AC-10241

8. Remove the bracket - air conditioner.
   (1) Remove the bolts and remove the bracket - air conditioner.

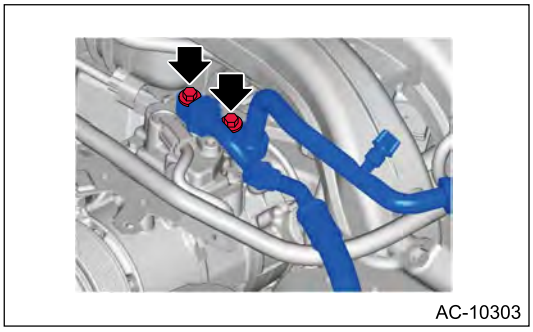


2. AUTO A/C MODEL

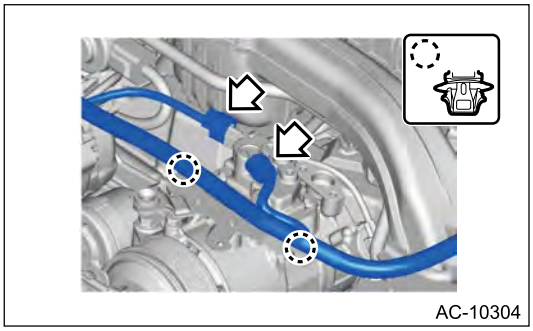
1. Perform compressor oil return operation. Ref. to AIR CONDITIONER>Compressor Oil>PROCEDURE.
2. Turn the A/C switch to OFF and stop the engine.
3. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
5. Remove the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>REMOVAL.
6. Detach the hose - pressure suction and the hose - pressure discharge.
   (1) Remove the bolts and detach the hose - pressure suction.
   (2) Remove the bolts and remove the hose - pressure discharge.

Caution:

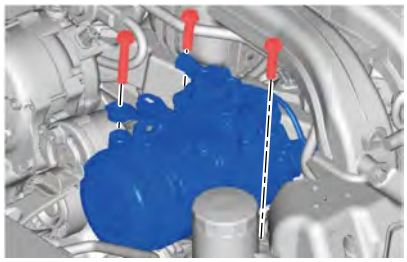
Seal the disconnected hose and engaging part of compressor with a plug or vinyl tape to prevent foreign matter from entering.



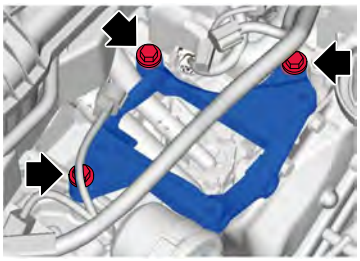
7. Remove the compressor assembly.
   (1) Remove the harness clip and connector.



   (2) Remove the bolts and remove the compressor assembly.


AC-10305

8. Remove the bracket - air conditioner.
   (1) Remove the bolts and remove the bracket - air conditioner.


AC-10243

AIR CONDITIONER > Compressor

INSTALLATION

1. MANUAL A/C MODEL

Caution:

- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **After replacing the compressor assembly, adjust the amount of the compressor oil. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**

1. Install the bracket - air conditioner.
   Tightening torque:
   36 N·m (3.7 kgf-m, 26.6 ft-lb)
2. Install the compressor assembly.
   Tightening torque:
   36 N·m (3.7 kgf-m, 26.6 ft-lb)
   Note:
   Tighten the compressor assembly in the numerical order as shown in the figure. Ref. to AIR CONDITIONER>General Description>COMPONENT > COMPRESSOR.
3. Install the hose - pressure suction and the hose - pressure discharge.
   Tightening torque:
   10 N·m (1 kgf-m, 704 ft-lb)
4. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

2. AUTO A/C MODEL

Caution:

- **After installing the compressor, do not start the engine until the A/C system is charged with refrigerant.**
- **If the engine is started with no refrigerant charge, replace the compressor assembly.**
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **After replacing the compressor assembly, adjust the amount of the compressor oil. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**

1. Install the bracket - air conditioner.
   Tightening torque:
   36 N·m (3.7 kgf-m, 26.6 ft-lb)
   Note:
   Tighten the bracket - air conditioner in the numerical order as shown in the figure. Ref. to AIR CONDITIONER>General Description>COMPONENT > COMPRESSOR.
2. Install the compressor assembly.
   Tightening torque:
   36 N·m (3.7 kgf-m, 26.6 ft-lb)
3. Install the hose - pressure suction and the hose - pressure discharge.
   Tightening torque:
   10 N·m (1 kgf-m, 704 ft-lb)
4. Install the V-belts. Ref. to MECHANICAL(H4DO)>V-belt>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.
7. After installing the compressor assembly, perform a break-in operation according to the following steps.
   Note:
   Do not increase the engine speed to and above 4,000 r/min unless the break-in operation finishes.
   (1) Check that all connectors are locked securely.
   (2) Reset the heater control assembly. (Disconnect and then connect the connector)
   (3) Attach a delivery (test) mode fuse to the main fuse box.
   (4) Using the Subaru Select Monitor, perform the break-in operation.
   Note:
   For detailed operation procedures, refer to "Application help".
   1. Connect the Subaru Select Monitor.
   2. On [Start] display, select [Diagnosis].
   3. On [Select Vehicle] display, enter vehicle information and select [OK].
   4. On [Main Menu] display, select [Each System].
   5. On [Select System] display, select [Air Conditioner], and then select [Next].
   6. On [Select Function] display, select [Work Support].
   7. Select [Variable compressor break-in drive].mode from the work support list, and display [Break-in variable compressor drive, finish status] by following the procedure.
   8. Start and idle the engine at or below 1,800 r/min. (The compressor operation is automatically changed to the break-in drive mode.)
   9. When [Break-in variable compressor drive, finish status] changes from [incomplete] to [ON], stop the engine.

   Caution:
   If the engine may have been started with no refrigerant charge, check for any diagnosis code (DTC) using Subaru Select Monitor. If the code B14A8 (REFRIGERANT NOT SEALED DRIVE ERROR) is output, replace the compressor assembly.
   (5) Remove the delivery (test) mode fuse from the main fuse box.

(6) The break-in operation finishes.

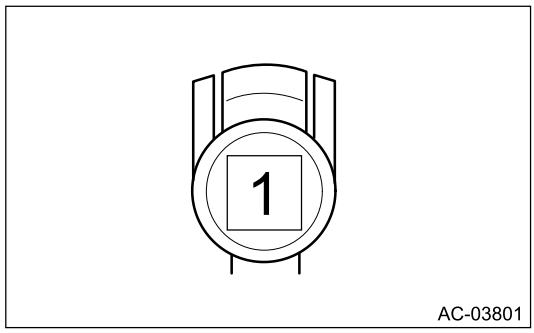
8. Check that the air conditioner system operates normally.

AIR CONDITIONER > Compressor

INSPECTION

1. MANUAL A/C MODEL

- **CHECK MAGNET CLUTCH CLEARANCE**
  1. Check the clearance of entire circumference around the drive plate and pulley.
     Specification:
     0.3 — 0.6 mm (0.0118 — 0.0236 in)
  2. Replace the compressor assembly if the inspection result is not within the standard.
- **MAGNET CLUTCH OPERATION INSPECTION**
  1. Check the magnet clutch operation when battery voltage is applied to the connector terminal.



Terminal No.	Inspection conditions	Specification
1 (+) — chassis ground (−)	Apply battery voltage.	Engaged

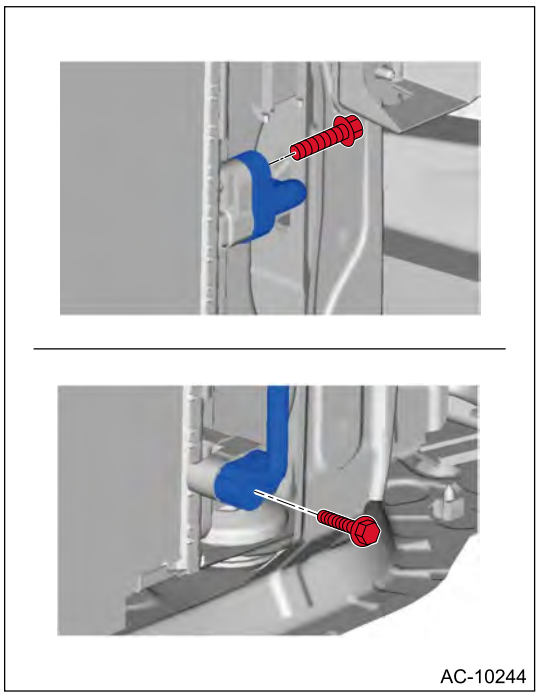
  2. If it does not operate normally, replace the compressor assembly.

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
4. Remove the lock assembly - front hood. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>REMOVAL.
5. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
6. Remove the bracket - bumper UPR and radiator upper frame. Ref. to COOLING(H4DO)>Radiator>REMOVAL.
7. Detach the hose - pressure discharge and the pipe - evaporator cooling.
   (1) Remove the bolts and remove the hose - pressure discharge.
   (2) Remove the bolt, and detach the pipe - evaporator cooling.

   Caution:

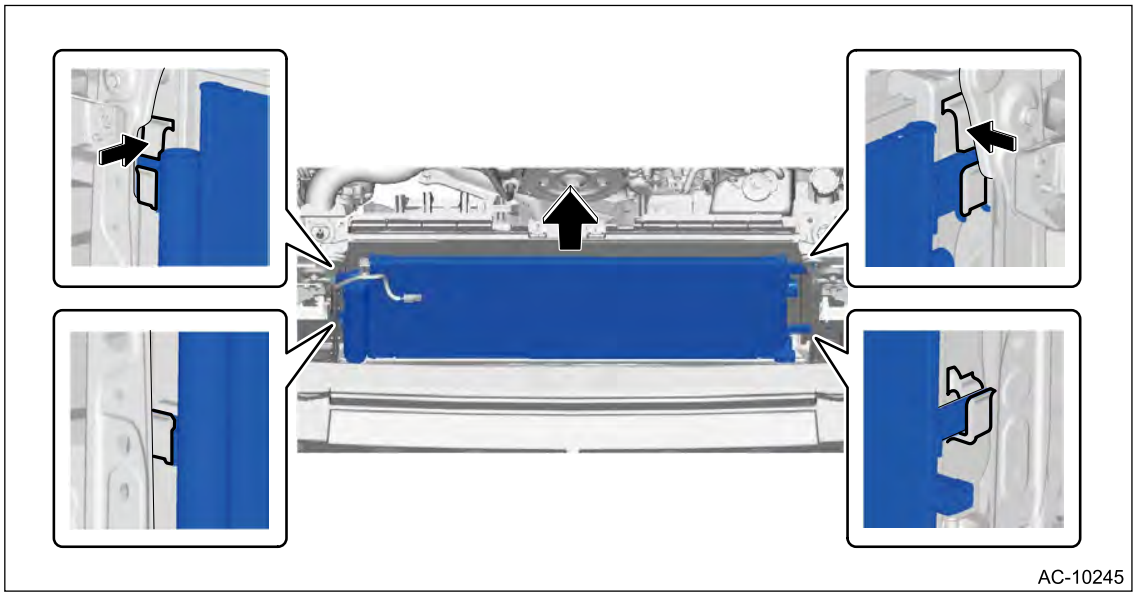
   Seal the disconnected hose, pipe and engaging part of condenser assembly with a plug or vinyl tape to prevent foreign matter from entering.



8. Remove the condenser assembly - air conditioner.
   (1) Release the hook and remove the guide.
   (2) Remove the condenser assembly - air conditioner as shown in the figure.

   Caution:

   Be careful not to damage the condenser and radiator fin. If a damaged fin is found, repair it using a thin screwdriver.



AIR CONDITIONER > Condenser

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **If the condenser assembly - air conditioner has been replaced, add an appropriate amount of compressor oil. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**

1. Install the condenser assembly - air conditioner.
2. Install the hose - pressure discharge and the pipe - evaporator cooling.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the bracket - bumper UPR and radiator upper frame. Ref. to COOLING(H4DO)>Radiator>INSTALLATION.
4. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
5. Install the lock assembly - front hood. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>INSTALLATION.
6. Install the air intake duct.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

AIR CONDITIONER > Condenser

INSPECTION

1. Check to see that the condenser fins are not clogged with debris or insects. Blow with compressed air or flush fins with water as needed.
2. If any oil leak is found, replace the condenser assembly - air conditioner.

REMOVAL

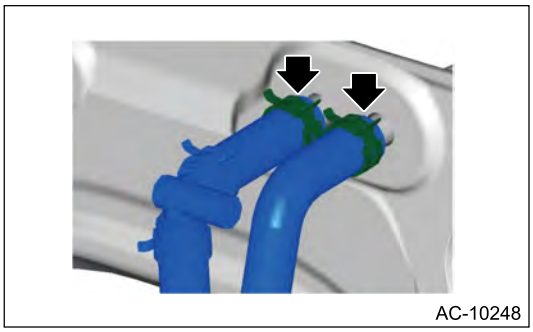
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the battery ground cable and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. Drain the coolant from the radiator. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT > DRAINING OF ENGINE COOLANT.
4. Move the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.

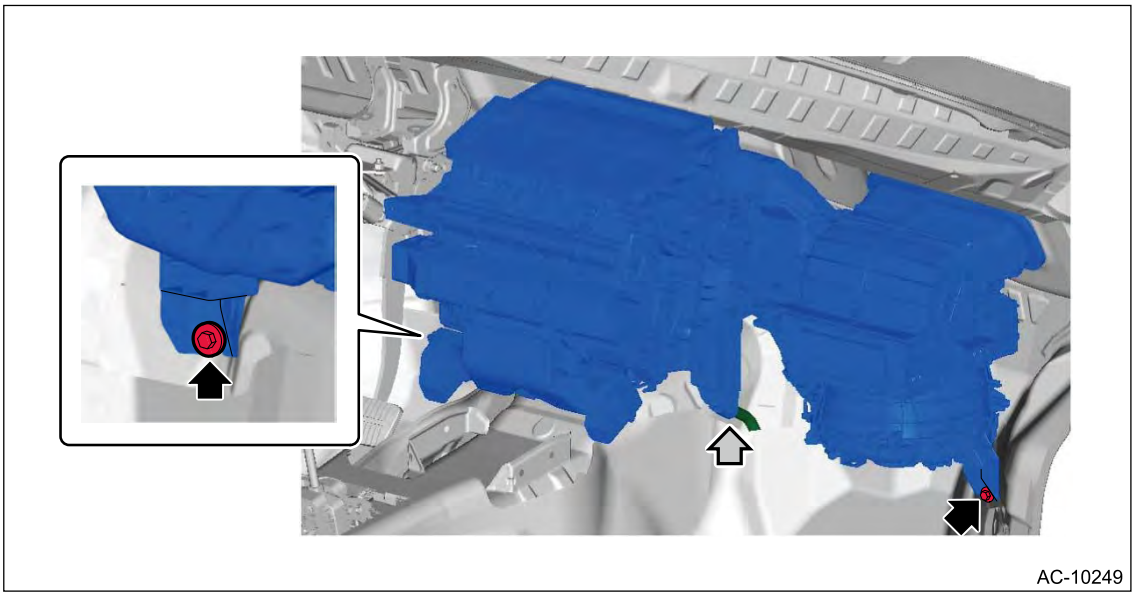
   Note:

   With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body.
5. Remove the expansion valve - cooling. Ref. to AIR CONDITIONER>Expansion Valve>REMOVAL.
6. Disconnect the hose - heater outlet and the hose - heater inlet.
   (1) Loosen the clamp, and detach the hose - heater outlet.
   (2) Loosen the clamp, and detach the hose - heater inlet.



   Note:

   Put alignment marks to hoses, clamps, etc.
7. Remove the instrument panel assembly and the beam COMPL - steering. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>REMOVAL.
8. Remove the duct - rear heater front. Ref. to AIR CONDITIONER>Heater Duct>REMOVAL > FRONT.
9. Remove the duct - foot. Ref. to AIR CONDITIONER>Heater Duct>REMOVAL > FOOT.
10. Remove the heater and cooling unit assembly.
    (1) Remove the hose - drain.
    (2) Remove the bolt and remove the heater and cooling unit assembly.



11. Remove the blower motor unit assembly. Ref. to AIR CONDITIONER>Blower Motor Unit Assembly>REMOVAL.

AIR CONDITIONER > Heater and Cooling Unit

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

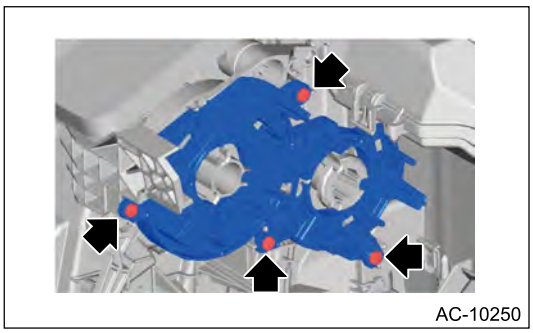
1. Install the blower motor unit assembly.
2. Install the heater and cooling unit assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the hose - drain.
4. Install the duct - foot.
5. Install the duct - rear heater front.
6. Install the instrument panel assembly and the beam COMPL - steering. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>INSTALLATION.
7. Install the hose - heater outlet and the hose - heater inlet.
8. Install the expansion valve - cooling. Ref. to AIR CONDITIONER>Expansion Valve>INSTALLATION.
9. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
11. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.
12. Fill engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.

REMOVAL

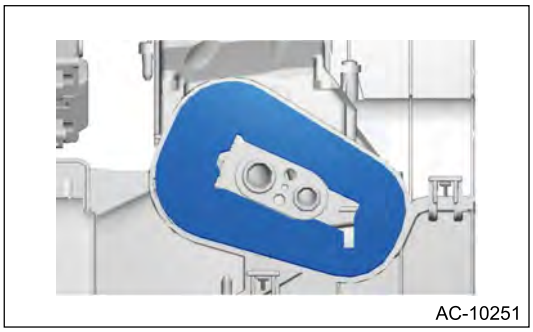
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

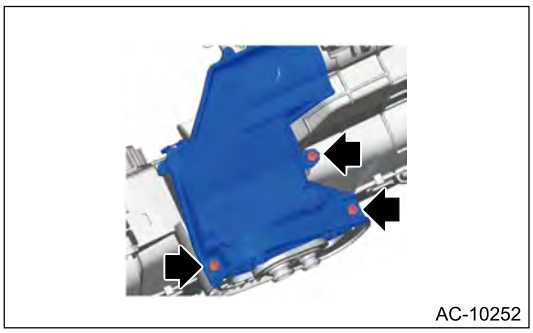
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>REMOVAL.
3. Remove the heater core. Ref. to AIR CONDITIONER>Heater Core>REMOVAL.
4. Remove the motor - actuator mix LH and RH. (auto A/C model) Ref. to AIR CONDITIONER>Air Mix Door Actuator>REMOVAL.
5. Remove the bracket - cable. (manual A/C model)
   (1) Remove the screws, and then remove the bracket - cable.


AC-10250

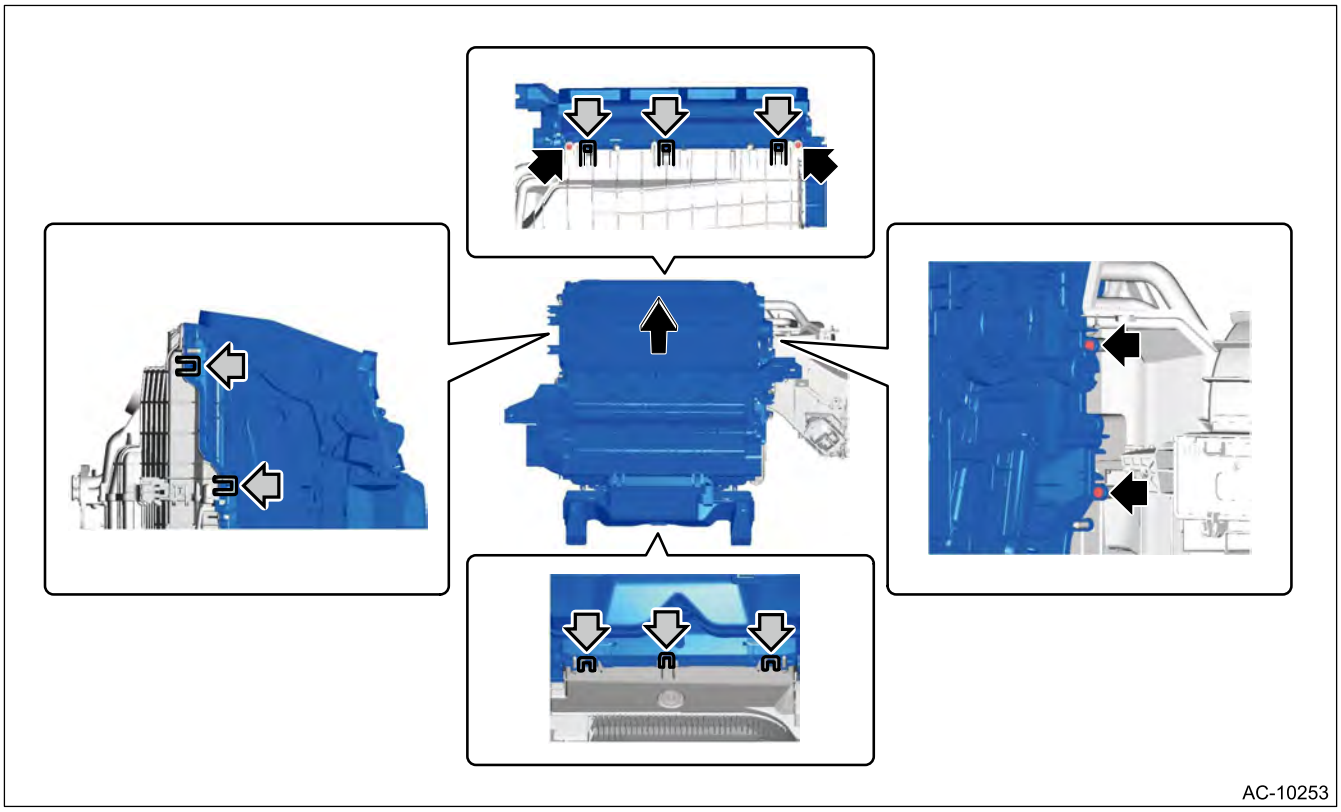
6. Remove the cover - evaporator.
   (1) Remove the packing.


AC-10251

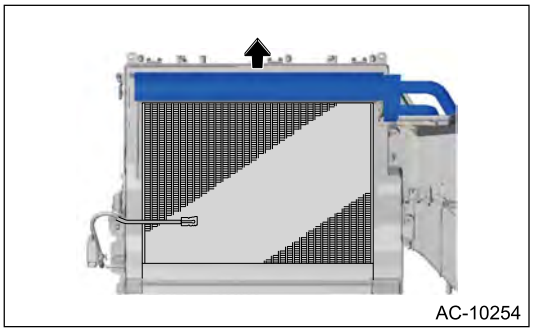
   (2) Remove the screws and lock to remove the cover - evaporator.


AC-10252

7. Remove the case assembly - heater unit.
   (1) Remove the screws.
   (2) Remove the lock, and remove the case assembly - heater unit.



8. Remove the evaporator assembly - cooling as shown in the figure.



9. Remove the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor>REMOVAL.

AIR CONDITIONER > Evaporator

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **If the evaporator has been replaced, add an appropriate amount of compressor oil to the compressor. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the evaporator sensor to the specified location. Ref. to AIR CONDITIONER>Evaporator Sensor>INSTALLATION.

2. Install the evaporator assembly - cooling.
3. Install the case assembly - heater unit.
4. Install the cover - evaporator.
5. Install the bracket - cable. (manual A/C model)
6. Install the motor - actuator mix LH and RH. (auto A/C model) Ref. to AIR CONDITIONER>Air Mix Door Actuator>INSTALLATION.
7. Attach the heater core.
8. Install the heater and cooling unit assembly. Ref. to AIR CONDITIONER>Heater and Cooling Unit>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Evaporator

INSPECTION

1. Check the evaporator fin for dust. Blow with compressed air or flush fins with water as needed.
2. If any oil leak is found from the evaporator, replace the evaporator assembly - cooling.

AIR CONDITIONER > Expansion Valve

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. Move the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.

   Note:

   With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body.
4. Disconnect the hose - pressure suction and the pipe - evaporator cooling.

   (1) Remove the bolts and nuts, and detach the hose - pressure suction.

   (2) Remove the clips, and detach the pipe - evaporator cooling.

   Caution:

   Seal the engaging parts of the disconnected hose, pipe and expansion valve - cooling with a plug or vinyl tape to prevent foreign matter from entering.

5. Remove the expansion valve - cooling.

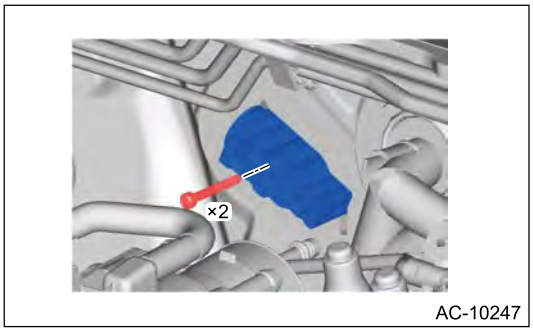
   (1) Remove the bolt, and remove the expansion valve - cooling.

   Caution:

   Seal the engaging parts of the pipe and expansion valve - cooling with a plug or vinyl tape to prevent foreign matter from entering.

   Preparation tool:

   Hexagon wrench: 4 mm (0.16 in)



AIR CONDITIONER > Expansion Valve

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**

1. Install the expansion valve - cooling.
   Preparation tool:
   Hexagon wrench: 4 mm (0.16 in)
   Tightening torque:
   3.5 N·m (0.4 kgf-m, 2.6 ft-lb)
2. Install the hose - pressure suction and the pipe - evaporator cooling.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

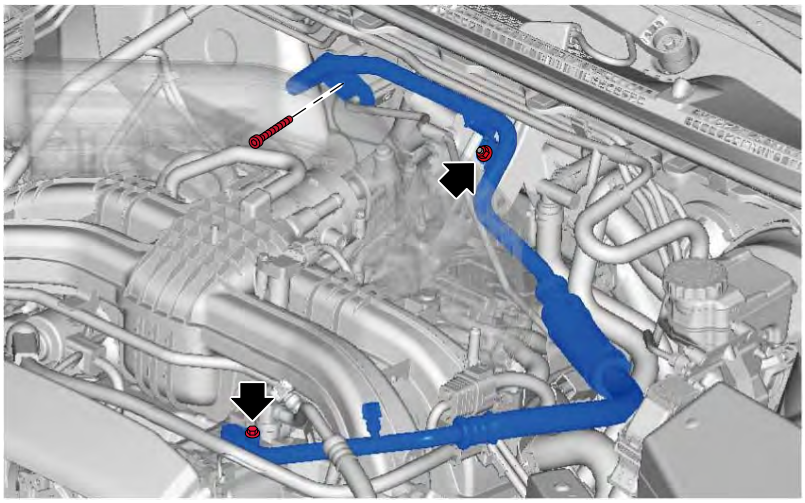
REMOVAL

1. LOW-PRESSURE HOSE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body, and move the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.
4. Remove the hose - pressure suction.
   (1) Remove the nut.
   (2) Remove the bolts and remove the hose - pressure suction.

Caution:

- **Do not apply excessive force to the hose.**
- **Seal the engaging parts of the disconnected hose, compressor assembly and expansion valve - cooling with a plug or vinyl tape to prevent foreign matter from entering.**



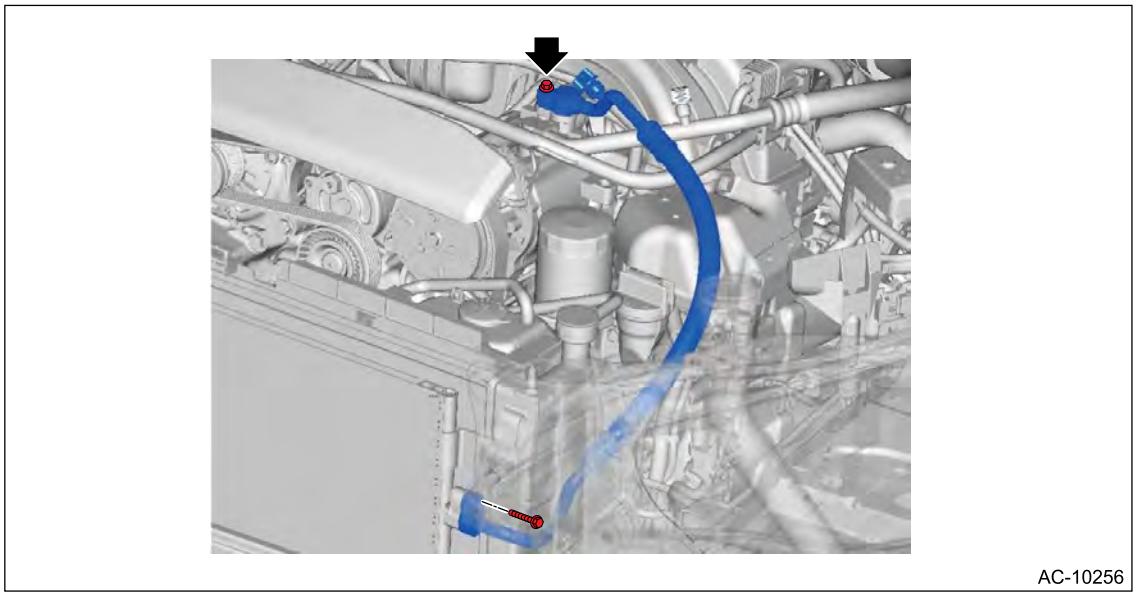
AC-10255

2. HIGH-PRESSURE HOSE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
4. Remove the lock assembly - front hood. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>REMOVAL.
5. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
6. Remove the bracket - bumper UPR and radiator upper frame. Ref. to COOLING(H4DO)>Radiator>REMOVAL.
7. Remove the hose - pressure discharge.
   (1) Remove the bolts, and remove the hose - pressure discharge.

Caution:

- **Do not apply excessive force to the hose.**
- **Seal the engaging parts of the disconnected hose, compressor assembly and condenser assembly - air conditioner with a plug or vinyl tape to prevent foreign matter from entering.**



3. A/C PIPE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Using the refrigerant recovery system, discharge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Recovery Procedure>PROCEDURE.
3. Remove the battery and battery box. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>REMOVAL.
4. Move the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>REMOVAL.

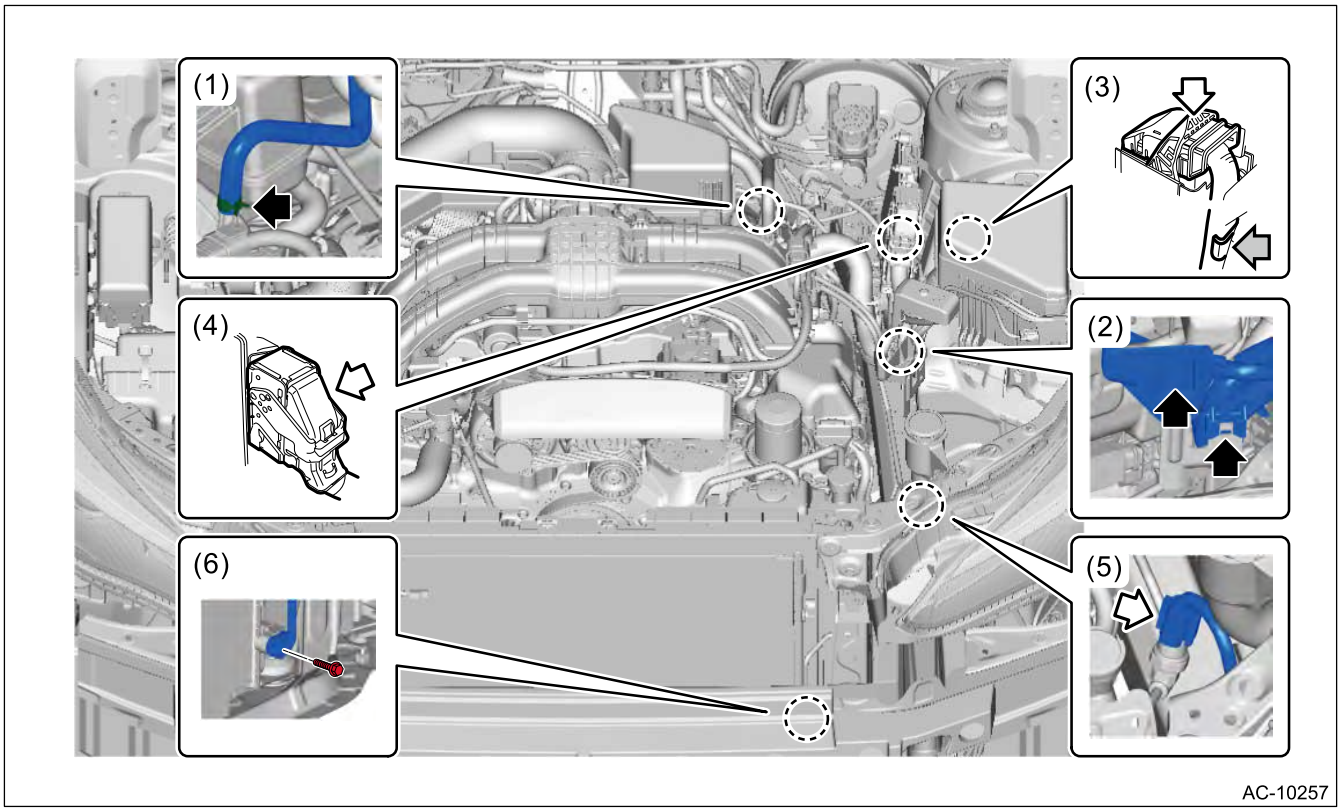
   Note:

   With the PCV hose connected, remove the air intake boot from the air cleaner case (rear) and throttle body.
5. Remove the hose - pressure suction. Ref. to AIR CONDITIONER>Hose and Pipe>REMOVAL > LOW-PRESSURE HOSE.
6. Remove the hose - pressure discharge. Ref. to AIR CONDITIONER>Hose and Pipe>REMOVAL > HIGH-PRESSURE HOSE.
7. Remove the pipe - evaporator cooling.

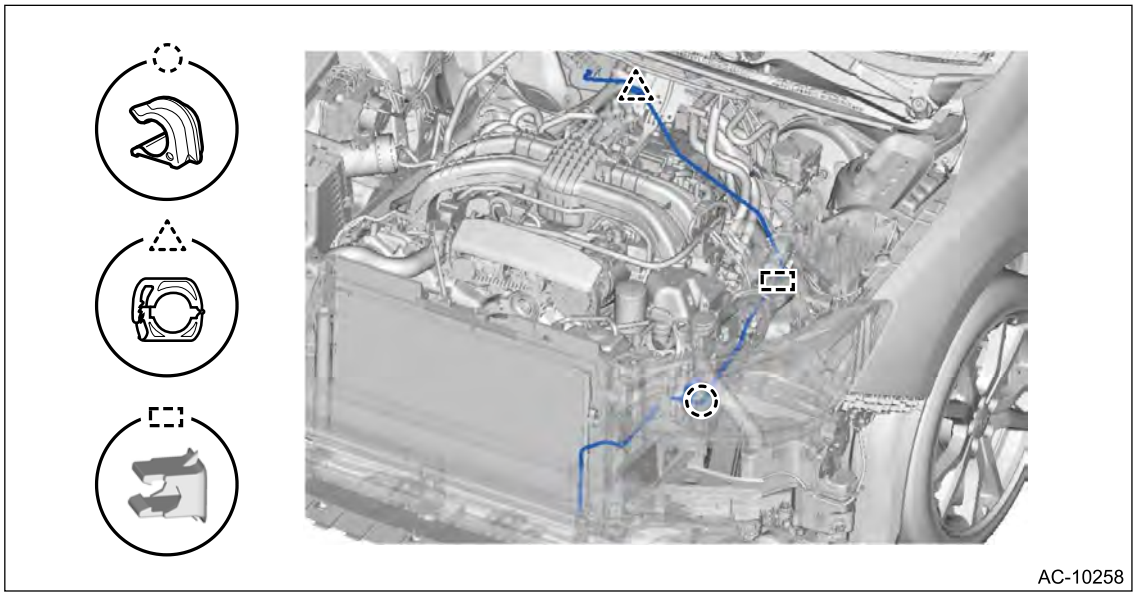
   Caution:

   - **Do not apply excessive force to the pipe.**
   - **Seal the engaging parts of the disconnected pipe, expansion valve - cooling and condenser assembly - air conditioner with a plug or vinyl tape to prevent foreign matter from entering.**
   - **Do not pull the harness and cable forcibly.**

   (1) Remove the clamp and remove the vacuum hose.
   (2) Release the claws, and remove the battery cable bracket and engine harness bracket.
   (3) Disconnect the battery box connector, and detach the harness clip.
   (4) Disconnect the upper connector of the engine control module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
   (5) Disconnect the connector of the pressure switch or pressure sensor.
   (6) Remove the bolt, and detach the pipe - evaporator cooling.



(7) Remove the clip - pipe and the clip, and remove the pipe - evaporator cooling.



AIR CONDITIONER > Hose and Pipe

INSTALLATION

1. LOW-PRESSURE HOSE

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **If the hose and pipe has been replaced, add an appropriate amount of compressor oil to the compressor. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **When connecting hoses, do not apply an excessive force to them. After installing, check that no torsion or excessive tension applied to the hoses.**

1. Install the hose - pressure suction.
   Tightening torque:
   Air conditioning unit: Ref. to AIR CONDITIONER>General Description>COMPONENT > AIR CONDITIONING UNIT.
2. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

2. HIGH-PRESSURE HOSE

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **If the hose and pipe has been replaced, add an appropriate amount of compressor oil to the compressor. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **When connecting hoses, do not apply an excessive force to them. After installing, check that no torsion or excessive tension applied to the hoses.**

1. Install the hose - pressure suction discharge.
   Tightening torque:
   Air conditioning unit: Ref. to AIR CONDITIONER>General Description>COMPONENT > AIR CONDITIONING UNIT.
2. Install the bracket - bumper UPR and radiator upper frame. Ref. to COOLING(H4DO)>Radiator>INSTALLATION.
3. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
4. Install the lock assembly - front hood. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>INSTALLATION.
5. Install the air intake duct.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

3. A/C PIPE

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **If the hose and pipe has been replaced, add an appropriate amount of compressor oil to the compressor. Ref. to AIR CONDITIONER>Compressor Oil>ADJUSTMENT.**
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **When connecting pipes, do not apply an excessive force to them. After installation, check that the pipes are not damaged.**

1. Install the pipe - evaporator cooling.
   (1) Install the pipe - evaporator cooling.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
   (2) Connect the connector of the pressure switch or pressure sensor.
   (3) Connect the upper connector of the engine control module (ECM). Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSTALLATION.
   (4) Connect the connector and harness of the battery box.
   (5) Install the engine harness bracket.
   (6) Install the battery cable bracket.
   (7) Install the vacuum hose.
2. Install the hose - pressure suction discharge. Ref. to AIR CONDITIONER>Hose and Pipe>INSTALLATION > HIGH-PRESSURE HOSE.
3. Install the hose - pressure suction. Ref. to AIR CONDITIONER>Hose and Pipe>INSTALLATION > LOW-PRESSURE HOSE.
4. Install the air intake boot. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Boot>INSTALLATION.
5. Install the battery and battery box. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSTALLATION.
6. Charge refrigerant. Ref. to AIR CONDITIONER>Refrigerant Charging Procedure>PROCEDURE.

AIR CONDITIONER > Hose and Pipe

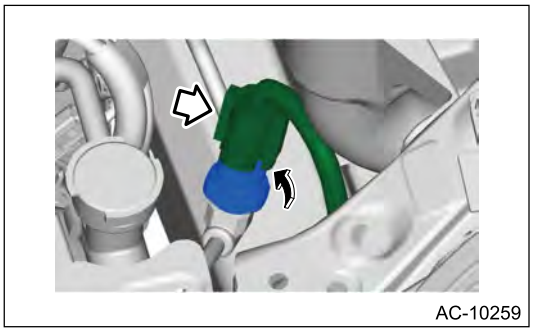
INSPECTION

1. Check the hoses for cracks, damage and expansion. If there is a malfunction, replace the hose - pressure suction or the hose - pressure discharge.
2. Check the pipes for crack or damage. If there is a malfunction, replace the pipe - evaporator cooling.

AIR CONDITIONER > Pressure Switch (Triple Pressure Switch)

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pressure switch.
   (1) Disconnect the connector.
   (2) Remove the pressure switch as shown in the figure.
   Caution:
   - **Do not deform the pipe.**
   - **Seal the engaging parts of the disconnected pipe and pressure switch with a plug or vinyl tape to prevent foreign matter from entering.**



AIR CONDITIONER > Pressure Switch (Triple Pressure Switch)

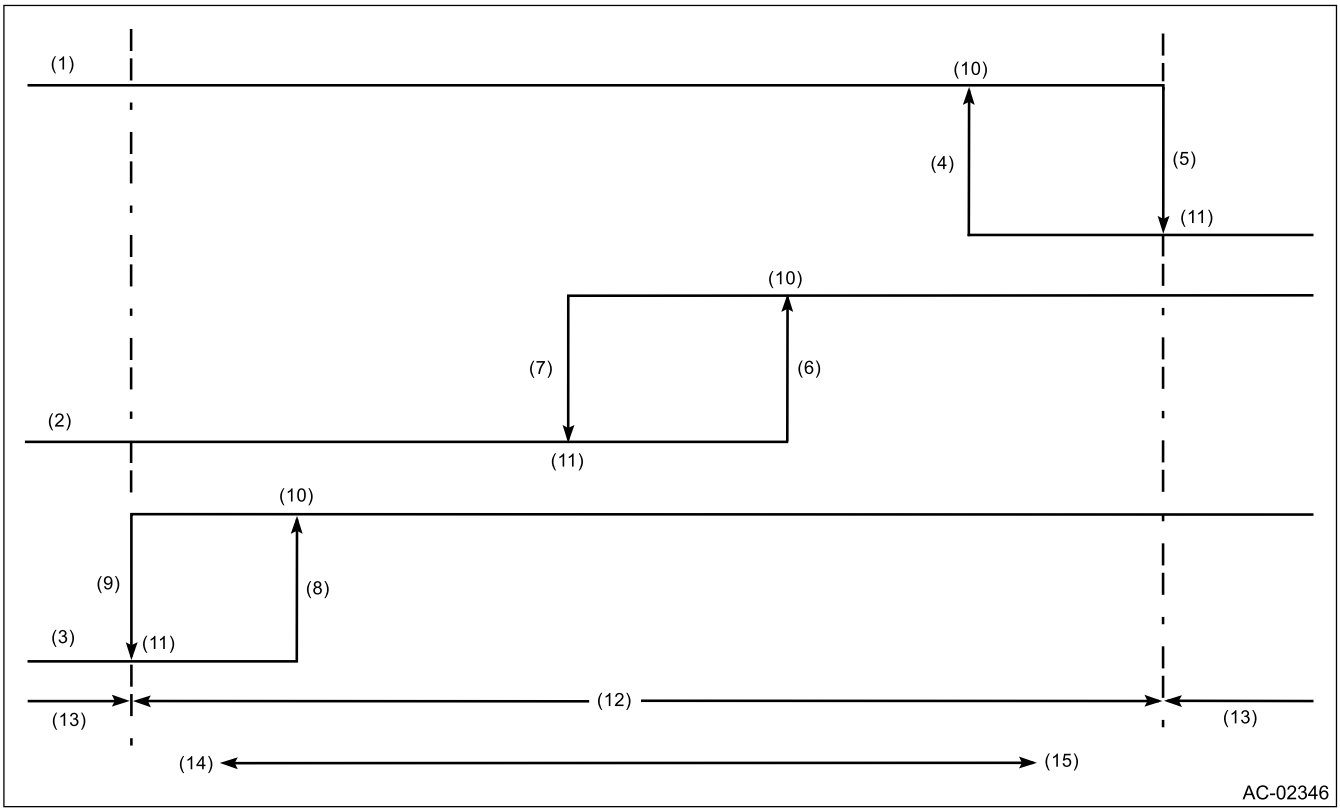
INSTALLATION

1. Install the pressure switch.
   Tightening torque:
   10.8 N·m (1.1 kgf-m, 8 ft-lb)
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Pressure Switch (Triple Pressure Switch)

INSPECTION

1. Connect the manifold gauge to the service valve on the high-pressure side.
2. Disconnect the pressure switch connector.
3. Start the air conditioner, and check the operating pressure of switch by turning the compressor (magnet clutch) to ON/OFF. Operation of each switch is as follows.



(1) High pressure switch

(2) Middle pressure switch

(3) Low pressure switch

(4) 2,475±325 kPa (25.24±3.31 kg/cm^2, 358.9±47.1 psi)

(5) $3{,}140^{+50}_{-200}$ kPa ($32.02^{+0.51}_{-2.04}$ kg/cm^2, $455.3^{+7.2}_{-29}$ psi)

(6) 1,770±80 kPa (18.05±0.82 kg/cm^2, 256.6±11.6 psi)

(7) 1,370±120 kPa (13.97±1.22 kg/cm^2, 198.6±17.4 psi)

(8) 225^{+25}_{-29} kPa ($2.29^{+0.25}_{-0.3}$ kg/cm^2, $32.6^{+3.6}_{-4.2}$ psi)

(9) 196±20 kPa (2±0.2 kg/cm^2, 28.4±2.9 psi)

(10) ON

(11) OFF

(12) Operative range of compressor

(13) Inoperative range of compressor

(14) Low pressure

(15) High pressure

Note:

- **High pressure switch turns the compressor (magnet clutch) to OFF when the refrigerant pressure becomes extremely high to prevent the evaporator, air conditioner piping and expansion valve from getting damaged, etc.**
- **The middle pressure switch is used to effectively control the radiator fan output by judging high load/low load in normal pressure range.**
- **The low pressure switch detects a refrigerant shortage and deactivates the compressor (magnet clutch) if the refrigerant pressure is abnormally low. (Because any further compressor operation in such a state may lead to compressor seizure)**

AIR CONDITIONER > Pressure Sensor

NOTE

For pressure sensor operation procedures, refer to “Pressure Switch (Triple Pressure Switch)” section.
Ref. to AIR CONDITIONER>Pressure Switch (Triple Pressure Switch).

AIR CONDITIONER > Pressure Sensor

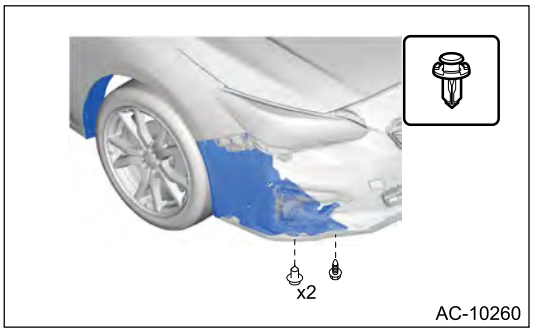
INSPECTION

1. Perform a diagnosis code (DTC) check by connecting the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.
   Note:
   For detailed operation procedures, refer to “Application help”.
2. If the following diagnosis code (DTC) is displayed, refer to “Diagnostic Procedure with Diagnostic Trouble Code (DTC)” in “AIR CONDITIONER (DIAGNOSTICS)” section.
   - DTC B14A3 (REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN): Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN.
   - DTC B14A4 (REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT): Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A4 REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT .

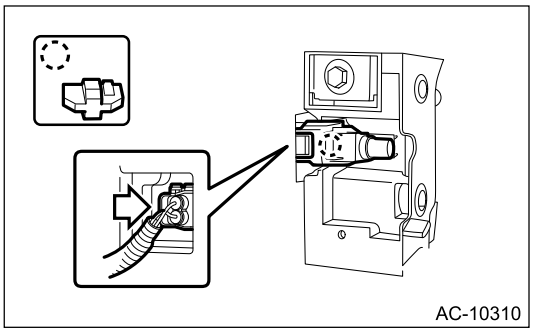
AIR CONDITIONER > Ambient Sensor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the screw and clips, and turn over the mud guard - front.



5. Disconnect the connector and remove the ambient sensor.
   (1) Disconnect the connector.
   (2) Release the claws and remove the ambient sensor.

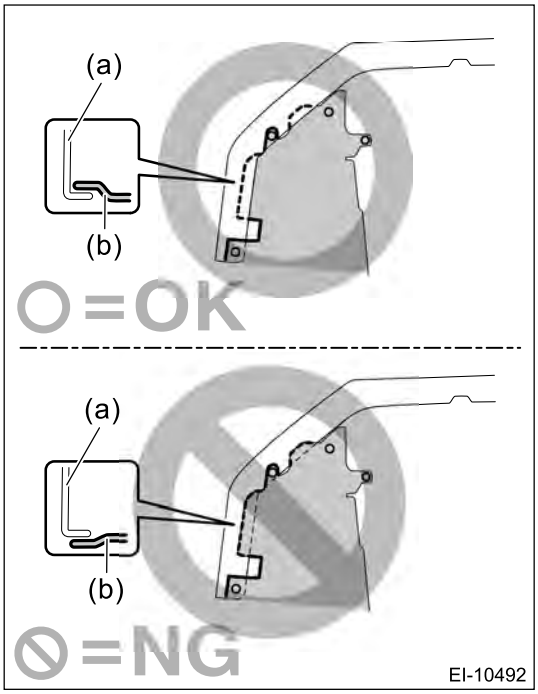


AIR CONDITIONER > Ambient Sensor

INSTALLATION

Caution:

Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Install the ambient sensor.
2. Install the mud guard - front.
3. Install the under cover - front.

   Tightening torque:

   18 N·m (1.8 kgf-m, 13.3 ft-lb)
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Ambient Sensor

INSPECTION

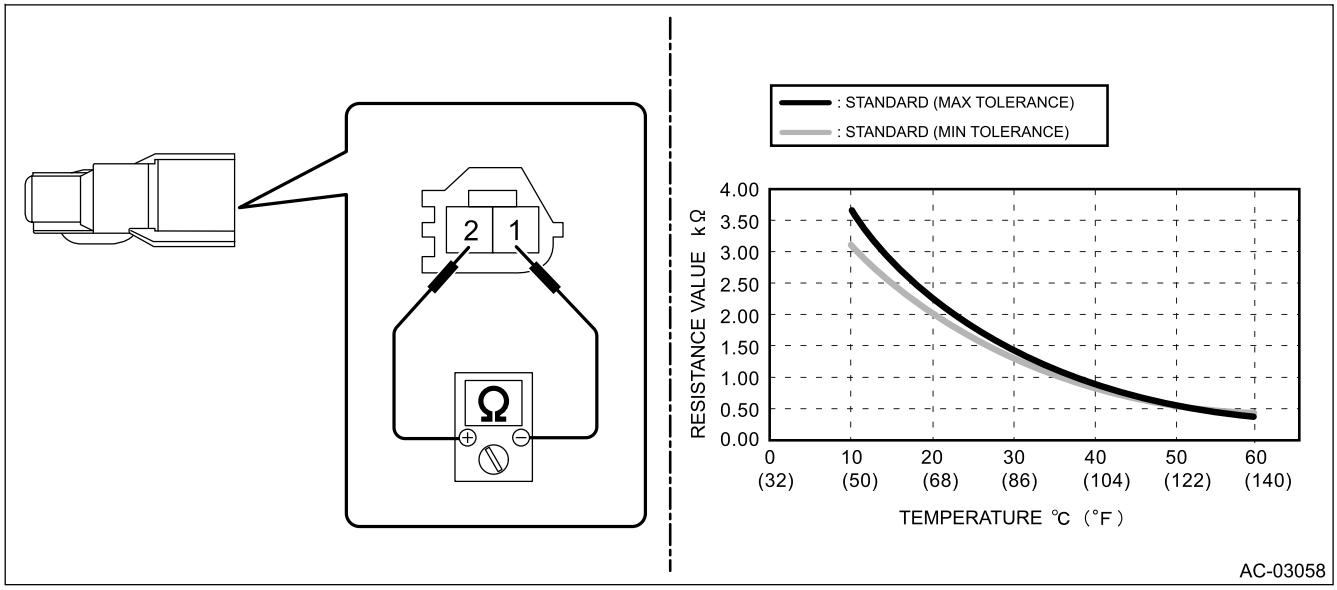
1. Visually check the ambient sensor for dirt or damage, and clean or replace as necessary.
2. Measure the resistance between connector terminals.

   Caution:

   During inspection, be careful not to touch the sensor end in order to avoid misjudgment due to body temperature.

   Preparation tool:

   Circuit tester



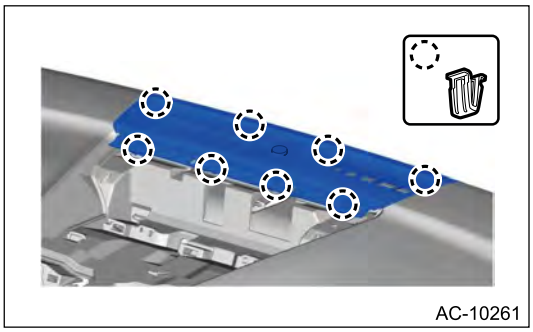
Terminal No.	Inspection conditions	Standard
1 — 2	10°C	3.12 — 3.7 kΩ
	15°C	2.49 — 2.88 kΩ
	20°C	2 — 2.26 kΩ
	25°C	1.62 — 1.79 kΩ
	30°C	1.32 — 1.42 kΩ
	35°C	1.08 — 1.14 kΩ
	40°C	0.89 — 0.92 kΩ
	45°C	0.74 — 0.75 kΩ
	50°C	0.62 — 0.62 kΩ
	55°C	0.52 — 0.51 kΩ
	60°C	0.44 — 0.42 kΩ

3. Replace the ambient sensor if the inspection result is not within the standard value.

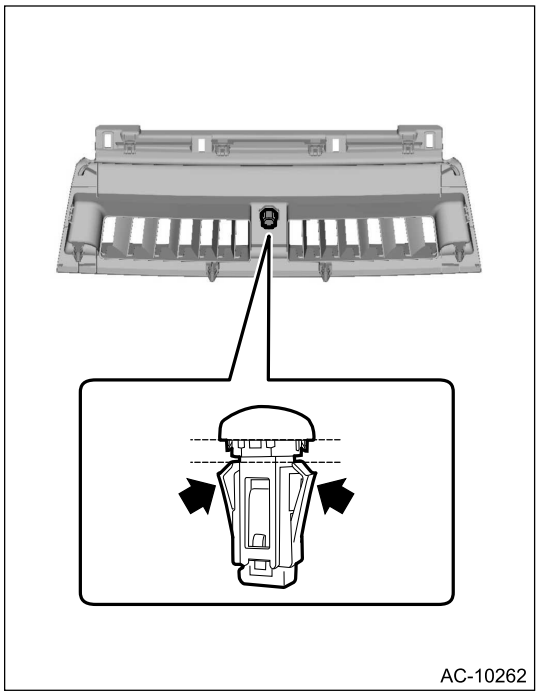
AIR CONDITIONER > Sunload Sensor (Auto A/C Model)

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the multi-function display. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD)>REMOVAL.
3. Remove the grille - front defroster.
   (1) Release the clips.



   (2) Disconnect the connector and remove the grille - front defroster.
4. Remove the sunload sensor.
   (1) Release the claws and remove the sunload sensor.



AIR CONDITIONER > Sunload Sensor (Auto A/C Model)

INSTALLATION

1. Install the sunload sensor.
2. Install the grille - front defroster.
3. Install the multi-function display. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD)>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Sunload Sensor (Auto A/C Model)

INSPECTION

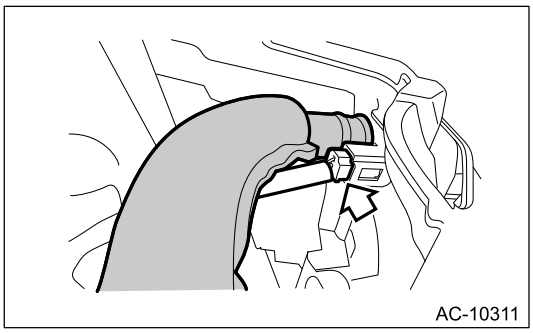
1. Check if there is anything that affects sensing, around the sunload sensor.
   (1) Is the sunload sensor free from any object that disturbs sensing?
   (2) Is the windshield glass free from any object such as sticker or film that disturbs sensing?
   - **Yes** → Go to step 2.
   - **No** → Remove everything that affects sensing.
2. Check the sunload sensor using the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (1) Connect the Subaru Select Monitor.
   (2) On [Start] display, select [Diagnosis].
   (3) On [Select Vehicle] display, enter vehicle information and select [OK].
   (4) On [Select multiple system] display, select [Air Conditioner], and then select [Next].
   (5) On [Select Function] display, select [Data Monitor].
   (6) From the data monitor item list, select [Quantity of Sunload].
   (7) Cover the sunload sensor with cloth and the like to avoid direct light. Does [Quantity of Sunload] indicate [0 W/m^2]?
   - **Yes** → Go to step 3.
   - **No** → Replace the sunload sensor.
3. From step 2), expose the sunload sensor to light.
   (1) Place intense light such as incandescent light at 300 mm (11.81 in) or less from the sunload sensor.
   (2) Does [Quantity of Sunload] show [2,000 W/m^2] or less?
   Caution:
   The value changes depending on the angle of light.
   - **Yes** → The sunload sensor is normal.
   - **No** → Replace the sunload sensor.

AIR CONDITIONER > In-Vehicle Sensor (Auto A/C Model)

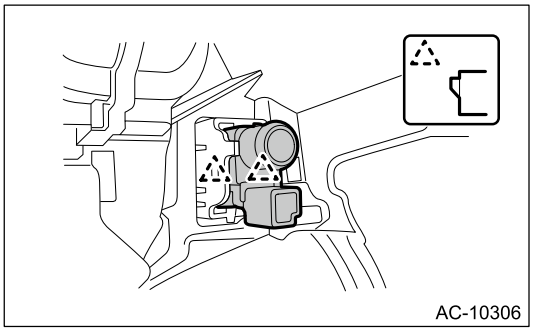
REMOVAL

Caution:
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the in-vehicle sensor.
   (1) Disconnect the aspirator hose and connector.



   (2) Release the claws and remove the in-vehicle sensor.



AIR CONDITIONER > In-Vehicle Sensor (Auto A/C Model)

INSTALLATION

Caution:
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the in-vehicle sensor.
2. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
3. Install the cover assembly - instrument panel LWR driver.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

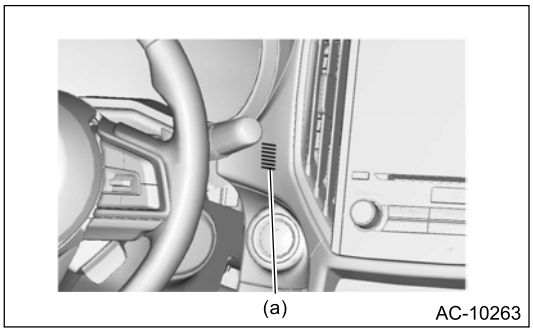
AIR CONDITIONER > In-Vehicle Sensor (Auto A/C Model)

INSPECTION

1. Set the vehicle to the following conditions.

Item	Condition
Ignition switch	ON
A/C switch	ON
Temperature adjustment dial	HI (MAX HOT)
Air flow control dial or switch	DEF
Fan dial	HI (MAX)

2. Check the suction port (a) for in-vehicle sensor of the cover assembly - instrument panel LWR driver.



(1) Put a strip of paper close to the front side of the suction port (a).

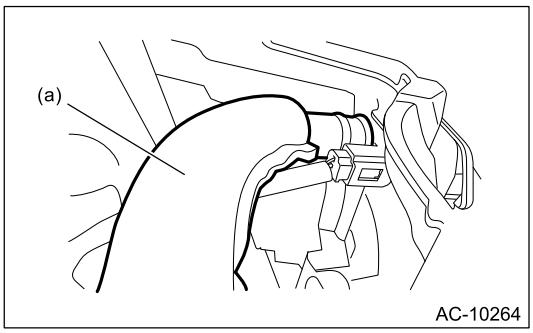
(2) Can you see the paper moving towards the port and the air being sucked into the port?

Caution:

Be careful not to let the paper get sucked into the port.

- **Yes** → Go to step 5.
- **No** → Go to step 3.

3. Remove the cover assembly - instrument panel LWR driver, and check the aspirator hose (a).



(1) Are the in-vehicle sensor and aspirator hose connected securely?

(2) Is the aspirator hose free from any kinks or cracks?

- **Yes** → Go to step 4.
- **No** → Repair or replace the aspirator hose if necessary.

4. Check if there is anything that affects sensing, around the in-vehicle sensor.

(1) Is the in-vehicle sensor hole free from clogging?

(2) Is the peripheral area of in-vehicle sensor free from any heat-producing parts?

- **Yes** → Go to step 5.
- **No** → Remove everything that affects sensing.

5. Check in-vehicle sensor.

(1) Disconnect the connector.

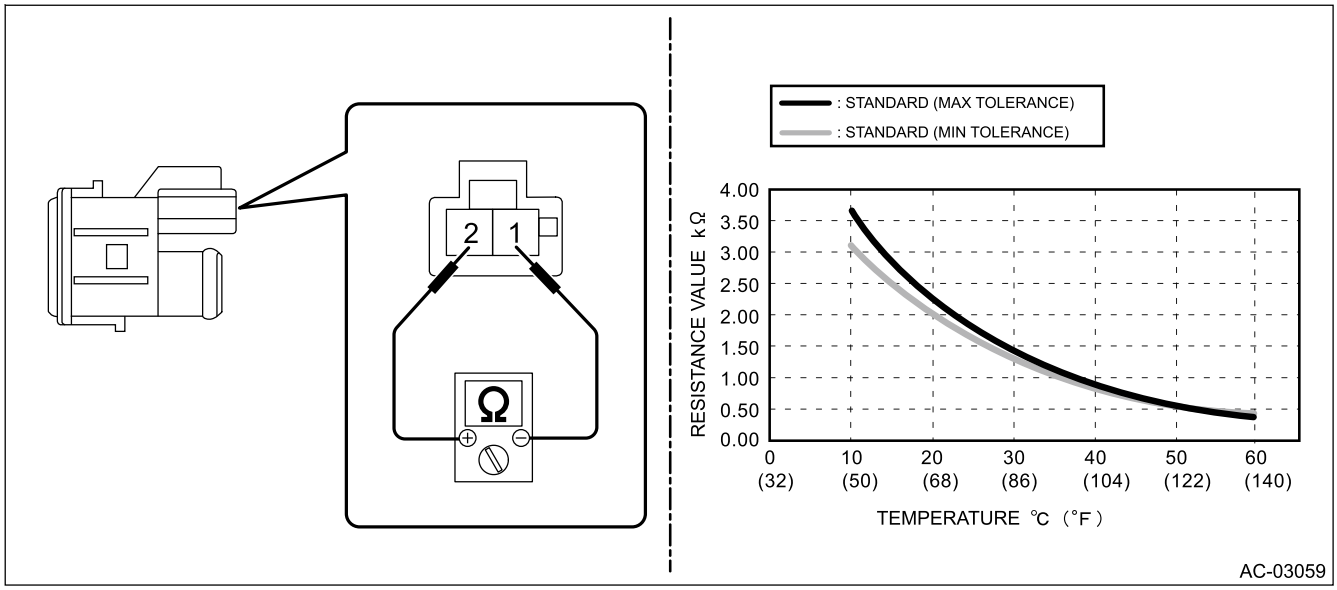
(2) Measure the resistance between connector terminals.

Caution:

During inspection, be careful not to touch the sensor end in order to avoid misjudgment due to body temperature.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	10°C	3.12 — 3.7 kΩ
	15°C	2.49 — 2.88 kΩ
	20°C	2 — 2.26 kΩ
	25°C	1.62 — 1.79 kΩ
	30°C	1.32 — 1.42 kΩ
	35°C	1.08 — 1.14 kΩ
	40°C	0.89 — 0.92 kΩ
	45°C	0.74 — 0.75 kΩ
	50°C	0.62 — 0.62 kΩ
	55°C	0.52 — 0.51 kΩ
	60°C	0.44 — 0.42 kΩ

(3) Is the resistance within the standard?

- **Yes** → The in-vehicle sensor is normal.
- **No** → Replace the in-vehicle sensor.

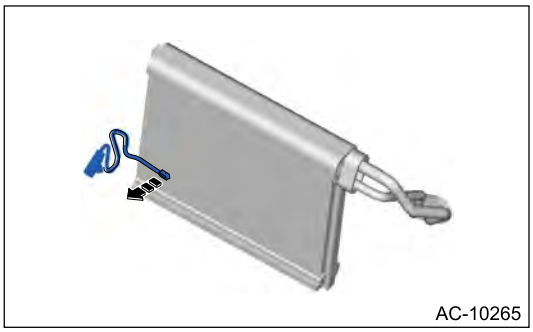
AIR CONDITIONER > Evaporator Sensor

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the evaporator assembly - cooling. Ref. to AIR CONDITIONER>Evaporator>REMOVAL.
3. Remove the evaporator sensor.
   (1) Remove the evaporator sensor as shown in the figure.



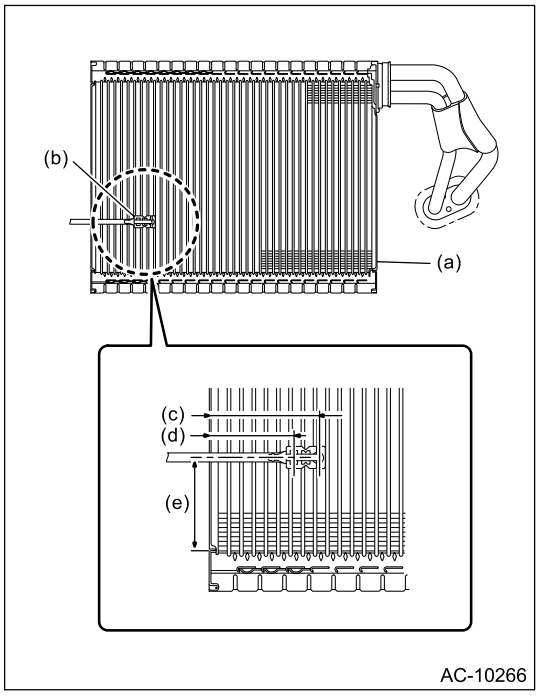
AIR CONDITIONER > Evaporator Sensor

INSTALLATION

Caution:

- **Since the auto A/C model uses the variable displacement compressor, be careful of the following items.**
  – Do not start the engine before charging refrigerant.
  – If the engine is started with no refrigerant charge, replace the compressor assembly.
- **Replace the O-rings with new parts, and then apply compressor oil to install completely.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the evaporator sensor at the position shown in the figure below.



(a) Evaporator
(b) Evaporator sensor
(c) 61.1 mm (2.41 in)
(d) 48 mm (1.89 in)
(e) 50 mm (1.97 in)

2. Install the evaporator assembly - cooling. Ref. to AIR CONDITIONER>Evaporator>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Evaporator Sensor

INSPECTION

1. Prepare the vehicle.
   Note:
   Check that the ambient temperature is 25 — 40°C (77 — 104°F) and that the humidity is 30% — 80%.
   - Place the vehicle in the workshop or in the shade and windless condition.
   - Open all windows.
2. Set the vehicle to the following conditions.

Item	Condition
Engine	Idling
Air vent grille	Shutter is fully open.
A/C switch	OFF
Temperature adjustment dial	LO (MAX COOL)
FRESH/RECIRC switch	RECIRC
Air flow control dial or switch	VENT
Fan dial	5/7 level

3. Using the Subaru Select Monitor, check the evaporator sensor.

Note:

For detailed operation procedures, refer to "Application help".

(1) Connect the Subaru Select Monitor.

(2) On [Start] display, select [Diagnosis].

(3) On [Select Vehicle] display, enter vehicle information and select [Confirmed].

(4) On [Select System] display, select [Air Conditioner], and then select [Confirmed].

(5) On [Select Function] display, select [Data Monitor].

(6) From the data monitor item list, select [Evaporator Temperature Target].

(7) Idle the engine for 15 minutes, and then compare the air flow outlet temperature with [Evaporator Temperature Target].

Preparation tool:

Thermometer and hygrometer

Note:

For outlet opening temperature, measure the average temperature of center grille assembly and side grille assembly.

(8) Is the difference between outlet opening temperature and [Evaporator Temperature Target] by 3°C (5.4°F) or more?

- **Yes** → Go to step 4.
- **No** → Evaporator sensor is normal.

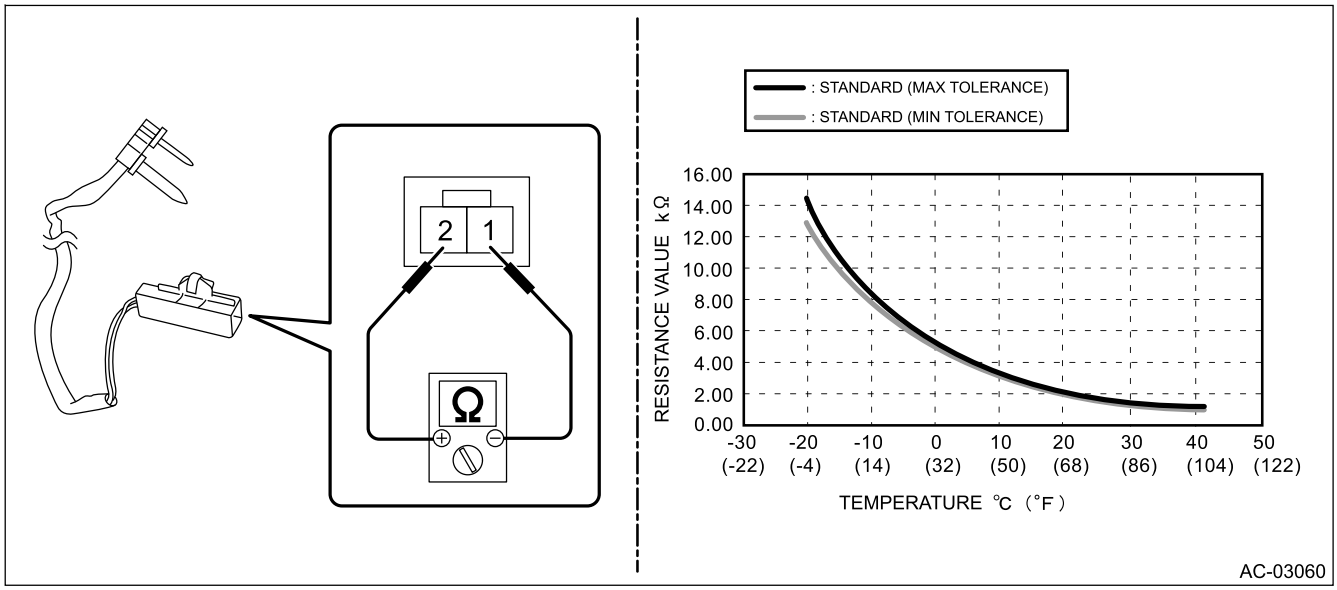
4. Check the evaporator sensor.

(1) Disconnect the connector.

(2) Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	−20°C	13.584 — 14.541 kΩ
	−15°C	10.34 — 10.946 kΩ
	−10°C	7.938 — 8.313 kΩ
	−5°C	6.143 — 6.366 kΩ
	0°C	4.79 — 4.914 kΩ
	5°C	3.718 — 3.829 kΩ
	10°C	2.889 — 3.031 kΩ
	15°C	2.247 — 2.435 kΩ
	20°C	1.785 — 1.952 kΩ

Terminal No.	Inspection conditions	Standard
	25°C	1.427 — 1.574 kΩ
	30°C	1.149 — 1.278 kΩ
	35°C	0.931 — 1.044 kΩ
	40°C	0.759 — 0.858 kΩ

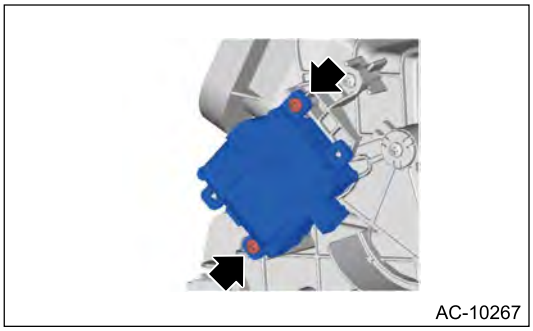
(3) Is the resistance within the standard?

- **Yes** → Evaporator sensor is normal.
- **No** → Replace the evaporator sensor.

AIR CONDITIONER > FRESH/RECIRC Door Actuator

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the motor - actuator intake.
   (1) Disconnect the connector.
   (2) Remove the screws, and remove the motor - actuator intake.



AIR CONDITIONER > FRESH/RECIRC Door Actuator

INSTALLATION

1. When replacing the link plate with a new part, apply a thin coat of grease evenly to the contact area inside the rail of link plate by using approx. 5 mm (0.2 in) width and approx. 0.1 g (0.004 oz) of grease squeezed out from a tube.
   Note:
   After installing the actuator, perform 3 — 5 times of adaptation for the grease to fit in.
   Preparation items:
   Genuine part: SUBARU genuine grease (72129AJ000)
2. Install the motor - actuator intake.
3. Install the pocket assembly and the back panel - pocket.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > FRESH/RECIRC Door Actuator

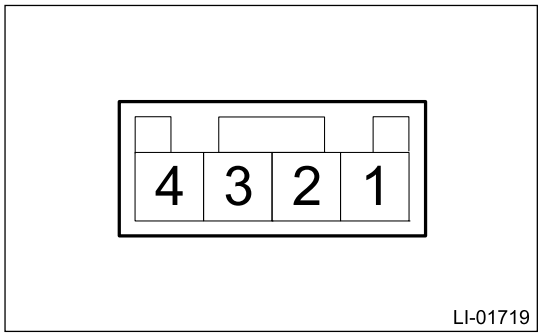
INSPECTION

1. ACTUATOR LINK

1. Visually check the operating range of the link, and remove the foreign matter if any.
2. Operate the FRESH/RECIRC switch, and check that the link operates normally.
3. If it does not operate normally as the result of inspection, perform a unit inspection of motor - actuator intake.

2. CHECK ACTUATOR

- **MANUAL A/C MODEL**
  1. Check the actuator operation when battery voltage is applied between the connector terminals.
     Caution:
     Disconnect the battery immediately after the actuator stops operation. Otherwise, the motor may be damaged.



Terminal No.	Inspection conditions	Operating position
4 (+) — 2 (−)	Apply battery voltage.	FRESH
4 (+) — 1 (−)		RECIRC

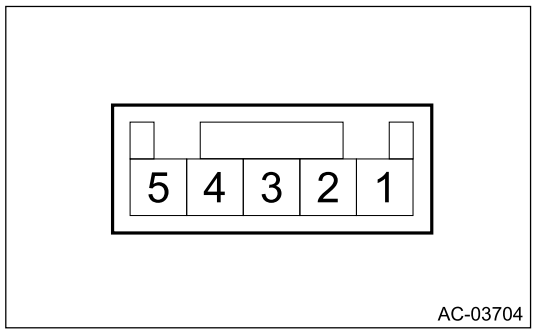
2. If it does not operate normally as the result of inspection, replace the motor - actuator intake.

- **AUTO A/C MODEL**

1. Check the actuator operation when battery voltage is applied between the connector terminals.

Caution:

Disconnect the battery immediately after the actuator stops operation. Otherwise, the motor may be damaged.



Terminal No.	Inspection conditions	Operating position
4 (+) — 5 (−)	Apply battery voltage.	FRESH
5 (+) — 4 (−)		RECIRC

2. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester

Terminal No.	Inspection conditions	Standard
1 — 3	Always	4.2 — 7.8 Ω

3. Connect the connector, turn the ignition switch to ON, and check the voltage between actuator terminals.

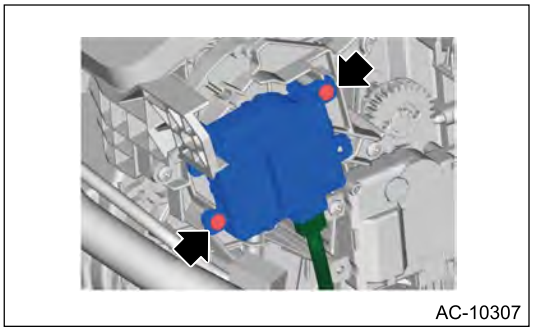
Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	FRESH	Approx. 1.9 V
	RECIRC	Approx. 4.5 V

4. If it is found defective as a result of inspection, replace the motor - actuator intake.

AIR CONDITIONER > Mode Door Actuator

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the motor - actuator mode.
   (1) Disconnect the connector.
   (2) Remove the screws and detach the motor - actuator mode.



AIR CONDITIONER > Mode Door Actuator

INSTALLATION

1. When replacing the link - mode with a new part, apply a thin coat of grease evenly to the contact area inside the rail of link - mode by using approx. 5 mm (0.2 in) width and approx. 0.1 g (0.004 oz) of grease squeezed out from a tube.
   Note:
   After installing the actuator, perform 3 — 5 times of adaptation for the grease to fit in.
   Preparation items:
   Genuine part: SUBARU genuine grease (72129AJ000)
2. Install the motor - actuator mode.
3. Install the pocket assembly and the back panel - pocket.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Mode Door Actuator

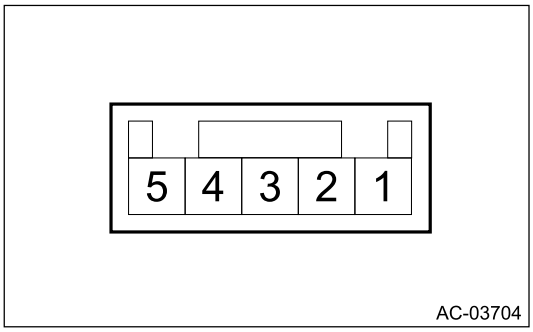
INSPECTION

1. ACTUATOR LINK

1. Visually check the operating range of the link, and remove the foreign matter if any.
2. Operate the air flow control dial or switch to check that the link operates normally.
3. If it does not operate normally as the result of inspection, perform a unit inspection of motor - actuator mode.

2. CHECK ACTUATOR OPERATION

1. Check the actuator operation when battery voltage is applied between the connector terminals.
   Caution:
   Disconnect the battery immediately after the actuator stops operation. Otherwise, the motor may be damaged.



Terminal No.	Inspection conditions	Operating position
4 (+) — 5 (−)	Apply battery voltage.	DEF
5 (+) — 4 (−)		FACE

2. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester

Terminal No.	Inspection conditions	Standard
1 — 3	Always	4.2 — 7.8 Ω

3. Connect the connector, turn the ignition switch to ON, and check the voltage between actuator terminals.

Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	FACE	Approx. 4.5 V
	DEF	Approx. 0.5 V

4. Replace the motor - actuator mode if it is found defective as a result of inspection.

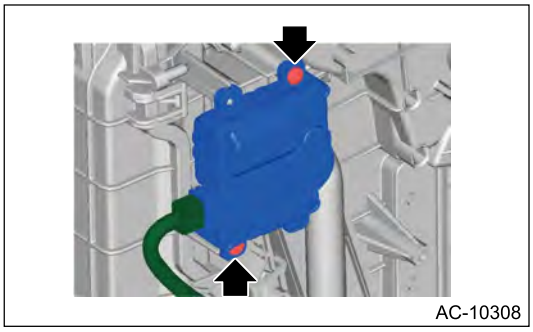
REMOVAL

1. DRIVER'S SIDE

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **If reusing the motor - actuator mix, perform the following procedures to prevent incorrect installation.**
  1. **While the part is installed to the vehicle, turn the temperature control dial to the MAX COOL position.**
  2. **Wait for 30 seconds in the condition 1, and remove the motor - actuator mix.**

1. Disconnect the battery ground cable and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the motor - actuator mix.
   (1) Disconnect the connector.
   (2) Remove the screws and detach the motor - actuator mix.



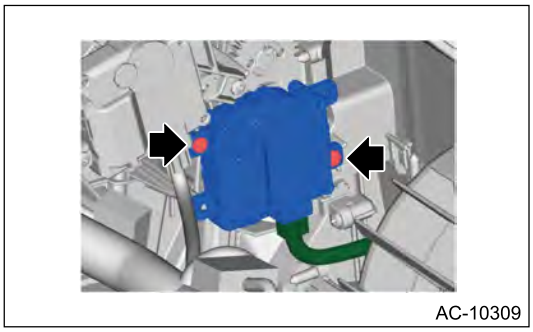
2. PASSENGER'S SIDE

Caution:

If reusing the motor - actuator mix, perform the following procedures to prevent incorrect installation.

1. **While the part is installed to the vehicle, turn the temperature control dial to the MAX COOL position.**
2. **Wait for 30 seconds in the condition 1, and remove the motor - actuator mix.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the motor - actuator mix.
   (1) Disconnect the connector.
   (2) Remove the screws and detach the motor - actuator mix.



AIR CONDITIONER > Air Mix Door Actuator

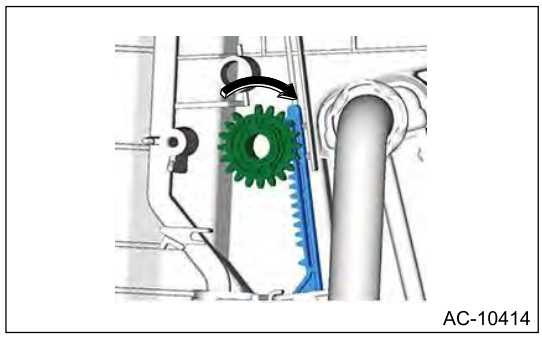
INSTALLATION

1. DRIVER'S SIDE

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Rotate the gear - mix slowly in the arrow direction shown in the figure until it stops.
   Caution:
   - **Do not rotate excessively.**
   - **Be sure to prevent dust or other foreign matters from contacting the greased gear portion.**



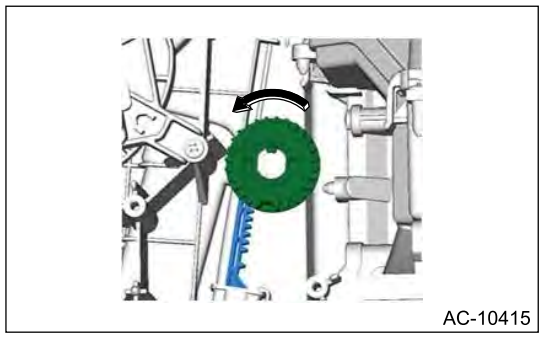
2. Install the motor - actuator mix.
   Note:
   Install it so that the gear position is not displaced.
3. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
4. Install the cover assembly - instrument panel LWR driver.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. PASSENGER'S SIDE

1. Rotate the gear - mix slowly in the arrow direction shown in the figure until it stops.

Caution:

- **Do not rotate excessively.**
- **Be sure to prevent dust or other foreign matters from contacting the greased gear portion.**



2. Install the motor - actuator mix.
   Note:
   Install it so that the gear position is not displaced.
3. Install the pocket assembly and the back panel - pocket.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Air Mix Door Actuator

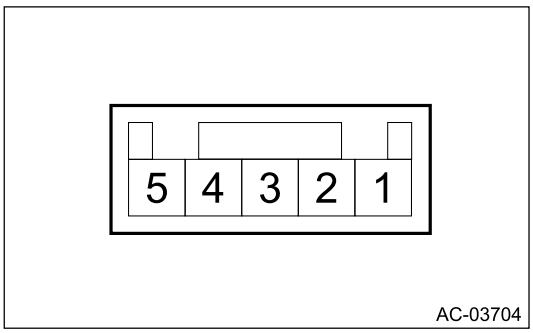
INSPECTION

1. ACTUATOR LINK

1. Visually check the operating range of the link, and remove the foreign matter if any.
2. Operate the temperature control dial to check that the link operates normally.
3. If it does not operate normally as the result of inspection, perform a unit inspection of motor - actuator mix.

2. CHECK ACTUATOR OPERATION

1. Check the actuator operation when battery voltage is applied between the connector terminals.
   Caution:
   Disconnect the battery immediately after the actuator stops operation. Otherwise, the motor may be damaged.



- Driver's side

Terminal No.	Inspection conditions	Operating position
5 (+) — 4 (−)	Connect battery to the terminals	COOL
4 (+) — 5 (−)		HOT

- Passenger's side

Terminal No.	Inspection conditions	Operating position

Terminal No.	Inspection conditions	Operating position
5 (+) — 4 (−)	Connect battery to the terminals	HOT
4 (+) — 5 (−)		COOL

2. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester

Terminal No.	Inspection conditions	Standard
1 — 3	Always	4.2 — 7.8 Ω

3. Connect the connector, turn the ignition switch to ON, and check the voltage between actuator terminals.

- Driver’s seat

Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	HOT	Approx. 0.5 V
	COOL	Approx. 4.5 V

- Passenger’s seat

Terminal No.	Inspection conditions	Standard
2 (+) — 3 (−)	HOT	Approx. 0.5 V
	COOL	Approx. 4.5 V

4. Replace the motor - actuator mix if it is found defective as a result of inspection.

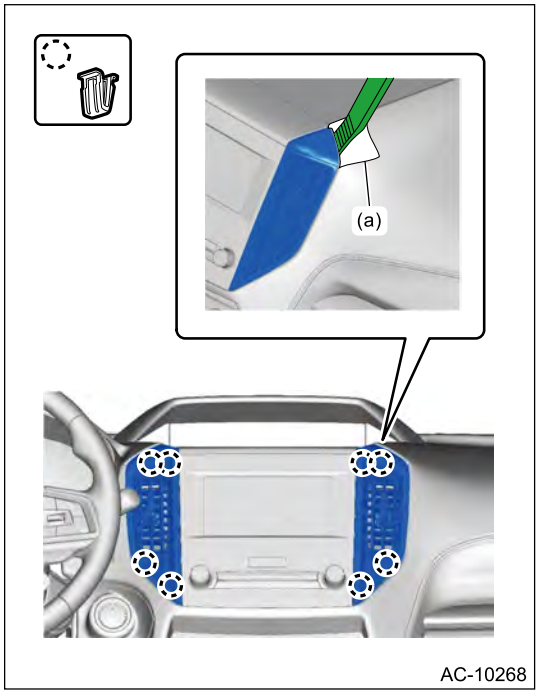
REMOVAL

1. CENTER GRILLE ASSEMBLY

1. Remove the grille assembly - CTR ventilation.
   (1) Attach the protective tape (a).
   (2) Release the clips, and then remove the grille assembly - CTR ventilation LH and RH.

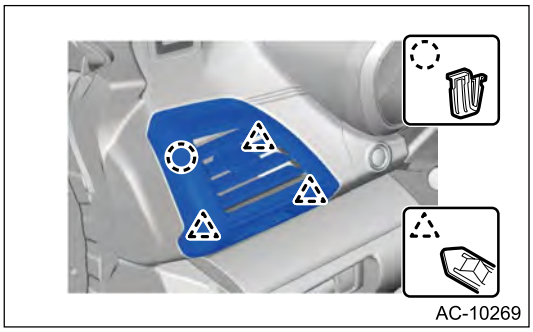
Caution:

Wrap a remover, etc. with protective tape or cloth. Use a remover, etc. by pressing it in the instrument panel side so that the grille assembly - CTR ventilation should not be damaged.

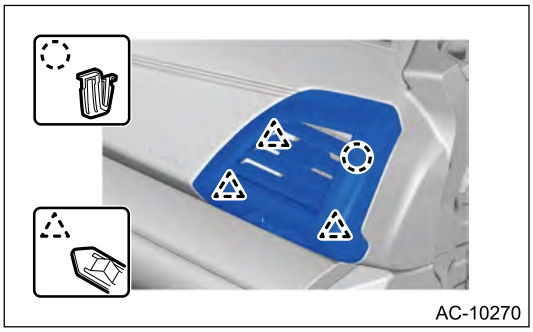


2. SIDE GRILLE ASSEMBLY

1. Remove the grille assembly - ventilation.
   (1) Release the claws and clips, then detach the grille assembly - ventilation.
   - LH side



   - RH side



AIR CONDITIONER > Air Vent Grille

INSTALLATION

1. CENTER GRILLE ASSEMBLY

Caution:

After installing the grille assembly, check that the grille assembly is inserted correctly into the air vent duct.

1. Install the grille assembly - CTR ventilation.

2. SIDE GRILLE ASSEMBLY

Caution:

After installing the grille assembly, check that the grille assembly is inserted correctly into the air vent duct.

1. Install the grille assembly - ventilation.

AIR CONDITIONER > Air Vent Grille

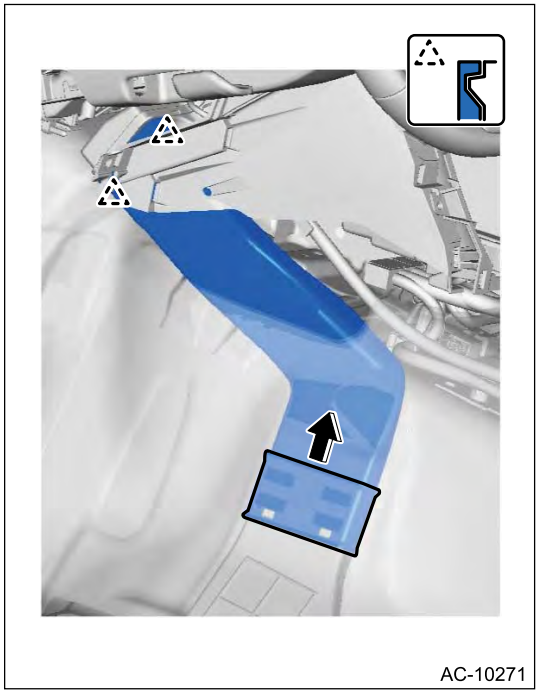
INSPECTION

1. Check that the direction and the amount of air can be adjusted smoothly. Replace the grille assembly if faulty.
2. Check that the adjustment can be maintained in each position. Replace the grille assembly if faulty.

REMOVAL

1. FRONT

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the cover assembly - instrument panel LWR driver INN. (When removing LH side) Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the pocket assembly and the back panel - pocket. (When removing RH side) Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
5. Remove the duct - rear heater front.
   (1) Remove the slide lock.
   (2) Release the claws, and remove the duct - rear heater front.

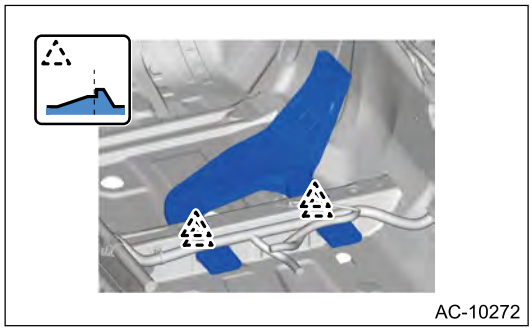


2. REAR

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the duct - rear heater front. Ref. to AIR CONDITIONER>Heater Duct>REMOVAL > FRONT.
3. Remove the front seats. Ref. to SEATS>Front Seat>REMOVAL.
4. Turn over the floor mat. Ref. to EXTERIOR/INTERIOR TRIM>Floor Mat>REMOVAL.
5. Remove the duct - rear heater rear.
   (1) Release the clips, and remove the adapter cord.
   (2) Release the claws, and then remove the duct - rear heater rear.



Note:

For models with power amplifier, remove the extension duct.

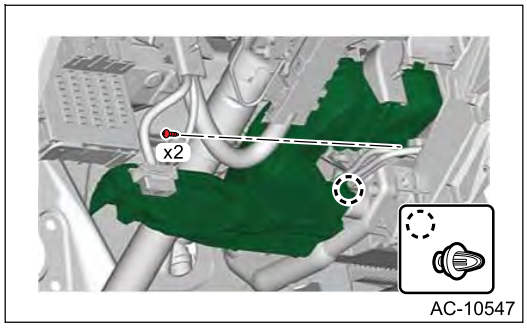
3. FOOT

LH SIDE

Caution:

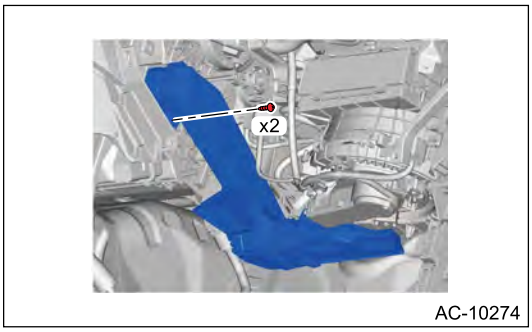
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the duct - foot driver.
   (1) Remove the screw, release the claws, which secure the spacer - foot and then remove the duct - foot driver together with the spacer - foot.
   Caution:
   If the duct - foot has been removed from the spacer - foot, replace the duct - foot with a new part. If the duct - foot is reused, the retention power of the claw and clip deteriorates and it may come off.



RH SIDE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the duct - foot passenger.
   (1) Remove the screws and remove the duct - foot passenger.



AIR CONDITIONER > Heater Duct

INSTALLATION

1. FRONT

1. Install the duct - rear heater front.
2. Install the pocket assembly and the back panel - pocket.
3. Install the cover assembly - instrument panel LWR driver INN.
4. Install the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. REAR

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the duct - rear heater rear.
2. Install the floor mat. Ref. to EXTERIOR/INTERIOR TRIM>Floor Mat>INSTALLATION.
3. Install the front seat. Ref. to SEATS>Front Seat>INSTALLATION.
4. Install the duct - rear heater front.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. FOOT

LH SIDE

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the duct - foot driver.
2. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>INSTALLATION.
3. Install the cover assembly - instrument panel LWR driver.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

RH SIDE

1. Install the duct - foot passenger.
2. Install the pocket assembly and the back panel - pocket.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

1. Check installation condition of duct. Connect the duct properly if defective.
2. Check that no foreign matter is mixed in the duct. Remove the foreign matter if any.

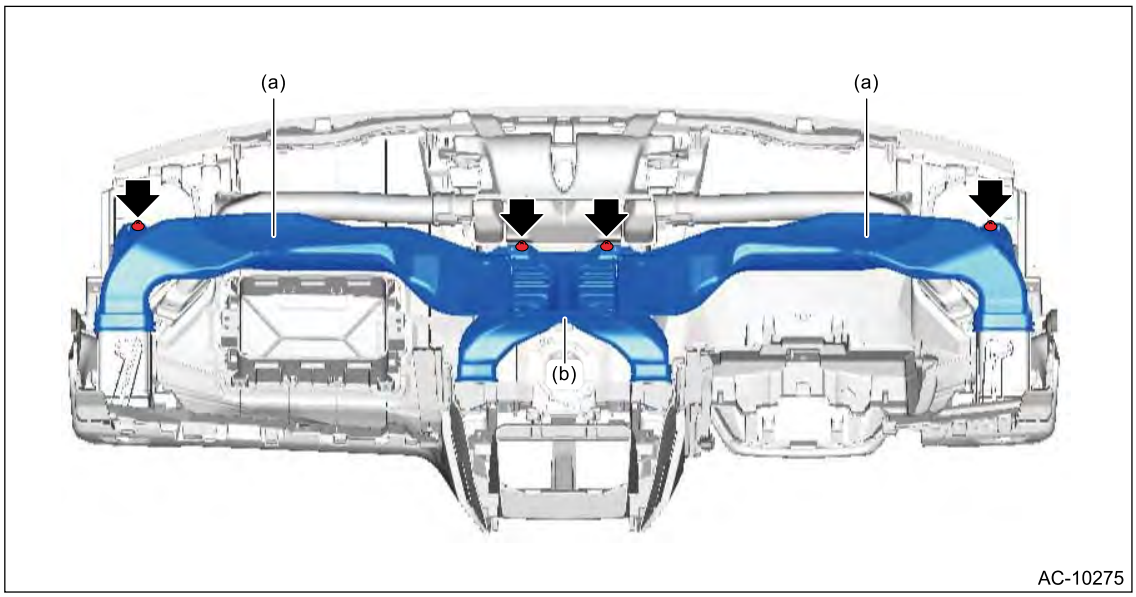
AIR CONDITIONER > Heater Vent Duct

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the instrument panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>REMOVAL.
3. Remove the duct - center vent and the duct - side ventilation.
   (1) Remove the screws and remove the duct - side ventilation LH and RH (a).
   (2) Remove the duct - center vent (b).



AIR CONDITIONER > Heater Vent Duct

INSTALLATION

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the duct - center vent and the duct - side ventilation.
2. Install the instrument panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIR CONDITIONER > Heater Vent Duct

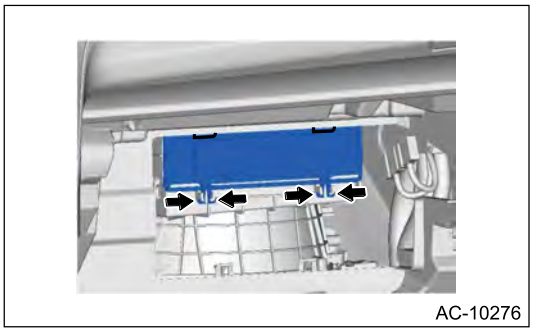
INSPECTION

1. Check installation condition of duct. Connect the duct properly if defective.
2. Check that no foreign matter is mixed in the duct. Remove the foreign matter if any.

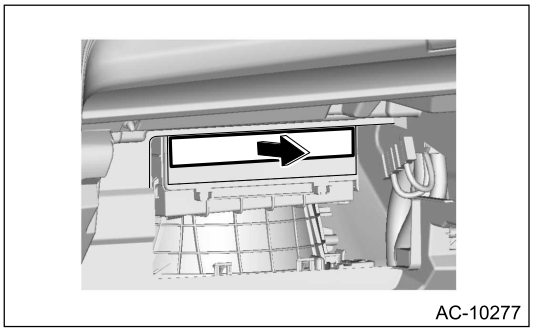
AIR CONDITIONER > A/C Filter

REPLACEMENT

1. Remove the pocket assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
2. Remove the filter.
   (1) Release the lock and guide, and remove the filter cover.



   (2) Remove the filter as shown in the figure.



Note:
Pull out while tilting the front side of the filter downward to prevent dirt or dust from falling inside the case.

3. Install new filter and filter cover.
4. Install the pocket assembly.

AIR CONDITIONER > A/C Filter

INSPECTION

Check the A/C filter for dust or dirt, and clean or replace as necessary.

INSPECTION

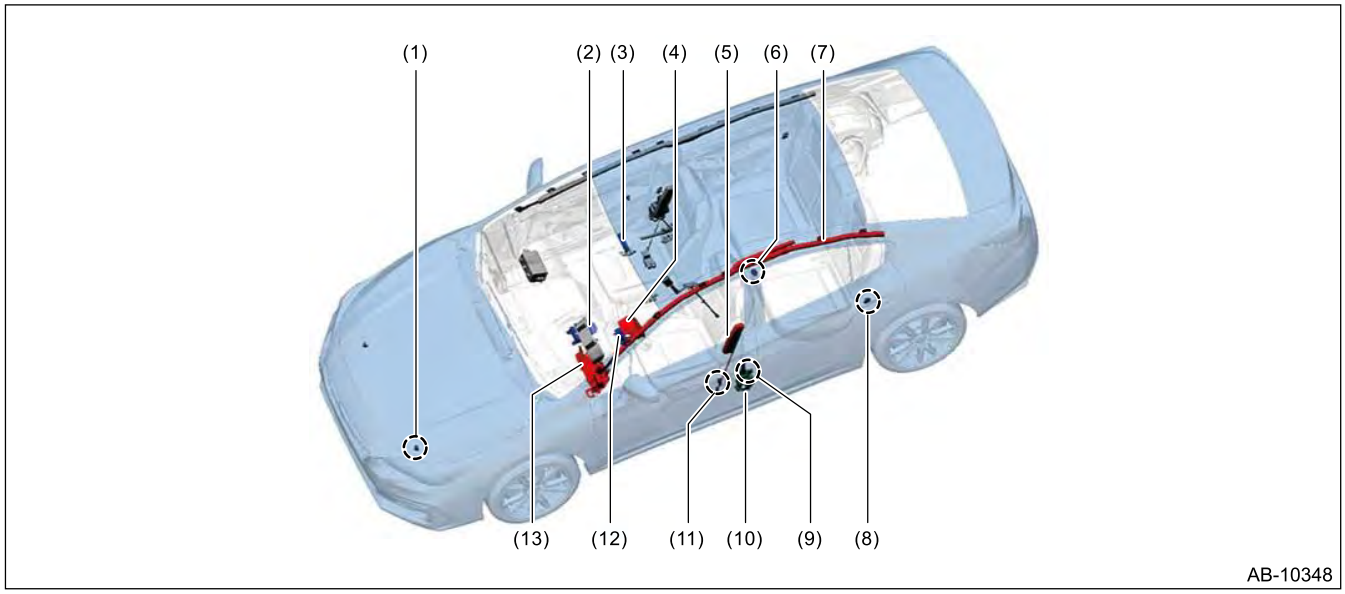
For the diagnostics with phenomenon, refer to “Diagnostics with Phenomenon” of “AIR CONDITIONER (DIAGNOSTICS)”. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon.

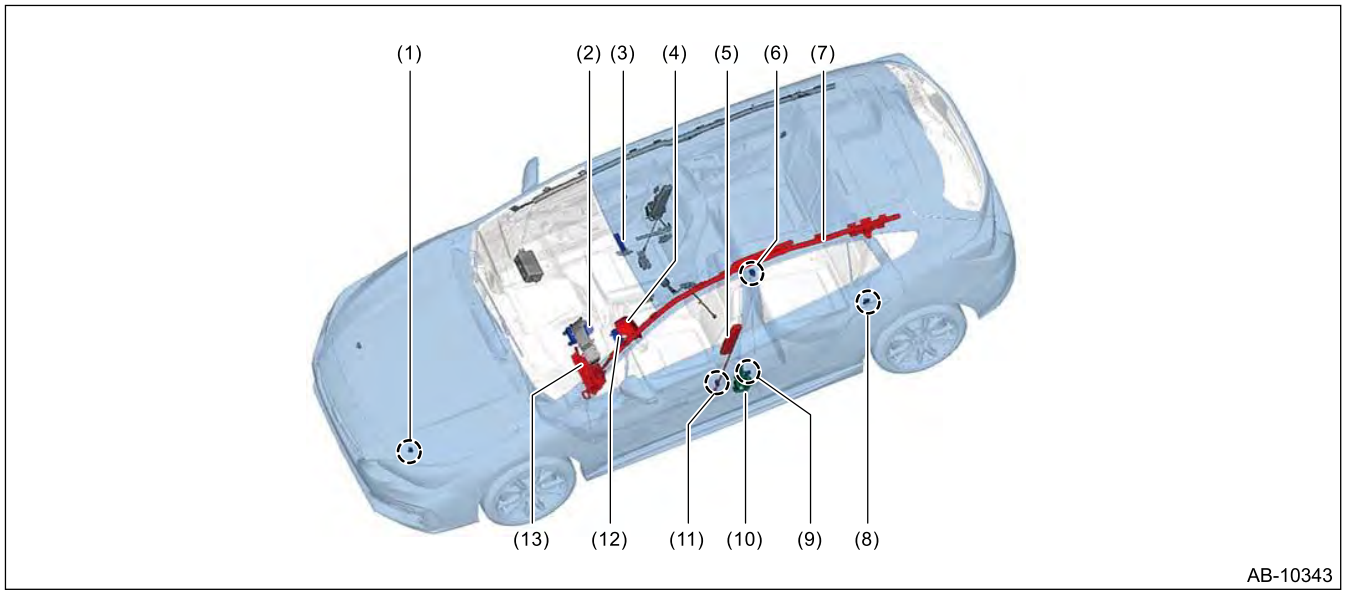
AIRBAG SYSTEM

AB

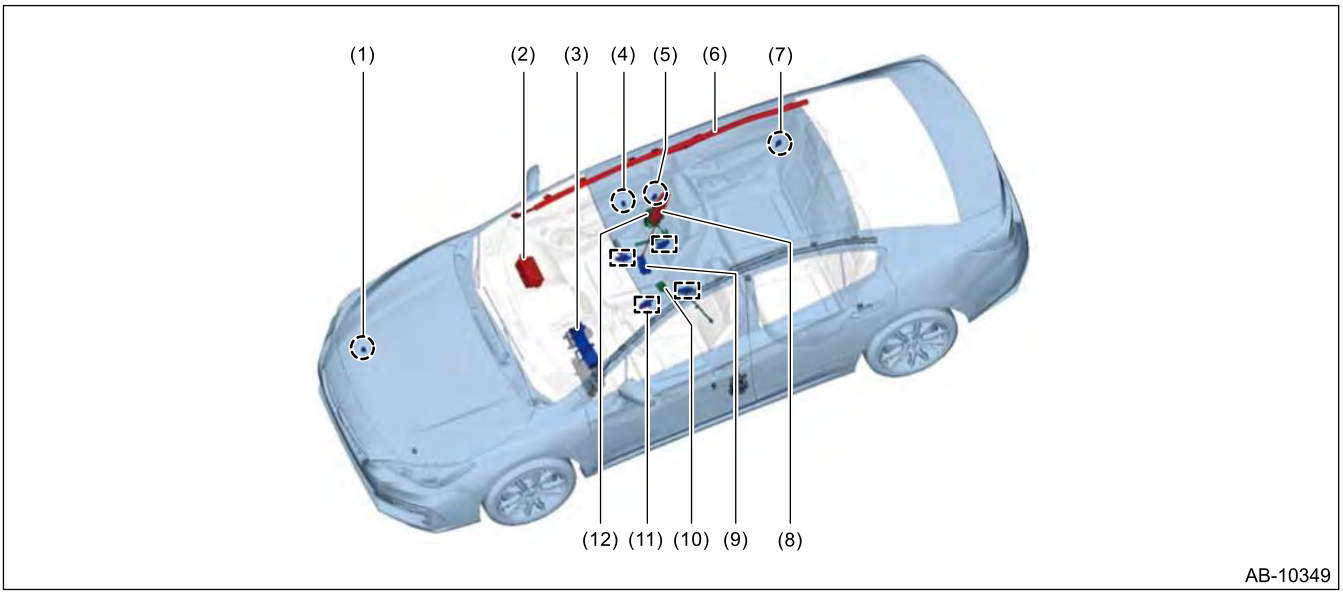
1. General Description
2. Airbag Connector
3. Inspection Locations after a Collision
4. Driver’s Airbag Module
5. Knee Airbag Module
6. Passenger’s Airbag Module
7. Side Airbag Module
8. Curtain Airbag Module
9. Airbag Control Module
10. Front Sub Sensor
11. Front Door Impact Sensor
12. Side Airbag Sensor
13. Curtain Airbag Sensor
14. Satellite Safing Sensor
15. Roll Connector
16. Airbag Module Disposal (Deployment Processing on Vehicle)

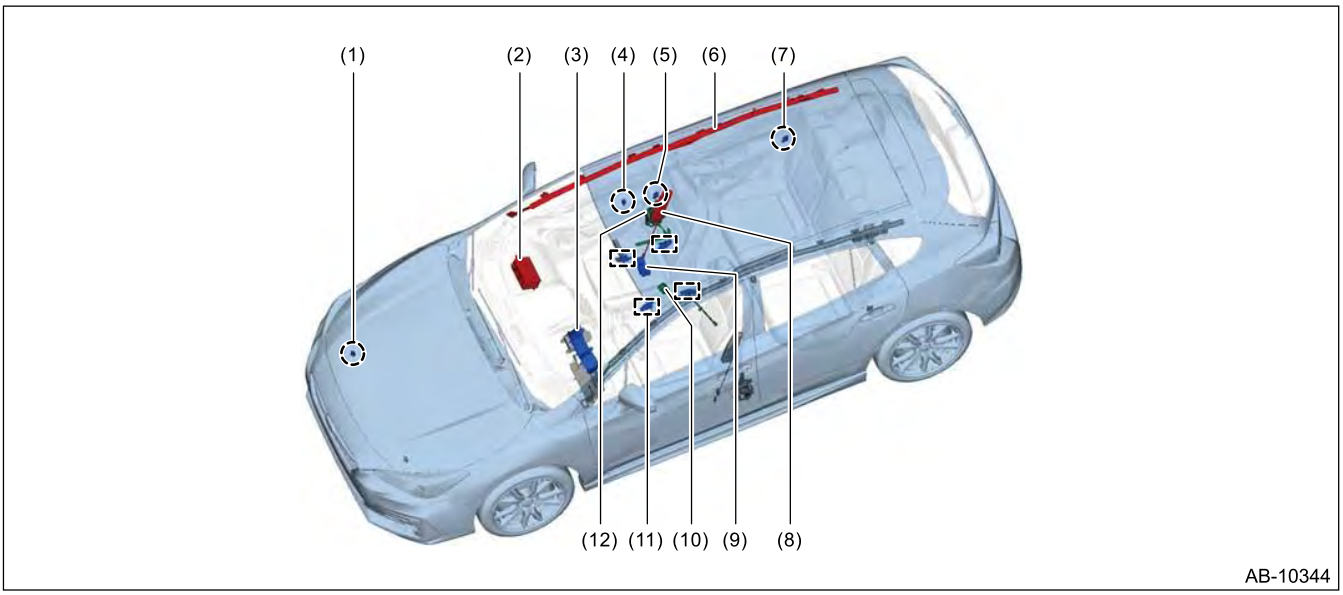
COMPONENT





(1) Front sub sensor LH
(2) Airbag control module
(3) Airbag ON/OFF indicator light (in warning box)
(4) Driver's airbag module
(5) Side airbag module LH
(6) Satellite safing sensor
(7) Curtain airbag module LH
(8) Curtain airbag sensor LH
(9) Side airbag sensor LH
(10) Seat belt pretensioner LH
(11) Front door impact sensor LH
(12) Steering roll connector
(13) Knee airbag module



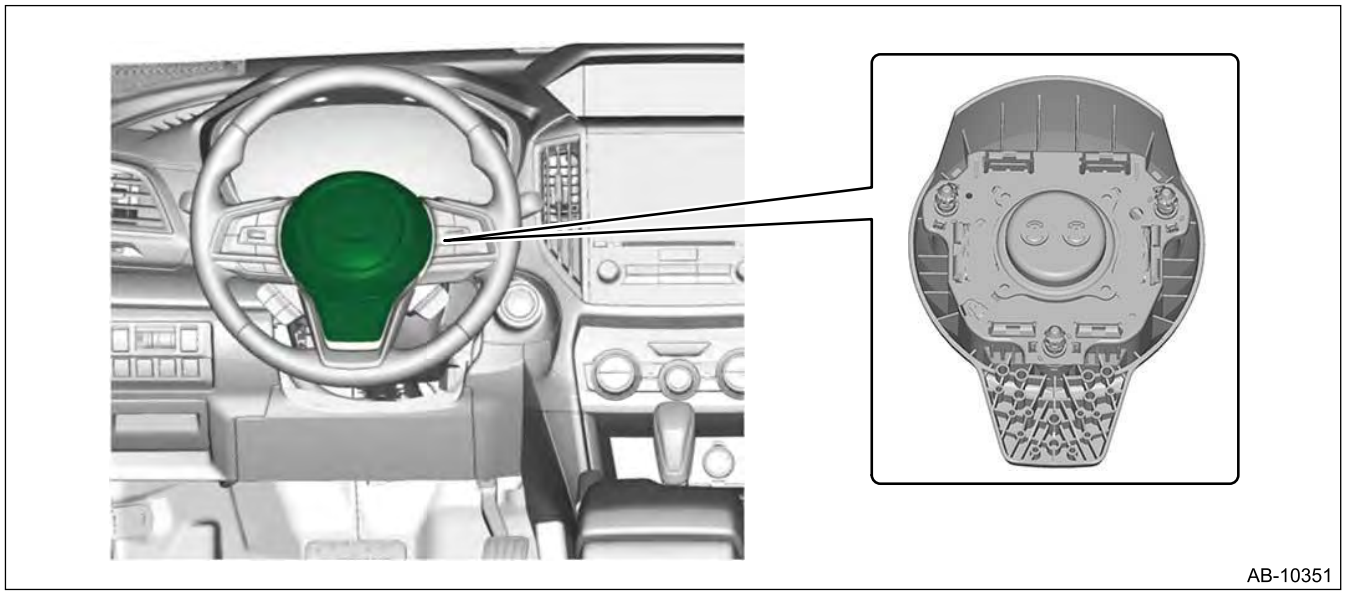


(1) Front sub sensor RH
(2) Passenger's airbag module
(3) Airbag warning light (in combination meter)
(4) Front door impact sensor RH
(5) Side airbag sensor RH
(6) Curtain airbag module RH
(7) Curtain airbag sensor RH
(8) Side airbag module RH
(9) Occupant detection control module
(10) Buckle switch RH
(11) Occupant detection sensor
(12) Seat belt pretensioner RH & lap seat belt pretensioner RH

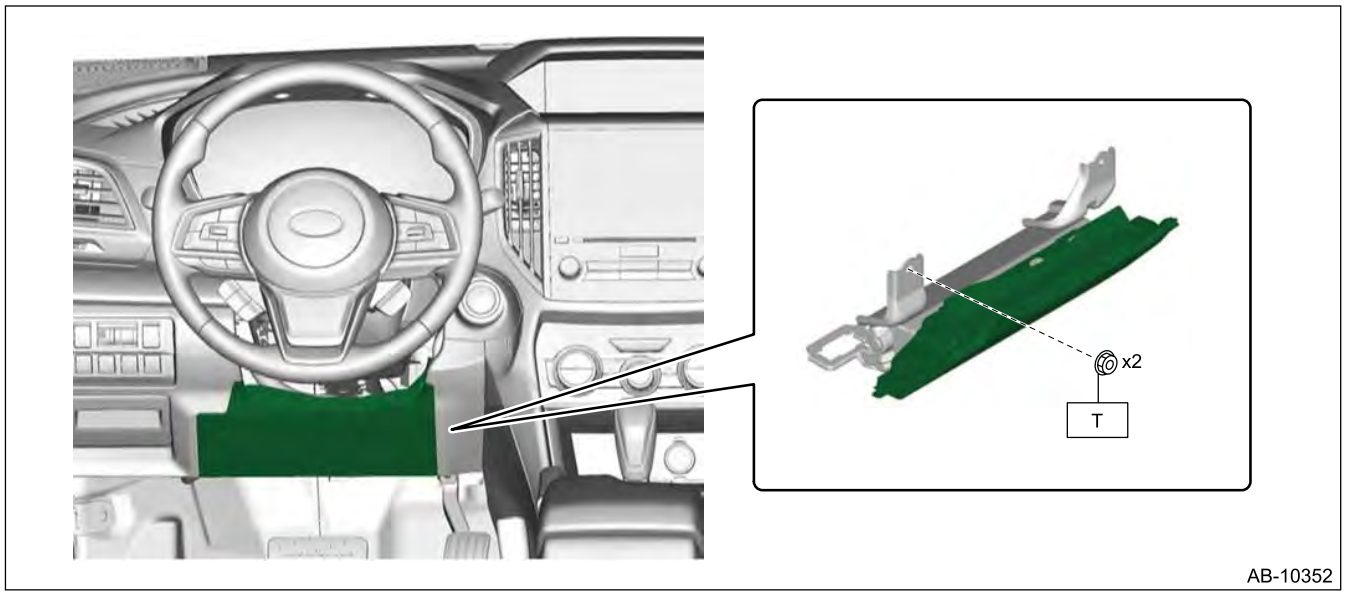
Note:

For detailed layout drawings on the occupant detection control module and occupant detection sensor, refer to "OCCUPANT DETECTION (DIAGNOSTICS)". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Electrical Component Location>LOCATION.

1. DRIVER'S AIRBAG MODULE



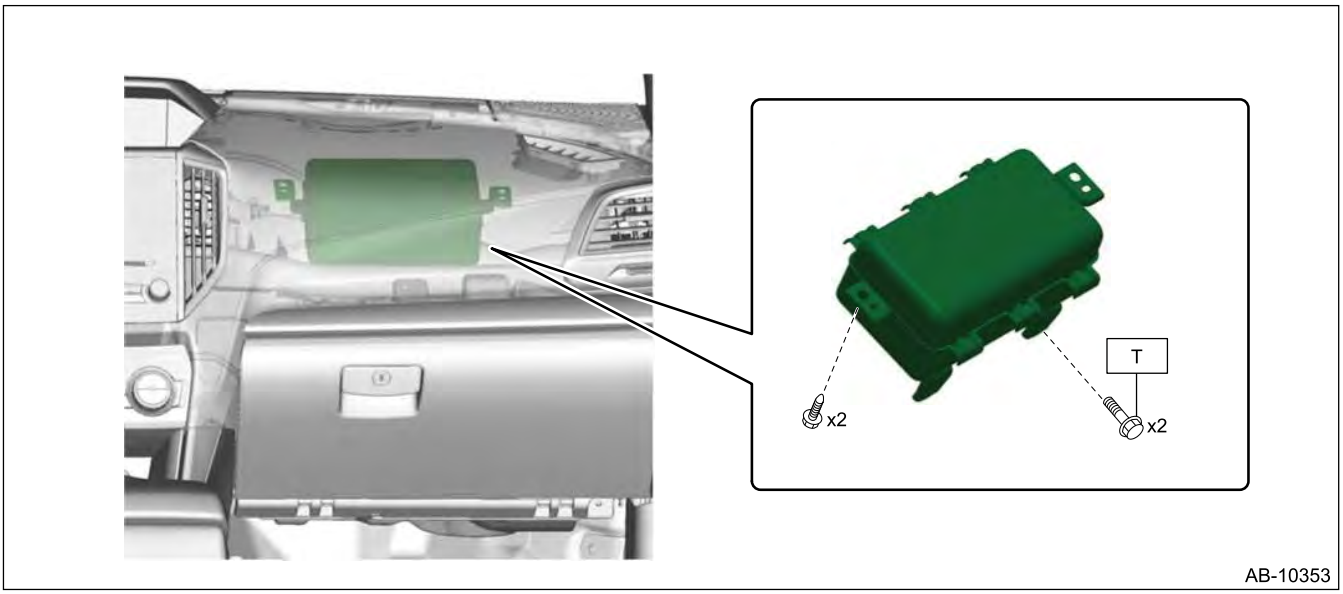
2. KNEE AIRBAG MODULE



Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

3. PASSENGER'S AIRBAG MODULE



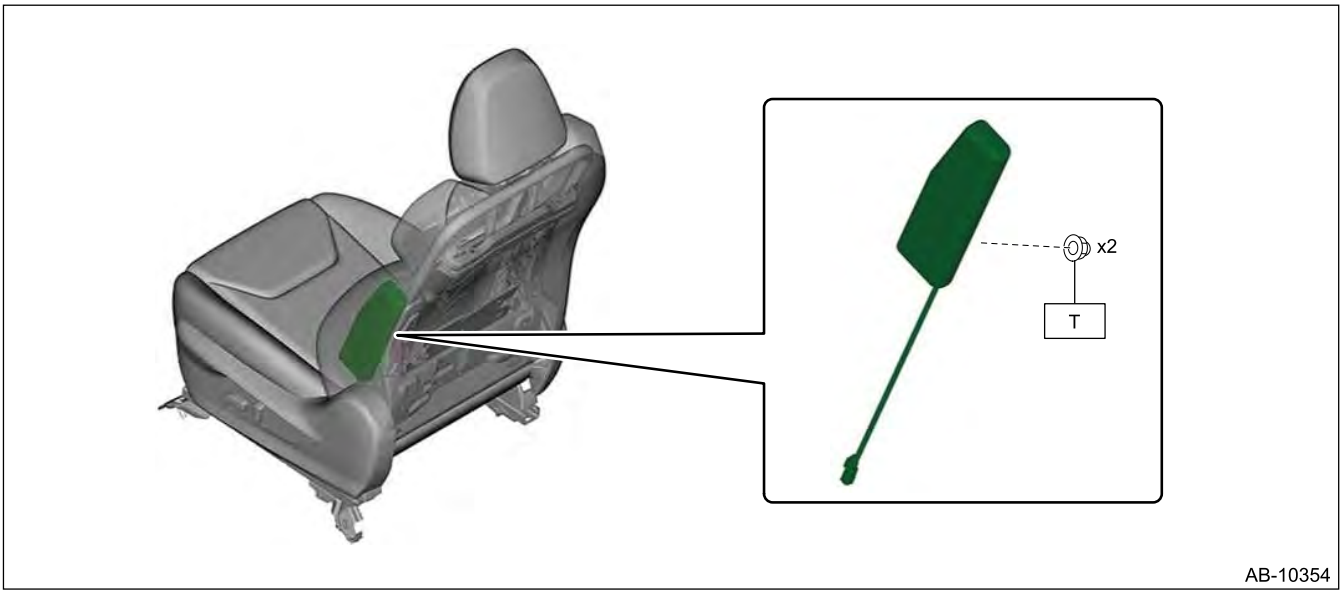
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

4. SIDE AIRBAG MODULE

Caution:

Do not reuse mounting nuts.



Tightening torque: N·m (kgf-m, ft-lb)

T: 6 (0.6, 4.4)

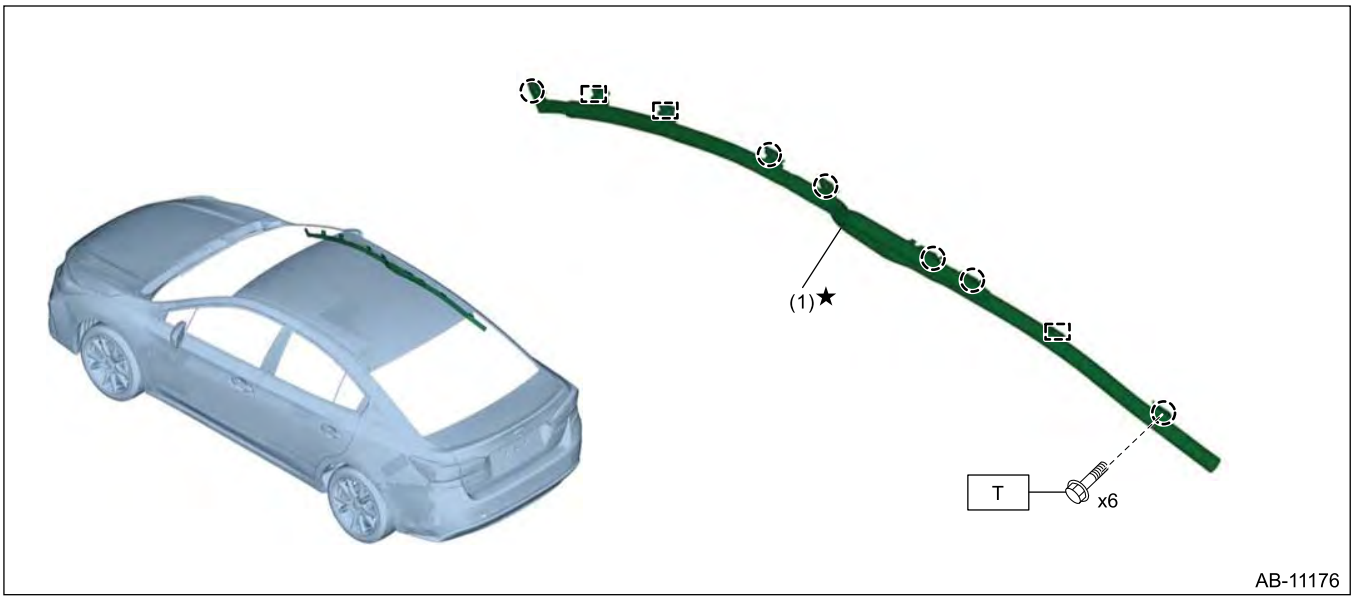
Note:

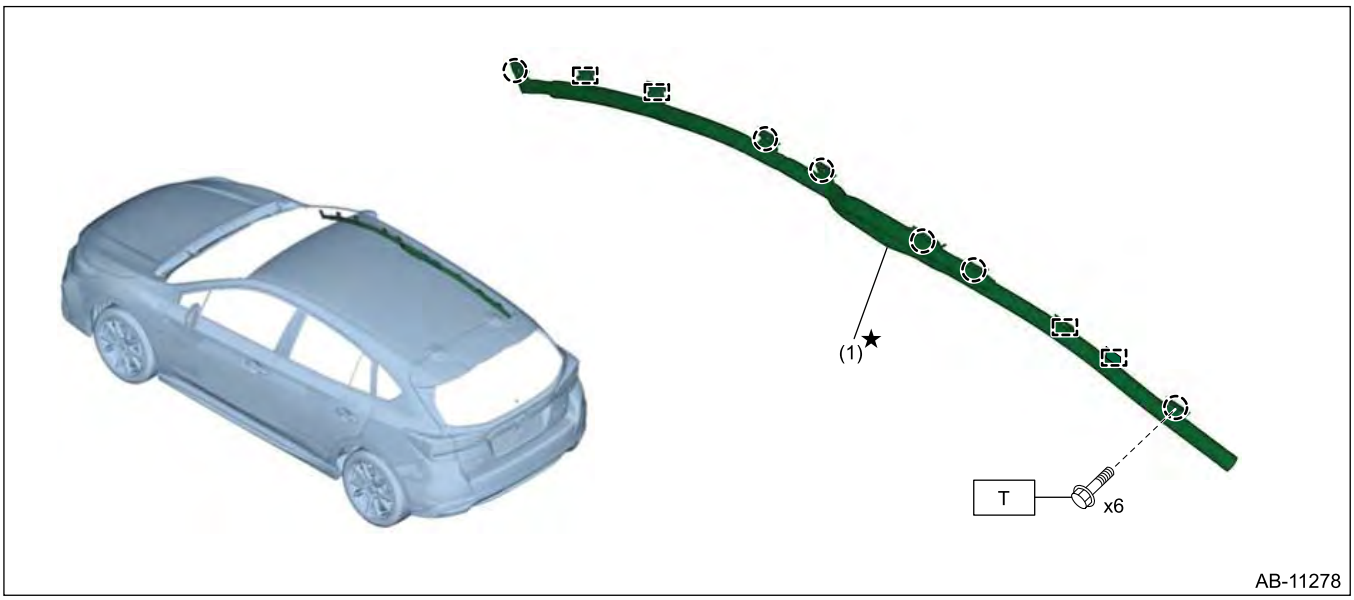
For operation procedures on side airbag module removal/installation, refer to the "SEATS" section.

5. CURTAIN AIRBAG MODULE

Caution:

The curtain airbag module cannot be reused if removed from the vehicle once, even if it has not operated yet.





(1) Clip

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

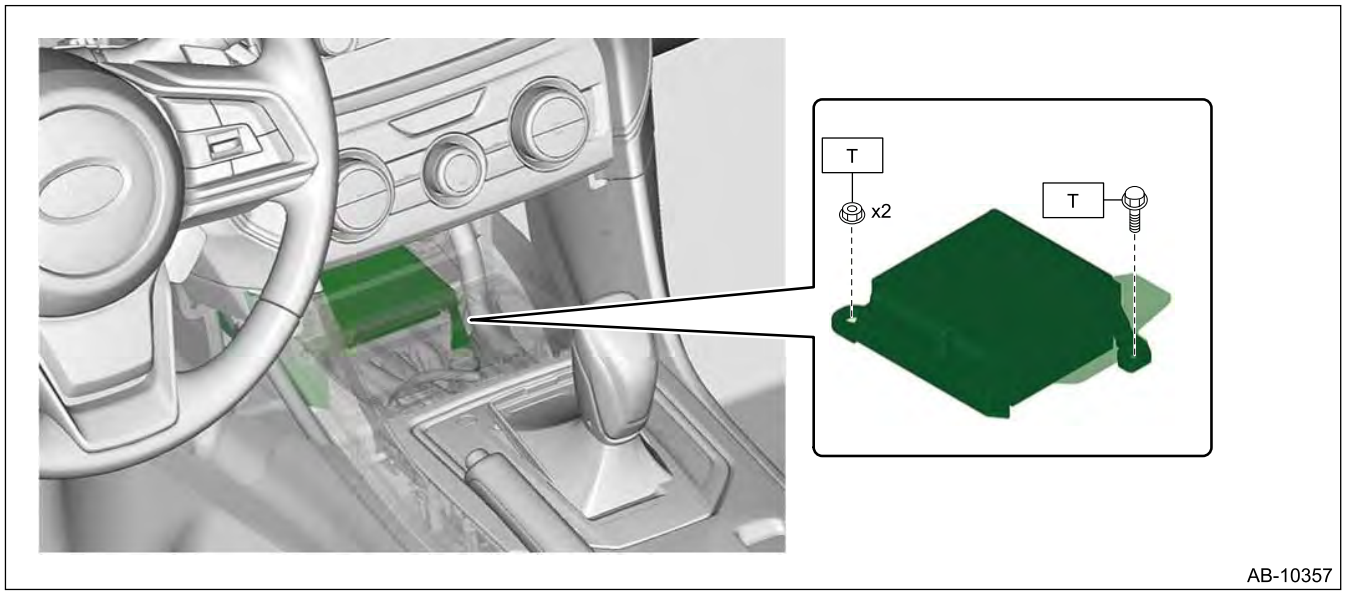
Note:

Mounting bolts can be reused.

6. AIRBAG CONTROL MODULE

Caution:

Do not reuse mounting bolts and nuts.



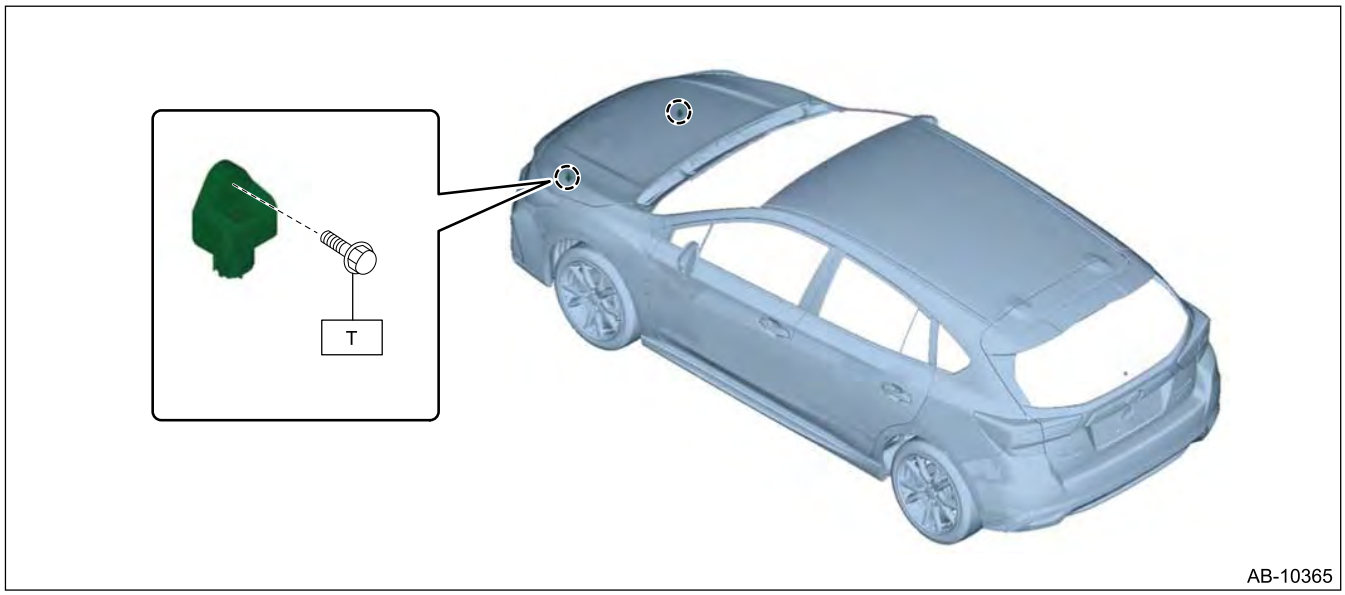
Tightening torque: N·m (kgf-m, ft-lb)

T: 25 (2.5, 18.4)

7. FRONT SUB SENSOR

Caution:

Do not reuse mounting bolts.



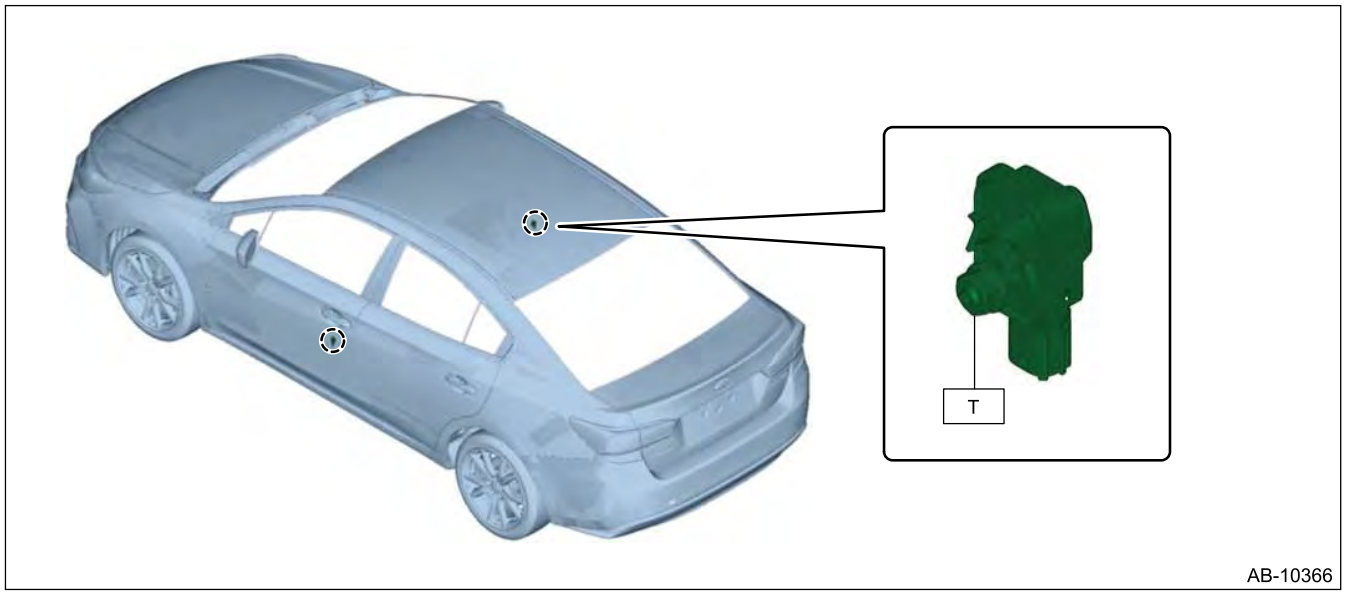
Tightening torque: N·m (kgf-m, ft-lb)

T: 13 (1.3, 9.6)

8. FRONT DOOR IMPACT SENSOR

Caution:

- **The nuts cannot be removed from the front door impact sensor. Do not remove the mounting nuts.**
- **Do not reuse the front door impact sensor if it is once removed.**



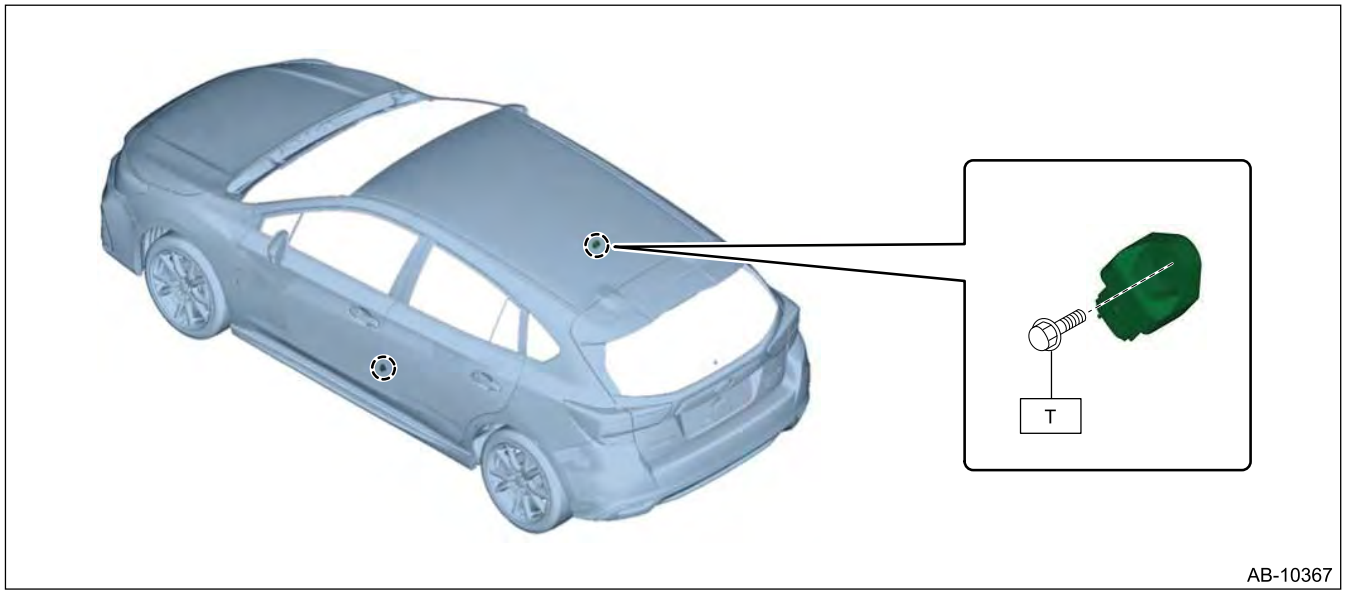
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

9. SIDE AIRBAG SENSOR

Caution:

Do not reuse mounting bolts and nuts.



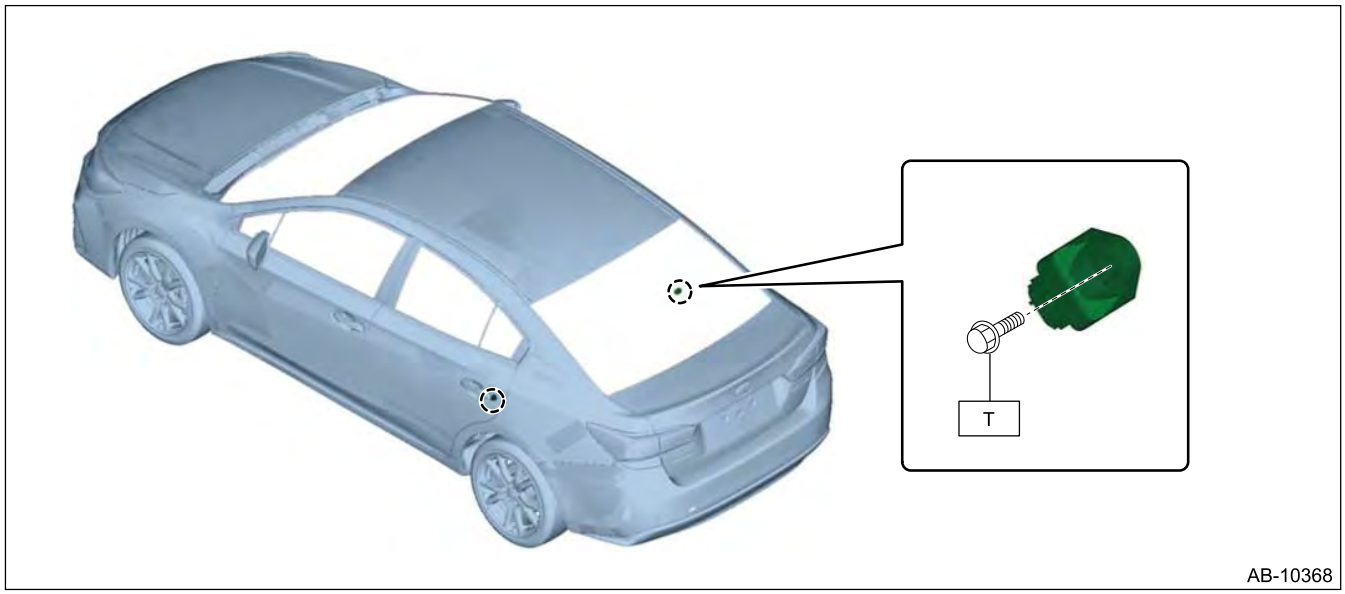
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

10. CURTAIN AIRBAG SENSOR

Caution:

Do not reuse mounting bolts and nuts.



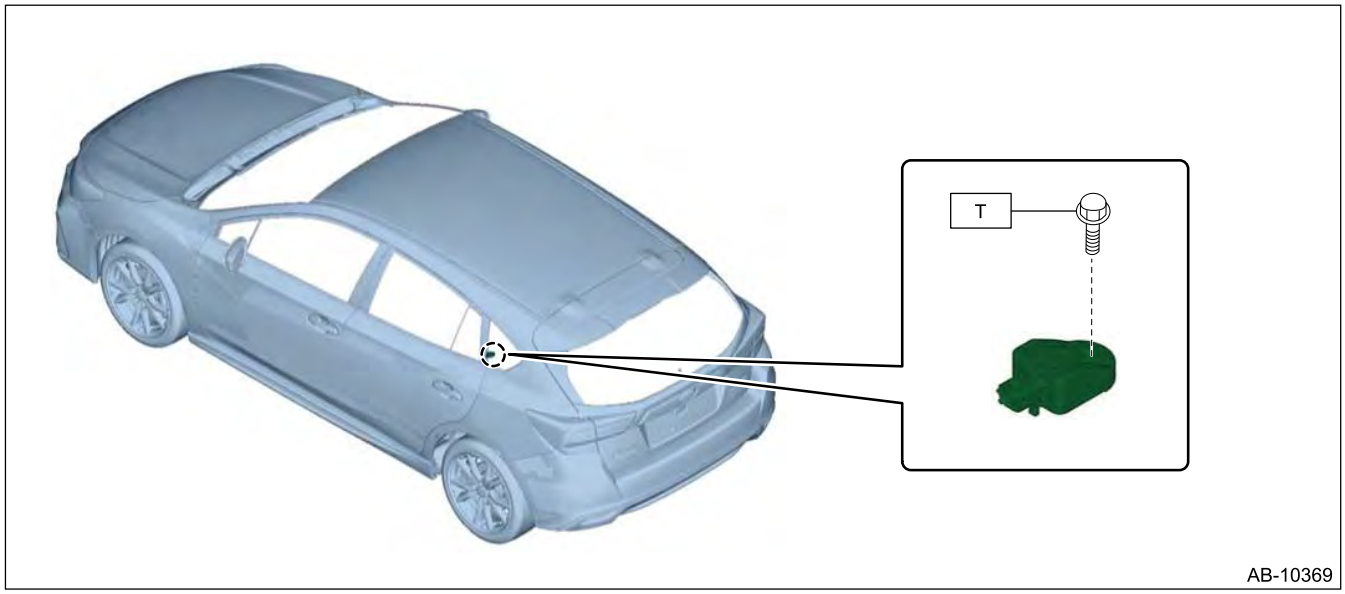
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

11. SATELLITE SAFING SENSOR

Caution:

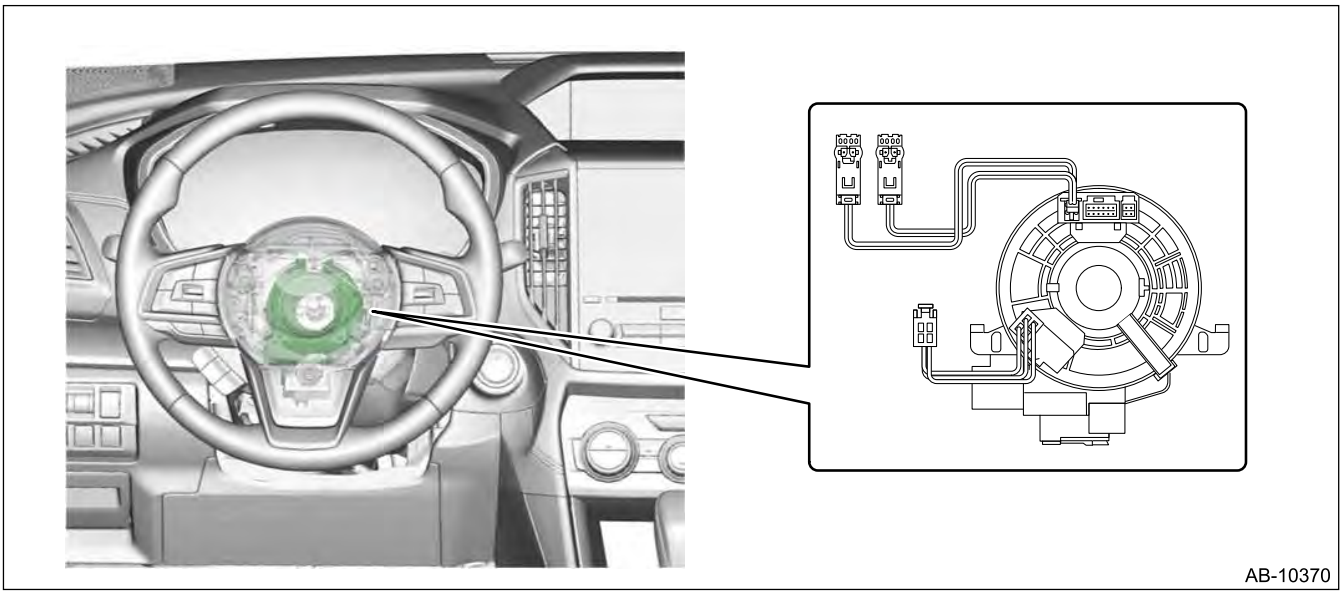
Do not reuse mounting bolts and nuts.



Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

12. STEERING ROLL CONNECTOR



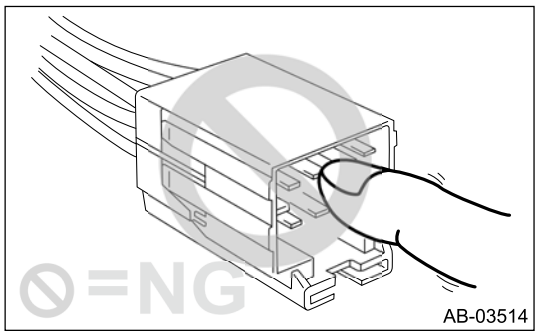
13. SEAT BELT PRETENSIONER

For the seat belt pretensioner, refer to the “SEAT BELT SYSTEM” section. Ref. to SEAT BELT SYSTEM>General Description.

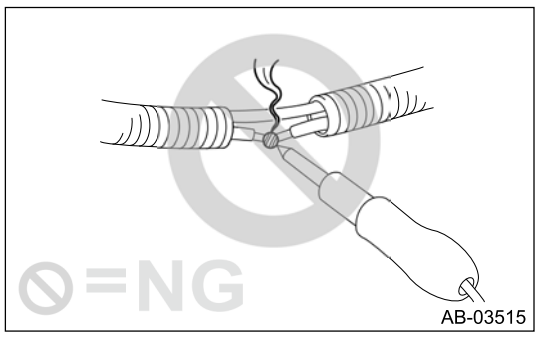
CAUTION

1. BEFORE STARTING ALL WORKS

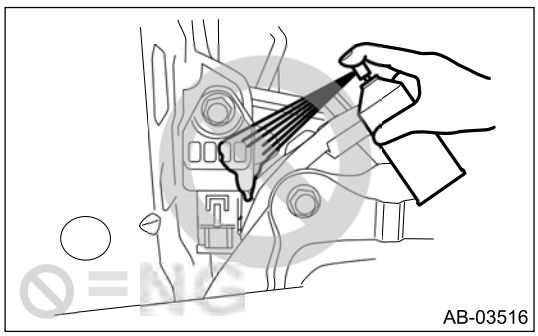
- Before performing vehicle maintenance, turn the ignition switch to OFF and wait for 60 seconds or more after disconnecting the negative terminal from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
- The airbag system (including pretensioner) is fitted with a backup power supply. After disconnecting the battery ground cable, the airbag may operate if you do not wait for 60 seconds or more before starting the service of airbag system.
- When performing an operation with the airbag system parts including pretensioners exposed, do not apply any impact to airbag modules and sensors.
- If the airbag warning light illuminates, check or repair the vehicle immediately to prevent it from airbag system malfunction.
- Do not allow water or oil to come in contact with the connector terminals. Also, do not touch the connector terminals directly.



- If damage, open circuit or rust is found on airbag system wiring harness, do not repair the harness. Always replace the faulty harness with a new genuine part.



- When painting or performing sheet metal work on the vehicle, remove the following parts. Performing the work without removing the parts may cause secondary malfunction.

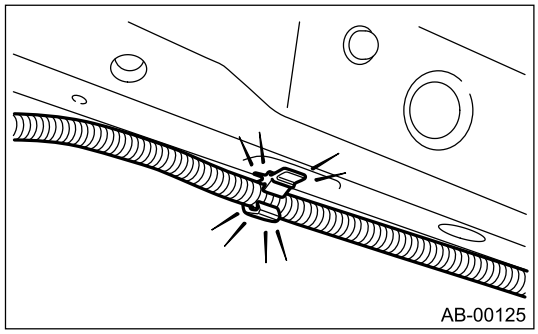


– Front part of the vehicle including the front wheel apron, front fender and radiator panel side
  - Front sub sensor of airbag system

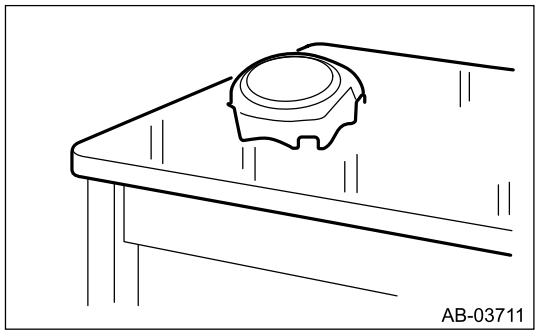
    - Wiring harness
  - Side or its vicinity of the vehicle including the side sill, center pillar and front and rear doors
    - Front door impact sensor
    - Side airbag sensor
    - Curtain airbag sensor
    - Satellite safing sensor
    - Wiring harness
- When attaching the steering wheel and steering roll connector, be sure to adjust the steering roll connector.

2. BEFORE STARTING PARTS REPLACEMENT

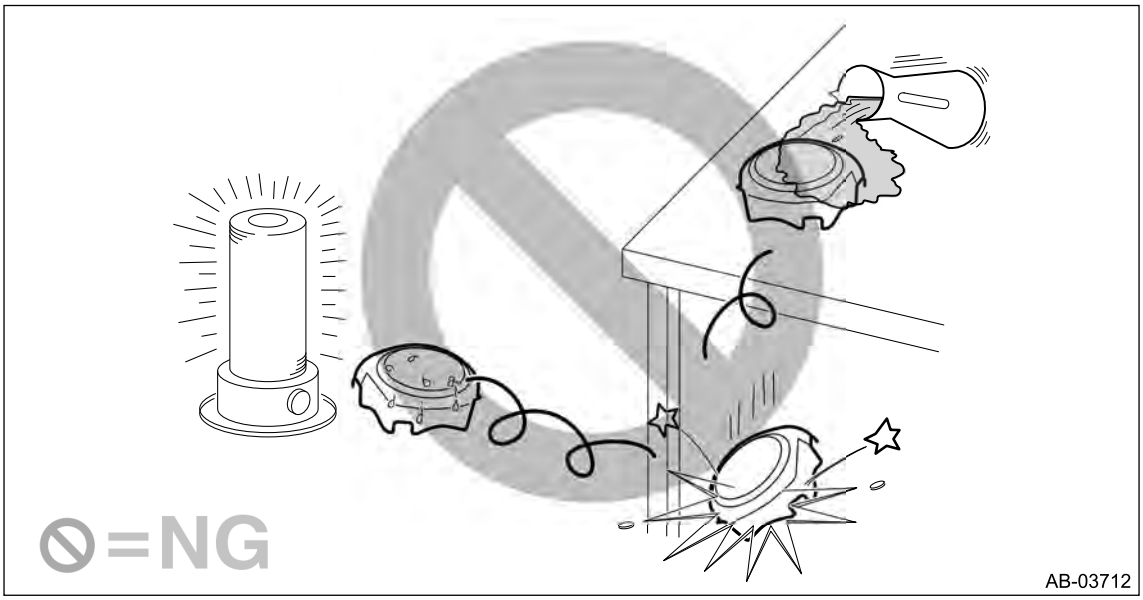
- If the following parts are deformed or damaged, replace with new parts.
  - Airbag sensors
  - Airbag modules and brackets
  - Airbag control module
  - Pretensioners and brackets
  - Harnesses
  - Cover - satellite safing
  - Plate - door UPR
- Install the wiring harness securely with the specified clips to avoid interference or tangled with other parts.



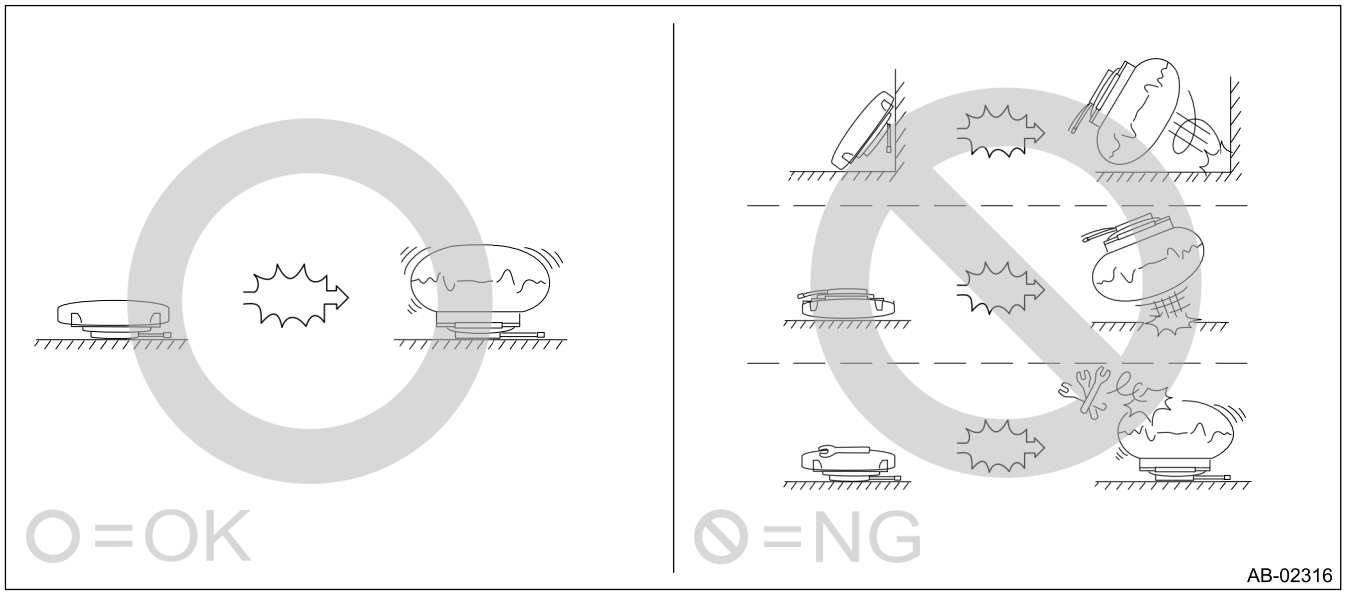
- Do not use the airbag or pretensioner parts from other vehicles. Always replace the defective parts with new parts.
- Never reuse any activated airbag module and pretensioner.
- Do not discard undeployed airbag or pretensioner. For the disposal procedures, refer to “Airbag Module Disposal”.
- Do not reuse the bolts and nuts when the following parts are removed. Always replace with the specified new bolts and nuts.
  - Airbag control module
  - Front door impact sensor
  - Front sub sensor
  - Side airbag sensor
  - Curtain airbag sensor
  - Satellite safing sensor
- When attaching the steering wheel and steering roll connector, be sure to adjust the steering roll connector.
- After removing each parts of the airbag system, keep them with the pad side facing upward on a dry, clean and flat surface away from heat, light sources, moisture and dust.



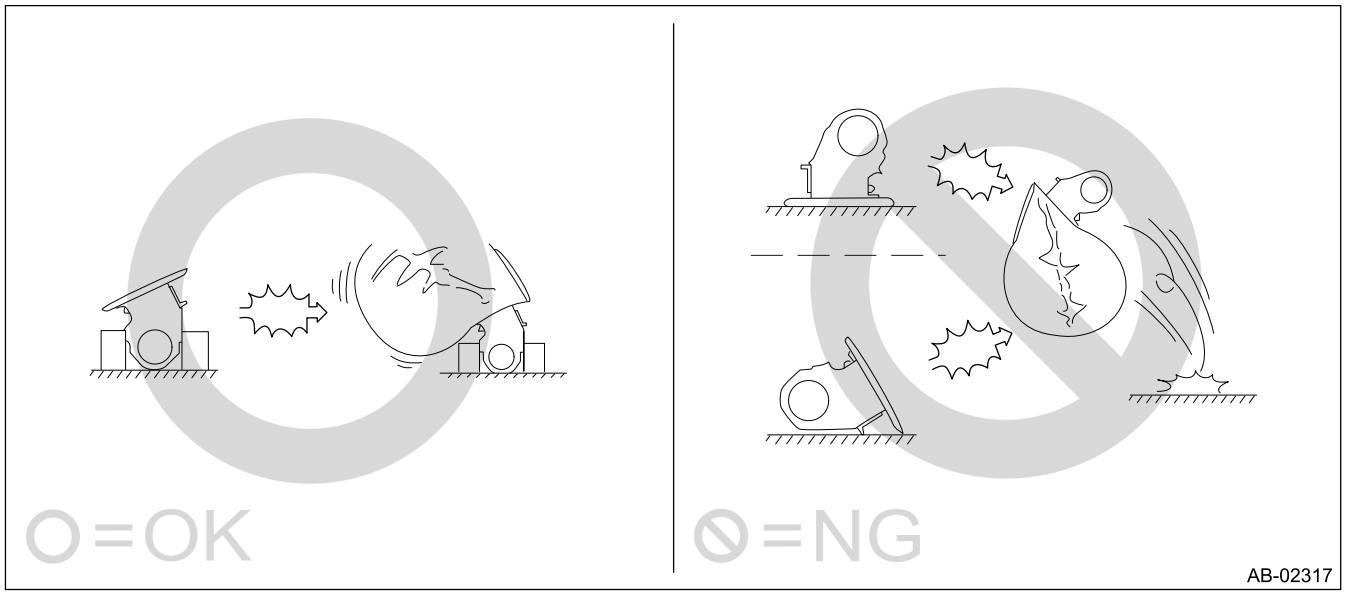
- Observe the following; the airbag system component or the internal parts of seat belt pretensioner may be damaged or the reliability may be greatly lowered.
  - Do not drop or otherwise apply impact.
  - Do not store it under high temperature environment at 85°C (185°F) or more, or do not near it to open flames.
  - Do not allow water, oil or grease to come in contact.



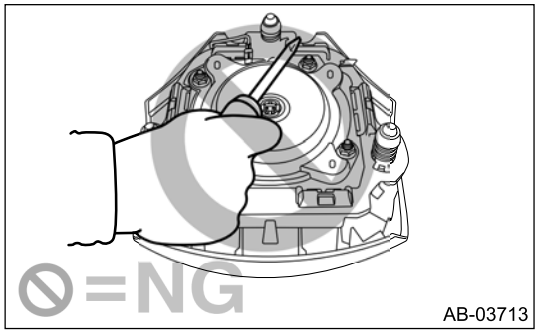
- When storing a removed airbag module, observe the following items. If the pad of the airbag module is in contact with other objects, it may cause a serious accident if the airbag accidentally operates.
  - Do not place the airbag module with the pad side facing downward.
  - Do not place any objects on the airbag module.
  - Do not pile up the airbag module.
  - Driver’s airbag module



- Passenger’s airbag module and side airbag module



- Do not disassemble the airbag modules and pretensioners.

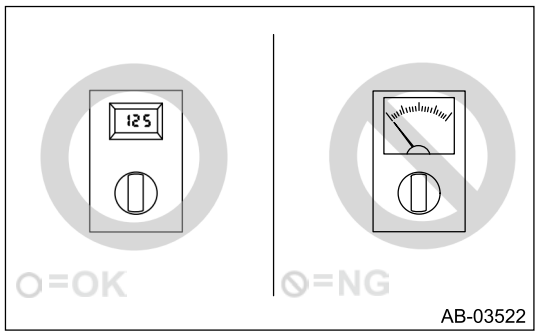


- The removed front seat with airbag module must be kept at least 200 mm (8 in) away from walls and other objects.

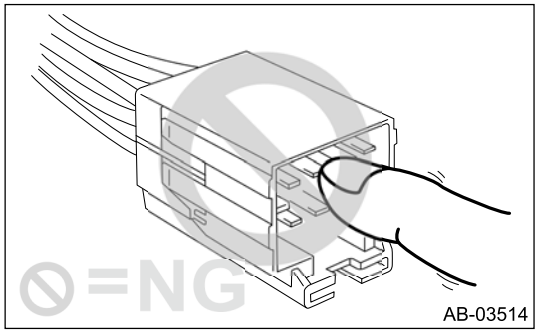
3. BEFORE STARTING TROUBLESHOOTING

- Even if any part must be replaced as the result of troubleshooting, do not use an airbag part or pretensioner part from other vehicles. Always replace the defective parts with new parts.

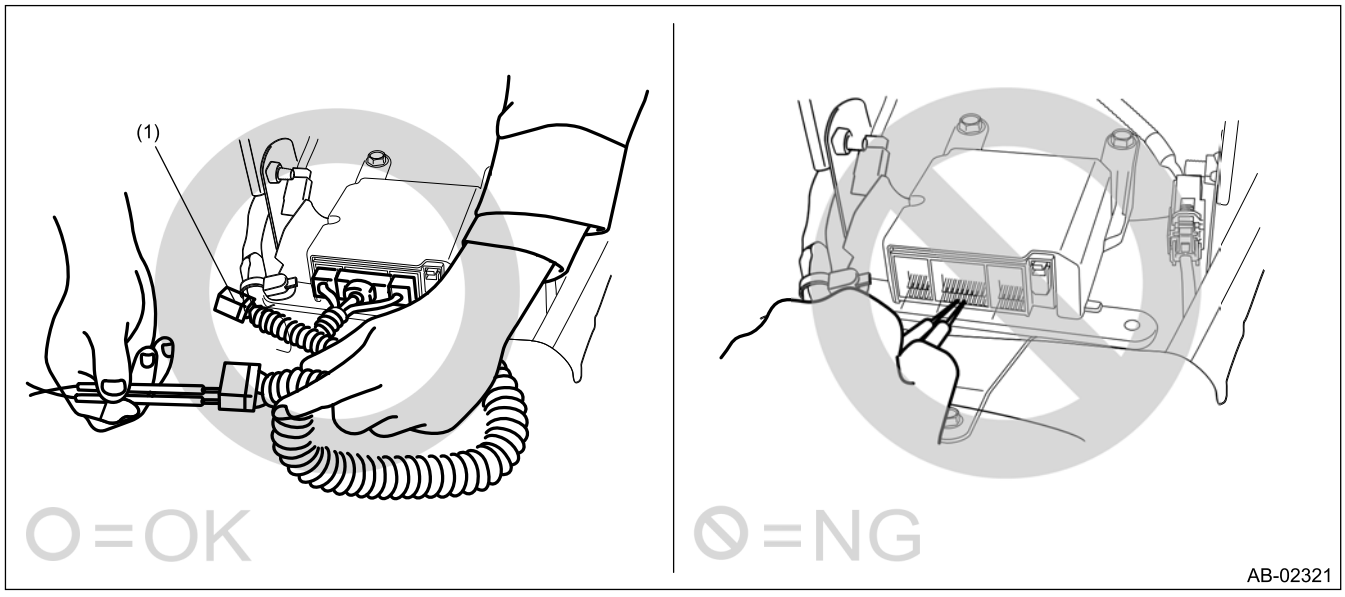
- When checking the airbag system, be sure to use a digital circuit tester. Use of an analog circuit tester may cause the airbag to activate erroneously due to a minimal current inside tester.



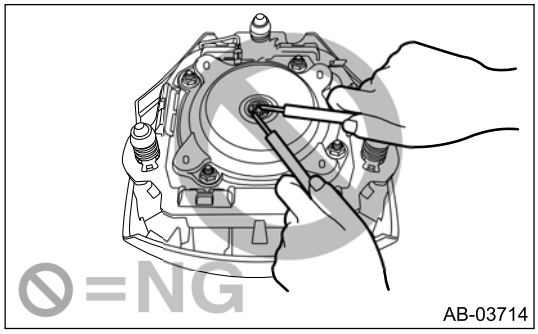
- Do not allow water or oil to come in contact with the connector terminals. Also, do not touch the connector terminals directly.



- When checking, use a test harness (1). Damage to connector terminal causes malfunction. Do not directly put the tester probe on airbag connector terminal.



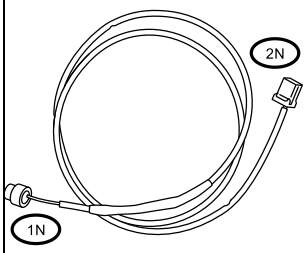
- Do not check the continuity of airbag modules and pretensioners.



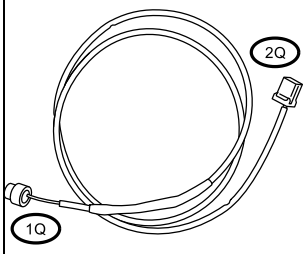
PREPARATION TOOL

1. SPECIAL TOOL

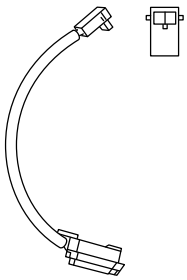
- TEST HARNESS N

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA000	98299SA000	TEST HARNESS N	Used for unit inspection of steering roll connector.

- TEST HARNESS Q

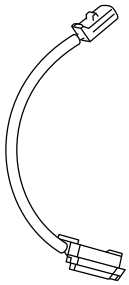
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA040	98299SA040	TEST HARNESS Q	Used for unit inspection of steering roll connector.

- TEST HARNESS ADAPTER D

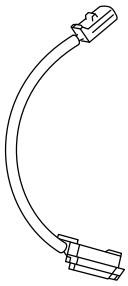
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA010	98299SA010	TEST HARNESS ADAPTER D	• Used for operation process of knee airbag module. • Used for operation process of curtain airbag module. • Used together with AIRBAG DEPLOYMENT TOOL. (98299PA030)

- TEST HARNESS ADAPTER AM

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FJ000	98299FJ000	TEST HARNESS ADAPTER AM	• Used for operation process of passenger’s airbag module. • Used together with AIRBAG DEPLOYMENT TOOL. (98299PA030)

- TEST HARNESS ADAPTER K

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FG010	98299FG010	TEST HARNESS ADAPTER K	• Used for operation process of side airbag module. • Used together with AIRBAG DEPLOYMENT TOOL. (98299PA030)

- AIRBAG DEPLOYMENT TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299PA030	98299PA030	AIRBAG DEPLOYMENT TOOL	• Used for operation process of airbag module. • Used together with each test harness adapter.

2. GENERAL TOOL

TOOL NAME	REMARKS
Steering wheel puller	Used for removing the steering wheel.
TORX® T40	Used for removing and installing the beam COMPL - steering.
Circuit tester	Used for measuring resistance, voltage and current.

PROCEDURE

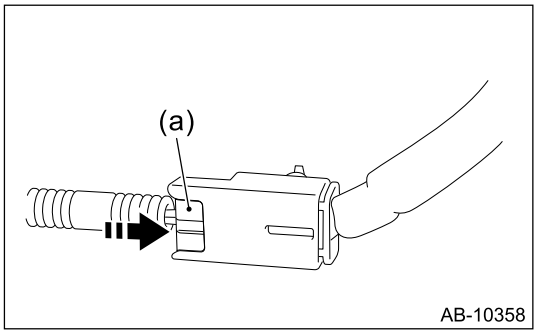
1. POWER SUPPLY

1. How to disconnect:

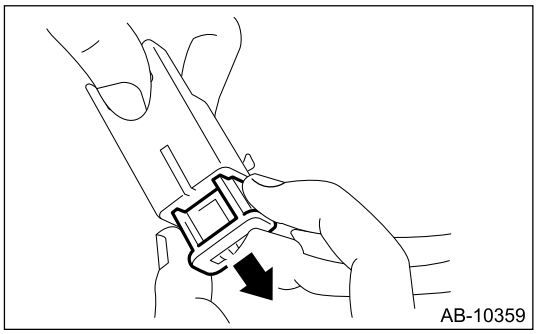
Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Push the slide lock (a) in the direction of arrow.



(2) With the slide lock pushed, disconnect the connector.

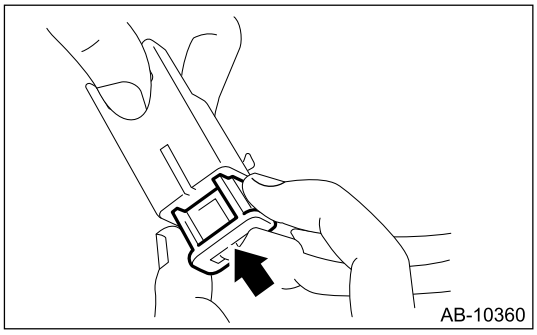


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.

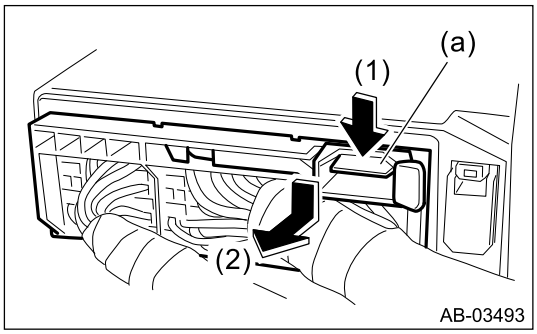


2. AIRBAG CONTROL MODULE

1. How to disconnect:

(1) Push the lock lever plate (a).

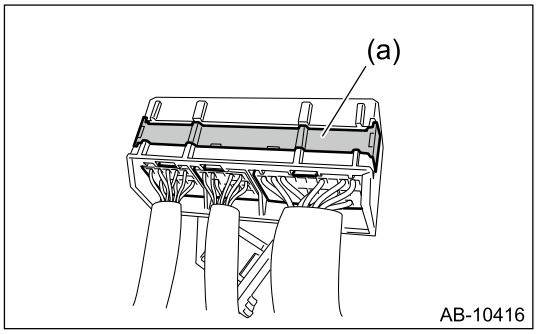
(2) While holding down the lock lever plate (a), pull the lever toward you.



2. How to separate:

(1) Remove the lock plate (a) behind the integrated connector.

(2) Release the lock levers of the connectors, and pull out the connectors.



3. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Insert the connector and push the lock lever in securely.

3. DRIVER'S AIRBAG MODULE (ROLL CONNECTOR)

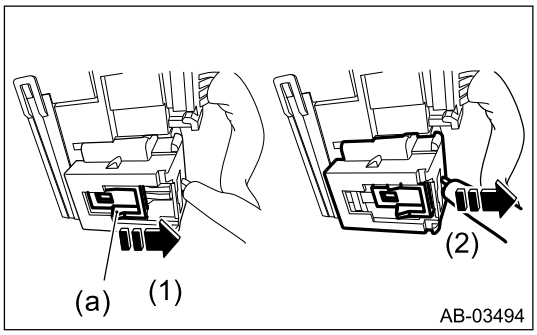
1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Pull the slide lock (a) in the direction of arrow.

(2) With the slide lock pulled, disconnect the connector.

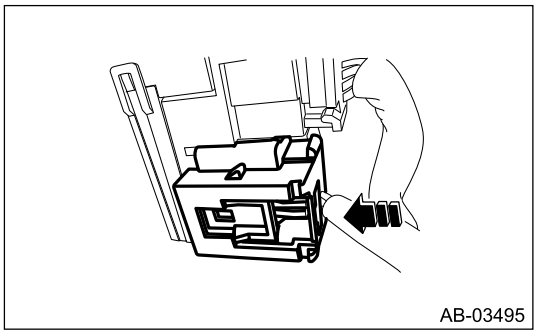


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.



4. PASSENGER'S AIRBAG MODULE AND PRETENSIONER

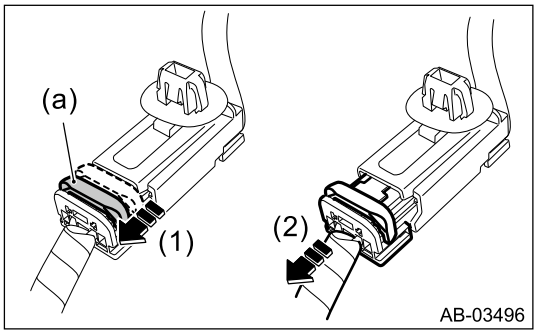
1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Pull the slide lock (a) in the direction of arrow.

(2) With the slide lock pulled, disconnect the connector.

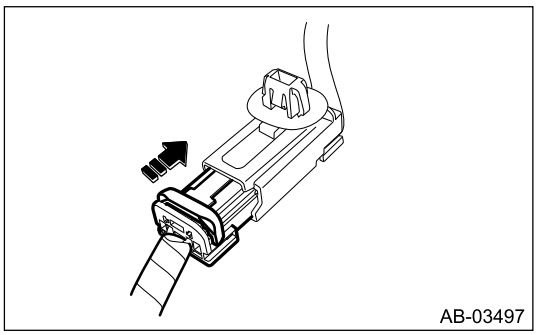


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.

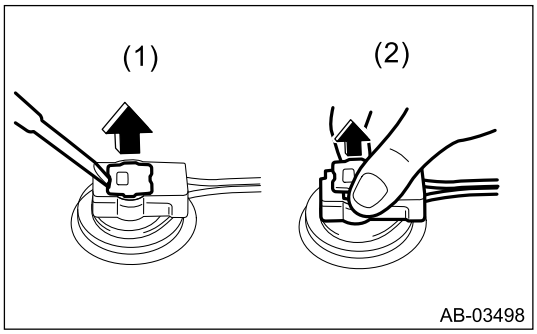


5. DRIVER'S AIRBAG MODULE AND CURTAIN AIRBAG MODULE

1. How to disconnect:

(1) Using a flat tip screwdriver, pry the push lock upward to unlock.

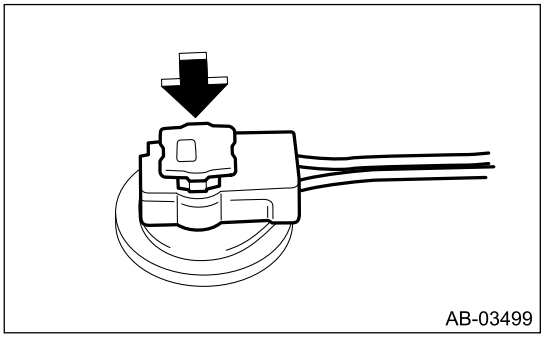
(2) Pull the connector to disconnect from the airbag module assembly or the retractor assembly.



2. How to connect:

Caution:

- **Be sure to insert the connector in until it is locked.**
- **Press in the push lock securely. Then pull it gently to make sure that it is locked.**



Connect the connector in the reverse order of disconnecting. At this time, be sure to insert until a clicking sound is heard.

6. FRONT SUB SENSOR AND SATELLITE SAFING SENSOR

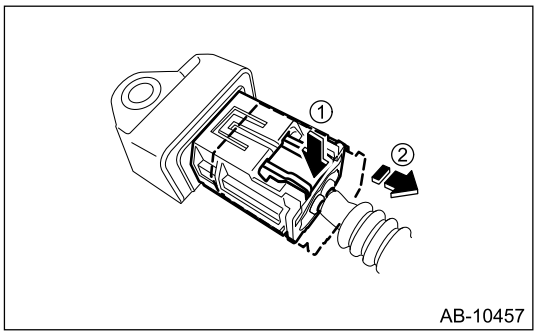
1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

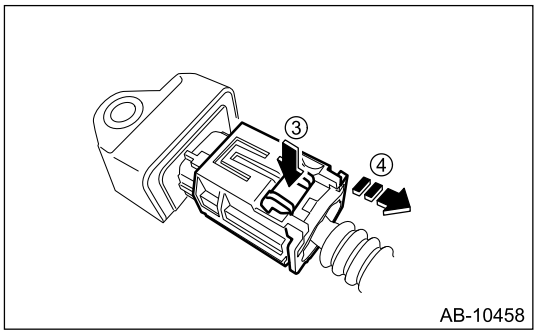
(1) Push the lock arm.

(2) Holding outer part, pull it one step in the direction of arrow.



(3) Push the lock arm again.

(4) Holding outer part, pull it in the direction of arrow to disconnect the connector.

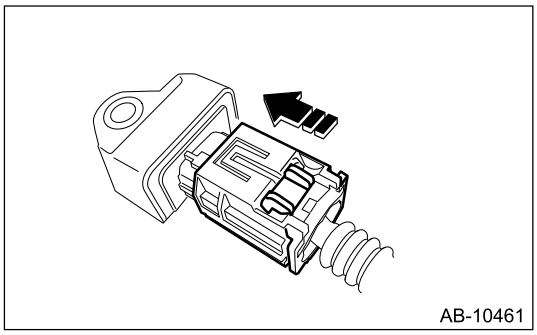


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.



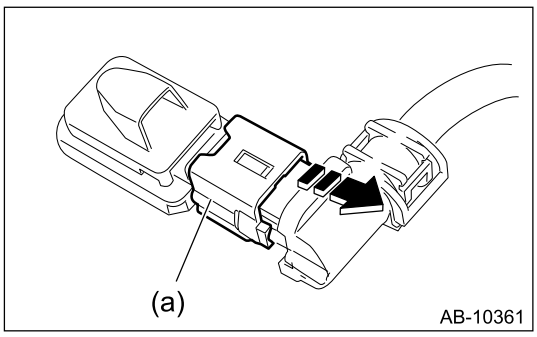
7. FRONT DOOR IMPACT SENSOR

1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

Holding outer part (a), pull it in the direction of arrow.

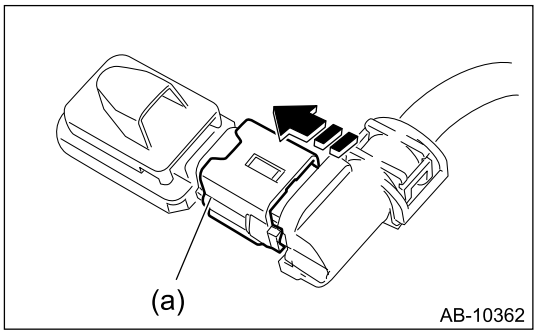


2. How to connect:

Caution:

- **The outer part (a) returns to the original position. Therefore do not touch the outer part.**
- **Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.**

Holding the connector, push it in securely until a clicking sound is heard.



8. FRONT DOOR IMPACT SENSOR (BETWEEN AIRBAG REAR HARNESS AND DOOR HARNESS)

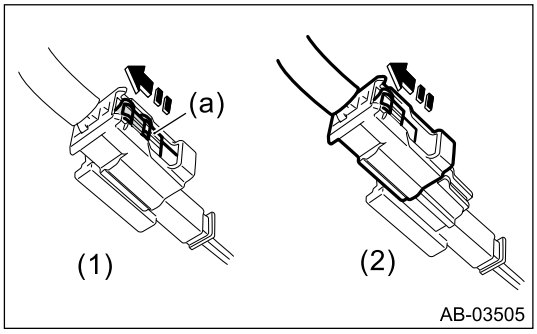
1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Pull the slide lock (a) in the direction of arrow.

(2) With the slide lock pulled, disconnect the connector.

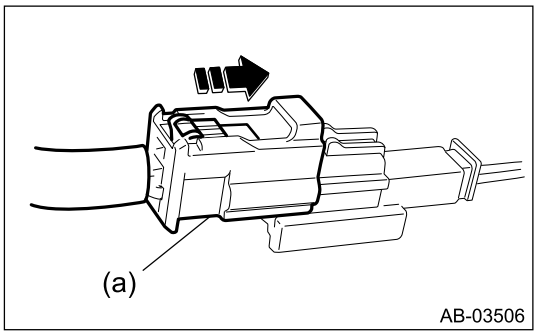


2. How to connect:

Caution:

- **The outer part (a) returns to the original position. Therefore do not touch the outer part.**
- **Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.**

Holding the connector, push it in securely until a clicking sound is heard.



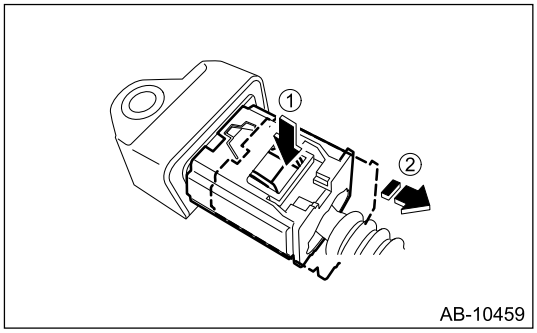
9. SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR

1. How to disconnect:

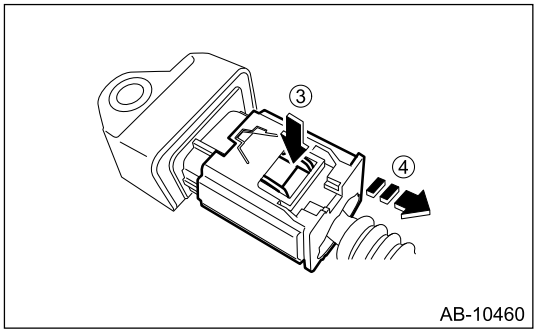
Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Push the lock arm.
(2) Holding outer part, pull it one step in the direction of arrow.



(3) Push the lock arm again.
(4) Holding outer part, pull it in the direction of arrow to disconnect the connector.

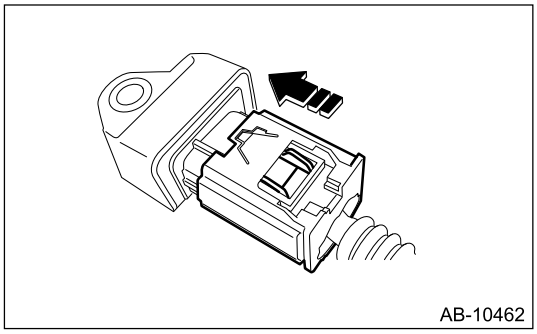


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.



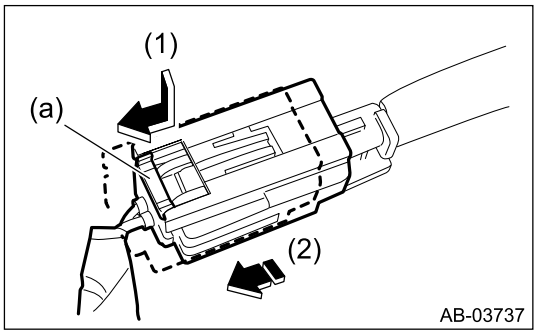
10. SIDE AIRBAG MODULE

1. How to disconnect:

Caution:

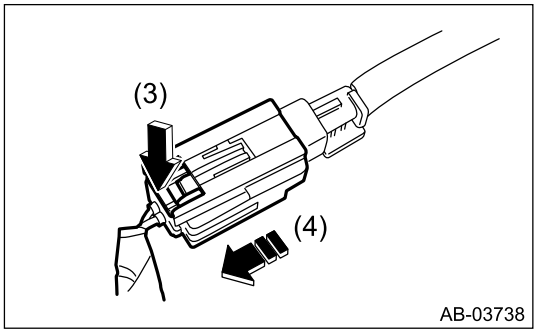
When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Pull the lock arm (a) one step while pushing.
(2) Holding outer part, pull it one step in the direction of arrow.



(3) Push the lock arm again.

(4) Holding outer part, pull it in the direction of arrow to disconnect the connector.



2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.

11. BUCKLE SWITCH RH

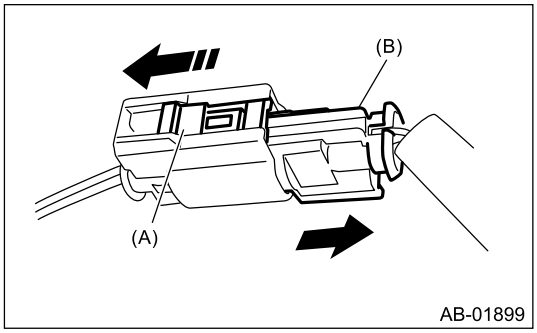
1. How to disconnect:

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

(1) Move the slide lock (A) in the direction of arrow and hold it.

(2) While holding the slide lock (A), pull the connector (B) in the direction of arrow.

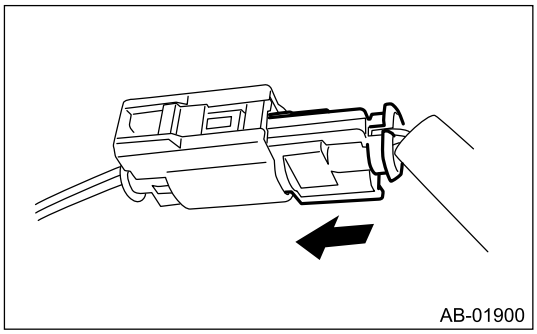


2. How to connect:

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

Holding the connector, push it in securely until a clicking sound is heard.

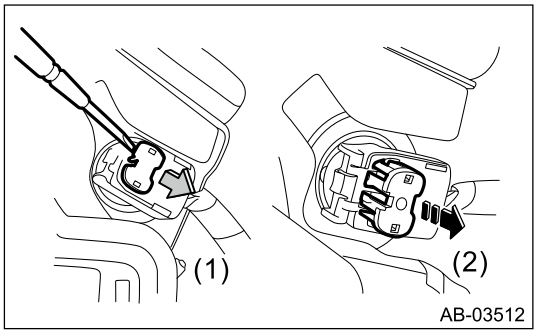


12. OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS)

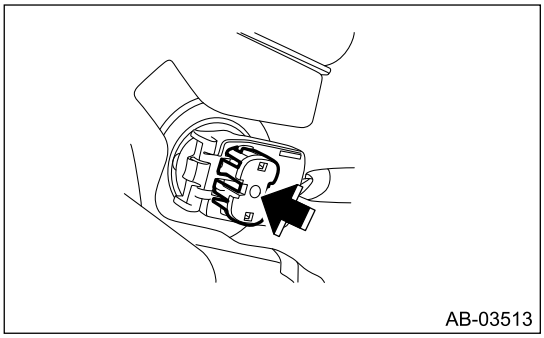
Refer to "OCCUPANT DETECTION SYSTEM" section. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Airbag Connector>PROCEDURE > OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS).

13. KNEE AIRBAG MODULE AND PASSENGER'S LAP SEAT BELT PRETENSIONER

1. How to disconnect:
   (1) Using a flat tip screwdriver, pry the push lock upward to unlock.
   (2) Pull the connector to disconnect from the airbag module assembly.



2. How to connect:
   Caution:
   - **Be sure to insert the connector in until it is locked.**
   - **Press in the push lock securely. Then pull it gently to make sure that it is locked.**



Connect the connector in the reverse order of disconnecting. At this time, be sure to insert until a clicking sound is heard.

INSPECTION

If the vehicle is involved in a collision, even if it is a slight collision, be sure to check the following systems.

1. DRIVER'S AIRBAG MODULE ASSEMBLY

1. Frontal collision (driver's airbag module assembly activated)
   1. Replace the following parts with new ones.
      - Airbag control module
      - Driver's airbag module
      - Knee airbag module
      - Passenger's airbag module (if deployed)
      - Curtain airbag module (right and left / if deployed)
      - Seat belt pretensioner (right and left)
      - Lap seat belt pretensioner (passenger's side only)
      - Locking tongue (front seat only) (right and left)
      - Front sub sensor (right and left)
      - Instrument panel assembly (because it is integrated with passenger's airbag module) (if passenger's airbag module is deployed)
      - Steering wheel
      - Column assembly - steering
      - Roll connector
      - Trim panel - roof assembly (if the curtain airbag is deployed)
      - Trim panel of each pillar (if the curtain airbag is deployed)
   2. Visually inspect the following items and replace any damaged part with a new one.
      - Universal joint assembly - steering
      - Steering gearbox
      - Beam COMPL - steering
      - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
      - Harnesses and connectors on body side that are linked to the replaced parts
2. Frontal collision (driver's airbag module not activated)
   Visually inspect the following items and replace any damaged or cracked part with a new one.
   Specially inspect the damage of airbag module body, mounting bracket and harness connector.
   - Driver's airbag module
   - Knee airbag module
   - Passenger's airbag module
   - Seat belt pretensioner (right and left)
   - Lap seat belt pretensioner (passenger's side only)
   - Locking tongue (front seat only) (right and left)
   - Front sub sensor (right and left)
   - Instrument panel assembly (because it is integrated with passenger's airbag module)
   - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
3. No frontal collision
   - Visually inspect the airbag modules for damage or contamination and replace any faulty part with a new one.

- Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. KNEE AIRBAG MODULE

1. Frontal collision (knee airbag module activated)

1. Replace the following parts with new ones.
   - Airbag control module
   - Driver’s airbag module
   - Knee airbag module
   - Passenger’s airbag module (if deployed)
   - Curtain airbag module (right and left / if deployed)
   - Seat belt pretensioner (right and left)
   - Lap seat belt pretensioner (passenger’s side only)
   - Locking tongue (front seat only) (right and left)
   - Front sub sensor (right and left)
   - Instrument panel assembly (because it is integrated with passenger’s airbag module) (if passenger’s airbag module is deployed)
   - Steering wheel
   - Column assembly - steering
   - Roll connector
   - Trim panel - roof assembly (if the curtain airbag is deployed)
   - Trim panel of each pillar (if the curtain airbag is deployed)
2. Visually inspect the following items and replace any damaged part with a new one.
   - Universal joint assembly - steering
   - Steering gearbox
   - Beam COMPL - steering
   - Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
   - Harnesses and connectors on body side that are linked to the replaced parts

2. Frontal collision (knee airbag module not activated)

Visually inspect the following items and replace any damaged or cracked part with a new one.
Specially inspect the damage of airbag module body, mounting bracket and harness connector.

- Driver’s airbag module
- Knee airbag module
- Passenger’s airbag module
- Seat belt pretensioner (right and left)
- Lap seat belt pretensioner (passenger’s side only)
- Locking tongue (front seat only) (right and left)
- Front sub sensor (right and left)
- Instrument panel assembly (because it is integrated with passenger’s airbag module)
- Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. No frontal collision

- Visually inspect the airbag modules for damage or contamination and replace any faulty part with a new one.
- Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT

DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. PASSENGER'S AIRBAG MODULE

1. Frontal collision (passenger's airbag module activated)
   1. Replace the following parts with new ones.
      - Airbag control module
      - Driver's airbag module
      - Knee airbag module
      - Passenger's airbag module
      - Curtain airbag module (right and left / if deployed)
      - Seat belt pretensioner (right and left)
      - Lap seat belt pretensioner (passenger's side only)
      - Locking tongue (front seat only) (right and left)
      - Front sub sensor (right and left)
      - Instrument panel assembly (because it is integrated with passenger's airbag module)
      - Steering wheel
      - Column assembly - steering
      - Roll connector
      - Trim panel - roof assembly (if the curtain airbag is deployed)
      - Trim panel of each pillar (if the curtain airbag is deployed)
   2. Visually inspect the following items and replace any damaged part with a new one.
      - Universal joint assembly - steering
      - Steering gearbox
      - Beam COMPL - steering
      - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
      - Harnesses and connectors on body side that are linked to the replaced parts
2. Frontal collision (passenger's airbag module not activated)
   Visually inspect the following items and replace any damaged or cracked part with a new one.
   Specially inspect the damage of airbag module body, mounting bracket and harness connector.
   - Driver's airbag module
   - Knee airbag module
   - Passenger's airbag module
   - Seat belt pretensioner (right and left)
   - Lap seat belt pretensioner (passenger's side only)
   - Locking tongue (front seat only) (right and left)
   - Front sub sensor (right and left)
   - Instrument panel assembly (because it is integrated with passenger's airbag module)
   - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
3. No frontal collision
   - Visually inspect the airbag modules for damage or contamination and replace any faulty part with a new one.
   - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

4. SIDE AIRBAG MODULE

1. Side impact (side airbag module activated)
   1. Replace the following parts with new ones.
      - Airbag control module
      - Satellite safing sensor
      - Cover - satellite safing
      - Front door impact sensor (collision side)
      - Plate - door UPR (collision side)
      - Seat belt pretensioner (collision side / if deployed)
      - Lap seat belt pretensioner (if deployed)
      - Locking tongue (front seat only) (if deployed)
      - Side airbag module (collision side)
      - Side airbag sensor (collision side)
      - Curtain airbag module (collision side)
      - Curtain airbag sensor (collision side)
      - Pad assembly - front seat backrest (collision side)
      - Frame assembly - front seat cushion (collision side)
      - Frame assembly - front backrest (collision side)
      - Cover COMPL - front backrest (collision side)
      - Trim panel - roof assembly
      - Trim panel for each pillar (collision side)
   2. Visually inspect the following items and replace any damaged part (collision side) with a new one.
      - Headrest assembly
      - Bushing - lock headrest
      - Slide rail assembly - OUT
      - Slide rail assembly - INN
      - Cover - hinge front seat (OUT/INN)
      - Knob - lifter
      - Lever - reclining
      - Seat belt pretensioner (if not deployed)
      - Lap seat belt pretensioner (if not deployed)
      - Locking tongue (if not deployed)
      - Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
      - Harnesses and connectors on body side that are linked to the replaced parts
2. Side impact (side airbag module not activated)

   Visually inspect the following items and replace any damaged or cracked part (collision side) with a new one.

   Specially inspect the damage of airbag module body, mounting bracket and harness connector.
   - Pad assembly - front seat backrest
   - Frame assembly - front backrest
   - Cover COMPL - front backrest
   - Satellite safing sensor
   - Cover - satellite safing
   - Front door impact sensor
   - Plate - door UPR
   - Side airbag module
   - Side airbag sensor
   - Curtain airbag module

- Curtain airbag sensor
- Seat belt pretensioner (if not deployed)
- Lap seat belt pretensioner (if not deployed)
- Locking tongue (if not deployed)
- Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. No side impact

- Visually inspect the airbag modules for contamination and replace any faulty part with a new one.
- Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

5. CURTAIN AIRBAG MODULE

1. Side impact or roll over (curtain airbag module activated)

1. Replace the following parts with new ones.
   - Airbag control module
   - Satellite safing sensor
   - Cover - satellite safing
   - Side airbag module (collision side)
   - Curtain airbag module (collision side)
   - Seat belt pretensioner (collision side / if deployed)
   - Lap seat belt pretensioner (if deployed)
   - Locking tongue (front seat only) (if deployed)
   - Front door impact sensor (collision side)
   - Plate - door UPR (collision side)
   - Side airbag sensor (collision side)
   - Curtain airbag sensor (collision side)
   - Pad assembly - front seat backrest (collision side)
   - Frame assembly - front seat cushion (collision side)
   - Frame assembly - front backrest (collision side)
   - Cover COMPL - front backrest (collision side)
   - Trim panel - roof assembly
   - Trim panel for each pillar (collision side)
   - Airbag bracket (model with sunroof) (collision side)
2. Visually inspect the following items and replace any damaged part (collision side) with a new one.
   - Assist rail - front and rear
   - Bracket - assist rail front and rear
   - Passenger's seat occupant detection system (Perform the inspection following the diagnostic procedure in the "OCCUPANT DETECTION (DIAGNOSTICS)" section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
   - Harnesses and connectors on body side that are linked to the replaced parts

2. Side impact (curtain airbag module not activated)

Visually inspect the following items and replace any damaged or cracked part (collision side) with a new one.

Specially inspect the damage of airbag module body, mounting bracket and harness connector.

- Trim panel - roof assembly
- Trim panel for each pillar
- Curtain airbag module

- Satellite safing sensor
- Cover - satellite safing
- Front door impact sensor
- Plate - door UPR
- Side airbag sensor
- Curtain airbag sensor
- Seat belt pretensioner (if not deployed)
- Lap seat belt pretensioner (if not deployed)
- Locking tongue (if not deployed)
- Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. No side impact

- Visually inspect the airbag covers for damage or contamination and replace any faulty part with a new one.
- Passenger’s seat occupant detection system (Perform the inspection following the diagnostic procedure in the “OCCUPANT DETECTION (DIAGNOSTICS)” section.) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

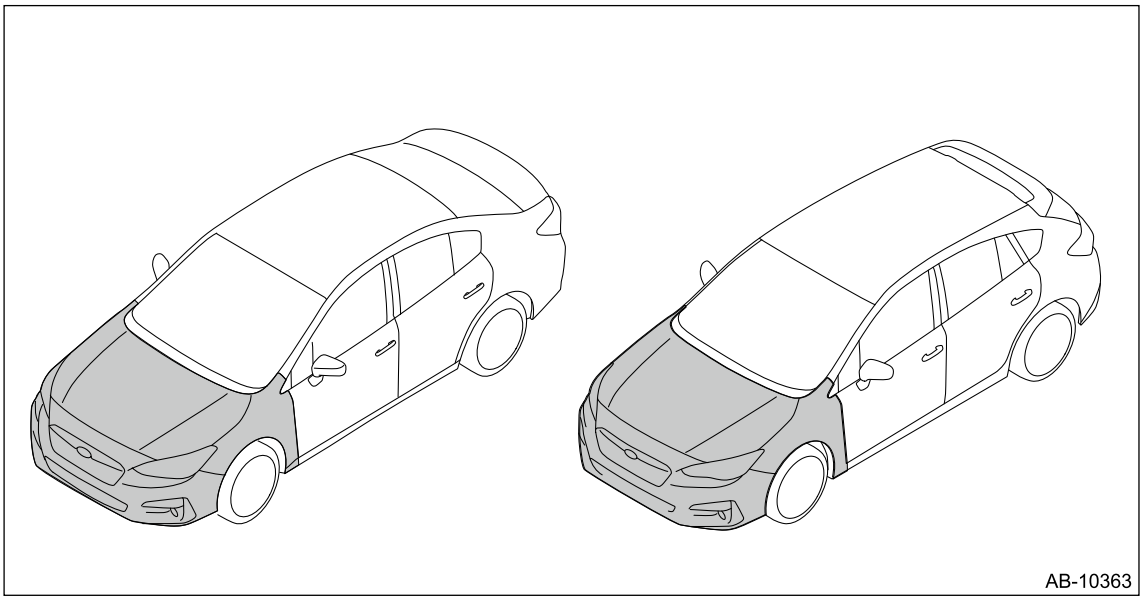
6. AIRBAG CONTROL MODULE

Check for the following, and replace the damaged parts with new parts.

- Control module is cracked or deformed.
- Connector is scratched, cracked or deformed.
- Driver’s airbag module has been activated.
- Knee airbag module has been activated.
- Passenger’s airbag module has been activated.
- Side airbag module has been activated.
- Curtain airbag module has been activated.
- Seat belt pretensioner has been activated.
- Lap seat belt pretensioner has been activated.
- Locking tongue has been activated.

7. FRONT SUB SENSOR

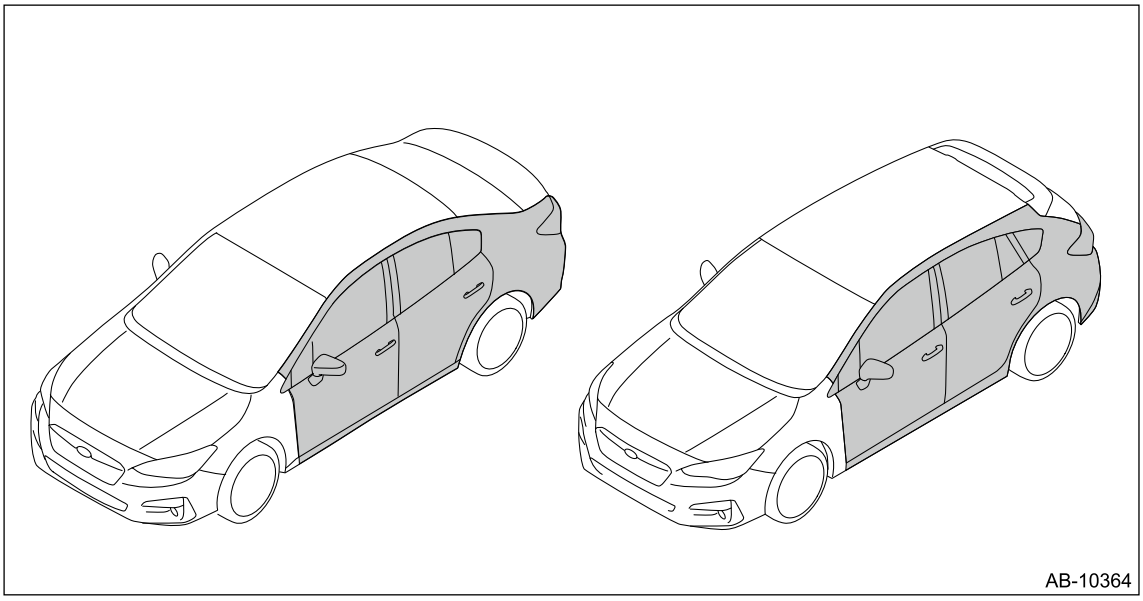
If the section of vehicle as shown in the figure is damaged, check the following items and replace the damaged parts with new parts.



- Front sub sensor is cracked or deformed.
- Connector is scratched, cracked or deformed.
- Driver’s airbag module, knee airbag module, passenger’s airbag module and curtain airbag module have been activated.

8. FRONT DOOR IMPACT SENSOR, SATELLITE SAFING SENSOR, SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR

If the section of vehicle as shown in the figure is damaged, check the following items and replace the damaged parts with new parts.



- Front door impact sensor, plate - door UPR, side airbag sensor, satellite safing sensor, sensor cover and curtain airbag sensor are cracked or deformed.
- Mounting bracket is cracked or deformed.
- Connector is scratched, cracked or deformed.
- Side airbag module or curtain airbag module has been activated. (Operating side)

9. ROLL CONNECTOR

Check for the following, and replace the damaged parts such as cracks, deformation, etc. with new parts.

- Combination switch
- Steering roll connector

10. CHECK STEERING SYSTEM

For steering wheel, column assembly - steering, universal joint assembly - steering, and steering gearbox, check the following items, and if there is anything out of standard value, it is considered to be damaged. If so, replace it with a new part.

- Check the following items for the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSPECTION.
  - Mounting conditions and deflection of front and rear, upward and downward directions of the steering wheel and column assembly - steering.
  - Deflection of front and rear, upward and downward directions, and mounting condition to vehicle body of the column assembly - steering. (After a collision, absorbing part of the column assembly - steering may have been operated.)
- Check for deflection and the swing load of the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSPECTION.
- Check the following items for the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox>INSPECTION.
  - Rack sliding resistance and deflection
  - Input shaft play
  - Rotational resistance of gearbox

11. PASSENGER'S SEAT

Caution:
Do not disassemble the frame assembly - front cushion, slide rail and load sensor, which are integrated in an assembly component. If scratches, cracks or deformation are detected, be sure to replace the part as an assembly.

1. Check for the following, and replace the damaged parts with new parts.
   - Body or bracket of the seat belt inner - front is scratched, cracked or deformed.
   - Frame assembly - front backrest is cracked or deformed.
   - Headrest assembly for deformation or play.
   - If the cover - front cushion and the cover COMPL - front backrest is damaged or frayed, replace the cover with a new part.
   - If the cover - front cushion and the seat heater are replaced, replace the cover hang wire with a new part.
2. When the passenger's seat is removed (including the case that the bolts are loosened), perform «Rezero» of the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.
3. When the passenger's seat cover COMPL - front seat has been removed or replaced, make sure that the occupant detection system operates normally.
4. Use the Subaru Select Monitor to check whether the passenger's seat belt buckle switch is operating normally.

12. INSPECTION OF OTHER PARTS

Check for the following parts, and replace the damaged parts with new parts.

1. Check the following parts equipped with the direct type connector for damage, and also check each harness for pinch and connector damage. Replace the main harness as a unit if damage is found.
   - Driver's airbag module
   - Knee airbag module

- Curtain airbag module
- Pretensioner

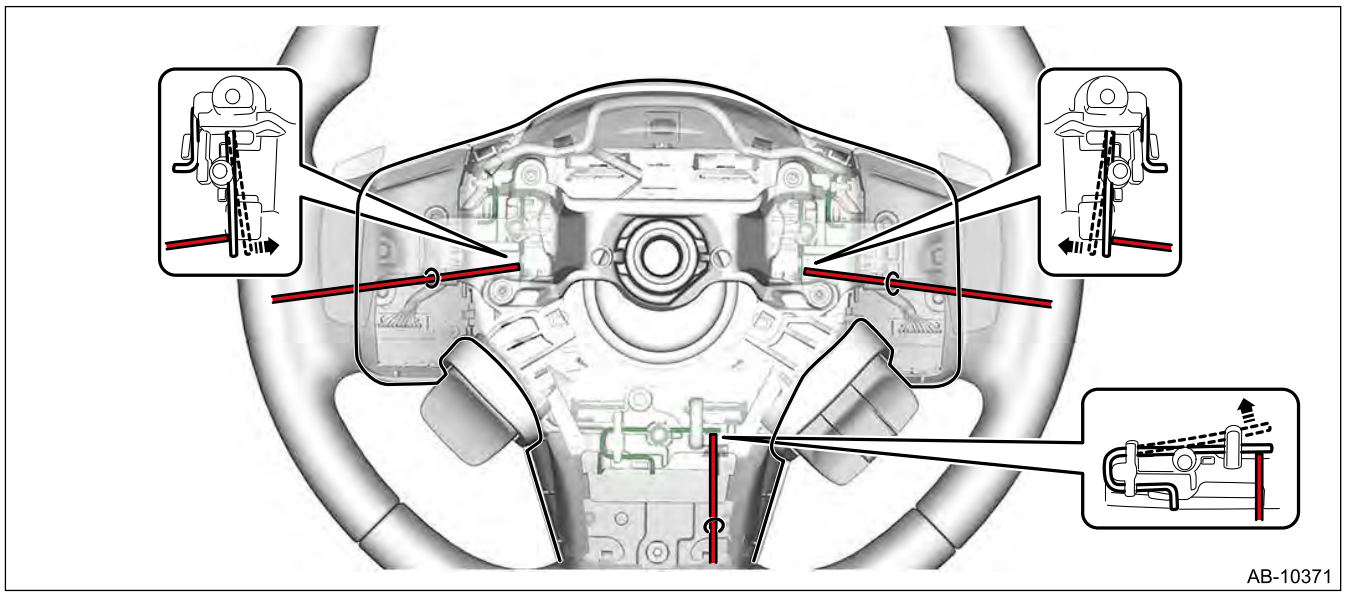
2. Check the seat cushion, backrest, slide rail and headrest for installation condition and looseness.
3. If any break or fray is found in the cover COMPL - front backrest of the driver’s seat or passenger’s seat, the side airbag system may not operate normally. In this case, replace the cover COMPL - front backrest with a new part.
4. If the securing clip mounting area of curtain airbag module or the bracket - assist rail is deformed or cracked, replace the defective part.

REMOVAL

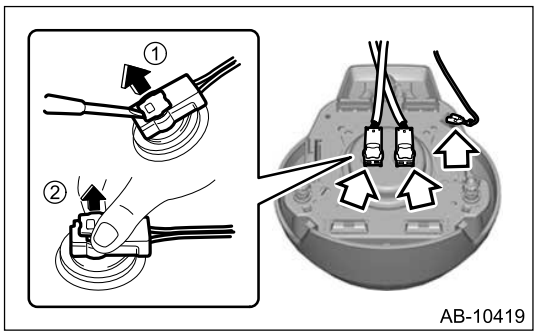
Caution:

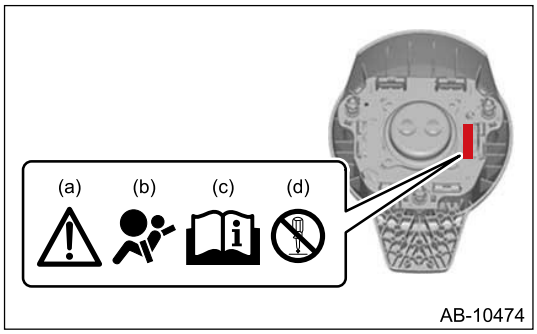
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Position the front wheels straight ahead.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the driver's airbag module.
   (1) Using a hexagon wrench etc. wrapped by protective tape, insert the snap pins and release the locks (three locations).



(2) Disconnect the horn harness and airbag connector, and remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > DRIVER'S AIRBAG MODULE AND CURTAIN AIRBAG MODULE.





Meaning of pictograms indicated on the label

(a) Flammable explosive substance encapsulated parts; be careful of handling.

(b) Indicates that this part is an airbag module.

(c) Before handling, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" in the service manual.
For the disposal procedures of the airbag modules, refer to "Airbag Module Disposal".

(d) Do not disassemble the airbag module.

AIRBAG SYSTEM > Driver's Airbag Module

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Airbag module is cracked or deformed.
   - Harness and/or connector is cracked, deformed or open.
   - Harness wire is exposed.
   - The steering wheel is in the way, making it difficult to install the airbag module.
   - The clearance between the driver's airbag module and steering wheel is not constant.
2. Install the driver's airbag module.
   Caution:
   - **Make sure that the snap pin is securely placed inside the guide before installing the airbag module.**
   - **Be sure to insert the connector in completely until it is locked.**
   - **Press in the push lock of the direct type connector securely. Then pull it gently to make sure that it is locked.**
   - **After the airbag module is installed, make sure that the airbag module locks (three positions) are securely locked.**

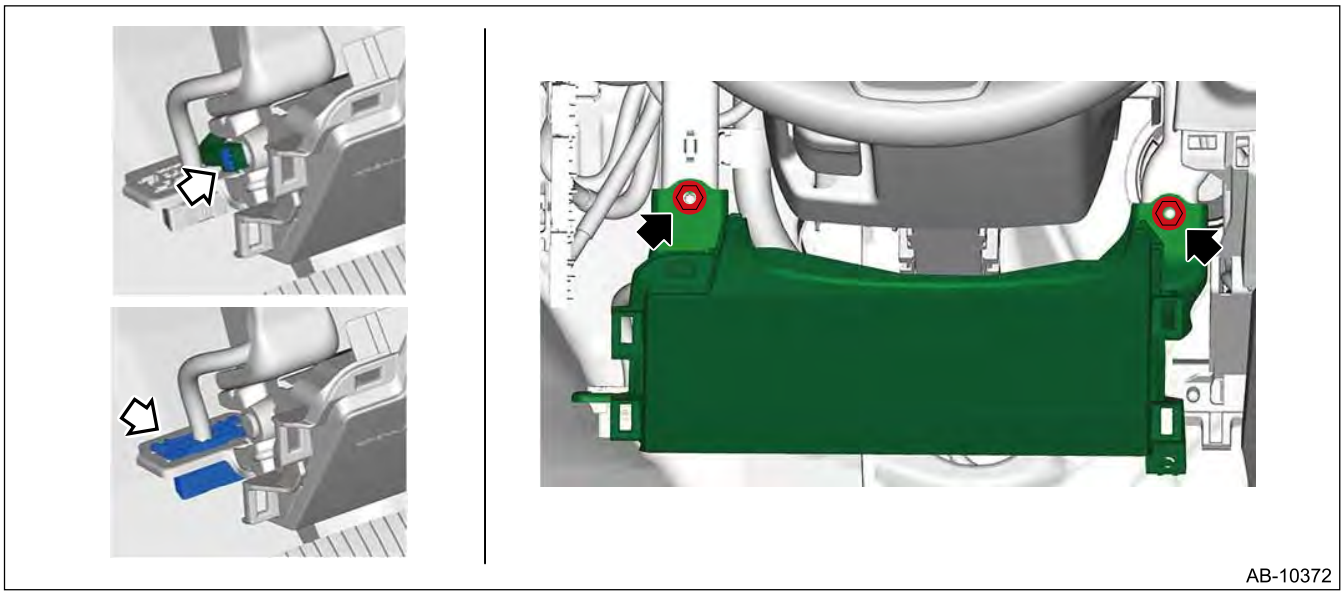
   (1) Connect the airbag connector to the airbag module securely.
   (2) Connect the horn harness.
   (3) Press in the locks (three positions) to install the airbag module.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

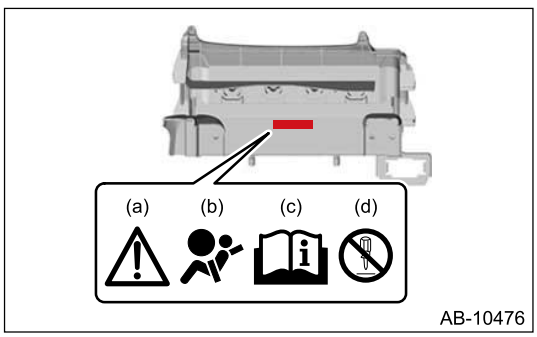
REMOVAL

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the nuts to remove the knee airbag module and disconnect the harness connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > KNEE AIRBAG MODULE AND PASSENGER'S LAP SEAT BELT PRETENSIONER.
   (1) Disconnect the connector of knee airbag module. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > KNEE AIRBAG MODULE AND PASSENGER'S LAP SEAT BELT PRETENSIONER.
   (2) Remove the data link connector.
   (3)Remove the nuts, and remove the knee airbag module.





Meaning of pictograms indicated on the label

(a) Flammable explosive substance encapsulated parts; be careful of handling.

(b) Indicates that this part is an airbag module.

(c) Before handling, always refer to “CAUTION” of “General Description” in “AIRBAG SYSTEM” in the service manual.
For the disposal procedures of the airbag modules, refer to “Airbag Module Disposal”.

(d) Do not disassemble the airbag module.

AIRBAG SYSTEM > Knee Airbag Module

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to “CAUTION” of “General Description” in “AIRBAG SYSTEM”. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Airbag module is cracked or deformed.
   - Knee airbag module bracket is cracked or deformed.
   - Harness and/or connector is cracked, deformed or open.
   - Harness wire is exposed.
   - Depending on the condition of the beam COMPL - steering, installation of the knee airbag module is difficult.
2. Install the knee airbag module.
   Caution:
   - **Be sure to insert the connector in completely until it is locked.**
   - **Press in the push lock of the direct type connector securely. Then pull it gently to make sure that it is locked.**

   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the data link connector.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

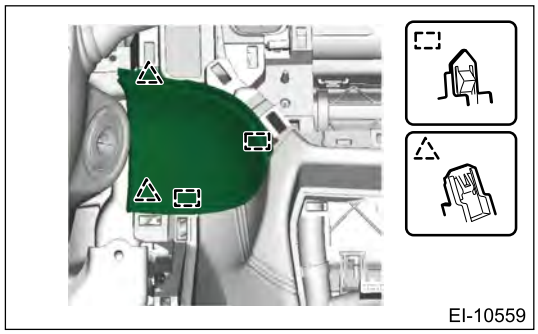
REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

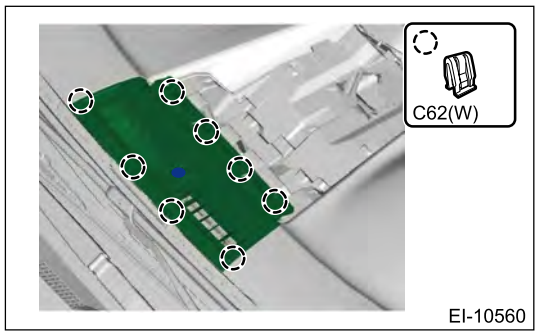
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For the power seat model, remove the console box before removing the battery ground terminal.**
3. Remove the boot - hand brake, the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
4. Remove the center grille assembly. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
5. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
6. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
7. Remove the panel center LWR, and remove the tray - center UPR. Ref. to EXTERIOR/INTERIOR TRIM>Center Console>REMOVAL.
8. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
9. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
10. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
11. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
12. Remove the visor assembly - combination meter, the cover assembly - visor LWR, and the combination meter assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
13. Release the claws and clips, and remove the cover - starter SW. (Models without the keyless access with push button start)

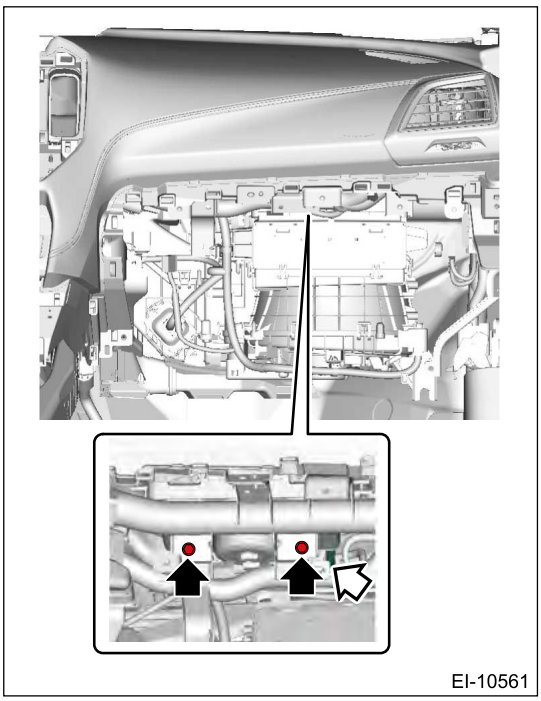


14. Remove the panel - starter SW and the push button ignition switch. (Model with keyless access with push button start) Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>REMOVAL.
15. Remove the trim panel - front pillar UPR on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.

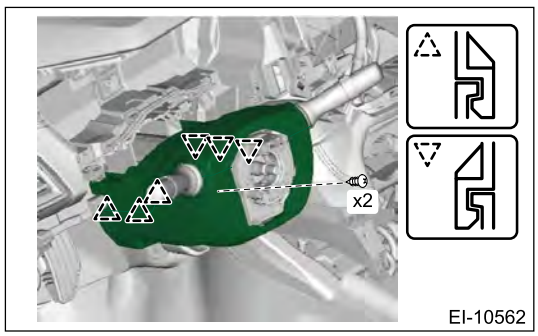
16. Remove the grille speaker side and the speaker assembly - tweeter on the left and right sides. Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > TWEETER.
17. Remove the glove box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
18. Remove the multi-function display assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD)>REMOVAL.
19. Remove the grille - front defroster.
    (1) Release the clips, and then raise the grille - front defroster.
    (2) Disconnect the sunload sensor connector, and remove the grille - front defroster.



20. Remove the bolts of the passenger's airbag module, and disconnect the connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > PASSENGER'S AIRBAG MODULE AND PRETENSIONER.

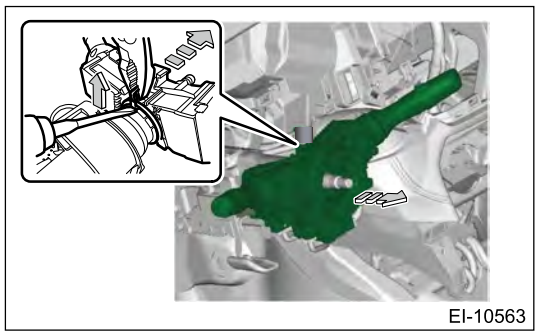


21. Remove the screws and release the claws, then detach the cover assembly - column.

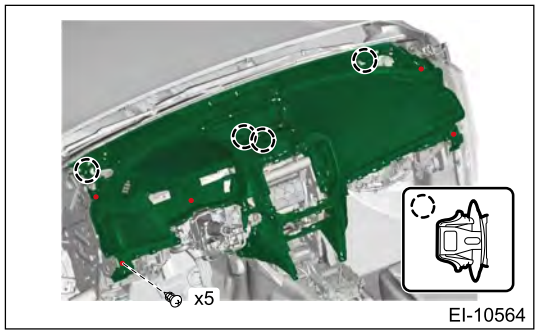


22. Remove the switch assembly - combination.

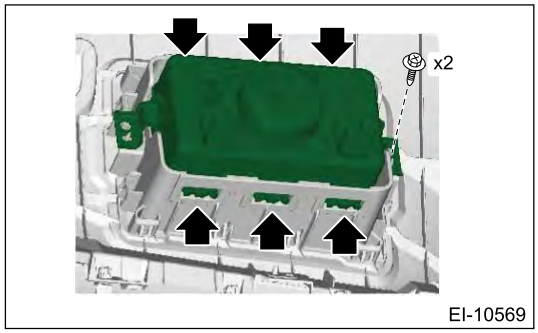
(1) Disconnect each connector, and loosen the clamp to release the claws.
(2) Pull out the switch assembly - combination from the column assembly - steering.



23. Remove the panel COMPL - instrument.
(1) Remove the harness clamp of the speaker assembly - tweeter.
(2) Release the clamps of the sunload sensor and multi-function display harnesses, and pull them out toward yourself.
Note:
Confirm the harness routing of the sunload sensor and multi-function display harnesses.
(3) Remove the screws, and remove the panel COMPL - instrument.



24. Remove the tapping screws and release the claws, and remove the passenger's airbag module.



25. For handling of the removed airbag module, refer to "CAUTION". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

AIRBAG SYSTEM > Passenger's Airbag Module

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **When reusing the tether clip on the upper part of the trim panel - front pillar UPR, check that there is no damage to the tether clip. If the tether clip is damaged, always replace it with a new tether clip. If the tether clip is damaged, its holding force is reduced and the trim panel - front pillar UPR may come off.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Passenger's airbag lid (instrument panel surface) is cracked or deformed.
   - Airbag module is cracked or deformed.
   - Harness and/or connector is cracked, deformed or open.
   - Harness wire is exposed.
   - Mounting bracket is cracked or deformed.
2. Install the panel COMPL - instrument. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>INSTALLATION.
3. Install the switch assembly - combination and the cover assembly - column.
4. Install the panel - starter SW and the push button ignition switch. (Model with keyless access with push button start)
5. Install the cover - starter SW. (Models without the keyless access with push button start)
6. Install the combination meter assembly, the cover assembly - visor LWR, and the visor assembly - combination meter.
7. Install the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSTALLATION.
8. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
9. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
10. Install the cover assembly - instrument panel LWR driver.
11. Install the glove box assembly.
12. Install the trim panel - front pillar UPR on the left and right sides.
13. Install the grille speaker side on the left and right sides.
14. Install the tray - center UPR and the panel center LWR.
15. Install the heater control assembly.
16. Install the panel center LWR on the left and right sides.
17. Install the console box assembly.
    Tightening torque:
    6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
18. Install the cover assembly - front.
19. Install the mat - center tray, the tray - center LWR, and the boot - hand brake.
20. Install the multi-function display assembly.
21. Install the audio assembly or navigation assembly.
22. Install the panel - center UPR.
23. Install the center grille assembly.
24. Install the cover - instrument panel side on the left and right sides.
25. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
    Note:
    After connecting the battery ground terminal, place the select lever in the "P" position.

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:

   For models with power seat, remove the slide rail installing bolt before removing the battery ground terminal.

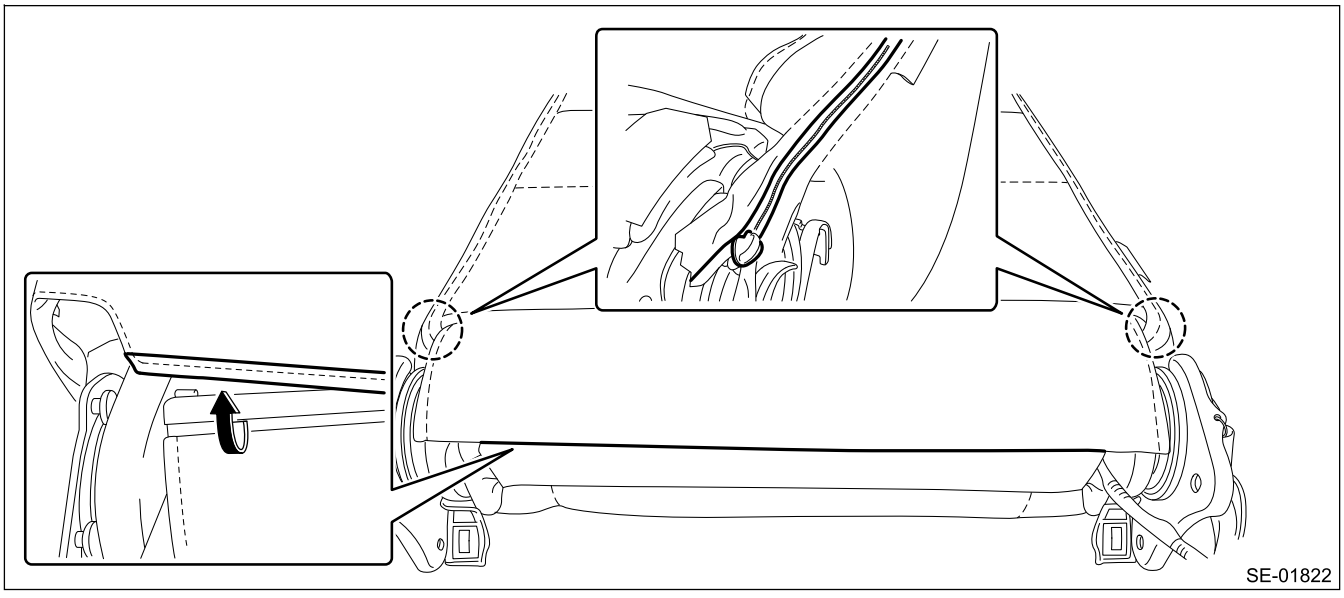
   After the bolts are removed, slide the seat to the middle position in order to make it easier to take out of the vehicle.
3. Remove the front seats. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the seat belt inner - front. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT INNER - FRONT.
5. Separate the backrest assembly and the seat cushion assembly. Ref. to SEATS>Front Seat>DISASSEMBLY.
6. Remove the side airbag module.

   Caution:

   Do not open the protective cover of the side airbag module. If any damage is present in the protective cover or the cloth of side airbag module comes out from the protective cover slit, replace the side airbag module with a new part.

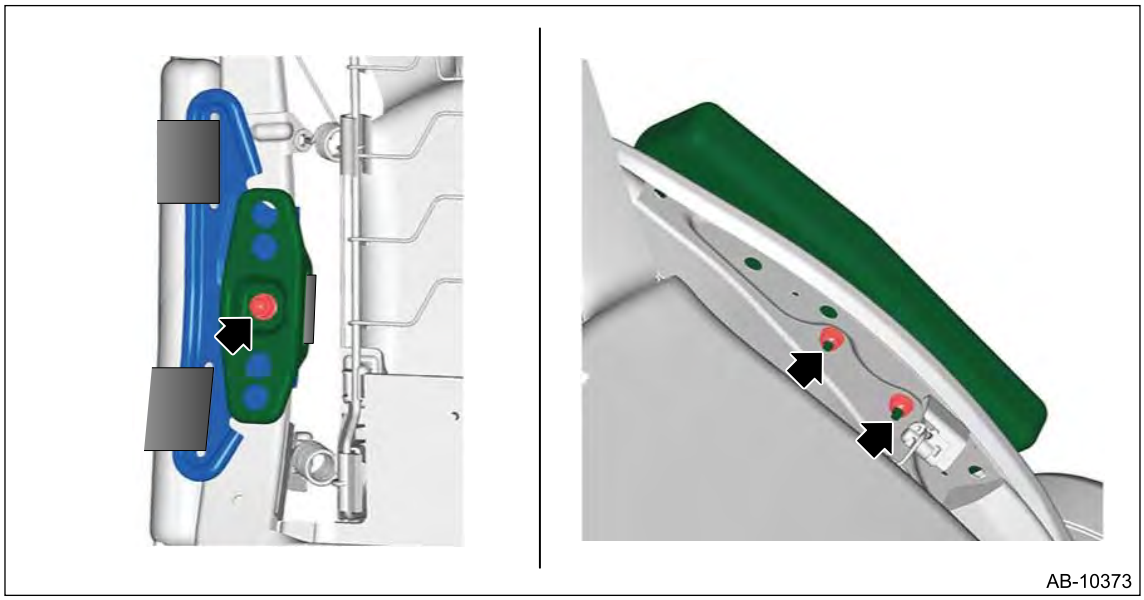
   (1) Remove the plastic fastener at the back side (bottom) of backrest assembly.

   (2) Open the fastener at the rear side of backrest assembly.



   (3) Remove the hexagon cap nut and nuts.

   (4) While taking care not to damage the airbag protective cover, remove the side airbag module.

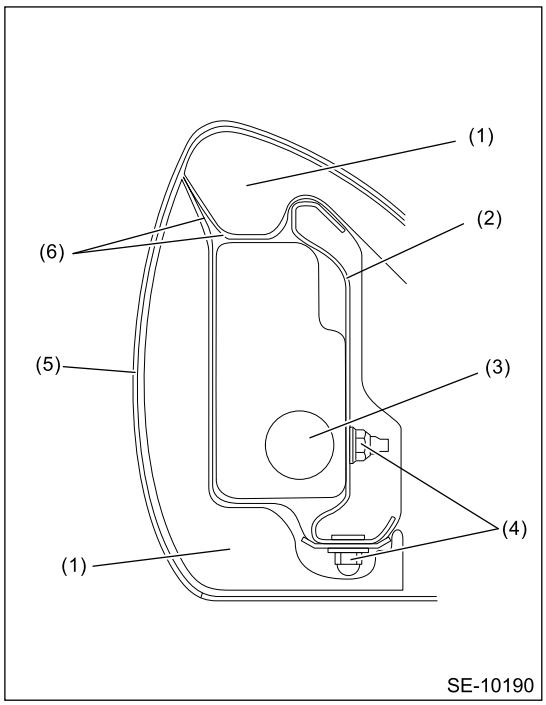


AIRBAG SYSTEM > Side Airbag Module

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Make sure that the side airbag module is installed as shown in the figure.**



(1) Pad ASSY - front seat backrest
(2) Frame ASSY - front backrest
(3) Side airbag module inflator
(4) Nut
(5) Cover COMPL - front backrest
(6) Side airbag guide cloth

- **Be careful not to stain or damage the cover COMPL - front backrest during assembly.**
- **Do not reuse hog rings.**
- **Secure the hog ring using hog ring pliers.**
- **Install the hog rings to the specified points securely and make sure that there is no wrinkle or twisting on the cover COMPL - front backrest.**

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Make sure that there is no foreign matter on side airbag module.
   - Front seat, airbag module and mounting bracket are damaged or deformed.
   - Harness and/or connector is cracked, deformed or open.
   - Harness wire is exposed.
2. Install the side airbag module to the frame assembly - front backrest.
   Tightening torque:
   6 N·m (0.6 kgf-m, 4.4 ft-lb)
3. Assemble the front seat. Ref. to SEATS>Front Seat>ASSEMBLY.
   Caution:
   After restoring the seat, operate the reclining and sliding mechanisms to check that the side airbag harness is not caught.
4. Install the seat belt inner - front. Ref. to SEAT BELT SYSTEM>Front Seat Belt>INSTALLATION > SEAT BELT INNER - FRONT.
5. Install the front seat assembly to the body. Ref. to SEATS>Front Seat>INSTALLATION.
   Caution:
   If the passenger's seat bolts are loosened or the seat is removed, be sure to perform [Rezero] for the occupant detection system after installing the seat to the vehicle.

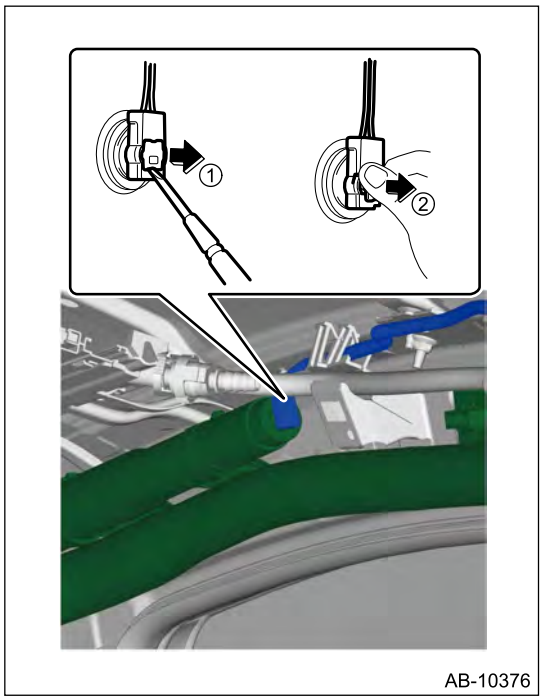
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Perform [Rezeroing] for the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

REMOVAL

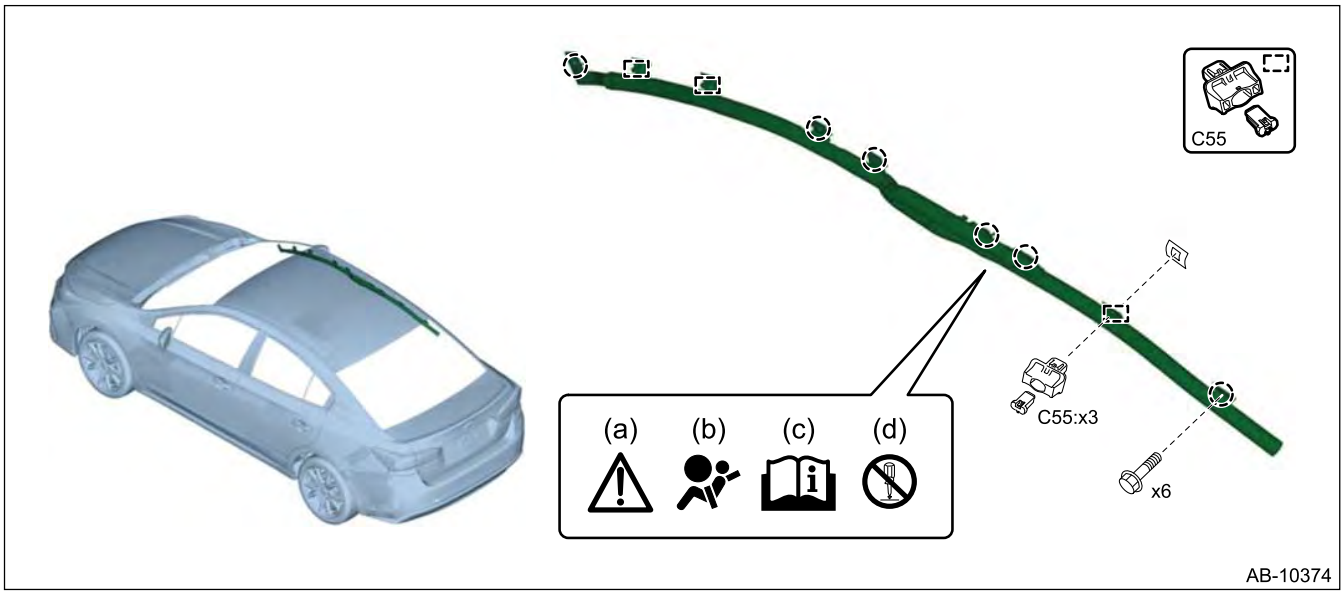
Note:
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

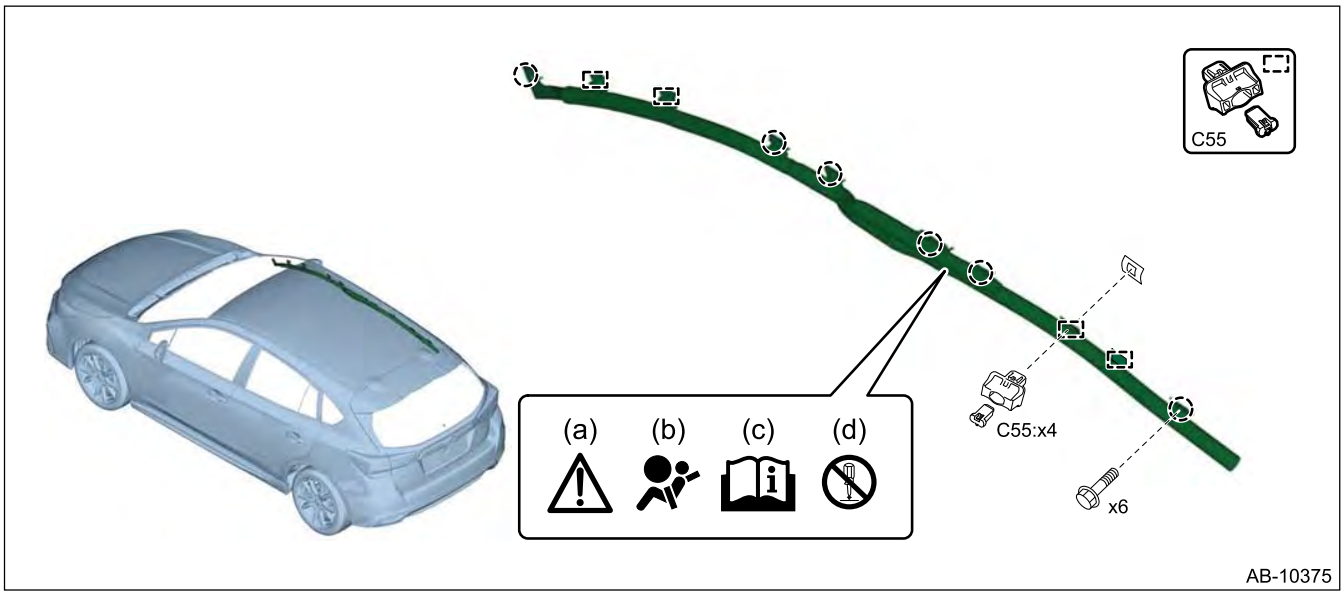
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For model with the power seat, move the seat to the front-most position before removing the battery ground terminal.**
3. Remove the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL.
4. Remove the curtain airbag module.
   Caution:
   - **Be careful not to damage the curtain airbag module during removal.**
   - **Never open the curtain airbag module before activation. Never reuse the deployed curtain airbag module.**
   - **Do not reuse the curtain airbag module of which clips have been removed.**
   - **Remove the modules in order starting from the vehicle front.**

   (1) Disconnect the curtain airbag module connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > DRIVER'S AIRBAG MODULE AND CURTAIN AIRBAG MODULE.



(2)Remove all the bolts and clips, and remove the curtain airbag module.





Meaning of pictograms indicated on the label

(a) Flammable explosive substance encapsulated parts; be careful of handling.

(b) Indicates that this part is an airbag module.

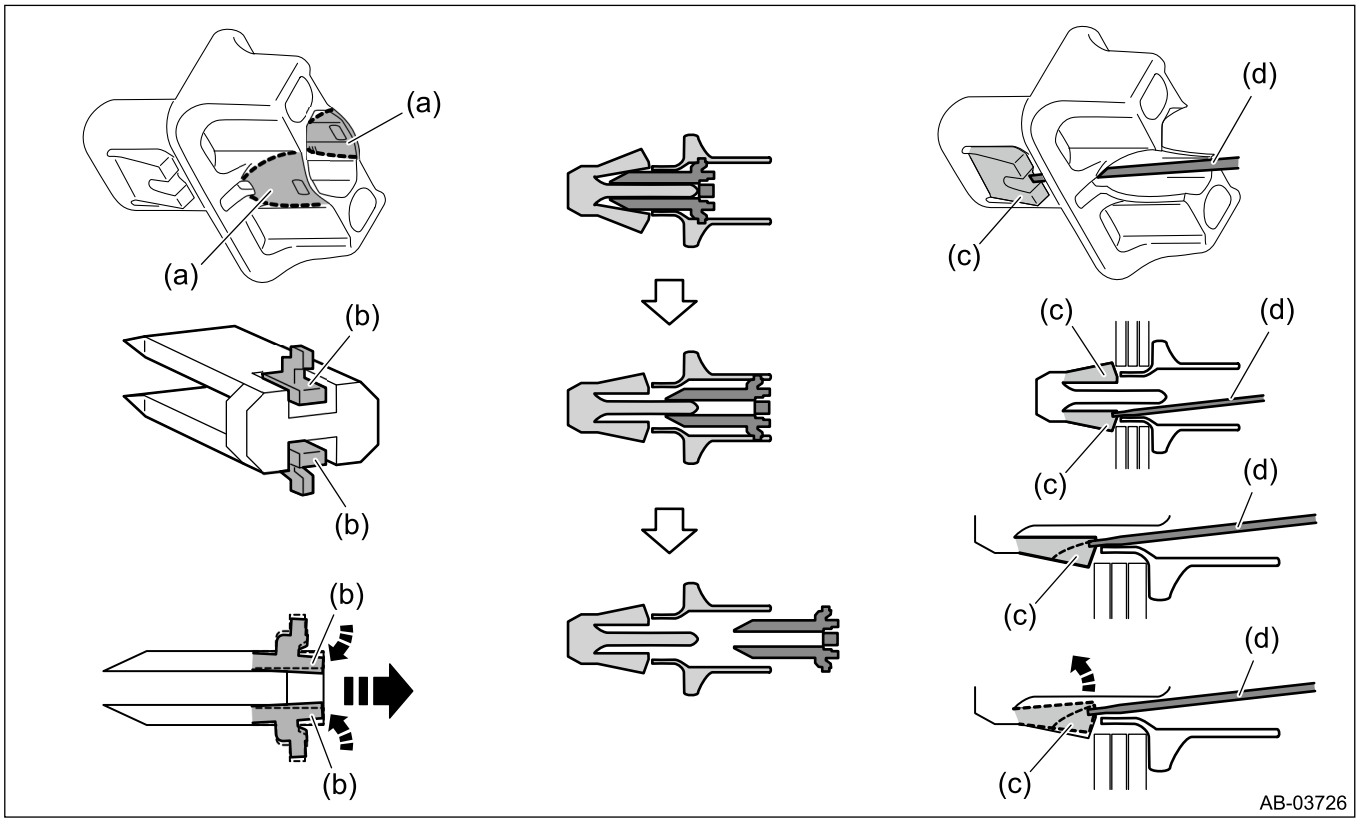
(c) Before handling, always refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" in the service manual.
For the disposal procedures of the airbag modules, refer to "Airbag Module Disposal".

(d) Do not disassemble the airbag module.

Note:

Remove the securing clip of curtain airbag module in the following procedures.

1. **Using a pair of nippers, cut off the clip base (a).**
2. **Remove the clip - pin while holding the lock (b) with needle nose pliers.**
3. **Release the locks (c) of the clips - bushing at two locations at the top and bottom completely using thin flat head screwdriver (d), and remove the clip - bushing.**

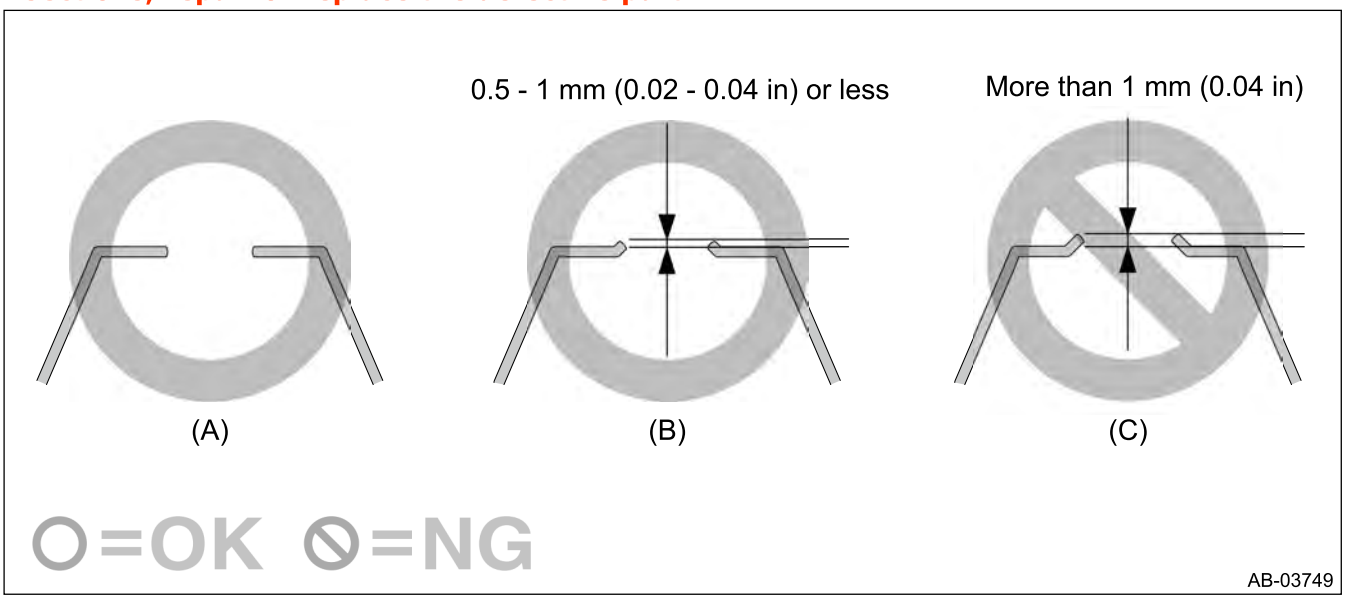


AIRBAG SYSTEM > Curtain Airbag Module

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When installing the curtain airbag module, install a specified part at specified place.**
- **Be careful not to damage the curtain airbag module during installation.**
- **Never open the curtain airbag module before activation. Never reuse the deployed curtain airbag module.**
- **Make sure that there are no foreign matter on airbag module.**
- **Do not reuse the curtain airbag module of which clips have been removed.**
- **If deformation or crack is found in the bracket - assist rail by visual check, replace the defective part.**
- **If deformation is found in the clip mounting holes of the side rail and rear quarter metal sections, repair or replace the defective part.**



(a) If no deformation is found, install the curtain airbag module with a new securing clip.

(b) If the amount of deformation is 0.5 to 1 mm (0.02 to 0.04 in), correct the deformed section to be flat and install the curtain airbag module with a new securing clip.

(c) If deformation is 1 mm (0.04 in) or more, replace the deformed part together with the panel. Refer to the repair manual for body panel replacement.

- **When reusing the tether clip on the upper part of the trim panel - front pillar UPR, check that there is no damage to the tether clip. If the tether clip is damaged, always replace it with a new tether clip. If the tether clip is damaged, its holding force is reduced and the trim panel - front pillar UPR may come off.**
- **Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.**
- **For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.**

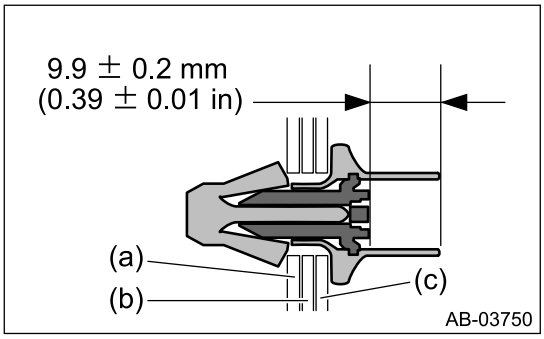
1. Before installation, inspect the following items and replace any faulty part with a new one.

- Airbag cover is scratched or torn.
- Harness and/or connector is cracked, deformed or open.
- Harness wire is exposed.
- Mounting bracket and securing clip are cracked or deformed.

2. Install the curtain airbag module.

Caution:

- **Be sure to insert the connector in completely until it is locked.**
- **Press in the push lock of the direct type connector securely. Then pull it gently to make sure that it is locked.**
- **Do not reuse the curtain airbag module of which clips have been removed.**
- **Install a new clip - bushing securely, and press the clip - pin securely into the clip - bushing.**
  After pressing the clip - pin securely, make sure that the heights of clip - bushing top surface and the clip - pin top surface are 9.9±0.2 mm (0.39±0.01 in).



(a) Body panel

(b) Plastic cover or plastic spacer

(c) Airbag module tab portion

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

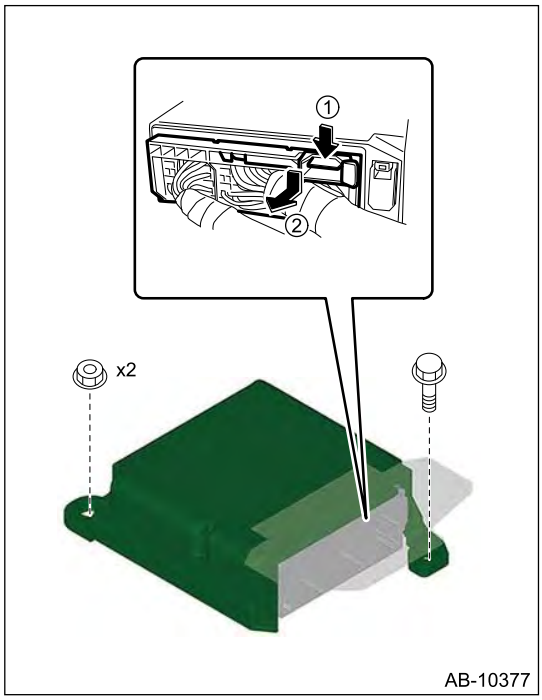
3. Install the trim panel roof - assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not disassemble the airbag control module.**
- **If the airbag control module is deformed or if there is any trace of water on the module, replace the airbag control module with a new one.**
- **Do not drop the airbag control module.**
- **After removal, keep the airbag control module on a dry, clean surface away from moisture, heat and dust.**

1. Turn the ignition switch to OFF.
   Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.
2. Remove the center grille assembly. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
5. Remove the boot - hand brake, the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
6. Remove the panel center LWR, and remove the tray - center UPR. Ref. to EXTERIOR/INTERIOR TRIM>Center Console>REMOVAL.
7. Remove the airbag control module.
   (1) Disconnect the connector from airbag control module. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > AIRBAG CONTROL MODULE.
   (2) Remove the bolt and nuts and remove the airbag control module.



AIRBAG SYSTEM > Airbag Control Module

INSTALLATION

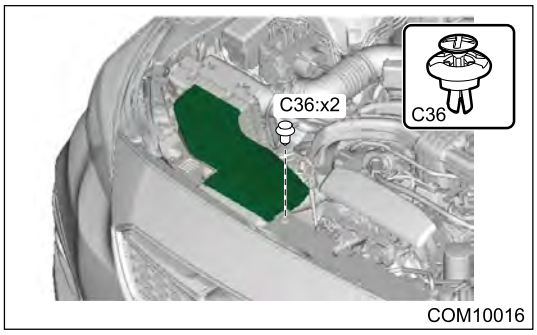
1. Before installation, inspect the following items and replace any faulty part with a new part.
   - Control module is deformed.
   - Control module connector is damaged.
2. Install the airbag control module.
   Caution:
   Do not reuse the bolt and nut.
   Always replace with the specified new bolts and nuts.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
3. Install the tray - center UPR.
4. Install the panel center LWR.
5. Install the console box assembly, the cover assembly - front and the boot - hand brake.
   Tightening torque:
   Console box: 6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
6. Install the heater control assembly.
7. Install the audio assembly or navigation assembly.
8. Install the panel - center UPR.
9. Install the center grille assembly.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
    Note:
    For CVT models, after connecting the battery ground terminal, place the select lever in the P position.

REMOVAL

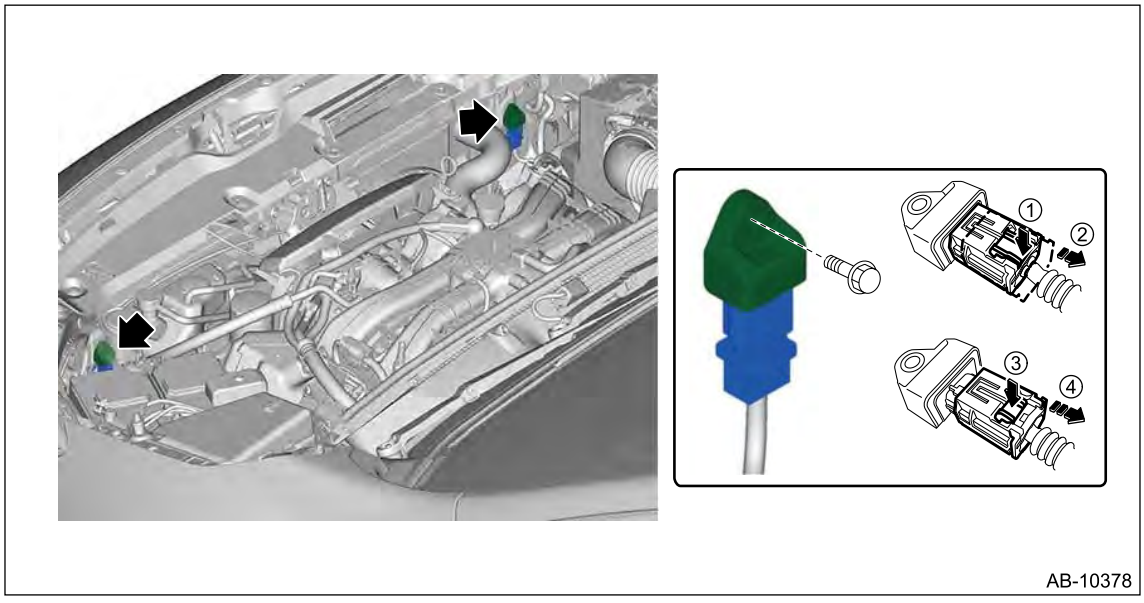
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the front sub sensor.
   (1) Remove the clips and remove the duct - air intake. (When removing the sensor RH)



   (2) Remove the bolt, and then detach the front sub sensor.
   (3) Disconnect the connector of front sub sensor. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > FRONT SUB SENSOR AND SATELLITE SAFING SENSOR.



INSTALLATION

1. Before installation, inspect the following items and replace any faulty part with a new part.
   - Front sub sensor damage
   - Connector damage
2. Install the front sub sensor.

Caution:

- **Do not reuse the bolt and nut.**
  Always replace with the specified new bolts and nuts.
- **When installing the sensor, insert the set pin on the backside of the sensor into the hole on the body side securely.**

Tightening torque:

13 N·m (1.3 kgf-m, 9.6 ft-lb)

3. Install the duct - air intake. (RH side only)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When the front door impact sensor is removed, always replace it with a new front door impact sensor. If it is reused, sealing capability on the contacting surface of door panel may be insufficient and impact pressure may not be detected correctly.**

1. Operate the power window switch to close the front door glass.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
5. Remove the sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL.
6. Remove the front door impact sensor.

   Caution:

   - **Do not reuse the front door impact sensor if it is once removed. Be sure to replace the front door impact sensor with a new part.**
   - **The nuts cannot be removed from the front door impact sensor. Do not remove the mounting nuts.**

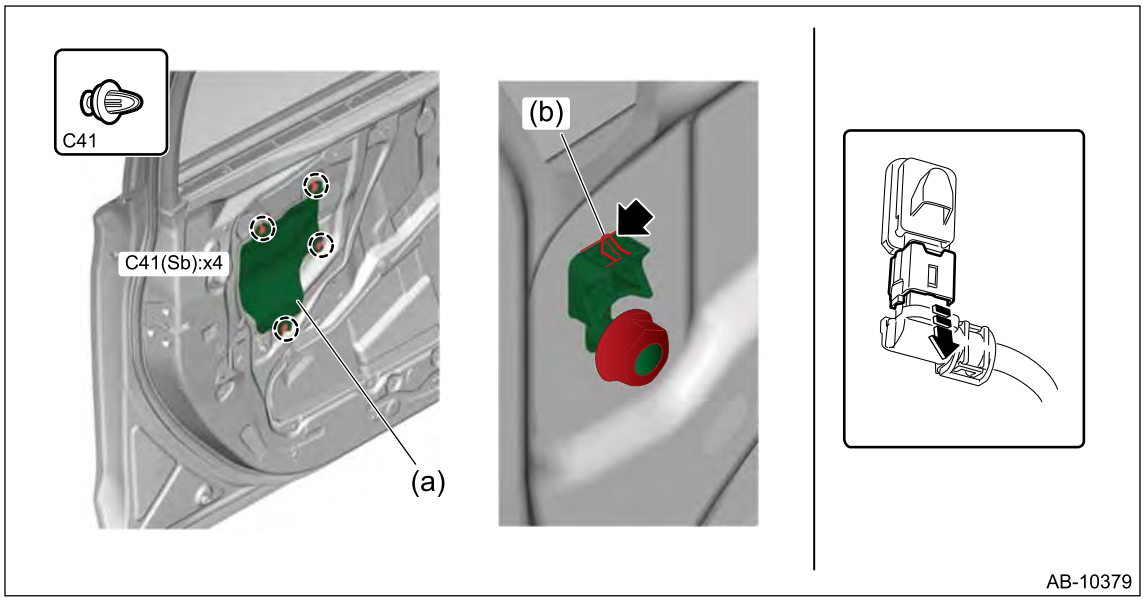
   (1) Remove the plate - door UPR (a).

   Caution:

   If the clip is damaged, replace it with a new part because the panel assembly - front door may be deformed.

   (2) Loosen the nuts, and remove the front door impact sensor with the claws (b) pressed.

   (3) Disconnect the airbag connector and remove the front door impact sensor. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > FRONT DOOR IMPACT SENSOR.



INSTALLATION

1. Before installation, inspect the following items and replace any faulty part with a new part.
   - The front door impact sensor or connector is damaged.
   - Inner panel area of the panel assembly - front door is deformed.
   - Side airbag module has been activated.
2. Install the front door impact sensor.

   Caution:
   - **Do not reuse the front door impact sensor if it is once removed. Be sure to replace the front door impact sensor with a new part.**
   - **The nuts cannot be removed from the front door impact sensor. Do not remove the mounting nuts.**
   - **Thoroughly clean the sensor mounting area before installing the front door impact sensor.**
   - **When the front door impact sensor is installed, be sure to fix the claws of the front door impact sensor into the door panel.**

   Tightening torque:

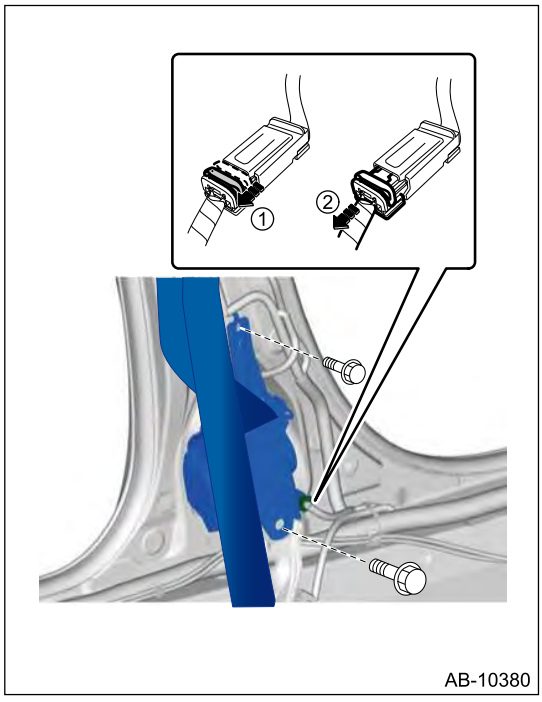
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the plate - door UPR.
4. Install the sealing cover.
5. Install the trim panel - front door.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

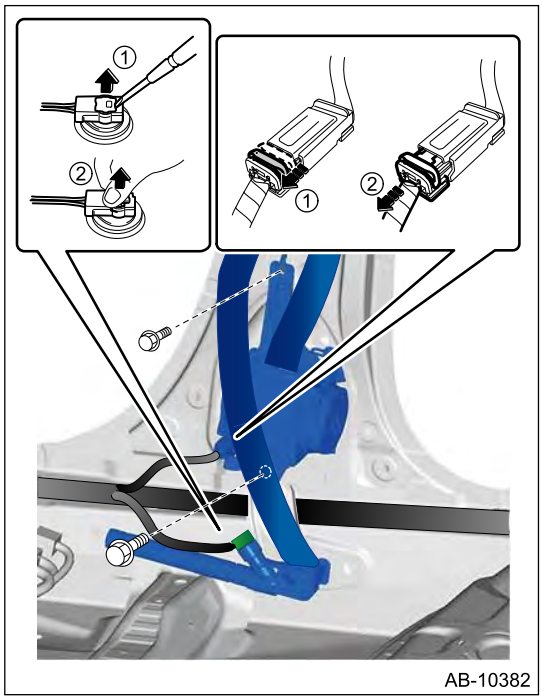
REMOVAL

Caution:

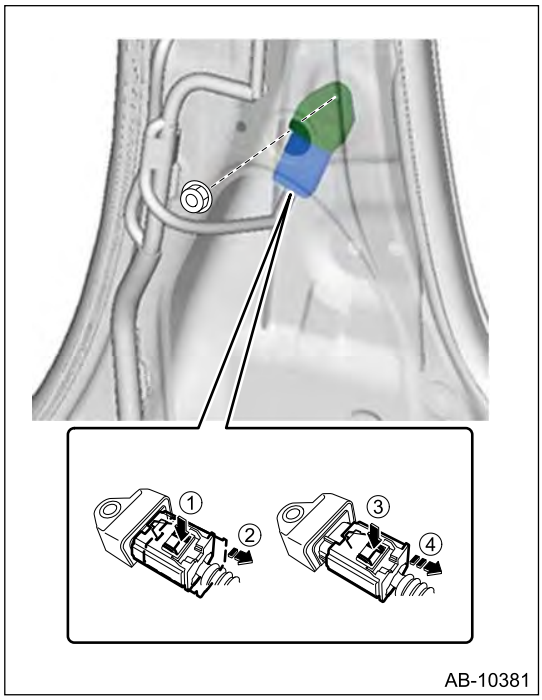
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Move the seat all the way forward, from which the side airbag sensor is to be removed.
   Note:
   This is to remove the seat belt retractor assembly.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   For model with the power seat, move the seat to the front-most position before removing the battery ground terminal.
4. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
5. Remove the cover side sill - front INN, cover side sill - rear INN, and trim panel - center pillar LWR. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
6. Remove the seat belt retractor. (On the side where the side airbag sensor is removed)
   (1) Turn over the floor mat to disconnect the belt tension sensor connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > PASSENGER'S AIRBAG MODULE AND PRETENSIONER.
   Note:
   Also disconnect the connector of the passenger's lap seat belt pretensioner. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > DRIVER'S AIRBAG MODULE AND CURTAIN AIRBAG MODULE.
   (2) Remove the bolt to remove the seat belt retractor.





7. Remove the nuts and then remove the side airbag sensor. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR.



AIRBAG SYSTEM > Side Airbag Sensor

INSTALLATION

1. Before installation, inspect the following items and replace any faulty part with a new part.
   - The side airbag sensor, sensor bracket, or connector are damaged.
   - Side airbag module has been activated.
2. Install the side airbag sensor.

Caution:

- **Do not reuse the bolt and nut.**
  Always replace with the specified new bolts and nuts.
- **When installing the sensor, insert the set pin on the backside of the sensor into the hole on the body side securely.**

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

3. Install the seat belt retractor.

   Tightening torque:

   Front seat belt: Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > FRONT SEAT BELT.
4. Install the cover side sill - front INN, cover side sill - rear INN, and trim panel - center pillar LWR.
5. Install the rear seat cushion assembly.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

AIRBAG SYSTEM > Curtain Airbag Sensor

REMOVAL

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the cover side sill rear - INN, and remove the trim panel - rear pillar LWR or the trim panel - rear apron.
   - 4 door model: Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 4 DOOR MODEL.
   - 5 door model: Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
5. Remove the nuts and then remove the curtain airbag sensor. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR.



AIRBAG SYSTEM > Curtain Airbag Sensor

INSTALLATION

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - Curtain airbag sensor or connector is damaged.
   - Curtain airbag module has been activated.
2. Install the curtain airbag sensor.

Caution:

- **Do not reuse the bolt and nut.**
  Always replace with the specified new bolts and nuts.
- **When installing the sensor, insert the set pin on the backside of the sensor into the hole on the body side securely.**

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

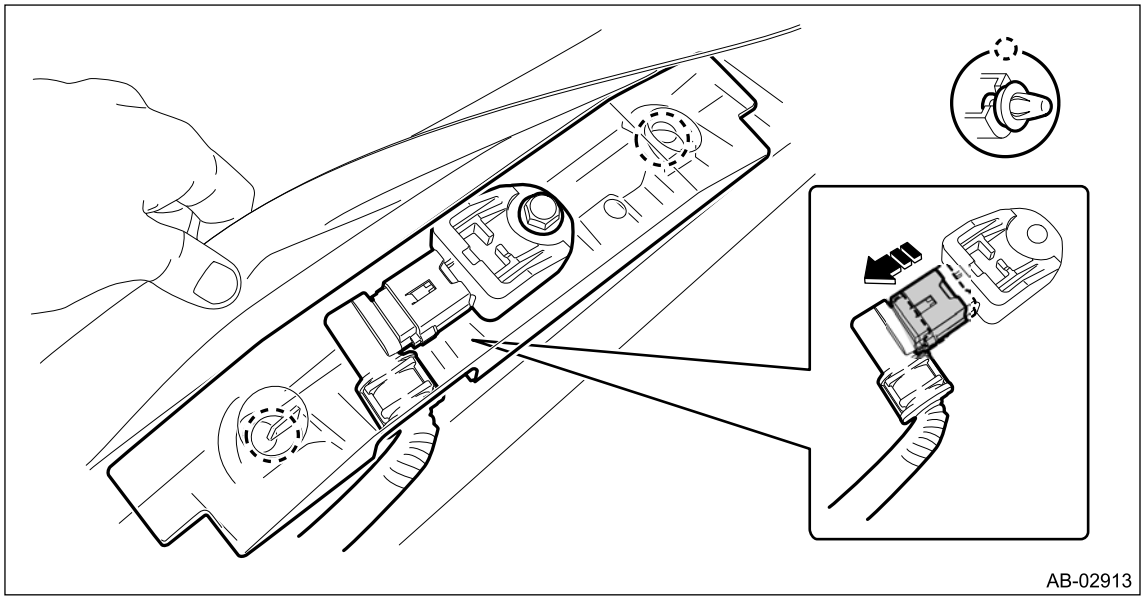
3. Install the cover side sill - rear INN, and install the trim panel - rear pillar LWR or the trim panel - rear apron.
4. Install the rear seat cushion assembly.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the satellite safing sensor.
   (1) Remove the clip, and remove the cover - satellite safing.
   (2) Remove the bolts and then remove the satellite safing sensor. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > FRONT DOOR IMPACT SENSOR.



INSTALLATION

1. Before installation, inspect the following items and replace any faulty part with a new one.
   - The satellite safing sensor connector is damaged.
   - The cover - satellite safing is damaged.
   - Side airbag or curtain airbag has been activated.
2. Install the satellite safing sensor.
   Caution:
   - **Do not reuse the bolt and nut.**
     Always replace with the specified new bolts and nuts.
   - **When installing the cover - satellite safing, push the cover securely until it contacts the floor panel.**
   - **If the cover - satellite safing is too loose at its mounting portion to remove easily, replace with a new cover - satellite safing.**
   - **After installing the cover - satellite safing, make sure that the sensor harness does not get caught.**

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

3. Install the rear seat cushion assembly.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

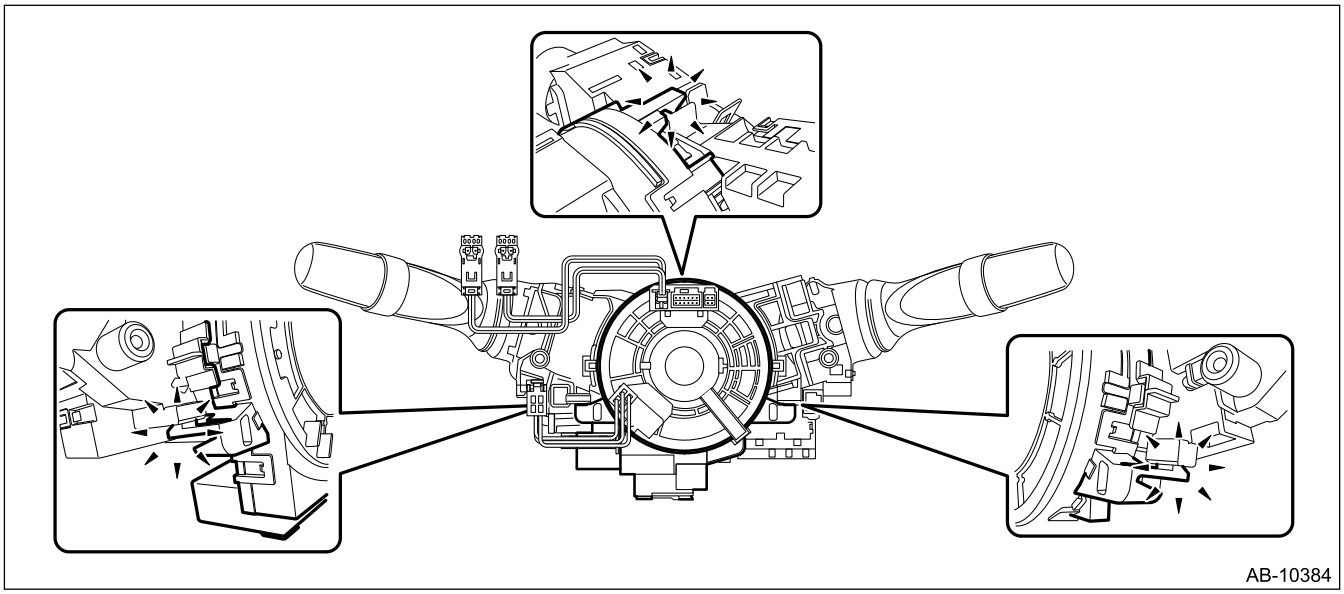
1. Position the front wheels straight ahead.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
5. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
6. Remove the cover assembly - column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
7. Remove the roll connector.

   Caution:

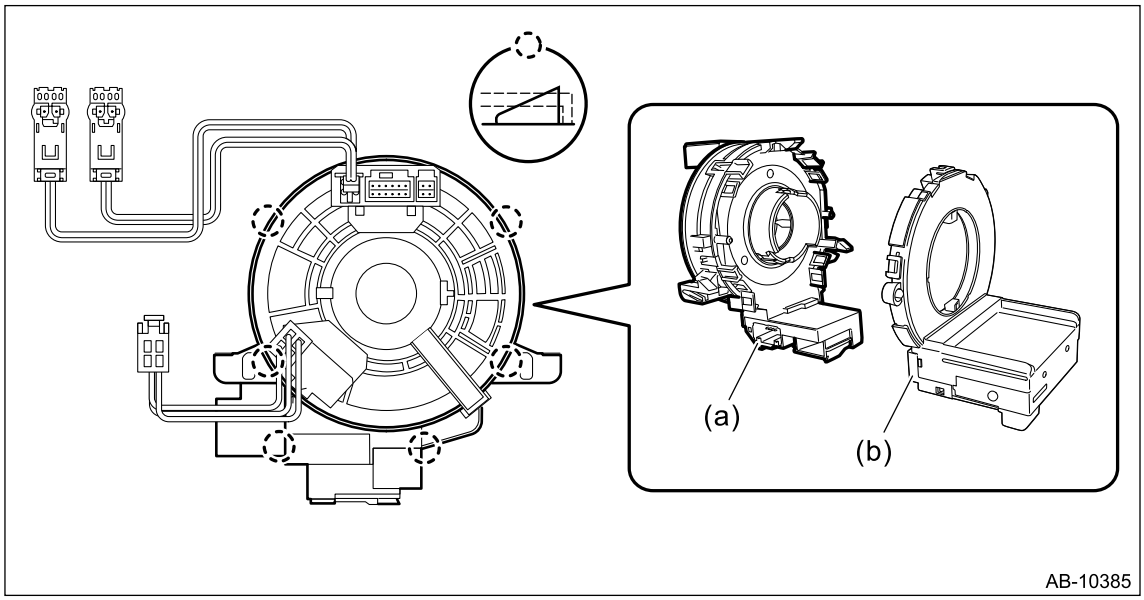
   Make sure that the roll connector is not turned from the original position.

   (1) Disconnect the connector under the roll connector.

   (2) Release the claws and remove the roll connector.



(3) Release the claws and separate the roll connector (a) and steering angle sensor (b).



AIRBAG SYSTEM > Roll Connector

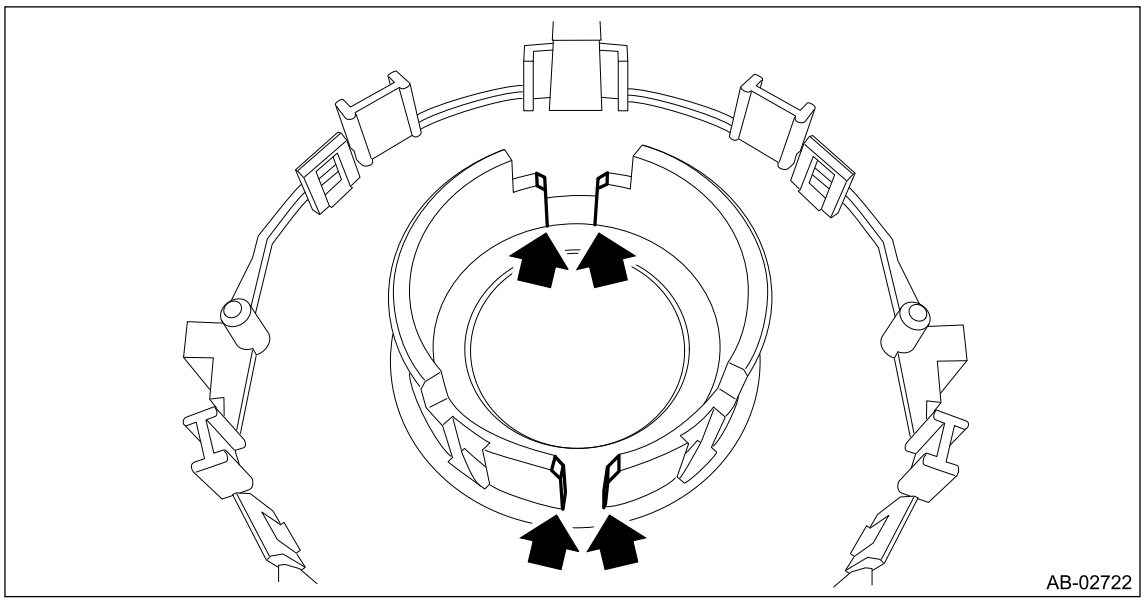
INSTALLATION

Caution:

If the steering wheel and steering angle sensor (steering roll connector) are removed, be sure to perform the following operations.

- **Align the center position of the steering roll connector.**
- **Perform the neutral position setting of the steering angle sensor.**

1. Before attaching a new roll connector, apply a thin coat of grease contained in the connector onto the areas shown by the arrows.



2. Install the roll connector.
3. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
4. Install the cover assembly - column.
5. Install the steering wheel.

   Tightening torque:

   Steering wheel: 39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

6. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
8. Perform the neutral position setting of the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

AIRBAG SYSTEM > Roll Connector

INSPECTION

1. VISUAL INSPECTION

Check for the following, and replace the damaged parts with new parts.

- Combination switch is cracked or deformed.
- Roll connector is cracked or deformed.

2. UNIT INSPECTION OF ROLL CONNECTOR

Caution:

- **Do not rotate the roll connector to more than the specified number of turns. Otherwise, the roll connector internal wire may be broken.**
- **When determining the end stop, rotate the connector slowly without applying excessive force. Applying excessive force at the end stop may break the internal wire.**

1. Adjust the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
2. Set the roll connector to the central position.
3. Connect the test harness to the connector E and connector F.

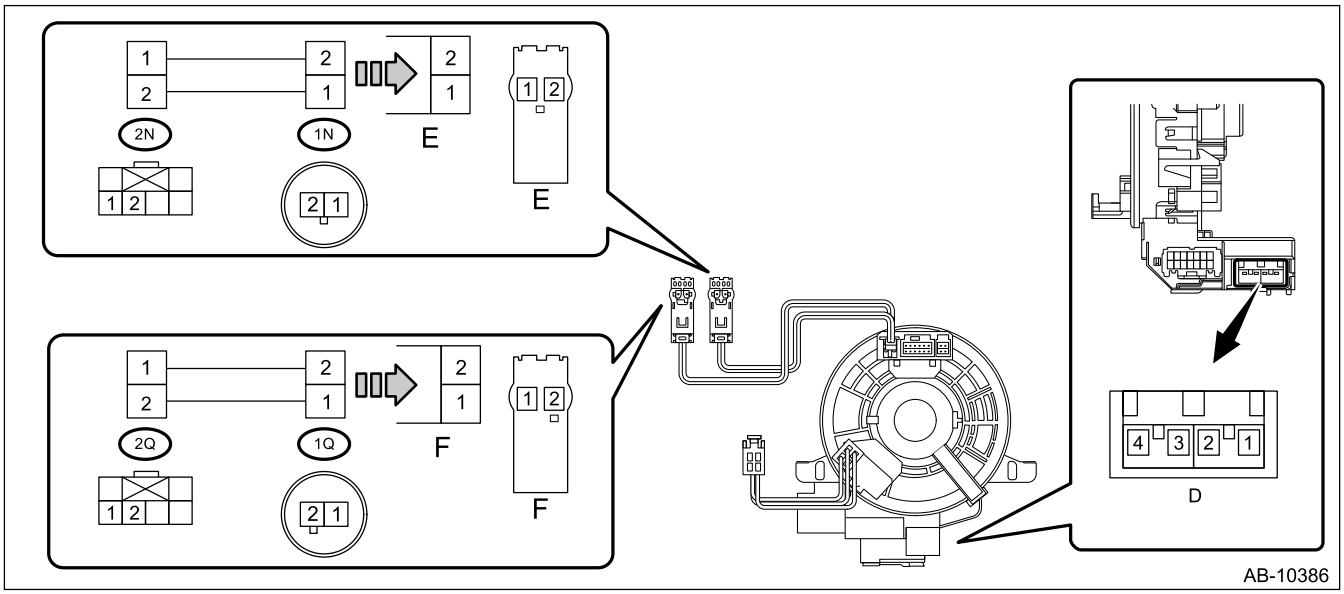
   Preparation tool:

   TEST HARNESS N (98299SA000)
   TEST HARNESS Q (98299SA040)

   - Connector E-TEST HARNESS N (1N)
   - Connector F-TEST HARNESS Q (1Q)
4. With the following conditions, check the resistance between the test harness connector terminals.
   - Perform the check with the roll connector centered (front wheels direct straightforward).
   - Rotate the roll connector counterclockwise from the center (front wheels direct straightforward) to an end stop. Then, perform the check while rotating it clockwise to approximately 4.5 turns.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
(2N) No. 1 — (2N) No. 2	Always	Less than 1 Ω
(2Q) No. 1 — (2Q) No. 2:	Always	Less than 1 Ω

Note:

The connector D is designed to short the terminals D1/D2 and D3/D4 when disconnected.

5. Replace the roll connector with a new part if the inspection result is not within the standard value.

AIRBAG SYSTEM > Roll Connector

ADJUSTMENT

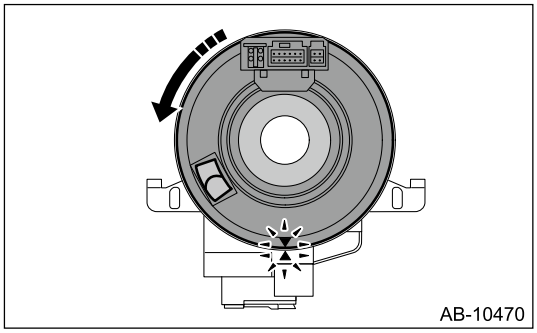
1. NEUTRAL POSITION ADJUSTMENT

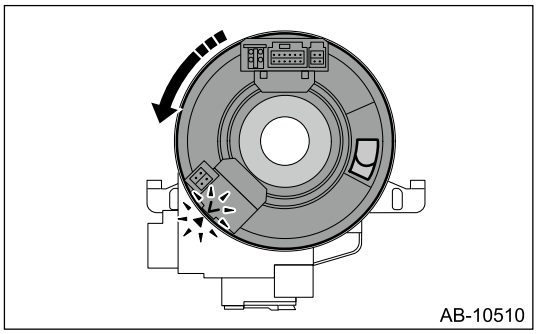
Caution:

- **Do not rotate the roll connector to more than the specified number of turns. Otherwise, the roll connector internal wire may be broken.**
- **When determining the end stop, rotate the connector slowly without applying excessive force. Applying excessive force at the end stop may break the internal wire.**

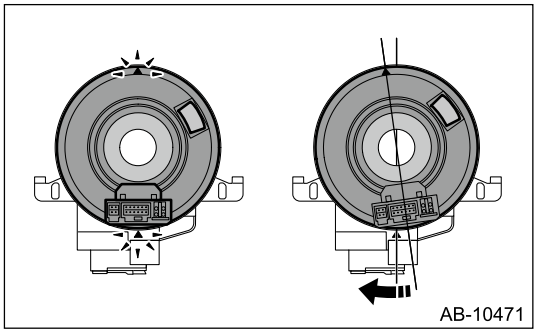
1. Check that front wheels are positioned in straight ahead direction.

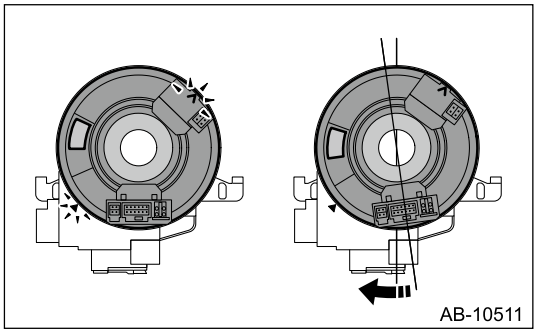
2. Be sure to slowly rotate the roll connector counterclockwise until it stops.



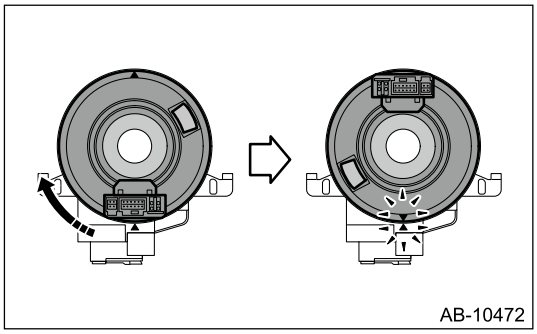


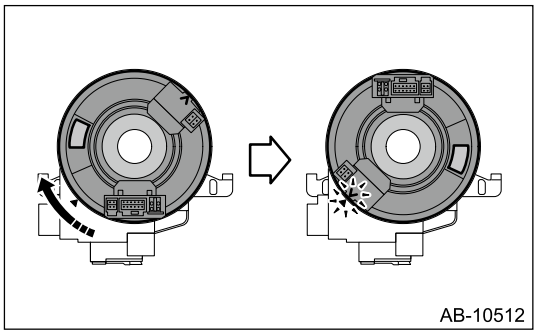
3. If the connector passes the lowermost position when it stops rotating, return the connector to the lowermost position.





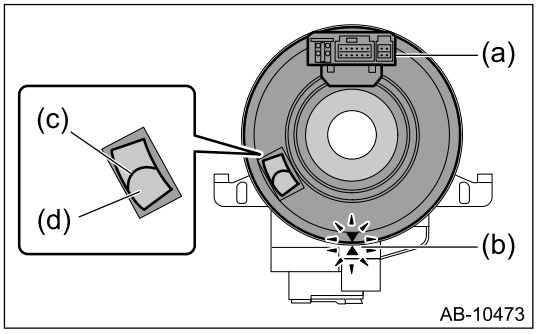
4. Make sure that the connector is at the lowermost position, and then rotate the roll connector clockwise by approx. 2.5 turns to return the connector to the uppermost position. The mark "▲" will be aligned.

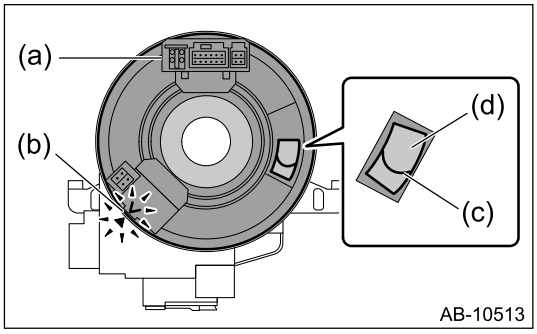




5. Check the following items to make sure that the spiral cable SUB ASSY is at the neutral position.

- The connector (a) is at the uppermost position.
- The alignment mark (b) is aligned.
- The top (c) of the flat cable U-turn section can be seen from the sight glass (d).





PROCEDURE

Warning:

Make sure to follow the instructions below. Otherwise, personal injuries may occur.

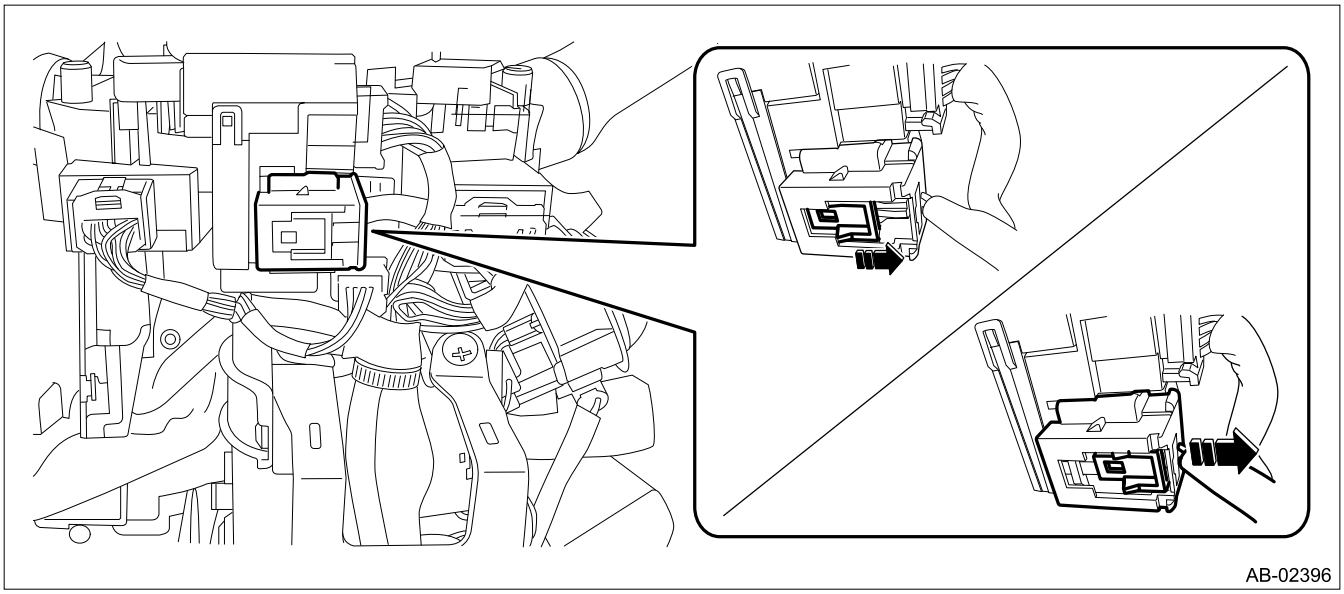
- **Before discarding an airbag module, always perform an operation process to prevent any false activation.**
- **Wear protective gloves, safety goggles and earplugs during this operation. Wash your hands afterwards.**
- **Do not touch the airbag module just after activation because it is very hot. Before handling it for disposal, wait for 40 minutes.**

Caution:

- **Airbag module operation process should be performed on a flat place in safety area. Do not perform the process outdoors when there is rain or strong wind.**
- **Activating an airbag module causes a high explosive noise, be sure to warn people in the area, and do not allow anyone within 5 m (16 ft) radius of the disposal site.**
- **After activating the airbag module, smoke may arise. Therefore, it must be activated in a well-ventilated place with no smoke detector nearby.**
- **Do not expose the activated airbag module to water.**
- **Wrap the activated airbag module in a sealed vinyl bag when discarding.**
- **If it is impossible to perform an airbag module operation process due to some situational reasons, consult SUBARU dealership or one of the authorized workshops.**

1. DRIVER'S AIRBAG MODULE

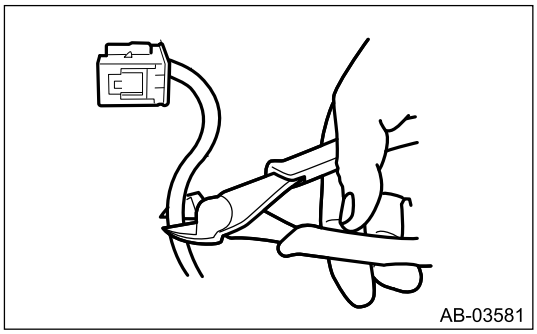
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the cover assembly - column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
4. Disconnect the driver's airbag module connector.



5. Cut off the body harness approx. 70 mm (2.76 in) from the edge of the removed body side connector.

   Preparation tool:

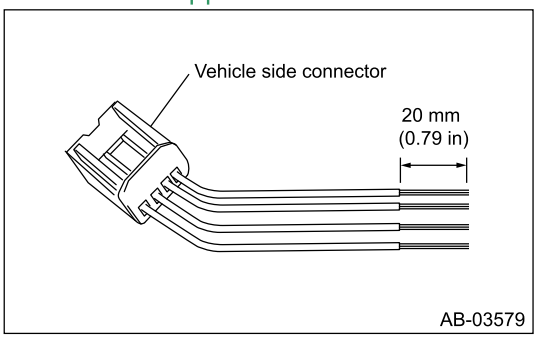
   Nippers



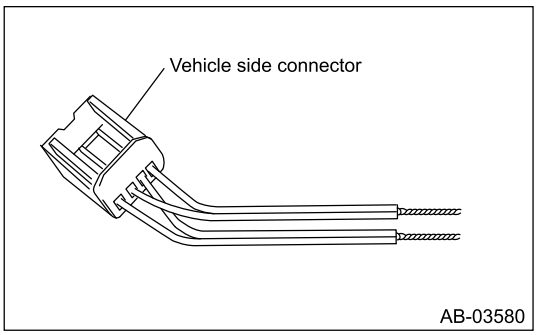
6. Peel off the shield (approx. 20 mm (0.79 in)) from the four harnesses of the removed body side connector.

Preparation tool:

Wire stripper

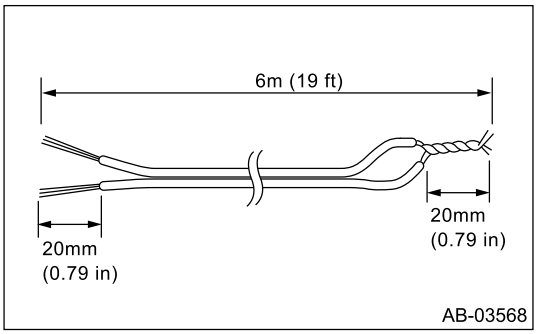


7. Twist the end of harness as shown in the figure.



8. Prepare two vinyl-shielded parallel wires of 6 m (19 ft) long. Peel off the shield of both ends approx. 20 mm (0.79 in) and twist one end together into shorted condition.

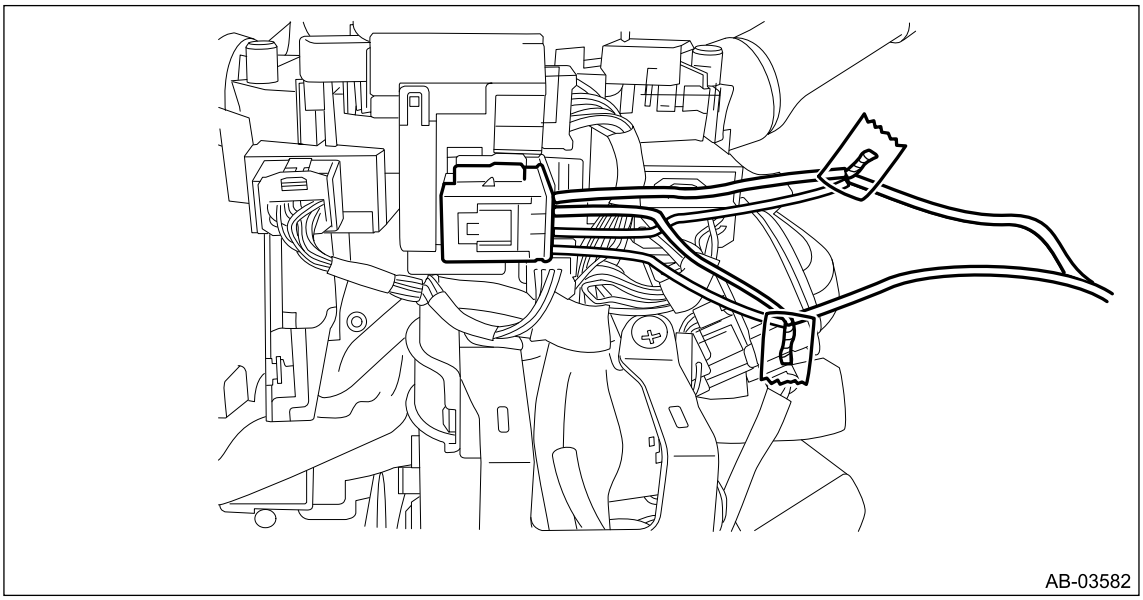
9. The other end, not shorted, will be connected to harnesses of repaired body connector as shown in the figure, and insulated with vinyl tape.



Note:

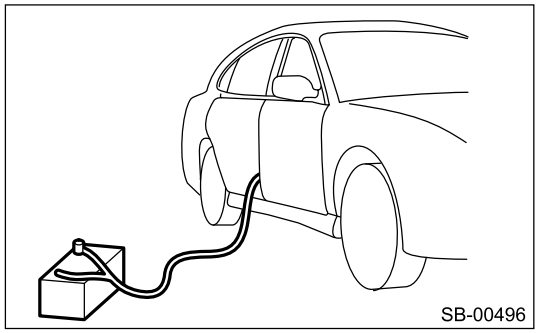
No concern about polarity.

10. After completing the connecting work, connect the body side connector to the connector of the airbag connector lower side again.



11. Bring the vinyl wire for operation out of the vehicle and make sure there is no person in the vehicle.

12. Extend the wiring of AIRBAG DEPLOYMENT TOOL to the limit, and close all the windows and sunroof completely.



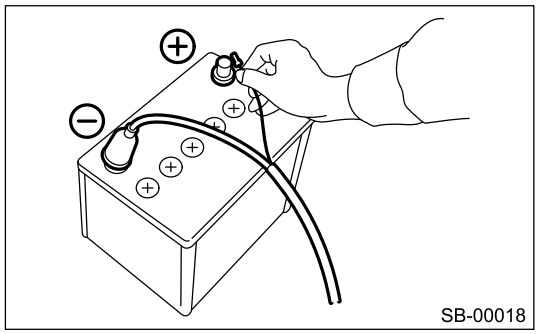
13. Move the battery at least 5 m (16 ft) from the vehicle, and confirm safety in the area.

14. Connect the AIRBAG DEPLOYMENT TOOL alligator clip to the battery negative (−) terminal.

15. Connect the other cable of AIRBAG DEPLOYMENT TOOL to the battery positive (+) terminal, and activate the airbag module.

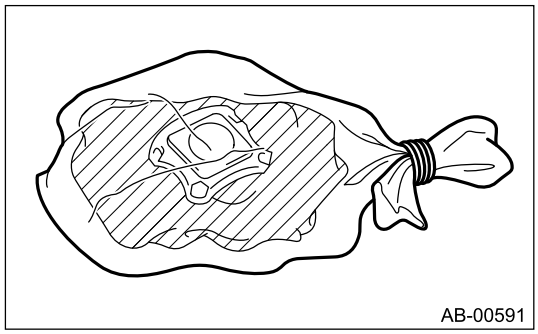
Caution:

- **After activation, the airbag module will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated airbag module to water.**



16. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.

17. Place the activated airbag module in a sealed vinyl bag, then discard.



2. KNEE AIRBAG MODULE

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
5. Short the terminal to the alligator clip furnished as AIRBAG DEPLOYMENT TOOL.

   Caution:

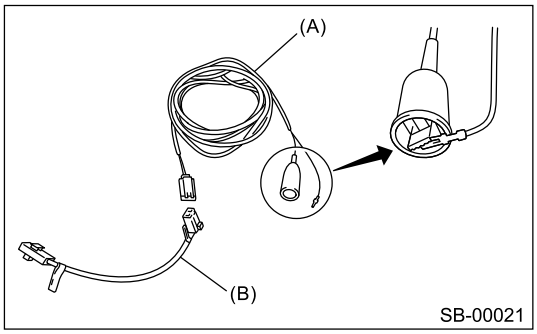
   The AIRBAG DEPLOYMENT TOOL should be kept shorted on the terminals until just before activation of airbag module.

   Preparation tool:

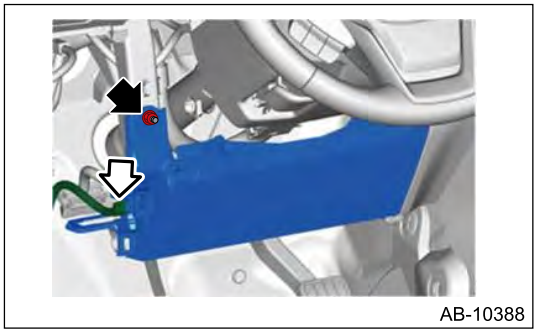
   ST: AIRBAG DEPLOYMENT TOOL (98299PA030)
6. Connect the AIRBAG DEPLOYMENT TOOL (A) and TEST HARNESS ADAPTER D (B).

   Preparation tool:

   ST: TEST HARNESS ADAPTER D (98299SA010)



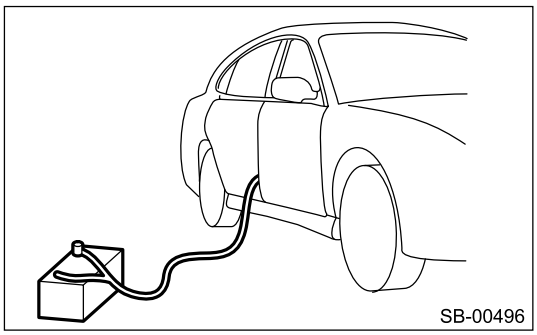
7. Connect the TEST HARNESS ADAPTER D to the knee airbag module and install the knee airbag module to the vehicle again.



   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Make sure there is no one inside the vehicle.

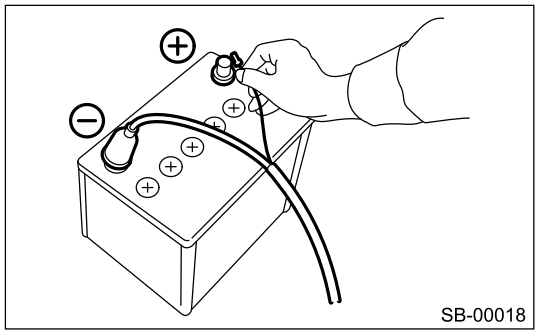
9. Extend the wiring of AIRBAG DEPLOYMENT TOOL to the limit, and close all the windows and sunroof completely.



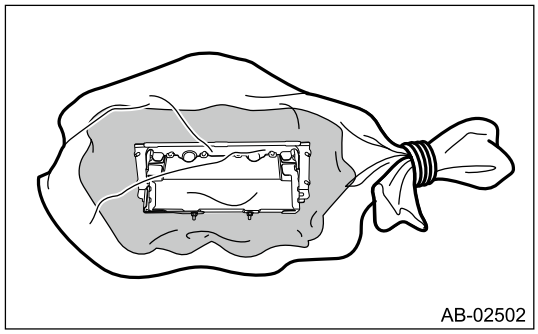
10. Move the battery at least 5 m (16 ft) from the vehicle, and confirm safety in the area.
11. Connect the AIRBAG DEPLOYMENT TOOL alligator clip to the battery negative (−) terminal.
12. Connect the other cable of AIRBAG DEPLOYMENT TOOL to the battery positive (+) terminal, and activate the airbag module.

Caution:

- **After activation, the airbag module will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated airbag module to water.**



13. Remove the bolts and remove knee airbag module.
14. Place the activated airbag module in a sealed vinyl bag, then discard.



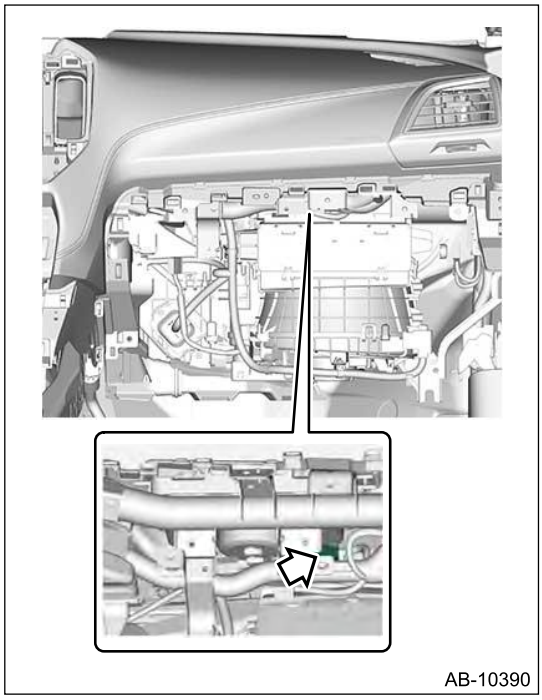
Note:

When necessary, fold the fabric part of airbag into three or four sections, rope and seal in a vinyl bag.

3. PASSENGER'S AIRBAG MODULE

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the glove box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
4. Disconnect the passenger's airbag module connector. Ref. to AIRBAG SYSTEM>Airbag

Connector>PROCEDURE > PASSENGER'S AIRBAG MODULE AND PRETENSIONER.



5. Short the terminal to the alligator clip furnished as AIRBAG DEPLOYMENT TOOL.

Caution:

The AIRBAG DEPLOYMENT TOOL should be kept shorted on the terminals until just before activation of airbag module.

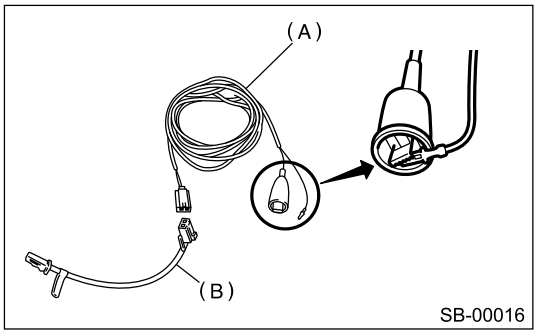
Preparation tool:

ST: AIRBAG DEPLOYMENT TOOL (98299PA030)

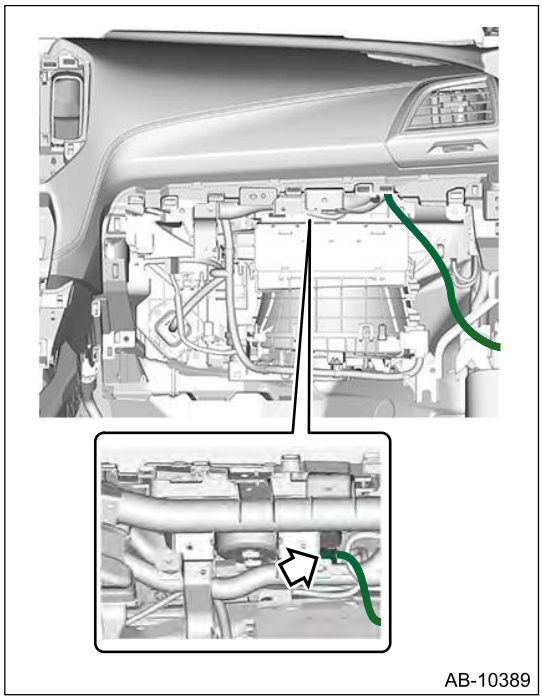
6. Connect the AIRBAG DEPLOYMENT TOOL (A) and TEST HARNESS ADAPTER AM (B).

Preparation tool:

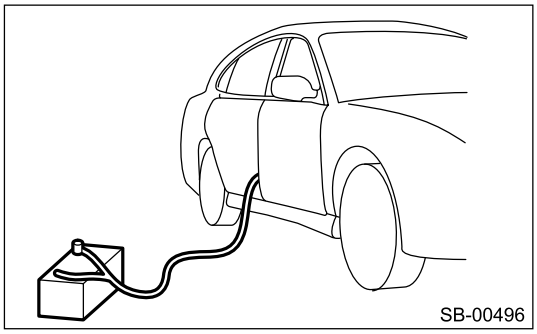
ST: TEST HARNESS ADAPTER AM (98299FJ000)



7. Connect the TEST HARNESS ADAPTER AM to the airbag connector.



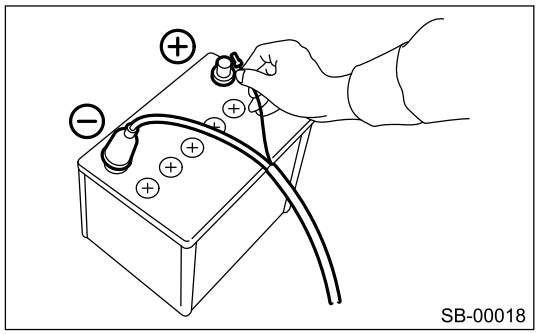
8. Make sure there is no one inside the vehicle.
9. Extend the wiring of AIRBAG DEPLOYMENT TOOL to the limit, and close all the windows and sunroof completely.



10. Move the battery at least 5 m (16 ft) from the vehicle, and confirm safety in the area.
11. Connect the AIRBAG DEPLOYMENT TOOL alligator clip to the battery negative (−) terminal.
12. Connect the other cable of AIRBAG DEPLOYMENT TOOL to the battery positive (+) terminal, and activate the airbag module.

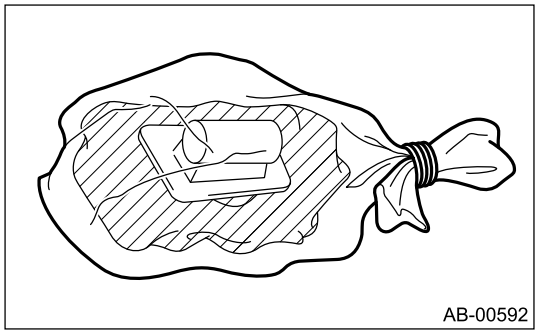
Caution:

- **After activation, the airbag module will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated airbag module to water.**



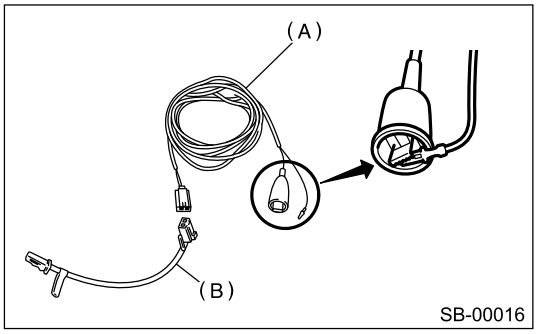
13. Remove the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.

14. Place the activated airbag module in a sealed vinyl bag, then discard.

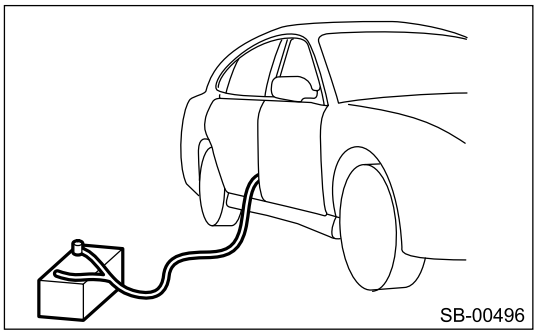


4. SIDE AIRBAG MODULE

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Disconnect the side airbag module connector under the front seat cushion. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > SIDE AIRBAG MODULE.
4. Adjust both the front seat and front seat backrest to the center positions.
5. Short the terminal to the alligator clip furnished as AIRBAG DEPLOYMENT TOOL.
   Caution:
   The AIRBAG DEPLOYMENT TOOL should be kept shorted on the terminals until just before activation of airbag module.
   Preparation tool:
   ST: AIRBAG DEPLOYMENT TOOL (98299PA030)
6. Connect the AIRBAG DEPLOYMENT TOOL (A) and test harness adapter AR (B).
   Preparation tool:
   ST: TEST HARNESS ADAPTER AR (98299CA000)



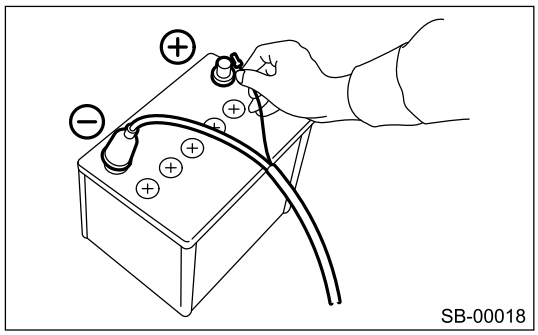
7. Connect the test harness adapter AR to the side airbag module connector (yellow).
   Caution:
   Do not place any object on front seat.
8. Make sure there is no one inside the vehicle.
9. Extend the wiring of AIRBAG DEPLOYMENT TOOL to the limit, and close all the windows and sunroof completely.



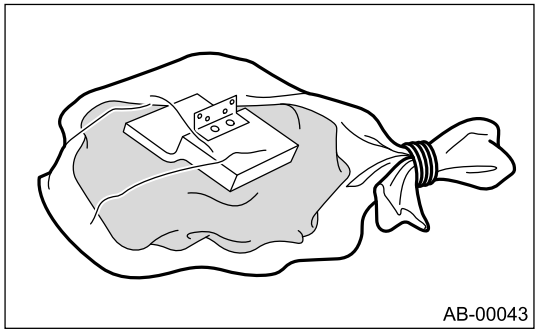
10. Move the battery at least 5 m (16 ft) from the vehicle, and confirm safety in the area.
11. Connect the AIRBAG DEPLOYMENT TOOL alligator clip to the battery negative (−) terminal.
12. Connect the other cable of AIRBAG DEPLOYMENT TOOL to the battery positive (+) terminal, and activate the airbag module.

Caution:

- **After activation, the airbag module will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated airbag module to water.**



13. Remove the side airbag module. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
14. Place the activated airbag module in a sealed vinyl bag, then discard.



5. CURTAIN AIRBAG MODULE

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the roof trim. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL.
4. Disconnect the curtain airbag module connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE.
5. Short the terminal to the alligator clip furnished as AIRBAG DEPLOYMENT TOOL.

Caution:

The AIRBAG DEPLOYMENT TOOL should be kept shorted on the terminals until just before activation of airbag module.

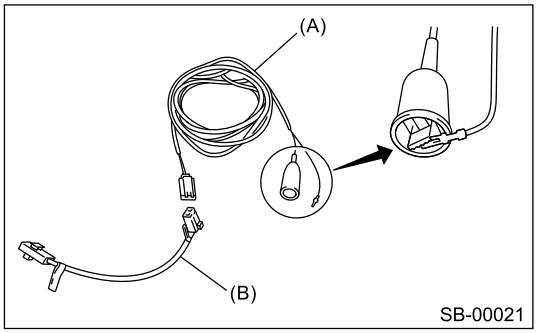
Preparation tool:

ST: AIRBAG DEPLOYMENT TOOL (98299PA030)

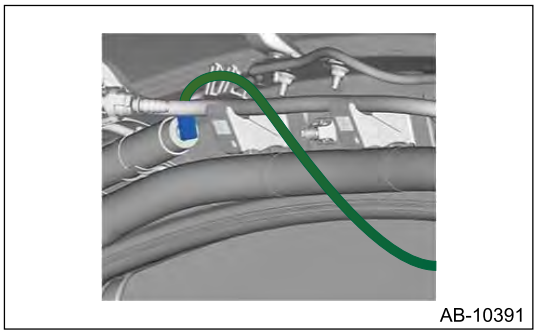
6. Connect the AIRBAG DEPLOYMENT TOOL (A) and TEST HARNESS ADAPTER D (B).

Preparation tool:

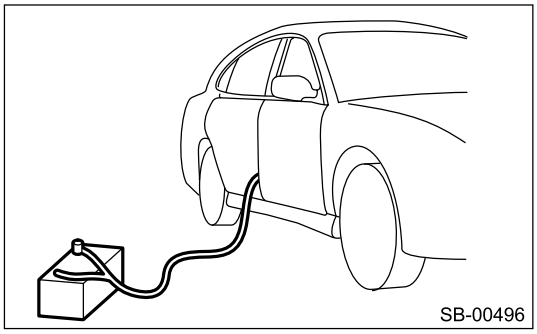
ST: TEST HARNESS ADAPTER D (98299SA010)



7. Connect the TEST HARNESS ADAPTER D to the curtain airbag module.



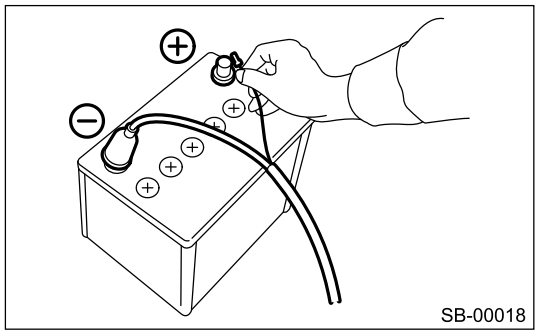
8. Make sure there is no one inside the vehicle.
9. Extend the wiring of AIRBAG DEPLOYMENT TOOL to the limit, and close all the windows and sunroof completely.



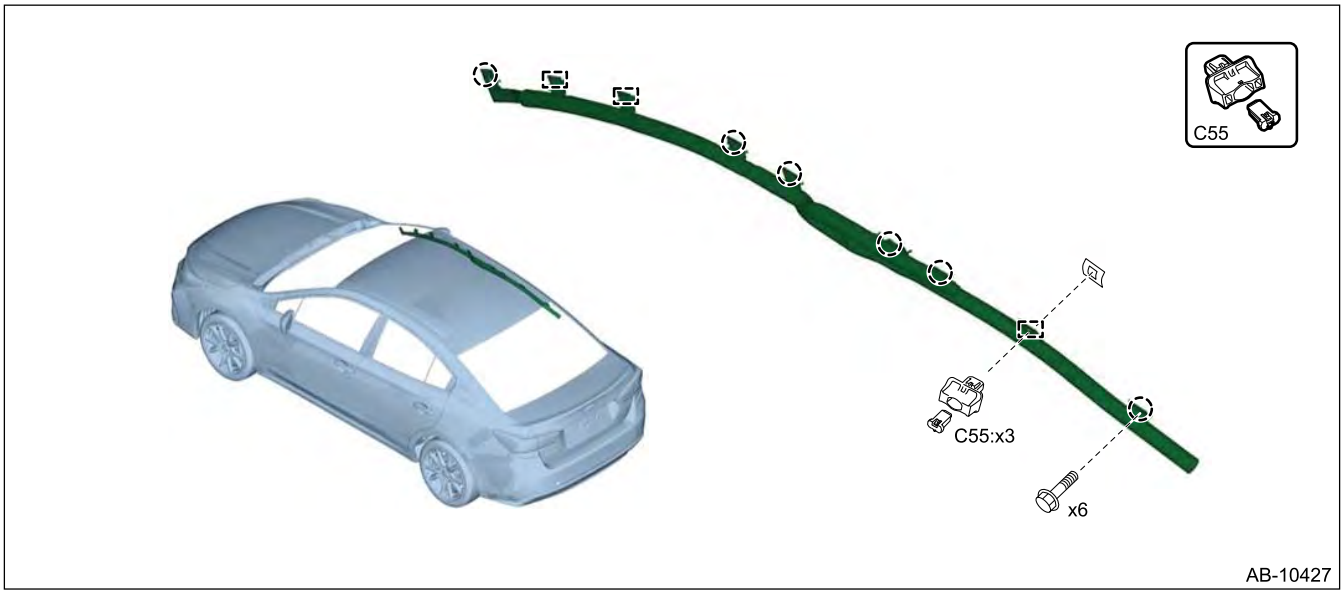
10. Move the battery at least 5 m (16 ft) from the vehicle, and confirm safety in the area.
11. Connect the AIRBAG DEPLOYMENT TOOL alligator clip to the battery negative (−) terminal.
12. Connect the other cable of AIRBAG DEPLOYMENT TOOL to the battery positive (+) terminal, and activate the airbag module.

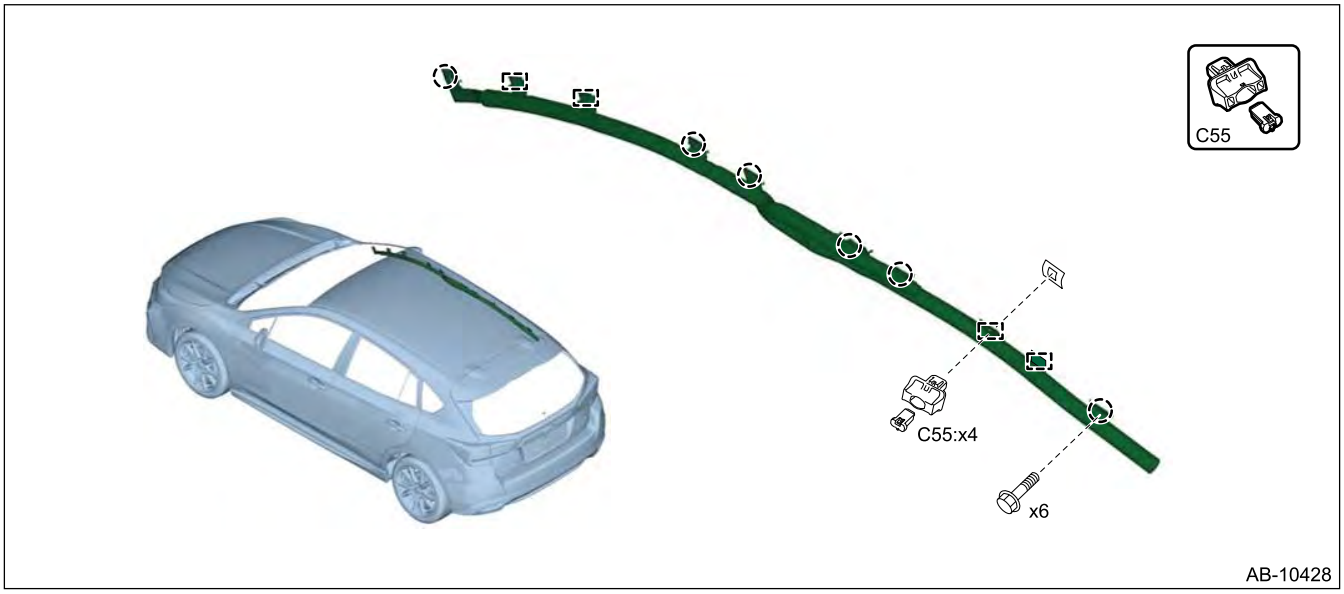
Caution:

- **After activation, the airbag module will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated airbag module to water.**

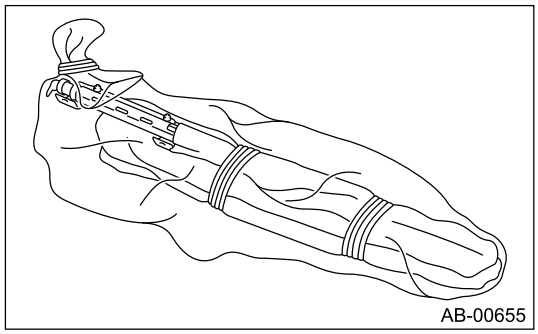


13. Remove the bolts and clips, and remove the curtain airbag module.





14. Place the activated airbag module in a sealed vinyl bag, then discard.



Note:

When necessary, fold the fabric part of airbag into three or four sections, rope and seal in a vinyl bag.

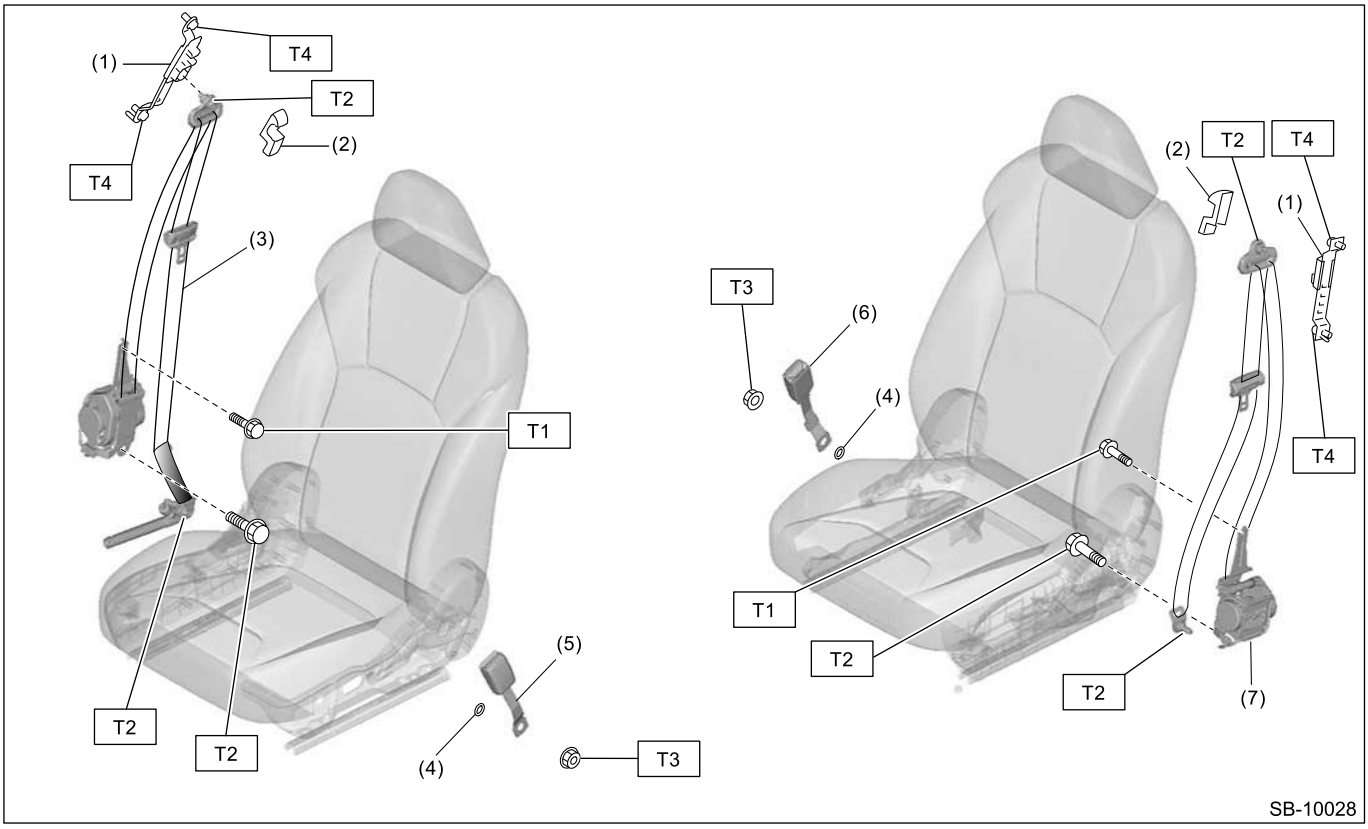
SEAT BELT SYSTEM

SB

1. General Description
2. Pretensioner Connector
3. Inspection Locations after a Collision
4. Seat Belt Warning System
5. Front Seat Belt
6. Rear Seat Belt
7. Disposal of Pretensioner

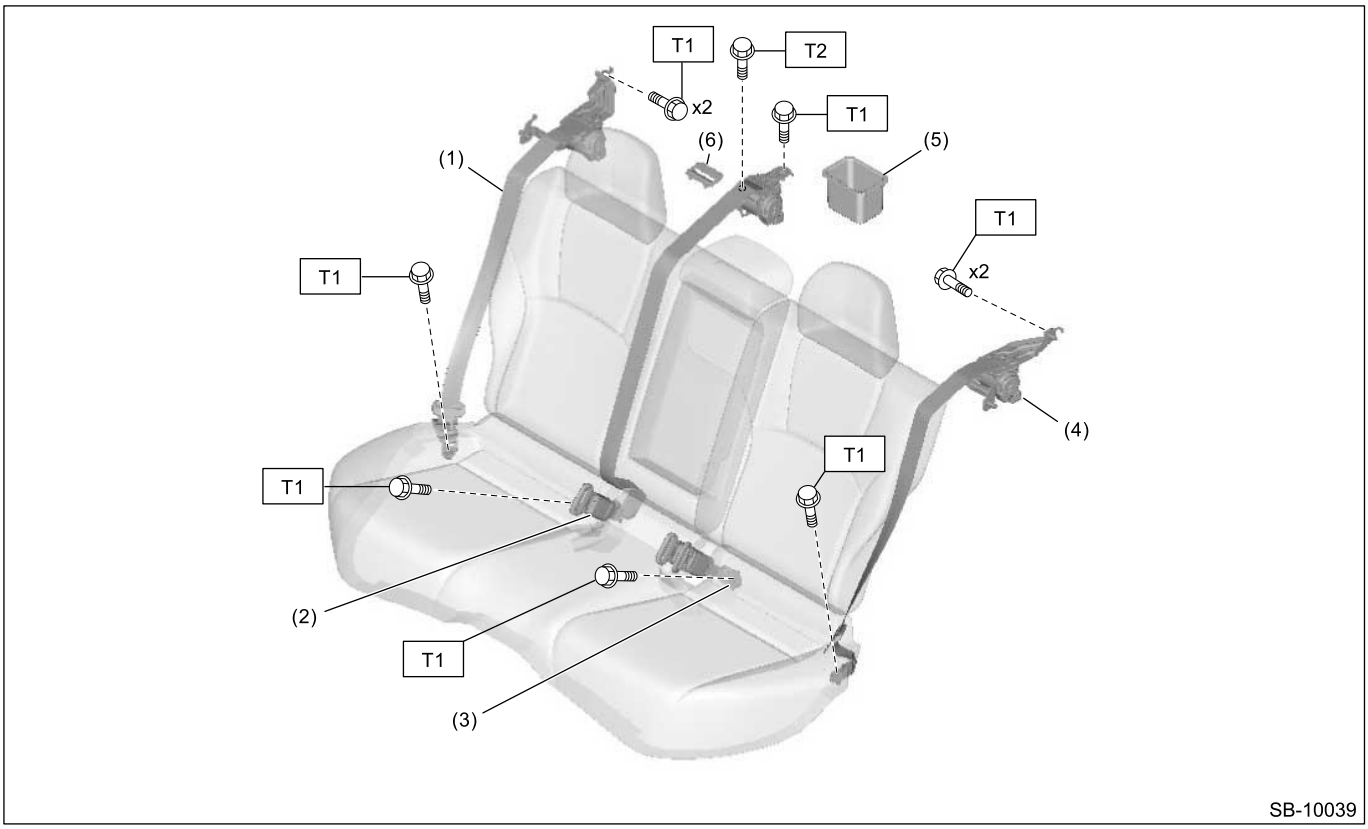
COMPONENT

1. FRONT SEAT BELT



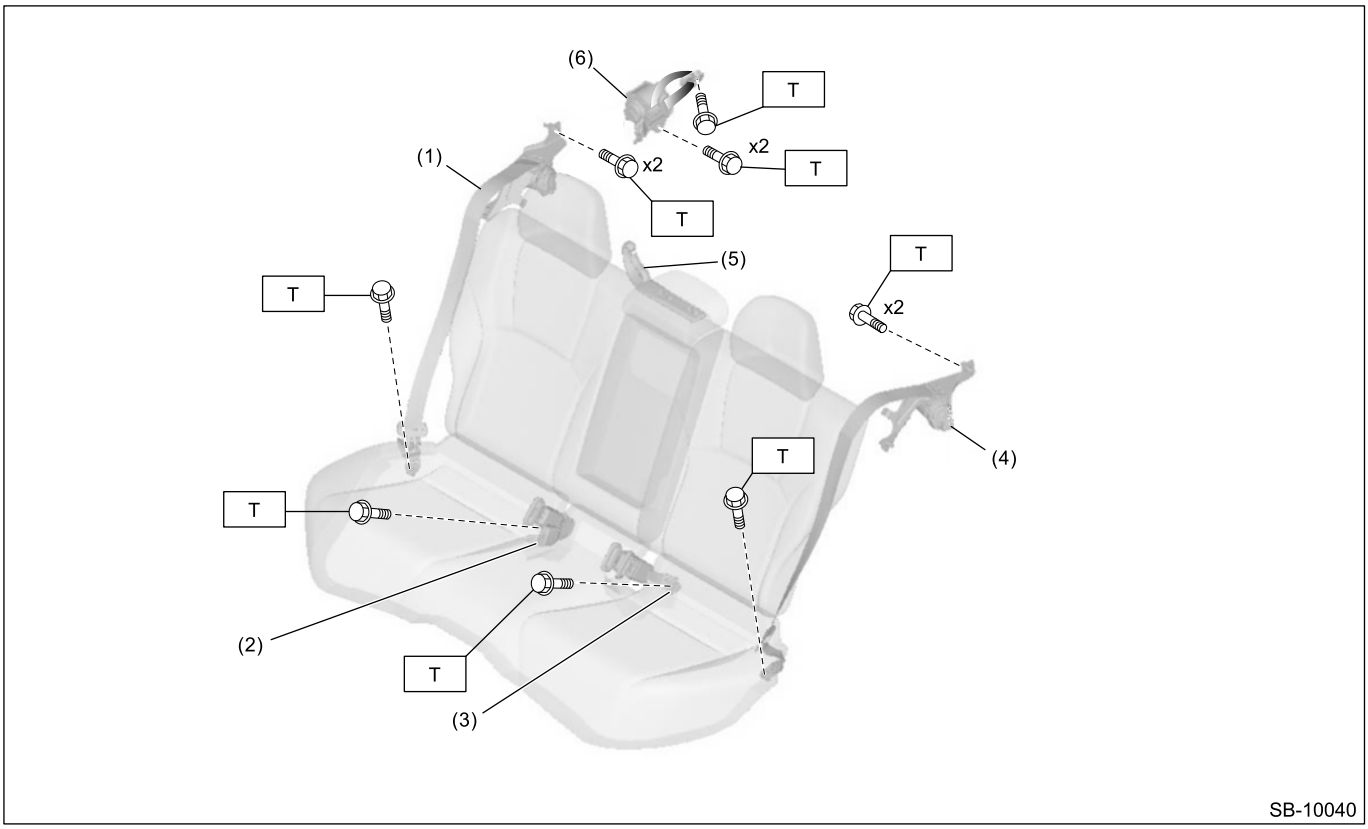
(1)	Adjuster ASSY - seat belt	(6)	Seat belt inner - front LH	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Cover through	(7)	Seat belt outer - front LH	***T1: 7.5 (0.8, 5.5)***
(3)	Seat belt outer - front RH (only on passenger's side with lap seat belt pretensioner)			***T2: 30 (3.1, 22.1)***
(4)	Wave washer			***T3: 38 (3.9, 28)***
(5)	Seat belt inner - front RH			***T4: 53 (5.4, 39.1)***

2. REAR SEAT BELT (4 DOOR MODEL)



(1)	Seat belt outer - rear RH	(4)	Seat belt outer - rear LH	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Seat belt - rear shoulder CTR	(5)	Cover - ELR	***T1: 30 (3.1, 22.1)***
(3)	Seat belt - CTR LH	(6)	Cover - belt rear	***T2: 53 (5.4, 39.1)***

3. REAR SEAT BELT (5 DOOR MODEL)



(1) Seat belt outer - rear RH

(2) Seat belt - CTR RH

(3) Seat belt - CTR LH

(4) Seat belt outer - rear LH

(5) Belt guide CTR

(6) Seat belt - rear shoulder CTR

Tightening torque: N·m (kgf-m, ft-lb)

T: 30 (3.1, 22.1)

CAUTION

For details of the following precautions for seat belt pretensioner, refer to “AIRBAG SYSTEM” section.
Ref. to AIRBAG SYSTEM>General Description>CAUTION.

- Before performing vehicle maintenance, turn the ignition switch to OFF and wait for 60 seconds or more after disconnecting the negative terminal from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
- Do not drop or apply any impact to the pretensioner.
- Do not allow oil, grease or water to come in contact with the pretensioner.
- Do not expose the pretensioner to high temperature or flame.
- Do not allow current to flow through or voltage to reach the pretensioner. Do not use a circuit tester to check resistance of the pretensioner.
- Do not disassemble or attempt to repair the pretensioner. If it is dented, cracked or deformed, replace it with a new genuine part.
- Do not use the airbag or pretensioner parts from other vehicles. Always replace parts with new genuine parts.
- When handling a seat belt with deployed pretensioner, wear gloves and goggles. Wash your hands afterwards.
- Do not reuse a seat belt with deployed pretensioner.
- Before disposal, make sure to perform an operation process to the pretensioners. Ref. to SEAT BELT SYSTEM>Disposal of Pretensioner>PROCEDURE.
- If material from the pretensioner enters the eyes or contacts skin during operation process, wash it away with clean water, and then consult a doctor.

PREPARATION TOOL

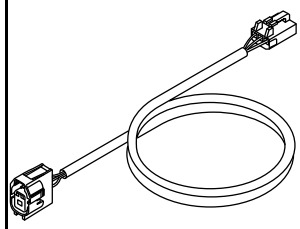
1. SPECIAL TOOL

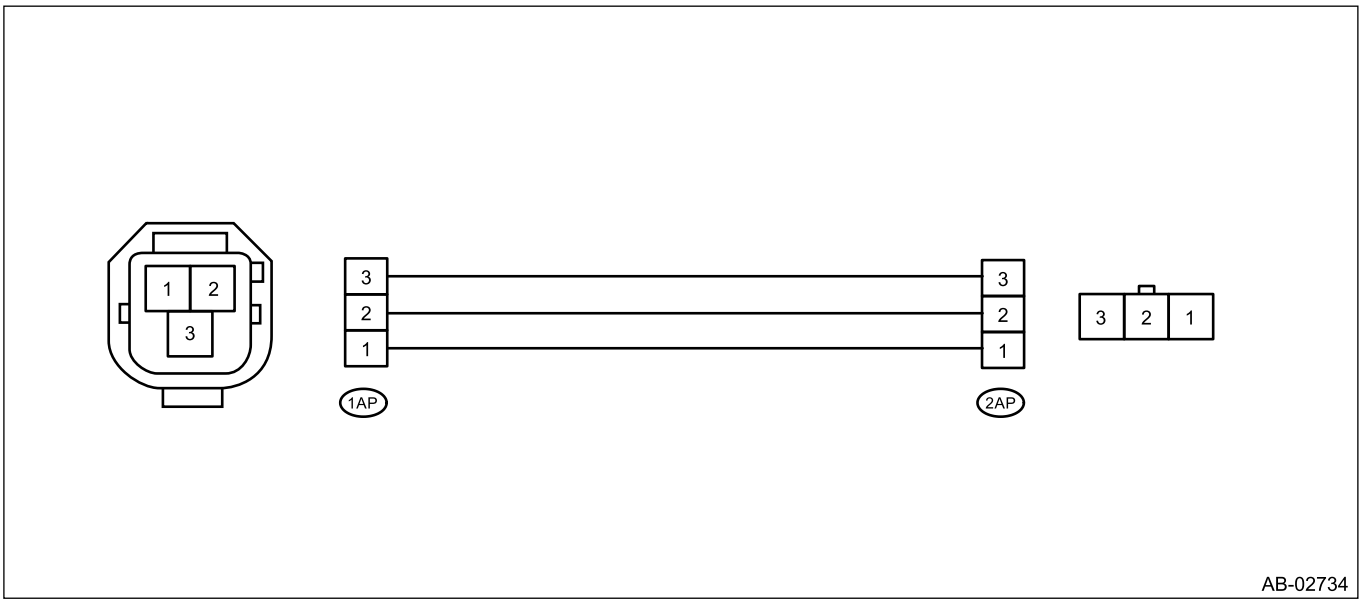
- SUBARU SELECT MONITOR

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to “Application help”.**

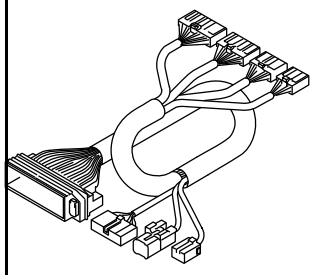
- TEST HARNESS AP

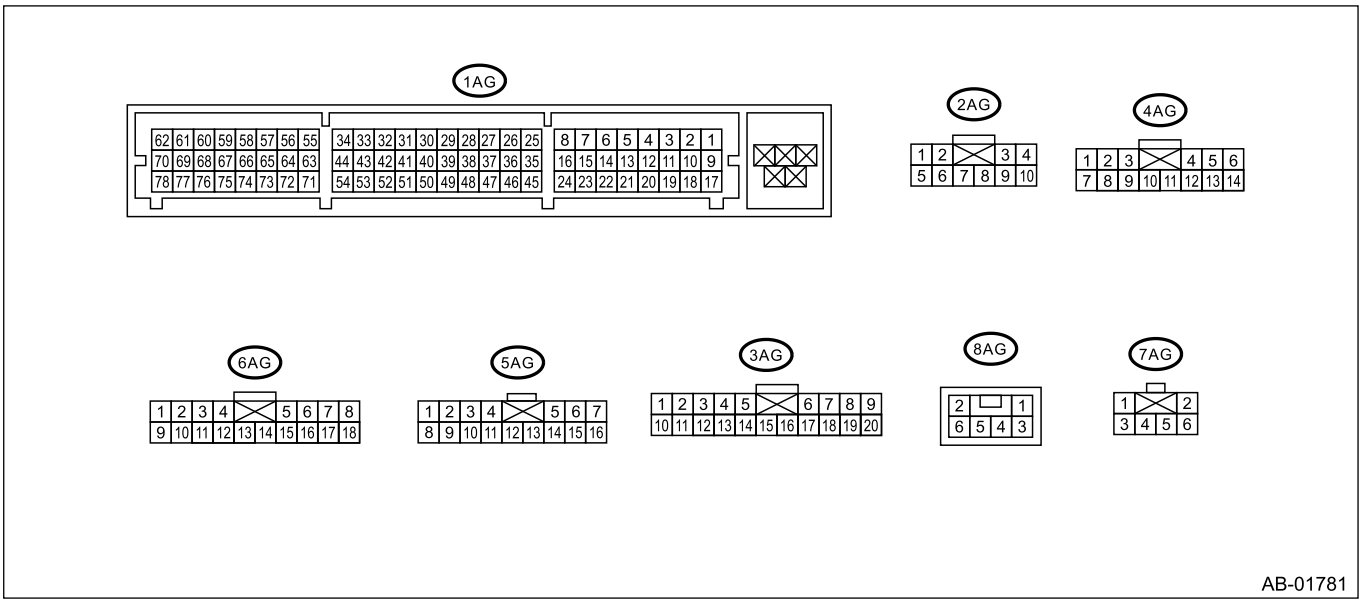
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

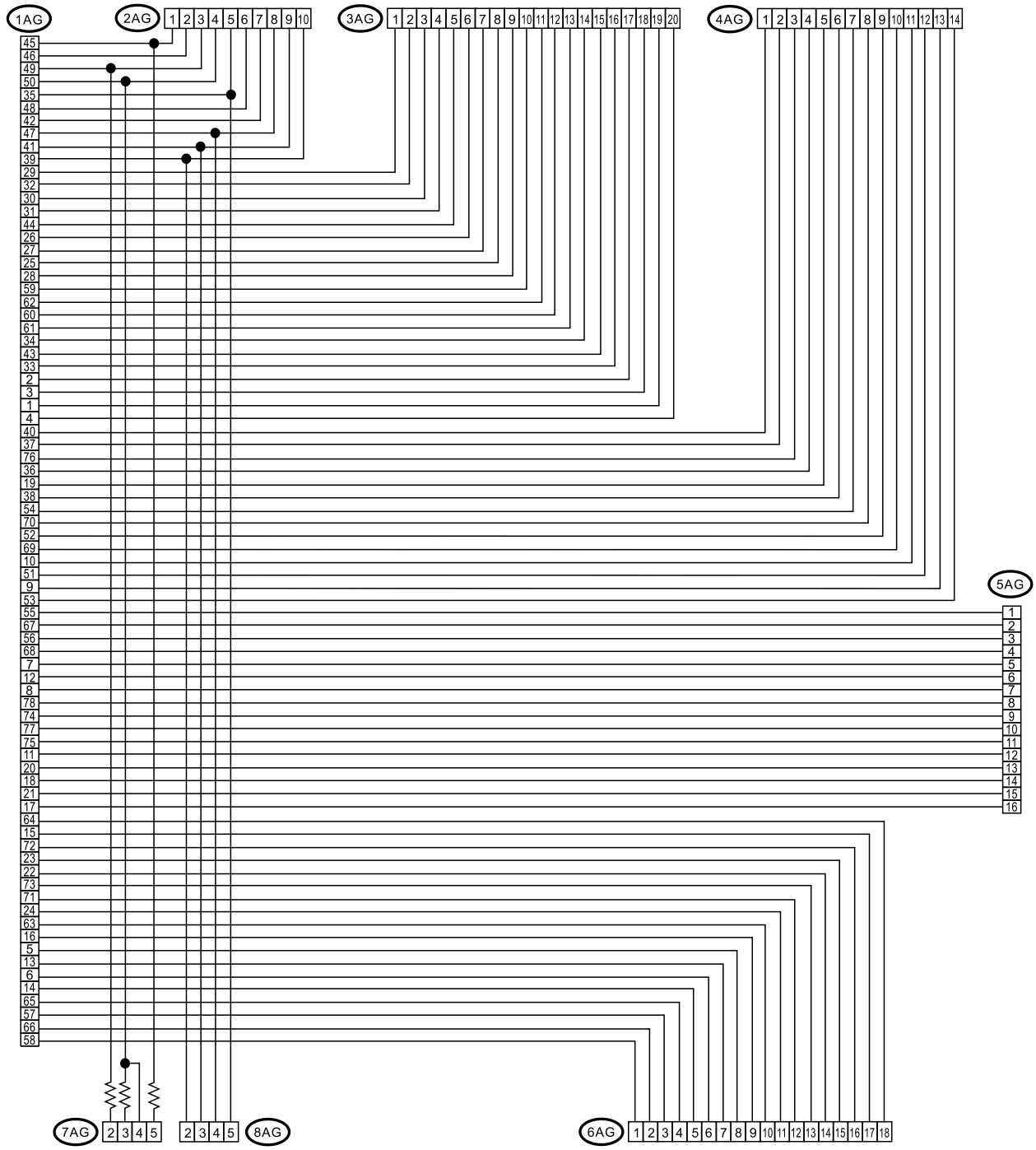
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FJ030	98299FJ030	TEST HARNESS AP	Used when measuring voltage and resistance of occupant detection system.



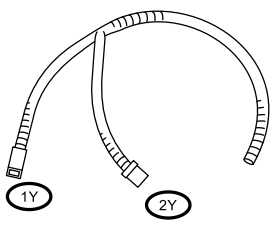
- TEST HARNESS AG

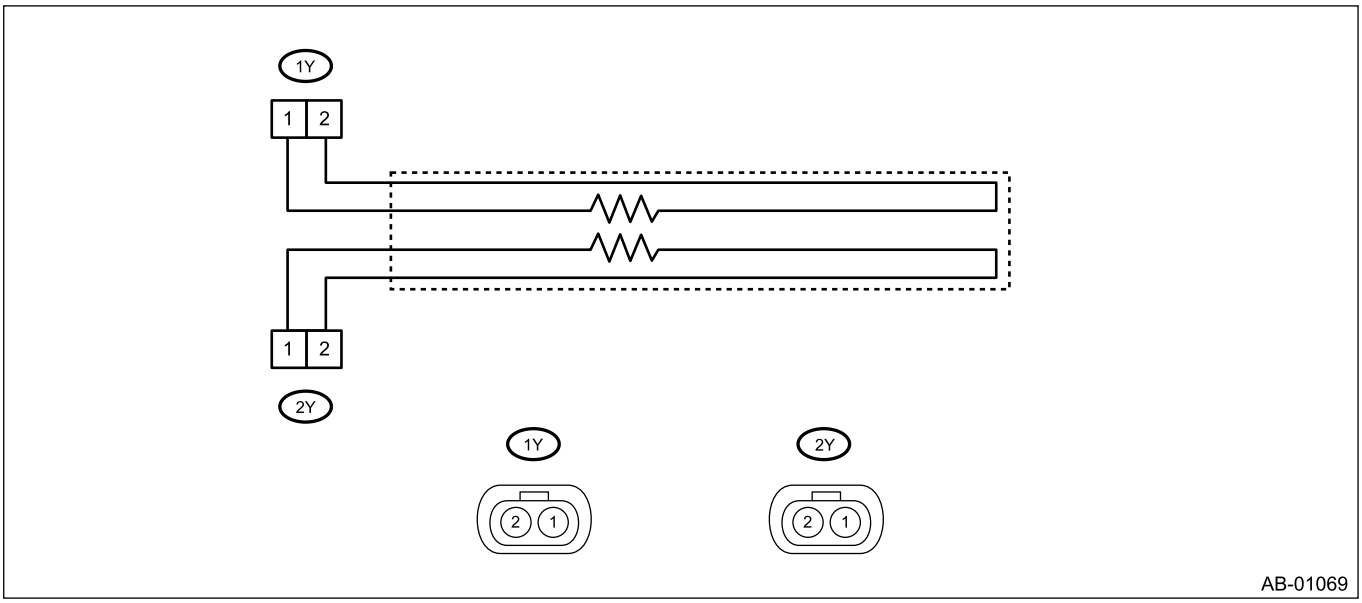
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG070	98299AG070	TEST HARNESS AG	Used when measuring voltage and resistance of airbag control module.


1AG
62 61 60 59 58 57 56 55
70 69 68 67 66 65 64 63
78 77 76 75 74 73 72 71
34 33 32 31 30 29 28 27 26 25
44 43 42 41 40 39 38 37 36 35
54 53 52 51 50 49 48 47 46 45
8 7 6 5 4 3 2 1
16 15 14 13 12 11 10 9
24 23 22 21 20 19 18 17
2AG
1 2 3 4
5 6 7 8 9 10
4AG
1 2 3 4 5 6
7 8 9 10 11 12 13 14
6AG
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16 17 18
5AG
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16
3AG
1 2 3 4 5 6 7 8 9
10 11 12 13 14 15 16 17 18 19 20
8AG
2 1
6 5 4 3
7AG
1 2
3 4 5 6
AB-01781

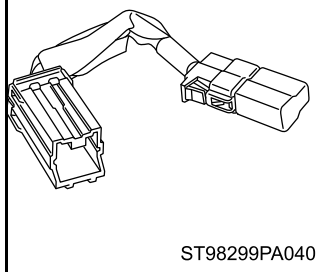


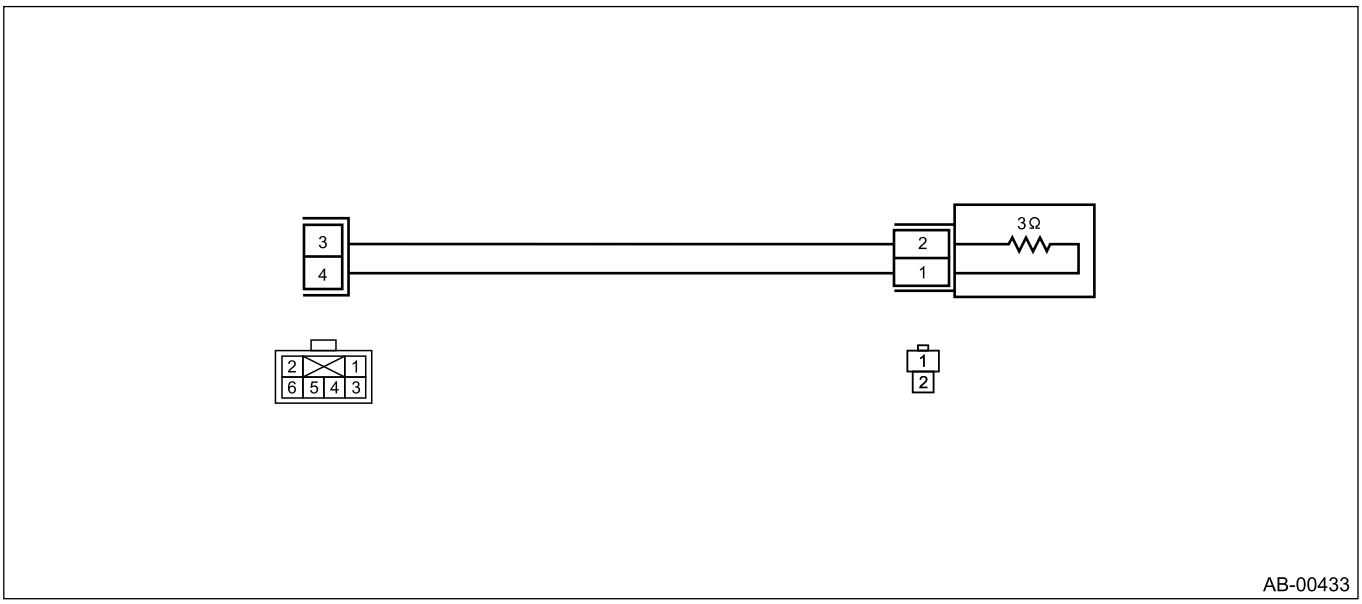
- TEST HARNESS Y

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	98299AG040	TEST HARNESS Y	Used for troubleshooting seat belt buckle switch.



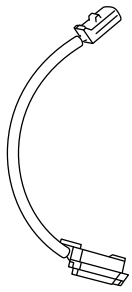
- AIRBAG RESISTOR

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299PA040	98299PA040	AIRBAG RESISTOR	Used in replacement of airbag module for which resistance value is same as airbag module.

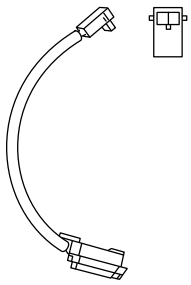


- TEST HARNESS ADAPTER AM

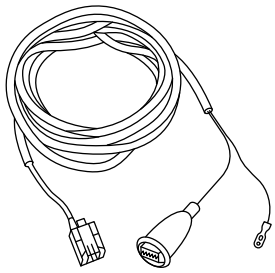
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FJ000	98299FJ000	TEST HARNESS ADAPTER AM	• Used for operation process of pretensioner. • Used together with AIRBAG DEPLOYMENT TOOL. (98299PA030)

- TEST HARNESS ADAPTER D

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA010	98299SA010	TEST HARNESS ADAPTER D	• Used for operation process of lap seat belt pretensioner. • Used together with AIRBAG DEPLOYMENT TOOL. (98299PA030)

- AIRBAG DEPLOYMENT TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299PA030	98299PA030	AIRBAG DEPLOYMENT TOOL	• Used for operation process of pretensioner. • Used together with each test harness adapter.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

PROCEDURE

For connectors of seat belt pretensioner, lap seat belt pretensioner and buckle switch RH, refer to “Airbag Connector” of “AIRBAG SYSTEM” section or “OCCUPANT DETECTION SYSTEM” section.

- Airbag system: Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE.
- Occupant detection system: Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Airbag Connector>PROCEDURE.

INSPECTION

Refer to “Inspection Locations after a Collision” of “AIRBAG SYSTEM” section. Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision.

WIRING DIAGRAM

Refer to "Seat Belt Warning System" in the wiring diagram. Ref. to WIRING SYSTEM>Seat Belt Warning System>WIRING DIAGRAM.

INSPECTION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When inspecting the airbag main harness, disconnect the connectors of the driver's airbag module, passenger's airbag module and knee airbag module for safety reasons.**
- **When inspecting the airbag rear harness, disconnect the side airbag module connector, curtain airbag module connector and seat belt pretensioner connector for safety reasons.**

Trouble symptom:

- Driver's side seat belt warning light does not illuminate or it remains illuminating.
- Warning buzzer does not beep.

1. CHECK FUNCTION.

1. Sit on the driver's seat and passenger's seat and disconnect the seat belts of the both.
2. Turn the ignition switch to ON (engine OFF).
3. Check the illumination of the driver's seat belt warning light in the combination meter, and the passenger's seat belt warning light in the warning box, and the sounding of the buzzer.

Do the driver's warning light and passenger's warning light blink and the buzzer sound while blinking?

Yes Go to 2.

No Go to 8.

2. CHECK FUNCTION.

1. Wait until the buzzer sound stops in step 1. (For approximately six seconds after starting sounding)
2. Connect and disconnect the seat belts of the driver's and passenger's.
3. Check the illumination of the driver's seat belt warning light in the combination meter and the passenger's seat belt warning light in the warning box.

Do the seat belts warning light illuminate ←→ go off according to the operation?

Yes — Go to 3.

No — Go to 4.

3. CHECK FUNCTION.

1. Wait until the buzzer sound stops in step 2. (For approximately six seconds after starting sounding)
2. Start the engine, and set the vehicle speed at 20 km/h (12 MPH) or more.
3. Check the seat belt warning lights of the driver's and the passenger's, and if the warning buzzer sounds.

Do the driver's warning light and passenger's warning light blink and the buzzer sound while blinking?

Yes — Go to 4.

No — Go to 9.

4. CHECK HARNESS.

1. Disconnect the negative terminal from the battery, and wait for 60 seconds or more.
2. Disconnect the connectors of the combination meter and the driver's seat belt buckle switch.
3. Check for short circuit to battery, open circuit and short circuit to ground between the combination meter and the driver's seat belt buckle switch.
   Connector & terminal
   (i10) No. 4 — (R108) No. 1:

Is the harness normal?

Yes — Go to 5.

No — Repair or replace the harness.

5. CHECK HARNESS.

Measure the resistance between the driver's seat belt buckle switch and chassis ground.
Connector & terminal
(R108) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK DRIVER'S SEAT BELT BUCKLE SWITCH.

Measure the resistance between the connector terminals of the driver's seat belt switch when the driver's seat belt is fastened and detached.
Connector & terminal
(R108) No. 1 — (R108) No. 2:

Is the resistance when the belt is fastened 1 MΩ or more, and less than 10 Ω when the belt is detached?

Yes — Go to 7.

No — Replace the seat belt inner - front LH. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.

7. CHECK DATA MONITOR.

1. Sit in the passenger's seat.
2. Using Subaru Select Monitor, select [Data monitor] and display the data of [Belt Buckle Switch RH].
   Note:
   For detailed operation procedures, refer to "Application help".
3. Fasten and detach the passenger's side seat belt buckle, and read the data of the seat belt switch. Ref. to COMBINATION METER (DIAGNOSTICS)>Data Monitor>OPERATION.

Does the seat belt switch display [Belted] ←→ [Unbelted] according to the operation of the seat belt buckle?

Yes — Go to 9.

No — Go to 8.

8. CHECK AIRBAG SYSTEM AND OCCUPANT DETECTION SYSTEM.

Perform the check in accordance with the diagnostic procedure DTC B1650 of the airbag system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.

Is the inspection result normal?

Yes — Go to 9.

No — Repair or replace with new parts according to DTC B1650.

9. CHECK PASSENGER'S SEAT BUCKLE SWITCH.

Perform the check in accordance with the diagnostic procedure DTC B1655 of the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.

Is the inspection result normal?

Yes — Go to 10.

No — Repair or replace with new parts according to DTC B1655.

10. CHECK AIRBAG CONTROL MODULE AND COMBINATION METER.

Perform the inspection according to the basic diagnostic procedure for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the inspection result normal?

Yes — Go to 11.

No — Repair or replace with new parts according to the diagnostic procedure.

11. CHECK WARNING BOX POWER SUPPLY VOLTAGE.

1. Disconnect the warning box connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the ignition power supply and the warning box.
   Connector & terminal
   (R161) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 12.

No — Check the harness for open or short between the fuse and the warning box.

12. CHECK WARNING BOX GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance between the warning box and chassis ground.
   Connector & terminal
   (R161) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 13.

No — Repair or replace the harness.

13. CHECK HARNESS BETWEEN WARNING BOX AND COMBINATION METER.

1. Disconnect the harness of the warning box and the combination meter.
2. Measure the resistance between warning box and combination meter.
   Connector & terminal
   (R161) No. 2 — (i10) No. 12:

Is the resistance less than 10 Ω?

Yes — Go to 14.

No — Repair or replace the harness.

14. CHECK COMMUNICATION STATUS BETWEEN WARNING BOX AND COMBINATION METER.

1. Remove the warning box, and install a properly operating warning box (new warning box).
2. Connect the connector and then turn the ignition switch to ON.
   Connector & terminal
   (R161) No. 2 — (i10) No. 12:

Is the warning box properly displayed?

Yes — Replace the warning box.

No — Replace the combination meter case assembly.

REMOVAL

1. SEAT BELT OUTER - FRONT

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**
- **Do not drop or subject the pretensioner to any impact.**
- **Since the pretensioner and bracket are integrated as a unit, do not disassemble them.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:

   For model with the power seat, move the seat to the front-most position before removing the battery ground terminal.
3. Tilt the front seat backrest assembly forward, and move the front seat all the way forward.

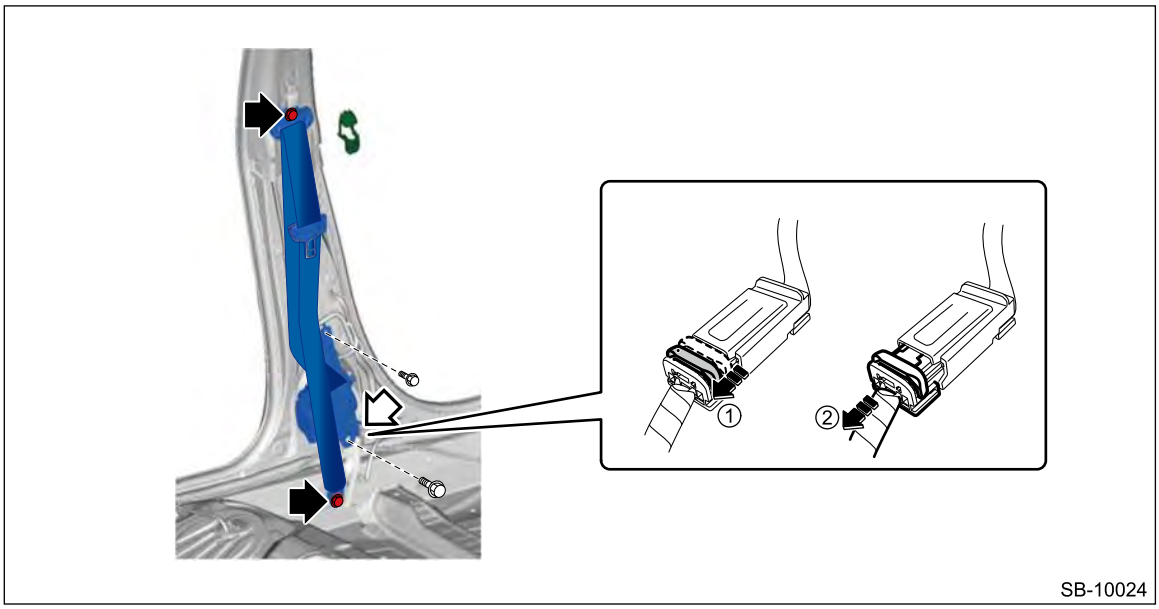
   Caution:

   For the power seat, move the seat, disconnect the battery ground cable, and then wait for 60 seconds or more before starting work.
4. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
5. Remove the cover side sill - front INN, cover side sill - rear INN, and trim panel - center pillar LWR. (On the side where seat belt assembly is removed) Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
6. Remove the seat belt outer - front.
   (1) Turn over the floor mat to disconnect the belt tension sensor connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > PASSENGER'S AIRBAG MODULE AND PRETENSIONER.

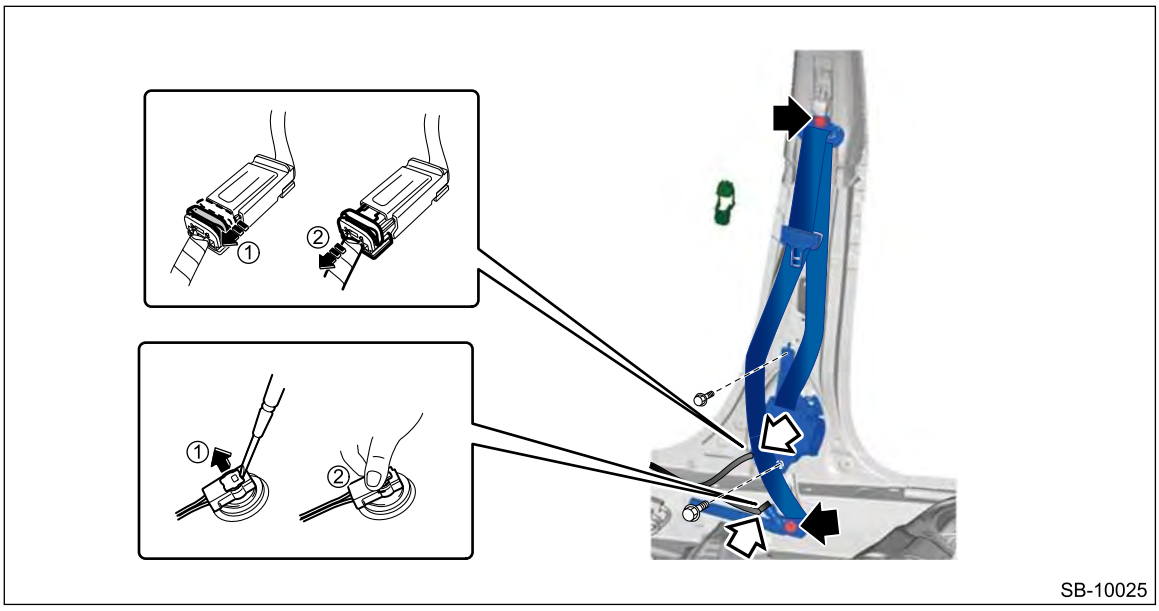
   Note:

   Also disconnect the connector of the passenger's lap seat belt pretensioner. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > KNEE AIRBAG MODULE AND PASSENGER'S LAP SEAT BELT PRETENSIONER.

   (2) Remove the cover through, and remove the seat belt anchor bolt.
   (3) Remove the bolt to remove the seat belt retractor.
   (4) Remove the lower anchor bolt, and remove the seat belt outer - front.
   - Driver's side



- Passenger’s side



7. Remove the adjuster assembly - seat belt.

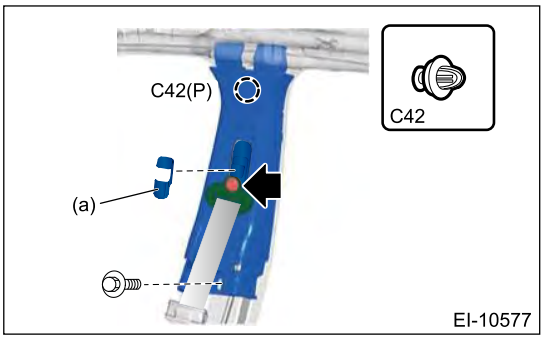
(1) Remove the cover through (a), and remove the seat belt anchor bolt.

(2) Remove the bolt on the lower side of the trim panel - center pillar UPR.

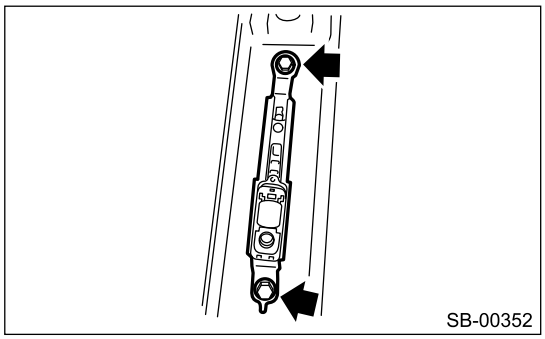
(3) Remove the clip by pulling the upper part of the trim toward you, and while lowering the entire trim, remove the trim panel - center pillar UPR.

Caution:

Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.



(4) Remove the bolts, and then remove the adjuster assembly - seat belt.



2. SEAT BELT INNER - FRONT

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

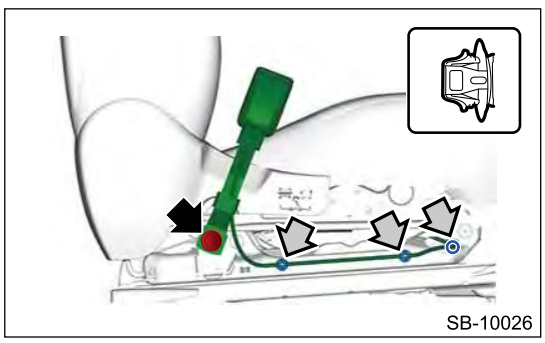
1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

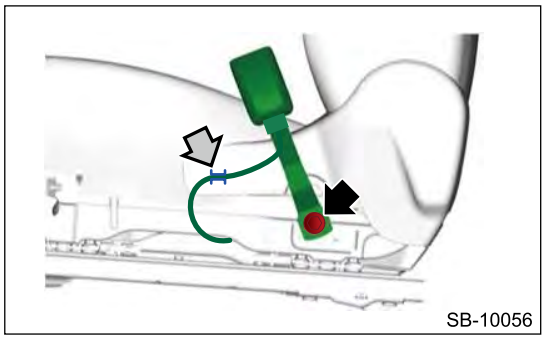
   Note:

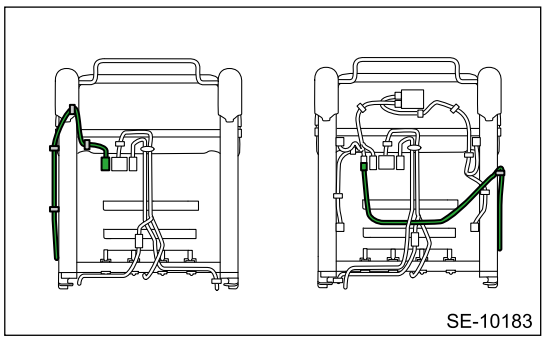
   For model with the power seat, move the seat to the front-most position before removing the battery ground terminal.
3. Remove the front seats. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the seat belt inner - front.

   (1) Remove the clip for the inner seat belt harness located under the seat cushion.

   (2) Remove the nut, and remove the seat belt inner - front.







SEAT BELT SYSTEM > Front Seat Belt

INSTALLATION

1. SEAT BELT OUTER - FRONT

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **The parts of the driver and passenger sides are not the same. Before installation, make sure that the correct part is used.**
- **During installation, make sure that the seat belts are not twisted.**
- **After installation, make sure that the seat belt can be pulled out and retracted smoothly.**
- **Make sure that the seat belt harness is not caught anywhere. Wrong harness rooting may cause the harness short from pinch.**
- **Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.**

1. Before installation, perform a unit inspection of retractor. Ref. to SEAT BELT SYSTEM>Front Seat Belt>INSPECTION.
2. Install the adjuster assembly - seat belt and the seat belt outer - front.
   Tightening torque:
   Front seat belt: Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > FRONT SEAT BELT.
3. Install the trim panel - center pillar UPR.
   Tightening torque
   Trim panel - center pillar UPR: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the trim panel - center pillar LWR, cover side sill - front INN, and cover side sill - rear INN.

Note:

Assemble the trim panel - center pillar LWR and the trim panel - center pillar UPR securely.

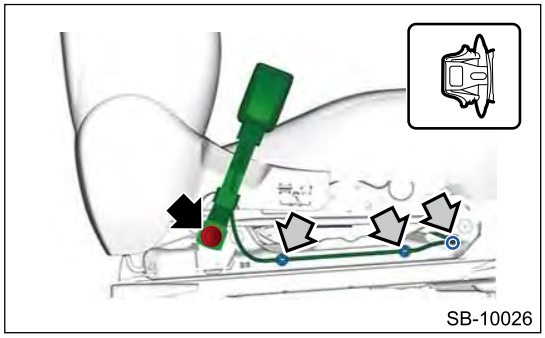
5. Install the rear seat cushion assembly.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
7. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt can be pulled out and retracted smoothly.
   - The adjuster assembly - seat belt can be moved smoothly.
   - Check that the airbag warning light lights up for approximately 6 seconds and then turns off when connecting the battery ground cable and turning the ignition switch to ON.

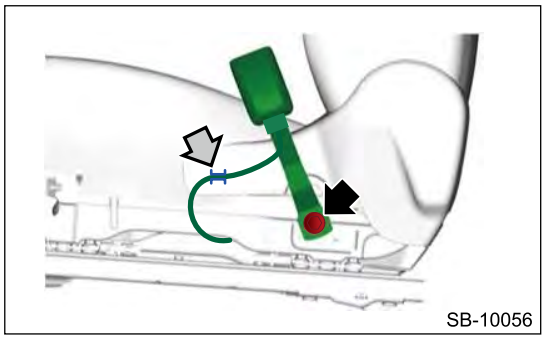
2. SEAT BELT INNER - FRONT

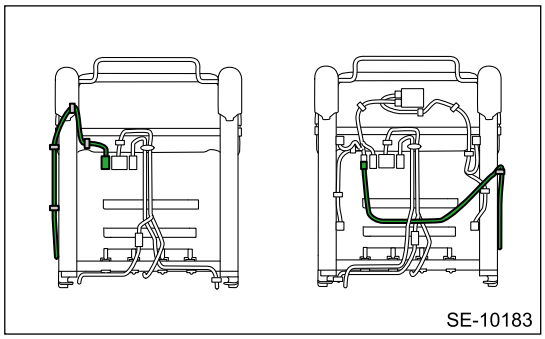
Caution:

- **Before installation, make sure that the correct part is used.**
- **During installation, make sure that the seat belts are not twisted.**
- **Check that there is no pinching of the seat belt harness. Wrong harness rooting may cause the harness short from pinch.**
- **Do not forget the wave washer, when installing front seat inner belt assembly.**
- **If the passenger's seat is removed, be sure to perform [Rezero] for the occupant detection system after installing the seat to the vehicle.**

1. Install the seat belt inner - front.
   (1) Install the wave washer, seat belt inner - front and nut in order and then tighten the nut.
   Tightening torque:
   53 N·m (5.4 kgf-m, 39.1 ft-lb)
   (2) Locate the seat belt harness and retain it with a harness clip.







2. Install the seat assembly to the body. Ref. to SEATS>Front Seat>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
4. If the passenger's seat is removed, make sure to perform [Rezero] in the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

SEAT BELT SYSTEM > Front Seat Belt

INSPECTION

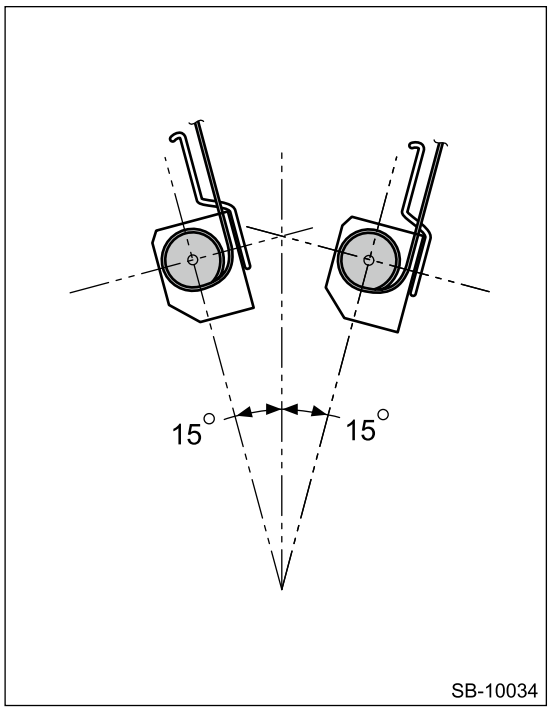
1. VISUAL INSPECTION

Check for the following, and replace with new parts if necessary.

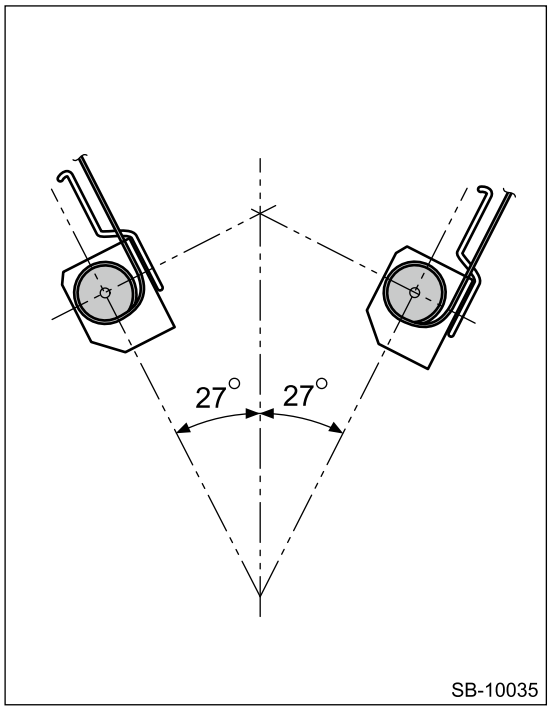
- Pretensioner is cracked or deformed.
- Adjuster assembly - seat belt is cracked or deformed.
- Seat belt is slackened, bent or worn.
- Seat belt is abnormally wound or extended.
- Seat belt inner - front is deformed or damaged.
- Seat belt buckle cannot be engaged properly.

2. ELR LOCK MECHANISM INSPECTION

1. Hold the retractor upright (as installed in the vehicle) and check the ELR lock mechanism.
2. Tilt the retractor from the upright posture and check the following points.
   - It does not lock if the inclination angle is 15° or less.



- It remains locked if the inclination angle is 27° or more.



3. If the ELR lock mechanism does not operate properly, replace the seat belt outer - front with a new part.

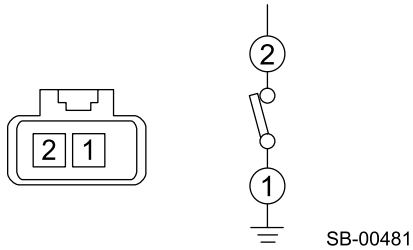
3. SEAT BELT SWITCH INSPECTION

Preparation tool:

Circuit tester

- Driver's seat

  Measure the resistance between the terminals when the seat belt inner - front is in each of the following operation conditions.

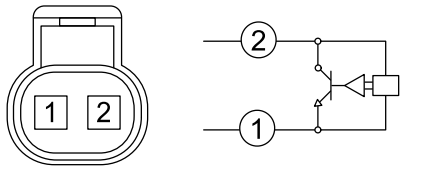
Terminal No.	Inspection conditions	Standard	Circuit
2 — 1	Tongue plate inserted	1 MΩ or more	
2 — 1	Tongue plate detached	1 Ω or less	

  Replace the seat belt inner - front if the inspection result is not within the standard.

- Passenger's seat

  Measure the current value between the terminals when the seat belt inner - front is in each of the following operation conditions.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Tongue plate inserted	12 — 18 mA	

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Tongue plate detached	4 — 7 mA	 SB-00482

Replace the seat belt inner - front if the inspection result is not within the standard.

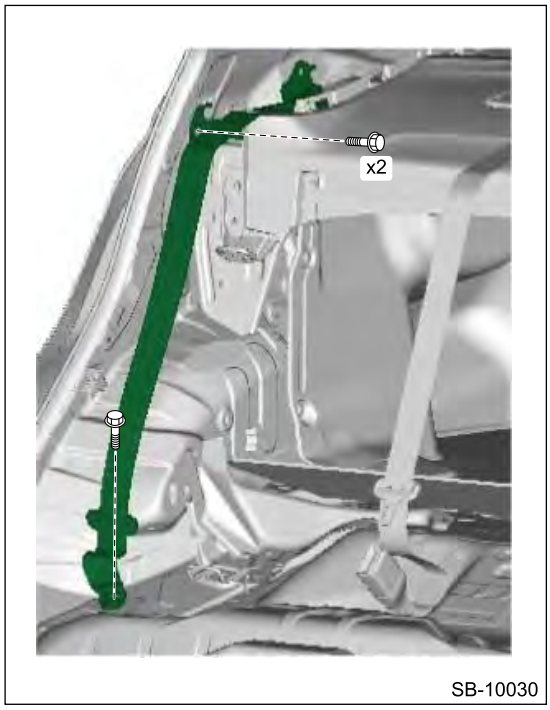
REMOVAL

1. SEAT BELT OUTER - REAR RH AND LH (4 DOOR MODEL)

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the cover side sill - rear INN. (On the side where seat belt assembly is removed) Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
5. Remove the trim panel - rear pillar LWR and the trim panel - rear pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 4 DOOR MODEL.
6. Remove the bolts, and remove the seat belt outer - rear.

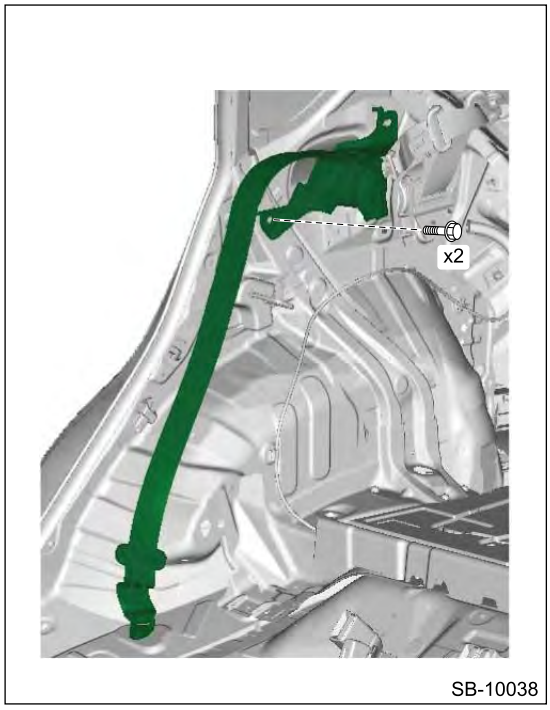


2. SEAT BELT OUTER - REAR RH AND LH (5 DOOR MODEL)

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the rear quarter trim. (On the side where seat belt assembly is removed) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
5. Remove the bolts, and remove the seat belt outer - rear.

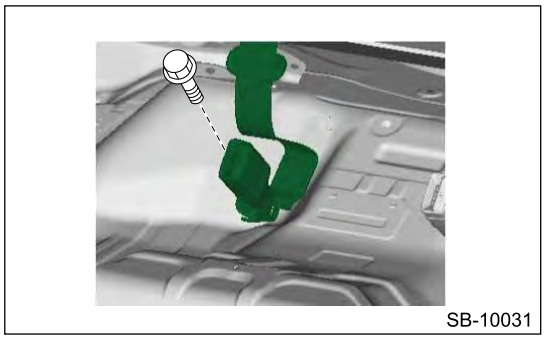


3. SEAT BELT - REAR SHOULDER CTR (4 DOOR MODEL)

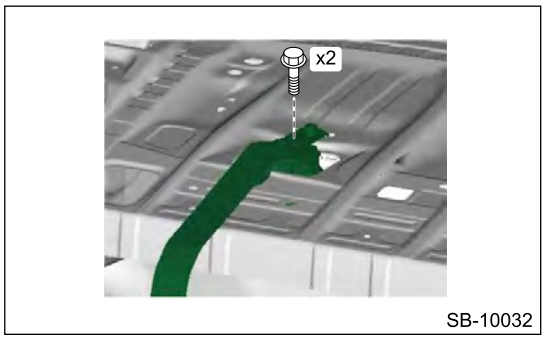
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the side sill cover - rear INN, trim panel - rear pillar LWR, and trim panel - rear pillar UPR on the RH and LH sides. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.
5. Remove the bolts, and remove the lower anchor of the seat belt - rear shoulder CTR.


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6. Remove the trim panel - rear shelf assembly. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>REMOVAL.
7. Remove the bolts, and remove the seat belt - rear shoulder CTR.



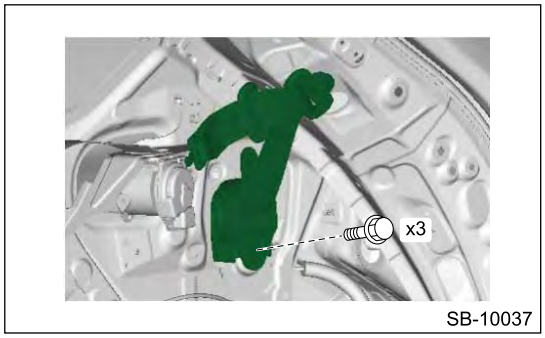
SB-10032

4. SEAT BELT - REAR SHOULDER CTR (5 DOOR MODEL)

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the rear quarter trim RH. (On the side where seat belt assembly is removed) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
5. Remove the bolts, and remove the seat belt - rear shoulder CTR.



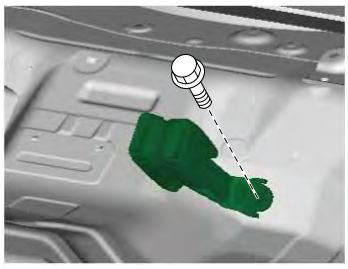
SB-10037

5. SEAT BELT - CTR LH (4 DOOR MODEL)

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the bolts, and remove the seat belt - CTR LH.

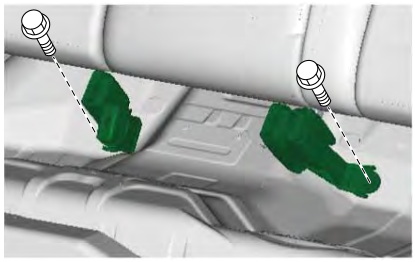

SB-10033

6. SEAT BELT - CTR RH AND LH (5 DOOR MODEL)

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the bolts, and remove the seat belt - CTR RH and LH.


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SEAT BELT SYSTEM > Rear Seat Belt

INSTALLATION

1. SEAT BELT OUTER - REAR RH AND LH (4 DOOR MODEL)

1. Before installation, perform a unit inspection of retractor. Ref. to SEAT BELT SYSTEM>Rear Seat Belt>INSPECTION.
2. Install the seat belt outer - rear.

   Caution:
   - **During installation, make sure that the seat belts are not twisted.**
   - **After installation, make sure that the seat belts are smoothly extended and wound.**

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. : Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > REAR SEAT BELT (4 DOOR MODEL).
3. Install the trim panel - rear pillar LWR, trim panel - rear pillar UPR, and cover side sill - rear INN.
4. Install the rear seat cushion assembly.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
6. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt can be pulled out and retracted smoothly.

2. SEAT BELT OUTER - REAR RH AND LH (5 DOOR MODEL)

1. Before installation, perform a unit inspection of retractor. Ref. to SEAT BELT SYSTEM>Rear Seat Belt>INSPECTION.
2. Install the seat belt outer - rear.

   Caution:
   - **During installation, make sure that the seat belts are not twisted.**
   - **After installation, make sure that the seat belts are smoothly extended and wound.**

   Tightening torque:

   Rear seat belt: Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > REAR SEAT BELT (5 DOOR MODEL).
3. Install the rear quarter trim.
4. Install the cover side sill - rear INN.
5. Install the rear seat cushion assembly.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
7. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt can be pulled out and retracted smoothly.

3. SEAT BELT - REAR SHOULDER CTR (4 DOOR MODEL)

1. Install the retractor of seat belt - rear shoulder CTR.

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. : Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > REAR SEAT BELT (4 DOOR MODEL).
2. Install the trim panel assembly - rear shelf.
3. Install the lower anchor of seat belt - rear shoulder CTR.

   Caution:
   - **During installation, make sure that the seat belts are not twisted.**
   - **After installation, make sure that the seat belts are smoothly extended and wound.**

   Tightening torque:

   30N·m (3.1 kgf-m, 22.1 ft-lb)
4. Install the trim panel - rear pillar LWR, trim panel - rear pillar UPR, and cover side sill - rear INN.
5. Install the rear seat cushion assembly.

6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
7. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt can be pulled out and retracted smoothly.

4. SEAT BELT - REAR SHOULDER CTR (5 DOOR MODEL)

1. Install the seat belt - rear shoulder CTR.
   Tightening torque:
   Rear seat belt: Ref. to SEAT BELT SYSTEM>General Description>COMPONENT > REAR SEAT BELT (5 DOOR MODEL).
2. Install the rear quarter trim.
3. Install the rear seat cushion assembly.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
5. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt can be pulled out and retracted smoothly.

5. SEAT BELT - CTR LH (4 DOOR MODEL)

1. Install the seat belt - CTR LH.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
2. Install the rear seat cushion assembly.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
4. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt engagement can be performed smoothly.

6. SEAT BELT - CTR RH AND LH (5 DOOR MODEL)

1. Install the seat belt - CTR RH and LH.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
2. Install the rear seat cushion assembly.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
4. After installation, check the following points.
   - The seat belt is not twisted.
   - The seat belt engagement can be performed smoothly.

SEAT BELT SYSTEM > Rear Seat Belt

INSPECTION

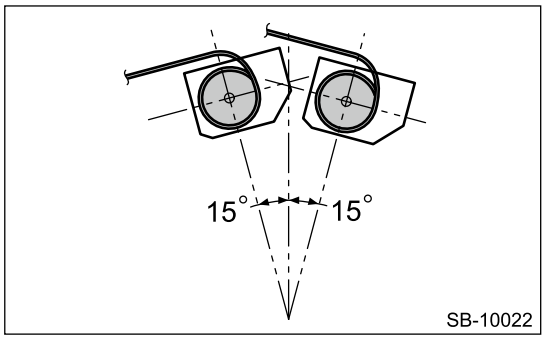
1. VISUAL INSPECTION

Check for the following, and replace with new parts if necessary.

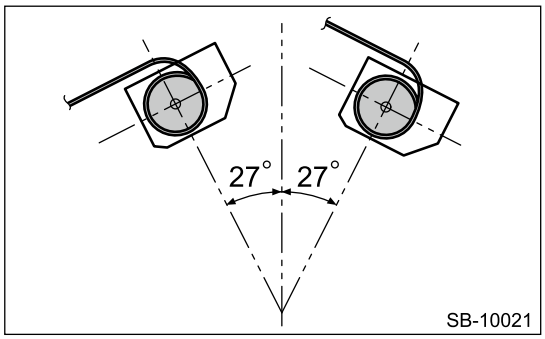
- Seat belt is slackened, bent or worn.
- Seat belt is abnormally wound or extended.
- Seat belt inner - rear is deformed or damaged.
- Seat belt buckle cannot be engaged properly.

2. ELR LOCK MECHANISM INSPECTION

1. Hold the retractor upright (as installed in the vehicle) and check the ELR lock mechanism.
2. Tilt the retractor from the upright posture and check the following points.
   - It does not lock if the inclination angle is 15° or less.



   - It remains locked if the inclination angle is 27° or more.



3. If the ELR lock mechanism does not operate properly, replace the seat belt outer - rear with a new part.

PROCEDURE

Warning:

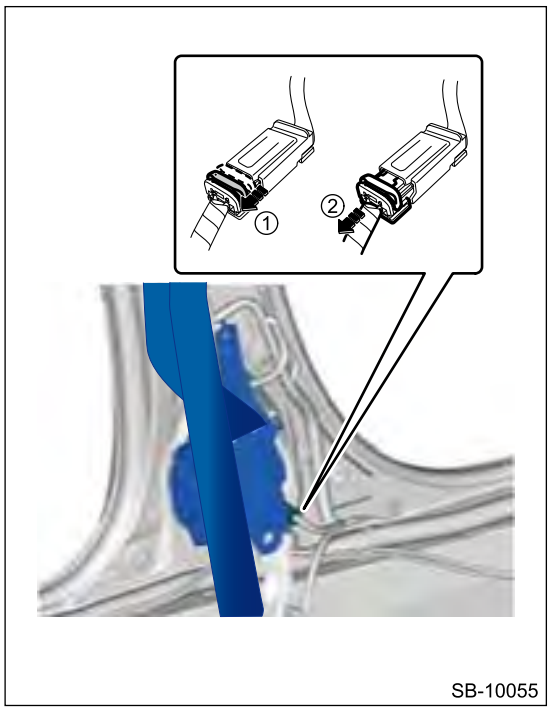
Make sure to follow the instructions below. Otherwise, personal injuries may occur.

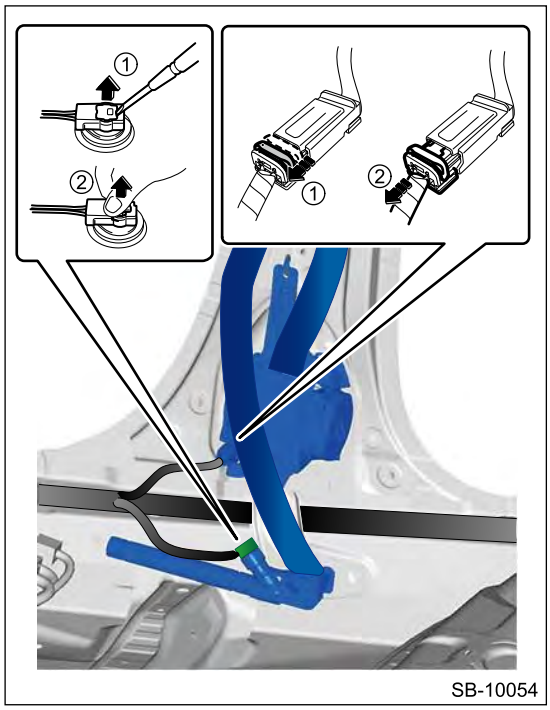
- **Before discarding a pretensioner, always perform an activation process to prevent any false activation.**
- **Wear protective gloves, safety goggles and earplugs during this operation. Wash your hands afterwards.**
- **Do not touch the pretensioner just after activation because it is very hot. Before handling it for disposal, wait for 40 minutes.**

Caution:

- **Perform a pretensioner operation process in a safe, level place. Do not perform the process outdoors when there is a strong rain or wind.**
- **Do not drop or damage the pretensioner.**
- **A large explosive noise will occur when the pretensioner is deployed. Warn persons in the area, and do not allow anyone to approach a radius of 5 m (16 ft) from the discard location.**
- **After activating the pretensioner, smoke may arise. Therefore, always perform an operation process in a well-ventilated place without any smoke sensor.**
- **Do not expose the activated pretensioner to water.**
- **Wrap the activated pretensioner in a sealed vinyl bag when discarding.**
- **If it is impossible to perform a pretensioner activation process due to some situational reasons, consult SUBARU dealership or one of the authorized workshops.**

1. Fold the backrest all the way forward, and move the front seat all the way forward.
2. Turn the ignition switch to OFF.
3. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.
   Ref. to REPAIR CONTENTS>NOTE > SAFETY.
4. Disconnect connector of the pretensioner.





5. Short the alligator clip and terminal of the airbag deployment tool together.

Caution:

Short the airbag deployment tool terminals until just before the pretensioner operation process.

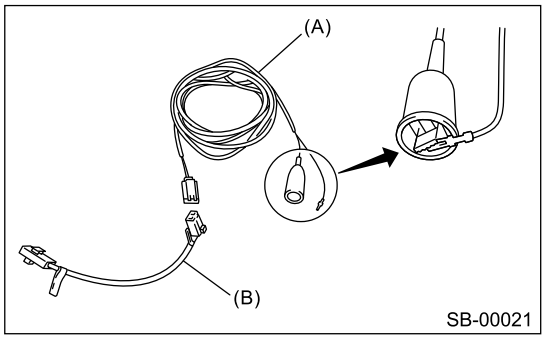
Preparation tool:

ST: AIRBAG DEPLOYMENT TOOL (98299PA030)

6. Connect airbag deployment tool (A) and test harness adapter AM (B).

Preparation tool:

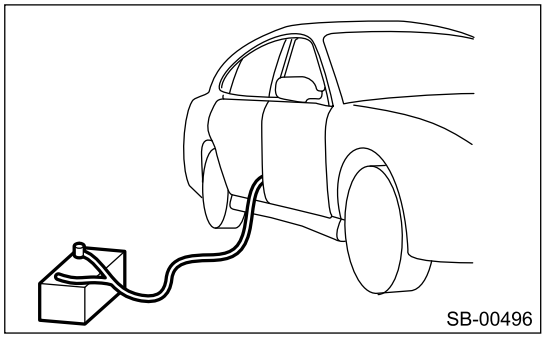
ST: TEST HARNESS ADAPTER AM (98299FJ000)



7. Connect the test harness adapter AM connector to the pretensioner.

8. Make sure there is no one inside the vehicle.

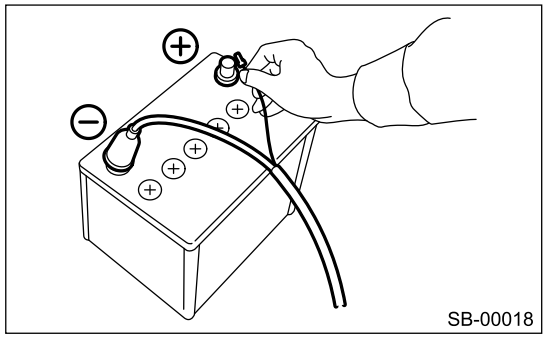
9. Extend the wiring of the airbag deployment tool to its limit, and completely close all the windows and sunroof.



10. Move the battery 5 m (16 ft) or more from the vehicle, and affix nearby.
11. Connect the airbag deployment tool alligator clip to the battery negative (−) terminal.
12. Connect the other cable of airbag deployment tool to the battery positive (+) terminal, and activate the pretensioner.

Caution:

- **After activation, the pretensioner will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated pretensioner to water.**



13. Perform operation process of lap seat belt pretensioner from steps 14) to 22) for the passenger's side.
14. Disconnect the connector from the lap seat belt pretensioner.
15. Short the alligator clip and terminal of the airbag deployment tool together.

Caution:

Short the airbag deployment tool terminals until just before the pretensioner operation process.

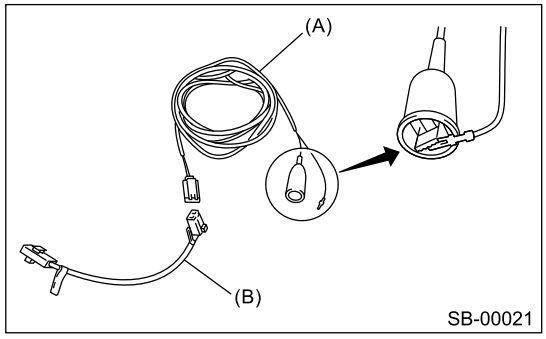
Preparation tool:

ST: AIRBAG DEPLOYMENT TOOL (98299PA030)

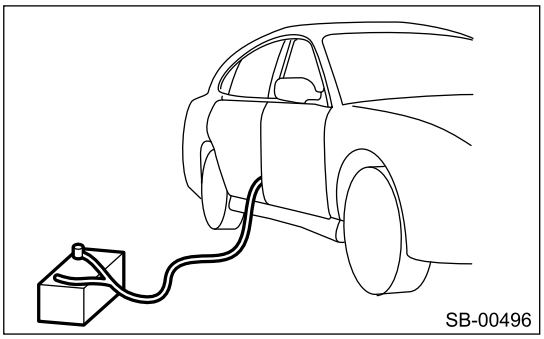
16. Connect the airbag deployment tool (A) and test harness adapter D (B).

Preparation tool:

ST: TEST HARNESS ADAPTER D (98299SA010)



17. Connect the test harness adapter D connector to the lap seat belt pretensioner.
18. Make sure there is no one inside the vehicle.
19. Extend the wiring of airbag deployment tool to the limit, and close all the windows and sunroof completely.



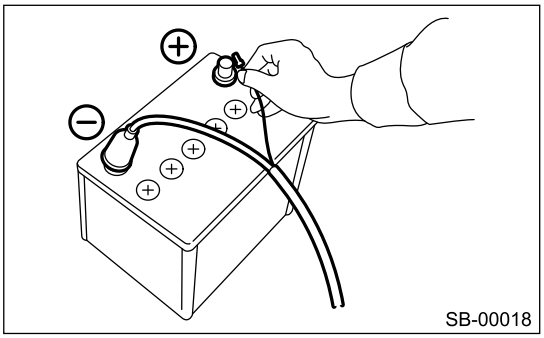
20. Move the battery 5 m (16 ft) or more from the vehicle, and affix nearby.

21. Connect the airbag deployment tool alligator clip to the battery negative (−) terminal.

22. Connect the other cable of airbag deployment tool to the battery positive (+) terminal, and activate the pretensioner.

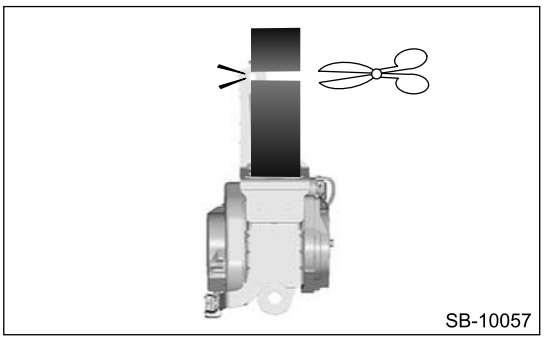
Caution:

- **After activation, the pretensioner will be extremely hot. Let it cool down for at least 40 minutes in an area with no one around.**
- **Do not expose the activated pretensioner to water.**

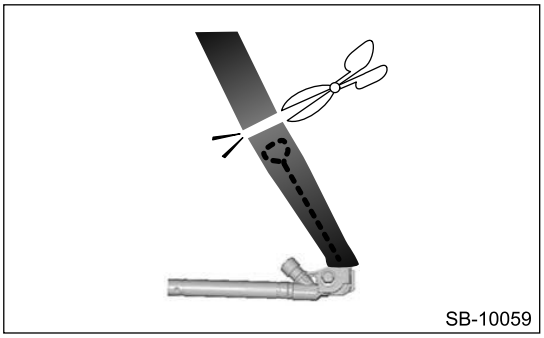


23. Remove the seat belt outer - front. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL.

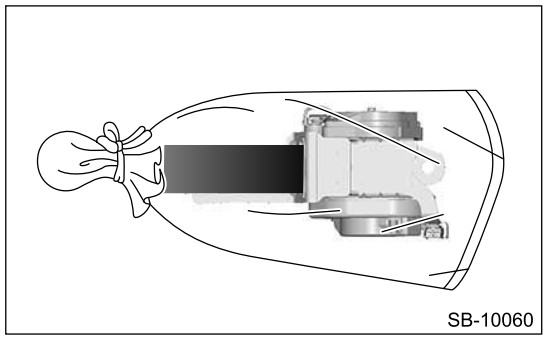
24. Cut the seat belt at a position as close as possible to the seat belt retractor.



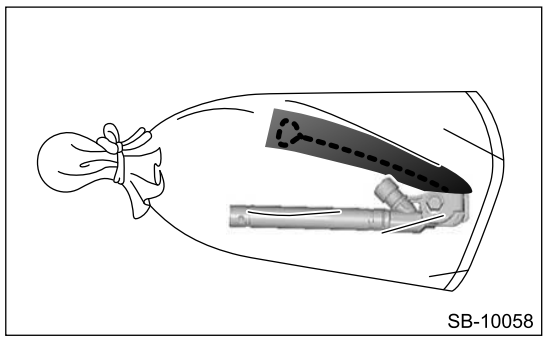
25. Cut the seat belt at a position as close as possible to the lap seat belt pretensioner.



26. Place the activated pretensioner in a sealed vinyl bag, then discard.



SB-10060



SB-10058

Blind Spot Detection/Rear Cross Traffic Alert

RVD

1. General Description
2. Relay and Fuse
3. Blind Spot Detection/Rear Cross Traffic Alert
4. Radar Sensor
5. Switches and Harness
6. Combination Meter
7. Outer Mirror Assembly
8. Diagnostics with Phenomenon

Blind Spot Detection/Rear Cross Traffic Alert > General Description

LOCATION

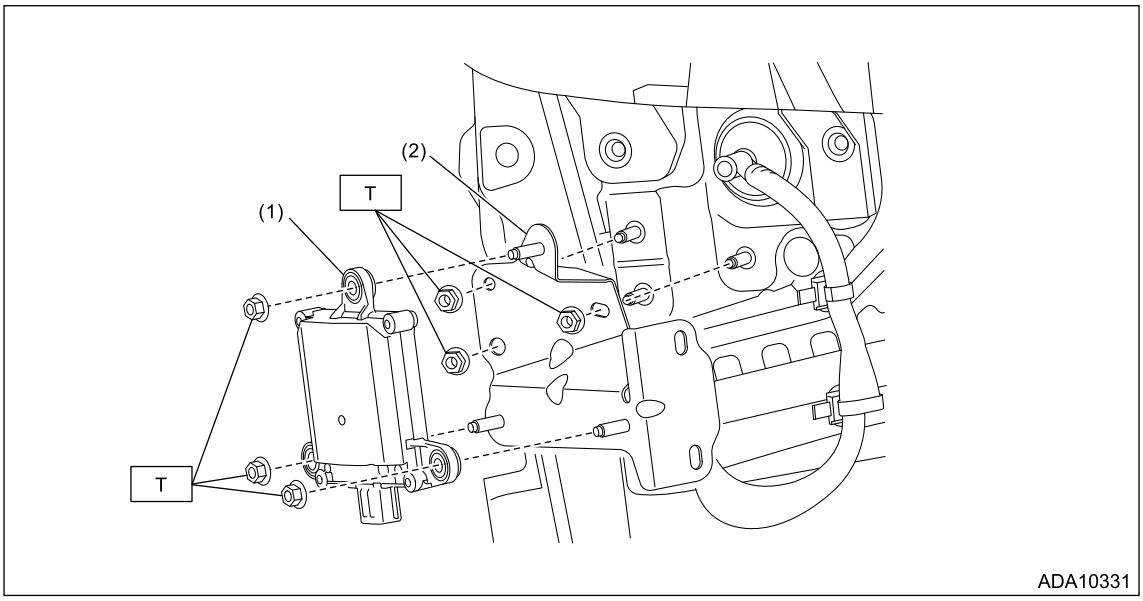
For location, refer to “LOCATION” of “Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)” section. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Electrical Component Location>LOCATION.

Blind Spot Detection/Rear Cross Traffic Alert > General Description

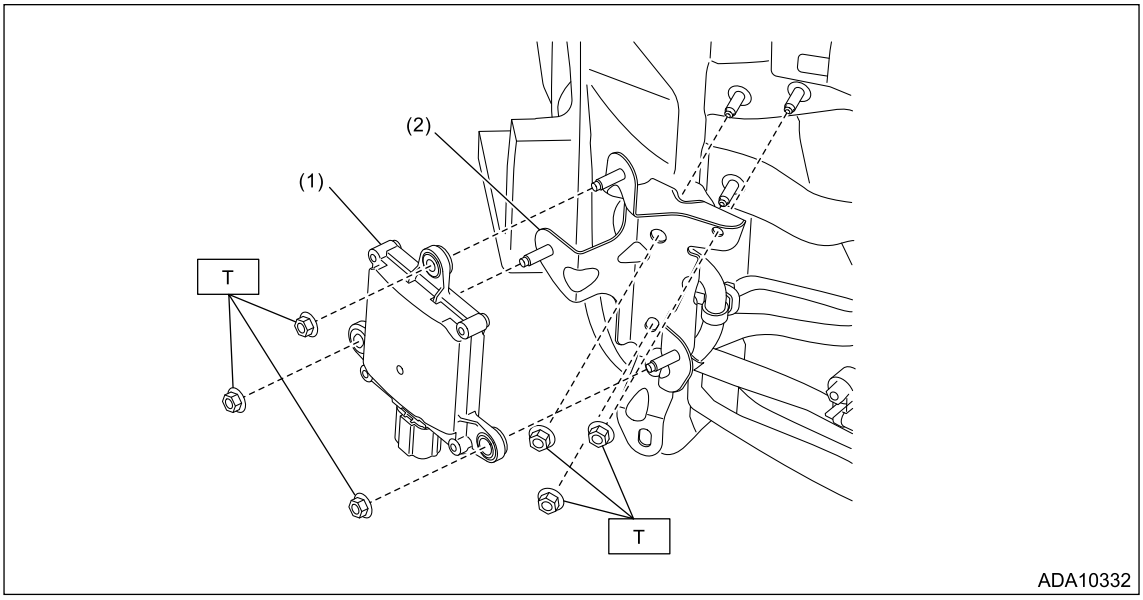
COMPONENT

1. RADAR SENSOR

- 4 door model



- 5 door model



(1) Radar sensor (master & slave) (2) Radar bracket

Tightening torque: N·m (kgf-m, ft-lb)

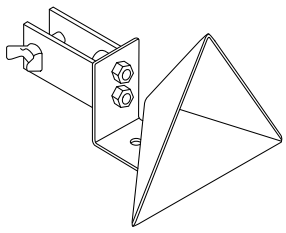
T: 7.5 (0.8, 5.5)

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the electrical parts provided with memory functions that store contents specified by a customer, record the memory contents before disconnecting the battery ground cable.
- For precautions for rear vehicle detection function, refer to "CAUTION" in "Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)" section. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>General Description>CAUTION.

PREPARATION TOOL

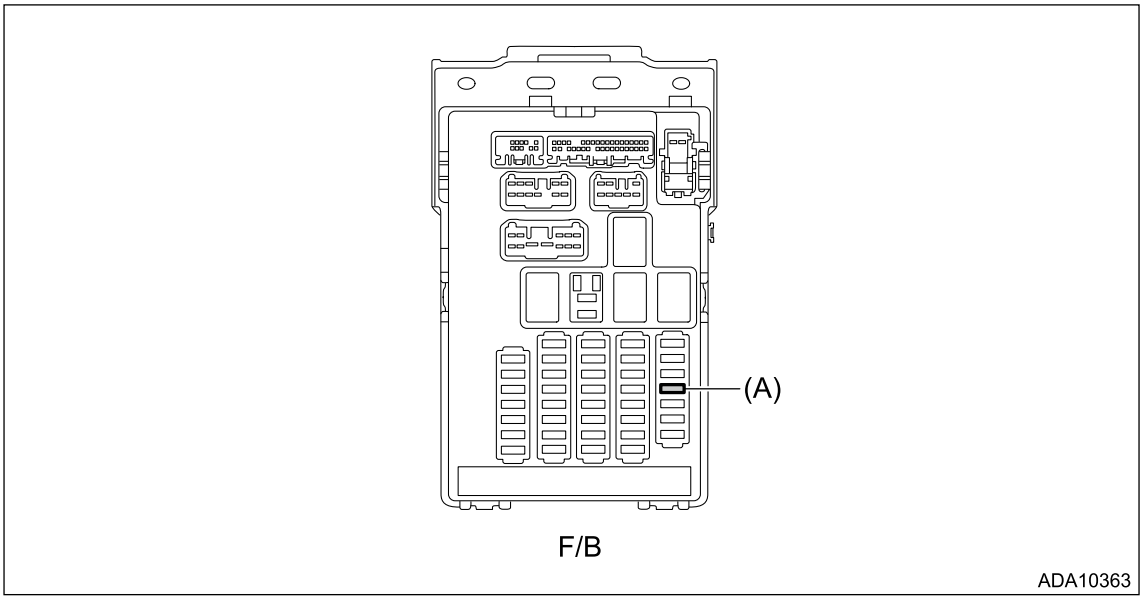
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST87699AL00A	87699AL00A	Radar reflector	Used for adjusting the radar axis of the radar sensor. **Note: Attach the radar reflector to a round pole with a diameter of approx. 20 mm (0.79 in) or a 20-mm (0.79 in) square pole.**
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.
Measure (5 m (16 ft) or more)	Used for adjusting the radar axis of the radar sensor.
Leveling line	
Plumb bob	
Packing tape	
Stand, tripod, etc.	

LOCATION



Fuse & relay box (F/B)	Fuse 10 A (radar sensor LH (master), radar sensor RH (slave))	(A)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

   Note:

   If the fuse is blown again, check the system wiring harness.

Blind Spot Detection/Rear Cross Traffic Alert > Blind Spot Detection/Rear Cross Traffic Alert

WIRING DIAGRAM

Refer to "Blind Spot Detection/Rear Cross Traffic Alert system" in the wiring diagram. Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.

Blind Spot Detection/Rear Cross Traffic Alert > Blind Spot Detection/Rear Cross Traffic Alert

ELECTRICAL SPECIFICATION

For electrical specification, refer to "Control Module I/O Signal" of "Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)" section. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Control Module I/O Signal.

Blind Spot Detection/Rear Cross Traffic Alert > Blind Spot Detection/Rear Cross Traffic Alert

INSPECTION

For inspection, refer to "Basic Diagnostic Procedure" of "Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)" section. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Basic Diagnostic Procedure.

Blind Spot Detection/Rear Cross Traffic Alert > Blind Spot Detection/Rear Cross Traffic Alert

NOTE

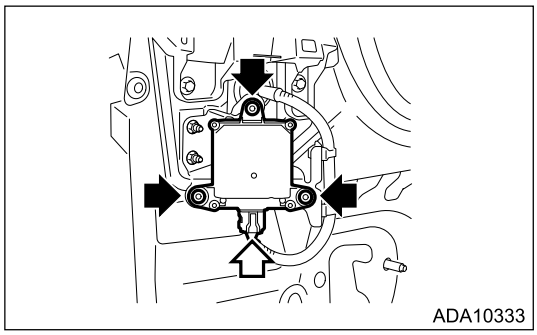
For procedure of each component in the Blind Spot Detection/Rear Cross Traffic Alert system, refer to the respective sections.

- Radar sensor: Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
- BSD/RCTA OFF switch: Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Switches and Harness.
- Combination meter: Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Combination Meter.
- Outer mirror assembly: Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Outer Mirror Assembly.

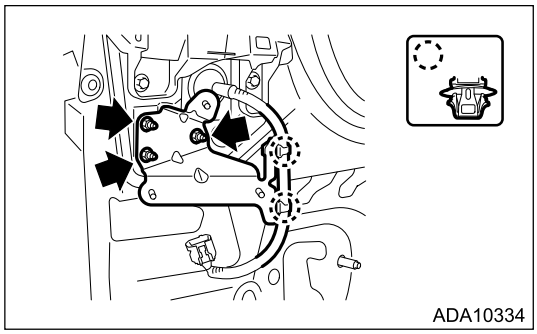
REMOVAL

1. RADAR SENSOR LH (MASTER)

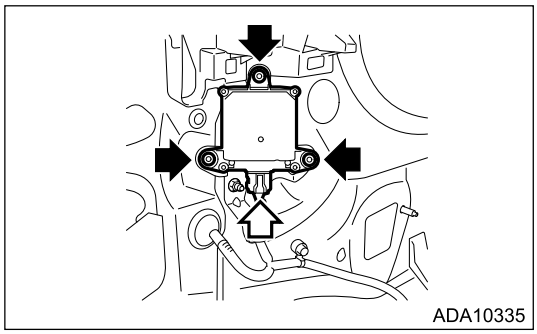
- **4 DOOR MODEL**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
  2. Remove the bumper face - rear. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper>REMOVAL > 4 DOOR MODEL.
  3. Remove the radar sensor LH (master).
     (1) Disconnect the connector.
     (2) Remove the nut and remove the radar sensor LH (master).



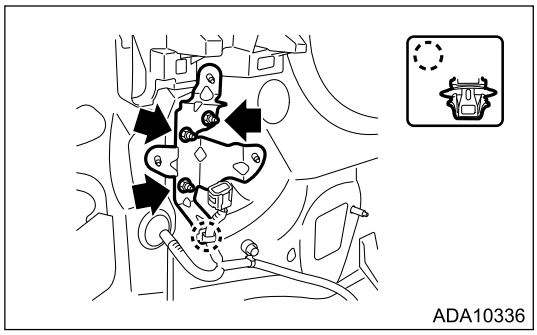
  4. Remove the radar bracket.
     (1) Remove the harness clamp.
     (2) Remove the nut and remove the radar bracket.



- **5 DOOR MODEL**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
  2. Remove the bumper face - rear. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper>REMOVAL > 5 DOOR MODEL.
  3. Remove the radar sensor LH (master).
     (1) Disconnect the connector.
     (2) Remove the nut and remove the radar sensor LH (master).



4. Remove the radar bracket.
   (1) Remove the harness clamp.
   (2) Remove the nut and remove the radar bracket.



2. RADAR SENSOR RH (SLAVE)

Note:
For the procedure of radar sensor RH (slave), refer to "RADAR SENSOR LH (MASTER)".

Blind Spot Detection/Rear Cross Traffic Alert > Radar Sensor

INSTALLATION

1. Install the radar bracket.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the radar sensor.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the bumper face - rear.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
5. Perform the adjustment of the radar sensor radar axis. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor>ADJUSTMENT > RADAR AXIS ADJUSTMENT.

Blind Spot Detection/Rear Cross Traffic Alert > Radar Sensor

ADJUSTMENT

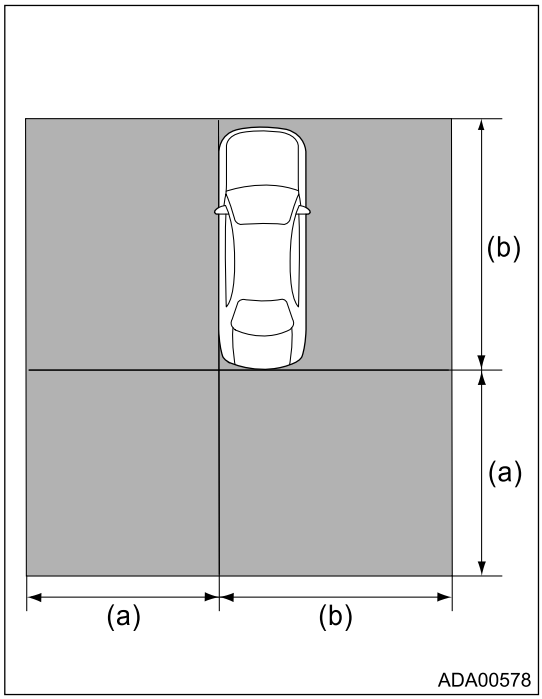
1. RADAR AXIS ADJUSTMENT

Caution:
- **After removal/installation or replacement of the radar sensor, perform the radar axis adjustment.**
- **The procedure for the master is only shown here. However the procedure for the slave can also be done in the same way as the master.**

1. Before performing the inspection, check the following items.
   - The inflation pressure of tires is correct.
   - The vehicle does not have load.
   - Vehicle's fuel tank is fully filled.
2. Place the vehicle on a level surface, where approximately 5 m (16.41 ft) square area can be secured behind the vehicle.

Caution:

- **No metallic objects around the vehicle and on the floor in the area.**
- **Do not let in objects other than the radar reflector (ST), persons and metallic objects inside the area.**



(a) Approx. 4 m (13.12 ft)

(b) Approx. 5 m (16.41 ft)

Note:

The illustration shows the secured area for adjusting the radar axis on the master side.

3. Prepare the Subaru Select Monitor, measure, leveling line, plumb bob, packing tape, RADAR REFLECTOR (ST), and stand or tripod for fixing the RADAR REFLECTOR.

Preparation tool:

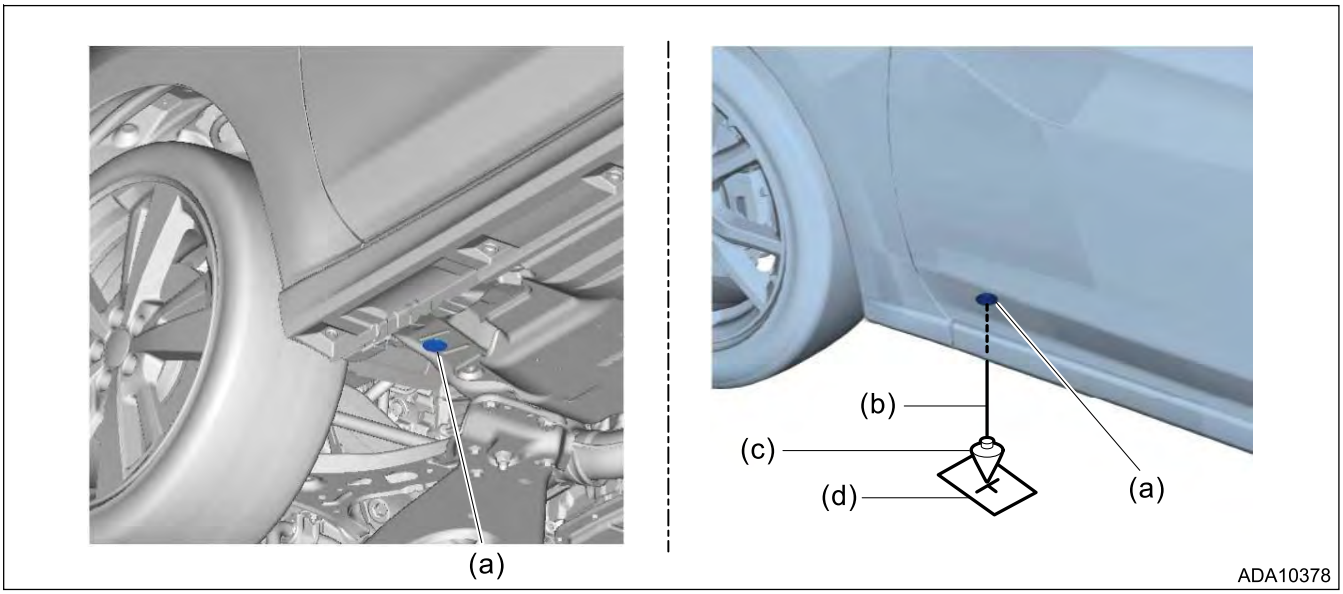
ST: RADAR REFLECTOR (87699AL00A)

4. Set up the radar reflector.

Note:

The following procedure explains the method of setting the radar reflector so that the distance between radar reflector and radar sensor is 1,500 mm (4.92 ft) and the radar is positioned at an angle of 50 degree.

(1) Suspend the plumb bob from the center of the front hole cap, and mark the position where the plumb bob touches the ground. (Point A)

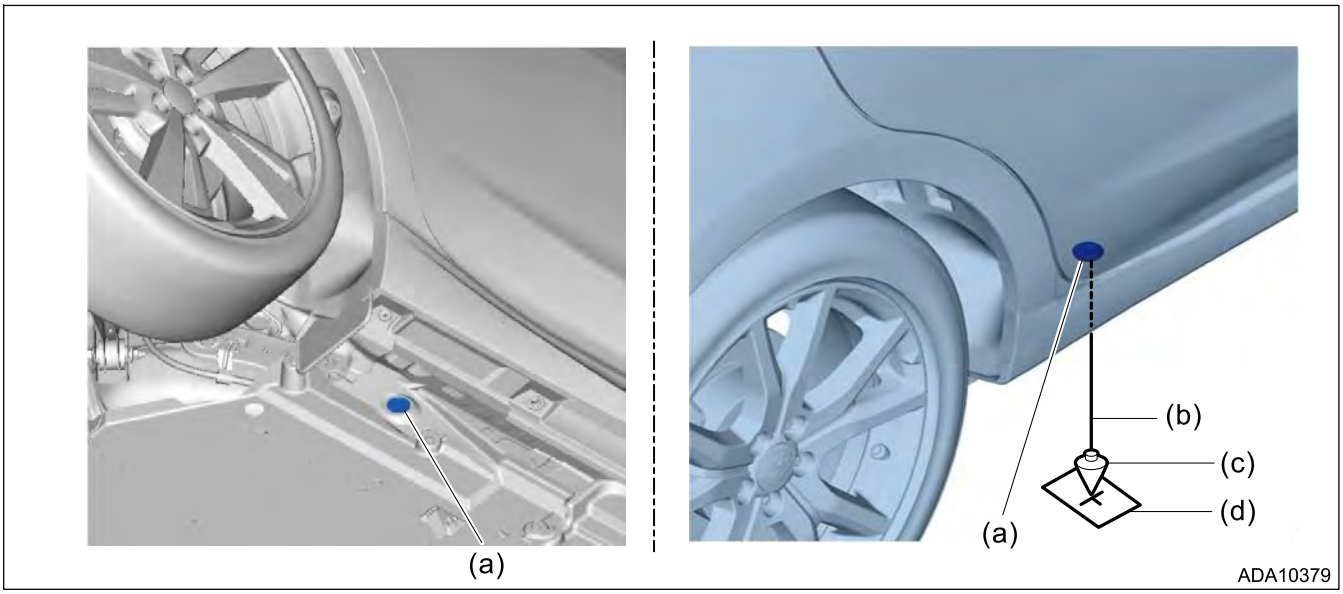


(a) Front hole cap
(b) Leveling line
(c) Plumb bob
(d) Point A

Note:

Stick the packing tape etc. on the floor, then make a marking on the tape.

(2) Suspend the plumb bob from the center of the rear hole cap, and mark the position where the plumb bob touches the ground. (Point B)



(a) Rear hole cap
(b) Leveling line
(c) Plumb bob
(d) Point B

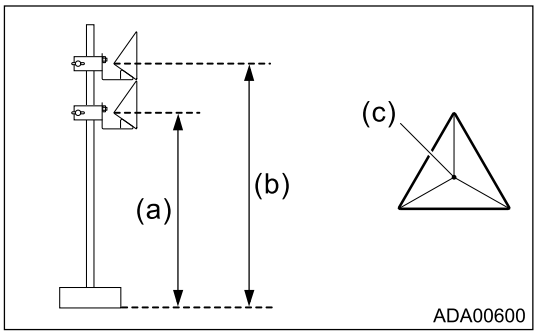
Note:

Stick the packing tape etc. on the floor, then make a marking on the tape.

(3) Stretch a leveling line to draw an arc with the marked point A as a pivot.
(4) Stretch a leveling line to draw an arc with the marked point B as a pivot.
(5)Set up the radar reflector at the cross point.

Caution:

When setting up the radar reflector, adjust the height so that the center of the pyramid points at the radar sensor as shown in the figure.

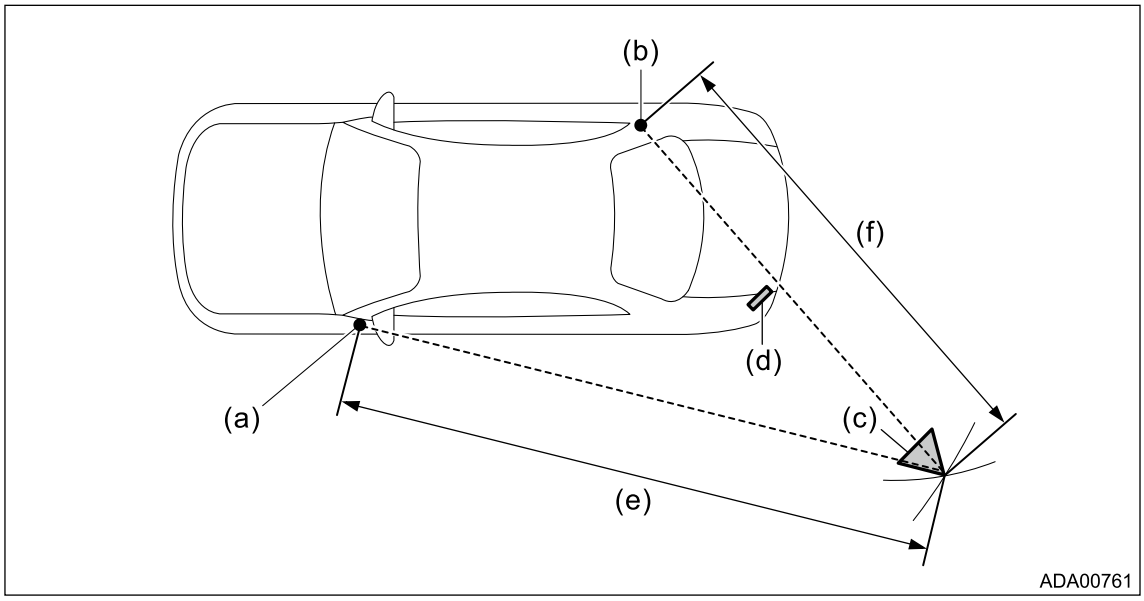


(a) 4 door model: 645.5±10 mm (25.41±0.39 in)

(b) 5 door model: 684.5±10 mm (26.45±0.39 in)

(c) Center of pyramid

- **4 door model**



(a) Point A

(b) Point B

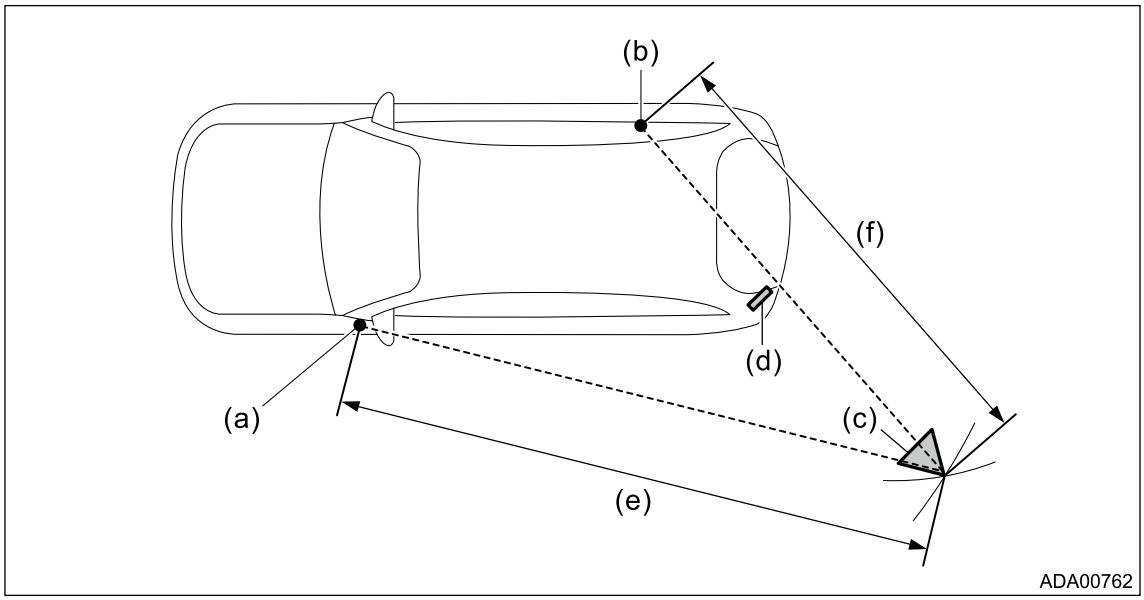
(c) Radar reflector

(d) Radar sensor

(e) 4,310 mm (14.15 ft)

(f) 3,435 mm (11.27 ft)

- **5 door model**



(a) Point A
(b) Point B
(c) Radar reflector
(d) Radar sensor
(e) 4,130 mm (13.56 ft)
(f) 3,330 mm (10.93 ft)

5. Connect the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

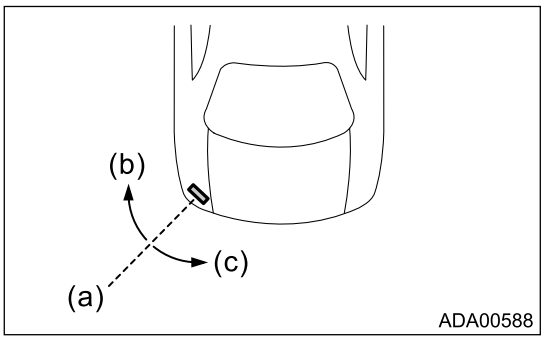
6. Turn the ignition switch to ON and wait for 10 seconds.

7. Perform radar axis adjustment.

(1) On [Start] display, select [Diagnosis].
(2) On [Vehicle selection] display, enter vehicle information and select [OK].
(3) On [Main Menu] display, select [Each System].
(4) On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Next].
(5) On [Select Function] display, select [Work Support].
(6) On the work support item list, select [RADAR Alignment].
(7) Follow the messages displayed on the Subaru Select Monitor screen when working.

Note:

Deviation of radar axis direction is indicated by + (plus) or − (minus).



(a) Center of radar
(b) + (plus)
(c) − (minus)

(8) If the result is out of permissive range, it is assumed that the radar reflector position may be incorrect or the radar bracket or its installation location on the vehicle may be deformed. Check

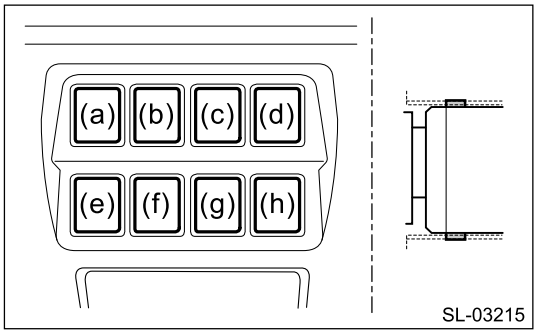
the set position of the radar reflector, radar bracket and other attachment, and perform the radar axis adjustment again.

Blind Spot Detection/Rear Cross Traffic Alert > Switches and Harness

REMOVAL

BSD/RCTA OFF switch

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
2. Remove the cover assembly - instrument panel LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the BSD/RCTA OFF switch.
   (1) Release the claws and remove the BSD/RCTA OFF switch (f).



Blind Spot Detection/Rear Cross Traffic Alert > Switches and Harness

INSTALLATION

BSD/RCTA OFF switch

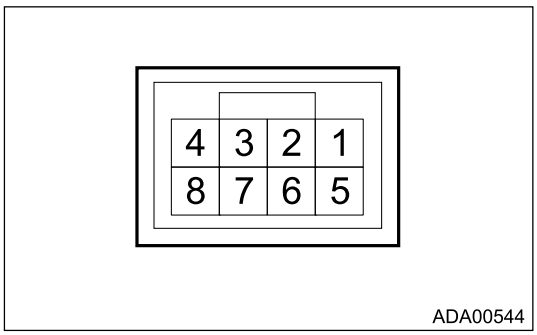
1. Install the BSD/RCTA OFF switch.
2. Install the cover assembly - instrument panel LWR driver OUT.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > SAFETY.

Blind Spot Detection/Rear Cross Traffic Alert > Switches and Harness

INSPECTION

BSD/RCTA OFF switch

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions	Standard
6 — 8	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
1 (+) — 4 (−)	Apply battery voltage.	Light ON

3. Replace the BSD/RCTA OFF switch if it is found defective.

NOTE

For the operation procedures for combination meter, refer to “INSTRUMENTATION/DRIVER INFO” section. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

NOTE

For the operation procedures for the outer mirror assembly, refer to “GLASS/WINDOWS/MIRRORS” section. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.

INSPECTION

For diagnostics with phenomenon, refer to “Diagnostics with Phenomenon” of “Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)” section. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostics with Phenomenon.

BODY STRUCTURE

BS

1. General Description

SPECIFICATION

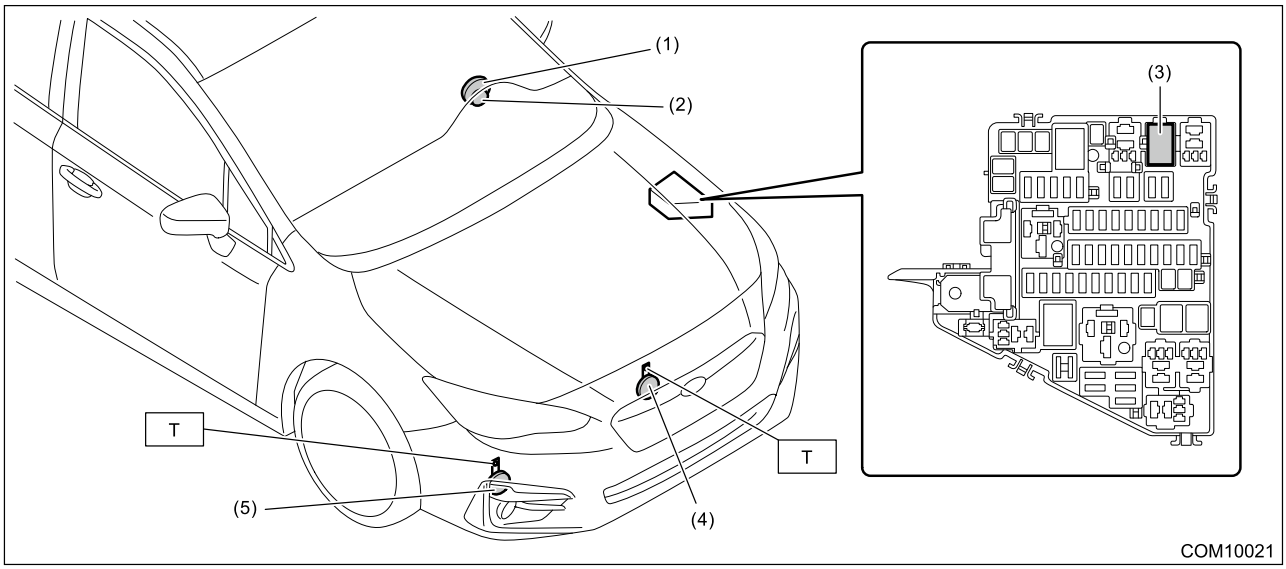
Refer to “Body Repair Manual” for general description of body structure, reference points and reference dimensions.

COMMUNICATION SYSTEM

COM

1. General Description
2. Relay and Fuse
3. Horn System
4. Horn
5. Horn Switch

COMPONENT



(1) Horn switch (driver's airbag module ASSY)
(2) Roll connector
(3) Horn relay
(4) Horn ASSY - Hi
(5) Horn ASSY - Lo

Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.8, 13.3)

CAUTION

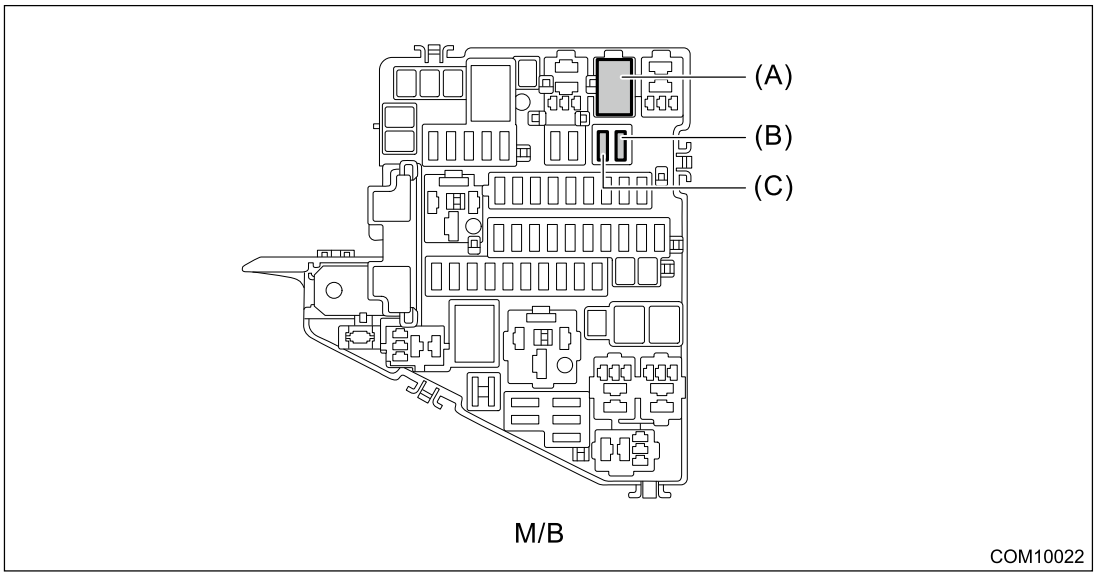
- Before performing vehicle maintenance, turn the ignition switch to OFF and disconnect the negative terminal from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
- When replacing the parts provided with memory functions such as audio, MFD, record the memory contents before disconnecting the battery ground cable.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM".
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column. Ref. to AIRBAG SYSTEM>General Description>CAUTION.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT.

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

LOCATION



Main fuse box (M/B)	Horn relay	(A)
	Fuse 7.5 A (horn assembly - Hi)	(B)
	Fuse 7.5 A (horn assembly - Lo)	(C)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

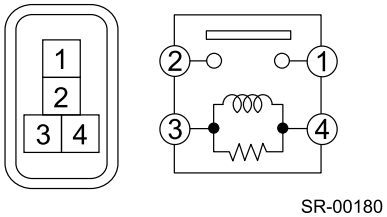
INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

2. CHECK RELAY

1. Check the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	
1 — 2	Apply battery voltage between terminals 4 and 3.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

COMMUNICATION SYSTEM > Horn System

WIRING DIAGRAM

Refer to "Horn System" in the wiring diagram. Ref. to WIRING SYSTEM>Horn System>WIRING DIAGRAM.

COMMUNICATION SYSTEM > Horn System

INSPECTION

Symptoms	Inspection steps
Horn does not sound	1. Check the fuse.
	2. Check the horn relay.
	3. Check the roll connector.
	4. Check the horn switch.
	5. Check the horn assembly.
	6. Check the harness.

COMMUNICATION SYSTEM > Horn System

NOTE

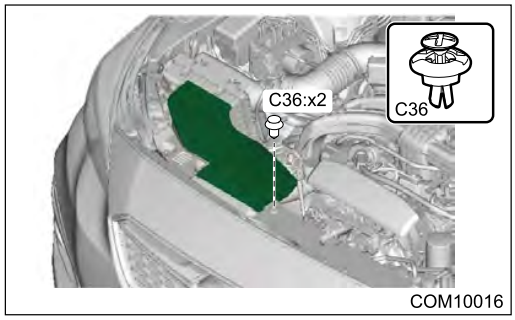
For procedure of each component in the horn system, refer to the respective section.

- Horn: Ref. to COMMUNICATION SYSTEM>Horn.
- Horn switch: Ref. to COMMUNICATION SYSTEM>Horn Switch.

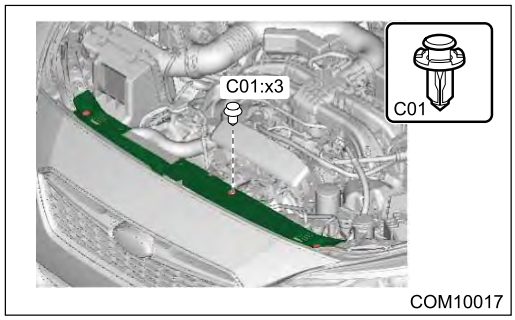
REMOVAL

1. HORN ASSEMBLY - HI

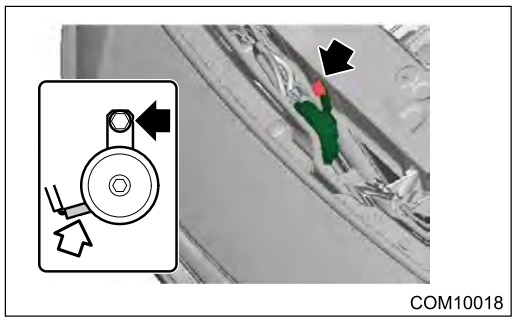
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clips and remove the duct - air intake.



3. Remove the clips, and remove the cover UPR - front.



4. Remove the horn assembly - Hi.
   (1) Disconnect the connector.
   (2) Remove the bolt, and remove the horn assembly - Hi.

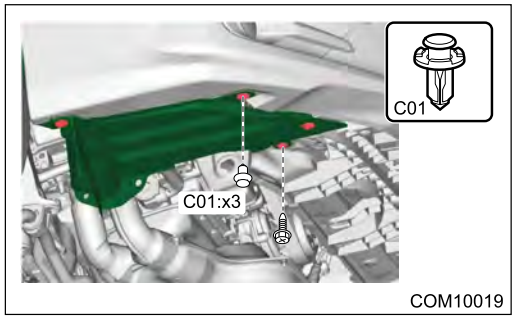


2. HORN ASSEMBLY - LO

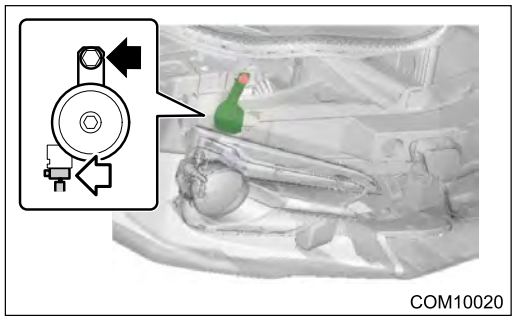
Caution:

When removing the horn, do not remove the bumper face - front. Bracket connection portion of the bumper face may become damaged.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the screw and clips, and turn over the mud guard - front on the right side.



5. Remove the horn assembly - Lo.
   (1) Disconnect the connector.
   (2) Remove the bolt, and remove the horn assembly - Lo.

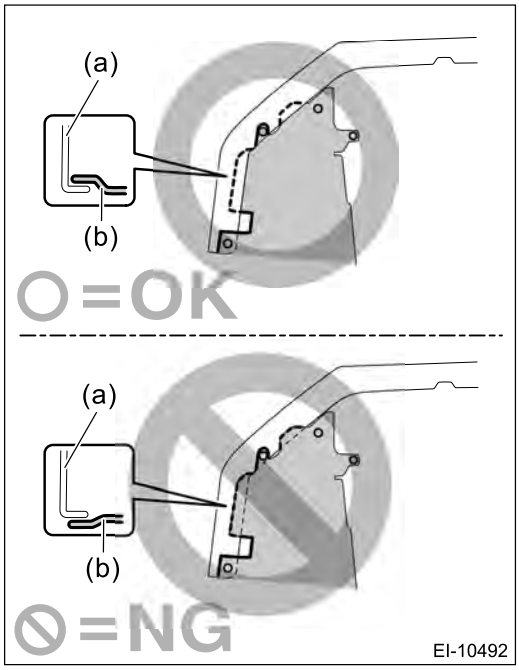


COMMUNICATION SYSTEM > Horn

INSTALLATION

Caution:

Install the mud guard - front so that the front end of the mud guard (b) (excluding the clip fixed portion) comes inside the bumper face (a).



1. Install the horn assembly.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Install the mud guard - front. (Horn assembly - Lo)
3. Install the under cover - front. (Horn assembly - Lo)

Tightening torque:

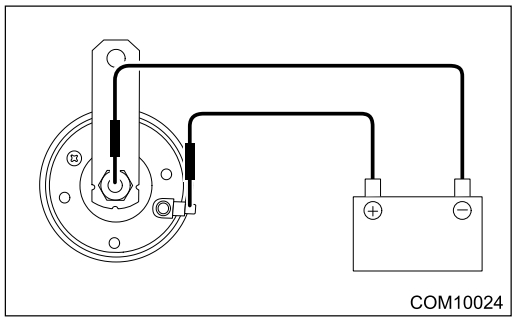
18 N·m (1.8 kgf-m, 13.3 ft-lb)

4. Lower the vehicle. (Horn assembly - Lo)
5. Install the cover UPR - front. (Horn assembly - Hi)
6. Install the duct - air intake. (Horn assembly - Hi)
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

COMMUNICATION SYSTEM > Horn

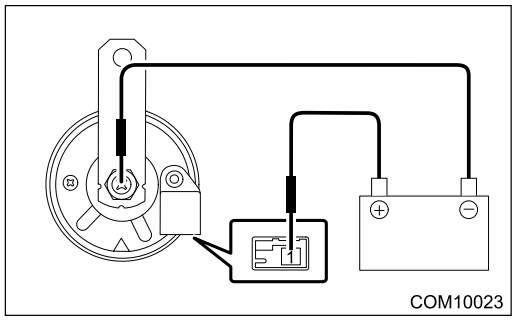
INSPECTION

1. Remove the horn assembly (Hi side & Lo side). Ref. to COMMUNICATION SYSTEM>Horn>REMOVAL.
2. Check the horn sounds when applying the battery voltage to the horn assembly.
   - Horn assembly - Hi side



Terminal No.	Inspection conditions	Specification
Connector terminal (+) — Horn case (−)	Connect battery to the terminals	Sounds

   - Horn assembly - Lo side



Terminal No.	Inspection conditions	Specification
1 (+) — Horn case (−)	Connect battery to the terminals	Sounds

3. If it does not operate normally, replace the horn assembly.

NOTE

Horn switch is a unit with the driver's airbag module. For operation procedures, refer to "Driver's Airbag Module" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>Driver's Airbag Module.

INSPECTION

1. CHECK HORN SWITCH

Caution:

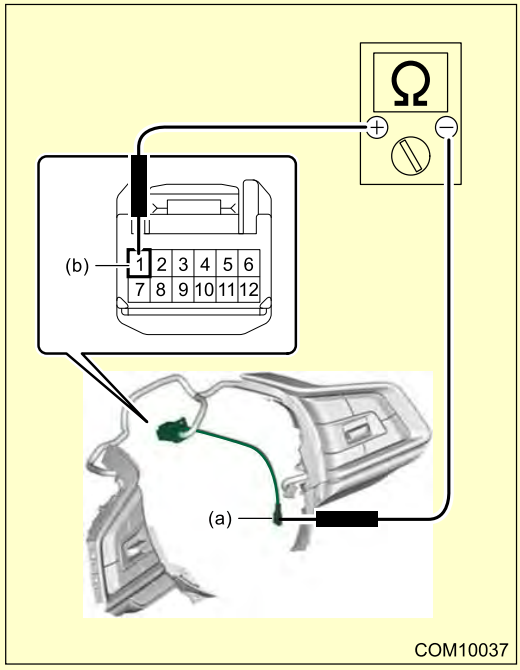
Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. CHECK HORN SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Check that the connection of the horn switch harness connector is correct.
5. Measure the resistance between connectors.

Preparation tool:

Circuit tester



(a) Ground terminal (b) Horn switch terminal

Terminal No.	Standard
Horn switch terminal — ground terminal	Less than 1 Ω

Is the measured value within the standard value?

Yes — Check the driver's airbag module.

No — It is possible that there is an open circuit in horn harness (horn switch terminal — ground terminal). Replace the satellite switch assembly.

2. CHECK STEERING ROLL CONNECTOR

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, be sure to perform the following operations.**
  – Align the center position of the steering roll connector.
  – Perform the neutral position setting of the steering angle sensor.

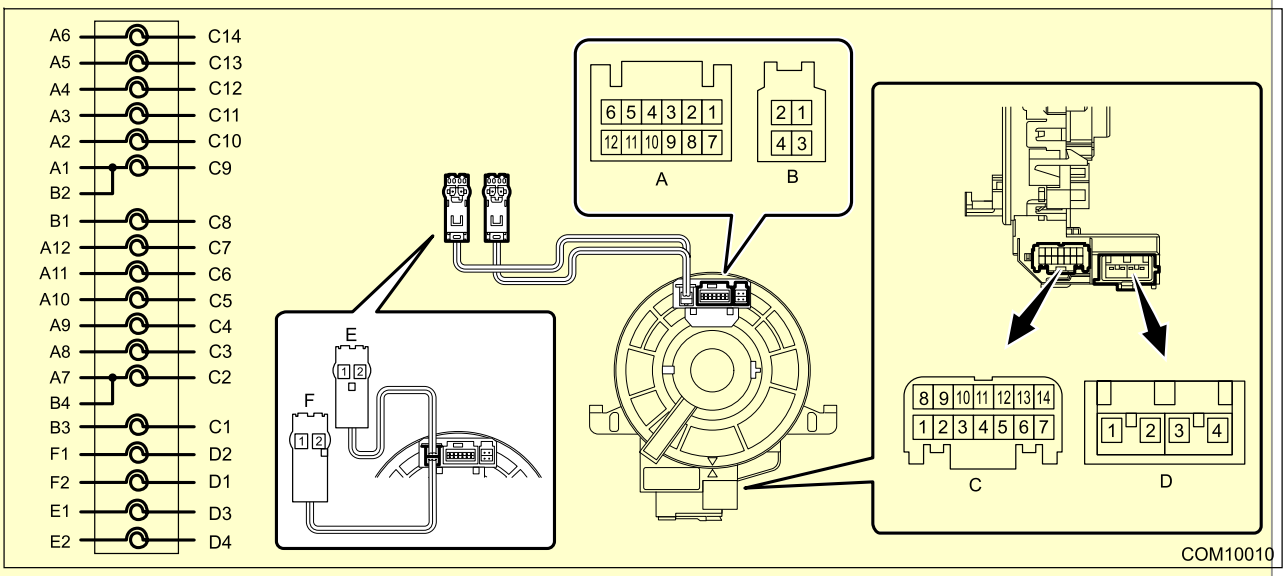
1. CHECK STEERING ROLL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.
   Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>REMOVAL.
4. Measure the resistance between connectors.

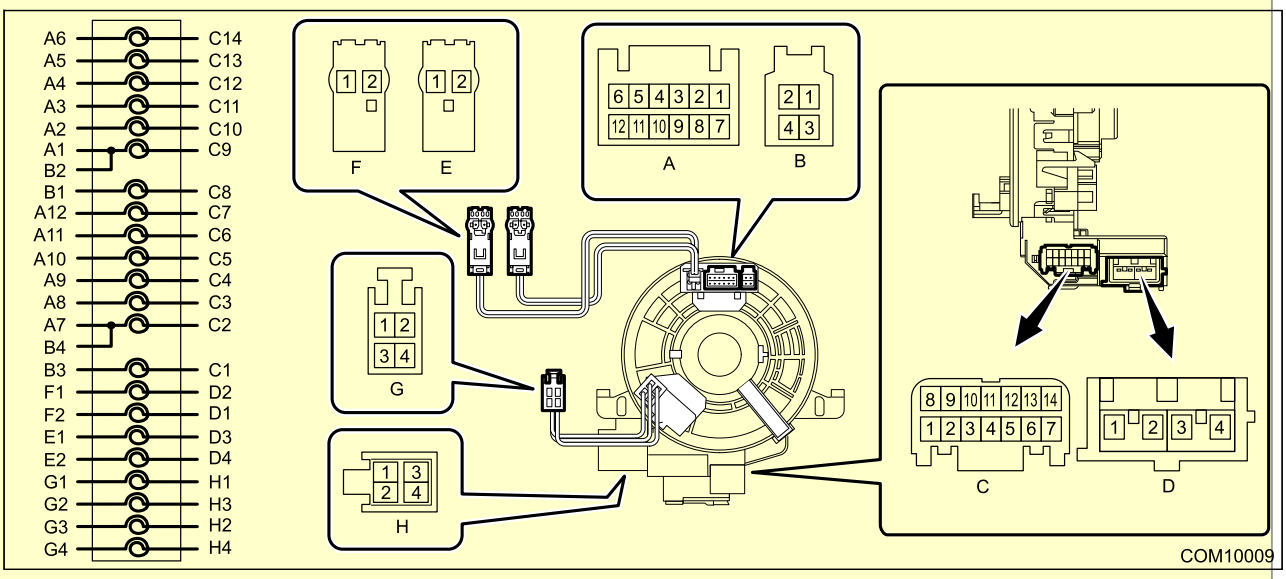
   Preparation tool:

   Circuit tester

   - Without steering heater



   - With steering heater



Terminal No.	Inspection conditions	Standard
A1 — C9	Always	Less than 1 Ω

Is the measured value within the standard value?

Yes — The steering roll connector is normal.

Replace the steering roll connector.

No

CRUISE CONTROL SYSTEM

CC

1. General Description
2. Relay and Fuse
3. Cruise Control System
4. Control Unit
5. Cruise Control Command Switch
6. Combination Meter
7. Stop Light & Brake Switch
8. Clutch Switch
9. Inhibitor Switch
10. Neutral Position Switch
11. Diagnostics with Phenomenon

CRUISE CONTROL SYSTEM > General Description

LOCATION

For location, refer to “LOCATION” of “CRUISE CONTROL SYSTEM (DIAGNOSTICS)” section. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Electrical Component Location>LOCATION.

CRUISE CONTROL SYSTEM > General Description

CAUTION

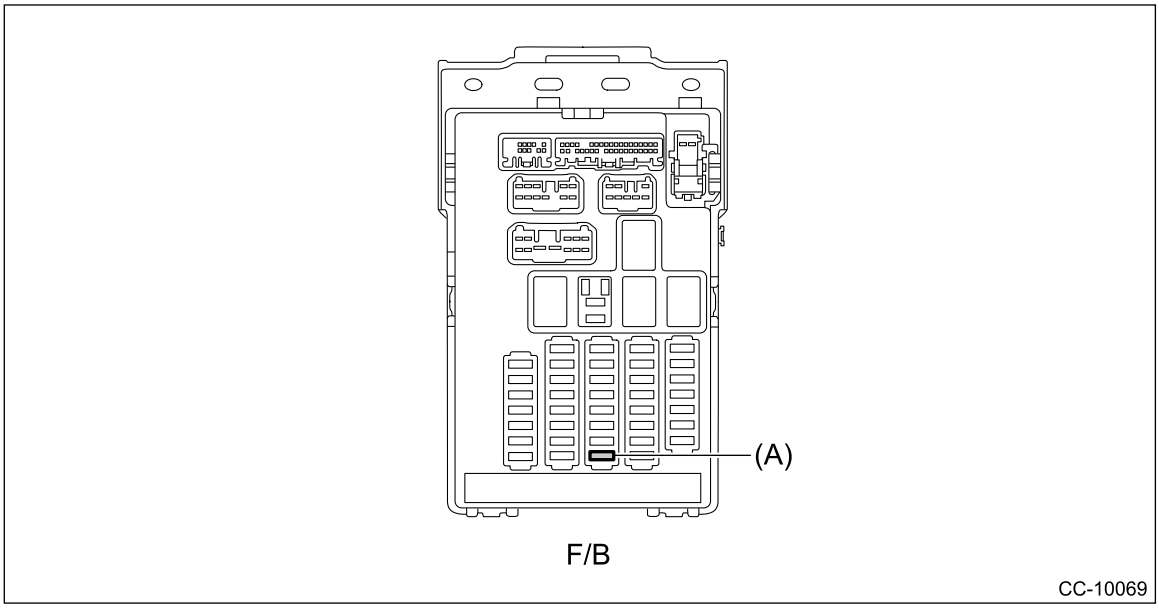
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the parts provided with memory functions such as audio, MFD, record the memory contents before disconnecting the battery ground cable.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of “AIRBAG SYSTEM”. Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform “VSC(VDC) Centering Mode” of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

CRUISE CONTROL SYSTEM > General Description

PREPARATION TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

LOCATION



Relay & fuse box (F/B)	Fuse 7.5 A (stop light and brake switch)	(A)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

   Note:

   If the fuse is blown again, check the system wiring harness.

CRUISE CONTROL SYSTEM > Cruise Control System

WIRING DIAGRAM

Refer to “Cruise Control System” in the wiring diagram. Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.

CRUISE CONTROL SYSTEM > Cruise Control System

ELECTRICAL SPECIFICATION

For electrical specification, refer to “Control Module I/O Signal” of “ENGINE (DIAGNOSTICS)” section.
Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal.

CRUISE CONTROL SYSTEM > Cruise Control System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “CRUISE CONTROL SYSTEM (DIAGNOSTICS)”.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

CRUISE CONTROL SYSTEM > Cruise Control System

NOTE

For operation procedures of each component of the cruise control system, refer to the respective section.

- Control module: Ref. to CRUISE CONTROL SYSTEM>Control Unit.
  Note:
  System control of the cruise control is performed by each module. For procedure, refer to the following sections.
  - Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
  - Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
- Cruise control command switch: Ref. to EyeSight>Switches and Harness.
- Combination meter: Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
- Stop light and brake switch: Ref. to BRAKE>Stop Light Switch.
- Clutch switch: Ref. to CLUTCH SYSTEM>Clutch Switch.
- Inhibitor switch: Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.
- Neutral position switch: Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness.

NOTE

System control of the cruise control is performed by each module. For procedure, refer to the following sections.

- Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
- Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

CRUISE CONTROL SYSTEM > Cruise Control Command Switch

NOTE

For the operation procedures for cruise control command switch assembly, refer to “EyeSight” section.
Ref. to EyeSight>Switches and Harness.

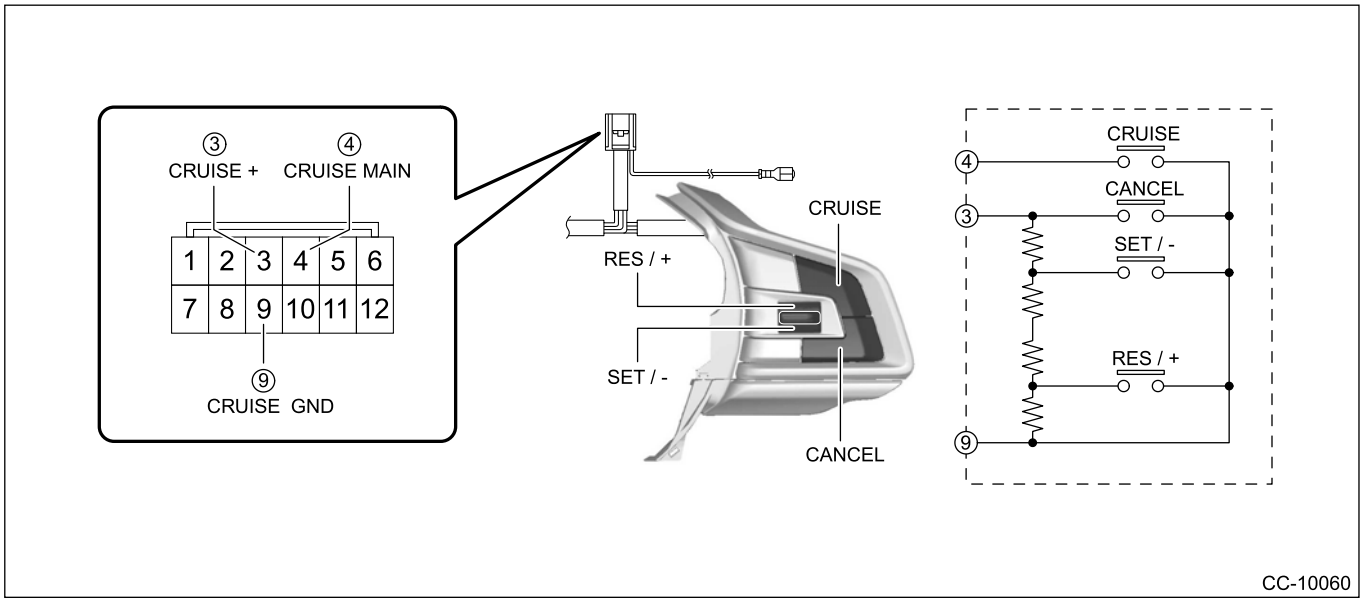
CRUISE CONTROL SYSTEM > Cruise Control Command Switch

INSPECTION

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions		Standard
3 — 9	CANCEL SET/− RES/+	All OFF	Approx. 4,020Ω
	CANCEL	ON	Less than 1 Ω
	SET/−	ON	Approx. 250 Ω
	RES/+	ON	Approx. 1,470Ω
4 — 9	CRUISE (MAIN)	OFF	3 MΩ or more
		ON	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
10 (+) — 11 (−)	Apply battery voltage.	Light ON

3. Replace the cruise control command switch assembly if it is found defective.

NOTE

For the operation procedures for combination meter, refer to “INSTRUMENTATION/DRIVER INFO” section. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

NOTE

For the operation procedures for stop light and brake switch, refer to “BRAKE” section. Ref. to BRAKE>Stop Light Switch.

NOTE

For the operation procedures for clutch switch, refer to “CLUTCH SYSTEM” section. Ref. to CLUTCH SYSTEM>Clutch Switch.

NOTE

For the operation procedures for inhibitor switch, refer to “CONTINUOUSLY VARIABLE TRANSMISSION” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

NOTE

For the operation procedures for neutral position switch, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness.

INSPECTION

For diagnostics with phenomenon, refer to “Diagnostics with Phenomenon” of “CRUISE CONTROL SYSTEM (DIAGNOSTICS)” section. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon.

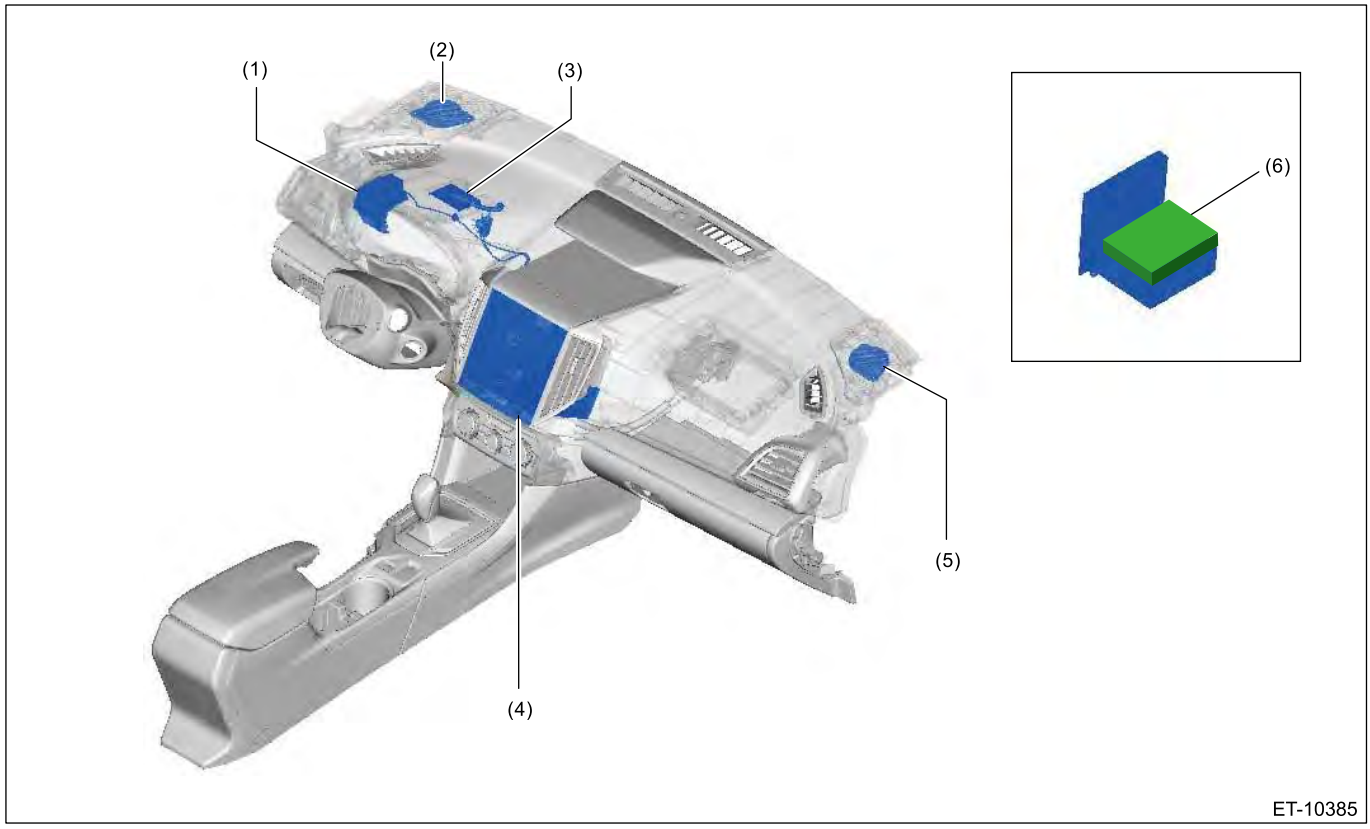
ENTERTAINMENT & MONITORING

ETM

1. General Description
2. Relay and Fuse
3. Audio System
4. Navigation System
5. Telematics System
6. Audio
7. Front Speaker
8. Rear Speaker
9. Power Amplifier
10. Antenna
11. Switches and Harness
12. Microphone
13. Navigation Body
14. Data Communication Module
15. Rearview Camera System
16. Accessory Power Supply Socket
17. External Connection Terminal
18. Diagnostics with Phenomenon
19. Service Diagnostics Mode

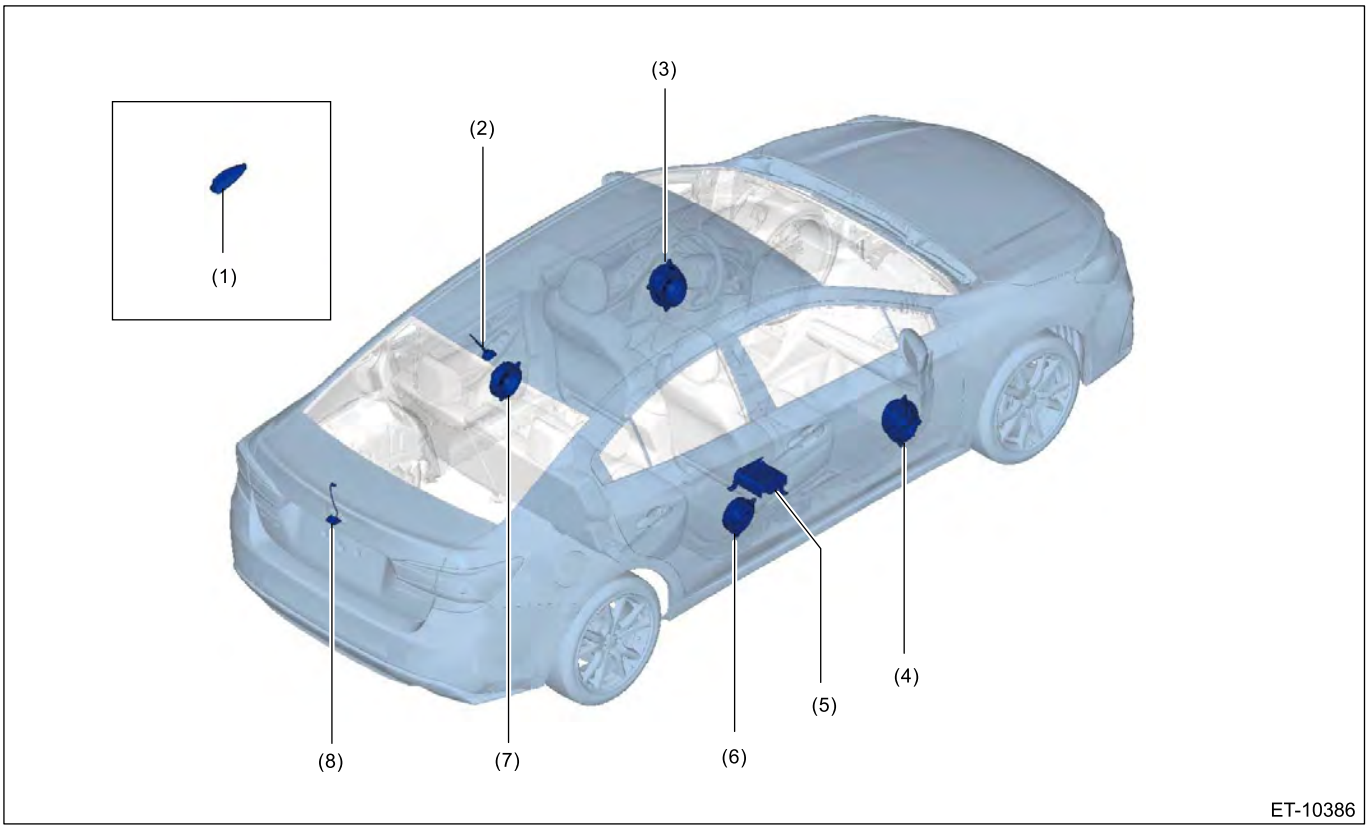
LOCATION

1. AUDIO AND NAVIGATION SYSTEM



(1) Telematics sub antenna∗1
(2) Speaker ASSY - tweeter LH
(3) GPS antenna ASSY
(4) Audio ASSY or navigation ASSY
(5) Speaker ASSY - tweeter RH
(6) Data communication module∗1

∗1: Model with telematics



(1) Telematics antenna∗1
(2) Antenna ASSY - roof
(3) Speaker ASSY - front LH
(4) Speaker ASSY - front RH
(5) Power amplifier ASSY
(6) Speaker ASSY - rear RH
(7) Speaker ASSY - rear LH
(8) Rearview camera ASSY

∗1: Model with telematics

Note:

For the 5 door model, the component is installed at the same location as the 4 door model.

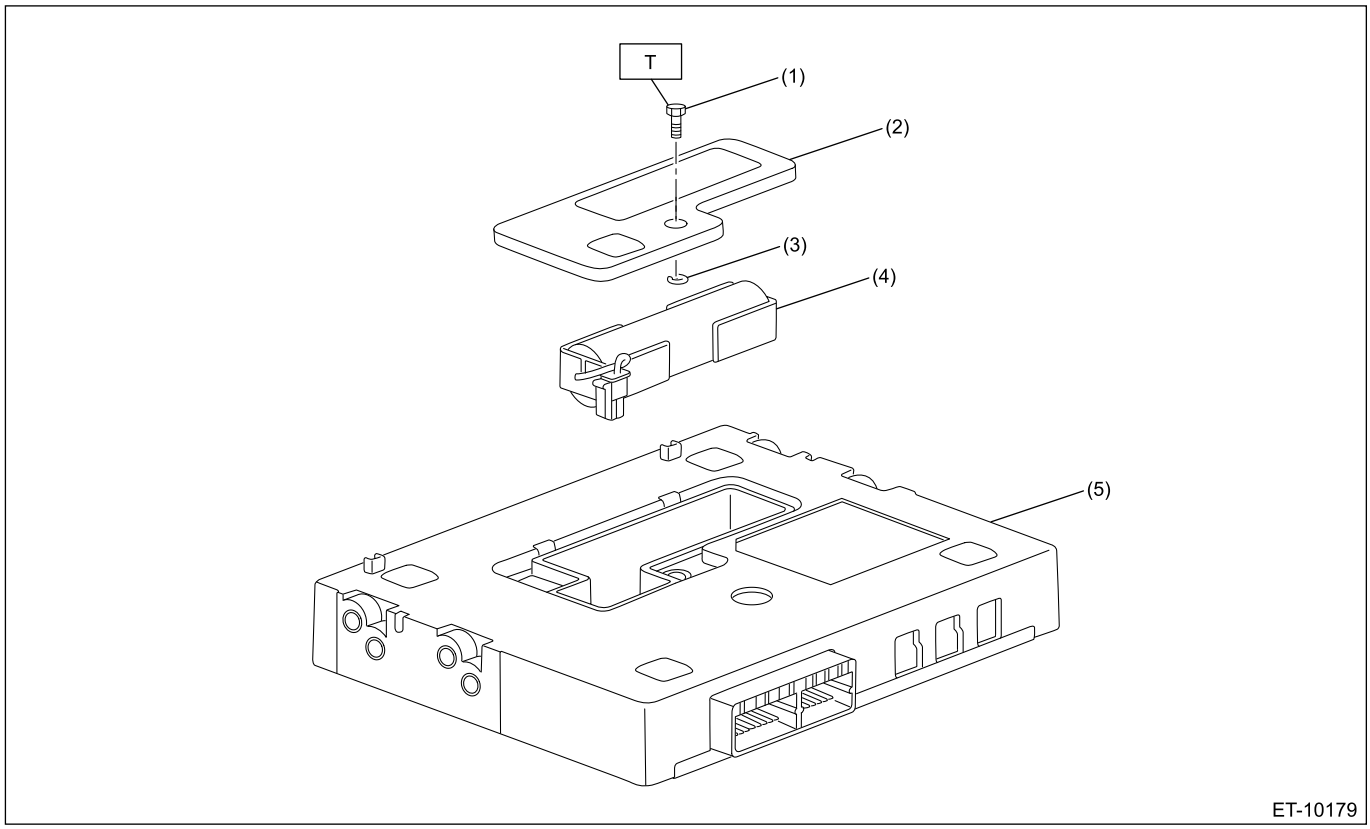
2. TELEMATICS SYSTEM

For locations, refer to “LOCATION” of “TELEMATICS SYSTEM (DIAGNOSTICS)” section. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Electrical Component Location>LOCATION.

ENTERTAINMENT & MONITORING > General Description

COMPONENT

1. DATA COMMUNICATION MODULE



(1)	Cap screw	(4)	Backup battery	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Battery cover	(5)	Data communication module body	***T: 0.3 (0.03, 0.2)***
(3)	Circlip			

ENTERTAINMENT & MONITORING > General Description

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the audio and MFD parts provided with memory functions, record the memory contents before disconnecting the battery ground cable.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

ENTERTAINMENT & MONITORING > General Description

PREPARATION TOOL

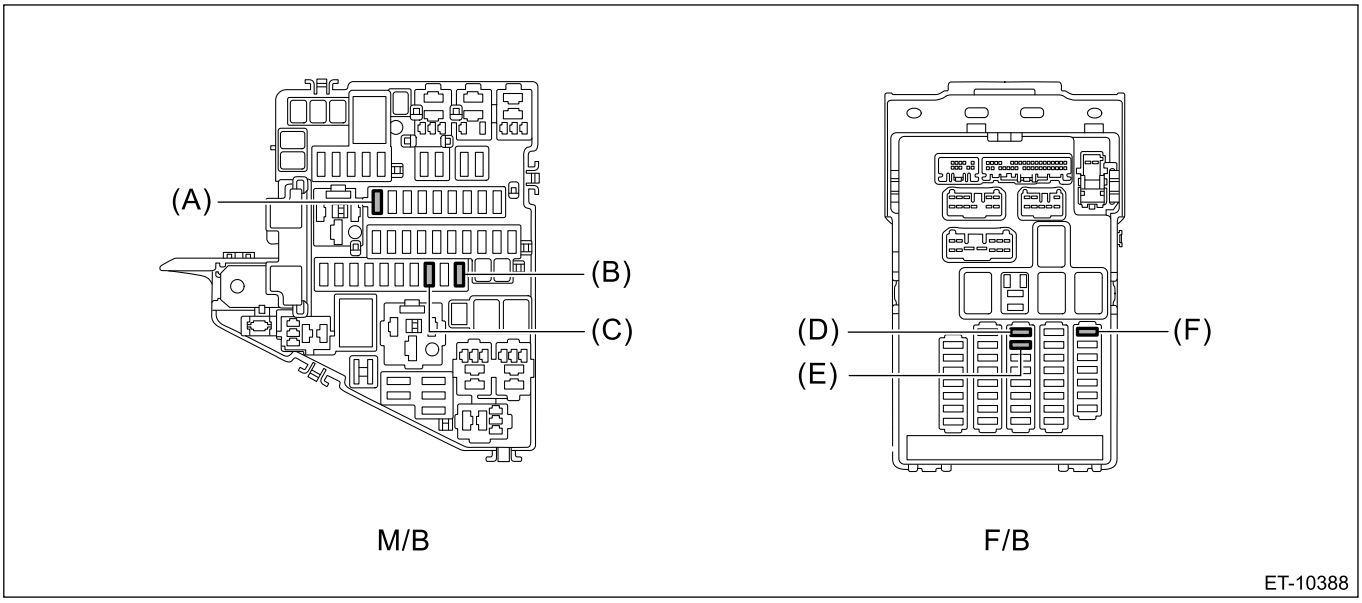
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

DESCRIPTION	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.

LOCATION



Main fuse box (M/B)	Fuse 10 A (data communication module*1)	(A)
	Fuse 30 A (audio)	(B)
	Fuse 20 A (power amplifier)	(C)
Relay & fuse box (F/B)	Fuse 20 A (front accessory power supply socket)	(D)
	Fuse 15 A (rear accessory power supply socket)	(E)
	Fuse 15 A (audio, external connection terminal, data communication module*1)	(F)

*1: Model with telematics

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

   Note:

   If the fuse is blown again, check the system wiring harness.

WIRING DIAGRAM

1. AUDIO

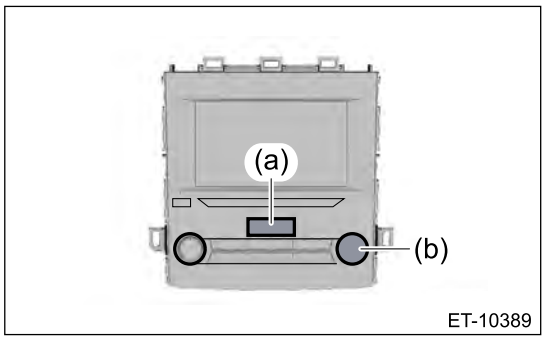
Refer to “Audio System” in the wiring diagram.

- Model without amplifier and without telematics: Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM > WITHOUT AUDIO AMPLIFIER & WITHOUT TELEMATICS.
- Model without amplifier and with telematics: Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM > WITHOUT AUDIO AMPLIFIER & WITH TELEMATICS.
- Model with amplifier and without telematics: Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM > WITH AUDIO AMPLIFIER & WITHOUT TELEMATICS.
- Model with amplifier and telematics: Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM > WITH AUDIO AMPLIFIER & WITH TELEMATICS.

OPERATION

1. CHECK CONNECTIONS WITH LINE DIAG MODE

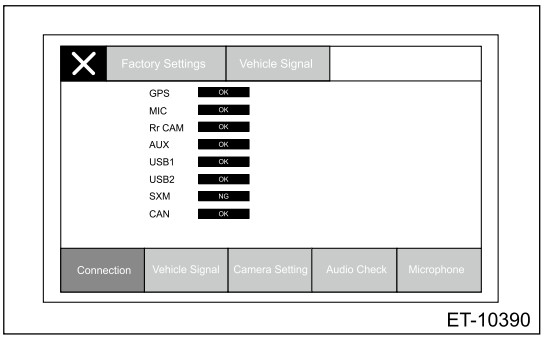
1. Turn the ignition switch to ACC.
2. Press the button (b) twice with the button (a) pressed.



Note:

Pressing the button (a) for 3 seconds or more, or turning the ignition switch from the OFF to ACC position can exit the diagnostic mode.

3. {Line Diag} screen is displayed.
4. Check the connection status with the {Connection} in the {Line Diag} screen.

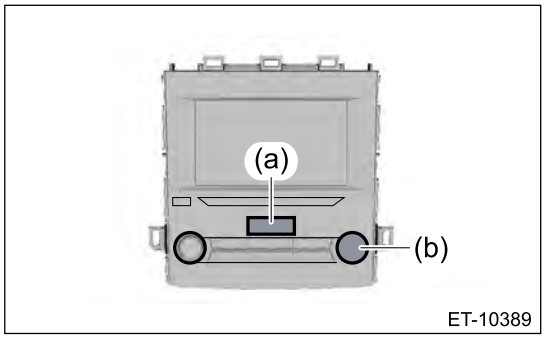


Item	Content	Inspection
GPS	GPS antenna connection	Check that the display shows OK. (Models with GPS antenna only)

Item	Content	Inspection
MIC	MIC connection	Check whether the map light illuminates. Check that the display shows OK.
Rr CAM	Rr CAM Video signal	Check that the display shows OK.
AUX	AUX connection	Connect the pin jack for check into the AUX terminal, and check that the display shows OK.
USB1	USB connection	Connect the memory for check into the USB terminal, and check that the display shows OK.
USB2		
SXM	SXM connection	Check that the display shows OK. (Models with SXM only)
CAN	CAN connection	Check that the display shows OK.

2. CHECK VEHICLE SIGNALS WITH LINE DIAG MODE

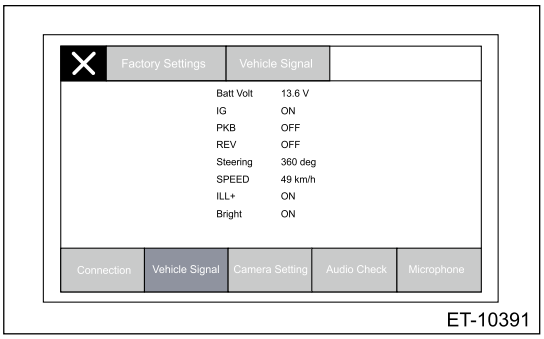
1. Turn the ignition switch to ACC.
2. Press the button (b) twice with the button (a) pressed.



Note:

Pressing the button (a) for 3 seconds or more, or turning the ignition switch from the OFF to ACC position can exit the diagnostic mode.

3. {Line Diag} screen is displayed.
4. Check the signal status with the {Vehicle Signal} in the {Line Diag} screen.

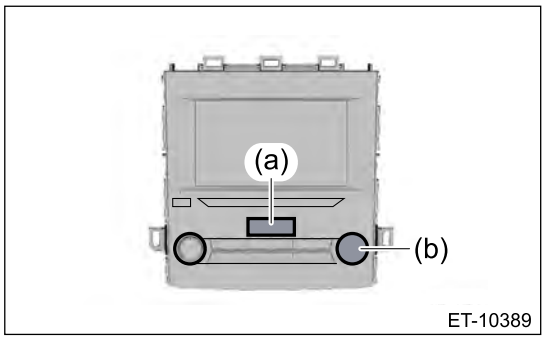


Item	Content	Inspection
ILL+	Illumination signal	Turn the lighting switch to ON, and check that the display shows OK.
SPEED	Speed pulse signal	Input the vehicle speed of 9 km/h or more, and check that the display shows OK.
PKB	Parking brake signal	Pull the parking brake, and check that the display shows OK.

Item	Content	Inspection
REV	Reverse signal	Place the select lever or gear shift lever in reverse, and check that the display shows OK.
IG	IGN signal	Check that the display shows ON.
Batt Volt	Battery voltage	Check that the battery voltage is displayed.
Steering	Steering angle	Check that the steering operation is reflected on the display.
Bright	Bright signal	Check that the display shows OK.

3. CHECK SPEAKER OUTPUT WITH LINE DIAG MODE AND ANTENNA CONNECTION

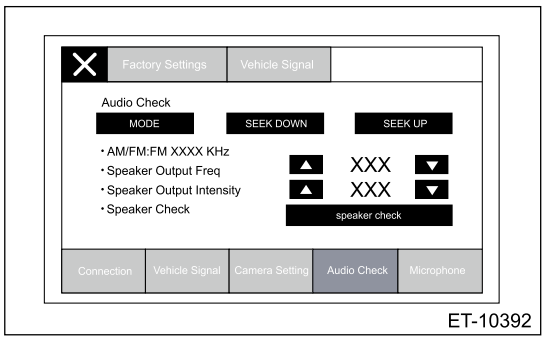
1. Turn the ignition switch to ACC.
2. Press the button (b) twice with the button (a) pressed.



Note:

Pressing the button (a) for 3 seconds or more, or turning the ignition switch from the OFF to ACC position can exit the diagnostic mode.

3. {Line Diag} screen is displayed.
4. Perform the speaker output check and antenna connection check with the {Audio Check} in the {Line Diag} screen.



Item	Content	Inspection
MODE	Radio band switching	Check that the radio band (AM/DM) can be switched.
SEEK UP/DOWN	SEEK UP/DOWN operation	Check that SEEK UP/DOWN adjusted can be performed.
Speaker Check	Speaker check operation	• 4 speakers: Front left → rear left → rear right → front right speakers will sound in this order for 0.5 seconds each. • 6 speakers: Tweeter left → front left → rear left → rear right → front right → tweeter right speakers will sound in this order for 0.5 seconds each.

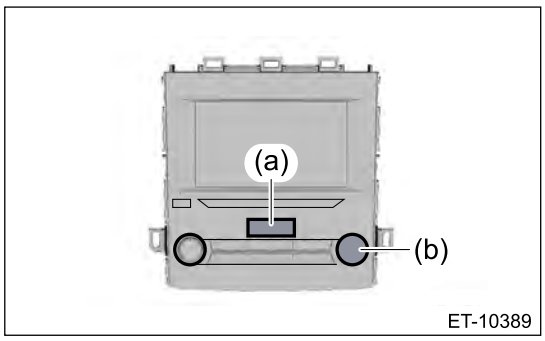
Note:

The sound volume during the speaker check is different depending on the speakers.

- **Standard speaker: Sounds at the maximum volume.**
- **Brand speaker: Sounds at 30 steps.**

4. CHECK MICROPHONE WITH LINE DIAG MODE

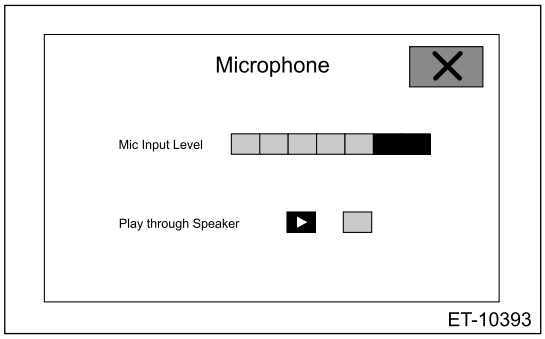
1. Turn the ignition switch to ACC.
2. Press the button (b) twice with the button (a) pressed.



Note:

Pressing the button (a) for 3 seconds or more, or turning the ignition switch from the OFF to ACC position can exit the diagnostic mode.

3. {Line Diag} screen is displayed.
4. Check the microphone level with the {Microphone} in the {Line Diag} screen.



Check that the microphone input level varies depending on the sound and voice.

ENTERTAINMENT & MONITORING > Audio System

INSPECTION

1. BASIC INSPECTION

For basic inspection, refer to “Basic Diagnostic Procedure” in “INFOTAINMENT SYSTEM (DIAGNOSTICS)”. Ref. to INFOTAINMENT(DIAGNOSTICS) >Basic Diagnostic Procedure.

2. SYSTEM BLOCK DIAGRAM

For system block diagram, refer to “System Block Diagram” in “INFOTAINMENT SYSTEM (DIAGNOSTICS)”. Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>SYSTEM BLOCK DIAGRAM.

3. MODULE I/O SIGNAL

For the specification (electrical component), refer to “Control Module I/O Signal” of “INFOTAINMENT SYSTEM (DIAGNOSTICS)”. Ref. to INFOTAINMENT(DIAGNOSTICS) >Control Module I/O

Signal>ELECTRICAL SPECIFICATION.

ENTERTAINMENT & MONITORING > Audio System

NOTE

For procedure of each component in the audio system, refer to the respective sections.

- Audio unit: Ref. to ENTERTAINMENT & MONITORING>Audio.
- Power amplifier: Ref. to ENTERTAINMENT & MONITORING>Power Amplifier.
- Front speaker
  - Tweeter (instrument panel): Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > TWEETER.
  - Door speaker: Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > DOOR SPEAKER.
- Rear speaker: Ref. to ENTERTAINMENT & MONITORING>Rear Speaker.
- Antenna: Ref. to ENTERTAINMENT & MONITORING>Antenna.
- Switches and harness: Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.
- External connection terminal: Ref. to ENTERTAINMENT & MONITORING>External Connection Terminal.
- Rearview camera: Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System.

ENTERTAINMENT & MONITORING > Navigation System

WIRING DIAGRAM

Refer to “Navigation System” in the wiring diagram.

- Model without telematics: Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM > WITHOUT TELEMATICS.
- Model with telematics: Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM > WITH TELEMATICS.

ENTERTAINMENT & MONITORING > Navigation System

OPERATION

For operation, refer to “Audio System”. Ref. to ENTERTAINMENT & MONITORING>Audio System>OPERATION.

ENTERTAINMENT & MONITORING > Navigation System

INSPECTION

For inspection, refer to “Audio System”. Ref. to ENTERTAINMENT & MONITORING>Audio System>INSPECTION.

ENTERTAINMENT & MONITORING > Navigation System

NOTE

For procedure of each component in the navigation system, refer to the respective section.

- Navigation unit: Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
- GPS antenna: Ref. to ENTERTAINMENT & MONITORING>Antenna.

ENTERTAINMENT & MONITORING > Telematics System

WIRING DIAGRAM

Refer to “Telematics System” in the wiring diagram.

- WITHOUT AUDIO AMPLIFIER: Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM > WITHOUT AUDIO AMPLIFIER.
- WITH AUDIO AMPLIFIER WITHOUT NAVIGATION SYSTEM: Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM > WITH AUDIO AMPLIFIER WITHOUT NAVIGATION SYSTEM.
- WITH AUDIO AMPLIFIER WITH NAVIGATION SYSTEM: Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM > WITH AUDIO AMPLIFIRE WITH NAVIGATION SYSTEM.

ENTERTAINMENT & MONITORING > Telematics System

OPERATION

1. REGISTRATION (COMM CHECK)

Caution:

Do not press and hold the i-button for more than two seconds during communication check, or settings will return to factory mode in poor radio wave environment. If the settings has returned to factory mode, perform the communication check again. To check the mode status, see “Subscription Status” in the current data display on Subaru Select Monitor.

1. Replace the data communication module with a new part.
2. Check that the LED of overhead console or stereo camera cover assembly illuminates in green.
3. Press and hold the i-button for 2 seconds or more.

Note:

When the subscription is completed, the telematics system will automatically activate.

ENTERTAINMENT & MONITORING > Telematics System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” in “TELEMATICS SYSTEM (DIAGNOSTICS)”. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

ENTERTAINMENT & MONITORING > Telematics System

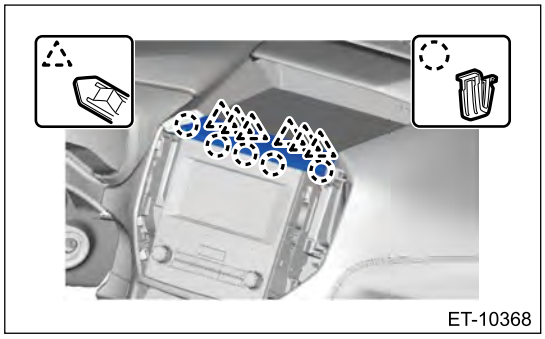
NOTE

For procedure of each component in the telematics system, refer to the respective section.

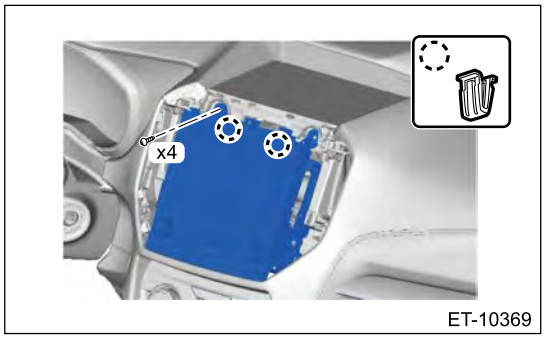
- Data communication module: Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
- Antenna: Ref. to ENTERTAINMENT & MONITORING>Antenna.
- Switches and harness: Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

REMOVAL

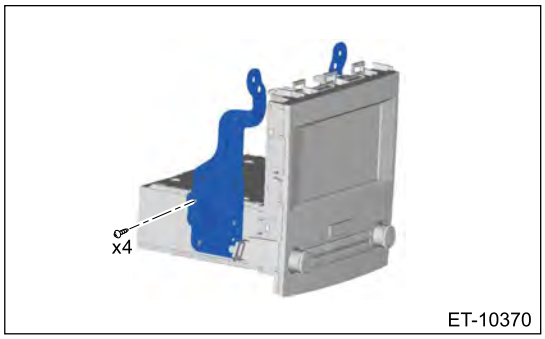
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the panel - center UPR.
   (1) Release the clips and claws, then detach the panel - center UPR.



4. Remove the audio assembly.
   (1) Remove the screws.
   (2) Release the clips and disconnect the connector, and then remove the audio assembly.



5. Remove the audio bracket.
   (1) Remove the screws, and then remove the audio bracket.



Note:

- **Remove the screws on RH side in the same procedure as on the LH side.**
- **For models with telematics, the data communication module is attached on the upper side of the audio assembly.**

INSTALLATION

Caution:

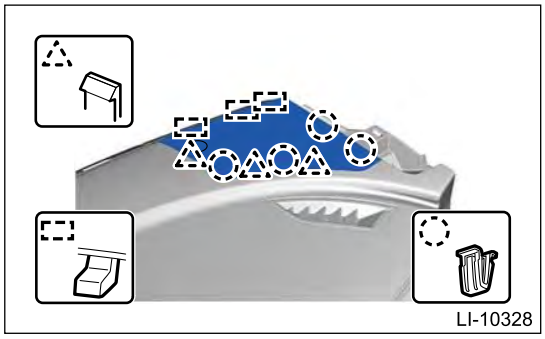
Do not allow harness and cables to interfere with or get caught by other parts.

1. Install the audio bracket.
2. Install the audio assembly.
3. Install the panel - center UPR.
4. Install the grille assembly - CTR ventilation.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

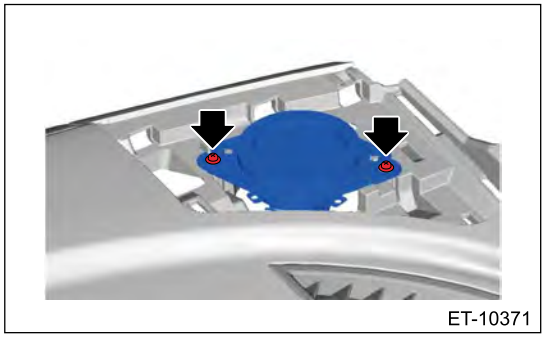
1. TWEETER

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
3. Remove the grille speaker side.
   (1) Release the clips, hooks and claws, then detach the grille speaker side.



Note:
For the grille speaker side RH, disconnect the light control sensor connector.

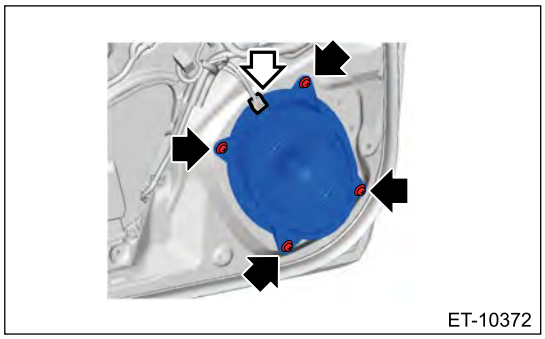
4. Remove the speaker assembly - tweeter.
   (1) Remove the screws.
   Preparation tool:
   Stubby screwdriver



   (2) Disconnect the connector and remove the speaker assembly - tweeter.

2. DOOR SPEAKER

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the speaker assembly - front.
   (1) Disconnect the connector.
   (2) Remove the screws and remove the speaker assembly - front.



ENTERTAINMENT & MONITORING > Front Speaker

INSTALLATION

1. TWEETER

1. Install the speaker assembly - tweeter.
2. Install the grille speaker side.
3. Install the trim panel - front pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

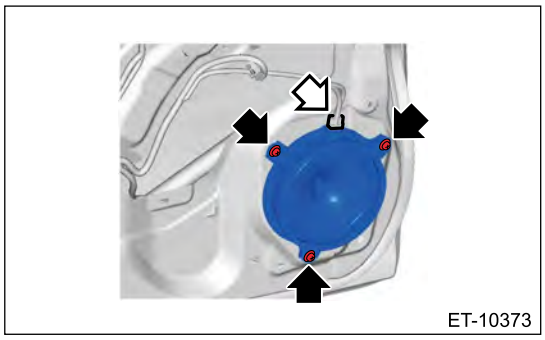
2. DOOR SPEAKER

1. Install the speaker assembly - front.
2. Install the trim panel - front door.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

ENTERTAINMENT & MONITORING > Rear Speaker

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the speaker assembly - rear.
   (1) Disconnect the connector.
   (2) Remove the screws and remove the speaker assembly - rear.



ENTERTAINMENT & MONITORING > Rear Speaker

INSTALLATION

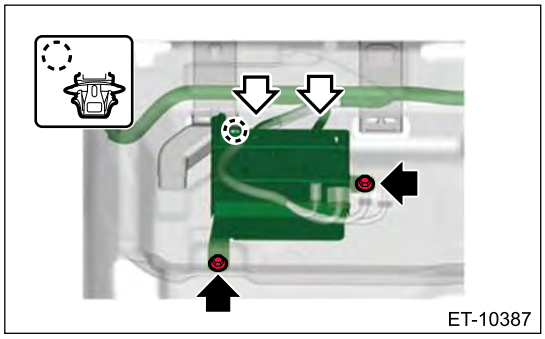
1. Install the speaker assembly - rear.
2. Install the trim panel - rear door.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

ENTERTAINMENT & MONITORING > Power Amplifier

REMOVAL

Note:
Remove the power amplifier assembly after sliding the passenger's seat back and forth as necessary.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the power amplifier assembly.
   (1) Remove the harness clip, and disconnect each connector.
   (2) Remove the nut and remove the power amplifier assembly.



ENTERTAINMENT & MONITORING > Power Amplifier

INSTALLATION

1. Install the power amplifier assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

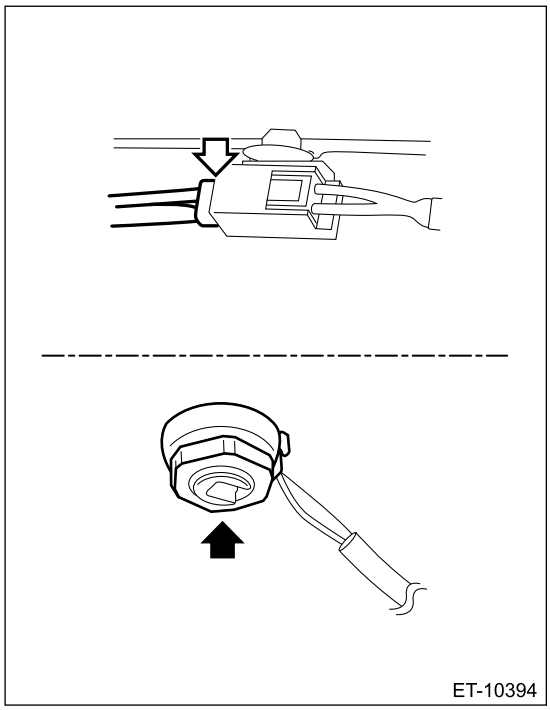
REMOVAL

1. ROOF ANTENNA/TELEMATICS ANTENNA

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lower the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL.

   Note:

   Procedures for the trim panel - roof assembly is performed inside the vehicle.
3. Remove the antenna assembly - radio or telematics.
   (1) Disconnect the connector.
   (2) Remove the nut, and remove the antenna assembly - radio or the telematics.



2. ANTENNA FEEDER CORD

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
5. Remove the panel center LWR LH. Ref. to EXTERIOR/INTERIOR TRIM>Center Console.
6. Remove the cover side sill - front LH and the cover side sill - front INN LH. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
7. Turn over the floor mat. Ref. to EXTERIOR/INTERIOR TRIM>Floor Mat>REMOVAL.
8. Lower the trim panel - roof assembly in the same manner as the removal procedure of the antenna assembly - radio or the telematics. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL.

9. Remove the cord assembly - antenna feeder.

3. TELEMATICS SUB ANTENNA

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
5. Remove the combination meter assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
6. Remove the GPS antenna assembly. Ref. to ENTERTAINMENT & MONITORING>Antenna>REMOVAL > GPS ANTENNA.

   Note:

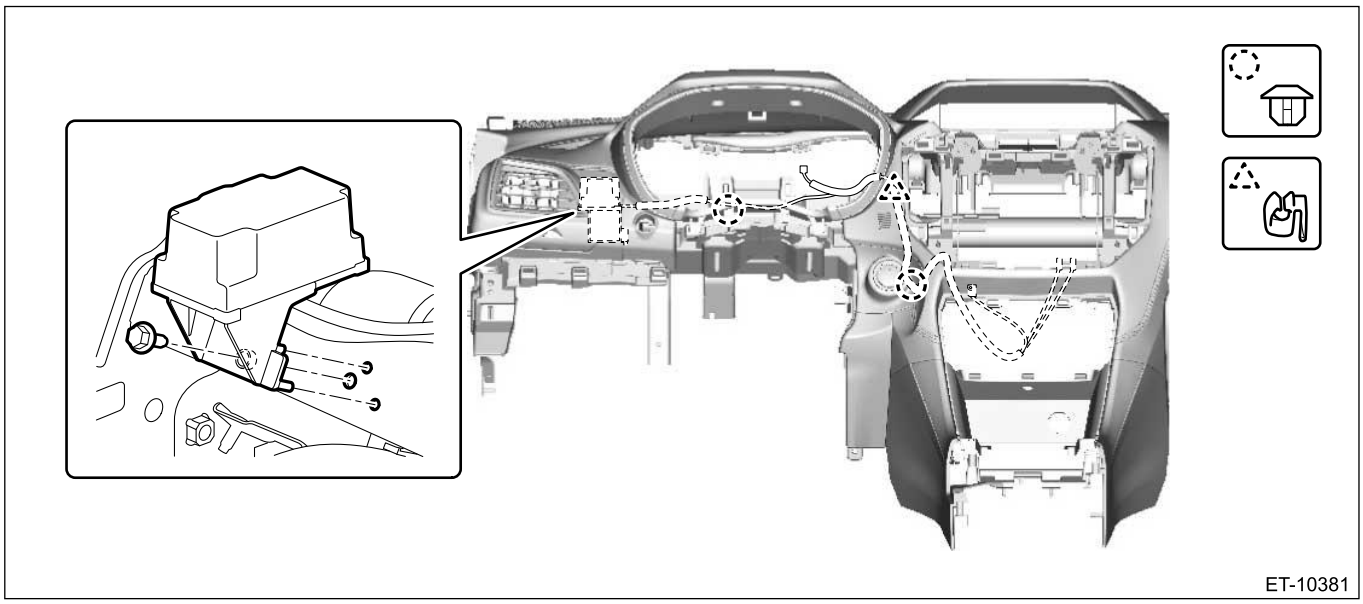
   Remove the antenna only. Do not pull the cord.
7. Remove the telematics sub antenna.

   (1) Attach a string to the telematics sub antenna connector and the GPS antenna assembly connector on the main body side.

   Note:

   - **A string makes operation easier during installation.**
   - **The telematics sub antenna is integrated into the GPS antenna assembly cord.**

   (2) Remove the bolts, cord clips and clamps, and pull out the telematics sub antenna from the combination meter side.



   (3) After the telematics sub antenna has been pulled out, remove the string attached to the connector in step (1).

   Note:

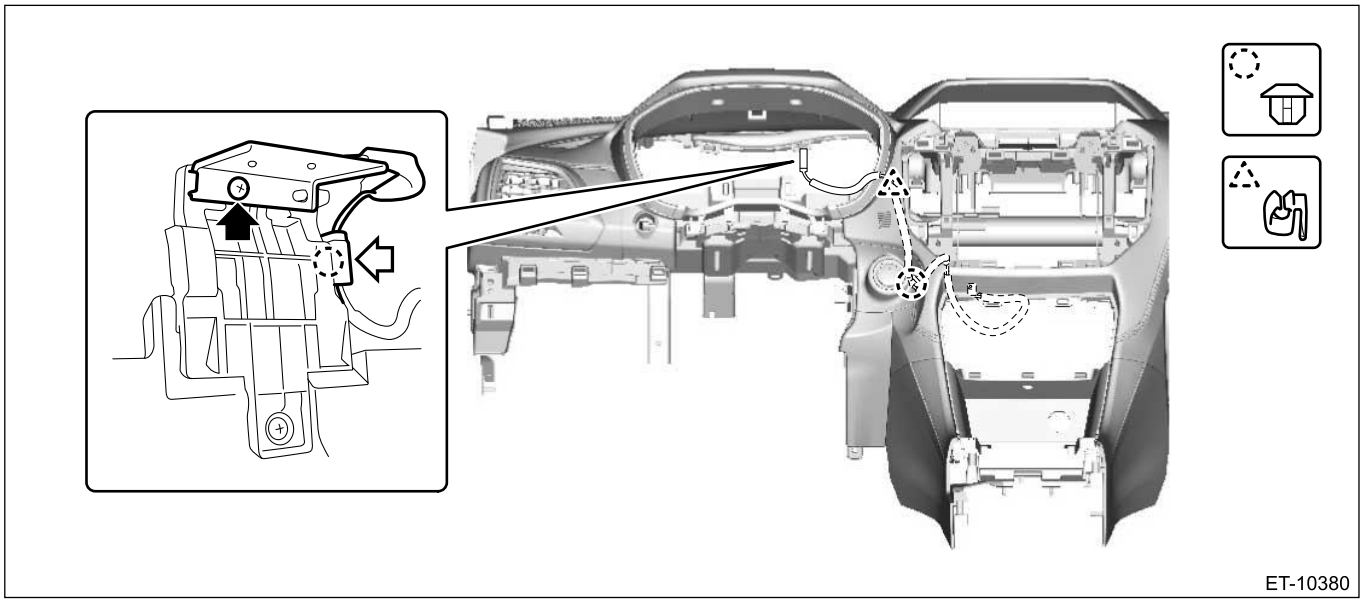
   Leave the attached string inside the instrument panel, and use it during installation.

4. GPS ANTENNA

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.

Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
5. Remove the combination meter assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
6. Remove the GPS antenna assembly.
   (1) Disconnect the connector.
   (2) Remove screws and remove the GPS antenna assembly.
   (3) Tie a string to the GPS antenna assembly connector on the main body side.
   Note:
   - **A string makes operation easier during installation.**
   - **For models with telematics, GPS antenna assembly cord cannot be removed as a single unit because it is integrated with the telematics sub antenna.**
   (4) Remove the cord clip and clamp, and pull out the GPS antenna assembly cord from the combination meter side.



   (5) When the GPS antenna assembly is pulled out, remove the string attached to the connector in step (3).
   Note:
   Leave the attached string inside the instrument panel, and use it during installation.

ENTERTAINMENT & MONITORING > Antenna

INSTALLATION

1. ROOF ANTENNA/TELEMATICS ANTENNA

1. Install the antenna assembly - radio or the telematics.
   Tightening torque:
   4.5 N·m (0.46 kgf-m, 3.3 ft-lb)
2. Install the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof

Trim>INSTALLATION.

3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. ANTENNA FEEDER CORD

1. Install the cord assembly - antenna feeder and the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
2. Install the floor mat. Ref. to EXTERIOR/INTERIOR TRIM>Floor Mat>INSTALLATION.
3. Install the cover side sill - front LH and the cover side sill - front INN LH.
4. Install the panel center LWR LH.
5. Install the cover assembly - instrument panel LWR driver.
6. Install the audio assembly or navigation assembly.
7. Install the grille assembly - CTR ventilation.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. TELEMATICS SUB ANTENNA

1. Install the telematics sub antenna.

   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

   Note:

   Install the telematics sub antenna by using the sting left inside the parts to pull the part into the instrument panel.
2. Install the GPS antenna assembly.
3. Install the combination meter assembly.
4. Install the cover assembly - instrument panel LWR driver.
5. Install the audio assembly or navigation assembly.
6. Install the grille assembly - CTR ventilation.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

4. GPS ANTENNA

1. Install the GPS antenna assembly and GPS antenna assembly cord.

Note:

Install the GPS antenna assembly cord by using the sting left inside the parts to pull the part into the instrument panel.

2. Install the combination meter assembly.
3. Install the cover assembly - instrument panel LWR driver.
4. Install the audio assembly or navigation assembly.
5. Install the grille assembly - CTR ventilation.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. SATELLITE SWITCH ASSEMBLY

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the tire to the straight-ahead position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the satellite switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

2. TELEMATICS BUTTON

The telematics button is a single unit with the spot map light or the stereo camera cover assembly. For operation procedures, refer to "LIGHTING SYSTEM" section. Ref. to LIGHTING SYSTEM>Spot Map Light.

INSTALLATION

1. SATELLITE SWITCH ASSEMBLY

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Securely install the switch. Improper insertion of the pin or claw of the switch may cause improper installation.**

1. Install the satellite switch assembly. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.
2. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
3. Install the steering wheel.
   Tightening torque:

39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. TELEMATICS BUTTON

The telematics button is a single unit with the spot map light or the stereo camera cover assembly. For operation procedures, refer to "LIGHTING SYSTEM" section. Ref. to LIGHTING SYSTEM>Spot Map Light.

ENTERTAINMENT & MONITORING > Switches and Harness

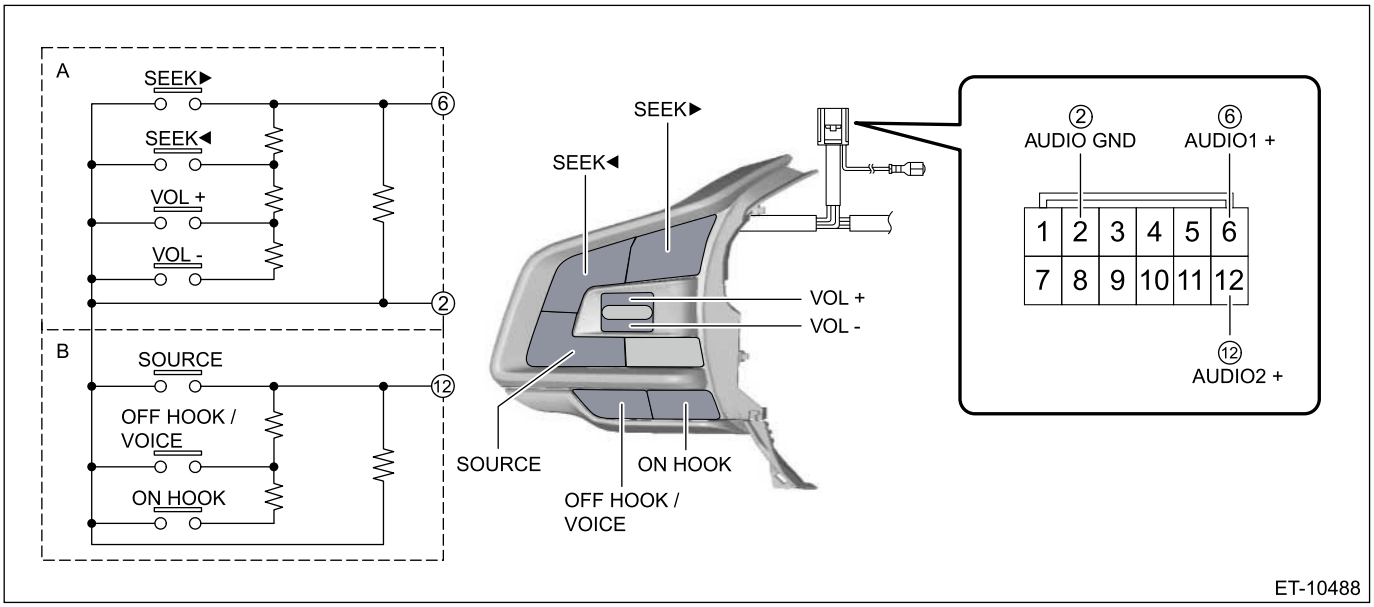
INSPECTION

1. SATELLITE SWITCH ASSEMBLY

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions		Standard
6 — 2	SEEK (›) SEEK (‹) VOL (+) VOL (−)	A circuit is all OFF.	Approx. 100 kΩ
	SEEK (›)	ON	Less than 1 Ω
	SEEK (‹)	ON	Approx. 330 Ω
	VOL (+)	ON	Approx. 1,000Ω
	VOL (−)	ON	Approx. 3,110Ω
12 — 2	SOURCE OFF HOOK/VOICE ON HOOK	B circuit is all OFF.	Approx. 100 kΩ
	SOURCE	ON	Less than 1 Ω

Terminal No.	Inspection conditions		Standard
	OFF HOOK/VOICE	ON	Approx. 330 Ω
	OFF HOOK	ON	Approx. 1,000Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
10 (+) — 11 (−)	Apply battery voltage.	Light ON

3. If it is found to be defective as a result of the measurement, replace the satellite switch assembly.

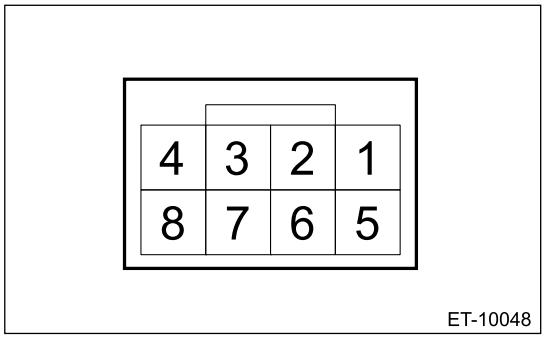
2. TELEMATICS BUTTON

1. Check the button.

(1)Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



- SOS button

Terminal No.	Inspection conditions	Standard
6 — 1	OFF	Approx. 1.6 kΩ
	ON	Less than 1 Ω

- i-button

Terminal No.	Inspection conditions	Standard
3 — 1	OFF	Approx. 1.6 kΩ
	ON	Less than 1 Ω

(2)Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
8 (+) — 2 (−)	Apply battery voltage.	Light ON

2. Check the indicator.

(1)Apply battery voltage between the connector terminals to check the lighting condition of the indicator.

Terminal No.	Indicator	Specification
4 (+) — 1 (−)	Apply battery voltage.	Illuminating in green
7 (+) — 1 (−)		Illuminating in red

3. If it is found to be defective as a result of the inspection, replace the spot map light or stereo

camera cover assembly.

NOTE

The microphone is integrated in the spot map light or stereo camera cover assembly.
For operation procedures, refer to “LIGHTING SYSTEM” section. Ref. to LIGHTING SYSTEM>Spot Map Light.

NOTE

For the operation procedures for navigation assembly, refer to “Audio” section. Ref. to ENTERTAINMENT & MONITORING>Audio.

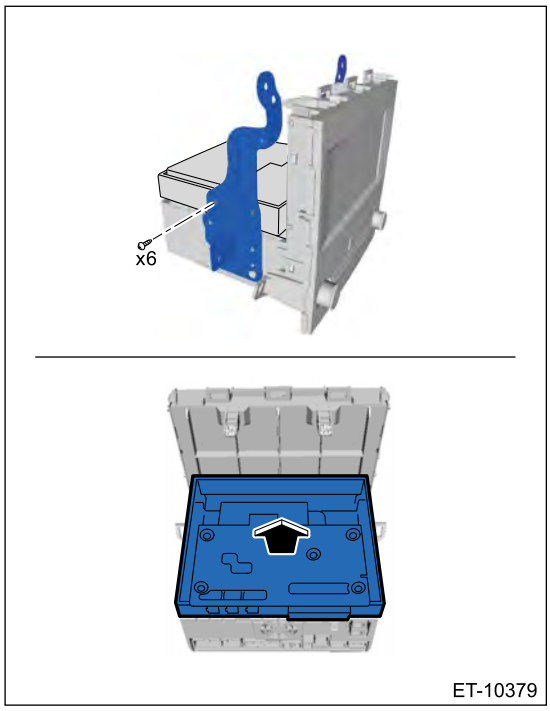
REMOVAL

1. DATA COMMUNICATION MODULE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the data communication module.
   (1) Remove the screws.
   (2) Remove the audio bracket or navigation bracket, and then remove the data communication module.

   Caution:

   Do not drop or apply any impact to the data communication module.



Note:

Remove the screws on RH side in the same procedure as on the LH side.

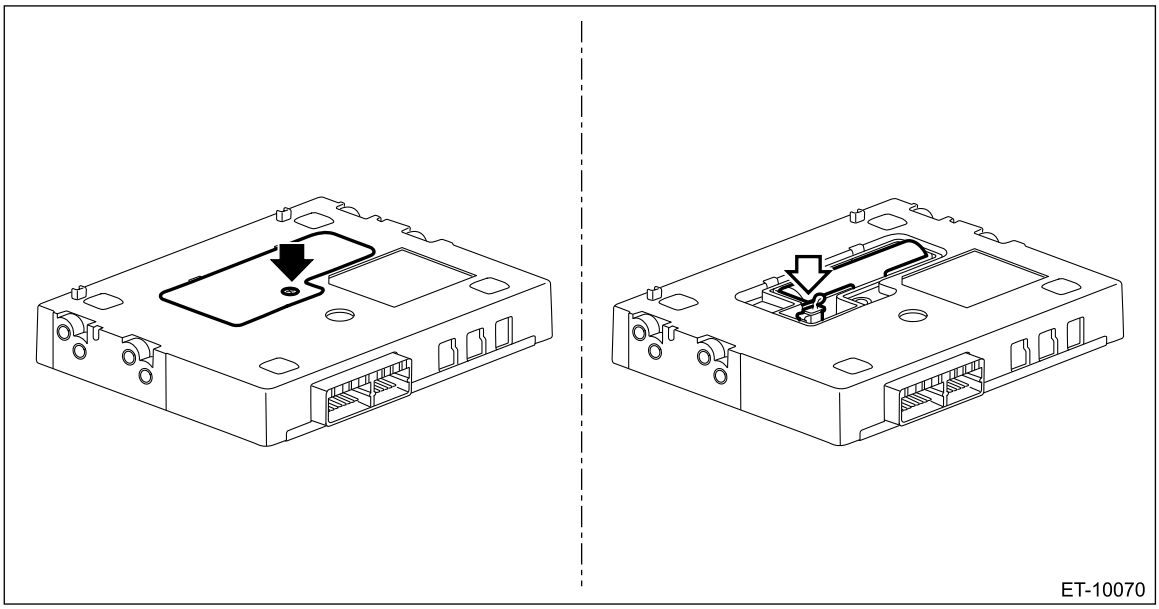
2. BACKUP BATTERY

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the data communication module. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module>REMOVAL > DATA COMMUNICATION MODULE.
3. Remove the backup battery.
   (1) Remove the screws, and then remove the battery cover.

   Preparation tool:

   TORX® T10

   (2) Disconnect the connector and remove the backup battery.

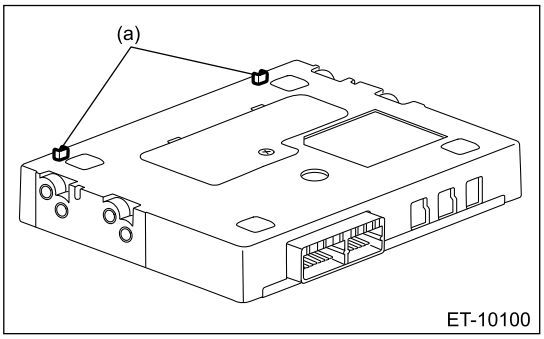


ENTERTAINMENT & MONITORING > Data Communication Module

INSTALLATION

1. DATA COMMUNICATION MODULE

1. Install the data communication module.
   Note:
   Align the positioning pin (a) of the data communication module with the positioning hole of the audio assembly or navigation assembly.



2. Install the audio assembly or navigation assembly.
3. Install the grille assembly - CTR ventilation.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Perform the registration if the data communication module is replaced with a new part. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION.
6. Check LED lighting status of spot map light or stereo camera cover assembly. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.

2. BACKUP BATTERY

1. Install the backup battery.
2. Install the battery cover.
   Tightening torque:
   0.3 N·m (0.03 kgf-m, 0.2 ft-lb)

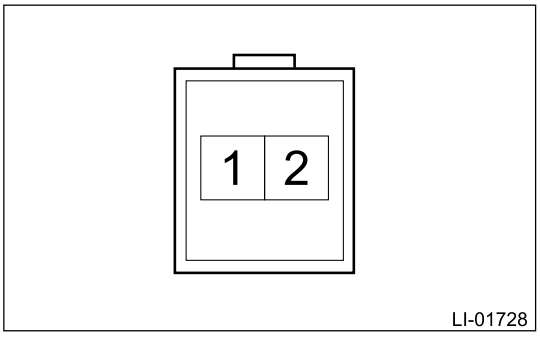
3. Install the data communication module. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module>INSTALLATION > DATA COMMUNICATION MODULE.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

ENTERTAINMENT & MONITORING > Data Communication Module

INSPECTION

1. BACKUP BATTERY

1. Measure the voltage between connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Standard
1 (+) — 2 (−)	2 V or more

2. Replace the backup battery if the inspection result is not within the standard value.

WIRING DIAGRAM

Refer to "Rearview Camera System" in the wiring diagram.

- 4 door model: Ref. to WIRING SYSTEM>Rearview Camera System>WIRING DIAGRAM > 4 DOOR MODEL.
- 5 door model: Ref. to WIRING SYSTEM>Rearview Camera System>WIRING DIAGRAM > 5 DOOR MODEL.

REMOVAL

1. 4 DOOR MODEL

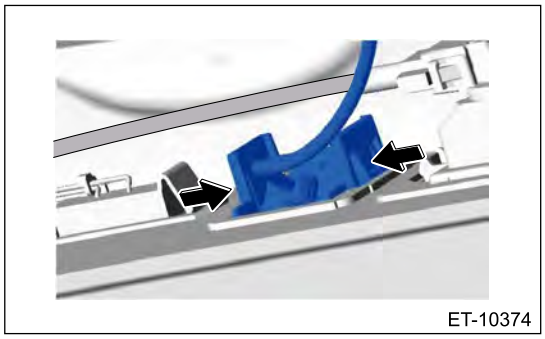
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the rearview camera assembly.

   Caution:

   Do not drop or apply any impact to the rearview camera because it is a precision equipment.

   (1) Disconnect the connector.

   (2) Disconnect the claws and then remove the rearview camera assembly.



2. 5 DOOR MODEL

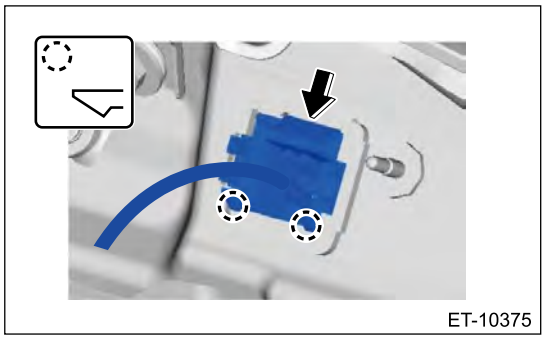
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>REMOVAL.
4. Remove the rearview camera assembly.

   Caution:

   Do not drop or apply any impact to the rearview camera because it is a precision equipment.

   (1) Disconnect the connector.

   (2) Release the claw and hook, and then remove the rearview camera assembly.



ENTERTAINMENT & MONITORING > Rearview Camera System

INSTALLATION

1. 4 DOOR MODEL

1. Install the rearview camera assembly.
   Note:
   Press-in the hook of the rearview camera assembly until a locking sound is heard.
2. Install the trim panel - trunk lid.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Confirm the marker position. Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System>INSPECTION.

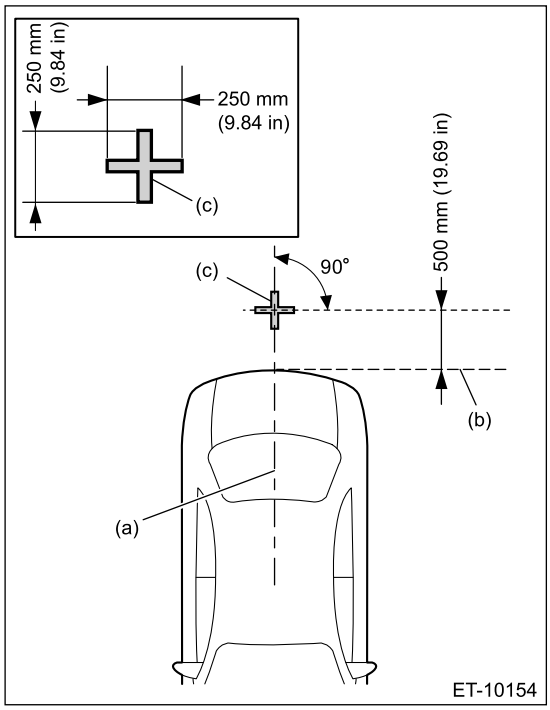
2. 5 DOOR MODEL

1. Install the rearview camera assembly.
   Note:
   Align the claws on the lower side of the rearview camera assembly with the panel, and press-in the hook on the upper side until a locking sound is heard.
2. Install the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>INSTALLATION.
3. Remove the trim panel - rear gate.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Confirm the marker position. Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System>INSPECTION.

ENTERTAINMENT & MONITORING > Rearview Camera System

INSPECTION

1. Park the vehicle at the level place where there are enough area at the rear of the vehicle.
2. Attach the tape as the target point for standard at the floor rearward of the vehicle as shown in the figure below.
   Note:
   Standard tape width is about 30 — 50 mm (1.18 — 1.97 in) and brilliant color shall be used.



(A) Vehicle body center line

(B) Rear edge of bumper

(C) Target point

3. Confirm the following before checking the corresponding items.

(1) Rearview camera image is not displayed. (Audio and navigation screens are displayed normally.)

1. Check the connecting condition of the back sensor. Ref. to ENTERTAINMENT & MONITORING>Audio System>OPERATION > CHECK VEHICLE SIGNALS WITH LINE DIAG MODE.
2. Check the rear view camera connection status. Ref. to ENTERTAINMENT & MONITORING>Audio System>OPERATION > CHECK CONNECTIONS WITH LINE DIAG MODE.

(2) Marker position is not aligned or displayed.

The rearview camera or its installation location on the vehicle may be deformed. Check the rearview camera and its installation location on the vehicle, and repair or replace if necessary.

WIRING DIAGRAM

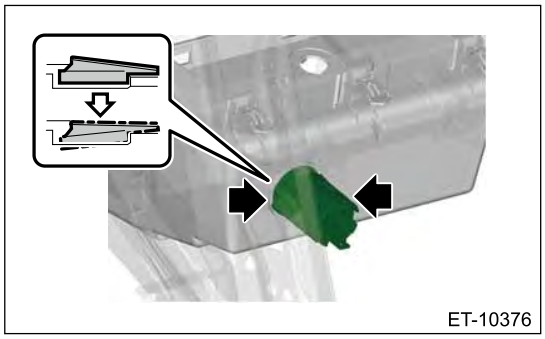
Refer to "Accessory Power Supply Socket System" in the wiring diagram.

- Front: Ref. to WIRING SYSTEM>Front Accessory Power Supply Socket System>WIRING DIAGRAM.
- Rear: Ref. to WIRING SYSTEM>Rear Accessory Power Supply Socket System>WIRING DIAGRAM.

REMOVAL

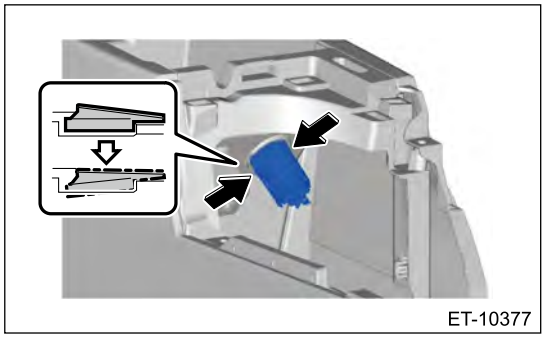
1. FRONT

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
5. Remove the socket assembly.
   (1) Disconnect the connector.
   (2) While releasing the claw, press it in from the rear to remove the socket assembly.



2. REAR

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the socket assembly.
   (1) While releasing the claw, press it in from the rear to remove the socket assembly.



INSTALLATION

1. FRONT

1. Install the socket assembly.
   Note:
   Align the groove of the tray - center UPR with the claw of the socket assembly.
2. Install the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>INSTALLATION.
3. Install the audio assembly or navigation assembly.
4. Install the grille assembly - CTR ventilation.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

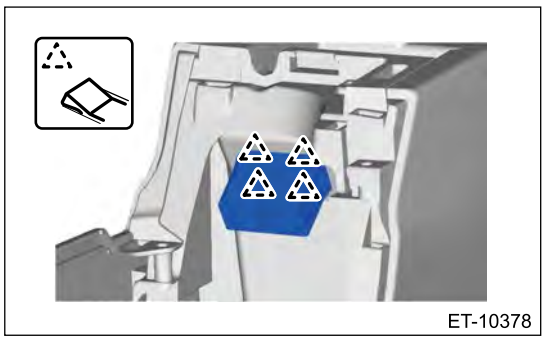
2. REAR

1. Install the socket assembly.
   Note:
   Align the groove of the console box assembly with the claw of the socket assembly.
2. Install the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

ENTERTAINMENT & MONITORING > External Connection Terminal

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the unit assembly - AUX.
   (1) While pressing the claw, press it in from the rear to remove the unit assembly - AUX.



ENTERTAINMENT & MONITORING > External Connection Terminal

INSTALLATION

1. Install the unit assembly - AUX.
2. Install the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

NOTE

For the diagnostics with phenomenon, refer to the “INFOTAINMENT SYSTEM (DIAGNOSTICS)” section.

Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon.

NOTE

For the service diagnostic mode, refer to the “INFOTAINMENT SYSTEM (DIAGNOSTICS)” section.
Ref. to INFOTAINMENT(DIAGNOSTICS) >Service Diagnostics Mode.

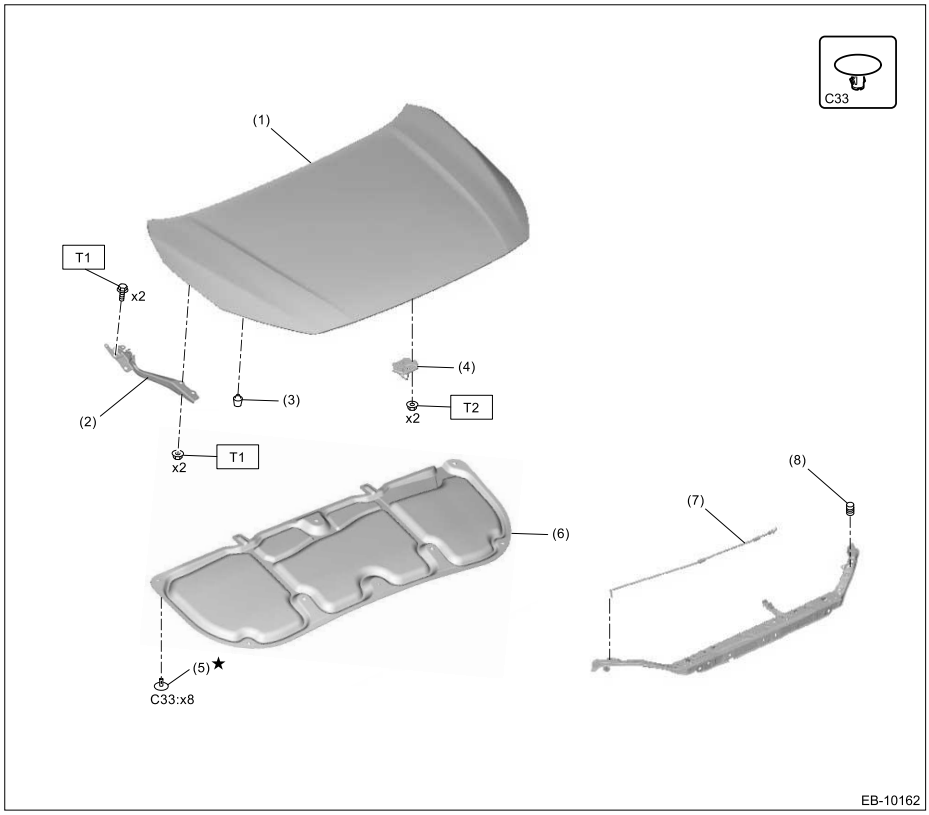
EXTERIOR BODY PANELS

EB

1. General Description
2. Front Hood
3. Front Fender
4. Front Door
5. Sealing Cover
6. Rear Door
7. Door Sash Tape
8. Trunk Lid
9. Rear Gate
10. Weather Strip

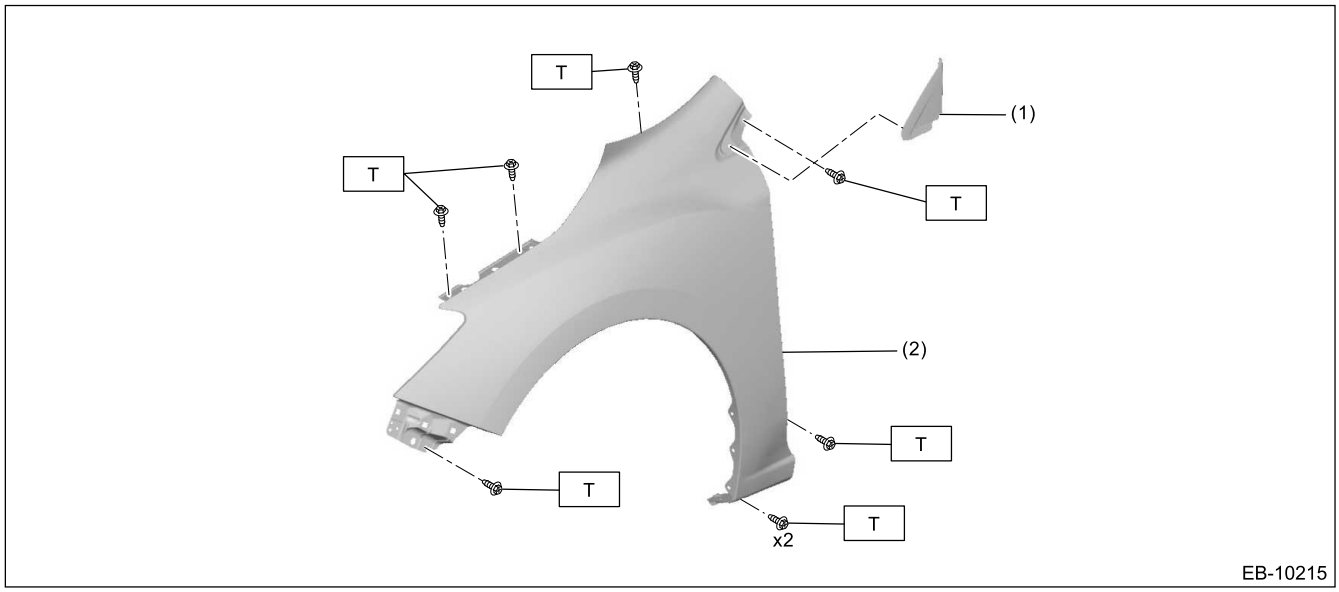
COMPONENT

1. FRONT HOOD



(1)	Hood COMPL - front	(5)	Clip	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Hinge COMPL - front hood	(6)	Insulator - front hood	***T1: 25 (2.5, 18.4)***
(3)	Stopper - front hood	(7)	Stay ASSY - front hood	***T2: 33 (3.4, 24.3)***
(4)	Striker - front hood	(8)	Buffer - front hood	

2. FRONT FENDER



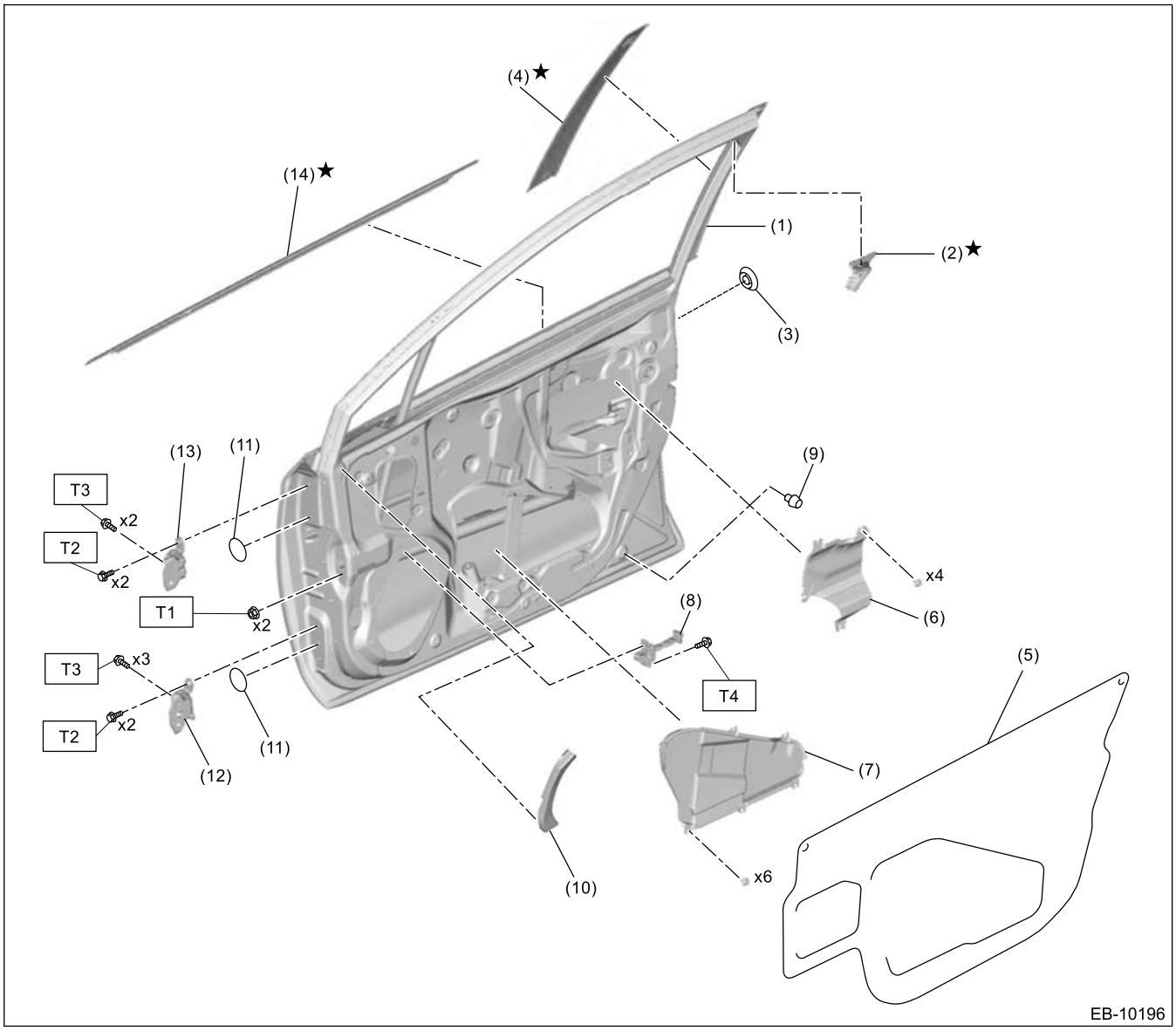
(1) Cover - A pillar ASSY

(2) Fender - front

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

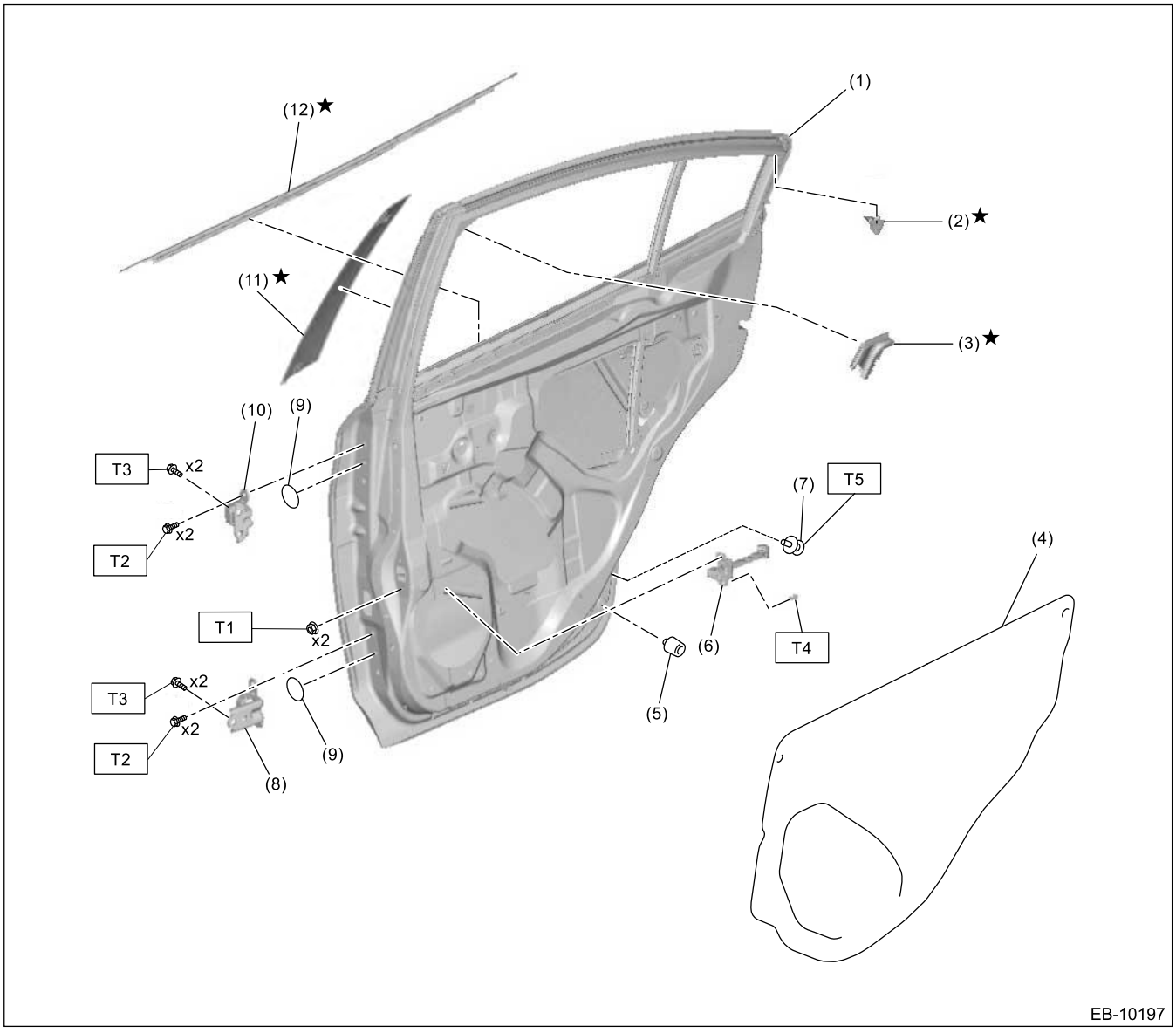
3. FRONT DOOR



(1)	Panel ASSY - front door	(8)	Checker ASSY - front door	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Cover B pillar - front door INN	(9)	Stopper rubber	***T1: 7.5 (0.8, 5.5)***	
(3)	Plug	(10)	Cover sash - inner front	***T2: 25 (2.5, 18.4)***	
(4)	Cover B pillar - front	(11)	Grommet	***T3: 30 (3.1, 22.1)***	
(5)	Sealing cover	(12)	Lower hinge - front door	***T4: 33 (3.4, 24.3)***	
(6)	Plate - door UPR	(13)	Upper hinge - front door		
(7)	Plate - door LWR	(14)	Weather strip outer - front door		

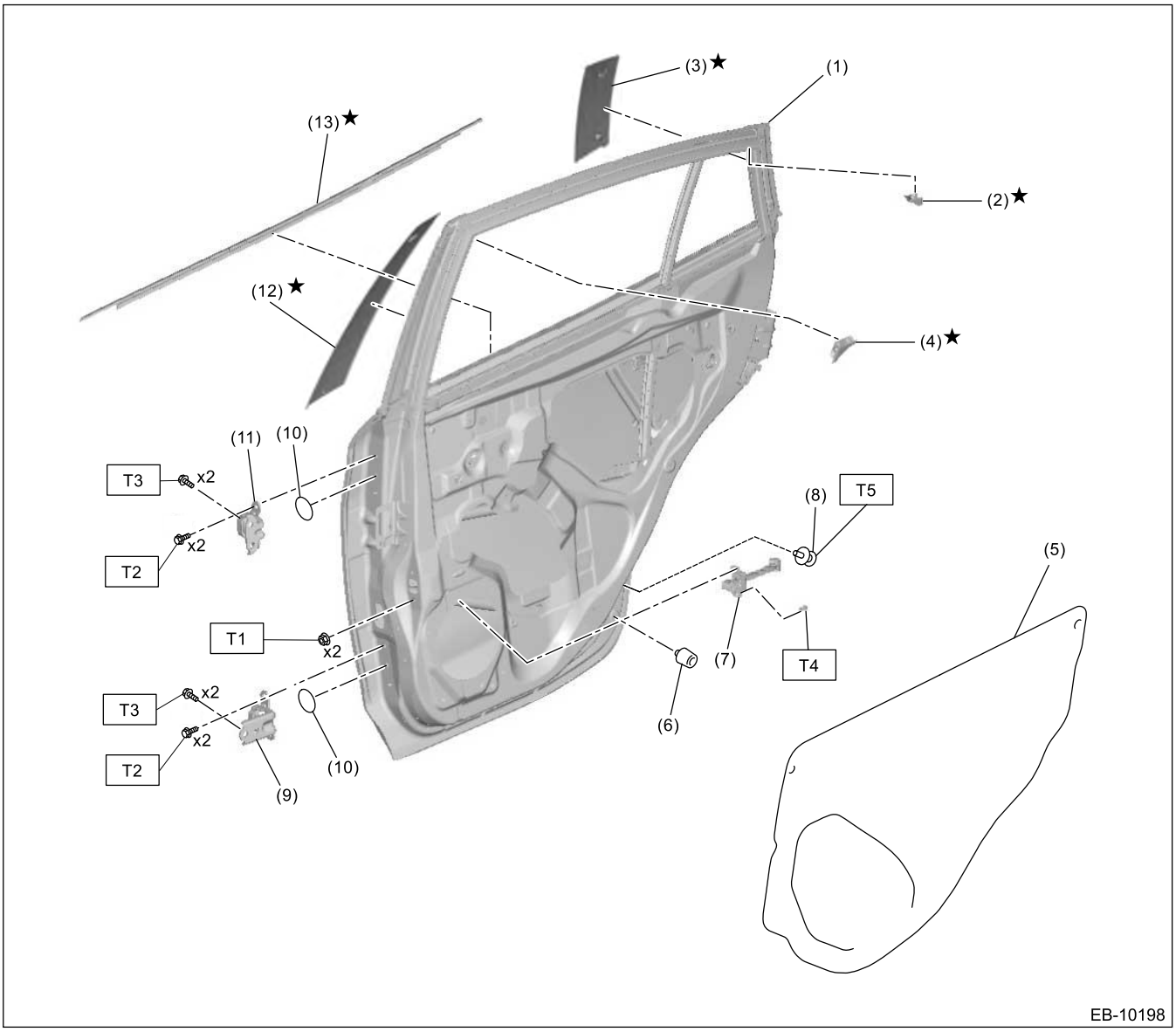
4. REAR DOOR

- 4 door model



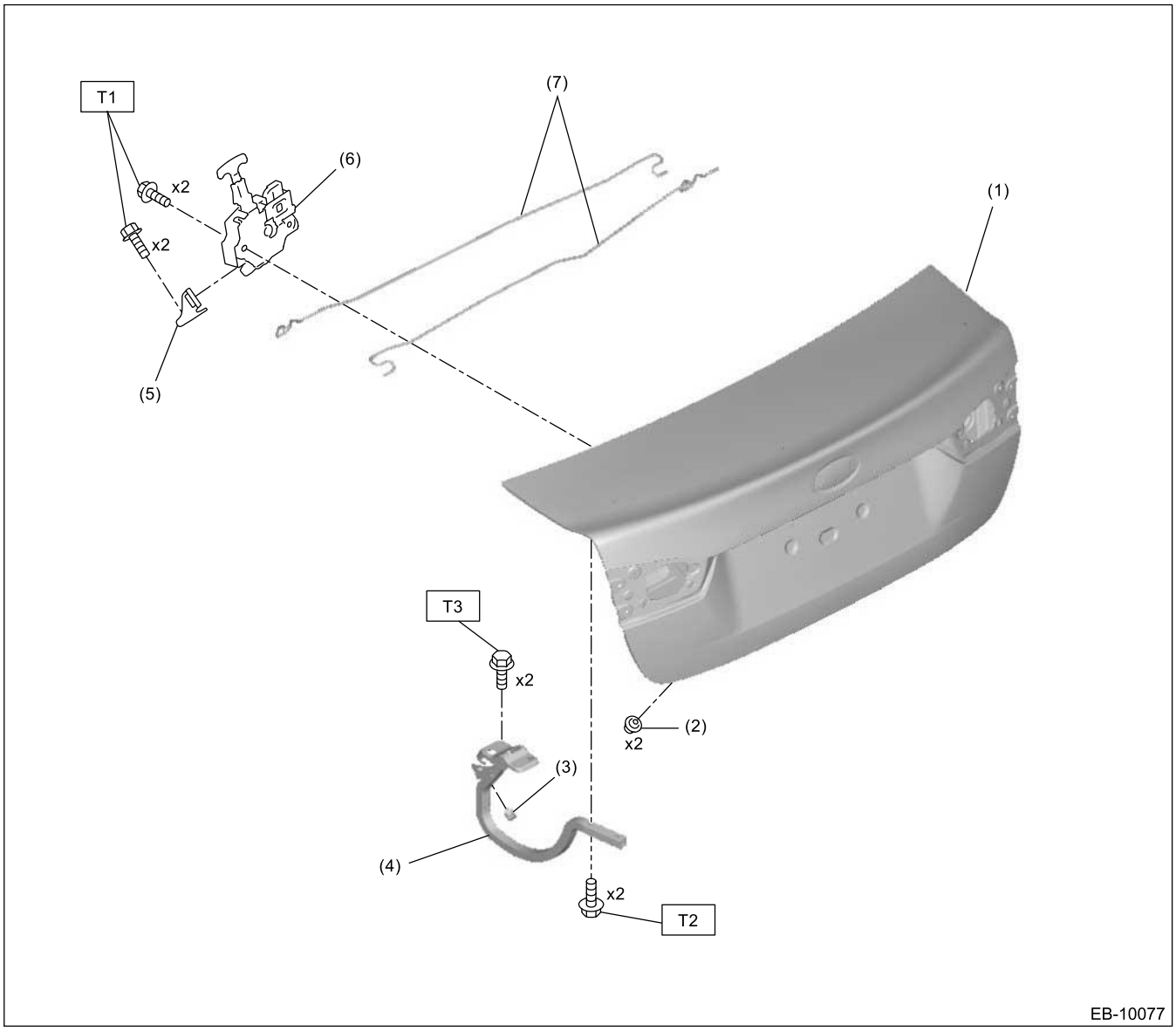
(1)	Panel ASSY - rear door	(7)	Catcher - rear door	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Cover C pillar - rear door INN	(8)	Lower hinge - rear door	***T1: 7.5 (0.8, 5.5)***	
(3)	Cover B pillar - rear door INN	(9)	Grommet	***T2: 25 (2.5, 18.4)***	
(4)	Sealing cover	(10)	Upper hinge - rear door	***T3: 30 (3.1, 22.1)***	
(5)	Stopper rubber	(11)	Cover B pillar - rear	***T4: 33 (3.4, 24.3)***	
(6)	Checker ASSY - rear door	(12)	Weather strip outer - rear door	***T5: 38 (3.9, 28)***	

- 5 door model



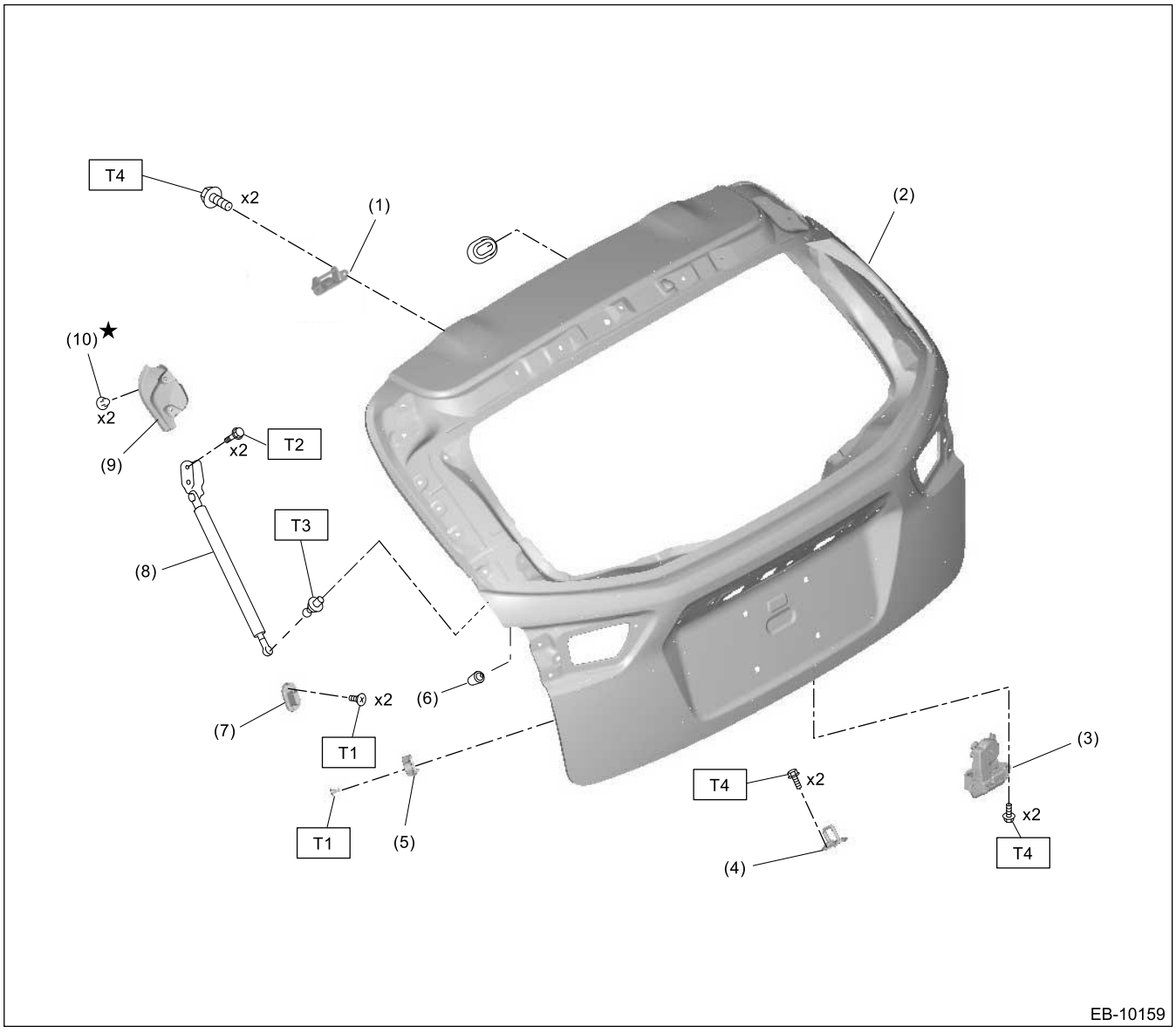
(1)	Panel ASSY - rear door	(8)	Catcher - rear door	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Cover C pillar - rear door INN	(9)	Lower hinge - rear door	***T1: 7.5 (0.8, 5.5)***	
(3)	Cover C pillar	(10)	Grommet	***T2: 25 (2.5, 18.4)***	
(4)	Cover B pillar - rear door INN	(11)	Upper hinge - rear door	***T3: 30 (3.1, 22.1)***	
(5)	Sealing cover	(12)	Cover B pillar - rear	***T4: 33 (3.4, 24.3)***	
(6)	Stopper rubber	(13)	Weather strip outer - rear door	***T5: 38 (3.9, 28)***	
(7)	Checker ASSY - rear door				

5. TRUNK LID PANEL



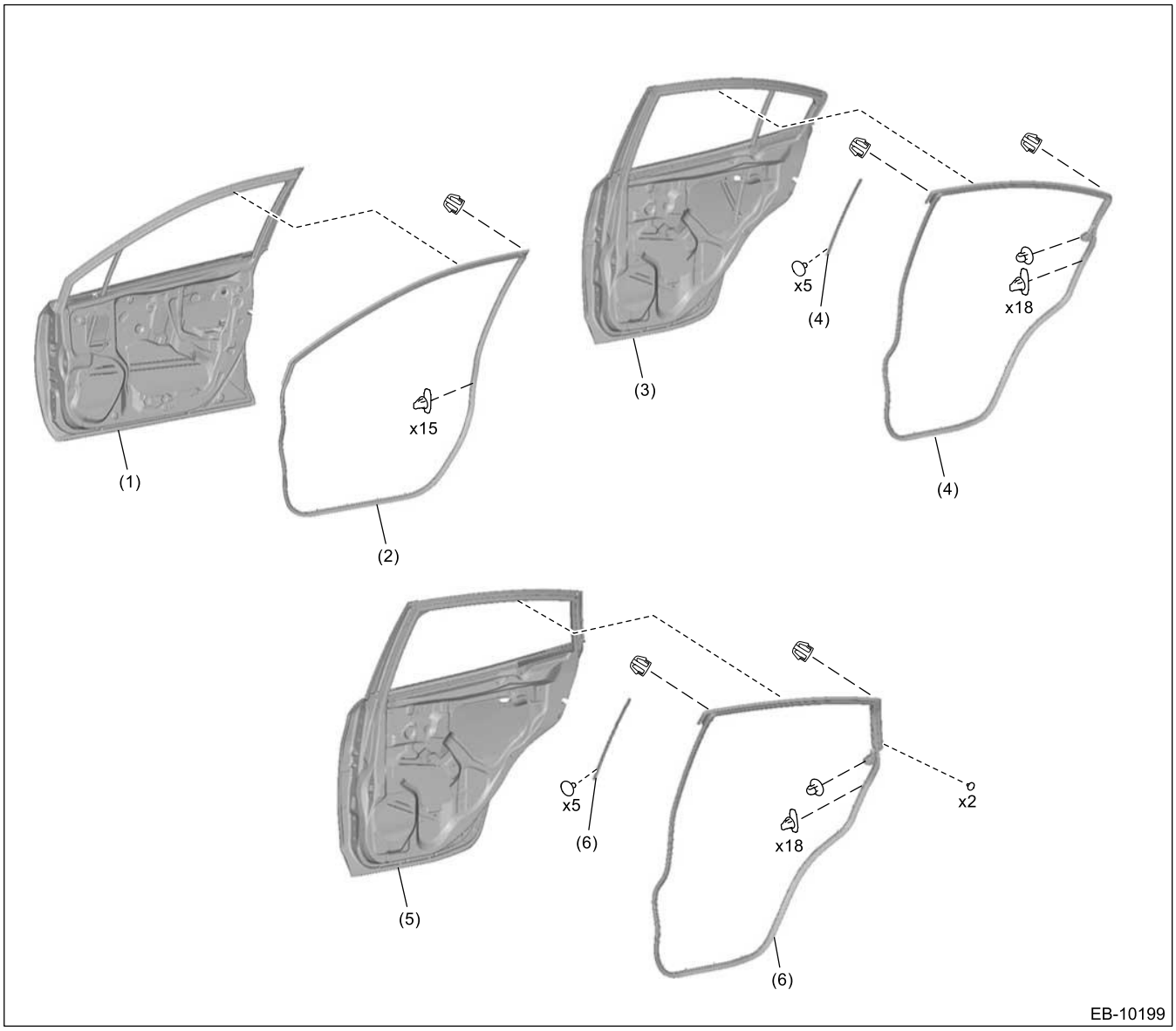
(1) Trunk lid COMPL	(5) Striker - trunk	***Tightening torque: N·m (kgf-m, ft-lb)***
(2) Stopper - trunk lid	(6) Lock ASSY - trunk lid	***T1: 7.5 (0.8, 5.5)***
(3) Stopper - trunk	(7) Torsion bar - trunk lid	***T2: 14 (1.4, 10.3)***
(4) Trunk lid arm ASSY		***T3: 18 (1.8, 13.3)***

6. REAR GATE



(1)	Hinge - rear gate	(6)	Stopper - rear gate	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Panel - rear gate	(7)	Buffer - body side	***T1: 7.5 (0.8, 5.5)***	
(3)	Latch & actuator - rear gate	(8)	Stay ASSY - rear gate	***T2: 16(1.6, 11.8)***	
(4)	Striker - rear gate	(9)	Drip - rear gate	***T3: 20 (2, 14.8)***	
(5)	Buffer - rear gate	(10)	Clip	***T4: 25 (2.5, 18.4)***	

7. WEATHER STRIP



(1) Panel ASSY - front door

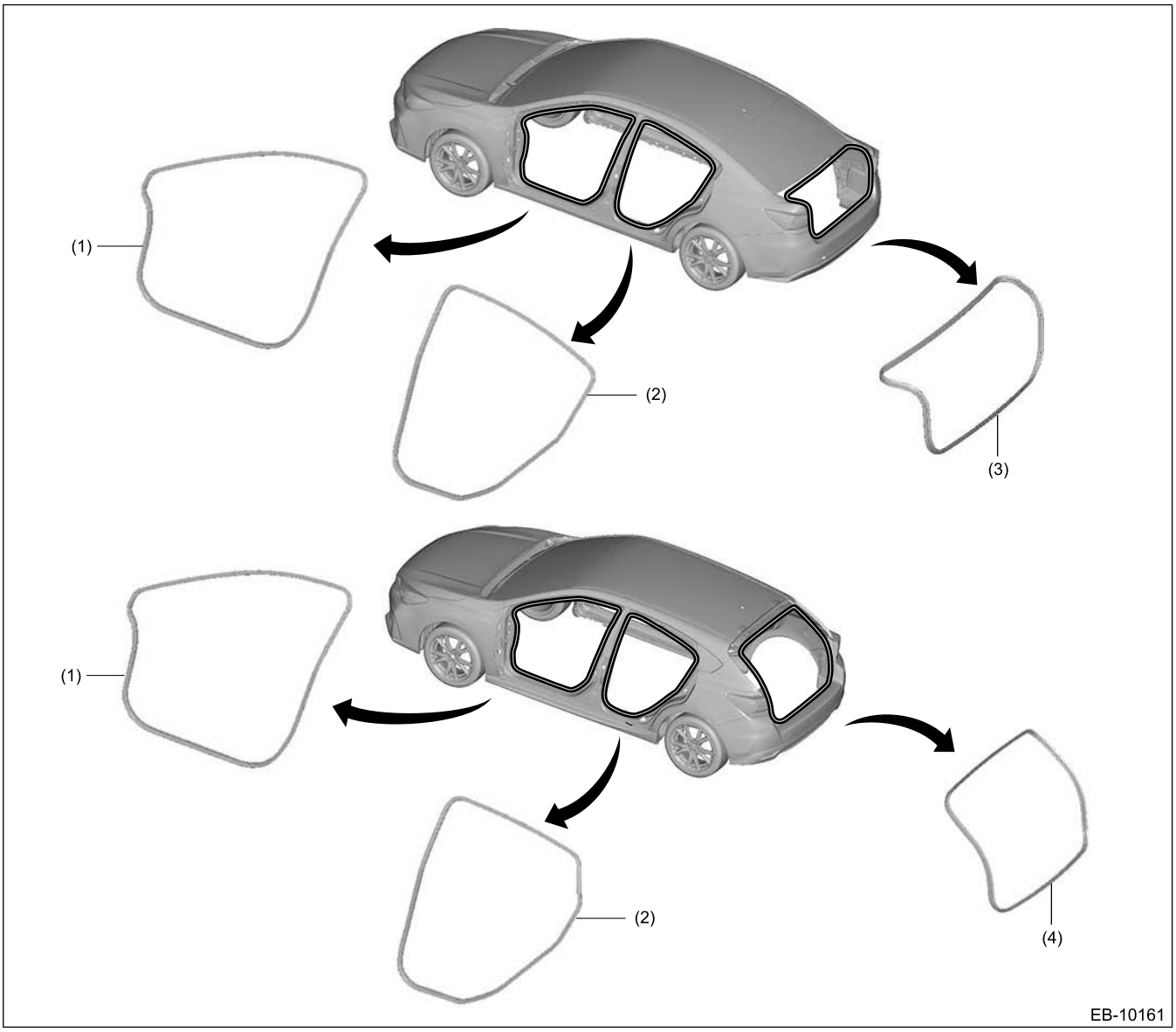
(2) Weather strip - front door

(3) Panel ASSY - rear door (4 door model)

(4) Weather strip - rear door (4 door model)

(5) Panel ASSY - rear door (5 door model)

(6) Weather strip - rear door (5 door model)



(1) Weather strip - body side flange front

(2) Weather strip - body side flange rear

(3) Weather strip - trunk lid (4 door model)

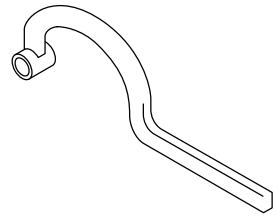
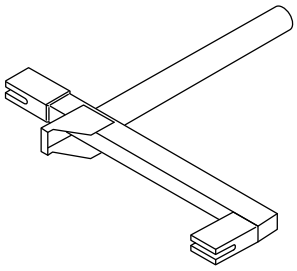
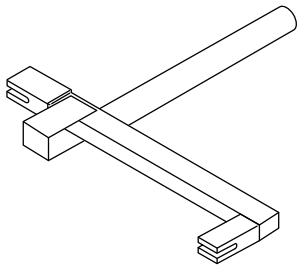
(4) Weather strip - rear gate (5 door model)

CAUTION

Exterior body panels are heavy. When removing or installing, do not drop and damage the panels. Do not damage the panel painting surface.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-925610000	925610000	WRENCH	Used for removing and installing door hinge.
 ST927780000	927780000	REMOVER	• Used for removing and installing the trunk torsion bar. • REMOVER (99099FJ000) can also be used.
 ST-99099FJ000	99099FJ000	REMOVER	• Used for removing and installing the trunk torsion bar. • REMOVER (927780000) can also be used.

2. GENERAL TOOL

TOOL NAME	REMARKS
Support jack	Used for supporting door panel.
Clip remover	Used for removing various types of clips.

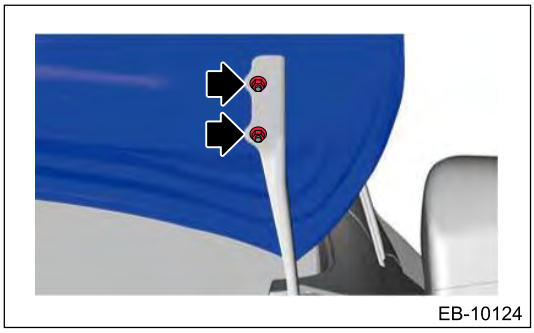
EXTERIOR BODY PANELS > Front Hood

REMOVAL

Caution:

The hood COMPL - front is heavy. When removing and installing it, always work in a team of two or more persons.

1. Open the hood COMPL - front.
2. Remove the nut on the hood COMPL - front side, and remove the hood COMPL - front.



EXTERIOR BODY PANELS > Front Hood

INSTALLATION

1. Install the hood COMPL - front.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
2. Adjust the clearance around the hood COMPL - front. Ref. to EXTERIOR BODY PANELS>Front Hood>ADJUSTMENT.

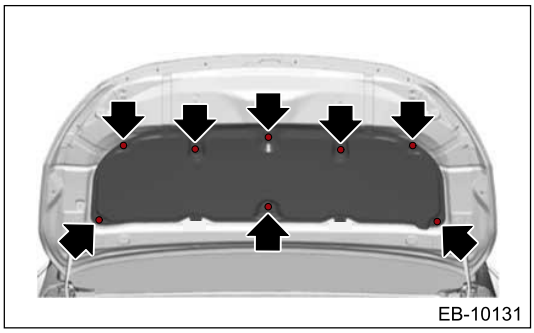
EXTERIOR BODY PANELS > Front Hood

DISASSEMBLY

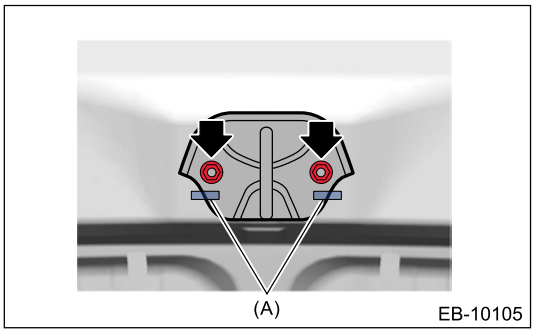
Caution:

The hood COMPL - front is heavy. When removing or installing the hood COMPL - front and the hinge COMPL - front hood, be sure to work in a group of two or more.

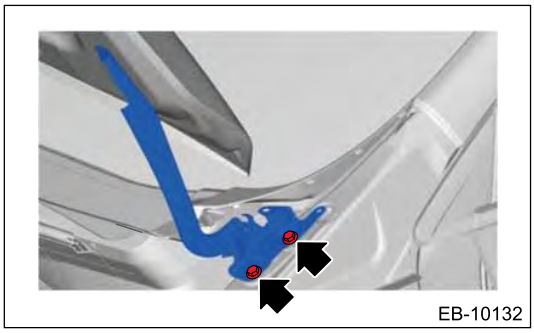
1. Remove the clips, and remove the insulator - front hood.



2. Make alignment marks (A), and remove the striker - front hood from the hood COMPL - front.



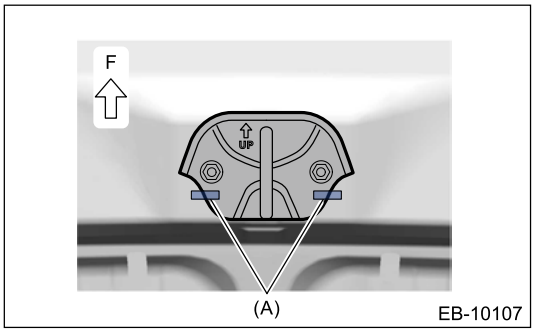
3. Remove the hinge COMPL - front hood from the body.



EXTERIOR BODY PANELS > Front Hood

ASSEMBLY

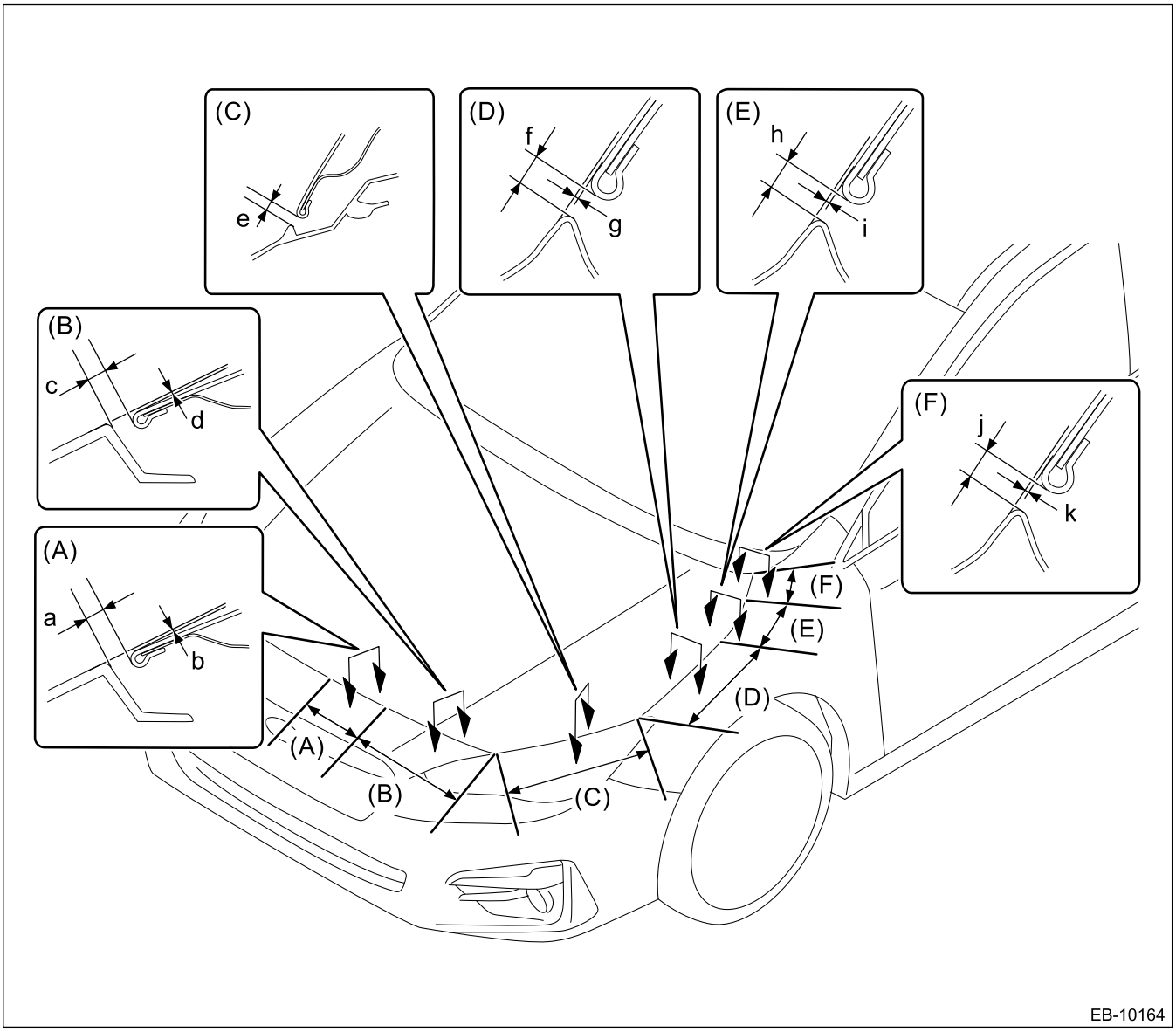
1. Install the hinge COMPL - front hood.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
2. Install the insulator - front hood.
3. Align the alignment marks (A), and install the striker - front hood to the hood COMPL - front.
   Caution:
   When installing the striker - front hood, make sure that the front and rear sides are positioned in a correct direction.
   Note:
   It is not necessary to adjust the striker - front hood because there is no span of adjustable range.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)



EXTERIOR BODY PANELS > Front Hood

ADJUSTMENT

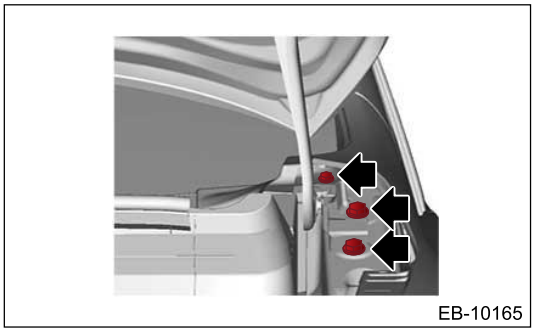
Adjust the clearance around the hood COMPL - front as follows.



Part		Standard
A	Hood COMPL - front to Bumper face - front	3.5 ± 1.7 mm (0.14 ± 0.07 in)
B	Surface level gap between Hood COMPL - front and Bumper face - front	0.7 ± 1.2 mm (0.03 ± 0.05 in)
C	Hood COMPL - front to Bumper face - front	3.5 ± 1.7 mm (0.14 ± 0.07 in)
D	Surface level gap between Hood COMPL - front and Bumper face - front	1±1.2 mm (0.04±0.05 in)
E	Hood COMPL - front to Light assembly - head	3±1.7 mm (0.12±0.07 in)
F	Hood COMPL - front to Fender - front	3.5±1mm (0.14±0.04 in)
G	Surface level gap: Hood COMPL - front to Fender - front	0±1mm (0±0.04 in)
H	Hood COMPL - front to Fender - front	3±1mm (0.12±0.04 in)
I	Surface level gap: Hood COMPL - front to Fender - front	0±1mm (0±0.04 in)
J	Hood COMPL - front to Fender - front	4±1mm (0.16±0.04 in)
K	Surface level gap: Hood COMPL - front to Fender - front	-0.5±1mm (-0.02±0.04 in)

1. Adjust the horizontal position of the hood COMPL - front.

(1) Loosen the attaching nuts of the hinge COMPL - front hood on the left and right sides.



(2) Adjust the horizontal clearance of the hood COMPL - front, and tighten the attaching nuts of the hinge COMPL - front hood.

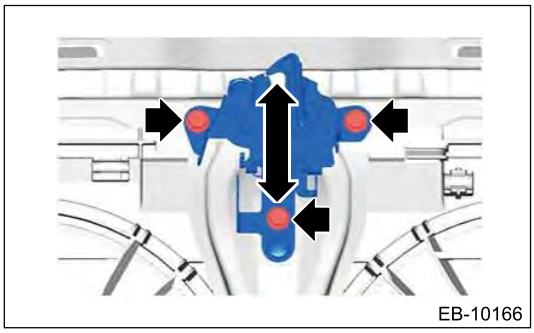
Tightening torque:

25 N·m (2.55 kgf-m, 18.4 ft-lb)

2. Adjust the front end height of the hood COMPL - front.

(1) Loosen the bolts on the lock assembly - front hood.

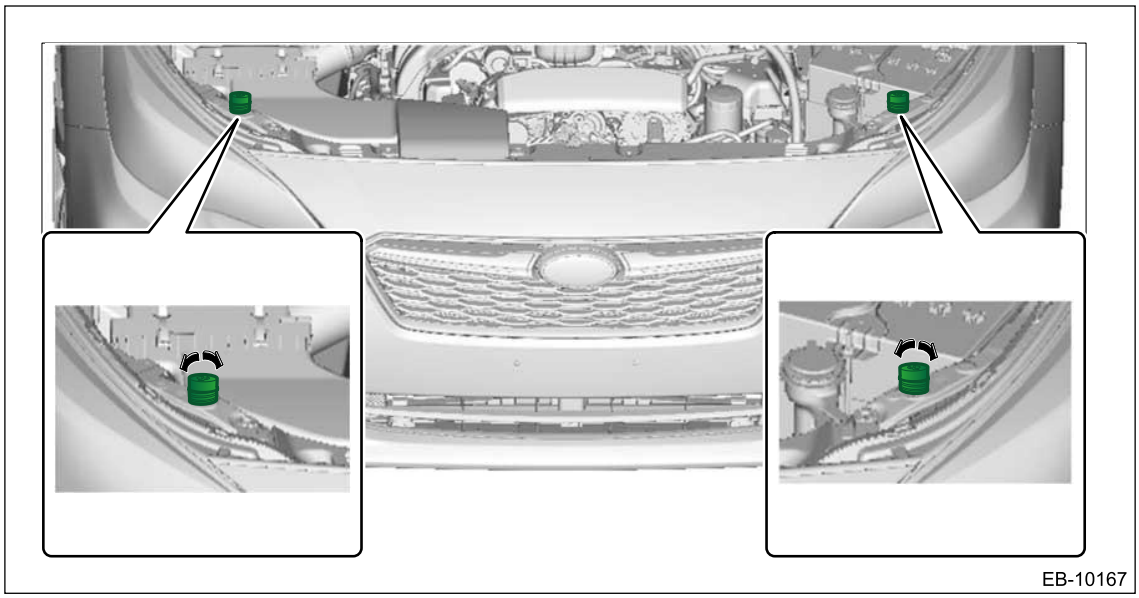
(2) Adjust the lock assembly - front hood by moving it up and down.



Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

3. Rotate the buffer - front hood of the hood COMPL - front to adjust the height.



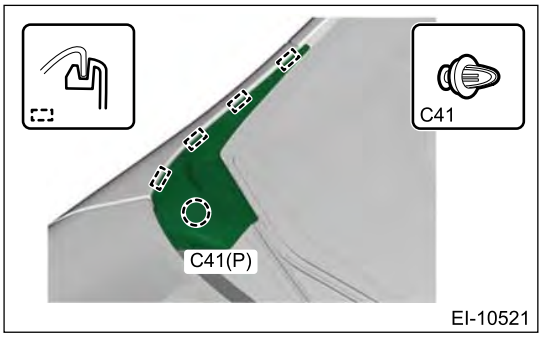
REMOVAL

1. FENDER PANEL

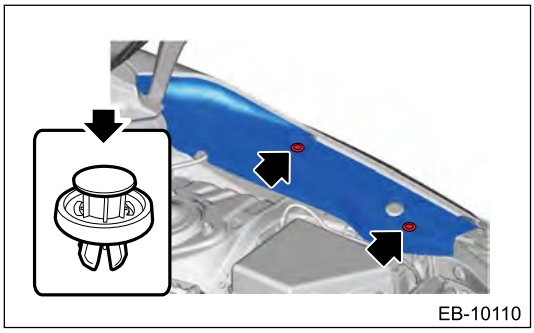
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Remove the light assembly - head. Ref. to LIGHTING SYSTEM>Headlight Assembly>REMOVAL.
4. Release the clips and claws, and then remove the cowl panel - on the left and right sides.

   Caution:

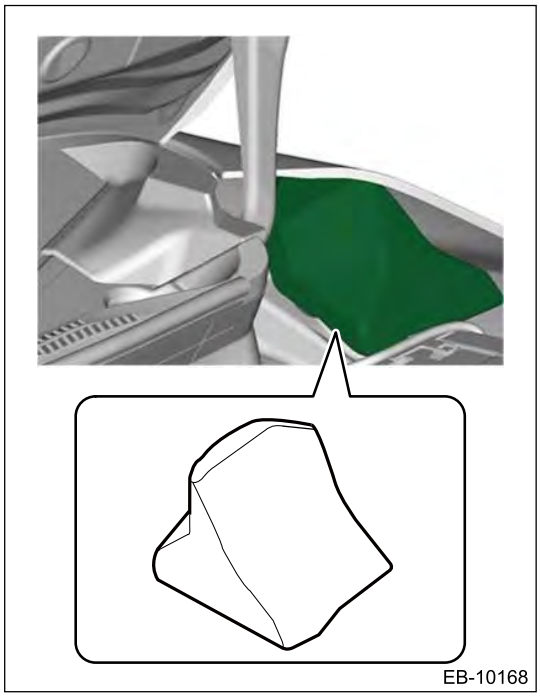
   Pulling with excessive force may damage the cowl panel - side. If it is difficult to remove, use a plastic remover or equivalent tool.



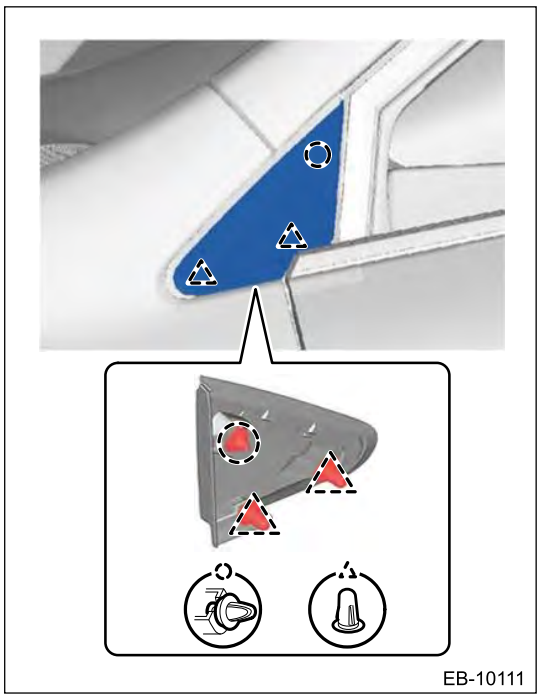
5. Remove the cover - front fender.



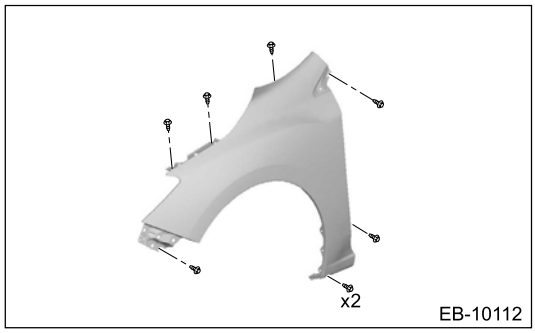
6. Remove the insulator - fender rear. (If equipped)



7. Remove the mud guard - front. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>REMOVAL.
8. Remove the spoiler assembly - side. Ref. to EXTERIOR/INTERIOR TRIM>Side Garnish>REMOVAL.
9. Remove the cover - A pillar assembly.



10. Remove the fender - front.



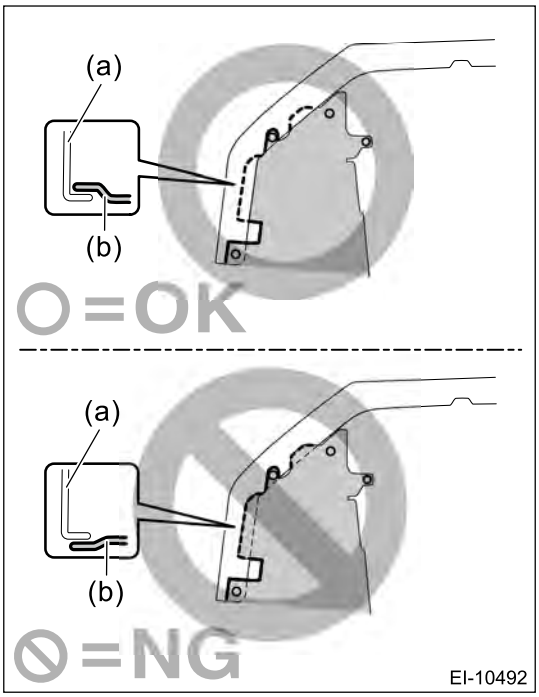
EXTERIOR BODY PANELS > Front Fender

INSTALLATION

1. FENDER PANEL

Caution:

Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Install the fender - front.

   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

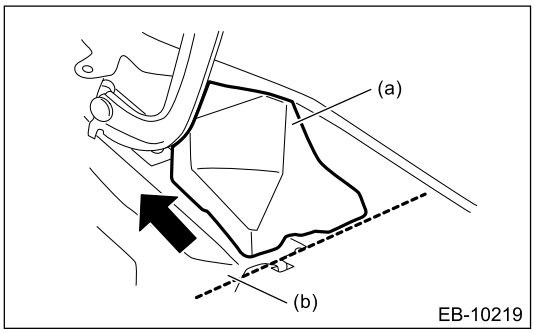
   Note:

   When installing the fender - front, make sure that a uniform clearance is created around it.

   - **Fender - front to Hood COMPL - front: Ref. to EXTERIOR BODY PANELS>Front Hood>ADJUSTMENT.**
   - **Fender - front to Panel assembly - front door: Ref. to EXTERIOR BODY PANELS>Front Door>ADJUSTMENT.**

1. Install the cover - A pillar assembly.
2. Install the spoiler assembly - side.
3. Install the mud guard - front.
4. Install the insulator - fender rear. (If equipped)

(1) Push the insulator - fender rear (a) so that the front side comes back of the reinforce - front panel side (b) end.

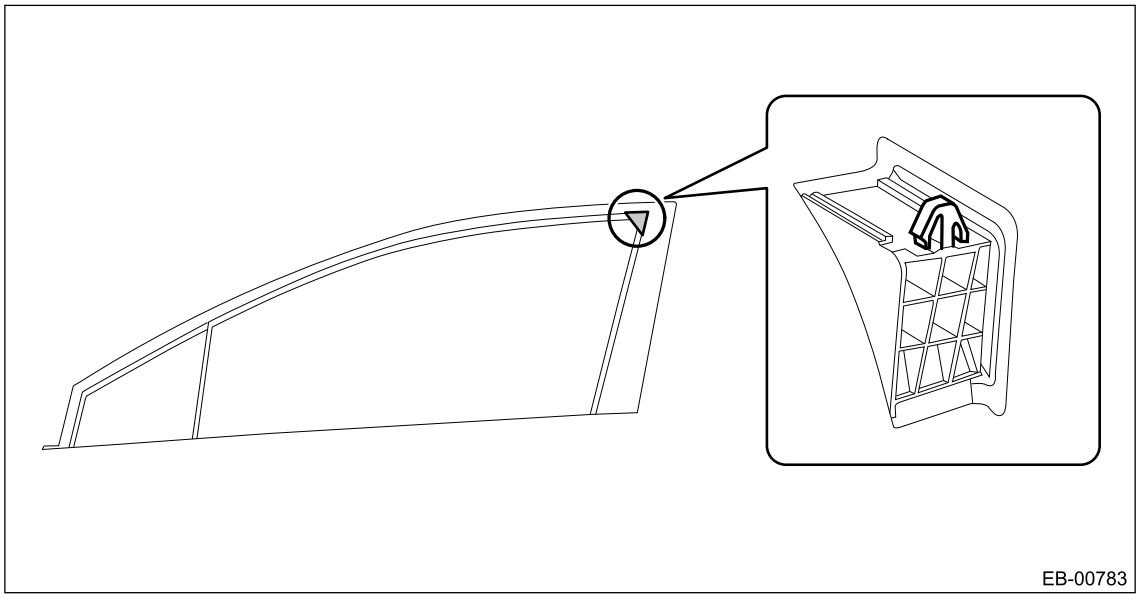


5. Install the cover - front fender.
6. Install the cowl panel - side.
7. Install the light assembly - head.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
10. Adjust the headlight beam and fog light beam.
    - Adjust the headlight beam. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT > HEADLIGHT BEAM ADJUSTMENT.
    - Adjust the fog light beam. (Model with fog light) Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>ADJUSTMENT > FOG LIGHT AIMING.

REMOVAL

1. FRONT DOOR PANEL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the front sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
4. Remove the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly>REMOVAL.
5. Remove the front door speaker assembly. Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > DOOR SPEAKER.
6. Remove the glass assembly - front door and the glass - front door partition. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL.
7. Remove the running channel - front door. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL > FRONT DOOR PARTITION GLASS.
8. Remove the cover B pillar - front door INN.
   Caution:
   - **Always replace with a new part, because engagement of the claw weakens.**
   - **Do not damage the sash or sash tape OUT while removing.**



9. Remove the door sash tape and the cover B pillar - front. Ref. to EXTERIOR BODY PANELS>Door Sash Tape>REMOVAL.
10. Remove the regulator and motor assembly - front. Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly>REMOVAL.
11. Remove the sash assembly - partition. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL > FRONT DOOR PARTITION GLASS.
12. Remove the latch and actuator assembly - front. Ref. to SECURITY AND LOCKS>Door Latch & Door Lock Actuator Assembly>REMOVAL > FRONT.
13. Remove the handle - door outer. Ref. to SECURITY AND LOCKS>Door Outer Handle>REMOVAL > FRONT.
14. Remove the weather strip - front door. Ref. to EXTERIOR BODY PANELS>Weather

Strip>REPLACEMENT.

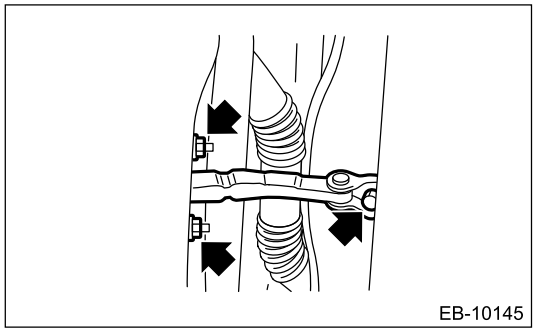
15. Remove the clips and the upper hooks, and remove the cover sash - inner front.

Caution:

Do not pull the cover sash - inner front forcibly. Doing so may damage the hook portion of the cover sash - inner front.



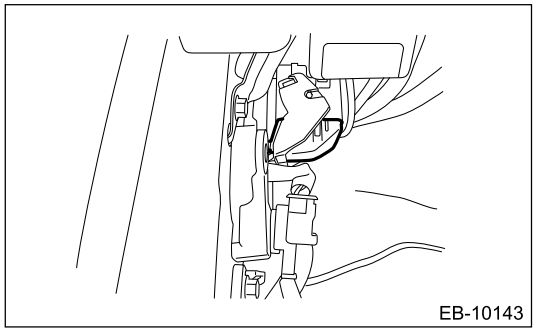
16. Remove the bolts and nuts, and then detach the checker assembly - front door.



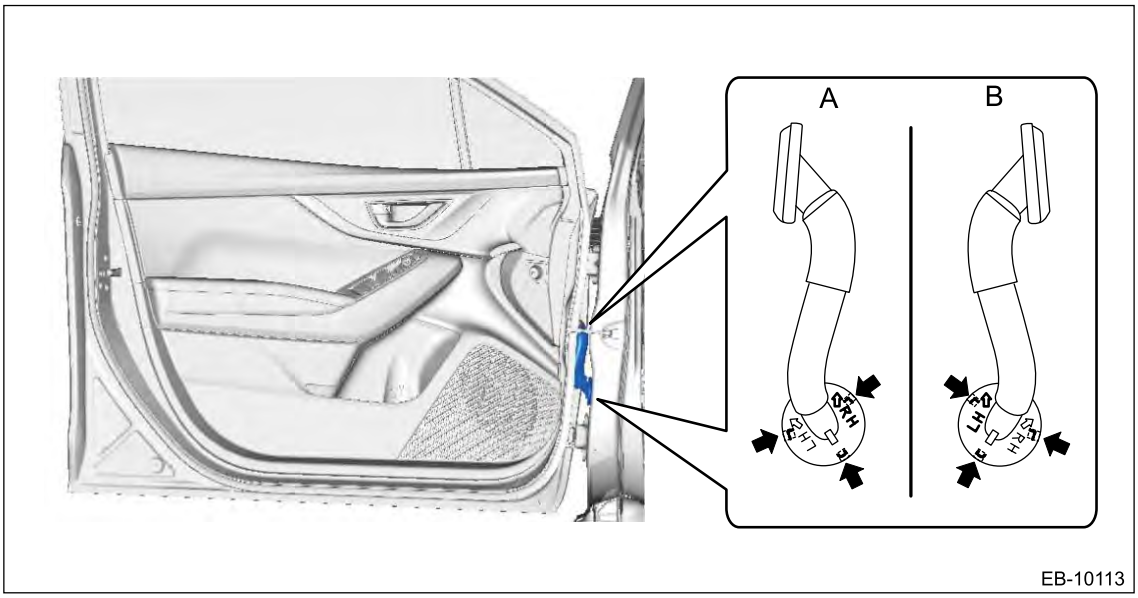
17. Remove the cover side sill - front INN and cover side sill - front. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.

18. Disconnect the front door harness connectors.

(1) Disconnect the connector of door harness from body harness.

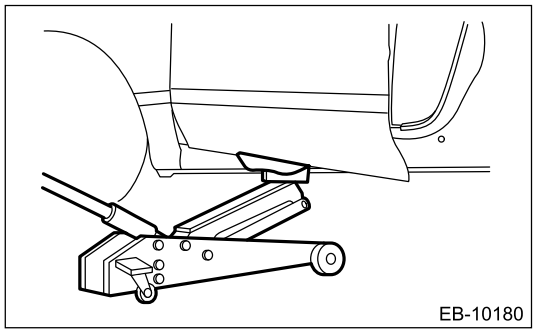


(2) Push in the claws to remove the grommet, and pull out the door harness connector.



A	Left door
B	Right door

19. Before removing the panel assembly - front door, make the following preparations.



(1) Put a wooden block on a floor jack and place the jack under the panel assembly - front door.
(2) Support the panel assembly - front door with the jack to protect it from damage.

Caution:

Do not excessively lift the panel assembly - front door with the floor jack. The door hinges may be damaged.

20. Remove the bolts on the side of the panel assembly - front door of the upper hinge - front door and the lower hinge - front door to remove the panel assembly - front door.

Caution:

The panel assembly - front door is heavy. When removing and installing it, always work in a team of two or more persons.

21. Remove the door hinge from vehicle.

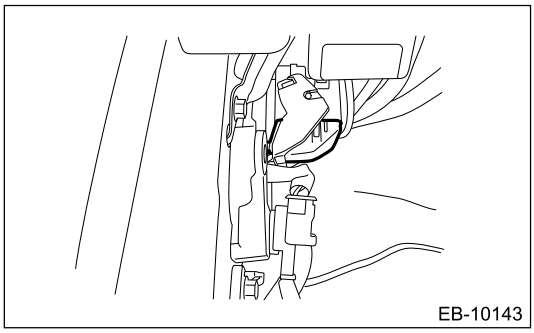
2. FRONT DOOR HINGE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

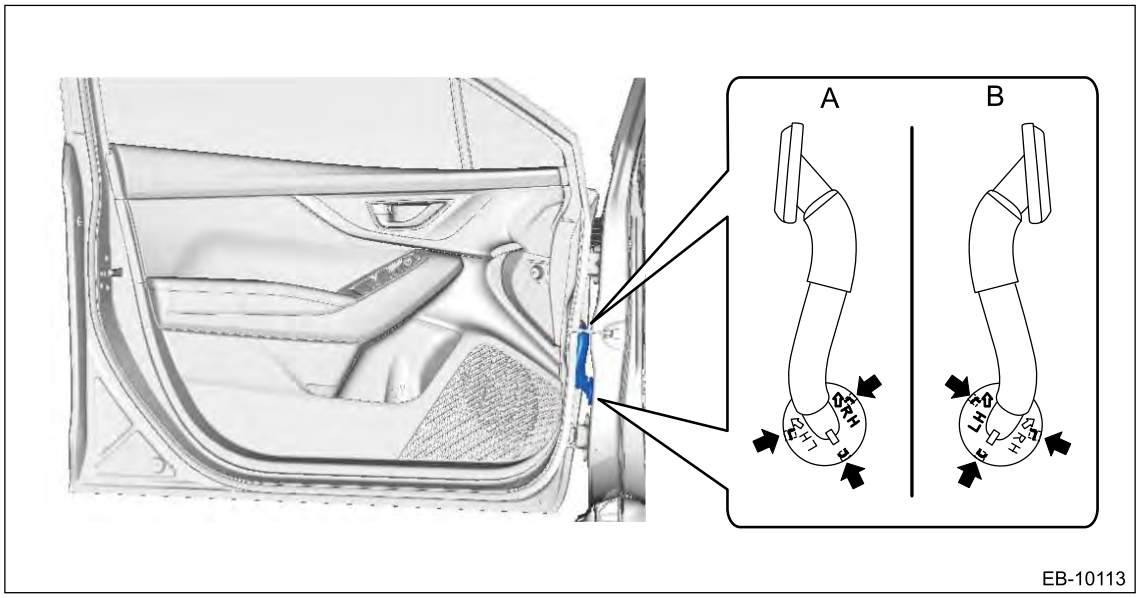
2. Remove the cover side sill - front INN and cover side sill - front. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.

3. Disconnect the front door harness connectors.

(1) Disconnect the connector of door harness from body harness.

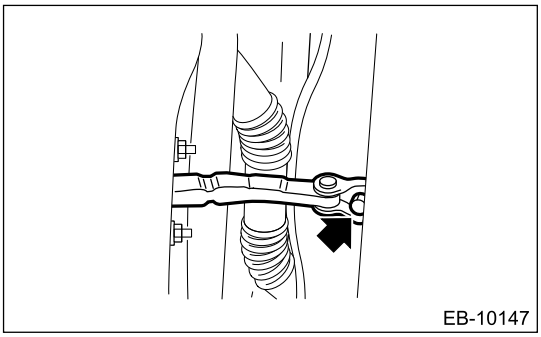


(2) Push in the claws to remove the grommet, and pull out the door harness connector.



A	Driver's side
B	Passenger's side

4. Remove the bolts on the vehicle side to disconnect the checker assembly - front door.



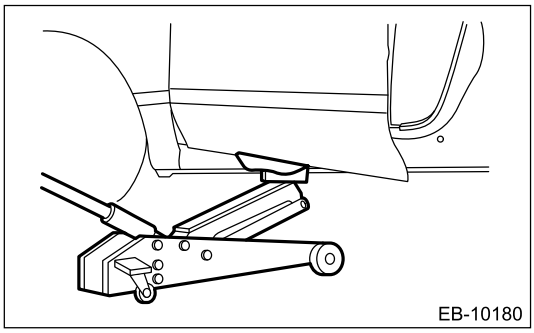
5. Before removing the door hinge, make the following preparations.

Caution:

- **The panel assembly - front door is heavy. When removing and installing it, always work in a team of two or more persons.**
- **Do not excessively lift the panel assembly - front door with the floor jack. The door hinges may be damaged.**

(1) Put a wooden block on a floor jack and place the jack under the panel assembly - front door.

(2) Support the panel assembly - front door with the jack to protect it from damage.



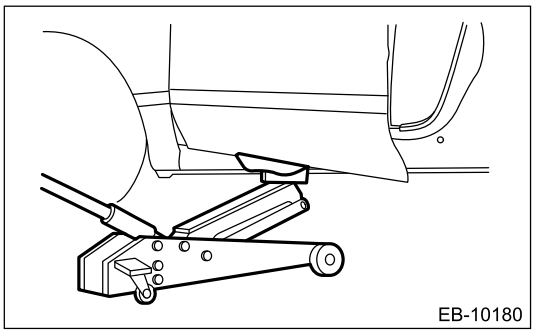
6. Remove the bolts on the side of the panel assembly - front door of the upper hinge - front door or the lower hinge - front door.
   Caution:
   Do not remove the upper hinge - front door and the lower hinge - front door at the same time.
7. Remove the hinge - front door from the vehicle.

EXTERIOR BODY PANELS > Front Door

INSTALLATION

1. FRONT DOOR PANEL

1. Put a wooden block and the like on a jack and place the panel assembly - front door on it.



2. Apply grease to the sliding area of door hinges, and install to vehicle.
3. Adjust the height by the jack, and temporarily install the panel assembly - front door to the upper hinge - front door and the lower hinge - front door.
   Note:
   - **When installing the panel assembly - front door, make sure that a uniform clearance is created around the panel.**
   - **Perform installation while paying attention to the assembly direction of the grommet.**
4. Adjust the clearance around the panel assembly - front door. Ref. to EXTERIOR BODY PANELS>Front Door>ADJUSTMENT.
5. Tighten the mounting bolts of the panel assembly - front door to the specified torque.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
6. Tighten the bolts and nuts of the checker assembly - front door.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to Target Not Found
7. Attach the door sash tape. Ref. to EXTERIOR BODY PANELS>Door Sash Tape>INSTALLATION.
8. Install the cover B pillar - front.
9. Before installing each part, check the following items.
   - Rod of the latch and actuator assembly - front is free from deformation.

- Grease is applied sufficiently to the rod joints of the latch and actuator assembly - front.
- Cable of the latch and actuator assembly - front is free from deformation such as fray.
- Grease is applied sufficiently to the cable joints of the latch and actuator assembly - front.

10. Install door internal parts in the reverse order of removal.
    - Cover sash - inner front
    - Weather strip - front door
    - Handle - door outer
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
    - Latch & actuator assembly - front
      Tightening torque:
      6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
    - Regulator & motor assembly - front for the front door
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
    - Sash ASSY - partition
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
    - Install the cover B pillar - front door INN.
      Caution:
      - **Always replace with a new part, because engagement of the claw weakens.**
      - **Do not damage the sash or sash tape INN while installing.**
    - Running channel - front door
      Caution:
      Check that the running channel - front door is securely fixed to the panel assembly - front door and to the sash assembly - partition.
    - Glass assembly - front door, and glass - front door partition
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
11. Connect door harness connector, and install the cover side sill - front. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>INSTALLATION.
12. Install the front door speaker assembly.
13. Install the outer mirror assembly.
    Tightening torque:
    7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
14. Install the front sealing cover.
15. Install the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.
16. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. FRONT DOOR HINGE

1. Apply grease to the sliding area of door hinges, and install the door hinge to vehicle.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
2. Adjust the height by the jack, and temporarily install the panel assembly - front door to the upper hinge - front door and the lower hinge - front door.
   Note:
   When installing the panel assembly - front door, make sure that a uniform clearance is created around the panel.

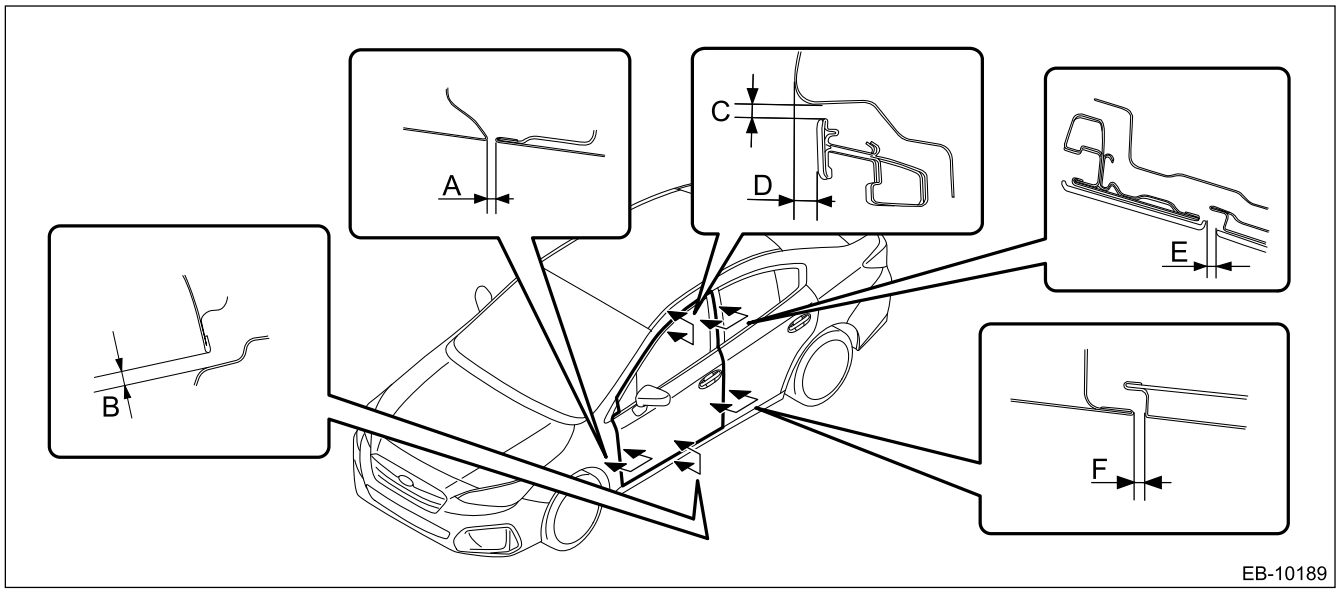
3. Adjust the clearance around the panel assembly - front door. Ref. to EXTERIOR BODY PANELS>Front Door>ADJUSTMENT.
4. Tighten the bolts of the panel assembly - front door to the specified torque.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
5. Connect door harness connector, and install the cover side sill - front. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>INSTALLATION.
6. Tighten the bolts and nuts of the checker assembly - front door.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to Target Not Found
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

EXTERIOR BODY PANELS > Front Door

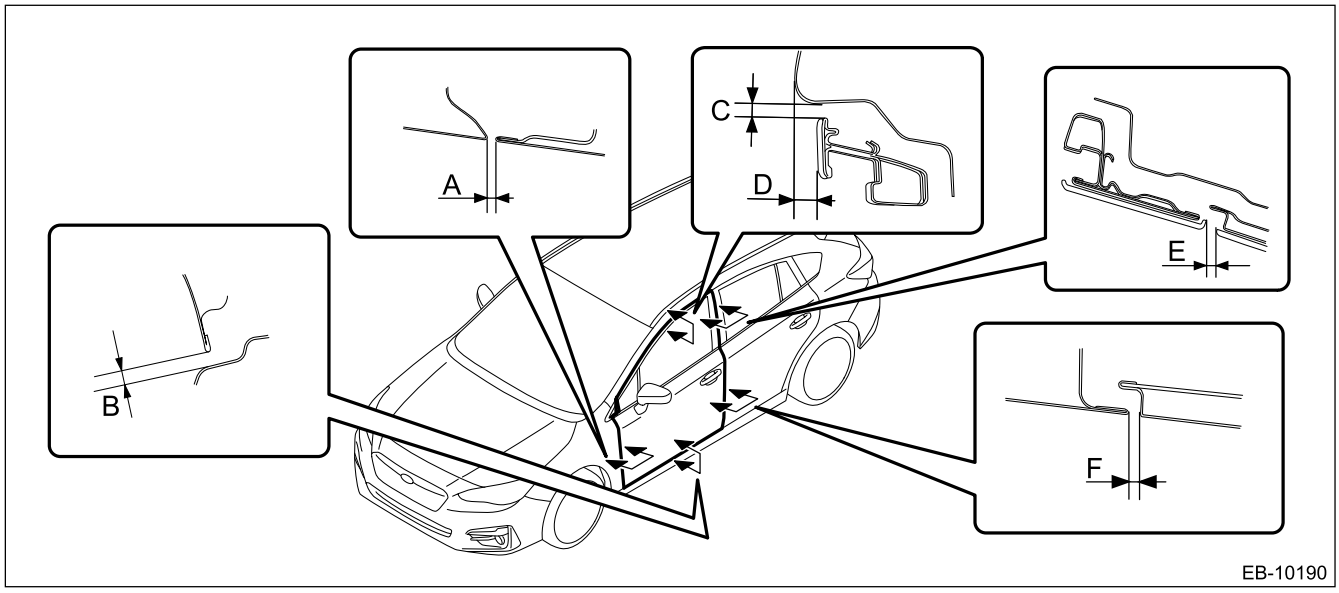
ADJUSTMENT

Adjust the clearance around the panel assembly - front door as follows.

- 4 door model



- 5 door model



	Part	Standard
A	Fender - front to Panel assembly - front door	3.9±0.9 mm (0.16±0.04 in)
B	Panel assembly - front door to Panel - side outer	6±1 mm (0.24±0.04 in)
C	Panel - side outer to Front door sash	5.1+1.5 ,-1 mm (0.2+0.06,-0.04 in)
D	Surface level gap between Panel - side outer to Front door sash	1.9±1.5 mm (0.07±0.06 in)
E	Cover B pillar - front to Cover B pillar - rear	5.8±1.7 mm (0.23±0.07 in)
F	Panel assembly - front door to Panel assembly - rear door	4±1 mm (0.16±0.04 in)

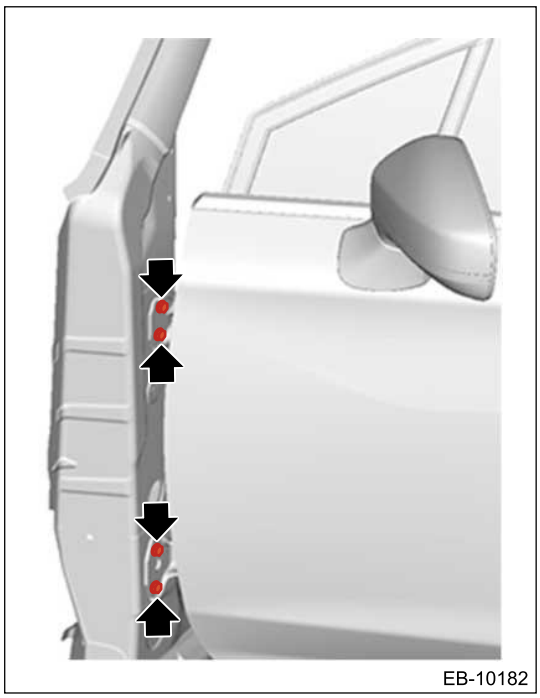
1. Adjust the vertical and horizontal positions of the panel assembly - front door.

(1) Using ST, loosen the bolts on vehicle side of the upper hinge - front door.

Preparation tool:

ST: WRENCH (925610000)

(2) Turn over the mud guard - front, and loosen the bolts on vehicle side of the lower hinge - front door.

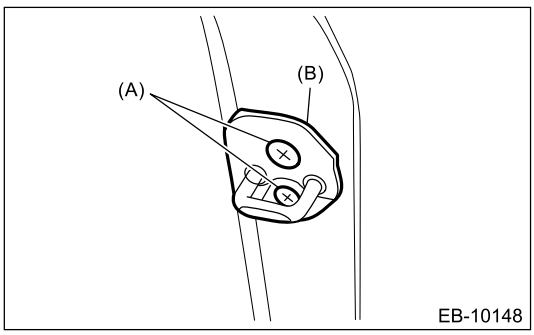


(3) Adjust the vertical and horizontal clearance of the panel assembly - front door.

2. Adjust the surface level gap between the panel assembly - front door and the panel assembly - rear door.

Caution:

Do not use an impact wrench. Welding area on the striker nut plate is easily broken.



(1) Loosen the screws (A).

(2) Tap the striker - front door (B) using a plastic hammer to adjust the surface level gap between the rear end of the panel assembly - front door and the front end of the panel assembly - rear door.

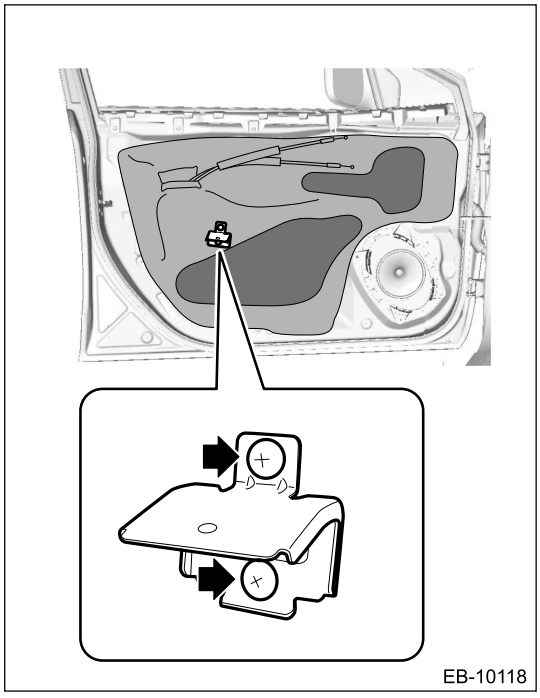
REMOVAL

1. FRONT SEALING COVER

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the front sealing cover.

   Caution:
   - **Carefully remove the butyl tape. Excessive force will easily break the cover.**
   - **If the front sealing cover gets broken, replace it with a new part.**
   - **Be careful not to allow the butyl tape to contact any trims and seats because the butyl tape, which has a strong adhesive force, is difficult to remove once it adhered.**

   (1) Remove the screw to remove the bracket - door trim front.
   (2) Disconnect connectors.
   (3) Carefully remove the butyl tape to remove the front sealing cover.



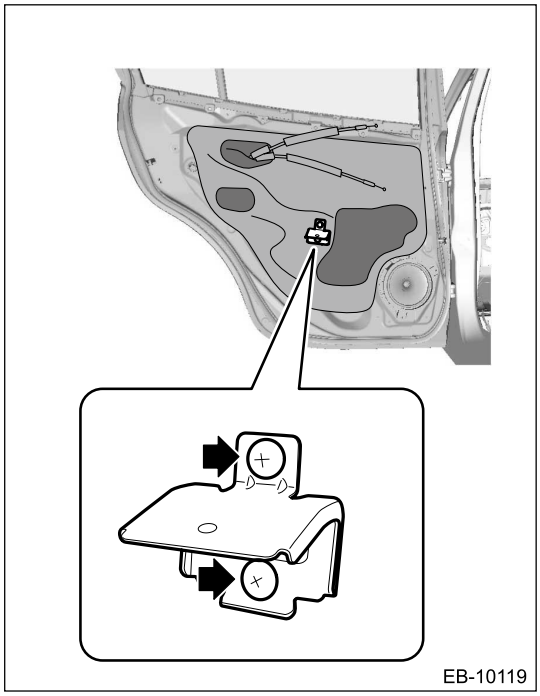
2. REAR SEALING COVER

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the rear sealing cover.

   Caution:
   - **Carefully remove the butyl tape. Excessive force will easily break the cover.**
   - **If the rear sealing cover gets broken, replace it with a new part.**
   - **Be careful not to allow the butyl tape to contact any trims and seats because the butyl tape, which has a strong adhesive force, is difficult to remove once it adhered.**

   (1) Remove the screw to remove the bracket - door trim rear.
   (2) Disconnect connectors.

(3) Carefully remove the butyl tape to remove the rear sealing cover.



EXTERIOR BODY PANELS > Sealing Cover

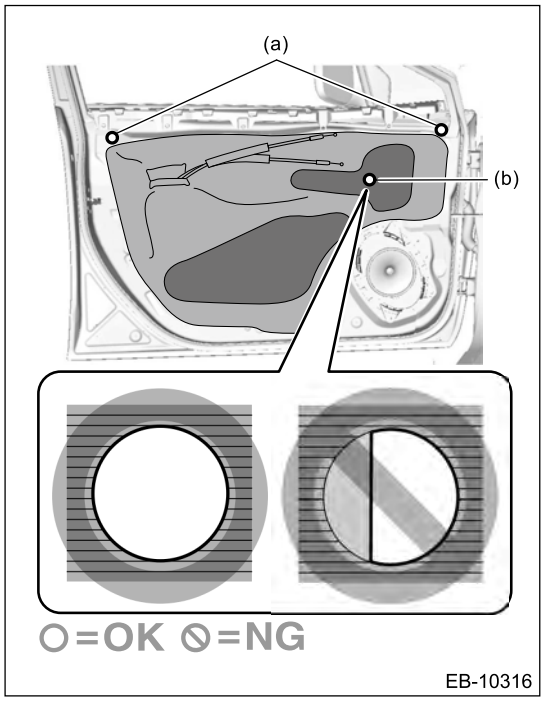
INSTALLATION

Caution:

- **If the sealing cover gets broken, replace it with a new part.**
- **Attach the sealing cover, keeping it from becoming wrinkled.**
- **If the sealing cover position is not aligned, it may cause improper door trim installation or water leakage.**
- **Apply a butyl tape evenly.**
- **Breaks in the bead will allow water leakage and contamination.**

1. FRONT SEALING COVER

1. Install the front sealing cover.
   (1) Install while aligning the reference holes located in the front and rear of the sealing cover with the reference projections (a) of the panel assembly - front door.
   (2) Check that the installation hole (b) of the trim panel - front door is not blocked.



(3) When replacing the sealing cover, use the butyl tape.

Preparation items:

Butyl tape: 3M Butyl Tape 8626 or equivalent

(4) Forcefully push the butyl tape portion to prevent any floating on surface.

2. Install the trim panel - front door.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. REAR SEALING COVER

1. Install the rear sealing cover.

(1) When replacing the sealing cover, use the butyl tape.

Preparation items:

Butyl tape: 3M Butyl Tape 8626 or equivalent

(2) Forcefully push the butyl tape portion to prevent any floating on surface.

2. Install the trim panel - rear door.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

EXTERIOR BODY PANELS > Sealing Cover

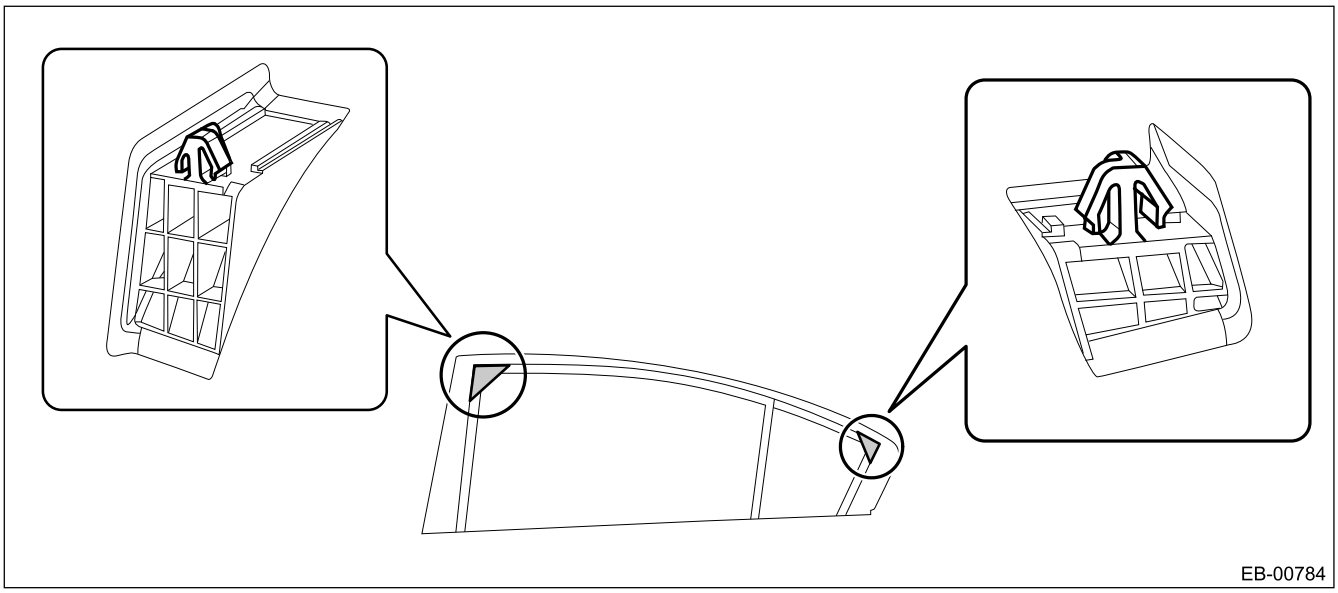
INSPECTION

If the sealing cover gets damaged, replace it with a new part.

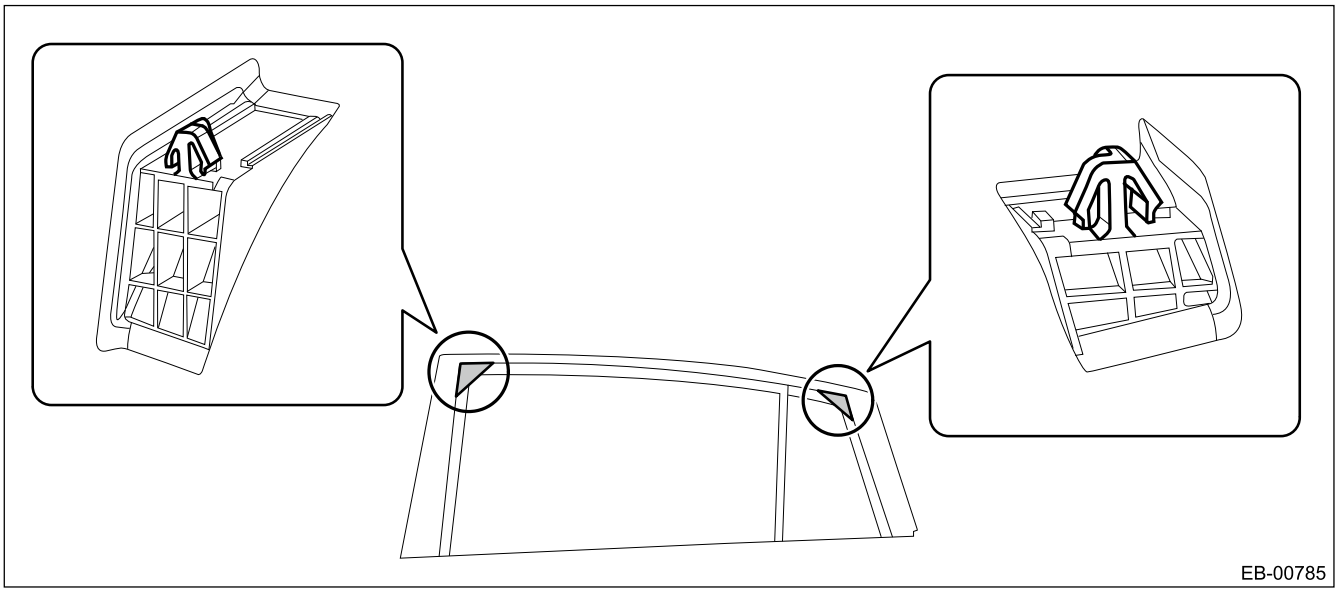
REMOVAL

1. REAR DOOR PANEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the rear sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
4. Remove the cover B pillar - rear door INN and the cover C pillar - rear door INN.
   Caution:
   - **Always replace with a new part, because engagement of the claw weakens.**
   - **Do not damage the sash or sash tape OUT while removing.**
   - 4 door model

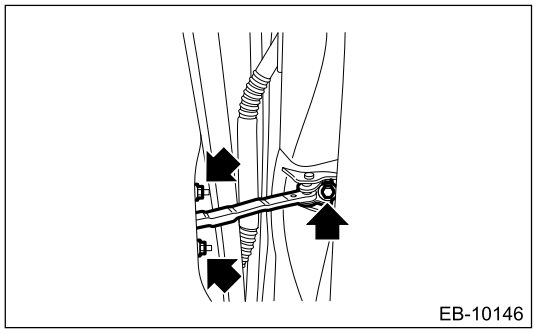


   - 5 door model

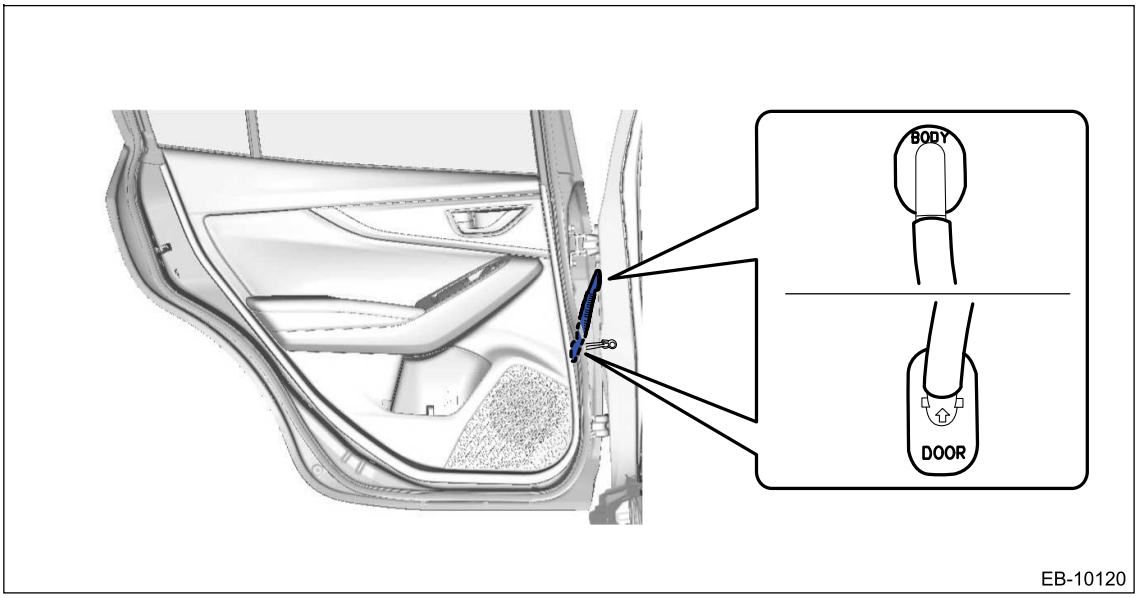


5. Remove the rear door speaker assembly. Ref. to ENTERTAINMENT & MONITORING>Rear Speaker>REMOVAL.

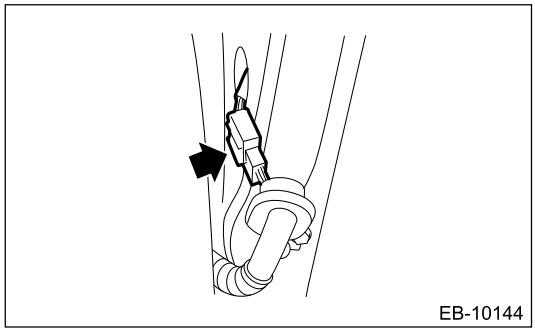
6. Remove the sash assembly - rear partition and the glass assembly - rear door. Ref. to GLASS/WINDOWS/MIRRORS>Rear Door Glass>REMOVAL.
7. Remove the door sash tape, the cover B pillar - rear and the cover C pillar (5 door model). Ref. to EXTERIOR BODY PANELS>Door Sash Tape>REMOVAL.
8. Remove the regulator - rear. Ref. to GLASS/WINDOWS/MIRRORS>Rear Regulator and Motor Assembly>REMOVAL.
9. Remove the latch and actuator assembly - rear. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>REMOVAL.
10. Remove the cover - handle rear outer. Ref. to SECURITY AND LOCKS>Door Outer Handle>REMOVAL > REAR.
11. Remove the weather strip - rear door. Ref. to EXTERIOR BODY PANELS>Weather Strip>REPLACEMENT.
12. Remove the bolts and nuts, and then detach the checker assembly - rear door.



13. Disconnect the rear door harness connectors.
    (1) Remove the grommet and pull out the rear door harness connector from inside the center pillar.



    (2) Disconnect the rear door harness connectors.



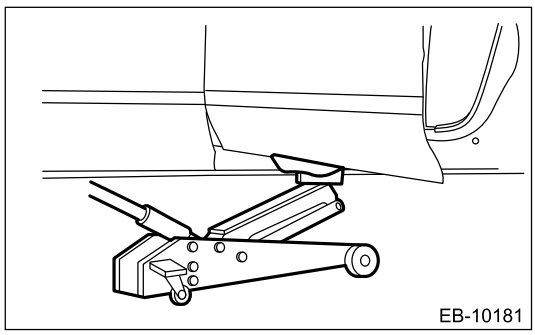
14. Before removing the panel assembly - rear door, make the following preparations.

Caution:

Do not excessively lift the panel assembly - rear door with the floor jack. The door hinges may be damaged.

(1) Put a wooden block on a floor jack and place the jack under the panel assembly - rear door.

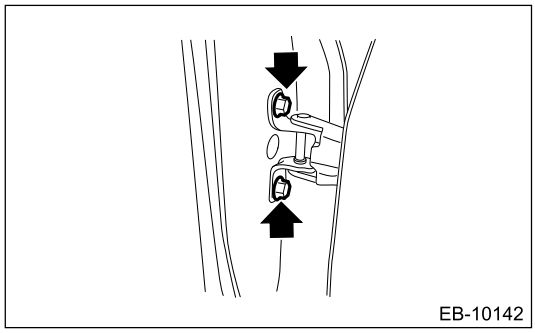
(2) Support the panel assembly - rear door with the jack to protect it from damage.



15. Remove the door-side bolts for the upper hinge - rear door and the lower hinge - rear door to remove the panel assembly - rear door.

Caution:

The panel assembly - rear door is heavy. When removing and installing it, always work in a team of two or more persons.



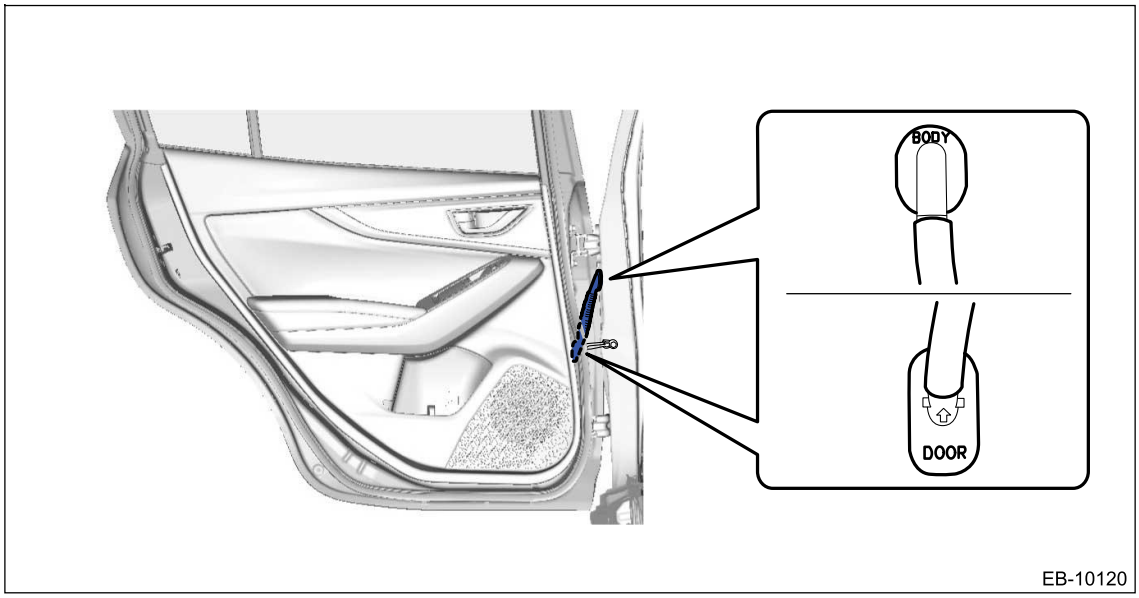
16. Remove the door hinge from vehicle. Ref. to EXTERIOR BODY PANELS>Rear Door>REMOVAL > REAR DOOR HINGE.

2. REAR DOOR HINGE

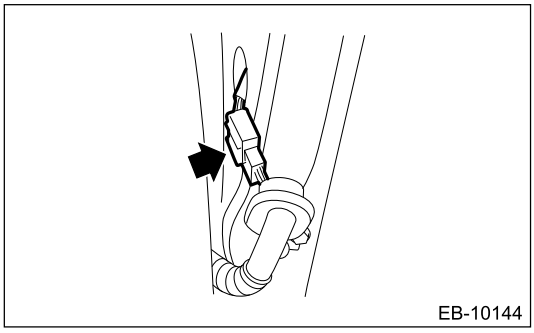
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. Disconnect the rear door harness connectors.

(1) Remove the grommet and pull out the rear door harness connector from inside the center pillar.



(2) Disconnect the rear door harness connectors.



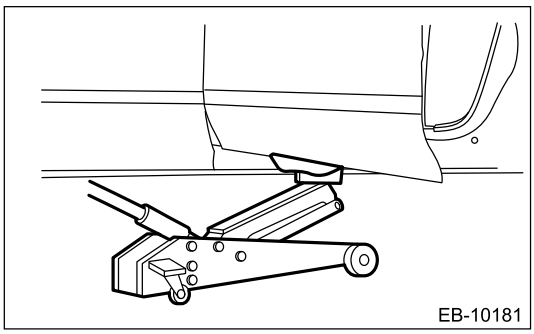
3. Before removing the panel assembly - rear door, make the following preparations.

Caution:

- **The panel assembly - rear door is heavy. When removing and installing it, always work in a team of two or more persons.**
- **Do not excessively lift the panel assembly - rear door with the floor jack. The door hinges may be damaged.**

(1) Put a wooden block on a floor jack and place the jack under the panel assembly - rear door.

(2) Support the panel assembly - rear door with the jack to protect it from damage.



4. Remove the bolts on the side of the panel assembly - rear door of the upper hinge - rear door or the lower hinge - rear door.

Caution:

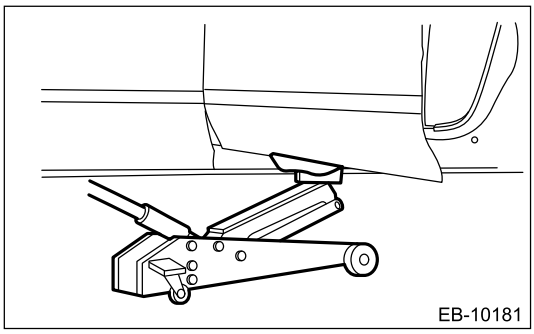
Do not remove the upper hinge - rear door and the lower hinge - rear door at the same time.

5. Remove the hinge - rear door from the vehicle.

INSTALLATION

1. REAR DOOR PANEL

1. Put a wooden block and the like on a jack and place the panel assembly - rear door on it.



2. Adjust the height by the jack, and temporarily install the panel assembly - rear door to the upper hinge - rear door and the lower hinge - rear door.
   Note:
   - **When installing the panel assembly - rear door, make sure that a uniform clearance is created around the panel.**
   - **Perform installation while paying attention to the assembly direction of the grommet.**
3. Adjust the clearance around the panel assembly - rear door. Ref. to EXTERIOR BODY PANELS>Rear Door>ADJUSTMENT.
4. Tighten the mounting bolts of the panel assembly - rear door to the specified torque.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
5. Tighten the bolts and nuts of the checker assembly - rear door.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to Target Not Found
6. Connect the door harness connector, and install the harness grommet.
7. Attach the door sash tape. Ref. to EXTERIOR BODY PANELS>Door Sash Tape>INSTALLATION.
8. Install the cover B pillar - rear and the cover C pillar (5 door model).
9. Before installing each part, check the following items.
   - Is the lever of the frame assembly - rear door outer is free from deformation?
   - Is grease applied sufficiently to the rod joints of the latch and actuator assembly - rear?
   - Is the cable of the latch and actuator assembly - rear free from deformation such as fray?
   - Is grease applied sufficiently to the cable joints of the latch and actuator assembly - rear?
10. Install door internal parts in the reverse order of removal.
    - Weather strip - rear door
    - Handle - door outer
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
    - Latch & actuator assembly - rear
      Tightening torque:
      6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
      Note:
      Make sure the child safety lock works correctly after installation.
    - Regulator & motor assembly - rear for the rear door
      Tightening torque:
      7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

- Sash assembly - rear partition, and glass assembly - rear door
  Tightening torque:
  7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
- Running channel - rear door
  Caution:
  Check that the running channel - rear door is securely fixed to the panel assembly - rear door and to the sash assembly - partition.

11. Install the cover B pillar - rear door INN and the cover C pillar - rear door INN.
    Caution:
    - **Always replace with a new part, because engagement of the claw weakens.**
    - **Do not damage the sash or sash tape INN while installing.**
12. Install the rear door speaker assembly.
13. Install the rear sealing cover.
14. Install the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.
15. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. REAR DOOR HINGE

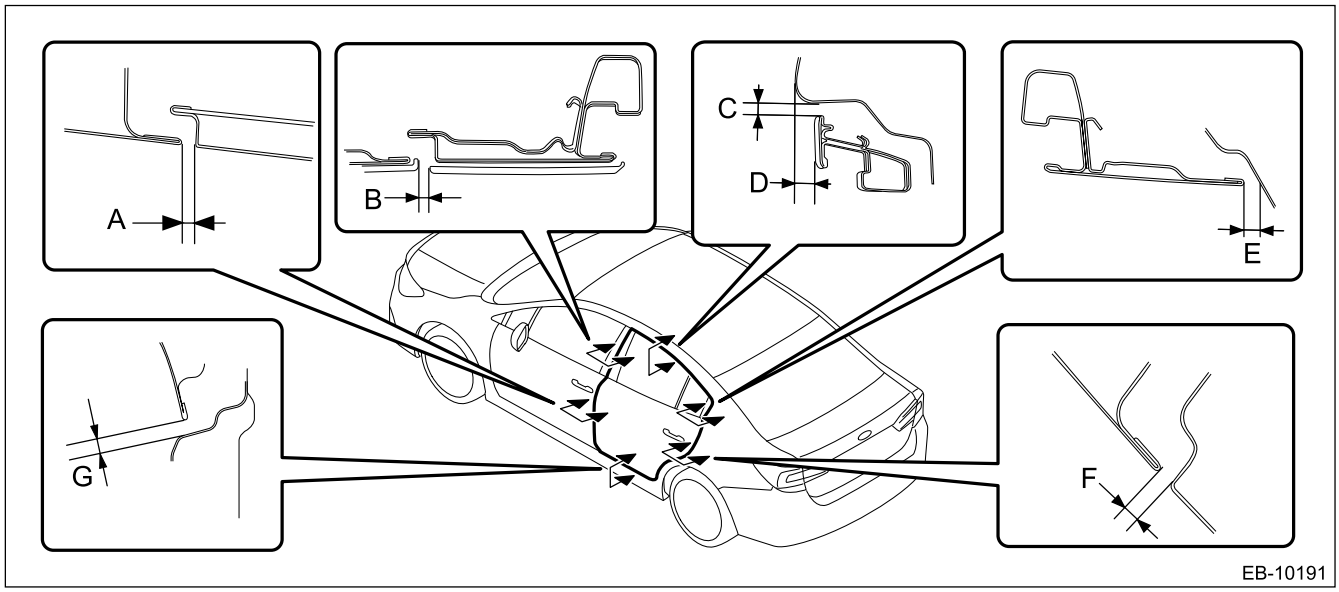
1. Apply grease to the sliding area of door hinges, and install to vehicle.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
2. Adjust the height by the jack, and temporarily install the panel assembly - rear door to the upper hinge - rear door and the lower hinge - rear door.
   Note:
   When installing the panel assembly - rear door, make sure that a uniform clearance is created around the panel.
3. Adjust the clearance around the panel assembly - rear door. Ref. to EXTERIOR BODY PANELS>Rear Door>ADJUSTMENT.
   Note:
   When installing the panel assembly - rear door, make sure that a uniform clearance is created around the panel.
4. Tighten the bolts of the panel assembly - rear door to the specified torque.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
5. Connect door harness connector.
6. Tighten the bolts on the vehicle side of the checker assembly - rear door.
   Tightening torque:
   Refer to “COMPONENT” of “General Description”. Ref. to Target Not Found
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

EXTERIOR BODY PANELS > Rear Door

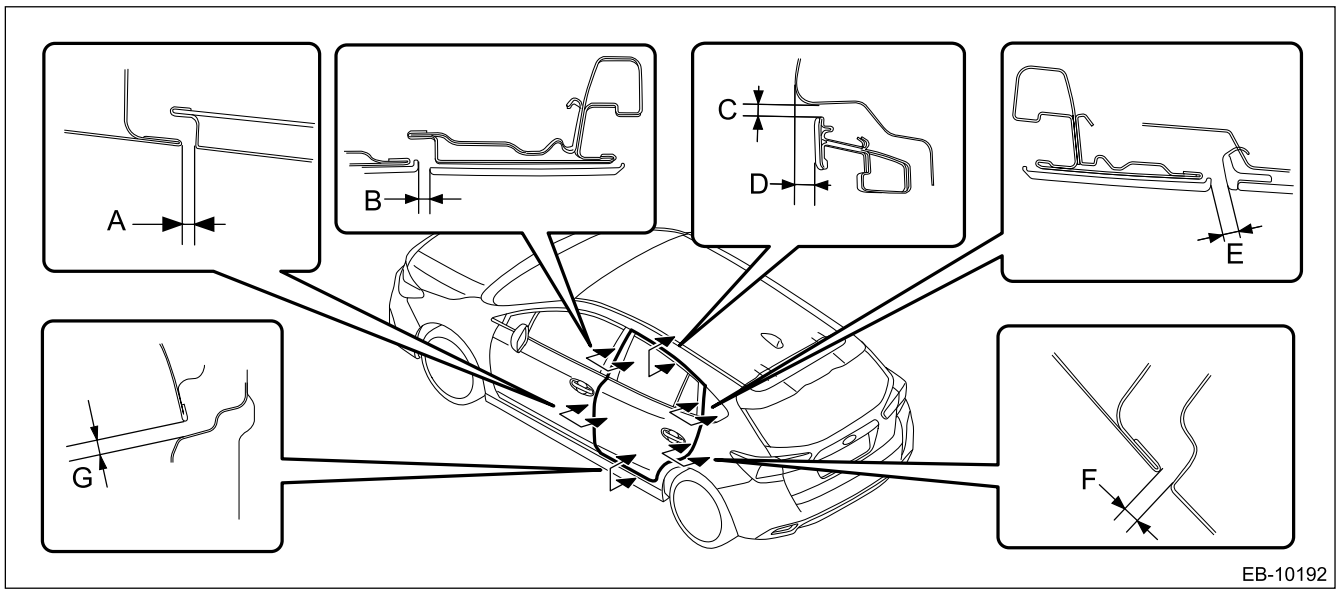
ADJUSTMENT

Adjust the clearance around the panel assembly - rear door as follows.

- 4 door model

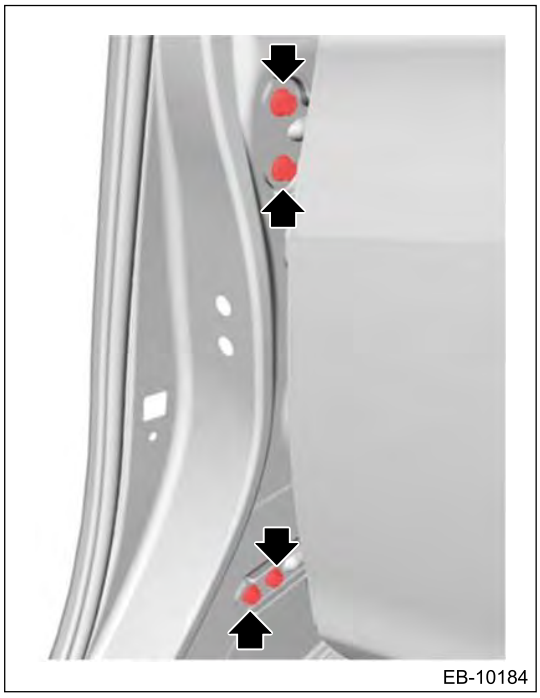


- 5 door model



Part		Standard
A	Panel assembly - front door to Panel assembly - rear door	4±1 mm (0.16±0.04 in)
B	Front door sash to Rear door sash	5.8±1.7 mm (0.23±0.07 in)
C	Panel - side outer to Rear door sash	5.1+1.5,−1 mm (0.2+0.06,−0.04 in)
D	Surface level gap between Panel - side outer to Rear door sash	2.7 ± 1.5 mm (0.11 ± 0.06 in)
E	Rear door sash to Panel - side outer	5.5±2.1 mm (0.22±0.08 in)
F	Panel assembly - rear door to Panel - side outer	3.9±0.9 mm (0.16±0.04 in)
G	Panel assembly - rear door to Panel - side outer	6±1 mm (0.24±0.04 in)

1. Adjust the vertical and horizontal positions of the panel assembly - rear door.
(1) Loosen the body side bolts of the upper hinge - rear door and the lower hinge - rear door.
(2) Adjust the vertical and horizontal clearance of the panel assembly - rear door.



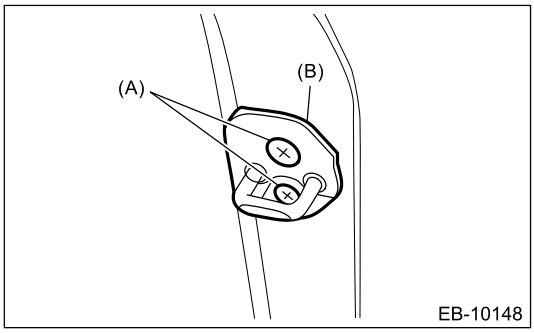
2. Adjust the surface level gap between the panel assembly - rear door and the body.

Caution:

Do not use an impact wrench. Welding area on the striker nut plate is easily broken.

(1) Loosen the screws (A).

(2) Tap the striker - rear door (B) using a plastic hammer to adjust the surface level gap between the rear end of the panel assembly - rear door and the rear quarter.

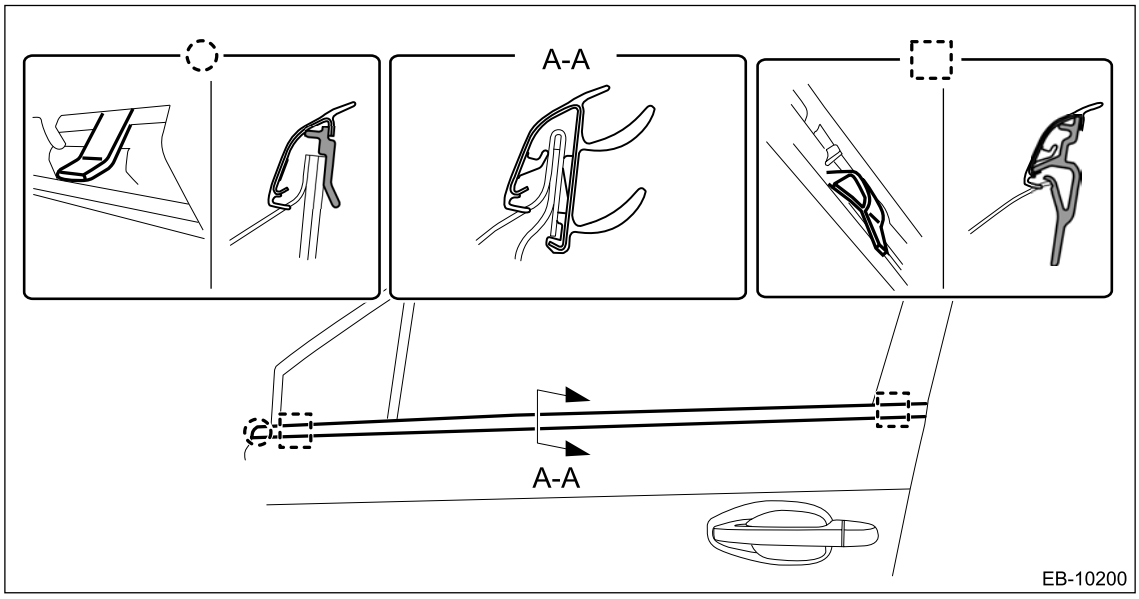


REMOVAL

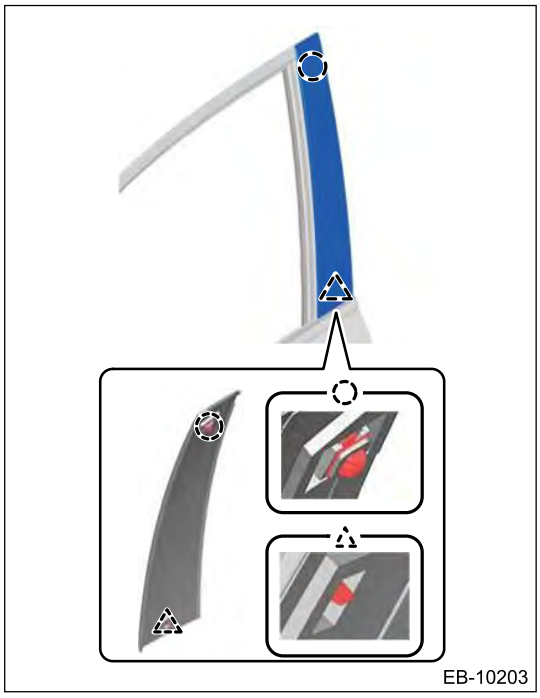
1. FRONT DOOR

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly>REMOVAL.
4. Remove the front sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
5. Remove the glass assembly - front door and the glass - front door partition. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL.
6. Remove the running channel - front door.
7. Remove the weather strip outer - front door.

   Caution:
   - **When removing the weather strip outer, be careful not to damage the vehicle.**
   - **Do not reuse the weather strip outer. Always replace with a new part.**



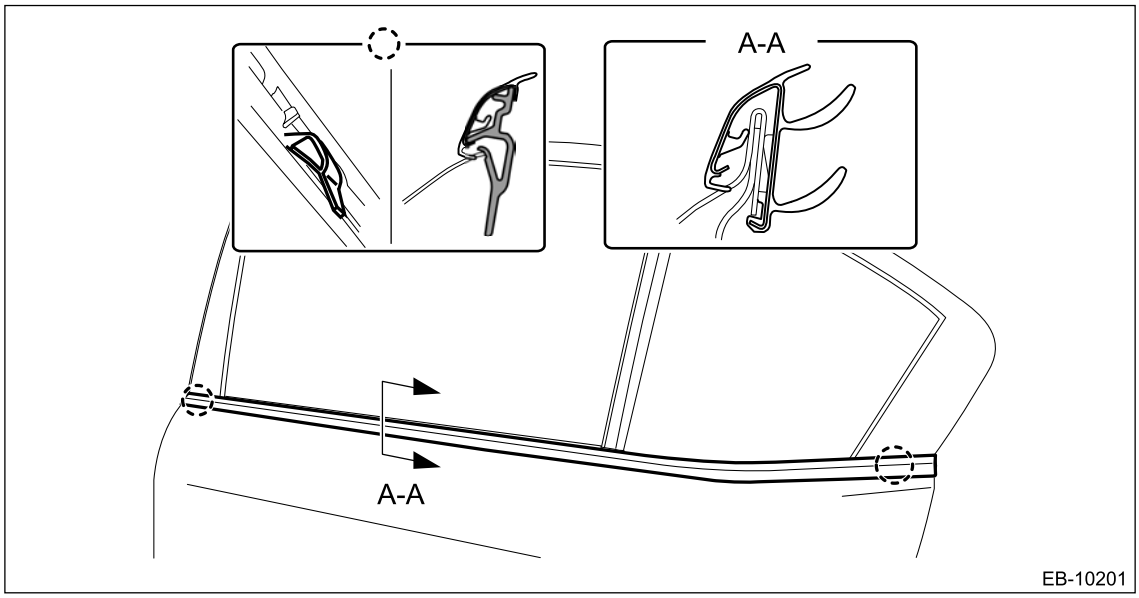
8. Remove the cover B pillar - front.



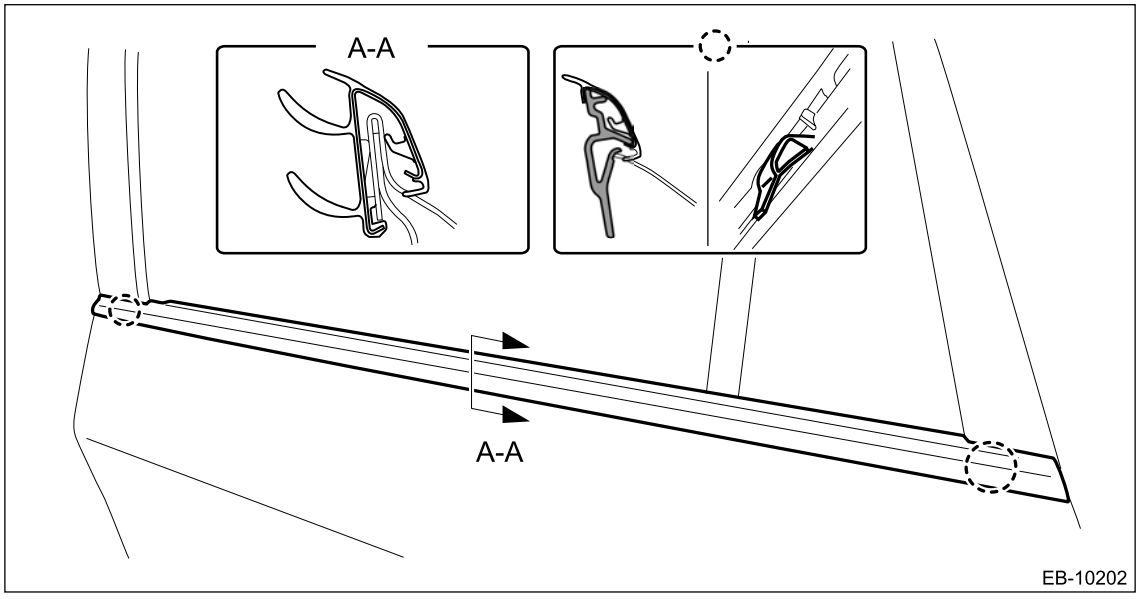
9. Peel the door sash tape from the door sash.
   Note:
   - **If the tape is difficult to remove, warm the tape with a hairdryer, etc. to make the removal easier.**
     Use a household hairdryer. Do not use industrial dryers.
   - **If tape residue is remaining on the door sash, wipe clean.**

2. REAR DOOR

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the rear sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
4. Remove the glass assembly - rear door. Ref. to GLASS/WINDOWS/MIRRORS>Rear Door Glass>REMOVAL.
5. Remove the running channel - rear door.
6. Remove the weather strip outer - rear door.
   Caution:
   - **When removing the weather strip outer, be careful not to damage the vehicle.**
   - **Do not reuse the weather strip outer. Always replace with a new part.**
   - 4 door model

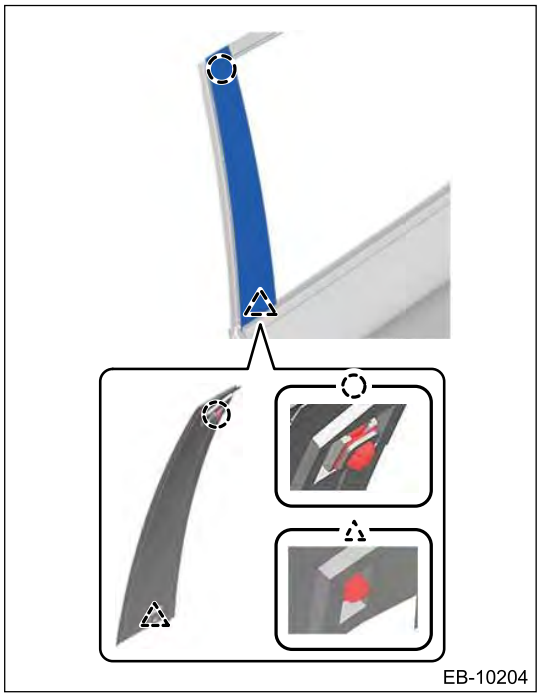


- 5 door model



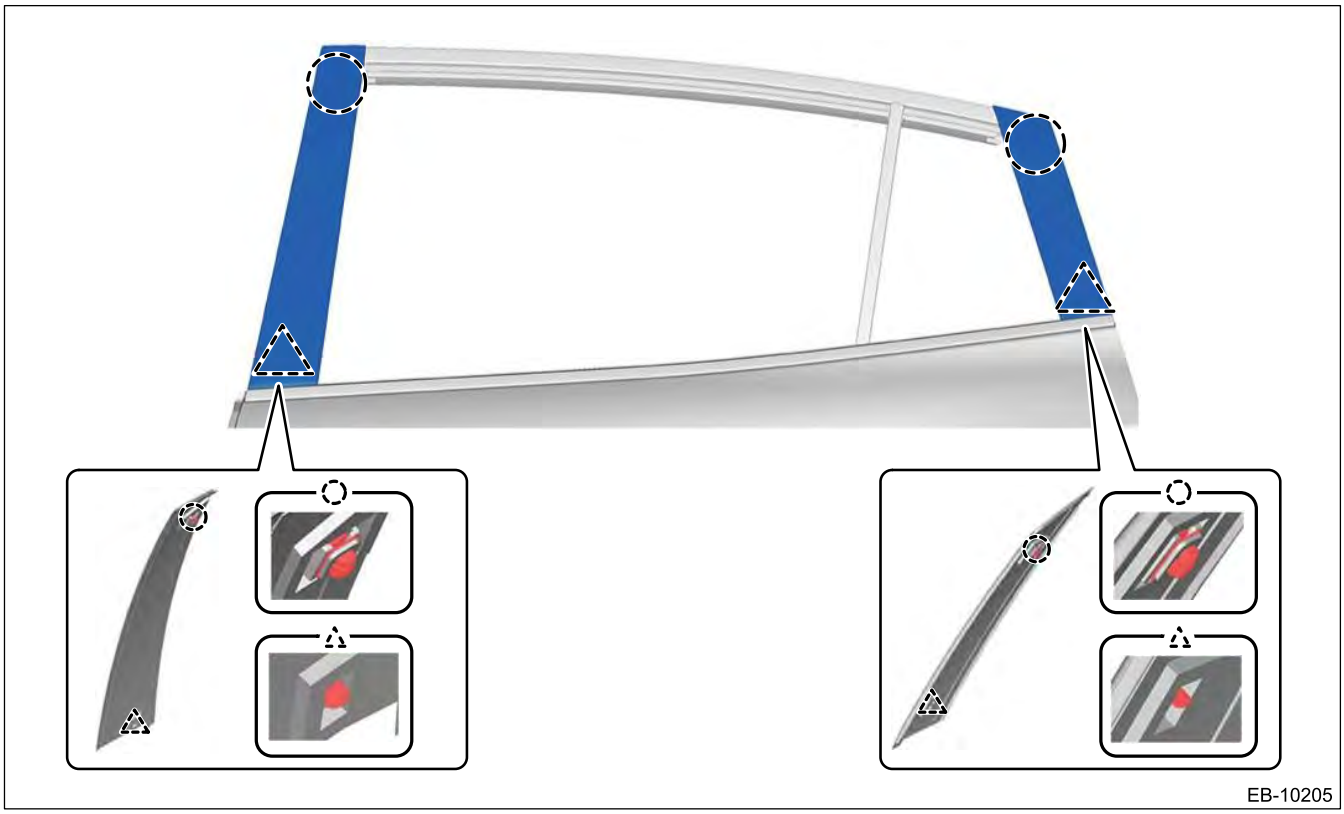
7. Remove the cover B pillar - rear and the cover C pillar (5 door model).

- 4 door model



(a) Cover B pillar - rear

- 5 door model



(a) Cover B pillar - rear (b) Cover C pillar

8. Peel the door sash tape from the door sash.

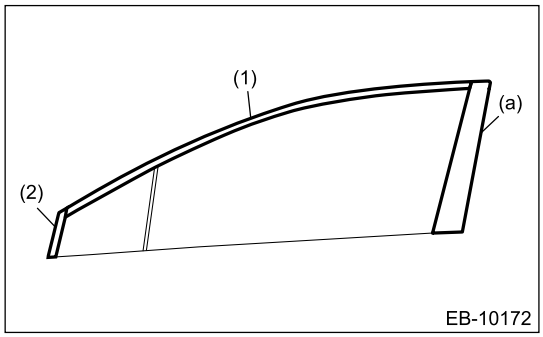
Note:

- **If the tape is difficult to remove, warm the tape with a hairdryer, etc. to make the removal easier.**
  Use a household hairdryer. Do not use industrial dryers.
- **If tape residue is remaining on the door sash, wipe clean.**

INSTALLATION

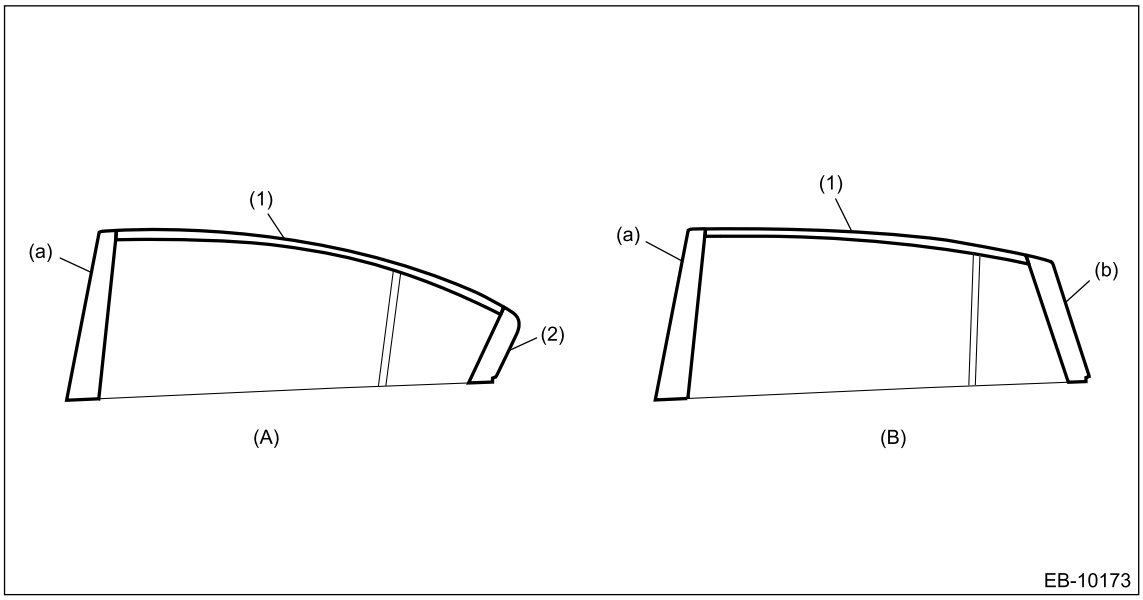
Caution:

- **Do not reuse the removed door sash tape. Replace it with a new tape.**
- **Press evenly along the sash when applying the tape using a spatula or similar object to make sure no bubbles are formed.**
  If air bubbles are formed, reapply the tape.
- **If the tape is wrinkled, etc. during application, replace the tape.**
- **Be sure to press the ends of the tape firmly to adhere securely. If the tape comes off at the ends or where folded, the adhesive strength is weakened and the tape may peel off.**
- **There are locations where the tape ends will overlap each other. When applying the tape, be careful of the order of their application.**
  - **Front**



(a) Cover B pillar - front

- **Rear**

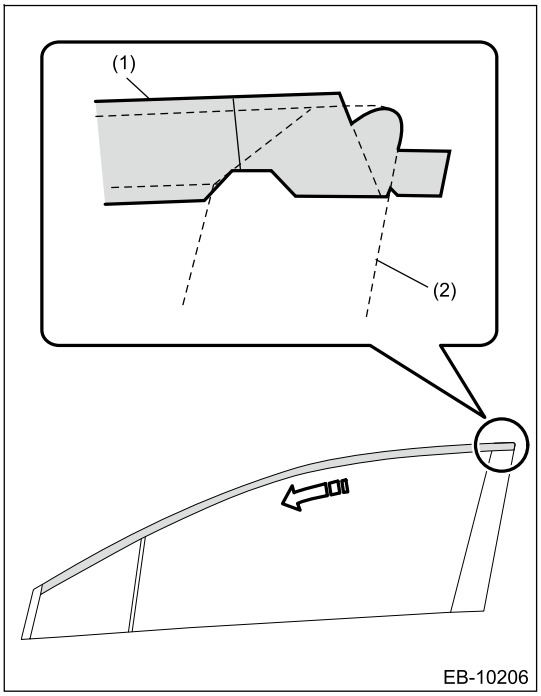


(A) 4 door model
(B) 5 door model
(a) Cover B pillar - rear
(b) Cover C pillar

- **Do not reuse the weather strip outer. Always replace with a new part.**

1. FRONT DOOR (4 DOOR MODEL)

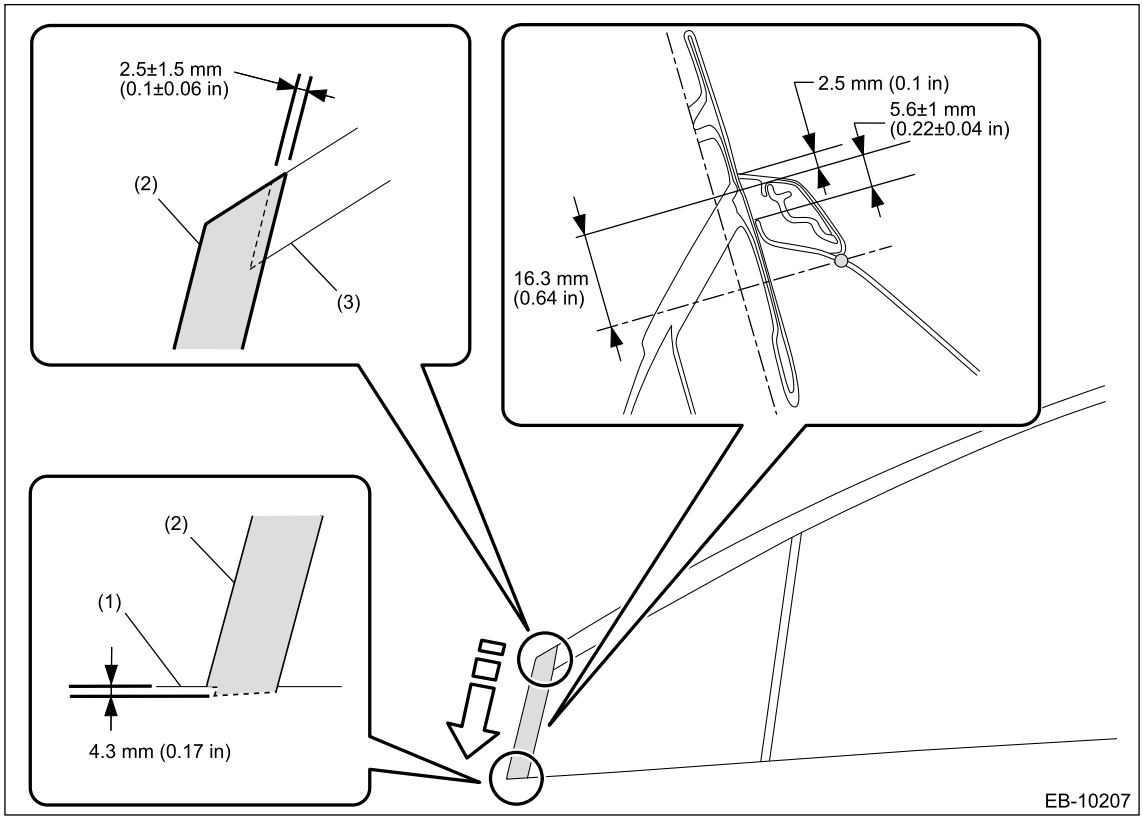
1. Apply the front door sash tape - medium from the rear of the vehicle towards the front.



(1) Front door sash tape - medium

(2) Cover B pillar - front

2. Apply the front door sash tape - front from the top of the vehicle towards the bottom.

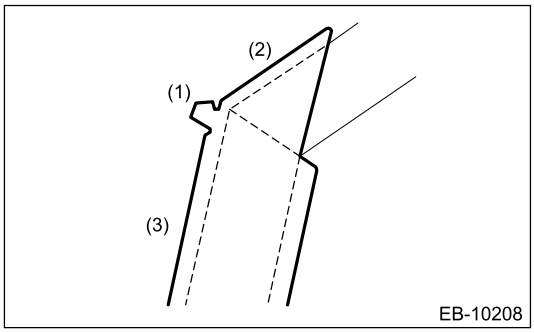


(1) End of panel outer

(2) Front door sash tape - front

(3) Front door sash tape - medium

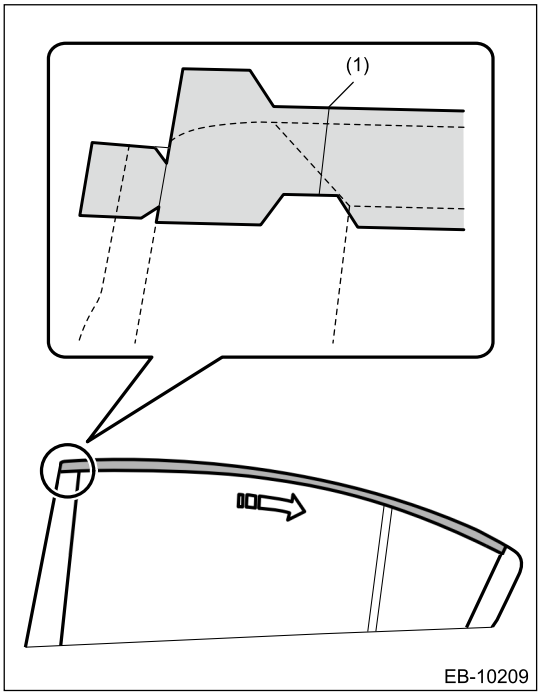
3. Fold the corners at the door upper end area in the order of (1) — (3).



4. Install the cover B pillar - front.
5. Install the weather strip outer - front door.
6. Install the running channel - front door.
7. Install the glass assembly - front door.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the front sealing cover.
9. Install the outer mirror assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
10. Install the trim panel - front door.
11. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

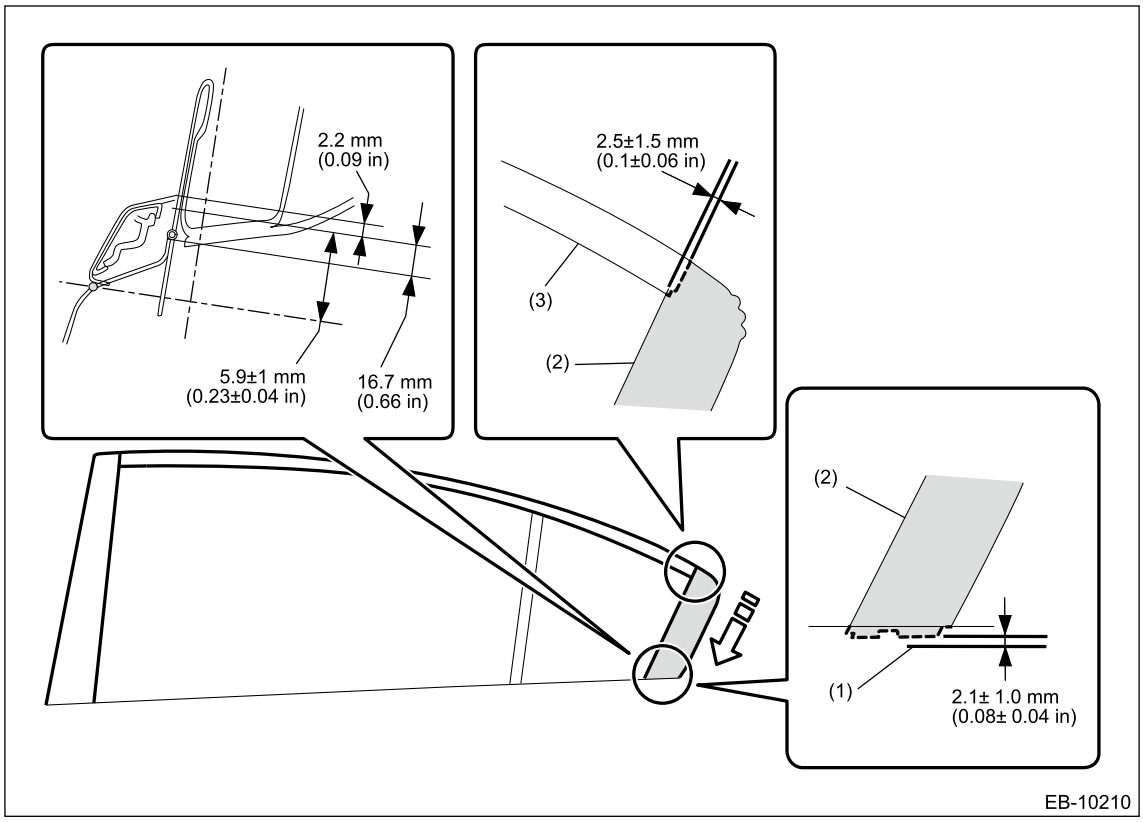
2. REAR DOOR (4 DOOR MODEL)

1. Apply the rear door sash tape - medium from the front of the vehicle towards the rear.



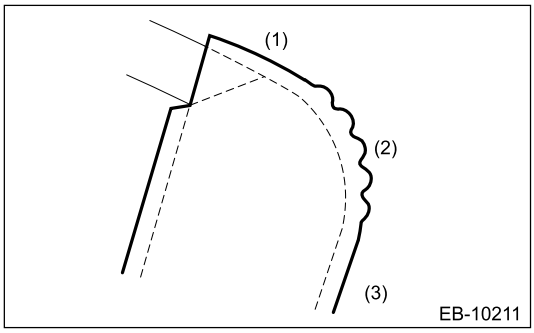
(1) Rear door sash tape - medium

2. Apply the rear door sash tape - rear from the top of the vehicle towards the bottom.



(1) End of panel outer (2) Rear door sash tape - rear (3) Rear door sash tape - medium

3. Fold the corners at the door upper end area in the order of (1) — (3).



4. Install the cover B pillar - rear.
5. Install the weather strip outer - rear door.
6. Install the running channel - rear door.
7. Install the glass assembly - rear door.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

8. Install the rear sealing cover.
9. Install the trim panel - rear door.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

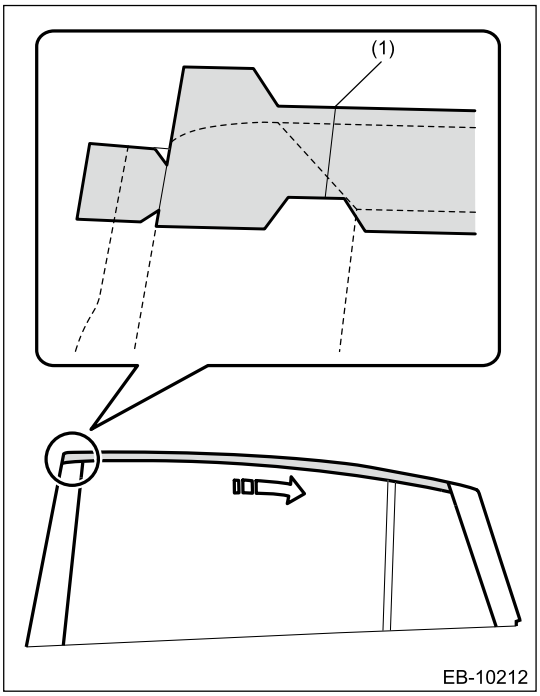
3. REAR DOOR (5 DOOR MODEL)

OUTER SASH TAPE

1. Apply the rear door sash tape - medium from the front of the vehicle towards the rear.

Note:

Apply the end of the tape to the position shown in the figure.



(1) Rear door sash tape - medium

REMOVAL

1. TORSION BAR

Caution:

Trunk lid COMPL is heavy. When removing and installing it, always work in a team of two or more persons.

1. Remove the trunk room trim. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
2. Remove the torsion bar - trunk lid.

   Caution:

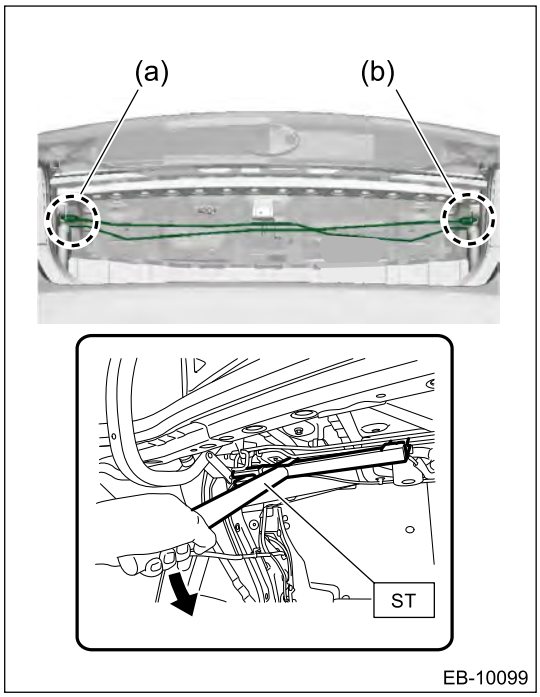
   During removal and installation, handle the torsion bar - trunk lid carefully, because it will generate reactive force.

   Preparation tool:

   ST: REMOVER (99099FJ000) and REMOVER (927780000)

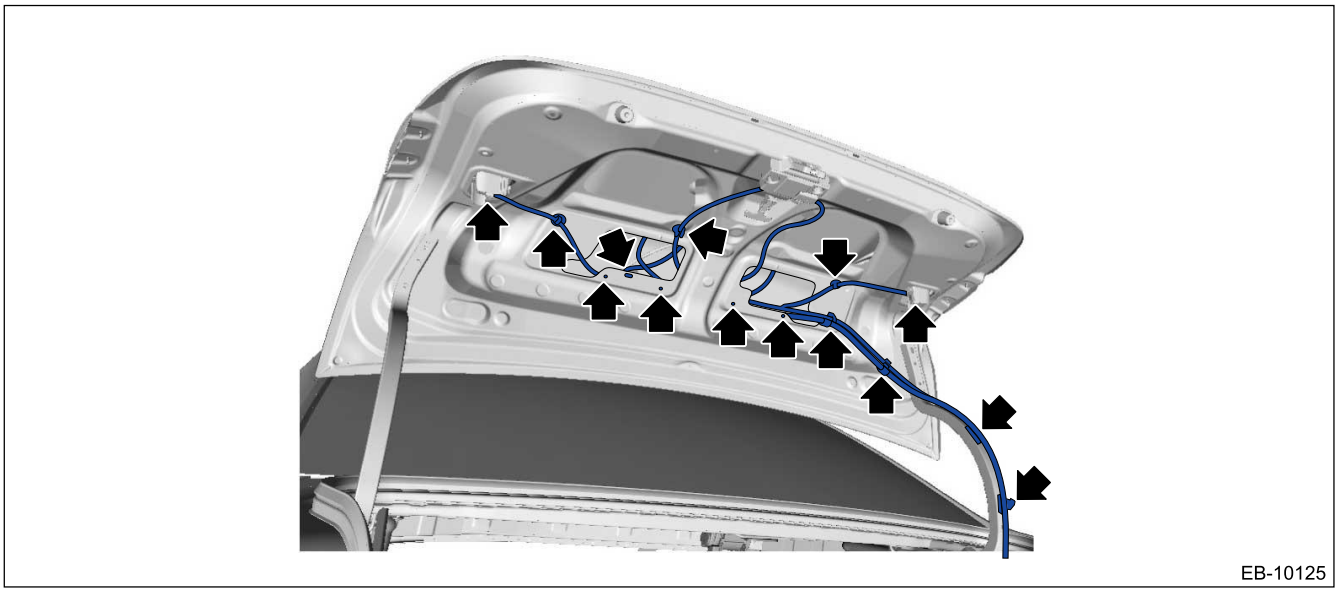
   (1) Remove the torsion bar - trunk lid on the LH side from the hinge link (a).

   (2) Remove the torsion bar - trunk lid on the RH side from the hinge link (b).



2. TRUNK LID PANEL

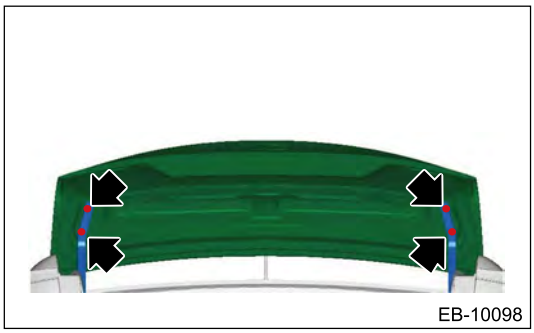
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trunk room trim. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the lock assembly - trunk lid. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly>REMOVAL.
4. Disconnect the connector to remove the trunk lid harness.



5. Remove the rear finisher light assembly. Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly>REMOVAL > 4 DOOR MODEL.
6. Remove the rearview camera assembly. Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System>REMOVAL.
7. Detach the rear spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Rear Spoiler>REMOVAL.
8. Remove the trunk lid COMPL.

Caution:

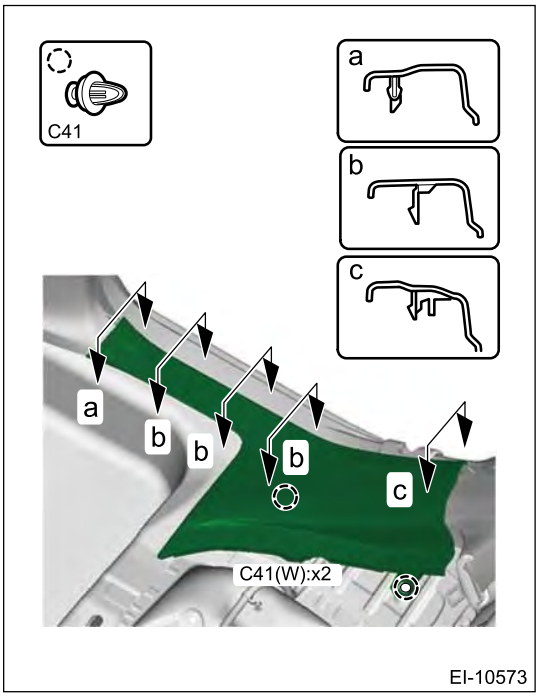
Trunk lid COMPL is heavy. When removing and installing it, always work in a team of two or more persons.



9. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
10. Release the clips and claws, and remove the side sill covers - rear INN on the left and right sides.

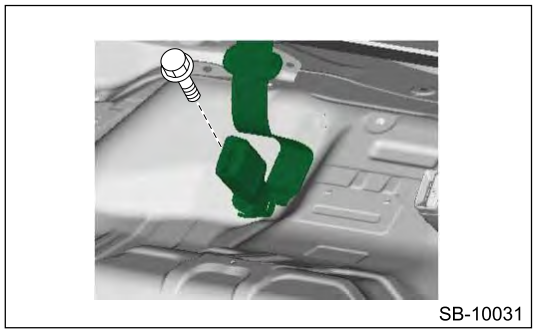
Caution:

Do not pull with excessive force. Doing so may damage the claws of the side sill cover - rear INN.



11. Remove the trim panel - rear pillar UPR and trim panel - rear pillar LWR on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.

12. Remove the bolts, and remove the lower anchor of the seat belt - rear shoulder CTR.

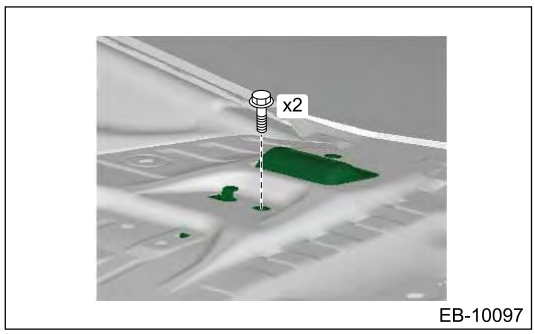


13. Remove the trim panel assembly - rear shelf. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>REMOVAL.

14. Remove the trunk lid arm assembly.

(1) Remove the torsion bar - trunk lid from the trunk lid arm. Ref. to EXTERIOR BODY PANELS>Trunk Lid>REMOVAL > TORSION BAR.

(2) Remove the left and right bolts, then remove the trunk lid arm assembly.



EXTERIOR BODY PANELS > Trunk Lid

INSTALLATION

1. Install the trunk lid arm assembly.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

2. Install the trim panel assembly - rear shelf.
3. Install the lower anchor of seat belt - rear shoulder CTR.

Tightening torque:

30 N·m (3.1 kgf-m, 22.1 ft-lb)

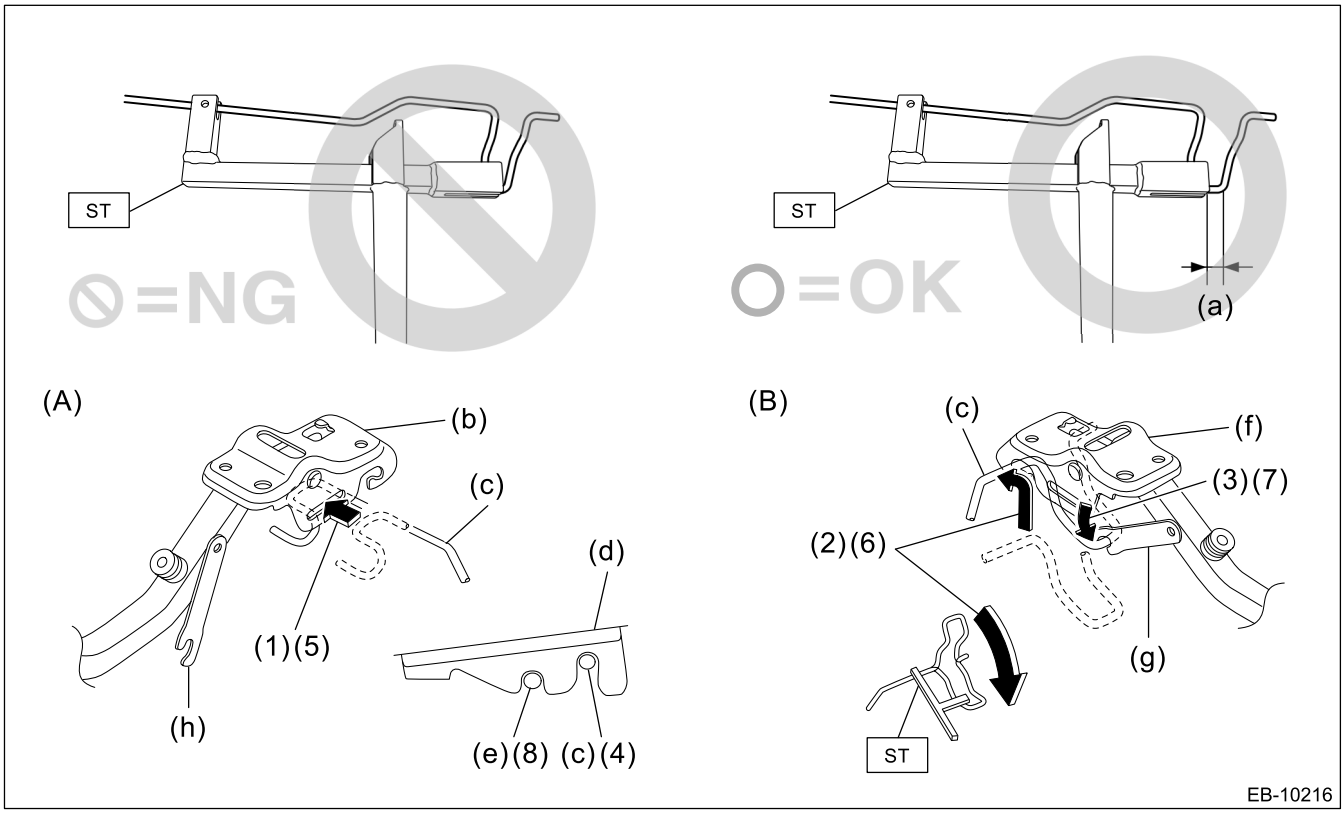
4. Install the trim panel - rear pillar UPR and the trim panel - rear pillar LWR.
5. Install the side sill cover - rear INN.
6. Install the rear seat cushion assembly.
7. Install the torsion bar - trunk lid.

Caution:

- **When performing installation, pay close attention to the original marks and shapes of the torsion bar - trunk lid on the RH and LH sides.**
- **When installing the remover to the torsion bar - trunk lid, leave a slight clearance (a).**

Preparation tool:

ST: REMOVER (99099FJ000) and REMOVER (927780000)



(A) Left Hand
(B) Right Hand

(a) Clearance
(b) Hinge bracket LH
(c) Torsion bar - trunk lid LH
(d) Bracket - torsion bar
(e) Torsion bar - trunk lid RH
(f) Hinge bracket RH
(g) Hinge link RH
(h) Hinge link LH

(1) Insert the left end of the torsion bar - trunk lid LH (c) into the hole of the hinge bracket LH (b).
(2) Using the ST, hook the right end of the torsion bar - trunk lid LH (c) on the hinge bracket RH (f).
(3) Hook the hinge link RH (g) on the torsion bar - trunk lid LH (c).
(4) Tuck it in the cutout of bracket - torsion bar (d).
(5) Insert the right end of the torsion bar - trunk lid RH (e) into the hole of the hinge bracket RH (f).
(6) Using the ST, hook the left end of the torsion bar - trunk lid RH (e) on the hinge bracket LH (b).
(7) Hook the hinge link LH (h) on the torsion bar - trunk lid RH (e).

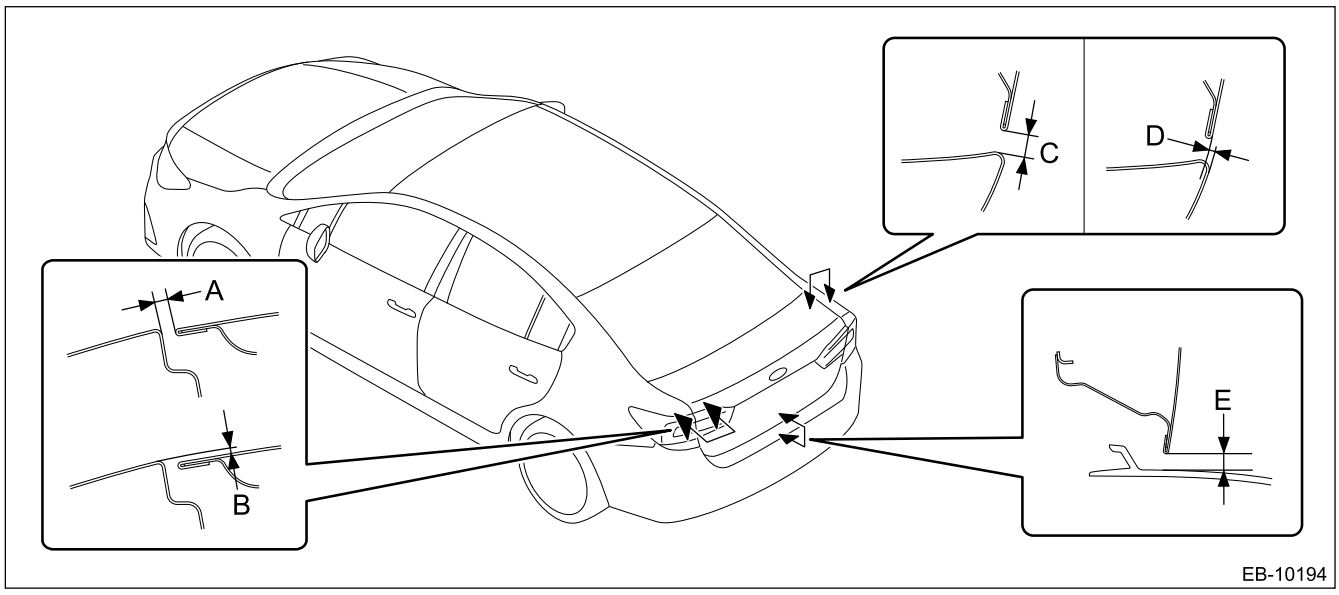
(8) Tuck it in the cutout of bracket - torsion bar (d).

8. Install the trunk lid COMPL.
   Tightening torque:
   14 N·m (1.4 kgf-m, 10.3 ft-lb)
9. Install the rear spoiler.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
10. Install the rearview camera assembly. Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System>INSTALLATION.
11. Install the rear finisher light assembly. Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly>INSTALLATION > 4 DOOR MODEL.
12. Install the trunk lid harness.
13. Install the lock assembly - trunk lid.
    Tightening torque:
    7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
14. Apply grease to the rotating area of hinges and the bracket - torsion bar in the vehicle center.
15. Install while paying attention to make a uniform clearance around the trunk lid COMPL. Ref. to EXTERIOR BODY PANELS>Trunk Lid>ADJUSTMENT.
    Tightening torque:
    Refer to "COMPONENT" of "General Description". Ref. to Target Not Found
16. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

EXTERIOR BODY PANELS > Trunk Lid

ADJUSTMENT

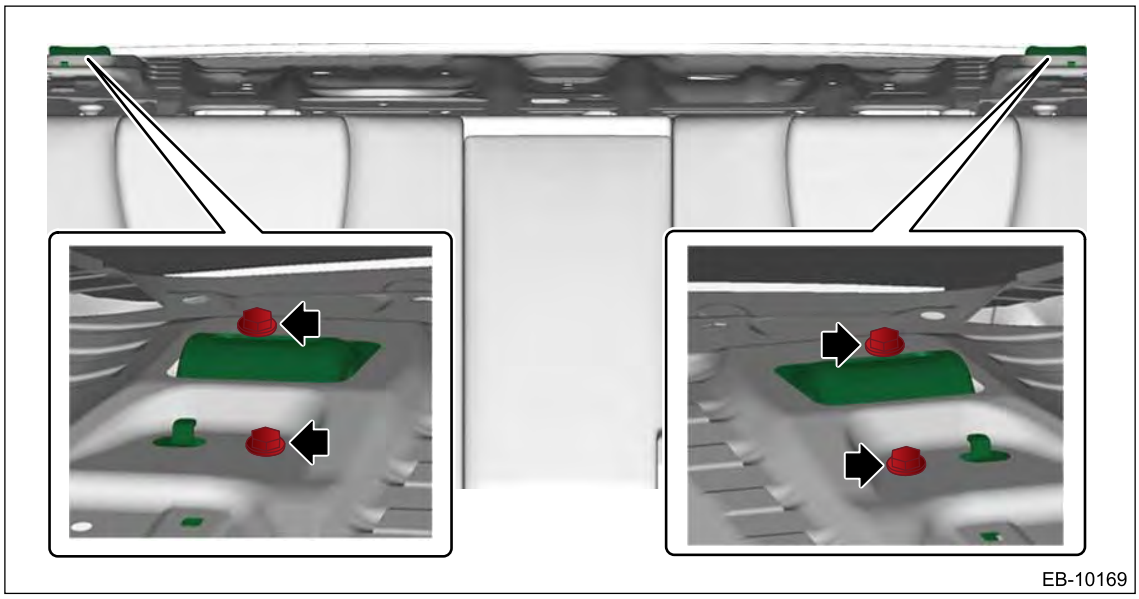
Adjust the clearance around the trunk lid COMPL as follows.



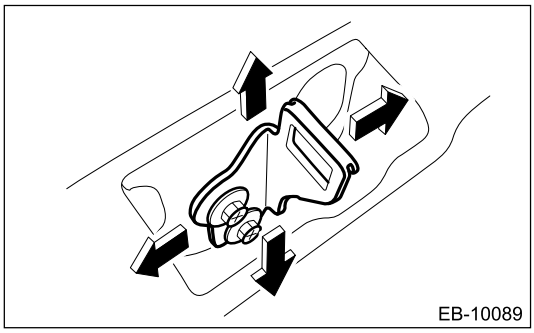
	Part	Standard
A	Trunk lid COMPL and Panel - side outer	3.5±1 mm (0.14±0.04 in)
B	Surface level gap between Trunk lid COMPL and Panel - side outer	−0.5±1 mm (−0.02±0.04)
C	Trunk lid COMPL and Panel - side outer	3.5±1 mm (0.14±0.04 in)
D	Surface level gap between Trunk lid COMPL and Panel - side outer	−0.5±1 mm (−0.02±0.04)

E	Trunk lid COMPL to Bumper face - rear	7.5 ± 1.5 mm (0.3 ± 0.06 in)

1. Adjust the horizontal position of the trunk lid COMPL.
(1) Loosen the mounting bolt.
(2) Adjust the horizontal clearance of the trunk lid COMPL.



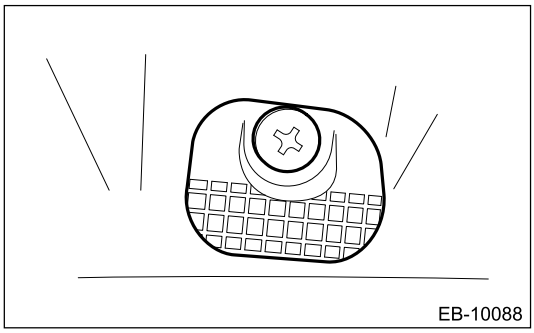
2. Adjust the surface level gap between the trunk lid COMPL and the body.
(1) Remove the trim panel - trunk rear.
(2) Loosen the bolt.
(3) Tap the striker - trunk using a plastic hammer to adjust the surface level gap between the trunk lid COMPL and the body.



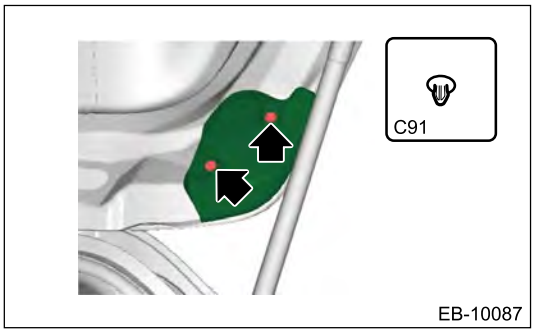
REMOVAL

1. REAR GATE PANEL

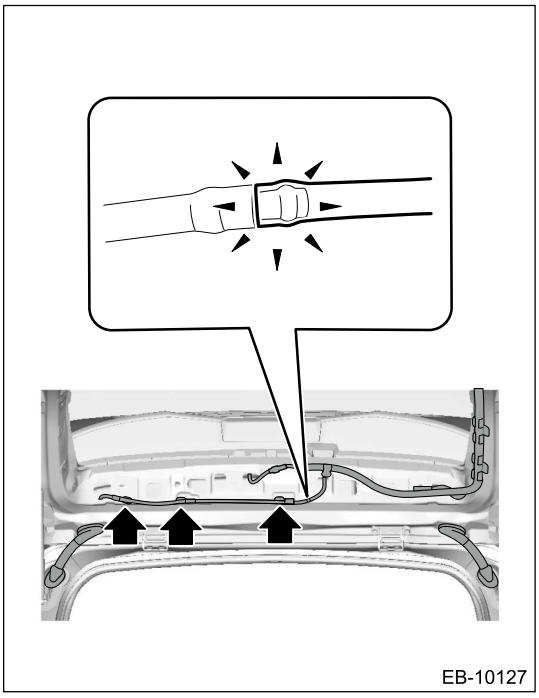
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear gate and the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>REMOVAL.
3. Remove the light assembly - rear finisher. Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly>REMOVAL.
4. Remove the license plate light. Ref. to LIGHTING SYSTEM>License Plate Light>REMOVAL.
5. Remove the arm assembly - rear wiper and the motor assembly - rear wiper. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor>REMOVAL.
6. Remove the rear gate latch and actuator - rear gate. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>REMOVAL.
7. Remove the buffer - rear gate.



8. Remove the clips, and remove the drip - rear gate.

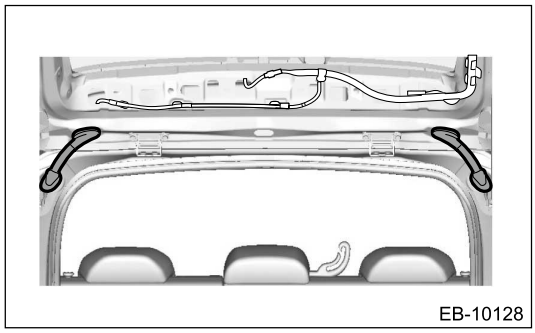


9. Remove the roof spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>REMOVAL.
10. Disconnect the hose assembly - rear washer.
    (1) Disconnect the joint portion of the hose assembly - rear washer.
    (2) Remove the clip.

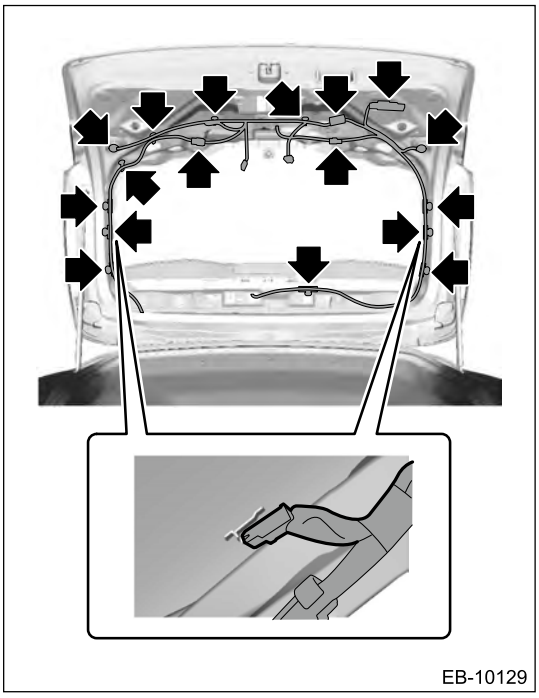


11. Remove the nozzle and hose assembly - rear washer. Ref. to WIPER AND WASHER SYSTEMS>Rear Washer>REMOVAL.

12. Remove the rubber duct connection.



13. Disconnect the connector, and then pull out the harness from the panel - rear gate shown in the figure (a).



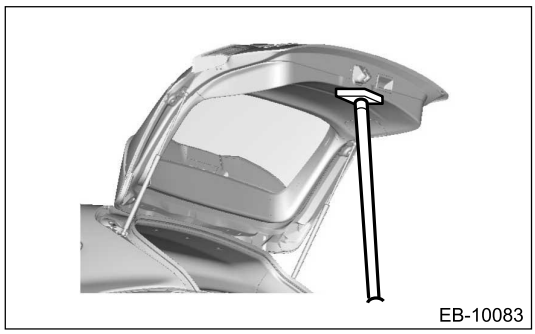
14. Remove the harness clip from the panel - rear gate.

15. Remove the rear gate glass. Ref. to GLASS/WINDOWS/MIRRORS>Rear Gate Glass>REMOVAL.

16. Before removing the stay assembly - rear gate, prevent the panel - rear gate from closing by using a prop or the like.

Caution:

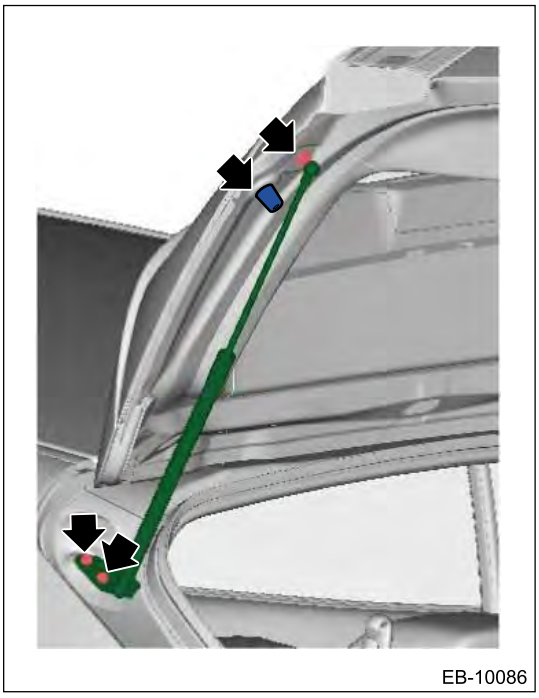
If the prop comes off, operators may get injured and vehicle may get damaged. Make sure to support the panel - rear gate with secure material to prevent injury or damage.



17. Remove the stay assembly - rear gate.

(1) Remove the stopper - rear gate and remove the attachment section on the side of the stay assembly - rear gate.

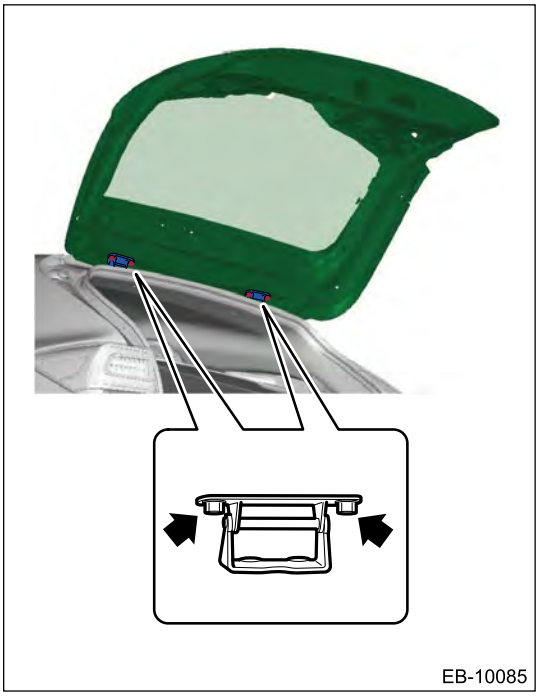
(2) Remove the mounting bolts on the body side.



18. Remove the bolts of the hinge - rear gate, and remove the panel - rear gate.

Caution:

The panel - rear gate is heavy. When removing and installing it, always work in a team of two or more persons.



19. Remove the hinge - rear gate from the vehicle.

2. REAR GATE DAMPER STAY

Caution:

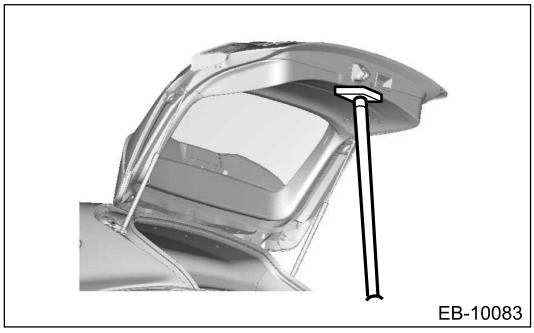
- **Do not damage piston rods and oil seals.**
- **Never disassemble cylinders: They contain gas.**
- **The panel - rear gate is heavy. When removing and installing it, always work in a team of two or more persons.**

1. Before removing the stay assembly - rear gate, prevent the panel - rear gate from closing by using

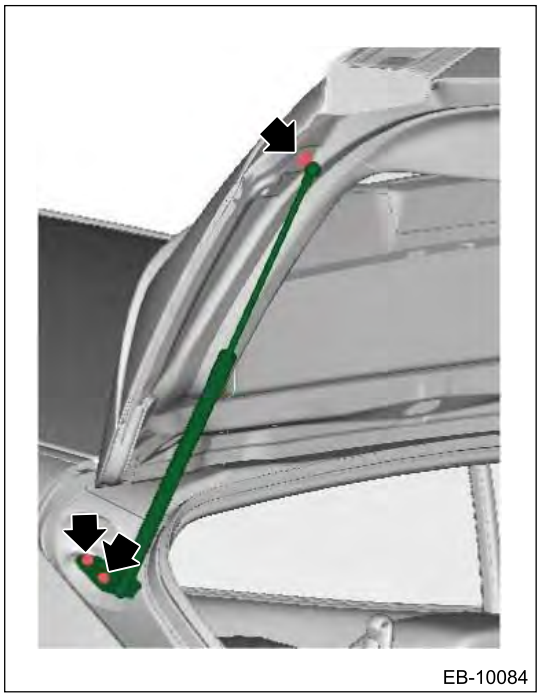
a prop or the like.

Caution:

If the prop comes off, operators may get injured and vehicle may get damaged. Make sure to support the panel - rear gate with secure material to prevent injury or damage.



2. Remove the mounting bolts and remove the stay assembly - rear gate.



EXTERIOR BODY PANELS > Rear Gate

INSTALLATION

1. REAR GATE PANEL

Caution:

The panel - rear gate is heavy. When removing and installing it, always work in a team of two or more persons.

1. Install the hinge - rear gate to the vehicle body.
2. Temporarily install the panel - rear gate to the hinge - rear gate.

   Note:

   When installing, make sure that a uniform clearance is created around the panel - rear gate.
3. Adjust the clearance around the panel - rear gate. Ref. to EXTERIOR BODY PANELS>Rear Gate>ADJUSTMENT.
4. Tighten the bolts of the hinge - rear gate.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)

5. Install the stay assembly - rear gate.

Caution:

Before installing, degrease the bracket surface of stay assembly - rear gate.

Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to Target Not Found

6. Install the rear gate glass. Ref. to GLASS/WINDOWS/MIRRORS>Rear Gate Glass>INSTALLATION.
7. Install the harness clip and the harness.
8. Install the light assembly - rear finisher. Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly>INSTALLATION.
9. Install the license plate light. Ref. to LIGHTING SYSTEM>License Plate Light>INSTALLATION > 5 DOOR MODEL.
10. Install the nozzle and hose assembly - rear washer. Ref. to WIPER AND WASHER SYSTEMS>Rear Washer>INSTALLATION.
11. Connect the hose assembly - rear washer.
12. Install the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>INSTALLATION.
13. Install the drip - rear gate.
14. Install the arm assembly - rear wiper and the motor assembly - rear wiper. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor>INSTALLATION.
15. Attach the buffer - rear gate and the stopper - rear gate.

Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to Target Not Found

16. Install the latch and actuator - rear gate. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSTALLATION.

2. REAR GATE DAMPER STAY

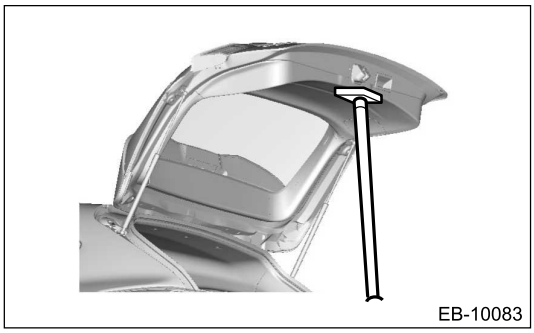
Caution:

The panel - rear gate is heavy. When removing and installing it, always work in a team of two or more persons.

1. Prevent the panel - rear gate from closing using prop or the like.

Caution:

If the prop comes off, operators may get injured and vehicle may get damaged. Make sure to support the panel - rear gate with secure material to prevent injury or damage.



2. Install the stay assembly - rear gate.

Caution:

Before installing, degrease the bracket surface of stay assembly - rear gate.

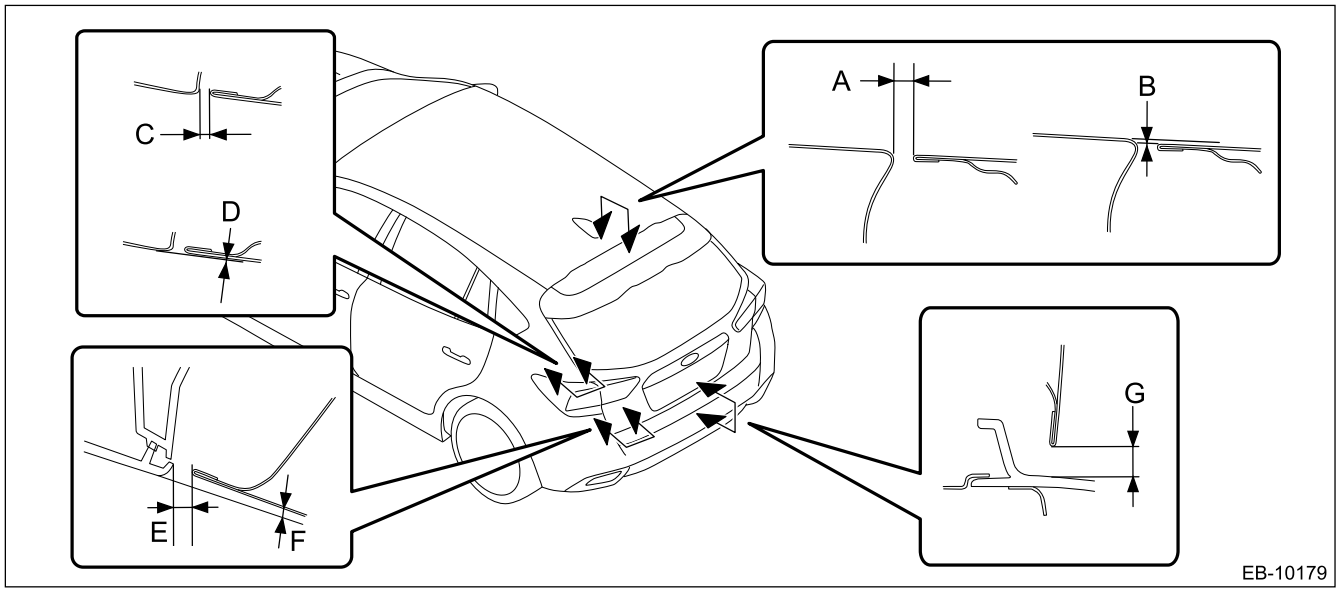
Tightening torque:

Refer to “COMPONENT” of “General Description”. Ref. to Target Not Found

EXTERIOR BODY PANELS > Rear Gate

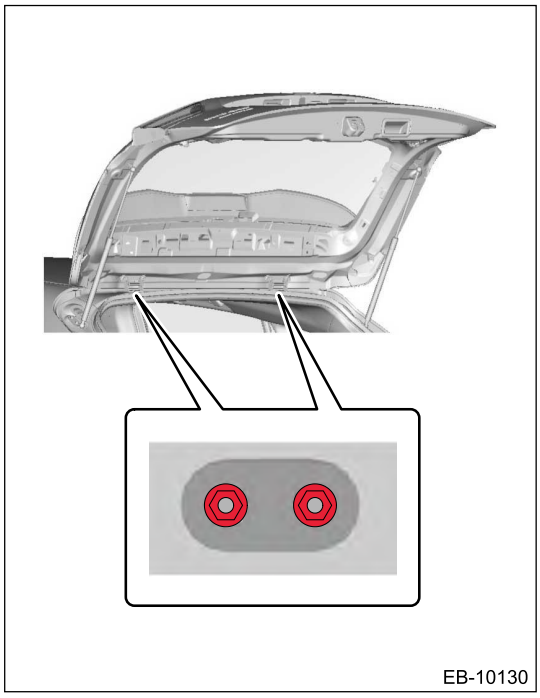
ADJUSTMENT

Adjust the clearance around the panel - rear gate as follows.



Part		Standard
A	Panel - rear gate to Roof panel	6±1 mm (0.24±0.04in)
B	Surface level gap: Panel - rear gate to Roof panel	1±1 mm (0.04±0.04 in)
C	Panel - rear gate to Panel - side outer	4.6±1 mm (0.18±0.04in)
D	Surface level gap: Panel - rear gate to Panel - side outer	2.2±1 mm (0.09±0.04in)
E	Panel - rear gate to Light assembly - rear combination	5±1.5 mm (0.2±0.06in)
F	Surface level gap: Panel - rear gate to Light assembly - rear combination	3.5 ± 1.6 mm (0.14 ± 0.06 in)
G	Panel - rear gate to Bumper face - rear	8±1.8 mm (0.31±0.07in)

1. Adjust the vertical and horizontal positions of the panel - rear gate.

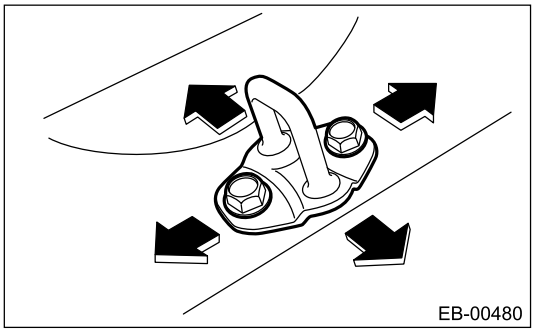


(1) Loosen the mounting bolts of the hinge - rear gate.
(2) Adjust the vertical and horizontal clearance of the panel - rear gate.

Tightening torque:

25 N·m (2.55 kgf-m, 18.4 ft-lb)

2. Adjust the surface level gap between the panel - rear gate and the body.



(1) Remove the trim panel - rear skirt.
(2) Loosen the bolt.
(3) Tap the striker - rear gate using a plastic hammer to adjust the surface level gap between the panel - rear gate and the body.

Tightening torque:

25 N·m (2.5 kgf-m, 18.4 ft-lb)

EXTERIOR BODY PANELS > Rear Gate

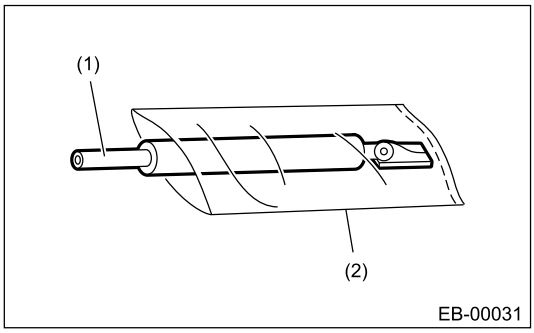
DISPOSAL

1. REAR GATE DAMPER STAY

Caution:

Gas is colorless, odorless, and harmless. However, gas pressure may spray cutting powder or oil. Be sure to wear dust-resistant goggles.

1. Cover with a vinyl sack as shown in the figure.



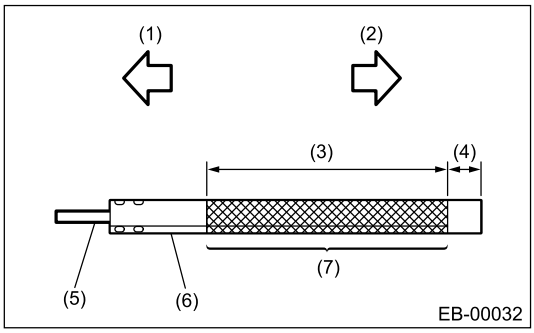
(1) Stay ASSY - rear gate

(2) Vinyl sack

Note:

Prevent the vinyl sack from being caught by drill cutting edge.

2. Lift the body side slightly with piston rods fully extended, and secure the body side with vise. Make a hole of 2 — 3 mm (0.08 — 0.12 in) diameter at a point 6 — 196 mm (0.24 — 7.72 in) from the body side by using a sander or saw, and bleed the gas in the rear gate damper stay completely.



(1) Door side

(2) Body side

(3) 196 mm (7.72 in)

(4) 6 mm (0.24 in)

(5) Piston rod

(6) Cylinder

(7) Portion to be drilled

REPLACEMENT

1. FLANGE

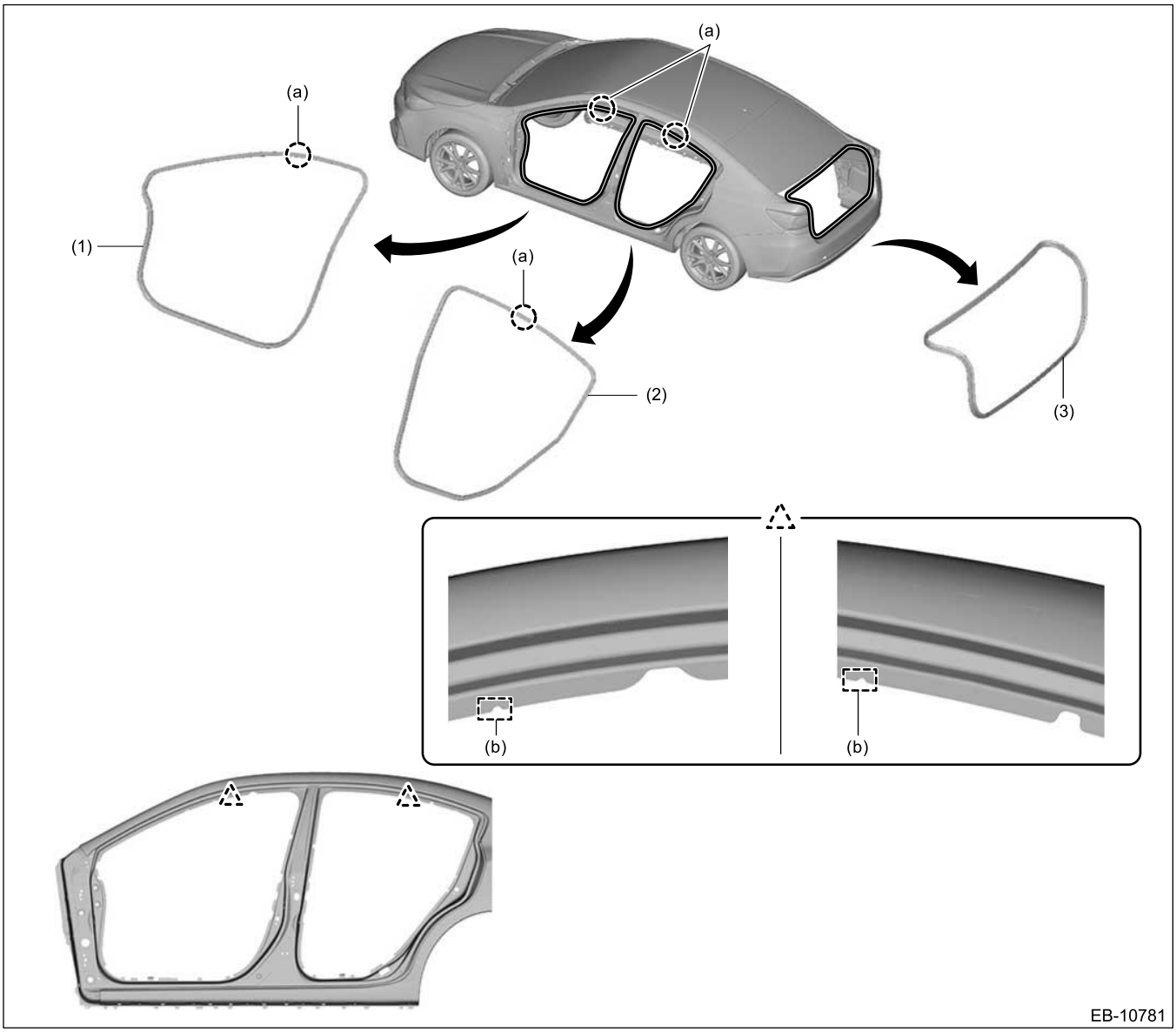
1. Remove each weather strip by pulling the rubber part. Be careful not to tear the rubber.
   - Weather strip - body side flange
   - Weather strip - trunk lid (4 door model)
   - Weather strip - rear gate (5 door model)

   Note:
   - **While removing the weather strip - trunk lid, be careful not to allow adhesive to contact the trim panel - trunk side.**
   - **While removing the weather strip - rear gate, be careful not to allow adhesive to contact the trim panel - roof assembly.**
2. Install each weather strip.
   - Weather strip - body side flange
   - Weather strip - trunk lid (4 door model)
   - Weather strip - rear gate (5 door model)

   Note:

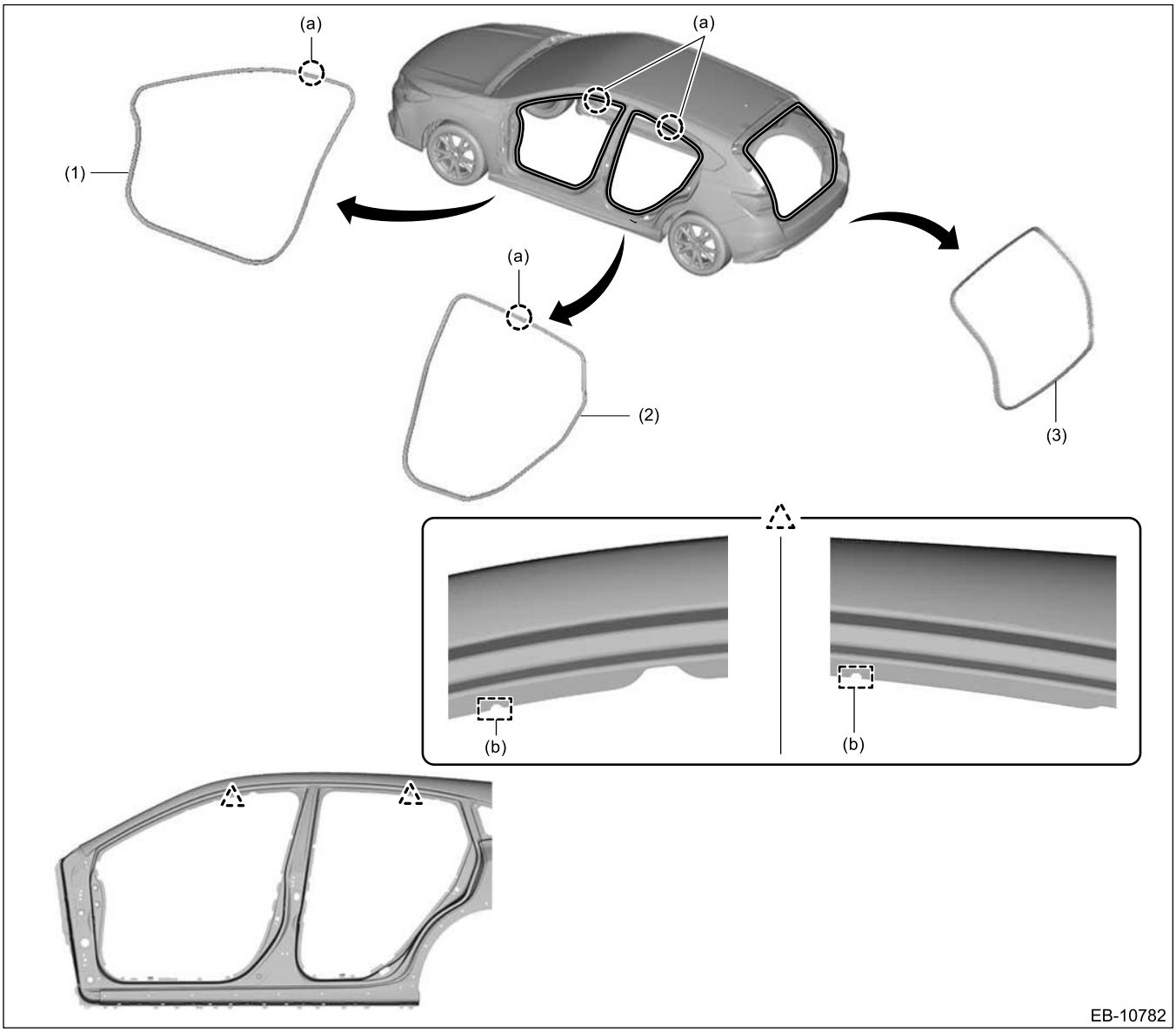
   When installing the weather strip - body side flange, install so that the alignment mark (a) and the cutout portion on the body side (b) are aligned.

- 4 door model



(a) Alignment mark
(b) Cutout portion
(1) Weather strip - body side flange front
(2) Weather strip - body side flange rear
(3) Weather strip - trunk lid

- 5 door model



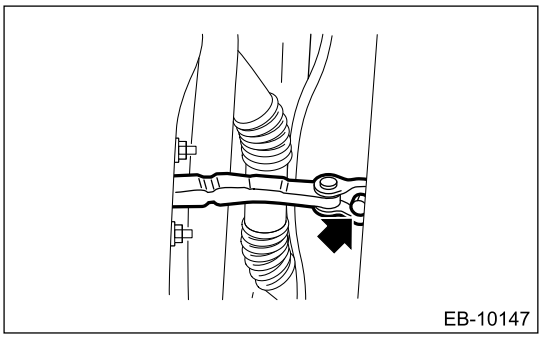
(a) Alignment mark
(b) Cutout portion
(1) Weather strip - body side flange front
(2) Weather strip - body side flange rear
(3) Weather strip - rear gate

2. FRONT DOOR

1. Remove the bolt from the checker assembly - front door.

Caution:

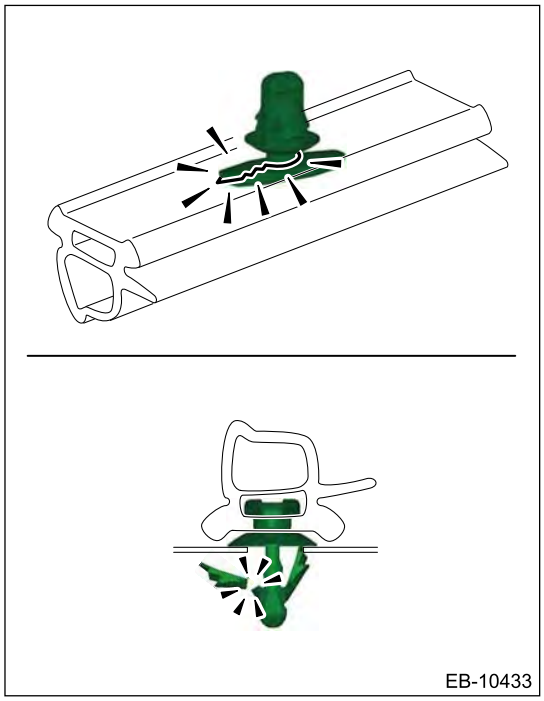
Cover the removed checker assembly - front door with waste cloth to prevent damage.



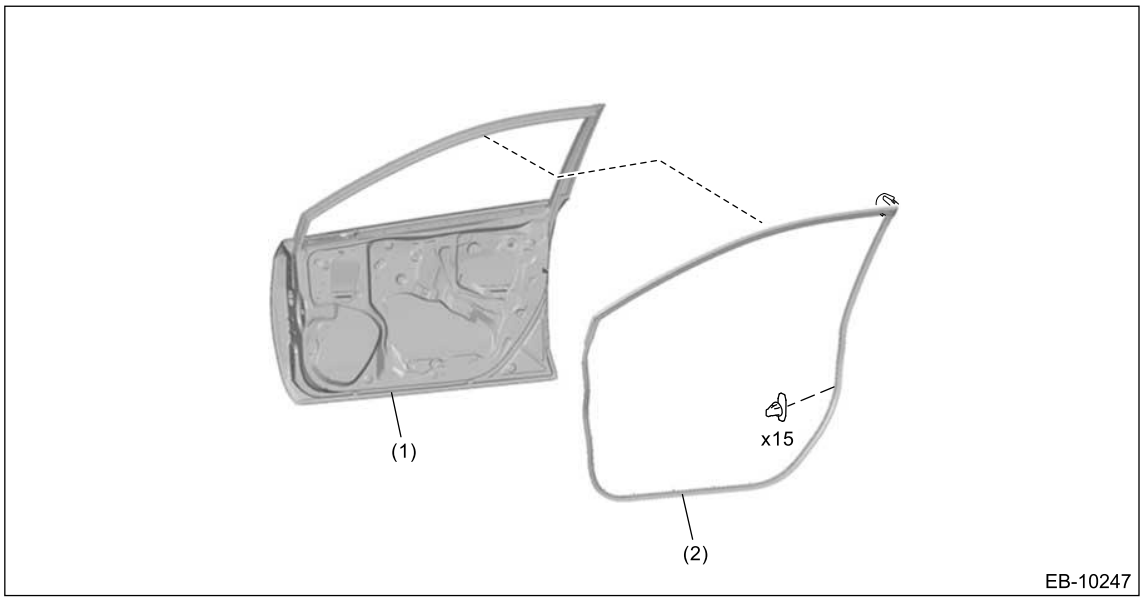
2. Remove the weather strip after removing the clip. Be careful not to tear the rubber.

Caution:

- **The weather strip may tear if being pulled. Also, the weather strip clip may be damaged if being removed with excessive force.**



- **When fragments of the damaged clip fall in the door panel, be sure to remove them.**



(1) Panel ASSY - front door (2) Weather strip - front door

3. Install each weather strip.

Caution:

- **Replace the damaged weather strip clip with a new part.**
- **When fragments of the clip fall in the door panel, be sure to remove them.**

4. Install the checker assembly - front door.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

3. REAR DOOR

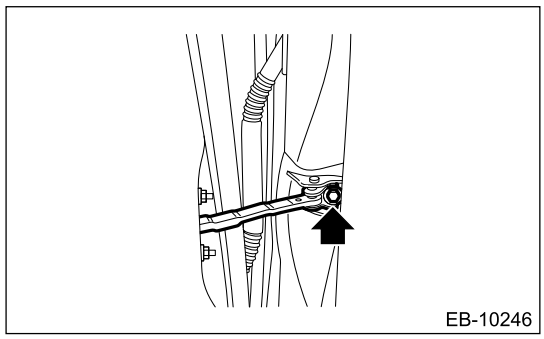
1. Remove the rear door trim. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR

DOOR.

2. Remove the bolt from the checker assembly - rear door.

Caution:

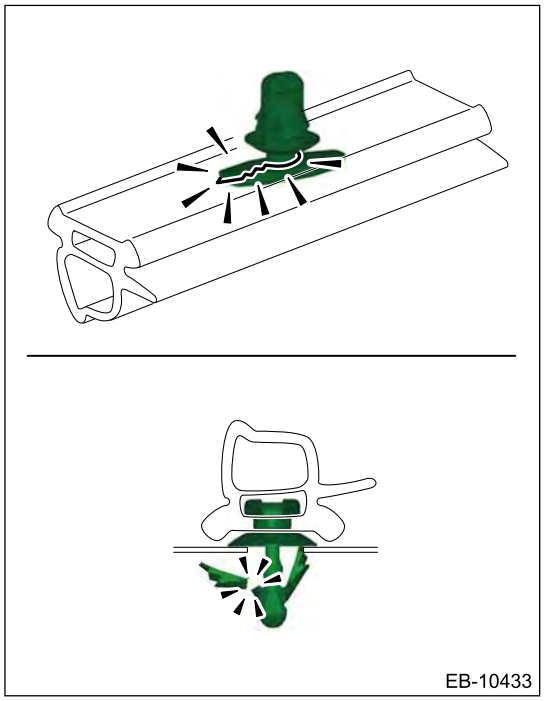
Cover the removed checker assembly - rear door with waste cloth to prevent damage.



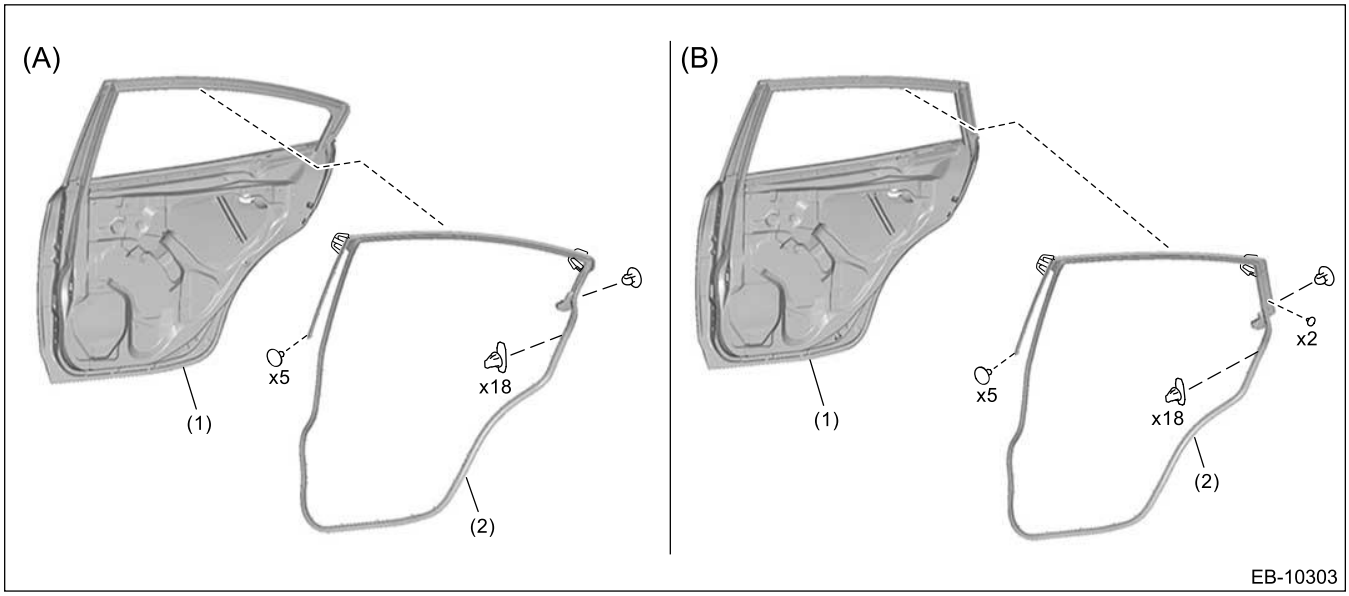
3. Remove the weather strip after removing the clip. Be careful not to tear the rubber.

Caution:

- **The weather strip may tear if being pulled. Also, the weather strip clip may be damaged if being removed with excessive force.**



- **When fragments of the damaged clip fall in the door panel, be sure to remove them.**



(A) 4 door model

(B) 5 door model

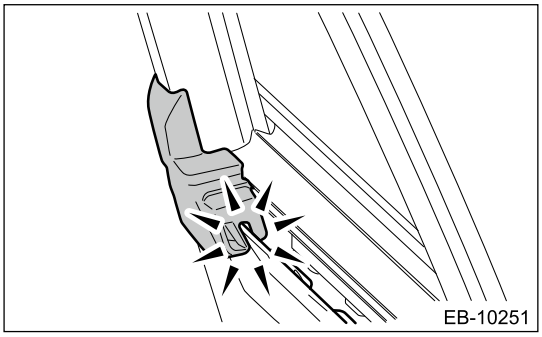
(1) Panel ASSY - rear door

(2) Weather strip - rear door

4. Install each weather strip.

Caution:

- **Replace the damaged weather strip clip with a new part.**
- **When fragments of the clip fall in the door panel, be sure to remove them.**
- **Do not forget to install the weather strip to the door panel.**



5. Install the checker assembly - rear door.

Tightening torque:

33 N·m (3.4 kgf-m, 24.3 ft-lb)

6. Install the rear door trim. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.

Note:

When the clearance between the door trim upper rear end and the weather strip is not uniform, perform installation of the weather strip again.

EXTERIOR/INTERIOR TRIM

EI

1. General Description
2. Front Under Cover
3. Mud Guard
4. Floor Under Protector
5. Fuel Tank Protector
6. Front Grille
7. Front Bumper
8. Rear Bumper
9. Cowl Panel
10. Roof Molding
11. Roof Rail
12. Side Garnish
13. Rear Gate Garnish
14. Rear Spoiler
15. Roof Spoiler
16. Heat Shield Cover
17. Ornament
18. Door Trim
19. Instrument Panel Lower Cover
20. Glove Box
21. Centor Cluster
22. Center Console
23. Console Box
24. Instrument Panel Assembly
25. Lower Inner Trim
26. Upper Inner Trim
27. Rear Quarter Trim
28. Rear Shelf Trim
29. Trunk Room Trim
30. Rear Gate Trim
31. Sun Visor
32. Assist Grip
33. Roof Trim
34. Floor Mat

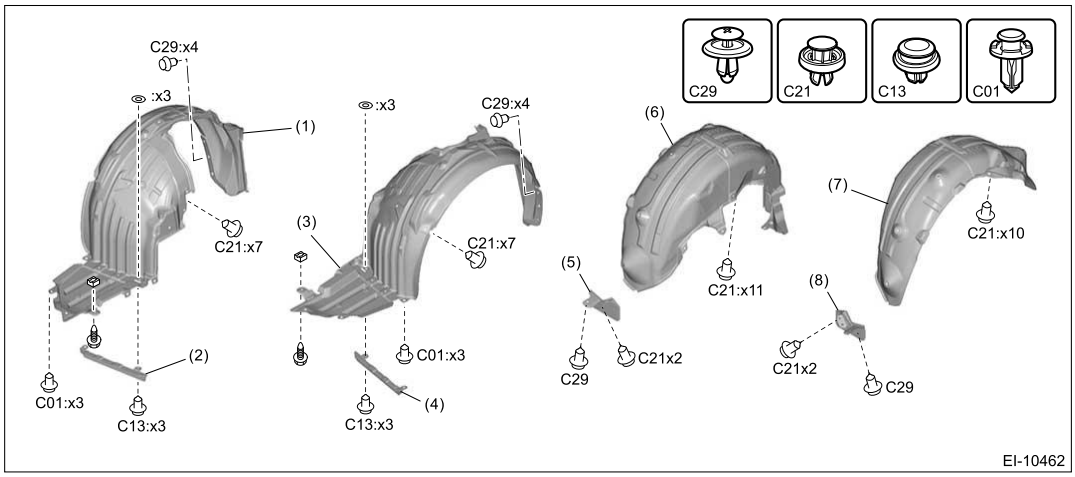
COMPONENT

Note:

- **The alphabet mark beside the clips in the figure indicate the colors of the clips.**
- **The clips with the same shape may have different engaging forces depending on their colors. Always use the specified parts when installing.**
- **The alphabets of color codes are used in the wiring diagram.**

Color code	Collar	Color code	Collar	Color code	Collar
B	Black	R	Red	Br	Brown
G	Green	V	Violet	Gr	Gray
L	Blue	W	White	Lg	Light green
Or	Orange	Y	Yellow	Sb	Light blue
P	Pink	Be	Beige		

1. MUD GUARD

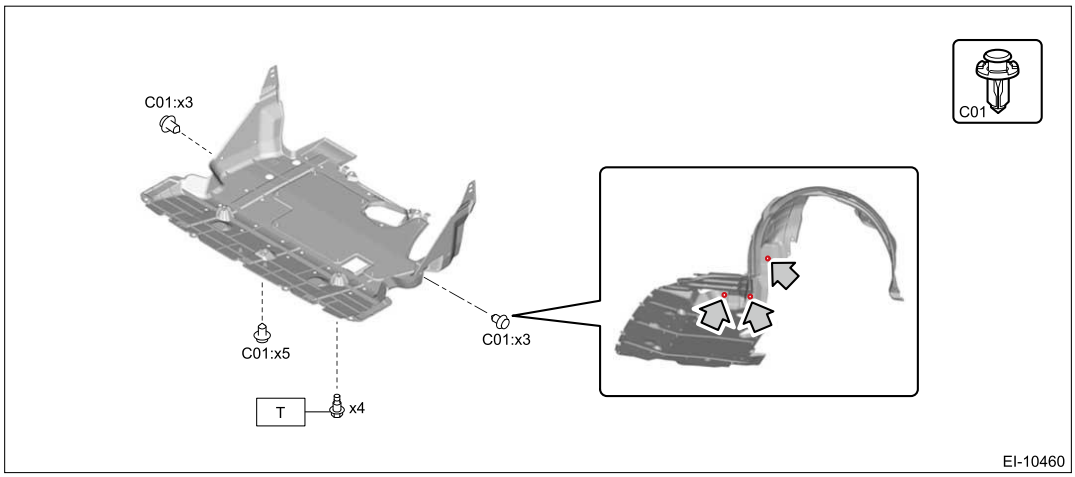


(1) Mud guard - front RH
(2) Plate air flap - front RH
(3) Mud guard - front LH
(4) Plate air flap - front LH
(5) Plate air flap - rear RH
(6) Mud guard - rear RH
(7) Mud guard - rear LH
(8) Plate air flap - rear LH

Note:

For model with the spoiler assembly - side sill, the number of clips is different.

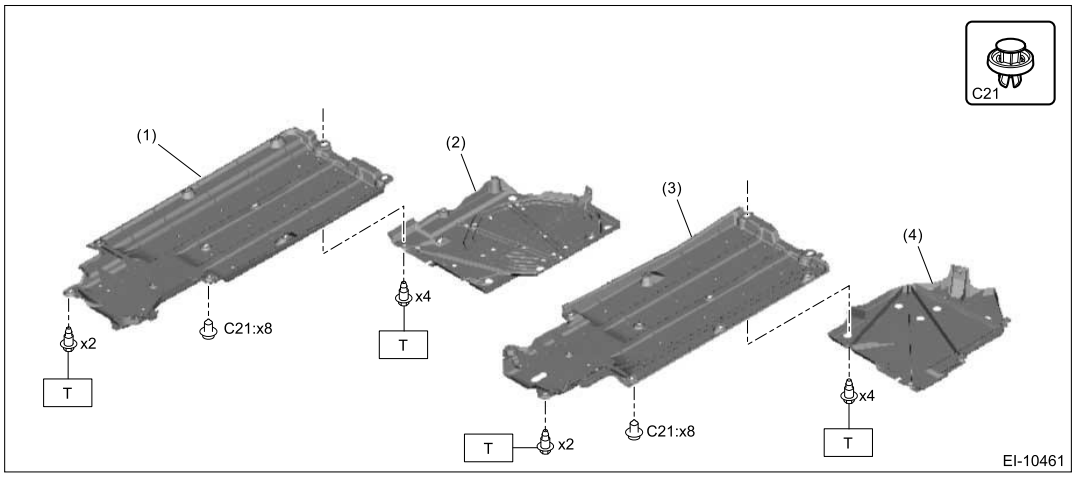
2. FRONT UNDER COVER



Tightening torque: N·m (kgf-m, ft-lb)

T: 18 (1.8, 13.3)

3. FLOOR UNDER PROTECTOR



(1) Floor under protector RH
(2) Fuel tank protector RH
(3) Floor under protector LH
(4) Fuel tank protector LH

Tightening torque: N·m (kgf-m, ft-lb)

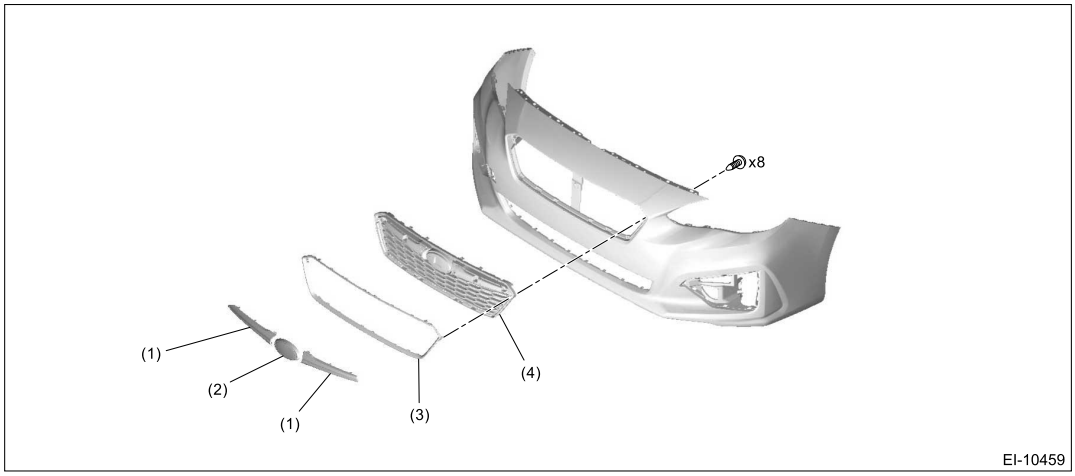
T: 7.5 (0.8, 5.5)

Note:

For detailed exploded view of the fuel tank protector, refer to "Fuel Tank" in "FUEL INJECTION" section.

4. FRONT GRILLE

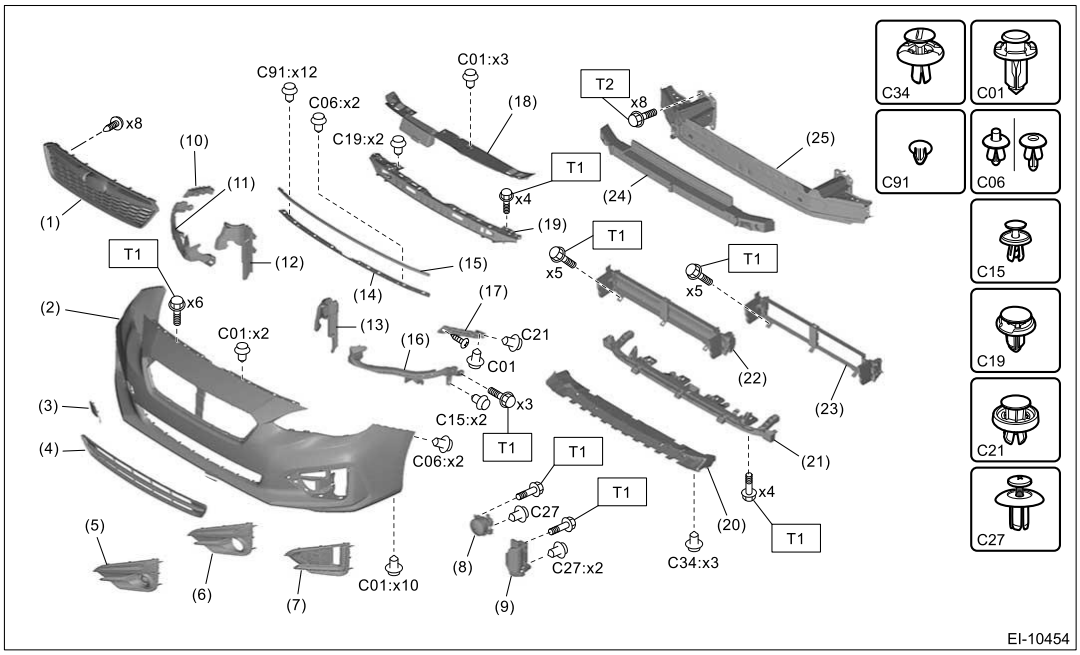
- 4 door model and 5 door model



(1) Molding - wing
(2) Ornament
(3) Molding - ring
(4) Base - front grille

5. FRONT BUMPER

- 4 door model and 5 door model



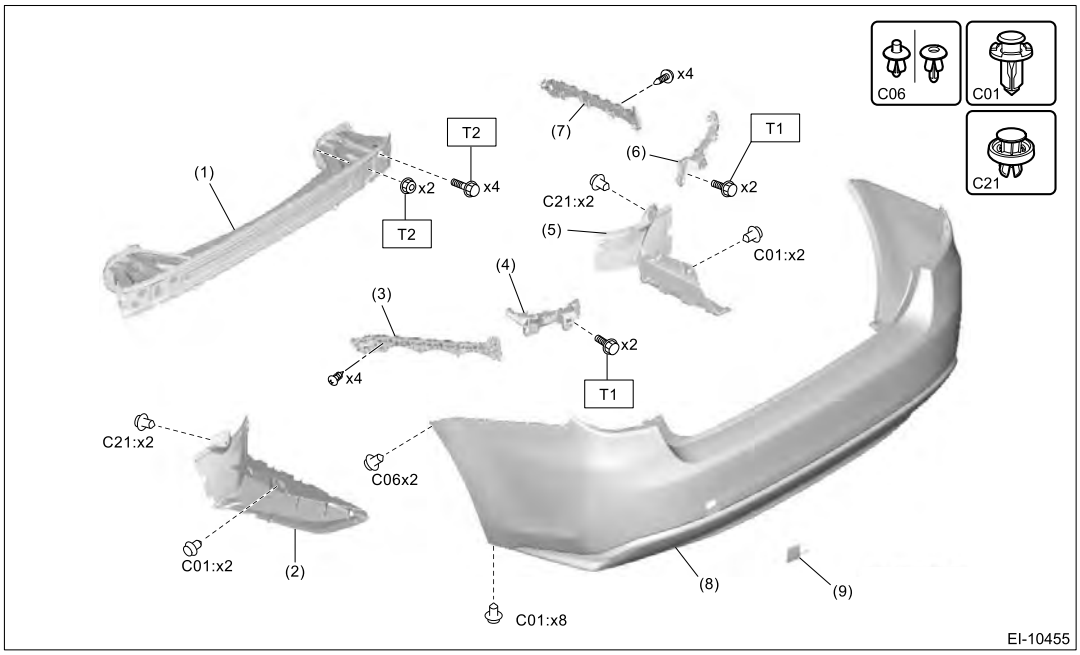
(1) Front grille ASSY	(11) Bracket - front bumper corner RH	(21) Bracket center LWR - front
(2) Bumper face - front	(12) Air guide RH	(22) Active grille shutter
(3) Cover hook - front	(13) Air guide LH	(23) Frame ASSY - active grille shutter (model without ACT GS)
(4) Cover intake - front	(14) Plate UPR - front	(24) Energy absorber foam
(5) Cover - fog light A (model without fog light)	(15) Sealing bumper - front	(25) Bumper beam COMPL - front
(6) Cover - fog light A (model with fog light)	(16) Bracket - front bumper corner LH	
(7) Cover - fog light B (model with DRL)	(17) Bracket - front bumper side LH	***Tightening torque: N·m (kgf-m, ft-lb)***
(8) Light ASSY - fog	(18) Cover UPR - front	***T1: 7.5 (0.8, 5.5)***
(9) Light ASSY - DRL	(19) Bracket - bumper UPR	***T2: 33 (3.4, 24.3)***
(10) Bracket - front bumper side RH	(20) Energy absorber LWR - front	

Note:

∗: For detailed exploded view of the active grille shutter and ambient sensor, refer to "Active Grille Shutter" in "COOLING" section. Ref. to COOLING(H4DO)>General Description>COMPONENT > ACTIVE GRILLE SHUTTER.

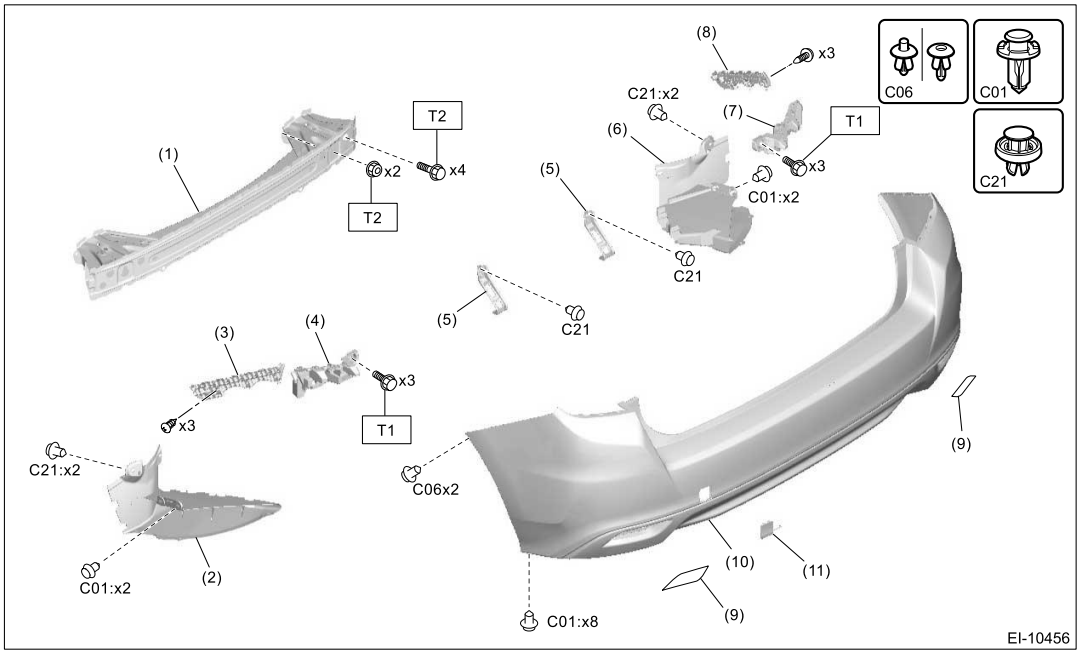
6. REAR BUMPER

- 4 door model



(1)	Bumper beam COMPL - rear	(6)	Bracket - rear bumper corner RH	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Cover - side LWR LH	(7)	Bracket - rear bumper side RH	***T1: 7.5 (0.8, 5.5)***	
(3)	Bracket - rear bumper side LH	(8)	Bumper face - rear	***T2: 53 (5.4, 39.1)***	
(4)	Bracket - rear bumper corner LH	(9)	Cover - rear bumper		
(5)	Cover - side LWR RH				

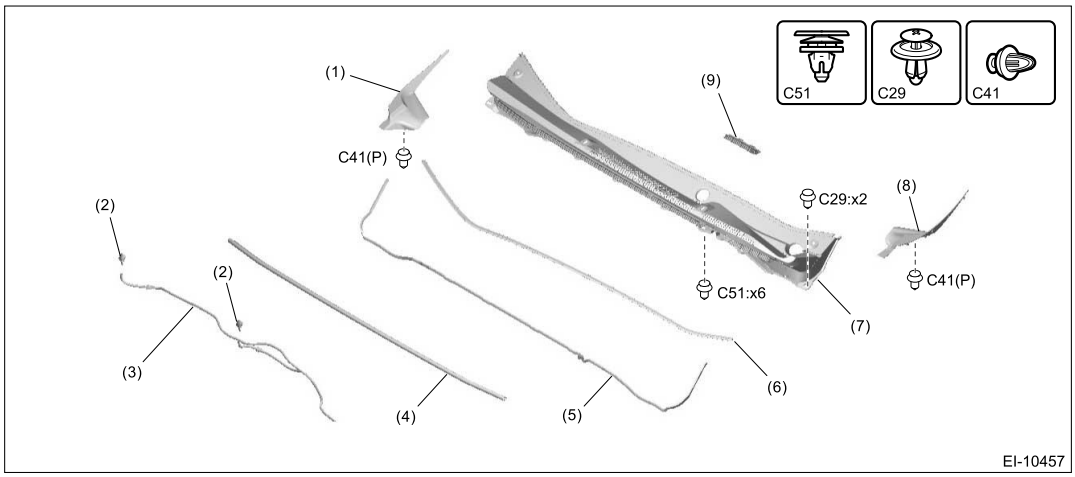
- 5 door model



(1)	Bumper beam COMPL - rear	(6)	Cover - side LWR RH	(11)	Cover - rear bumper
(2)	Cover - side LWR LH	(7)	Bracket - rear bumper corner RH		
(3)	Bracket - rear bumper side LH	(8)	Bracket - rear bumper side RH	***Tightening torque: N·m (kgf-m, ft-lb)***	
(4)	Bracket - rear bumper corner LH	(9)	Reflex reflector	***T1: 7.5 (0.76, 5.5)***	
(5)	Bracket LWR - rear	(10)	Bumper face - rear	***T2: 53 (5.4, 39.1)***	

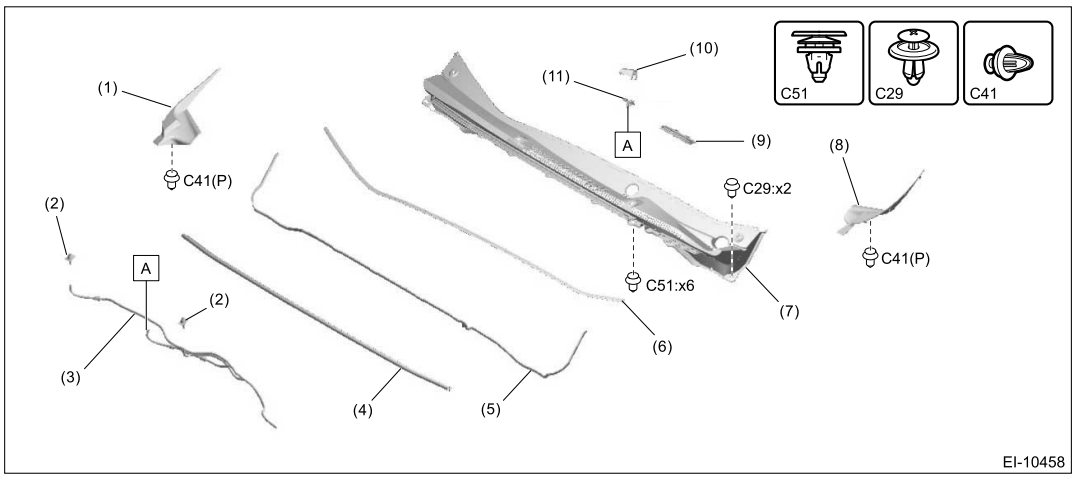
7. COWL PANEL

- Models without EyeSight



(1) Cowl panel - side RH
(2) Nozzle - windshield washer
(3) Hose - windshield washer
(4) Seal - cowl
(5) Gasket
(6) Protector - cowl
(7) Cowl panel
(8) Cowl panel - side LH
(9) Cover - cowl

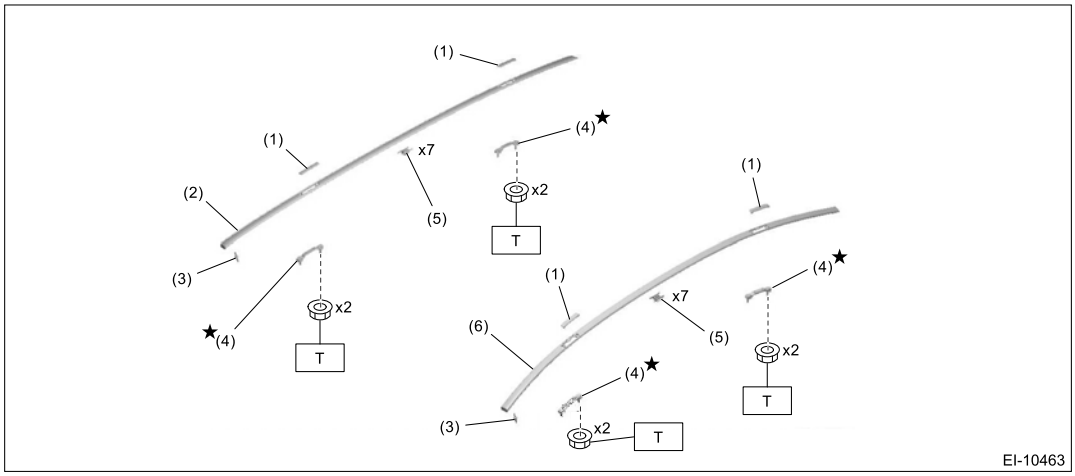
- Models with EyeSight



(1) Cowl panel - side RH
(2) Nozzle - windshield washer
(3) Hose - windshield washer
(4) Seal - cowl
(5) Gasket
(6) Protector - cowl
(7) Cowl panel
(8) Cowl panel - side LH
(9) Cover - cowl
(10) Cover - joint
(11) Joint - washer hose

8. ROOF MOLDING

- 4 door model

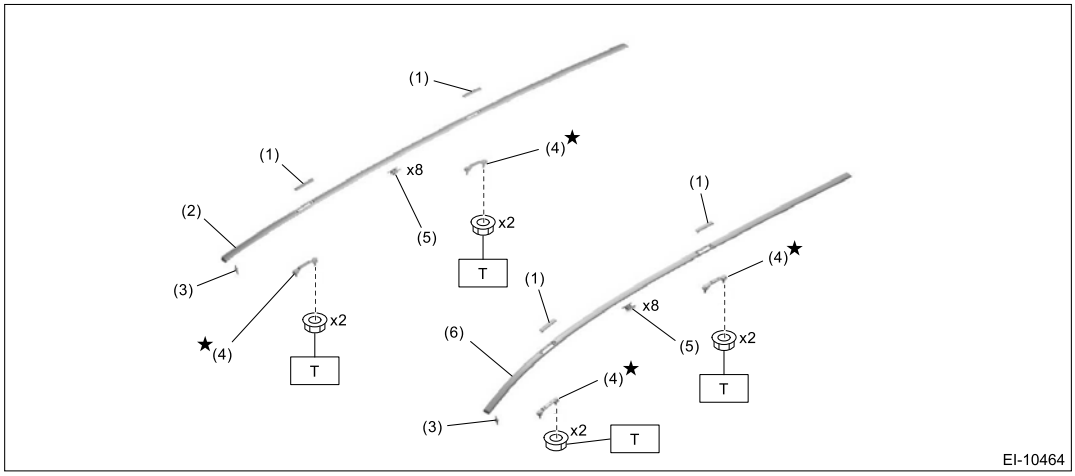


(1) Cap - lid
(5) Carrier BRKT

Tightening torque: N·m (kgf-m, ft-lb)

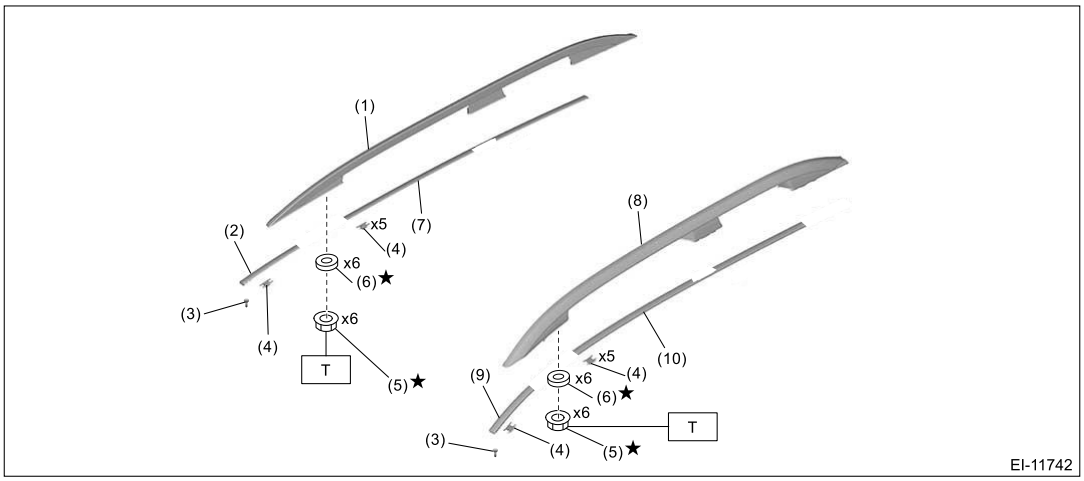
(3) Molding - roof RH
(4) Rivet
(7) Fastener
(8) Molding - roof LH
T: 7.5 (0.8, 5.5)

- 5 door model



(1) Cap - lid
(2) Molding - roof RH
(3) Rivet
(4) Carrier BRKT
(5) Fastener
(6) Molding - roof LH
Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.8, 5.5)

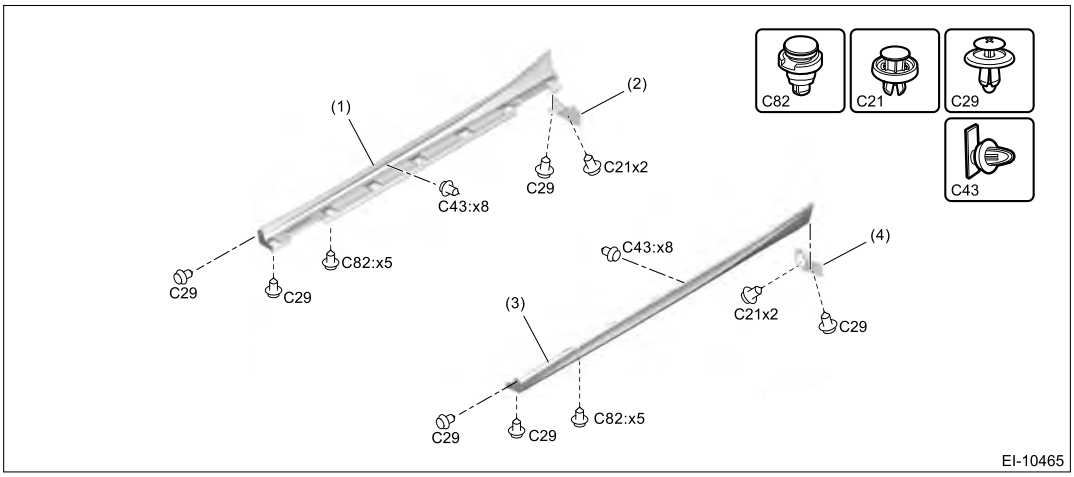
9. ROOF RAIL



(1) Roof rail ASSY RH
(2) Molding - roof front RH
(3) Rivet
(4) Fastener
(5) Self-locking nut
(6) Gasket
(7) Molding - roof rear RH
(8) Roof rail ASSY LH
(9) Molding - roof front LH
(10) Molding - roof rear LH
Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.76, 5.5)

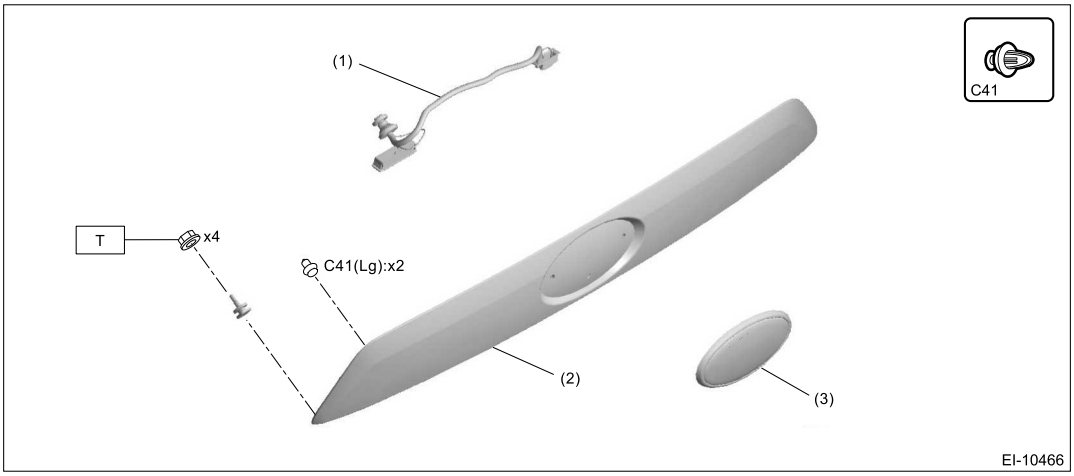
10. SIDE GARNISH & SIDE SPOILER

- 4 door model and 5 door model



(1) Spoiler ASSY - side sill RH
(2) Plate air flap - rear RH
(3) Spoiler ASSY - side sill LH
(4) Plate air flap - rear LH

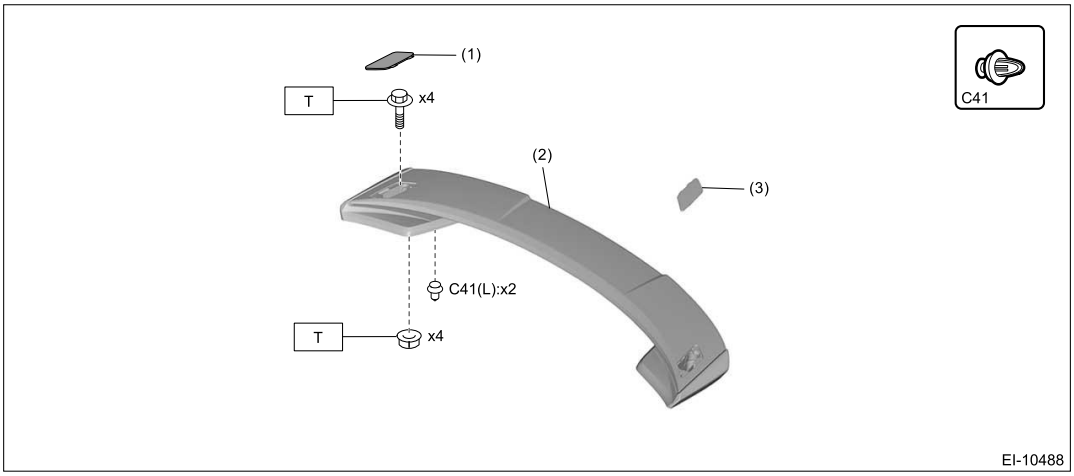
11. REAR GATE GARNISH



(1) Rear lock button harness (model with keyless access)
(2) Garnish ASSY - rear gate
(3) Ornament

Tightening torque: N·m (kgf-m, ft-lb)
T: 4.5 (0.46, 3.3)

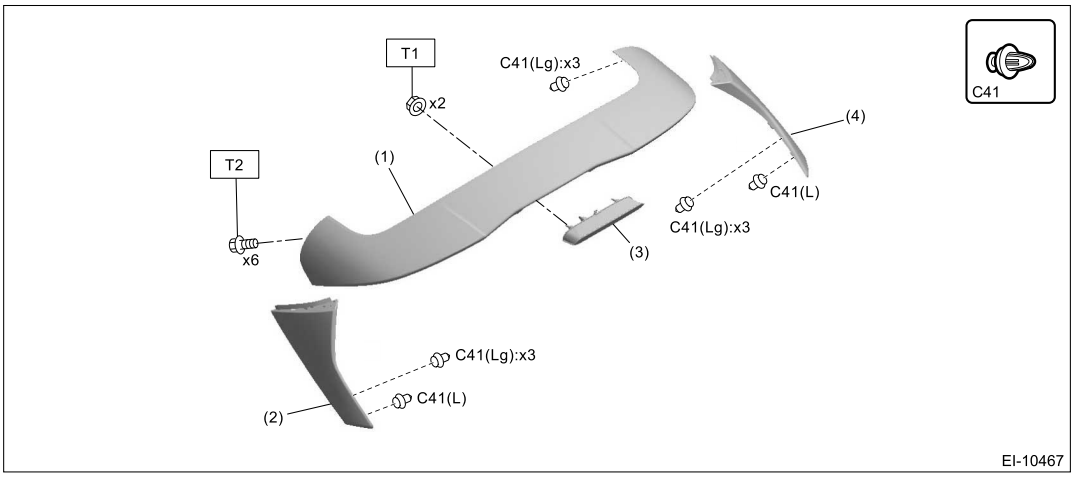
12. REAR SPOILER



(1) Cap - rear spoiler RH
(2) Rear spoiler ASSY
(3) Cap - rear spoiler LH

Tightening torque: N·m (kgf-m, ft-lb)
T: 7.5 (0.8, 5.5)

13. ROOF SPOILER

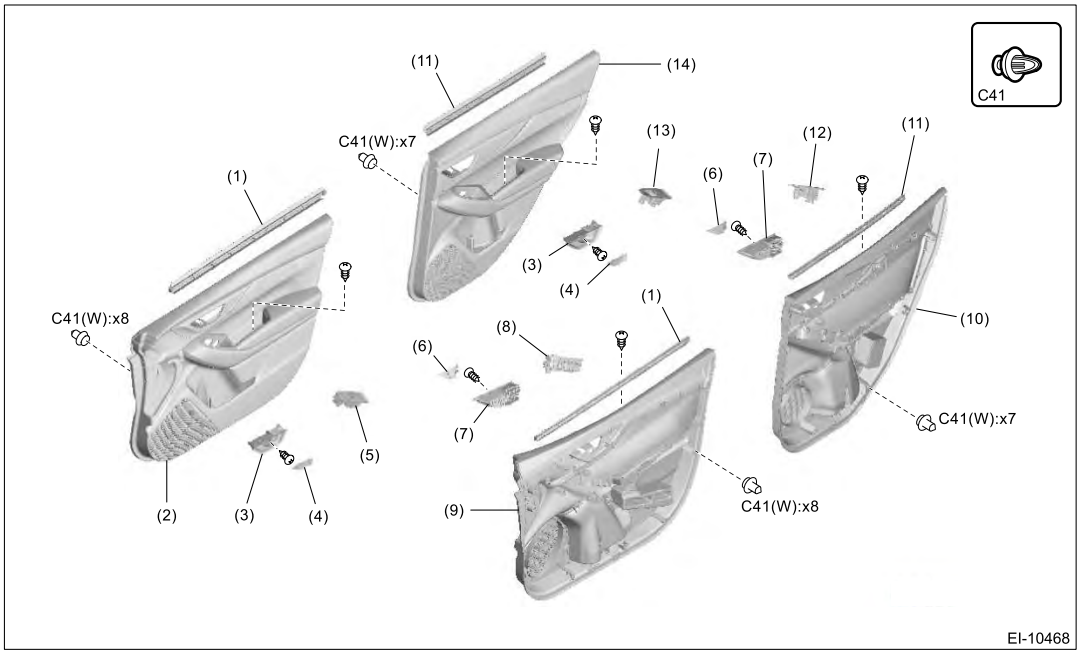


(1) Spoiler ASSY - roof CTR
(2) Spoiler ASSY - roof LH
(3) Light ASSY - high-mounted
(4) Spoiler ASSY - roof RH

Tightening torque: N·m (kgf-m, ft-lb)

T1: 4.5(0.5,3.3)
T2: 7.5 (0.8, 5.5)

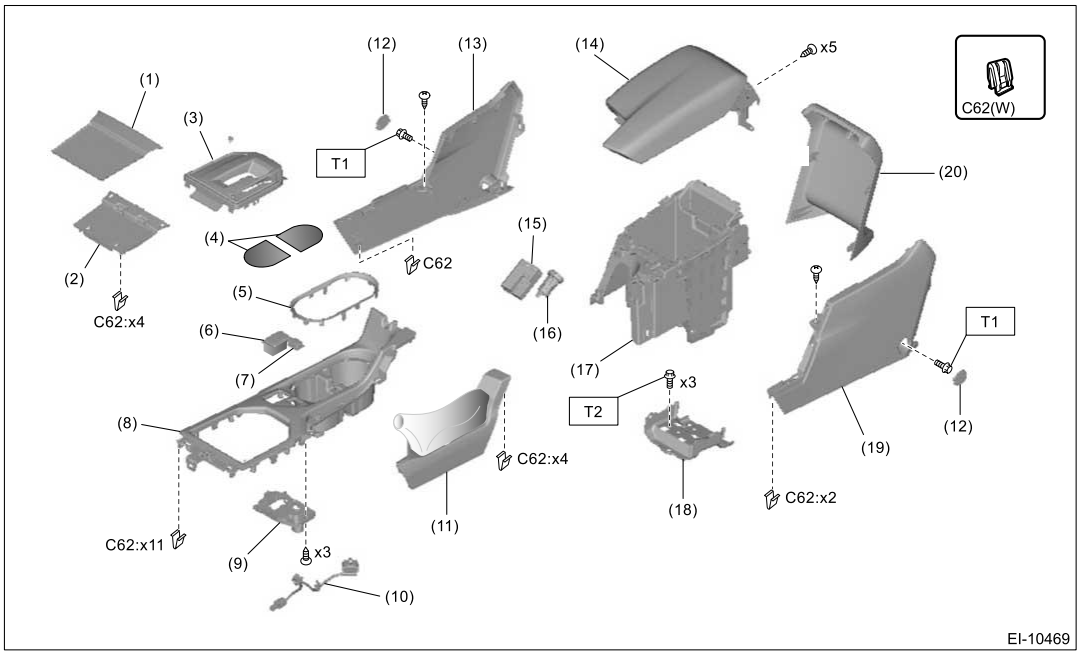
14. DOOR TRIM



(1) Weather strip - front door INN
(2) Trim panel - front door RH
(3) Remote ASSY - door INN RH
(4) Cover - remote door RH
(5) Switch ASSY - power window sub front
(6) Cover - remote door LH
(7) Remote ASSY - door INN LH
(8) Switch ASSY - power window main
(9) Trim panel - front door LH
(10) Trim panel - rear door LH
(11) Weather strip - rear door INN
(12) Switch ASSY - power window SUB rear LH
(13) Switch ASSY - power window SUB rear RH
(14) Trim panel - rear door RH

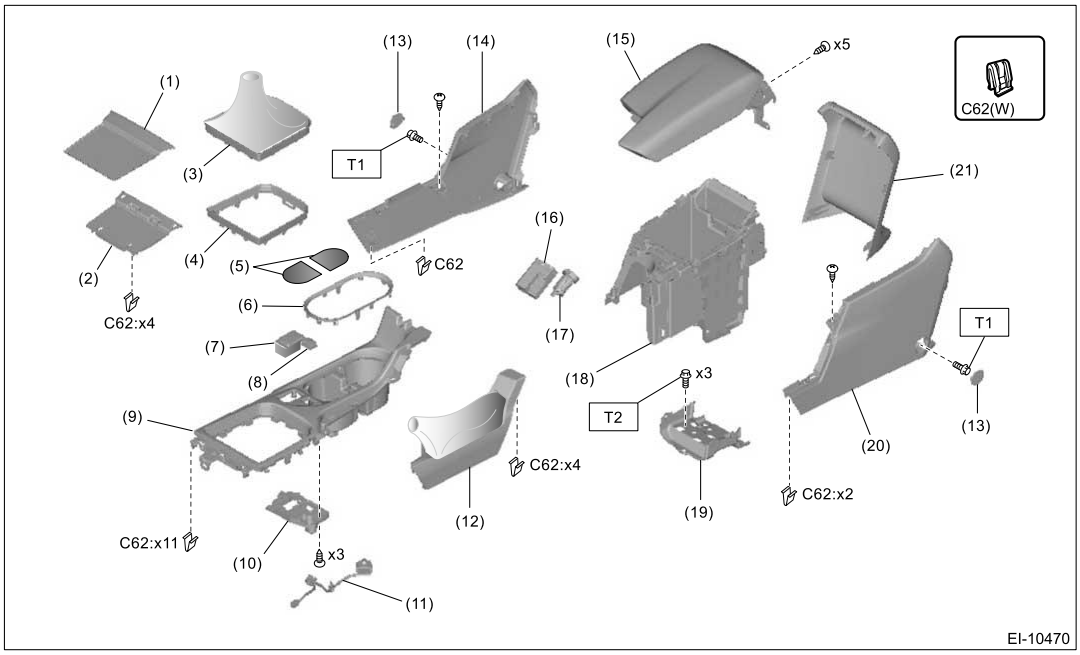
15. CONSOLE BOX

- CVT model



(1) Mat - center tray	(9) Switch case	(17) Pocket - console
(2) Tray - center LWR	(10) Adapter cord - console	(18) Bracket - console B
(3) Cover - selector	(11) Boot - hand brake	(19) Outer cover - console box LH
(4) Mat - cup holder	(12) Cap - console box	(20) End cover - console box
(5) Ring - cup holder	(13) Outer cover - console box RH	
(6) Switch - seat heater	(14) Lid ASSY - console box	***Tightening torque: N·m (kgf-m, ft-lb)***
(7) Cover	(15) AUX unit	***T1: 6.5 (0.7, 4.8)***
(8) Cover ASSY - front CVT	(16) Accessory socket	***T2: 18 (1.8, 13.3)***

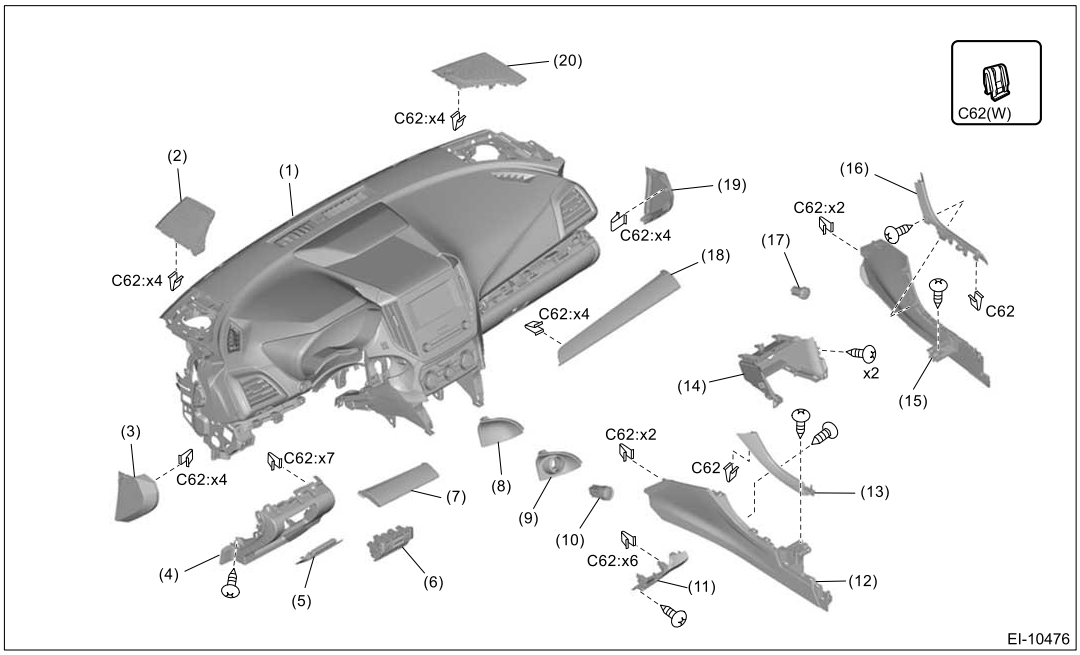
- MT model



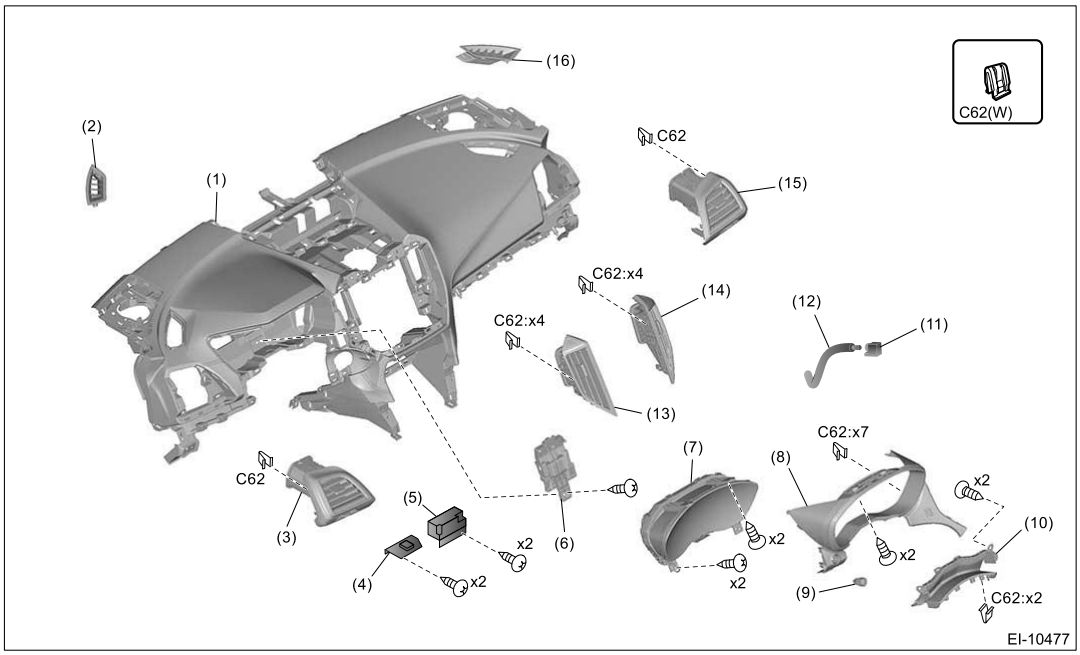
(1) Mat - center tray	(10) Switch case	(19) Bracket - console B
(2) Tray - center LWR	(11) Adapter cord - console	(20) Outer cover - console box LH
(3) Boot - shift knob	(12) Boot - hand brake	(21) End cover - console box
(4) Ring - shift knob	(13) Cap - console box	
(5) Mat - cup holder	(14) Outer cover - console box RH	***Tightening torque: N·m (kgf-m, ft-lb)***
(6) Ring - cup holder	(15) Lid ASSY - console box	***T1: 6.5 (0.7, 4.8)***
(7) Switch - seat heater	(16) AUX unit	***T2: 18 (1.8, 13.3)***

(8) Cover
(9) Cover ASSY - front MT
(17) Accessory socket
(18) Pocket - console

16. INSTRUMENT PANEL



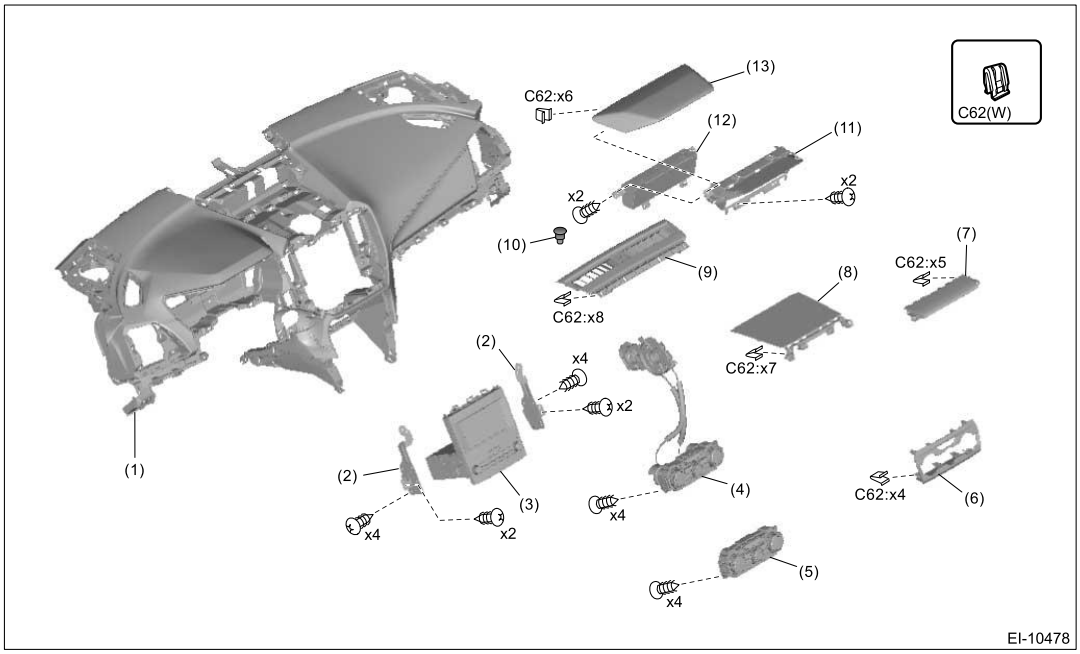
(1) Instrument panel ASSY
(2) Grille speaker side LH
(3) Cover - instrument panel side LH
(4) Cover ASSY - instrument panel LWR driver OUT
(5) Lid ASSY - fuse box
(6) Switch ASSY - instrument panel
(7) Ornament panel - driver
(8) Cover - starter SW
(9) Panel - starter SW
(10) Push button ignition switch
(11) Cover ASSY - instrument panel LWR driver INN
(12) Panel center LWR LH
(13) Ornament panel - console LH
(14) Tray - center UPR
(15) Panel center LWR RH
(16) Ornament panel - console RH
(17) Socket ASSY
(18) Ornament panel - passenger
(19) Cover - instrument panel side RH
(20) Grille speaker side RH



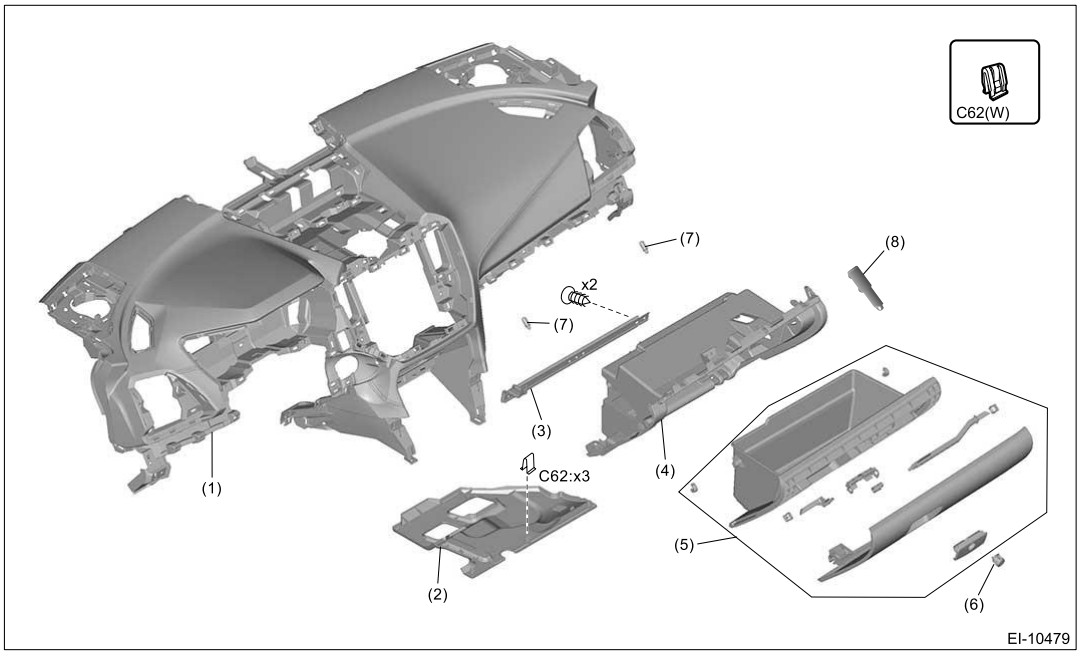
(1) Panel COMPL - instrument
(2) Grille defroster - front LH
(7) Combination meter ASSY
(8) Visor ASSY - combination
(13) Grille ASSY - CTR ventilation LH
(14) Grille ASSY - CTR ventilation

meter

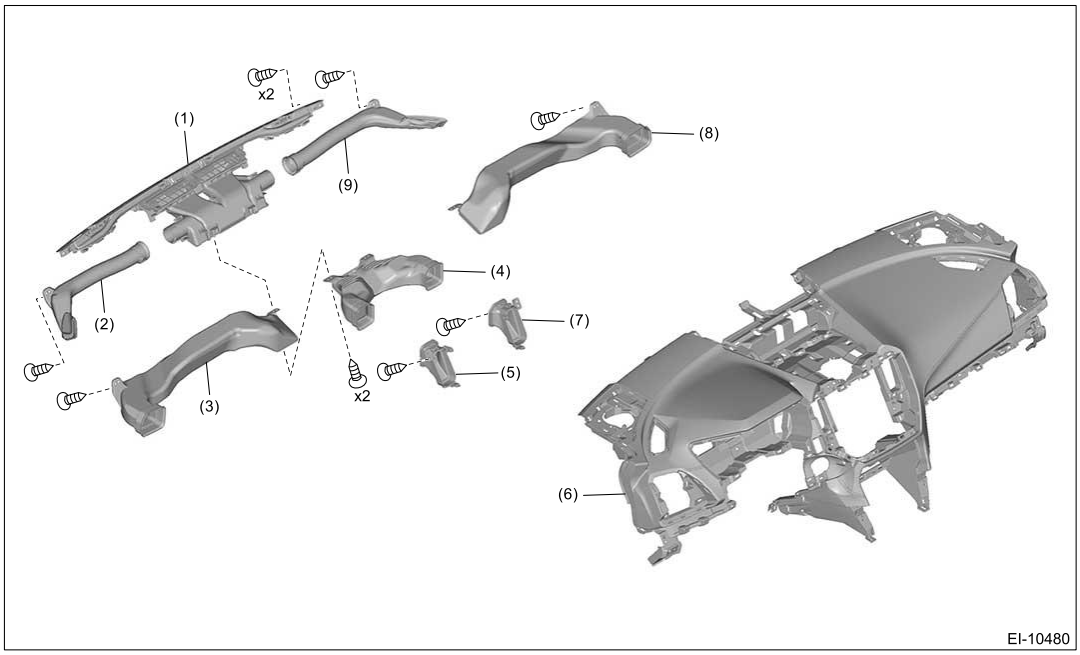
(3) Grille ASSY - ventilation LH
(4) Antenna ASSY - GPS
(5) SUB antenna ASSY - telematics
(6) Reinforcement - combination meter
(9) Switch ASSY - trip reset
(10) Cover ASSY - visor LWR.
(11) In-vehicle sensor (auto A/C model only)
(12) Aspirator hose (auto A/C model only)
RH
(15) Grille ASSY - ventilation RH
(16) Grille defroster - front RH



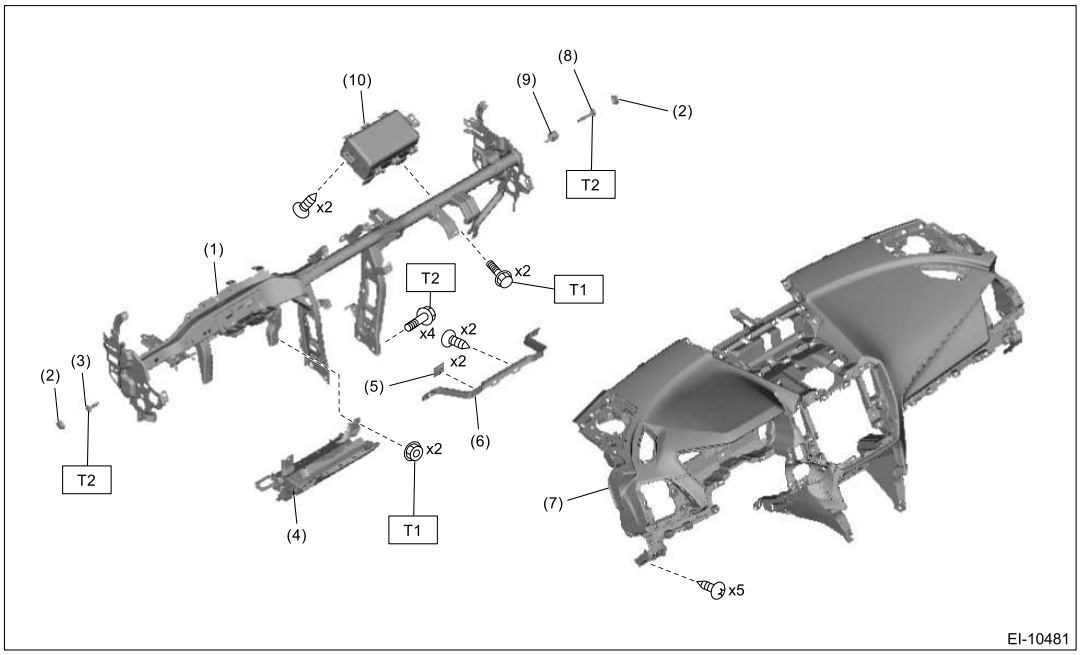
(1) Panel COMPL - instrument
(2) Bracket - audio
(3) Audio ASSY
(4) Heater control ASSY (manual)
(5) Heater control ASSY (auto)
(6) Panel ASSY - heater
(7) Panel - center UPR
(8) Cover - center UPR
(9) Grille - front defroster
(10) Sunload sensor (auto A/C model only)
(11) Panel - display LWR
(12) Multi-function display ASSY
(13) Panel - display UPR



(1) Panel COMPL - instrument
(2) Under cover ASSY - passenger
(3) Reinforcement - passenger
(4) Back panel - pocket
(5) Pocket ASSY
(6) Key cylinder
(7) Cushion - pocket
(8) Damper COMPL - pocket



(1) Nozzle - front defroster
(2) Duct - side defroster LH
(3) Duct - side ventilation LH
(4) Duct - center ventilation
(5) Duct - grille CTR ventilation LH
(6) Panel COMPL - instrument
(7) Duct - grille CTR ventilation RH
(8) Duct - side ventilation RH
(9) Duct - side defroster RH



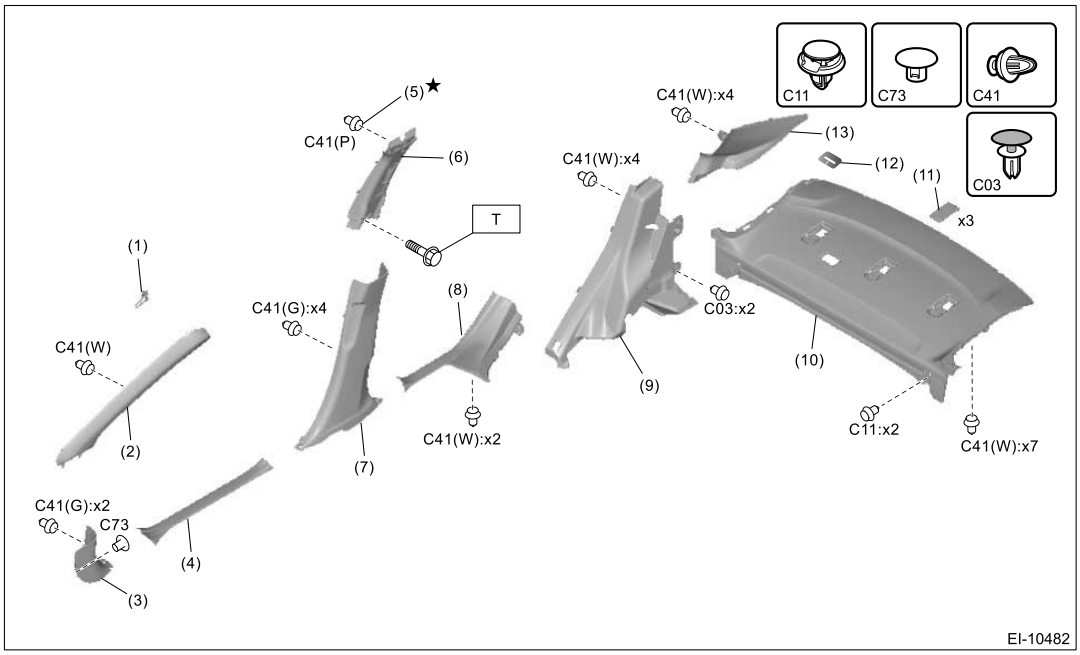
(1) Beam COMPL - steering
(2) Cap - bolt
(3) TORX® bolt (M8 × 37)
(4) Knee airbag module ASSY
(5) Cushion
(6) Reinforcement - CTR LWR
(7) Panel COMPL - instrument
(8) TORX® bolt (M8 × 57)
(9) Adjuster - clip space
(10) Passenger's airbag module ASSY

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.8, 5.5)
T2: 25 (2.5, 18.4)

17. INNER TRIM

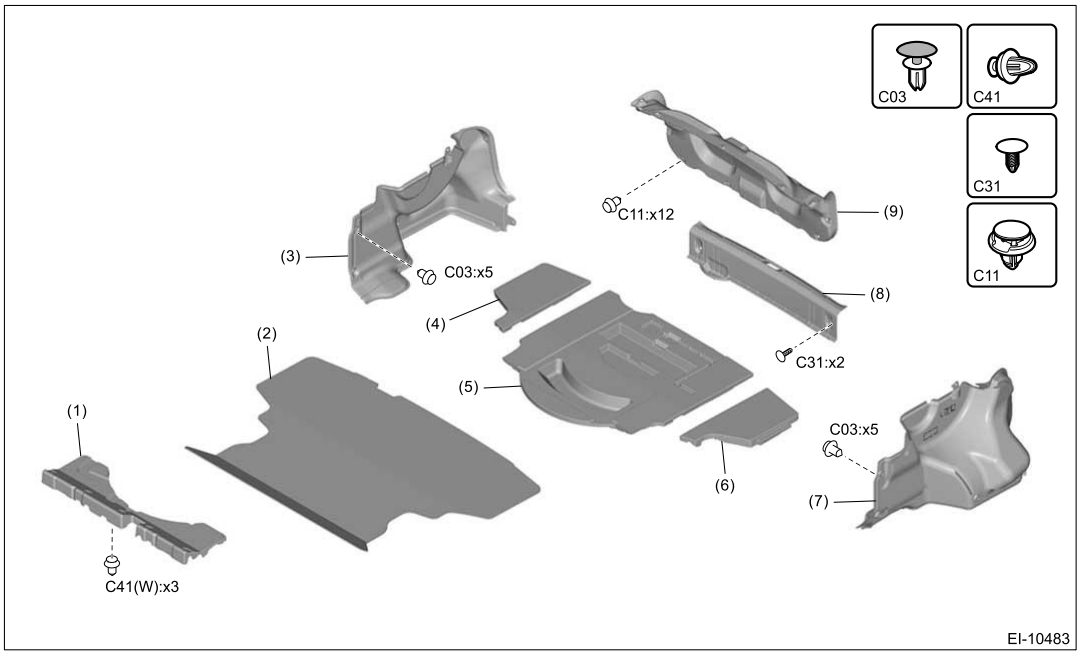
- 4 door model



(1) Tether clip
(2) Trim panel - front pillar UPR
(3) Cover side sill - front
(4) Cover side sill - front INN
(5) Clip
(6) Trim panel - center pillar UPR
(7) Trim panel - center pillar LWR
(8) Cover side sill - rear INN
(9) Trim panel - rear pillar LWR
(10) Trim panel ASSY - rear shelf
(11) Cap - child anchor
(12) Belt guide
(13) Trim panel - rear pillar UPR

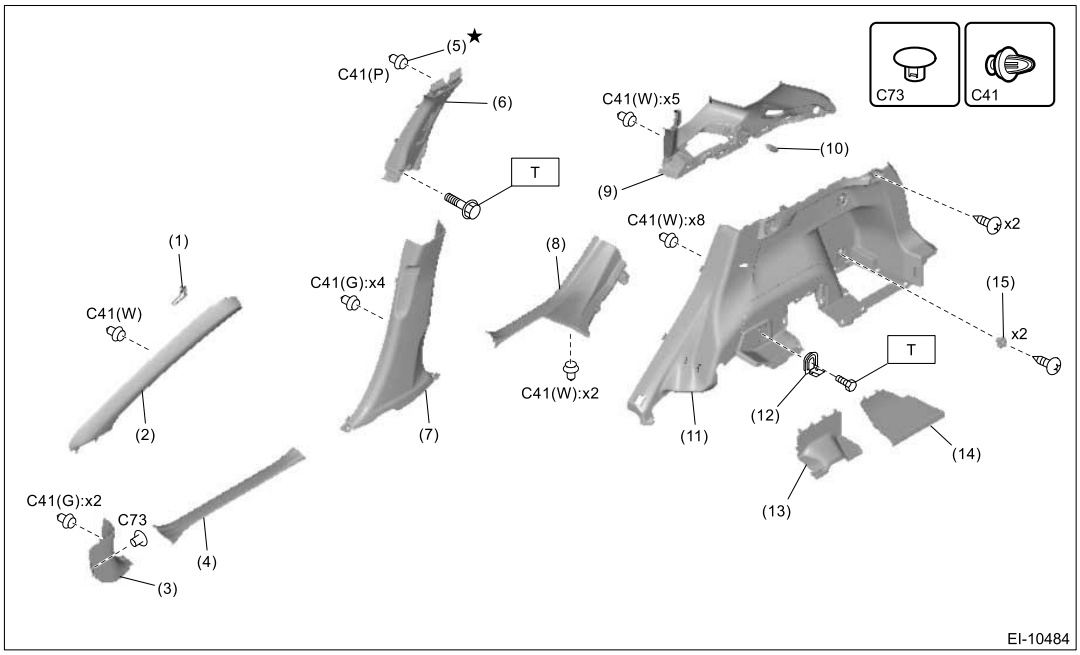
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)



(1) Spacer - rear floor CTR
(2) Mat - trunk
(3) Trim panel - trunk side RH
(4) Trim panel - trunk side RH
(5) Box - sub trunk
(6) Spacer - rear floor side LH
(7) Trim panel - trunk side LH
(8) Trim panel - trunk rear
(9) Trim panel - trunk lid

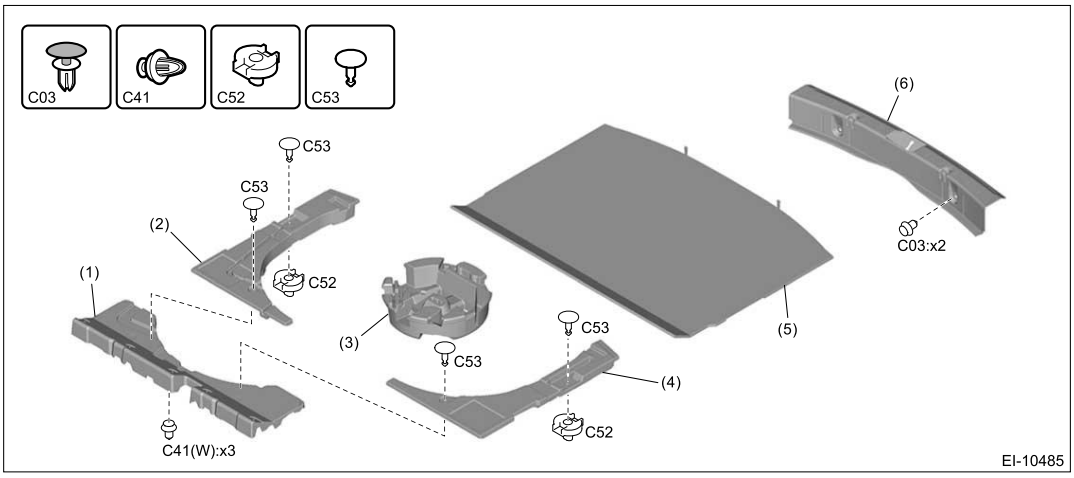
- 5 door model



(1) Tether clip
(2) Trim panel - front pillar UPR
(3) Cover side sill - front
(4) Cover side sill - front INN
(5) Clip
(6) Trim panel - center pillar UPR
(7) Trim panel - center pillar LWR
(8) Cover side sill - rear INN
(9) Trim panel - rear pillar UPR
(10) Holder - belt (RH side only)
(11) Trim panel - rear apron
(12) Luggage hook
(13) Cap - rear suspension
(14) Lid - rear apron
(15) Hook

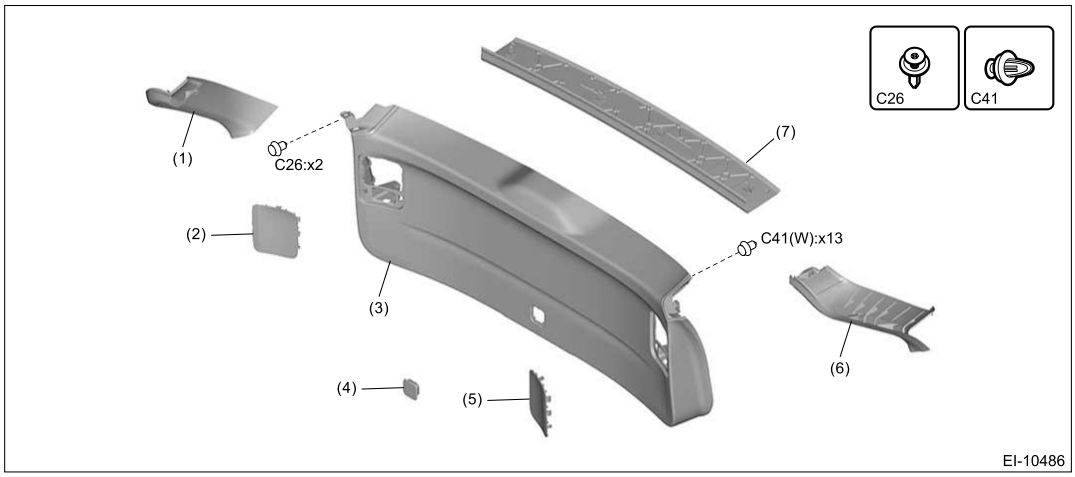
Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)



(1) Spacer - rear floor CTR
(2) Spacer - rear floor side RH
(3) Holder
(4) Spacer - rear floor side LH
(5) Mat - rear floor
(6) Trim panel - rear skirt

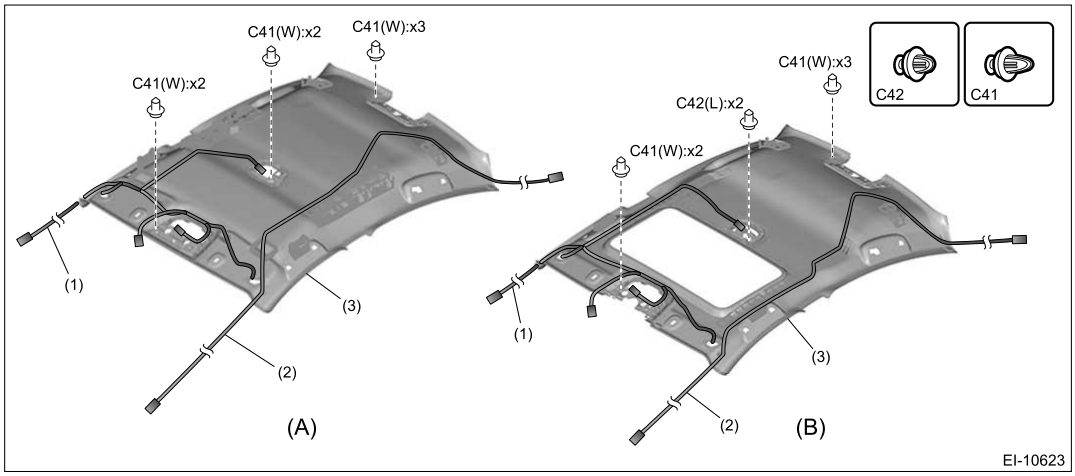
18. REAR GATE TRIM



(1) Trim panel - rear gate pillar side RH
(2) Cap - rear gate RH
(3) Trim panel - rear gate LWR
(4) Cap - emergency
(5) Cap - rear gate LH
(6) Trim panel - rear gate pillar side LH
(7) Trim panel - rear gate UPR

19. ROOF TRIM

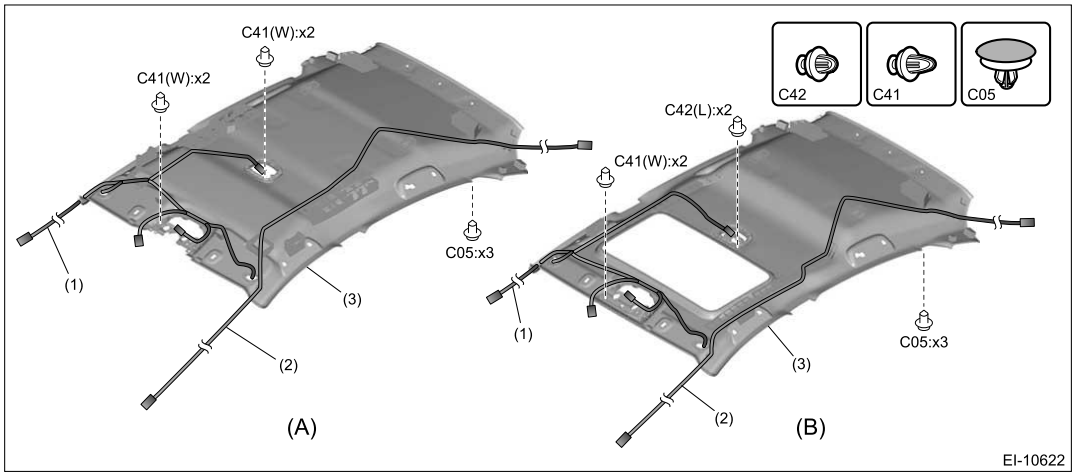
- 4 door model



(A) Normal roof type
(B) Sunroof type

(1) Cord - roof
(2) Cord ASSY - antenna feeder
(3) Trim panel - roof ASSY

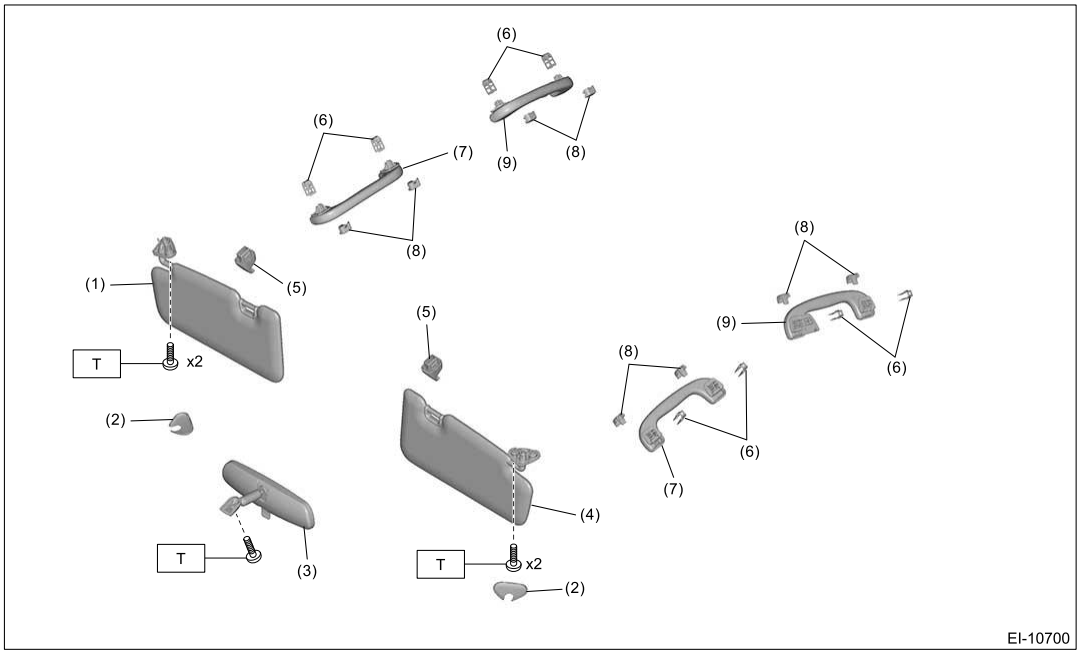
- 5 door model



(A) Normal roof type
(B) Sunroof type

(1) Cord - roof (2) Cord ASSY - antenna feeder (3) Trim panel - roof ASSY

20. ROOM INNER PARTS



(1) Sun visor ASSY RH
(2) Cap - sun visor
(3) Mirror ASSY rearview inner
(4) Sun visor ASSY LH
(5) Hook - sun visor
(6) Steel clip
(7) Assist rail - front
(8) Cap - assist rail
(9) Assist rail - rear

Tightening torque: N·m (kgf-m, ft-lb)

T: 2 (0.2, 1.5)

Note:

For exploded view of the inner mirror, refer to "Rearview Mirror" in "GLASS/WINDOWS/MIRRORS" section.
Ref. to GLASS/WINDOWS/MIRRORS>General Description>COMPONENT > REAR VIEW MIRROR.

EXTERIOR/INTERIOR TRIM > General Description

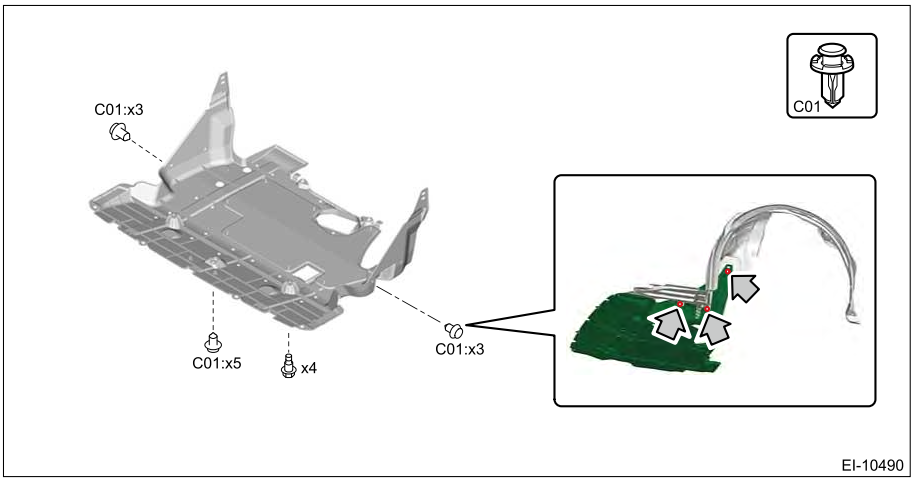
PREPARATION TOOL

TOOL NAME	REMARKS
Clip remover	Used for removing trim. • KTC AP201-10A • KTC AP201-N • KTC AP203-10A • KTC AP20L-10B Or equivalent.
Clip clamp pliers	Used for removal of various clips and clamps. • KTC CCP-190 Or equivalent.
TORX® T20	Used for removing and installing the mirror assembly - inner rearview.

EXTERIOR/INTERIOR TRIM > Front Under Cover

REMOVAL

1. Lift up the vehicle.
2. Remove the bolts and clips, and remove the under cover - front.



EXTERIOR/INTERIOR TRIM > Front Under Cover

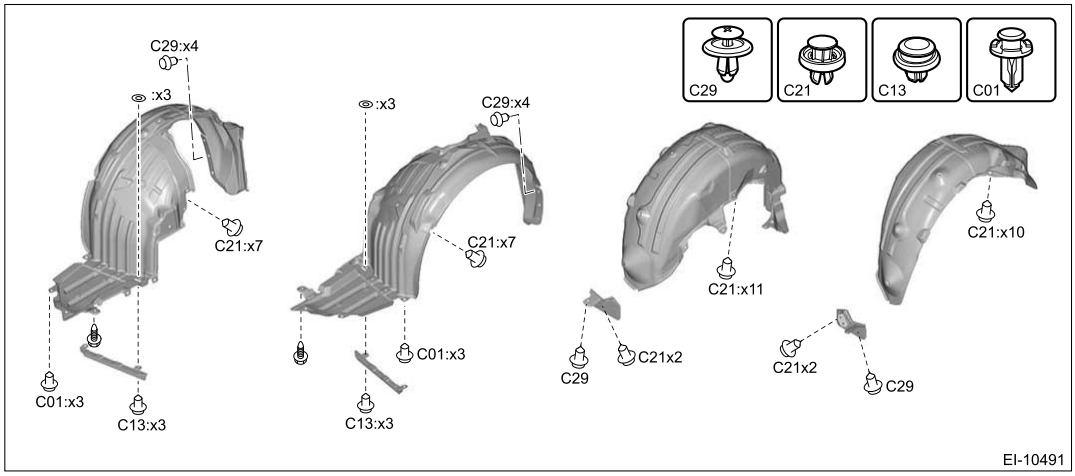
INSTALLATION

1. Install the under cover - front.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
2. Lower the vehicle.

EXTERIOR/INTERIOR TRIM > Mud Guard

REMOVAL

1. Lift up the vehicle.
2. Remove the wheels.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the screws and clips, and remove the mud guard and air flap.



Note:

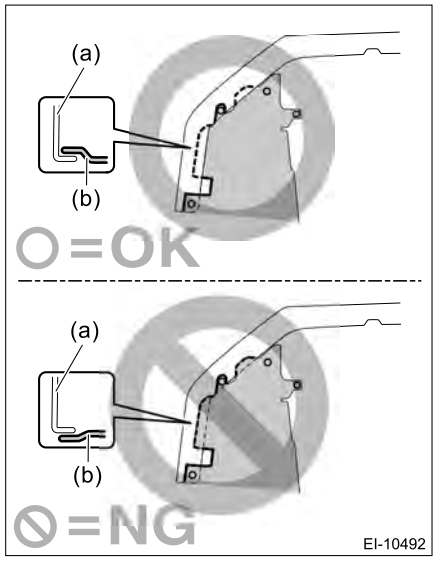
For model with the spoiler assembly - side sill, the number of clips is different.

EXTERIOR/INTERIOR TRIM > Mud Guard

INSTALLATION

Caution:

Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Install the mud guard - front.
2. Install the wheel.

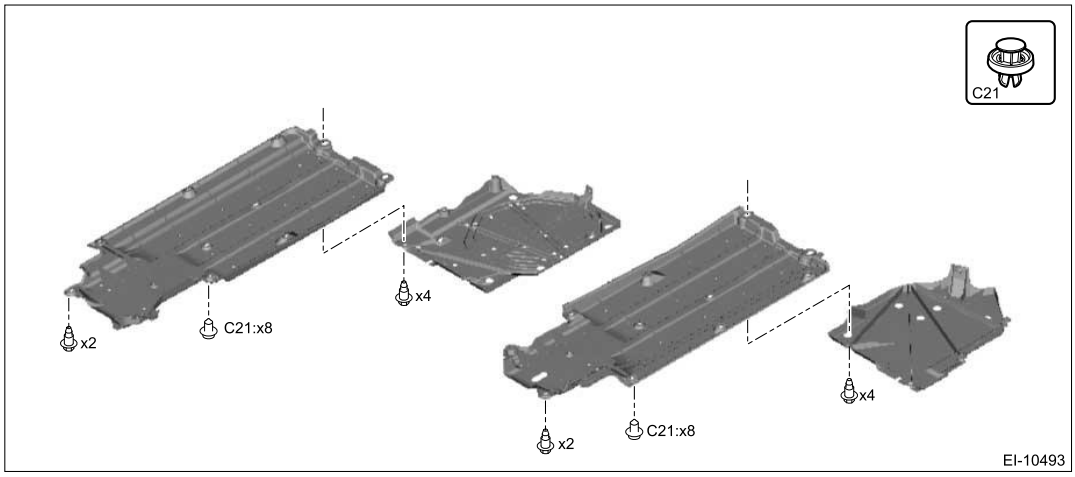
   Tightening torque:

   Wheel nut: 120 N·m (12.2 kgf-m, 88.5 ft-lb)
3. Lower the vehicle.

EXTERIOR/INTERIOR TRIM > Floor Under Protector

REMOVAL

1. Lift up the vehicle.
   Caution:
   Do not use a plate type lift.
2. Remove the bolts, and remove the fuel tank protector.
3. Remove the bolts and clips, and remove the floor under protector.



EXTERIOR/INTERIOR TRIM > Floor Under Protector

INSTALLATION

1. Install the floor under protector and fuel tank protector.
   Tightening torque:
   Refer to "COMPONENT" of "General Description". Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > FLOOR UNDER PROTECTOR.
2. Lower the vehicle.

NOTE

Refer to “FUEL INJECTION” section for removal and installation procedure of the fuel tank protector.

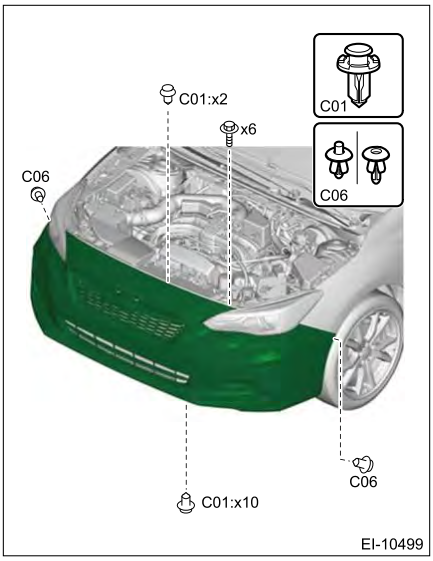
NOTE

For removal/installation procedures of front grille assembly, refer to “DISASSEMBLY” or “ASSEMBLY” in “FRONT BUMPER”.

REMOVAL

1. BUMPER FACE

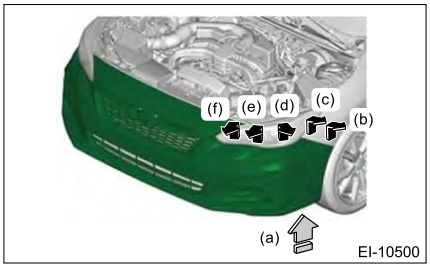
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - front.
   (1) Remove the bolt and clip.



(2) While pushing up the lower side (a) of the bumper face - front, release the engagement in the order from (b) to (f).

Caution:

Do not pull forcibly. It may damage the flange section on the bumper face - front side when it comes off from the claws of the bracket - front bumper.



(3) Disconnect the connector of the fog light assembly or the daytime light assembly.

Note:

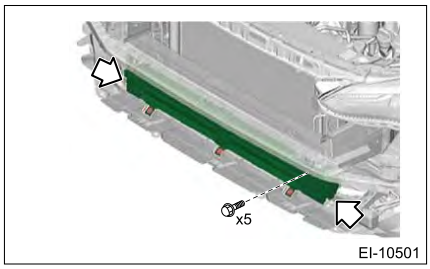
Detach the opposite side in the same manner.

(4) Remove the bumper face while pulling up the center part of the bumper.



2. BUMPER BEAM

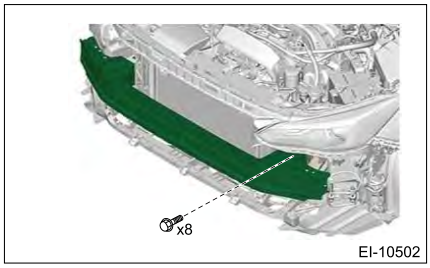
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - front.
3. Remove the energy absorber.
4. Remove the bolts and disconnect the connector, and remove the active grille shutter.



Note:

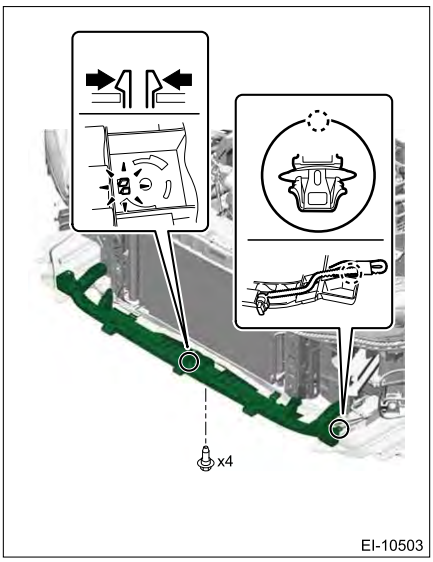
For models without active grille shutter, remove the frame assembly - active grille shutter.

5. Remove the bolts, and remove the bumper beam COMPL - front.



3. BUMPER BRACKET

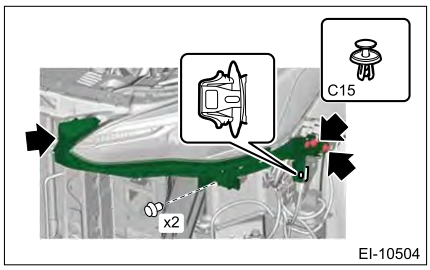
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - front.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the bracket center LWR - front.
   (1) Remove the active grille shutter harness clamp.
   (2) Remove the bolts, and remove the bracket center LWR - front.



Note:

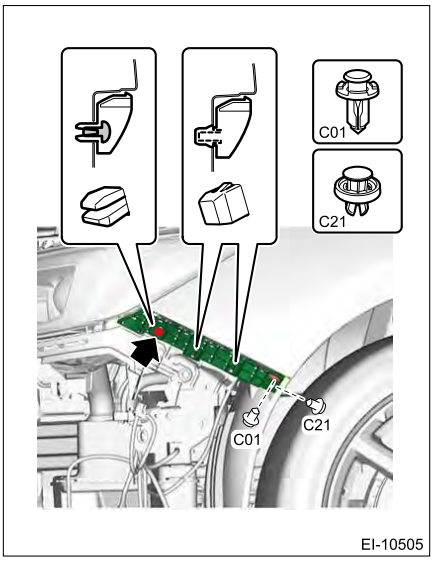
Release the claws if the under cover is mounted.

5. Remove the bolts and clips, and remove the bracket - front bumper corner.
   (1) Remove the keyless buzzer.
   (2) Remove the bolts and clips, and remove the bracket - front bumper corner.



6. Remove the bracket - front bumper side.

(1) Remove the screws.
(2) Remove the claws from behind the fender COMPL - front, and remove the bracket - front bumper side.

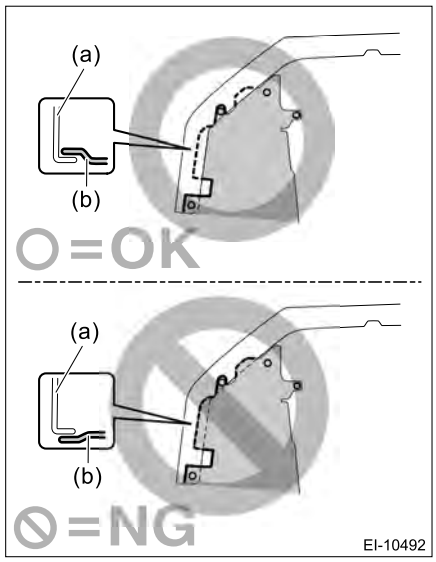


EXTERIOR/INTERIOR TRIM > Front Bumper

INSTALLATION

Caution:

- **Before installing the bumper face, match the claws on the bracket - front bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.**
- **Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).**



1. Install the fog light assembly - front. Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>INSTALLATION.
2. Install the bracket - front bumper side.
3. Install the bracket - front bumper corner.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the bracket - front center LWR.
   Tightening torque:
   9.5 N·m (1 kgf-m, 7 ft-lb)
5. Install the under cover - front.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
6. Install the bumper beam COMPL - front.
   Tightening torque:

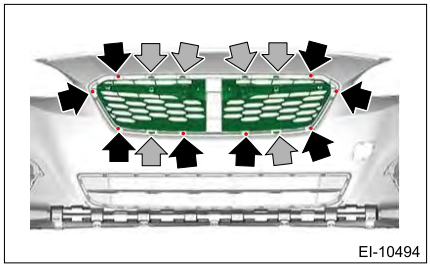
33 N·m (3.4 kgf-m, 24.3 ft-lb)

7. Install the active grille shutter.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the energy absorber.
9. Install the bumper face - front.
   Tightening torque:
   Plate UPR - front: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
11. Adjust the headlight beam and fog light beam.
    - Adjust the headlight beam. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT > HEADLIGHT BEAM ADJUSTMENT.
    - Adjust the fog light beam. (Model with fog light) Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>ADJUSTMENT > FOG LIGHT AIMING.

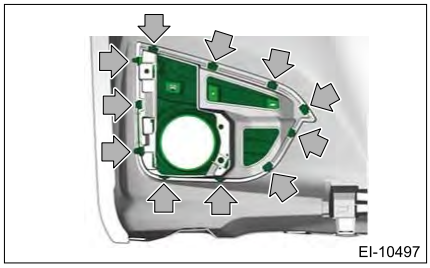
EXTERIOR/INTERIOR TRIM > Front Bumper

DISASSEMBLY

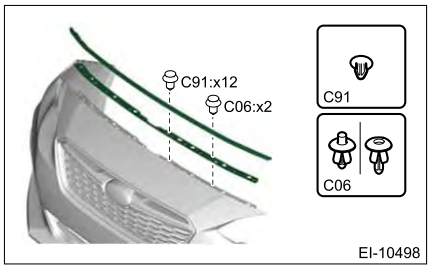
1. Remove the front grille assembly.
   (1) Remove the screws on the back side.
   (2) Release the claws, and remove the front grille assembly.
   - 4 door model and 5 door model



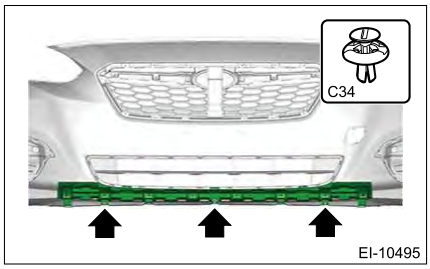
2. Remove the fog light assembly - front or the light assembly - daytime running. Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>REMOVAL.
3. Release the claws, and then remove the cover - fog light.



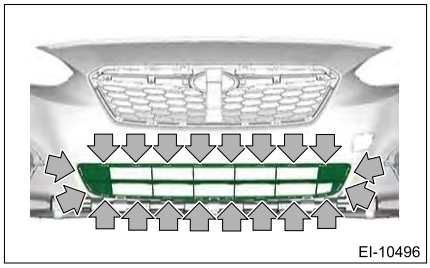
4. Remove the clips, and remove the sealing bumper - front and the plate UPR - front.



5. Remove the clips, and remove the energy absorber LWR - front.



6. Release the claws, and then remove the cover intake - front.



EXTERIOR/INTERIOR TRIM > Front Bumper

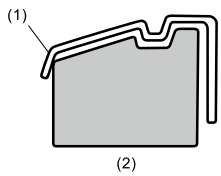
ASSEMBLY

1. Install the cover intake - front.
2. Install the energy absorber LWR - front.
3. Remove the clips, and install the sealing bumper - front and the plate UPR - front.
4. Install the cover - fog light.
5. Install the fog light assembly - front or the light assembly - daytime running.
6. Install the front grille assembly.

EXTERIOR/INTERIOR TRIM > Front Bumper

REPAIR

1. COATING METHOD FOR PP BUMPER

<table>
<tr><th>Process No.</th><th>Process name</th><th colspan="2">Job contents</th></tr>
<tr><td>1</td><td>Bumper installation</td><td>Place the bumper on a paint worktable as required. Use the paint worktable conforming to inner shape of bumper if possible.</td><td>Cross section of bumper

(1) Bumper
(2) Paint worktable</td></tr>
<tr><td>2</td><td>Degreasing/cleaning</td><td colspan="2">Clean all parts to be painted with appropriate cleaning solvent, normal alcohol, etc. to remove dirt, oil, grease, etc.</td></tr>
<tr><td>3</td><td>Primer paint</td><td colspan="2">Apply primer to all parts to be painted, using spray gun. Use primer (clear).</td></tr>
<tr><td>4</td><td>Drying</td><td colspan="2">Dry at normal temperature. [10 — 15 min. at 20°C (68°F)]
In half-dried condition, PP primer paint is dissolved by solvent, e.g. thinner, etc.
Therefore, if dust or dirt must be removed, use ordinary alcohol etc.</td></tr>
<tr><td rowspan="2">5</td><td rowspan="2">Top coat paint (I)</td><td>Non-colored</td><td>Metallic paint</td></tr>
<tr><td colspan="2"></td></tr>
</table>

Process No.	Process name	Job contents	
		Use section (block) paint for top coat. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 10 — 13 sec./20°C (68°F) • Film thickness: 35 — 45 µ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)	Use section (block) paint for top coat. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 10 — 13 sec./20°C (68°F) • Film thickness: 15 — 20 µ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)
6	Drying	Not required.	Dry at normal temperature [at least 10 min. at 20°C (68°F)]. In half-dried condition, avoid dust, dirt.
7	Top coat paint (II)	Not required.	Apply a clear coat to parts with top coat paint (I), three times at 5 — 7 minute intervals. For paint/hardener mixture, observe the specifications recommended by the manufacturers. • Viscosity: 14 — 16 sec./20°C (68°F) • Film thickness: 25 — 30 µ • Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)
8	Drying	60°C (140°F), 60 min. or 80°C (176°F), 30 min. If the temperature is higher than 80°C (176°F), PP may be deformed. Keep maximum temperature at 80°C (176°F) or less.	
9	Inspection	Check paint.	

2. REPAIR INSTRUCTIONS FOR COLORED PP BUMPER

Note:

If grained PP bumper surface is damaged, it cannot normally be restored to its former condition. Damages limited to the shallow scratches that cause only a change in the luster of the base material or coating, can be almost fully restored. Before repairing a damaged area, explain this point to the customer and obtain an understanding about the matter.

Repair methods are outlined below, based on a classification of the extent of damage.

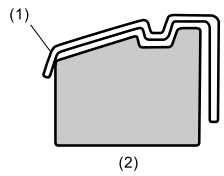
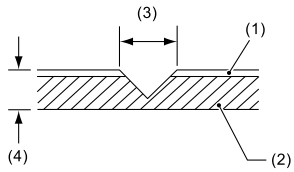
1. Minor damage causing only a change in the luster of the bumper due to a light touch
Almost restorable.

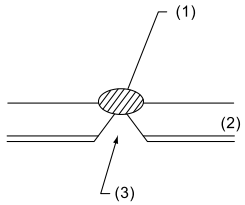
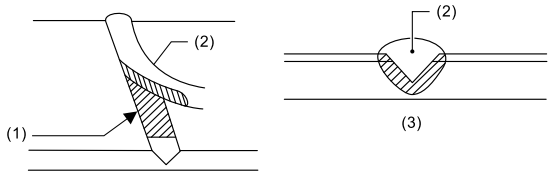
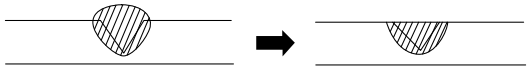
Process No.	Process name	Job contents	
1	Cleaning	Clean the area to be repaired using water.	
2	Sanding	Grind the repairing area with No. 500 sand paper in a “feathering” motion.	
3	Finish	Resin section	Coated section
		Repeatedly apply wax to the affected area using soft cloth (such as flannel). Recommended wax: Tire wax or equivalent	Perform either the same procedures as for the resin section or the process in step 18 and subsequent in section 3, depending on the degree and nature of damage.
		Polish the waxed area with clean cloth after 5 — 10 minutes.	

2. Deep damage caused by scratching with fences etc.
A dent cannot be repaired but a whitened or swelled part can be removed.

Process No.	Process name	Job contents	
1	Cleaning	Clean the damaged area with water.	
2	Removal of damaged area	Cut off protruding area, if any, due to collision, using a putty knife.	
3	Sanding	Grind the repairing area with No. 100 — 500 sand paper.	
4	Finish	Resin section	Coated section
		Same as step 3 in section "1".	Perform the step 12 and subsequent operations in section "3".

3. Deep damage such as a break or hole that requires filling
Much of the peripheral grained surface must be sacrificed for repair. The degree of restoration is not really worth the expense. (The surface, however, will become almost flush with adjacent areas.)

Process No.	Process name	Job contents	
1	Bumper removal	Remove the bumper as required.	
2	Removal of parts	Remove the parts built into bumper as required.	
3	Bumper placement	Place the bumper on a paint worktable as required. It is recommended to use the paint worktable conforming to internal shape of bumper.	Cross section of bumper  EI-00234 (1) Bumper (2) Paint worktable
4	Surface preparation	Remove dust, oil, etc. from areas to be repaired and surrounding areas, using an appropriate solvent (appropriate cleaning solvent or alcohol, etc.).	
5	Cutting	If the damage is a crack or a hole, cut a guide slit of 20 — 30 mm (0.79 — 1.18 in) in length along the crack or hole up to the bumper base surface. Next, use a knife or grinder to carve a V-shaped groove in the area for repair.	 EI-00235 (1) Paint surface (2) PP base surface (3) 20 — 30 mm (0.79 — 1.18 in) (4) 3 mm (0.12 in)
6	Sanding (I)	Grind the beveled surface with sand paper (No. 40 — 60) to smooth finish.	
7	Cleaning	Clean the sanded surface with the same solvent as used in process No. 4.	
8	Temporary welding	Grind the side opposite to the beveled area with sand paper (No. 40 — 60) and clean using a solvent. Temporarily spot-weld the side, using PP welding rod and heater gun.	

Process No.	Process name	Job contents
		 EI-00236 (1) Welded point (Use heater gun and PP welding rod) (2) PP base surface (3) Beveled section **Note:** • **Do not melt welding rod until it flows out. This results in reduced strength.** • **Leave the welded spot unattended until it cools completely.**
9	Welding	Using a heater gun and PP welding rod, weld the beveled spot while melting both the rod and damaged area.
		 EI-00237 (1) Welding rod (2) Melt hatched area (3) Section **Note:** • **Melt the sections indicated by hatched area.** • **Do not melt the welding rod until it flows out, in order to provide strength.** • **Always keep the heater gun 1 — 2 cm (0.4 — 0.8 in) away from the welding spot.** • **Leave the welded spot unattended until it cools completely.**
10	Sanding (II)	Remove excess part of weld with a putty knife. If a drill or disc wheel is used instead of the knife, operate it with a rotating speed of less than 1,500 r/min and grind the excess part little by little. A higher rpm will cause the PP substrate to melt from the heat.
		 EI-00042
		Sand the welded spot smooth with No. 240 sand paper.
11	Cleaning/degreasing	Completely clean the entire coated area, using solvent similar to that used in process No. 4.
12	Primer coating	Apply a coat of primer for bumpers to the repaired surface and its surrounding areas. Mask these areas, if necessary. **Note:** **Be sure to apply a coat of primer using a spray gun at a pressure of 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi).**

<table>
<tr><th>Process No.</th><th>Process name</th><th colspan="2">Job contents</th></tr>
<tr><td>13</td><td>Leave unattended</td><td colspan="2">Leave the repaired area unattended at 20°C (68°F) for 10 — 15 minutes until primer is half-dry.
Note:
If dirt or dust comes in contact with the coated area, wipe it off with a cloth dampened with alcohol. (Do not use thinner since it could melt the coated area.)</td></tr>
<tr><td>14</td><td>Surfacer coating</td><td colspan="2">Apply a coat of surfacer for PP bumpers to the repaired area two or three times at an interval of 3 — 5 minutes.
For surfacer/hardener mixture, viscosity and paint thickness, observe the specifications of the surfacers to be used.</td></tr>
<tr><td>15</td><td>Drying</td><td colspan="2">Allow the coated surface to dry for 20 minutes at 20°C (68°F) [or 30 minutes at 60°C (140°F)].</td></tr>
<tr><td>16</td><td>Sanding (III)</td><td colspan="2">Sand the coated surface and its surrounding areas using No. 400 sand paper and water.</td></tr>
<tr><td>17</td><td>Cleaning/degreasing</td><td colspan="2">Same as process No. 12.</td></tr>
<tr><td rowspan="2">18</td><td rowspan="2">Top coat (I)</td><td>Non-colored</td><td>Metallic paint</td></tr>
<tr><td>Use a “block” coating method.
For paint/hardener mixture, observe the specifications recommended by the manufacturers.
• Viscosity: 11 — 13 sec./20°C (68°F)
• Coating film thickness: 40 — 50 μ
• Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)</td><td>Use a “block” coating method.
For paint/hardener mixture, observe the specifications recommended by the manufacturers.
• Viscosity: 11 — 13 sec./20°C (68°F)
• Coating film thickness: 20 — 30 μ
• Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)</td></tr>
<tr><td>19</td><td>Leave unattended</td><td>Not required.</td><td>Leave unattended at 20°C (68°F) for at least 10 minutes until the topcoated area is half-dry.
Note:
Be careful to keep dust or dirt from coming in contact with the affected area.</td></tr>
<tr><td>20</td><td>Top coat (II)</td><td>Not required.</td><td>Apply a clear coat three times at an interval of 3 to 5 minutes.
For paint/hardener mixture, observe the specifications recommended by the manufacturers.
• Viscosity: 10 — 13 sec./20°C (68°F)
• Coating film thickness: 20 — 30 μ
• Spraying pressure: 245 — 343 kPa (2.5 — 3.5 kgf/cm^2, 36 — 50 psi)</td></tr>
<tr><td>21</td><td>Drying</td><td colspan="2">Allow the coated surface to dry for two hours at 20°C (68°F) or 30 minutes at 60°C (140°F).
Note:
Do not allow the temperature to exceed 80°C (176°F) since this will deform the PP substrate.</td></tr>
<tr><td>22</td><td>Inspection</td><td colspan="2">Carefully check the condition of the repaired area.</td></tr>
<tr><td>23</td><td>Parts installation</td><td colspan="2">Install parts on the bumper in reverse order of removal.</td></tr>
<tr><td>24</td><td>Bumper installation</td><td colspan="2">Install the bumper.</td></tr>
</table>

REMOVAL

1. 4 DOOR MODEL

- **BUMPER FACE**

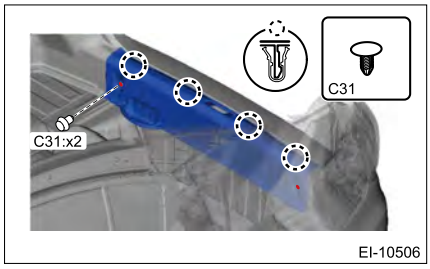
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trunk room mat.
3. Remove the trim panel - trunk rear.

   Caution:

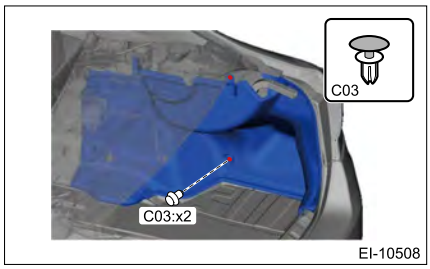
   Pull up the trim panel - trunk rear vertically. If it is pulled up obliquely, the claws may be damaged.

   (1) Remove the clip.

   (2) Release the claws, and remove the trim panel - trunk rear.



4. Remove the clips, and turn over the trim panel - trunk side.



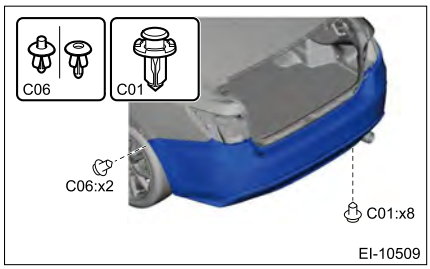
5. Remove the rear combination light assembly. Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>REMOVAL > 4 DOOR MODEL.
6. Remove the bumper face - rear.

   Caution:

   - **Pulling with excessive force may damage the bracket or bumper face.**
   - **For models with Reverse Automatic Braking, the connector of the cord assembly - sonar is secured on the bumper beam COMPL.**

     Pulling the bumper face with excessive force may break the harness.

   (1) Remove the clips, and remove the bumper face - rear.



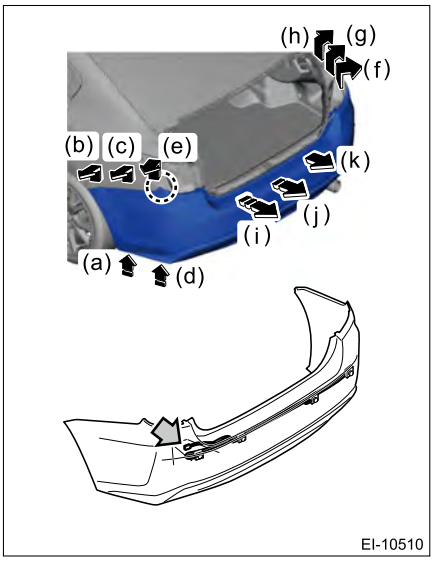
   (2) Detach (b) and (c) while pulling up (a) of the bumper face - rear.

   (3) Detach (e) while pulling up (d) of the bumper face - rear.

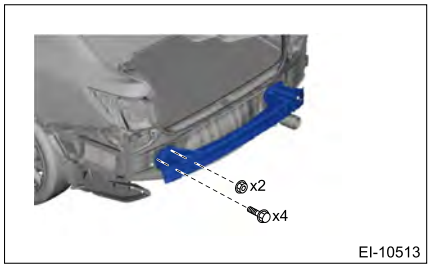
   (4) Perform the same procedures when detaching (f) to (h) on the opposite side.

   (5) While pulling up the center part of the bumper face - rear, carefully pull it toward you to detach (i) to (k) in this order.

   (6) For models with Reverse Automatic Braking, disconnect the connector (gray arrow section) located on the bumper beam COMPL.



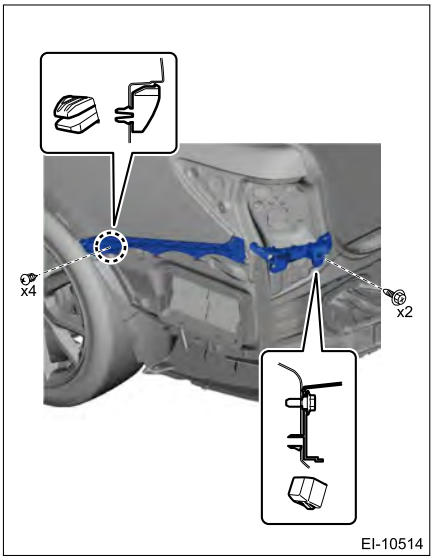
- **BUMPER BEAM**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. Remove the bolts and nuts, and remove the bumper beam COMPL - rear.



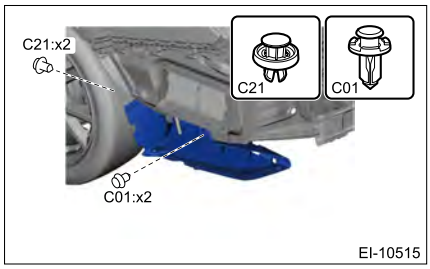
- **BRACKET**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. Remove bumper brackets.

     (1) Remove the bracket - front bumper corner.
     1. Remove the screws.
     2. Release the claws, and then remove the bracket - front bumper corner.

     (2) Remove the bracket - rear bumper side.
     1. Remove the screws.
     2. Turn over the trim panel - trunk side, and remove by detaching the claws from the inside of the trunk.



(3) Remove the clips, and remove the cover - side LWR.



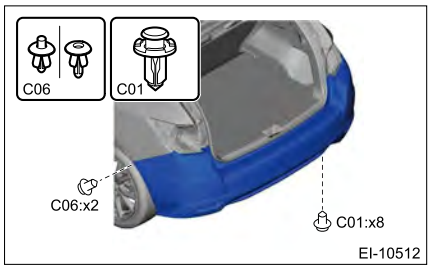
- **SONAR SENSOR & HARNESS**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. If removing the following parts, refer to "Sensor & Harness" of the "Reverse Automatic Braking" section. Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness>REMOVAL.
     - Cord assembly - sonar
     - Sonar - sensor

2. 5 DOOR MODEL

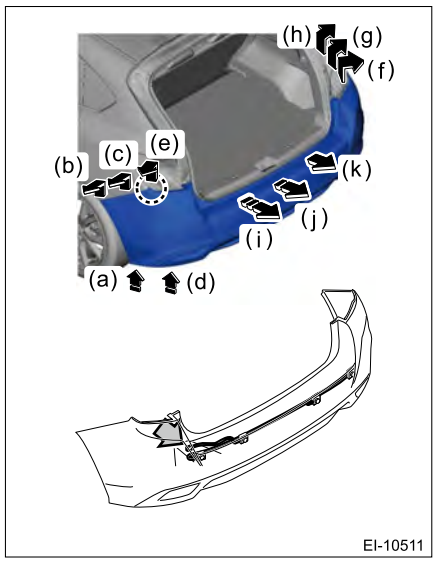
- **BUMPER FACE**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the rear combination light assembly. Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>REMOVAL > 5 DOOR MODEL.
  3. Remove the bumper face - rear.

     Caution:
     - **Pulling with excessive force may damage the bracket or bumper face.**
     - **For models with Reverse Automatic Braking, the connector of the cord assembly - sonar is secured on the bumper beam COMPL.**
       Pulling the bumper face with excessive force may break the harness.

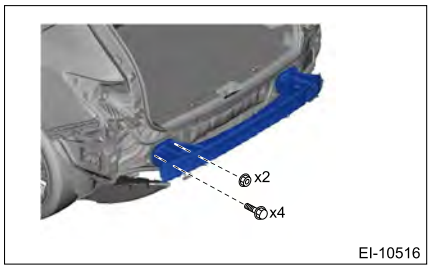
     (1) Remove the clips, and remove the bumper face - rear.



     (2) Detach (b) and (c) while pulling up (a) of the bumper face - rear.
     (3) Detach (e) while pulling up (d) of the bumper face - rear.
     (4) Perform the same procedures when detaching (f) to (h) on the opposite side.
     (5) While pulling up the center part of the bumper face - rear, carefully pull it toward you to detach (i) to (k) in this order.
     (6) For models with Reverse Automatic Braking, disconnect the connector (gray arrow section) located on the bumper beam COMPL.



- **BUMPER BEAM**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. Remove the bolts and nuts, and remove the bumper beam COMPL - rear.



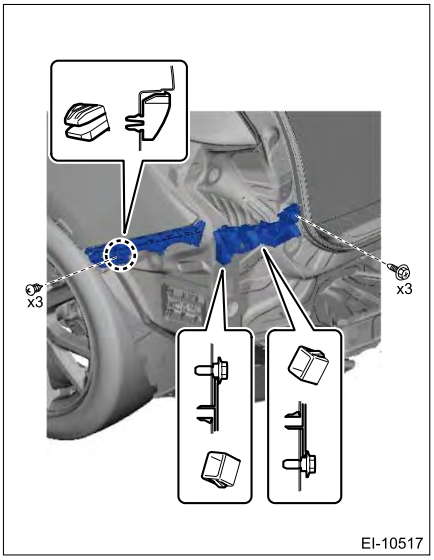
- **BRACKET**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. Remove bumper brackets.

(1) Remove the bracket - front bumper corner.

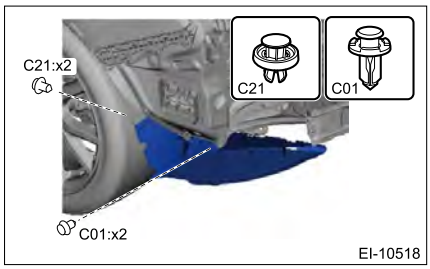
1. Remove the screws.
2. Release the claws, and then remove the bracket - front bumper corner.

(2) Remove the bracket - rear bumper side.

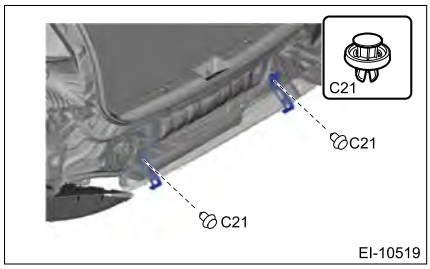
1. Remove the trim panel - rear apron. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
2. Remove the screws.
3. Release the claws from the inside of the panel, and remove the bracket - rear bumper side.



(3) Remove the clips, and remove the cover - side LWR.



(4) Remove the clips, and remove the bracket LWR - rear.



- **SONAR SENSOR & HARNESS**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  2. Remove the bumper face - rear.
  3. If removing the following parts, refer to "Sensor & Harness" of the "Reverse Automatic Braking" section. Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness>REMOVAL.
     - Cord assembly - sonar
     - Sonar - sensor

EXTERIOR/INTERIOR TRIM > Rear Bumper

INSTALLATION

1. 4 DOOR MODEL

Caution:

Before installing the bumper face, match the claws on the bracket - rear bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.

1. If installing the following parts, refer to "Sensor & Harness" of the "Reverse Automatic Braking" section. Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness>INSTALLATION.
   - Sonar - sensor
   - Cord assembly - sonar
   - Holder - sonar
2. Install each bumper bracket.
3. Install the bumper beam COMPL - rear.
   Tightening torque:
   53 N·m (5.4 kgf-m, 39.1 ft-lb)
4. Install the bumper face - rear.
   Caution:
   For models with Reverse Automatic Braking, securely fasten the connector of the cord assembly - sonar.
   Note:
   If the bumper face - rear comes off too easily, adjust the hook of the center bracket side.
5. Install the light assembly - rear combination.
   Caution:
   Replace the gasket - rear combination with a new part. If a gasket is reused, water leakage may occur.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
6. Install the trim panel - trunk rear and trunk room mat.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

Caution:

Before installing the bumper face, match the claws on the bracket - rear bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.

1. If installing the following parts, refer to "Sensor & Harness" of the "Reverse Automatic Braking" section. Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness>INSTALLATION.
   - Sonar - sensor
   - Cord assembly - sonar
   - Holder - sonar
2. Install each bumper bracket.
3. Install the trim panel - rear apron.
4. Install the bumper beam COMPL - rear.

Tightening torque:

53 N·m (5.4 kgf-m, 39.1 ft-lb)

5. Install the bumper face - rear.

Caution:

For models with Reverse Automatic Braking, securely fasten the connector of the cord assembly - sonar.

Note:

If the bumper face - rear comes off too easily, adjust the hook of the center bracket side.

6. Install the light assembly - rear combination.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Rear Bumper

REPAIR

Refer to the description concerning repair in “Front Bumper” section. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REPAIR.

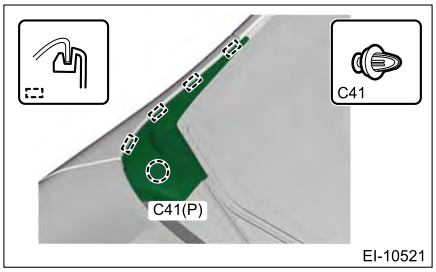
EXTERIOR/INTERIOR TRIM > Cowl Panel

REMOVAL

1. Remove the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
2. Release the clips and claws, and then remove the cowl panel - on the left and right sides.

Caution:

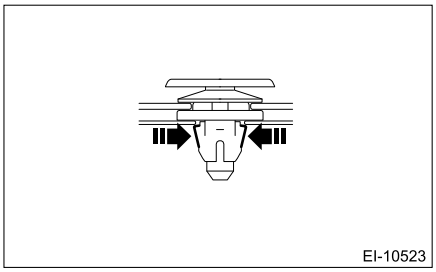
Pulling with excessive force may damage the cowl panel - side. If it is difficult to remove, use a plastic remover or equivalent tool.



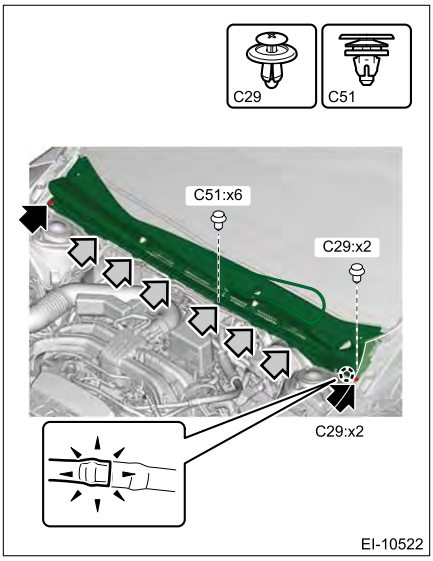
3. Remove the cowl panel assembly.

Caution:

- **Before removing the cowl panel, use an air blower and nylon brush to sweep gravel from the lower area of the front side of the glass.**
- **When removing the clip from the cowl panel center, push the claw of the clip from both sides.**
  - **Be careful not to apply excessive force when pulling the clip, as the clip may become damaged.**
  - **If pushing the claw of the clip is difficult, turning the claw position will facilitate the operation.**



(1) Disconnect the washer hose.
(2) Remove the clip.
(3) Remove the cowl panel assembly by pulling it out towards the front of the vehicle.



(4) Remove the washer nozzle and washer hose as required. Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>REMOVAL.

EXTERIOR/INTERIOR TRIM > Cowl Panel

INSTALLATION

Caution:

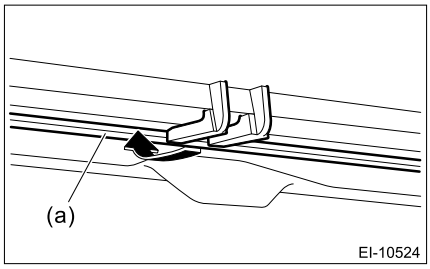
Before installing the windshield glass and cowl panel, make sure there are no gravel in the installing area.

1. Install the cowl panel assembly.

Caution:

If the cowl panel assembly cannot be installed properly, do not hit or set it forcibly. The claws of the cowl panel or the windshield glass may be damaged.

(1) Hook the claw of the cowl panel on the lower end (a) of the windshield glass.



(2) Align the center protrusion of the cowl panel assembly to the cutout portion of the vehicle side, then install the cowl panel assembly.

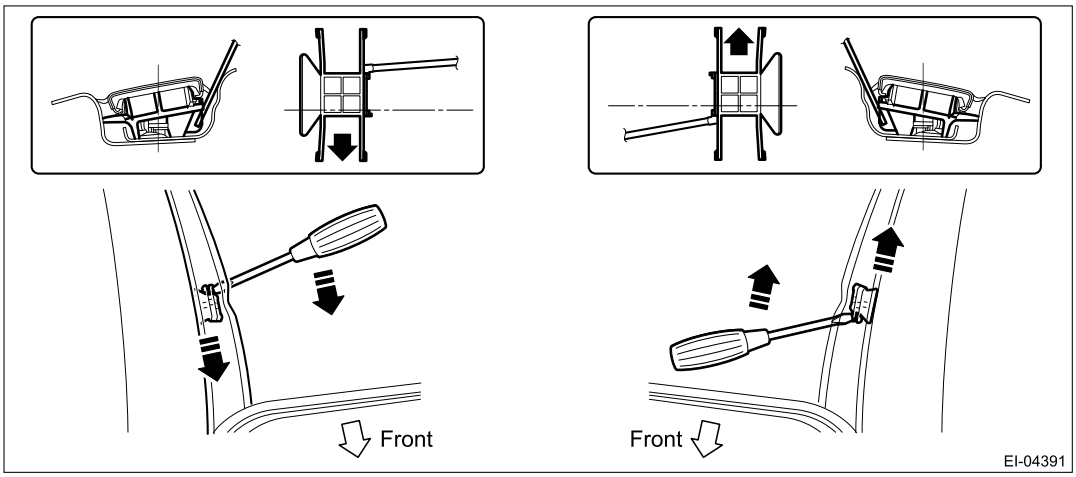
(3) Attach the clip and connect the washer hose.

2. Install the cowl panel - side.
3. Install the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>INSTALLATION.
4. If the washer nozzles have been removed from the cowl panel assembly, adjust the washer spray positions. Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>ADJUSTMENT.

REMOVAL

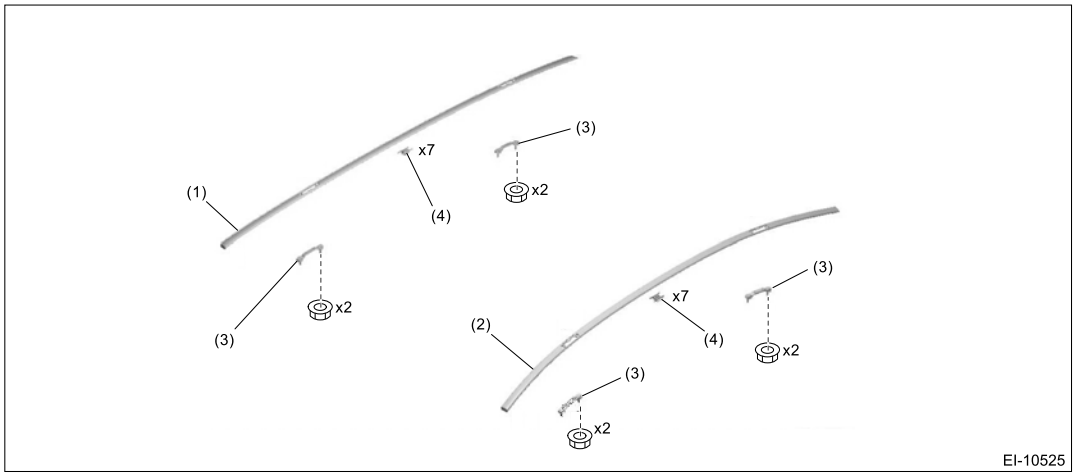
Caution:
Be careful not to damage the body.

1. Turn over the front end of the molding - roof.
2. Slide the inner fastener in the direction of the arrow using a thin flat tip screwdriver or a precision screwdriver, then remove the fastener from the stud on the vehicle side.



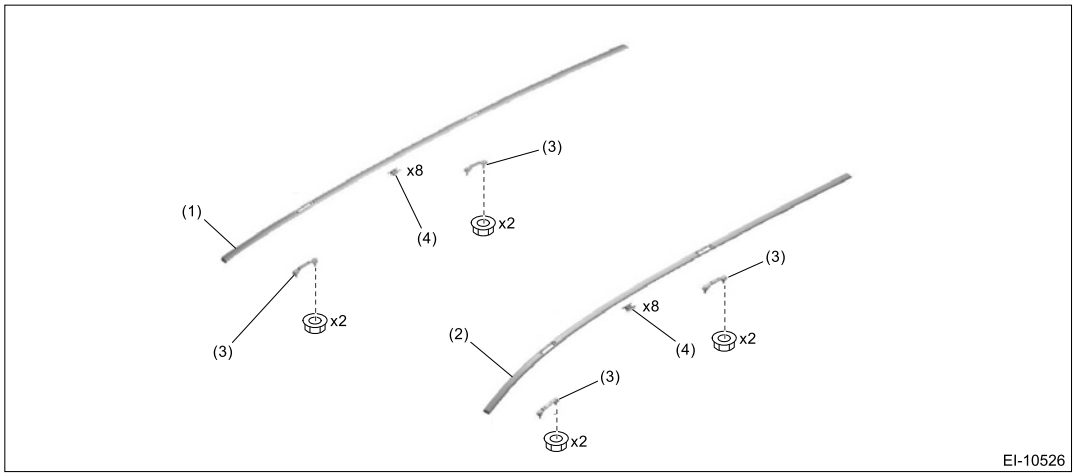
Right side: Slide towards the front of the vehicle.
Left side: Slide towards the rear of the vehicle.

- 4 door model, 7 locations per side



(1) Molding - roof RH
(2) Molding - roof LH
(3) Carrier BRKT
(4) Fastener

- 5 door model, 8 locations per side

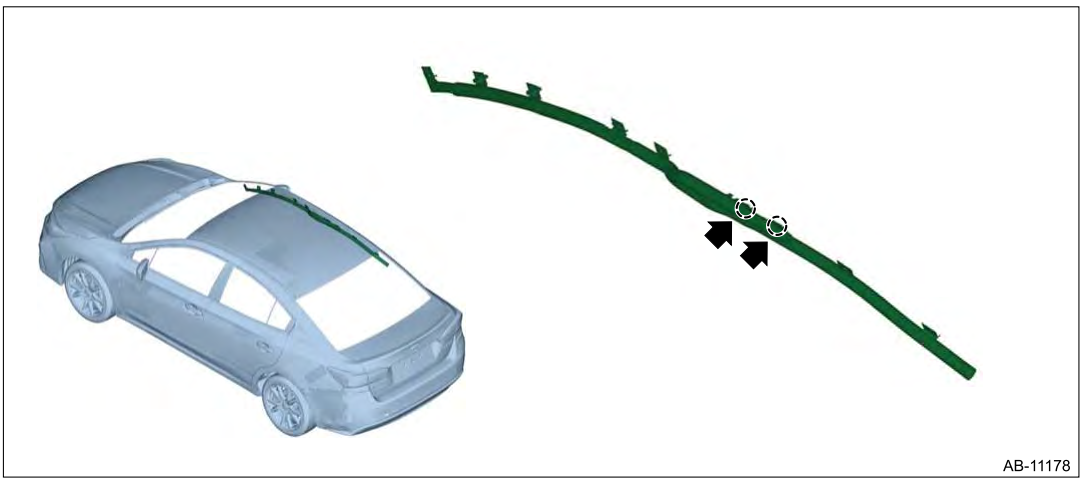


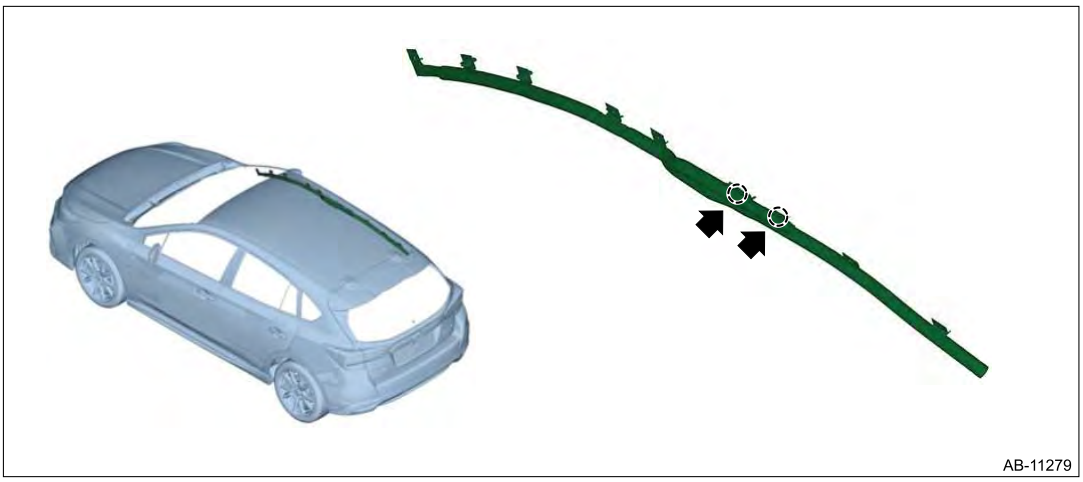
(1) Molding - roof RH
(2) Molding - roof LH
(3) Carrier BRKT
(4) Fastener

3. Pull up the molding - roof, and remove from the vehicle.
4. When removing the carrier BRKT, remove the bolts (2 places) that secure the trim panel - roof and the curtain airbag module.
   (1) Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   (2) Remove the trim panel - roof. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL.
   (3) Remove the bolts (2 places) securing the curtain airbag module.

Caution:

- **Do not remove the clips securing the curtain airbag module. If any of the clips are removed, the curtain airbag module may not deploy properly in collision.**
  If the clip is removed, replace the curtain airbag module assembly.
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Be careful not to damage the curtain airbag module during removal.**





   (4) Remove the nuts, and remove the carrier BRKT.

EXTERIOR/INTERIOR TRIM > Roof Molding

INSTALLATION

1. Install the carrier BRKT.

Caution:

Always replace the carrier BRKT and self-locking nut with a new part when the carrier BRKT is removed. If the carrier BRKT and self-locking nut are reused, water leakage may occur.

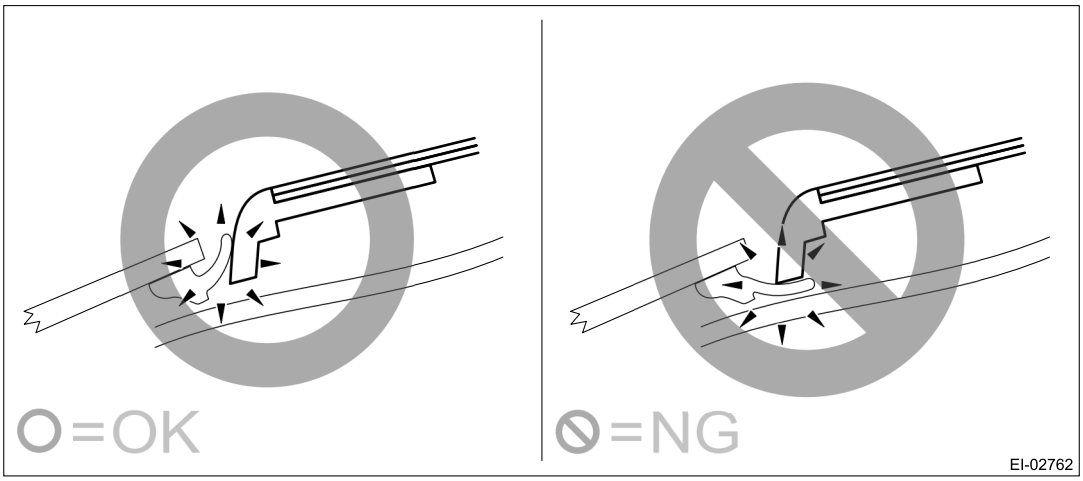
Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

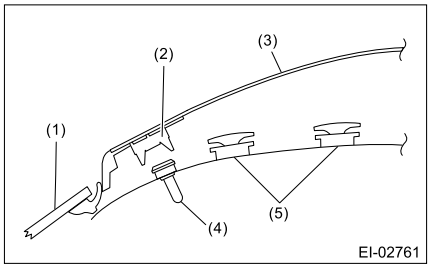
2. Install the curtain airbag module. Ref. to AIRBAG SYSTEM>Curtain Airbag Module>INSTALLATION.
3. Install the trim panel - roof. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
4. Remove the clips from the molding - roof, and attach to the studs on the vehicle.

Caution:

- **Always replace the clips that were damaged during removal of the molding - roof with new parts.**
- **While installing the molding - roof, be careful not to catch the glass molding with the tip of the front side and rear side.**



5. Push the front end of the molding - roof against the front window, and attach the forward positioning clip onto the rivet on the body.



(1) Windshield
(2) Positioning clip
(3) Molding - roof
(4) Rivet
(5) Fastener

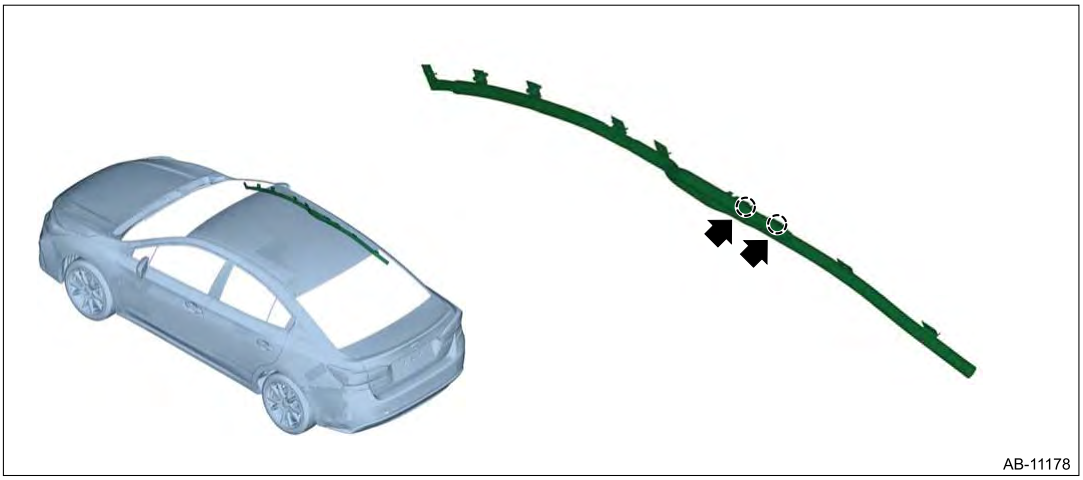
6. While pushing down the molding - roof from above, fit the molding - roof and the fastener.

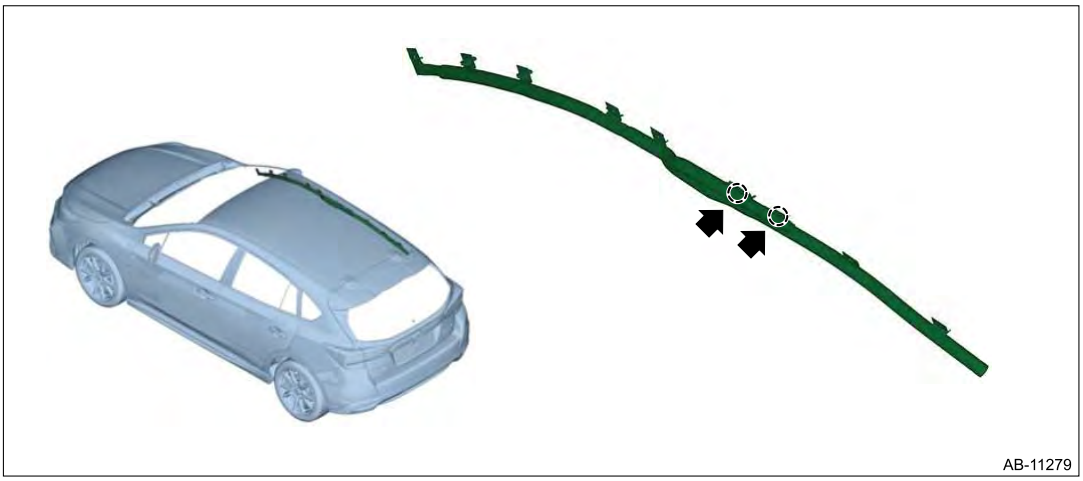
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

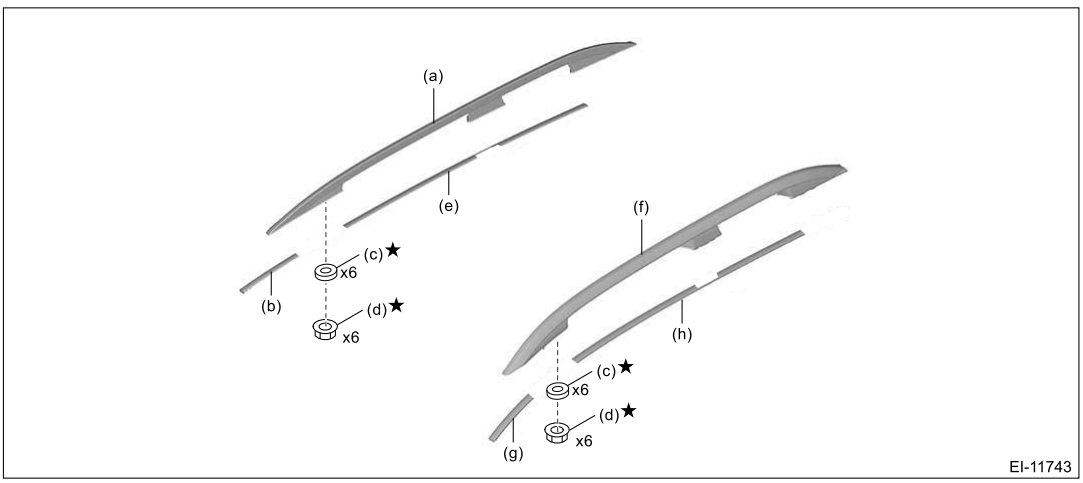
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - roof. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL > 5 DOOR MODEL.
3. Remove the bolts (2 places) securing the curtain airbag module.

   Caution:
   - **Do not remove the clips securing the curtain airbag module. If any of the clips are removed, the curtain airbag module may not deploy properly in collision.**
     If the clip is removed, replace the curtain airbag module assembly.
   - **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
   - **Be careful not to damage the curtain airbag module during removal.**





4. Remove the six attachment nuts and remove the roof rail.



(a) Roof rail ASSY RH
(b) Molding - roof front RH
(c) Gasket
(d) Self-locking nut
(e) Molding - roof rear RH
(f) Roof rail ASSY LH
(g) Molding - roof front LH
(h) Molding - roof rear LH

EXTERIOR/INTERIOR TRIM > Roof Rail

INSTALLATION

Caution:

- **When removing or installing the roof rail, be careful not to scratch the body panel with the stud bolt of roof rail.**
- **Be sure to replace the self-locking nut and gasket with new ones. If the self-locking nut and gasket are reused, water leakage may occur.**

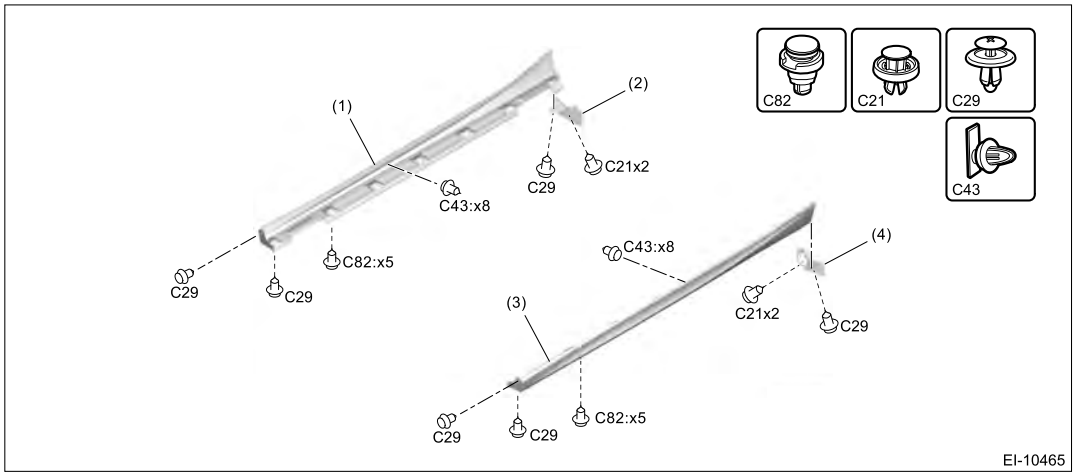
Install each part in the reverse order of removal.

1. Install the roof rail.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the curtain airbag module. Ref. to AIRBAG SYSTEM>Curtain Airbag Module>INSTALLATION.
3. Install the trim panel - roof. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Side Garnish

REMOVAL

1. Remove the clips and remove the spoiler assembly - side sill.



(1) Spoiler ASSY - side sill RH
(2) Plate air flap - rear RH
(3) Aero flap - rear RH
(4) Plate air flap - rear LH

EXTERIOR/INTERIOR TRIM > Side Garnish

INSTALLATION

Caution:

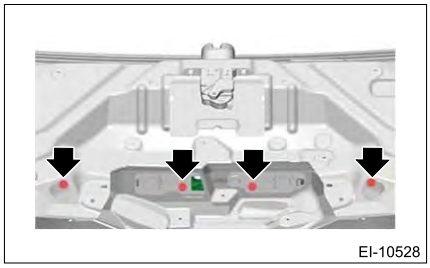
Make sure that there is a gasket attached on the clip of the spoiler assembly or garnish assembly. If a gasket is not attached, water leakage may occur.

Install the spoiler assembly - side sill.

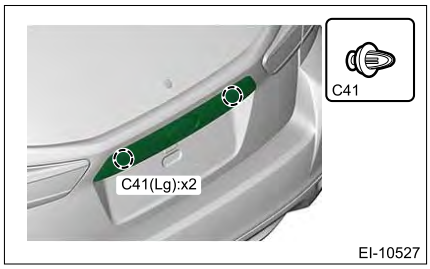
EXTERIOR/INTERIOR TRIM > Rear Gate Garnish

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear gate trim. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the garnish assembly - rear gate.
   (1) Remove the nuts.



   (2) Remove the clips and remove the garnish assembly - rear gate.



4. As necessary, remove each part from the garnish assembly - rear gate.
   - Switch - opener rear gate: Ref. to SECURITY AND LOCKS>Rear Gate Opener Button>REMOVAL.

EXTERIOR/INTERIOR TRIM > Rear Gate Garnish

INSTALLATION

Caution:
- **Make sure that there is a gasket attached on the clip of the spoiler assembly or garnish assembly and bolt. If a gasket is not attached, water leakage may occur.**
- **Make sure that the harness grommet is securely installed. If not properly installed, this may cause leaks or noises.**

1. Install each part.
   - Switch - opener rear gate: Ref. to SECURITY AND LOCKS>Rear Gate Opener Button>INSTALLATION.
2. Install the garnish assembly - rear gate.
   Tightening torque:
   Garnish assembly - rear gate: 4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
3. Install the rear gate trim.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Rear Gate Garnish

REPLACEMENT

1. ORNAMENT

1. Press the ornament from the back of garnish, and remove the ornament.
   Caution:
   - **Be careful not to damage the surface of garnish assembly during operation.**
   - **Do not reuse the ornament.**
2. Remove the double-sided tape remaining on the garnish side, then clean the adhesive surface.
   Caution:
   - **If even a slight amount of double-sided tape remains on the adhesive surface, it may lead to improper adhesion.**
   - **Do not use any solvents that may damage the garnish coating.**
3. Degrease the mounting surface of ornament with appropriate cleaning solvent or alcohol.
4. Apply primer to the ornament mounting surfaces of garnish.
   Preparation items:

Primer: 3M K-520, K-500 or equivalent

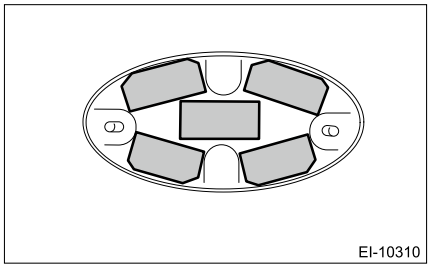
5. Install the ornament.

Caution:

Affix so that there should be no gap between garnish assembly and ornament.

Preparation items:

Double-sided tape: 3M GT7112 (t1.2) or equivalent



EXTERIOR/INTERIOR TRIM > Rear Spoiler

REMOVAL

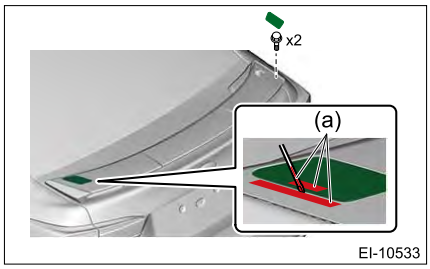
1. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
2. Detach the rear spoiler assembly.

Caution:

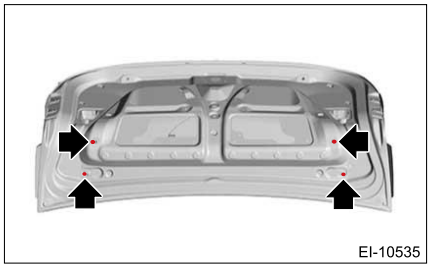
- **Be careful not to damage the vehicle body during removal and installation.**
- **When removing the nut, be careful not to drop the nut inside the trunk lid panel.**
- **The reactive force of trunk lid increases when the rear spoiler is removed.**

(1) Attach protective tape (a) to the rear spoiler assembly, the cap - rear spoiler, and a screwdriver.

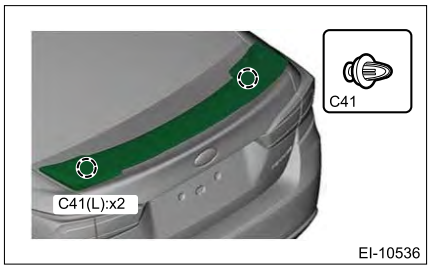
(2) Remove the cap - rear spoiler, and remove the bolts.



(3) Remove the nut from the inside of the trunk lid.



(4) Disengage the clips and remove the rear spoiler assembly.



EXTERIOR/INTERIOR TRIM > Rear Spoiler

INSTALLATION

1. Clean the trunk lid and spoiler attachment surface before installation.

Caution:

Make sure that there is a gasket attached on the clip and bolt of the spoiler assembly or garnish assembly. If a gasket is not attached, water leakage may occur.

2. Install the rear spoiler assembly.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

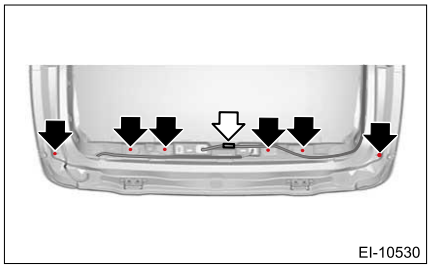
EXTERIOR/INTERIOR TRIM > Roof Spoiler

REMOVAL

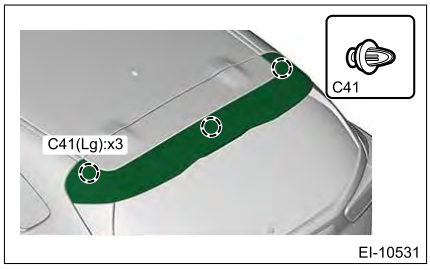
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate UPR. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the clips, and remove the drip - rear gate.



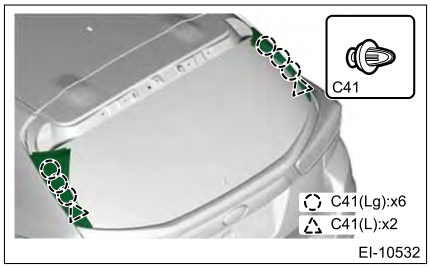
4. Remove the roof spoiler assembly.
   (1) Disconnect the connector of high-mounted stop light.
   (2) Remove the bolt.



   (3) Remove the clips and remove the spoiler assembly - roof CTR.



   (4) Remove the clips and remove the spoiler assembly - roof LH/RH.



EXTERIOR/INTERIOR TRIM > Roof Spoiler

INSTALLATION

Caution:

- **Make sure that there is a gasket attached on the clip and bolt of the spoiler assembly or garnish assembly. If a gasket is not attached, water leakage may occur.**
- **Make sure the bolt is tightened securely because improper installation may cause the water leakage.**

1. Install the roof spoiler.
   Tightening torque:
   4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
2. Install the drip - rear gate.
3. Install the trim panel - rear gate UPR and the trim panel - rear gate pillar side. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>INSTALLATION.

4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

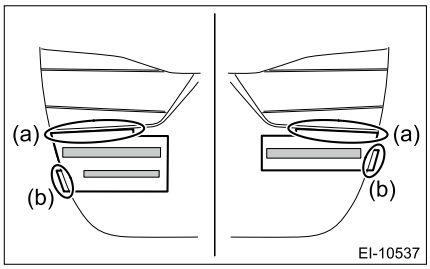
NOTE

Refer to “EXHAUST” section for removal and installation procedure of the heat shield cover.

INSTALLATION

1. LETTER MARK

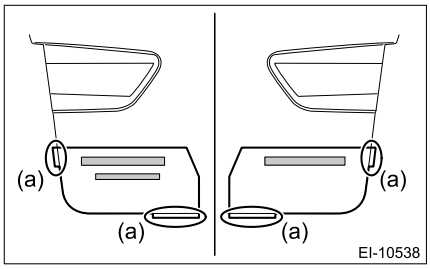
- 4 door model
  Align the end of application tape with the end of panel, then adhere the letter mark.



(a) Fit along the R terminal of the finisher light.

(b) Bend the application board, and fit along the end of the trunk panel.

- 5 door model
  Align the end of application tape with the end of panel and the rounded end, then adhere the letter mark.

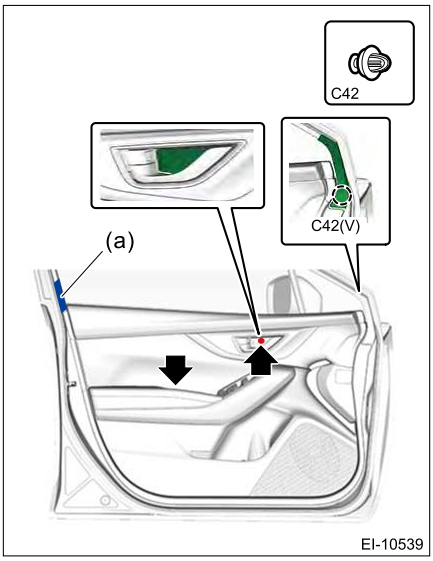


(a) Bend the application board, and fit along the end of the rear gate panel.

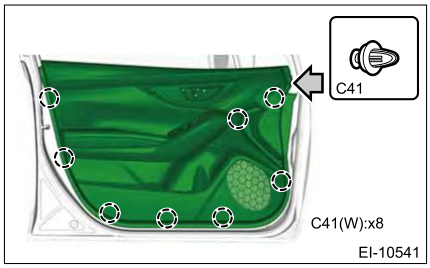
REMOVAL

1. FRONT DOOR

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front door.
   (1) Attach the protective tape (a).
   (2) Remove the cover of the inner handle, and remove the screw.
   (3) Open the hand cup cover and remove the screw.
   (4) Remove the clips, and remove the cover sash - front.

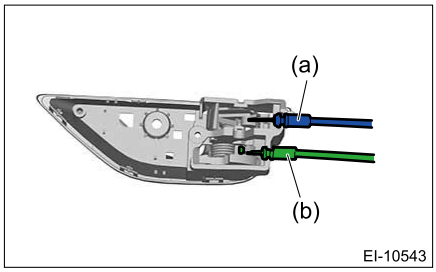


   (5) Remove the clips, and remove the trim panel - front door from the panel assembly - front door.



Note:
It is easier to remove the door trim if the removal is performed from the gray arrow section.

   (6) Remove the cable from the remote assembly - door.

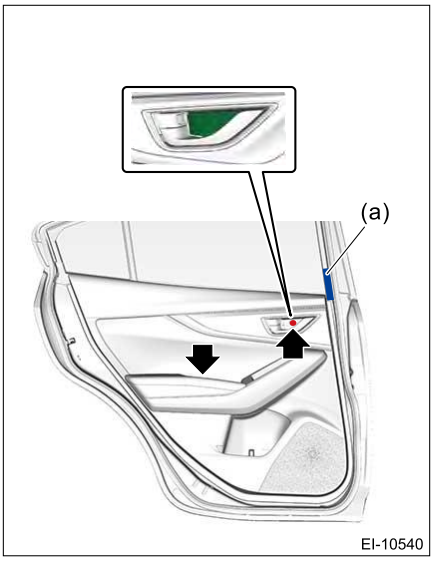


(a) Door lock cable
(b) Door open cable

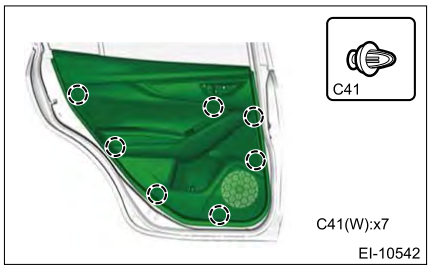
   (7) Disconnect the harness connector and remove the trim panel - front door.
3. Remove each part as required.
   - Remote assembly - door:
   - Switch - power window main: Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>REMOVAL > MAIN SWITCH.
   - Weather strip - door INN: Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>DISASSEMBLY.

2. REAR DOOR

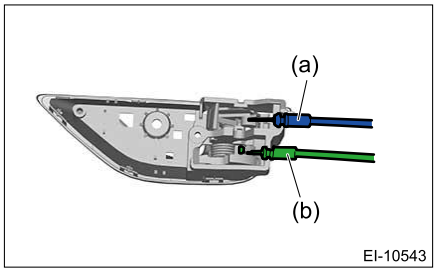
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front door.
   (1) Attach the protective tape (a).
   (2) Remove the cover of the inner handle, and remove the screw.
   (3) Open the hand cup cover and remove the screw.



(4) Remove the clips, and remove the trim panel - rear door from the panel assembly - rear door.



(5) Remove the cable from the remote assembly - door.



(a) Door lock cable
(b) Door open cable

(6) Disconnect the harness connector and remove the trim panel - rear door.

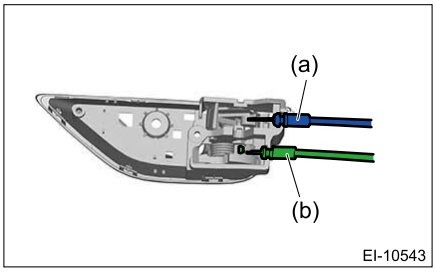
3. Remove each part as required.
   - Remote assembly - door:
   - Switch - power window sub: Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>REMOVAL > SUB-SWITCH.
   - Weather strip - door INN: Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>DISASSEMBLY.

EXTERIOR/INTERIOR TRIM > Door Trim

INSTALLATION

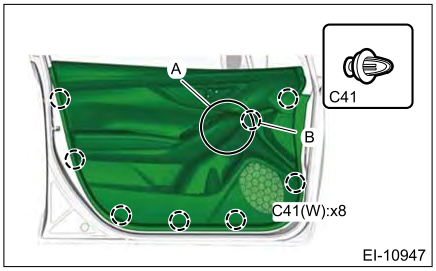
1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
   - Grease is applied sufficiently to cable joints.
     If grease is insufficient, add it as necessary before assembling the cable.
   - Make sure that the sealing cover is securely installed. Ref. to EXTERIOR BODY PANELS>Sealing Cover>INSTALLATION.

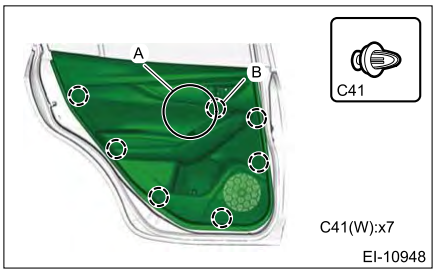
2. Install the removed parts to the trim panel - door.
3. Install the trim panel - door.
   (1) Attach the harness connector.
   (2) Install the cable to the remote assembly - door.
   Note:
   Attach the door lock cable (a) to the upper side, and attach the door open cable (b) to the lower side.



(a) Door lock cable
(b) Door open cable

   (3) Insert the upper portion of the trim panel - door into the window shoulder portion of the panel assembly - door.
   Note:
   For an easier procedure, attach the front side first.
   (4) Check if the screw position is correct, and slowly push in the trim (A) portion in order to securely install the clip (B) to the panel.
   Note:
   When insertion of the clip is not possible, check the installation status of the clip and clip hole of the trim panel - door.



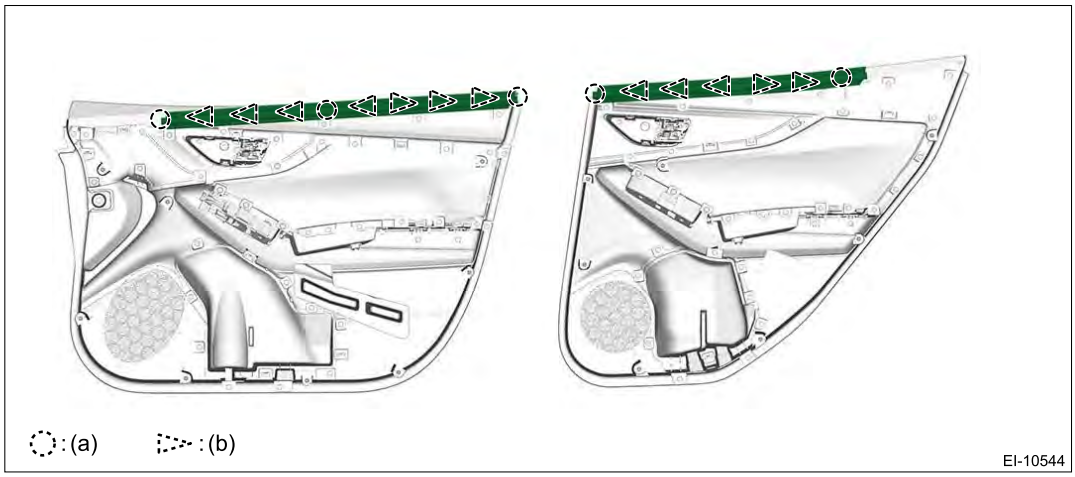


   (5) Attach the remaining clips and tighten the screws.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Door Trim

DISASSEMBLY

1. Remove the trim panel - door.
2. Disengage the rivets and claws, and remove the weather strip - door INN from the trim panel - door.



(a) Rivet (b) Claw

Note:

Remove the rivets with a rivet cutter or nipper, etc.

EXTERIOR/INTERIOR TRIM > Door Trim

ASSEMBLY

1. Bend the claws while pushing the weather strip - door INN against the trim panel - door.

Caution:

Beware of the direction of folding the claws.

2. Install the rivet.

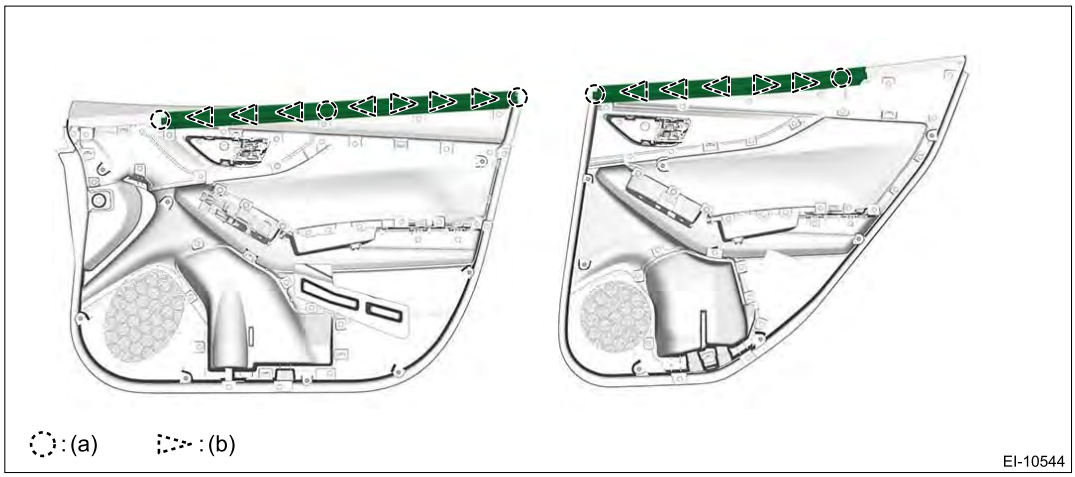
Caution:

Set the height of rivet crimped section as 3 mm (0.12 in). If the crimp is not sufficient, press it with pliers, etc. in order not to interfere the trim panel - door.

Preparation tool and item:

Hand riveter (corresponding to ⌀3.2 mm (0.13 in))

Rivet



(a) Rivet (b) Direction of folding claws

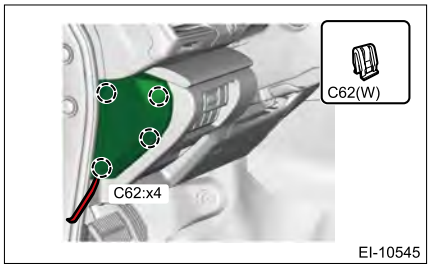
3. After installing the weather strip - door INN, perform the following checks.

- Make sure there are no gaps between the weather strip - door INN and the trim panel - door.
- Make sure there are no looseness when pulling the weather strip - door INN lightly.

EXTERIOR/INTERIOR TRIM > Instrument Panel Lower Cover

REMOVAL

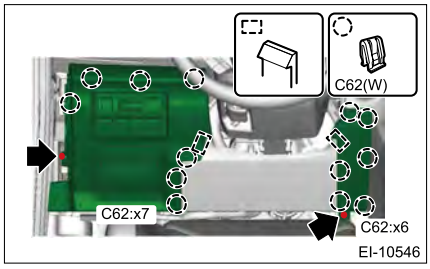
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the clips, and remove the cover - instrument panel side LH.



Note:

- **Use a plastic remover.**
- **If removing is difficult, remove the weather strip, then remove the part from the gap using a plastic remover.**

3. Remove the cover assembly - instrument panel LWR driver INN and OUT.
   (1) Remove the screws and release the clips and claws.
   (2) Disconnect each connector, and remove the cover assembly - instrument panel LWR driver INN and OUT.



EXTERIOR/INTERIOR TRIM > Instrument Panel Lower Cover

INSTALLATION

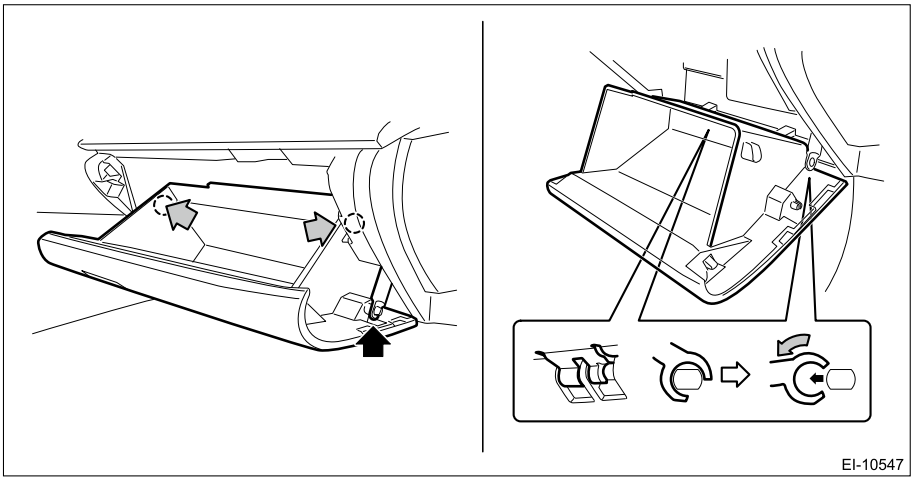
1. Install the cover assembly - instrument panel LWR driver INN and OUT.
2. Install the cover - instrument panel side LH.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

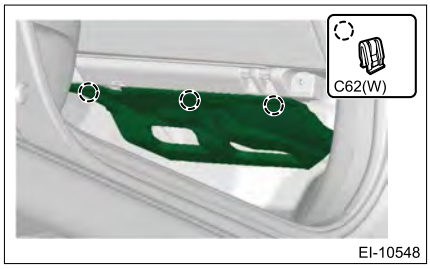
Note:

Refer to "Security and Locks" section for key cylinder replacement. Ref. to SECURITY AND LOCKS>Key Lock Cylinders>REPLACEMENT > GLOVE BOX LID.

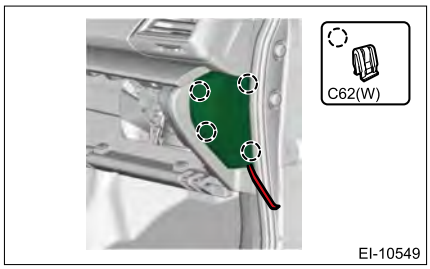
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly.
   (1) Remove the damper COMPL - pocket.
   (2) Release the stoppers and remove the pocket assembly by pulling it toward you.



3. Remove the back panel - pocket.
   (1) Release the clips, and remove the under cover assembly - passenger.



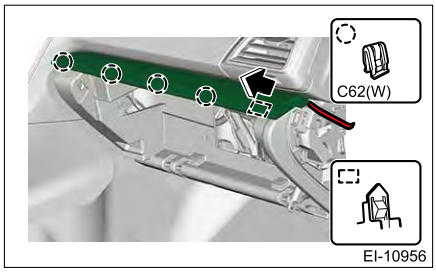
   (2) Remove the clips, and remove the cover - instrument panel side RH.



Note:

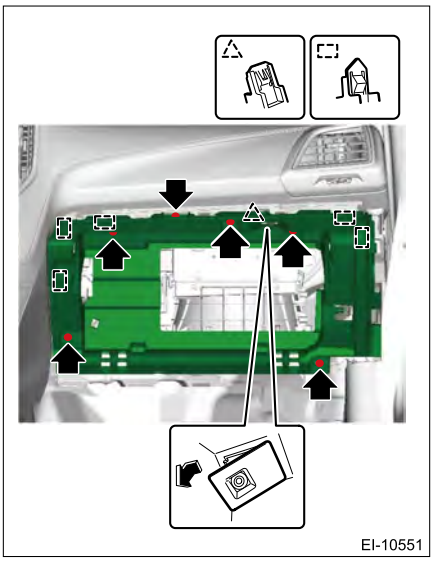
- **Use a plastic remover.**
- **If removing is difficult, remove the weather strip, then remove the part from the gap using a plastic remover.**

   (3) Release the clips, and remove the ornament - panel assembly passenger.



   (4) Remove the glove box light LED, and disconnect the connector.

(5) Release the claws and remove the screws, then remove the back panel - pocket.



EXTERIOR/INTERIOR TRIM > Glove Box

INSTALLATION

1. Install the back panel - pocket.
2. Connect the connector, and install the glove box light LED.
3. Install the ornament - panel assembly passenger.
   Caution:
   Make sure that the directions of the clip and claw, and insert until a clicking sound is heard.
4. Install the under cover assembly - passenger.
5. Install the pocket assembly.
6. Install the cover - instrument panel side RH.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Centor Cluster

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the center grille assembly. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.

EXTERIOR/INTERIOR TRIM > Centor Cluster

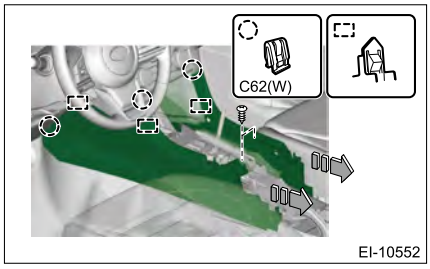
INSTALLATION

1. Install the audio assembly or navigation assembly.
2. Install the panel - center UPR.
3. Install the center grille assembly.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

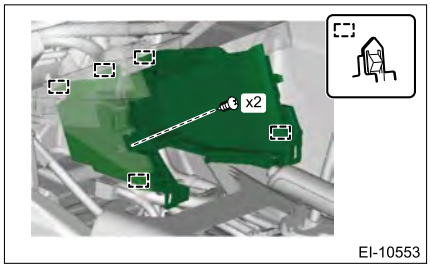
EXTERIOR/INTERIOR TRIM > Center Console

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **On power seat models, move the front seat all the way forward before disconnecting the battery ground cable.**
2. Remove the center grille assembly. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
5. Remove the boot - hand brake, the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
6. Remove the left and right panel center LWR.
   (1) Remove the screws.
   (2) Release the claws and clips, and then pull the panel center LWR to remove.



7. Remove the tray - center UPR.
   (1) Disconnect the connector and remove the screw.
   (2) Release the claws, and then remove the tray - center UPR.



EXTERIOR/INTERIOR TRIM > Center Console

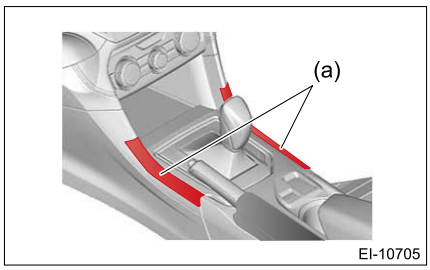
INSTALLATION

1. Install the tray - center UPR.
2. Install the panel center LWR.
3. Install the console box assembly, the cover assembly - front and the boot - hand brake.
   Tightening torque:
   Console box: 6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
4. Install the heater control assembly.
5. Install the audio assembly or navigation assembly.
6. Install the panel - center UPR.
7. Install the center grille assembly.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

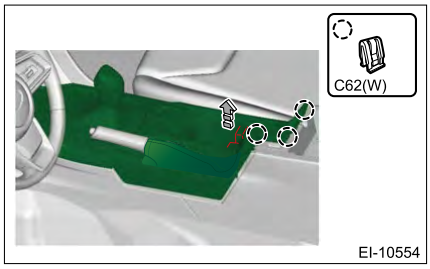
Note:
After connecting the battery ground terminal, place the select lever in the "P" position.

REMOVAL

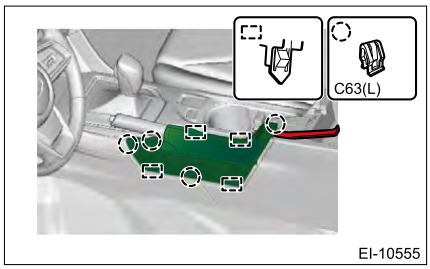
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **On power seat models, move the front seat all the way forward before disconnecting the battery ground cable.**
2. Affix protective tape (a) to the ornament panel - console.



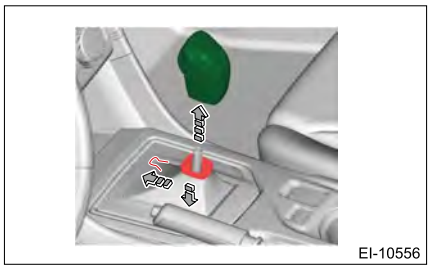
3. Remove the boot - hand brake.
   (1) Pull up the cup holder, and release the engagement of the clip at the end of the cover assembly - front.



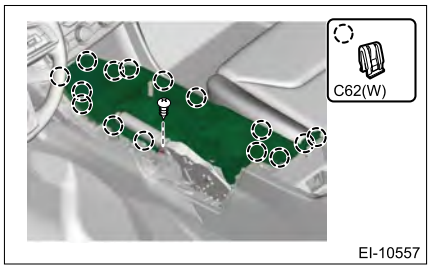
   (2) Release the engagement of claws and clips, and then remove the boot - hand brake.



4. Remove the cover assembly - front.
   Caution:
   - **Remove the mat - center tray and the tray - center LWR together with the cover assembly - front. Removing the mat - center tray first may damage the parts.**
   - **For models with smart keyless access with push button start, the interior antenna is installed behind the tray - center LWR. Be careful not to damage the harness when removing the cover assembly - front.**
   (1) Remove the shift knob. (MT model)
   (2) Remove the select lever knob. (CVT model) Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.

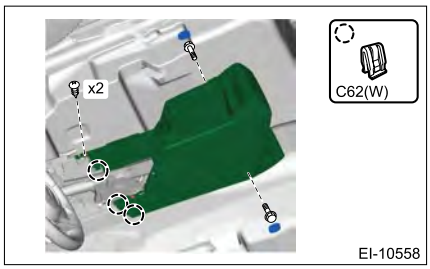


   (3) Remove the screws and release the clips, then detach the cover assembly - front.



(4) Disconnect the harness connector.
(5) Remove the mat - center tray and the tray - center LWR.

5. Remove the console box assembly.
(1) Remove the caps and remove the bolts.
(2) Remove the screws and release the clip.
(3) Disconnect the harness connector, and remove the console box assembly.



6. Disassemble the cover assembly - front and the console box assembly as required.

EXTERIOR/INTERIOR TRIM > Console Box

INSTALLATION

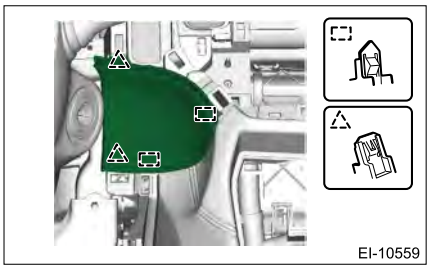
1. Assemble the cover assembly - front and the console box assembly.
2. Install the console box assembly.
Tightening torque:
6.5 N·m (0.7 kgf-m, 4.8 ft-lb)
3. Install the cover assembly - front.
4. Install the mat - center tray and the tray - center LWR.
5. Install the shift knob or selector knob.
6. Install the boot - hand brake.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
Note:
After connecting the battery ground terminal, place the select lever in the "P" position.

REMOVAL

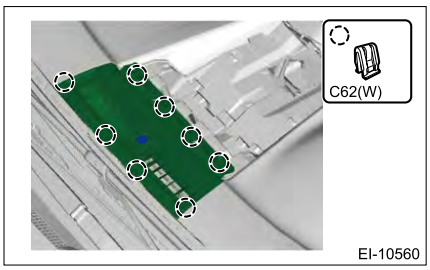
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Be careful not to damage the airbag system harness when servicing the instrument panel. Damage may cause the system to malfunction.**

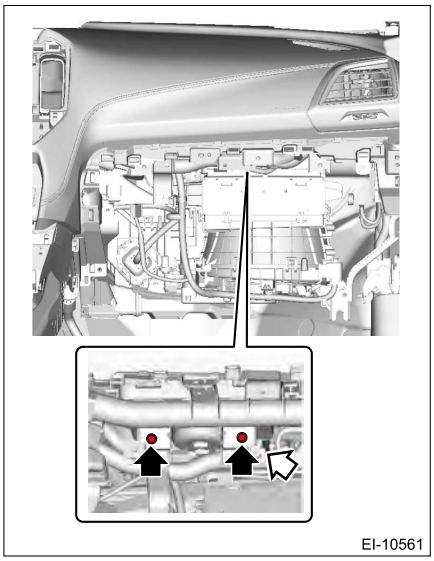
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For the power seat model, remove the console box before removing the battery ground terminal.**
2. Remove the boot - hand brake, the cover assembly - front and the console box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the center grille assembly. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
4. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
5. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
6. Remove the panel center LWR, and remove the tray - center UPR. Ref. to EXTERIOR/INTERIOR TRIM>Center Console>REMOVAL.
7. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Assembly>REMOVAL.
8. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
9. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
10. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
11. Remove the visor assembly - combination meter, the cover assembly - visor LWR, and the combination meter assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
12. Release the claws and clips, and remove the cover - starter SW. (Models without the keyless access with push button start)



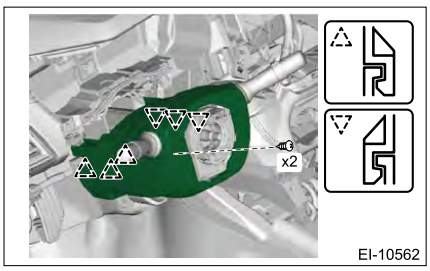
13. Remove the panel - starter SW and the push button ignition switch. (Model with keyless access with push button start) Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>REMOVAL.
14. Remove the trim panel - front pillar UPR on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
15. Remove the grille speaker side and the speaker assembly - tweeter on the left and right sides. Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > TWEETER.
16. Remove the glove box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
17. Remove the multi-function display assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD)>REMOVAL.
18. Remove the grille - front defroster.
    (1) Release the clips, and then raise the grille - front defroster.
    (2) Disconnect the sunload sensor connector, and remove the grille - front defroster.



19. Remove the bolts of the passenger's airbag module, and disconnect the connector. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > PASSENGER'S AIRBAG MODULE AND PRETENSIONER.



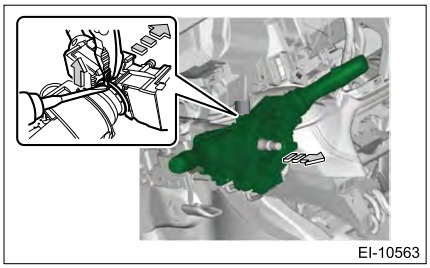
20. Remove the screws and release the claws, then detach the cover assembly - column.



21. Remove the switch assembly - combination.

(1) Disconnect each connector, and loosen the clamp to release the claws.

(2) Pull out the switch assembly - combination from the column assembly - steering.



22. Remove the panel COMPL - instrument.

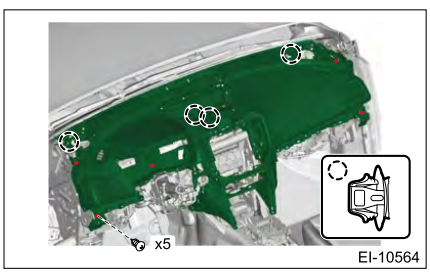
(1) Remove the harness clamp of the speaker assembly - tweeter.

(2) Release the clamps of the sunload sensor and multi-function display harnesses, and pull them out toward yourself.

Note:

Confirm the harness routing of the sunload sensor and multi-function display harnesses.

(3) Remove the screws, and remove the panel COMPL - instrument.



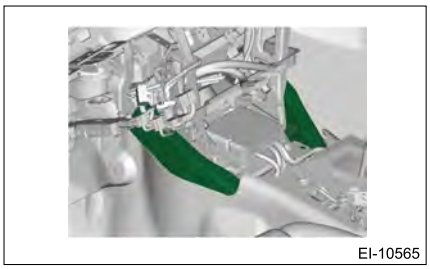
23. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.

24. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.

25. Remove the cover side sill - front INN and cover side sill - front on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.

26. Remove the body side weather strip - flange front.

27. Remove the duct assembly - rear floor.



28. Remove the beam COMPL - steering.

Caution:

The beam COMPL - steering is heavy. Always work in a team of two persons when removing them from the vehicle, so as not to damage the vehicle interior.

(1) Remove the fuse box.

(2) Disconnect all harness clamps and connectors of the instrument panel harness.

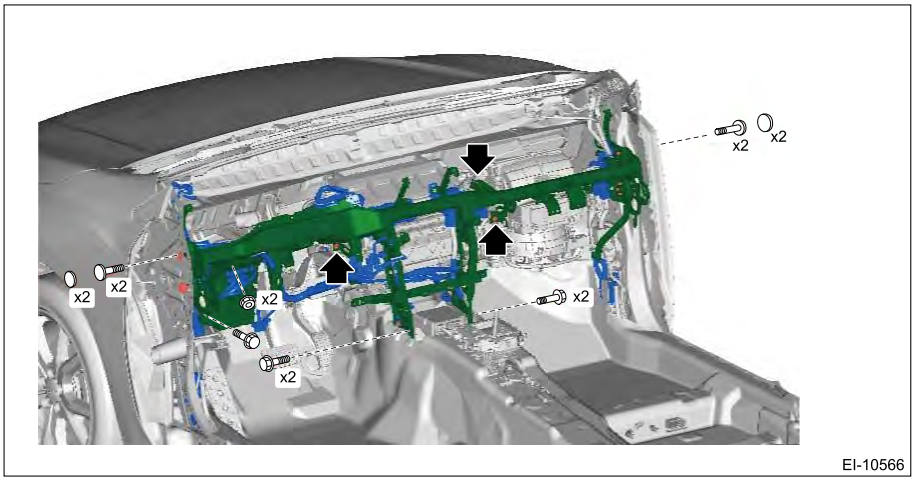
(3) Release all lock points for the ground bolt, heater & cooling unit assembly and the beam COMPL - steering.

(4) Remove the cap - bolt, and remove the TORX® bolt.

PREPARATION TOOL

TORX® T40

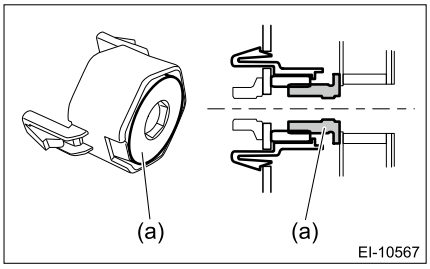
(5) Remove the bolts at the floor center.



(6) Loosen the adjuster portion (a) of the adjuster - clip space. (only passenger's side of beam COMPL - steering)

PREPARATION TOOL

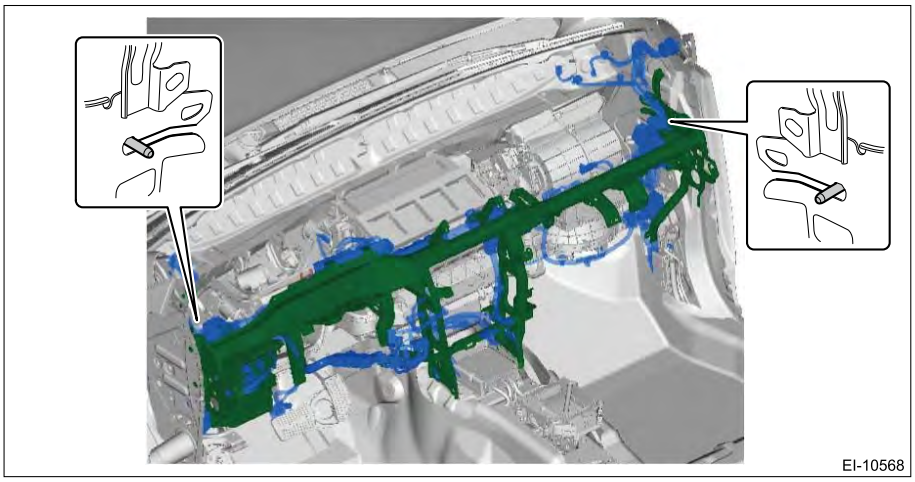
Hexagon wrench: 8 mm (0.31 in)



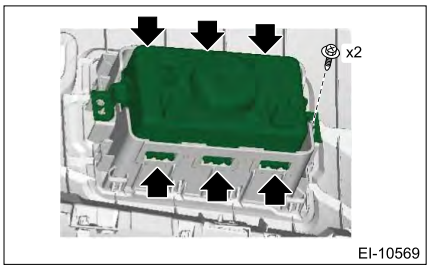
(7) Slightly lift it up to detach the left and right pins, and then pull it toward you to remove together with the beam COMPL - steering.

Caution:

- **Check that all lock points for the harness clamps, harness connectors and the beam COMPL - steering have been released completely.**
- **The instrument panel assembly and the beam COMPL - steering are heavy. Always work in a team of two persons when removing them from the vehicle, so as not to damage the vehicle interior.**



29. Remove the tapping screws and release the claws, and remove the passenger's airbag module.



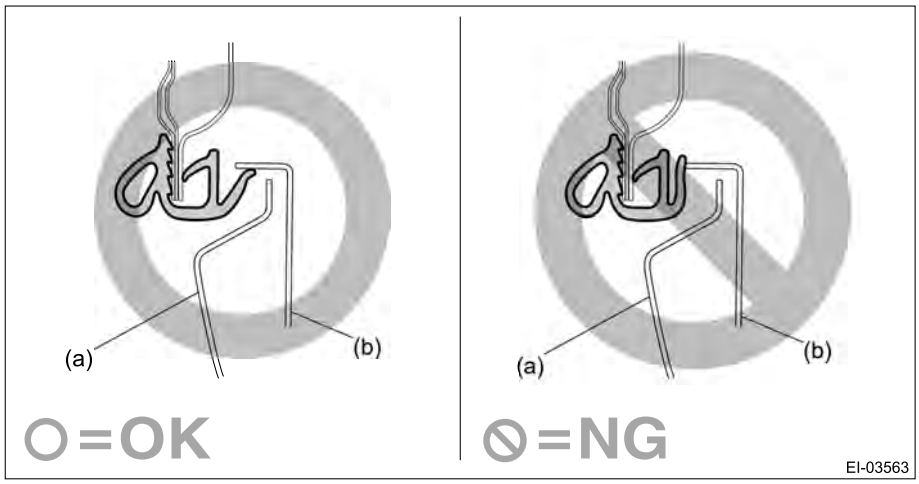
30. Remove the ventilation duct as required.

EXTERIOR/INTERIOR TRIM > Instrument Panel Assembly

INSTALLATION

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When installing the cover - instrument panel side (a), make sure that the body side weather strip - flange front does not come inside the panel COMPL - instrument (b).**



- **When reusing the tether clip on the upper part of the trim panel - front pillar UPR, check that there is no damage to the tether clip. If the tether clip is damaged, always replace it with a new tether clip. If the tether clip is damaged, its holding force is reduced and the trim panel - front pillar UPR may come off.**
- **Do not reuse the tether clip removed from the upper part of the trim panel - front pillar UPR. Always replace with a new part.**
- **Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.**

1. Attach each part until the panel COMPL - instrument is assembled.

Note:

Method of installing insulator

- **Adhesive**

  Use polyurethane adhesive. When assembling the instrument panel assembly, wait until the adhesive has evaporated to prevent filling of the smell in the compartment.
- **Double-sided tape**

  Use commercial double-sided tape. (Use strong double-sided adhesive tape.)

2. Install the beam COMPL - steering.

(1) Place the beam COMPL - steering on the vehicle, and check that the pins on both sides are inserted securely and the harness is routed properly. Connect each connector.

(2) Secure the beam COMPL - steering to the heater and cooling unit assembly.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

(3) Install the ground bolt and fuse box.

Tightening torque:

Ground bolt: 13 N·m (1.3 kgf-m, 9.6 ft-lb)

Fuse box, relay box: 7.5N·m (0.8 kgf-m, 5.5 ft-lb)

(4) Temporarily tighten the bolts of the beam COMPL - steering.

(5) Tighten the adjuster portion (a) of the adjuster - clip space. (Only RH side of the beam COMPL - steering)

Preparation tool:

Hexagon wrench: 8 mm (0.31 in)

Note:

When the TORX® bolt is tightened after setting the adjuster portion (a) of the adjuster - clip space to the free position, the adjuster is secured at the position where there is no gap to the body, and then the TORX® bolt is tightened.

Tightening torque:

Adjuster - clip space: 0.8 — 4 N·m (0.08 — 0.4 kgf-m, 0.6 — 3 ft-lb)

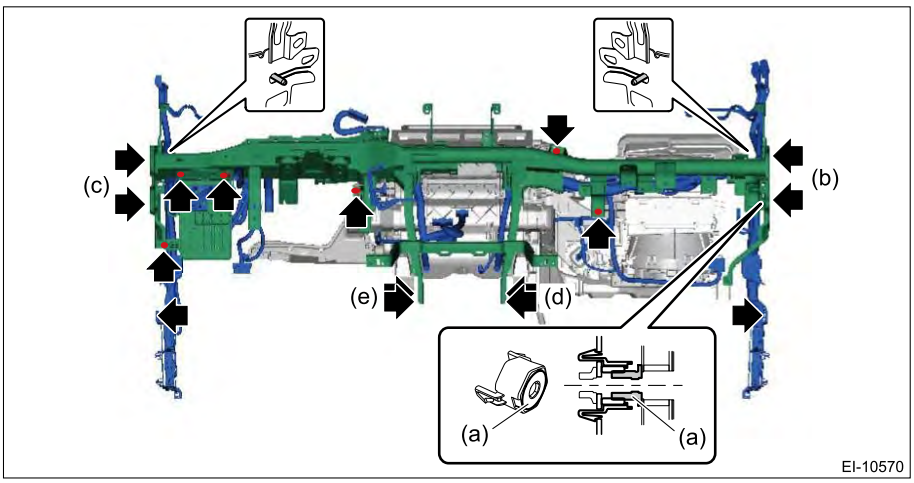
(6) Tighten the beam COMPL - steering in the order from (b) to (e) to the specified torque.

Preparation tool:

TORX® T40

Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to EXTERIOR/INTERIOR TRIM>General Description>COMPONENT > INSTRUMENT PANEL.



3. Install the duct - rear floor.
4. Install the column assembly - steering.

Tightening torque:

Column assembly - steering: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>General Description>COMPONENT > STEERING WHEEL AND COLUMN.

5. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
6. Install the panel COMPL - instrument.

Caution:

Be careful not to allow the harness to be caught.

(1) Align the matching pins on the body side (three locations - one in the center and the remaining two on both sides) with the panel COMPL - instrument.

(2) Route each connector of the sunload sensor and multi-function display harnesses in the specified position.

(3) Secure the clamps of the speaker assembly - tweeter, sunload sensor and multi-function display harnesses.

7. Install the sunload sensor and the grille - front defroster.
8. Install the passenger's airbag module, and connect the connector.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

9. Install the switch assembly - combination and the cover assembly - column.
10. Install the panel - starter SW and the push button ignition switch. (Model with keyless access with push button start)
11. Install the cover - starter SW. (Models without the keyless access with push button start)
12. Install the combination meter assembly, the cover assembly - visor LWR, and the visor assembly - combination meter.
13. Install the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>INSTALLATION.
14. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
15. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
16. Install the cover assembly - instrument panel LWR driver.
17. Install the glove box assembly.
18. Install the trim panel - front pillar UPR on the left and right sides.
19. Install the grille speaker side on the left and right sides.
20. Install the tray - center UPR and the panel center LWR.
21. Install the heater control assembly.
22. Install the panel center LWR on the left and right sides.
23. Install the console box assembly.

Tightening torque:

6.5 N·m (0.7 kgf-m, 4.8 ft-lb)

24. Install the cover assembly - front.
25. Install the mat - center tray, the tray - center LWR, and the boot - hand brake.
26. Install the multi-function display assembly.
27. Install the audio assembly or navigation assembly.
28. Install the panel - center UPR.
29. Install the center grille assembly.
30. Install the body side weather strip - flange front.
31. Install the cover side sill - front on the left and right sides.
32. Install the cover side sill - front INN on the left and right sides.
33. Install the cover - instrument panel side on the left and right sides.
34. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

Note:

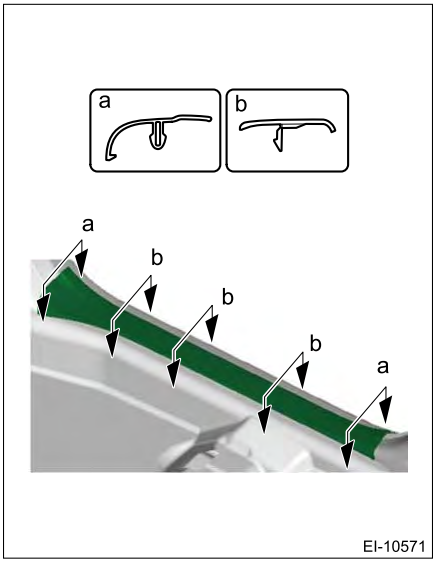
After connecting the battery ground terminal, place the select lever in the "P" position.

REMOVAL

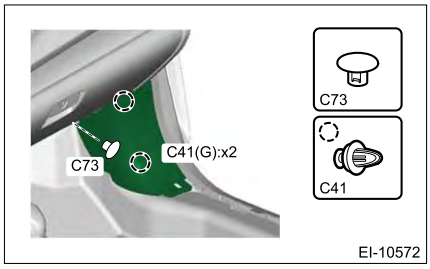
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Release the claws, and then remove the cover side sill - front INN.
   Caution:
   Do not pull with excessive force. Doing so may damage the claws of the cover side sill - front INN.



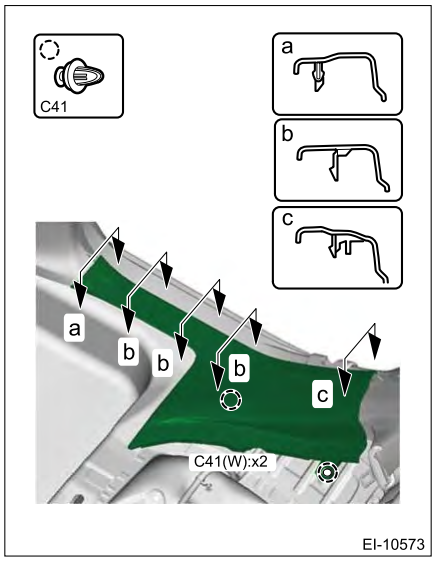
3. Remove the clips, and remove the cover side sill - front.



4. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
5. Release the clips and claws, and then remove the cover side sill - rear INN.

Caution:

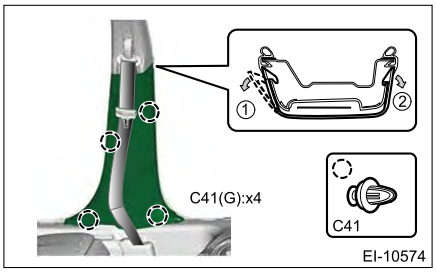
Do not pull with excessive force. Doing so may damage the claws of the cover side sill - rear INN.



6. Remove the trim panel - center pillar LWR.
   (1) Release the clip by pulling the trim panel - center pillar LWR toward you.
   (2) Expand the claws of the trim panel - center pillar LWR outward, and remove it from the trim panel - center pillar UPR.

   Caution:

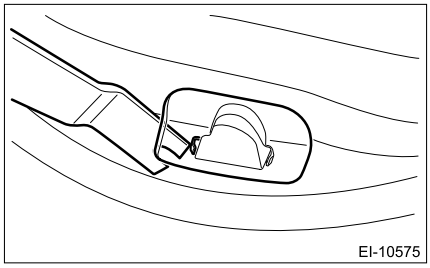
   Do not expand the trim panel - center pillar LWR excessively. Doing so may damage the trim.



Note:

First release the claw located to the front of the vehicle.

7. Disconnect the claws and remove the cover - catcher.



Note:

Remove the cover - catcher using a plastic remover.

8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Lower Inner Trim

INSTALLATION

1. Install the cover - catcher.
2. Install the trim panel - center pillar LWR.

   Note:

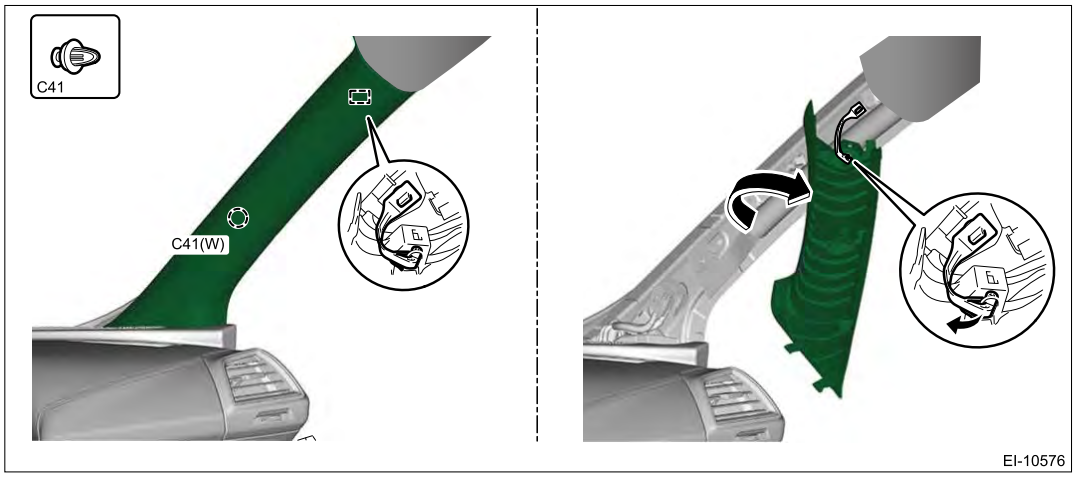
   Assemble the trim panel - center pillar LWR to the trim panel - center pillar UPR securely.
3. Install the cover side sill - rear INN.
4. Install the rear seat cushion assembly.
5. Install the cover side sill - front.
6. Install the cover side sill - front INN.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

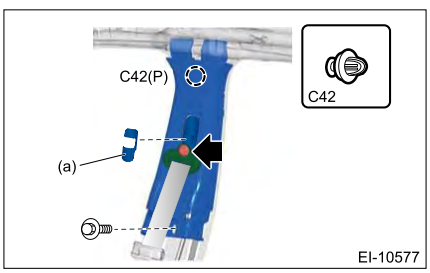
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the left and right grille speaker sides. Ref. to ENTERTAINMENT & MONITORING>Front Speaker>REMOVAL > TWEETER.
3. Remove the trim panel - front pillar UPR.
   (1) Pull the trim panel - front pillar UPR towards the center of the vehicle to release the clips.
   (2) Rotate the trim panel - front pillar UPR in the arrow direction.
   (3) Release the hook at the end of the tether clip, and remove the trim panel - front pillar UPR.
   Caution:
   - **Do not use any tool when releasing the hook at the end of the trim panel - front pillar UPR.**
   - **Be careful not to damage the surface of the trim panel - front pillar UPR and the curtain airbag module.**



4. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
5. Remove the cover side sill - front INN, cover side sill - rear INN, and trim panel - center pillar LWR. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
6. Remove the trim panel - center pillar UPR.
   (1) Remove the cover through (a), and remove the seat belt anchor bolt.
   (2) Remove the bolt on the lower side of the trim panel - center pillar UPR.
   (3) Remove the clip by pulling the upper part of the trim toward you, and while lowering the entire trim, remove the trim panel - center pillar UPR.
   Caution:
   Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.



INSTALLATION

Caution:

- **When reusing the tether clip on the upper part of the trim panel - front pillar UPR, check that there is no damage to the tether clip. If the tether clip is damaged, always replace it with a new tether clip. If the tether clip is damaged, its holding force is reduced and the trim panel - front pillar UPR may come off.**
- **Do not reuse the tether clip removed from the upper part of the trim panel - front pillar UPR. Always replace with a new part.**
- **Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.**
- **Before installing the trim panel - front pillar UPR, check the condition of protective non-woven fabric (white) of the curtain airbag. If it is damaged (airbag module cloth is exposed), replace the curtain airbag module assembly with a new part.**

1. Install the trim panel - front pillar UPR.

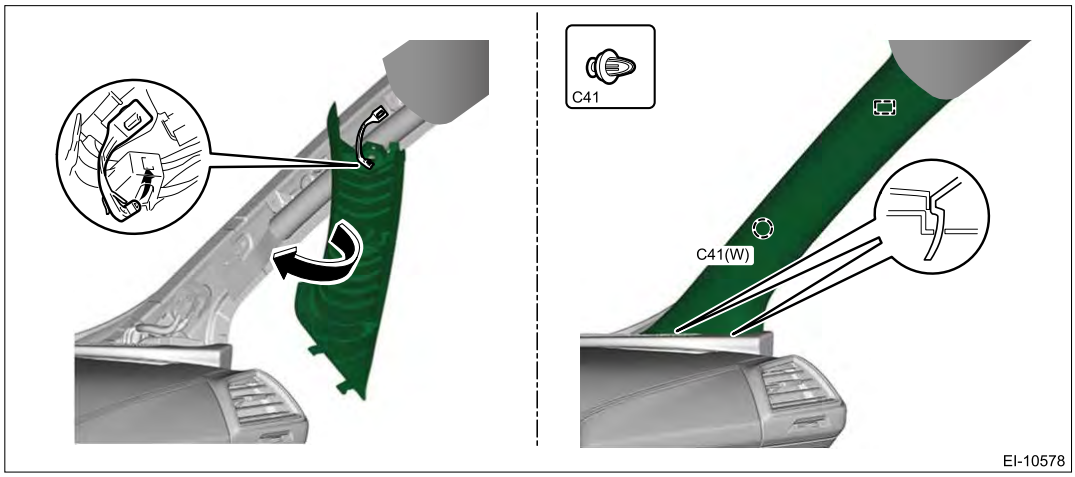
   Caution:

   When engaging the trim panel - front pillar UPR into the tether clips, do not use any tools. If the tether clip is damaged, always replace it with a new tether clip.

   (1) Hook the tip of the tether clip on the trim panel - front pillar UPR.

   (2) Rotate the trim panel - front pillar UPR in the arrow direction as shown in the figure.

   (3) Insert the claw at the end of the trim panel - front pillar UPR, and engage the clip.



2. Install the trim panel - center pillar UPR.

   Tightening torque

   Trim panel - center pillar UPR: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

   Front seat belt anchor: 30 N·m (3.1 kgf-m, 22.1 ft-lb)

3. Install the trim panel - center pillar LWR, cover side sill - front INN, and cover side sill - rear INN.

   Note:

   Assemble the trim panel - center pillar LWR to the trim panel - center pillar UPR securely.

4. Install the rear seat cushion assembly.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. 4 DOOR MODEL

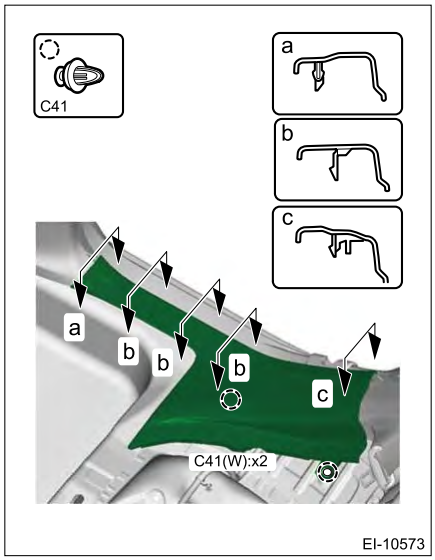
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
3. Release the clips and claws, and then remove the cover side sill - rear INN.

   Caution:

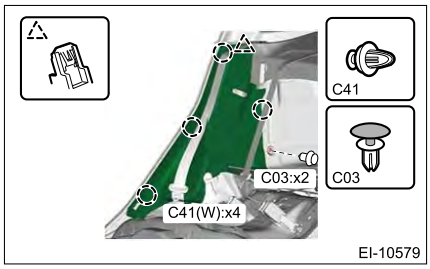
   Do not pull with excessive force. Doing so may damage the claws of the cover side sill - rear INN.



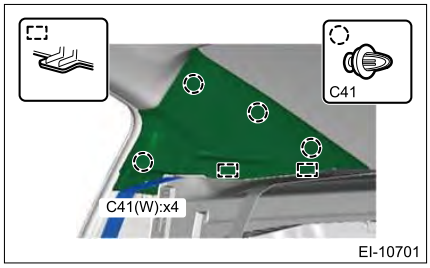
4. Remove the trim panel - rear pillar LWR.
   (1) Remove the clips, and turn over the trim panel - trunk side.
   (2) Remove the clips, and remove the trim panel - rear pillar LWR.

   Caution:

   Forcibly removing the clips near the seat belt lower anchor bolts may deform or damage the clip base. Use a clip remover for operation.



5. Remove the clips, and remove the trim panel - rear pillar UPR.



2. 5 DOOR MODEL

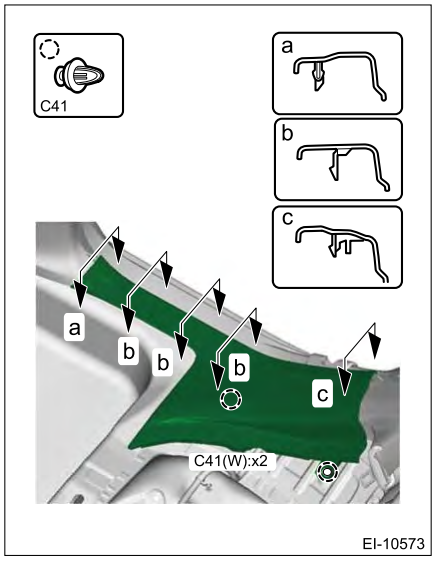
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

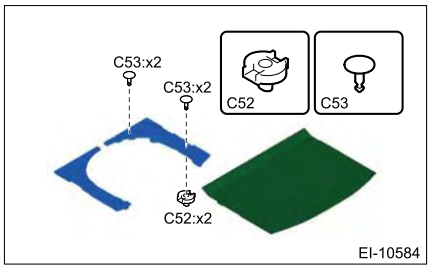
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
3. Release the clips and claws, and then remove the cover side sill - rear INN.

   Caution:

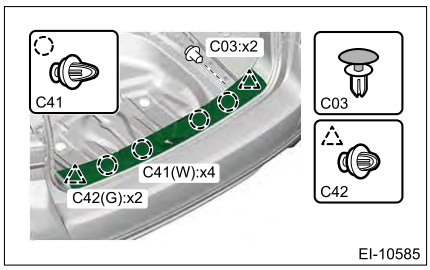
   Do not pull with excessive force. Doing so may damage the claws of the cover side sill - rear INN.



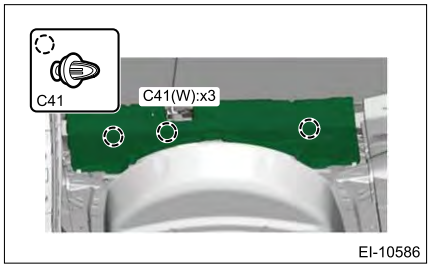
4. Remove the mat - rear floor and the spacer - rear floor side.



5. Remove the clips, and remove the trim panel - rear skirt.



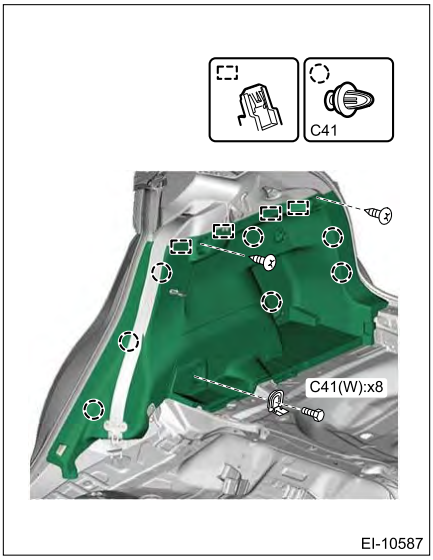
6. Remove the spacer - rear floor CTR.
   (1) Tilt the backrest forward and remove the clips, and then turn over the backrest backside mat.
   (2) Release the clips, then detach the spacer - rear floor CTR.



7. Remove the trim panel - rear apron.
   (1) Remove the screws and bolts.
   (2) Disengage the claws and clips, and remove the trim panel - rear apron.

Caution:

Forcibly removing the clips near the seat belt lower anchor bolts may deform or damage the clip base. Use a clip remover for operation.



Note:

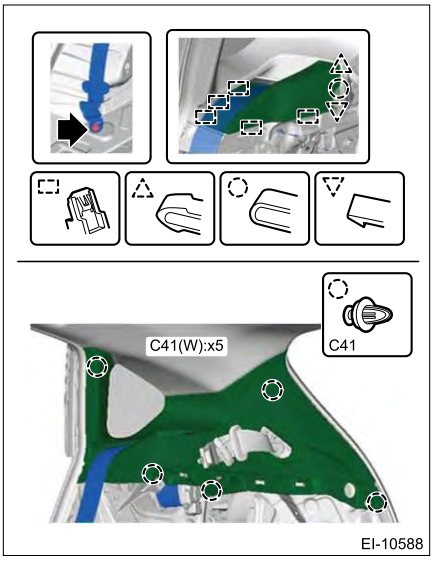
For LH side, disconnect the connector of the luggage light.

8. Remove the trim panel - rear pillar UPR.
   (1) Remove the lower anchor bolts of seat belts.
   (2) Remove the belt cover.

Note:

If the belt cover cannot be removed, remove the trim panel - rear pillar UPR first.

   (3) Disengage the claws and clips, and remove the trim panel - rear apron.



EXTERIOR/INTERIOR TRIM > Rear Quarter Trim

INSTALLATION

1. 4 DOOR MODEL

1. Install the trim panel - rear pillar UPR.
2. Install the trim panel - rear pillar LWR.
3. Install the cover side sill - rear INN.
4. Install the rear seat cushion assembly. Ref. to SEATS>Rear Seat>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

1. Install the trim panel - rear pillar UPR.
2. Install the trim panel - rear apron.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the lower anchor bolts of seat belts.
   Tightening torque:
   33 N·m (3.4 kgf-m, 24.3 ft-lb)
4. Install the spacer - rear floor CTR.
5. Install the clips of the backrest backside mat.
6. Install the trim panel - rear skirt.
7. Install the mat - rear floor and the spacer - rear floor.
8. Install the cover side sill - rear INN.
9. Install the rear seat cushion assembly.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

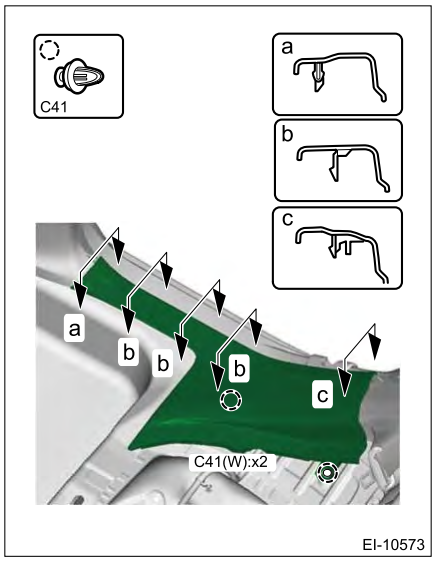
EXTERIOR/INTERIOR TRIM > Rear Shelf Trim

REMOVAL

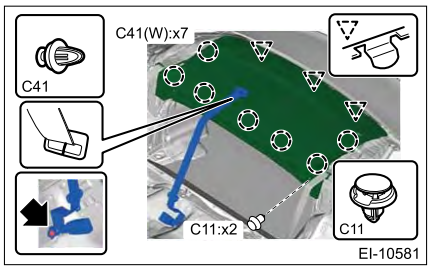
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
3. Release the clips and claws, and remove the side sill covers - rear INN on the left and right sides.
   Caution:
   Do not pull with excessive force. Doing so may damage the claws of the side sill cover - rear INN.



4. Remove the trim panel - rear pillar UPR and trim panel - rear pillar LWR on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.
5. Remove the trim panel assembly - rear shelf.
   (1) Remove the bolts, and remove the lower anchor of the seat belt - rear shoulder CTR.
   (2) Release the clips, and raise the rear shelf panel assembly.
   (3) Release the belt guide, and guide the anchor of the seat belt - rear shoulder CTR to behind the trim panel - rear shelf assembly.
   (4) Remove the trim panel assembly - rear shelf.



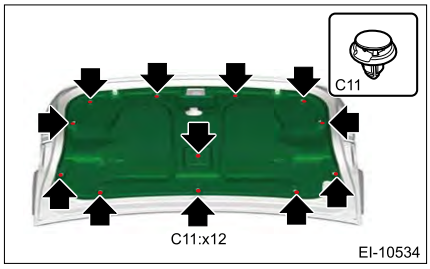
EXTERIOR/INTERIOR TRIM > Rear Shelf Trim

INSTALLATION

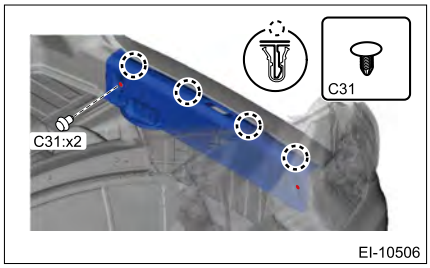
1. Install the trim panel assembly - rear shelf.
2. Install the lower anchor of seat belt - rear shoulder CTR.
   Tightening torque:
   30 N·m (3.1 kgf-m, 22.1 ft-lb)
3. Install the trim panel - rear pillar UPR and the trim panel - rear pillar LWR.
4. Install the side sill cover - rear INN.
5. Install the rear seat cushion assembly.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

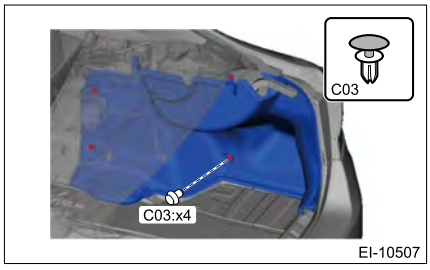
1. Remove the clips, and remove the trim panel - trunk lid.



2. Tilt the backrest assembly forward.
3. Remove the trunk room mat.
4. Remove the trim panel - trunk rear.
   (1) Remove the clip.
   (2) Release the claws, and remove the trim panel - trunk rear.



5. Remove the clips, and remove the trim panel - trunk side.



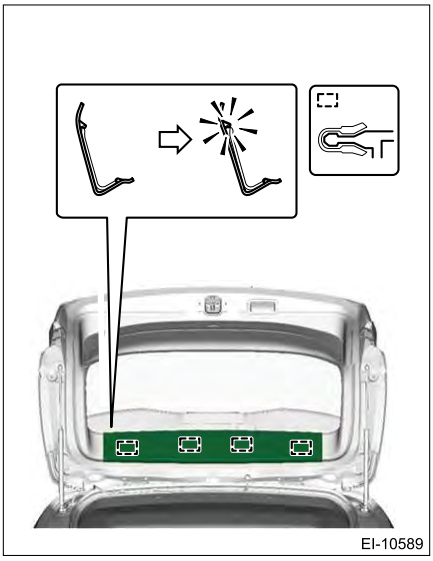
INSTALLATION

1. Install the trim panel - trunk side.
2. Install the trim panel - trunk rear.
3. Install the trim panel - trunk lid.
4. Install the trunk room mat.

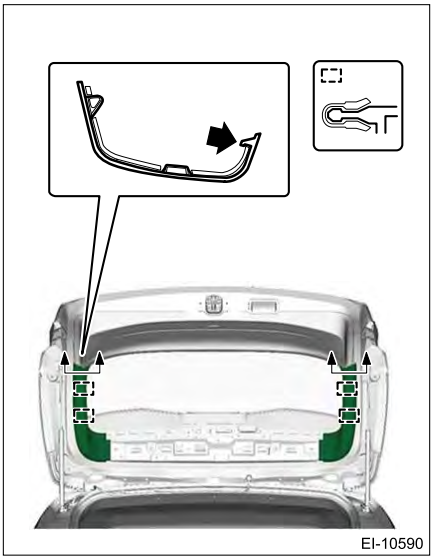
EXTERIOR/INTERIOR TRIM > Rear Gate Trim

REMOVAL

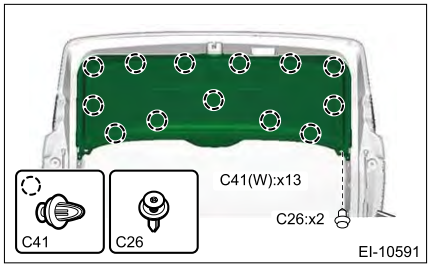
1. Remove the trim panel - rear gate UPR.
   (1) Remove the claws on the trim edge.
   (2) Release the claws in the center of trim, and remove the trim panel - rear gate UPR.



2. Remove the trim panel - rear gate pillar side.
   (1) Release the claws.
   (2) Remove the claws on the bottom of trim, and remove the trim panel - rear gate pillar side.



3. Remove the trim panel - rear gate LWR.
   (1) Remove the clips on both ends.
   (2) Release the clips, and remove the trim panel - rear gate LWR.



EXTERIOR/INTERIOR TRIM > Rear Gate Trim

INSTALLATION

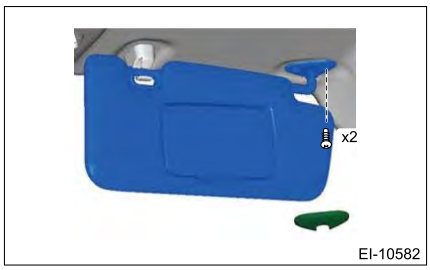
1. Install the trim panel - rear gate LWR.

2. Install the trim panel - rear gate pillar side.
3. Install the trim panel - rear gate UPR.

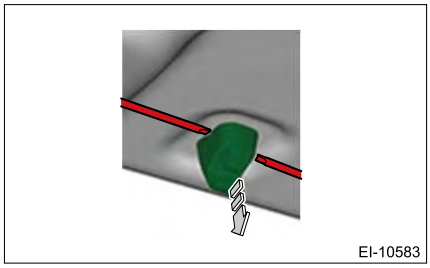
EXTERIOR/INTERIOR TRIM > Sun Visor

REMOVAL

1. Disconnect the ground cable from battery. (Only model with vanity mirror light) Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the sun visor assembly.
   (1) Remove the cap - sun visor, and then remove the screws.
   (2) Disconnect the connector. (Only model with vanity mirror light)
   (3) Disconnect the connector and remove the sun visor assembly.



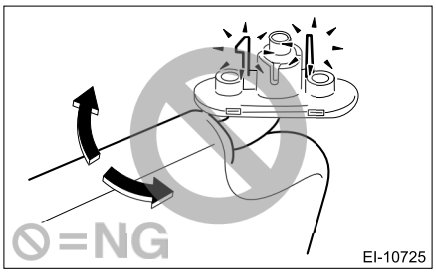
3. Remove the hook - sun visor.
   (1) Press both sides using a flat tip screwdriver.
   (2) Remove the hook - sun visor by pulling it toward you.



EXTERIOR/INTERIOR TRIM > Sun Visor

INSTALLATION

1. Install the hook - sun visor.
2. Install the sun visor assembly.
   Caution:
   Do not rotate the sun visor assembly when it is temporarily installed. The claw for temporary installation may be damaged.

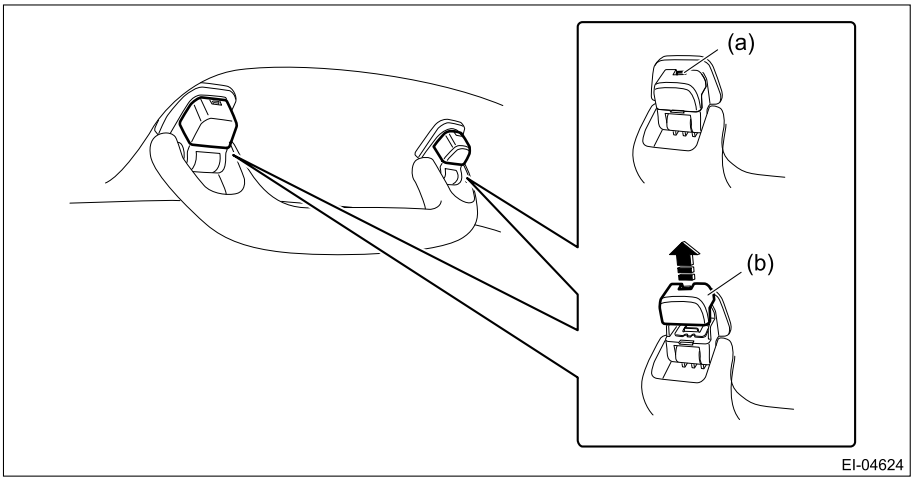


   Tightening torque:
   2N·m (0.2 kgf-m, 1.5 ft-lb)
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EXTERIOR/INTERIOR TRIM > Assist Grip

REMOVAL

1. Pull up the cap (b) while pulling the knob (a) toward you with a flat tip screwdriver or similar tool wrapped with a protection tape.
2. Pull the assist grip toward yourself (toward the vehicle center) to remove.



EXTERIOR/INTERIOR TRIM > Assist Grip

INSTALLATION

1. Pinch the metal clip with pliers, and remove it from the assist grip BRKT.
2. Install the metal clip to the assist grip side.
3. Install the cap to the assist grip.
   Note:
   If the metal clip is not inserted to the end, the cap cannot be installed.
4. Install the assist grip to the vehicle.

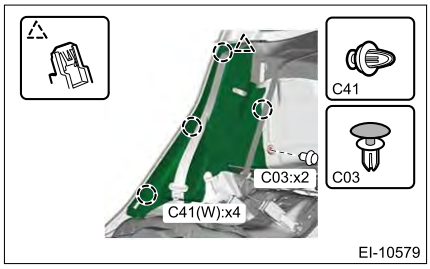
REMOVAL

1. 4 DOOR MODEL

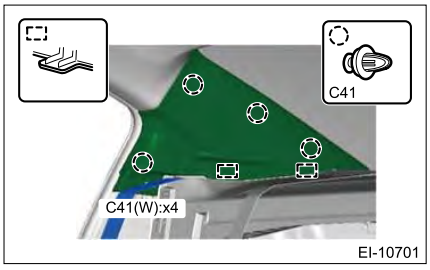
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Adjust the passenger's seat position.
   (1) Remove the headrest.
   (2) Move the passenger's seat to the front-most position, and move the backrest to the front-most position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   - **On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.**
   - **For model with power seat, adjust the passenger's seat to the specified position, and remove the driver's seat and then disconnect the battery ground terminal.**
3. Remove the driver's seat. Ref. to SEATS>Front Seat>REMOVAL.
4. Remove the console box assembly and the cover - shift lever. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
5. Cover the following areas to protect from damage.
   - Steering wheel surface
   - Instrument panel surface
   - Glove box surface
6. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
7. Remove the lower inner trim on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
8. Remove the upper inner trim on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
9. Remove the trim panel - rear pillar LWR.
   (1) Remove the clips, and turn over the trim panel - trunk side.
   (2) Remove the clips, and remove the trim panel - rear pillar LWR.



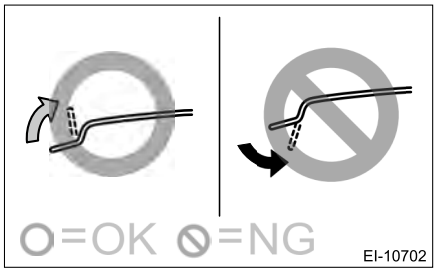
10. Remove the clips, and remove the trim panel - rear pillar UPR.



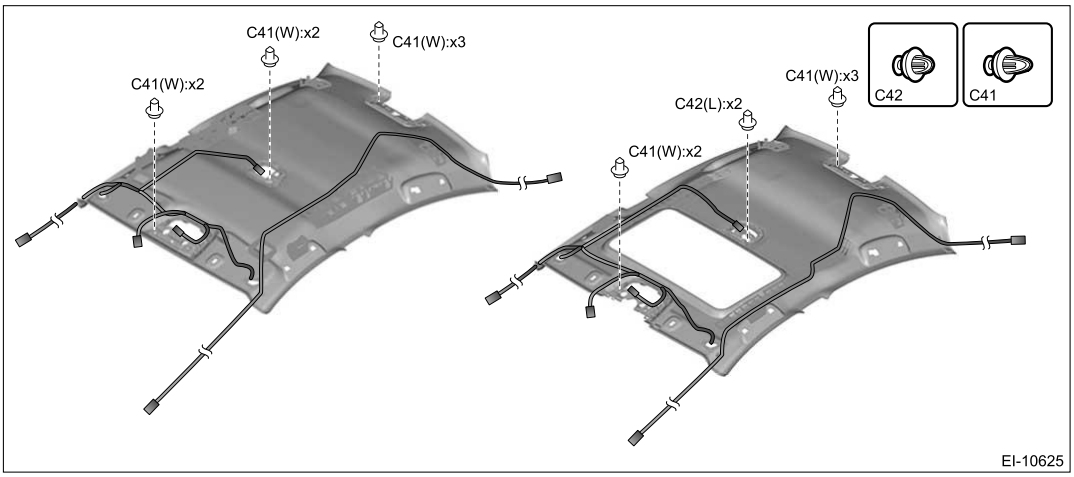
11. Remove the following parts from the driver's side rear door.
    - Rear door trim assembly: Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
    - Rear speaker assembly: Ref. to ENTERTAINMENT & MONITORING>Rear Speaker>REMOVAL.
12. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
13. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
14. Remove the left and right sun visor assembly. Ref. to EXTERIOR/INTERIOR TRIM>Sun Visor>REMOVAL.
15. Remove the light assembly - room. Ref. to LIGHTING SYSTEM>Room Light>REMOVAL.
16. Remove the light assembly - high-mounted. Ref. to LIGHTING SYSTEM>High-mounted Stop Light>REMOVAL > 4 DOOR MODEL.
17. Remove all assist rails. Ref. to EXTERIOR/INTERIOR TRIM>Assist Grip>REMOVAL.
18. Remove the garnish - roof. (Model with sunroof)
19. Remove the trim panel - roof assembly.

Caution:

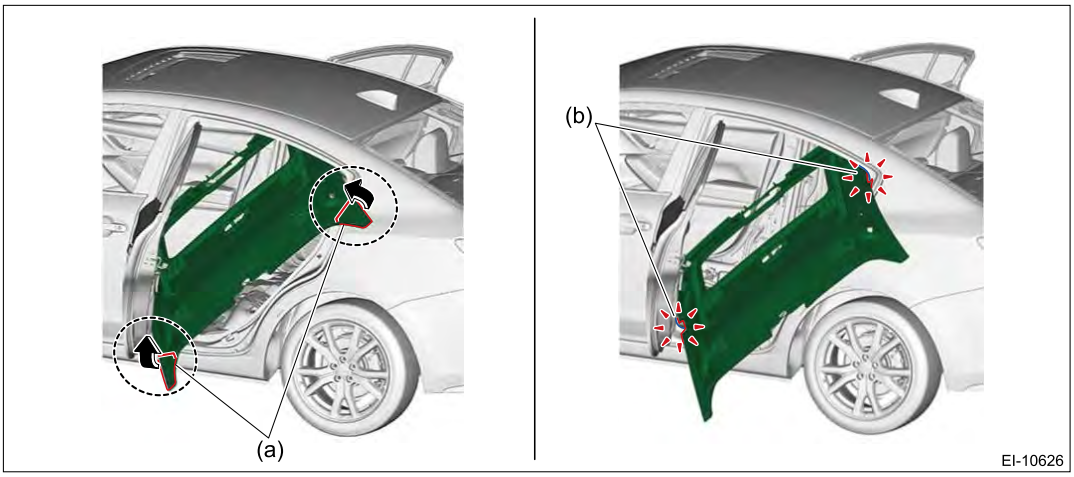
When taking out the trim panel - roof assembly from the vehicle, be sure to fold it to the roof side. Do not fold it to the cabin side. Otherwise it may be wrinkled.



(1) Remove the harness clamp of the cord assembly - antenna feeder and the cord - roof, and disconnect the connectors.
(2) Remove the clip.
(3) Remove the weather strip - body side flange from the front/rear and left/right doors, and remove the trim panel - roof assembly.



(4) While folding the rear end of the trim panel - roof assembly to the roof side along with the mark-off line (a), take the part out of the vehicle.
(5) Align the recess (b) on the center pillar of the trim panel - roof assembly with the flange of the door opening, and bend the entire trim to take it out of the vehicle.



2. 5 DOOR MODEL

Caution:

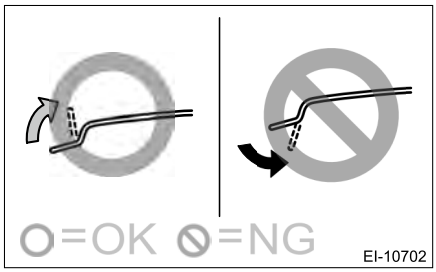
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Adjust the front seat position.
(1) Remove the headrest.
(2) Move the seat to the front-most position and tilt the backrest rearward.

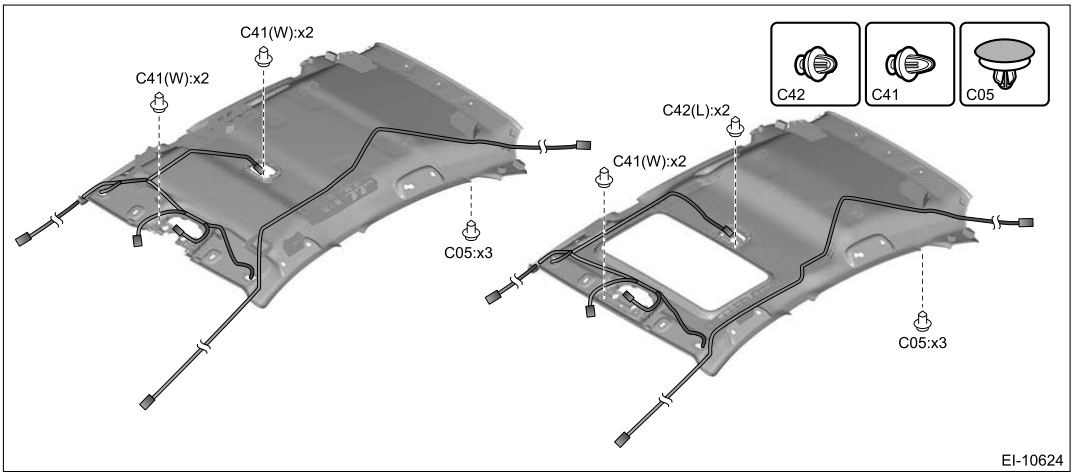
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the lower inner trim on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
5. Remove the upper inner trim on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
6. Remove the right and left trim panels - rear apron and rear quarter trims UPR. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
7. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
8. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
9. Remove the left and right sun visor assembly. Ref. to EXTERIOR/INTERIOR TRIM>Sun Visor>REMOVAL.
10. Remove the light assembly - room. Ref. to LIGHTING SYSTEM>Room Light>REMOVAL.
11. Remove all assist rails. Ref. to EXTERIOR/INTERIOR TRIM>Assist Grip>REMOVAL.
12. Remove the garnish - roof. (Model with sunroof)
13. Remove the trim panel - roof assembly.

Caution:

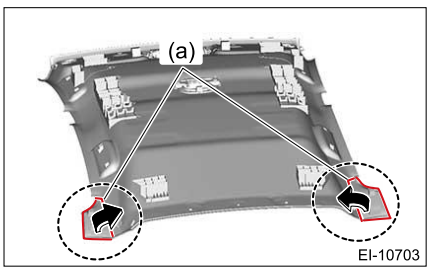
When taking out the trim panel - roof assembly from the vehicle, be sure to fold it to the roof side. Do not fold it to the cabin side. Otherwise it may be wrinkled.



(1) Remove the harness clamp of the cord assembly - antenna feeder and the cord - roof, and disconnect the connectors.
(2) Remove the clip.
(3) Remove the weather strip - body side flange from the front/rear and left/right doors, and remove the trim panel - roof assembly.



(4) While folding the rear end of the trim panel - roof assembly to the roof side along with the mark-off line (a), take the part out of the vehicle.



EXTERIOR/INTERIOR TRIM > Roof Trim

INSTALLATION

Caution:

- **For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.**
- **When reusing the tether clip on the upper part of the trim panel - front pillar UPR, check that there is no damage to the tether clip. If the tether clip is damaged, always replace it with a new tether clip. If the tether clip is damaged, its holding force is reduced and the trim panel - front pillar UPR may come off.**
- **Do not reuse the tether clip removed from the upper part of the trim panel - front pillar UPR. Always replace with a new part.**
- **Do not reuse the upper clips of the trim panel - center pillar UPR. Once the clip is removed, its holding force is reduced. Be sure to replace it with a new clip.**
- **Before installing the trim panel - front pillar UPR, check the condition of protective non-woven fabric (white) of the curtain airbag. If it is damaged (airbag module cloth is exposed), replace the curtain airbag module assembly with a new part.**

1. Install the trim panel - roof assembly.

(1) Attach the feeder cord and roof cord to the roof trim.

Caution:

Route each cord carefully. The cord may interfere, thus preventing normal deployment of the curtain airbag when necessary.

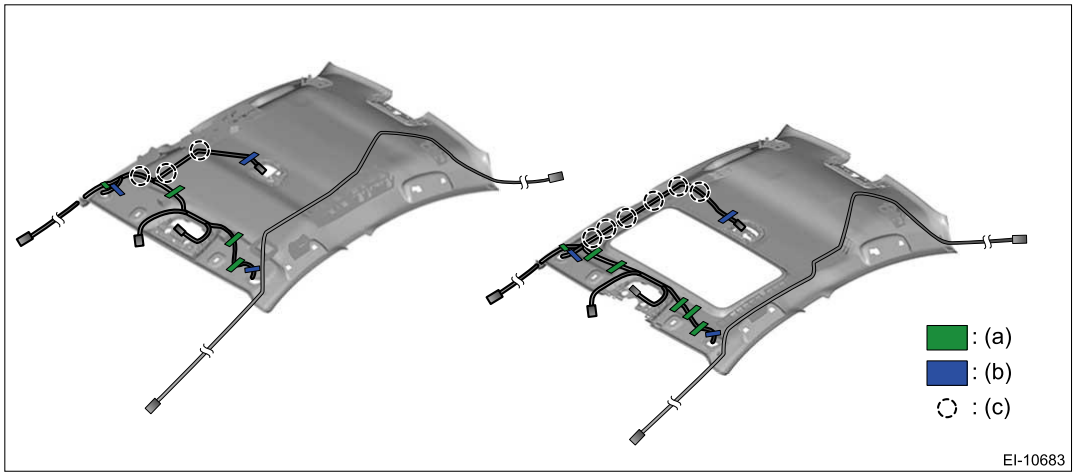
Preparation items:

Part No.: 86359SC000/TAPE

- Roof cord (4 door model, 5 door model)

Note:

Use the tape (service parts) by cutting it into 80 mm × 20 mm (3.2 in × 0.8 in).



(a) Affix with tape while aligning with the trim mark-off line.

(b) Align the marking (white tape) of the cord with the clamp to secure.

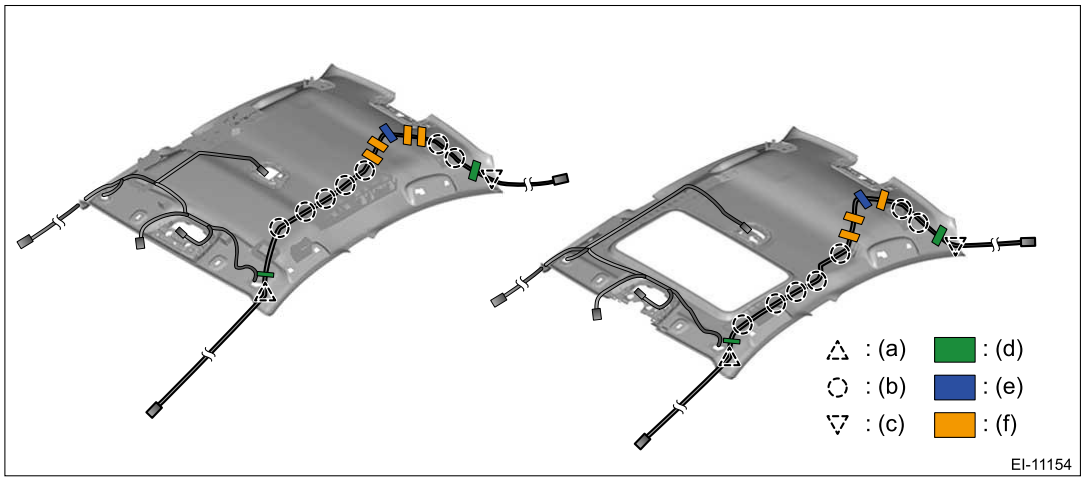
(c) Secure the cord to the roof pad clamp.

- Feeder cord

Note:

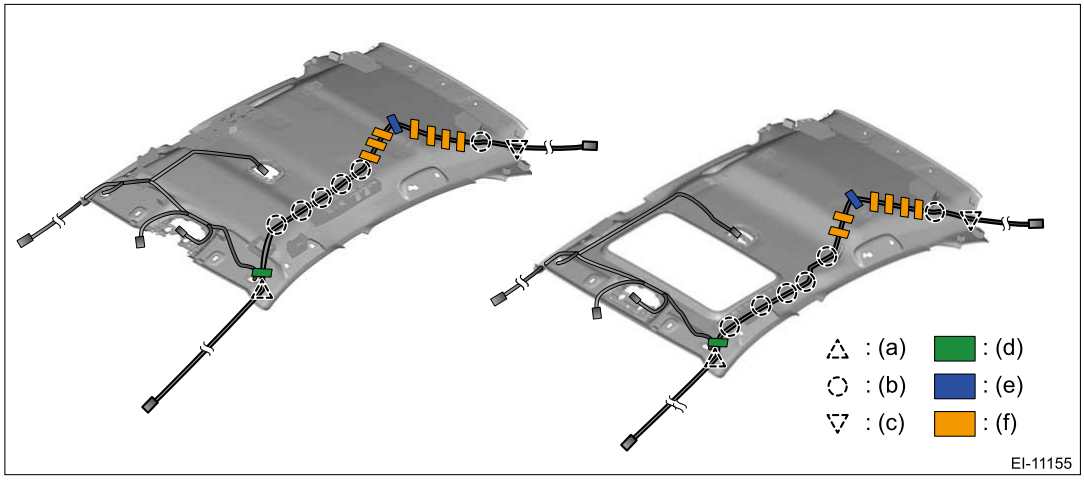
Use the tape (service parts) by cutting it into 80 mm × 50 mm (3.2 in × 2 in).

– 4 door model



(a) Place the clamp between the polyurethane sections to secure.
(b) Secure the cord to the roof pad clamp.
(c) Align the marking (tape) on the cord with the trim end.
(d) Affix with tape while aligning with the trim mark-off line.
(e) Adjust the excess cord and secure it with tape.
(f) Secure with several pieces of tape with a pitch of 100 mm (3.9 in) or less.

– 5 door model



(a) Place the clamp between the polyurethane sections to secure.
(b) Secure the cord to the roof pad clamp.
(c) Align the marking (tape) on the cord with the trim end.
(d) Affix with tape while aligning with the trim mark-off line.
(e) Adjust the excess cord and secure it with tape.
(f) Secure with several pieces of tape with a pitch of 100 mm (3.9 in) or less.

(2) Bring the trim panel - roof assembly inside the vehicle.
(3) Secure the trim panel - roof assembly with the clips and with the weather strip - body side flange.

2. Install the assist rail.
3. Install the light assembly - high-mounted. (4 door model)
4. Install the light assembly - room.
5. Install the sun visor assembly.
6. Install the stereo camera cover assembly. (Models with EyeSight)
7. Install the light assembly - map. (Models without EyeSight)
8. Install the garnish - roof. (Model with sunroof)
9. Install the trim panel - rear pillar UPR. (4 door model)
10. Install the trim panel - rear apron and the rear quarter trim UPR. (5 door model)

Tightening torque:

Trim panel - rear apron: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

11. Install the upper inner trim.

Tightening torque:

Trim panel - center pillar UPR: 7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

Front seat belt anchor: 30 N·m (3.1 kgf-m, 22.1 ft-lb)

12. Install the lower inner trim.
13. Install the rear seat cushion assembly.
14. Install the following parts from the driver's side rear door. (4 door model)
    - Rear door trim assembly: Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.
    - Rear speaker assembly: Ref. to ENTERTAINMENT & MONITORING>Rear Speaker>INSTALLATION.
15. Install the console box assembly and cover - shift lever. (4 door model)

Tightening torque:

Console box: 6.5 N·m (0.7 kgf-m, 4.8 ft-lb)

16. Install the driver's seat. (4 door model)

Tightening torque:

53 N·m (5.4 kgf-m, 39.1 ft-lb)

17. Connect the battery ground terminal.

Note:

After connecting the battery ground terminal, place the select lever in the "P" position.

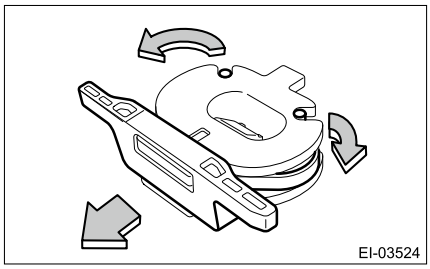
EXTERIOR/INTERIOR TRIM > Floor Mat

REMOVAL

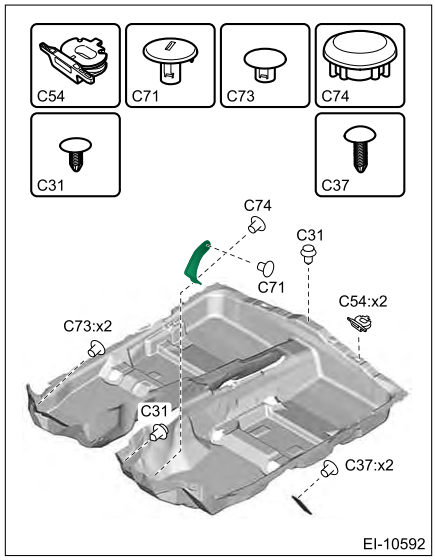
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.
2. Remove the front seat assembly. Ref. to SEATS>Front Seat>REMOVAL.
3. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
4. Remove the console box assembly, the cover - shift lever and the panel center LWR. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
5. Remove the lower inner trim on the left and right sides. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
6. Remove the pull handle cover. Ref. to SECURITY AND LOCKS>Remote Openers>REMOVAL > FUEL FLAP OPENER.
7. Remove the knobs of the hook - seat cushion rear.



8. Take out the floor mat from the vehicle.
   (1) Remove the clips from the floor mat.
   (2) Remove the mat hook on both sides.
   (3) Fold down the floor mat and take it out from the vehicle.

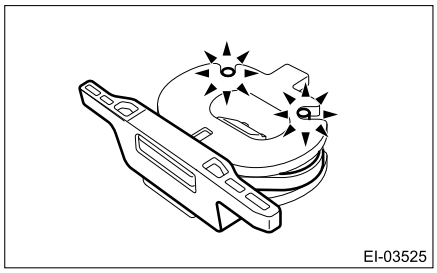


EXTERIOR/INTERIOR TRIM > Floor Mat

INSTALLATION

Caution:

- **If the passenger’s seat is removed, be sure to perform [Rezeroing] for the occupant detection system after installing the seat to the vehicle.**
- **Make sure that the knobs of the hook - seat cushion rear are securely installed.**



1. Bring the floor mat into the vehicle, and secure with the clips.
2. Install the hook - seat cushion rear.
3. Install the pull handle cover.
4. Install the lower inner trim.
5. Install the console box assembly, the cover - shift lever and the panel center LWR.
6. Install the rear seat cushion assembly.
7. Install the front seat.

   Tightening torque:

   53 N·m (5.4 kgf-m, 39.1 ft-lb)
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:

   After connecting the battery ground terminal, place the select lever in the “P” position.
9. Perform [Rezeroing] for the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

EyeSight

ES

1. General Description
2. Relay and Fuse
3. EyeSight System
4. Control Unit
5. Stereo Camera
6. Camera Adjustment, Inspection
7. Switches and Harness
8. Combination Meter
9. Stop Light & Brake Switch
10. Roll Connector
11. Diagnostics with Phenomenon

EyeSight > General Description

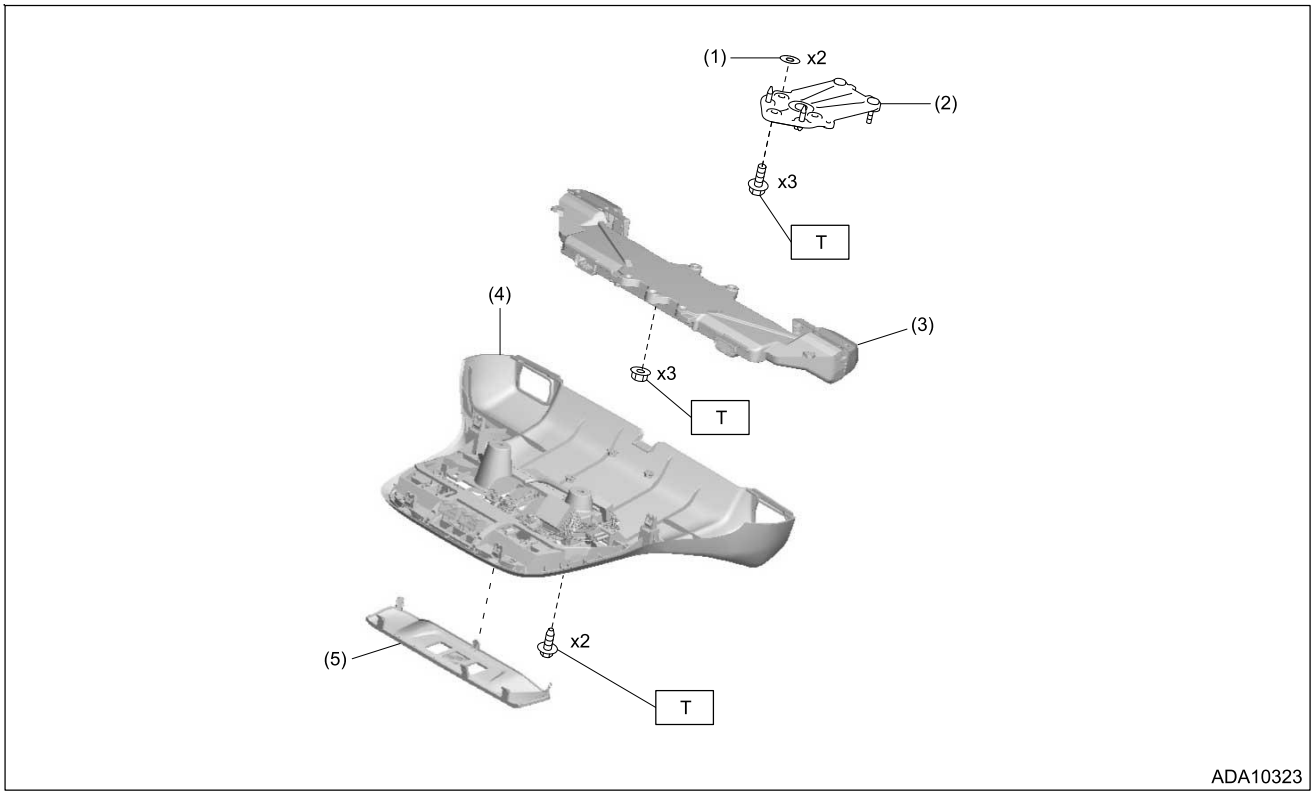
LOCATION

For location, refer to "LOCATION" of "EyeSight (DIAGNOSTICS)" section. Ref. to EyeSight (DIAGNOSTICS)>Electrical Component Location>LOCATION.

EyeSight > General Description

COMPONENT

1. STEREO CAMERA



(1) Shim (washer)
(2) Camera plate
(3) Stereo camera
(4) Stereo camera cover ASSY
(5) Cap

Tightening torque: N·m (kgf-m, ft-lb)

T: 5.5±1 (0.56±0, 4.1±0.7)

EyeSight > General Description

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the audio and MFD parts provided with memory functions, record the memory contents before disconnecting the battery ground cable.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC.

Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

- If the damage is found in the glass repair prohibited area, always replace the glass. Damage, dirt, aftermarket part installation or sticker attachment in the prohibited area can affect the recognition of stereo camera, and thereby the EyeSight function may not operate properly. Ref. to CAUTION > CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT.
- When the suspension-related components have been removed, installed or replaced, or the wheel alignment is adjusted, perform "Clear Active Lane Keep System Learning Value". Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value>OPERATION.

EyeSight > General Description

PREPARATION TOOL

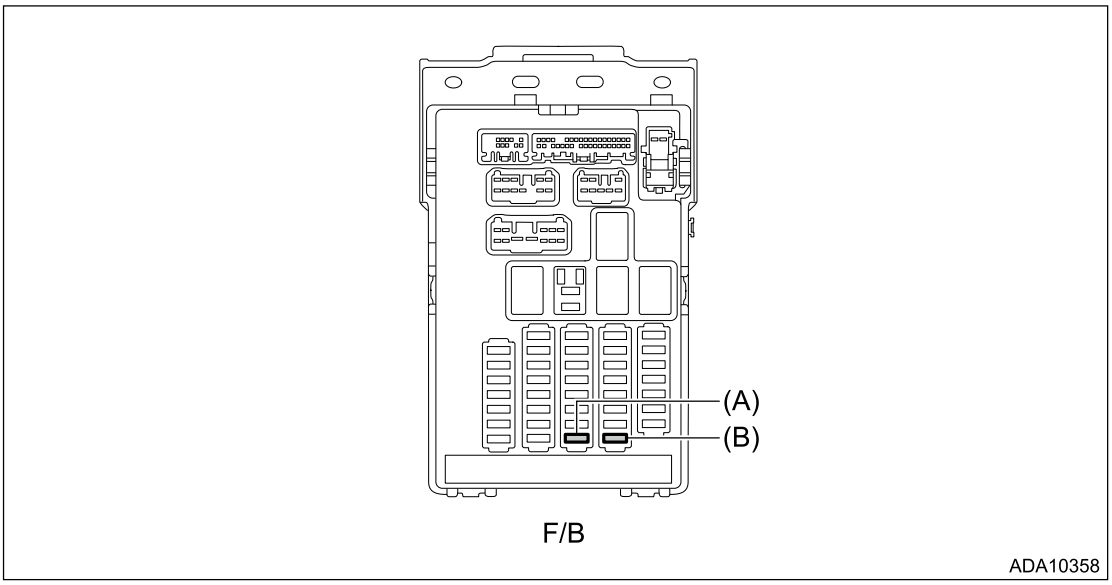
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST87599VA000	87599VA000	RANDOM CHART	Used for adjusting stereo camera.
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.
Measure (5 m (16 ft) or more)	Used for adjusting stereo camera.
Leveling line	
Plumb bob	
Packing tape	

LOCATION



Relay & fuse box (F/B)	Fuse 7.5 A (stop light and brake switch, brake light relay)	(A)
	Fuse 7.5 A (stereo camera)	(B)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

   Note:

   If the fuse is blown again, check the system wiring harness.

EyeSight > EyeSight System

WIRING DIAGRAM

Refer to "EyeSight System" in the wiring diagram. Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.

EyeSight > EyeSight System

ELECTRICAL SPECIFICATION

For electrical specification, refer to "Control Module I/O Signal" of "EyeSight (DIAGNOSTICS)" section. Ref. to EyeSight (DIAGNOSTICS)>Control Module I/O Signal.

EyeSight > EyeSight System

INSPECTION

For inspection, refer to "Basic Diagnostic Procedure" of "EyeSight (DIAGNOSTICS)" section. Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight > EyeSight System

NOTE

For procedure of each component in the EyeSight system, refer to the respective section.

- Control module: Ref. to EyeSight>Control Unit.
  Note:
  System control of the EyeSight is performed by each module. For procedure, refer to the following sections.
  - **Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Engine Control Module (ECM).**
  - **Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).**
  - **VDC control module & hydraulic control unit (VDCCM&H/U): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).**
  - **Stereo camera: Ref. to EyeSight>Stereo Camera.**
  - **Power steering control module: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.**
  - **Body integrated unit: Ref. to SECURITY AND LOCKS>Body Integrated Unit.**
  - **Reverse Automatic Braking CM: Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.**
- Combination meter: Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
- Stop light and brake switch: Ref. to BRAKE>Stop Light Switch.
- Switches and harness: Ref. to EyeSight>Switches and Harness.
- Roll connector (steering angle sensor): Ref. to AIRBAG SYSTEM>Roll Connector.
- Multi-function display (MFD): Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

NOTE

System control of the EyeSight is performed by each module. For procedure, refer to the following sections.

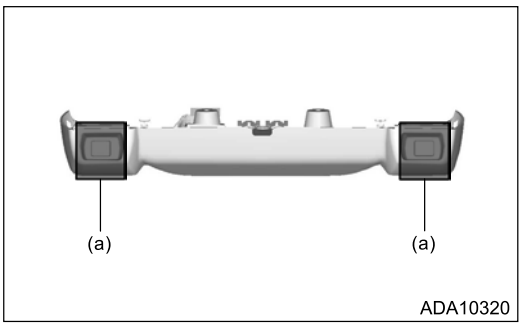
- Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
- Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
- VDC control module & hydraulic control unit (VDCCM&H/U): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
- Stereo camera: Ref. to EyeSight>Stereo Camera.
- Power steering control module: Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.
- Body integrated unit: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
- Reverse Automatic Braking CM: Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.

REMOVAL

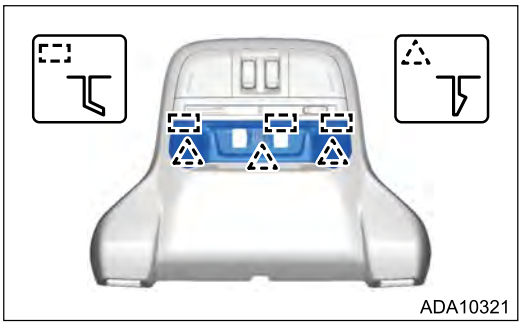
Caution:

- **When the stereo camera or windshield glass has been replaced, removed or installed, always perform the adjustment and inspection of the camera. (When the stereo camera has been replaced with a new part, the camera remains in a failed state until adjustment and inspection are performed.)**
- **Since the stereo camera is a precision equipment, install the protective cover before handling it. (New stereo camera is equipped with a protective cover as a service part.)**
- **During removal, do not hold at the left and right cameras.**
- **Do not apply any impact to the stereo camera. (Even the slightest shock will deviate the optical axis of the camera, resulting in the loss of normal operation of the camera.)**
- **Do not disassemble the stereo camera.**
- **Attach the protective cover to the replacement part, put it into the box in the same way as the other parts and return it.**
- **Do not touch the lens filter on the stereo camera. If touched, replace the stereo camera.**
- **When removing the stereo camera cover assembly, cover with dust-free paper such as copy paper to avoid interference with the lens filter section, and attach the paper using tape while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure.**
  Also, do not put your hand on the polyurethane section of the windshield contact surface. Doing so may cause the polyurethane section to be removed, which may interfere with the normal operation if it hangs down in front of the lens filter section.

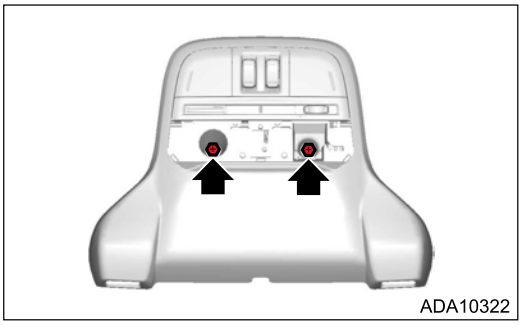
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Attach dust-free paper (a) such as copy paper to the stereo camera cover assembly.



3. Remove the stereo camera cover assembly.
   (1) Disconnect the claws and hooks and remove the cap.



   (2) Remove the bolt.



(3) Pull down the rear of the stereo camera cover assembly, and then release the clips.
(4) Release the hook on the front side of stereo camera cover assembly.



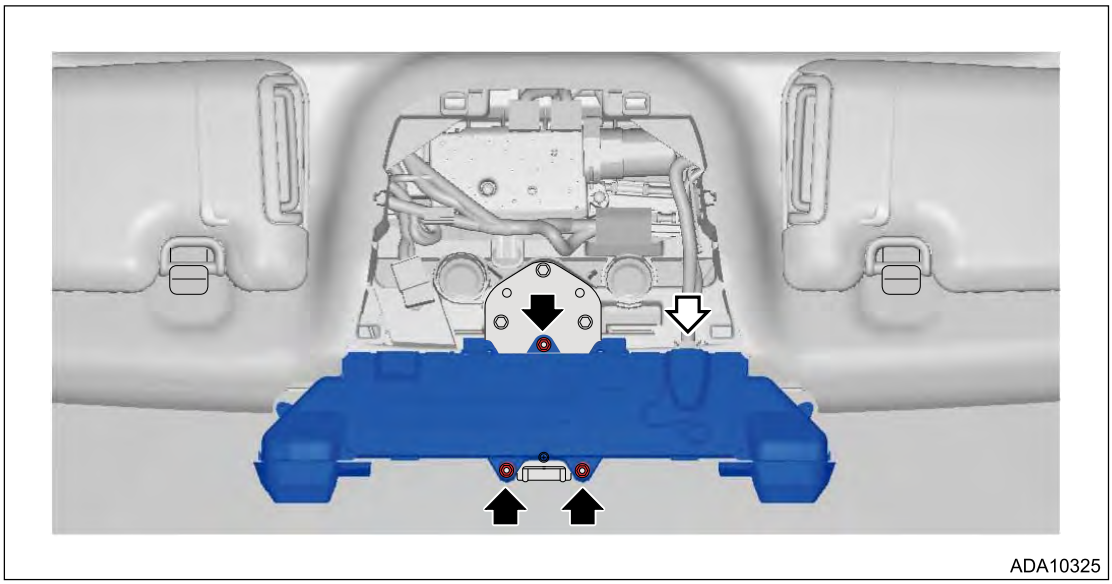
(5) Disconnect the connectors, and remove the stereo camera cover assembly.

4. Remove the stereo camera.

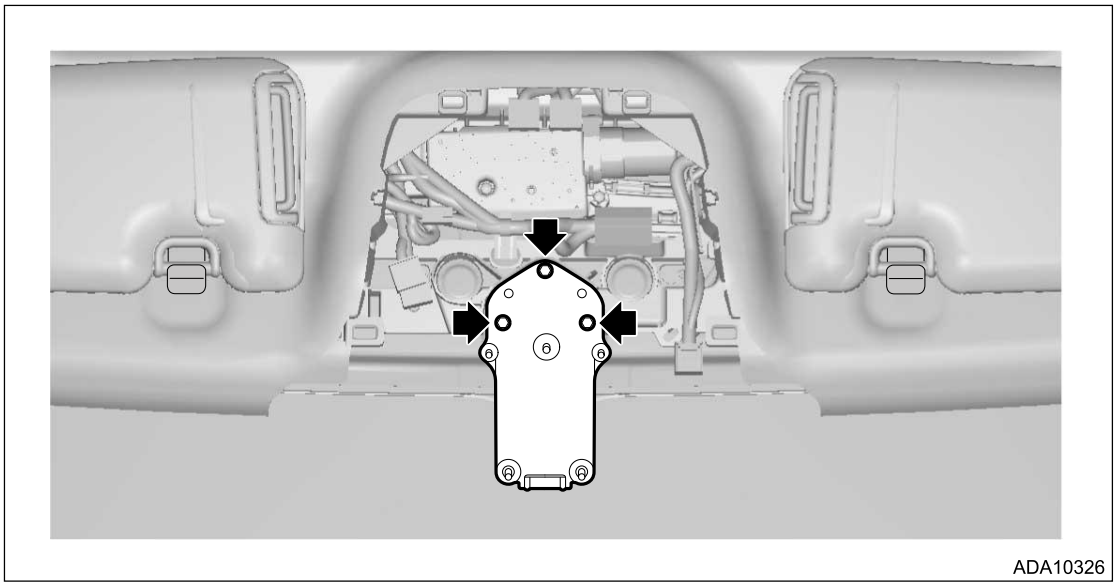
Caution:

Handle the stereo camera with special care.

(1) Disconnect the connector.
(2) Remove the nuts, and then remove the stereo camera.



5. Remove the bolts, then remove the camera plate.



EyeSight > Stereo Camera

INSTALLATION

Caution:

- **Do not remove the protective cover until just before installing the stereo camera cover assembly. Using the bolt and nut, install the stereo camera with the protective cover attached, connect the connectors, and then remove the protective cover.**
- **Do not apply any impact to the stereo camera. (Even the slightest shock will deviate the optical axis of the camera, resulting in the loss of normal operation of the camera.)**
- **During installation, do not hold at the left and right cameras.**
- **Do not change the installation position of the stereo camera or do not modify the surrounding structure.**
- **Remove the protective cover, install the stereo camera cover assembly, and then perform adjustment and inspection of the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection.**
- **Do not touch the lens filter on the stereo camera. If touched, replace the stereo camera.**
- **When installing the stereo camera cover assembly, cover with dust-free paper such as copy paper to avoid interference with the lens filter section, and attach the paper using tape while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure.**
  Also, do not put your hand on the polyurethane section of the windshield contact surface. Doing so may cause the polyurethane section to be removed, which may interfere with the normal operation if it hangs down in front of the lens filter section.
- **When installing the stereo camera cover assembly, take care so that the harness does not interfere with the stereo camera or does not get caught.**
- **Do not allow the stereo camera cover assembly to come in contact with the stereo camera. Install the stereo camera cover assembly precisely so that it will not block the visibility of the camera.**
- **Because the stereo camera is incompatible, be sure to check the part number before installation.**

1. Attach the camera plate.
   Tightening torque:
   5.5±1 N·m (0.56±0.1 kgf-m, 4.1±0.7 ft-lb)

Note:

Align the positioning pins of camera plate to the positioning holes of front rail.

2. Install the stereo camera.

Tightening torque:

5.5±1 N·m (0.56±0.1 kgf-m, 4.1±0.7 ft-lb)

Note:

Align the positioning holes of stereo camera to the positioning pins of camera plate.

3. Install the stereo camera cover assembly.

Tightening torque:

5.5±1 N·m (0.56±0.1 kgf-m, 4.1±0.7 ft-lb)

4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Remove the paper affixed on the stereo camera cover assembly.
6. Perform the adjustment or inspection of the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection.

PROCEDURE

Caution:

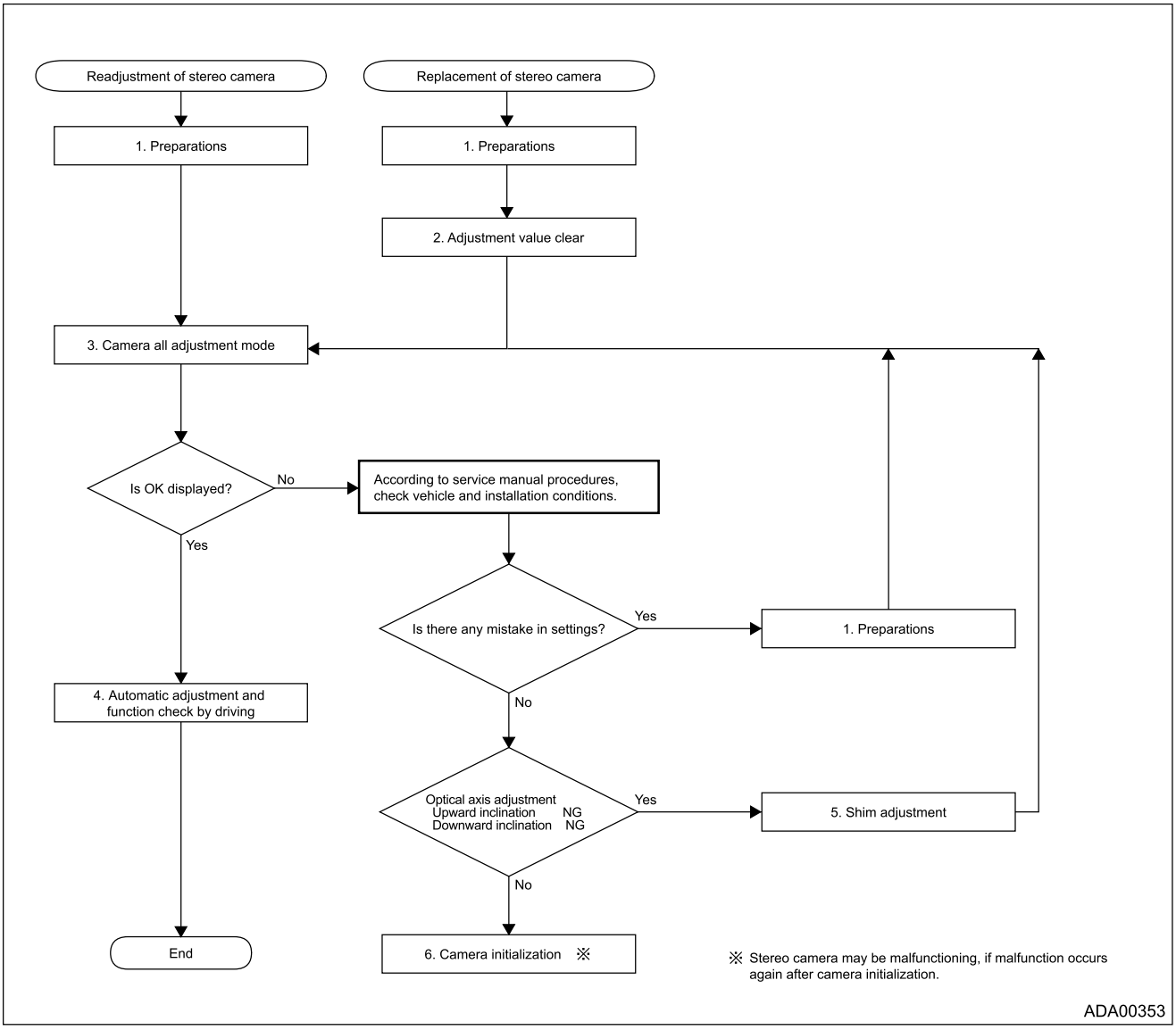
- **Perform the camera adjustment and inspection at curb weight without passengers.**
- **Handle RANDOM CHART (ST) carefully so as not to break it with the adhesive force of the tape.**

Perform inspection or adjustment according to the following procedures.

- Readjustment of stereo camera
  Perform the adjustment in the following order: [1. Preparations] → [3. Camera all adjustment mode (replacement/removal)] → [4. Automatic adjustment and function check by driving].
- Replacement of stereo camera
  Perform the replacement in the following order: [1. Preparations] → [2. Adjustment value clear] → [3. Camera all adjustment mode (replacement/removal)] → [4. Automatic adjustment and function check by driving].

  Note:

  When the stereo camera or windshield glass has been removed or installed, always perform readjustment of the stereo camera.

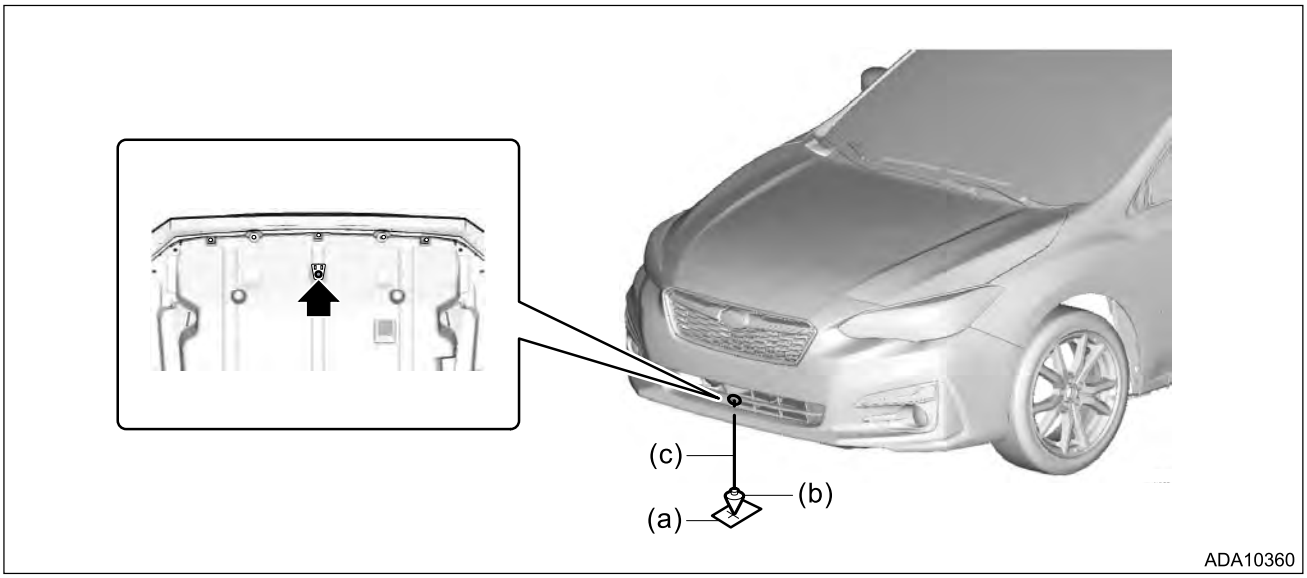


1. PREPARATIONS

Perform the preparation of the adjustment and inspection for the stereo camera.

- **WHEN PERFORMING ADJUSTMENT OR INSPECTION BY AFFIXING RANDOM CHART ONTO PARTITION**

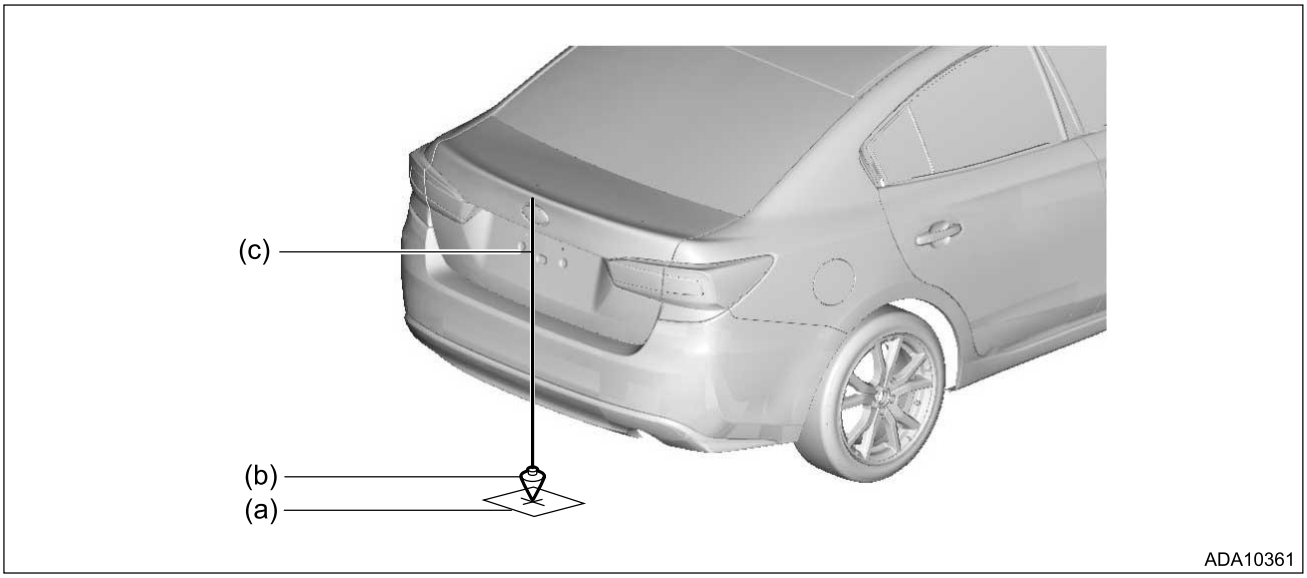
1. Before preparation, check the following items.
   (1) The headlight is off.
   (2) The vehicle is parked on a level surface.
   (3) The inflation pressure of tires is correct.
   (4) The vehicle does not have load.
   (5) The front wheels are directed to the straight ahead position, when the steering wheel is set to the center position.
   Note:
   When the front wheels are not directed to the straight ahead position, adjust the alignment. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
2. Prepare the Subaru Select Monitor, measure, plumb bob, leveling line and RANDOM CHART (ST).
   Preparation tool:
   ST: RANDOM CHART (87599VA000)
3. Place the vehicle on a level surface, where approximately 5 m (16.41 ft) space can be secured in front of the vehicle.
4. Suspend the plumb bob with leveling line from front center position of vehicle (center clip of under cover), and mark the position where the plumb bob touches the ground. (Point A)



(a) Point A (b) Plumb bob (c) Leveling line

Note:
Stick the packing tape etc. on the floor, then make a marking on the tape.

5. Suspend the plumb bob with leveling line from rear center position of vehicle (center of rear ornament), and mark the position where the plumb bob touches the ground. (Point B)

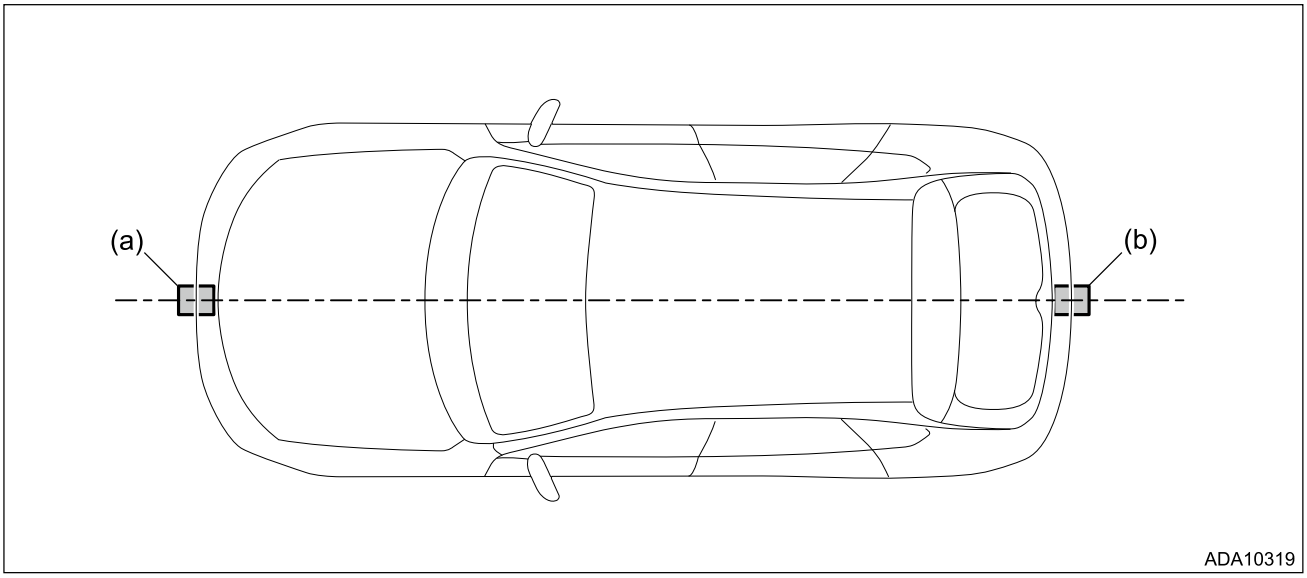


(a) Point B (b) Plumb bob (c) Leveling line

Note:

- **Stick the packing tape etc. on the floor, then make a marking on the tape.**
- **For 5 door model, mark in the same manner as 4 door model.**

6. Strain approximately 5 m (16.41 ft) leveling line from the marking point B through the marking point A toward front of the vehicle, and fix it with packing tape. (A-B line)



(a) Point A (b) Point B

Note:

Confirm that there is no wet condition or unevenness on the floor, to strain the leveling line correctly.

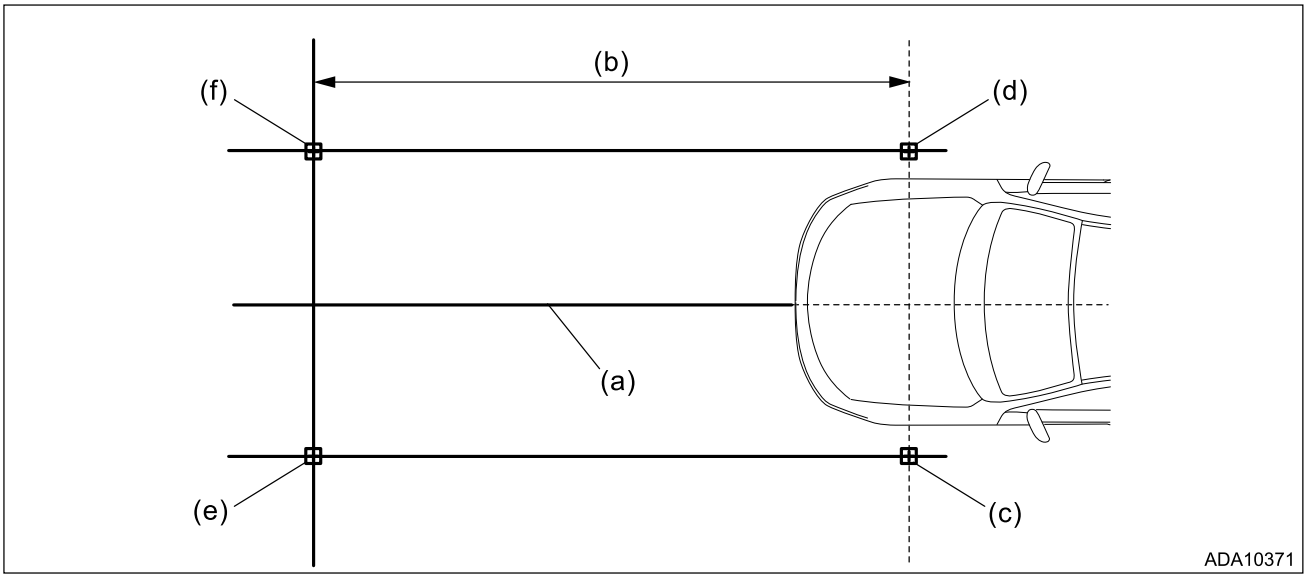
7. Mark the installation position of the partition.

(1) Suspend the plumb bob from the center of each front wheel, and mark the point C and point D.

(2) Strain the leveling lines from the point C and point D toward the front of vehicle parallel to the vehicle body center line (A-B line), and fix the leveling lines with packing tape.

(3) Make markings at the points 4,000 mm (13 ft, 1 1/2 in) ahead of the vehicle from the point C and point D. (Point E and point F)

(4) Strain the leveling line so that it passes through the point E and point F. (E-F line)



(a) Vehicle body center line (A-B line)
(b) 4,000 mm (13 ft, 1 1/2 in)
(c) Point C
(d) Point D
(e) Point E
(f) Point F

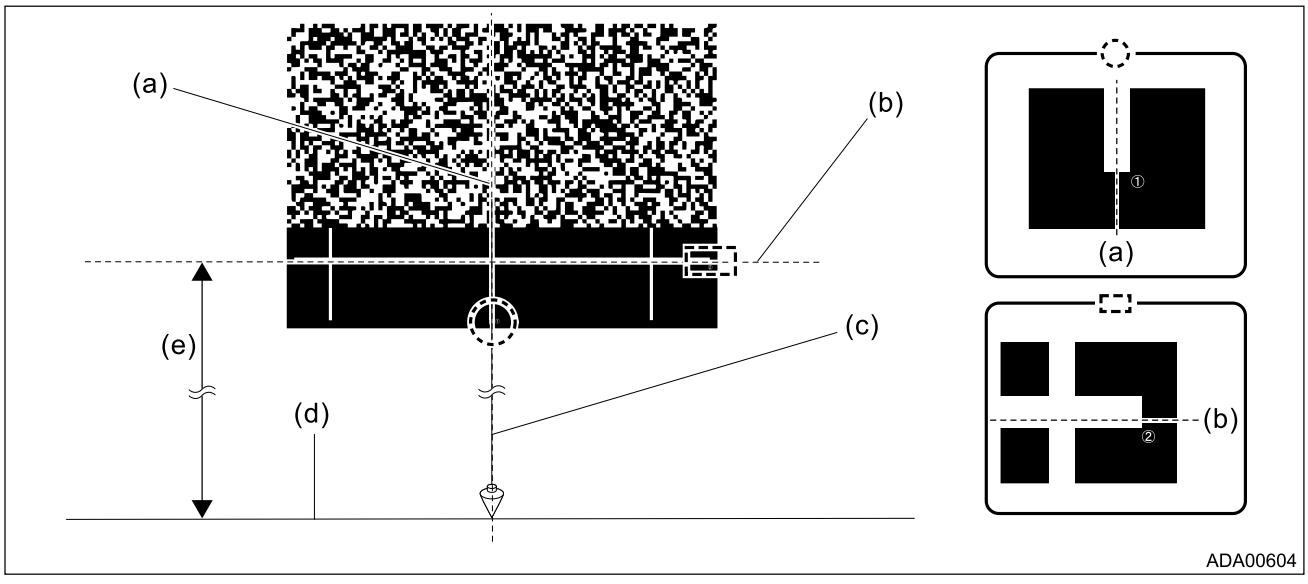
8. Place the partition and RANDOM CHART.

Caution:

- **Affix the RANDOM CHART onto the vertical partition with flat surface.**
- **When affixing the RANDOM CHART using tape, place the tape within 10 mm (0.39 in) from the edge of the CHART. In this case, do not affix with lustrous tapes which may reflect the light.**
- **Perform the adjustment work at lighted places. If the lighting is not enough, adjustment cannot be done, and accuracy rate may not be acquired.**
- **The adjustment in the outdoors cannot be recommended. Note the sun position, when adjusting it in outdoor by necessity. (It is not acceptable when the sunlight comes from front or rear of the vehicle)**

(1) Using the plumb bob, attach the RANDOM CHART on the wall or partition, so that the setting reference (vertical line) center is aligned with the vehicle body center line (leveling line) and the height of the setting reference (horizontal line) center from the floor is 1,000 mm (3 ft, 3 3/8 in).

(2) Adjust the partition so that it is parallel to E-F line.



(a) ① = Setting reference
(c) Plumb bob
(e) 1,000 mm (3 ft, 3 3/8 in)

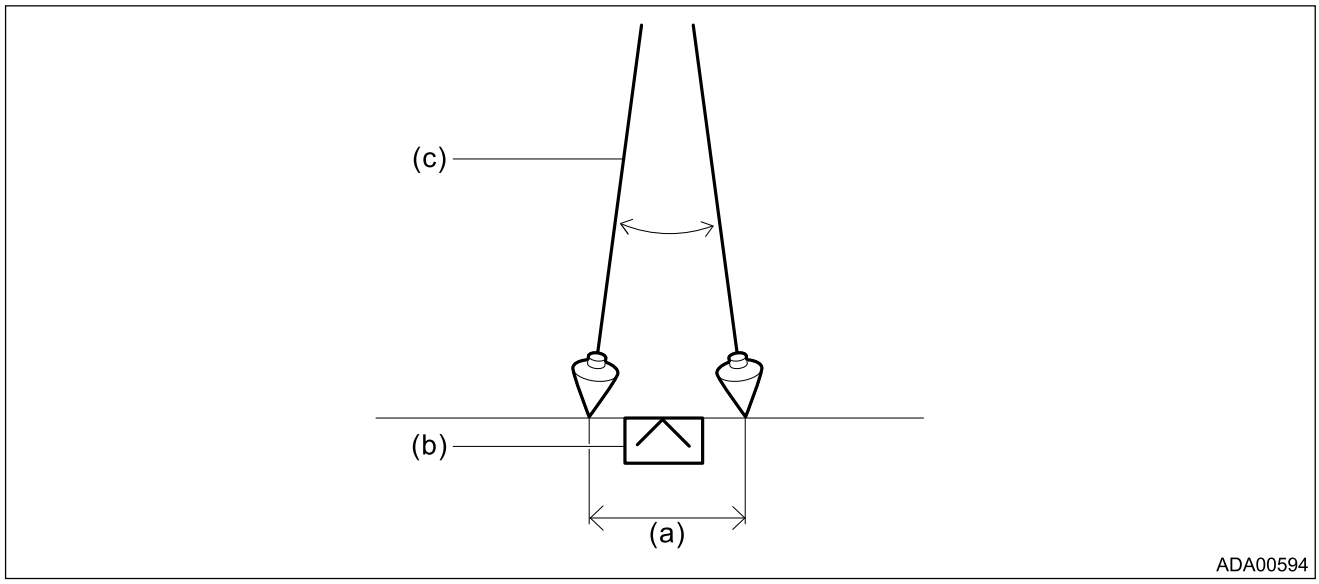
(vertical line) and vehicle body center line (A-B line)

(b) ② = Setting reference (horizontal line)

(d) E-F line

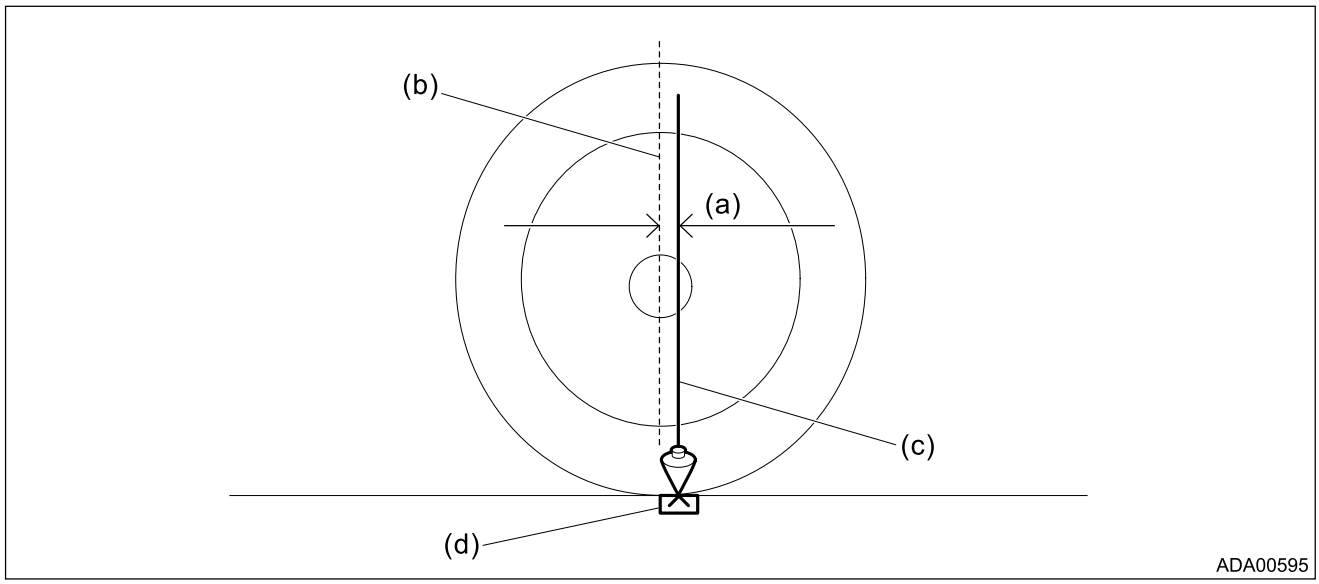
Caution:

- **Centering accuracy of the plumb bob shall be ±4 mm (±0.16 in) or less.**



(a) ±4 mm (±0.16 in) (b) Marking (c) Plumb bob

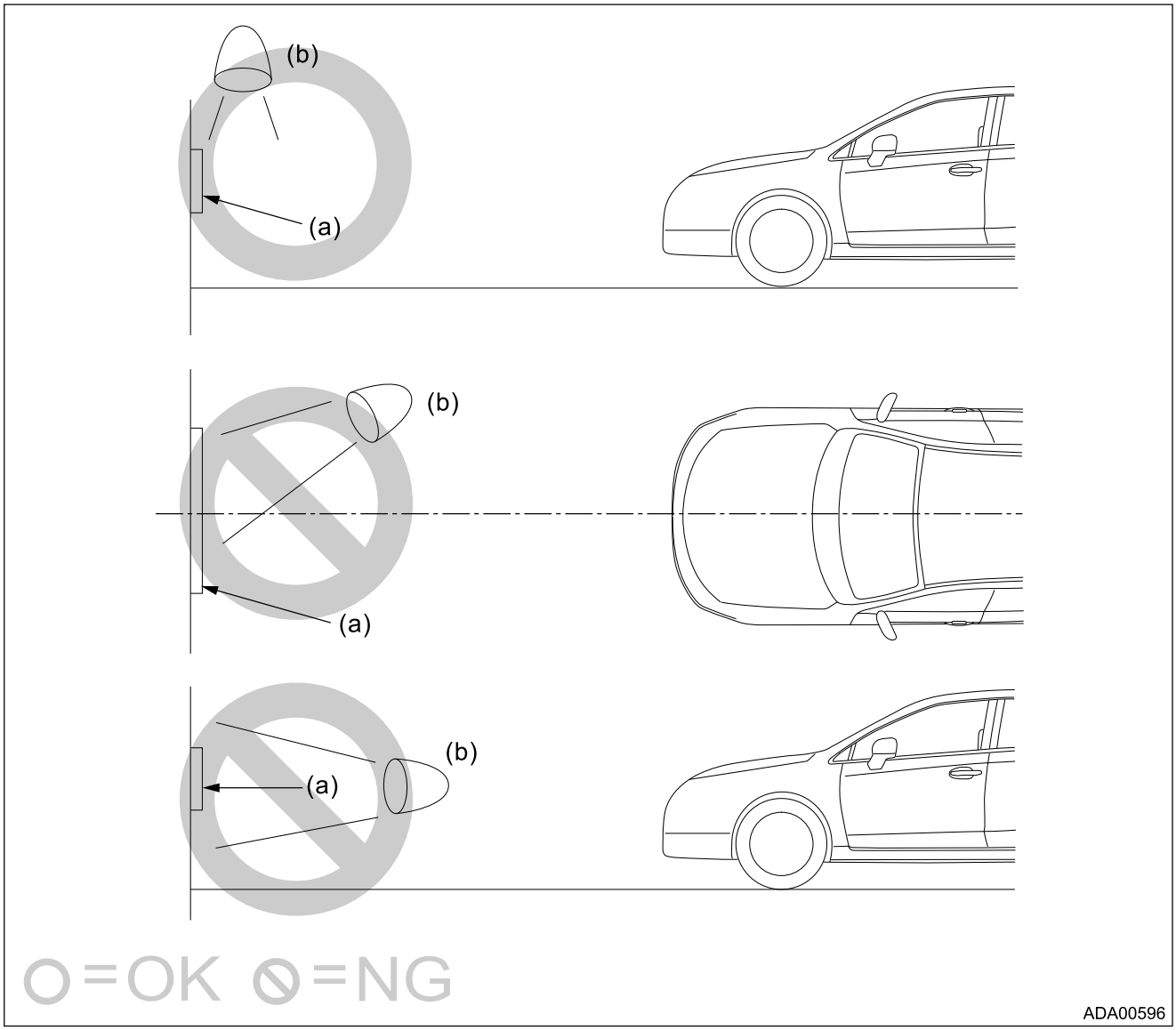
- **Positioning accuracy of the measure shall be ±2 mm (±0.08 in) or less.**
- **Centering accuracy of the tire shall be ±4 mm (±0.16 in) or less.**



(a) ±4 mm (±0.16 in) (c) Plumb bob (d) Marking

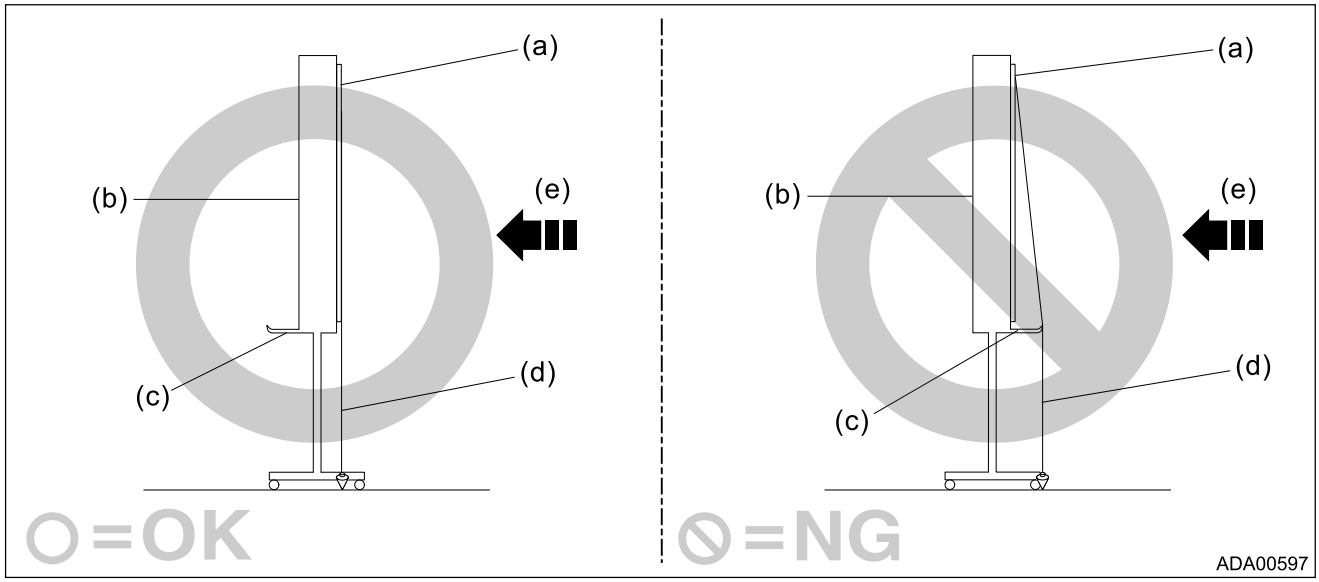
(b) Tire center line

- **Apply the lighting from the upper direction of RANDOM CHART, and make adjustment so that brightness is even in the CHART. (If the lighting is applied from the position where light reflects at RANDOM CHART, the adjustment cannot be done, because the reflected light enters the camera.)**



(a) RANDOM CHART (b) Lighting

- **When using a white board as a partition, affix the RANDOM CHART on the flat surface without protrusion such as penholder. When suspending the plumb bob, suspend it vertically from the RANDOM CHART by avoiding protrusion.**



(a) RANDOM CHART
(b) White board
(c) Protrusion (penholder, etc.)
(d) Plumb bob
(e) Vehicle travel direction

9. Turn the ignition switch to OFF.
10. Check the windshield glass and the dashboard. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.
Caution:
If there are any dirt, object or reflection from dashboard within the visibility of stereo camera, the correct adjustment and inspection can not be performed. Especially, do not put paper etc. on the dashboard.
11. Connect the Subaru Select Monitor.
Note:
For detailed operation procedures, refer to "Application help".
12. Turn the ignition switch to ON.
13. Wait for 10 seconds.
14. On [Start] display, select [Diagnosis].
15. On [Vehicle selection] display, enter vehicle information and select [OK].
16. On [Main Menu] display, select [Each System].
17. On the [Select System] display, select [EyeSight], and then select [Next] while pressing the pre-collision brake OFF switch and the lane departure warning OFF switch mounted on the stereo camera cover assembly at the same time.
Note:
If [EyeSight] is selected without pressing two switches at the same time, the camera adjustment items are not displayed in [Work Support]. (for preventing misoperation) Also, the message is not displayed, when the camera does not finish the start-up (approx. 10 seconds after ignition switch ON). In that case, repeat from the selection of [EyeSight].
18. On [Select Function] display, select [Work Support].
19. From the work support item list, select and perform camera adjustment or other inspections.
Note:
- **When performing {Camera adjustment, inspection}, pre-collision brake OFF indicator light, lane departure warning OFF indicator light in the meter will illuminate, and the normal function will be disabled.**
- **After camera adjustment, the function will be enabled, when the ignition switch is turned to OFF and system is restarted.**

WHEN PERFORMING ADJUSTMENT OR INSPECTION BY AFFIXING RANDOM CHART ONTO WALL

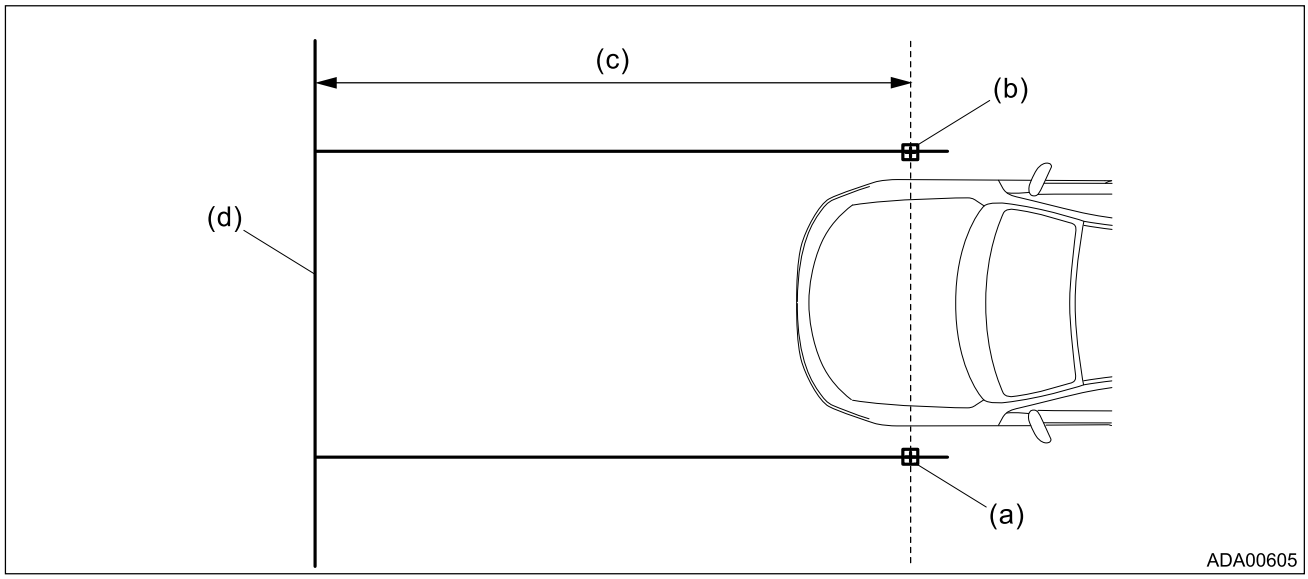
1. Before preparation, check the following items.
(1) The headlight is off.
(2) The vehicle is parked on a level surface.
(3) The inflation pressure of tires is correct.
(4) The vehicle does not have load.
(5) The front wheels are directed to the straight ahead position, when the steering wheel is set to the center position.
Note:
When the front wheels are not directed to the straight ahead position, adjust the alignment. Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
2. Prepare the Subaru Select Monitor, measure, plumb bob, leveling line and RANDOM CHART (ST).
Preparation tool:
ST: RANDOM CHART (87599VA000)
3. Mark the park position of the vehicle.

(1) Strain the leveling line so that it is at right angles to wall on which the RANDOM CHART is affixed, and fix the leveling line with packing tape.
(2) Make a marking 4,000 mm (13 ft, 1 1/2 in) away from the wall where the leveling line is fixed. (Point A and point B)

Note:

Stick the packing tape etc. on the floor, then make a marking on the tape.

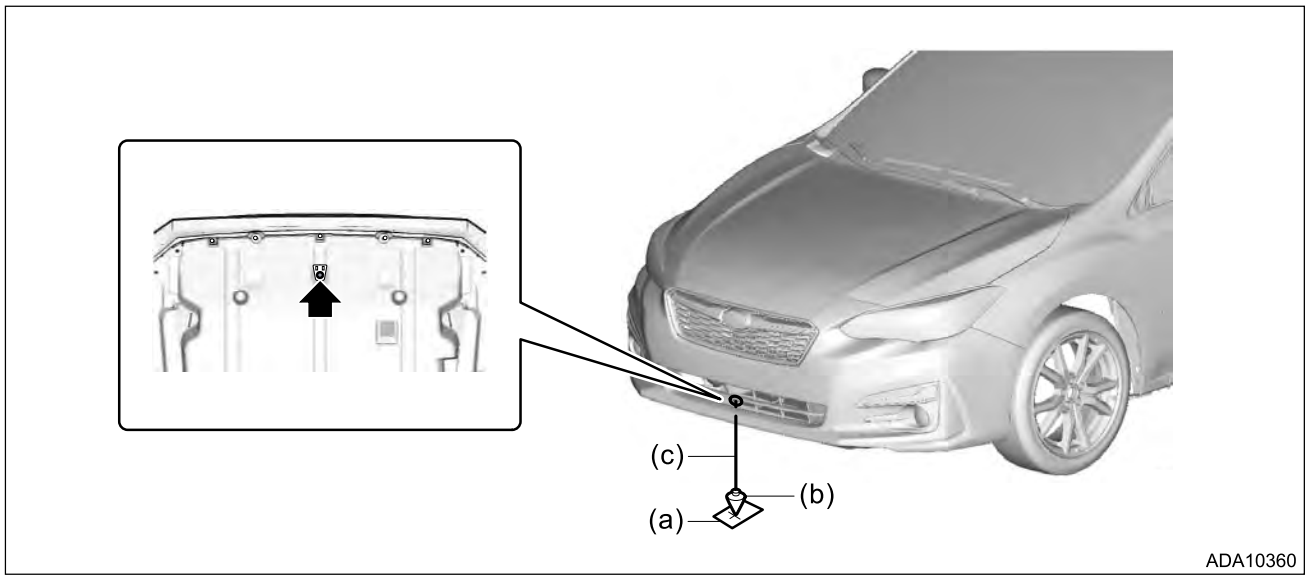
(3) Strain the leveling line so that it passes through the point A and point B. (A-B line)



(a) Point A
(b) Point B
(c) 4,000 mm (13 ft, 1 1/2 in)
(d) Wall

4. Suspend the plumb bob from the center of each front wheel of the vehicle, and place the vehicle so that it is aligned with the leveling line (A-B line).

5. Suspend the plumb bob with leveling line from front center position of vehicle (center clip of under cover), and mark the position where the plumb bob touches the ground. (Point C)

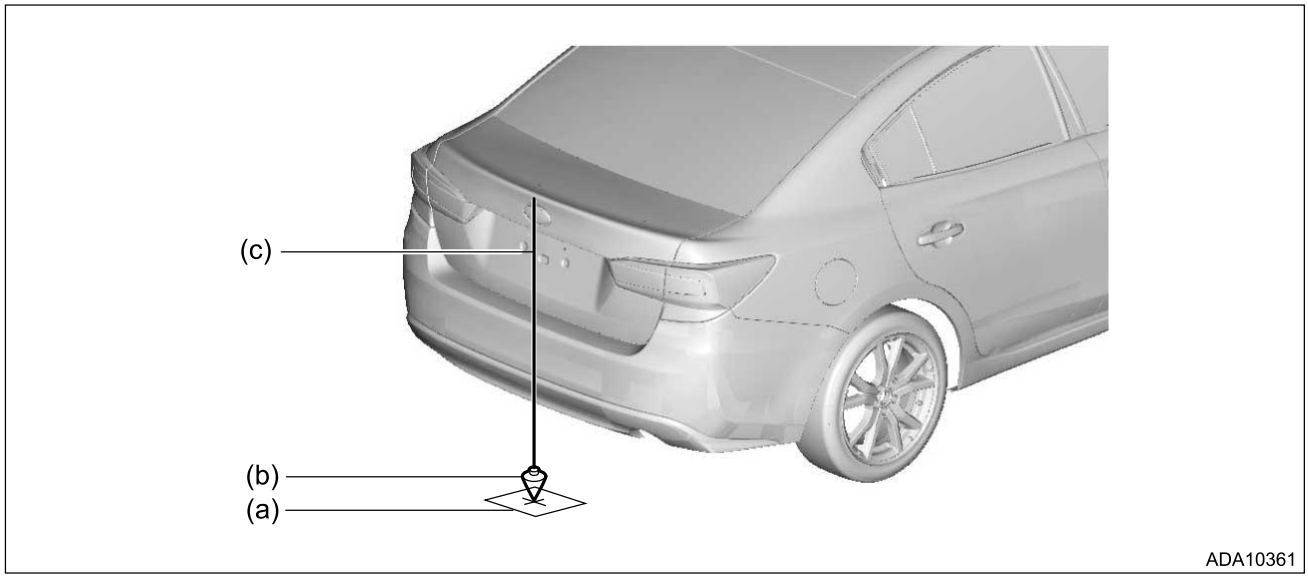


(a) Point C
(c) Plumb bob
(e) Leveling line

Note:

Stick the packing tape etc. on the floor, then make a marking on the tape.

6. Suspend the plumb bob with leveling line from rear center position of vehicle (center of rear ornament), and mark the position where the plumb bob touches the ground. (Point D)

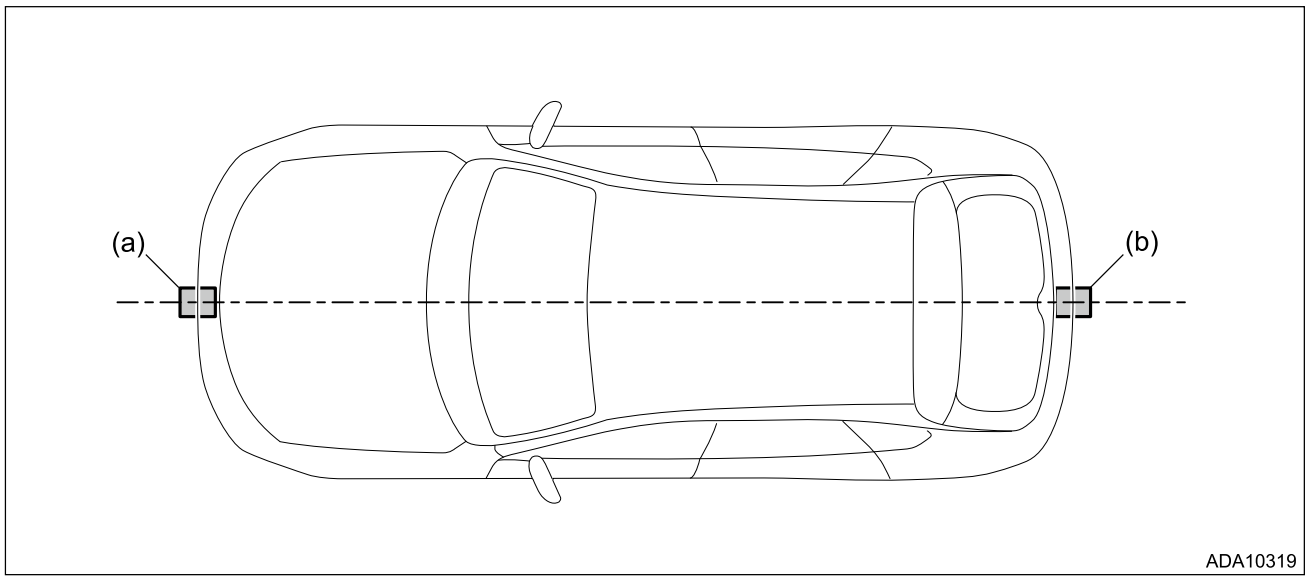


(a) Point D (b) Plumb bob (c) Leveling line

Note:

- **Stick the packing tape etc. on the floor, then make a marking on the tape.**
- **For 5 door model, mark in the same manner as 4 door model.**

7. Strain the leveling line from the making point D through the marking point C to the wall, and fix it with packing tape. (C-D line)



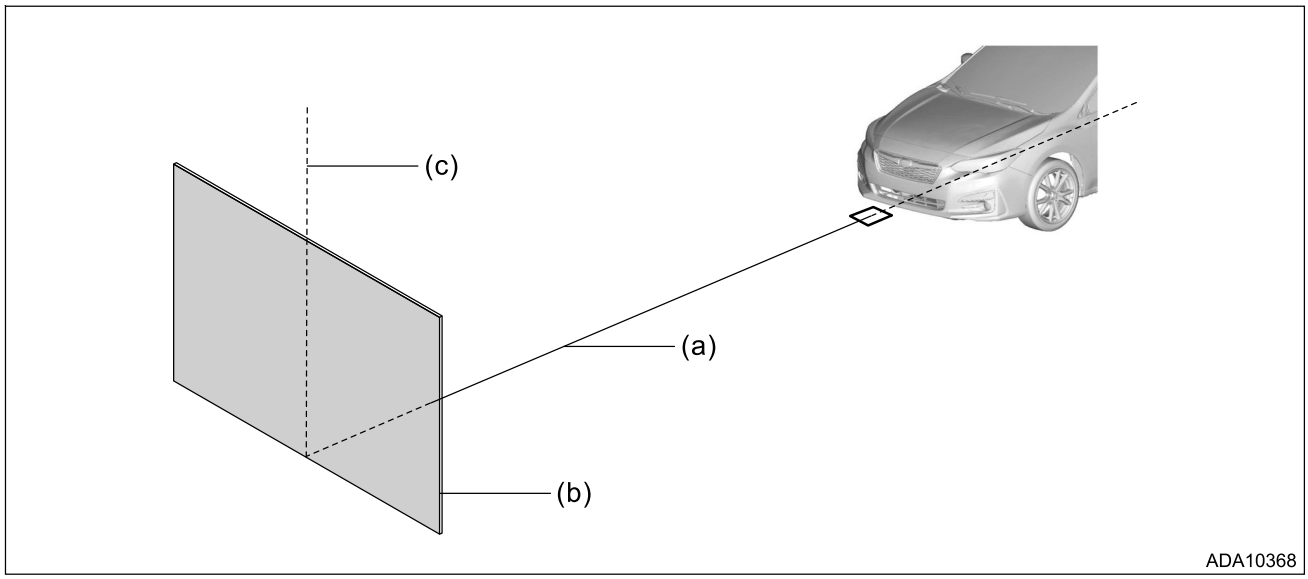
(a) Point C (b) Point D

8. Place the RANDOM CHART.

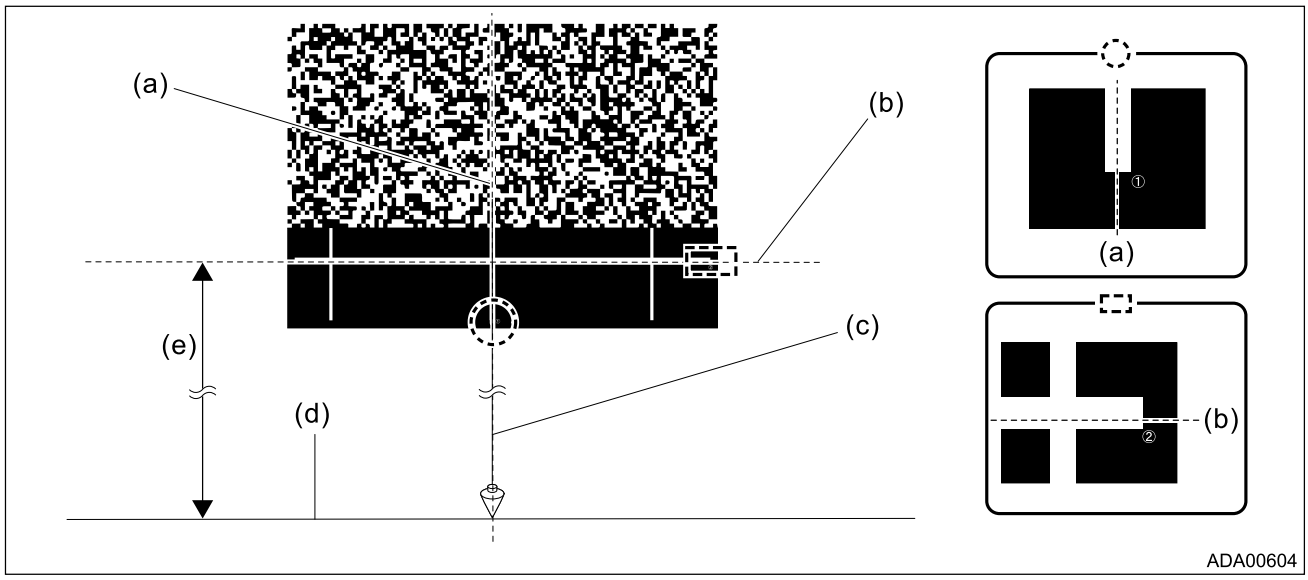
Caution:

- **Affix the RANDOM CHART onto the vertical wall, etc. with flat surface.**
- **When affixing the RANDOM CHART using tape, place the tape within 10 mm (0.39 in) from the edge of the CHART. In this case, do not affix with lustrous tapes which may reflect the light.**
- **Perform the adjustment work at lighted places. If the lighting is not enough, adjustment cannot be done, and accuracy rate may not be acquired.**
- **The adjustment in the outdoors cannot be recommended. Note the sun position, when adjusting it in outdoor by necessity. (It is not acceptable when the sunlight comes from front or rear of the vehicle)**

(1)Using the plumb bob, attach the RANDOM CHART on a wall, so that the setting reference (vertical line) center is aligned with the vehicle body center line (leveling line) and the height of the setting reference (horizontal line) center from the floor is 1,000 mm (3 ft, 3 3/8 in).



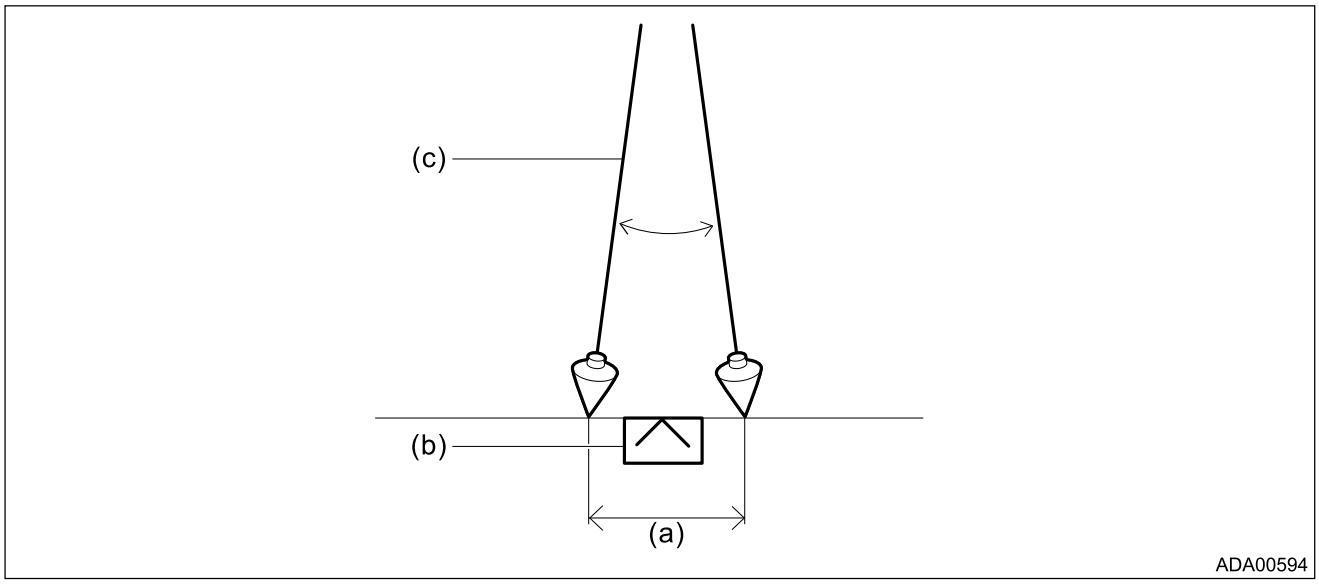
(a) Vehicle body center line (C-D line)
(b) Wall
(c) Setting reference (vertical line)



(a) ① = Setting reference (vertical line) and vehicle body center line (C-D line)
(b) ② = Setting reference (horizontal line)
(c) Plumb bob
(d) Floor
(e) 1,000 mm (3 ft, 3 3/8 in)

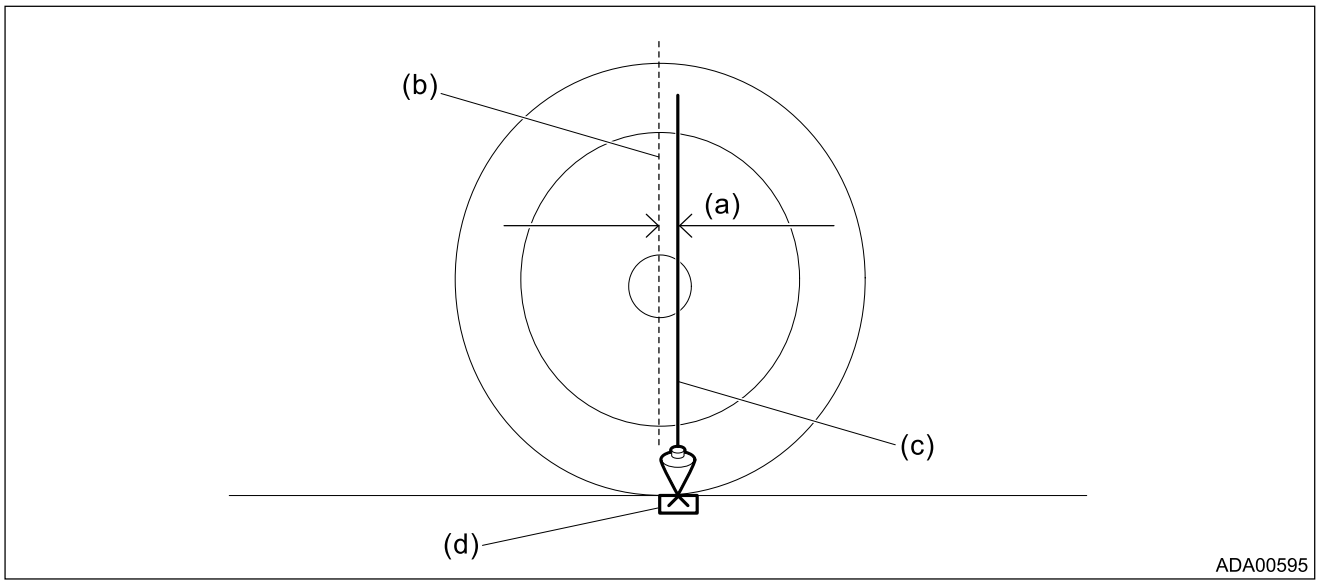
Caution:

- **Centering accuracy of the plumb bob shall be ±4 mm (±0.16 in) or less.**



(a) ±4 mm (±0.16 in) (b) Marking (c) Plumb bob

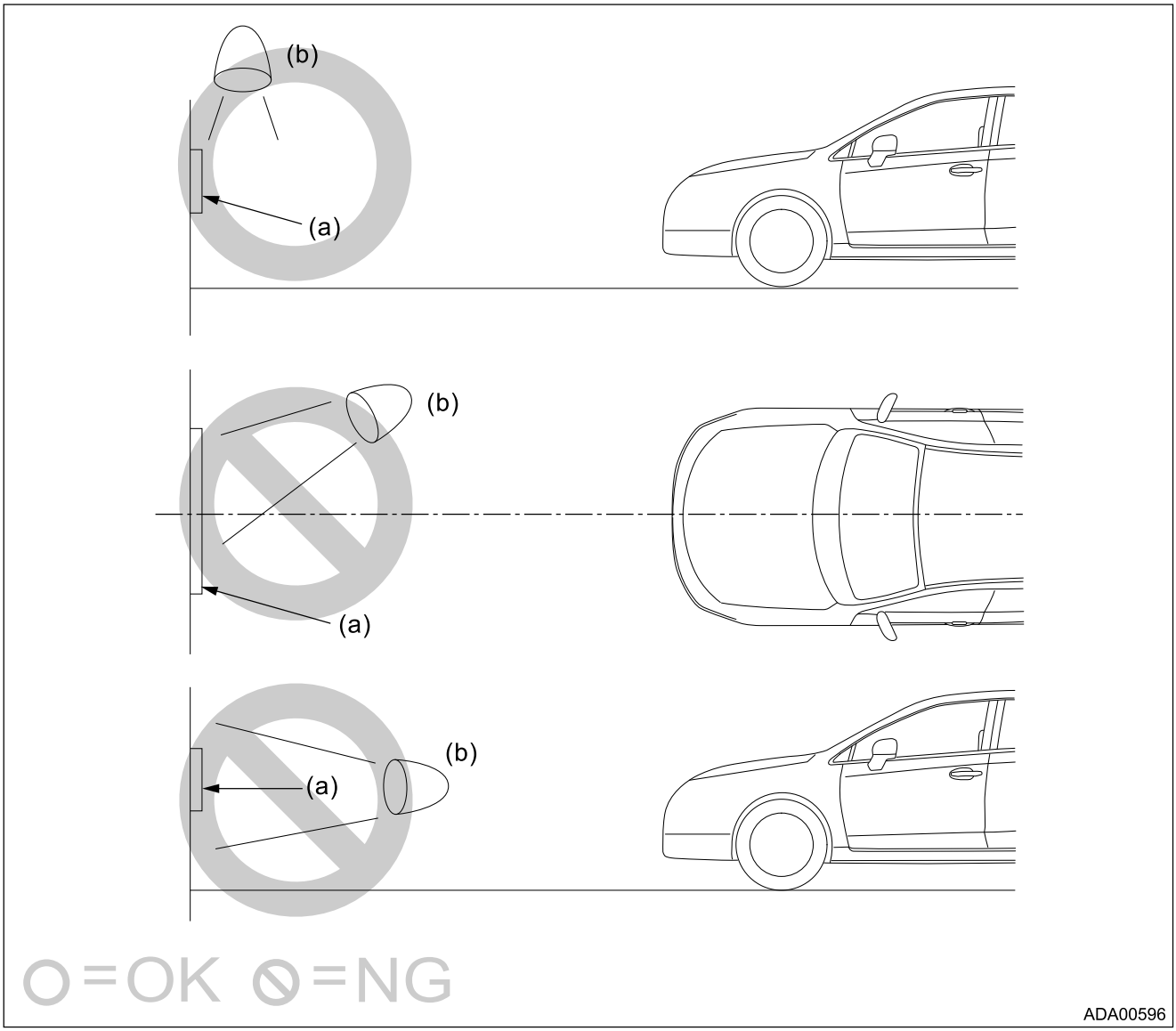
- **Positioning accuracy of the measure shall be ±2 mm (±0.08 in) or less.**
- **Centering accuracy of the tire shall be ±4 mm (±0.16 in) or less.**



(a) ±4 mm (±0.16 in) (c) Plumb bob (d) Marking

(b) Tire center line

- **Apply the lighting from the upper direction of RANDOM CHART, and make adjustment so that brightness is even in the CHART. (If the lighting is applied from the position where light reflects at RANDOM CHART, the adjustment cannot be done, because the reflected light enters the camera.)**



(a) RANDOM CHART (b) Lighting

9. Turn the ignition switch to OFF.

10. Check the windshield glass and the dashboard. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.

Caution:

If there are any dirt, object or reflection from dashboard within the visibility of stereo camera, the correct adjustment and inspection can not be performed. Especially, do not put paper etc. on the dashboard.

11. Connect the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

12. Turn the ignition switch to ON.

13. Wait for 10 seconds.

14. On [Start] display, select [Diagnosis].

15. On [Vehicle selection] display, enter vehicle information and select [Set].

16. On [Main Menu] display, select [Each System].

17. On the [Select System] display, select [EyeSight], and then select [Next] while pressing the pre-collision brake OFF switch and the lane departure warning OFF switch mounted on the stereo camera cover assembly at the same time.

Note:
If [EyeSight] is selected without pressing two switches at the same time, the camera adjustment items are not displayed in [Work Support]. (for preventing misoperation) Also, the message is not displayed, when the camera does not finish the start-up (approx. 10 seconds after ignition switch ON). In that case, repeat from the selection of [EyeSight].

18. On [Select Function] display, select [Work Support].
19. From the work support item list, select and perform camera adjustment or other inspections.

Note:
- **When performing {Camera adjustment, inspection}, pre-collision brake OFF indicator light, lane departure warning OFF indicator light in the meter will illuminate, and the normal function will be disabled.**
- **After camera adjustment, the function will be enabled, when the ignition switch is turned to OFF and system is restarted.**

2. ADJUSTMENT VALUE CLEAR

Perform when replacing stereo camera. (Do not perform when performing stereo camera re-adjustment and inspection)

1. On the work support item list, select [Clear adjustment value].
2. When [Make the following adjustment/inspection. Please push OK if ready. CAUTION! - Please confirm because the chart position height differs according to the model (vehicle height). - Set the ignition switch to OFF after press Cancel at the end of adjustment/inspection mode.] is displayed, select [OK] if preparation is ready.
3. After [Clear the adjustment value. CAUTION! Perform this only under the conditions listed in the service manual.] is displayed, select [OK].
4. When [Clearing adjustment value...] is displayed, wait until it finishes.
5. When the adjustment value clear is finished correctly, and [Adjustment value clear OK! Adjustment value clear is completed. Please to IG OFF more than 5 seconds. (CODE &BYTE03)] is displayed, select [OK] to finish.
6. Turn the ignition switch to OFF and wait for approx. 5 seconds or more.

   Caution:
   If the ignition switch OFF period is short, the adjustment value clear can not be performed correctly.
7. Next, perform the camera all adjustment mode (replacement/removal). Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > CAMERA ALL ADJUSTMENT MODE (REPLACEMENT/REMOVAL).

3. CAMERA ALL ADJUSTMENT MODE (REPLACEMENT/REMOVAL)

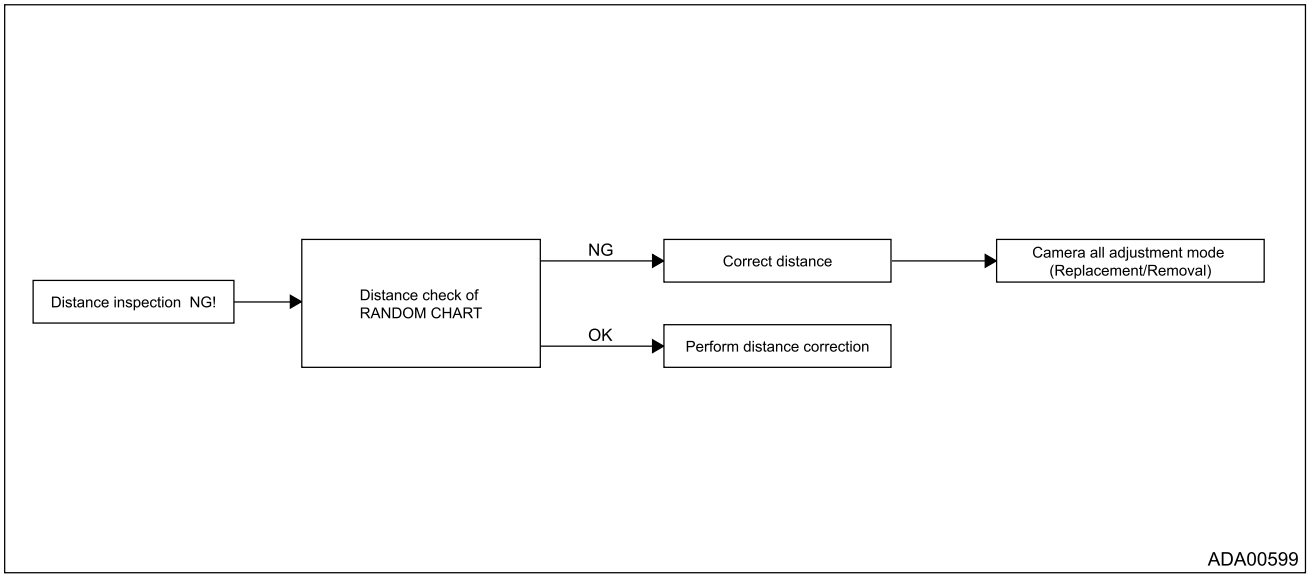
Perform this procedure when the stereo camera is replaced or re-adjustment is necessary (when stereo camera malfunctioning, when stereo camera reinstalled, when windshield glass replaced).

Caution:
- **When the stereo camera is replaced, be sure to perform the Clear adjustment value first. When {Clear adjustment value} was skipped, restart the procedure from {Clear adjustment value} again. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > ADJUSTMENT VALUE CLEAR.**
- **Perform the camera adjustment and inspection at curb weight without passengers.**
- **When the camera all adjustment mode is performed, the procedures must be completed correctly to the end. Otherwise, the warning is displayed on the meter LCD when the vehicle moves.**

1. On the work support item list, select [Camera all adjustment mode (replacement/removal)].
2. When [Make the following adjustment/inspection. Please push OK if ready. CAUTION! - Please confirm

because the chart position height differs according to the model (vehicle height). - Set the ignition switch to OFF after press Cancel at the end of adjustment/inspection mode.] is displayed, select [OK] if preparation is ready.

3. When [In process...] is displayed, wait until it finishes.
4. When the accuracy rate inspection is finished correctly, and [Accuracy rate ○○% OK!] is displayed, select [OK] to go to step 9).
5. When [Distance inspection NG! Distance inspection abnormal. Reconfirm distance from vehicle to chart. If distance is OK, press "OK" to continue. Perform distance correction & accuracy rate check If distance is NG, press "Cancel". Correct distance installation and start over again (CODE 03-2)] is displayed, refer to the NOTE below.



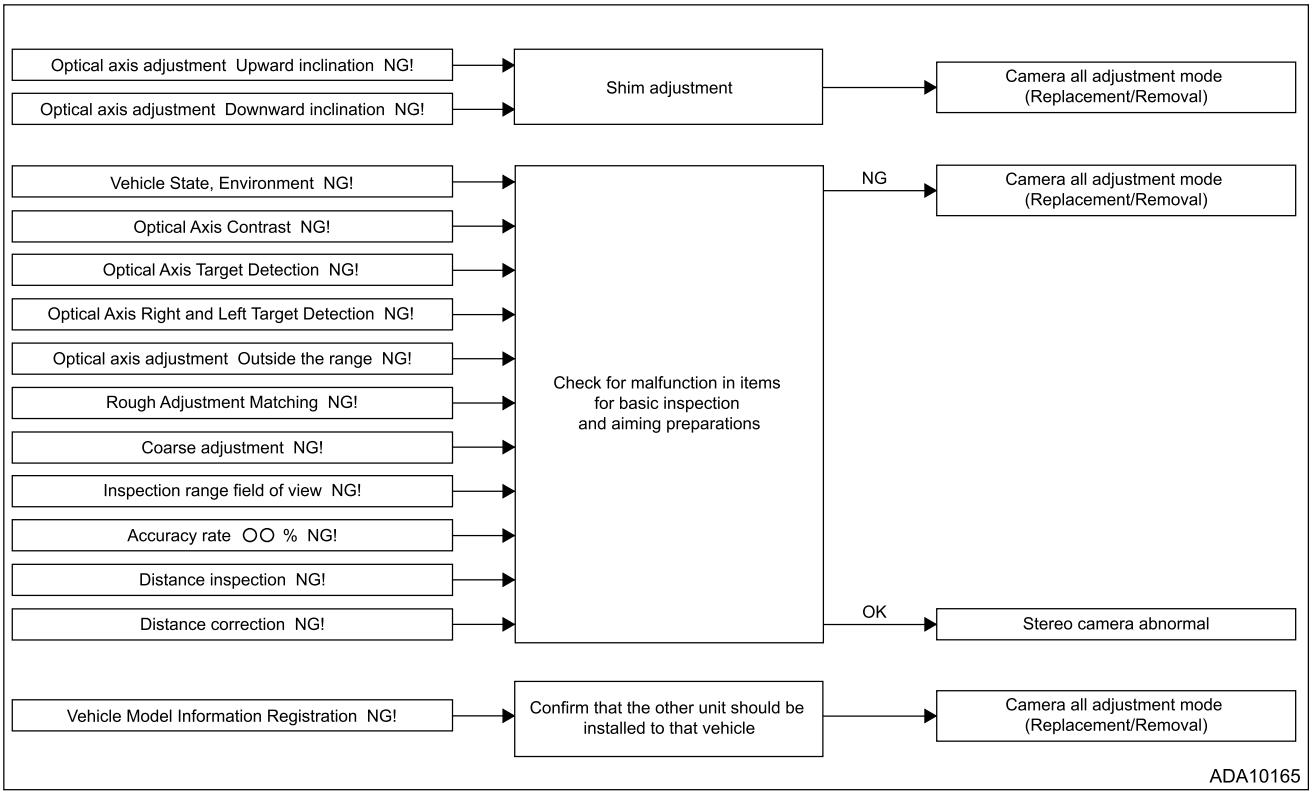
Note:

Distance check and adjustment of RANDOM CHART Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > PREPARATIONS.

6. When [Perform distance correction. CAUTION! Perform only at the time of distance inspection NG (CODE 03-2).] is displayed, select [OK]. When the distance correction is finished correctly, and [Distance correction OK! Distance correction has been completed normally. Perform accuracy rate inspection again.] is displayed, select [OK] and go to the accuracy rate inspection.
7. When [Perform accuracy rate inspection.] is displayed, select [OK]. When the accuracy rate inspection is finished correctly, and [Accuracy rate &INT03% OK! Camera inspection has been completed normally. To save and apply adjustment, inspection results, turn OFF ignition SW more than 5 seconds.] is displayed, select [OK] to go to the next step.
8. When [○○ NG!] is displayed during adjustment, refer to the NOTE below.

Caution:

For details on the displayed items, refer to the following list. Check the list items, and if the same NG item is displayed even when aiming is performed again, replace the stereo camera.



LIST

Error code	Display	Check items on error	Remarks
1401	[Vehicle State • Environment NG!]	Check body integrated unit.	—
1402	[Vehicle Model Information Registration NG!]	Confirm the part numbers of EyeSight system components, and reconfirm that the unit should be installed to that vehicle. To confirm the components, check each item.	—
1403	[Optical Axis Contrast NG!]	1. Make sure that the stereo camera cover assembly is installed correctly. 2. There should be no obstacles that blocks the stereo camera. 3. Stereo camera and camera plate are assembled with no gap. 4. Random chart for ver. 3 must be used. 5. There should be no obstacles that blocks the random chart. 6. Random chart must be set correctly for the vehicle. 7. Grid pattern of random chart should not be dirty or damaged. 8. Lighting circumstance for random chart should be normal. 9. Make sure that the headlight is off. 10. There should be no objects (reflection) on the instrument panel. 11. Dirt should not adhere to the windshield or the lens filter of the stereo camera.	Highly relevant with the check items 1 to 12.
1404	[Optical Axis Target Detection NG!]		Highly relevant with the check items 4, 6, 7, 8, 9, 10, 11 and 12.
1405	[Optical Axis Target Detection NG!]		Highly relevant with the check items 4, 6, 7, 8, 9, 10, 11 and 12.
1406	[Optical Axis Right and Left Target Detection NG!]		Highly relevant with the check items 1 to 12.

Error code	Display	Check items on error	Remarks
1407	[Out of the Optical Axis Adjustment Range NG!]	12. There should be no crack on the windshield. **Note:** **Detecting measures for the error codes 1403, 1404, 1405, 1406 and 1407 are different. Check items on error with high relevance are shown in the remarks.**	Highly relevant with the check items 3 and 6.
1408	[Optical axis adjustment Upward inclination NG!]	1. Random chart must be set correctly for the vehicle. 2. Aiming is performed with the vehicle at curb weight. 3. There should be no malfunction in the suspension. If there are no problems above, perform shim adjustment so that optical axis turns downward.	—
1409	[Optical axis adjustment Downward inclination NG!]	1. Random chart must be set correctly for the vehicle. 2. Aiming is performed with the vehicle at curb weight. 3. There should be no malfunction in the suspension. If there are no problems above, perform shim adjustment so that optical axis turns upward.	—
140 A	[Rough Adjustment Matching NG!]	1. Make sure that the stereo camera cover assembly is installed correctly. 2. There should be no obstacles that blocks the stereo camera. 3. Stereo camera and camera plate are assembled with no gap. 4. There should be no obstacles that blocks the random chart. 5. Random pattern of random chart should not be dirty or damaged. 6. Lighting circumstance for random chart should be normal. 7. There should be no objects (reflection) on the instrument panel. 8. Dirt should not adhere to the windshield or the lens filter of the stereo camera. 9. There should be no crack on the windshield.	Highly relevant with the check items 1 to 9.
140 B	[Coarse adjustment NG!]		Highly relevant with the check items 3, 5, 7 and 9.

Error code	Display	Check items on error	Remarks
140C	[Coarse adjustment NG!]	**Note:** **Detecting measures for the error codes 140A, 140B and 140C are different. Check items on error with high relevance are shown in the remarks.**	Highly relevant with the check items 3, 5, 7 and 9.
140E	[Inspection range field of view NG!]	1. Make sure that the stereo camera cover assembly is installed correctly. 2. There should be no obstacles that blocks the random chart. 3. Random pattern of random chart should not be dirty or damaged. 4. Lighting circumstance for random chart should be normal. 5. There should be no objects (reflection) on the instrument panel. 6. Dirt should not adhere to the windshield or the lens filter of the stereo camera. 7. There should be no crack on the windshield. 8. Windshield for EyeSight should be assembled.	—
140F	[Distance inspection NG!]	1. Distance from random chart to wheel center of the vehicle should be 4,000 mm (13.12 ft). 2. Lighting circumstance for random chart should be normal.	—
1410	[Accuracy rate 00% NG!]	1. Lighting circumstance for random chart should be normal. 2. Random pattern of random chart should not be dirty or damaged. 3. There should be no objects (reflection) on the instrument panel. 4. Dirt should not adhere to the windshield or the lens filter of the stereo camera. 5. There should be no crack on the windshield.	—
1501	[Distance correction NG!]	When [Distance inspection NG!] is displayed and distance correction is performed without inspection, check the following. 1. Distance from random chart to wheel center of the vehicle should be 4,000 mm (13.12 ft). 2. Lighting circumstance for random chart should be normal.	—

Note:

- **Shim adjustment: Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > SHIM ADJUSTMENT.**
- **Basic inspection items: Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION.**
- **Aiming preparation items: Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > PREPARATIONS.**

9. Turn the ignition switch to OFF and wait for approx. 10 seconds. (time necessary to save adjustment and inspection result)

   Caution:

   - **If the ignition switch OFF period after adjustment and inspection finished is short, the adjustment and inspection result cannot be saved correctly. The warning is displayed on the meter LCD, when the vehicle moves.**
   - **When aiming begins, normal recognition process stops and the warning is displayed on the meter LCD. The warning display will be cleared by turning the ignition switch OFF → ON.**
   - **If the steering wheel is operated many times during adjustment and inspection preparation, the power steering control module is overheated. Therefore, you may have to wait for at least 10 seconds after turning the ignition switch to OFF.**

10. Turn the ignition switch to ON. Make sure the [Aiming Completion Status] of [Data Monitor] is [Exit] using Subaru Select Monitor.
11. Perform the {Clear Memory}, and turn the ignition switch to OFF.
12. Subsequently perform the automatic adjustment and function check by a test driving. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > AUTOMATIC ADJUSTMENT AND FUNCTION CHECK BY DRIVING.

4. AUTOMATIC ADJUSTMENT AND FUNCTION CHECK BY DRIVING

Caution:

Make sure to perform the automatic adjustment and function check by driving after replacing or readjusting the stereo camera and windshield for securing the stereo camera recognition accuracy.

Note:

The automatic adjustment and function check by driving can adjust the stereo camera more in detail in addition to the stereo camera adjustment using RANDOM CHART.

1. Perform this procedure after finishing stereo camera adjustment and inspection.
2. Connect the Subaru Select Monitor.

   Note:

   For detailed operation procedures, refer to “Application help”.
3. On [Start] display, select [Diagnosis].
4. On [Select Vehicle] display, enter vehicle information and select [Confirmed].
5. On [Main Menu] display, select [Each System].
6. On [Select System] display, select [EyeSight], and then select [Next].
7. On [Select Function] display, select [Data monitor].
8. From the data monitor item list, select [Automatic Adjustment Status].
9. Drive the vehicle until [Automatic adjustment status] displays [0F], [1F], [2F] or [3F].

Caution:

- **For the automatic adjustment, drive the vehicle on straight road with white lines on both sides at a speed of 40 km/h (25 MPH) or more for at least five minutes, while maintaining distance from the preceding vehicle 40 m (132 ft) or more.**
- **Maintain the following conditions until [Automatic Adjustment Status] displays [0F], [1F], [2F] or [3F].**
  – Turn the active lane keep and cruise main to OFF.
  – Hold down the pre-collision brake OFF switch for two seconds to turn OFF the pre-collision brake function.

Display	Contents	Unit of measure	Note (at idling)
[Automatic adjustment status]	Index for automatic adjustment operation performed by the driving test after the completion of the optical axis adjustment	—	[0F], [1F], [2F] or [3F] is displayed when completed.

Note:

- **It may takes long until [0F], [1F], [2F] or [3F] is displayed depending on the road condition etc.**
- **For new vehicles, [00] may be displayed. It is not necessary to drive the vehicle before delivery because high-accuracy aiming has been performed at vehicle shipment.**

10. From the data monitor item list, display [Lane recognition status] to check if any of the following appears.

Note:

When driving does not continue until [0F], [1F], [2F] or [3F] is displayed, it may take long before recognition completes.

- Recognizing white lines on both sides during driving at 40 km/h (25 MPH) or more: [03]
- Recognizing white lines on both sides with lane width 3 m (10 ft) or more during driving at 65 km/h (40 MPH) or more: [05]

Display	Contents	Unit of measure	Note (at idling)
[Lane Recognition Status]	Display of lane recognition status	—	Recognized when vehicle lane can be seen by 20 m (66 ft) or more.

11. From the data monitor item list, display [Preceding vehicle distance] to check if the distance from the preceding vehicle is approximately the same.

5. SHIM ADJUSTMENT

1. Turn the ignition switch to OFF.

2. Detach the stereo camera cover assembly, and remove the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

3. Remove the stereo camera plate, and insert the shim into the vehicle body and camera plate.

Preparation items:

Genuine part: Shim (washer) (031105000)

Note:

- **Inserting the shim into the vehicle front side makes camera downward.**
- **Inserting the shim into the vehicle rear side makes camera upward.**
- **There is a case that the shim may be inserted at the production line, but it is not abnormal.**

4. Install the stereo camera plate.

Tightening torque:
5.5±1 N·m (0.56±0.1 kgf-m, 4.1±0.7 ft-lb)

5. Install the stereo camera and stereo camera cover assembly. Ref. to EyeSight>Stereo Camera>INSTALLATION.
6. Perform the camera all adjustment mode (replacement/removal). Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > CAMERA ALL ADJUSTMENT MODE (REPLACEMENT/REMOVAL).

6. CAMERA INITIALIZATION

This is a recovery measures prepared for the data failure caused by the low battery voltage during data storage to inside the stereo camera.

Caution:
Do not usually perform camera initialization because it will clear the aiming data and/or DTCs.

Perform the camera initialization only when the aiming result is NG even if the vehicle is placed correctly as shown in the flowchart described in "A: Procedure". After camera initialization, perform the aiming in the same procedure as for camera replacement.

1. Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
2. Turn the ignition switch to ON.
3. Wait for 10 seconds.
4. On [Start] display, select [Diagnosis].
5. On [Select Vehicle] display, enter vehicle information and select [Confirmed].
6. On [Main Menu] display, select [Each System].
7. On [Select System] display, select [EyeSight], and then select [Confirmed].
8. On [Select Function] display, select [DTC].
9. Select [Clear memory] while pressing the pre-collision brake OFF switch and the lane departure warning OFF switch mounted on the stereo camera cover at the same time.
10. Turn the ignition switch to OFF.
11. Wait for 5 seconds.
12. Next, perform the clear adjustment value. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE > ADJUSTMENT VALUE CLEAR.

REMOVAL

1. PRE-COLLISION BRAKE OFF & LANE DEPARTURE WARNING OFF SWITCH

The pre-collision brake OFF & lane departure warning OFF switch is integrated in the stereo camera cover assembly. For operation procedure, replace the stereo camera cover assembly. Ref. to EyeSight>Stereo Camera.

2. EYESIGHT STEERING SWITCH

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the tire to the straight-ahead position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the EyeSight steering switch. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

INSTALLATION

1. PRE-COLLISION BRAKE OFF & LANE DEPARTURE WARNING OFF SWITCH

The pre-collision brake OFF & lane departure warning OFF switch is integrated in the stereo camera cover assembly. For operation procedure, replace the stereo camera cover assembly. Ref. to EyeSight>Stereo Camera.

2. EYESIGHT STEERING SWITCH

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **Make sure that the steering roll connector is not turned from the original position.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Securely install the switch. Improper insertion of the pin or claw of the switch may cause improper installation.**

1. Install the EyeSight steering switch.
2. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
3. Install the steering wheel.

   Tightening torque:

   39 N·m (4 kgf-m, 28.8 ft-lb)

Clearance:

Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)

4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

EyeSight > Switches and Harness

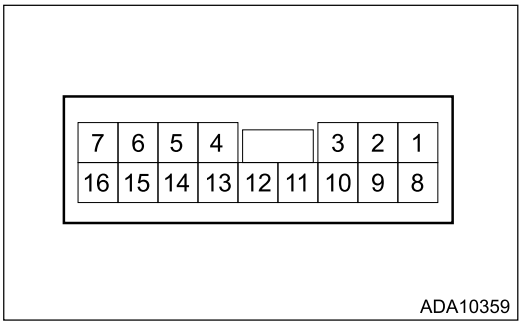
INSPECTION

1. PRE-COLLISION BRAKE OFF SWITCH AND LANE DEPARTURE WARNING OFF SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



- Pre-collision brake OFF switch

Terminal No.	Inspection conditions	Standard
10 — 13	OFF	Approx. 1 kΩ
	ON	Less than 1 Ω

- Lane departure warning OFF switch

Terminal No.	Inspection conditions	Standard
9 — 13	OFF	Approx. 1 kΩ
	ON	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
8 (+) — 12 (−)	Apply battery voltage.	Light ON

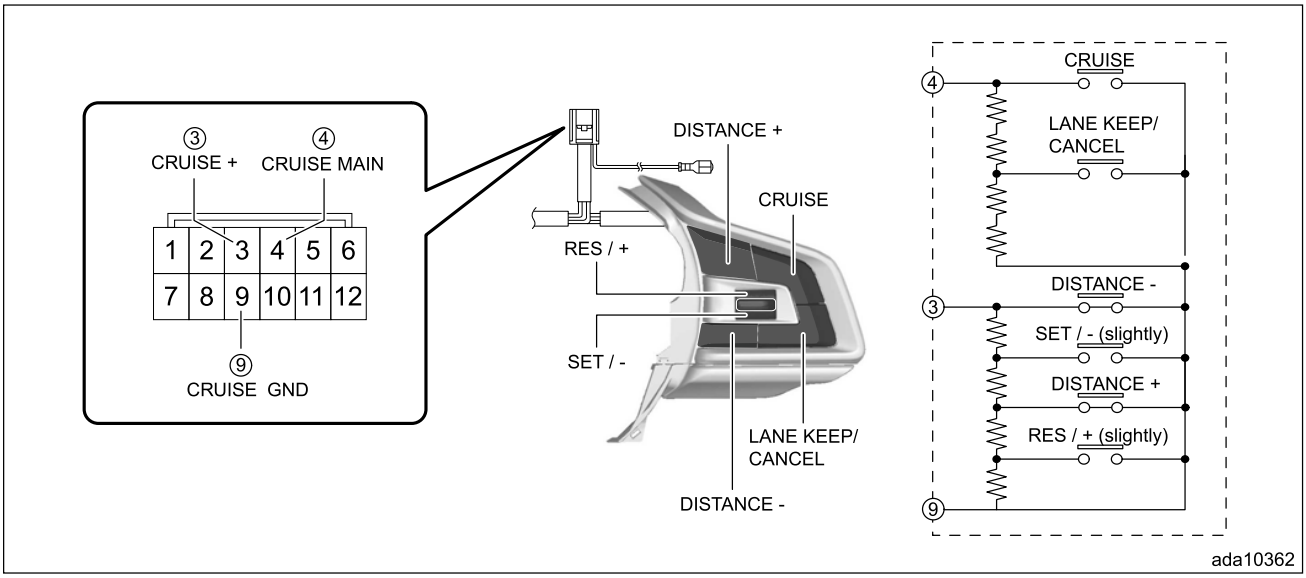
3. Replace the stereo camera cover assembly if faulty is found in the inspection.

2. EYESIGHT STEERING SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions		Standard
3 — 9	DISTANCE− SET/− DISTANCE+ RES/+	All OFF	Approx. 4,020Ω
	DISTANCE−	ON	Less than 1 Ω
	SET/−	ON	Approx. 250 Ω
	DISTANCE+	ON	Approx. 680 Ω
	RES/+	ON	Approx. 1,470Ω
4 — 9	CRUISE LANE KEEP/CANCEL	All OFF	Approx. 4,020Ω
	CRUISE	ON	Less than 1 Ω
	LANE KEEP/CANCEL	ON	Approx. 680 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
10 (+) — 11 (−)	Apply battery voltage.	Light ON

3. Replace the EyeSight steering switch if it is found defective.

NOTE

For the operation procedures for combination meter, refer to “INSTRUMENTATION/DRIVER INFO” section.
Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

NOTE

For the operation procedures for stop light and brake switch, refer to “BRAKE” section. Ref. to BRAKE>Stop Light Switch.

NOTE

For the operation procedures for roll connector (steering angle sensor), refer to “AIRBAG SYSTEM” section.
Ref. to AIRBAG SYSTEM>Roll Connector.

INSPECTION

For diagnostics with phenomenon, refer to “Diagnostics with Phenomenon” of “EyeSight (DIAGNOSTICS)” section. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon.

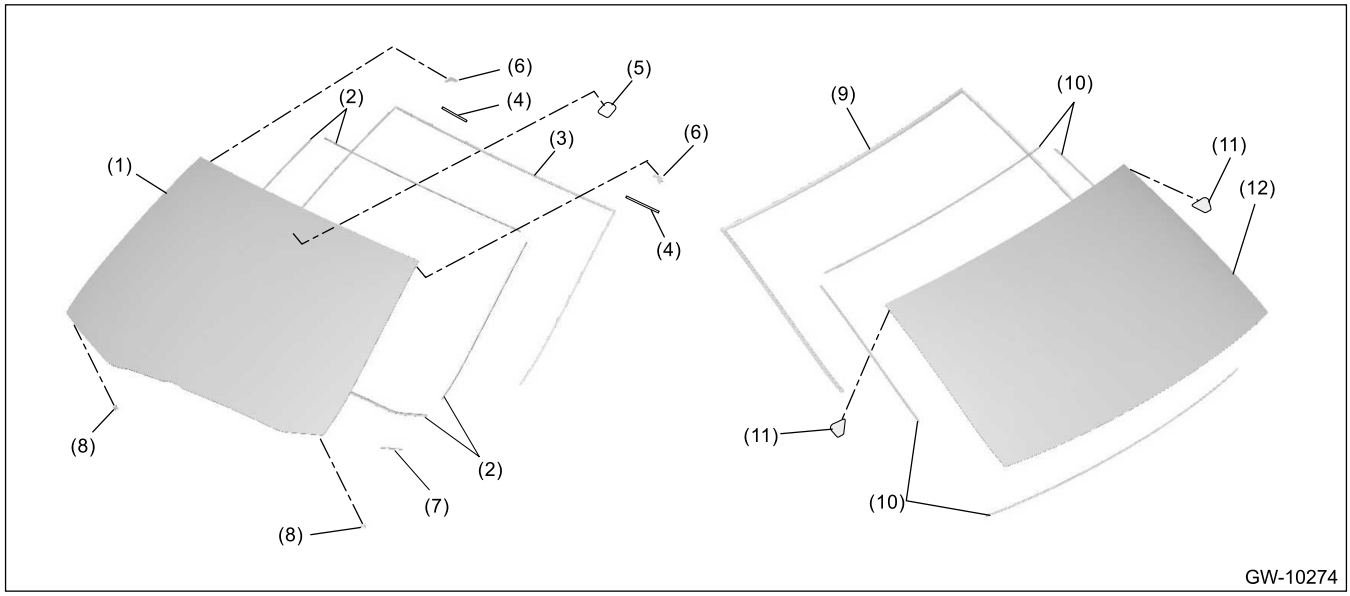
GLASS/WINDOWS/MIRRORS

GW

1. General Description
2. Relay and Fuse
3. Power Window System
4. Power Window Control Switch
5. Front Door Glass
6. Front Regulator and Motor Assembly
7. Remote Control Mirror System
8. Outer Mirror Assembly
9. Remote Control Mirror Switch
10. Rearview Mirror
11. Rear Door Glass
12. Rear Regulator and Motor Assembly
13. Windshield Glass
14. Rear Window Glass
15. Rear Gate Glass
16. Rear Window Defogger System
17. Rear Quarter Glass
18. Wiper Deicer System

COMPONENT

1. FIXED GLASS (4 DOOR MODEL)

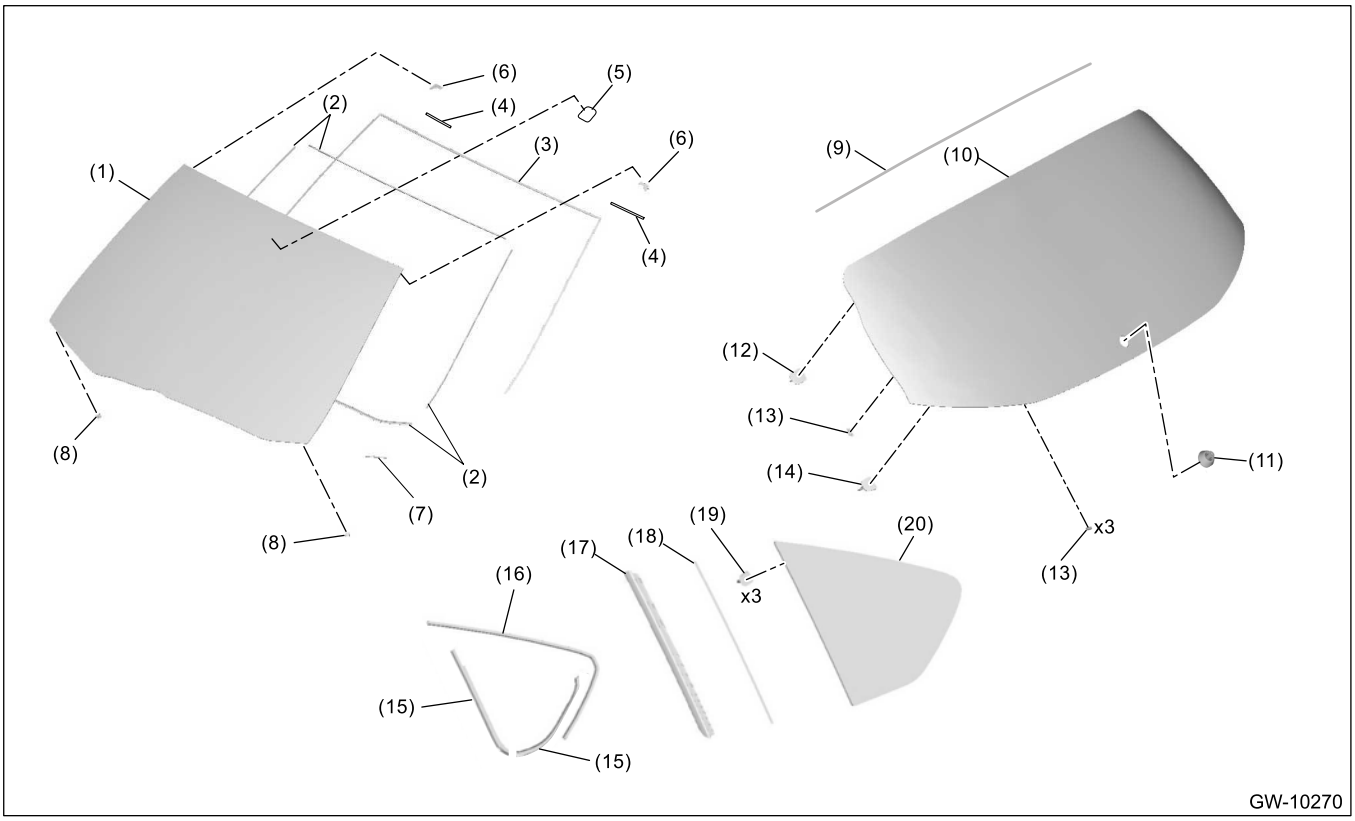


(1) Glass - front window	(6) Locating pin - front window	(11) Locating pin - rear window
(2) Dam rubber - front	(7) Seal - lower VIN	(12) Glass - rear window
(3) Molding - front window	(8) Seal - lower	
(4) Seal - upper	(9) Molding - rear window	
(5) Base - inner mirror	(10) Dam rubber - rear	

Note:

Base - inner mirror cannot be removed from the glass - front window.

2. FIXED GLASS (5 DOOR MODEL)

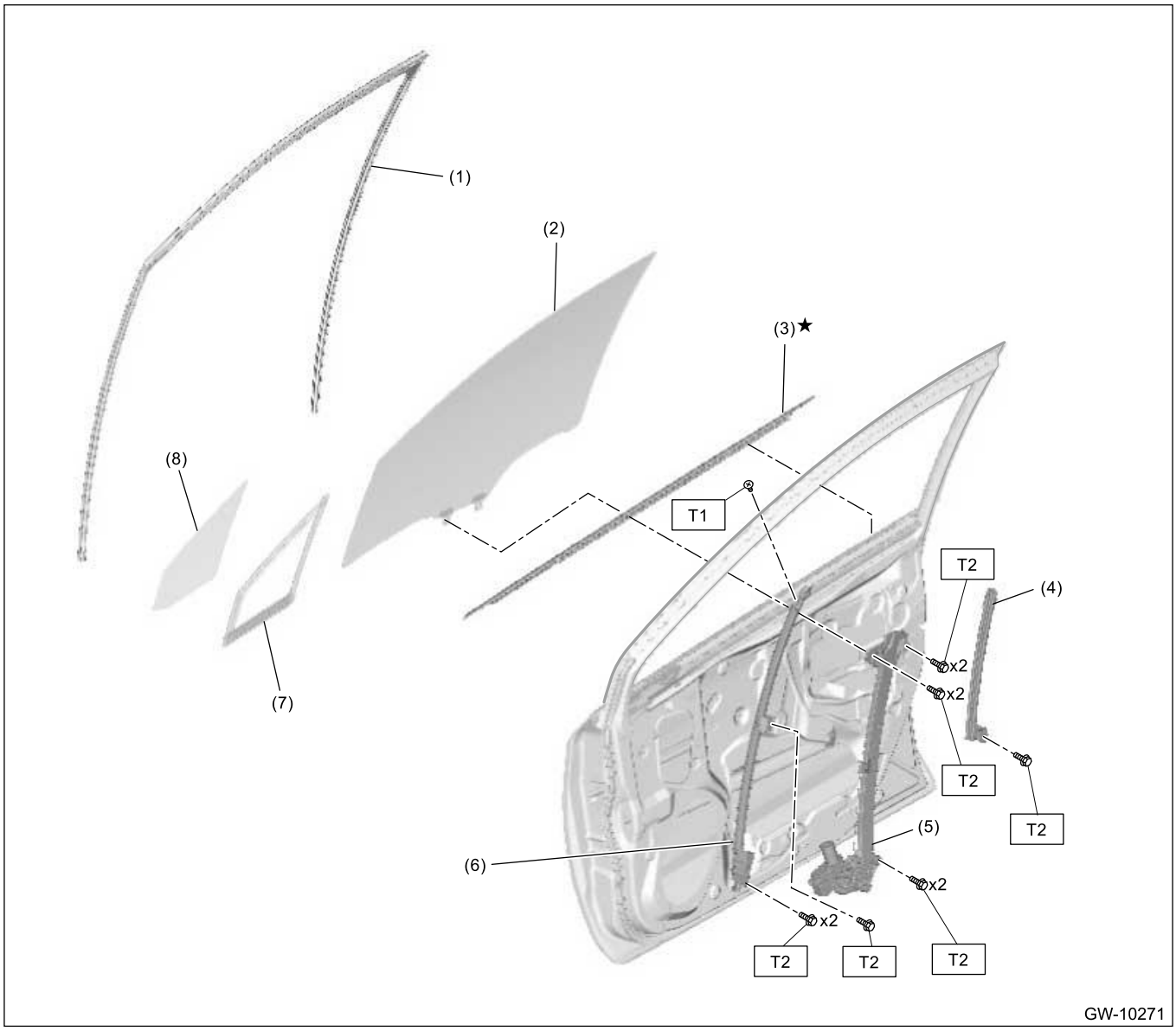


(1) Glass - front window
(2) Dam rubber - front
(3) Molding - front window
(4) Seal - upper
(5) Base - inner mirror
(6) Locating pin - front window
(7) Seal - lower VIN
(8) Seal - lower
(9) Dam rubber - rear gate
(10) Glass - rear gate
(11) Cap - pivot
(12) Locating pin - rear gate
(13) Spacer - rear gate
(14) Holder - rear gate
(15) Dam rubber B - rear quarter
(16) Dam rubber A - rear quarter
(17) Molding - rear quarter
(18) Molding tape - rear quarter
(19) Locating pin - rear quarter
(20) Glass - rear quarter

Note:

Base - inner mirror cannot be removed from the glass - front window.

3. FRONT DOOR GLASS



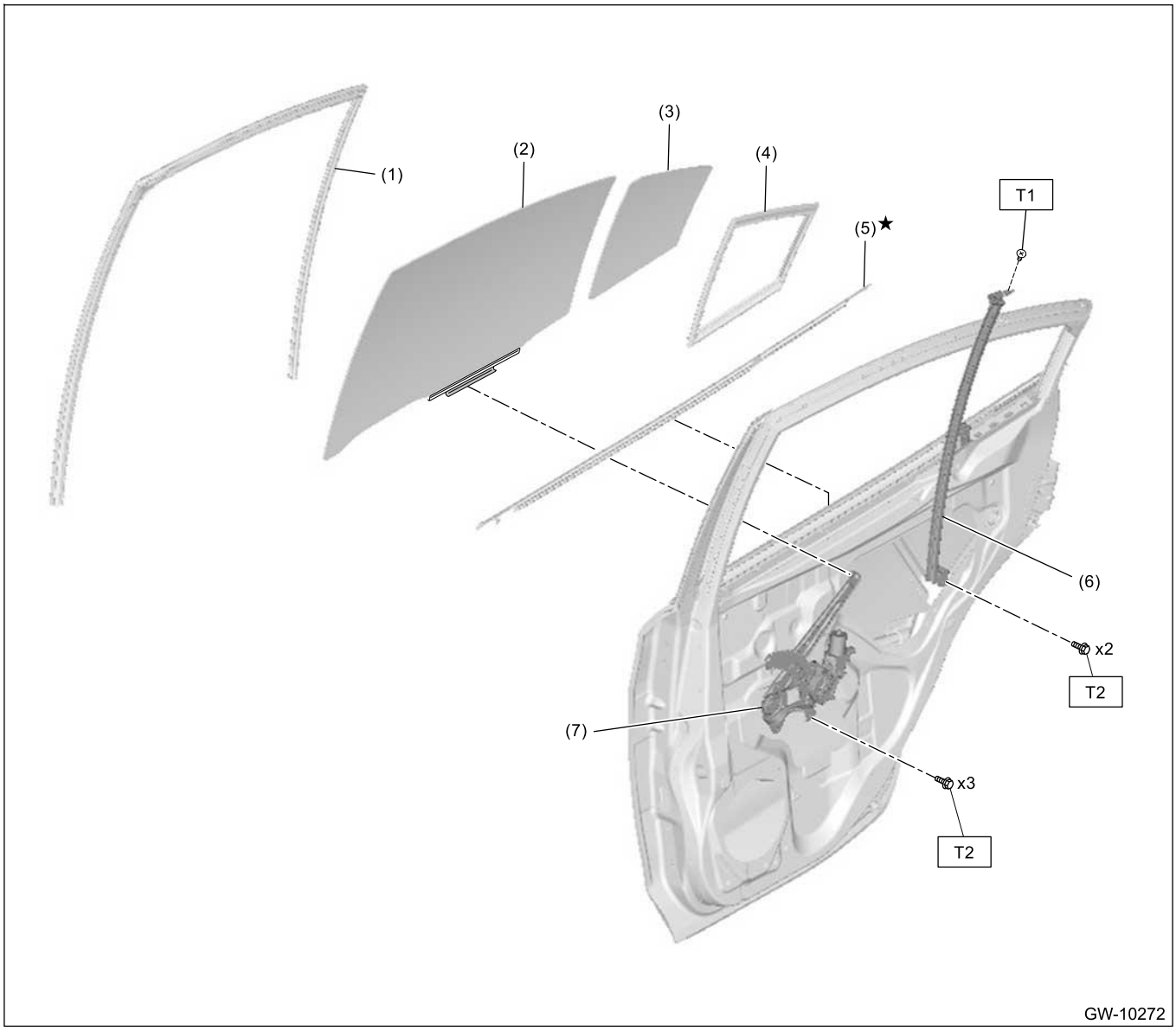
(1) Running channel - front door
(2) Glass ASSY - front door
(3) Weather strip outer - front door
(4) Sash ASSY - lower
(5) Regulator & motor ASSY - front
(6) Sash ASSY - partition
(7) Weather strip - front door partition
(8) Glass - front door partition

Tightening torque: N·m (kgf-m, ft-lb)

T1: 2.2 (0.2, 1.6)
T2: 7.5 (0.8, 5.5)

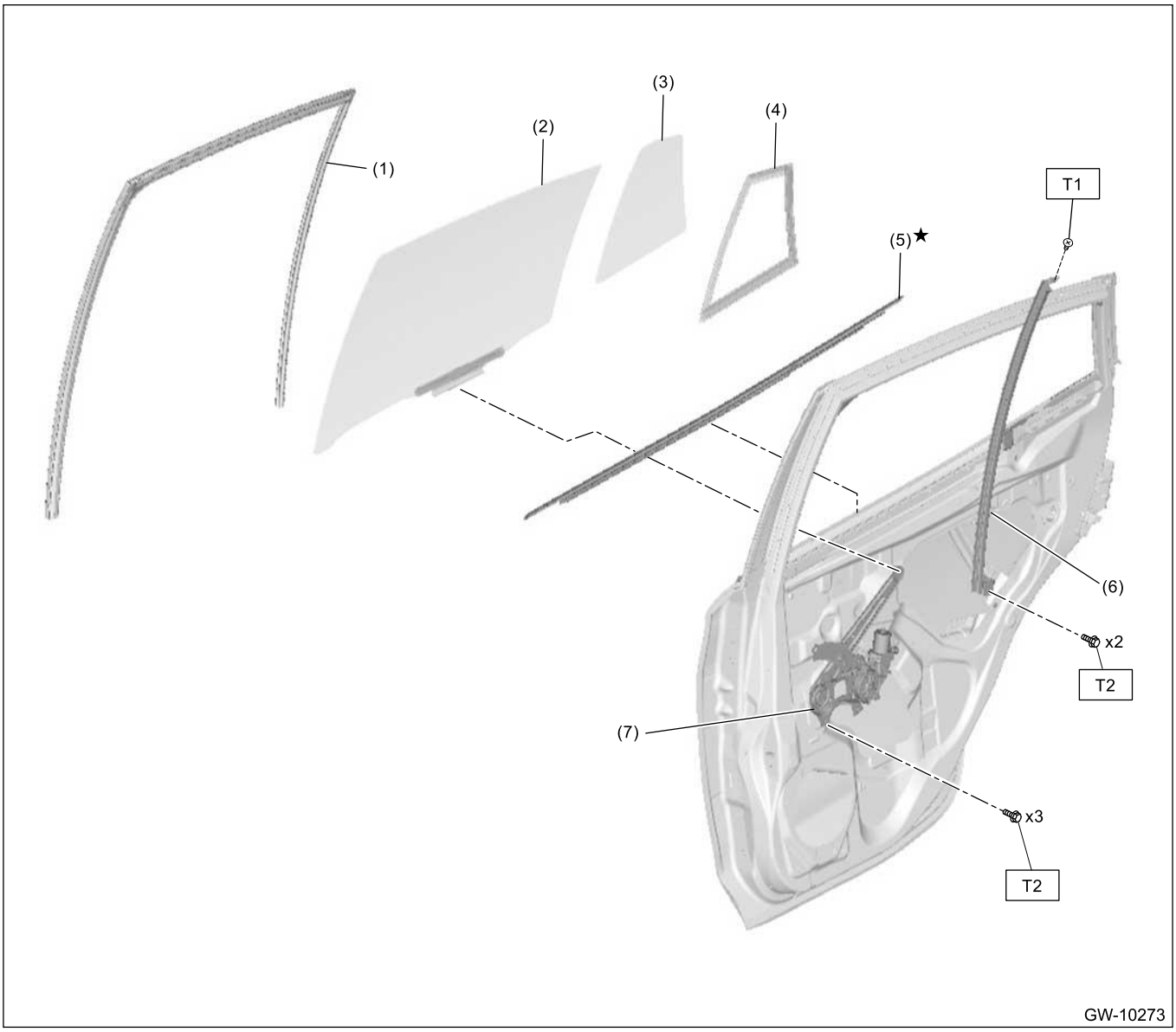
4. REAR DOOR GLASS

- 4 door model



(1)	Running channel - rear door	(5)	Weather strip outer - rear door	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Glass ASSY - rear door	(6)	Sash ASSY - rear partition	***T1: 2.2 (0.2, 1.6)***
(3)	Glass - rear door partition	(7)	Regulator & motor ASSY - rear	***T2: 7.5 (0.8, 5.5)***
(4)	Weather strip - rear door partition			

- 5 door model

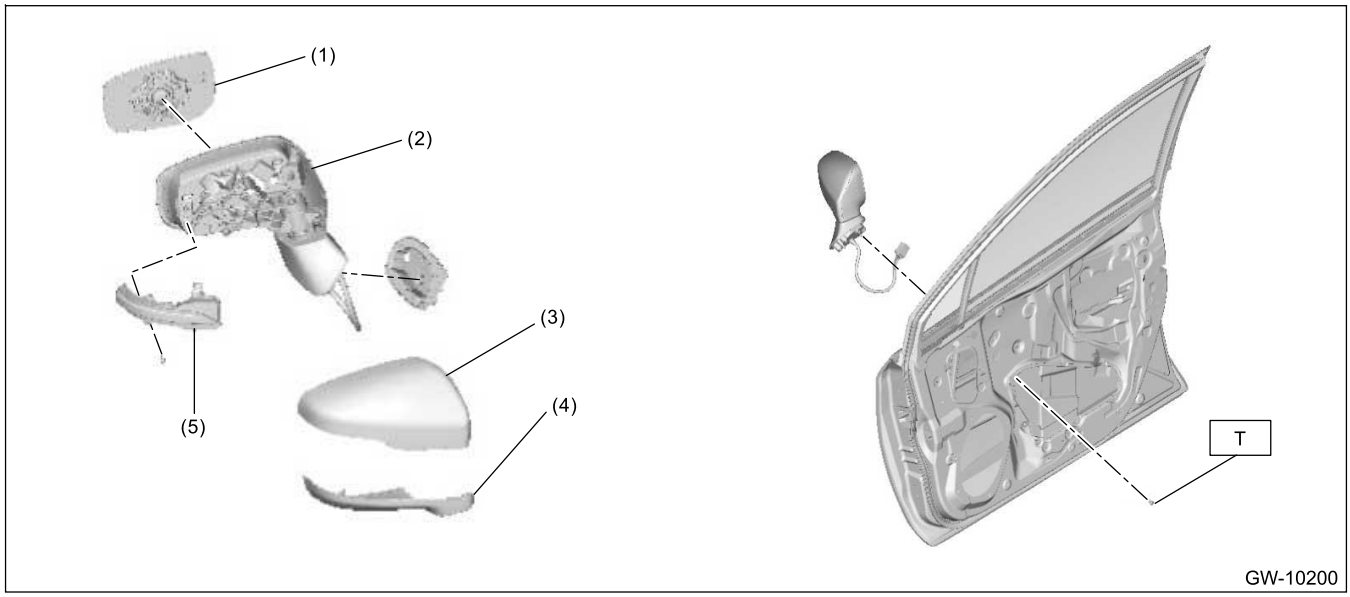


(1) Running channel - rear door
(2) Glass ASSY - rear door
(3) Glass - rear door partition
(4) Weather strip - rear door partition
(5) Weather strip outer - rear door
(6) Sash ASSY - rear partition
(7) Regulator & motor ASSY - rear

Tightening torque: N·m (kgf-m, ft-lb)

T1: 2.2 (0.2, 1.6)
T2: 7.5 (0.8, 5.5)

5. OUTER MIRROR

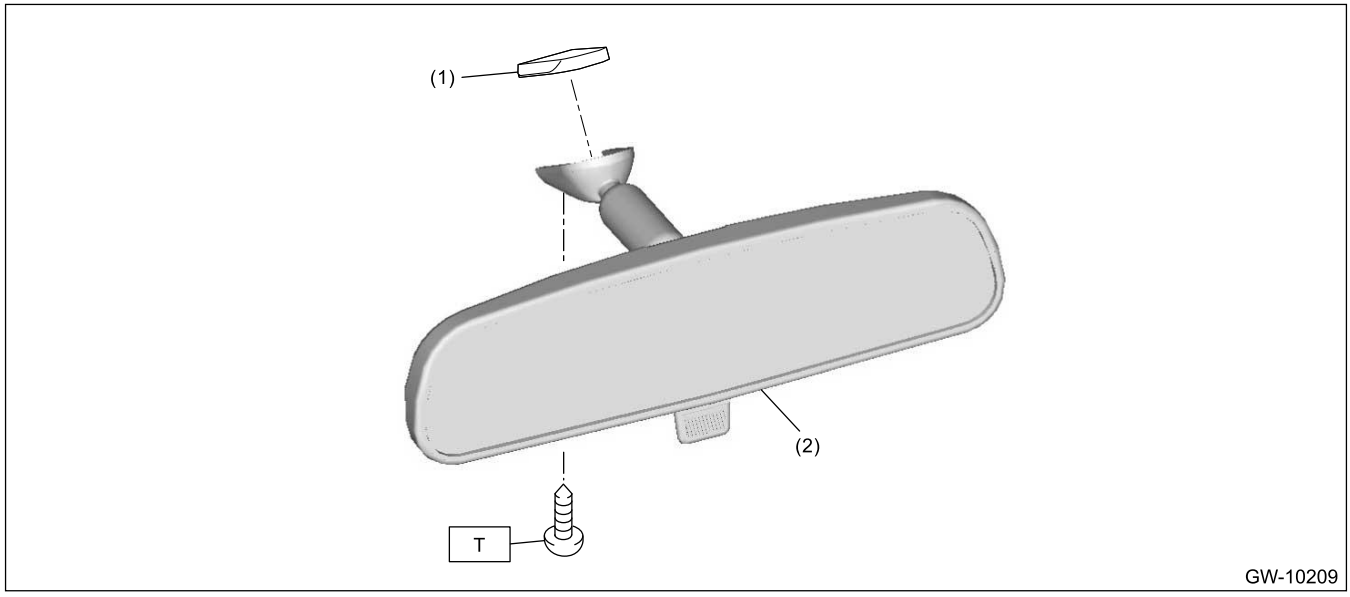


(1) Mirror - repair
(2) Mirror unit - door
(3) Cover - cap outer mirror
(4) Cover - cap outer mirror lower
(5) Light ASSY - side turn mirror

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

6. REAR VIEW MIRROR



(1) Base - inner mirror
(2) Mirror ASSY - inner rearview

Tightening torque: N·m (kgf-m, ft-lb)

T: 2 (0.2, 1.5)

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the audio and MFD parts provided with memory functions, record the memory contents before disconnecting the battery ground cable.
- Avoid impact and damage to the glass.

PREPARATION TOOL

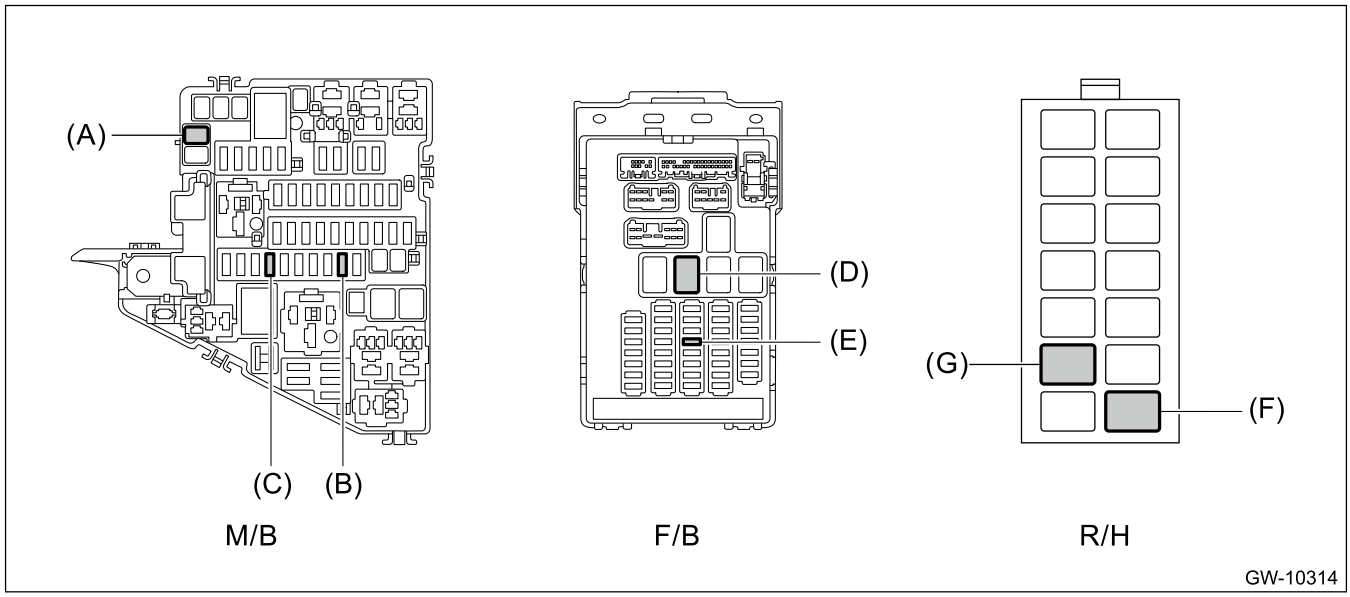
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Piano wire	Used for removing the window glass.
Cutter knife	Used for removing the window glass.
Windshield glass knife	Used for removing the window glass.

LOCATION



Main fuse box (M/B)	Slow blow fuse (power window)	(A)
	Fuse 25 A (rear defogger, mirror heater)	(B)
	Fuse 10 A (wiper deicer)	(C)
Fuse & relay box (F/B)	Power window relay	(D)
	Fuse 7.5 A (remote control mirror)	(E)
Relay holder (R/H)	Rear defogger relay Mirror heater relay	(F)
	Wiper deicer relay	(G)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

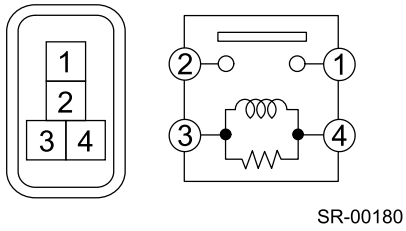
1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

2. CHECK RELAY

1. Check the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Apply battery voltage between terminals 4 and 3.	Less than 1 Ω	 SR-00180

2. Replace the relay if the inspection result is not within the standard value.

GLASS/WINDOWS/MIRRORS > Power Window System

WIRING DIAGRAM

Refer to “Power Window System” in the wiring diagram. Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.

GLASS/WINDOWS/MIRRORS > Power Window System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “POWER WINDOW (DIAGNOSTICS)” section.
Ref. to POWER WINDOW(DIAGNOSTICS) >Basic Diagnostic Procedure.

GLASS/WINDOWS/MIRRORS > Power Window System

NOTE

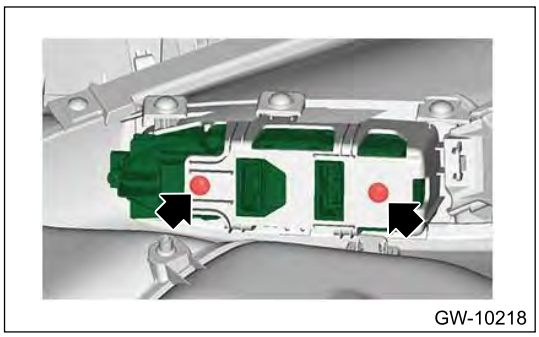
For procedure of each component in the power window system, refer to the respective section.

- Power window control switch: Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch.
- Front door glass: Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass.
- Front regulator and motor assembly: Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
- Rear door glass: Ref. to GLASS/WINDOWS/MIRRORS>Rear Door Glass.
- Rear regulator and motor assembly: Ref. to GLASS/WINDOWS/MIRRORS>Rear Regulator and Motor Assembly.

REMOVAL

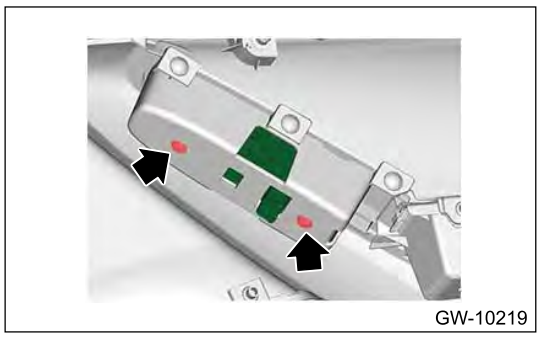
1. MAIN SWITCH

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the screws and remove the switch - power window main.


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2. SUB-SWITCH

- **SWITCH - POWER WINDOW SUB FRONT**
  For removal of the switch - power window sub front on the passenger's seat, refer to the removal procedure of the switch - power window main. Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>REMOVAL > MAIN SWITCH.
- **SWITCH - POWER WINDOW SUB REAR**
  1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
  2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
  3. Remove the screws and remove the switch - power window sub rear.


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INSTALLATION

Caution:

- **After installing the switch - power window main, always perform the initial setting. Failure to do so may cause the improper activation of auto-reverse operation for pinching hazard prevention. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION.**
- **Use protective paper to avoid damage to the trim panel.**

1. MAIN SWITCH

1. Install the panel - power window main switch to the trim panel - front door.
2. Install the trim panel - front door.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. SUB-SWITCH

- **SWITCH - POWER WINDOW SUB FRONT**
  For installation of the switch - power window sub front on the passenger's seat, refer to the installation procedure of the switch - power window main. Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>INSTALLATION > MAIN SWITCH.
- **SWITCH - POWER WINDOW SUB REAR**
  1. Install the panel - power window sub switch rear to the trim panel - rear door.
  2. Install the trim panel - rear door.
  3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

GLASS/WINDOWS/MIRRORS > Power Window Control Switch

INSPECTION

Caution:

Since the power window switch is controlled by CPU, do not check continuity for switch alone with the circuit tester. Performing continuity check with circuit tester may damage the power window switch circuit.

For power window system inspection, refer to "POWER WINDOW (DIAGNOSTICS)" section. Ref. to POWER WINDOW(DIAGNOSTICS) >Basic Diagnostic Procedure.

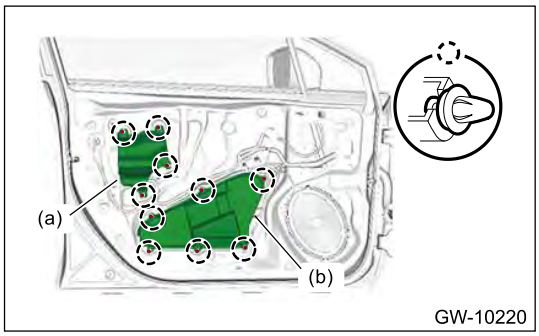
REMOVAL

1. FRONT DOOR GLASS

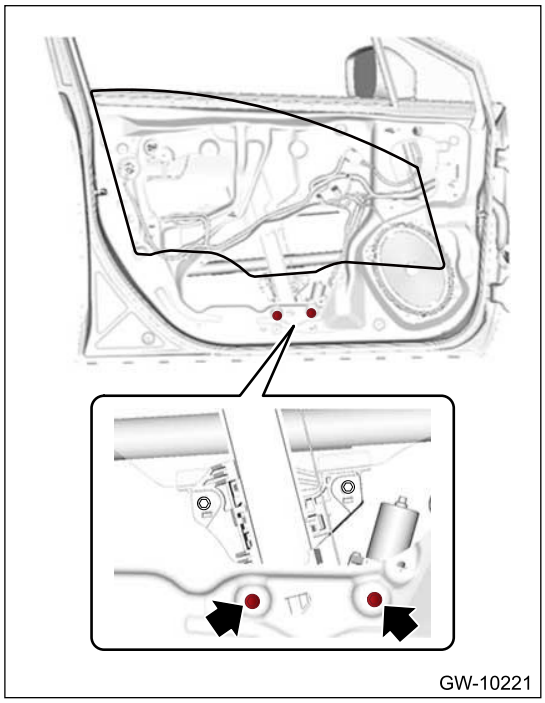
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the front sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
4. Remove the plate - door UPR (a) and plate - door LWR (b).

   Caution:

   If it is removed with an excessive force, the panel assembly - front door may be deformed. Also, if the clip is damaged, replace it with a new clip.



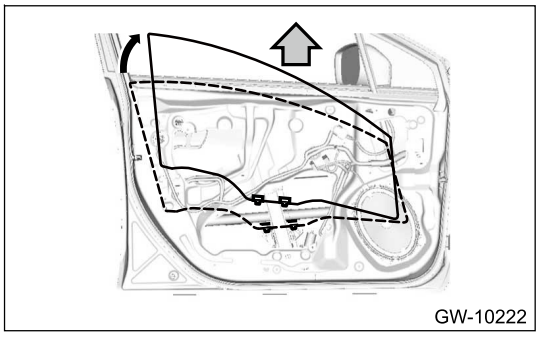
5. Remove the glass assembly - front door.
   (1) Connect the switch - power window, and connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   (2) Turn the ignition switch to ON, and operate the switch - power window to move the glass assembly - front door to the position where the mounting bolts can be seen.
   (3) Turn the ignition switch to OFF, then disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
   (4) Remove the mounting bolts from the glass assembly - front door.



(5) While tilting the glass, remove the glass assembly - front door.

Caution:

Avoid impact and damage to the glass assembly - front door.



2. FRONT DOOR PARTITION GLASS

1. Remove the front door glass. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL > FRONT DOOR GLASS.
2. Remove the glass - front door partition.

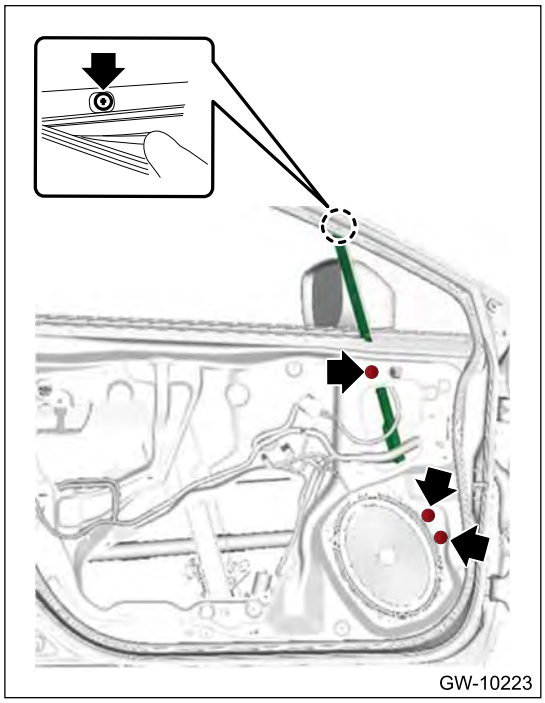
Caution:

Do not damage the sash or sash tape OUT while removing.

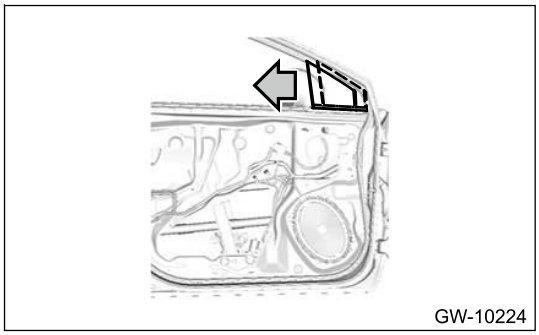
(1) Partially turn over the running channel - front door.

(2) Turn over the weather strip - door, and remove the screws.

(3) Remove the bolts, and remove the sash assembly - partition while lowering it.



(4) Remove the glass - front door partition.



GLASS/WINDOWS/MIRRORS > Front Door Glass

INSTALLATION

1. FRONT DOOR GLASS

1. Install the glass assembly - front door.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the plate - door UPR and plate - door LWR.
3. Install the front sealing cover.
4. Install the trim panel - front door.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

2. FRONT DOOR PARTITION GLASS

1. Temporarily assemble the running channel - front door to the sash assembly - partition.
   Note:
   Assemble so that the end face of the running channel - front door is aligned with the mounting surface of the sash assembly - partition on vehicle side.
2. Install the glass - front door partition and the sash assembly - partition temporarily assembled.

Caution:

Check that the running channel - front door is securely fixed to the panel assembly - front door and to the sash assembly - partition.

Note:

- **Engage the claws on top of the sash assembly - partition with the panel assembly - front door.**
- **Install the glass - front door partition so that its molding part does not come off.**

Tightening torque:

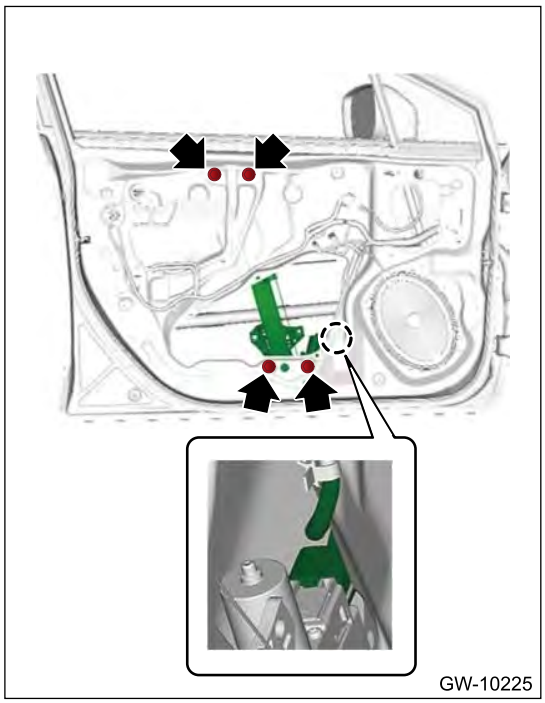
7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

3. Install the glass assembly - front door. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>INSTALLATION > FRONT DOOR GLASS.

GLASS/WINDOWS/MIRRORS > Front Regulator and Motor Assembly

REMOVAL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the front sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
4. Remove the glass assembly - front door. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>REMOVAL > FRONT DOOR GLASS.
5. Remove the regulator and motor assembly - front.
   (1) Disconnect the motor - front connector.
   (2) Remove the bolts, and then remove the regulator and motor assembly - front.



GLASS/WINDOWS/MIRRORS > Front Regulator and Motor Assembly

INSTALLATION

1. Install the regulator and motor assembly - front.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the glass assembly - front door. Ref. to GLASS/WINDOWS/MIRRORS>Front Door Glass>INSTALLATION > FRONT DOOR GLASS.
3. Install the front sealing cover.
4. Install the trim panel - front door.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

GLASS/WINDOWS/MIRRORS > Front Regulator and Motor Assembly

INSPECTION

For motor - front inspection, refer to “POWER WINDOW (DIAGNOSTICS)” section. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

WIRING DIAGRAM

Refer to "Remote Control Mirror System" in the wiring diagram. Ref. to WIRING SYSTEM>Remote Control Mirror System>WIRING DIAGRAM.

INSPECTION

1. SYMPTOM CHART

Symptoms	Inspection order
All function does not operate.	1. Check the fuse. 2. Check the remote control mirror switch. 3. Check the wiring harness.
One side of the mirror motor does not operate.	1. Check the remote control mirror switch. 2. Check the mirror motor. 3. Check the wiring harness.
Mirror heater does not operate.	1. Check the rear defogger switch. 2. Check the rear defogger relay. 3. Check the mirror heater. 4. Check the wiring harness. 5. Check body integrated unit.

Note:

The mirror heater operates with the rear window defogger at the same time. Refer to "INSPECTION" of "Rear Window Defogger System" for details. Ref. to GLASS/WINDOWS/MIRRORS>Rear Window Defogger System>INSPECTION.

NOTE

For procedure of each component in the remote control mirror system, refer to the respective section.

- Outer mirror assembly: Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.
- Remote control mirror switch: Ref. to GLASS/WINDOWS/MIRRORS>Remote Control Mirror Switch.

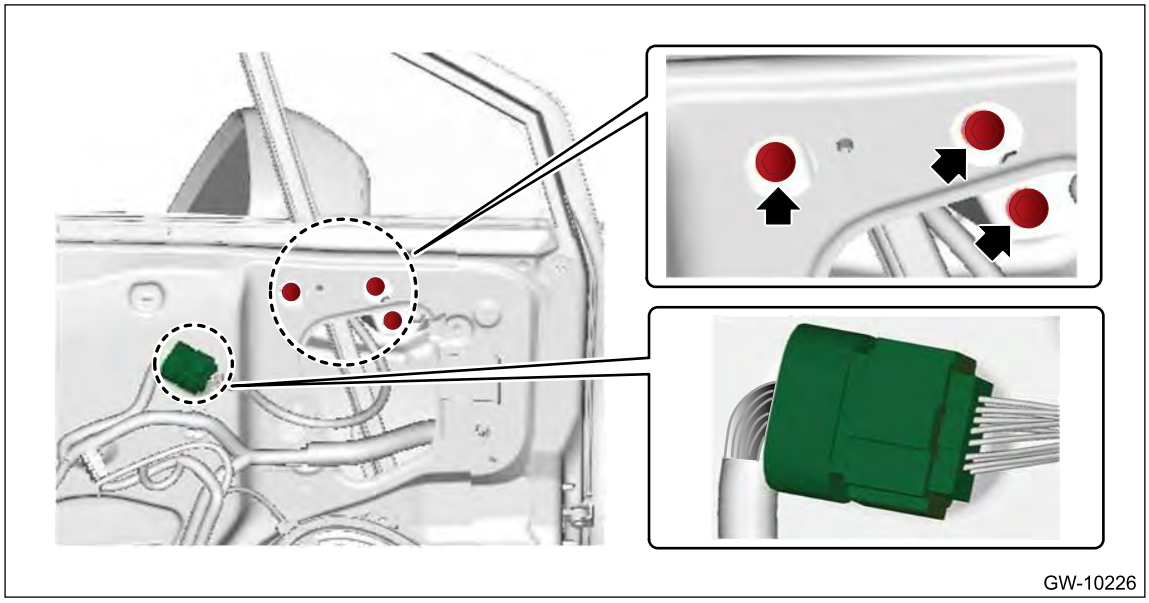
GLASS/WINDOWS/MIRRORS > Outer Mirror Assembly

REMOVAL

Refer to "DISASSEMBLY" for removal procedures of scalp cap and mirror face. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly>DISASSEMBLY.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Turn over the front sealing cover.
   Caution:
   - **Carefully remove the butyl tape. Excessive force will easily break the front sealing cover.**
   - **If the front sealing cover gets broken, replace it with a new part.**
   - **Be careful not to allow the butyl tape to contact any trims and seats because the butyl tape, which has a strong adhesive force, is difficult to remove once it adhered.**

   (1) Remove the connector clip that is installed on the panel assembly - front door, and disconnect the connector.
   (2) Carefully remove and turn over the front sealing cover within the area where the operation can be performed.
4. Remove the bolts to remove outer mirror assembly.



GLASS/WINDOWS/MIRRORS > Outer Mirror Assembly

INSTALLATION

Caution:
Be careful not to catch the harness in between the parts.

1. Install the outer mirror assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the front sealing cover.
3. Install the trim panel - front door.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND

TERMINAL REMOVAL OR INSTALLATION.

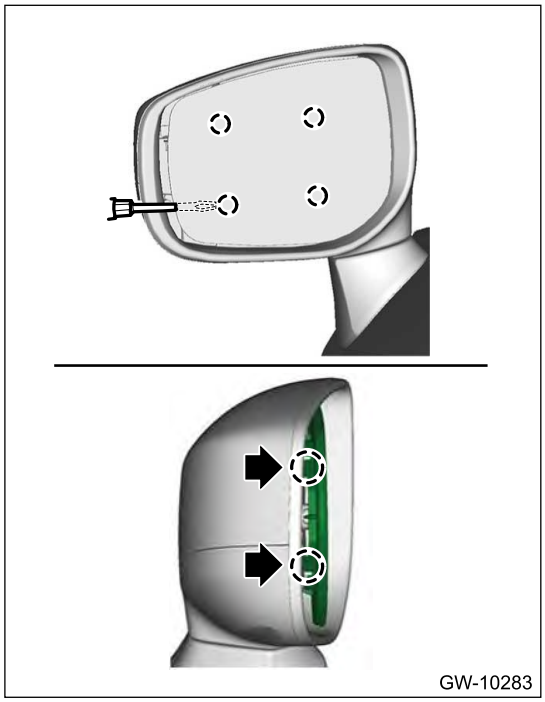
GLASS/WINDOWS/MIRRORS > Outer Mirror Assembly

DISASSEMBLY

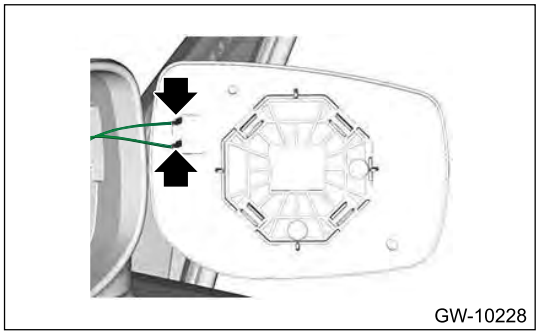
Caution:

When removing the mirror - repair, be careful not to damage the back surface of mirror - repair with a flat tip screwdriver.

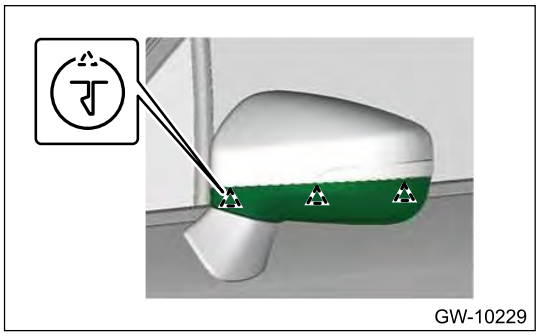
1. Operate the remote control mirror switch to face the mirror - repair upward.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Remove the mirror - repair.
   (1) Insert a flat tip screwdriver or similar tool into the tool insertion opening shown in the figure, release the engagement and take the mirror - repair outward to remove.



   (2) Disconnect connectors. (Model with mirror heater and Blind Spot Detection/Rear Cross Traffic Alert system)



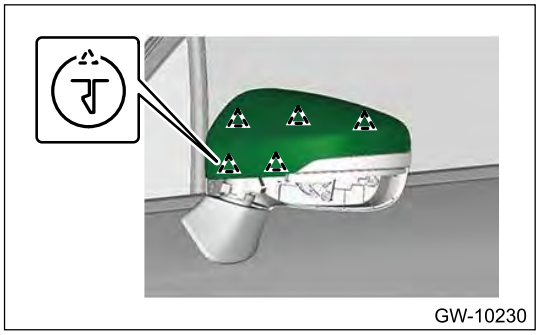
4. Release the claws, and then remove the cover - cap outer mirror lower.



5. Release the claws, and then remove the cover - cap outer mirror.

Caution:

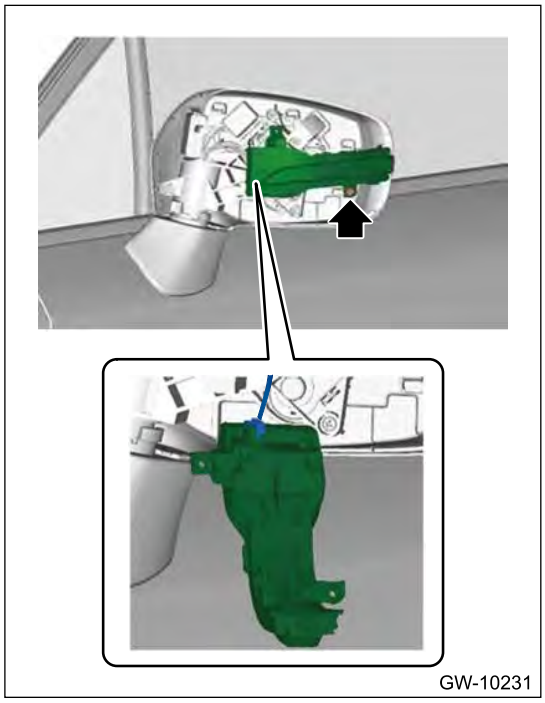
Be careful not to apply excessive force when removing the cover - cap outer mirror, as the lower hooks may become damaged.



6. Remove the light assembly - side turn mirror. (Model with side turn signal light)

(1) Remove the screws and pull out the light assembly - side turn mirror to the front of the vehicle.

(2) Disconnect the connector and remove the light assembly - side turn mirror.



GLASS/WINDOWS/MIRRORS > Outer Mirror Assembly

ASSEMBLY

Caution:

- **Be careful not to catch the harness in between the parts.**
- **When installing the mirror - repair, insert the connector and clip securely.**

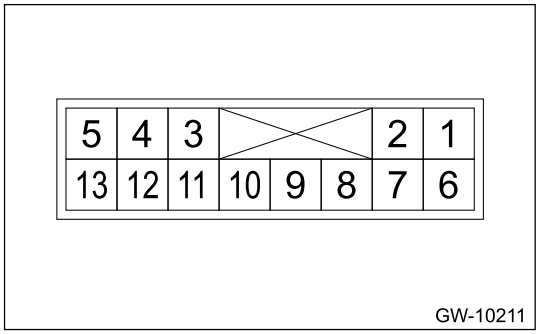
1. Install the light assembly - side turn mirror. (Model with side turn signal light)
2. Install the cover - cap outer mirror.
3. Install the cover - cap outer mirror lower.
4. Check that all the claws are securely engaged.
5. Install the mirror - repair in the reverse order of disassembly.

GLASS/WINDOWS/MIRRORS > Outer Mirror Assembly

INSPECTION

1. CHECK MOTOR OPERATION

1. Apply battery voltage between the outer mirror connector terminals and check the mirror operation.



Terminal No.	Inspection conditions	Switch position
—	—	OFF
4 (+) — 3 (−)	Apply battery voltage between terminals.	UP
3 (+) — 4 (−)	Apply battery voltage between terminals.	DOWN
5 (+) — 4 (−)	Apply battery voltage between terminals.	LEFT
4 (+) — 5 (−)	Apply battery voltage between terminals.	RIGHT

2. If it does not operate normally, replace the outer mirror assembly.

2. CHECK OPERATION OF Blind Spot Detection/Rear Cross Traffic Alert INDICATOR

1. Check the Blind Spot Detection/Rear Cross Traffic Alert system. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Basic Diagnostic Procedure.
2. Check the outer mirror assembly.
   (1) Check that the BSD/RCTA indicator on the mirror surface illuminates normally when the BSD/RCTA OFF switch is turned ON while it is installed to the vehicle.
   (2) If it does not illuminate normally, replace the mirror - repair.
   (3) Check that it illuminates normally again. If it does not illuminate normally, replace the outer mirror assembly.

GLASS/WINDOWS/MIRRORS > Remote Control Mirror Switch

REMOVAL

1. The remote control mirror switch is integrated into the switch - power window main. Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>REMOVAL > MAIN SWITCH.

GLASS/WINDOWS/MIRRORS > Remote Control Mirror Switch

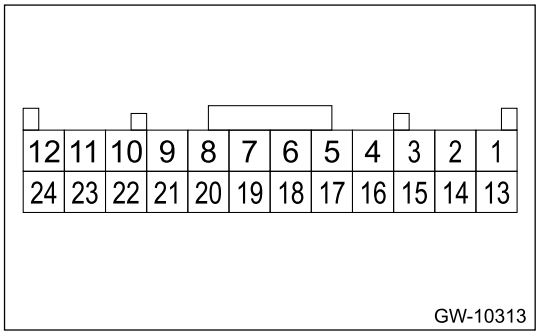
INSTALLATION

1. The remote control mirror switch is integrated into the switch - power window main. Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch>INSTALLATION > MAIN SWITCH.

GLASS/WINDOWS/MIRRORS > Remote Control Mirror Switch

INSPECTION

1. Check the resistance between switch - door mirror terminals.
   Preparation tool:
   Circuit tester



- Changeover switch RH

Terminal No.	Inspection conditions	Standard
—	OFF	1 MΩ or more
12 — 18 17 — 1	UP	Less than 1 Ω
12 — 17 18 — 1	DOWN	Less than 1 Ω
12 — 16 18 — 1	LEFT	Less than 1 Ω
12 — 18 16 — 1	RIGHT	Less than 1 Ω

- Changeover switch LH

Terminal No.	Inspection conditions	Standard
—	OFF	1 MΩ or more
12 — 21 20 — 1	UP	Less than 1 Ω
12 — 20 21 — 1	DOWN	Less than 1 Ω
12 — 19 21 — 1	LEFT	Less than 1 Ω

Terminal No.	Inspection conditions	Standard
12 — 21 19 — 1	RIGHT	Less than 1 Ω

2. If the inspection result is not within the standard, replace the switch - door mirror.

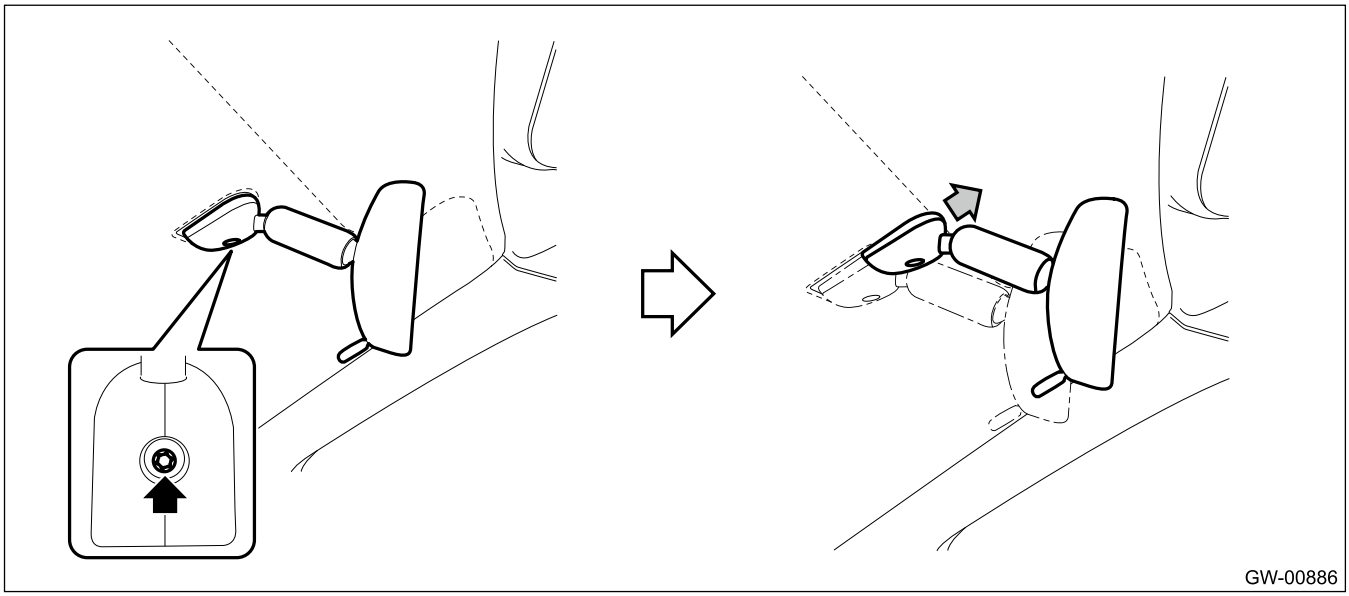
GLASS/WINDOWS/MIRRORS > Rearview Mirror

REMOVAL

Caution:

Be careful not to damage the mirror surface and the glass - front window.

1. Remove the TORX® screws, and slide the mirror assembly - inner rearview to remove.
   Preparation tool:
   TORX® T20



2. If the mirror mounting is damaged, replace the windshield glass.

GLASS/WINDOWS/MIRRORS > Rearview Mirror

INSTALLATION

Caution:

When tightening the mounting TORX® screw, be sure to observe the tightening torque. Otherwise, the mount may be damaged in over-torque conditions.

1. Slide the mirror assembly - inner rearview to the mirror mount to install.
   Note:
   If the mirror mounting is damaged, replace the windshield glass.
   Tightening torque:
   2N·m (0.2 kgf-m, 1.5 ft-lb)

GLASS/WINDOWS/MIRRORS > Rearview Mirror

INSPECTION

Check that the mirror assembly - inner rearview and base - inner mirror for damage.

REMOVAL

1. Operate the switch - power window sub rear to move the glass assembly - rear door to the lowest position.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
3. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
4. Remove the rear sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
6. Remove the glass assembly - rear door.

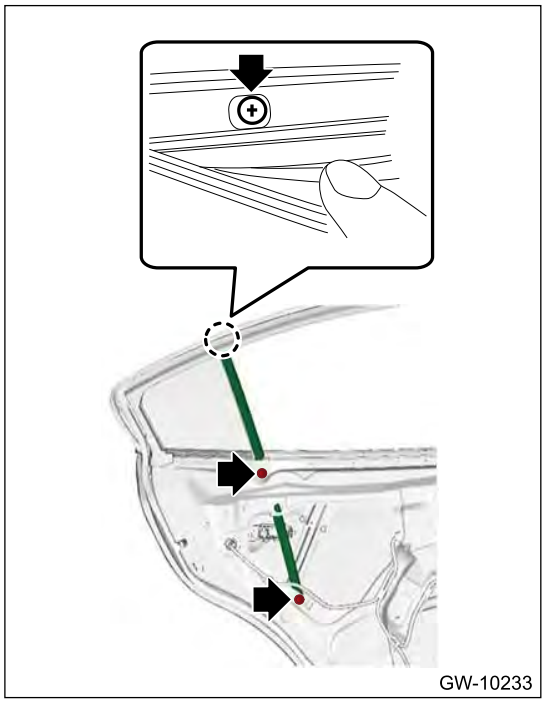
   Caution:

   Do not damage the sash or sash tape OUT while removing.

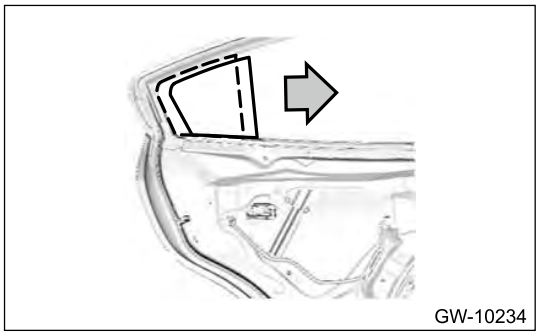
   (1) Partially turn over the running channel - rear door.

   (2) Turn over the weather strip - door, and remove the screws.

   (3) Remove the bolts, and remove the sash assembly - rear partition while lowering it.



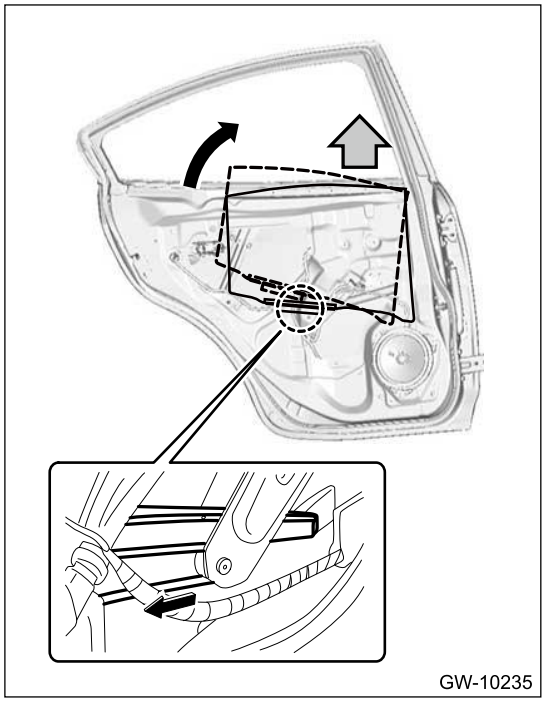
(4) Remove the glass - rear door partition.



(5) While tilting the glass assembly - rear door, remove the guide from the roller of the regulator and motor assembly - rear, then remove the glass assembly - rear door.

Caution:

Avoid impact and damage to the glass assembly - rear door.



(6) Remove the running channel - rear door.

GLASS/WINDOWS/MIRRORS > Rear Door Glass

INSTALLATION

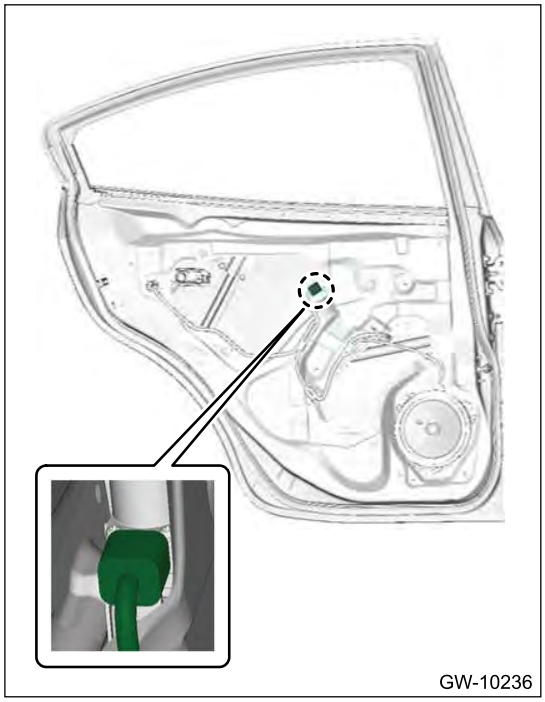
1. Install the glass assembly - rear door.
   Caution:
   Avoid impact and damage to the glass assembly - rear door.
2. Temporarily assemble the running channel - rear door to the sash assembly - rear partition.
   Note:
   Assemble so that the end face of the running channel - rear door is aligned with the mounting surface of the sash assembly - rear partition on vehicle side.
3. Install the glass - rear door partition and the sash assembly - rear partition temporarily assembled.
   Caution:
   Check that the running channel - rear door is securely fixed to the panel assembly - rear door and to the sash assembly - rear partition.
   Note:
   - **Engage the claws on top of the sash assembly - partition with the panel assembly - rear door.**
   - **Install the glass - rear door partition so that its molding part does not come off.**

   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
4. Install the rear sealing cover.
5. Install the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

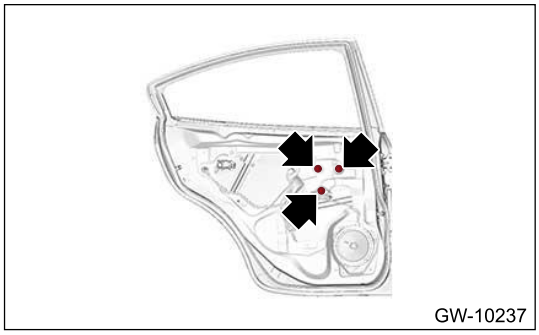
GLASS/WINDOWS/MIRRORS > Rear Regulator and Motor Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the rear sealing cover. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
4. Remove the glass assembly - rear door. Ref. to GLASS/WINDOWS/MIRRORS>Rear Door Glass>REMOVAL.
5. Remove the regulator and motor assembly - rear.
   (1) Disconnect the connector of the motor - rear.



   (2) Remove the bolts, and then remove the regulator and motor assembly - rear.



GLASS/WINDOWS/MIRRORS > Rear Regulator and Motor Assembly

INSTALLATION

1. Install the regulator and motor assembly - rear.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the glass assembly - rear door. Ref. to GLASS/WINDOWS/MIRRORS>Rear Door

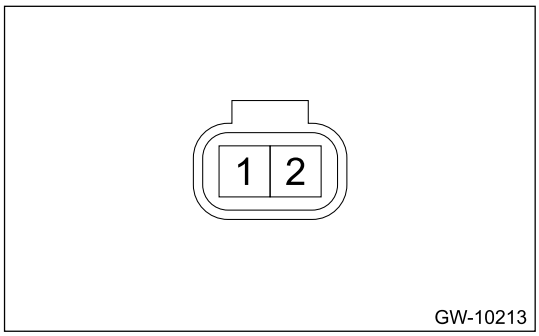
Glass>INSTALLATION.

3. Install the rear sealing cover.
4. Install the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

GLASS/WINDOWS/MIRRORS > Rear Regulator and Motor Assembly

INSPECTION

1. Check the motor operation when battery voltage is applied between terminals of the motor - rear connector.



- LH side

Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	Apply battery voltage between terminals.	Increase
1 (+) — 2 (−)	Apply battery voltage between terminals.	Decrease

- RH side

Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	Apply battery voltage between terminals.	Increase
1 (+) — 2 (−)	Apply battery voltage between terminals.	Decrease

2. If it does not operate properly as a result of inspection, replace the regulator and motor assembly - rear.

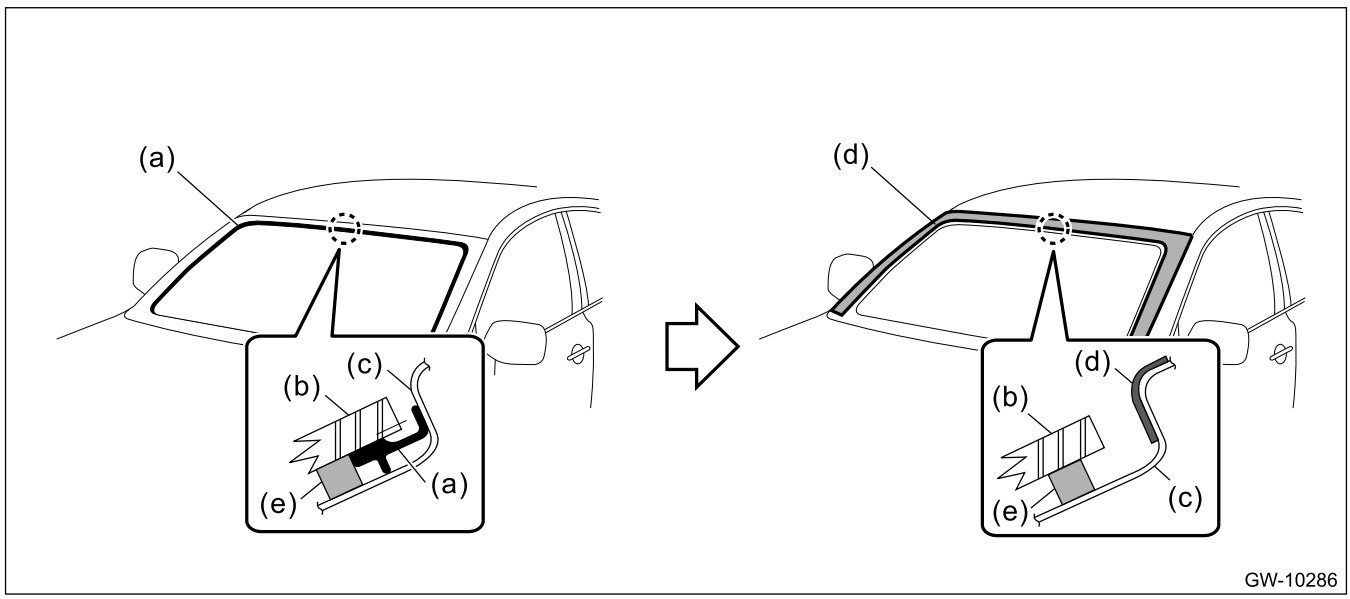
REMOVAL

Caution:

- **For model with EyeSight, always remove the glass - front window after the stereo camera is removed.**
- **For model with EyeSight, always use Subaru genuine windshield glass specially designed for EyeSight. (If the windshield glass other than the glass specially designed for EyeSight is used, the visibility of the camera is blocked or the distortion of the glass prevents the correct measurement of the object, resulting in the EyeSight abnormal operation.)**
- **For model with EyeSight, if the windshield glass is installed after removal or replaced, always perform the "Inspection" and "Adjustment and check" of the stereo camera. Inspection: Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION. Adjustment and check: Ref. to EyeSight>Camera Adjustment, Inspection.**
- **If the damage is found in the glass repair prohibited area, always replace the glass. Damage, dirt, aftermarket part installation or sticker attachment in the prohibited area can affect the recognition of each camera, and thereby the EyeSight and high beam assist functions may not operate properly. Ref. to CAUTION > CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT.**

1. WHEN USING WINDSHIELD GLASS KNIFE

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
3. Remove the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>REMOVAL.
4. Disconnect the wiper deicer connector. (Models with wiper deicer)
5. Remove the stereo camera cover assembly and stereo camera assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
6. Remove the molding - front window from the glass - front window, and attach protective tape on the body side of the circumference of the glass - front window.



(a) Molding - front window
(b) Glass - front window
(c) Body panel
(d) Protective tape
(e) Adhesive

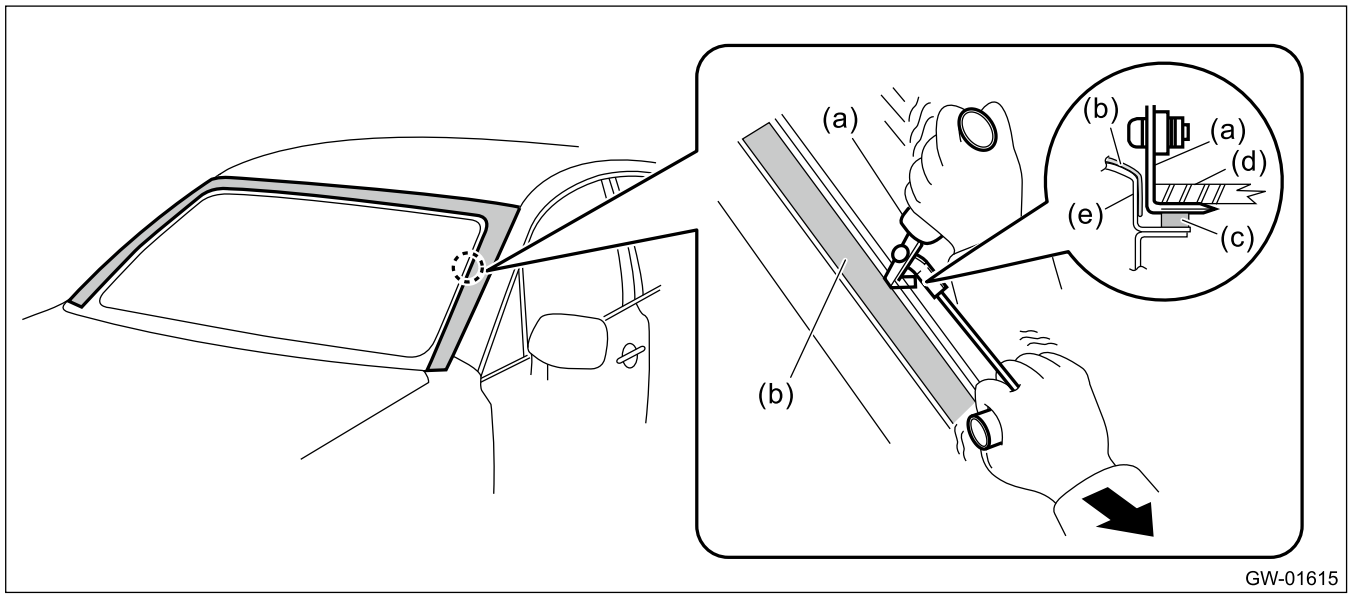
7. Remove the glass - front window.

(1) Apply sufficient amount of soapy water to the adhesive part and insert the windshield glass knife.

(2) While holding the edges of the knife and the glass - front window at a right angle, move the windshield glass knife parallel to the edge of the glass - front window, and cut the adhesive along the surface and the edge of the glass - front window.

Caution:

- **Cutting of adhesive part should be started from an area with wider gap between the glass - front window and the body.**
- **Never twist the windshield glass knife.**

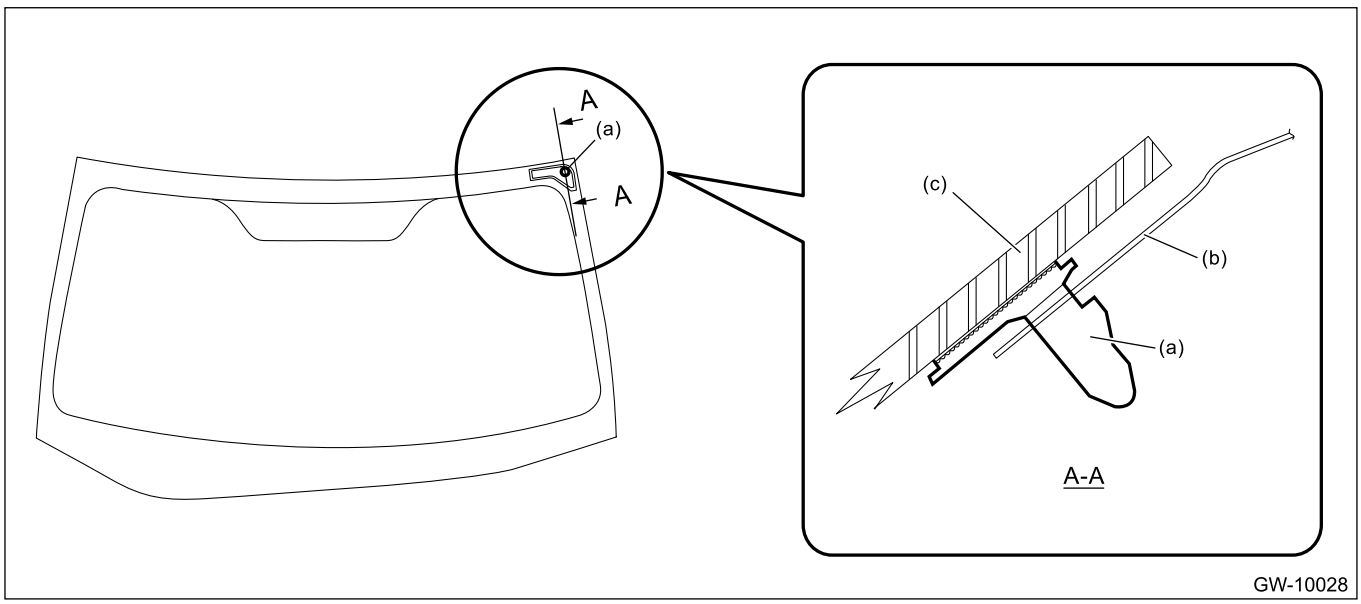


(a) Windshield glass knife
(c) Adhesive
(e) Body panel
(b) Protective tape
(d) Glass - front window

(3) Disconnect the locating pin - front window, and remove the glass - front window.

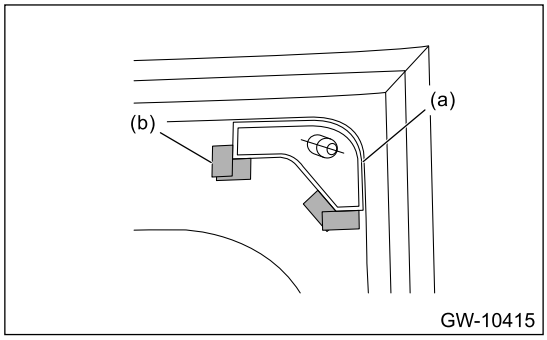
Note:

The locating pin - front window are bonded to the corners of the glass - front window. Use piano wire to disconnect the pins.



(a) Locating pin - front window
(b) Body panel
(c) Glass - front window

8. Remove the locating pin. (When reusing the glass)
   (1)Attach tape to the locating pin outer surface to identify the installation position.



(a) Locating pin - front window (b) Tape

   (2) Using a scraper, etc., remove locating pins (2 places).

Caution:

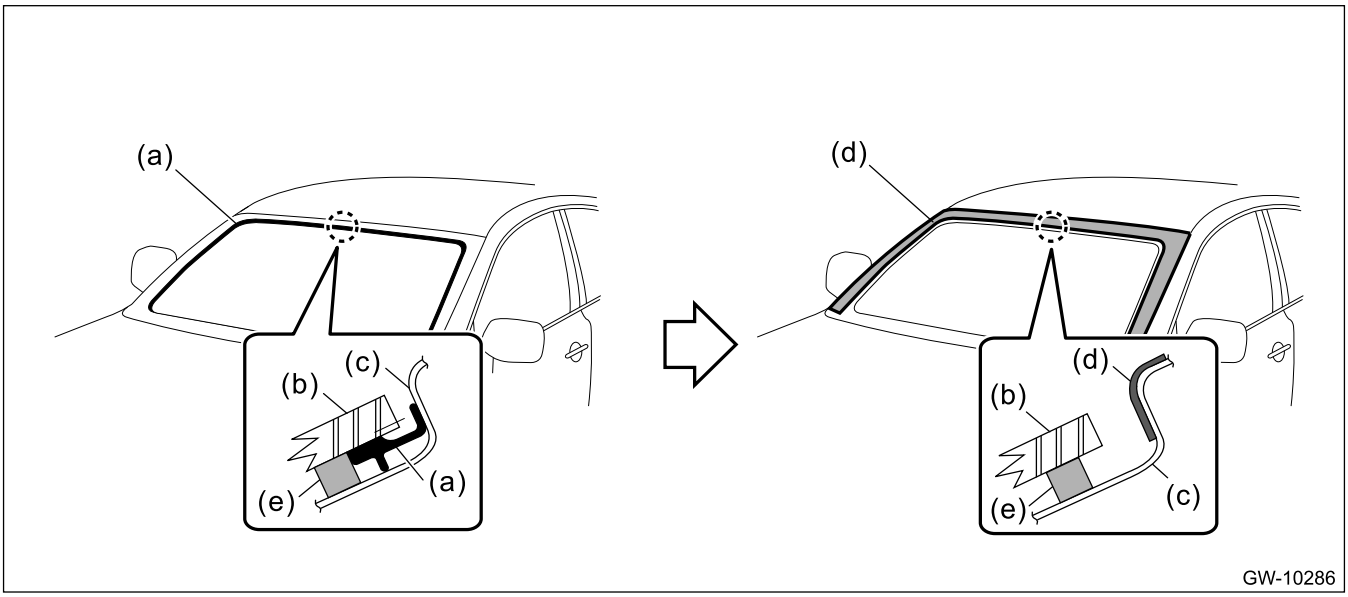
- **Do not remove the tape because it is used as reference during installation.**
- **Be careful not to damage the glass - front window during operation.**

2. WHEN USING PIANO WIRE

Caution:

- **Do not tightly pull the piano wire against the glass - front window edge.**
- **Apply protective tape, etc, and be careful that the inner and outer components of the vehicle are not damaged.**
- **Do not cross piano wires. Otherwise they may be cut.**

1. Disconnect the ground cable from battery. (Models with wiper deicer) Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - front pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
3. Remove the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>REMOVAL.
4. Disconnect the wiper deicer connector. (Models with wiper deicer)
5. Remove the stereo camera cover assembly and stereo camera assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
6. Remove the molding - front window from the glass - front window, and attach protective tape on the body side of the circumference of the glass - front window.



(a) Molding - front window
(b) Glass - front window
(c) Body panel
(d) Protective tape
(e) Adhesive

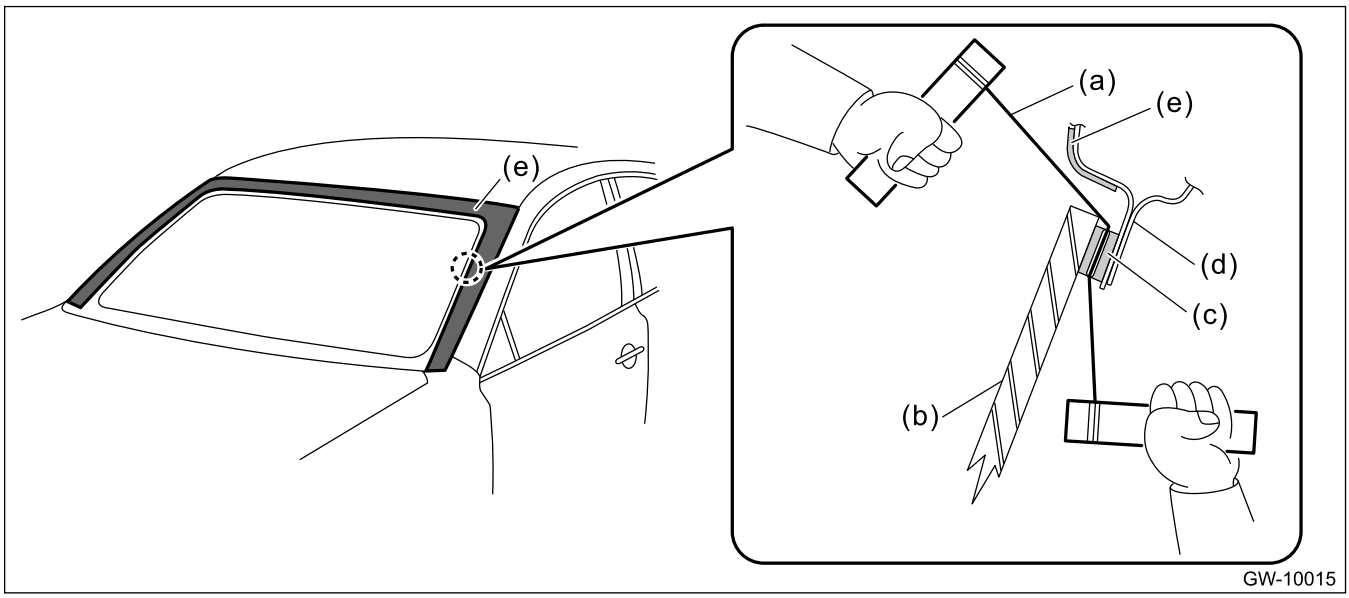
7. Remove the glass - front window.

(1) Using a drill, make a hole in the adhesive part.

(2) Pass the piano wire through the hole, and pull the wire ends alternately to cut off the adhesive part and locating pin.

Caution:

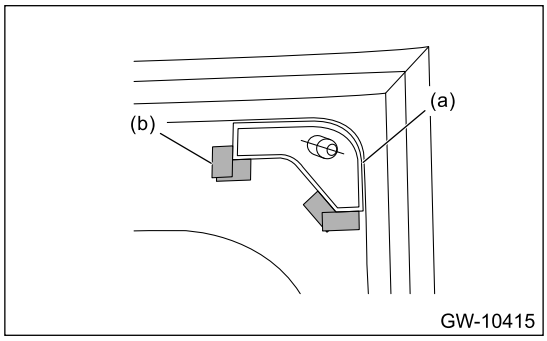
Attach a piece of wood to both piano wire ends.



(a) Piano wire
(b) Glass - front window
(c) Adhesive
(d) Body panel
(e) Protective tape

8. Remove the locating pin. (When reusing the glass)

(1) Attach tape to the locating pin outer surface to identify the installation position.



(a) Locating pin - front window (b) Tape

(2) Using a scraper, etc., remove locating pins (2 places).

Caution:

- **Do not remove the tape because it is used as reference during installation.**
- **Be careful not to damage the glass - front window during operation.**

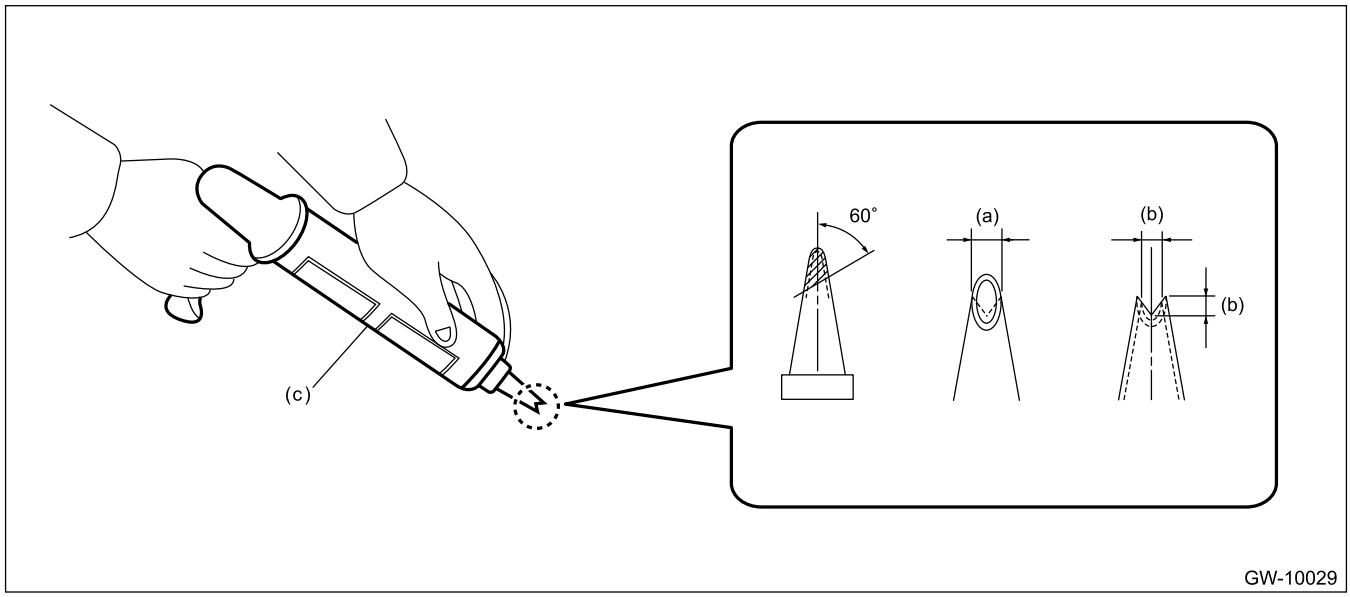
GLASS/WINDOWS/MIRRORS > Windshield Glass

INSTALLATION

Caution:

- **For model with EyeSight, always use Subaru genuine windshield glass specially designed for EyeSight. (If the windshield glass other than the glass specially designed for EyeSight is used, the visibility of the camera is blocked or the distortion of the glass prevents the correct measurement of the object, resulting in the EyeSight abnormal operation.)**
- **For model with EyeSight, if the windshield glass is installed after removal or replaced, always perform the "Inspection" and "Adjustment and check" of the stereo camera. Inspection: Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION. Adjustment and check: Ref. to EyeSight>Camera Adjustment, Inspection.**
- **If the damage is found in the glass repair prohibited area, always replace the glass. Damage, dirt, aftermarket part installation or sticker attachment in the prohibited area can affect the recognition of each camera, and thereby the EyeSight and high beam assist functions may not operate properly. Ref. to CAUTION > CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT.**

1. Fabricate the cartridge nozzle tip as shown and set the sealant gun with the adhesive.

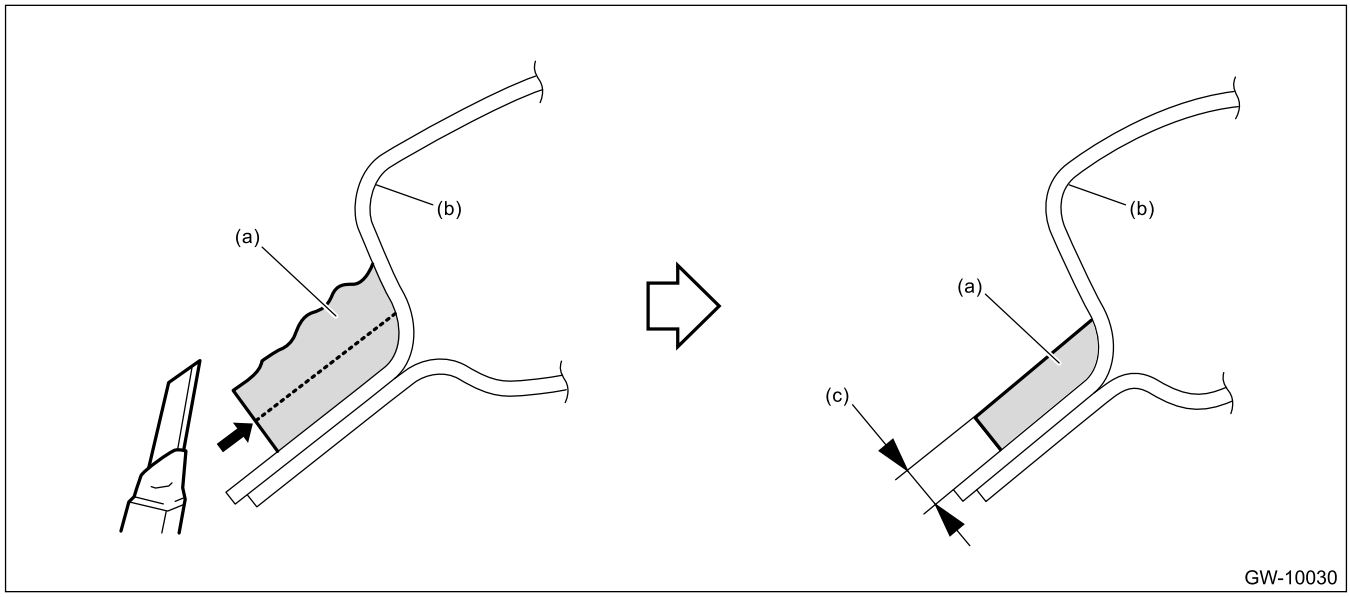


(a) 10 mm (0.39 in) (b) 8 mm (0.31 in) (c) Sealant gun

2. Remove the adhesive layer on the body using cutter knife to obtain smooth face of 2 mm (0.08 in) thick.

Caution:

- **Be careful not to damage the body and paint surface.**
- **Be sure to keep some amount of old adhesive.**



(a) Adhesive (b) Body panel (c) 2 mm (0.08 in)

3. Clean the glass - front window and the body.

(1) Using a scraper, remove adhesive and double-sided tape left on the glass - front window. (When reusing the glass)

(2) Clean the glass - front window and the body with alcohol or appropriate cleaning solvent to completely eliminate cutting powder, dust and dirt.

4. Install the locating pin. (When reusing the glass)

(1) Using a sponge, apply primer to the locating pin installation position on the glass - front window.

Preparation items

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

Note:

- **Let primer dry for about one hour before installing the locating pin.**
- **Do not touch the surface coated with primer.**

(2) Apply adhesive to the locating pin adhesive surface.

Preparation items:

Adhesive: Dow Automotive ESSEX U-400HV or equivalent

(3) Install two locating pins (2 places) to the positions marked with tapes, and remove the tapes.

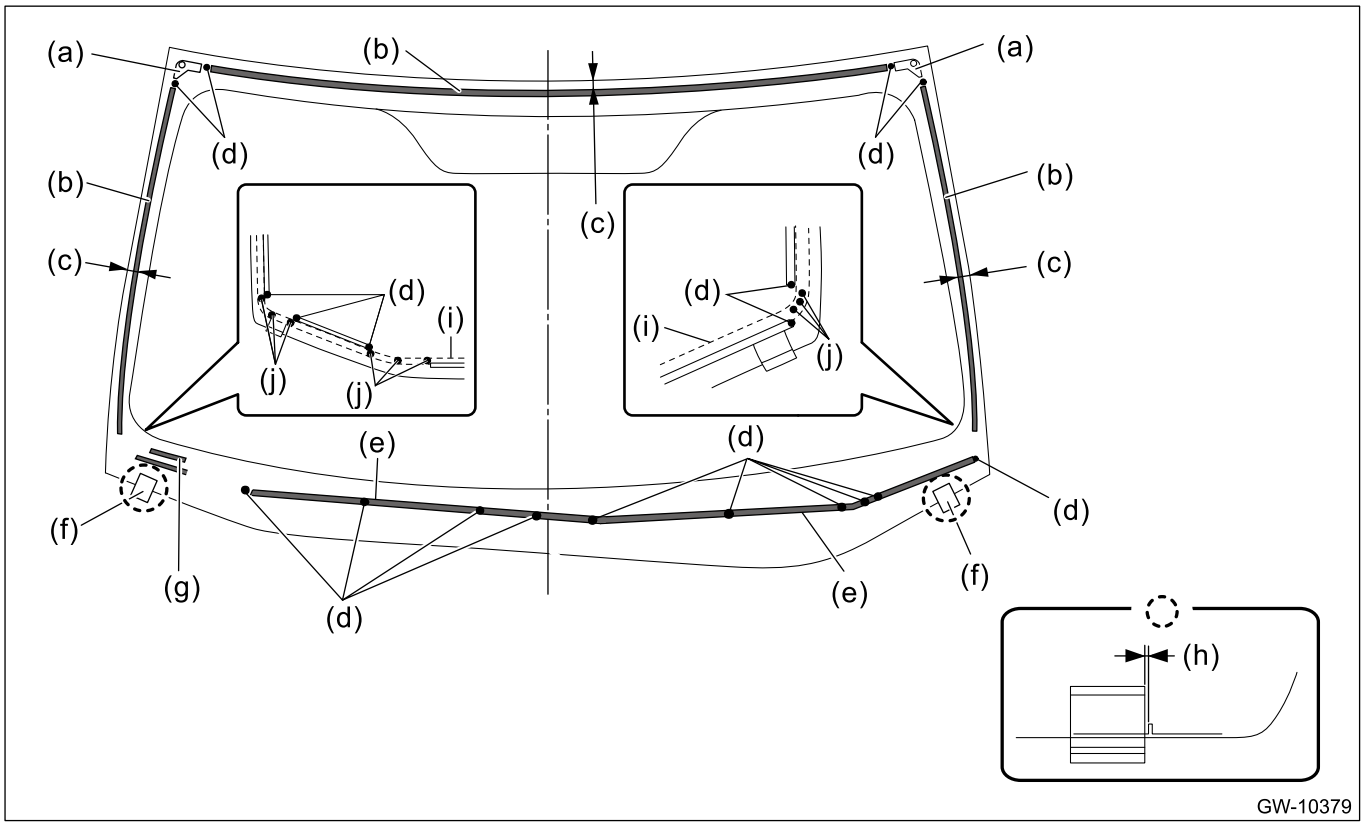
Caution:

Always use new locating pins.

5. Attach the dam rubber - front to the glass - front window.

Caution:

- **Install the driver's side dam rubber - front lower along with the dam rubber set mark on the glass side.**
- **Attach the passenger's side dam rubber - front lower straight between the dam rubber set marks while aligning with the dam rubber set mark.**

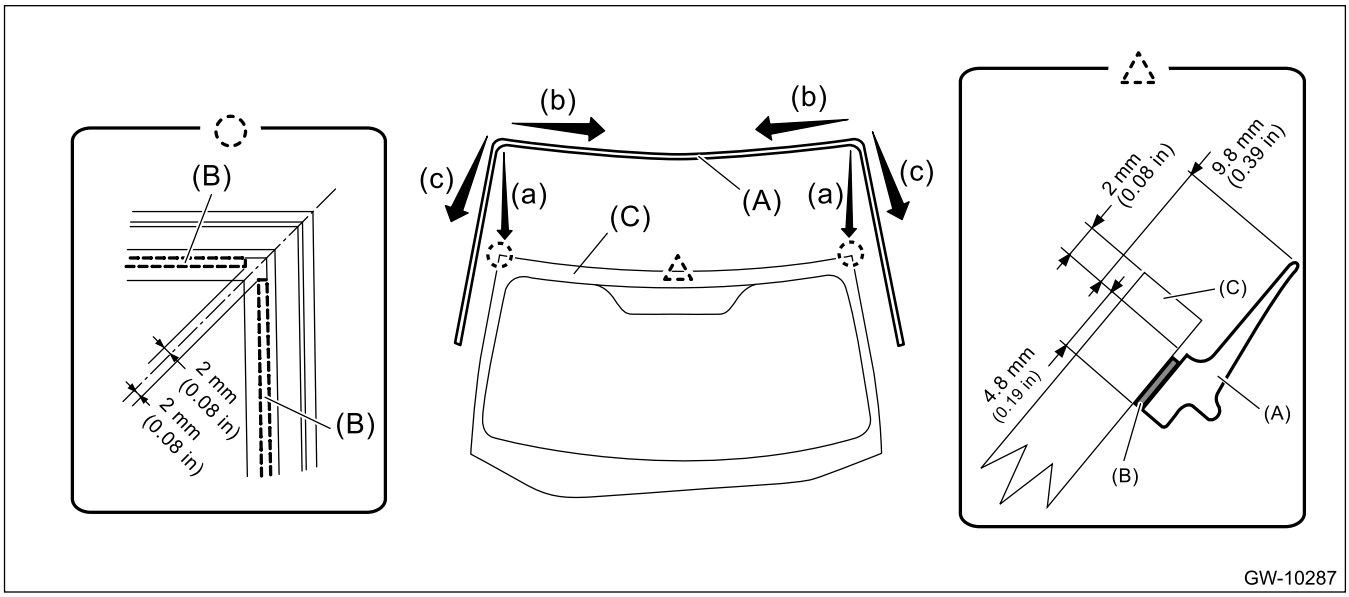


(a)	Locating pin - front window	(e)	Dam rubber - front lower	(i)	Adhesive
(b)	Dam rubber - front upper	(f)	Seal - lower	(j)	Adhesive application mark
(c)	19.8 mm (0.78 in)	(g)	VIN plate confirmation window		
(d)	Dam rubber set mark	(h)	0+5 mm (0+0.2 in)		

6. Attach the molding - front window to the glass - front window.

Caution:

Be careful to attach the molding - front window so that the molding has no loose or undulating part.



(1) Using a sponge, apply primer to the molding installation surface in the glass - front window side.

Preparation items

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

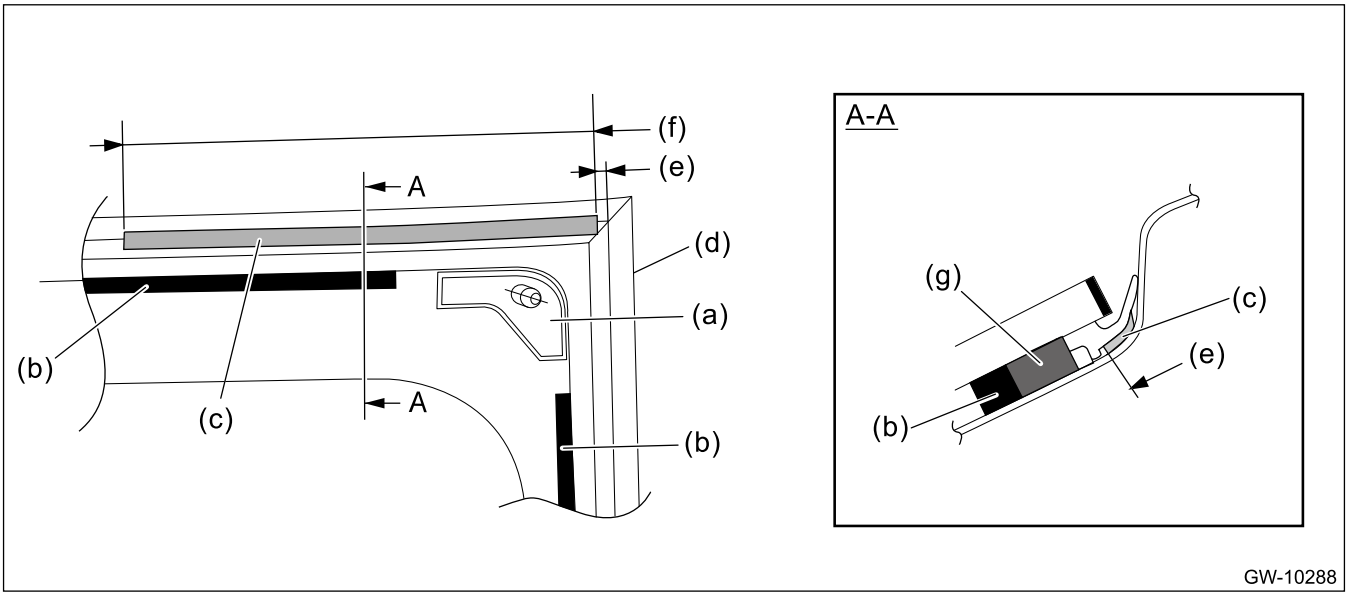
(2) Align the molding - front window (A) to the upper ends (a) of the glass - front window (C).

(3) Install the molding - front window from both corners of the upper edge toward the center (b).

(4) Install the molding - front window from both corners of the upper edge toward the lower side (c).

(5) Firmly apply the double sided tape (B) of the molding - front window evenly to the surface of the glass - front window.

7. Attach the seal - upper to the molding - front window.



(a) Locating pin - front window
(b) Dam rubber - front upper
(c) Seal - upper
(d) Molding - front window
(e) 0+5 mm (0+0.2 in)
(f) 165 mm (6.5 in)
(g) Adhesive

8. Install the glass - front window.

(1) Apply the primer to the adhesive surface of glass - front window side and body side using sponge.

Caution:

Do not apply primer to adhesive remaining on the body side.

Preparation items:

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

Painted surface primer: Dow Automotive ESSEX U-413 or equivalent

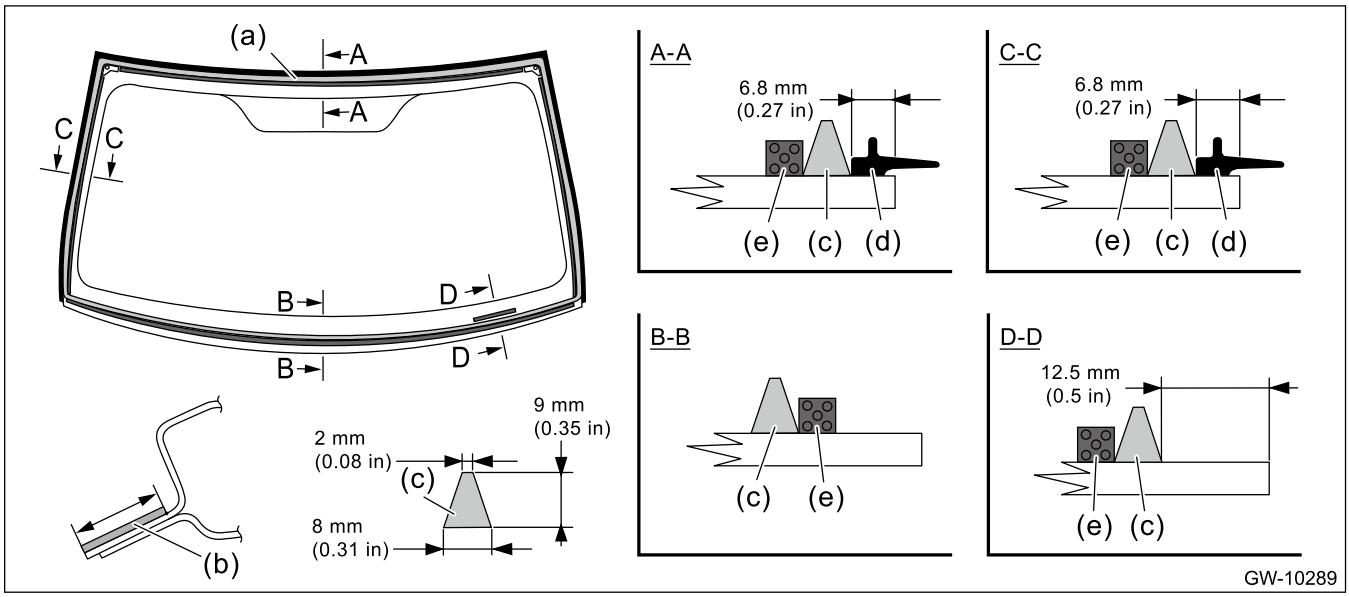
Note:

- **Primer once attached to the painted surface of the body and internal trim is hard to wipe off. Mask the circumference of such area.**
- **Let primer dry for about ten minutes before installing the glass - front window.**
- **Do not touch the surface coated with primer.**

(2)Apply adhesive to the end back surface of the glass - front window.

Preparation items:

Adhesive: Dow Automotive ESSEX U-400HV or equivalent



(a) Application of primer (glass side)

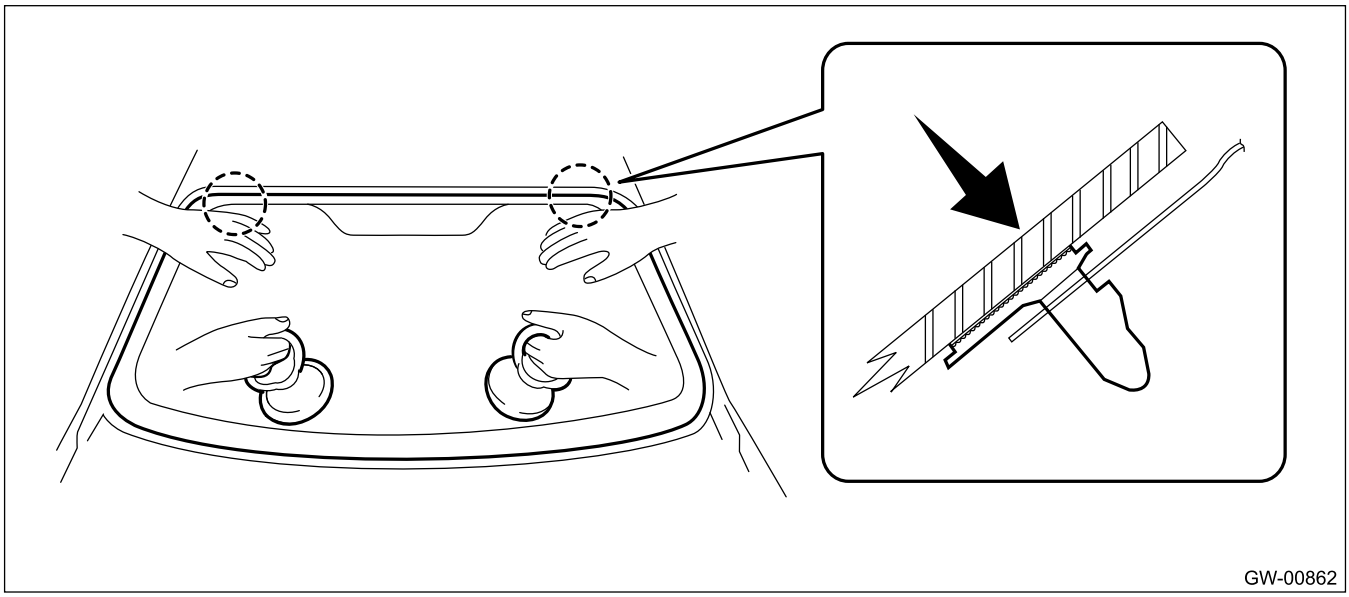
(b) Application of primer (body side)

(c) Adhesive

(d) Molding - front window

(e) Dam rubber - front

(3) Fit the locating pins - front window to the vehicle body using suction rubber cups to install the glass - front window.



(4) Lightly press the entire perimeter of the glass - front window for tight fit.

(5) Make flush the adhesive surface jutted out using spatula.

9. After completion of all work, allow the vehicle to stand for about 24 hours.

Note:

- **When opening/closing the door after the glass - front window was bonded, always lower the glass assembly - door first, and then open/close it carefully.**
- **Move the vehicle slowly.**
- **For minimum drying time and vehicle standing time before driving after bonding, follow instructions or instruction manual from the adhesive manufacturer.**

10. Connect the wiper deicer connector. (Models with wiper deicer)

11. Install the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>INSTALLATION.

12. Install the stereo camera cover and stereo camera assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>INSTALLATION.

13. Install the trim panel - front pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>INSTALLATION.

14. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

15. After curing of adhesive, pour the water on external surface of vehicle to check that there are no water leaks.

Note:

When a vehicle is returned to the user, tell him or her that the vehicle should not be subjected to heavy impact for at least three days.

GLASS/WINDOWS/MIRRORS > Rear Window Glass

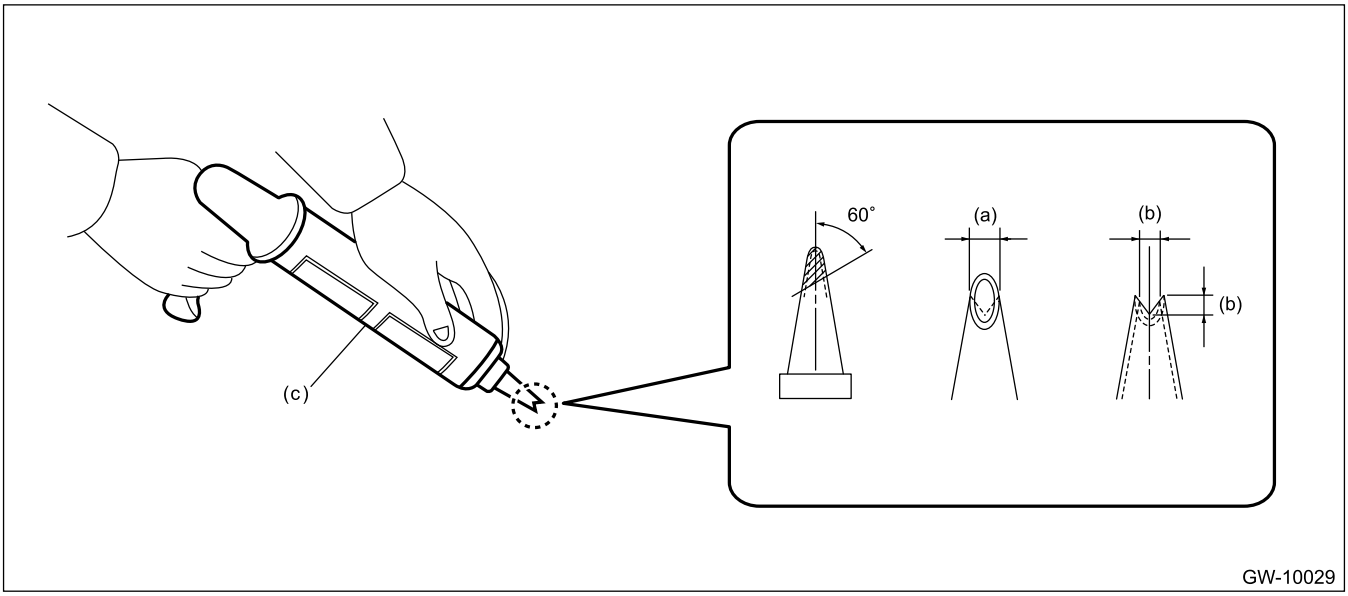
REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Disconnect the rear defogger connector.
3. Remove the glass - rear window in the same procedure as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>REMOVAL.

GLASS/WINDOWS/MIRRORS > Rear Window Glass

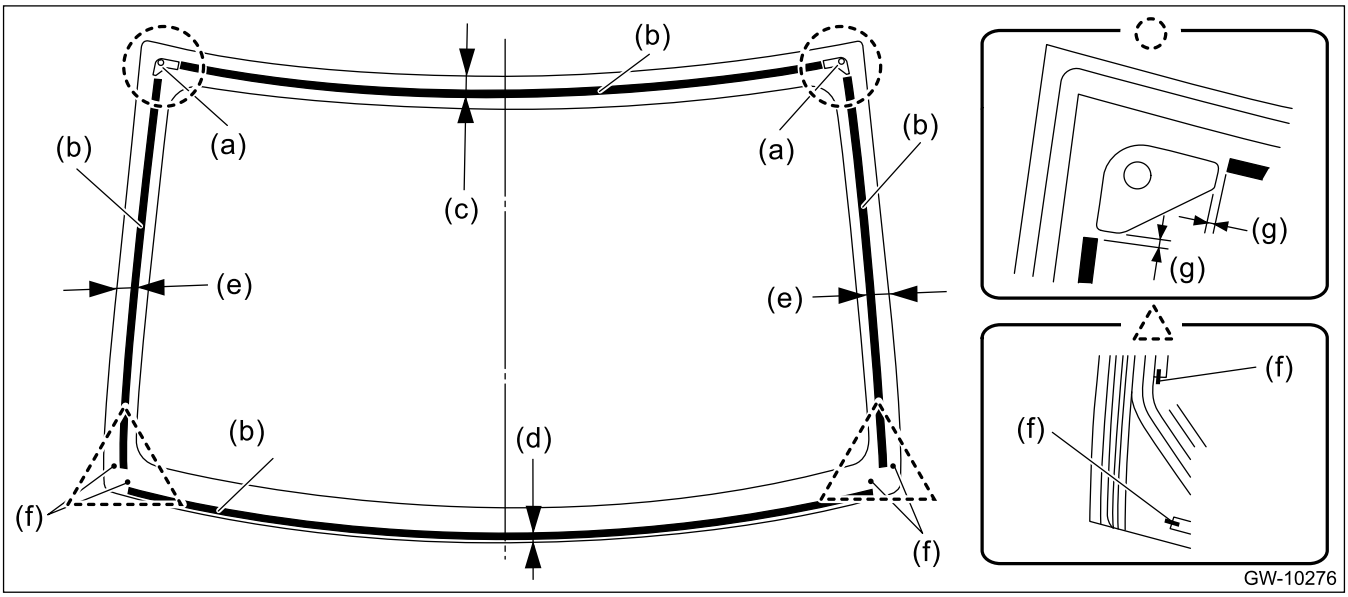
INSTALLATION

1. Fabricate the cartridge nozzle tip as shown and set the sealant gun with the adhesive.



(a) 10 mm (0.39 in) (b) 8 mm (0.31 in) (c) Sealant gun

2. Smoothen and clean the adhesive surfaces of the glass - rear window and body using the same procedures as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>INSTALLATION.
3. Attach the dam rubber - rear to the glass - rear window.

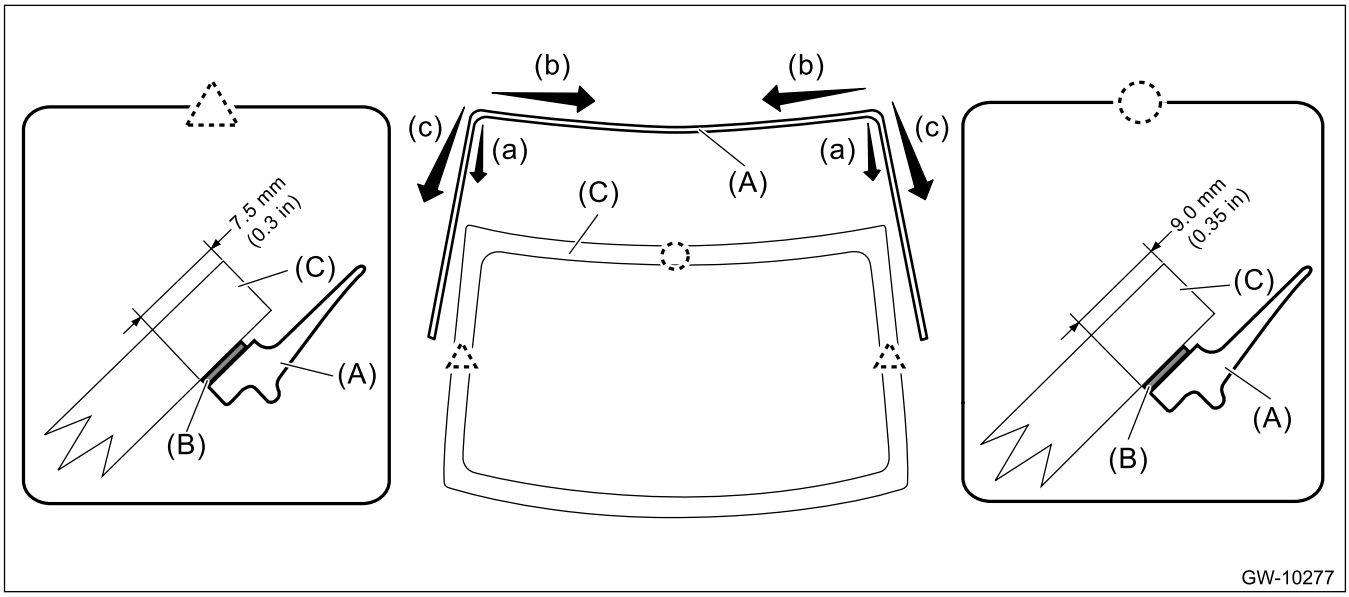


(a) Locating pin - rear window
(b) Dam rubber - rear
(c) 22 mm (0.87 in)
(d) 10.6 mm (0.42 in)
(e) 20.5 mm (0.81 in)
(f) Dam rubber set mark (Ag print)
(g) 3 mm (0.12 in)

4. Attach the molding - rear window to the glass - rear window.

Caution:

Be careful to attach the molding - rear window so that the molding has no loose or undulating part.



(1) Using a sponge, apply primer to the molding installation surface in the glass - rear window side.

Preparation items

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

(2) Align the molding - rear window (A) to the upper ends (a) of the glass - rear window (C).

(3) Install the molding - rear window from both corners of the upper edge toward the center (b).

(4) Install the molding - rear window from both corners of the upper edge toward the lower side (c).

(5) Firmly apply the double sided tape (B) of the molding - rear window evenly to the surface of the glass - rear window.

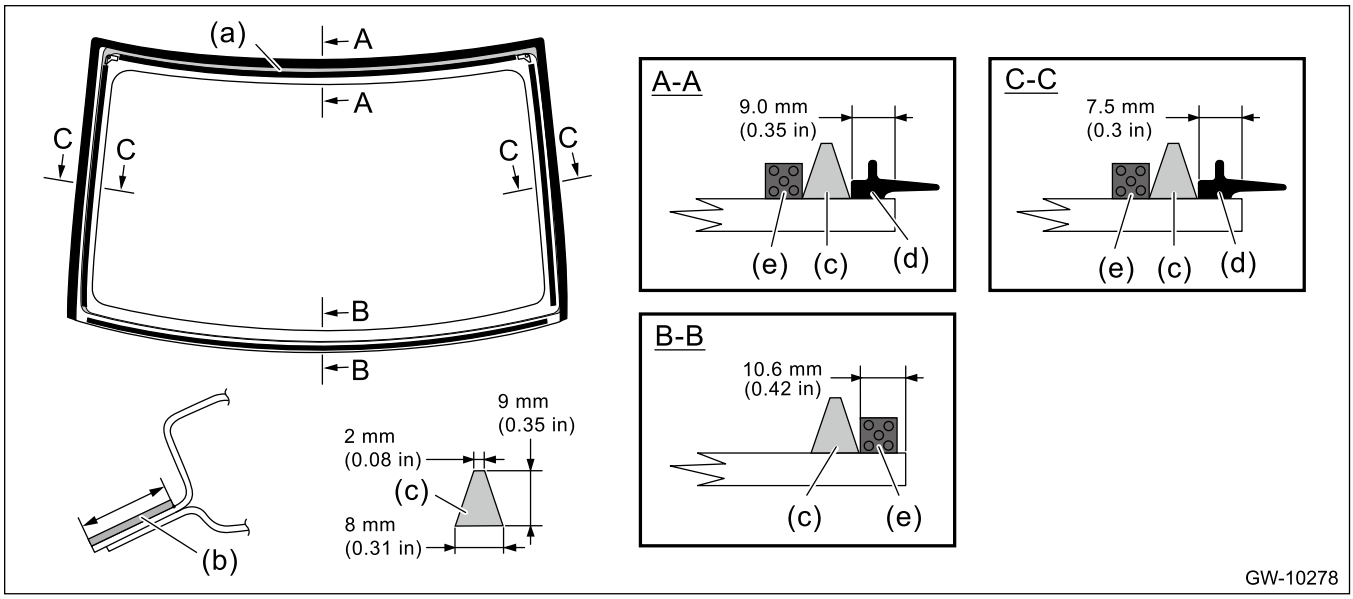
5. Install the glass - rear window in the same procedure as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>INSTALLATION.

(1) Apply the primer to the adhesive surface of glass - rear window side and body side using sponge.

(2)Apply adhesive to the end back surface of the glass - rear window.

Caution:

Do not apply primer to adhesive remaining on the body side.



(a) Application of primer (glass side)
(b) Application of primer (body side)
(c) Adhesive
(d) Molding - rear window
(e) Dam rubber - rear

(3) Insert the locating pins - rear window into the roof panel holes, and install the glass - rear window.
(4) Lightly press the entire perimeter of the glass - rear window for tight fit.
(5) Make flush the adhesive surface jutted out using spatula.

6. After completion of all work, allow the vehicle to stand for about 24 hours.

Note:

- **When opening/closing the door after the glass - rear window was bonded, always lower the glass assembly - door first, and then open/close it carefully.**
- **Move the vehicle slowly.**
- **For minimum drying time and vehicle standing time before driving after bonding, follow instructions or instruction manual from the adhesive manufacturer.**

7. Connect the rear defogger connector.

8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

9. After curing of adhesive, pour the water on external surface of vehicle to check that there are no water leaks.

Note:

When a vehicle is returned to the user, tell him or her that the vehicle should not be subjected to heavy impact for at least three days.

GLASS/WINDOWS/MIRRORS > Rear Gate Glass

REMOVAL

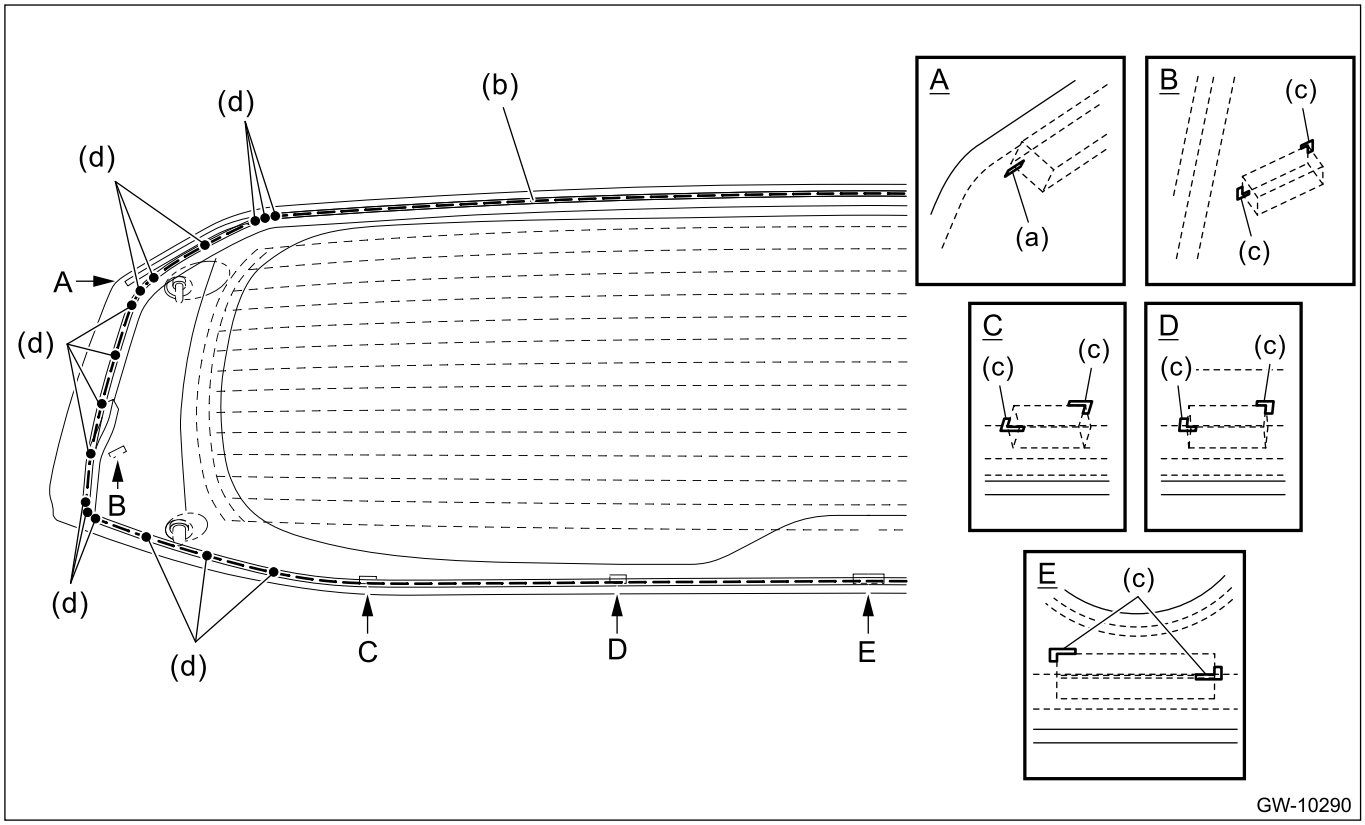
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear gate and the motor assembly - rear wiper. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor>REMOVAL.
3. Remove the roof spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>REMOVAL.
4. Disconnect the rear defogger connector.
5. Remove the glass - rear gate in the same procedure as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>REMOVAL.

GLASS/WINDOWS/MIRRORS > Rear Gate Glass

INSTALLATION

Note:

Use the markings on the glass to apply adhesive and primer, and to install the dam rubber - rear gate and the spacer - rear gate.



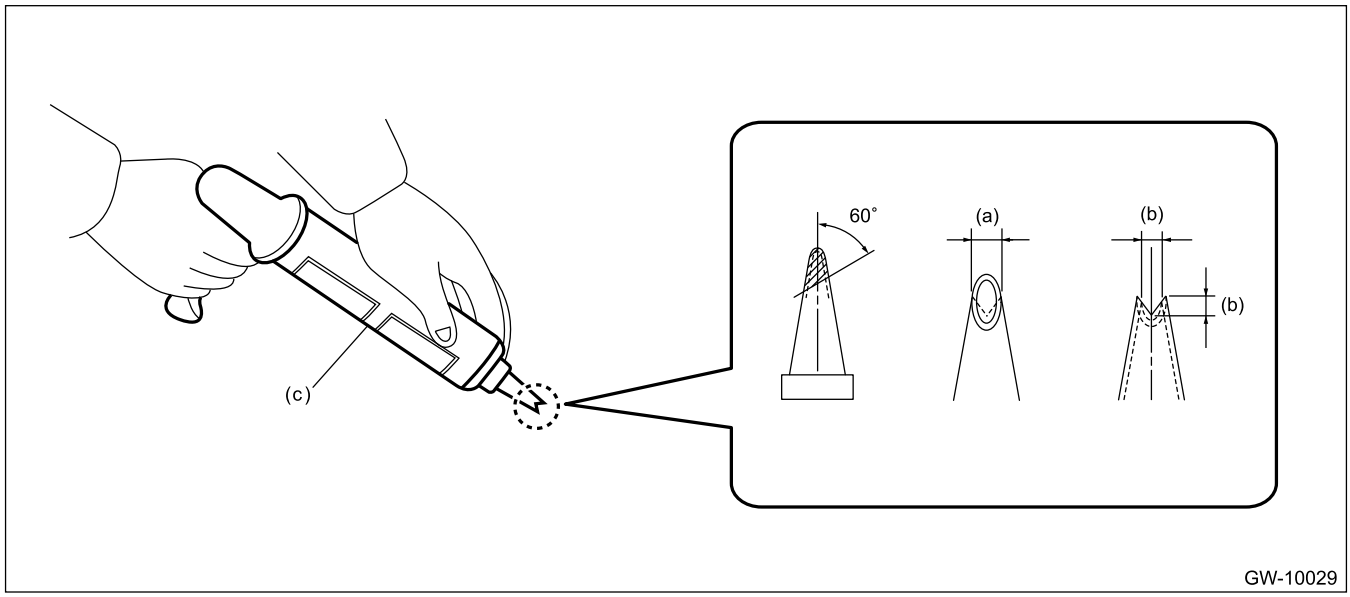
(a) Marking for dam rubber - rear gate application (Ag print)

(b) Center line for adhesive

(c) Marking for spacer - rear gate application (Ag print)

(d) Marking for primer application

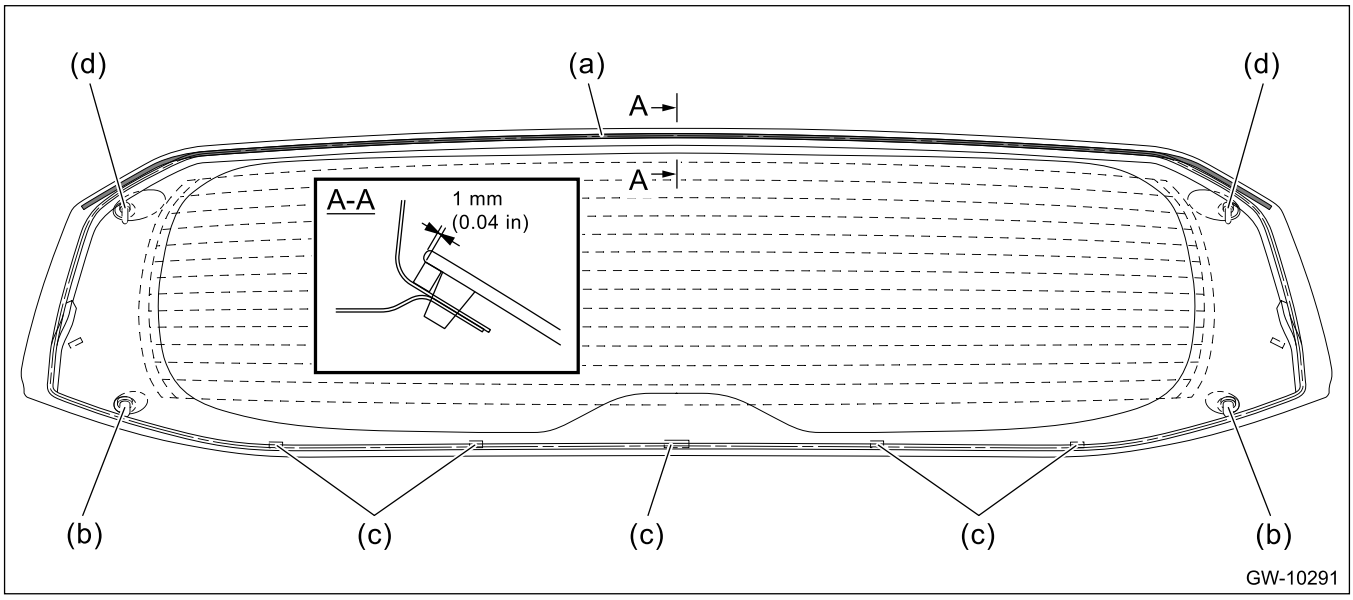
1. Fabricate the cartridge nozzle tip as shown and set the sealant gun with the adhesive.



(a) 10 mm (0.39 in) (b) 8 mm (0.31 in) (c) Sealant gun

2. Smoothen and clean the adhesive surfaces of the glass - rear gate and body using the same procedures as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>INSTALLATION.

3. Attach the dam rubber - rear gate to the glass - rear gate.



(a) Dam rubber - rear gate (c) Spacer - rear gate (d) Locating pin - rear gate
(b) Holder - rear gate

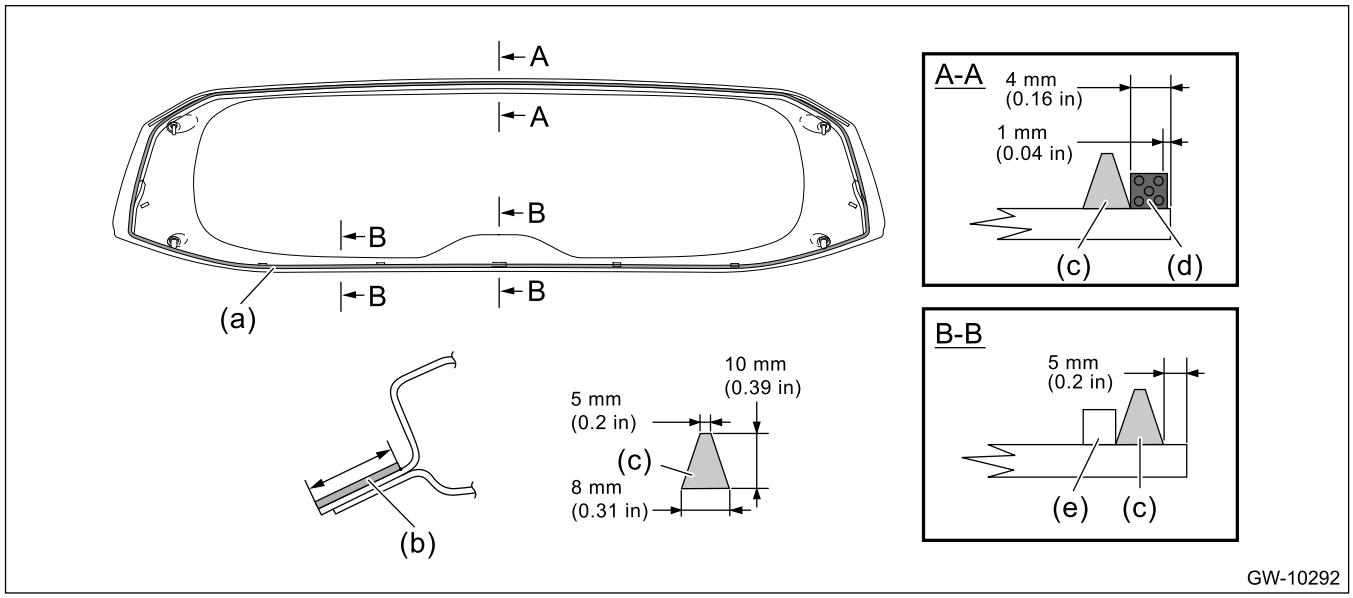
4. Install the glass - rear gate.

(1) Apply the primer to the adhesive surface of glass - rear gate side and body side using sponge.

(2)Apply adhesive to the glass - rear gate end back surface.

Caution:

Do not apply primer to adhesive.



(a) Application of primer (glass side)
(b) Application of primer (body side)
(c) Adhesive
(d) Dam rubber - rear gate
(e) Spacer - rear gate

(3) Attach the clip to the holder - rear gate of the glass - rear gate.
(4) Insert the locating pins - rear gate into the rear gate panel holes, and install the glass - rear gate.
(5) Lightly press the entire perimeter of the glass - rear gate for tight fit.
(6) Make flush the adhesive surface jutted out using spatula.

5. After completion of all work, allow the vehicle to stand for about 24 hours.

Note:

- **When opening/closing the door after the glass - rear gate was bonded, always lower the glass assembly - door first, and then open/close it carefully.**
- **Move the vehicle slowly.**
- **For minimum drying time and vehicle standing time before driving after bonding, follow instructions or instruction manual from the adhesive manufacturer.**

6. Connect the rear defogger connector.

7. Install the motor assembly - rear wiper and the arm assembly - rear wiper. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor>INSTALLATION.

Tightening torque:

Motor assembly - rear wiper and arm assembly - rear wiper: Ref. to WIPER AND WASHER SYSTEMS>General Description>COMPONENT > REAR WIPER.

8. Install the roof spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>INSTALLATION.

9. Install the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>INSTALLATION.

10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

11. After curing of adhesive, pour the water on external surface of vehicle to check that there are no water leaks.

Note:

When a vehicle is returned to the user, tell him or her that the vehicle should not be subjected to heavy impact for at least three days.

WIRING DIAGRAM

Refer to "Rear Defogger System" in the wiring diagram. Ref. to WIRING SYSTEM>Rear Defogger System>WIRING DIAGRAM.

INSPECTION

1. SYSTEM INSPECTION

Symptoms	Inspection order
Rear window defogger does not operate.	1. Check the fuse. 2. Check the rear defogger relay. 3. Check the rear window defogger switch. 4. Check the heat wire. 5. Check the wiring harness. 6. Check body integrated unit.

Note:

Rear window defogger system can be customized using the Subaru Select Monitor, when the customize setting [Auto A/C Setting] of the body integrated unit is set to With.

System name	Initial setting	Customize setting
Rr Defogger op. mode	Normal	Continuous*

***: When the battery voltage remains at 10 V or less for 30 seconds, the continuous operation is suspended and turned to the normal operation.**

2. CHECK WITH SUBARU SELECT MONITOR

Caution:

Before performing inspection, check whether the rear defogger operation mode setting is either in initial setting or customize setting.

1. Check the input signal when the rear window defogger switch is operated using Subaru Select Monitor.

(1) Connect the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

(2) Turn the ignition switch to ON.

(3) On [Start] display, select [Diagnosis].

(4) On [Select Vehicle] display, input the target vehicle information and select [Set].

(5) On [Main Menu] display, select [Each System].

(6) On [Select System] display, select [Body Control], and then select [Enter].

(7) On [Select Function] display, select [Data monitor].

(8) From the data monitor item list, select [Auto A/C Setting].

(9) Check the vehicle equipment and the settings of body integrated unit.

If correct, go to (10).

If not correct, go to (13).

(10) From the data monitor item list, select [Rr Defogger output].

(11) Check the displayed data (ON/OFF) by operating the rear window defogger switch.

(12) On [Select Function] display, select [Customize].
(13) From the Customize item list, select [Auto A/C Setting] and match the auto A/C ECM setting to the actual vehicle equipment.

2. Check the operation with rear window defogger switch ON.
   - When customize setting is set as “Continuous”, it is normal if the 15-minute operation and 2-minute stop repeats.
   - When customize setting is “Normal”, it is normal if the operation lasts for 15 minutes and then turns OFF.
3. When the operation in 2) above fails, replace the body integrated unit.

3. HEAT WIRE INSPECTION

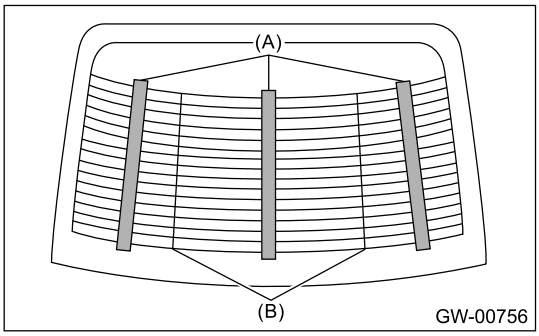
Caution:

When wiping off the stain on glass with cloth, use a dry and soft cloth and move it in the direction of the heat wire extension to avoid damage to the heat wire.

1. Prepare the following checking items.
   - Liquid crystal thermograph sheet (approximate Size: 300 × 300 mm (11.8 × 11.8 in) and thermal temperature: 35 — 40°C (95 — 104°F))
   - Aluminum foil
2. Turn the ignition switch to ON.
3. Turn the defogger switch to ON.
4. Push the liquid crystal thermograph sheet from the outside of the glass.

   Note:

   Use the liquid crystal thermograph sheet every range it is separated with the separate line.



(A) Liquid crystal thermograph sheet
(B) Separate line

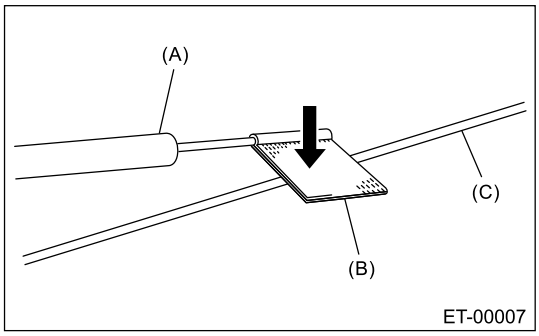
5. Determine the faulty heat wire by checking the color of the liquid crystal thermograph sheet.

Liquid crystal thermograph sheet	Criteria
Change occurred (red → blue)	Normal
No change (black)	Open

Note:

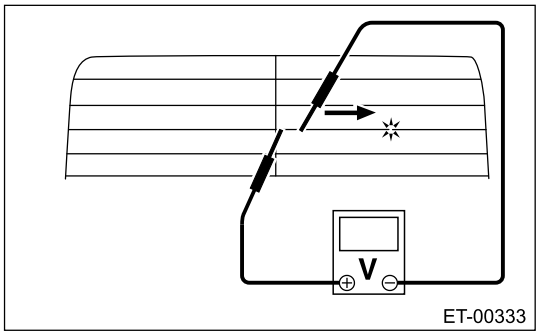
- **Check from the inside of the glass - rear window if the liquid crystal thermograph sheet does not change.**
- **The time for the color change may differ depends on the surface temperature of the glass.**

6. Wrap a piece of aluminum foil around the tip of tester probe and press it against the heat wire with your finger.



(A) Tester probe
(B) Aluminum foil
(C) Heat wire

7. To both ends of the section that has been found to include an open in the step 5), apply the tester positive (+) probe and the negative (−) probe.
8. Move the tester probe on the negative (−) side slowly along the heat wire. If voltage changes from zero while moving the tester probe, heat wire is open at the voltage change point.



9. Repair the heat wire that determines the place of the open circuit. Ref. to GLASS/WINDOWS/MIRRORS>Rear Window Defogger System>REPAIR.

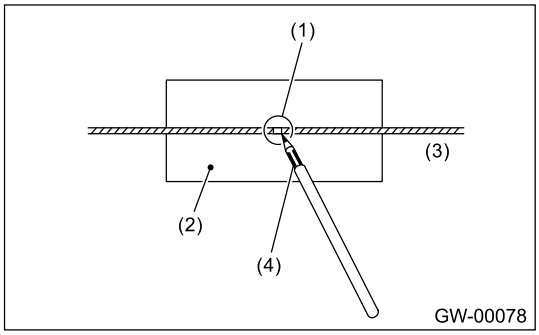
GLASS/WINDOWS/MIRRORS > Rear Window Defogger System

REPAIR

1. Clean the broken portion with alcohol or appropriate cleaning solvent.
2. Mask both side of wire with masking tape.
3. Apply the conductive silver composition to the broken portion.

Preparation items:

Conductive silver composition: DUPONT No. 4817 or equivalent



(1) Broken portion
(2) Masking tape
(3) Broken wire

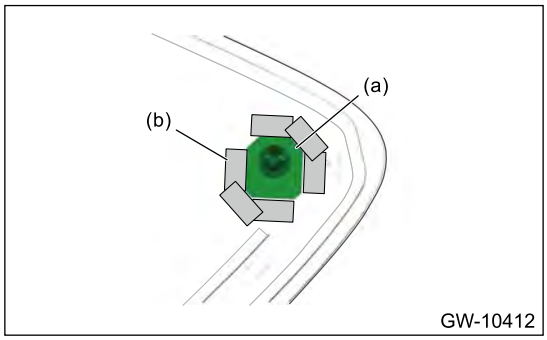
(4) Conductive silver composition

4. After repair, check the wire.

GLASS/WINDOWS/MIRRORS > Rear Quarter Glass

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.
2. Remove the trim panel - rear pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
3. Remove the glass - rear quarter in the same procedure as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>REMOVAL.
4. Remove the locating pin. (When reusing the glass)
   (1)Attach tape to the locating pin outer surface to identify the installation position.



(a) Locating pin - rear quarter (b) Tape

(2) Using a scraper, etc., remove locating pins (3 places).

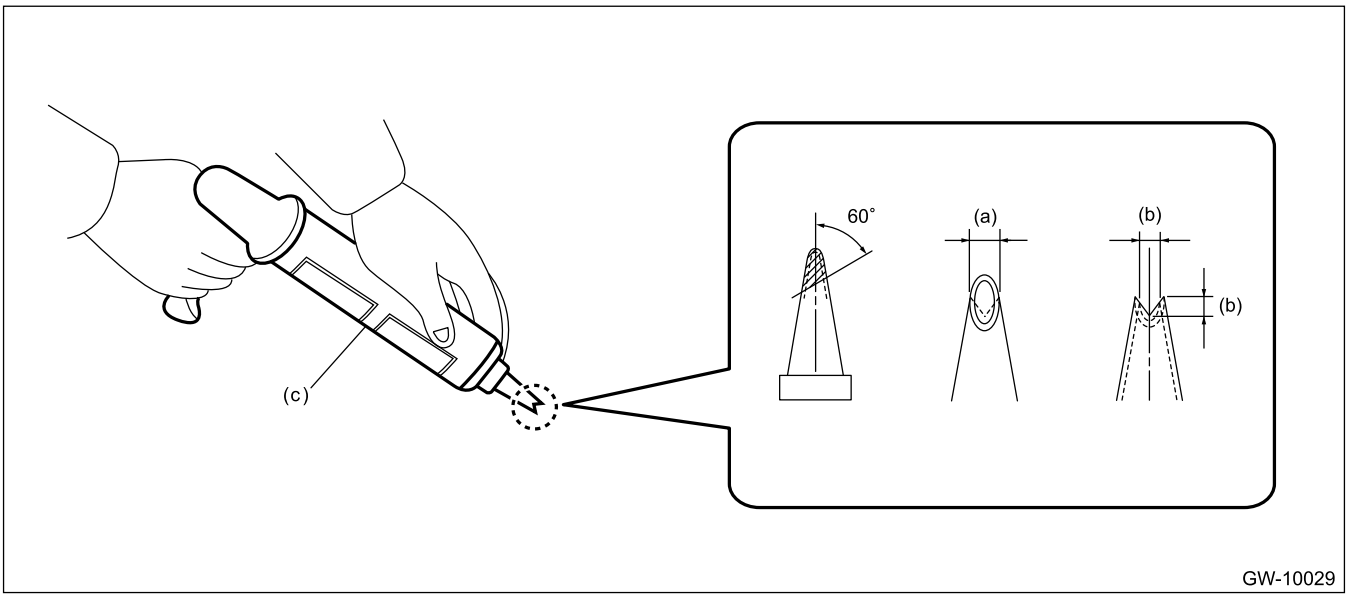
Caution:

- **Do not remove the tape because it is used as reference during installation.**
- **Be careful not to damage the glass - rear quarter.**

GLASS/WINDOWS/MIRRORS > Rear Quarter Glass

INSTALLATION

1. Fabricate the cartridge nozzle tip as shown and set the sealant gun with the adhesive.



(a) 10 mm (0.39 in) (b) 8 mm (0.31 in) (c) Sealant gun

2. Smoothen and clean the adhesive surfaces of the glass - rear quarter and body using the same

procedures as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>INSTALLATION.

3. Install the locating pin. (When reusing the glass)

(1) Using a sponge, apply primer to the locating pin installation position on the glass - rear quarter.

Preparation items

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

Note:

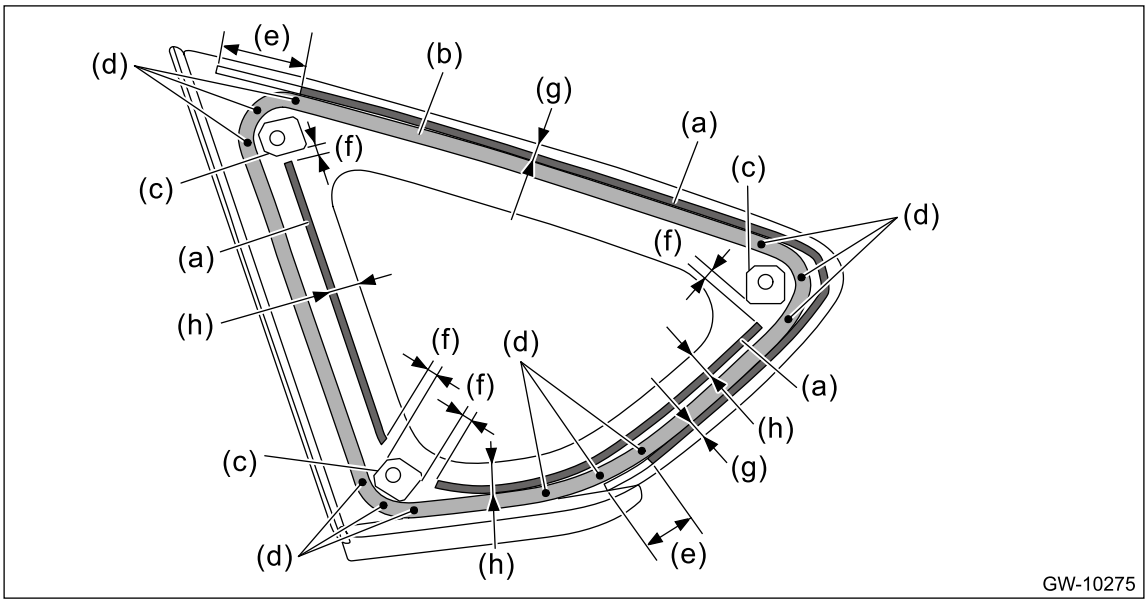
- **Let primer dry for about one hour before installing the locating pin.**
- **Do not touch the surface coated with primer.**

(2) Install two locating pins (3 places) to the positions marked with tapes, and remove the tapes.

Caution:

Always use new locating pins.

4. Attach the dam rubber - rear to the glass - rear quarter.

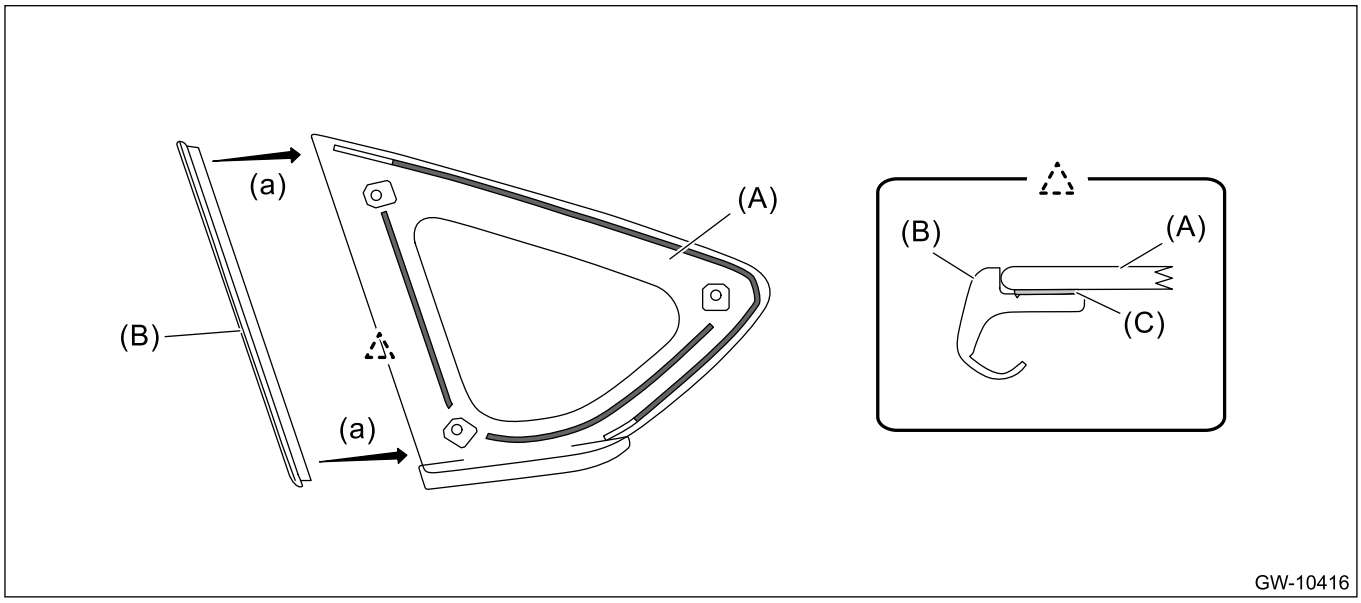


(a)	Dam rubber - rear quarter	(d)	Adhesive application mark (ceramic through hole)	(g)	8 mm (0.31 in)
(b)	Adhesive application area	(e)	Dam rubber edge position range	(h)	14 mm (0.55 in)
(c)	Locating pin - rear quarter	(f)	5 mm (0.2 in)		

5. Attach the molding - rear quarter to the glass - rear quarter.

Caution:

Be careful to attach the molding - rear quarter so that the molding has no loose or undulating part.



(1) Using a sponge, apply primer to the molding installation surface in the glass - quarter side.

Preparation items

Glass primer: Dow Automotive ESSEX U-401, U-402 or equivalent

Note:

- **Let primer dry for about ten minutes before installing the molding - rear quarter.**
- **Do not touch the surface coated with primer.**

(2) Align the molding - rear quarter (A) to the front (a) of the glass - rear quarter (B).

(3) Firmly apply the double sided tape (C) of the molding - rear quarter evenly to the surface of the glass - rear quarter.

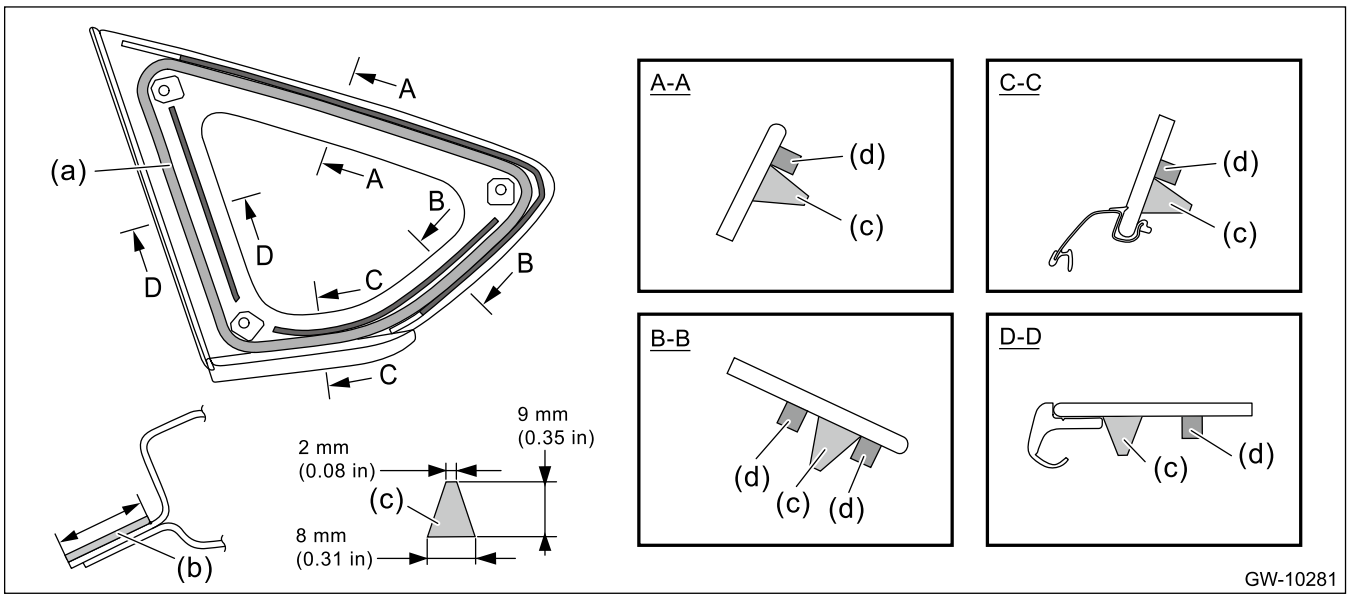
6. Install the glass - rear quarter in the same procedure as for the glass - front window. Ref. to GLASS/WINDOWS/MIRRORS>Windshield Glass>INSTALLATION.

(1) Apply the primer to the adhesive surface of glass - rear quarter side and body side using sponge.

(2)Apply adhesive to the glass - rear quarter end back surface.

Caution:

Do not apply primer to adhesive remaining on the body side.



(a) Application of primer (glass side)

(c) Adhesive

(d) Dam rubber - rear quarter

(b) Application of primer (body side)

(3) Insert the locating pins - rear quarter into the side panel holes, and install the glass - rear quarter.
(4) Lightly press the entire perimeter of the glass - rear quarter for tight fit.
(5) Make flush the adhesive surface jutted out using spatula.

7. After completion of all work, allow the vehicle to stand for about 24 hours.

Note:

- **When opening/closing the door after the glass - rear quarter was bonded, always lower the glass assembly - door first, and then open/close it carefully.**
- **Move the vehicle slowly.**
- **For minimum drying time and vehicle standing time before driving after bonding, follow instructions or instruction manual from the adhesive manufacturer.**

8. Install the trim panel - rear pillar UPR. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>INSTALLATION.

9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE>BATTERY>GROUND TERMINAL REMOVAL OR INSTALLATION.

10. After curing of adhesive, pour the water on external surface of vehicle to check that there are no water leaks.

Note:

When a vehicle is returned to the user, tell him or her that the vehicle should not be subjected to heavy impact for at least three days.

WIRING DIAGRAM

Refer to “Wiper Deicer System” in the wiring diagram. Ref. to WIRING SYSTEM>Wiper Deicer System.

INSPECTION

1. SYSTEM INSPECTION

Note:

- **The wiper deicer does not operate when the ambient temperature becomes 5°C (41°F) or more.**
- **The wiper deicer operates with the rear window defogger at the same time.**
- **It is possible to perform a forced operation if you keep holding the rear window defogger switch for 3 seconds or more.**

Symptoms	Inspection order
Wiper deicer does not operate.	1. Check the fuse. 2. Check the wiper deicer relay. 3. Check the wiper deicer switch. 4. Check the heat wire. 5. Check the wiring harness. 6. Check body integrated unit.

Note:

- **Wiper deicer system can be customized using the Subaru Select Monitor, when the customize setting [Auto A/C Setting] of the body integrated unit is set to With.**
- **Set the system using the Rr Defogger op. mode, and setting will be the same as rear defogger system setting.**

System name	Initial setting	Customize setting
Rr Defogger op. mode	Normal	Continuous*

***: When one of the following conditions occurs, the continuous operation is suspended and turned to the normal operation.**

- **Ambient temperature at 5°C (41°F) or more continues for 10 seconds.**
- **Malfunction occurs on ambient sensor.**
- **Vehicle speed of 15 km/h (9 MPH) or less continues 15 minutes (OFF when conditions are met)**
- **Malfunction occurs in CAN communication.**
- **Battery voltage remains at 10 V or less for 30 seconds.**
- **SI-DRIVE [I] mode driving continues for 10 seconds.**

2. CHECK WITH SUBARU SELECT MONITOR

Caution:

Before performing the inspection, check the following settings.

- **Wiper deicer setting → “support”. If “no support”, set to “support” using customize setting.**
- **Rear defogger operation mode setting → initial setting or customize setting.**

1. Check the input signal when the rear window defogger switch is operated using Subaru Select

Monitor.
(1) Connect the Subaru Select Monitor to data link connector.
Note:
For detailed operation procedures, refer to “Application help”.
(2) Turn the ignition switch to ON.
(3) On [Start] display, select [Diagnosis].
(4) On [Select Vehicle] display, input the target vehicle information and select [Set].
(5) On [Main Menu] display, select [Each System].
(6) On [Select System] display, select [Body Control], and then select [Enter].
(7) On [Select Function] display, select [Data monitor].
(8) From the data monitor item list, select [Auto A/C Setting].
(9) Check the vehicle equipment and the settings of body integrated unit.
If correct, go to (10).
If not correct, go to (13).
(10) From the data monitor item list, select [Rr Defogger output].
(11) Check the displayed data (ON/OFF) by operating the rear window defogger switch.
(12) On [Select Function] display, select [Customize].
(13) From the Customize item list, select [Auto A/C Setting] and match the auto A/C ECM setting to the actual vehicle equipment.

2. Check the operation with rear window defogger switch ON.
   - When customize setting is set as “Continuous”, it is normal if the 15-minute operation and 2-minute stop repeats.
   - When customize setting is “Normal”, it is normal if the operation lasts for 15 minutes and then turns OFF.
3. When the operation in 2) above fails, replace the body integrated unit.

3. HEAT WIRE INSPECTION

Refer to “HEAT WIRE INSPECTION” of “Rear Window Defogger System”. Ref. to GLASS/WINDOWS/MIRRORS>Rear Window Defogger System>INSPECTION > HEAT WIRE INSPECTION.

Note:
Heat wire inspection needs removing/installing procedure of instrument panel assembly.

GLASS/WINDOWS/MIRRORS > Wiper Deicer System

REPAIR

Refer to “REPAIR” of “Rear Window Defogger System”. Ref. to GLASS/WINDOWS/MIRRORS>Rear Window Defogger System>REPAIR.

Note:
Heat wire repair needs removing/installing procedure of instrument panel assembly.

INSTRUMENTATION/DRIVER INFO

IDI

1. General Description
2. Relay and Fuse
3. Combination Meter System
4. Multi-function Display (MFD) System
5. Combination Meter
6. Multi-function Display (MFD)
7. Switches and Harness
8. Warning Box

SPECIFICATION

1. COMBINATION METER ASSEMBLY

Note:

Specifications of the combination meter vary depending on the market and the grade.

- Model with normal meter

Meter, display	Operation method, display method	Drive control	When checking the indicator needle operation/needle reading operation
Speedometer	Stepping motor type	Combination meter	—
Tachometer			
ECO gauge			
ABS warning light	LED	Combination meter	On/Off
STEERING warning light			
AT oil temperature warning light			
Driver’s seat belt warning light			
Door warning light			
Tire pressure warning light			
AWD warning light			
Hill start assist warning light / hill start assist OFF indicator light			
VDC warning light / VDC operation indicator light			
VDC OFF indicator light			
High beam indicator light			
Front fog light indicator light			
Malfunction indicator light			
Airbag warning light			
Engine oil level warning light			
Washer fluid level warning light			
Oil pressure warning light			
Charge warning light			
Turn signal indicator light			
Parking brake/brake fluid level warning light			
Meter illumination back light			Light ON
LCD back light			
Fuel level warning light			On/Off (area near the E mark is illuminated)
Engine coolant temperature warning light (red)			On (red)/Off

Meter, display	Operation method, display method	Drive control	When checking the indicator needle operation/needle reading operation
Engine coolant temperature indicator light (blue)			Off/On (blue)
Security indicator light		Body integrated unit	Turns on or off according to module control
ODO indicator	LCD	Combination meter	—
Trip indicator			
Select lever / shift position indicator			
Cruise control system indicator • Constant speed cruise • SET • Set speed			

- Model with color TFT meter

Meter, display	Operation method, display method	Drive control	When checking the indicator needle operation/needle reading operation
Speedometer	Stepping motor type	Combination meter	—
Tachometer			
ABS warning light	LED	Combination meter	On/Off
STEERING warning light			
AT oil temperature warning light			
Driver’s seat belt warning light			
Tire pressure warning light			
AWD warning light			
Hill start assist warning light / hill start assist OFF indicator light			
VDC warning light / VDC operation indicator light			
VDC OFF indicator light			
High beam indicator light			
Front fog light indicator light			
Lighting indicator light			
Fuel level warning light			
Malfunction indicator light			
Airbag warning light			
Oil pressure warning light			

Meter, display	Operation method, display method	Drive control	When checking the indicator needle operation/needle reading operation
Charge warning light			
Lane departure warning OFF indicator light			
Pre-collision brake OFF indicator light			
Turn signal indicator light			
Parking brake/brake fluid level warning light			
Meter illumination back light			Light ON
LCD back light			
Engine coolant temperature warning light (red)			On (red)/Off
Engine coolant temperature indicator light (blue)			Off/On (blue)
Security indicator light		Body integrated unit	Turns on or off according to module control
ODO indicator	TFT	Combination meter	—
Trip indicator			
Select lever / shift position indicator			
Information (intervention) display			
Warning and indicator display • Door partially latched • Engine oil level • BSD/RCTA • BSD/RCTA OFF • SRF OFF • Washer fluid level • Low ambient temperature • High Beam Assist • Access key • RAB • RAB OFF • LED low beam • SRH OFF • Auto leveler			
FUEL meter			
Cruise control system indicator • Constant speed cruise • SET • Set speed			

Meter, display	Operation method, display method	Drive control	When checking the indicator needle operation/needle reading operation
EyeSight system indicator • Adaptive cruise • Constant speed cruise • READY • Preceding vehicle • Following distance setting • Set speed • Traffic lane • EyeSight warning • EyeSight temporary stop • Lane keep			

2. MULTI FUNCTION DISPLAY

Note:

Specifications of the multi-function display vary depending on the market and the grade.

- Normal type

Display	Display method
Cruising distance, average/instantaneous fuel economy, continuous driving time, average vehicle speed, ambient temperature, current time	LCD

- High grade type

Display	Display method
Preventive safety screen, EyeSight screen, Favorite screen, audio screen, fuel economy screen, clock screen, setting shift screen, interruption screen, air conditioner screen, setting screen, diagnosis screen, weather screen∗1, TBT & direction screen∗2	TFT

∗1: Model with XM

∗2: Model with navigation system

3. WARNING BOX

Display	Display method
Passenger’s airbag ON indicator light	LED
Passenger’s airbag OFF indicator light	
Passenger’s seat belt warning light	

LOCATION

1. COMBINATION METER SYSTEM

For location, refer to “Electrical Component Location” for “COMBINATION METER (DIAGNOSTICS)” section. Ref. to COMBINATION METER (DIAGNOSTICS)>Electrical Component Location.

2. MULTI-FUNCTION DISPLAY (MFD) SYSTEM

For location, refer to “Electrical Component Location” for “MULTI-FUNCTION DISPLAY (DIAGNOSTICS)” section. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Electrical Component Location.

INSTRUMENTATION/DRIVER INFO > General Description

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the parts provided with memory functions such as audio, MFD, record the memory contents before disconnecting the battery ground cable.
- Use gloves to avoid damage to and get fingerprints on the glass surface. Wipe off using a soft cloth, if the part is contaminated.
- If any immobilizer related part has been replaced, make sure to register the immobilizer.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of “AIRBAG SYSTEM”. Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform “VSC(VDC) Centering Mode” of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

INSTRUMENTATION/DRIVER INFO > General Description

PREPARATION TOOL

1. SPECIAL TOOL

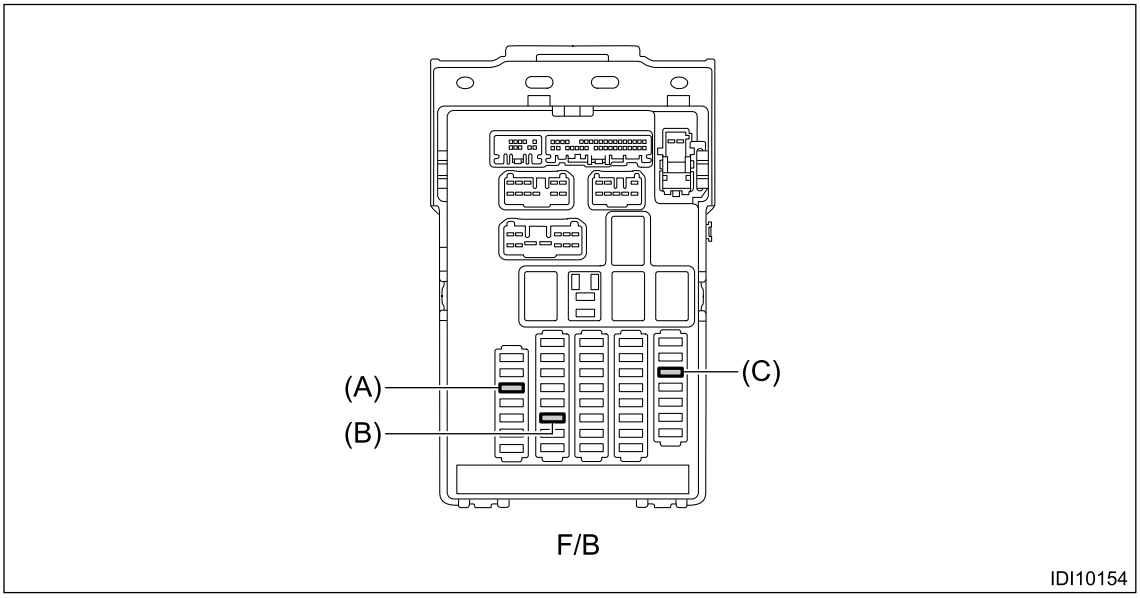
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to “Application help”.**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.

INSTRUMENTATION/DRIVER INFO > Relay and Fuse

LOCATION



Relay & fuse box (F/B)	Fuse 7.5 A (combination meter, MFD)	(A)
	Fuse 10 A (MFD)	(B)
	Fuse 7.5 A (combination meter)	(C)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSTRUMENTATION/DRIVER INFO > Relay and Fuse

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

Note:

If the fuse is blown again, check the system wiring harness.

INSTRUMENTATION/DRIVER INFO > Combination Meter System

WIRING DIAGRAM

Refer to “Combination Meter System” in the wiring diagram.

- Models with normal meters: Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM > NORMAL METER MODEL.
- Model with color TFT meter: Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM > COLOR TFT METER MODEL.

INSTRUMENTATION/DRIVER INFO > Combination Meter System

ELECTRICAL SPECIFICATION

For the specification (electrical component), refer to “Control Module I/O Signal” of “COMBINATION METER (DIAGNOSTICS)” section. Ref. to COMBINATION METER (DIAGNOSTICS)>Control Module I/O Signal.

INSTRUMENTATION/DRIVER INFO > Combination Meter System

OPERATION

1. SELF-DIAGNOSIS DISPLAY MODE

The combination meter self-diagnosis can be performed as a single unit according to the following procedure.
When the self-diagnosis display mode operates, it switches in the order of [1. Meter pointer operation check]→[2. Meter pointer indication check]→[3. LCD/TFT display check].

1. Procedure

   Caution:

   - **Perform the steps described in (1) through (4) within 10 seconds.**
   - **There are two methods. Follow either of the methods.**

   – Method with lighting switch

(1)	Within 3 seconds after turning the ignition switch to ON, set the parking (tail) light switch or the headlight switch to ON.
(2)	While the switch is in ON, press the trip reset switch three times.
(3)	Turn the parking (tail) light switch or the headlight switch to OFF, and press the trip reset switch three times.
(4)	Turn the parking (tail) light switch or the headlight switch to ON, and press the trip reset switch three times.

   – Method with seat belt

(1)	Unfasten → fasten the driver’s seat belt within 3 seconds after the ignition switch is turned to ON.
(2)	With the driver’s seat belt fastened, press the trip reset switch three times.
(3)	Unfasten the driver’s seat belt, and then press the trip reset switch three times.
(4)	Fasten the driver’s seat belt again, and then press the trip reset switch three times.

2. Go to the self-diagnosis display mode.

   Caution:

   If the procedure is not performed properly, turn the ignition switch from ON to OFF to stop the operation halfway, and then proceed from step (1) to (4).

Note:

- **Turn the ignition switch to OFF (ACC OFF) to cancel the self-diagnosis function.**
- **When the engine starts during diagnosis, the self-diagnosis function is not cancelled, however, once the vehicle starts driving, the self-diagnosis function is deactivated automatically.**
- **If the self-diagnosis function is not deactivated, the check items in operation are displayed. After the check items 1 to 3 are displayed, the check item 1 is displayed repeatedly.**
- **The buzzer sounds when the check item is switched, to indicate that the item is switched and make sure that the buzzer sounds.**

1. METER POINTER OPERATION CHECK

In meter pointer operation check, the meter operation, warning /indicator light, illumination and LCD/TFT are checked.

1. After a buzzer sounds for 0.5 seconds and "STEP1" is displayed on LCD/TFT, the meter pointer operation check mode is initiated.

Time (sec)	Meter indicator	LCD/TFT display, illumination	Warning light/ indicator light
6	MIN indication ↓ MAX indication	ILL1 (Min. brightness) ↓*4 ILL6 (Max. brightness)	*1, *2, *3
6	MAX indication ↓ MIN indication	ILL6 (Max. brightness) ↓*4 ILL1 (Min. brightness)	

*1: Warning lights and indicator lights controlled by the meter drive circuit are illuminated. Ref. to INSTRUMENTATION/DRIVER INFO>General Description>SPECIFICATION.

*2: Warning lights and indicator lights controlled by other module are turned on/off according to the module control. Ref. to INSTRUMENTATION/DRIVER INFO>General Description>SPECIFICATION.

*3: Engine coolant temperature warning light illuminates in red.

*4: Display for one second for each level.

2. METER POINTER INDICATION CHECK

In meter pointer indication check, the meter operation, warning /indicator light and LCD/TFT are checked.

Note:

ILL indication illuminates at the same brightness as immediately before entering "Meter pointer indication check".

1. Press the trip reset switch.
2. After a buzzer sounds for 0.5 seconds and "STEP2" is displayed on LCD/TFT, the meter pointer indication check mode is initiated.

Time (sec)	Speedometer (km/h)	Tachometer (r/min)	ECO gauge	Warning light/ indicator light
1.5	0	0	Lowest point	The following lights

Time (sec)	Speedometer (km/h)	Tachometer (r/min)	ECO gauge	Warning light/ indicator light
1.5	0	0	−Max	are lit.∗ 1 • Engine coolant temperature indicator light (blue) • Fuel level warning light (near the E mark)∗2
1.5	40	1,000	0	
1.5	100	4,000	+Max	
1.5	40	1,000	0	
1.5	0	0	−Max	

*1: Warning lights and indicator lights controlled by other module are turned on/off according to the module control. Ref. to INSTRUMENTATION/DRIVER INFO>General Description>SPECIFICATION.

*2: Model with normal meter

3. LCD/TFT DISPLAY CHECK

Check the LCD/TFT display.

Note:

- **The meter needle indicate 0 or the lowest position.**
- **ILL indication illuminates at the same brightness as immediately before entering "LCD/TFT display check".**
- **For model with normal meter, after No. 14 is displayed in the illumination order, the display is repeated from No. 1 again.**
- **For model with color TFT meter, after No. 8 is displayed in the illumination order, the display is repeated from No. 1 again. The version display contents of the illumination order No. 1 varies depending on the vehicle.**

1. Press the trip reset switch.
2. After a buzzer sounds for 0.5 seconds and "STEP3" is displayed on LCD/TFT, the LCD/TFT display check mode is initiated.
   - Model with normal meter

ORDER	AT/SS	LO	CRUISE/SET	TRIP/ODO	MODE (X/S/I/S#)	FUEL METER	LFW	TIME (SEC)
1	▲ ▼	LO	SET	A B 8 8 8 . 8 km/h MPH 8 8 8 8 8 8 km miles	[I] [S] S#	E F	OFF	1
2		OFF	OFF	1 1 1 . 1 1 1 1 1 1 1	OFF	E F	OFF	1
3	▲	OFF	OFF	A 2 2 2 . 2 km/h 2 2 2 2 2 2 km	OFF	E F	OFF	1
4		OFF	OFF	3 3 3 . 3 3 3 3 3 3 3		E F	OFF	1
5	▼	LO		B 4 4 4 . 4 MPH 4 4 4 4 4 4 miles	OFF	E F	OFF	1
6		OFF	OFF	5 5 5 . 5 5 5 5 5 5 5	OFF	E F	OFF	1
7	▲	OFF	OFF	A 6 6 6 . 6 km/h 6 6 6 6 6 6 km	[I]	E F	OFF	1
8		OFF	OFF	7 7 7 . 7 7 7 7 7 7 7	OFF	E F	OFF	1
9	▼	LO	SET	B 8 8 8 . 8 MPH 8 8 8 8 8 8 miles	OFF	E F	OFF	1
10		OFF	OFF	9 9 9 . 9 9 9 9 9 9 9	[S]	E F	OFF	1
11	▲	OFF	OFF	A 0 0 0 . 0 km/h 0 0 0 0 0 0 km	OFF	E F	OFF	1
12		OFF	OFF	8 8 8 . 8 8 8 8 8 8 8	OFF	E F	OFF	1
13	▼	LO	SET	B 8 8 8 . 8 MPH 8 8 8 8 8 8 miles	S#	E F	Illuminate	1
14		OFF	OFF	8 8 8 . 8 8 8 8 8 8 8	OFF		OFF	1

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- Model with color TFT meter

Order	TFT display	Warning/indicator light	Time (sec)
1	Version display & color gradation	Light OFF	10
2	Black	Light OFF	10
3	Red	Light OFF	10
4	Green	Light OFF	10
5	Blue	Light OFF	10
6	White	Light OFF	10

Order	TFT display	Warning/indicator light	Time (sec)
7	Color gradation	Light OFF	10
8	Cross talking	Light OFF	10

2. DEMONSTRATION MODE (MODEL WITH COLOR TFT METER ONLY)

The demonstration mode screen of the combination meter can be displayed according to the following procedure.

Caution:

- **To avoid battery discharge, perform the operation under the following condition.**
  – Perform the operation while the battery is being charged.
  – While performing the operation and displaying the demonstration mode, close all doors and do not operate any electrical parts.
- **To display the demonstration mode, set the Demonstration mode permission / fault permission of the user customize mode to permission. For detailed operation procedures, refer to "Application help".**
- **When the demonstration mode display is completed, make sure to set "Demonstration mode permission / fault permission" of the user customize mode to "fault permission". Do not deliver the vehicle to the customer with "Demonstration mode permission / fault permission" set to "permission".**
- **Even if the backup fuse is removed, the demonstration mode can be initiated.**

1. Procedure

Caution:

While the ignition switch is OFF (ACC OFF) and the odo/trip meter is not displayed, perform the steps described in (1) through (4) within 10 seconds.

(1)	Press the trip reset switch once.
(2)	Press the i/SET switch three times within three seconds after the operation (1) above is performed.
(3)	Press the trip reset switch once, and press the i/SET switch three times.
(4)	Press the trip reset switch once, and press the i/SET switch three times.

2. The demonstration mode is initiated.

Caution:

If the procedure is not performed properly, turn the ignition switch from ON to OFF to stop the operation halfway, and then proceed from step (1) to (4).

Note:

The demonstration mode will be cancelled in the following condition.
When resuming the operation after cancellation, the demonstration mode is displayed.
However, the resuming can only be accepted after approx. 1 minute.

- **At the completion of the "goodbye screen" display that is shown 60 minutes after the demonstration mode is initiated**
- **When the ignition switch is turned to ON**
- **When the i/SET switch is turned to ON for two seconds**
- **When the battery voltage is low**
- **When the interruption screens except for the followings and the door open warning light illuminate**
  - **– Low keyless transmitter battery warning**
  - **– Key left warning**
  - **– Light-on warning**
  - **– Door open warning**
  - **– Fuel level warning**

3. VARIANT WORK

Perform when replacing with a new combination meter assembly.

- When the combination meter before replacement can communicate with Subaru Select Monitor ([Read Control module setting information] is workable): Perform the operation procedure A.
- When the combination meter before replacement cannot communicate with Subaru Select Monitor ([Read Control module setting information] is not workable): Perform the operation procedure B.

Caution:

When incorrect information is written by [Reading and Writing of the ECU Configuration Information and Odometer Value], [Write ECU setting save data] and [Write ECU setting 12 columns of models], a new combination meter cannot be used because correct information is not displayed. Obtain another new combination meter and write information again.

Item		Contents
[Read Control module setting information]		Read the setting information from the combination meter before replacement, and save it to the Subaru Select Monitor. *1
[Write Control module setting information]	[Write ECU setting save data]	Write the setting information saved by [Read Control module setting information] to the new combination meter. *2
	[Write ECU setting 12 columns of models]	Using applied models and option codes, write the setting information to the new combination meter. *2
[Reading and Writing of the ECU Configuration Information and Odometer Value]		Read the setting information and odometer value from the combination meter before replacement, and write them to the new combination meter.

*1: Odometer value reading and storing are not possible

*2: Odometer value writing is not possible

OPERATION PROCEDURE A

Caution:

- **Carry-over of the odometer value is possible only once. If failed, odometer carry-over cannot be performed anymore.**
- **When odometer value reading is performed, the odometer displays "------" and continued use of the combination meter assembly is impossible.**
- **When the power supply of the Subaru Select Monitor is turned OFF during work, the odometer value data is cleared and carry-over becomes impossible. Be careful of the state of power supply connection of Subaru Select Monitor.**

1. Read and store the setting information and odometer value.
   (1) Connect the Subaru Select Monitor and then turn the ignition switch to ON.
   (2) On [Start] screen, select [Diagnosis].
   (3) On [Select Vehicle] screen, enter vehicle information and select [OK].
   (4) On [Main Menu] screen, select [Each System].
   (5) On [Select System] screen, select [Combination Meter], and then select [Next].
   (6) On [Select Function] screen, select [Work Support], and then select [Reading and Writing of the ECU Configuration Information and Odometer Value].
   (7) Save under a new name according to the display screen.
   (8) When [Do you read the Odometer Value? Odometer of the Meter is locked] is displayed, click the [YES] button.
   (9) Confirm that [Read the Odometer Value] is displayed, and then turn the ignition switch to OFF.
2. Replace the combination meter assembly with a new part. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
   Caution:
   Do not perform the following. Otherwise, saved odometer values will be cleared.
   - **Turn the power supply of Subaru Select Monitor to OFF.**
   - **Communication between Subaru Select Monitor and DST-i is lost. (USB cable is disconnected)**

   Note:
   The data link connector can be removed. If it is interfering with the work, move it outside the vehicle.
3. Write the setting information and odometer value.
   Note:
   When the odometer value writing operation is completed correctly, the odometer value is automatically cleared from the Subaru Select Monitor.
   (1) [Did you replace the Meter?] is displayed. Click the [YES] button.
   (2) When [Do you write Odometer Value?] is displayed, click the [YES] button.
   (3) When [Completed the writing of Odometer Value. Write the ECU Configuration Information] is displayed, click the [OK] button.
   (4) Select the file saved with [Reading and Writing of the ECU Configuration Information and Odometer Value], and click the [Execution] button.
   (5) When [Write?] is displayed, select the [YES] button.
   (6) Confirm that [Write operation was completed.] is displayed, and click the [OK] button.
4. Check if the combination meter assembly operates normally.

OPERATION PROCEDURE B

Note:
With [Write ECU setting 12 columns of models], carry-over of odometer value cannot be performed.

1. Replace the combination meter assembly with a new part. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
2. Write the vehicle data.
   (1) Connect the Subaru Select Monitor and then turn the ignition switch to ON.
   (2) On [Start] screen, select [Diagnosis].
   (3) On [Vehicle selection] screen, enter vehicle information and select [OK].
   (4) On [Main Menu] screen, select [Each System].
   (5) On [Select System] screen, select [Combination Meter], and then select [Next].
   (6) On [Select Function] screen, select [Work Support], and then select [Write Control module setting information].
   (7) From the item list, select [Write ECU setting 12 columns of models]. Enter the applied model (7 digits) and click the [OK] button. Ref. to IDENTIFICATION > IDENTIFICATION NUMBER & LABEL LOCATIONS.
   (8) Enter the option code (4 digits) and click the [OK] button. Ref. to IDENTIFICATION > IDENTIFICATION NUMBER & LABEL LOCATIONS.
   (9) Confirm the vehicle information on [Write ECU setting 12 columns of models] screen, and click the [OK] button.
   (10) When [Write?] is displayed, select the [YES] button.
   (11) Confirm that [Write operation is complete.] is displayed, and click the [OK] button.
3. Check if the combination meter assembly operates normally.

INSTRUMENTATION/DRIVER INFO > Combination Meter System

INSPECTION

1. COMBINATION METER

For inspection, refer to "Basic Diagnostic Procedure" of "COMBINATION METER (DIAGNOSTICS)" section. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. BUZZER

1. Using the Subaru Select Monitor, perform the active test for buzzer. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.
   Note:
   For detailed operation procedures, refer to "Application help".
2. If no buzzer sounds, replace the combination meter assembly.

3. SWITCH

Illumination intensity does not change even when the illumination control switch is operated.
Note:
Illumination intensity does not change even when the illumination control switch is operated with the lighting switch OFF.

1. CHECK CURRENT DATA.

Display the data of [Bright switch input state] and [Illumination control switch input state] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Do the display change as [OFF] ← [ON] and the value range from 0 to 100 when the bright switch and illumination control switch are operated?

Yes — Replace the combination meter assembly.

No — Go to 2.

2. CHECK ILLUMINATION CONTROL SWITCH UNIT.

Check the illumination control switch. Ref. to INSTRUMENTATION/DRIVER INFO>Switches and Harness>INSPECTION > ILLUMINATION CONTROL SWITCH.

Is the switch normal?

Yes — Go to 3.

No — Replace the illumination control switch.

3. CHECK HARNESS.

1. Disconnect the connectors of combination meter assembly and illumination control switch.
2. Measure the resistance between the combination meter assembly and the illumination control switch.

Connector & terminal

(i10) No. 29 — (i79) No. 6:
(i10) No. 30 — (i79) No. 5:
(i10) No. 31 — (i79) No. 4:
(i10) No. 32 — (i79) No. 1:

Is the resistance less than 1 Ω?

Yes — Replace the combination meter assembly.

No — Repair or replace the harness.

NOTE

For procedure of each component in the combination meter system, refer to the respective section.

- Combination meter assembly: Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
- Switches and harness: Ref. to INSTRUMENTATION/DRIVER INFO>Switches and Harness.

WIRING DIAGRAM

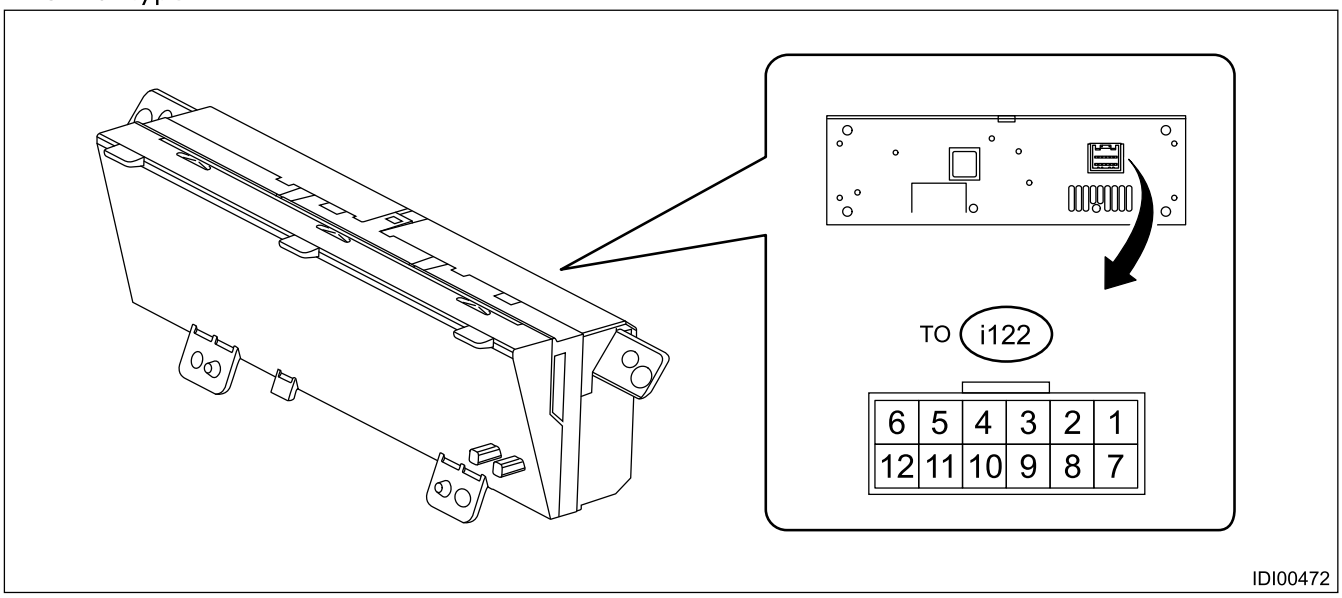
Refer to "Multi-function Display (MFD) System" in WI section.

- Normal type: Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM > STANDARD MFD.
- High grade type: Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM > HIGH GRADE MFD.

ELECTRICAL SPECIFICATION

1. MULTI FUNCTION DISPLAY

- Normal type



Terminal No.	Item	Measuring condition	Standard
1 (+B) ←→ Chassis ground	Voltage	Always	10 — 14 V
2 (IG) ←→ Chassis ground	Voltage	IG OFF → ON	0 V → 10 — 14 V
3 (GND) ←→ Chassis ground	Resistance	Always	Less than 1 Ω
4 (MFD SW+) ←→ Chassis ground	Voltage	SW OFF → ON	0 V → 10 — 14 V
8 (U-ART com.)	—	Cannot be measured	—

- High grade type
  For the specification (electrical component), refer to the "Control Module I/O Signal" of the "MULTI-FUNCTION DISPLAY(DIAGNOSTICS)" section. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

OPERATION

1. DIAGNOSTIC MODE (HIGH GRADE TYPE ONLY)

The settings of the multi-function display can be changed by performing the following procedures to display the diagnostic mode.

Caution:

- **To avoid battery discharge, perform the procedure while charging the battery.**
- **While performing the work, close the front hood and all doors, and do not operate any electrical parts.**
- **Display can not be switched to diagnostic mode if the illumination control dial is set to the position for the dimming cancel function (maximum brightness).**

1. Procedure

Caution:

Perform the steps described in (2) through (5) within 10 seconds.

(1)	Within 3 seconds after turning the ignition switch to ON, set the parking (tail) light switch or the headlight switch to ON.
(2)	While the switch is in ON, press the MFD (INFO) switch three times.
(3)	Turn the parking (tail) light switch or the headlight switch to OFF, and press the MFD (INFO) switch three times.
(4)	Turn the parking (tail) light switch or the headlight switch to ON again, and press the MFD (INFO) switch three times.
(5)	Turn the parking (tail) light switch or the headlight switch to OFF again, and press the MFD (INFO) switch three times.
(6)	Go to “Diagnostic mode”.

Note:

- **Except for the demonstration display setting of the diagnostic mode, the display will terminate by turning the ignition switch to OFF (ACC OFF) or by selecting “Back” from the menu screen.**
- **The demonstration display setting of the diagnostic mode will terminate by starting the engine or removing the battery. Even if the ignition switch is turned to OFF (ACC OFF), then to ON again, the diagnostic mode will not terminate.**
- **To select other menus from the demonstration display setting, terminate the diagnostic mode by starting the engine or removing the battery, then access to the diagnostic mode again.**

2. Display menu

Change the display and settings from each menu.

Menu	Item	Content
Demonstration display setting	—	Shows demonstration display.
Vehicle status confirmation	• CAN communication	Displays the connection and status of input signals.
	• USB	
	• Camera 1 connection	
	• Camera 2 connection	
	• +B	
	• +IGN	
	• Operation button	
Key operation sound	Key operation sound	Select “ON” or “OFF”, then select “Set” to determine.

Menu	Item	Content
Back	—	Finish the diagnostic mode.

INSTRUMENTATION/DRIVER INFO > Multi-function Display (MFD) System

INSPECTION

- Normal type
  Refer to the following inspection steps. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION > SYMPTOM CHART.
- High grade type
  For inspection, refer to “Basic Diagnostic Procedure” of “MULTI-FUNCTION DISPLAY (DIAGNOSTICS)” section. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Basic Diagnostic Procedure.

1. SYMPTOM CHART

Symptoms	Repair order	Note
No display is shown.	1. Power supply 2. Ground circuit 3. Communication circuit harness 4. MFD	Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION > CHECK POWER SUPPLY AND GROUND CIRCUIT AND COMMUNICATION CIRCUIT.
Ambient air temperature/fuel economy displays do not appear.	1. Power supply 2. Ground circuit 3. MFD	Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION > CHECK CLOCK SYSTEM COMMUNICATION CIRCUIT.
Only ambient air temperature display is not displayed.	1. Power supply 2. Harness 3. Ambient sensor 4. Communication circuit 5. MFD	Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION > CHECK AMBIENT TEMPERATURE METER SYSTEM COMMUNICATION CIRCUIT.
Only fuel economy display is not displayed.	1. Setting 2. MFD	Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION > CHECK COMMUNICATION CIRCUIT OF FUEL ECONOMY SYSTEM.

2. CHECK POWER SUPPLY AND GROUND CIRCUIT AND COMMUNICATION CIRCUIT

1. CHECK POWER SUPPLY.

1. Disconnect the MFD connector.
2. Measure the voltage between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Check the harness for open or short between the fuse and MFD.

2. CHECK GROUND CIRCUIT.

Measure the resistance between MFD connector and chassis ground.
Connector & terminal
(i122) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair or replace the harness.

3. CHECK HARNESS BETWEEN MFD AND COMBINATION METER ASSEMBLY.

1. Disconnect the connector of combination meter assembly.
2. Check the harness between MFD and combination meter assembly.
   Connector & terminal
   (i122) No. 8 — (i10) No. 11:

Is harness normal?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK MFD.

1. Remove the MFD.
2. Attach the clock to another vehicle on which the clock display operates normally, and check its operation.

Is MFD normal?

Yes — Replace the meter - main assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

No — Replace MFD.

3. CHECK CLOCK SYSTEM COMMUNICATION CIRCUIT

1. CHECK POWER SUPPLY.

1. Disconnect the MFD connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 2 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 2.

No — Repair or replace the harness.

2. CHECK GROUND CIRCUIT.

Measure the resistance between MFD connector and chassis ground.
Connector & terminal
(i122) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair or replace the harness.

3. CHECK MFD.

1. Remove the MFD.
2. Attach the clock to another vehicle on which the clock display operates normally, and check its operation.

Is MFD normal?

Yes	Repair the poor contact of connector.
No	Replace MFD.

4. CHECK AMBIENT TEMPERATURE METER SYSTEM COMMUNICATION CIRCUIT

1. CHECK AMBIENT SENSOR POWER SUPPLY.

1. Disconnect the ambient sensor connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the ambient sensor connector and chassis ground.
   Connector & terminal
   (B480) No. 2 (+) — Chassis ground (−):

Is the voltage 4 V or more?

Yes	Go to 2.
No	Check the harness for open or short between the fuse and ambient sensor.

2. CHECK HARNESS BETWEEN AMBIENT SENSOR AND COMBINATION METER ASSEMBLY.

1. Disconnect the connector of combination meter assembly.
2. Check harness between ambient sensor and combination meter assembly.
   Connector & terminal
   (B480) No. 1 — (i10) No. 24:
   (B480) No. 2 — (i10) No. 23:

Is harness normal?

Yes	Go to 3.
No	Repair or replace the harness.

3. CHECK AMBIENT SENSOR.

Check the ambient sensor.

Is the ambient sensor operating properly? Ref. to AIR CONDITIONER>Ambient Sensor>INSPECTION.

Yes — Go to 4.

No — Replace the ambient sensor.

4. CHECK AMBIENT TEMPERATURE DISPLAY.

1. Connect the combination meter assembly connector.
2. Install the 3 kΩ resistance between connector terminals of the ambient sensor.
3. Turn the ignition switch to ON.

Connector & terminal

(B480) No. 1 — No. 2:

Does the ambient temperature display 25°C (77°F)?

Yes — Repair the poor contact between the ambient sensor and harness connector.

No — Go to 5.

5. CHECK CURRENT DATA.

Display the [Ambient Air Temperature] data using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to “Application help”.

Is the ambient temperature of 25°C (77°F) output?

Yes — Go to 6.

No — Replace the meter - main assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

6. CHECK MFD.

1. Remove the MFD.
2. Attach the ambient temperature display to another vehicle on which the ambient temperature display operates normally to check its operation.

Does the ambient temperature display 25°C (77°F)?

Yes	Replace MFD.
No	Replace the meter - main assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

5. CHECK COMMUNICATION CIRCUIT OF FUEL ECONOMY SYSTEM

1. CHECK FUEL ECONOMY DISPLAY OFF MODE.

Check that the mode display changes when the MFD (INFO) switch is operated.
(Display changes in the following order: cruising distance → average fuel economy → instantaneous fuel economy → continuous driving time → average vehicle speed → blank display)

Is fuel economy displayed?

Yes	MFD is normal.
No	Go to 2.

2. CHECK MFD.

1. Remove the MFD.
2. Attach the fuel economy display to another vehicle on which the fuel economy display operates normally to check its operation.

Is the fuel economy display correct?

Yes	Replace the meter - main assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Replace MFD.

INSTRUMENTATION/DRIVER INFO > Multi-function Display (MFD) System

NOTE

For procedure of each component in the Multi-Function Display (MFD) system, refer to the respective section.

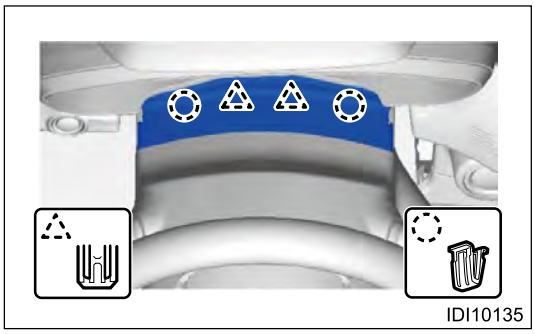
- Multi-function display (MFD): Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
- Multi-function display switch: Ref. to INSTRUMENTATION/DRIVER INFO>Switches and Harness.

REMOVAL

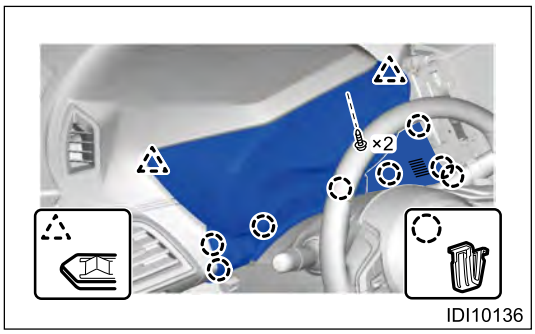
Caution:

When the combination meter assembly is replaced, perform the variant work. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > VARIANT WORK.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Release the lock, tilt the steering column to the lowest end and fully extend the column by the telescopic system.
3. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
4. Remove the grille assembly - CTR ventilation LH. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
5. Remove the visor assembly - combination meter.
   (1) Release the clips and claws of the cover assembly - visor LWR.



   (2) Release the screws, clips and claws.

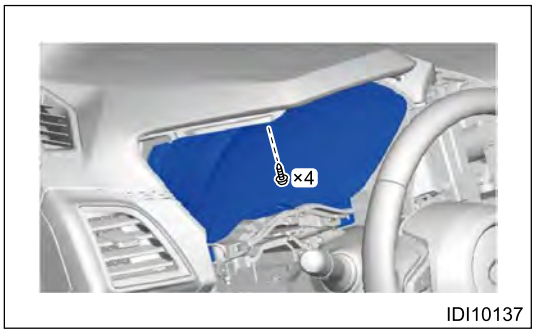


   (3) Disconnect the connector, and remove the visor assembly - combination meter.
6. Remove the combination meter assembly.

   Caution:

   Be careful not to damage the meter glass or instrument panel.

   (1) Remove the screws.



(2) Pull the combination meter assembly toward you and disconnect the connector.

INSTRUMENTATION/DRIVER INFO > Combination Meter

INSTALLATION

Caution:

- **Make sure the electrical connector is connected securely.**
- **Make sure that each meter operates normally.**
- **For the model without keyless access with push button start except for C5 model, when the combination meter assembly is replaced, perform the registration of immobilizer. For detailed operation procedure, refer to "Type B" described in "REGISTRATION MANUAL FOR IMMOBILIZER".**
- **When the combination meter assembly is replaced, perform the variant work. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > VARIANT WORK.**

1. Install the combination meter assembly.
2. Install the visor assembly - combination meter.
3. Install the grille assembly - CTR ventilation LH.
4. Install the cover assembly - instrument panel LWR driver.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

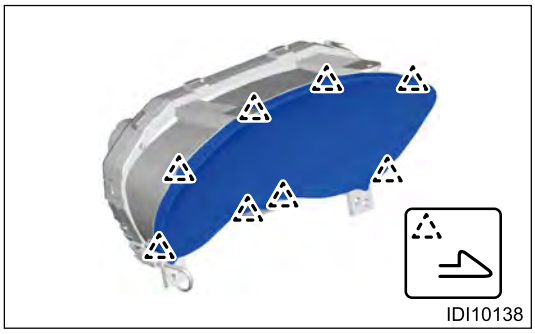
INSTRUMENTATION/DRIVER INFO > Combination Meter

DISASSEMBLY

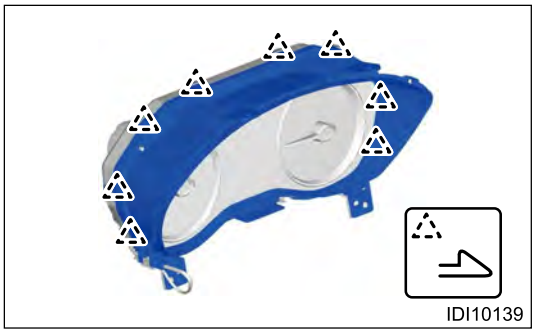
Caution:

- **Use gloves to avoid damage and getting fingerprints on the glass surface and meter surfaces.**
- **Be sure not to touch the meter indicator needle.**
- **Because LED components are used for all of warning lights and indicator lights, they are not removable from the meter - main assembly.**

1. Remove the glass - combination meter.
   (1) Release the claws, and then remove the glass - combination meter.



2. Remove the visor - combination meter.
   (1) Release the claws, and then remove the visor - combination meter.



INSTRUMENTATION/DRIVER INFO > Combination Meter

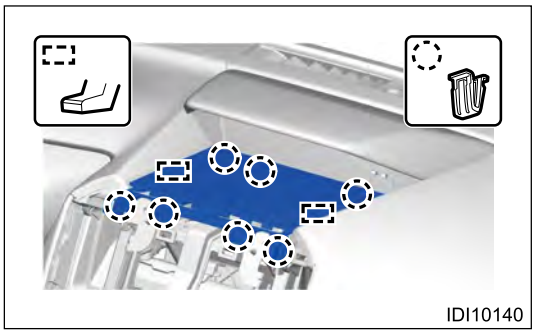
ASSEMBLY

1. Install the visor - combination meter.
2. Install the glass - combination meter.

INSTRUMENTATION/DRIVER INFO > Multi-function Display (MFD)

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
3. Remove the panel - center UPR, and remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
4. Remove the cover - center UPR.
   (1) Release the clip and hook, and then remove the cover - center UPR.



Note:

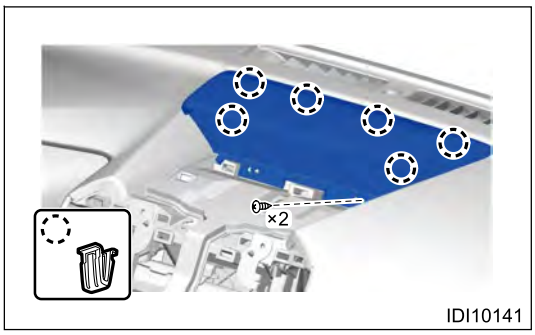
Lightly push up the back of the cover - center UPR, hook the finger to the end portion and pull it toward you to remove it.

5. Remove the multi-function display.

Caution:

Be careful not to damage the multi-function display or instrument panel.

(1) Remove the screws and release the clip.
(2) Pull the multi-function display assembly toward yourself, and disconnect the connector.



(3) Remove the screws and then remove the multi-function display.



INSTRUMENTATION/DRIVER INFO > Multi-function Display (MFD)

INSTALLATION

Caution:

- **Make sure the electrical connector is connected securely.**
- **Make sure that the multi-function display operates normally.**

1. Install the multi-function display.
2. Install the cover - center UPR.
3. Install the audio assembly or navigation assembly.
4. Install the panel - center UPR.
5. Install the grille assembly - CTR ventilation.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. MULTI INFORMATION DISPLAY SWITCH

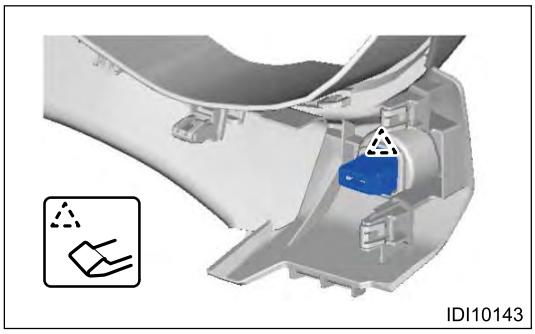
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the tire to the straight-ahead position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the switch assembly - steering (MID). Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>DISASSEMBLY.

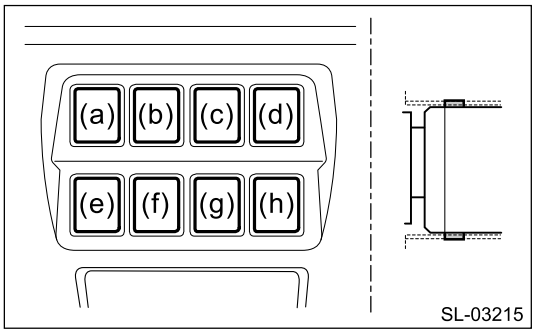
2. TRIP RESET SWITCH

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the visor assembly - combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
4. Remove the switch - meter.
   (1) Release the claws, and remove the switch - meter.



3. ILLUMINATION CONTROL SWITCH

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the illumination control switch.
   (1) Release the claws and remove the illumination control switch (b).



4. MULTI-FUNCTION DISPLAY SWITCH

The multi-function display switch is integrated into the satellite switch assembly. For the operation procedures, refer to the "ENTERTAINMENT & MONITORING" section. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

INSTRUMENTATION/DRIVER INFO > Switches and Harness

INSTALLATION

1. MULTI INFORMATION DISPLAY SWITCH

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**
- **Securely install the switch. Improper insertion of the pin or claw of the switch may cause improper installation.**

1. Install the switch assembly - steering (MID).
2. Align the center position of the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>ADJUSTMENT.
3. Install the steering wheel.
   Tightening torque:
   39 N·m (4 kgf-m, 28.8 ft-lb)
   Clearance:
   Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)
4. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. TRIP RESET SWITCH

1. Install the switch - meter.
2. Install the visor assembly - lower.
3. Install the cover assembly - instrument panel LWR driver.

4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. ILLUMINATION CONTROL SWITCH

1. Install the illumination control switch.
2. Install the cover assembly - instrument panel LWR driver OUT.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

4. MULTI-FUNCTION DISPLAY SWITCH

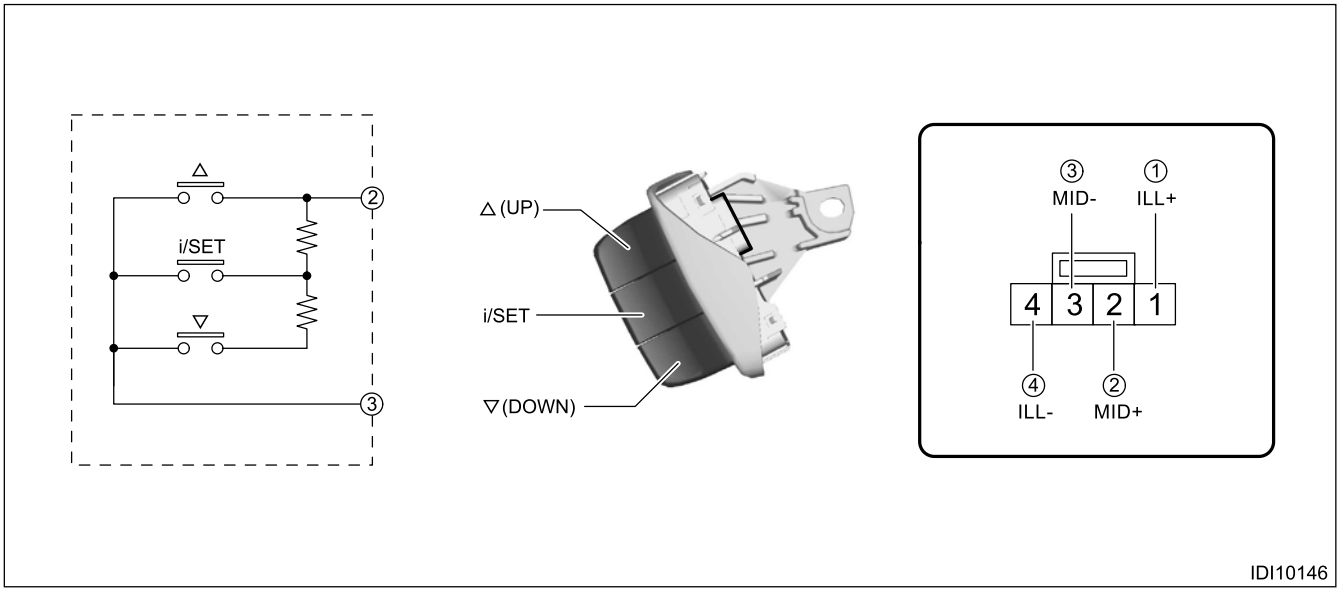
The multi-function display switch is integrated into the satellite switch assembly. For the operation procedures, refer to the "ENTERTAINMENT & MONITORING" section. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

INSTRUMENTATION/DRIVER INFO > Switches and Harness

INSPECTION

1. MULTI INFORMATION DISPLAY SWITCH

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions		Standard
3 — 2	△ (UP) i/SET ▽ (DOWN)	All OFF	Approx. 1 MΩ or more
	△ (UP)	ON	Less than 1 Ω
	i/SET	ON	Approx. 1,000 Ω
	▽ (DOWN)	ON	Approx. 3,700 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
1 (+) — 4 (−)	Apply battery voltage.	Light ON

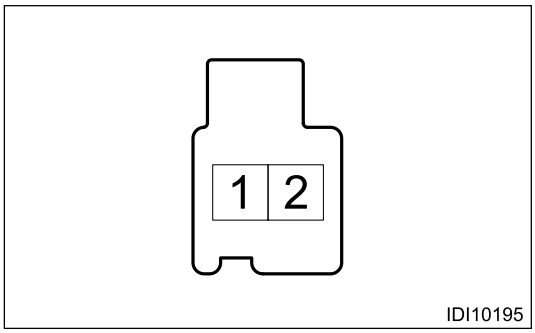
3. Replace the switch assembly - steering (MID) if it is found defective.

2. TRIP RESET SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

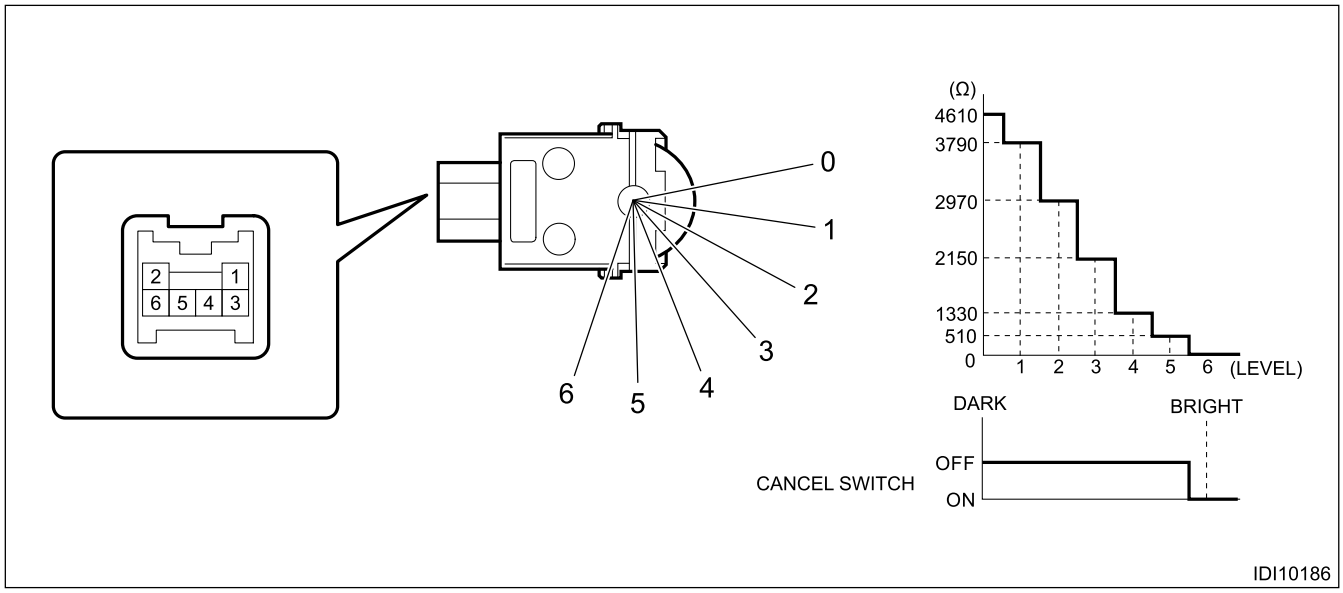
2. Replace the switch - meter if it is found defective.

3. ILLUMINATION CONTROL SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 6	Bright switch OFF	10 kΩ or more
	Bright switch ON	Less than 1 Ω
4 — 6	Always	Approx. 4,710 Ω
5 — 6	Illumination control switch upward fully open	Approx. 510 Ω
	Illumination control switch downward fully open	Approx. 4,610 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination

inside the switch.

Terminal No.	Inspection conditions	Specification
2 (+) — 3 (−)	Apply battery voltage.	Light ON

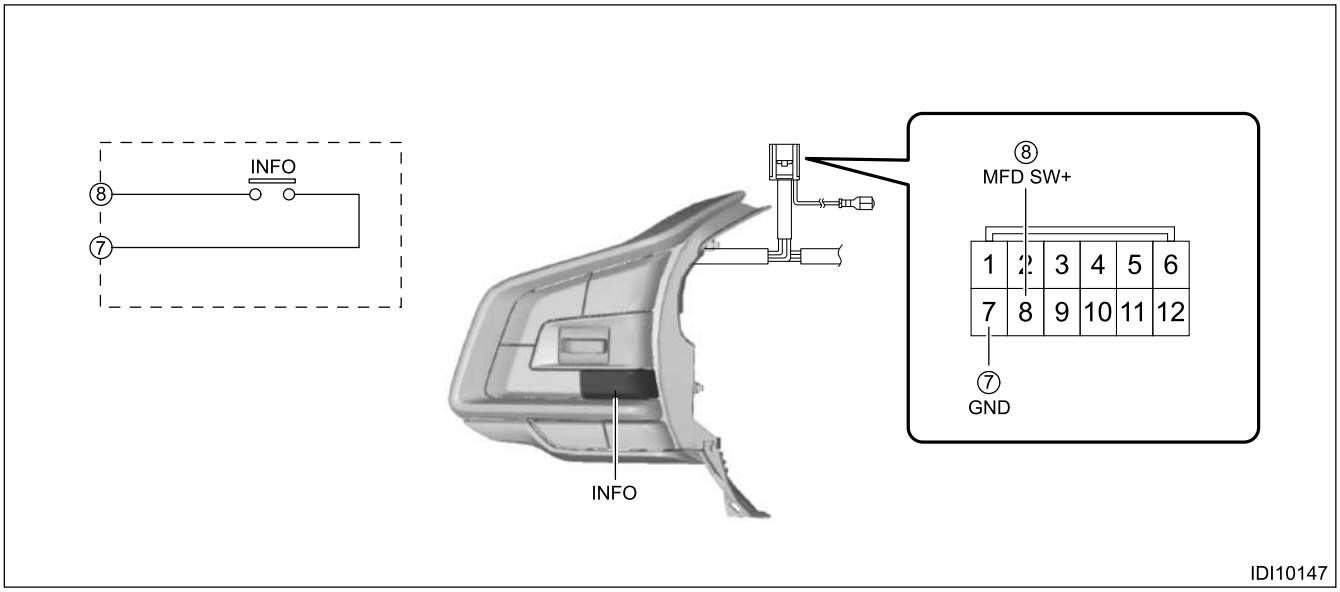
3. Replace the illumination control switch if it is found defective.

4. MULTI-FUNCTION DISPLAY SWITCH

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions		Standard
8 — 7	INFO	OFF	3 MΩ or more
		ON	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

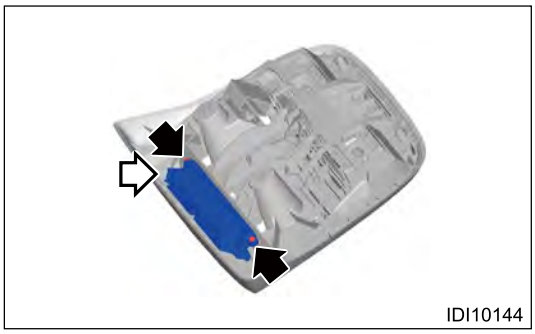
Terminal No.	Inspection conditions	Specification
10 (+) — 11 (−)	Apply battery voltage.	Light ON

3. If it is found to be defective as a result of the inspection, replace the satellite switch (INFO).

REMOVAL

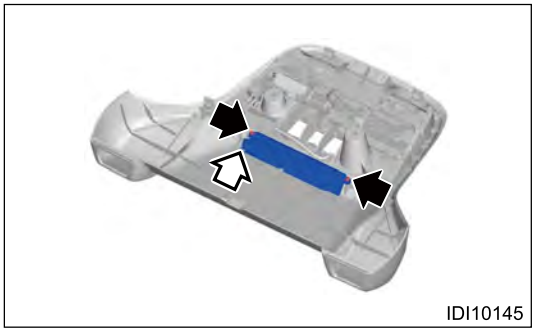
1. MODELS WITHOUT EYESIGHT

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the overhead console. Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
3. Remove the warning box.
   (1) Disconnect the connector.
   (2) Remove the screws, and remove the warning box.



2. MODELS WITH EYESIGHT

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the stereo camera cover assembly. Ref. to EyeSight>Stereo Camera>REMOVAL.
3. Remove the warning box.
   (1) Disconnect the connector.
   (2) Remove the screws, and remove the warning box.



INSTALLATION

1. MODELS WITHOUT EYESIGHT

Caution:

- **Make sure the electrical connector is connected securely.**
- **Make sure that each indicator operates normally.**

1. Install the warning box.
2. Install the overhead console. Ref. to LIGHTING SYSTEM>Spot Map Light>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. MODELS WITH EYESIGHT

Caution:

- **Make sure the electrical connector is connected securely.**
- **Make sure that each indicator operates normally.**

1. Install the warning box.
2. Install the stereo camera cover assembly. Ref. to EyeSight>Stereo Camera>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

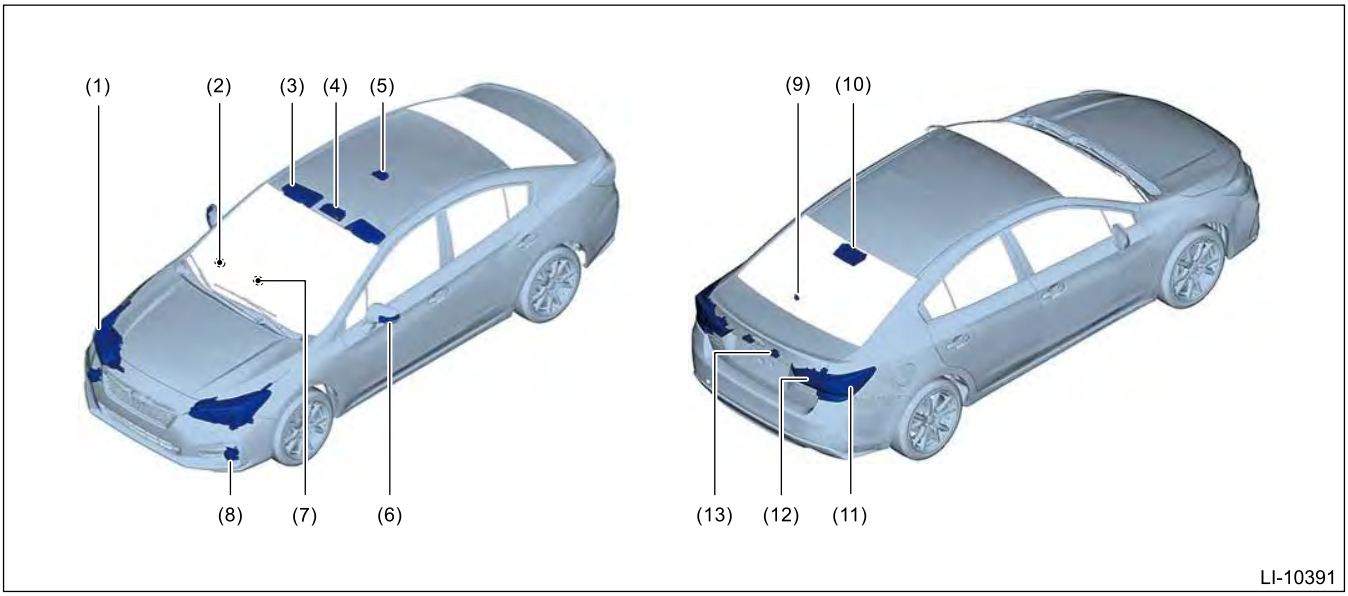
LIGHTING SYSTEM

LI

1. General Description
2. Relay and Fuse
3. Headlight System
4. High Beam Assist System
5. Day Time Running Light System
6. Clearance Light and Illumination Light System
7. Front Fog Light System
8. Turn Signal Light and Hazard Light System
9. Back-up Light System
10. Stop Light System
11. Interior Light System
12. Auto Headlight Beam Leveler System
13. Combination Switch (Light)
14. Light Control Sensor
15. Headlight Assembly
16. Hazard Switch
17. Front Fog Light Assembly
18. Day Time Running Light Assembly
19. Side Turn Signal Light Assembly
20. Rear Combination Light Assembly
21. Rear Finisher Light Assembly
22. License Plate Light
23. High-mounted Stop Light
24. Spot Map Light
25. Room Light
26. Luggage Room Light
27. Trunk Room Light
28. LED Illumination Light
29. Vanity Mirror Light
30. Ignition Switch Illumination
31. Auto Headlight Beam Leveler Control Module
32. Rear Height Sensor
33. Reflex Reflector
34. Door Switch
35. SRF OFF Switch
36. SRH OFF Switch

SPECIFICATION

- 4 door model

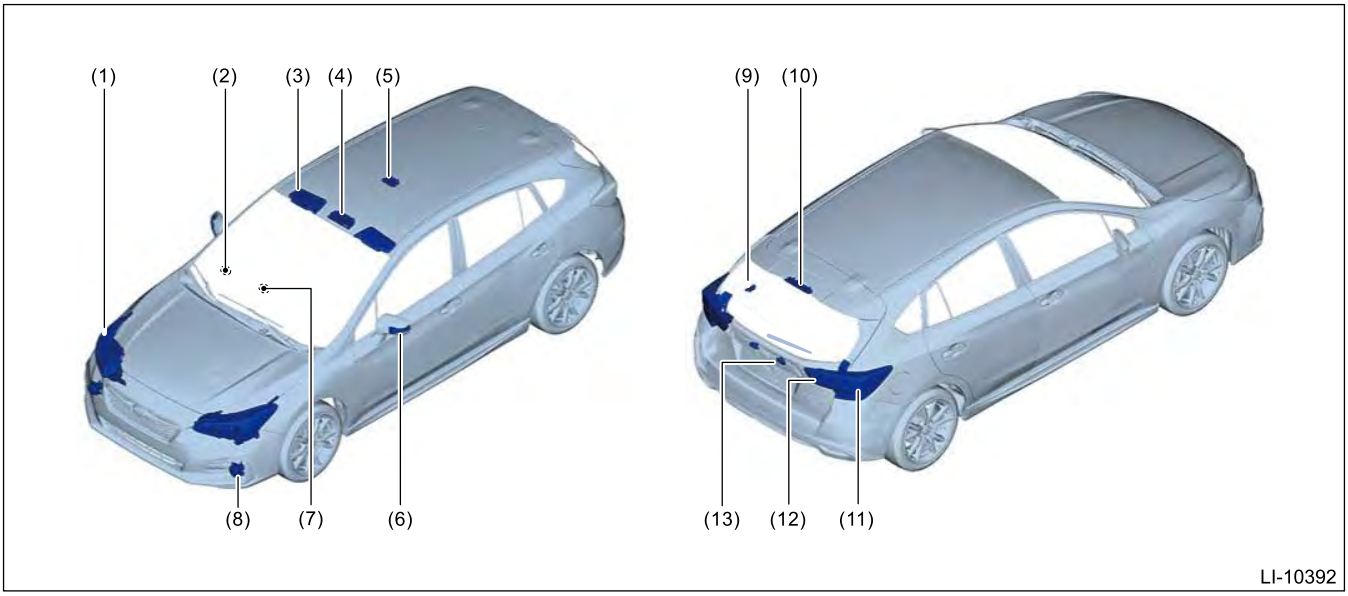


No.	Description		Capacity and wattage	Type
(1)	Headlight (halogen type)	Low beam	12 V — 55 W	H11
		High beam	12 V — 60 W	HB3
		Parking light / front turn signal light	12 V — 8 / 28 W	744NA
		Side marker light	12 V — 5 W	W5W
	Headlight (LED type)	Low beam / high beam	12.5 V — 23 W (LED)	*
		Front turn signal light	12 V — 28 W	744NA
		Daytime running light / parking light	12 V — 11.8 /0.9 W (LED)	*
		Side marker light	12 V — 5 W	W5W
(2)	Glove box light		12 V — 1.4 W (LED)	*
(3)	Vanity mirror light		12 V — 2 W	—
(4)	Spot map light		12 V — 8 W	—
(5)	Room light		12 V — 8 W	—
(6)	Side turn signal light		12 V — 0.4 W (LED)	*
(7)	Pocket light		12 V — 1.4 W (LED)	*
(8)	Front fog light	Model without SRF	12 V — 19 W	H16
		Model with SRF	12 V — 55 W	H11
	Daytime running light		12 V — 1.9 W (LED)	*
(9)	Trunk room light		12 V — 3.8 W	SAE#194
(10)	High-mounted stop light	Normal glass	12 V — 0.7 W (LED)	*
		Privacy glass	12 V — 2 W (LED)	*
(11)	Rear combination light	Tail light / side marker light	12 V — 5 W	W5W
		Stop light	13.5 V — 2 W (LED)	*

No.	Description		Capacity and wattage	Type
		Turn signal light	12 V — 21 W	WY21W
(12)	Rear finisher light	Back-up light	12 V — 21 W	W21W
(13)	License plate light		12 V — 5 W	W5W

*: Non-disassembly type

- 5 door model



No.	Description		Capacity and wattage	Type
(1)	Headlight (halogen type)	Low beam	12 V — 55 W	H11
		High beam	12 V — 60 W	HB3
		Parking light / front turn signal light	12 V — 8 / 28 W	744NA
		Side marker light	12 V — 5 W	W5W
	Headlight (LED type)	Low beam / high beam	12.5 V — 23 W (LED)	*
		Front turn signal light	12 V — 28 W	744NA
		Daytime running light / parking light	12 V — 11.8 /0.9 W (LED)	*
		Side marker light	12 V — 5 W	W5W
(2)	Glove box light		12 V — 1.4 W (LED)	*
(3)	Vanity mirror light		12 V — 2 W	—
(4)	Spot map light		12 V — 8 W	—
(5)	Room light		12 V — 8 W	—
(6)	Side turn signal light		12 V — 0.4 W (LED)	*
(7)	Pocket light		12 V — 1.4 W (LED)	*
(8)	Front fog light	Model without SRF	12 V — 19 W	H16
		Model with SRF	12 V — 55 W	H11
(9)	Luggage room light		12 V — 5 W	W5W
(10)	High-mounted stop light		12 V — 1.1 W (LED)	*

No.	Description		Capacity and wattage	Type
(11)	Rear combination light	Tail light	12 V — 5 W	W5W
		Stop light	13.5 V — 2 W (LED)	*
		Turn signal light	12 V — 21 W	WY21W
		Side marker light	12 V — 5 W	W5W
(12)	Rear finisher light	Back-up light	12 V — 21 W	W21W
(13)	License plate light		12 V — 5 W	W5W

*: Non-disassembly type

LIGHTING SYSTEM > General Description

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the audio and MFD parts provided with memory functions, record the memory contents before disconnecting the battery ground cable.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.
- Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
- Always replace with a bulb that is the same model and wattage as those of the old one.

LIGHTING SYSTEM > General Description

PREPARATION TOOL

1. SPECIAL TOOL

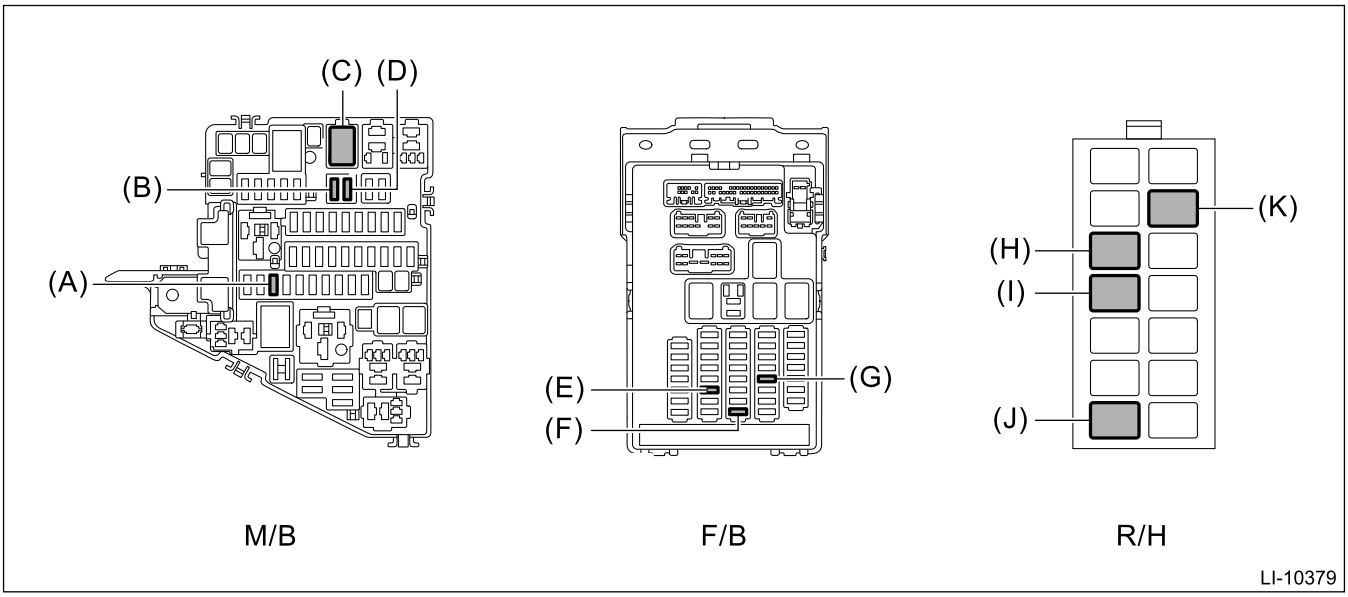
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

TOOL NAME	REMARKS
DST-i	Used together with Subaru Select Monitor 4.
Clip remover	Used for removing clips.

LOCATION



Main fuse box (M/B)	Fuse 15 A (front fog light relay)	(A)
	Fuse 15 A (front combination light LH)	(B)
	Headlight relay LO	(C)
	Fuse 15 A (front combination light RH)	(D)
Relay & fuse box (F/B)	Fuse 10 A (luggage room light, trunk room light)	(E)
	Fuse 7.5 A (stop light and brake switch)	(F)
	Fuse 10 A (daytime running light relay)	(G)
Relay holder (R/H)	Front fog light relay RH*2	(H)
	Front fog light relay LH*2	(I)
	Front fog light relay*1	
	Daytime running light relay	(J)
	Stop light relay	(K)

*1: Model without SRF
*2: Model with SRF

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

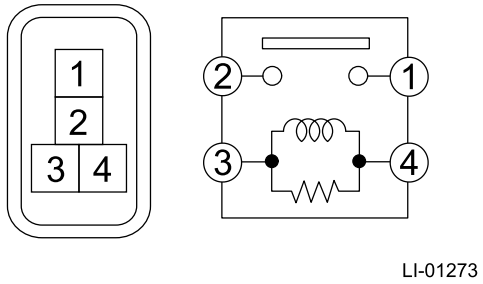
1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

Note:

If the fuse is blown again, check the system wiring harness.

2. CHECK RELAY

1. Measure the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 LI-01273
1 — 2	Apply battery voltage between terminals 4 and 3.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

WIRING DIAGRAM

Refer to "Headlight System and Day Time Running Light System" in the wiring diagram. Ref. to WIRING SYSTEM>Headlight System and Daytime Running Light System>WIRING DIAGRAM.

INSPECTION

1. CHECK HALOGEN HEADLIGHT SYSTEM

Trouble symptom:
Headlight does not illuminate.

1. CHECK HEADLIGHT AND TAIL LIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Set the lighting switch to the switch 1 (TAIL/PARKING) and switch 2 (HEAD).

Do the headlight and tail light illuminate?

Yes	The headlight system is normal.
No	Go to 2.

2. CHECK BULB.

Check the headlight bulb.

Is the bulb normal?

Yes	Go to 3.
No	Replace the headlight bulb.

3. CHECK CURRENT DATA.

Display the data of [Lighting I Switch Input] and [Lighting II Switch Input] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Does the display switch between [OFF] ←→ [ON] when the lighting switch is moved to the switch 1 (TAIL/PARKING) and switch 2 (HEAD) positions?

Yes — Go to 6.

No — Go to 4.

4. CHECK COMBINATION SWITCH (LIGHT).

1. Turn the ignition switch to OFF.
2. Check the combination switch (light). Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

Is the combination switch (light) normal?

Yes — Go to 5.

No — Replace the combination switch (light).

5. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and combination switch (light).
2. Check the harness between body integrated unit and combination switch (light).

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

6. CHECK CURRENT DATA.

1. Turn the ignition switch to ON.
2. Display the data of [Lighting I Lamp Output] and [Lighting II Lamp Output] using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when the lighting switch is moved to the switch 1 (TAIL/PARKING) and switch 2 (HEAD) positions?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 7.

7. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Check the harness between body integrated unit and headlight and between body integrated unit and tail light.

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

2. CHECK LED HEADLIGHT SYSTEM

Trouble symptom:
Headlight does not illuminate, or headlight is weak.

1. CHECK HEADLIGHT AND TAIL LIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Set the lighting switch to the switch 1 (TAIL/PARKING) and switch 2 (HEAD).

Do the headlight and tail light illuminate?

Yes	The headlight system is normal.
No	Go to 2.

2. CHECK BULB.

Display the data of [LED HEADLAMP(RH) error Signal] and [LED HEADLAMP(LH) error Signal] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is «ON» displayed?

Yes	Go to 3.
No	Replace the headlight assembly.

3. CHECK CONNECTOR CONNECTION.

Check that the headlight connector is connected.

Is the connector connected?

Yes	Go to 4.
No	Connect the connector. When it does not illuminate even though the switch is turned to ON: Go to 4.

4. CHECK HARNESS.

1. Disconnect the headlight connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the headlight connector and chassis ground.

Connector & terminal

LH side

(B487) No. 1 (+) — Chassis ground (−):

(B487) No. 3 (+) — Chassis ground (−):

RH side

(B477) No. 1 (+) — Chassis ground (−):

(B477) No. 3 (+) — Chassis ground (−):

Is the voltage 10 — 13.5 V?

Yes — Go to 5.

No — Go to 6.

5. CHECK HEADLIGHT.

Apply battery voltage between headlight unit connector terminals.

Terminals

Low beam

No.3 (+) — No. 4 (−):

High beam

No.1 (+) — No. 2 (−):

Does the headlight (low beam and high beam) come on at normal brightness?

Yes — Go to 6.

No — Replace the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly.
Perform inspection for the malfunction signal line if the [LED HEADLAMP(RH) error Signal] and [LED HEADLAMP(LH) error Signal] do not illuminate in step 2). If short circuit to power supply occurs, repair or replace the harness.

6. CHECK CURRENT DATA.

1. Turn the ignition switch to ON.
2. Display the data of [Lighting I Lamp Output] and [Lighting II Lamp Output] using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when the lighting switch is moved to the switch 1 (TAIL/PARKING) and switch 2 (HEAD) positions?

Yes — Go to 9.

No — Go to 7.

7. CHECK COMBINATION SWITCH (LIGHT).

1. Turn the ignition switch to OFF.
2. Check the combination switch (light). Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

Is the combination switch (light) normal?

Yes — Go to 8.

No — Replace the combination switch (light). Ref. to LIGHTING SYSTEM>Combination Switch (Light).

8. CHECK HARNESS.

1. Disconnect the connector of body integrated unit.
2. Check the harness between body integrated unit and combination switch (light).

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

9. CHECK CURRENT DATA.

1. Turn the ignition switch to ON.
2. Display the data of [Lighting I Lamp Output] and [Lighting II Lamp Output] using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when the lighting switch is moved to the switch 1 (TAIL/PARKING) and switch 2 (HEAD) positions?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 10.

10. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector and the headlight and tail light connectors.
3. Check the harness between body integrated unit and headlight and between body integrated unit and tail light.

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

3. AUTO HEADLIGHT SYSTEM CHECK

Note:

Check each headlight system before checking the auto headlight system.

- **Halogen headlight: Ref. to LIGHTING SYSTEM>Headlight System>INSPECTION > CHECK HALOGEN HEADLIGHT SYSTEM.**
- **LED headlight: Ref. to LIGHTING SYSTEM>Headlight System>INSPECTION > CHECK LED HEADLIGHT SYSTEM.**

1. CHECK HEADLIGHT AND TAIL LIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Make the light control sensor vicinity dark.
3. Set the lighting switch to AUTO position.
4. Make the light control sensor vicinity bright.
5. Turn the lighting switch to the OFF position and turn to the AUTO position again.

Do the parking light, headlight and tail light illuminate?

Yes — The auto headlight system is normal.

No — Go to 2.

2. CHECK CURRENT DATA.

1. Display the [Illumination Sensor Output] data using Subaru Select Monitor.
2. Measure the voltage when the area around the light control sensor, which was dark, becomes bright.

Note:

For detailed operation procedures, refer to "Application help".

Illumination sensor output

Dark condition: Approx. 0.6 V or less

Bright condition: Approx. 3 V or more

Is the voltage output according to the brightness?

Yes — Go to 5.

No — Go to 3.

3. CHECK LIGHT CONTROL SENSOR.

Check the light control sensor. Ref. to LIGHTING SYSTEM>Light Control Sensor>INSPECTION.

Is the light control sensor normal?

Yes — Go to 4.

No — Replace the light control sensor.

4. CHECK HARNESS.

1. Disconnect the connectors from body integrated unit and light control sensor.
2. Check the harness between body integrated unit and light control sensor.
   Connector & terminal
   (i171) No. 8 — (i89) No. 1:
   (i171) No. 28 — (i89) No. 2:
   (i171) No. 34 — (i89) No. 3:

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

5. CHECK CURRENT DATA.

Display the [Lighting AUTO input] data using Subaru Select Monitor.

Does the display change as [OFF] ←→ [ON] when the lighting switch is moved to AUTO position?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 6.

6. CHECK COMBINATION SWITCH (LIGHT).

1. Turn the ignition switch to OFF.
2. Check the combination switch (light). Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

Is the combination switch (light) normal?

Yes — Go to 7.

No — Replace the combination switch (light).

7. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and combination switch (light).
2. Check the harness between body integrated unit and combination switch (light).

Is harness normal?

Yes	Check the body integrated unit and replace it if defective. • Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. • Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair or replace the harness.

4. CHECK OF WELCOME LIGHTING SYSTEM

Trouble symptom:
Welcome lighting does not illuminate.

1. CHECK BODY INTEGRATED UNIT SETTING.

Display the data of [Welcome Light Off Delay Time(Approaching)] or [Welcome Light Off Delay Time(Exiting)] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to "Application help".

Is the setting other than [OFF]?

Yes	Go to 2.
No	Turn the setting to other than [OFF].

2. CHECK BODY INTEGRATED UNIT SETTING.

Display the [Illumination Sensor Setting] data using Subaru Select Monitor.

Is the setting in the [Exist]?

Yes	Go to 3.
No	Turn the setting to [Support].

3. CHECK AUTO HEADLIGHT.

1. Set the lighting switch to AUTO position.
2. Make the light control sensor vicinity dark.
3. Turn the ignition switch to ON.

Do the parking light, tail and headlight illuminate?

Yes — Go to 4.

No — Check the auto headlight system. Ref. to LIGHTING SYSTEM>Headlight System>INSPECTION > AUTO HEADLIGHT SYSTEM CHECK.

4. CHECK DOOR LOCK.

Operate the door lock using the keyless transmitter or the access key.

Do the lock and unlock operate properly?

Yes — Go to 5.

No
- Check keyless entry system. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Basic Diagnostic Procedure.
- Check the keyless access with push button start system. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.

5. CHECK BODY INTEGRATED UNIT.

1. Display the [IGN voltage] data using Subaru Select Monitor.
2. Turn the ignition switch to ON.

Is the voltage 10 — 15 V?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

5. CHECK OF WELCOME LIGHTING SYSTEM

Trouble symptom:
Welcome lighting does not go off.

1. CHECK BODY INTEGRATED UNIT SETTING.

Display the data of [Welcome Light Off Delay Time(Approaching)] or [Welcome Light Off Delay Time(Exiting)] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is the illumination time setting correct?

Yes — Go to 2.

No — Set the illumination time.

2. CHECK THE LIGHTS.

Set the lighting switch to the switch 1 (TAIL/PARKING) and switch 2 (HEAD).

Do the parking light, tail light and headlight illuminate?

Yes — Go to 3.

No — Check the combination switch (light) and each light circuit.

3. CHECK BODY INTEGRATED UNIT.

Display the [Driver's door SW input] data using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when driver's door is opened/closed?

Yes — Go to 4.

No — Check the door switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR SWITCH.

4. CHECK DOOR LOCK.

Operate the door lock using the keyless transmitter or the access key.

Do the lock and unlock operate properly?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No
- Check keyless entry system. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Basic Diagnostic Procedure.
- Check the keyless access with push button start system. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.

6. CHECK WIPER INTERLOCK HEADLIGHT SYSTEM

Trouble symptom:
The headlights do not go off when the wiper is deactivated, or the headlights do not turn on when the wiper is activated.

1. CHECK HEADLIGHT SYSTEM.

Check the operation of the headlight system.

Is the headlight system normal?

Yes — Go to 2.

No — Check and repair the headlight system.
- Halogen headlight: Ref. to LIGHTING SYSTEM>Headlight System>INSPECTION > CHECK HALOGEN HEADLIGHT SYSTEM.
- LED headlight: Ref. to LIGHTING SYSTEM>Headlight System>INSPECTION > CHECK LED HEADLIGHT SYSTEM.

2. CHECK BODY INTEGRATED UNIT SETTING.

Display the [Illumination Sensor Setting] data using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is the setting in the [Support]?

Yes — Go to 3.

No — Turn the setting to [Support].

3. CHECK BODY INTEGRATED UNIT.

1. Display the [IGN voltage] data using Subaru Select Monitor.
2. Turn the ignition switch to ON.

Is the voltage 10 — 15 V?

Yes — Go to 6.

No — Go to 4.

4. CHECK HARNESS.

Measure the voltage between F/B fuse No. 5 and chassis ground.

Is the voltage 10 V or more?

Yes — Repair or replace the harness between the body integrated unit and the ignition switch.

No — Go to 5.

5. CHECK CONNECTOR.

Check the connector or terminal of the body integrated unit for poor contact.

Is there any fault?

Yes — Repair or replace the connector and harness.

No — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

6. CHECK BODY INTEGRATED UNIT.

Display the [Lighting AUTO input] data using Subaru Select Monitor.

Does the display change as [OFF] ←→ [ON] when the lighting switch is moved to AUTO position?

Yes — Go to 11.

No — Go to 7.

7. CHECK BODY INTEGRATED UNIT.

Measure the voltage between the body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 20 (+) — Chassis ground (−):

Does the voltage change as OFF (9 to 16 V) ←→ ON (less than 1 V) when the lighting switch is moved to the AUTO position?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 8.

8. CHECK HARNESS.

1. Disconnect the connectors of the combination switch (light) and the body integrated unit.
2. Check the harness between the combination switch (light) and the body integrated unit.
   Connector & terminal
   (i73) No. 12 — (i81) No. 20:

Is the resistance less than 10 Ω?

Yes — Go to 9.

No — Repair or replace the harness between the combination switch (light) and the body integrated unit.

9. CHECK HARNESS.

Check the harness between the combination switch (light) and chassis ground.
Connector & terminal
(i73) No. 19 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 10.

No — Repair or replace the harness between the combination switch (light) and chassis ground.

10. CHECK COMBINATION SWITCH (LIGHT).

Check the combination switch (light). Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

Is the combination switch (light) normal when the combination switch (light) is moved to AUTO position?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the combination switch (light).

11. CHECK BODY INTEGRATED UNIT.

Display the [Fr wiper input] data using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when the combination switch (wiper) is operated to INT/LO/HI?

Yes — Go to 16.

No — Go to 12.

12. CHECK BODY INTEGRATED UNIT.

Measure the voltage between the body integrated unit connector and chassis ground.

Connector & terminal

(B280) No. 1 (+) — Chassis ground (−):

Does the voltage switch between OFF (less than 1 V) ←→ ON (9 to 16 V) when the combination switch (wiper) is operated to INT/LO/HI?

Yes — Check the body integrated unit and replace it if defective.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 13.

13. CHECK HARNESS.

1. Disconnect the connectors of the front wiper motor and the body integrated unit.
2. Check the harness between the front wiper motor and the body integrated unit.

Connector & terminal

(B8) No. 1 — (B280) No. 6:

Is the resistance less than 10 Ω?

Yes — Go to 14.

No — Repair or replace the harness between the front wiper motor and the body integrated unit.

14. CHECK HARNESS.

Check the harness between the front wiper motor and chassis ground.

Connector & terminal

(B8) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 15.

No — Repair or replace the harness between the he front wiper motor and chassis ground.

15. CHECK FRONT WIPER MOTOR.

Check the continuity between front wiper motor terminals.

Connector & terminal

(B8) No. 3 — (B8) No. 5:

Is there continuity?

Yes — Check the body integrated unit and replace it if defective.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the front wiper motor. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Motor and Link.

16. CHECK BODY INTEGRATED UNIT.

Display the [Front washer switch input] data using Subaru Select Monitor.

Does the display switch between [OFF] ←→ [ON] when the front washer switch on the combination switch (wiper) is operated?

Yes — Check the connection status of the harness and connector that may have a temporary poor contact.

No — Go to 17.

17. CHECK BODY INTEGRATED UNIT.

Measure the voltage between the body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 12 (+) — Chassis ground (−):

Does the voltage switch between OFF (less than 1 V) ⟷ ON (9 to 16 V) when the front washer switch on the combination switch (wiper) is operated?

Yes — Check the body integrated unit and replace it if defective.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 18.

18. CHECK HARNESS.

1. Disconnect the connectors of the combination switch (wiper) and the body integrated unit.
2. Check the harness between the combination switch (wiper) and the body integrated unit.

Connector & terminal

(i68) No. 3 — (i81) No. 12:

Is the resistance less than 10 Ω?

Yes — Go to 19.

No — Repair or replace the harness between the combination switch (wiper) and the body integrated unit.

19. CHECK HARNESS.

Check the harness between the combination switch (wiper) and chassis ground.

Connector & terminal

(i68) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 20.

No — Repair or replace the harness between the combination switch (wiper) and chassis ground.

20. CHECK COMBINATION SWITCH (WIPER).

Check the continuity between terminals when the front washer switch on the combination switch (wiper) is pressed.

Connector & terminal

(i68) No. 3 — (i68) No. 2:

Is there continuity?

Yes — Check the body integrated unit and replace it if defective.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the combination switch (wiper). Ref. to WIPER AND WASHER SYSTEMS>Combination Switch (Wiper).

7. CHECK LIGHTING SWITCH

For inspection, refer to "Combination Switch (Light)". Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

8. CHECK DIMMER & PASSING SWITCH

For inspection, refer to "Combination Switch (Light)". Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

LIGHTING SYSTEM > Headlight System

NOTE

For operation procedures of each component of the headlight system, refer to the respective section.

- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Headlight bulb: Ref. to LIGHTING SYSTEM>Headlight Assembly>DISASSEMBLY.
- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).
- Combination switch (wiper): Ref. to WIPER AND WASHER SYSTEMS>Combination Switch (Wiper).
- Light control sensor: Ref. to LIGHTING SYSTEM>Light Control Sensor.

LIGHTING SYSTEM > High Beam Assist System

WIRING DIAGRAM

Refer to “Headlight System and Day Time Running Light System” in the wiring diagram. Ref. to WIRING SYSTEM>Headlight System and Daytime Running Light System>WIRING DIAGRAM.

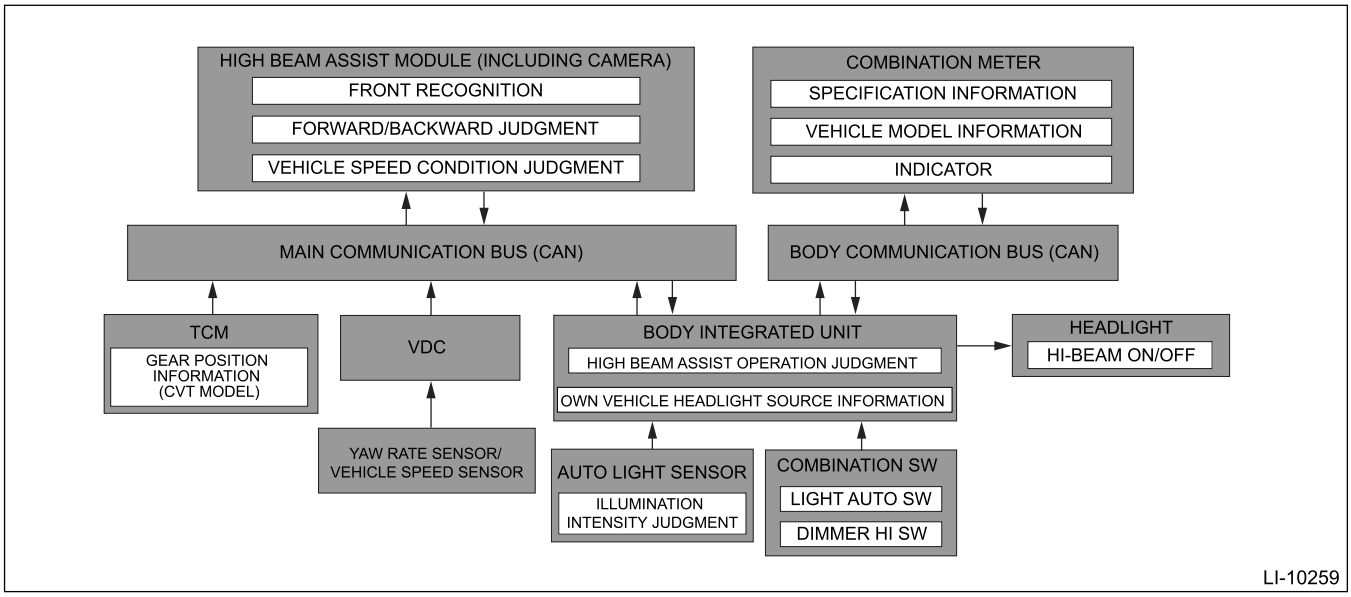
LIGHTING SYSTEM > High Beam Assist System

INSPECTION

1. BASIC INSPECTION

For inspection, refer to “Diagnostics with Phenomenon” of “BODY CONTROL SYSTEM (DIAGNOSTICS)”. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon.

2. SYSTEM BLOCK DIAGRAM



Note:

The high beam assist system uses the stereo cameras of the EyeSight system to recognize the conditions in front of the vehicle, and automatically switches the high beam and low beam of the headlight.

LIGHTING SYSTEM > High Beam Assist System

NOTE

For operation procedures of each component of the headlight system, refer to the respective section.

- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Headlight bulb: Ref. to LIGHTING SYSTEM>Headlight Assembly>DISASSEMBLY.
- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).
- Light control sensor: Ref. to LIGHTING SYSTEM>Light Control Sensor.
- Body integrated unit: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
- Stereo camera: Ref. to EyeSight>Stereo Camera.

WIRING DIAGRAM

Refer to "Headlight System and Day Time Running Light System" in the wiring diagram. Ref. to WIRING SYSTEM>Headlight System and Daytime Running Light System>WIRING DIAGRAM.

INSPECTION

1. CHECK DAYTIME RUNNING LIGHT SYSTEM (HALOGEN HEADLIGHT MODEL)

1. CHECK HEADLIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Turn the lighting switch to the switch II (HEAD) position.
3. Turn the dimmer & passing switch to the switch UP position.

Does the headlight (high beam) illuminate? Ref. to SECURITY AND LOCKS>Body Integrated Unit.

Yes — Go to 2.

No — Check the combination switch (light) and headlight bulb.

2. CHECK BODY INTEGRATED UNIT.

Read the DTC of body integrated unit using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is DTC displayed?

Yes — Perform the diagnosis according to DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

No — Go to 3.

3. CHECK CURRENT DATA.

Display the following items using Subaru Select Monitor.
- [Parking Position Switch]
- [Shift Position]
- [Lighting II Switch Input]

Is the input signal normal?

Yes — Go to 4.

No — Check the defective part.

4. CHECK DAYTIME RUNNING LIGHT.

1. Turn the ignition switch to OFF.
2. Check the daytime running light. Ref. to LIGHTING SYSTEM>Day Time Running Light Assembly>INSPECTION.

Is the daytime running light normal?

Yes — Go to 5.

No — Replace the daytime running light.

5. CHECK HARNESS.

1. Disconnect the connectors of the body integrated unit and daytime running light.
2. Check each harness.

Is harness normal?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

2. CHECK DAYTIME RUNNING LIGHT SYSTEM (LED HEADLIGHT MODEL)

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse on the upstream of the daytime running light relay.

Is the fuse OK?

Yes	Go to 2.
No	Replace the fuse.

2. CHECK RELAY.

Check the daytime running light relay. Ref. to LIGHTING SYSTEM>Relay and Fuse>INSPECTION.

Is the relay OK?

Yes	Go to 3.
No	Replace the relay.

3. CHECK HEADLIGHT ILLUMINATION.

1. Turn the ignition switch to ON.
2. Turn the lighting switch to the switch II (HEAD) position.
3. Turn the dimmer & passing switch to the switch UP position.

Does the headlight (high beam) illuminate?

Yes	Go to 4.
No	Check the combination switch (light) and headlight bulb.

4. CHECK BODY INTEGRATED UNIT.

Read the DTC of body integrated unit using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is DTC displayed?

Yes — Perform the diagnosis according to DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

No — Go to 5.

5. CHECK CURRENT DATA.

Display the following items using Subaru Select Monitor.

- [Parking Position Switch]
- [Shift Position]
- [Lighting II Switch Input]

Is the input signal normal?

Yes — Go to 6.

No — Check the defective part.

6. CHECK DAYTIME RUNNING LIGHT ILLUMINATION.

1. Disconnect the headlight connector.
2. Apply battery voltage to the DRL terminal input of the headlight unit.

Terminals

NO. 7 (+) — NO. 9 (−):

Does the daytime running light illuminate?

Yes — Go to 7.

No — Replace the headlight.

7. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit, daytime running light relay and headlight.
2. Check each harness.

Is harness normal?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair or replace the harness.

LIGHTING SYSTEM > Day Time Running Light System

NOTE

For operation procedures of each component of the daytime running light system, refer to the respective section.

- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Headlight bulb: Ref. to LIGHTING SYSTEM>Headlight Assembly>DISASSEMBLY.
- Daytime running light assembly: Ref. to LIGHTING SYSTEM>Day Time Running Light Assembly.
- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).

LIGHTING SYSTEM > Clearance Light and Illumination Light System

WIRING DIAGRAM

Refer to “Clearance Light and Illumination Light System” in the wiring diagram. Ref. to WIRING SYSTEM>Clearance Light and Illumination Light System>WIRING DIAGRAM.

LIGHTING SYSTEM > Clearance Light and Illumination Light System

INSPECTION

1. CHECK LIGHTING SWITCH

For inspection, refer to “Combination Switch (Light)”. Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

LIGHTING SYSTEM > Clearance Light and Illumination Light System

NOTE

For operation procedures of each component of the clearance light & illumination light system, refer to the respective sections.

- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).
- Clearance light bulb: Ref. to LIGHTING SYSTEM>Headlight Assembly>DISASSEMBLY.
- Rear combination light assembly: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly.
- Tail light/stop light bulb: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>DISASSEMBLY.
- License plate light: Ref. to LIGHTING SYSTEM>License Plate Light.
- LED illumination light: Ref. to LIGHTING SYSTEM>LED Illumination Light.
- Ignition switch illumination: Ref. to LIGHTING SYSTEM>Ignition Switch Illumination.

WIRING DIAGRAM

Refer to “Front Fog Light System” in the wiring diagram.

- Model without SRF: Ref. to WIRING SYSTEM>Front Fog Light System>WIRING DIAGRAM > WITHOUT SRF.
- Model with SRF: Ref. to WIRING SYSTEM>Front Fog Light System>WIRING DIAGRAM > WITH SRF.

INSPECTION

1. CHECK STEERING RESPONSIVE FOG LIGHT SYSTEM

For inspection, refer to “Basic Diagnostic Procedure” of “HEADLIGHT / FOGLIGHT (DIAGNOSTICS)” section. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK FRONT FOG LIGHT SWITCH

For inspection, refer to “Combination Switch (Light)”. Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

NOTE

For operation procedures of each component of the front fog light system, refer to the respective section.

- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).
- Front fog light assembly: Ref. to LIGHTING SYSTEM>Front Fog Light Assembly.
- Front fog light bulb: Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>DISASSEMBLY.

WIRING DIAGRAM

Refer to "Turn Signal Light and Hazard Light System" in the wiring diagram. Ref. to WIRING SYSTEM>Turn Signal Light and Hazard Light System>WIRING DIAGRAM.

INSPECTION

1. CHECK HAZARD LIGHT OPERATION

1. CHECK HAZARD LIGHT OPERATION.

1. Turn the hazard switch to ON.
2. Check that the hazard light operates properly.

Does the hazard light blink?

Yes — The hazard light system is normal.

No — Go to 2.

2. CHECK BULB.

Check the hazard (turn signal) light bulb.

Is the bulb normal?

Yes — Go to 3.

No — Replace the hazard (turn signal) light bulb.

3. CHECK CURRENT DATA.

Display the [Hazard switch Input] data using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Does the display change as [OFF] ←→ [ON], when the hazard switch is turned to ON?

Yes — Go to 6.

No — Go to 4.

4. CHECK HAZARD SWITCH.

Check the hazard switch. Ref. to LIGHTING SYSTEM>Hazard Switch>INSPECTION.

Is the hazard switch normal?

Yes — Go to 5.

No — Replace the hazard switch.

5. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and hazard switch.
2. Check the harness between body integrated unit and hazard switch.

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

6. CHECK CURRENT DATA.

Display the data of [Left turn signal output] and [Right turn signal output] using Subaru Select Monitor.

Does the display change as [OFF] ←→ [ON], when the hazard switch is turned to ON?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 7.

7. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and each turn signal light.
2. Check the harness between body integrated unit and each turn signal light.

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

2. CHECK TURN SIGNAL LIGHT SYSTEM

1. CHECK TURN SIGNAL LIGHT OPERATION.

1. Turn the ignition switch to ON.
2. Turn the turn signal light switch LH and RH to ON.

Does the turn signal light blink?

Yes — The turn signal light system is normal.

No — Go to 2.

2. CHECK CURRENT DATA.

Display the data of [Left turn signal input] and [Right turn signal input] using Subaru Select Monitor.

Note:
For detailed operation procedures, refer to “Application help”.

Does the display change as [OFF] ←→ [ON], when the turn signal switch is turned to ON?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Go to 3.

3. CHECK TURN SIGNAL SWITCH.

Check the turn signal switch. Ref. to LIGHTING SYSTEM>Hazard Switch>INSPECTION.

Is the turn signal switch OK?

Yes — Go to 4.

No — Replace the combination switch (light).

4. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and combination switch (light).
2. Check the harness between body integrated unit and combination switch (light).

Is harness normal?

Yes — Check the body integrated unit and replace it if defective.
- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

3. CHECK OF LANE CHANGE SIGNAL

Trouble symptom:
Lane change signal function does not operate.

1. CHECK HAZARD LIGHT SYSTEM.

Check the hazard light system. Ref. to LIGHTING SYSTEM>Turn Signal Light and Hazard Light System>INSPECTION > CHECK HAZARD LIGHT OPERATION.

Is the hazard light system normal?

Yes — Go to 2.

No — Repair the hazard light system.

2. CHECK TURN SIGNAL LIGHT SYSTEM.

Check the turn signal light system. Ref. to LIGHTING SYSTEM>Turn Signal Light and Hazard Light System>INSPECTION > CHECK TURN SIGNAL LIGHT SYSTEM.

Is the turn signal light system normal?

Yes	Go to 3.
No	Repair the turn signal light system.

3. CHECK BODY INTEGRATED UNIT SETTING.

Display the [Lane change signal setting] data using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Is the setting in the [Support]?

Yes	Check the body integrated unit and replace it if defective. • Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. • Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Turn the setting to [Support].

4. CHECK TURN SIGNAL SWITCH

For inspection, refer to "Combination Switch (Light)". Ref. to LIGHTING SYSTEM>Combination Switch (Light)>INSPECTION.

5. CHECK HAZARD SWITCH

For inspection, refer to "Hazard Switch". Ref. to LIGHTING SYSTEM>Hazard Switch>INSPECTION.

LIGHTING SYSTEM > Turn Signal Light and Hazard Light System

NOTE

For operation procedures of each component of the turn signal and hazard light system, refer to the respective sections.

- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Combination switch (light): Ref. to LIGHTING SYSTEM>Combination Switch (Light).
- Front turn signal light bulb: Ref. to LIGHTING SYSTEM>Headlight Assembly>DISASSEMBLY.
- Side turn signal light assembly: Ref. to LIGHTING SYSTEM>Side Turn Signal Light Assembly.
- Rear combination light assembly: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly.
- Rear turn signal light bulb: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>DISASSEMBLY.

- Hazard switch: Ref. to LIGHTING SYSTEM>Hazard Switch.

WIRING DIAGRAM

Refer to “Back-up Light System” in the wiring diagram.

- 4 door model: Ref. to WIRING SYSTEM>Back-up Light System>WIRING DIAGRAM > 4 DOOR MODEL.
- 5 door model: Ref. to WIRING SYSTEM>Back-up Light System>WIRING DIAGRAM > 5 DOOR MODEL.

INSPECTION

1. CHECK BACK-UP LIGHT SWITCH (MT model)

For inspection, refer to “MANUAL TRANSMISSION AND DIFFERENTIAL” section. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>INSPECTION > BACK-UP LIGHT SWITCH.

2. CHECK INHIBITOR SWITCH (CVT MODEL)

For inspection, refer to “Inhibitor Switch” in “CONTINUOUSLY VARIABLE TRANSMISSION” section. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch>INSPECTION.

NOTE

For operation procedures of each component of the back-up light system, refer to the respective section.

- Rear finisher light assembly: Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly.
- Back-up light bulb: Ref. to LIGHTING SYSTEM>Rear Finisher Light Assembly>DISASSEMBLY.

LIGHTING SYSTEM > Stop Light System

WIRING DIAGRAM

Refer to “Stop Light System” in the wiring diagram.

- 4 door model: Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > 4 DOOR MODEL.
- 5 door model: Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM > 5 DOOR MODEL.

LIGHTING SYSTEM > Stop Light System

INSPECTION

1. CHECK STOP LIGHT SWITCH

For inspection, refer to “Stop Light Switch” in “BRAKE” section. Ref. to BRAKE>Stop Light Switch>INSPECTION.

LIGHTING SYSTEM > Stop Light System

NOTE

For operation procedures of each component of the stop light system, refer to the respective section.

- Rear combination light assembly: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly.
- Tail light/stop light bulb: Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>DISASSEMBLY.
- High-mounted stop light: Ref. to LIGHTING SYSTEM>High-mounted Stop Light.

LIGHTING SYSTEM > Interior Light System

WIRING DIAGRAM

Refer to “Interior Light System” in the wiring diagram. Ref. to WIRING SYSTEM>Interior Light System>WIRING DIAGRAM.

LIGHTING SYSTEM > Interior Light System

INSPECTION

1. CHECK DOOR SWITCH

For inspection, refer to “Door Switch”. Ref. to LIGHTING SYSTEM>Door Switch>INSPECTION.

2. CHECK TRUNK LID LATCH SWITCH

For inspection, refer to “Trunk Lid Latch and Actuator Assembly” in “SECURITY AND LOCKS” section. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly>INSPECTION > ACTUATOR.

3. CHECK REAR GATE LATCH SWITCH

For inspection, refer to “Rear Gate Latch and Actuator Assembly” in “SECURITY AND LOCKS” section. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSPECTION > ACTUATOR.

LIGHTING SYSTEM > Interior Light System

NOTE

For operation procedures of each component of the interior light system, refer to the respective section.

- Spot map light: Ref. to LIGHTING SYSTEM>Spot Map Light.
- Room light: Ref. to LIGHTING SYSTEM>Room Light.
- Trunk room light: Ref. to LIGHTING SYSTEM>Trunk Room Light.
- Luggage room light: Ref. to LIGHTING SYSTEM>Luggage Room Light.
- LED illumination light: Ref. to LIGHTING SYSTEM>LED Illumination Light.
- Vanity mirror light: Ref. to LIGHTING SYSTEM>Vanity Mirror Light.
- Door switch: Ref. to LIGHTING SYSTEM>Door Switch.

LIGHTING SYSTEM > Auto Headlight Beam Leveler System

WIRING DIAGRAM

Refer to “Headlight Beam Leveler System” in the wiring diagram. Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.

LIGHTING SYSTEM > Auto Headlight Beam Leveler System

ELECTRICAL SPECIFICATION

1. AUTO HEADLIGHT BEAM LEVELER CM

For the specification (electrical component), refer to “Control Module I/O Signal” of “HEADLIGHT / FOGLIGHT (DIAGNOSTICS)” section. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

LIGHTING SYSTEM > Auto Headlight Beam Leveler System

INSPECTION

1. CHECK AUTO HEADLIGHT BEAM LEVELER SYSTEM

For inspection, refer to “Basic Diagnostic Procedure” of “HEADLIGHT / FOGLIGHT (DIAGNOSTICS)” section. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Basic Diagnostic Procedure.

PROCEDURE

When parts related to the auto headlight beam leveler system are removed or replaced, perform the following procedures to initialize or reinitialize.

Note:

Before performing initialization or reinitialization, check the following:

- **The vehicle is parked on a level surface.**
- **The inflation pressure of tires is correct.**
- **The vehicle does not have load.**
- **Vehicle's fuel tank is fully filled.**
- **Refer to the following chart to determine whether to initialize or reinitialize.**

Initialization	When the auto headlight beam leveler CM was replaced with a new module.
Reinitialization	• When the auto headlight beam leveler CM was replaced with a part from another vehicle. • When suspension parts have been removed or replaced. (Crossmember, front arm, sub frame, lateral link, housing, strut etc.) • When the vehicle height sensor has been replaced or removed.

Caution:

If the indicator does not flash three times or the headlight beam does not operate, it can be assumed that there is an open circuit or faulty wiring in the harness of the auto headlight beam leveler CM, vehicle height sensors or headlight assembly. Perform inspection and repair according to the inspection results, then perform initialization/reinitialization again.

- **Initialization: Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > INITIALIZATION.**
- **Reinitialization: Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.**

1. INITIALIZATION

1. Check that the indicator in the meter is flashing twice repeatedly.
2. Bounce the vehicle several times to normalize the suspension.
3. Make certain that someone is seated in the driver's seat.
4. Turn the ignition switch to ON, and within 1.5 to 20 seconds, turn the headlight switch OFF → ON three times.
5. Make sure that the indicator in the meter flashes three times and then turns OFF, indicating that initialization has been successfully completed. (At this time, the headlight beam drops once, and then returns to the original position.)
6. Perform beam adjustment for the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.

2. REINITIALIZATION

1. Bounce the vehicle several times to normalize the suspension.
2. Make certain that someone is seated in the driver's seat.
3. Turn the ignition switch to ON, and within 1.5 to 10 seconds, turn the headlight switch OFF → ON five or more successive times.
4. Check that the headlight beam drops once, then returns to normal.
5. After confirming 4), turn the ignition switch to OFF (ACC OFF) within 30 seconds.

6. Turn the ignition switch to ON again, and within 1.5 to 10 seconds, turn the headlight switch OFF → ON five or more successive times.
7. Make sure that the indicator in the meter flashes three times and then turns OFF, indicating that reinitialization has been successfully completed. (At this time, the headlight beam drops once, and then returns to the original position.)
8. Perform beam adjustment for the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.

LIGHTING SYSTEM > Auto Headlight Beam Leveler System

NOTE

For operation procedures of each component of the auto headlight beam leveler system, refer to the respective section.

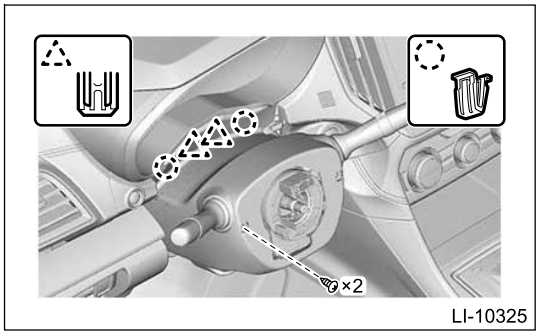
- Headlight assembly: Ref. to LIGHTING SYSTEM>Headlight Assembly.
- Auto headlight beam leveler CM: Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
- Vehicle height sensor: Ref. to LIGHTING SYSTEM>Rear Height Sensor.

REMOVAL

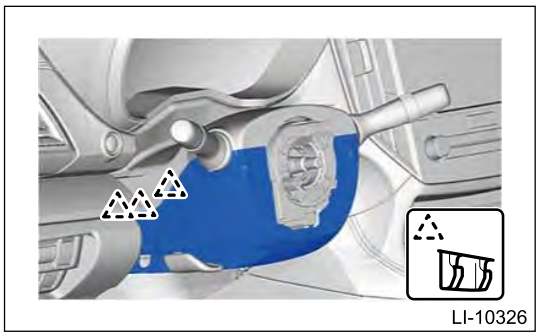
Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Set the tire to the straight-ahead position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
4. Remove the steering wheel. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Wheel>REMOVAL.
5. Remove the cover assembly - column.
   (1) Remove the clip, and remove the cover assembly - visor LWR.
   (2) Remove the screws.



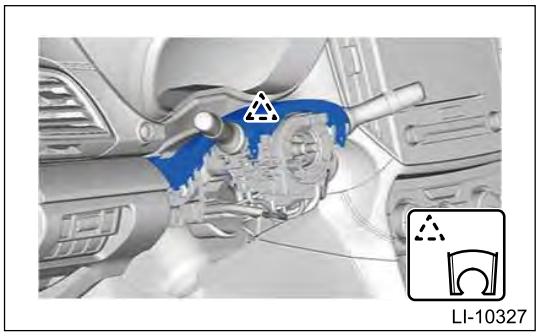
   (3) Release the claws and remove the cover assembly - column LWR.



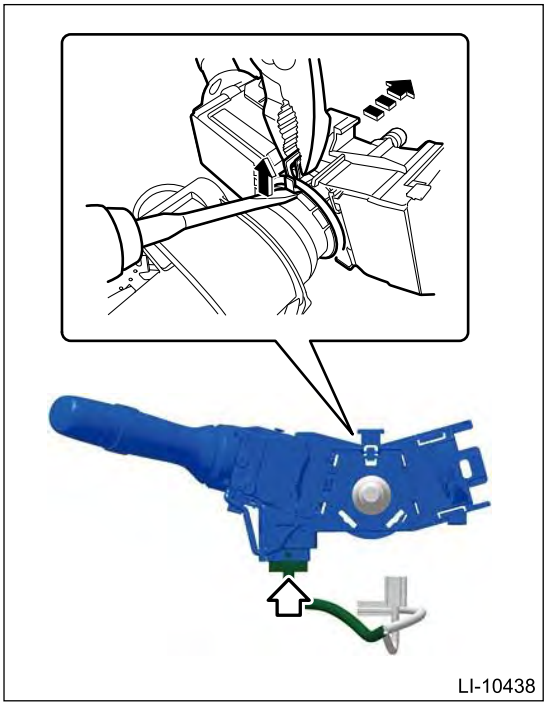
Note:

- **Release the claws on RH side in the same procedure as on the LH side.**
- **For models with keyless access with push button start, remove the cap - key cylinder.**

   (4) Release the claws and remove the cover assembly - column UPR.



6. Remove the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>REMOVAL.
7. Remove the switch assembly - combination wiper select. Ref. to WIPER AND WASHER SYSTEMS>Combination Switch (Wiper)>REMOVAL.
8. Remove the switch assembly - combination turn dimmer.
   (1) Disconnect the connector.
   (2) Using pliers, loosen the clamp.
   (3) With the clamp loosened, release the claw using a flat tip screwdriver wrapped with a protection tape, and remove the switch assembly - combination turn dimmer.
   Caution:
   Do not pry off forcibly. Otherwise, the claws may be damaged.



LIGHTING SYSTEM > Combination Switch (Light)

INSTALLATION

Caution:

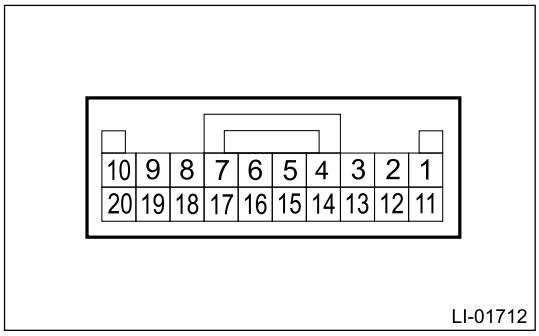
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **If the steering wheel has been removed, make sure that the steering roll connector is not turned from the original position.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**

1. Install the switch assembly - combination turn dimmer.
2. Install the switch assembly - combination wiper select.
3. Install the steering roll connector. Ref. to AIRBAG SYSTEM>Roll Connector>INSTALLATION.
4. Install the cover assembly - column.
5. Install the steering wheel.
   Tightening torque:
   39 N·m (4 kgf-m, 28.8 ft-lb)
   Clearance:
   Between cover assembly - column and steering wheel: 4 — 6 mm (0.16 — 0.24 in)
6. Install the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>INSTALLATION.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > Combination Switch (Light)

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



- Lighting switch

Terminal No.	Inspection conditions	Standard
18 — 12 19 — 12 20 — 12	Switch OFF	1 MΩ or more
19 — 12	Switch AUTO	Less than 1 Ω
18 — 12	Switch 1 (TAIL/PARKING)	Less than 1 Ω
18 — 12 20 — 12	Switch 2 (HEAD)	Less than 1 Ω

- Dimmer & passing switch

Terminal No.	Inspection conditions	Standard
11 — 12 17 — 12	Switch PASS	Less than 1 Ω
11 — 12	Switch UP	Less than 1 Ω

- Turn signal switch

Terminal No.	Inspection conditions	Standard
13 — 12	Switch TURN (RH)	Less than 1 Ω
15 — 12	Switch TURN (LH)	Less than 1 Ω

- Front fog light switch

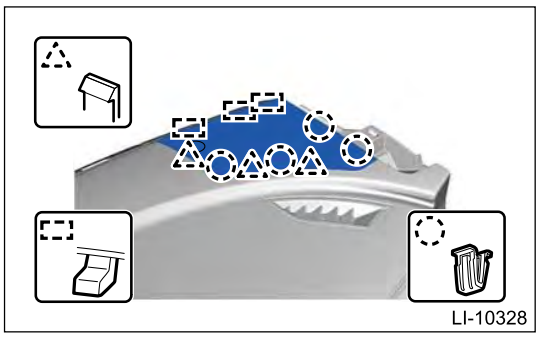
Terminal No.	Inspection conditions	Standard
4 — 3	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

2. Replace the switch assembly - combination turn dimmer if the inspection result is not within the standard value.

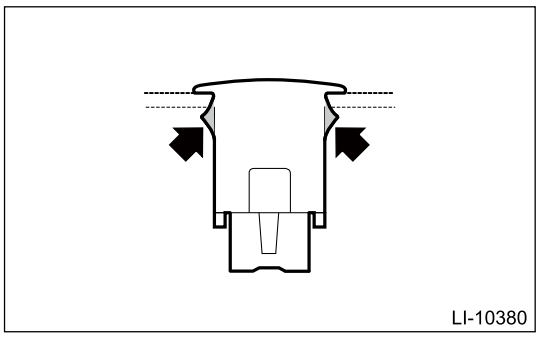
LIGHTING SYSTEM > Light Control Sensor

REMOVAL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front pillar UPR RH. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>REMOVAL.
3. Remove the grille speaker side RH.
   (1) Release the clips, hooks and claws.
   (2) Disconnect the connector and remove the grille speaker side RH.



4. Remove the light control sensor.
   (1) Release the claws, and then remove the light control sensor.



LIGHTING SYSTEM > Light Control Sensor

INSTALLATION

1. Install the light control sensor.
2. Install the grille speaker side RH.
3. Install the trim panel - front pillar UPR RH. Ref. to EXTERIOR/INTERIOR TRIM>Upper Inner Trim>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

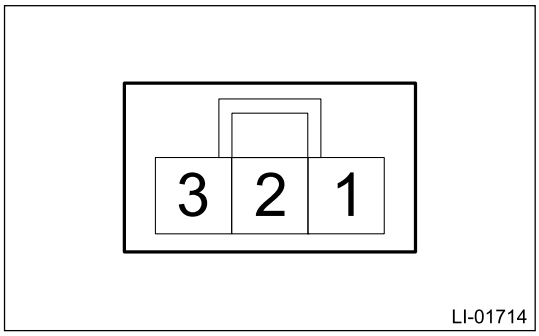
LIGHTING SYSTEM > Light Control Sensor

INSPECTION

1. Connect the connector.
2. Turn the ignition switch to ON, and set the lighting switch to the AUTO position.
3. Measure the voltage between connector terminals.

   Preparation tool:

   Circuit tester



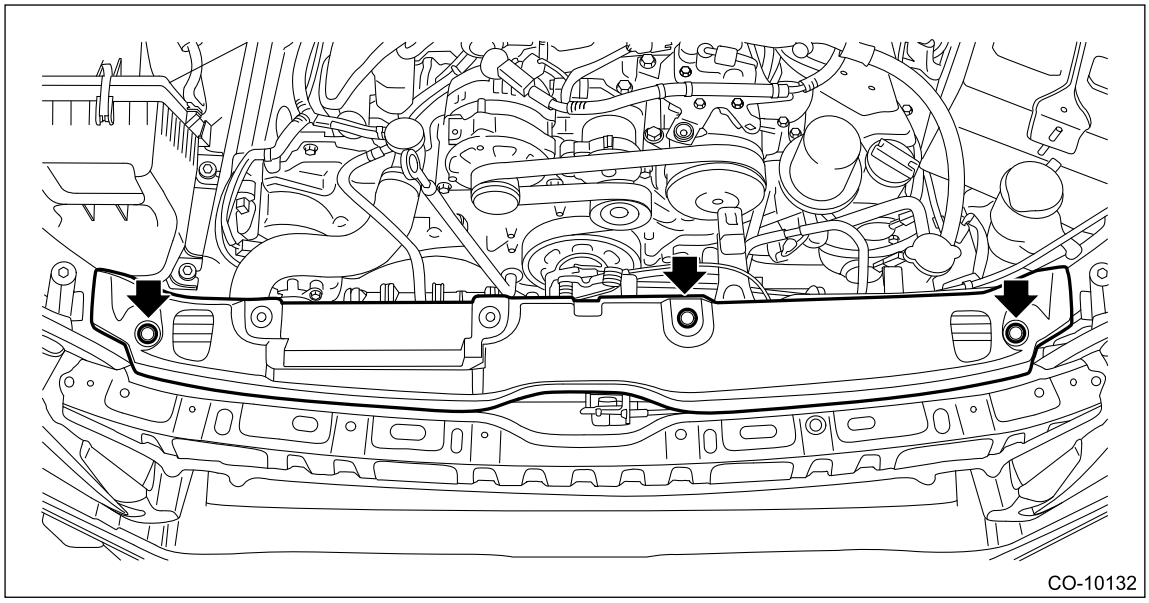
Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	Measure the voltage when the area around the light control sensor, which was dark, becomes bright.	Dark condition: Approx. 0.6 V or less
		Bright condition: Approx. 3 V or more

4. Replace the light control sensor if the inspection result is not within the standard value.

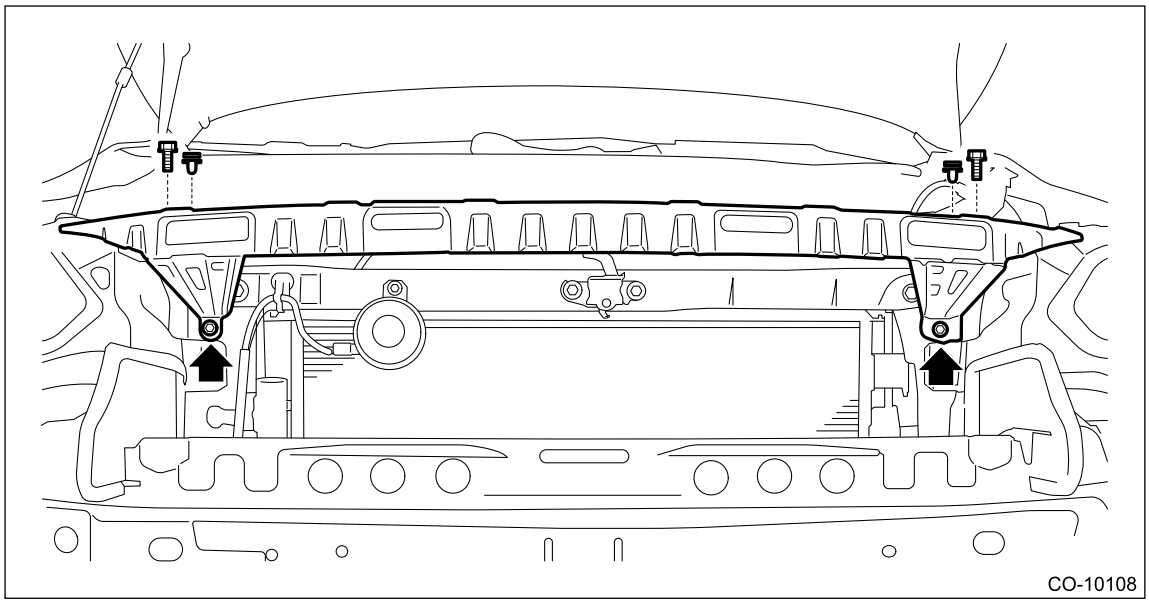
REMOVAL

Caution:
Do not perform work with wet hands, because there is a possibility of electrical shock.

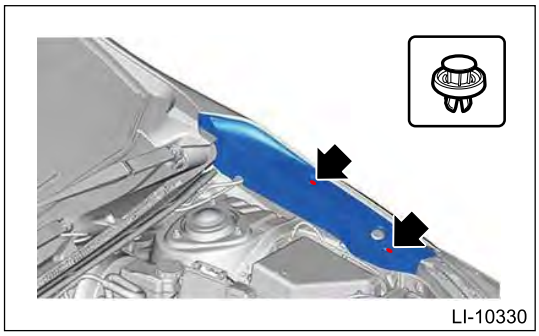
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
3. Remove the cover UPR - front.
   (1) Remove the clips, and remove the cover UPR - front.



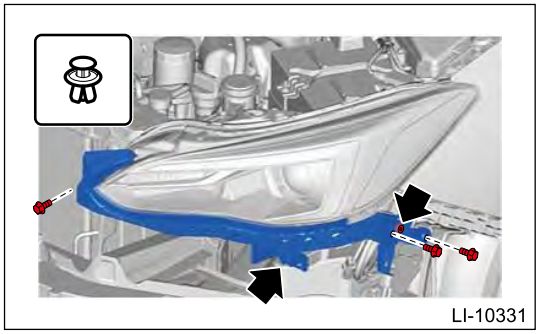
4. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
5. Remove the bracket - bumper UPR.
   (1) Remove the bolts and clips, and remove the bracket - bumper UPR.



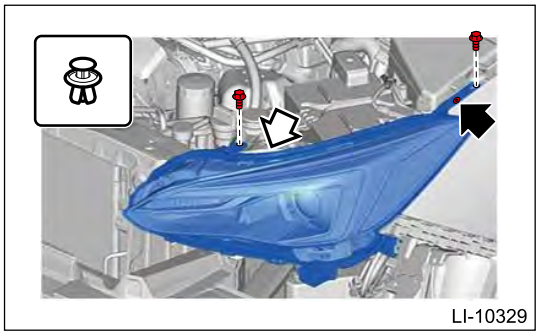
6. Remove the cover - front fender.
   (1) Remove the clip, and remove the cover - front fender.


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7. Remove the keyless buzzer. (When the light assembly - head on the left side is removed) Ref. to SECURITY AND LOCKS>Keyless Buzzer>REMOVAL.
8. Remove the bracket - front bumper corner.
   (1) Remove the clip.
   (2) Remove the bolts, and then remove the bracket - front bumper corner.


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9. Remove the light assembly - head.
   Caution:
   Be careful not to damage the light assembly - head and the fender COMPL - front.
   (1) Disconnect the connector.
   (2) Remove the bolts and clips, and remove the light assembly - head.

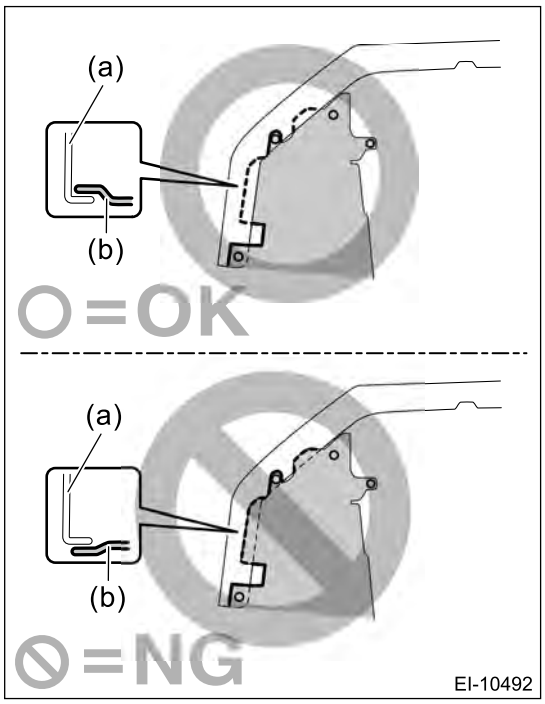

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LIGHTING SYSTEM > Headlight Assembly

INSTALLATION

Caution:

- **Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).**



- **Before installing the bumper face, match the claws on the bracket - front bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.**

1. Install the light assembly - head.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the bracket - front bumper corner.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the keyless buzzer. (When the light assembly - head on the left side is removed)
4. Install the cover - front fender.
5. Install the bracket - bumper UPR.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
6. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
7. Install the cover UPR - front.
8. Install the air intake duct.
9. Check and adjust the clearance between the hood COMPL - front and the light assembly - head. Ref. to EXTERIOR BODY PANELS>Front Hood>ADJUSTMENT.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
11. Adjust the headlight beam and fog light beam.
    - Adjust the headlight beam. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT > HEADLIGHT BEAM ADJUSTMENT.
    - Adjust the fog light beam. (Model with fog light) Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>ADJUSTMENT > FOG LIGHT AIMING.

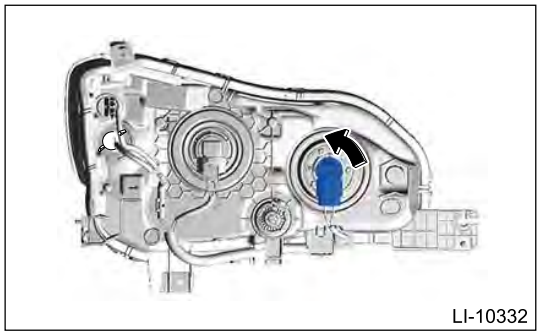
DISASSEMBLY

Caution:

- **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
- **Do not leave the light assembly - head without the bulb for a long time. Dust, moisture, etc. entering the light may affect its performance.**
- **When removing with the light assembly - head installed, turn over the mud guard - front and remove each bulb.**
  - **– Halogen headlight: Remove the parking light bulb / turn signal light bulb and side marker light bulb.**
  - **– LED headlight: Remove the side marker light bulb.**

1. HIGH BEAM BULB

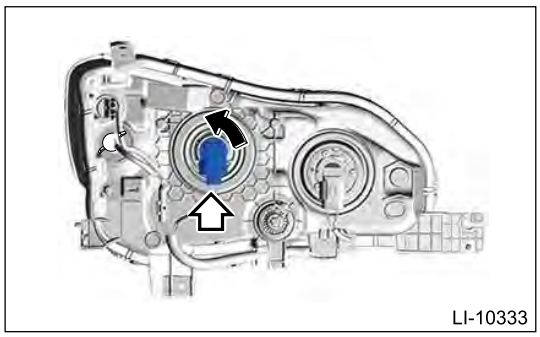
- **HALOGEN TYPE**
  1. Disconnect the connector.
  2. Rotate in the direction of arrow shown in the figure to remove the high beam bulb.



- **LED TYPE**
  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

2. LOW BEAM BULB

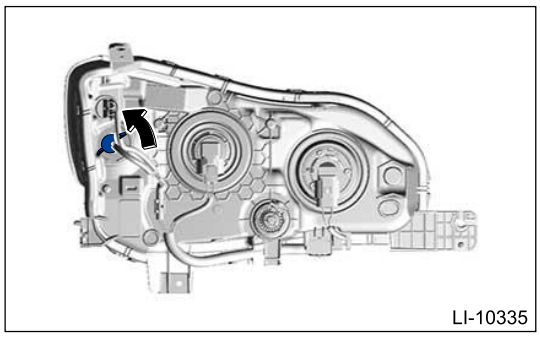
- **HALOGEN TYPE**
  1. Disconnect the connector.
  2. Rotate in the direction of arrow shown in the figure to remove the low beam bulb.



- **LED TYPE**
  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

3. PARKING LIGHT BULB

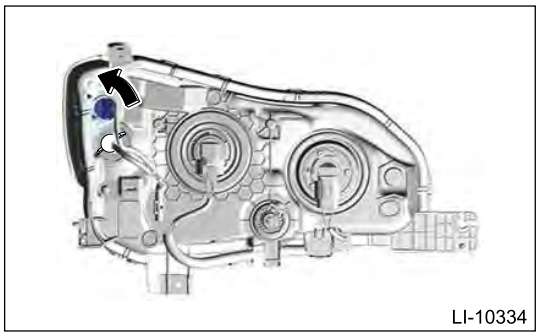
- **HALOGEN TYPE**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the parking light bulb.



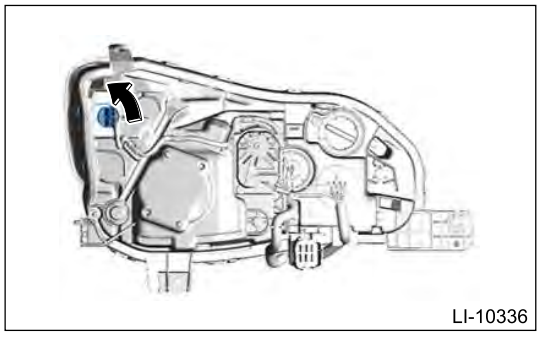
- **LED TYPE**
  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

4. SIDE MARKER LIGHT BULB

- **HALOGEN TYPE**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the side marker light bulb.

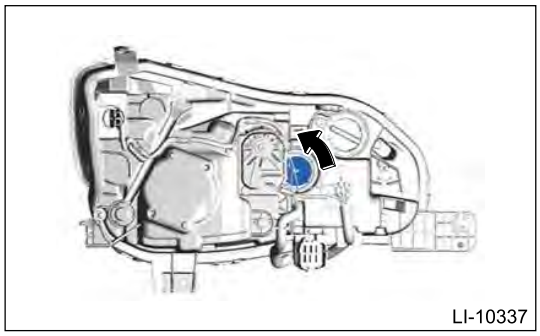


- **LED TYPE**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the side marker light bulb.



5. TURN SIGNAL LIGHT BULB

- **HALOGEN TYPE**
  It is integrated with the parking light bulb. For operation procedures, refer to “Parking Light Bulb”.
- **LED TYPE**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the turn signal light bulb.



ASSEMBLY

Caution:

Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

1. HIGH BEAM BULB

- **HALOGEN TYPE**
  1. Install the high beam bulb.
  2. Connect the connector.
- **LED TYPE**

  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

2. LOW BEAM BULB

- **HALOGEN TYPE**
  1. Install the low beam bulb.
  2. Connect the connector.
- **LED TYPE**

  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

3. PARKING LIGHT BULB

- **HALOGEN TYPE**
  1. Install the parking light bulb.
  2. Install the bulb socket.
- **LED TYPE**

  Since it is a non-disassembled part, it cannot be removed. Replace the light assembly - head if faulty.

4. SIDE MARKER LIGHT BULB

- **HALOGEN TYPE**
  1. Install the side marker light bulb.
  2. Install the bulb socket.
- **LED TYPE**
  1. Install the side marker light bulb.
  2. Install the bulb socket.

5. TURN SIGNAL LIGHT BULB

- **HALOGEN TYPE**
  It is integrated with the parking light bulb. For operation procedures, refer to "Parking Light Bulb".
- **LED TYPE**
  1. Install the turn signal light bulb.
  2. Install the bulb socket.

LIGHTING SYSTEM > Headlight Assembly

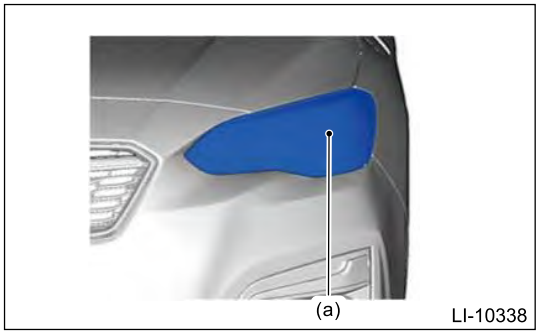
ADJUSTMENT

1. HEADLIGHT BEAM ADJUSTMENT

Caution:

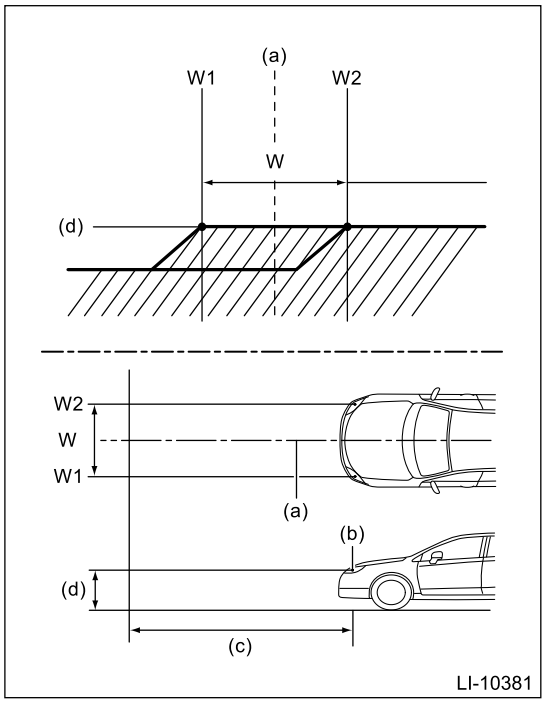
- **Turn off the light before adjusting the headlight beam level. If it is necessary to inspect the beam level, do not keep the light on for two minutes or more.**
- **When blocking the light emitted from the headlight, use a light shield or equivalent. Do not apply the tape on the lens or place the cloth over it. It may raise the temperature in the light and cause deformation/bubble formations of the plastic lens.**

1. Before checking the headlight beam level, be sure of the following:
   - Check the area around the headlight for any scratches, damage or other type of deformation.
   - The vehicle is parked on a level surface.
   - The inflation pressure of tires is correct.
   - The vehicle does not have load.
   - Vehicle's fuel tank is fully filled.
2. Set the headlight beam leveler switch to "0" position. (Model with manual leveler)
3. Bounce the vehicle several times to normalize the suspension.
4. Make certain that someone is seated in the driver's seat.
5. Measure the distance of the light source centers and the height of the light source centers for the low beam.



(a) Light source center

6. Adjust the headlight beam.
   (1) Place the vehicle with the front end facing to the measurement panel, open the front hood, and then illuminate the low beam.



(a) Vehicle center

(b) Light source center

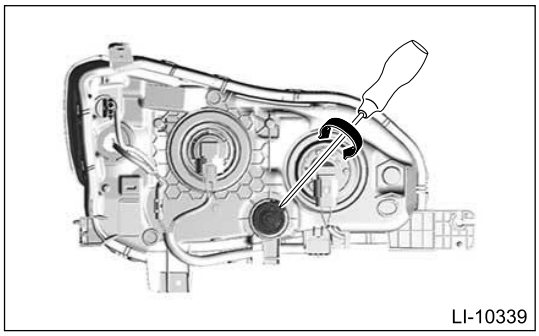
(c) 3 m (10 ft)

(d) Height of light source center

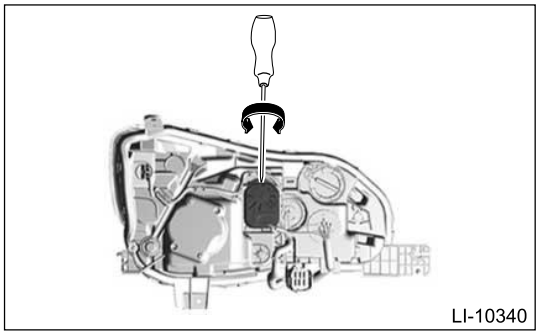
W mm (in)
Halogen type: 1,320 (51.97)
LED type: 1,376 (54.17)

(2) Adjust the beam level by turning the aiming screw.

- Halogen type



- LED type



LIGHTING SYSTEM > Hazard Switch

NOTE

The switch - hazard is integrated into the heater control assembly. For operation procedures, refer to the "AIR CONDITIONER" section. Ref. to AIR CONDITIONER>Control Panel.

LIGHTING SYSTEM > Hazard Switch

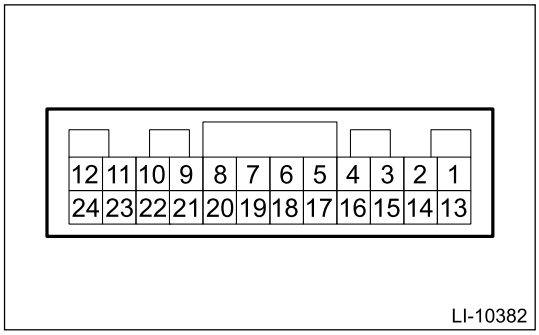
INSPECTION

1. Measure the resistance between connector terminals.

Preparation tool:

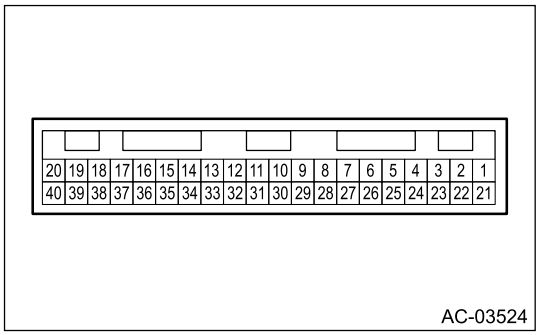
Circuit tester

- Manual A/C model



Terminal No.	Inspection conditions	Standard
12 — 18	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

- Auto A/C model



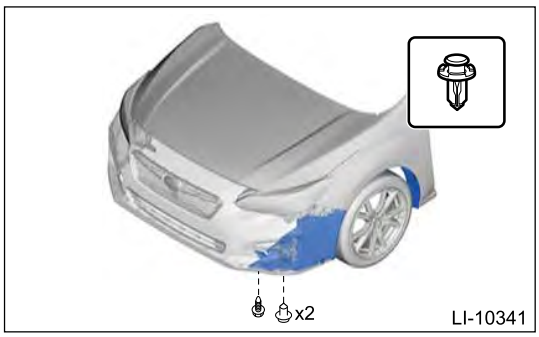
Terminal No.	Inspection conditions	Standard
26 — 10	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

2. Replace the heater control assembly if it is found defective.

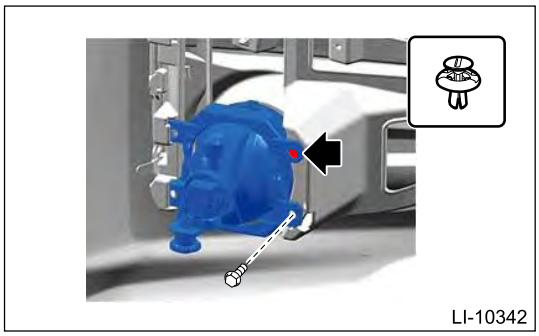
LIGHTING SYSTEM > Front Fog Light Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Turn over the mud guard - front.
   (1) Remove the clip.
   (2) Remove the screws, and turn over the mud guard - front.



5. Remove the fog light assembly - front.
   (1) Disconnect the connector.
   (2) Remove the bolt and clip.
   (3) Remove the guides, then remove the fog light assembly - front.



Note:

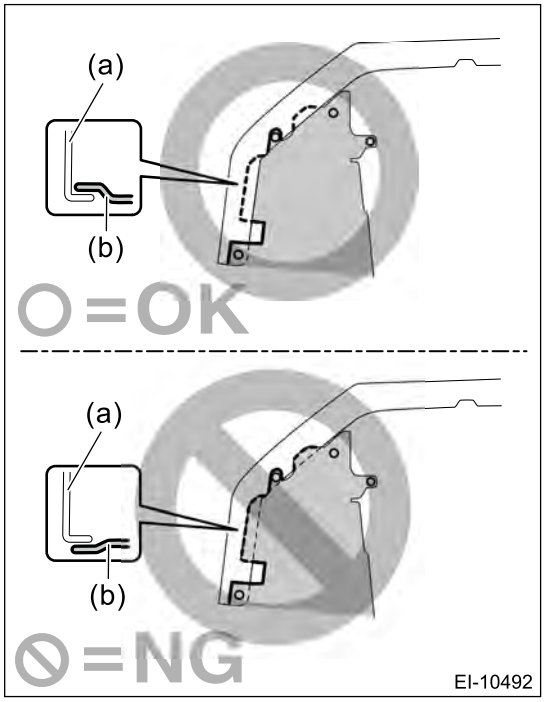
Perform the same procedures for the models with SRF.

LIGHTING SYSTEM > Front Fog Light Assembly

INSTALLATION

Caution:

Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Install the fog light assembly - front.
2. Install the mud guard - front.
3. Install the under cover - front.

   Tightening torque:

   18 N·m (1.8 kgf-m, 13.3 ft-lb)
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Adjust the fog light beam. Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>ADJUSTMENT > FOG LIGHT AIMING.

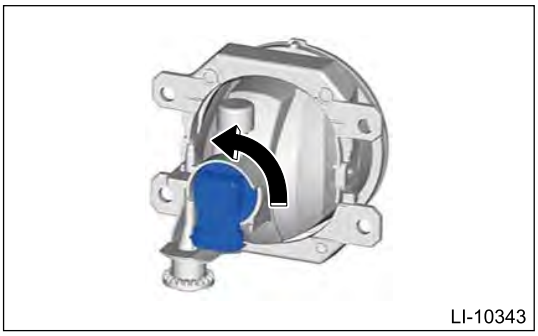
LIGHTING SYSTEM > Front Fog Light Assembly

DISASSEMBLY

Caution:

- **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
- **Do not leave the fog light assembly - front without the bulb for a long time. Dust, moisture, etc. entering the light may affect its performance.**
- **When removing with the bumper face - front installed, turn over the mud guard - front and remove the front fog light bulbs.**

Rotate in the direction of arrow shown in the figure to remove the front fog light bulb.



Note:

Perform the same procedures for the models with SRF.

LIGHTING SYSTEM > Front Fog Light Assembly

ASSEMBLY

Caution:

Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

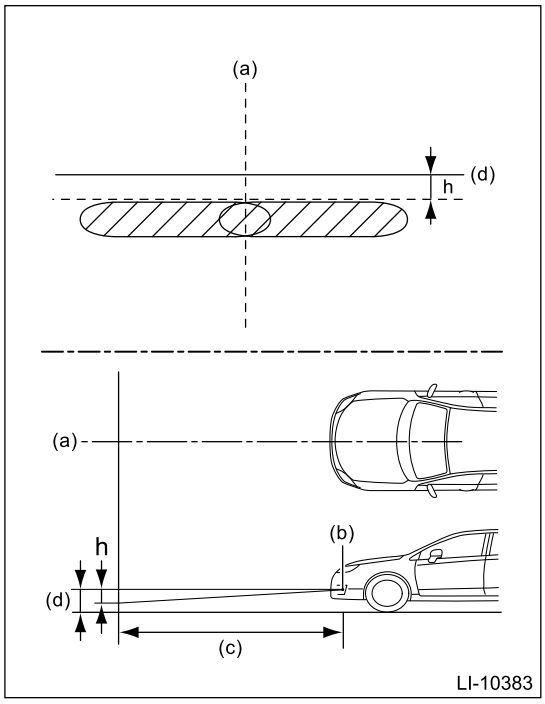
Install the front fog light bulb.

LIGHTING SYSTEM > Front Fog Light Assembly

ADJUSTMENT

1. FOG LIGHT AIMING

1. Before checking the fog light beam level, be sure of the following:
   - Check the area around the fog light for any scratches, damage or other type of deformation.
   - The vehicle is parked on a level surface.
   - The inflation pressure of tires is correct.
   - The vehicle does not have load.
   - Vehicle’s fuel tank is fully filled.
2. Bounce the vehicle several times to normalize the suspension.
3. Make certain that someone is seated in the driver’s seat.
4. Place the vehicle with the front end facing to the measurement panel.



(a) Vehicle center

(b) Bulb center marking

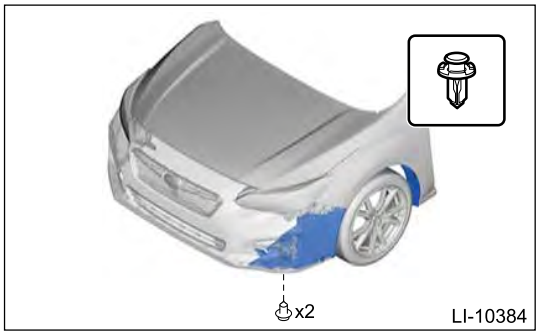
(c) 3 m (10 ft)

(d) Height of fog light center

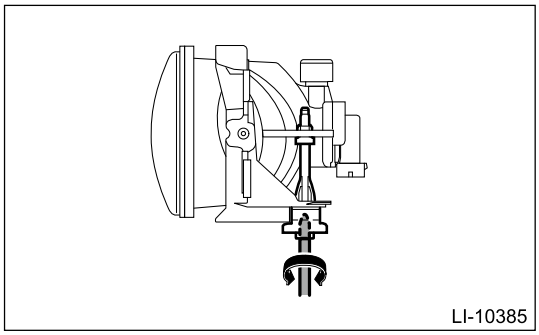
h mm (in) at 3 m (10 ft)
45 (1.77)

5. Adjust the fog light beam.

(1) Remove the clips, and turn over the mud guard - front.



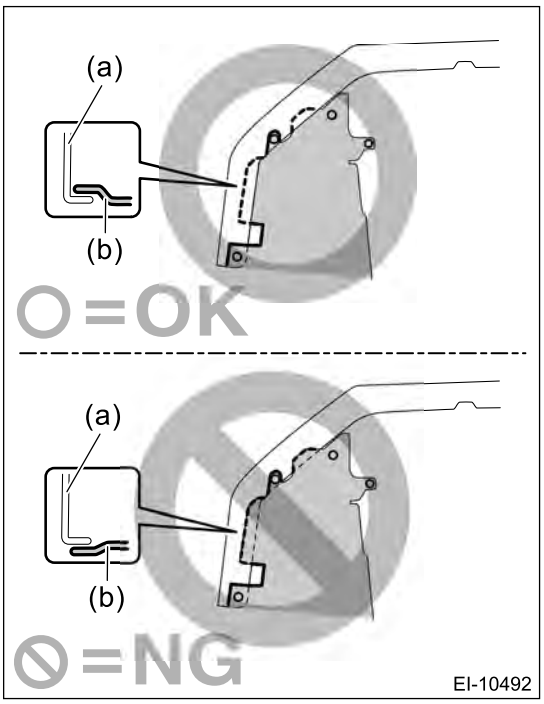
(2) Adjust the beam level by turning the aiming screw.



(3) Install the mud guard - front.

Caution:

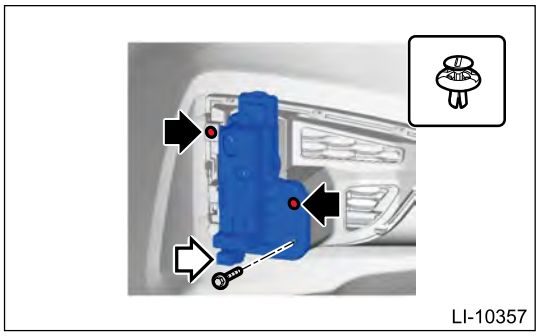
Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



LIGHTING SYSTEM > Day Time Running Light Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Remove the daytime running light assembly.
   (1) Disconnect the connector.
   (2) Remove the bolt and clip, and remove the daytime running light assembly.

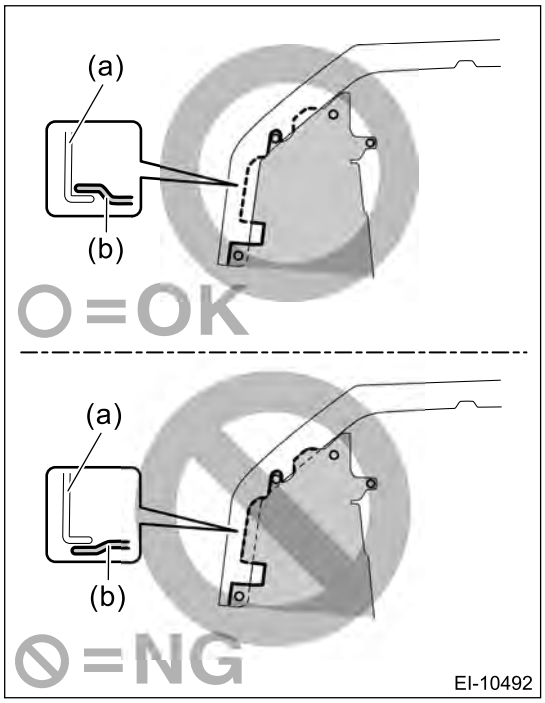


LIGHTING SYSTEM > Day Time Running Light Assembly

INSTALLATION

Caution:

- **Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).**



- **Before installing the bumper face, match the claws on the bracket - front bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.**

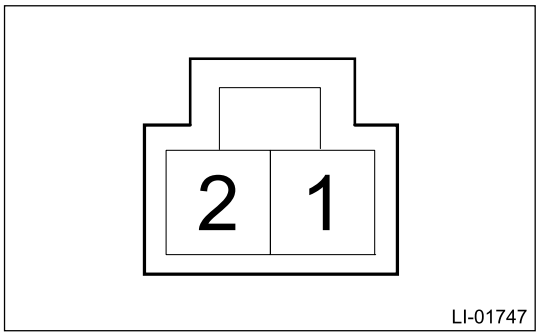
1. Install the daytime running light assembly.
   Tightening torque:
   7.5 N·m(0.8 kgf-m, 5.5 ft-lb)

2. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > Day Time Running Light Assembly

INSPECTION

1. Apply battery voltage between the connector terminals to check the lighting condition of the light.



Terminal No.	Inspection conditions	Specification
1 (+) — 2 (−)	Apply battery voltage.	Light ON

2. Replace the daytime running light assembly if it is found defective.
Note:
Since the daytime running light assembly uses LED (Light Emitting Diode), replace the daytime running light assembly if the light does not illuminate.

LIGHTING SYSTEM > Side Turn Signal Light Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - side turn mirror. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly>DISASSEMBLY.

LIGHTING SYSTEM > Side Turn Signal Light Assembly

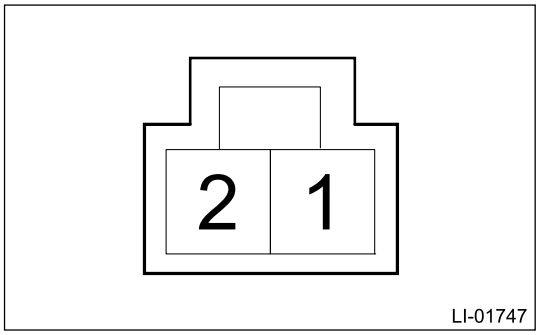
INSTALLATION

1. Install the light assembly - side turn mirror. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly>ASSEMBLY.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > Side Turn Signal Light Assembly

INSPECTION

1. Apply battery voltage between the connector terminals to check the lighting condition of the light.



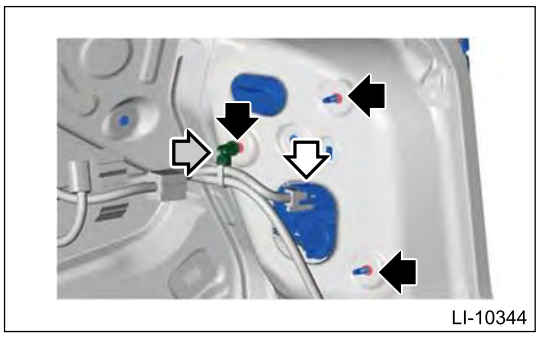
Terminal No.	Inspection conditions	Specification
1 (+) — 2 (−)	Apply battery voltage.	Light ON

2. Replace the light assembly - side turn mirror if faulty is found in the inspection.
   Note:
   Since LED (Light Emitting Diode) is used for the light, replace the light assembly - side turn mirror if the light does not illuminate.

REMOVAL

1. 4 DOOR MODEL

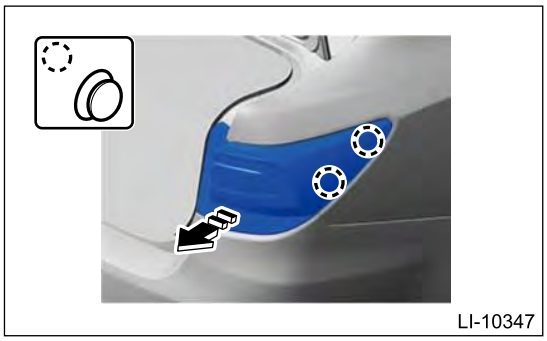
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk side. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the light assembly - rear combination.
   (1) Disconnect the connector.
   (2) Remove the harness clips and nuts.



   (3) Release the clips, and remove the light assembly - rear combination as shown in the figure.

Caution:

Be careful not to damage the clips.

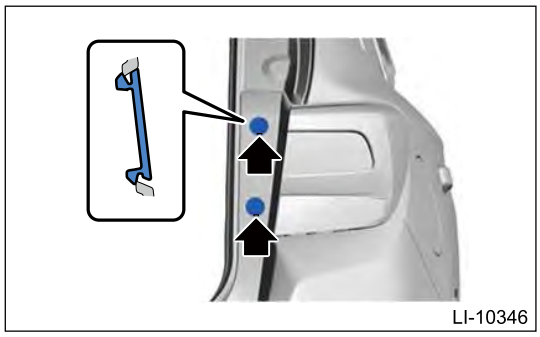


2. 5 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - rear combination.
   (1) Release the claws and then remove the grommet.

Caution:

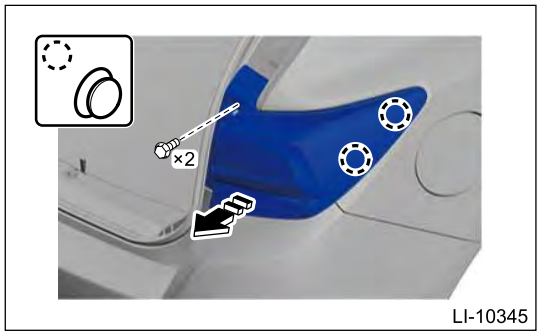
When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.



(2) Release the bolts and clips, then pull out the light assembly - rear combination to the rear of the vehicle as shown in the figure.

Caution:

Be careful not to damage the clips.



(3) Disconnect the connector and remove the light assembly - rear combination.

LIGHTING SYSTEM > Rear Combination Light Assembly

INSTALLATION

1. 4 DOOR MODEL

1. Replace the light assembly gasket with a new part.
2. Install the light assembly - rear combination.

   Caution:

   Be careful not to catch the harness in between the parts.

   Tightening torque:

   4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
3. Install the trim panel - trunk side.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

1. Install the light assembly - rear combination.

   Caution:

   Be careful not to catch the harness in between the parts.

   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the grommet.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

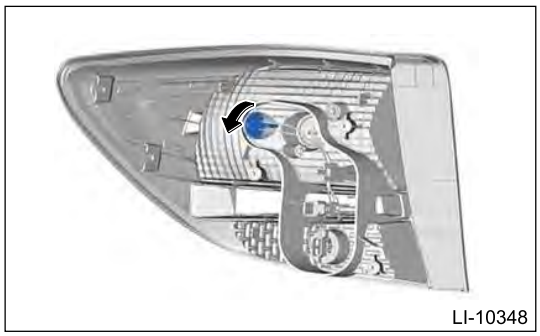
DISASSEMBLY

Caution:

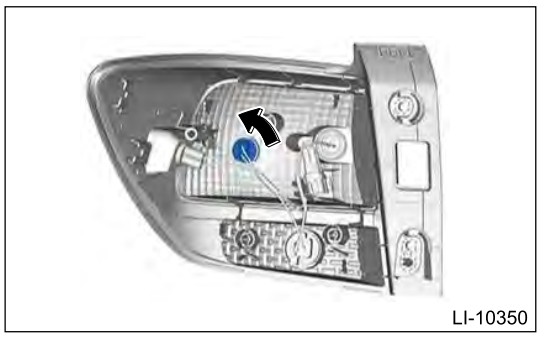
- **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
- **Do not leave the light assembly - rear combination without the bulb for a long time. Dust, moisture, etc. entering the light may affect its performance.**
- **For 4 door model, when removing with the light assembly - rear combination installed, turn over the trim panel - trunk side and remove each bulb.**

1. TAIL LIGHT BULB

- **4 DOOR MODEL**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the tail light bulb.



- **5 DOOR MODEL**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the tail light bulb.



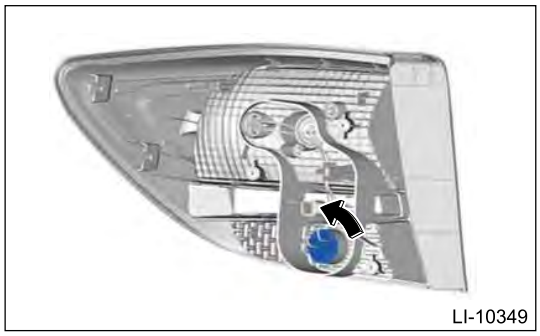
2. STOP LIGHT BULB

Note:

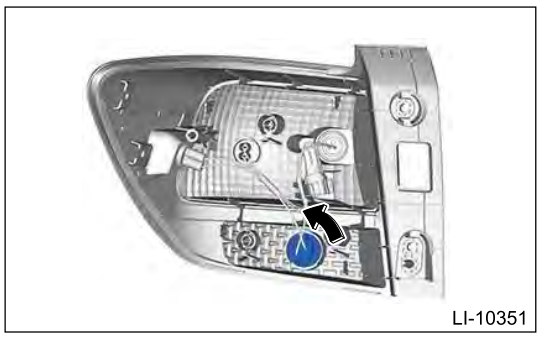
Since the LED type is a non-disassembled part, it cannot be removed. Replace the light assembly - rear combination if defective.

3. TURN SIGNAL LIGHT BULB

- **4 DOOR MODEL**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the turn signal light bulb.



- **5 DOOR MODEL**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the turn signal light bulb.



4. SIDE MARKER LIGHT BULB

- **4 DOOR MODEL**
  It is integrated with the tail light bulb. For operation procedures, refer to “Tail Light Bulb”.
- **5 DOOR MODEL**
  1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
  2. Remove the side marker light bulb.



LIGHTING SYSTEM > Rear Combination Light Assembly

ASSEMBLY

Caution:
Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

1. TAIL LIGHT

- **4 DOOR MODEL**
  1. Install the tail light bulb.
  2. Install the bulb socket.

- **5 DOOR MODEL**
  1. Install the tail light bulb.
  2. Install the bulb socket.

2. STOP LIGHT BULB

Note:

Since the LED type is a non-disassembled part, it cannot be removed. Replace the light assembly - rear combination if defective.

3. TURN SIGNAL LIGHT BULB

- **4 DOOR MODEL**
  1. Install the turn signal light bulb.
  2. Install the bulb socket.
- **5 DOOR MODEL**
  1. Install the turn signal light bulb.
  2. Install the bulb socket.

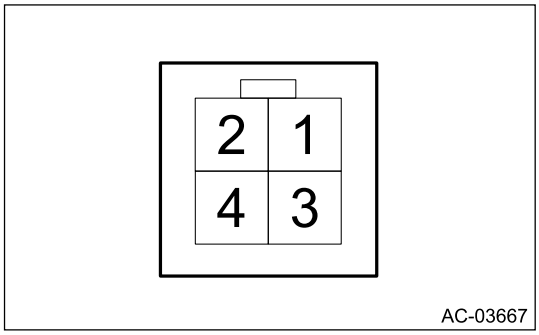
4. SIDE MARKER LIGHT BULB

- **4 DOOR MODEL**

  It is integrated with the tail light bulb. For operation procedures, refer to “Tail Light Bulb”.
- **5 DOOR MODEL**
  1. Install the side marker light bulb.
  2. Install the bulb socket.

INSPECTION

1. Apply battery voltage between the connector terminals to check the lighting condition of the light.



- 4 door model

Terminal No.	Inspection conditions	Specification
3 (+) — 2 (−)	Apply battery voltage.	Stop light on
1 (+) — 2 (−)		Tail / side marker light on
4 (+) — 2 (−)		Turn signal light on

- 5 door model

Terminal No.	Inspection conditions	Specification
2 (+) — 4 (−)	Apply battery voltage.	Stop light on
1 (+) — 4 (−)		Tail / side marker light on
3 (+) — 4 (−)		Turn signal light on

2. Replace the harness and bulb if it is found defective.

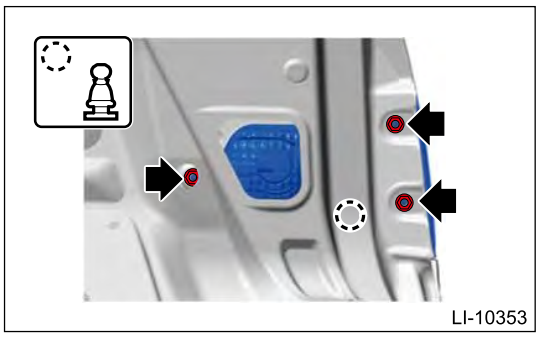
Note:

Since LED (Light Emitting Diode) is used for the stop light, replace the light assembly - rear combination if the light does not illuminate.

REMOVAL

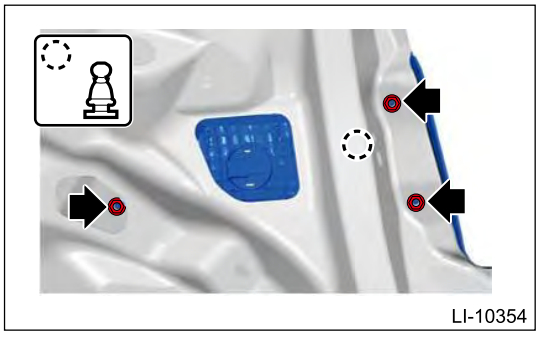
1. 4 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the light assembly - finisher rear.
   (1) Disconnect the connector.
   (2) Release the nuts and pins, then remove the light assembly - finisher rear.



2. 5 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the light assembly - finisher rear.
   (1) Disconnect the connector.
   (2) Release the nuts and pins, then remove the light assembly - finisher rear.



INSTALLATION

1. 4 DOOR MODEL

1. Replace the light assembly gasket with a new part.
2. Install the light assembly - finisher rear.
   Tightening torque:
   4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
3. Install the trim panel - trunk lid.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

1. Replace the light assembly gasket with a new part.
2. Install the light assembly - finisher rear.
   Tightening torque:
   4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
3. Install the trim panel - rear gate.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

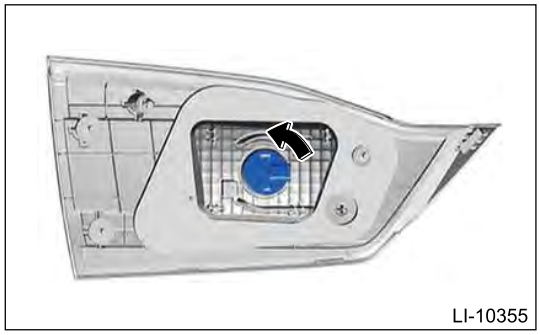
LIGHTING SYSTEM > Rear Finisher Light Assembly

DISASSEMBLY

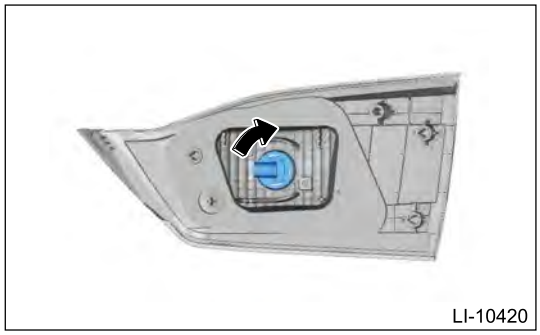
Caution:

- **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
- **Do not leave the light assembly - finisher rear without the bulb for a long time. Dust, moisture, etc. entering the light may affect its performance.**
- **When removing with the light assembly - finisher rear installed, remove each bulb in the following procedures.**
  – 4 door model: Turn over the trim panel - trunk side and remove the bulb.
  – 5 door model: Remove the bulb inspection cover and remove the bulb.

1. Rotate in the direction of arrow shown in the figure to remove the bulb socket.
2. Remove the back-up light bulb.
   - 4 door model
     – RH side



     – LH side



   - 5 door model
     – RH side



– LH side



LIGHTING SYSTEM > Rear Finisher Light Assembly

ASSEMBLY

Caution:

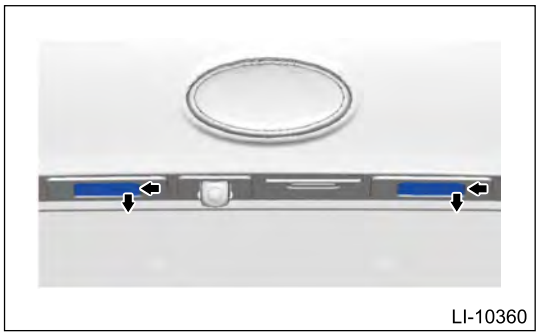
Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

1. Install the back-up light bulb.
2. Install the bulb socket.

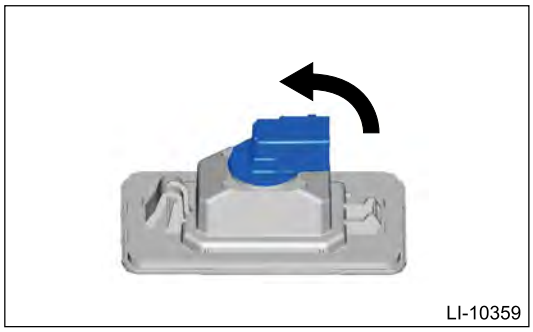
REMOVAL

1. 4 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the license plate light.
   (1) Release the claws as shown in the figure, and pull out the license plate light.

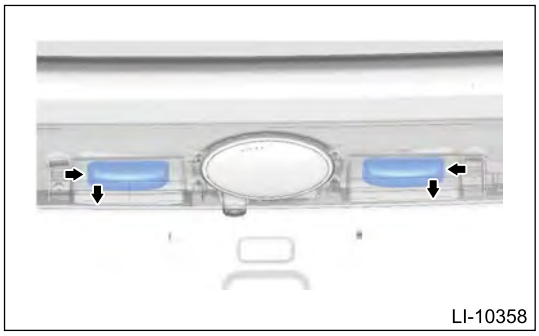


   (2) Disconnect the connector, and remove the license plate light.
3. Remove the license plate light bulb.
   Caution:
   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
   (1) Rotate the bulb socket in the direction of arrow shown in the figure to remove the license plate light bulb.



2. 5 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the license plate light.
   (1) Release the claws as shown in the figure, and pull out the license plate light.

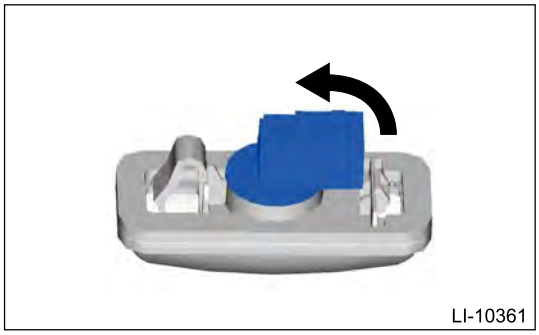


   (2) Disconnect the connector, and remove the license plate light.
3. Remove the license plate light bulb.

Caution:

Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

(1) Rotate the bulb socket in the direction of arrow shown in the figure to remove the license plate light bulb.



LIGHTING SYSTEM > License Plate Light

INSTALLATION

1. 4 DOOR MODEL

1. Install the license plate light bulb.

   Caution:

   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the license plate light.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

1. Install the license plate light bulb.

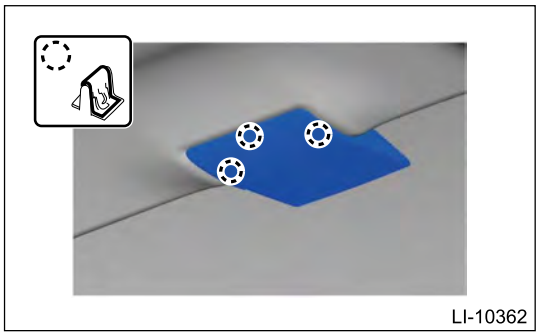
   Caution:

   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the license plate light.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. 4 DOOR MODEL

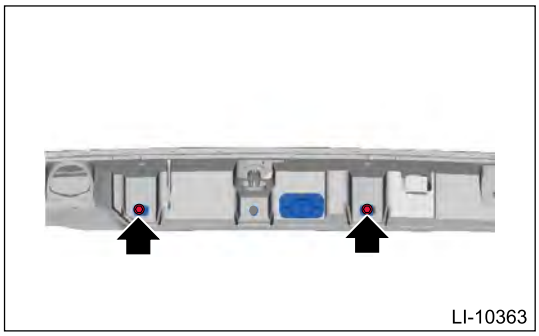
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - high-mounted.
   (1) Release the clips.



   (2) Disconnect the connector and remove the light assembly - high-mounted.

2. 5 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the roof spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>REMOVAL.
4. Remove the light assembly - high-mounted.
   (1) Remove the nuts and remove the light assembly - high-mounted.



INSTALLATION

1. 4 DOOR MODEL

1. Install the light assembly - high-mounted.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. 5 DOOR MODEL

Caution:
Make sure the bolt is tightened securely because improper roof spoiler installation may cause water leakage.

1. Install the light assembly - high-mounted.

Tightening torque:

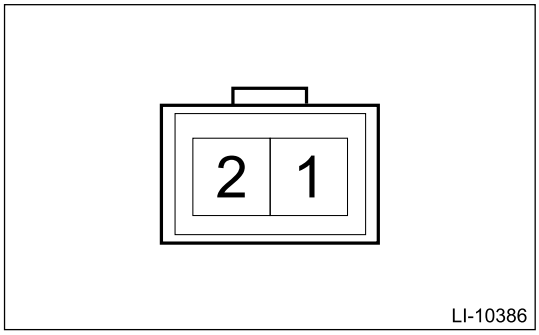
4.5 N·m (0.5 kgf-m, 3.3 ft-lb)

2. Install the roof spoiler. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>INSTALLATION.
3. Install the trim panel - rear gate.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > High-mounted Stop Light

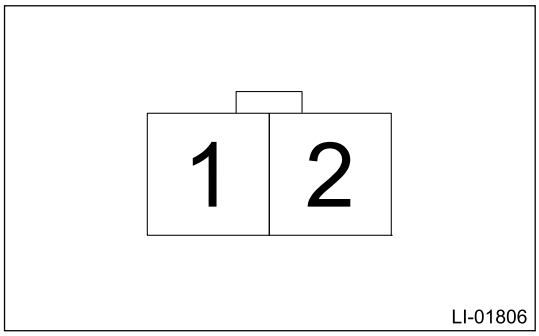
INSPECTION

1. Apply battery voltage between the connector terminals to check the lighting condition of the light.
   - 4 door model



Terminal No.	Inspection conditions	Specification
2 (+) — 1 (−)	Apply battery voltage.	Light ON

   - 5 door model



Terminal No.	Inspection conditions	Specification
1 (+) — 2 (−)	Apply battery voltage.	Light ON

2. Replace the light assembly - high-mounted if faulty is found in the inspection.

Note:

Since LED (Light Emitting Diode) is used for the high-mounted stop light, replace the light assembly - high-mounted if the light does not illuminate.

REMOVAL

1. MODELS WITHOUT EYESIGHT

Note:

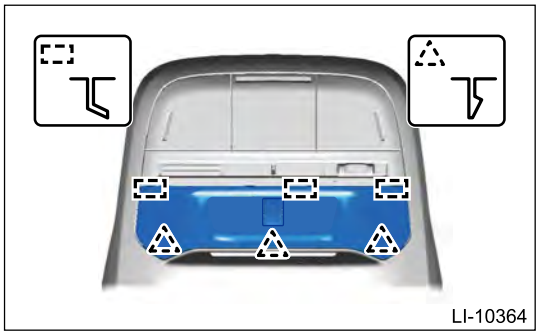
Do not remove the light assembly - map if removing the bulb only.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - map.

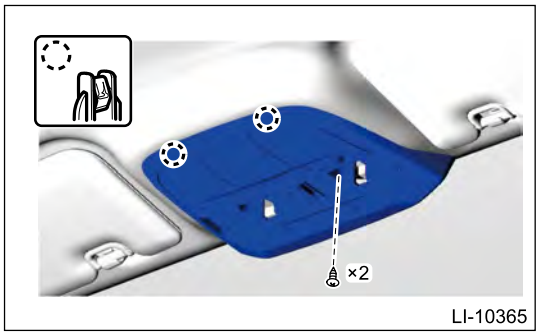
   Caution:

   When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.

   (1) Release the claws and then remove the cap.



   (2) Remove the screws and release the clip.

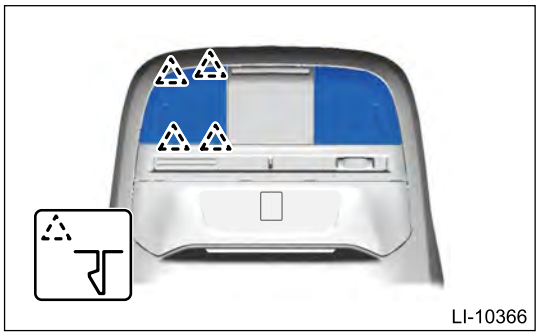


   (3) Disconnect the connector and remove the light assembly - map.
3. Remove the map light bulb.

   Caution:

   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws and remove the lens.



(2) Remove the map light bulb.



2. MODELS WITH EYESIGHT

Note:

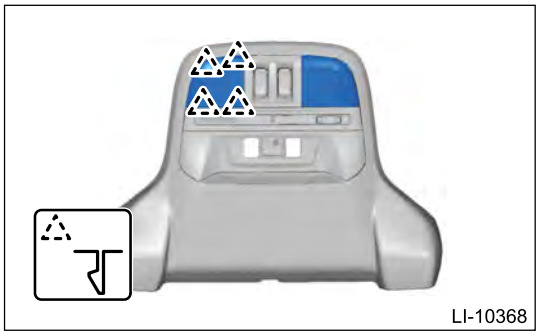
- **The light assembly - map is a single unit with the stereo camera cover assembly. If defective, replace the stereo camera cover assembly. Ref. to EyeSight>Stereo Camera.**
- **Do not remove the stereo camera cover assembly if removing the bulb only.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the map light bulb.

   Caution:

   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws and remove the lens.



(2) Remove the map light bulb.



LIGHTING SYSTEM > Spot Map Light

INSTALLATION

1. MODELS WITHOUT EYESIGHT

1. Install the map light bulb and lens.
   Caution:
   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the light assembly - map.
3. Install cap.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

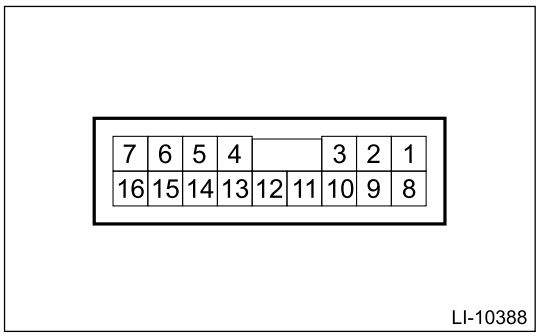
2. MODELS WITH EYESIGHT

1. Install the map light bulb and lens.
   Caution:
   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > Spot Map Light

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



- Light switch

Terminal No.	Inspection conditions	Standard
1 — 13	Switch OFF	1 MΩ or more
	Switch ON	Approx. 18 Ω

- Door switch

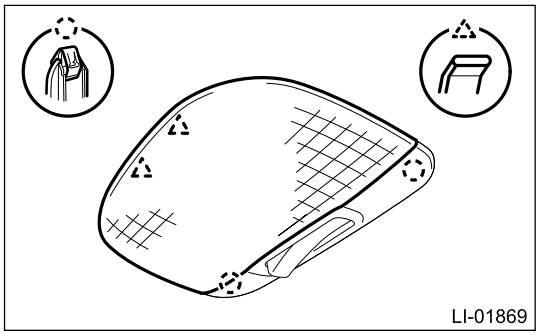
Terminal No.	Inspection conditions	Specification
1 — 4	Switch door	Continuity exists

2. Replace the light assembly - map if it is found defective.

REMOVAL

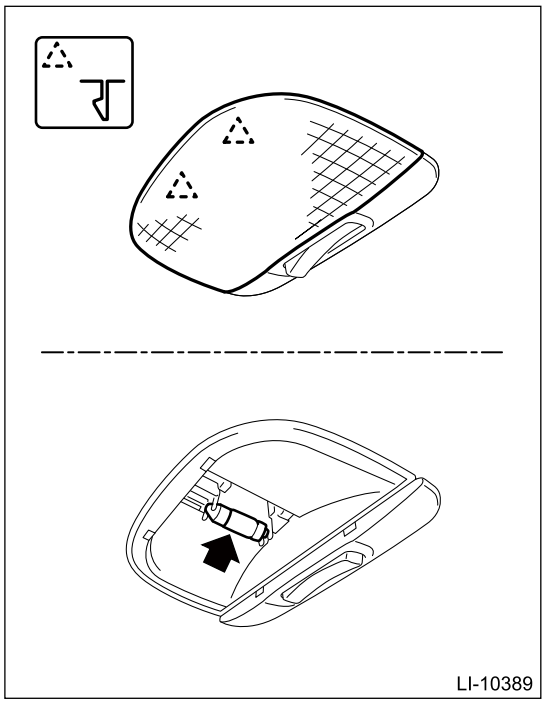
Note:
Do not remove the light assembly - room if removing the bulb only.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - room.
   (1) Remove the clips, and remove the hook.



   (2) Disconnect the connector and remove the light assembly - room.
3. Remove the room light bulb.
   Caution:
   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws and remove the lens.
   (2) Remove the room light bulb.



INSTALLATION

1. Install the room light bulb and lens.

   Caution:

   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.

2. Install the light assembly - room.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

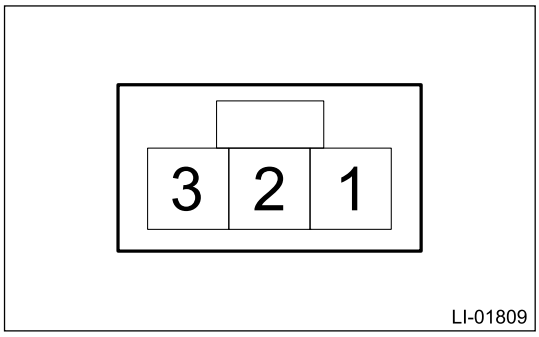
LIGHTING SYSTEM > Room Light

INSPECTION

1. Measure the resistance between connector terminals.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 3	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω
2 — 3	Switch door	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check the lighting condition of the light.

Terminal No.	Inspection conditions	Specification
3 (+) — 1 (−) 3 (+) — 2 (−)	Switch OFF	Light OFF
	Switch ON	Light ON
	Switch door	Light ON

3. Replace the light assembly - room if faulty is found in the inspection.

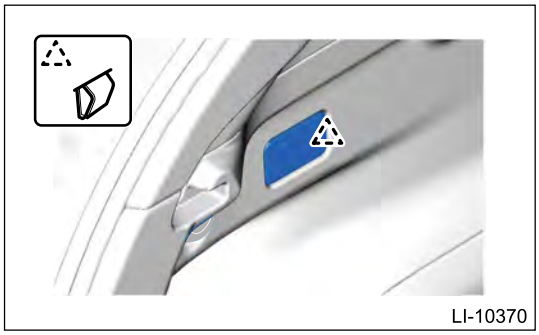
REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - luggage room.

   Caution:

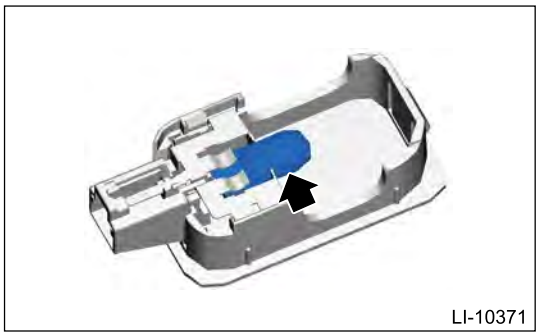
   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws and remove the main body of the light assembly - luggage room.



   (2) Disconnect the connector.

   (3) Remove the light assembly - luggage room and the bulb.



INSTALLATION

1. Install the luggage room light bulb.

   Caution:

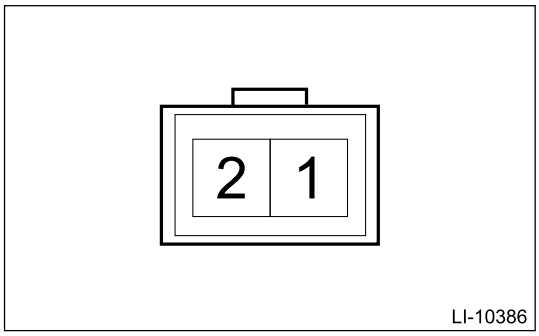
   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the light assembly - luggage room.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

1. Measure the resistance between connector terminals.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	Switch OFF	1 MΩ or more
	Switch ON	Less than 1 Ω

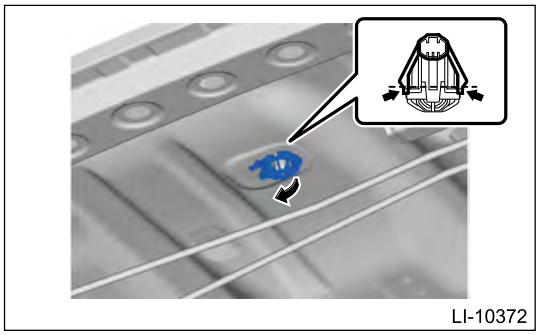
2. Replace the light assembly - luggage room if the inspection result is not within the standard value.

REMOVAL

Note:

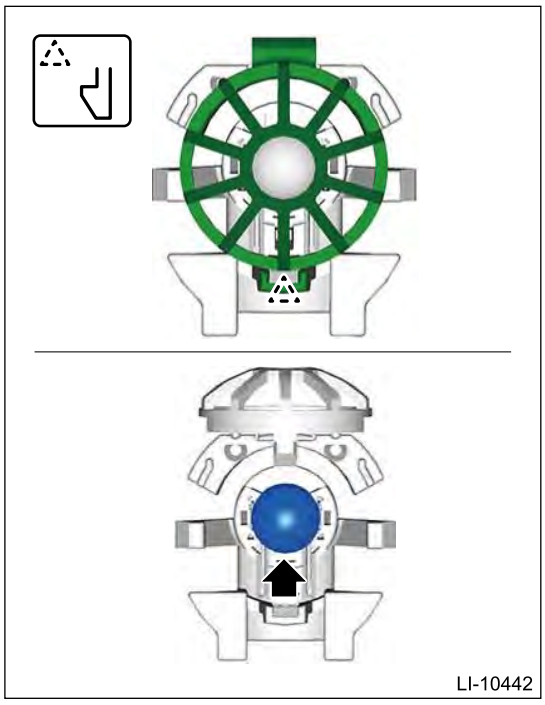
Do not remove the light assembly - trunk room if removing the bulb only.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - trunk room.
   (1) Release the claws and pull out the light assembly - trunk room as shown in the figure.



   (2) Disconnect the connector and remove the light assembly - trunk room.
3. Remove the trunk room light bulb.
   Caution:
   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws, and open the bulb cover.
   (2) Remove the trunk room light bulb.



INSTALLATION

1. Install the trunk room light bulb and bulb cover.
   Caution:
   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the light assembly - trunk room.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. GLOVE BOX LIGHT

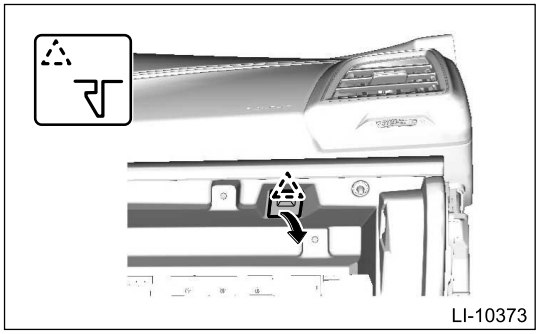
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the light - pocket cover.

   Caution:

   When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.

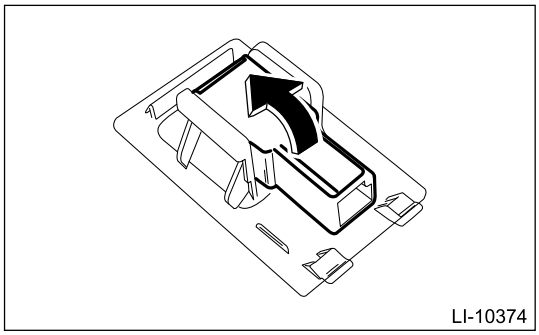
   (1) Release the claws.

   (2) Disconnect the connector, and remove the light - pocket cover.



4. Remove the light - pocket.

   (1) Release the claws, and remove the light - pocket.



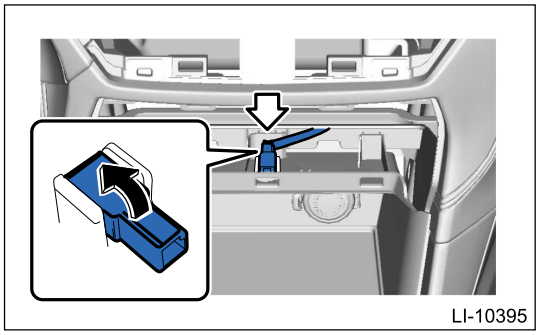
2. POCKET LIGHT

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. (manual A/C model) Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the grille assembly - CTR ventilation. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
4. Remove the audio assembly or navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Audio>REMOVAL.
5. Remove the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>REMOVAL.
6. Remove the light - pocket.

   Caution:

   When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.

(1) Disconnect the connector.
(2) Release the claws, and remove the light - pocket.



LIGHTING SYSTEM > LED Illumination Light

INSTALLATION

1. GLOVE BOX LIGHT

1. Install the light - pocket.
2. Install the light - pocket cover.
3. Install the pocket assembly.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. POCKET LIGHT

1. Install the light - pocket.
2. Install the heater control assembly. Ref. to AIR CONDITIONER>Control Panel>INSTALLATION.
3. Install the audio assembly or navigation assembly.
4. Install the grille assembly - CTR ventilation.
5. Install the pocket assembly and the back panel - pocket. (manual A/C model)
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

Note:

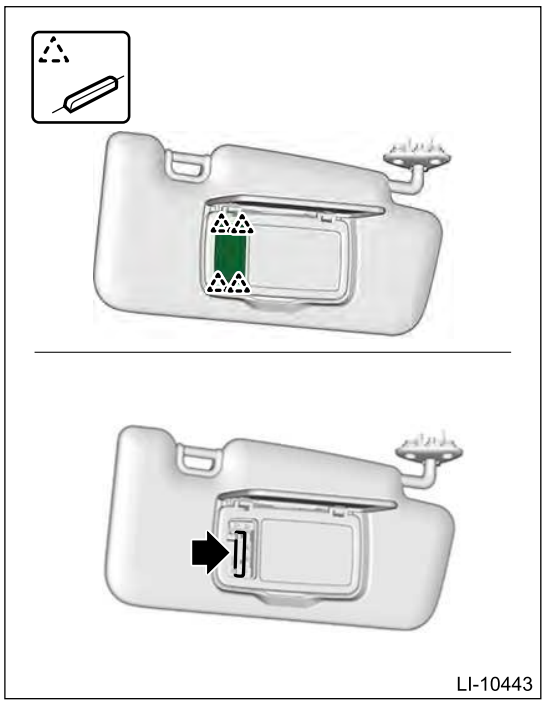
- **The vanity mirror light is integrated into the sun visor assembly. Replace the sun visor assembly if faulty. Ref. to EXTERIOR/INTERIOR TRIM>Sun Visor>REMOVAL.**
- **Do not remove the sun visor assembly if removing the bulb only.**

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the sun visor assembly. Ref. to EXTERIOR/INTERIOR TRIM>Sun Visor>REMOVAL.
3. Remove the vanity mirror light bulb.

   Caution:

   - **Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.**
   - **When using a flat tip screwdriver, use an appropriate sized tool for the insertion opening, apply protective tape or cloth around the tool, and be careful not to cause damage.**

   (1) Release the claws and remove the lens.
   (2) Remove the vanity mirror light bulb.



INSTALLATION

1. Install the vanity mirror light bulb and lens.

   Caution:

   Use a dry clean cloth so that no grease or water adheres to the glass portion of the bulb.
2. Install the sun visor assembly.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

NOTE

The ignition switch illumination is integrated into the immobilizer antenna assembly. For operation procedures, refer to the "SECURITY AND LOCKS" section. Ref. to SECURITY AND LOCKS>Immobilizer Antenna.

INSPECTION

1. CHECK IGNITION SWITCH ILLUMINATION.

1. Turn the ignition switch to ON.
2. Check the lighting condition of the ignition switch illumination.

Does the ignition switch illumination blink?

Yes	Check the function setting of body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit.
No	Go to 2.

2. CHECK IGNITION SWITCH ILLUMINATION OPERATION.

1. Turn the ignition switch to OFF.
2. Open and close the driver's side door.

When door is opened/closed, does the ignition switch illumination switch between ON ←→ OFF?

Yes	Ignition switch illumination is normal.
No	Go to 3.

3. CHECK CURRENT DATA.

Display the [Driver's door SW input] data using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Does the display change as [ON] ←→ [OFF], when the door is opened/closed?

Yes	Go to 4.
No	Check the door switch circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR SWITCH.

4. CHECK CURRENT DATA.

Display the [key illumination lamp o/p] data using Subaru Select Monitor.

Does the display change as [ON] ←→ [OFF], when the door is opened/closed?

Yes	Check the ignition switch illumination circuit, and repair or replace the harness.
No	Check the body integrated unit and replace it if defective. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

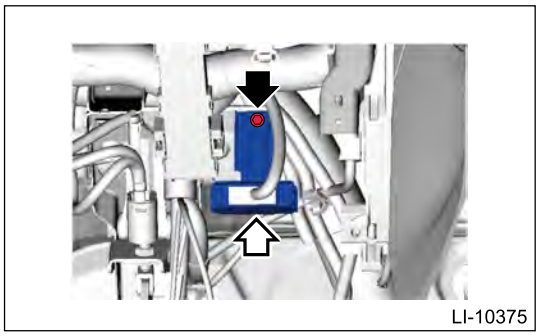
LIGHTING SYSTEM > Auto Headlight Beam Leveler Control Module

REMOVAL

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Disconnect the battery ground cable and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the auto headlight beam leveler CM.
   (1) Disconnect the connector.
   (2) Remove the bolts, and pull out the auto headlight beam leveler CM.



LIGHTING SYSTEM > Auto Headlight Beam Leveler Control Module

INSTALLATION

Caution:

Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. Install the auto headlight beam leveler CM.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
3. Install the cover assembly - instrument panel LWR driver.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Perform initialization and reinitialization of the auto headlight beam leveler system. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

LIGHTING SYSTEM > Rear Height Sensor

REMOVAL

Caution:

Always remove the sensor assembly - headlight beam leveler before removing any parts related to the suspension.

Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

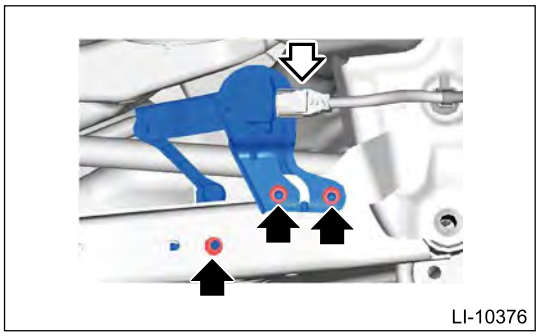
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the sensor assembly - headlight beam leveler.

   Caution:

   Do not disassemble the sensor and lever.

   (1) Disconnect the connector.

   (2) Remove the nuts, and remove the sensor assembly - headlight beam leveler.



LIGHTING SYSTEM > Rear Height Sensor

INSTALLATION

Caution:

Do not apply impact to the sensor assembly - headlight beam leveler or forcibly move the arm. Doing so may cause sensor damage and malfunction.

1. Install the sensor assembly - headlight beam leveler.

   Tightening torque:

   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Lower the vehicle.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Perform reinitialization of the auto headlight beam leveler system. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > REINITIALIZATION.

   Note:

   When replacing the rear vehicle height sensor with a new part, perform the initialization. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE > INITIALIZATION.

LIGHTING SYSTEM > Rear Height Sensor

INSPECTION

1. Connect three dry cell batteries (1.5 V) in series.

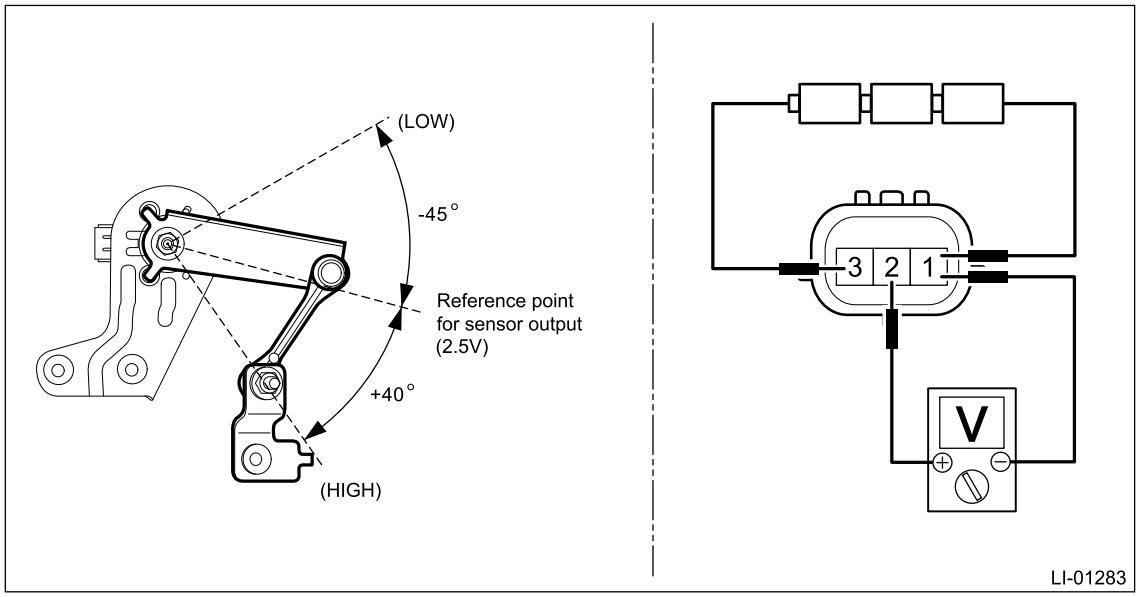
Note:

- **Use new dry-cell batteries.**
- **Using a circuit tester, check that the initial voltage of each dry-cell battery is 1.6 V or more. And also check that the voltage of three batteries in series is between 4.8 — 5.2 V.**
- **For power supply, 5 V DC constant voltage power source can also be used.**

2. Connect the dry-cell battery positive terminal to the connector terminal No. 3, and the dry-cell battery ground terminal to the connector terminal No. 1.
3. With voltage applied, measure the voltage between connector terminals when the sensor link is moved slowly up and down.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
2 (+) — 1 (−)	Move the link within the operation range.	Approx. 0.5 — 4.1 V

Note:

When the link is moved upward from the standard output position, the sensor output varies to the 0.5 V side. When the link is moved downward, the sensor output varies to the 4.1 V side.

4. Replace the sensor assembly - headlight beam leveler if the inspection result is not within the standard value.

REMOVAL

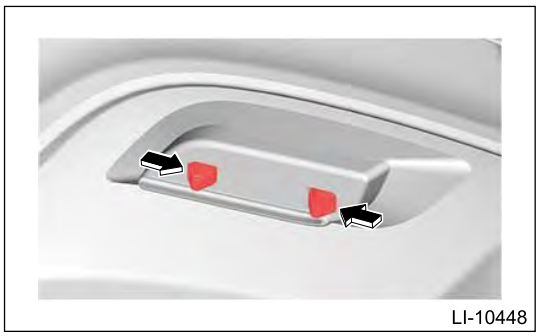
1. 4 DOOR MODEL

Note:

The reflex reflector is integrated into the rear combination light assembly. For operation procedures, refer to "Rear Combination Light Assembly". Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>REMOVAL > 4 DOOR MODEL.

2. 5 DOOR MODEL

1. Remove the reflex reflector assembly.
(1) From behind the bumper face - rear, release the claws.
(2) Remove the reflex reflector assembly.



INSTALLATION

1. 4 DOOR MODEL

Note:

The reflex reflector is integrated into the rear combination light assembly. For operation procedures, refer to "Rear Combination Light Assembly". Ref. to LIGHTING SYSTEM>Rear Combination Light Assembly>INSTALLATION > 4 DOOR MODEL.

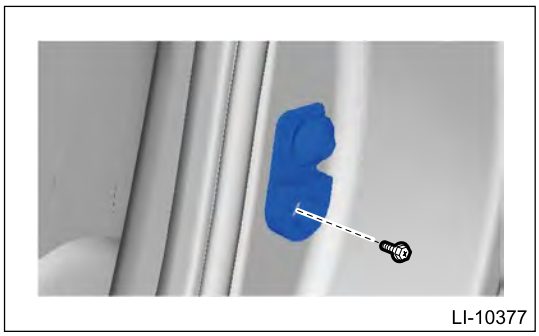
2. 5 DOOR MODEL

1. Install the reflex reflector assembly.

LIGHTING SYSTEM > Door Switch

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the switch assembly - door.
   (1) Remove the screws, and pull out the switch assembly - door toward you.



   (2) Disconnect the connector and remove the switch assembly - door.

LIGHTING SYSTEM > Door Switch

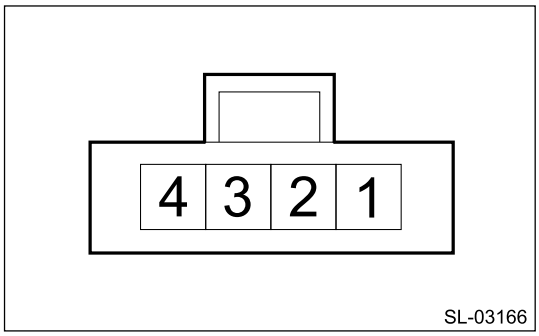
INSTALLATION

1. Install the switch assembly - door.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > Door Switch

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



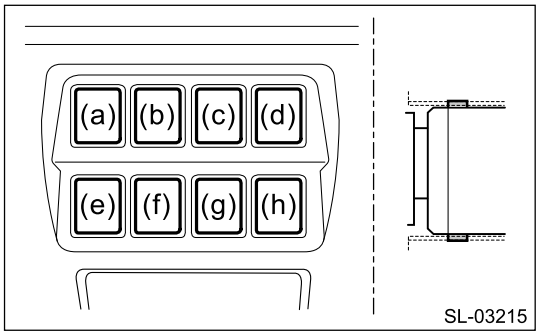
Terminal No.	Inspection conditions	Standard
1 — 2	When the switch is not pressed	Less than 1 Ω
	When the switch is pressed	1 MΩ or more

2. Replace the switch assembly - door if the inspection result is not within the standard value.

LIGHTING SYSTEM > SRF OFF Switch

REMOVAL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the SRF OFF switch.
   (1) Release the claws and remove the SRF OFF switch (d).



LIGHTING SYSTEM > SRF OFF Switch

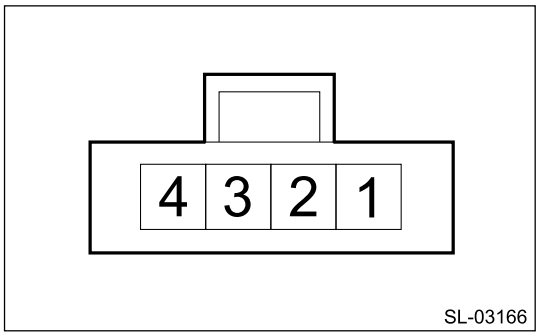
INSTALLATION

1. Install the SRF OFF switch.
2. Install the cover assembly - instrument panel LWR driver OUT.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

LIGHTING SYSTEM > SRF OFF Switch

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 4	OFF	1 MΩ or more
	ON	Less than 1 Ω

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Terminal No.	Inspection conditions	Specification
2 (+) — 3 (−)	Apply battery voltage.	Light ON

3. Replace the SRF OFF switch if it is found defective.

NOTE

For the operation and inspection procedures of the SRH OFF switch, refer to “SRF OFF Switch”. Ref. to LIGHTING SYSTEM>SRF OFF Switch.

REVERSE AUTOMATIC BRAKING

RAB

1. General Description
2. Relay and Fuse
3. Reverse Automatic Braking
4. Reverse Automatic Braking CM
5. Sensor and Harness
6. Control Unit
7. Stereo Camera
8. Combination Meter
9. Multi-function Display (MFD)
10. Audio

REVERSE AUTOMATIC BRAKING > General Description

NOTE

Using the EyeSight brake control, the Reverse Automatic Braking detects obstacles with the Reverse Automatic Braking CM and sonar sensor to operate the system.

REVERSE AUTOMATIC BRAKING > General Description

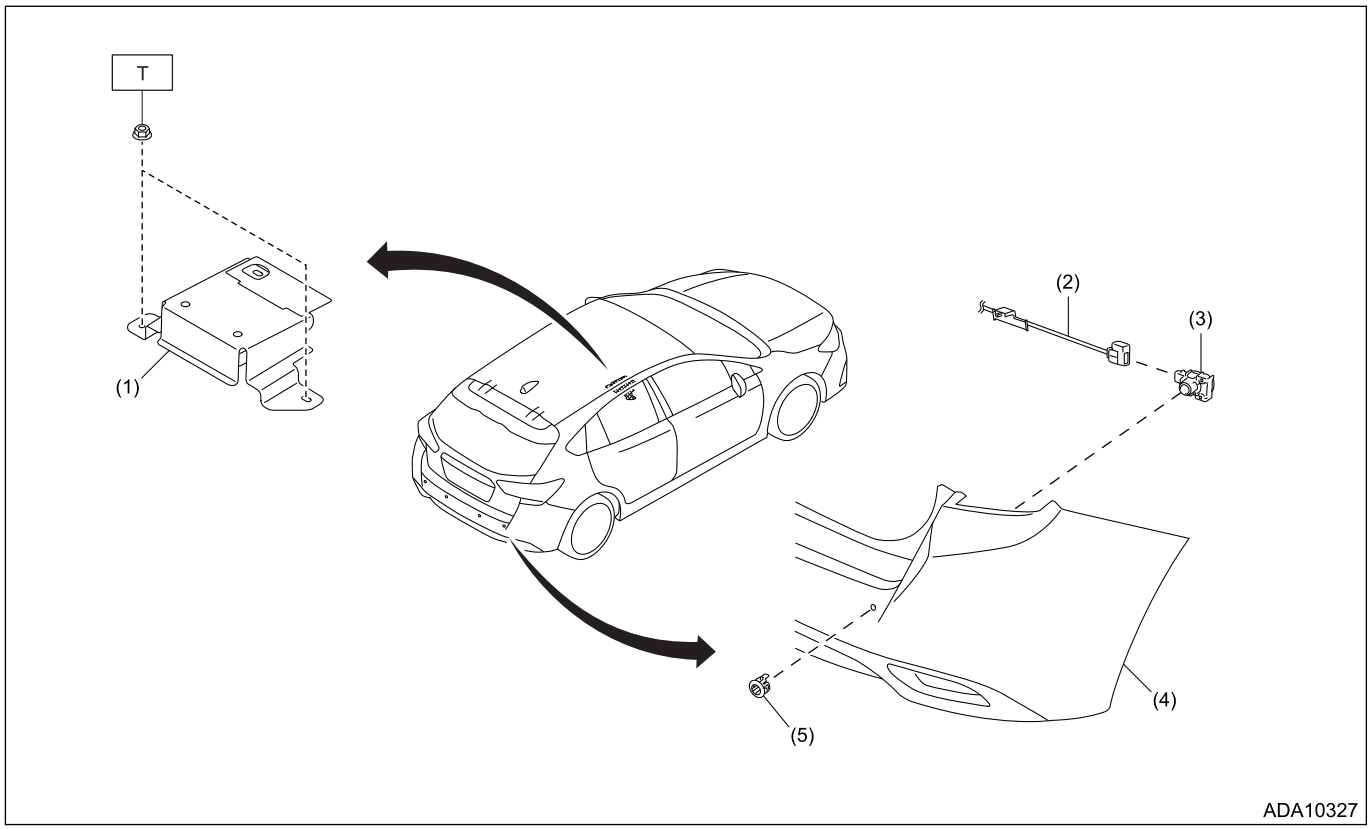
LOCATION

For location, refer to “LOCATION” in the “Reverse Automatic Braking (DIAGNOSTICS)” section.
Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Electrical Component Location>LOCATION.

REVERSE AUTOMATIC BRAKING > General Description

COMPONENT

1. REVERSE AUTOMATIC BRAKING CM AND SONAR SENSOR



(1)	Reverse Automatic Braking CM	(4)	Bumper face - rear	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Cord ASSY - sonar	(5)	Bezel - sonar	***T: 7.5 (0.8, 5.5)***	
(3)	Sonar sensor				

REVERSE AUTOMATIC BRAKING > General Description

CAUTION

- Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the electrical parts provided with memory functions that store contents

specified by a customer, record the memory contents before disconnecting the battery ground cable.

- For precautions for Reverse Automatic Braking, refer to “CAUTION” in “Reverse Automatic Braking (DIAGNOSTICS)” section. Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>General Description>CAUTION.

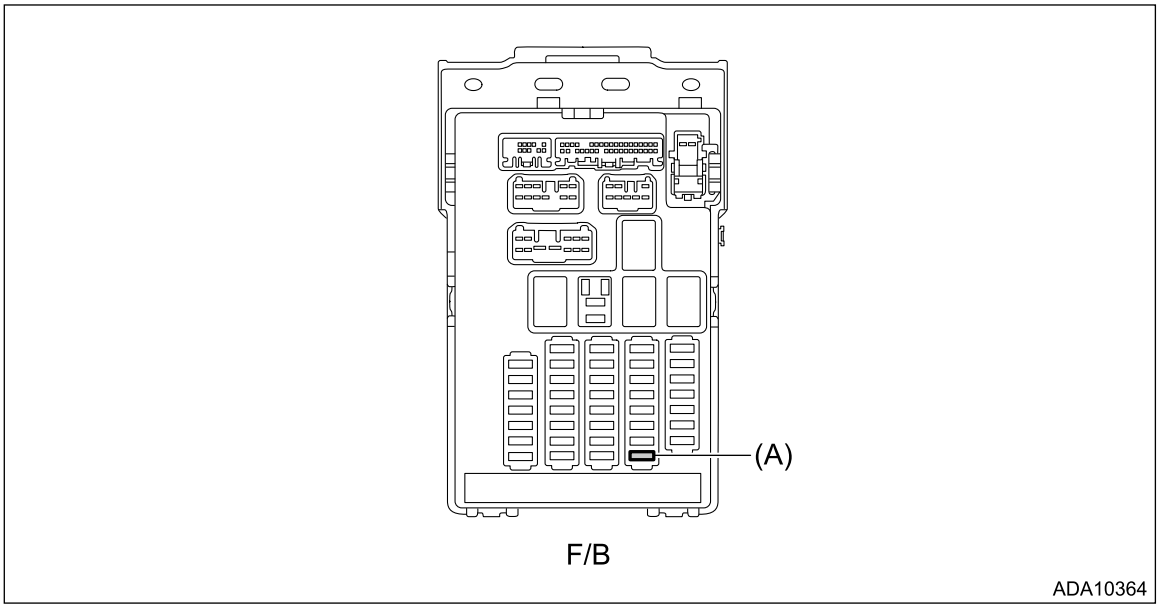
REVERSE AUTOMATIC BRAKING > General Description

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Clip remover	Used for removing clips.
Angle gauge	Used for inspecting height and angle of the sonar sensor.
Try square	
Measure	
Leveling line	
Plumb bob	
Packing tape	

LOCATION



Fuse & relay box (F/B)	Fuse 7.5 A (RAB CM)	(A)

Note:

- **Refer to "LOCATION" of the "EyeSight" section because the Reverse Automatic Braking uses the EyeSight system control. Ref. to EyeSight>Relay and Fuse>LOCATION.**
- **For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.**

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

   Note:

   If the fuse is blown again, check the system wiring harness.

REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking

WIRING DIAGRAM

Refer to "Reverse Automatic Braking" in the wiring diagram. Ref. to WIRING SYSTEM>Reverse Automatic Braking>WIRING DIAGRAM.

REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking

ELECTRICAL SPECIFICATION

For electrical specification, refer to "Control Module I/O Signal" of "Reverse Automatic Braking (DIAGNOSTICS)" section. Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Control Module I/O Signal.

REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking

INSPECTION

For inspection, refer to "Basic Diagnostic Procedure" of "Reverse Automatic Braking (DIAGNOSTICS)" section. Ref. to REVERSE AUTOMATIC BRAKING (DIAGNOSTICS)>Basic Diagnostic Procedure.

REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking

NOTE

For procedure of each component in the Reverse Automatic Braking, refer to the respective section.

- Control module: Ref. to REVERSE AUTOMATIC BRAKING>Control Unit.
  Note:
  System control of the Reverse Automatic Braking is performed by each module. For procedure, refer to the following sections.
  - Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
  - Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
  - VDC control module (VDC CM): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
  - Body integrated unit: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
  - Reverse Automatic Braking CM: Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.
- Sensor and harness: Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness.
- Stereo camera: Ref. to EyeSight>Stereo Camera.
- Combination meter: Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
- Multi-function display (MFD): Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
- Audio (navigation): Ref. to ENTERTAINMENT & MONITORING>Audio.

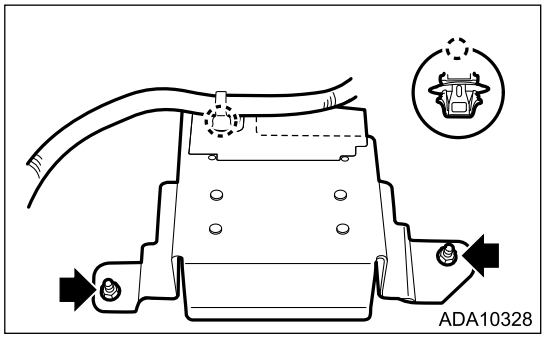
REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking CM

REMOVAL

Note:

The Reverse Automatic Braking CM is installed under the front seat LH. Remove the Reverse Automatic Braking CM after sliding the front seat LH as necessary.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the Reverse Automatic Braking CM.
   (1) Remove the nut to remove the harness clip.
   (2) Disconnect the connector and remove the Reverse Automatic Braking CM.



REVERSE AUTOMATIC BRAKING > Reverse Automatic Braking CM

INSTALLATION

1. Install the Reverse Automatic Braking CM.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

REMOVAL

1. SONAR SENSOR

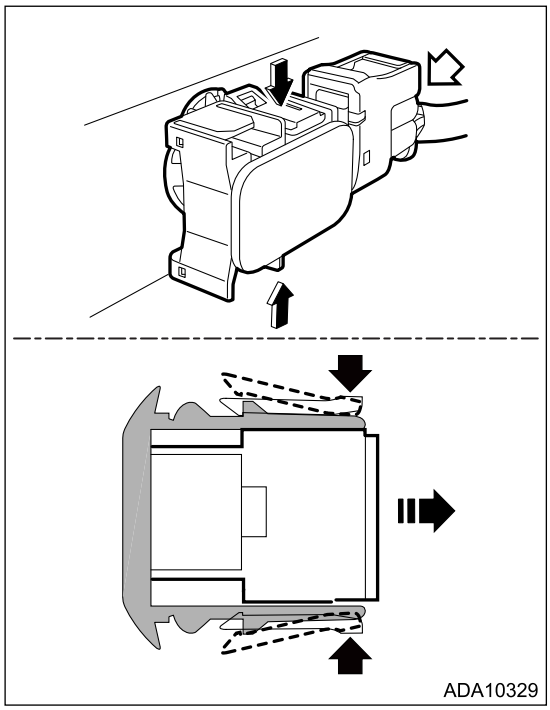
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - rear. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper>REMOVAL.
3. Remove the sonar sensor.

Caution:

When reusing the sensor, make sure to place a mark on the sensor and the bumper face - rear or others, and surely return each sensor to the original position before removed.

(1) Disconnect the connector.

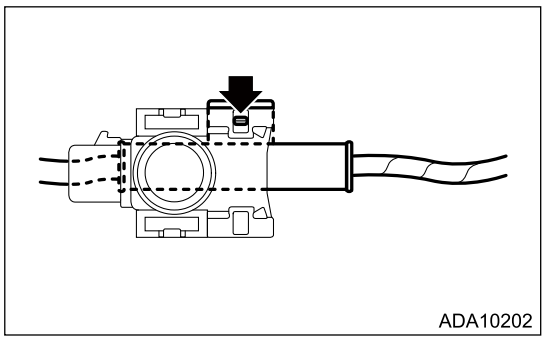
(2) Release the claws and then remove the sonar sensor.



Note:

- **The sonar sensors are equipped at four portions on the bumper face - rear.**
- **The figure indicates the sonar sensor (right corner). Remove the rest of the sensors in the same manner.**

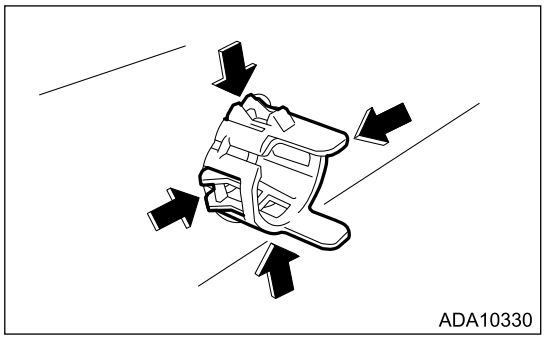
(3) Using a flat tip screwdriver wrapped with a protection tape, release the lock from the front side of the sonar sensor to remove the cord assembly - sonar.



Note:

Use a flat tip screwdriver with an appropriate size for the insertion opening.

(4) Release the claws, and then remove the bezel - sonar.



REVERSE AUTOMATIC BRAKING > Sensor and Harness

INSTALLATION

1. SONAR SENSOR

Caution:

When reusing the sensor, make sure to align the mark on the sensor and the bumper face - rear or others, and surely return each sensor to the original position before removed.

1. Install the bezel - sonar.
2. Install the sonar sensor.
3. Install the cord assembly - sonar.
4. Install the bumper face - rear.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. When the bumper face - rear and the sonar sensor are replaced, check the installation height and angle. Ref. to REVERSE AUTOMATIC BRAKING>Sensor and Harness>INSPECTION > SONAR SENSOR.

REVERSE AUTOMATIC BRAKING > Sensor and Harness

INSPECTION

1. SONAR SENSOR

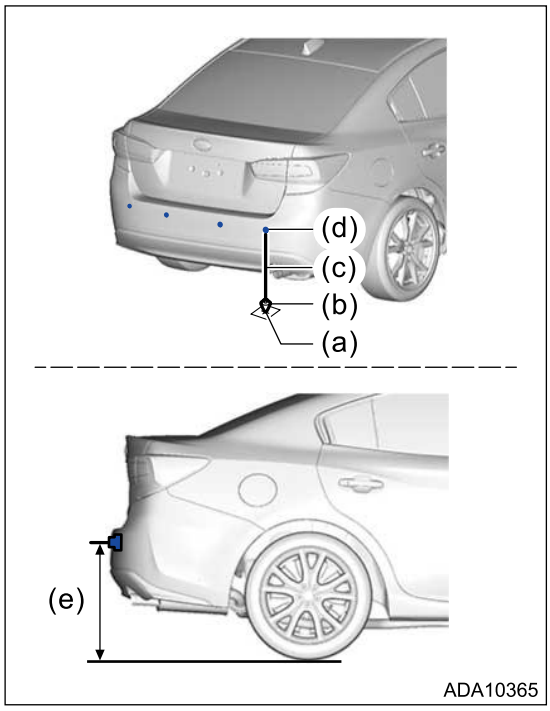
HEIGHT AND ANGLE INSPECTION

Caution:

Perform the inspection for each sonar sensor at curb weight.

1. Before performing measurement, check the following items.
   (1) The vehicle is parked on a level surface.
   (2) The inflation pressure of tires is correct.
   (3) The vehicle does not have load.
   (4) Check the area around the sensor and rear bumper for any scratches or other type of deformation.
2. Prepare the measure, plumb bob, leveling line, angle gauge and try square.
3. Measure installation height of the sonar sensor.
   (1) Suspend the plumb bob with leveling line from the sensor, and mark the position where the plumb bob touches the ground. (Point A)
   Note:
   Stick the packing tape etc. on the floor, then make a marking on the tape.

(2) Measure the height from the sensor to the marked Point A.



(a) Point A
(b) Plumb bob
(c) Leveling line
(d) Sonar sensor

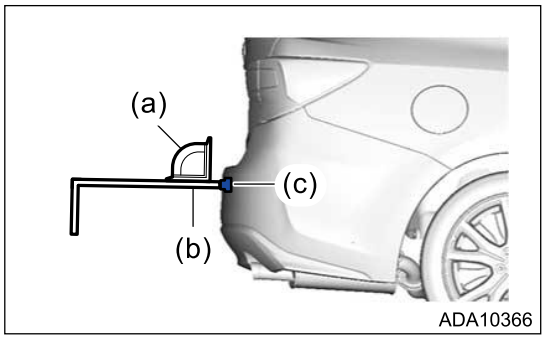
(3) Confirm that sensor installation height is within the acceptable limit.

Specification:

4 door model: 555 — 605 mm (21.85 — 23.82 in)
5 door model: 545 — 595 mm (21.46 — 23.43 in)

4. Measure the installation angle of the sonar sensor.

(1) Using an angle gauge and try square, measure the installation angle as shown in the figure.



(a) Angle gauge
(b) Try square
(c) Sonar sensor

Note:

Use the measurement tools while placing them perpendicularly to the sonar sensor.

(2) Confirm that sensor installation angle is within the acceptable limit.

Specification:

4 door model: 0.5° — 5.5 °

5 door model: 2.5° — 7.5 °

5. If the inspection result is not within the standard value, the rear bumper, bezel - sonar or sonar sensor may be improperly installed or deformed. Check the installation status of each part, and perform inspection again.

NOTE

System control of the Reverse Automatic Braking is performed by each module. For procedure, refer to the following sections.

- Engine control module (ECM): Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
- Transmission control module (TCM): Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
- VDC control module (VDC CM): Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
- Body integrated unit: Ref. to SECURITY AND LOCKS>Body Integrated Unit.
- Reverse Automatic Braking CM: Ref. to REVERSE AUTOMATIC BRAKING>Reverse Automatic Braking CM.

NOTE

For the operation procedures for the stereo camera, refer to “EyeSight” section. Ref. to EyeSight>Stereo Camera.

NOTE

For the operation procedures for combination meter, refer to “INSTRUMENTATION/DRIVER INFO” section. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

NOTE

For the operation procedures for Multi-Function Display (MFD), refer to “INSTRUMENTATION/DRIVER INFO” section. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System.

NOTE

For the operation procedures for the audio (navigation), refer to “ENTERTAINMENT & MONITORING” section. Ref. to ENTERTAINMENT & MONITORING>Audio.

SEATS

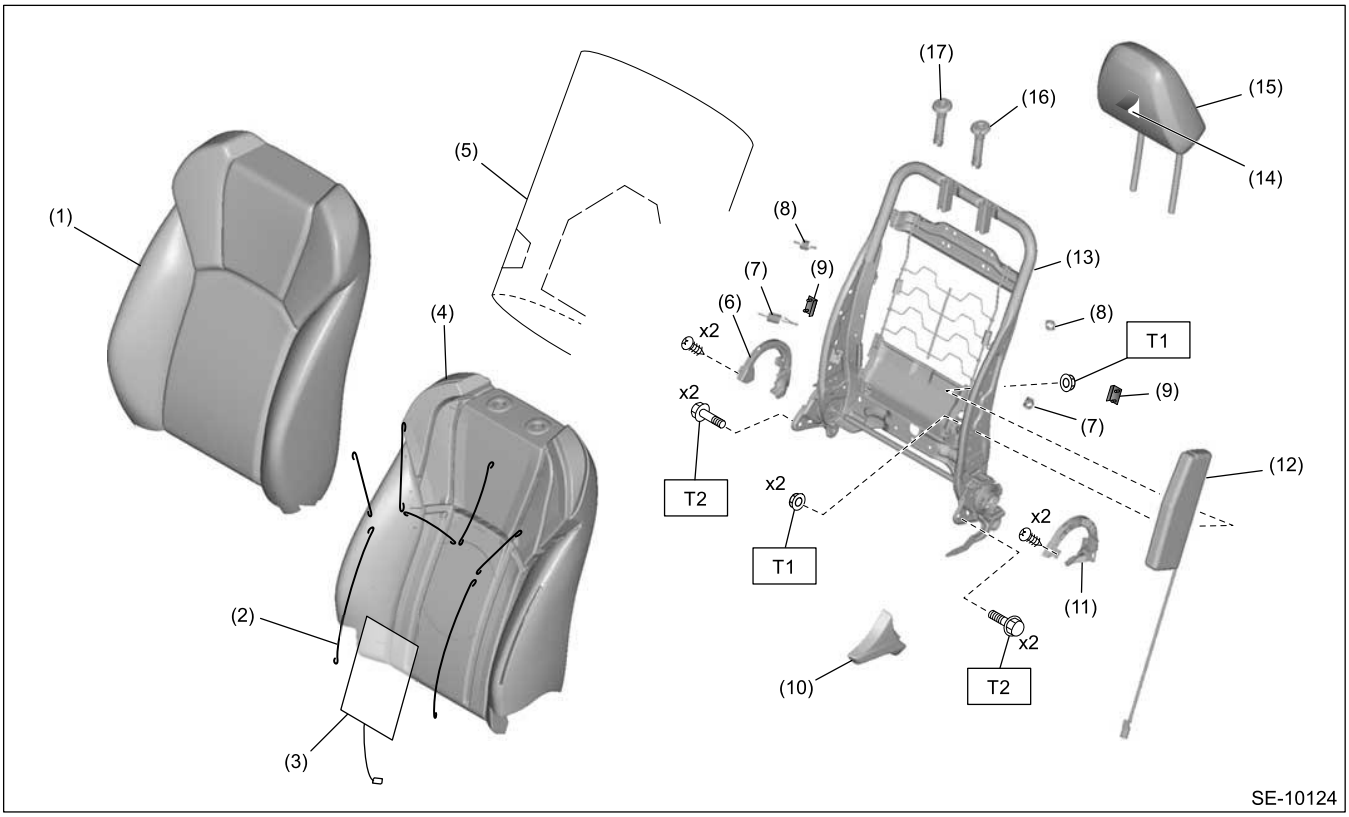
SE

1. General Description
2. Front Seat
3. Rear Seat
4. Power Seat System
5. Seat Heater System

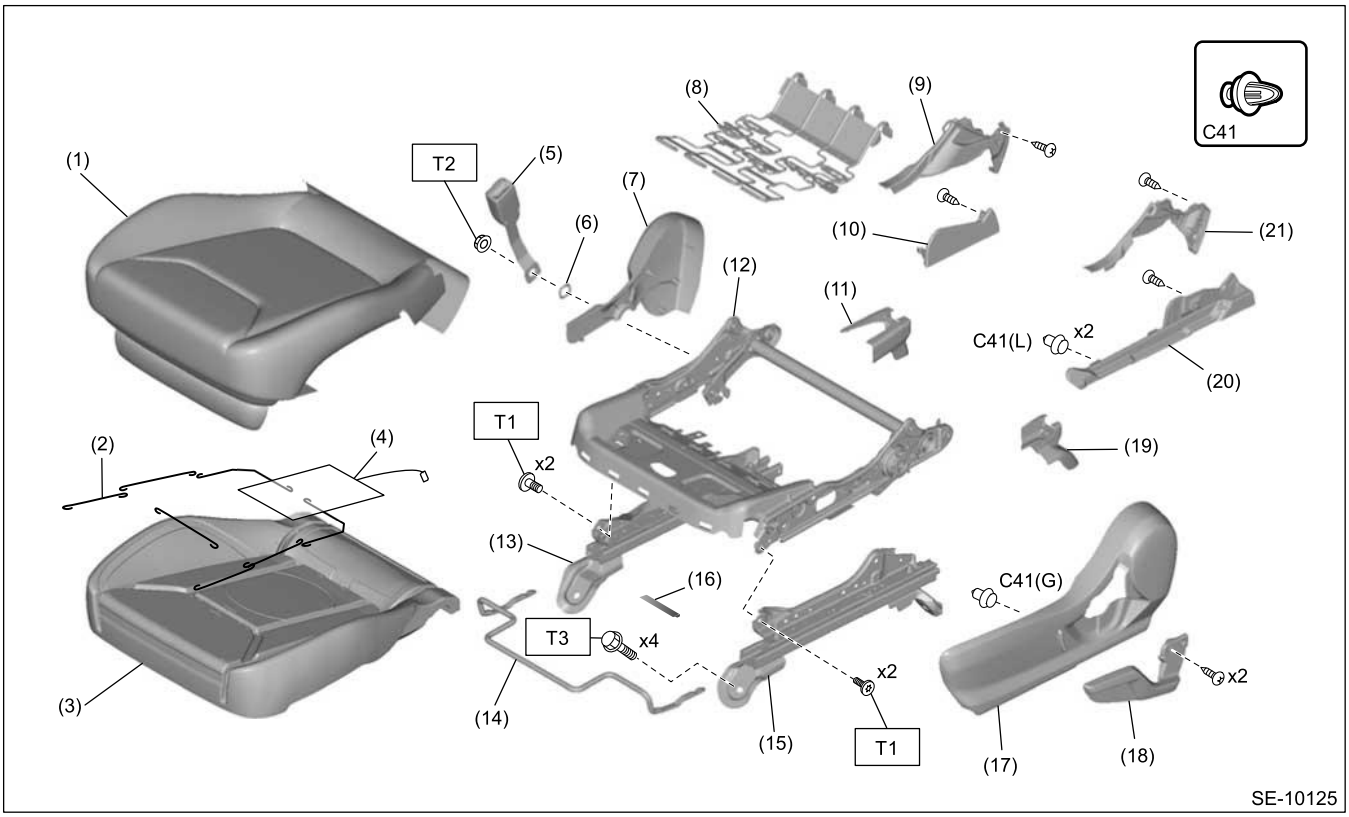
COMPONENT

1. FRONT SEAT

- Manual seat LH



(1) Cover COMPL - front seat backrest	(8) Hook spring UPR	(15) Headrest ASSY - front
(2) Wire set - front seat backrest	(9) Cover - hook spring	(16) Bushing - lock headrest
(3) Heater unit - front seat backrest	(10) Lever - reclining	(17) Bushing - free headrest
(4) Pad ASSY - front seat backrest	(11) Cover - hinge front seat OUT	
(5) Silencer cover	(12) Side airbag module	***Tightening torque: N·m (kgf-m, ft-lb)***
(6) Cover - hinge base front seat INN	(13) Frame ASSY - front seat backrest	***T1: 6 (0.6, 4.4)***
(7) Hook spring LWR	(14) Cover - front headrest	***T2: 52 (5.3, 38.4)***

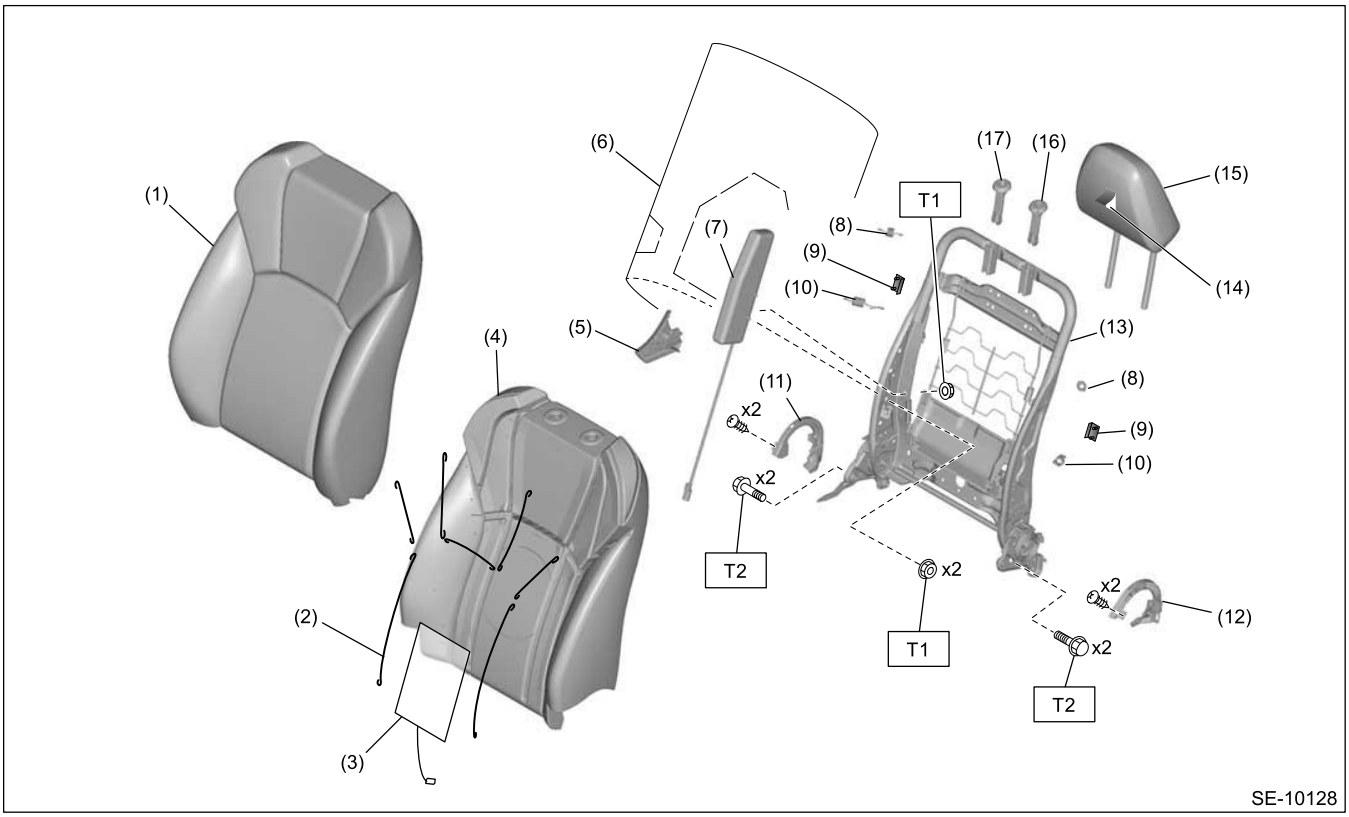


(1) Cover - front seat cushion
(2) Wire set - front seat cushion
(3) Pad ASSY - front seat cushion
(4) Heater unit - front seat cushion
(5) Seat belt inner - front
(6) Wave washer
(7) Cover - hinge front seat INN
(8) Panel - front wire
(9) Cover - frame front seat cushion INN
(10) Cover - slide rail INN
(11) Cover - bolt rear INN
(12) Frame ASSY - front seat cushion
(13) Slide rail ASSY INN
(14) Lever - slide rail
(15) Slide rail ASSY OUT
(16) Cover - hinge front seat OUT
(17) Knob - lifter
(18) Cover - bolt rear OUT
(19) Cover - slide rail OUT
(20) Cover - frame front seat cushion OUT

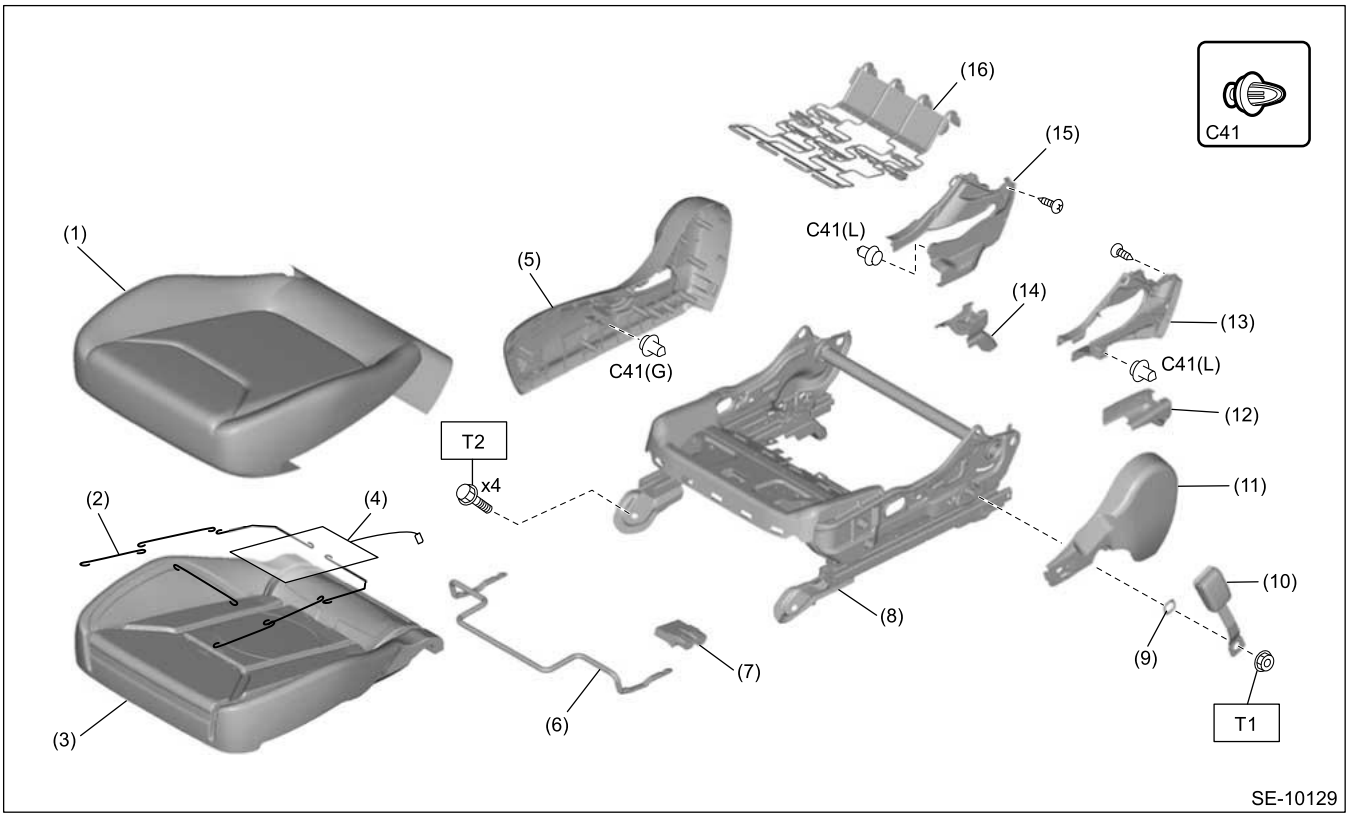
Tightening torque: N·m (kgf-m, ft-lb)

T1: 17.6 (1.8, 13)
T2: 38 (3.9, 28)
T3: 53 (5.4, 39.1)

- Manual seat RH



(1) Cover COMPL - front seat backrest	(8) Hook spring UPR	(15) Headrest ASSY - front
(2) Wire set - front seat backrest	(9) Cover - hook spring	(16) Bushing - lock headrest
(3) Heater unit - front seat backrest	(10) Hook spring LWR	(17) Bushing - free headrest
(4) Pad ASSY - front seat backrest	(11) Cover - hinge front seat OUT	
(5) Lever - reclining	(12) Cover - hinge front seat INN	***Tightening torque: N·m (kgf-m, ft-lb)***
(6) Silencer cover	(13) Frame ASSY - front seat backrest	***T1: 6 (0.6, 4.4)***
(7) Side airbag module	(14) Cover - front headrest	***T2: 52 (5.3, 38.4)***



(1) Cover - front seat cushion
(2) Wire set - front seat cushion
(3) Pad ASSY - front seat cushion
(4) Heater unit - front seat cushion
(5) Cover - hinge front seat OUT
(6) Lever - slide rail
(7) Control unit - occupant detection system
(8) Frame ASSY - front seat cushion
(9) Wave washer
(10) Seat belt inner - front
(11) Cover - hinge front seat INN
(12) Cover - bolt rear INN
(13) Cover - frame front seat cushion INN
(14) Cover - bolt rear OUT
(15) Cover - frame front seat cushion OUT
(16) Panel - front wire

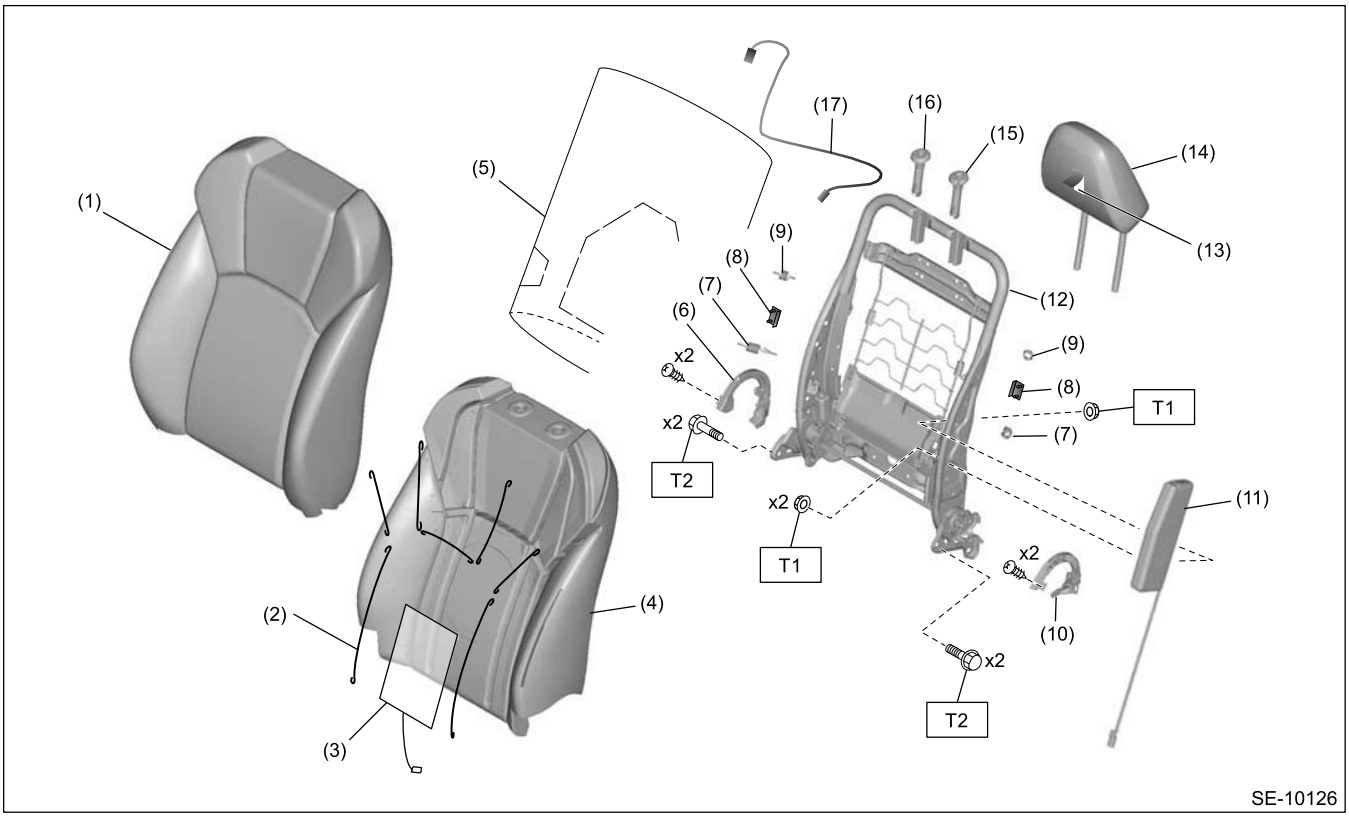
Tightening torque: N·m (kgf-m, ft-lb)

T1: 38 (3.9, 28)
T2: 53 (5.4, 39.1)

Note:

Do not disassemble the load sensor, cushion frame assembly and slide rail assembly, which are integrated in an assembly component.

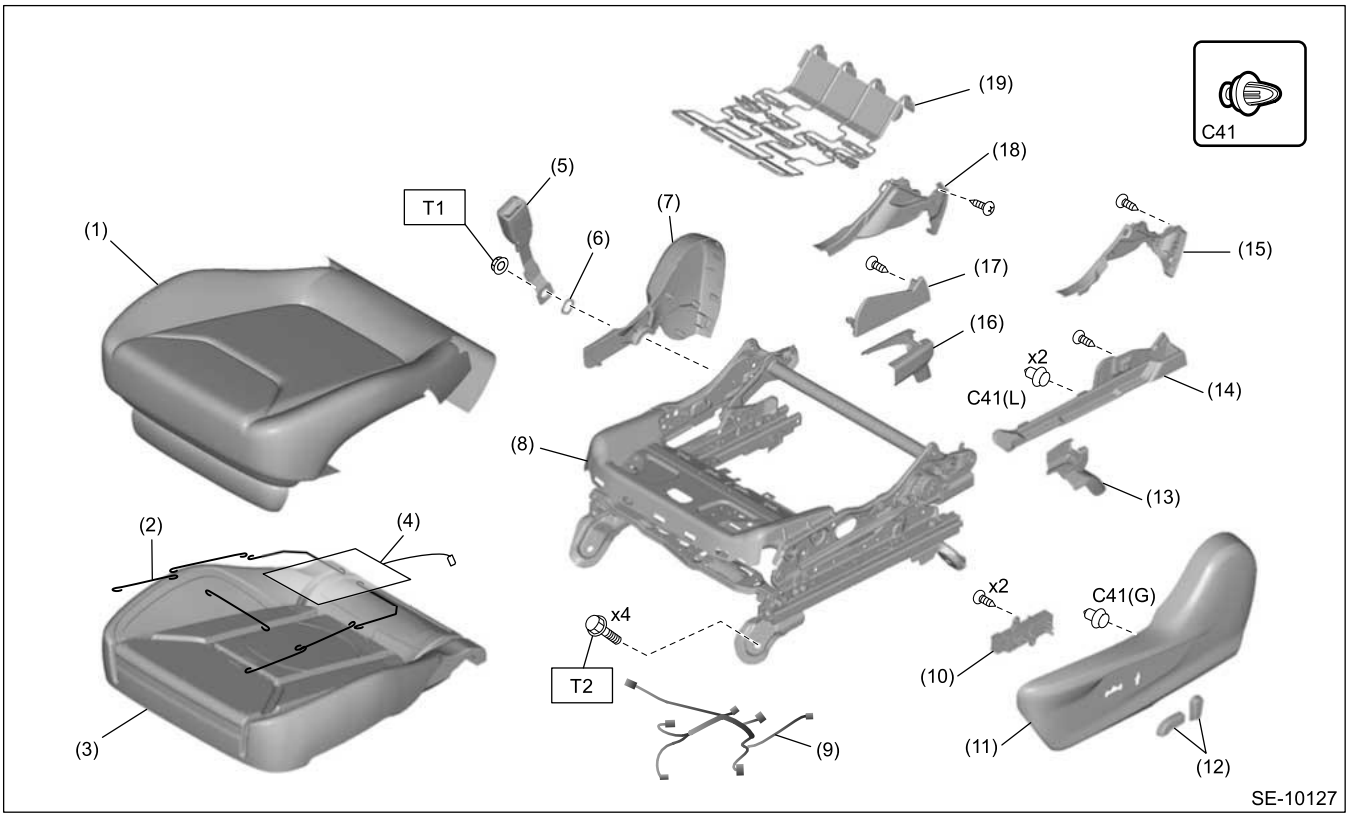
- Power seat



(1) Cover COMPL - front seat backrest
(2) Wire set - front seat backrest
(3) Heater unit - front seat backrest
(4) Pad ASSY - front seat backrest
(5) Silencer cover
(6) Cover - hinge front seat INN
(7) Hook spring LWR
(8) Cover - hook spring
(9) Hook spring UPR
(10) Cover - hinge front seat OUT
(11) Side airbag module
(12) Frame ASSY - front seat backrest
(13) Cover - front headrest
(14) Headrest ASSY - front
(15) Bushing - lock headrest
(16) Bushing - free headrest
(17) Harness ASSY - reclining

Tightening torque: N·m (kgf-m, ft-lb)

T1: 6 (0.6, 4.4)
T2: 52 (5.3, 38.4)

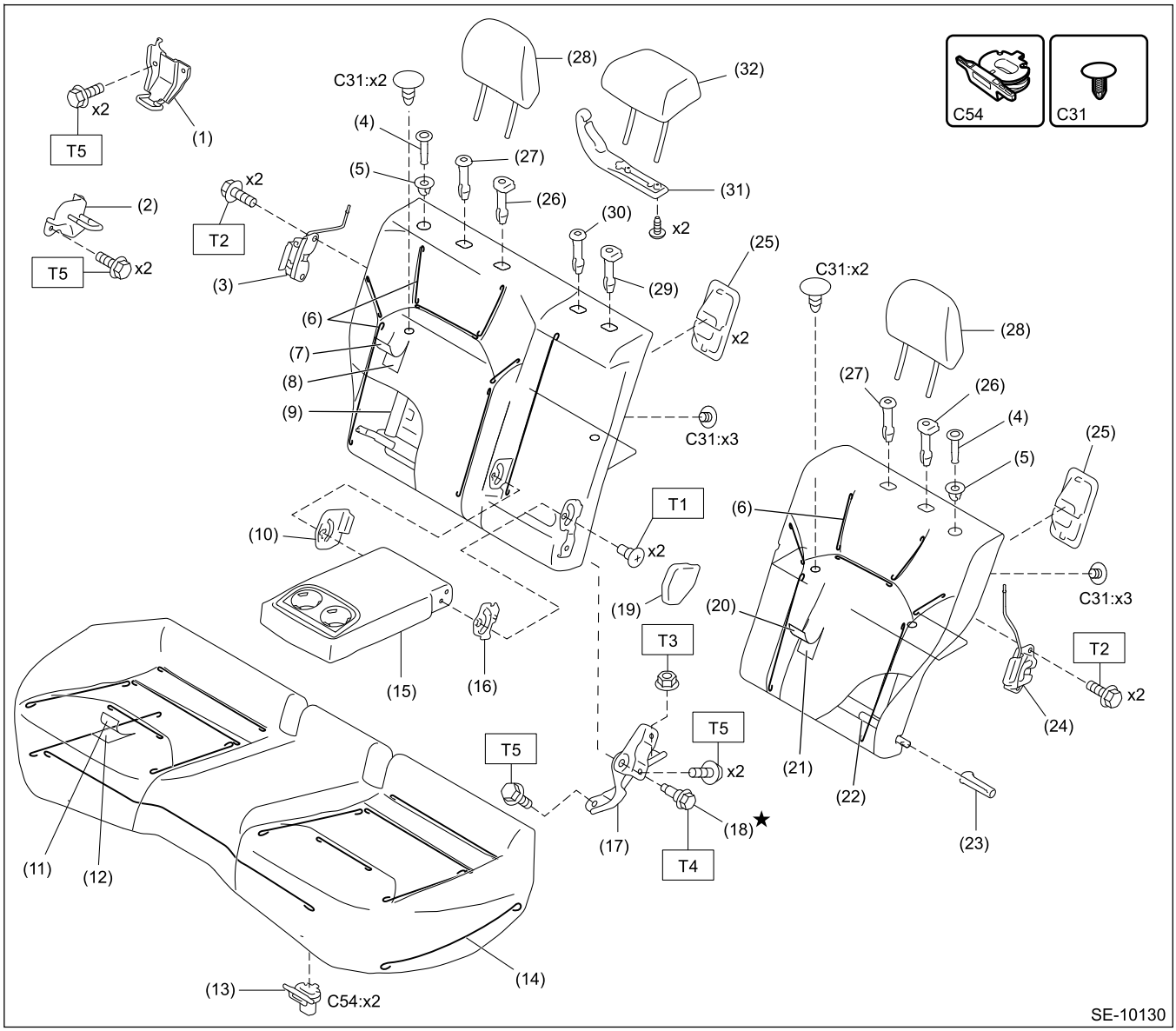


(1) Cover - front seat cushion
(2) Wire set - front seat cushion
(3) Pad ASSY - front seat cushion
(4) Heater unit - front seat cushion
(5) Seat belt inner - front
(6) Wave washer
(7) Cover - hinge front seat INN
(8) Frame ASSY - front seat cushion
(9) Harness ASSY - power seat
(10) Switch ASSY - power seat
(11) Cover - hinge front seat OUT
(12) Knob - power seat
(13) Cover - bolt rear OUT
(14) Cover - slide rail OUT
(15) Cover - frame front seat cushion OUT
(16) Cover - bolt rear INN
(17) Cover - slide rail INN
(18) Cover - frame front seat cushion INN
(19) Panel - front wire

Tightening torque: N·m (kgf-m, ft-lb)

T1: 38 (3.9, 28)
T2: 53 (5.4, 39.1)

2. REAR SEAT



(1) Striker - backrest rear RH (4 door model)

(2) Striker - backrest rear RH (5 door model)

(3) Lock ASSY - backrest rear RH

(4) Knob - backrest rear

(5) Knob - guide

(6) Wire set - rear backrest

(7) Cover COMPL - rear backrest RH

(8) Pad ASSY - rear seat backrest RH

(9) Frame ASSY - rear backrest RH

(10) Bushing - rear armrest RH

(14) Wire set - rear cushion

(15) Armrest ASSY - rear center (with armrest)

(16) Bushing - rear armrest LH (with armrest)

(17) Hinge ASSY - backrest center

(18) Flange bolt

(19) Cover - armrest (with armrest)

(20) Cover COMPL - rear backrest LH

(21) Pad ASSY - rear seat backrest LH

(22) Frame ASSY - rear backrest LH

(23) Bushing - backrest hinge

(27) Bushing - free headrest

(28) Headrest ASSY - rear

(29) Bushing - lock headrest CTR

(30) Bushing - free headrest CTR

(31) Belt guide - rear seat (5 door model only)

(32) Headrest ASSY - rear CTR

Tightening torque: N·m (kgf-m, ft-lb)

T1: 14.7 (1.5, 10.8)

T2: 22.7 (2.3, 16.7)

(with armrest)

(11) Cover - rear cushion

(12) Pad and frame ASSY & rear cushion

(13) Hook - seat cushion rear

(24) Lock ASSY - backrest rear LH

(25) Tether anchor cover (5 door model only)

(26) Bushing - lock headrest

T3: 24.5 (2.5, 18.1)

T4: 29 (3, 21.4)

T5: 33 (3.4, 24.3)

CAUTION

When removing the front seat from the vehicle, refer to “CAUTION” of “General Description” in “AIRBAG SYSTEM” section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Long nose pliers	Used for removing the hog ring.
Hog ring pliers	Used for installing the hog ring.
Circuit tester	Used for measuring resistance, voltage and current.
TORX® T50	Used for removing and installing the slide rail of manual type driver’s seat.

REMOVAL

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When any of the following operation has been done, be sure to perform [Rezeroing] of occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.**
  - **Replacing occupant detection system**
  - **Removing and disassembling passenger's seat**
  - **Loosening passenger's seat bolt**

1. Remove the headrest assembly - front.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:

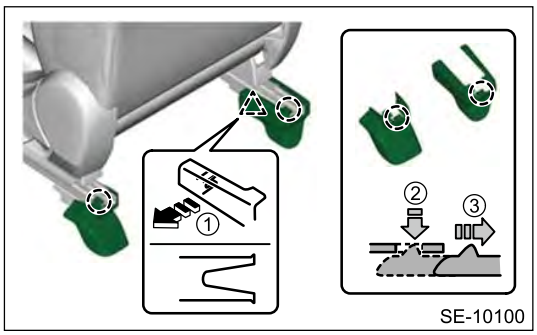
   For models with power seat, remove the slide rail installing bolt before removing the battery ground cable.
3. Remove the slide rail assembly installing bolt.

   Caution:

   Install the front seat with low head bolts. Use a suitable tool to prevent bolt damage.

   (1) Tilt the backrest assembly forward and move the front seat to the front most position.

   (2) Remove the cover - bolt rear, and remove the bolts.



   Note:

   The illustration shows the LH side.

   (3) Move the front seat to the rearmost position, and remove the bolts.

   Note:

   - **After the bolts are removed, slide the seat to the middle position in order to make it easier to take out of the vehicle.**
   - **For the power seat models, disconnect the battery ground terminal.**
4. Disconnect the connector under the front seat.
   - Seat belt warning light connector (driver's seat)
   - Occupant detection system harness connector (passenger's seat) Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Airbag Connector>PROCEDURE > OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS).
   - Side airbag connector Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > SIDE AIRBAG MODULE.
   - Seat heater connector (manual seat) (model with seat heater)
   - Seat harness connector & power seat connector (power seat)

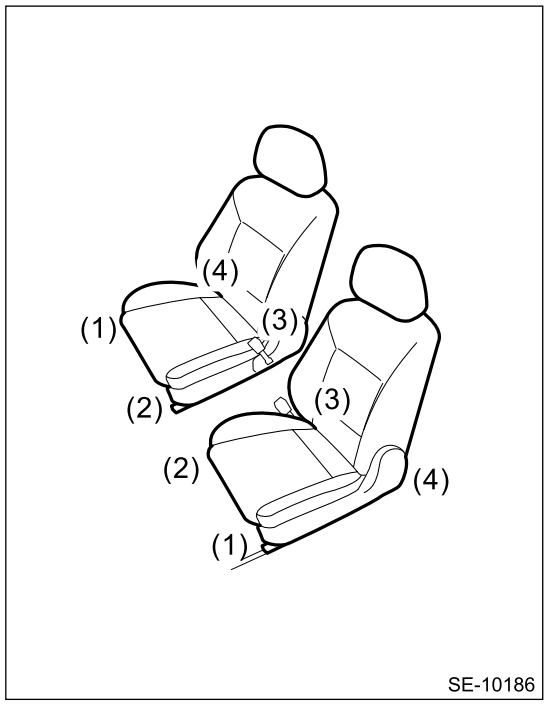
- Buckle switch RH connector (passenger's seat) Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > BUCKLE SWITCH RH.

5. Take out the front seat from the vehicle.
   Caution:
   Be careful not to damage the body.

SEATS > Front Seat

INSTALLATION

1. Bring the front seat inside the vehicle.
2. Connect the connectors located under the front seat.
3. Install the seat assembly.
   Caution:
   - **Install the front seat with low head bolts. Use a suitable tool to prevent bolt damage.**
   - **Tighten the slide rail assembly installing bolts in the order as shown in the figure, in several steps by gradually increasing the torque until they reach the specified torque.**



   Tightening torque:
   53 N·m (5.4 kgf-m, 39.1 ft-lb)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Install the headrest assembly - front.
6. Perform [Rezeroing] for the occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

SEATS > Front Seat

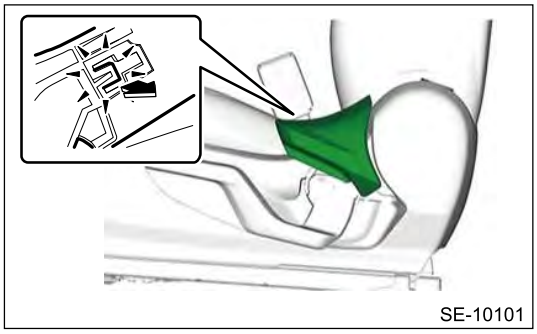
DISASSEMBLY

1. MANUAL SEAT

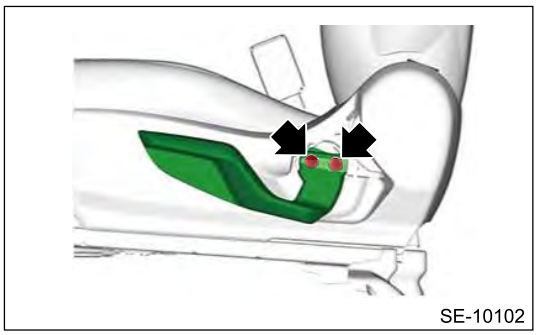
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **The load sensor of the occupant detection system (passenger seat only) is fixed to the cushion frame assembly. Never remove the load sensor from the cushion frame assembly.**
- **The cushion pad, cushion cover, occupant detection control module and seat harness can be replaced as a single unit. When the cushion frame assembly is replaced, the occupant detection control module, seat harness and load sensor are assembled. When replacing the cushion frame assembly, do not touch the load sensor to avoid electrical damage.**
- **If the cover - front cushion is removed, make sure to replace the hang wire on the cover - front cushion side with a new wire.**
- **Before assembling, make sure how the harnesses such as side airbag harness and seat belt inner - front harness are routed in order to avoid misarranging. Assembling with harnesses improperly routed may cause the harness to get caught and short out.**
- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

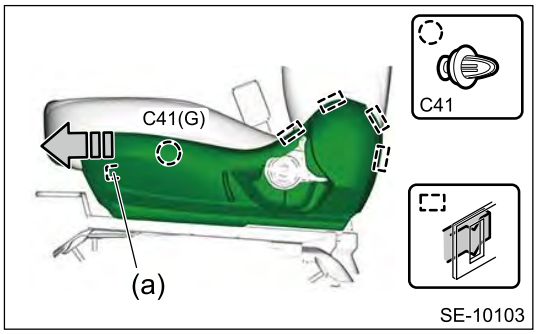
1. Remove the front seat from vehicle. Ref. to SEATS>Front Seat>REMOVAL.
2. Remove the lever - reclining.
   (1) Pull up the lever - reclining and release the claws on the back.
   (2) Pull out the lever - reclining.



3. Remove the screws and remove the knob - lifter.



4. Remove the cover - hinge front seat OUT.
   (1) Release the claw in the rear section of the cover - hinge front seat OUT.
   (2) Release the clips.
   (3) Release the claw (a) in the front section of the cover - hinge front seat OUT, then remove the cover - hinge front seat OUT.

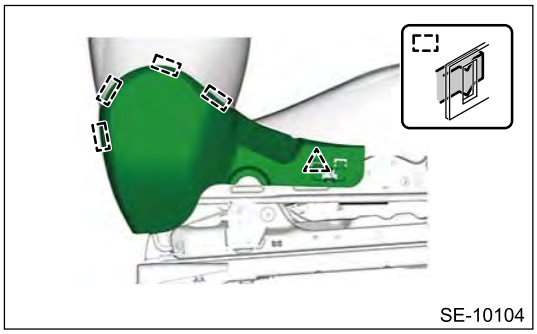


5. Remove the seat belt inner - front. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT INNER - FRONT.

6. Remove the cover - hinge front seat INN.

(1) Release the claw in the rear section of the cover - hinge front seat INN.

(2) Release the clips in the front section of the cover - hinge front seat INN, then remove the cover - hinge front seat INN.



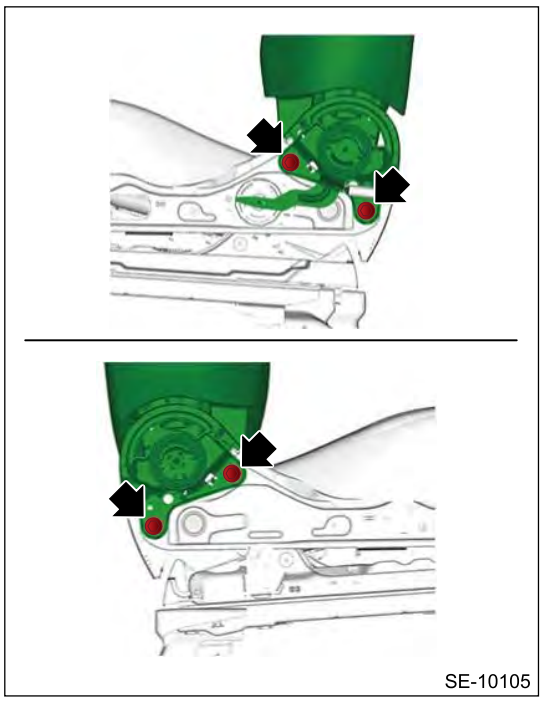
7. Separate the backrest assembly and the seat cushion assembly.

(1) Remove the harness on the back side of the seat cushion assembly.

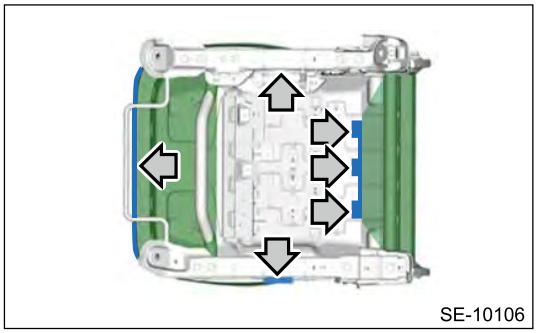
- Side airbag harness
- Seat heater harness (with seat heater)

(2) Remove the bolts from reclining hinge of both sides.

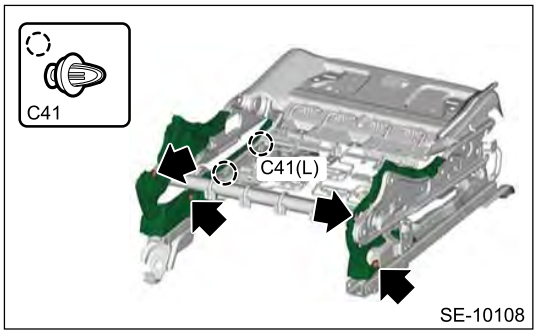
(3) While taking care not to damage the airbag harness, separate the backrest assembly and the seat cushion assembly.



8. Remove the pad assembly - front seat cushion and the cover - front cushion.
(1) Unfasten the J-fastener on the front side.
(2) Detach the plastic hooks on the right, left and rear.
(3) Remove the pad assembly - front seat cushion and the cover - front cushion from the seat cushion assembly.



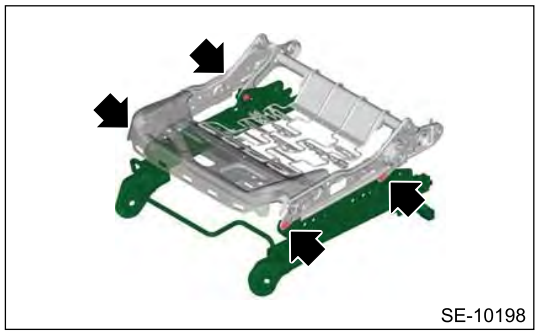
9. Remove the screws and clips to remove the covers.
(1) Remove the cover - frame front seat cushion.
(2) Remove the cover - slide rail.



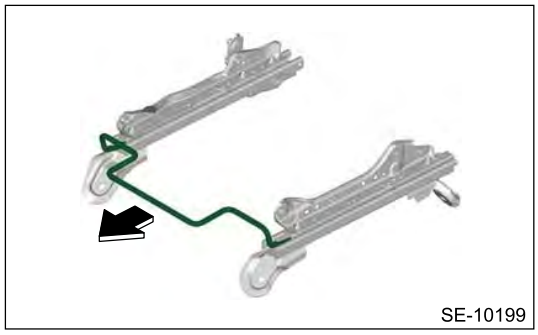
10. Remove the bolts, then remove the slide rail.

Preparation tool:

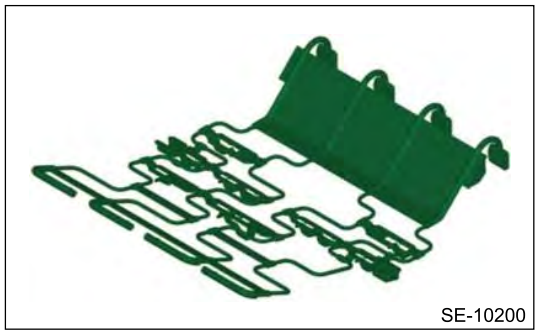
TORX® T50



11. Remove the lever - slide rail by pulling out from the slide rail.



12. Remove the panel - front wire.



13. Remove the cover - front cushion.

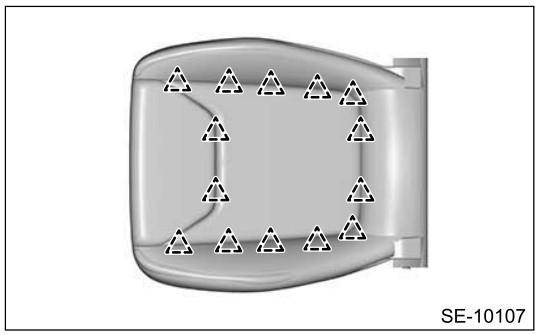
Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

(1) Remove the hog ring.



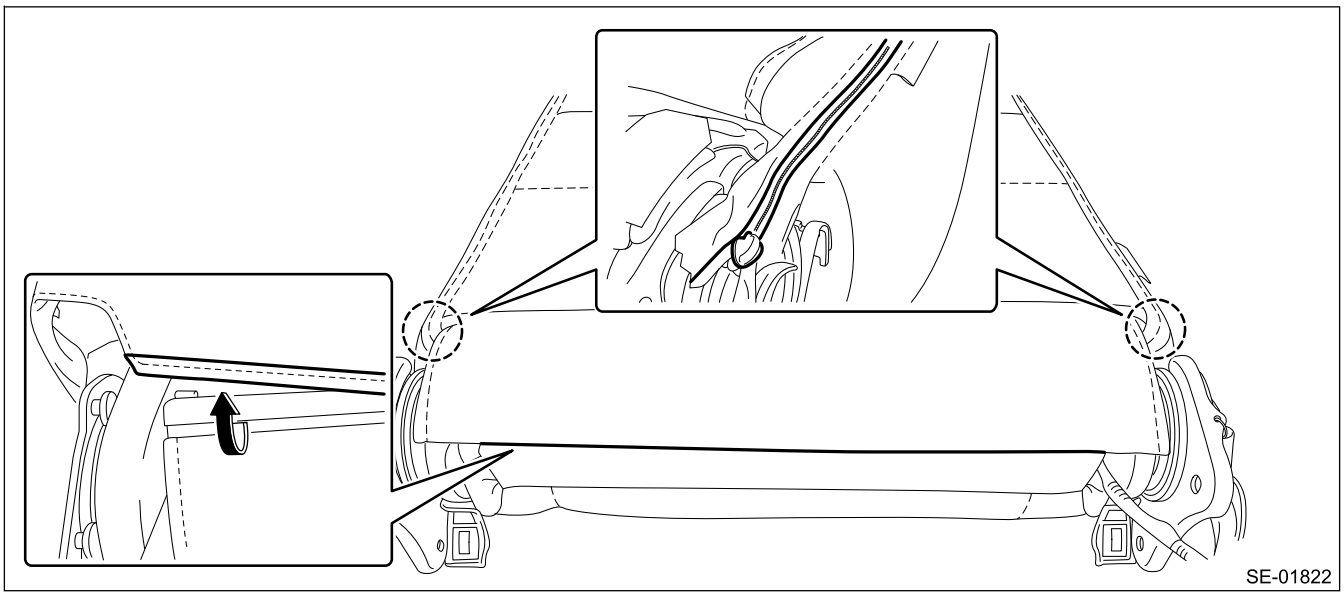
(2) Pull out the pad assembly - front seat cushion from the cover - front cushion.

(3) Remove the seat heater module from the pad assembly as necessary.

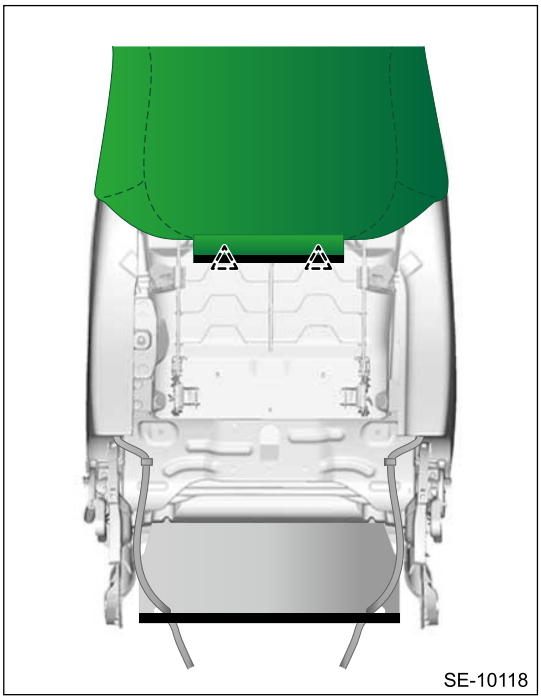
14. Remove the pad assembly - front seat backrest and the cover COMPL - front backrest.

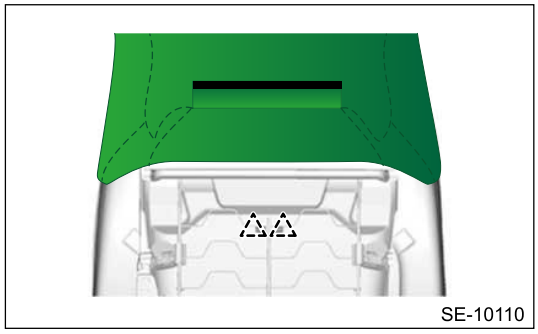
(1) Remove the plastic fastener at the back side (bottom) of backrest assembly.

(2) Open the fastener at the rear side of backrest assembly.



(3) Remove the hog ring.





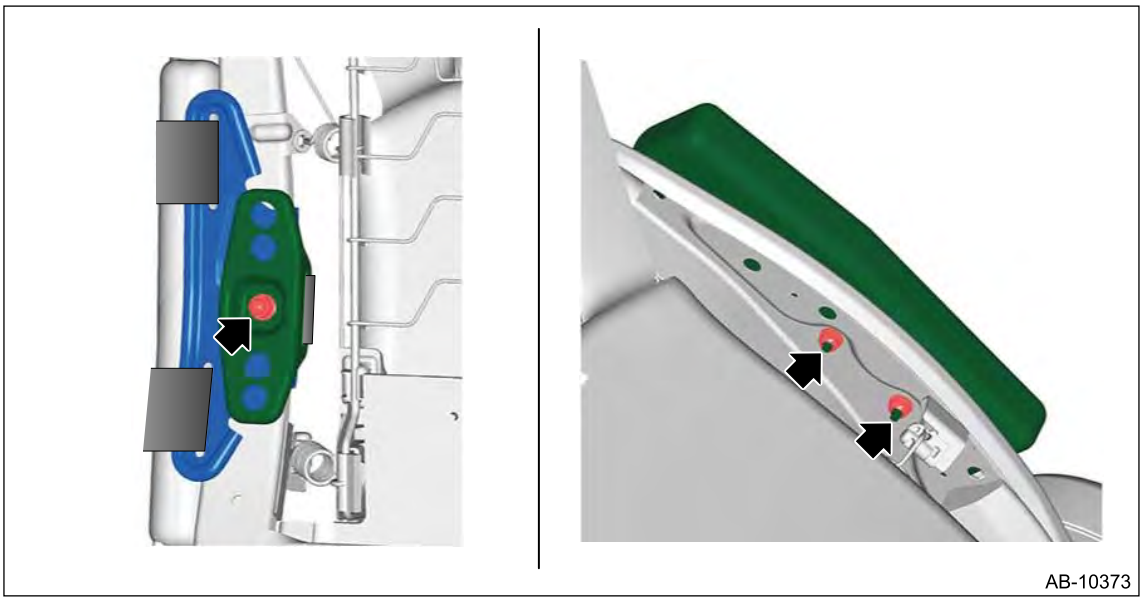
15. Remove the side airbag module.

Caution:

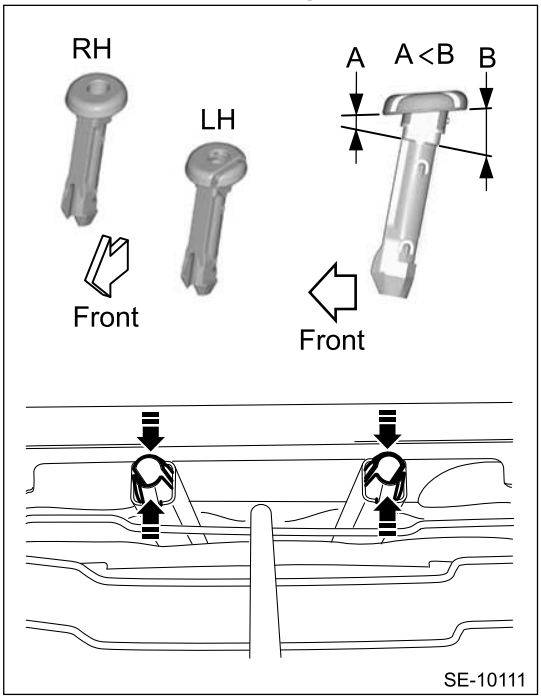
Do not open the protective cover of the side airbag. If any damage is present in the protective cover or the cloth of side airbag module comes out from the protective cover slit, replace the side airbag module with a new part.

(1) Remove the hexagon cap nut and nuts.

(2) While taking care not to damage the airbag protective cover, remove the side airbag module.



16. Remove the bushing - headrest.

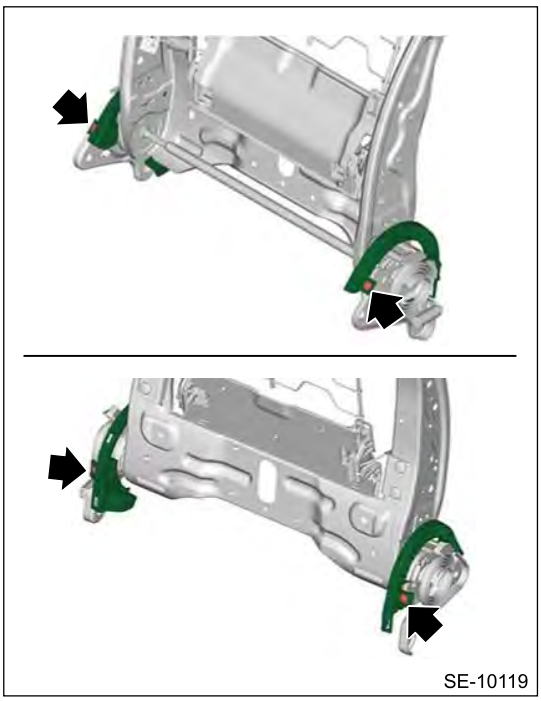


Note:

Catch the tip of the bushing - headrest with pliers and push it outward from the inside of seat to remove it.

17. Pull out the frame assembly - front backrest.

18. Remove the screws and detach the cover - hinge base.



19. Remove the cover COMPL - front backrest.

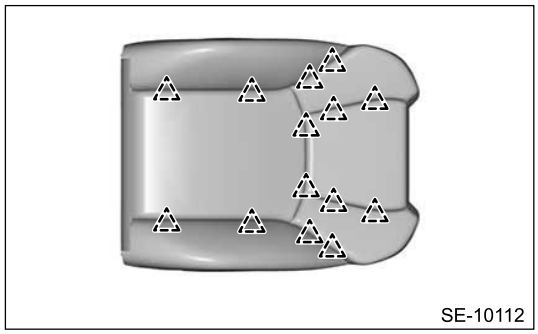
Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

(1) Remove the hog ring.



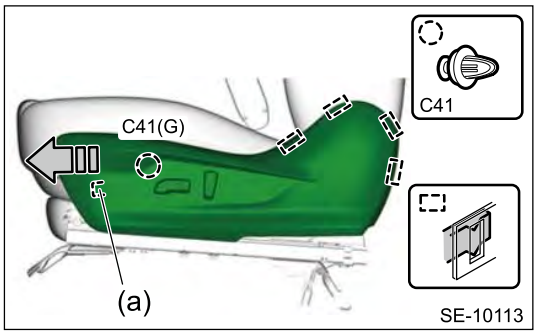
(2) Pull out the pad assembly - front seat backrest from the cover COMPL - front backrest.
(3) Remove the seat heater module from the pad assembly as necessary.

2. POWER SEAT

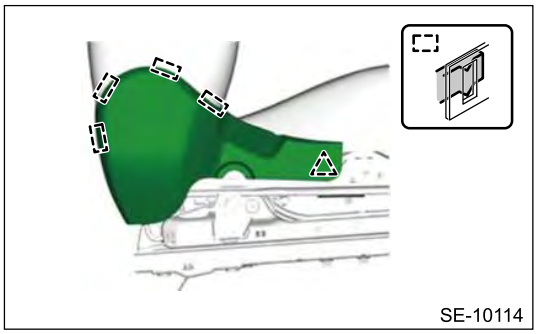
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Before assembling, make sure how the harnesses such as side airbag harness and seat belt inner - front harness are routed in order to avoid misarranging. Assembling with harnesses improperly routed may cause the harness to get caught and short out.**
- **If the cover - front cushion is removed, make sure to replace the hang wire on the cover - front cushion side with a new wire.**
- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

1. Remove the front seat from vehicle. Ref. to SEATS>Front Seat>REMOVAL.
2. Disconnect the connectors from the backside of seat cushion.
3. Remove the cover - hinge front seat OUT.
   (1) Release the claw in the upper section of the cover - hinge front seat OUT.
   (2) Release the clips, and release the claws (a) in the front section of the cover - hinge front seat OUT.
   (3) Disconnect the power seat switch connector, and remove the cover - hinge front seat OUT.



4. Remove the seat belt inner - front. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT INNER - FRONT.
5. Remove the cover - hinge front seat INN.
   (1) Release the claw in the rear section of the cover - hinge front seat INN.
   (2) Release the clips in the front section of the cover - hinge front seat INN, then remove the cover - hinge front seat INN.



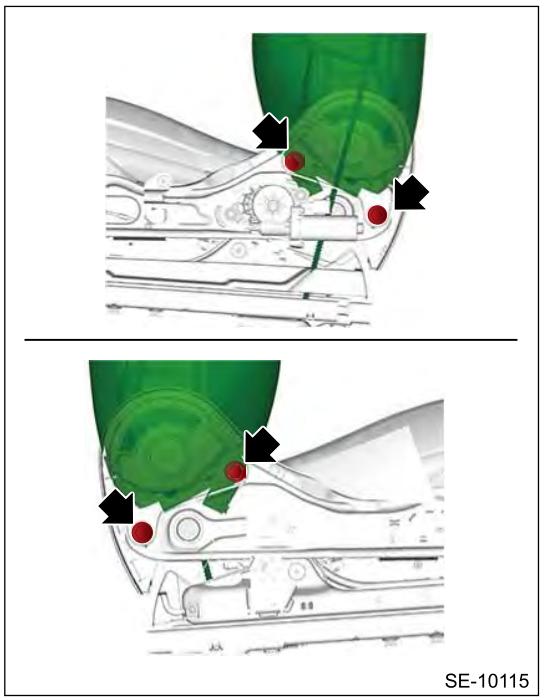
6. Separate the backrest assembly and the seat cushion assembly.

(1) Remove the harness on the back side of the seat cushion assembly.

- Side airbag harness
- Reclining motor harness
- Seat heater harness (with seat heater)

(2) Remove the bolts from reclining hinge of both sides.

(3) While taking care not to damage the airbag harness, separate the backrest assembly and the seat cushion assembly.

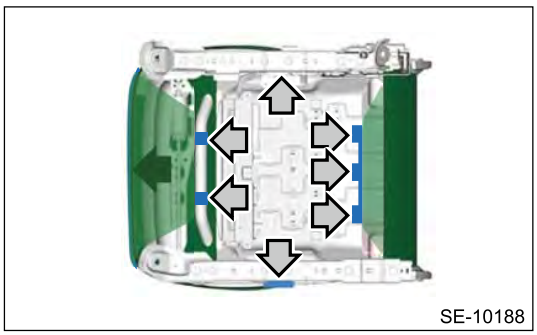


7. Remove the pad assembly - front seat cushion and the cover - front cushion.

(1) Remove the plastic hook on the front side, and remove the J-fastener.

(2) Detach the plastic hooks on the right, left and rear.

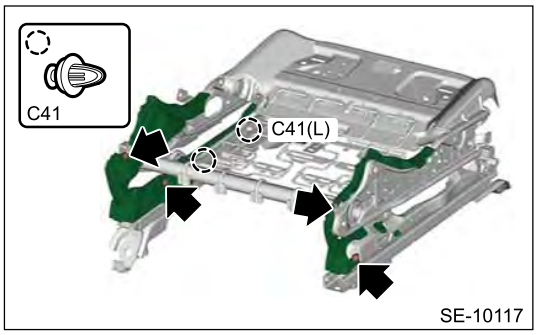
(3) Remove the pad assembly - front seat cushion and the cover - front cushion from the seat cushion assembly.



8. Remove the screws and clips to remove the covers.

(1) Remove the cover - frame front seat cushion.

(2) Remove the cover - slide rail.



9. Remove the cover - front cushion.

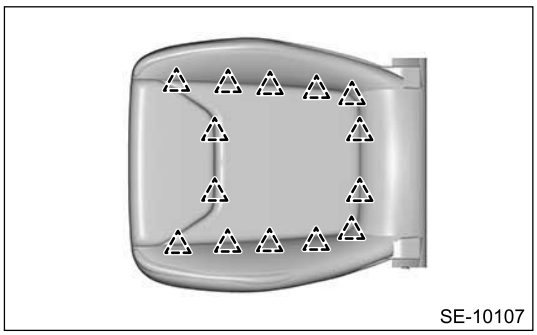
Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

(1) Remove the hog ring.



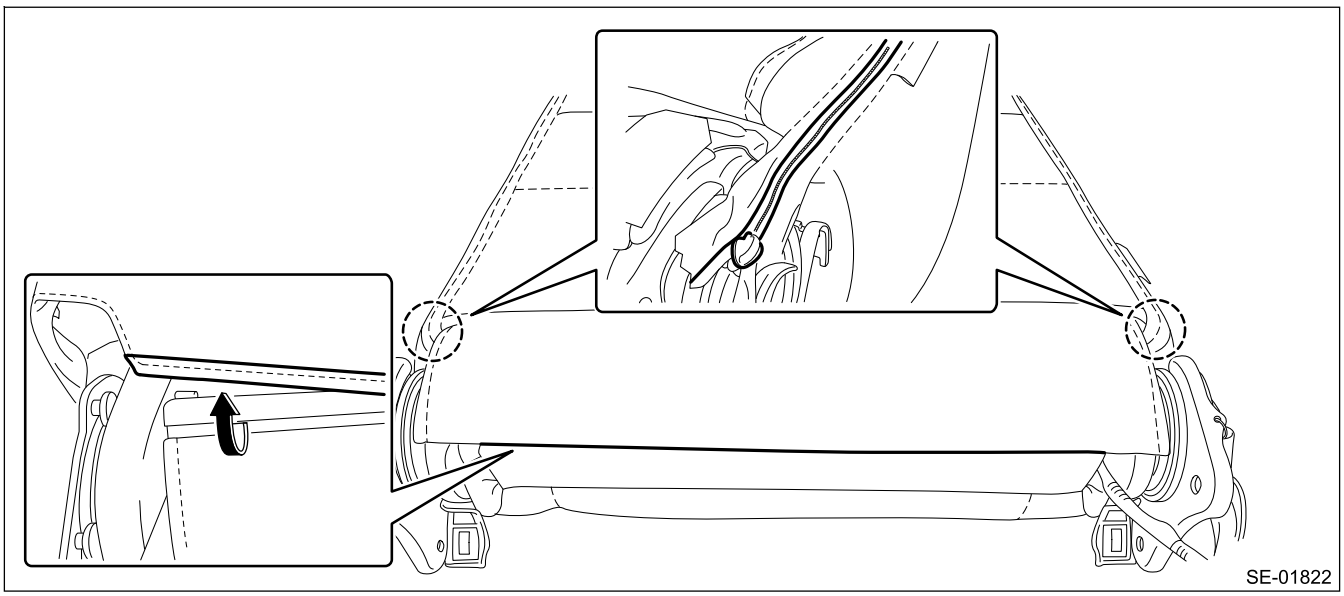
(2) Pull out the pad assembly - front seat cushion from the cover - front cushion.

(3) Remove the seat heater module from the pad assembly as necessary.

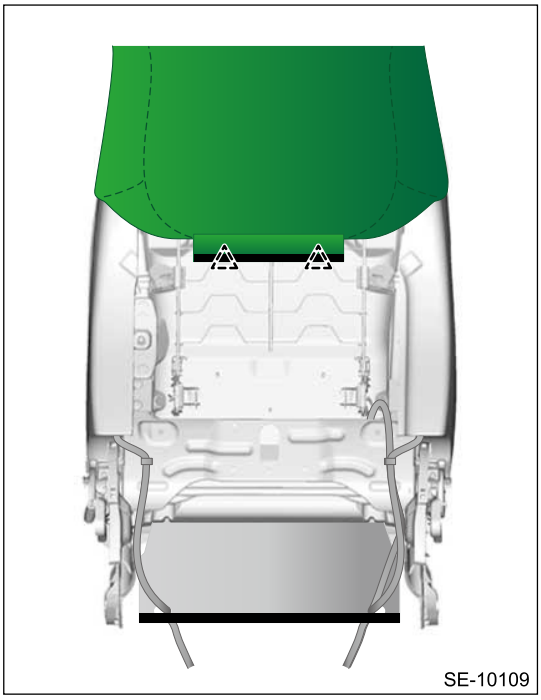
10. Remove the pad assembly - front seat backrest and the cover COMPL - front backrest.

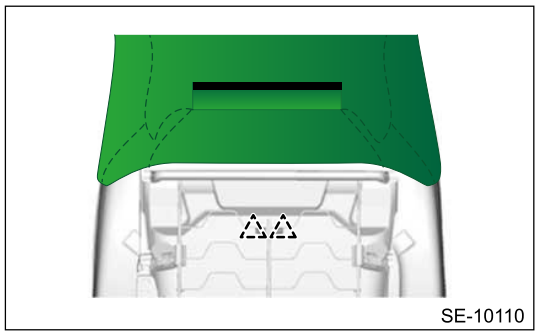
(1) Remove the plastic fastener at the back side (bottom) of backrest assembly.

(2) Open the fastener at the rear side of backrest assembly.



(3) Remove the hog ring.





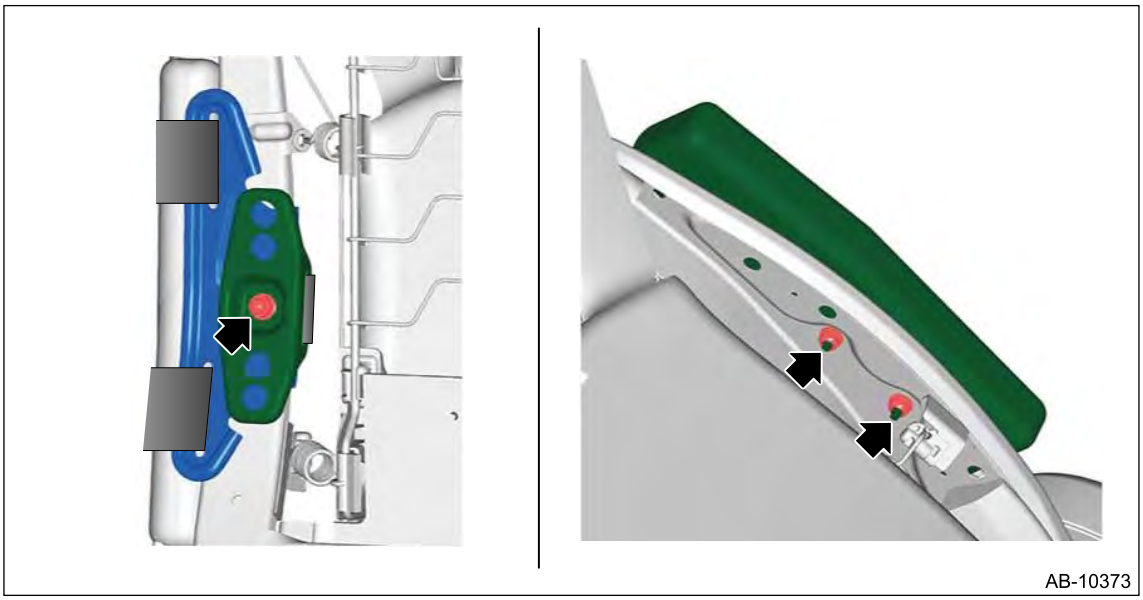
11. Remove the side airbag module.

Caution:

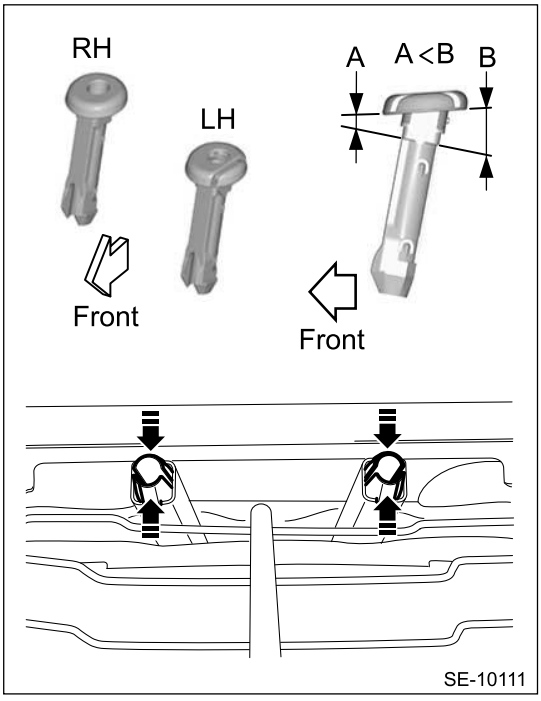
Do not open the protective cover of the side airbag. If any damage is present in the protective cover or the cloth of side airbag module comes out from the protective cover slit, replace the side airbag module with a new part.

(1) Remove the hexagon cap nut and nuts.

(2) While taking care not to damage the airbag protective cover, remove the side airbag module.



12. Remove the bushing - headrest.

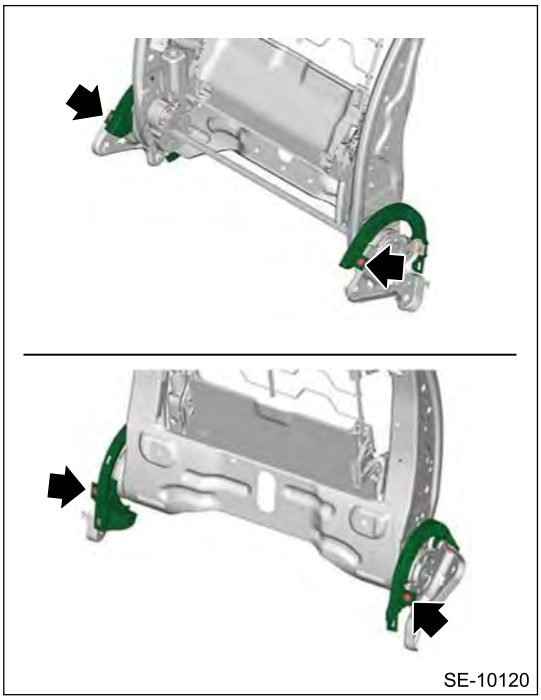


Note:

Catch the tip of the bushing - headrest with pliers and push it outward from the inside of seat to remove it.

13. Pull out the frame assembly - front backrest.

14. Remove the screws and detach the cover - hinge base.



15. Remove the cover COMPL - front backrest.

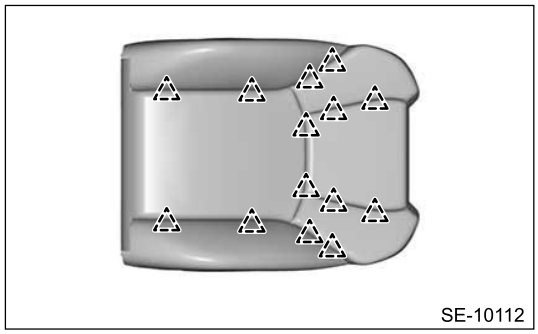
Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

(1) Remove the hog ring.



(2) Pull out the pad assembly - front seat backrest from the cover COMPL - front backrest.

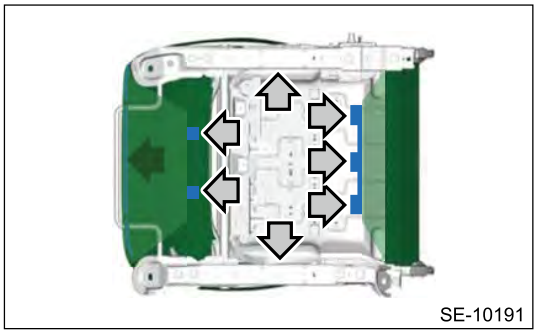
(3) Remove the seat heater module from the pad assembly as necessary.

3. PASSENGER'S SEAT

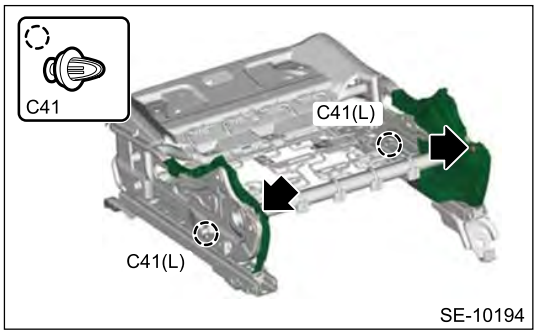
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **The load sensor of the occupant detection system is fixed to the cushion frame assembly. Never remove the load sensor from the cushion frame assembly.**
- **The cushion pad, cushion cover, occupant detection control module and seat harness can be replaced as a single unit. When the cushion frame assembly is replaced, the occupant detection control module, seat harness and load sensor are assembled. When replacing the cushion frame assembly, do not touch the load sensor to avoid electrical damage.**
- **If the cover - front cushion is removed, make sure to replace the hang wire on the cover - front cushion side with a new wire.**
- **When removing or replacing the seat, perform "Occupant Detection System Inspection" after installing the seat to check if the occupant detection system operates normally. Ref. to PRE-DELIVERY INSPECTION>PRE-DELIVERY INSPECTION (PDI) PROCEDURE > SEAT.**
- **Before assembling, make sure how the harnesses such as side airbag harness and seat belt inner - front harness are routed in order to avoid misarranging. Assembling with harnesses improperly routed may cause the harness to get caught and short out.**
- **If the seat heater module is removed, replace the seat cushion pad with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

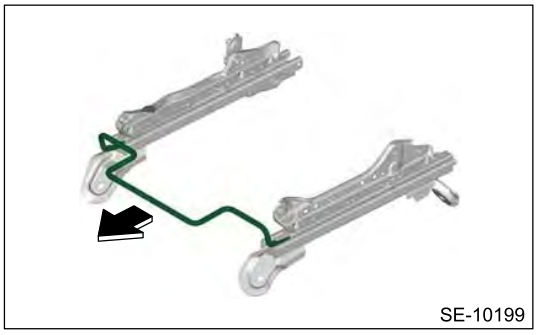
1. Remove the front seat (passenger's side) from vehicle. Ref. to SEATS>Front Seat>REMOVAL.
2. For the following operation, refer to the disassembly procedures for the driver's seat. Ref. to SEATS>Front Seat>DISASSEMBLY > MANUAL SEAT.
   - Separating the backrest assembly and the seat cushion assembly
   - Disassembling the backrest assembly
3. Remove the pad assembly - front seat cushion and the cover - front cushion.
   (1) Remove the plastic hook on the front side, and remove the J-fastener.
   (2) Detach the plastic hooks on the right, left and rear.
   (3) Remove the pad assembly - front seat cushion and the cover - front cushion from the seat cushion assembly.

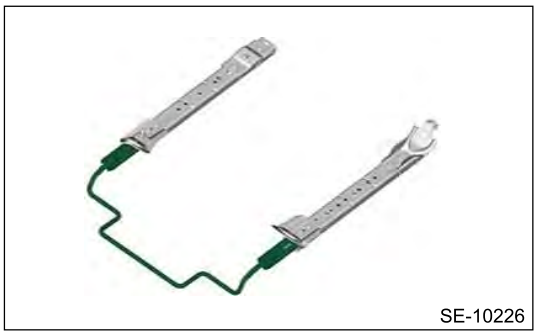


4. Remove the screws and clips to remove the covers.
   (1) Remove the cover - frame front seat cushion.
   (2) Remove the cover - slide rail.



5. Remove the lever - slide rail by pulling out from the slide rail.





6. Remove the cover - front cushion.

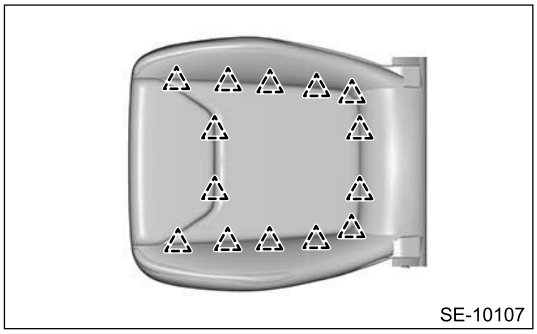
Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

(1) Remove the hog ring.



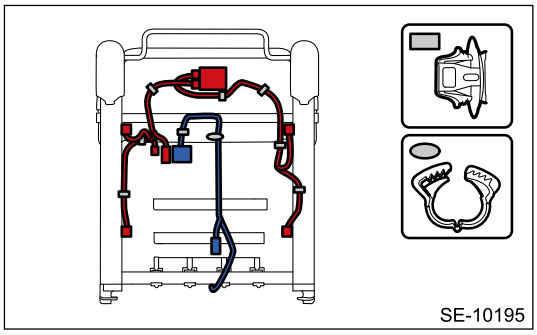
(2) Pull out the pad assembly - front seat cushion from the cover - front cushion.

(3) Remove the seat heater module from the pad assembly as necessary.

7. Remove the seat harness.

Caution:

- **Do not remove the load sensor.**
- **Do not touch the load sensor. Otherwise, the load sensor may be damaged due to possible static electricity.**

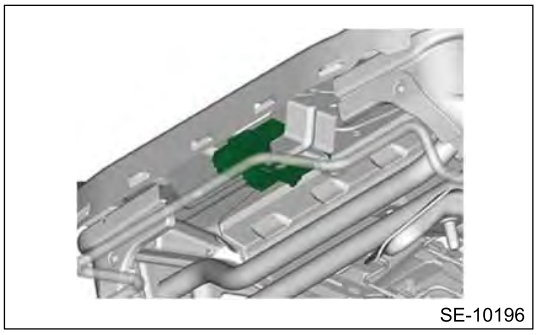


8. Remove the occupant detection control module.

Caution:

If the occupant detection control module is removed from the bracket, do not reuse it. Once removed from the bracket, the engaging force of the claw is reduced, and it may come off from the bracket due to vibration while driving.

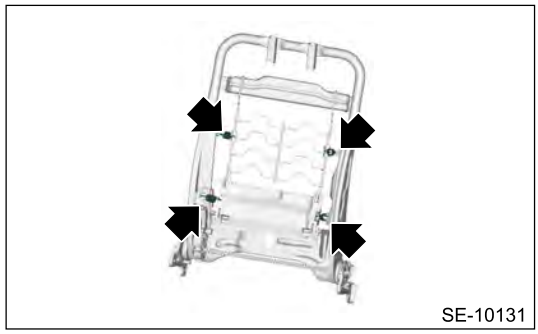
(1) Release the claws, and remove it from the bracket.



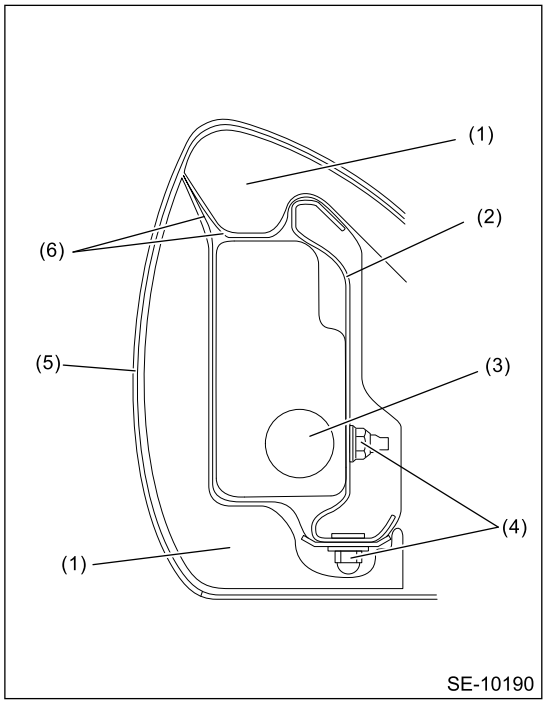
ASSEMBLY

Caution:

- **Do not confuse the harness routing of the side airbag harness and the seat belt inner - front harness, etc. Assembling with harnesses improperly routed may cause the harness to get caught and short out.**
- **If the hook spring of the frame assembly - front backrest is deformed or comes off due to the deformation, replace the hook spring with a new part.**



- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Make sure that the side airbag module is installed as shown in the figure.**



(1) Pad ASSY - front seat backrest
(2) Frame ASSY - front backrest
(3) Side airbag module inflator
(4) Nut
(5) Cover COMPL - front backrest
(6) Side airbag guide cloth

Besides, if the cover COMPL - front backrest is not installed securely, the side airbag may not be activated properly, therefore keep strictly to the following procedures.

- **Do not reuse the mounting bolts and nuts of the air bag module.**
  Always replace with the specified new bolts and nuts.
- **Be careful not to stain or damage the cover COMPL - front backrest during assembly.**
- **Do not reuse the hog ring and hang wire.**
- **Secure the hog ring using hog ring pliers.**
- **Install the hog rings to the specified points securely and make sure that there is no wrinkle or twisting on the cover COMPL - front backrest.**

1. Install a new occupant detection control module. (Passenger's side only)

Caution:

If the occupant detection control module is removed from the bracket, do not reuse it. Once removed from the bracket, the engaging force of the claw is reduced, and it may come off from the bracket due to vibration while driving.

2. Install the seat heater module.

Caution:

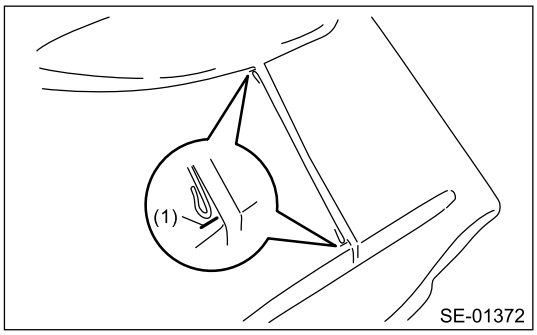
If the seat heater module is reused, remove the polyurethane section and double-sided tape from the reverse side completely. Be sure to use new double-sided tape.

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

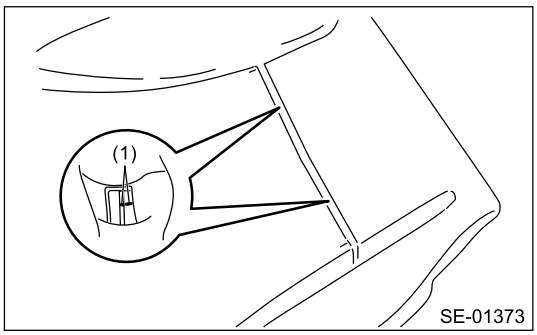
3. Make sure that there is no foreign matter on side airbag module.
4. Assemble the seat cover.

(1) Adjust so that the left and right clearances between wire and seat pad become equal, and mark the seat pad.



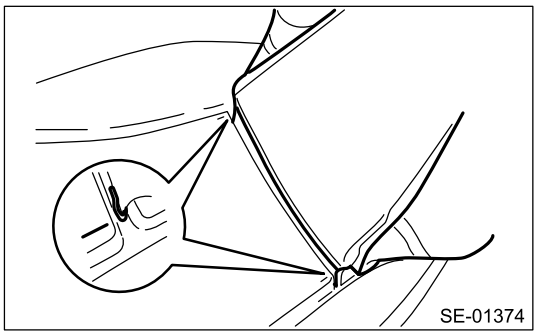
(1) Marking

(2) Mark the center of the wire on the pad side to which the hog ring is attached.

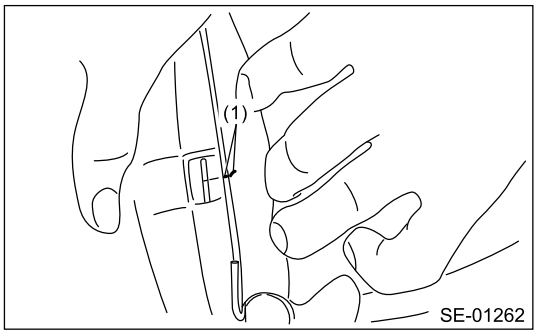


(1) Marking

(3) Insert the wire into the seat cover, and align the wire with the position marked in step 1).

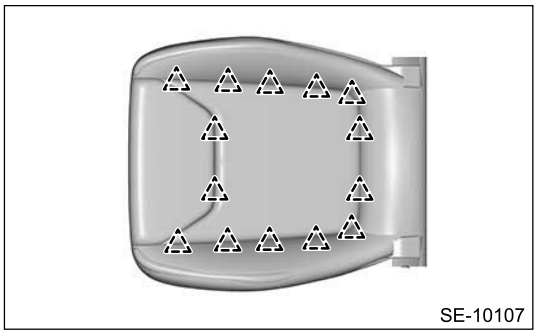


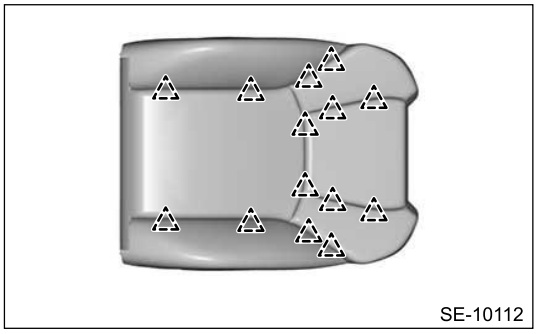
(4) Mark the wire on the seat cover side according to the markings on the seat pad.

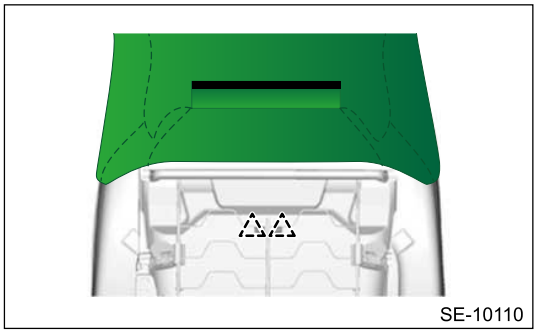


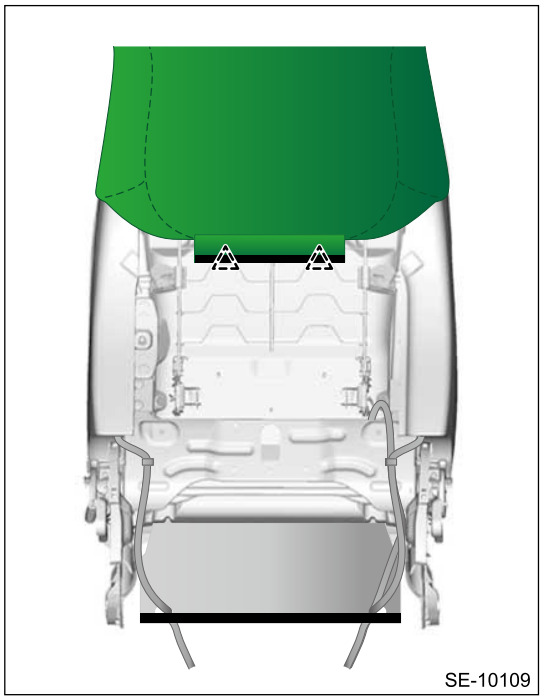
(1) Marking

(5) Perform steps (1) to (4) for all sections to which the hog rings are attached.
(6) Make sure that all hog rings are attached securely.





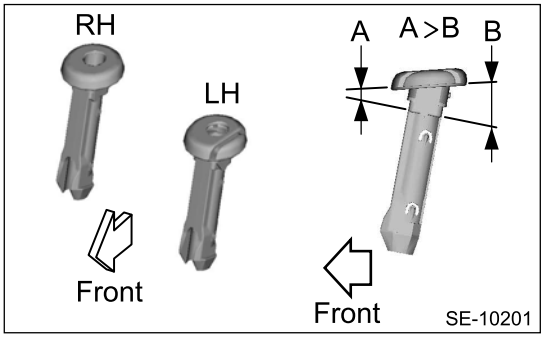




5. Assemble remaining parts in the reverse order of disassemble.

Note:

- **Check the shape and front/rear directions before assembling the headrest bushing.**



- **When installing the seat belt inner - front, follow the procedures described in the seat belt section. Ref. to SEAT BELT SYSTEM>Front Seat Belt>INSTALLATION.**
- **Install the backrest assembly and seat cushion assembly in the following procedure.**
  1. **Temporarily tighten the four reclining hinge bolts.**
  2. **Place the backrest in the most upright position.**
  3. **Tighten the reclining hinge bolts in order from (1) to (4) two or three times, until they reach the specified torque.**



Tightening torque:

Refer to "COMPONENT" of "General Description". Ref. to SEATS>General Description>COMPONENT > FRONT SEAT.

6. If any wrinkles are found after the assembly of the seat cover, finish the seat cover with iron.

(1) Place the wet towel on wrinkles.



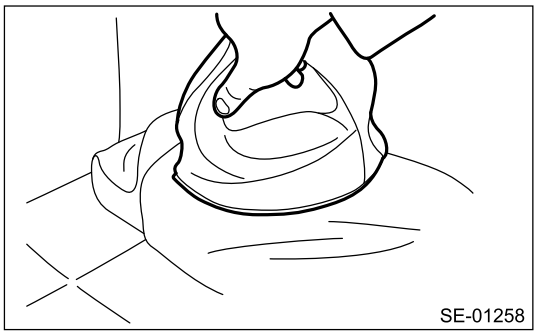
(2) Touch up with warm iron.

Caution:

Keep moving the iron, otherwise the seat cover surface can be damaged.

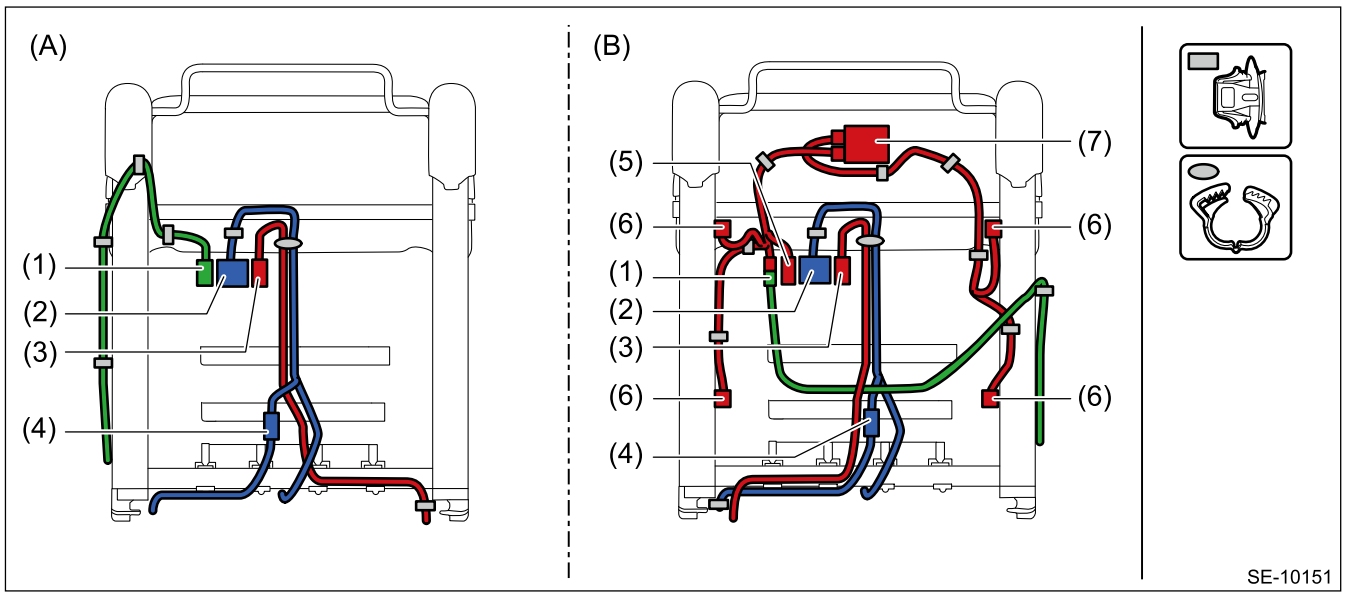
Note:

This method is available for genuine leather, synthetic leather, cloth, etc.



7. Install connectors located under the front seat.

- Manual seat



(A) Driver's seat

(B) Passenger's seat

(1) Seat belt switch connector

(2) Seat heater connector

(3) Side airbag connector

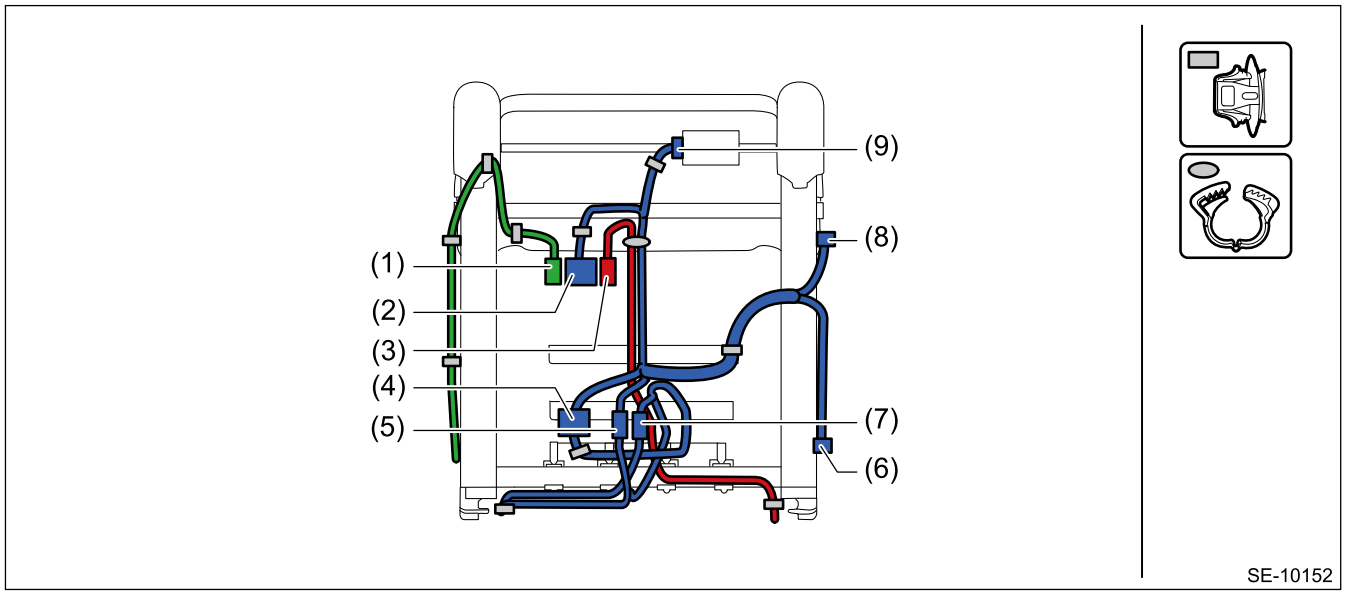
(4) Seat backrest heater connector

(5) Occupant detection connector

(6) Load sensor connector

(7) Occupant detection control module

- Power seat



(1)	Seat belt switch connector	(4)	Power seat connector	(7)	Seat backrest heater connector
(2)	Seat harness (power & heater) connector	(5)	Reclining motor harness connector	(8)	Power seat switch connector
(3)	Side airbag connector	(6)	Lifter motor	(9)	Slide motor connector

8. Install the seat assembly. Ref. to SEATS>Front Seat>INSTALLATION.

Caution:

For the passenger's seat, be sure to perform [Rezeroing] for the occupant detection system after installing the seat assembly. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

SEATS > Front Seat

INSPECTION

1. SEAT COVER

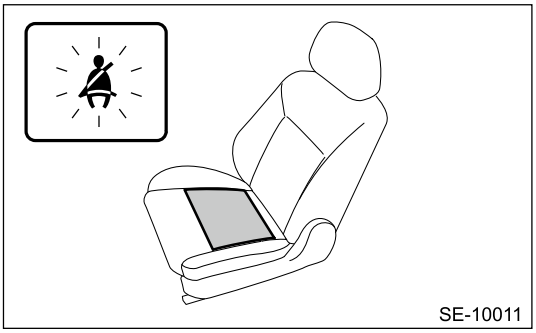
Check that there is no tear or fray on the cover COMPL - front backrest and the cover - front cushion.

Note:

If the door side of the cover COMPL - front backrest is torn or frayed, the side airbag may not be deployed properly. In this case, replace the cover COMPL - front backrest with a new part.

2. CHECK ILLUMINATION OF PASSENGER'S SEAT BELT WARNING LIGHT

Check that the passenger's seat belt warning light illuminates when the passenger's seat is occupied.

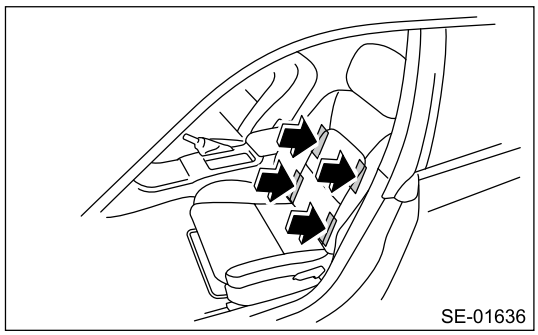


If it does not illuminate, check the seat belt warning system and the occupant detection system.

- Seat belt warning system: Ref. to SEAT BELT SYSTEM>Seat Belt Warning System.
- Occupant detection system: Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Basic Diagnostic Procedure.

3. HOOK SPRING

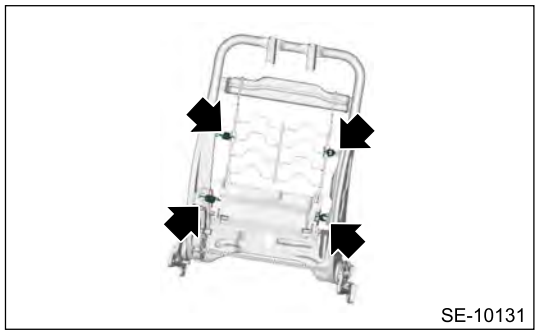
Check the flat mat hook spring by applying weight to the backrest assembly.



Note:

If the appropriate stiffness is not obtained by applying weight to the backrest assembly, the hook spring may be disengaged.

If it is due to the deformation of the hook spring, replace the hook spring with a new part.



REMOVAL

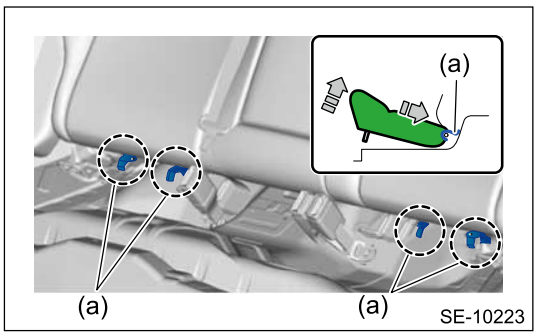
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Airbag system satellite safing sensor is located under the front center of the rear seat cushion. Be careful not to apply strong impact to the sensor when working with the rear seat cushion removed.**

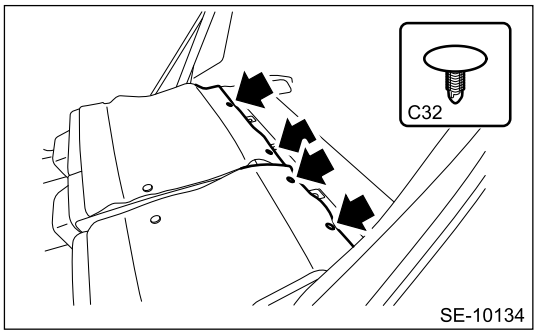
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear seat cushion assembly.
   (1) While pushing the corners of the rear seat cushion from above, pull the knob of the hook - seat cushion rear towards yourself.
   (2) While pulling the knob towards yourself, disconnect the hooks by lifting up the rear seat cushion.



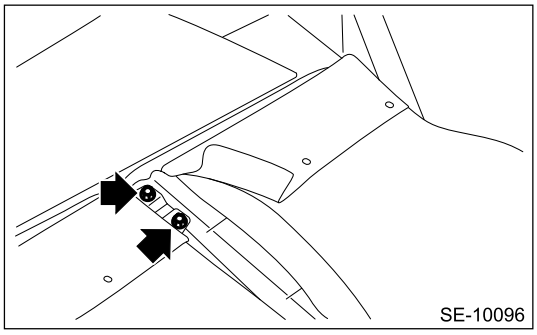
   (3) Remove the hook (a) by pushing it back while lifting the front side of the rear seat cushion, and remove the rear seat cushion.



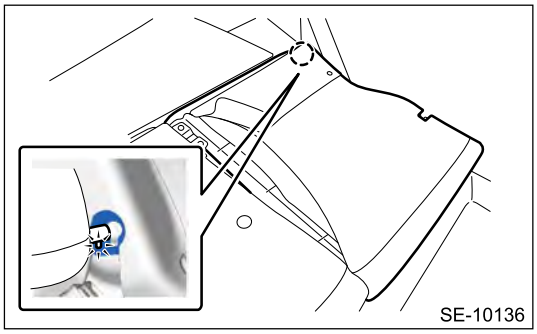
3. Remove the backrest assembly LH.
   (1) Tilt the backrest assembly forward.
   (2) Remove the clips located at the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



(3) Turn over the cover COMPL - rear backrest LH to remove the bolts.



(4) While raising the backrest assembly LH, remove the backrest assembly LH from the hinge assembly.

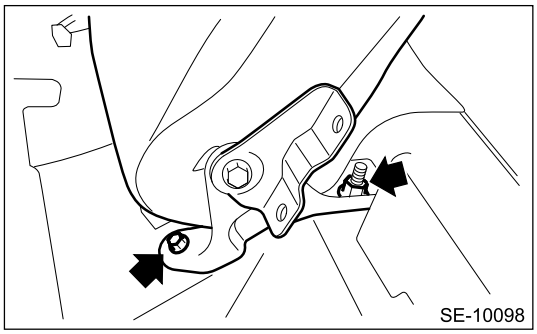


Note:

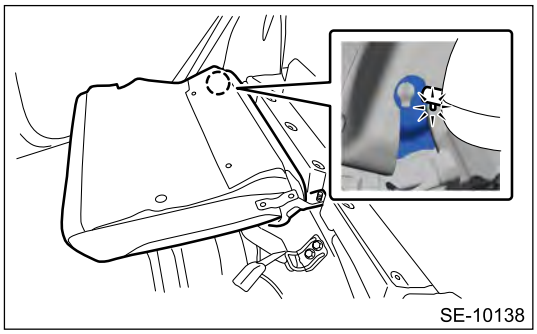
The backrest assembly cannot be removed unless pin positions on the hinge assembly side and backrest assembly side are aligned.

4. Remove the backrest assembly RH.

(1) Remove the bolts and nuts.



(2) While raising the backrest assembly RH, remove the backrest assembly RH from the hinge assembly.



Note:

The backrest assembly cannot be removed unless pin positions on the hinge assembly side and backrest assembly side are aligned.

SEATS > Rear Seat

INSTALLATION

1. Install the backrest assembly RH and LH.

   Tightening torque:

   Refer to "COMPONENT" of "General Description" for the tightening torque. Ref. to SEATS>General Description>COMPONENT > REAR SEAT.

   Note:

   - **After installing the backrest assembly, make sure that each seat belt operates normally.**
   - **Make sure that they are properly secured on each hook on the vehicle side.**
2. Install the rear seat cushion assembly.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

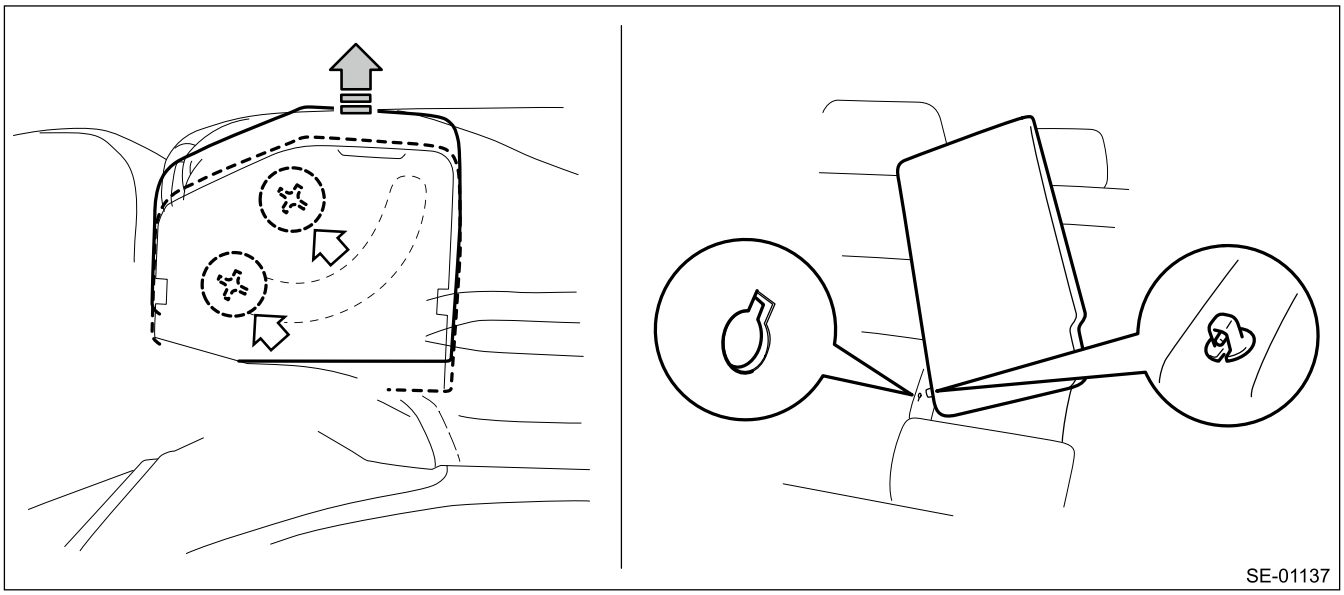
SEATS > Rear Seat

DISASSEMBLY

1. Remove the rear seat. Ref. to SEATS>Rear Seat>REMOVAL.
2. Remove the headrest assembly - rear backrest.
3. Remove the armrest assembly - rear center. (Models with armrest)

   (1) Remove the cover - armrest by pulling it in the direction of the arrow (black).

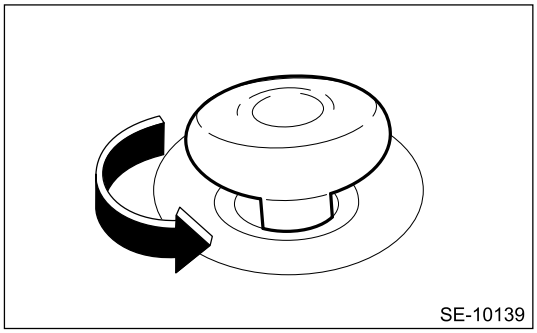
   (2) Remove the screws and remove the armrest assembly - rear center.



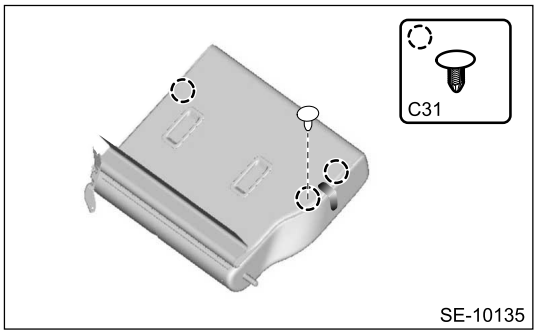
Note:

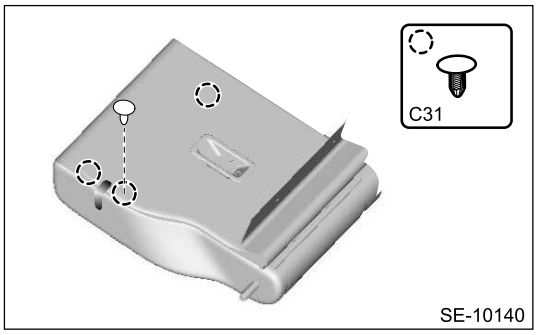
The armrest assembly - rear center cannot be detached unless pin positions on the RH side of the backrest assembly and on the center side of the armrest assembly - rear are aligned.

4. Remove the knob - backrest. (Screw-in type)



5. Remove the clips on the backside of the cover COMPL - rear backrest.



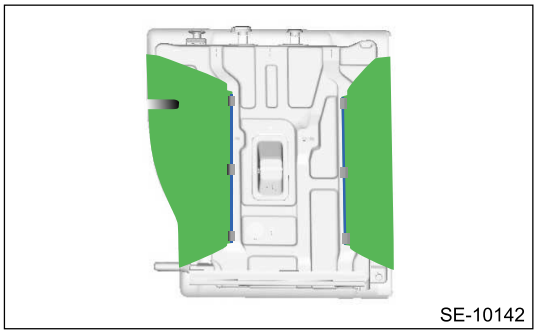


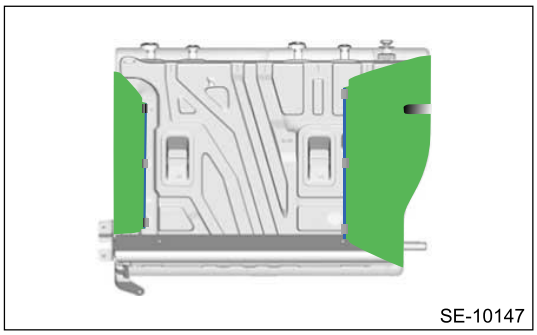
6. Detach the plastic fastener at the bottom of backrest assembly and turn over the cover COMPL - rear backrest.





7. Remove the plastic hooks on the back side of the backrest assembly.

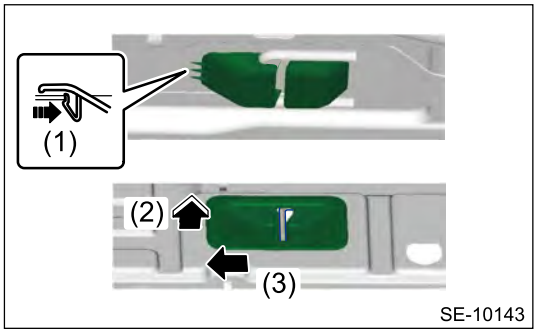




8. Remove the tether anchor cover from the inside of back board. (5 door model)

Caution:

Pay attention to the burrs on the panel edge.



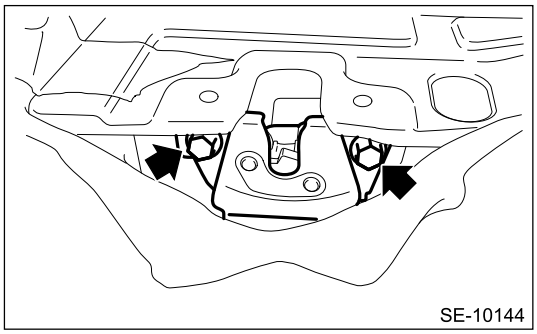
Note:

Turn over the backrest assembly. While pulling up the pad and cover, remove the tether anchor cover.

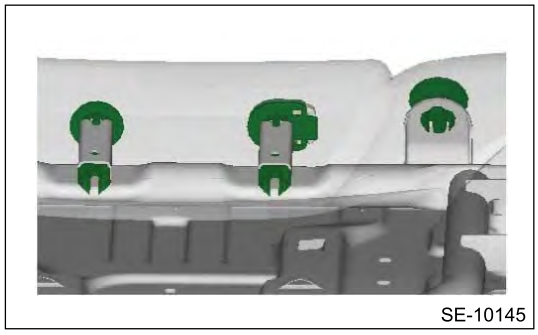
9. Remove the lock assembly - rear backrest rear.

Caution:

Pay attention to the burrs on the panel edge.



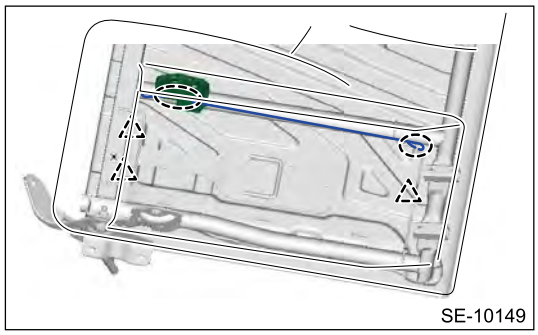
10. Remove the bushing - headrest and the bushing - lock assembly.



Note:

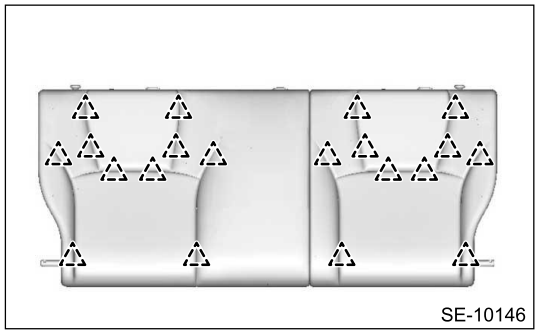
Catch the tip of the bushing - headrest with pliers and push it outward from the inside of seat to remove it.

11. For the backrest LH, remove the hog ring and wire clamp. (Models with armrest)

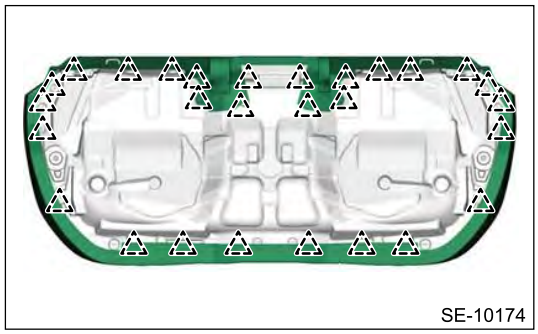


12. Remove the frame assembly - rear backrest.

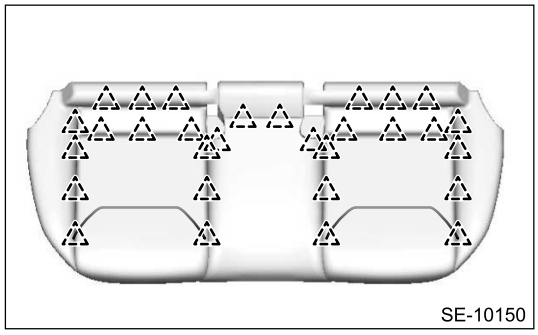
13. Remove the hog rings, then remove the cover COMPL - rear backrest.



14. Remove the hog rings on the back side of the rear seat cushion assembly.



15. Remove the hog rings, then remove the cover - rear cushion.



SEATS > Rear Seat

ASSEMBLY

Caution:

- **Do not reuse the hog ring and hang wire.**
- **Secure the hog ring using hog ring pliers.**
- **Install the hog rings to the specified points securely and make sure that there is no wrinkle or twisting on the cover COMPL - rear backrest.**

1. Assemble the cover COMPL - rear backrest and the cover - rear cushion in the same manner as for the front seat. Ref. to SEATS>Front Seat>ASSEMBLY.

2. Install the hog rings on the back side of the rear seat cushion assembly.

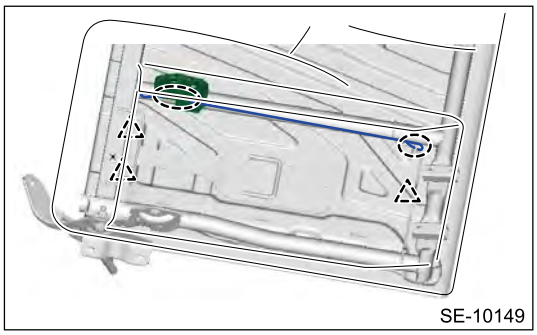
3. Install the hog rings and wire clip, then install the cover COMPL - rear backrest.

Note:

- **Do not contaminate or damage the cover COMPL - rear backrest and the cover - rear cushion.**
- **While installing the hog rings, prevent the cover COMPL - rear backrest and the cover - rear cushion from getting wrinkled.**

4. Install the frame assembly - rear backrest.

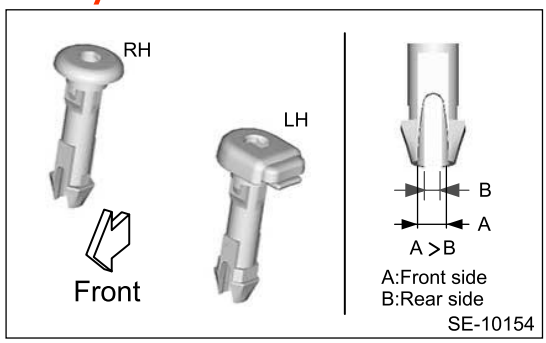
5. For the backrest LH, install the hog ring and wire clamp. (Models with armrest)



6. Install the bushing - headrest and the bushing - lock assembly.

Caution:

Pay attention to the orientation of the bushing - headrest.



7. Install the lock assembly - rear backrest rear.

   Tightening torque:

   Refer to "COMPONENT" of "General Description". Ref. to SEATS>General Description>COMPONENT > REAR SEAT.
8. Install the plastic hooks on the back side of the backrest assembly.
9. Install the clips on the backside of the cover COMPL - rear backrest.
10. Install the knob - backrest. (Screw-in type)
11. Install the tether anchor cover. (5 door model)
12. Install the armrest. (Models with armrest)

    Tightening torque:

    Refer to "COMPONENT" of "General Description". Ref. to SEATS>General Description>COMPONENT > REAR SEAT.
13. Install the headrest assembly - rear backrest.
14. Before installation, check the following items.
    - No tear and fray on the cover COMPL - rear backrest and the cover - rear cushion.
15. Install the rear seat. Ref. to SEATS>Rear Seat>INSTALLATION.

SEATS > Rear Seat

INSPECTION

1. SEAT COVER

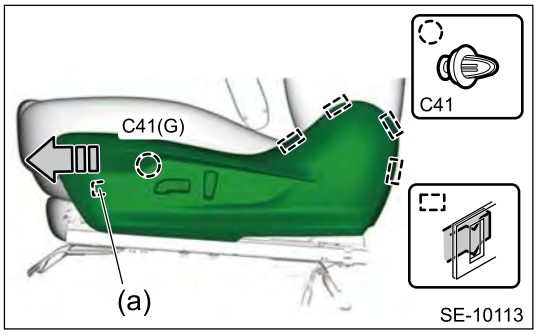
Check that there is no tear or fray on the cover COMPL - rear backrest and the cover - rear cushion.

REMOVAL

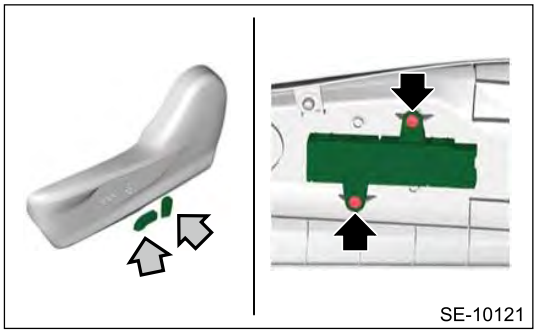
Caution:
When removing the front seat, disconnect the ground cable from the battery before disconnecting the airbag system and the occupant detection system harness connector, and wait for 60 seconds before starting the operation.

1. POWER SEAT SWITCH

1. Remove the seat from vehicle. Ref. to SEATS>Front Seat>REMOVAL.
2. Remove the cover - hinge front seat OUT.
   (1) Release the claw in the upper section of the cover - hinge front seat OUT.
   (2) Release the clips, and release the claws (a) in the front section of the cover - hinge front seat OUT.
   (3) Disconnect the power seat switch connector, and remove the cover - hinge front seat OUT.



3. Remove the power seat switch assembly.
   (1) Remove the knob - power seat.
   (2) Remove the screws to remove the power seat switch assembly.



INSTALLATION

1. Install the power seat switch assembly.
2. Install the cover - hinge front seat OUT.
3. Install the knob - power seat.
4. Install the seat assembly. Ref. to SEATS>Front Seat>INSTALLATION.

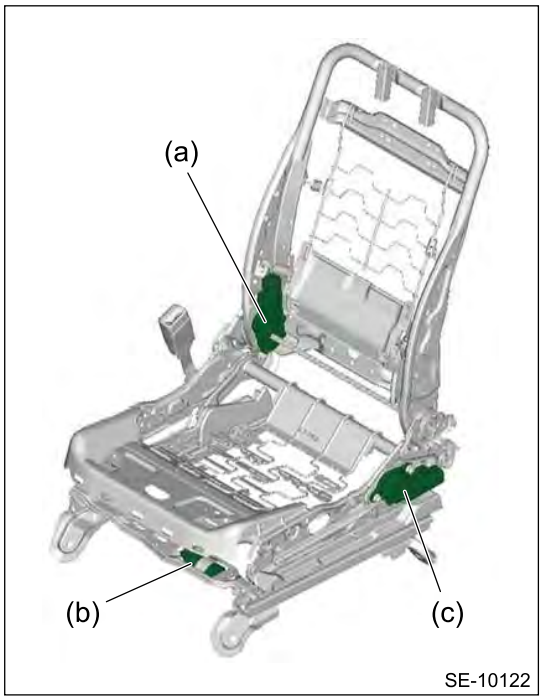
INSPECTION

1. WIRING DIAGRAM

Refer to “Power Seat” in WI section. Ref. to WIRING SYSTEM>Power Seat System>WIRING DIAGRAM.

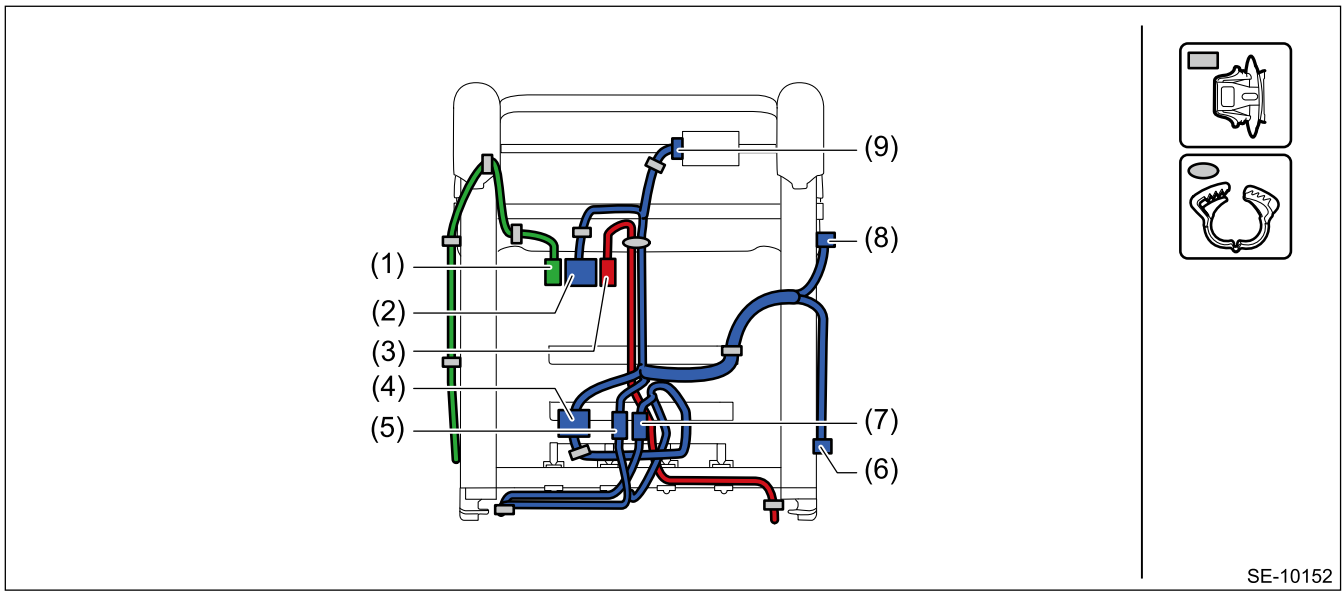
2. NOTE

MOTOR LAYOUT



(a) Reclining motor
(b) Slide motor
(c) Lifter motor

HARNESS LAYOUT



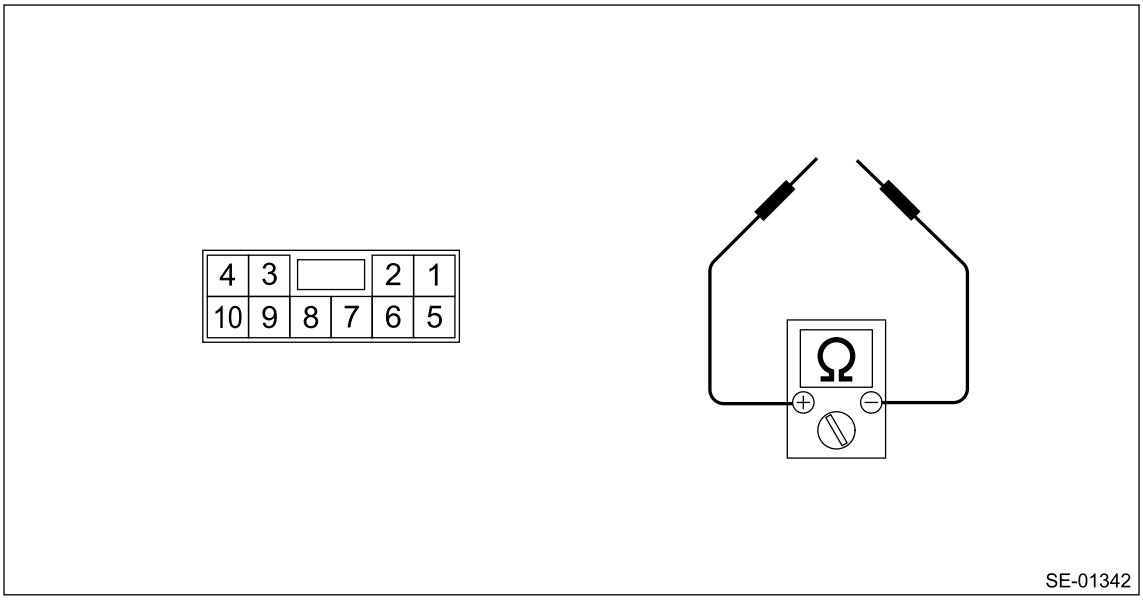
(1) Seat belt switch connector
(2) Seat harness connector
(3) Side airbag connector
(4) Power seat connector
(5) Reclining motor harness connector
(6) Lifter motor
(7) Seat backrest heater connector
(8) Power seat switch connector
(9) Slide motor connector

3. TROUBLE SYMPTOM

Symptoms	Criteria
All functions do not operate. Ref. to SEATS>Power Seat System>INSPECTION > ALL FUNCTIONS DO NOT OPERATE.	• Power seat switch • Power seat harness • Body harness
A part of function does not operate. Ref. to SEATS>Power Seat System>INSPECTION > SOME MOTORS DO NOT OPERATE.	• Power seat switch • Power seat harness • Relevant motor

4. CHECK POWER SEAT SWITCH

Measure resistance between terminals while operating each switch.



Switch position	Terminal No.	Standard
Slide forward	1 and 8 4 and 7	Less than 10 Ω
Slide rearward	1 and 7 4 and 8	Less than 10 Ω
Lifter up	1 and 6 4 and 9	Less than 10 Ω
Lifter down	1 and 9 4 and 6	Less than 10 Ω
Reclining forward	1 and 10 4 and 5	Less than 10 Ω
Reclining rearward	1 and 5 4 and 10	Less than 10 Ω

Replace the power seat switch if the inspection result is not within the standard value.

5. ALL FUNCTIONS DO NOT OPERATE

1. CHECK SEAT FUNCTIONS.

Operate each power seat switch and check that each power seat function operates normally.

Does all function fail to operate?

Yes — Go to 2.

No — Check the motor which does not operate. Ref. to SEATS>Power Seat System>INSPECTION > SOME MOTORS DO NOT OPERATE.

2. CHECK FUSE.

Check the power seat fuse inside the fuse box.

Is the fuse blown out?

Yes — Replace the appropriate fuse.

No — Go to 3.

3. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the power seat switch connector.
2. Measure the voltage between harness connector and chassis ground.
   Connector & terminal
   (R200) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 4.

No — Check body harness.

4. CHECK POWER SUPPLY CIRCUIT.

Measure the resistance between power seat switch harness connector and chassis ground.
Connector & terminal
(R200) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Replace the power seat switch assembly.

No — Check body harness.

6. SOME MOTORS DO NOT OPERATE

- **Slide operation failure**

1. CHECK SWITCH.

1. Disconnect the power seat switch connector.
2. Measure the resistance between connector terminals when moving the switch to slide forward and slide backward. Ref. to SEATS>Power Seat System>INSPECTION > CHECK POWER SEAT SWITCH.

Is the inspection result normal?

Yes — Go to 2.

No — Replace the power seat switch assembly.

2. CHECK HARNESS.

1. Disconnect the slide motor connector.
2. Measure the resistance between power seat switch connector and slide motor connector.
   Connector & terminal
   (R200) No. 8 — (R202) No. 5:
   (R200) No. 7 — (R202) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Check power seat harness.

3. CHECK SLIDE MOTOR.

1. Connect the power seat switch connector and slide motor connector.
2. Apply 12 V to the slide motor and check the motor rotation.
   Connector & terminal
   (R202) No. 5 (+) — (R202) No. 1 (−):
   (R202) No. 1 (+) — (R202) No. 5 (−):

Does the motor rotate normally?

Yes	Check for temporary poor contact or mechanical trouble in slide rail.
No	Slide motor problem. Replace the seat cushion frame assembly.

- **Malfunction of lifter operation**

1. CHECK SWITCH.

1. Disconnect the power seat switch connector.
2. Measure the resistance between connector terminals when moving the switch to lifter up and lifter down. Ref. to SEATS>Power Seat System>INSPECTION > CHECK POWER SEAT SWITCH.

Is the inspection result normal?

Yes	Go to 2.
No	Replace the power seat switch assembly.

2. CHECK HARNESS.

1. Disconnect the lifter motor connector.
2. Measure the resistance between power seat switch connector and lifter motor connector.
   Connector & terminal
   (R200) No. 6 — (R204) No. 6:
   (R200) No. 9 — (R204) No. 4:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Check power seat harness.

3. CHECK LIFTER MOTOR.

1. Connect the power seat switch connector and lifter motor connector.
2. Apply 12 V to the lifter motor and check the motor rotation.
   Connector & terminal
   (R204) No. 6 (+) — (R204) No. 4 (−):
   (R204) No. 4 (+) — (R204) No. 6 (−):

Does the motor rotate normally?

Yes	Check for temporary poor contact or mechanical trouble in lifter mechanism.
No	Lifter motor problem. Replace the seat cushion frame assembly.

- **Malfunction of reclining operation**

1. CHECK SWITCH.

1. Disconnect the power seat switch connector.
2. Measure the resistance between connector terminals when moving the switch to reclining forward and reclining backward. Ref. to SEATS>Power Seat System>INSPECTION > CHECK POWER SEAT SWITCH.

Is the inspection result normal?

Yes	Go to 2.
No	Replace the power seat switch assembly.

2. CHECK HARNESS.

1. Disconnect the reclining motor connector.
2. Measure the resistance between power seat switch connector and reclining motor connector.
   Connector & terminal
   (R200) No. 10 — (R201) No. 6:
   (R200) No. 5 — (R201) No. 4:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Check power seat harness.

3. CHECK RECLINING MOTOR.

1. Connect the power seat switch connector and reclining motor connector.
2. Apply 12 V to the reclining motor and check the motor rotation.

Connector & terminal

(R201) No. 6 (+) — (R201) No. 4 (−):

(R201) No. 4 (+) — (R201) No. 6 (−):

Does the motor rotate normally?

Yes	Check for temporary poor contact or mechanical trouble in reclining hinge.
No	Reclining motor problem. Replace the backrest frame assembly.

REMOVAL

1. SEAT HEATER UNIT

Caution:

- **If the seat heater module is removed, replace the pad assembly with a new part.**
- **If the seat heater module is reused, remove the polyurethane section from the reverse side completely and attach a new pad assembly with a double-sided tape.**

Preparation items:

Double-sided tape: NITTO DENKO 501L or equivalent

1. Remove the front seats. Ref. to SEATS>Front Seat>REMOVAL.
2. Remove the backrest cover of front seat and seat cushion cover. Ref. to SEATS>Front Seat>DISASSEMBLY.
3. Remove the seat heater module.

2. SEAT HEATER SWITCH

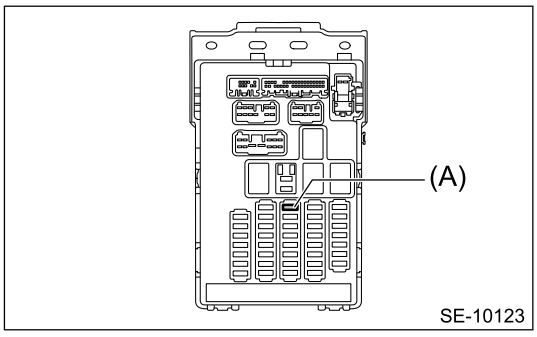
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

   Note:

   On CVT models, shift the select lever into "N" before disconnecting the battery ground cable.
2. Remove the cover assembly - front. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Release the claws, and remove the seat heater switch from the back of the cover assembly - front.

3. SEAT HEATER RELAY AND FUSE

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the glove box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
4. Remove the seat heater relay and fuse.
   (1) Remove the relay & fuse box bolts.
   (2) Remove the seat heater relay from the relay holder.



Relay & fuse box	Fuse 20 A	(A)

INSTALLATION

1. SEAT HEATER UNIT

1. Install the seat heater module.
   Caution:
   - **If the seat heater module is removed, replace the pad assembly with a new part.**
   - **If the seat heater module is reused, remove the polyurethane section from the reverse side completely and attach a new pad assembly with a double-sided tape.**

   Preparation items:
   Double-sided tape: NITTO DENKO 501L or equivalent
2. Assemble the backrest cover of front seat and seat cushion cover. Ref. to SEATS>Front Seat>ASSEMBLY.
3. Install the front seat. Ref. to SEATS>Front Seat>INSTALLATION.

2. SEAT HEATER SWITCH

1. Install the seat heater switch.
2. Install the console box assembly.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   After connecting the battery sensor terminal, place the select lever in the "P" position.

3. SEAT HEATER RELAY AND FUSE

1. Install the seat heater relay & fuse.
2. Install the glove box assembly.
3. Install the cover assembly - instrument panel LWR driver.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SEATS > Seat Heater System

INSPECTION

1. WIRING DIAGRAM

Refer to "Seat Heater System" in the wiring diagram. Ref. to WIRING SYSTEM>Seat Heater System>WIRING DIAGRAM.

2. DIAGNOSTIC CHART

Symptoms	Repair order
Seat heater does not operate.	1. Check the fuse. Ref. to SEATS>Seat Heater System>INSPECTION > CHECK SEAT HEATER FUSE.
	2. Check the seat heater system power supply and ground circuit. Ref. to SEATS>Seat Heater System>INSPECTION > CHECK POWER SUPPLY AND GROUND CIRCUIT.
	3. Check the seat heater module. Ref. to SEATS>Seat Heater System>INSPECTION > SEAT HEATER UNIT.
	4. Check the seat heater switch circuit. Ref. to SEATS>Seat Heater System>INSPECTION > SEAT HEATER SWITCH.

3. CHECK SEAT HEATER FUSE

1. CHECK FUSE.

Remove the seat heater fuse, and then visually check.

Is the fuse blown out?

Yes — Check the power supply and ground circuit.

No — Check the power supply and ground circuit.

4. CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the harness connector of seat heater switch.
2. Turn the ignition switch to ON.
3. Measure the voltage between harness connector terminal and chassis ground.

Connector & terminal

(AD27) No. 7 (+) — Chassis ground (−):

Is the voltage 12 V or more?

Yes — Go to 2.

No — Check the harness between the seat heater switch and fuse.

2. CHECK GROUND CIRCUIT.

Measure the resistance between harness connector terminal and chassis ground.
Measure the resistance between harness connector terminal and chassis ground.

Connector & terminal

(AD27) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair the harness.

3. CHECK GROUND CIRCUIT.

Measure the resistance between seat heater switch terminals.

Connector & terminal

(AD27) No. 7 — (AD27) No. 2:

Is the resistance less than 10 Ω?

Yes	The power supply and ground circuit are OK.
No	Replace the seat heater switch. Ref. to SEATS>Seat Heater System>REMOVAL > SEAT HEATER SWITCH.

5. SEAT HEATER UNIT

1. Disconnect the seat heater unit connector, and check the continuity between terminals of connector.

Connector & terminal

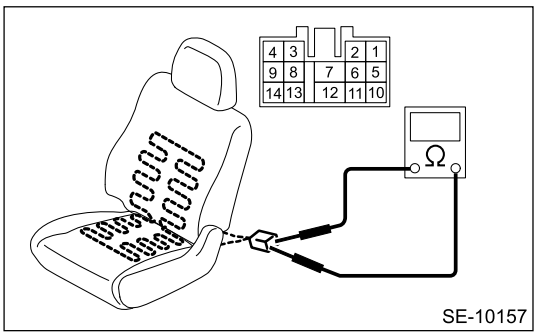
HI

No. 6 — No. 12:

No. 2 — No. 12:

LOW

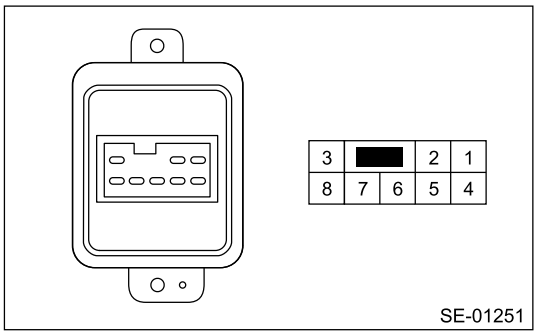
No. 2 — No. 12:



2. If no continuity exists, replace the seat heater module with a new part. Ref. to SEATS>Front Seat>DISASSEMBLY.

6. SEAT HEATER SWITCH

1. Inspect the continuity between the seat heater switch terminals.



Connector & terminal

HI

No. 7 — No. 2:

No. 7 — No. 4:
No. 7 — No. 8:
No. 2 — No. 1:
No. 2 — No. 3:

LOW

No. 7 — No. 1:
No. 7 — No. 2:
No. 7 — No. 3:

2. If no continuity exists, replace the seat heater switch with a new part. Ref. to SEATS>Seat Heater System>REMOVAL > SEAT HEATER SWITCH.

SECURITY AND LOCKS

SL

1. General Description
2. Relay and Fuse
3. Door Lock Control System
4. Keyless Entry System
5. Keyless Access With Push Button Start System
6. Security System
7. Door Inner Remote
8. Door Outer Handle
9. Door Latch & Door Lock Actuator Assembly
10. Rear Gate Opener Button
11. Rear Gate Latch and Actuator Assembly
12. Trunk Lid Latch and Actuator Assembly
13. Front Hood Lock Assembly
14. Remote Openers
15. Ignition Key Lock
16. Key Lock Cylinders
17. Keyless Entry Control Module
18. Keyless Buzzer
19. Body Integrated Unit
20. Keyless Transmitter
21. Access Key
22. Immobilizer Control Module
23. Immobilizer Antenna
24. Keyless Access Indoor Antenna
25. Keyless Access Outdoor Antenna
26. Trunk Opener Button
27. Rear Lock Button
28. Keyless Access CM
29. ID Code Box
30. Steering Lock CM
31. Push Button Ignition Switch
32. Access Buzzer
33. Function Setting (Customize)
34. Diagnostics with Phenomenon

LOCATION

1. KEYLESS ENTRY SYSTEM

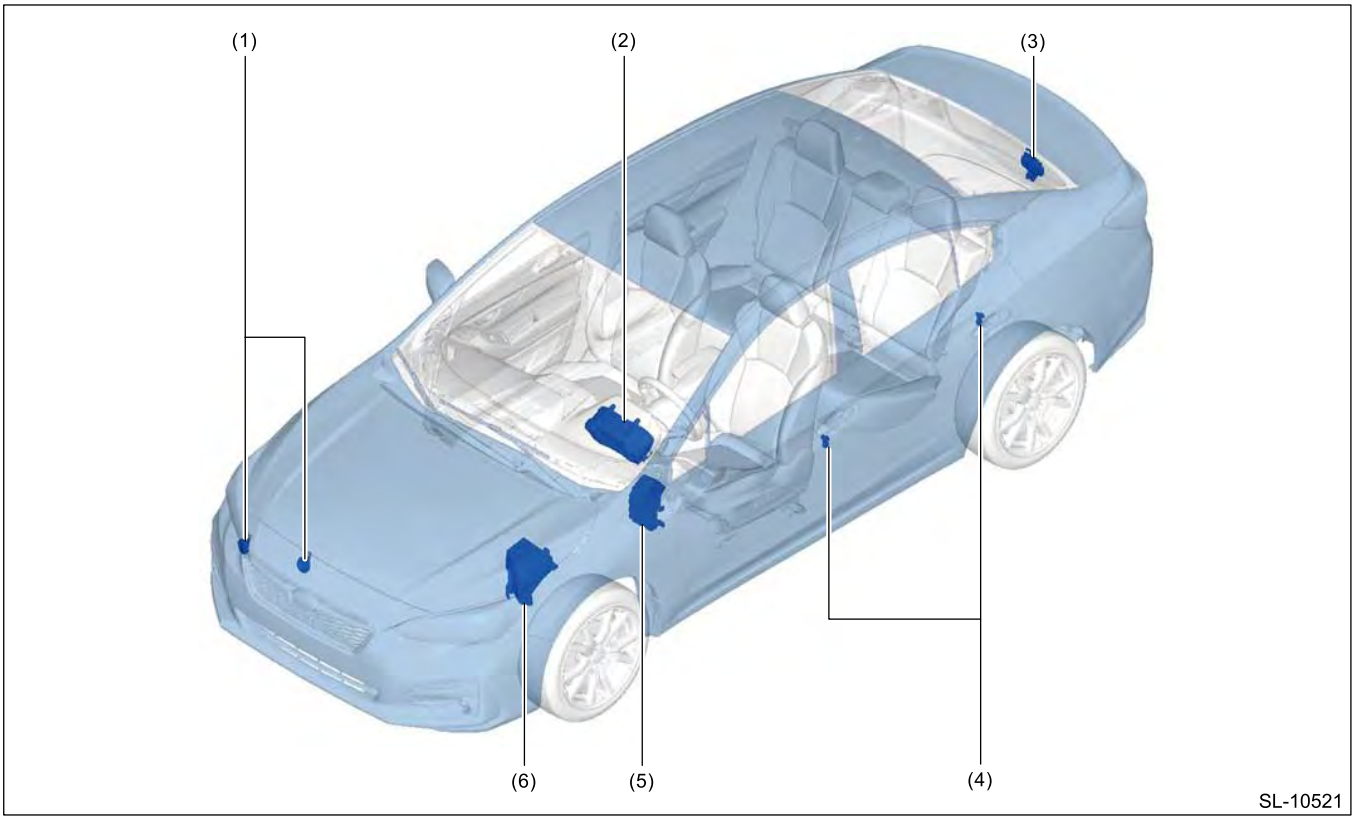
For location, refer to “Electrical Component Location” for “KEYLESS ENTRY (DIAGNOSTICS)” section.
Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Electrical Component Location.

2. KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

Refer to “Electrical Component Location” for “KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)” section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Electrical Component Location.

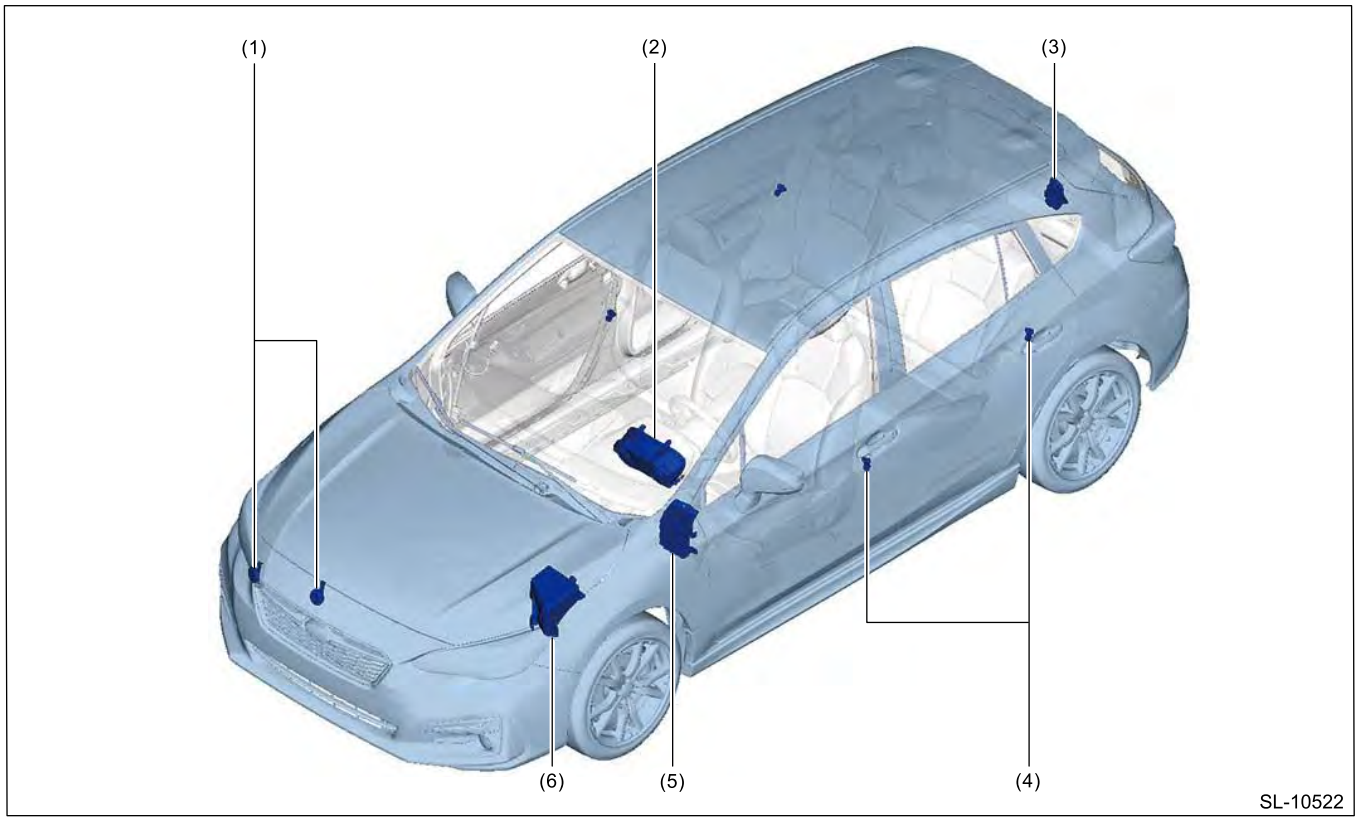
3. SECURITY SYSTEM

- 4 door model



(1) Horn
(2) Security indicator light (in combination meter)
(3) Trunk lid latch switch
(4) Door switch
(5) Body integrated unit
(6) Horn relay (in main fuse box)

- 5 door model



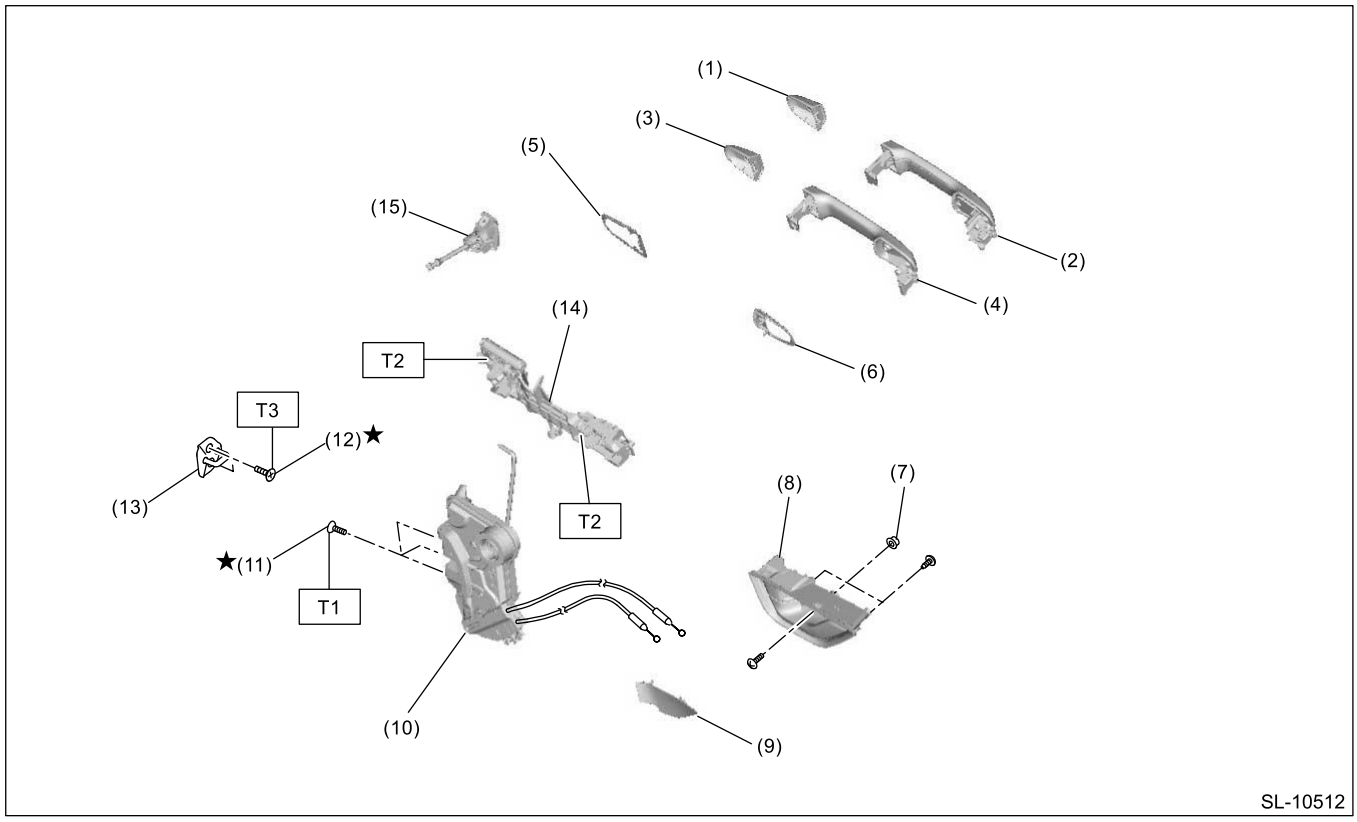
(1) Horn
(2) Security indicator light (in combination meter)
(3) Rear gate latch switch
(4) Door switch
(5) Body integrated unit
(6) Horn relay (in main fuse box)

SECURITY AND LOCKS > General Description

COMPONENT

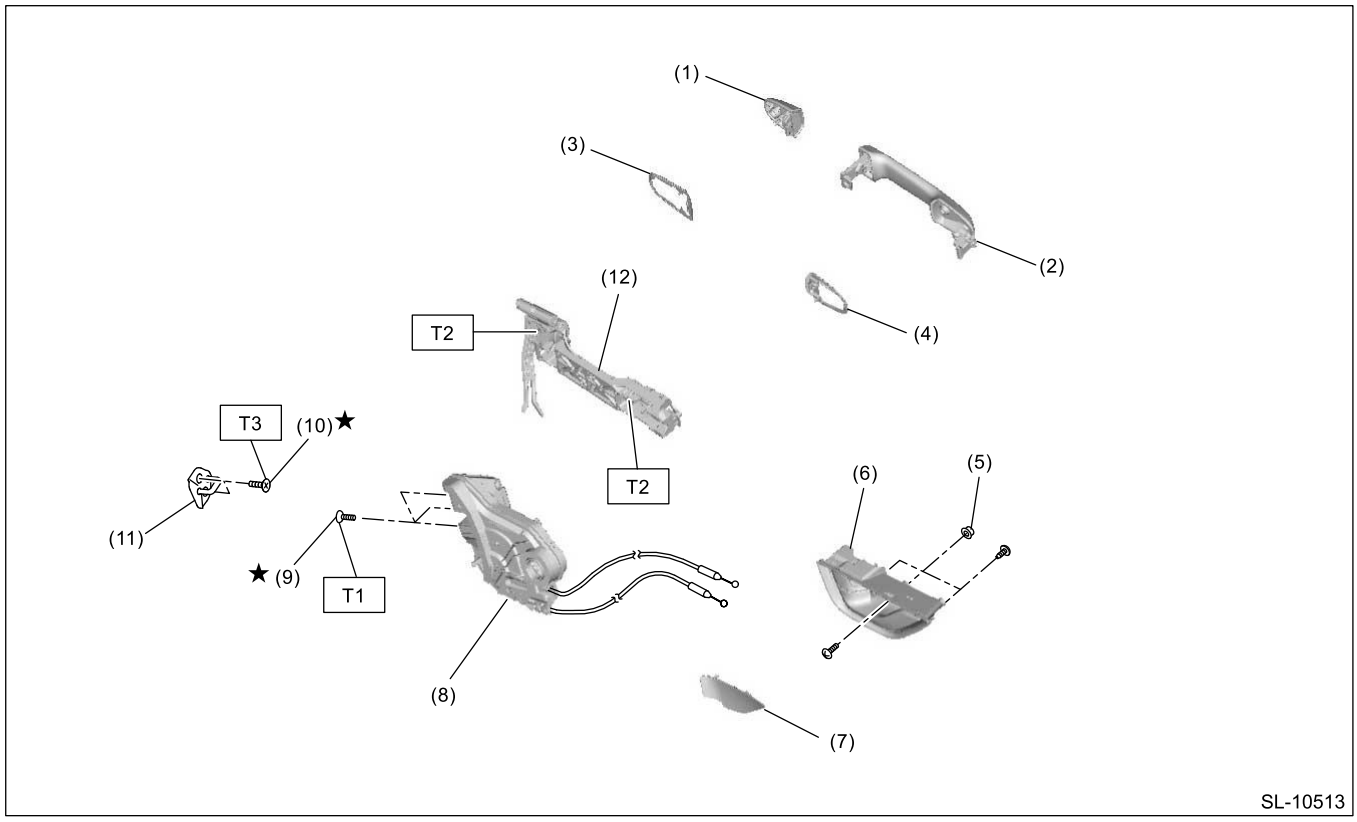
1. DOOR LOCK ASSEMBLY

- Front



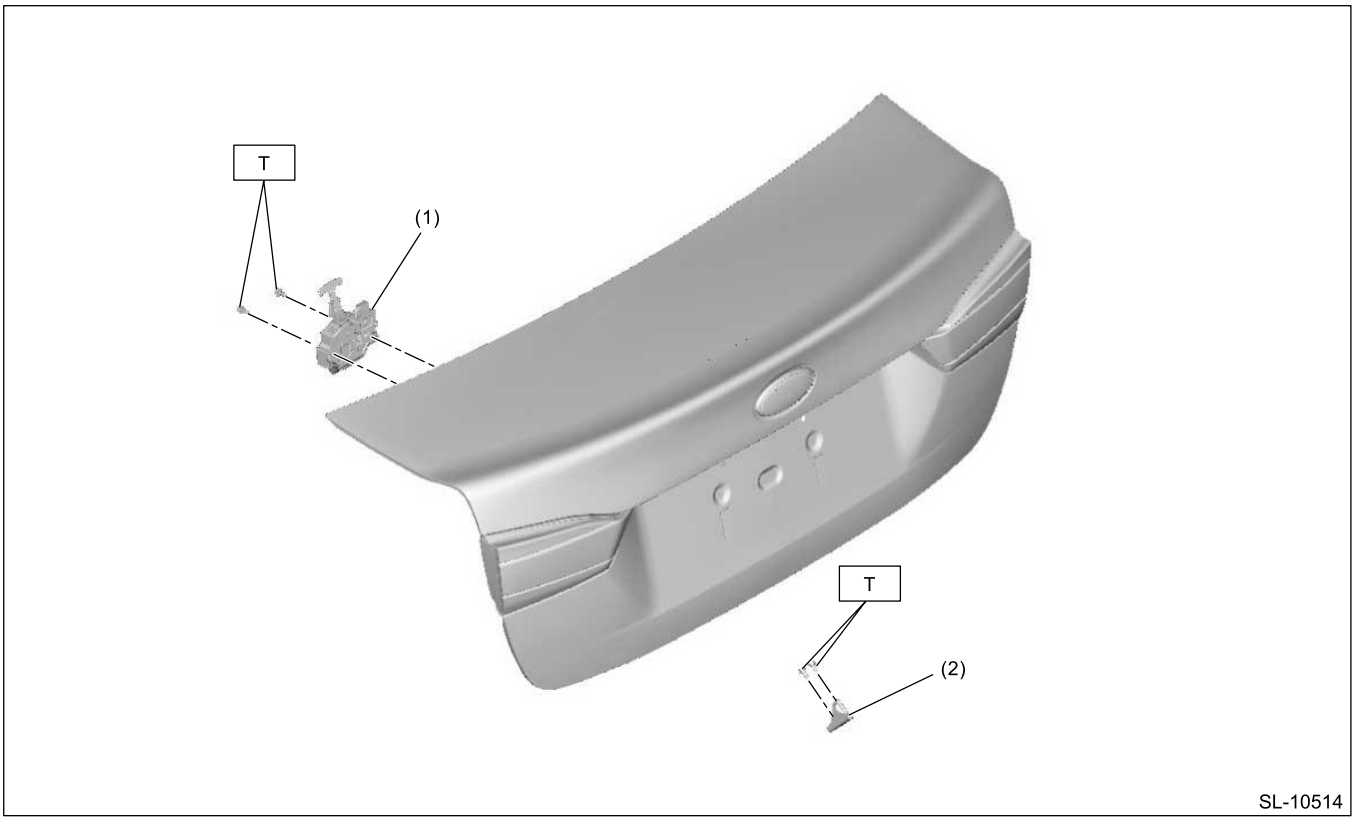
(1) Cover - handle front outer (passenger's seat)	(8) Remote ASSY - door	(15) Key lock - door (driver's seat only)
(2) Handle - door outer (model with keyless access with push button start)	(9) Cover - remote door	
(3) Cover - handle front outer (driver's seat)	(10) Latch & actuator ASSY - front	***Tightening torque: N·m (kgf-m, ft-lb)***
(4) Handle - door outer (keyless entry model)	(11) TORX® bolt	***T1: 6.5 (0.7, 4.8)***
(5) Spacer - door handle outer B	(12) TORX® bolt	***T2: 7.5 (0.8, 5.5)***
(6) Spacer - door handle outer A	(13) Striker - door	***T3: 18 (1.8, 13.3)***
(7) Grommet - screw	(14) Frame ASSY - front door outer	

- Rear



(1)	Cover - handle rear outer	(7)	Cover - remote door	***Tightening torque: N·m (kgf-m, ft-lb)***
(2)	Handle - door outer	(8)	Latch & actuator ASSY - rear	***T1: 6.5 (0.7, 4.8)***
(3)	Spacer - door handle outer B	(9)	TORX® bolt	***T2: 7.5 (0.8, 5.5)***
(4)	Spacer - door handle outer A	(10)	TORX® bolt	***T3: 18 (1.8, 13.3)***
(5)	Grommet - screw	(11)	Striker - door	
(6)	Remote ASSY - door	(12)	Frame ASSY - rear door outer	

2. TRUNK LID LOCK



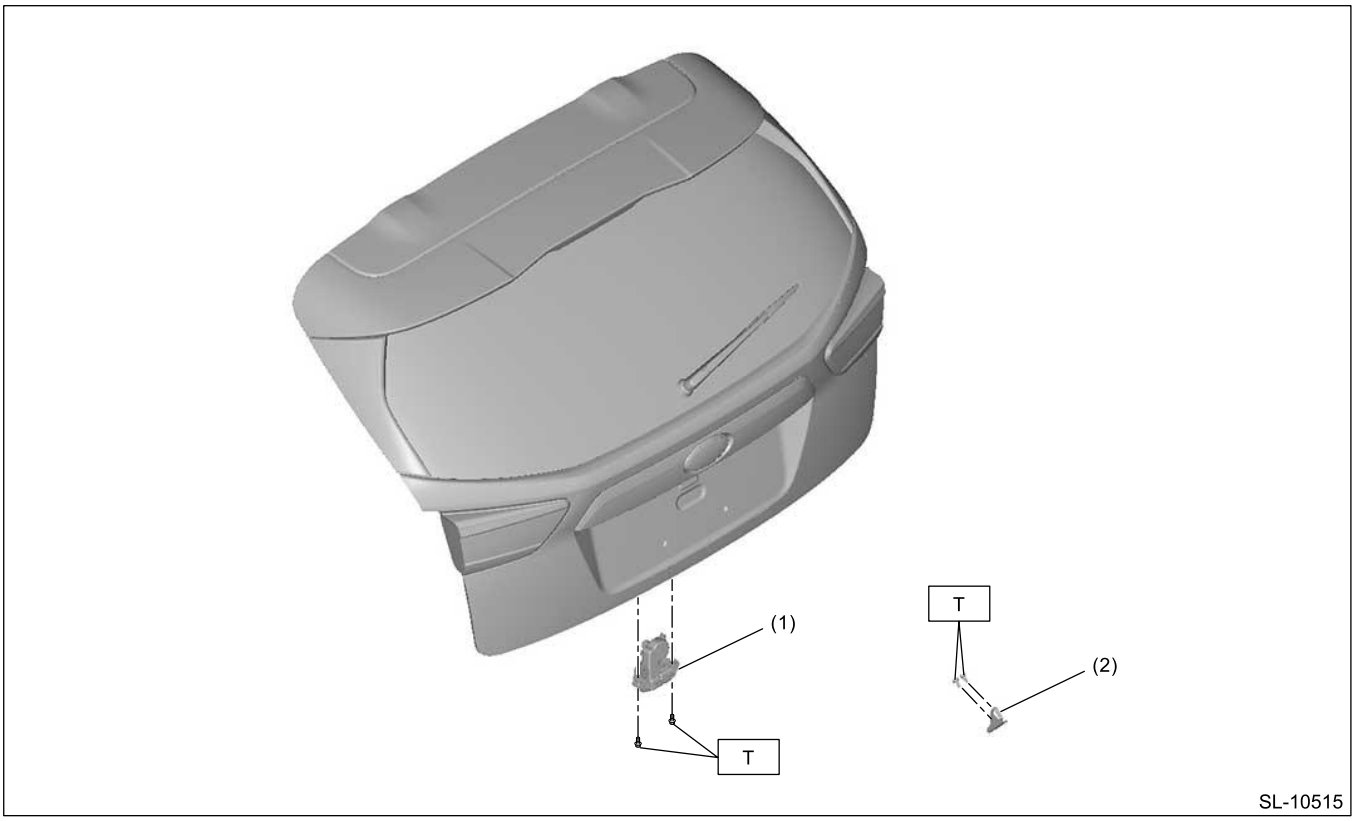
(1) Lock ASSY - trunk lid

(2) Striker - trunk lid

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

3. REAR GATE LOCK

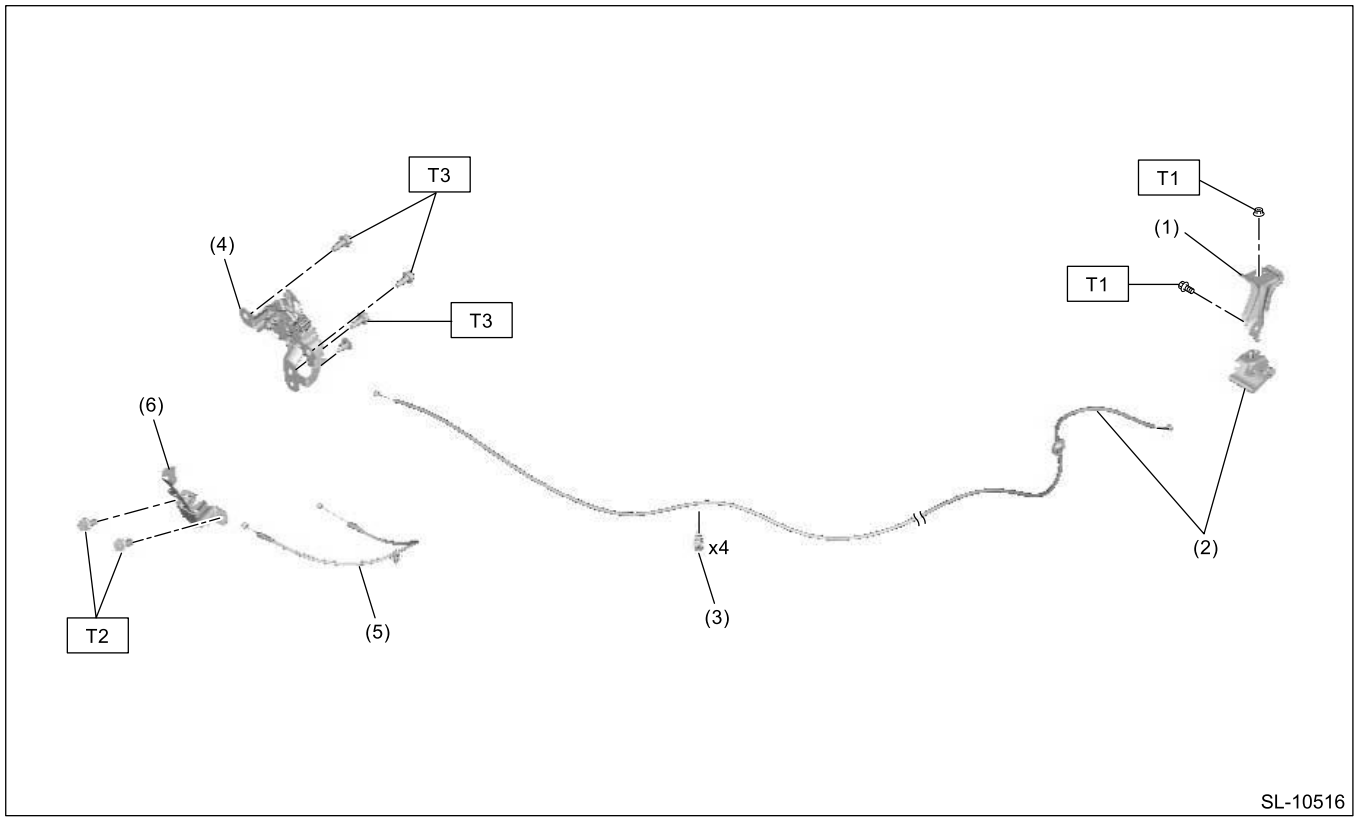


(1) Latch & actuator - rear gate (2) Striker - rear gate

Tightening torque: N·m (kgf-m, ft-lb)

T: 25 (2.5, 18.4)

4. FRONT HOOD LOCK



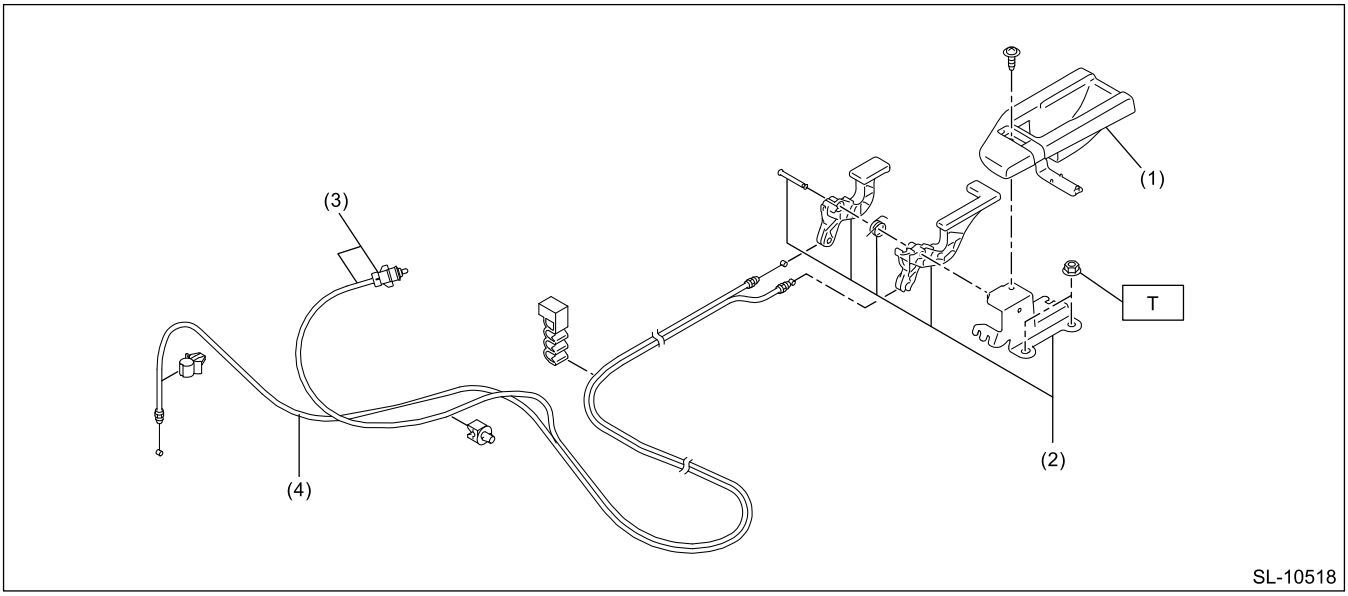
(1) Bracket - opener handle
(2) Cable - front hood
(3) Clip
(4) Lock ASSY - front hood
(5) Cable - safety
(6) Lever ASSY - safety

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7.5 (0.8, 5.5)
T2: 18 (1.8, 13.3)
T3: 33 (3.4, 24.3)

5. REMOTE OPENER

- 4 door model

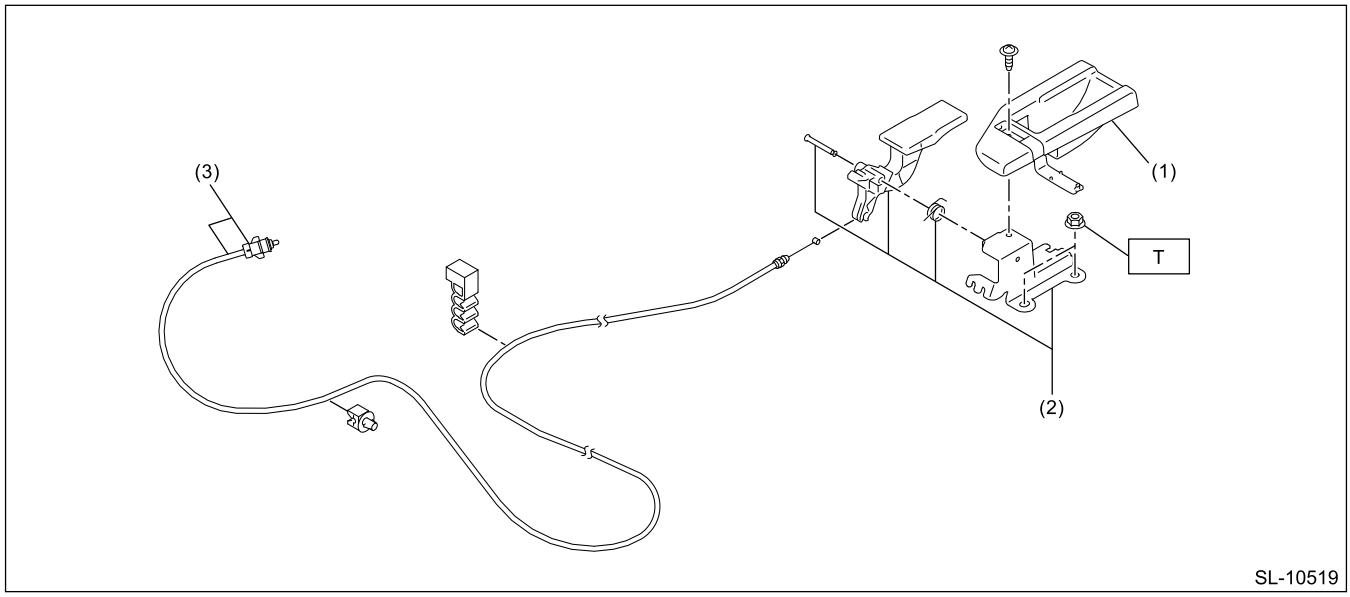


(1) Cover - handle
(2) Pull handle - opener
(3) Cable ASSY - fuel
(4) Cable ASSY - trunk lid

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

- 5 door model

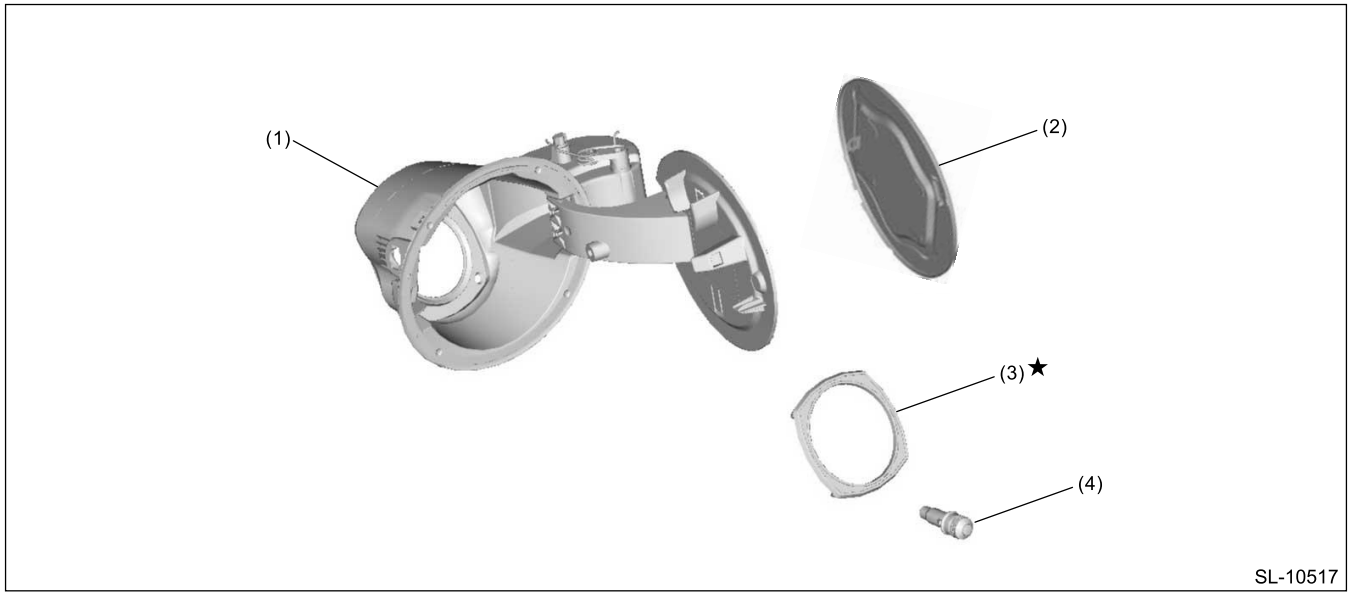


(1) Cover - handle
(2) Pull handle - opener
(3) Cable ASSY - fuel

Tightening torque: N·m (kgf-m, ft-lb)

T: 7.5 (0.8, 5.5)

6. FUEL FLAP



(1) Saucer - COMPL
(2) Flap - COMPL fuel
(3) Ring clip
(4) Lifter

SECURITY AND LOCKS > General Description

CAUTION

- Before disassembling or reassembling parts, always disconnect the battery ground cable from battery. When replacing the audio, control module and other parts provided with memory functions, record the memory contents before disconnecting the battery ground cable. Otherwise, the memory is cleared.
- If any immobilizer related part has been replaced, make sure to register the immobilizer.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.

- Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.
- Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.

- When removing, installing or replacing the VDCCM&H/U, VDCCM&H/U bracket, steering wheel or steering angle sensor (steering roll connector), perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

SECURITY AND LOCKS > General Description

PREPARATION TOOL

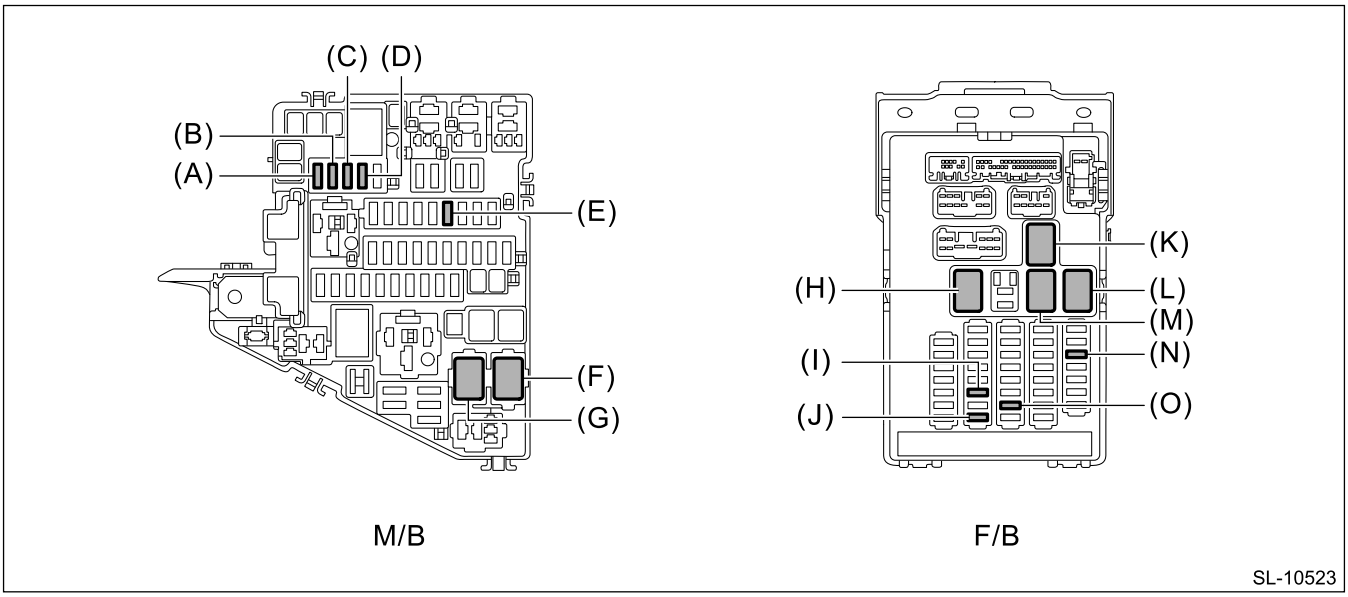
1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Drill	Used for replacing ignition key lock.
Reverse tap	Used for replacing ignition key lock.
TORX® T30	Used for removing and installing the latch & actuator assembly, door outer handle cover and frame assembly.
Clip remover	Used for removing clips.

LOCATION



Main fuse box (M/B)	Fuse 10 A (body integrated unit)	(A)
	Fuse 10 A (body integrated unit)	(B)
	Fuse 10 A (body integrated unit)	(C)
	Fuse 10 A (body integrated unit)	(D)
	Fuse 15 A (body integrated unit)	(E)
	Starter cut relay	(F)
	Starter relay	(G)
Relay & fuse box (F/B)	IG 2 relay	(H)
	Fuse 10 A (body integrated unit, immobilizer antenna)	(I)
	Fuse 7.5 A (key warning switch, keyless access CM, steering lock CM)	(J)
	IG 1 relay	(K)
	Accessory relay 1	(L)
	Accessory relay 2	(M)
	Fuse 7.5 A (body integrated unit, immobilizer antenna)	(N)
	Fuse 7.5 A (body integrated unit)	(O)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

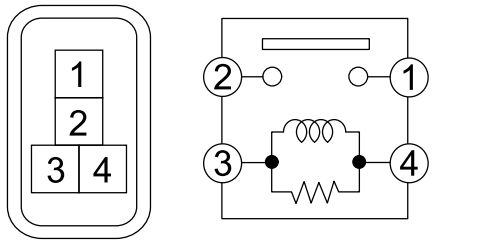
1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

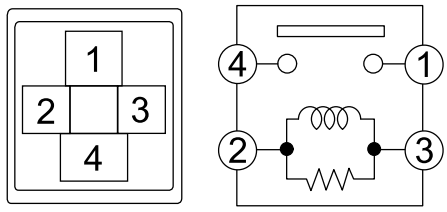
Note:

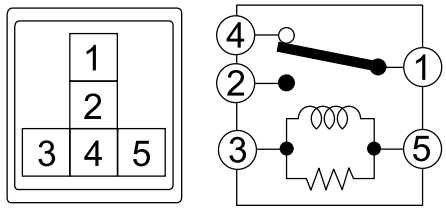
If the fuse is blown again, check the system wiring harness.

2. CHECK RELAY

1. Measure the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 LI-01273
1 — 2	Apply battery voltage between terminals 4 and 3.	Less than 1 Ω	

Terminal No.	Inspection conditions	Standard	Circuit
1 — 4	Always	1 MΩ or more	 AC-02796
1 — 4	Apply battery voltage between terminals 2 and 3.	Less than 1 Ω	

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 SL-01566
1 — 4	Always	Less than 1 Ω	
1 — 2	Apply battery voltage between terminals 3 and 5.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

SECURITY AND LOCKS > Door Lock Control System

WIRING DIAGRAM

For wiring diagrams related to the door lock control system, refer to the following items.

- Keyless entry system: Ref. to WIRING SYSTEM>Keyless Entry System>WIRING DIAGRAM.
- Keyless access with push button start system: Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.

SECURITY AND LOCKS > Door Lock Control System

ELECTRICAL SPECIFICATION

1. BODY INTEGRATED UNIT

For the specification (electrical component), refer to "Control Module I/O Signal" of "BODY CONTROL SYSTEM (DIAGNOSTICS)" section. Ref. to BODY CONTROL(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

SECURITY AND LOCKS > Door Lock Control System

INSPECTION

1. SYMPTOM CHART

Symptoms	Repair order	Reference
The door lock control system does not operate.	1. Remove and visually inspect the following fuses. • No. 14 (in fuse & relay box) • No. 26 (in fuse & relay box) • No. 13 (in main fuse box)	If the fuse is blown out, replace the fuse with a new part. When there is no defective with the fuse, check the power supply and ground circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK POWER SUPPLY AND GROUND CIRCUIT.
	2. Check the power supply and ground circuit for body integrated unit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK POWER SUPPLY AND GROUND CIRCUIT.
	3. Check the door lock switch and the circuit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR LOCK SWITCH.
	4. Check the door switch and the circuit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR SWITCH.

Symptoms	Repair order	Reference
	5. Check the opener switch and the circuit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK REAR GATE OPENER BUTTON CIRCUIT.
	6. Check the door lock actuator and the circuit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR LOCK ACTUATOR AND CIRCUIT.
A specific door lock actuator does not operate.	Check the door lock actuator and circuit.	Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR LOCK ACTUATOR AND CIRCUIT.

2. CHECK POWER SUPPLY AND GROUND CIRCUIT

1. CHECK POWER SUPPLY.

1. Disconnect the connector of body integrated unit.
2. Measure the voltage between the body integrated unit connector and chassis ground.
   Connector & terminal
   (B152) No. 3 (+) — Chassis ground (−):
   (B280) No. 1 (+) — Chassis ground (−):
   (B281) No. 7 (+) — Chassis ground (−):
   (B287) No. 4 (+) — Chassis ground (−):

Is the voltage 9 V or more?

Yes — Go to 2.

No — Check the harness for open or short circuit between body integrated unit and fuse.

2. CHECK GROUND CIRCUIT.

Measure the resistance between the body integrated unit connector and chassis ground.
Connector & terminal
(i84) No. 4 — Chassis ground:
(B287) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — The power supply and ground circuit are OK.

No — Repair or replace the harness.

3. CHECK DOOR LOCK SWITCH

1. CHECK DATA MONITOR.

Display the [Manual lock SW input] data using Subaru Select Monitor.
Note:
For detailed operation procedures, refer to "Application help".

Does the display change as [OFF] ←→ [ON] when each door lock switch is moved to LOCK?

Yes — Go to 2.

No — Go to 3.

2. CHECK DOOR LOCK SWITCH.

From the condition in step 1), operate each door lock switch (driver's and passenger's) in the UNLOCK direction.

Does the display switch between [OFF] ←→ [ON]?

Yes — The door lock switch is OK.

No — Go to 4.

3. CHECK REMOTE CONTROL MIRROR SWITCH (DOOR LOCK SWITCH).

1. Disconnect the remote control mirror switch (door lock switch) connector.
2. Check the continuity between terminals when moving the remote control mirror switch (door lock switch) in the LOCK direction.
   Connector & terminal
   Driver's side
   (D149) No. 9 — (D7) No. 1:
   Passenger's side
   (D125) No. 7 — (D125) No. 3:

Did the indicator change from "No continuity" (1 MΩ or more) to "Continuity exists" (less than 10 Ω)?

Yes — Go to 4.

No — Replace the remote control mirror switch (door lock switch).

4. CHECK REMOTE CONTROL MIRROR SWITCH (DOOR LOCK SWITCH).

Check the continuity between terminals when moving the remote control mirror switch (door lock switch) in the UNLOCK direction.

Connector & terminal
Driver's side
(D149) No. 8 — (D7) No. 1:
Passenger's side
(D125) No. 2 — (D125) No. 3:

Did the indicator change from "No continuity" (1 MΩ or more) to "Continuity exists" (less than 10 Ω)?

Yes — Go to 5.

No — Replace the remote control mirror switch (door lock switch).

5. CHECK HARNESS.

Measure the resistance between the remote control mirror switch (door lock switch) connector and chassis ground.

Connector & terminal

Driver's side

(D149) No. 1 — Chassis ground:

Passenger's side

(D125) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK HARNESS.

Check the harness between body integrated unit and remote control mirror switch (door lock switch).

Connector & terminal

Driver's side

(D149) No. 9 — (i171) No. 32:

(D149) No. 8 — (i171) No. 12:

Passenger's side

(D125) No. 7 — (i171) No. 32:

(D125) No. 2 — (i171) No. 12:

Is harness normal?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Repair or replace the harness.

4. CHECK DOOR SWITCH

1. CHECK DATA MONITOR.

Display the following items using Subaru Select Monitor.

- [Driver's door SW input]
- [P-door SW input]
- [Rear right door SW input]
- [Rear left door SW input]
- [R Gate SW input]

Note:

For detailed operation procedures, refer to "Application help".

Does the display switch between [OFF] ←→ [ON] when each door, trunk lid, or rear gate is opened/closed?

Yes — The door switches, trunk lid latch switch or rear gate latch switch are normal.

No — Go to 2.

2. CHECK HARNESS.

1. Disconnect the connector of body integrated unit.
2. Disconnect the connector of the door switch, trunk lid latch switch or rear gate latch switch that the display does not change.
3. Check the harness between body integrated unit and defective switch.

Connector & terminal

Front door LH
(i171) No. 39 — (R9) No. 2:

Front door RH
(i171) No. 13 — (R12) No. 2:

Rear door LH
(i171) No. 14 — (R22) No. 2:

Rear door RH
(i171) No. 27 — (R16) No. 2:

Trunk lid
(i171) No. 15 — (R186) No. 3:

Rear gate
(i171) No. 15 — (D46) No. 3:

Is harness normal?

Yes — Go to 3.

No — Repair or replace the harness.

3. CHECK HARNESS.

Measure the resistance between the faulty switch connector and chassis ground.

Connector & terminal

Front door LH

(R9) No. 1 — Chassis ground:

Front door RH

(R12) No. 1 — Chassis ground:

Rear door LH

(R22) No. 1 — Chassis ground:

Rear door RH

(R16) No. 1 — Chassis ground:

Trunk lid

(R186) No. 2 — Chassis ground:

Rear gate

(D46) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK DOOR SWITCH.

Measure the resistance between faulty switch terminals.

Terminals

Front LH door switch

No. 2 — No. 1:

Front RH door switch

No. 2 — No. 1:

Rear LH door switch

No. 2 — No. 1:

Rear RH door switch

No. 2 — No. 1:

Trunk lid latch switch

No. 3 — No. 2:

Rear gate latch switch

No. 3 — No. 4:

Is the resistance 1 MΩ or more when the door switch is pushed and the trunk lid is closed?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the faulty parts.

- Door switches
- Trunk lid latch and actuator assembly
- Rear gate latch and actuator assembly

5. CHECK REAR GATE OPENER BUTTON CIRCUIT

1. CHECK DATA MONITOR.

Display the [R Gate Release SW input] data using Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>OPERATION.

Note:

For detailed operation procedures, refer to "Application help".

Does the display change to [OFF] ←→ [ON], when the rear gate opener button is operated?

Yes — Rear gate opener button is normal.

No — Go to 2.

2. CHECK HARNESS.

1. Disconnect the connectors of body integrated unit and rear gate opener button.
2. Check the harness between the body integrated unit and rear gate opener button.

Connector & terminal

Model without keyless access with push button start

(i171) No. 6 — (D47) No. 1:

Model with keyless access with push button start

(i171) No. 6 — (D77) No. 1:

Is harness normal?

Yes — Go to 3.

No — Repair or replace the harness.

3. CHECK HARNESS.

Measure the resistance between the rear gate opener button connector and chassis ground.

Connector & terminal

Model without keyless access with push button start

(D47) No. 2 — Chassis ground:

Model with keyless access with push button start

(D77) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK REAR GATE OPENER BUTTON.

Measure the resistance between terminals both when the rear gate opener button is pressed and when not pressed.

Terminals

No. 1 — No. 2:

Is the resistance less than 10 Ω when the switch is pressed and 1 MΩ or more when not pressed?

Yes — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

No — Replace the rear gate opener button.

6. CHECK DOOR LOCK ACTUATOR AND CIRCUIT

1. CHECK HARNESS (DOOR LOCK).

1. Disconnect the body integrated unit and each door lock actuator connector.
2. Check the harness between body integrated unit and each door lock actuator.

Connector & terminal

Front door LH

(i265) No. 4 — (D72) No. 4:

Front door RH

(i265) No. 4 — (D18) No. 4:

Rear door LH

(i266) No. 5 — (D26) No. 4:

Rear door RH

(i266) No. 4 — (D32) No. 4:

Is harness normal?

Yes — Go to 2.

No — Repair or replace the harness.

2. CHECK HARNESS (DOOR UNLOCK).

Check the harness between body integrated unit and each door lock actuator.

Connector & terminal

Front door LH

(i84) No. 6 — (D72) No. 1:

Front door RH

(i265) No. 2 — (D18) No. 1:

Rear door LH

(i266) No. 9 — (D26) No. 1:

Rear door RH

(i266) No. 3 — (D32) No. 1:

Is harness normal?

Yes — 4 door model: Go to 5.
5 door model: Go to 3.

No — Repair or replace the harness.

3. CHECK HARNESS (REAR GATE UNLOCK).

Check the harness between the body integrated unit and rear gate lock actuator.

Connector & terminal

(i266) No. 7 — (D46) No. 1:

Is harness normal?

Yes — Go to 4.

No — Repair or replace the harness.

4. CHECK HARNESS (REAR GATE UNLOCK).

Measure the resistance between the rear gate lock actuator connector and chassis ground.

Connector & terminal

(D46) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

5. CHECK HARNESS (TRUNK UNLOCK).

Check the harness between the body integrated unit and trunk lid lock actuator.

Connector & terminal

(i266) No. 7 — (R186) No. 1:

Is harness normal?

Yes — Go to 6.

No — Repair or replace the harness.

6. CHECK HARNESS (TRUNK UNLOCK).

Measure the resistance between the trunk lid lock actuator connector and chassis ground.

Connector & terminal

(R186) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 7.

No — Repair or replace the harness.

7. CHECK BODY INTEGRATED UNIT OUTPUT SIGNAL.

1. Connect the body integrated unit connector.
2. Measure the voltage between terminals of the body integrated unit when operating the door lock switch to LOCK direction.

Connector & terminal

Front door LH

(i265) No. 6 (+) — (i84) No. 6 (−):

Front door RH

(i265) No. 7 (+) — (i265) No. 2 (−):

Rear door LH

(i266) No. 5 (+) — (i266) No. 9 (−):

Rear door RH

(i266) No. 4 (+) — (i266) No. 3 (−):

Does the voltage change from less than 1 V → 9 V or more? (During lock output)

Yes — Go to 8.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

8. CHECK BODY INTEGRATED UNIT OUTPUT SIGNAL.

Measure the voltage between terminals of the body integrated unit when operating the door lock switch to UNLOCK direction.

Connector & terminal

Front door LH

(i84) No. 6 (+) — (i265) No. 6 (−):

Front door RH

(i265) No. 2 (+) — (i265) No. 7 (−):

Rear door LH

(i266) No. 9 (+) — (i266) No. 5 (−):

Rear door RH

(i266) No. 3 (+) — (i266) No. 4 (−):

Does the voltage change from less than 1 V → 9 V or more? (During unlock output)

Yes — Go to 9.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

9. CHECK BODY INTEGRATED UNIT OUTPUT SIGNAL.

Measure the voltage between body integrated unit and chassis ground when operating the rear gate opener button.

Connector & terminal

(i266) No. 7 (+) — Chassis ground (−):

Does the voltage change from less than 1 V → 9 V or more? (During unlock output)

Yes — Go to 10.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

10. CHECK DOOR LOCK ACTUATOR.

Check the door lock actuator. Ref. to SECURITY AND LOCKS>Door Latch & Door Lock Actuator Assembly>INSPECTION.

Is the door lock actuator OK?

Yes
- 4 door model: Go to 12.
- 5 door model: Go to 11.

No — Replace the door latch and door lock actuator assembly.

11. CHECK REAR GATE LOCK ACTUATOR.

Check the rear gate lock actuator. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly.

Is the rear gate lock actuator normal?

Yes — Check the connection status of the harness and connector that may have a temporary poor contact.

No — Replace the rear gate latch and actuator assembly.

12. CHECK TRUNK LID LOCK ACTUATOR.

Check the trunk lid lock actuator. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly.

Is trunk lid lock actuator normal?

Yes	Check the connection status of the harness and connector that may have a temporary poor contact.
No	Replace the trunk lid latch & actuator assembly.

SECURITY AND LOCKS > Keyless Entry System

WIRING DIAGRAM

Refer to “Keyless Entry System” in the wiring diagram. Ref. to WIRING SYSTEM>Keyless Entry System>WIRING DIAGRAM.

SECURITY AND LOCKS > Keyless Entry System

ELECTRICAL SPECIFICATION

For the specification (electrical component), refer to “Control Module I/O Signal” of “KEYLESS ENTRY (DIAGNOSTICS)” section. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Control Module I/O Signal>ELECTRICAL SPECIFICATION.

SECURITY AND LOCKS > Keyless Entry System

INSPECTION

For inspection, refer to “Basic Diagnostic Procedure” of “KEYLESS ENTRY (DIAGNOSTICS)” section. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Basic Diagnostic Procedure.

WIRING DIAGRAM

Refer to "Keyless Access With Push Button Start System" in WI section. Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.

ELECTRICAL SPECIFICATION

For the specification (electrical component), refer to "Control Module I/O Signal" of "KEYLESS ACCESS WITH PUSH BUTTON START (DIAGNOSTICS)" section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

INSPECTION

1. KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

For inspection, refer to "Basic Diagnostic Procedure" of "KEYLESS ACCESS WITH PUSH BUTTON START (DIAGNOSTICS)" section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.

2. IGNITION/ACC CHANGE FUNCTION CHECK

1. Check push button ignition switch function
   (1) Check the change control through push button ignition switch, brake pedal operation, and shift position.
   - CVT model

Shift lever position	Brake pedal operation	Push button ignition switch operation
P	Released	Repeat Ignition switch OFF → ACC ON → Ignition switch ON → Ignition switch OFF
P	Released	Engine running → Ignition switch OFF
P	Depressed	Ignition switch OFF → Engine started
P	Depressed	ACC ON → Engine started
P	Depressed	Ignition switch ON → Engine started
P	Depressed	Engine running → Ignition switch OFF
N	Released	Repeat Ignition switch OFF → ACC ON → Ignition switch ON → ACC ON
N	Released	Engine running → ACC ON
N	Depressed	Ignition switch OFF → Engine started
N	Depressed	ACC ON → Engine started
N	Depressed	Ignition switch ON → Engine started
N	Depressed	Engine running → ACC ON
Except for P and N	Released	Repeat Ignition switch OFF → ACC ON → Ignition switch ON → ACC ON
Except for P and N	Released	Engine running → ACC ON
Except for P and N	Depressed	Ignition switch OFF → Ignition switch ON

Shift lever position	Brake pedal operation	Push button ignition switch operation
Except for P and N	Depressed	ACC ON → Ignition switch ON
Except for P and N	Depressed	Engine running → ACC ON

- MT model

Shift lever position	Brake pedal operation	Push button ignition switch operation
—	Released	Repeat Ignition switch OFF → ACC ON → Ignition switch ON → Ignition switch OFF
	Released	Engine running → Ignition switch OFF
	Depressed	Ignition switch OFF → Engine started
	Depressed	ACC ON → Engine started
	Depressed	Ignition switch ON → Engine started
	Depressed	Engine running → Ignition switch OFF

(2) Check the changeover functions other than push button ignition switch operation.
With ACC ON or the ignition switch ON, and the shift lever in "P" position, check that ACC is ON or Ignition switch is ON → Ignition switch is OFF when the vehicle is left for 1 hour or more.

(3) If the inspection result indicates an improper operation, check the push button start system.
Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > POWER SUPPLY SWITCHING SYSTEM.

2. Check power status display

(1) Check the power indicator display of the push button ignition switch.

Note:

∗1: Key collation is normal, and the stop light switch (CVT) is ON.

Indicator display

Push button ignition switch status	Indicator lighting status
Ignition switch OFF (except for condition ∗1)	Light OFF
ACC ON (except for condition ∗1)	Orange light
Ignition switch ON (except for condition ∗1)	Orange light
Engine start standby (∗1)	Green light
After engine is started	Light OFF

(2)If the inspection result indicates an improper operation, check the push button start system.
Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > POWER SUPPLY SWITCHING SYSTEM.

Note:

The indicator blinks if any of the following malfunctions are detected.

Detected malfunction	Indicator lighting status
Steering lock stuck	Green blinking
Steering lock CM internal malfunction	Orange blinking
Keyless access CM internal malfunction	Orange blinking
Vehicle speed signal malfunction	Orange blinking

SECURITY AND LOCKS > Security System

WIRING DIAGRAM

Refer to “Security System” in the wiring diagram. Ref. to WIRING SYSTEM>Security System>WIRING DIAGRAM.

SECURITY AND LOCKS > Security System

ELECTRICAL SPECIFICATION

For the specification (electrical component), refer to “Control Module I/O Signal” of “BODY CONTROL SYSTEM (DIAGNOSTICS)” section. Ref. to BODY CONTROL(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

SECURITY AND LOCKS > Security System

INSPECTION

1. BASIC DIAGNOSTIC PROCEDURE

1. INITIAL CHECK.

Check the keyless entry system or keyless access with push button start system.

Does the keyless entry system or keyless access with push button start system operate normally?

Yes — Go to 2.

No — Check the keyless entry system or keyless access with push button start system.

- Keyless entry system: Ref. to KEYLESS ENTRY(DIAGNOSTICS) >General Description>INSPECTION.
- Keyless access with push button start system: Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>INSPECTION.

2. CHECK SECURITY ON/OFF SETTING.

1. Remove the key from ignition switch or turn the ignition switch to OFF, and close all doors.
2. Check the status of security indicator light.
3. Press the LOCK button of the keyless transmitter or access key.
4. Check the security indicator light blinking patterns.

Is the security indicator light blinking patterns as follows?
• Before pressing the LOCK button: Blinks once within 3 seconds
• After pressing the LOCK button: When monitoring lag is set to 0 second, blinks twice within 0.5 seconds in 2 second intervals. When monitoring lag is set to 30 seconds: Blinks once every 0.4 seconds continuously for 30 seconds, then blinks twice every 0.5 seconds at 2 second intervals.

Yes — Go to 4.

No — Go to 3.

3. CHANGE SETTING OF SECURITY SYSTEM.

Change the setting of security system to ON using Subaru Select Monitor. Ref. to SECURITY AND LOCKS>Security System>INSPECTION > SECURITY SYSTEM ON/OFF SETTING.

Is setting change completed correctly?

Yes — Go to 4.

No — Check Subaru Select Monitor communication, and if there is no problem, replace the body integrated unit.

- Inspection: Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.
- Replacement: Ref. to SECURITY AND LOCKS>Body Integrated Unit.

4. CHECK SECURITY SYSTEM OPERATION.

1. Remove the key from ignition switch or turn the ignition switch to OFF, and close all doors.
2. Press the LOCK button on the keyless transmitter or access key, then wait for 30 seconds.
3. Check the security indicator light blinking patterns.

Does the security indicator light blink twice within 0.5 seconds in 2 second intervals?

Yes — Go to 5.

No — Check the security indicator light. Ref. to IMMOBILIZER (DIAGNOSTICS)>Warning Light Illumination Pattern>INSPECTION.

5. CHECK SECURITY ALARM OPERATION.

1. Operate the driver's door lock switch to the UNLOCK side.
2. Open any door, trunk lid or rear gate.

Does the security alarm operate when opening any door, trunk lid, or rear gate?

Yes — Go to 6.

No — Check the following parts. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

- Door switches
- Trunk lid latch switch
- Rear gate latch switch

6. CHECK SECURITY ALARM OPERATION.

Check the security alarm operation status.

During the operation, does the horn keep sounding and the hazard light blink?

Yes — Go to 7.

No — Check the following parts.

- Horn: Ref. to SECURITY AND LOCKS>Security System>INSPECTION > CHECK HORN.
- Hazard light: Ref. to SECURITY AND LOCKS>Security System>INSPECTION > CHECK HAZARD LIGHT OPERATION.

7. CHECK SECURITY ALARM CANCEL OPERATION.

Press the LOCK button of the transmitter or access key while the security alarm is operating.

Do the horn sound and the blinking of the hazard light stop?

Yes — Go to 8.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

8. CHECK SECURITY SYSTEM CONDITION MEMORY.

1. Remove the key from ignition switch or turn the ignition switch to OFF, and close all doors.
2. Open the front hood.
3. Press the LOCK button on the keyless transmitter or access key, then wait for 30 seconds.
4. Disconnect the ground cable from battery.
5. Connect the ground cable to battery.
6. Check the status of security indicator light.

Does the security indicator light blinks twice within 0.5 seconds at 2 second intervals?

Yes — Go to 9.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

9. CHECK SECURITY SYSTEM MANUAL ON/OFF SETTING.

1. Press the UNLOCK button of the keyless transmitter or access key.
2. Change the setting of security system. Ref. to SECURITY AND LOCKS>Security System>INSPECTION > SECURITY SYSTEM ON/OFF SETTING.

Is setting change completed correctly?

Yes — Restore the security system settings to those before the diagnosis and finish the diagnosis.

No — Check the following parts.

- Ignition switch circuit: Ref. to SECURITY AND LOCKS>Ignition Key Lock>INSPECTION.
- Door lock switch circuit: Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR LOCK SWITCH.

Note:
If the horn sounds when the security is turned on (monitor condition) using the keyless transmitter or access key, check the function setting of the body integrated unit. As a cause, it is possible that the impact sensor present (ON) / not present (OFF) setting is set to ON in the customization function though there is no impact sensor. Ref. to BODY CONTROL(DIAGNOSTICS)>Customize.

2. CHECK SECURITY SYSTEM CONDITION MEMORY

1. Pull out the key from the ignition switch, or turn the ignition switch to OFF.
2. Close all the doors, trunk lid and rear gate.
3. Open the front hood.
4. Press the LOCK button of the keyless transmitter or access key.
   Note:
   Wait until the security indicator light blinks twice within 0.5 seconds at 2 second intervals.
   If the 30 second monitoring lag has been set, wait for 30 seconds.
5. Disconnect the battery ground terminal, and then reconnect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
6. Check that the security indicator light blinks twice within 0.5 seconds at 2 second intervals. When it does not blink, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

3. SECURITY SYSTEM ON/OFF SETTING

Note:
It can be set by [Security Alarm Setup] in unit customizing using Subaru Select Monitor. For detailed operation procedures, refer to "Application help".

1. Close all doors, trunk lid and rear gate, and sit down on the driver seat. Press the UNLOCK button of the keyless transmitter or access key.
2. Turn the ignition switch to ON.
3. Press the central door unlock switch and open the driver's door simultaneously. (Keep the central door unlock switch pressed down.)
4. When the condition in step 3) continues for 10 seconds, the system switches to a mode reverse to the current mode.

Setting	Horn activation	Meter display*1	Meter display*2
ON → OFF	2 times	[AL_OF]	[AL_oF]
OFF → ON	1 time	[AL_ON]	[AL_on]

*1: Model with color TFT meter
*2: Model with normal meter

4. CHECK DOOR SWITCH

For operation procedure, refer to "CHECK DOOR SWITCH" of "Keyless Entry System". Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > CHECK DOOR SWITCH.

5. CHECK SECURITY INDICATOR LIGHT CIRCUIT

For operation procedures, refer to "Warning Light Illumination Pattern" of "IMMOBILIZER (DIAGNOSTICS)" section. Ref. to BODY CONTROL(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

6. CHECK HORN

1. CHECK HORN OPERATION.

Check the horn sounds when the horn switch is pushed.

Does the horn sound?

Yes — Go to 2.

No — Check the horn circuit.

2. CHECK BODY INTEGRATED UNIT.

Select and perform the [Horn Output] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Does the horn sound?

Yes — Horn circuit is OK.

No — Go to 3.

3. CHECK HORN RELAY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector of body integrated unit.
3. Remove the horn relay.
4. Check the harness between body integrated unit and horn relay.

Connector & terminal

(B280) No.24 — Horn relay No.4:

Is harness normal?

Yes — Check body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Repair or replace the harness.

7. CHECK HAZARD LIGHT OPERATION

For operation procedures, refer to "CHECK HAZARD LIGHT SYSTEM" of "LIGHTING SYSTEM". Ref. to LIGHTING SYSTEM>Turn Signal Light and Hazard Light System>INSPECTION > CHECK HAZARD

LIGHT OPERATION.

8. CHECK IGNITION SWITCH CIRCUIT

1. CHECK DATA MONITOR.

Display the data of [Battery Voltage] and [Ignition Power Supply Voltage] using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

Does the [Ignition Power Supply Voltage] indicate 0 V when the ignition switch is OFF, and fall within a range of ±1 V from the [Battery Voltage] when the ignition switch is ON?

Yes — The ignition switch input circuit is OK.

No — Go to 2.

2. CHECK IGNITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector of body integrated unit.
3. Turn the ignition switch to ON.
4. Measure the voltage between the body integrated unit connector and chassis ground.

Connector & terminal

(B281) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

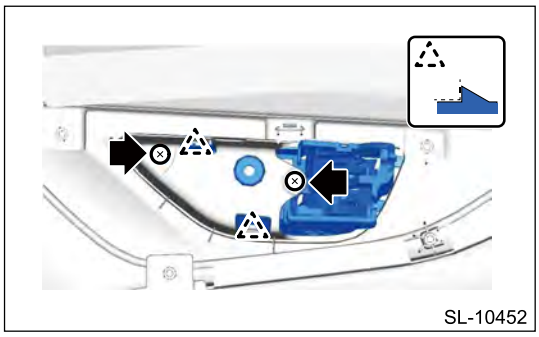
Yes — Check body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

No — Check the harness for open or short circuit between body integrated unit and fuse.

REMOVAL

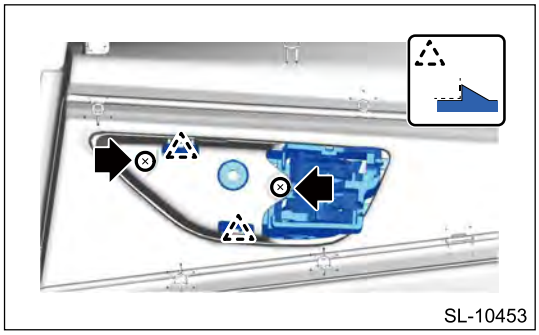
1. FRONT

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
3. Remove the remote assembly - front door.
   (1) Remove the screws.
   (2) Release the claws and guides, and remove the remote assembly - front door.



2. REAR

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
3. Remove the remote assembly - rear door.
   (1) Remove the screws.
   (2) Release the claws and guides, and remove the remote assembly - rear door.



INSTALLATION

1. FRONT

1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
   - Grease is applied sufficiently to cable joints.
     If grease is insufficient, add it as necessary before assembling the cable.
2. Install the remote assembly - front door.
3. Install the trim panel - front door.

4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. REAR

1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
   - Grease is applied sufficiently to cable joints.
     If grease is insufficient, add it as necessary before assembling the cable.
2. Install the remote assembly - rear door.
3. Install the trim panel - rear door.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Door Inner Remote

INSPECTION

Check if the remote inner handle operates normally.

- If the lever is faulty, replace the remote assembly - door.
- If the cable is deformed, replace the latch & actuator assembly.

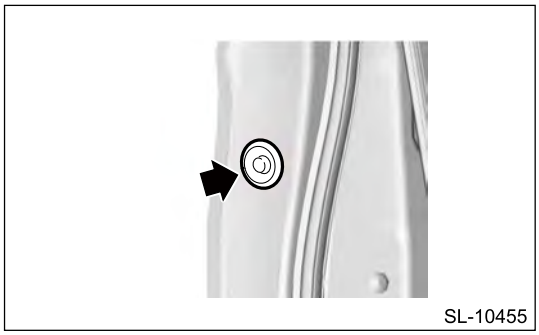
REMOVAL

1. FRONT

1. Raise the glass assembly - front door to the top position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
4. Remove the sealing cover - front door. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
5. Remove the plate - door UPR.
   (1) Release the clips, and remove the plate - door UPR.


SL-10454

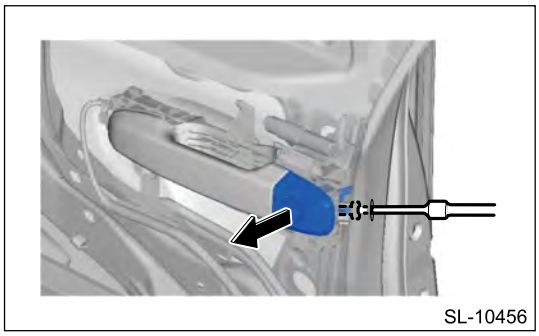
6. Remove the cover - handle front outer.
   (1) Remove the plug at the rear end of the panel assembly - front door.


SL-10455

   (2) Loosen the TORX® bolt and remove the cover - handle front outer.

Preparation tool:

TORX® T30


SL-10456

Note:

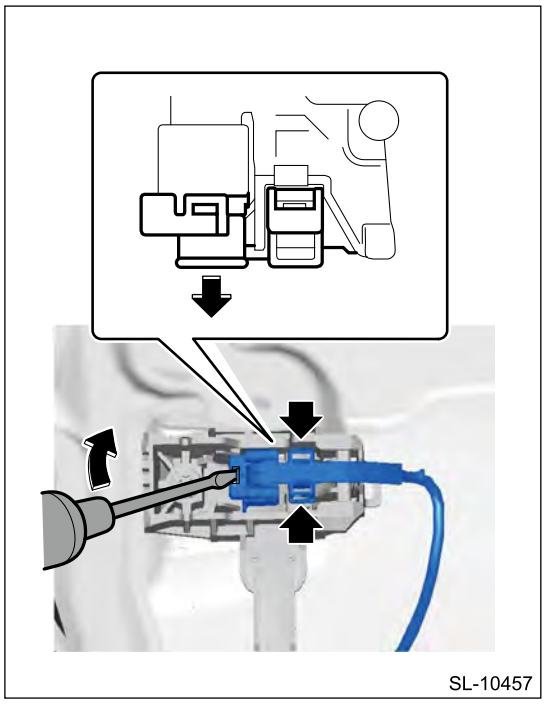
Since the key cylinder is not installed to the RH side, release the claws, and then remove the cover - handle front outer.

7. Remove the handle - front door outer.

Note:

Do not apply excessive force to remove the handle - front door outer from the frame assembly - front door.

(1) For model with keyless access with push button start, disconnect the harness clip and exterior antenna (touch sensor) connector using a flat tip screwdriver or similar tool wrapped with protection tape.

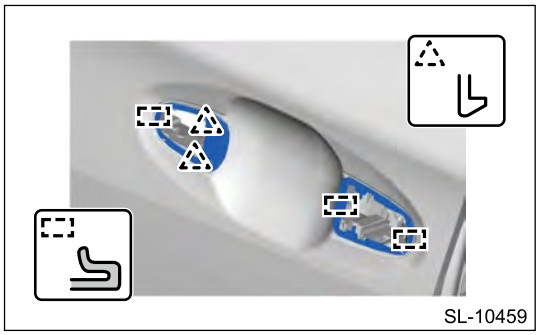


(2) Remove the handle - front door outer by pulling it toward yourself and to the rear as shown in the figure.



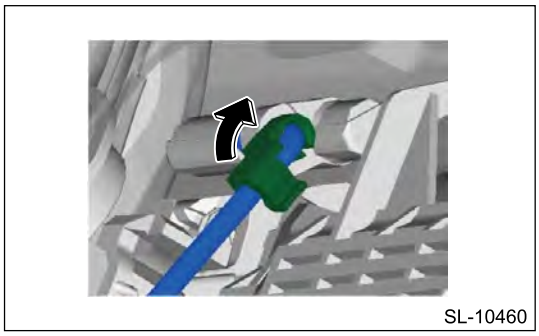
8. Remove the spacer - door handle outer.

(1) Release the claws and hooks, and remove the spacer - door handle outer A and B.



9. Remove the frame assembly - front door outer.

(1) Remove the rod clamp and remove the rod.

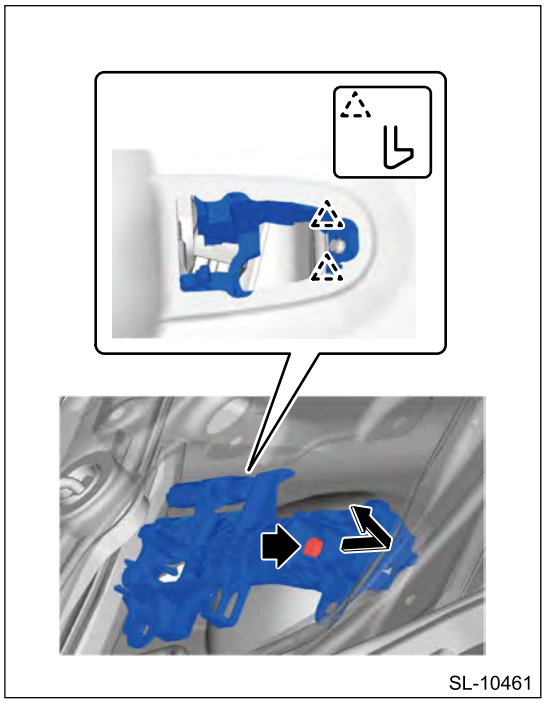


(2) Loosen the TORX® bolt.

Preparation tool:

TORX® T30

(3) Release the claws, and remove the frame assembly - front door outer as shown in the figure.



2. REAR

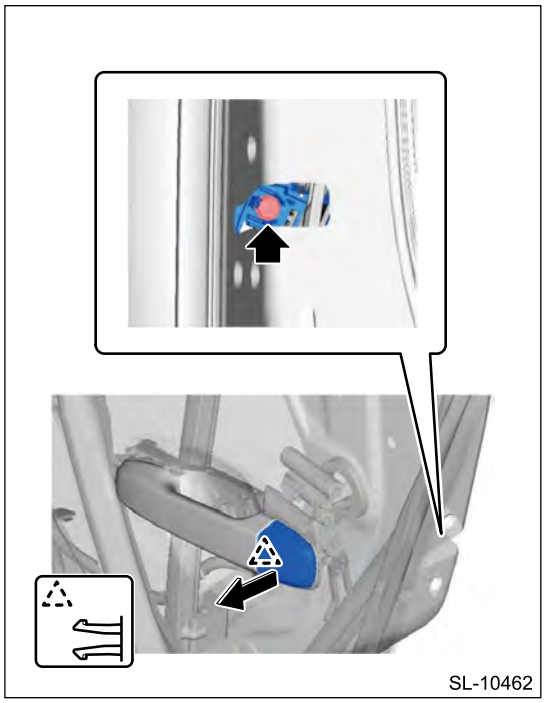
1. Raise the glass assembly - rear door to the top position.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
4. Remove the sealing cover - rear door. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
5. Remove the latch and actuator assembly - rear. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>REMOVAL.
6. Remove the cover - handle rear outer.

(1) Loosen the TORX® bolt.

Preparation tool:

TORX® T30

(2) Release the claws, and then remove the cover - handle rear outer.



7. Remove the handle - rear door outer.

Caution:

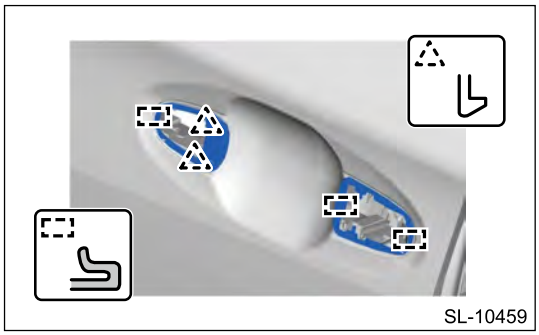
Do not apply excessive force to remove the handle - rear door outer from the frame assembly - rear door.

(1) Remove the handle - rear door outer by pulling it toward yourself and to the rear as shown in the figure.



8. Remove the spacer - door handle outer.

(1) Release the claws and hooks, and remove the spacer - door handle outer A and B.

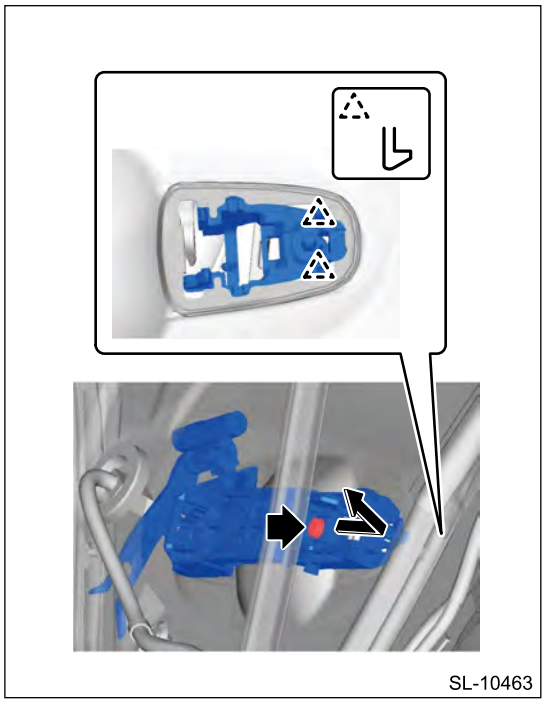


9. Remove the frame assembly - rear door outer.

(1) Loosen the TORX® bolt and remove the frame assembly - rear door outer as shown in the figure.

Preparation tool:

TORX® T30



SECURITY AND LOCKS > Door Outer Handle

INSTALLATION

1. FRONT

1. Before installation, check the following items.
   - Rod is free from deformation.
   - Grease is applied sufficiently to rod joints.
     If grease is insufficient, add it as necessary before assembling the rod.
2. Install the frame assembly - front door outer.
   Preparation tool:
   TORX® T30
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the spacer - door handle outer A and B.
4. Install the handle - front door outer.
5. Install the cover - handle front outer.
   Caution:
   - **When installing the cover - handle front outer on driver's side, make sure that the key cylinder shaft is correctly inserted into the latch & actuator assembly - front.**
   - **After installation, perform the operation check using the key.**

   Preparation tool:
   TORX® T30
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
6. Install the plate - door UPR.
7. Install the sealing cover - front door.
8. Install the trim panel - front door.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. REAR

1. Before installation, check the following items.
   - Lever is free from deformation.
   - Grease is applied sufficiently to lever joints.
     If grease is insufficient, add it as necessary before assembling the lever.
2. Install the frame assembly - rear door outer.
   Preparation tool:
   TORX® T30
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the spacer - door handle outer A and B.
4. Install the handle - rear door outer.
5. Install the cover - handle rear outer.
   Preparation tool:
   TORX® T30
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
6. Install the latch and actuator assembly - rear. Ref. to SECURITY AND LOCKS>Door Latch & Door Lock Actuator Assembly>INSTALLATION.
7. Install the sealing cover - rear door.
8. Install the trim panel - rear door.
9. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Door Outer Handle

INSPECTION

Check if the outer handle operates normally.

- If the handle joint portion is faulty, replace the handle - door outer or the frame assembly - door outer.
- If the rod or lever is deformed, replace the latch & actuator assembly.

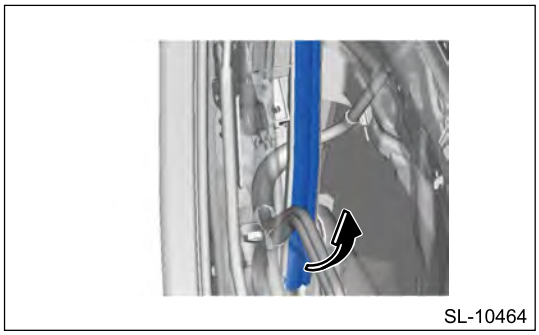
REMOVAL

1. FRONT

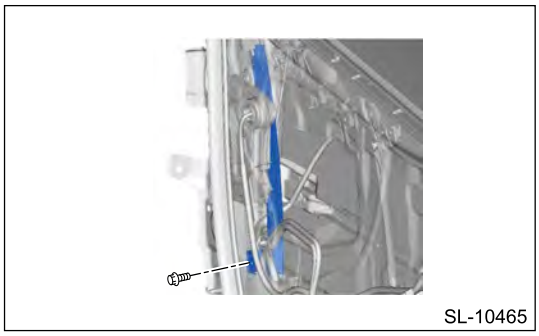
1. Raise the glass assembly - front door to the top position.
2. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the trim panel - front door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > FRONT DOOR.
4. Remove the sealing cover - front door. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > FRONT SEALING COVER.
5. Remove the plate - door UPR.
   (1) Release the clips, and remove the plate - door UPR.


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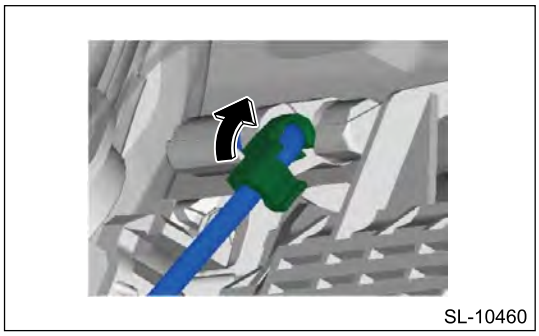
6. Remove the sash COMPL - lower.
   (1) Remove the lower side of the running channel - front door.


SL-10464

   (2) Remove the bolts, and remove the sash COMPL - lower.


SL-10465

7. Remove the latch and actuator assembly - front.
   (1) Remove the rod clamp and remove the rod.

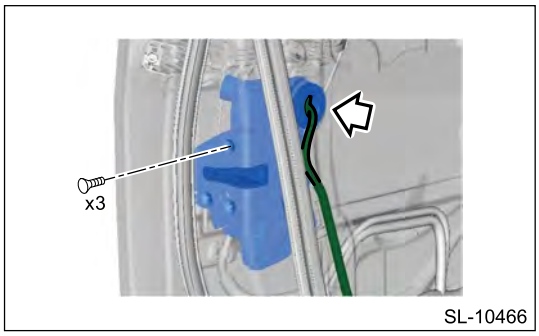


(2) Disconnect the connector.

(3) Remove the TORX® bolts to remove the latch & actuator assembly - front.

Preparation tool:

TORX® T30



2. REAR

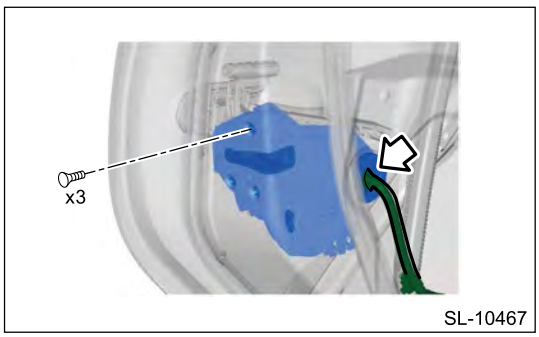
1. Raise the glass assembly - rear door to the top position.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the trim panel - rear door. Ref. to EXTERIOR/INTERIOR TRIM>Door Trim>REMOVAL > REAR DOOR.
4. Remove the sealing cover - rear door. Ref. to EXTERIOR BODY PANELS>Sealing Cover>REMOVAL > REAR SEALING COVER.
5. Remove the latch and actuator assembly - rear.

   (1) Disconnect the connector.

   (2) Remove the TORX® bolts to remove the latch & actuator assembly - rear.

   Preparation tool:

   TORX® T30



SECURITY AND LOCKS > Door Latch & Door Lock Actuator Assembly

INSTALLATION

1. FRONT

1. Before installation, check the following items.
   - Cable and rod are free from deformation.
   - Grease is applied sufficiently to cable and rod joints.
     If grease is insufficient, add it as necessary before assembling the cable and rod.
2. Install the latch and actuator assembly - front.
   Caution:
   Do not re-use the screws. Always replace with a new part.
   Preparation tool:
   TORX® T30
   Tightening torque:
   6.5 N·m (0.7 kgf-m, 5.2 ft-lb)
3. Install the sash COMPL - lower.
4. Install the plate - door UPR.
5. Install the sealing cover - front door.
6. Install the trim panel - front door.
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. REAR

1. Before installation, check the following items.
   - Cable and lever are free from deformation.
   - Grease is applied sufficiently to cable and lever joints.
     If grease is insufficient, add it as necessary before assembling the cable and lever.
2. Install the latch and actuator assembly - rear.
   Caution:
   Do not re-use the screws. Always replace with a new part.
   Preparation tool:
   TORX® T30
   Tightening torque:
   6.5 N·m (0.7 kgf-m, 5.2 ft-lb)
3. Install the sealing cover - rear door.
4. Install the trim panel - rear door.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Door Latch & Door Lock Actuator Assembly

INSPECTION

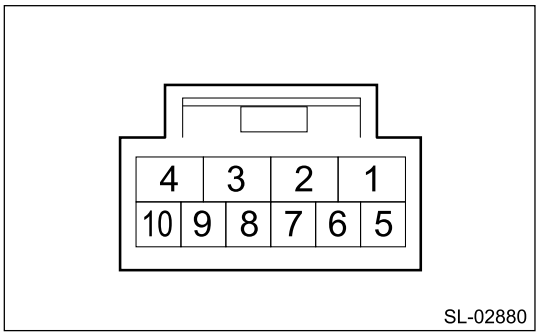
1. LATCH

Check if the latch operates normally.

- If latch deformation, abnormal wear, or unsmooth operation is observed, replace the latch & actuator assembly.
- If the cable, rod or lever is deformed, replace the latch & actuator assembly.

2. LOCK ACTUATOR

- **FRONT**
  1. Check door lock operation
     Check the door lock operation when battery voltage is applied between the connector terminals.



Terminal No.	Inspection conditions	Specification
4 (+) — 1 (−)	Apply battery voltage.	LOCK
1 (+) — 4 (−)		UNLOCK

2. Check of position switch (model with keyless access with push button start only)
Measure the resistance between connector terminals.

Preparation tool:

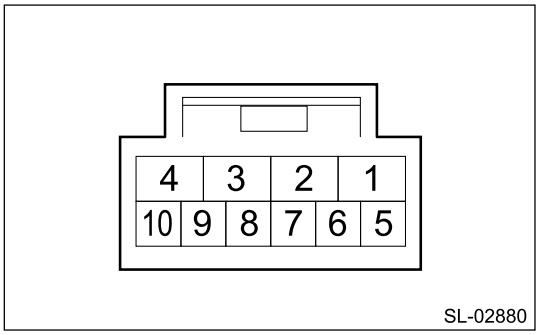
Circuit tester

Terminal No.	Inspection conditions	Standard
8 — 7	LOCK	1 MΩ or more
	UNLOCK	Less than 1 Ω

3. Replace the latch & actuator assembly - front if it is found defective.

- **REAR**

1. Check door lock operation
Check the door lock operation when battery voltage is applied between the connector terminals.



Terminal No.	Inspection conditions	Specification
4 (+) — 1 (−)	Apply battery voltage.	LOCK
1 (+) — 4 (−)		UNLOCK

2. If it does not operate properly as a result of inspection, replace the latch & actuator assembly - rear.

SECURITY AND LOCKS > Rear Gate Opener Button

REMOVAL

Note:

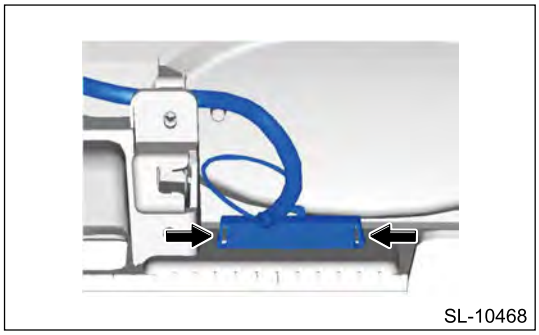
The button - opener rear gate of the model with keyless access with push button start is integrated with the rear lock button. For operation procedures, refer to "Rear Lock Button". Ref. to SECURITY AND LOCKS>Rear Lock Button>REMOVAL.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>REMOVAL.
4. Remove the button - opener rear gate.

   Caution:

   When using a flat tip screwdriver, apply protective tape or cloth and be careful not to cause damage.

   (1) Remove the button - opener rear gate by pressing the lock portions on both sides.



SECURITY AND LOCKS > Rear Gate Opener Button

INSTALLATION

Caution:

Make sure that the harness grommet of the garnish assembly - rear gate is securely installed. If not properly installed, this may cause leaks.

1. Install the switch - opener rear gate.
2. Install the garnish assembly - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Garnish>INSTALLATION.
3. Install the trim panel - rear gate.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Rear Gate Opener Button

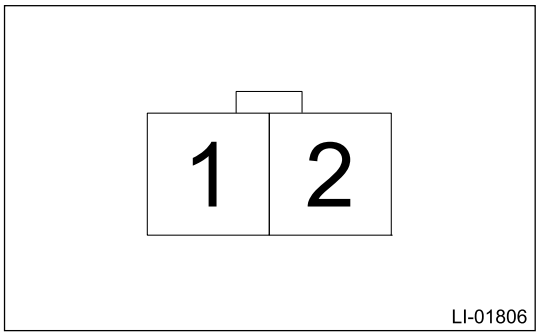
INSPECTION

1. Measure the resistance between connector terminals.

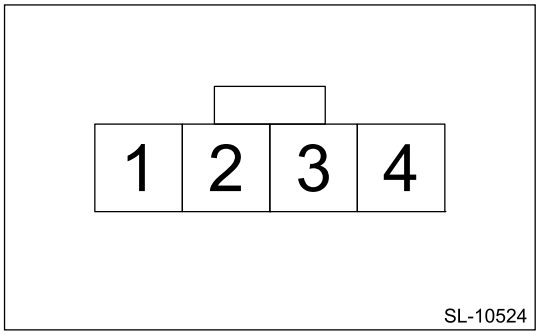
   Preparation tool:

   Circuit tester

   - Keyless entry model



- Model with keyless access with push button start



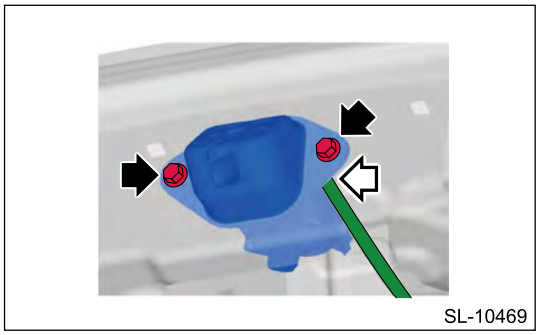
Terminal No.	Inspection conditions	Standard
1 — 2	When the switch is not pressed (CLOSE)	1 MΩ or more
	When the switch is pressed (OPEN)	Less than 5 Ω

2. If the inspection result is not within the standard, replace the button - opener rear gate.

SECURITY AND LOCKS > Rear Gate Latch and Actuator Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the latch and actuator - rear gate.
   (1) Disconnect the connector.
   (2) Remove the bolts, and remove the latch and actuator - rear gate.



SECURITY AND LOCKS > Rear Gate Latch and Actuator Assembly

INSTALLATION

1. Install the latch and actuator - rear gate.
   Tightening torque:
   25 N·m (2.5 kgf-m, 18.4 ft-lb)
2. Install the trim panel - rear gate.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Rear Gate Latch and Actuator Assembly

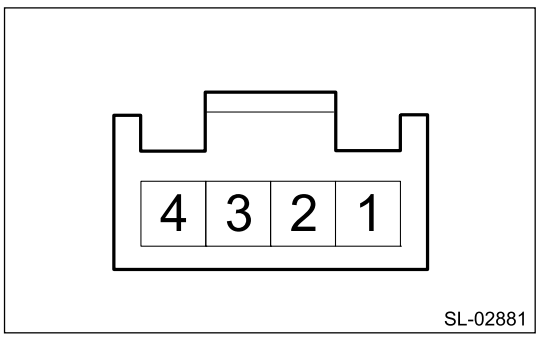
INSPECTION

1. LATCH

Check if the latch operates normally.
If latch deformation, abnormal wear, or unsmooth lock operation is observed, replace the latch and actuator - rear gate.

2. ACTUATOR

1. Check door lock operation
   Check the door lock operation when battery voltage is applied between the connector terminals.



Terminal No.	Inspection conditions	Specification

Terminal No.	Inspection conditions	Specification
1 (+) — 2 (−)	Connect battery to the terminals	OPEN

2. Check switch

Measure the resistance between connector terminals.

Preparation tool:

Circuit tester

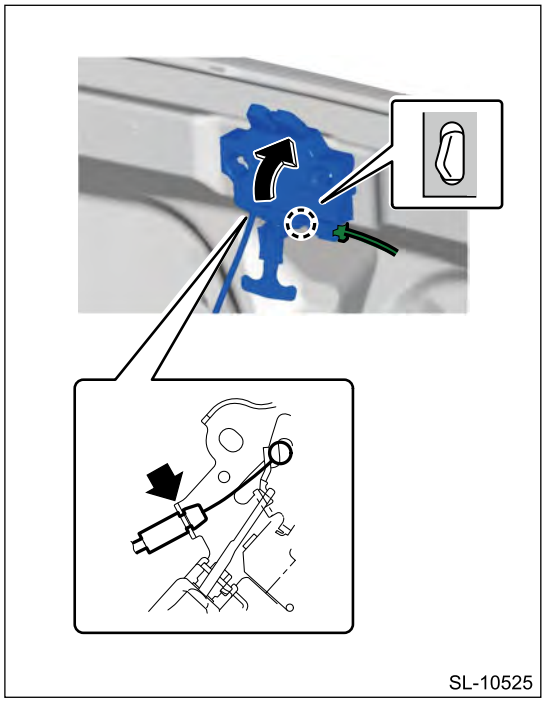
Terminal No.	Inspection conditions	Standard
3 — 4	LOCK	1 MΩ or more
	UNLOCK	Less than 1.5Ω

3. Replace the latch and actuator - rear gate if it is found defective.

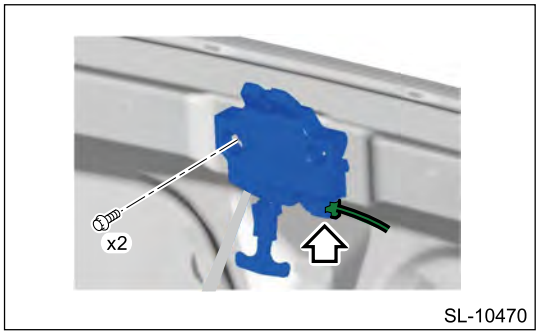
SECURITY AND LOCKS > Trunk Lid Latch and Actuator Assembly

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the lock assembly - trunk lid.
   (1) Release the claws, and open the cover of the lock assembly - trunk lid.
   (2) Remove the cable assembly - trunk lid from the lock assembly - trunk lid.



   (3) Disconnect the connector.
   (4) Remove the bolts, then remove the lock assembly - trunk lid.



SECURITY AND LOCKS > Trunk Lid Latch and Actuator Assembly

INSTALLATION

1. Install the lock assembly - trunk lid.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the cable assembly - trunk lid.
3. Install the trim panel - trunk lid.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Trunk Lid Latch and Actuator Assembly

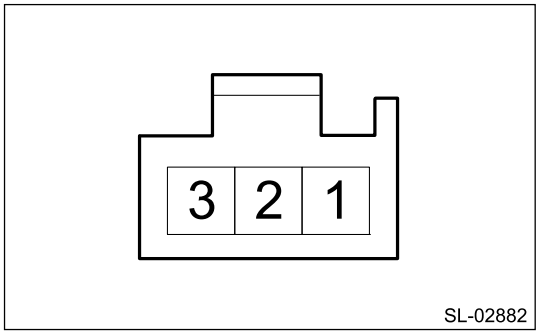
INSPECTION

1. LATCH

Check if the latch operates normally.
If latch deformation, abnormal wear, or unsmooth lock operation is observed, replace the lock assembly - trunk lid.

2. ACTUATOR

1. Check door lock operation
Check the door lock operation when battery voltage is applied between the connector terminals.



Terminal No.	Inspection conditions	Specification
1 (+) — 2 (−)	Connect battery to the terminals	LOCK → UNLOCK

2. Check switch
Measure the resistance between connector terminals.
Preparation tool:
Circuit tester

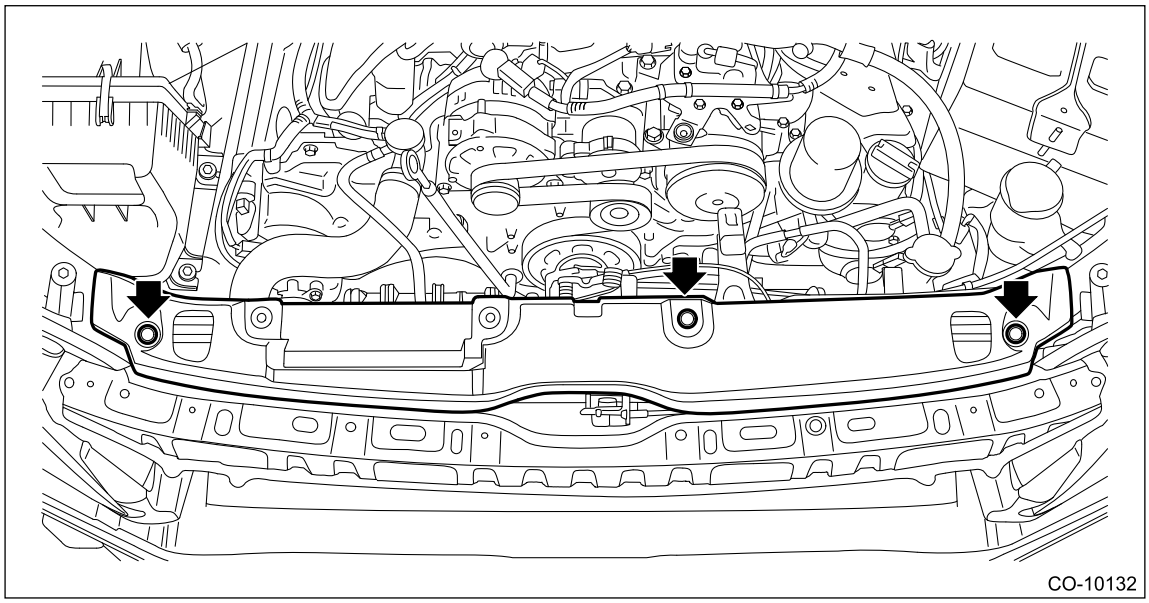
Terminal No.	Inspection conditions	Standard
2 — 3	LOCK	1 MΩ or more
	UNLOCK	Less than 1 Ω

3. Replace the lock assembly - trunk lid if it is found defective.

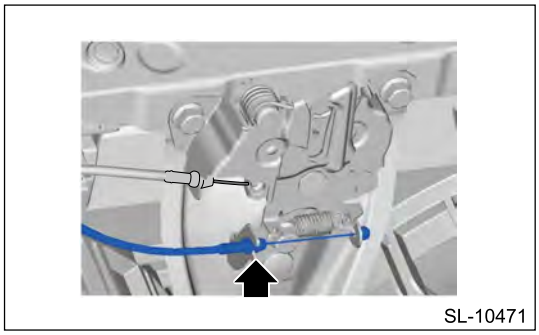
REMOVAL

1. LEVER ASSEMBLY

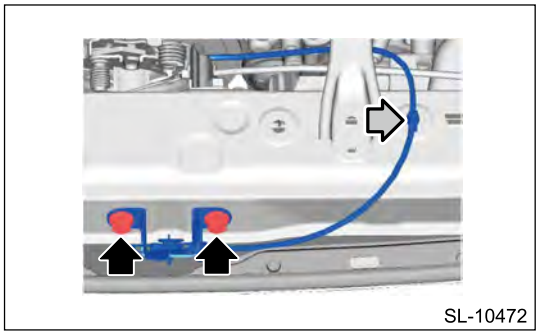
1. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.
2. Remove the cover UPR - front.
   (1) Remove the clips, and remove the cover UPR - front.



3. Remove the lever assembly - safety.
   (1) Disconnect the cable - safety from the lock assembly - front hood.



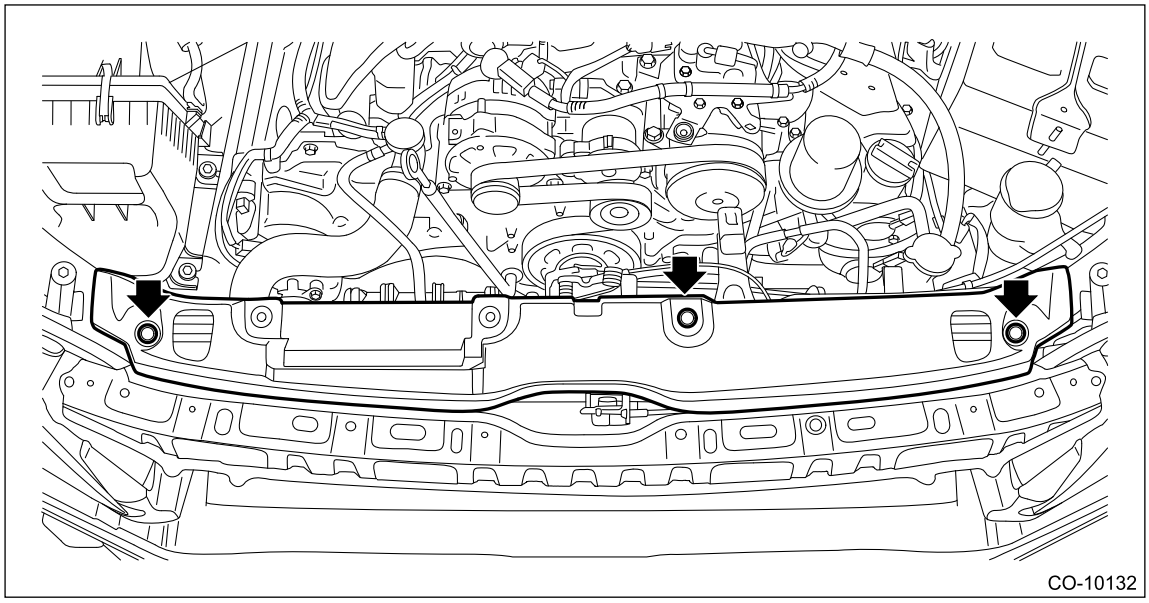
   (2) Remove the clip of the cable - safety.
   (3) Remove the bolts, and remove the lever assembly - safety.



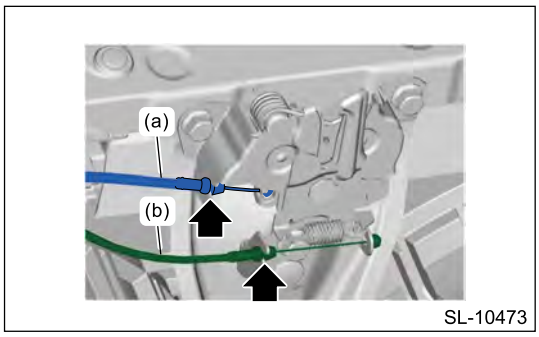
2. LOCK ASSEMBLY

1. Remove the air intake duct. Ref. to INTAKE (INDUCTION)(H4DO)>Air Intake Duct>REMOVAL.

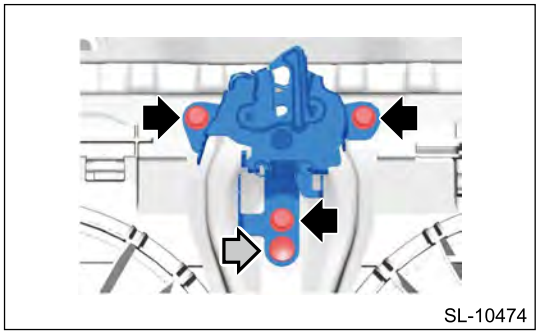
2. Remove the cover UPR - front.
   (1) Remove the clips, and remove the cover UPR - front.



3. Remove the lock assembly - front hood.
   (1) Remove the cable - front hood (a) and the cable - safety (b).



   (2) Remove the bolts and clips, and remove the lock assembly - front hood.



SECURITY AND LOCKS > Front Hood Lock Assembly

INSTALLATION

1. LEVER ASSEMBLY

1. Before installation, check the following items.
   - Is the cable deformed?
   - Grease is applied sufficiently to cable joints.
     If grease is insufficient, add it as necessary before assembling the cable.
2. Install the lever assembly - safety.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

3. Install the cable - safety.
4. Install the cover UPR - front.
5. Install the air intake duct.

2. LOCK ASSEMBLY

1. Before installation, check the following items.
   - Is the cable deformed?
   - Grease is applied sufficiently to cable joints.

   If grease is insufficient, add it as necessary before assembling the cable.
2. Adjust and install the lock assembly - front hood.

   Note:

   Refer to "ADJUSTMENT" of the lock assembly - front hood. Ref. to SECURITY AND LOCKS>Front Hood Lock Assembly>ADJUSTMENT.

   Tightening torque:

   33 N·m (3.4 kgf-m, 24.3 ft-lb)
3. Install the cable - front hood and the cable - safety.
4. Install the cover UPR - front.
5. Install the air intake duct.
6. Check the clearance and surface level gap between hood COMPL - front and bumper face front, and adjust if it is outside the standard value. Ref. to EXTERIOR BODY PANELS>Front Hood>ADJUSTMENT.

SECURITY AND LOCKS > Front Hood Lock Assembly

ADJUSTMENT

1. Remove the clips of the lock assembly - front hood.

   Note:

   After adjusting the lock assembly - front hood, dispose the clips since they are no longer needed.

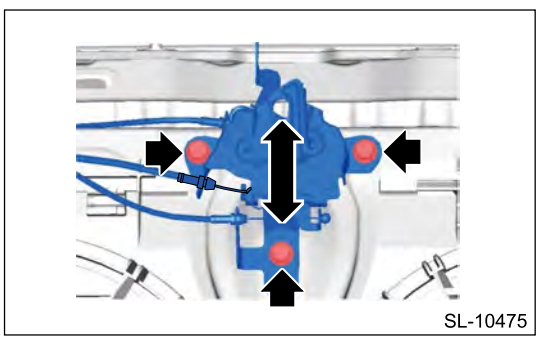
   The clips cannot be inserted because the clip holes become smaller due to adjustment.
2. Loosen the bolt, and adjust the lock assembly - front hood while moving it up and down.

   Caution:

   After adjustment, tighten the bolts securely.

   Tightening torque:

   33 N·m (3.4 kgf-m, 24.3 ft-lb)



Note:

Check the clearance and surface level gap between hood COMPL - front and bumper face front. Ref. to EXTERIOR BODY PANELS>Front Hood>ADJUSTMENT.

INSPECTION

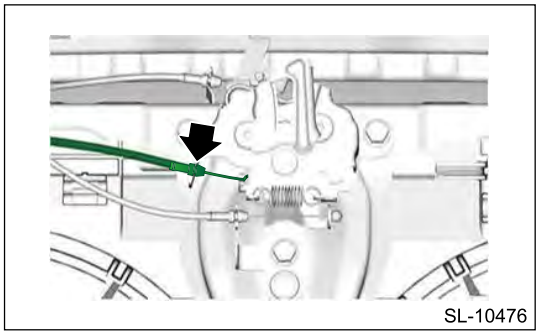
Check if the lever assembly and lock assembly operate normally.

- If deformation or unsmooth operation of the lever is observed, replace the lever assembly - safety.
- If deformation, abnormal wear, or unsmooth lock operation of the latch is observed, replace the lock assembly - front hood.

REMOVAL

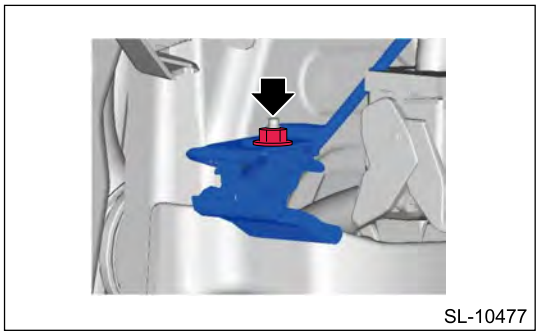
1. FRONT HOOD OPENER

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver OUT. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the mud guard - front LH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>REMOVAL.
4. Remove the cable - front hood.
   (1) Remove the cable - front hood from the lock assembly - front hood, and then attach a string to the end of the cable - front hood.

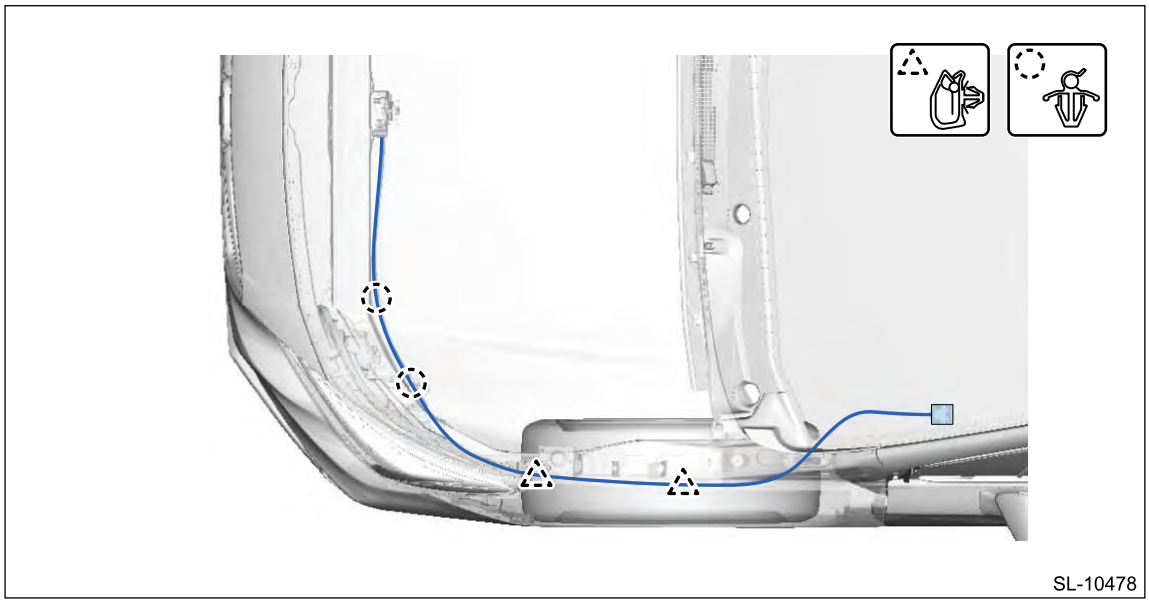

SL-10476

Note:
A string makes operation easier during installation.

(2) Remove the nut.


SL-10477

(3) Remove the cable clip, and remove the cable - front hood.



(4) Remove the attached string from the end of the cable - front hood.

Note:

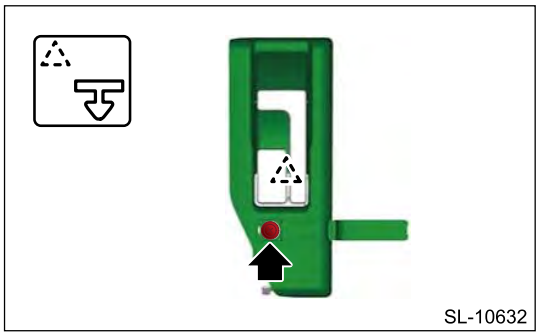
Leave the string attached to the body, and use it during installation.

2. TRUNK LID OPENER

1. Remove the cover - handle.

(1) Release the claws, and open the cover.

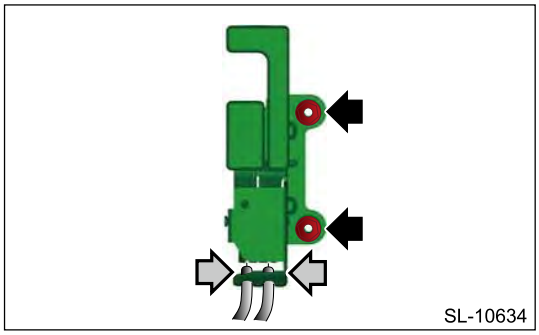
(2) Remove the screws and release the claws, then detach the cover - handle.



2. Remove the pull handle - opener.

(1) Remove the nut.

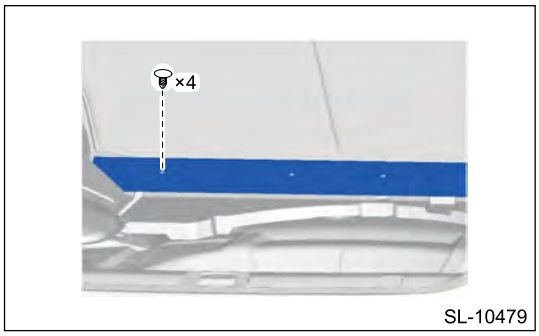
(2) Remove the cable assembly - trunk lid and the cable assembly - fuel from the pull handle - opener.



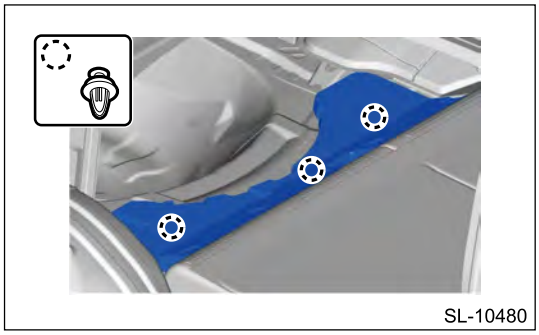
3. Remove the trim panel - trunk mat and the spacer - CTR.

4. Remove the spacer - rear floor front.

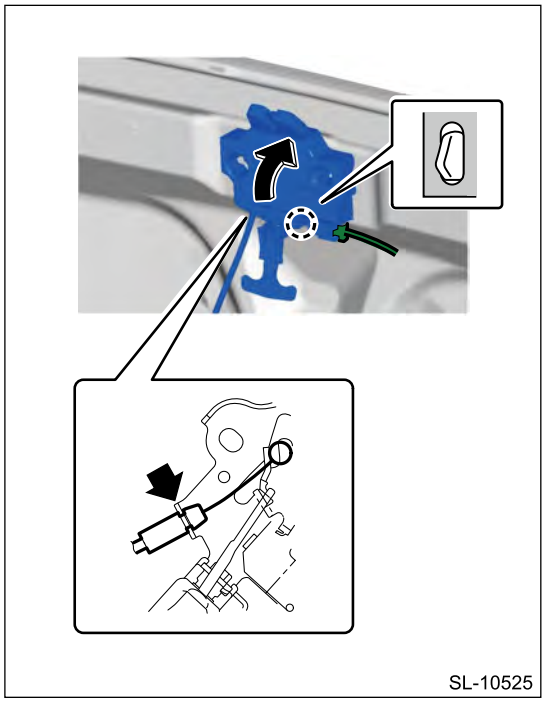
(1) Release the clips, and fold back the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



(2) Release the clips, then detach the spacer - rear floor front.

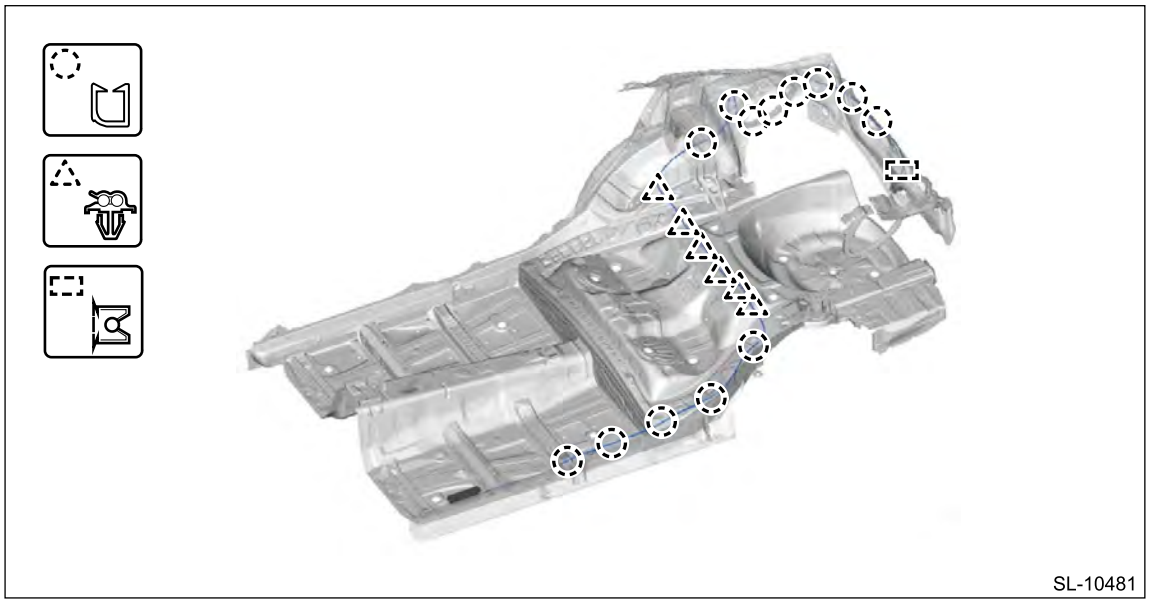


5. Remove the trim panel - trunk side RH and trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
6. Remove the lower inner trim. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
7. Remove the cable assembly - trunk lid.
   (1) Release the claws, and open the cover of the lock assembly - trunk lid.
   (2) Remove the cable assembly - trunk lid from the lock assembly - trunk lid.

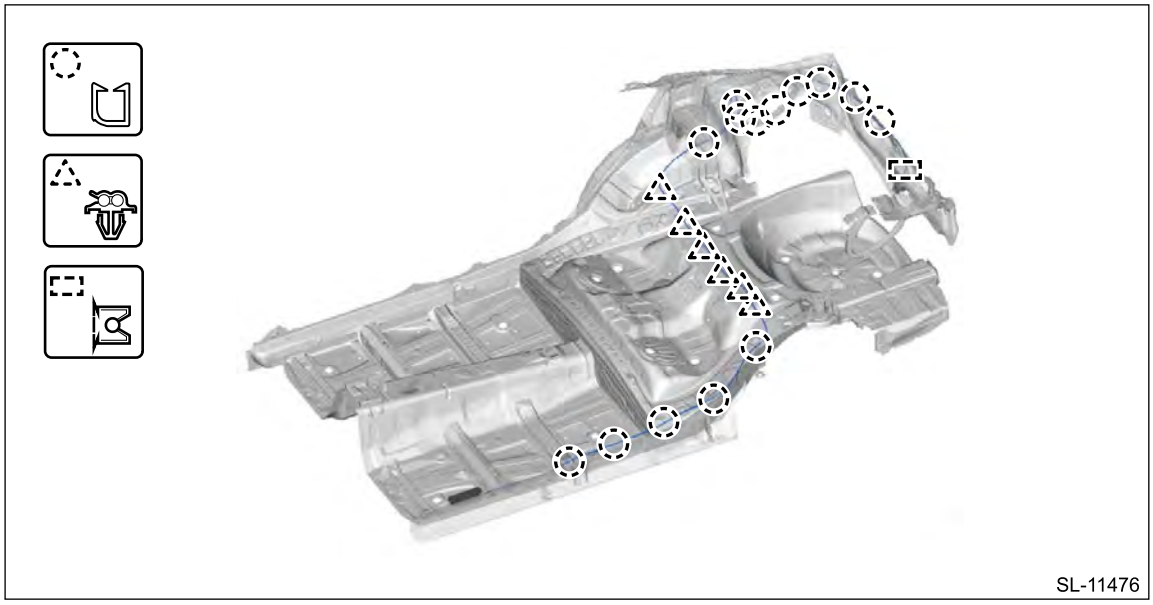


(3) Remove the cable clip, and remove the cable assembly - trunk lid.

- Type A



- Type B



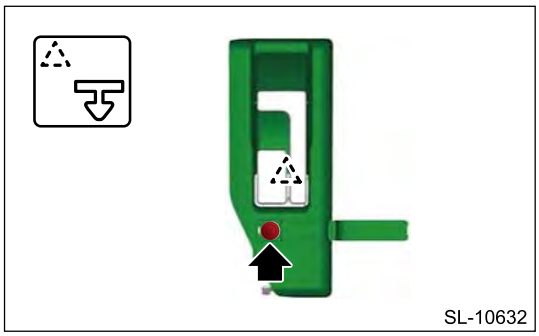
3. FUEL FLAP OPENER

1. Remove the cover - handle.

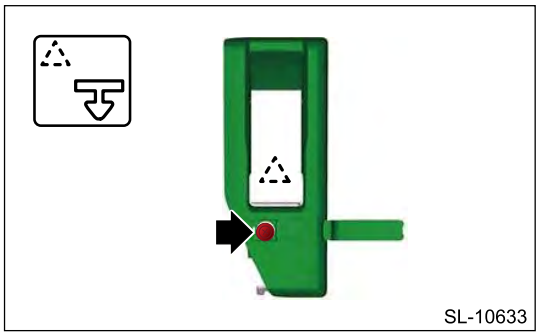
(1) Release the claws, and open the cover.

(2) Remove the screws and release the claws, then detach the cover - handle.

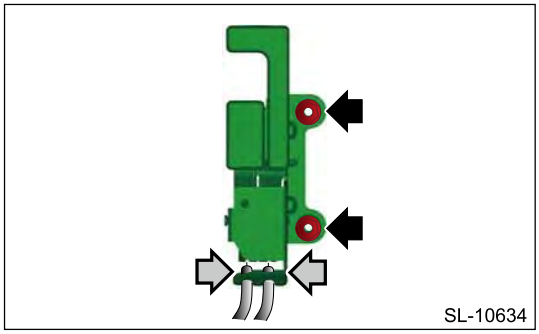
- 4 door model



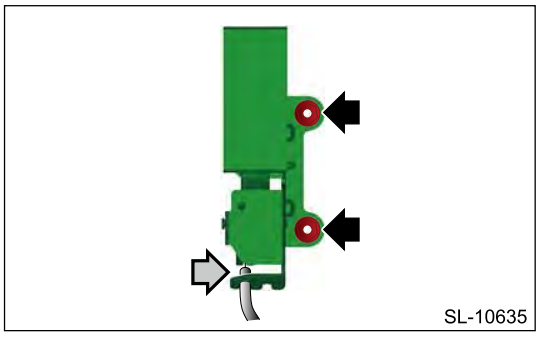
- 5 door model



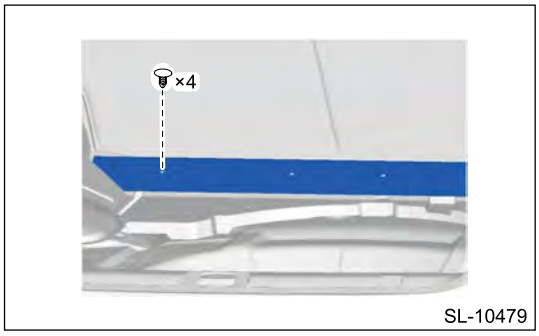
2. Remove the pull handle - opener.
(1) Remove the nut.
(2) Remove the cable assembly - trunk lid or the cable assembly - fuel from the pull handle - opener.
- 4 door model



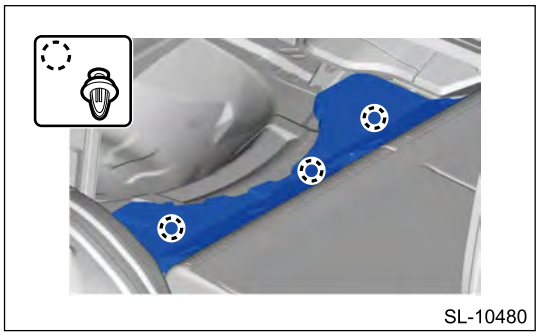
- 5 door model



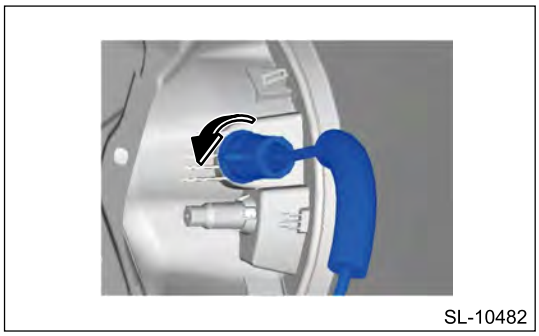
3. Remove the lower inner trim. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
4. Remove the trim panel - trunk mat and the spacer - CTR. (4 door model)
5. Remove the mat - floor rear, spacer - side LH, and spacer - side RH. (5 door model)
6. Remove the spacer - rear floor front.
(1) Release the clips, and fold back the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



(2) Release the clips, then detach the spacer - rear floor front.

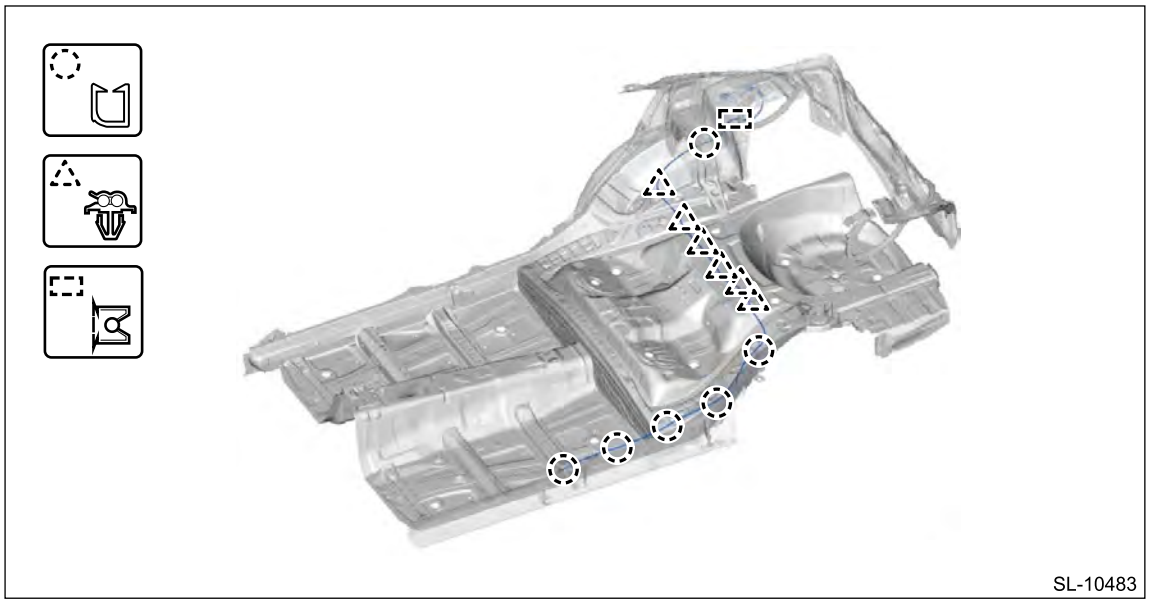


7. Remove the trim panel - trunk side RH. (4 door model) Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
8. Remove the trim panel - rear apron RH. (5 door model) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
9. Remove the cable assembly - fuel.
   (1) Turn the cable assembly - fuel by 90 degrees, and pull it toward vehicle rear.

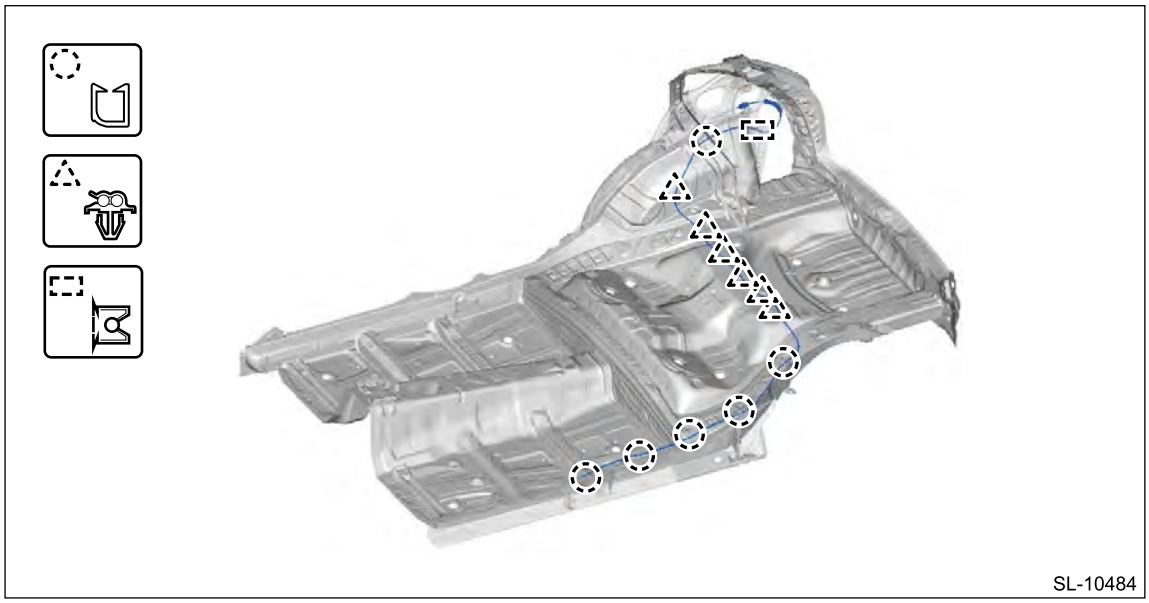


(2) Remove the cable clip, and remove the cable assembly - fuel.

- 4 door model

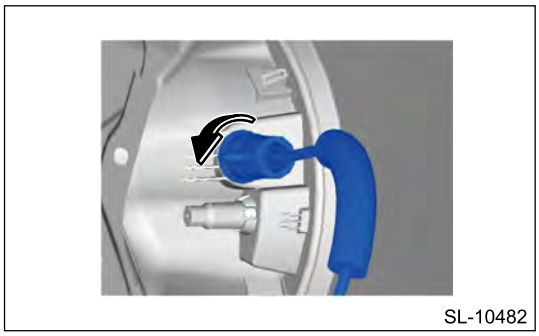


- 5 door model

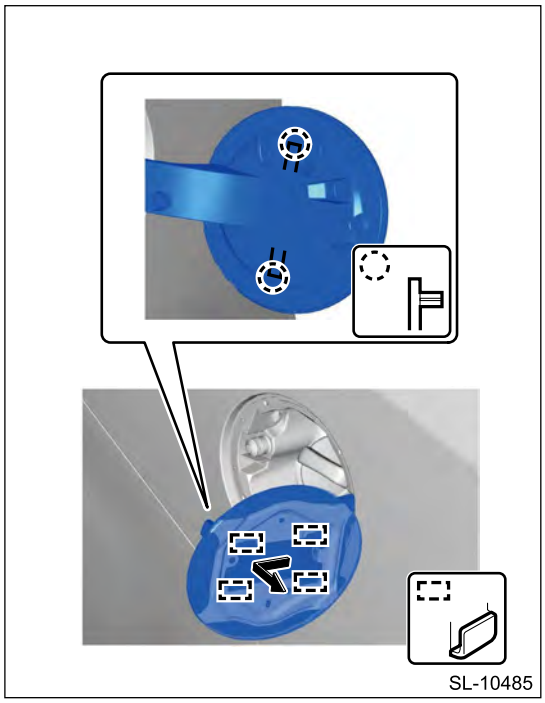


4. FUEL FLAP

1. Remove the trim panel - trunk side RH. (4 door model) Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
2. Remove the trim panel - rear apron RH. (5 door model) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL > 5 DOOR MODEL.
3. Remove the cable assembly - fuel.
   (1) Turn the cable assembly - fuel by 90 degrees, and pull it toward vehicle rear.



4. Remove the mud guard - rear RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>REMOVAL.
5. Remove the drain filter assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter>REMOVAL.
6. Remove the flap - COMPL fuel.
   (1) Release the claws using a flat tip screwdriver or similar tool wrapped with protection tape or a cloth.
   (2) With the condition of (1), slide the flap - COMPL fuel to vehicle rear as shown in the figure, and release the guide.



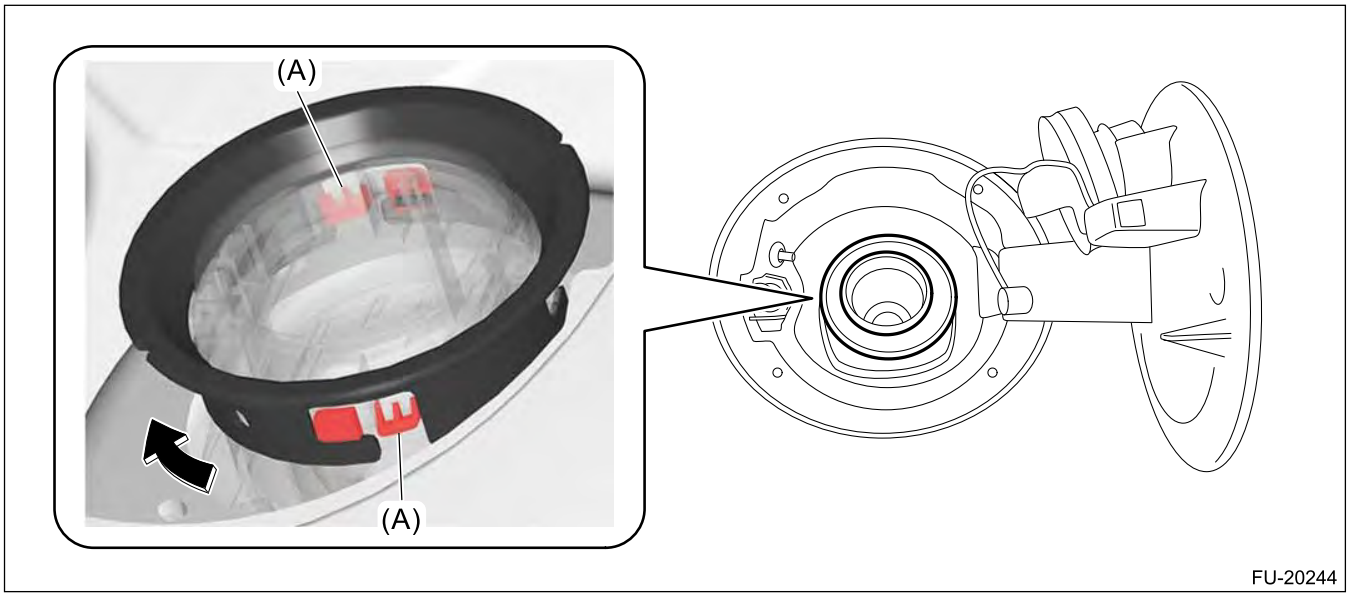
7. Remove the fuel filler cap.

Note:

The clip of the fuel filler cap cannot be reused, therefore, do not remove the clip unless the saucer - COMPL is replaced.

8. Remove the fuel filler pipe protector.

(1) While pressing the claw (A), turn the fuel filler pipe protector in the direction of the arrow to unlock and remove it.

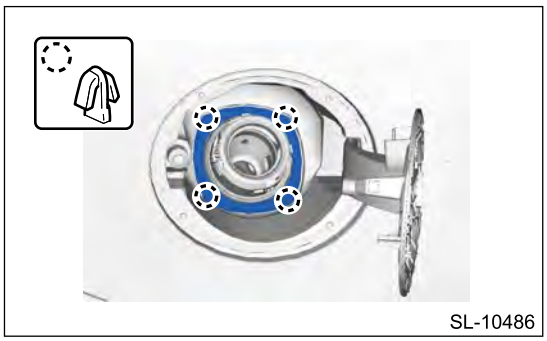


9. Disconnect the ring clips.

(1) Release the claws and then remove the ring clip.

Caution:

Do not reuse the ring clip and replace with a new part, because engagement of the claw weakens.



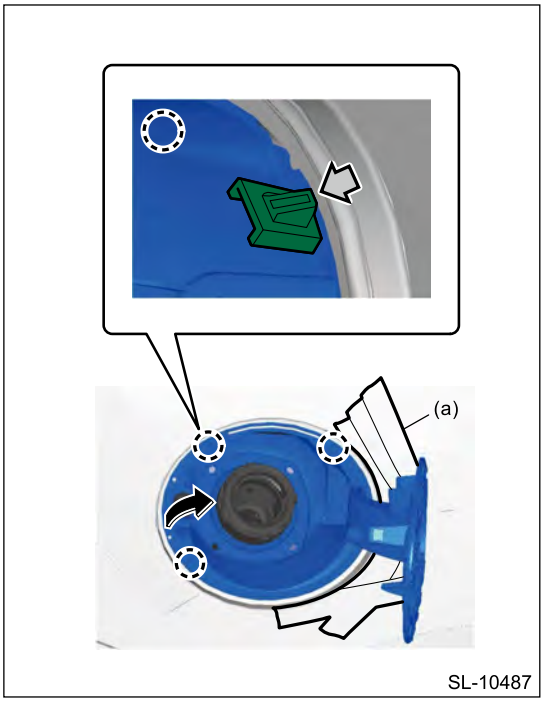
10. Remove the saucer - COMPL.

Caution:

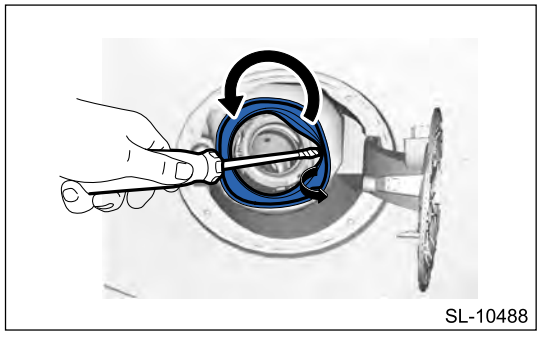
Be careful not to damage by forcibly prying at the rubber portion with a flat tip screwdriver or similar tool.

(1) Attach the protective tape (a) to the panel side outer.

(2) Release the claws from vehicle inside, and pull out the saucer - COMPL toward yourself.



(3) Remove the rubber portion from the fuel filler pipe using a flat tip screwdriver or similar tool wrapped with protection tape, and pull out the saucer - COMPL while tilting toward vehicle front.



INSTALLATION

1. FRONT HOOD OPENER

1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
2. Install the cable - front hood.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
   Note:
   Pull the string attached to the cable - front hood into the vehicle, and install the cable clip and cable - front hood.
3. Install the mud guard - front LH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>INSTALLATION.
4. Install the cover assembly - instrument panel LWR driver OUT.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. TRUNK LID OPENER

1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
2. Install the cable assembly - trunk lid.
3. Install the lower inner trim. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>INSTALLATION.
4. Install the trim panel - trunk side RH and the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>INSTALLATION.
5. Install the spacer - rear floor front.
6. Install the trim panel - trunk mat and the spacer - CTR.
7. Install the pull handle - opener.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
8. Install the cover - handle.

3. FUEL FLAP OPENER

1. Before installation, check the following items.
   - Cable is free from deformation such as fray.
2. Install the cable assembly - fuel.
3. Install the trim panel - rear apron RH. (5 door model) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>INSTALLATION.
4. Install the trim panel - trunk side RH. (4 door model) Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>INSTALLATION.
5. Install the spacer - rear floor front.
6. Install the mat - floor rear, spacer - side LH, and spacer - side RH. (5 door model)
7. Install the trim panel - trunk mat and the spacer - CTR. (4 door model)
8. Install the lower inner trim.
9. Install the pull handle - opener.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
10. Install the cover - handle.

4. FUEL FLAP

1. Install the saucer - COMPL.
   Note:
   Securely install the rubber portion of the saucer - COMPL to the fuel filler pipe assembly.
2. Attach the ring clips.
   Caution:
   Do not reuse the ring clip and replace with a new part, because engagement of the claw weakens.
3. Install the fuel filler pipe protector.
4. Install the fuel filler cap.
5. Install the flap - COMPL fuel.
6. Install the drain filter assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter>INSTALLATION.
7. Install the mud guard - rear RH. Ref. to EXTERIOR/INTERIOR TRIM>Mud Guard>INSTALLATION.
8. Install the cable assembly - fuel.
9. Install the trim panel - rear apron RH. (5 door model) Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>INSTALLATION.
10. Install the trim panel - trunk side RH. (4 door model) Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>INSTALLATION.

SECURITY AND LOCKS > Remote Openers

INSPECTION

Check if the front hood, fuel flap and trunk lid operate normally.

- If the lever or cable is deformed, replace the opener or cable assembly.
- If the flap is deformed, replace the flap - COMPL fuel.

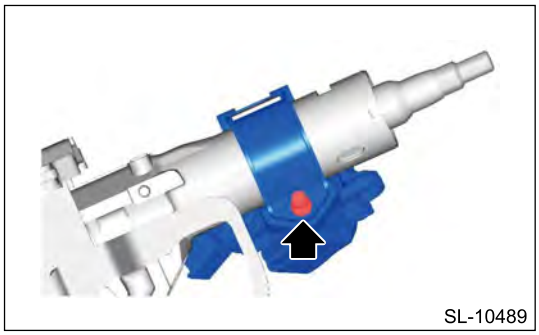
SECURITY AND LOCKS > Ignition Key Lock

REPLACEMENT

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>REMOVAL.
5. Remove the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
6. Remove the ignition key lock.
   (1) Secure the column assembly - steering in a vise.
   (2) Use the reverse tap and drill to remove the set bolt and remove the ignition key lock.



7. Install the ignition key lock.
   (1) Secure the ignition key lock to the column assembly - steering.
   (2) Use new set bolts. Tighten the bolt until the bolt head is broken (bolt head wrenched off).
8. Install the column assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>INSTALLATION.
9. Install the universal joint assembly - steering. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Universal Joint>INSTALLATION.
10. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
11. Install the cover assembly - instrument panel LWR driver.
12. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

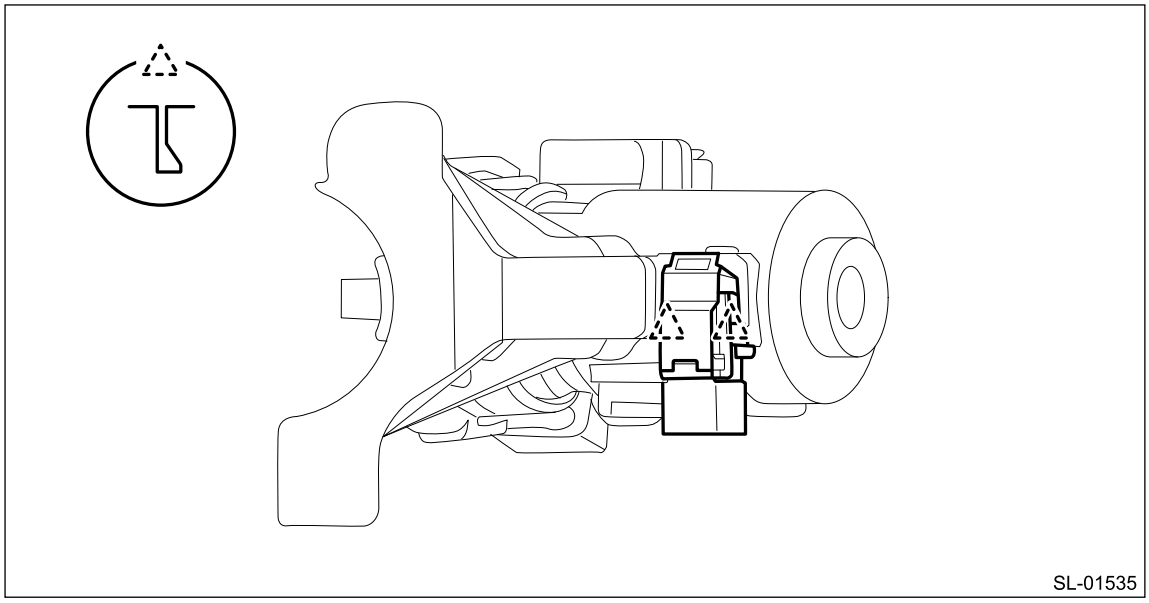
SECURITY AND LOCKS > Ignition Key Lock

DISASSEMBLY

1. Remove the immobilizer antenna assembly. Ref. to SECURITY AND LOCKS>Immobilizer Antenna>REMOVAL.

2. Remove the key warning switch.

(1) Release the claws, and pull the key warning switch downwards to remove.

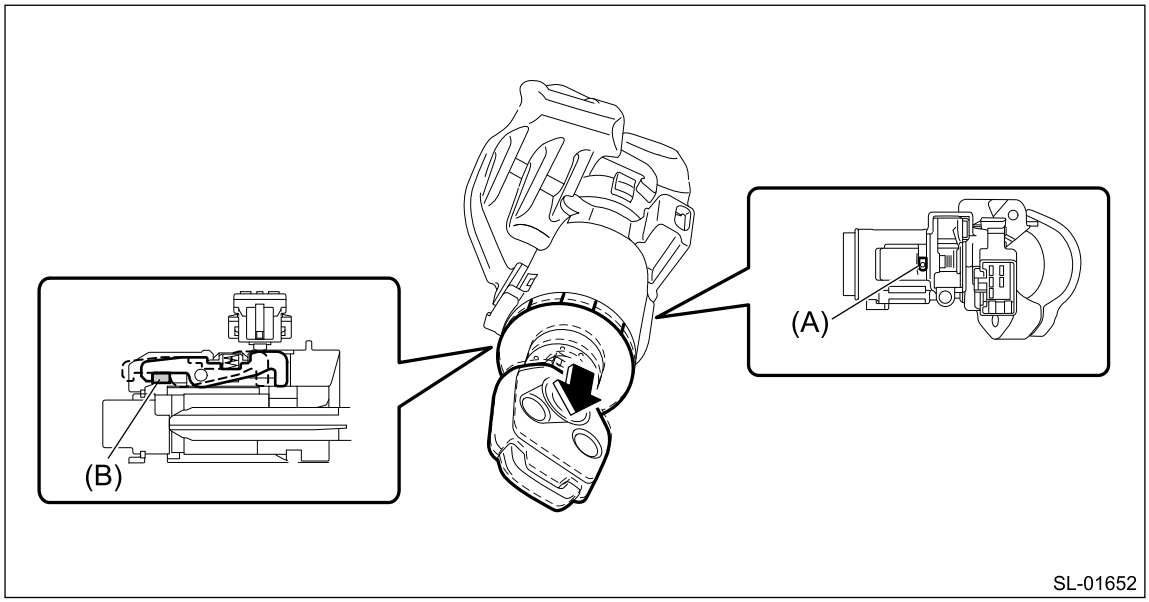


3. Remove the key lock assembly.

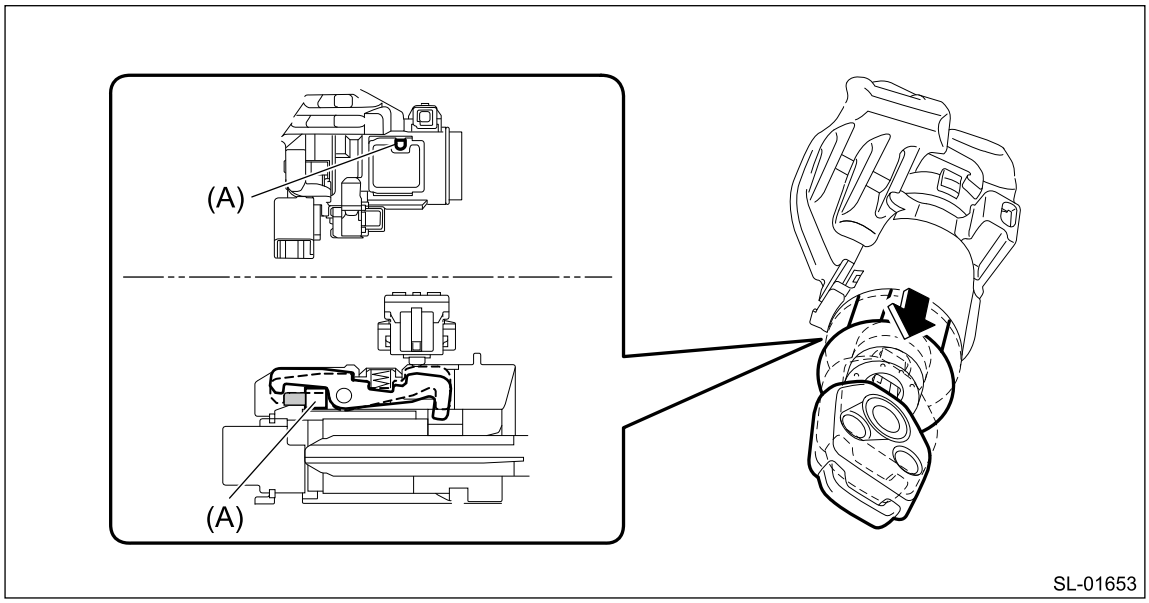
(1) Insert the key into the key lock assembly, and turn the key to the ACC position.

(2) Release the lock by inserting a flat tip screwdriver from the steering lock frame hole (A).

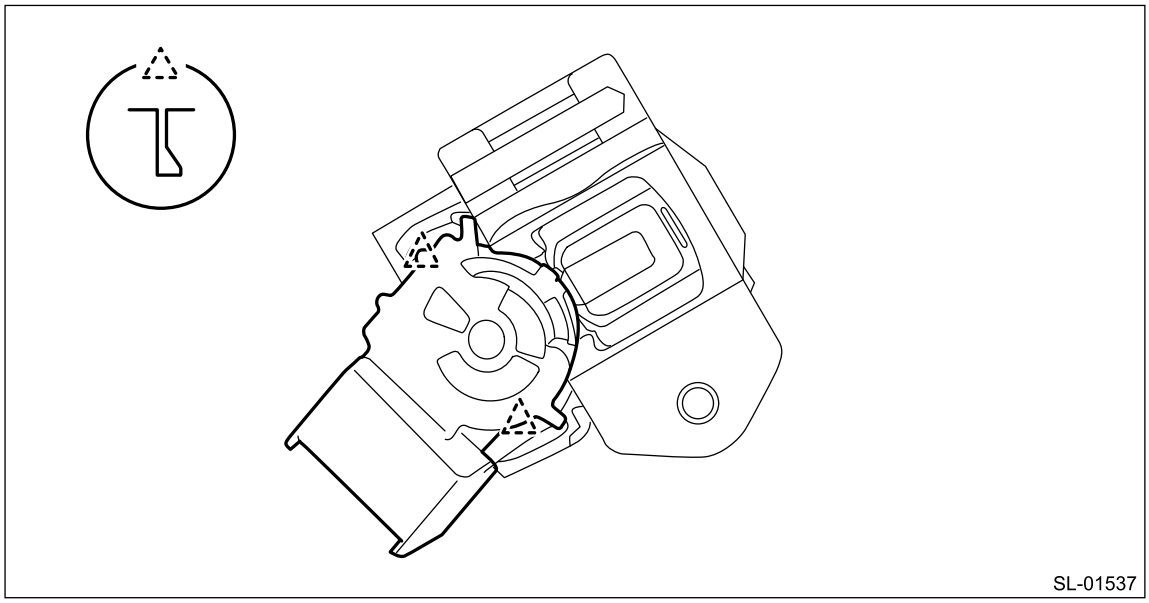
(3) Pull the key lock assembly until the key lock assembly claws touch the steering lock frame stopper (B).



(4) Insert a flat tip screwdriver from the steering lock frame hole (A), and release the claws to pull out the key lock assembly.



4. Release the claws and remove the ignition switch assembly.



SECURITY AND LOCKS > Ignition Key Lock

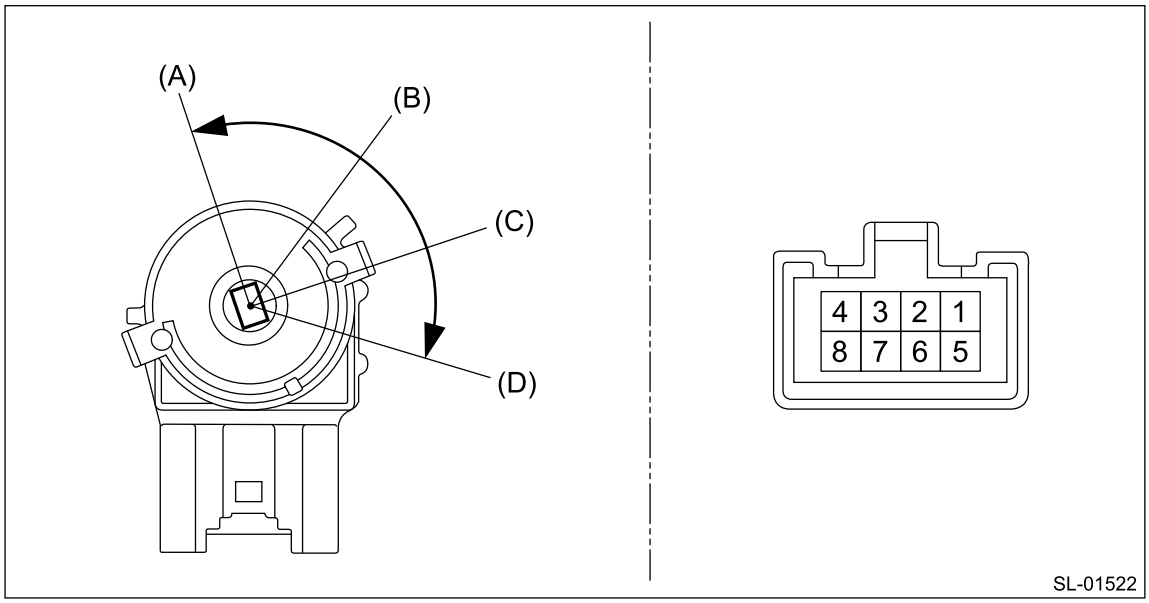
ASSEMBLY

1. Install the ignition switch assembly.
2. Install the key lock assembly.
3. Install the key warning switch.
4. Install the immobilizer antenna assembly.

SECURITY AND LOCKS > Ignition Key Lock

INSPECTION

1. Measure the resistance between connector terminals.
   Preparation tool:
   Circuit tester



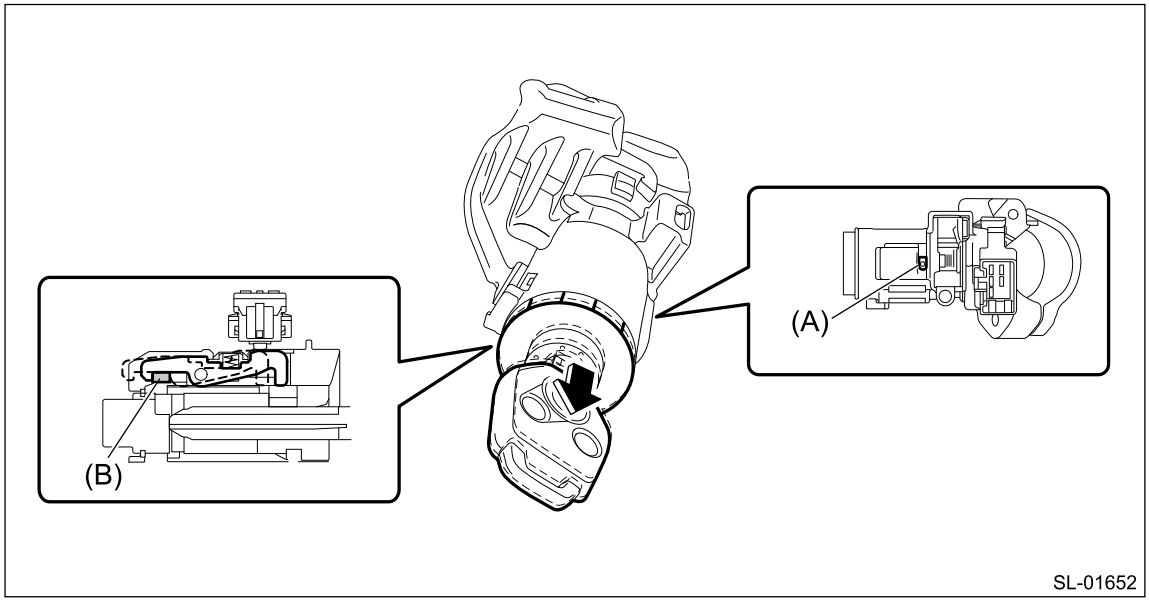
Terminal No.	Inspection conditions		Standard
Between all terminals	(A)	LOCK	1 MΩ or more
2 — 4	(B)	ACC	Less than 1 Ω
1 — 2 — 4 5 — 6	(C)	ON	Less than 1 Ω
1 — 3 — 4 5 — 6 — 7	(D)	ST	Less than 1 Ω

2. Replace the ignition switch assembly if the inspection result is not within the standard.

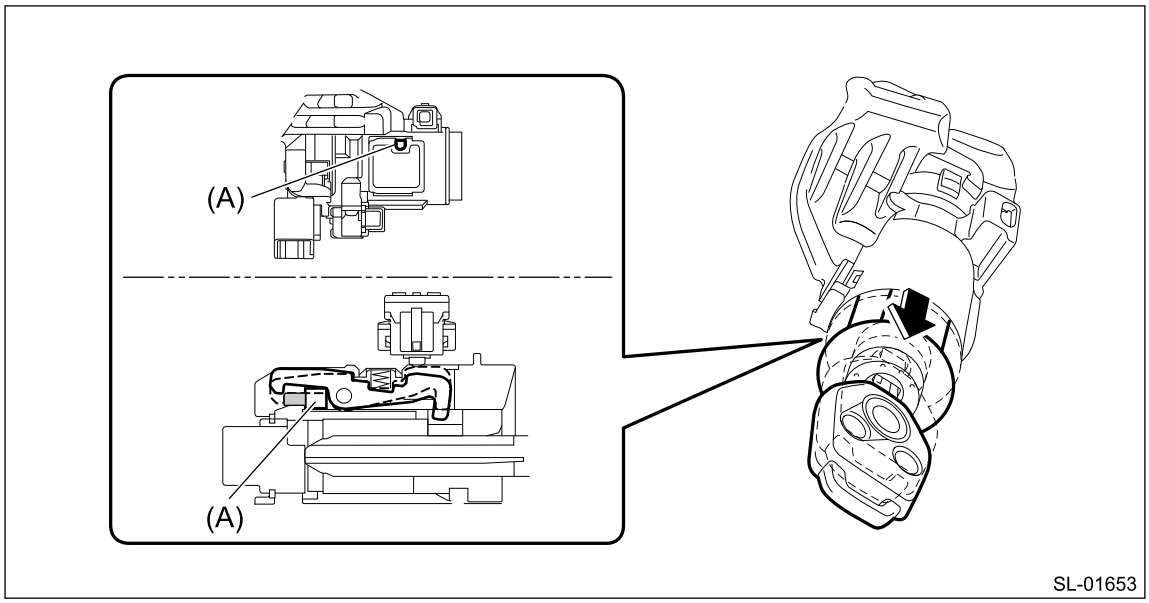
REPLACEMENT

1. STEERING LOCK

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the immobilizer antenna assembly. Ref. to SECURITY AND LOCKS>Immobilizer Antenna>REMOVAL.
3. Remove the key lock assembly.
   (1) Insert the key into the key lock assembly, and turn the key to the ACC position.
   (2) Release the lock by inserting a flat tip screwdriver from the steering lock frame hole (A).
   (3) Pull the key lock assembly until the key lock assembly claws touch the steering lock frame stopper (B).



   (4) Insert a flat tip screwdriver from the steering lock frame hole (A), and release the claws to pull out the key lock assembly.



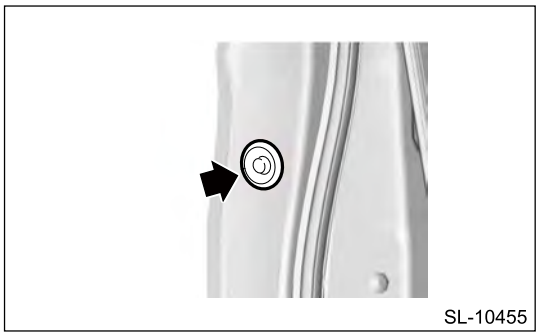
4. Install the key lock assembly.
5. Install the immobilizer antenna assembly. Ref. to SECURITY AND LOCKS>Immobilizer

Antenna>INSTALLATION.

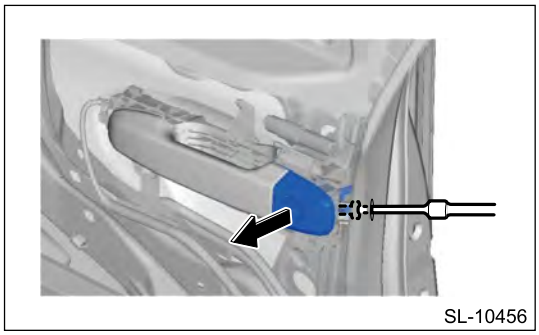
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. FRONT DOOR

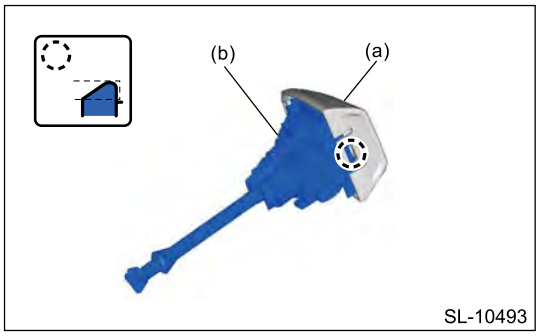
1. Raise the glass assembly - front door to the top position.
2. Remove the cover - handle front outer.
   (1) Remove the plug at the rear end of the panel assembly - front door.



   (2) Loosen the TORX® bolt and remove the cover - handle front outer.
   Preparation tool:
   TORX® T30



3. Replace the key cylinder.
   (1) Release the claws.
   (2) Remove the key cylinder (b) from the cover - handle front outer (a), and replace the key cylinder.



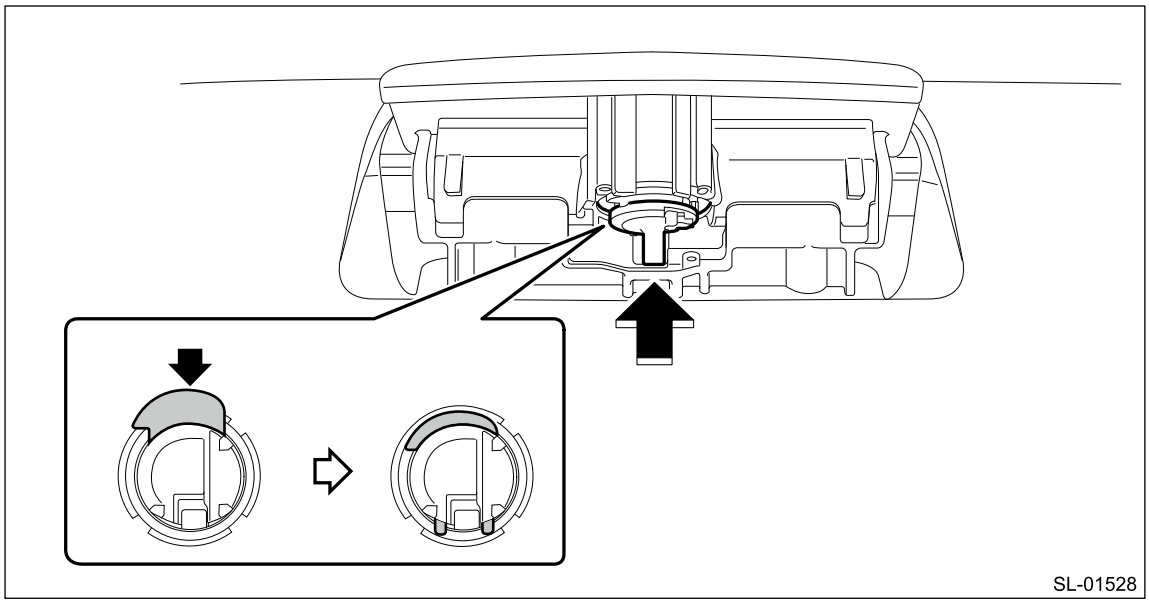
4. Install the cover - handle front outer.
   Caution:
   - **When installing the cover - handle front outer on driver's side, make sure that the key cylinder shaft is correctly inserted into the latch & actuator assembly - front.**
   - **After installation, perform the operation check using the key.**

   Preparation tool:
   TORX® T30
   Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

3. GLOVE BOX LID

1. Remove the pocket assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
2. Replace the key cylinder.
   (1) Pull up the lock knob.
   (2) Push out the key cylinder from the pocket assembly while pressing in the metal plate.

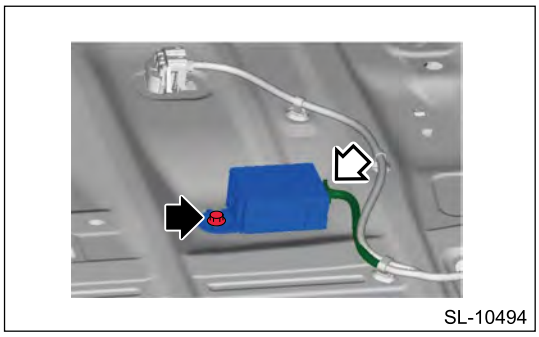


3. Install the pocket assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>INSTALLATION.

REMOVAL

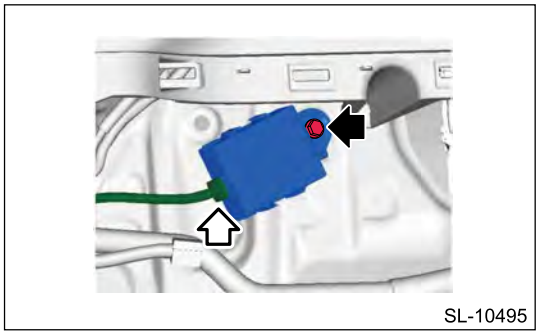
1. 4 DOOR MODEL

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel assembly - rear shelf. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>REMOVAL.
3. Remove the keyless entry control module.
   (1) Disconnect the connector.
   (2) Remove the bolt and then remove the keyless entry control module.



2. 5 DOOR MODEL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear apron LH. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.
3. Remove the keyless entry control module.
   (1) Disconnect the connector.
   (2) Remove the bolt and then remove the keyless entry control module.



INSTALLATION

1. 4 DOOR MODEL

1. Install the keyless entry control module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the trim panel assembly - rear shelf. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

4. When the keyless entry control module is replaced, register the transmitter ID. (Model with TPMS) Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID)>OPERATION.

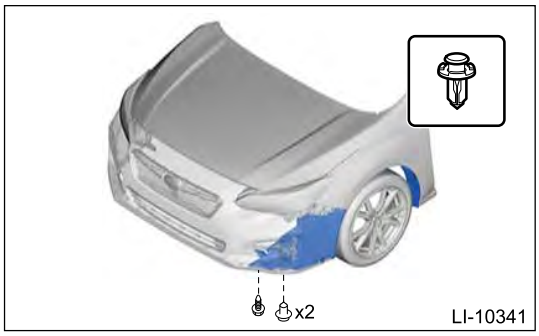
2. 5 DOOR MODEL

1. Install the keyless entry control module.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the trim panel - rear apron LH. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>INSTALLATION > 5 DOOR MODEL.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. When the keyless entry control module is replaced, register the transmitter ID. (Model with TPMS) Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID)>OPERATION.

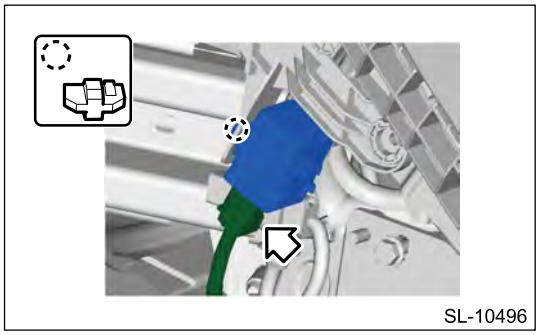
SECURITY AND LOCKS > Keyless Buzzer

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the screw and clips, and turn over the mud guard - front.



5. Remove the keyless buzzer.
   (1) Disconnect the connector.
   (2) Remove the clip and detach the keyless buzzer.

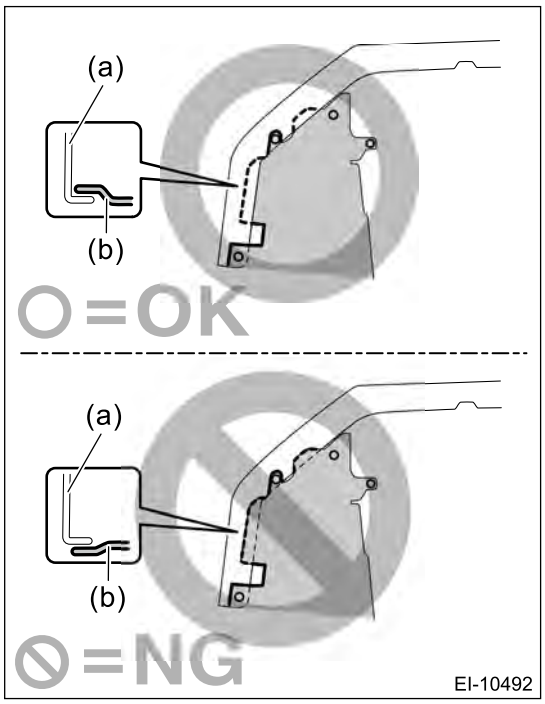


SECURITY AND LOCKS > Keyless Buzzer

INSTALLATION

Caution:

Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Install the keyless buzzer.
2. Install the mud guard - front.
3. Install the under cover - front.

   Tightening torque:

   18 N·m (1.8 kgf-m, 13.3 ft-lb)
4. Lower the vehicle.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

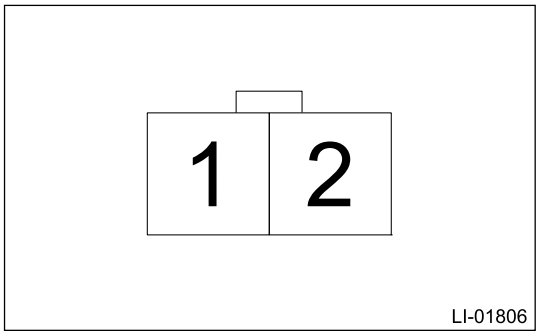
SECURITY AND LOCKS > Keyless Buzzer

INSPECTION

1. Measure the resistance between connector terminals.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	Always	270 — 330 Ω

2. Replace the keyless buzzer if the inspection result is not within the standard value.

NOTE

1. REPLACE BODY INTEGRATED UNIT

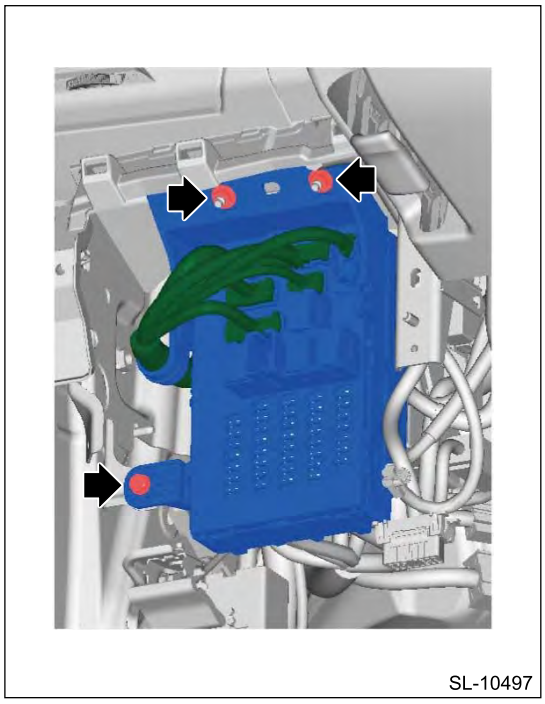
1. Check and record the current setting. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION > CONFIRM CURRENT SETTING.
2. Prepare all immobilizer keys already registered. (Models without the keyless access with push button start)
3. Replace the body integrated unit with a new part.
   - Removal: Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.
   - Installation: Ref. to SECURITY AND LOCKS>Body Integrated Unit>INSTALLATION.
4. Set the current settings as recorded. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION > REGISTRATION BODY INTEGRATED UNIT (FUNCTION SETTING).
5. Register the immobilizer. For detailed operation procedure, refer to “Type B” described in “REGISTRATION MANUAL FOR IMMOBILIZER”.

REMOVAL

Caution:

- **When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to “Type B” described in “REGISTRATION MANUAL FOR IMMOBILIZER”.**
- **Before handling the airbag system components, refer to “CAUTION” of “General Description” in “AIRBAG SYSTEM”. Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
4. Remove the body integrated unit (fuse & relay box).
   (1) Disconnect connectors.
   (2) Remove the bolts and nuts, and remove the body integrated unit (fuse & relay box).



SECURITY AND LOCKS > Body Integrated Unit

INSTALLATION

Caution:

- **When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to "Type B" described in "REGISTRATION MANUAL FOR IMMOBILIZER".**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**

1. Install the body integrated unit (fuse & relay box).
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
2. Install the cover assembly - instrument panel LWR driver.
3. Install the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

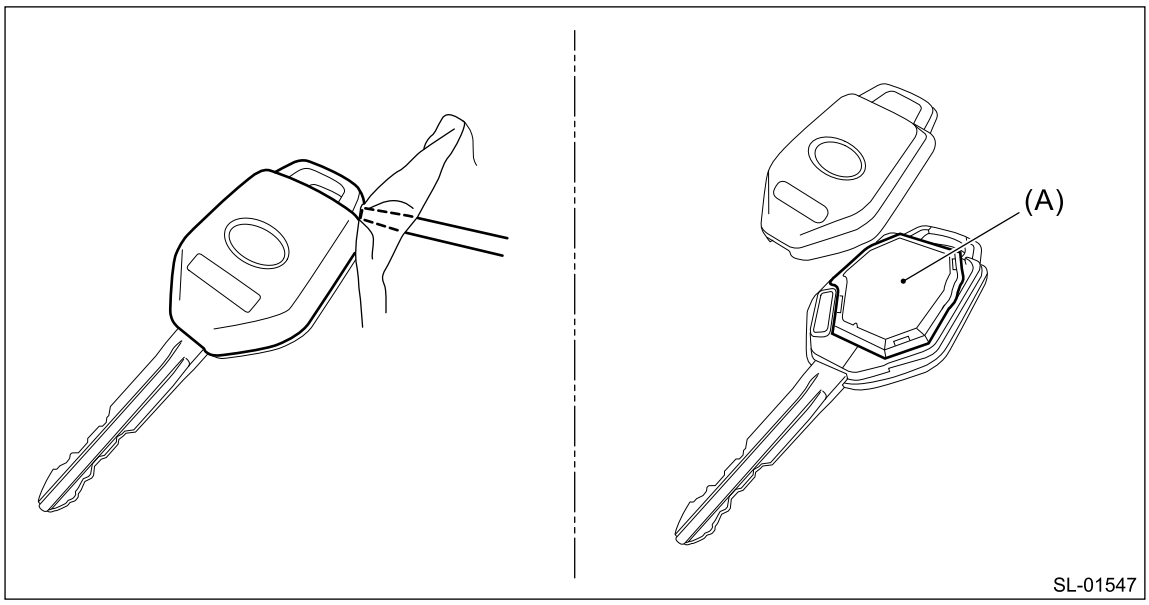
REMOVAL

1. KEYLESS TRANSMITTER BATTERY

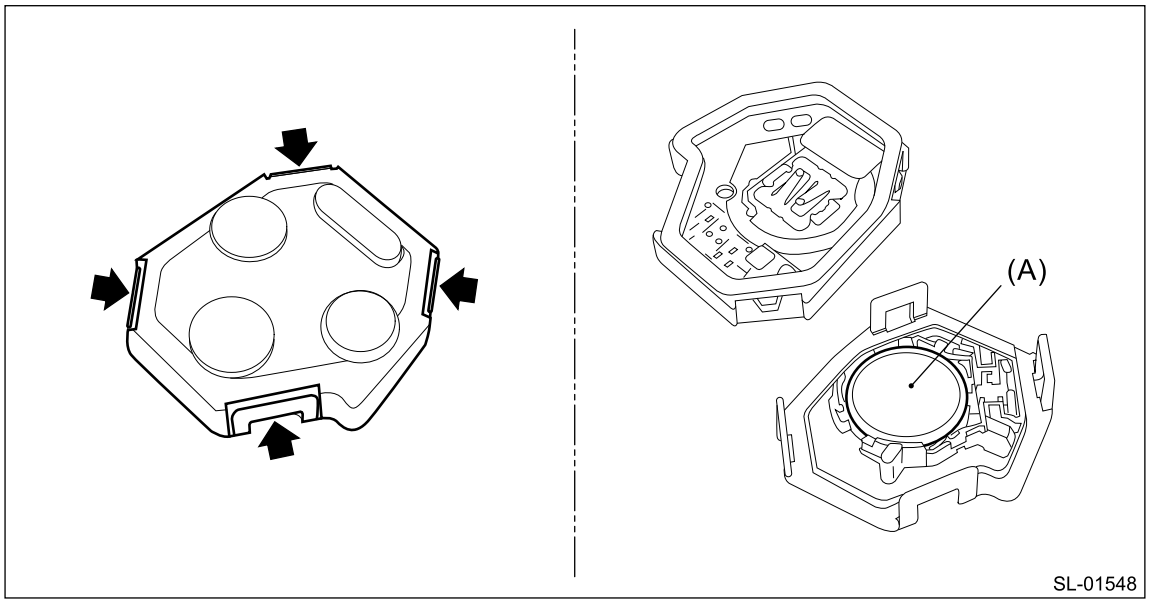
Caution:

To prevent static electricity damage to the keyless transmitter printed circuit board, touch the steel area of building with hand to discharge static electricity carried on body or clothes before disassembling the keyless transmitter.

1. Take out the transmitter case.
   (1) Release the claws, and then remove the keyless transmitter cover.
   Caution:
   Use a flat tip screwdriver with protective tape or cloth in order not to damage the components.
   (2) Remove the transmitter case (A).



2. Take out the keyless transmitter battery.
   (1) Release the claws, and remove the transmitter case.
   (2) Take out the keyless transmitter battery (A).
   Caution:
   When using a flat tip screwdriver, apply insulation tape around a flat tip screwdriver.



SECURITY AND LOCKS > Keyless Transmitter

INSTALLATION

1. KEYLESS TRANSMITTER BATTERY

1. Install the keyless transmitter battery.
2. Install the transmitter.
3. Install the keyless transmitter cover.

SECURITY AND LOCKS > Keyless Transmitter

INSPECTION

1. KEYLESS TRANSMITTER BATTERY

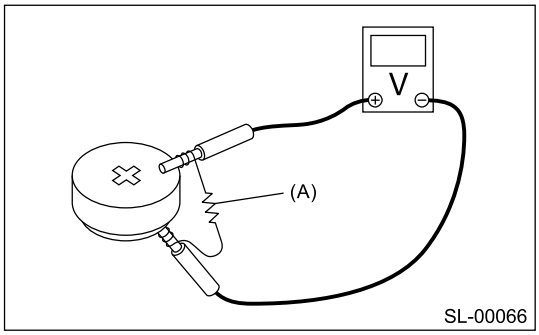
1. Measure the keyless transmitter battery voltage.

   Preparation tool:

   Circuit tester

   Note:

   Complete the measurement within 5 seconds because the battery discharges during measurement.



Battery terminal	Inspection conditions	Standard
(+) — (−)	Connect resistor (A) 47 Ω	2.5 — 3 V

2. Replace the battery if the inspection result is not within the standard value. (Use CR1620 or

equivalent.)

REPLACEMENT

1. REGISTRATION OF KEYLESS TRANSMITTER WITH SUBARU SELECT MONITOR

Note:

- **A maximum of four keyless transmitters can be registered for each individual vehicle.**
- **When replacing or adding the keyless transmitter, new registration of transmitter is necessary.**

1. Register the transmitter.
   (1) Connect the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to "Application help".
   (2) Turn the ignition switch to ON.
   (3) On [Start] display, select [Diagnosis].
   (4) On [Select Vehicle] display, input the target vehicle information and select [OK].
   (5) On [Main Menu] display, select [Each System].
   (6) On [Select System] display, select [Keyless Entry], and then select [Next].
   (7) On [Select Function] display, select [Work Support].
   (8) On [Work Support] display, select [Keyless ID registration].
   (9) According to the directions on the screen, press the button of the transmitter to be registered in order of Lock → Unlock. (When registration completed: Outside buzzer sounds once.)
   Note:
   - **Repeat the procedure as many times as the number of transmitters to be registered.**
   - **When attempting to register a key that has already been registered, the external buzzer sounds twice.**
   (10) Press the [Exit] button to finish the operations.

2. CLEAR THE REGISTRATION OF IMMOBILIZER

For detailed immobilizer registration clear, refer to "Type B" described in "REGISTRATION MANUAL FOR IMMOBILIZER".

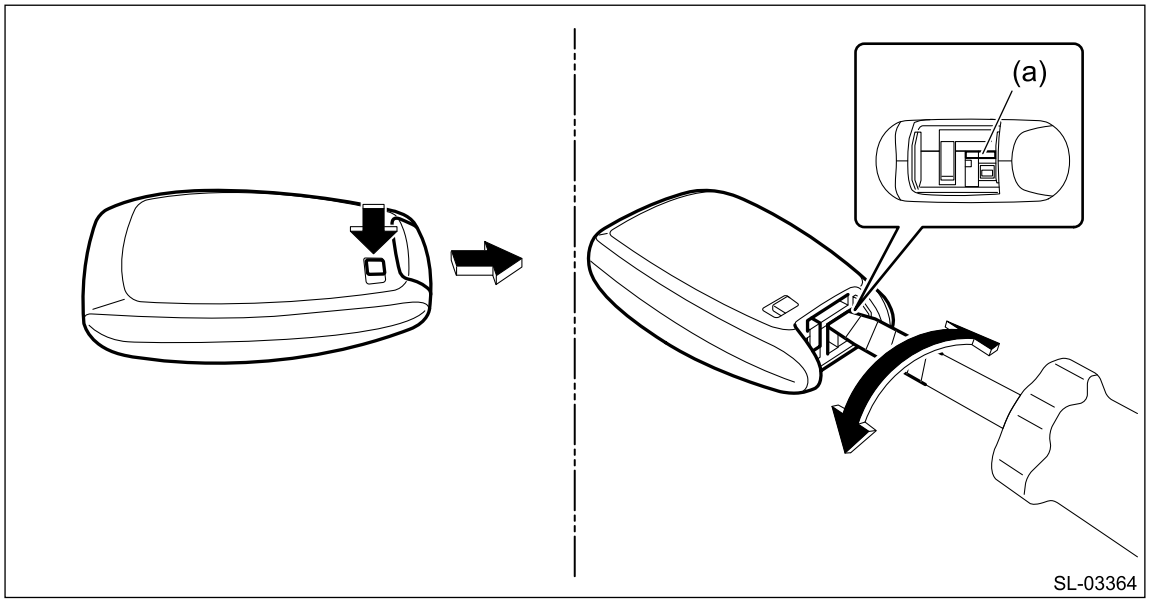
REMOVAL

1. ACCESS KEY BATTERY

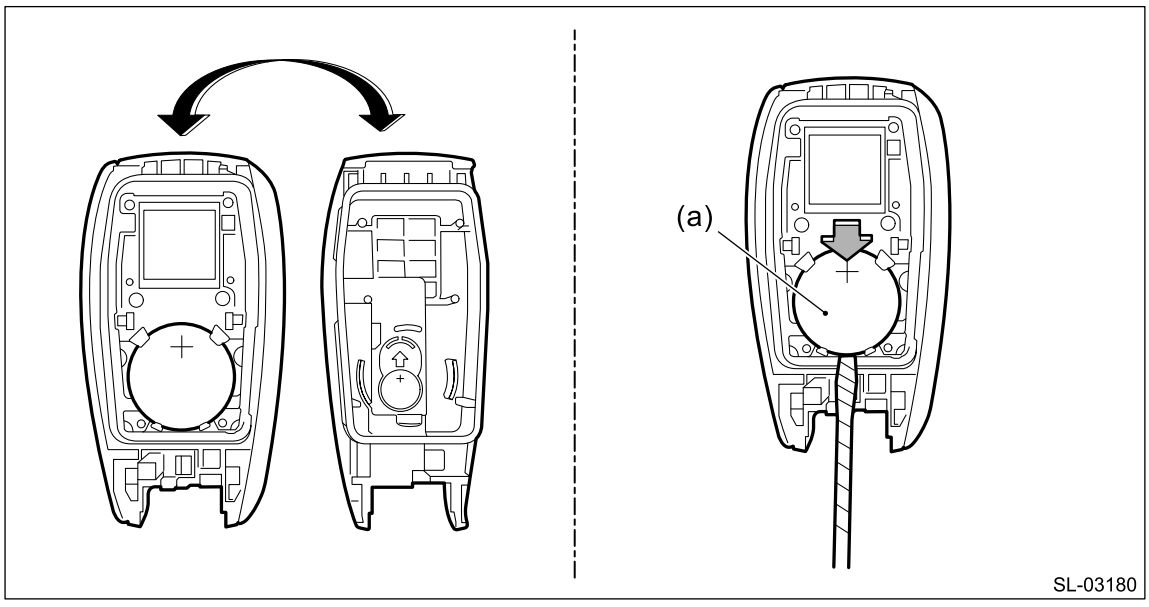
Caution:

To prevent static electricity damage to the access key printed circuit board, touch the steel area of building with hand to discharge static electricity carried on body or clothes before disassembling the access key.

1. Remove the mechanical key.
   (1) Push the lock button and remove the mechanical key from the access key.
2. Remove the access key battery.
   (1) Insert a flat tip screwdriver end wrapped with insulating tape etc. into the slit (a) of the access key to open the case.



(2) Insert a flat tip screwdriver wrapped with insulating tape, and while holding the upper side of the battery (a), remove the battery (a) from the case.



INSTALLATION

1. ACCESS KEY BATTERY

1. Install the access key battery.
2. Install the mechanical key.

SECURITY AND LOCKS > Access Key

INSPECTION

1. ACCESS KEY BATTERY

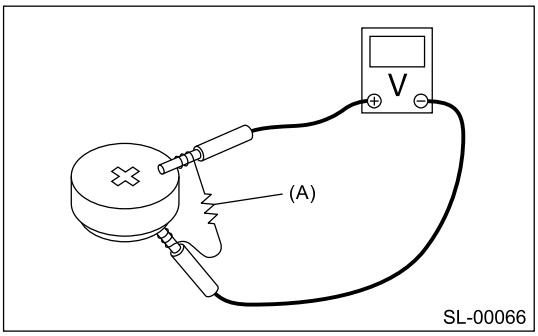
Measure the access key battery voltage.

Preparation tool:

Circuit tester

Note:

Complete the measurement within 5 seconds because the battery discharges during measurement.



Battery terminal	Inspection conditions	Standard
(+) — (−)	Connect resistor (A) 47 Ω	2.5 — 3 V

Replace the battery if the inspection result is not within the standard value. (Use CR2032 V or equivalent.)

SECURITY AND LOCKS > Access Key

REPLACEMENT

1. ACCESS KEY REGISTRATION

Note:

- **A maximum of seven access keys can be registered for each individual vehicle.**
- **When replacing or adding an access key, new registration of the access key is necessary.**
- **When the access key has been newly added, it is registered to the immobilizer system at the same time.**

2. CLEARING ACCESS KEY REGISTRATION

For detailed access key registration clear, refer to “Type D” described in “REGISTRATION MANUAL FOR IMMOBILIZER”.

NOTE

Caution:

When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to "Type E" described in "REGISTRATION MANUAL FOR IMMOBILIZER".

For removal/installation procedures of immobilizer control module, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".

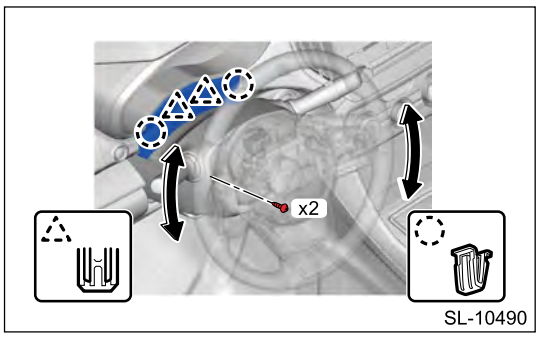
Note:

Equipped on C5 model with keyless access with push button start.

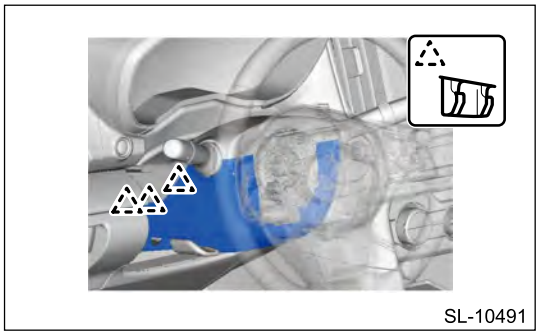
REMOVAL

1. MODEL WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work.
   Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - column.
   (1) Remove the clip, and remove the cover assembly - visor LWR.
   (2) Remove the screws by turning the steering wheel to right and left.

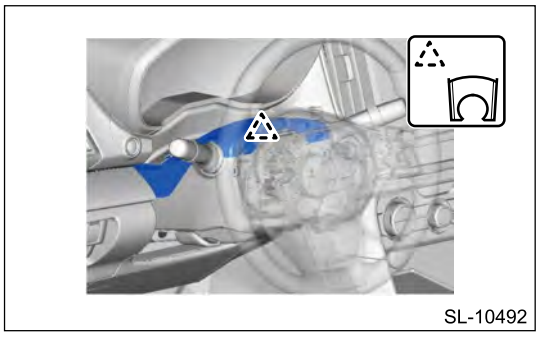


   (3) Release the claws and remove the cover assembly - column LWR.



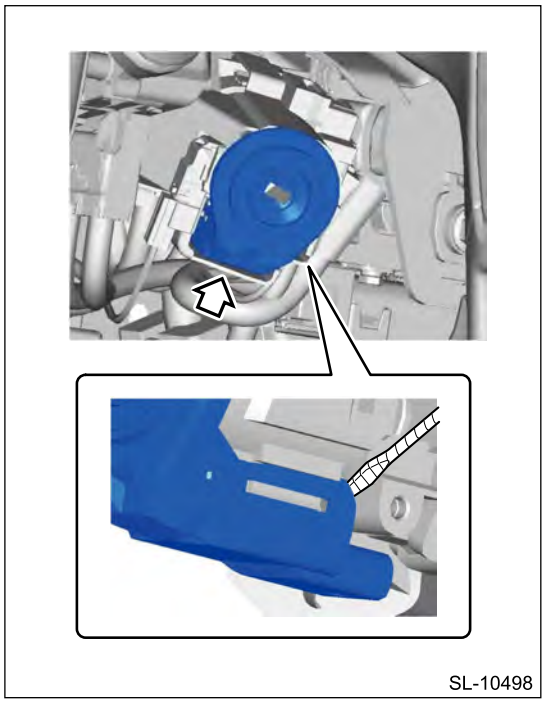
Note:
Release the claws on RH side in the same procedure as on the LH side.

   (4) Release the claws and remove the cover assembly - column UPR.



3. Remove the immobilizer antenna assembly.
   (1) Disconnect the connector.
   (2) Release the claws using a flat tip screwdriver or similar tool wrapped with protection tape, and remove the immobilizer antenna assembly.

Caution:
Do not apply excessive force to disengage the lock of immobilizer antenna assembly. Otherwise they may be broken because those parts are the products made of a plastic.



2. MODEL WITH KEYLESS ACCESS WITH PUSH BUTTON START

Note:

Immobilizer antenna is integrated with the switch - push button start. For the operation procedures, refer to "Push Button Ignition Switch". Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

SECURITY AND LOCKS > Immobilizer Antenna

INSTALLATION

1. MODEL WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START

1. Install the immobilizer antenna assembly.
2. Install the cover assembly - column.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. MODEL WITH KEYLESS ACCESS WITH PUSH BUTTON START

Note:

Immobilizer antenna is integrated with the push button ignition switch. For the operation procedures, refer to "Push Button Ignition Switch". Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

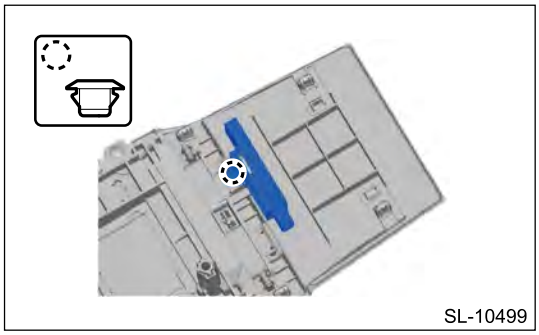
REMOVAL

1. FRONT ANTENNA

Caution:

Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - front. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>REMOVAL.
3. Remove the front antenna assembly - interior.
   (1) Release the clips, and remove the front antenna assembly - interior.

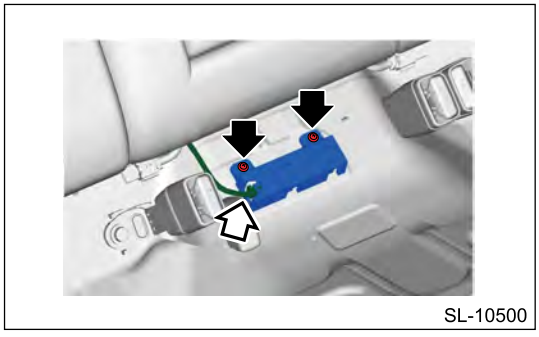


2. CENTER ANTENNA

Caution:

When replacing the antenna, do not reuse the tapping screw. Always replace with new tapping screws.

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear seat cushion assembly. Ref. to SEATS>Rear Seat>REMOVAL.
3. Remove the center antenna assembly - interior.
   (1) Disconnect the connector.
   (2) Remove the screw, and remove the center antenna assembly - interior.



Note:

Do not remove the antenna assembly from the cover. If removed, the antenna assembly and cover mounting becomes loose, causing abnormal noises.

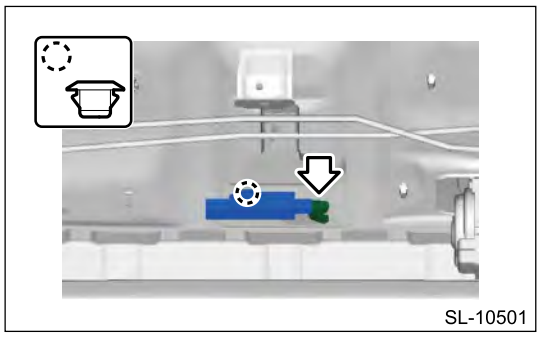
3. REAR ANTENNA

- **4 DOOR MODEL**

Caution:

Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the rear antenna assembly - interior.
   (1) Disconnect the connector.
   (2) Release the clips, and remove the rear antenna assembly - interior.

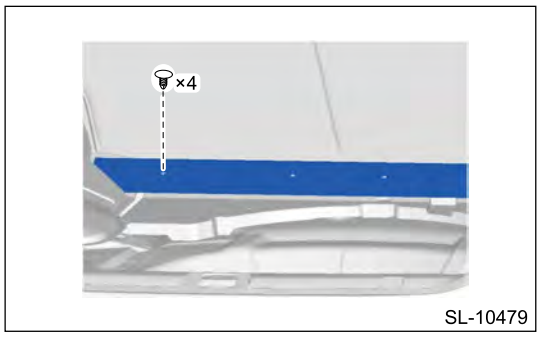


- **5 DOOR MODEL**

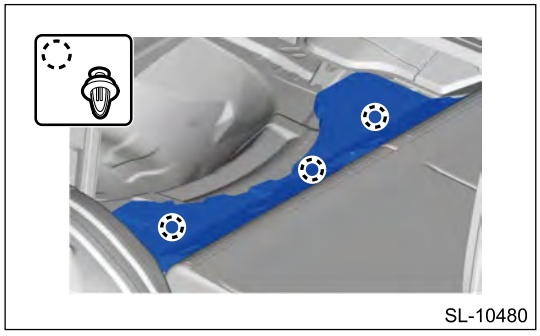
Caution:

Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.

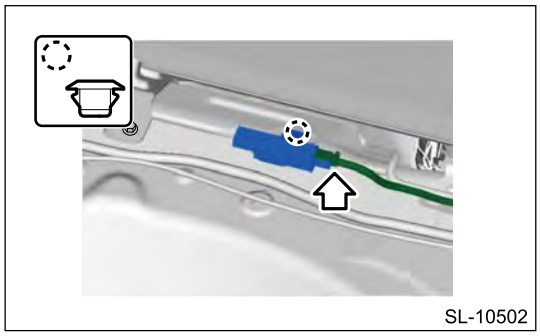
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the mat - floor rear, spacer - side LH, and spacer - side RH.
3. Remove the spacer - rear floor front.
   (1) Release the clips, and fold back the bottom of the cover COMPL - rear backrest LH and RH of the rear seat back.



   (2) Release the clips, then detach the spacer - rear floor front.



4. Remove the rear antenna assembly - interior.
   (1) Disconnect the connector.
   (2) Release the clips, and remove the rear antenna assembly - interior.



SECURITY AND LOCKS > Keyless Access Indoor Antenna

INSTALLATION

Caution:

- **Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.**
- **When replacing the antenna, do not reuse the tapping screw. Always replace with new tapping screws.**

1. FRONT ANTENNA

1. Install the front antenna assembly - interior.
2. Install the cover assembly - front. Ref. to EXTERIOR/INTERIOR TRIM>Console Box>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. CENTER ANTENNA

1. Install the center antenna assembly - interior.
2. Install the rear seat cushion assembly. Ref. to SEATS>Rear Seat>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. REAR ANTENNA

- **4 DOOR MODEL**
  1. Install the rear antenna assembly - interior.
  2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
- **5 DOOR MODEL**
  1. Install the rear antenna assembly - interior.
  2. Install the spacer - rear floor front.
  3. Install the mat - floor rear, spacer - side LH, and spacer - side RH.
  4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Keyless Access Indoor Antenna

INSPECTION

Check the keyless access interior antenna using the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

1. Check the setting by performing the keyless access with push button start system check. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button

Start Check.

2. Operate the touch sensor of the door handle to check if door lock operates.
3. If the system does not operate normally as the result of inspection, refer to “Diagnostics with Phenomenon” of the “KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)” section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > KEYLESS ACCESS SYSTEM.

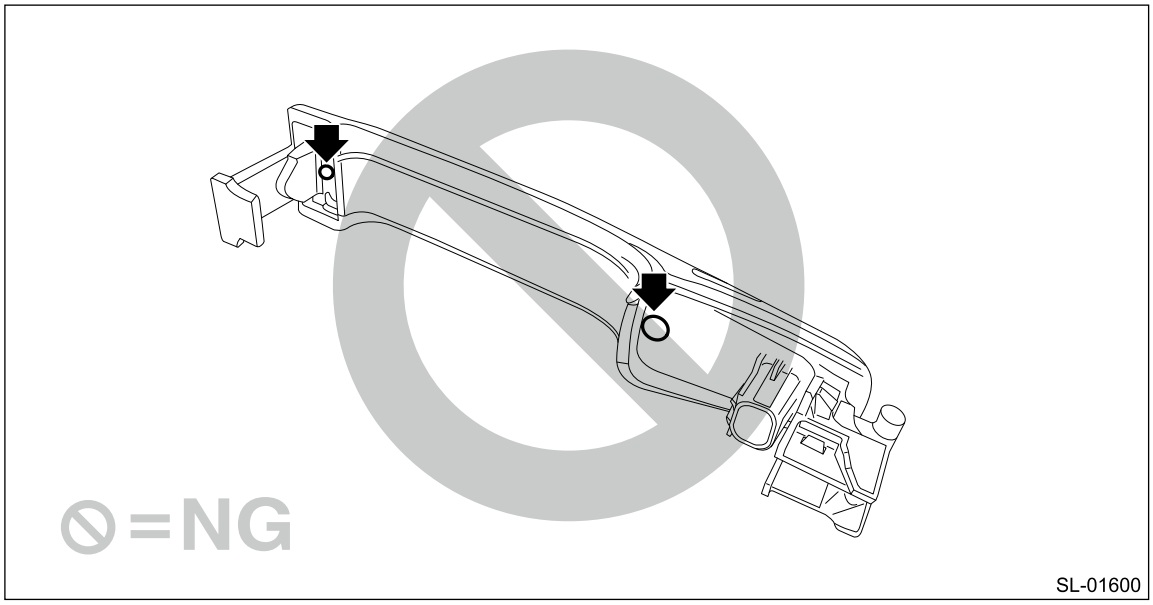
REMOVAL

1. FRONT ANTENNA

Caution:

Do not detach the antenna from the handle - door outer.

If replacement is required, replace the handle - door outer assembly as a unit.



1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the handle - door outer assembly. Ref. to SECURITY AND LOCKS>Door Outer Handle>REMOVAL.

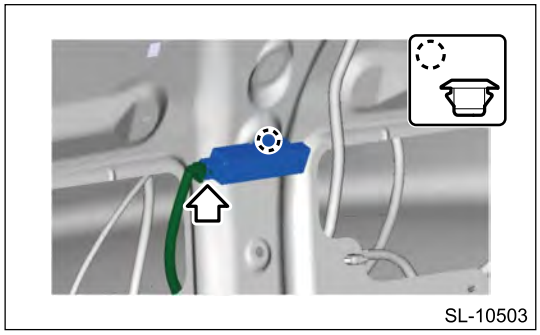
2. REAR ANTENNA

- **4 DOOR MODEL**

Caution:

Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the rear antenna assembly - exterior.
   (1) Disconnect the connector.
   (2) Release the clips, and remove the rear antenna assembly - exterior.

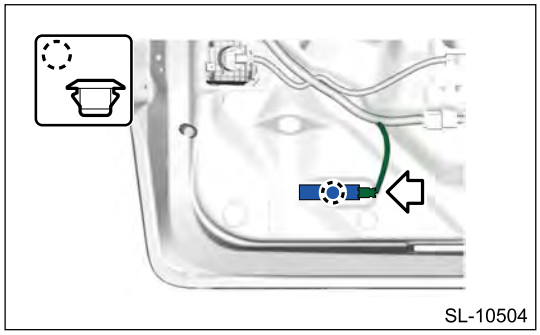


- **5 DOOR MODEL**

Caution:

Do not detach the antenna except when replacing it. Detaching unnecessarily will lead to insecure attachment of the antenna.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the rear antenna assembly - exterior.
   (1) Disconnect the connector.
   (2) Release the clips, and remove the rear antenna assembly - exterior.



SECURITY AND LOCKS > Keyless Access Outdoor Antenna

INSTALLATION

1. FRONT ANTENNA

1. Install the handle - door outer. Ref. to SECURITY AND LOCKS>Door Outer Handle>INSTALLATION.
2. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

2. REAR ANTENNA

1. Install the rear antenna assembly - exterior.
2. Install the trim panel - trunk lid. (4 door model)
3. Install the trim panel - rear gate. (5 door model)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Keyless Access Outdoor Antenna

INSPECTION

Check the keyless access exterior antenna using the Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

1. Check the setting by performing the keyless access with push button start system check. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
2. While bringing the access key, operate the trunk opener button to check if the trunk is opened. (4 door model)
3. While bringing the access key, operate the opener switch on the rear gate and the lock request switch to check if the door lock or lock operates. (5 door model)
4. If the system does not operate normally as the result of inspection, refer to "Diagnostics with

Phenomenon” of the “KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)” section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > KEYLESS ACCESS SYSTEM.

SECURITY AND LOCKS > Trunk Opener Button

REMOVAL

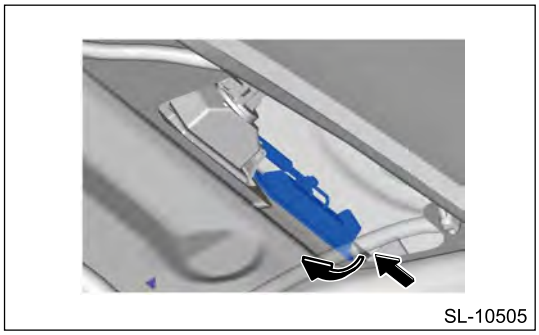
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - trunk lid. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
3. Remove the switch - request.

   Caution:

   When using a flat tip screwdriver, apply protective tape or cloth and be careful not to cause damage.

   (1) Disconnect the connector.

   (2) Remove it by pressing the lock portion of the switch - request as shown in the figure.



SECURITY AND LOCKS > Trunk Opener Button

INSTALLATION

1. Install the switch - request.
2. Install the trim panel - trunk lid.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

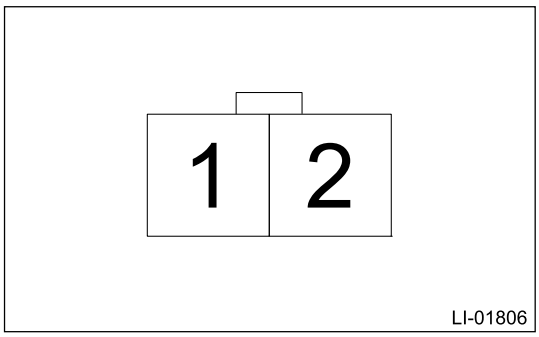
SECURITY AND LOCKS > Trunk Opener Button

INSPECTION

1. Measure the resistance between connector terminals.

   Preparation tool:

   Circuit tester



Terminal No.	Inspection conditions	Standard
1 — 2	When the switch is not pressed (CLOSE)	1 MΩ or more
	When the switch is pressed (OPEN)	Less than 1 Ω

2. Replace the switch - request if the inspection result is not within the standard value.

SECURITY AND LOCKS > Rear Lock Button

REMOVAL

Note:

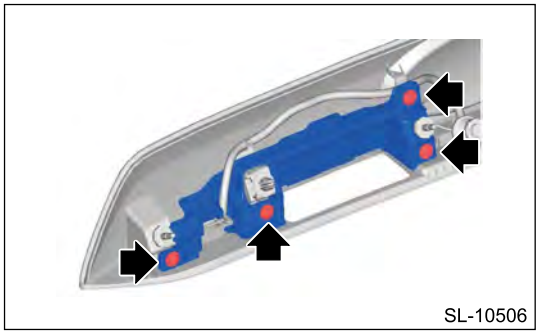
The rear lock button is integrated with the switch - opener rear gate.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the button - opener rear gate. Ref. to SECURITY AND LOCKS>Rear Gate Opener Button>REMOVAL.
3. Remove the switch - request (lock).

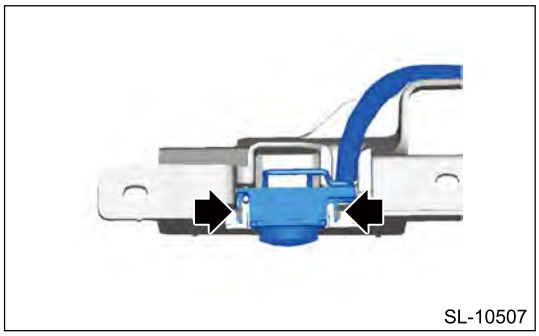
   Caution:

   When using a flat tip screwdriver, apply protective tape or cloth and be careful not to cause damage.

   (1) Remove the screws, and then remove the garnish switch bracket.



   (2) Remove the switch - request (lock) by pressing the lock portions on both sides.



SECURITY AND LOCKS > Rear Lock Button

INSTALLATION

Caution:

Make sure that the harness grommet is securely installed.

If not properly installed, this may cause leaks.

1. Install the switch - request (lock).
2. Install the switch - opener rear gate. Ref. to SECURITY AND LOCKS>Rear Gate Opener Button>INSTALLATION.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

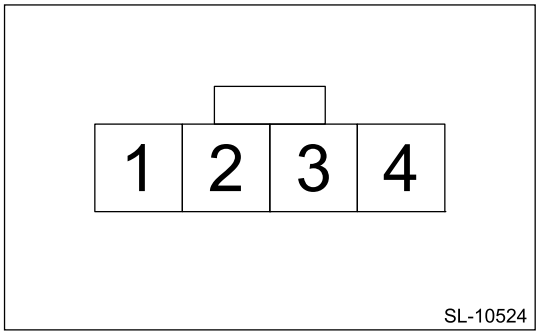
SECURITY AND LOCKS > Rear Lock Button

INSPECTION

1. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester



Terminal No.	Inspection conditions	Standard
3 — 4	When the switch is not pressed (CLOSE)	1 MΩ or more
	When the switch is pressed (OPEN)	Less than 5 Ω

2. Replace the switch - request (lock) if the inspection result is not within the standard value.

SECURITY AND LOCKS > Keyless Access CM

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket assembly and the back panel - pocket. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
3. Remove the keyless access CM.

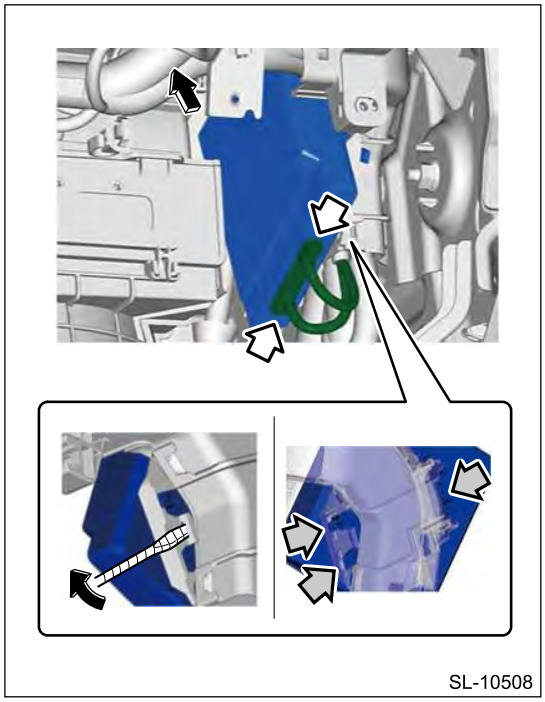
   Caution:

   Be careful to keep water and other foreign materials away from body integrated unit terminals.

   (1) Disconnect the connector.

   (2) Release the claws using a flat tip screwdriver or similar tool wrapped with protection tape.

   (3) Release the guides, and pull out the keyless access CM as shown in the figure.



SECURITY AND LOCKS > Keyless Access CM

INSTALLATION

Caution:

When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to "Type D" described in "REGISTRATION MANUAL FOR IMMOBILIZER".

1. Install the keyless access CM.
2. Install the pocket assembly and the back panel - pocket.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

NOTE

Caution:

When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to "Type D" described in "REGISTRATION MANUAL FOR IMMOBILIZER".

For removal/installation procedures of ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".

Note:

Equipped on C5 model with keyless access with push button start.

SECURITY AND LOCKS > Steering Lock CM

REPLACEMENT

Caution:

- **When the control module related to immobilizer has been replaced, be sure to perform the registration of immobilizer system. For detailed operation procedure, refer to "Type D" described in "REGISTRATION MANUAL FOR IMMOBILIZER".**
- **Do not apply any impact to the set bolt by a chisel or punch. Doing so may damage the steering lock CM.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not allow harness and connectors to interfere or get tangled up with other parts.**
- **If the steering wheel and steering angle sensor (steering roll connector) are removed, perform "VSC(VDC) Centering Mode" of the VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.**

For operation procedures of the steering lock CM, refer to "Ignition Key Lock". Ref. to SECURITY AND LOCKS>Ignition Key Lock.

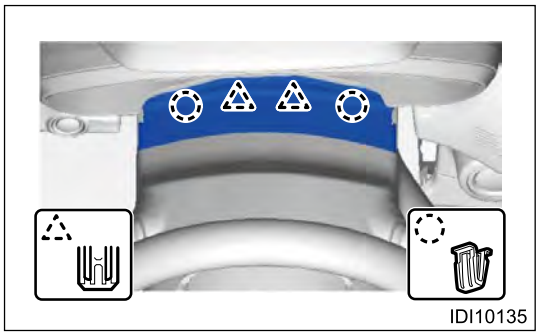
SECURITY AND LOCKS > Steering Lock CM

INSPECTION

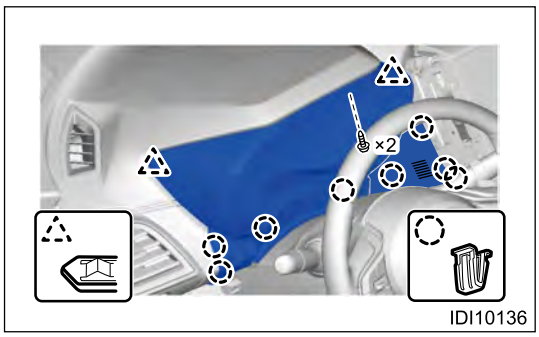
For inspection of the steering lock CM, refer to "Diagnostics with Phenomenon" of "KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)" section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > STEERING LOCK SYSTEM.

REMOVAL

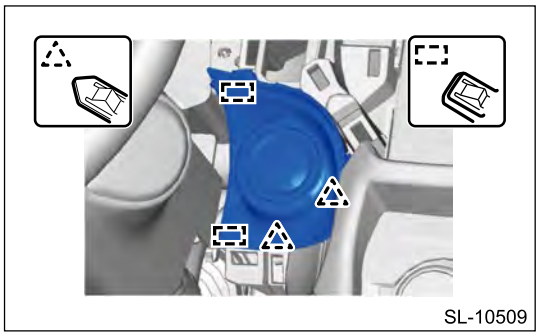
1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
3. Remove the grille assembly - CTR ventilation LH. Ref. to AIR CONDITIONER>Air Vent Grille>REMOVAL > CENTER GRILLE ASSEMBLY.
4. Remove the visor assembly - combination meter.
   (1) Release the clips of the cover assembly - visor LWR.



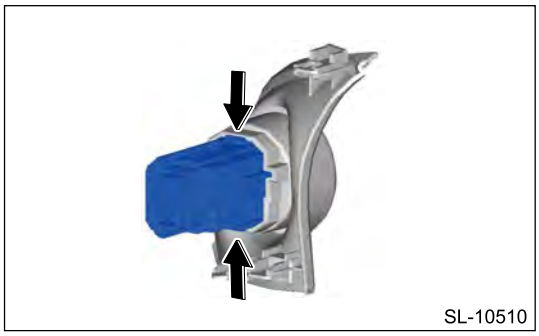
   (2) Release the screws, clips and claws.



   (3) Disconnect the connector, and remove the visor assembly - combination meter.
5. Remove the panel - starter SW.
   (1) Release the claws.
   (2) Detach the connectors and remove the panel - starter SW.



6. Remove the switch - push button start.
   (1) Release the claws, and remove the switch - push button start.



SECURITY AND LOCKS > Push Button Ignition Switch

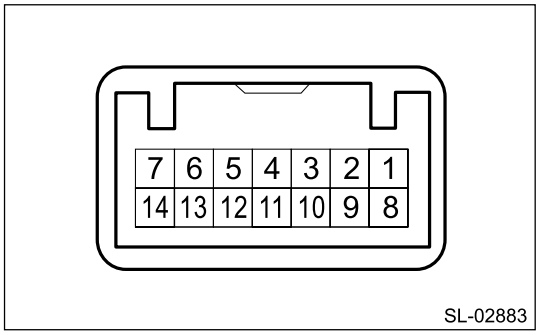
INSTALLATION

1. Install the switch - push button start.
2. Install the panel - starter SW.
3. Install the visor assembly - combination meter.
4. Install the grille assembly - CTR ventilation LH. Ref. to AIR CONDITIONER>Air Vent Grille>INSTALLATION.
5. Install the cover assembly - instrument panel LWR driver.
6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SECURITY AND LOCKS > Push Button Ignition Switch

INSPECTION

1. Check the continuity between the connector terminals.
   Preparation tool:
   Circuit tester



Terminal No.	Inspection conditions	Specification
4 (COM) — 5 (GND)	Always	Continuity exists
7 (SSW1) — 5 (GND)	Push button ignition switch released → pressed	Continuity exists
2 (SSW2) — 5 (GND)	Push button ignition switch released → pressed	Continuity exists

2. Check the push button ignition switch operation when battery voltage is applied between the connector terminals.

Terminal No.	Inspection conditions	Specification
11 (SWIL) — 5 (GND)	Connect battery to the terminals	Goes off → Red switch illumination light

Terminal No.	Inspection conditions	Specification
12 (INDS) — 5 (GND)		Turns off → Switch indicator lights in green
13 (INDW) — 5 (GND)		Turns off → Switch indicator lights in orange

3. Replace the push button ignition switch if it is found defective.

NOTE

For operation procedures of access buzzer, refer to “Keyless Buzzer” section. Ref. to SECURITY AND LOCKS>Keyless Buzzer.

OPERATION

Disabling/Activating the keyless access system
The following functions are disabled when the keyless access system functions are disabled:

- LOCK function performed by the operation of touch sensor on the door outer handle
- Rear gate LOCK function by rear lock button operation
- UNLOCK function by holding the door handle
- Trunk lid open function by trunk opener button operation in the trunk lid lock condition
- Rear gate open function by rear gate opener button operation in the rear gate lock condition
- Lockout protection function
- Warning function
- Engine starting control using keyless access collation

SECURITY AND LOCKS > Function Setting (Customize)

PROCEDURE

1. STOPPING KEYLESS ACCESS SYSTEM FUNCTION BY DOOR OPEN/CLOSE PROCEDURE

1. Check that the vehicle status is as follows:
   - Ignition switch OFF
   - One window is completely open
   - Keyless access system is activated (or disabled if re-activating)
2. Sit in the driver's seat with the door closed and press the door lock switch to UNLOCK once.
3. Open the driver's door within five seconds.
4. Within 5 seconds, with the driver's door opened, slowly press the door lock switch to UNLOCK twice.
5. Within 10 seconds after finishing step 4), perform the closing → opening operation of the driver's door twice.
6. Within 10 seconds after finishing step 5), with the driver's door opened, slowly press the door lock switch to UNLOCK twice.
7. Within 10 seconds after finishing step 6), perform the closing → opening operation of the driver's door once.
8. Within five seconds after finishing step 7), close the drivers door.
   Note:
   - **Perform the same procedures to re-activate the keyless access system from the disabled condition.**
   - **In step 4) and step 6), press the door lock switch completely. The function may not work properly if the switch is pressed shortly.**

2. STOPPING KEYLESS ACCESS SYSTEM FUNCTION BY USING ACCESS KEY

1. Open the driver's door, and then push the door lock knob forward (LOCK direction).
2. Press the lock button of access key and trunk/rear gate button simultaneously for five seconds or more.
3. The buzzer sounds for two seconds, and the function stops.

Note:

- **For stopping the keyless access system function by using access key, it is necessary to ask the customer to register the secret code of the secret code keyless entry. (Refer to owner’s manual for details.)**
- **Perform the same procedures to re-activate the keyless access system from the disabled condition.**

INSPECTION

1. KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

For the diagnostics with phenomenon for keyless access with push button start system, refer to “Diagnostics with Phenomenon” of “KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM (DIAGNOSTICS)” section. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon.

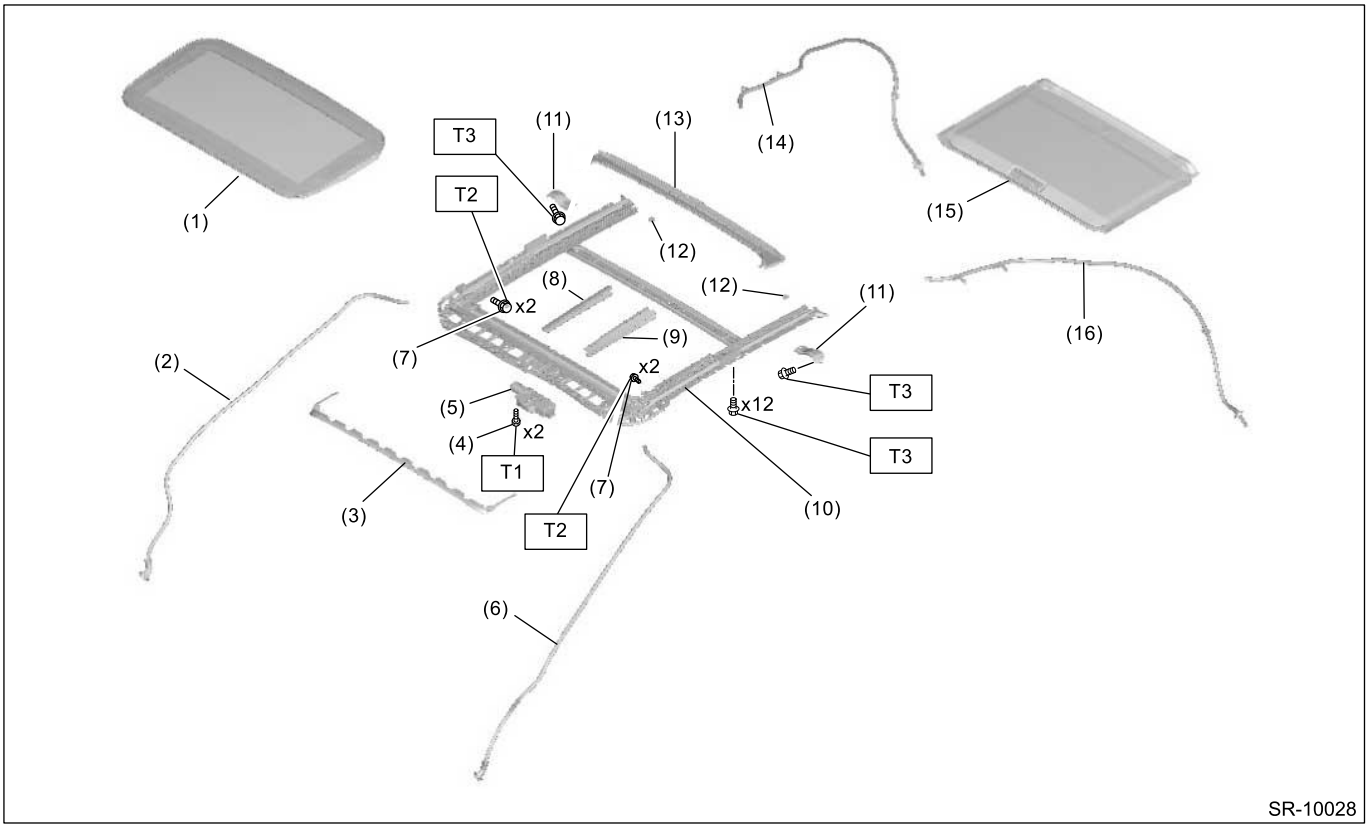
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)

SR

1. General Description
2. Relay and Fuse
3. Sunroof Control System
4. Glass Lid
5. Sunroof Switch
6. Sunroof Motor
7. Sunshade
8. Sunroof Assembly

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > General Description

COMPONENT



(1)	Lid ASSY - sunroof	(8)	Cover - lid RH	(15)	Sunshade ASSY
(2)	Drain tube - sunroof RH front	(9)	Cover - lid LH	(16)	Drain tube - sunroof LH rear
(3)	Deflector ASSY - sunroof	(10)	Frame ASSY - sunroof		
(4)	TORX® screw	(11)	Sunroof BRKT	***Tightening torque: N·m (kgf-m, ft-lb)***	
(5)	Motor ASSY - sunroof	(12)	Stopper rubber	***T1: 3 (0.3, 2.2)***	
(6)	Drain tube - sunroof LH front	(13)	Drain plate - sunroof	***T2: 4.5 (0.5, 3.3)***	
(7)	TORX® bolt	(14)	Drain tube - sunroof RH rear	***T3: 6 (0.6, 4.4)***	

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > General Description

CAUTION

Before disconnecting connectors of sensors or units, be sure to disconnect the ground cable from battery. When replacing the electrical parts provided with memory functions that store contents specified by a customer, record the memory contents before disconnecting the battery ground cable.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > General Description

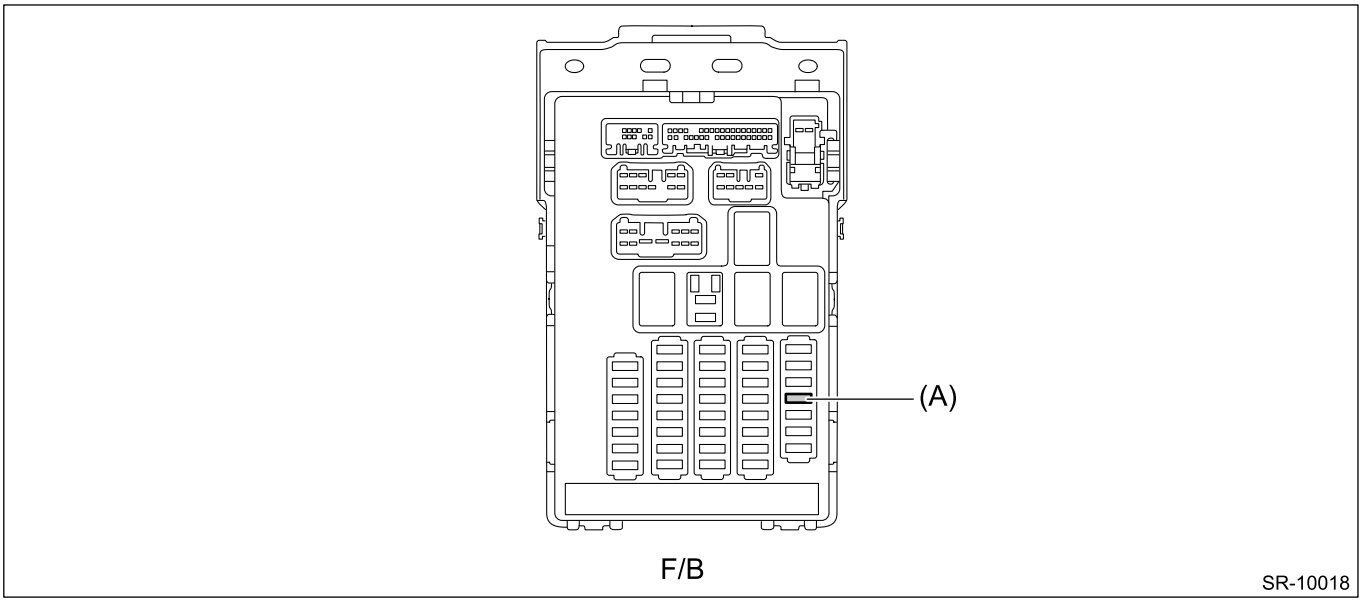
PREPARATION TOOL

1. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.

TOOL NAME	REMARKS
Hexagon wrench	Used for forcibly driving the motor assembly - sunroof. Width across flat 4 mm (0.16 in)
TORX® T25	Used for removing and installing the lid assembly - sunroof and motor assembly - sunroof.

LOCATION



Fuse box (F/B)	Fuse 10 A (IG 2)	(A)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

INSPECTION

1. CHECK FUSE

1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

WIRING DIAGRAM

Refer to "Sunroof Control System" in the wiring diagram. Ref. to WIRING SYSTEM>Sunroof Control System>WIRING DIAGRAM.

INSPECTION

Symptoms	Inspection steps
Water leakage	1. Check the roof panel and the lid assembly - sunroof for improper or poor sealing. 2. Check the drain tube - sunroof for clogging. 3. Check the joints of the rail assembly - sunroof for improper sealing and for proper installation to the body.
Booming noise, wind noise and other noise	1. Check the lid assembly - sunroof and the roof panel for improper clearance. 2. Check the sunshade assembly and the trim panel - roof assembly for improper clearance.
Motor and cable noise	1. Check installing part of motor for looseness. 2. Check gears and bearings for wear. 3. Check cable assembly for wear.
Failure of sunroof (Motor operates properly.)	1. Check guide rail for foreign particles. 2. Check parts for mutual interference. 3. Check slider for improper clinching.
Motor does not rotate or rotate improperly.	1. Check fuse for blown out. 2. Check switch for improper function. 3. Check harness for open or short and terminals for poor connections. 4. Check motor assembly - sun roof for incorrect terminal voltage.
Incorrect reverse operation of the lid assembly - sunroof	Check guide rail for foreign particles.

Incorrect reverse operation of the lid assembly - sunroof while driving on rough road

The lid assembly - sunroof has auto-reverse function. When the lid assembly - sunroof is pushed in the opening direction with a force of 100 N (10.2 kgf, 22.5 lbf), the glass lid moves in reverse and stops.

Therefore, if you operate (open or close) the lid assembly - sunroof while driving on rough road, the vibration may be judged as a force and the lid may incorrectly move in the reverse direction.

When the incorrect reverse operation is occurred repeatedly, perform inspection around the sunroof frame. If there are no problems, perform the initialization operation with following procedure.

OPERATION

1. INITIALIZE OPERATION

Caution:

During initialization, perform the position learning and the sliding learning. Sliding learning mode can not be initiated unless the position learning is performed.

Note:

When initialize operation is performed, it is necessary to press the switch repeatedly as it operates for only at the moment when the switch is pressed, even when the switch is held down.

POSITION IS NOT MEMORIZED (AUTOMATIC OPEN/CLOSE CANNOT BE PERFORMED)

«Position learning»

1. Position the lid assembly - sunroof at the fully tilt up position, and press and hold the tilt up switch for ten seconds.
2. The motion of the glass lid shifts to inching operation until it reaches the mechanical lock position (further tilt up position than the fully tilt up position). After the mechanical lock, it returns to the fully tilt up position and then stops.
3. Release the tilt up switch to finish the position learning.

«Sliding learning»

4. Within six seconds after the position learning is finished, press and hold the tilt up switch again.
5. The lid assembly - sunroof moves to the full close position, full open position, and the full close position successively, and stops at the full close position.
6. Release the tilt up switch and turn the ignition switch to OFF to finish the initializing.

POSITION IS MEMORIZED (AUTOMATIC OPEN/CLOSE CAN BE PERFORMED)

«Position learning»

1. Position the lid assembly - sunroof at the fully tilt up position, and press and hold the tilt up switch for ten seconds.
2. The motion of the glass lid shifts to inching operation until it reaches the mechanical lock position (further tilt up position than the fully tilt up position). After the mechanical lock, it returns to the fully tilt up position and then stops.
3. Release the tilt up switch to finish the position learning.

   Note:

   If the glass lid does not shift to inching operation until it reaches to the mechanical lock position in step 2, perform steps 4 — 6.
4. Position the lid assembly - sunroof at the fully open position, and press and hold the tilt up switch for ten seconds.
5. The motion of the glass lid shifts to inching operation until it reaches the mechanical lock position. After that, it returns to the fully tilt up position and then stops.
6. Release the tilt up switch to finish the position learning.

«Sliding learning»

7. Within six seconds after the position learning is finished, press and hold the tilt up switch again.
8. The lid assembly - sunroof moves to the full close position, full open position, and the full close position successively, and stops at the full close position.
9. Release the tilt up switch and turn the ignition switch to OFF to finish the initializing.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Control System

NOTE

For procedure of each component in the sunroof control system, refer to the respective section.

- Glass lid: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Glass Lid.
- Sunroof assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Assembly.
- Sunroof motor: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Motor.

- Sunroof switch: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Switch.
- Sunshade: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunshade.

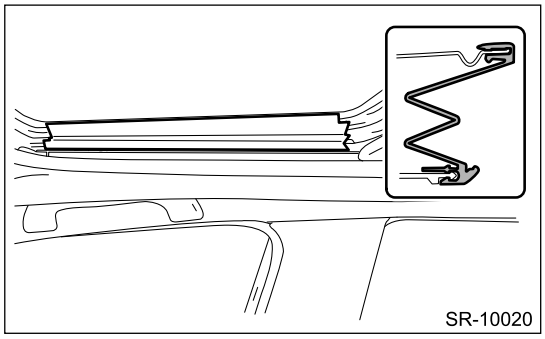
REMOVAL

1. GLASS LID

Caution:

Be careful not to damage the lid assembly - sunroof.

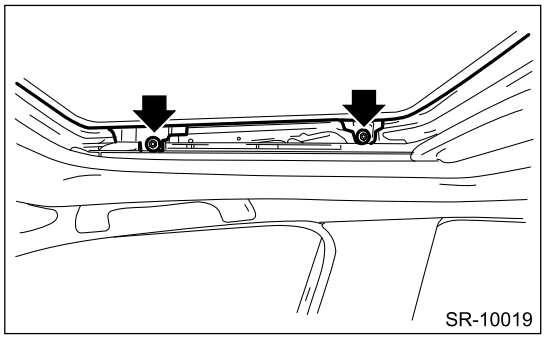
1. Completely close the lid assembly - sunroof, and open the sunshade assembly.
2. Remove the cover - lid.



3. Remove the lid assembly - sunroof.

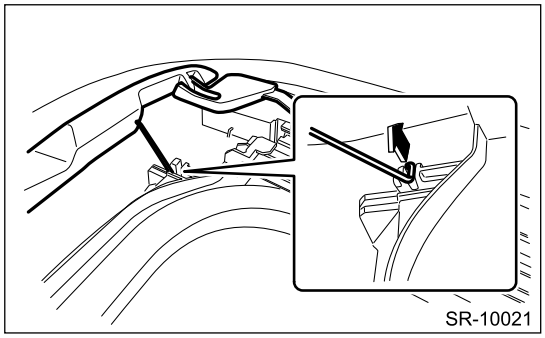
Preparation tool:

TORX® T25

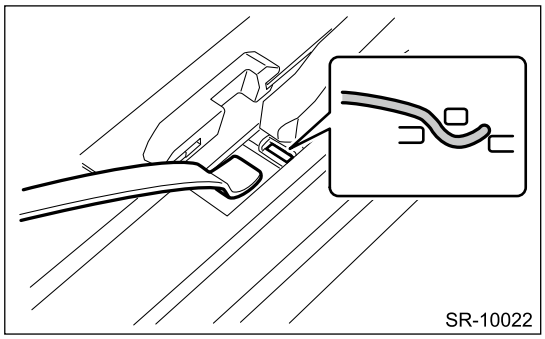


2. DEFLECTOR ASSEMBLY

1. Open the lid assembly - sunroof and the sunshade assembly.
2. Remove the deflector assembly - sunroof.
   (1) Remove the spring from the rail assembly - sunroof.



   (2) While lifting up the deflector assembly - sunroof, remove the deflector assembly - sunroof from the hook on the rail assembly - sunroof.

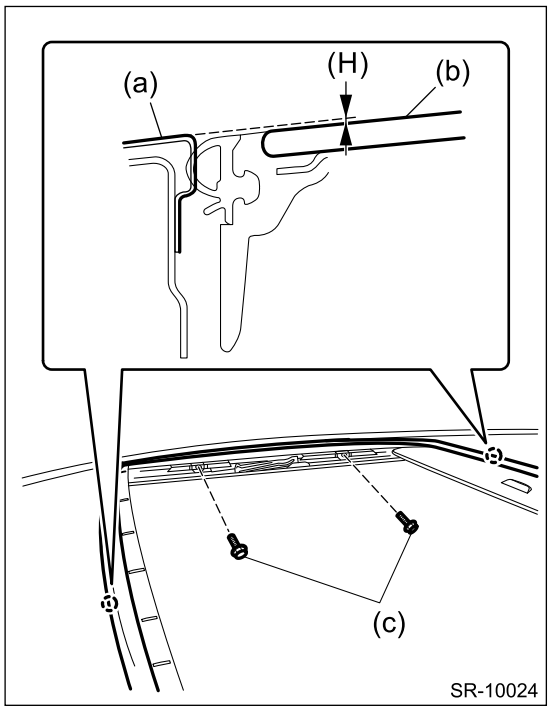


SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Glass Lid

INSTALLATION

1. GLASS LID

1. Using a new TORX® bolt, temporarily install the lid assembly - sunroof.
   Preparation tool:
   TORX® T25
2. Perform the open/close operation checks for the glass lid.
3. Tighten the TORX®bolts to the specified torque while adjusting the height of the lid assembly - sunroof to the specified value.
   Specification:
   Lid assembly - sunroof to Roof panel (H): 0.7±1 mm (0.03±0.04 in)



(a) Roof panel
(b) Lid ASSY - sunroof
(c) TORX® bolt

Tightening torque:
4.5 N·m (0.5 kgf-m, 3.3 ft-lb)

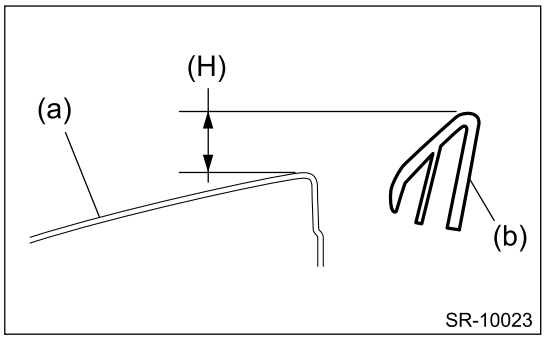
4. Install the cover - lid.

2. DEFLECTOR ASSEMBLY

1. Install the deflector assembly - sunroof.
2. After installation, measure the height from the roof panel when deflector assembly - sunroof is activated.

Specification:

Deflector assembly - sunroof to Roof panel (H): 13.7 mm (0.54 in)



(a) Roof panel

(b) Deflector ASSY - sunroof

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Glass Lid

FORCED DRIVE

If the lid assembly - sunroof does not operate or the motor assembly is not supplied with power, move the lid assembly - sunroof using the hexagon wrench.

Preparation tool:

Hexagon wrench: width across flat 4 mm (0.16 in)

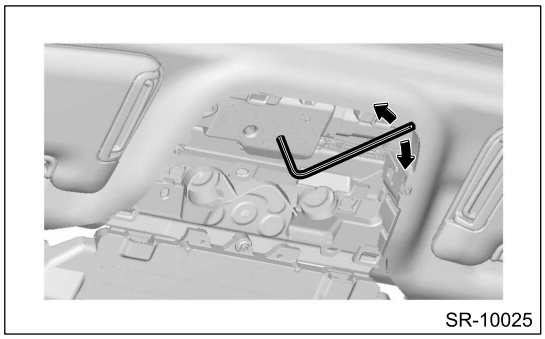
Caution:

After a forced operation, make sure to perform an initialize operation.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
3. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
4. Insert the hexagon wrench securely until it touches the motor shaft end.
5. Turn the hexagon wrench, and move the lid assembly - sunroof.
   - Turning right, the lid assembly - sunroof opens.
   - Turning left, the lid assembly - sunroof closes.

   Caution:

   Be careful not to damage the adjacent parts with the rod end when moving the lid assembly - sunroof with the hexagon wrench.

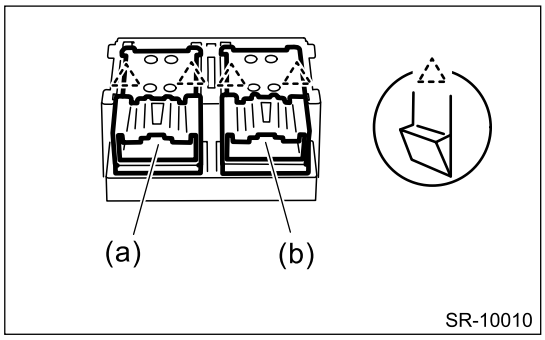


6. Install the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>INSTALLATION.
7. Install the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
9. Perform the initialize operation. Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Control System>OPERATION > INITIALIZE OPERATION.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Switch

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
3. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
4. Release the claws, and then remove the sunroof switch.



(a) Sunroof switch (tilt)

(b) Sunroof switch (slide)

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Switch

INSTALLATION

Caution:

For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.

1. Install the sunroof switch.
2. Install the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>INSTALLATION.
3. Install the light assembly - map. (Models without EyeSight)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

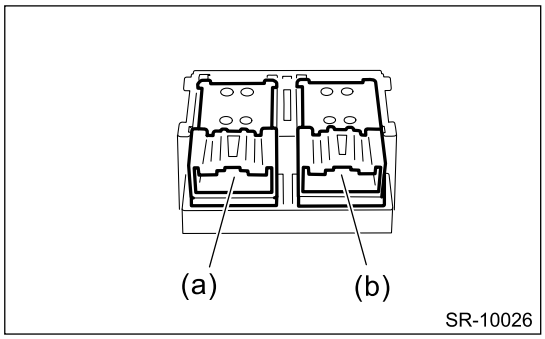
SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Switch

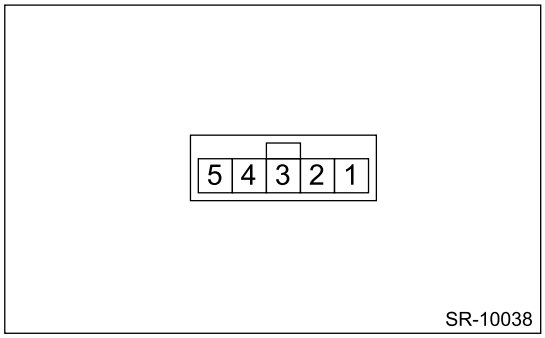
INSPECTION

1. Disconnect the harness connector of sunroof switch.
2. Measure the resistance between connector terminals.

Preparation tool:

Circuit tester





Terminal No.	Inspection conditions	Standard	Connector
1 — 3	OPEN	Less than 1 Ω	(b): Slide switch
4 — 3	CLOSE	Less than 1 Ω	
4 — 3	Tilt down	Less than 1 Ω	(a): Tilt switch
1 — 3	Tilt up	Less than 1 Ω	

3. Replace the sunroof switch if the inspection result is not within the standard value.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Motor

REMOVAL

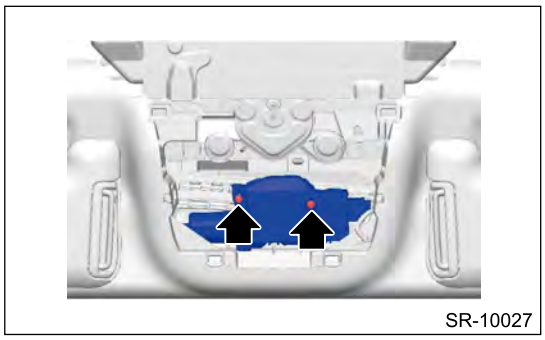
1. Completely close the lid assembly - sunroof.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
4. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
5. Remove the motor assembly - sunroof.
   (1) Disconnect the harness connector.
   (2) Remove the TORX® screws and remove the motor assembly - sunroof.

Caution:

When removing the motor assembly - sunroof, secure the cable assembly so that it does not move.

Preparation tool:

TORX® T25



SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Motor

INSTALLATION

Caution:

- **For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.**
- **When installing the motor assembly - sunroof, be careful not to move the cable assembly.**

1. Install the motor assembly - sunroof.
2. Install the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>INSTALLATION.
3. Install the light assembly - map. (Models without EyeSight)
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Perform the initialize operation. Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Control System>OPERATION > INITIALIZE OPERATION.
6. Check the operation of sunroof by following the table below.

Operation	Switch position
(1) Lid assembly - sunroof closes completely.	Close
(2) Lid assembly - sunroof is tilted up to the top position.	Tilt up

Operation	Switch position
(3) Lid assembly - sunroof closes completely.	Tilt down
(4) Lid assembly - sunroof opens completely.	Open
(5) Lid assembly - sunroof closes completely.	Close

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Motor

INSPECTION

Check the auto-reverse mechanism.

Caution:

Do not place objects in the way to check the auto-reverse mechanism.

1. Open the lid assembly - sunroof.
2. Push the lid assembly - sunroof in the opening direction with a force of 100 N (10.2 kgf, 22.5 lbf) during auto-closing, and check if the window auto-reverse mechanism operates properly.

   Note:

   If the auto function is cancelled, perform the initialize operation. Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Control System>OPERATION > INITIALIZE OPERATION.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunshade

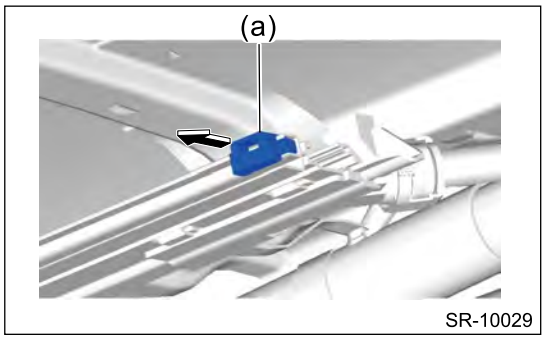
REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - roof assembly.
   - 4 door model: Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL > 4 DOOR MODEL.
   - 5 door model: Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL > 5 DOOR MODEL.
3. Remove the sunshade assembly.

   Caution:

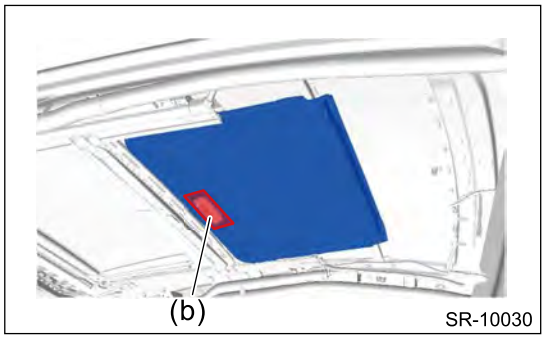
   Be careful not to damage the sunshade assembly.

   (1) Remove the left and right stopper rubbers (a).



   (2) Attach protective tape (b) on the handle of sunshade assembly.

   (3) Remove the sunshade assembly while pulling the center of the brace downward.



SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunshade

INSTALLATION

Caution:

For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.

1. Attach protective tape on the handle and the edge surface of the sunshade assembly, and install the sunshade assembly.
2. Install the left and right stopper rubbers.
3. Install the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunshade

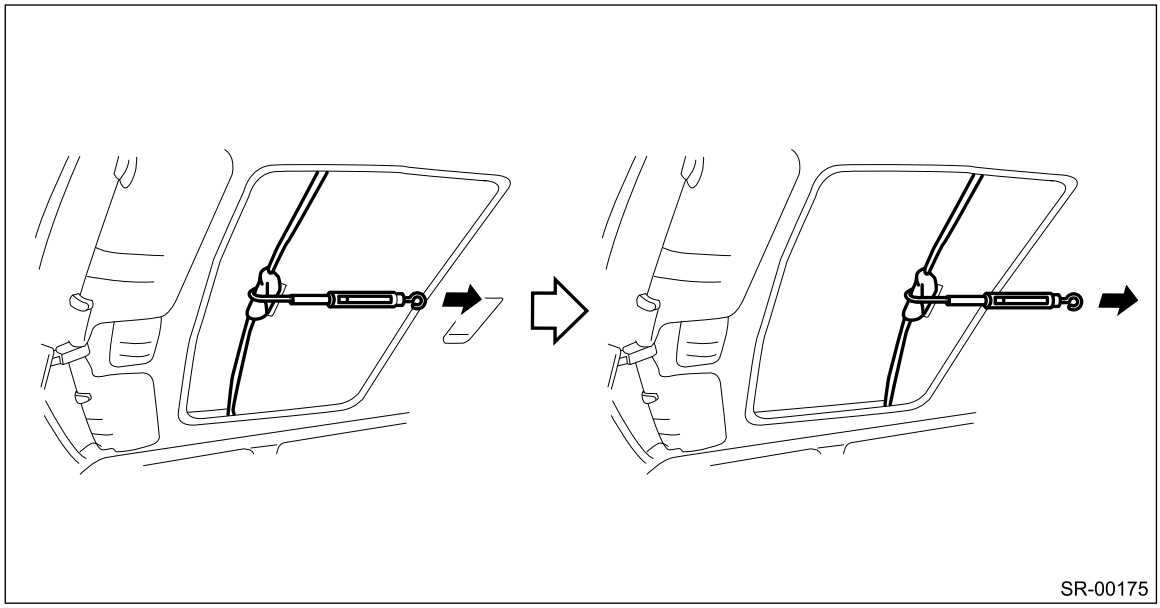
INSPECTION

1. MOVING LOAD OF SUNSHADE ASSEMBLY

1. Attach a spring scale together with a cloth to the edge of sunshade assembly.
2. Pull the spring scale to check the moving load of the sunshade assembly.

   Moving load of sunshade assembly:

   15.5±9.5 N (1.6 kgf, 3.5 lbf±1 kgf, 2.1 lbf)



Note:

Moving load is larger at the beginning of pulling a spring scale, so take a spring scale reading while the sunshade assembly is sliding smoothly.

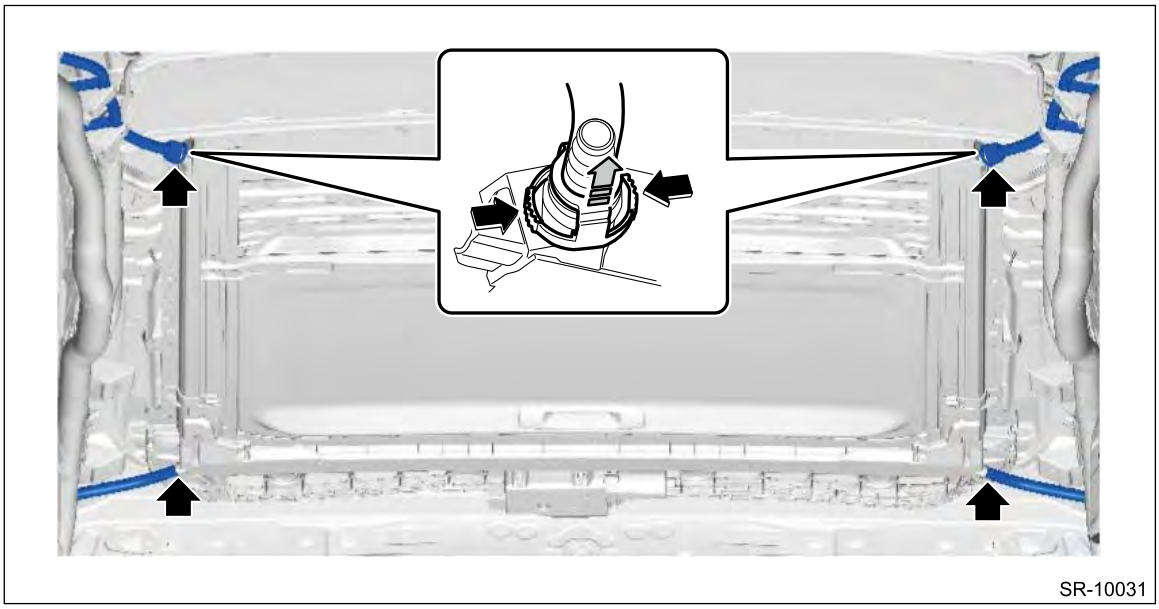
3. If the inspection result exceeds the standard, check that the sunshade assembly or the rail assembly - sunroof is installed properly. If necessary, replace the sunshade assembly or the rail assembly - sunroof.

REMOVAL

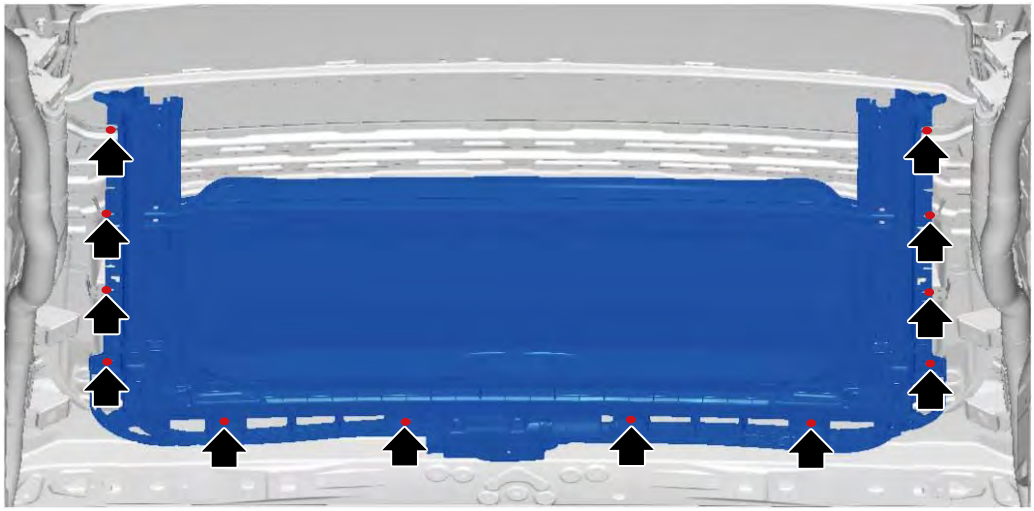
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **When removing the clip, use great care not to damage the trim panel - roof assembly.**

1. Disconnect the ground cable from battery and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
   Note:
   Completely close the lid assembly - sunroof, then disconnect the ground cable.
2. Remove the light assembly - map. (Models without EyeSight) Ref. to LIGHTING SYSTEM>Spot Map Light>REMOVAL.
3. Remove the stereo camera cover assembly. (Models with EyeSight) Ref. to EyeSight>Stereo Camera>REMOVAL.
4. Disconnect the connector of the motor assembly - sunroof.
5. Remove the trim panel - roof assembly.
   - 4 door model: Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL > 4 DOOR MODEL.
   - 5 door model: Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>REMOVAL > 5 DOOR MODEL.
6. Remove the drain tube - sunroof.
   Note:
   When removing the drain tube - sunroof completely, perform the step 8).



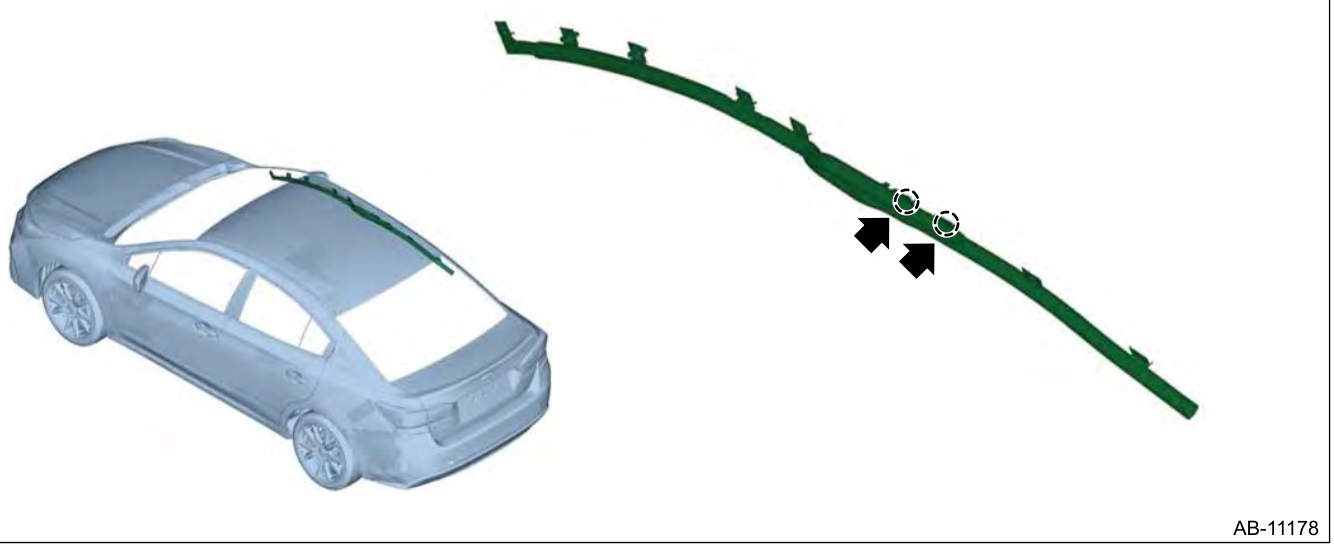
7. Remove the rail assembly - sunroof.
   (1) Remove the bolt, and then remove the rail assembly - sunroof.

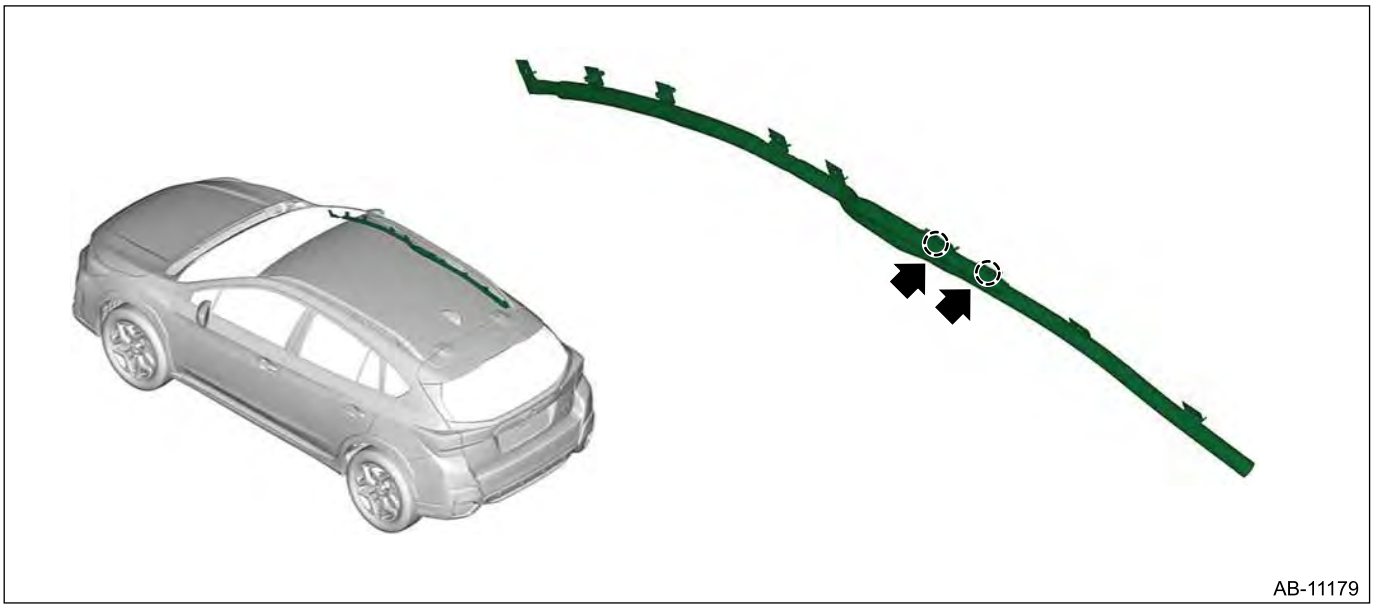


(2) Remove the bolts (2 places) securing the curtain airbag module.

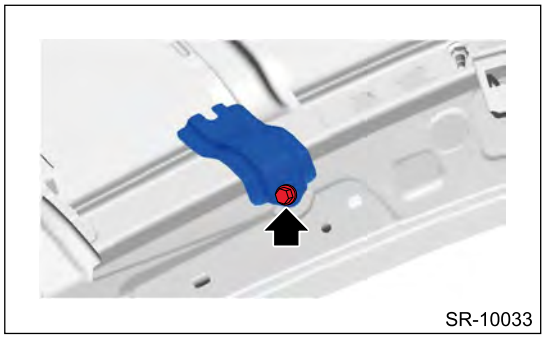
Caution:

- **Do not remove the clips securing the curtain airbag module. If any of the clips are removed, the curtain airbag module may not deploy properly in collision. If the clip is removed, replace the curtain airbag module assembly.**
- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Be careful not to damage the curtain airbag module during removal.**





(3) Remove the bolts and then remove the sunroof bracket.



8. Remove the drain tube - sunroof.

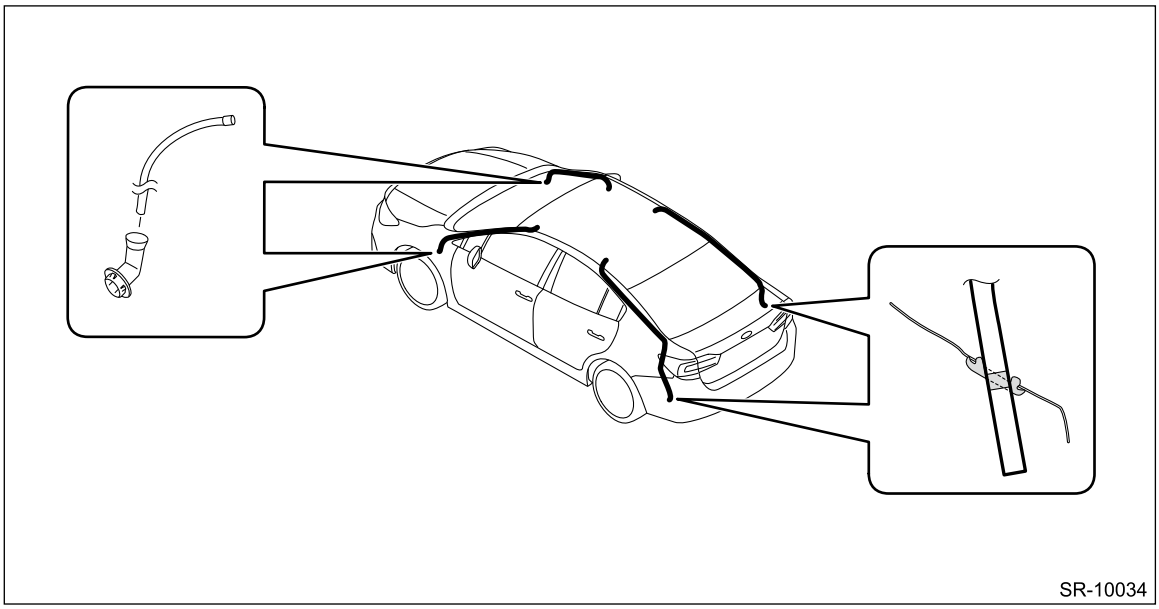
Note:

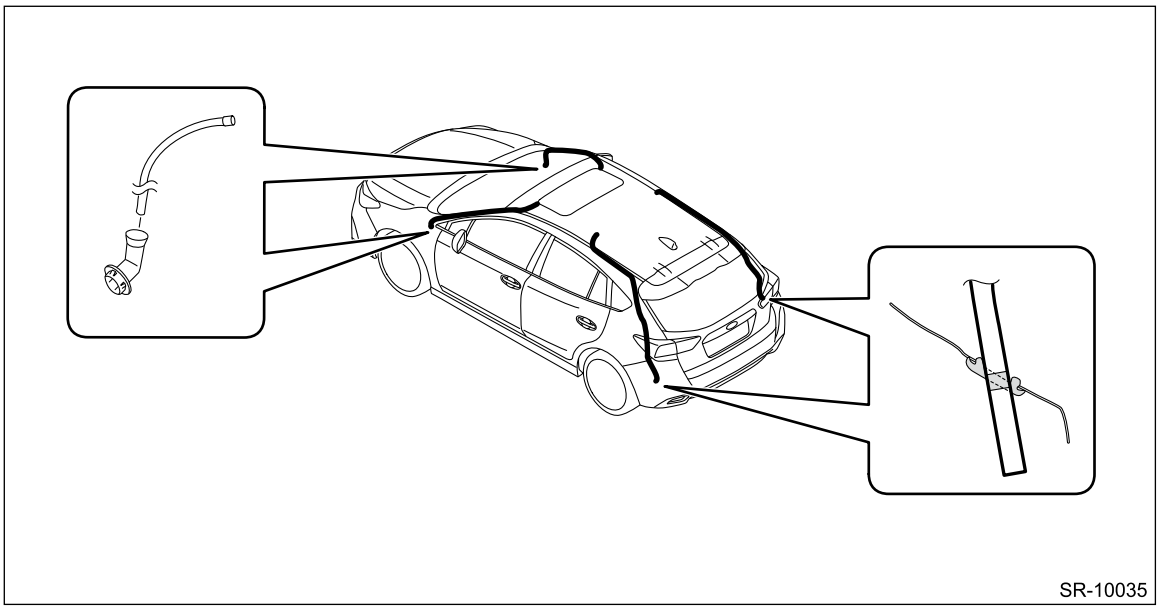
For easy replacement work, attach a string when pulling the drain tube - sunroof.

- Front side
  1. Remove the cover assembly - instrument panel LWR driver. Ref. to EXTERIOR/INTERIOR TRIM>Instrument Panel Lower Cover>REMOVAL.
  2. Remove the glove box assembly. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
  3. Turn over the toe board insulator while avoiding to touch the harness around the drain tube.
  4. Remove the clips, and turn over the rear side of the mud guard - front.

     Note:

     Remove the front wheels as necessary.
  5. Remove the front side of drain tube - sunroof.
  6. Remove the drain tube - sunroof.
- Rear side
  1. Remove the mat - trunk and trim panel - trunk side. (4 door model) Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
  2. Remove the bumper face - rear.
  3. Remove the rear side of drain tube - sunroof.
  4. Remove the drain tube - sunroof.





SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Assembly

INSTALLATION

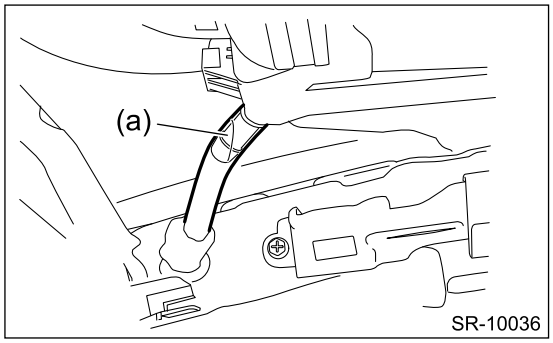
Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **For installation of the stereo camera cover assembly, refer to "INSTALLATION", "Stereo Camera" in the "EyeSight" section and observe the precautions for installation. Ref. to EyeSight>Stereo Camera>INSTALLATION.**
- **Be careful not to snag the harness.**

1. Install the drain tube - sunroof.
2. Install the rail assembly - sunroof.
   Tightening torque:
   6 N·m (0.6 kgf-m, 4.4 ft-lb)
3. Install the curtain airbag module. Ref. to AIRBAG SYSTEM>Curtain Airbag

Module>INSTALLATION.

4. Install the sunroof bracket.
   Tightening torque:
   6 N·m (0.6 kgf-m, 4.4 ft-lb)
5. Connect the harness connector of the drain tube - sunroof and the motor assembly.
   Caution:
   - **Insert the drain tubes on the front side until they contact all the way to the end (a) of drain pipes.**



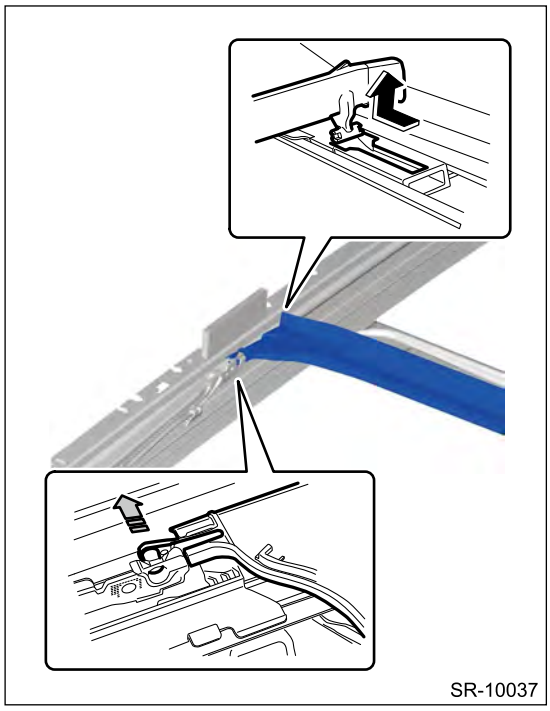
   - **For the drain tubes on the rear side, securely insert the resin connector until a clicking sound is heard.**
6. Check for the water leakage for each part and if there is no problem install the following parts.
   - Front side
     1. Mud guard - front
     2. Glove box assembly
     3. Cover ASSY - instrument panel LWR driver
   - Rear side
     1. Mat - trunk and trim panel - trunk side (4 door model)
     2. Bumper face - rear
7. Install the trim panel - roof assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Trim>INSTALLATION.
8. Using a new TORX® bolt, install the lid assembly - sunroof.
   Preparation tool:
   TORX® T25
   Tightening torque:
   4.5 N·m (0.5 kgf-m, 3.3 ft-lb)
9. Install the cover - lid.
10. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Assembly

DISASSEMBLY

1. Remove the following parts referring the respective procedures.
   - Lid assembly - sunroof: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Glass Lid>REMOVAL > GLASS LID.
   - Deflector assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Glass Lid>REMOVAL > DEFLECTOR ASSEMBLY.
   - Sunshade assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunshade>REMOVAL.
   - Sunroof motor assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Assembly>REMOVAL.

2. Remove the drain plate - sunroof.
   (1) Release the claws on the front side.
   (2) Slide the drain plate - sunroof and remove from the rail section.



SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF) > Sunroof Assembly

ASSEMBLY

1. Remove the drain plate - sunroof.
2. Remove the following parts referring the respective procedures.
   - Lid assembly - sunroof: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Glass Lid>INSTALLATION > GLASS LID.
   - Deflector assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Glass Lid>INSTALLATION > DEFLECTOR ASSEMBLY.
   - Sunshade assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunshade>INSTALLATION.
   - Sunroof motor assembly: Ref. to SUNROOF/T-TOP/CONVERTIBLE TOP (SUNROOF)>Sunroof Assembly>INSTALLATION.

WIPER AND WASHER SYSTEMS

WW

1. General Description
2. Relay and Fuse
3. Wiper and Washer System
4. Combination Switch (Wiper)
5. Wiper Blade
6. Washer Tank and Motor
7. Front Wiper Arm
8. Front Wiper Motor and Link
9. Front Washer Nozzle and Hose
10. Rear Wiper Arm
11. Rear Wiper Motor
12. Rear Washer

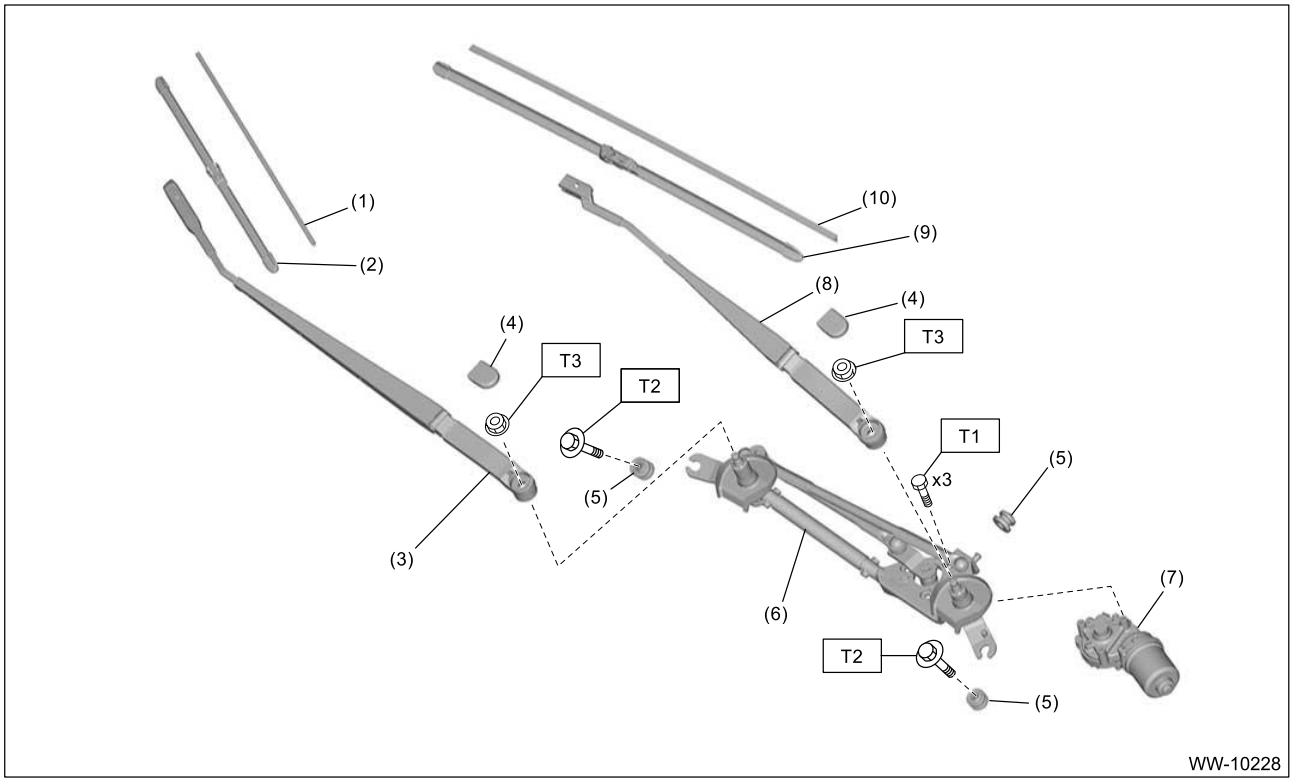
SPECIFICATION

Front wiper motor	Input	12 V — 72 W or less
Rear wiper motor	Input	12 V — 42 W or less
Front washer motor	Pump type	Centrifugal
	Input	12 V — 72 W or less
Rear washer motor	Pump type	Centrifugal
	Input	12 V — 42 W or less

COMPONENT

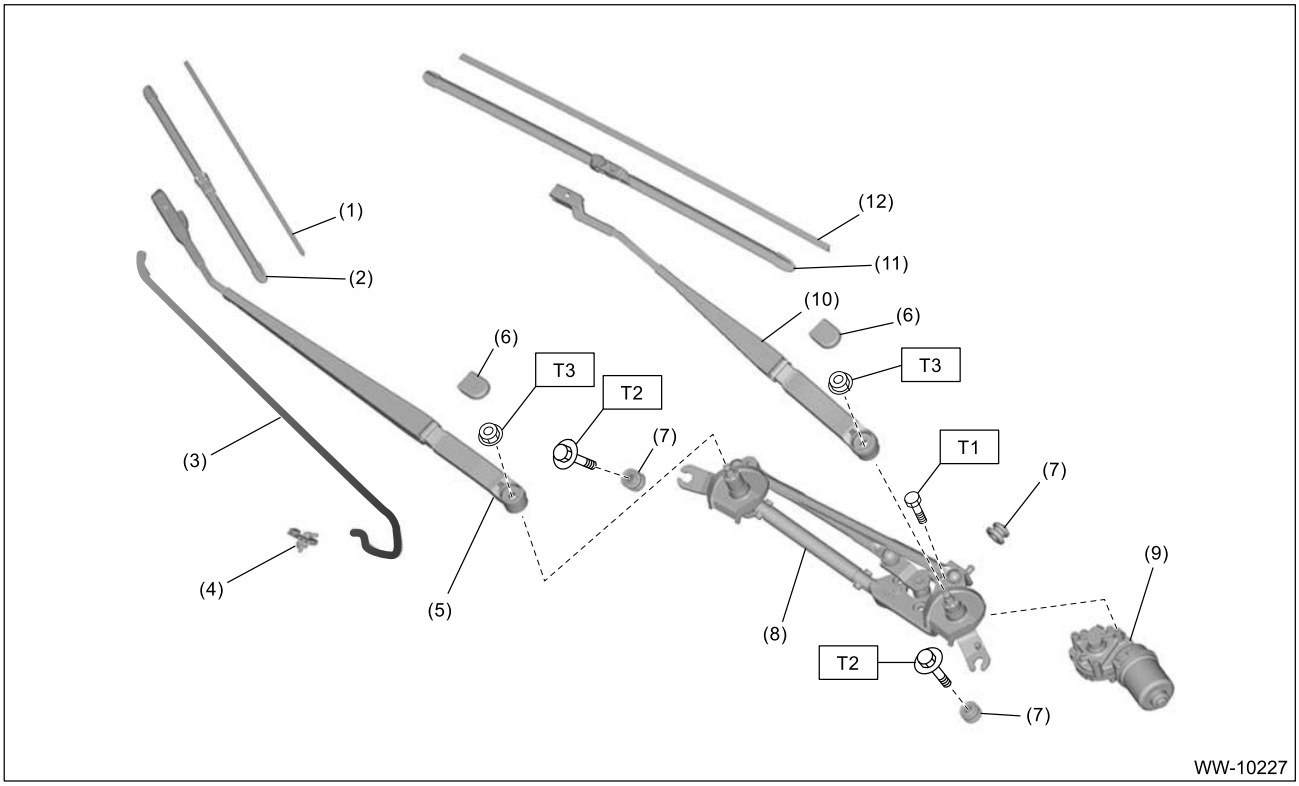
1. FRONT WIPER

- Models without EyeSight



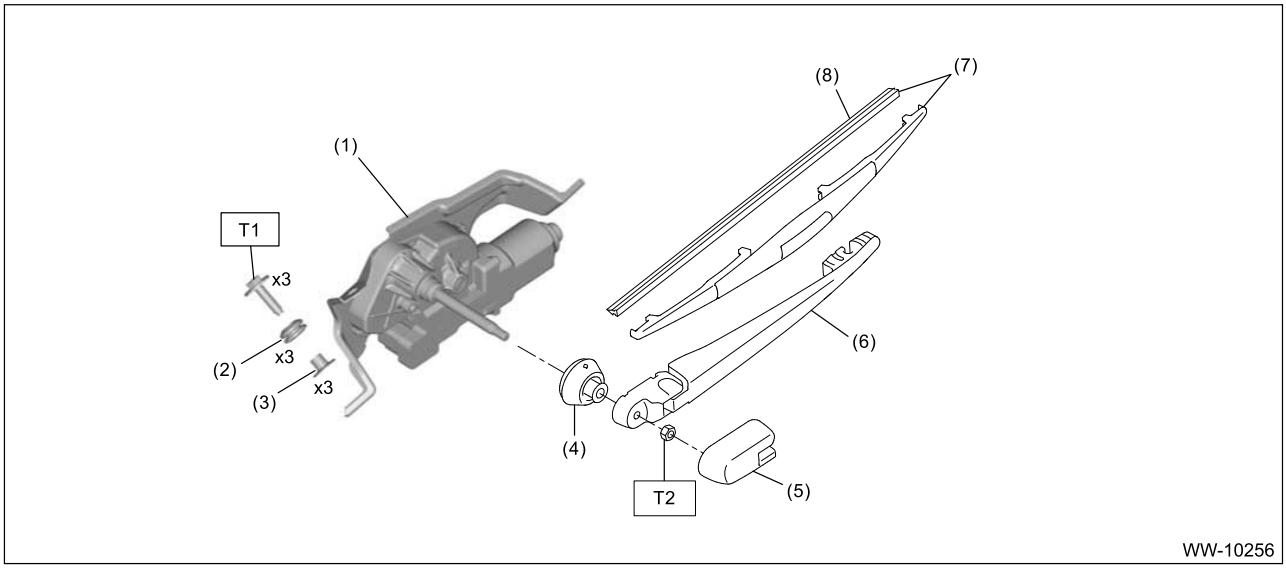
(1)	Rubber ASSY - windshield wiper assistor	(6)	Link ASSY - windshield wiper	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Blade ASSY - windshield wiper assistor	(7)	Motor ASSY - windshield wiper	***T1: 5.5 (0.6, 4.1)***	
(3)	Arm ASSY - windshield wiper assistor	(8)	Arm ASSY - windshield wiper driver	***T2: 6 (0.6, 4.4)***	
(4)	Cover - windshield wiper arm	(9)	Blade ASSY - windshield wiper driver	***T3: 26 (2.7, 19.2)***	
(5)	Busing - wiper link	(10)	Rubber ASSY - windshield wiper driver		

- Models with EyeSight



(1)	Rubber ASSY - windshield wiper assistor	(7)	Busing - wiper link	***Tightening torque: N·m (kgf-m, ft-lb)***	
(2)	Blade ASSY - windshield wiper assistor	(8)	Link ASSY - windshield wiper	***T1: 5.5 (0.6, 4.1)***	
(3)	Hose - wiper arm washer	(9)	Motor ASSY - windshield wiper	***T2: 6 (0.6, 4.4)***	
(4)	Joint - washer hose	(10)	Arm ASSY - windshield wiper driver	***T3: 26 (2.7, 19.2)***	
(5)	Arm ASSY - windshield wiper assistor	(11)	Blade ASSY - windshield wiper driver		
(6)	Cover - windshield wiper arm	(12)	Rubber ASSY - windshield wiper driver		

2. REAR WIPER



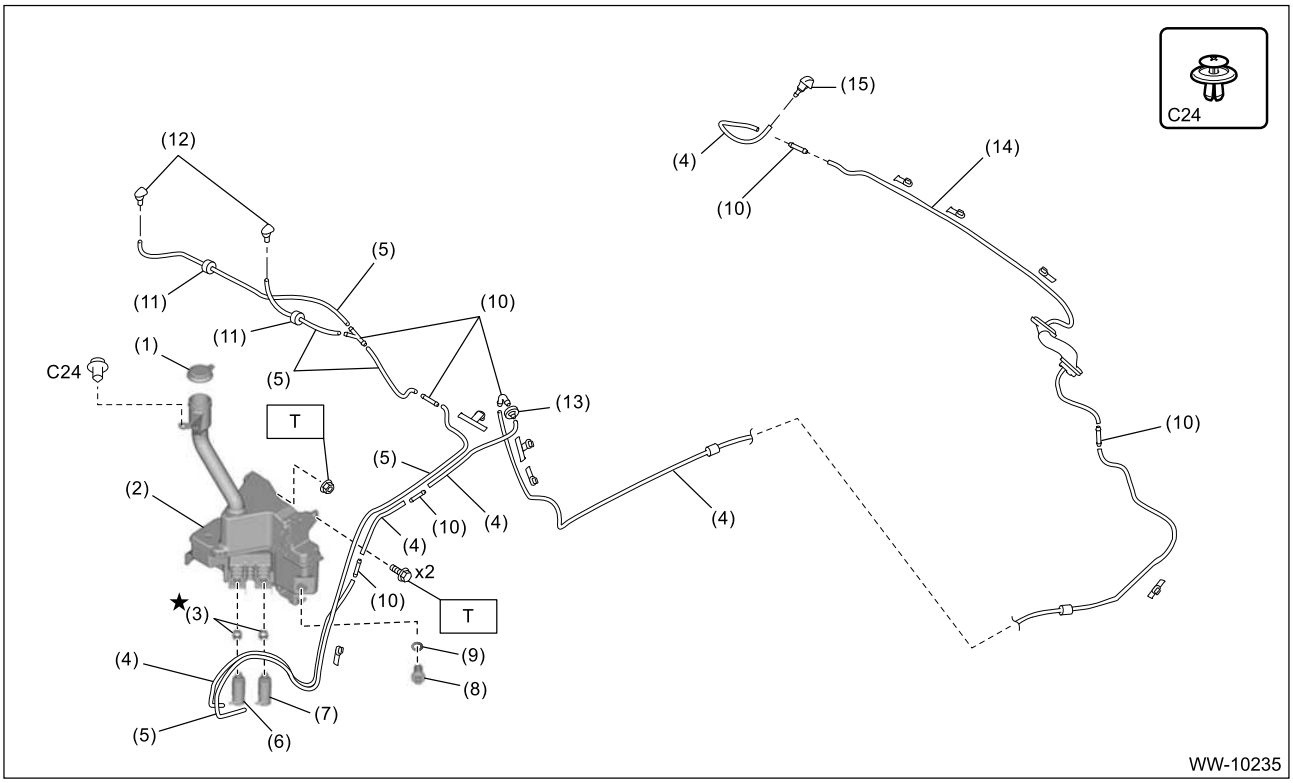
(1) Motor ASSY - rear wiper
(2) Mount rubber
(3) Collar
(4) Cap - pivot wiper
(5) Cover - rear wiper arm
(6) Arm ASSY - rear wiper
(7) Blade ASSY - rear wiper
(8) Rubber ASSY - rear wiper

Tightening torque: N·m (kgf-m, ft-lb)

T1: 7 (0.7, 5.2)
T2: 8 (0.8, 5.9)

3. WASHER TANK

- Models without EyeSight



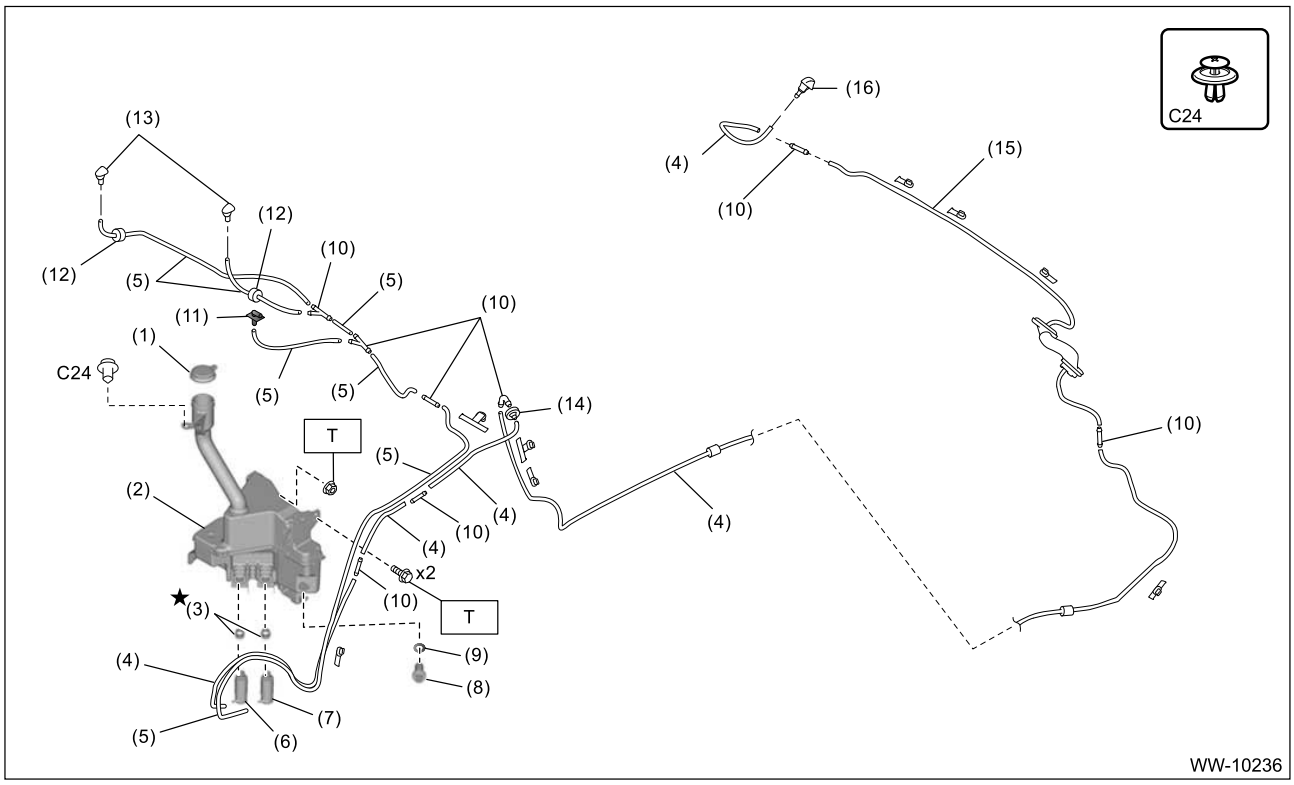
(1) Cap - windshield washer tank
(2) Tank ASSY - washer
(3) Packing - washer motor
(7) Motor pump ASSY - washer front
(8) Sensor - washer tank
(9) Packing - washer sensor
(13) Grommet - washer hose (5 door model)
(14) Hose ASSY - rear washer (included in rear gate harness ASSY) (5 door model)
(15) Nozzle - rear washer (5 door

model)

(4) Hose - rear washer (5 door model)
(5) Hose - windshield washer
(6) Motor pump ASSY - washer rear (5 door model)
(10) Joint - washer hose
(11) Check valve - windshield washer
(12) Nozzle - windshield washer

Tightening torque: N·m (kgf-m, ft-lb)
T: 6 (0.6, 4.4)

- Models with EyeSight



(1) Cap - windshield washer tank
(2) Tank ASSY - washer
(3) Packing - washer motor
(4) Hose - rear washer (5 door model)
(5) Hose - windshield washer
(6) Motor pump ASSY - washer rear (5 door model)
(7) Motor pump ASSY - washer front
(8) Sensor - washer tank
(9) Packing - washer sensor
(10) Joint - washer hose
(11) Joint - arm washer hose
(12) Check valve - windshield washer
(13) Nozzle - windshield washer
(14) Grommet - washer hose (5 door model)
(15) Hose ASSY - rear washer (included in rear gate harness ASSY) (5 door model)
(16) Nozzle - rear washer (5 door model)

Tightening torque: N·m (kgf-m, ft-lb)
T: 6 (0.6, 4.4)

CAUTION

- Before performing vehicle maintenance, turn the ignition switch to OFF and disconnect the negative terminal from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
- Be careful of the following items. Failing to do so may cause the airbag system malfunction.
  - Yellow connectors and harnesses with yellow tapes around them are the connectors and harnesses for the airbag system. When using a tester on these circuits, follow the cautions of "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.
  - Be careful not to damage the airbag system wiring harness when servicing the electrical parts around the steering column.
- When connecting the washer hoses, be careful not to cause bend or blockage.
- If even a small amount of silicon oil or grease enters the tank - washer and the washer fluid passages, an oil film will be formed on the glass and will cause the wiper to chatter and judder. Make sure that no oil comes into contact with the system.

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

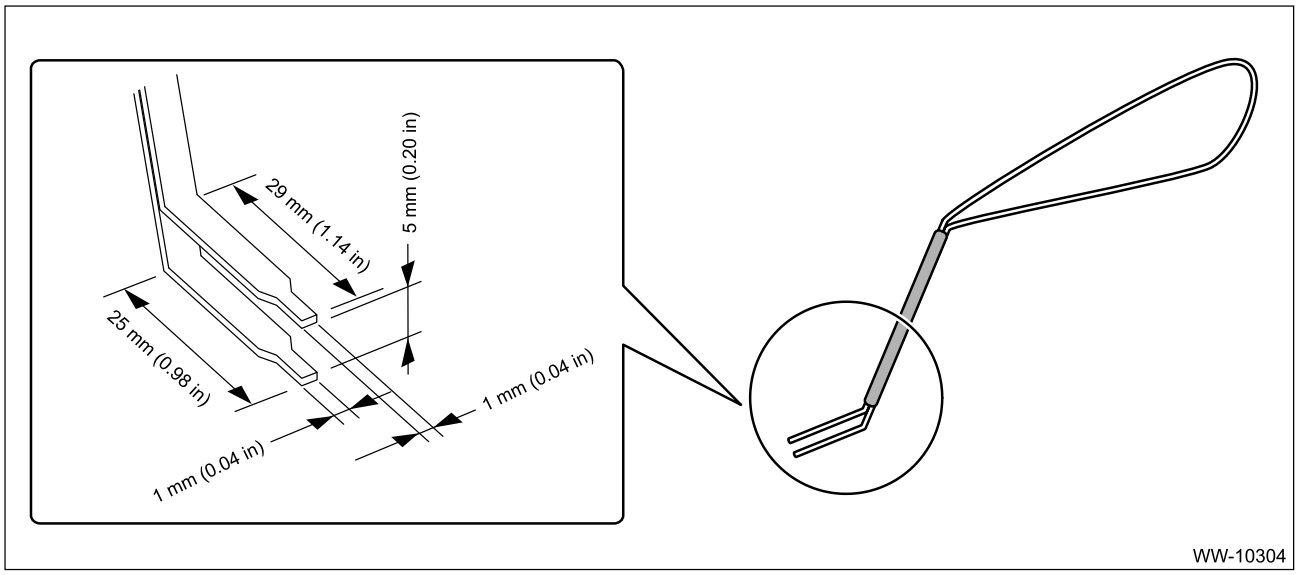
TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

3. HANDMADE TOOL

- **WASHER NOZZLE ADJUSTMENT JIG**

Note:

Referring to the data described below, prepare the materials to make a nozzle - windshield washer adjustment tool.

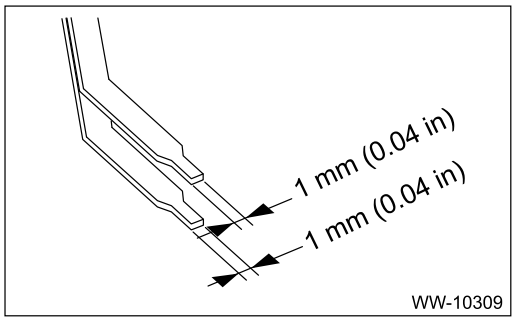


Preparation items:

Vertebra of wiper blade which is to be discarded

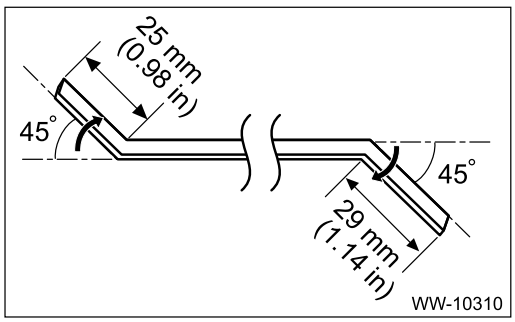
Vinyl tape

1. Grind the vertebra edge until the width becomes 1 mm (0.04 in).

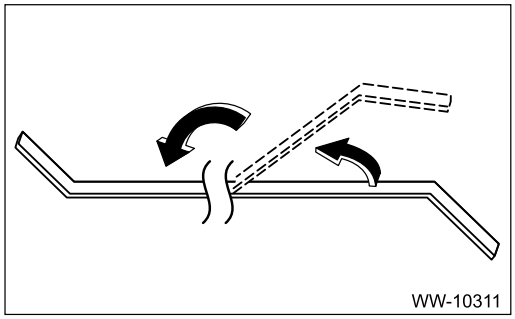


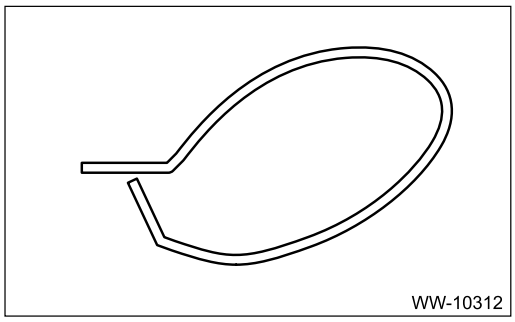
2. Bend the vertebra at the position 25 mm (0.98 in) away from its end by 45°.

3. Bend the vertebra at the position 29 mm (1.14 in) away from the other end by 45°.

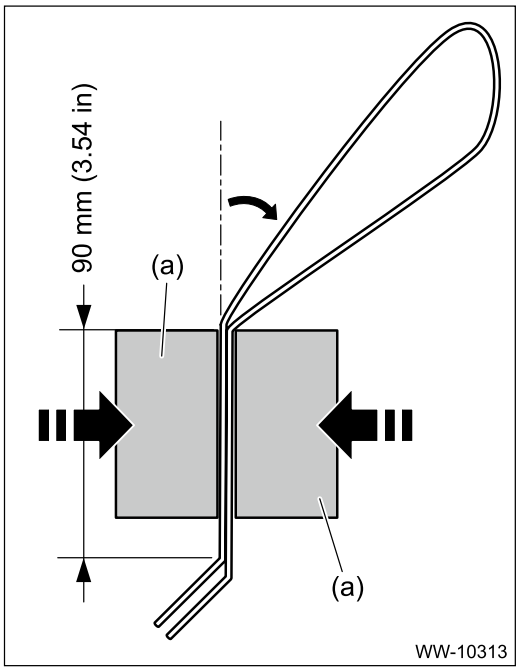


4. Double up the vertebra so that the longer end (29 mm (1.14 in)) comes upward.

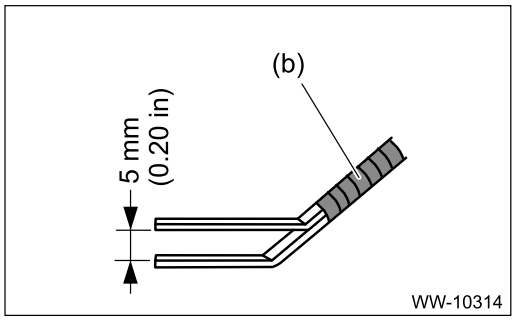




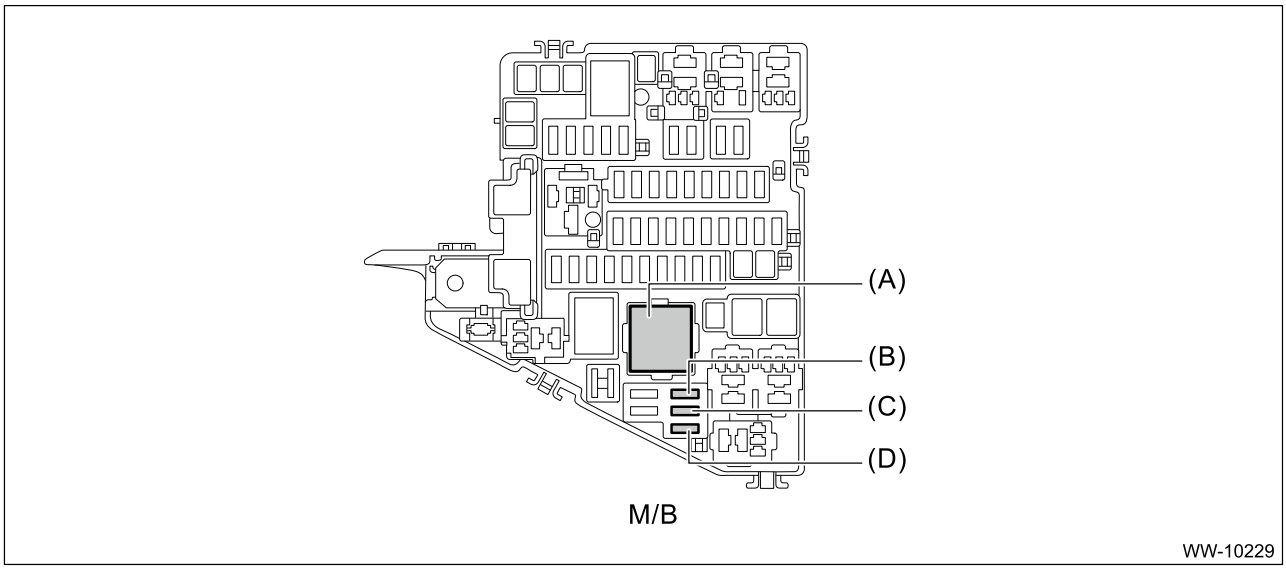
5. Secure the vertebra with a vise (a) so that the tip clearance between upper and lower becomes 5 mm (0.2 in).
6. Bend the vertebra at the position approximately 90 mm (3.54 in) away from the bending point for the longer end.



7. Check that the tip clearance between upper and lower is 5 mm (0.2 in), and secure the vertebra with vinyl tape (b).



LOCATION



Main fuse box (M/B)	Wiper relay	(A)
	Fuse 30 A (front wiper)	(B)
	Fuse 15 A (front washer)	(C)
	Fuse 15 A (rear wiper, rear washer)	(D)

Note:

For other related fuses, refer to the wiring diagram. Ref. to WIRING SYSTEM>Power Supply Circuit.

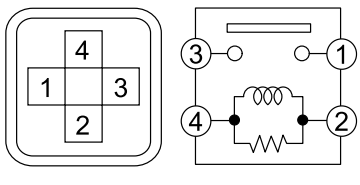
INSPECTION

1. CHECK FUSE

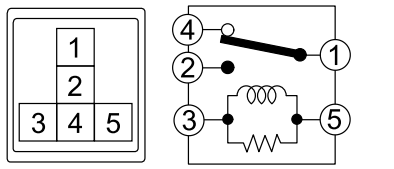
1. Remove the fuse and inspect visually.
2. If the fuse is blown out, replace the fuse.

2. CHECK RELAY

1. Measure the resistance between relay terminals.

Terminal No.	Inspection conditions	Standard	Circuit
1 — 3	Always	1 MΩ or more	
1 — 3	Apply battery voltage between terminals 4 and 2.	Less than 1 Ω	

Terminal No.	Inspection conditions	Standard	Circuit

Terminal No.	Inspection conditions	Standard	Circuit
1 — 2	Always	1 MΩ or more	 SL-01085
1 — 4	Always	Less than 1 Ω	
1 — 2	Apply battery voltage between terminals 3 and 5.	Less than 1 Ω	

2. Replace the relay if the inspection result is not within the standard value.

WIRING DIAGRAM

1. WIPER AND WASHER (FRONT)

Refer to "Front Wiper and Washer System" in the wiring diagram. Ref. to WIRING SYSTEM>Front Wiper and Washer System>WIRING DIAGRAM.

2. WIPER AND WASHER (REAR)

Refer to "Rear Wiper and Washer System" in the wiring diagram. Ref. to WIRING SYSTEM>Rear Wiper and Washer System>WIRING DIAGRAM.

INSPECTION

Symptoms	Repair order
Wiper and washers do not operate.	1. Wiper fuse 2. Combination switch 3. Motor assembly - wiper 4. Wiring harness
Wipers do not operate in LO or HI.	1. Combination switch 2. Motor assembly - wiper 3. Wiring harness
Wipers do not operate in INT.	1. Combination switch 2. Motor assembly - wiper 3. Wiring harness
Washer motor does not operate.	1. Combination switch 2. Motor pump assembly - washer 3. Wiring harness
Wipers do not operate when washer switch is ON.	1. Motor assembly - wiper 2. Wiring harness
Washer fluid spray does not operate properly.	1. Motor pump assembly - washer 2. Hose assembly - washer 3. Nozzle - washer
Wiper chatters or judders during operation.	1. Oil film and dirt on the glass 2. Arm assembly - windshield wiper 3. Motor assembly - wiper

NOTE

For procedure of each component of the wiper and washer system, refer to the respective sections.

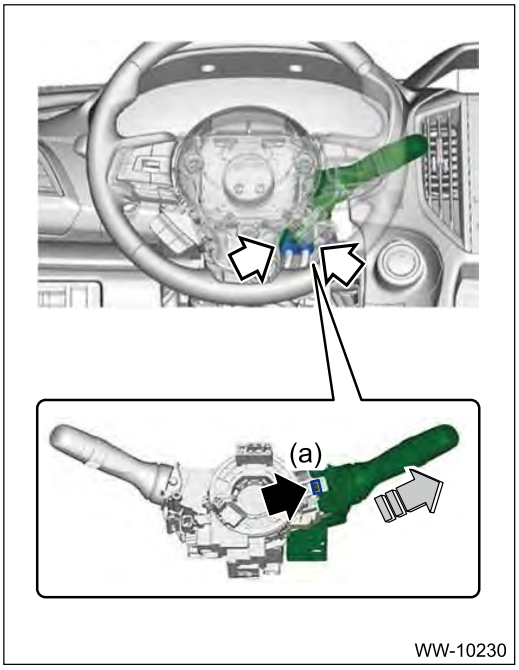
- Combination switch (wiper): Ref. to WIPER AND WASHER SYSTEMS>Combination Switch (Wiper).
- Wiper blade: Ref. to WIPER AND WASHER SYSTEMS>Wiper Blade.
- Front wiper arm: Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm.
- Front wiper motor and link: Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Motor and Link.
- Rear wiper arm: Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Arm.
- Rear wiper motor: Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor.
- Washer tank and motor pump: Ref. to WIPER AND WASHER SYSTEMS>Washer Tank and Motor.
- Front washer nozzle & hose: Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose.
- Rear washer nozzle: Ref. to WIPER AND WASHER SYSTEMS>Rear Washer.

WIPER AND WASHER SYSTEMS > Combination Switch (Wiper)

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cover assembly - column. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Steering Column>REMOVAL.
3. Remove the switch assembly - combination wiper select.
   (1) Disconnect the connector.
   (2) Press the claws (a), and pull out the switch assembly - combination wiper select.

Caution:
Do not press the claws with excessive force. They may be damaged.



WIPER AND WASHER SYSTEMS > Combination Switch (Wiper)

INSTALLATION

1. Install the switch assembly - combination wiper select.
2. Install the cover assembly - column.
3. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

WIPER AND WASHER SYSTEMS > Combination Switch (Wiper)

INSPECTION

1. CHECK WITH SUBARU SELECT MONITOR

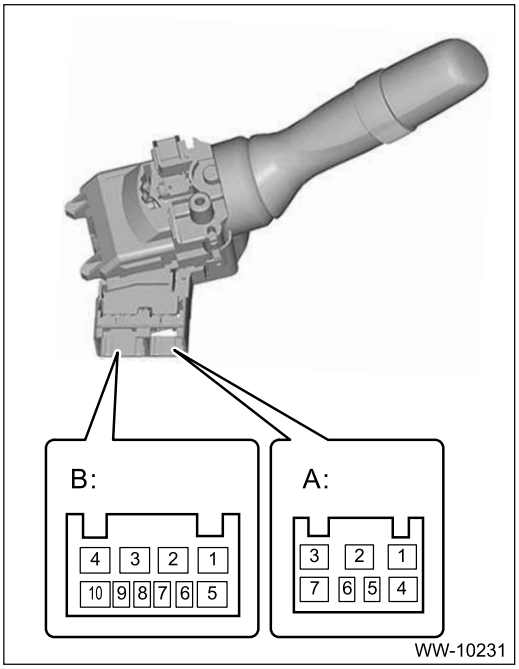
Note:
For detailed operation procedures, refer to "Application help".

1. Check the input signal when the switch assembly - combination wiper is operated, using the [Data monitor] display. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>LIST.
   - F wiper input
   - R wiper (ON) SW input
   - R wiper (INT) SW input
   - R washer SW input
2. Does the input signal change corresponding to the switch operation?

- **Yes** → Finish the diagnosis.
- **No** → Check the harness.

2. INSPECTION OF SWITCH UNIT

1. Operate the switches to check the continuity between terminals.
   Preparation tool:
   Circuit tester



- Front

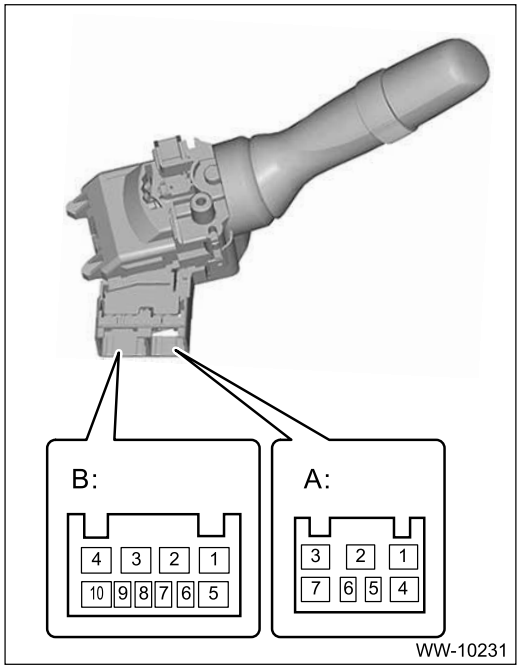
Switch position	Terminal No.	Standard
OFF	B3 and B1	Less than 1 Ω
INT	B3 and B1	Less than 1 Ω
LO	B2 and B3	Less than 1 Ω
HI	B2 and B4	Less than 1 Ω
Washer ON	A3 and A2	Less than 1 Ω

- Rear

Switch position	Terminal No.	Standard
Washer ON (wiper interlock operation)	A7 and A2 B5 and A2	Less than 1 Ω
OFF	A7 and A2 A6 and A2 B5 and A2	1 MΩ or more
LO	A6 and A2	Less than 1 Ω
HI	A7 and A2	Less than 1 Ω
Washer ON	B5 and A2	Less than 1 Ω

2. Replace the switch if the inspection result is not within the standard value.
3. Install the switch assembly - combination wiper select. Ref. to WIPER AND WASHER SYSTEMS>Combination Switch (Wiper)>INSTALLATION.

3. CHECK THE INTERMITTENT OPERATION (INSPECTION OF THE WIPER SWITCH ALONE)

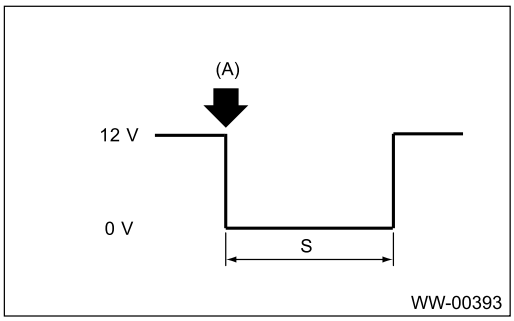


1. Set the voltmeter between terminal No. B2 (+) — No. A2 (−).
2. Connect the battery to connector. (Terminal No. B2 (+), Terminal No. A2 (−))
3. Turn the switch assembly - combination wiper select to INT.
4. Connect the battery (+) to the terminal No. B2 for 5 seconds.
5. Connect the battery (−) to the terminal No. A2, and check the voltage between terminals No. B2 — and No. A2 during intermittent operation.
6. Perform step 1 to 5 above when intermittent control switch is in MIN or MAX, and replace the switch if the operation is not as specified.

Intermittent stationary time

MIN: Approx. 2 seconds

MAX: Approx. 16 seconds



(A): Connect the battery (−) to the terminal No. B2.

S: Intermittent downtime (sec.)

4. REAR WIPER

1. CHECK INPUT OF BODY INTEGRATED UNIT.

Check the input signal when the rear wiper switch is operated using Subaru Select Monitor.

Note:

For detailed operation procedures, refer to "Application help".

1. Turn the ignition switch to ON.
2. Operate the rear wiper switch to each position of ON, INT and Washer ON.

Does the input signal change corresponding to the switch operation?

Yes — Go to 3.

No — Go to 2.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Disconnect the connector of body integrated unit and wiper switch.
4. Measure the resistance between body integrated unit and wiper switch.

Connector & terminal

(i81) No. 19 — (i68) No. 7:
(i81) No. 3 — (i68) No. 6:
(i81) No. 10 — (i69) No. 5:

Is the resistance less than 10 Ω?

Yes — Go to 3.

No — Repair the harness between the body integrated unit and wiper switch.

3. CHECK OUTPUT OF BODY INTEGRATED UNIT.

Check the output signal when the rear wiper switch is operated using Subaru Select Monitor.

1. Turn the ignition switch to ON.
2. Operate the rear wiper switch to ON and Washer ON.
3. When the operation in step (2) is performed, check the output signal of body integrated unit to motor assembly - rear wiper.

When the rear wiper switch is set to ON, is ON output continuous? Also, when the washer is set to ON, is ON output?

Yes — Go to 4.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>NOTE.

4. CHECK OUTPUT OF BODY INTEGRATED UNIT.

Check the output signal when the rear wiper switch is operated using Subaru Select Monitor.

1. Turn the ignition switch to ON.
2. Set the rear wiper switch to INT.
3. When the operation in step (2) is performed, check the output signal of body integrated unit.

When the rear wiper switch is set to INT, is ON/OFF output repeated? (INT OFF time (when vehicle parked): 12 seconds)

Yes — Go to 7.

No — Go to 5.

5. CHECK HARNESS BETWEEN BODY INTEGRATED UNIT AND MOTOR ASSEMBLY - REAR WIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Disconnect the connector of body integrated unit and wiper switch.
4. Measure the resistance between the harness connector terminals of the body integrated unit and the motor assembly - rear wiper.
   Connector & terminal
   (B280) No. 5 — (D43) No. 1:

Is the resistance less than 10 Ω?

Yes — Go to 6.

No — Repair the open circuit of the harness between body integrated unit and the motor assembly - rear wiper.

6. CHECK STOP POSITION CIRCUIT OF MOTOR ASSEMBLY - REAR WIPER.

1. Disconnect the harness connector of the motor assembly - rear wiper.
2. Check the continuity of the stop position circuit for the motor assembly - rear wiper.
   Connector & terminal
   (D43) No. 1 — (D43) No. 4:

Is there continuity between terminals?

Yes — Go to 7.

No — Replace the rear wiper motor assembly.

7. CHECK POWER SUPPLY CIRCUIT OF MOTOR ASSEMBLY - REAR WIPER.

1. Disconnect the harness connector of the motor assembly - rear wiper.
2. Turn the ignition switch to ON.
3. Measure the voltage between the motor assembly - rear wiper harness connector terminal and chassis ground.
   Connector & terminal
   (D43) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes — Go to 8.

No — Check the fuse (No. 42 in main fuse box).

8. CHECK GROUND CIRCUIT OF MOTOR ASSEMBLY - REAR WIPER.

1. Turn the ignition switch to OFF.
2. Measure the resistance between the motor assembly - rear wiper harness connector terminal and chassis ground.
   Connector & terminal
   (D43) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes — Go to 9.

No — Repair the open circuit of the motor assembly - rear wiper ground circuit.

9. CHECK HARNESS BETWEEN REAR WIPER RELAY AND MOTOR ASSEMBLY - REAR WIPER.

1. Turn the ignition switch to OFF.
2. Disconnect the harness connector of the rear wiper relay.
3. Disconnect the harness connector of the motor assembly - rear wiper.
4. Measure the resistance between the harness connector terminals of the rear wiper relay and the motor assembly - rear wiper.
   Connector & terminal
   (B225) No. 14 — (D43) No. 2:

Is the resistance less than 10 Ω?

Yes — Go to 10.

No — Repair the open circuit of the harness between body integrated unit and the motor assembly - rear wiper.

10. CHECK OUTPUT OF BODY INTEGRATED UNIT.

1. Connect the harness connector of body integrated unit.
2. Disconnect the connector of the motor assembly - rear wiper.
3. Turn the ignition switch to ON.
4. Measure the voltage between the motor assembly - rear wiper connector and chassis ground.
   Connector & terminal
   (D43) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1.5 V when the rear wiper switch is OFF, and is the voltage 10 V or more when the rear wiper switch is ON?

Yes — Go to 11.

No — Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>NOTE.

11. CHECK OPERATION OF MOTOR ASSEMBLY - REAR WIPER.

1. Remove the motor assembly - rear wiper.
2. Check the motor assembly - rear wiper. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Motor>INSPECTION.

Does the motor assembly - rear wiper rotate normally?

Yes — End.

No — Replace the motor assembly - rear wiper assembly.

Note:

Rear wiper intermittent stopping time

Select lever position	Vehicle speed (km/h (MPH))	Intermittent stopping time (sec.)
Rev.	—	Continuous operation
Except for reverse mode	80 — (50 —)	3
	50 — 80 (31 — 50)	6
	20 — 50 (12 — 31)	9
	0 — 20 (0 — 12)	12

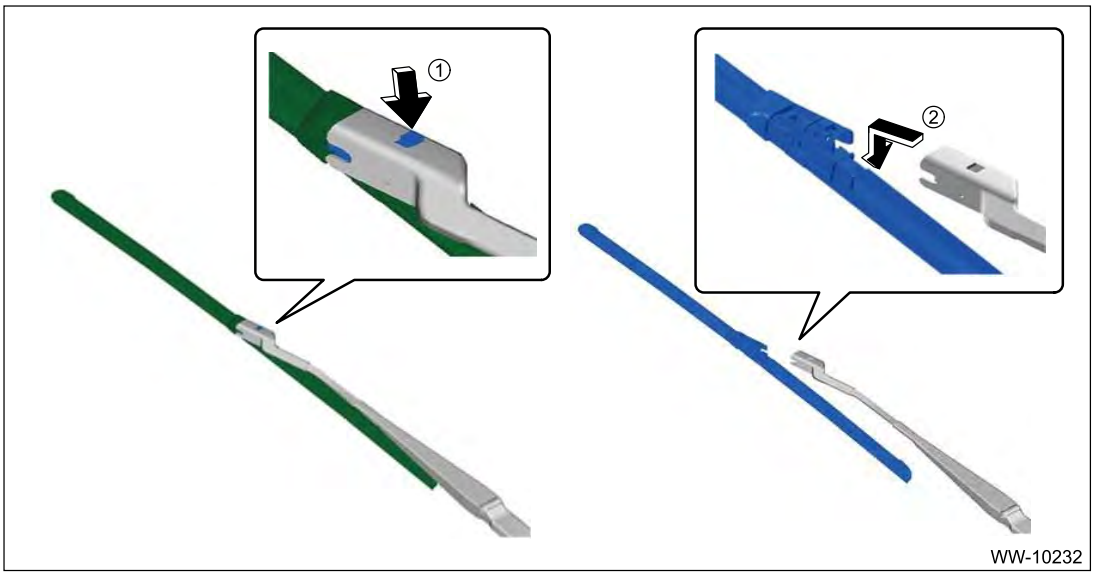
REMOVAL

1. FRONT

Caution:

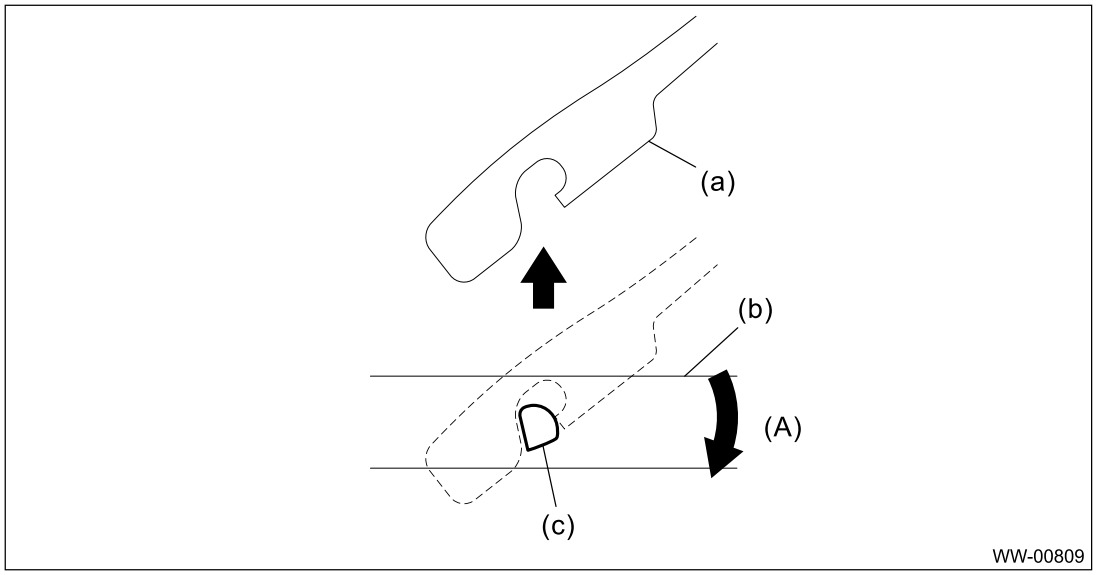
- **When standing up the arm assembly - windshield wiper, perform the driver's side first in order not to interfere the arms with each other.**
- **When standing up the arm assembly - windshield wiper, make sure to hold the arm portion. Holding the blade portion may cause the blade deformation.**

1. Remove the blade assembly - windshield wiper.
(1) Press the lock button shown as (1).
(2) Pull the blade assembly - windshield wiper in the arrow direction to remove shown as (2).



2. REAR

Turn the blade assembly - rear wiper in the direction of arrow (A) and remove it from the arm assembly - rear wiper.



(A) Rubber ASSY - windshield wiper assistor

(a) Arm ASSY - rear wiper (b) Blade ASSY - rear wiper (c) Blade ASSY - rear wiper installation portion

WIPER AND WASHER SYSTEMS > Wiper Blade

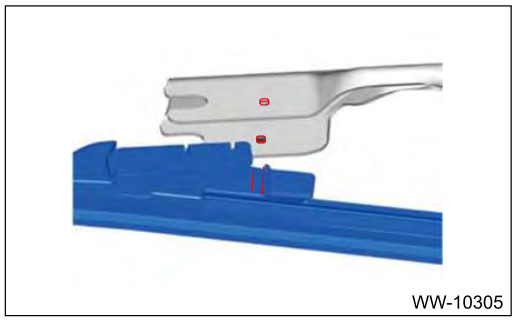
INSTALLATION

1. FRONT

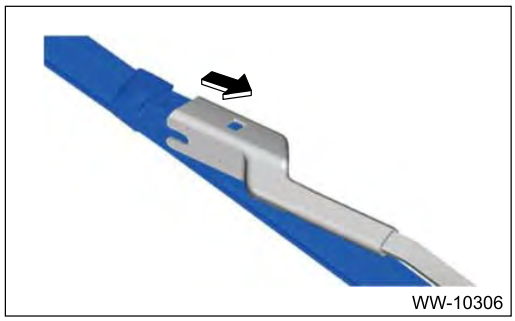
Caution:

After installation, confirm that the lock button is locked securely.

1. Align the protrusion section of arm inner and the groove on the blade side.



2. Slide until the lock button is locked and install the blade assembly.



2. REAR

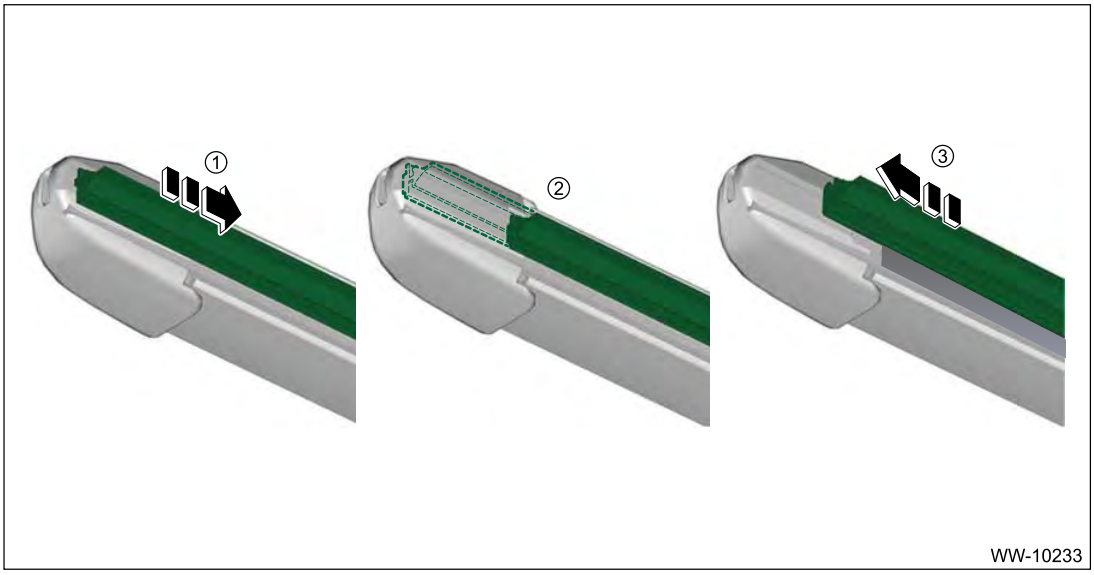
Install each part in the reverse order of removal.

WIPER AND WASHER SYSTEMS > Wiper Blade

DISASSEMBLY

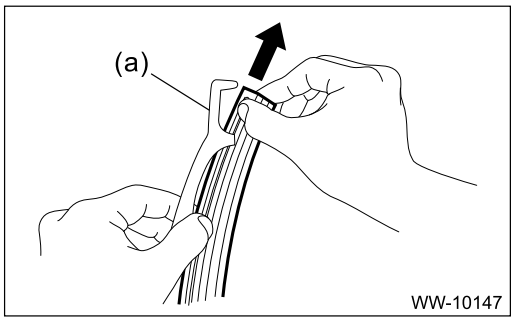
1. FRONT

1. Hold the blade assembly - windshield and pull the rubber assembly - windshield wiper in the arrow direction (1) until the position (2) shown in the figure.
2. Pull out the rubber assembly - windshield wiper from the slit of the blade assembly shown as (3).



2. REAR

Slightly pull the top of the rubber assembly - rear wiper from the stopper (a), and pull out completely.



WIPER AND WASHER SYSTEMS > Wiper Blade

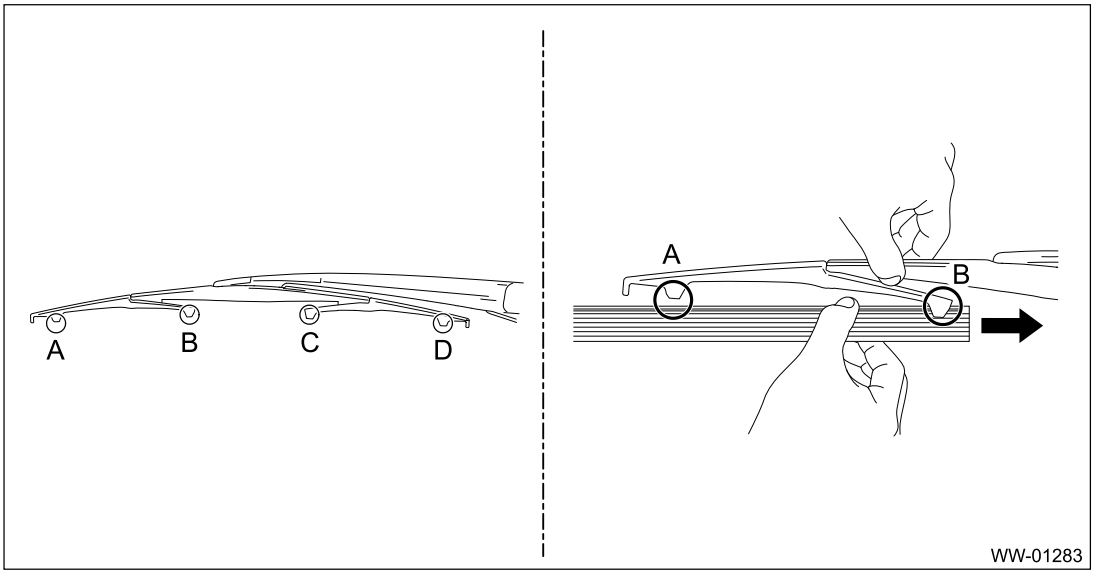
ASSEMBLY

1. FRONT

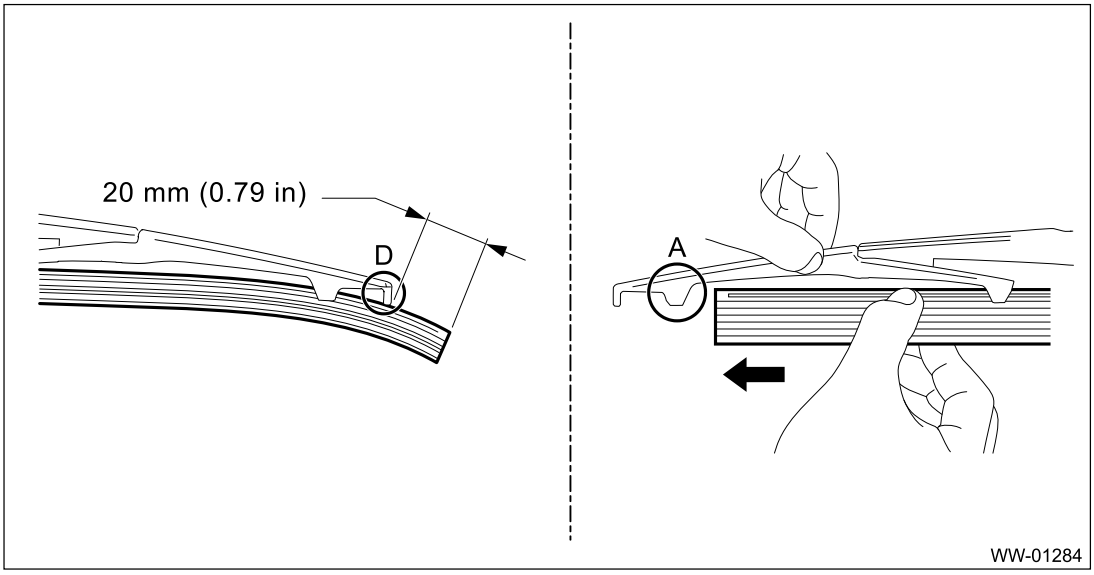
Install the rubber assembly - windshield wiper in the reverse order.

2. REAR

1. Insert the rubber assembly - rear wiper into claw (B).



2. Insert the rubber assembly - rear wiper until its top end protrudes approx. 20 mm (0.79 in) from stopper (D).
3. Insert the rubber assembly - rear wiper into claw (A).



WIPER AND WASHER SYSTEMS > Wiper Blade

INSPECTION

1. Check and clean the rubber assembly - windshield wiper.
   Caution:
   - **Do not use organic solvent-based cleaner when cleaning rubber parts in order to avoid rubber part deterioration.**
   - **Clean rubber parts using a soft cloth or paper towel dampened with windshield washer fluid or mild synthetic detergent.**

   Replace the rubber assembly - wiper if rubber part hardening, deformation or damage is found.
2. Operate the washer system to check if a chattering sound or insufficient wiping occurs.
3. If a chattering sound or insufficient wiping occurs, perform the following procedures.
   (1) Make sure that the blade assembly - windshield wiper is not deformed and the movable part moves smoothly.
   (2) Remove oil film and dirt from the glass.

Caution:

- **When powder-type glass cleaner is used, use after having been dissolved in water sufficiently. If it is used in less water, the glass surface may be damaged.**
- **Clean the glass surface using a soft cloth or sponge with glass cleaner.**

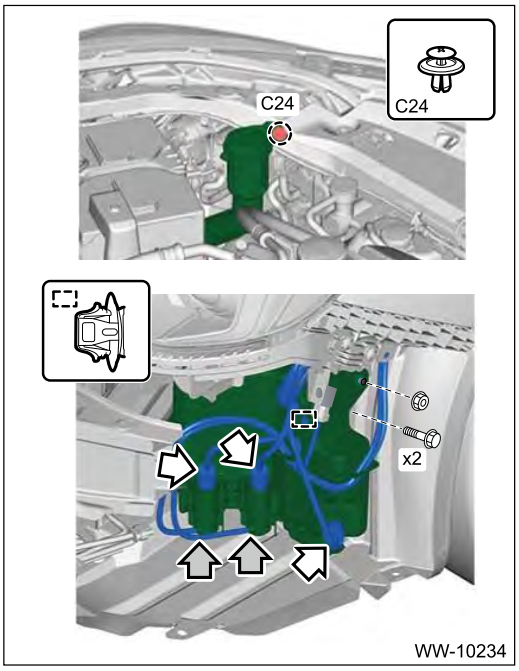
(3) Operate the windshield wiper again. If a chattering sound or insufficient wiping occurs, perform the procedures again.

4. If defective is not improved after performing step 1) to step 3), replace the blade assembly - windshield wiper with a new part.

REMOVAL

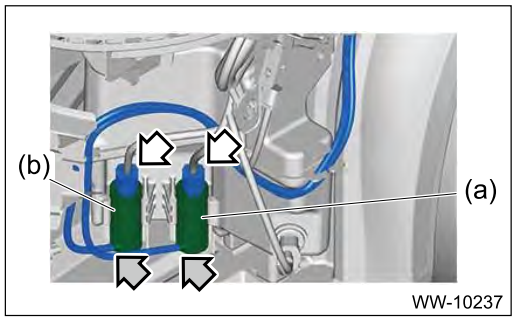
1. WASHER TANK

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Remove the tank - washer assembly.
   (1) Remove the clip of the holder - windshield washer tank.
   (2) Disconnect the connector from the motor pump assembly - washer and the sensor - washer tank, and then remove the harness clip.
   (3) Prepare a container before disconnecting the hose - washer, and drain all washer fluid in the tank - washer.
   (4) Remove the bolt and nuts and remove the tank - washer assembly.



2. WASHER MOTOR PUMP

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the clips and screws, and turn over the mud guard - front LH.
5. Disconnect the connector from the motor pump assembly - washer.
6. Prepare a container before disconnecting the hose - washer, and drain all washer fluid in the tank - washer.
7. Remove the motor pump assembly - washer.



(a): Front washer pump motor

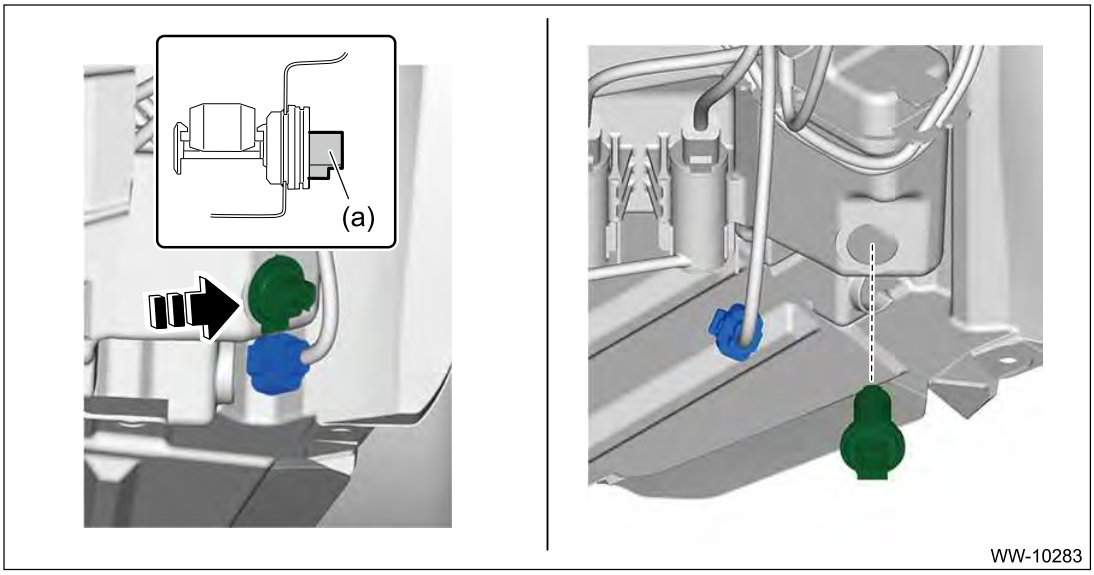
(b): Rear washer pump motor

3. WASHER FLUID LEVEL SENSOR

Caution:

Do not hit or apply any impact to the sensor - washer tank, because it has a poor resistance to impact. Sensor internal parts may be damaged when an impact is applied.

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Lift up the vehicle.
3. Remove the under cover - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Under Cover>REMOVAL.
4. Remove the clips and screws, and turn over the mud guard - front LH.
5. Remove the sensor - washer tank.
   (1) Disconnect the connector.
   (2) Prepare a container before disconnecting the hose - washer, and drain all washer fluid in the tank - washer.
   (3) Push the section (a) in the direction of the arrow with a thick towel or the like to remove the sensor - washer tank.



WIPER AND WASHER SYSTEMS > Washer Tank and Motor

INSTALLATION

1. WASHER TANK

Caution:

Before installing the bumper face, match the claws on the bracket - front bumper with the engaging position of flange section on the bumper face side. If the engaging position is not correct, the flange section may be broken or the clearance between fender panel and bumper face may not be uniform.

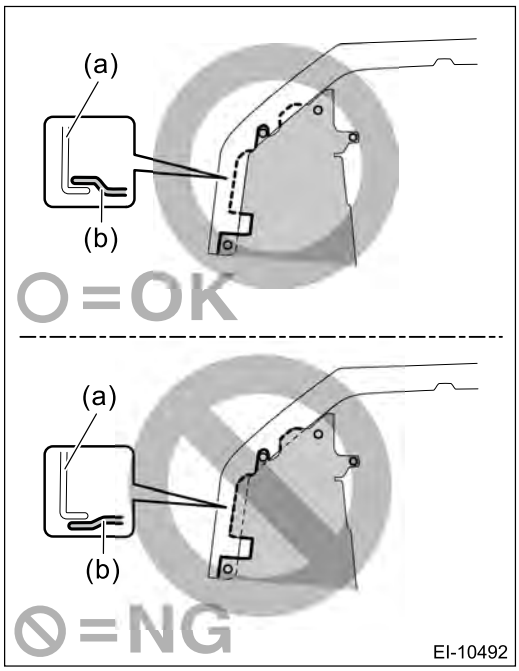
1. Install the tank - washer assembly.
   Tightening torque:
   6.0 N·m (0.6 kgf-m, 4.4 ft-lb)
2. Connect the hose - washer.
3. Connect each connector.
4. Add new washer fluid.
5. Install the bumper face - front. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>INSTALLATION.

6. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
7. Adjust the fog light beam. (Model with fog light) Ref. to LIGHTING SYSTEM>Front Fog Light Assembly>ADJUSTMENT > FOG LIGHT AIMING.

2. WASHER MOTOR PUMP

Caution:

- **Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).**



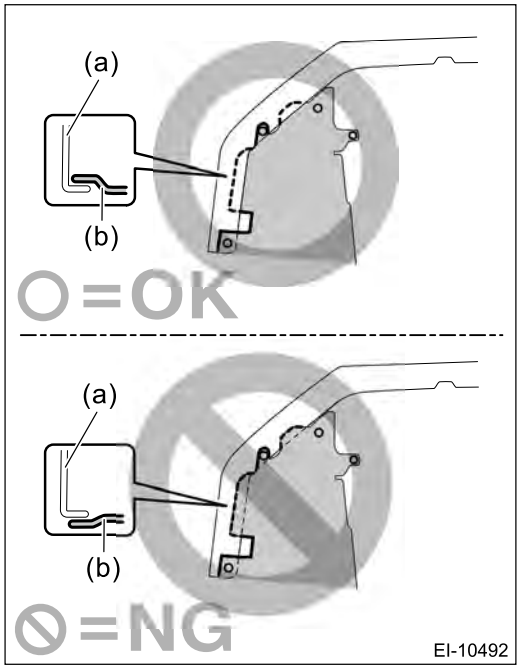
- **Do not reuse the packing - washer motor pump.**

1. Install the motor pump assembly - washer to the tank - washer.
2. Connect the hose - washer.
3. Connect each connector.
4. Add new washer fluid.
5. Install the mud guard - front LH.
6. Install the under cover - front.
   Tightening torque:
   18 N·m (1.8 kgf-m, 13.3 ft-lb)
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. WASHER FLUID LEVEL SENSOR

Caution:

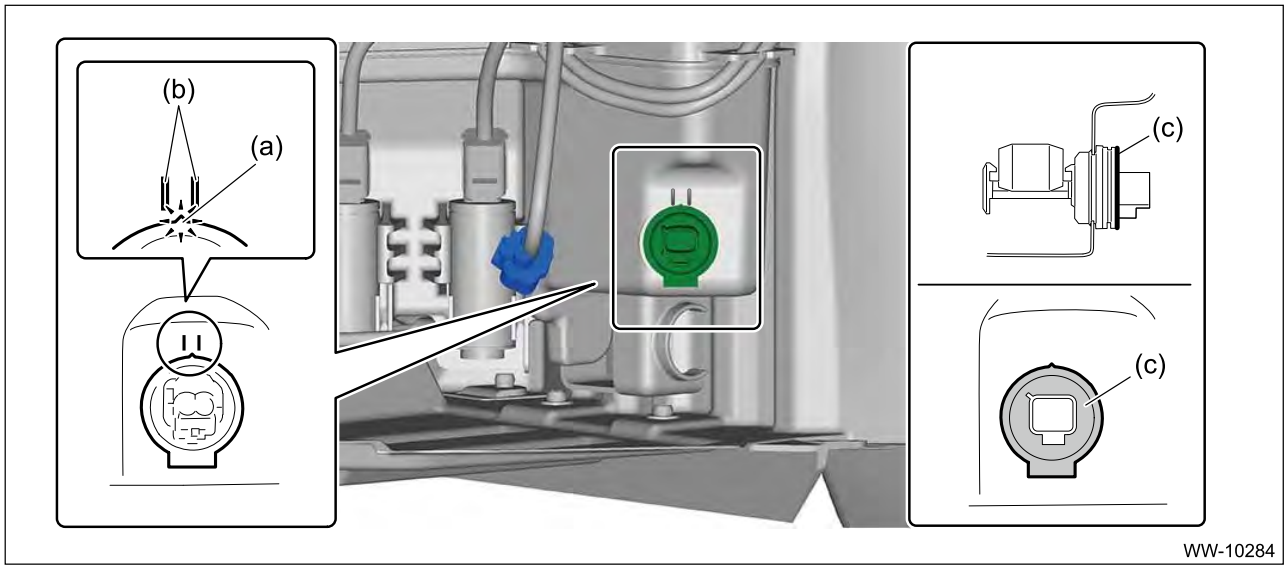
Install the mud guard - front so that the front end of the mud guard (b), except for the clip fixing point, comes inside the bumper face (a).



1. Align the protrusion (a) of the sensor - washer tank with a center position of double line marks (b) on the tank - washer side, and push the flat surface (c) to install.

   Caution:

   - **Do not hit or apply any impact to the sensor - washer tank when it is reused, because it has a poor resistance to impact.**
   - **When the installation is difficult, apply washer fluid to the packing. Do not use silicone grease.**



2. After installing the sensor - washer tank, perform the following confirmations.
   - There is no gap between the tank - washer and the packing.
   - There is no gap between the packing and the sensor - washer tank.
   - There is no turn over to the packing and its peripheral area.
3. Connect each connector.
4. Add new washer fluid.
5. Install the mud guard - front LH.
6. Install the under cover - front.

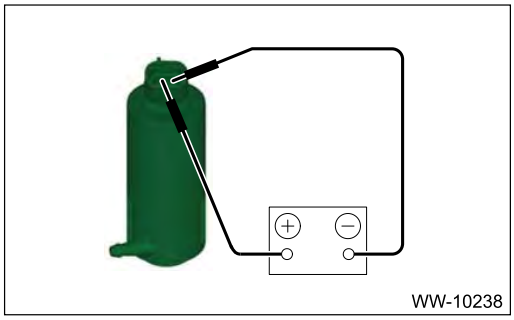
   Tightening torque:

   18 N·m (1.8 kgf-m, 13.3 ft-lb)
7. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

INSPECTION

1. WASHER PUMP

Apply battery voltage to the connector terminal of the motor pump assembly - washer, and make sure that the motor operates.



2. WASHER FLUID LEVEL SENSOR

1. CHECK CONNECTION STATUS.

Check the connection status of washer fluid level sensor connector.

Does the low washer fluid warning light illuminate after draining the washer fluid? And does the low washer fluid warning light go off after refilling the washer fluid?

Yes	Normal.
No	Go to 2.

2. CHECK INPUT VOLTAGE.

Using a tester, measure the voltage of the washer fluid level sensor connector.

Is the voltage approx. 8.5 V or more?

Yes	Go to 3.
No	Check harness and meter, and replace if necessary.

3. CHECK WARNING LIGHT.

Check low washer warning light in the combination meter.

Does the meter indicator illuminate if you short the washer fluid level sensor connector?

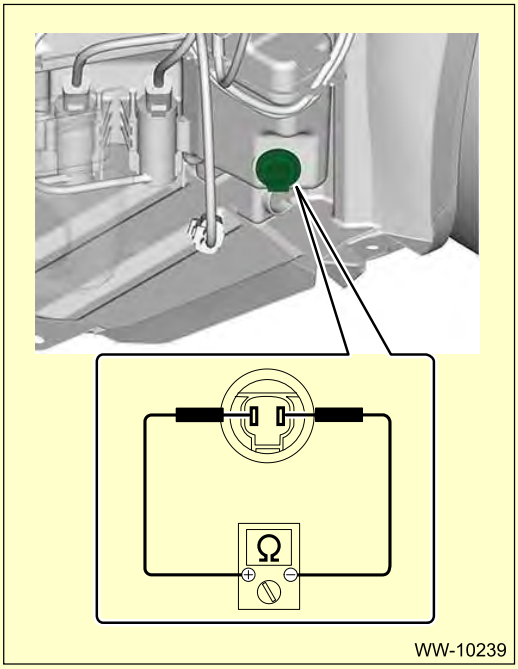
Yes — Go to 4.

No — Check meter, and replace if necessary.

4. CHECK WASHER FLUID LEVEL SENSOR CONTINUITY.

Using a tester, measure the resistance of the washer fluid level sensor.

1. Turn over the mud guard.
2. Measure the resistance of the washer fluid level sensor.



Amount of washer fluid in the tank	Standard
No remaining quantity (ON)	Less than 10 Ω
There is remaining quantity (OFF)	1 MΩ or more

Is the resistance within the standard?

Yes — Normal.

No — Replace the washer level sensor.

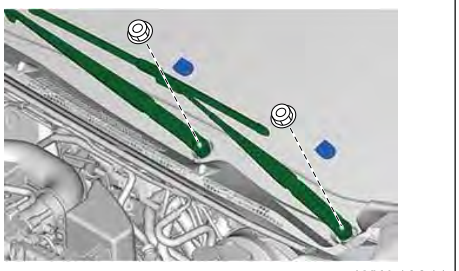
REMOVAL

1. MODELS WITHOUT EYESIGHT

Caution:

- **When standing up the arm assembly - windshield wiper, perform the driver's side first in order not to interfere the arms with each other.**
- **When standing up the arm assembly - windshield wiper, make sure to hold the arm portion. Holding the blade portion may cause the blade deformation.**

1. Remove the cover - windshield wiper arm.
2. Remove the nuts, and remove the arm assembly - windshield wiper.

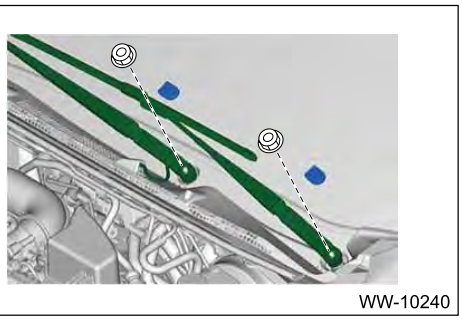

WW-10241

2. MODELS WITH EYESIGHT

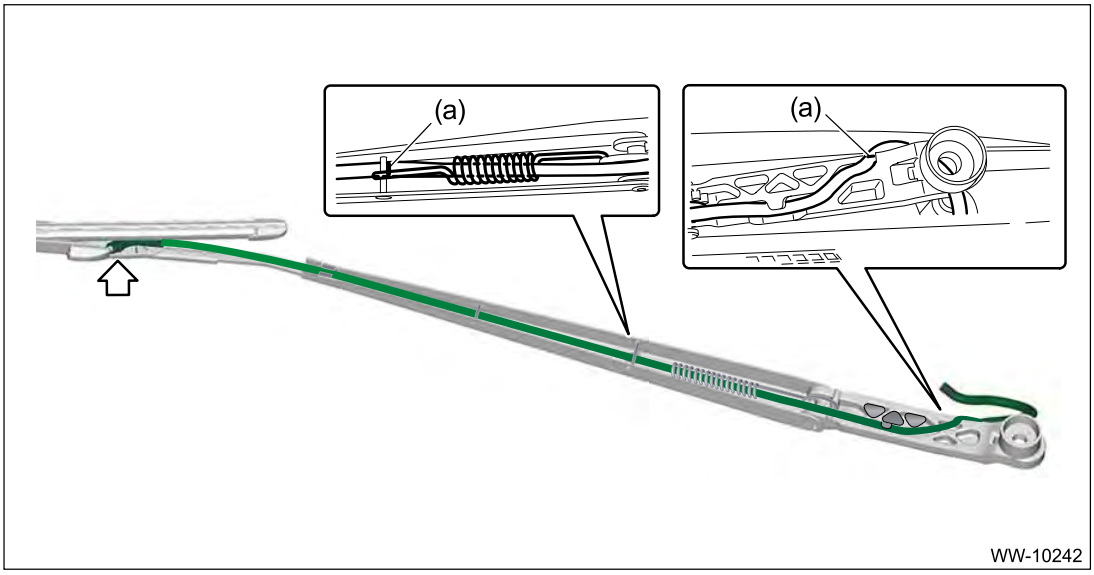
Caution:

- **When standing up the arm assembly - windshield wiper, perform the driver's side first in order not to interfere the arms with each other.**
- **When standing up the arm assembly - windshield wiper, make sure to hold the arm portion. Holding the blade portion may cause the blade deformation.**

1. Remove the cover - windshield wiper arm.
2. Remove the arm assembly - windshield wiper.
   (1) Remove the nuts, and remove the arm assembly - windshield wiper.


WW-10240

(2) Put alignment marks (a) at two places and disconnect the hose from the nozzle.



(3) Pull out the hose and remove the arm assembly - windshield wiper assistor.

3. When removing the hose from the joint - washer hose, refer to the removal of "Nozzle - wiper arm washer & hose". Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>REMOVAL > NOZZLE - WIPER ARM WASHER & HOSE (MODEL WITH EYESIGHT).

Caution:

Do not remove the nozzle - wiper arm washer from the arm assembly - windshield wiper assistor.

If nozzle replacement is required, replace the arm assembly - windshield wiper assistor as a unit.

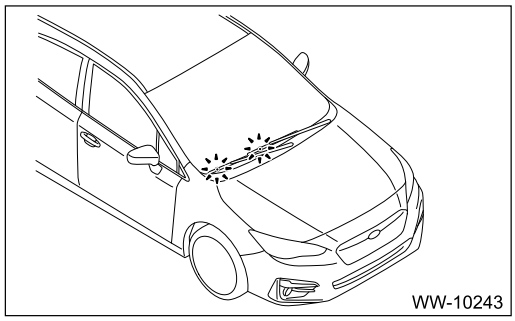
WIPER AND WASHER SYSTEMS > Front Wiper Arm

INSTALLATION

1. MODELS WITHOUT EYESIGHT

1. Install the arm assembly - windshield wiper.

(1) Assemble the arm assembly - windshield wiper so that the blade assembly - windshield wiper is aligned to the ceramic print point mark of the windshield glass.



(2) Tighten the arm assembly - windshield wiper to specified torque and install the cap.

Tightening torque:

26 N·m (2.7 kgf-m, 19.2 ft-lb)

2. Operate the windshield wiper to check that the stop position is aligned with the point mark.

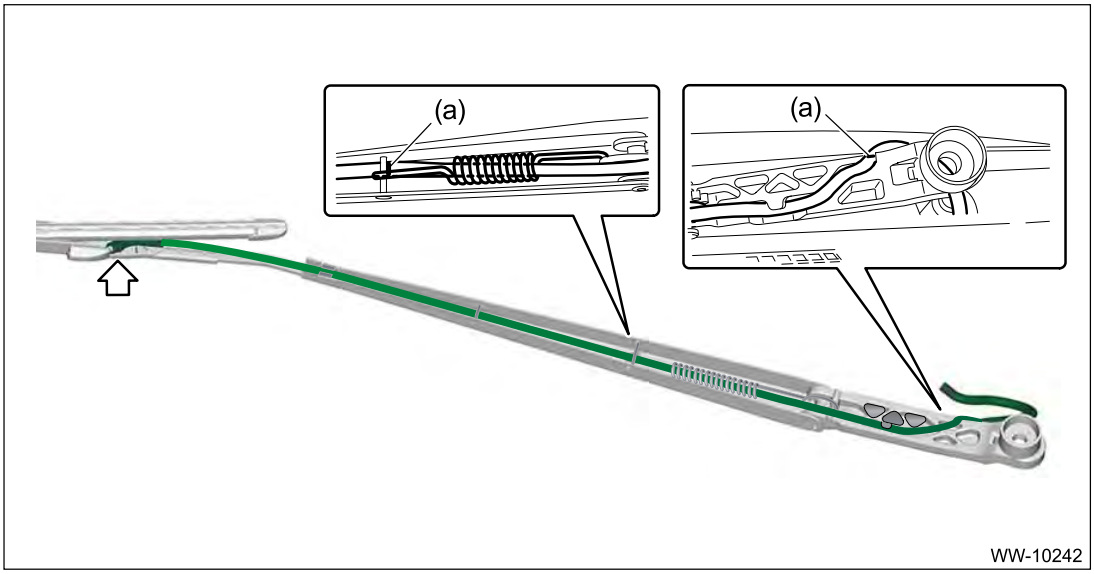
If it is not aligned with the point mark, perform the removal and installation of the windshield wiper over again. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.

2. MODELS WITH EYESIGHT

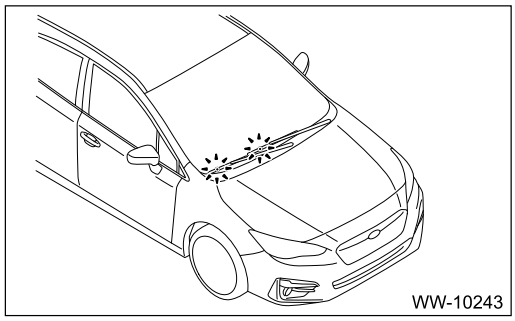
Caution:

Install firmly so that the hose is not bent, compressed or flattened.

1. When the hose is removed from the joint - washer hose, refer to "Installation" of "Front washer nozzle & hose". Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>INSTALLATION.
2. Install the arm assembly - windshield wiper.
   (1) Align the alignment mark (a), and install the hose to the arm assembly - windshield wiper assistor.



   (2) Assemble the arm assembly - windshield wiper so that the blade assembly - windshield wiper is aligned to the ceramic print point mark of the windshield glass.

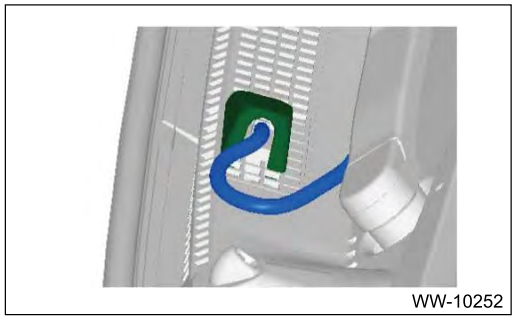


   (3) Tighten the arm assembly - windshield wiper to specified torque and install the cap.

Tightening torque:

26 N·m (2.7 kgf-m, 19.2 ft-lb)

3. Operate the windshield wiper to check that the stop position is aligned with the point mark.
   If it is not aligned with the point mark, perform the removal and installation of the windshield wiper over again. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
4. Make sure that the hose and the cover - joint do not interfere during windshield wiper operation.

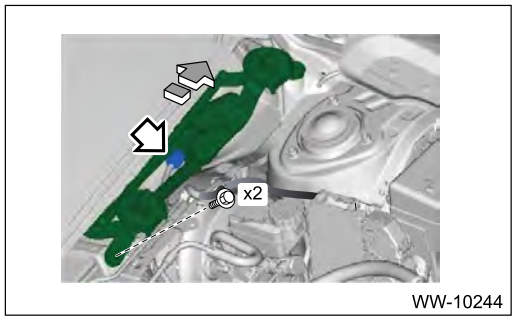


REMOVAL

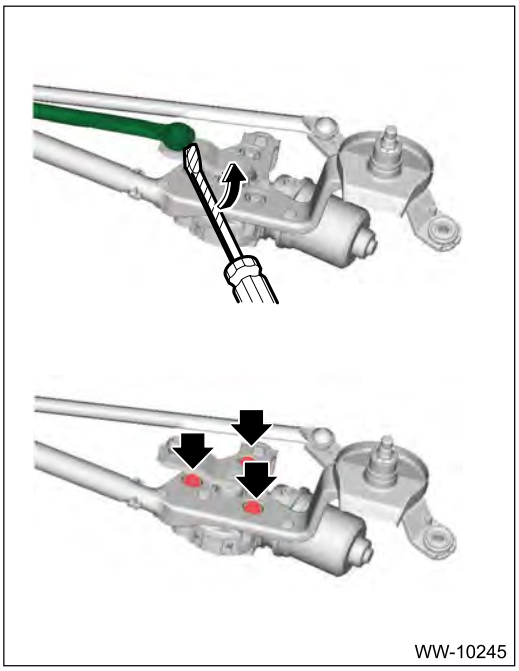
1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
3. Remove the cowl panel - side and the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>REMOVAL.

   Caution:

   Before removing the cowl panel, use an air blower and nylon brush to sweep gravel from the lower area of the front side of the glass.
4. Remove the link assembly - windshield wiper.
   (1) Remove the bolt.
   (2) Slide the entire link assembly in the arrow direction and remove the link assembly - windshield wiper.
   (3) Disconnect the connector of the motor assembly - windshield wiper and remove the link assembly - windshield wiper.



5. Remove the motor assembly - windshield wiper.
   (1) Using a crowbar wrapped with protective tape, disconnect the link assembly - windshield wiper from the link plate.
   (2) Remove the bolts, and remove the motor assembly - windshield wiper.

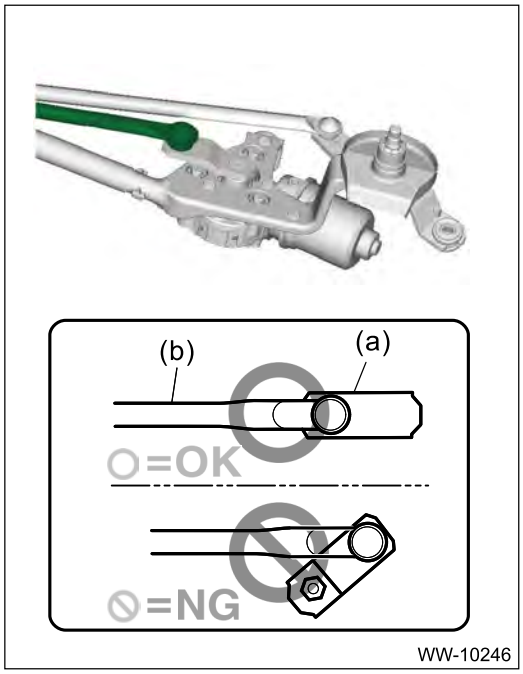


INSTALLATION

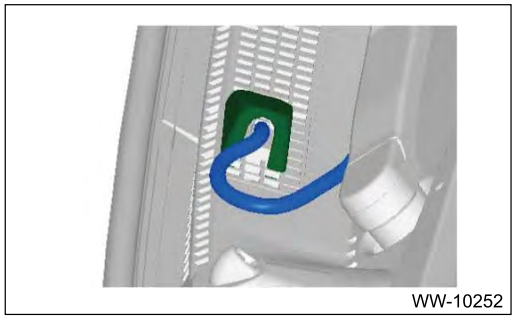
Caution:

- **If the cowl panel assembly cannot be installed properly, do not hit or set it forcibly. The claws of the cowl panel or the windshield glass may be damaged.**
- **Before installing the windshield glass and cowl panel, make sure there are no gravel in the installing area.**

1. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Check that the motor assembly - windshield wiper is at the auto stop position.
   Caution:
   During motor operation, do not touch the movable part.
   (1) Connect the harness of front wiper to the motor assembly - windshield wiper.
   (2) Switch the wiper switch to ON/OFF once.
3. Disconnect the ground cable from battery again. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
4. Install the motor assembly - windshield wiper.
   (1) Align the link plate position.
   Caution:
   Install the motor assembly - windshield wiper at the position where the rod (b) and link plate (a) are aligned in a straight line.



   (2) Install the motor assembly - windshield wiper.
   Tightening torque:
   5.5 N·m (0.6 kgf-m, 4.1 ft-lb)
5. Install the link assembly - windshield wiper.
   Tightening torque:
   6 N·m (0.6 kgf-m, 4.4 ft-lb)
6. Install the cowl panel - side and the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>INSTALLATION.
7. Install the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>INSTALLATION.
8. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
9. Operate the windshield wiper to check that the stop position is aligned with the point mark.
   If it is not aligned with the point mark, perform the removal and installation of the windshield wiper over again. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
10. Make sure that the hose and the cover - joint do not interfere during windshield wiper operation. (Models with EyeSight)



INSPECTION

1. Check that the following operations perform normally.

   Caution:

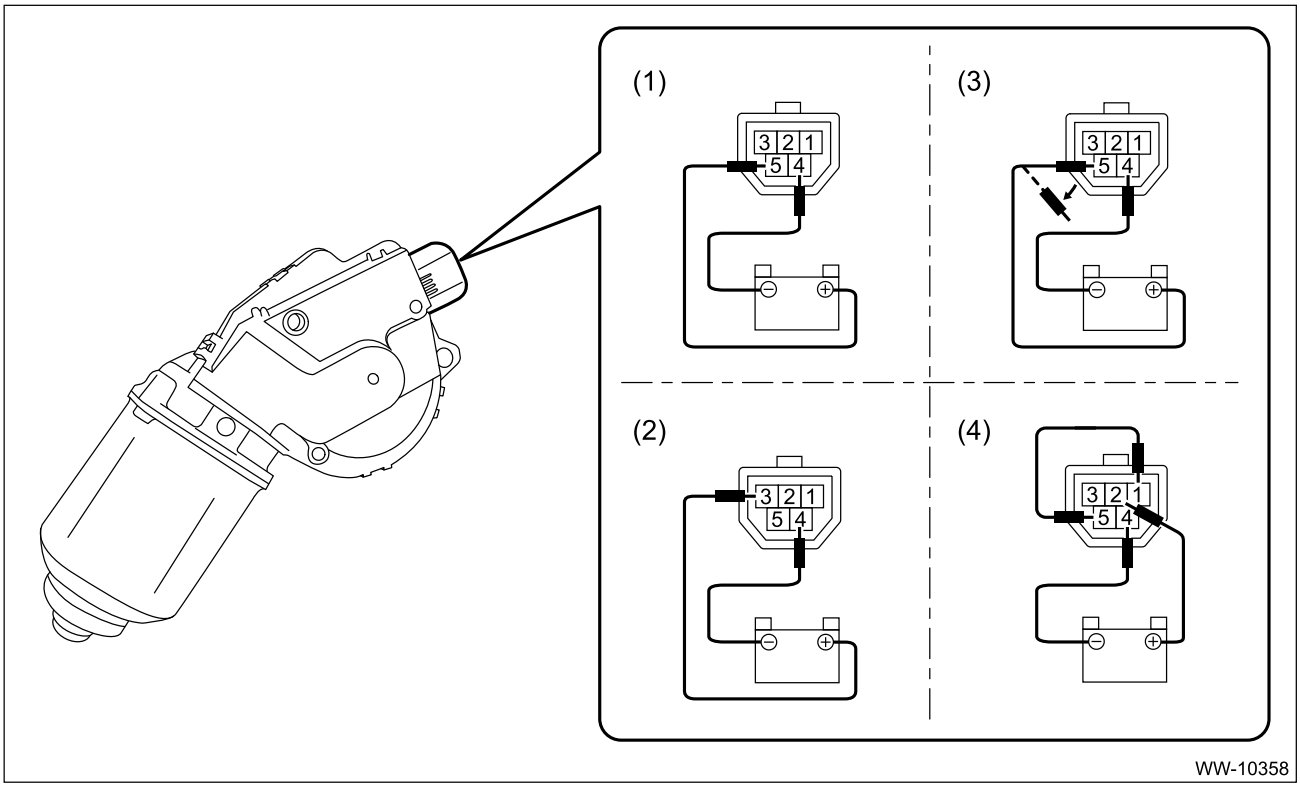
   Fix the motor to prevent the motor from being shorted by moving during operation.

   (1) When the battery is connected to the terminal of connectors, confirm that the motor operates at low speed.

   (2) When the battery is connected to the terminal of connectors, confirm that the motor operates at high speed.

   (3) Connect the battery to terminals of the connector, and remove the terminal connection with motor rotating at low speed, and stop the motor assembly - windshield wiper in mid-operation.

   (4) Connect the battery and check that the motor stops at the automatic stop position after the motor operates at low speed again.



2. Replace the motor assembly - windshield wiper if it is found defective.

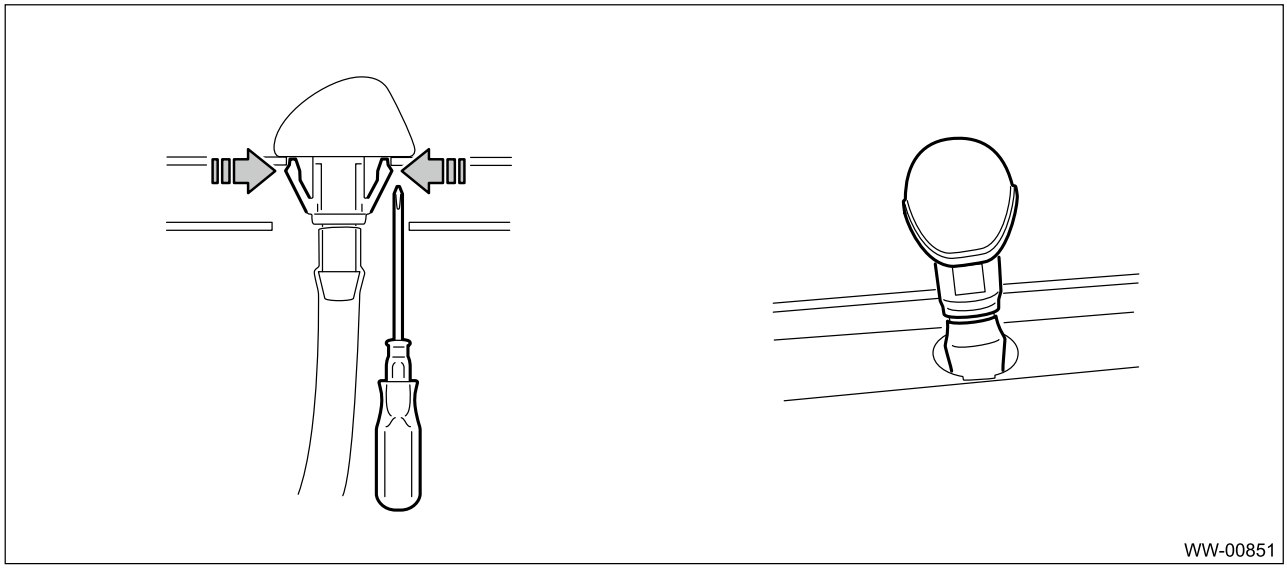
REMOVAL

1. NOZZLE - WINDSHIELD WASHER & HOSE

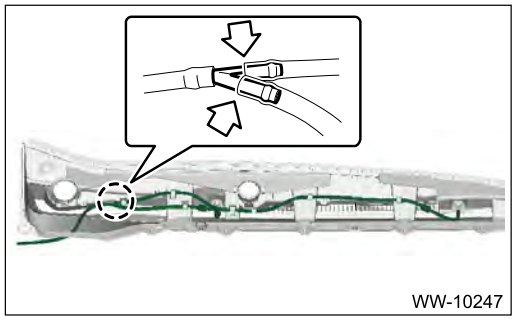
1. Remove the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
2. Remove the cowl panel - side and the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>REMOVAL.

   Caution:

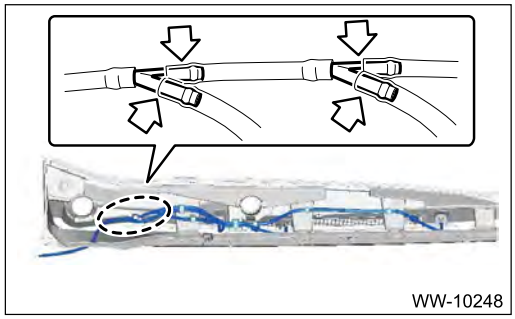
   Before removing the cowl panel, use an air blower and nylon brush to sweep gravel from the lower area of the front side of the glass.
3. Remove the nozzle - windshield washer.
   (1) Push the claw using a flat tip screwdriver, etc.
   (2) When the nozzle - windshield washer lifts up, pull out the nozzle - windshield washer using a clip remover, etc.
   (3) Disconnect the hose - windshield washer, and remove the nozzle - windshield washer.



4. Disconnect the hose - windshield washer as necessary.
   - Models without EyeSight



   - Models with EyeSight



2. NOZZLE - WIPER ARM WASHER & HOSE (MODEL WITH EYESIGHT)

Caution:

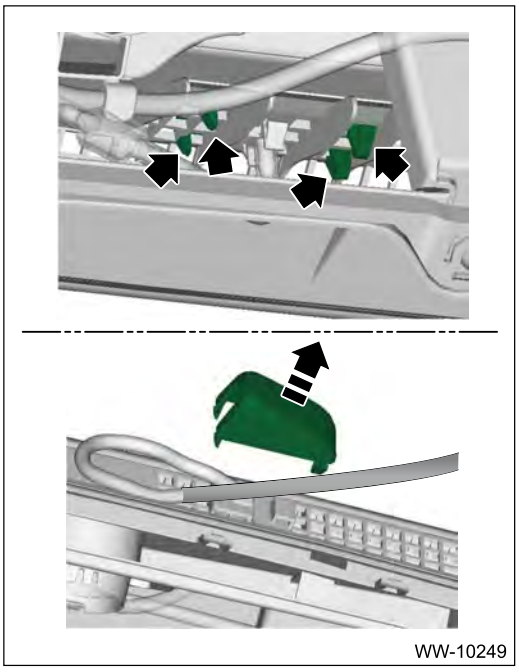
Do not remove the nozzle - wiper arm washer from the arm assembly - windshield wiper assistor.

If nozzle replacement is required, replace the arm assembly - windshield wiper assistor as a unit.

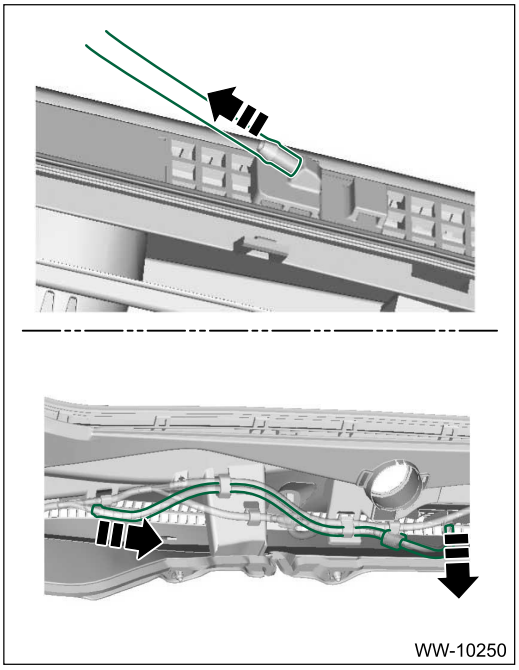
1. Remove the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
2. Remove the cowl panel - side and the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>REMOVAL.

   Caution:

   Before removing the cowl panel, use an air blower and nylon brush to sweep gravel from the lower area of the front side of the glass.
3. Release the claws, and remove the cover - joint from cowl panel assembly.



4. Remove the hose - wiper arm washer.

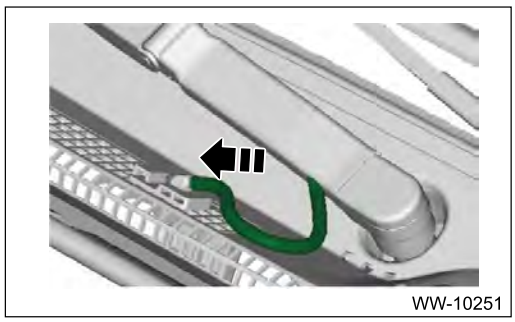


WIPER AND WASHER SYSTEMS > Front Washer Nozzle and Hose

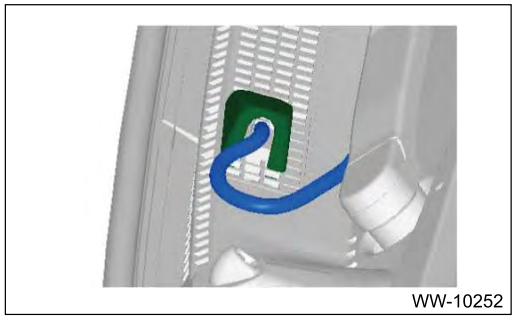
INSTALLATION

Caution:
Before installing the windshield glass and cowl panel, make sure there are no gravel in the installing area.

1. Install the nozzle - windshield washer.
   (1) Install the nozzle - windshield washer.
   (2) Install the hose - windshield washer.
2. Install the cowl panel - side and the cowl panel assembly. Ref. to EXTERIOR/INTERIOR TRIM>Cowl Panel>INSTALLATION.
3. Install the arm assembly - windshield wiper. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>INSTALLATION.
4. Install the hose to the joint - washer hose. (Models with EyeSight)



5. Install the cover - joint to the cowl panel assembly. (Models with EyeSight)
6. Adjust the position of the nozzle - windshield washer. Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>ADJUSTMENT.
7. Operate the windshield wiper to check that the stop position is aligned with the point mark.
   If it is not aligned with the point mark, perform the removal and installation of the windshield wiper over again. Ref. to WIPER AND WASHER SYSTEMS>Front Wiper Arm>REMOVAL.
8. Make sure that the hose and the cover - joint do not interfere during windshield wiper operation. (Models with EyeSight)



WIPER AND WASHER SYSTEMS > Front Washer Nozzle and Hose

INSPECTION

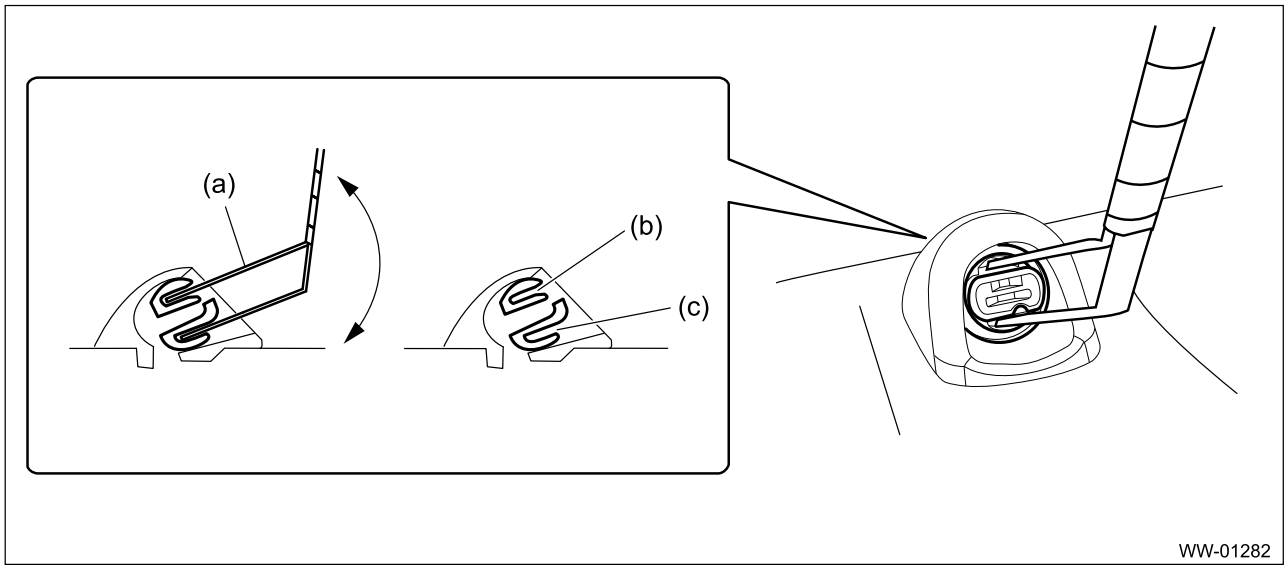
- Make sure the nozzle - windshield washer and the hose - windshield washer are not clogged.
- Make sure the hose - windshield washer is not bent.
- Check the position of the nozzle - windshield washer. Ref. to WIPER AND WASHER SYSTEMS>Front Washer Nozzle and Hose>ADJUSTMENT.

WIPER AND WASHER SYSTEMS > Front Washer Nozzle and Hose

ADJUSTMENT

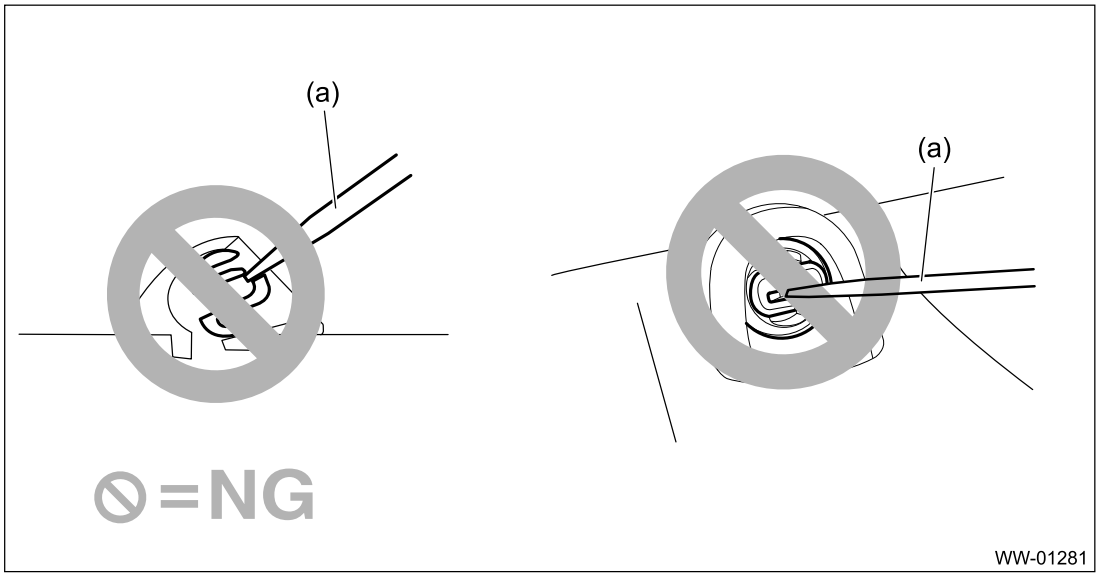
1. NOZZLE - WINDSHIELD WASHER

1. Turn the wiper switch to OFF position.
2. While the vehicle is at a standstill, insert the washer nozzle adjustment tool (a) into upper side (b) and lower side (c) of the nozzle - windshield washer to perform necessary adjustment.

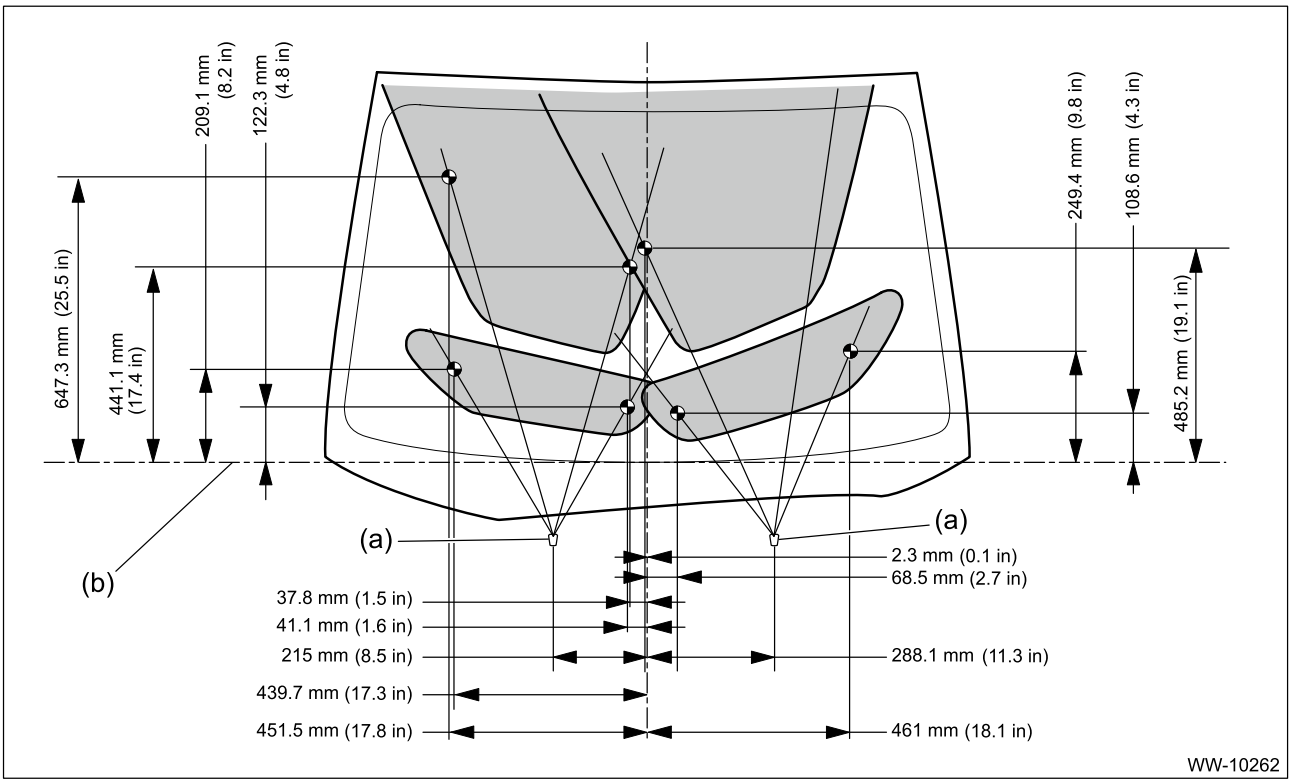


Caution:

Washer nozzle is made of resin. If precision screwdriver (a) or equivalent is inserted into discharge port for adjustment, the discharge port can be deformed, and washer fluid cannot be sprayed.



3. Adjust the washer injection position as shown in the figure.



(a) Nozzle - windshield washer (b) Line extending from ceramic line lower end

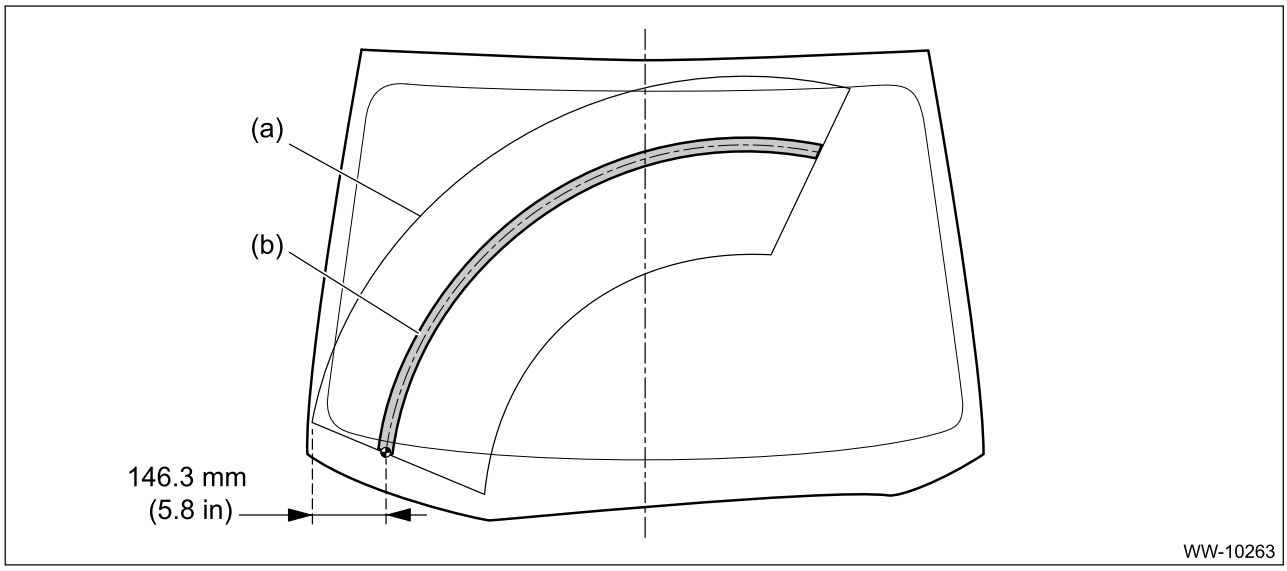
2. NOZZLE - WIPER ARM WASHER (MODEL WITH EYESIGHT)

Caution:

Check and adjust the spray position of the nozzle - wiper arm at the position where the wiper arm stops.

1. Turn the wiper switch to OFF position.

2. While the vehicle is stopped, check that the washer spray position is as shown in the figure.
3. After inspection, if the spray position is really out of the specified range, replace with a new arm assembly - windshield wiper assistor.



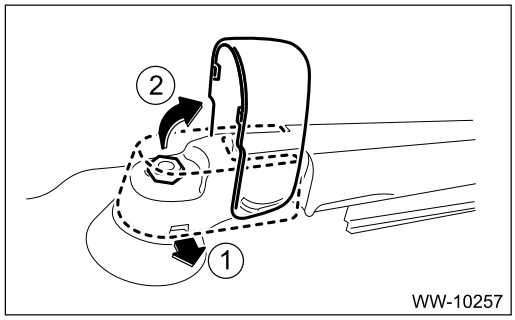
(a) Wiping area of arm ASSY - windshield wiper assistor

(b) Spray area

WIPER AND WASHER SYSTEMS > Rear Wiper Arm

REMOVAL

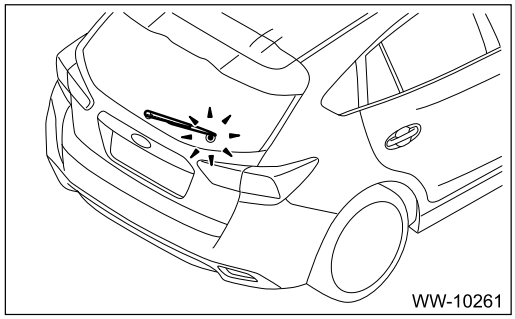
1. Pull up the cover - rear wiper arm.
2. Remove the nut, and remove the arm assembly - rear wiper.



WIPER AND WASHER SYSTEMS > Rear Wiper Arm

INSTALLATION

1. Install the arm assembly - rear wiper.
   (1) Assemble the blade assembly - rear wiper aligning it with the marking on the glass.

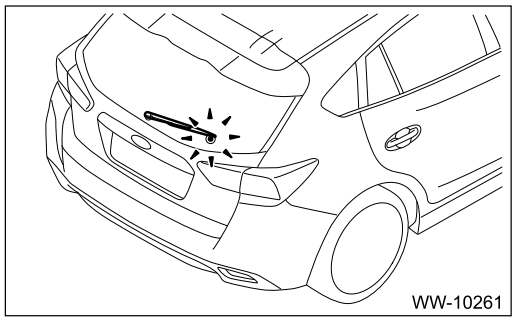


   (2) Tighten the arm assembly - rear wiper to the specified torque, and install the cover - rear wiper arm.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)
2. Operate the wiper to check whether the wiper blade aligns with the point mark. If not, perform installation over again.

WIPER AND WASHER SYSTEMS > Rear Wiper Arm

ADJUSTMENT

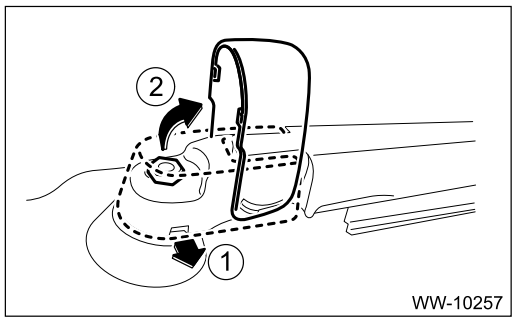
1. Operate the rear wiper once.
2. If the wiper blade is not aligned with the point mark, perform the removal of the rear wiper to align with the marking. Ref. to WIPER AND WASHER SYSTEMS>Rear Wiper Arm>REMOVAL.



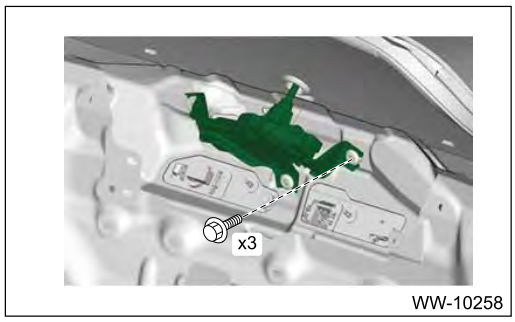
WIPER AND WASHER SYSTEMS > Rear Wiper Motor

REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>REMOVAL.
3. Remove the arm assembly - rear wiper.
   (1) Remove the cover - rear wiper arm.
   (2) Remove the nut, and remove the arm assembly - rear wiper.



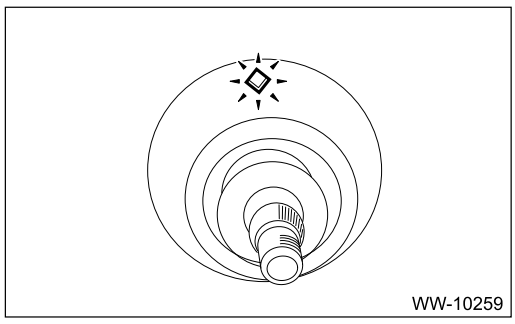
4. Remove the motor assembly - rear wiper.
   (1) Disconnect the harness connector of the motor assembly - rear wiper.
   (2) Remove the bolts, and remove the motor assembly - rear wiper.



WIPER AND WASHER SYSTEMS > Rear Wiper Motor

INSTALLATION

1. Check that the mark on the cap - pivot wiper faces up.



2. Install the motor assembly - rear wiper.
   (1) Install the bolts, and install the motor assembly - rear wiper.
   Tightening torque:
   7 N·m (0.7 kgf-m, 5.2 ft-lb)
   (2) Install the harness connector of the motor assembly - rear wiper.
3. Install the arm assembly - rear wiper.
   (1) Install the nuts, and install the arm assembly - rear wiper.
   Tightening torque:
   8 N·m (0.8 kgf-m, 5.9 ft-lb)

(2) Install the cover - rear wiper arm.

4. Install the rear gate trim. Ref. to EXTERIOR/INTERIOR TRIM>Rear Gate Trim>INSTALLATION.
5. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

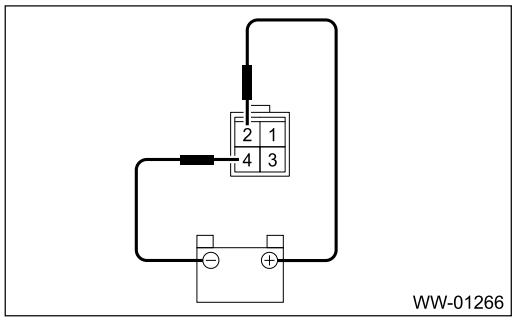
WIPER AND WASHER SYSTEMS > Rear Wiper Motor

INSPECTION

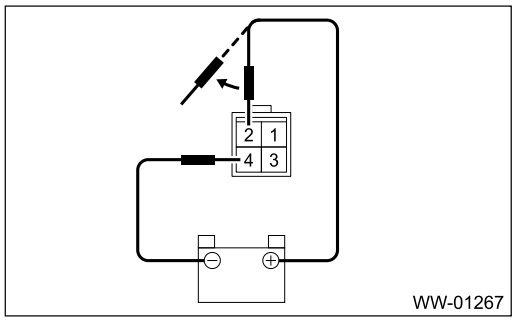
Caution:

Fix the motor to prevent the motor from being shorted by moving during operation.

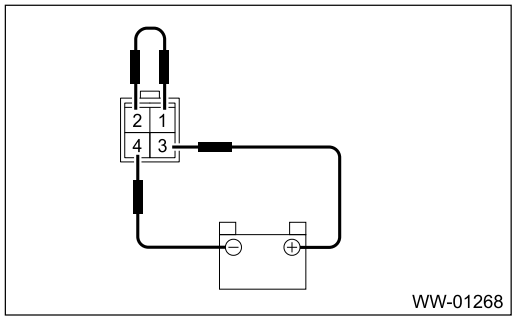
1. Connect the battery to the motor assembly - rear wiper connector, and check that the motor assembly - rear wiper operates.



2. Connect the battery to terminals of the connector, and remove the terminal connection with motor rotating, and stop the motor in mid-operation.

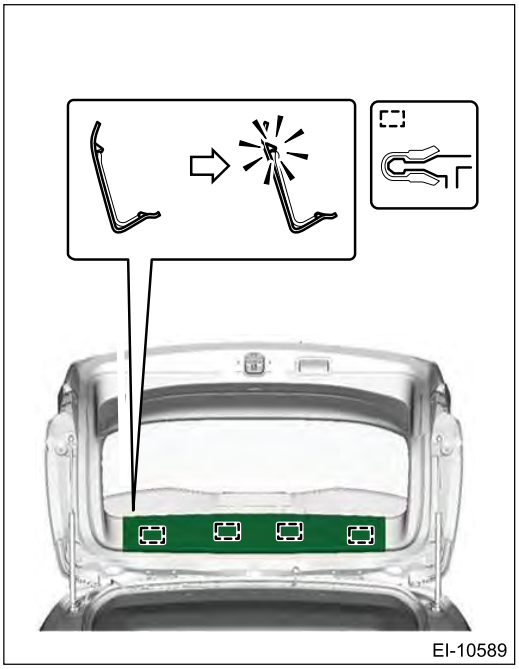


3. Connect the battery and check that the motor stops at the automatic stop position after the motor operates at low speed again.



REMOVAL

1. Disconnect the ground cable from battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the trim panel - rear gate UPR.
   (1) Remove the claws on the trim edge.
   (2) Release the claws in the center of trim, and remove the trim panel - rear gate UPR.

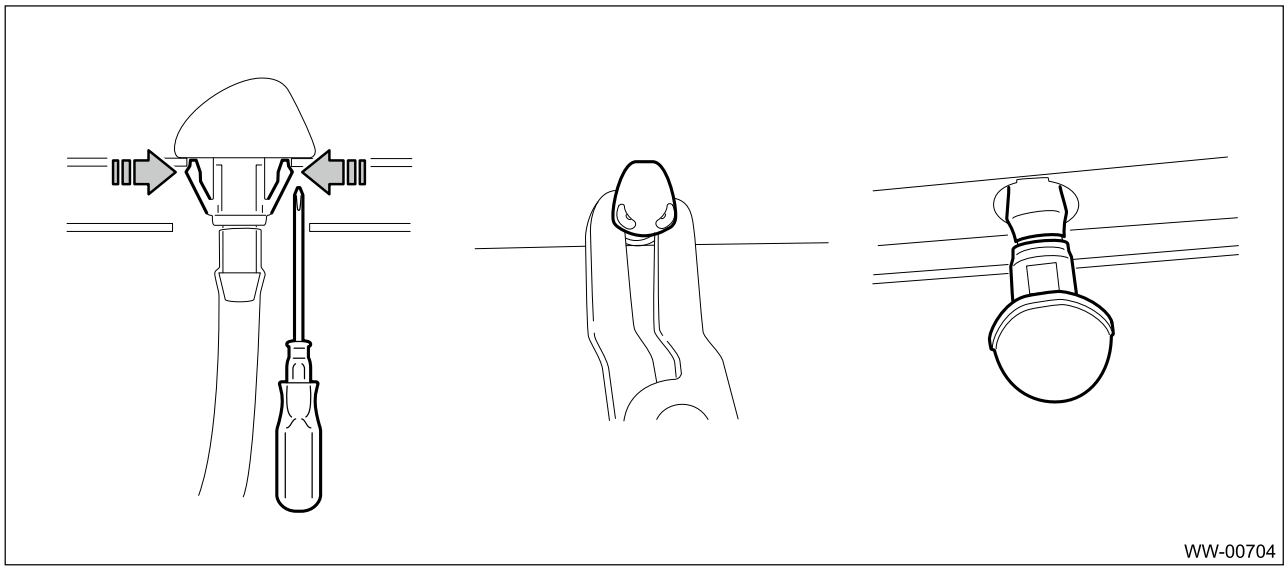


3. Remove the roof spoiler assembly. Ref. to EXTERIOR/INTERIOR TRIM>Roof Spoiler>REMOVAL.
4. Remove the nozzle - rear washer.

   Caution:

   Before removing, apply protective tape to the body panel and used tools not to damage the panel - rear gate.

   (1) Push the claw using a flat tip screwdriver, etc.
   (2) When the nozzle - rear washer lifts up, pull out the nozzle - rear washer using a clip remover, etc.
   (3) Disconnect the hose - rear washer, and remove the nozzle - rear washer.



INSTALLATION

1. Install the nozzle - rear washer.
2. Install the roof spoiler assembly.
   Tightening torque:
   7.5 N·m (0.8 kgf-m, 5.5 ft-lb)
3. Install the trim panel - rear gate UPR.
4. Connect the battery ground terminal. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. Check the nozzle - rear washer position. Ref. to WIPER AND WASHER SYSTEMS>Rear Washer>INSPECTION > VISUAL INSPECTION.

WIPER AND WASHER SYSTEMS > Rear Washer

INSPECTION

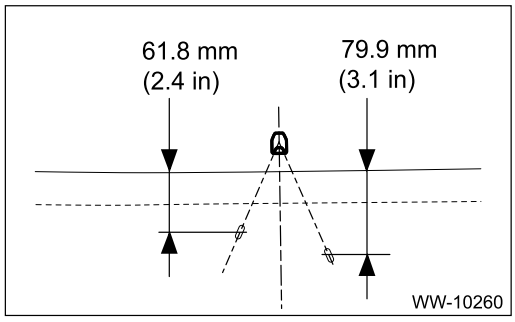
1. VISUAL INSPECTION

Check for the following items, and if any malfunction is found, replace the corresponding part.

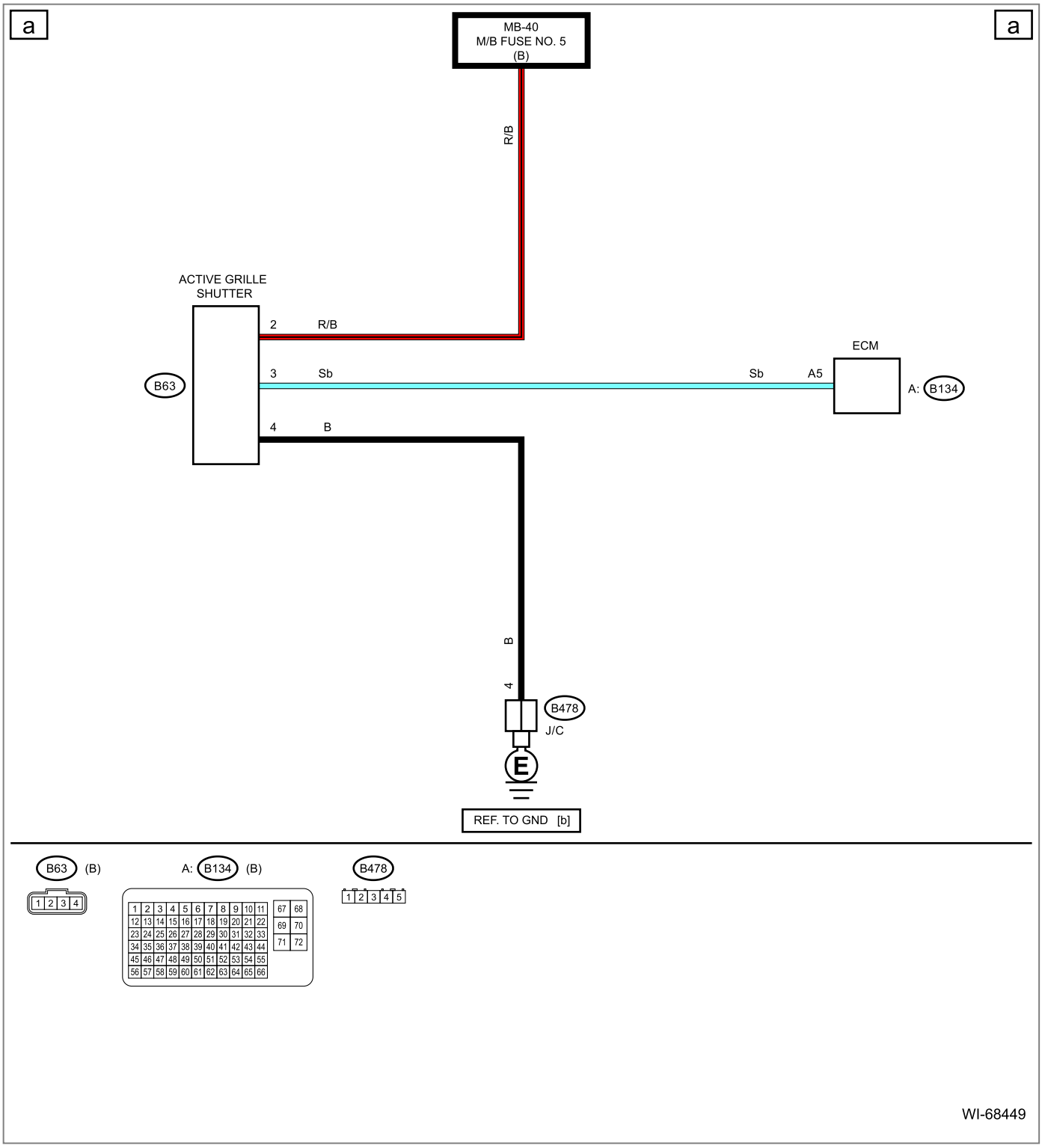
- Make sure the nozzle - rear washer and the hose - rear washer are not clogged.
- Make sure the hose - rear washer is not bent.

2. INSPECTING THE SPRAY POSITION

1. Turn the wiper switch to OFF position.
2. While the vehicle is stopped, check that the washer spray position is as shown in the figure.
3. After inspection, if the spray position is significantly out of the specified range, replace the nozzle - rear washer with a new part.

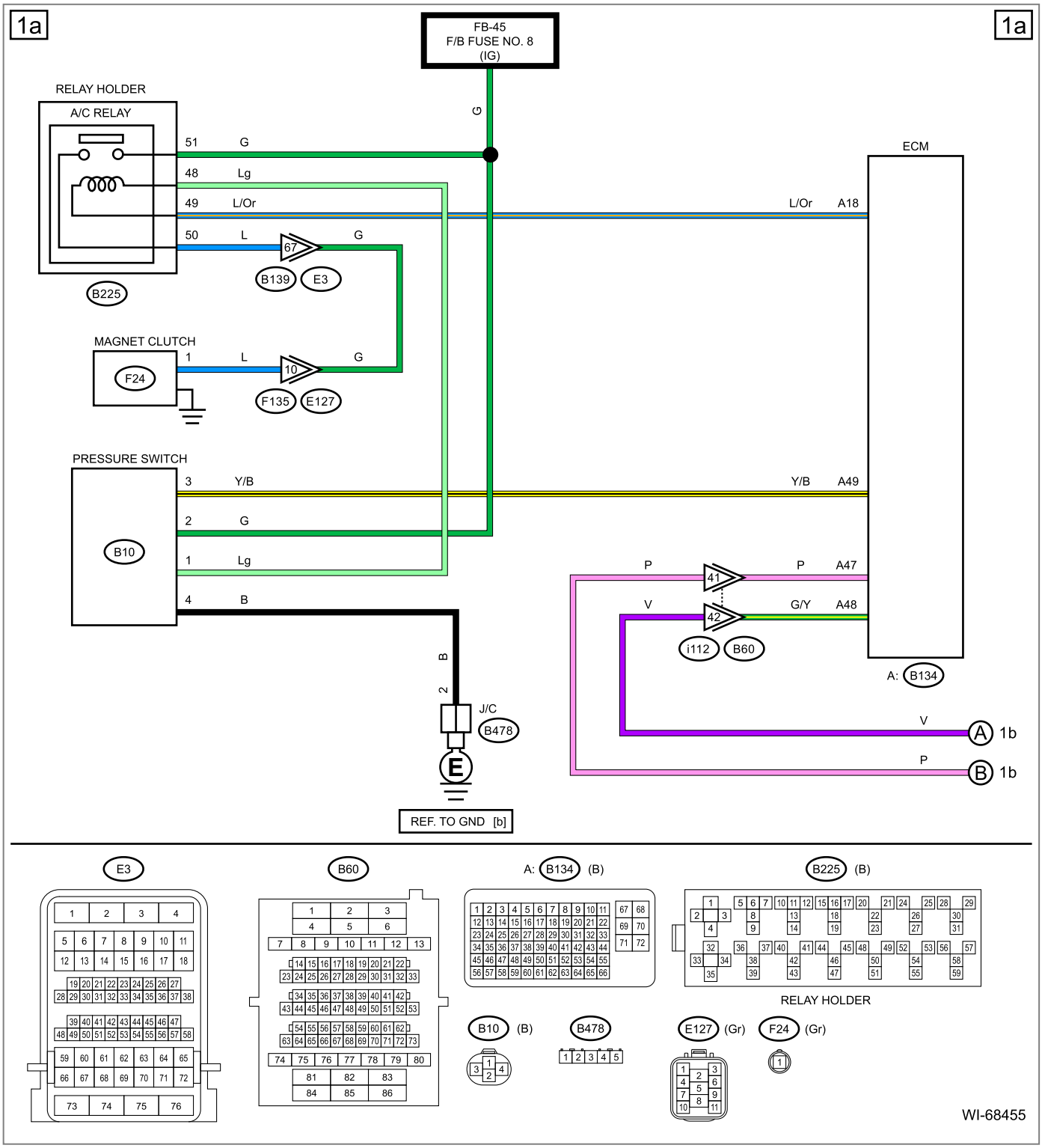


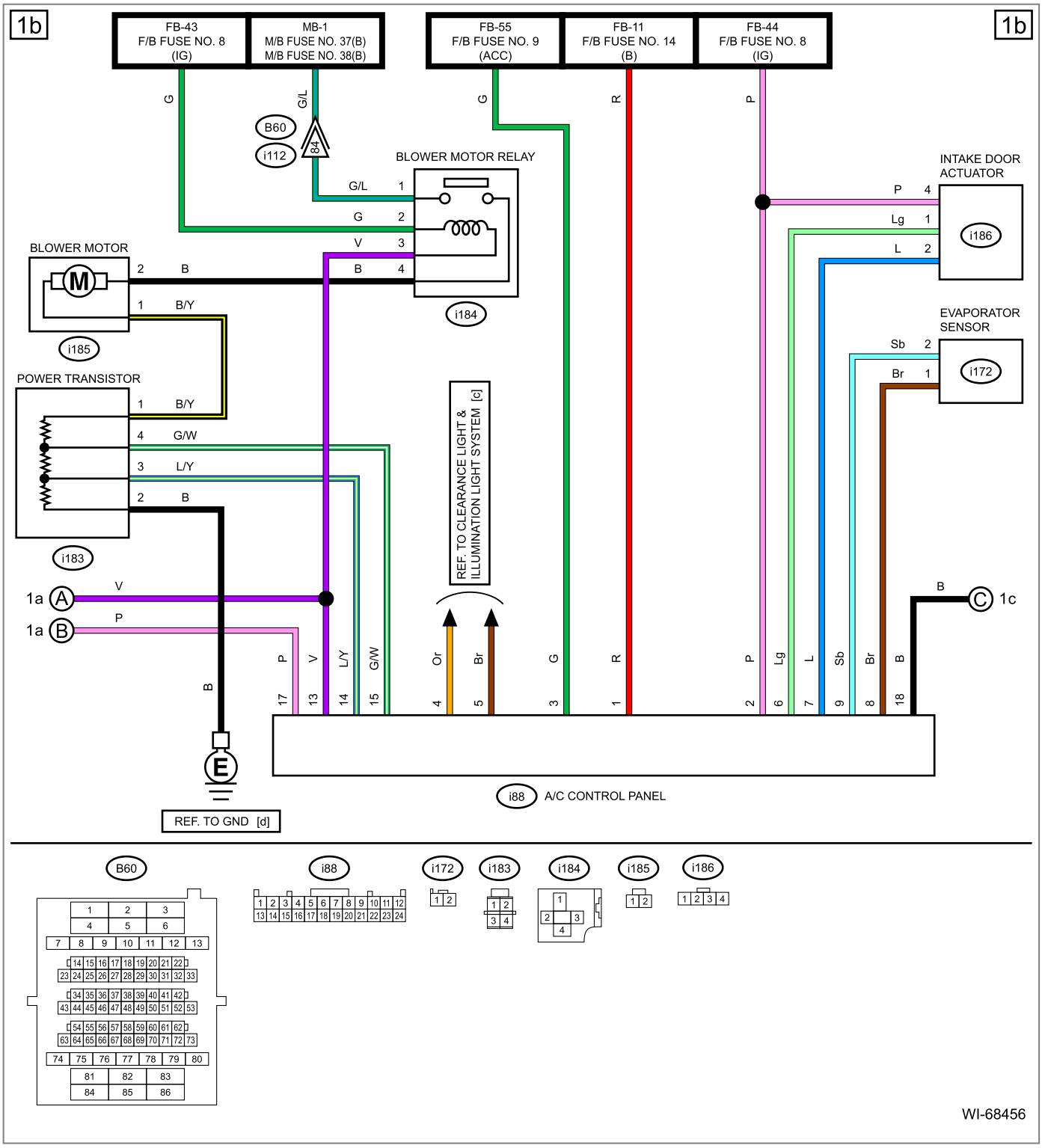
WIRING DIAGRAM

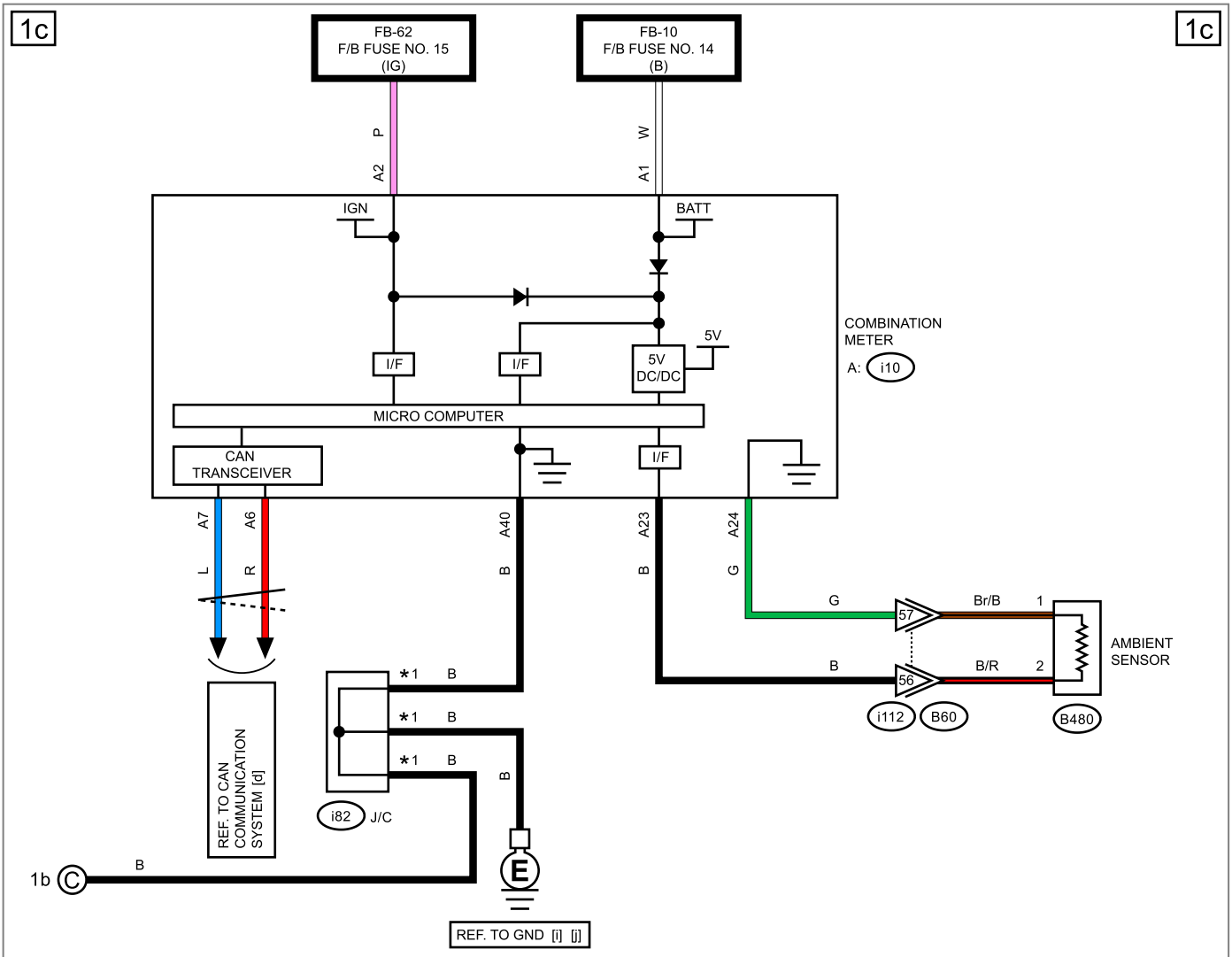

a
a
MB-40
M/B FUSE NO. 5
(B)
R/B
ACTIVE GRILLE
SHUTTER
2
R/B
ECM
B63
3
Sb
Sb
A5
A:
B134
4
B
B
4
B478
J/C
E
REF. TO GND [b]
B63
(B)
A:
B134
(B)
B478
WI-68449

WIRING DIAGRAM

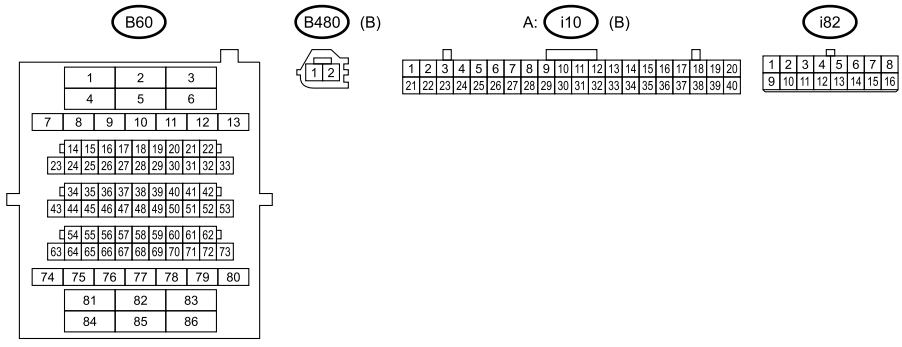
1. MANUAL A/C




1b
1b
FB-43
F/B FUSE NO. 8
(IG)
MB-1
M/B FUSE NO. 37(B)
M/B FUSE NO. 38(B)
FB-55
F/B FUSE NO. 9
(ACC)
FB-11
F/B FUSE NO. 14
(B)
FB-44
F/B FUSE NO. 8
(IG)
B60
i112
84
BLOWER MOTOR RELAY
i184
INTAKE DOOR
ACTUATOR
i186
BLOWER MOTOR
M
i185
EVAPORATOR
SENSOR
i172
POWER TRANSISTOR
i183
REF. TO CLEARANCE LIGHT &
ILLUMINATION LIGHT SYSTEM [c]
1a A
1a B
1c C
E
REF. TO GND [d]
i88 A/C CONTROL PANEL
G
G/L
R
P
V
B
B/Y
G/W
L/Y
Or
Br
Lg
L
Sb
WI-68456

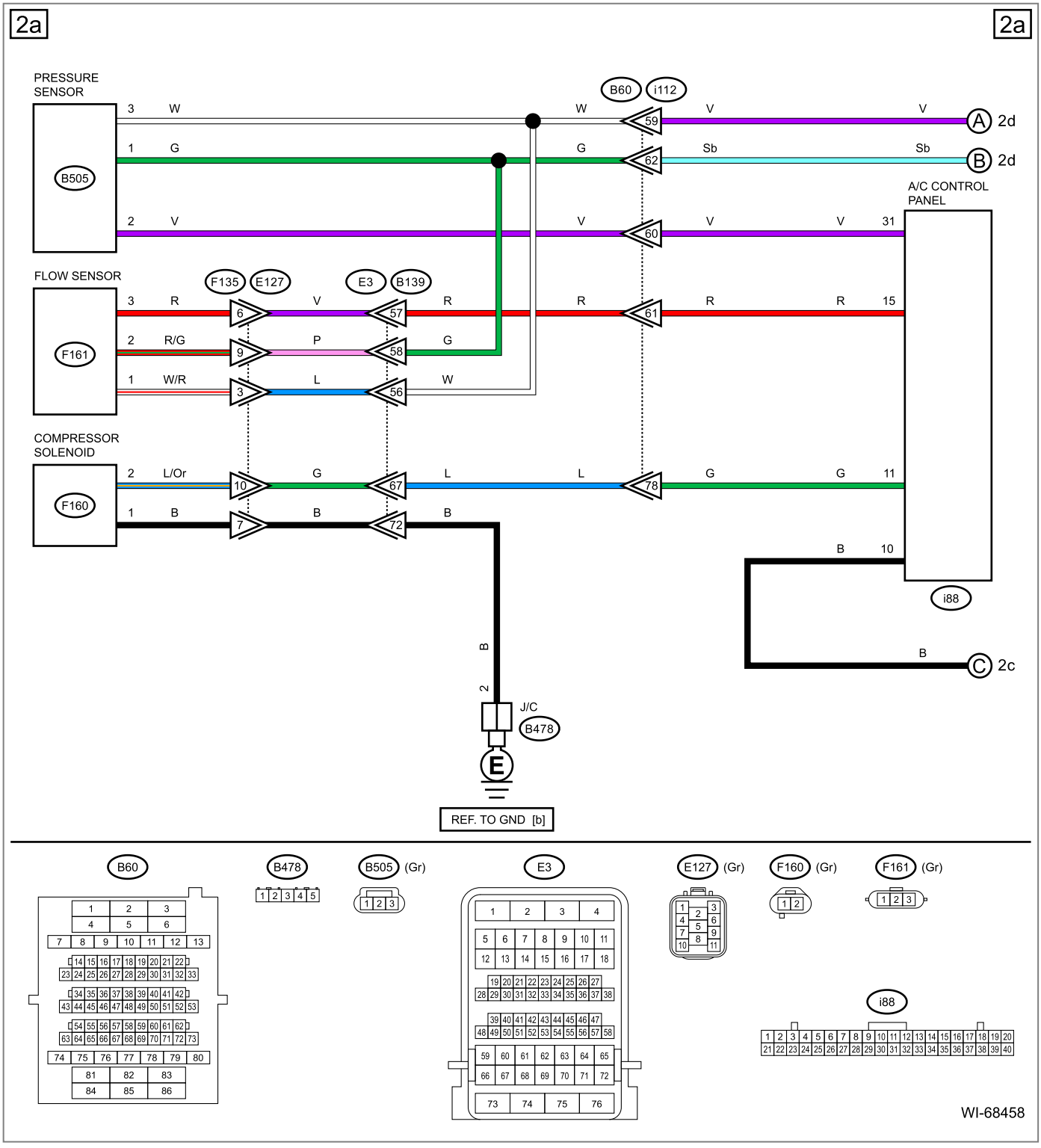


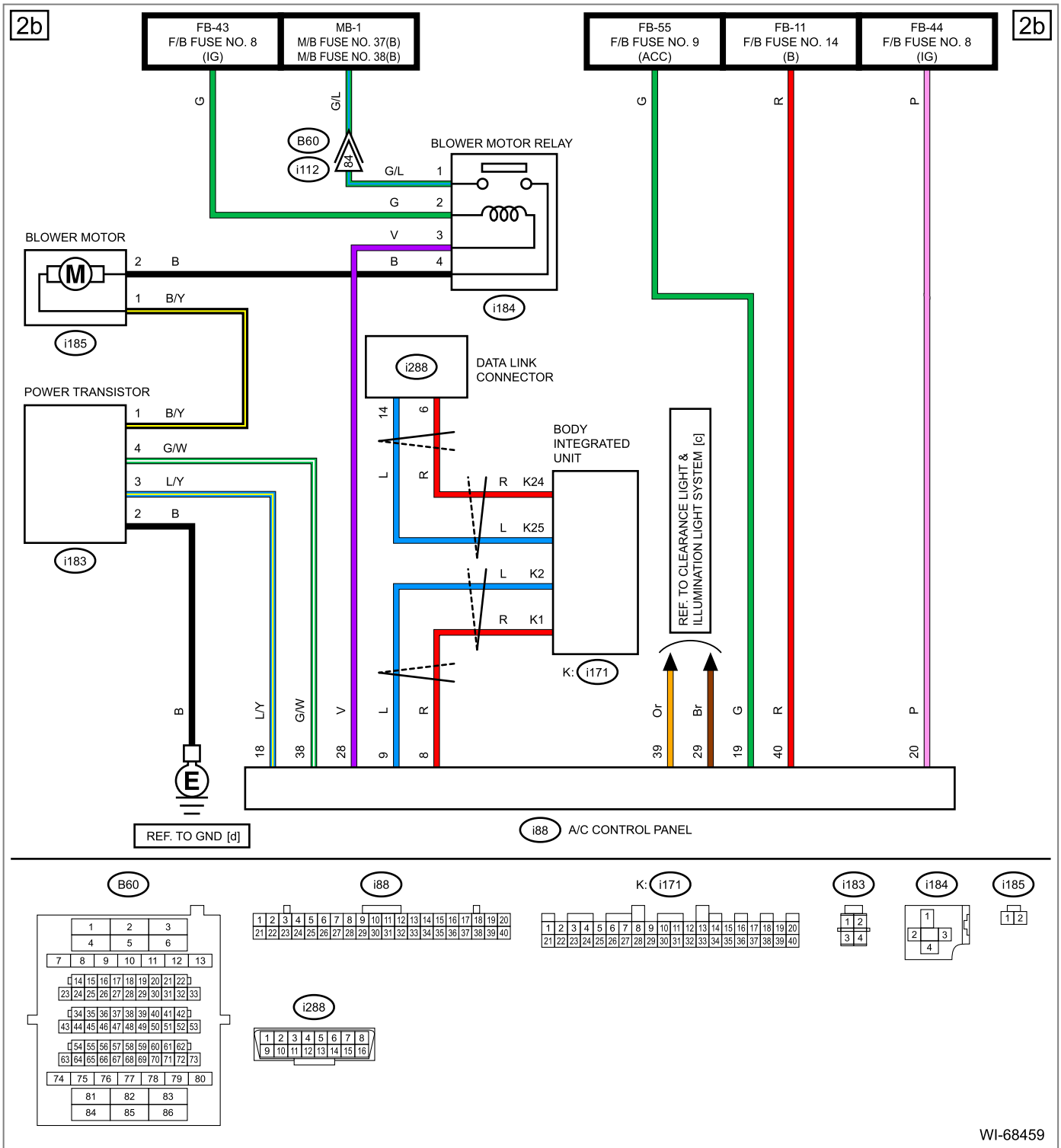
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

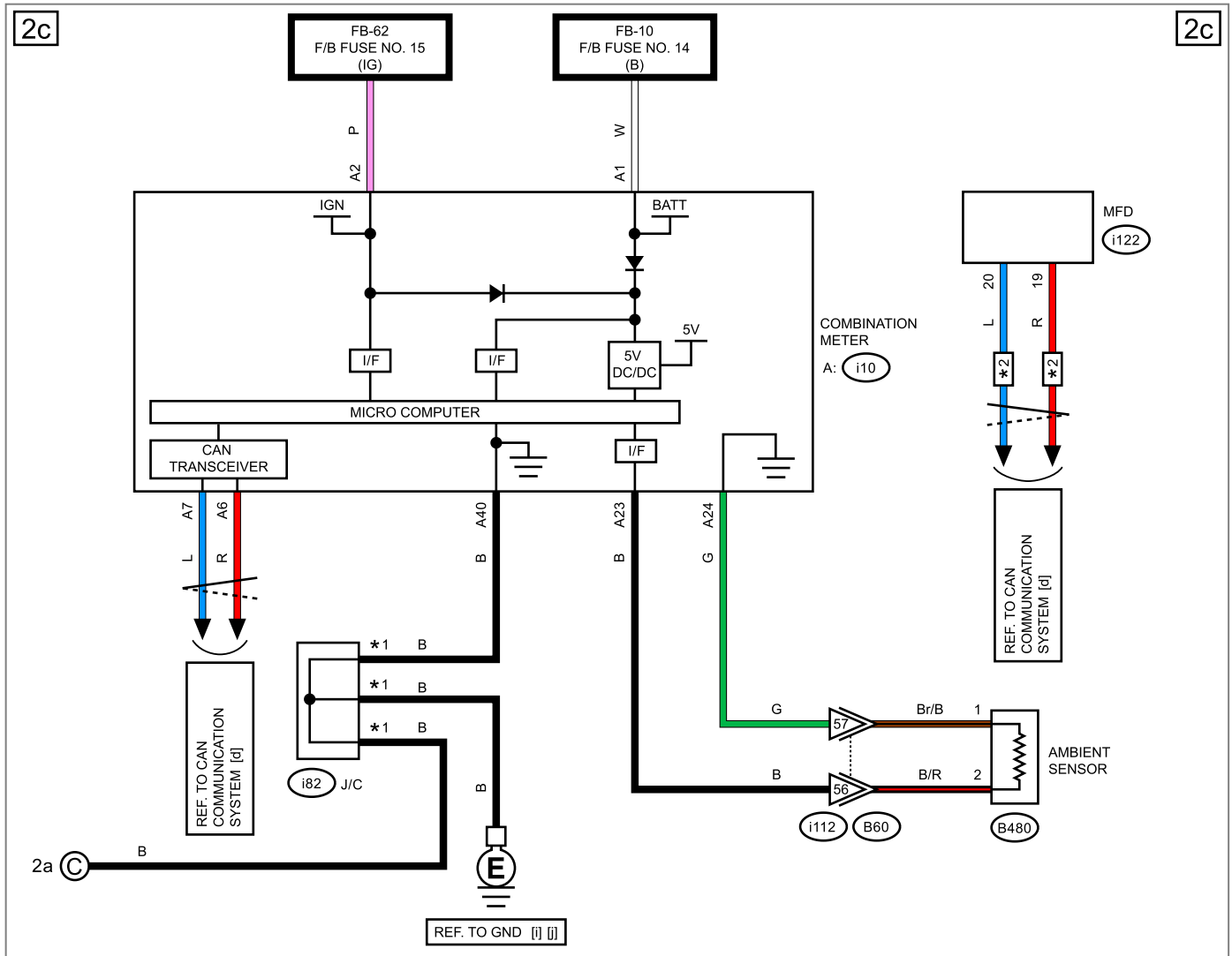


WI-68457

2. AUTO A/C


2a
2a
PRESSURE SENSOR
B505
3 W
1 G
2 V
B60 i112
59
62
60
A 2d
B 2d
A/C CONTROL PANEL
31
FLOW SENSOR
F161
F135 E127
E3 B139
3 R
2 R/G
1 W/R
6
9
3
57
58
56
61
15
COMPRESSOR SOLENOID
F160
2 L/Or
1 B
10
7
67
72
78
11
B 10
i88
B
C 2c
J/C
B478
E
REF. TO GND [b]
B60
B478
B505 (Gr)
E3
E127 (Gr)
F160 (Gr)
F161 (Gr)
i88
WI-68458

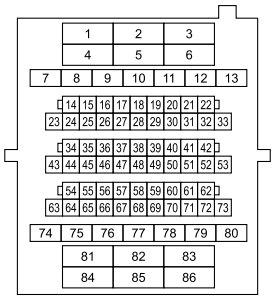

2b
FB-43
F/B FUSE NO. 8
(IG)
MB-1
M/B FUSE NO. 37(B)
M/B FUSE NO. 38(B)
FB-55
F/B FUSE NO. 9
(ACC)
FB-11
F/B FUSE NO. 14
(B)
FB-44
F/B FUSE NO. 8
(IG)
2b
G
G/L
G
R
P
B60
i112
84
BLOWER MOTOR RELAY
G/L 1
G 2
V 3
B 4
i184
BLOWER MOTOR
2 B
1 B/Y
i185
i288
DATA LINK
CONNECTOR
POWER TRANSISTOR
1 B/Y
4 G/W
3 L/Y
2 B
i183
14
6
L
R
BODY
INTEGRATED
UNIT
R K24
L K25
L K2
R K1
K: i171
REF. TO CLEARANCE LIGHT &
ILLUMINATION LIGHT SYSTEM [c]
B
L/Y
G/W
V
L
R
Or
Br
G
R
P
18
38
28
9
8
39
29
19
40
20
E
REF. TO GND [d]
i88
A/C CONTROL PANEL
B60
i88
K: i171
i183
i184
i185
i288
WI-68459



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH HIGH GRADE MFD

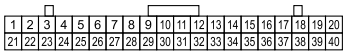
B60



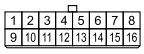
B480 (B)



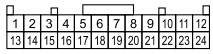
A: i10 (B)



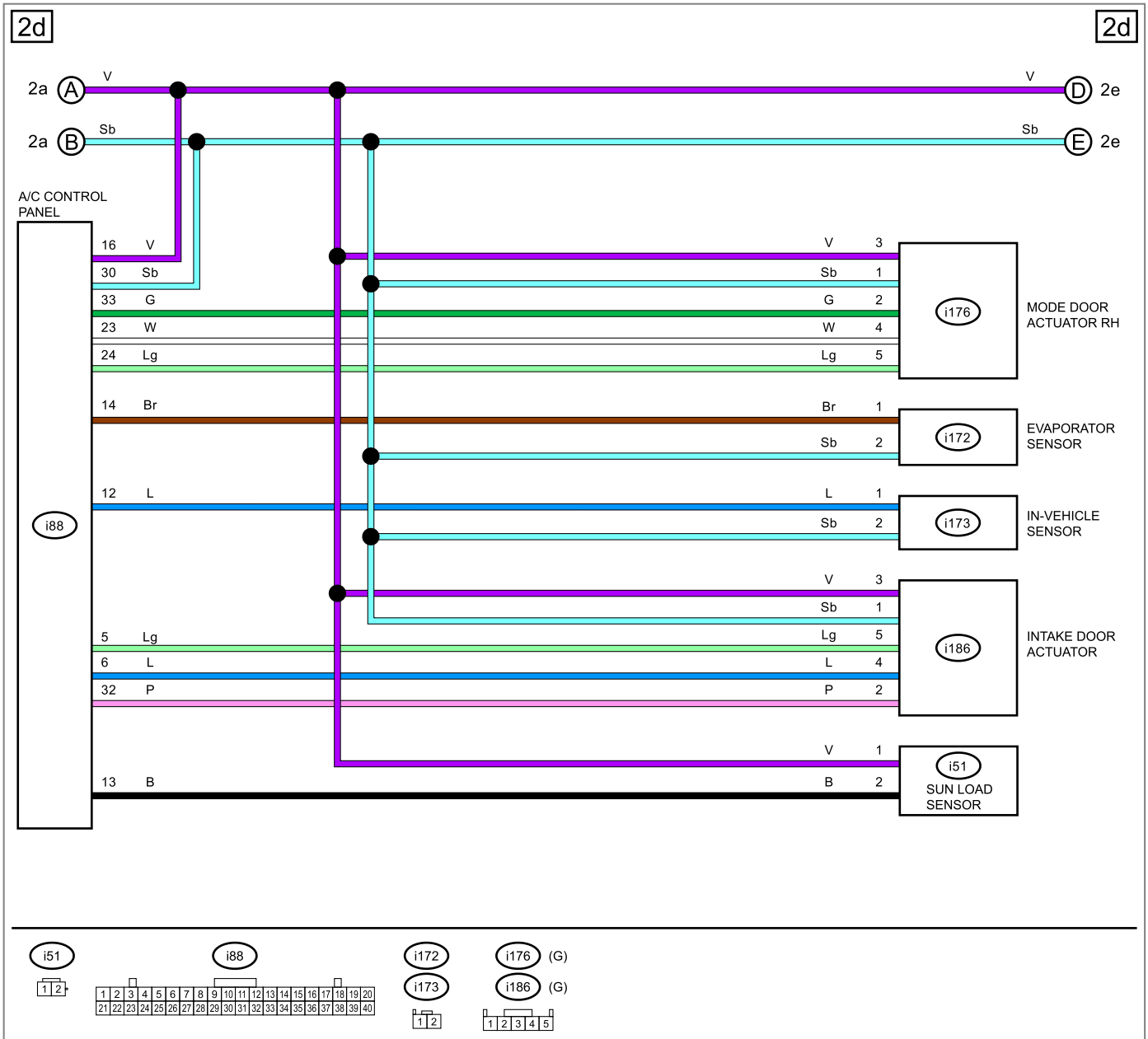
i82



i122



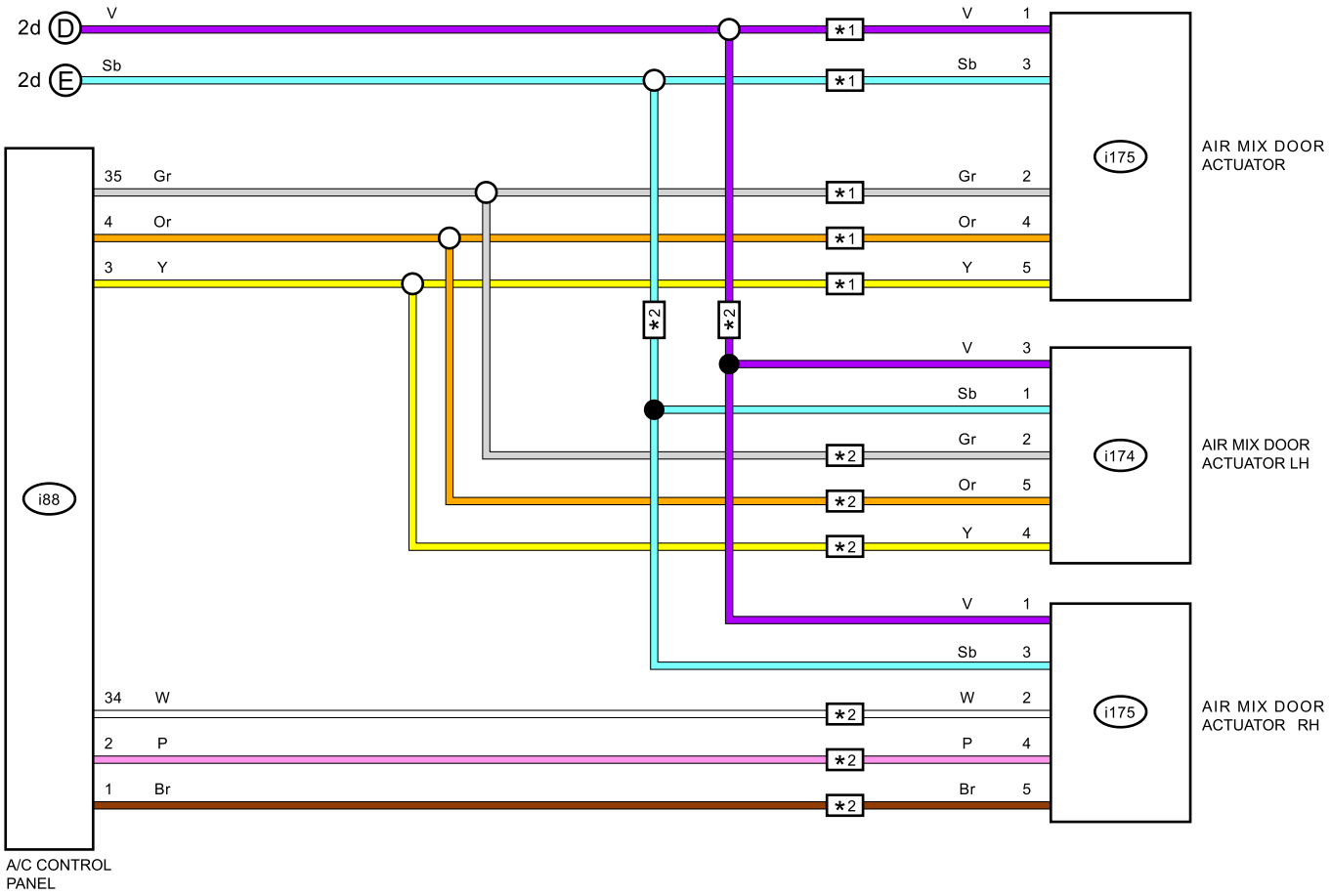
WI-68460


2d
2d
2a A V
2a B Sb
V D 2e
Sb E 2e
A/C CONTROL PANEL
i88
16 V
30 Sb
33 G
23 W
24 Lg
14 Br
12 L
5 Lg
6 L
32 P
13 B
V 3
Sb 1
G 2
W 4
Lg 5
i176
MODE DOOR ACTUATOR RH
Br 1
Sb 2
i172
EVAPORATOR SENSOR
L 1
Sb 2
i173
IN-VEHICLE SENSOR
V 3
Sb 1
Lg 5
L 4
P 2
i186
INTAKE DOOR ACTUATOR
V 1
B 2
i51
SUN LOAD SENSOR

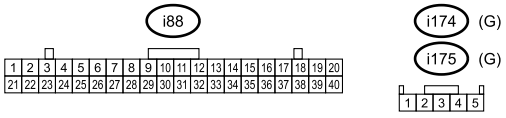
i51
1 2
i88
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
i172
i173
1 2
i176 (G)
i186 (G)
1 2 3 4 5

WI-68461

2e

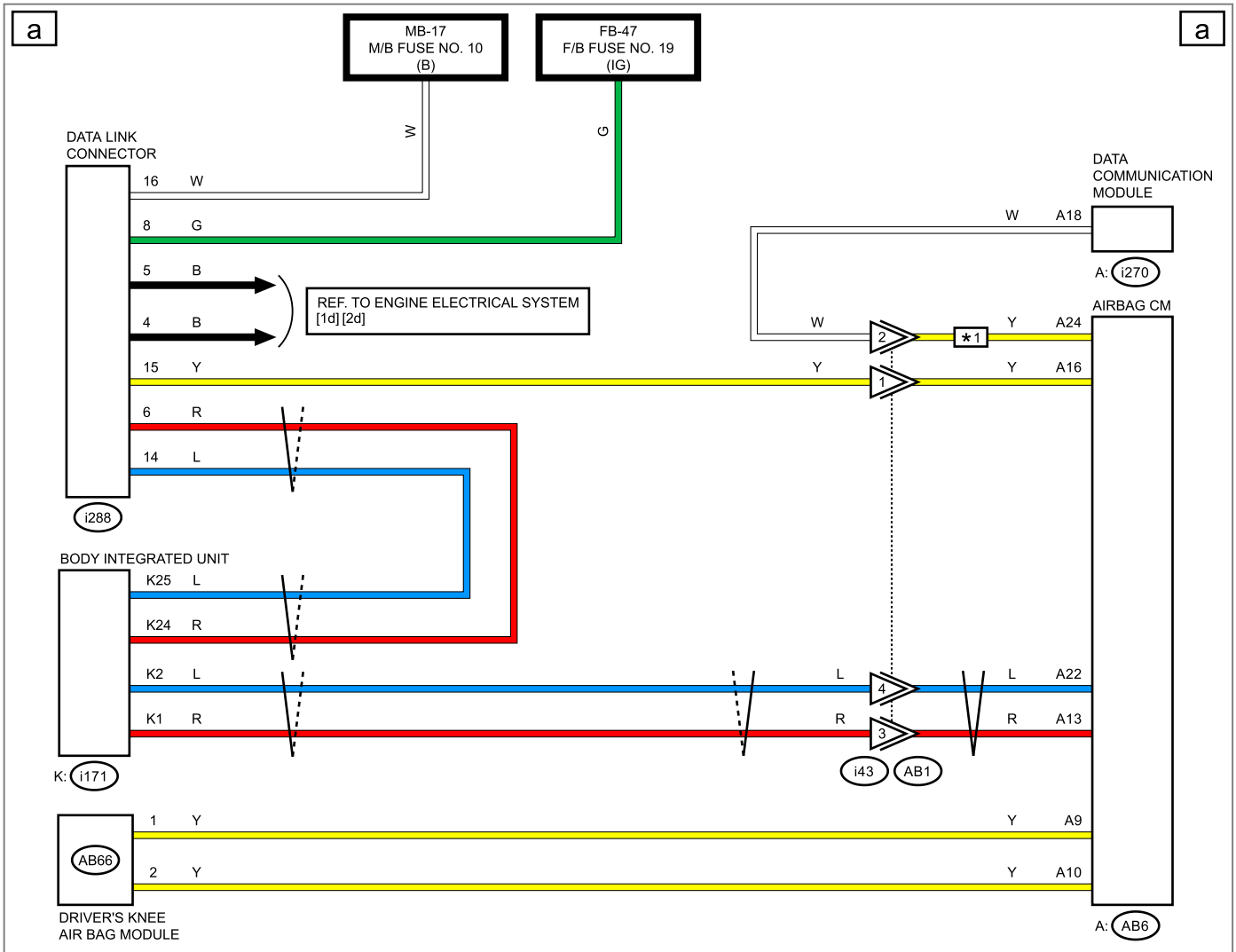


*1 : WITHOUT L/R INDEPENDENT AIR CONDITIONER
*2 : WITH L/R INDEPENDENT AIR CONDITIONER



WI-68722

WIRING DIAGRAM

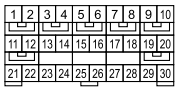


*1 : WITH TELEMATICS

AB1



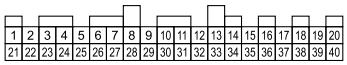
A: AB6 (Y)



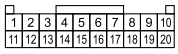
AB66 (B)



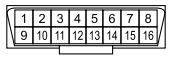
K: i171



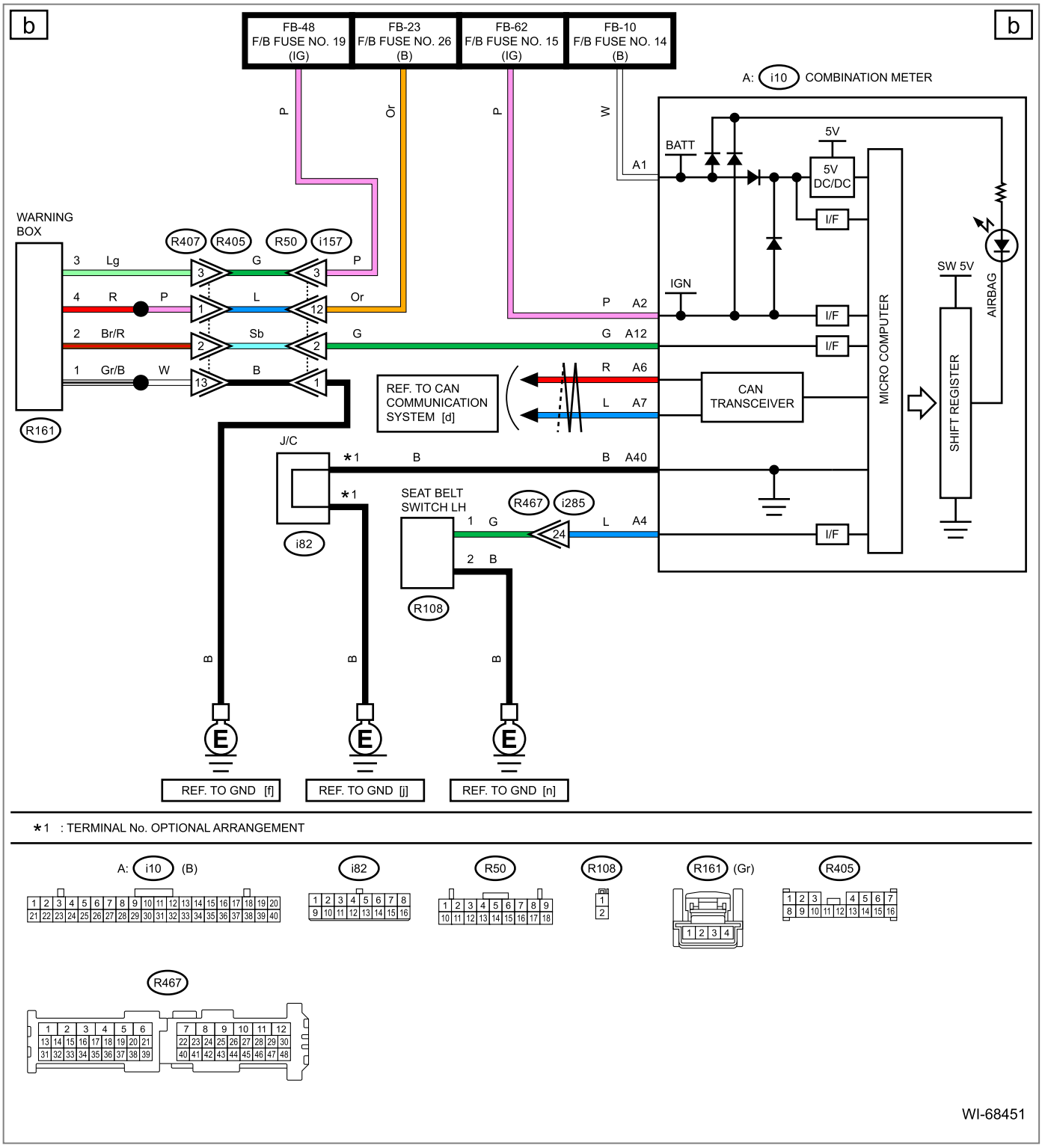
A: i270 (Gr)

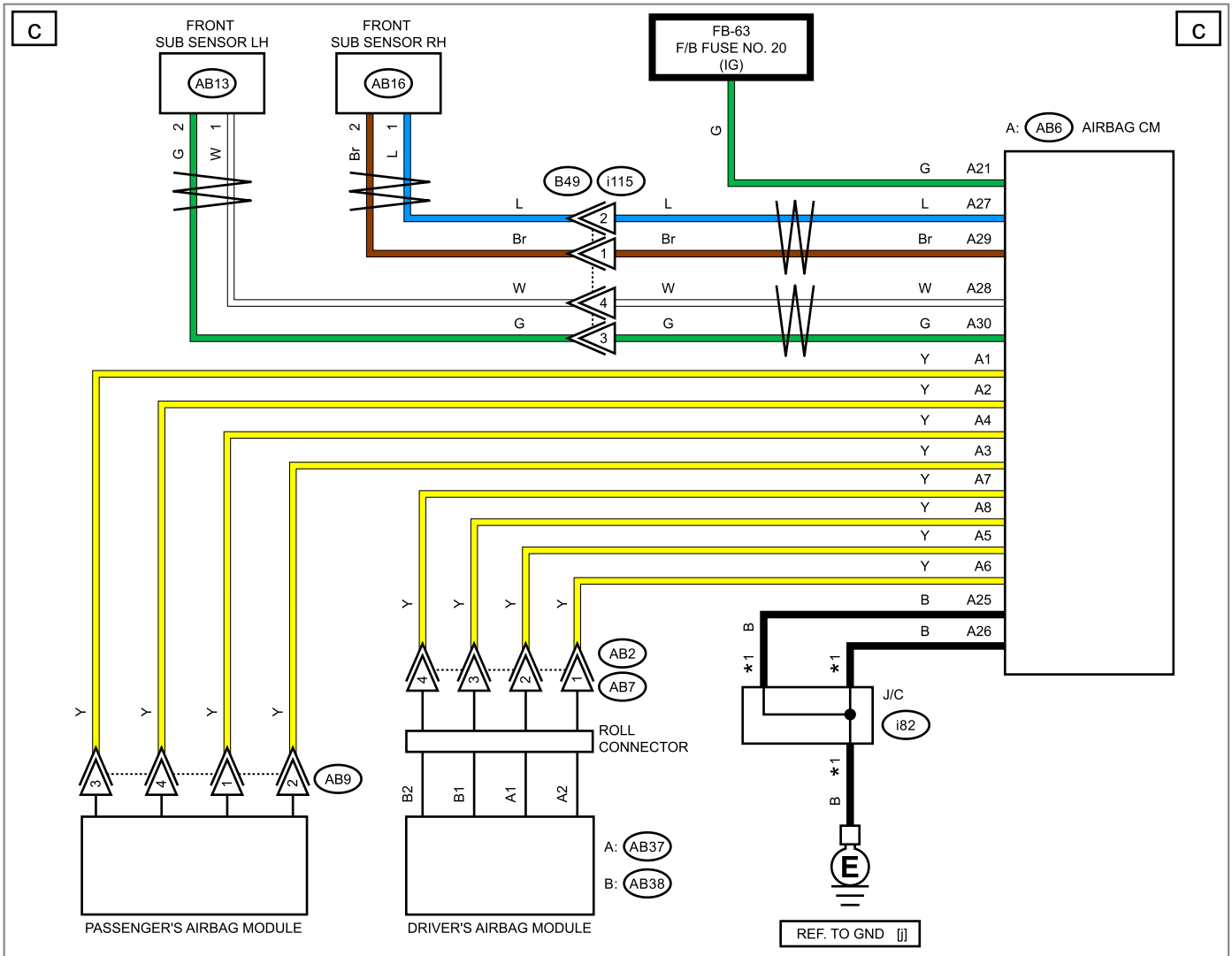


i288

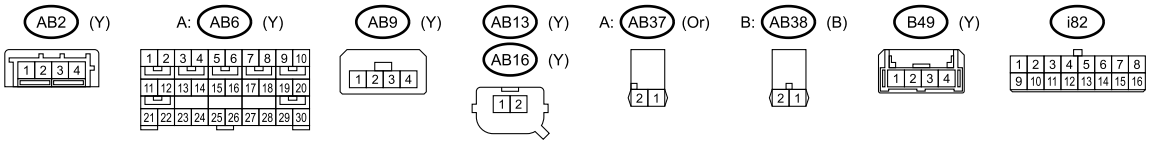


WI-68450

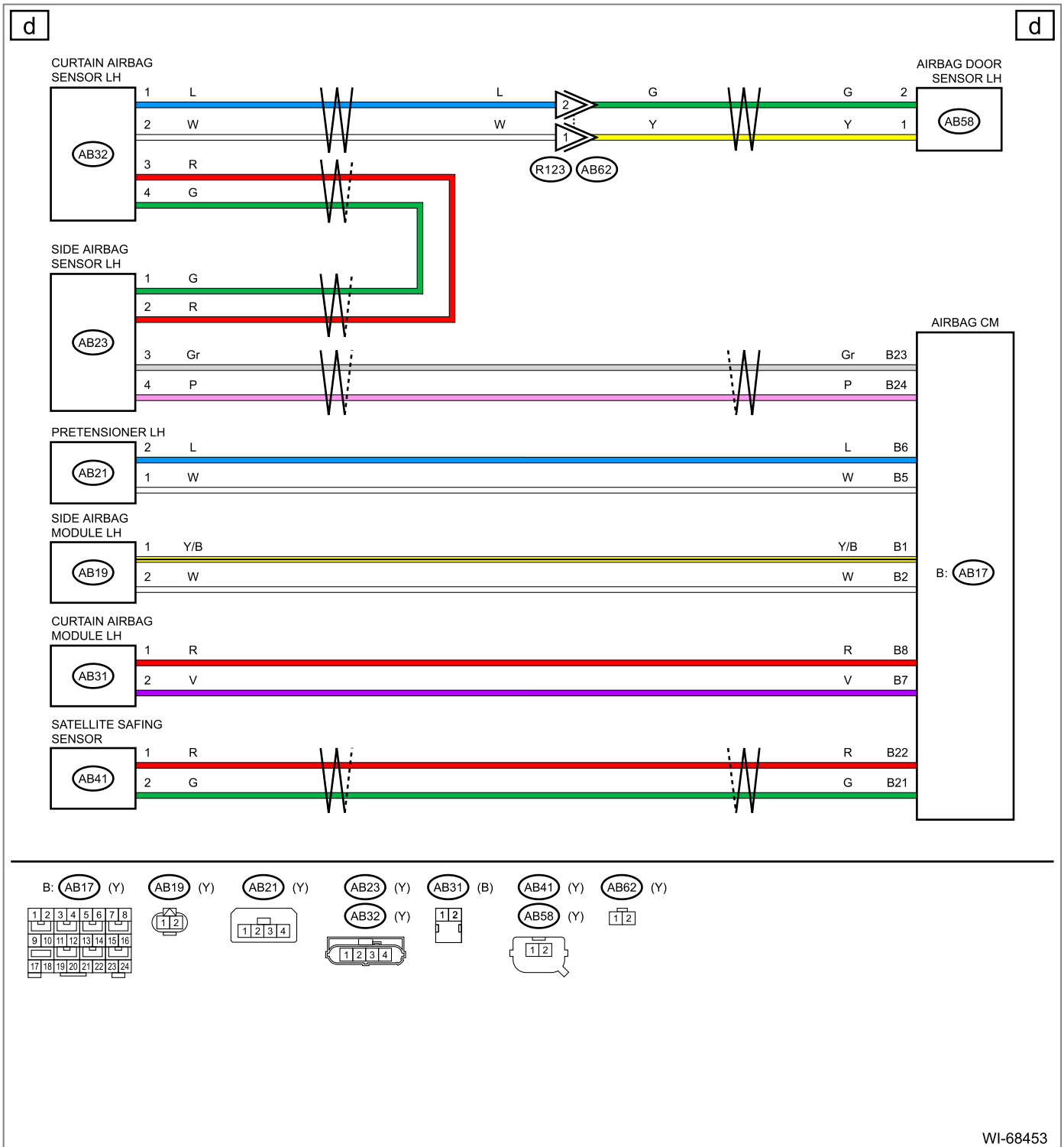

b
b
FB-48
F/B FUSE NO. 19
(IG)
FB-23
F/B FUSE NO. 26
(B)
FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
A: i10 COMBINATION METER
P
Or
P
W
BATT
A1
5V
5V
DC/DC
I/F
WARNING
BOX
R407
R405
R50
i157
3 Lg
G
P
4 R
P
L
Or
2 Br/R
Sb
G
1 Gr/B
W
B
IGN
P A2
G A12
R A6
L A7
I/F
I/F
I/F
REF. TO CAN
COMMUNICATION
SYSTEM [d]
CAN
TRANSCEIVER
MICRO COMPUTER
SHIFT REGISTER
SW 5V
AIRBAG
R161
J/C
*1
B
B A40
*1
SEAT BELT
SWITCH LH
R467
i285
1 G
L A4
2 B
i82
R108
B
B
B
REF. TO GND [f]
REF. TO GND [j]
REF. TO GND [n]
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
A: i10 (B)
i82
R50
R108
R161 (Gr)
R405
R467
WI-68451



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

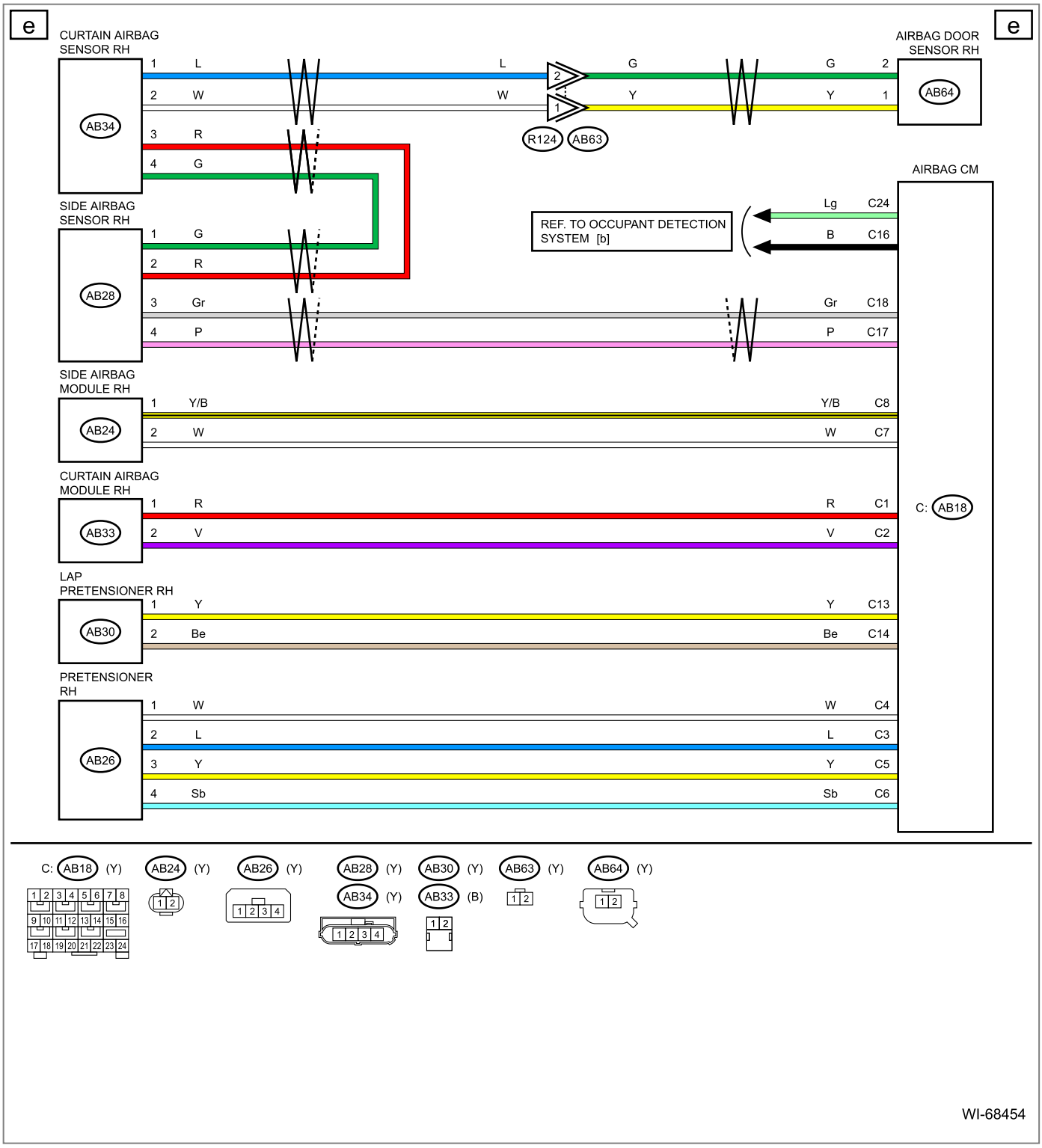


WI-68452


d
d
CURTAIN AIRBAG SENSOR LH
AB32
1 L
2 W
3 R
4 G
L
W
2
1
R123
AB62
G
Y
AIRBAG DOOR SENSOR LH
AB58
G 2
Y 1
SIDE AIRBAG SENSOR LH
AB23
1 G
2 R
3 Gr
4 P
AIRBAG CM
Gr B23
P B24
PRETENSIONER LH
AB21
2 L
1 W
L B6
W B5
SIDE AIRBAG MODULE LH
AB19
1 Y/B
2 W
Y/B B1
W B2
B: AB17
CURTAIN AIRBAG MODULE LH
AB31
1 R
2 V
R B8
V B7
SATELLITE SAFING SENSOR
AB41
1 R
2 G
R B22
G B21

B: AB17 (Y)
AB19 (Y)
AB21 (Y)
AB23 (Y)
AB32 (Y)
AB31 (B)
AB41 (Y)
AB58 (Y)
AB62 (Y)

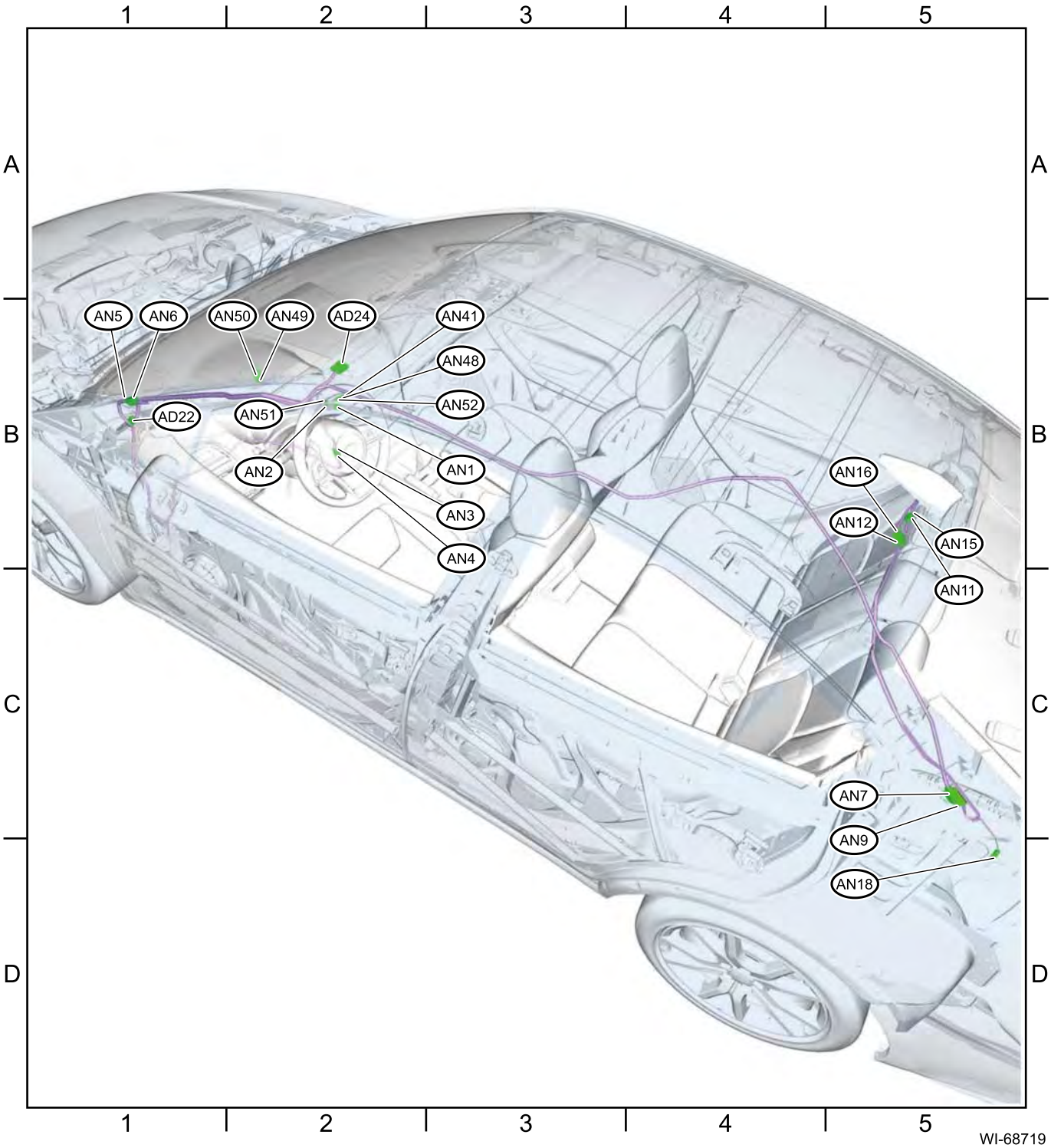
WI-68453


e
e
CURTAIN AIRBAG SENSOR RH
AB34
1 L
2 W
3 R
4 G
L
W
2
1
R124
AB63
G
Y
G
Y
2
1
AB64
AIRBAG DOOR SENSOR RH
SIDE AIRBAG SENSOR RH
AB28
1 G
2 R
3 Gr
4 P
REF. TO OCCUPANT DETECTION SYSTEM [b]
Lg C24
B C16
Gr C18
P C17
AIRBAG CM
SIDE AIRBAG MODULE RH
AB24
1 Y/B
2 W
Y/B C8
W C7
CURTAIN AIRBAG MODULE RH
AB33
1 R
2 V
R C1
V C2
C: AB18
LAP PRETENSIONER RH
AB30
1 Y
2 Be
Y C13
Be C14
PRETENSIONER RH
AB26
1 W
2 L
3 Y
4 Sb
W C4
L C3
Y C5
Sb C6
C: AB18 (Y)
AB24 (Y)
AB26 (Y)
AB28 (Y)
AB34 (Y)
AB30 (Y)
AB33 (B)
AB63 (Y)
AB64 (Y)

WI-68454

LOCATION

1. 4 DOOR MODEL

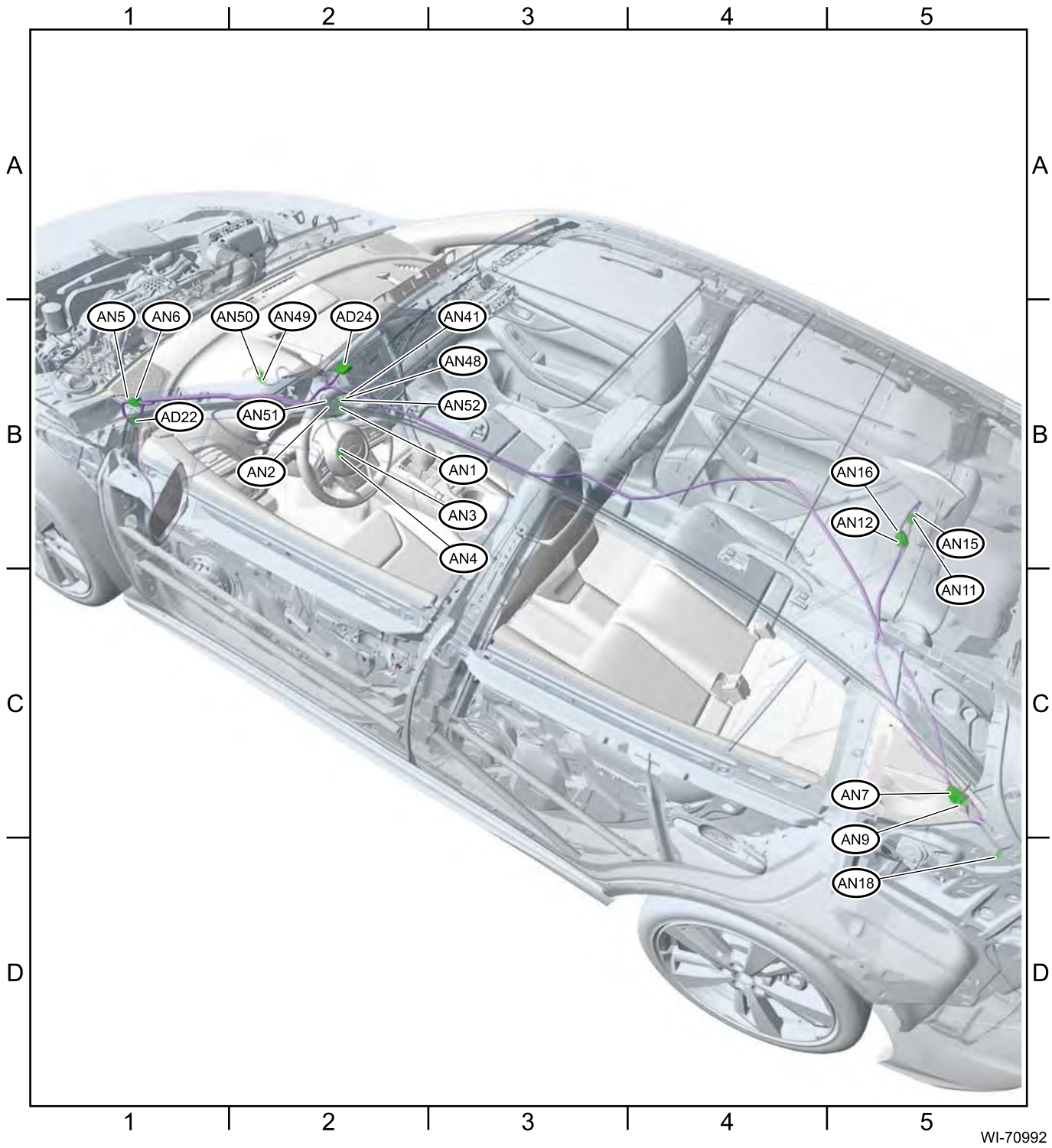


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AD22	8	★	B-1	i276	Instrument panel wiring harness (without telematics)
	16	★	B-1	i276	Instrument panel wiring harness (with telematics)
AD24	16	★	B-2	R468	Roof cord

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AN1	3	★	B-2		Audio (without navigation)
	3	★	B-2		Navigation unit (with navigation)
AN2	1	L	B-2		Audio (without navigation)
	1	L	B-2		Navigation unit (with navigation)
AN3	4	★	B-2	AN4	Antenna cord (without satellite antenna)
	4	Gr	B-2	AN4	Antenna cord (with satellite antenna & without telematics)
	3	L	B-2	AN4	Antenna cord (with satellite antenna & with telematics)
AN4	4	★	B-2	AN3	Antenna cord (without satellite antenna)
	4	Gr	B-2	AN3	Antenna cord (with satellite antenna & without telematics)
	3	L	B-2	AN3	Antenna cord (with satellite antenna & with telematics)
AN5	3	★	B-1	AN6	Antenna cord (without satellite antenna)
	3	Gr	B-1	AN6	Antenna cord (with satellite antenna & without telematics)
	3	L	B-1	AN6	Antenna cord (with satellite antenna & with telematics)
AN6	3	★	B-1	AN5	Antenna cord (without telematics)
	3	L	B-1	AN5	Antenna cord (with telematics)
AN7	3	★	C-5	AN9	Antenna cord (without satellite antenna)
	3	Gr	C-5	AN9	Antenna cord (with satellite antenna & without telematics)
	3	L	C-5	AN9	Antenna cord (with satellite antenna & with telematics)
AN9	3	★	C-5	AN7	Antenna cord (without satellite antenna)
	3	Gr	C-5	AN7	Antenna cord (with satellite antenna & without telematics)
	3	L	C-5	AN7	Antenna cord (with satellite antenna & with telematics)
AN11	3	P	B-5	AN15	Antenna
AN12	1	Gr	B-5	AN16	
AN15	3	P	B-5	AN11	Antenna cord
AN16	1	Gr	B-5	AN12	
AN18	1	★	D-5	R97	Rear wiring harness LH
AN41	1	G	B-2		Data communication module
AN48	1	Gr	B-2		
AN49	1	G	B-2	AN50	GPS antenna (without navigation & with telematics)
	3	★	B-2	AN50	GPS antenna (with navigation & with telematics)
	1	G	B-2	AN50	GPS antenna (without telematics)

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
AN50	1	G	B-2	AN49	Antenna cord (without navigation & with telematics)
	3	★	B-2	AN49	Antenna cord (with navigation & with telematics)
	1	G	B-2	AN49	Antenna cord (without telematics)
AN51	1	Gr	B-2		Navigation unit
AN52	1	Br	B-2		Data communication module
★: White or natural color					

2. 5 DOOR MODEL



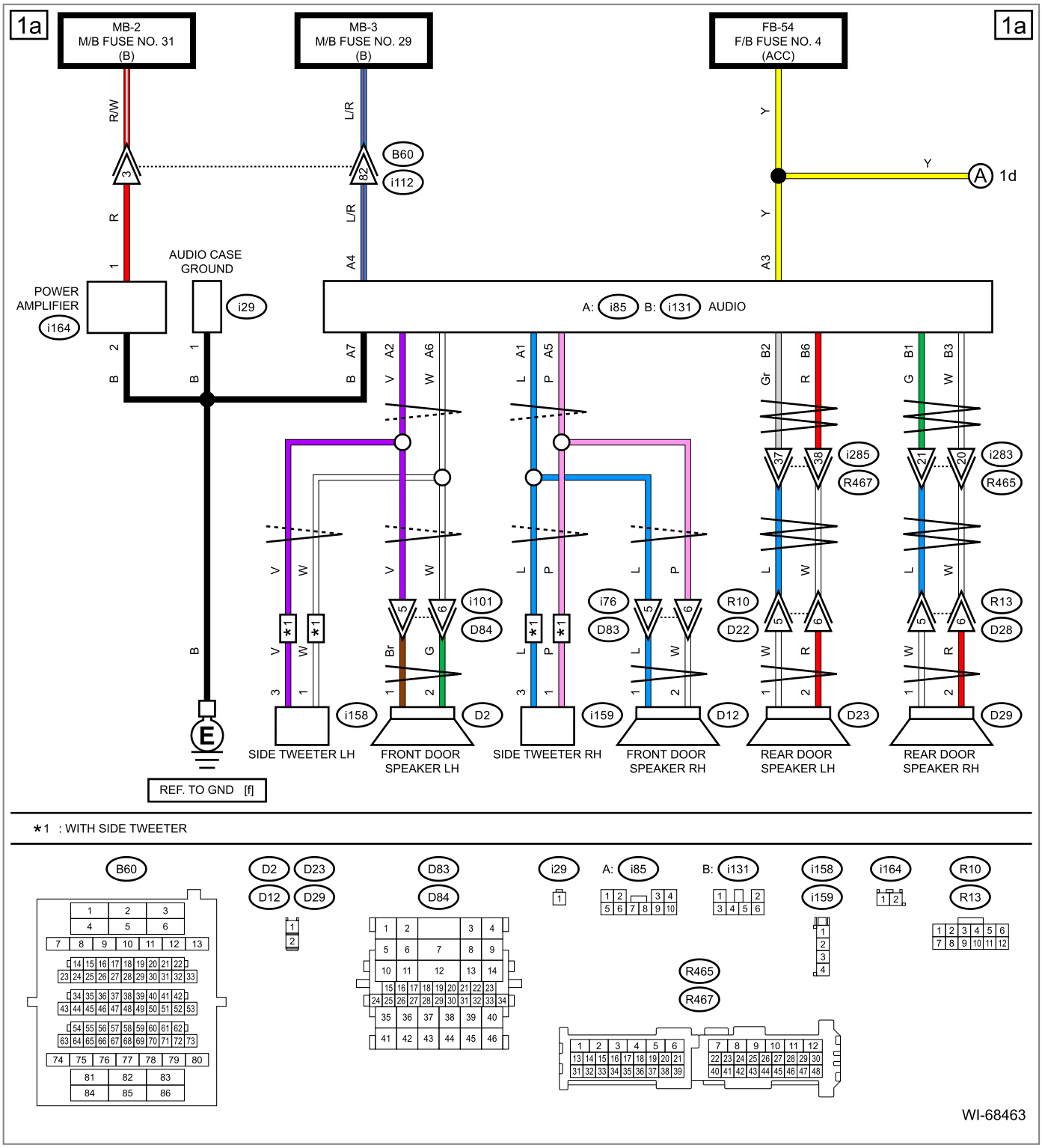
Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
AD22	8	★	B-1	i276	Instrument panel wiring harness (without telematics)
	16	★	B-1	i276	Instrument panel wiring harness (with telematics)
AD24	16	★	B-2	R468	Roof cord
AN1	3	★	B-2		Audio (without navigation)
	3	★	B-2		Navigation unit (with navigation)
AN2	1	L	B-2		Audio (without navigation)
	1	L	B-2		Navigation unit (with navigation)

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AN3	4	★	B-2	AN4	Antenna cord (without satellite antenna)
	4	Gr	B-2	AN4	Antenna cord (with satellite antenna & without telematics)
	3	L	B-2	AN4	Antenna cord (with satellite antenna & with telematics)
AN4	4	★	B-2	AN3	Antenna cord (without satellite antenna)
	4	Gr	B-2	AN3	Antenna cord (with satellite antenna & without telematics)
	3	L	B-2	AN3	Antenna cord (with satellite antenna & with telematics)
AN5	3	★	B-1	AN6	Antenna cord (without satellite antenna)
	3	Gr	B-1	AN6	Antenna cord (with satellite antenna & without telematics)
	3	L	B-1	AN6	Antenna cord (with satellite antenna & with telematics)
AN6	3	★	B-1	AN5	Antenna cord (without telematics)
	3	L	B-1	AN5	Antenna cord (with telematics)
AN7	3	★	C-5	AN9	Antenna cord (without satellite antenna)
	3	Gr	C-5	AN9	Antenna cord (with satellite antenna & without telematics)
	3	L	C-5	AN9	Antenna cord (with satellite antenna & with telematics)
AN9	3	★	C-5	AN7	Antenna cord (without satellite antenna)
	3	Gr	C-5	AN7	Antenna cord (with satellite antenna & without telematics)
	3	L	C-5	AN7	Antenna cord (with satellite antenna & with telematics)
AN11	3	★	B-5	AN15	Antenna
AN12	1	P	B-5	AN16	
AN15	3	★	B-5	AN11	Antenna cord
AN16	1	P	B-5	AN12	
AN18	1	★	D-5	R97	Rear wiring harness LH
AN41	1	G	B-2		Data communication module
AN48	1	Gr	B-2		
AN49	1	G	B-2	AN50	GPS antenna (with navigation & with telematics)
	3	★	B-2	AN50	GPS antenna (without navigation & with telematics)
	1	G	B-2	AN50	GPS antenna (without telematics)
AN50	1	G	B-2	AN49	Antenna cord (without navigation & with telematics)
	3	★	B-2	AN49	Antenna cord (with navigation & with telematics)
	1	G	B-2	AN49	Antenna cord (without telematics)

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
AN51	1	Gr	B-2		Navigation unit
AN52	1	Br	B-2		Data communication module
★: White or natural color					

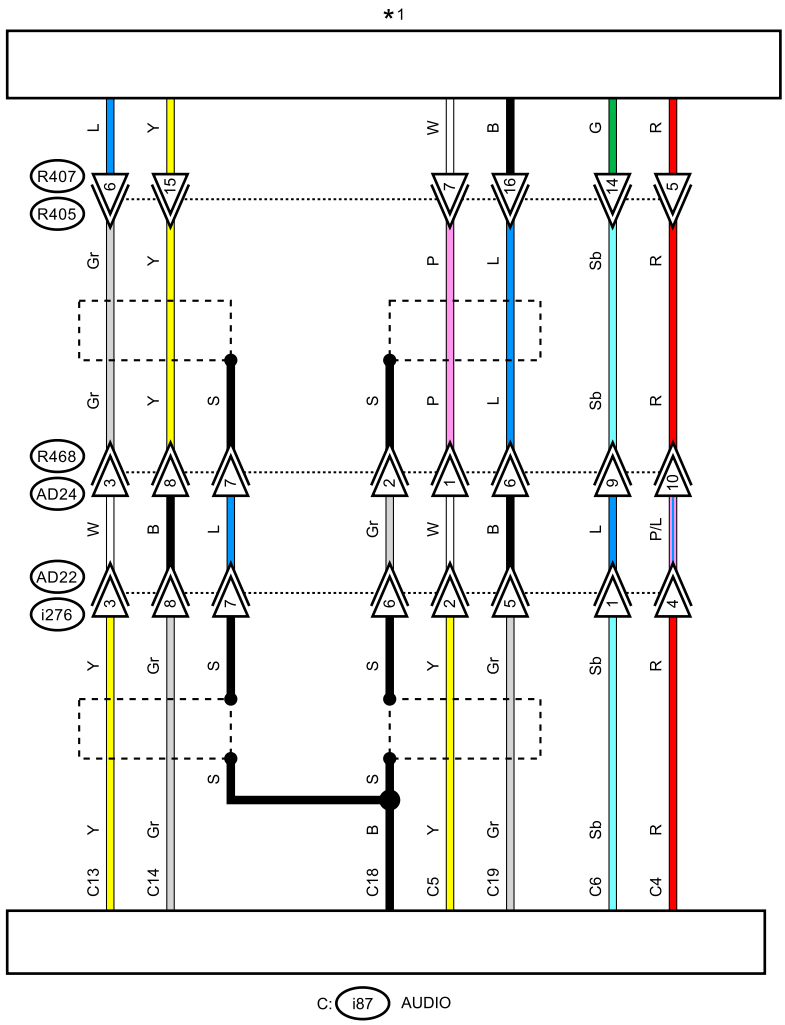
WIRING DIAGRAM

1. WITHOUT AUDIO AMPLIFIER & WITHOUT TELEMATICS



1b

1b



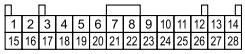
C: i87 AUDIO

*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)

AD22



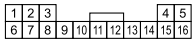
C: i87



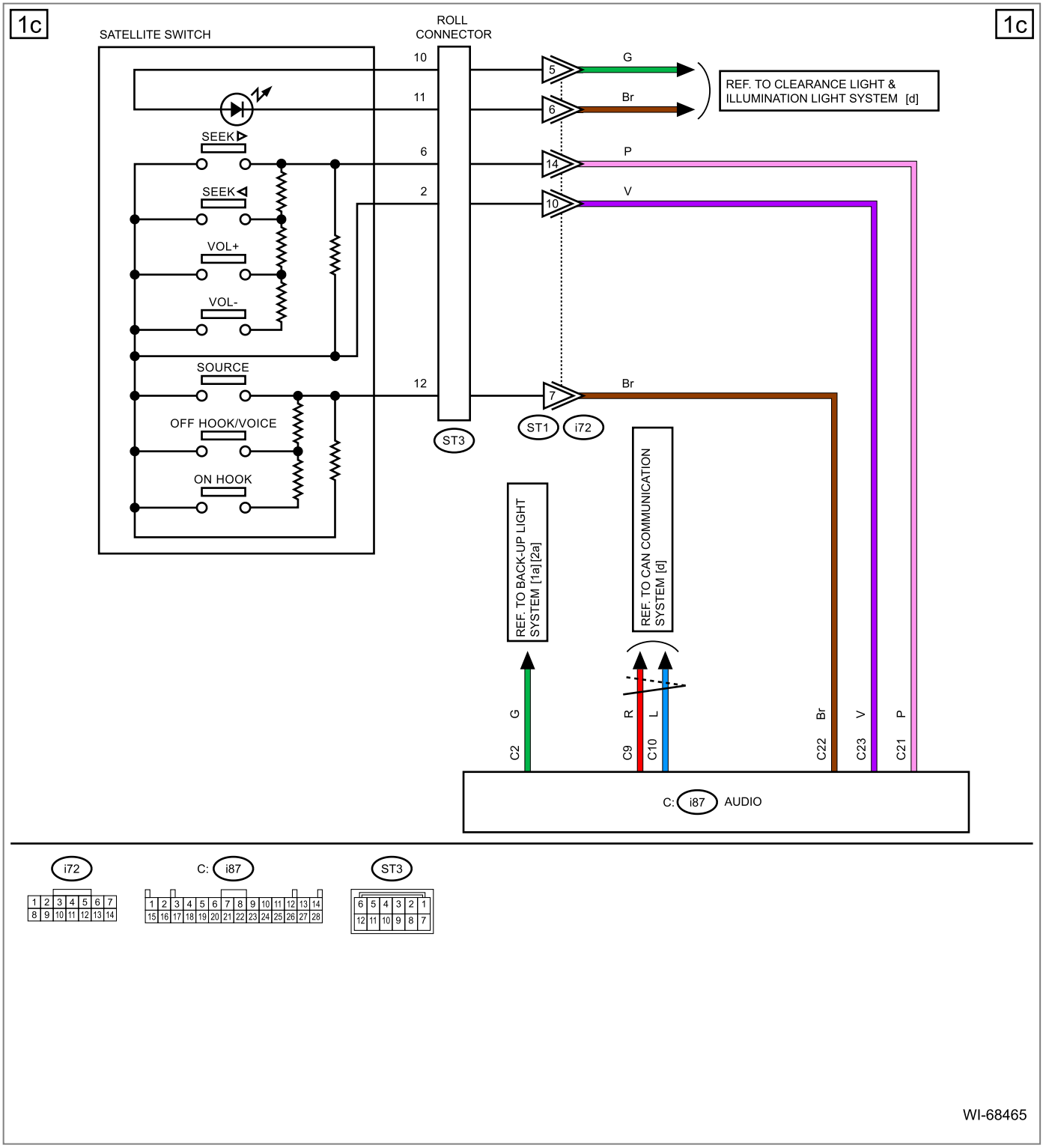
R405



R468

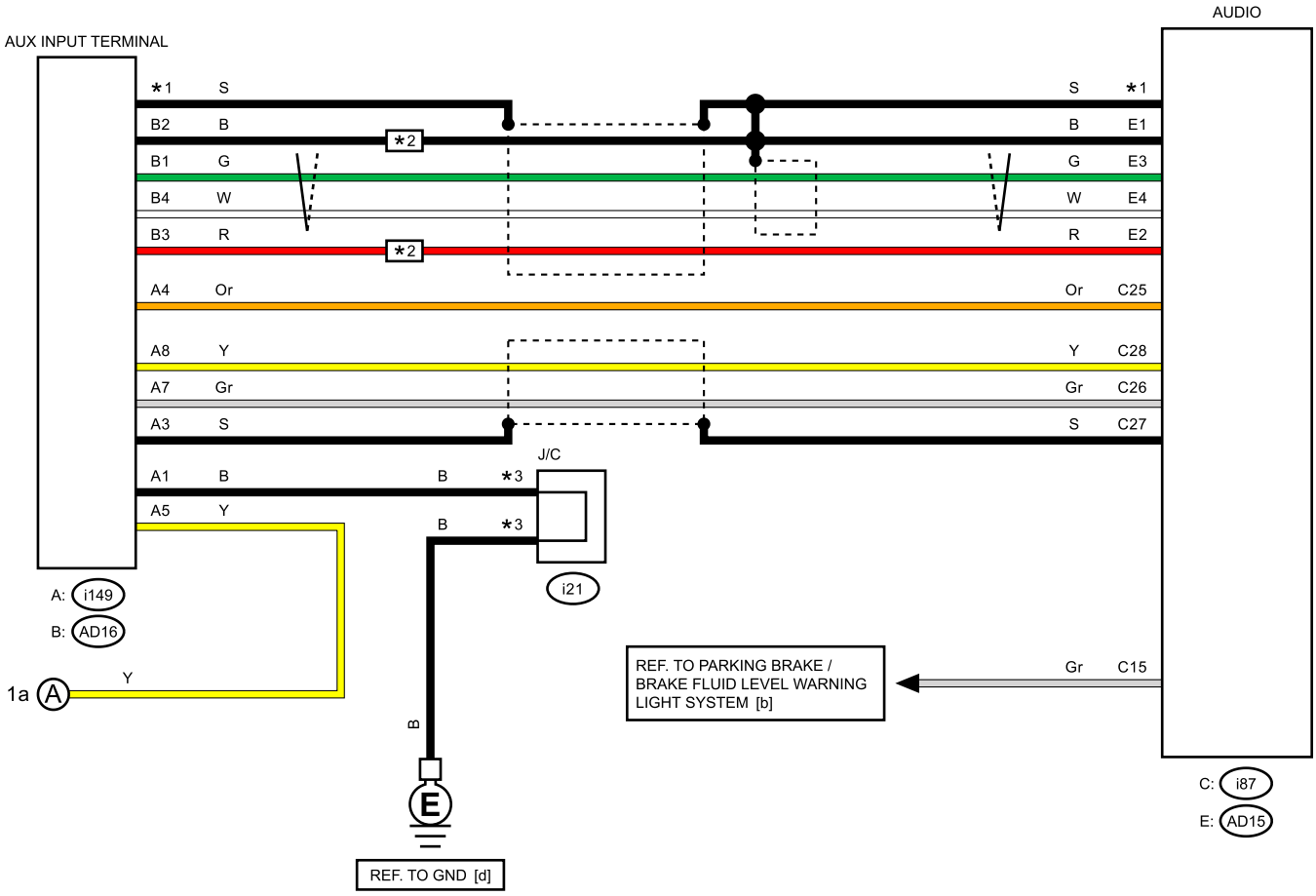


WI-68464

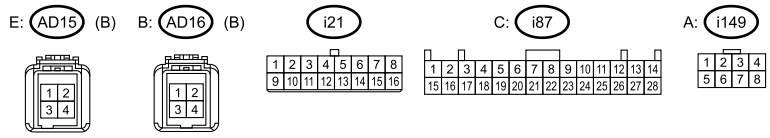

1c
1c
SATELLITE SWITCH
ROLL CONNECTOR
10
11
6
2
12
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/VOICE
ON HOOK
ST3
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
C2
G
C9
R
C10
L
C22
Br
C23
V
C21
P
C: i87 AUDIO
i72
C: i87
ST3

WI-68465

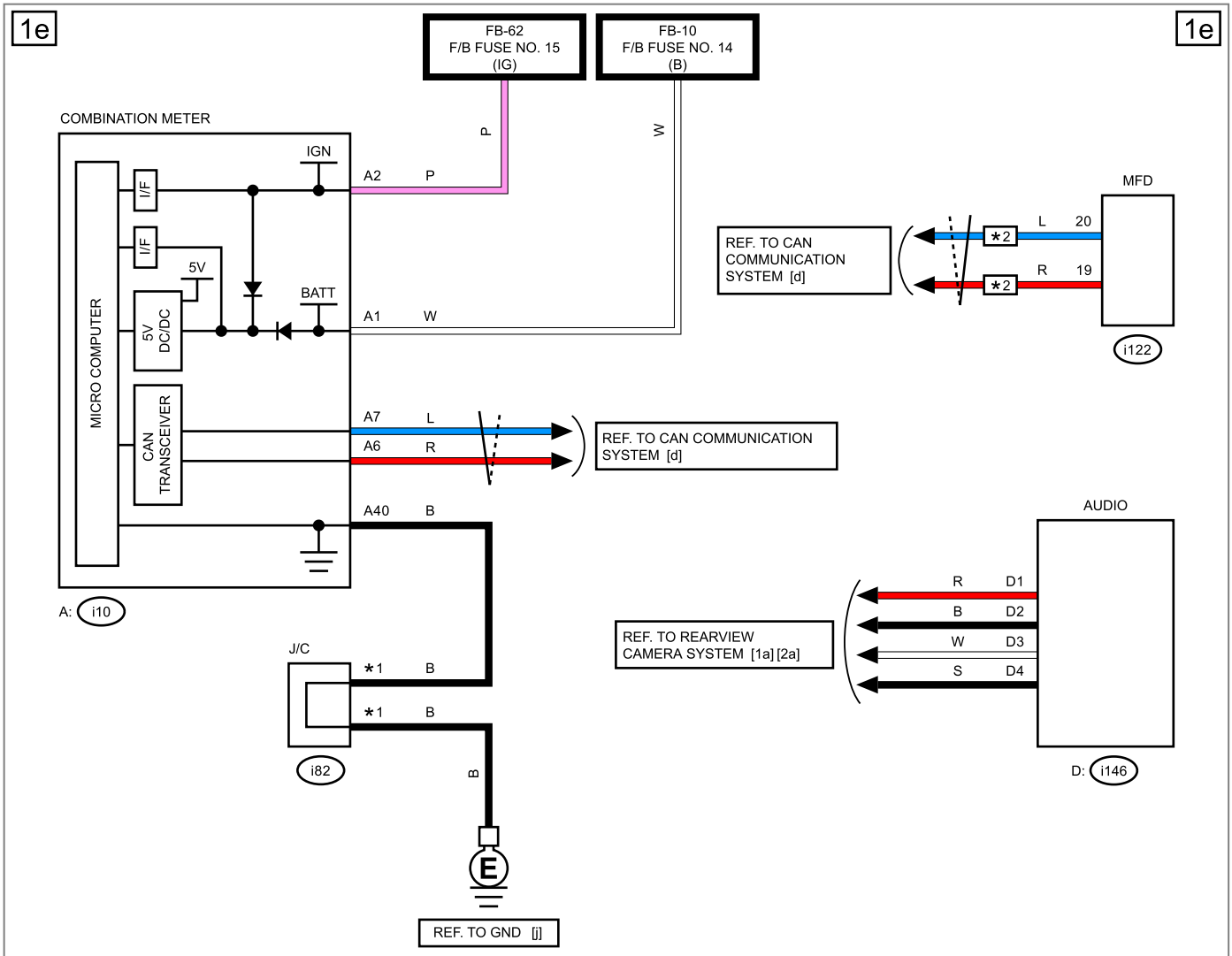
1d



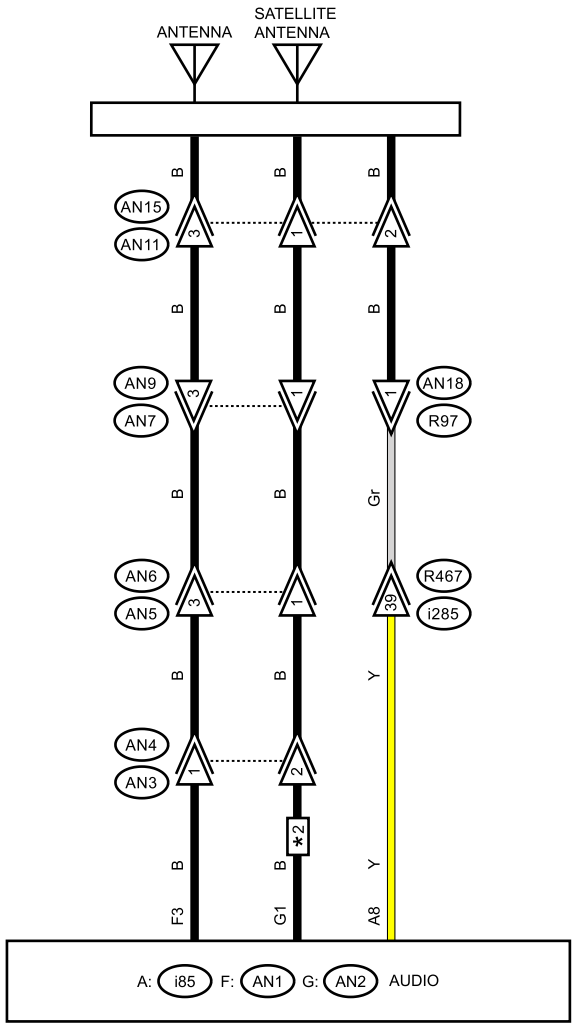
*1 : SHIELD CONNECTOR
*2 : SINGLE USB PORT TYPE
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



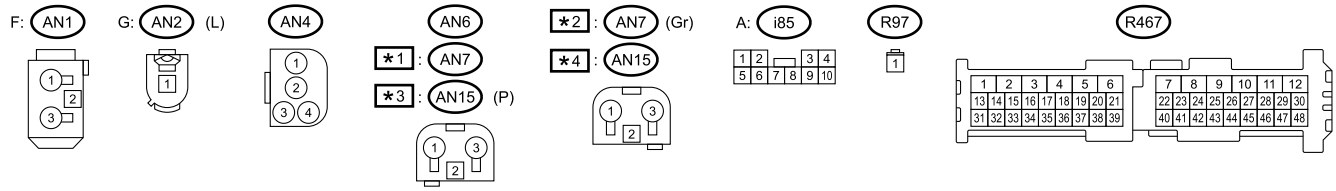
WI-68466


1e
1e
FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
COMBINATION METER
IGN
I/F
I/F
5V
BATT
5V
DC/DC
MICRO COMPUTER
CAN
TRANSCEIVER
A2
P
A1
W
A7
L
A6
R
A40
B
P
W
MFD
L
20
R
19
*2
*2
REF. TO CAN
COMMUNICATION
SYSTEM [d]
i122
REF. TO CAN COMMUNICATION
SYSTEM [d]
AUDIO
R
D1
B
D2
W
D3
S
D4
REF. TO REARVIEW
CAMERA SYSTEM [1a] [2a]
D: i146
A: i10
J/C
*1
B
*1
B
i82
B
REF. TO GND [j]
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH HIGH GRADE MFD
A: i10 (B)
i82
i122
D: i146
WI-68467

1f

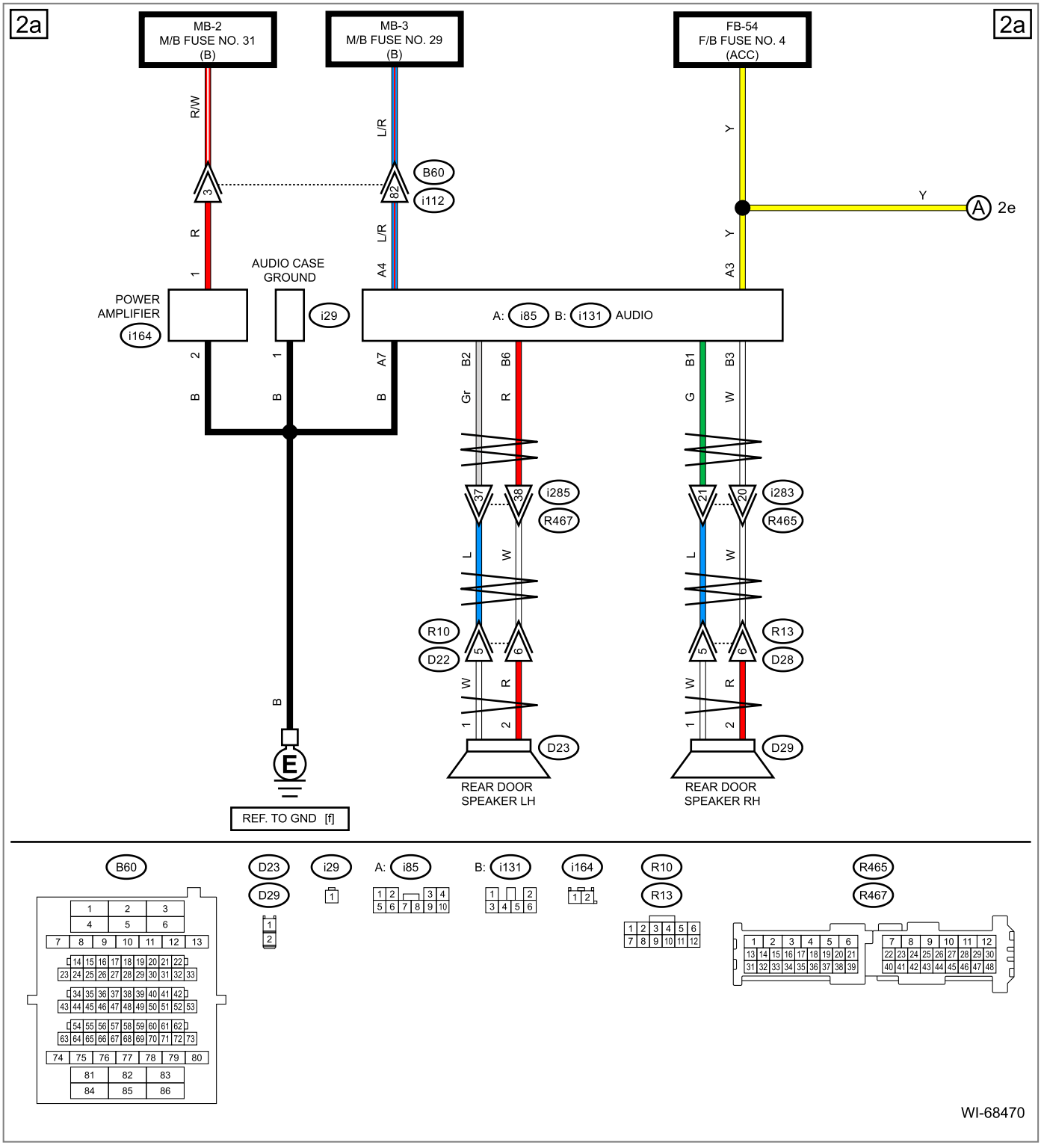


*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL

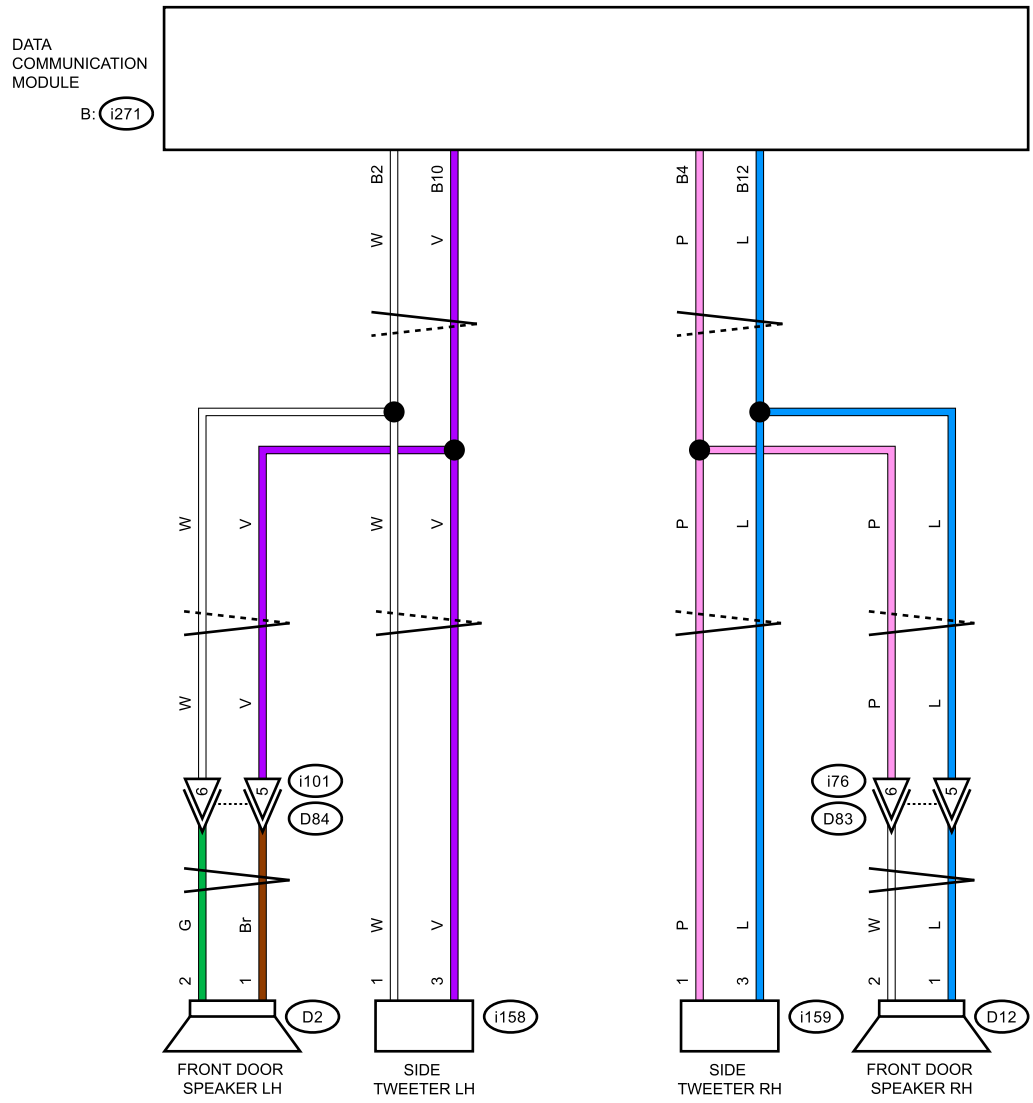


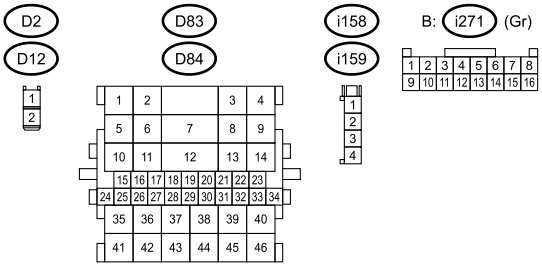
WI-68468

2. WITHOUT AUDIO AMPLIFIER & WITH TELEMATICS



2b

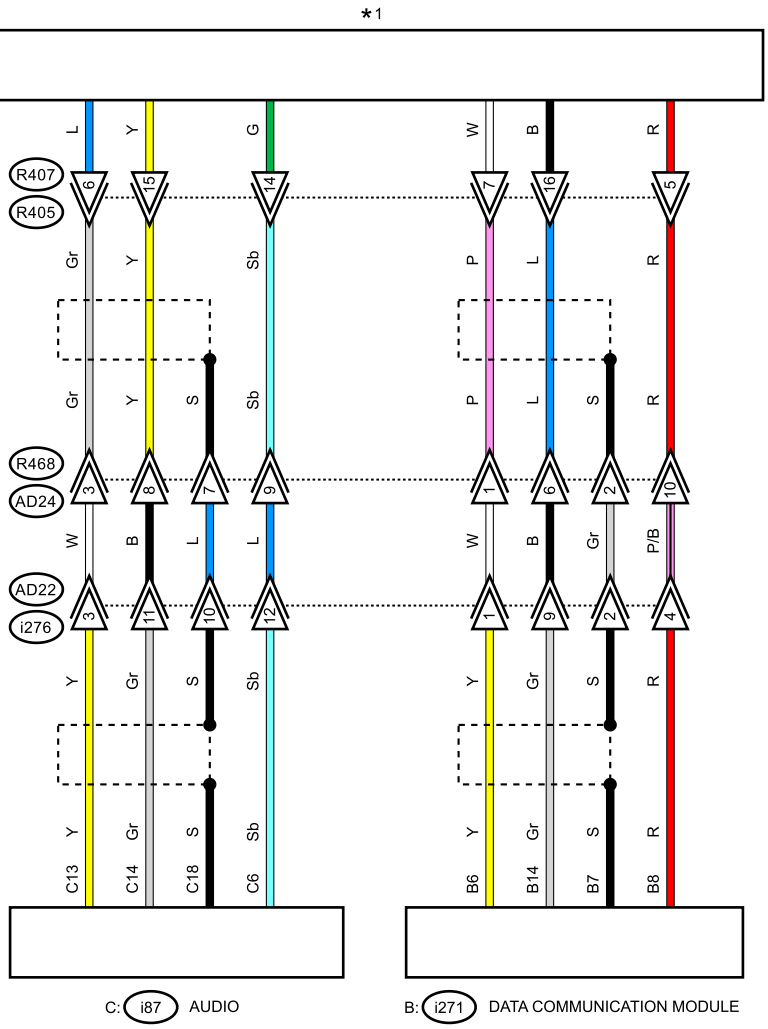

DATA
COMMUNICATION
MODULE
B: i271
B2
B10
B4
B12
W
V
P
L
i101
D84
i76
D83
G
Br
D2
i158
i159
D12
FRONT DOOR
SPEAKER LH
SIDE
TWEETER LH
SIDE
TWEETER RH
FRONT DOOR
SPEAKER RH


D2
D12
D83
D84
i158
i159
B: i271 (Gr)

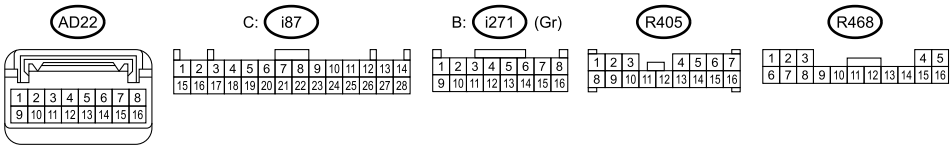
WI-68471

2c

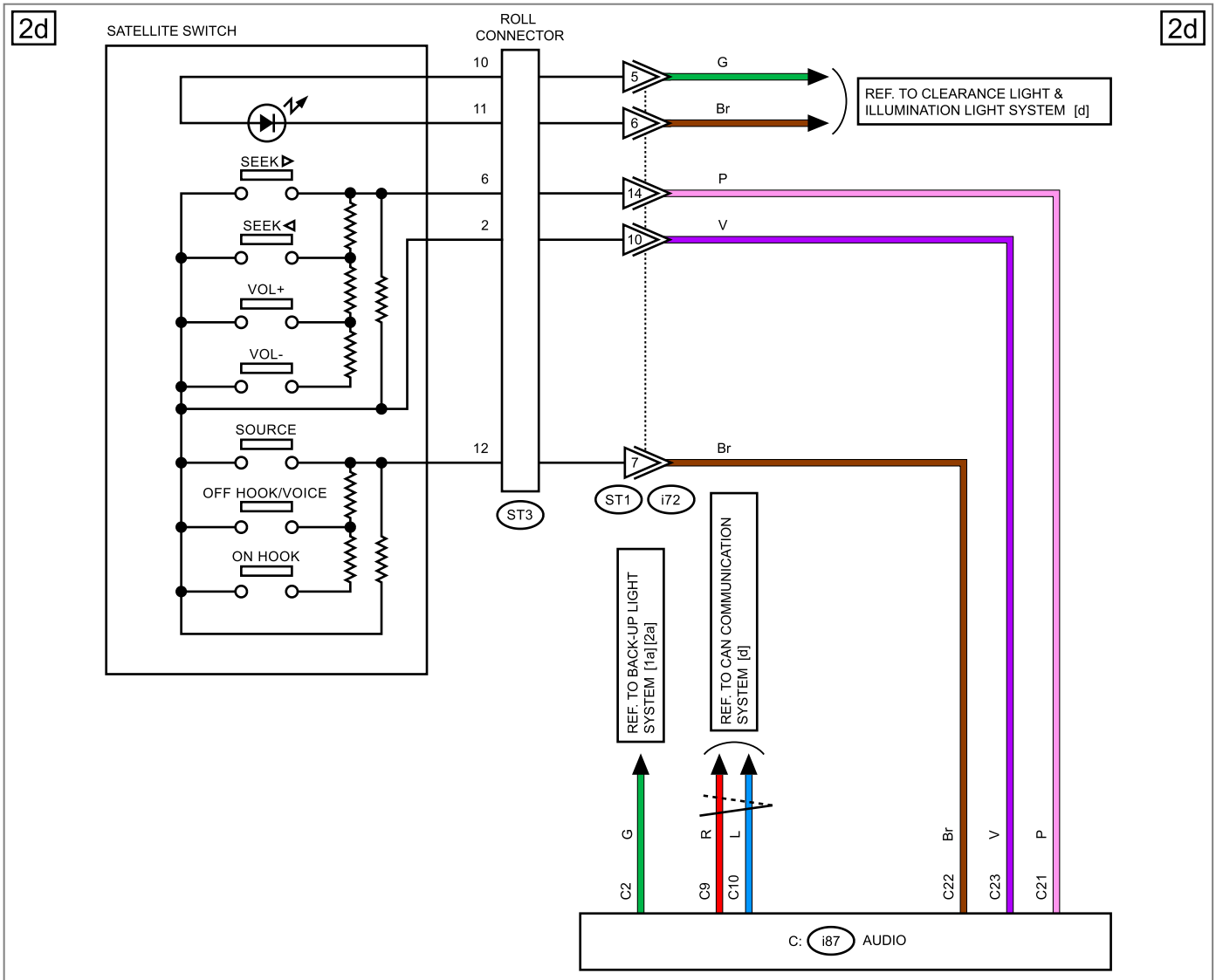
2c

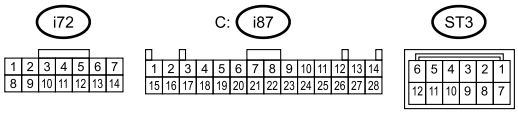


*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



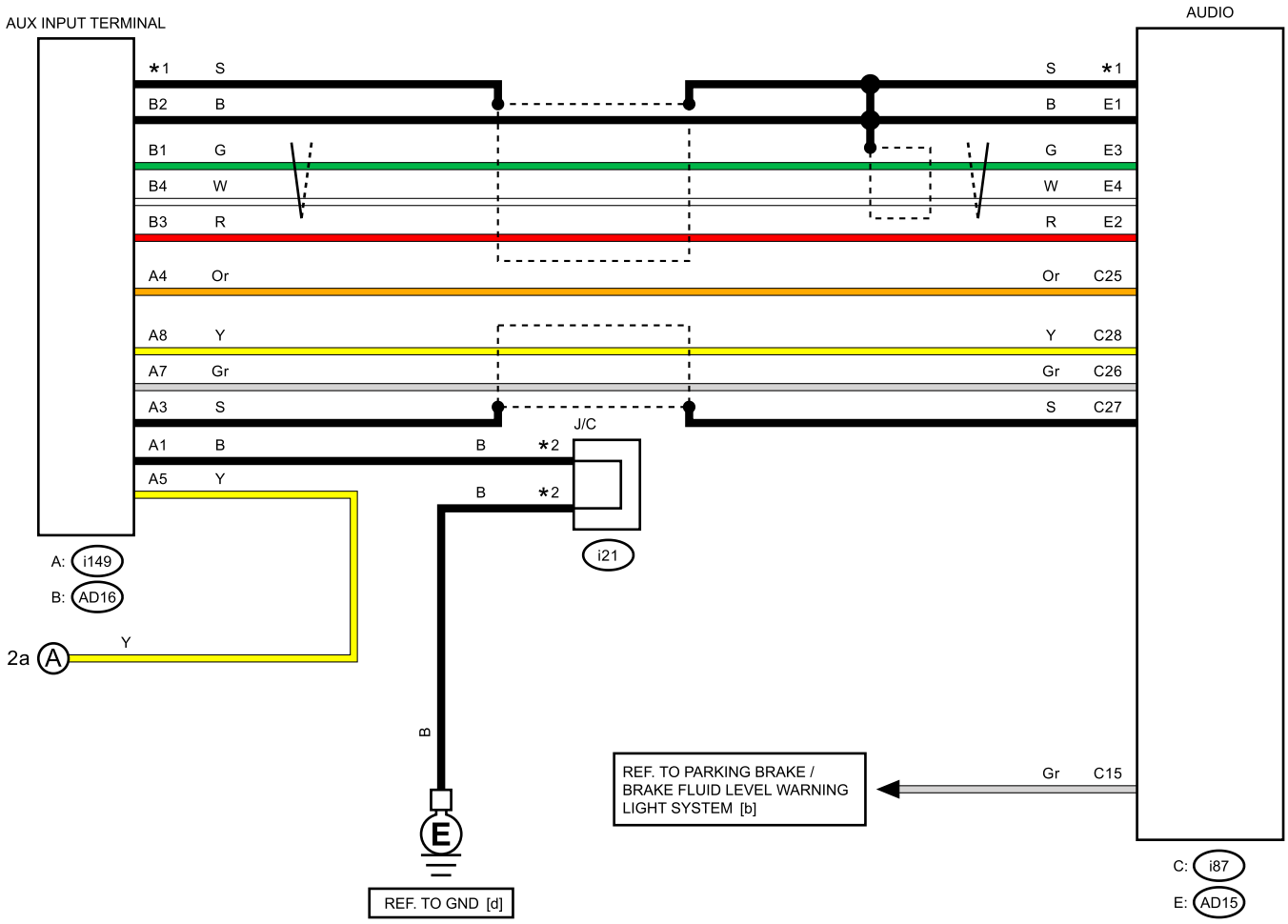
WI-68472


2d
SATELLITE SWITCH
ROLL CONNECTOR
2d
10
11
6
2
12
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/VOICE
ON HOOK
ST3
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
G
C2
R
L
C9
C10
Br
C22
V
C23
P
C21
C: i87 AUDIO


i72
C: i87
ST3

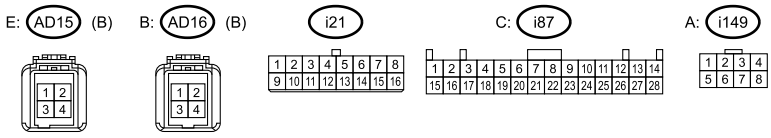
WI-68473

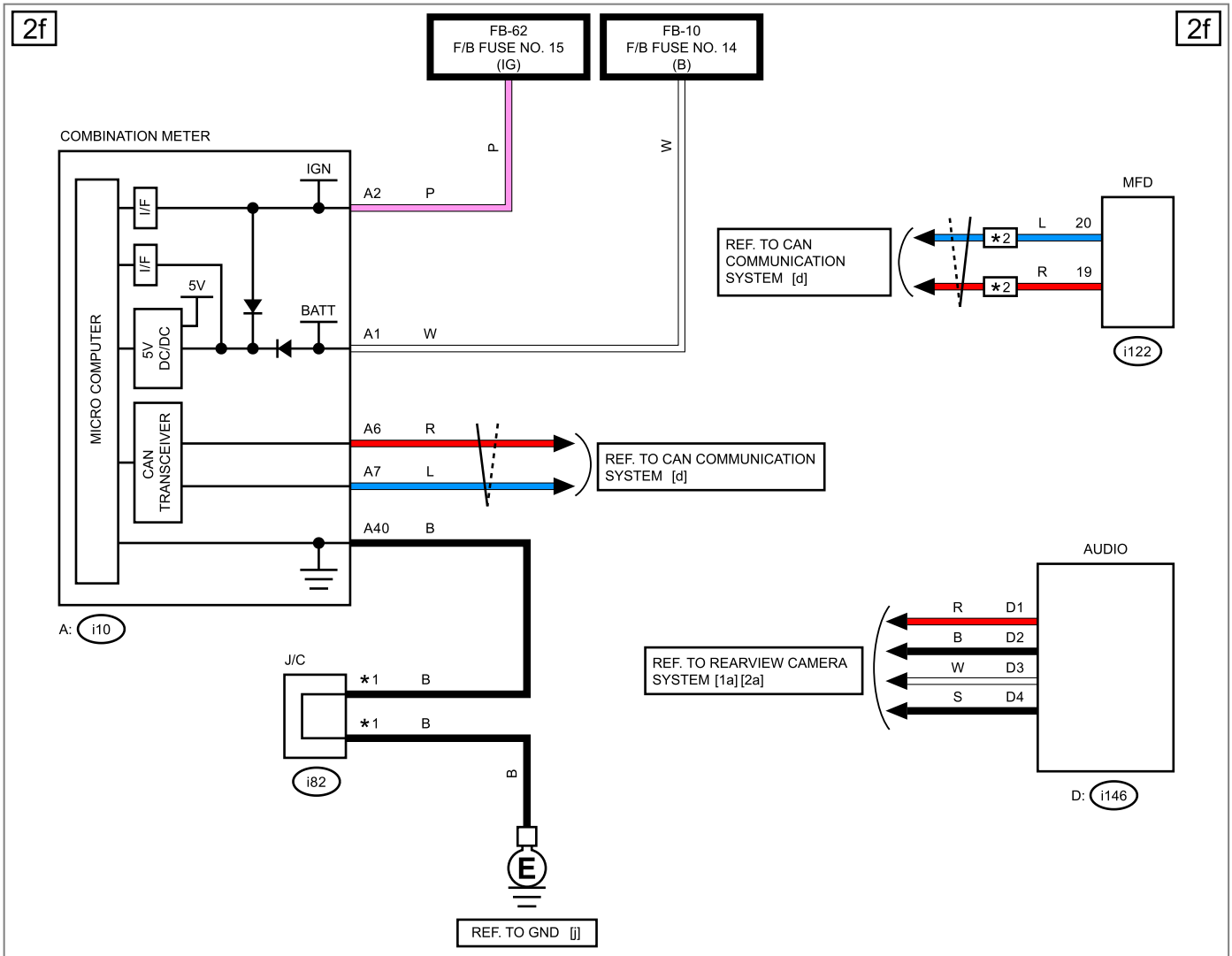
2e



*1 : SHIELD CONNECTOR

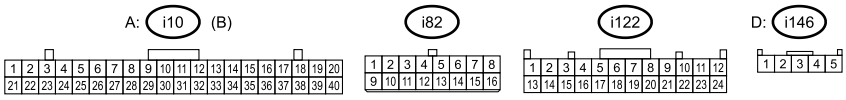
*2 : TERMINAL No. OPTIONAL ARRANGEMENT





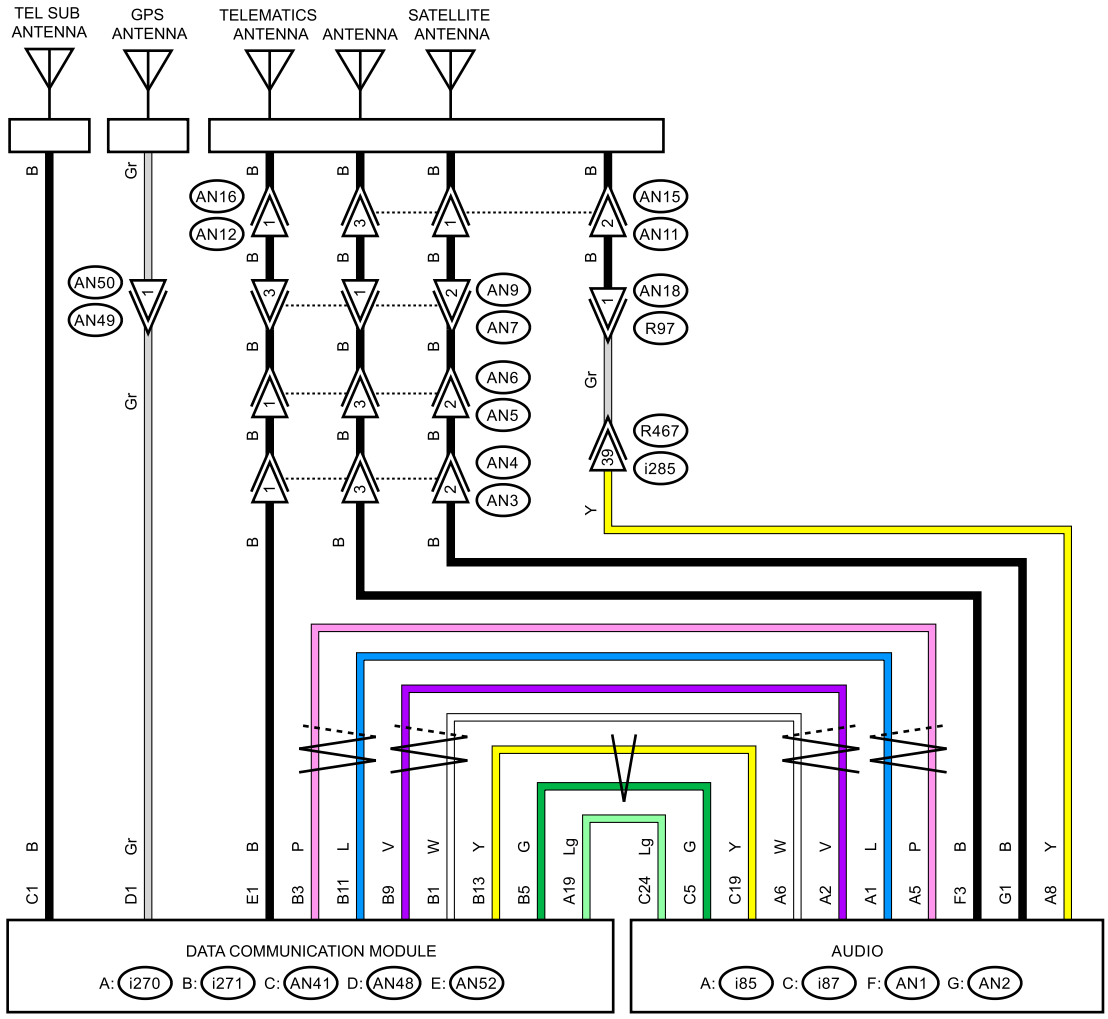
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH HIGH GRADE MFD

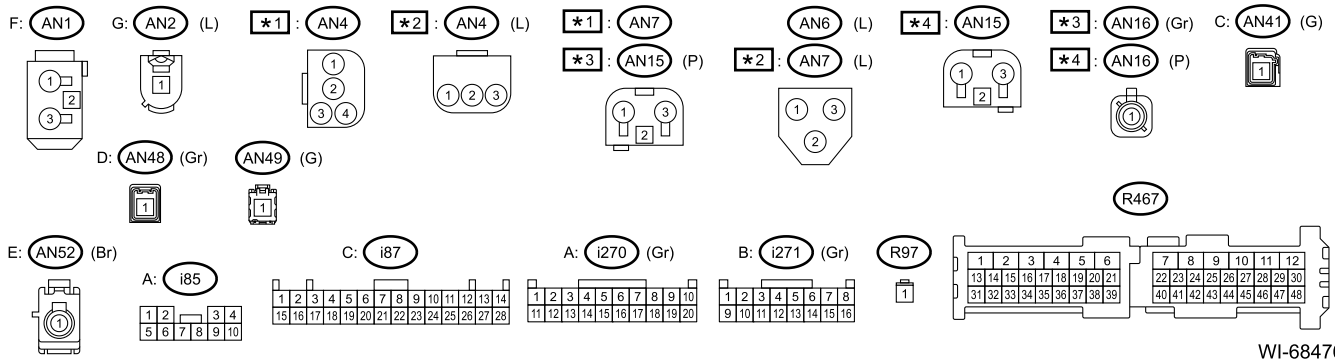


WI-68475

2g

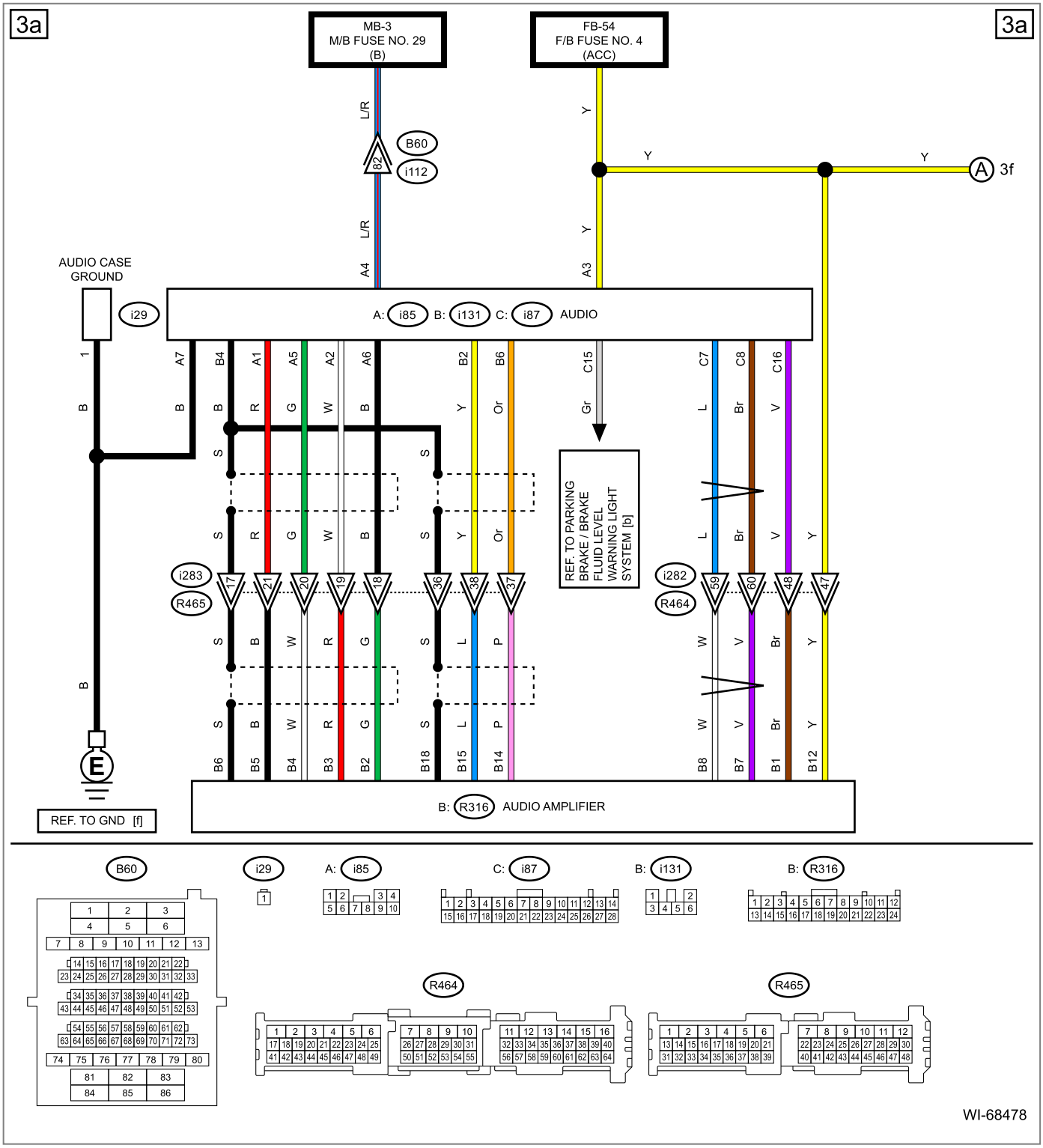


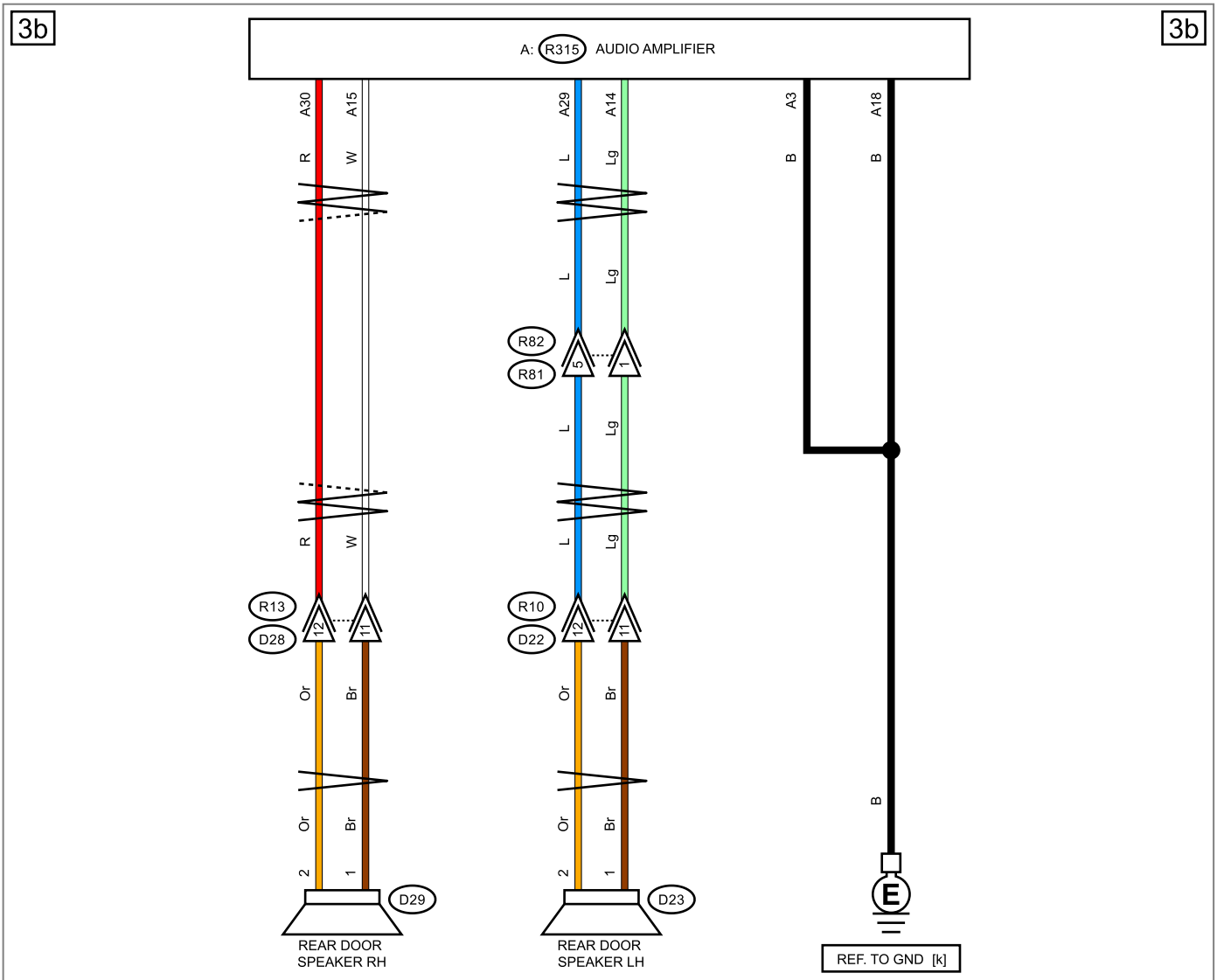
*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL



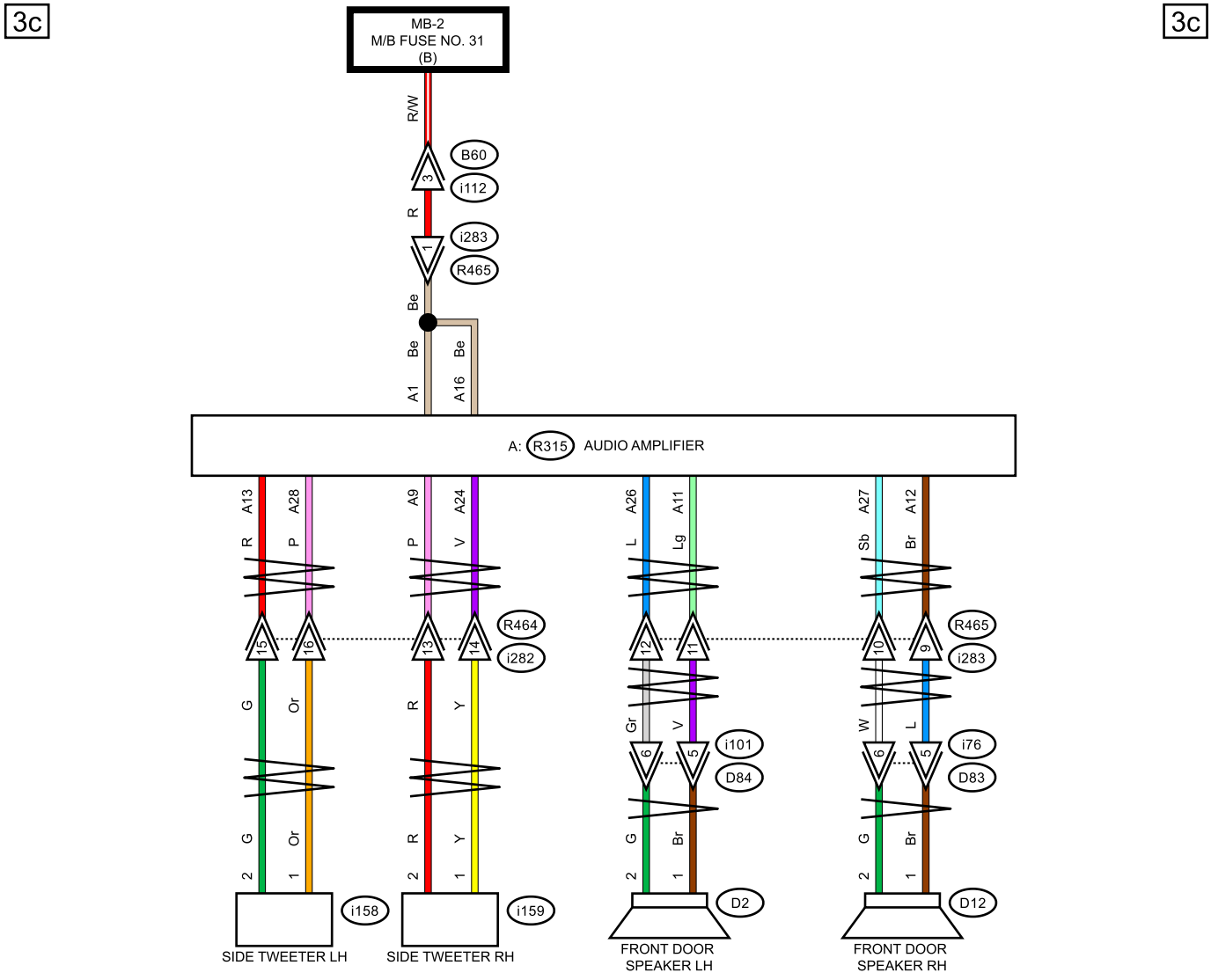
WI-68476

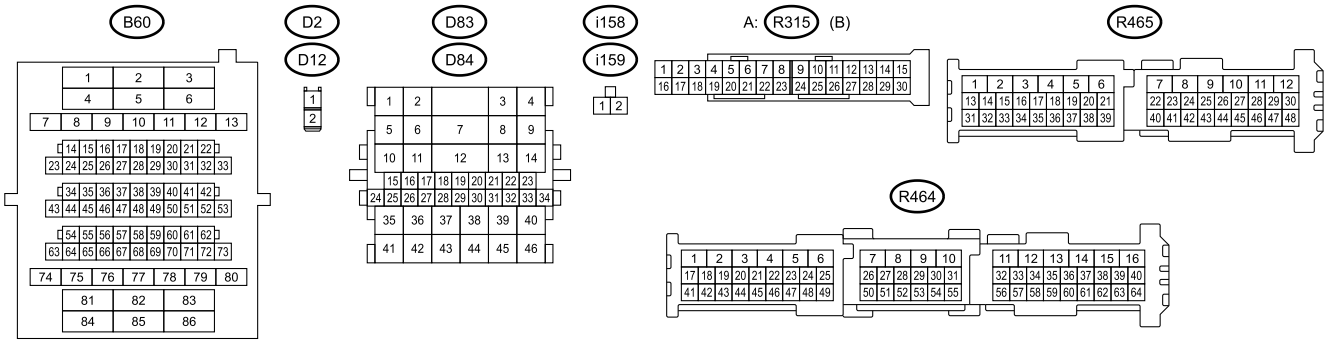
3. WITH AUDIO AMPLIFIER & WITHOUT TELEMATICS




3b
3b
A: R315 AUDIO AMPLIFIER
A30
A15
A29
A14
A3
A18
R
W
L
Lg
B
R82
R81
5
1
R13
D28
12
11
R10
D22
Or
Br
2
1
D29
D23
REAR DOOR SPEAKER RH
REAR DOOR SPEAKER LH
E
REF. TO GND [k]
D23
D29
R10
R13
R82
A: R315 (B)
WI-68479

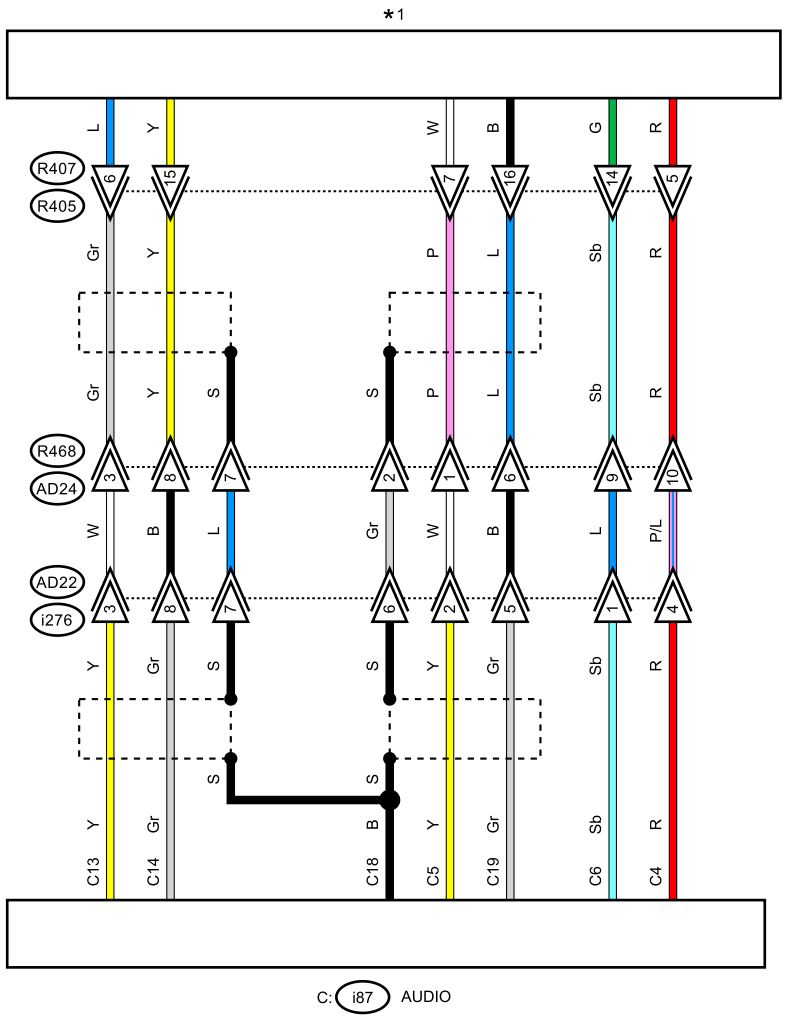
3c


MB-2
M/B FUSE NO. 31
(B)
R/W
B60
3
i112
R
i283
1
R465
Be
Be
Be
A1
A16
A: R315 AUDIO AMPLIFIER
A13
A28
A9
A24
A26
A11
A27
A12
R
P
P
V
L
Lg
Sb
Br
R464
i282
R465
i283
i101
D84
i76
D83
G
Or
R
Y
Gr
V
W
L
G
Or
R
Y
G
Br
G
Br
i158
i159
D2
D12
SIDE TWEETER LH
SIDE TWEETER RH
FRONT DOOR SPEAKER LH
FRONT DOOR SPEAKER RH


B60
D2
D12
D83
D84
i158
i159
A: R315 (B)
R465
R464

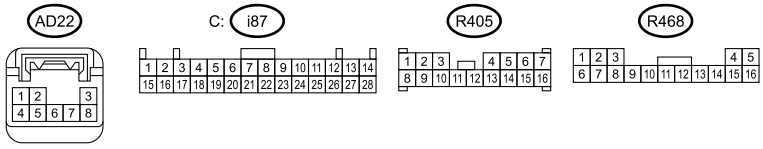
WI-68480

3d

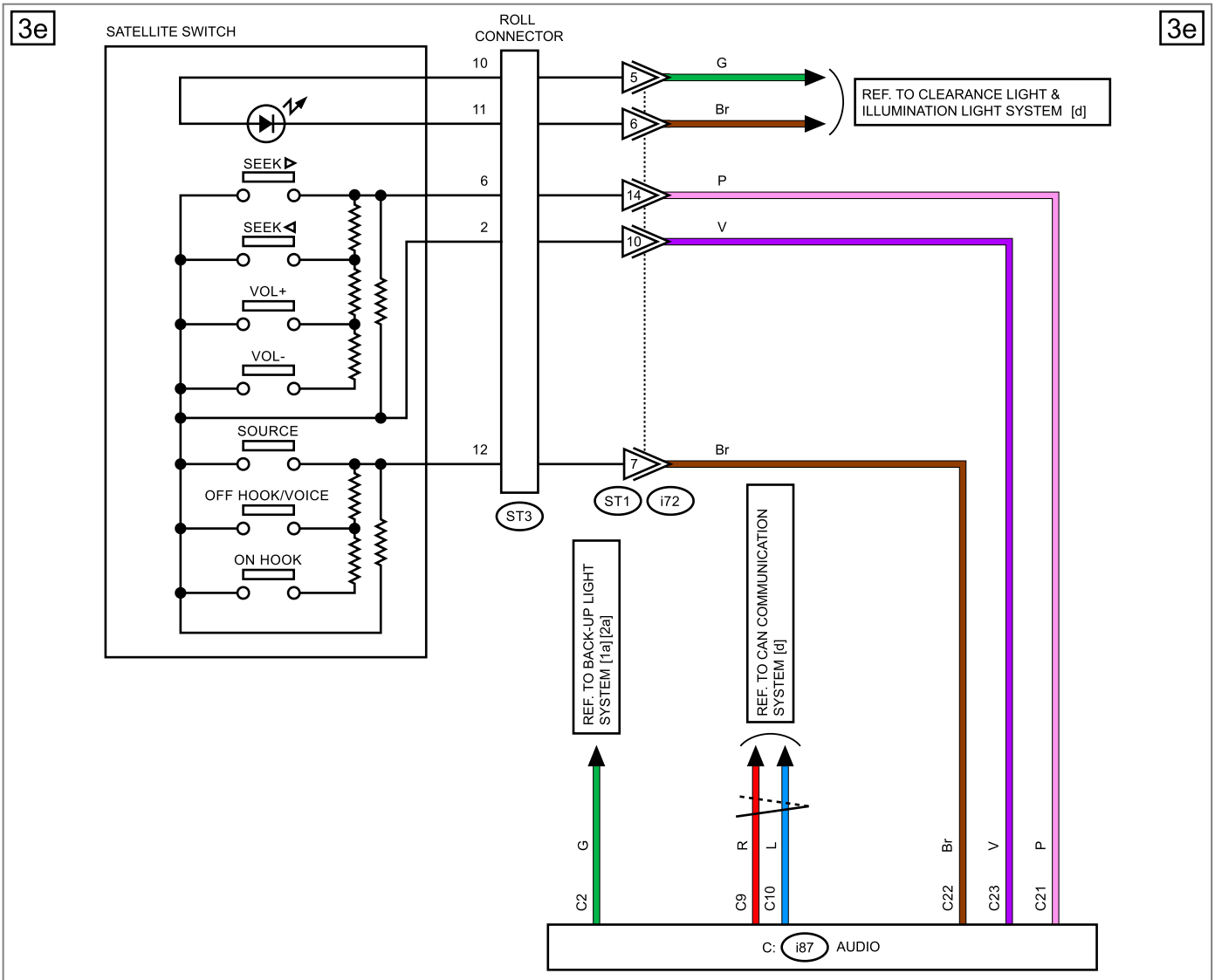


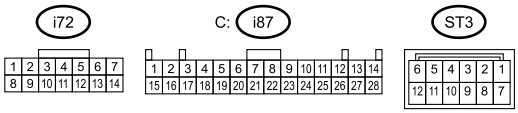
C: i87 AUDIO

*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



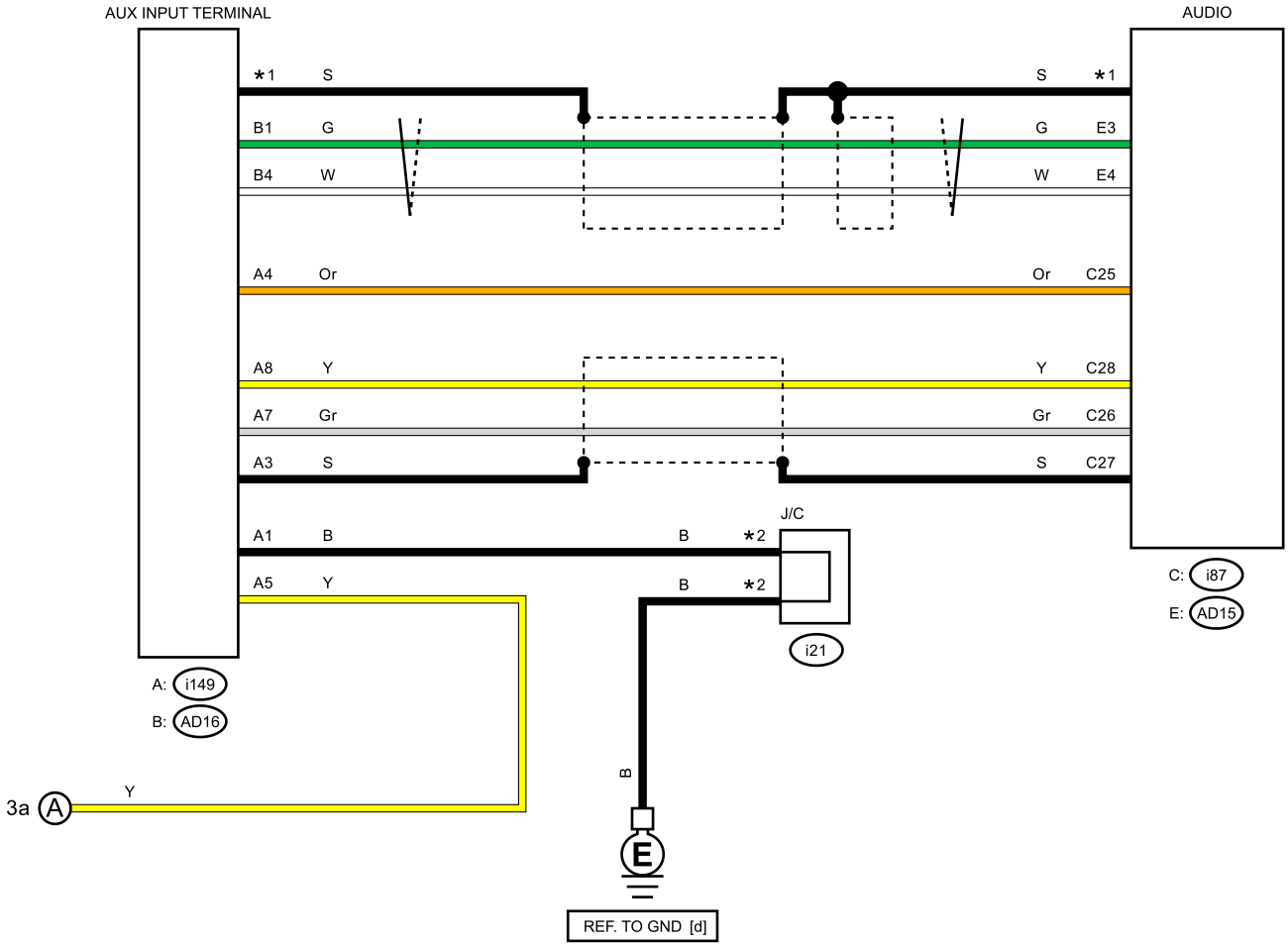
WI-68481


3e
3e
SATELLITE SWITCH
ROLL CONNECTOR
10
11
6
2
12
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/VOICE
ON HOOK
ST3
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
G
C2
R
L
C9
C10
Br
V
P
C22
C23
C21
C: i87 AUDIO


i72
C: i87
ST3

WI-68482

3f



*1 : SHIELD CONNECTOR

*2 : TERMINAL No. OPTIONAL ARRANGEMENT

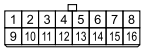
E: AD15 (B)



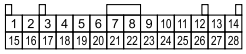
B: AD16 (B)



i21



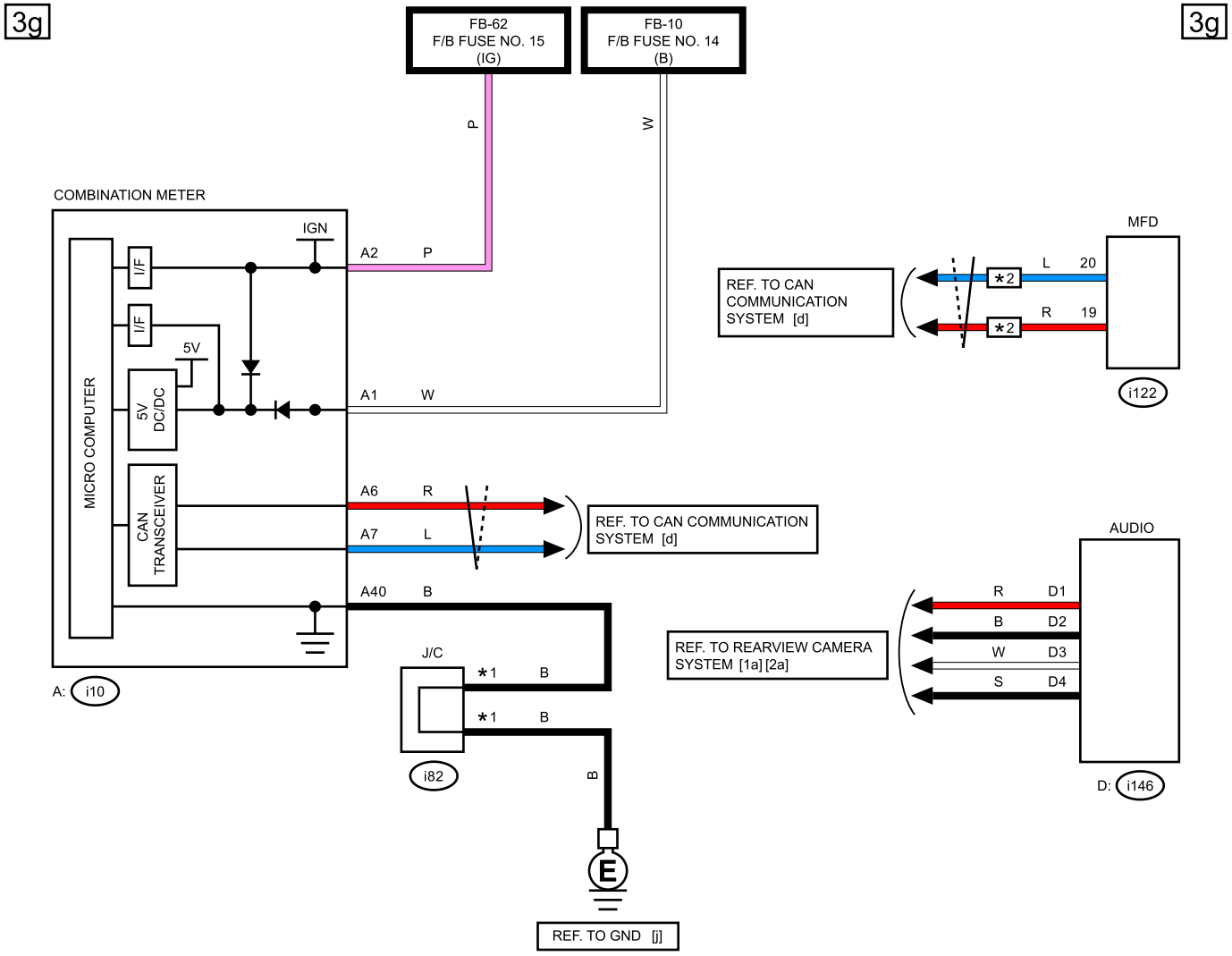
C: i87



A: i149

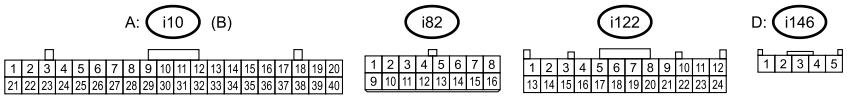


WI-68483



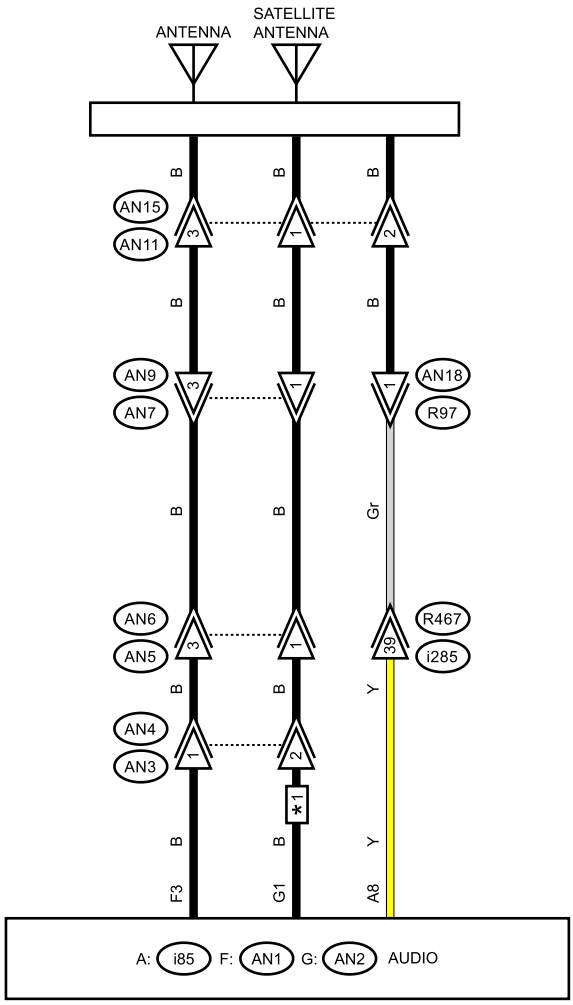
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH HIGH GRADE MFD



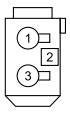
WI-68484

3h



*1 : WITH SATELLITE ANTENNA
*2 : WITHOUT SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL

F: AN1



G: AN2 (L)



*1 : AN4 (Gr)
*2 : AN4



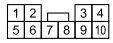
AN6
*2 : AN7
*3 : AN15 (P)



*1 : AN7 (Gr)
*4 : AN15



A: i85



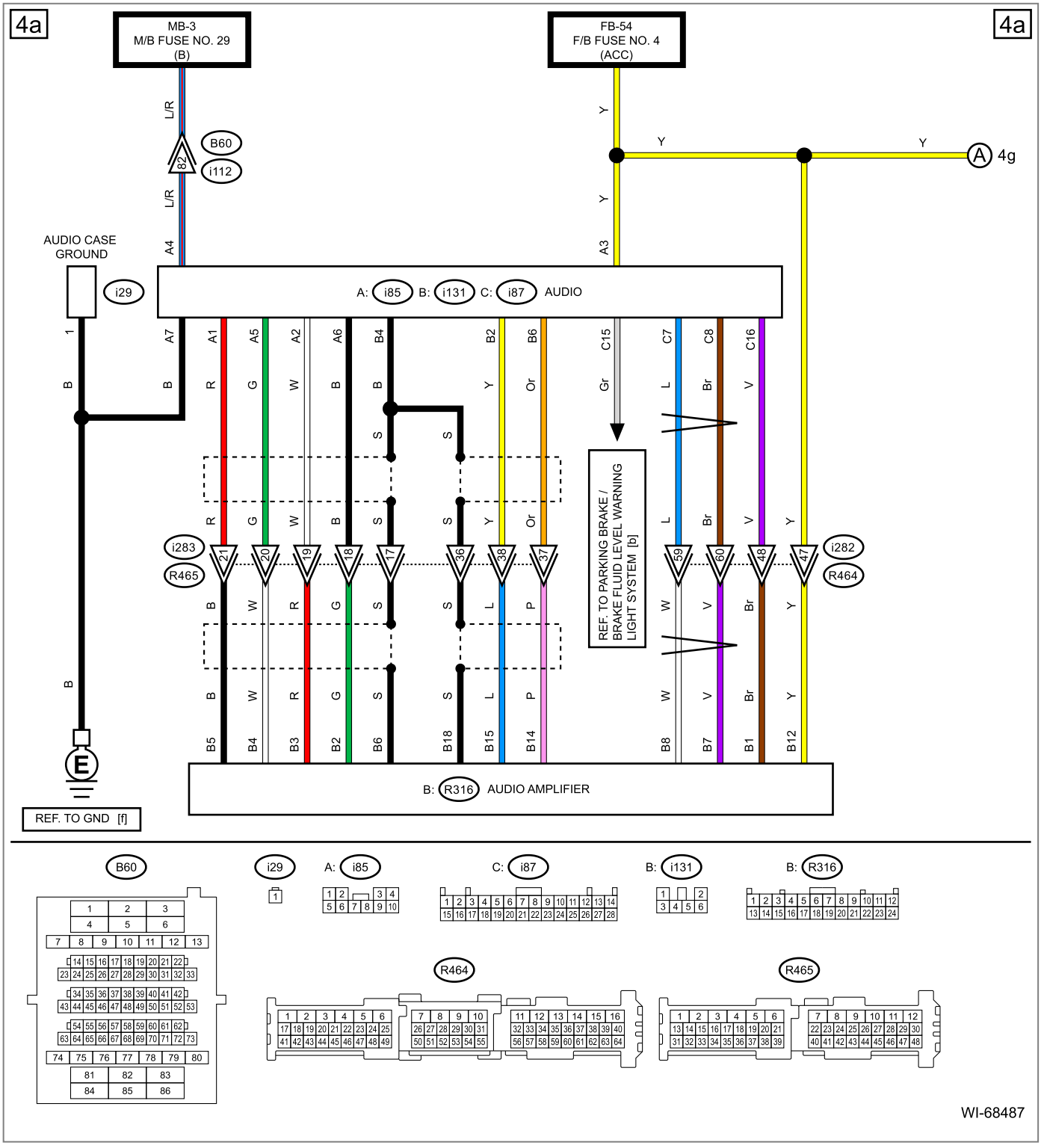
R97



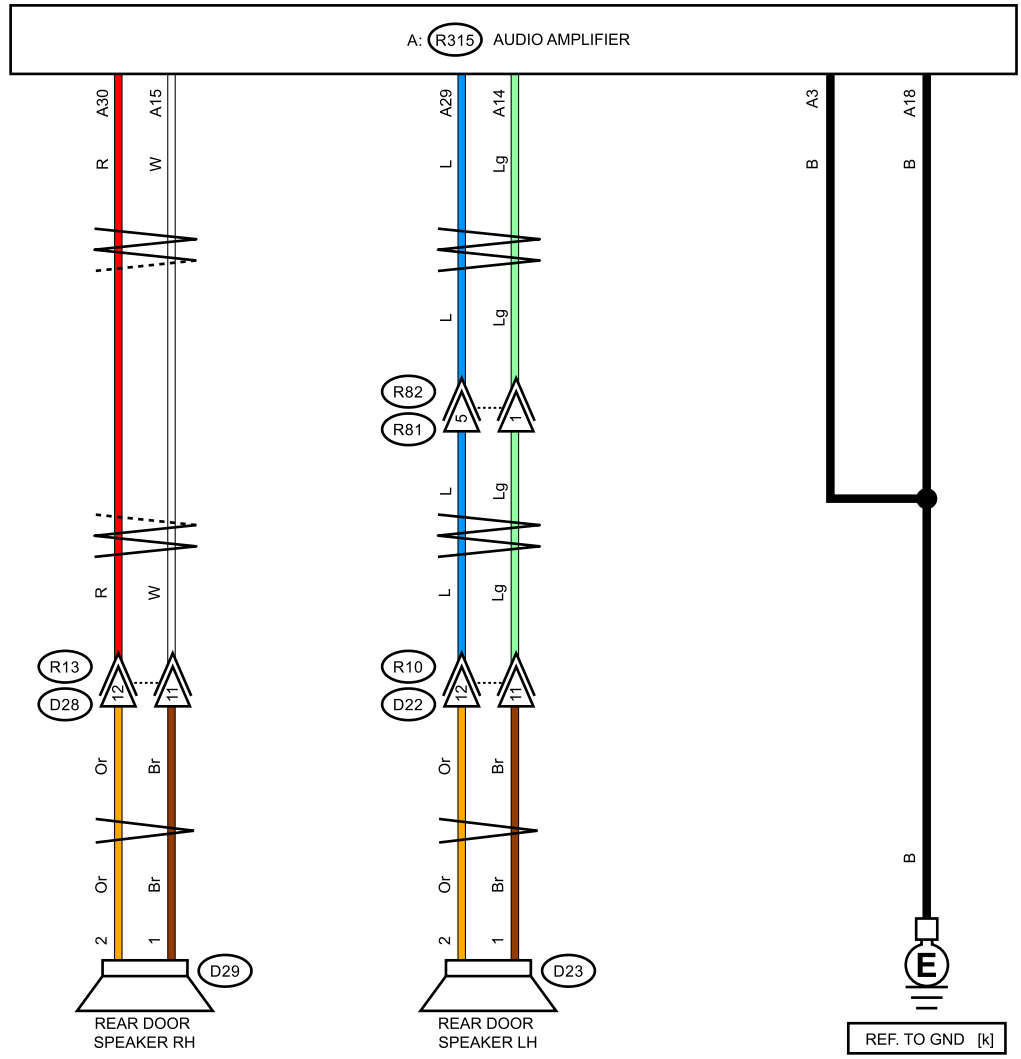
R467

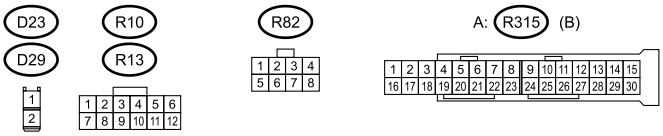
WI-68485

4. WITH AUDIO AMPLIFIER & WITH TELEMATICS



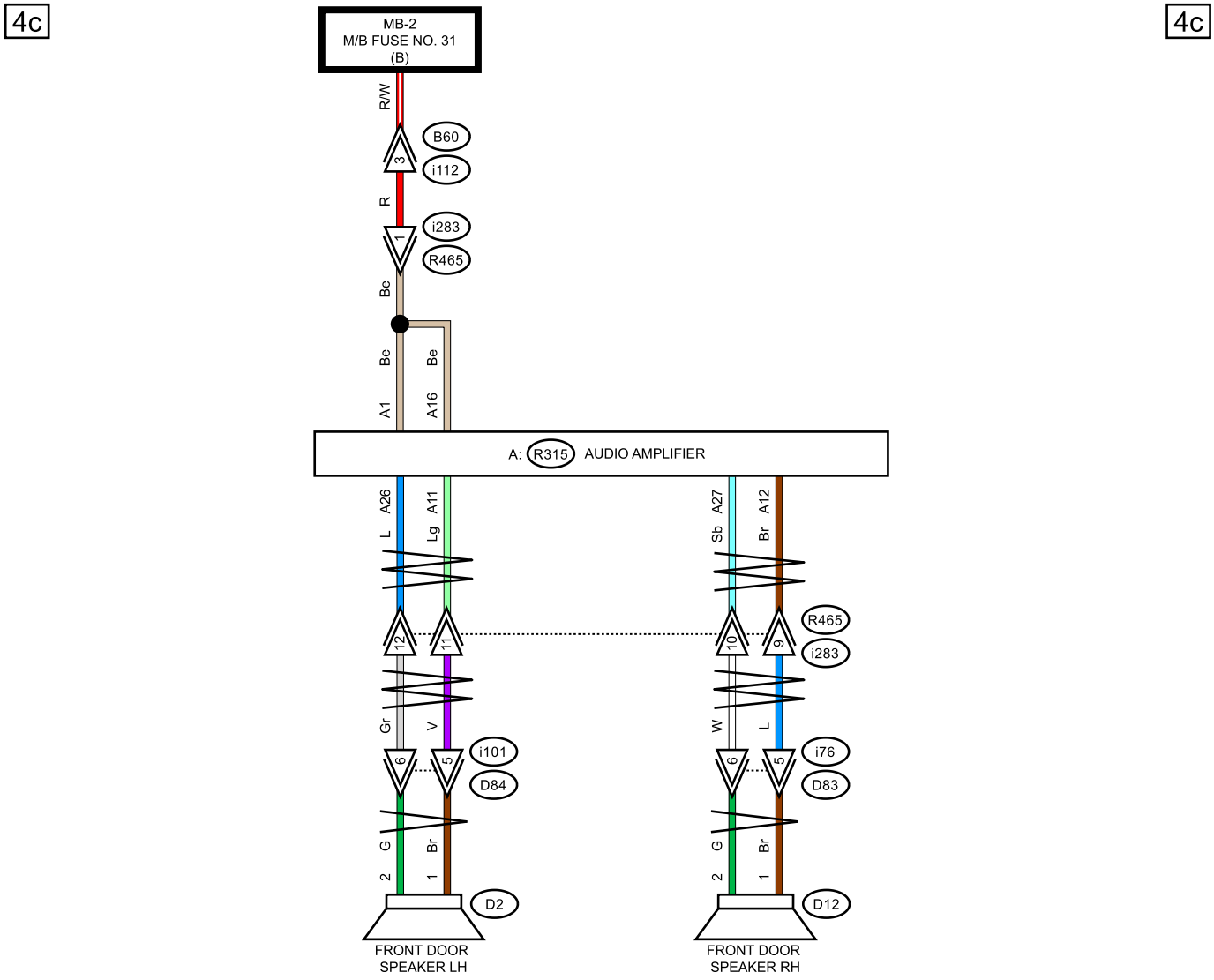
4b

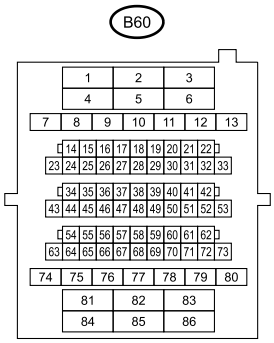

A: R315 AUDIO AMPLIFIER
A30
A15
R
W
A29
A14
L
Lg
A3
A18
B
B
R82
R81
5
1
R13
D28
12
11
R10
D22
Or
Br
2
1
D29
D23
B
E
REAR DOOR SPEAKER RH
REAR DOOR SPEAKER LH
REF. TO GND [k]

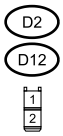

D23
D29
R10
R13
R82
A: R315 (B)

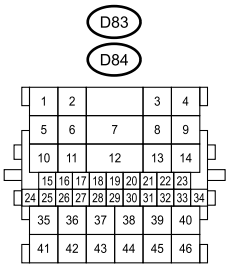
WI-68488

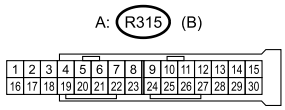
4c

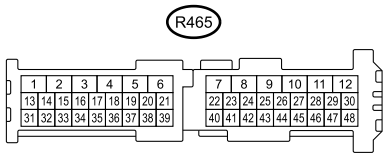

MB-2
M/B FUSE NO. 31
(B)
R/W
B60
i112
3
R
i283
R465
1
Be
Be
Be
A1
A16
A: R315 AUDIO AMPLIFIER
A26
A11
A27
A12
L
Lg
Sb
Br
12
11
10
9
R465
i283
Gr
V
W
L
6
5
6
5
i101
D84
i76
D83
G
Br
G
Br
2
1
2
1
D2
D12
FRONT DOOR
SPEAKER LH
FRONT DOOR
SPEAKER RH


B60


D2
D12
1
2

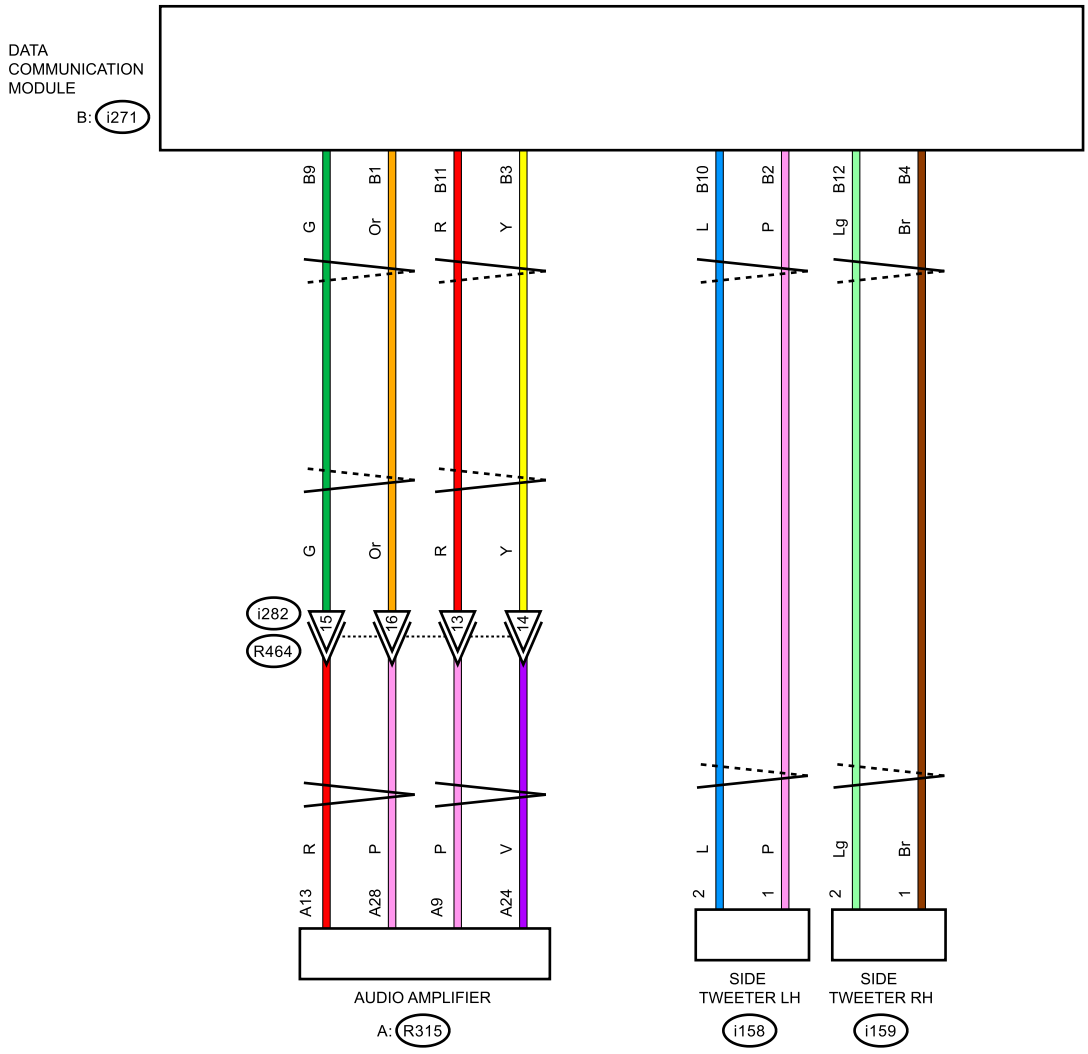

D83
D84

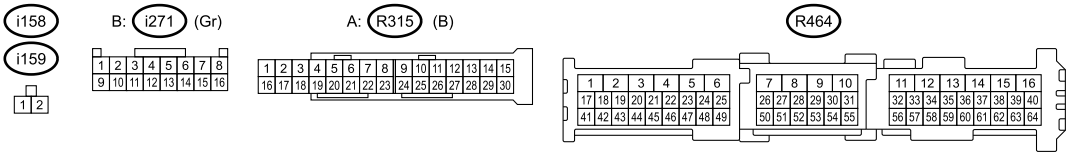

A: R315 (B)


R465

WI-68489

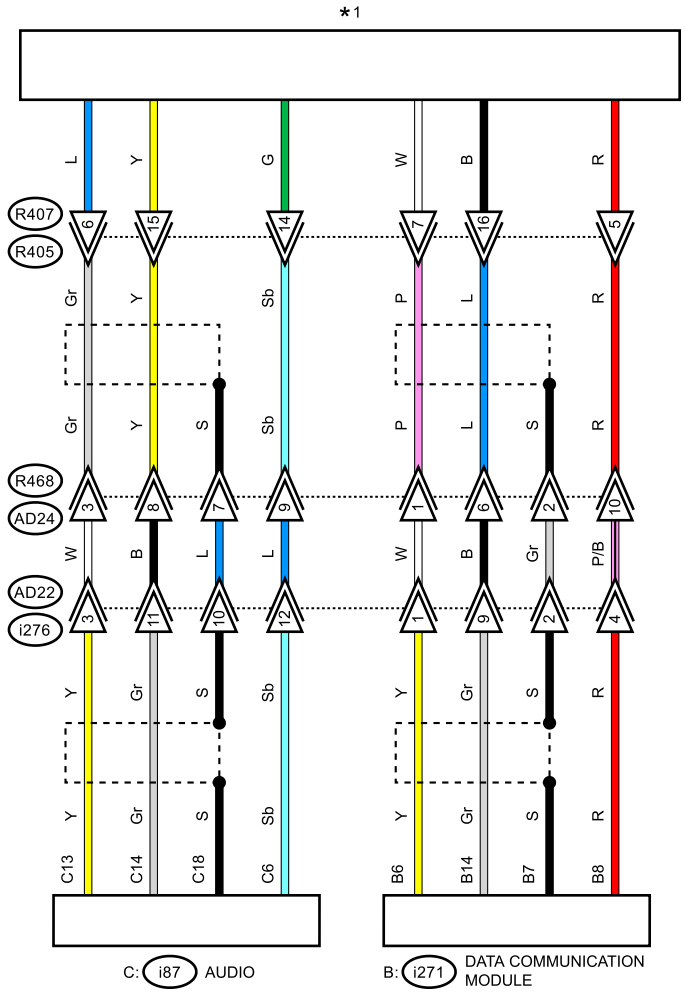
4d


DATA
COMMUNICATION
MODULE
B: i271
B9
G
B1
Or
B11
R
B3
Y
B10
L
B2
P
B12
Lg
B4
Br
i282
R464
15
16
13
14
A13
R
A28
P
A9
P
A24
V
2
L
1
P
2
Lg
1
Br
AUDIO AMPLIFIER
A: R315
SIDE
TWEETER LH
i158
SIDE
TWEETER RH
i159

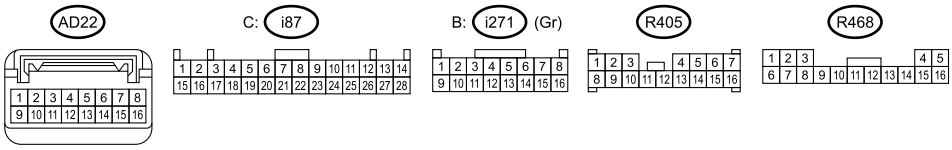

i158
i159
1 2
B: i271 (Gr)
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
A: R315 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
R464
1 2 3 4 5 6
17 18 19 20 21 22 23 24 25
41 42 43 44 45 46 47 48 49
7 8 9 10
26 27 28 29 30 31
50 51 52 53 54 55
11 12 13 14 15 16
32 33 34 35 36 37 38 39 40
56 57 58 59 60 61 62 63 64

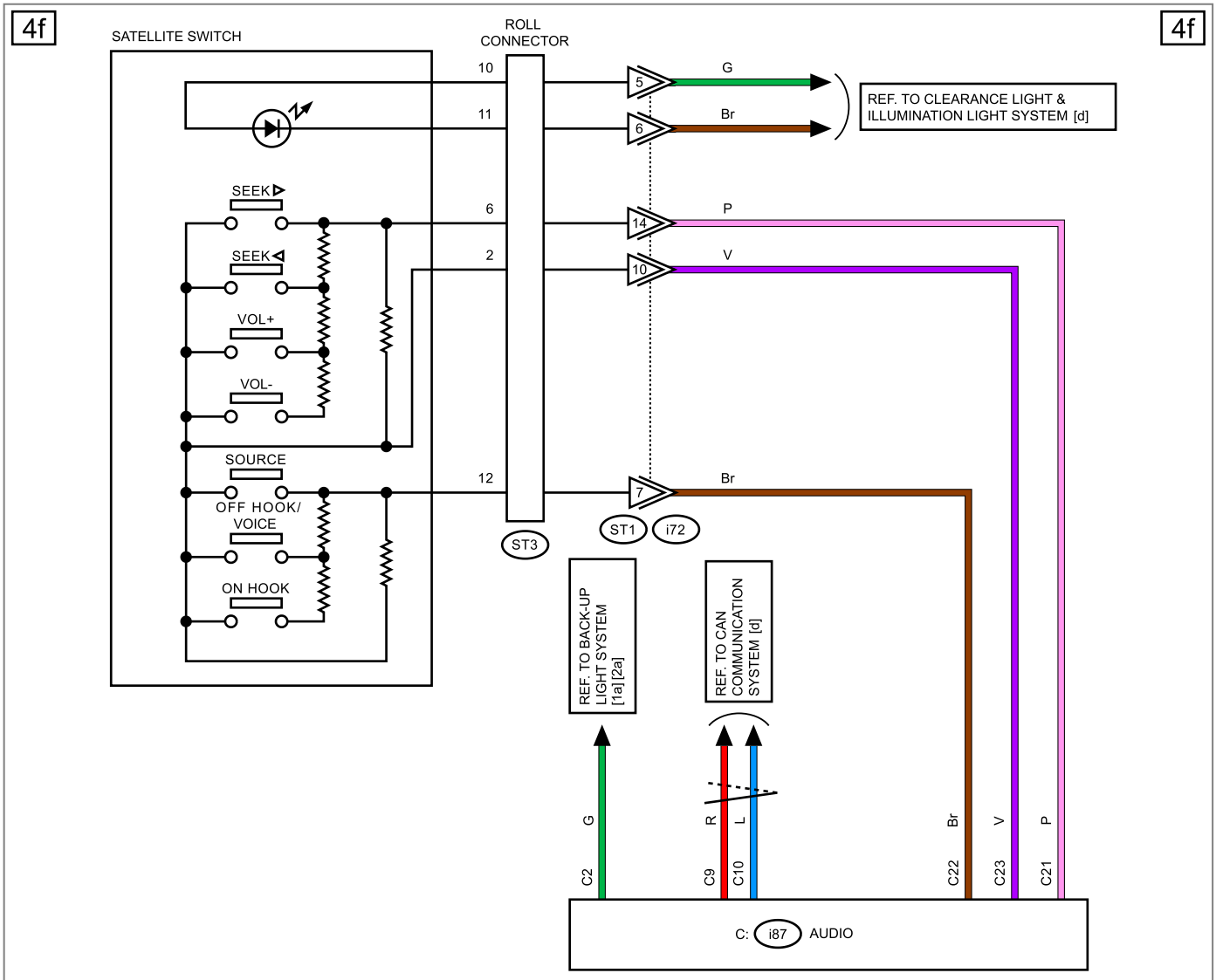
WI-68490

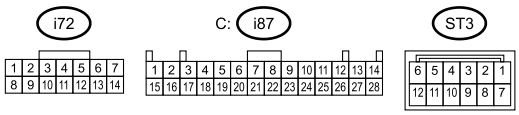
4e



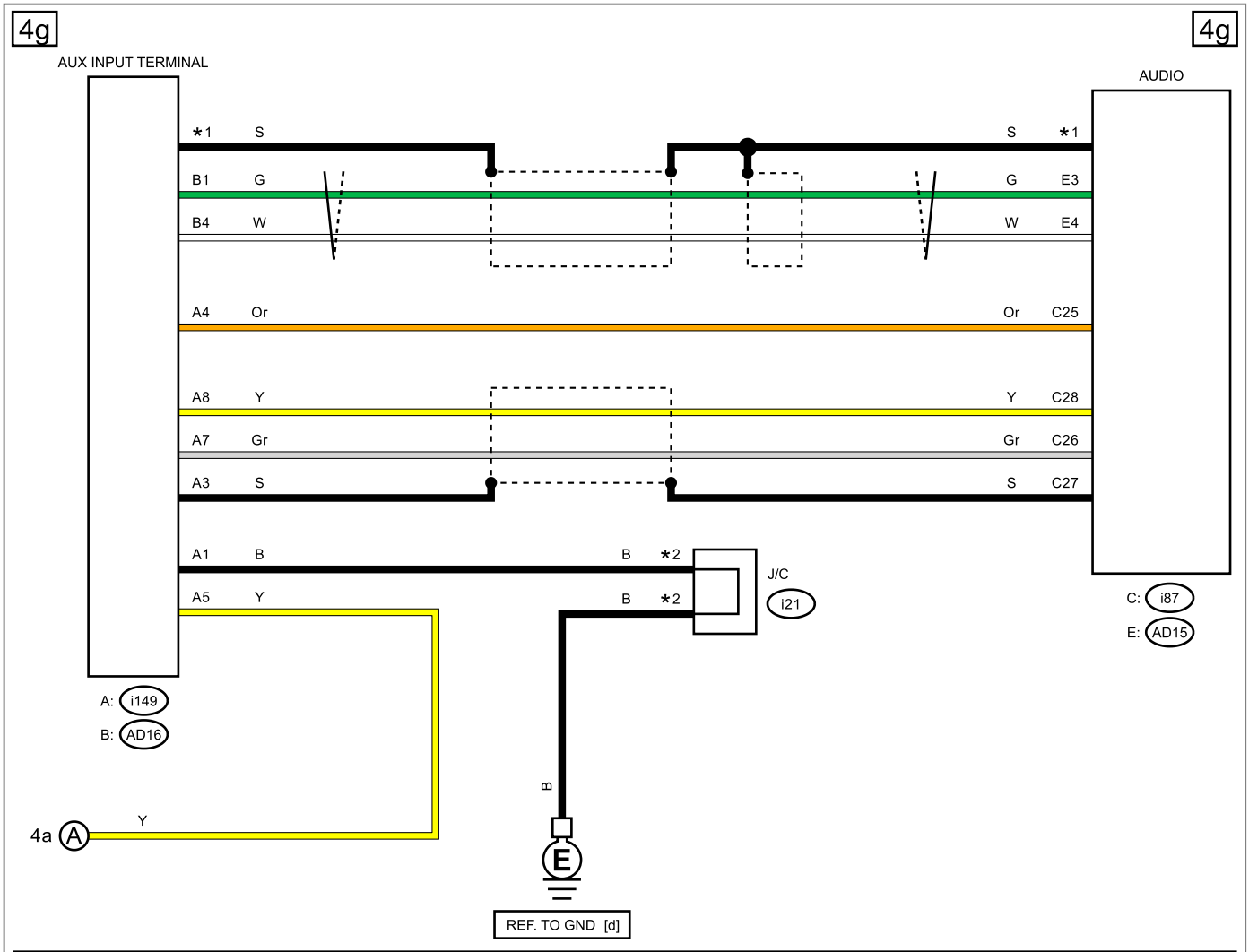
*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



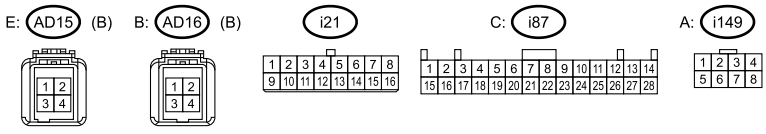

4f
4f
SATELLITE SWITCH
ROLL CONNECTOR
10
11
6
2
12
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/ VOICE
ON HOOK
ST3
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
G
R
L
Br
V
P
C2
C9
C10
C22
C23
C21
C: i87 AUDIO


i72
C: i87
ST3

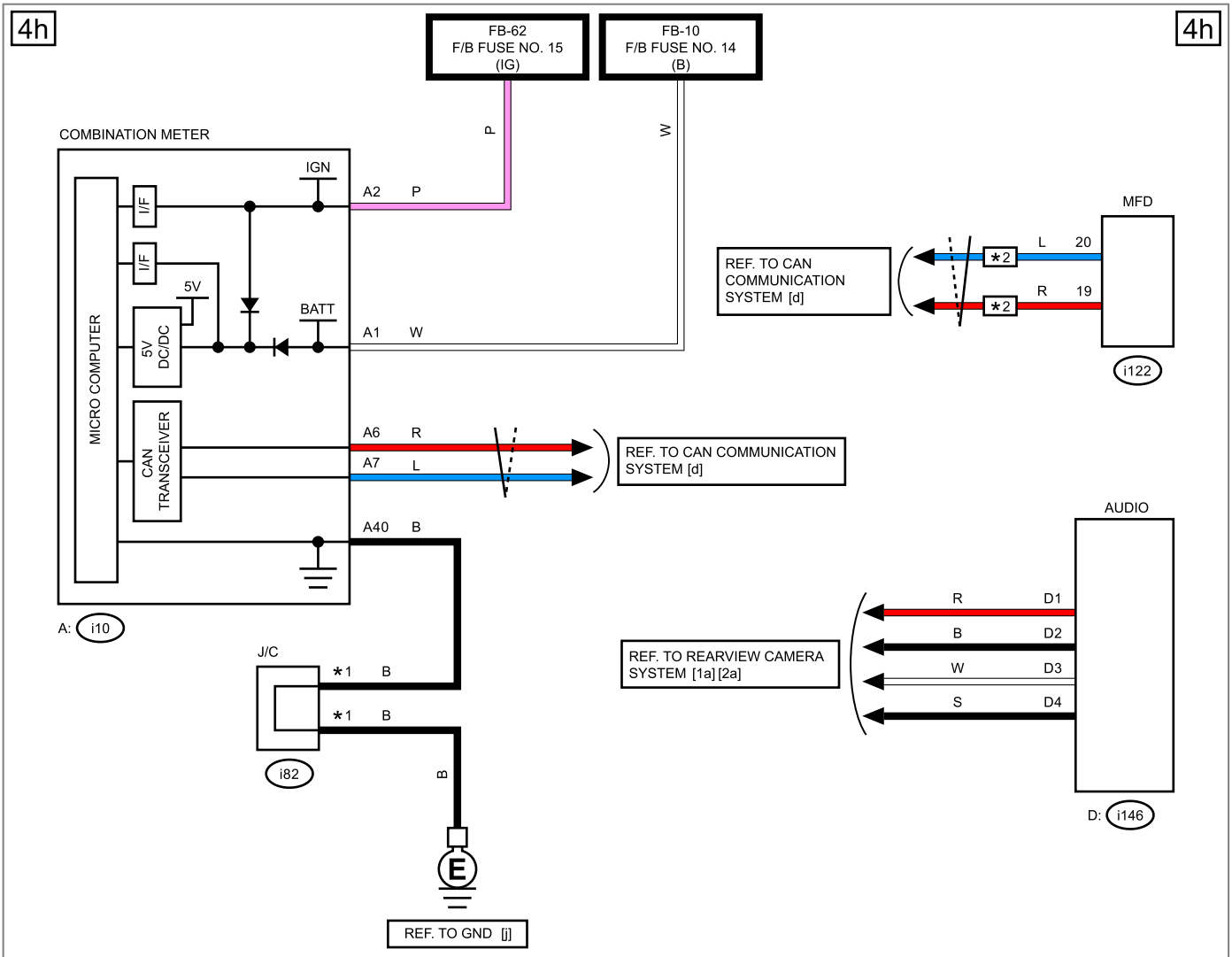
WI-68492



*1 : SHIELD CONNECTOR
*2 : TERMINAL No. OPTIONAL ARRANGEMENT

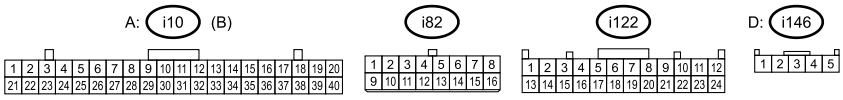


WI-68493



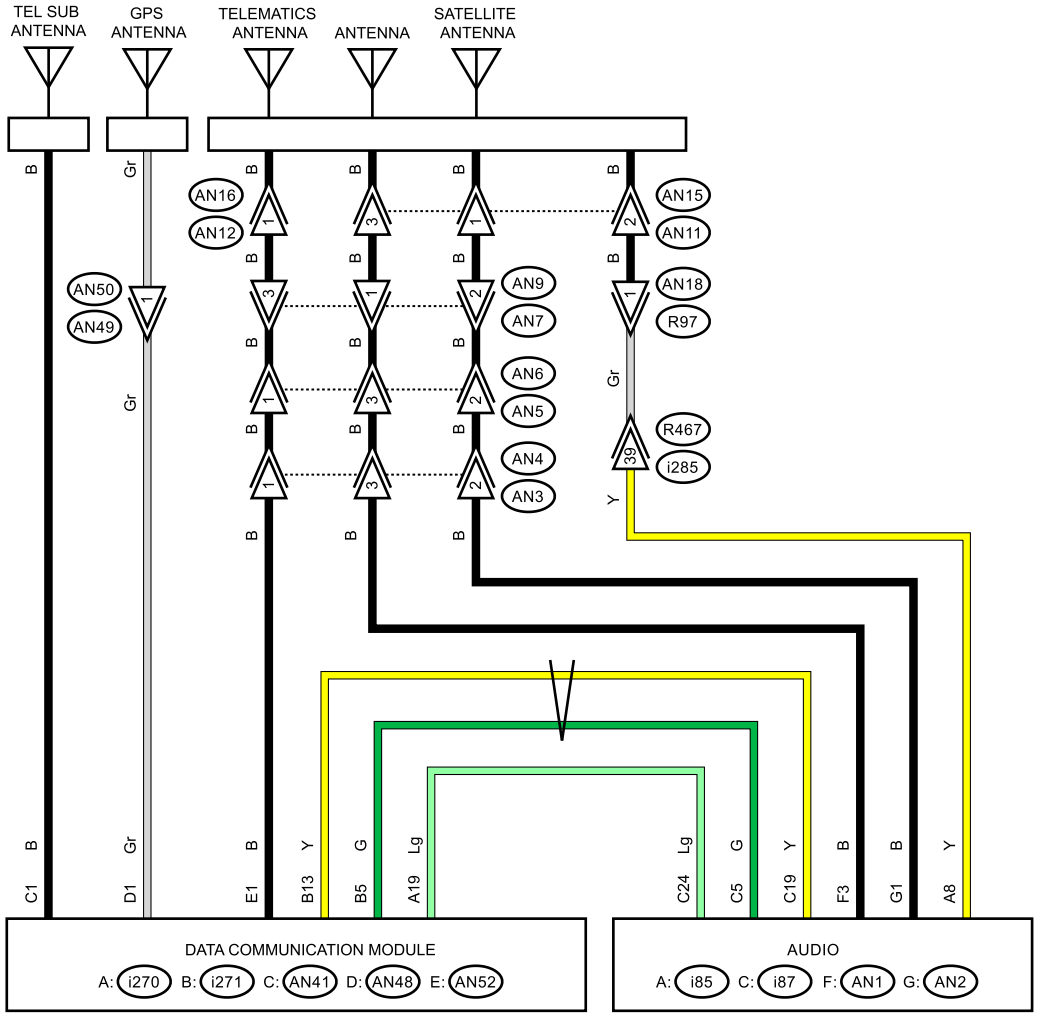
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH HIGH GRADE MFD

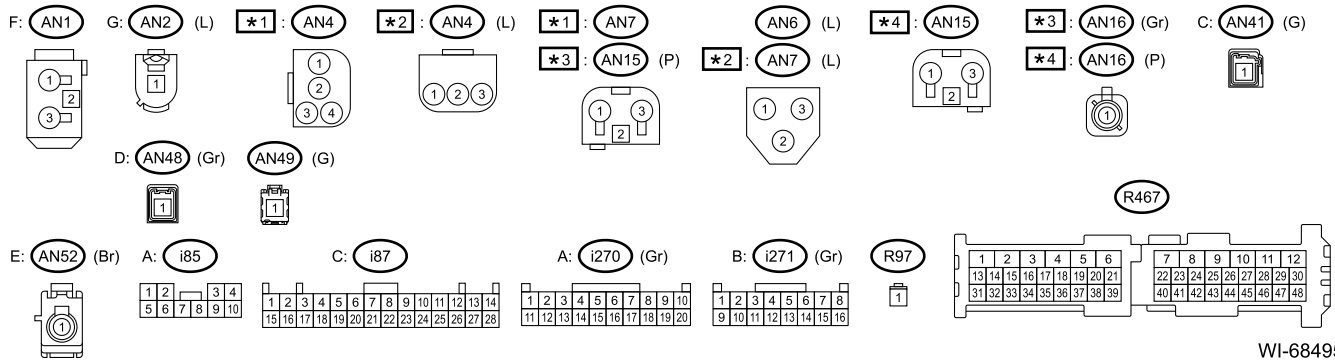


WI-68494

4i



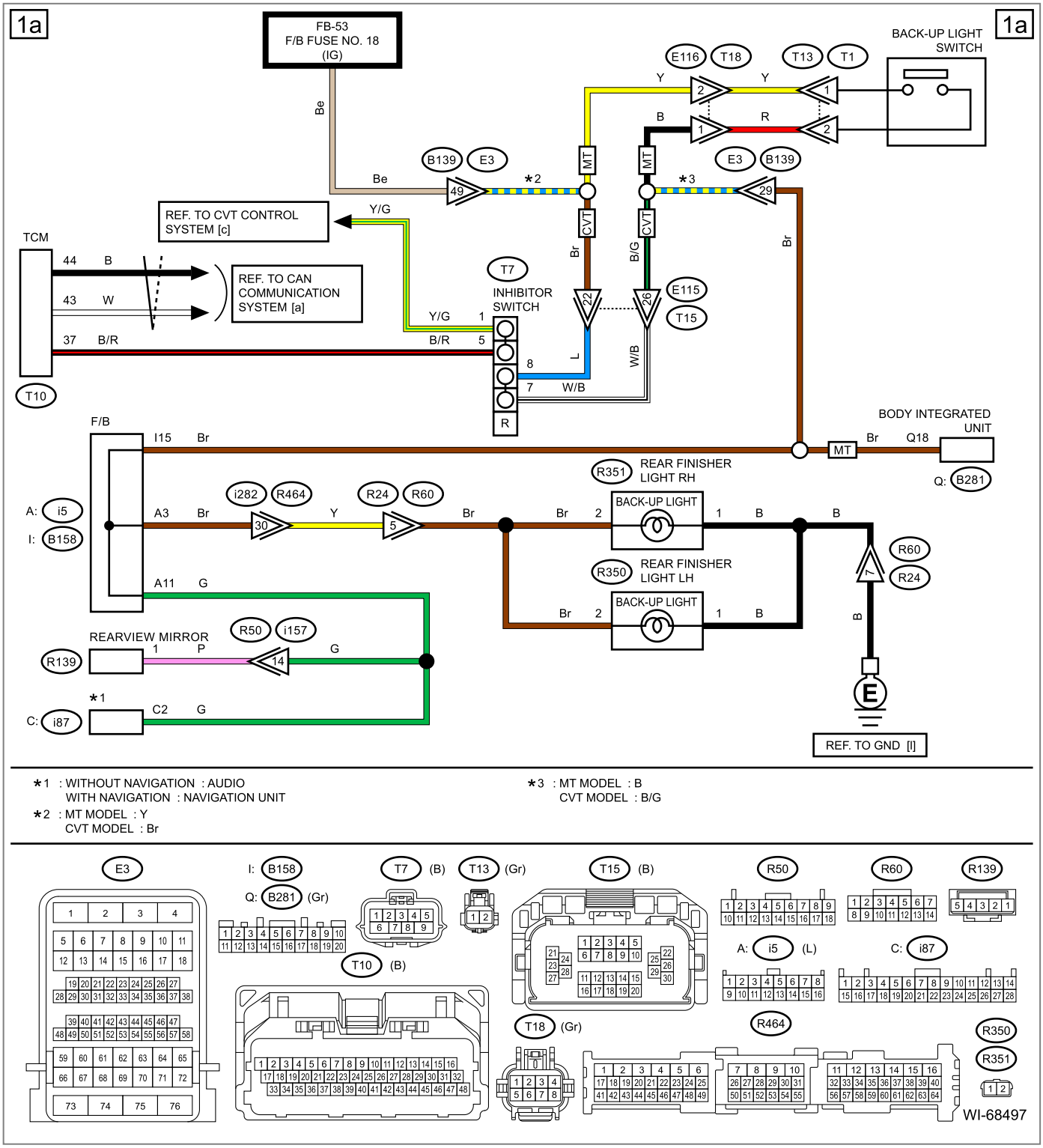
∗1 : WITHOUT SATELLITE ANTENNA
∗2 : WITH SATELLITE ANTENNA
∗3 : 4 DOOR MODEL
∗4 : 5 DOOR MODEL



WI-68495

WIRING DIAGRAM

1. 4 DOOR MODEL

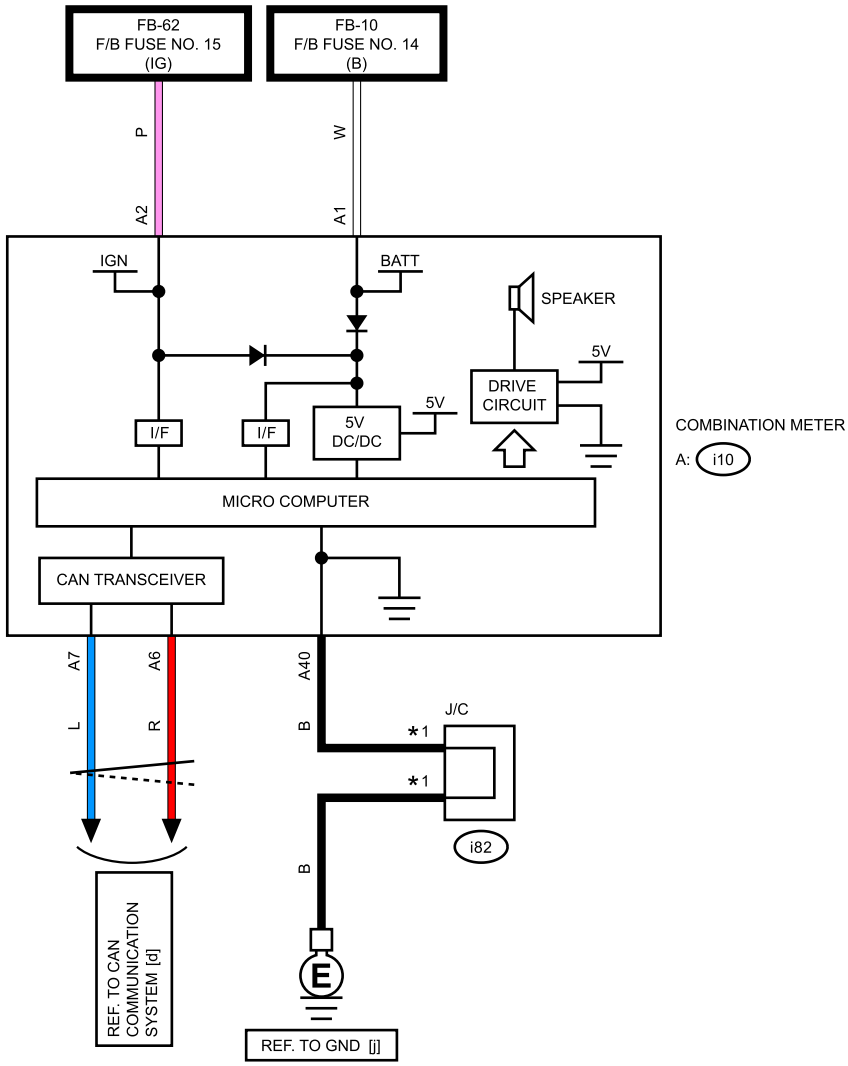


*1 : WITHOUT NAVIGATION : AUDIO
WITH NAVIGATION : NAVIGATION UNIT

*2 : MT MODEL : Y
CVT MODEL : Br

*3 : MT MODEL : B
CVT MODEL : B/G

1b



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

A: i10 (B)

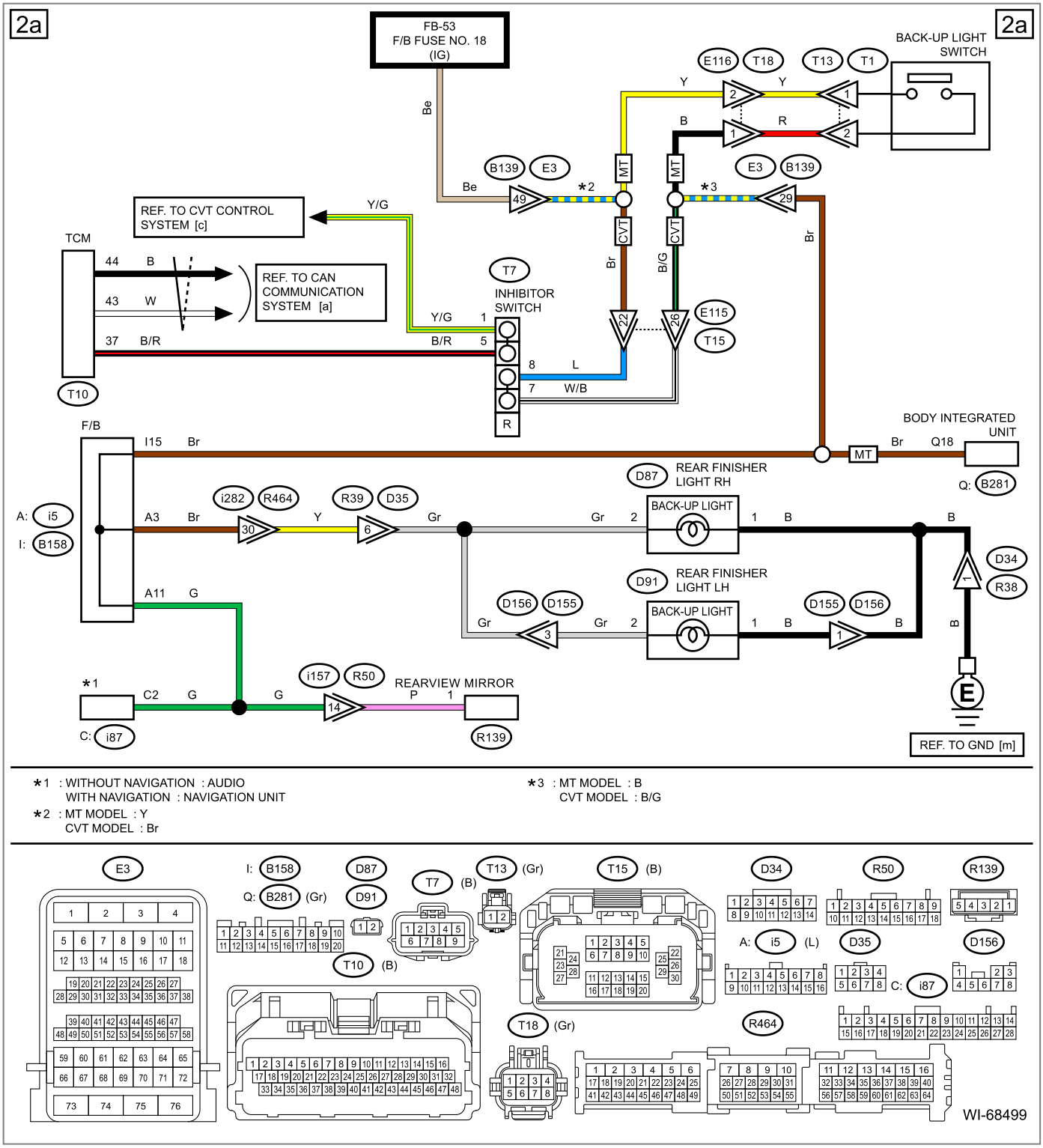
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

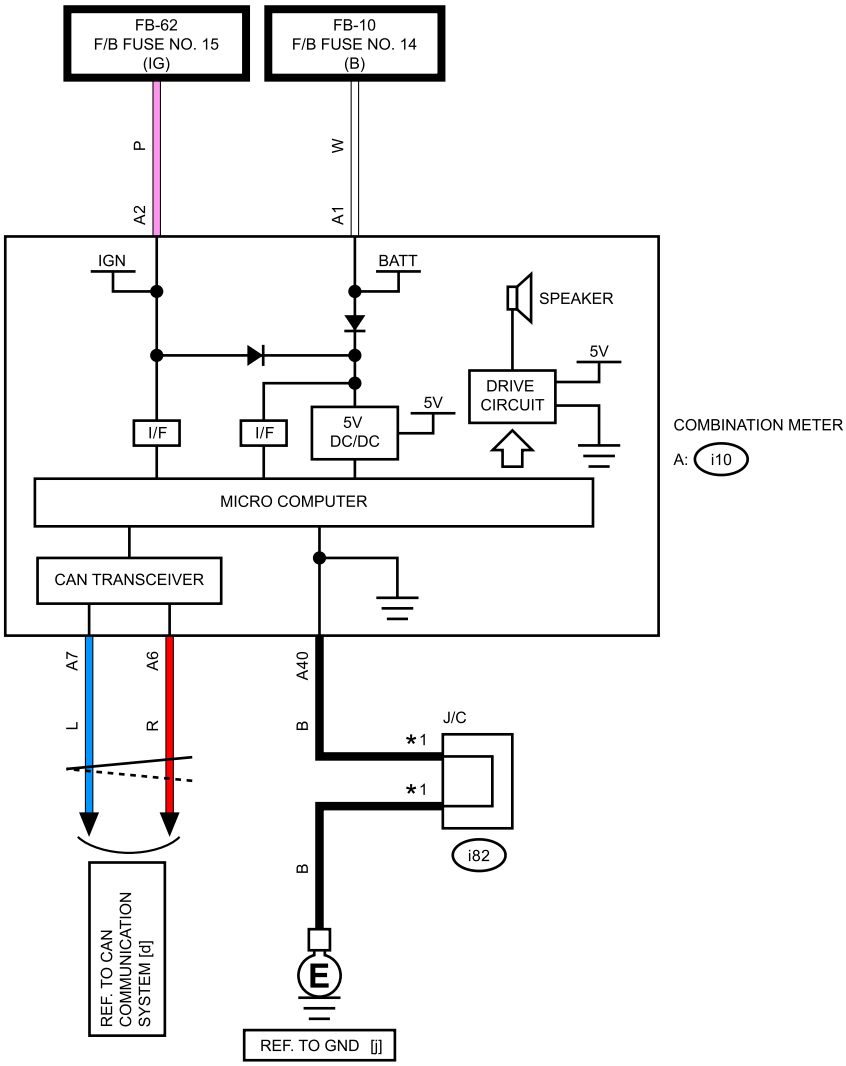
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

WI-68498

2. 5 DOOR MODEL



2b



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

A: i10 (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

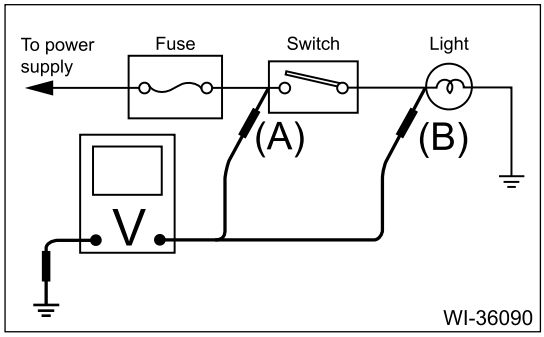
i82

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

BASIC INSPECTION

1. VOLTAGE MEASUREMENT

1. Using a voltmeter, connect the negative lead to a good ground point or negative battery terminal. Connect the positive lead to the connector or component terminal.
2. Contact the positive lead of the voltmeter on connector (A). The voltmeter will indicate a voltage.
3. Shift the positive lead contacting the connector (A) to the connector (B). The voltmeter will indicate no voltage.
4. Turn the switch to ON with the positive lead contacting the connector (B).
   The voltmeter will indicate a voltage and, at the same time, the light will illuminate.
5. The circuit is normal. If a problem such as a light failing to illuminate occurs, use the procedures above to track down the malfunction.

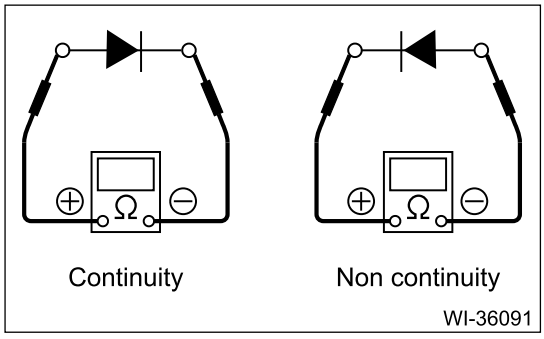


2. CONTINUITY CHECK

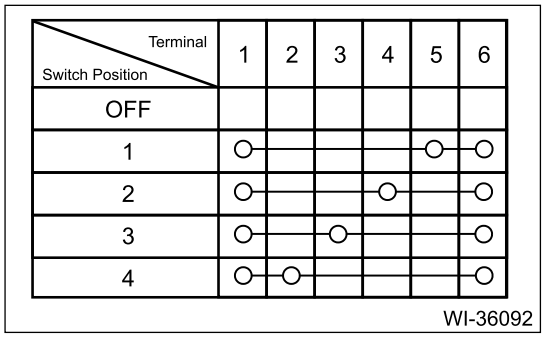
1. Disconnect the battery terminal or connector so there is no voltage between the check points. Contact the leads of an ohmmeter between the check points, and check that there is continuity.
2. When checking the diode continuity using an ohmmeter, allow the positive lead to contact the diode positive side and the negative lead to the negative side. At this time, there must be continuity. Also, when contacting the leads in reverse, there should be no continuity.

   Note:

   Some testers have reverse polarity, therefore, refer to the instruction manual of the tester.

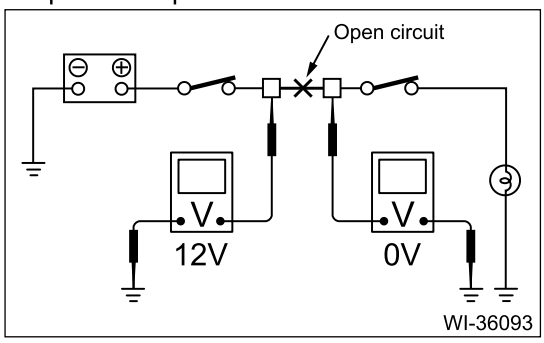


3. When checking switch continuity using an ohmmeter, perform the check while the switch operates. For example, when a switch position is at 3, continuity exists among terminals 1, 3 and 6, as shown below.

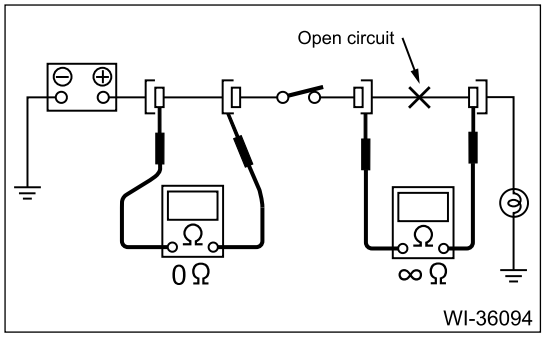


3. HOW TO IDENTIFY AN OPEN CIRCUIT

1. With voltmeter:
   An open circuit is determined by measuring the voltage between respective connectors and ground using a voltmeter, starting with the connector closest to the power supply. The power supply must be turned ON so that current flows in the circuit. If voltage is not present between a particular connector and ground, the circuit between that connector and the previously checked point is open.

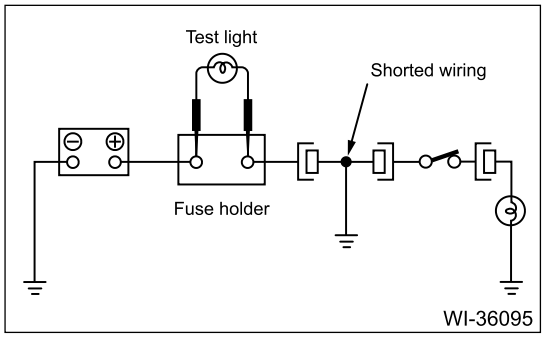


2. With ohmmeter:
   Disconnect all connectors affected, and check continuity in the harness between adjacent connectors. When the ohmmeter indicates “infinite”, the harness is open.

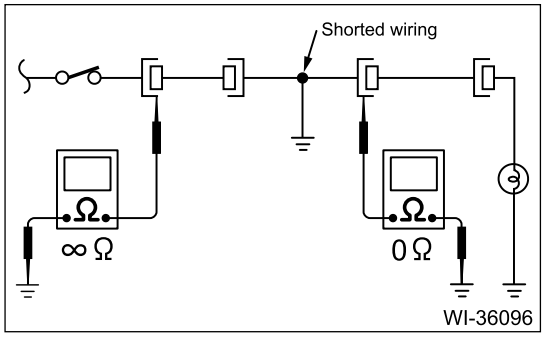


4. HOW TO DETERMINE A SHORT CIRCUIT

1. With test light:
   Connect a test light (rated at approx. 3 watts) in place of the blown fuse and allow current to flow through the circuit. Disconnect one connector at a time. At that time, always start with the connector located farthest from the power supply. If the test light goes out when a connector is disconnected, the harness between that connector and the next connector (farther from the power supply) is shorted.



2. With ohmmeter:
Disconnect all affected connectors, and check continuity between each connector and ground. When the ohmmeter indicates continuity between a particular connector and a ground, that connector is shorted.



BASIC PROCEDURES

1. GENERAL DESCRIPTION

The most important purpose of diagnostics is to quickly determine which fault is the root cause of the symptom, to save time and labor.

2. IDENTIFICATION OF TROUBLE CAUSE

1. Using the diagnostics, narrow down the causes.
2. Refer to the wiring diagram and check the system’s circuit. If necessary, use a voltmeter, ohmmeter, etc.
3. Before replacing component parts, check for fuse blowout, open wiring harness on the power supply circuit and the ground circuit, and poor connectors, switches, relays, etc. If no problem is encountered, check the component parts.

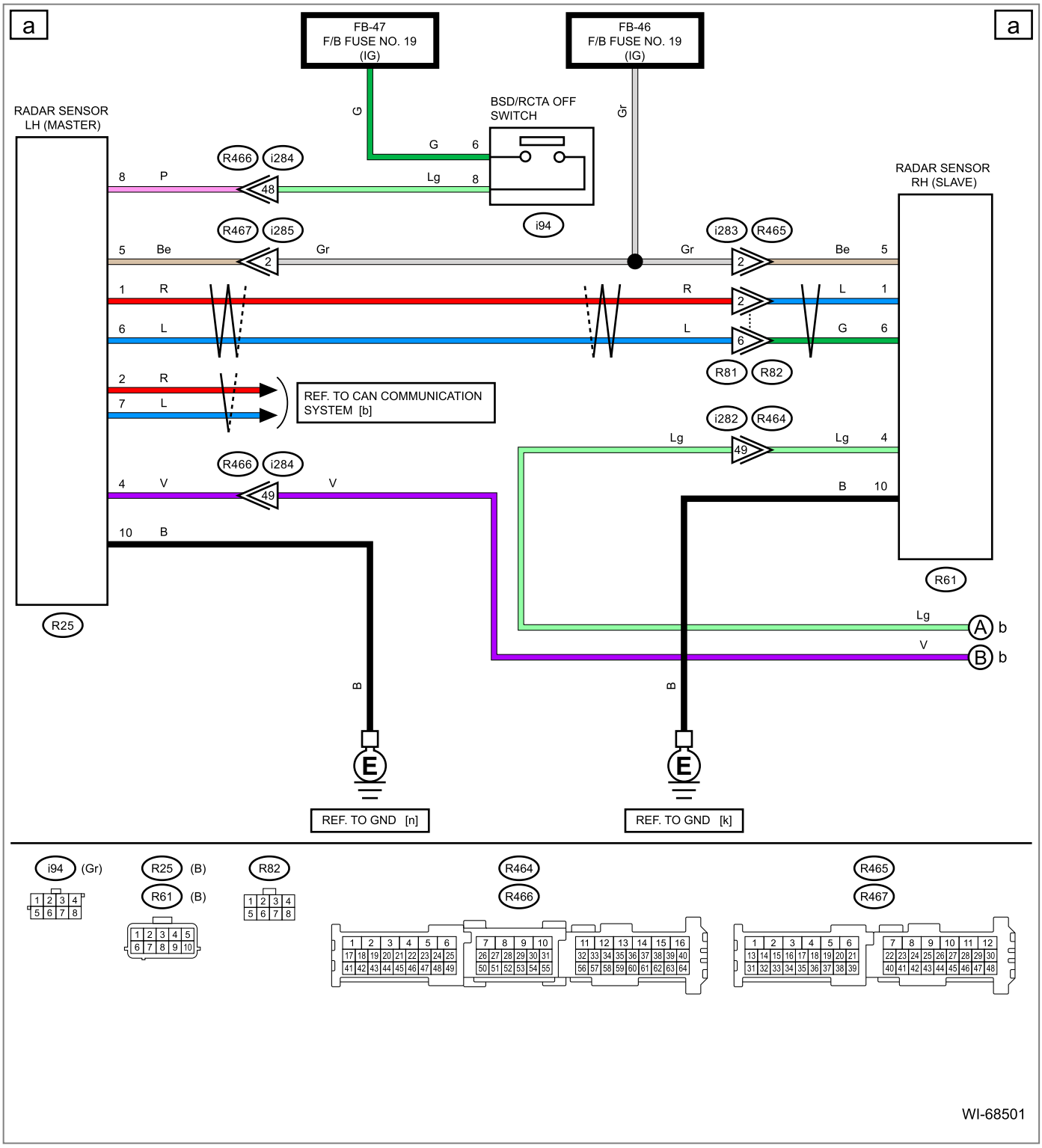
3. SYSTEM OPERATION CHECK

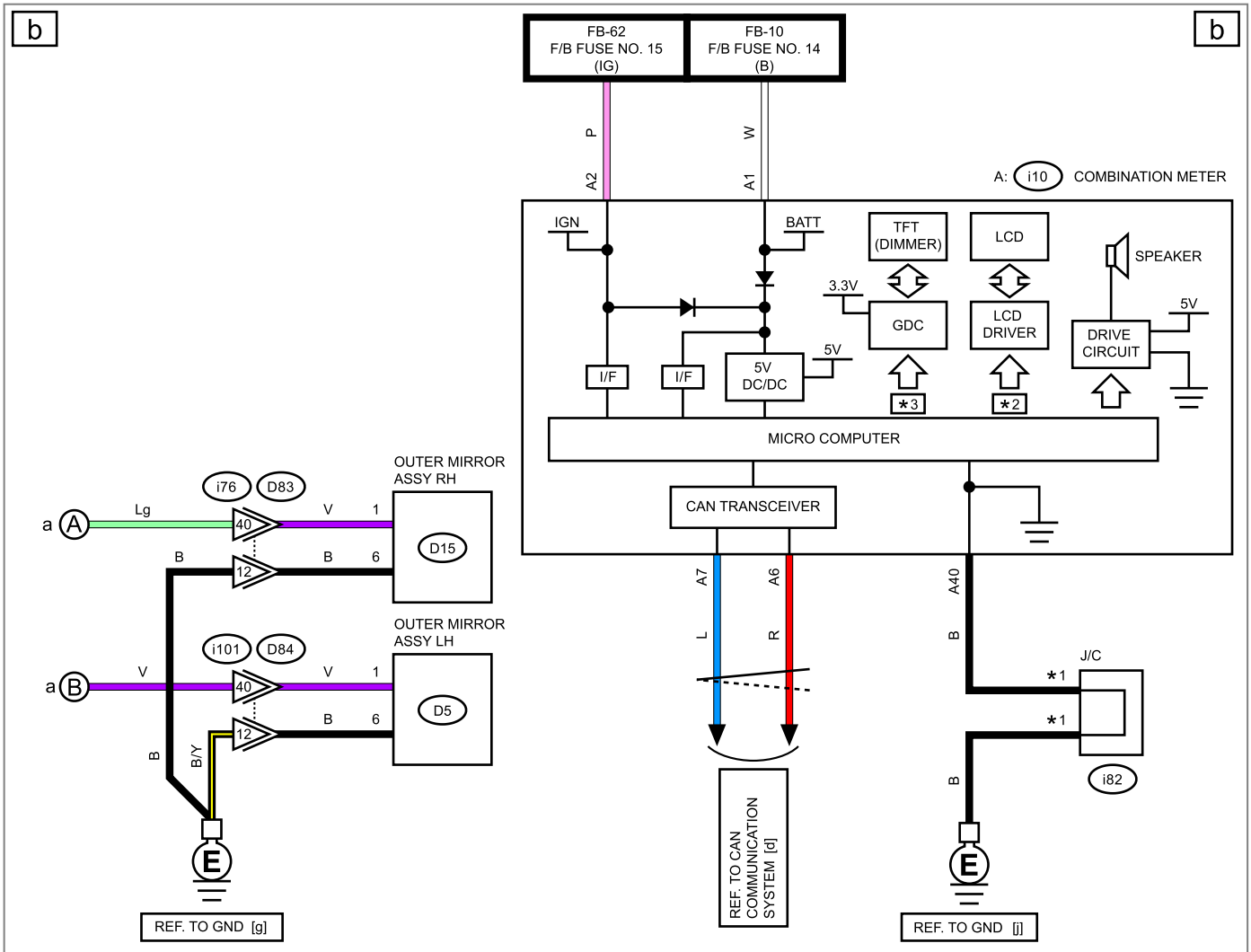
After inspection and repair, ensure that the system operates properly.

HOW TO READ WIRING DIAGRAMS

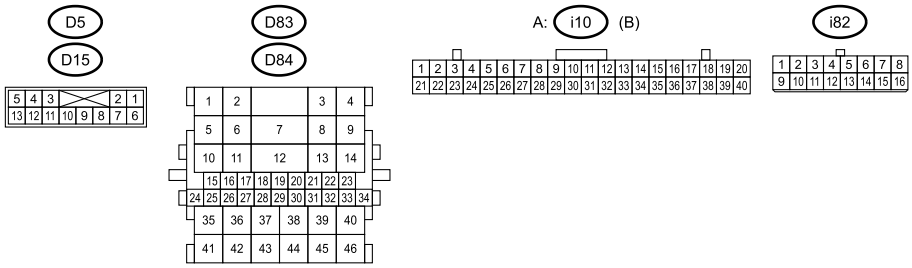
Refer to HELP on how to read the wiring diagram.

WIRING DIAGRAM


a
a
FB-47
F/B FUSE NO. 19
(IG)
FB-46
F/B FUSE NO. 19
(IG)
RADAR SENSOR
LH (MASTER)
BSD/RCTA OFF
SWITCH
i94
RADAR SENSOR
RH (SLAVE)
R466
i284
R467
i285
i283
R465
i282
R464
R81
R82
R61
R25
REF. TO CAN COMMUNICATION
SYSTEM [b]
REF. TO GND [n]
REF. TO GND [k]
A b
B b
i94 (Gr)
R25 (B)
R61 (B)
R82
R464
R466
R465
R467
WI-68501

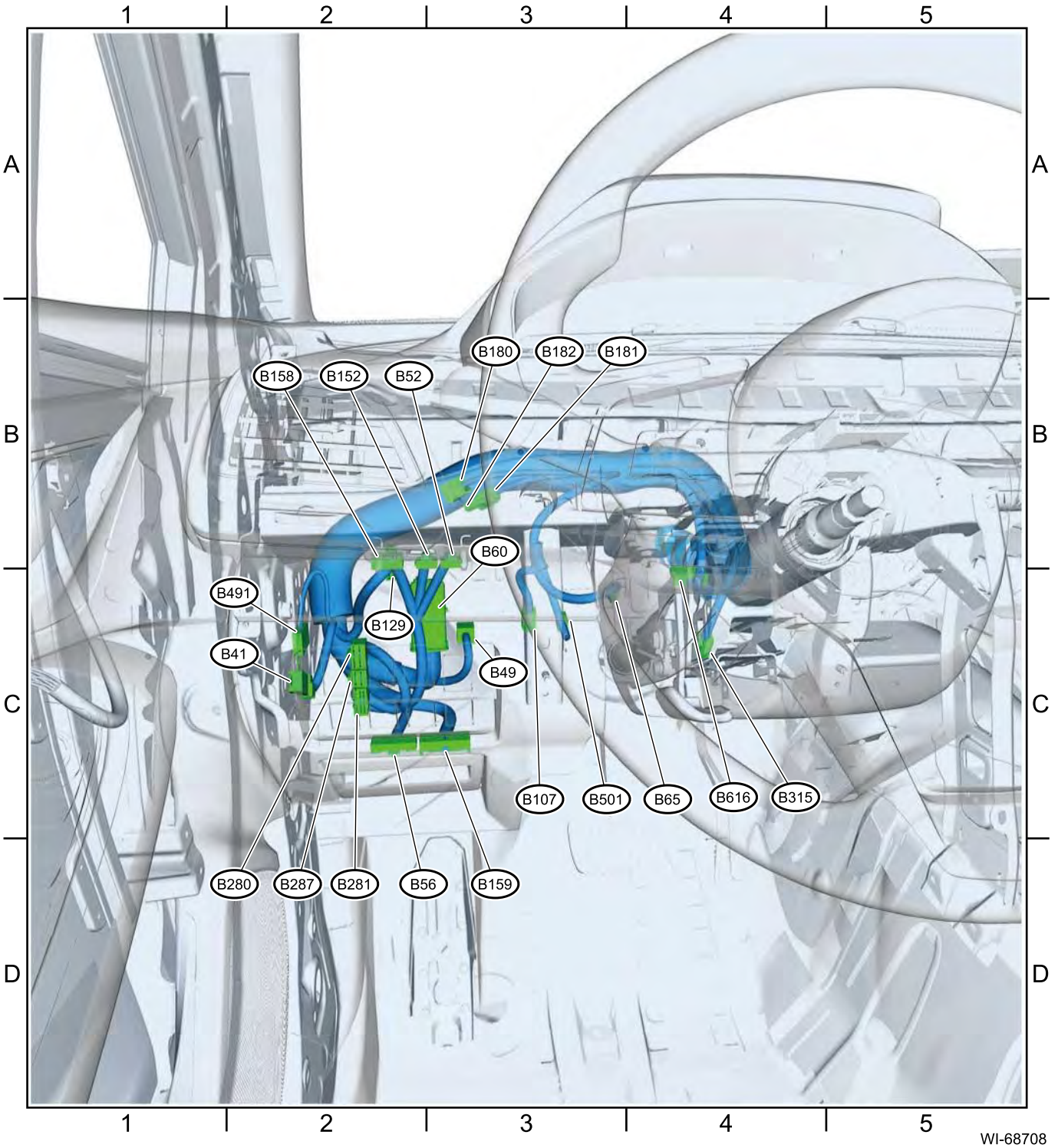


*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : NORMAL METER MODEL
*3 : COLOR TFT METER MODEL



WI-68502

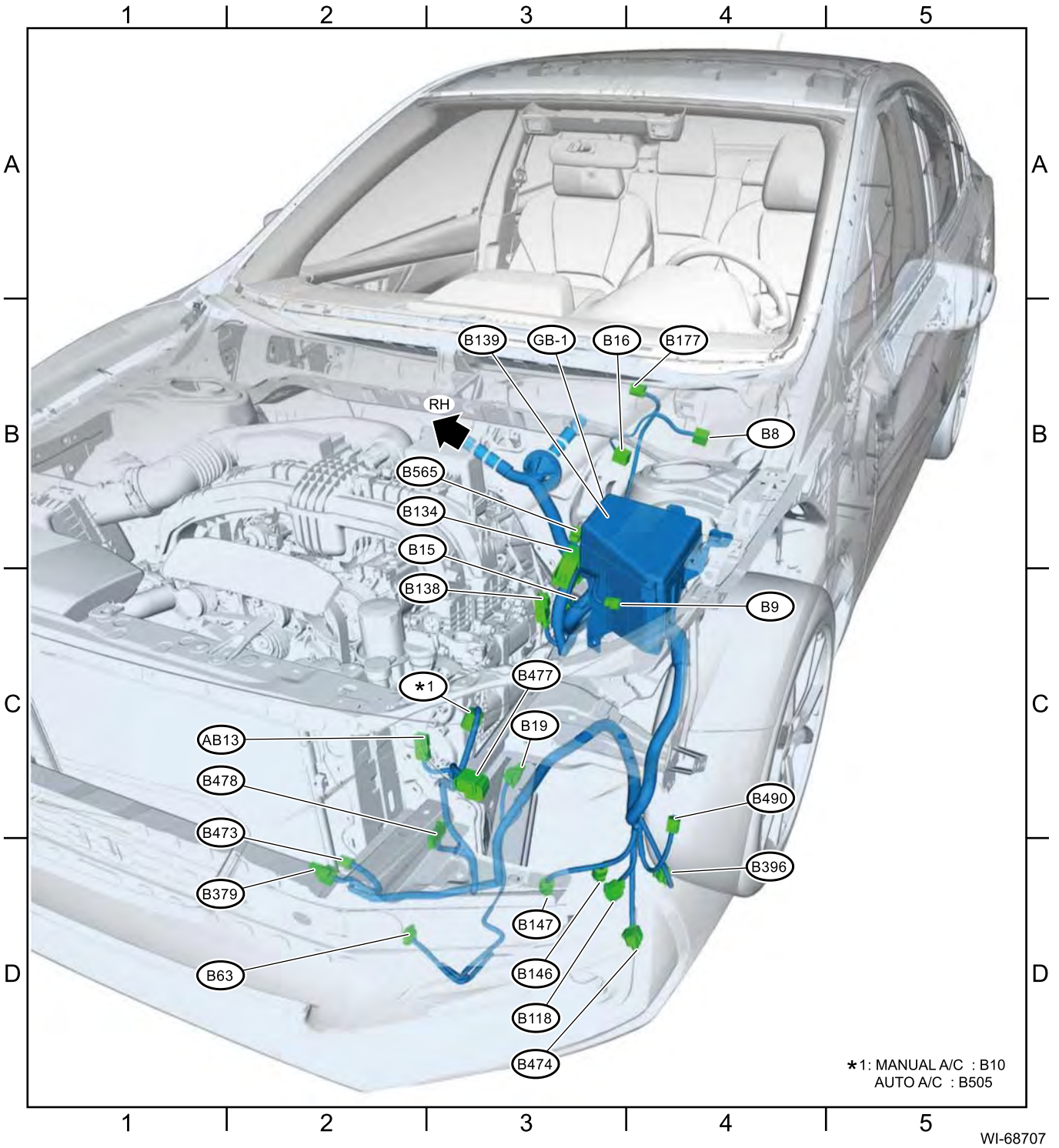
LOCATION



Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
B41	2	★	C-2		Power window circuit breaker
B49	4	Y	C-3	i115	Instrument panel wiring harness
B52	4	★	B-3		F/B
B56	8	Br	C-2		
B60	86	★	C-3	i112	Instrument panel wiring harness

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
B65	5	★	C-3		Stop light & brake switch
B107	2	L	C-3		Clutch switch
B129	20	★	C-2	i215	Instrument panel wiring harness
B152	4	B	B-2		F/B
B158	20	★	B-2		
B159	4	★	C-3		
B180	4	★	B-3		Remote engine start CM
B181	2	★	B-3	B182	Short connector
B182	2	★	B-3	B181	
B280	12	B	C-2		Body integrated unit
B281	20	Gr	C-2		
B287	8	★	C-2		
B315	6	B	C-4		Accelerator pedal position sensor
B491	5	★	C-2		J/C
B501	10	Gr	C-3		Clutch start switch
B616	24	★	C-4		Auto headlight beam leveler CM
★: White or natural color					

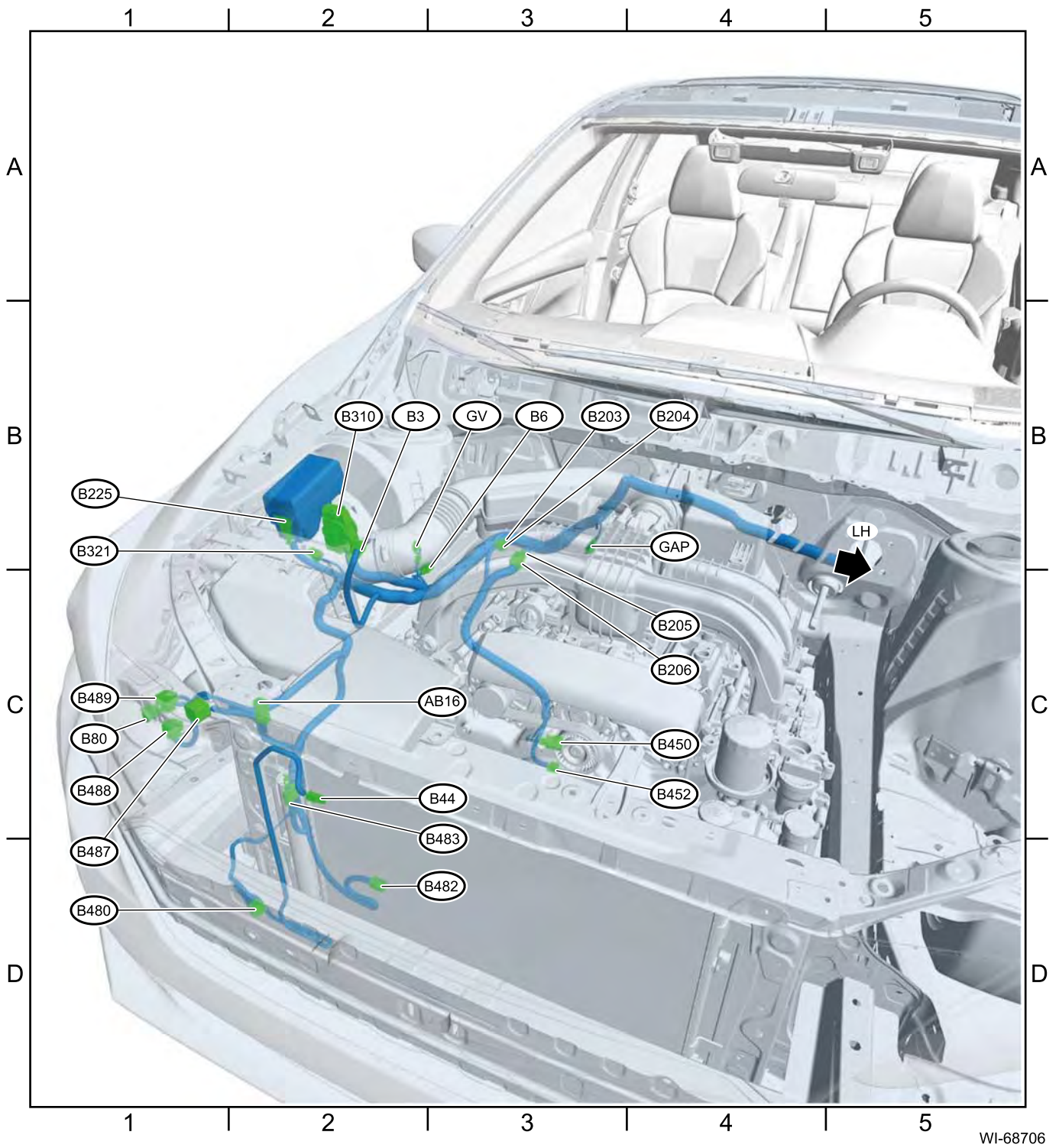
LOCATION



Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB13	2	Y	C-2		Front sub sensor LH
B8	5	Gr	B-4		Front wiper motor
B9	3	B	C-3		Battery sensor
B10	4	B	C-3		Pressure switch
B15	2	Gr	C-3		Front ABS wheel speed sensor LH

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
B16	2	Gr	B-3		Brake fluid level switch
B19	4	B	C-3		Transmission cord
B63	4	B	D-2		Active grille shutter
B118	2	★	D-3		Daytime running light LH
B134	72	B	B-3		ECM
B138	8	B	C-3		J/C
B139	76	★	B-3	E3	Engine wiring harness
B146	2	Gr	D-3		Front washer motor
B147	2	B	D-3		Rear washer motor
B177	2	Gr	B-4		Wiper deicer
B379	4	Gr	D-2		Front oxygen (A/F) sensor
B396	2	B	D-4		Washer fluid level sensor
B473	2	Gr	D-2		Main fan motor
B474	2	B	D-4		Front fog light LH
B477	8	Gr	C-3		Front combination light LH (halogen model)
	16	Gr	C-3		Front combination light LH (LED model)
B478	5	★	C-3		J/C
B490	2	B	C-4		Keyless buzzer
B505	3	Gr	C-3		Pressure sensor
B565	3	Gr	B-3		Brake booster pressure sensor
GB-1	—	—	B-3		—
★: White or natural color					

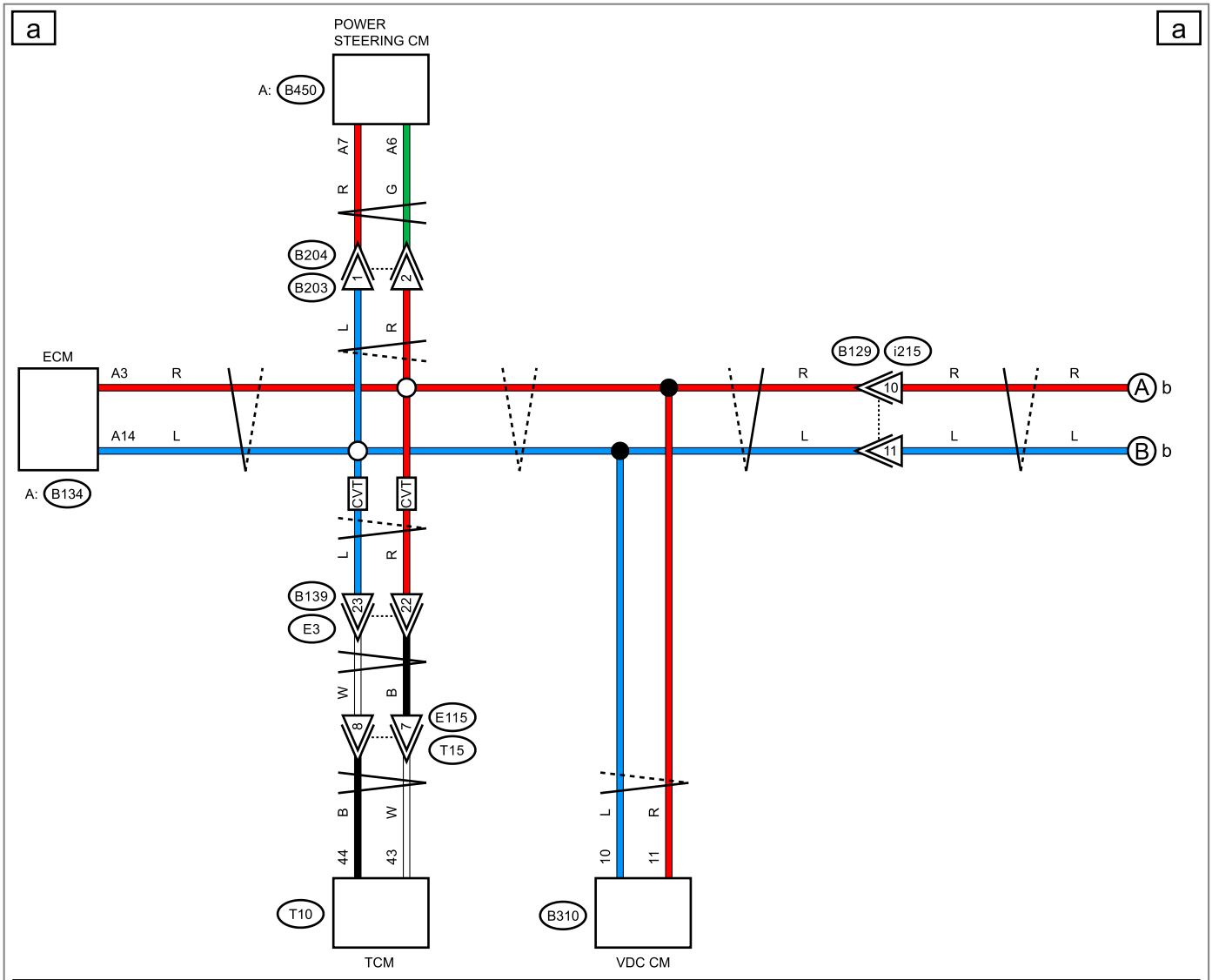
LOCATION

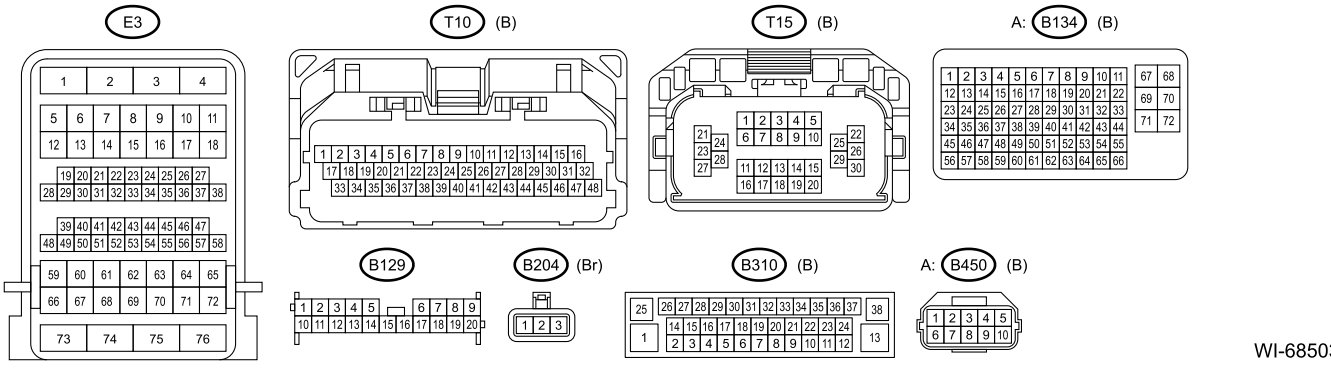


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB16	2	Y	C-2		Front sub sensor RH
B3	4	B	B-2		Mass air flow & intake air temperature sensor
B6	2	Gr	B-2		Front ABS wheel speed sensor RH
B44	1	B	C-2		Horn
B80	2	★	C-1		Daytime running light RH

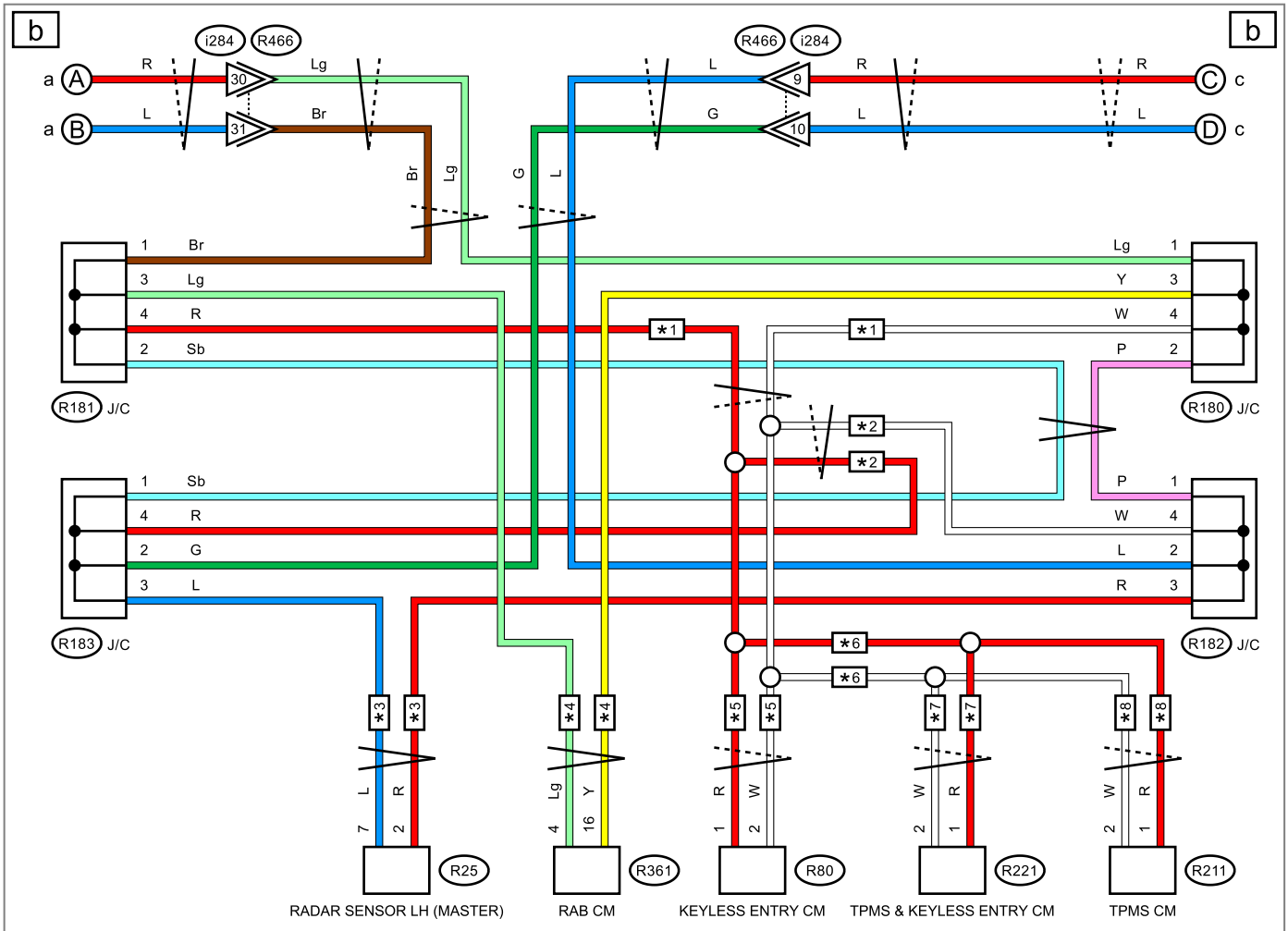
Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
B203	3	Br	B-3	B204	Electrical power steering harness
B204	3	Br	B-3	B203	Bulkhead wiring harness
B205	2	Gr	B-3	B206	Electrical power steering harness
B206	2	Gr	B-3	B205	Bulkhead wiring harness
B225	59	B	B-2		Relay holder
B310	38	B	B-2		VDC CM
B321	2	B	B-2		Hood switch
B450	10	B	C-3		Power steering CM
B452	2	B	C-3		
B480	2	B	D-2		Ambient sensor
B482	2	Gr	D-2		Sub fan motor
B483	3	★	C-2		J/C
B487	8	Gr	C-1		Front combination light RH (halogen model)
	16	Gr	C-1		Front combination light RH (LED model)
B488	2	B	C-1		Front fog light RH
B489	1	B	C-1		Horn
GAP	—	—	B-3		—
GV	—	—	B-2		—
★: White or natural color					

WIRING DIAGRAM

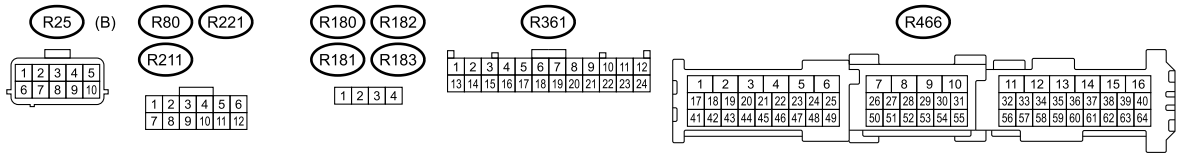

a
a
POWER STEERING CM
A: B450
A7
A6
R
G
B204
B203
1
2
L
R
ECM
A3
R
A14
L
A: B134
B129
i215
10
11
A b
B b
CVT
CVT
L
R
B139
E3
23
22
W
B
E115
T15
8
7
B
W
44
43
T10
TCM
L
R
10
11
B310
VDC CM


E3
T10 (B)
T15 (B)
A: B134 (B)
B129
B204 (Br)
B310 (B)
A: B450 (B)

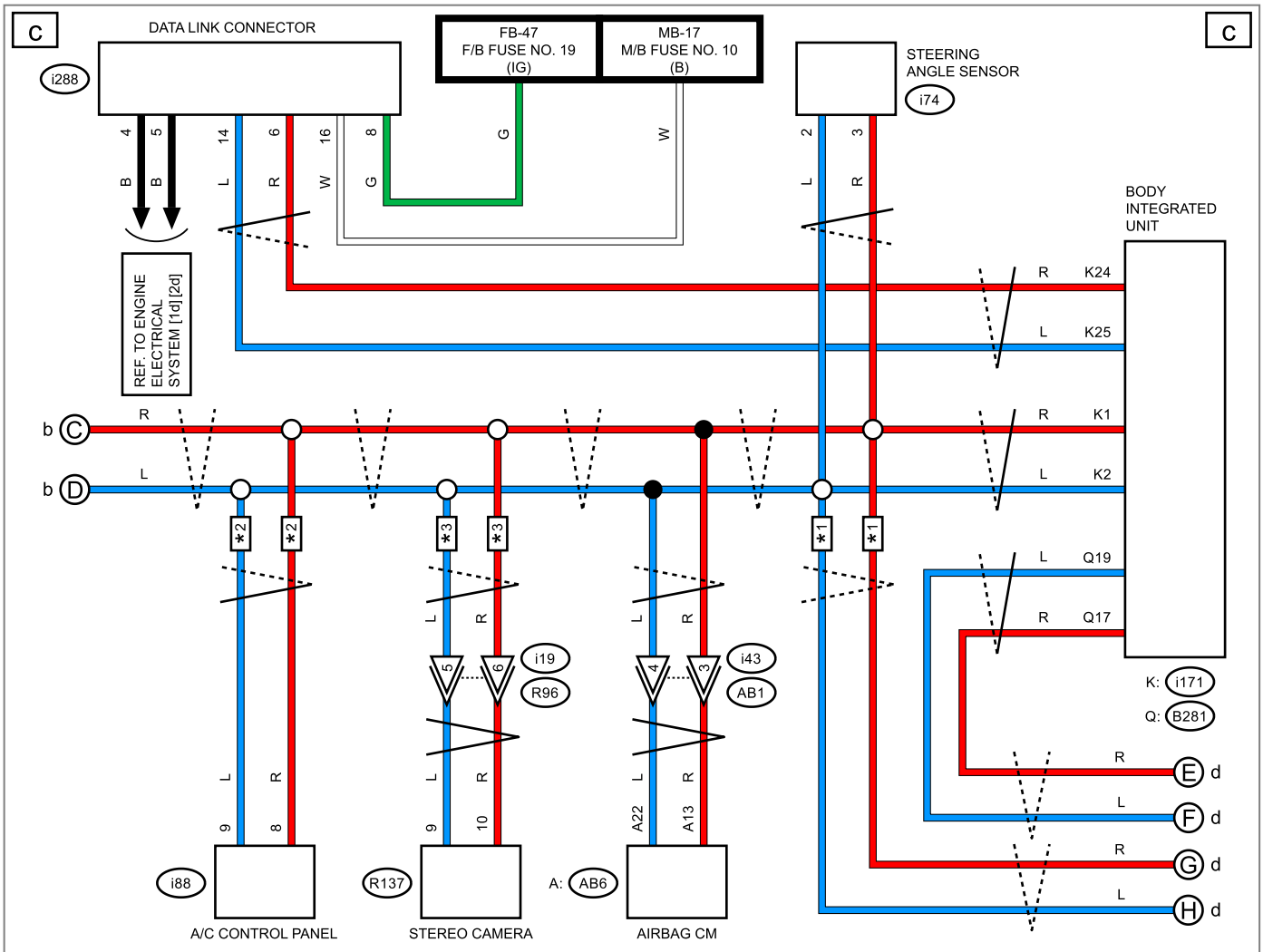
WI-68503



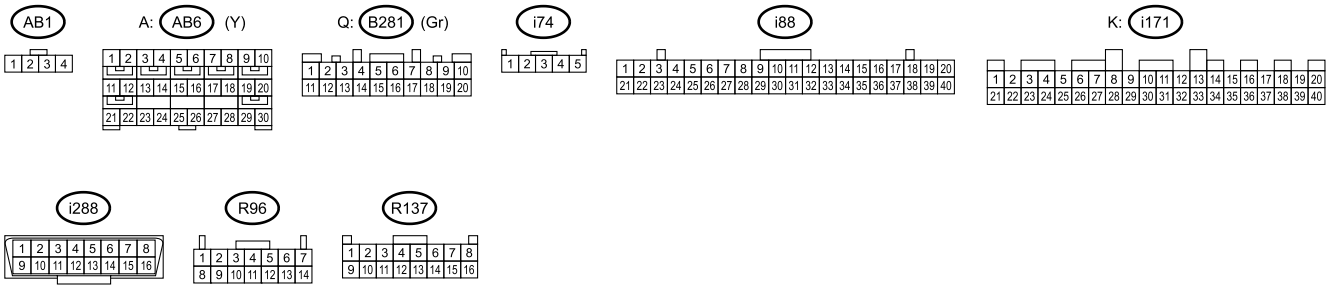
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
*3 : WITH BSD/RCTA
*4 : WITH RAB
*5 : WITHOUT PUSH BUTTON START & WITHOUT TPMS
*6 : WITH TPMS
*7 : WITHOUT PUSH BUTTON START
*8 : WITH PUSH BUTTON START



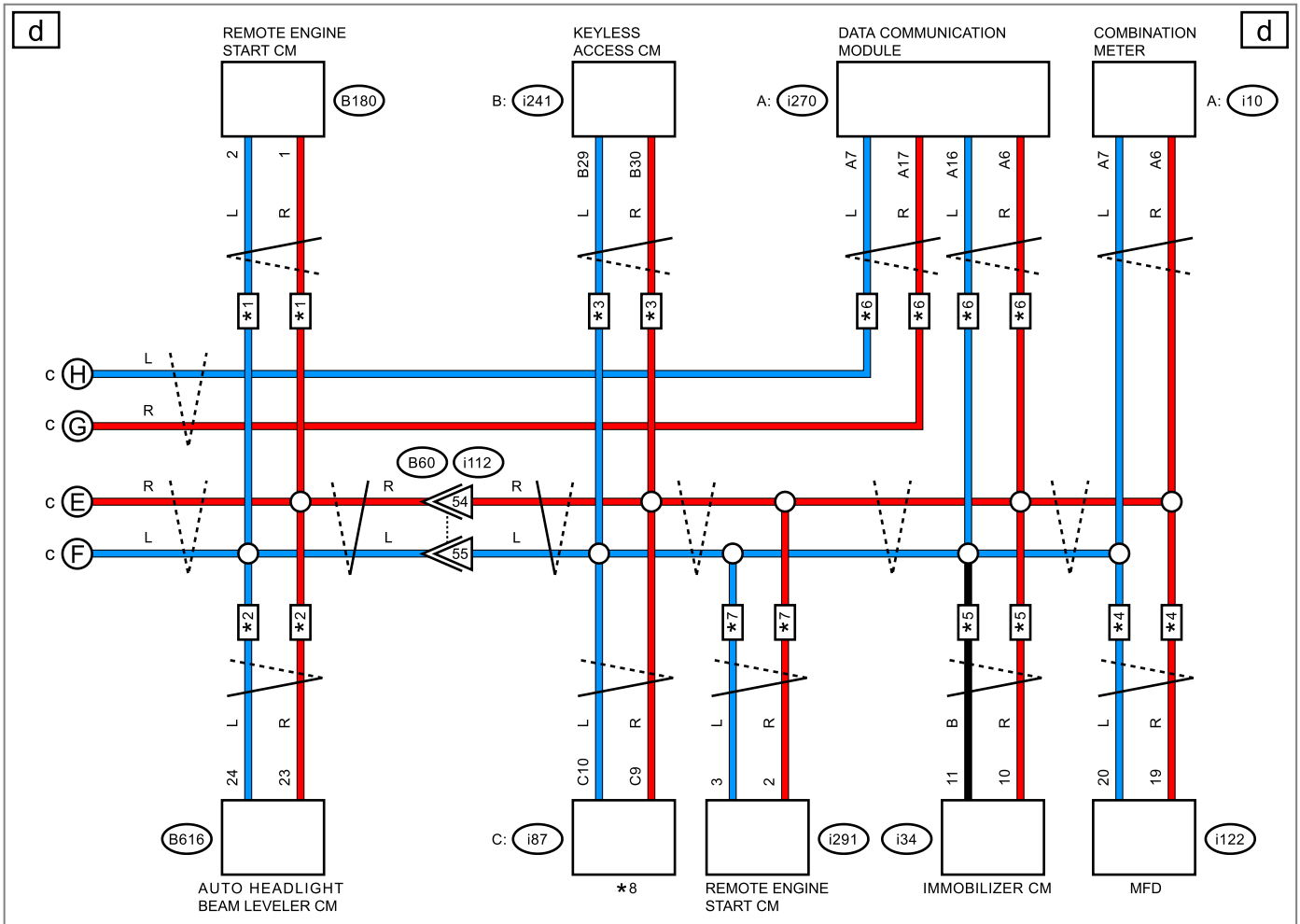
WI-68504



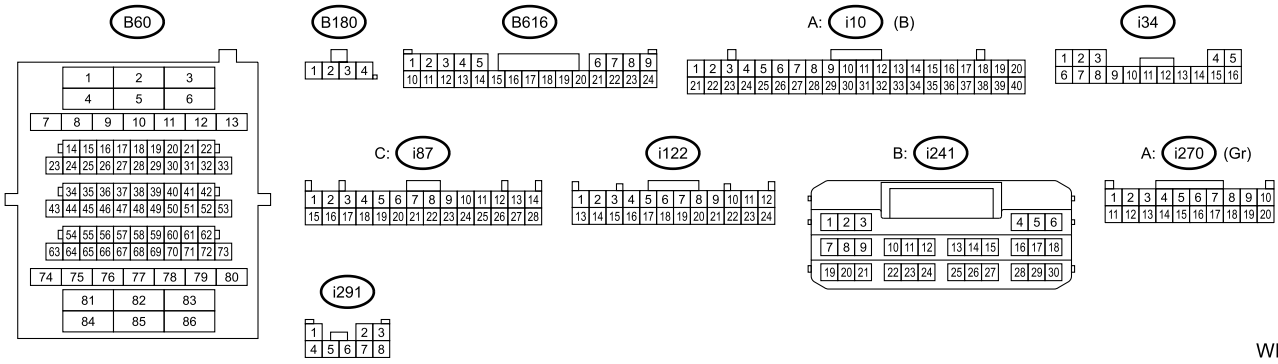
∗1 : WITH TELEMATICS
∗2 : AUTO A/C
∗3 : WITH EyeSight



WI-68505

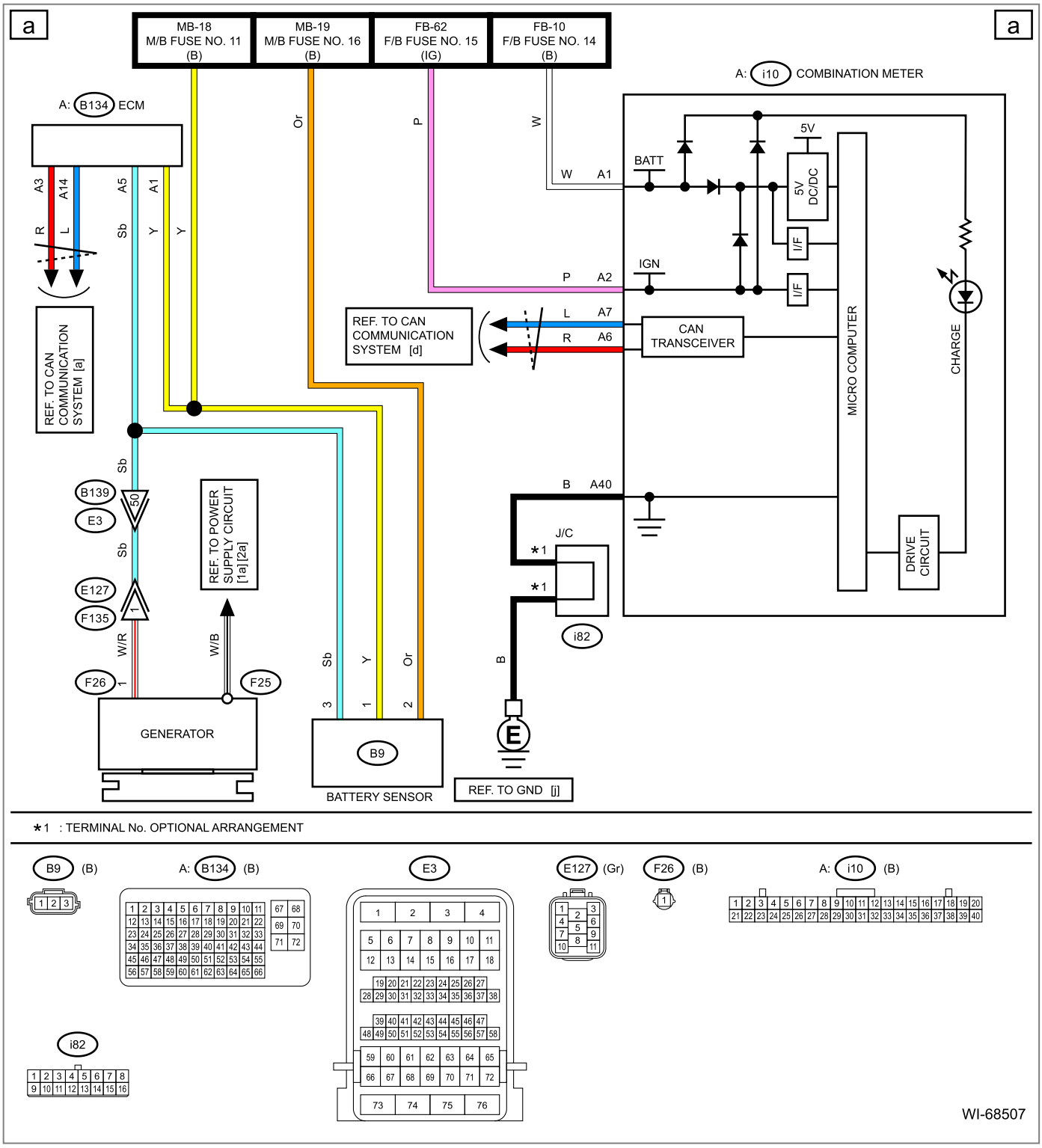


*1 : WITH REMOTE ENGINE START WITHOUT PUSH BUTTON START
*2 : LED MODEL
*3 : WITH PUSH BUTTON START
*4 : WITH HIGH GRADE MFD
*5 : WITH IMMOBILIZER CM
*6 : WITH TELEMATICS
*7 : WITH REMOTE ENGINE START WITH PUSH BUTTON START
*8 : WITHOUT NAVIGATION : AUDIO
WITH NAVIGATION : NAVIGATION UNIT

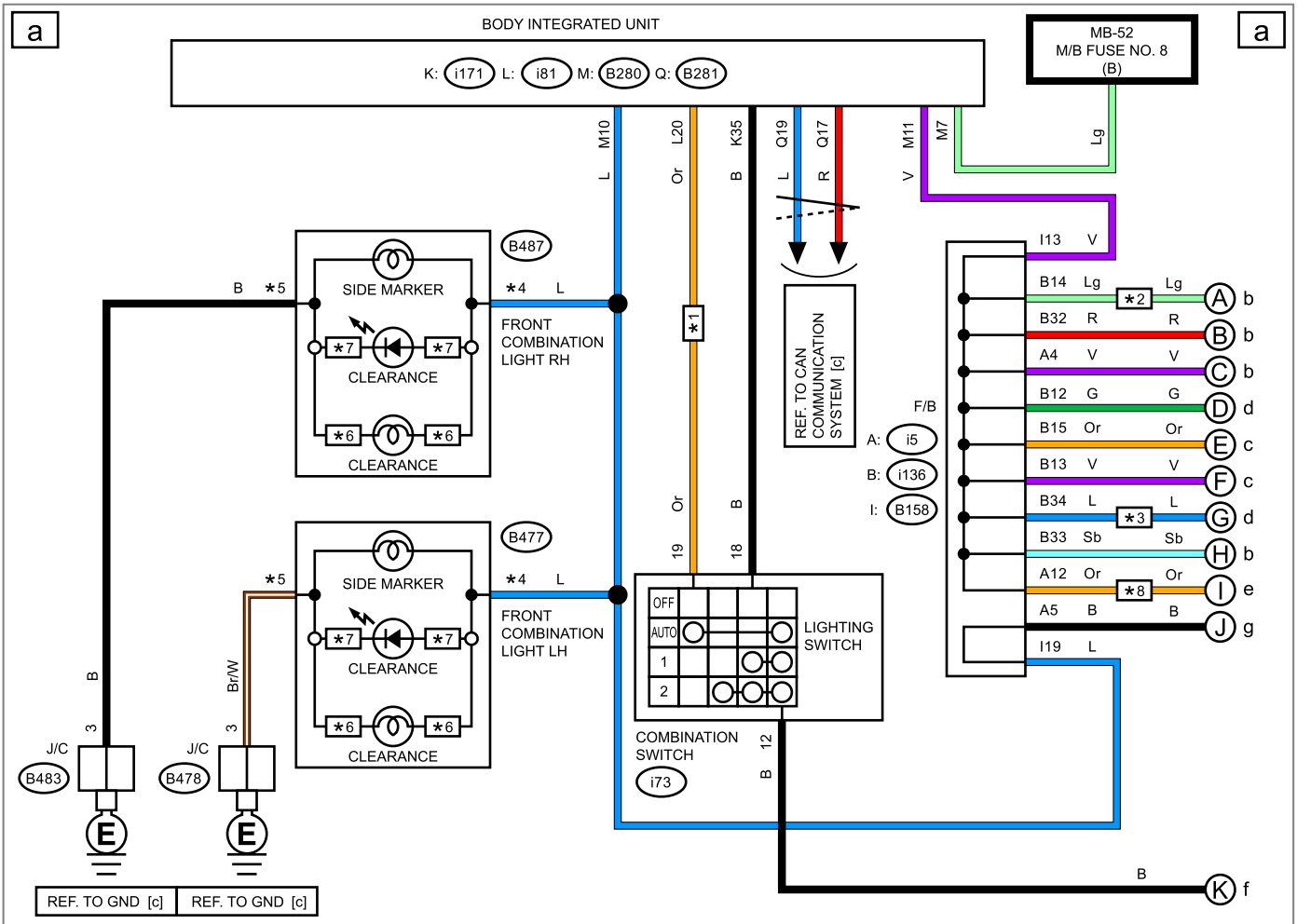


WI-68506

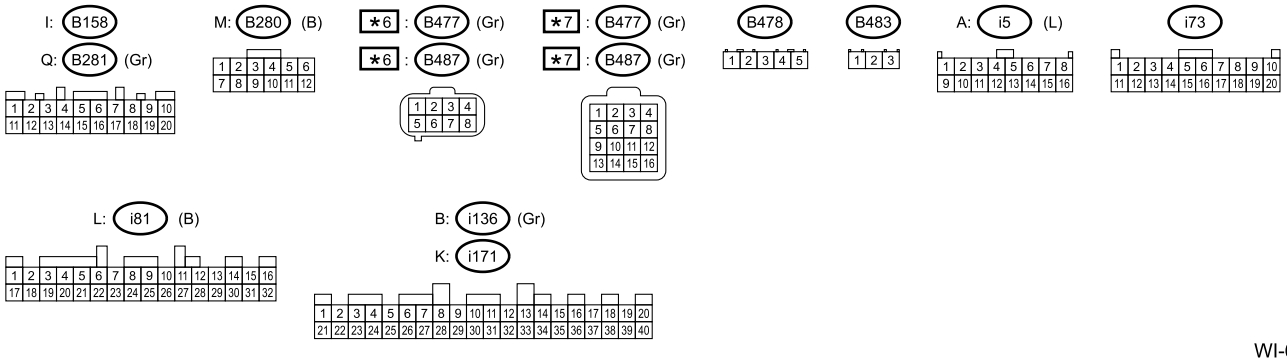
WIRING DIAGRAM


a
a
MB-18
M/B FUSE NO. 11
(B)
MB-19
M/B FUSE NO. 16
(B)
FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
A: i10 COMBINATION METER
A: B134 ECM
Or
P
W
BATT
W A1
5V
5V DC/DC
I/F
I/F
IGN
P A2
L A7
R A6
CAN TRANSCEIVER
MICRO COMPUTER
CHARGE
DRIVE CIRCUIT
REF. TO CAN COMMUNICATION SYSTEM [d]
REF. TO CAN COMMUNICATION SYSTEM [a]
A3
A14
A5
A1
R
L
Sb
Y
Y
Sb
B139
E3
50
Sb
E127
F135
W/R
W/B
F26
1
F25
REF. TO POWER SUPPLY CIRCUIT [1a] [2a]
GENERATOR
3
Sb
1
Y
2
Or
B9
BATTERY SENSOR
B A40
J/C
*1
*1
i82
B
REF. TO GND [j]
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
B9 (B)
A: B134 (B)
E3
E127 (Gr)
F26 (B)
A: i10 (B)
i82
WI-68507

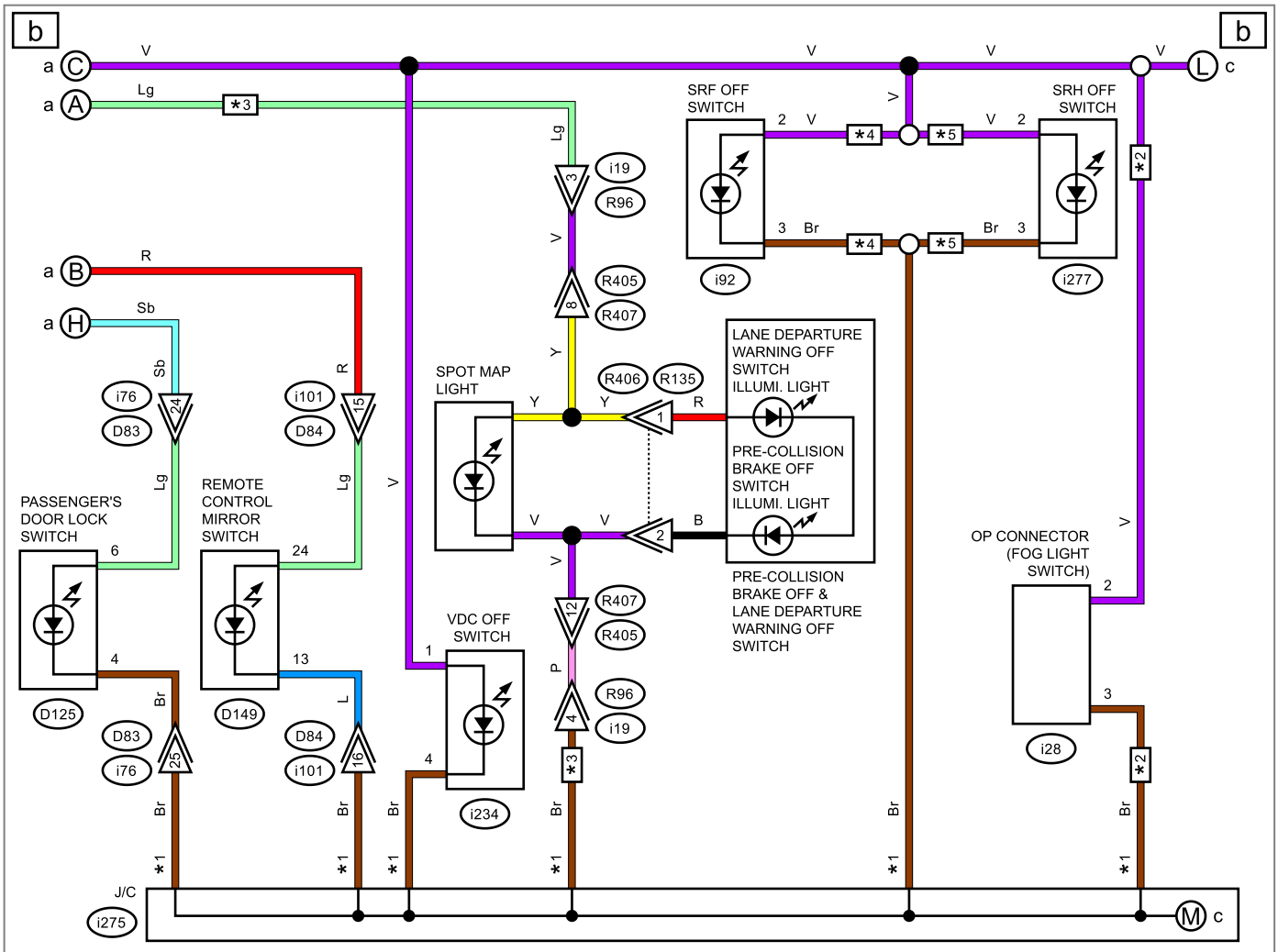
WIRING DIAGRAM



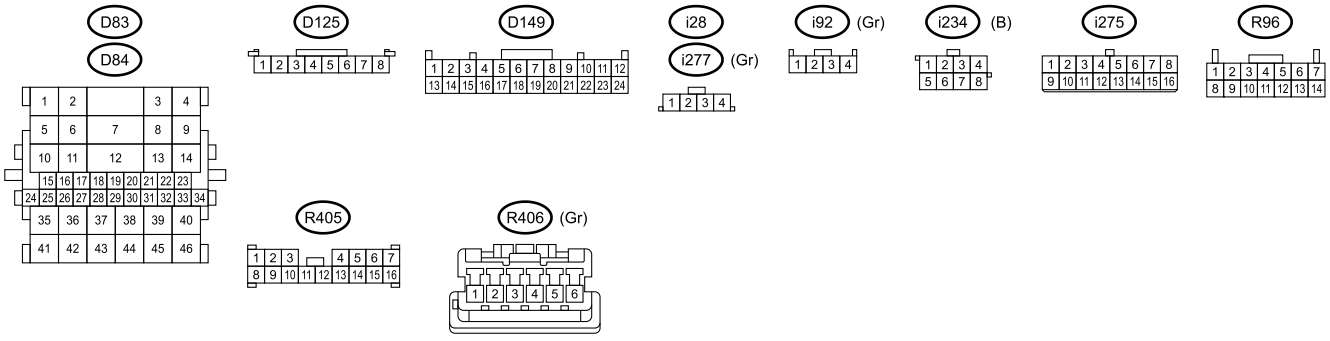
*1 : WITH AUTO LIGHT
*2 : WITH EyeSight
*3 : WITH GLOVE BOX ILLUMI. LIGHT
*4 : HALOGEN MODEL : 3
LED MODEL : 6
*5 : HALOGEN MODEL : 4
LED MODEL : 9
*6 : HALOGEN MODEL
*7 : LED MODEL
*8 : WITH TELEMATICS



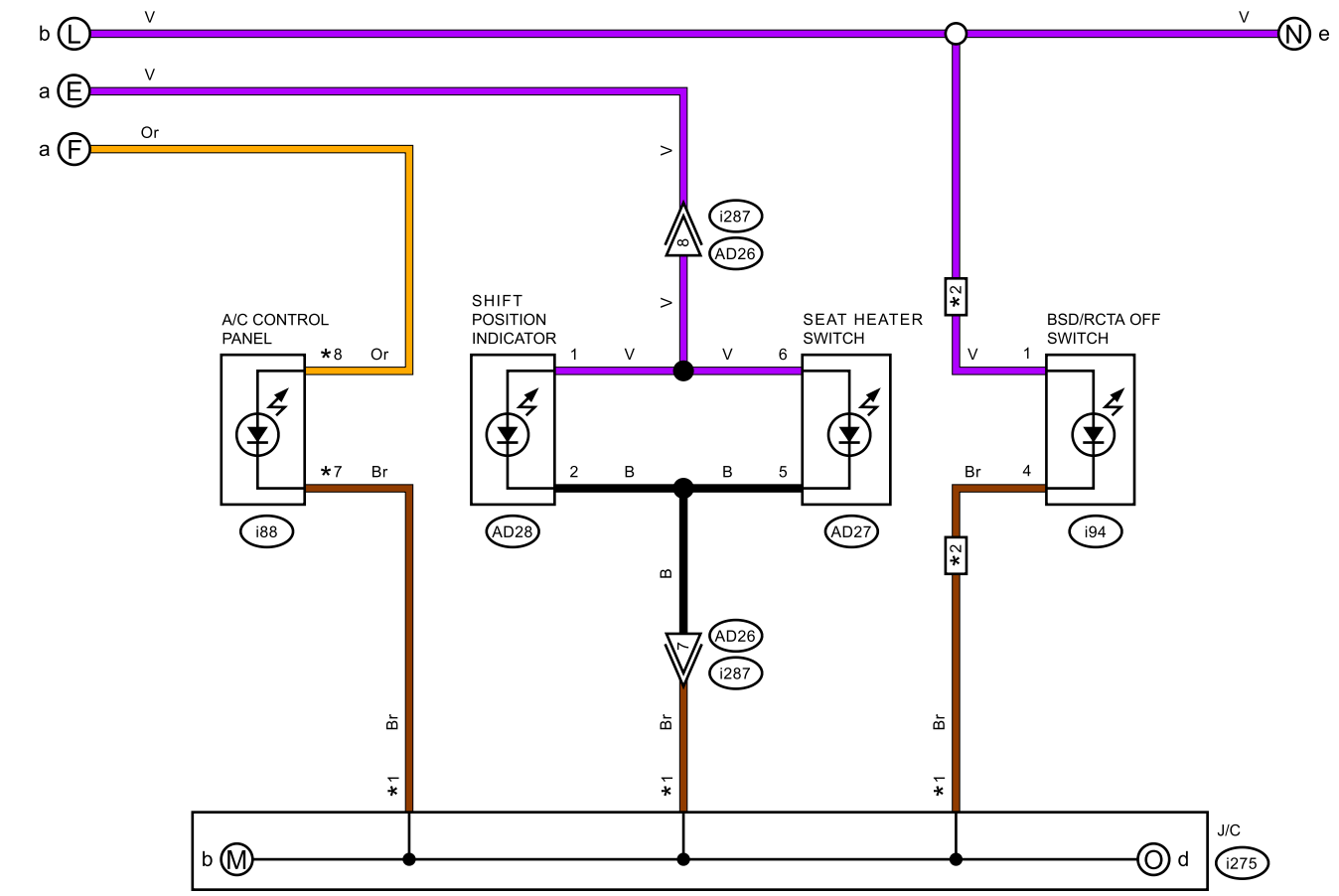
WI-68508



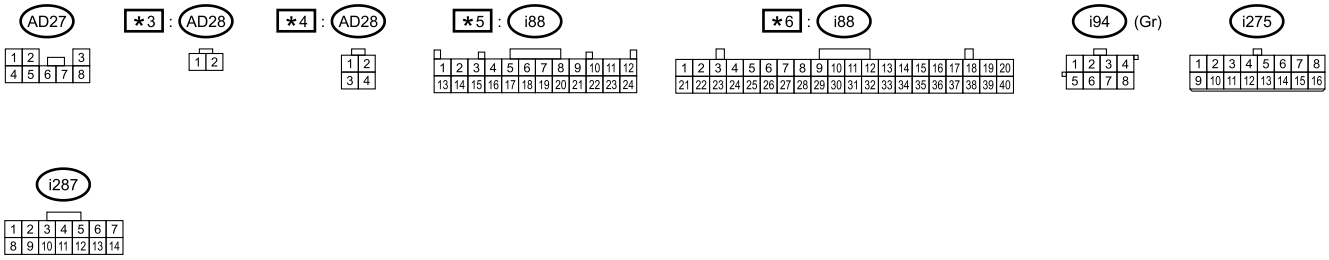
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH OP CONNECTOR (FOG LIGHT SWITCH)
*3 : WITH EyeSight
*4 : WITH SRF
*5 : WITH SRH



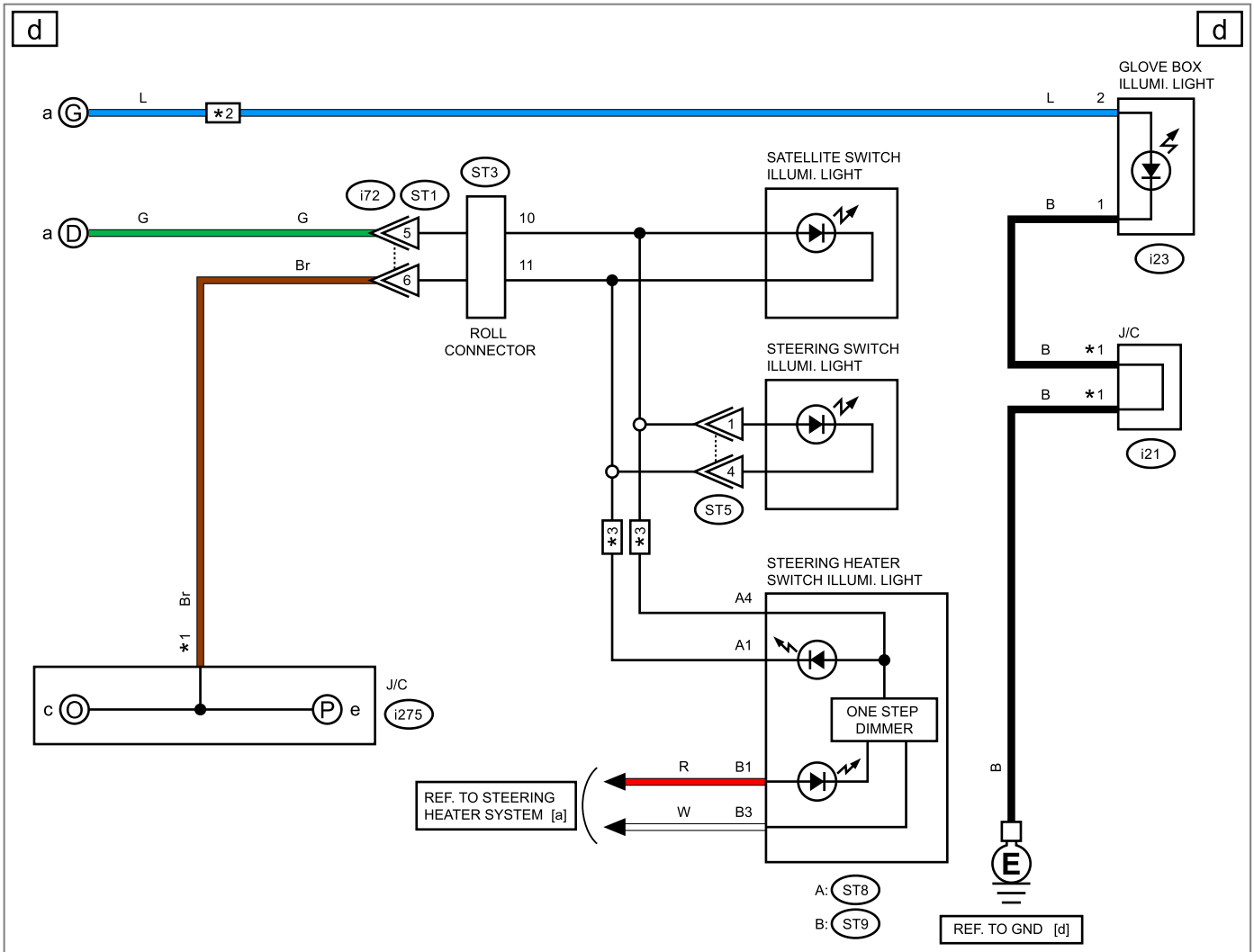
WI-68509



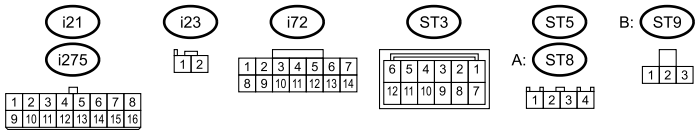
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH BSD/RCTA
*3 : WITHOUT SHIFT POSITION INDICATOR LAMP
*4 : WITH SHIFT POSITION INDICATOR LAMP
*5 : MANUAL A/C
*6 : AUTO A/C
*7 : MANUAL A/C : 5
AUTO A/C : 29
*8 : MANUAL A/C : 4
AUTO A/C : 39



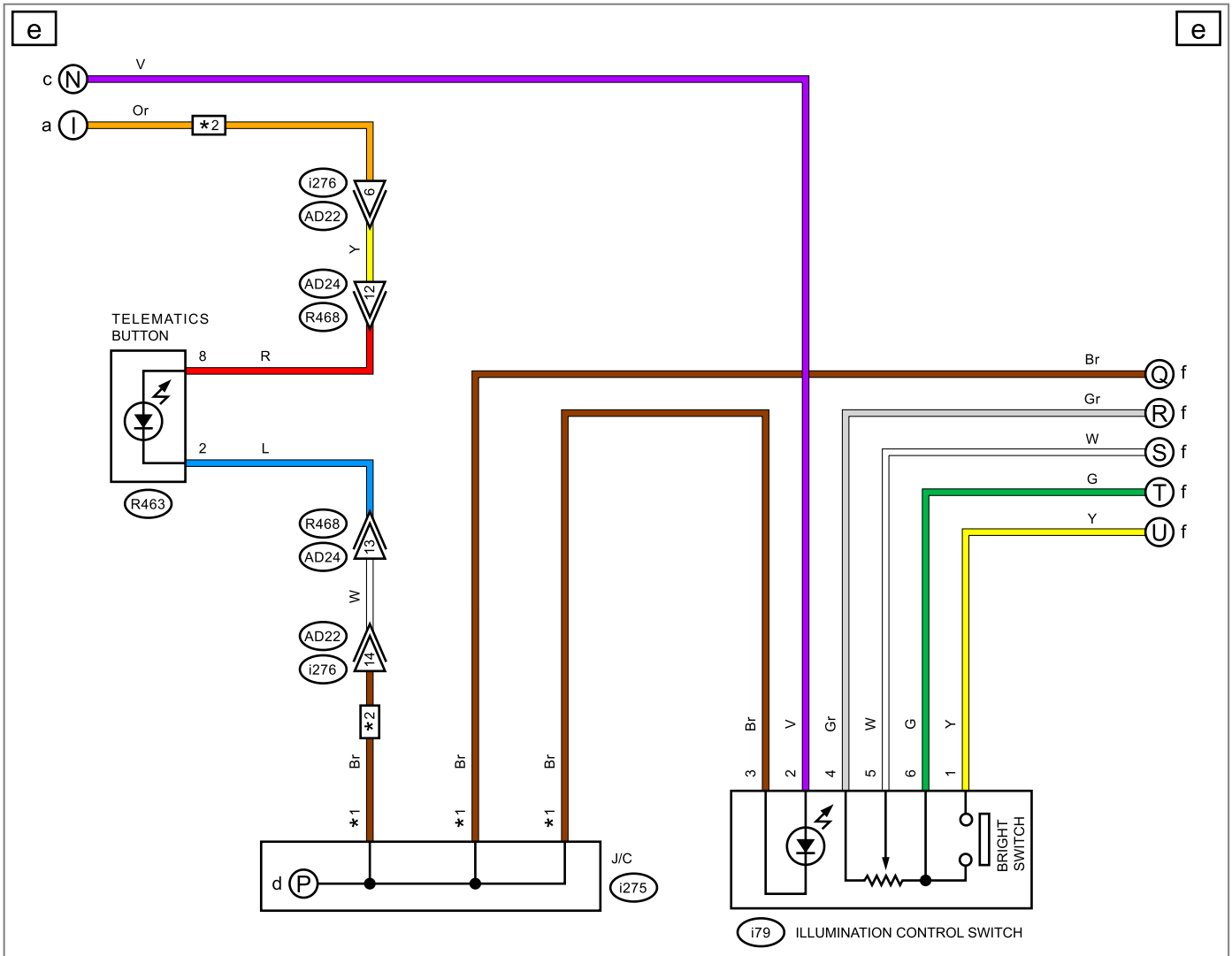
WI-68510



*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH GLOVE BOX ILLUMI. LIGHT
*3 : WITH STEERING HEATER

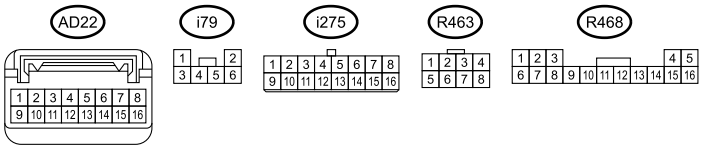


WI-68511

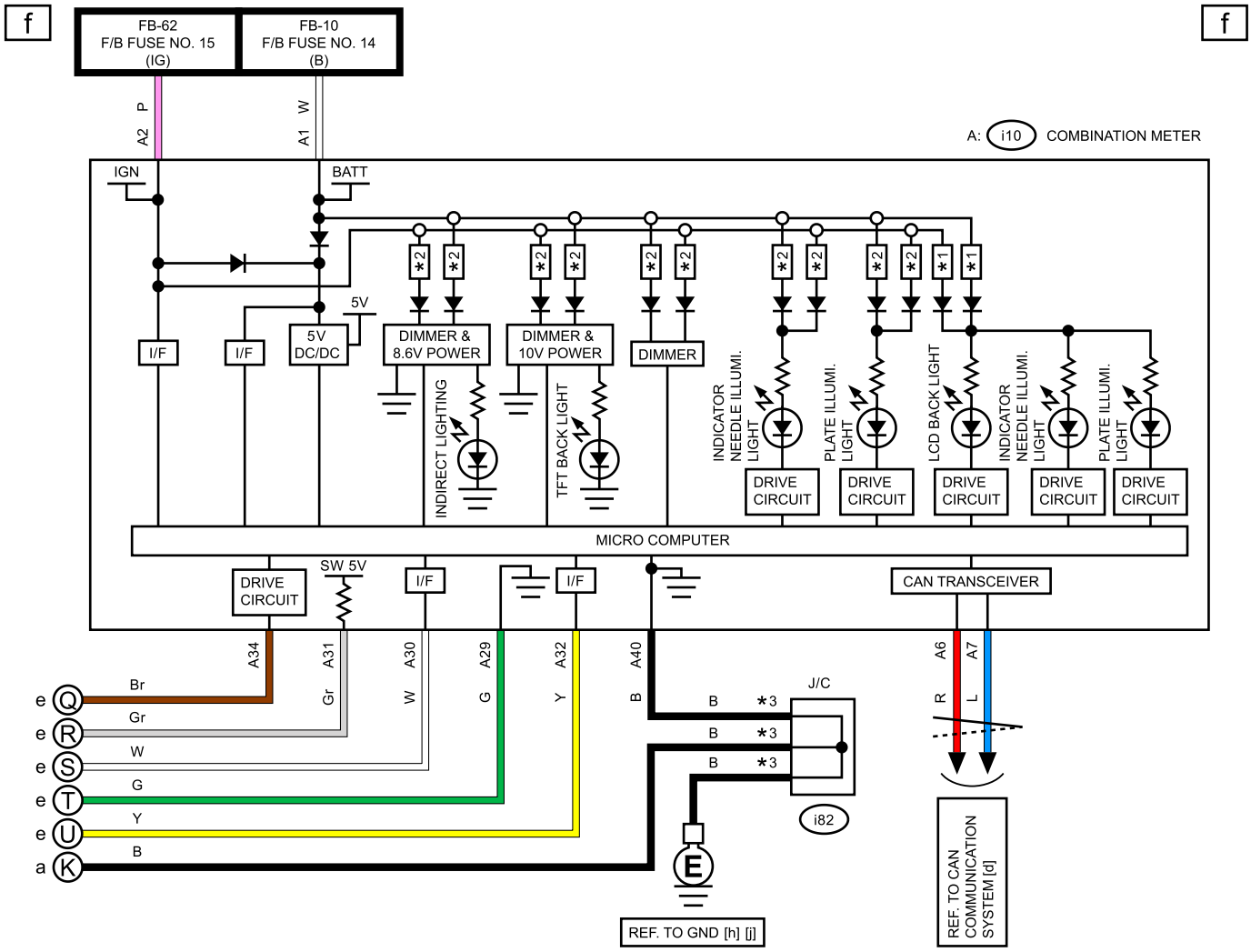


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH TELEMATICS



WI-68512



*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

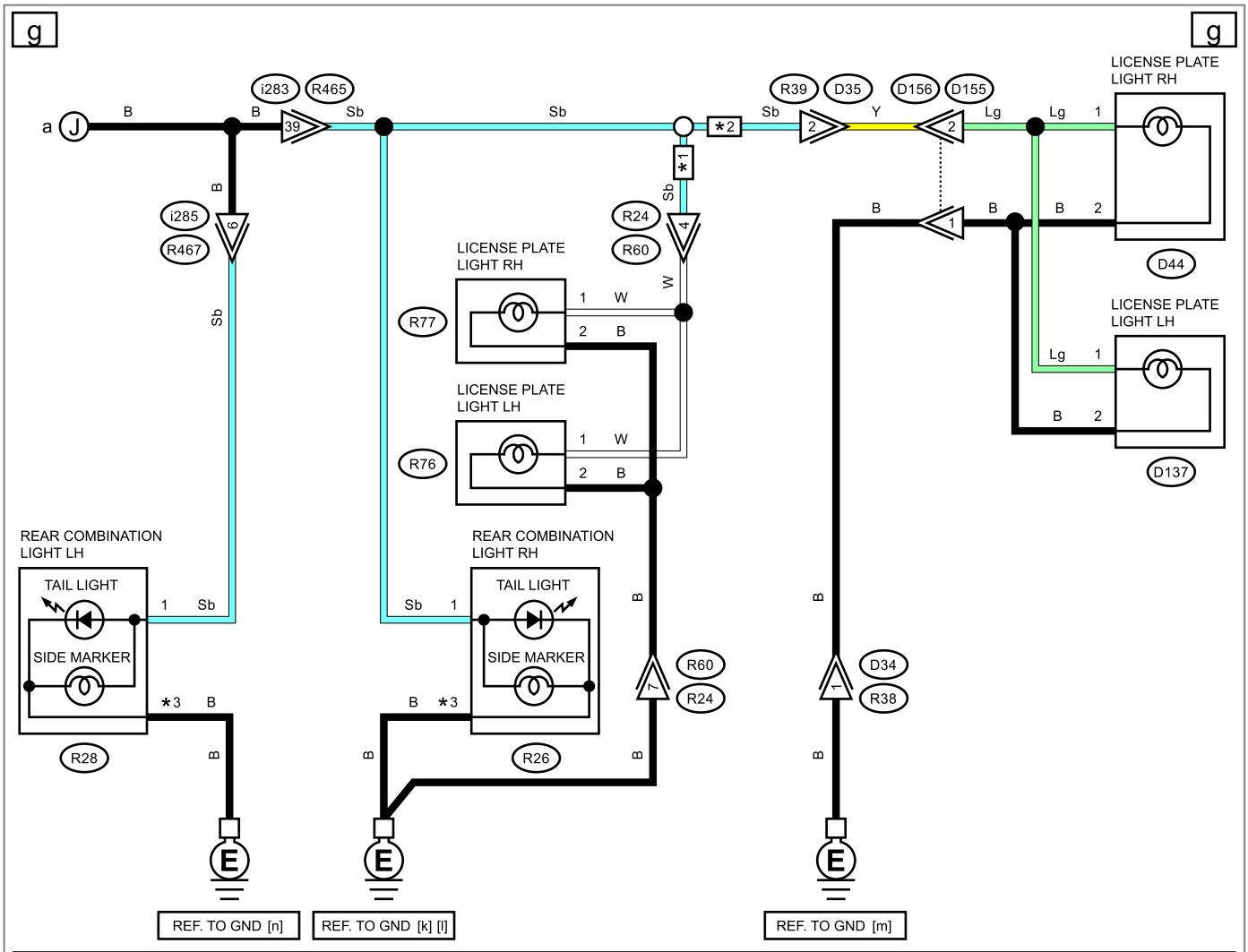
A: i10 (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

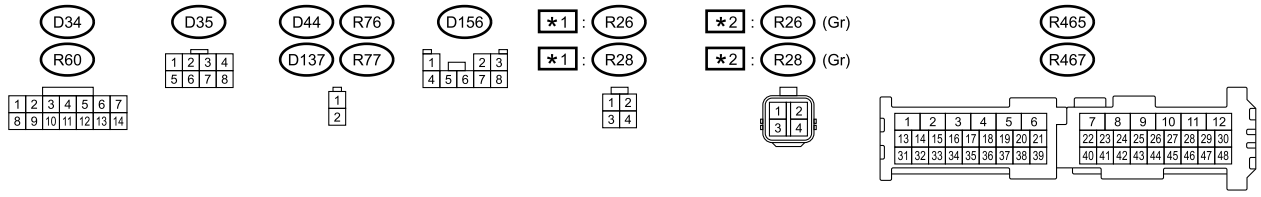
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

WI-68513

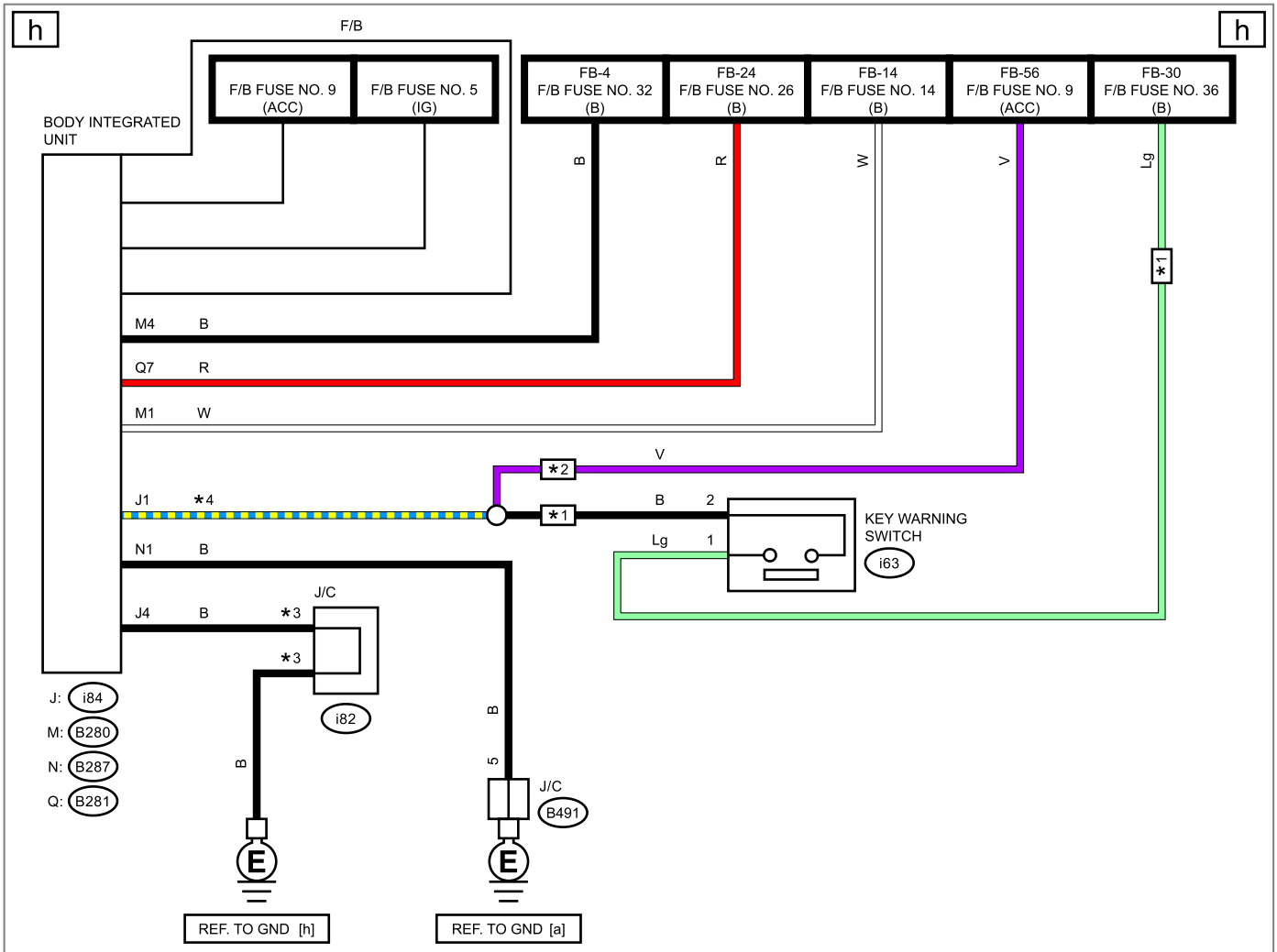


*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL

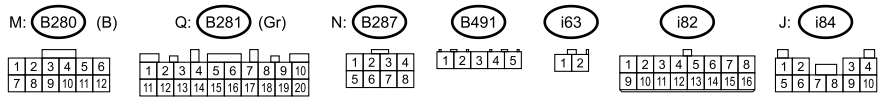
*3 : 4 DOOR MODEL : 2
5 DOOR MODEL : 4



WI-68514



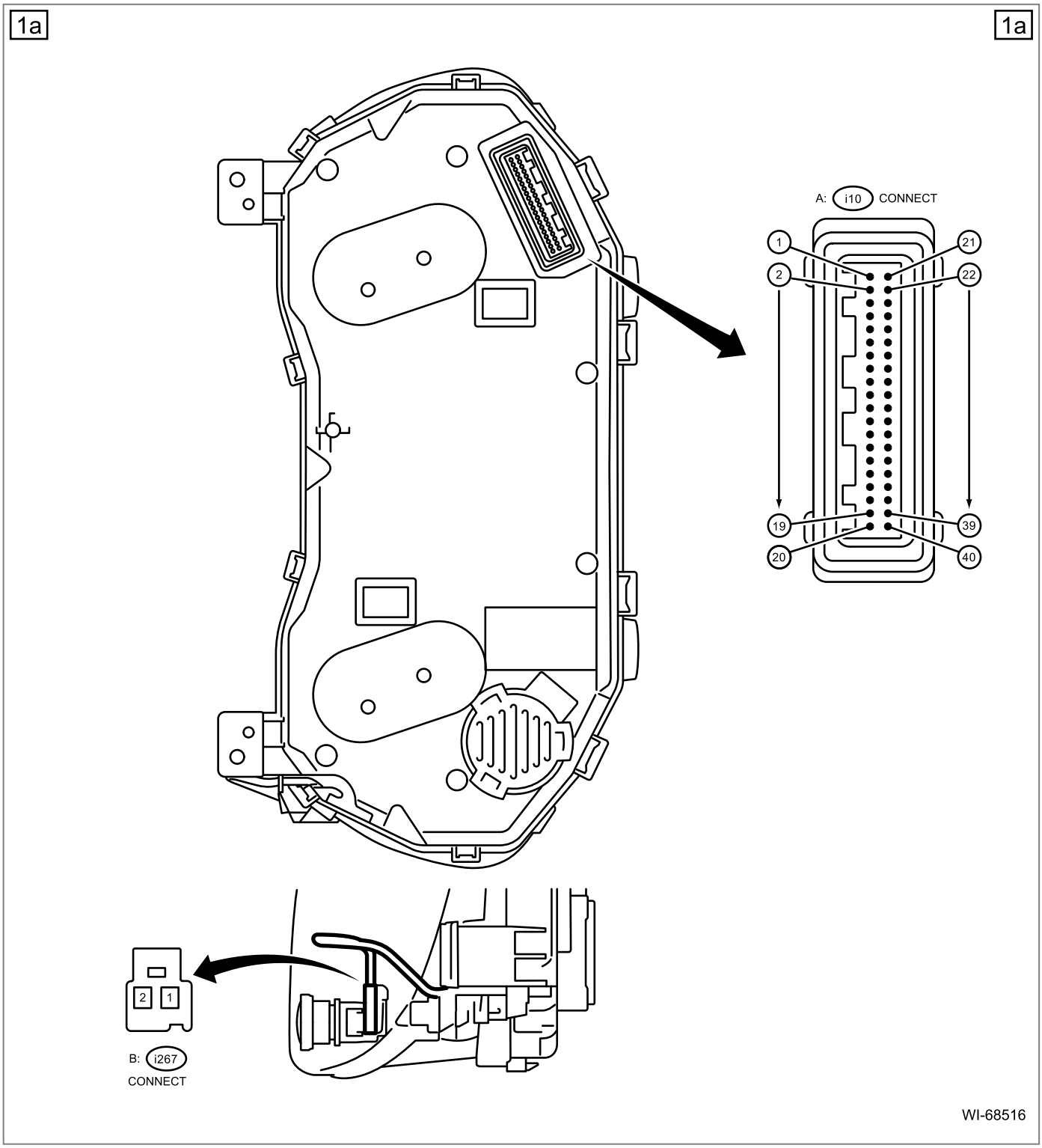
*1 : WITHOUT PUSH BUTTON START
*2 : WITH PUSH BUTTON START
*3 : TERMINAL No. OPTIONAL ARRANGEMENT
*4 : WITHOUT PUSH BUTTON START : B
WITH PUSH BUTTON START : V

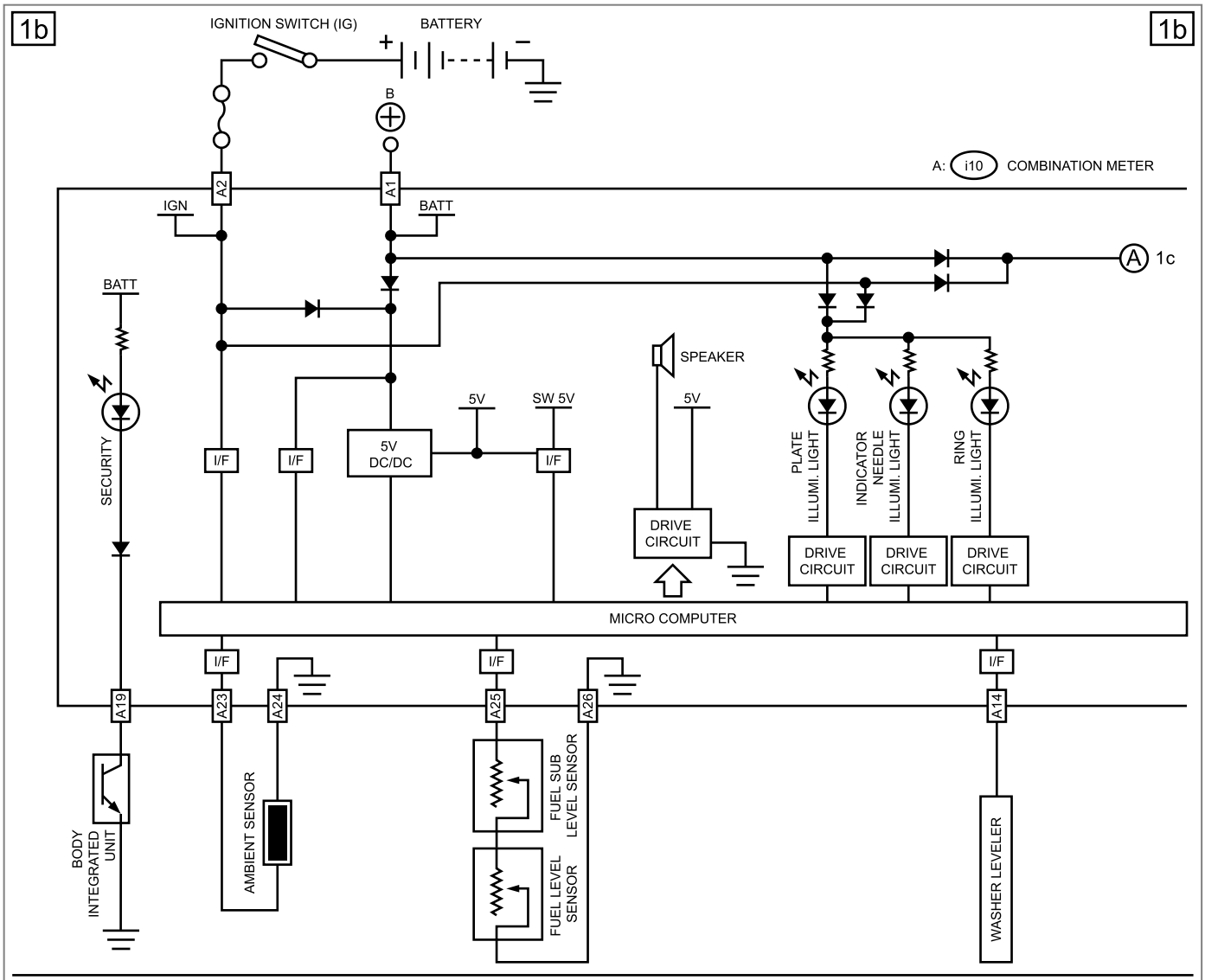


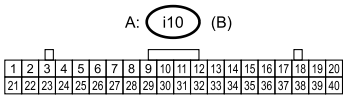
WI-68515

WIRING DIAGRAM

1. NORMAL METER MODEL




1b
1b
IGNITION SWITCH (IG)
BATTERY
B
A: i10 COMBINATION METER
A2
A1
IGN
BATT
A 1c
BATT
SECURITY
I/F
I/F
5V DC/DC
5V
SW 5V
I/F
SPEAKER
5V
DRIVE CIRCUIT
PLATE ILLUMI. LIGHT
INDICATOR NEEDLE ILLUMI. LIGHT
RING ILLUMI. LIGHT
DRIVE CIRCUIT
DRIVE CIRCUIT
DRIVE CIRCUIT
MICRO COMPUTER
I/F
I/F
I/F
A19
A23
A24
A25
A26
A14
BODY INTEGRATED UNIT
AMBIENT SENSOR
FUEL SUB LEVEL SENSOR
FUEL LEVEL SENSOR
WASHER LEVELER

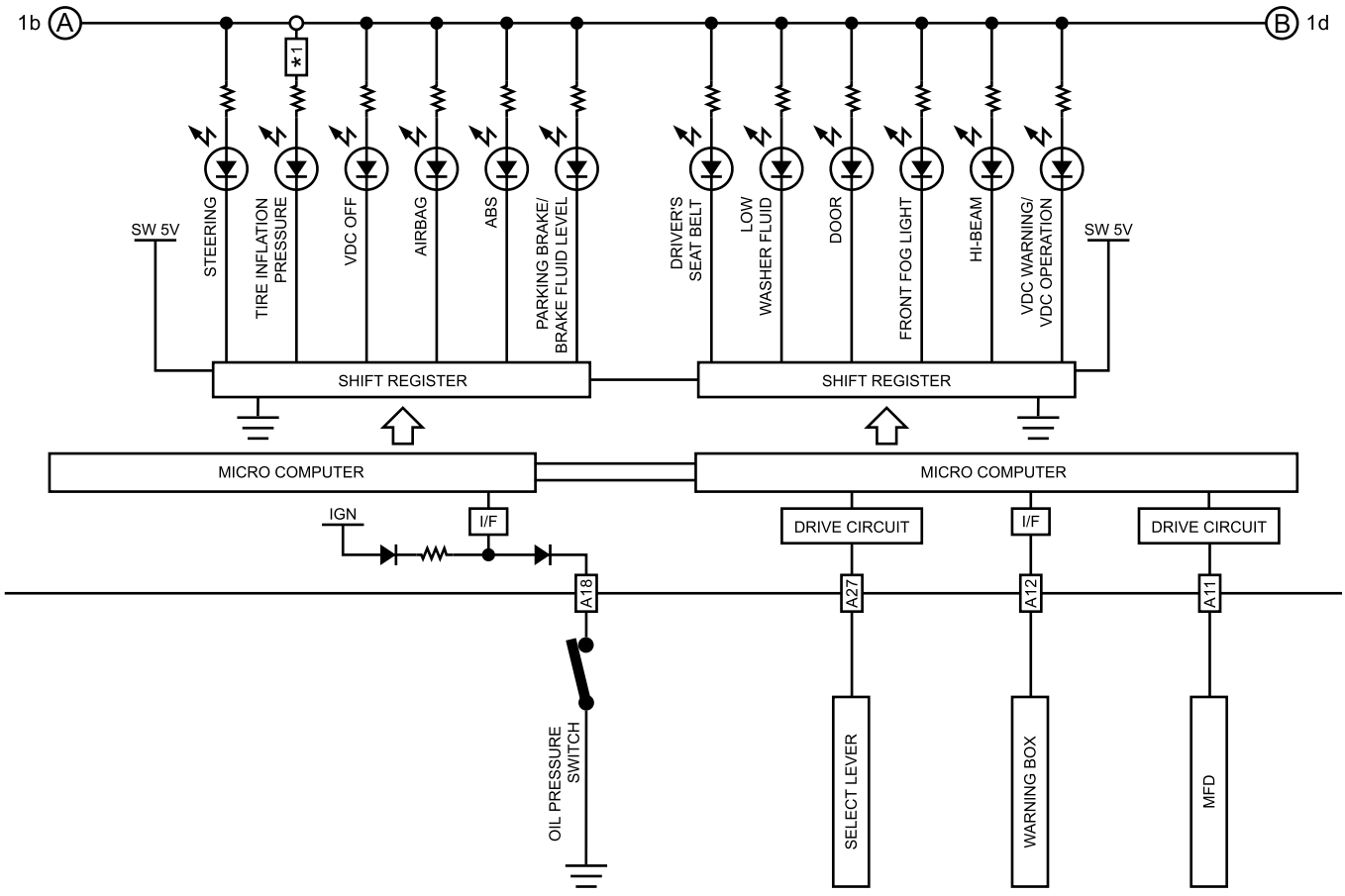

A: i10 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

WI-68517

1c

1c

A: (i10) COMBINATION METER



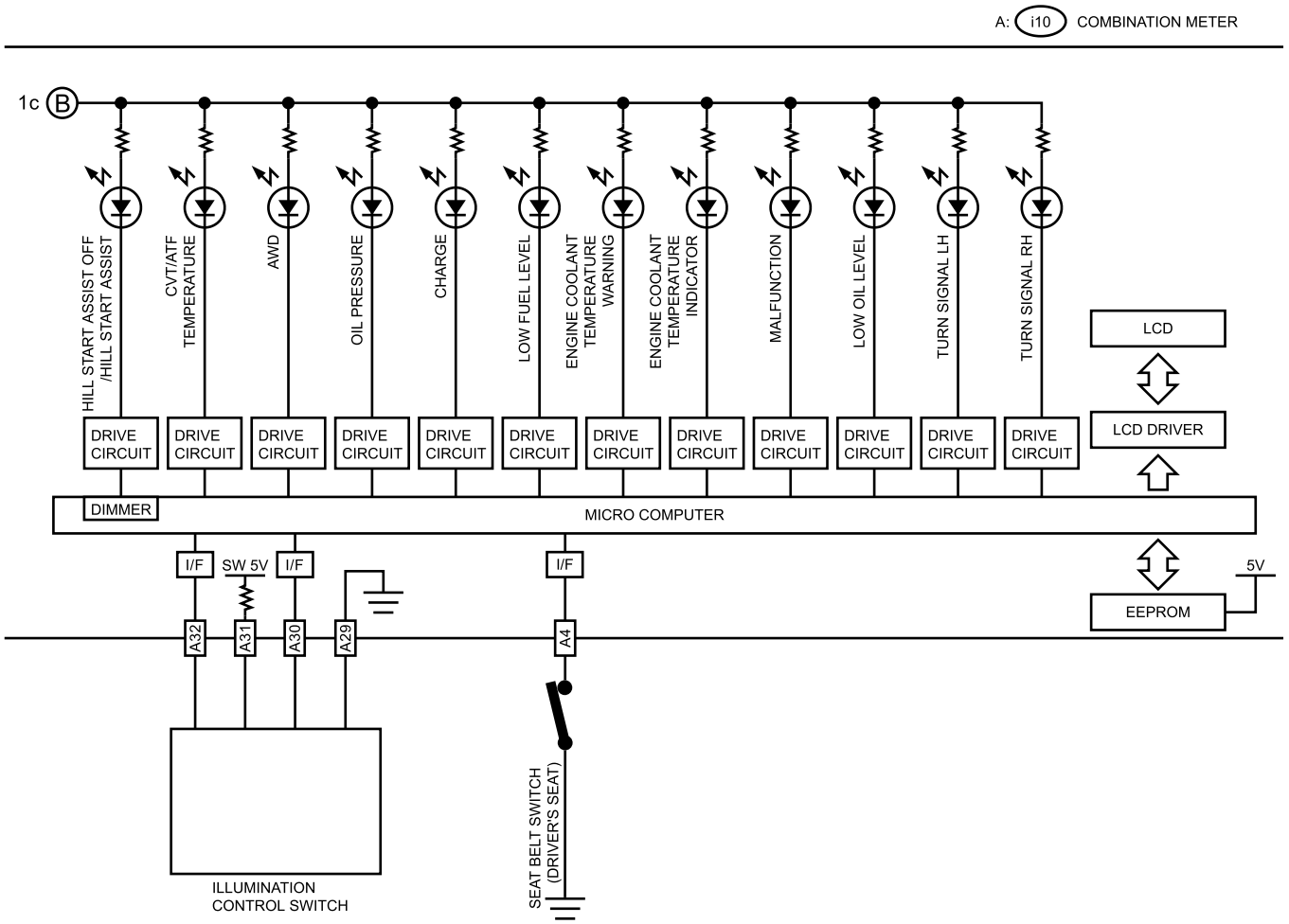
*1 : WITH TPMS

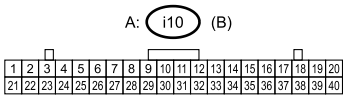
A: (i10) (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

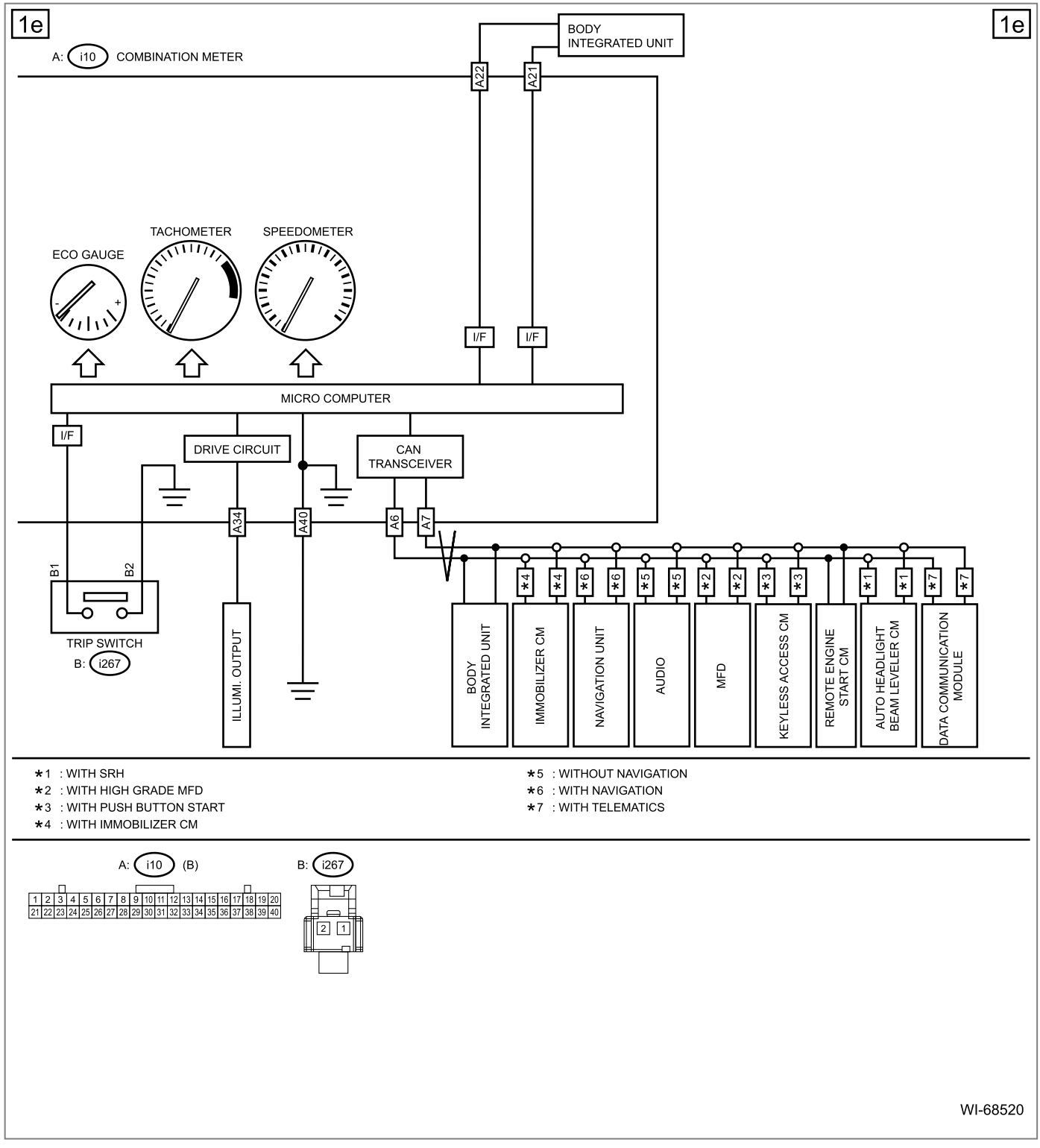
WI-68518

1d


A: i10 COMBINATION METER
1c B
HILL START ASSIST OFF /HILL START ASSIST
CVT/ATF TEMPERATURE
AWD
OIL PRESSURE
CHARGE
LOW FUEL LEVEL
ENGINE COOLANT TEMPERATURE WARNING
ENGINE COOLANT TEMPERATURE INDICATOR
MALFUNCTION
LOW OIL LEVEL
TURN SIGNAL LH
TURN SIGNAL RH
DRIVE CIRCUIT
LCD
LCD DRIVER
DIMMER
MICRO COMPUTER
I/F
SW 5V
I/F
I/F
5V
EEPROM
A32
A31
A30
A29
A4
ILLUMINATION CONTROL SWITCH
SEAT BELT SWITCH (DRIVER'S SEAT)


A: i10 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

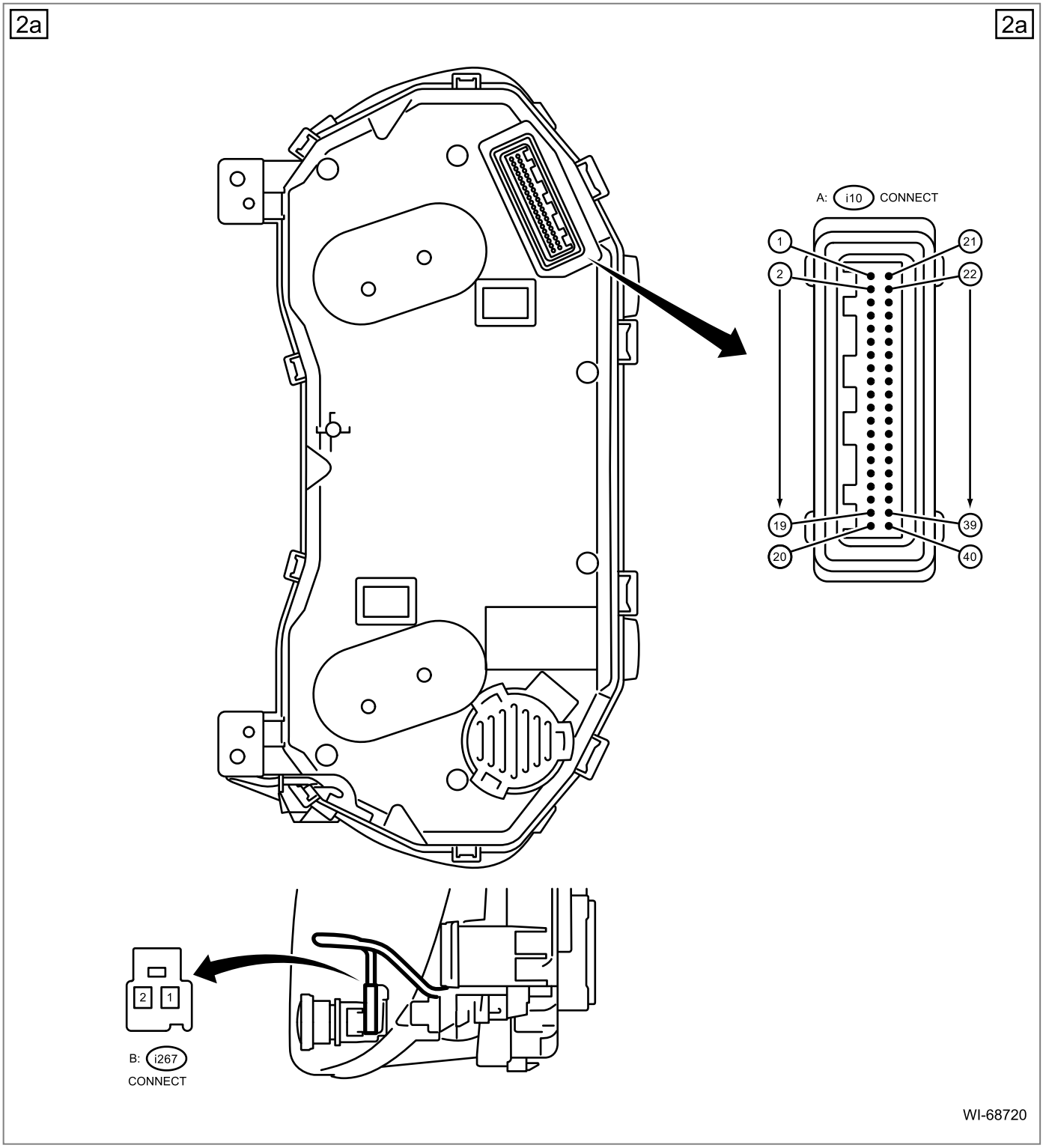
WI-68519

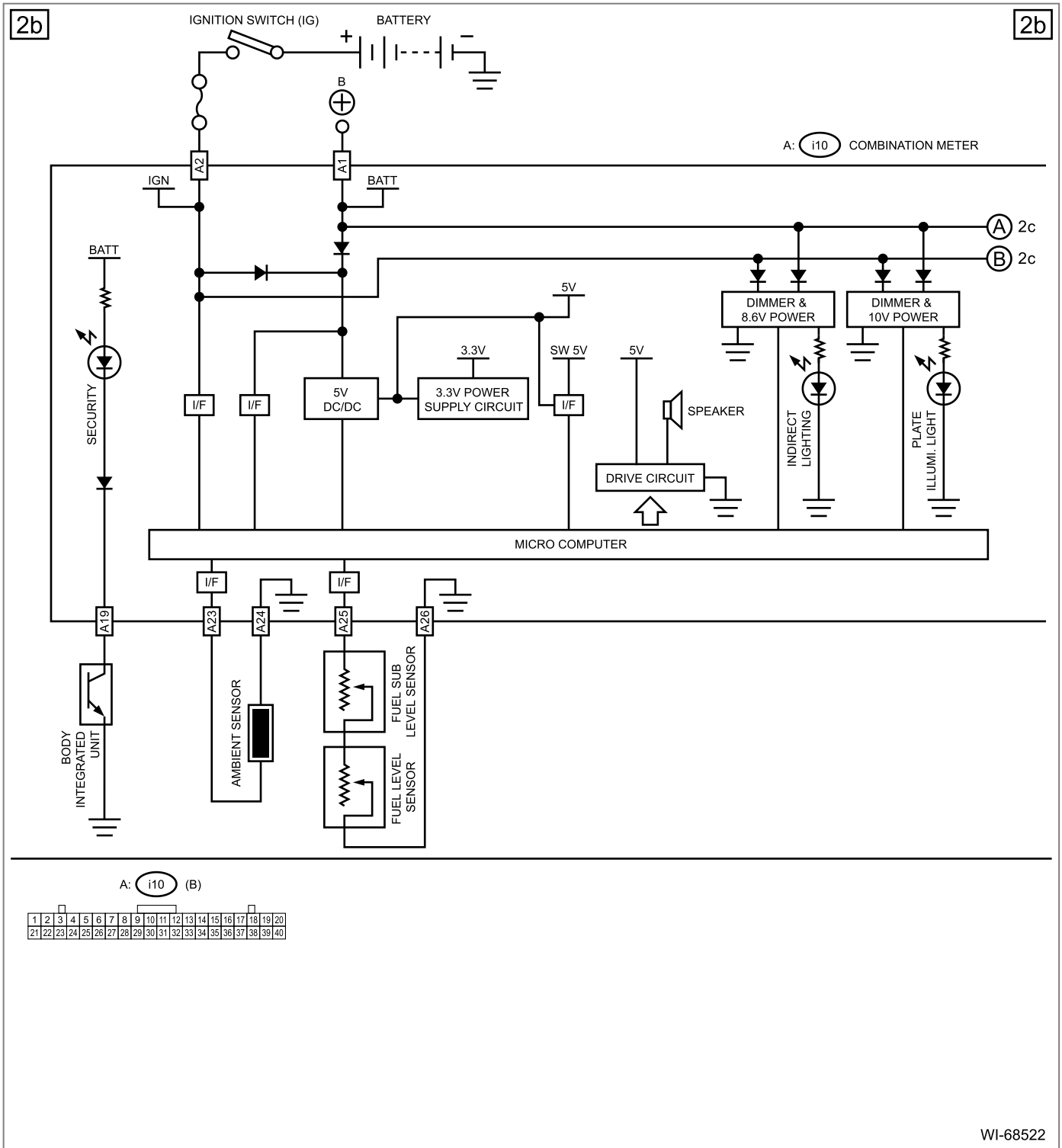


∗1 : WITH SRH
∗2 : WITH HIGH GRADE MFD
∗3 : WITH PUSH BUTTON START
∗4 : WITH IMMOBILIZER CM
∗5 : WITHOUT NAVIGATION
∗6 : WITH NAVIGATION
∗7 : WITH TELEMATICS

WI-68520

2. COLOR TFT METER MODEL

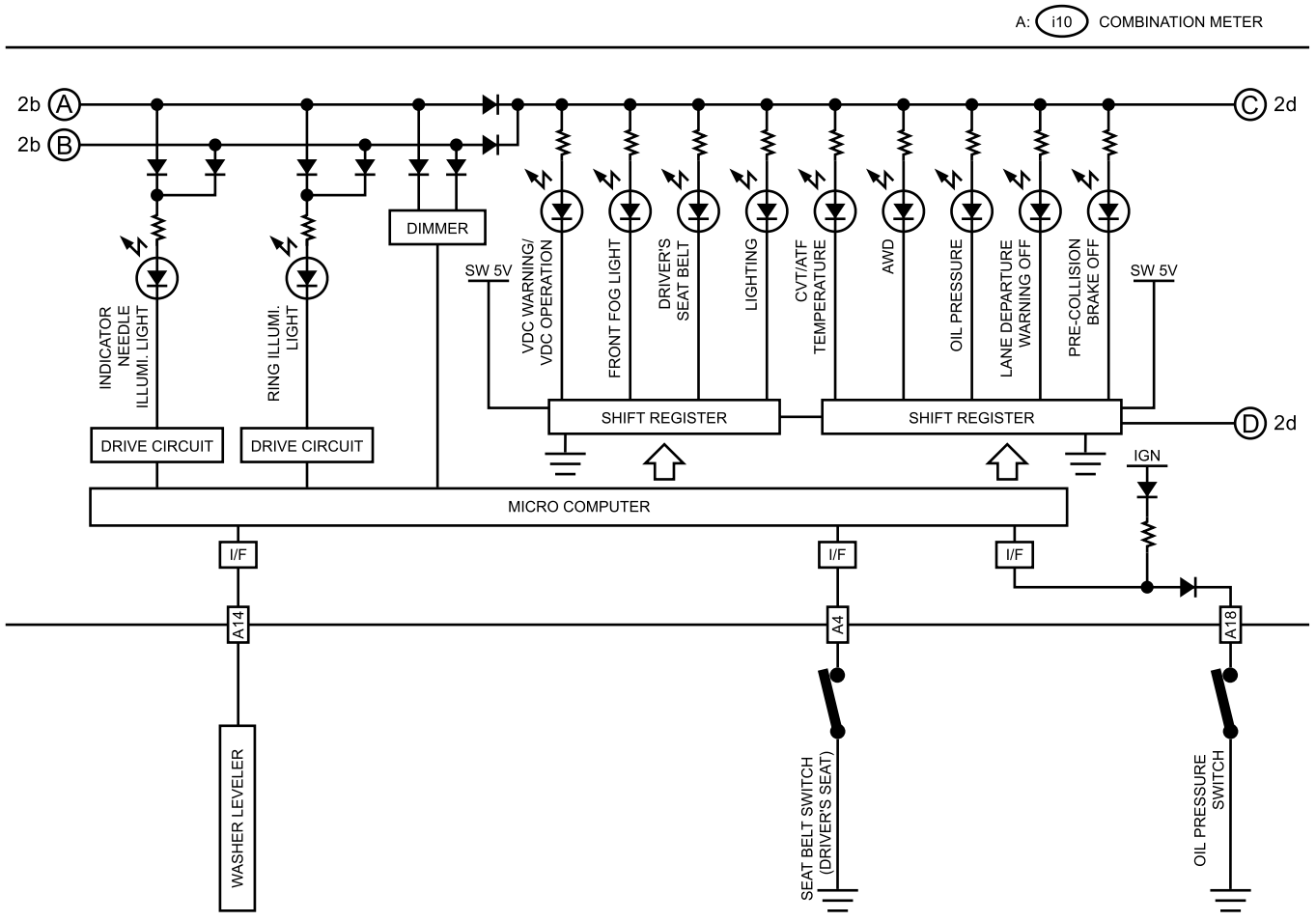


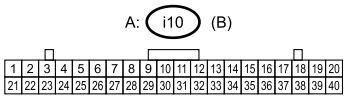

2b
2b
IGNITION SWITCH (IG)
BATTERY
+
−
B
A: i10 COMBINATION METER
A2
A1
IGN
BATT
BATT
A 2c
B 2c
5V
DIMMER & 8.6V POWER
DIMMER & 10V POWER
3.3V
SW 5V
5V
SECURITY
I/F
I/F
5V DC/DC
3.3V POWER SUPPLY CIRCUIT
I/F
SPEAKER
INDIRECT LIGHTING
PLATE ILLUMI. LIGHT
DRIVE CIRCUIT
MICRO COMPUTER
I/F
I/F
A19
A23
A24
A25
A26
BODY INTEGRATED UNIT
AMBIENT SENSOR
FUEL SUB LEVEL SENSOR
FUEL LEVEL SENSOR

A: i10 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

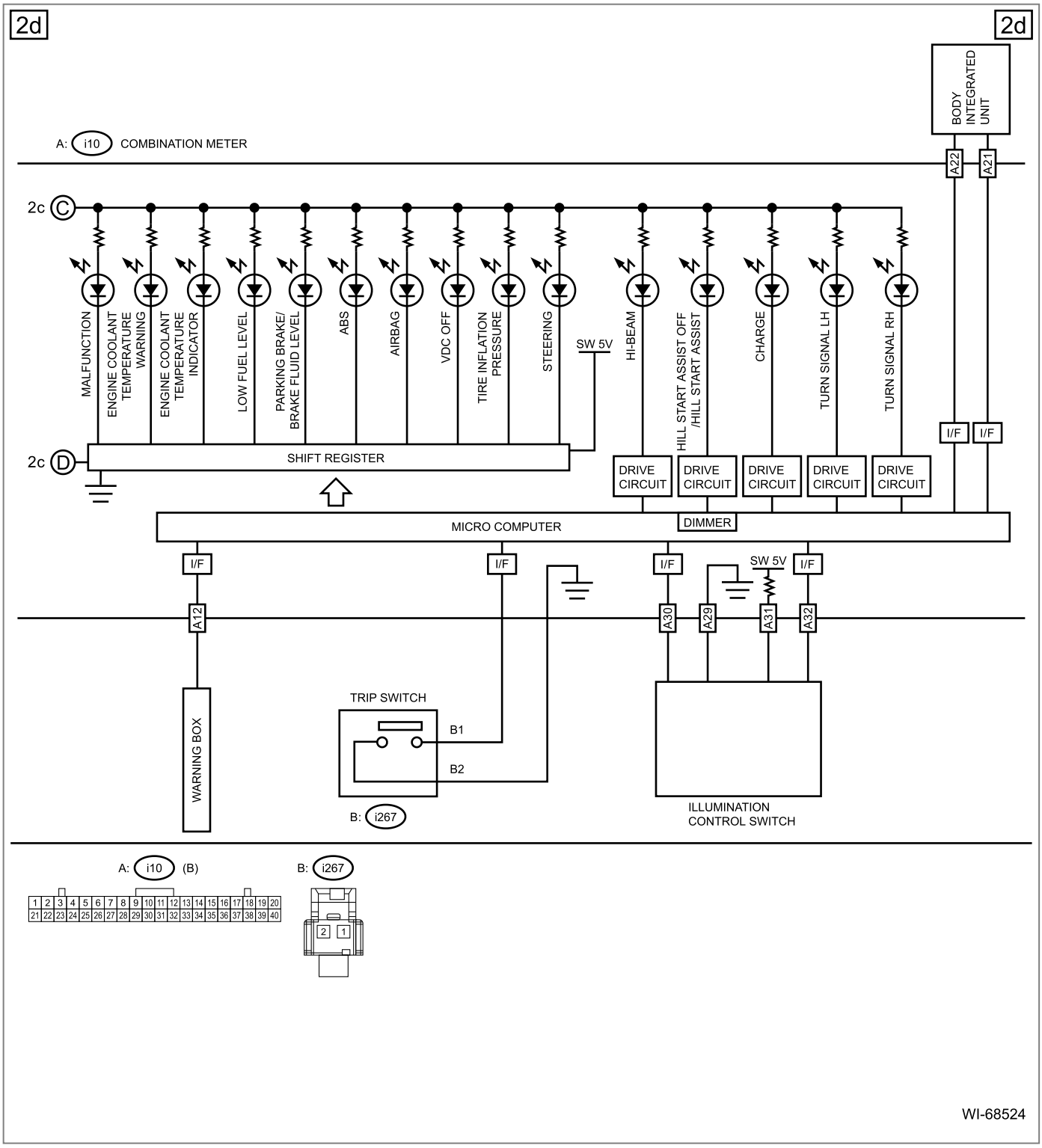
WI-68522

2c


A: i10 COMBINATION METER
2b A
2b B
C 2d
D 2d
DIMMER
SW 5V
SW 5V
INDICATOR NEEDLE ILLUMI. LIGHT
RING ILLUMI. LIGHT
VDC WARNING/ VDC OPERATION
FRONT FOG LIGHT
DRIVER'S SEAT BELT
LIGHTING
CVT/ATF TEMPERATURE
AWD
OIL PRESSURE
LANE DEPARTURE WARNING OFF
PRE-COLLISION BRAKE OFF
SHIFT REGISTER
SHIFT REGISTER
DRIVE CIRCUIT
DRIVE CIRCUIT
IGN
MICRO COMPUTER
I/F
I/F
I/F
A14
A4
A18
WASHER LEVELER
SEAT BELT SWITCH (DRIVER'S SEAT)
OIL PRESSURE SWITCH

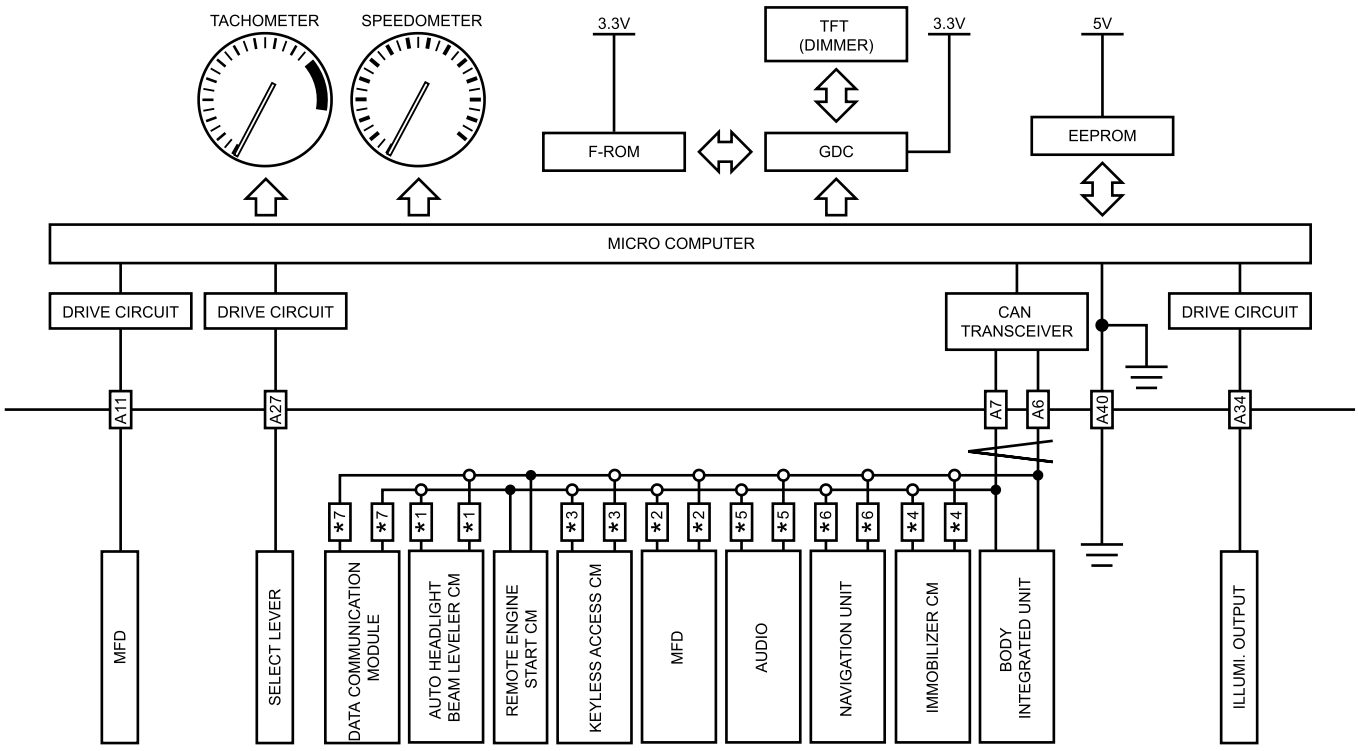

A: i10 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

WI-68523


2d
2d
BODY INTEGRATED UNIT
A: i10 COMBINATION METER
A22
A21
2c C
MALFUNCTION
ENGINE COOLANT TEMPERATURE WARNING
ENGINE COOLANT TEMPERATURE INDICATOR
LOW FUEL LEVEL
PARKING BRAKE/ BRAKE FLUID LEVEL
ABS
AIRBAG
VDC OFF
TIRE INFLATION PRESSURE
STEERING
SW 5V
HI-BEAM
HILL START ASSIST OFF /HILL START ASSIST
CHARGE
TURN SIGNAL LH
TURN SIGNAL RH
I/F
I/F
2c D
SHIFT REGISTER
DRIVE CIRCUIT
DRIVE CIRCUIT
DRIVE CIRCUIT
DRIVE CIRCUIT
DRIVE CIRCUIT
MICRO COMPUTER
DIMMER
I/F
I/F
I/F
SW 5V
I/F
A12
A30
A29
A31
A32
WARNING BOX
TRIP SWITCH
B1
B2
B: i267
ILLUMINATION CONTROL SWITCH
A: i10 (B)
B: i267
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
2 1
WI-68524

2e

A: (i10) COMBINATION METER

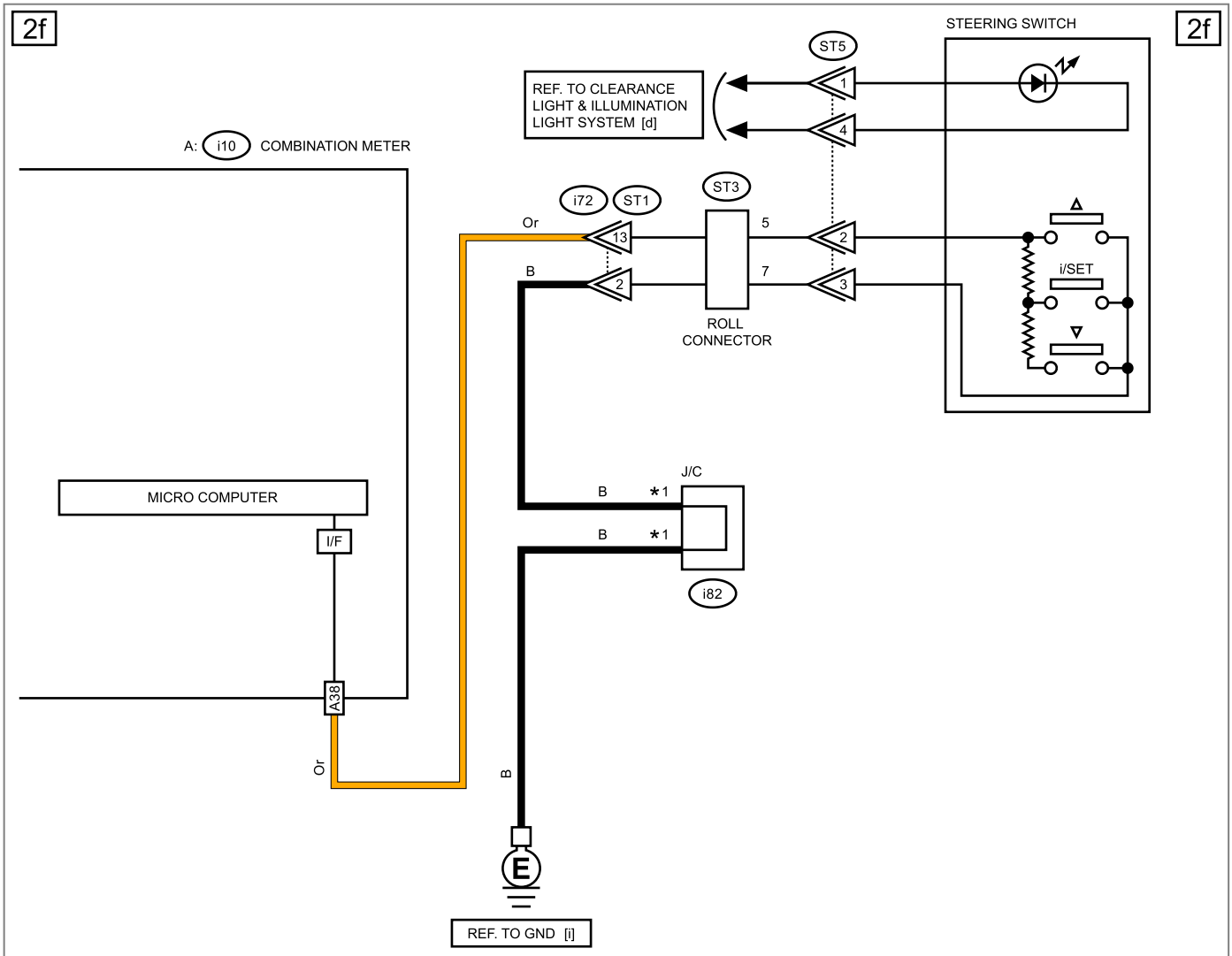


*1 : WITH SRH
*2 : WITH HIGH GRADE MFD
*3 : WITH PUSH BUTTON START
*4 : WITH IMMOBILIZER CM
*5 : WITHOUT NAVIGATION
*6 : WITH NAVIGATION
*7 : WITH TELEMATICS

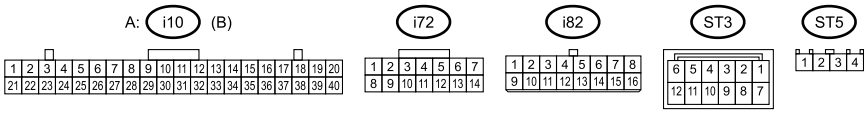
A: (i10) (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

WI-68525

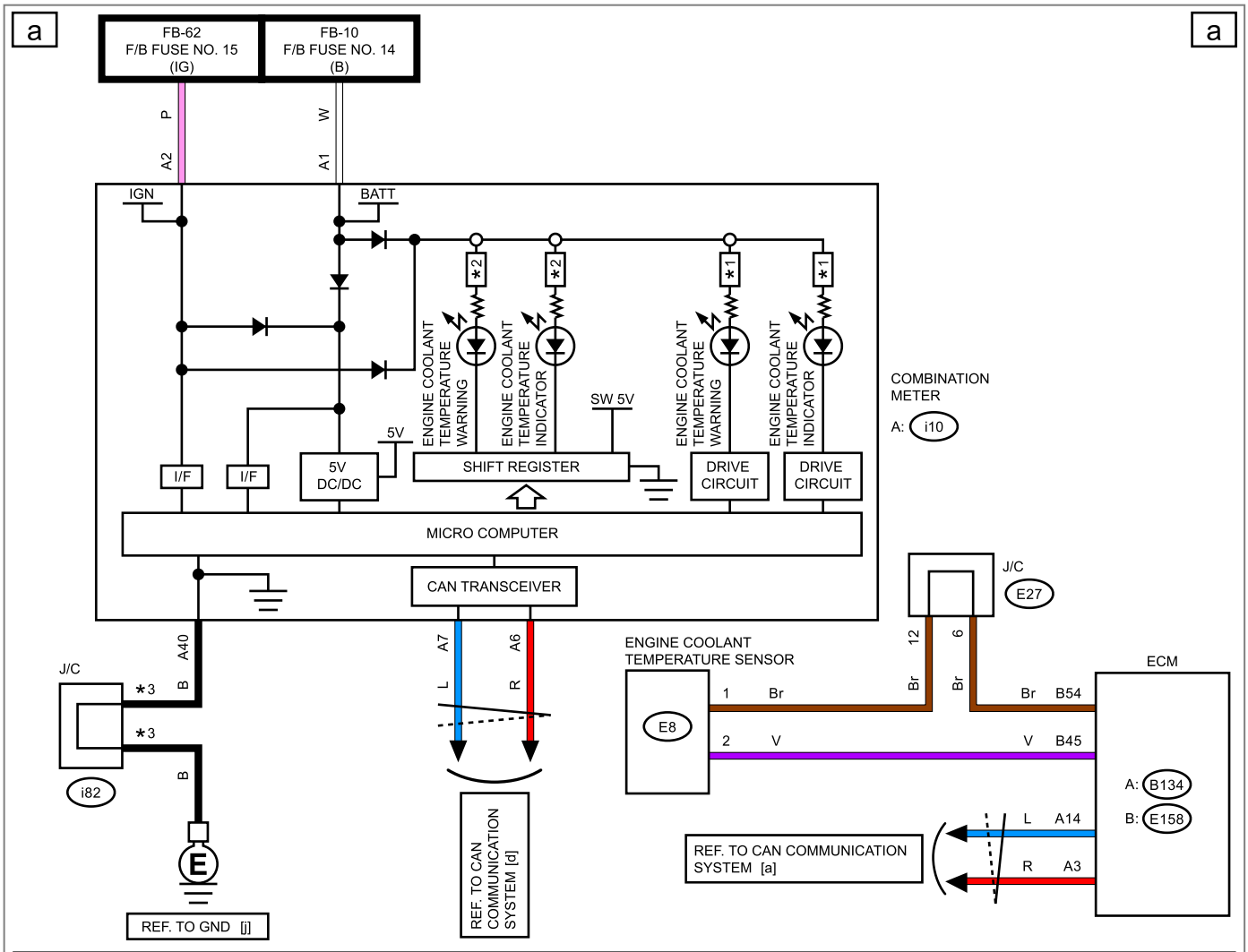


*1 : TERMINAL No. OPTIONAL ARRANGEMENT



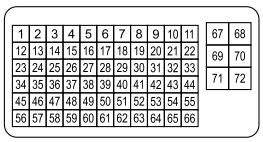
WI-68526

WIRING DIAGRAM



*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

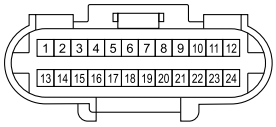
A: B134 (B)



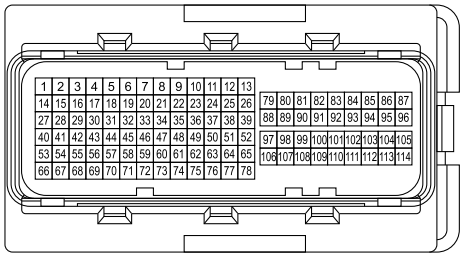
E8 (B)



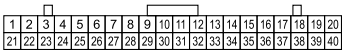
E27 (B)



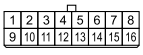
B: E158 (B)



A: i10 (B)

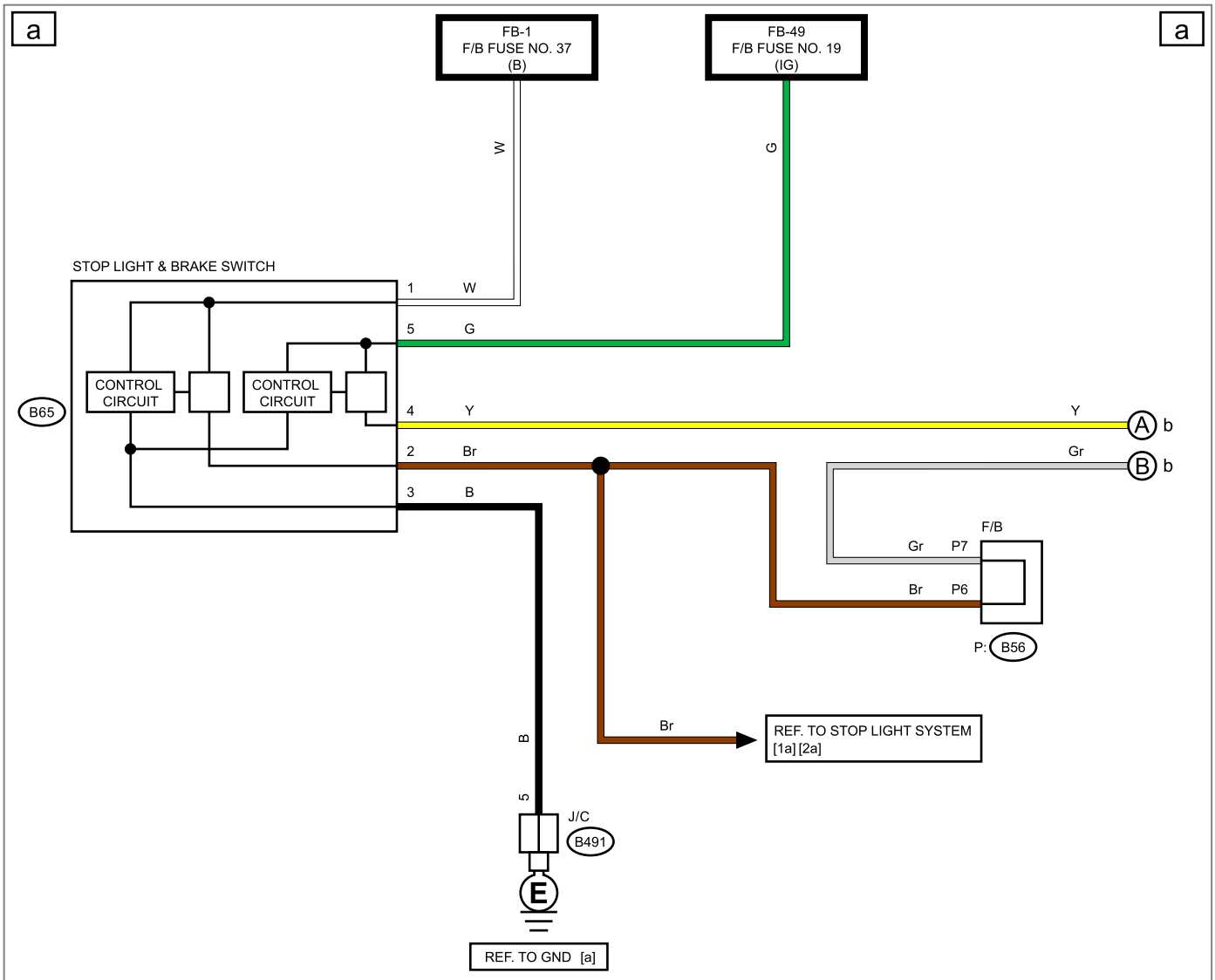


i82

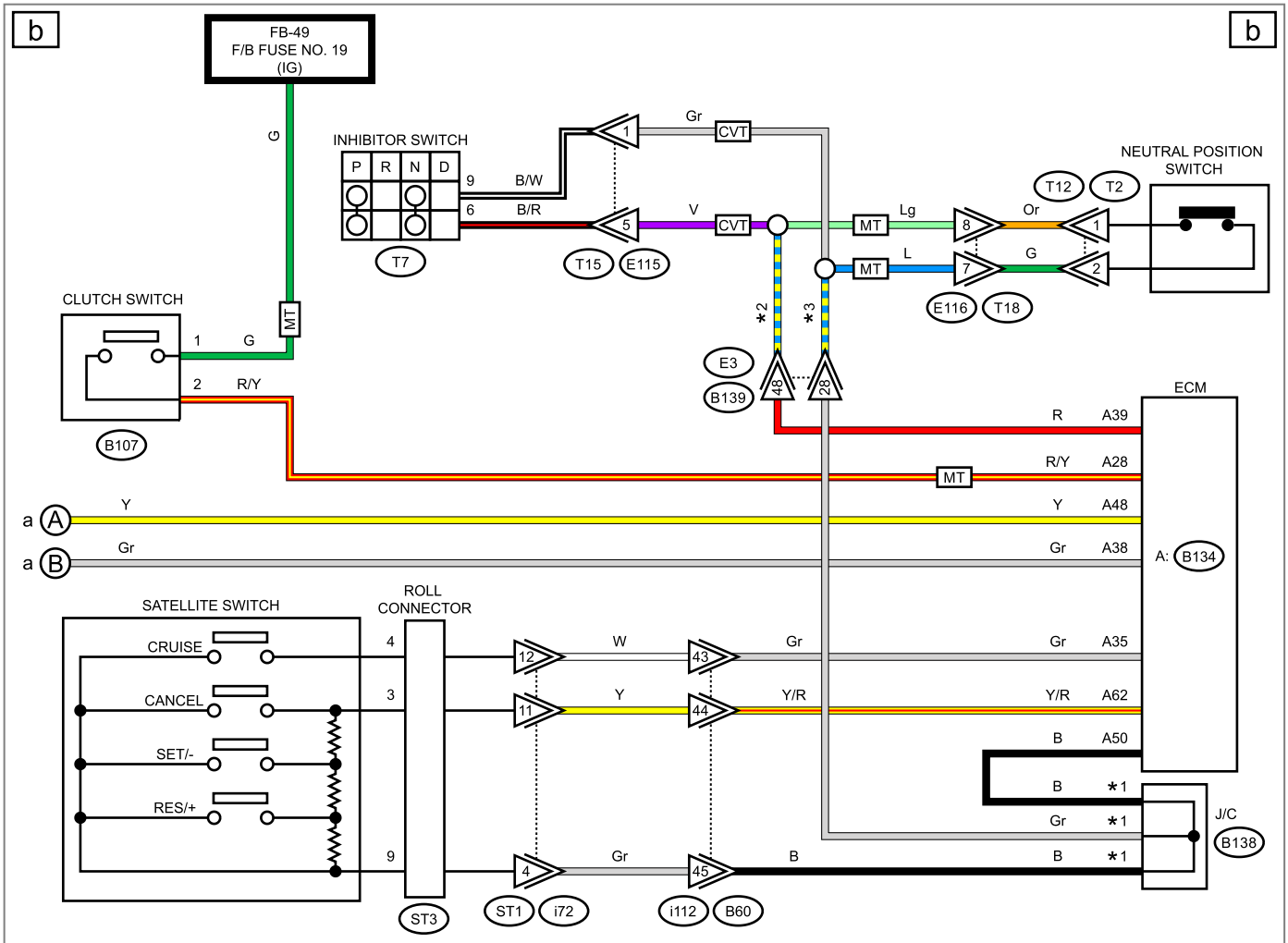


WI-68527

WIRING DIAGRAM


a
a
FB-1
F/B FUSE NO. 37
(B)
FB-49
F/B FUSE NO. 19
(IG)
W
G
STOP LIGHT & BRAKE SWITCH
1 W
5 G
CONTROL CIRCUIT
CONTROL CIRCUIT
B65
4 Y
Y
A b
2 Br
Gr
B b
3 B
F/B
Gr P7
Br P6
P: B56
Br
REF. TO STOP LIGHT SYSTEM
[1a] [2a]
B
5
J/C
B491
E
REF. TO GND [a]
P: B56 (Br)
1 2 3 4 5 6 7 8
B65
1 2 3 4 5
B491
1 2 3 4 5

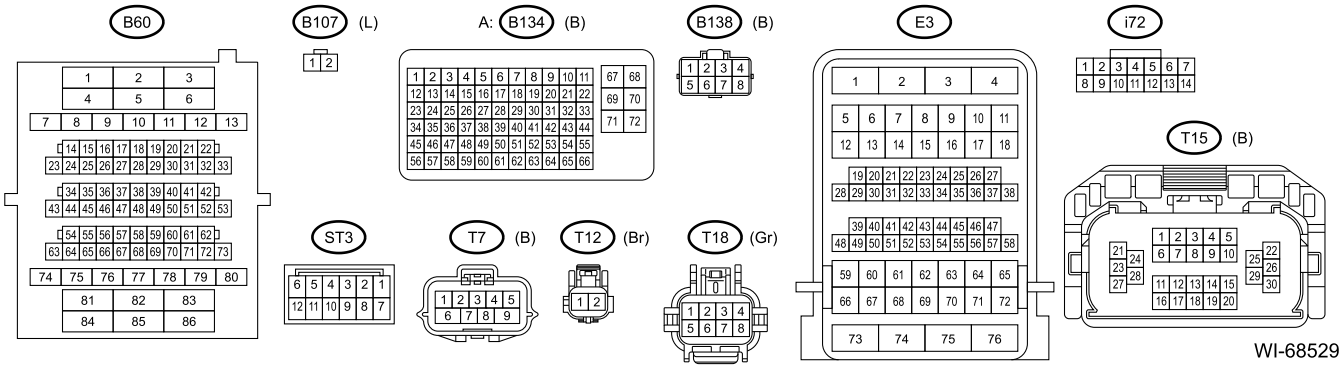
WI-68528

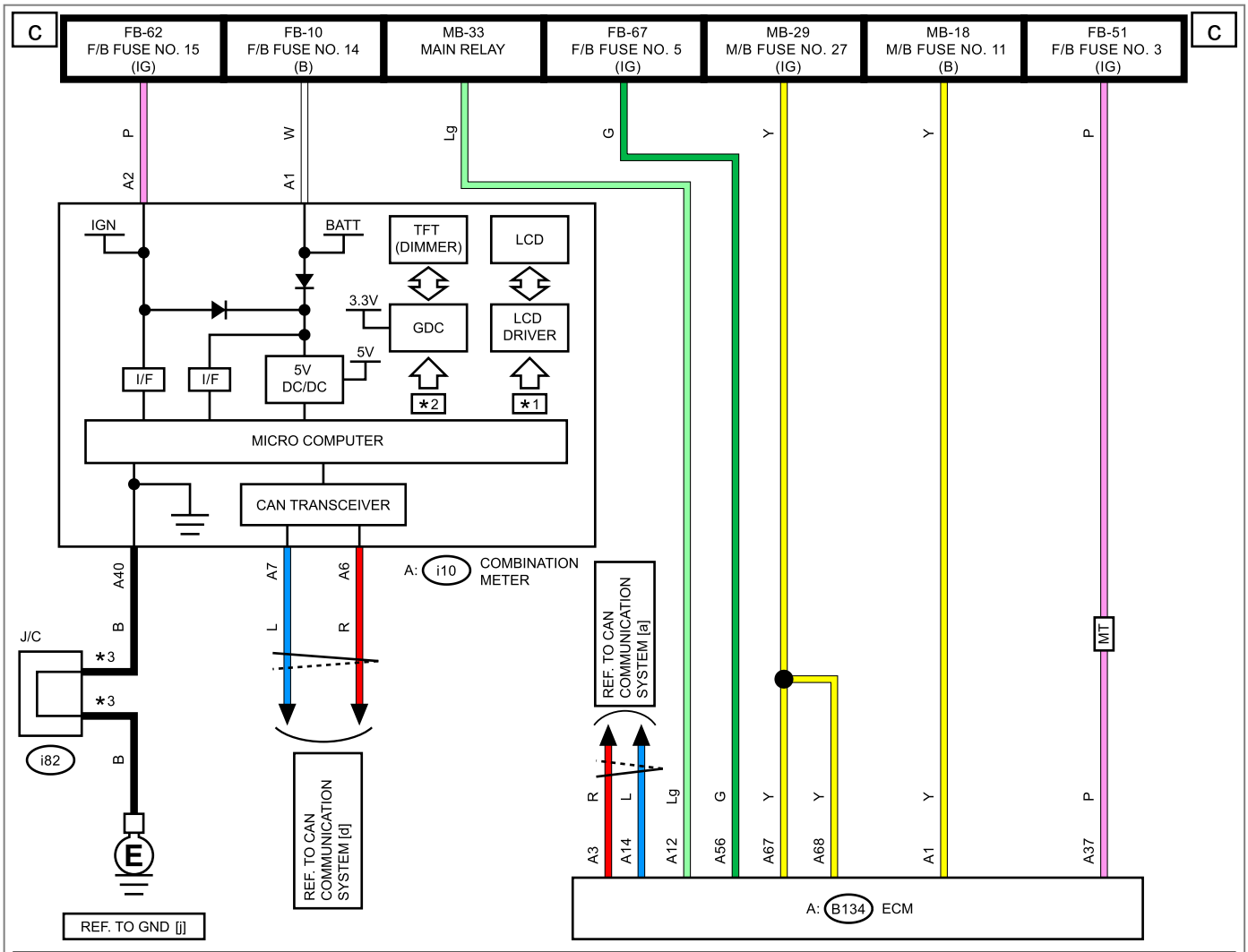


*1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6

*2 : MT MODEL : Lg
CVT MODEL : V

*3 : MT MODEL : L
CVT MODEL : Gr





*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

A: B134 (B)

1	2	3	4	5	6	7	8	9	10	11	67 68
12	13	14	15	16	17	18	19	20	21	22	69 70
23	24	25	26	27	28	29	30	31	32	33	71 72
34	35	36	37	38	39	40	41	42	43	44	
45	46	47	48	49	50	51	52	53	54	55	
56	57	58	59	60	61	62	63	64	65	66	

A: i10 (B)

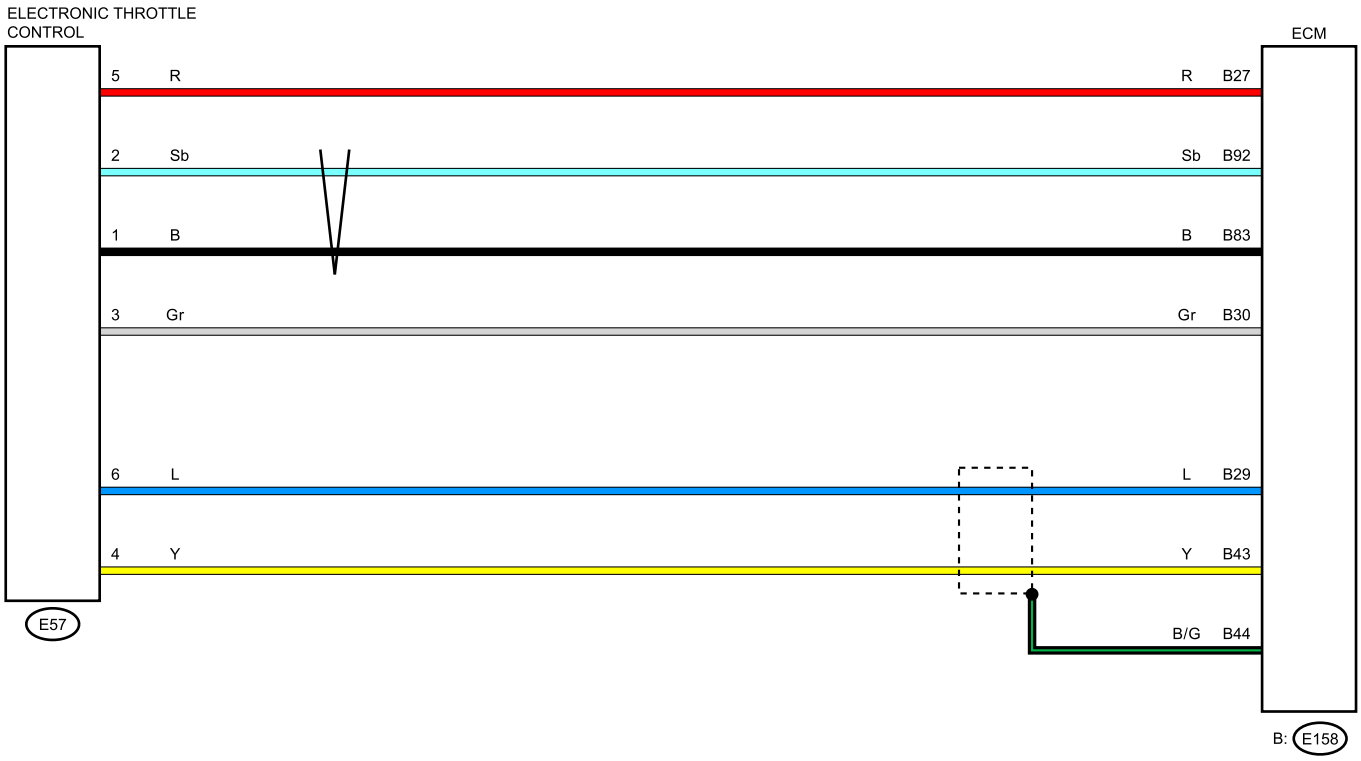
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

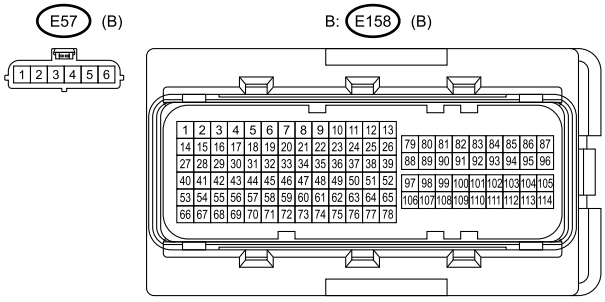
i82

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

WI-68530

d

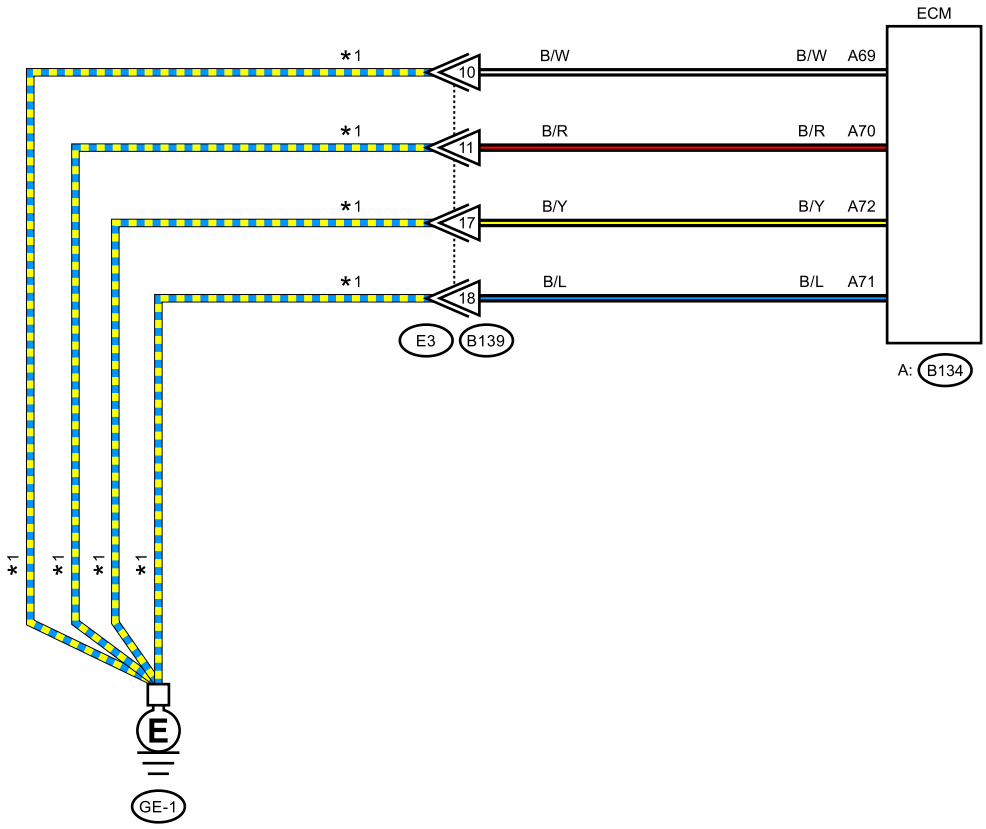

ELECTRONIC THROTTLE CONTROL
ECM
5 R
R B27
2 Sb
Sb B92
1 B
B B83
3 Gr
Gr B30
6 L
L B29
4 Y
Y B43
B/G B44
E57
B: E158


E57 (B)
1 2 3 4 5 6
B: E158 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18 19 20 21 22 23 24 25 26
27 28 29 30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63 64 65
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106 107 108 109 110 111 112 113 114

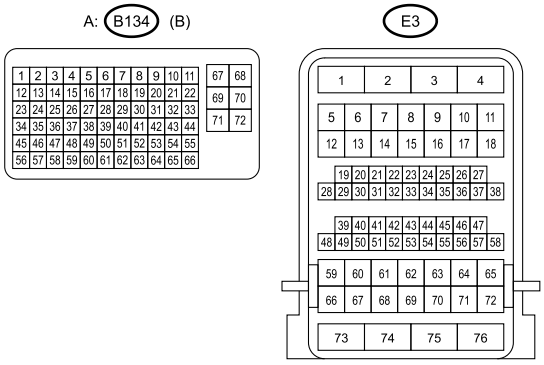
WI-68531

e

e

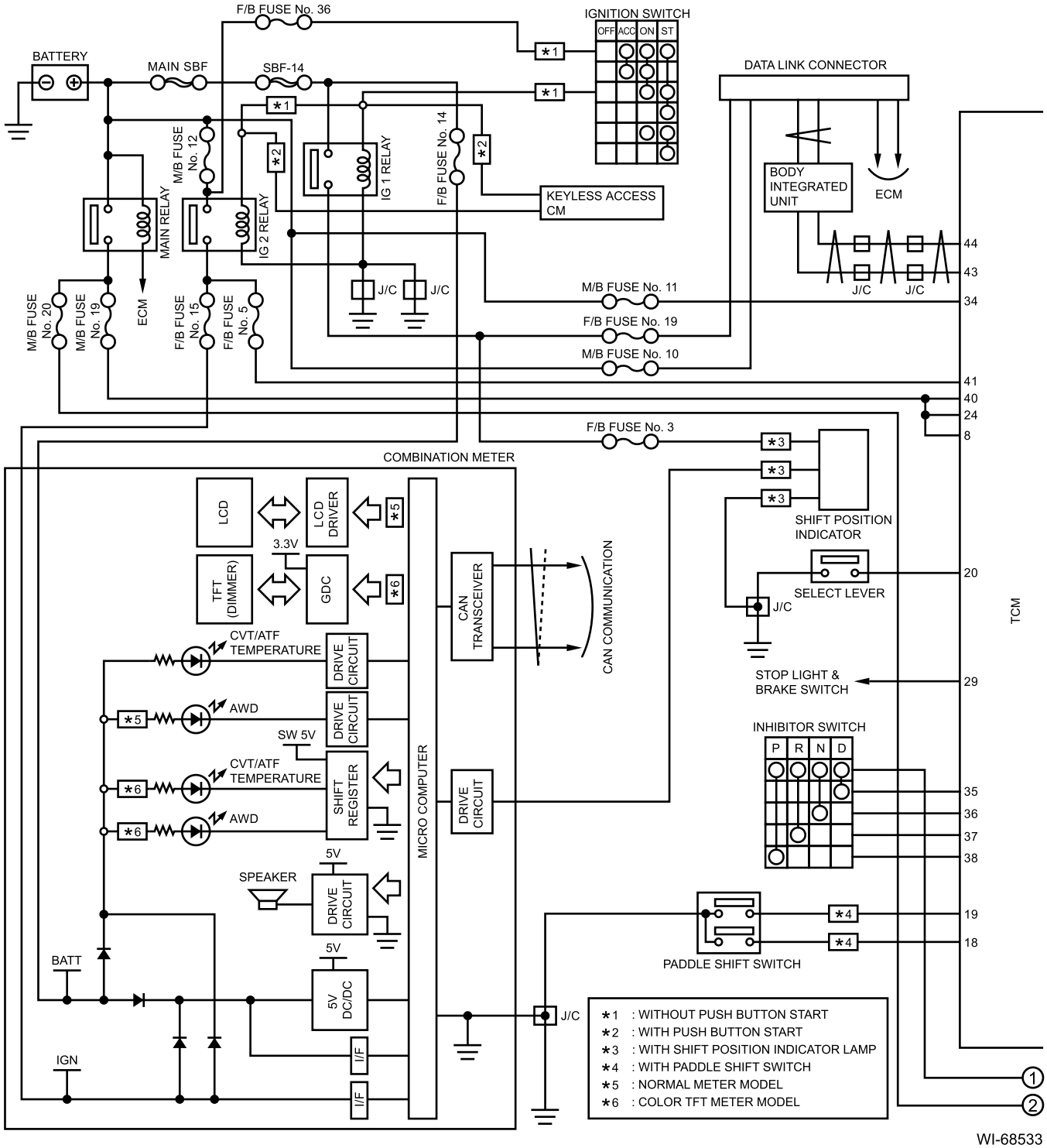


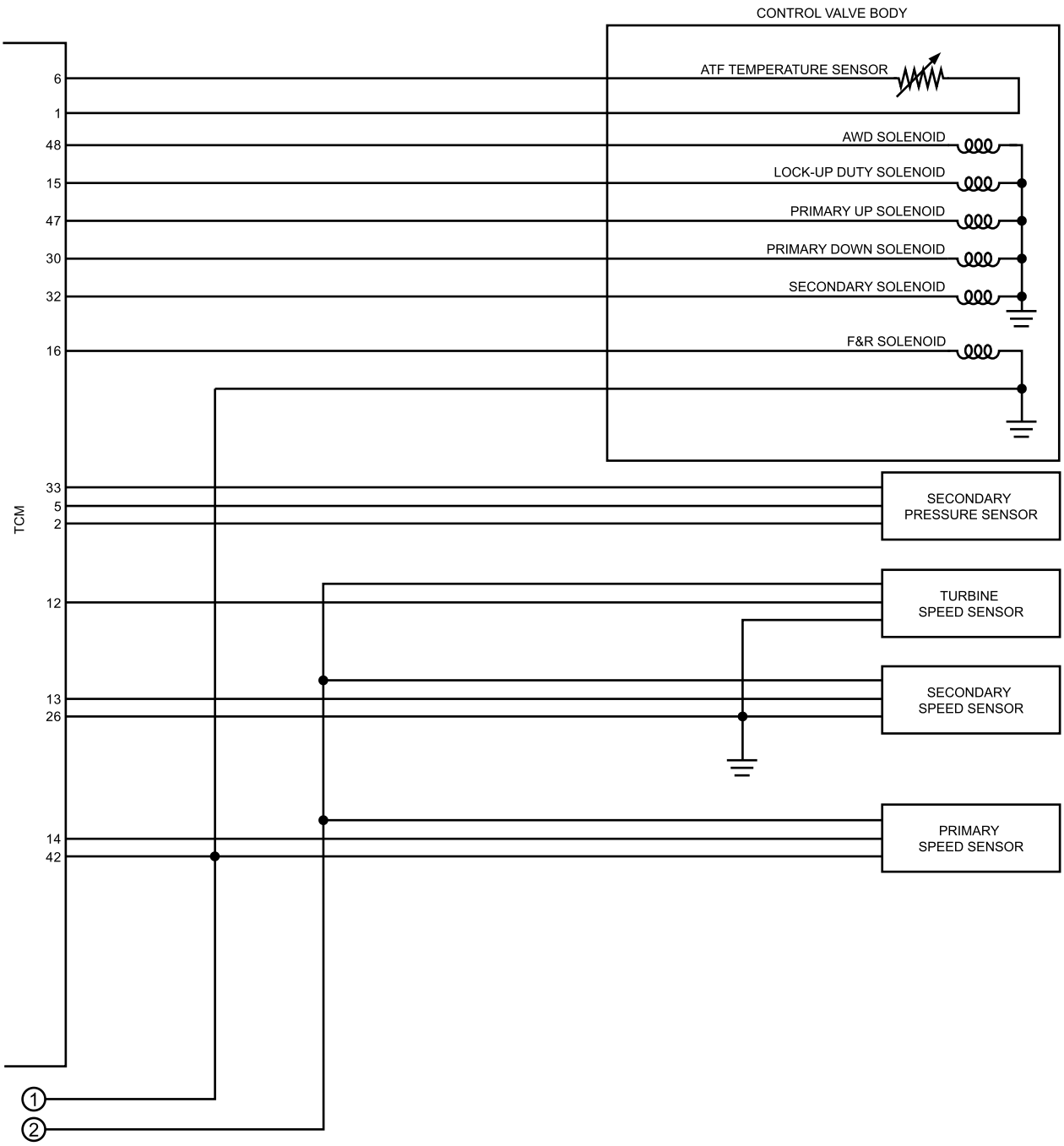
*1 : MT MODEL : Gr
CVT MODEL : B



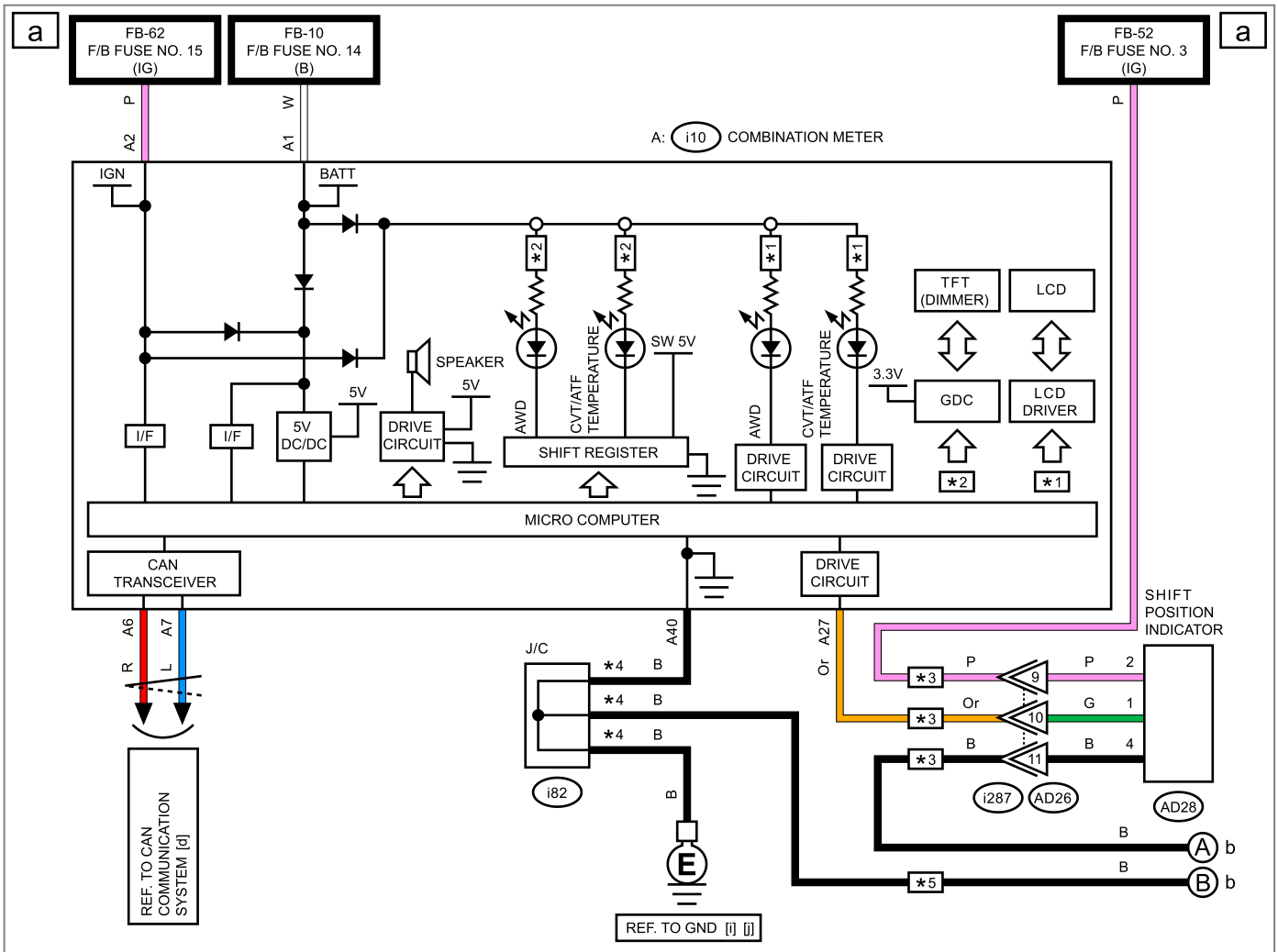
WI-68532

WIRING DIAGRAM

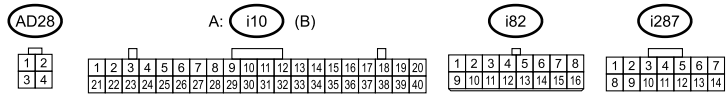



CONTROL VALVE BODY
ATF TEMPERATURE SENSOR
AWD SOLENOID
LOCK-UP DUTY SOLENOID
PRIMARY UP SOLENOID
PRIMARY DOWN SOLENOID
SECONDARY SOLENOID
F&R SOLENOID
TCM
6
1
48
15
47
30
32
16
33
5
2
12
13
26
14
42
SECONDARY PRESSURE SENSOR
TURBINE SPEED SENSOR
SECONDARY SPEED SENSOR
PRIMARY SPEED SENSOR
1
2

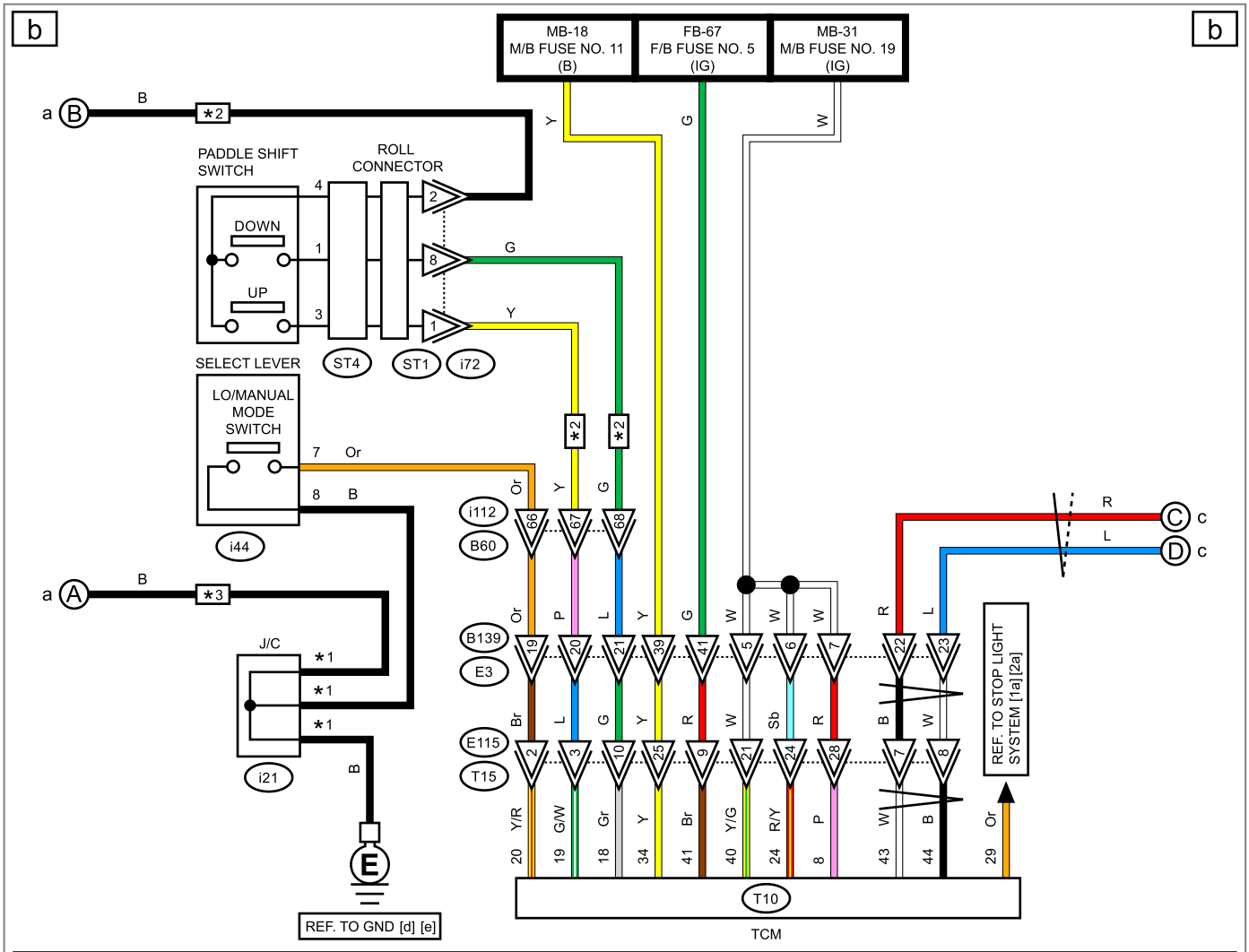
WI-68534



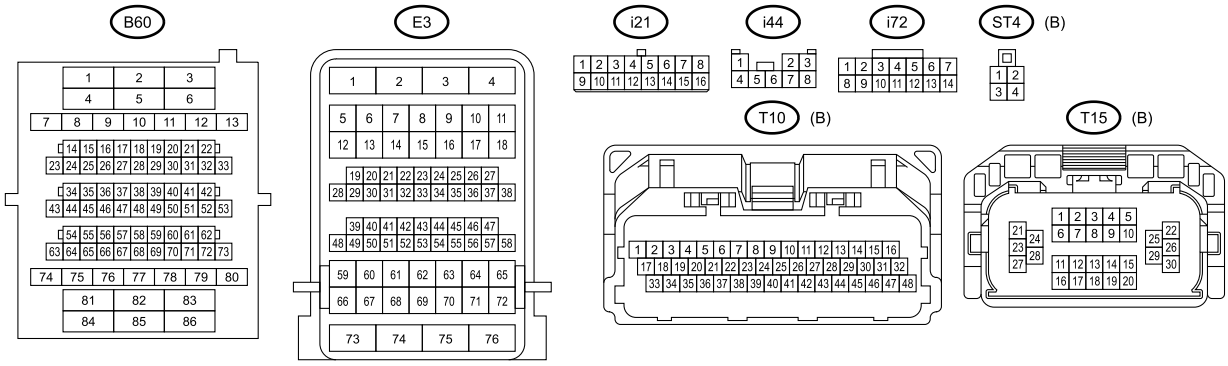
*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : WITH SHIFT POSITION INDICATOR LAMP
*4 : TERMINAL No. OPTIONAL ARRANGEMENT
*5 : WITH PADDLE SHIFT SWITCH



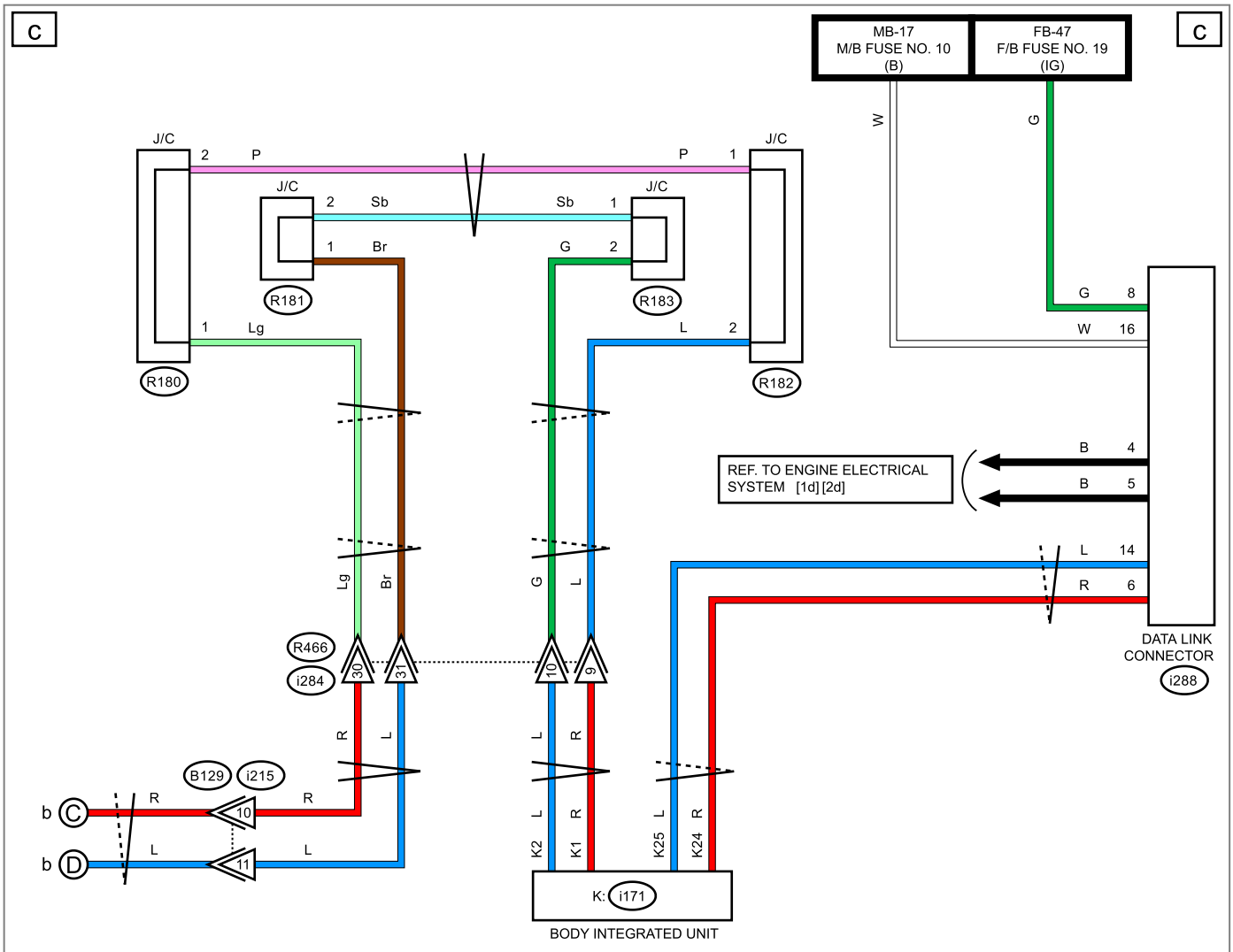
WI-68535

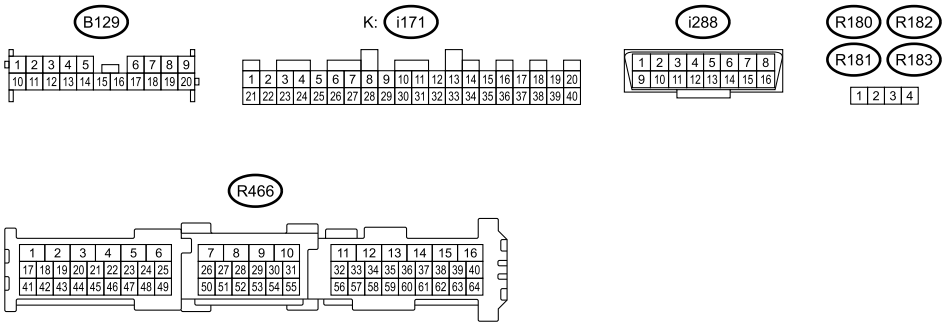


*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH PADDLE SHIFT SWITCH
*3 : WITH SHIFT POSITION INDICATOR LAMP

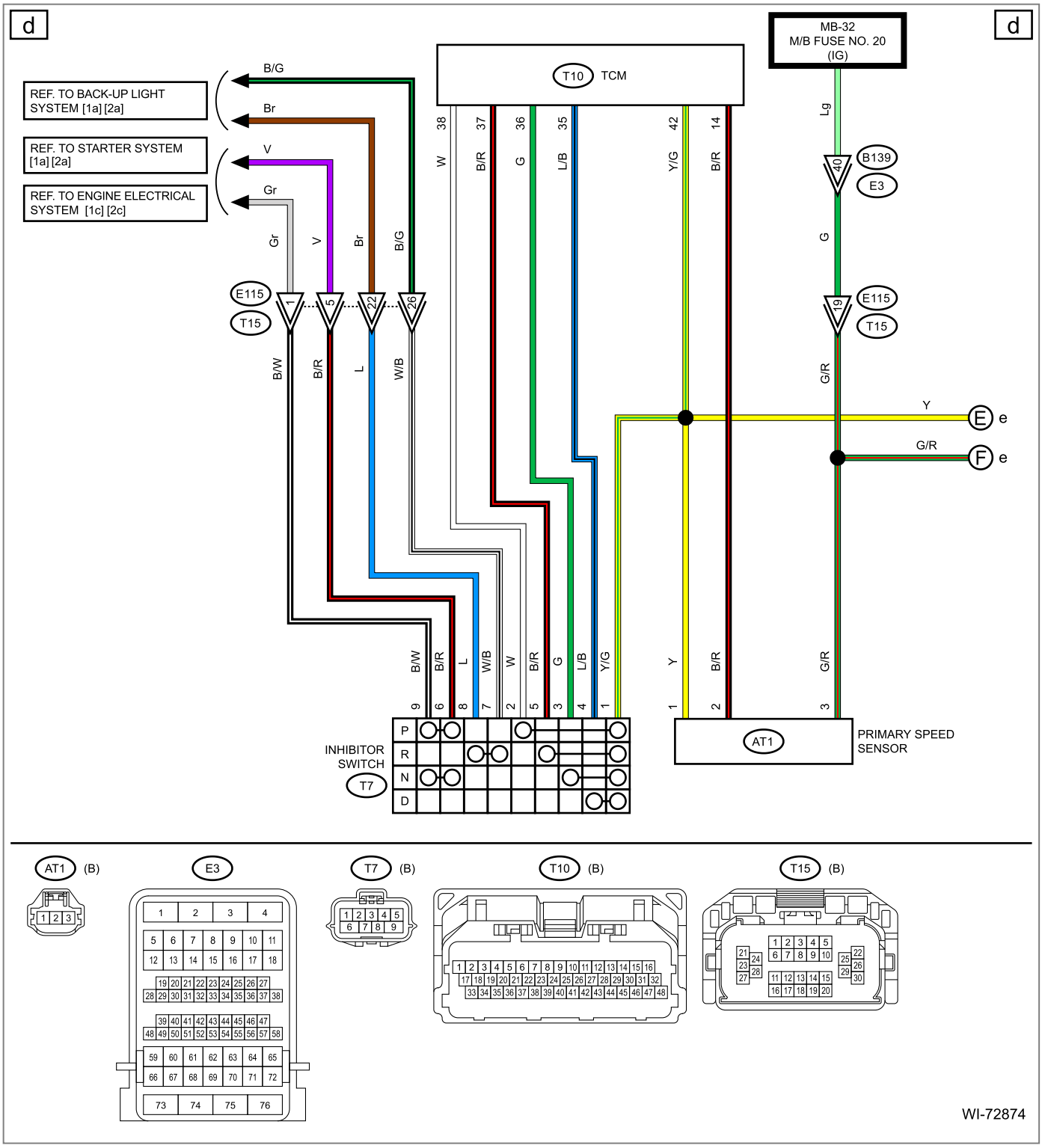


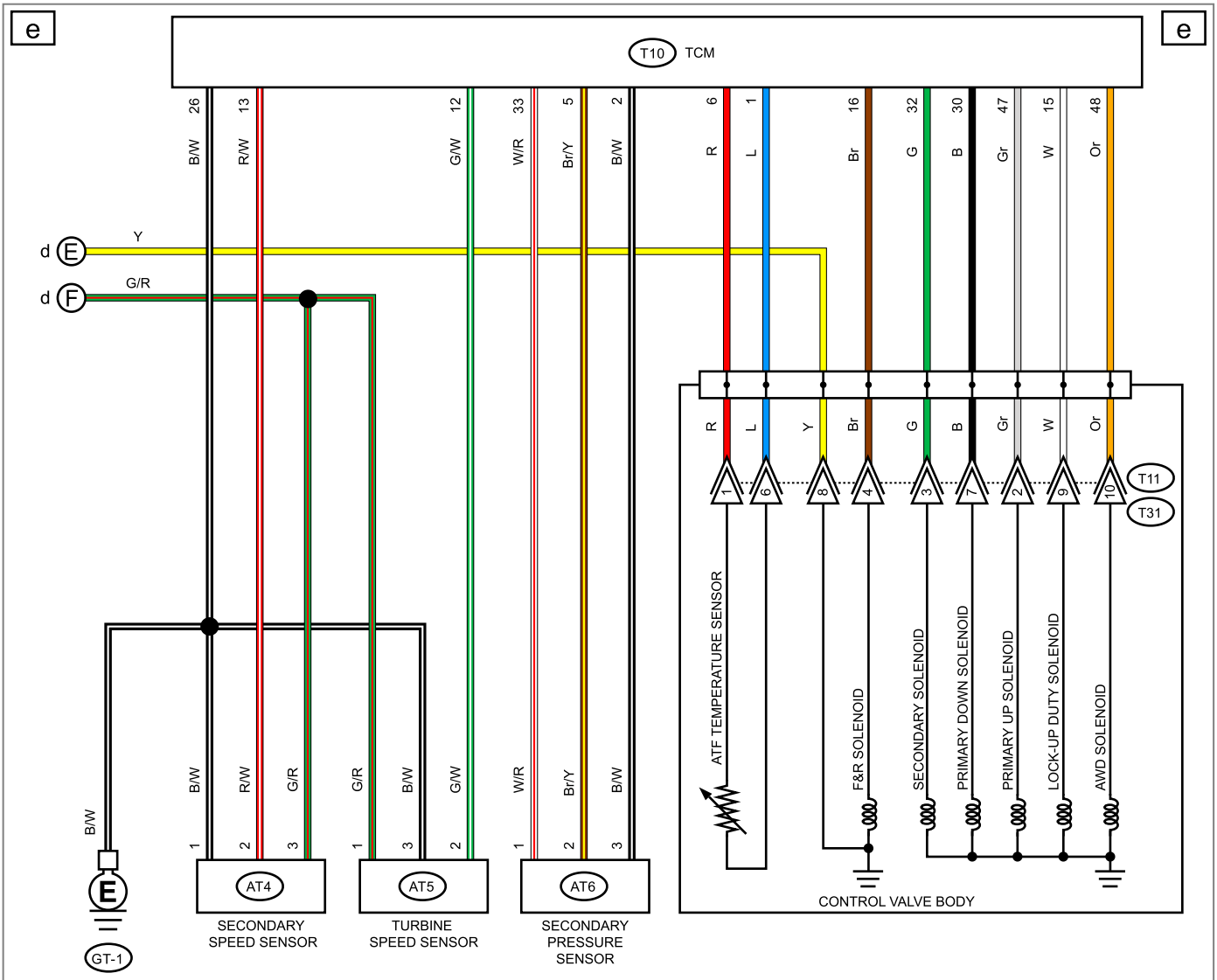
WI-68536


C
MB-17
M/B FUSE NO. 10
(B)
FB-47
F/B FUSE NO. 19
(IG)
C
W
G
J/C
2
P
P
1
J/C
J/C
2
Sb
Sb
1
J/C
1
Br
G
2
R181
R183
1
Lg
L
2
R180
R182
G
8
W
16
B
4
B
5
REF. TO ENGINE ELECTRICAL
SYSTEM [1d] [2d]
L
14
R
6
DATA LINK
CONNECTOR
i288
Lg
Br
G
L
R466
i284
30
31
10
9
R
L
L
R
B129
i215
b
C
R
10
R
b
D
L
11
L
L
R
L
R
K2
K1
K25
K24
K: i171
BODY INTEGRATED UNIT

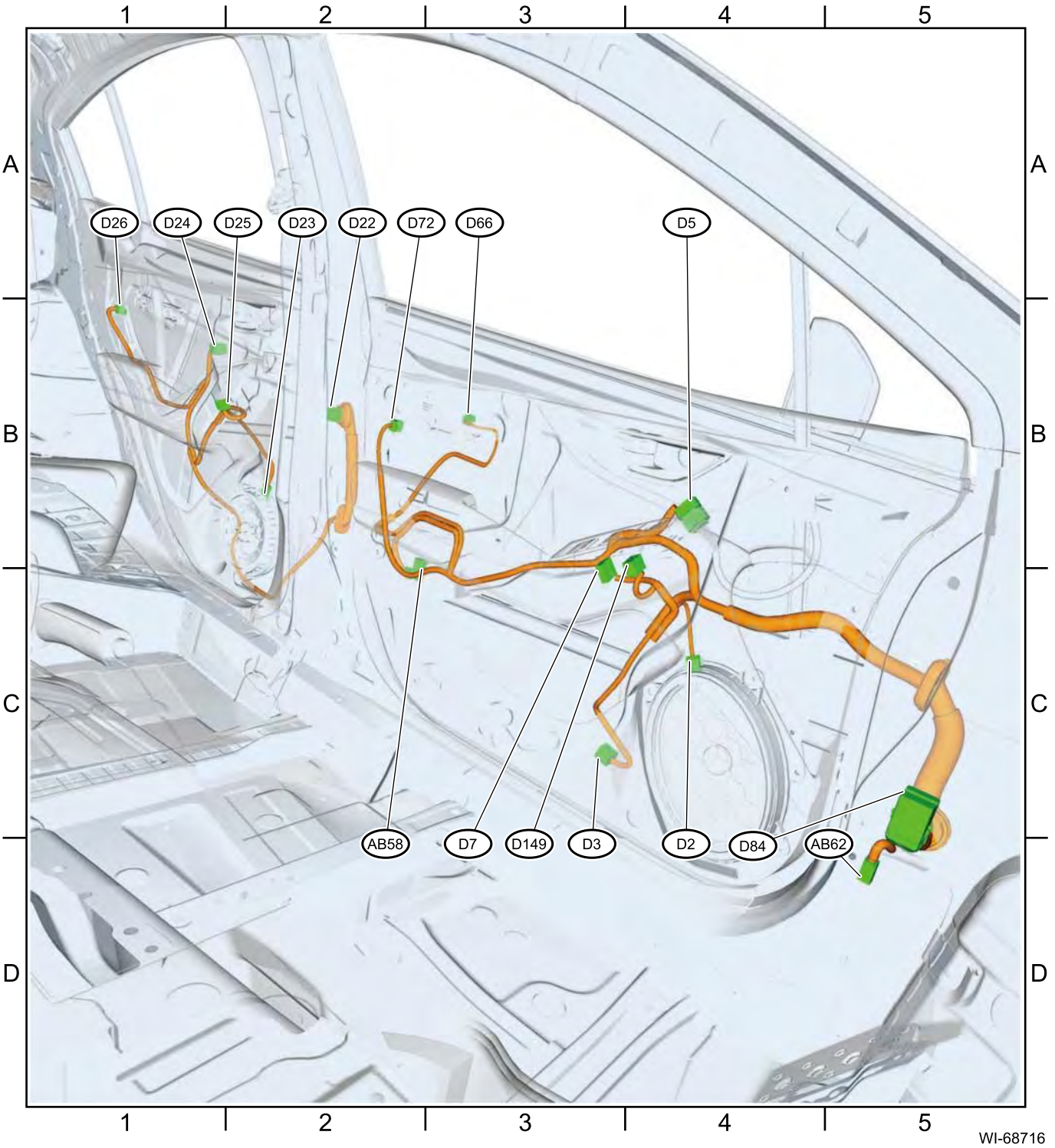

B129
K: i171
i288
R180
R182
R181
R183
R466

WI-68723


d
d
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO STARTER SYSTEM [1a] [2a]
REF. TO ENGINE ELECTRICAL SYSTEM [1c] [2c]
B/G
Br
V
Gr
T10 TCM
MB-32
M/B FUSE NO. 20
(IG)
Lg
B139
E3
E115
T15
INHIBITOR SWITCH
T7
AT1
PRIMARY SPEED SENSOR
P
R
N
D
Y
G/R
E
F
e
AT1 (B)
E3
T7 (B)
T10 (B)
T15 (B)
WI-72874


e
e
T10 TCM
26 B/W
13 R/W
12 G/W
33 W/R
5 Br/Y
2 B/W
6 R
1 L
16 Br
32 G
30 B
47 Gr
15 W
48 Or
d E Y
d F G/R
R L Y Br G B Gr W Or
1 6 8 4 3 7 2 9 10
T11
T31
ATF TEMPERATURE SENSOR
F&R SOLENOID
SECONDARY SOLENOID
PRIMARY DOWN SOLENOID
PRIMARY UP SOLENOID
LOCK-UP DUTY SOLENOID
AWD SOLENOID
CONTROL VALVE BODY
B/W
E
GT-1
B/W 1
R/W 2
G/R 3
AT4
SECONDARY SPEED SENSOR
G/R 1
B/W 3
G/W 2
AT5
TURBINE SPEED SENSOR
W/R 1
Br/Y 2
B/W 3
AT6
SECONDARY PRESSURE SENSOR
AT4 (Gr)
AT5 (Gr)
AT6 (B)
T10 (B)
T11
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
1 2 3 4 5
6 7 8 9 10
WI-72875

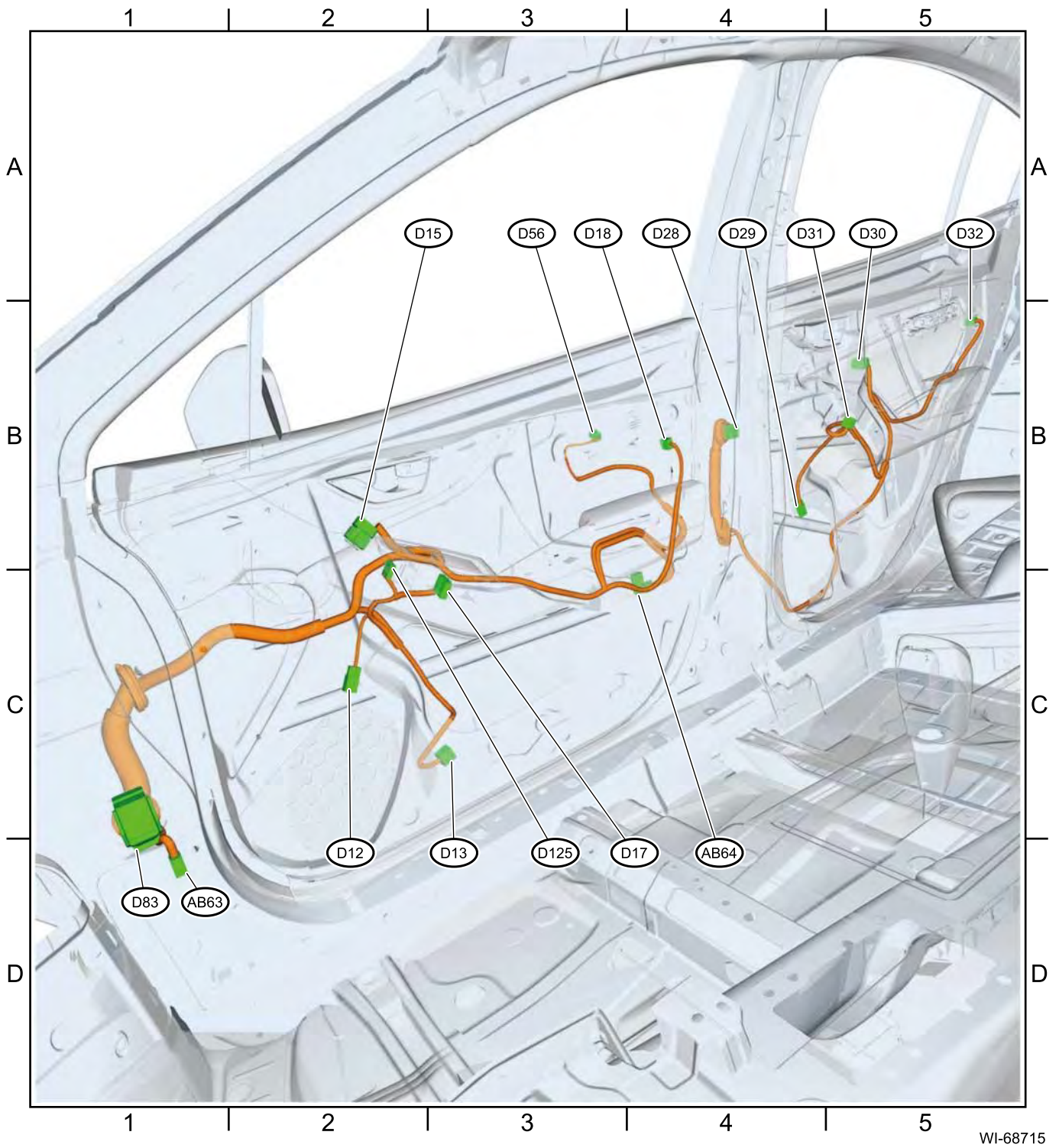
LOCATION



Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB58	2	Y	C-2		Airbag door sensor LH
AB62	2	Y	D-5	R123	Rear wiring harness LH
D2	2	★	C-4		Front door speaker LH
D3	8	B	C-3		Front power window motor LH
D5	13	★	B-4		Outer mirror ASSY LH

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
D7	18	B	C-3		Power window main switch
D22	12	★	B-2	R13	Rear wiring harness LH
D23	2	★	B-2		Rear door speaker LH
D24	2	B	B-1		Rear power window motor LH
D25	5	★	B-1		Rear power window switch LH
D26	10	★	B-1		Rear door lock actuator LH
D66	6	★	B-3		Outer handle LH
D72	10	★	B-2		Front door lock actuator LH
D84	46	★	C-5	i101	Instrument panel wiring harness
D149	24	★	B-4		Remote control mirror switch
★: White or natural color					

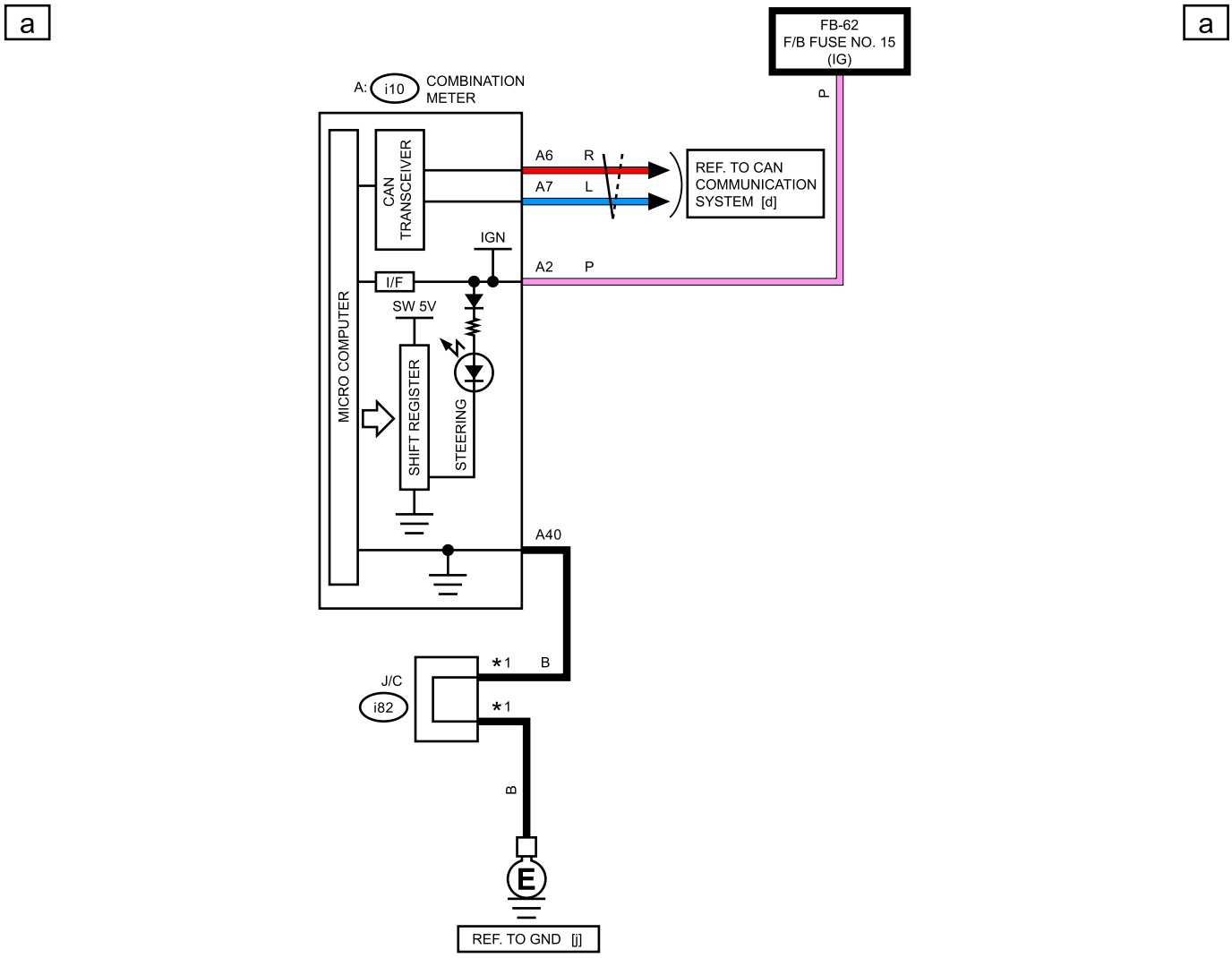
LOCATION



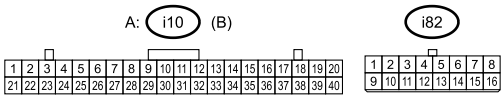
Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB63	2	Y	D-1	R124	Rear wiring harness RH
AB64	2	Y	C-4		Airbag door sensor RH
D12	2	★	C-2		Front door speaker RH
D13	8	B	C-3		Front power window motor RH
D15	13	★	B-2		Outer mirror ASSY RH

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
D17	8	★	C-3		Front power window sub-switch
D18	10	★	B-4		Front door lock actuator RH
D28	12	★	B-4	R10	Rear wiring harness RH
D29	2	★	B-4		Rear door speaker RH
D30	2	B	B-5		Rear power window motor RH
D31	5	★	B-5		Rear power window switch RH
D32	10	★	B-5		Rear door lock actuator RH
D56	6	★	B-3		Outer handle RH
D83	46	★	C-1	i76	Instrument panel wiring harness
D125	8	★	B-2		Passenger's door lock switch
★: White or natural color					

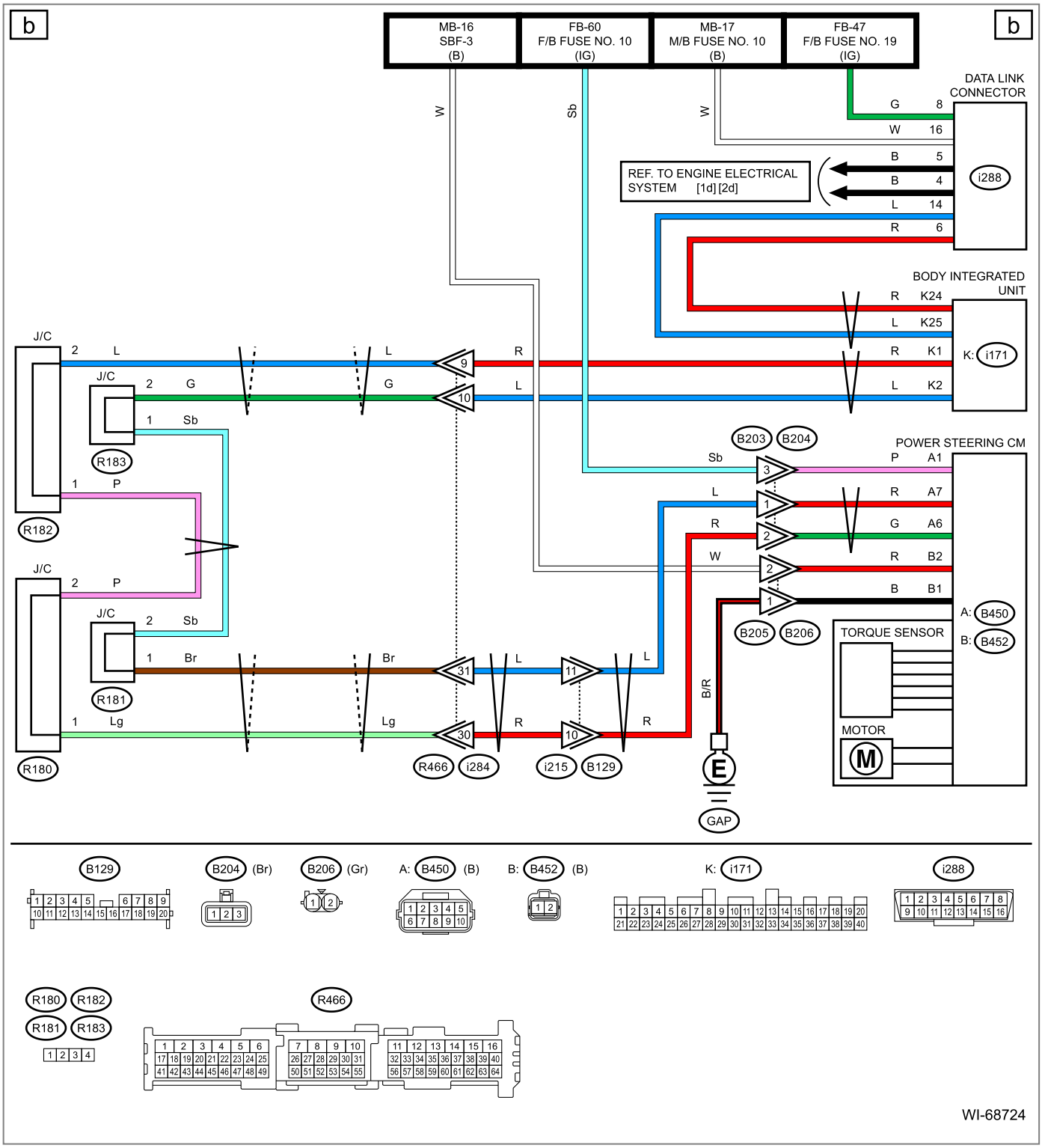
WIRING DIAGRAM



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

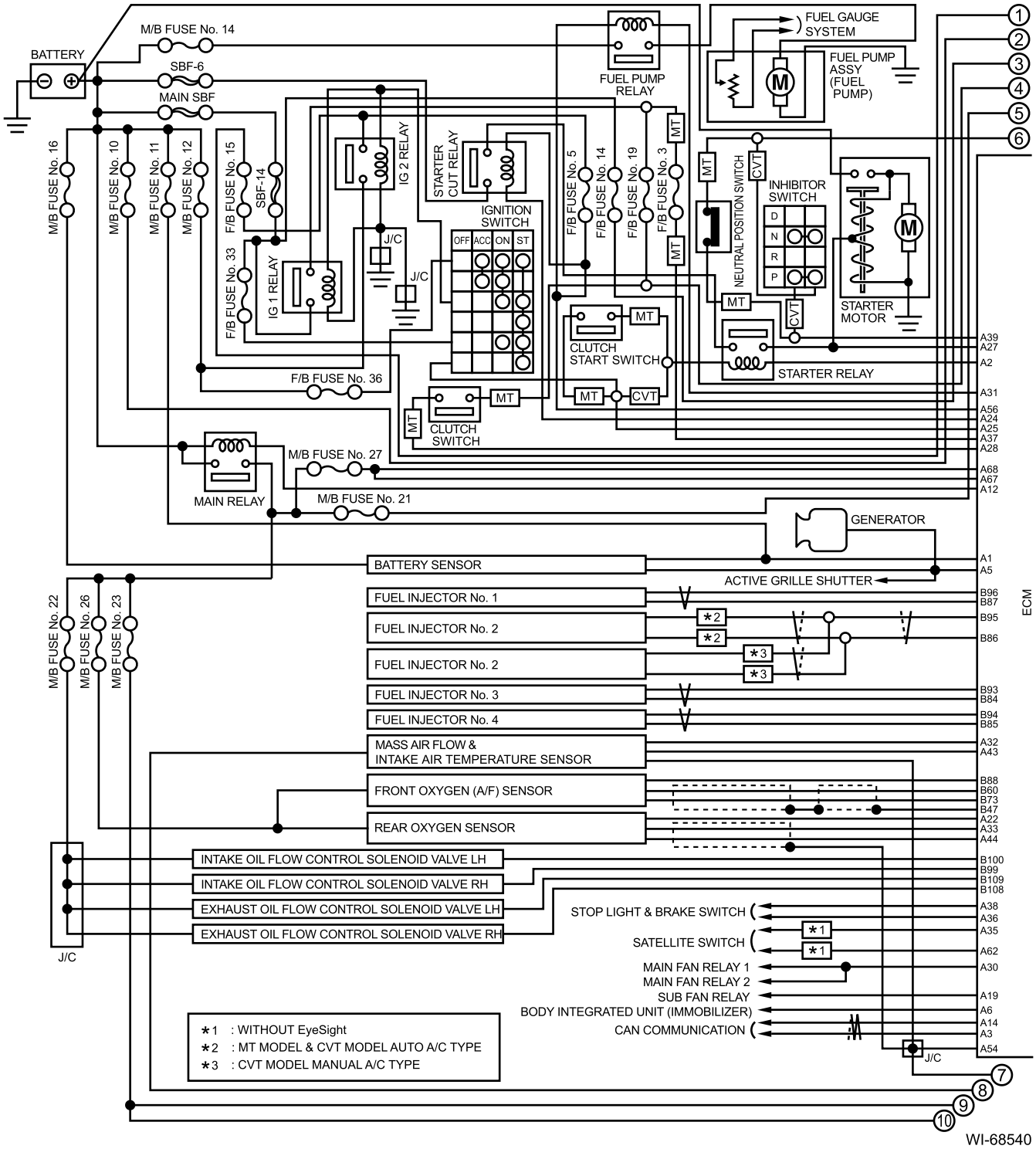


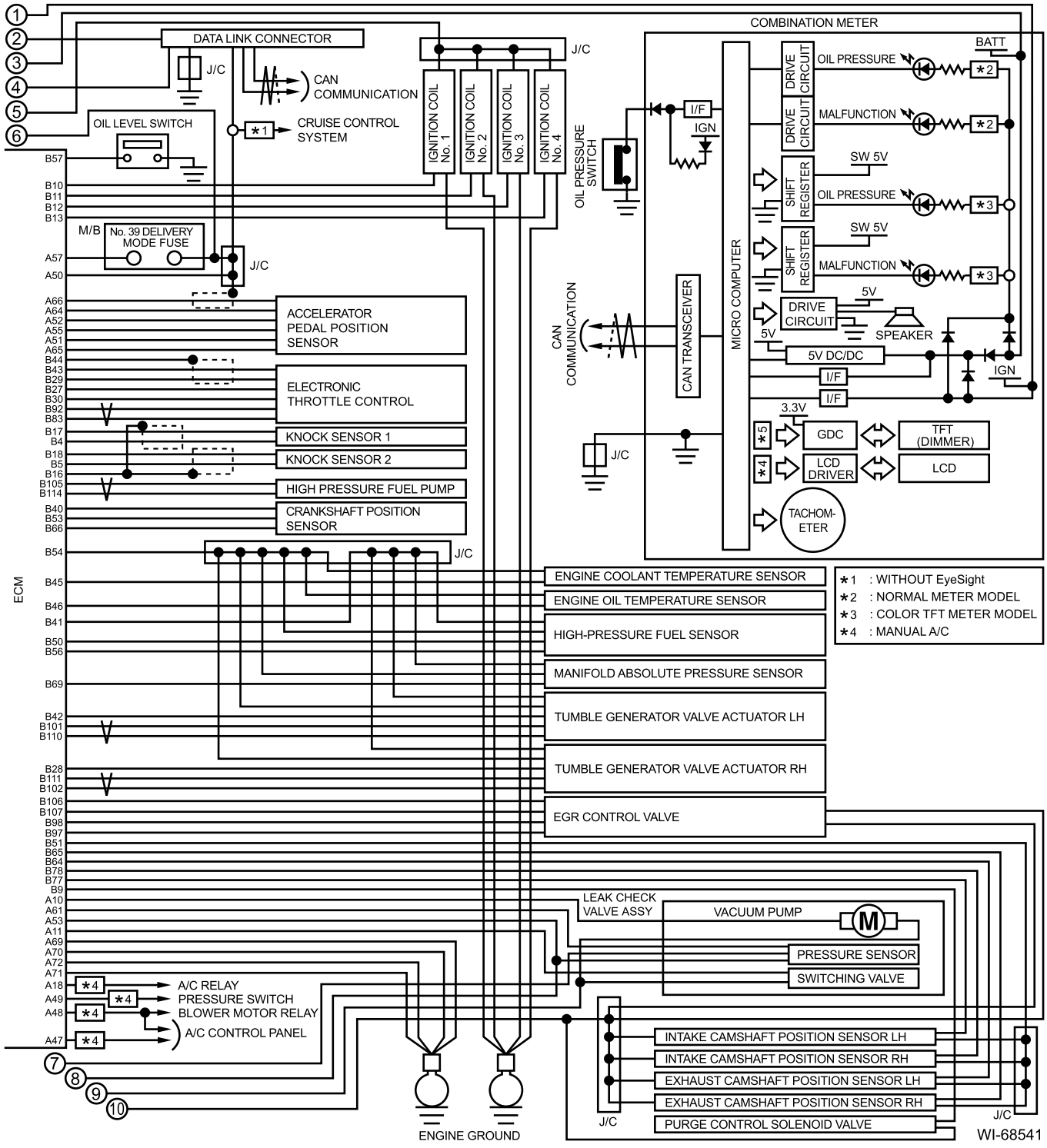
WI-68539

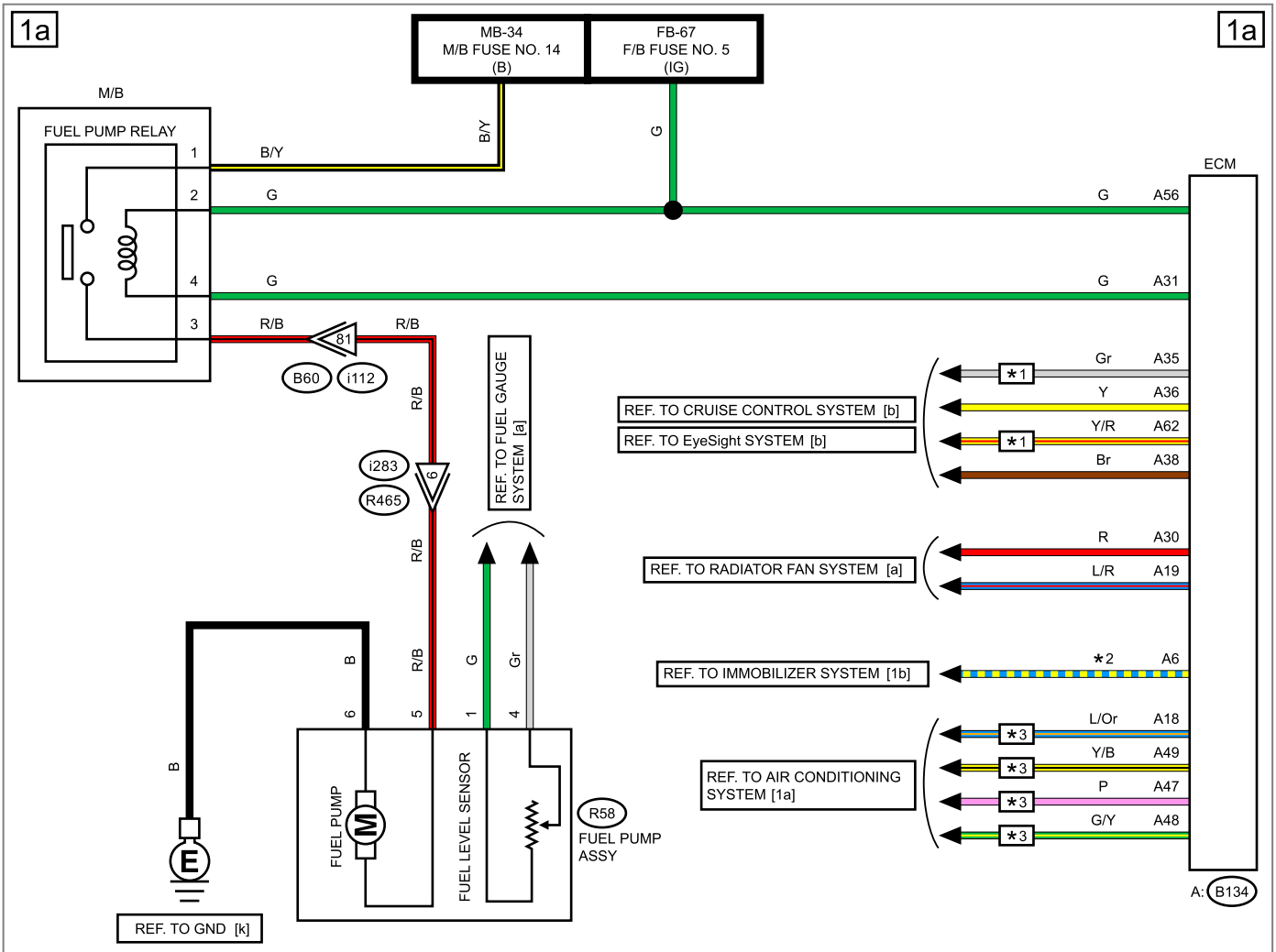

b
b
MB-16
SBF-3
(B)
FB-60
F/B FUSE NO. 10
(IG)
MB-17
M/B FUSE NO. 10
(B)
FB-47
F/B FUSE NO. 19
(IG)
DATA LINK
CONNECTOR
G 8
W 16
B 5
B 4
L 14
R 6
i288
REF. TO ENGINE ELECTRICAL
SYSTEM [1d] [2d]
BODY INTEGRATED
UNIT
R K24
L K25
R K1
L K2
K: i171
J/C
2 L
L
9
R
J/C
2 G
G
10
L
1 Sb
R183
1 P
R182
J/C
2 P
J/C
2 Sb
1 Br
Br
31
L
11
L
R181
1 Lg
Lg
30
R
10
R
R180
R466
i284
i215
B129
B203
B204
POWER STEERING CM
Sb
3
P A1
L
1
R A7
R
2
G A6
W
2
R B2
1
B A1
B205
B206
A: B450
B: B452
TORQUE SENSOR
MOTOR
M
B/R
E
GAP
B129
B204 (Br)
B206 (Gr)
A: B450 (B)
B: B452 (B)
K: i171
i288
R180
R182
R181
R183
R466
WI-68724

WIRING DIAGRAM

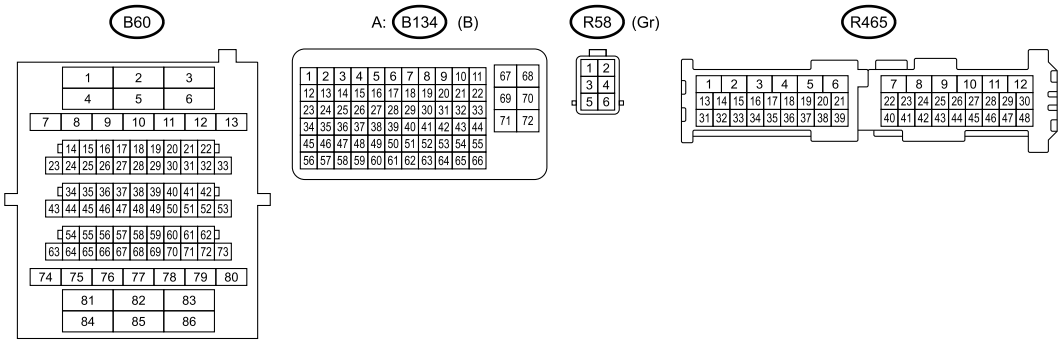
1. WITHOUT PUSH BUTTON START



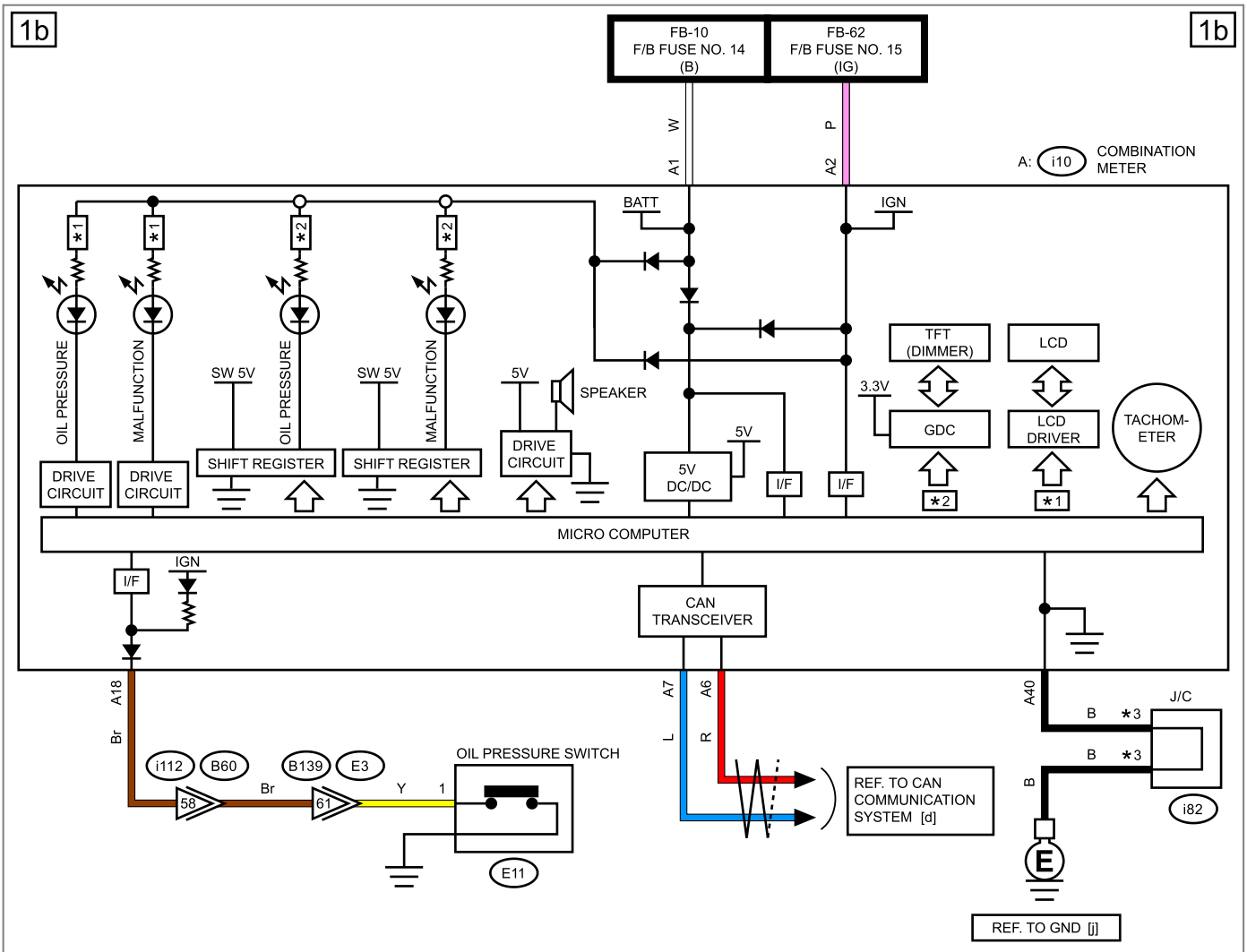

COMBINATION METER
DATA LINK CONNECTOR
J/C
CAN COMMUNICATION
CRUISE CONTROL SYSTEM
OIL LEVEL SWITCH
IGNITION COIL No. 1
IGNITION COIL No. 2
IGNITION COIL No. 3
IGNITION COIL No. 4
OIL PRESSURE SWITCH
M/B
No. 39 DELIVERY MODE FUSE
ACCELERATOR PEDAL POSITION SENSOR
ELECTRONIC THROTTLE CONTROL
KNOCK SENSOR 1
KNOCK SENSOR 2
HIGH PRESSURE FUEL PUMP
CRANKSHAFT POSITION SENSOR
ECM
ENGINE COOLANT TEMPERATURE SENSOR
ENGINE OIL TEMPERATURE SENSOR
HIGH-PRESSURE FUEL SENSOR
MANIFOLD ABSOLUTE PRESSURE SENSOR
TUMBLE GENERATOR VALVE ACTUATOR LH
TUMBLE GENERATOR VALVE ACTUATOR RH
EGR CONTROL VALVE
LEAK CHECK VALVE ASSY
VACUUM PUMP
PRESSURE SENSOR
SWITCHING VALVE
A/C RELAY
PRESSURE SWITCH
BLOWER MOTOR RELAY
A/C CONTROL PANEL
INTAKE CAMSHAFT POSITION SENSOR LH
INTAKE CAMSHAFT POSITION SENSOR RH
EXHAUST CAMSHAFT POSITION SENSOR LH
EXHAUST CAMSHAFT POSITION SENSOR RH
PURGE CONTROL SOLENOID VALVE
ENGINE GROUND
I/F
IGN
BATT
DRIVE CIRCUIT
OIL PRESSURE
MALFUNCTION
SHIFT REGISTER
SW 5V
5V
SPEAKER
5V DC/DC
3.3V
GDC
TFT (DIMMER)
LCD DRIVER
LCD
TACHOM-ETER
CAN TRANSCEIVER
MICRO COMPUTER
CAN COMMUNICATION
*1 : WITHOUT EyeSight
*2 : NORMAL METER MODEL
*3 : COLOR TFT METER MODEL
*4 : MANUAL A/C
WI-68541



∗1 : WITHOUT EyeSight
∗2 : WITHOUT IMMOBILIZER CM : W/L
WITH IMMOBILIZER CM : R/W
∗3 : MANUAL A/C



WI-68542



*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

B60

	1	2	3			
	4	5	6			
7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53
54	55	56	57	58	59	60	61	62
63	64	65	66	67	68	69	70	71	72	73
74	75	76	77	78	79	80
	81	82	83			
	84	85	86			

E3

1	2	3	4			
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58
59	60	61	62	63	64	65
66	67	68	69	70	71	72
73	74	75	76			

E11

1

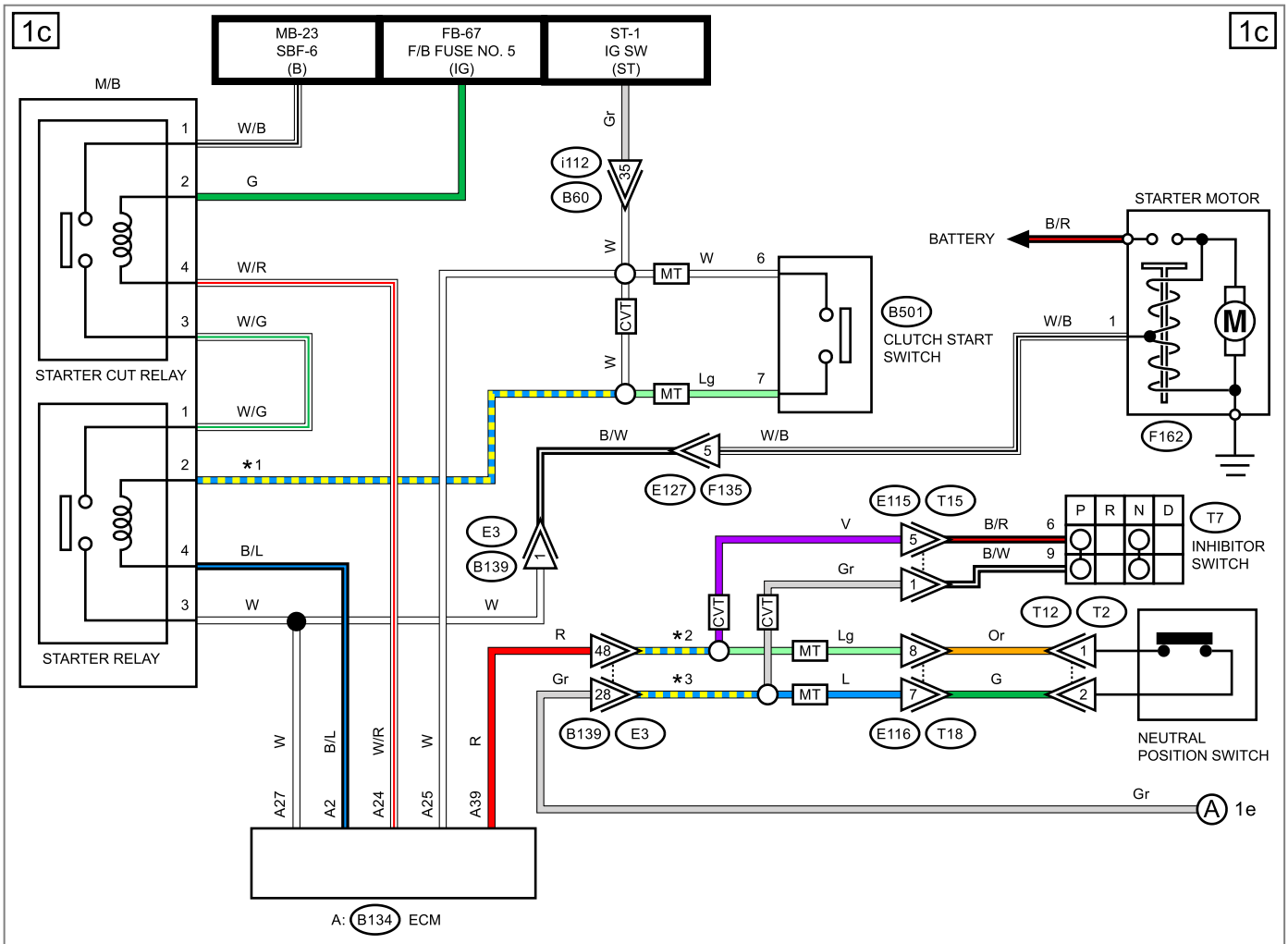
A: i10 (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

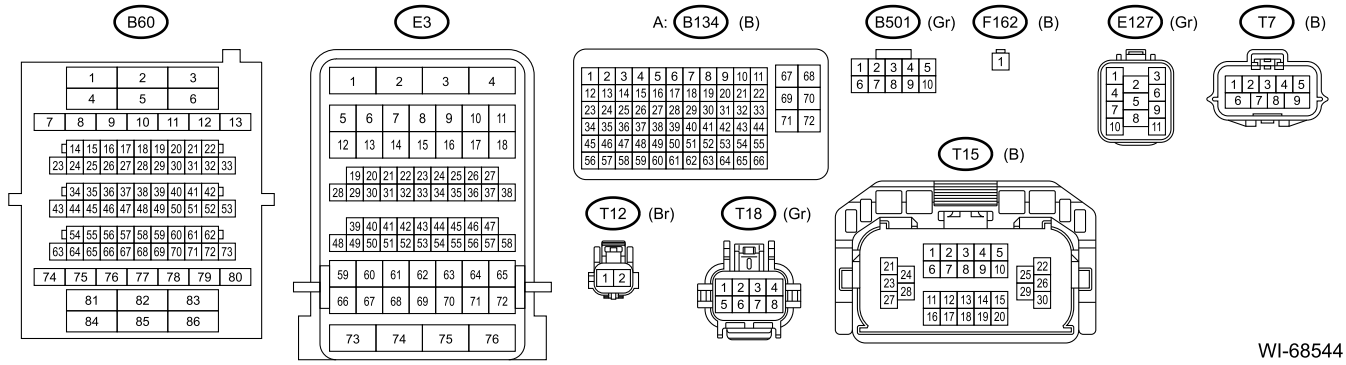
WI-68543



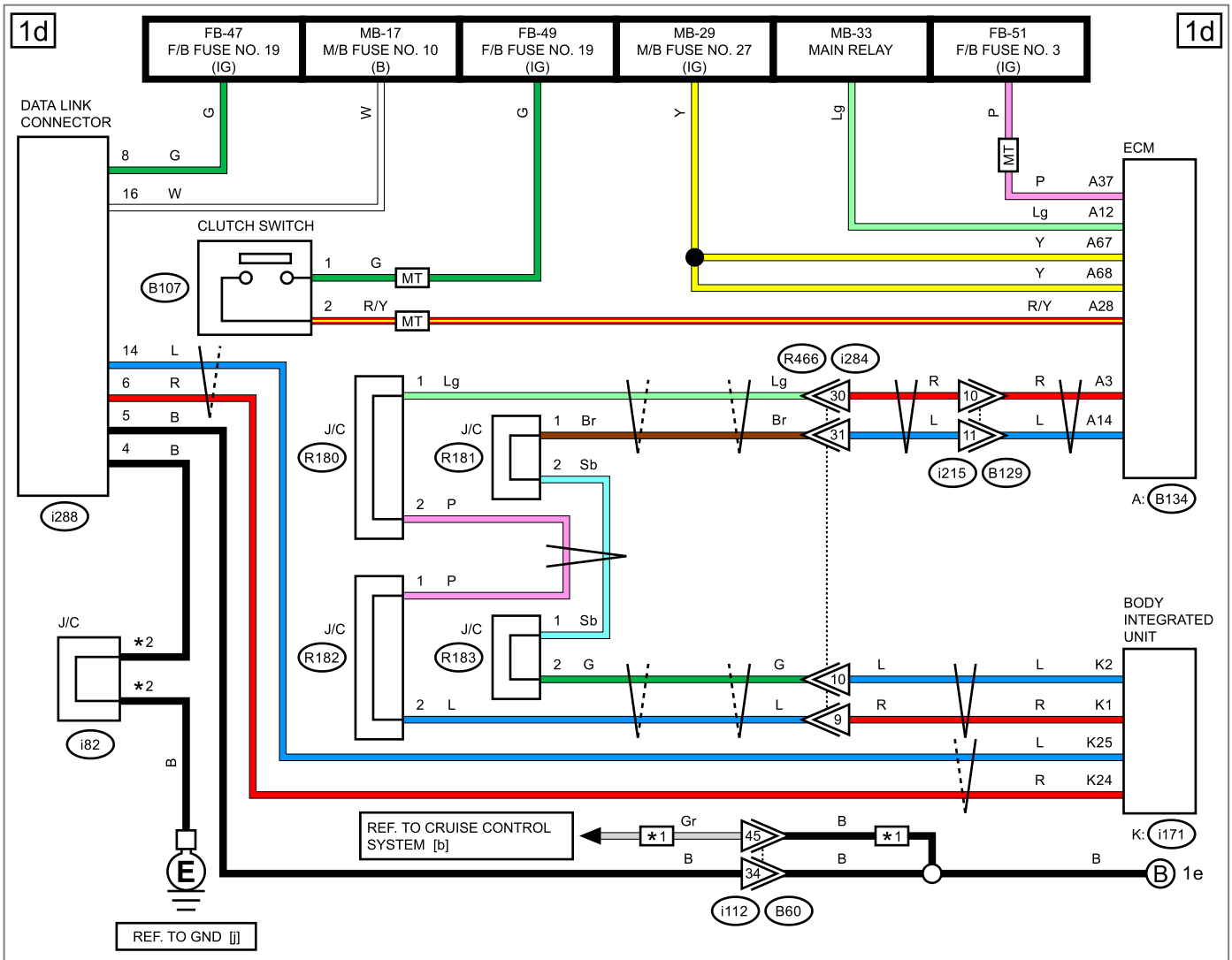
*1 : MT MODEL : Lg
CVT MODEL : W

*2 : MT MODEL : Lg
CVT MODEL : V

*3 : MT MODEL : L
CVT MODEL : Gr

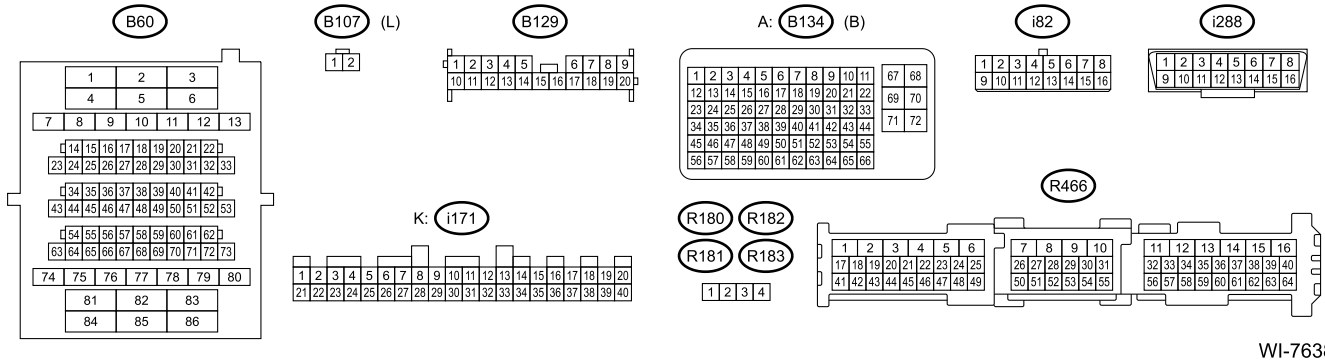


WI-68544



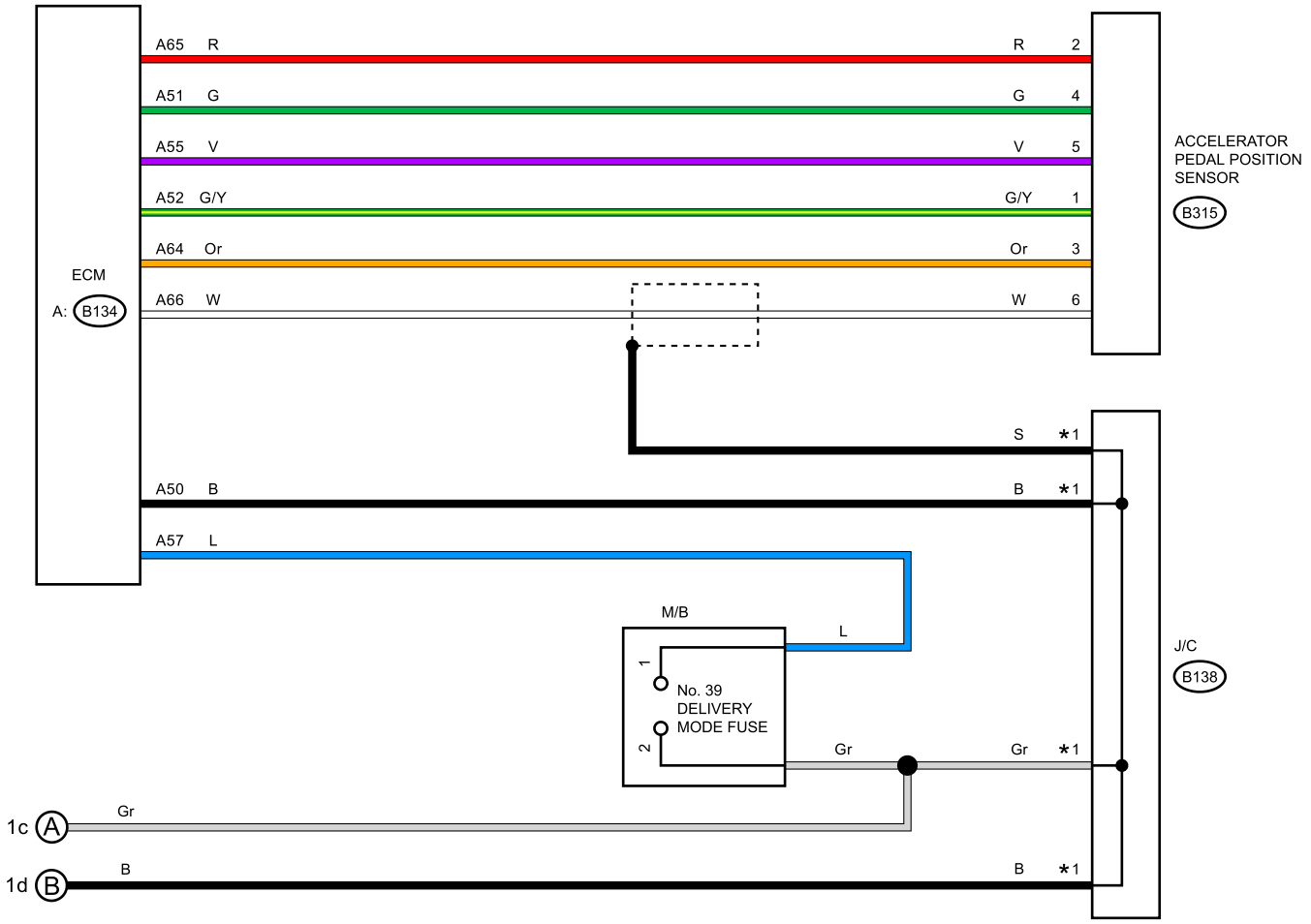
*1 : WITHOUT EyeSight

*2 : TERMINAL No. OPTIONAL ARRANGEMENT



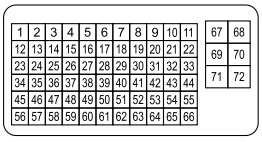
WI-76385

1e



*1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6

A: B134 (B)



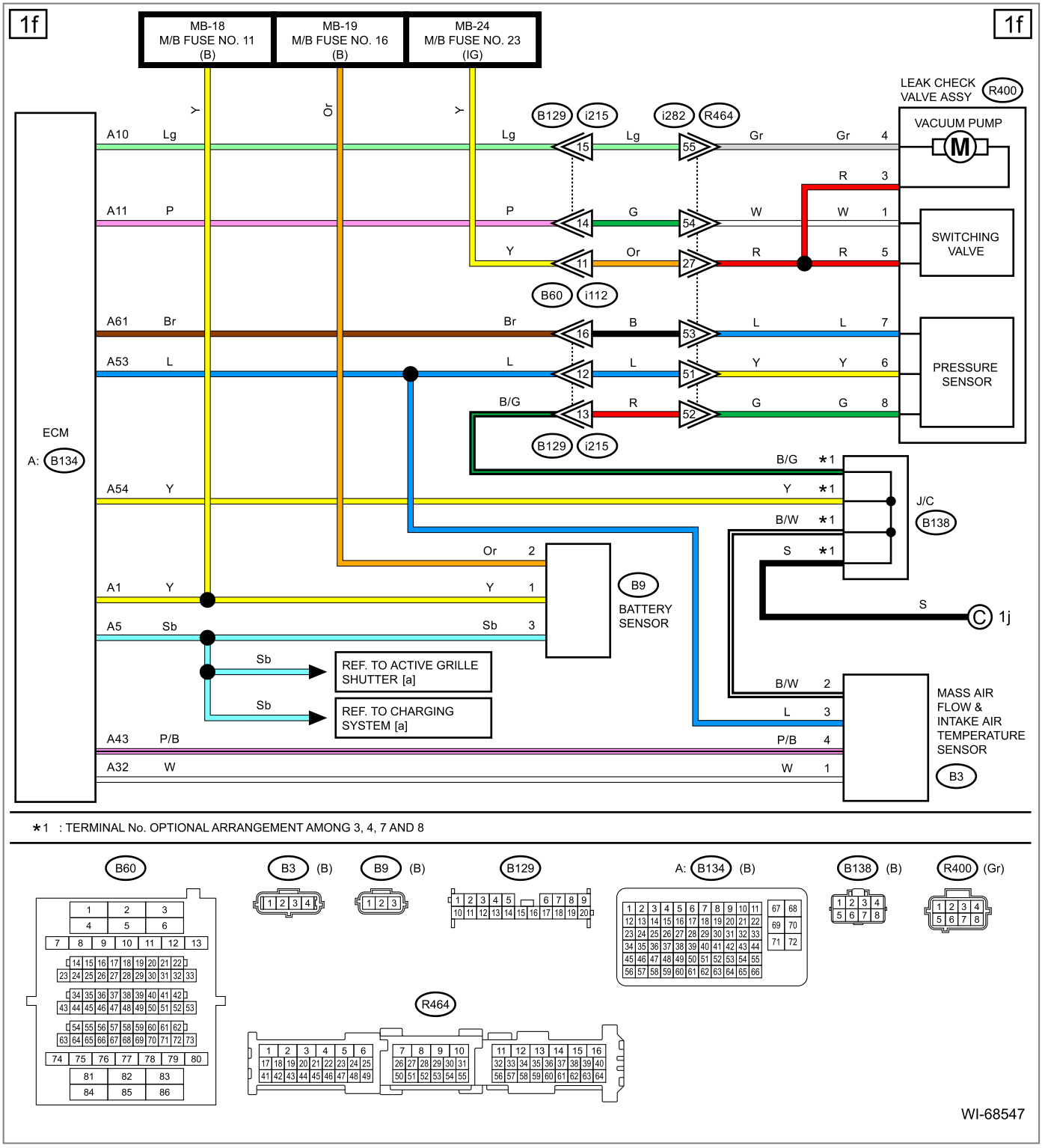
B138 (B)



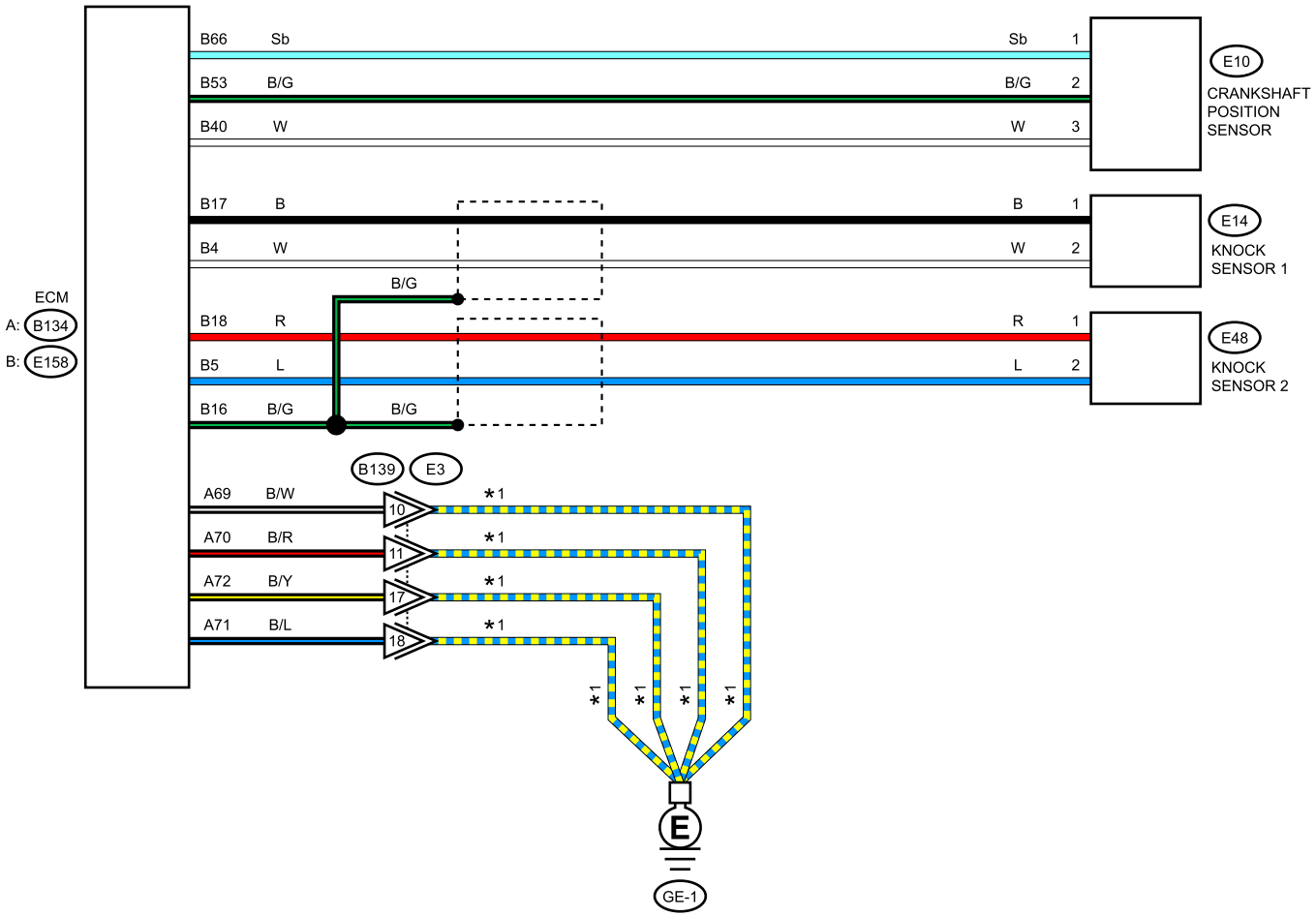
B315 (B)



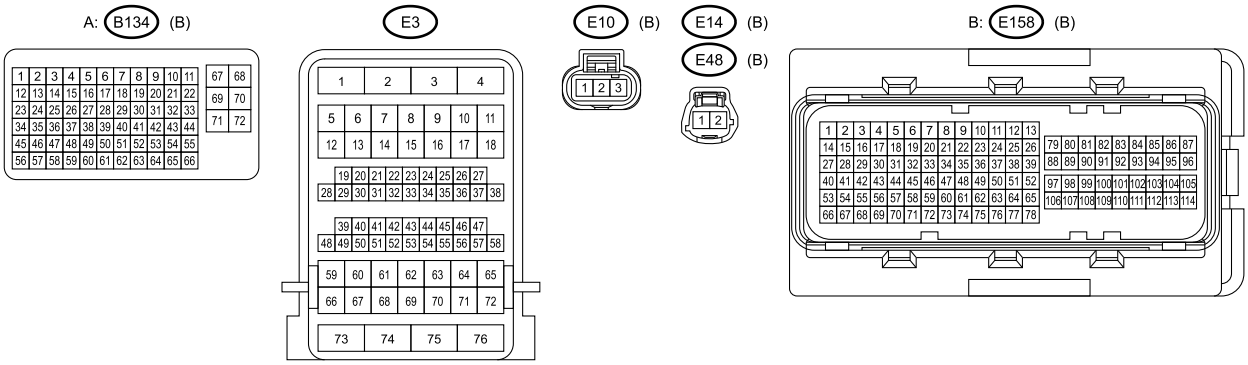
WI-68546


1f
1f
MB-18
M/B FUSE NO. 11
(B)
MB-19
M/B FUSE NO. 16
(B)
MB-24
M/B FUSE NO. 23
(IG)
LEAK CHECK
VALVE ASSY
R400
VACUUM PUMP
M
SWITCHING
VALVE
PRESSURE
SENSOR
ECM
A: B134
B129
i215
i282
R464
B60
i112
J/C
B138
B9
BATTERY
SENSOR
C 1j
REF. TO ACTIVE GRILLE
SHUTTER [a]
REF. TO CHARGING
SYSTEM [a]
MASS AIR
FLOW &
INTAKE AIR
TEMPERATURE
SENSOR
B3
A10 Lg
A11 P
A61 Br
A53 L
A54 Y
A1 Y
A5 Sb
A43 P/B
A32 W
Y
Or
Y
Lg
P
Y
Br
L
B/G
Y
Sb
Sb
Lg
G
Or
B
L
R
Gr
W
R
L
Y
G
P/B
W
B/G *1
Y *1
B/W *1
S *1
S
Or 2
Y 1
Sb 3
B/W 2
L 3
P/B 4
W 1
4
3
1
5
7
6
8
*1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 3, 4, 7 AND 8
B60
B3 (B)
B9 (B)
B129
A: B134 (B)
B138 (B)
R400 (Gr)
R464
WI-68547

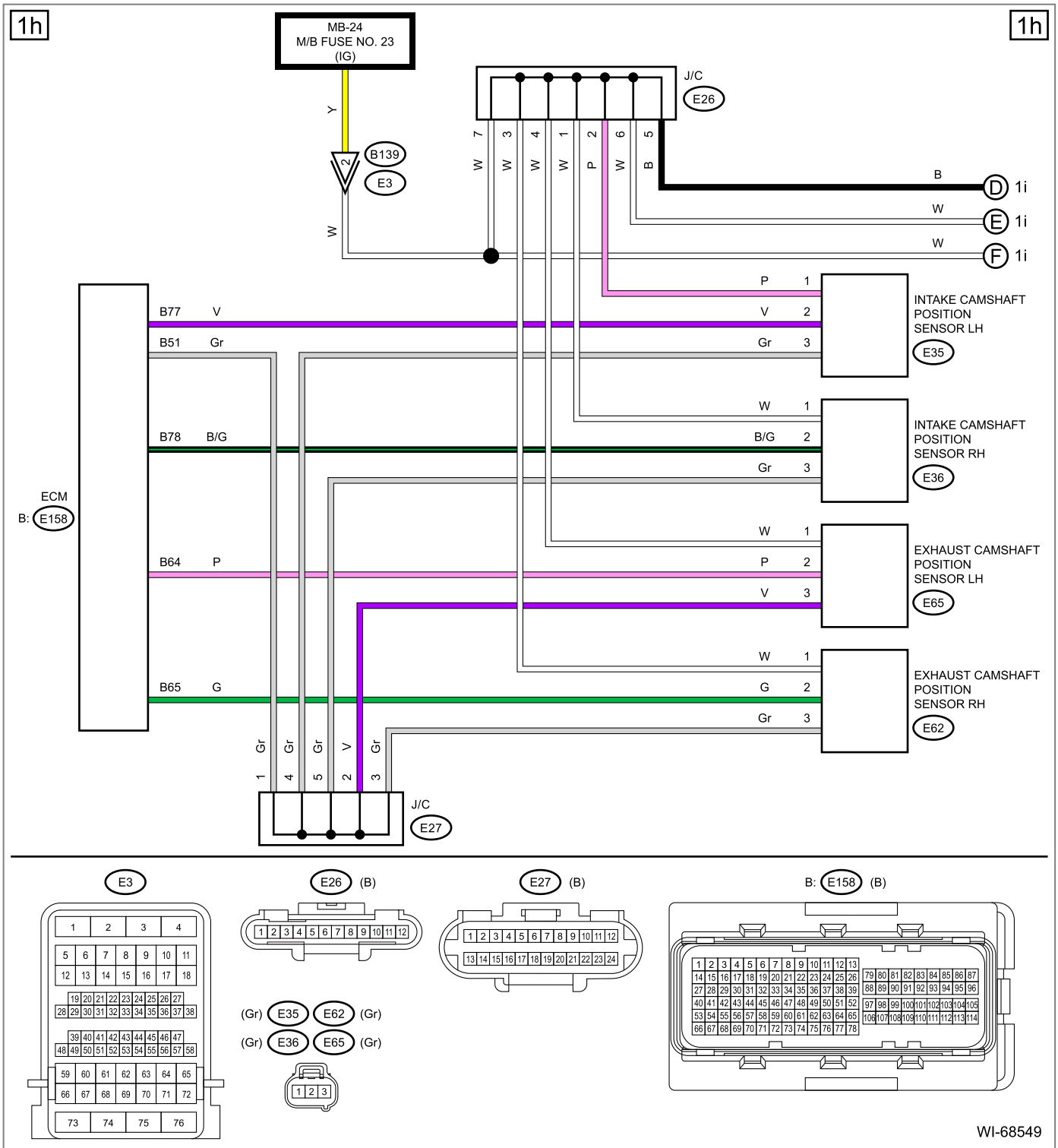
1g



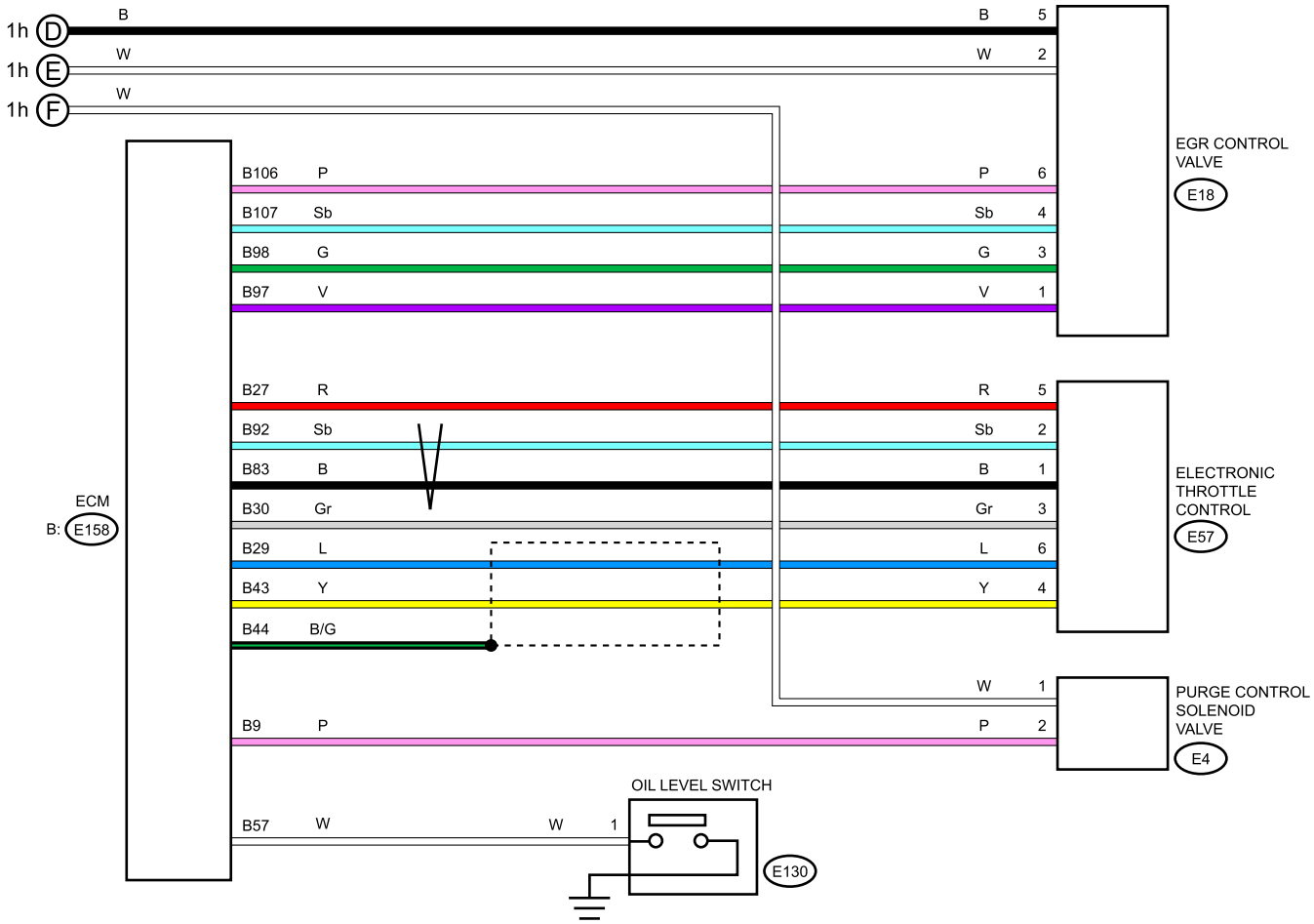
*1 : MT MODEL : Gr
CVT MODEL : B

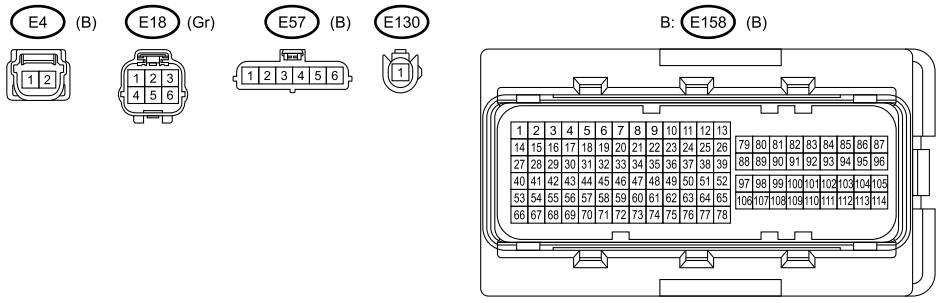


WI-68548

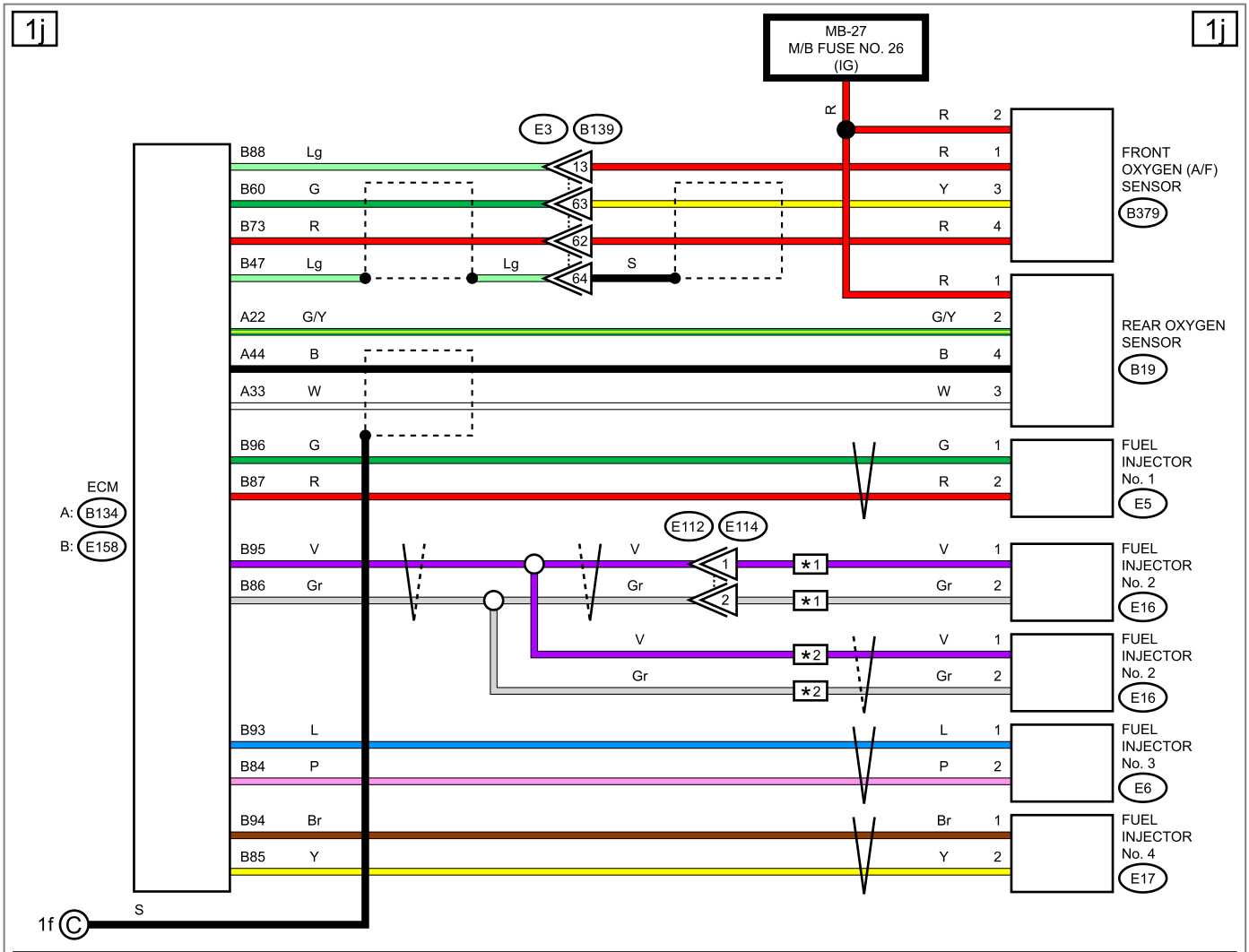

1h
1h
MB-24
M/B FUSE NO. 23
(IG)
Y
B139
E3
W
J/C
E26
W 7
W 3
W 4
W 1
P 2
W 6
B 5
B
D 1i
W
E 1i
W
F 1i
ECM
B: E158
B77 V
B51 Gr
B78 B/G
B64 P
B65 G
P 1
V 2
Gr 3
INTAKE CAMSHAFT POSITION SENSOR LH
E35
W 1
B/G 2
Gr 3
INTAKE CAMSHAFT POSITION SENSOR RH
E36
W 1
P 2
V 3
EXHAUST CAMSHAFT POSITION SENSOR LH
E65
W 1
G 2
Gr 3
EXHAUST CAMSHAFT POSITION SENSOR RH
E62
Gr 1
Gr 4
Gr 5
V 2
Gr 3
J/C
E27
E3
E26 (B)
E27 (B)
B: E158 (B)
(Gr) E35 E62 (Gr)
(Gr) E36 E65 (Gr)
WI-68549

1i

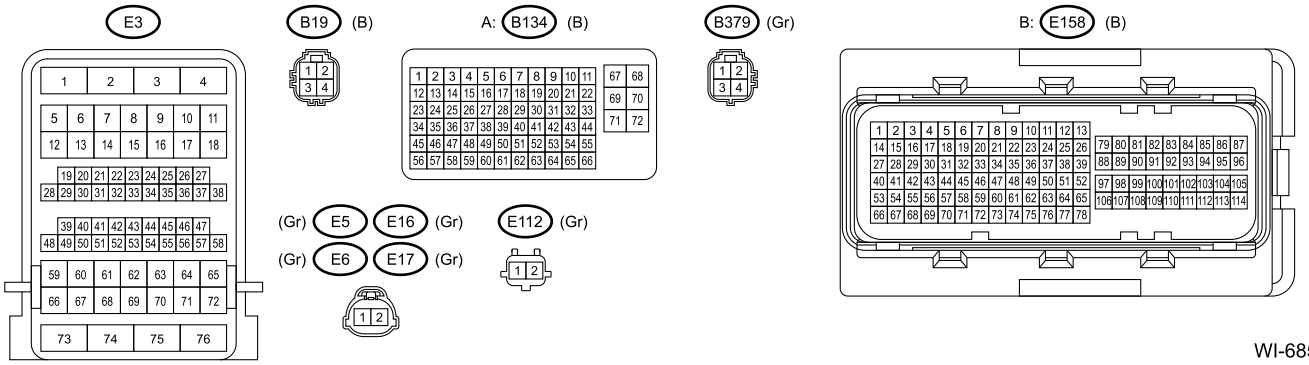

1h D
1h E
1h F
B
W
W
B 5
W 2
EGR CONTROL VALVE
E18
B106 P
B107 Sb
B98 G
B97 V
P 6
Sb 4
G 3
V 1
B27 R
B92 Sb
B83 B
B30 Gr
B29 L
B43 Y
B44 B/G
R 5
Sb 2
B 1
Gr 3
L 6
Y 4
ELECTRONIC THROTTLE CONTROL
E57
ECM
B: E158
W 1
PURGE CONTROL SOLENOID VALVE
E4
B9 P
P 2
OIL LEVEL SWITCH
B57 W
W 1
E130


E4 (B)
E18 (Gr)
E57 (B)
E130
B: E158 (B)

WI-68550

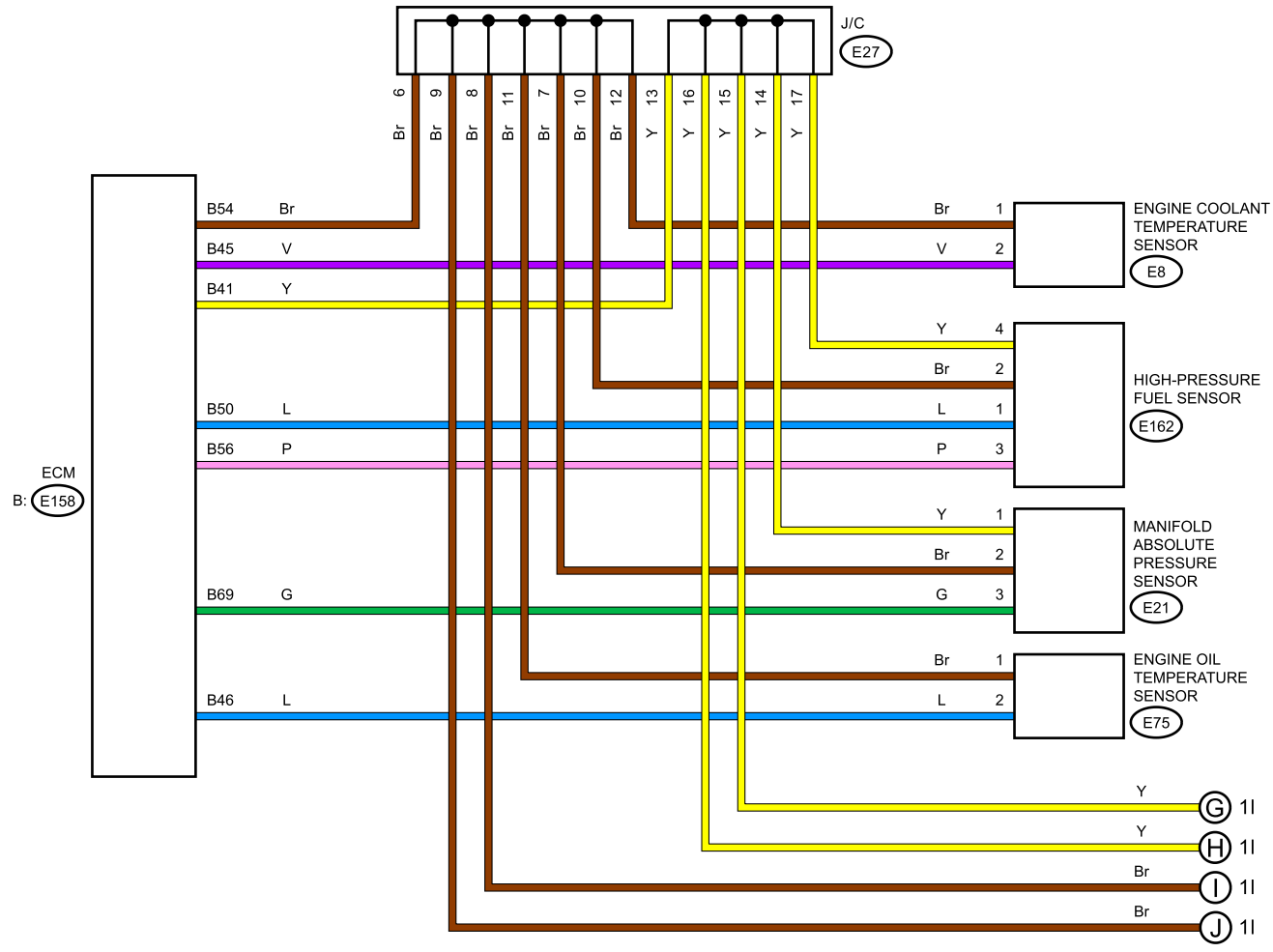


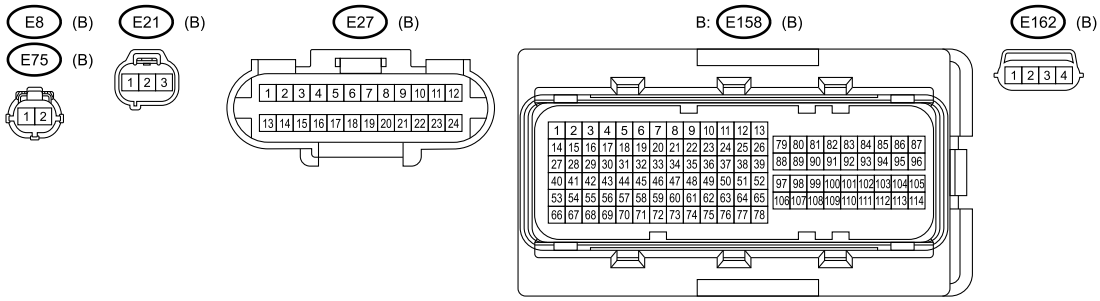
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE



WI-68551

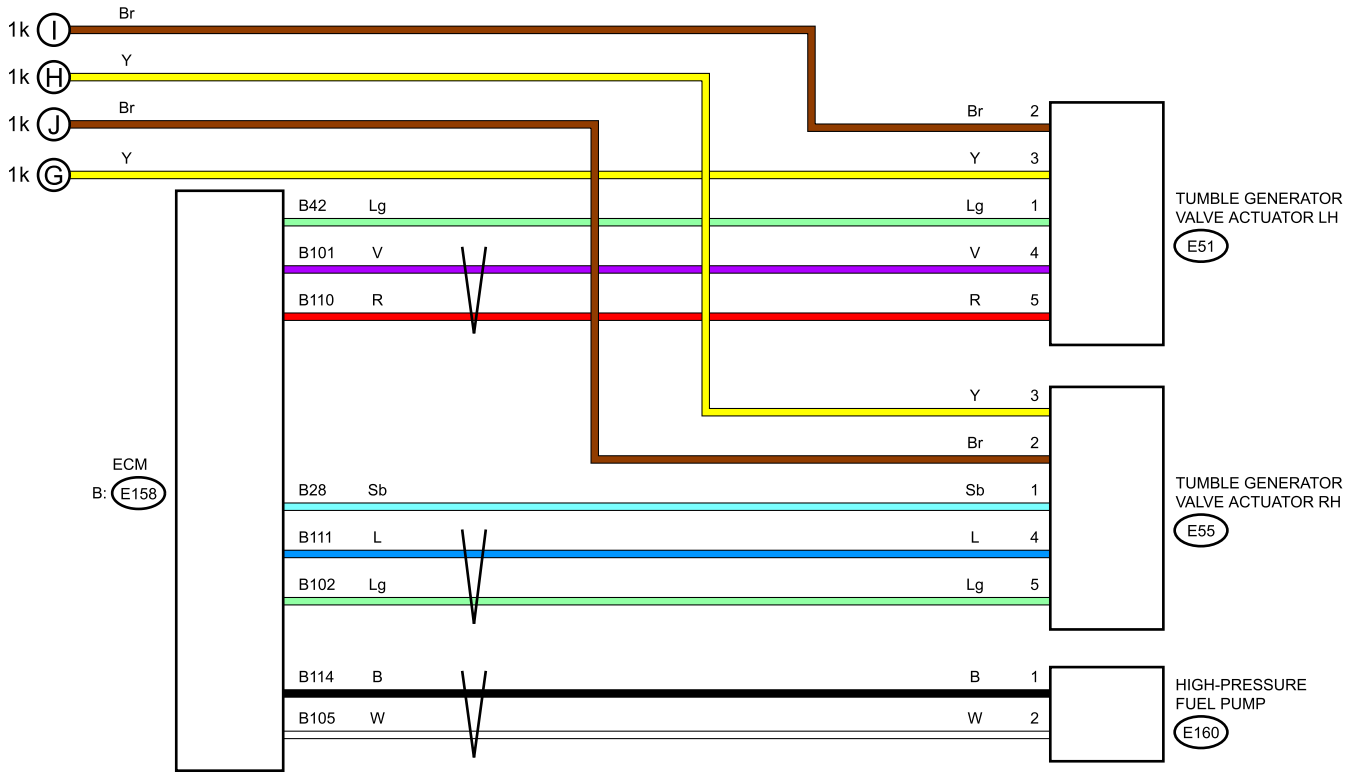
1k

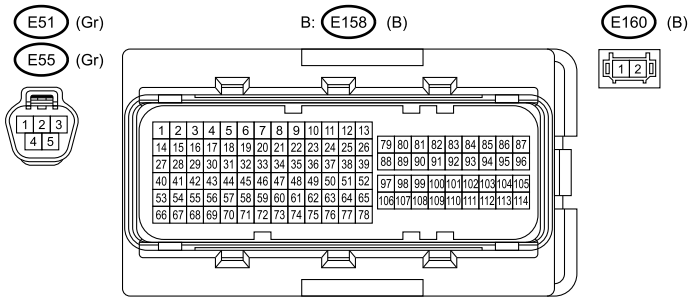

J/C
E27
6 Br
9 Br
8 Br
11 Br
7 Br
10 Br
12 Br
13 Y
16 Y
15 Y
14 Y
17 Y
ECM
B: E158
B54 Br
B45 V
B41 Y
B50 L
B56 P
B69 G
B46 L
Br 1
V 2
ENGINE COOLANT TEMPERATURE SENSOR
E8
Y 4
Br 2
L 1
P 3
HIGH-PRESSURE FUEL SENSOR
E162
Y 1
Br 2
G 3
MANIFOLD ABSOLUTE PRESSURE SENSOR
E21
Br 1
L 2
ENGINE OIL TEMPERATURE SENSOR
E75
Y G 1I
Y H 1I
Br I 1I
Br J 1I


E8 (B)
E75 (B)
E21 (B)
E27 (B)
B: E158 (B)
E162 (B)

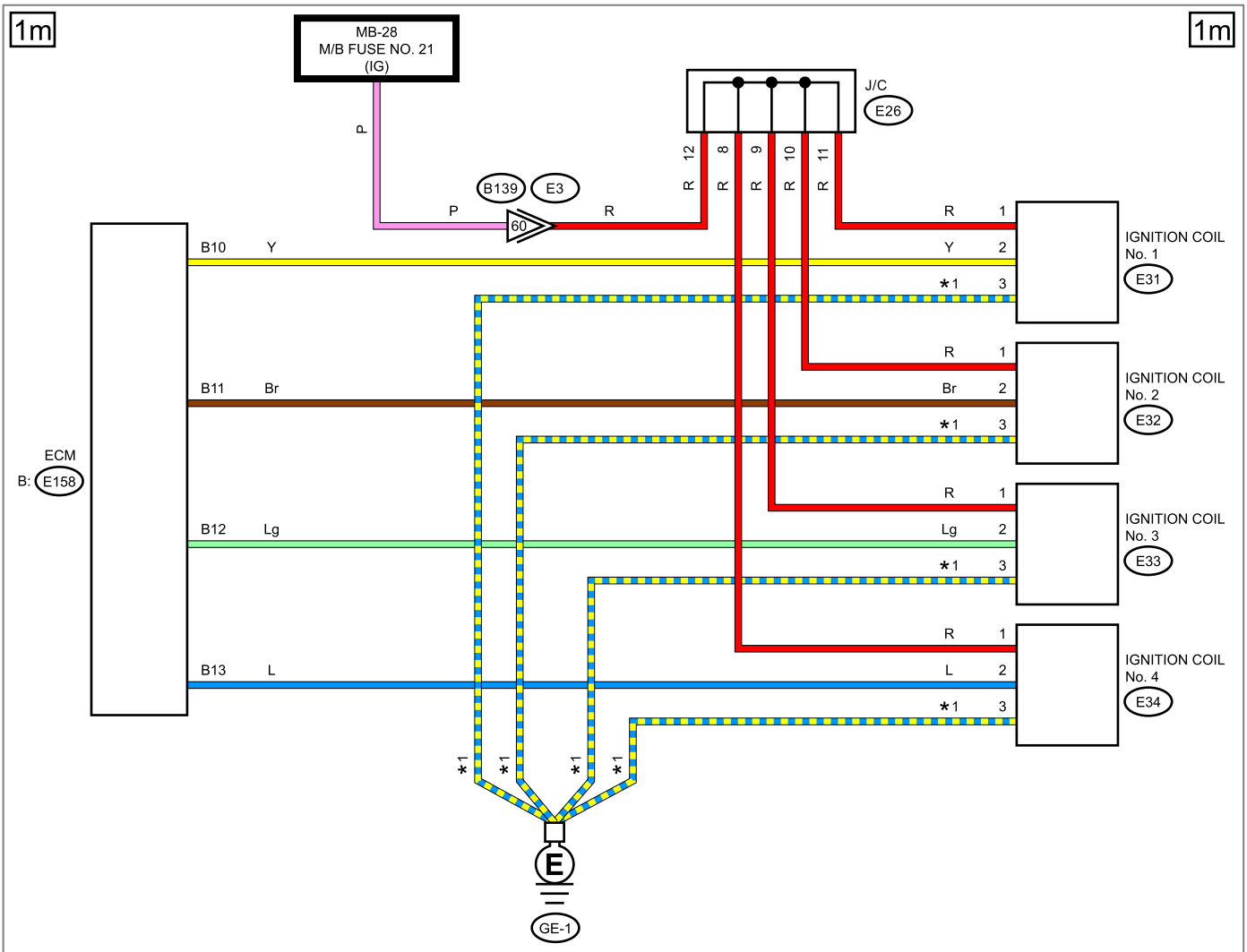
WI-68552

1I

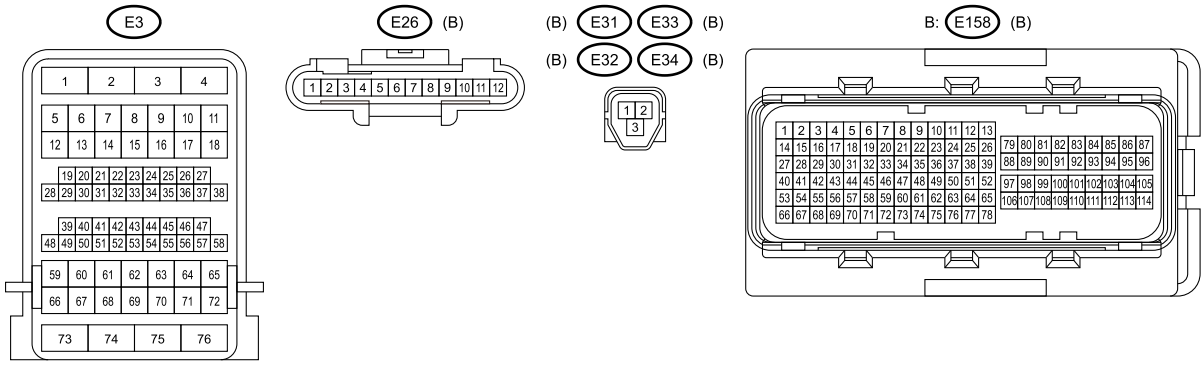

1k I Br
1k H Y
1k J Br
1k G Y
Br 2
Y 3
Lg 1
V 4
R 5
TUMBLE GENERATOR VALVE ACTUATOR LH
E51
Y 3
Br 2
ECM
B: E158
B28 Sb
B111 L
B102 Lg
Sb 1
L 4
Lg 5
TUMBLE GENERATOR VALVE ACTUATOR RH
E55
B114 B
B105 W
B 1
W 2
HIGH-PRESSURE FUEL PUMP
E160


E51 (Gr)
E55 (Gr)
B: E158 (B)
E160 (B)

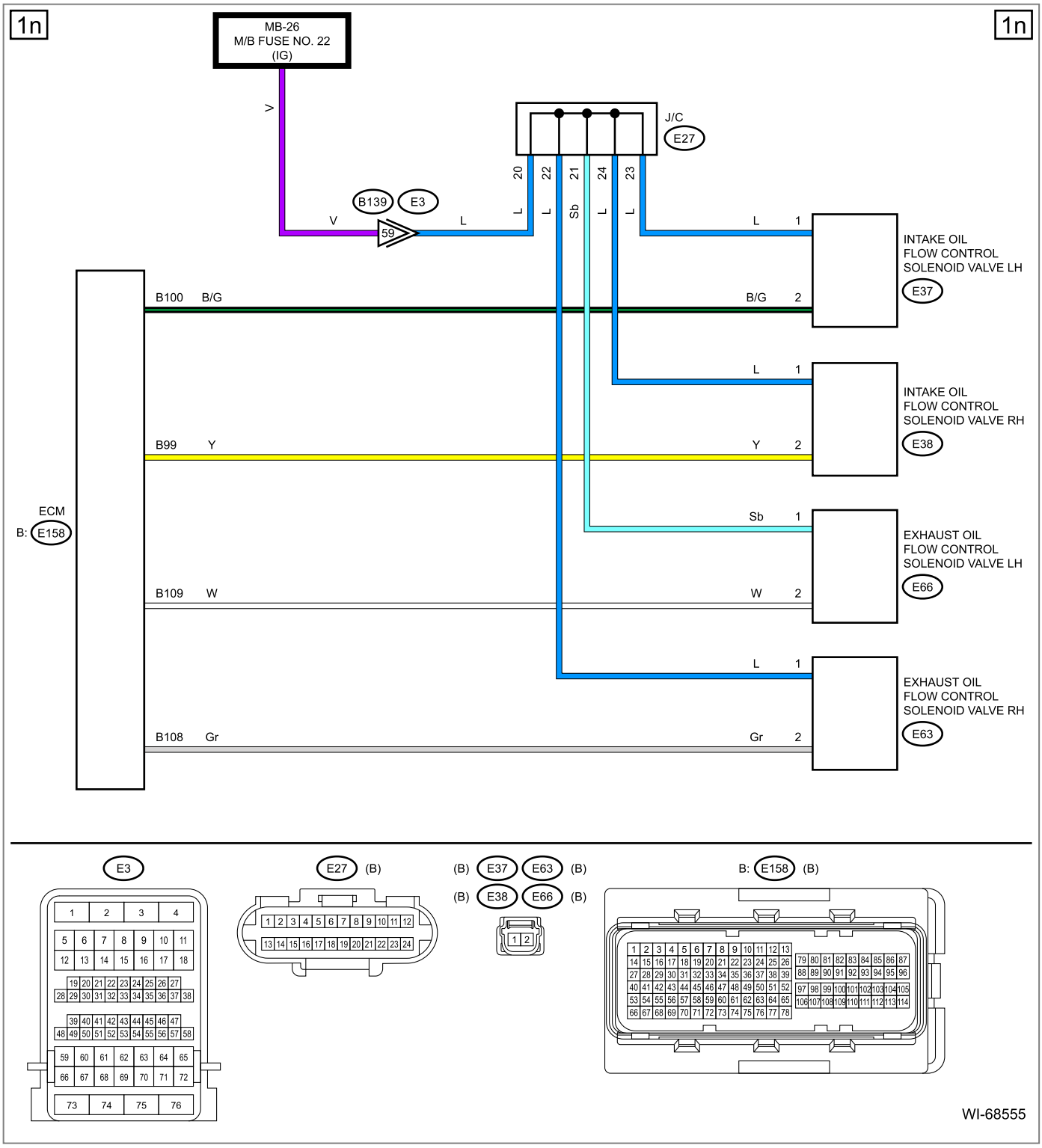
WI-68553



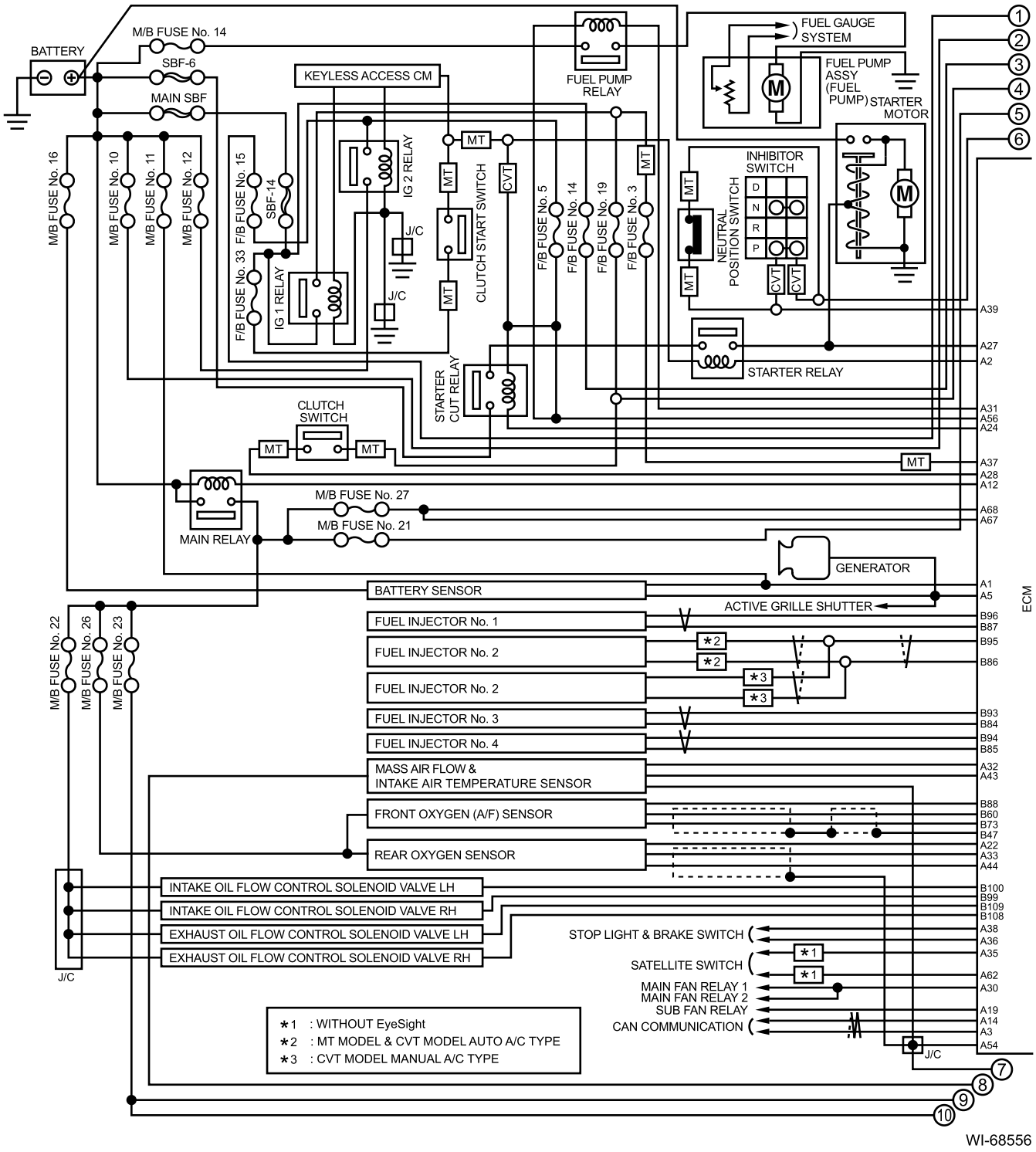
*1 : MT MODEL : Gr
CVT MODEL : B

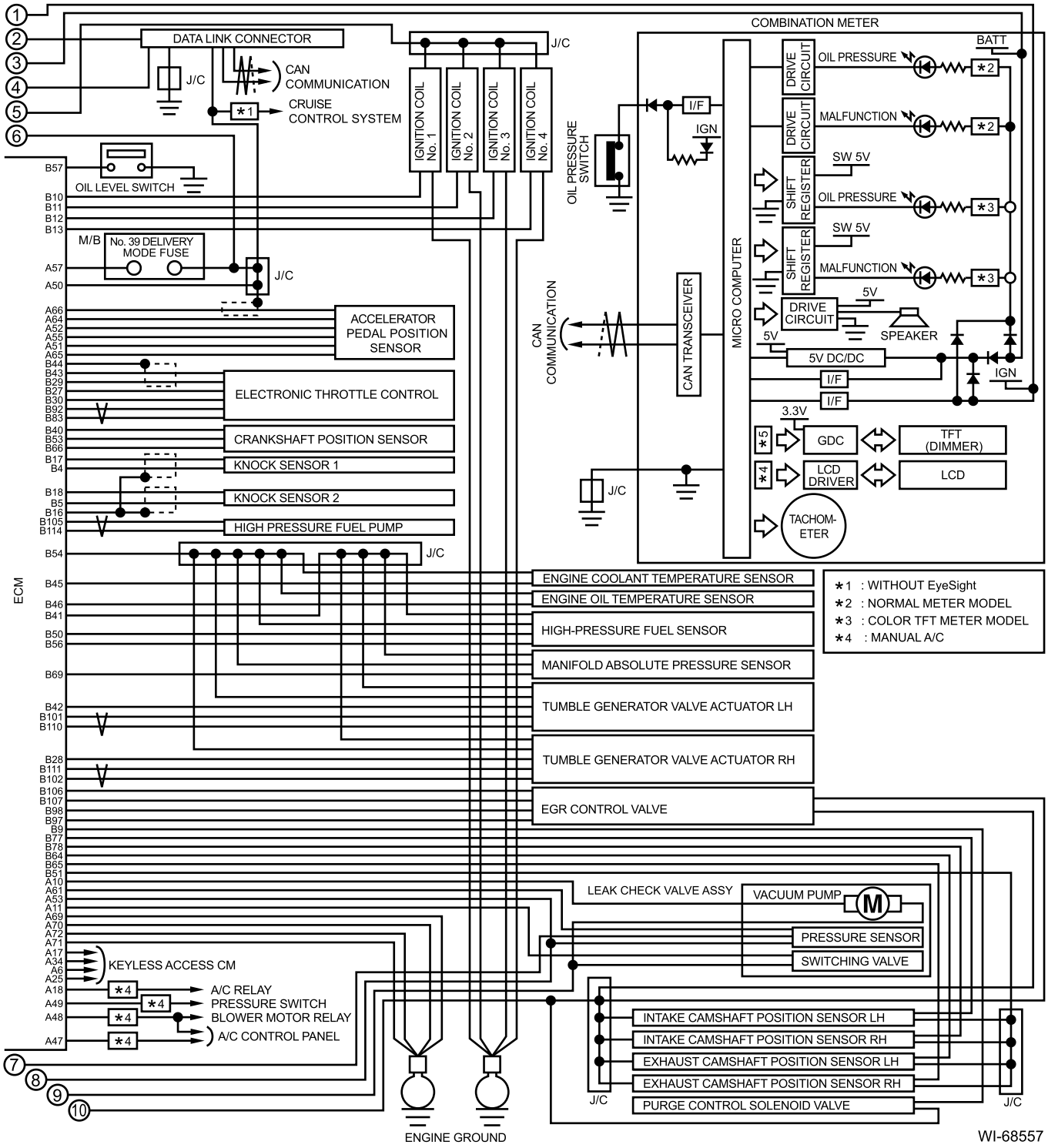


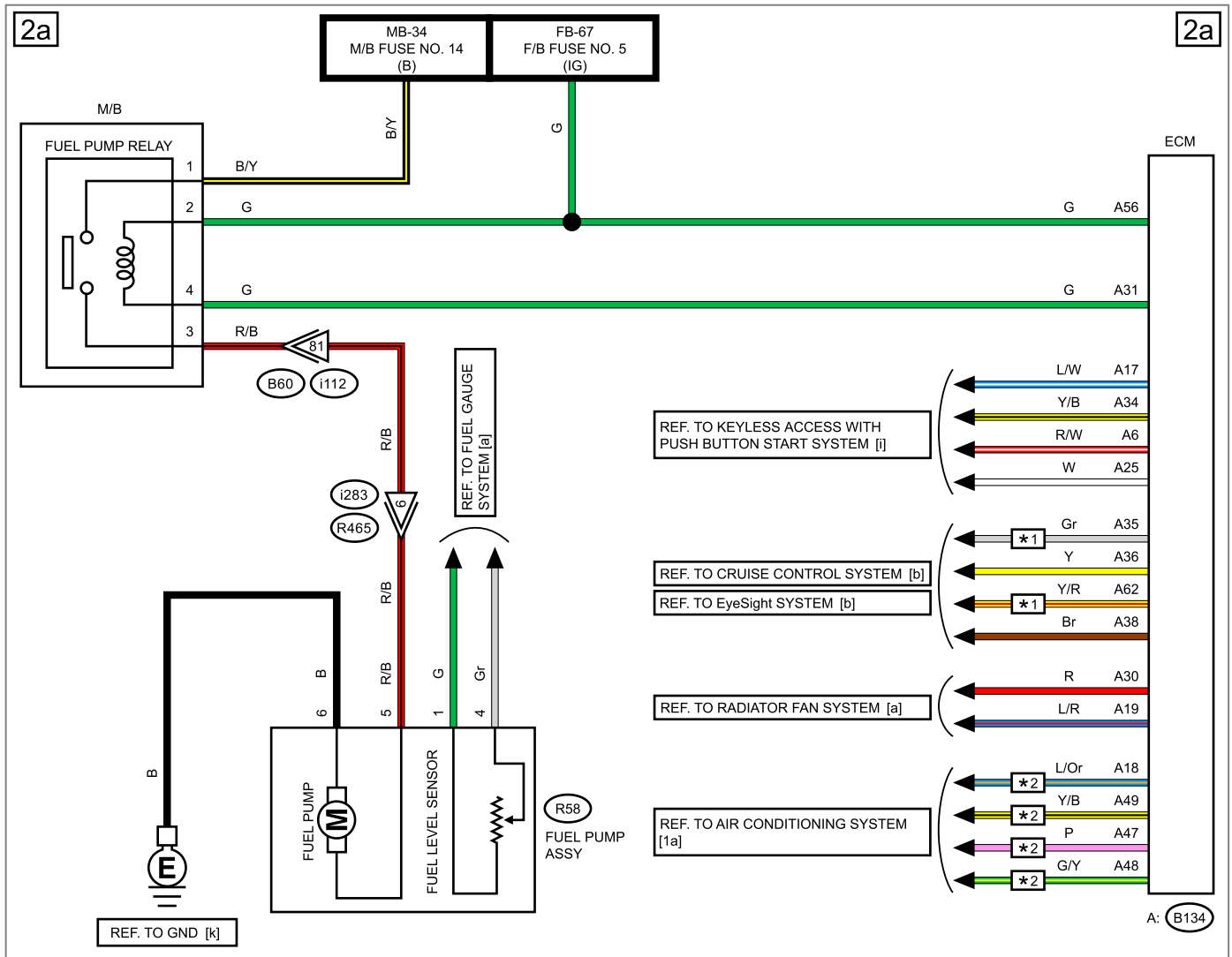
WI-68554

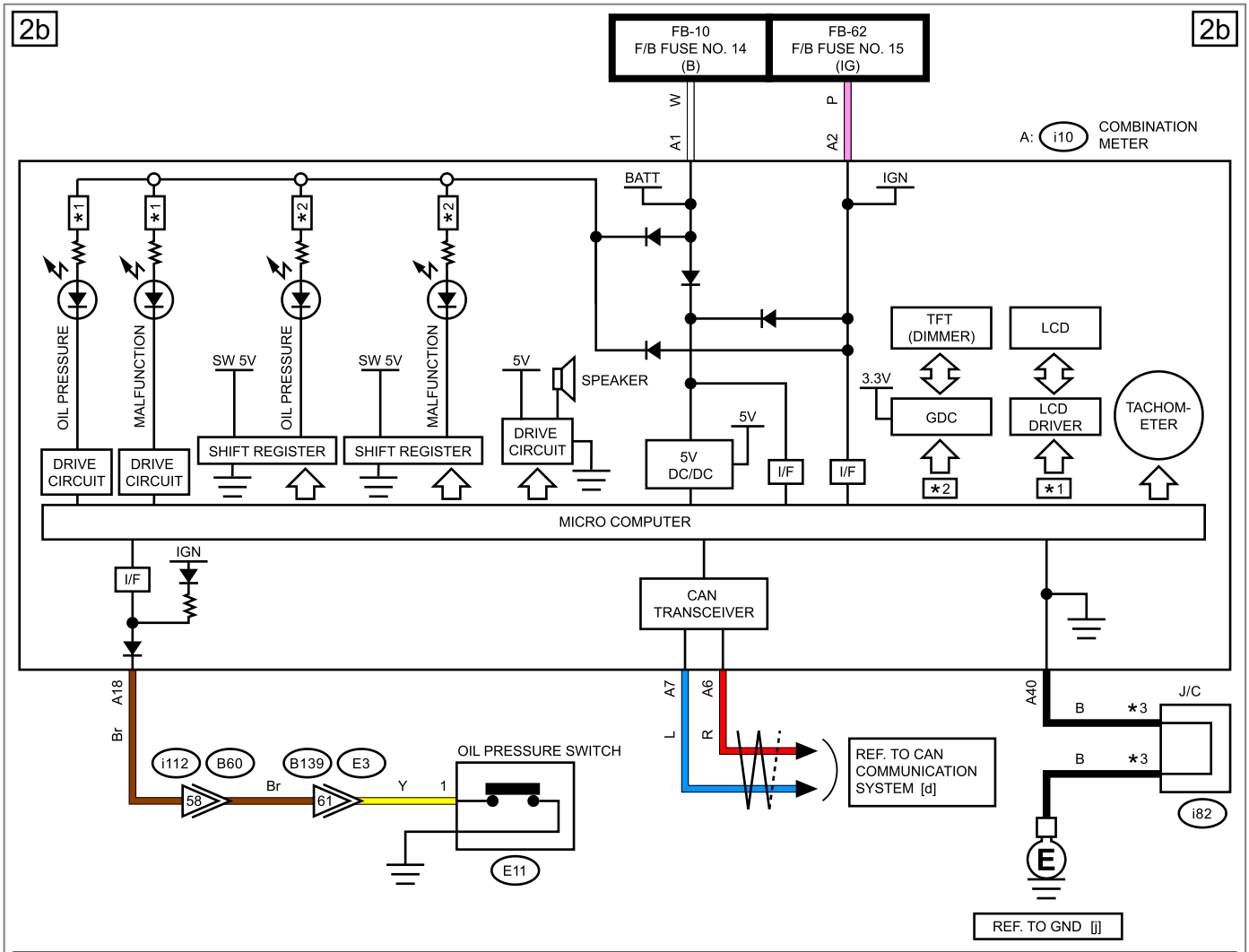

1n
1n
MB-26
M/B FUSE NO. 22
(IG)
V
J/C
E27
B139
E3
V
59
L
20
22
21
24
23
L
L
Sb
L
L
L 1
INTAKE OIL
FLOW CONTROL
SOLENOID VALVE LH
E37
B100 B/G
B/G 2
L 1
INTAKE OIL
FLOW CONTROL
SOLENOID VALVE RH
E38
B99 Y
Y 2
ECM
B: E158
Sb 1
EXHAUST OIL
FLOW CONTROL
SOLENOID VALVE LH
E66
B109 W
W 2
L 1
EXHAUST OIL
FLOW CONTROL
SOLENOID VALVE RH
E63
B108 Gr
Gr 2
E3
E27 (B)
(B) E37 E63 (B)
(B) E38 E66 (B)
B: E158 (B)
WI-68555

2. WITH PUSH BUTTON START




COMBINATION METER
DATA LINK CONNECTOR
J/C
CAN COMMUNICATION
CRUISE CONTROL SYSTEM
IGNITION COIL No. 1
IGNITION COIL No. 2
IGNITION COIL No. 3
IGNITION COIL No. 4
OIL PRESSURE SWITCH
I/F
IGN
BATT
DRIVE CIRCUIT
OIL PRESSURE
MALFUNCTION
SHIFT REGISTER
SW 5V
MICRO COMPUTER
CAN TRANSCEIVER
5V
SPEAKER
5V DC/DC
3.3V
GDC
TFT (DIMMER)
LCD DRIVER
LCD
TACHOM-ETER
OIL LEVEL SWITCH
M/B
No. 39 DELIVERY MODE FUSE
ACCELERATOR PEDAL POSITION SENSOR
ELECTRONIC THROTTLE CONTROL
CRANKSHAFT POSITION SENSOR
KNOCK SENSOR 1
KNOCK SENSOR 2
HIGH PRESSURE FUEL PUMP
ECM
ENGINE COOLANT TEMPERATURE SENSOR
ENGINE OIL TEMPERATURE SENSOR
HIGH-PRESSURE FUEL SENSOR
MANIFOLD ABSOLUTE PRESSURE SENSOR
TUMBLE GENERATOR VALVE ACTUATOR LH
TUMBLE GENERATOR VALVE ACTUATOR RH
EGR CONTROL VALVE
LEAK CHECK VALVE ASSY
VACUUM PUMP
PRESSURE SENSOR
SWITCHING VALVE
KEYLESS ACCESS CM
A/C RELAY
PRESSURE SWITCH
BLOWER MOTOR RELAY
A/C CONTROL PANEL
INTAKE CAMSHAFT POSITION SENSOR LH
INTAKE CAMSHAFT POSITION SENSOR RH
EXHAUST CAMSHAFT POSITION SENSOR LH
EXHAUST CAMSHAFT POSITION SENSOR RH
PURGE CONTROL SOLENOID VALVE
ENGINE GROUND
*1 : WITHOUT EyeSight
*2 : NORMAL METER MODEL
*3 : COLOR TFT METER MODEL
*4 : MANUAL A/C
WI-68557


2a
2a
MB-34
M/B FUSE NO. 14
(B)
FB-67
F/B FUSE NO. 5
(IG)
M/B
FUEL PUMP RELAY
B/Y
G
ECM
1
2
4
3
B/Y
G
G
A56
G
G
A31
R/B
81
B60
i112
R/B
i283
R465
6
REF. TO FUEL GAUGE SYSTEM [a]
R/B
R/B
B
6
5
G
1
Gr
4
B
E
REF. TO GND [k]
FUEL PUMP
FUEL LEVEL SENSOR
R58
FUEL PUMP ASSY
REF. TO KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM [i]
L/W
A17
Y/B
A34
R/W
A6
W
A25
REF. TO CRUISE CONTROL SYSTEM [b]
REF. TO EyeSight SYSTEM [b]
Gr
A35
*1
Y
A36
Y/R
A62
*1
Br
A38
REF. TO RADIATOR FAN SYSTEM [a]
R
A30
L/R
A19
REF. TO AIR CONDITIONING SYSTEM [1a]
L/Or
A18
*2
Y/B
A49
*2
P
A47
*2
G/Y
A48
*2
A:
B134
*1 : WITHOUT EyeSight
*2 : MANUAL A/C
B60
A:
B134
(B)
R58
(Gr)
R465
WI-68558



*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

B60

1	2	3				
4	5	6				
7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53
54	55	56	57	58	59	60	61	62
63	64	65	66	67	68	69	70	71	72	73
74	75	76	77	78	79	80
81	82	83				
84	85	86				

E3

1	2	3	4			
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46	47
48	49	50	51	52	53	54	55	56	57	58
59	60	61	62	63	64	65
66	67	68	69	70	71	72
73	74	75	76			

E11

1

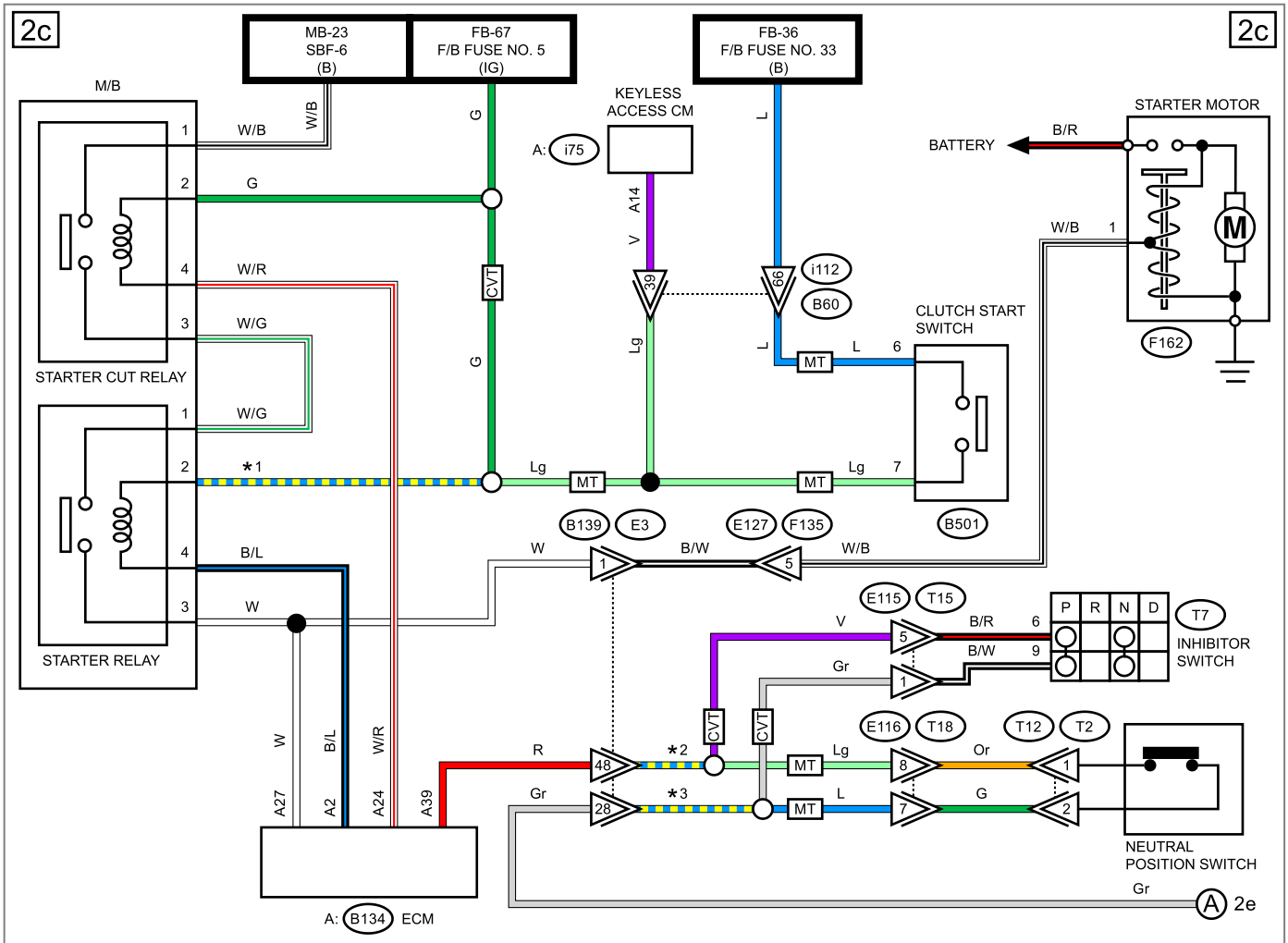
A: i10 (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

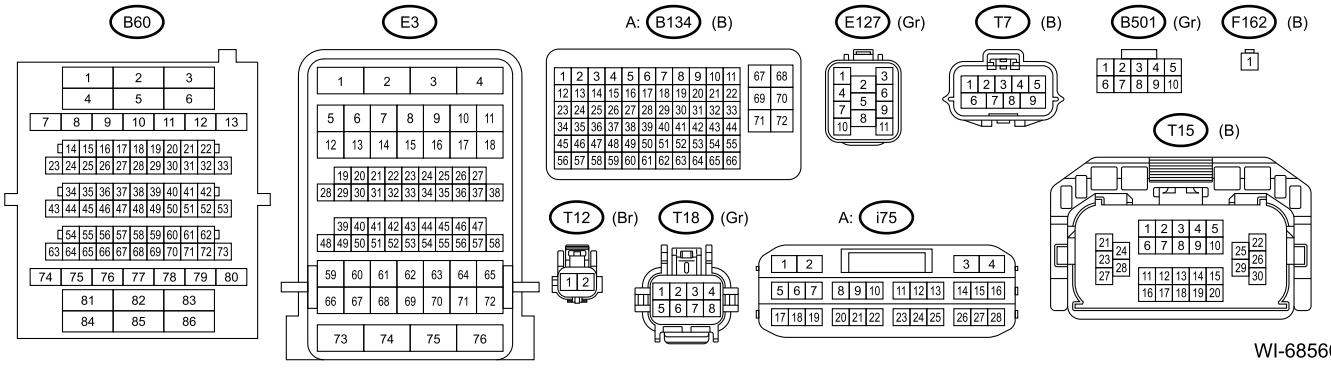
WI-68559

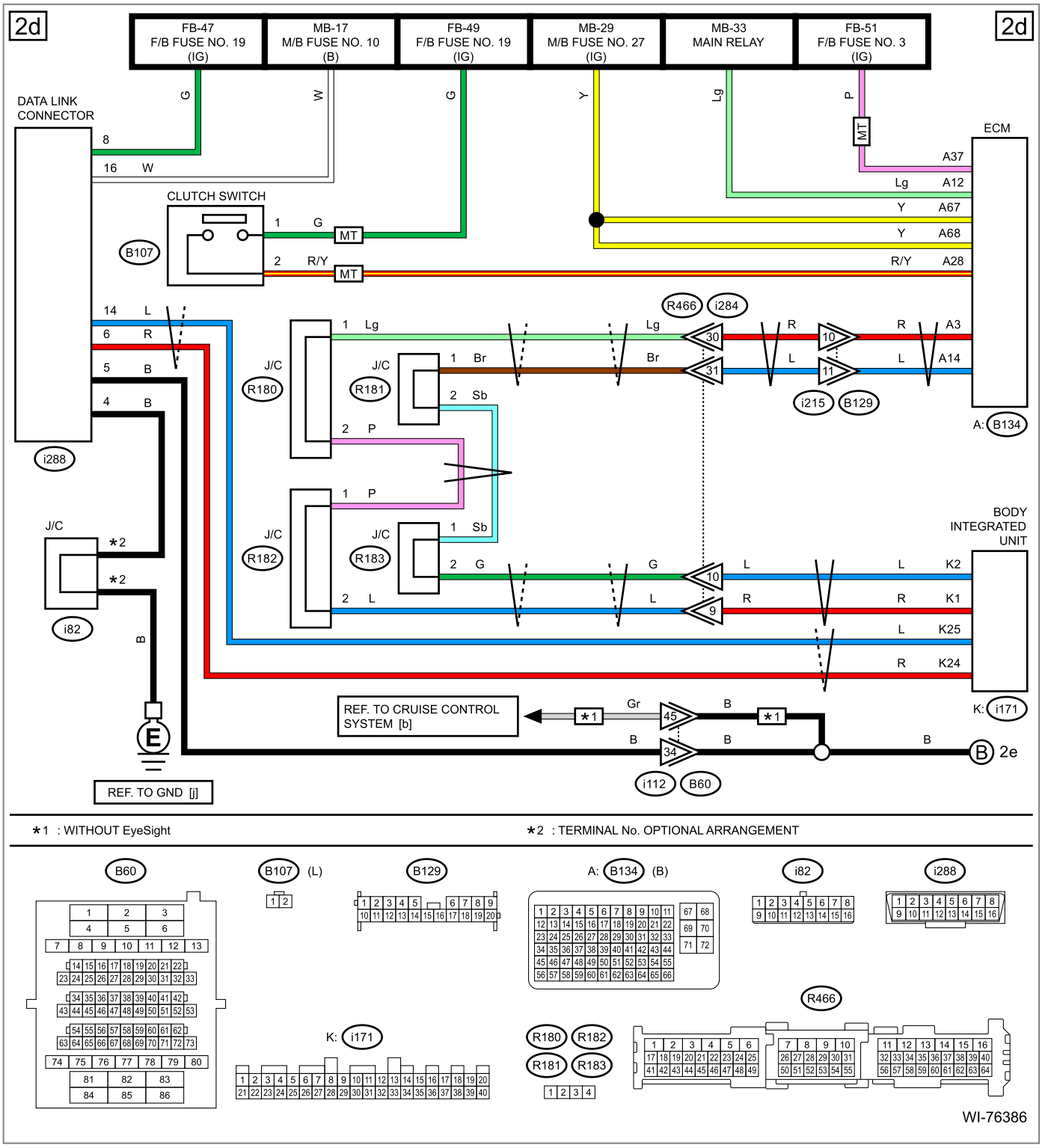


*1 : MT MODEL : Lg
CVT MODEL : G

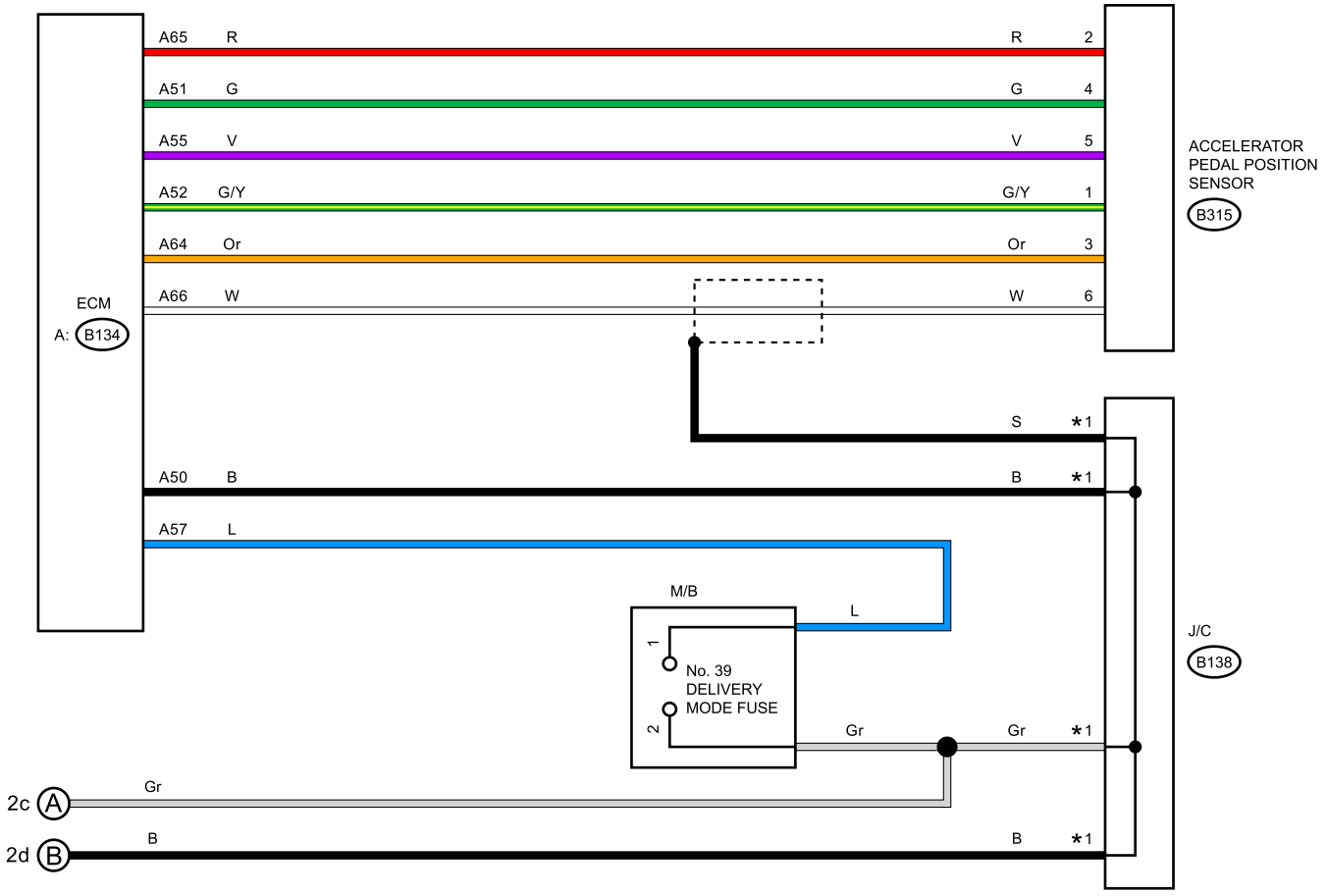
*2 : MT MODEL : Lg
CVT MODEL : V

*3 : MT MODEL : L
CVT MODEL : Gr



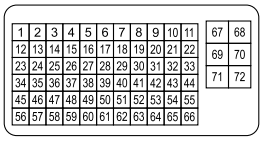

2d
2d
FB-47
F/B FUSE NO. 19
(IG)
MB-17
M/B FUSE NO. 10
(B)
FB-49
F/B FUSE NO. 19
(IG)
MB-29
M/B FUSE NO. 27
(IG)
MB-33
MAIN RELAY
FB-51
F/B FUSE NO. 3
(IG)
DATA LINK
CONNECTOR
ECM
CLUTCH SWITCH
B107
MT
A37
A12
A67
A68
A28
R466
i284
i215
B129
A: B134
i288
J/C
R180
R181
R182
R183
BODY
INTEGRATED
UNIT
i82
K: i171
REF. TO CRUISE CONTROL
SYSTEM [b]
REF. TO GND [j]
B 2e
i112
B60
*1 : WITHOUT EyeSight
*2 : TERMINAL No. OPTIONAL ARRANGEMENT
B60
B107 (L)
B129
A: B134 (B)
i82
i288
K: i171
R180
R182
R181
R183
R466
WI-76386

2e



*1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6

A: B134 (B)



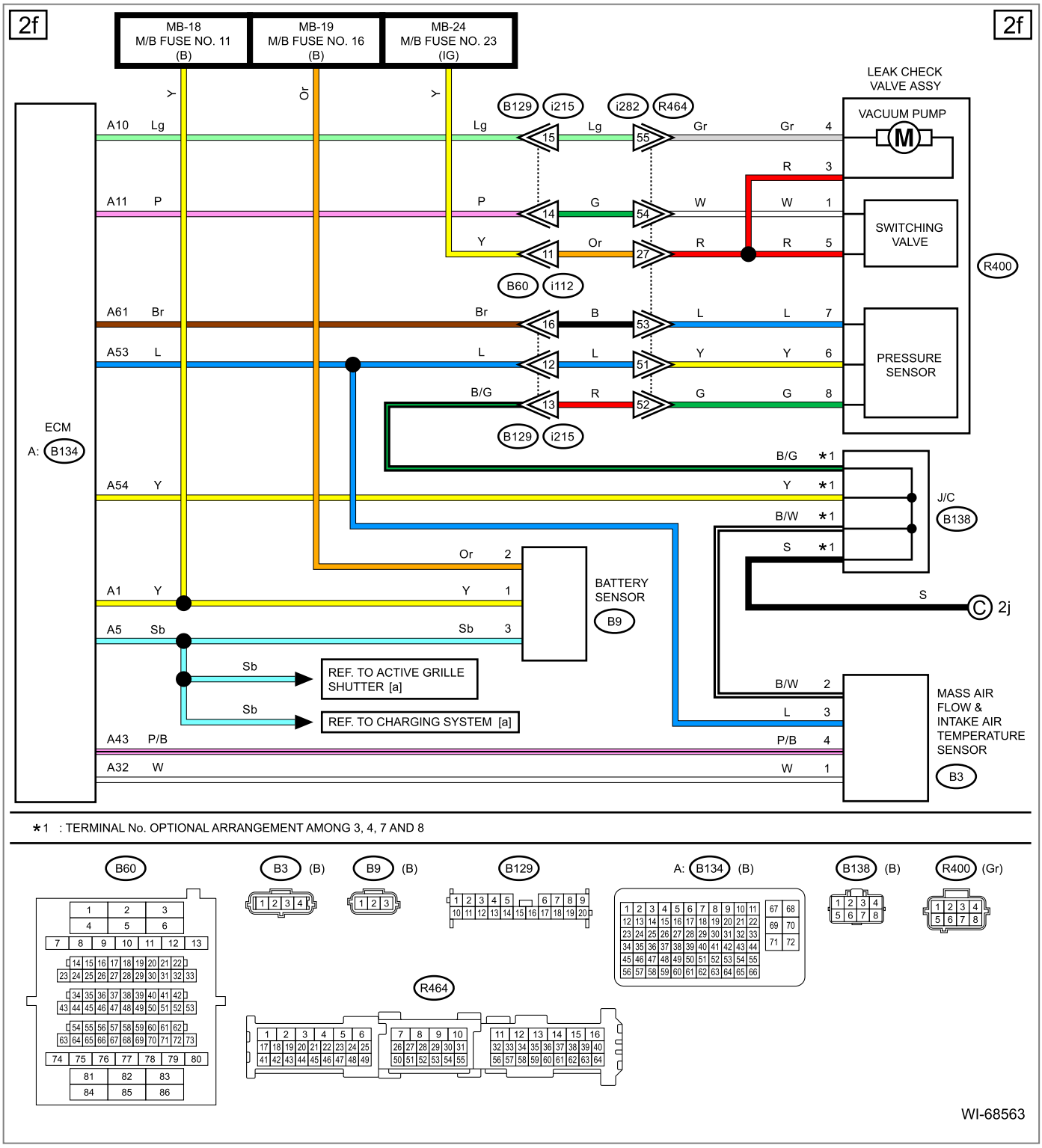
B138 (B)



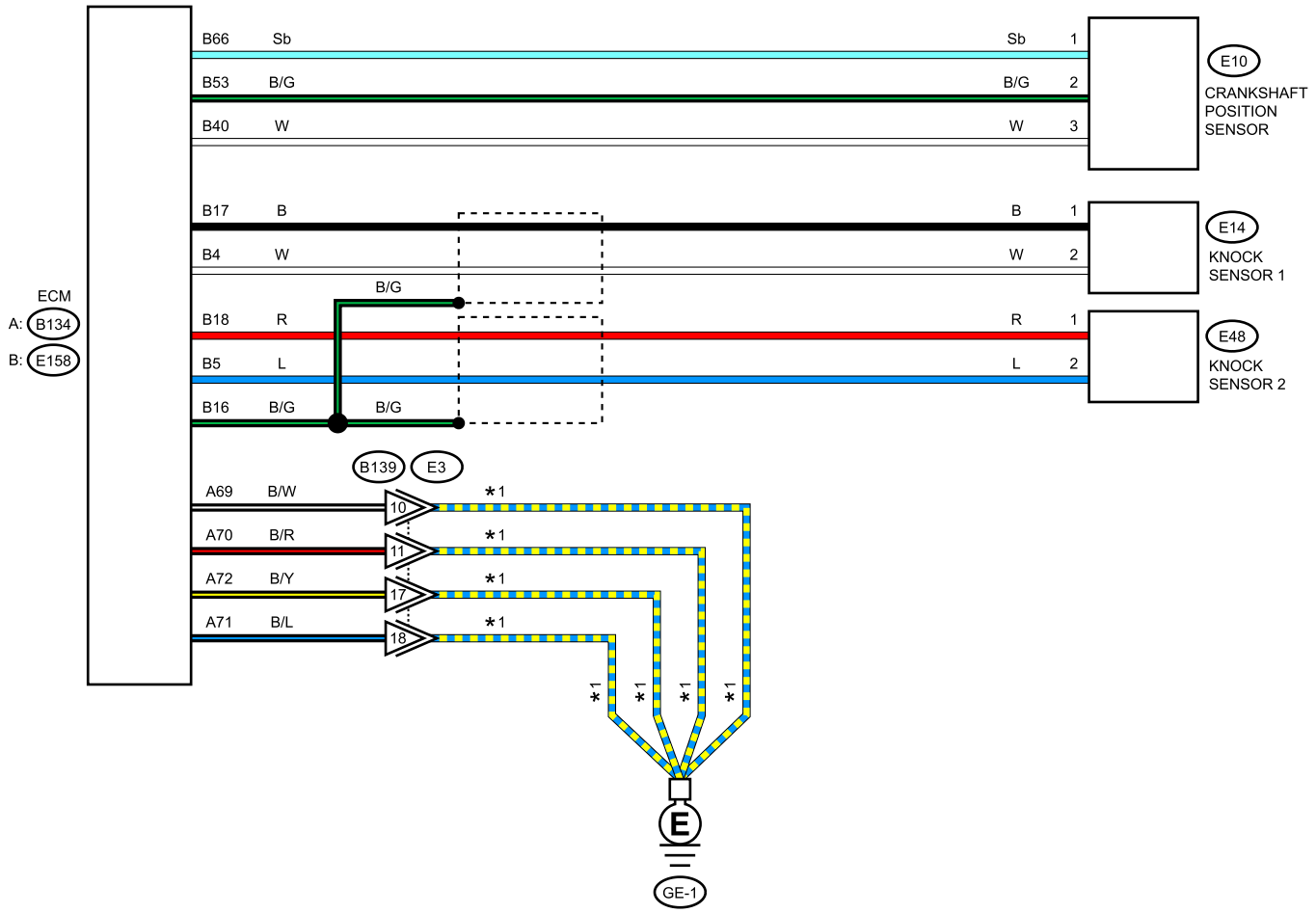
B315 (B)



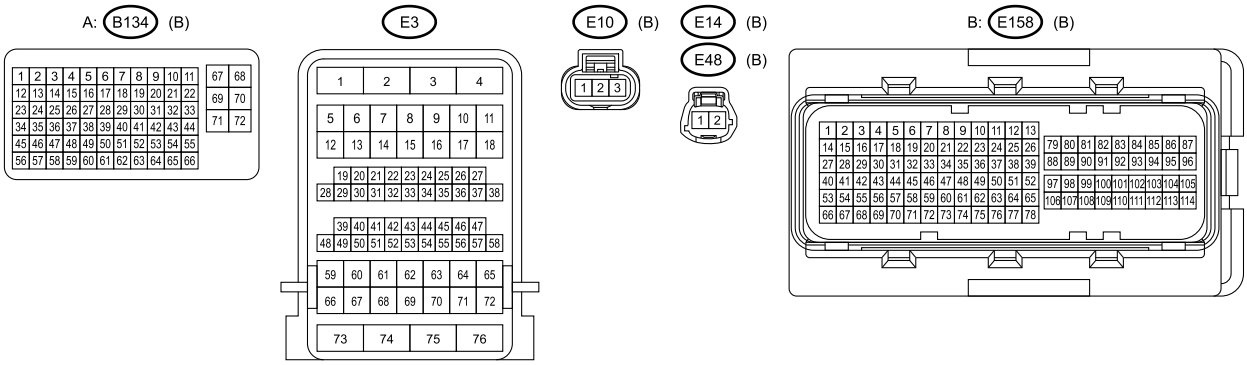
WI-68562


2f
2f
MB-18
M/B FUSE NO. 11
(B)
MB-19
M/B FUSE NO. 16
(B)
MB-24
M/B FUSE NO. 23
(IG)
LEAK CHECK
VALVE ASSY
VACUUM PUMP
M
SWITCHING
VALVE
PRESSURE
SENSOR
R400
ECM
A: B134
A10 Lg
A11 P
A61 Br
A53 L
A54 Y
A1 Y
A5 Sb
A43 P/B
A32 W
B129 i215 i282 R464
B60 i112
B129 i215
J/C
B138
BATTERY
SENSOR
B9
MASS AIR
FLOW &
INTAKE AIR
TEMPERATURE
SENSOR
B3
2j
REF. TO ACTIVE GRILLE
SHUTTER [a]
REF. TO CHARGING SYSTEM [a]
*1 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 3, 4, 7 AND 8
B60
B3 (B)
B9 (B)
B129
A: B134 (B)
B138 (B)
R400 (Gr)
R464
WI-68563

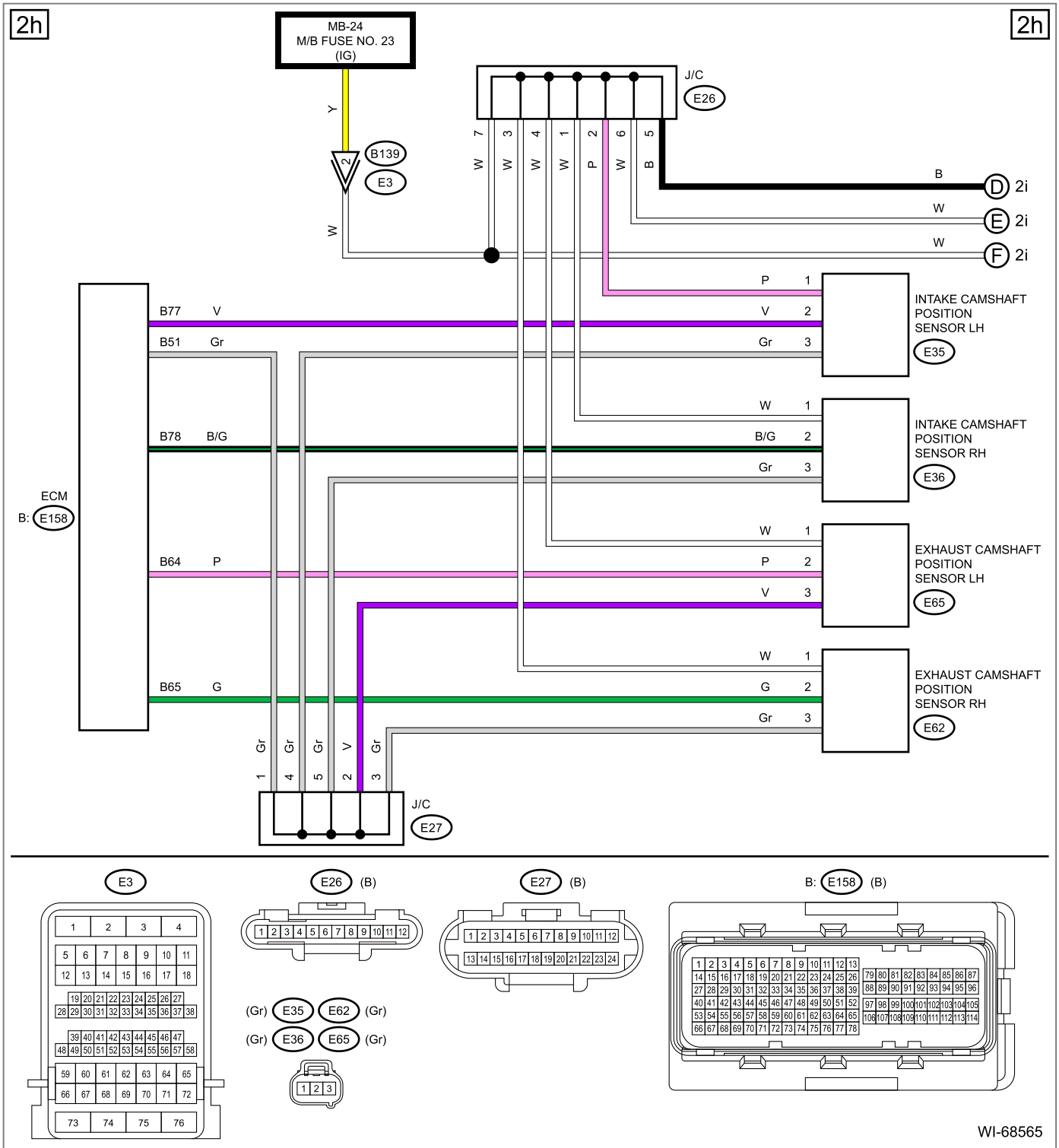
2g



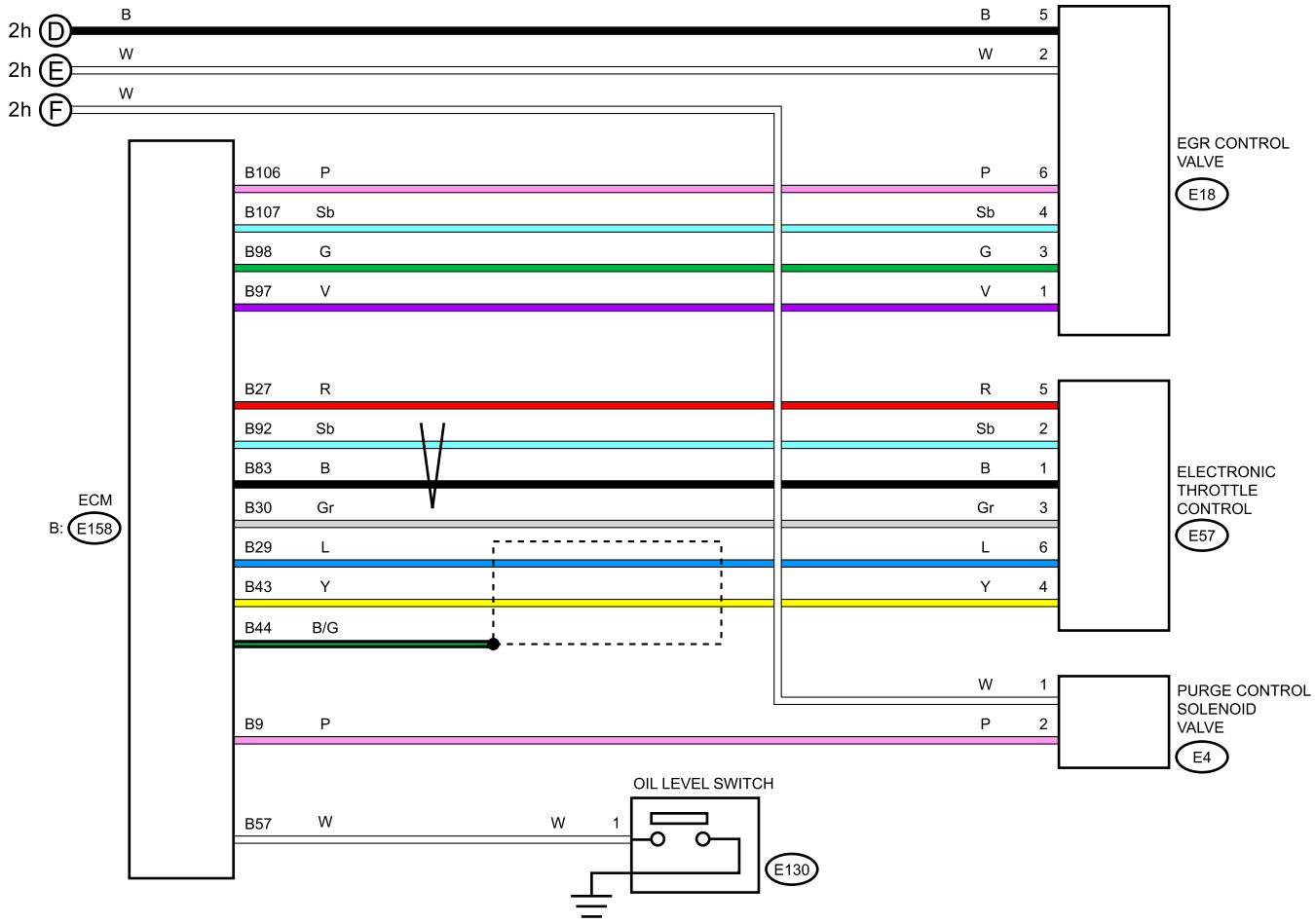
*1 : MT MODEL : Gr
CVT MODEL : B

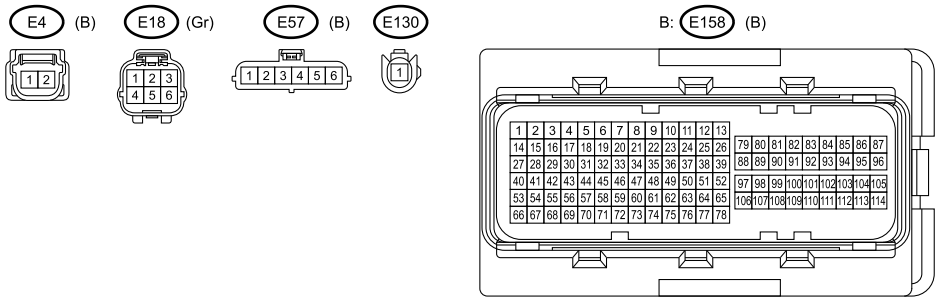


WI-68564

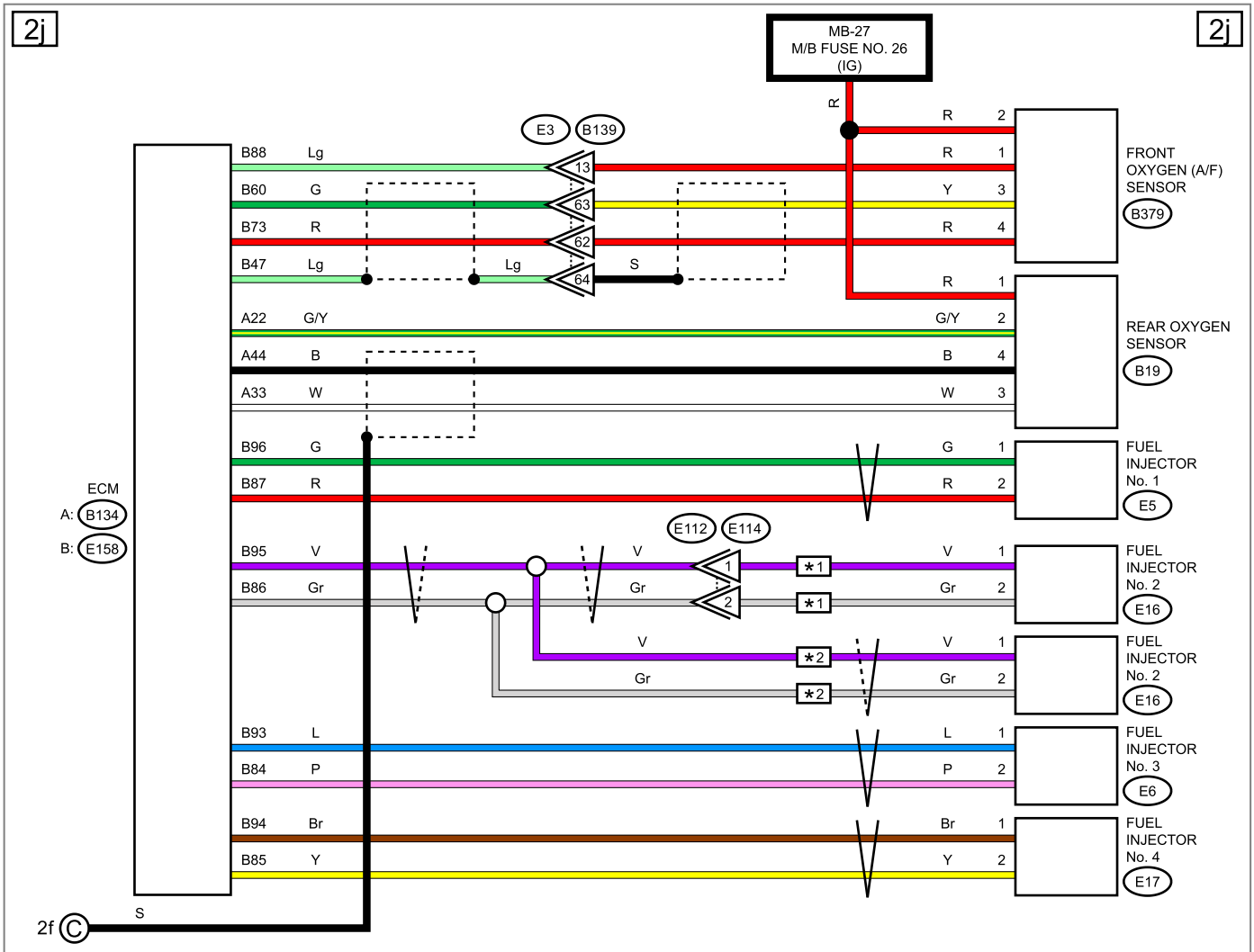

2h
2h
MB-24
M/B FUSE NO. 23
(IG)
Y
B139
E3
W
J/C
E26
W 7
W 3
W 4
W 1
P 2
W 6
B 5
B
D 2i
W
E 2i
W
F 2i
ECM
B: E158
B77 V
B51 Gr
B78 B/G
B64 P
B65 G
P 1
V 2
Gr 3
INTAKE CAMSHAFT POSITION SENSOR LH
E35
W 1
B/G 2
Gr 3
INTAKE CAMSHAFT POSITION SENSOR RH
E36
W 1
P 2
V 3
EXHAUST CAMSHAFT POSITION SENSOR LH
E65
W 1
G 2
Gr 3
EXHAUST CAMSHAFT POSITION SENSOR RH
E62
Gr 1
Gr 4
Gr 5
V 2
Gr 3
J/C
E27
E3
E26 (B)
E27 (B)
B: E158 (B)
(Gr) E35 E62 (Gr)
(Gr) E36 E65 (Gr)
WI-68565

2i

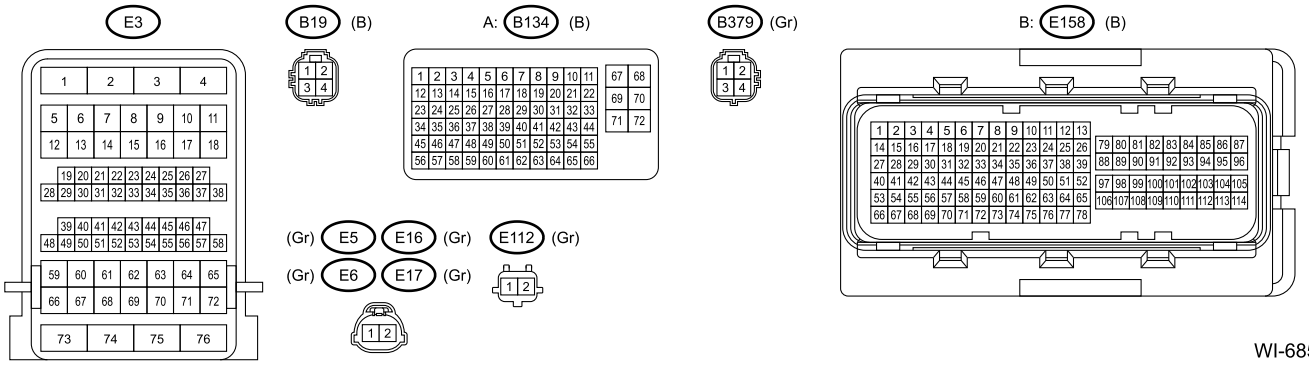

2h D
2h E
2h F
B
W
W
B 5
W 2
EGR CONTROL VALVE
E18
B106 P
B107 Sb
B98 G
B97 V
P 6
Sb 4
G 3
V 1
B27 R
B92 Sb
B83 B
B30 Gr
B29 L
B43 Y
B44 B/G
R 5
Sb 2
B 1
Gr 3
L 6
Y 4
ELECTRONIC THROTTLE CONTROL
E57
ECM
B: E158
W 1
P 2
PURGE CONTROL SOLENOID VALVE
E4
B9 P
OIL LEVEL SWITCH
B57 W
W 1
E130


E4 (B)
E18 (Gr)
E57 (B)
E130
B: E158 (B)

WI-68566



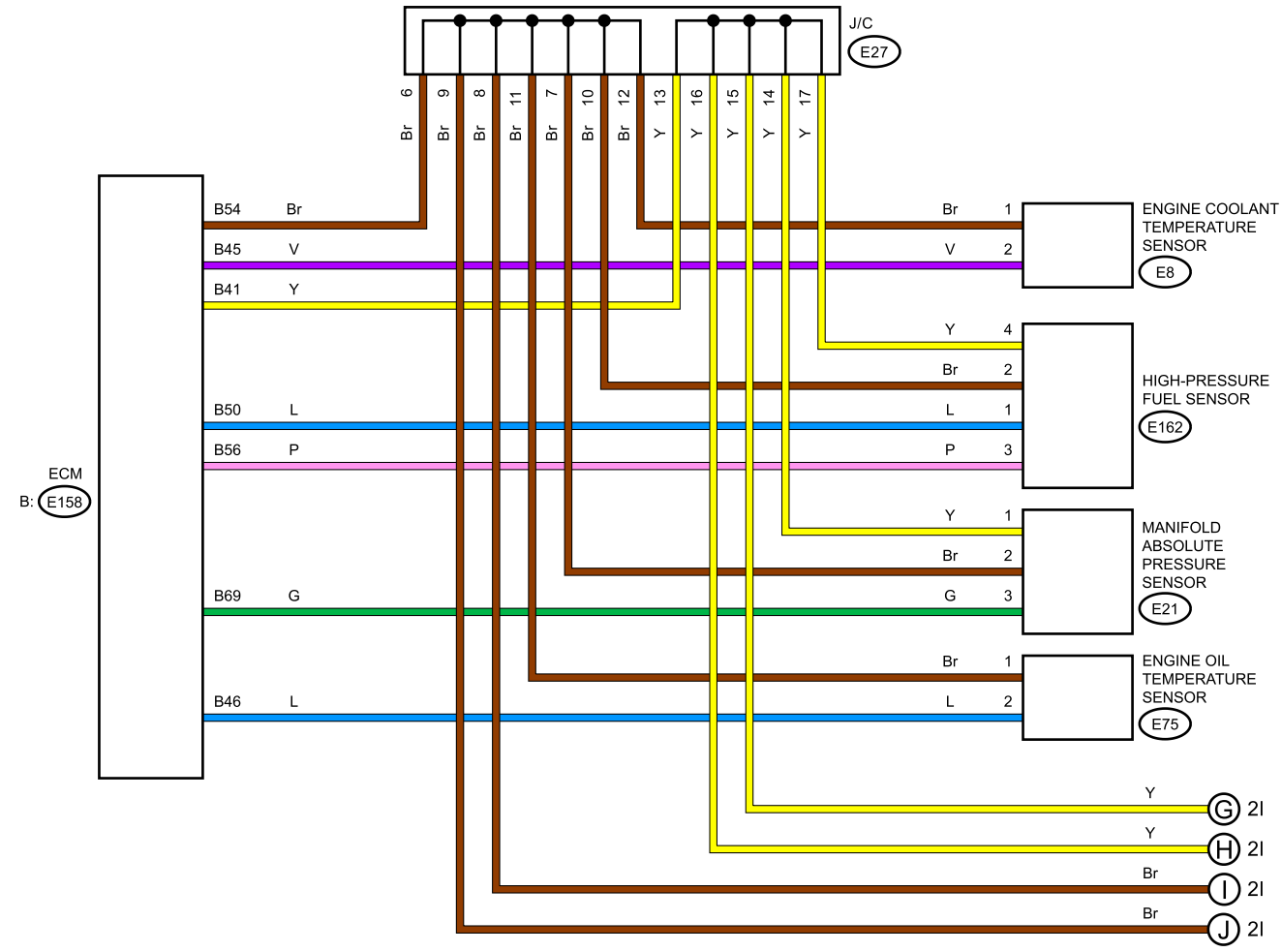
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE

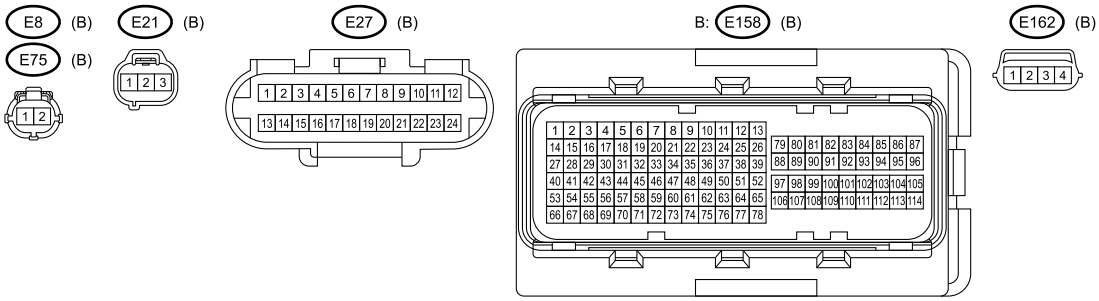


WI-68567

2k

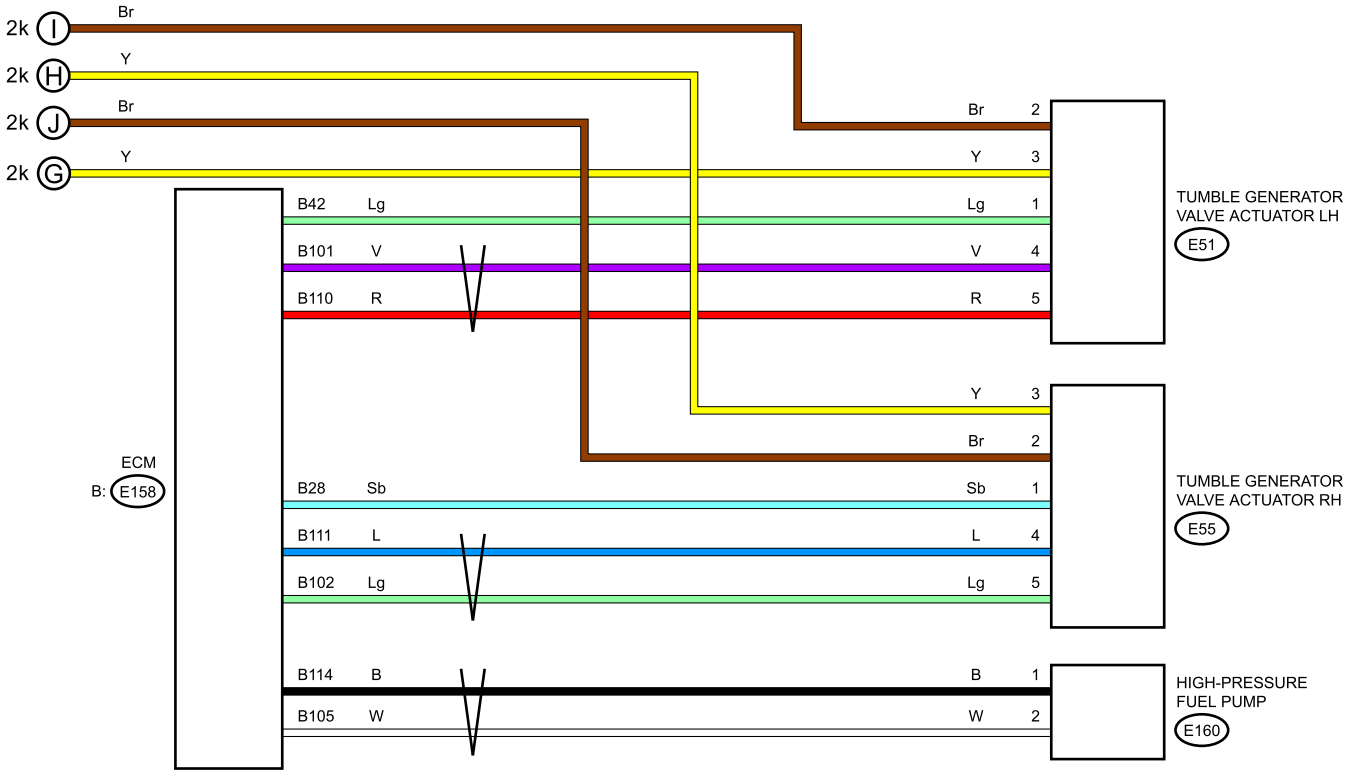
2k

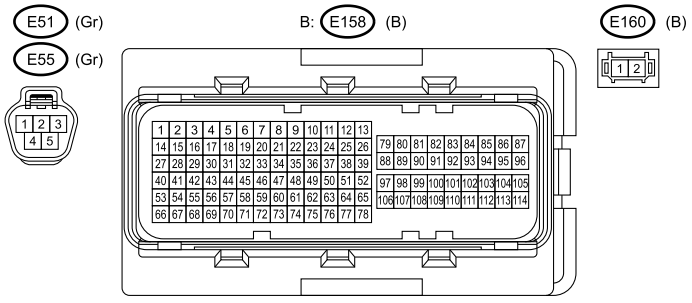




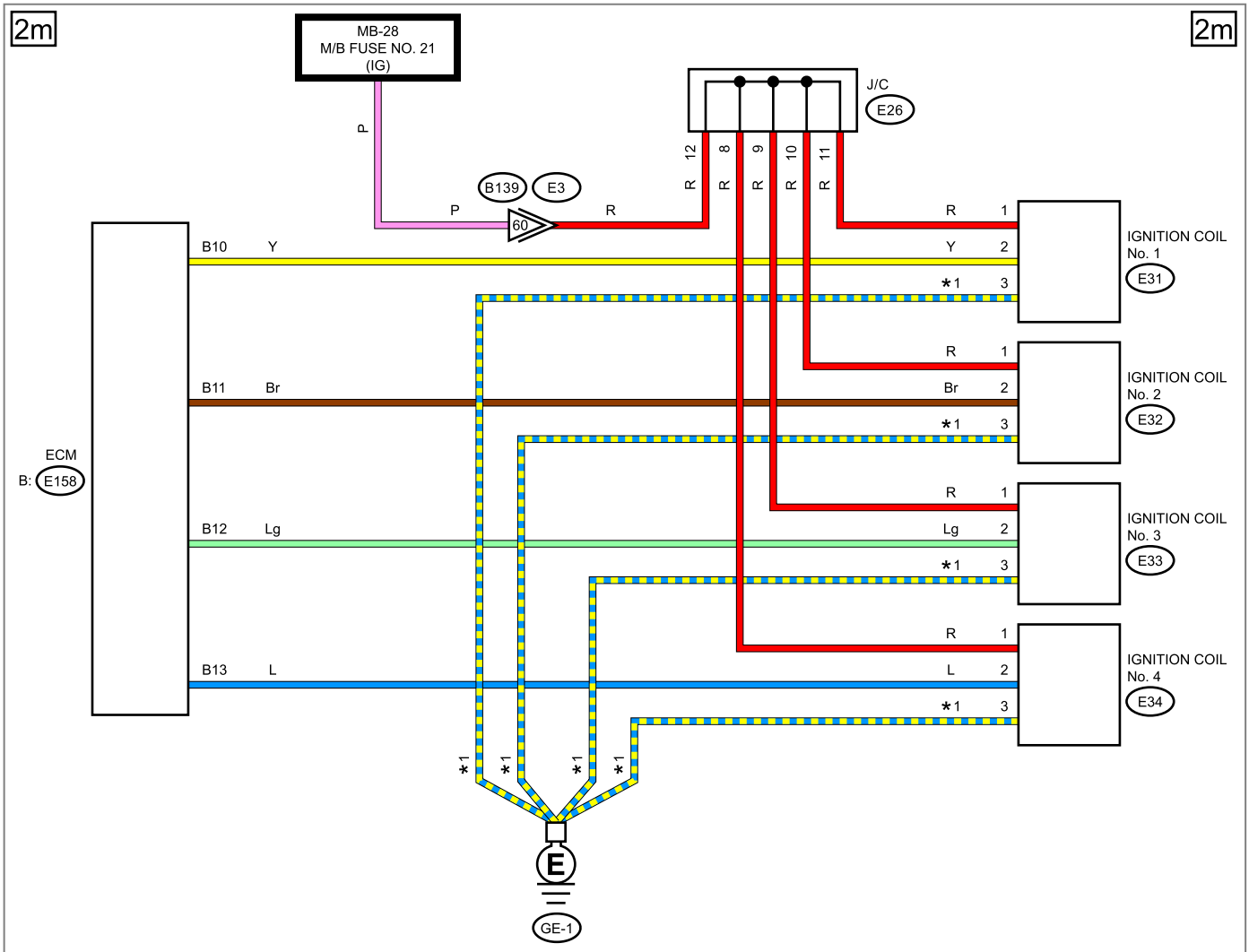
WI-68568

2I

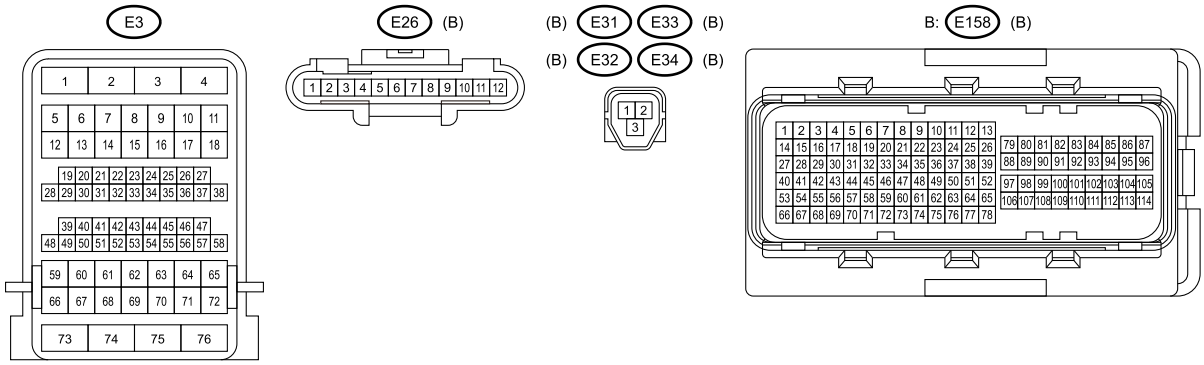

2k I
Br
2k H
Y
2k J
Br
2k G
Y
ECM
B: E158
B42 Lg
B101 V
B110 R
B28 Sb
B111 L
B102 Lg
B114 B
B105 W
Br 2
Y 3
Lg 1
V 4
R 5
TUMBLE GENERATOR VALVE ACTUATOR LH
E51
Y 3
Br 2
Sb 1
L 4
Lg 5
TUMBLE GENERATOR VALVE ACTUATOR RH
E55
B 1
W 2
HIGH-PRESSURE FUEL PUMP
E160


E51 (Gr)
E55 (Gr)
1 2 3
4 5
B: E158 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18 19 20 21 22 23 24 25 26
27 28 29 30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63 64 65
66 67 68 69 70 71 72 73 74 75 76 77 78
79 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96
97 98 99 100 101 102 103 104 105
106 107 108 109 110 111 112 113 114
E160 (B)
1 2

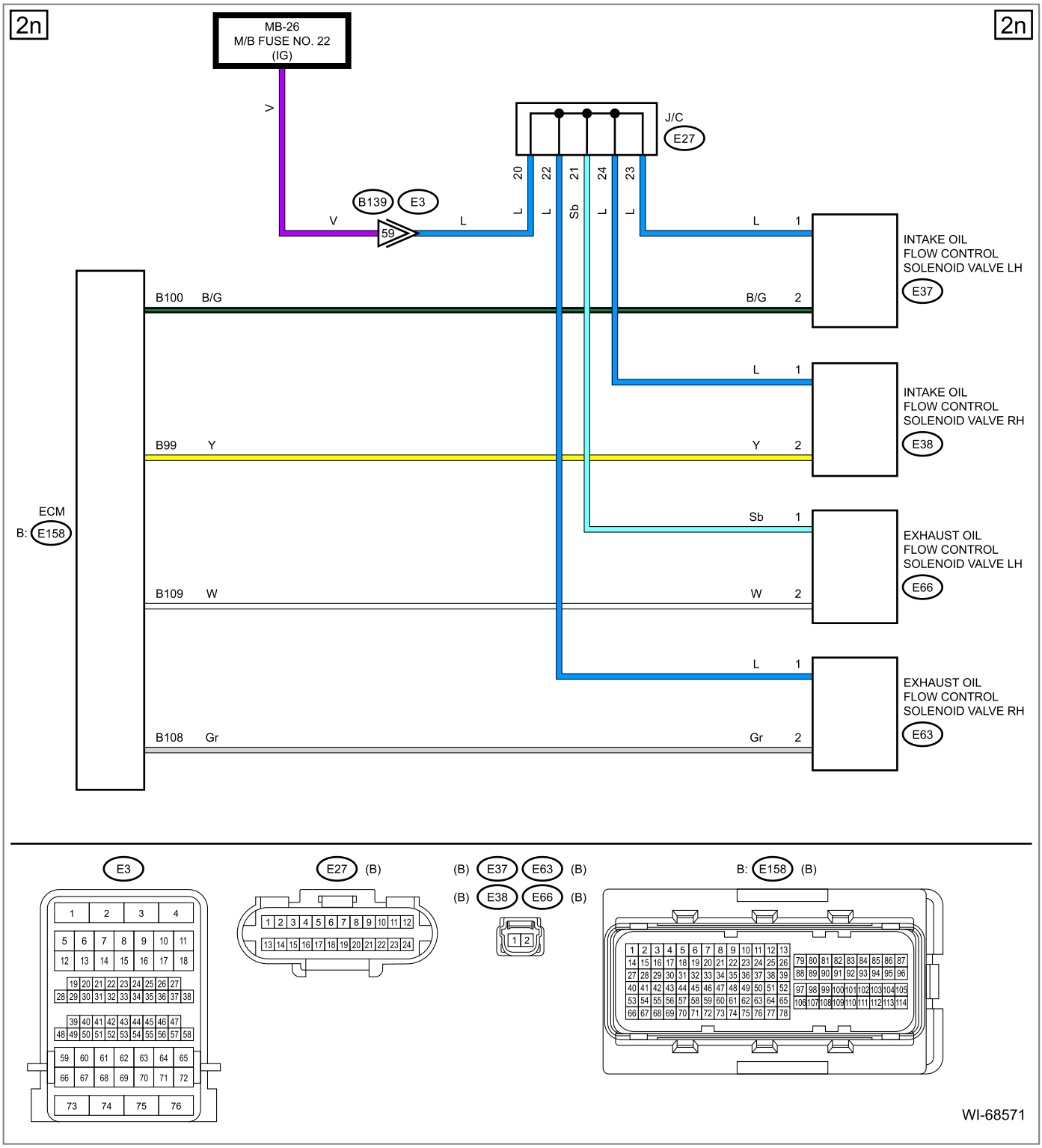
WI-68569



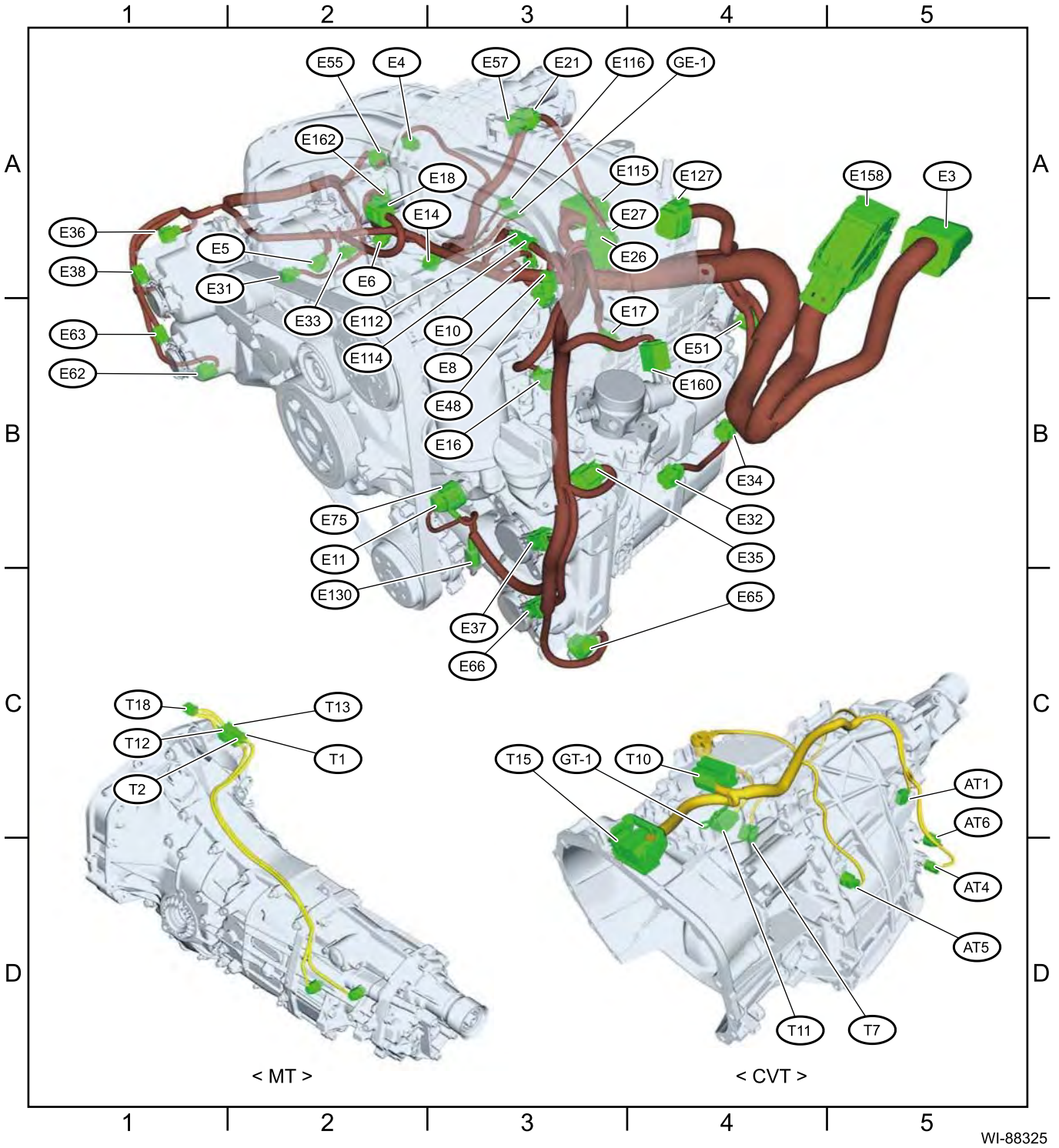
*1 : MT MODEL : Gr
CVT MODEL : B



WI-68570


2n
2n
MB-26
M/B FUSE NO. 22
(IG)
V
J/C
E27
B139
E3
V
59
L
20
22
21
24
23
L
L
Sb
L
L
L 1
INTAKE OIL
FLOW CONTROL
SOLENOID VALVE LH
E37
B100 B/G
B/G 2
L 1
INTAKE OIL
FLOW CONTROL
SOLENOID VALVE RH
E38
B99 Y
Y 2
ECM
B: E158
Sb 1
EXHAUST OIL
FLOW CONTROL
SOLENOID VALVE LH
E66
B109 W
W 2
L 1
EXHAUST OIL
FLOW CONTROL
SOLENOID VALVE RH
E63
B108 Gr
Gr 2
E3
E27 (B)
(B) E37 E63 (B)
(B) E38 E66 (B)
B: E158 (B)
WI-68571

LOCATION

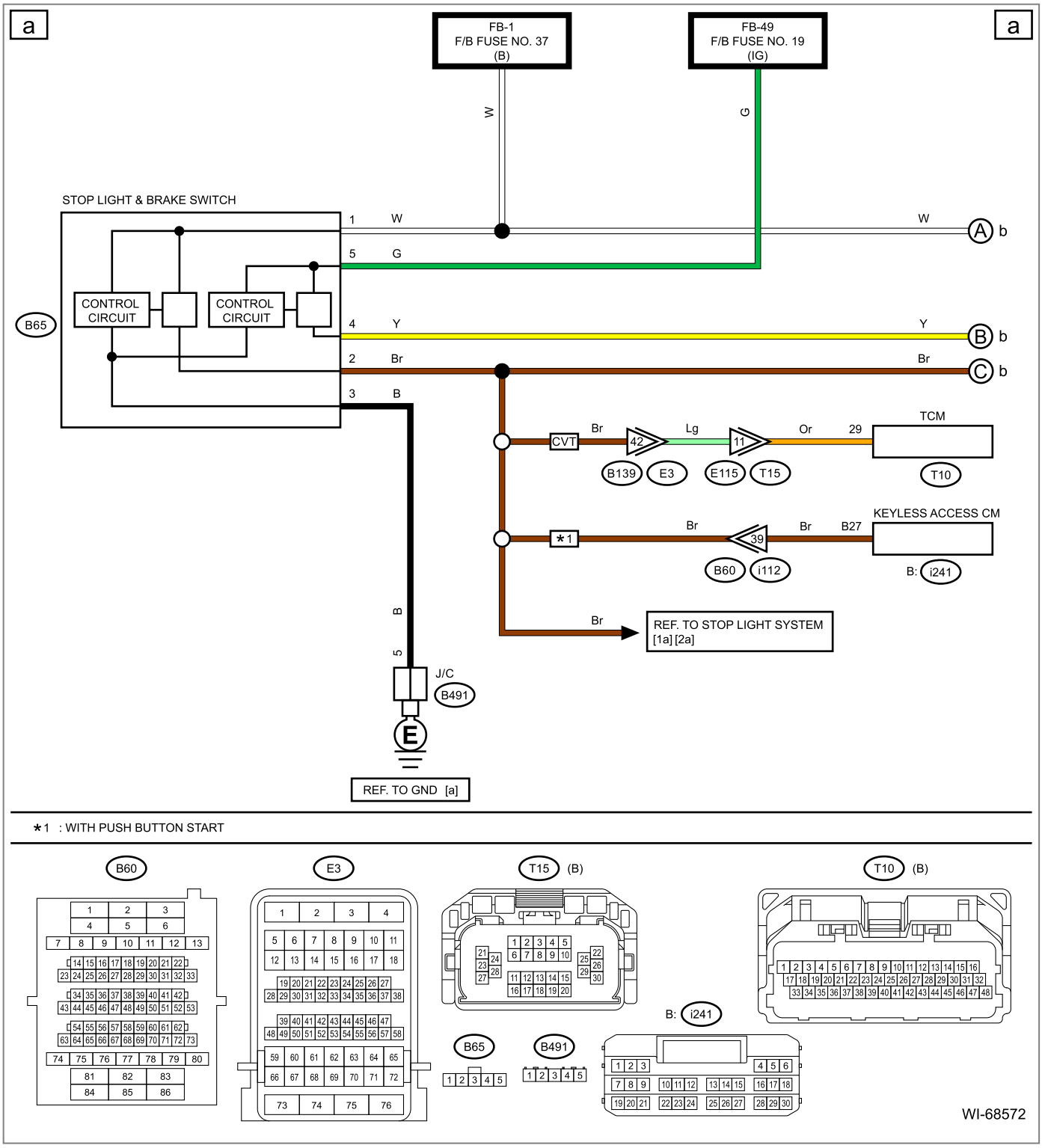


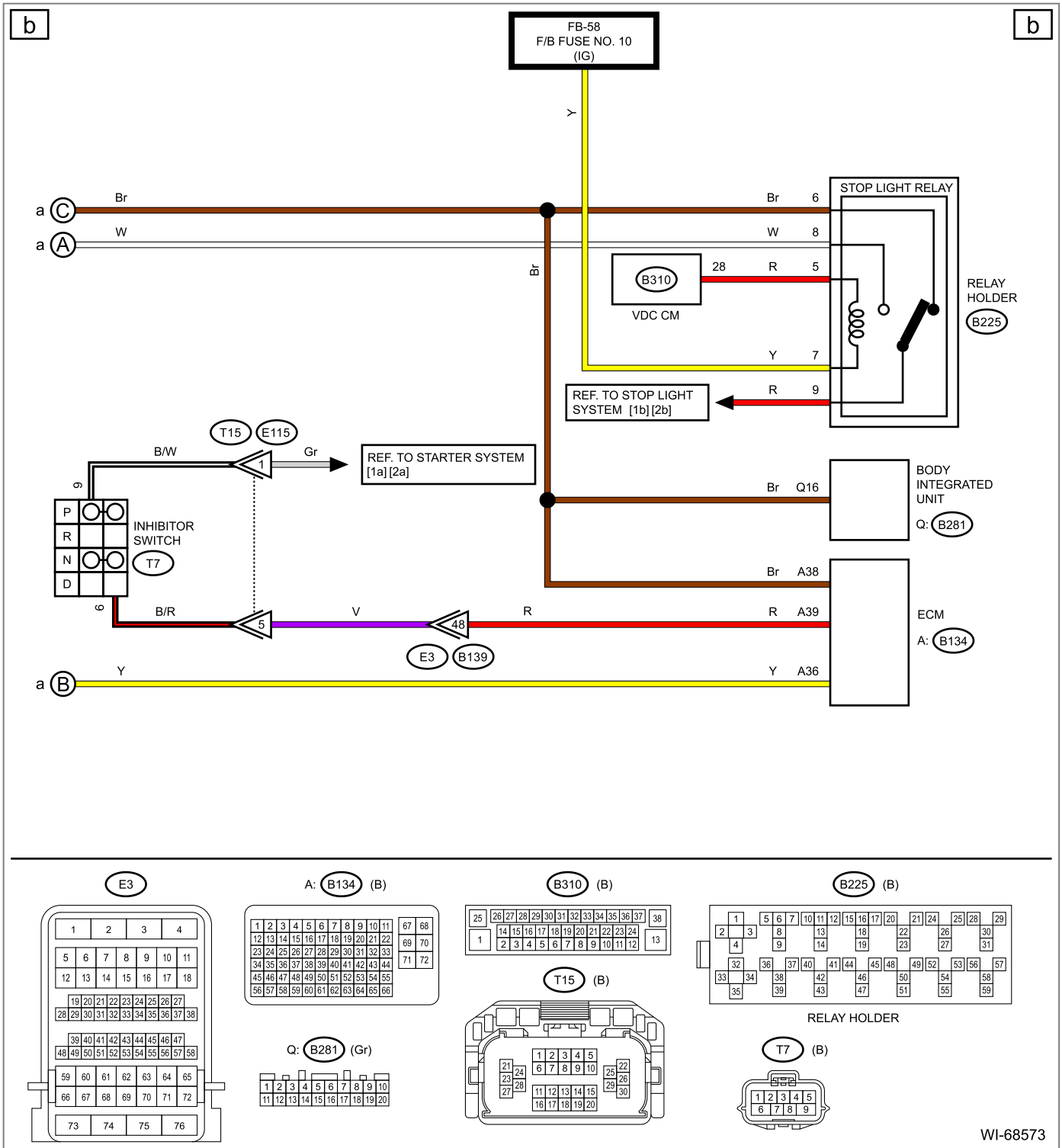
Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AT1	3	B	C-5		Primary speed sensor
AT4	3	Gr	D-5		Secondary speed sensor
AT5	3	Gr	D-5		Turbine speed sensor
AT6	3	B	C-5		Secondary pressure sensor
E3	76	★	A-5	B139	Bulkhead wiring harness

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
E4	2	B	A-2		Purge control solenoid valve
E5	2	Gr	A-2		Fuel injector No. 1
E6	2	Gr	A-2		Fuel injector No. 3
E8	2	B	A-3		Engine coolant temperature sensor
E10	3	B	A-3		Crankshaft position sensor
E11	1	★	B-3		Oil pressure switch
E14	2	B	A-3		Knock sensor 1
E16	2	Gr	B-3		Fuel injector No. 2
E17	2	Gr	B-3		Fuel injector No. 4
E18	6	Gr	A-2		EGR control valve
E21	3	B	A-3		Manifold absolute pressure sensor
E26	12	B	A-3		J/C
E27	24	B	A-3		
E31	3	B	A-2		Ignition coil No. 1
E32	3	B	B-4		Ignition coil No. 2
E33	3	B	A-2		Ignition coil No. 3
E34	3	B	B-4		Ignition coil No. 4
E35	3	Gr	B-3		Intake camshaft position sensor LH
E36	3	Gr	A-1		Intake camshaft position sensor RH
E37	2	B	B-3		Intake oil control solenoid LH
E38	2	B	A-1		Intake oil control solenoid RH
E48	2	B	A-3		Knock sensor 2
E51	5	Gr	B-4		Tumble generator valve actuator LH
E55	5	Gr	A-2		Tumble generator valve actuator RH
E57	6	B	A-3		Electronic throttle control
E62	3	Gr	B-1		Exhaust camshaft position sensor RH
E63	2	B	B-1		Exhaust oil flow control solenoid valve RH
E65	3	Gr	C-3		Exhaust camshaft position sensor LH
E66	2	B	C-3		Exhaust oil flow control solenoid valve LH
E75	2	B	B-3		Engine oil temperature sensor
E112	2	Gr	A-3		Engine wiring harness
E114	2	Gr	A-3		
E115	30	B	A-3	T15	Transmission cord
E116	8	Gr	A-3	T18	
E127	11	Gr	A-4	F135	Front wiring harness
E130	1	★	B-3		Oil level switch
E158	114	B	A-5		ECM
E160	2	B	B-4		High-pressure fuel pump
E162	4	B	A-2		Fuel pressure sensor
T1	2	Gr	C-2	T13	Transmission cord
T2	2	Br	C-2	T12	

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
T7	9	B	C-4		Inhibitor switch
T10	48	B	C-4		TCM
T11	10	★	C-4		Control valve body
T12	2	Br	C-1		Neutral position switch 1
T13	2	Gr	C-2		Back-up light switch
T15	30	B	C-3	E115	Engine wiring harness
T18	8	Gr	C-1	E116	
GE-1	—	—	A-3		—
GT-1	—	—	C-4		—
★: White or natural color					

WIRING DIAGRAM


a
a
FB-1
F/B FUSE NO. 37
(B)
FB-49
F/B FUSE NO. 19
(IG)
W
G
STOP LIGHT & BRAKE SWITCH
1 W
5 G
4 Y
2 Br
3 B
CONTROL CIRCUIT
CONTROL CIRCUIT
B65
W
Y
Br
A b
B b
C b
CVT
Br
42
Lg
11
Or
29
TCM
B139
E3
E115
T15
T10
*1
Br
39
Br
B27
KEYLESS ACCESS CM
B60
i112
B: i241
Br
REF. TO STOP LIGHT SYSTEM
[1a] [2a]
B
5
J/C
B491
E
REF. TO GND [a]
*1 : WITH PUSH BUTTON START
B60
E3
T15 (B)
T10 (B)
B: i241
B65
B491
WI-68572


b
b
FB-58
F/B FUSE NO. 10
(IG)
Y
a C
a A
Br
W
Br 6
W 8
STOP LIGHT RELAY
B310
28
R 5
VDC CM
RELAY
HOLDER
B225
Y 7
R 9
REF. TO STOP LIGHT
SYSTEM [1b] [2b]
T15
E115
B/W
Gr
1
REF. TO STARTER SYSTEM
[1a] [2a]
9
P
R
N
D
INHIBITOR
SWITCH
T7
6
B/R
V
5
48
R
E3
B139
Br Q16
BODY
INTEGRATED
UNIT
Q: B281
Br A38
R A39
ECM
A: B134
a B
Y
Y A36

E3

A: B134 (B)

Q: B281 (Gr)

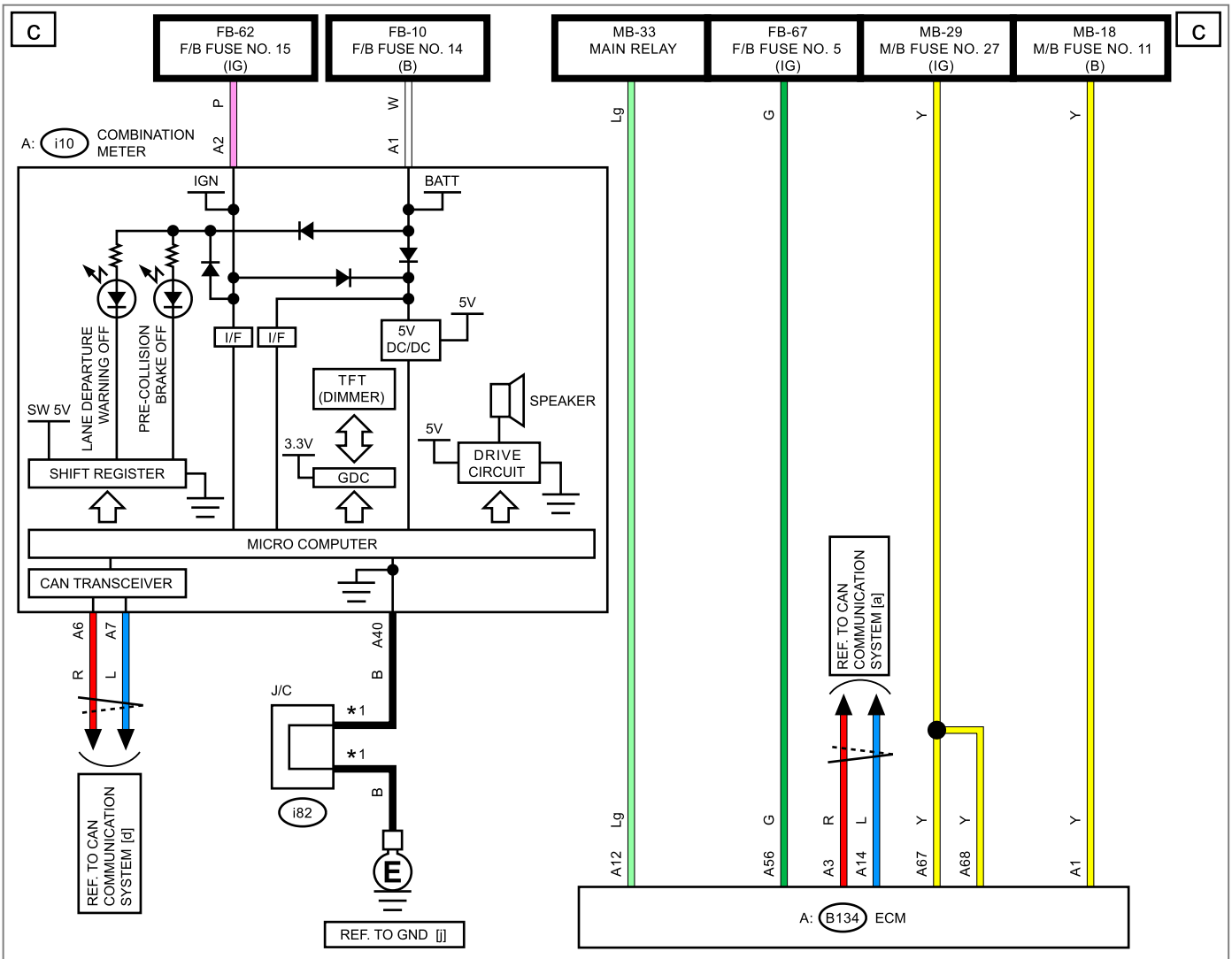
B310 (B)

T15 (B)

B225 (B)
RELAY HOLDER

T7 (B)

WI-68573



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

A: B134 (B)

1	2	3	4	5	6	7	8	9	10	11	67	68
12	13	14	15	16	17	18	19	20	21	22	69	70
23	24	25	26	27	28	29	30	31	32	33	71	72
34	35	36	37	38	39	40	41	42	43	44		
45	46	47	48	49	50	51	52	53	54	55		
56	57	58	59	60	61	62	63	64	65	66		

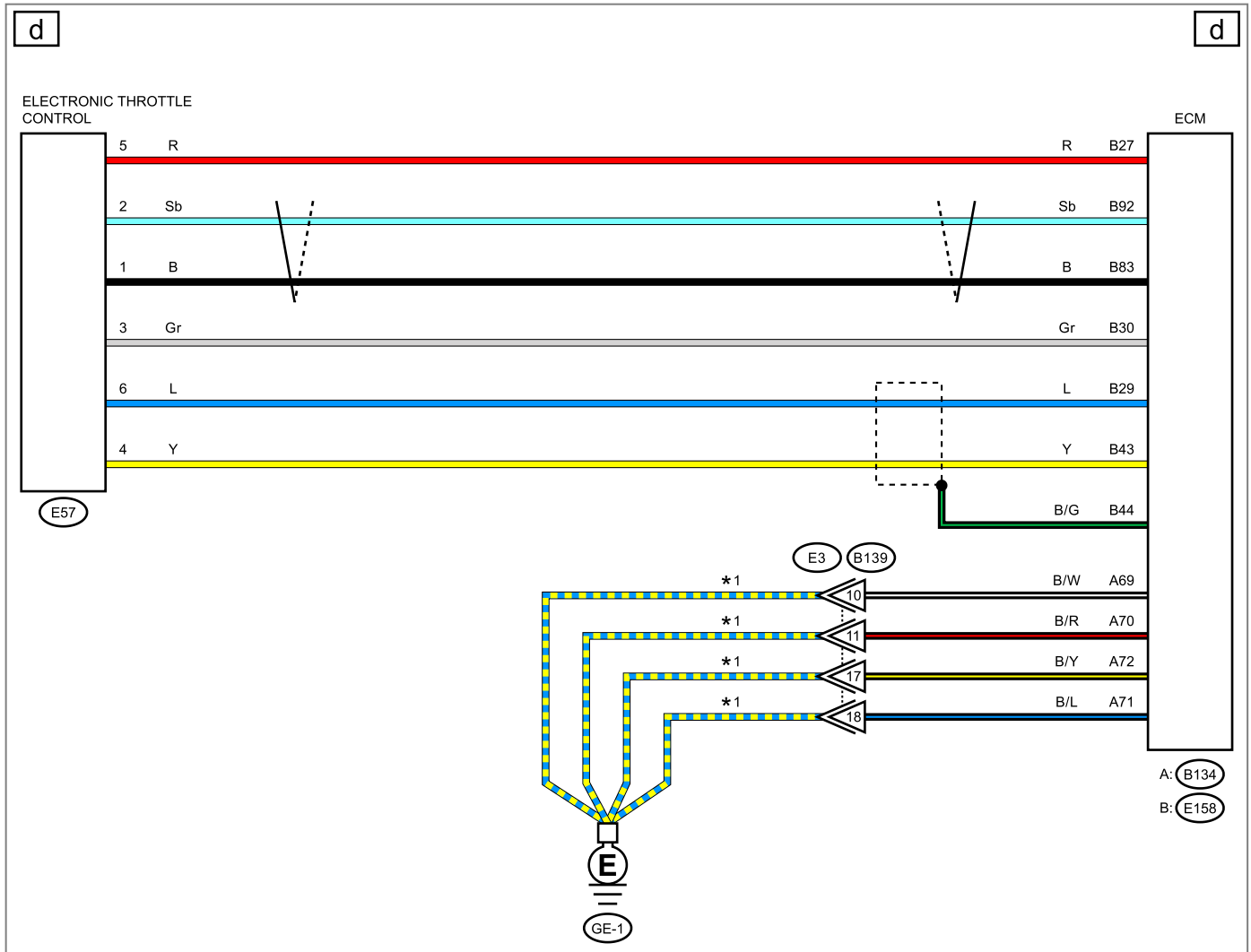
A: i10 (B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

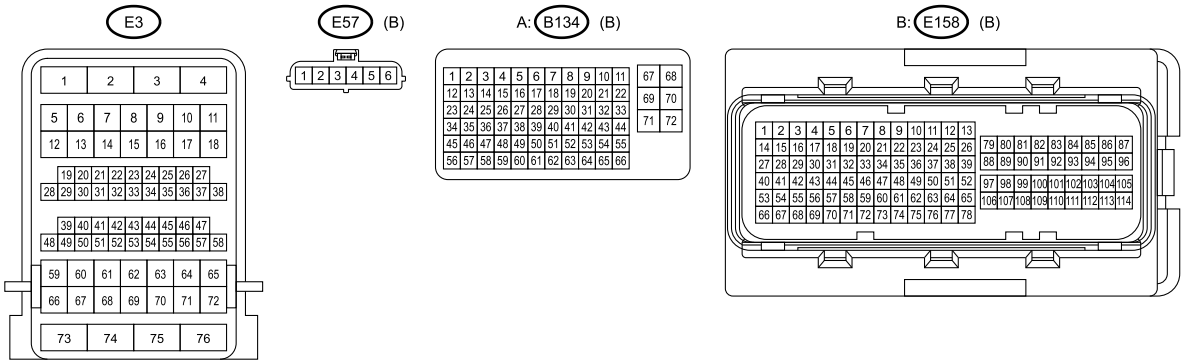
i82

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

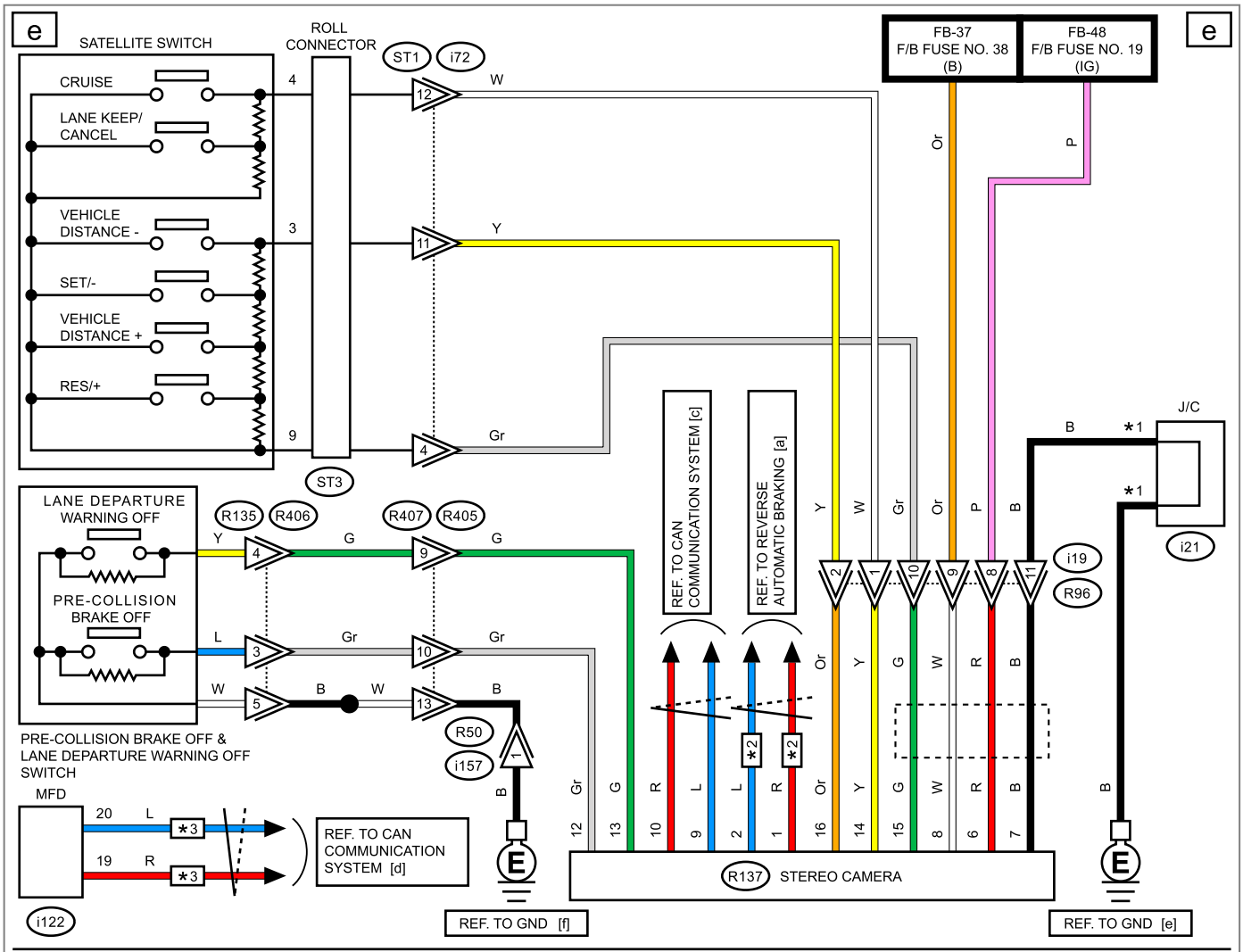
WI-68574



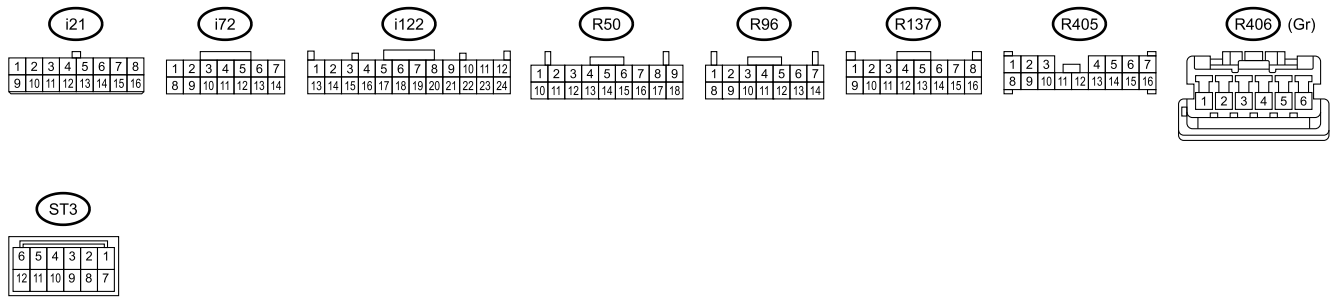
*1 : MT MODEL : Gr
CVT MODEL : B



WI-68575

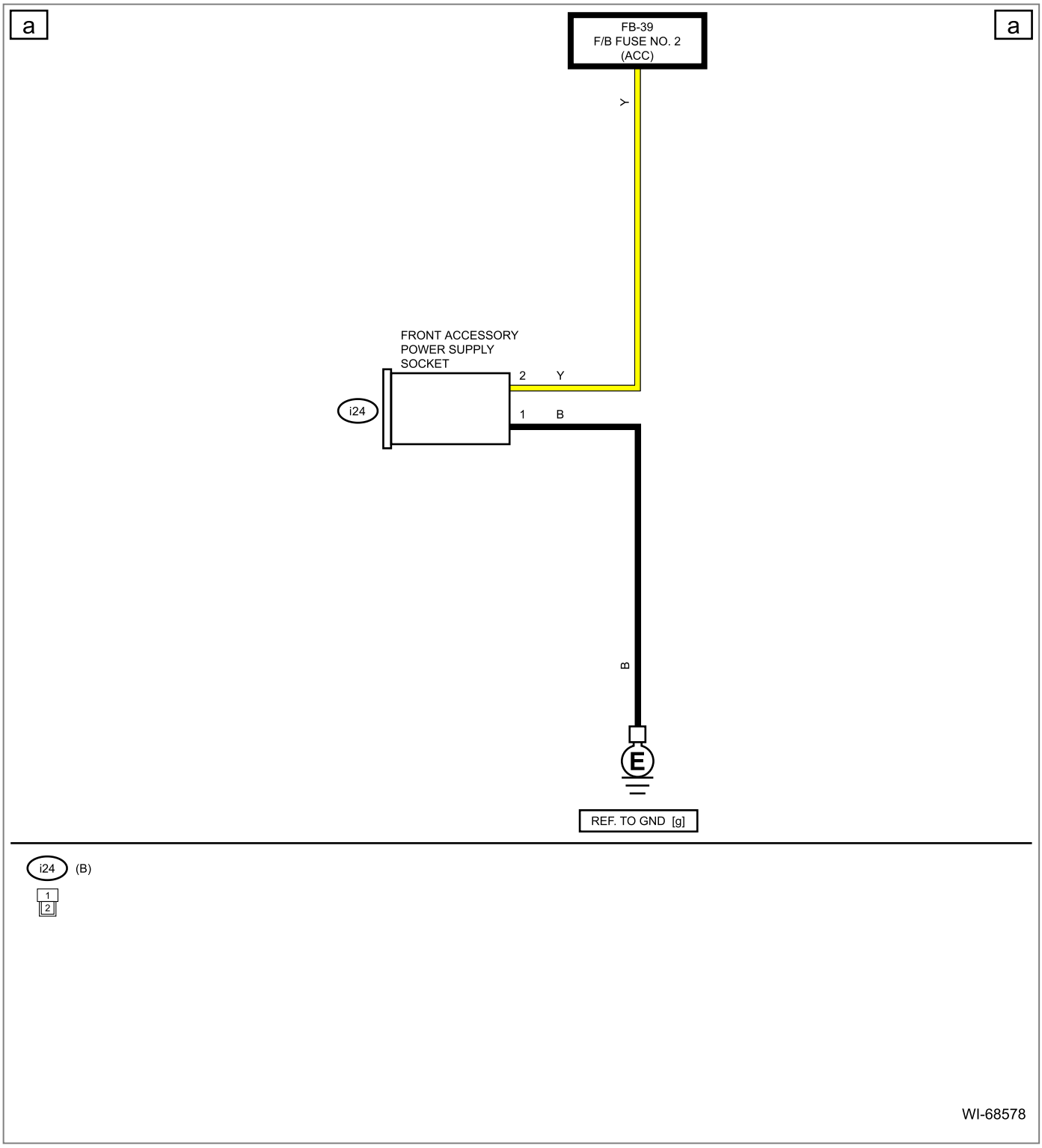


*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH REVERSE AUTOMATIC BRAKING
*3 : WITH HIGH GRADE MFD



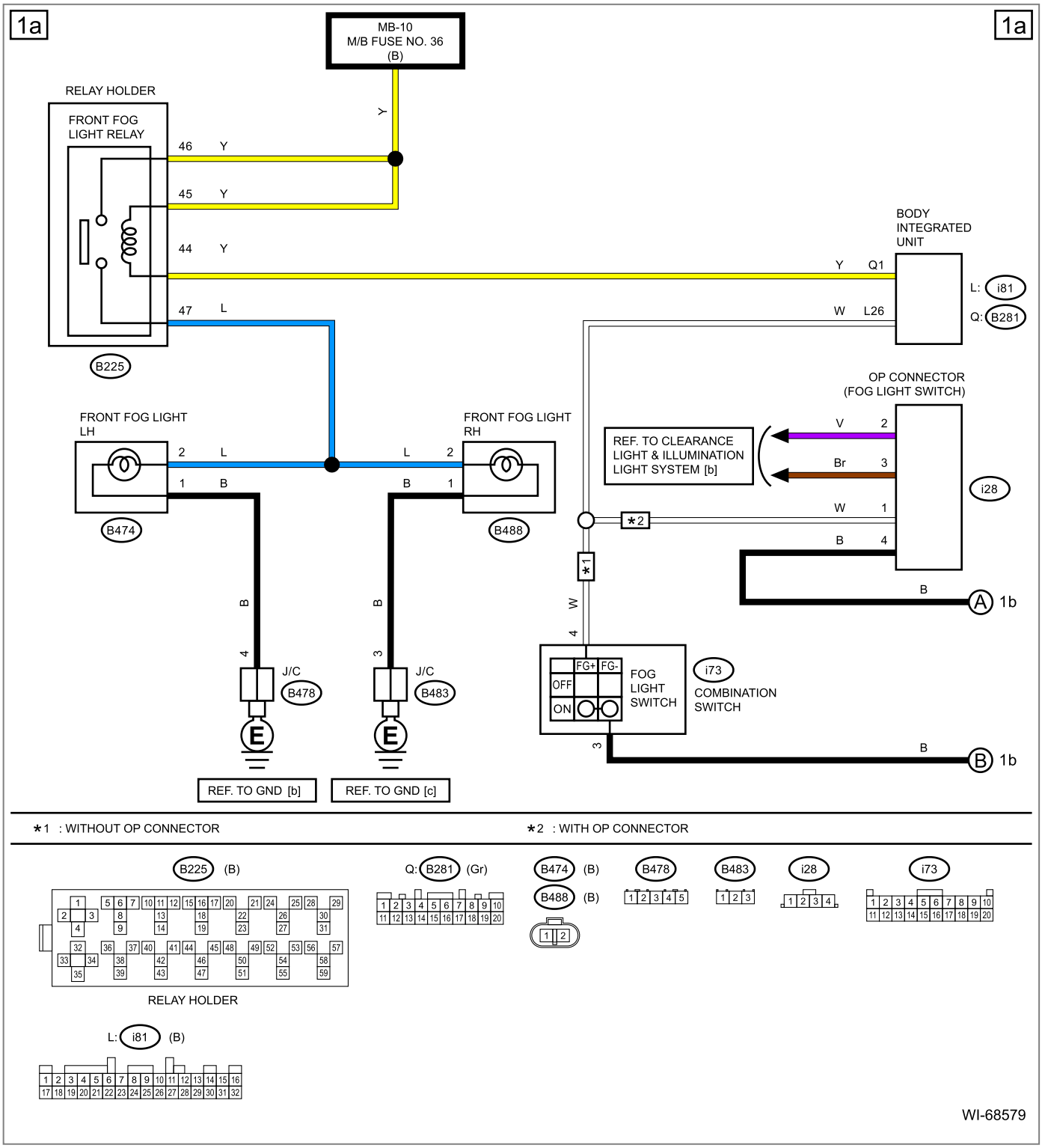
WI-68577

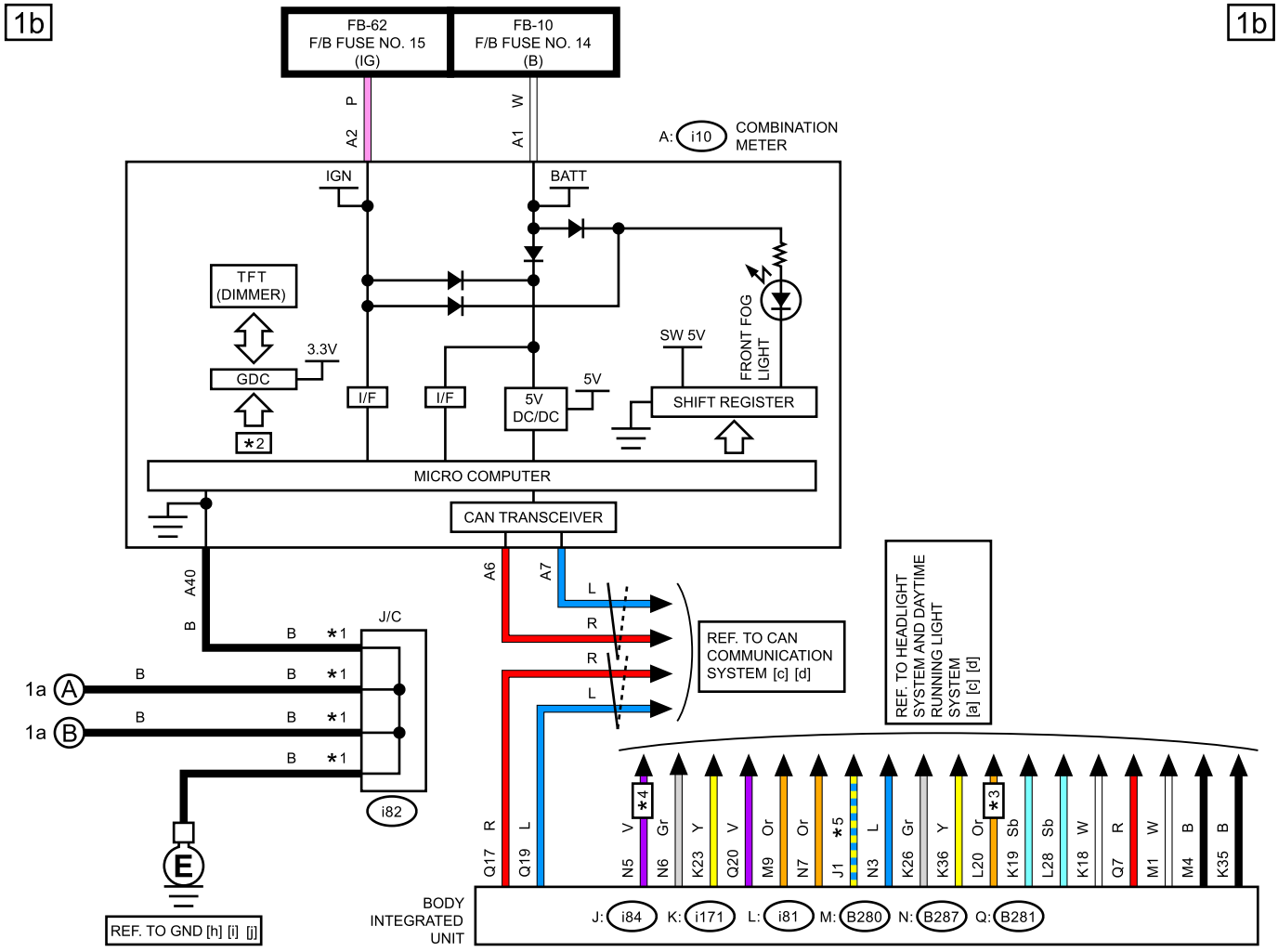
WIRING DIAGRAM


a
a
FB-39
F/B FUSE NO. 2
(ACC)
Y
FRONT ACCESSORY
POWER SUPPLY
SOCKET
i24
2 Y
1 B
B
E
REF. TO GND [g]
i24 (B)
1
2
WI-68578

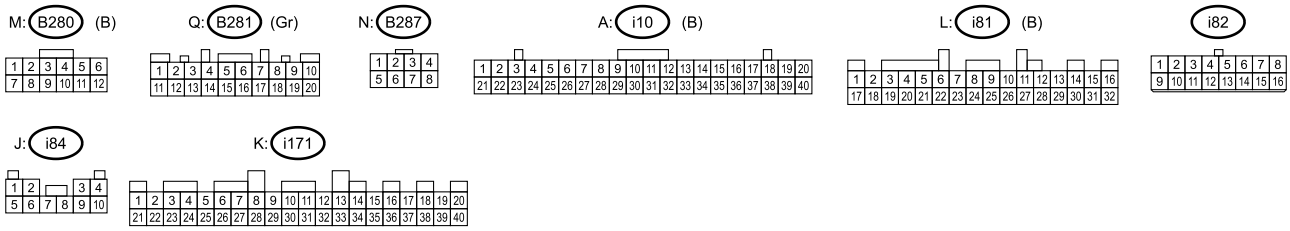
WIRING DIAGRAM

1. WITHOUT SRF



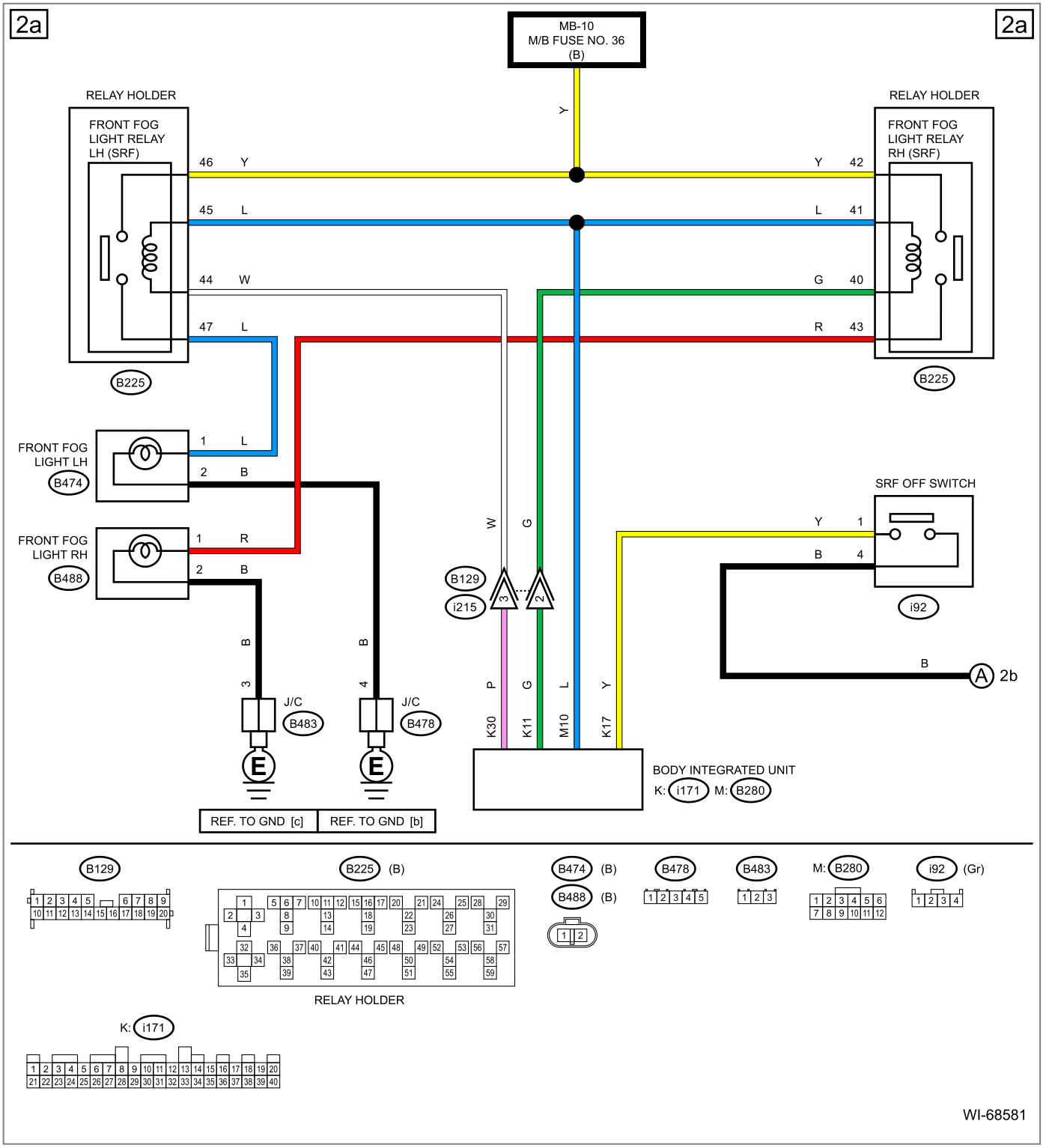


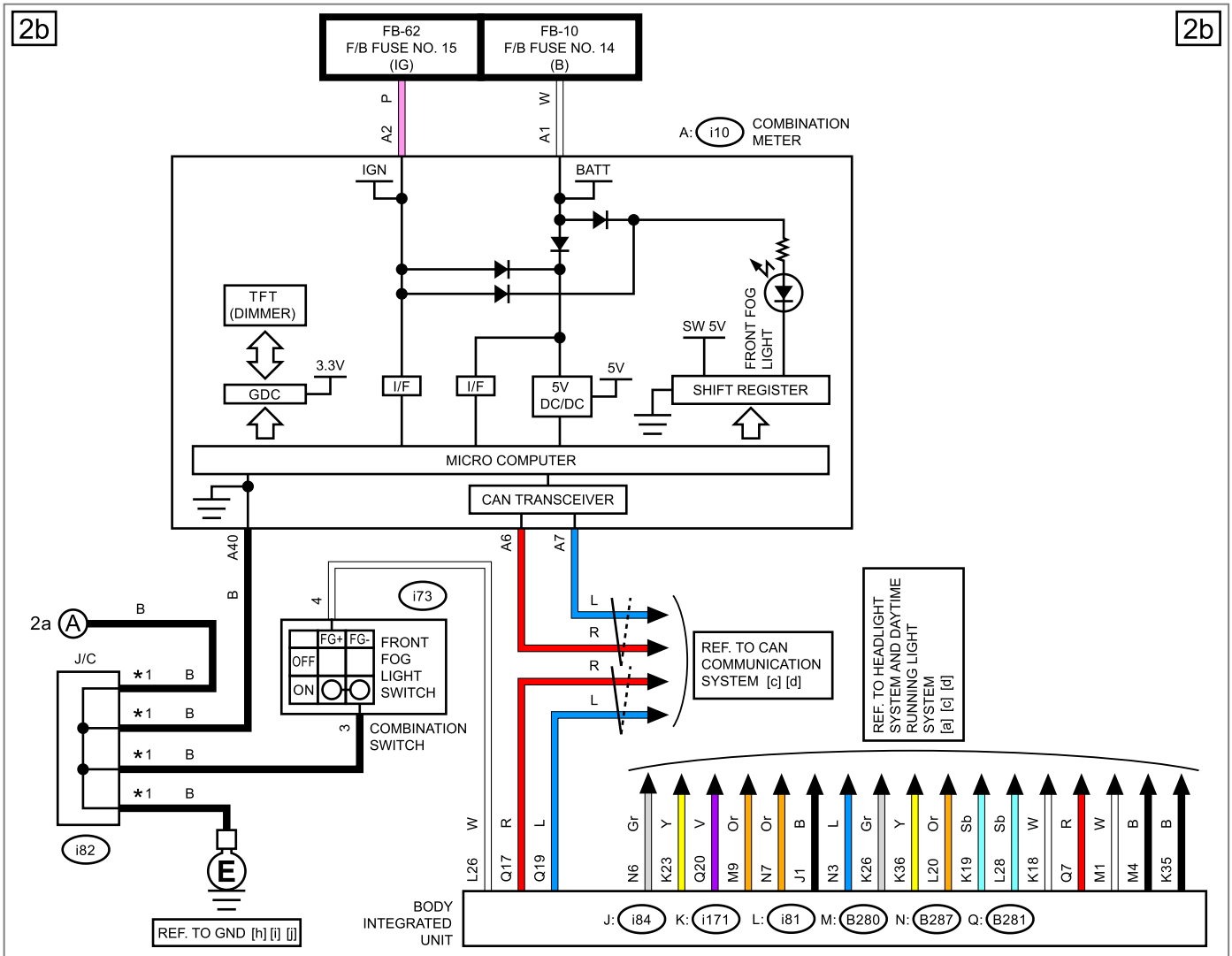
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : COLOR TFT METER MODEL
*3 : WITH AUTO LIGHT
*4 : WITH DAYTIME RUNNING LIGHT LED TYPE
*5 : WITHOUT PUSH BUTTON START : B
WITH PUSH BUTTON START : V



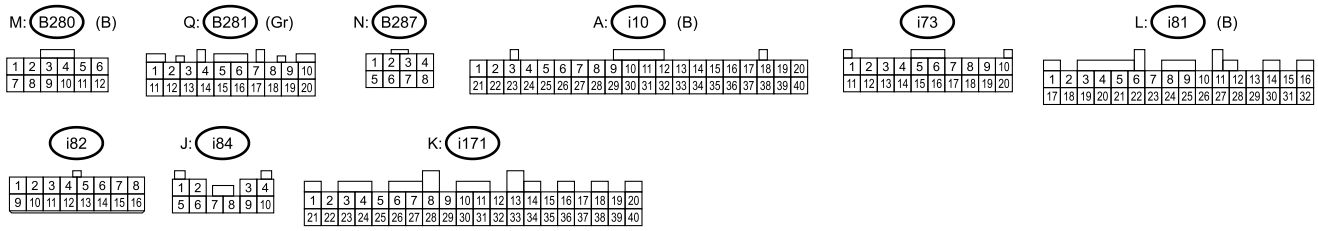
WI-68580

2. WITH SRF


2a
2a
MB-10
M/B FUSE NO. 36
(B)
RELAY HOLDER
FRONT FOG
LIGHT RELAY
LH (SRF)
RELAY HOLDER
FRONT FOG
LIGHT RELAY
RH (SRF)
46 Y
45 L
44 W
47 L
Y 42
L 41
G 40
R 43
B225
B225
FRONT FOG
LIGHT LH
B474
FRONT FOG
LIGHT RH
B488
1 L
2 B
1 R
2 B
SRF OFF SWITCH
Y 1
B 4
i92
B
A 2b
W
G
B129
i215
3
2
B 3
B 4
J/C
B483
J/C
B478
E
E
K30 P
K11 G
M10 L
K17 Y
BODY INTEGRATED UNIT
K: i171 M: B280
REF. TO GND [c]
REF. TO GND [b]
B129
B225 (B)
B474 (B)
B488 (B)
B478
B483
M: B280
i92 (Gr)
RELAY HOLDER
K: i171
WI-68581

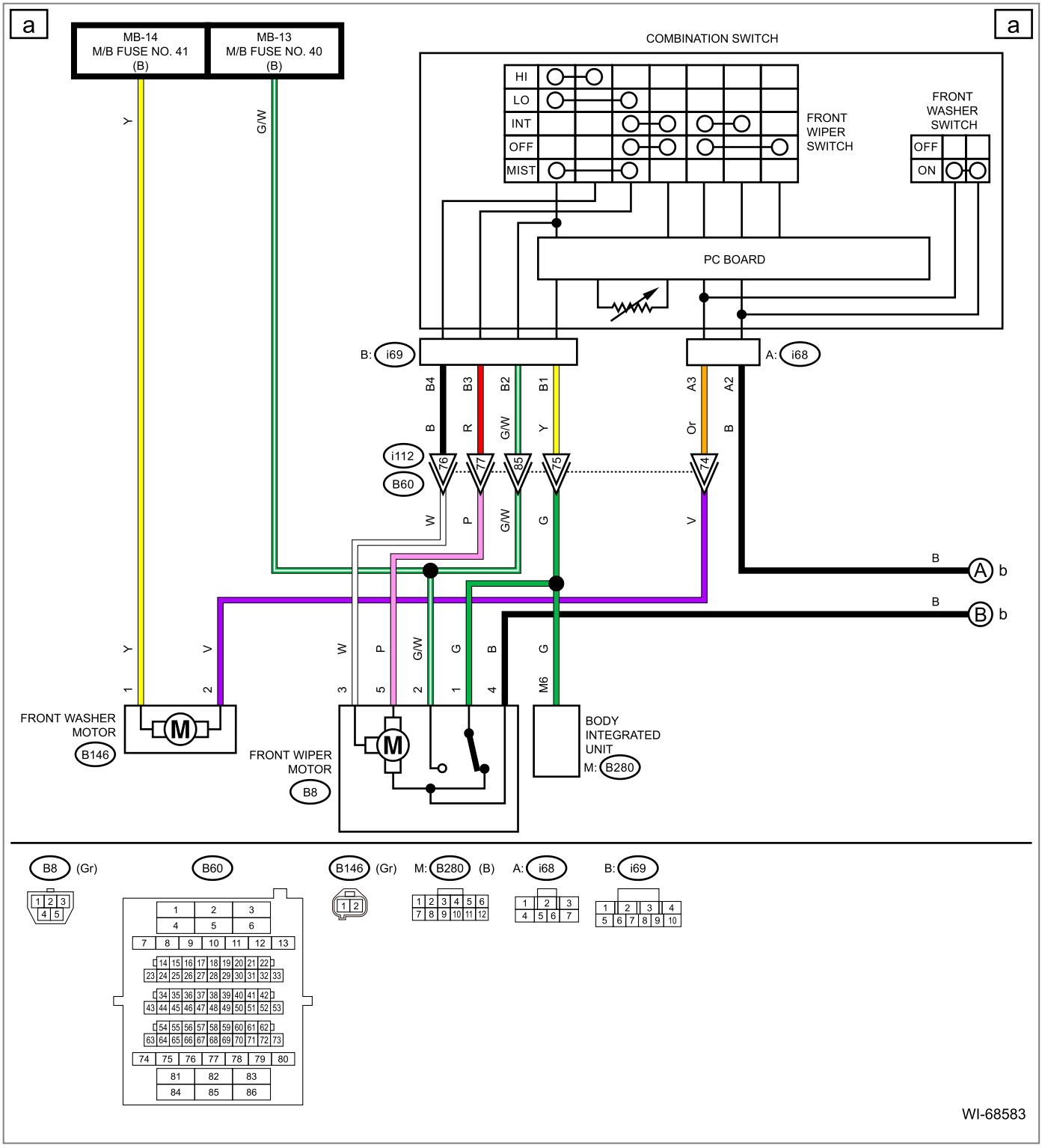


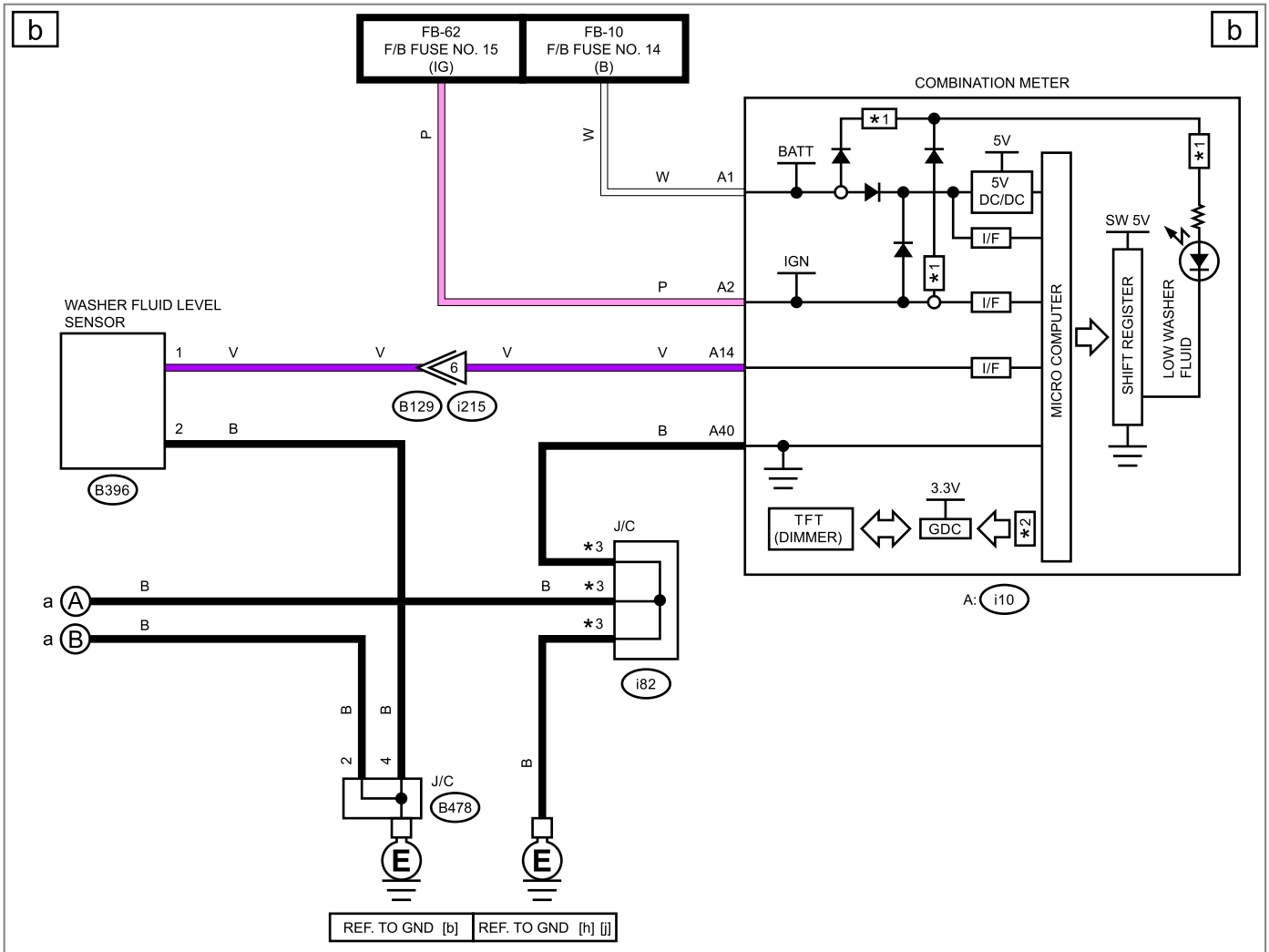
*1 : TERMINAL No. OPTIONAL ARRANGEMENT



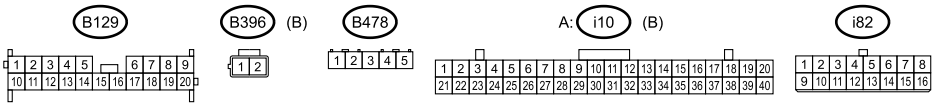
WI-68582

WIRING DIAGRAM


a
a
MB-14
M/B FUSE NO. 41
(B)
MB-13
M/B FUSE NO. 40
(B)
COMBINATION SWITCH
HI
LO
INT
OFF
MIST
FRONT
WIPER
SWITCH
FRONT
WASHER
SWITCH
OFF
ON
PC BOARD
B: i69
A: i68
i112
B60
Y
G/W
B4
B3
B2
B1
A3
A2
B
R
G/W
Y
Or
B
76
77
85
75
74
W
P
G/W
G
V
B
A b
B
B b
Y
V
W
P
G/W
G
B
G
1
2
3
5
2
1
4
M6
FRONT WASHER
MOTOR
B146
FRONT WIPER
MOTOR
B8
BODY
INTEGRATED
UNIT
M: B280
B8 (Gr)
B60
B146 (Gr)
M: B280 (B)
A: i68
B: i69
WI-68583

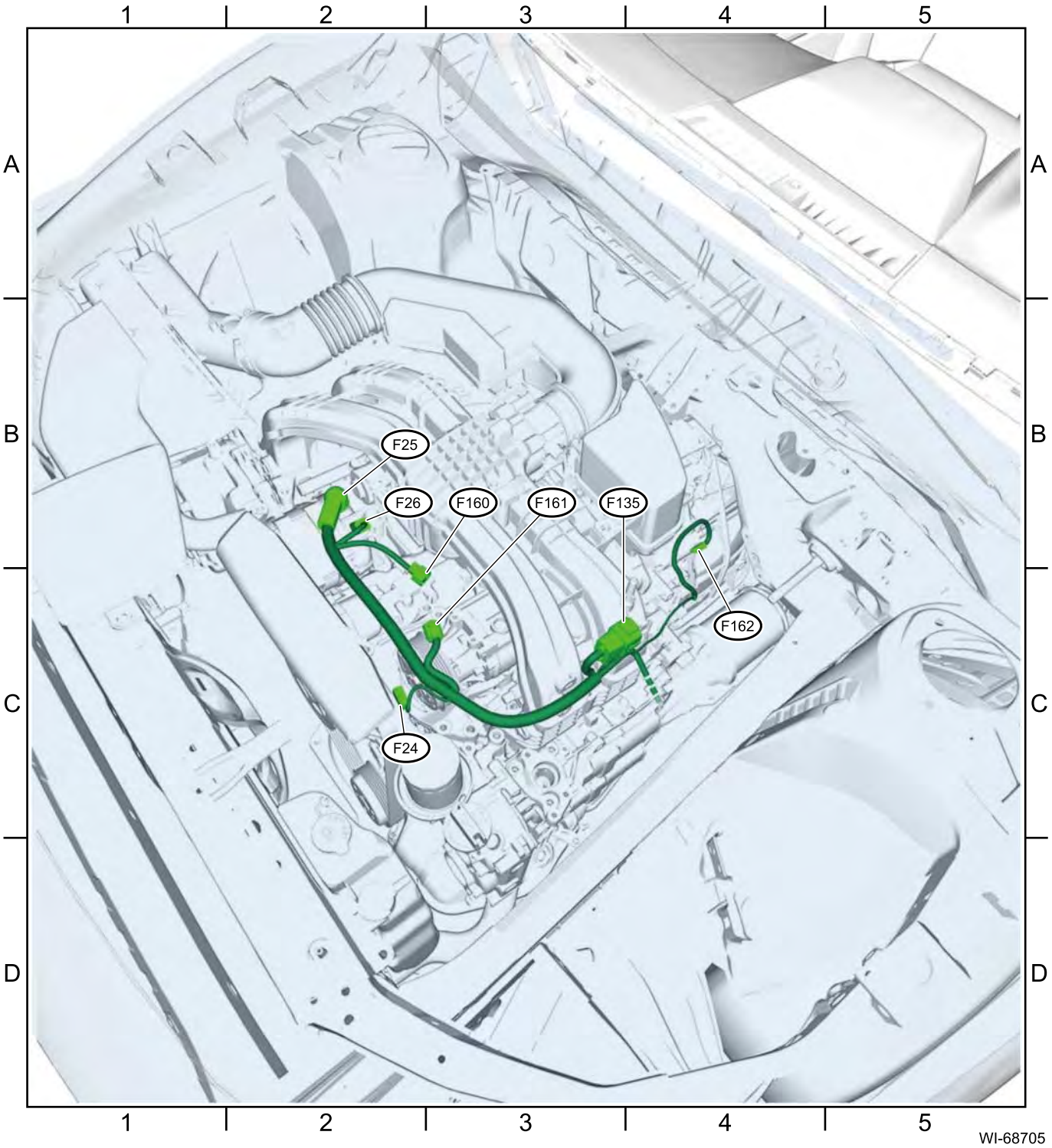


*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68584

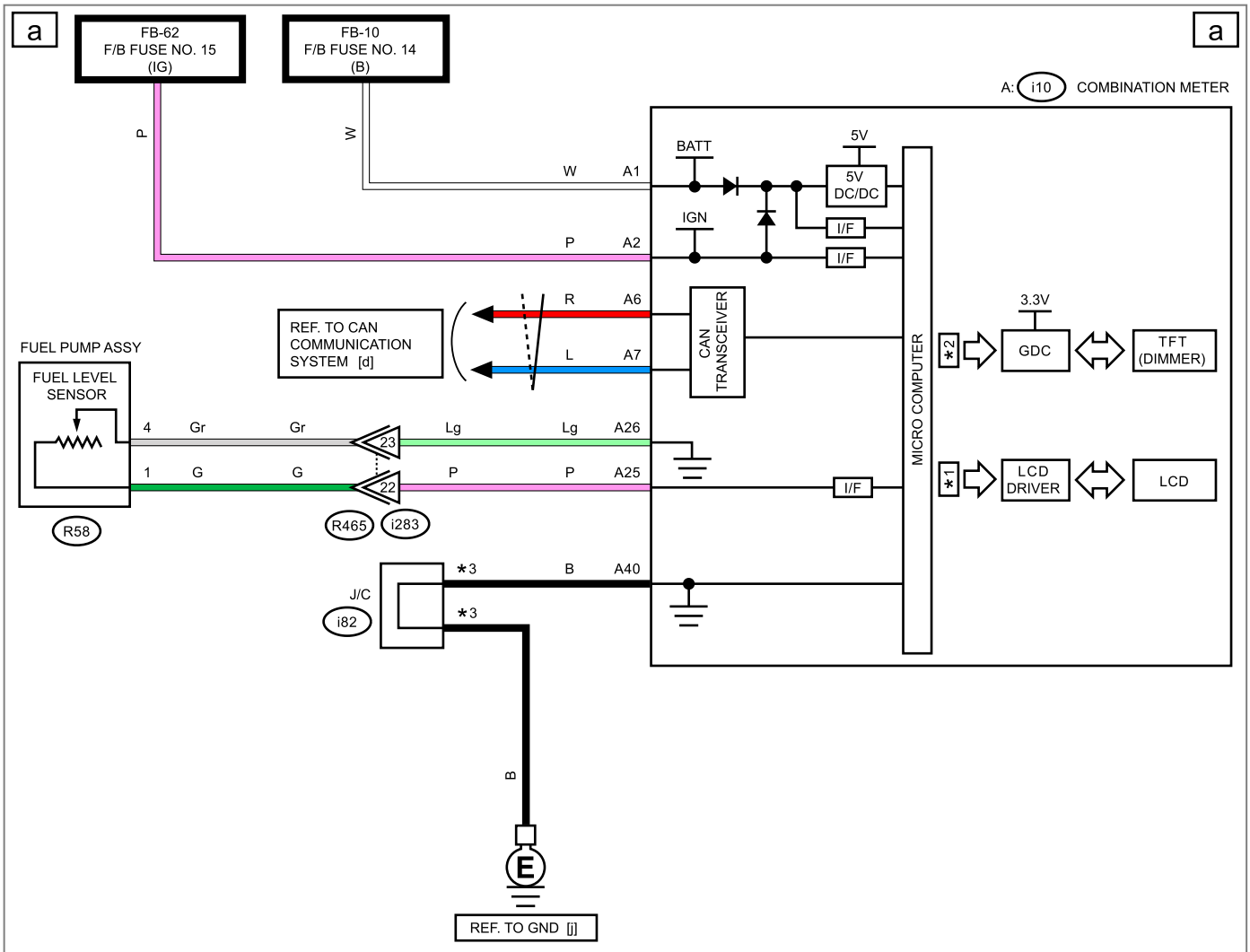
LOCATION



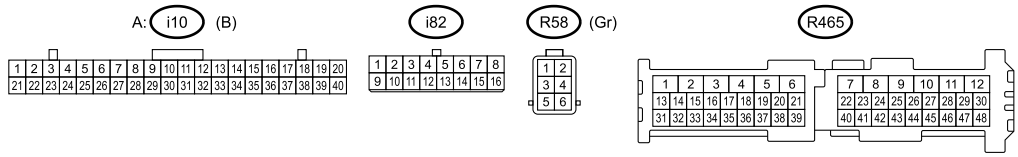
Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
F24	1	Gr	C-2		Magnet clutch
F25	1	V	B-2		Generator terminal B
F26	1	B	B-2		Generator
F135	11	Gr	C-3	E127	Engine wiring harness
F160	2	Gr	C-2		Compressor solenoid

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
F161	3	Gr	C-3		Flow sensor
F162	1	B	B-4		Starter motor
★:White or natural color					

WIRING DIAGRAM



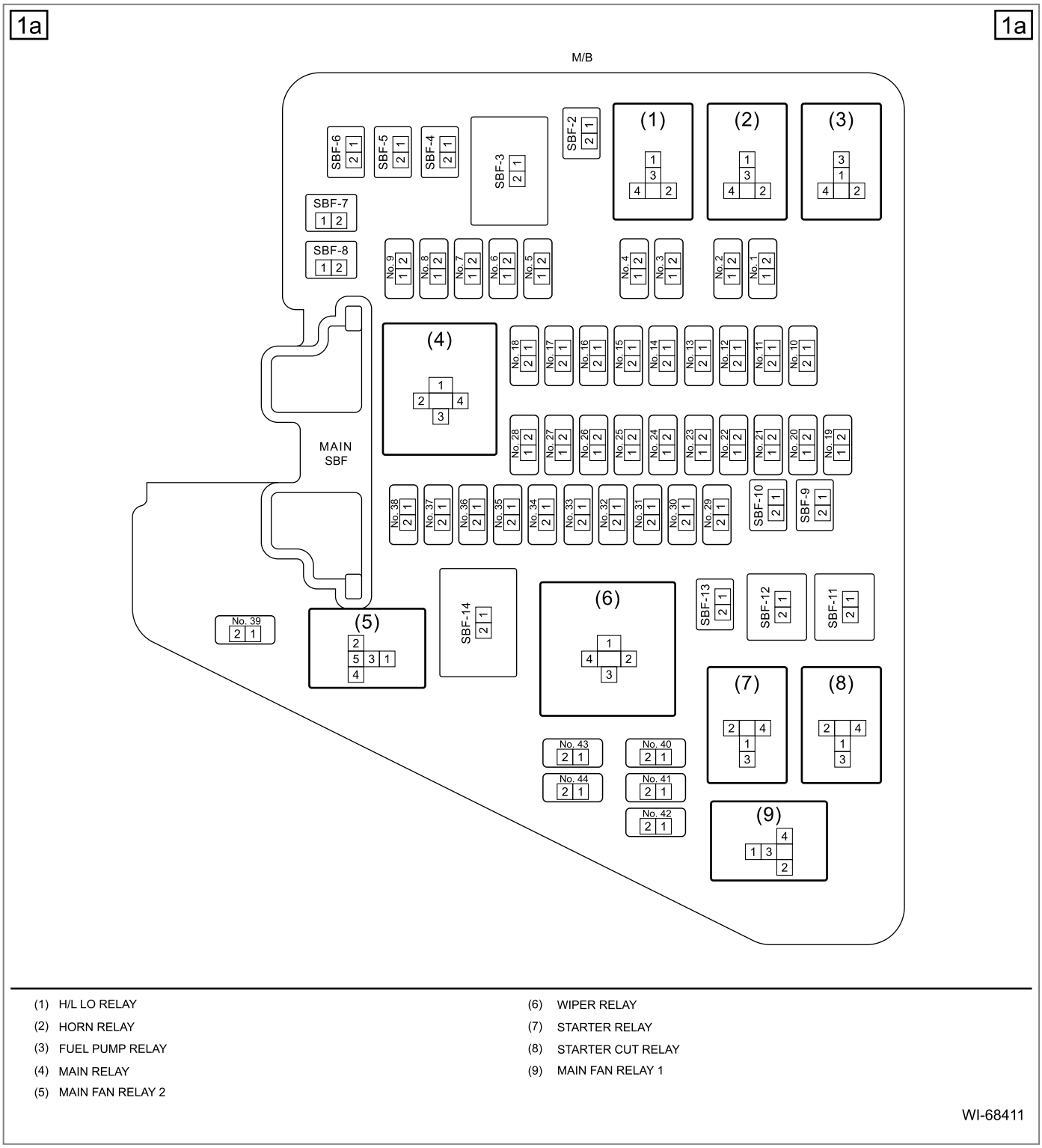
*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68585

LOCATION

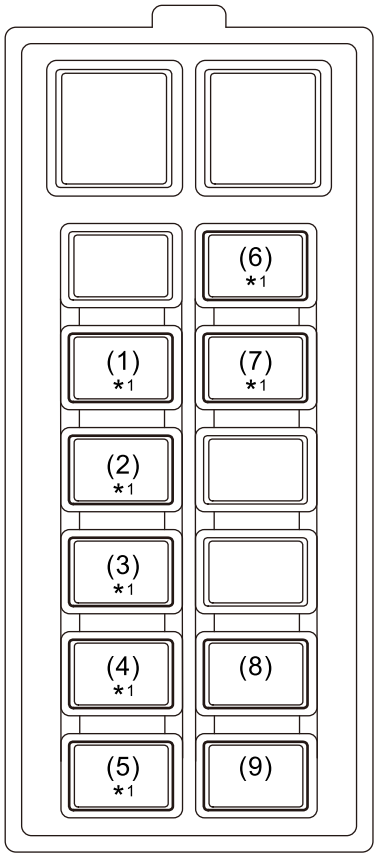
1. ENGINE COMPARTMENT SIDE



(1) H/L LO RELAY
(2) HORN RELAY
(3) FUEL PUMP RELAY
(4) MAIN RELAY
(5) MAIN FAN RELAY 2
(6) WIPER RELAY
(7) STARTER RELAY
(8) STARTER CUT RELAY
(9) MAIN FAN RELAY 1

WI-68411

1b



B225 RELAY HOLDER

*1 : IF EQUIPPED

(1) FRONT FOG LIGHT RELAY RH (SRF)

(2) WITHOUT SRF : FRONT FOG LIGHT RELAY
WITH SRF : FRONT FOG LIGHT RELAY LH (SRF)

(3) A/C RELAY

(4) WIPER DEICER RELAY

(5) DAYTIME RUNNING LIGHT RELAY

(6) STOP LIGHT RELAY

(7) REAR WIPER RELAY

(8) SUB FAN RELAY

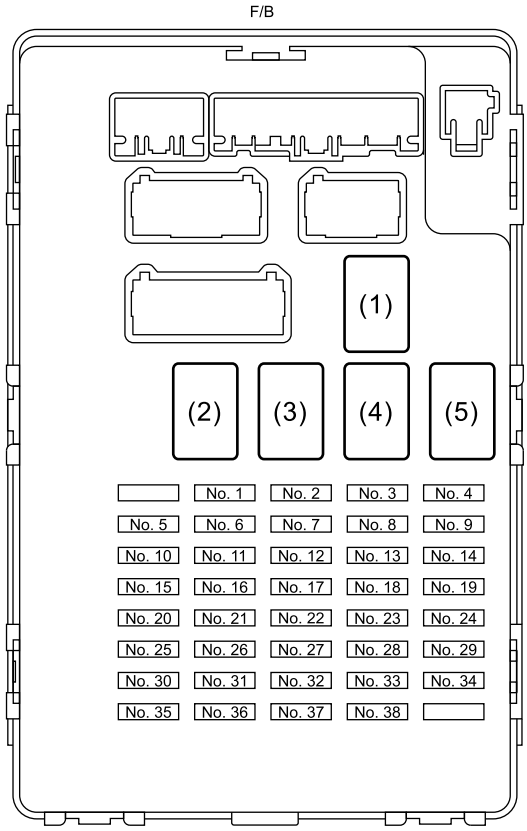
(9) REAR DEFOGGER RELAY

WI-68412

2. PASSENGER ROOM SIDE

2a

2a



(1) IG 1 RELAY

(2) IG 2 RELAY

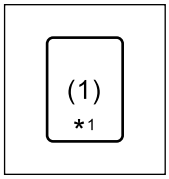
(3) POWER WINDOW RELAY

(4) ACCESSORY RELAY 2

(5) ACCESSORY RELAY 1

WI-68413

2b

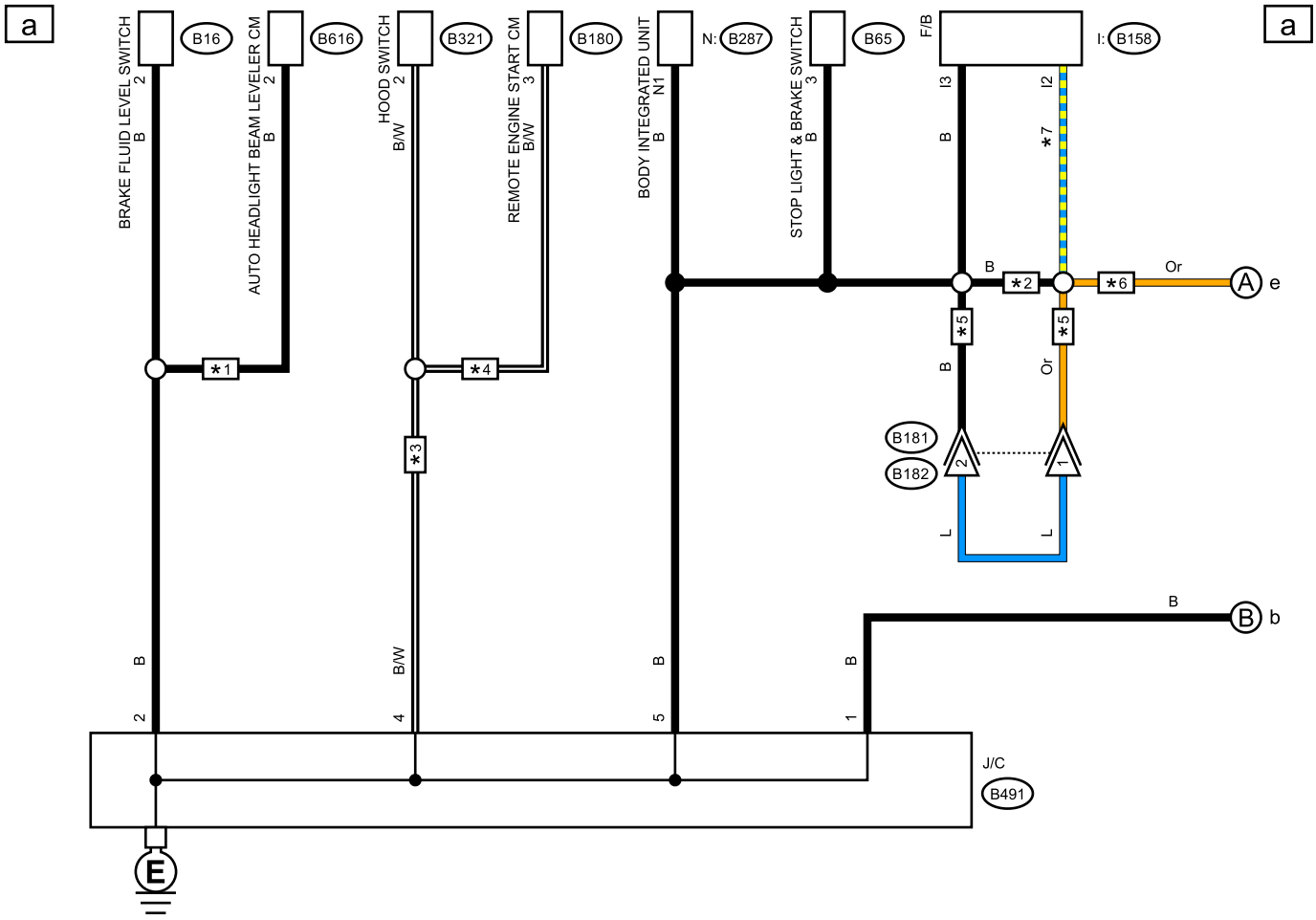


i280 RELAY HOLDER

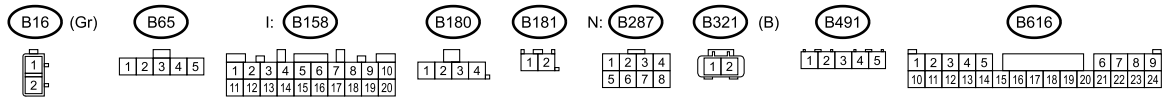
*1 : IF EQUIPPED

(1) STEERING HEATER RELAY

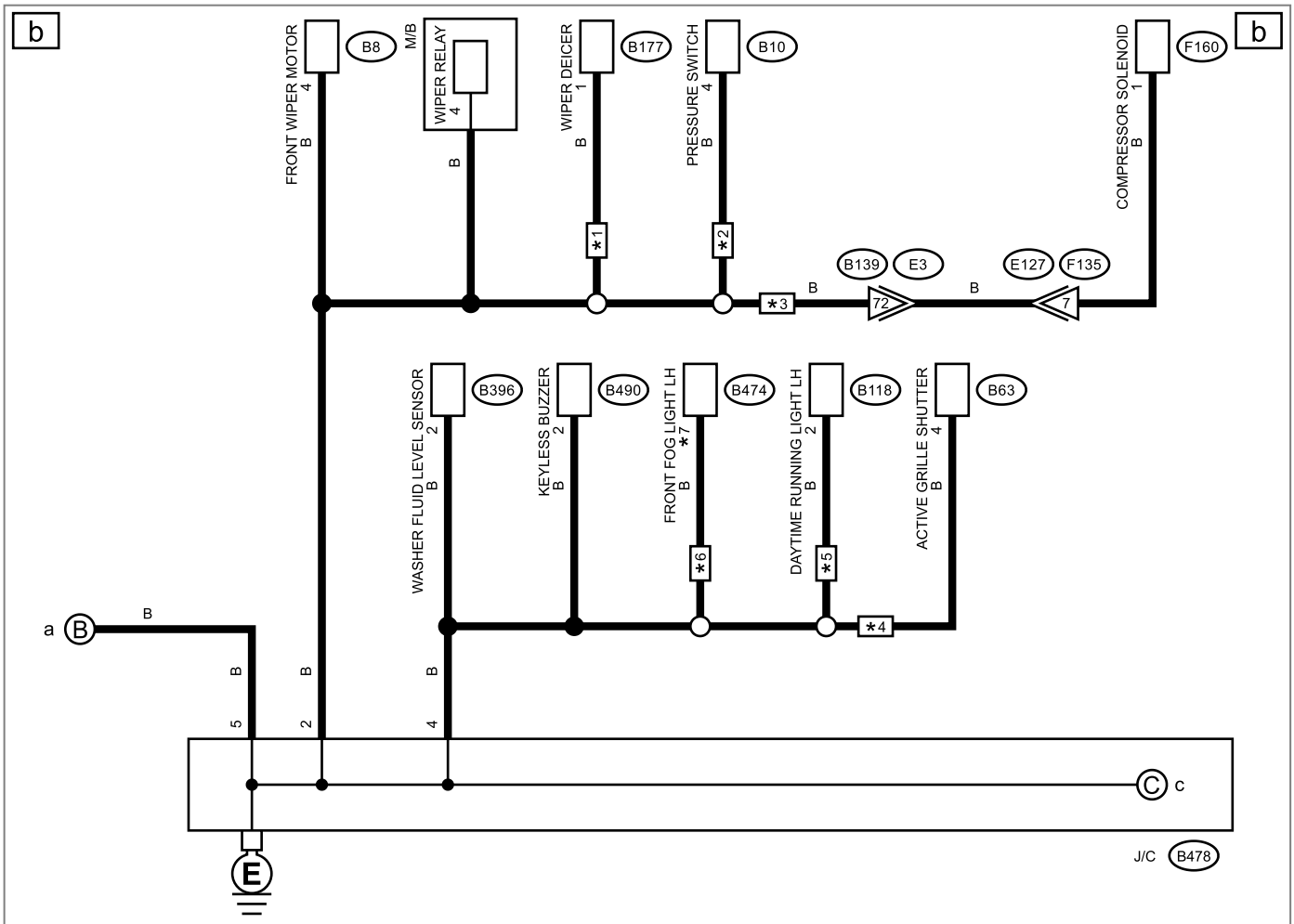
WIRING DIAGRAM



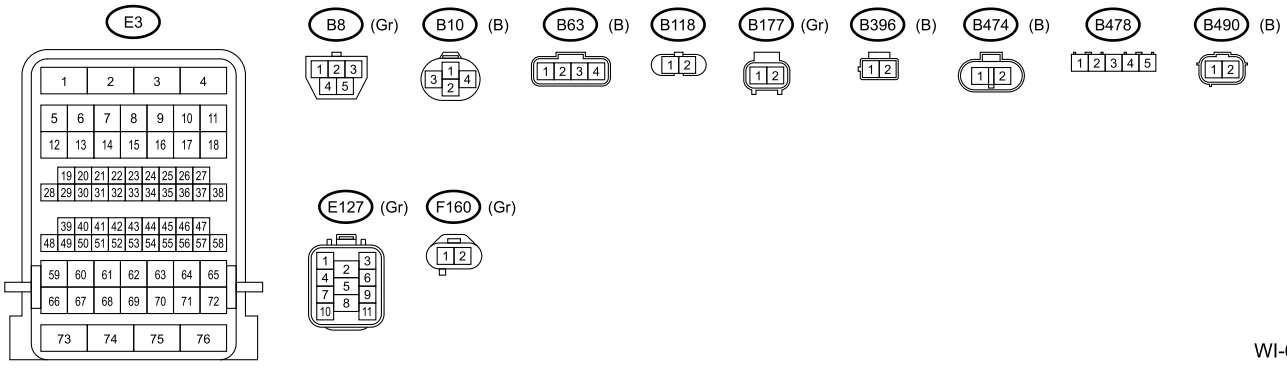
*1 : WITH SRH
*2 : WITHOUT REMOTE ENGINE START
*3 : WITH REMOTE ENGINE START
*4 : WITHOUT PUSH BUTTON START
*5 : WITHOUT PUSH BUTTON START & WITH REMOTE ENGINE START
*6 : WITH PUSH BUTTON START & WITH REMOTE ENGINE START
*7 : WITHOUT REMOTE ENGINE START : B
WITH REMOTE ENGINE START : Or



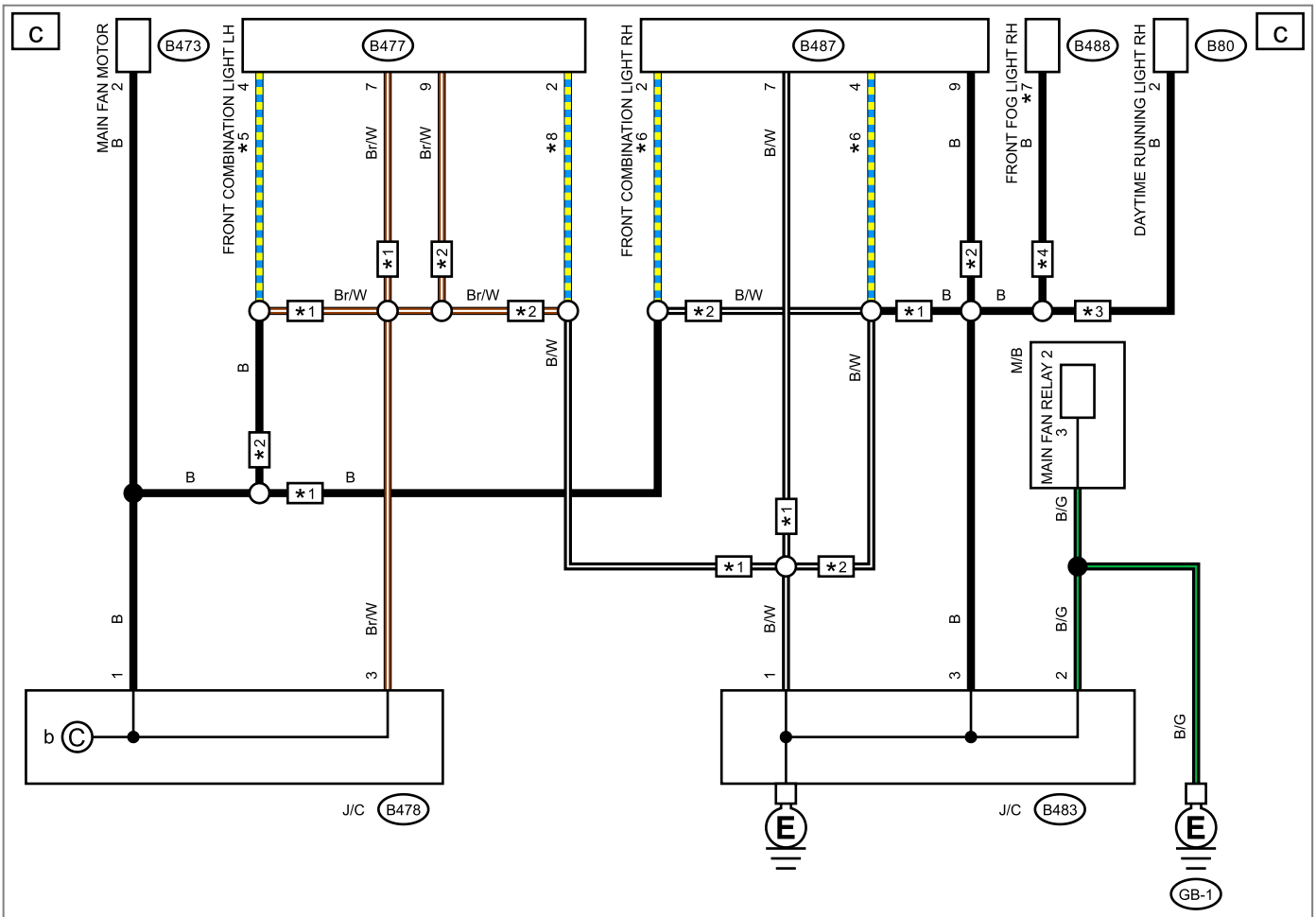
WI-68435



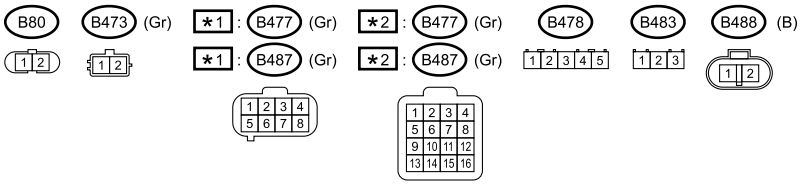
*1 : WITH DEICER
*2 : MANUAL A/C
*3 : AUTO A/C
*4 : WITH ACTIVE GRILLE SHUTTER
*5 : HALOGEN MODEL WITH DAYTIME RUNNING LIGHT LED TYPE
*6 : WITH FRONT FOG LIGHT
*7 : WITHOUT SRF : 1
WITH SRF : 2



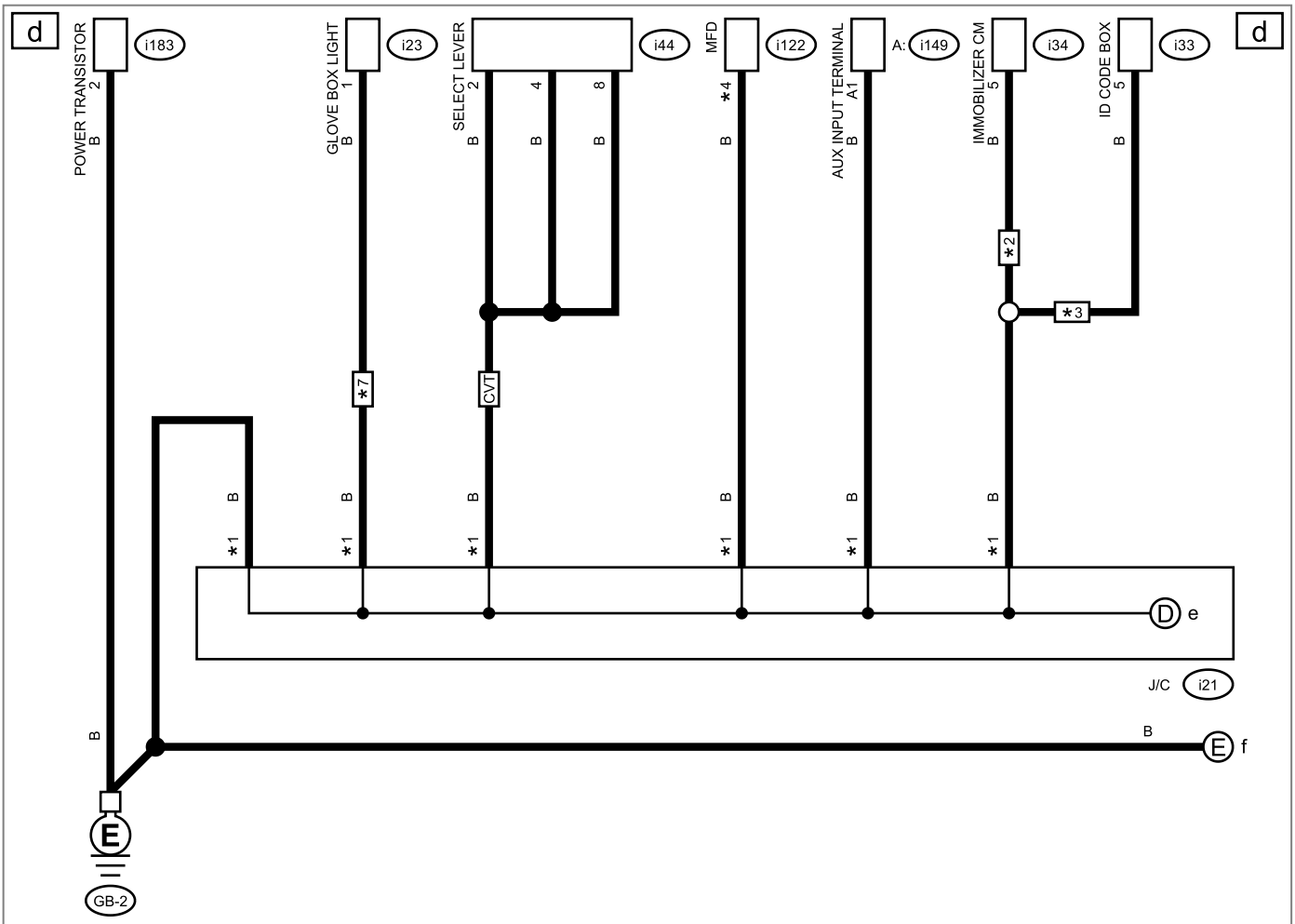
WI-68436



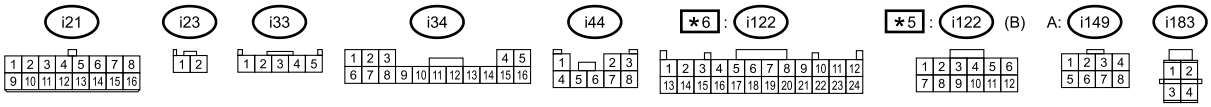
*1 : HALOGEN MODEL
*2 : LED MODEL
*3 : HALOGEN MODEL WITH DAYTIME RUNNING LIGHT LED TYPE
*4 : WITH FRONT FOG LIGHT
*5 : HALOGEN MODEL : Br/W
LED MODEL : B
*6 : HALOGEN MODEL : B
LED MODEL : B/W
*7 : WITHOUT SRF : 1
WITH SRF : 2
*8 : HALOGEN MODEL : B/W
LED MODEL : Br/W



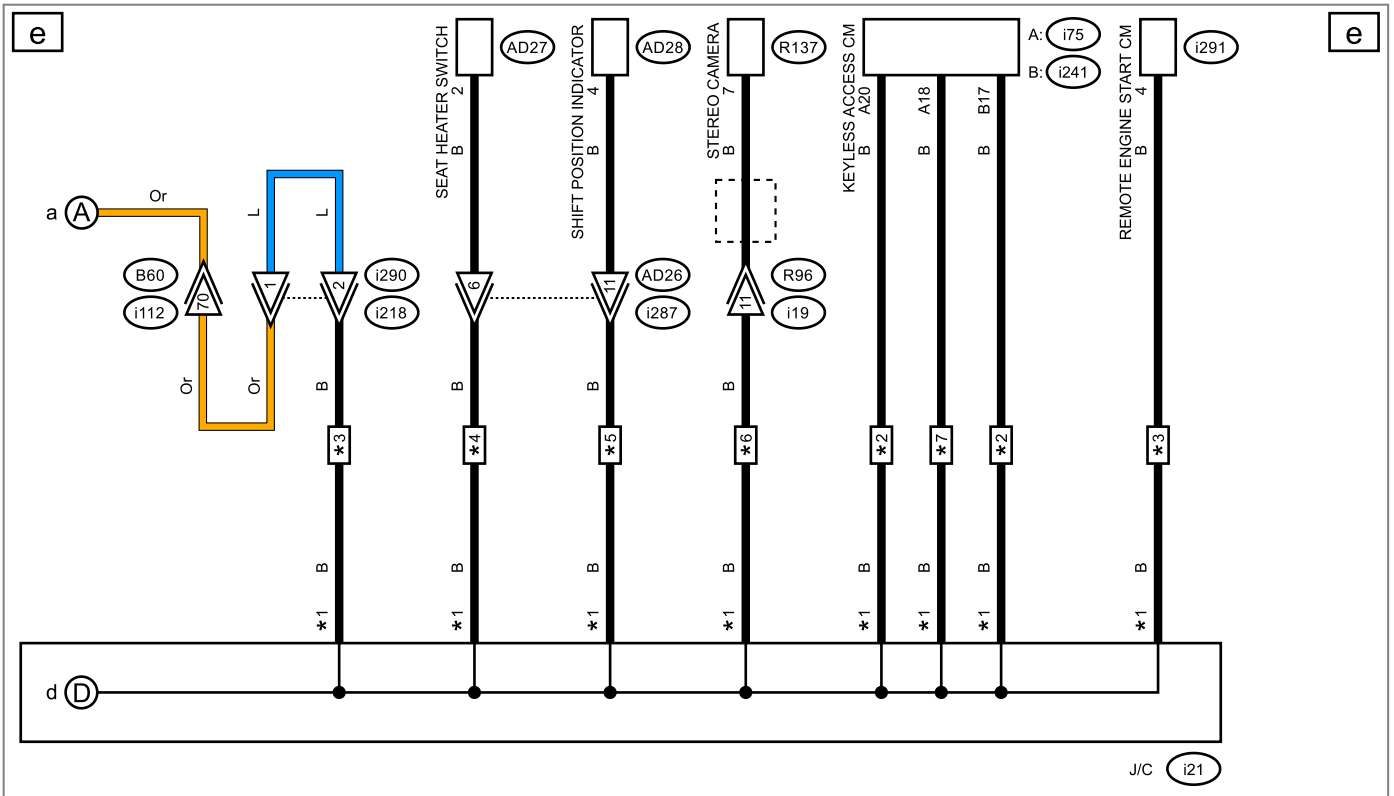
WI-68437



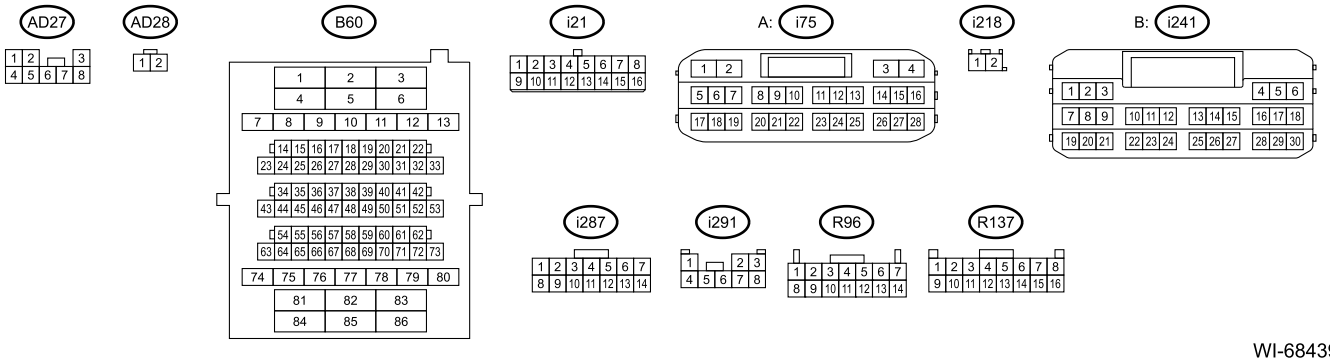
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH IMMOBILIZER CM
*3 : WITH ID CODE BOX
*4 : WITH STANDARD MFD : 3
WITH HIGH GRADE MFD : 21
*5 : WITH STANDARD MFD
*6 : WITH HIGH GRADE MFD
*7 : WITH GLOVE BOX ILLUMI. LIGHT



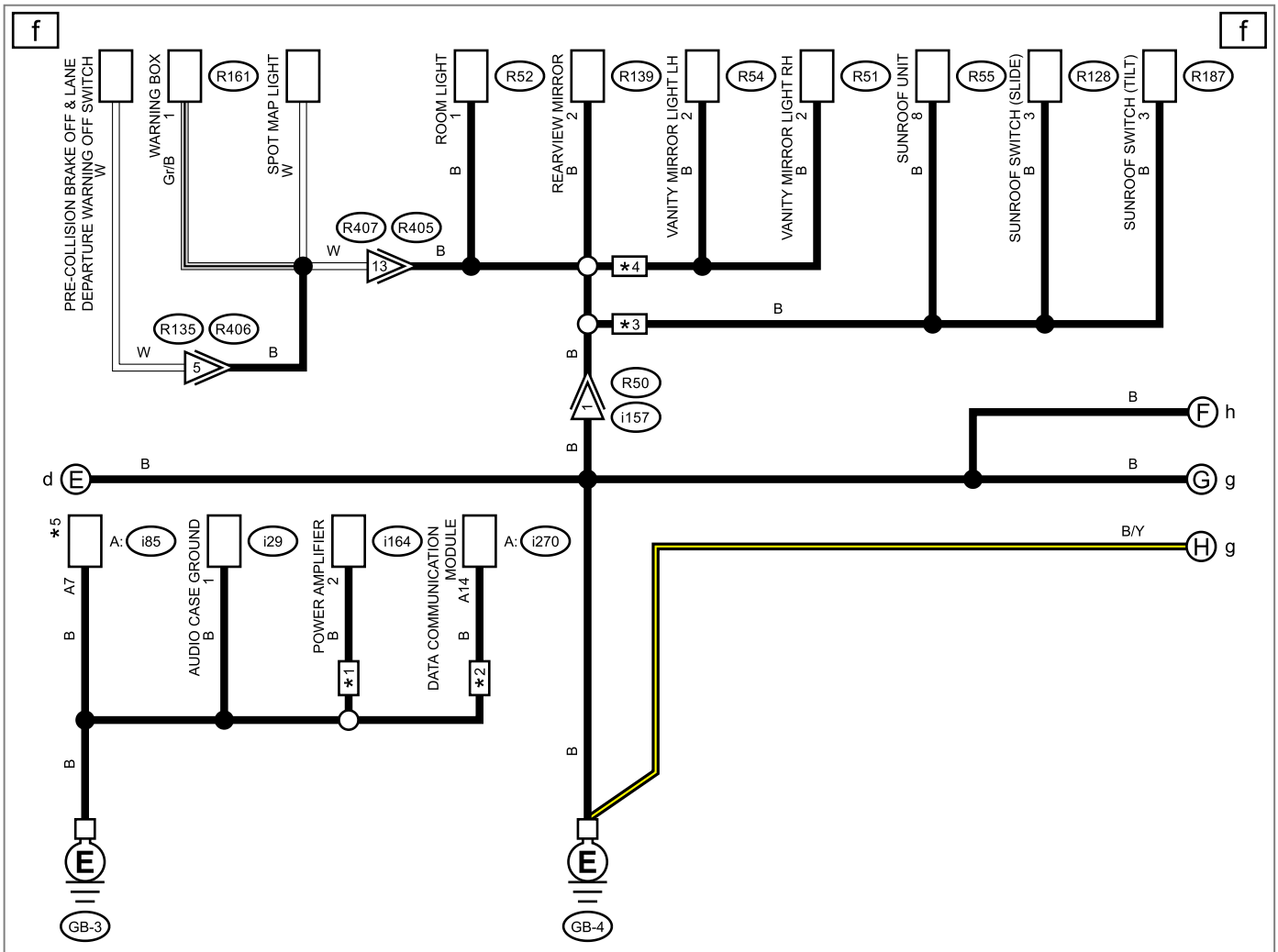
WI-68438



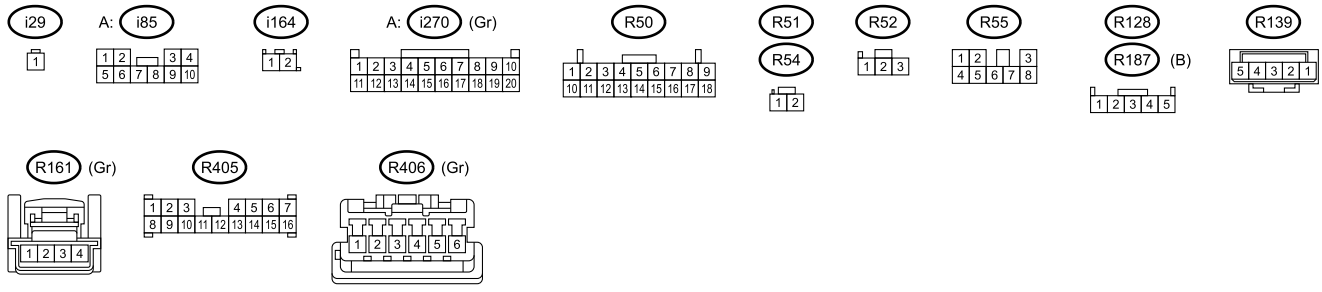
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH PUSH BUTTON START
*3 : WITH PUSH BUTTON START & WITH REMOTE ENGINE START
*4 : WITH SEAT HEATER
*5 : WITH SHIFT POSITION INDICATOR LAMP
*6 : WITH EyeSight
*7 : WITH PUSH BUTTON START & WITH ID CODE BOX



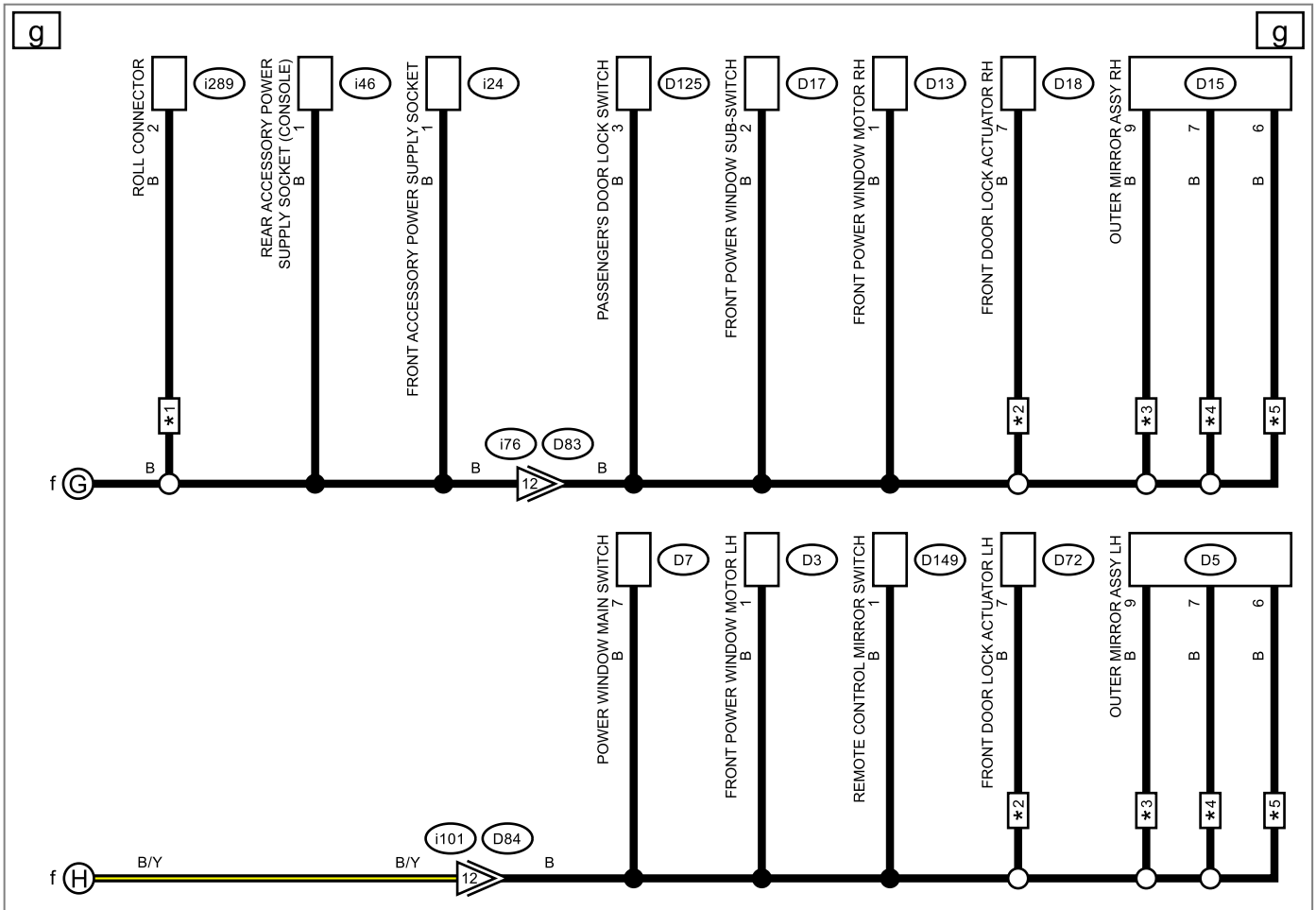
WI-68439



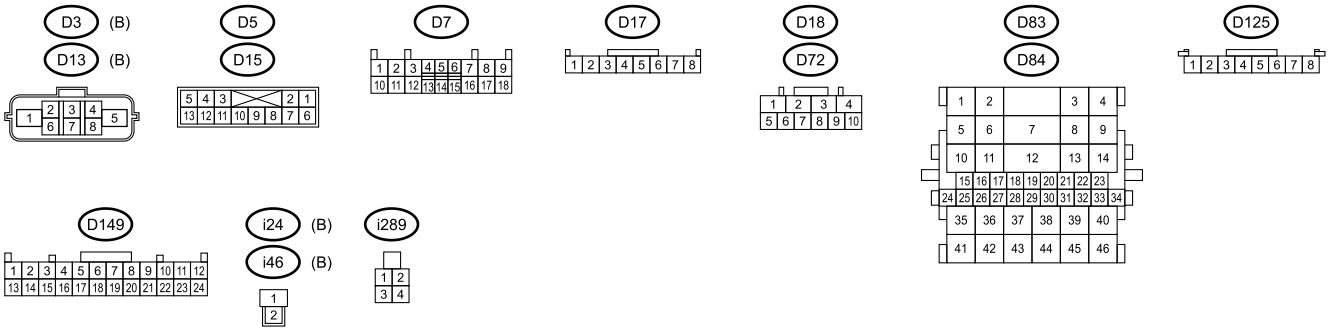
*1 : WITH POWER AMPLIFIER
*2 : WITH TELEMATICS
*3 : WITH SUNROOF
*4 : WITH VANITY MIRROR ILLUMI. LIGHT
*5 : WITHOUT NAVIGATION : AUDIO
WITH NAVIGATION : NAVIGATION UNIT



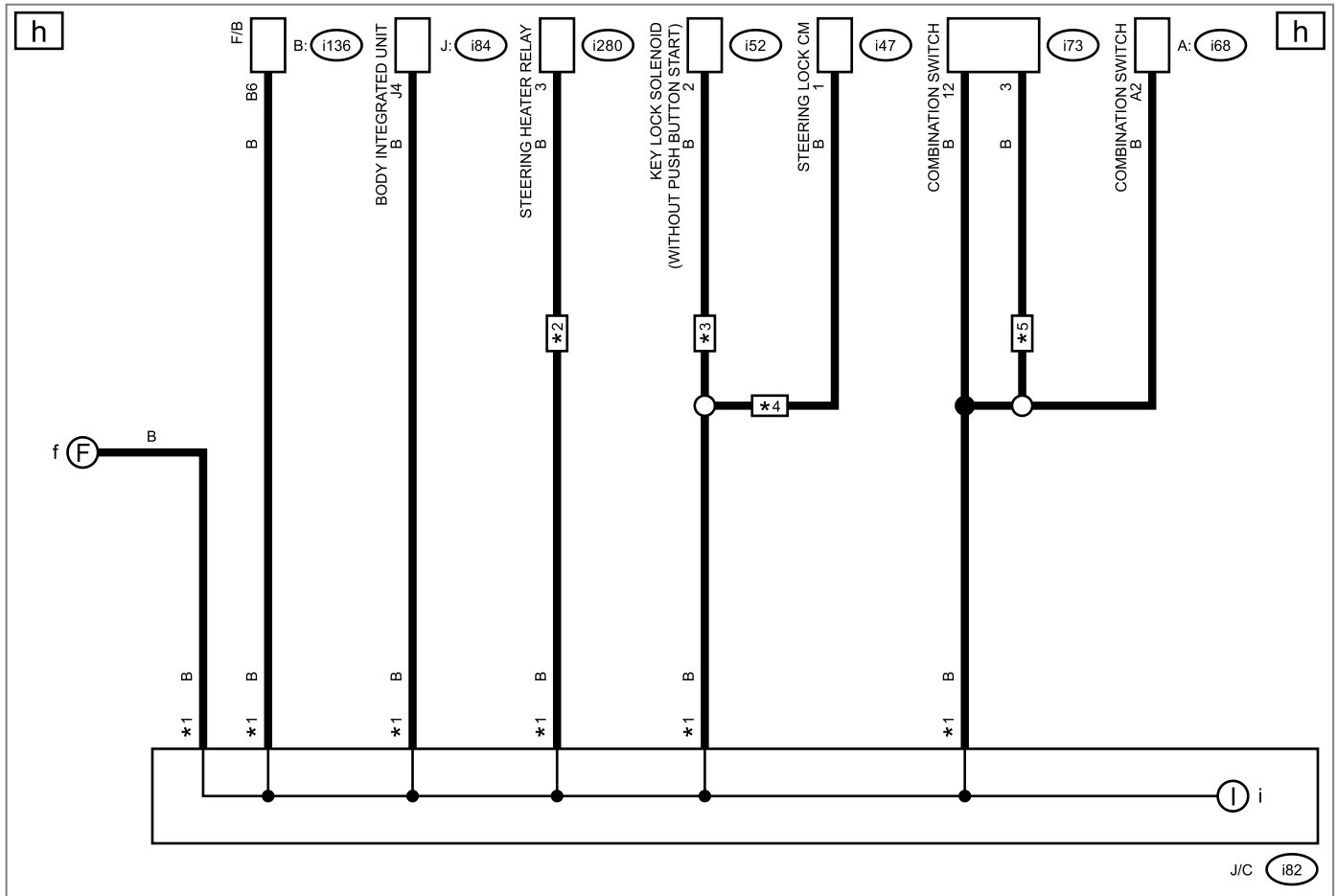
WI-68440



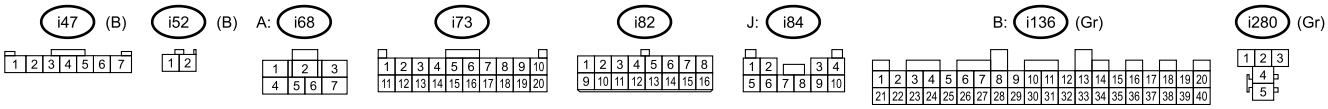
*1 : WITH STEERING HEATER
*2 : WITH PUSH BUTTON START
*3 : WITH MIRROR HEATER
*4 : WITH MIRROR TURN
*5 : WITH BSD/RCTA



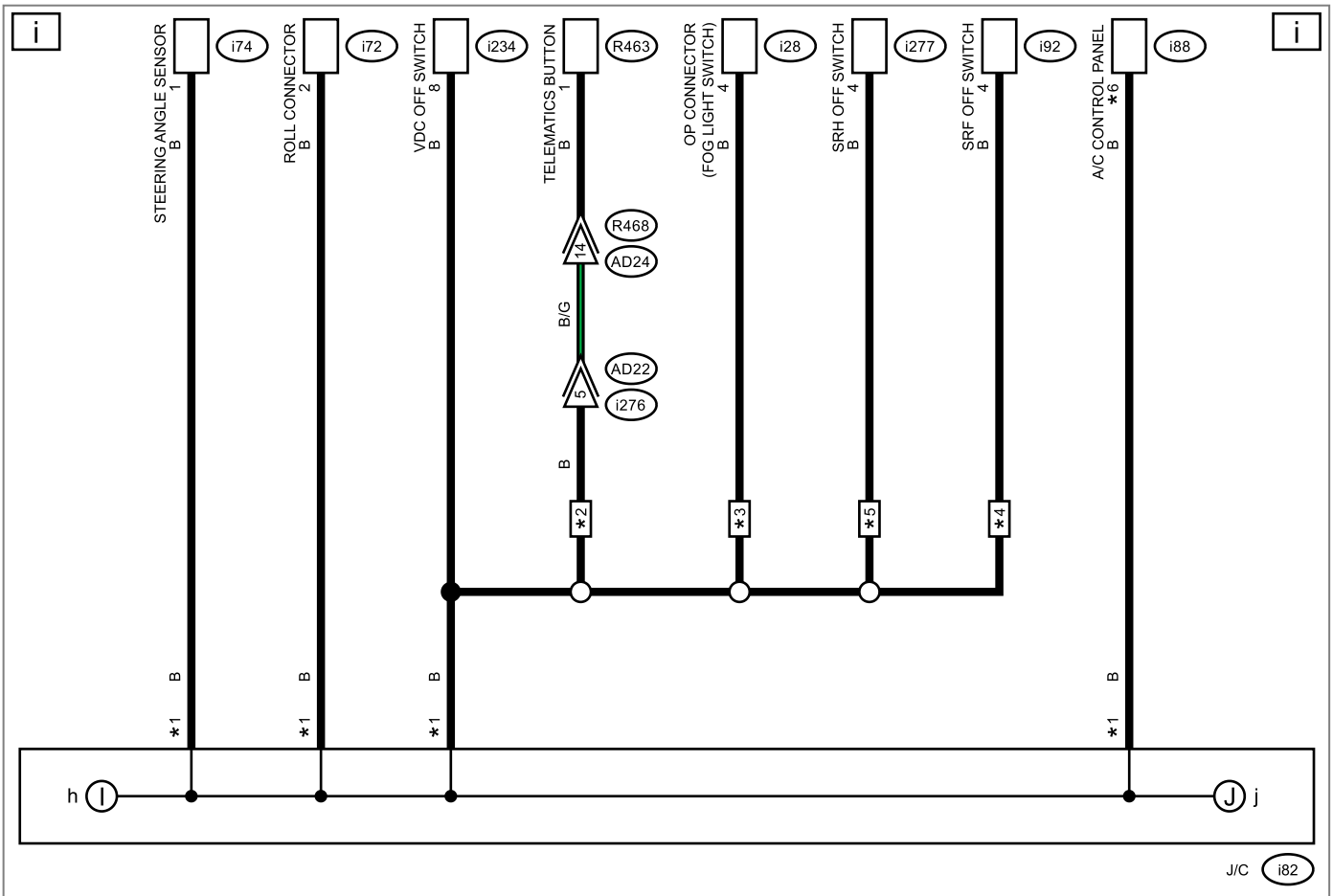
WI-68441



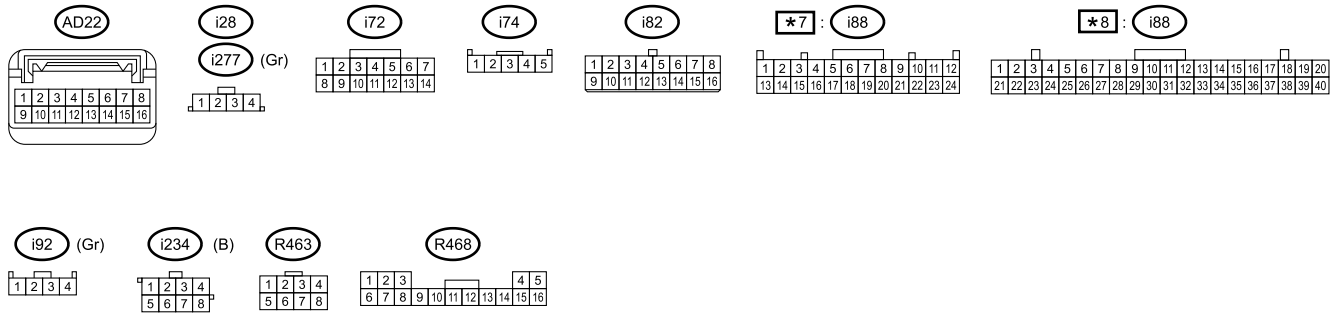
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH STEERING HEATER
*3 : CVT MODEL WITHOUT PUSH BUTTON START
*4 : WITH PUSH BUTTON START
*5 : WITHOUT OP CONNECTOR (FRONT FOG LIGHT)



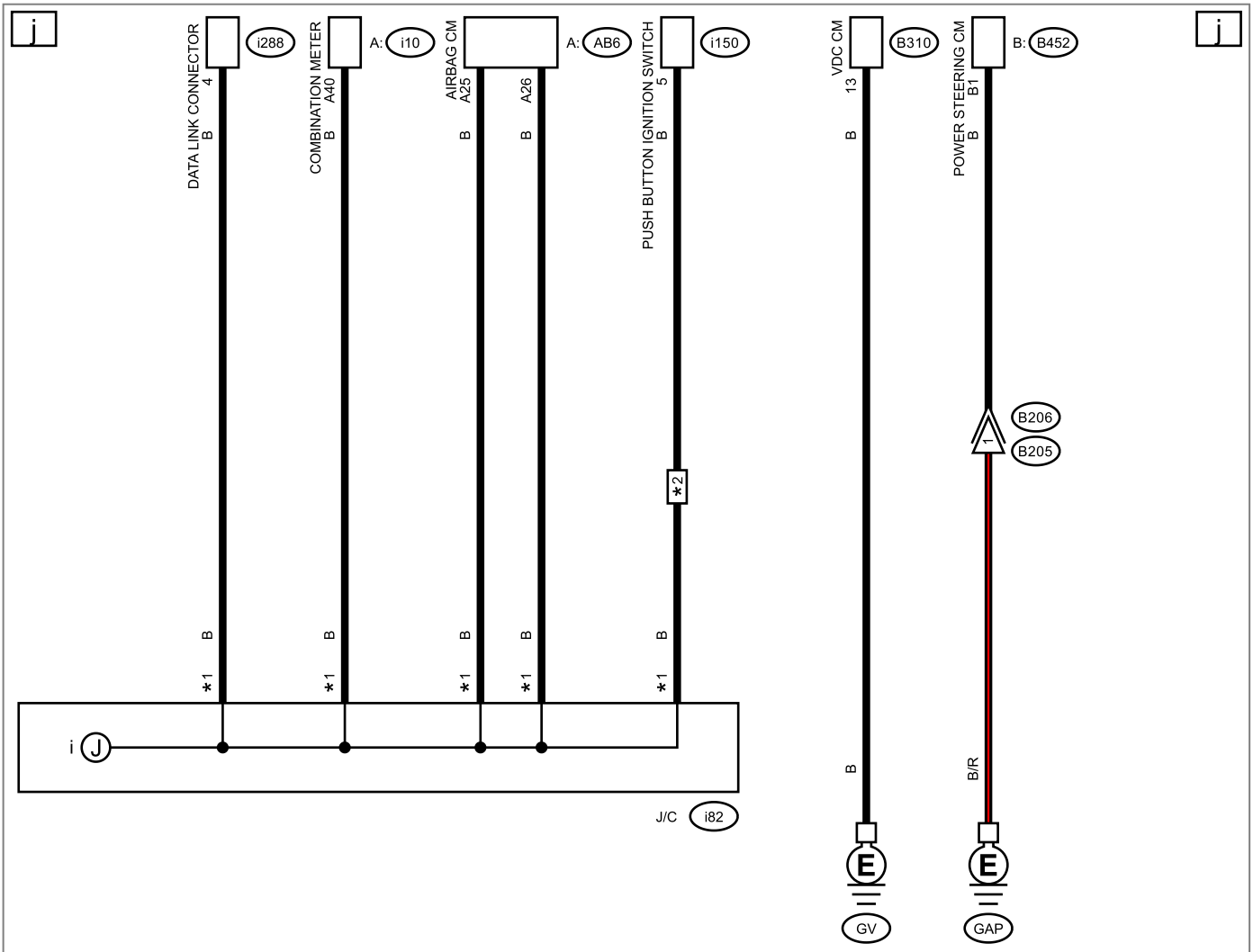
WI-68442



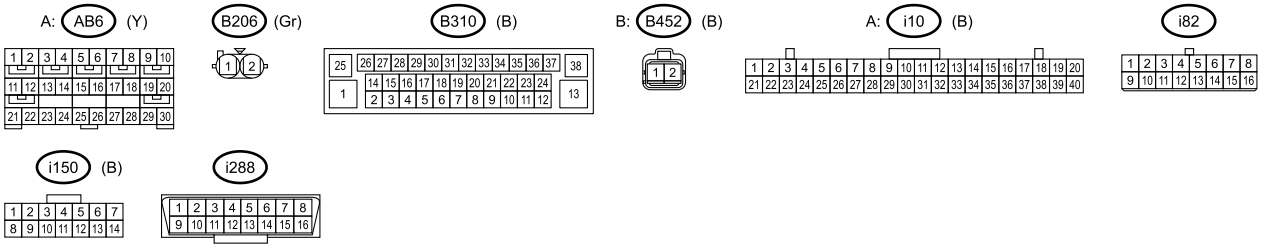
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH TELEMATICS
*3 : WITH OP CONNECTOR (FRONT FOG LIGHT)
*4 : WITH SRF
*5 : WITH SRH
*6 : MANUAL A/C : 18
AUTO A/C : 10
*7 : MANUAL A/C
*8 : AUTO A/C



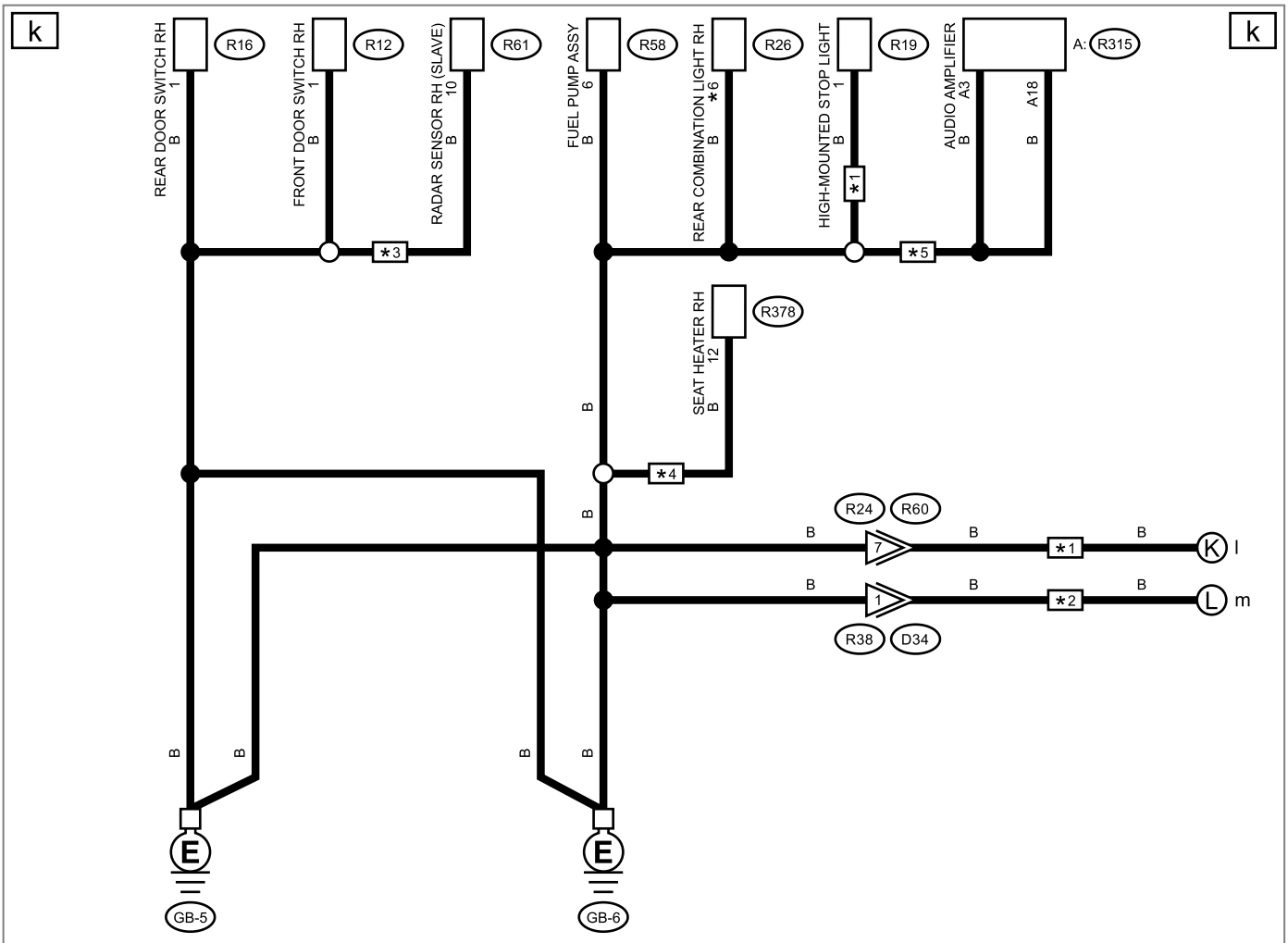
WI-68443



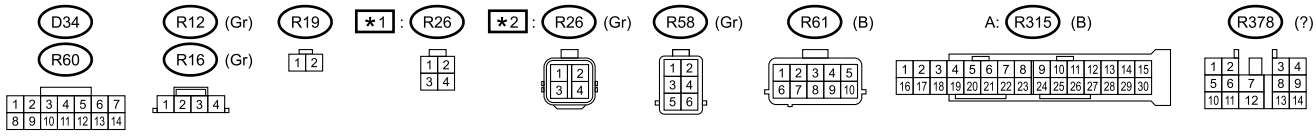
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH PUSH BUTTON START



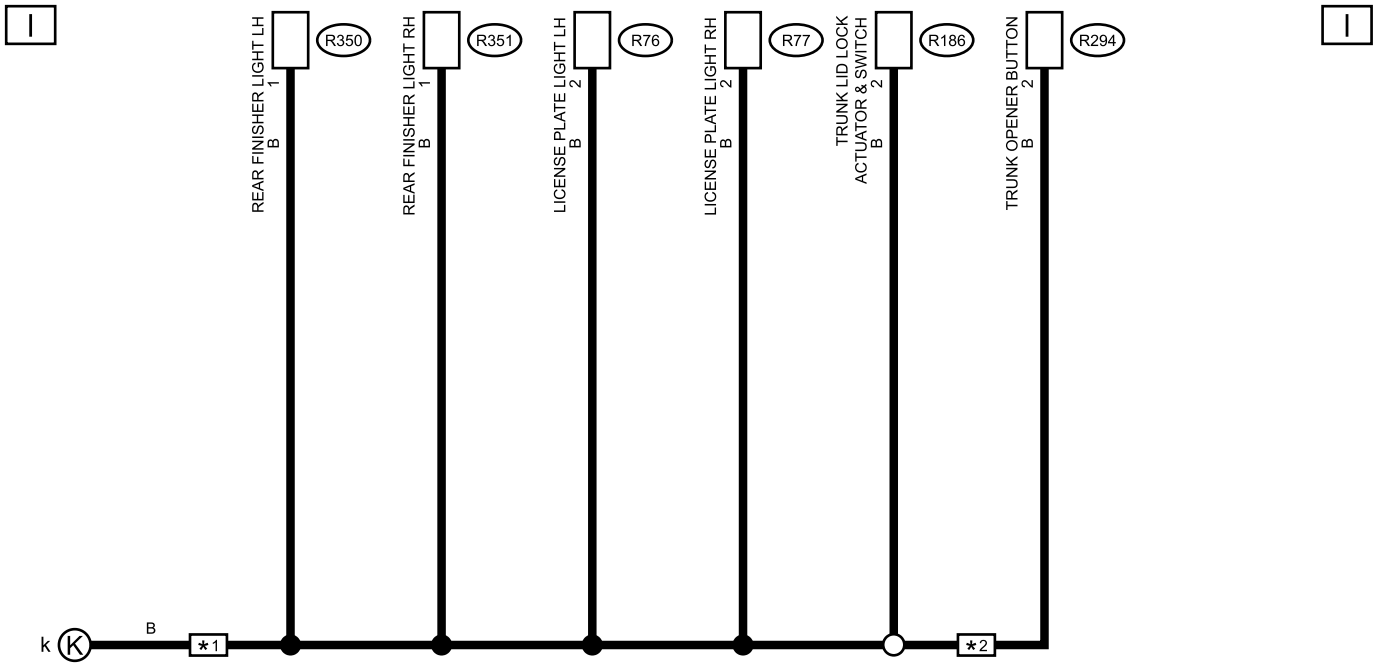
WI-68444



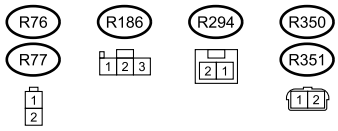
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
*3 : WITH BSD/RCTA
*4 : WITH SEAT HEATER
*5 : WITH AUDIO AMPLIFIER
*6 : 4 DOOR MODEL : 2
5 DOOR MODEL : 4



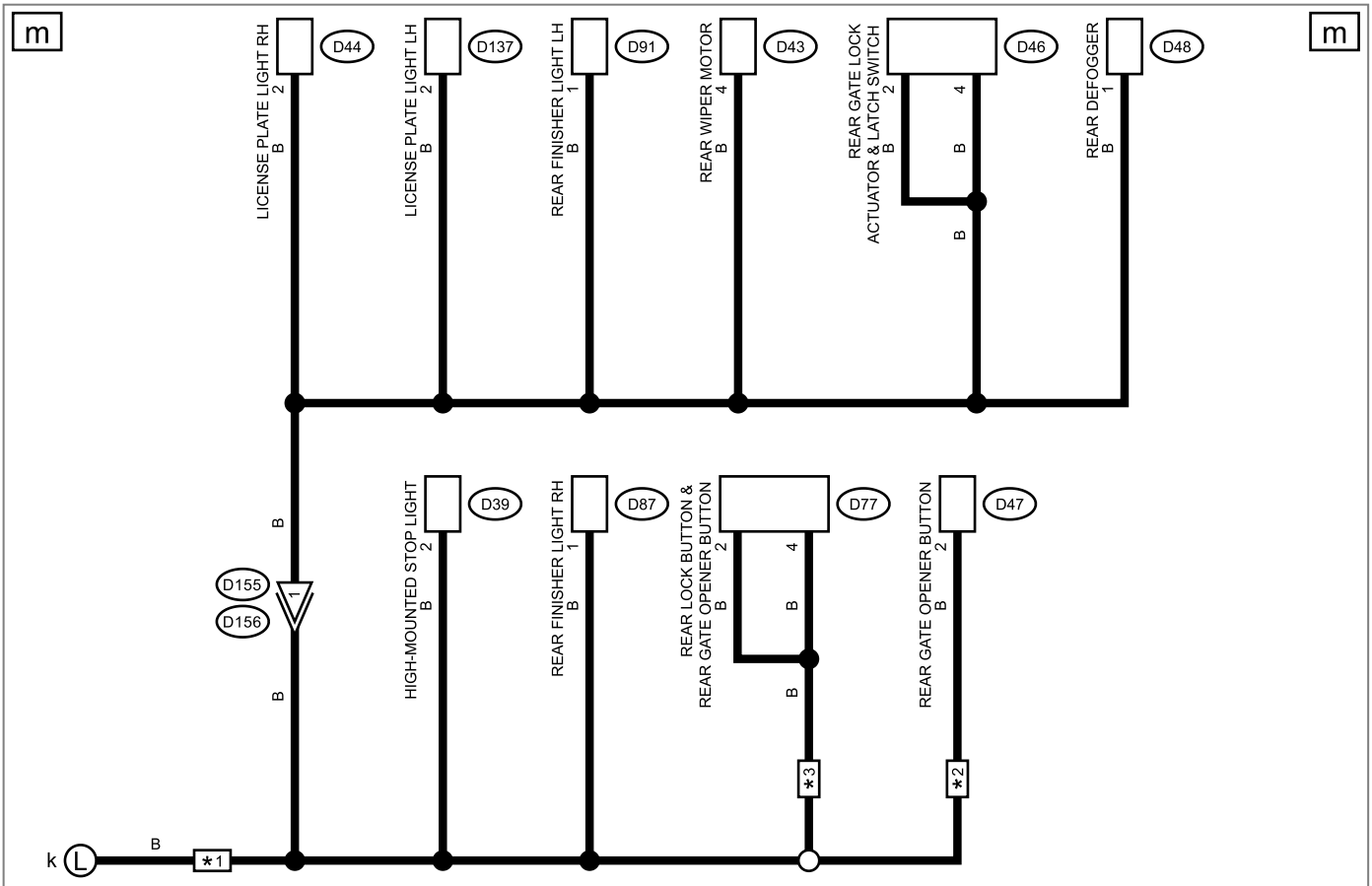
WI-68445



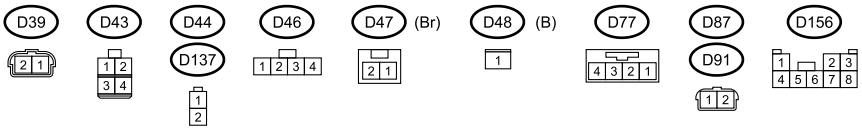
*1 : 4 DOOR MODEL
*2 : WITH PUSH BUTTON START



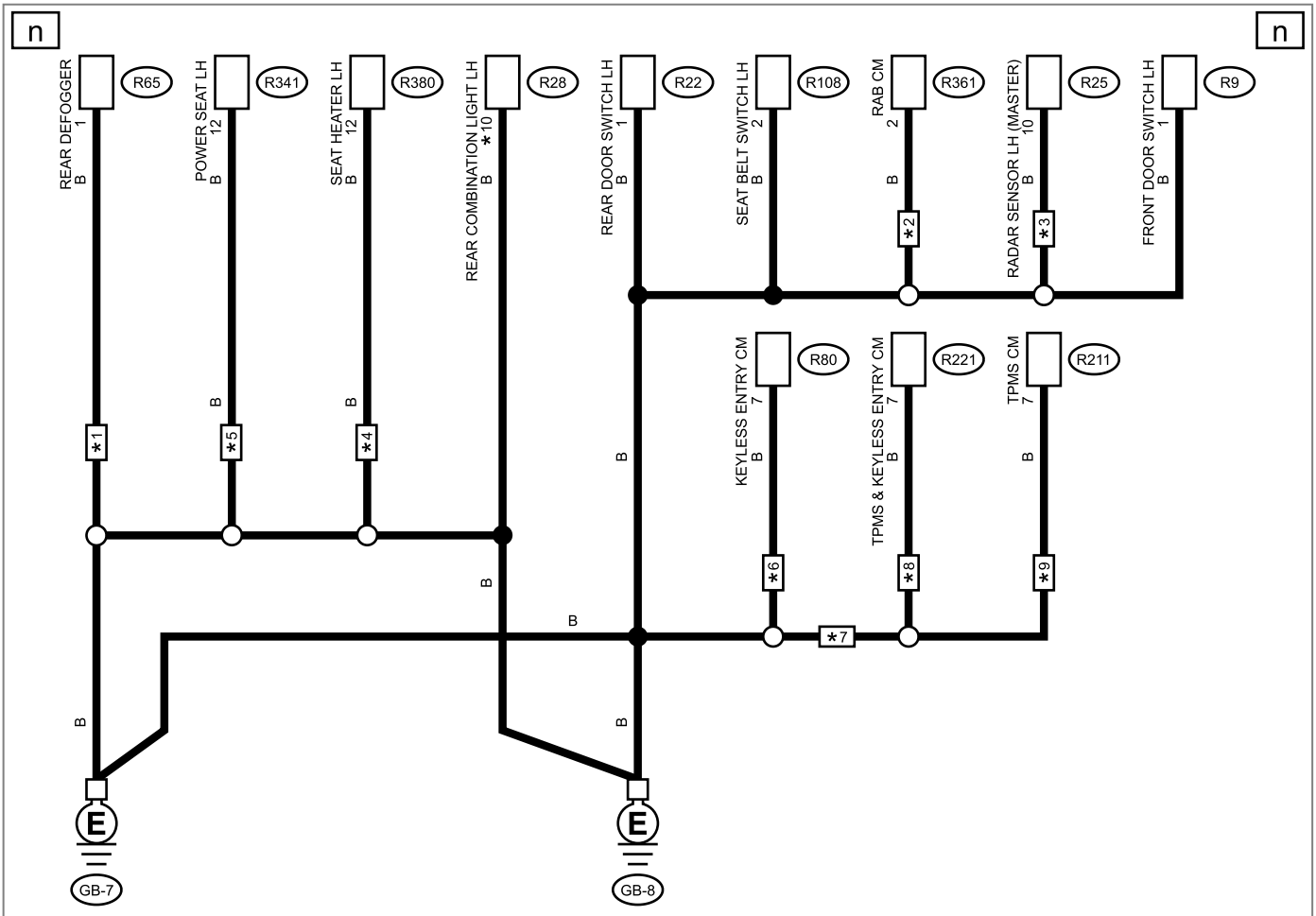
WI-68446



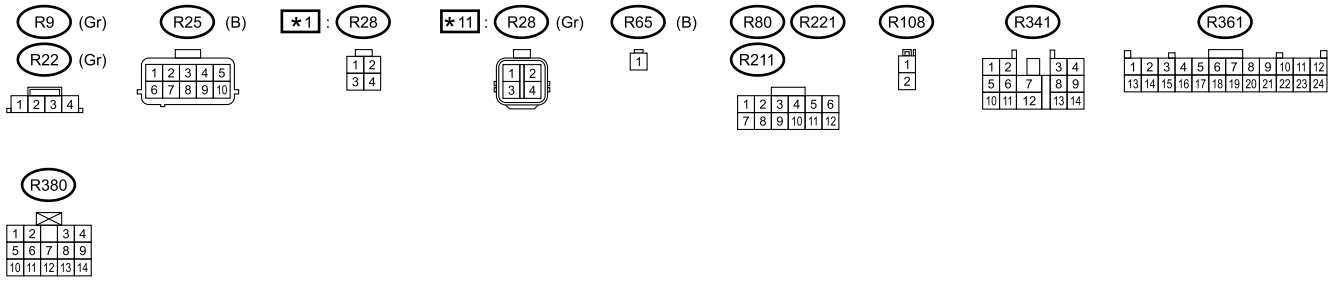
*1 : 5 DOOR MODEL
*2 : WITHOUT PUSH BUTTON START
*3 : WITH PUSH BUTTON START



WI-68447



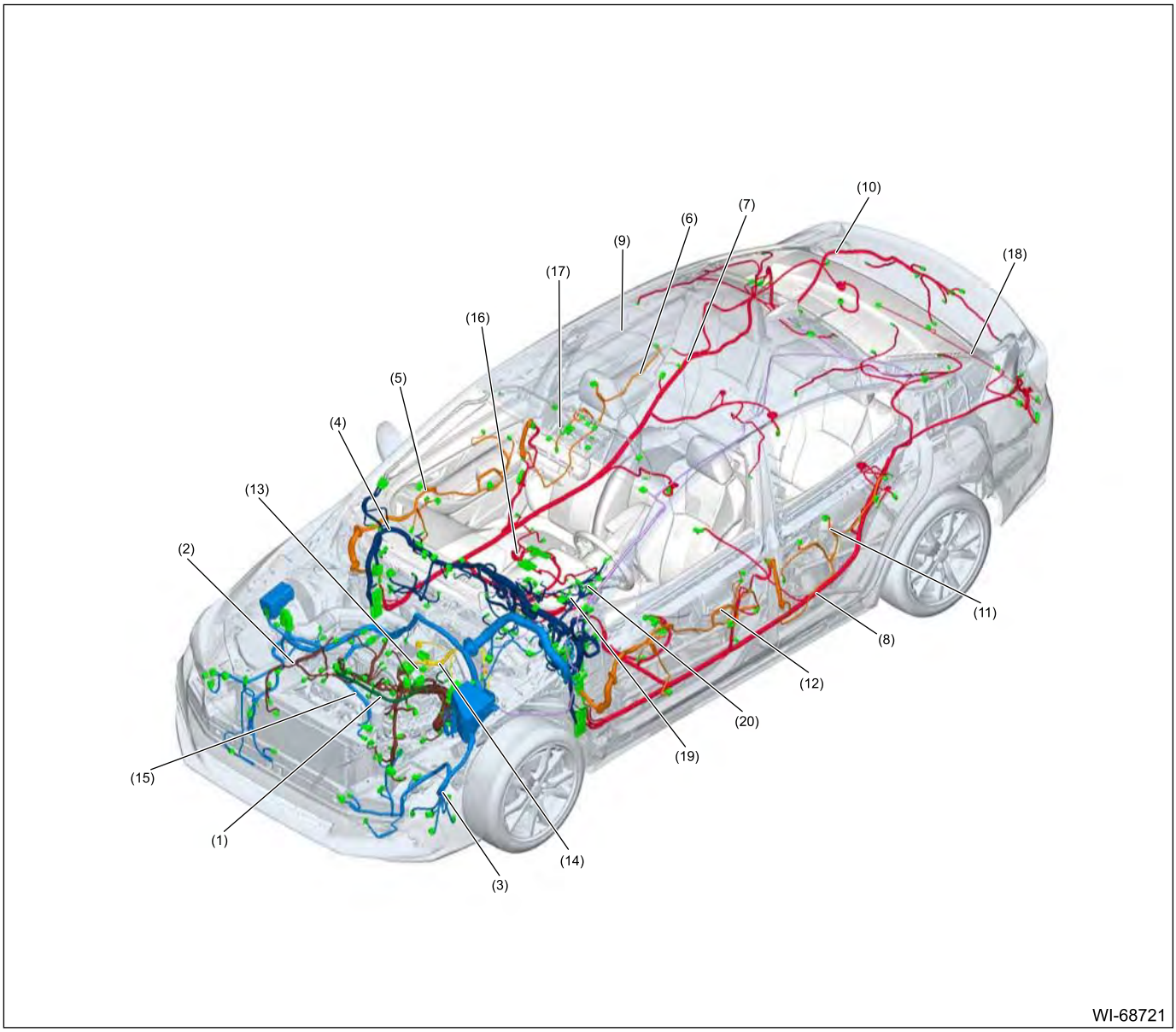
*1 : 4 DOOR MODEL
*2 : WITH RAB
*3 : WITH BSD/RCTA
*4 : WITHOUT POWER SEAT
*5 : WITH POWER SEAT
*6 : WITHOUT PUSH BUTTON START & WITHOUT TPMS
*7 : WITH TPMS
*8 : WITHOUT PUSH BUTTON START
*9 : WITH PUSH BUTTON START
*10 : 4 DOOR MODEL : 2
5 DOOR MODEL : 4
*11 : 5 DOOR MODEL



WI-68448

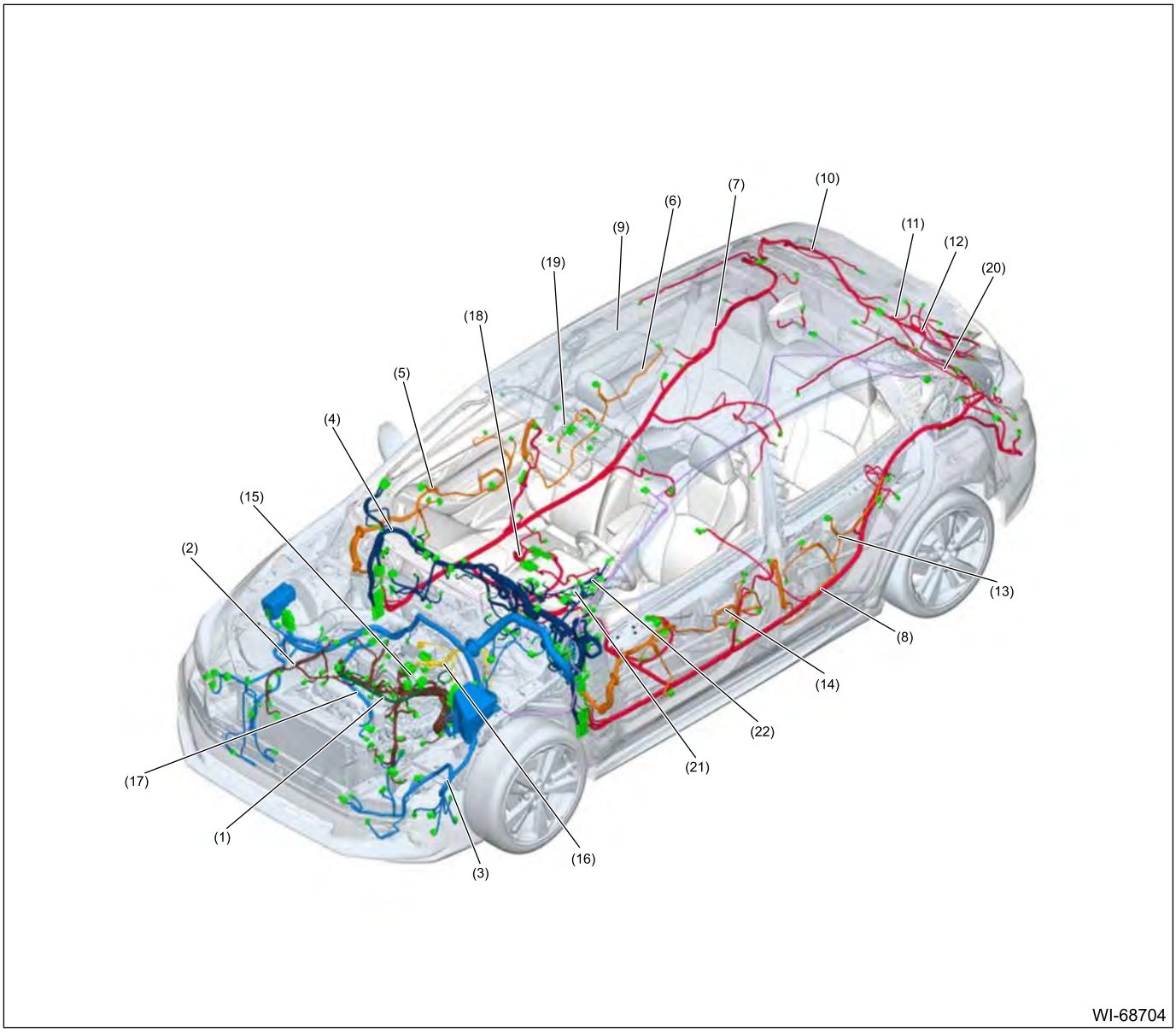
LOCATION

1. 4 DOOR MODEL



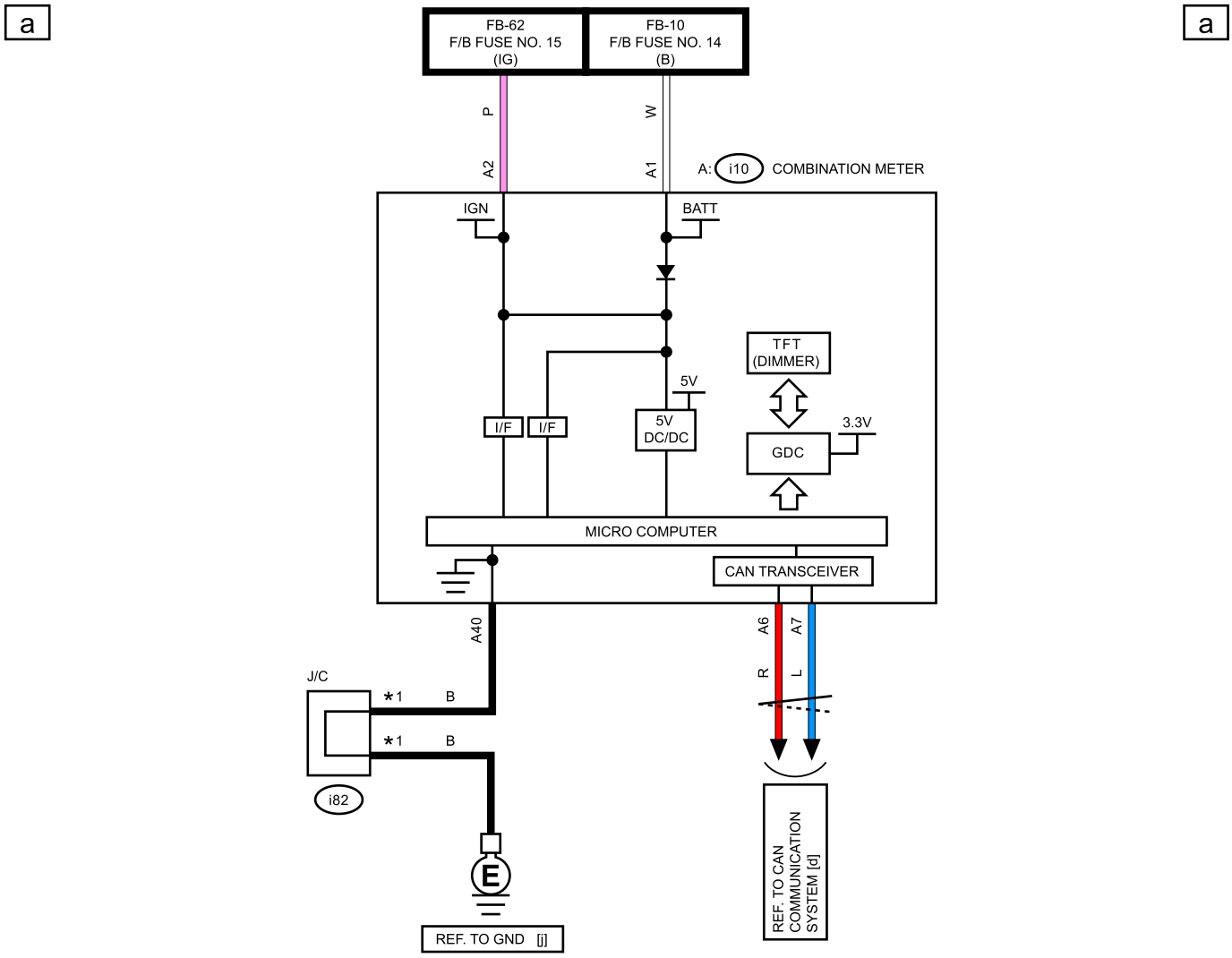
(1) Front wiring harness	(8) Rear wiring harness LH	(15) Electrical power steering harness
(2) Engine wiring harness	(9) Roof cord	(16) Occupant detection wiring harness
(3) Bulkhead wiring harness	(10) Trunk lid cord	(17) Stereo camera cover adapter cord
(4) Instrument panel wiring harness	(11) Rear door cord LH	(18) Sonar sensor cord
(5) Front door cord RH	(12) Front door cord LH	(19) Adapter cord (AUX)
(6) Rear door cord RH	(13) Transmission cord	(20) Adapter cord (console)
(7) Rear wiring harness RH	(14) Transmission cord	

2. 5 DOOR MODEL

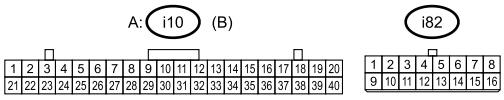


(1) Front wiring harness
(2) Engine wiring harness
(3) Bulkhead wiring harness
(4) Instrument panel wiring harness
(5) Front door cord RH
(6) Rear door cord RH
(7) Rear wiring harness RH
(8) Rear wiring harness LH
(9) Roof cord
(10) Rear gate cord RH
(11) Rear gate cord LWR
(12) Rear gate cord LH
(13) Rear door cord LH
(14) Front door cord LH
(15) Transmission cord
(16) Transmission cord
(17) Electrical power steering harness
(18) Occupant detection wiring harness
(19) Stereo camera cover adapter cord
(20) Sonar sensor cord
(21) Adapter cord (AUX)
(22) Adapter cord (console)

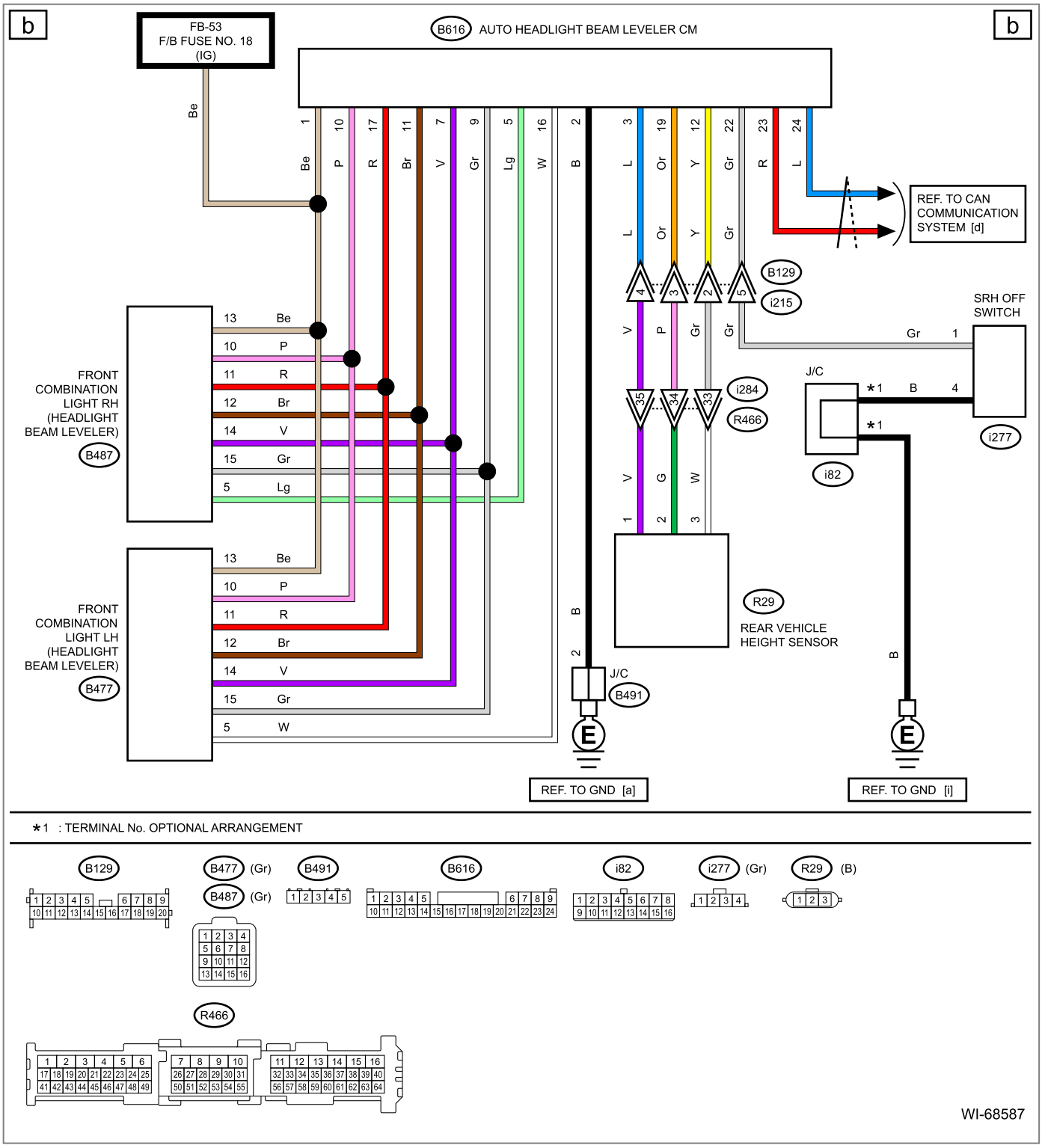
WIRING DIAGRAM



*1 : TERMINAL No. OPTIONAL ARRANGEMENT



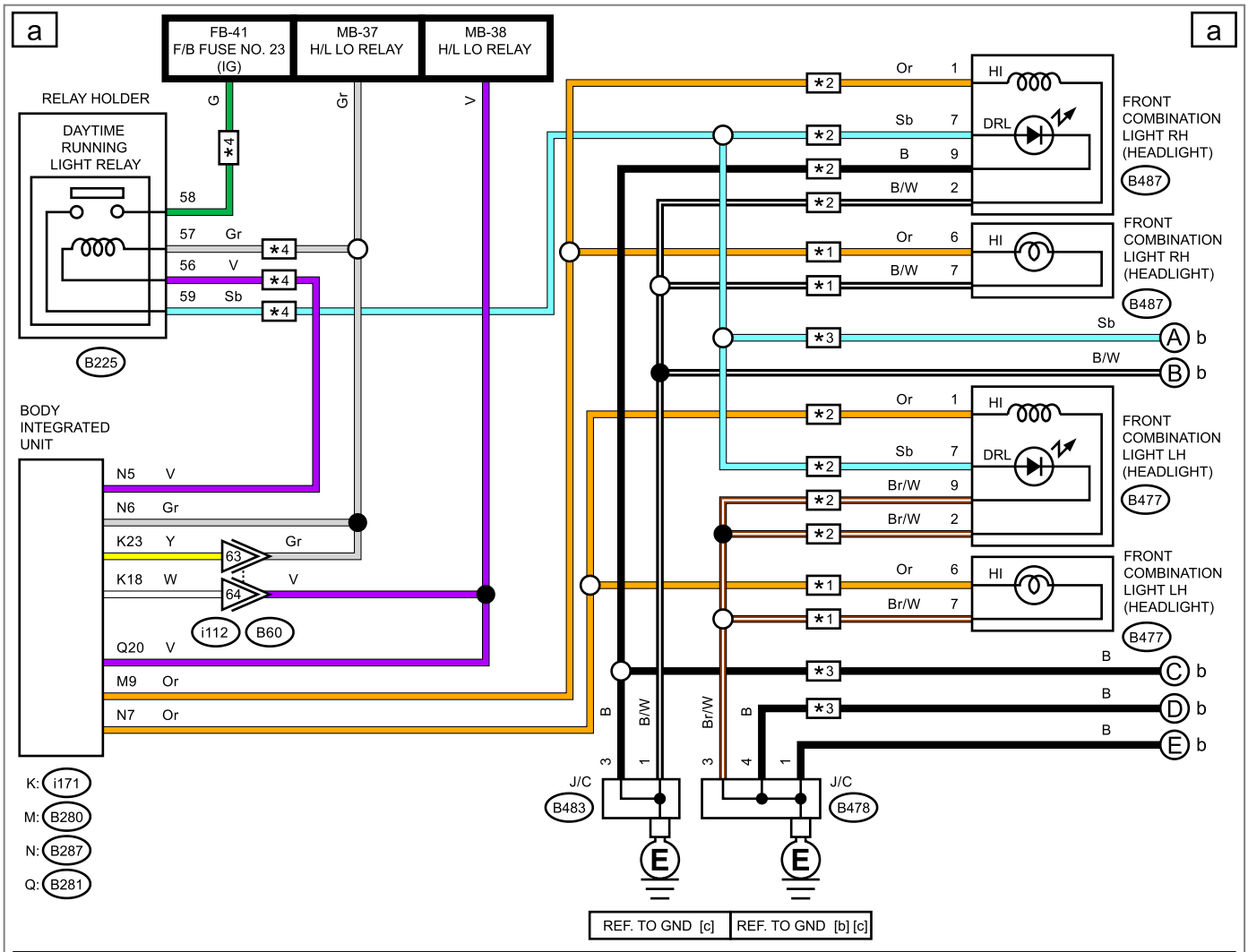
WI-68586



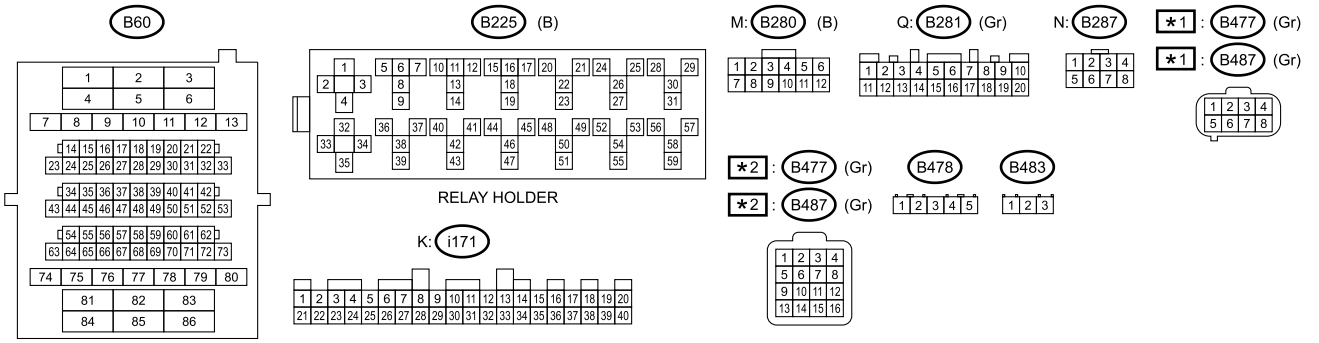
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

WI-68587

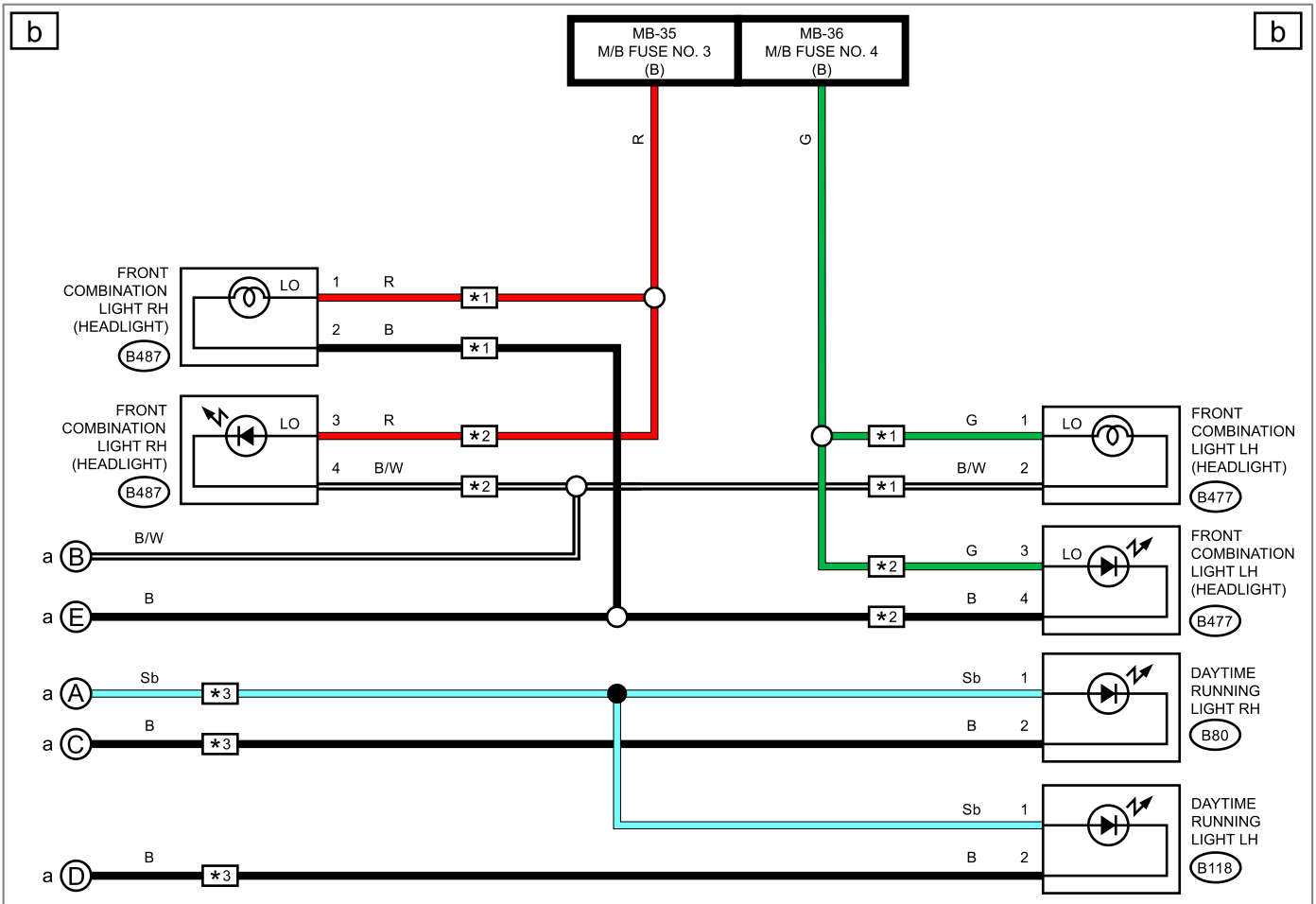
WIRING DIAGRAM



∗1 : HALOGEN MODEL
∗2 : LED MODEL
∗3 : HALOGEN MODEL WITH DAYTIME RUNNING LIGHT LED TYPE
∗4 : WITH DAYTIME RUNNING LIGHT LED TYPE



WI-68588



*1 : HALOGEN MODEL
*2 : LED MODEL
*3 : HALOGEN MODEL WITH DAYTIME RUNNING LIGHT LED TYPE

B80
B118



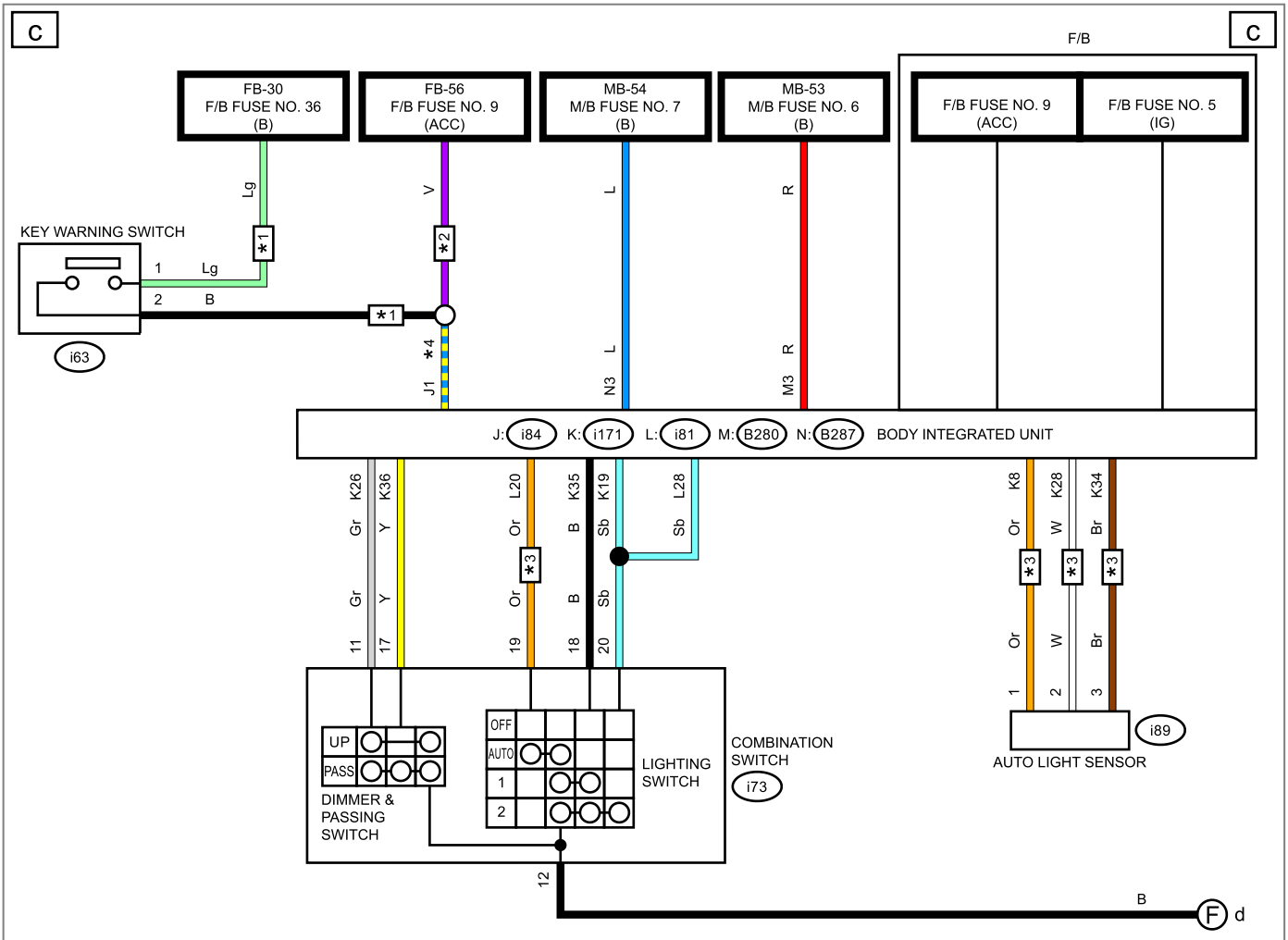
*1 : B477 (Gr)
*1 : B487 (Gr)



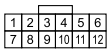
*2 : B477 (Gr)
*2 : B487 (Gr)



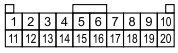
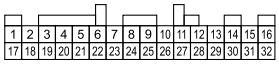
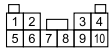
WI-68589

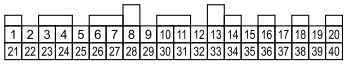


*1 : WITHOUT PUSH BUTTON START
*2 : WITH PUSH BUTTON START
*3 : WITH AUTO LIGHT
*4 : WITHOUT PUSH BUTTON START : B
WITH PUSH BUTTON START : V

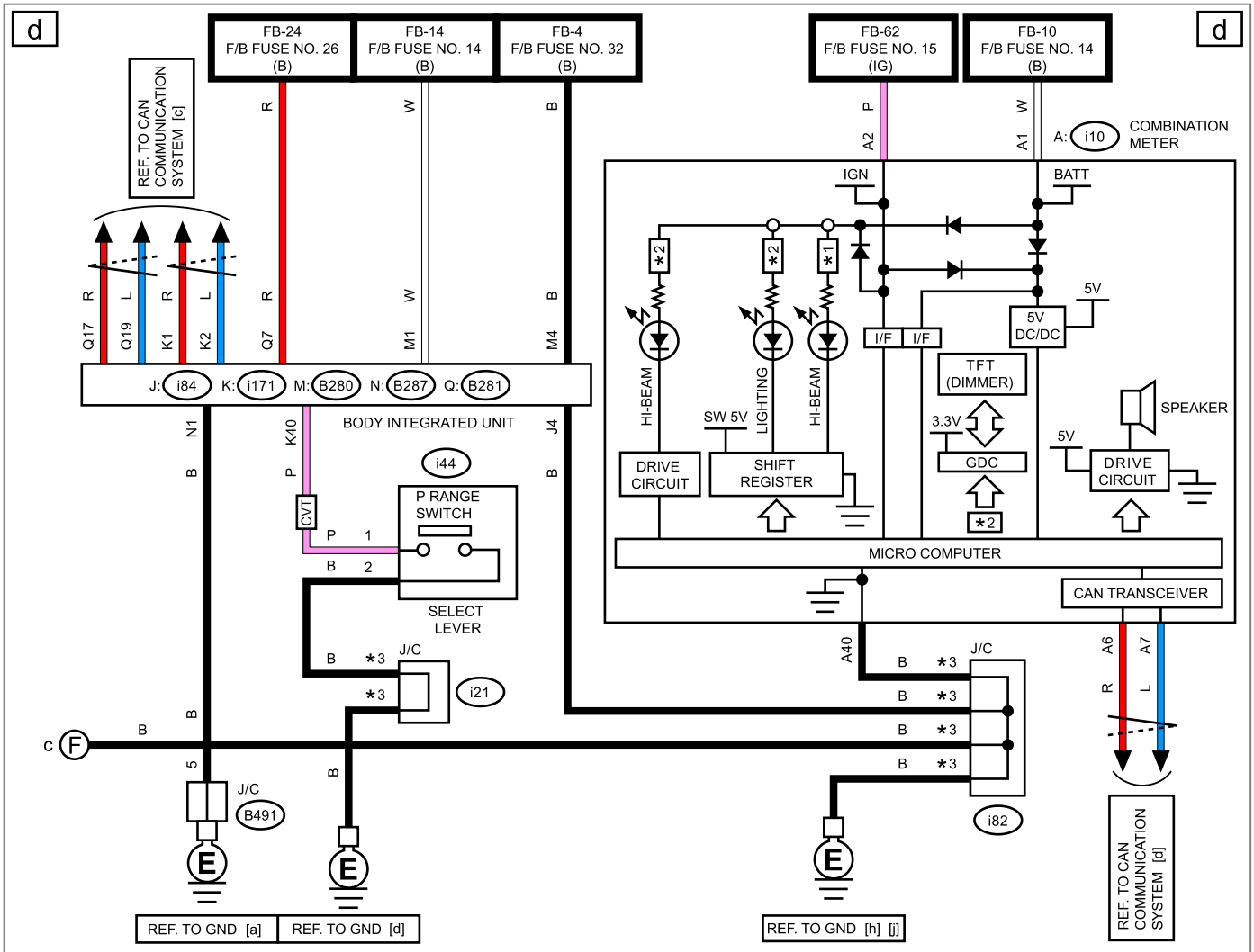
M: B280 (B)

N: B287

i63

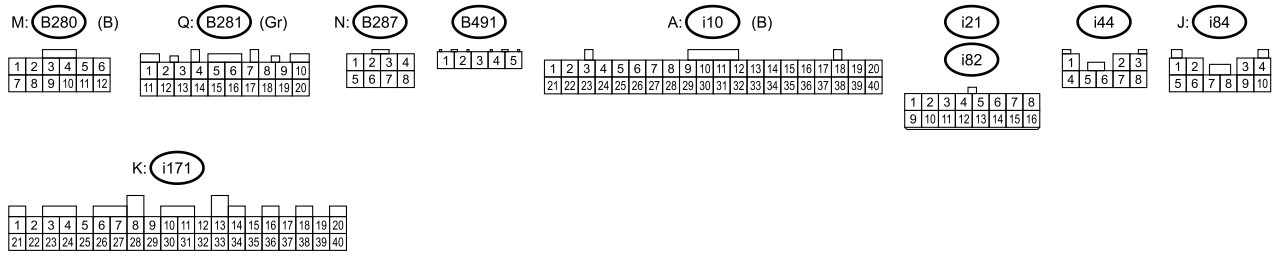
i73

L: i81 (B)

J: i84

i89

K: i171


WI-68590

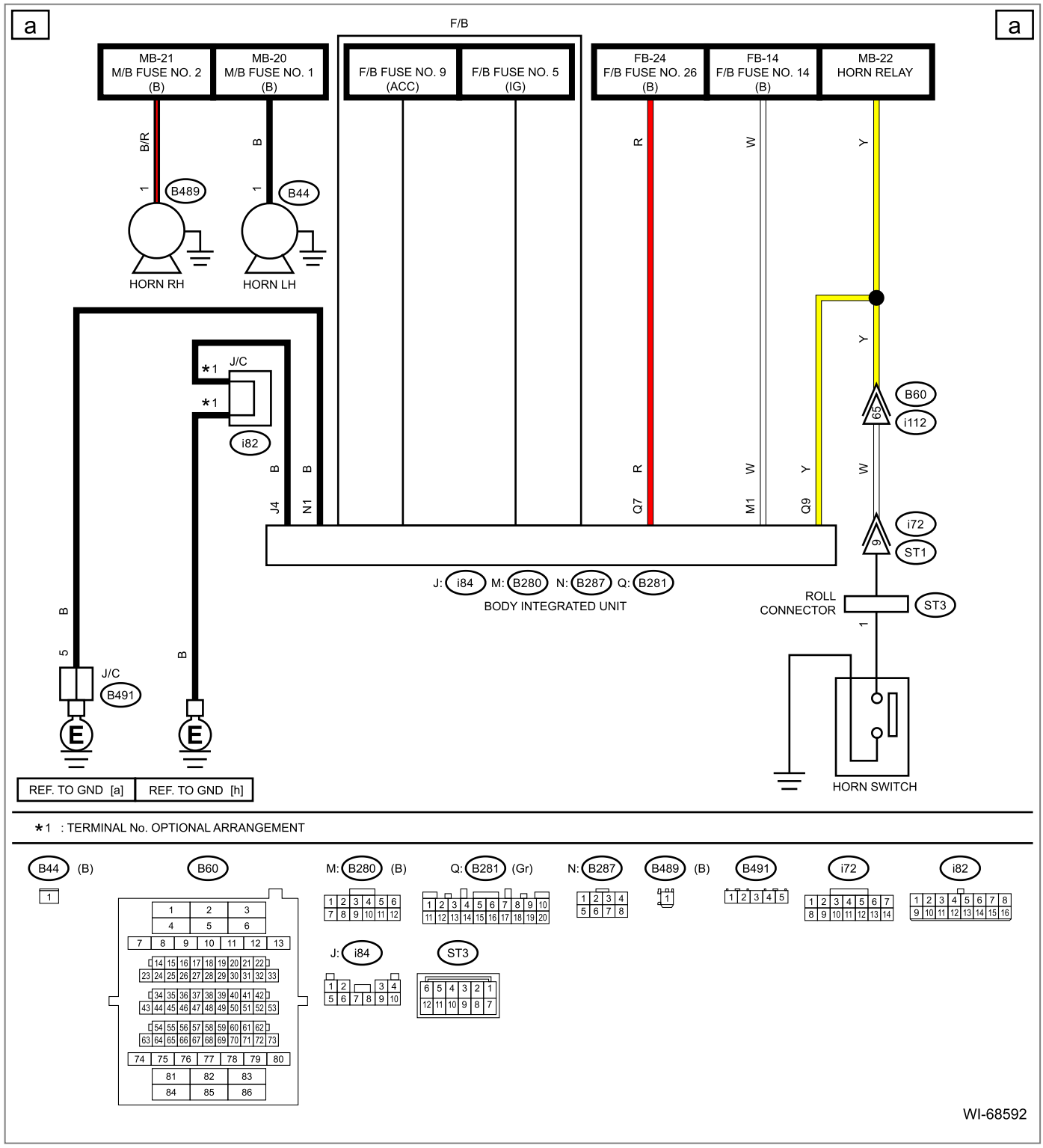


*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68591

WIRING DIAGRAM

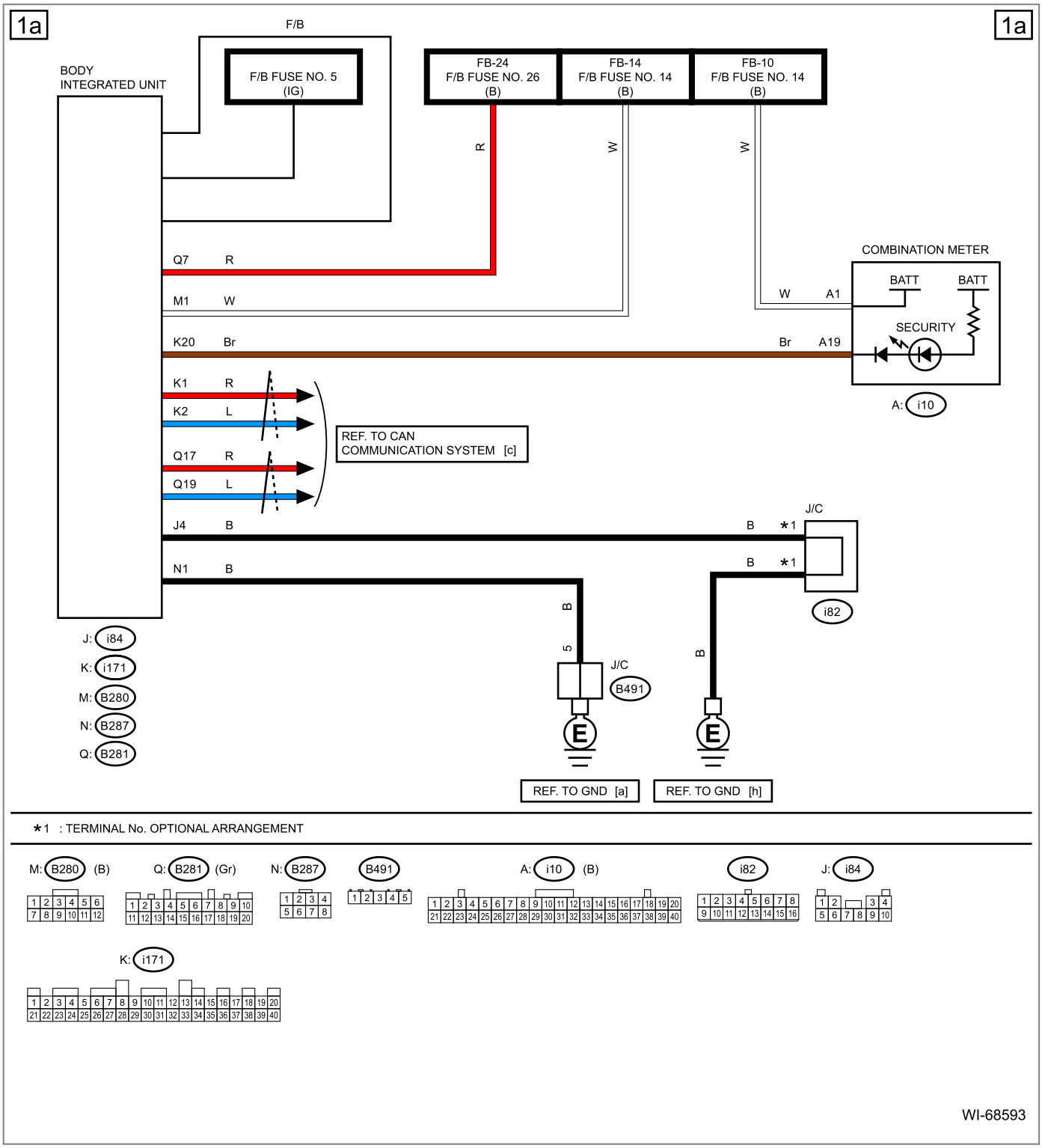


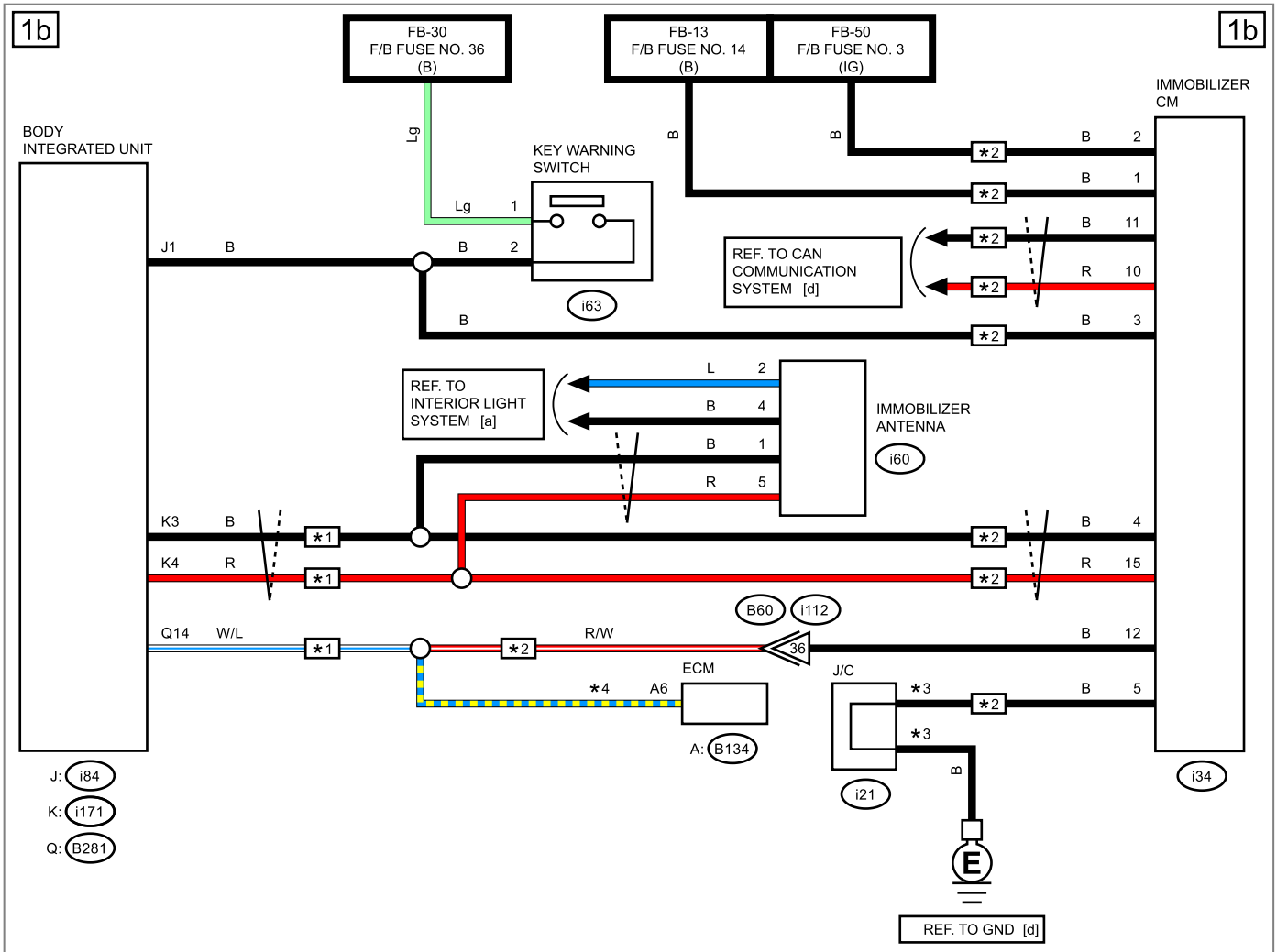
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

WI-68592

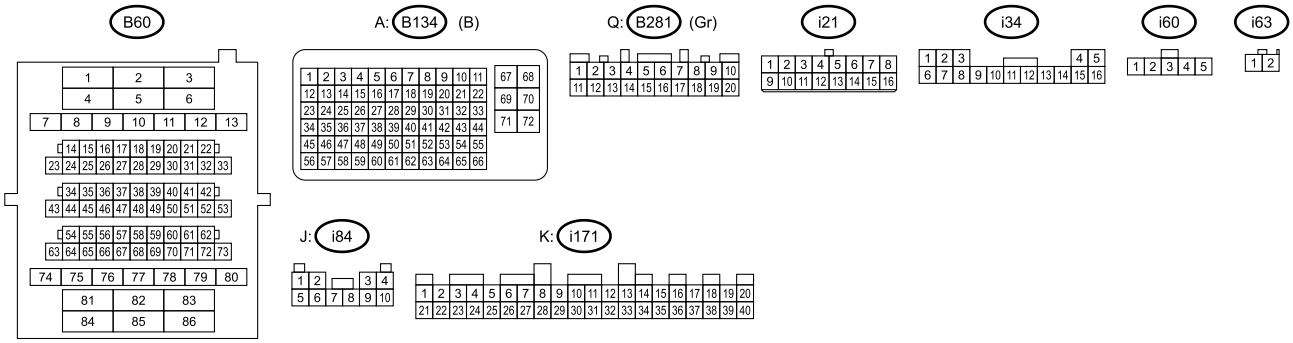
WIRING DIAGRAM

1. WITHOUT PUSH BUTTON START



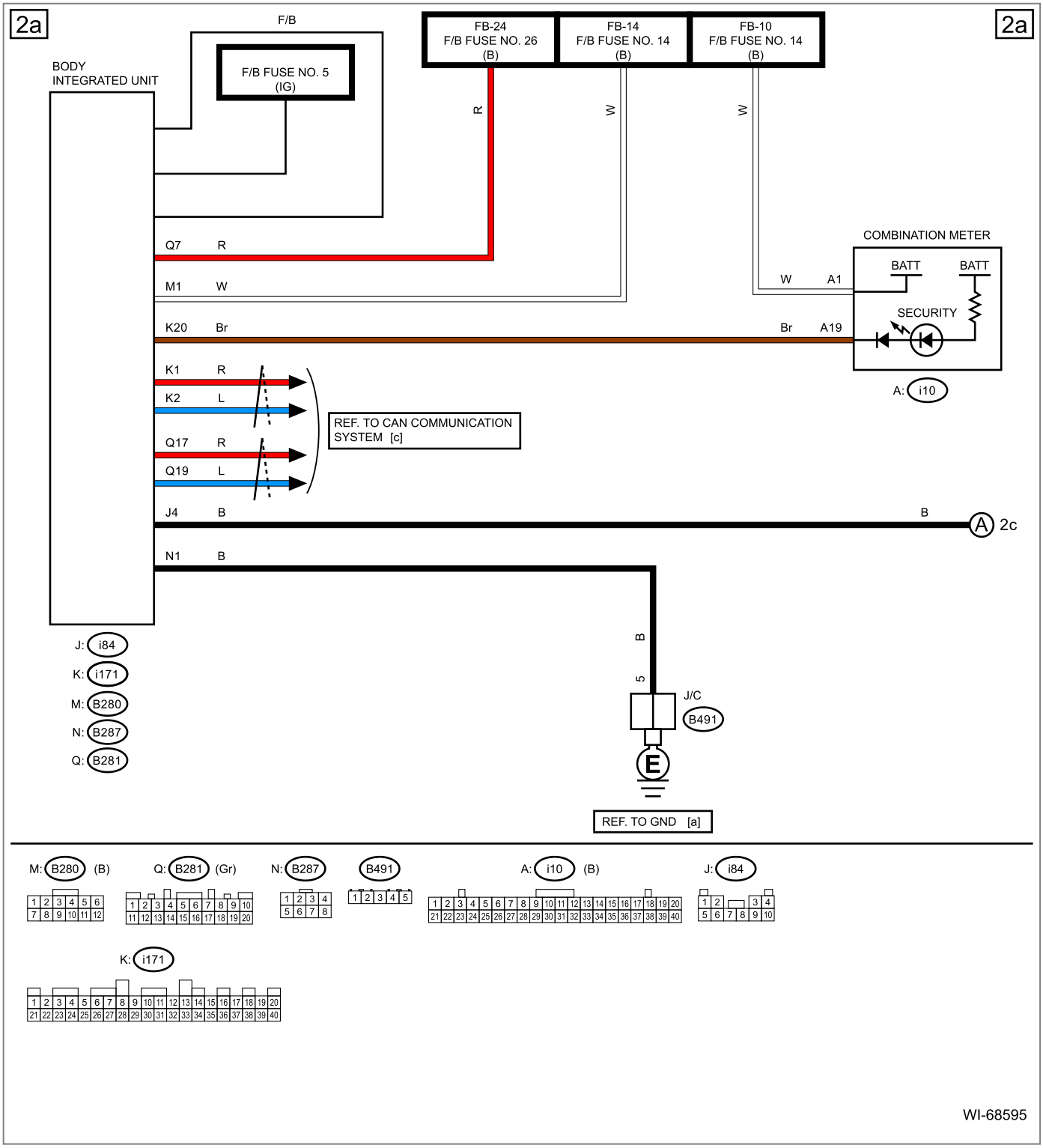


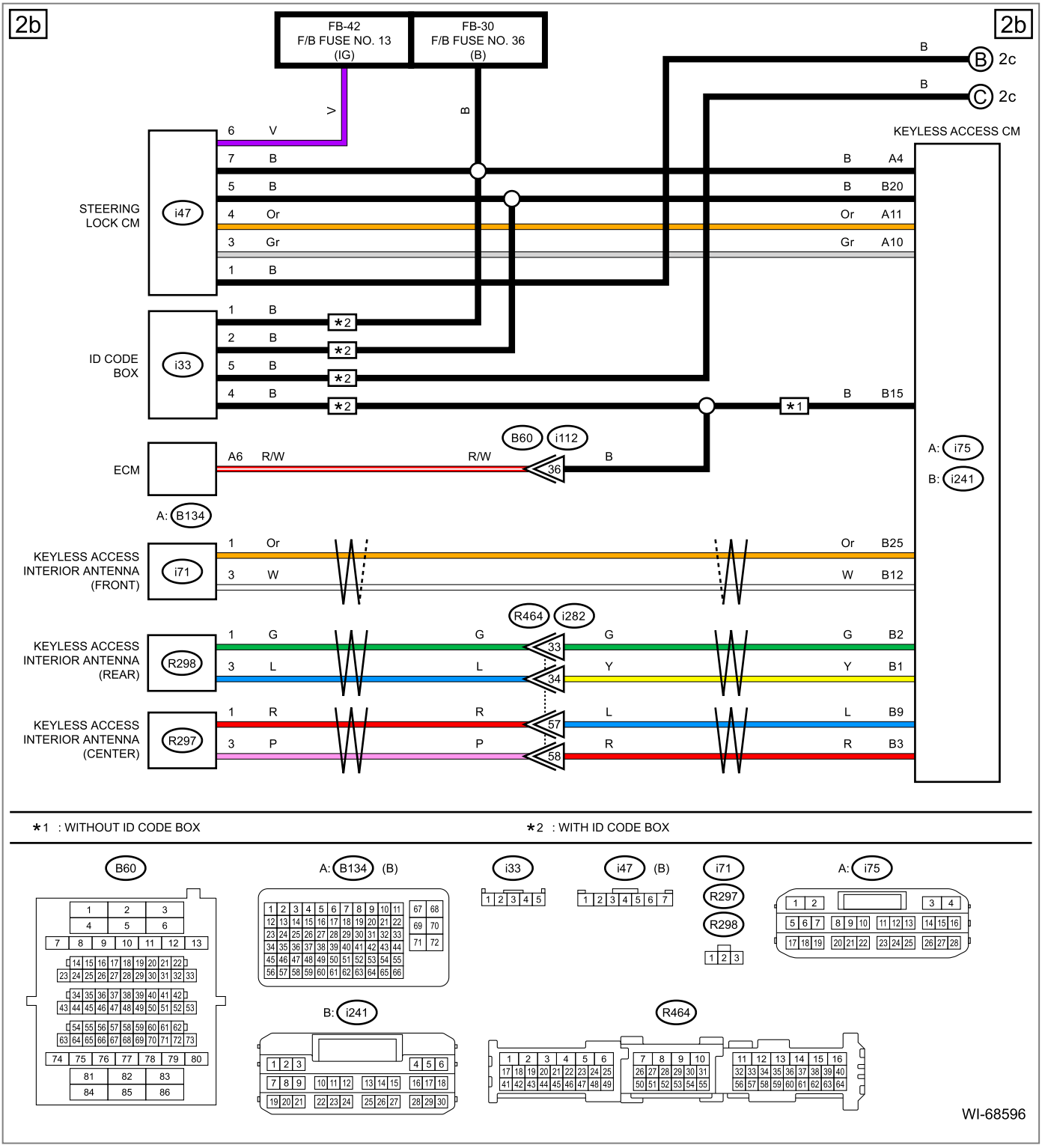
*1 : WITHOUT IMMOBILIZER CM
*2 : WITH IMMOBILIZER CM
*3 : TERMINAL No. OPTIONAL ARRANGEMENT
*4 : WITHOUT IMMOBILIZER CM : W/L
WITH IMMOBILIZER CM : R/W

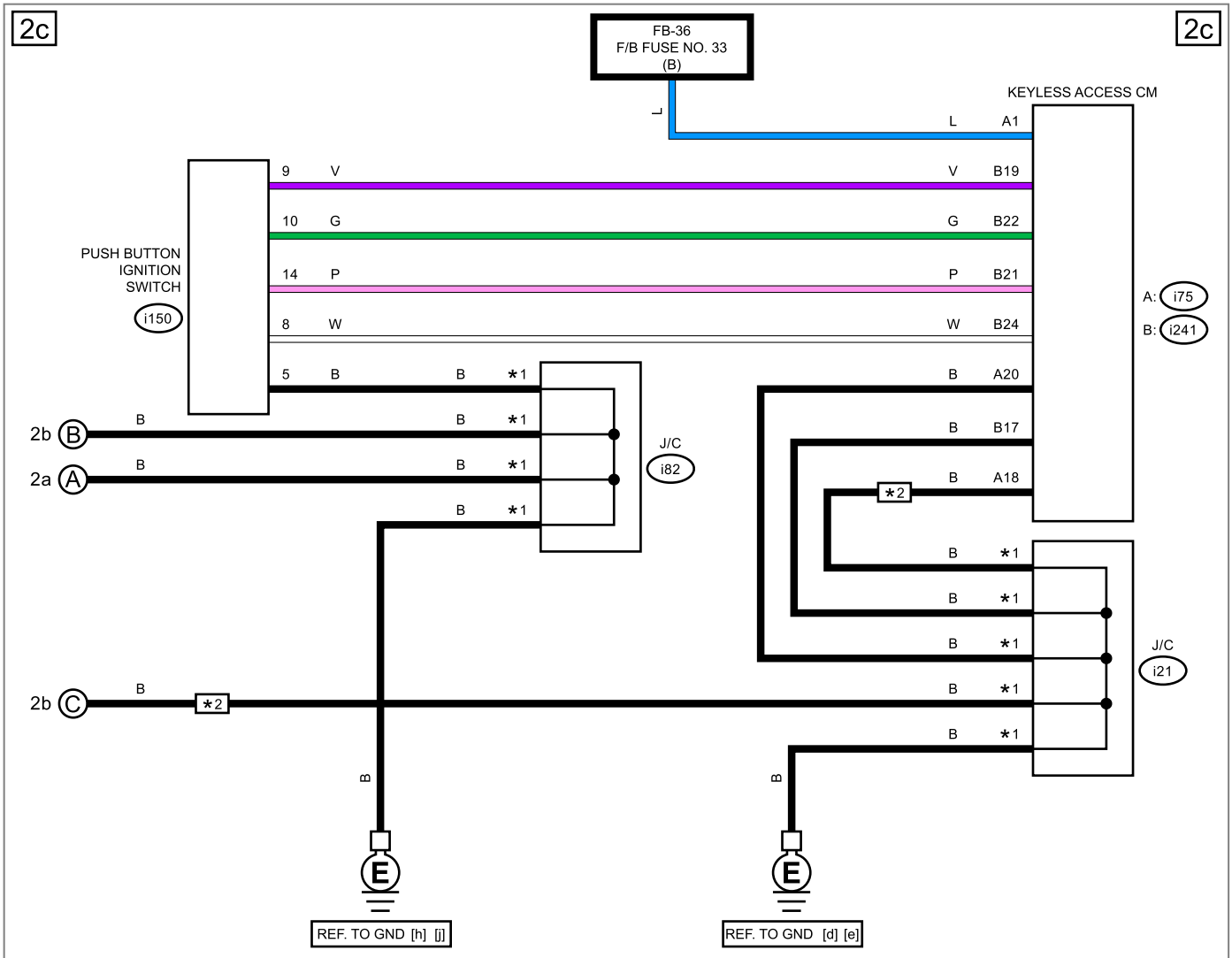


WI-68594

2. WITH PUSH BUTTON START

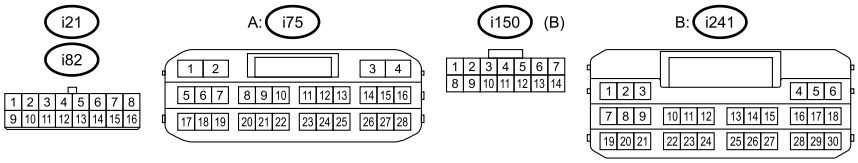



2b
2b
FB-42
F/B FUSE NO. 13
(IG)
FB-30
F/B FUSE NO. 36
(B)
V
B
B
2c
B
2c
KEYLESS ACCESS CM
STEERING
LOCK CM
i47
6 V
7 B
5 B
4 Or
3 Gr
1 B
B A4
B B20
Or A11
Gr A10
ID CODE
BOX
i33
1 B
2 B
5 B
4 B
*2
*1
B B15
ECM
A6 R/W
R/W
B60
i112
36
B
A: i75
B: i241
A: B134
KEYLESS ACCESS
INTERIOR ANTENNA
(FRONT)
i71
1 Or
3 W
Or B25
W B12
KEYLESS ACCESS
INTERIOR ANTENNA
(REAR)
R298
R464
i282
1 G
3 L
G
L
33
34
G B2
Y B1
KEYLESS ACCESS
INTERIOR ANTENNA
(CENTER)
R297
1 R
3 P
R
P
57
58
L B9
R B3
*1 : WITHOUT ID CODE BOX
*2 : WITH ID CODE BOX
B60
A: B134 (B)
i33
i47 (B)
i71
R297
R298
A: i75
B: i241
R464
WI-68596



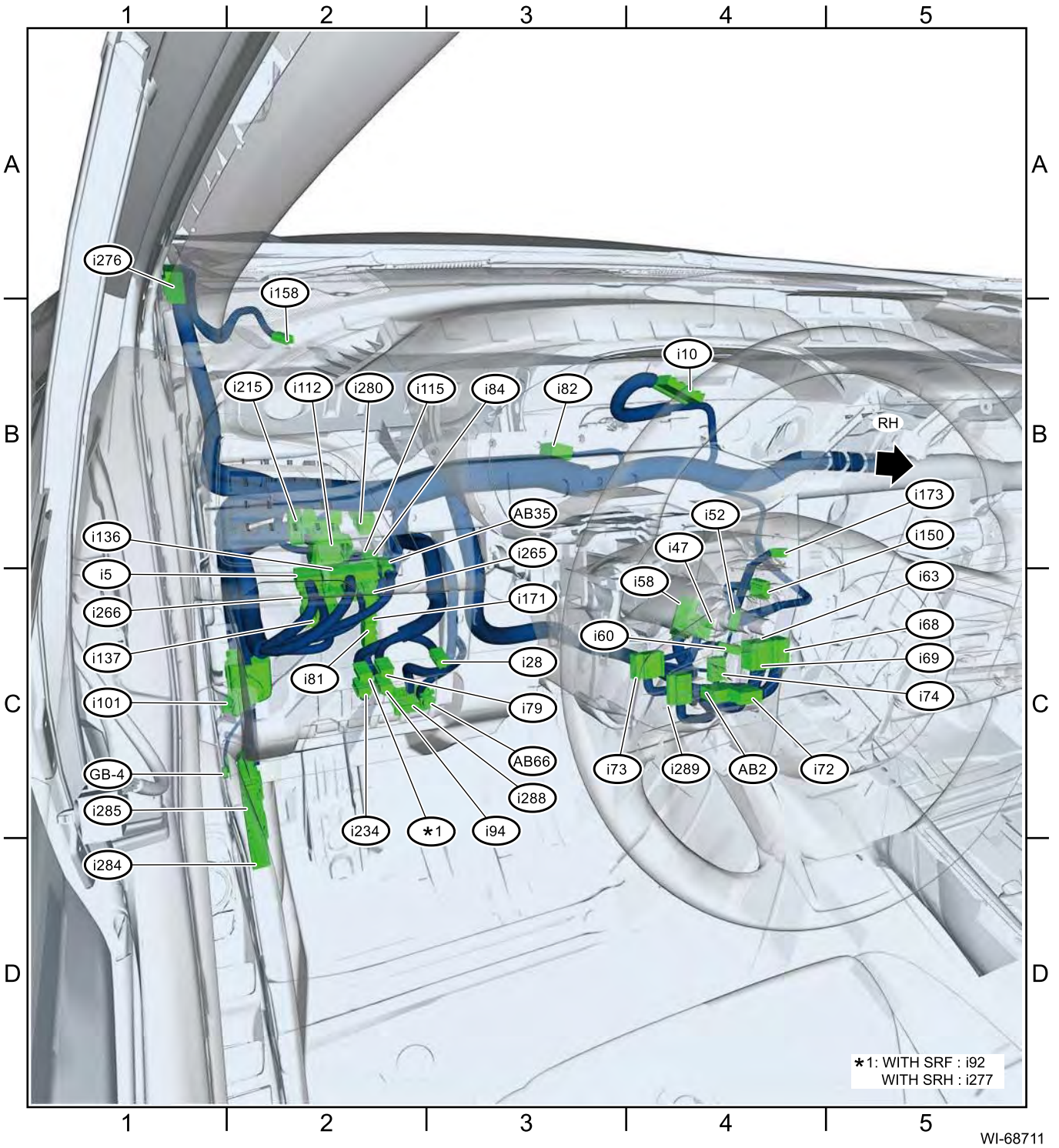
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH ID CODE BOX



WI-68597

LOCATION

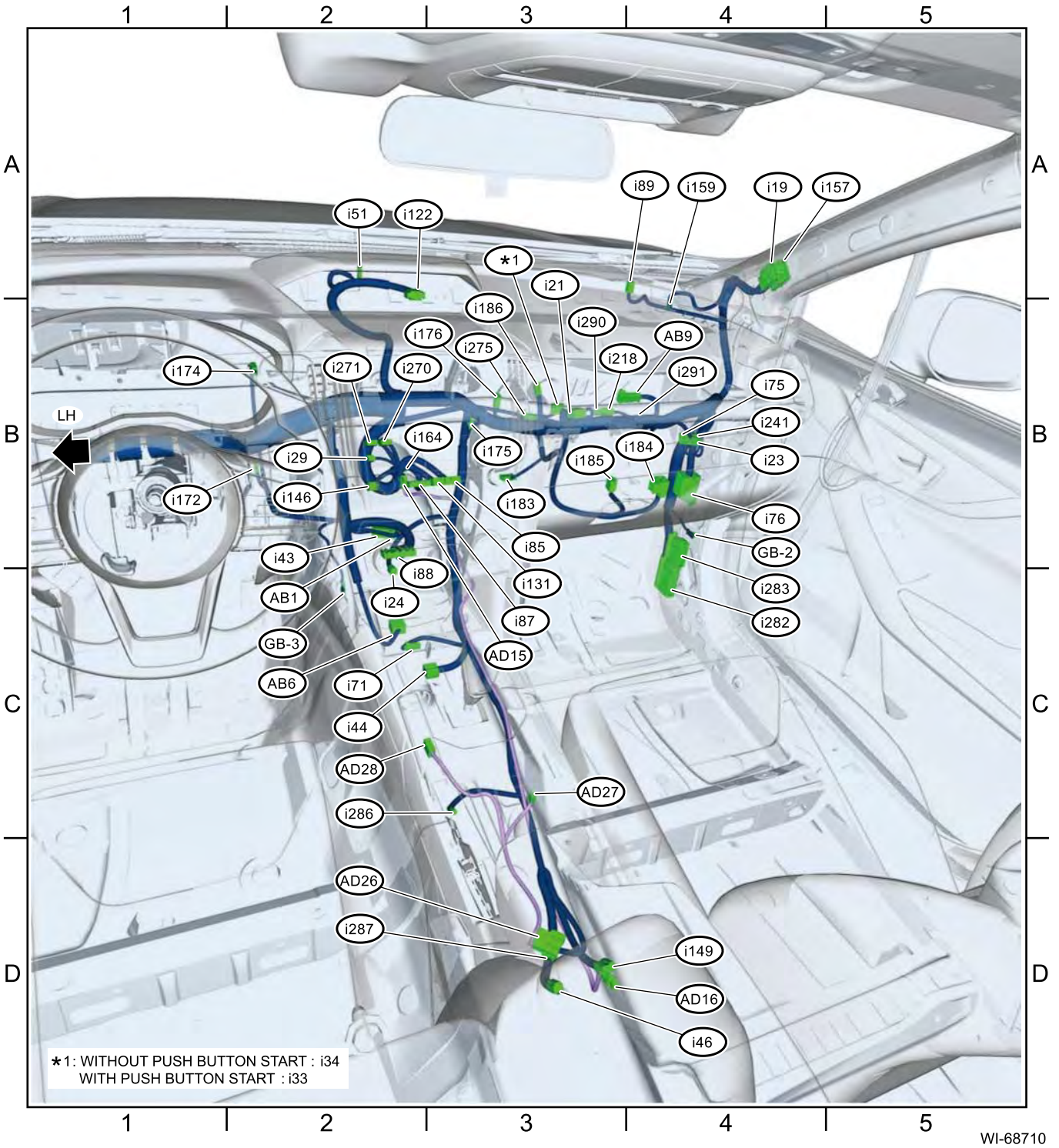


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB2	4	Y	C-4	AB7	Driver's airbag module
AB35	2	★	B-2		F/B
AB66	2	B	C-2		Driver's knee airbag module
i5	16	L	C-2		F/B
i10	40	B	B-4		Combination meter

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
i28	4	★	C-3		OP connector (fog light switch)
i47	7	B	C-4		Steering lock CM
i52	2	B	C-4		Key lock solenoid (without push button start)
i58	8	★	C-4		Ignition switch (without push button start)
i60	5	★	C-4		Immobilizer antenna (without push button start)
i63	2	★	C-4		Key warning switch
i68	7	★	C-4		Combination switch
i69	10	★	C-4		
i72	14	★	C-4	ST1	Roll connector
i73	20	★	C-4		Combination switch
i74	5	★	C-4		Steering angle sensor
i79	6	★	C-2		Illumination control switch
i81	32	B	C-2		Body integrated unit
i82	16	★	B-3		J/C
i84	10	★	B-2		Body integrated unit
i92	4	Gr	C-2		SRF OFF switch
i94	8	Gr	C-2		BSD/RCTA OFF switch
i101	46	★	C-2	D84	Front door cord LH
i112	86	★	B-2	B60	Bulkhead wiring harness
i115	4	Y	B-2	B49	
i136	40	Gr	C-2		F/B
i137	12	Br	C-2		
i150	14	B	C-4		Push button ignition switch
i158	4	★	B-2		Side tweeter LH (without audio amplifire)
	2	★	B-2		Side tweeter LH (with audio amplifire)
i171	40	★	C-2		Body integrated unit
i173	2	★	B-4		In-vehicle sensor
i215	20	★	B-2	B129	Bulkhead wiring harness
i234	8	B	C-2		VDC OFF switch
i265	8	★	C-2		F/B
i266	12	★	C-2		
i276	16	★	A-1	AD22	Adapter cord (with telematics)
	8	★	A-1	AD22	Adapter cord (without telematics)
i277	4	Gr	C-2		SRH OFF switch
i280	5	Gr	B-2		Steering heater relay
i284	64	★	D-2	R466	Rear wiring harness LH
i285	48	★	C-2	R467	
i288	16	★	C-2		Data link connector
i289	4	★	C-4	ST13	Roll connector
GB-4	—	—	C-1		—

★: White or natural color

LOCATION

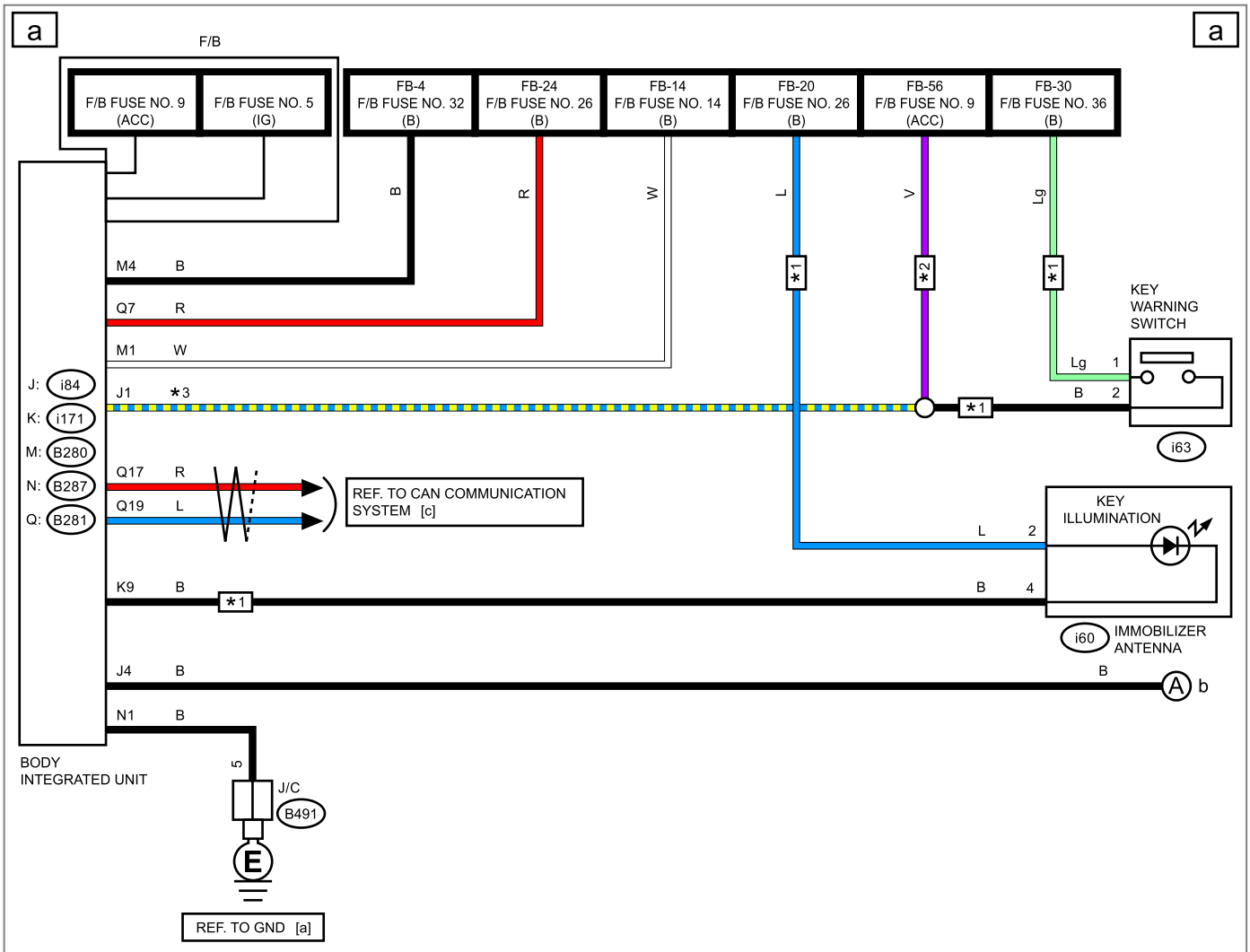


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB1	4	★	B-2	i43	Instrument panel wiring harness
AB6	30	Y	C-2		Airbag CM
AB9	4	Y	B-4		Passenger’s airbag module
AD15	4	B	B-2		Audio
	4	B	B-2		Navigation unit

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AD16	4	B	D-3		AUX input terminal
AD26	14	★	D-3	i287	Instrument panel wiring harness
AD27	8	★	C-3		Seat heater switch
AD28	2	★	C-3		Shift position indicator (without shift position indicator lamp)
	4	★	C-3		Shift position indicator (with shift position indicator lamp)
i19	14	★	A-4	R96	Roof cord
i21	16	★	B-3		J/C
i23	2	★	B-4		Glove box light
i24	2	B	C-2		Front accessory power supply socket
i29	1	★	B-2		Audio case ground
i33	5	★	B-3		ID code box
i34	16	★	B-3		Immobilizer CM
i43	4	★	B-2	AB1	Airbag wiring harness
i44	8	★	C-3		Select lever
i46	2	B	D-3		Rear accessory power supply socket (console)
i51	2	★	A-2		Sunload sensor
i71	3	★	C-2		Keyless access interior antenna (front)
i75	28	★	B-4		Keyless access CM
i76	46	★	B-4	D83	Front door cord RH
i85	10	★	B-3		Audio
	10	★	B-3		Navigation unit
i87	28	★	B-2		Audio
	28	★	B-2		Navigation unit
i88	40	★	B-2		A/C control panel (auto A/C)
	24	★	B-2		A/C control panel (manual A/C)
i89	3	★	A-4		Auto light sensor
i122	24	★	A-2		MFD (with high grade MFD)
	12	B	A-2		MFD (with standard MFD)
i131	6	★	B-3		Audio
	6	★	B-3		Navigation unit
i146	5	★	B-2		Audio
	5	★	B-2		Navigation unit
i149	8	★	D-3		AUX input terminal
i157	18	★	A-4	R50	Roof cord
i159	4	★	B-4		Side tweeter RH (without audio amplifire)
	2	★	B-4		Side tweeter RH (with audio amplifire)
i164	2	★	B-2		Power amplifier
i172	2	★	B-2		Evaporator sensor
i174	5	G	B-2		Air mix door actuator LH

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
i175	5	G	B-3		Air mix door actuator (without L/R independent air conditioner)
	5	G	B-3		Air mix door actuator RH (with L/R independent air conditioner)
i176	5	G	B-3		Mode door actuator
i183	5	★	B-3		Power transistor
i184	4	★	B-4		Blower motor relay
i185	2	★	B-3		Blower motor
i186	5	G	B-3		Intake door actuator (auto A/C)
	4	★	B-3		Intake door actuator (manual A/C)
i218	2	★	B-3	i290	Instrument panel wiring harness
i241	30	★	B-4		Keyless access CM
i270	20	Gr	B-2		Data communication module
i271	16	Gr	B-2		
i275	16	★	B-3		J/C
i282	64	★	C-4	R464	Rear wiring harness RH
i283	48	★	B-4	R465	
i286	1	B	C-3		Parking brake switch
i287	14	★	D-3	AD26	Adapter cord (console)
i290	2	★	B-3	i218	Instrument panel wiring harness
i291	8	★	B-4		Remote engine start CM
GB-2	—	—	B-4		—
GB-3	—	—	C-2		—
★: White or natural color					

WIRING DIAGRAM



*1 : WITHOUT PUSH BUTTON START
*2 : WITH PUSH BUTTON START
*3 : WITHOUT PUSH BUTTON START : B
WITH PUSH BUTTON START : V

M: B280 (B)

1	2	3	4	5	6
7	8	9	10	11	12

Q: B281 (Gr)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

N: B287

1	2	3	4
5	6	7	8

B491

1	2	3	4	5

i60

1	2	3	4	5

i63

1	2

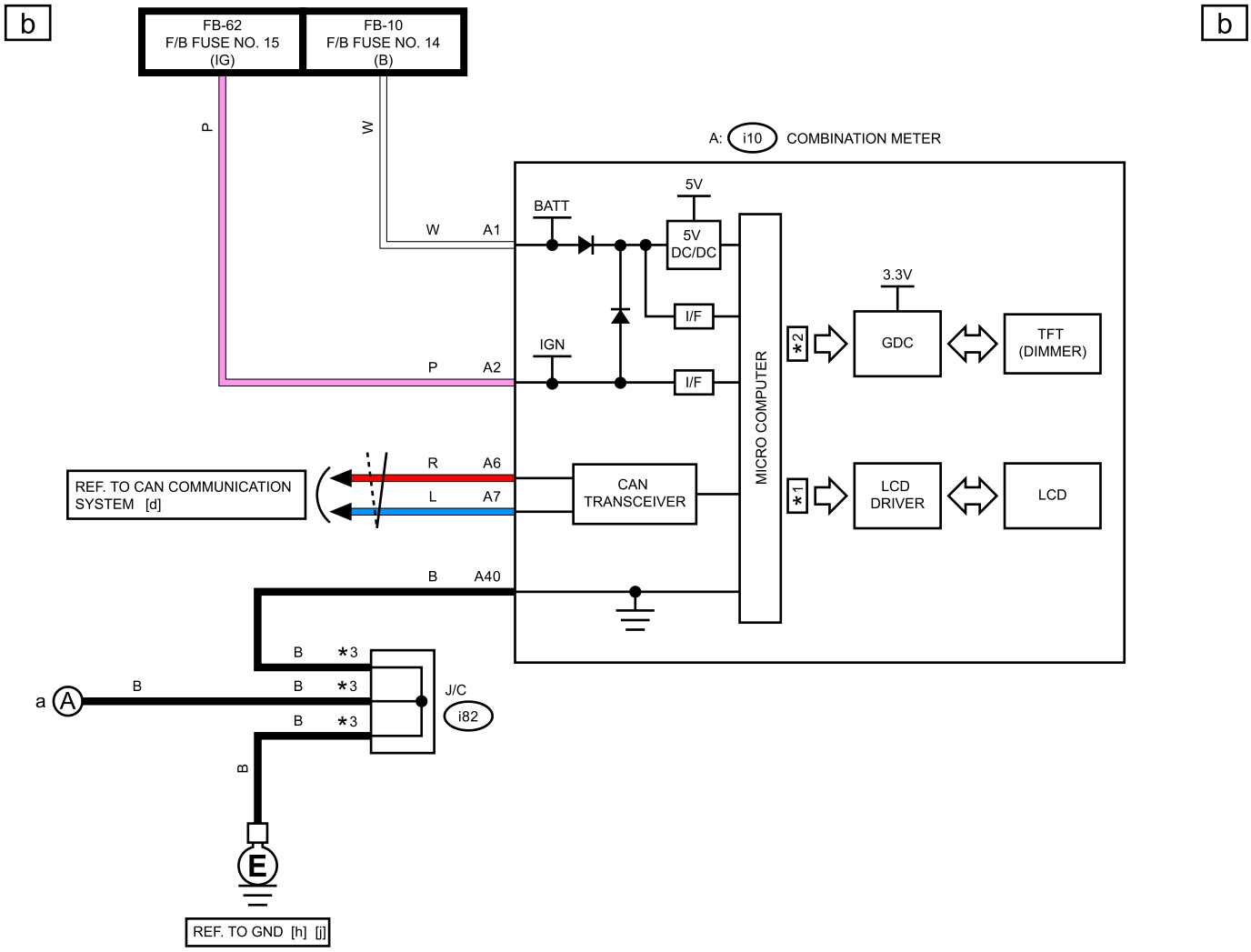
J: i84

1	2		3	4
5	6	7	8	9	10

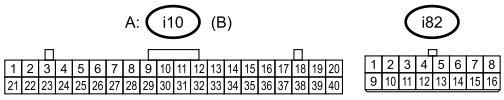
K: i171

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

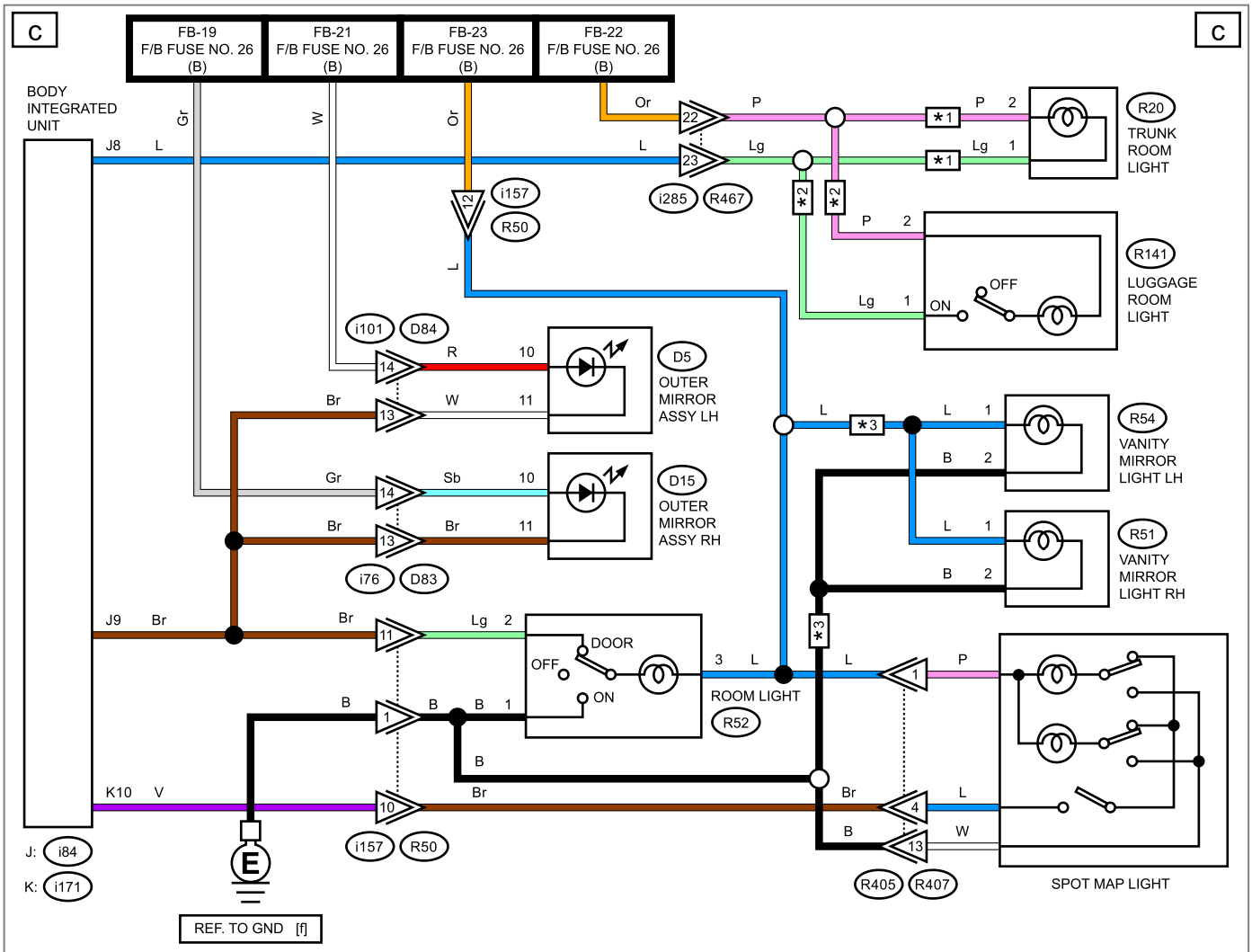
WI-68598



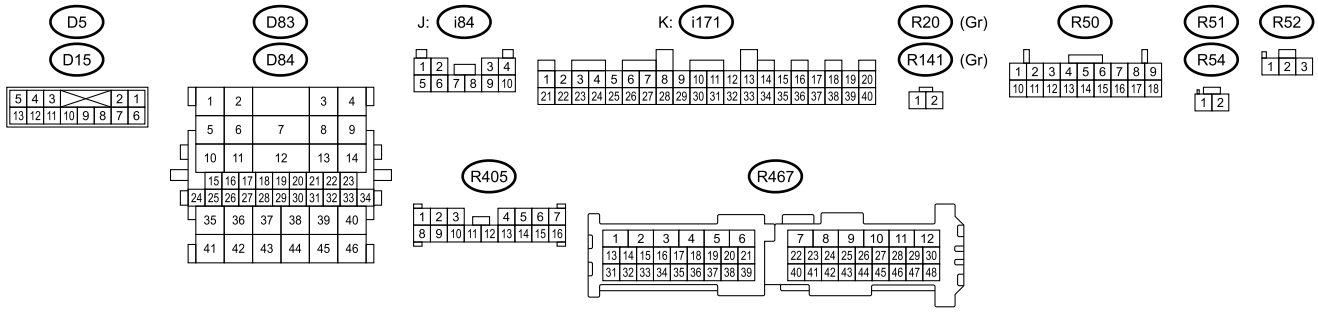
*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



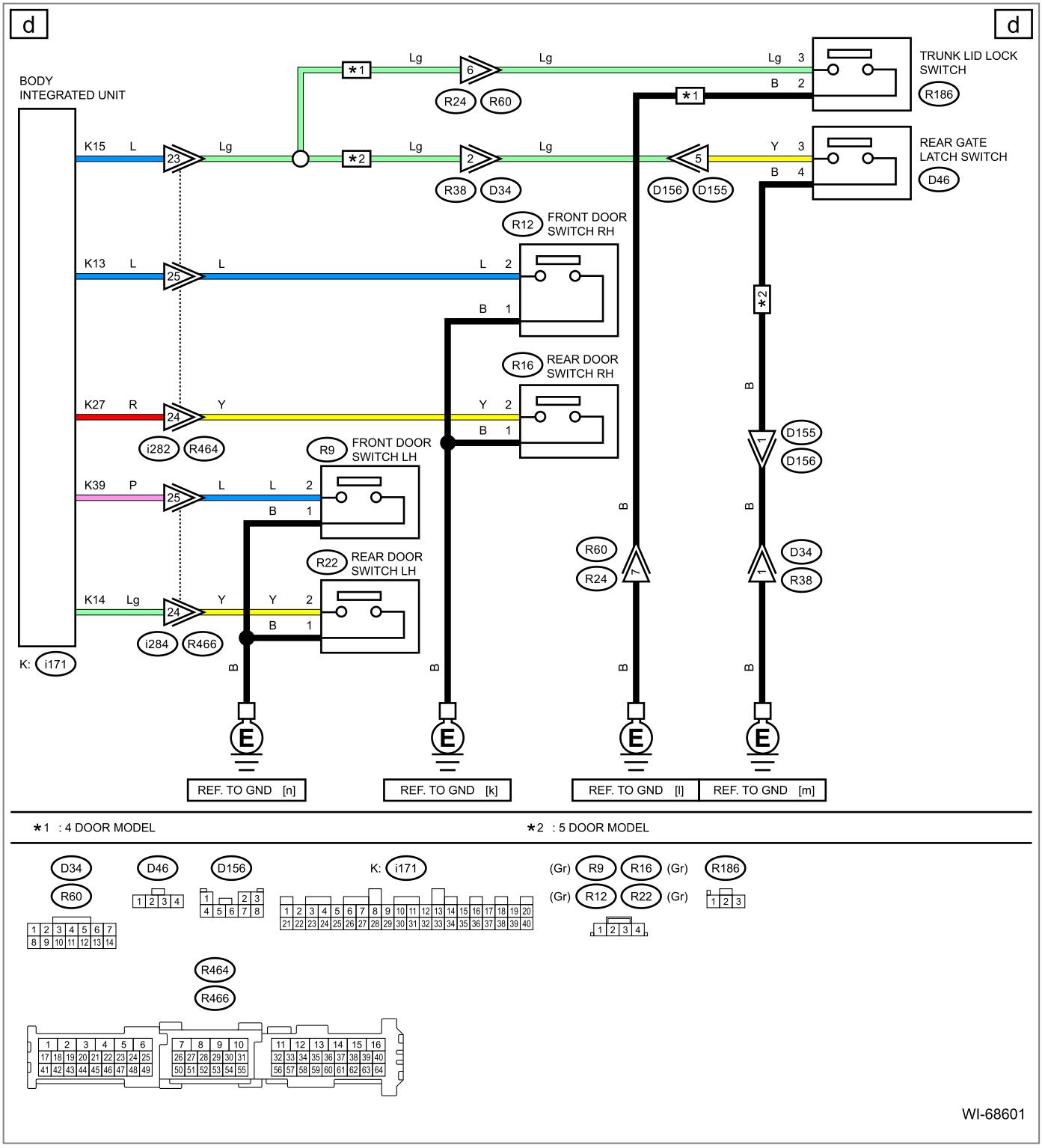
WI-68599



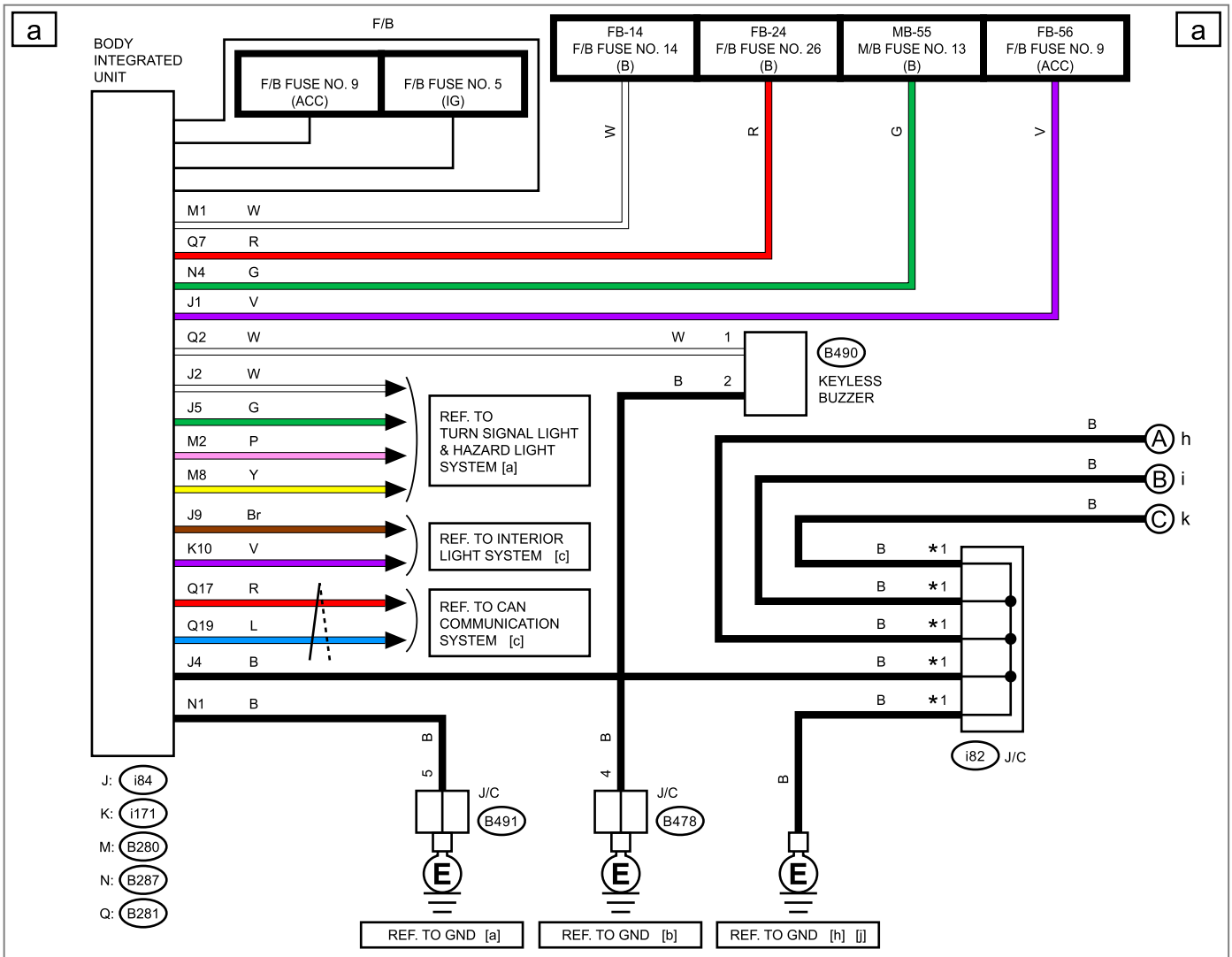
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
*3 : WITH VANITY MIRROR ILLUMI. LIGHT



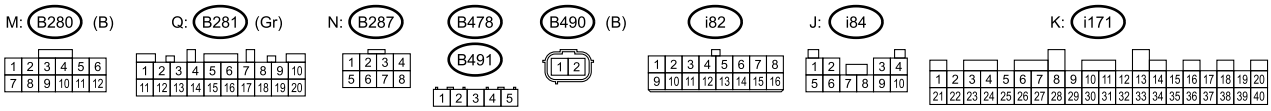
WI-68600


d
d
BODY
INTEGRATED UNIT
K15 L 23
K13 L 25
K27 R 24
K39 P 25
K14 Lg 24
K: i171
i282 R464
i284 R466
*1
*2
Lg 6
R24 R60
Lg 2
R38 D34
TRUNK LID LOCK
SWITCH
R186
REAR GATE
LATCH SWITCH
D46
D156 D155
R12 FRONT DOOR
SWITCH RH
R16 REAR DOOR
SWITCH RH
R9 FRONT DOOR
SWITCH LH
R22 REAR DOOR
SWITCH LH
R60
R24
D155
D156
D34
R38
REF. TO GND [n]
REF. TO GND [k]
REF. TO GND [l]
REF. TO GND [m]
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
D34
R60
D46
D156
K: i171
(Gr) R9 R16 (Gr)
(Gr) R12 R22 (Gr)
R186
R464
R466
WI-68601

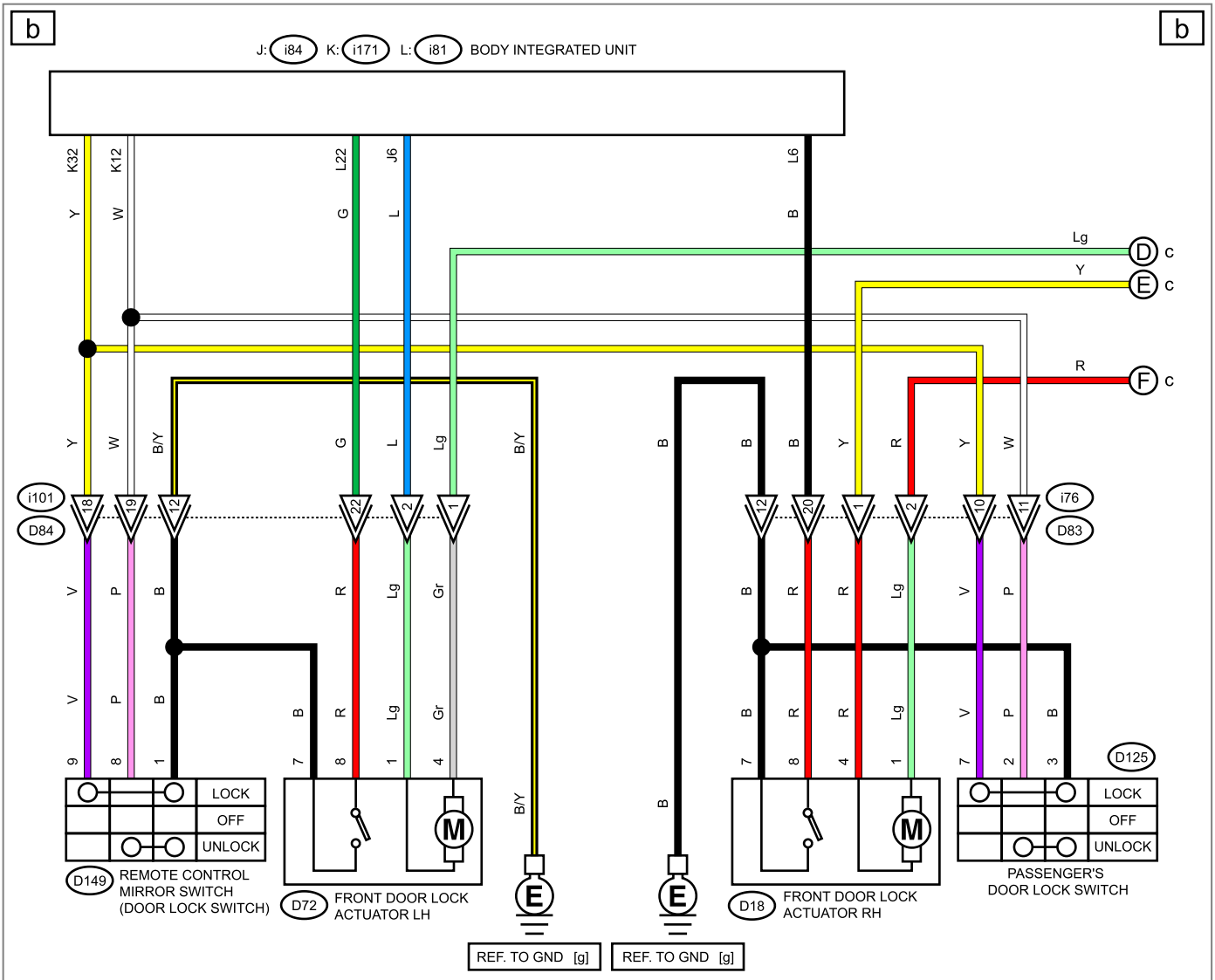
WIRING DIAGRAM



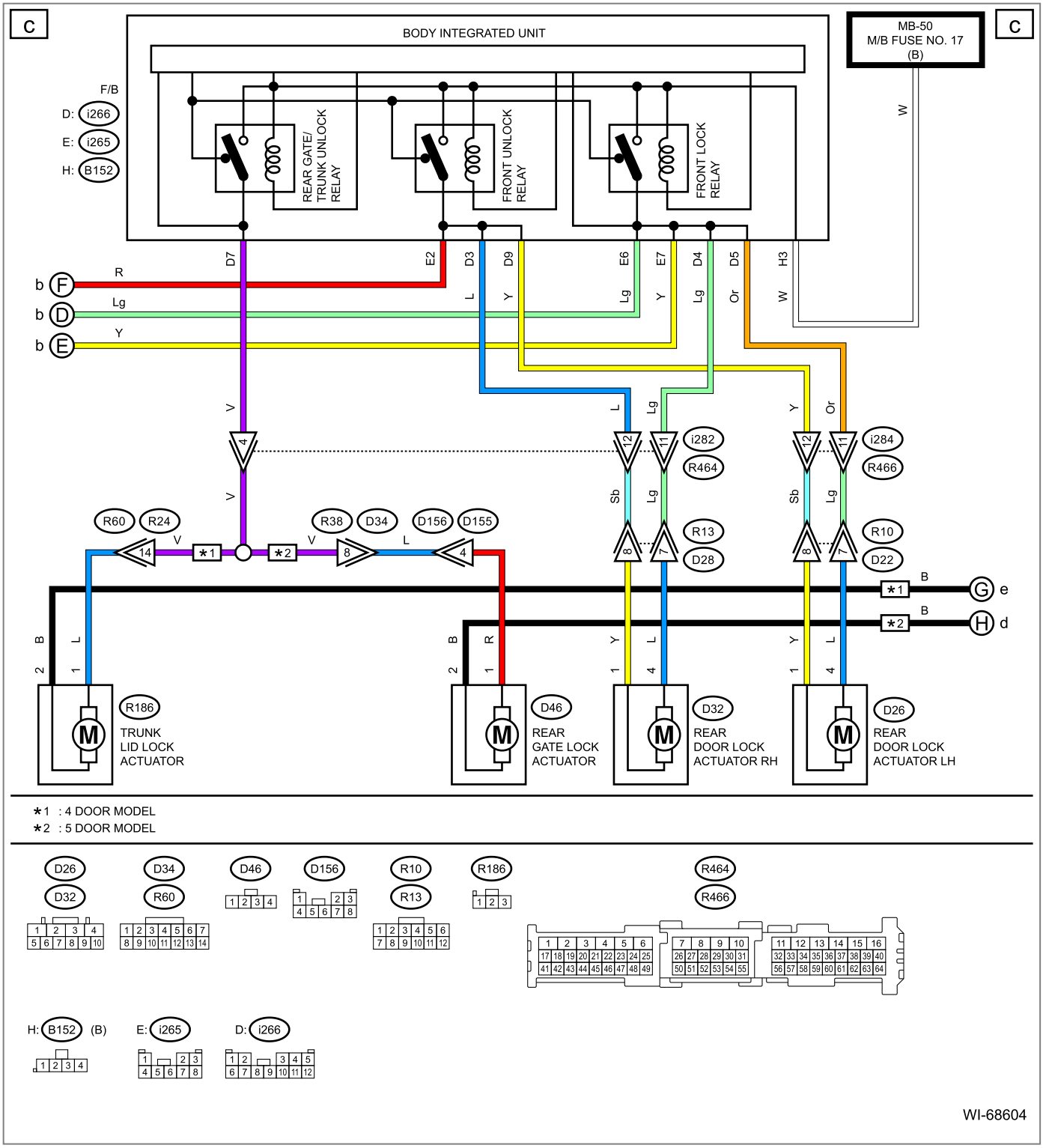
*1 : TERMINAL No. OPTIONAL ARRANGEMENT



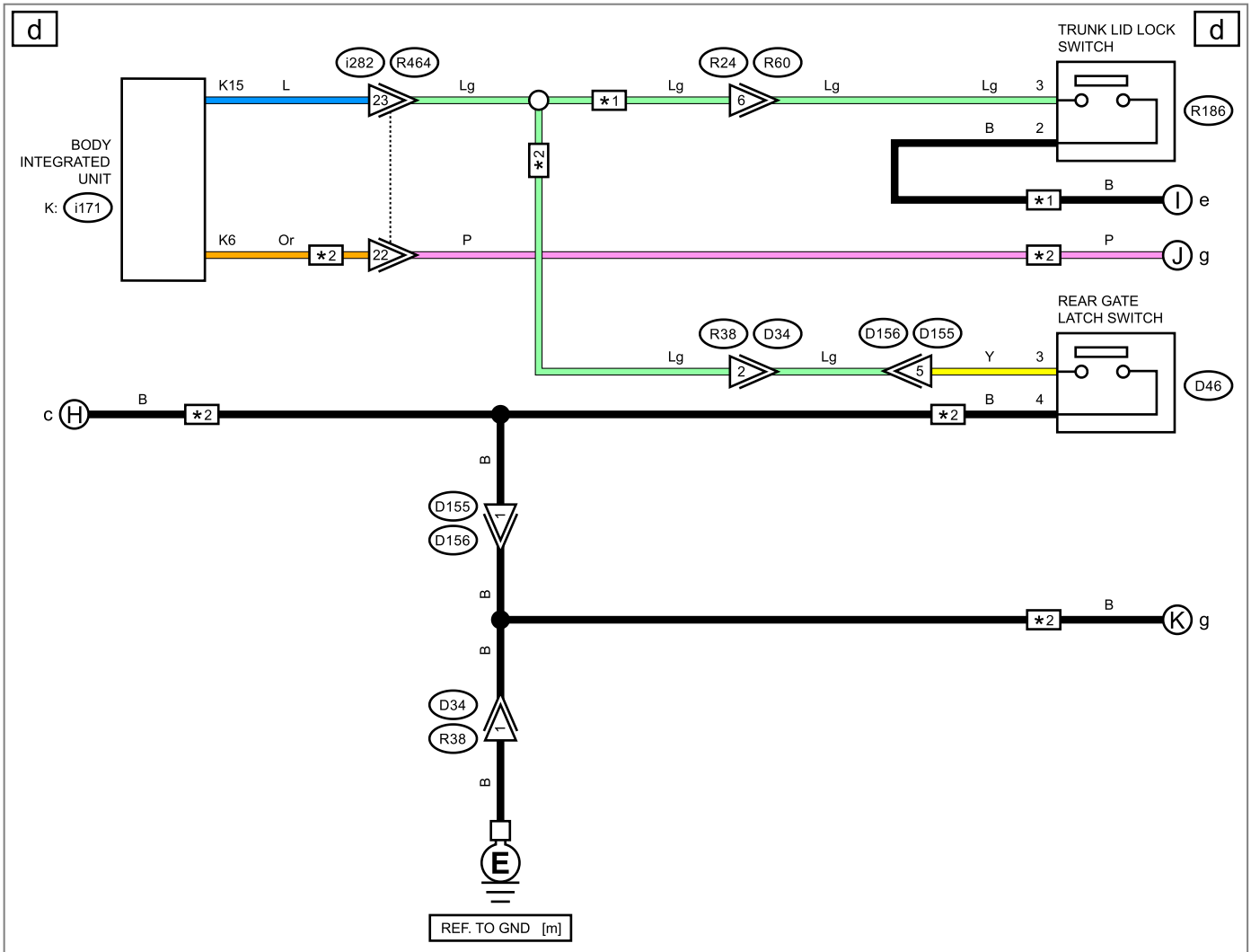
WI-68602


b
b
J: i84 K: i171 L: i81 BODY INTEGRATED UNIT
K32
K12
L22
J6
L6
Lg
Y
R
i101
D84
i76
D83
LOCK
OFF
UNLOCK
D149
REMOTE CONTROL MIRROR SWITCH (DOOR LOCK SWITCH)
D72
FRONT DOOR LOCK ACTUATOR LH
D18
FRONT DOOR LOCK ACTUATOR RH
D125
PASSENGER'S DOOR LOCK SWITCH
REF. TO GND [g]
REF. TO GND [g]
D18
D72
D83
D84
D125
D149
L: i81 (B)
J: i84
K: i171

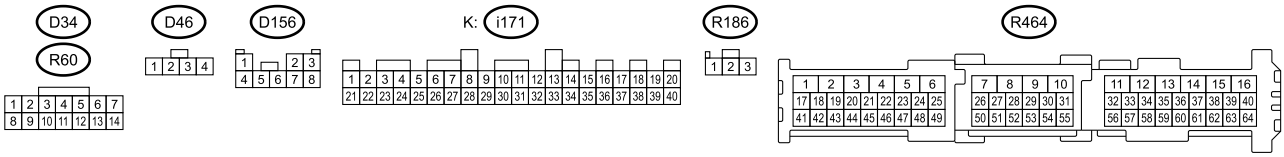
WI-68603


C
BODY INTEGRATED UNIT
MB-50
M/B FUSE NO. 17
(B)
C
F/B
D: i266
E: i265
H: B152
REAR GATE/
TRUNK UNLOCK
RELAY
FRONT UNLOCK
RELAY
FRONT LOCK
RELAY
W
b F R
b D Lg
b E Y
D7
E2
D3
D9
E6
E7
D4
D5
H3
L
Y
Lg
Y
Lg
Or
W
V
L
Lg
Y
Or
i282
R464
i284
R466
Sb
Lg
Sb
Lg
R13
D28
R10
D22
R60
R24
R38
D34
D156
D155
V
V
L
14
*1
*2
8
4
B
*1
G e
B
*2
H d
B
L
B
R
Y
L
Y
L
R186
TRUNK
LID LOCK
ACTUATOR
D46
REAR
GATE LOCK
ACTUATOR
D32
REAR
DOOR LOCK
ACTUATOR RH
D26
REAR
DOOR LOCK
ACTUATOR LH
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
D26
D32
D34
R60
D46
D156
R10
R13
R186
R464
R466
H: B152 (B)
E: i265
D: i266

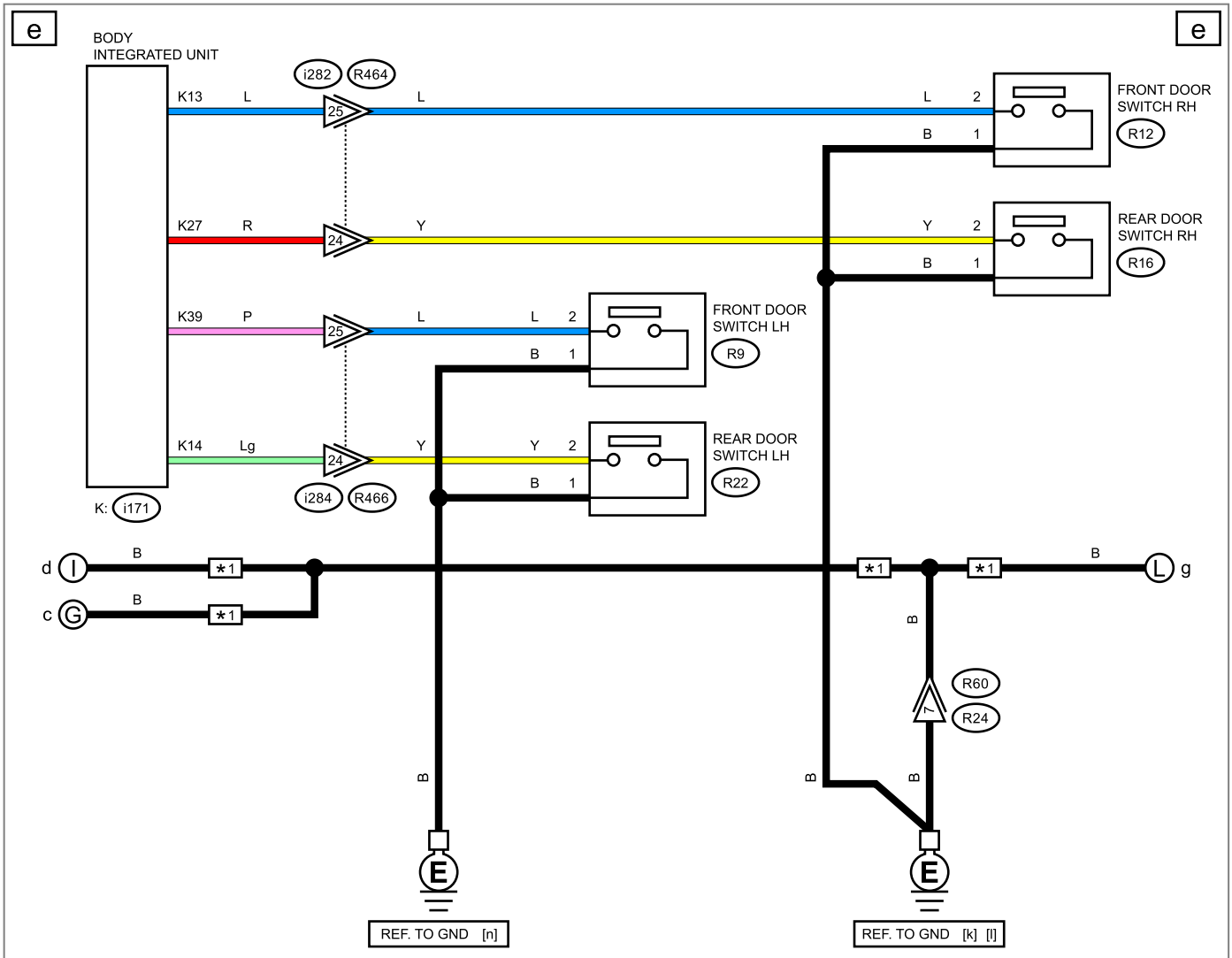
WI-68604



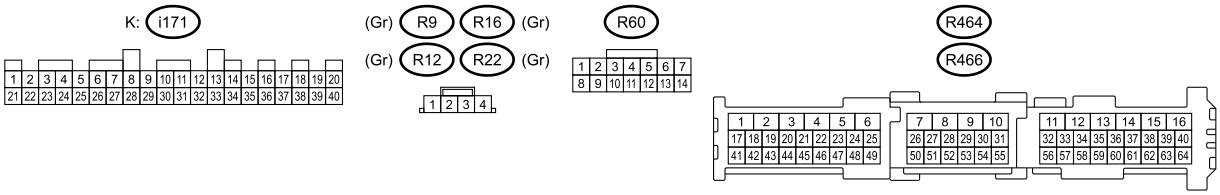
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL



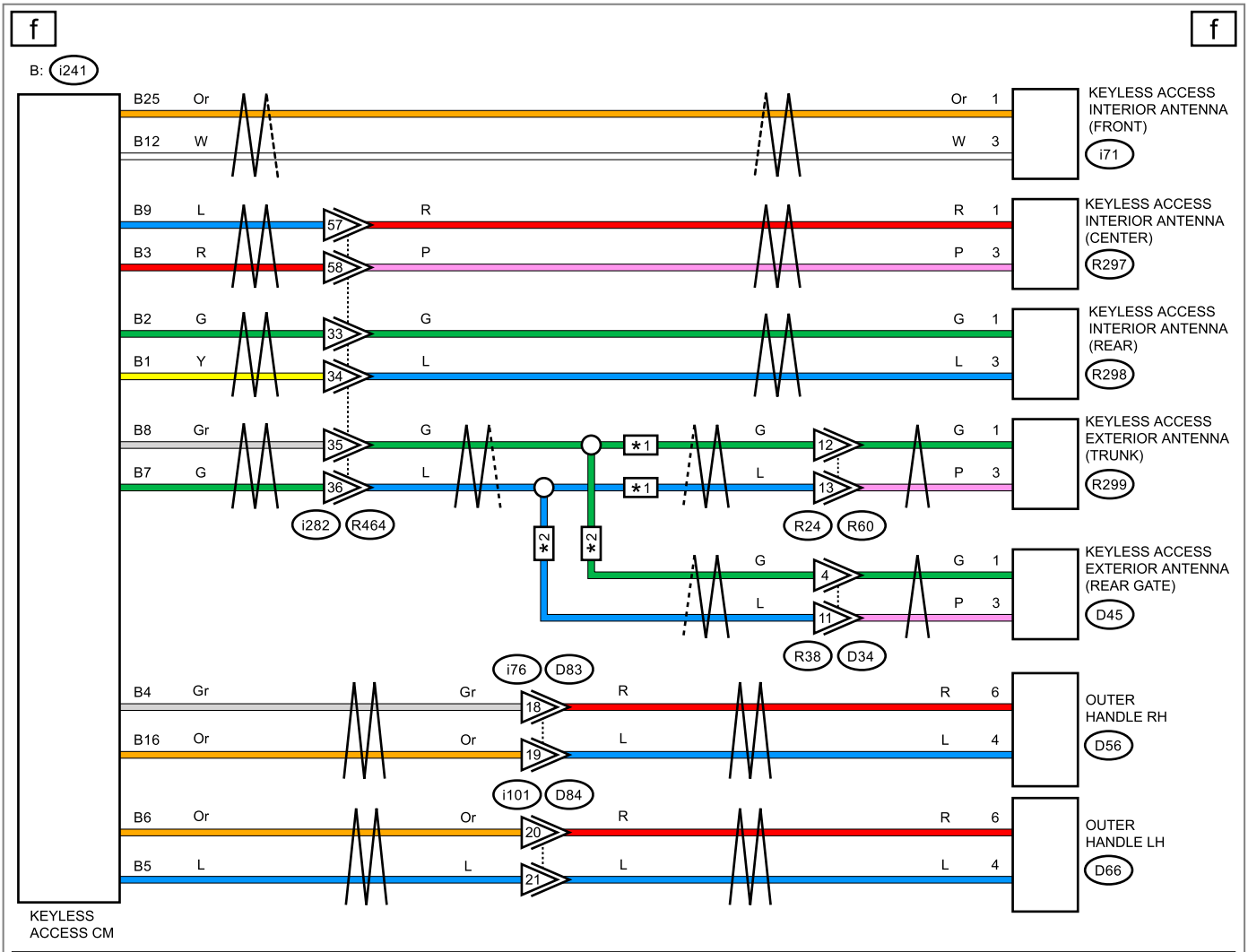
WI-68605

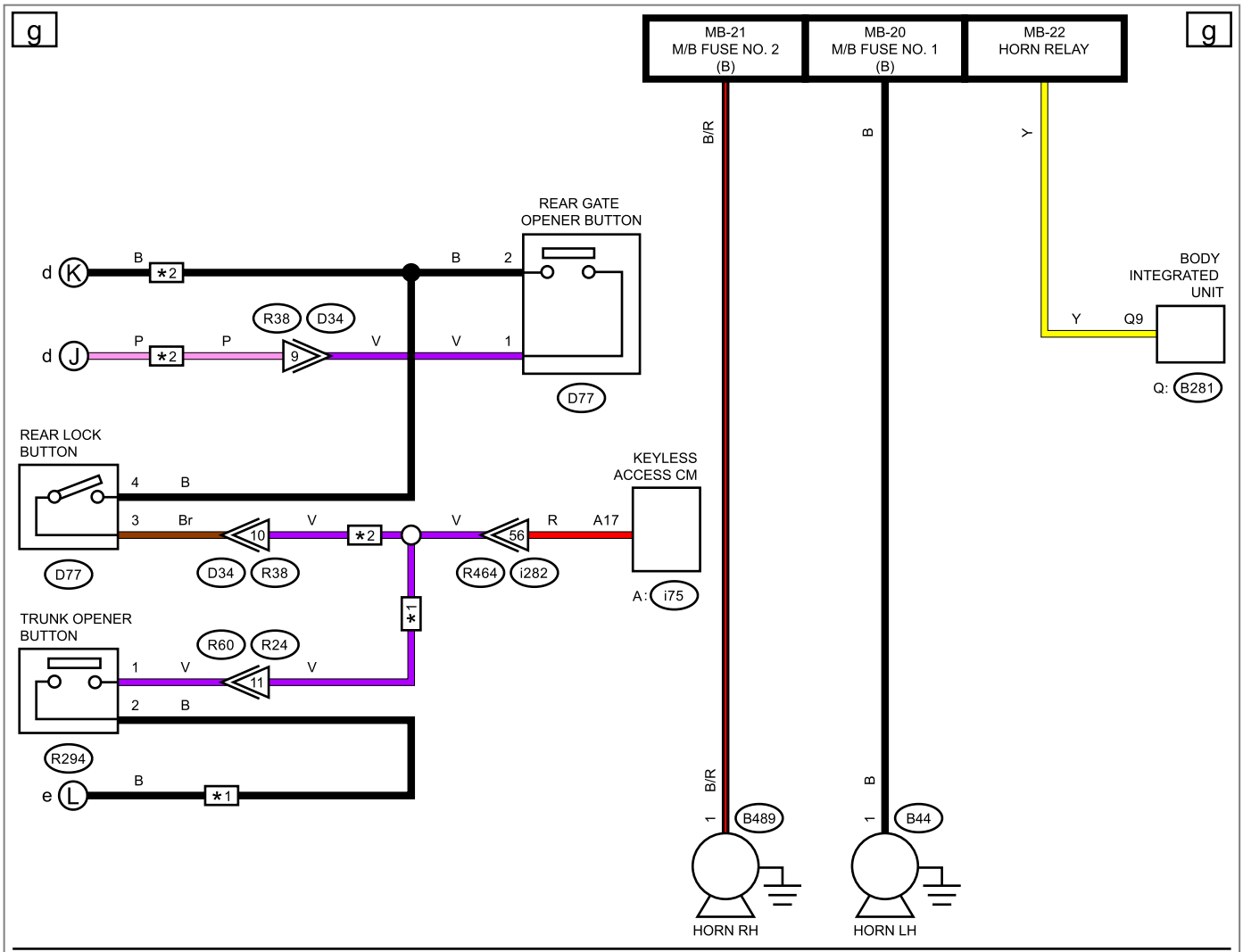


*1 : 4 DOOR MODEL

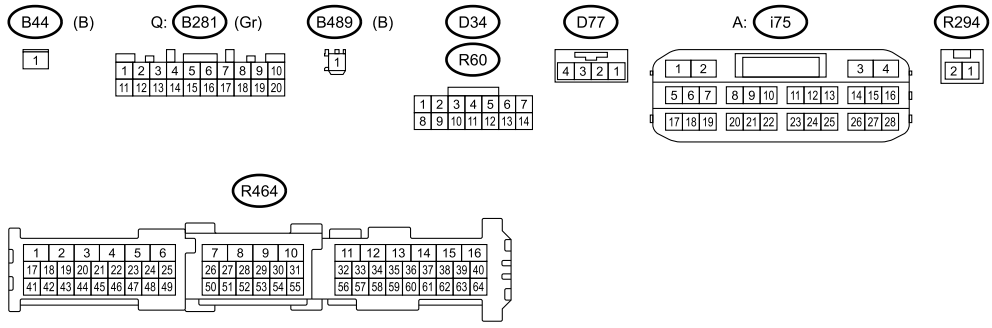


WI-68606


f
f
B: i241
B25 Or
B12 W
Or 1
W 3
KEYLESS ACCESS INTERIOR ANTENNA (FRONT)
i71
B9 L
B3 R
57
58
R
P
R 1
P 3
KEYLESS ACCESS INTERIOR ANTENNA (CENTER)
R297
B2 G
B1 Y
33
34
G
L
G 1
L 3
KEYLESS ACCESS INTERIOR ANTENNA (REAR)
R298
B8 Gr
B7 G
35
36
G
L
*1
*1
G
L
12
13
G 1
P 3
KEYLESS ACCESS EXTERIOR ANTENNA (TRUNK)
R299
i282
R464
R24
R60
*2
*2
G
L
4
11
G 1
P 3
KEYLESS ACCESS EXTERIOR ANTENNA (REAR GATE)
D45
R38
D34
i76
D83
B4 Gr
B16 Or
Gr
Or
18
19
R
L
R 6
L 4
OUTER HANDLE RH
D56
i101
D84
B6 Or
B5 L
Or
L
20
21
R
L
R 6
L 4
OUTER HANDLE LH
D66
KEYLESS ACCESS CM
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
D34
R60
D56
D66
D83
D84
B: i241
D45
R298
i71
R299
R297
R464
WI-68607

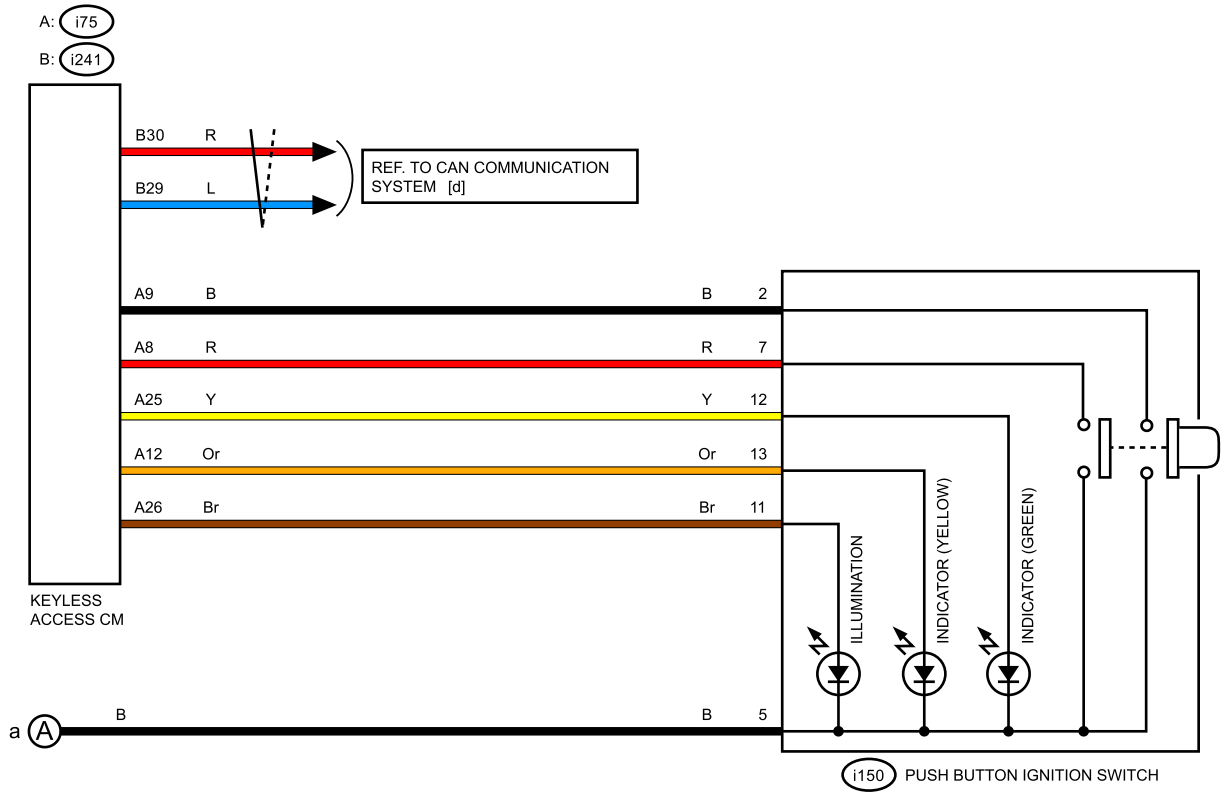


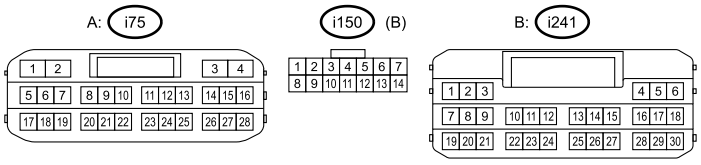
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL



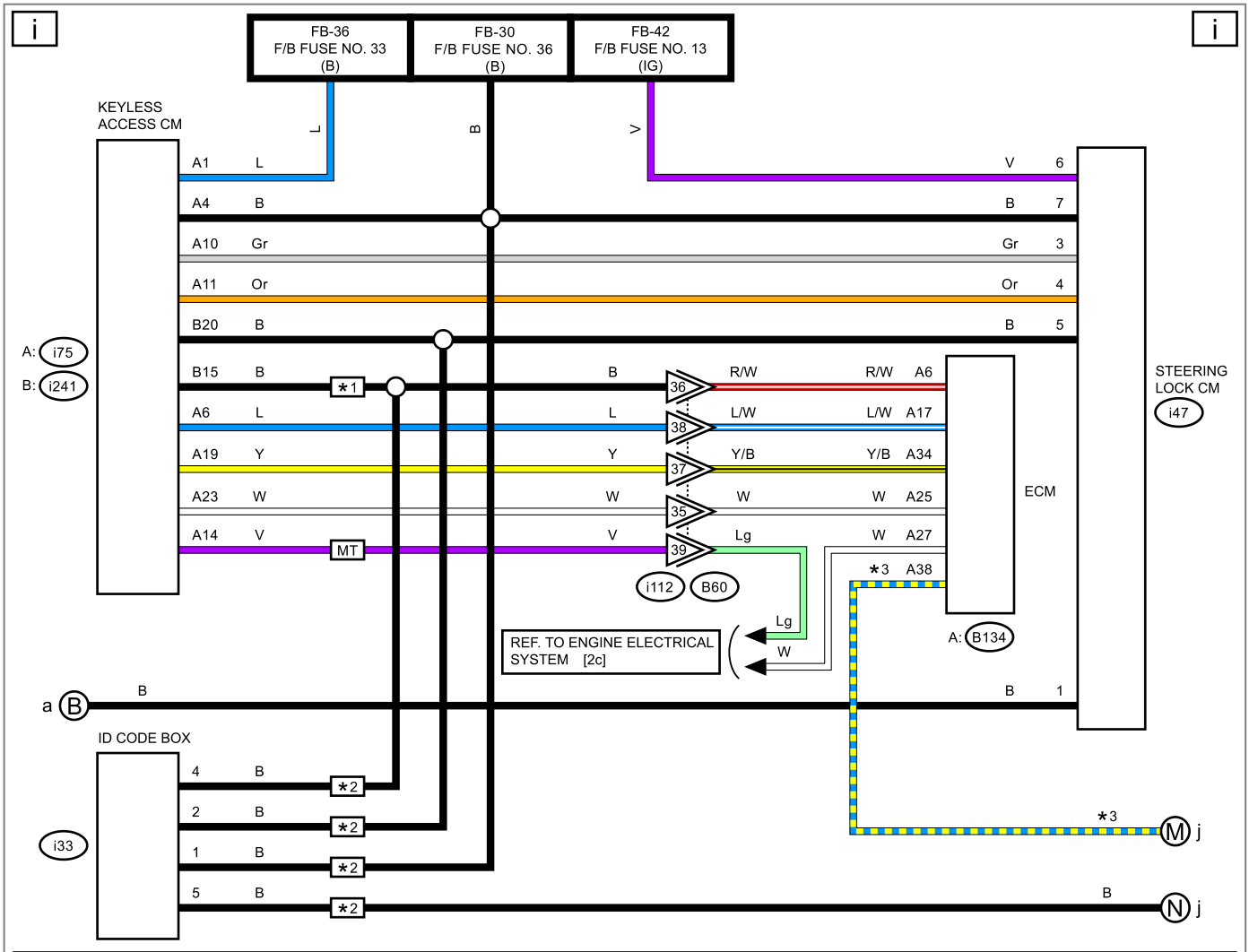
WI-68608

h


A: i75
B: i241
B30 R
B29 L
REF. TO CAN COMMUNICATION SYSTEM [d]
A9 B B 2
A8 R R 7
A25 Y Y 12
A12 Or Or 13
A26 Br Br 11
KEYLESS ACCESS CM
a A B B 5
ILLUMINATION
INDICATOR (YELLOW)
INDICATOR (GREEN)
i150 PUSH BUTTON IGNITION SWITCH

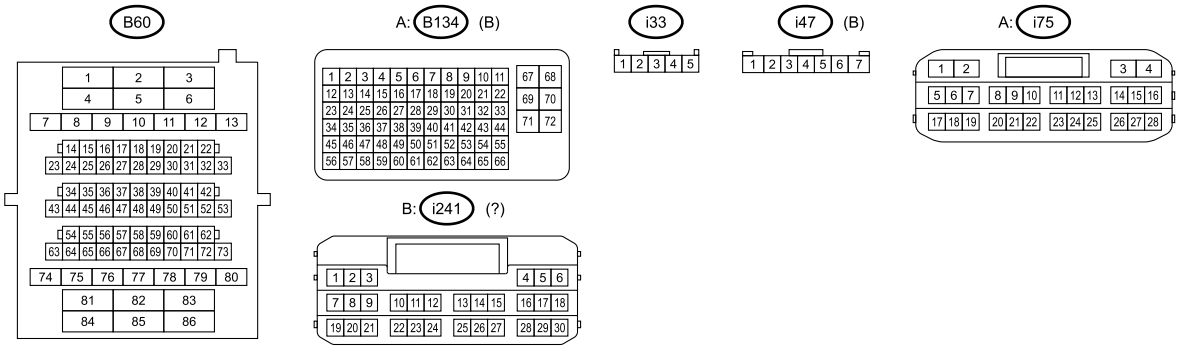

A: i75
i150 (B)
B: i241

WI-68609

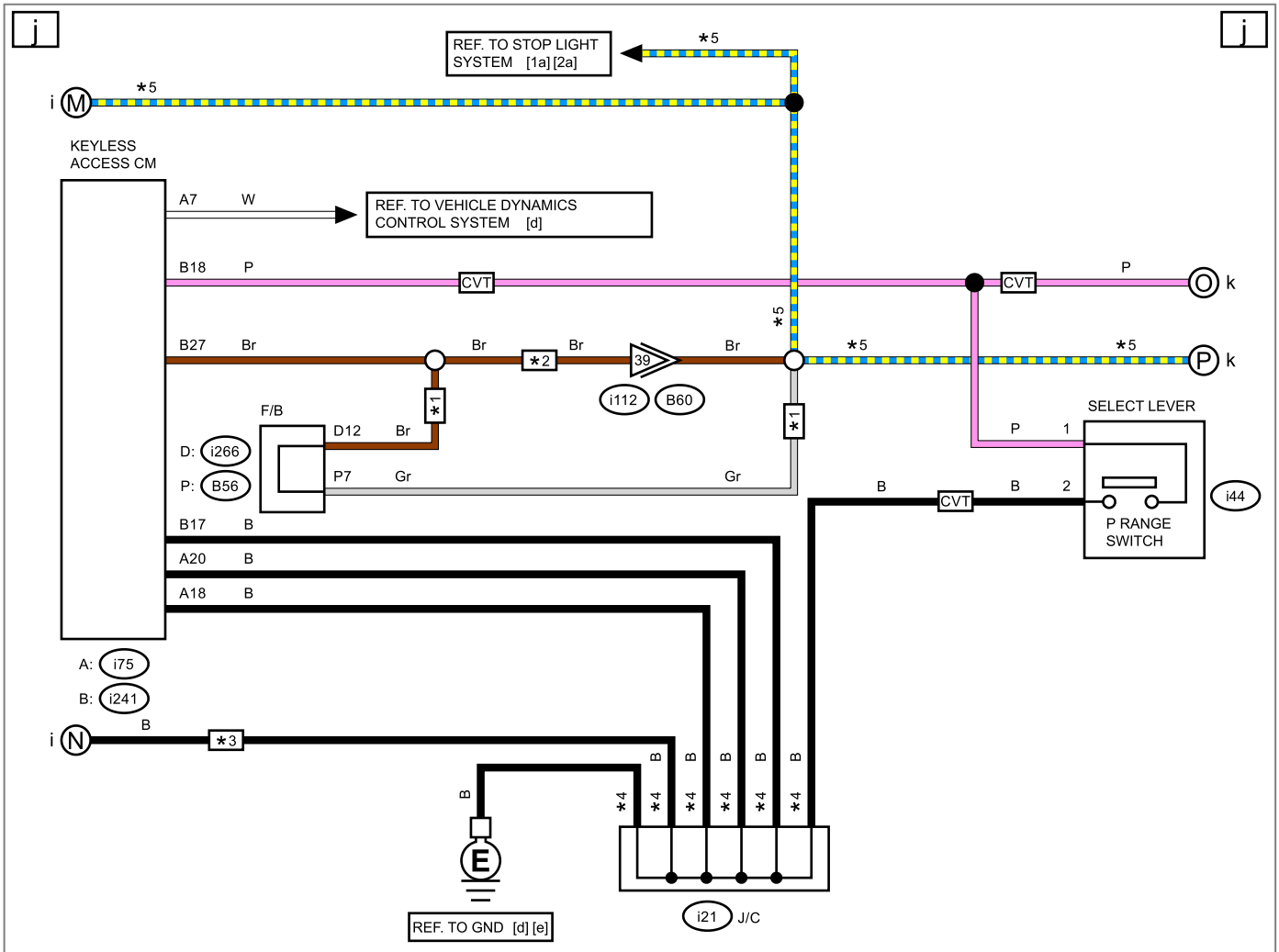


*1 : WITHOUT ID CODE BOX
*2 : WITH ID CODE BOX

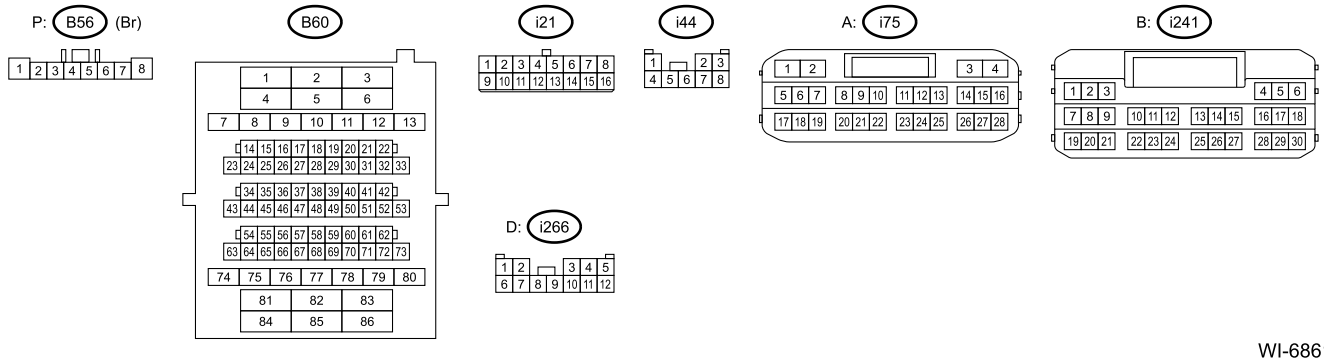
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : Br



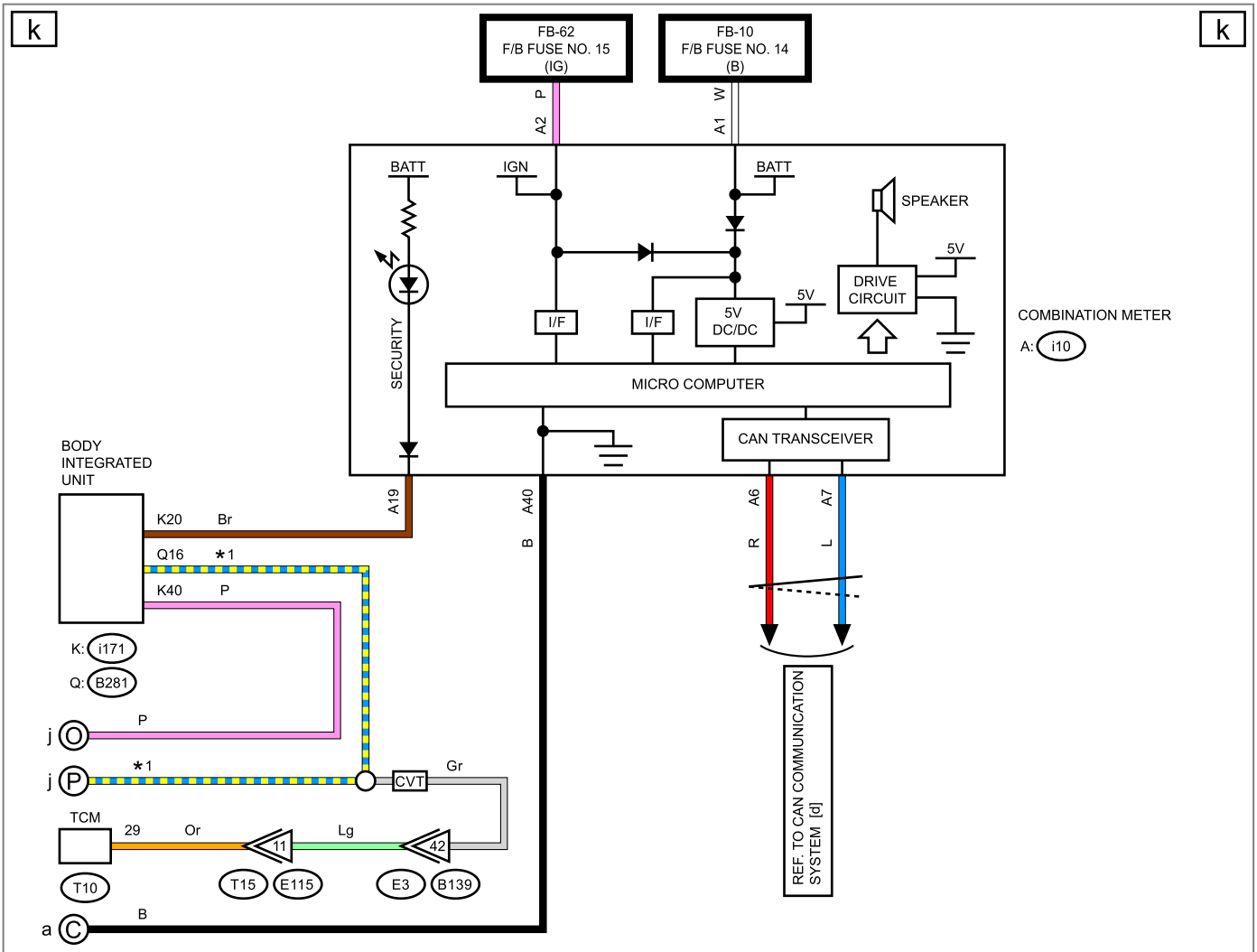
WI-68610



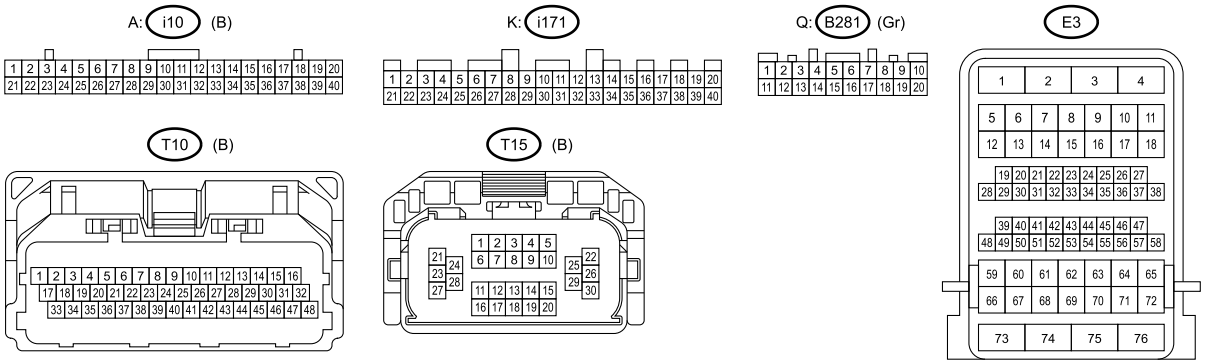
*1 : CVT MODEL WITHOUT EyeSight
*2 : CVT MODEL WITH EyeSight
*3 : WITH ID CODE BOX
*4 : TERMINAL No. OPTIONAL ARRANGEMENT
*5 : WITHOUT EyeSight : Gr
WITH EyeSight : Br



WI-68611

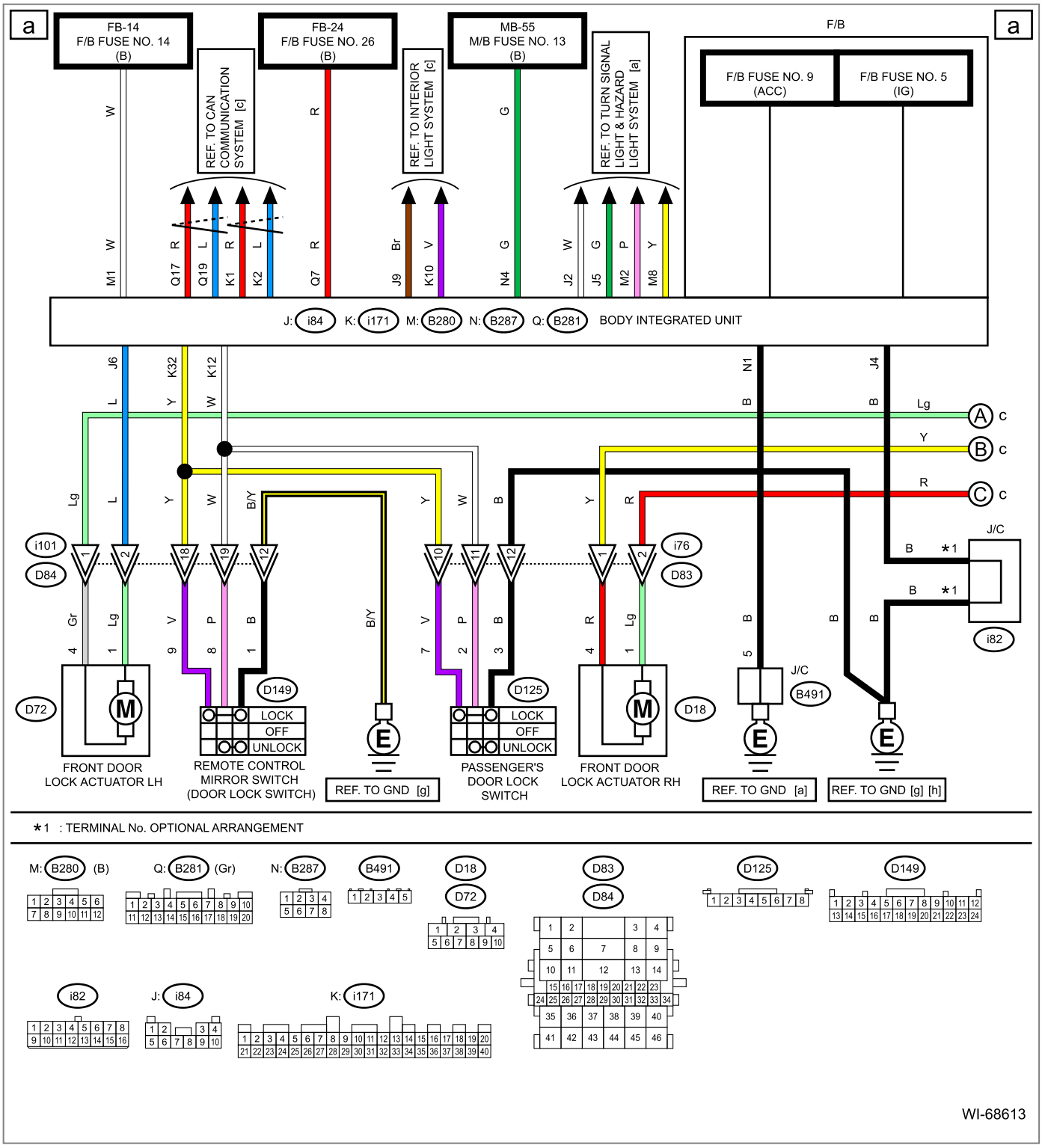


*1 : WITHOUT EyeSight : Gr
WITH EyeSight : Br



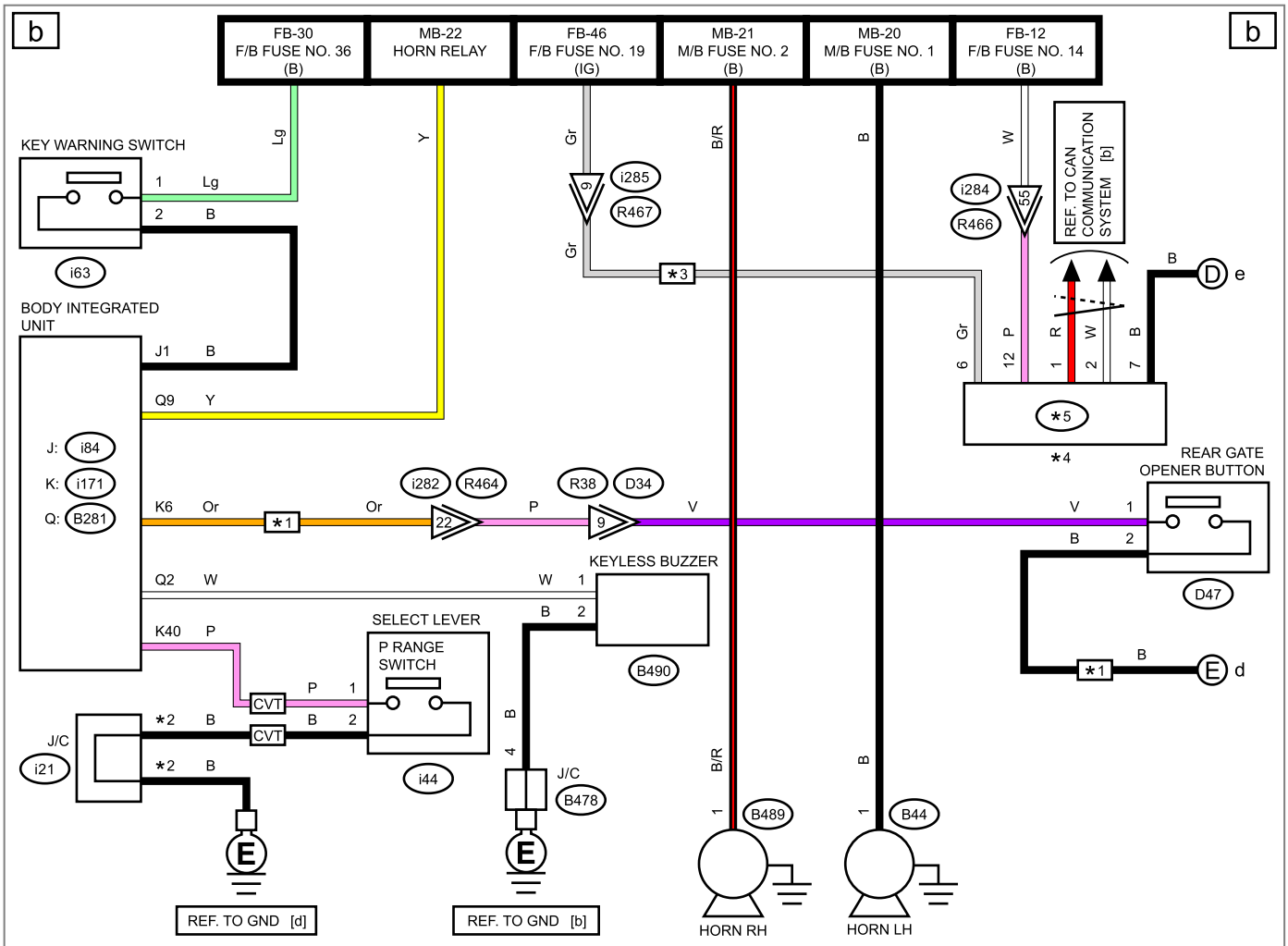
WI-68612

WIRING DIAGRAM

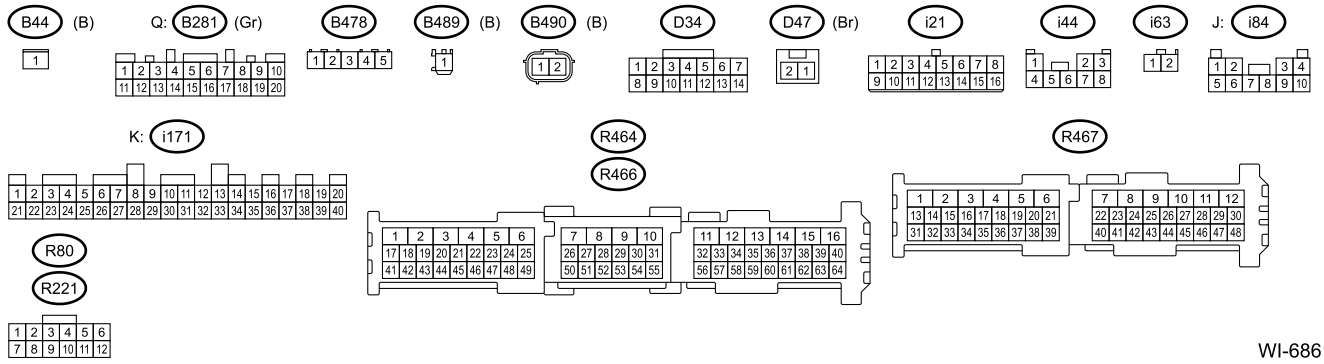


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

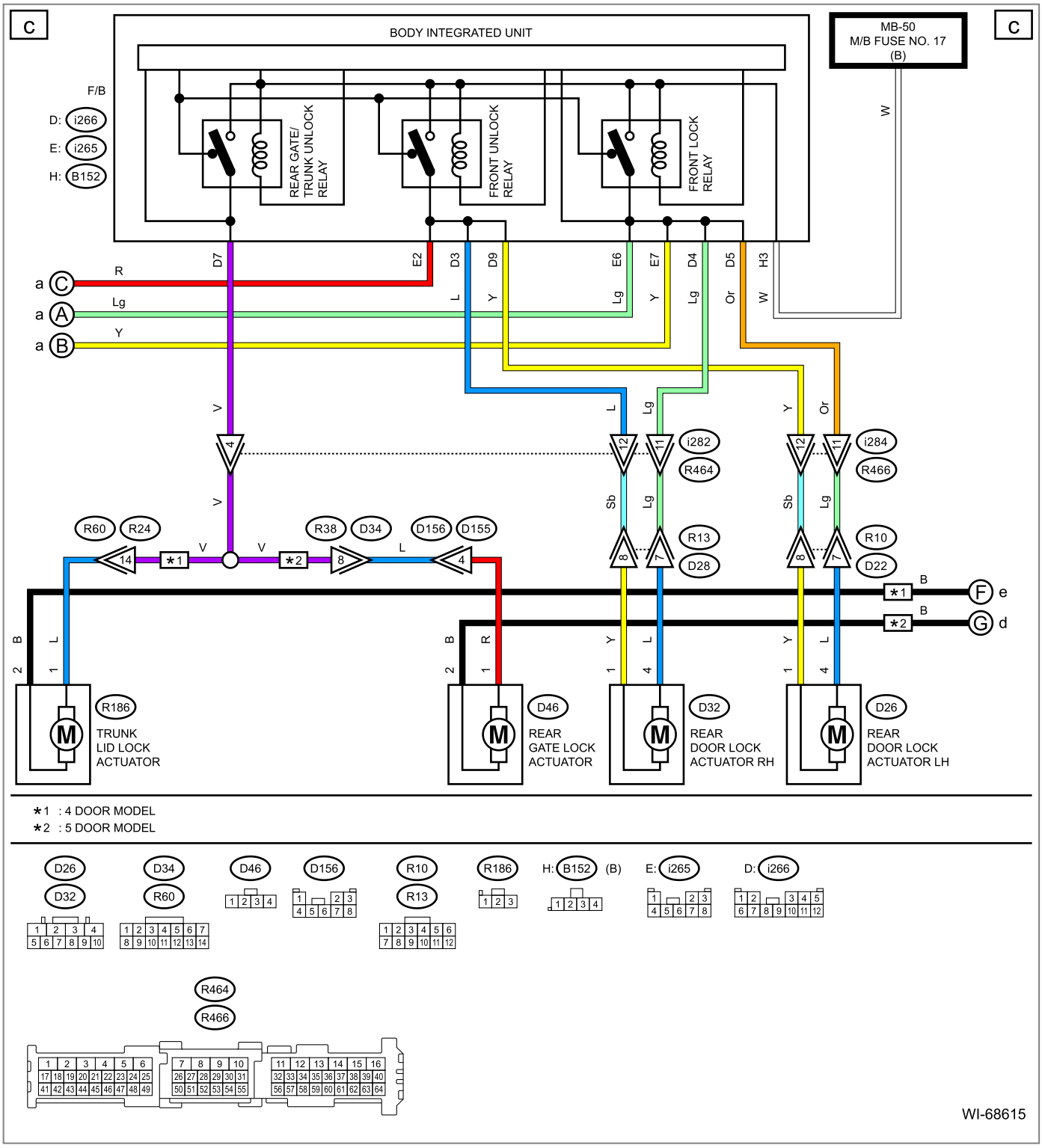
WI-68613



*1 : 5 DOOR MODEL
*2 : TERMINAL No. OPTIONAL ARRANGEMENT
*3 : WITH TPMS
*4 : WITHOUT TPMS : KEYLESS ENTRY CM
WITH TPMS : TPMS & KEYLESS ENTRY CM
*5 : WITHOUT TPMS : R80
WITH TPMS : R221

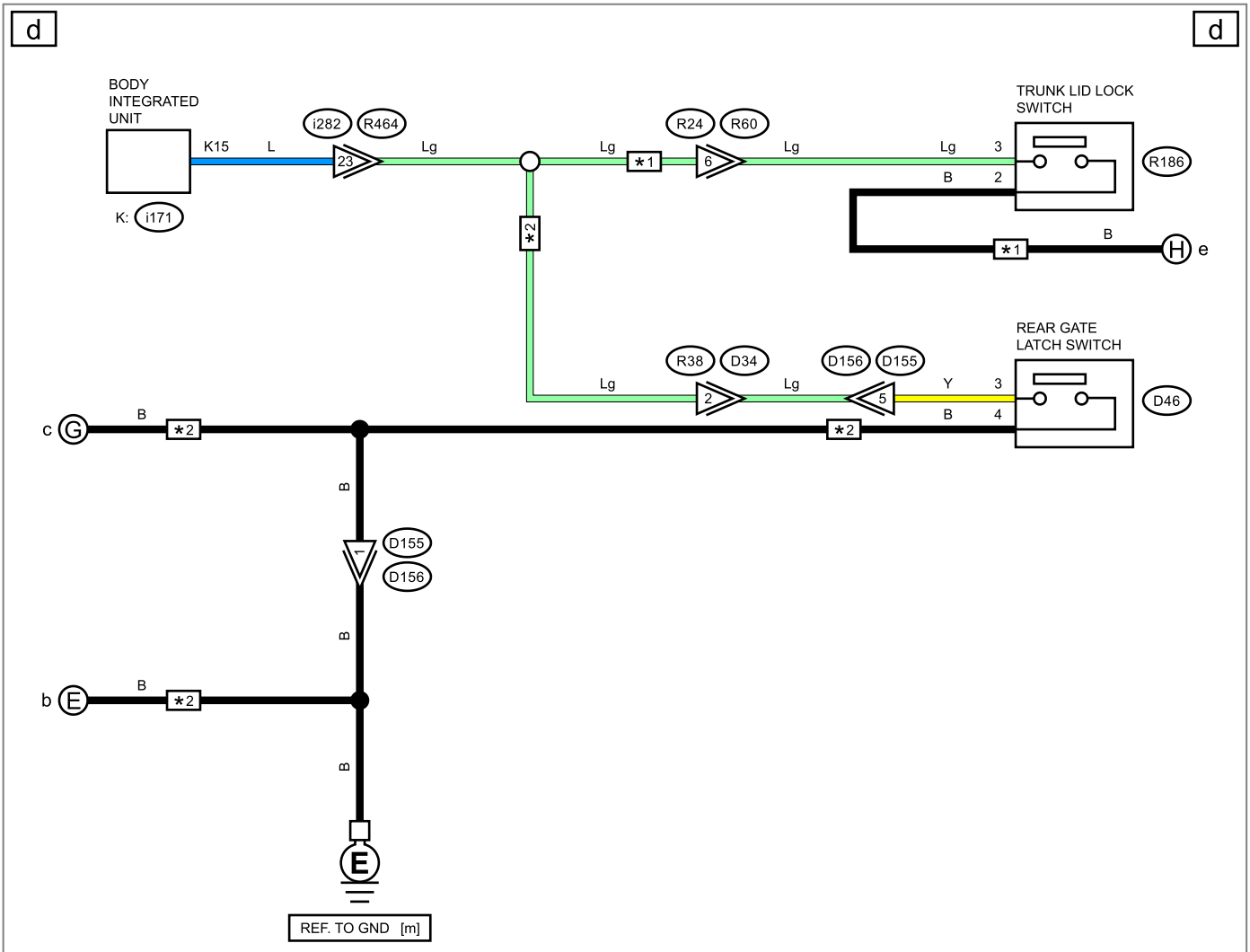


WI-68614

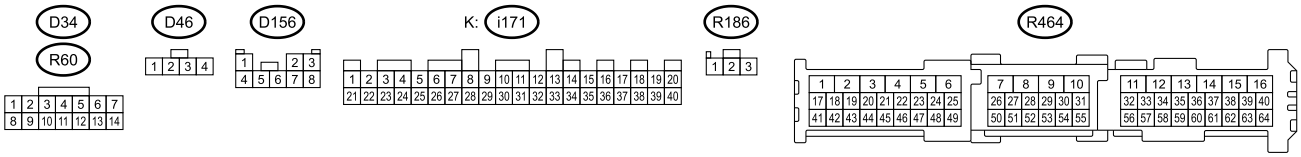


*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL

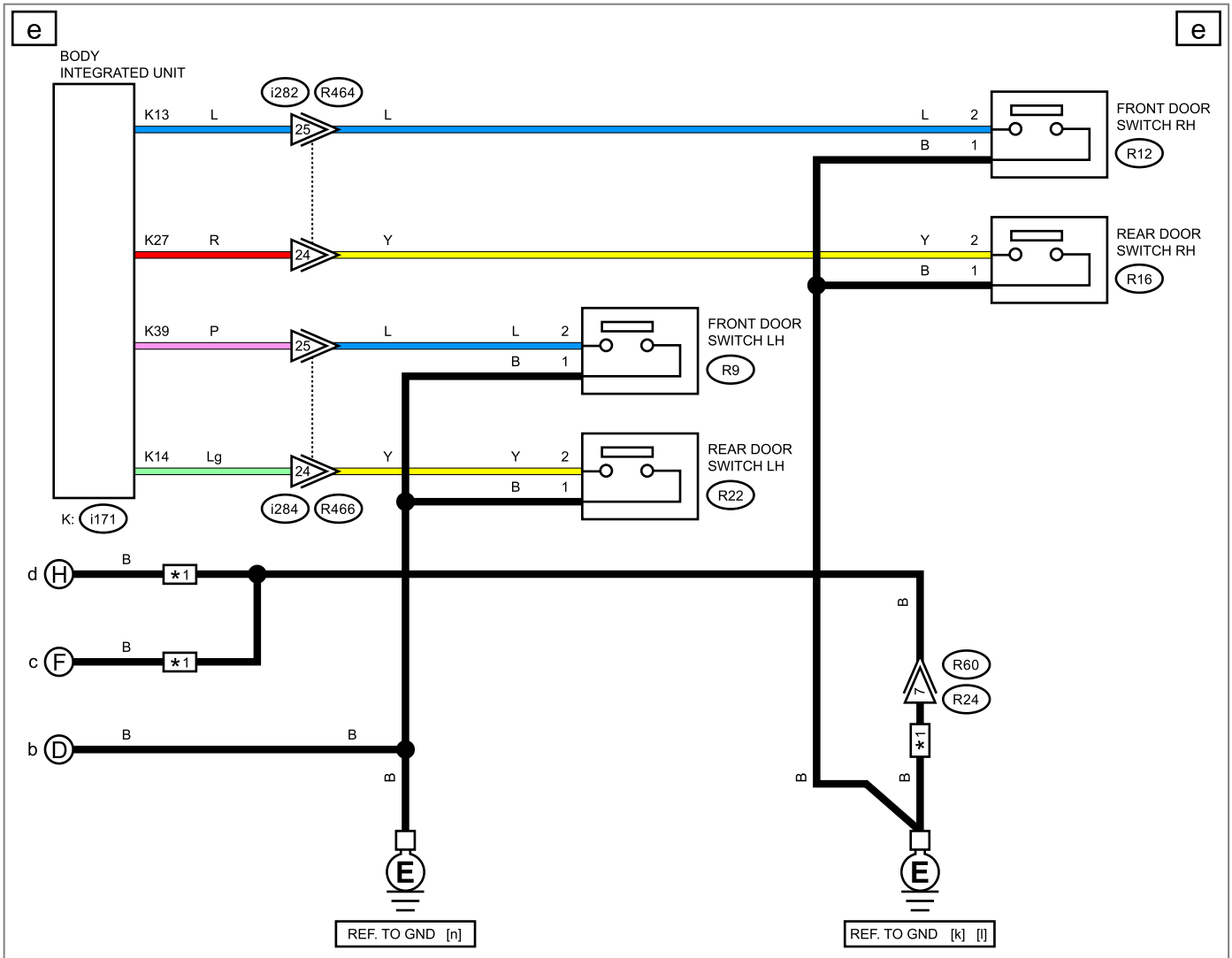
WI-68615



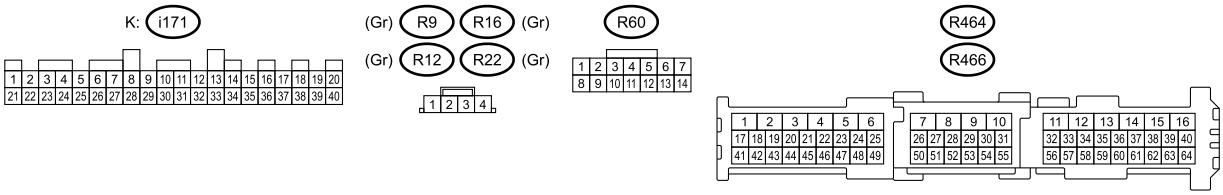
*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL



WI-68616



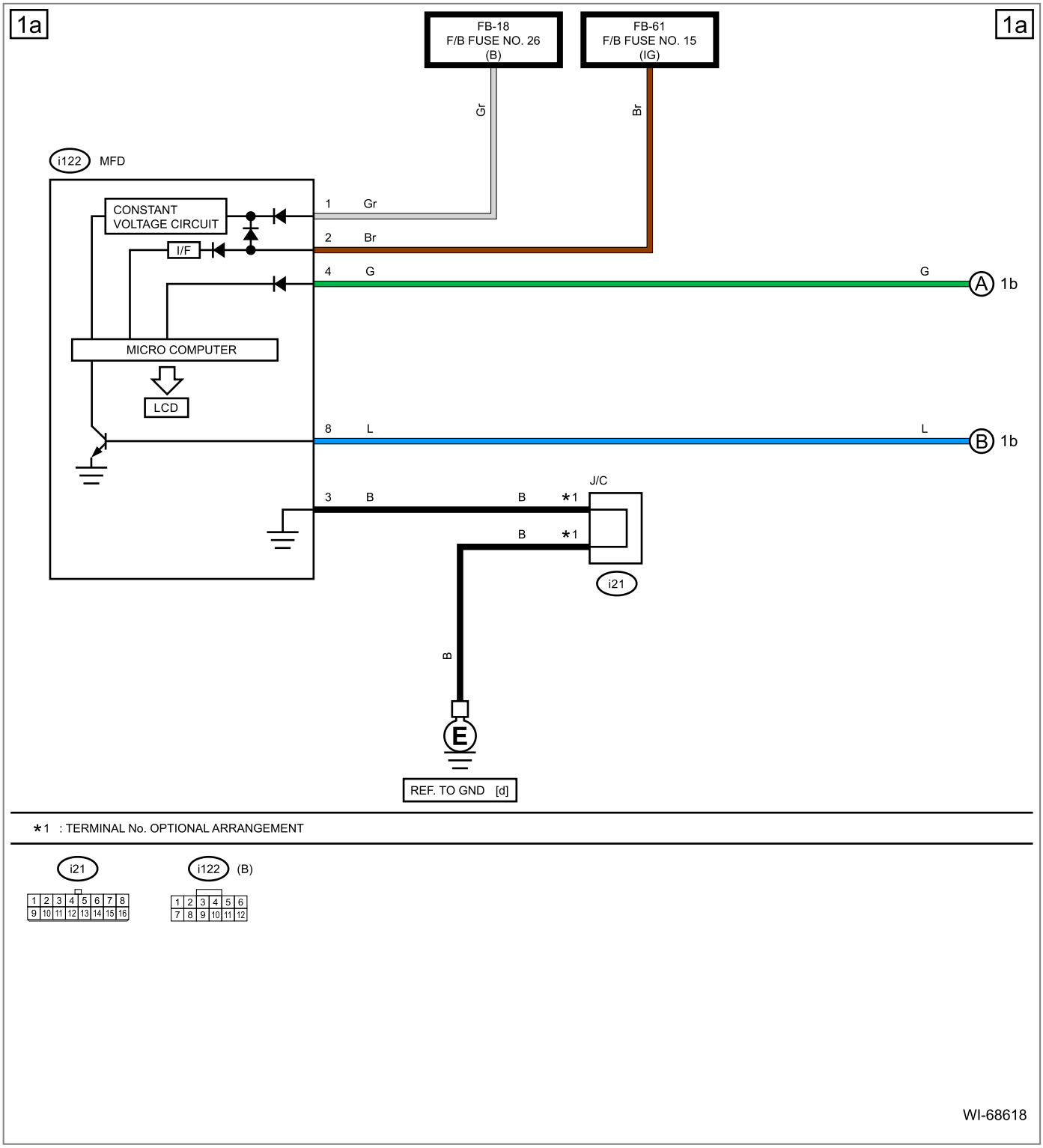
*1 : 4 DOOR MODEL



WI-68617

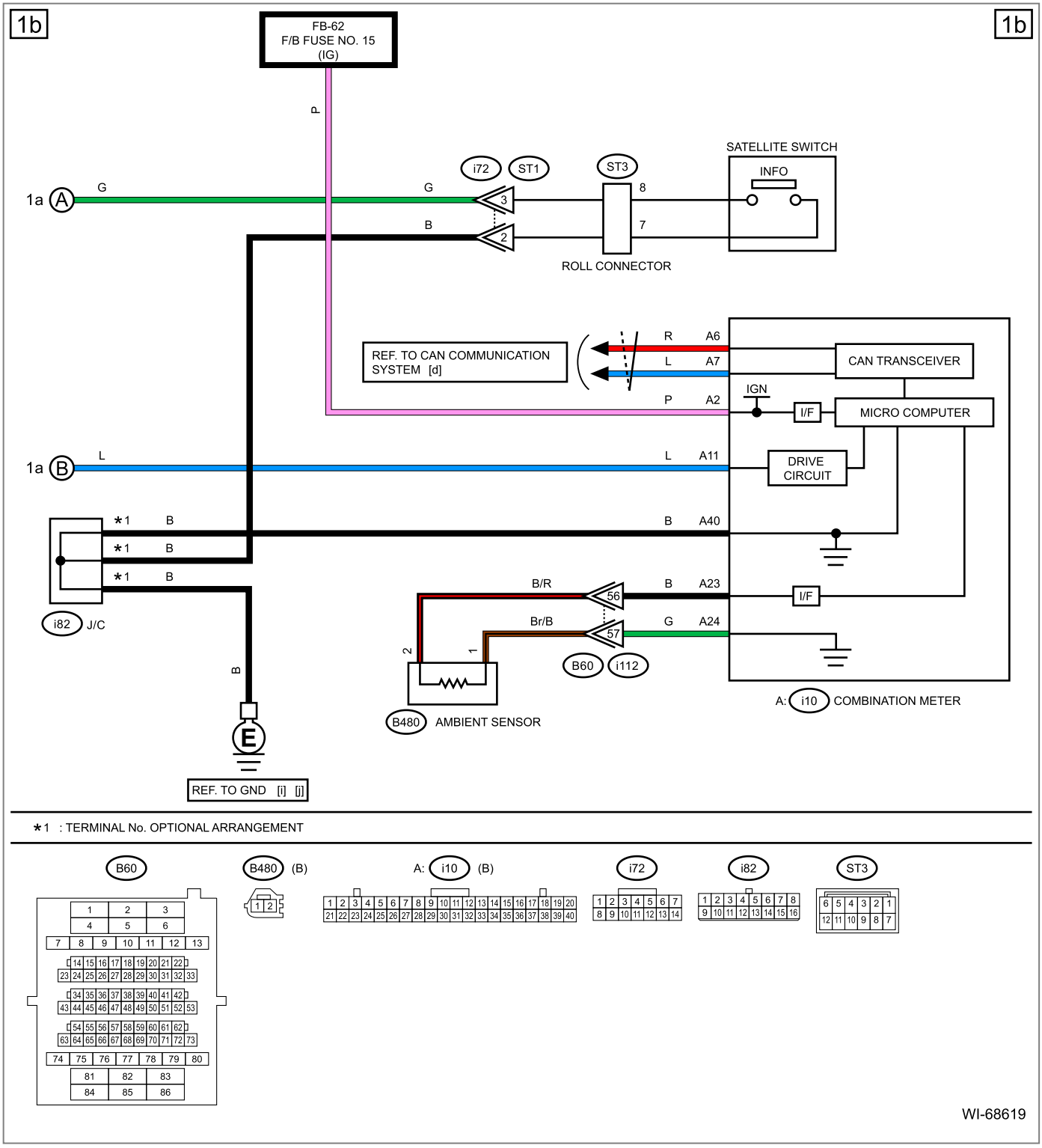
WIRING DIAGRAM

1. STANDARD MFD



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

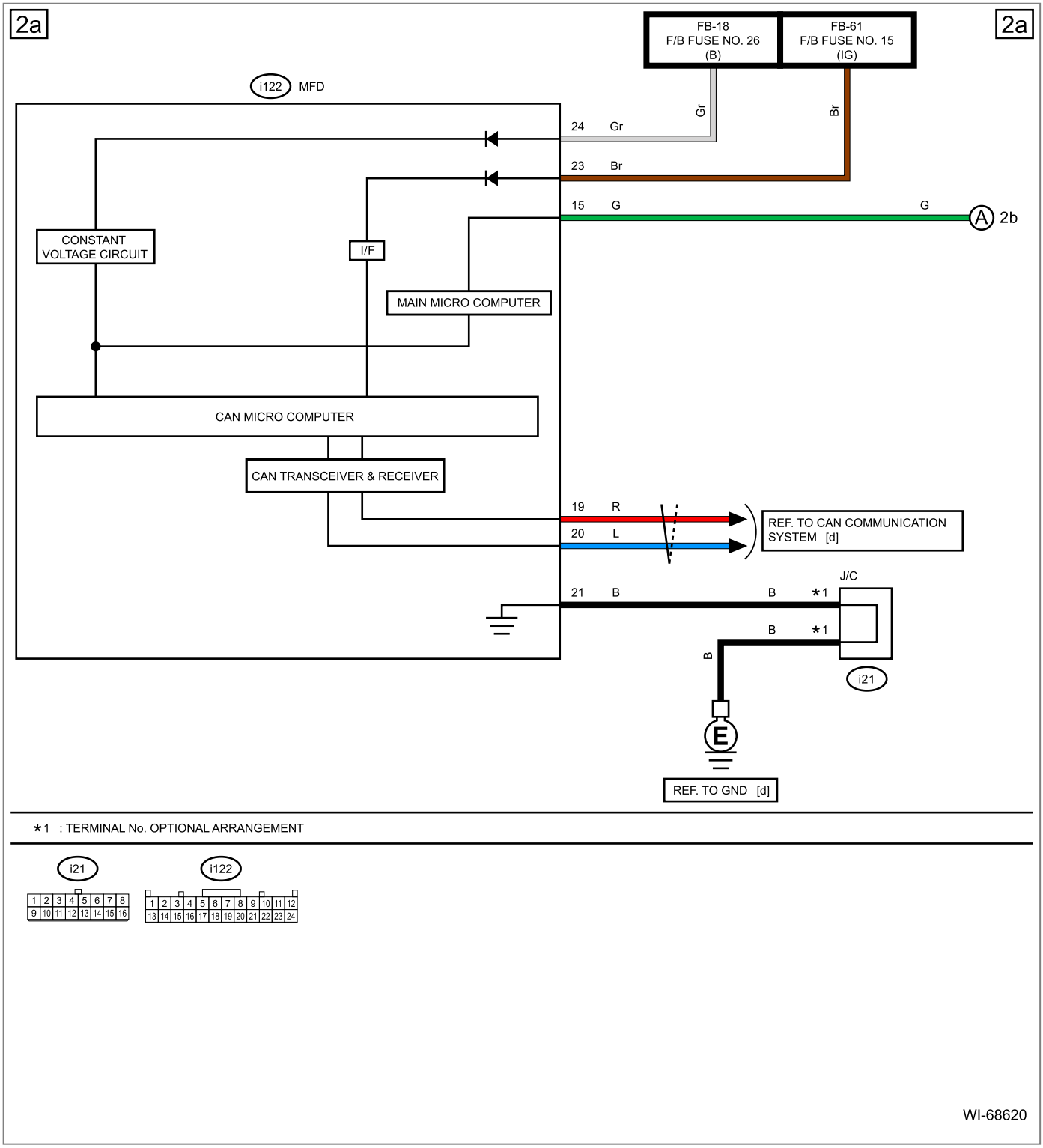
WI-68618



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

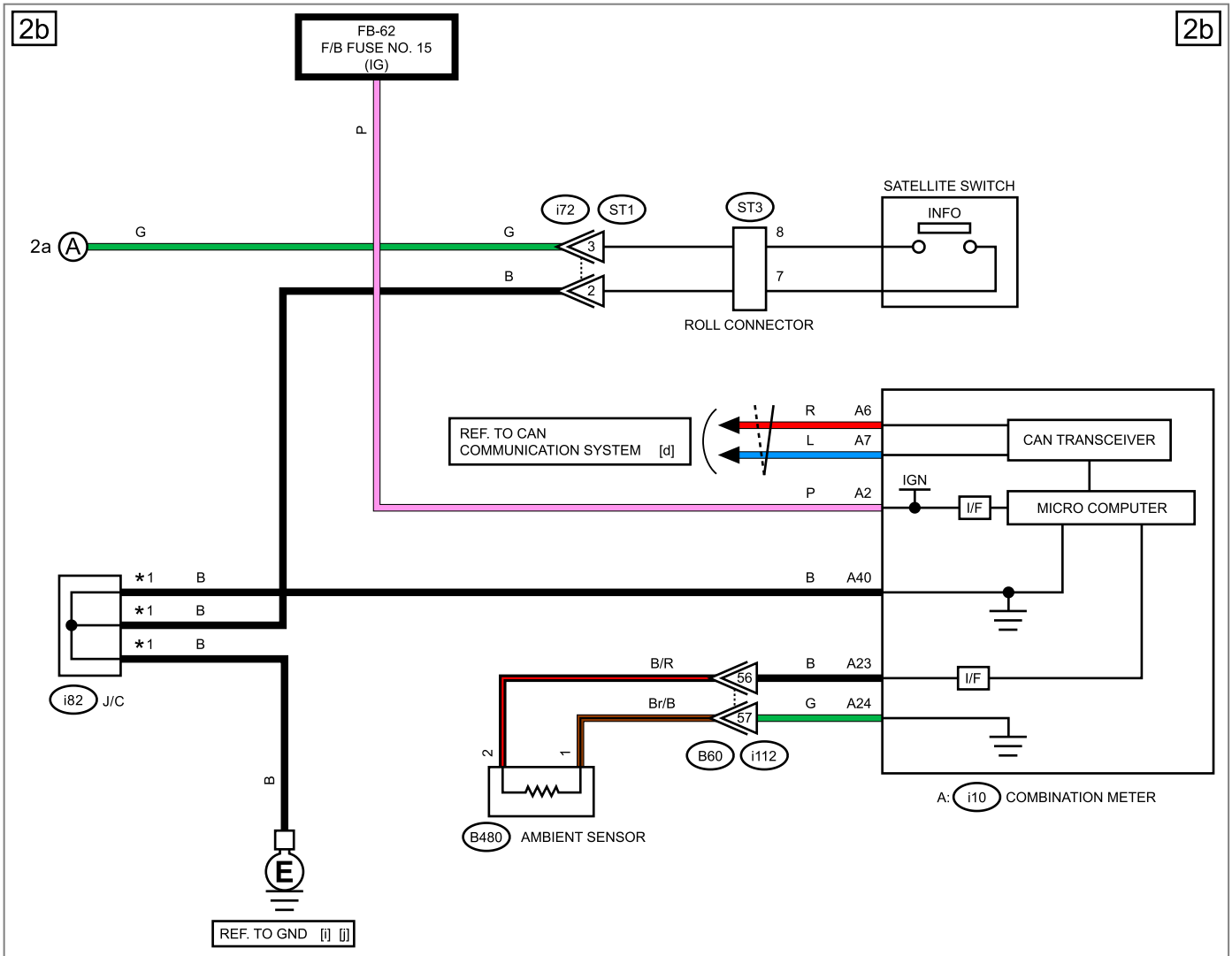
WI-68619

2. HIGH GRADE MFD

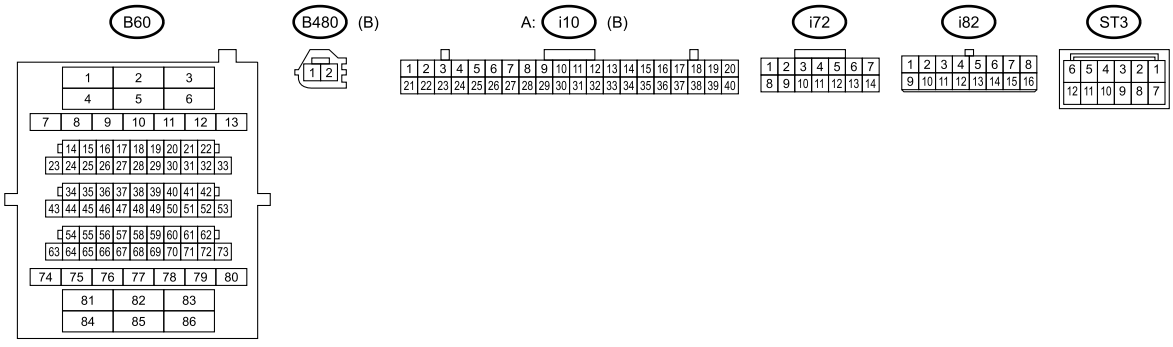


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

WI-68620



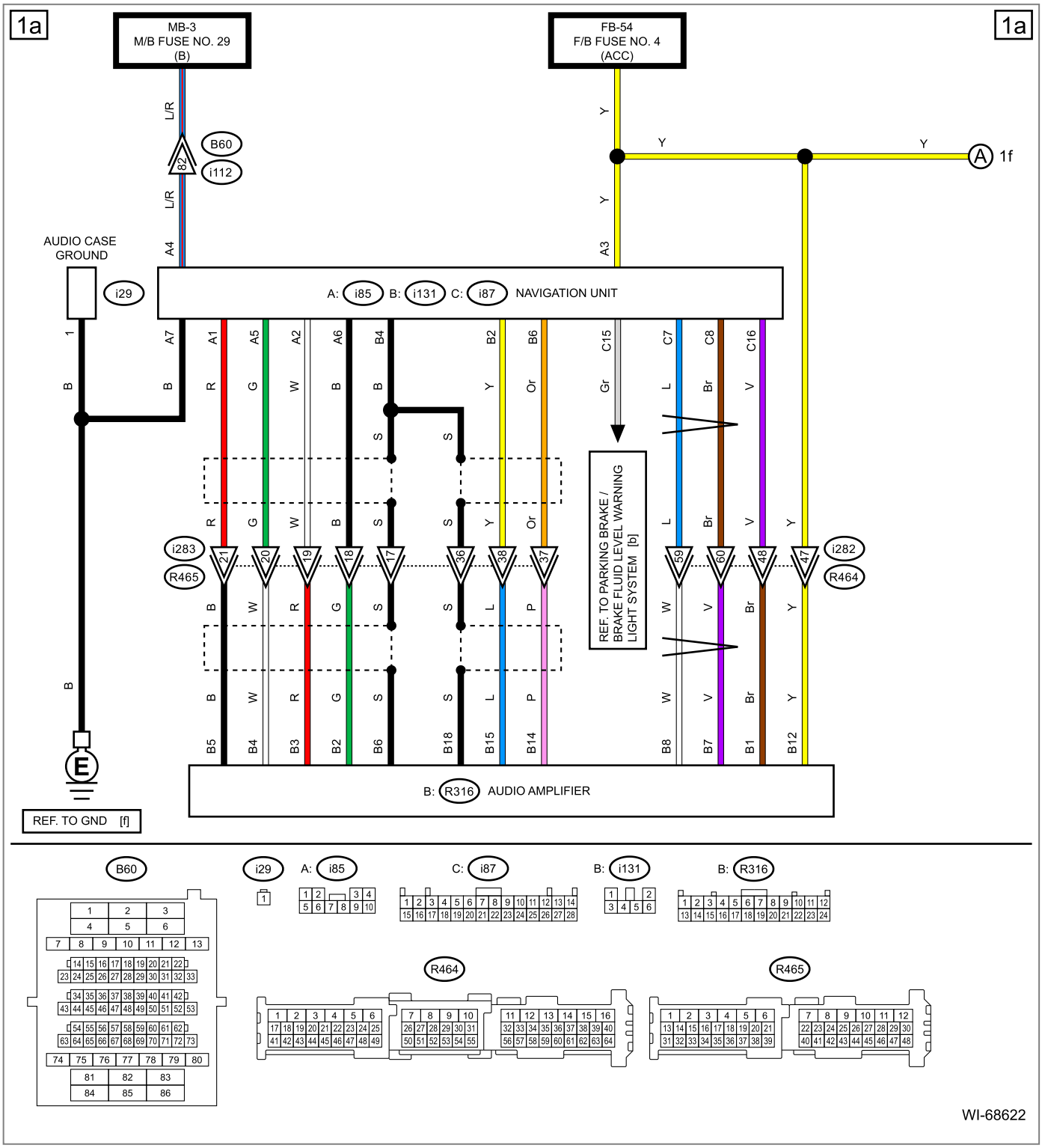
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

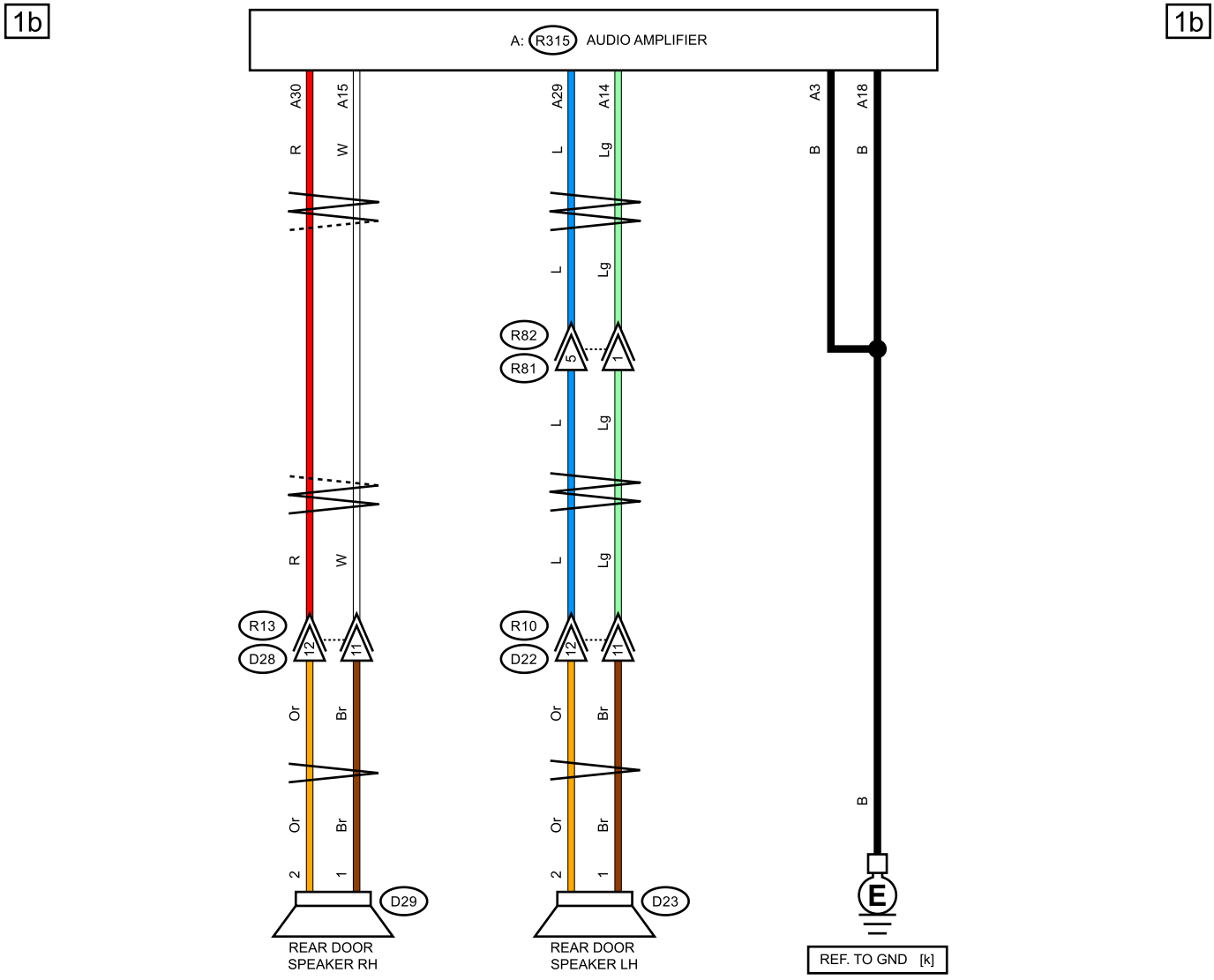


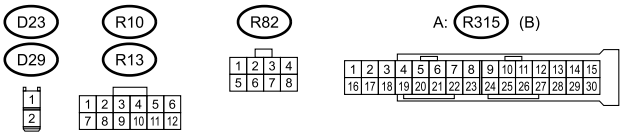
WI-68621

WIRING DIAGRAM

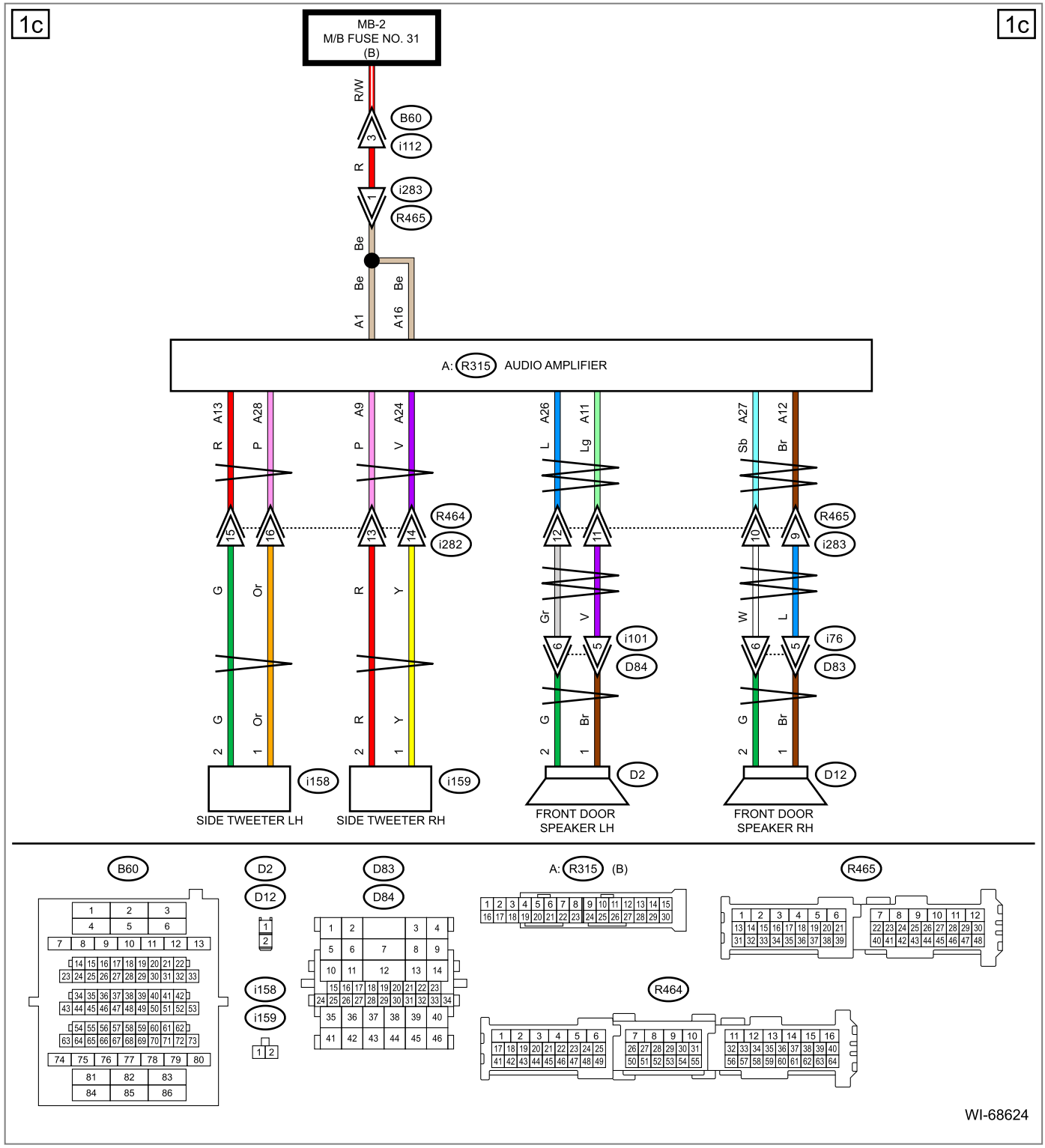
1. WITHOUT TELEMATICS




1b
1b
A: R315 AUDIO AMPLIFIER
A30
A15
A29
A14
A3
A18
R
W
L
Lg
B
B
R82
R81
5
1
R13
D28
12
11
R10
D22
Or
Br
2
1
D29
D23
REAR DOOR SPEAKER RH
REAR DOOR SPEAKER LH
E
REF. TO GND [k]

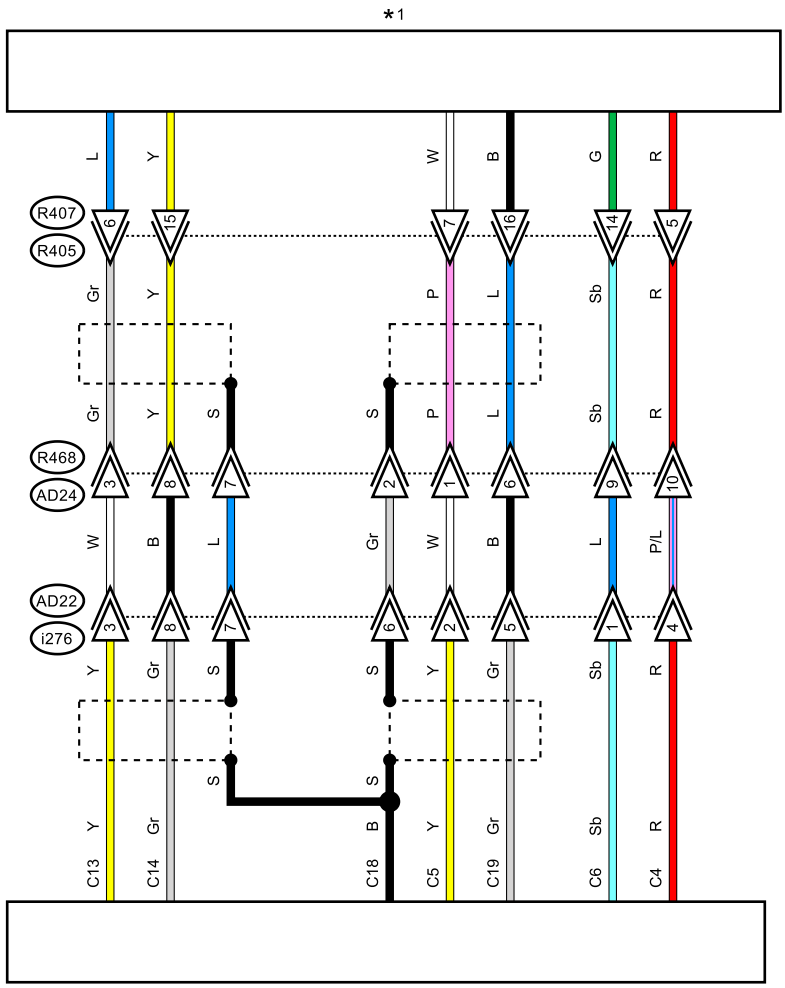

D23
D29
R10
R13
R82
A: R315 (B)

WI-68623


1c
1c
MB-2
M/B FUSE NO. 31
(B)
R/W
B60
i112
R
i283
R465
Be
Be
Be
A1
A16
A: R315 AUDIO AMPLIFIER
A13
A28
A9
A24
A26
A11
A27
A12
R
P
P
V
L
Lg
Sb
Br
15
16
13
14
12
11
10
9
R464
i282
R465
i283
G
Or
R
Y
Gr
V
W
L
6
5
6
5
i101
D84
i76
D83
G
Or
R
Y
G
Br
G
Br
2
1
2
1
2
1
2
1
i158
i159
D2
D12
SIDE TWEETER LH
SIDE TWEETER RH
FRONT DOOR
SPEAKER LH
FRONT DOOR
SPEAKER RH
B60
D2
D12
D83
D84
A: R315 (B)
R465
R464
i158
i159
WI-68624

1d

1d



C: i87 NAVIGATION UNIT

*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICTOPHONE)

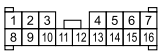
AD22



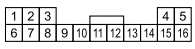
C: i87



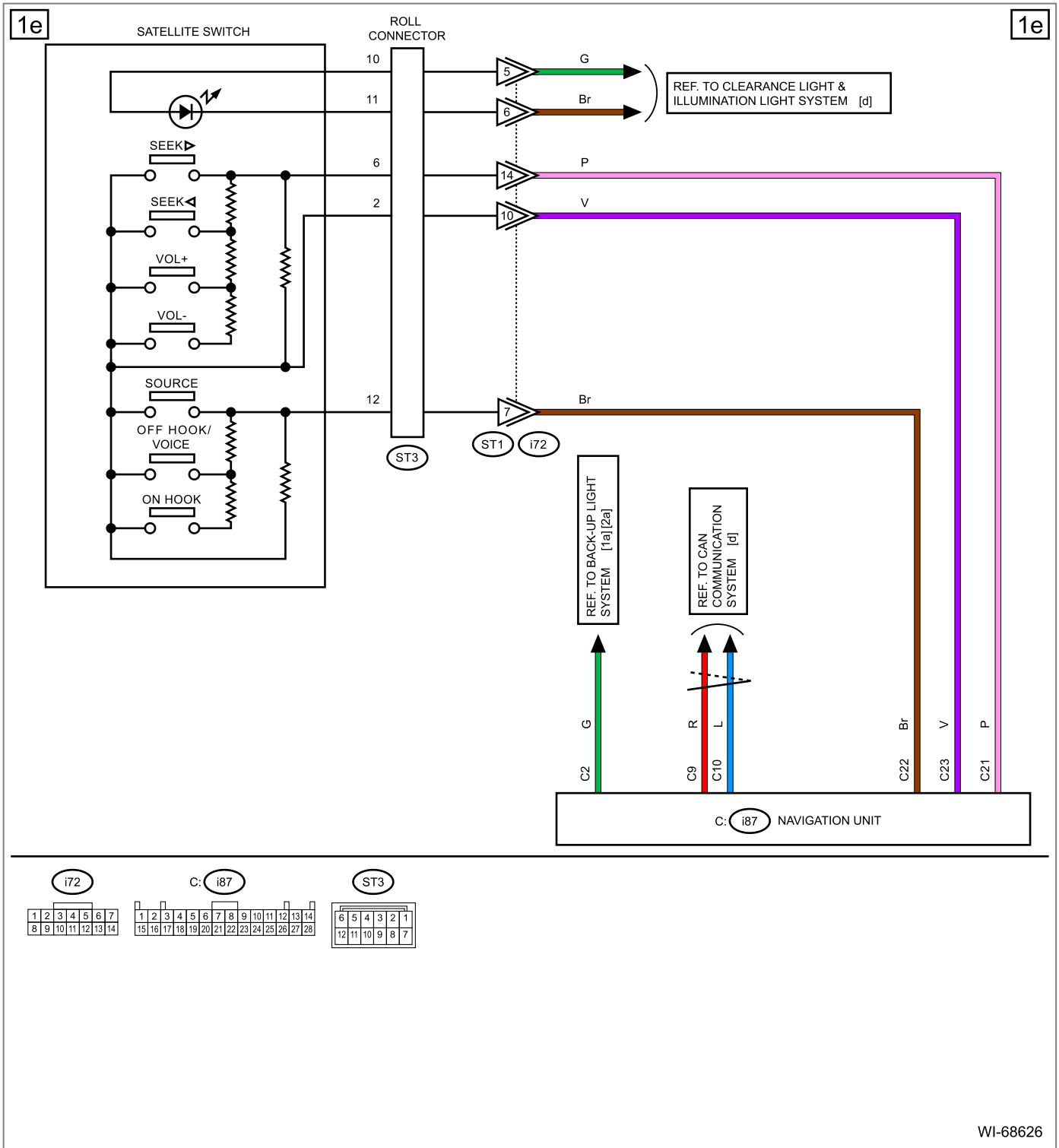
R405



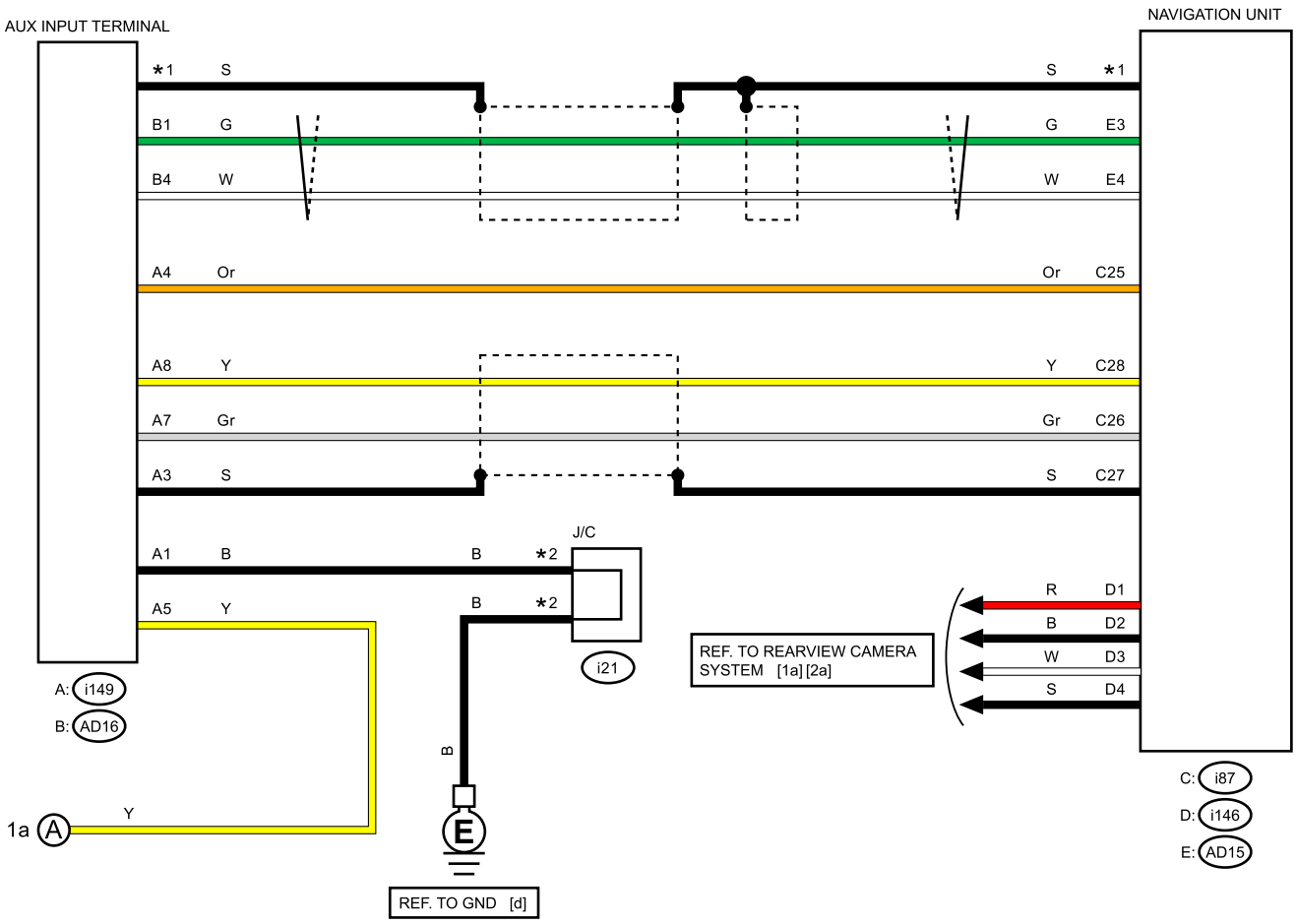
R468



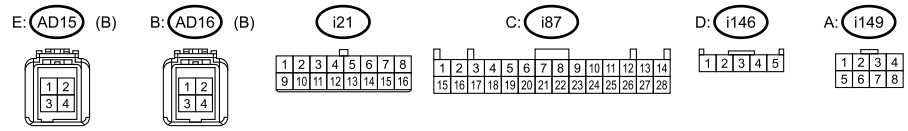
WI-68625


1e
1e
SATELLITE SWITCH
ROLL CONNECTOR
10
11
6
2
12
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/ VOICE
ON HOOK
ST3
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a][2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
C2
C9
C10
C22
C23
C21
G
R
L
Br
V
P
C: i87 NAVIGATION UNIT
i72
C: i87
ST3
WI-68626

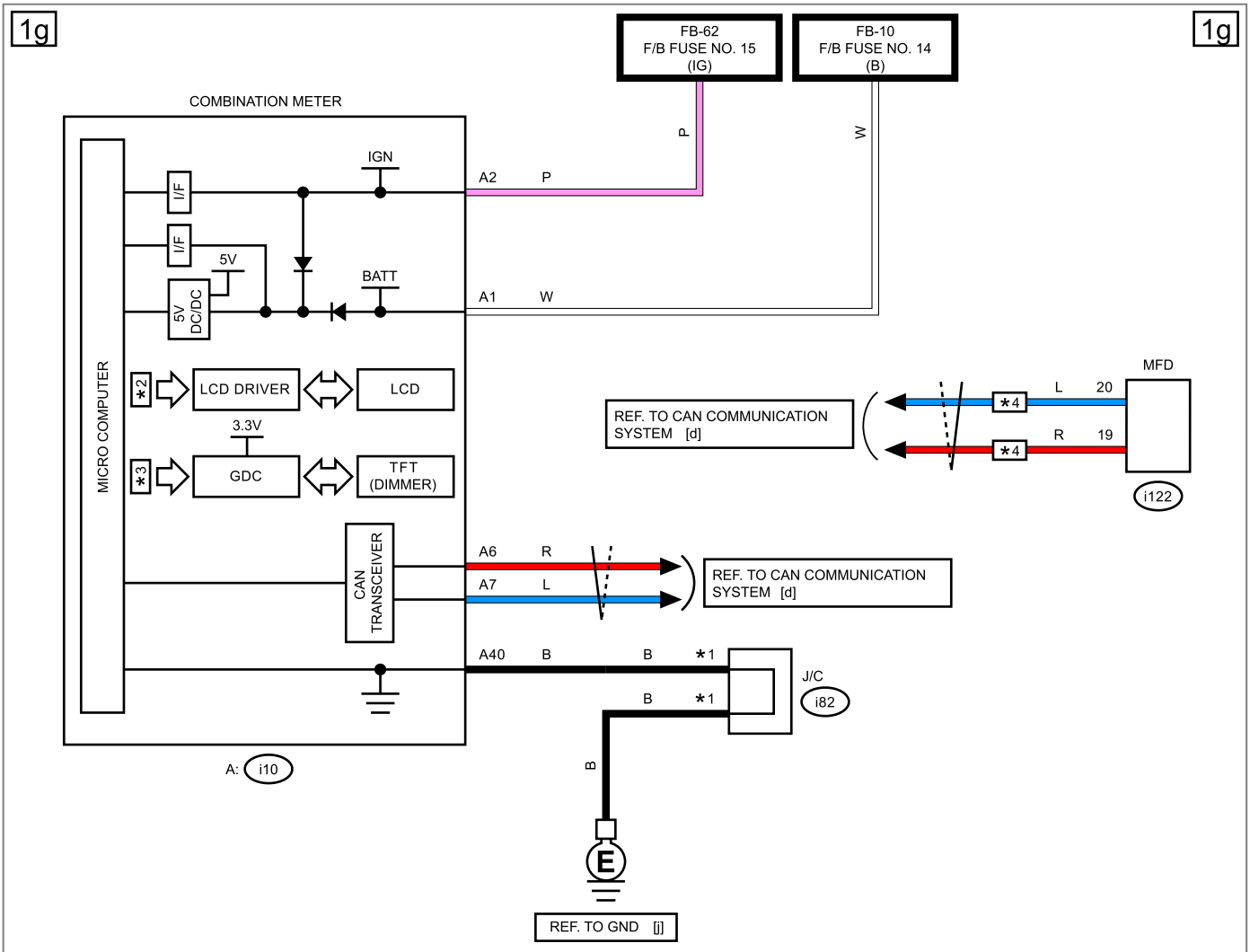
1f



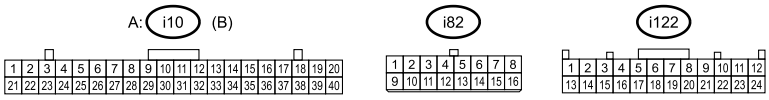
*1 : SHIELD CONNECTOR
*2 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68627

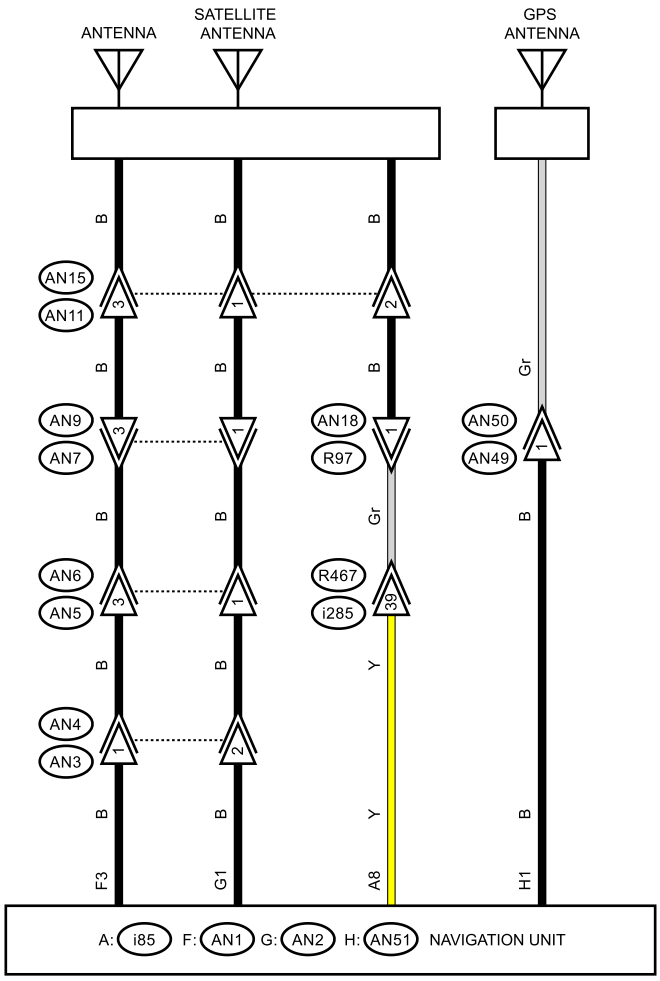


*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : NORMAL METER MODEL
*3 : COLOR TFT METER MODEL
*4 : WITH HIGH GRADE MFD



WI-68628

1h



*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL

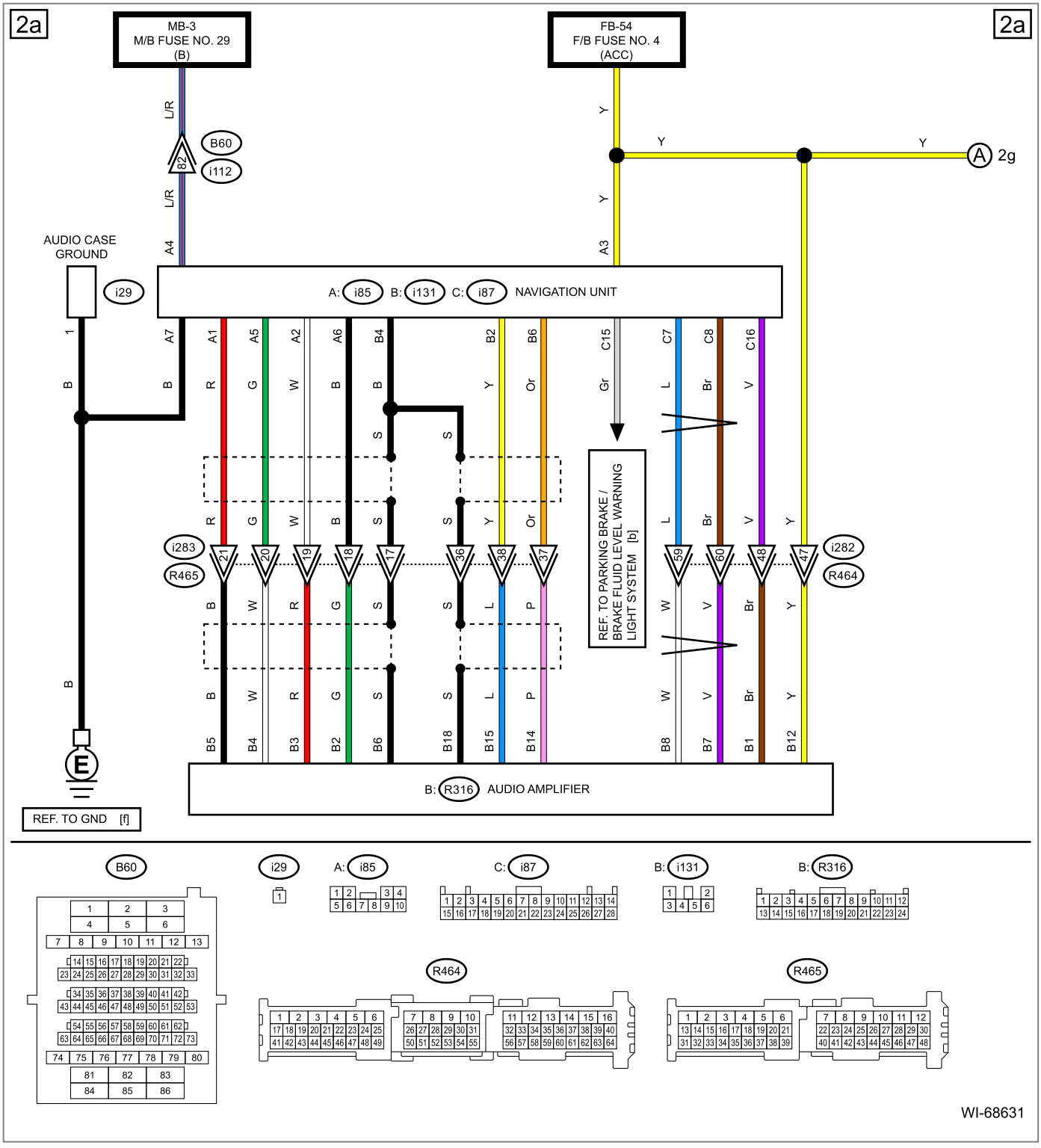
F: AN1
G: AN2 (L)
H: AN51 (Gr)
*1 : AN4
*2 : AN4 (Gr)
AN6
*1 : AN7
*3 : AN15 (P)
*2 : AN7 (Gr)
*4 : AN15
AN50 (G)
A: i85
R97

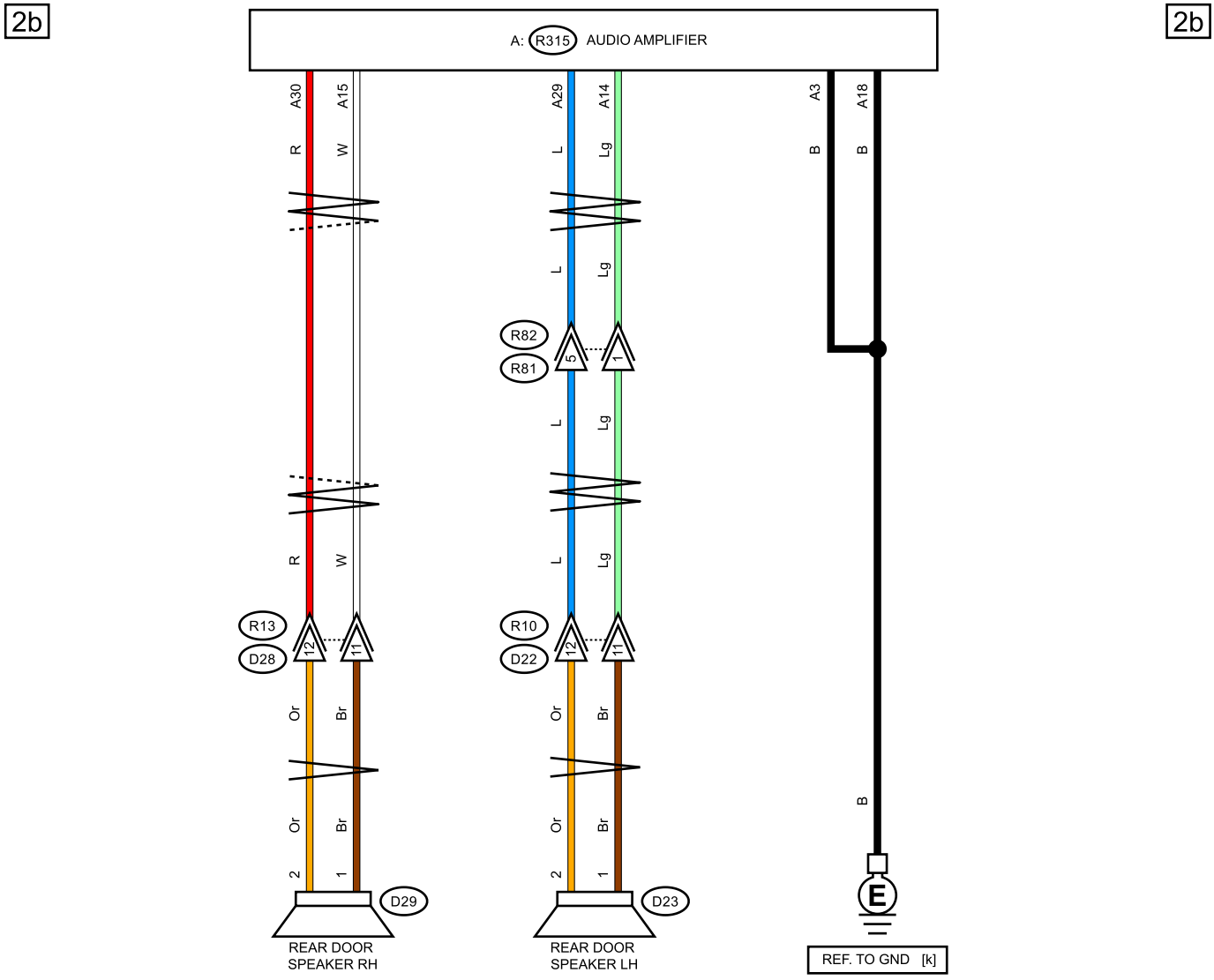


R467

WI-68629

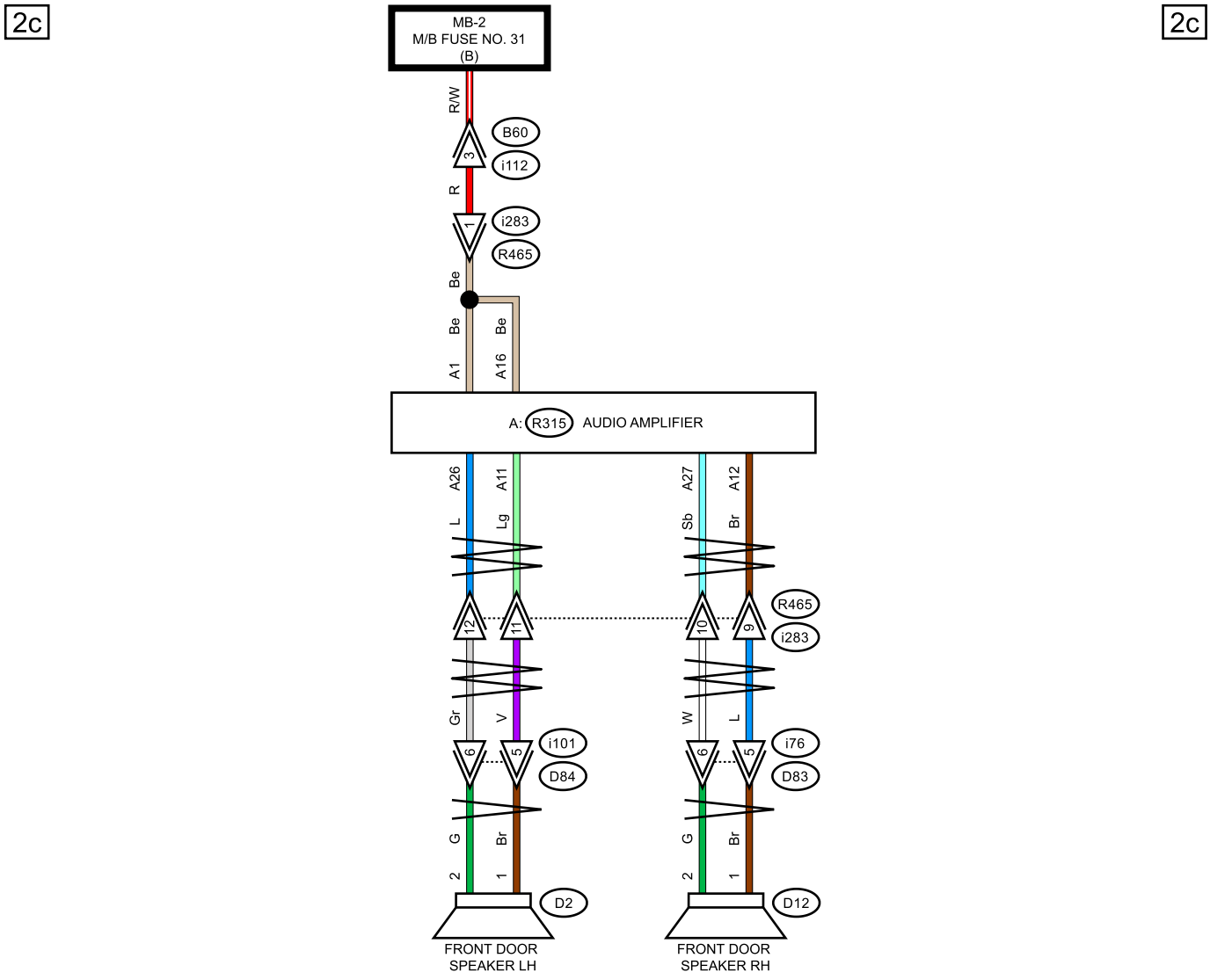
2. WITH TELEMATICS

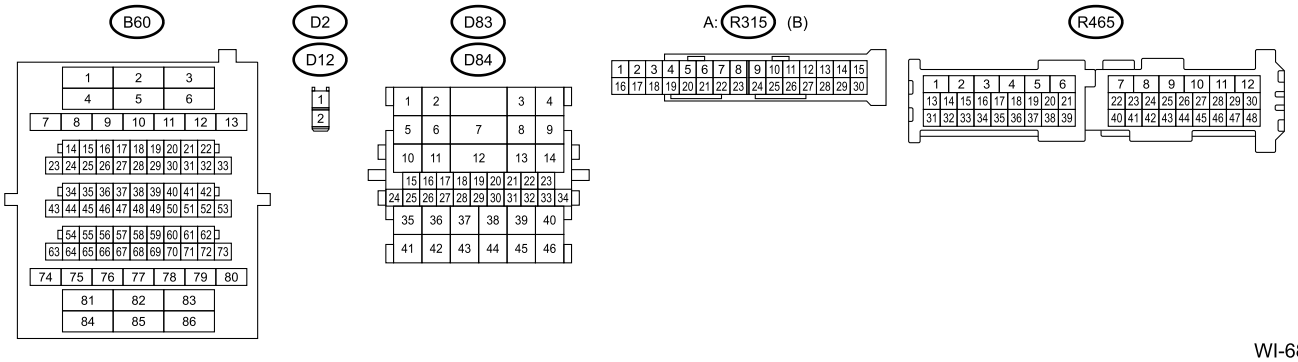



2b
2b
A: R315 AUDIO AMPLIFIER
A30
A15
A29
A14
A3
A18
R
W
L
Lg
B
B
R82
R81
5
1
R13
D28
12
11
R10
D22
Or
Br
2
1
D29
D23
B
E
REAR DOOR SPEAKER RH
REAR DOOR SPEAKER LH
REF. TO GND [k]
D23
D29
R10
R13
R82
A: R315 (B)

WI-68632

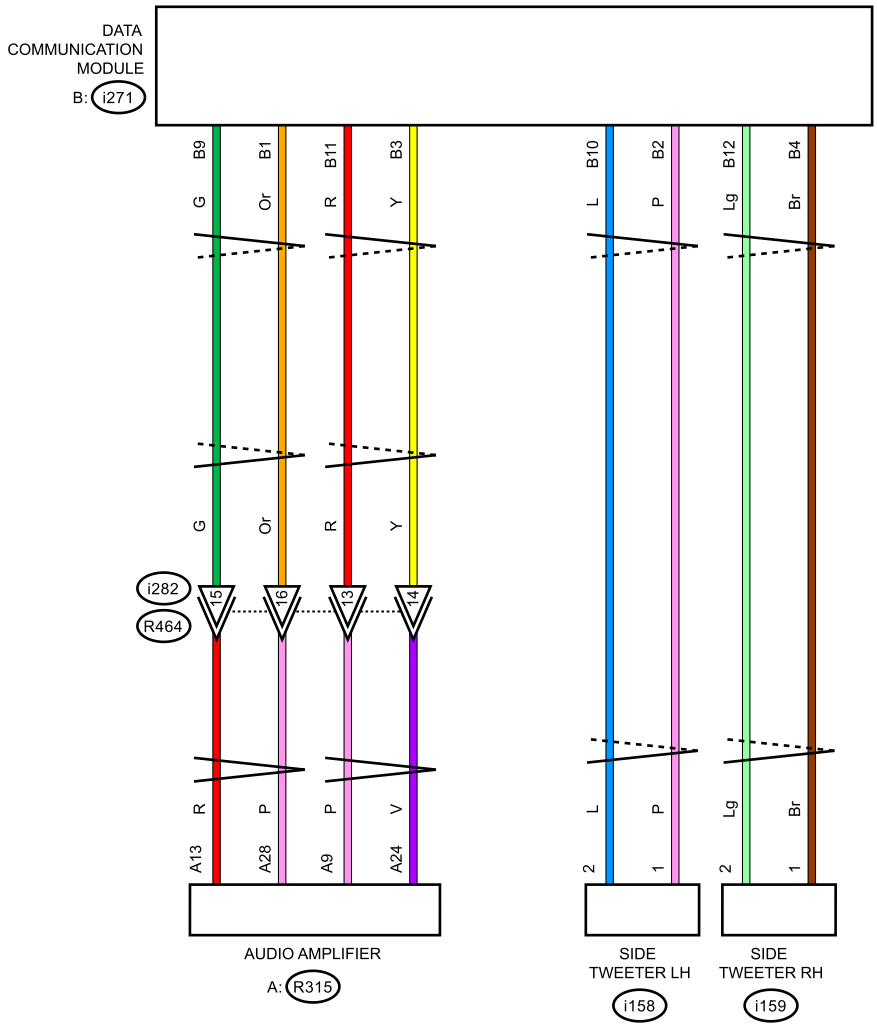
2c

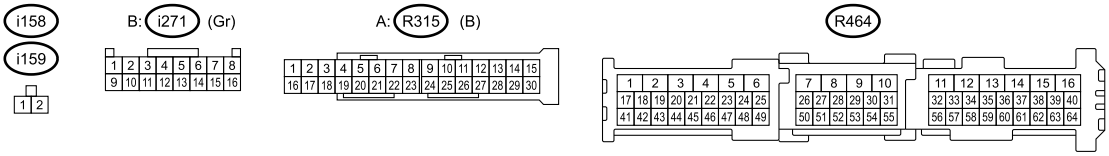

MB-2
M/B FUSE NO. 31
(B)
R/W
B60
i112
R
i283
R465
Be
Be
Be
A1
A16
A: R315 AUDIO AMPLIFIER
A26
A11
A27
A12
L
Lg
Sb
Br
R465
i283
Gr
V
W
L
i101
D84
i76
D83
G
Br
G
Br
D2
D12
FRONT DOOR SPEAKER LH
FRONT DOOR SPEAKER RH


B60
D2
D12
D83
D84
A: R315 (B)
R465

WI-68633

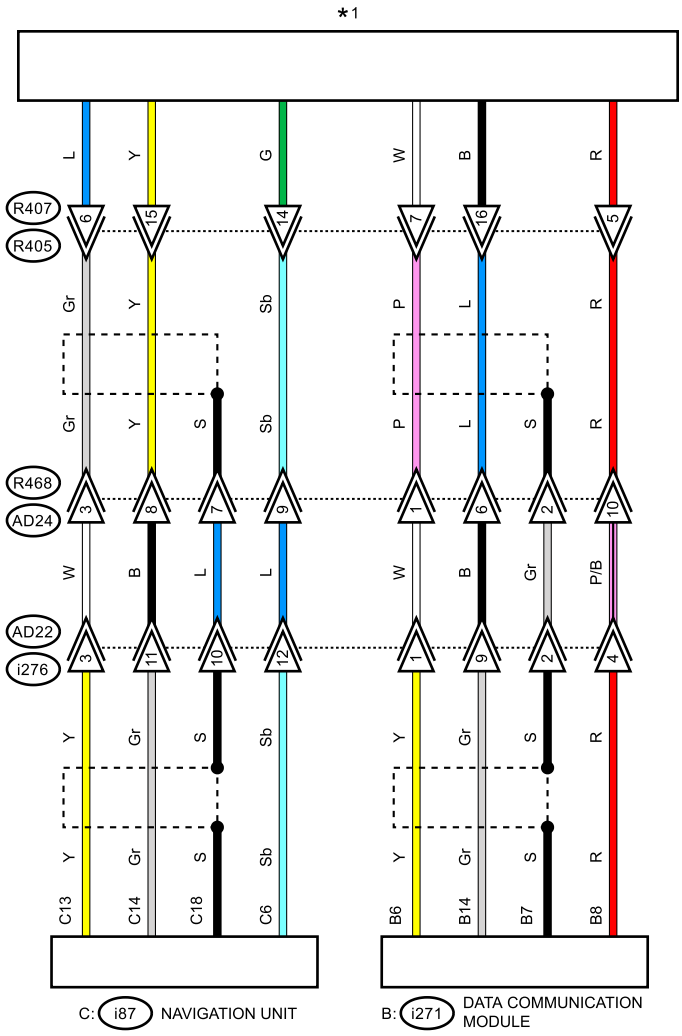
2d


DATA COMMUNICATION MODULE
B: i271
B9
G
B1
Or
B11
R
B3
Y
B10
L
B2
P
B12
Lg
B4
Br
i282
R464
15
16
13
14
A13
R
A28
P
A9
P
A24
V
2
L
1
P
2
Lg
1
Br
AUDIO AMPLIFIER
A: R315
SIDE TWEETER LH
i158
SIDE TWEETER RH
i159

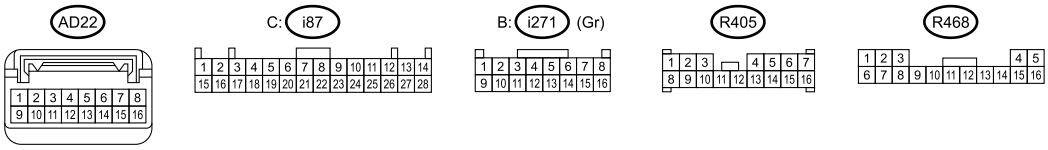

i158
i159
1 2
B: i271 (Gr)
1 2 3 4 5 6 7 8
9 10 11 12 13 14 15 16
A: R315 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
R464
1 2 3 4 5 6
17 18 19 20 21 22 23 24 25
41 42 43 44 45 46 47 48 49
7 8 9 10
26 27 28 29 30 31
50 51 52 53 54 55
11 12 13 14 15 16
32 33 34 35 36 37 38 39 40
56 57 58 59 60 61 62 63 64

WI-68634

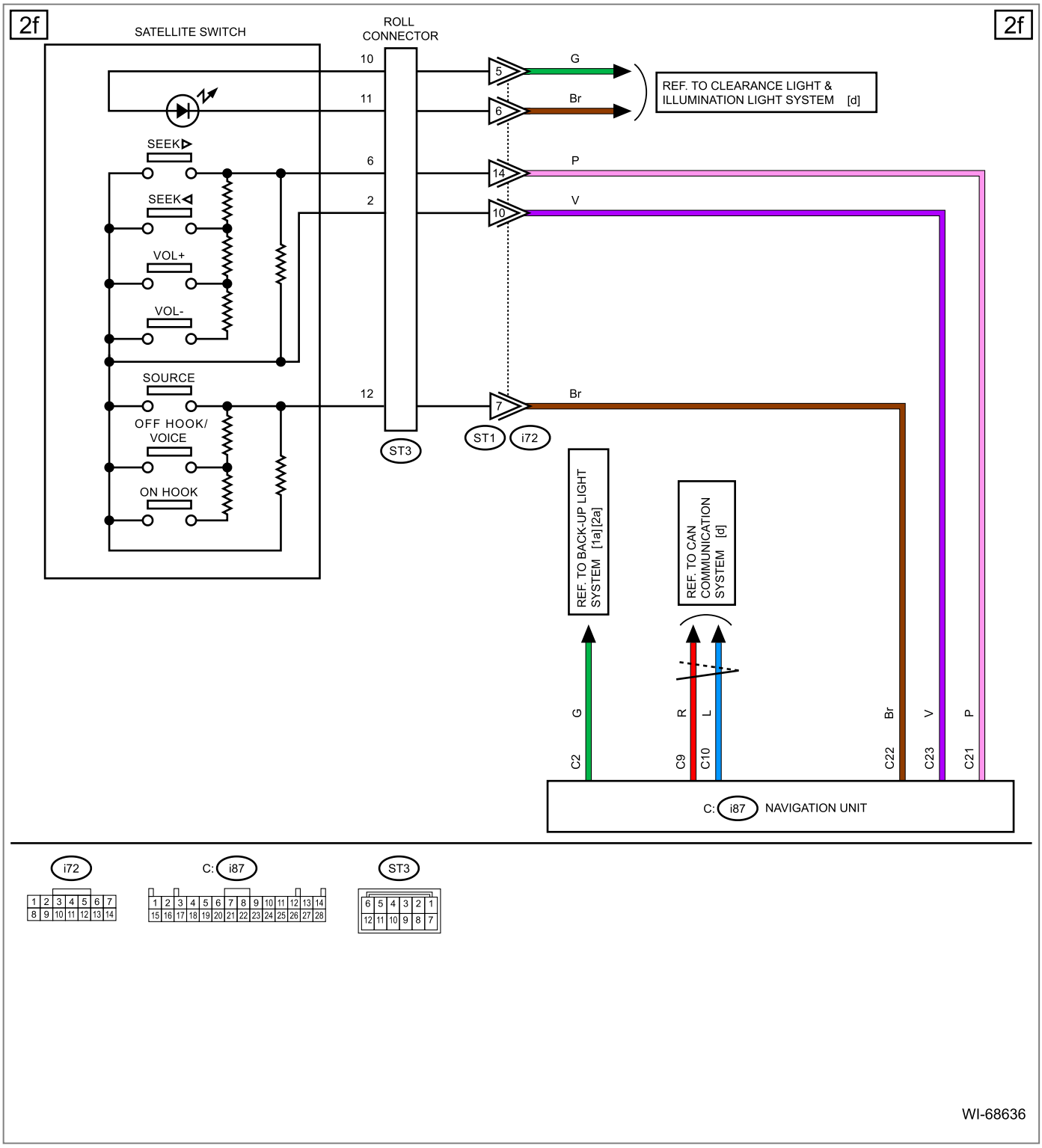
2e



*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICTOPHONE)

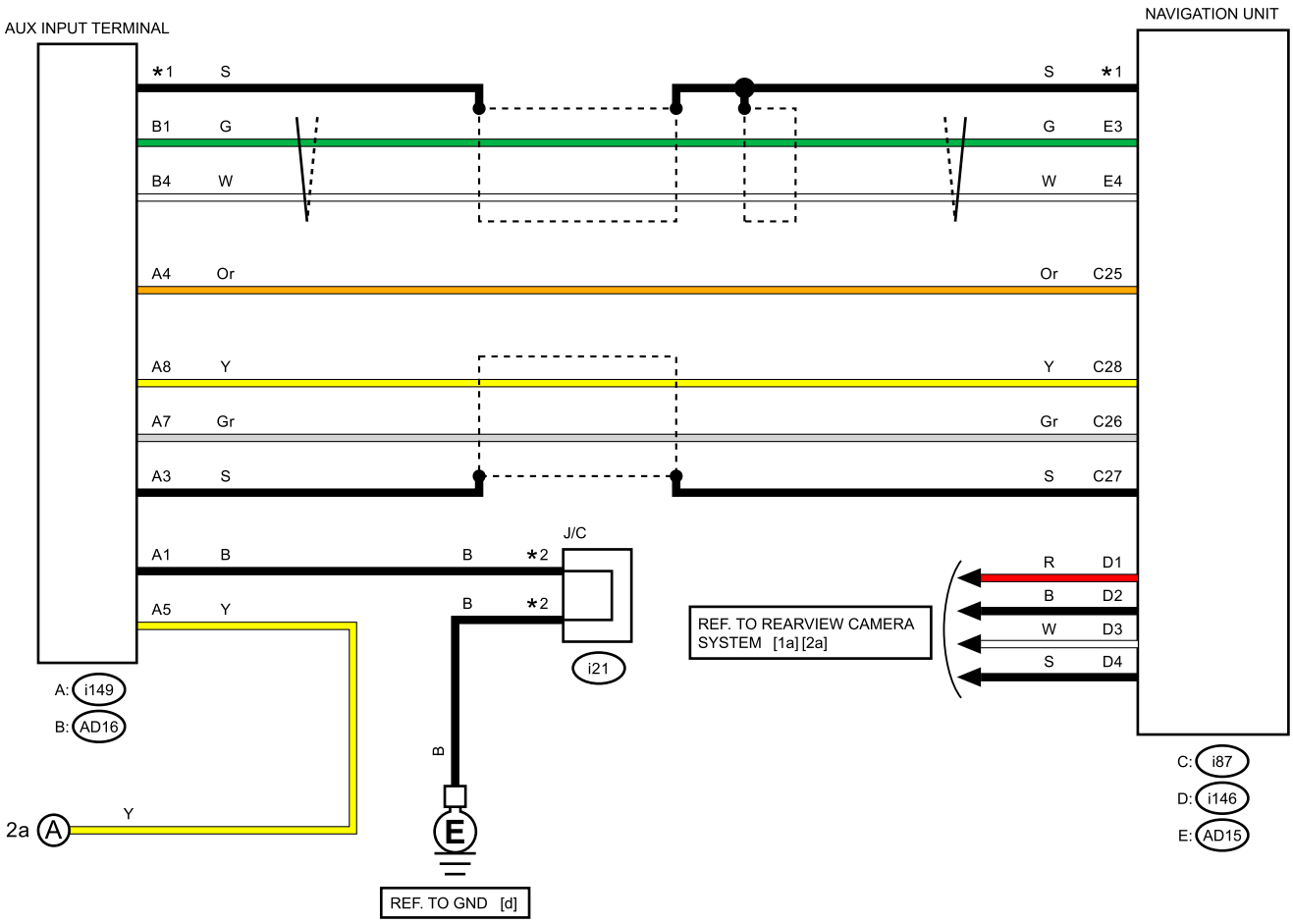


WI-68635

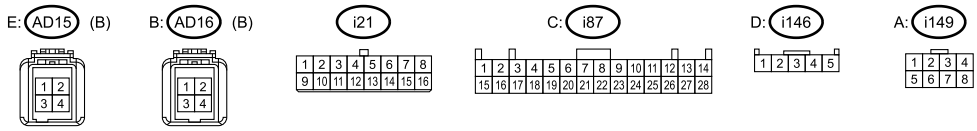

2f
SATELLITE SWITCH
ROLL CONNECTOR
2f
10
11
6
2
12
SEEK
SEEK
VOL+
VOL-
SOURCE
OFF HOOK/ VOICE
ON HOOK
ST3
5
6
14
10
7
G
Br
P
V
Br
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [d]
ST1
i72
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO CAN COMMUNICATION SYSTEM [d]
G
R
L
Br
V
P
C2
C9
C10
C22
C23
C21
C: i87 NAVIGATION UNIT
i72
C: i87
ST3

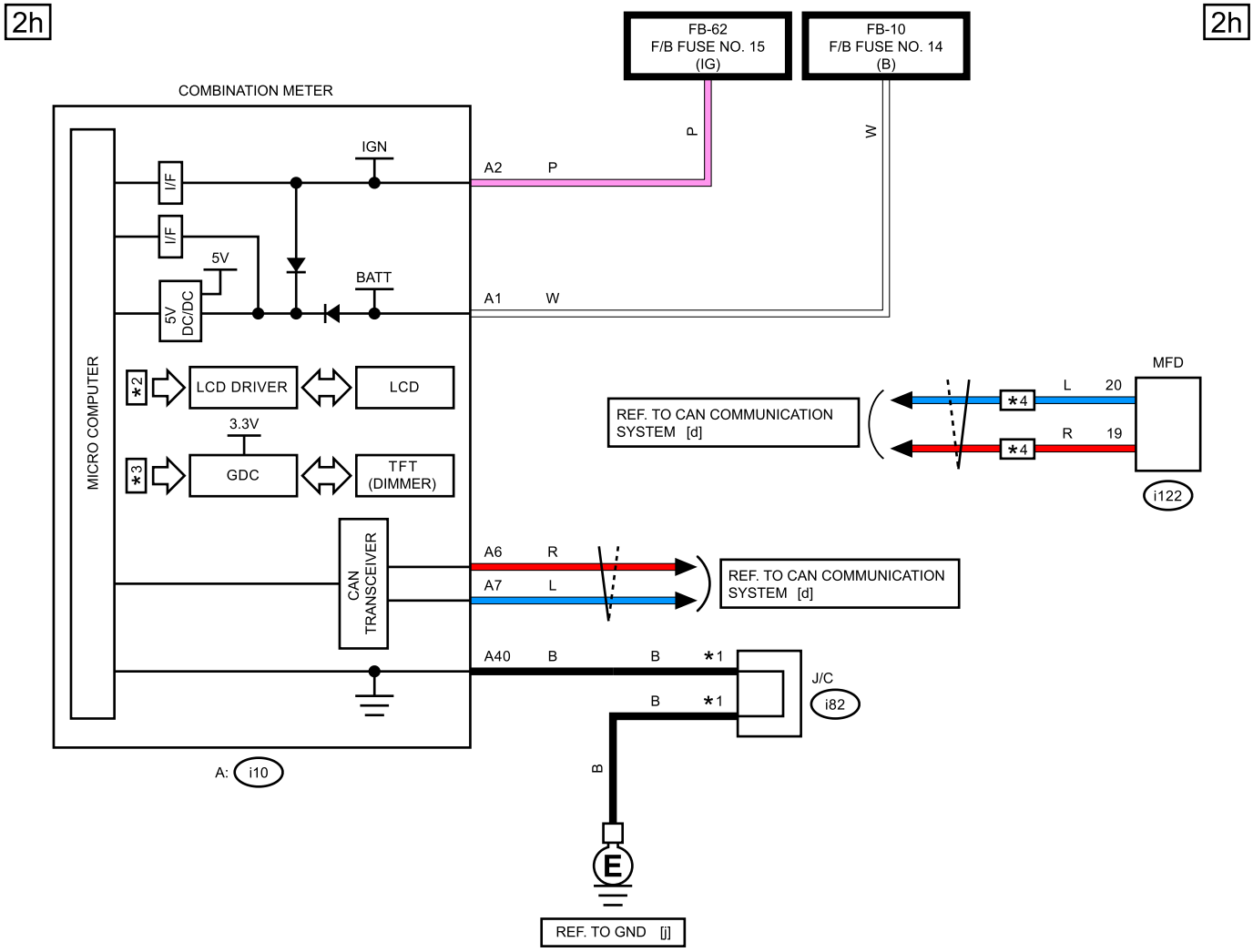
WI-68636

2g

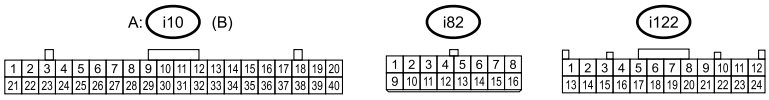


*1 : SHIELD CONNECTOR
*2 : TERMINAL No. OPTIONAL ARRANGEMENT

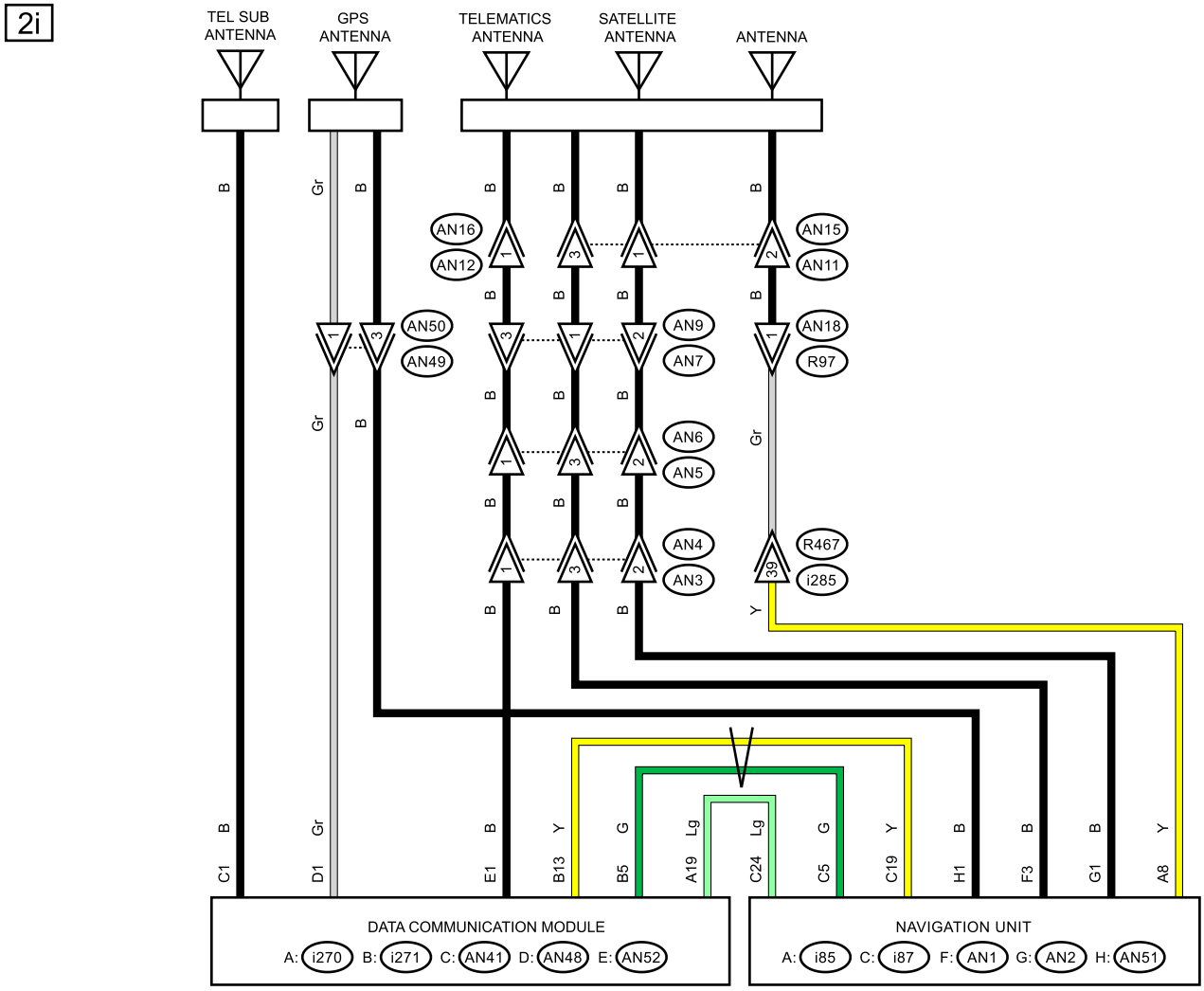




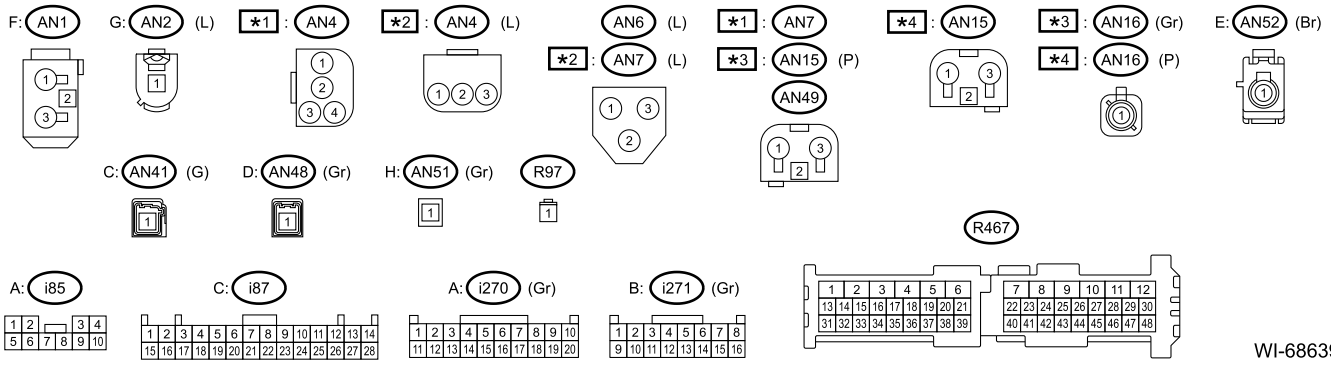
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : NORMAL METER MODEL
*3 : COLOR TFT METER MODEL
*4 : WITH HIGH GRADE MFD



WI-68638

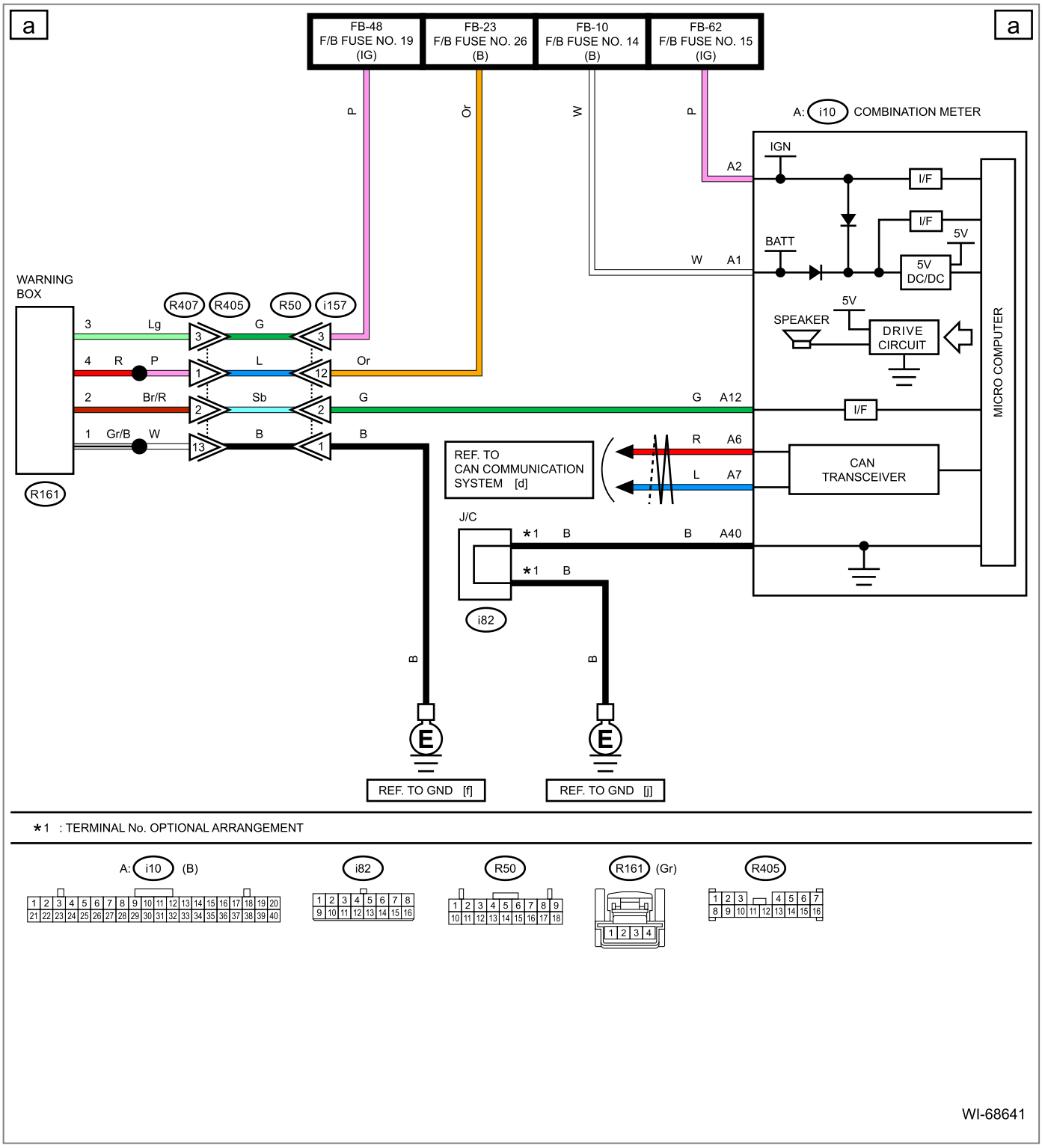


*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL



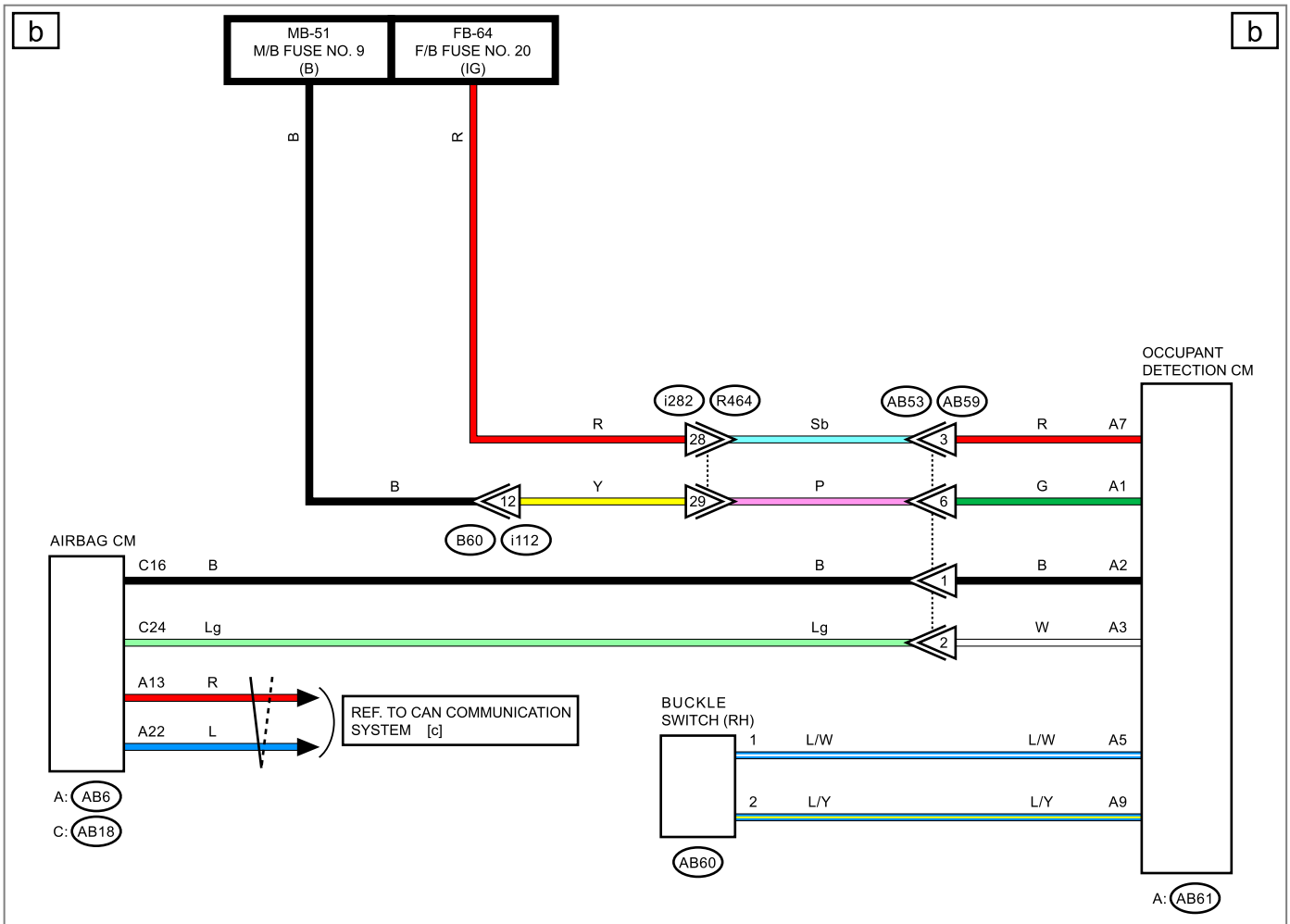
WI-68639

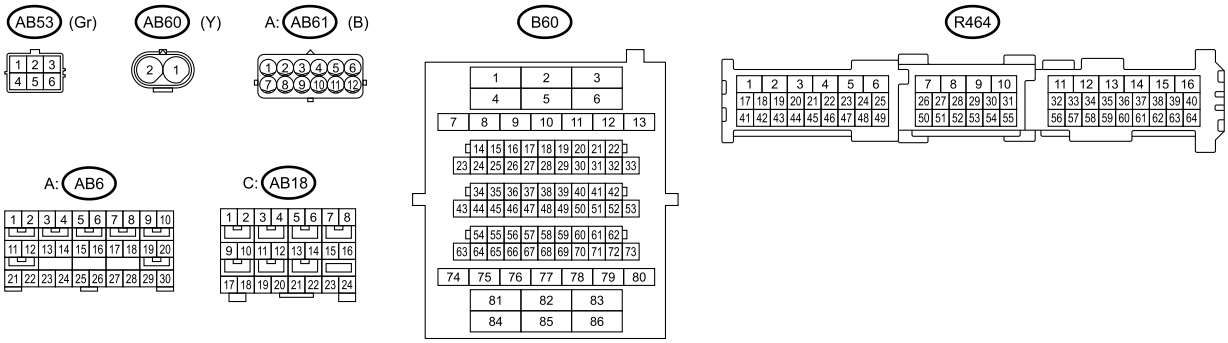
WIRING DIAGRAM



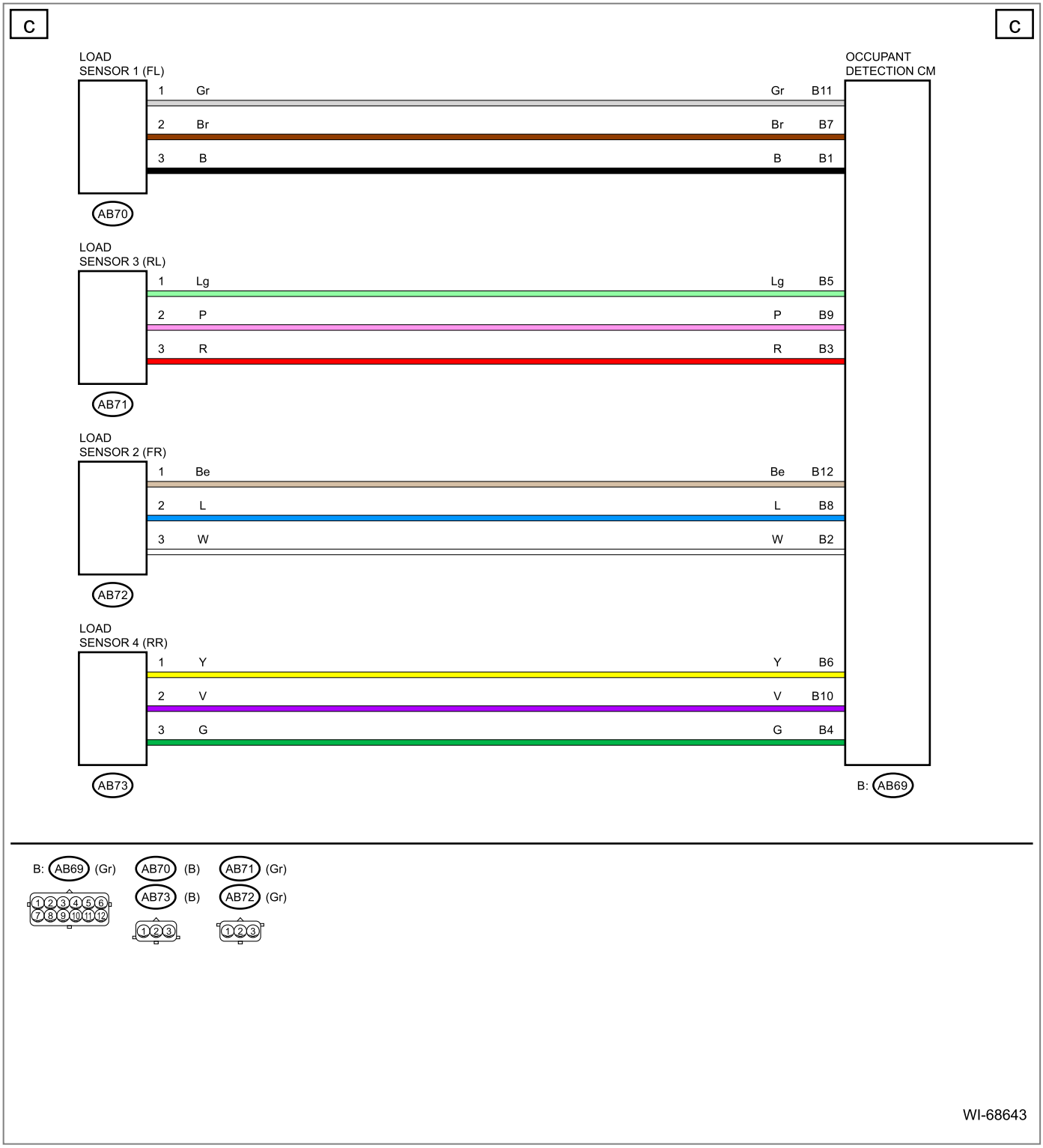
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

WI-68641


b
b
MB-51
M/B FUSE NO. 9
(B)
FB-64
F/B FUSE NO. 20
(IG)
B
R
OCCUPANT
DETECTION CM
i282
R464
AB53
AB59
R
Sb
R
A7
28
3
B
Y
P
G
A1
12
29
6
B60
i112
AIRBAG CM
C16
B
B
B
A2
1
C24
Lg
Lg
W
A3
2
A13
R
A22
L
REF. TO CAN COMMUNICATION
SYSTEM [c]
BUCKLE
SWITCH (RH)
1
L/W
L/W
A5
2
L/Y
L/Y
A9
A: AB6
C: AB18
AB60
A: AB61


AB53 (Gr)
AB60 (Y)
A: AB61 (B)
B60
R464
A: AB6
C: AB18

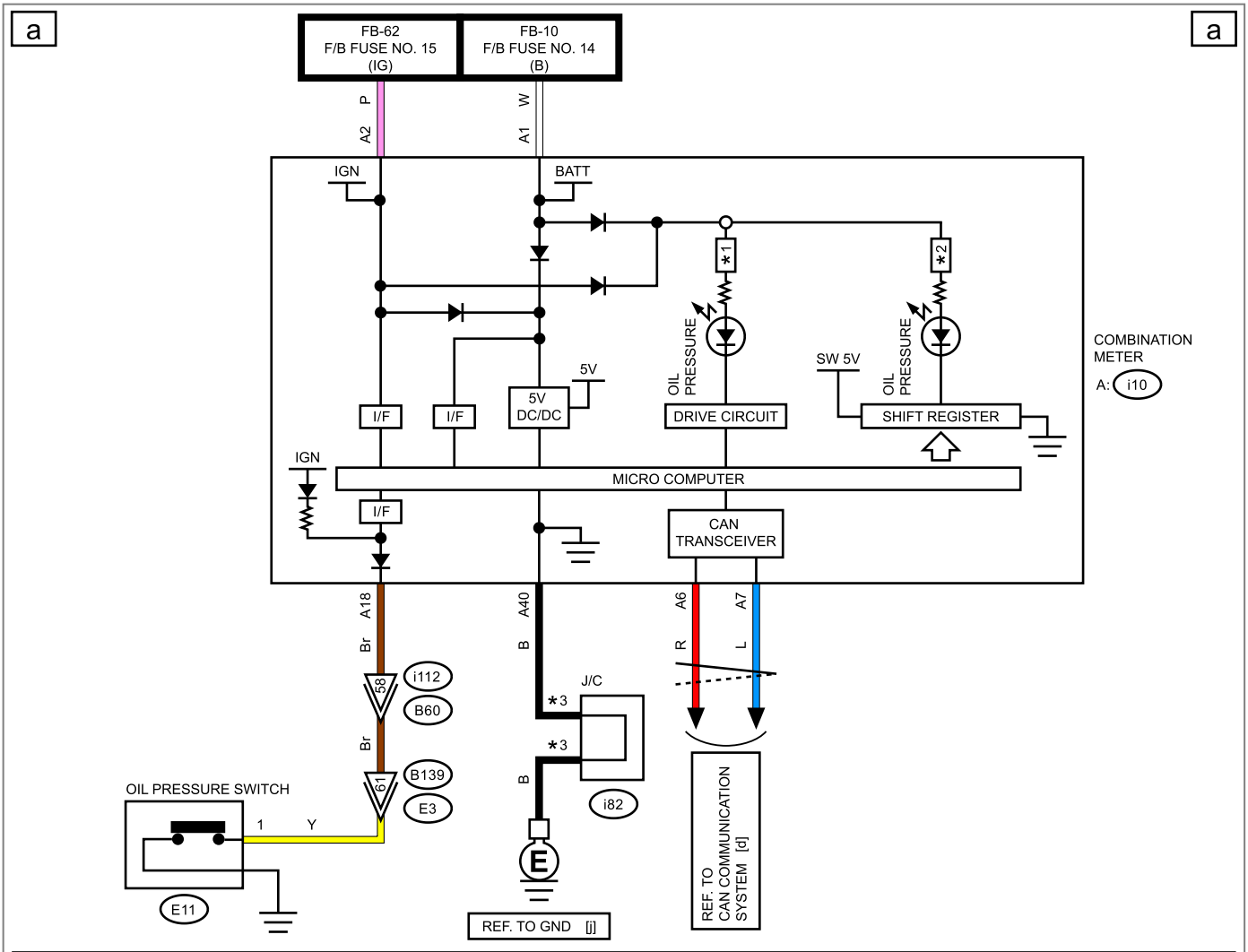
WI-68642


C
C
LOAD
SENSOR 1 (FL)
1 Gr
2 Br
3 B
AB70
LOAD
SENSOR 3 (RL)
1 Lg
2 P
3 R
AB71
LOAD
SENSOR 2 (FR)
1 Be
2 L
3 W
AB72
LOAD
SENSOR 4 (RR)
1 Y
2 V
3 G
AB73
OCCUPANT
DETECTION CM
Gr B11
Br B7
B B1
Lg B5
P B9
R B3
Be B12
L B8
W B2
Y B6
V B10
G B4
B: AB69

B: AB69 (Gr)
AB70 (B)
AB71 (Gr)
AB73 (B)
AB72 (Gr)

WI-68643

WIRING DIAGRAM



*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL

*3 : TERMINAL No. OPTIONAL ARRANGEMENT

B60

		1	2	3						
		4	5	6						
7	8	9	10	11	12	13				
14	15	16	17	18	19	20	21	22		
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42		
43	44	45	46	47	48	49	50	51	52	53
54	55	56	57	58	59	60	61	62		
63	64	65	66	67	68	69	70	71	72	73
74	75	76	77	78	79	80				
		81	82	83						
		84	85	86						

E3

1	2	3	4				
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36	37	38
39	40	41	42	43	44	45	46	47		
48	49	50	51	52	53	54	55	56	57	58
59	60	61	62	63	64	65				
66	67	68	69	70	71	72				
73	74	75	76							

E11

1

A: i10 (B)

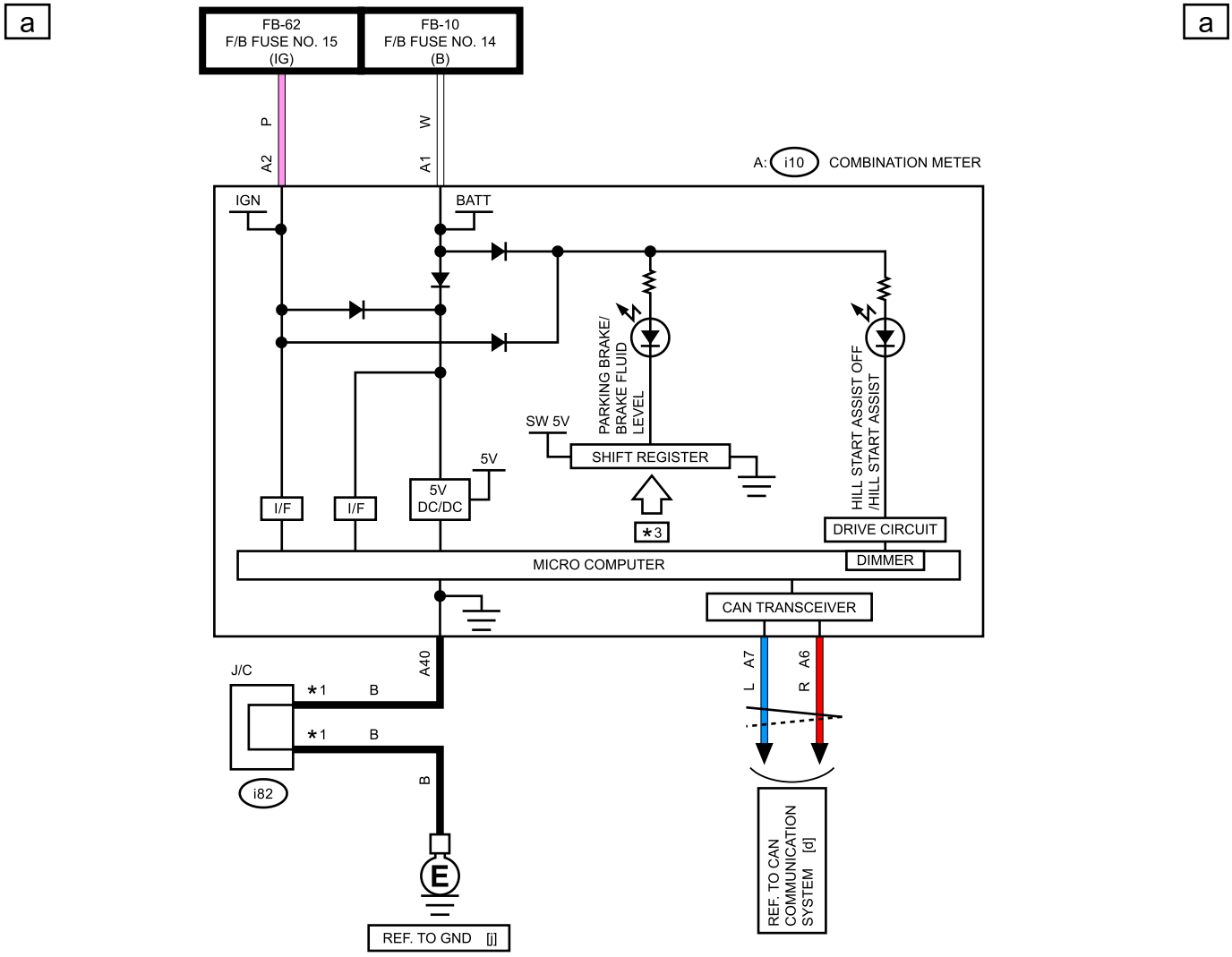
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

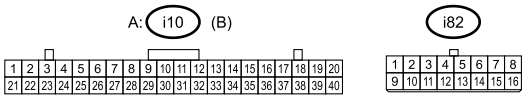
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

WI-68644

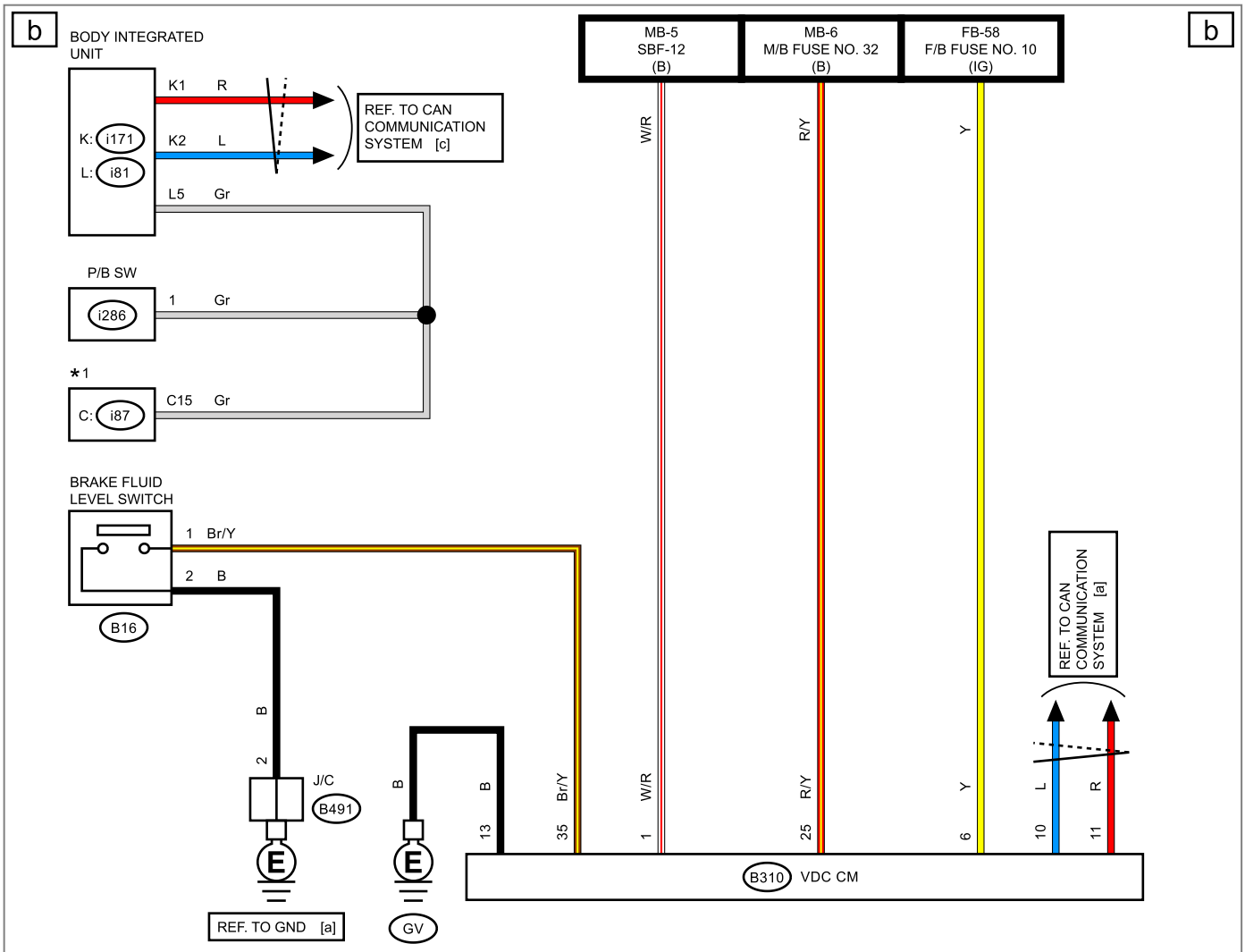
WIRING DIAGRAM



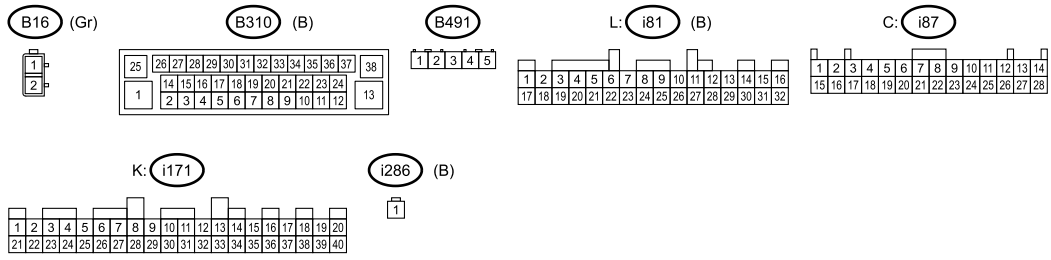
*1 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68645

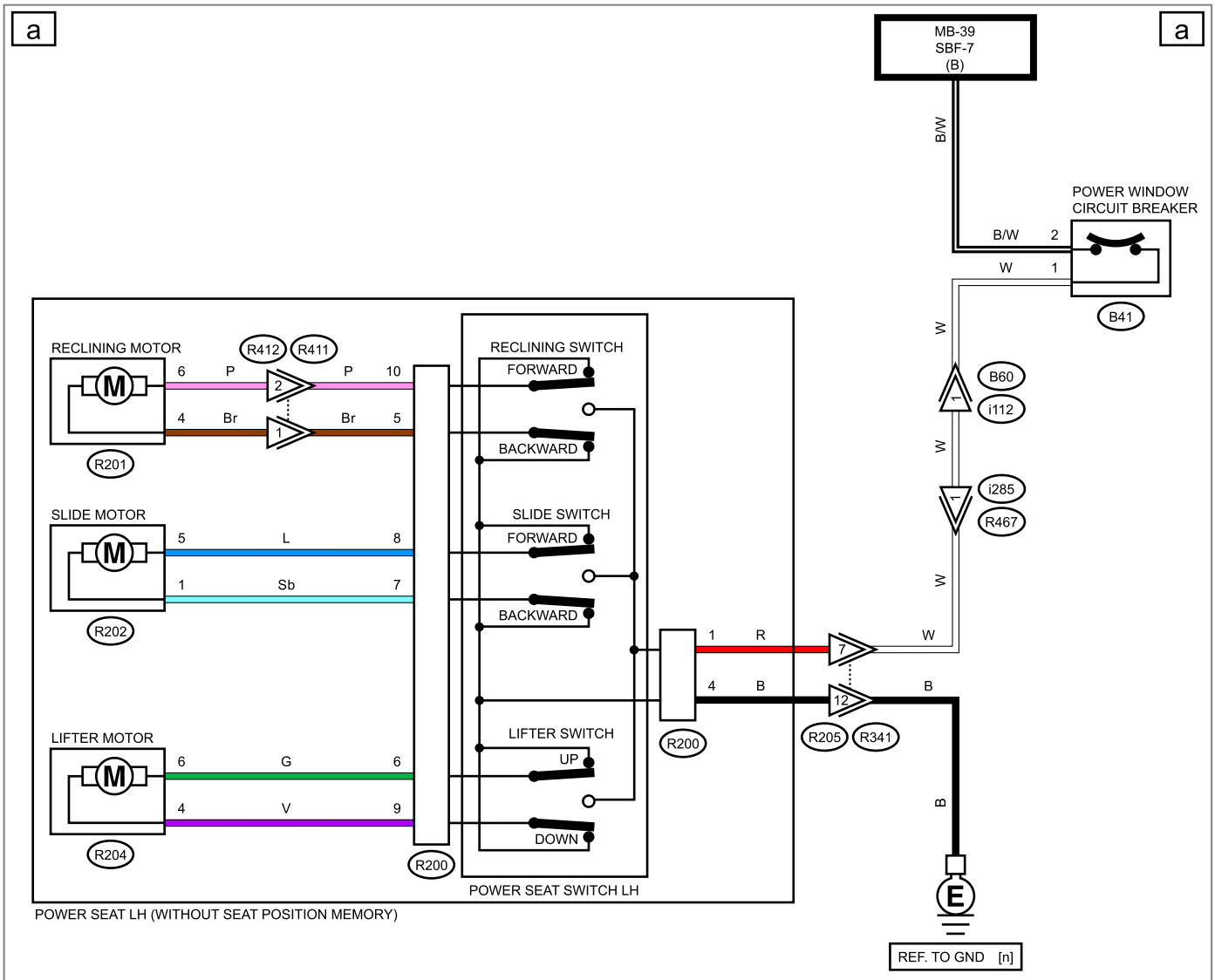


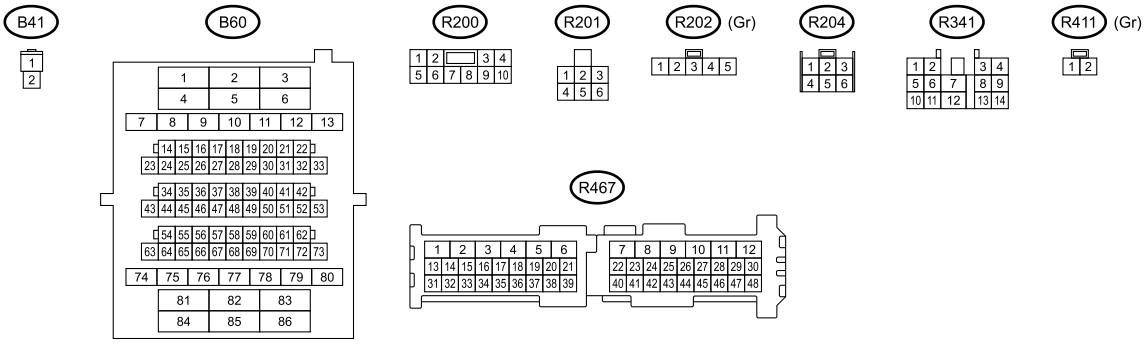
*1 : WITHOUT NAVIGATION : AUDIO
WITH NAVIGATION : NAVIGATION UNIT



WI-68646

WIRING DIAGRAM

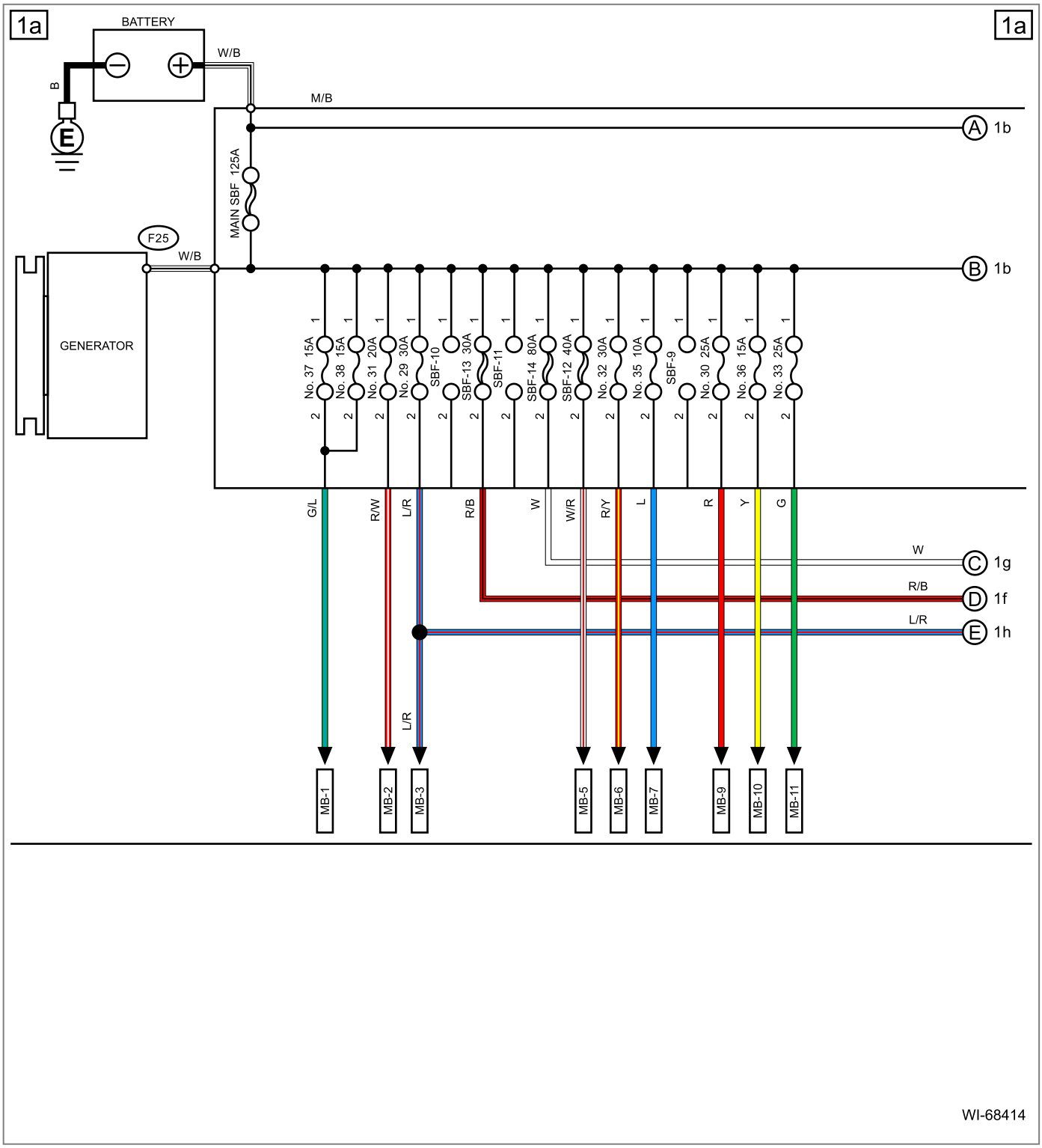

a
a
MB-39
SBF-7
(B)
B/W
POWER WINDOW
CIRCUIT BREAKER
B/W 2
W 1
B41
W
B60
i112
W
i285
R467
W
W
B
B
E
REF. TO GND [n]
RECLINING MOTOR
R412
R411
6 P P 10
4 Br Br 5
R201
SLIDE MOTOR
5 L 8
1 Sb 7
R202
LIFTER MOTOR
6 G 6
4 V 9
R204
RECLINING SWITCH
FORWARD
BACKWARD
SLIDE SWITCH
FORWARD
BACKWARD
LIFTER SWITCH
UP
DOWN
R200
R200
1 R
4 B
7
12
R205
R341
POWER SEAT SWITCH LH
POWER SEAT LH (WITHOUT SEAT POSITION MEMORY)

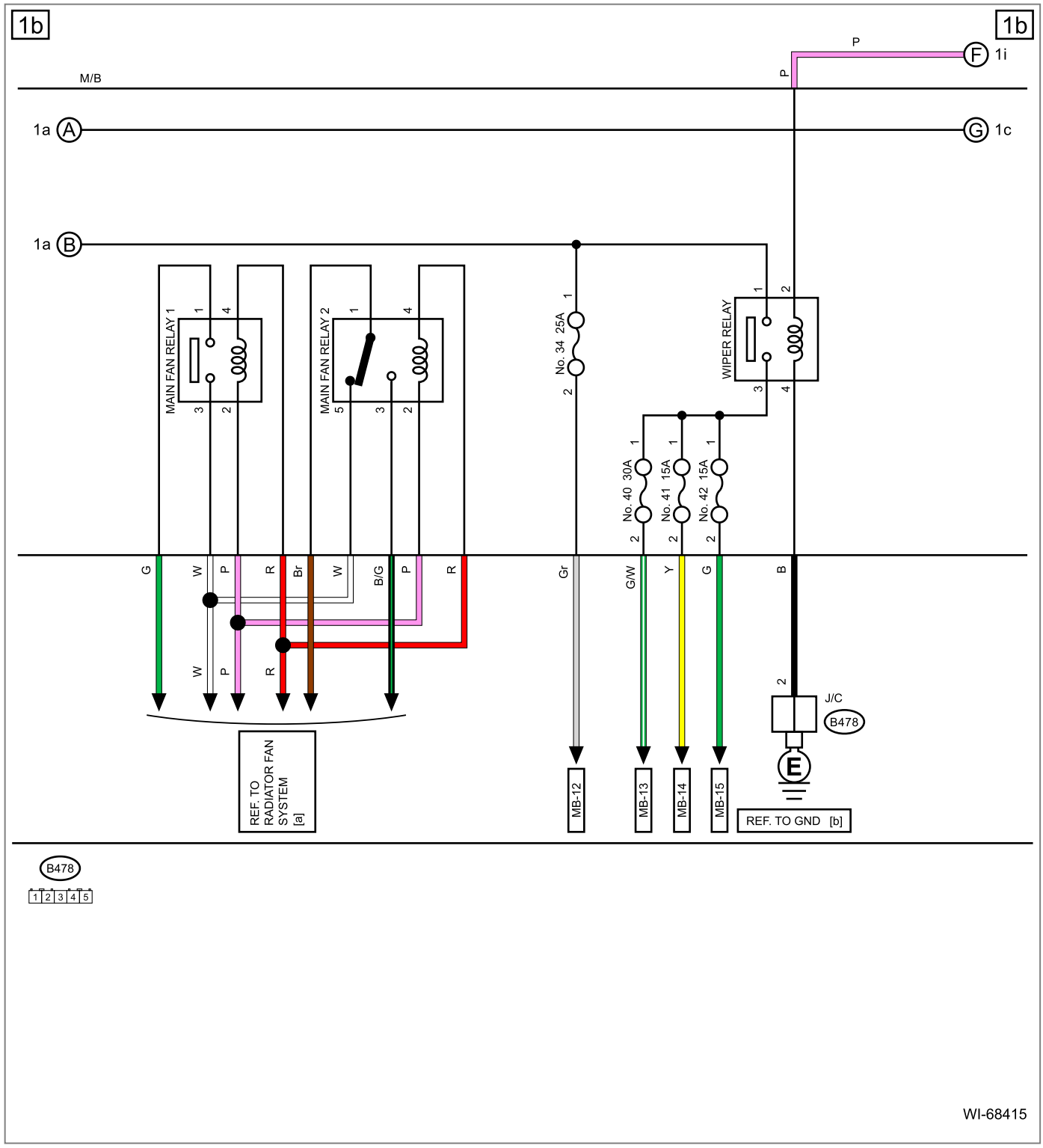

B41
B60
R200
R201
R202 (Gr)
R204
R341
R411 (Gr)
R467

WI-68647

WIRING DIAGRAM

1. WITHOUT PUSH BUTTON START

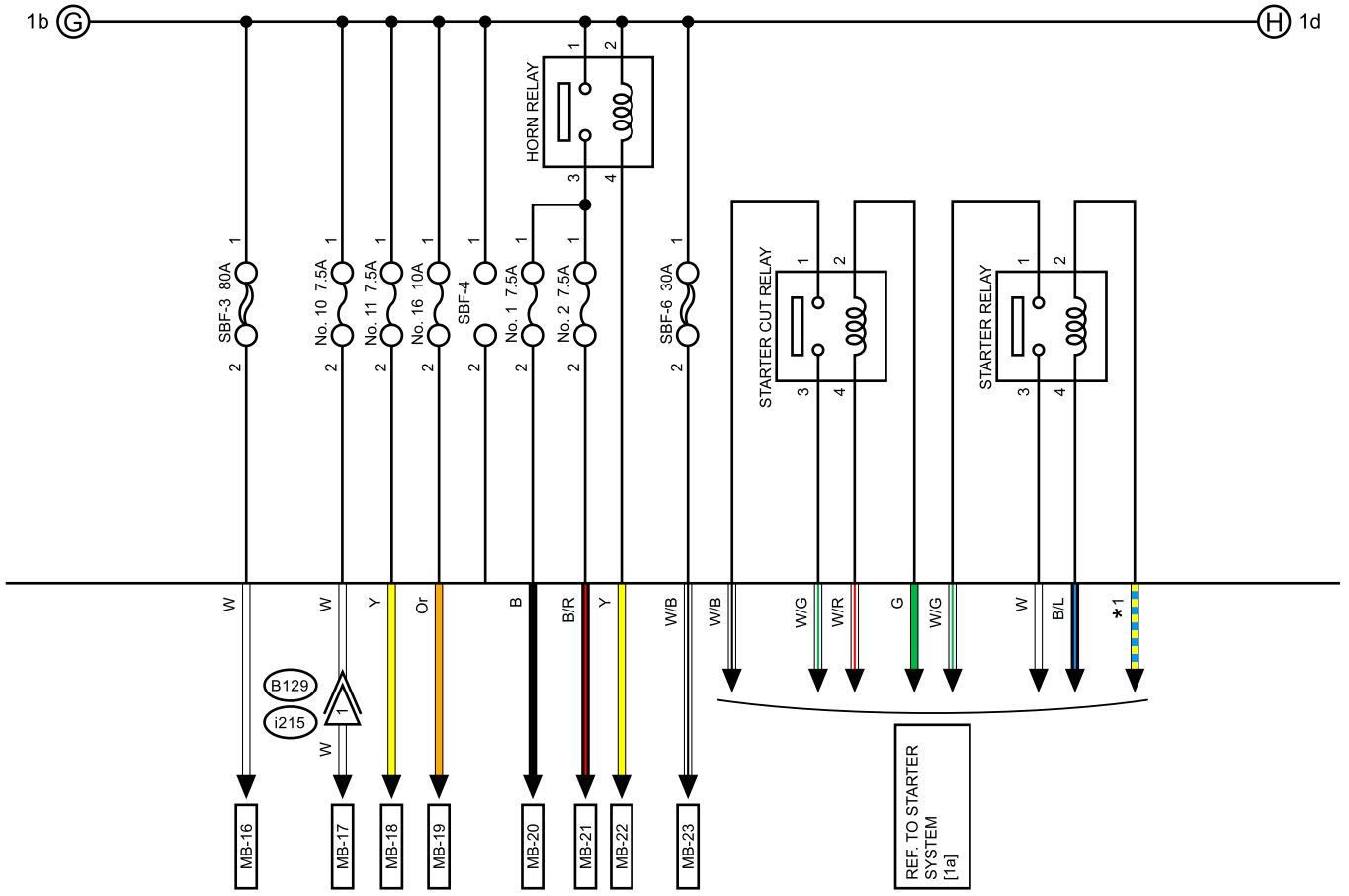



1b
1b
M/B
P
P
F 1i
1a A
G 1c
1a B
MAIN FAN RELAY 1
MAIN FAN RELAY 2
No. 34 25A
WIPER RELAY
No. 40 30A
No. 41 15A
No. 42 15A
G
W
P
R
Br
W
B/G
P
R
Gr
G/W
Y
G
B
W
P
R
J/C
B478
E
REF. TO RADIATOR FAN SYSTEM [a]
MB-12
MB-13
MB-14
MB-15
REF. TO GND [b]
B478
1 2 3 4 5
WI-68415

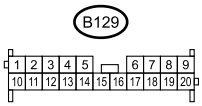
1c

1c

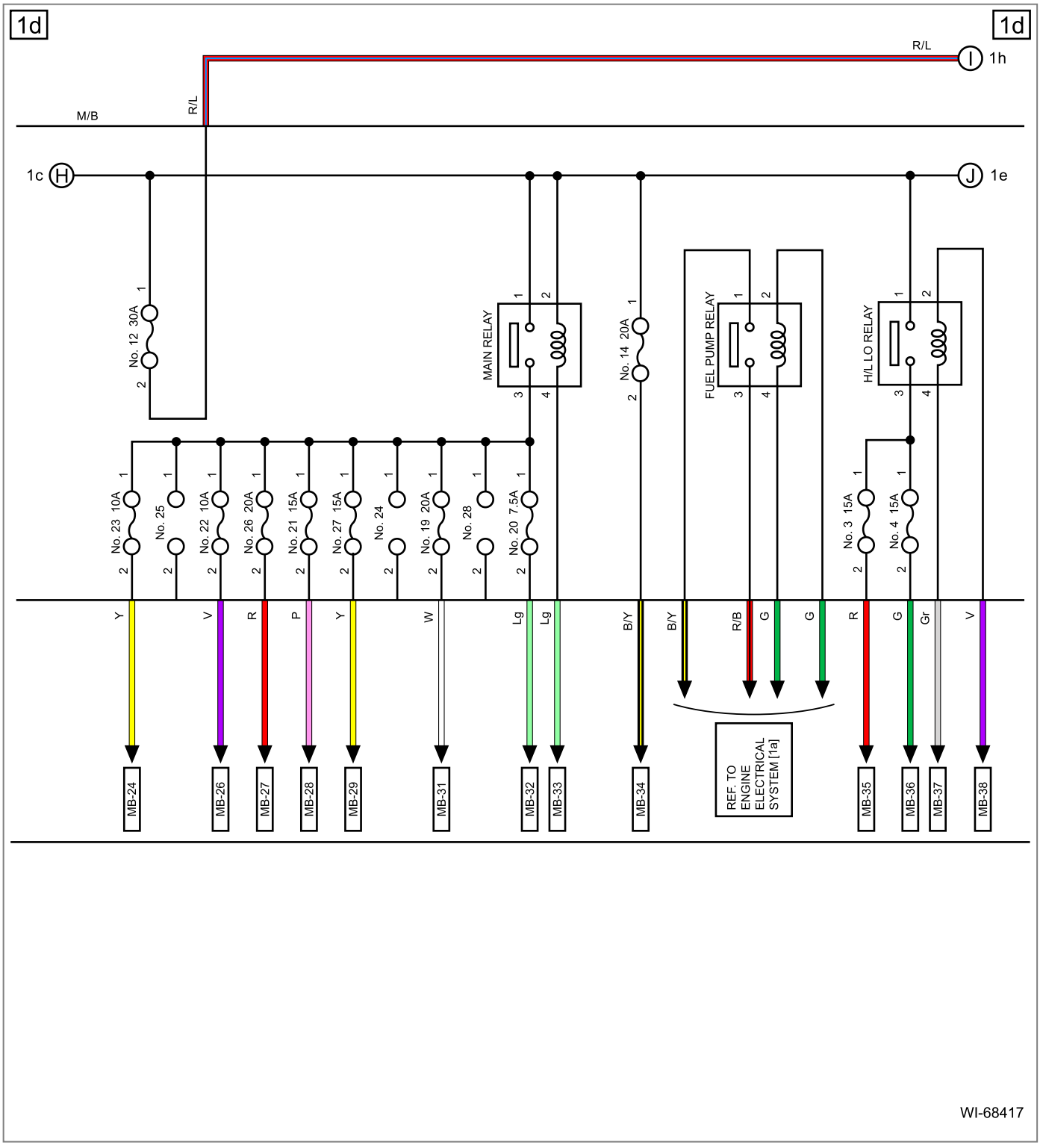
M/B

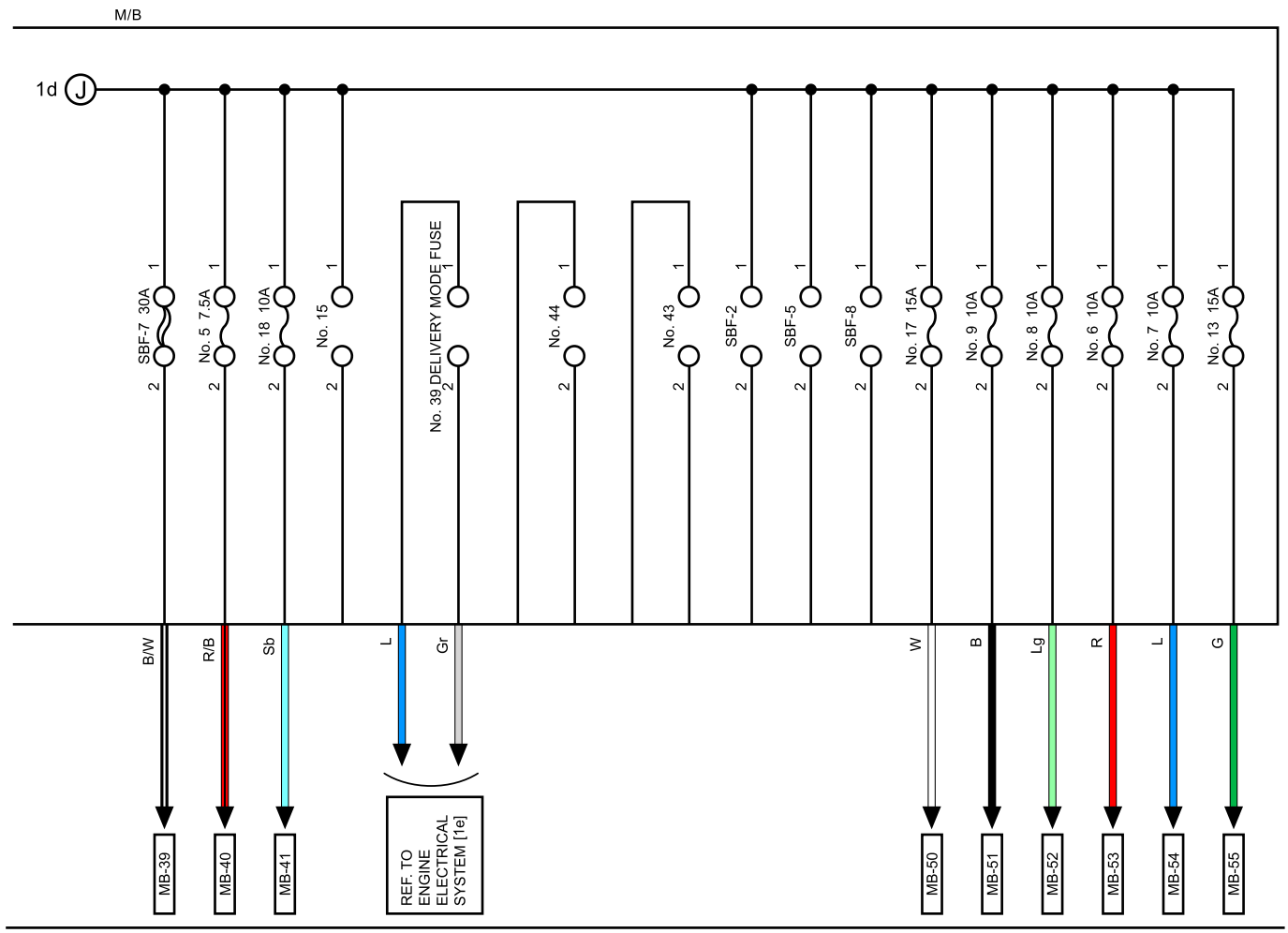


*1 : MT MODEL : Lg
CVT MODEL : W

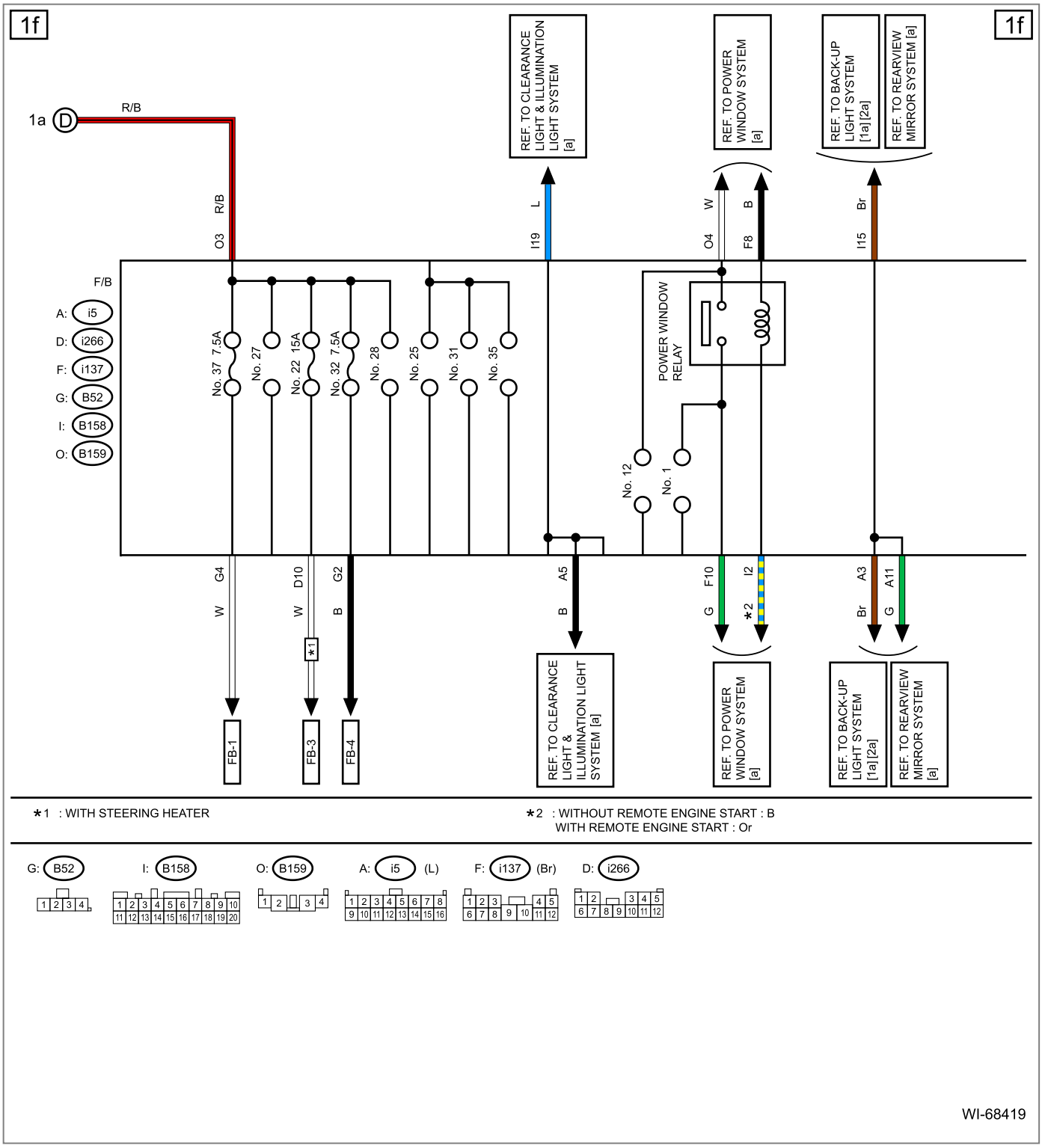


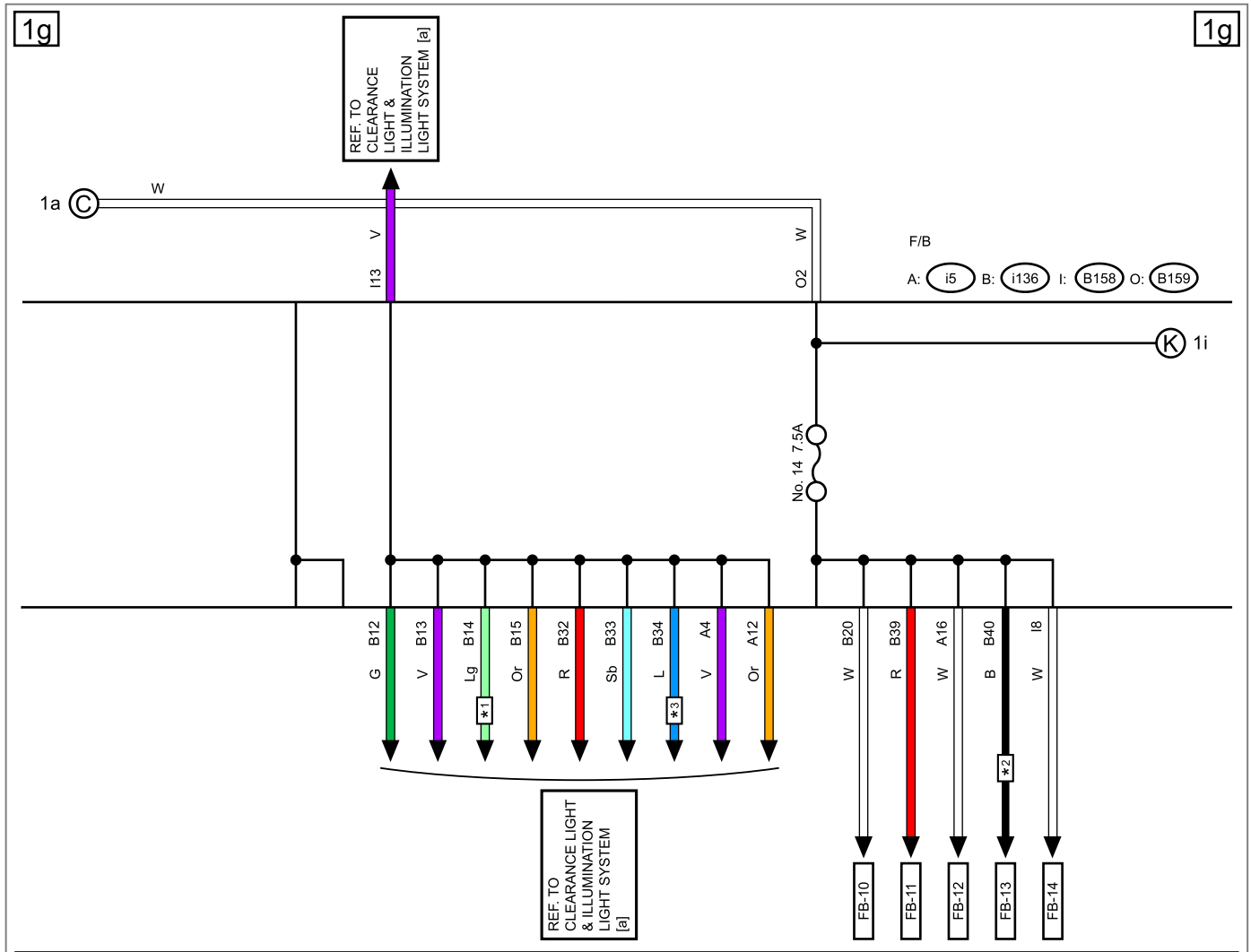
WI-68416


1d
1d
R/L
1h
M/B
R/L
1c
H
J
1e
No. 12 30A
MAIN RELAY
No. 14 20A
FUEL PUMP RELAY
H/L LO RELAY
No. 23 10A
No. 25
No. 22 10A
No. 26 20A
No. 21 15A
No. 27 15A
No. 24
No. 19 20A
No. 28
No. 20 7.5A
No. 3 15A
No. 4 15A
Y
V
R
P
Y
W
Lg
Lg
B/Y
B/Y
R/B
G
G
R
G
Gr
V
MB-24
MB-26
MB-27
MB-28
MB-29
MB-31
MB-32
MB-33
MB-34
REF. TO ENGINE ELECTRICAL SYSTEM [1a]
MB-35
MB-36
MB-37
MB-38
WI-68417

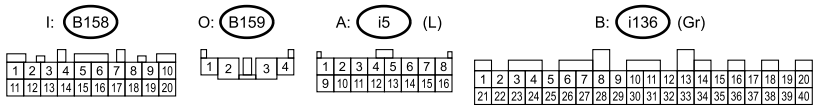

M/B
1d
J
SBF-7 30A
No. 5 7.5A
No. 18 10A
No. 15
No. 39 DELIVERY MODE FUSE
No. 44
No. 43
SBF-2
SBF-5
SBF-8
No. 17 15A
No. 9 10A
No. 8 10A
No. 6 10A
No. 7 10A
No. 13 15A
B/W
R/B
Sb
L
Gr
W
B
Lg
R
L
G
MB-39
MB-40
MB-41
REF. TO ENGINE ELECTRICAL SYSTEM [1e]
MB-50
MB-51
MB-52
MB-53
MB-54
MB-55

WI-68418

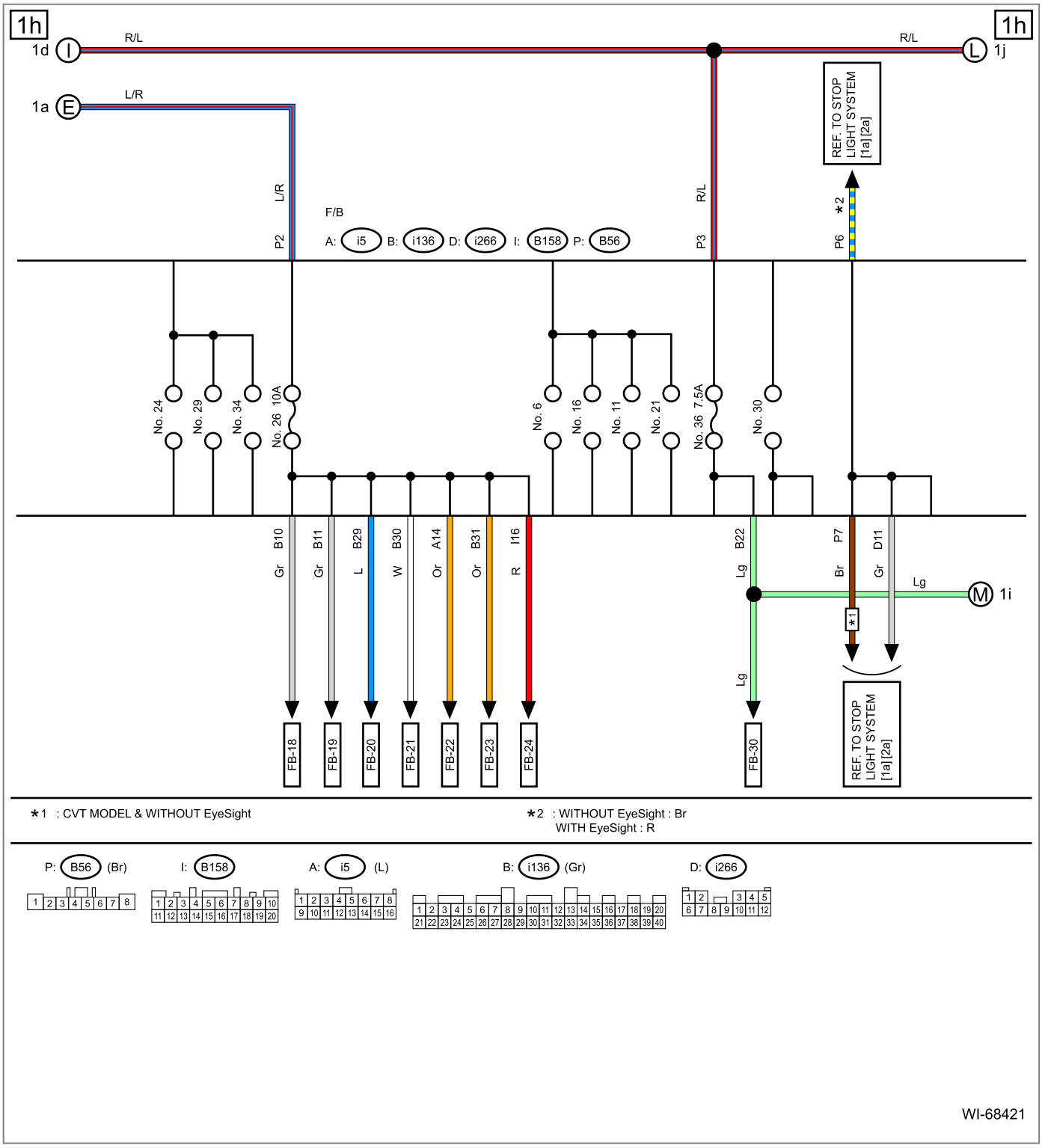

1f
1f
1a
D
R/B
R/B
O3
F/B
A: i5
D: i266
F: i137
G: B52
I: B158
O: B159
No. 37 7.5A
No. 27
No. 22 15A
No. 32 7.5A
No. 28
No. 25
No. 31
No. 35
No. 12
No. 1
POWER WINDOW RELAY
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [a]
REF. TO POWER WINDOW SYSTEM [a]
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO REARVIEW MIRROR SYSTEM [a]
I19 L
O4 W
F8 B
I15 Br
W G4
W D10
B G2
B A5
G F10
*2 I2
Br A3
G A11
*1
FB-1
FB-3
FB-4
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [a]
REF. TO POWER WINDOW SYSTEM [a]
REF. TO BACK-UP LIGHT SYSTEM [1a] [2a]
REF. TO REARVIEW MIRROR SYSTEM [a]
*1 : WITH STEERING HEATER
*2 : WITHOUT REMOTE ENGINE START : B
WITH REMOTE ENGINE START : Or
G: B52
I: B158
O: B159
A: i5 (L)
F: i137 (Br)
D: i266
WI-68419



*1 : WITH EyeSight
*2 : WITH IMMOBILIZER CM
*3 : WITH GLOVE BOX ILLUMI. LIGHT



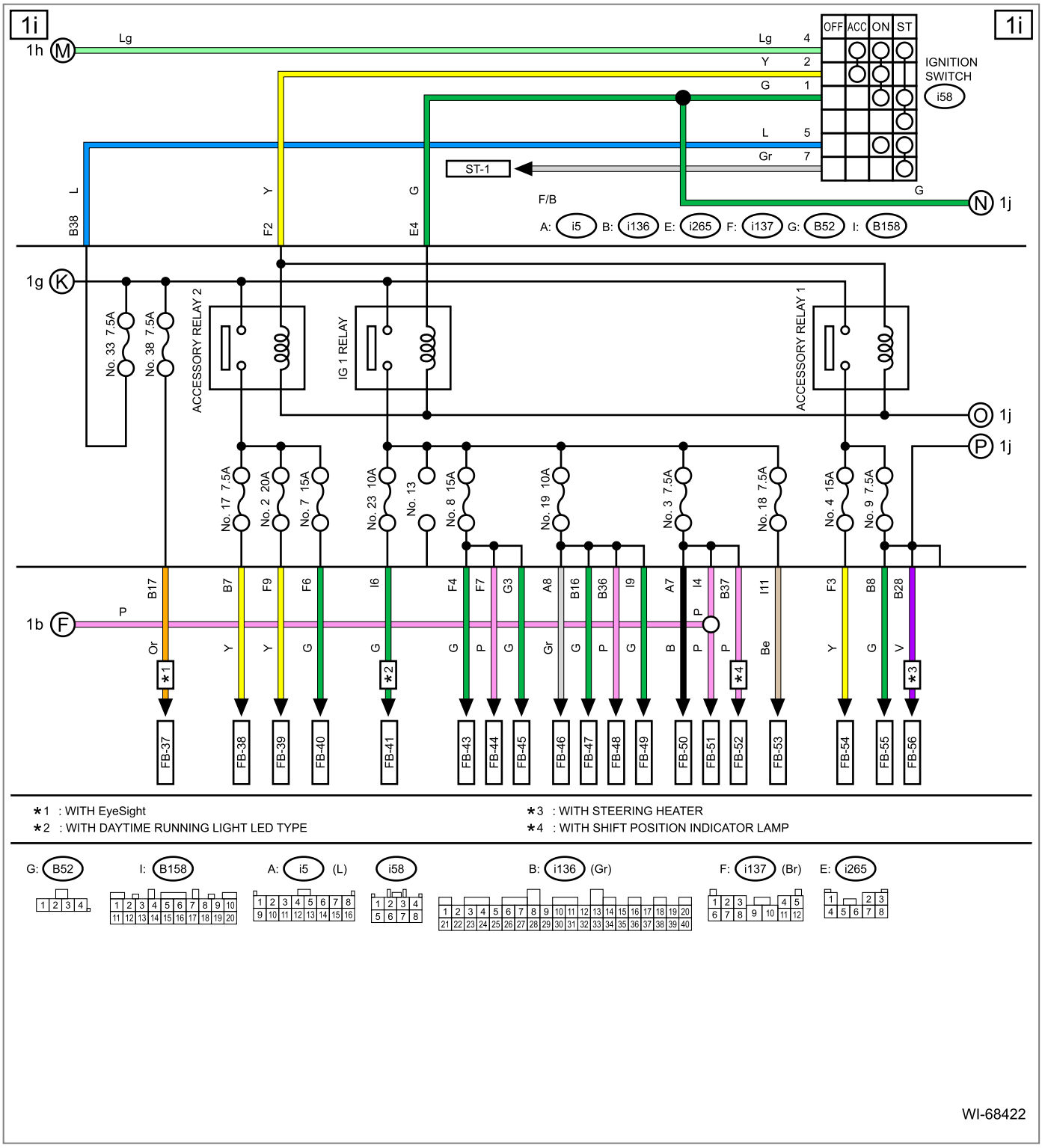
WI-68420



*1 : CVT MODEL & WITHOUT EyeSight

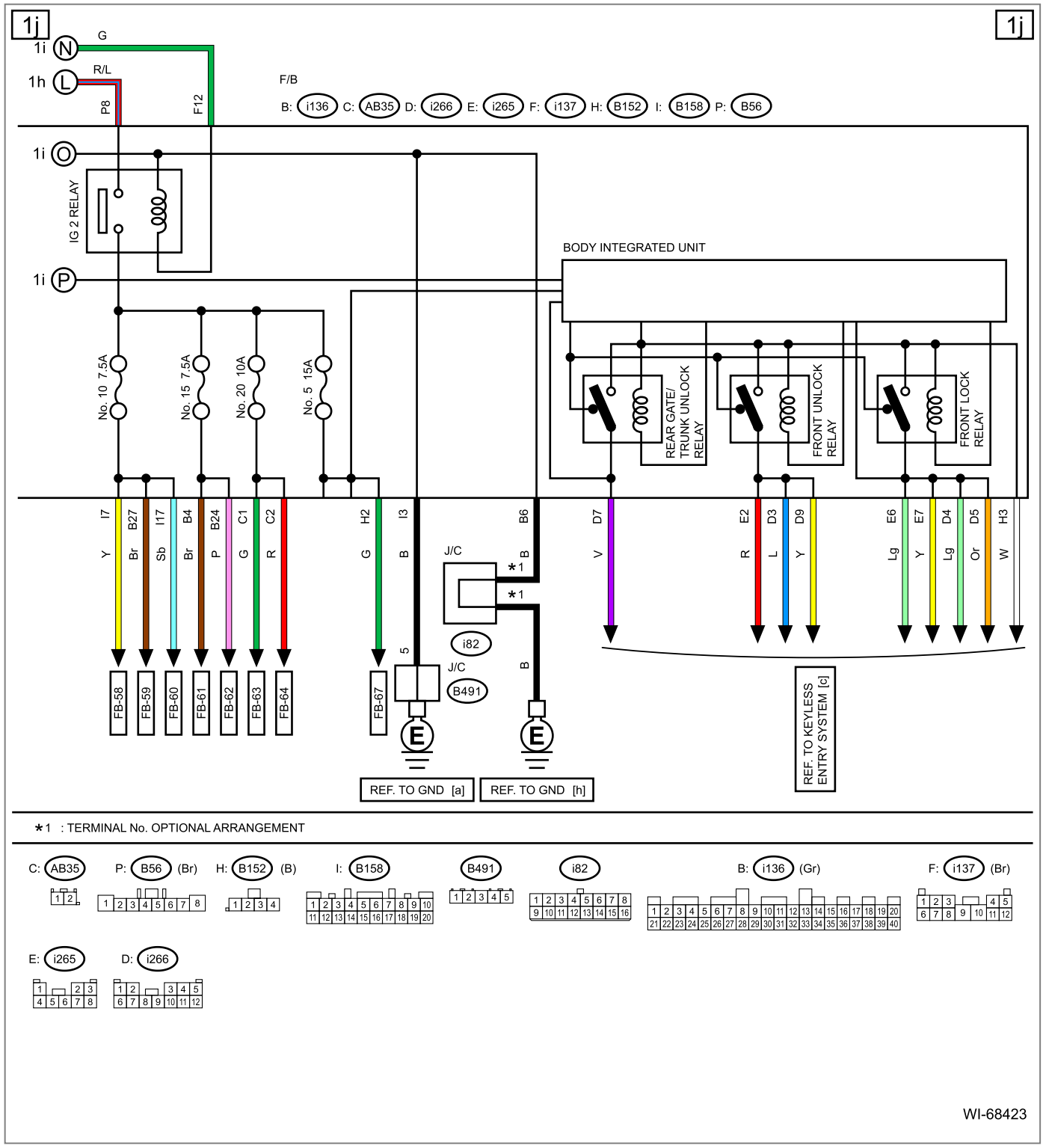
*2 : WITHOUT EyeSight : Br
WITH EyeSight : R

WI-68421



*1 : WITH EyeSight
*2 : WITH DAYTIME RUNNING LIGHT LED TYPE
*3 : WITH STEERING HEATER
*4 : WITH SHIFT POSITION INDICATOR LAMP

WI-68422



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

C: AB35

P: B56 (Br)

H: B152 (B)

I: B158

B491

i82

B: i136 (Gr)

F: i137 (Br)

E: i265

D: i266

WI-68423

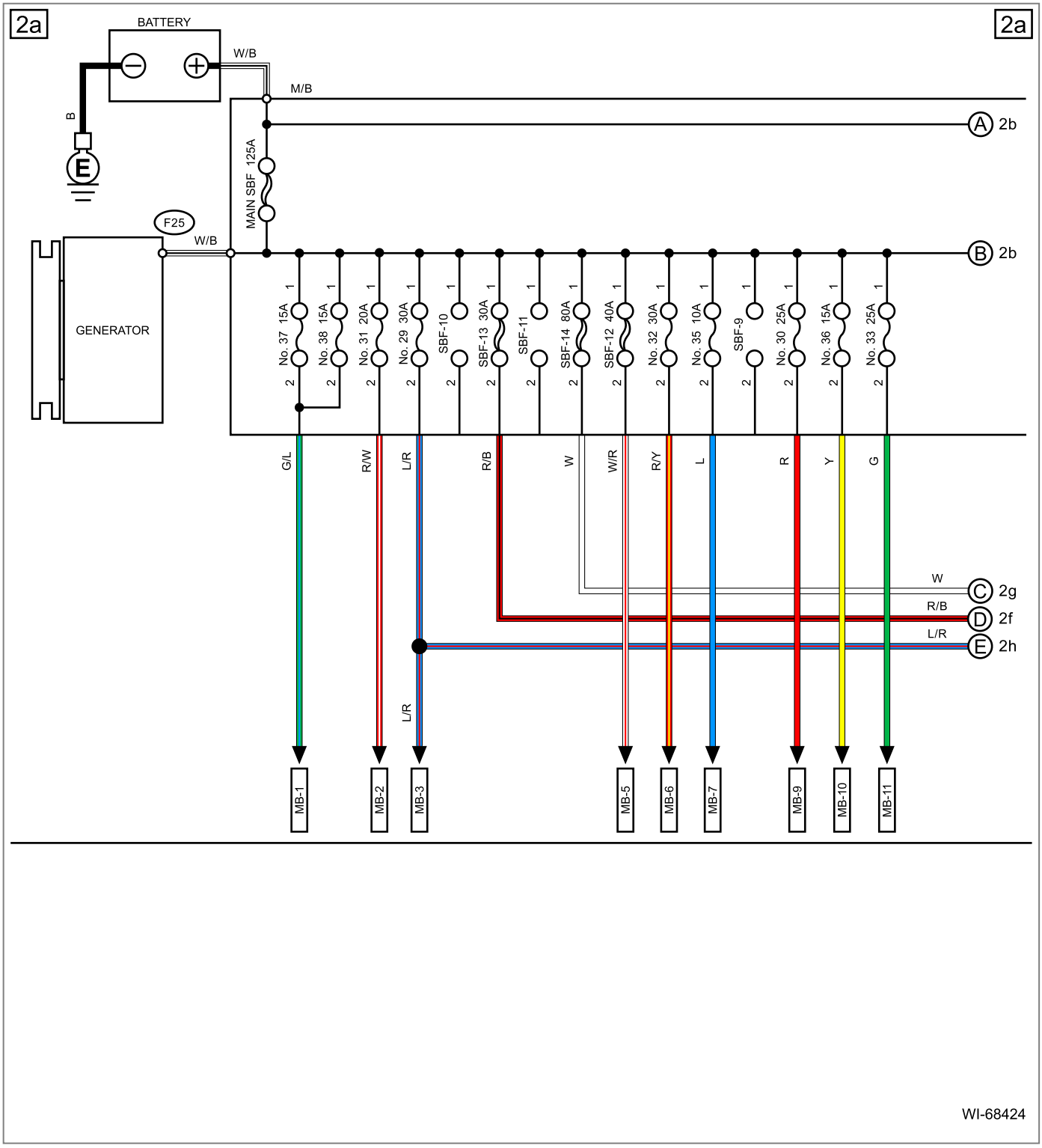
No.	Load
MB-1	Blower motor relay
MB-2	Power amplifier
	Audio amplifier
MB-3	Audio
MB-5	VDC CM
MB-6	VDC CM
MB-7	Wiper deicer relay
MB-9	Rear defogger relay
MB-10	Front fog light relay
MB-11	Main fan relay 1
MB-12	Sub fan relay
MB-13	Front wiper motor
	Combination switch
MB-14	Front washer motor
MB-15	Rear washer motor
	Rear wiper motor
	Rear wiper relay
MB-16	Power steering CM
MB-17	Data link connector
MB-18	ECM
	Battery sensor
	TCM
MB-19	Battery sensor
MB-20	Horn
MB-21	Horn
MB-22	Body integrated unit
	Horn switch
MB-23	Starter cut relay
MB-24	EGR control valve
	Intake camshaft position sensor LH
	Intake camshaft position sensor RH
	Leak check valve ASSY
	Purge control solenoid valve
	Exhaust camshaft position sensor RH
	Exhaust camshaft position sensor LH
MB-26	Intake oil control solenoid LH
	Intake oil control solenoid RH
	Exhaust oil flow control solenoid valve RH
	Exhaust oil flow control solenoid valve LH
MB-27	Transmission cord
	Front oxygen (A/F) sensor
MB-28	Ignition coil No. 1

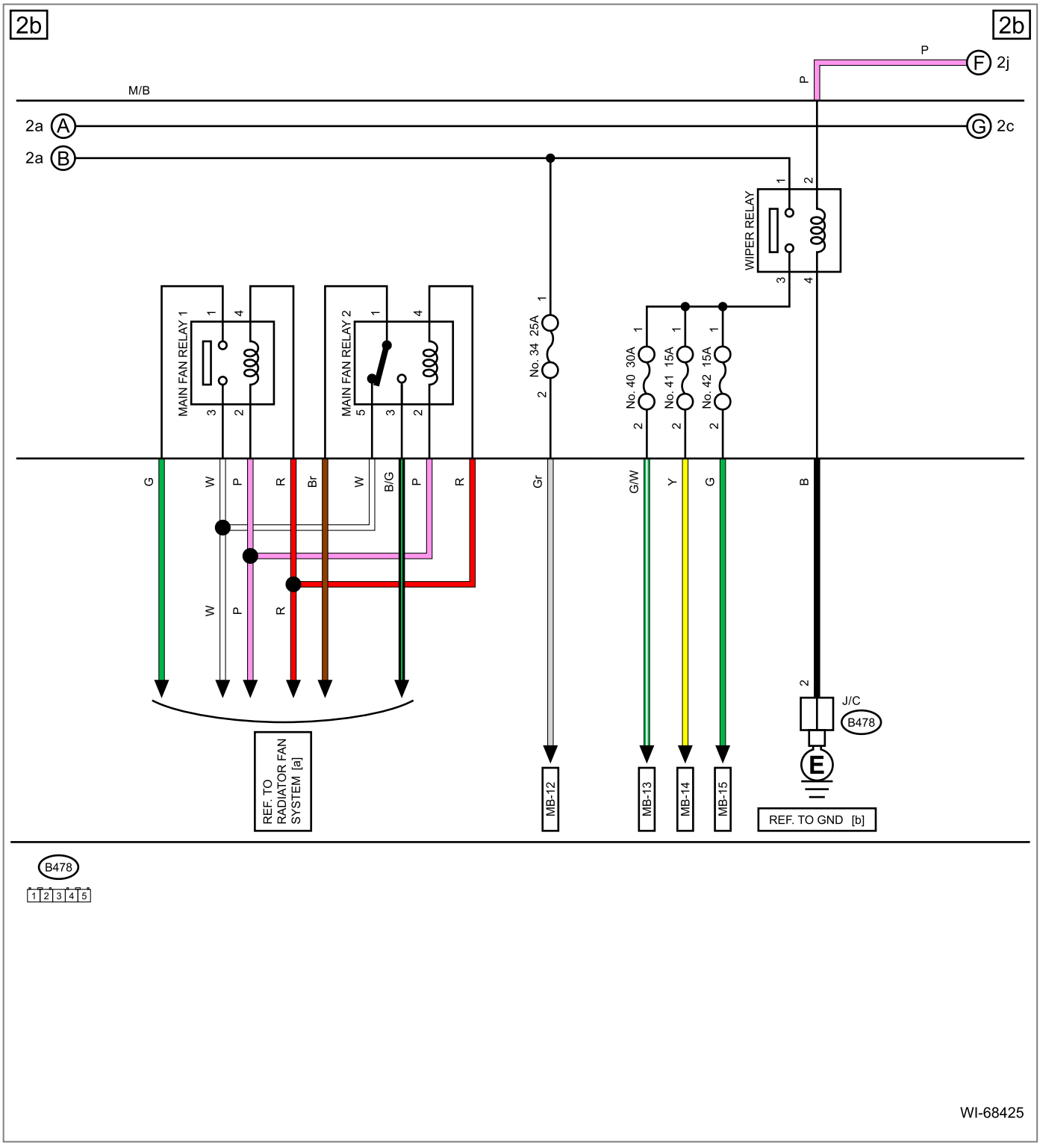
No.	Load
	Ignition coil No. 2
	Ignition coil No. 3
	Ignition coil No. 4
MB-29	ECM
MB-31	TCM
MB-32	Primary speed sensor
	Secondary speed sensor
	Turbine speed sensor
MB-33	ECM
MB-34	Fuel pump relay
MB-35	Front combination light RH
MB-36	Front combination light LH
MB-37	Body integrated unit
	Daytime running light relay
MB-38	Body integrated unit
MB-39	Power window circuit breaker
MB-40	Active grille shutter
MB-41	Data communication module
MB-50	Front lock relay
	Front unlock relay
	Rear gate/trunk unlock relay
	Body integrated unit
MB-51	Occupant detection CM
MB-52	Body integrated unit
MB-53	Body integrated unit
MB-54	Body integrated unit
MB-55	Body integrated unit
FB-1	Stop light & brake switch
	Stop light relay
FB-3	Steering heater relay
FB-4	Body integrated unit
FB-10	Combination meter
FB-11	A/C control panel
FB-12	TPMS & keyless entry CM
	Keyless entry CM (without push button start)
FB-13	Immobilizer CM
FB-14	Body integrated unit
FB-18	MFD
FB-19	Outer mirror ASSY RH
FB-20	Immobilizer antenna (without push button start)
FB-21	Outer mirror ASSY LH
FB-22	Luggage room light

No.	Load
	Trunk room light
FB-23	Warning box
	Vanity mirror light RH
	Room light
	Vanity mirror light LH
	Spot map light
FB-24	Body integrated unit
FB-30	Ignition switch
	Key warning switch
FB-37	Stereo camera
	RAB CM
FB-38	Remote control mirror switch
	Rearview mirror
FB-39	Seat heater switch
	Front accessory power supply socket
FB-40	Rear accessory power supply socket (console)
FB-41	Daytime running light relay
FB-43	Blower motor relay
FB-44	Data communication module
	A/C control panel
	Intake door actuator
FB-45	A/C relay
	Pressure switch
	Rear defogger relay
	Sub fan relay
	Wiper deicer relay
FB-46	TPMS CM
	TPMS & keyless entry CM
	Radar sensor LH (master)
	RAB CM
	Radar sensor RH (slave)
	Keyless entry CM (without push button start)
FB-47	BSD/RCTA OFF switch
	Data link connector
FB-48	Stereo camera
	Warning box
	Sunroof unit
FB-49	Clutch switch
	Stop light & brake switch
FB-50	Power window relay
	Immobilizer CM
FB-51	ECM

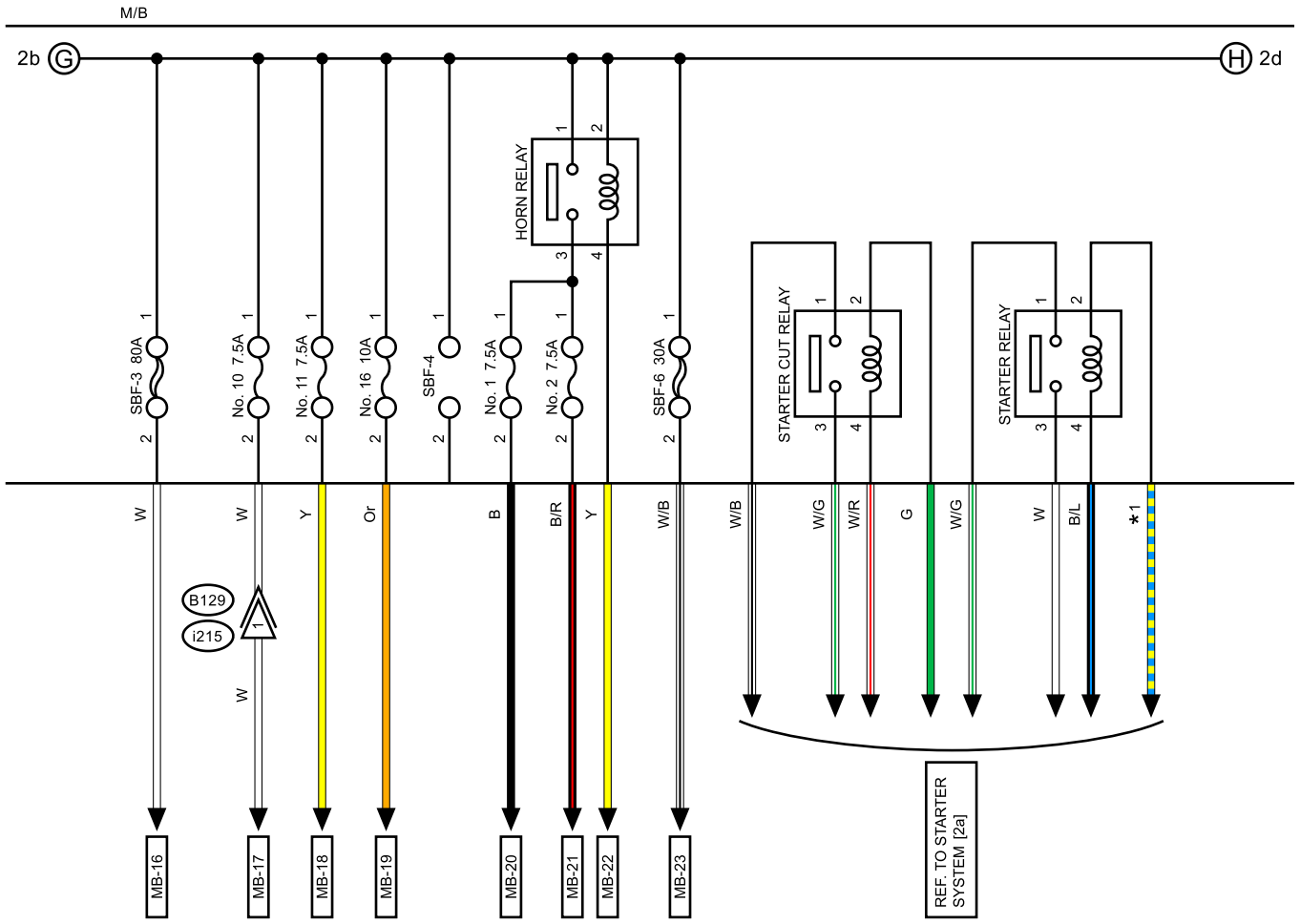
No.	Load
	Main fan relay 1
	Main fan relay 2
FB-52	Shift position indicator
FB-53	Front combination light LH
	Front combination light RH
	Auto headlight beam leveler CM
	Back-up light switch
	Transmission cord
	Inhibitor switch
FB-54	AUX input terminal
	Data communication module
	Audio
	Audio amplifier
FB-55	A/C control panel
FB-56	Steering heater relay
FB-58	VDC CM
	Stop light relay
FB-59	Steering angle sensor
FB-60	Power steering CM
FB-61	MFD
FB-62	Combination meter
FB-63	Airbag CM
FB-64	Occupant detection CM
FB-67	ECM
	Fuel pump relay
	Starter cut relay
	Starter relay
	TCM

2. WITH PUSH BUTTON START

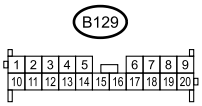

2a
2a
BATTERY
W/B
M/B
B
E
MAIN SBF 125A
A 2b
F25
W/B
B 2b
GENERATOR
No. 37 15A
No. 38 15A
No. 31 20A
No. 29 30A
SBF-10
SBF-13 30A
SBF-11
SBF-14 80A
SBF-12 40A
No. 32 30A
No. 35 10A
SBF-9
No. 30 25A
No. 36 15A
No. 33 25A
G/L
R/W
L/R
R/B
W
W/R
R/Y
L
R
Y
G
W
C 2g
R/B
D 2f
L/R
E 2h
L/R
MB-1
MB-2
MB-3
MB-5
MB-6
MB-7
MB-9
MB-10
MB-11
WI-68424


2b
2b
P
F 2j
P
M/B
2a A
G 2c
2a B
WIPER RELAY
1
2
3
4
MAIN FAN RELAY 1
MAIN FAN RELAY 2
No. 34 25A
No. 40 30A
No. 41 15A
No. 42 15A
G
W
P
R
Br
W
B/G
P
R
Gr
G/W
Y
G
B
W
P
R
2
J/C
B478
E
REF. TO RADIATOR FAN SYSTEM [a]
MB-12
MB-13
MB-14
MB-15
REF. TO GND [b]
B478
1 2 3 4 5
WI-68425

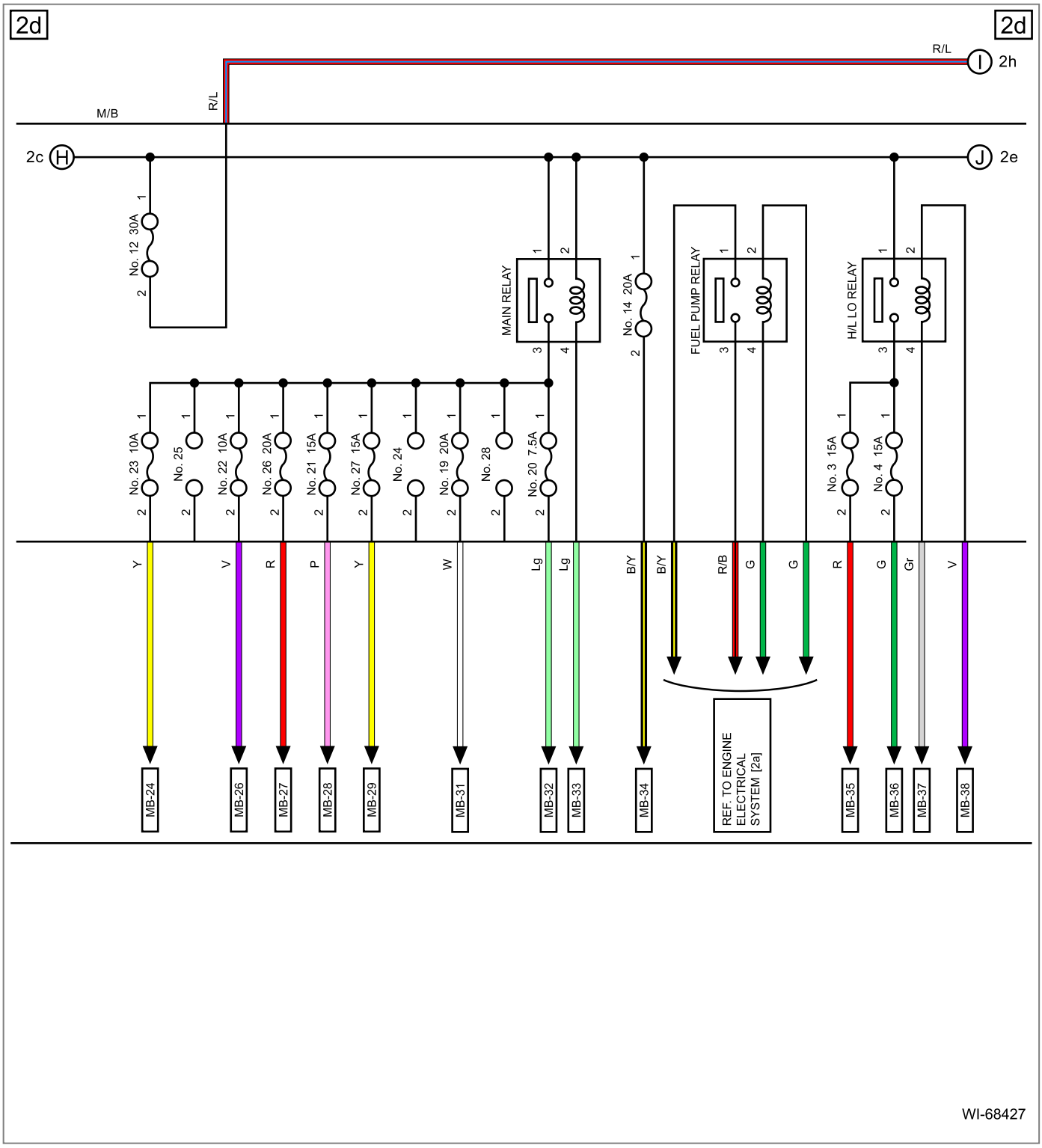
2c



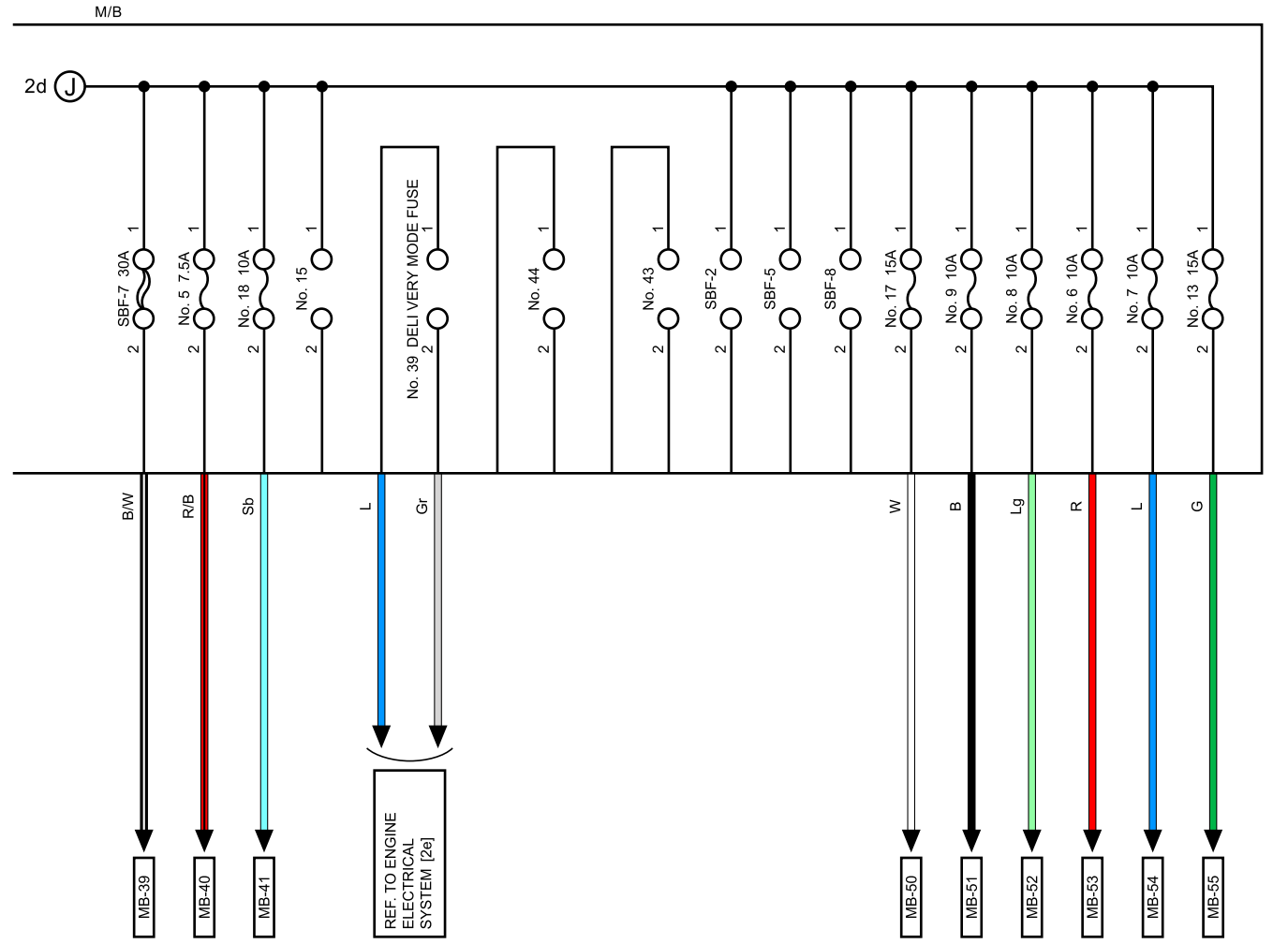
*1 : MT MODEL : Lg
CVT MODEL : G



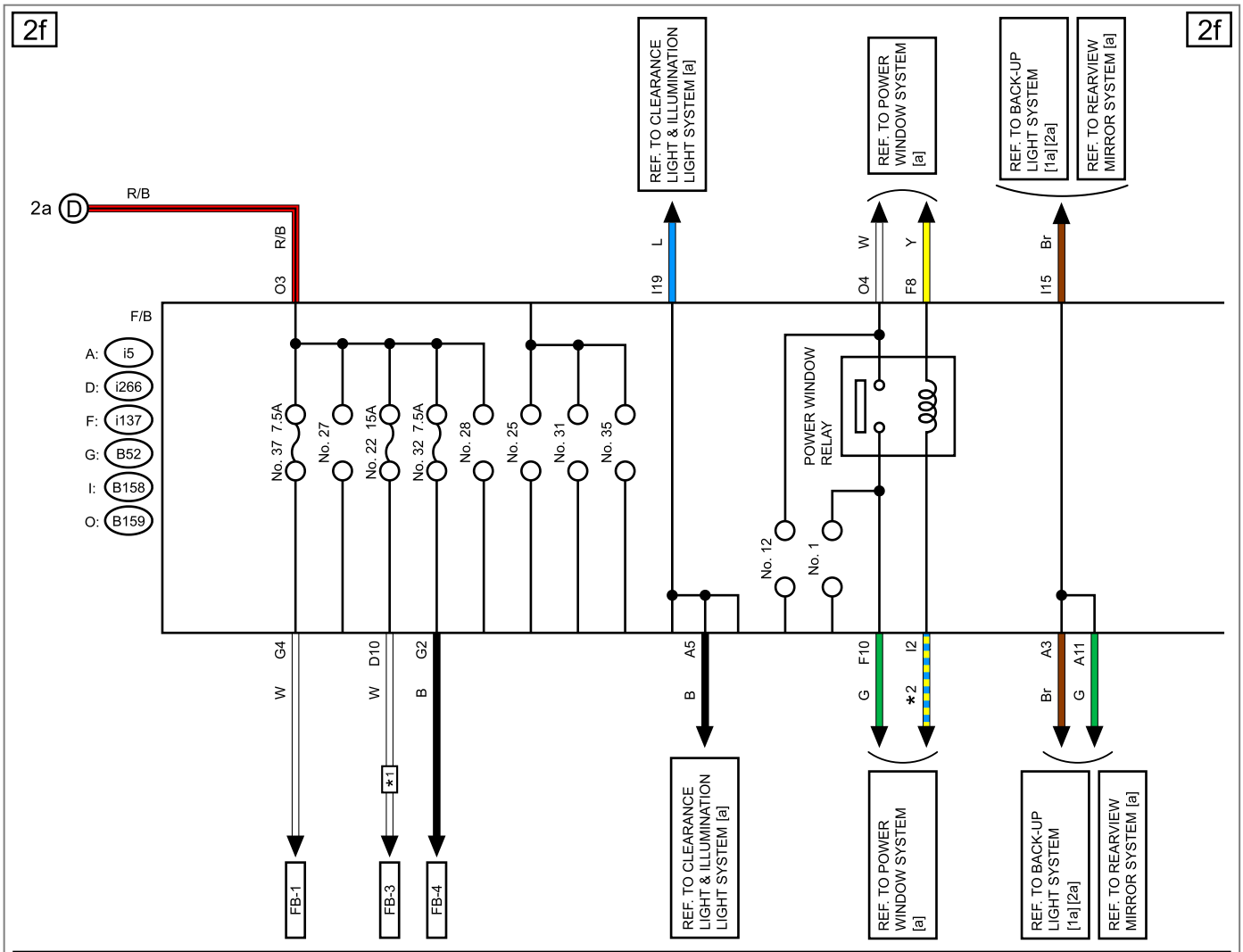
WI-68426


2d
2d
R/L
2h
M/B
R/L
2c H
J 2e
No. 12 30A
MAIN RELAY
No. 14 20A
FUEL PUMP RELAY
H/L LO RELAY
No. 23 10A
No. 25
No. 22 10A
No. 26 20A
No. 21 15A
No. 27 15A
No. 24
No. 19 20A
No. 28
No. 20 7.5A
No. 3 15A
No. 4 15A
Y
V
R
P
Y
W
Lg
Lg
B/Y
B/Y
R/B
G
G
R
G
Gr
V
MB-24
MB-26
MB-27
MB-28
MB-29
MB-31
MB-32
MB-33
MB-34
REF. TO ENGINE ELECTRICAL SYSTEM [2a]
MB-35
MB-36
MB-37
MB-38
WI-68427

2e

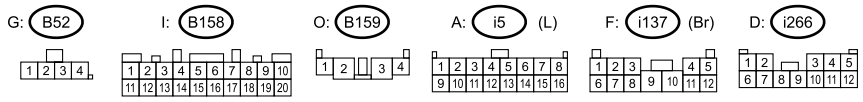

M/B
2d
J
SBF-7 30A
No. 5 7.5A
No. 18 10A
No. 15
No. 39 DELI VERY MODE FUSE
No. 44
No. 43
SBF-2
SBF-5
SBF-8
No. 17 15A
No. 9 10A
No. 8 10A
No. 6 10A
No. 7 10A
No. 13 15A
B/W
R/B
Sb
L
Gr
W
B
Lg
R
L
G
MB-39
MB-40
MB-41
REF. TO ENGINE ELECTRICAL SYSTEM [2e]
MB-50
MB-51
MB-52
MB-53
MB-54
MB-55

WI-68428

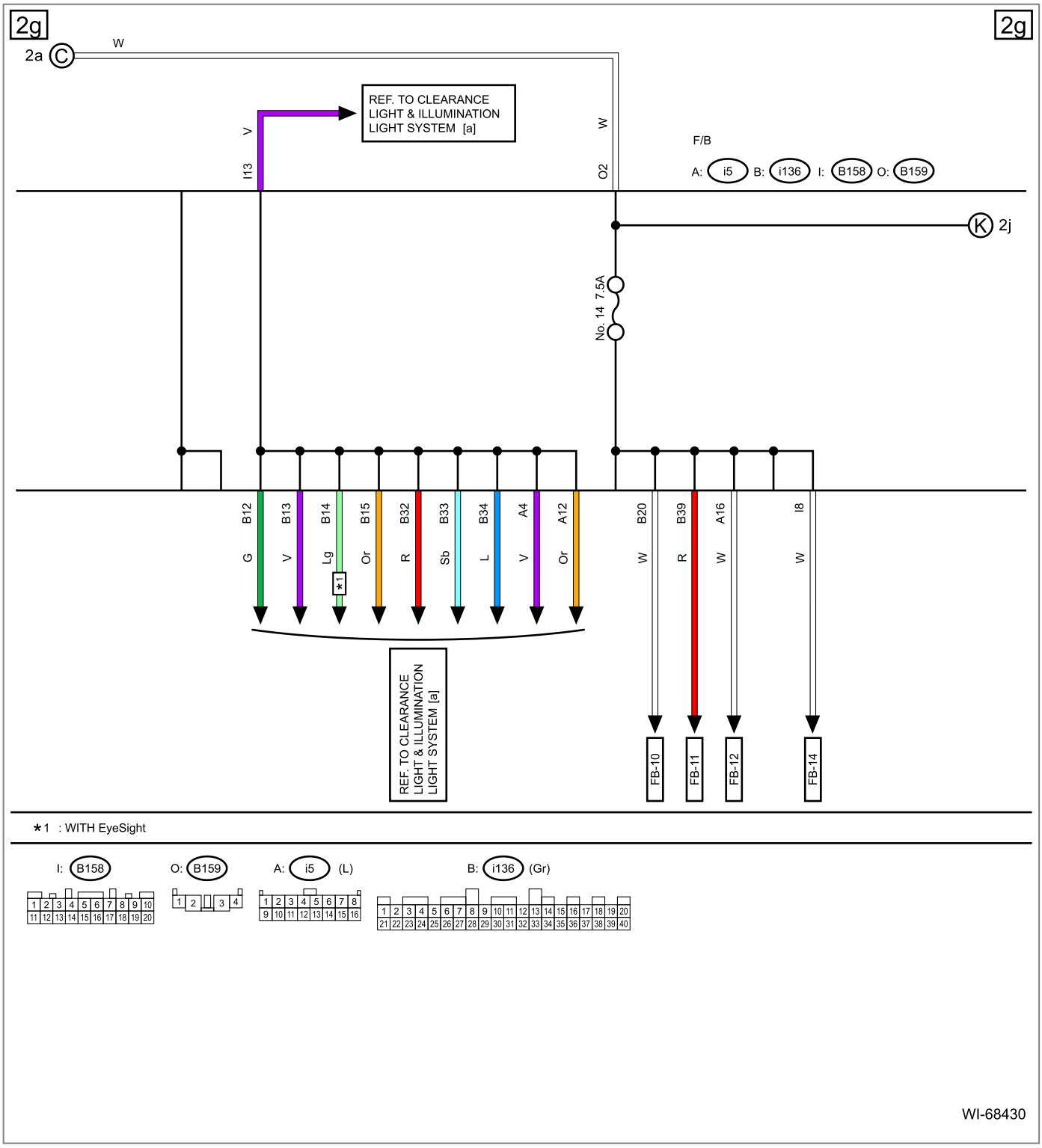


*1 : WITH STEERING HEATER

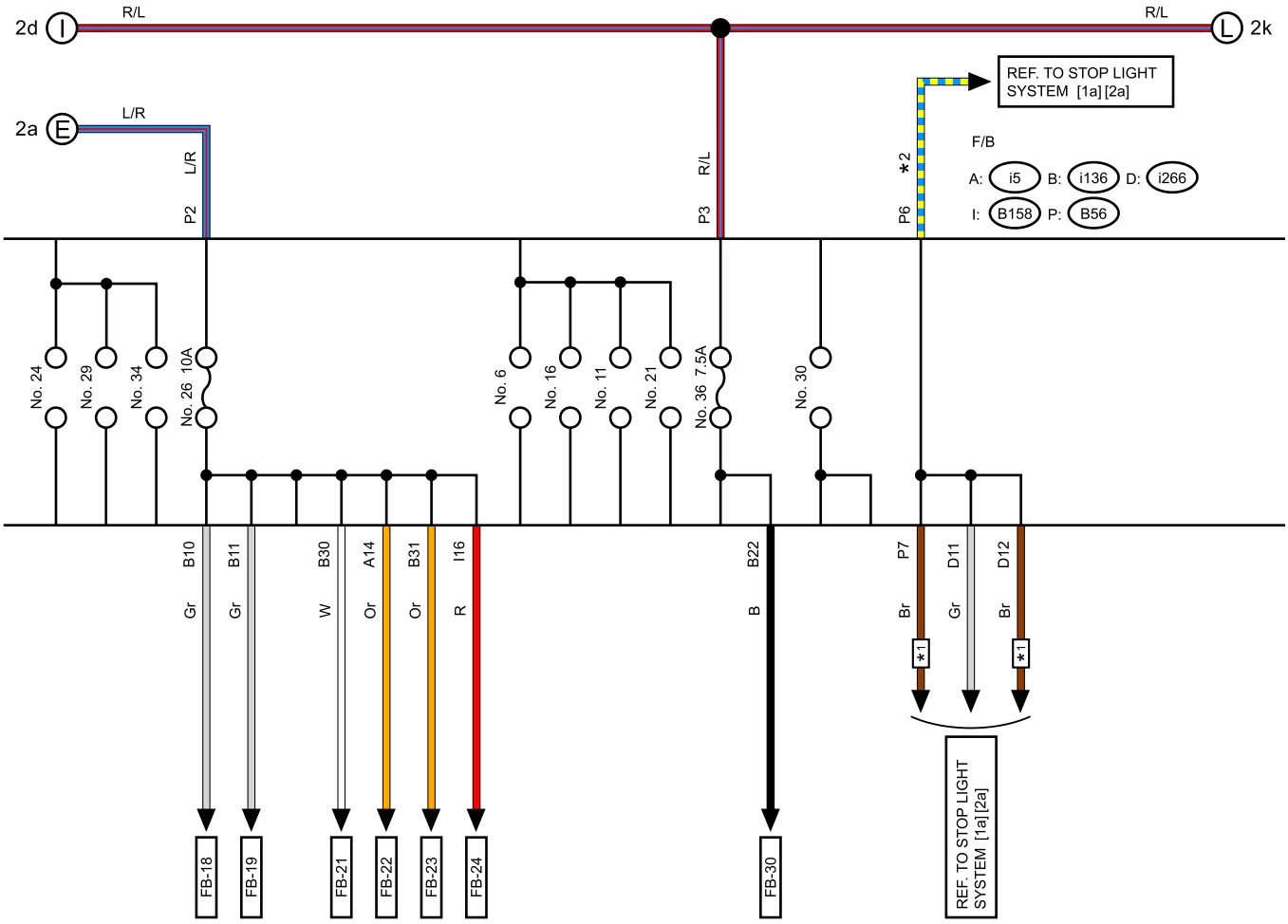
*2 : WITHOUT REMOTE ENGINE START : B
WITH REMOTE ENGINE START : Or



WI-68429

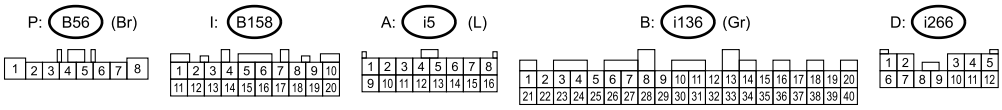

2g
2g
2a
W
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [a]
V
I13
W
O2
F/B
A: i5 B: i136 I: B158 O: B159
2j
No. 14 7.5A
B12 G
B13 V
B14 Lg
*1
B15 Or
B32 R
B33 Sb
B34 L
A4 V
A12 Or
B20 W
B39 R
A16 W
I8 W
REF. TO CLEARANCE LIGHT & ILLUMINATION LIGHT SYSTEM [a]
FB-10
FB-11
FB-12
FB-14
*1 : WITH EyeSight
I: B158
O: B159
A: i5 (L)
B: i136 (Gr)
WI-68430

2h



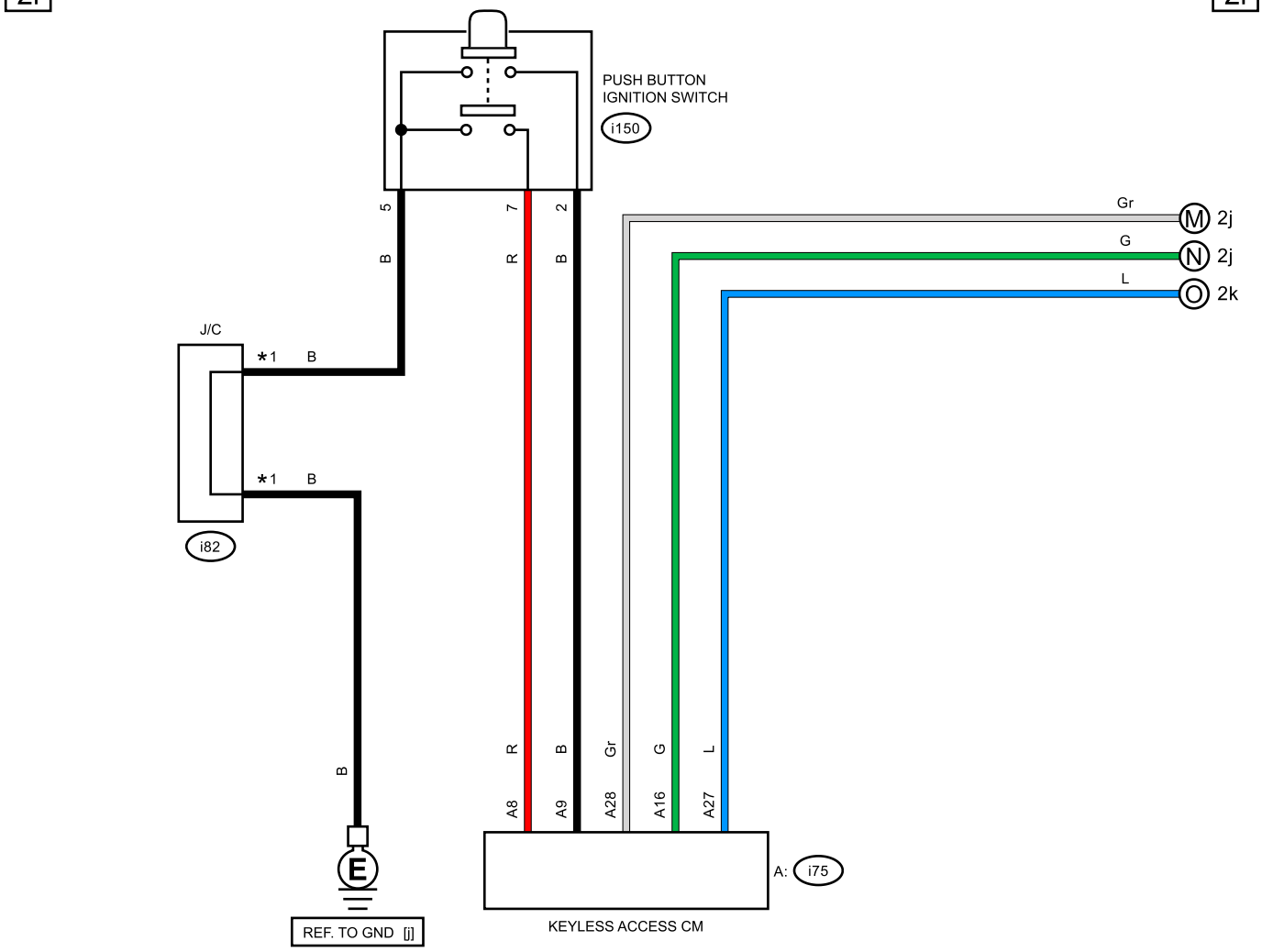
*1 : CVT MODEL & WITHOUT EyeSight

*2 : WITHOUT EyeSight : Br
WITH EyeSight : R

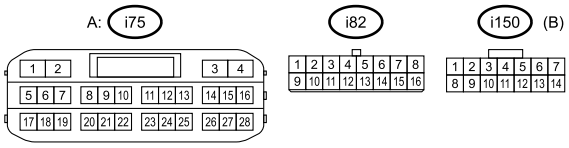


WI-68431

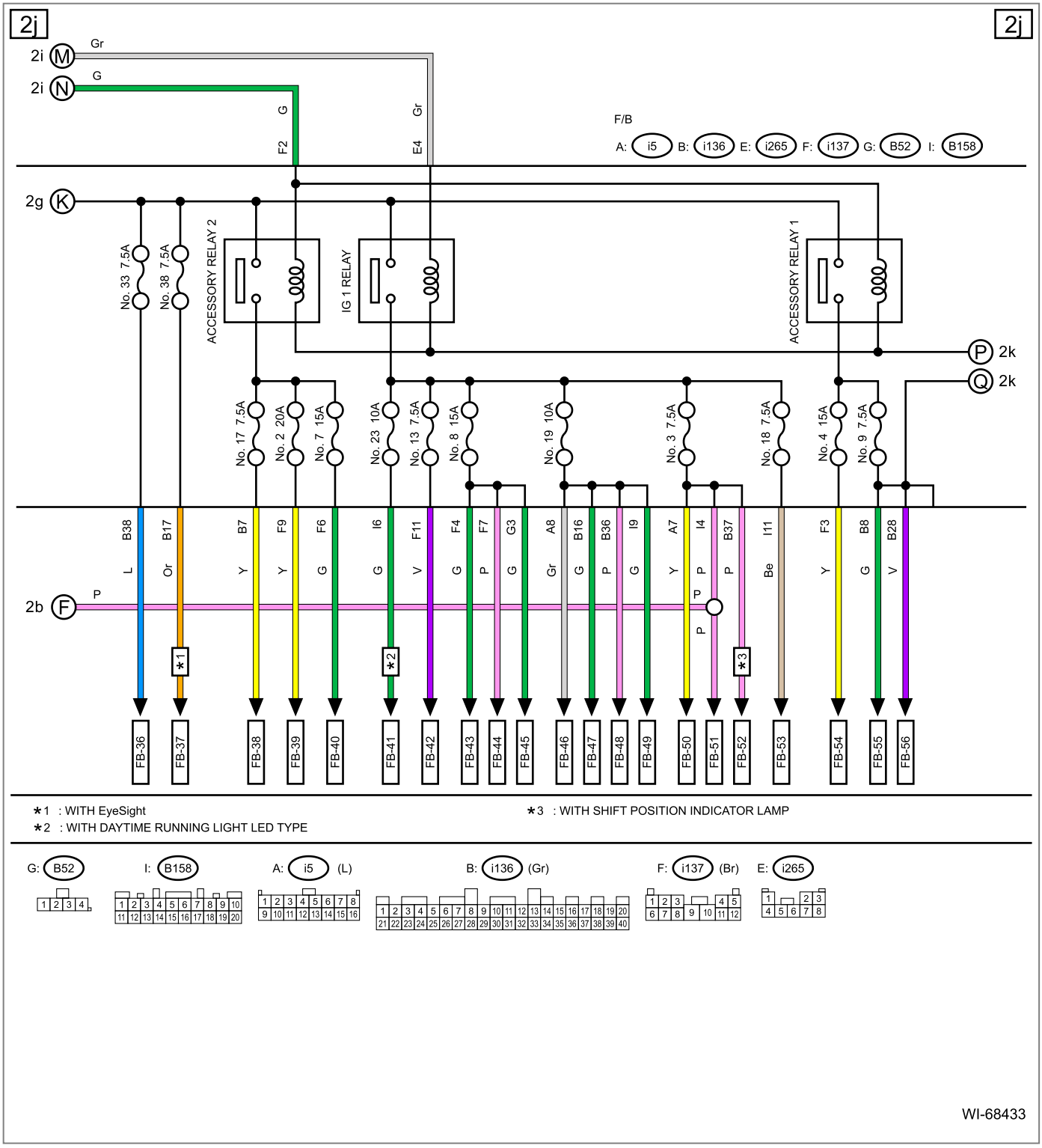
2i



*1 : TERMINAL No. OPTIONAL ARRANGEMENT



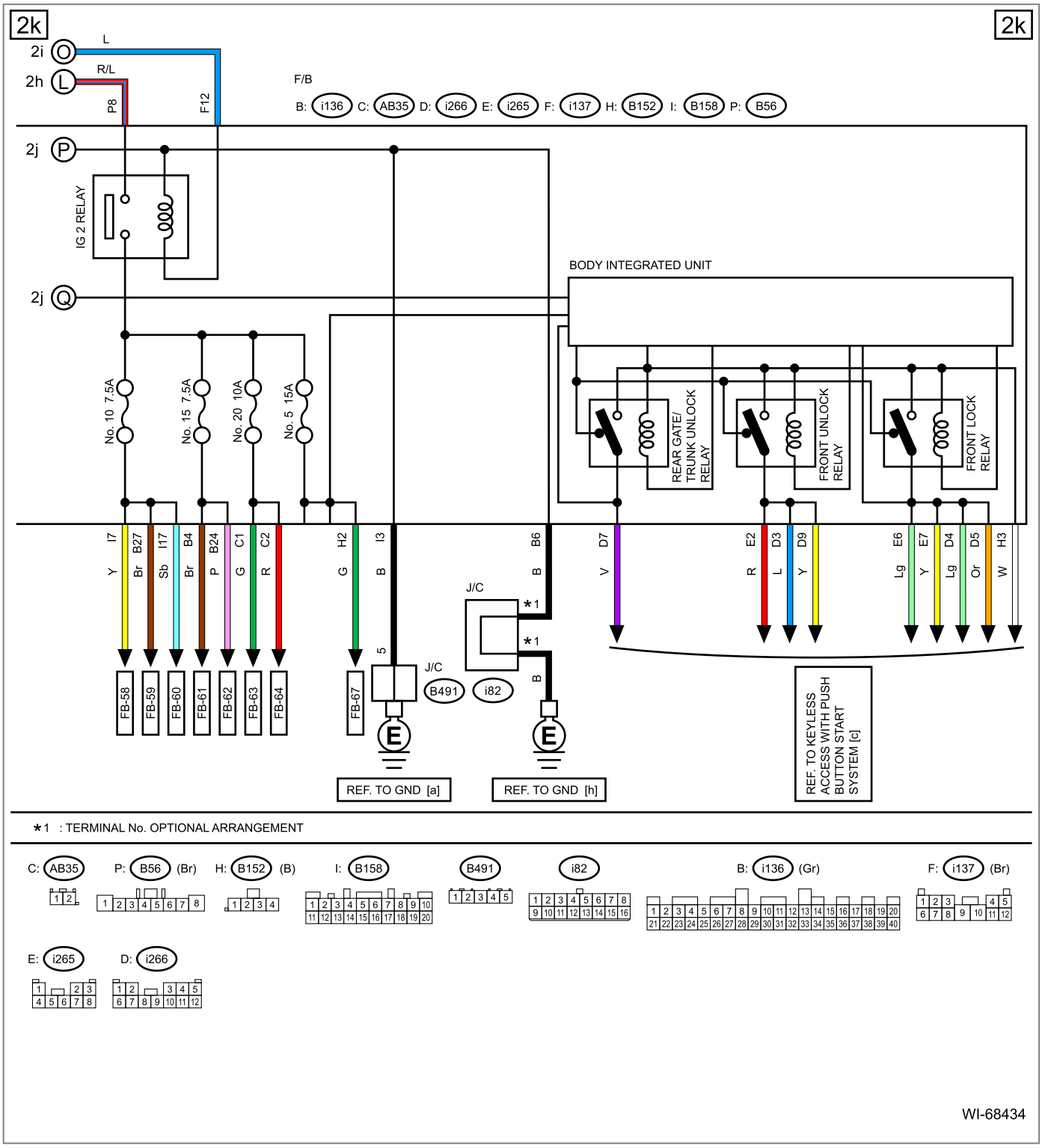
WI-68432



*1 : WITH EyeSight
*2 : WITH DAYTIME RUNNING LIGHT LED TYPE
*3 : WITH SHIFT POSITION INDICATOR LAMP

G: B52 I: B158 A: i5 (L) B: i136 (Gr) F: i137 (Br) E: i265

WI-68433



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

C: AB35 P: B56 (Br) H: B152 (B) I: B158 B491 i82 B: i136 (Gr) F: i137 (Br)

E: i265 D: i266

WI-68434

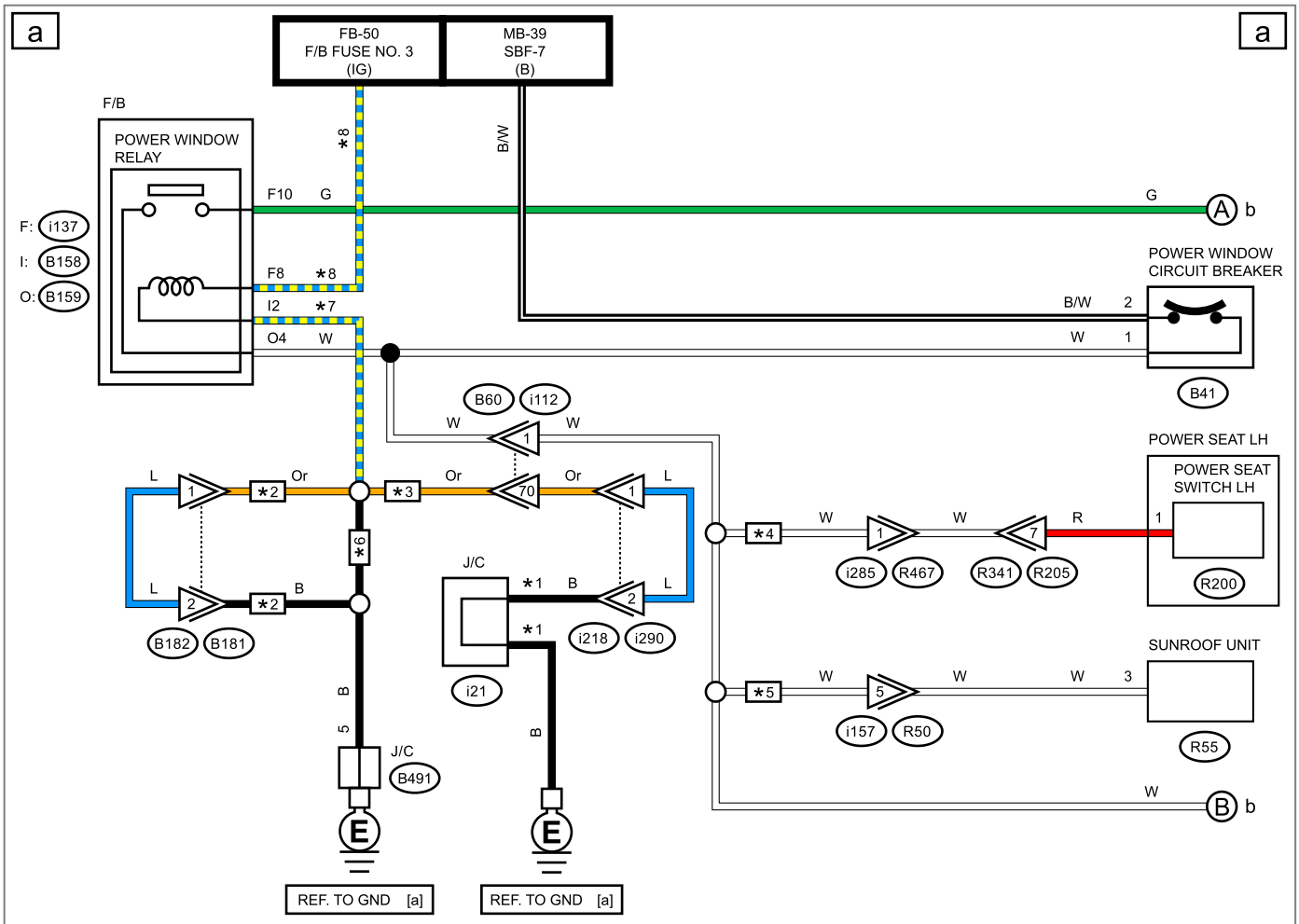
No.	Load
MB-1	Blower motor relay
MB-2	Power amplifier
	Audio amplifier
MB-3	Audio
MB-5	VDC CM
MB-6	VDC CM
MB-7	Wiper deicer relay
MB-9	Rear defogger relay
MB-10	Front fog light relay
MB-11	Main fan relay 1
MB-12	Sub fan relay
MB-13	Front wiper motor
	Combination switch
MB-14	Front washer motor
MB-15	Rear washer motor
	Rear wiper motor
	Rear wiper relay
MB-16	Power steering CM
MB-17	Data link connector
MB-18	ECM
	Battery sensor
	TCM
MB-19	Battery sensor
MB-20	Horn
MB-21	Horn
MB-22	Body integrated unit
	Horn switch
MB-23	Starter cut relay
MB-24	EGR control valve
	Intake camshaft position sensor LH
	Intake camshaft position sensor RH
	Leak check valve ASSY
	Purge control solenoid valve
	Exhaust camshaft position sensor RH
	Exhaust camshaft position sensor LH
MB-26	Intake oil control solenoid LH
	Intake oil control solenoid RH
	Exhaust oil flow control solenoid valve RH
	Exhaust oil flow control solenoid valve LH
MB-27	Transmission cord
	Front oxygen (A/F) sensor
MB-28	Ignition coil No. 1

No.	Load
	Ignition coil No. 2
	Ignition coil No. 3
	Ignition coil No. 4
MB-29	ECM
MB-31	TCM
MB-32	Primary speed sensor
	Secondary speed sensor
	Turbine speed sensor
MB-33	ECM
MB-34	Fuel pump relay
MB-35	Front combination light RH
MB-36	Front combination light LH
MB-37	Body integrated unit
	Daytime running light relay
MB-38	Body integrated unit
MB-39	Power window circuit breaker
MB-40	Active grille shutter
MB-41	Data communication module
MB-50	Front lock relay
	Front unlock relay
	Rear gate/trunk unlock relay
	Body integrated unit
MB-51	Occupant detection CM
MB-52	Body integrated unit
MB-53	Body integrated unit
MB-54	Body integrated unit
MB-55	Body integrated unit
FB-1	Stop light & brake switch
	Stop light relay
FB-3	Steering heater relay
FB-4	Body integrated unit
FB-10	Combination meter
FB-11	A/C control panel
FB-12	TPMS CM
FB-14	Body integrated unit
FB-18	MFD
FB-19	Outer mirror ASSY RH
	Remote engine start CM
FB-20	Immobilizer antenna (without push button start)
FB-21	Outer mirror ASSY LH
FB-22	Luggage room light
	Trunk room light

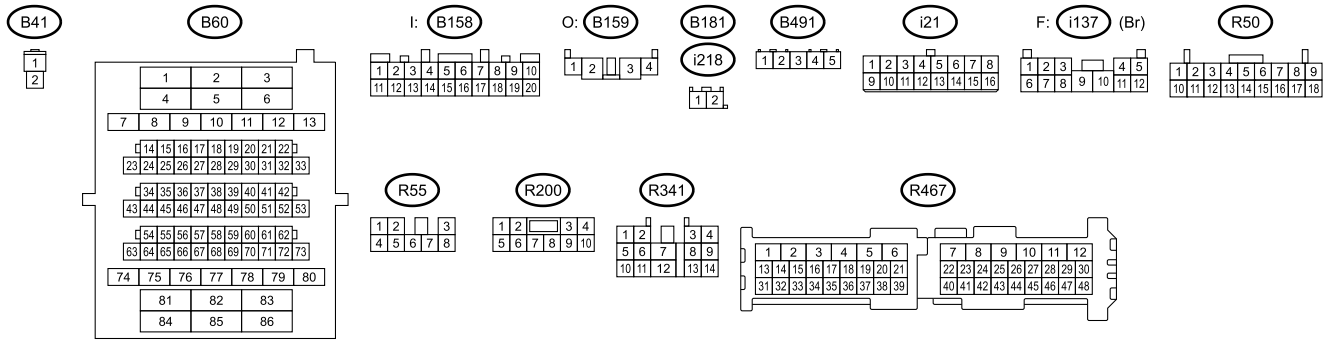
No.	Load
FB-23	Warning box
	Vanity mirror light RH
	Room light
	Vanity mirror light LH
	Spot map light
FB-24	Body integrated unit
FB-30	ID code box
	Steering lock CM
	Keyless access CM
FB-36	Clutch start switch
	keyless access CM
FB-37	Stereo camera
	RAB CM
FB-38	Remote control mirror switch
	Rearview mirror
FB-39	Seat heater switch
	Front accessory power supply socket
FB-40	Rear accessory power supply socket (console)
FB-41	Daytime running light relay
FB-42	Steering lock CM
FB-43	Blower motor relay
FB-44	Data communication module
	A/C control panel
	Intake door actuator
FB-45	A/C relay
	Pressure switch
	Rear defogger relay
	Sub fan relay
	Wiper deicer relay
FB-46	TPMS CM
	TPMS & keyless entry CM
	Radar sensor LH (master)
	RAB CM
	Radar sensor RH (slave)
	Keyless entry CM (without push button start)
FB-47	BSD/RCTA OFF switch
	Data link connector
	Remote engine start CM
FB-48	Stereo camera
	Warning box
	Sunroof unit
FB-49	Clutch switch

No.	Load
	Stop light & brake switch
FB-50	Power window relay
FB-51	ECM
	Main fan relay 1
	Main fan relay 2
FB-52	Shift position indicator
FB-53	Front combination light LH
	Front combination light RH
	Auto headlight beam leveler CM
	Back-up light switch
	Transmission cord
	Inhibitor switch
FB-54	AUX input terminal
	Data communication module
	Audio
	Audio amplifier
FB-55	A/C control panel
FB-56	Steering heater relay
	Body integrated unit
FB-58	VDC CM
	Stop light relay
FB-59	Steering angle sensor
FB-60	Power steering CM
FB-61	MFD
FB-62	Combination meter
FB-63	Airbag CM
FB-64	Occupant detection CM
FB-67	ECM
	Fuel pump relay
	Starter cut relay
	Starter relay
	TCM

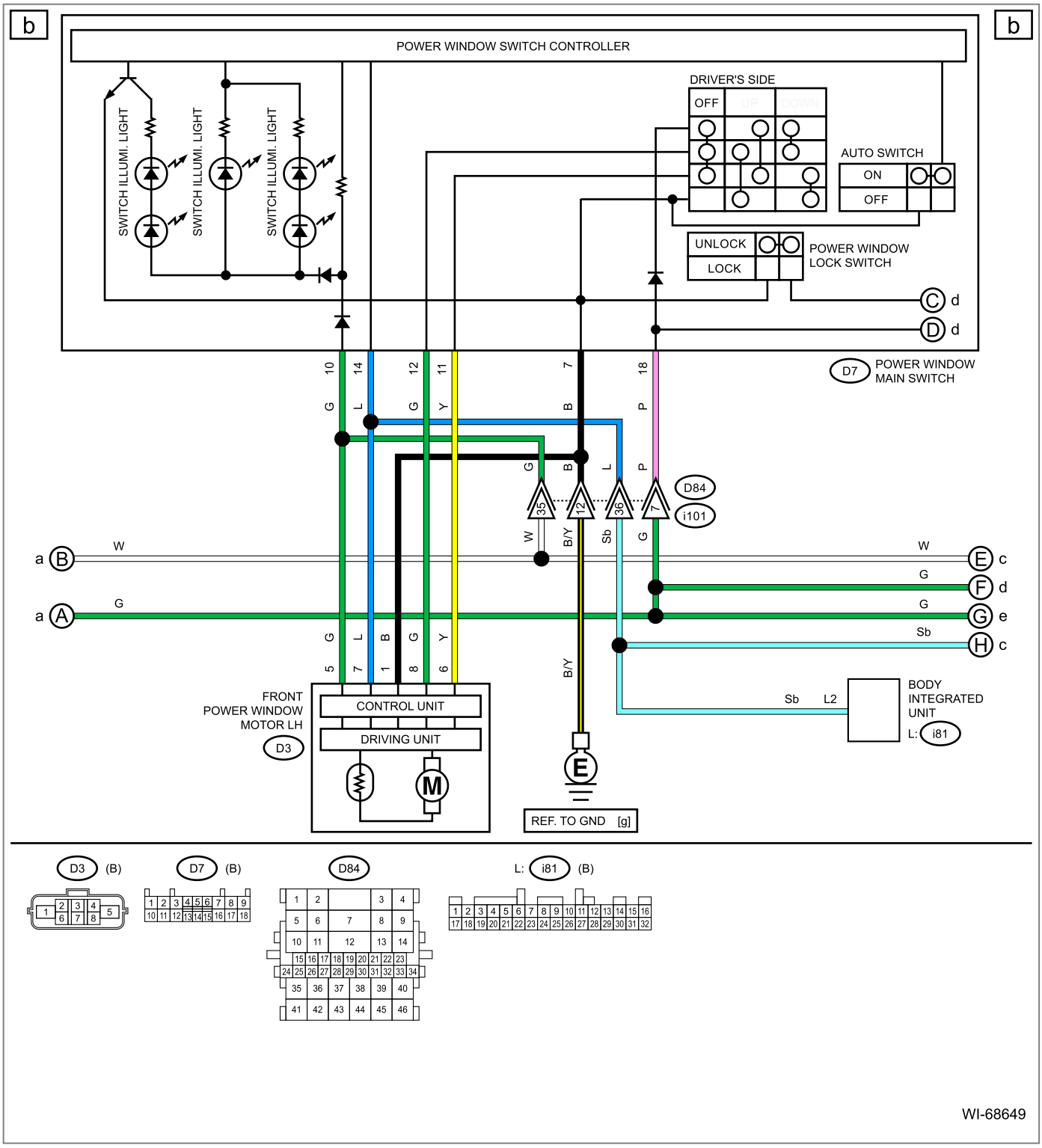
WIRING DIAGRAM

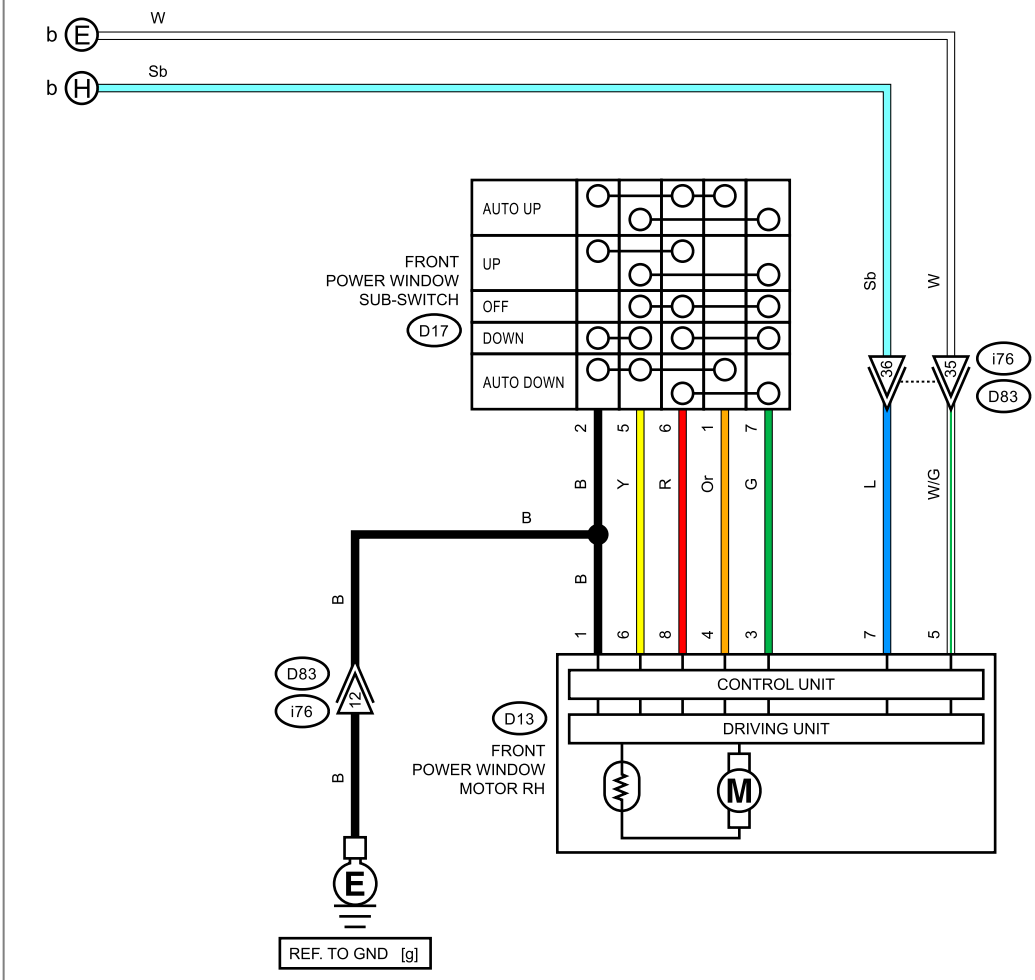


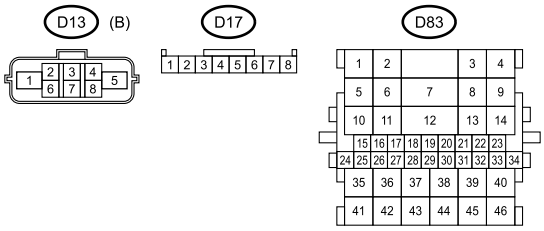
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITHOUT PUSH BUTTON START & WITH REMOTE ENGINE START
*3 : WITH PUSH BUTTON START & WITH REMOTE ENGINE START
*4 : WITH POWER SEAT
*5 : WITH SUNROOF
*6 : WITHOUT REMOTE ENGINE START
*7 : WITHOUT REMOTE ENGINE START : B
WITH REMOTE ENGINE START : Or
*8 : WITHOUT PUSH BUTTON START : B
WITH PUSH BUTTON START : Y



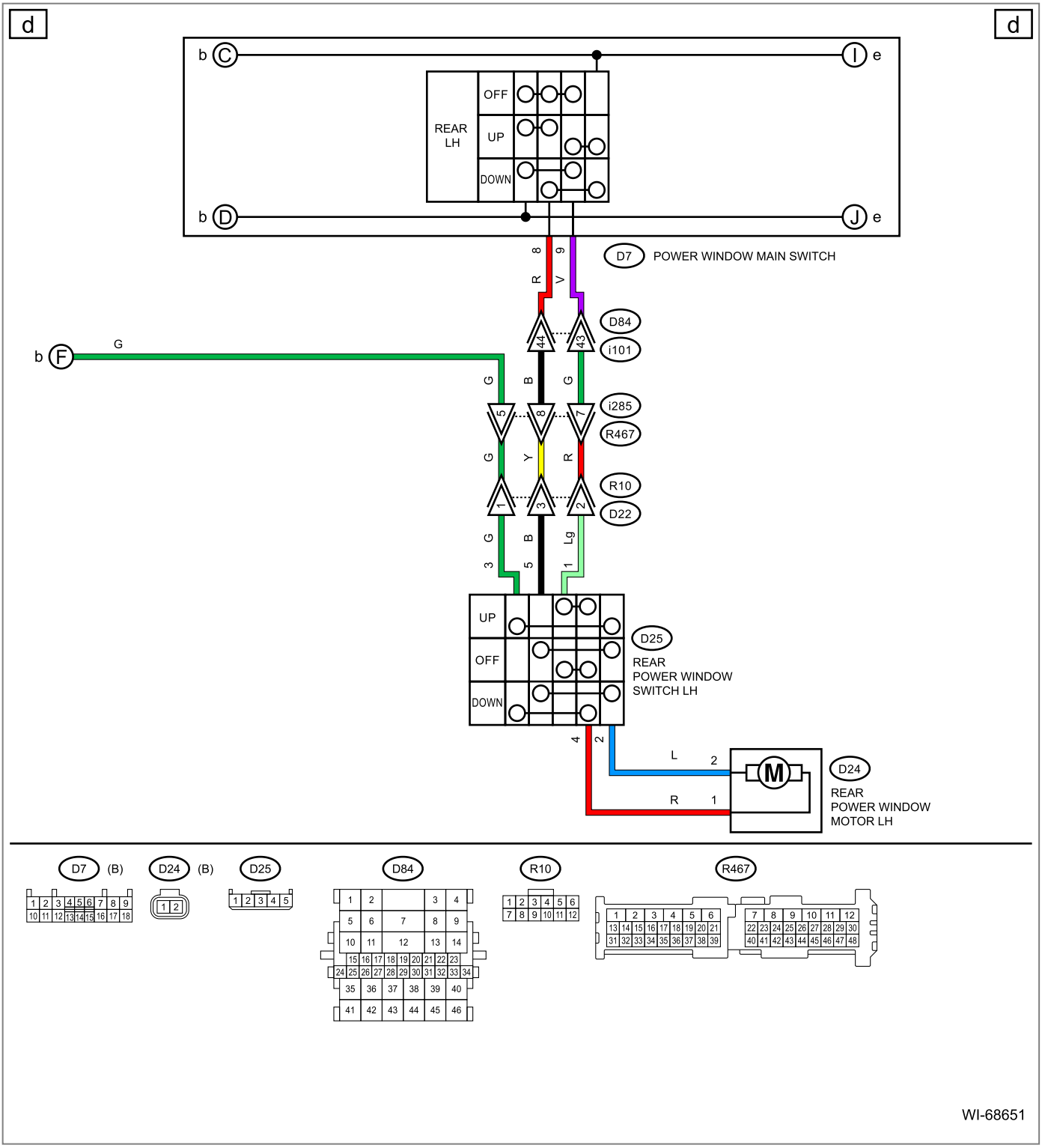
WI-68648

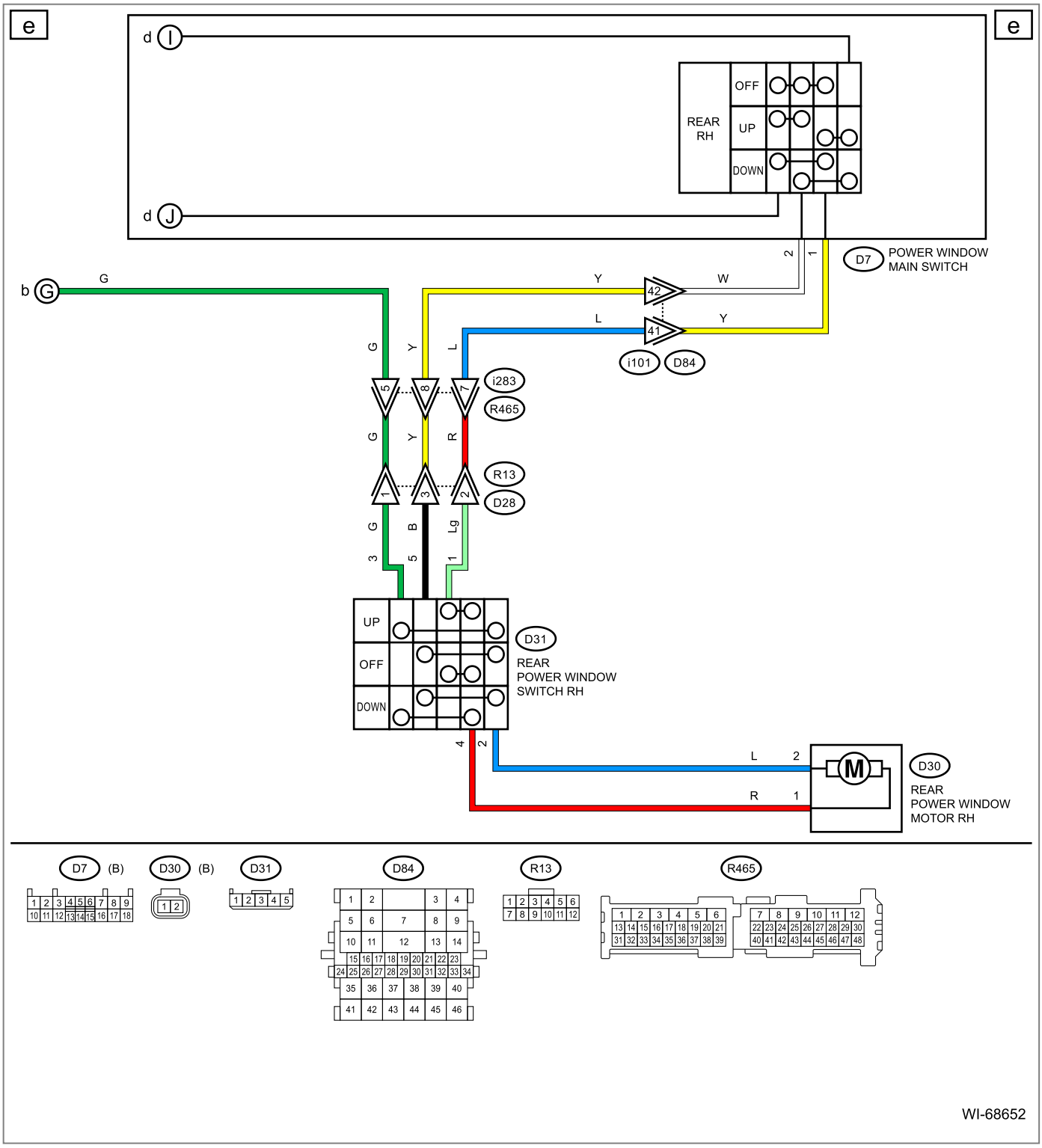

b
b
POWER WINDOW SWITCH CONTROLLER
SWITCH ILLUMI. LIGHT
SWITCH ILLUMI. LIGHT
SWITCH ILLUMI. LIGHT
DRIVER'S SIDE
OFF
UP
DOWN
AUTO SWITCH
ON
OFF
UNLOCK
LOCK
POWER WINDOW LOCK SWITCH
C d
D d
D7
POWER WINDOW MAIN SWITCH
10 G
14 L
12 G
11 Y
7 B
18 P
G
B
L
P
35
12
36
7
D84
i101
W
B/Y
Sb
G
a B W
a A G
W E c
G F d
G G e
Sb H c
5 G
7 L
1 B
8 G
6 Y
B/Y
FRONT POWER WINDOW MOTOR LH
D3
CONTROL UNIT
DRIVING UNIT
M
E
REF. TO GND [g]
Sb L2
BODY INTEGRATED UNIT
L: i81
D3 (B)
D7 (B)
D84
L: i81 (B)
WI-68649


C
C
b E
W
b H
Sb
AUTO UP
UP
OFF
DOWN
AUTO DOWN
FRONT
POWER WINDOW
SUB-SWITCH
D17
Sb
W
36
35
i76
D83
2
5
6
1
7
B
Y
R
Or
G
L
W/G
B
B
1
6
8
4
3
7
5
B
D83
i76
12
B
CONTROL UNIT
DRIVING UNIT
D13
FRONT
POWER WINDOW
MOTOR RH
M
E
REF. TO GND [g]

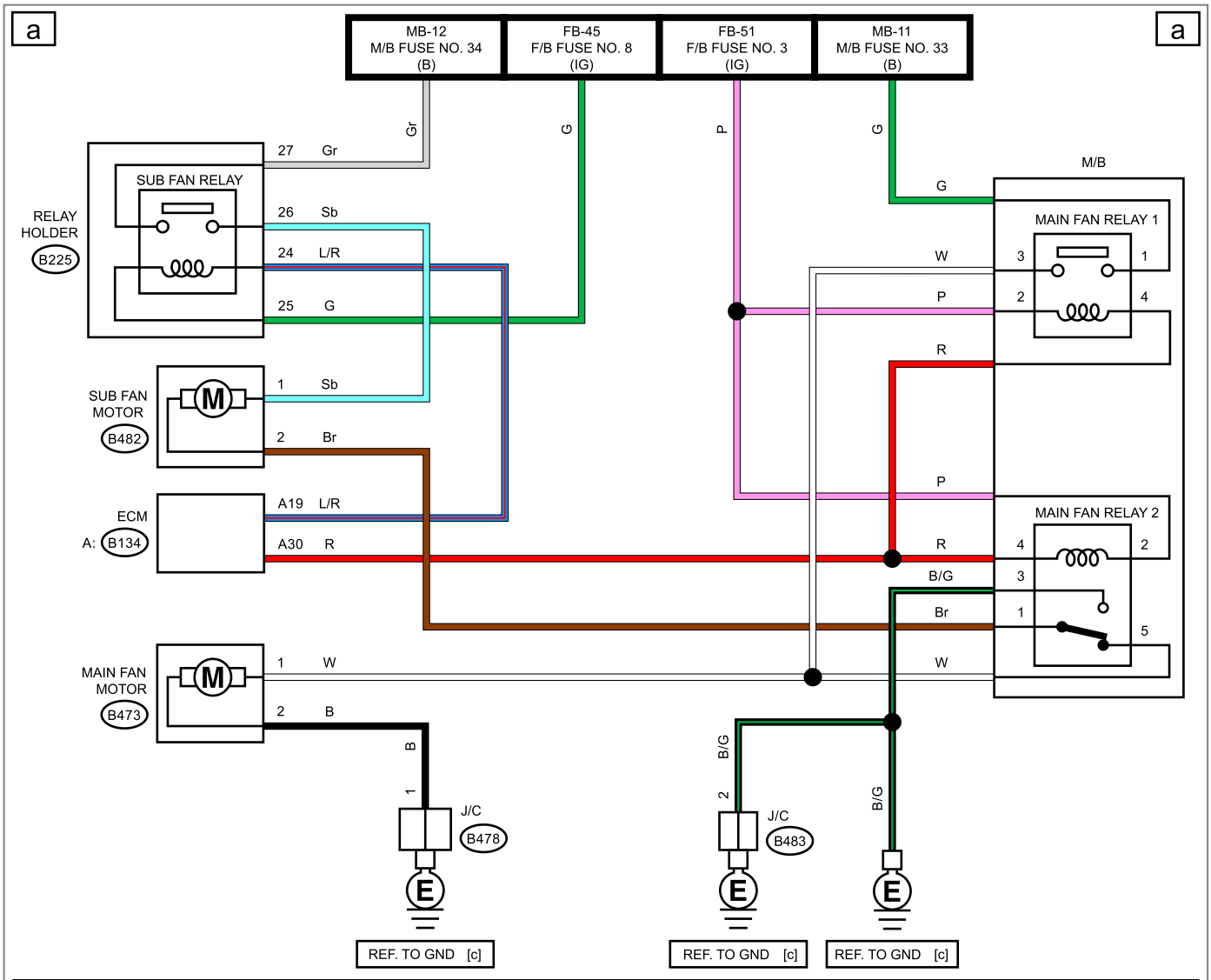

D13
(B)
D17
D83
1 2 3 4 5 6 7 8
1 2 3 4 5 6 7 8
1 2 3 4
5 6 7 8 9
10 11 12 13 14
15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31 32 33 34
35 36 37 38 39 40
41 42 43 44 45 46

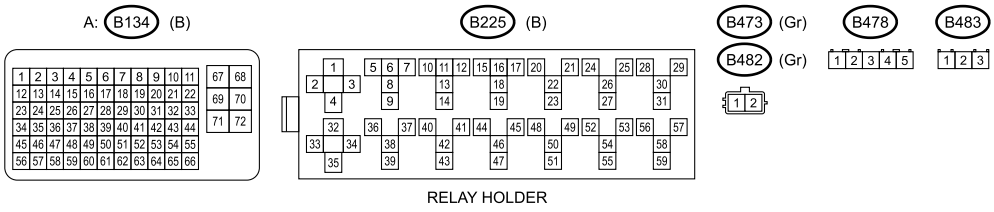
WI-68650


d
d
b C
I e
REAR LH
OFF
UP
DOWN
b D
J e
D7 POWER WINDOW MAIN SWITCH
8 R
9 V
D84
44
43
i101
b F
G
G
B
G
i285
5
8
7
R467
G
Y
R
R10
1
3
2
D22
3 G
5 B
1 Lg
UP
OFF
DOWN
D25
REAR
POWER WINDOW
SWITCH LH
4
2
L
2
R
1
M
D24
REAR
POWER WINDOW
MOTOR LH
D7 (B)
D24 (B)
D25
D84
R10
R467
WI-68651


e
e
d I
d J
REAR RH
OFF
UP
DOWN
D7 POWER WINDOW MAIN SWITCH
b G
G
Y
W
L
Y
42
41
i101
D84
i283
R465
R13
D28
G
Y
L
R
G
B
Lg
UP
OFF
DOWN
D31
REAR POWER WINDOW SWITCH RH
L
R
M
D30
REAR POWER WINDOW MOTOR RH
D7 (B)
D30 (B)
D31
D84
R13
R465
WI-68652

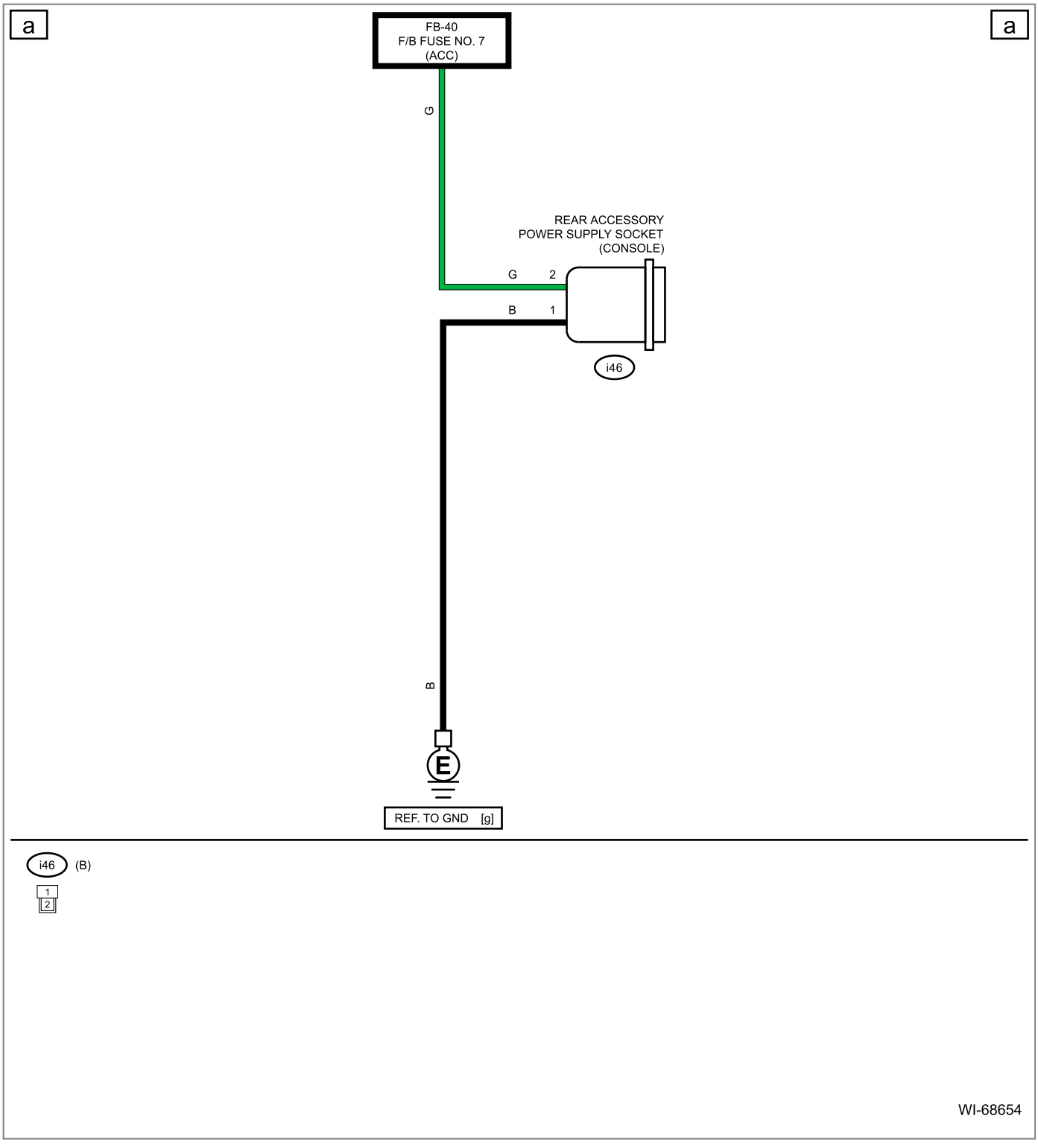
WIRING DIAGRAM


a
a
MB-12
M/B FUSE NO. 34
(B)
FB-45
F/B FUSE NO. 8
(IG)
FB-51
F/B FUSE NO. 3
(IG)
MB-11
M/B FUSE NO. 33
(B)
Gr
G
P
G
M/B
G
MAIN FAN RELAY 1
W
P
R
P
MAIN FAN RELAY 2
R
B/G
Br
W
B/G
B/G
B
SUB FAN RELAY
RELAY HOLDER
B225
27 Gr
26 Sb
24 L/R
25 G
SUB FAN MOTOR
B482
1 Sb
2 Br
ECM
A: B134
A19 L/R
A30 R
MAIN FAN MOTOR
B473
1 W
2 B
J/C
B478
J/C
B483
REF. TO GND [c]
REF. TO GND [c]
REF. TO GND [c]

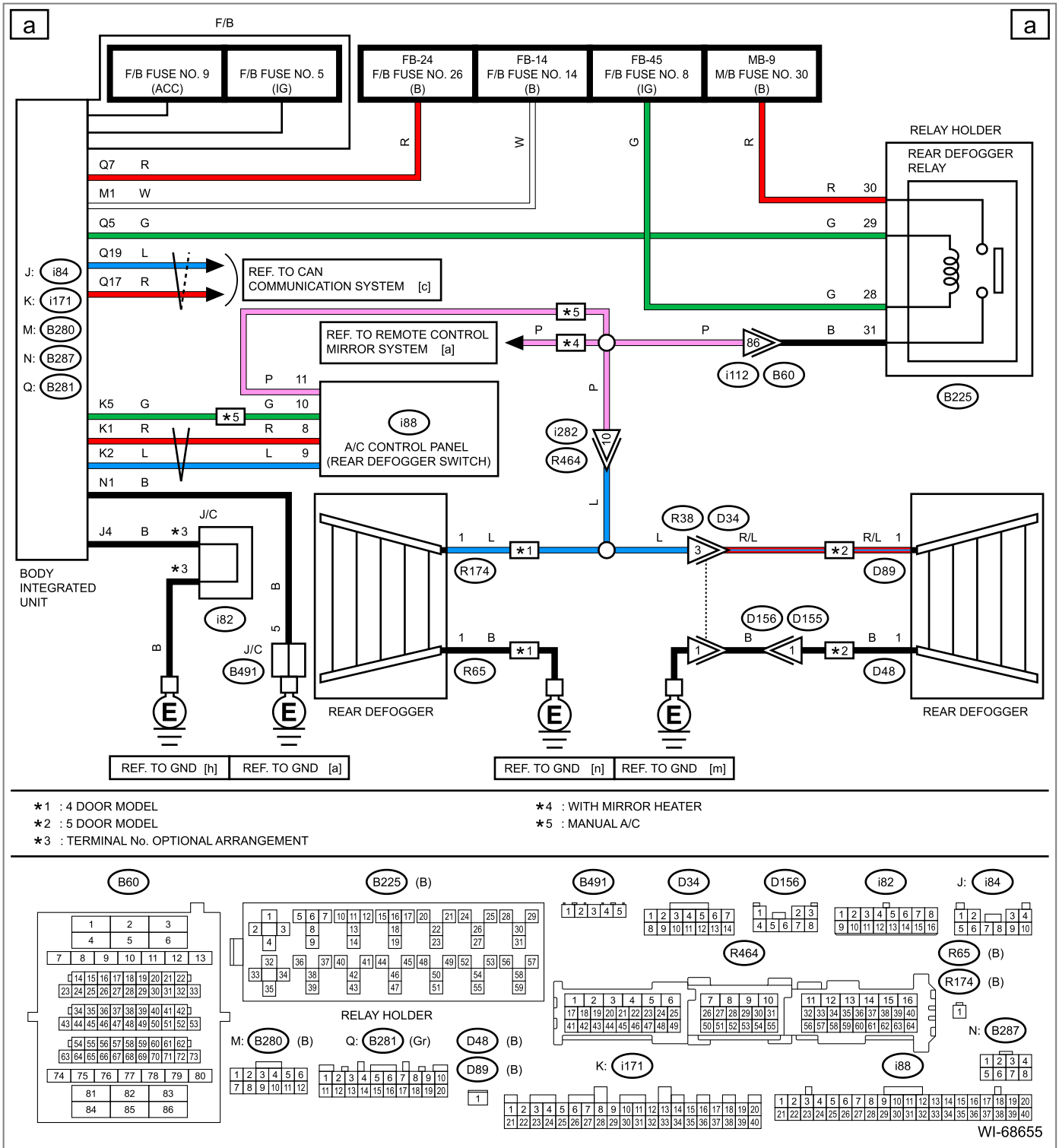

A: B134 (B)
B225 (B)
B473 (Gr)
B482 (Gr)
B478
B483
RELAY HOLDER

WI-68653

WIRING DIAGRAM


a
a
FB-40
F/B FUSE NO. 7
(ACC)
G
REAR ACCESSORY
POWER SUPPLY SOCKET
(CONSOLE)
G 2
B 1
i46
B
E
REF. TO GND [g]
i46 (B)
1
2
WI-68654

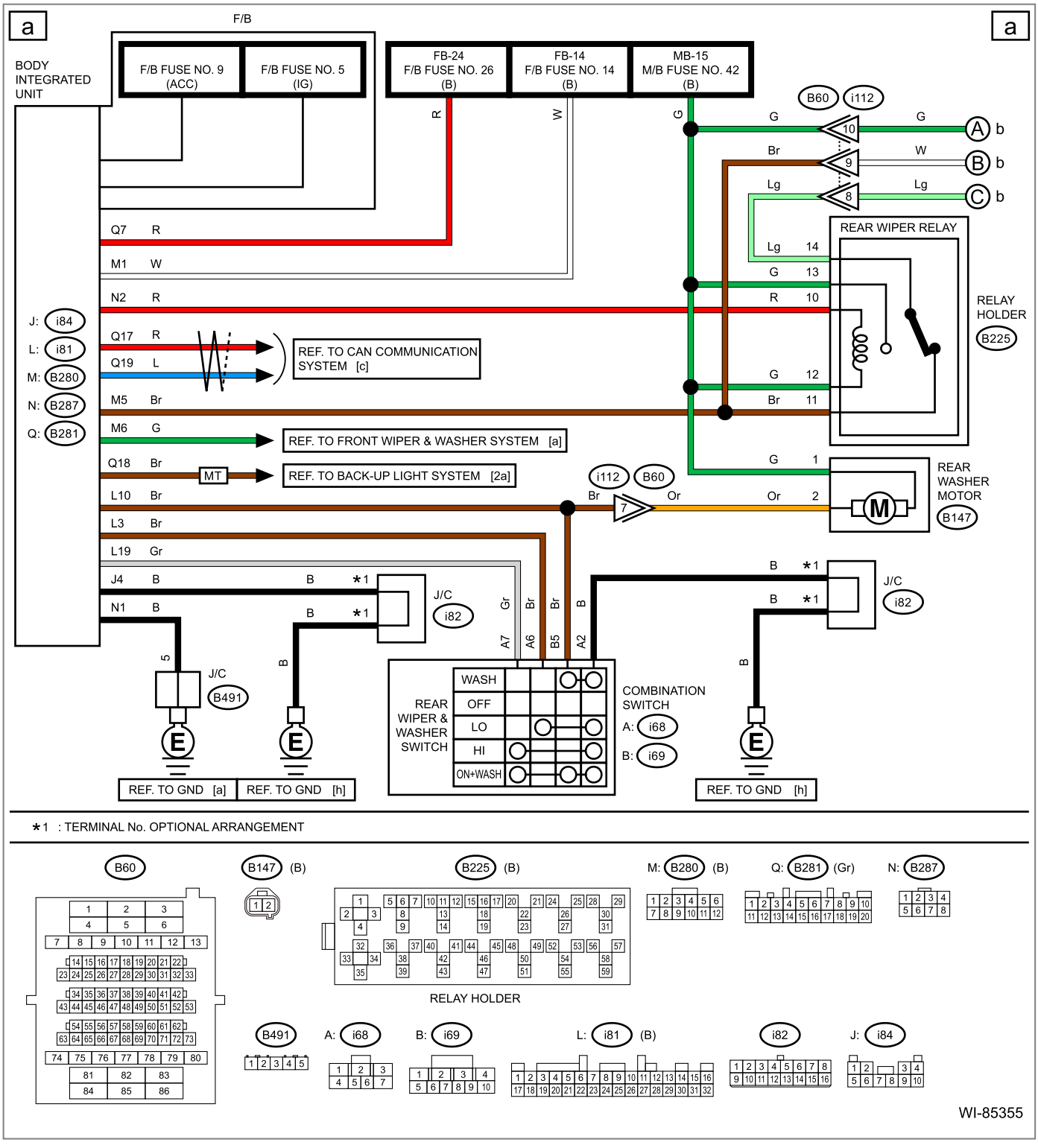
WIRING DIAGRAM



*1 : 4 DOOR MODEL
*2 : 5 DOOR MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT
*4 : WITH MIRROR HEATER
*5 : MANUAL A/C

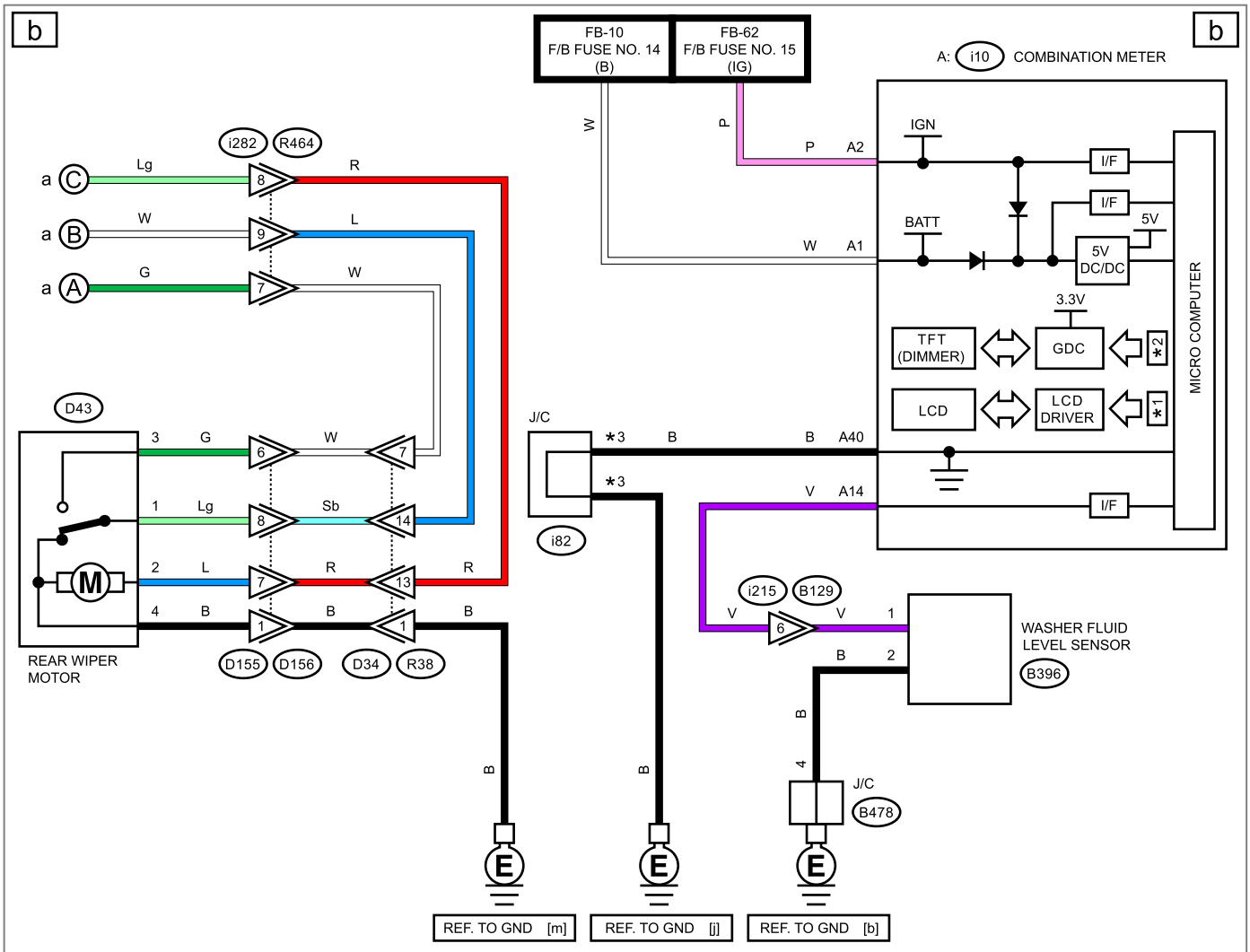
WI-68655

WIRING DIAGRAM

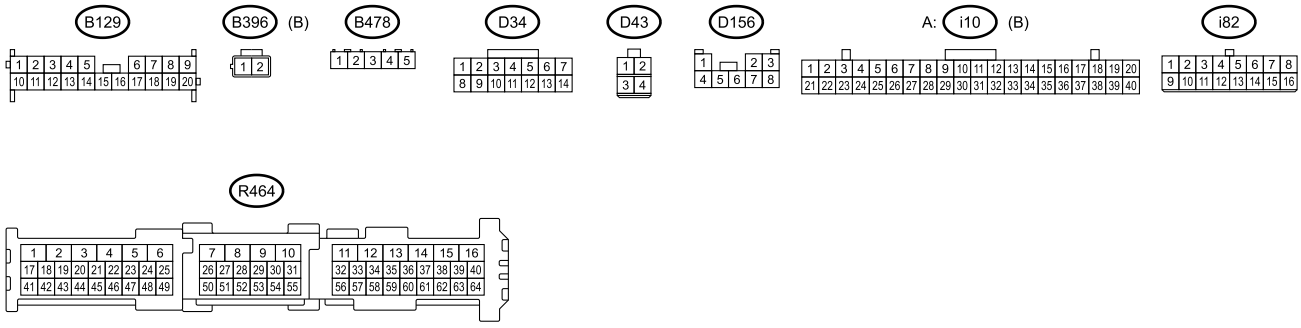


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

WI-85355

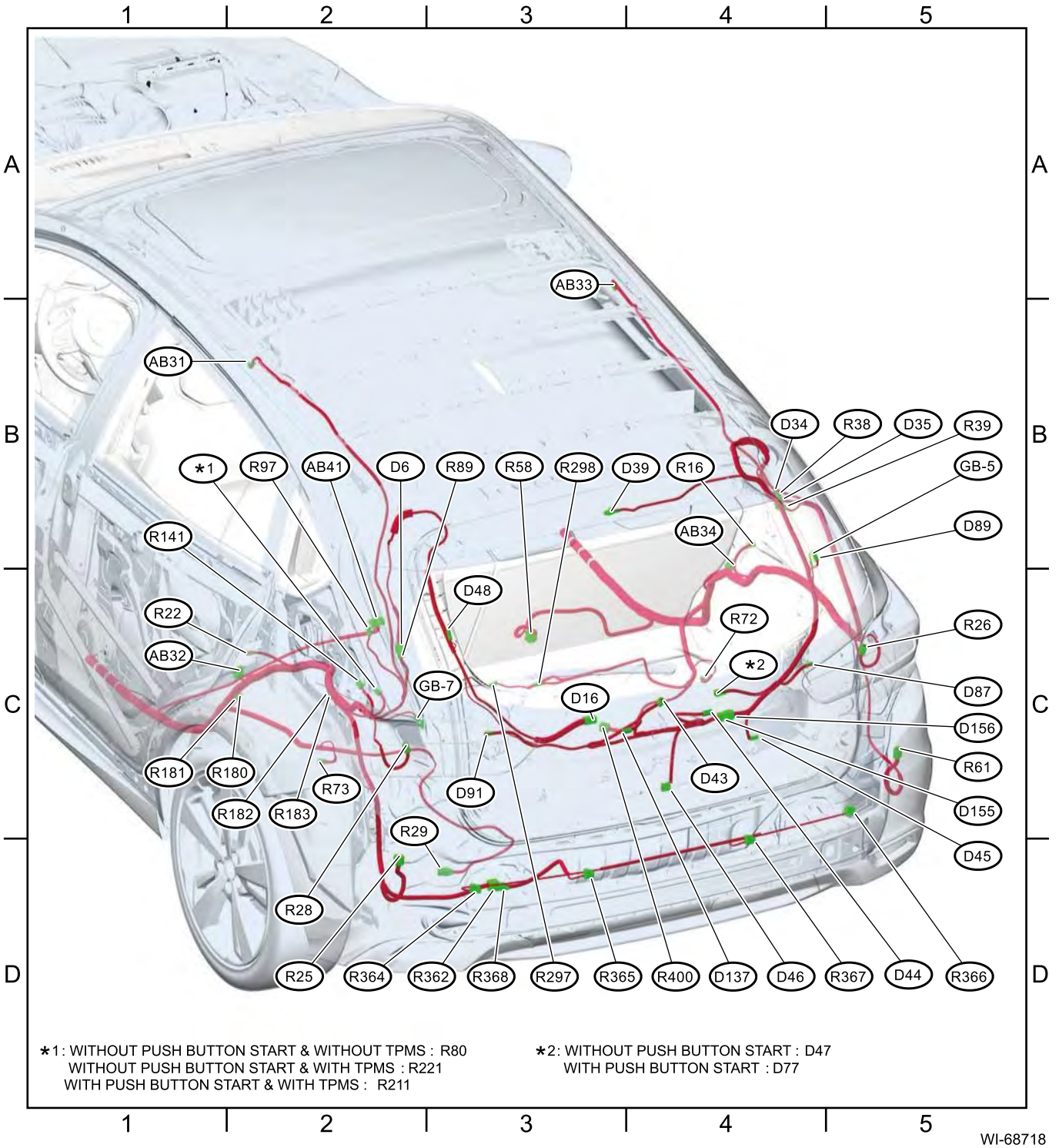


*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68660

LOCATION

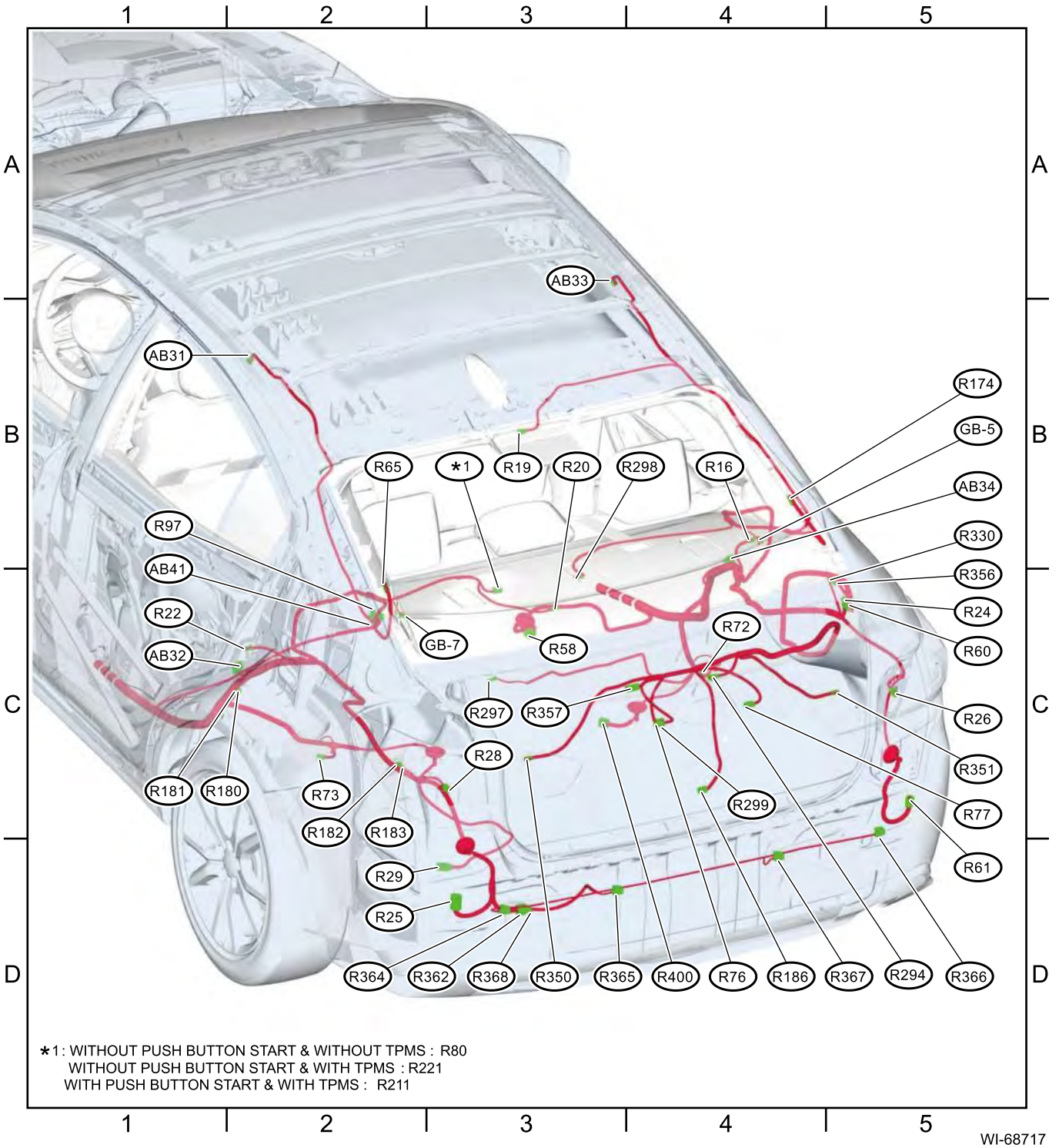


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB31	2	B	B-2		Curtain airbag module LH
AB32	4	Y	C-2		Curtain airbag sensor LH
AB33	2	B	A-3		Curtain airbag module RH
AB34	4	Y	B-4		Curtain airbag sensor RH
AB41	2	Y	C-2		Satellite safing sensor

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
D6	8	★	C-2	R89	Rear wiring harness LH
D16	6	★	C-3		Rearview camera
D34	14	★	B-4	R38	Rear wiring harness RH
D35	8	★	B-4	R39	
D39	2	★	B-3		High-mounted stop light
D43	4	★	C-4		Rear wiper motor
D44	2	★	C-4		License plate light RH
D45	3	★	C-4		Keyless access exterior antenna (rear gate)
D46	4	★	C-4		Rear gate lock actuator & latch switch
D47	2	Br	C-4		Rear gate opener button
D48	1	B	C-3		Rear defogger
D77	4	★	C-4		Rear lock button & rear gate button
D87	2	★	C-4		Rear finisher light RH
D89	1	B	B-4		Rear defogger
D91	2	★	C-3		Rear finisher light LH
D137	2	★	C-4		License plate light LH
D155	8	★	C-4	D156	Rear gate cord RH
D156	8	★	C-4	D155	Rear gate cord LWR
R16	4	Gr	B-4		Rear door switch RH
R22	4	Gr	C-2		Rear door switch LH
R25	10	B	D-2		Radar sensor LH (master)
R26	4	Gr	C-5		Rear combination light RH
R28	4	Gr	C-2		Rear combination light LH
R29	3	B	D-3		Rear vehicle height sensor
R38	14	★	B-4	D34	Rear gate cord RH
R39	8	★	B-4	D35	
R58	6	Gr	C-3		Fuel pump ASSY
R61	10	B	C-5		Radar sensor RH (slave)
R72	2	Gr	C-4		Rear ABS wheel speed sensor RH
R73	2	Gr	C-2		Rear ABS wheel speed sensor LH
R80	12	★	C-2		Keyless entry CM (without push button start)
R89	8	★	C-2	D6	Rear gate cord LH
R97	1	★	C-2	AN18	Antenna
R141	2	Gr	C-2		Luggage room light
R180	4	★	C-2		J/C
R181	4	★	C-2		
R182	4	★	C-2		
R183	4	★	C-2		
R211	12	★	C-2		TPMS CM
R221	12	★	C-2		TPMS & keyless entry CM
R297	3	★	C-3		Keyless access interior antenna (center)

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
R298	3	★	C-3		Keyless access interior antenna (rear)
R362	8	B	D-3		Sonar sensor cord
R364	2	B	D-3		Sonar sensor (left corner)
R365	2	B	D-3		Sonar sensor (left inner)
R366	2	B	C-5		Sonar sensor (right corner)
R367	2	B	D-4		Sonar sensor (right inner)
R368	8	B	D-3	R362	Rear wiring harness
R400	8	Gr	C-3		Leak check valve ASSY
GB-5	—	—	B-4		—
GB-7	—	—	C-2		—
★: White or natural color					

LOCATION

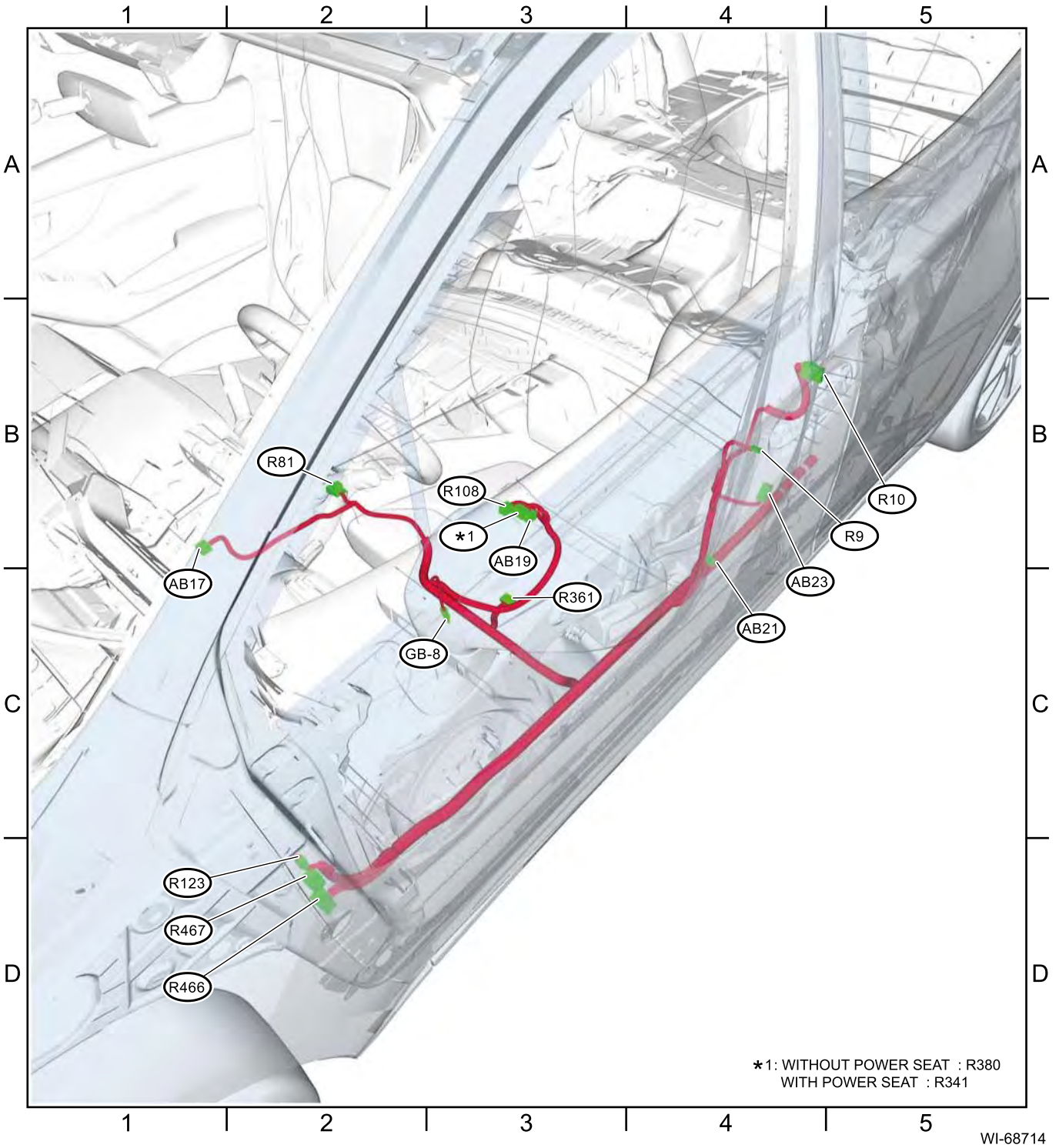


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB31	2	B	B-2		Curtain airbag module LH
AB32	4	Y	C-2		Curtain airbag sensor LH
AB33	2	B	A-3		Curtain airbag module RH
AB34	4	Y	B-4		Curtain airbag sensor RH
AB41	2	Y	C-2		Satellite safing sensor

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
R16	4	Gr	B-4		Rear door switch RH
R19	2	★	B-3		High-mounted stop light
R20	2	Gr	C-3		Trunk room light
R22	4	Gr	C-2		Rear door switch LH
R24	14	★	C-5	R60	Trunk lid cord
R25	10	B	D-3		Radar sensor LH (master)
R26	4	★	C-5		Rear combination light RH
R28	4	★	C-3		Rear combination light LH
R29	3	B	D-3		Rear vehicle height sensor
R58	6	Gr	C-3		Fuel pump ASSY
R60	14	★	C-5	R24	Rear wiring harness RH
R61	10	B	C-5		Radar sensor RH (slave)
R65	1	B	C-2		Rear defogger
R72	2	Gr	C-4		Rear ABS wheel speed sensor RH
R73	2	Gr	C-2		Rear ABS wheel speed sensor LH
R76	2	★	C-4		License plate light LH
R77	2	★	C-4		License plate light RH
R80	12	★	C-3		Keyless entry CM (without push button start)
R97	1	★	C-2	AN18	Antenna
R174	1	B	B-4		Rear defogger
R180	4	★	C-2		J/C
R181	4	★	C-2		
R182	4	★	C-2		
R183	4	★	C-2		
R186	3	★	C-4		Trunk lid lock actuator & switch
R211	12	★	C-3		TPMS CM
R221	12	★	C-3		TPMS & keyless entry CM
R294	2	★	C-4		Trunk opener button
R297	3	★	C-3		Keyless access interior antenna (center)
R298	3	★	C-3		Keyless access interior antenna (rear)
R299	3	★	C-4		Keyless access exterior antenna (trunk)
R330	8	★	C-5	R356	Trunk lid cord
R350	2	★	C-3		Rear finisher light LH
R351	2	★	C-5		Rear finisher light RH
R356	8	★	C-5	R330	Rear wiring harness RH
R357	6	★	C-4		Rearview camera
R362	8	B	D-3		Sonar sensor cord
R364	2	B	D-3		Sonar sensor (left corner)
R365	2	B	D-3		Sonar sensor (left inner)
R366	2	B	C-5		Sonar sensor (right corner)
R367	2	B	D-4		Sonar sensor (right inner)

Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
R368	8	B	D-3	R362	Rear wiring harness
R400	8	Gr	C-3		Leak check valve ASSY
GB-5	—	—	B-4		—
GB-7	—	—	C-2		—
★: White or natural color					

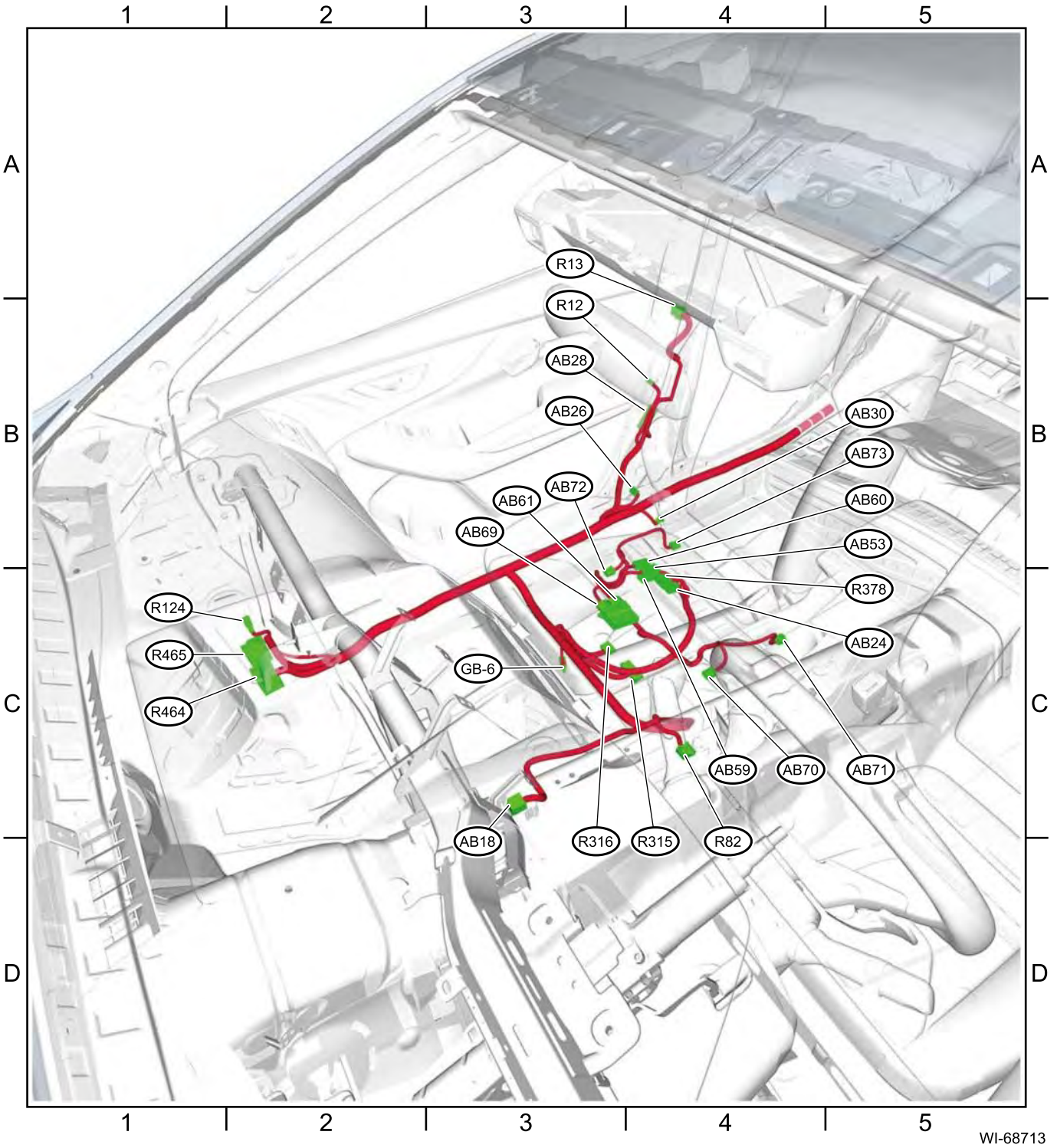
LOCATION



Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB17	24	Y	B-1		Airbag CM
AB19	2	Y	B-3		Side airbag module LH
AB21	4	Y	B-4		Pretensioner LH
AB23	4	Y	B-4		Side airbag sensor LH
R9	4	Gr	B-4		Front door switch LH

Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
R10	12	★	B-4	D22	Rear door cord LH
R81	8	★	B-2	R82	Rear wiring harness RH
R108	2	★	B-3		Seat belt switch LH
R123	2	Y	D-2	AB62	Airbag wiring harness
R341	14	★	B-3	R205	Power seat LH
R361	24	★	C-3		RAB CM
R380	14	★	B-3		Seat heater LH
R466	64	★	D-2	i284	Instrument panel wiring harness
R467	48	★	D-2	i285	
GB-8	—	—	C-3		—
★: White or natural color					

LOCATION

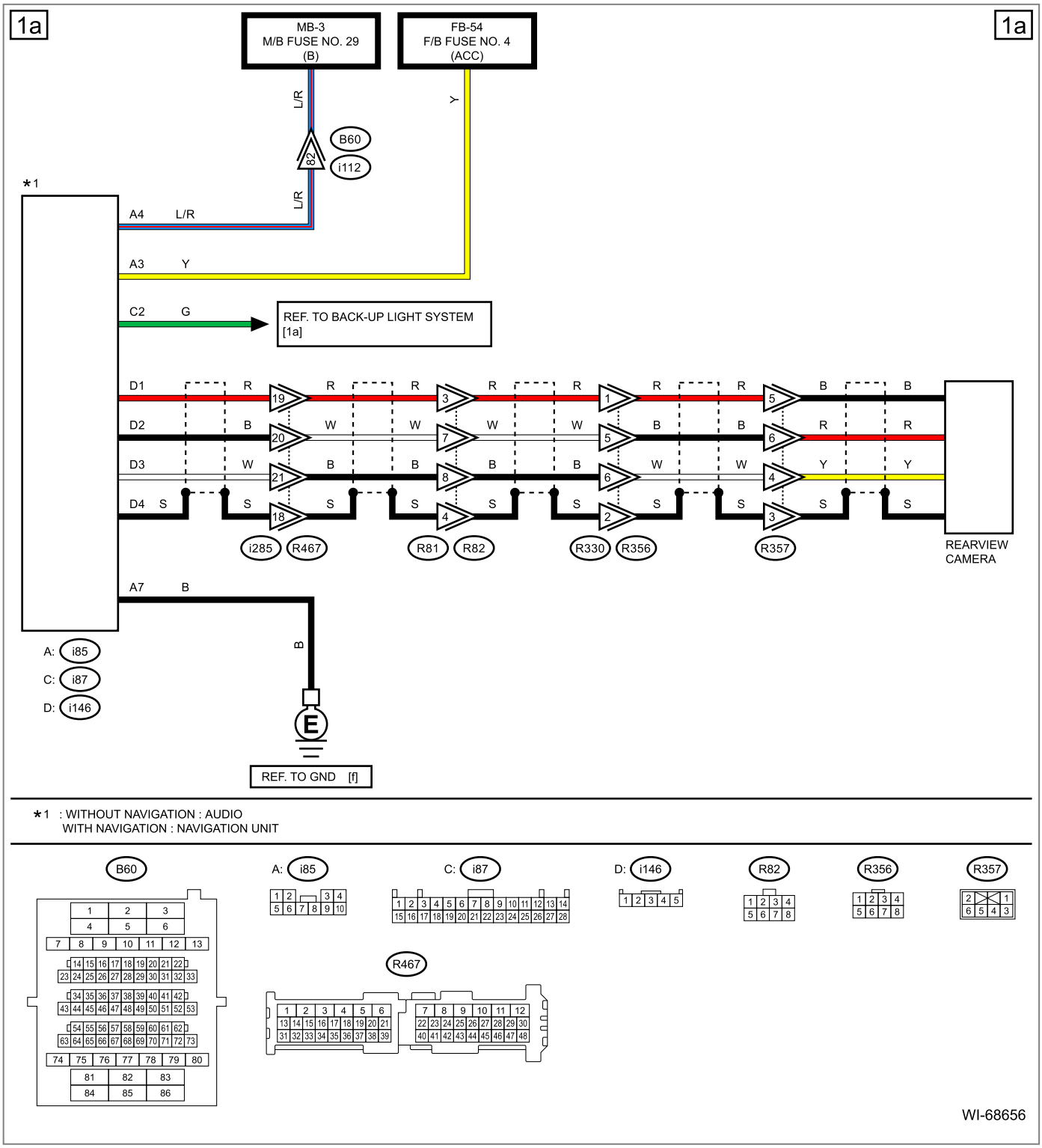


Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB18	24	Y	C-3		Airbag CM
AB24	2	Y	C-4		Side airbag module RH
AB26	4	Y	B-4		Pretensioner RH
AB28	4	Y	B-4		Side airbag sensor RH
AB30	2	Y	B-4		Lap pretensioner RH

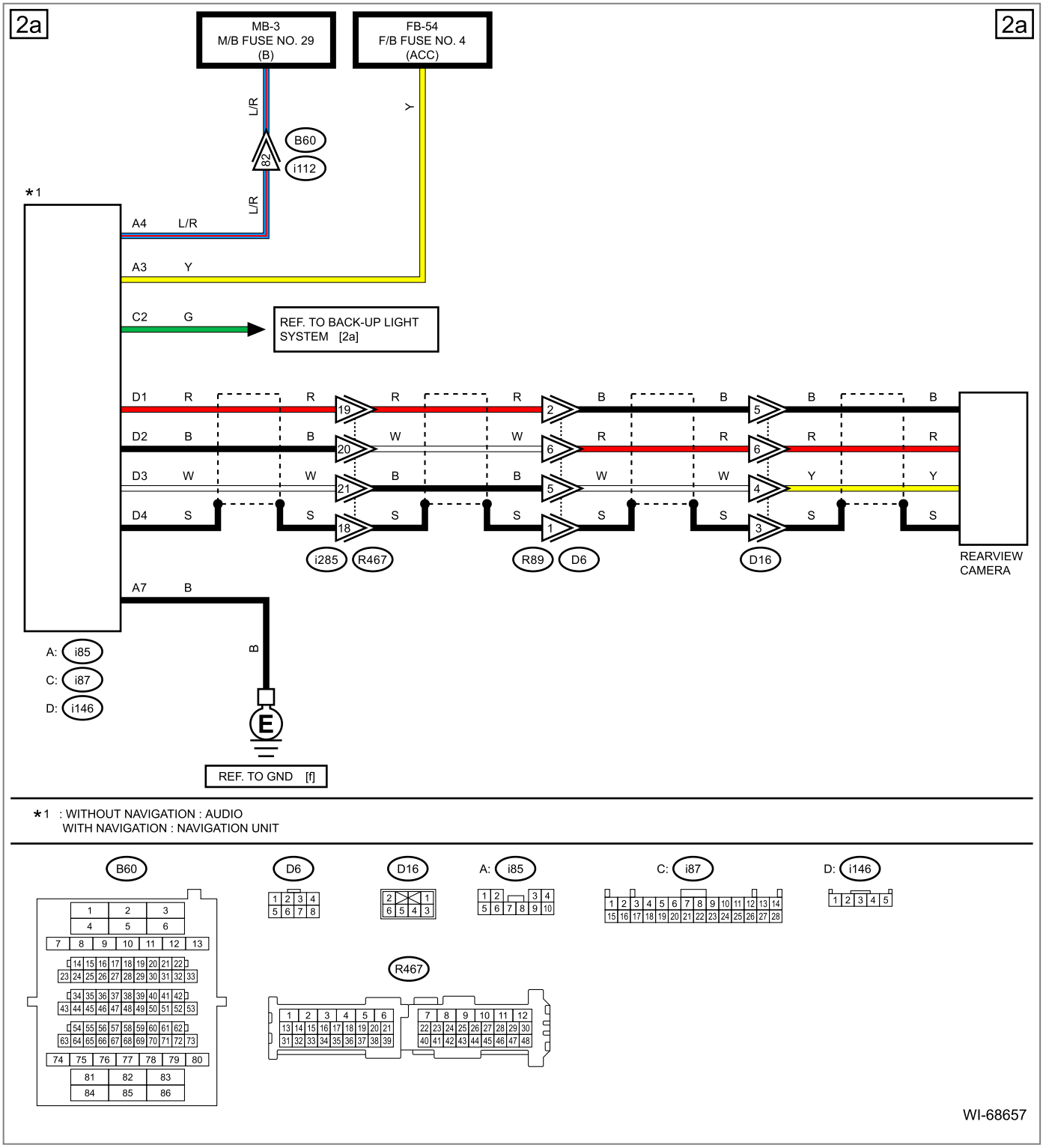
Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
AB53	6	Gr	B-4	AB59	Occupant detection wiring harness
AB59	6	Gr	C-4	AB53	Rear wiring harness RH
AB60	2	Y	B-4		Buckle switch (RH)
AB61	12	B	C-3		Occupant detection CM
AB69	12	Gr	C-3		
AB70	3	B	C-4		Load sensor 1 (FL)
AB71	3	Gr	C-4		Load sensor 3 (RL)
AB72	3	Gr	C-3		Load sensor 2 (FR)
AB73	3	B	B-4		Load sensor 4 (RR)
R12	4	Gr	B-4		Front door switch RH
R13	12	★	B-4	D28	Rear door cord RH
R82	8	★	C-4	R81	Rear wiring harness LH
R124	2	Y	C-2	AB63	Airbag wiring harness
R315	30	B	C-4		Audio amplifier
R316	24	★	C-3		
R378	14	★	C-4		Seat heater RH
R464	64	★	C-2	i282	Instrument panel wiring harness
R465	48	★	C-2	i283	
GB-6	—	—	C-3		—
★: White or natural color					

WIRING DIAGRAM

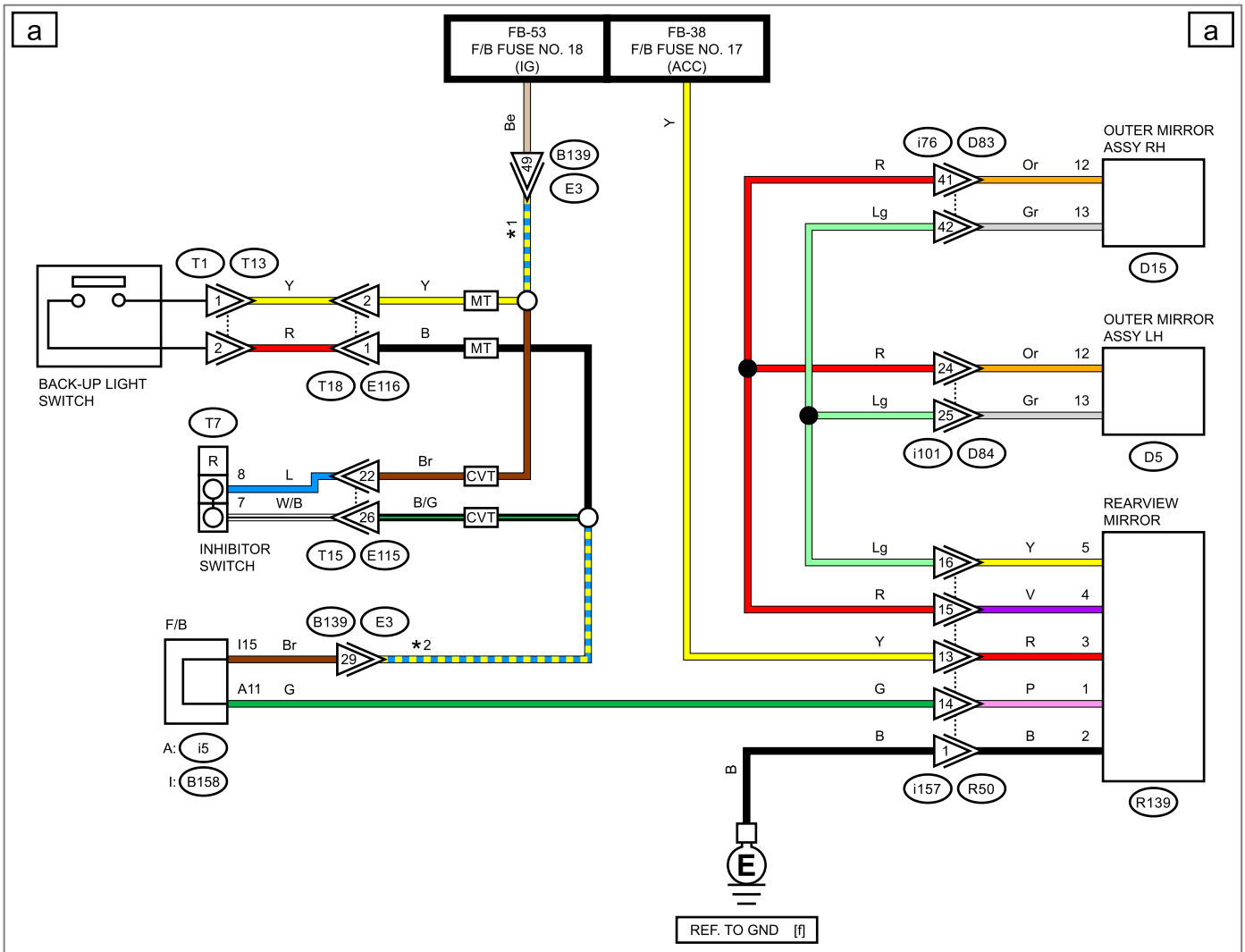
1. 4 DOOR MODEL



2. 5 DOOR MODEL

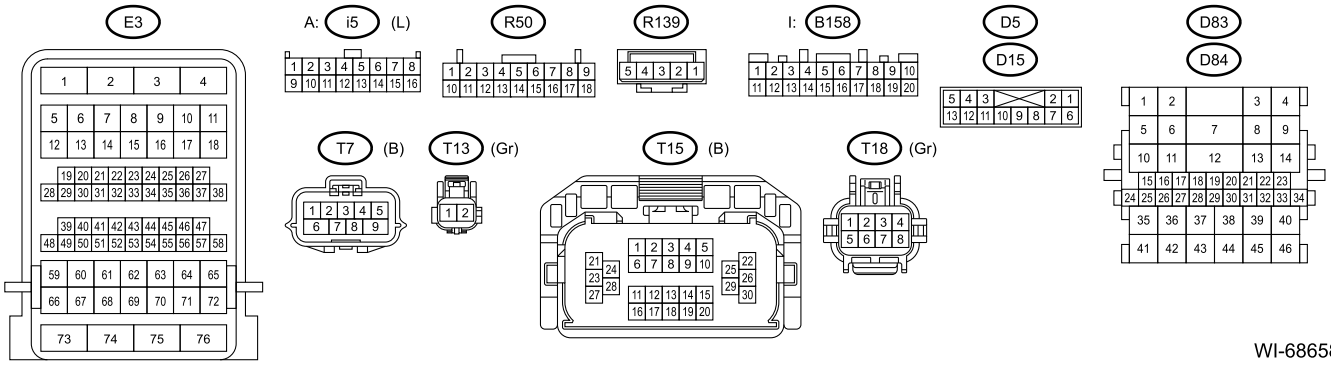


WIRING DIAGRAM



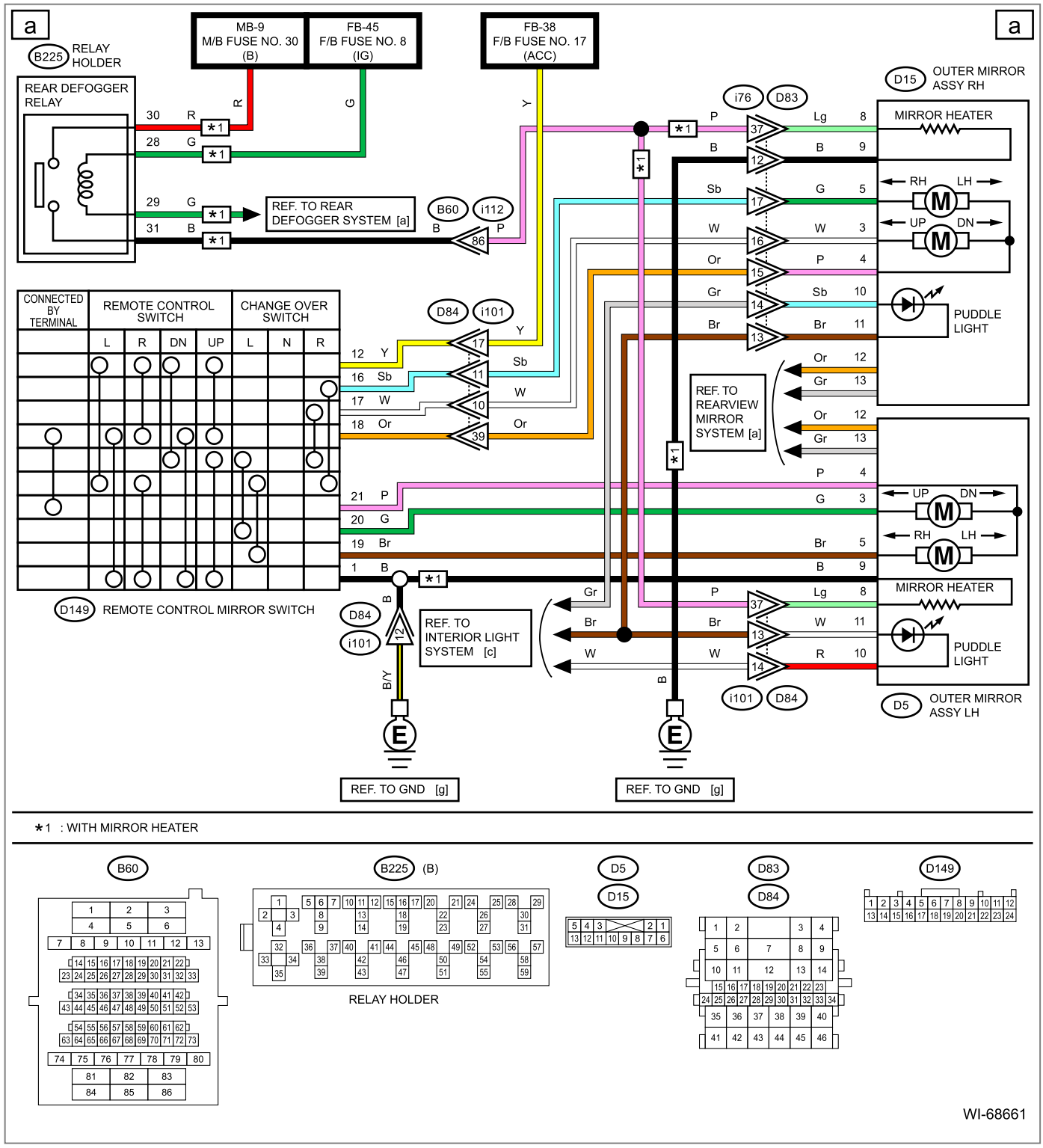
*1 : MT MODEL : Y
CVT MODEL : Br

*2 : MT MODEL : B
CVT MODEL : B/G



WI-68658

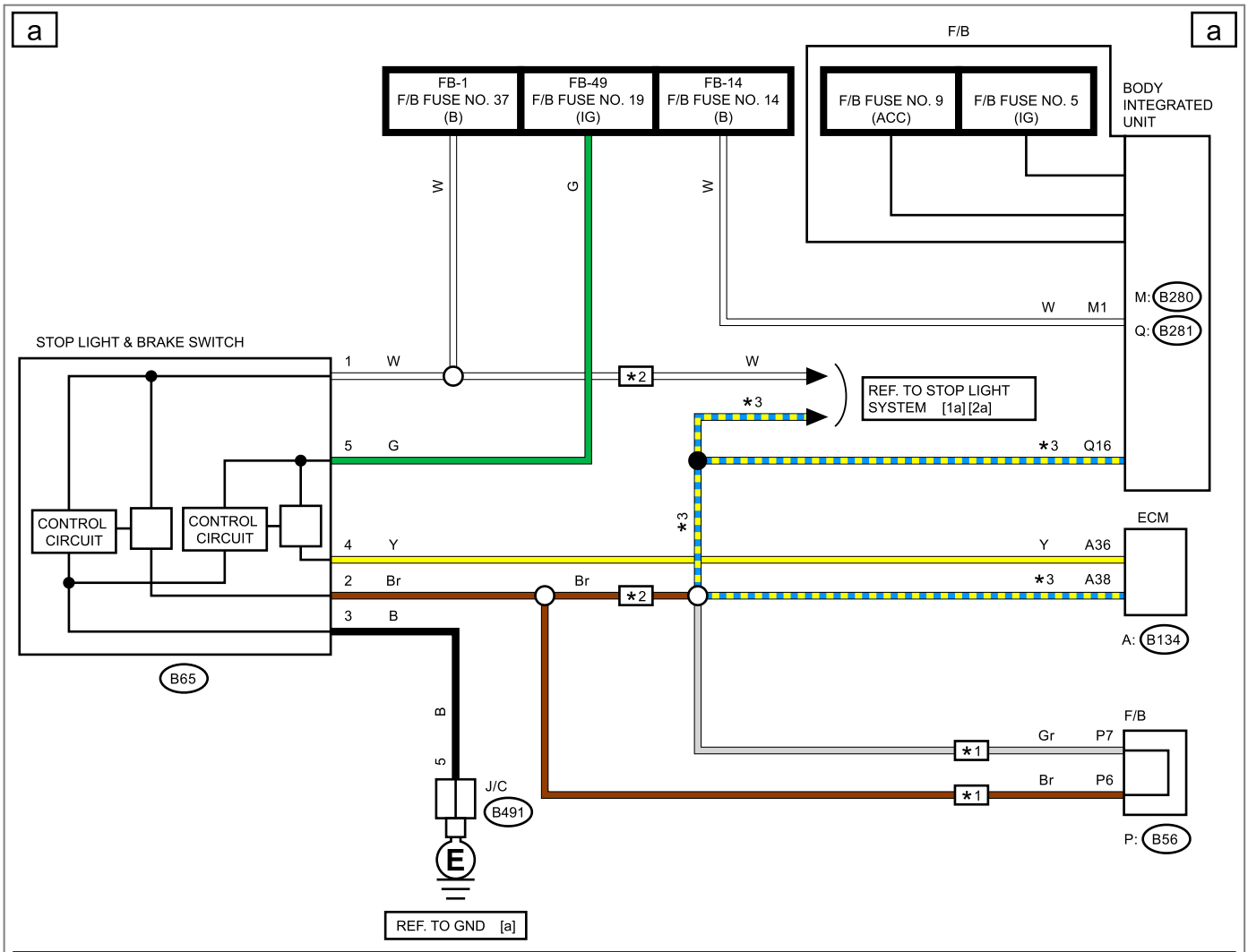
WIRING DIAGRAM

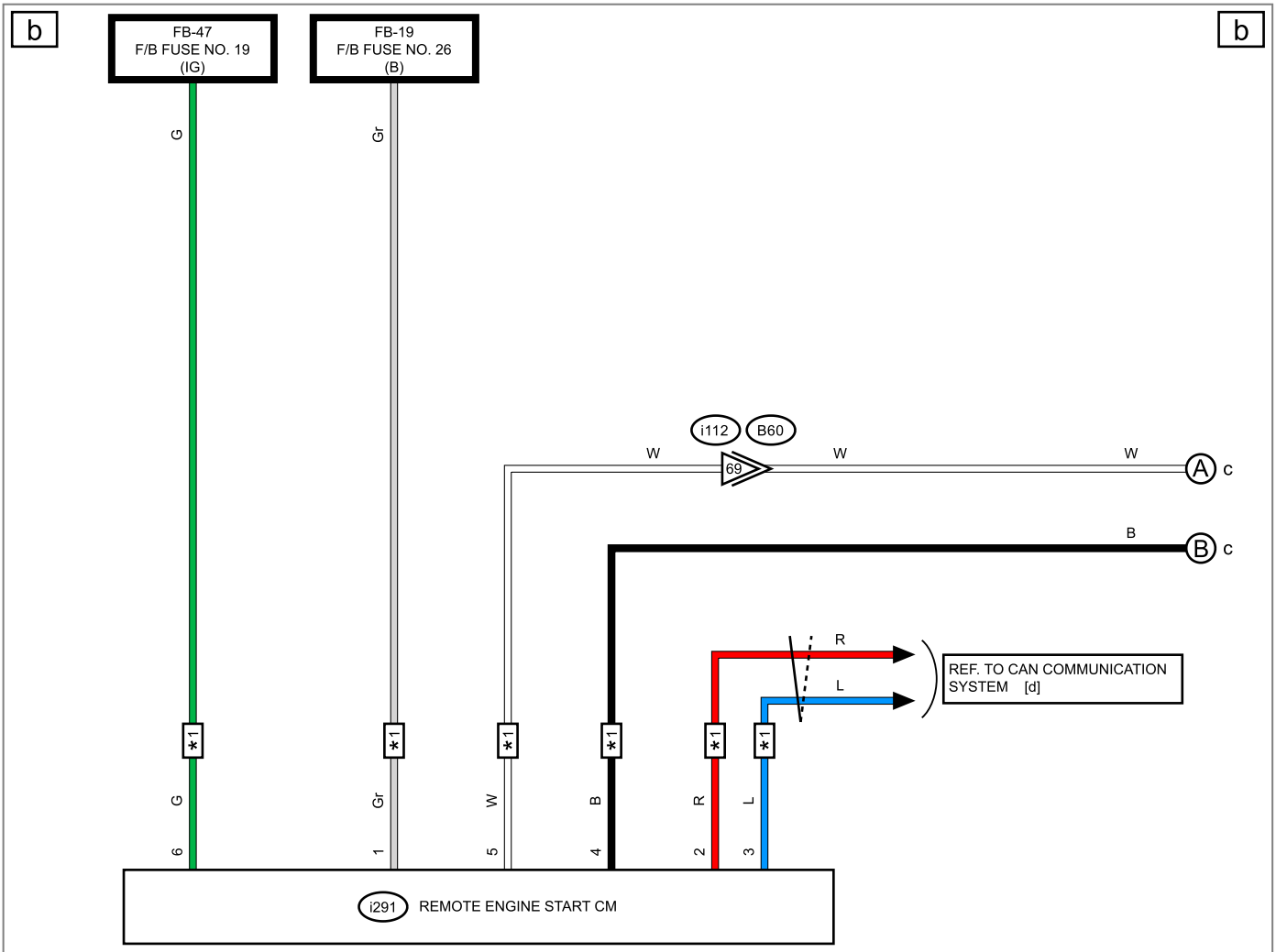


*1 : WITH MIRROR HEATER

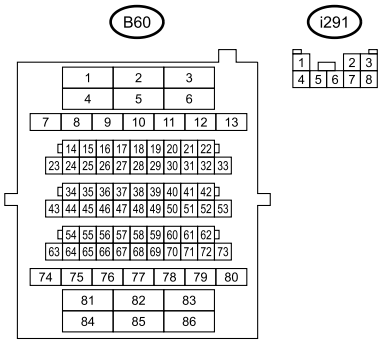
WI-68661

WIRING DIAGRAM

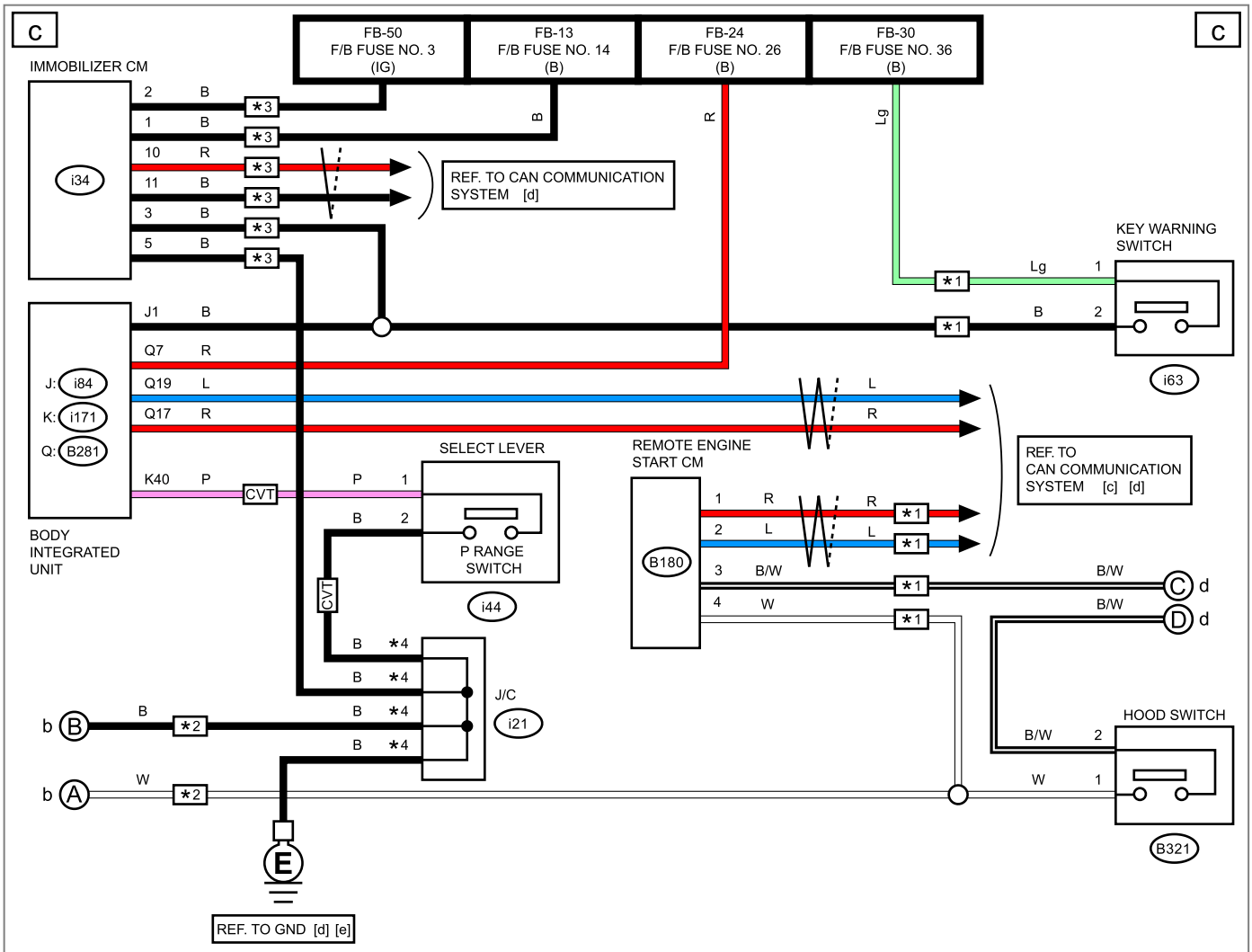

a
a
F/B
FB-1
F/B FUSE NO. 37
(B)
FB-49
F/B FUSE NO. 19
(IG)
FB-14
F/B FUSE NO. 14
(B)
F/B FUSE NO. 9
(ACC)
F/B FUSE NO. 5
(IG)
BODY
INTEGRATED
UNIT
W
G
W
W M1
M: B280
Q: B281
STOP LIGHT & BRAKE SWITCH
1 W
*2
W
REF. TO STOP LIGHT
SYSTEM [1a] [2a]
*3
5 G
*3 Q16
CONTROL
CIRCUIT
CONTROL
CIRCUIT
*3
ECM
4 Y
Y A36
2 Br
Br
*2
*3 A38
3 B
A: B134
B65
B
5
J/C
B491
F/B
Gr P7
*1
Br P6
*1
P: B56
E
REF. TO GND [a]
*1 : WITHOUT EyeSight
*2 : WITH EyeSight
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : Br
P: B56 (Br)
B65
A: B134 (B)
M: B280 (B)
Q: B281 (Gr)
B491
WI-68662



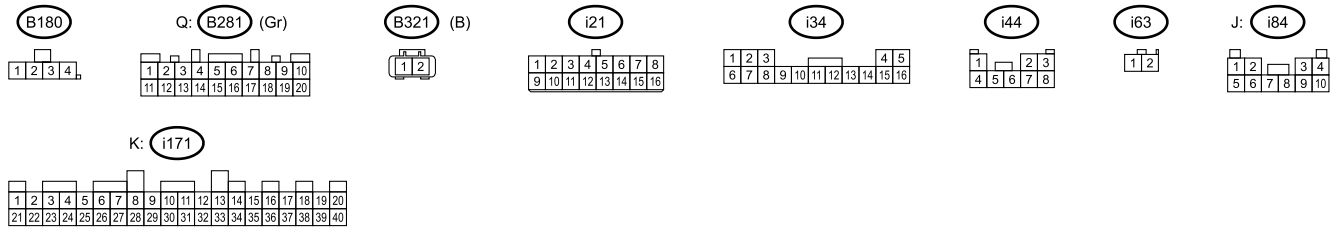
*1 : WITH PUSH BUTTON START



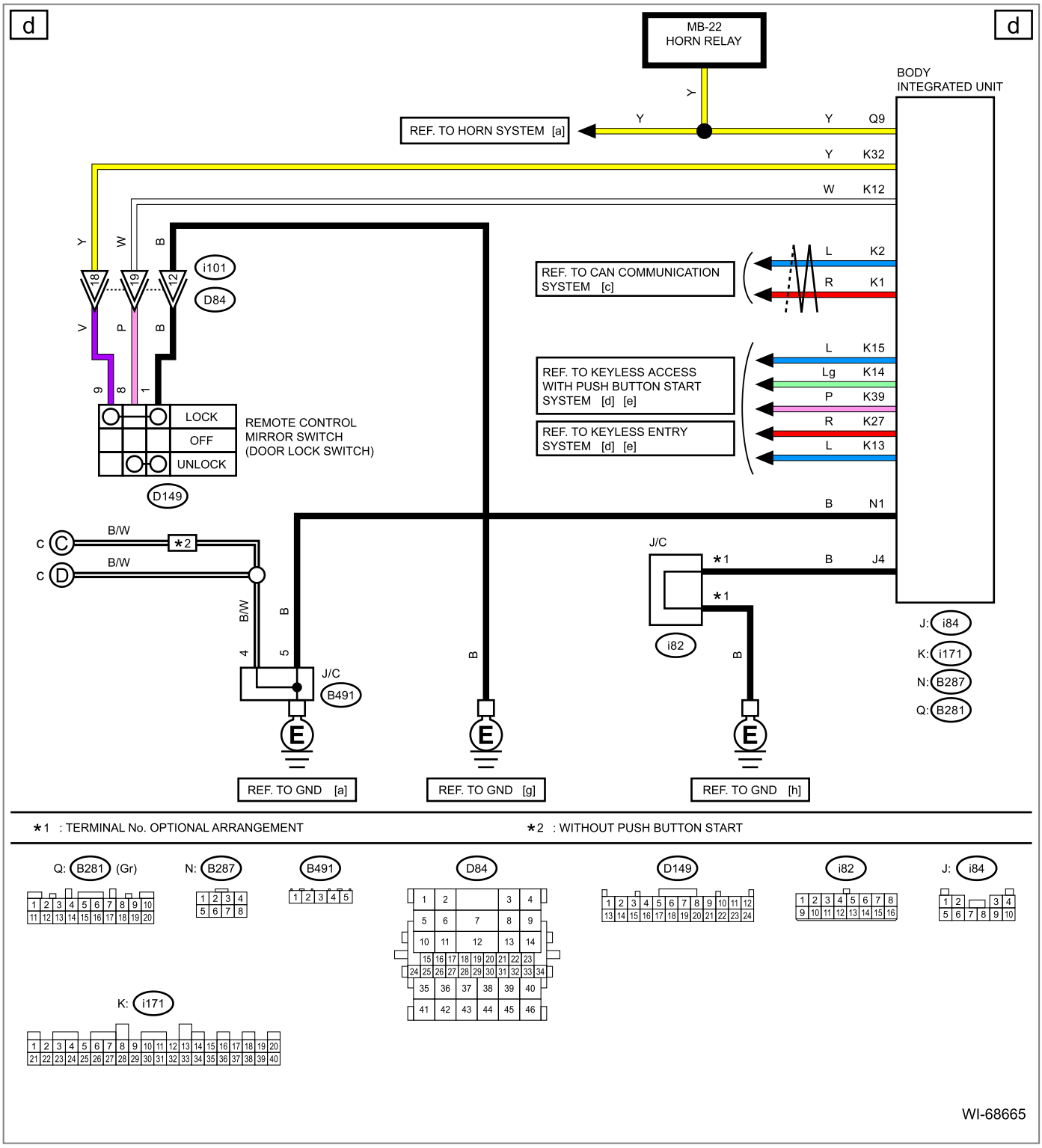
WI-68663



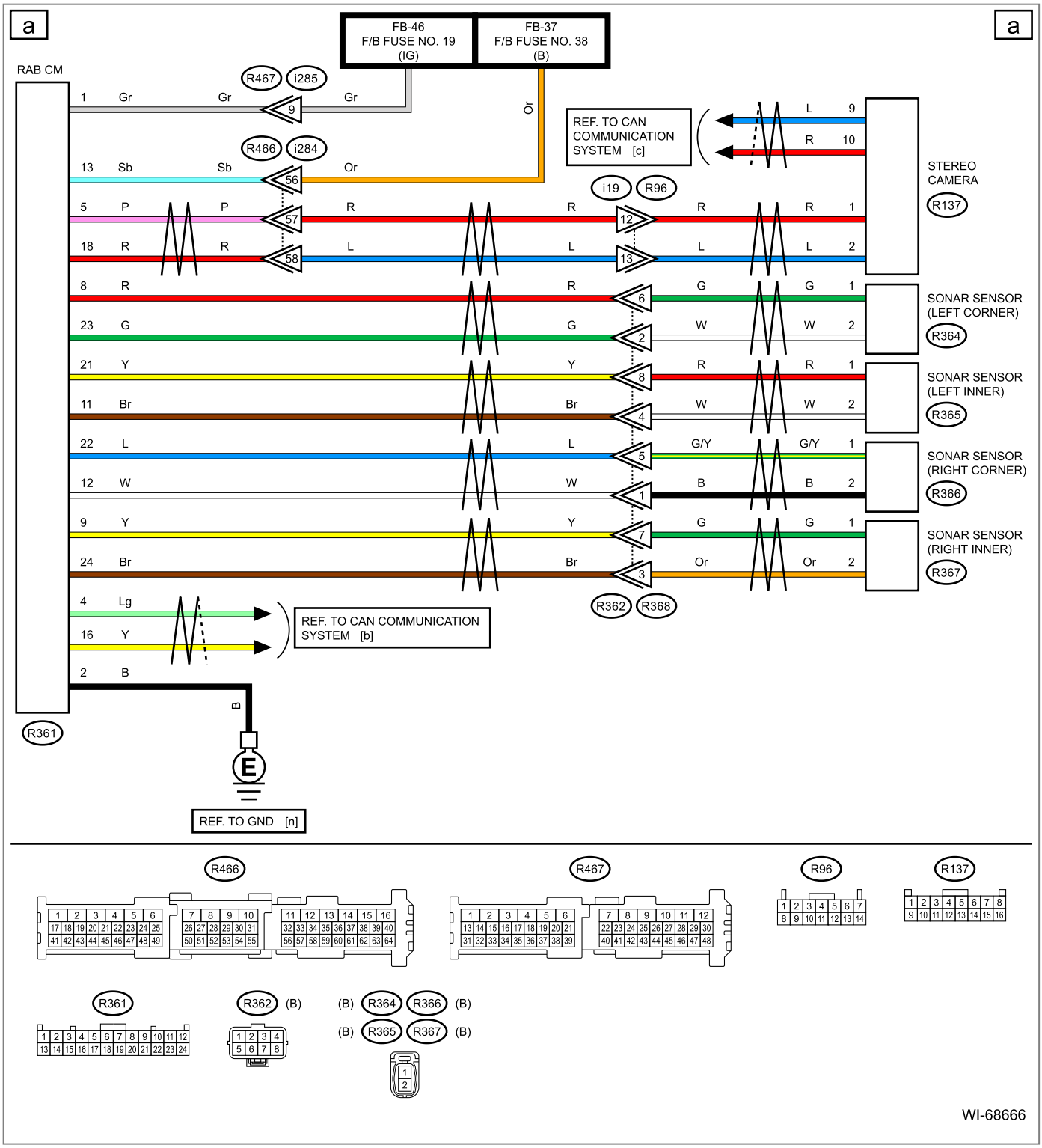
*1 : WITHOUT PUSH BUTTON START
*2 : WITH PUSH BUTTON START
*3 : WITH IMMOBILIZER CM
*4 : TERMINAL No. OPTIONAL ARRANGEMENT

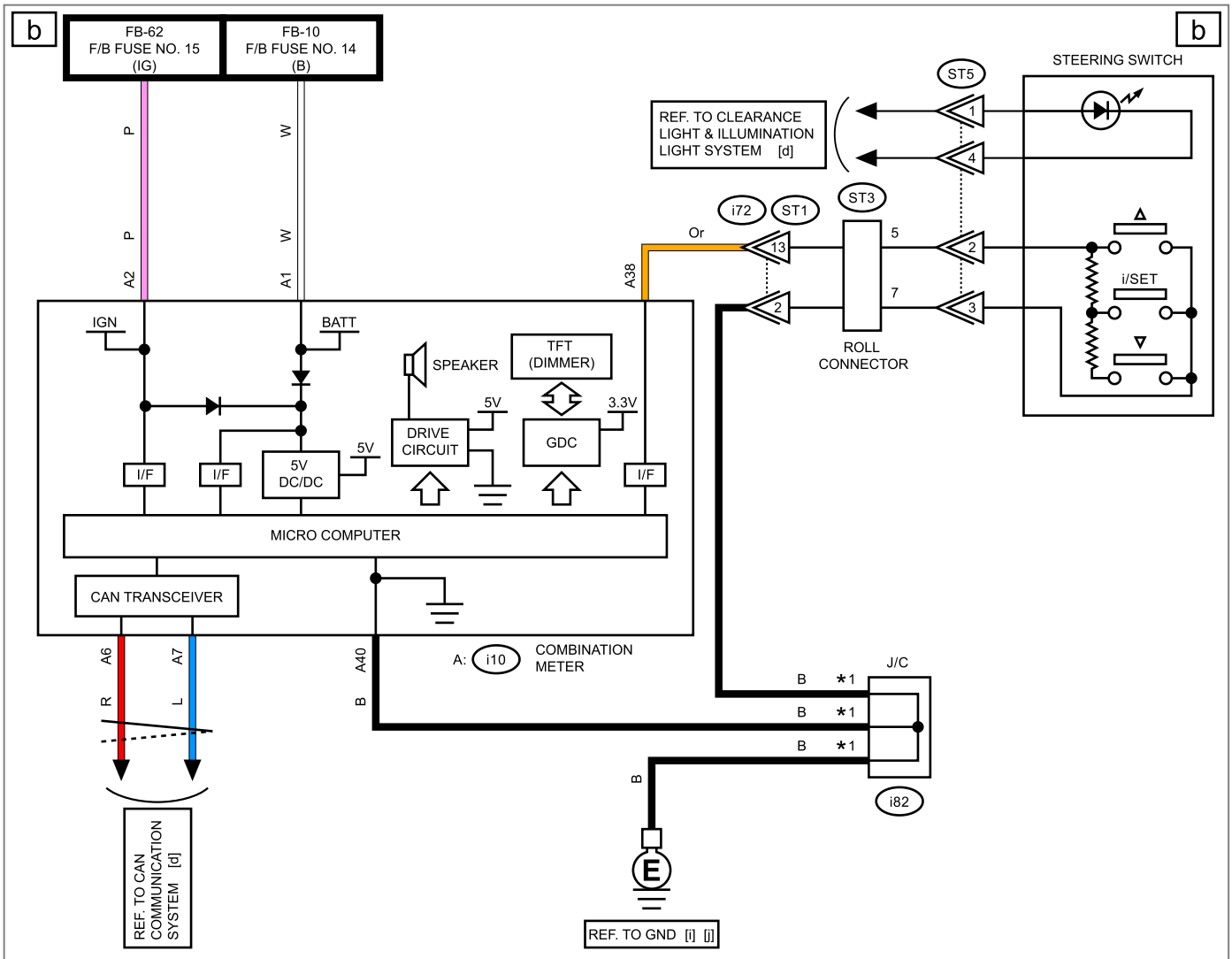


WI-68664

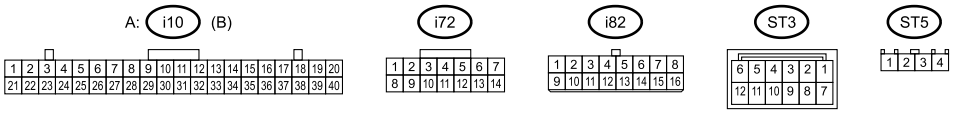

d
d
MB-22
HORN RELAY
BODY
INTEGRATED UNIT
REF. TO HORN SYSTEM [a]
Y
Y Q9
Y K32
W K12
REF. TO CAN COMMUNICATION SYSTEM [c]
L K2
R K1
REF. TO KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM [d] [e]
REF. TO KEYLESS ENTRY SYSTEM [d] [e]
L K15
Lg K14
P K39
R K27
L K13
B N1
i101
D84
D149
LOCK
OFF
UNLOCK
REMOTE CONTROL MIRROR SWITCH (DOOR LOCK SWITCH)
B/W
*2
J/C
B491
i82
*1
B J4
J: i84
K: i171
N: B287
Q: B281
REF. TO GND [a]
REF. TO GND [g]
REF. TO GND [h]
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITHOUT PUSH BUTTON START
Q: B281 (Gr)
N: B287
B491
D84
D149
i82
J: i84
K: i171
WI-68665

WIRING DIAGRAM


a
a
FB-46
F/B FUSE NO. 19
(IG)
FB-37
F/B FUSE NO. 38
(B)
RAB CM
R467
i285
R466
i284
1 Gr Gr 9 Gr
13 Sb Sb 56 Or
Or
REF. TO CAN COMMUNICATION SYSTEM [c]
L 9
R 10
STEREO CAMERA
R137
i19
R96
5 P P 57 R R 12 R R 1
18 R R 58 L L 13 L L 2
8 R R 6 G G 1
SONAR SENSOR (LEFT CORNER)
R364
23 G G 2 W W 2
21 Y Y 8 R R 1
SONAR SENSOR (LEFT INNER)
R365
11 Br Br 4 W W 2
22 L L 5 G/Y G/Y 1
SONAR SENSOR (RIGHT CORNER)
R366
12 W W 1 B B 2
9 Y Y 7 G G 1
SONAR SENSOR (RIGHT INNER)
R367
24 Br Br 3 Or Or 2
R362
R368
4 Lg
16 Y
REF. TO CAN COMMUNICATION SYSTEM [b]
2 B
B
R361
E
REF. TO GND [n]
R466
R467
R96
R137
R361
R362 (B)
(B) R364 R366 (B)
(B) R365 R367 (B)
WI-68666

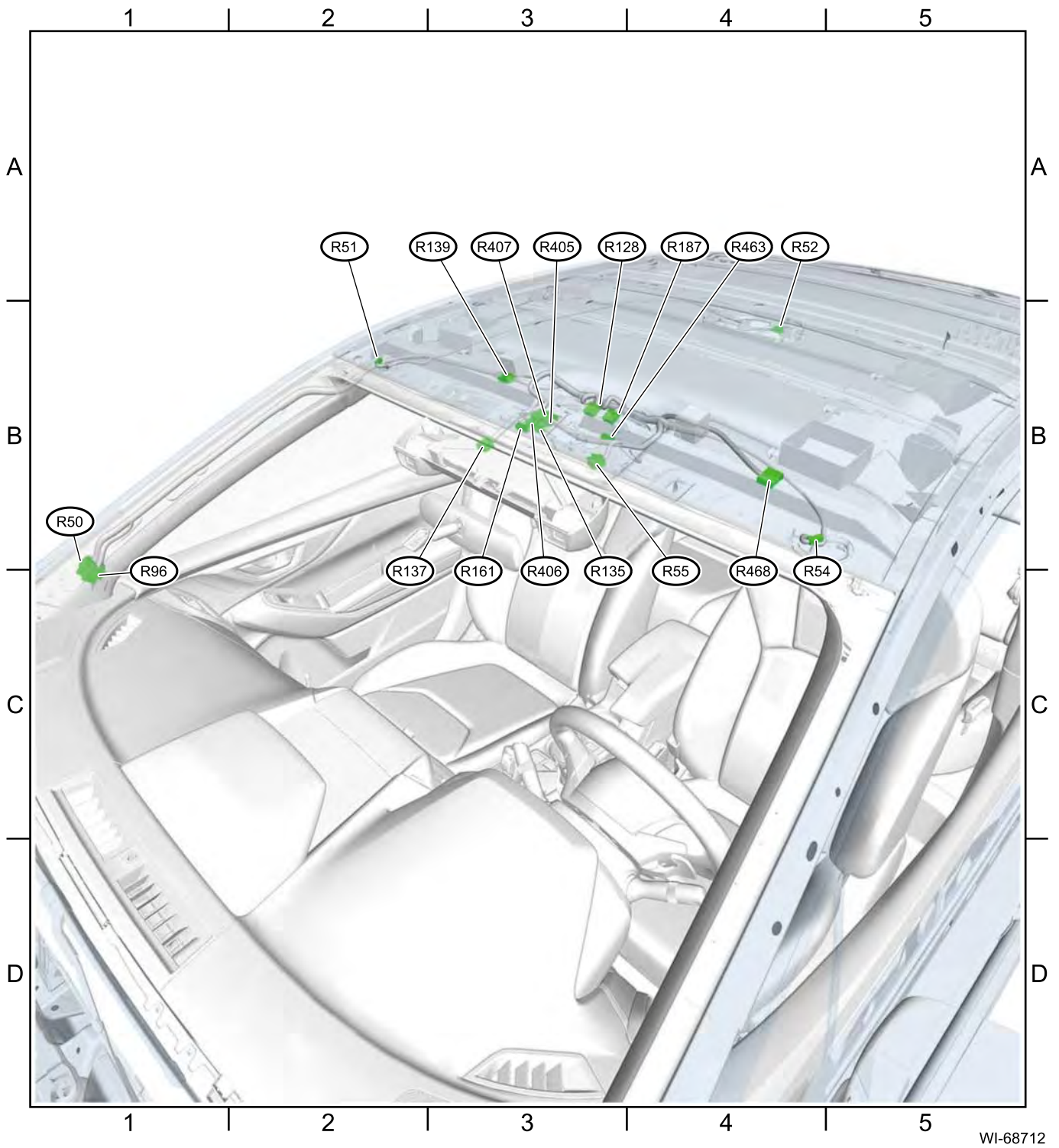


*1 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68667

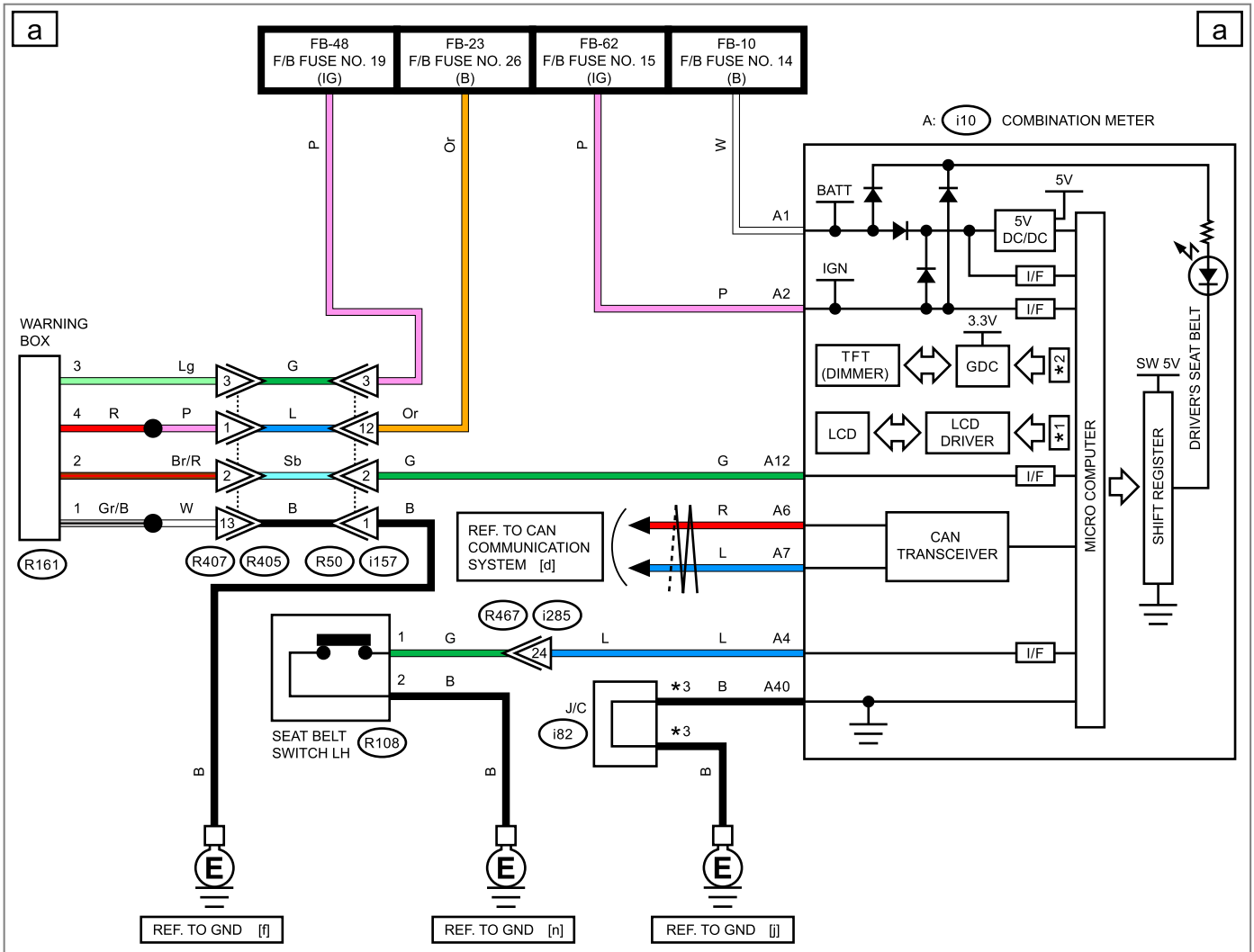
LOCATION



Connector				Connecting to	
No.	Pole	Color	Area	No.	Description
R50	18	★	B-1	i157	Instrument panel wiring harness
R51	2	★	B-2		Vanity mirror light RH
R52	3	★	B-4		Room light
R54	2	★	B-4		Vanity mirror light LH
R55	8	★	B-3		Sunroof unit

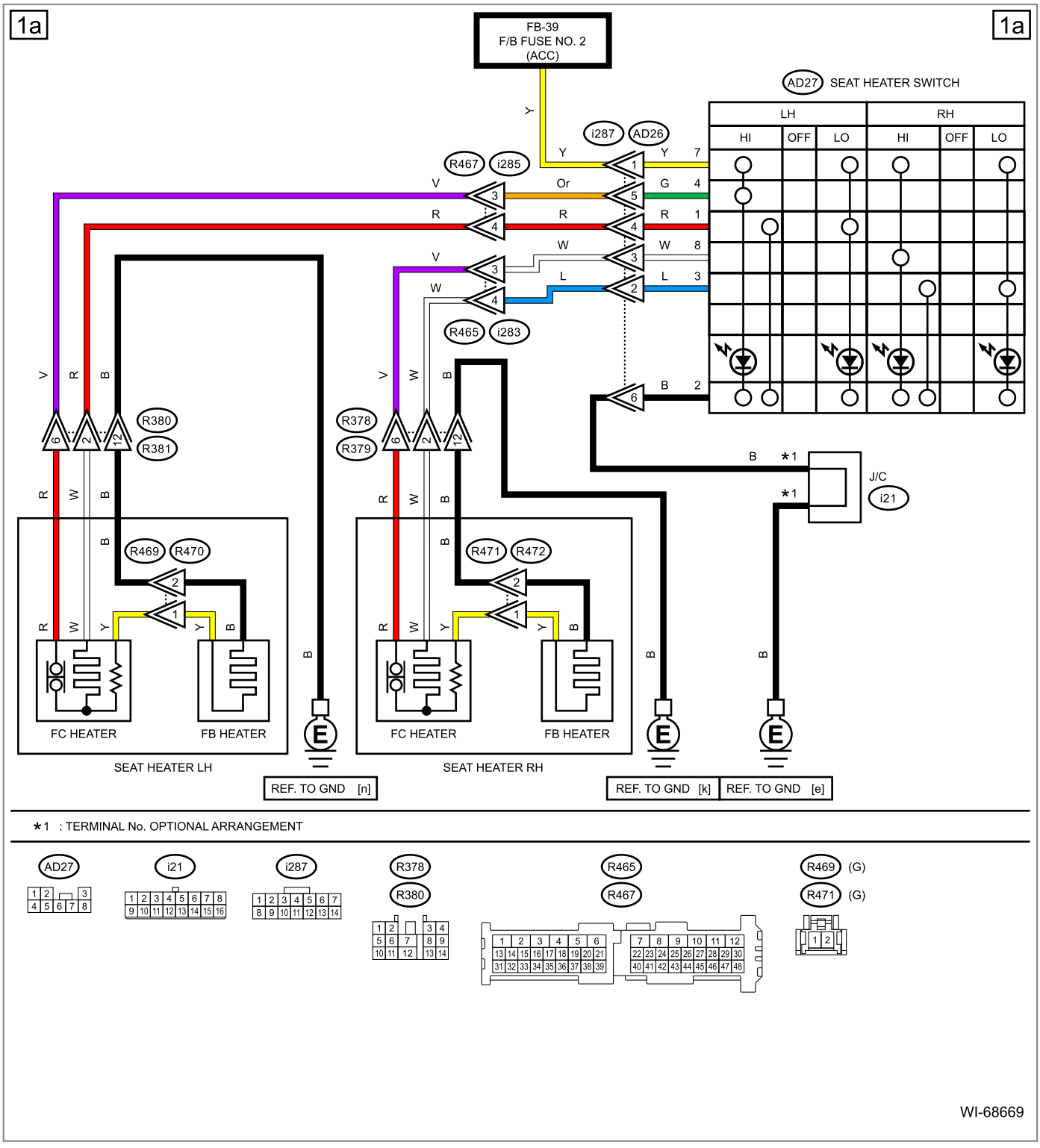
Connector				Connecting to	
No.	**Pole**	**Color**	**Area**	**No.**	**Description**
R96	14	★	C-1	i19	Instrument panel wiring harness
R128	5	★	B-3		Sunroof switch (slide)
R135	6	★	B-3	R406	Stereo camera cover adapter cord
R137	16	★	B-3		Stereo camera
R139	5	★	B-3		Rearview mirror
R161	4	Gr	B-3		Warning box
R187	5	B	B-3		Sunroof switch (tilt)
R405	16	★	B-3	R407	Stereo camera cover adapter cord
R406	6	Gr	B-3	R135	Pre-collision brake off & lane departure warning off switch
R407	16	★	B-3	R405	Roof cord
R463	8	★	B-3		Telematics button
R468	16	★	B-4	AD24	Adapter cord
★: White or natural color					

WIRING DIAGRAM

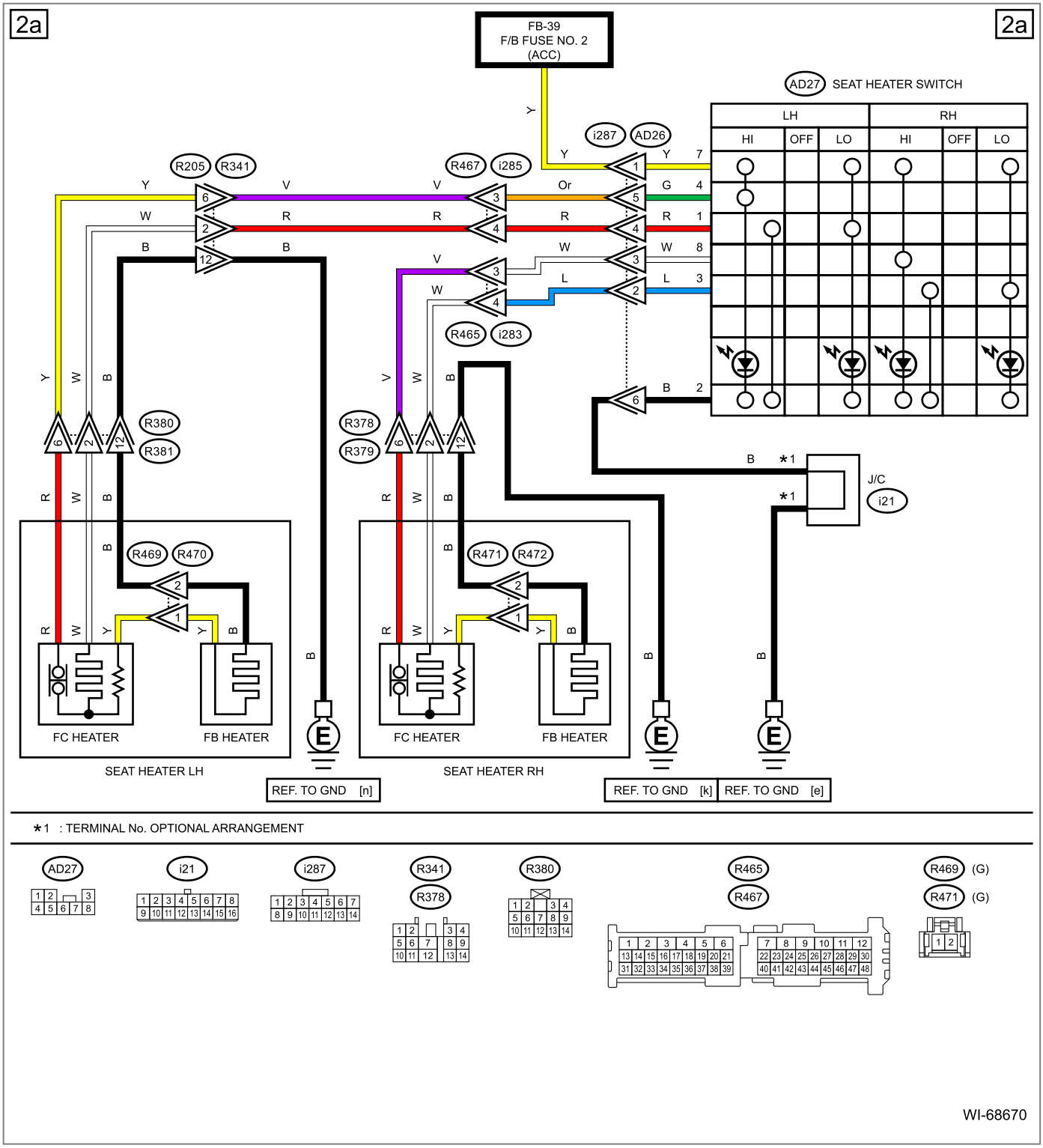

a
a
FB-48
F/B FUSE NO. 19
(IG)
FB-23
F/B FUSE NO. 26
(B)
FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
A: i10 COMBINATION METER
BATT
5V
5V DC/DC
IGN
I/F
3.3V
TFT (DIMMER)
GDC
LCD
LCD DRIVER
MICRO COMPUTER
SHIFT REGISTER
SW 5V
DRIVER'S SEAT BELT
CAN TRANSCEIVER
WARNING BOX
R161
R407
R405
R50
i157
REF. TO CAN COMMUNICATION SYSTEM [d]
R467
i285
SEAT BELT SWITCH LH
R108
J/C
i82
REF. TO GND [f]
REF. TO GND [n]
REF. TO GND [j]
*1 : NORMAL METER MODEL
*2 : COLOR TFT METER MODEL
*3 : TERMINAL No. OPTIONAL ARRANGEMENT
A: i10 (B)
i82
R50
R108
R161 (Gr)
R405
R467
WI-68668

WIRING DIAGRAM

1. WITHOUT POWER SEAT



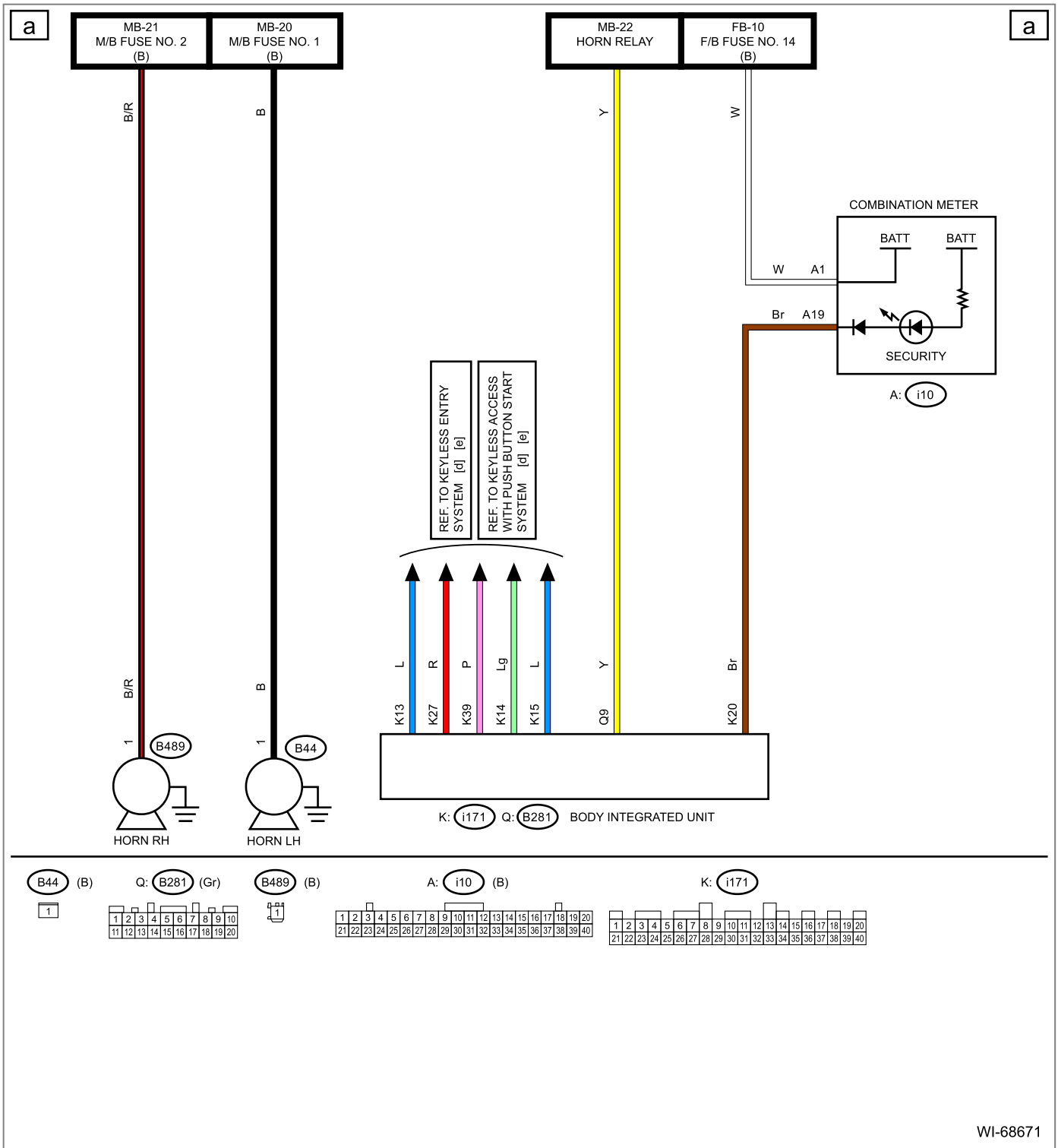
2. WITH POWER SEAT

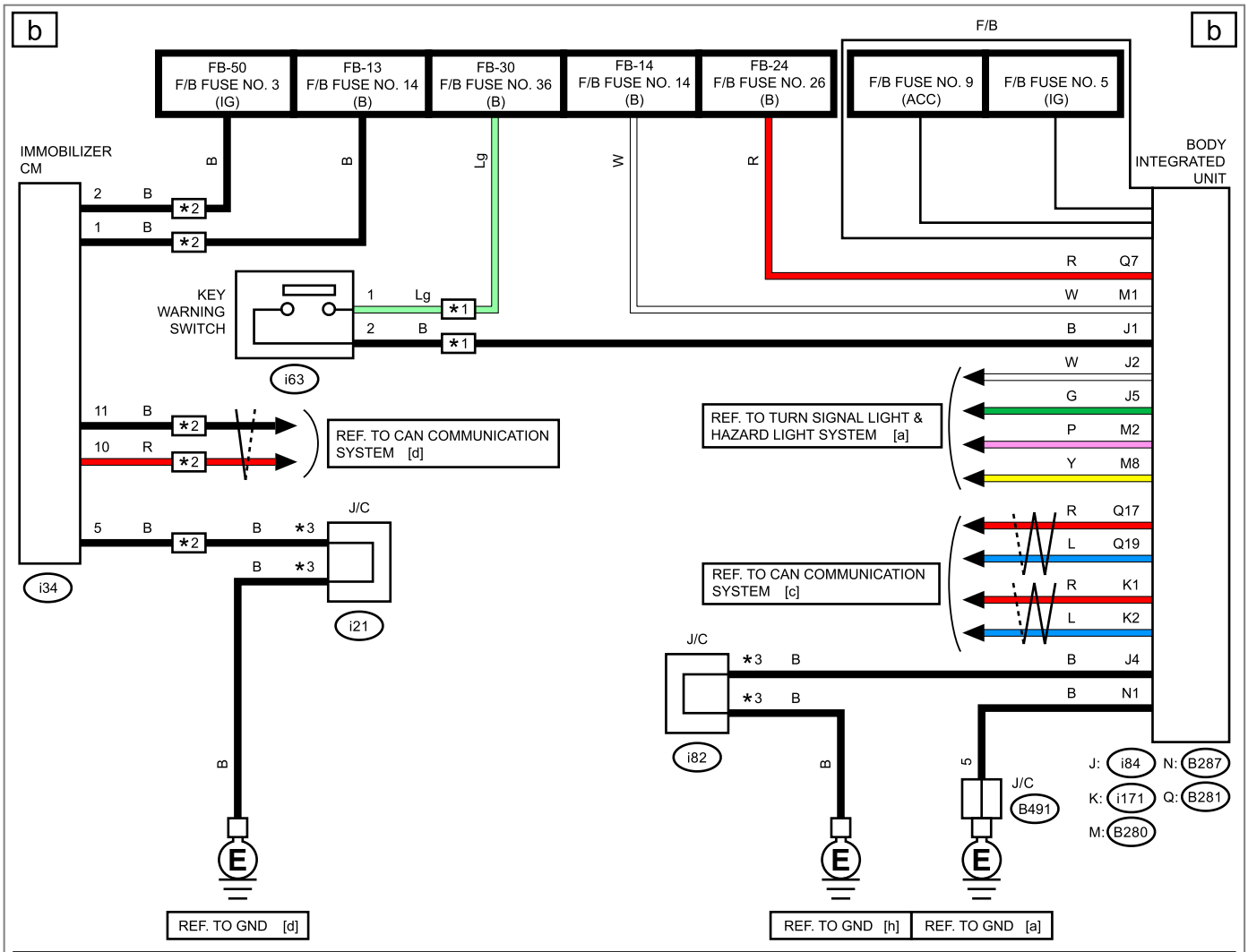


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

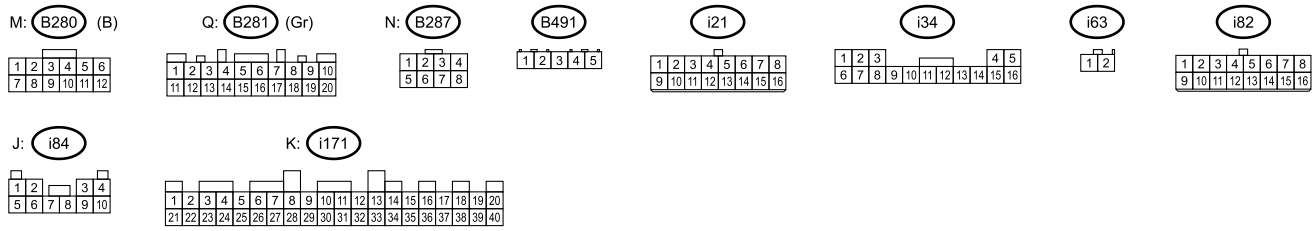
WI-68670

WIRING DIAGRAM


a
a
MB-21
M/B FUSE NO. 2
(B)
MB-20
M/B FUSE NO. 1
(B)
MB-22
HORN RELAY
FB-10
F/B FUSE NO. 14
(B)
B/R
B
Y
W
COMBINATION METER
BATT
BATT
W
A1
Br
A19
SECURITY
A: i10
REF. TO KEYLESS ENTRY SYSTEM [d] [e]
REF. TO KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM [d] [e]
L
R
P
Lg
L
Y
Br
K13
K27
K39
K14
K15
Q9
K20
B489
B44
HORN RH
HORN LH
K: i171
Q: B281
BODY INTEGRATED UNIT
B44 (B)
Q: B281 (Gr)
B489 (B)
A: i10 (B)
K: i171
WI-68671

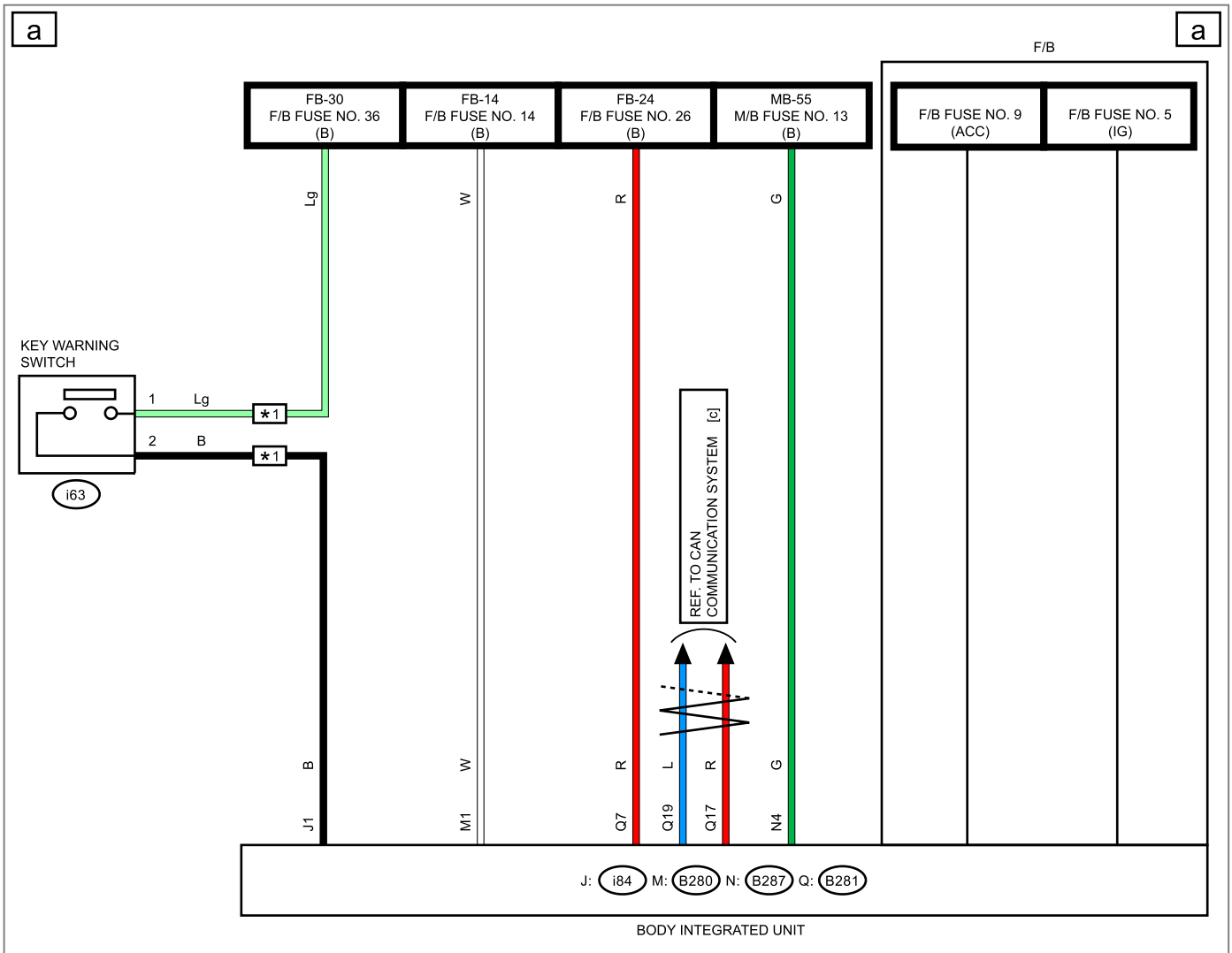


*1 : WITHOUT PUSH BUTTON START
*2 : WITH IMMOBILIZER CM
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

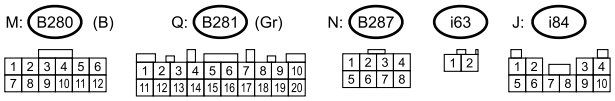


WI-68672

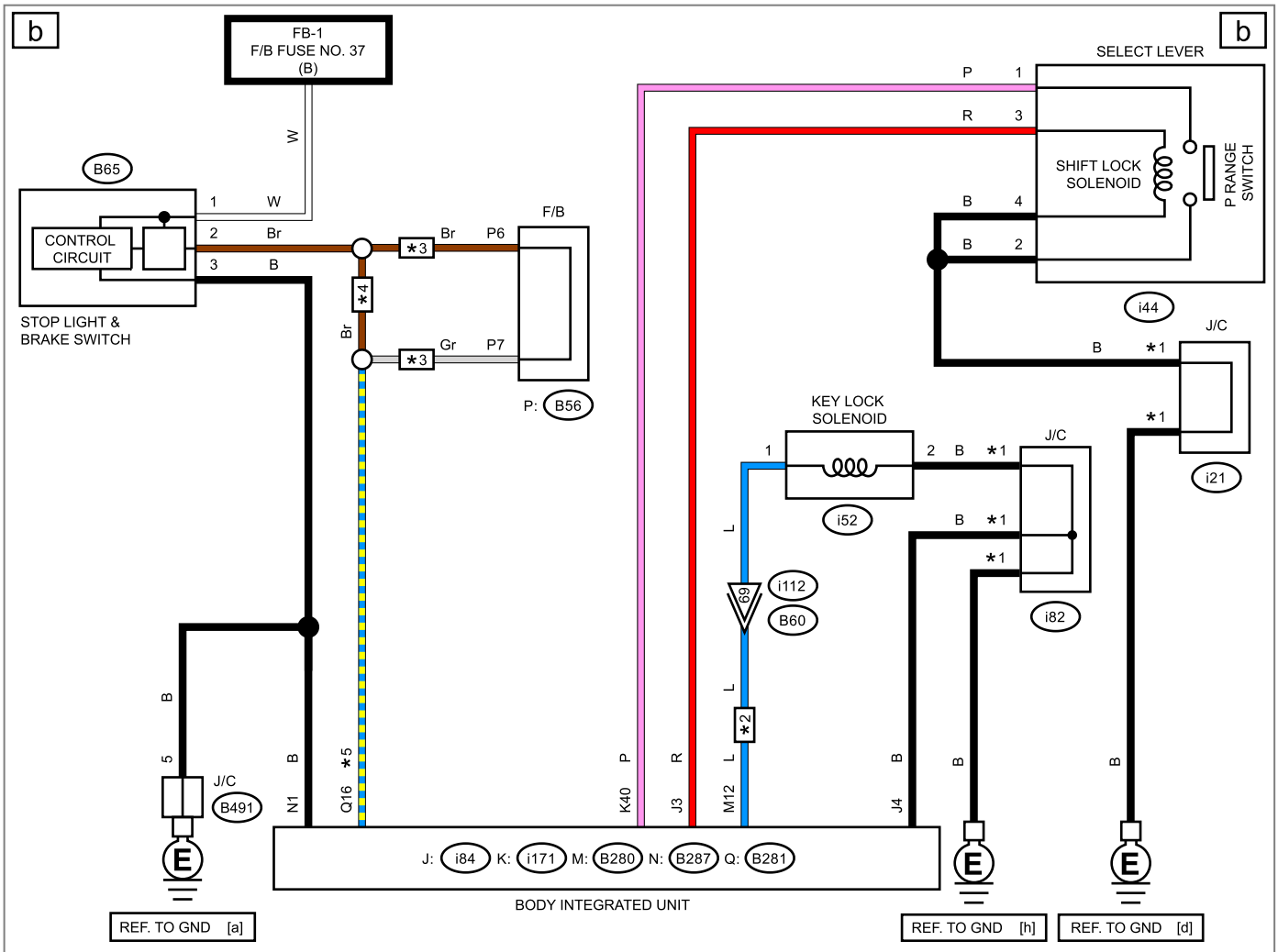
WIRING DIAGRAM



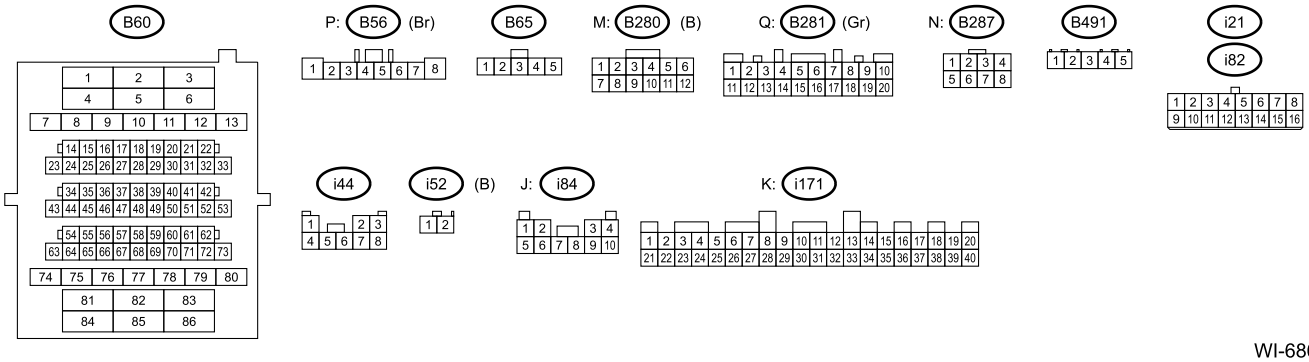
*1 : WITHOUT PUSH BUTTON START



WI-68673

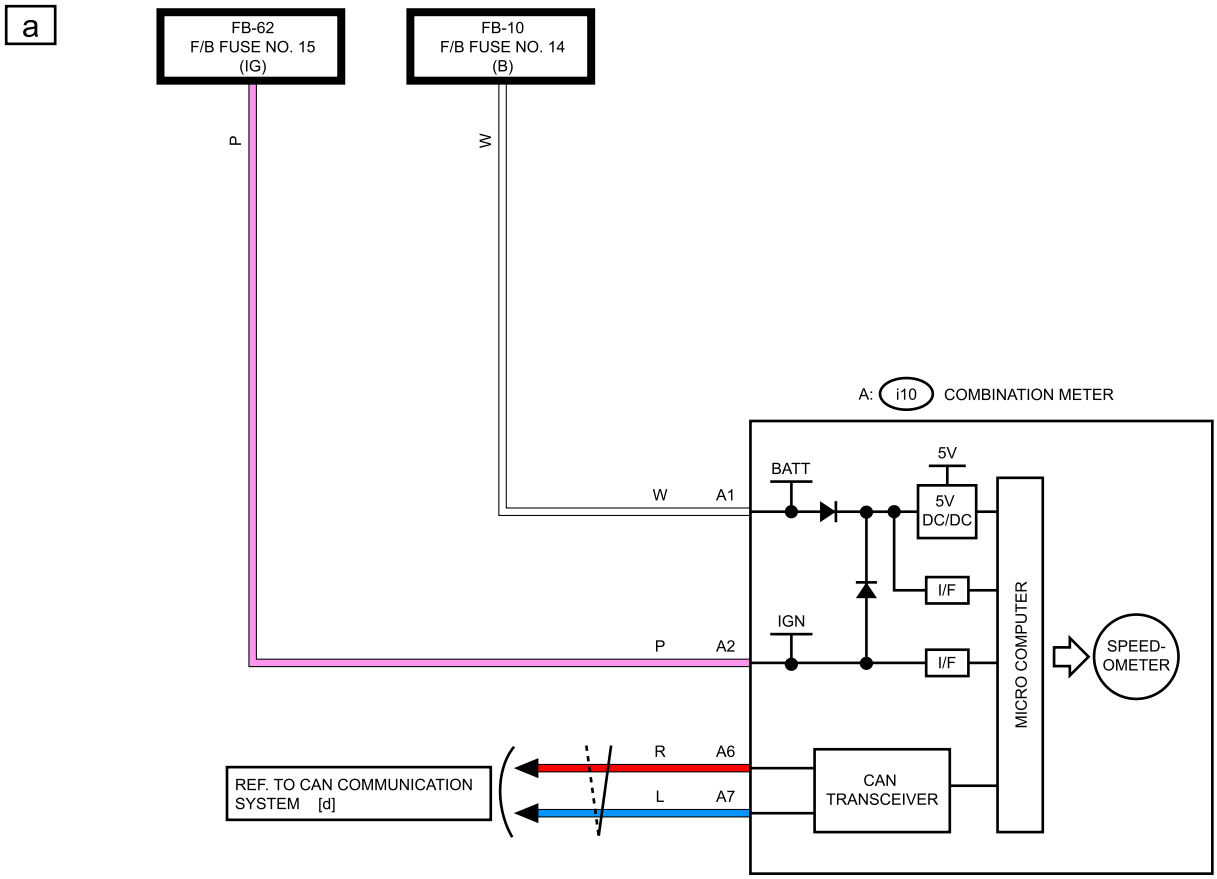


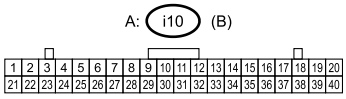
∗1 : TERMINAL No. OPTIONAL ARRANGEMENT
∗2 : WITHOUT PUSH BUTTON START
∗3 : WITHOUT EyeSight
∗4 : WITH EyeSight
∗5 : WITHOUT EyeSight : Gr
WITH EyeSight : Br



WI-68674

WIRING DIAGRAM

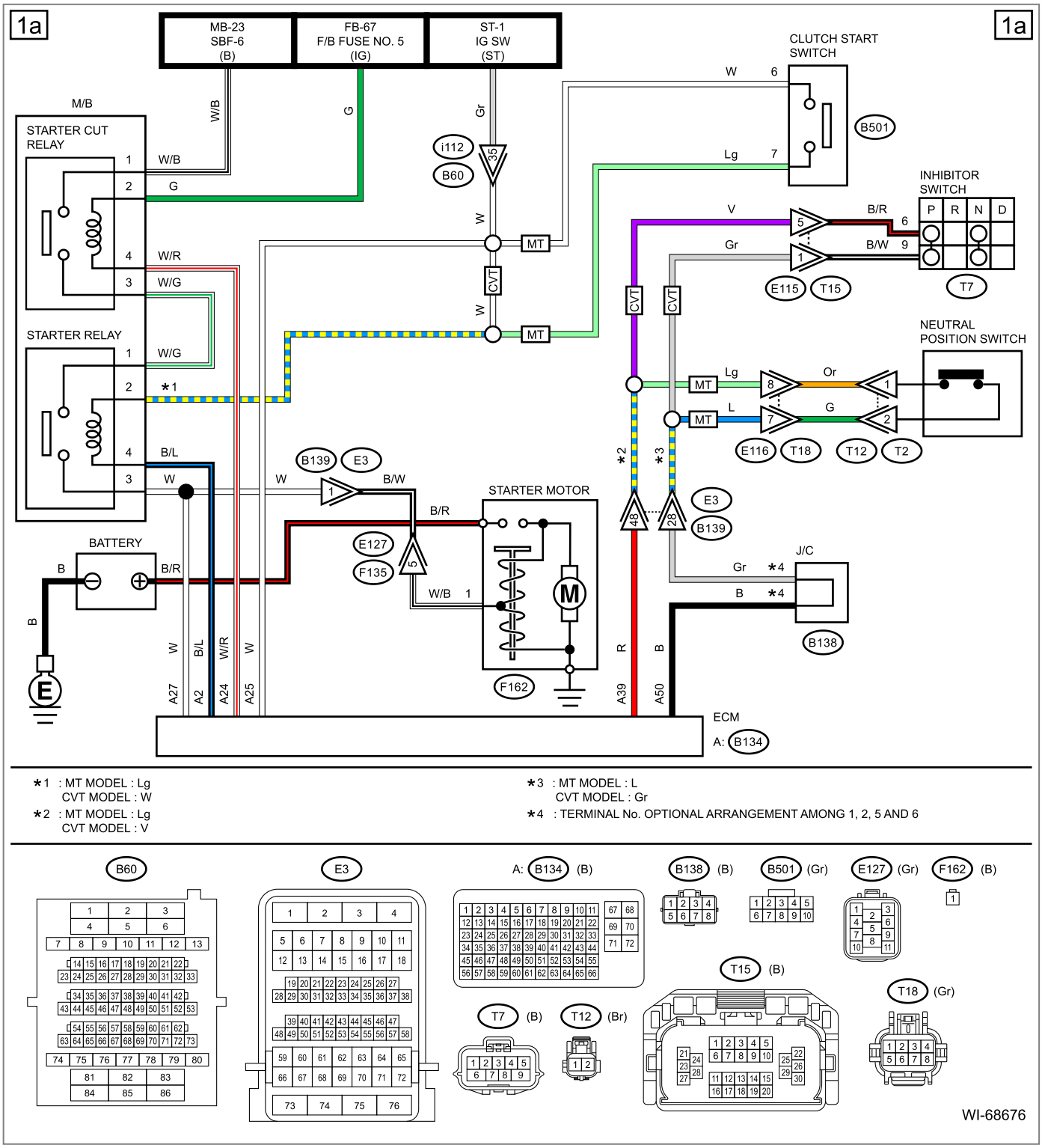

a
a
FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
P
W
A: i10 COMBINATION METER
BATT
5V
W A1
5V
DC/DC
I/F
IGN
P A2
I/F
MICRO COMPUTER
SPEED-
OMETER
R A6
L A7
REF. TO CAN COMMUNICATION
SYSTEM [d]
CAN
TRANSCEIVER


A: i10 (B)
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

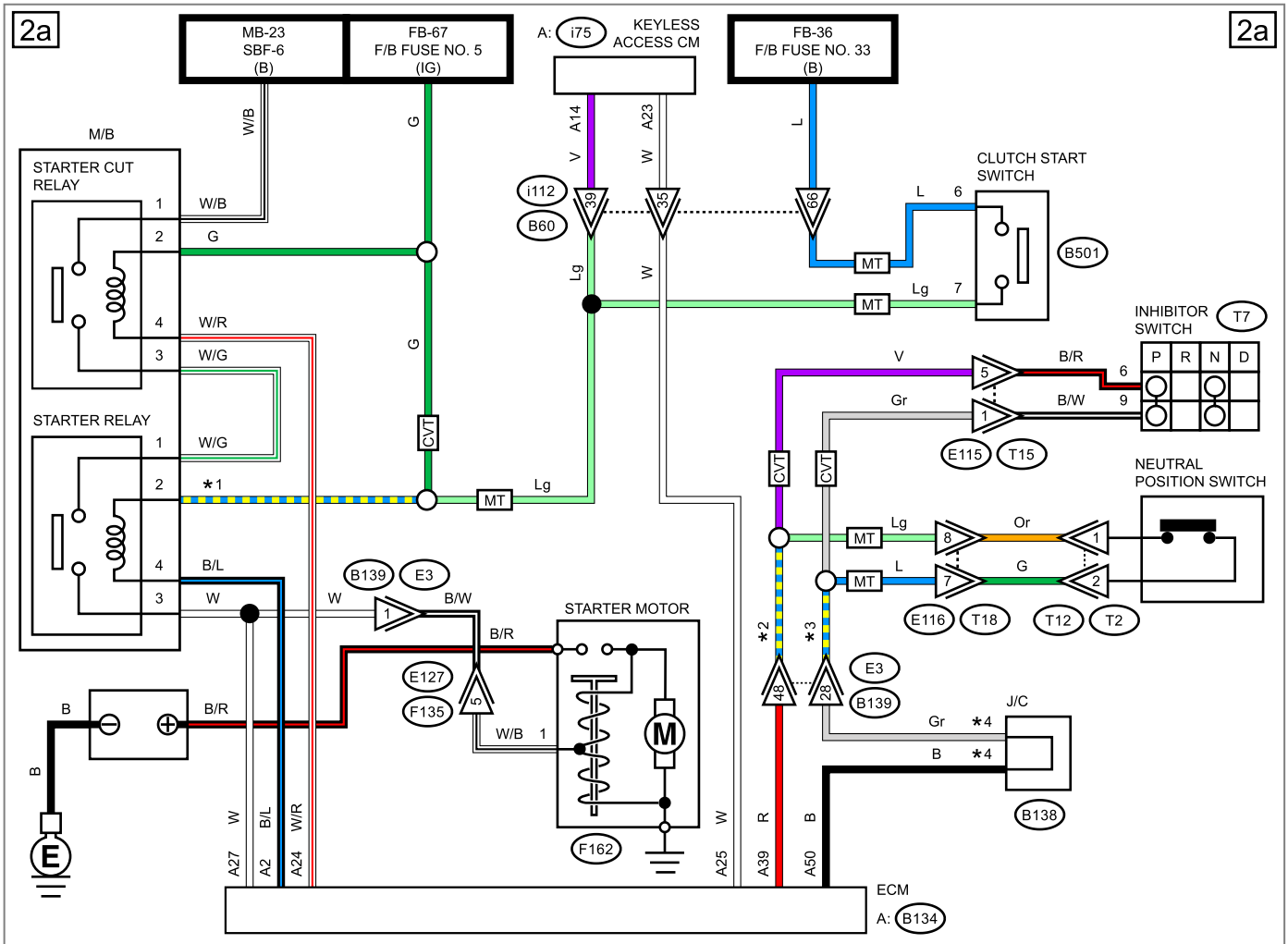
WI-68675

WIRING DIAGRAM

1. ENGINE TYPE FB (WITHOUT PUSH BUTTON START)



2. ENGINE TYPE FB (WITH PUSH BUTTON START)

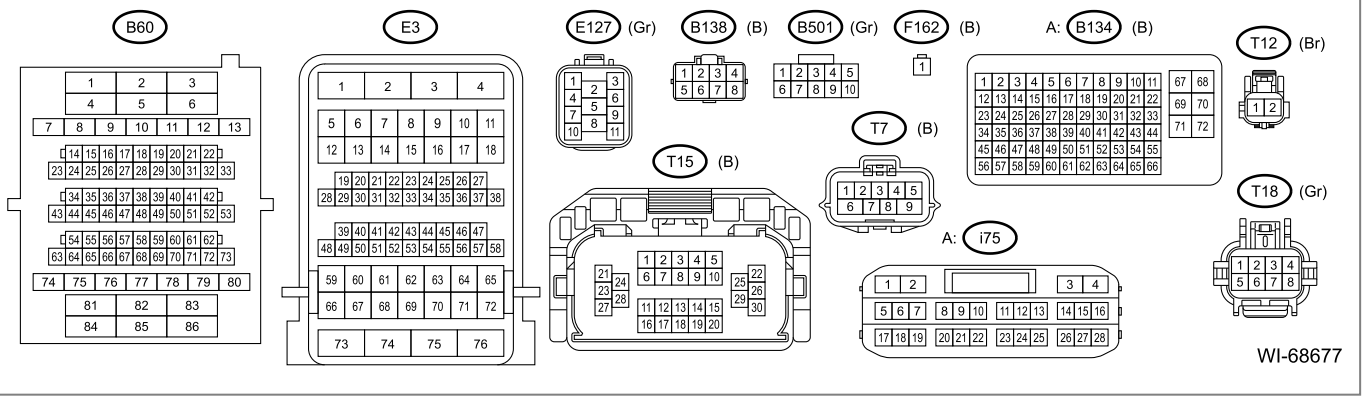


*1 : MT MODEL : Lg
CVT MODEL : G

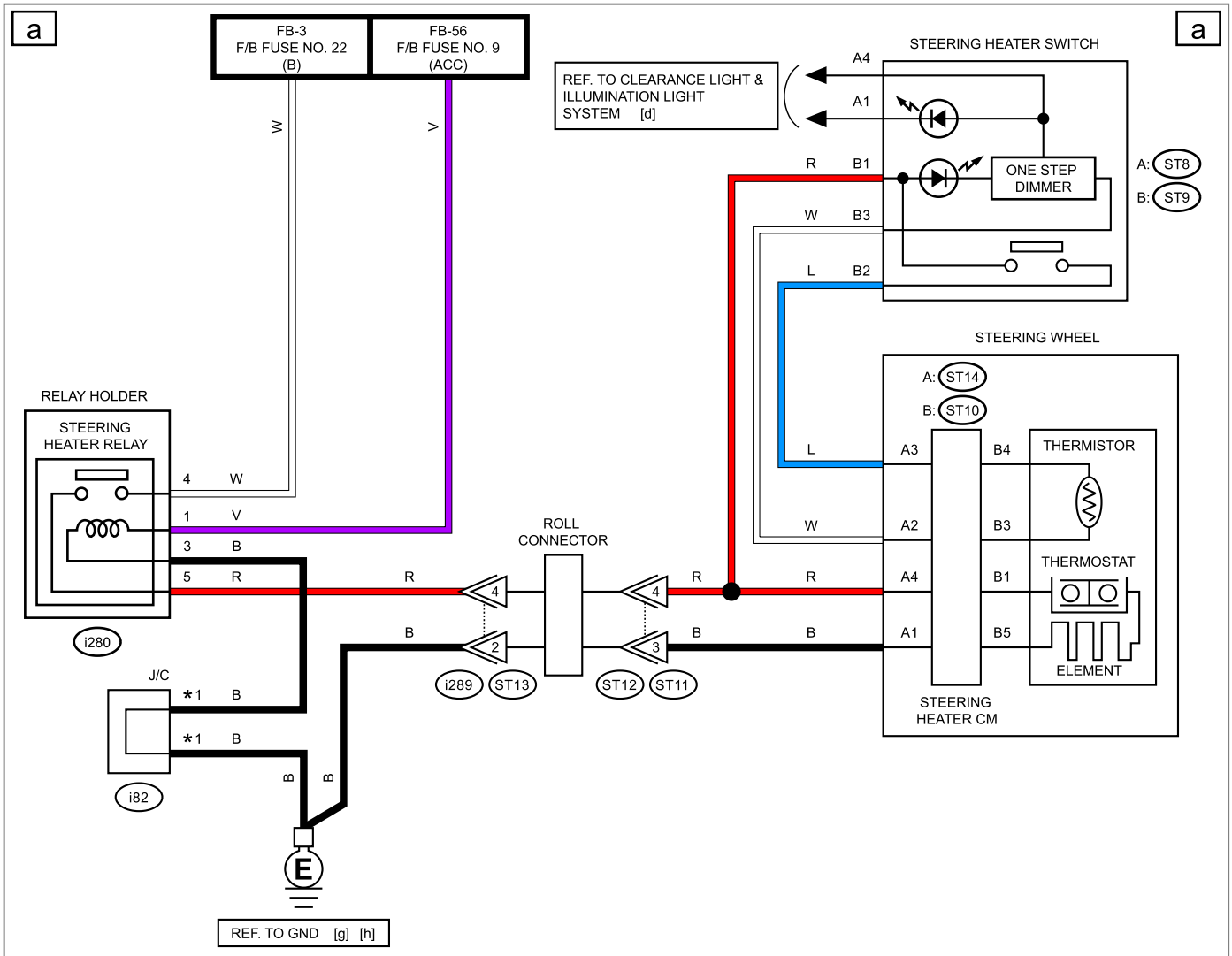
*2 : MT MODEL : Lg
CVT MODEL : V

*3 : MT MODEL : L
CVT MODEL : Gr

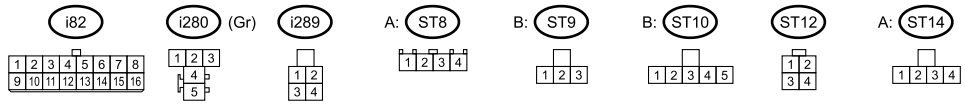
*4 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6



WIRING DIAGRAM



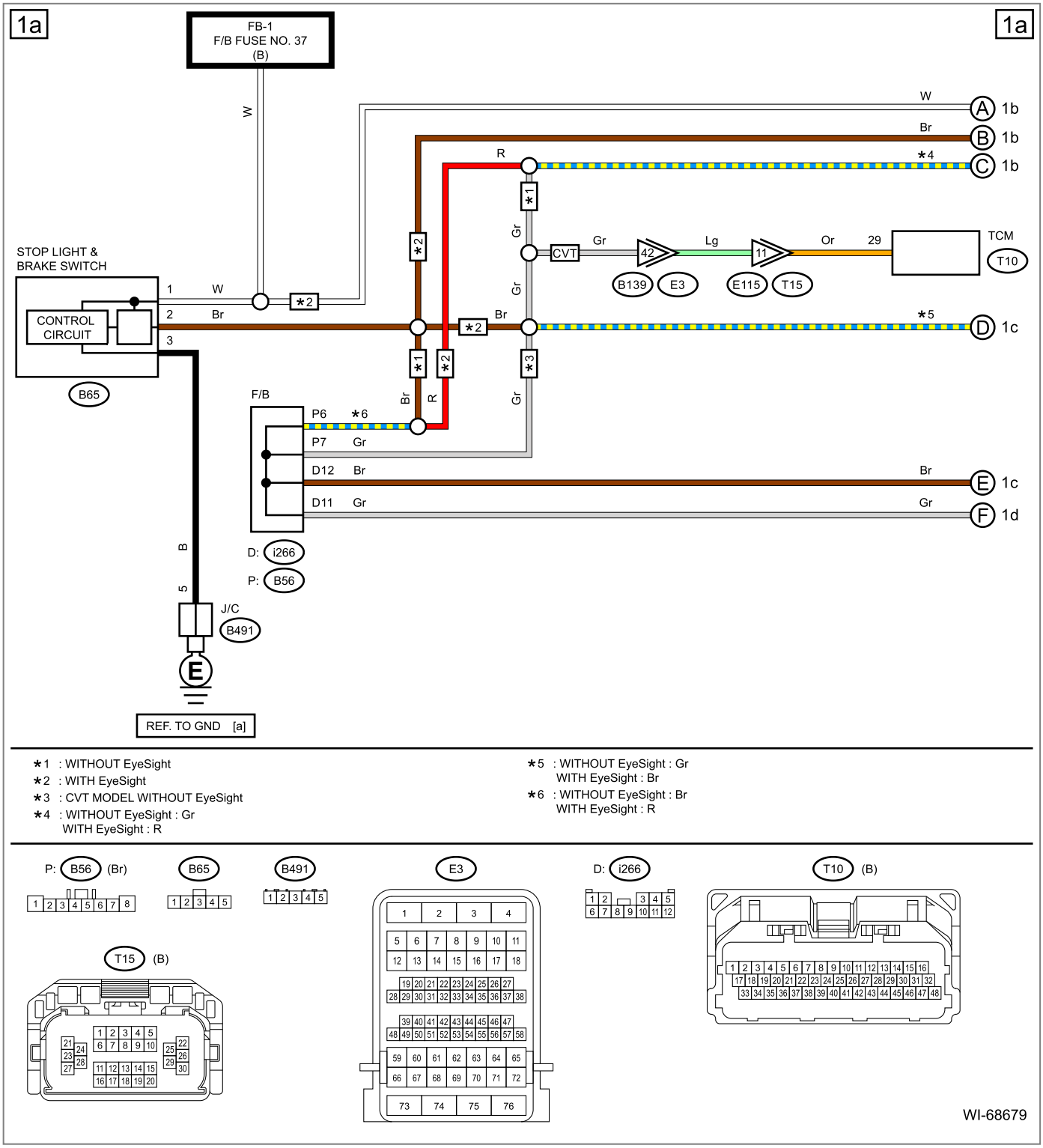
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

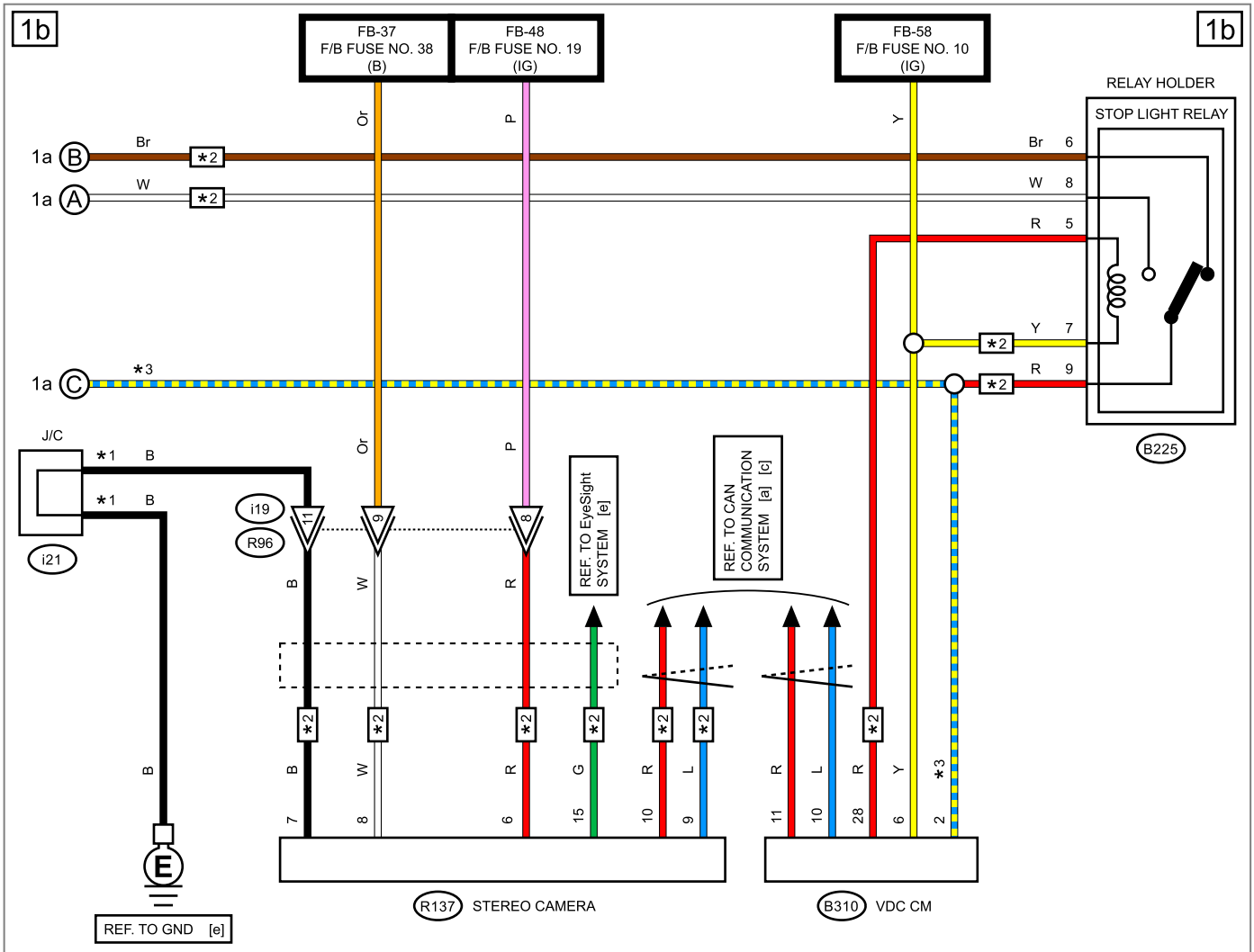


WI-68678

WIRING DIAGRAM

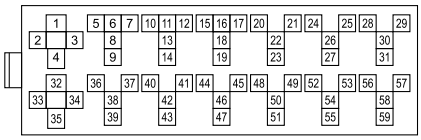
1. 4 DOOR MODEL





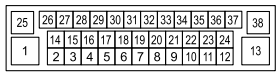
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH EyeSight
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : R

B225 (B)

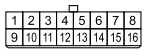


RELAY HOLDER

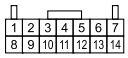
B310 (B)



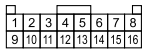
i21



R96

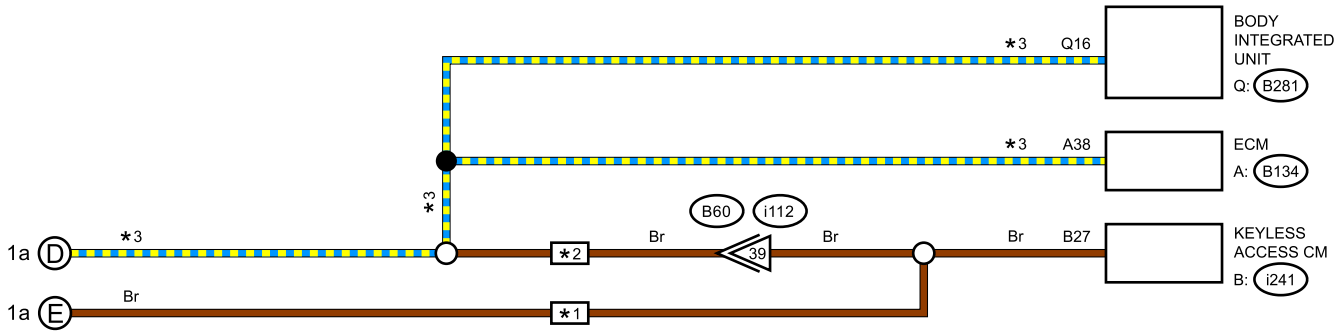


R137



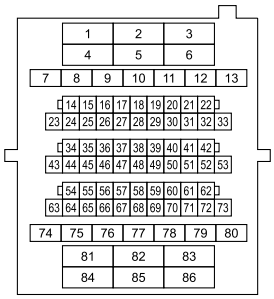
WI-68680

1c

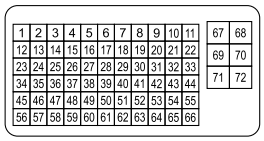


*1 : CVT MODEL WITHOUT EyeSight & WITH PUSH BUTTON START
*2 : CVT MODEL WITH EyeSight & WITH PUSH BUTTON START
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : Br

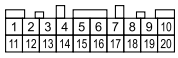
B60



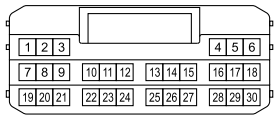
A: B134 (B)



Q: B281 (Gr)

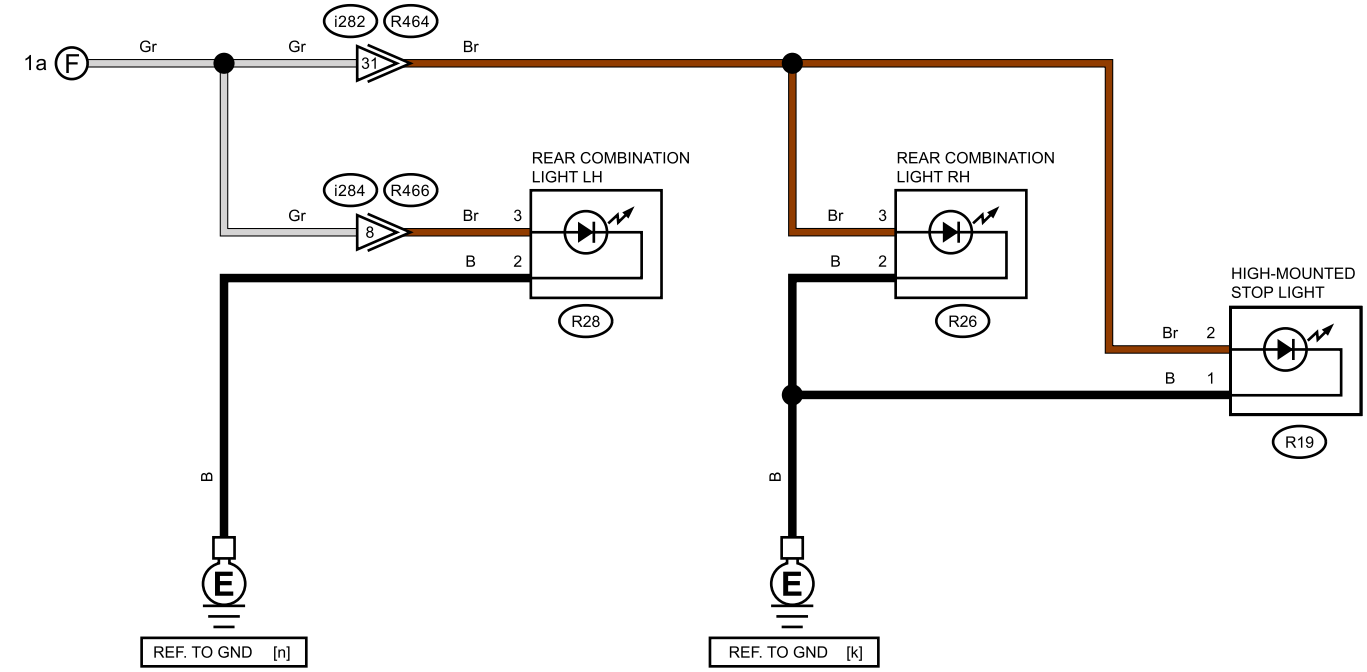


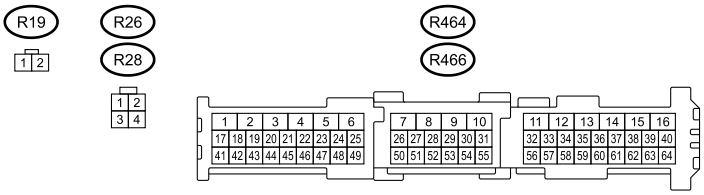
B: i241



WI-68725

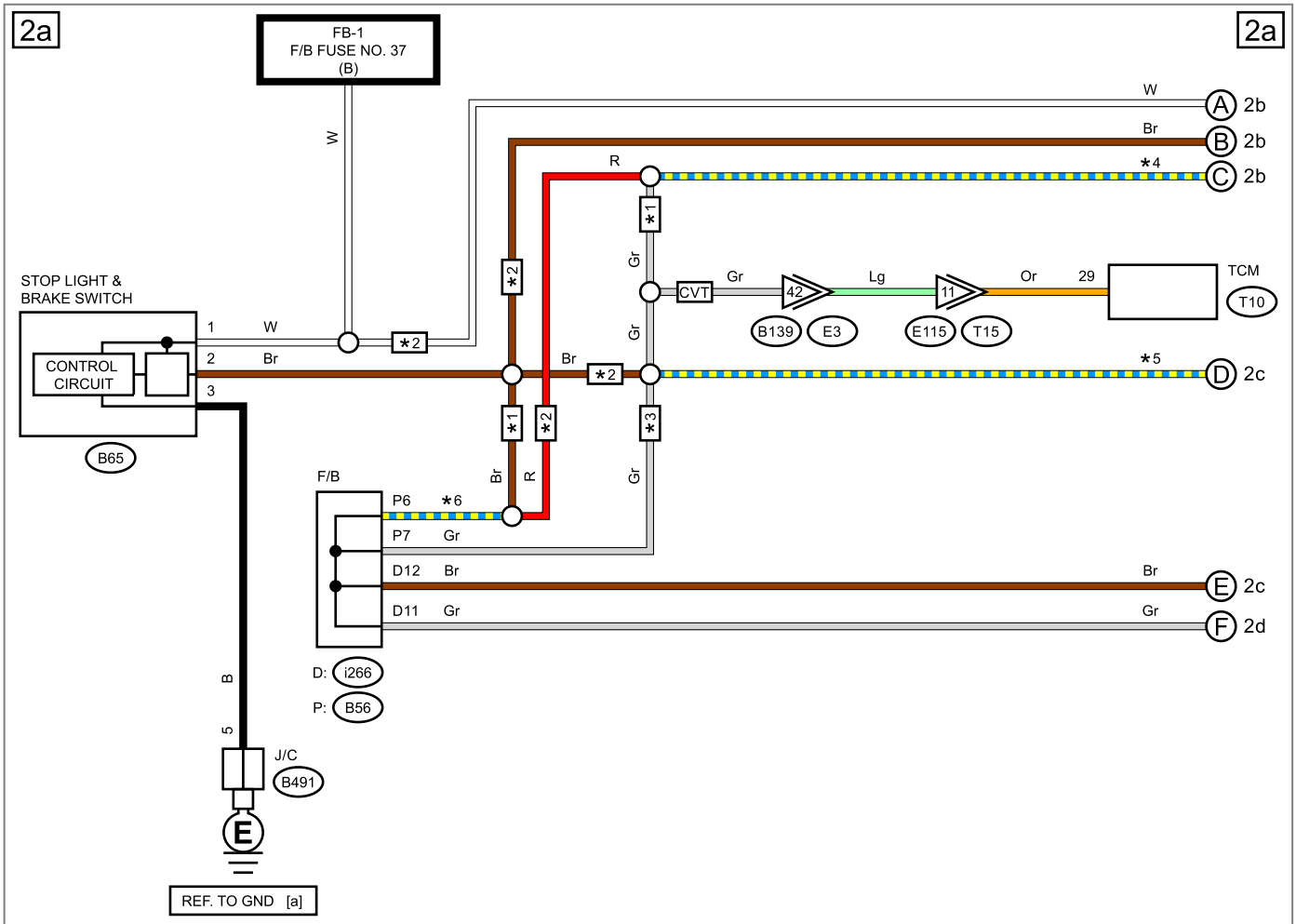
1d


1a
F
Gr
Gr
I282
R464
31
Br
REAR COMBINATION LIGHT LH
I284
R466
Gr
8
Br
3
B
2
R28
REAR COMBINATION LIGHT RH
Br
3
B
2
R26
HIGH-MOUNTED STOP LIGHT
Br
2
B
1
R19
B
B
E
E
REF. TO GND [n]
REF. TO GND [k]

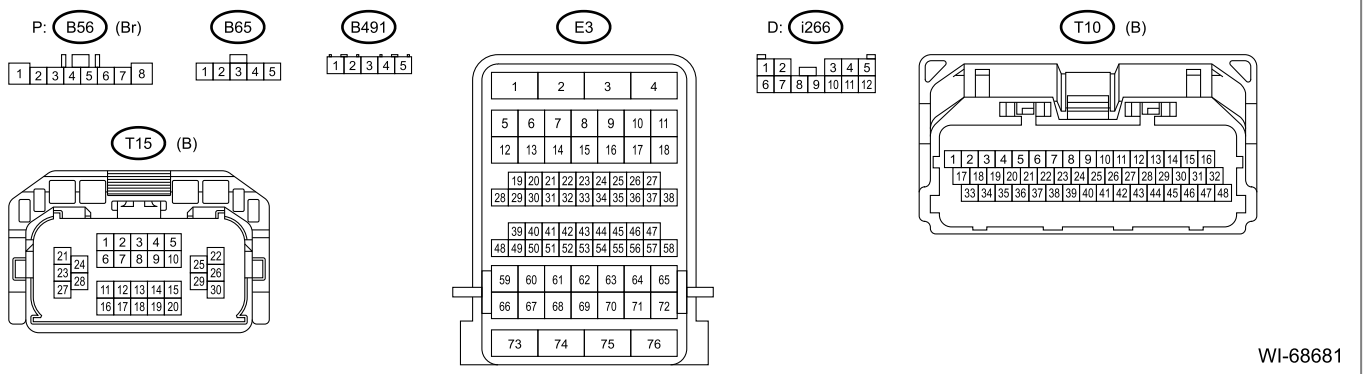

R19
1 2
R26
R28
1 2
3 4
R464
R466
1 2 3 4 5 6
17 18 19 20 21 22 23 24 25
41 42 43 44 45 46 47 48 49
7 8 9 10
26 27 28 29 30 31
50 51 52 53 54 55
11 12 13 14 15 16
32 33 34 35 36 37 38 39 40
56 57 58 59 60 61 62 63 64

WI-68726

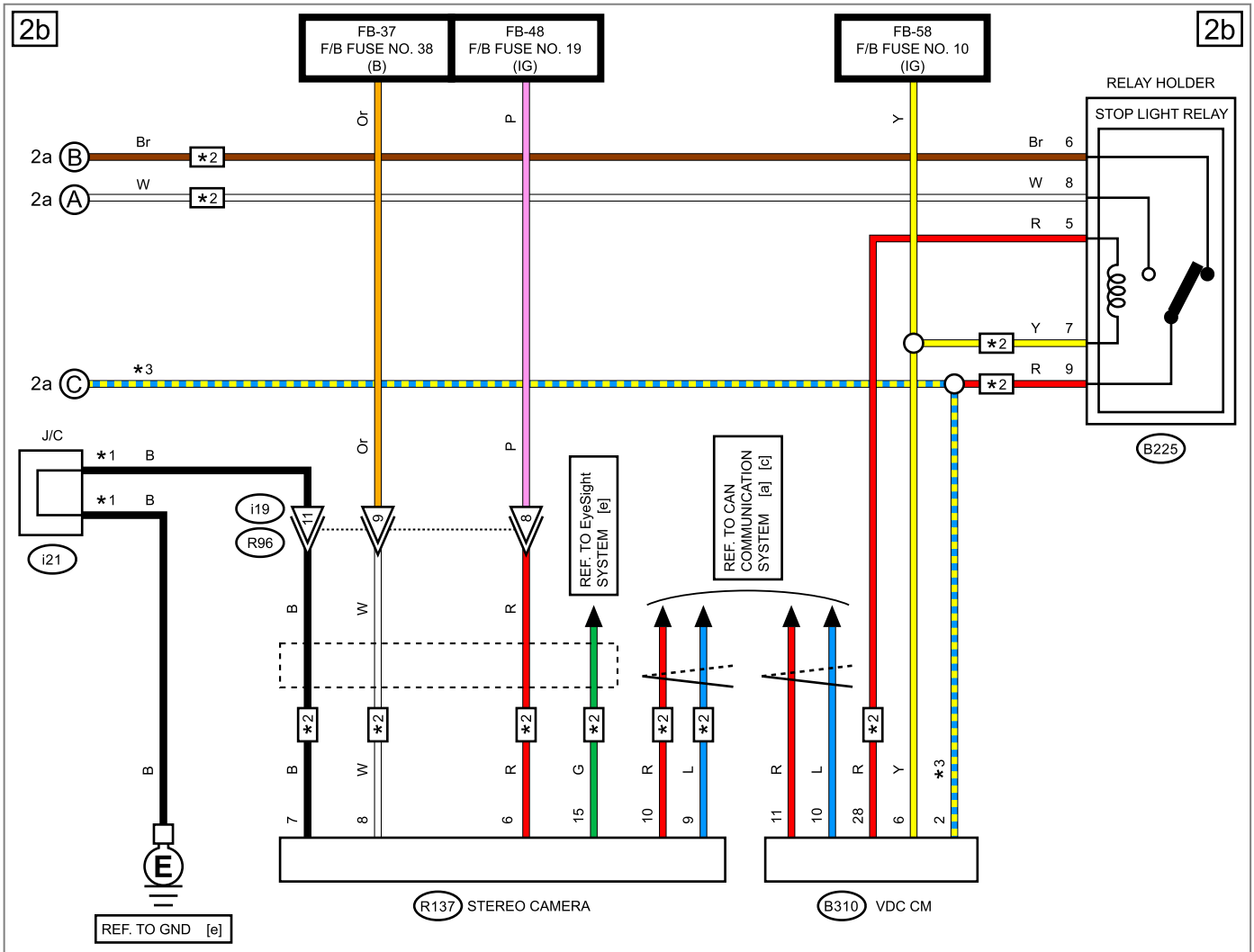
2. 5 DOOR MODEL



*1 : WITHOUT EyeSight
*2 : WITH EyeSight
*3 : CVT MODEL WITHOUT EyeSight
*4 : WITHOUT EyeSight : Gr
WITH EyeSight : R
*5 : WITHOUT EyeSight : Gr
WITH EyeSight : Br
*6 : WITHOUT EyeSight : Br
WITH EyeSight : R

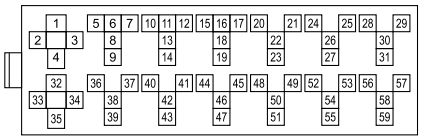


WI-68681



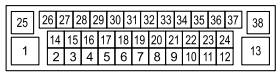
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH EyeSight
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : R

B225 (B)

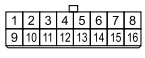


RELAY HOLDER

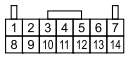
B310 (B)



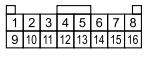
i21



R96

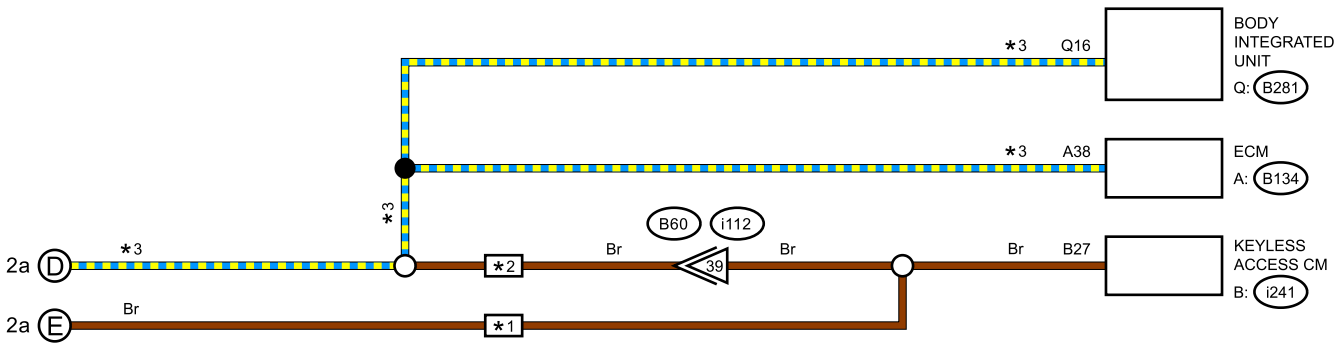


R137



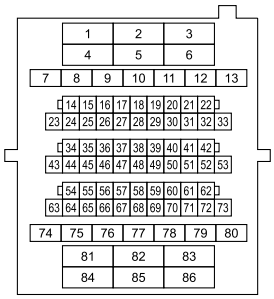
WI-68682

2c

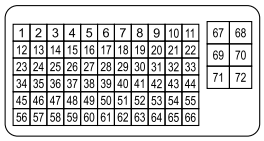


*1 : CVT MODEL WITHOUT EyeSight & WITH PUSH BUTTON START
*2 : CVT MODEL WITH EyeSight & WITH PUSH BUTTON START
*3 : WITHOUT EyeSight : Gr
WITH EyeSight : Br

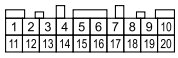
B60



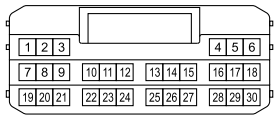
A: B134 (B)



Q: B281 (Gr)

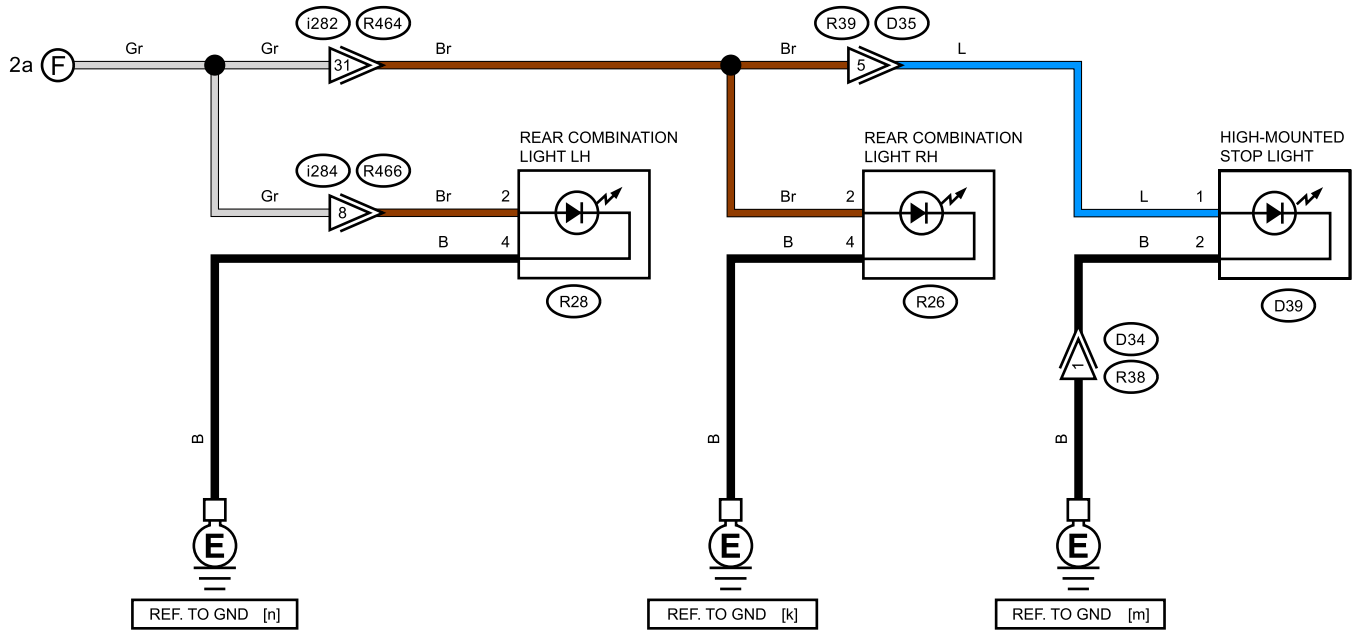


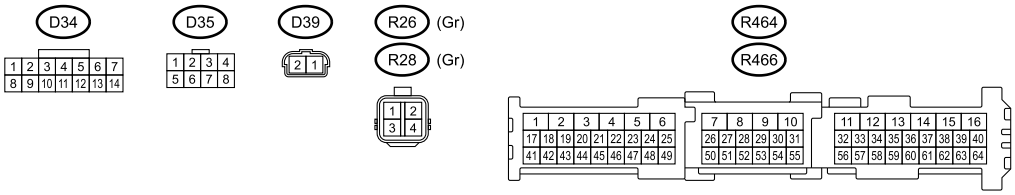
B: i241



WI-68727

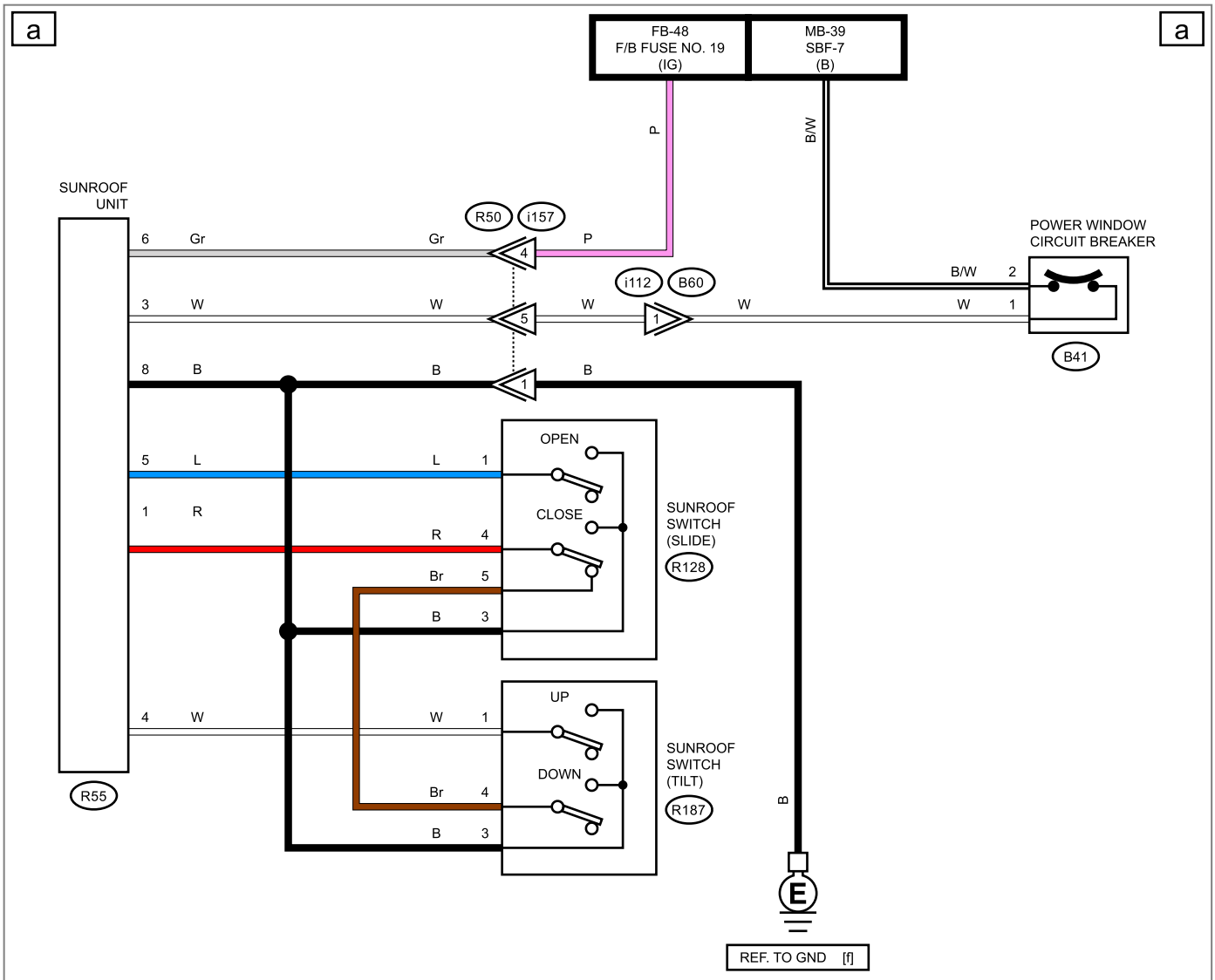
2d

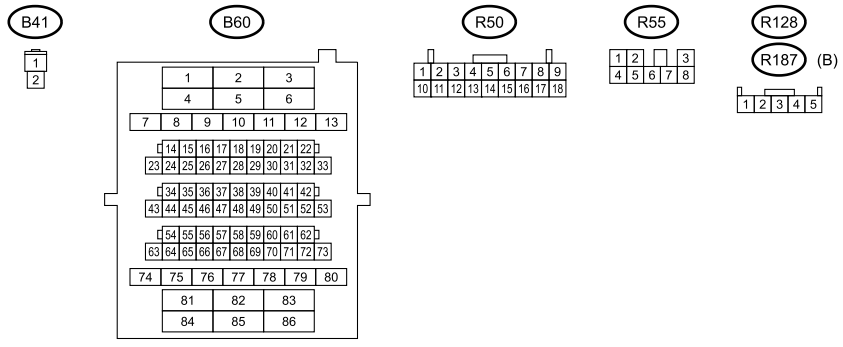

2a
F
Gr
Gr
i282
R464
31
Br
Br
R39
D35
5
L
REAR COMBINATION LIGHT LH
REAR COMBINATION LIGHT RH
HIGH-MOUNTED STOP LIGHT
i284
R466
8
Gr
Br
2
B
4
R28
R26
D39
L
1
B
2
D34
R38
B
REF. TO GND [n]
REF. TO GND [k]
REF. TO GND [m]


D34
D35
D39
R26 (Gr)
R28 (Gr)
R464
R466

WI-70945

WIRING DIAGRAM

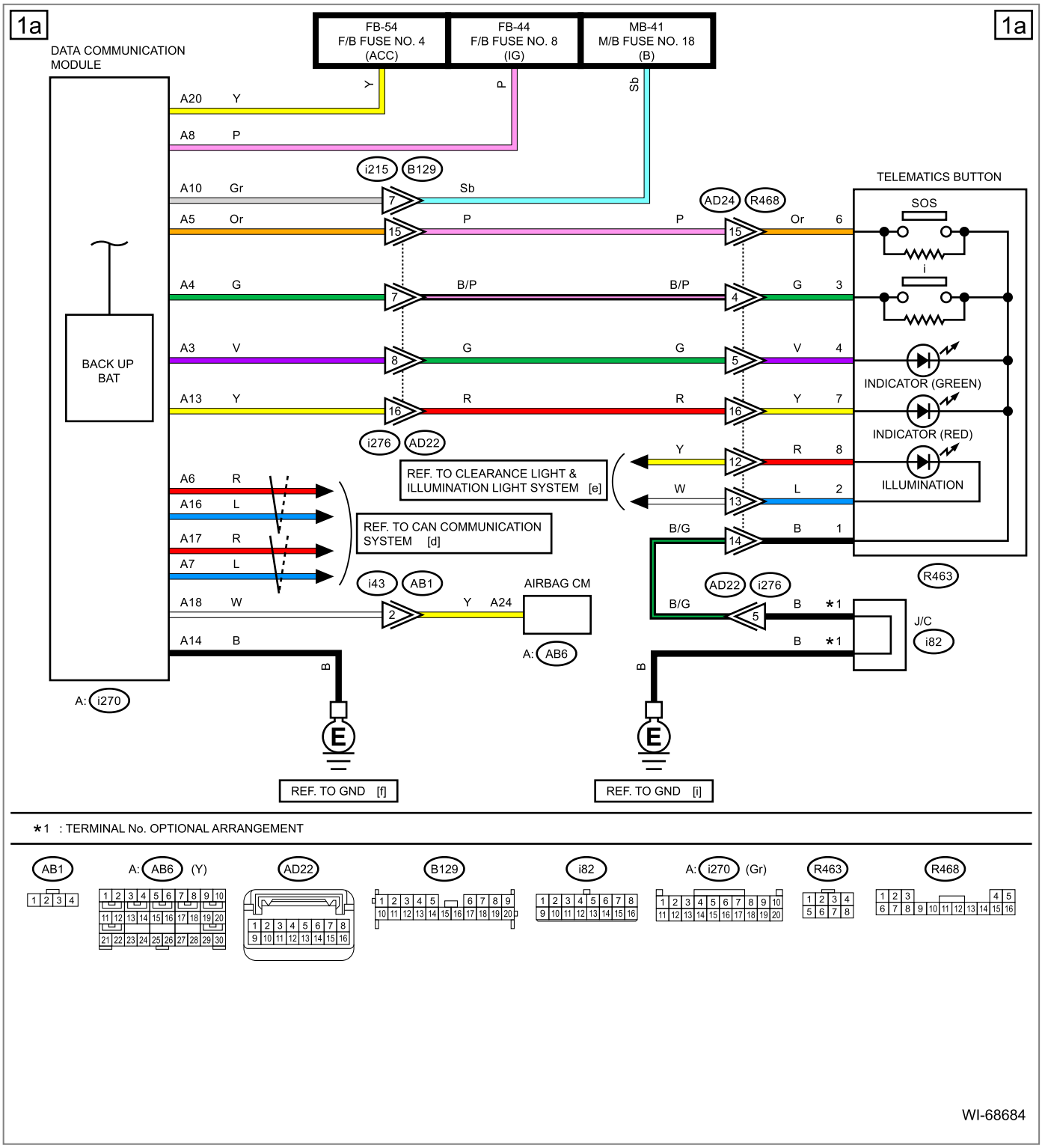

a
a
FB-48
F/B FUSE NO. 19
(IG)
MB-39
SBF-7
(B)
P
B/W
SUNROOF
UNIT
R50
i157
POWER WINDOW
CIRCUIT BREAKER
6 Gr Gr 4 P
B/W 2
i112
B60
3 W W 5 W 1 W W 1
B41
8 B B 1 B
OPEN
5 L L 1
CLOSE
1 R
R 4
Br 5
B 3
SUNROOF
SWITCH
(SLIDE)
R128
UP
4 W W 1
DOWN
Br 4
B 3
SUNROOF
SWITCH
(TILT)
R187
B
R55
E
REF. TO GND [f]

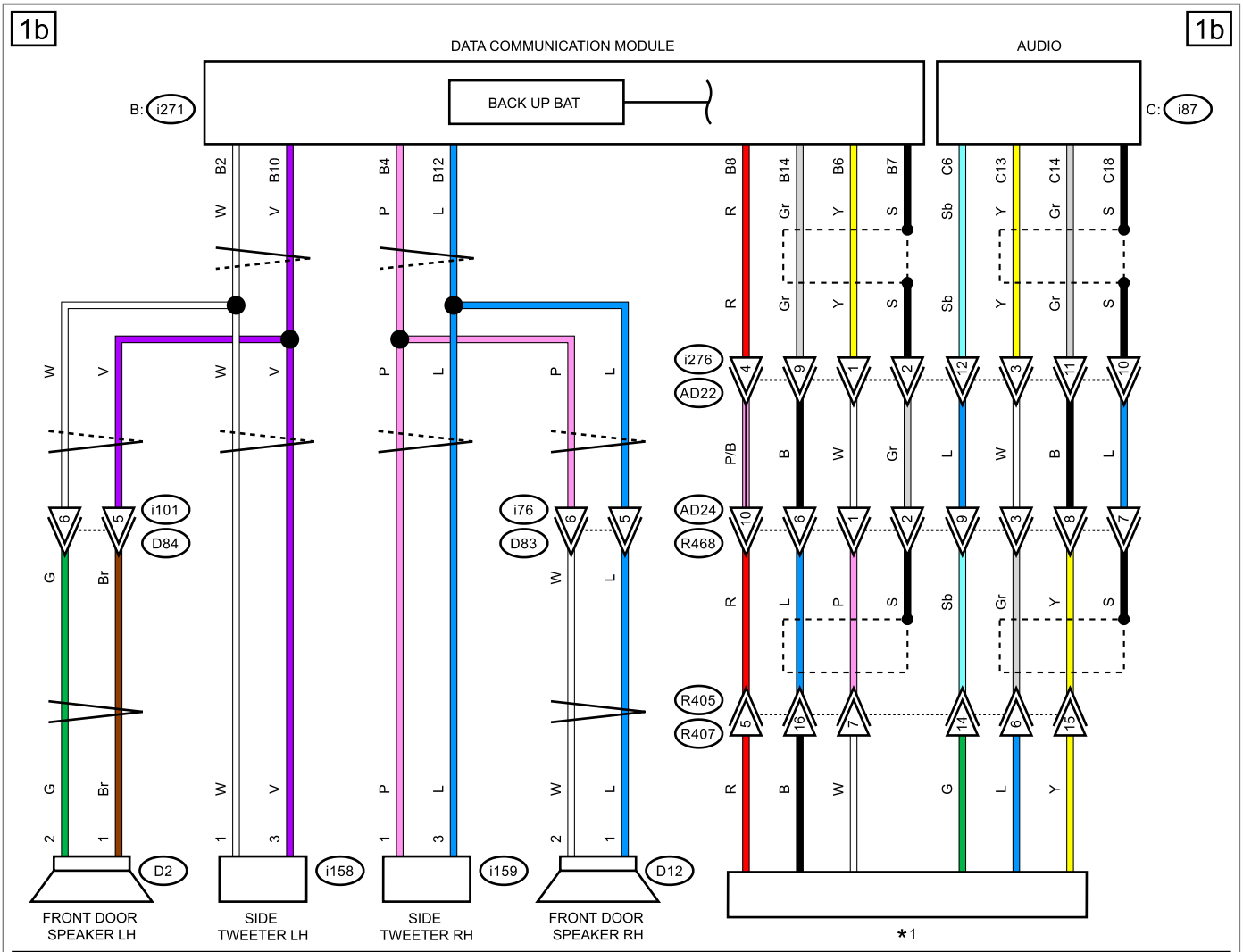

B41
B60
R50
R55
R128
R187 (B)

WI-68683

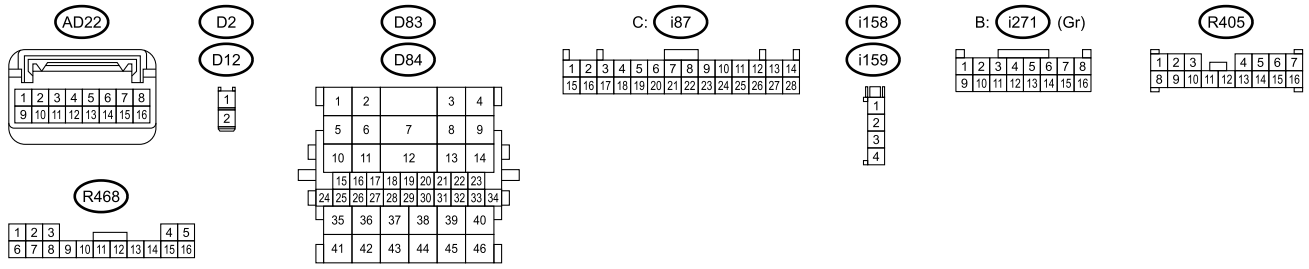
WIRING DIAGRAM

1. WITHOUT AUDIO AMPLIFIER

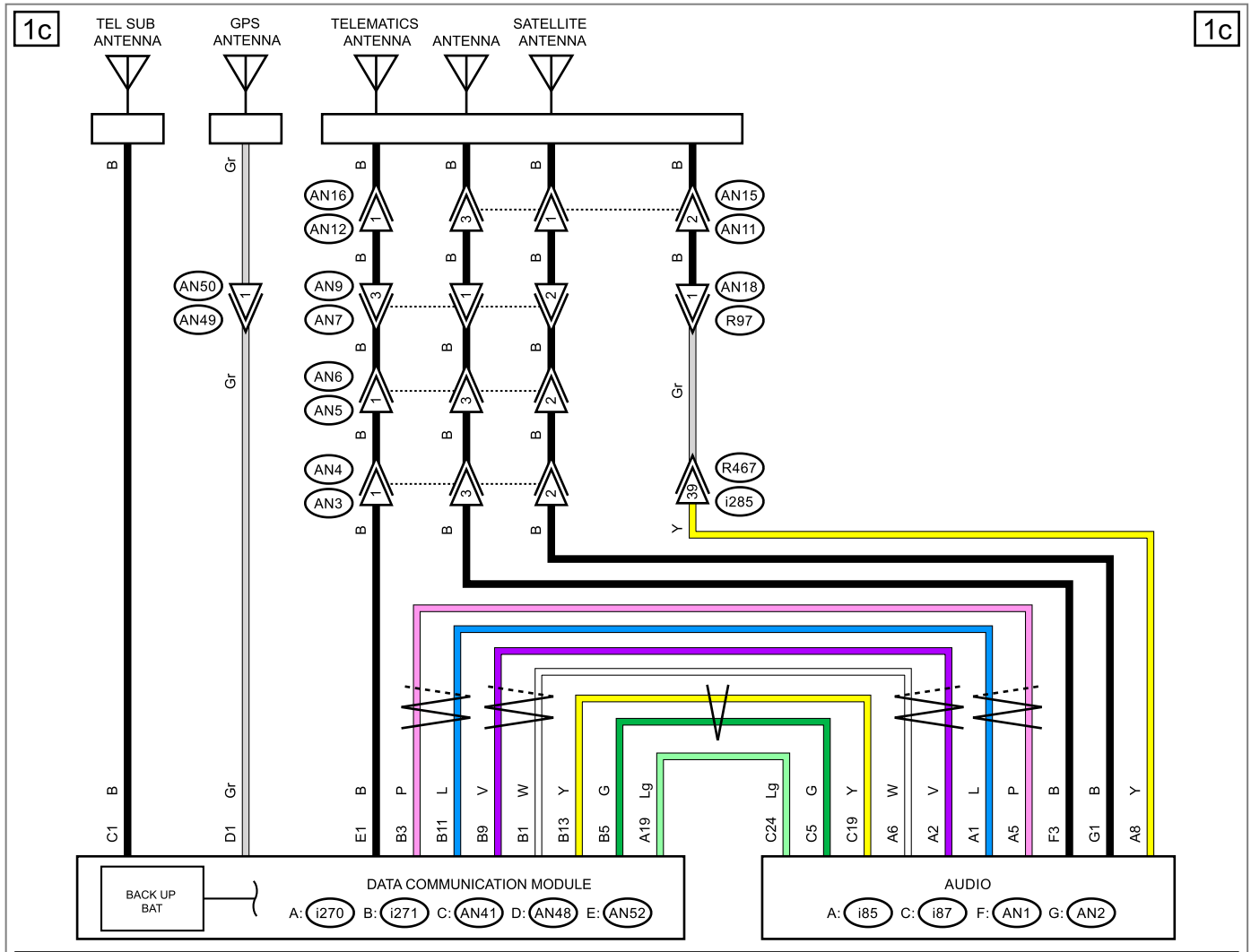




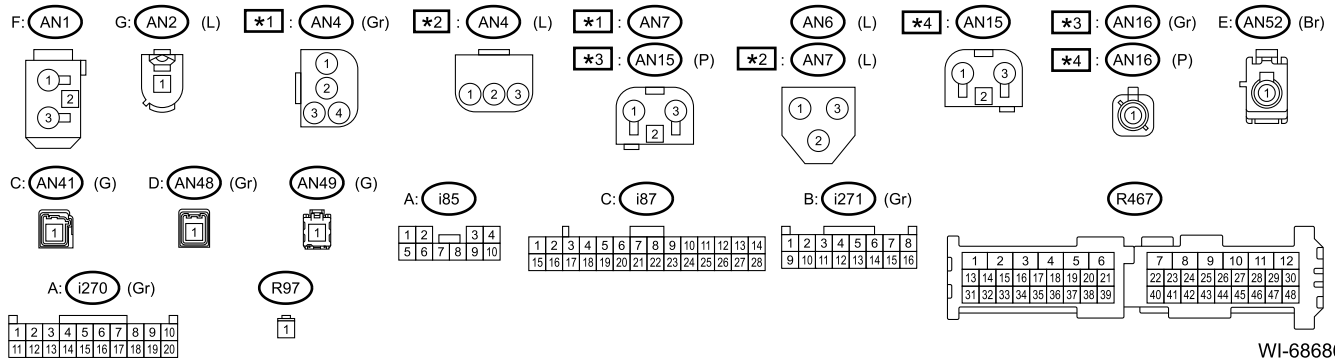
*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



WI-68685

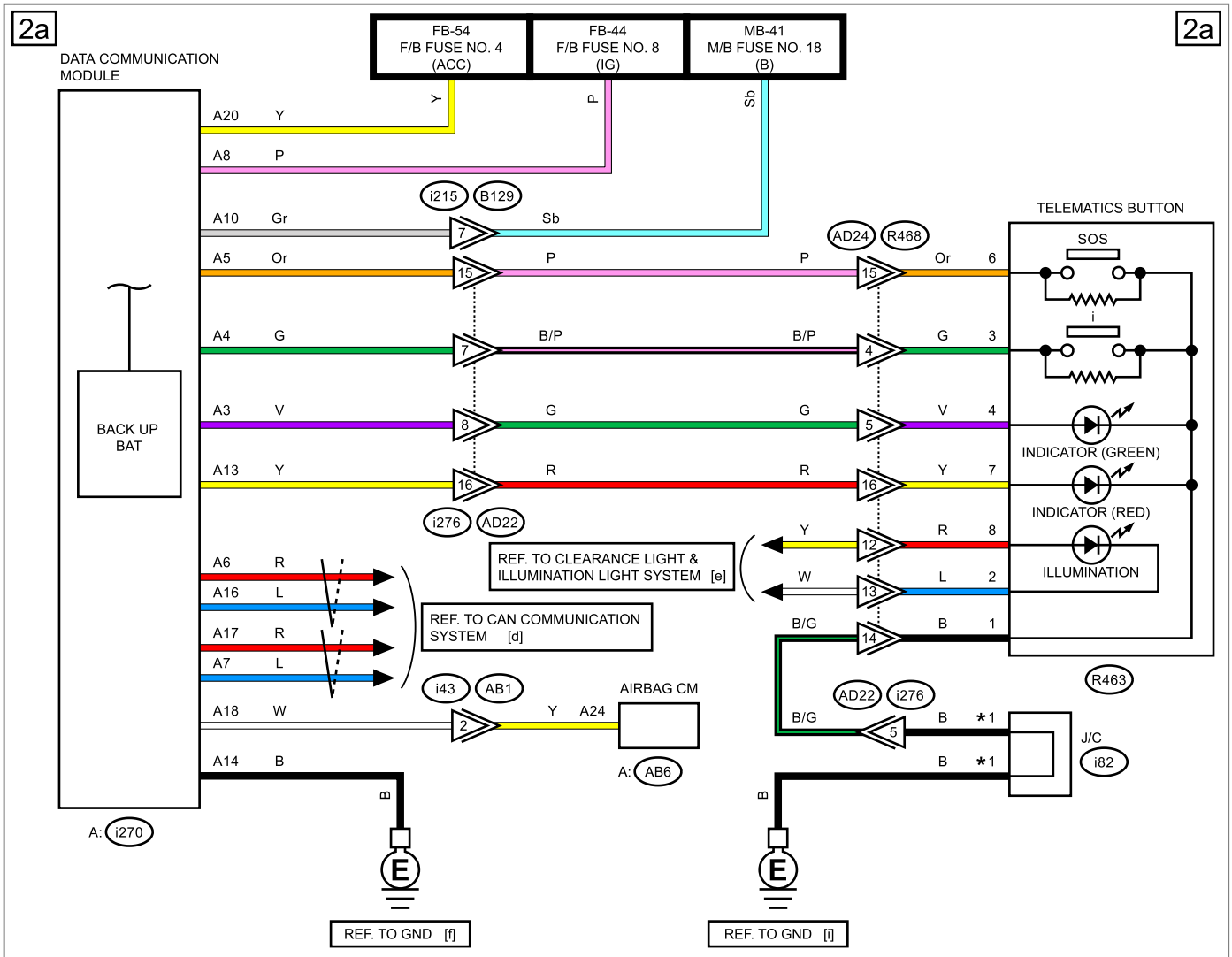


*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL

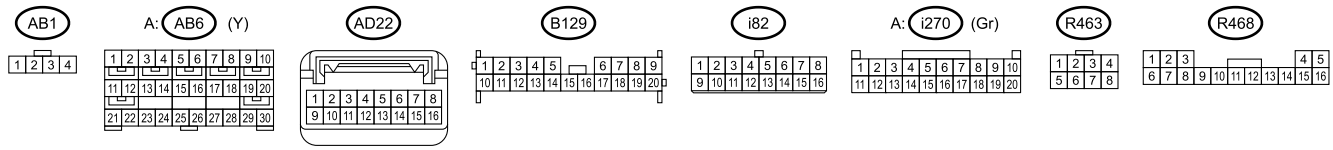


WI-68686

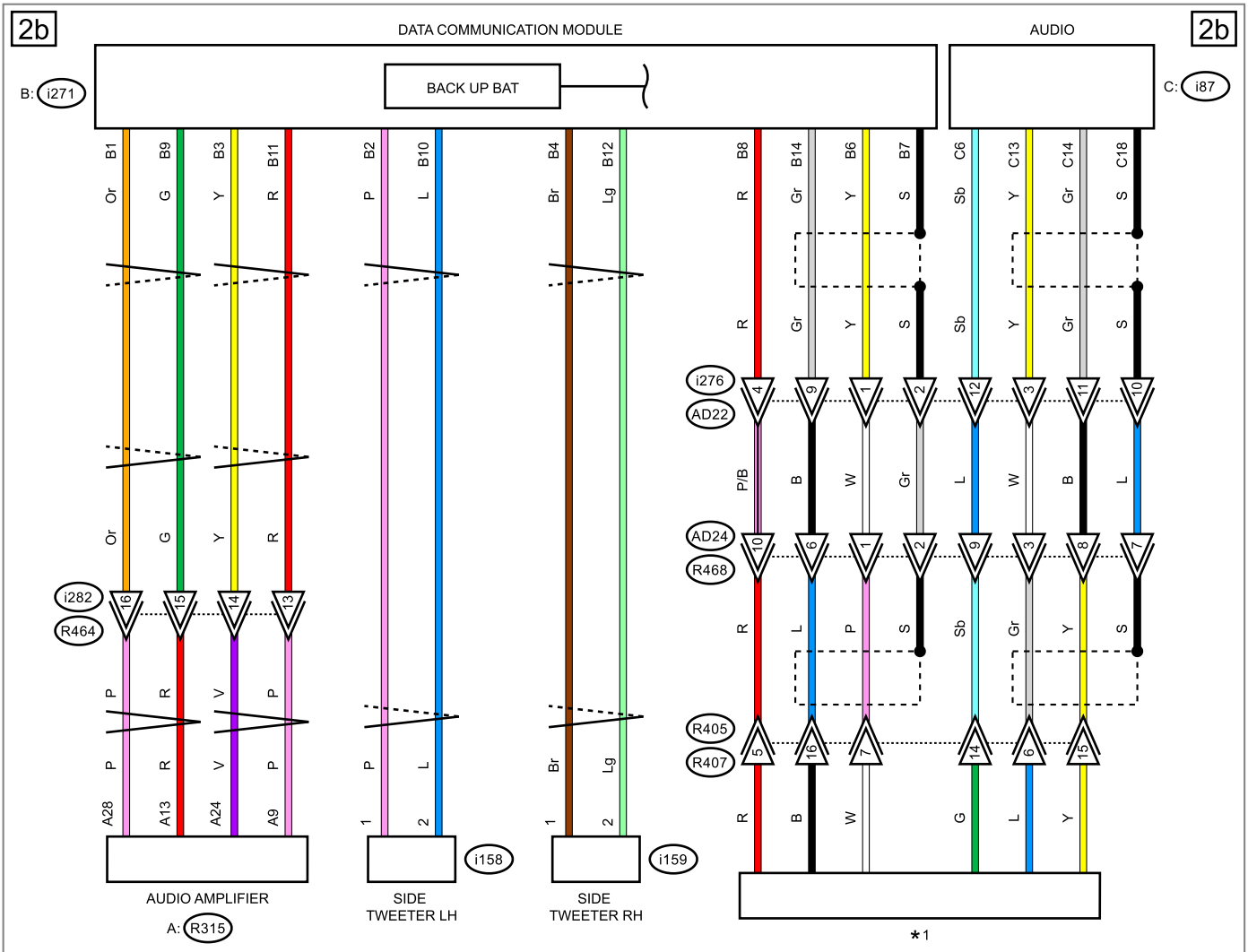
2. WITH AUDIO AMPLIFIER WITHOUT NAVIGATION SYSTEM



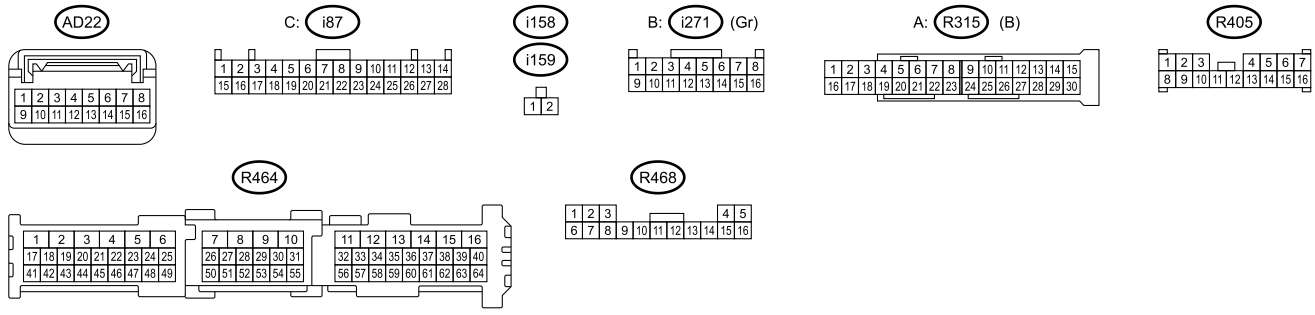
*1 : TERMINAL No. OPTIONAL ARRANGEMENT



WI-68687

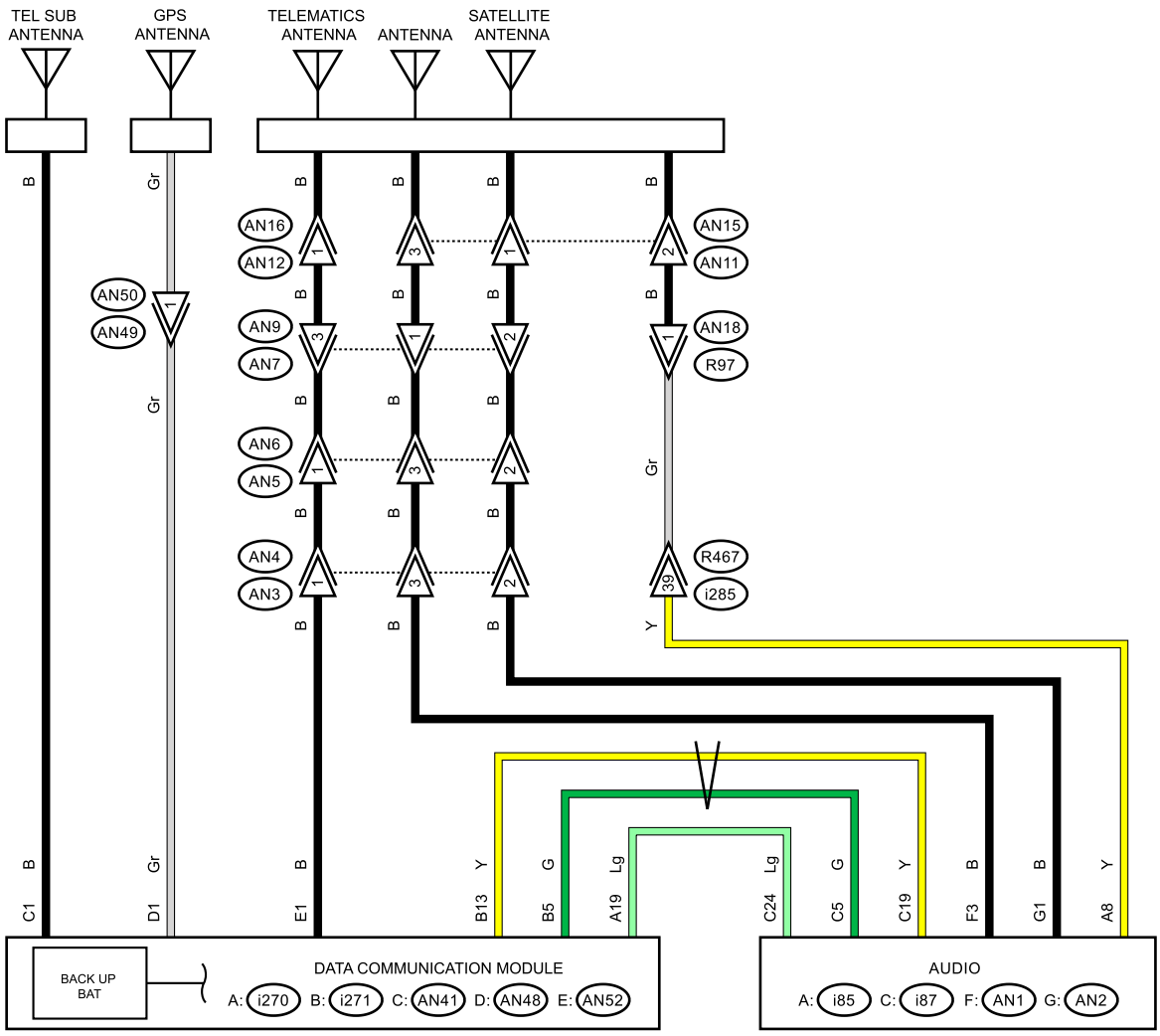


*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



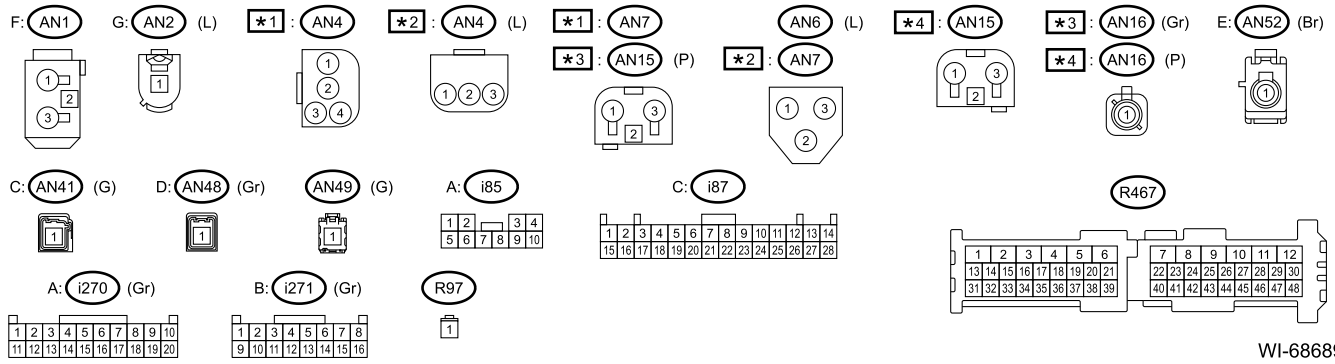
WI-68688

2c



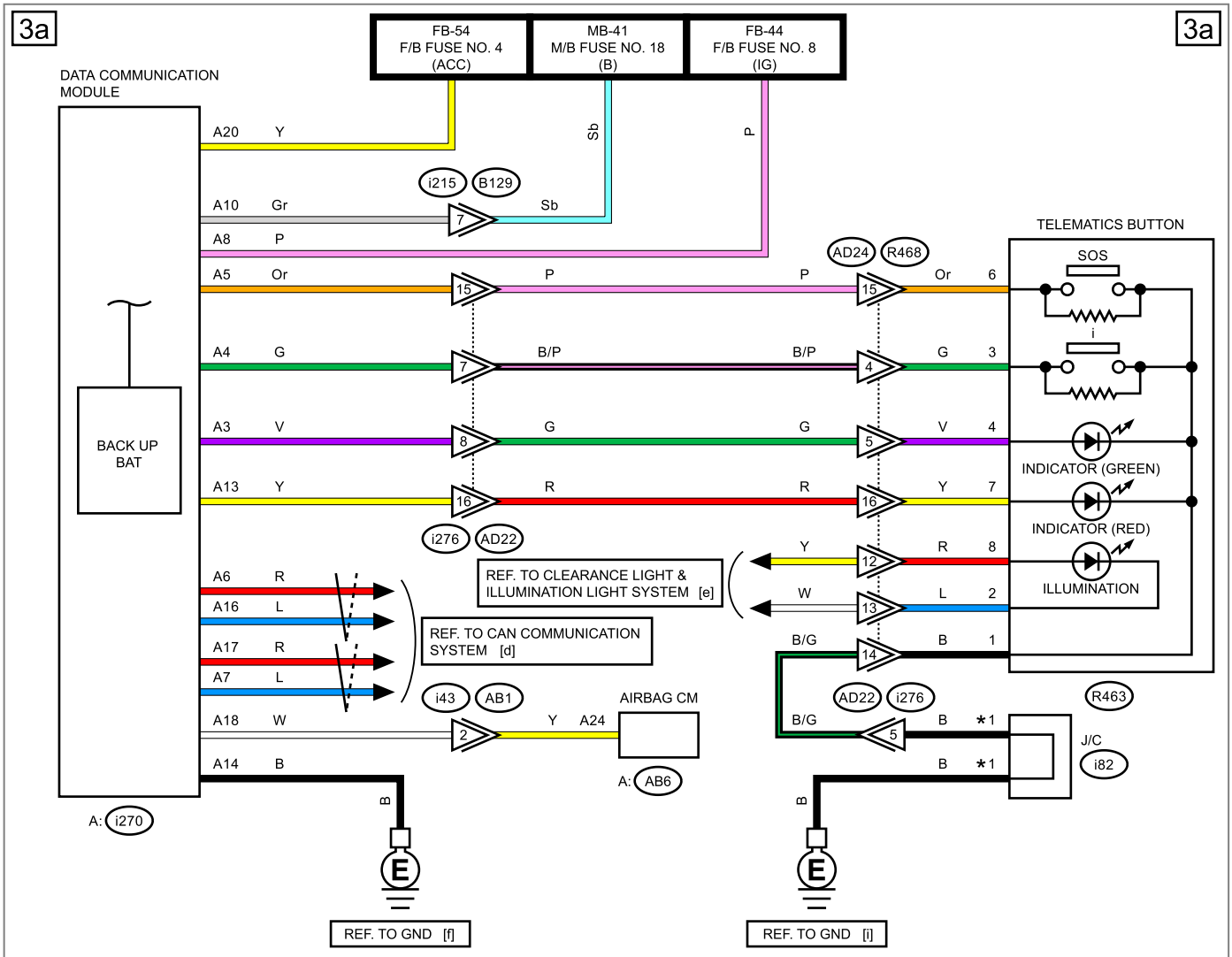
2c

*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL

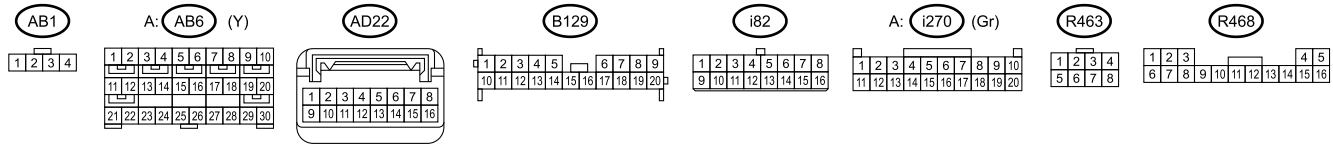


WI-68689

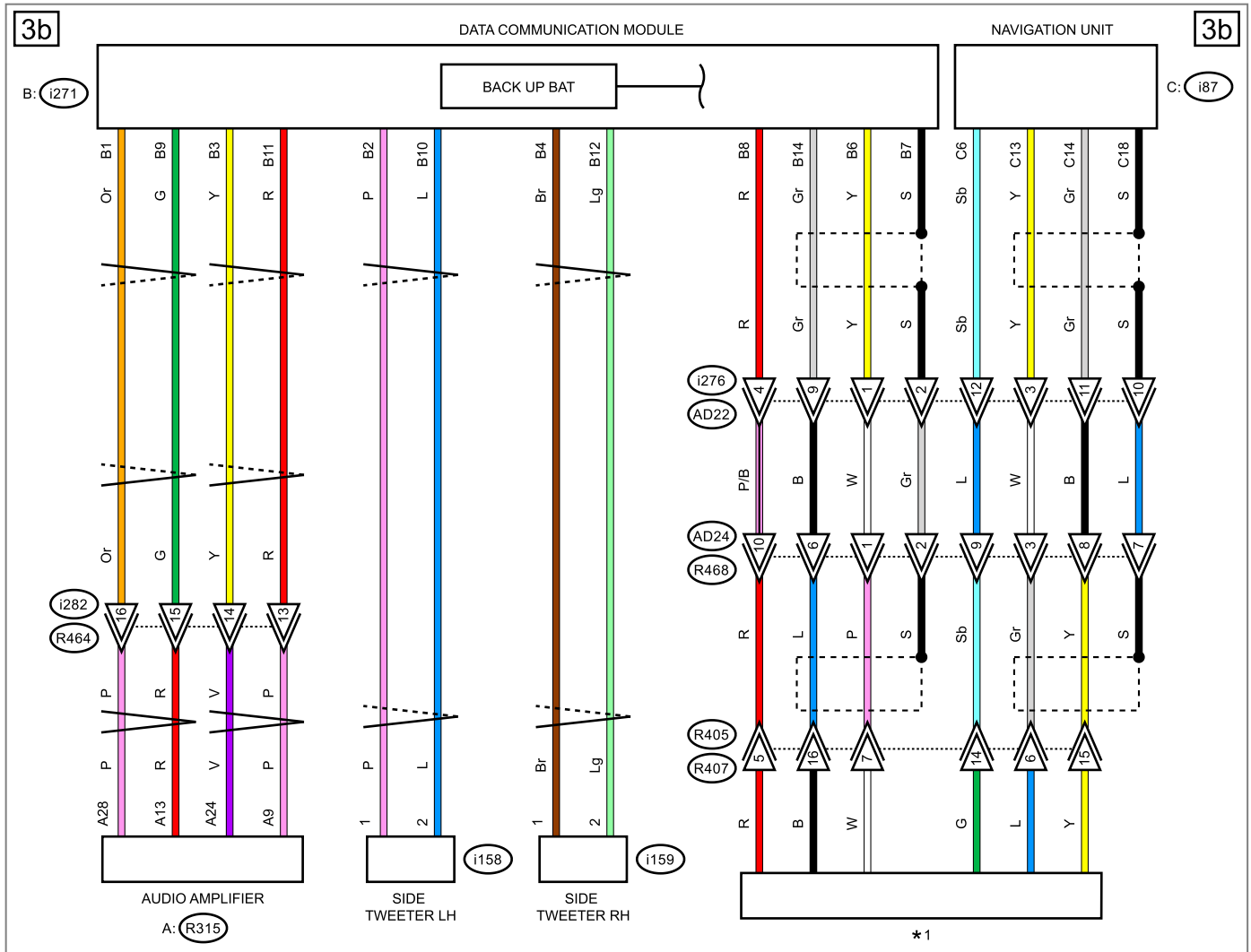
3. WITH AUDIO AMPLIFIRE WITH NAVIGATION SYSTEM



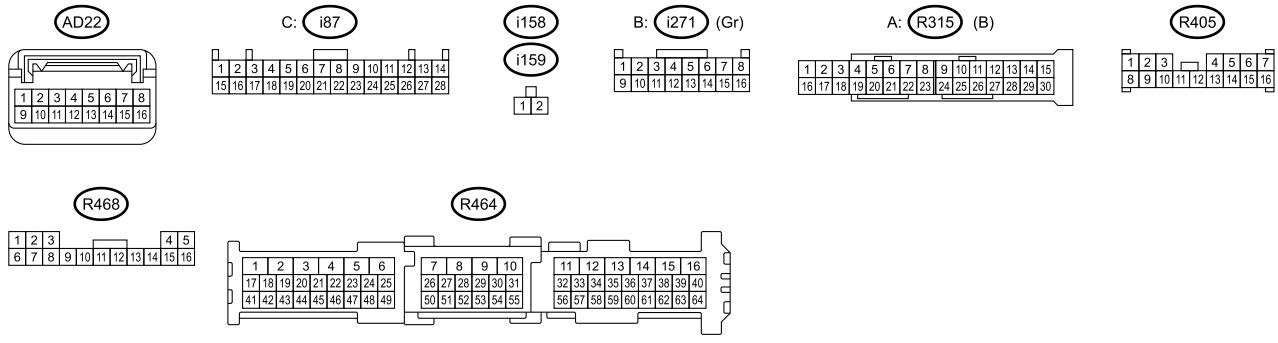
*1 : TERMINAL No. OPTIONAL ARRANGEMENT



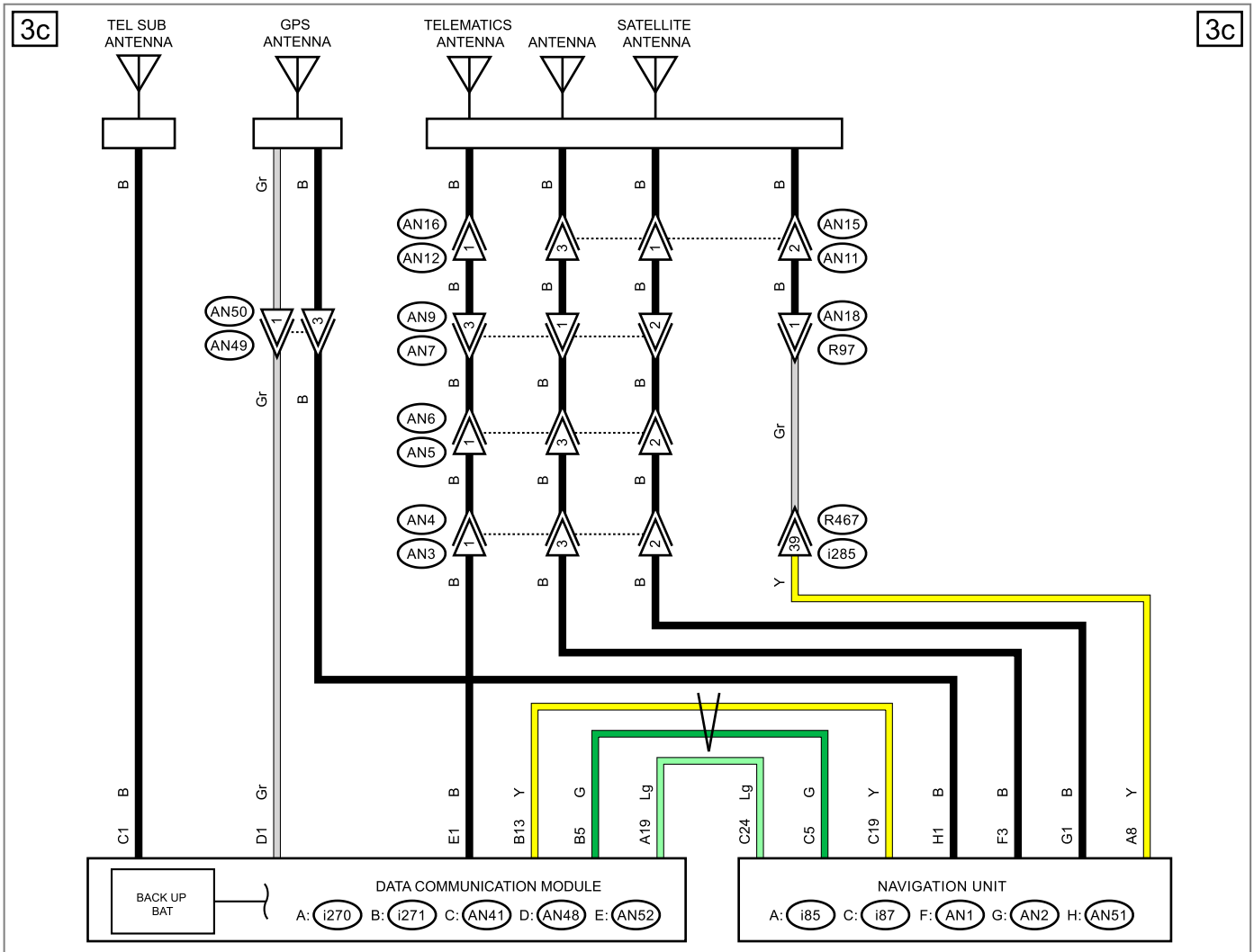
WI-68690



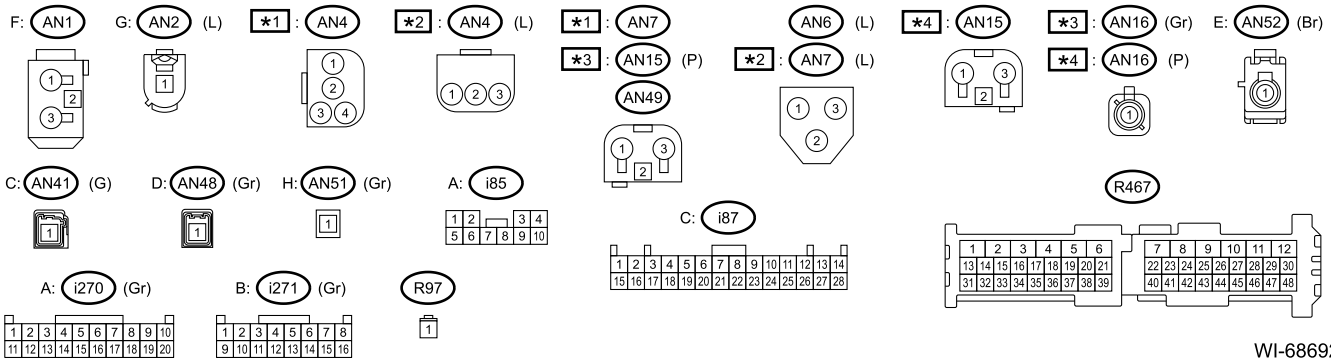
*1 : WITHOUT EyeSight : OVERHEAD CONSOLE (MICROPHONE)
WITH EyeSight : STEREO CAMERA COVER (MICROPHONE)



WI-68691

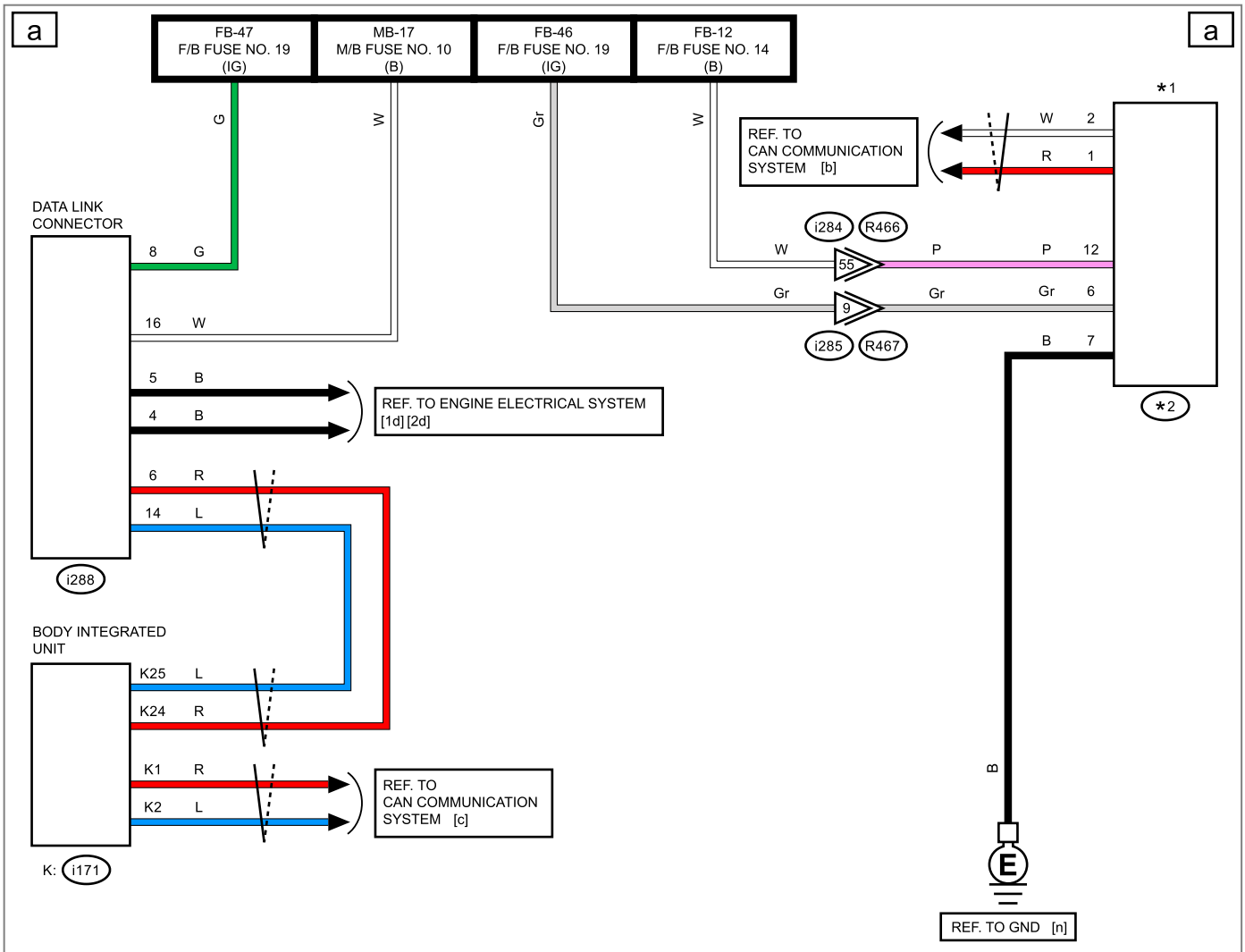


*1 : WITHOUT SATELLITE ANTENNA
*2 : WITH SATELLITE ANTENNA
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL



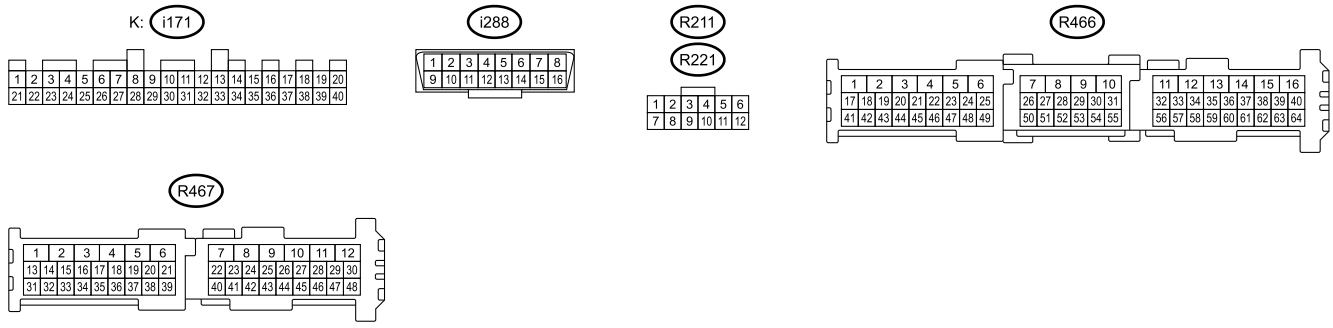
WI-68692

WIRING DIAGRAM

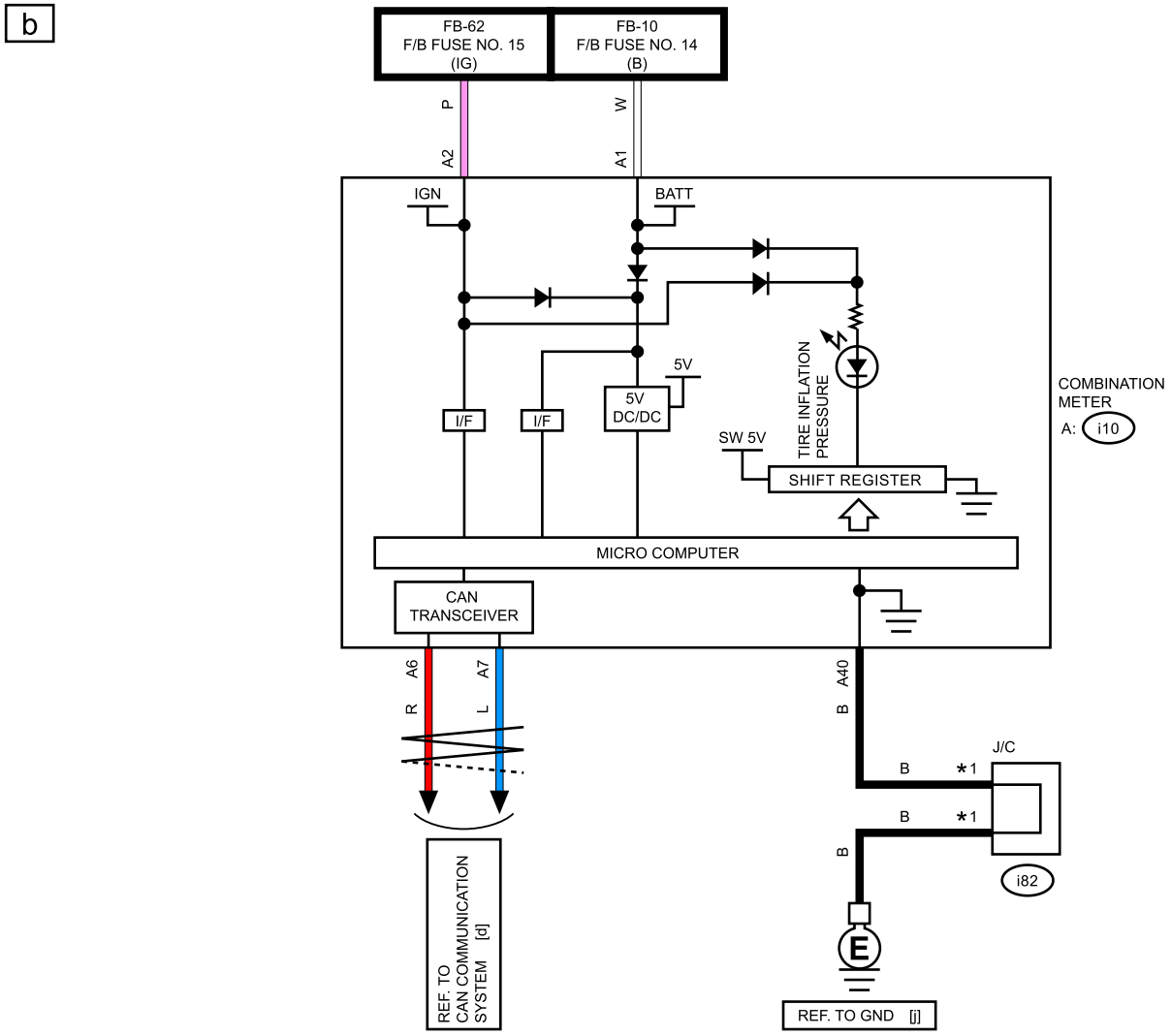


*1 : WITHOUT PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH PUSH BUTTON START : TPMS CM

*2 : WITHOUT PUSH BUTTON START : R221
WITH PUSH BUTTON START : R211



WI-68693



*1 : TERMINAL No. OPTIONAL ARRANGEMENT

A: i10 (B)

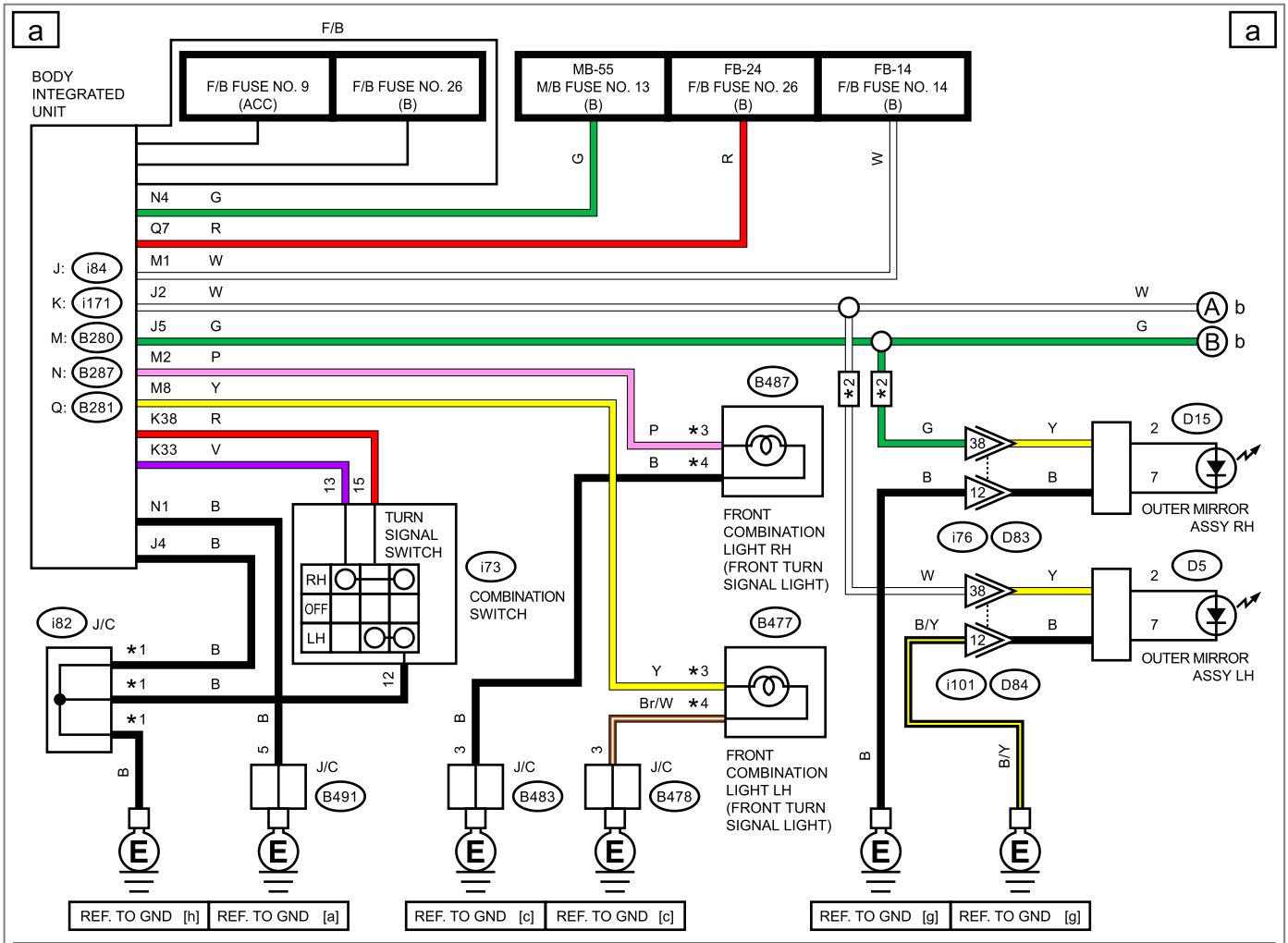
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

i82

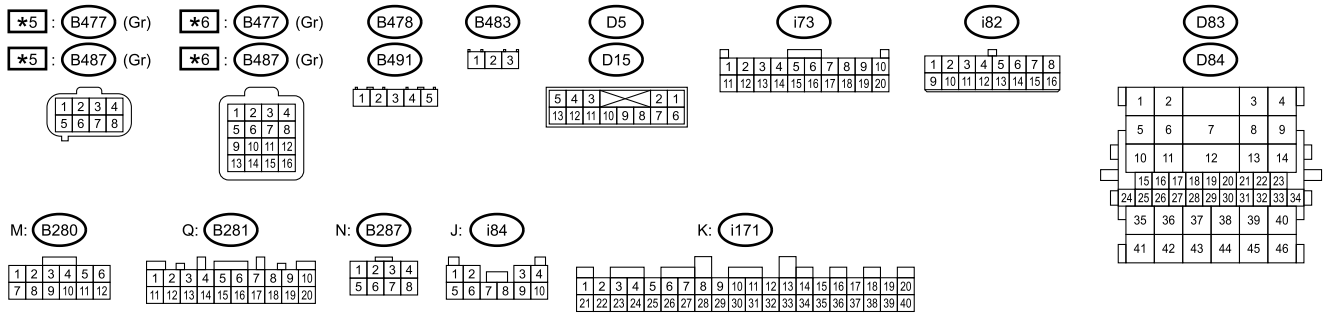
1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

WI-68694

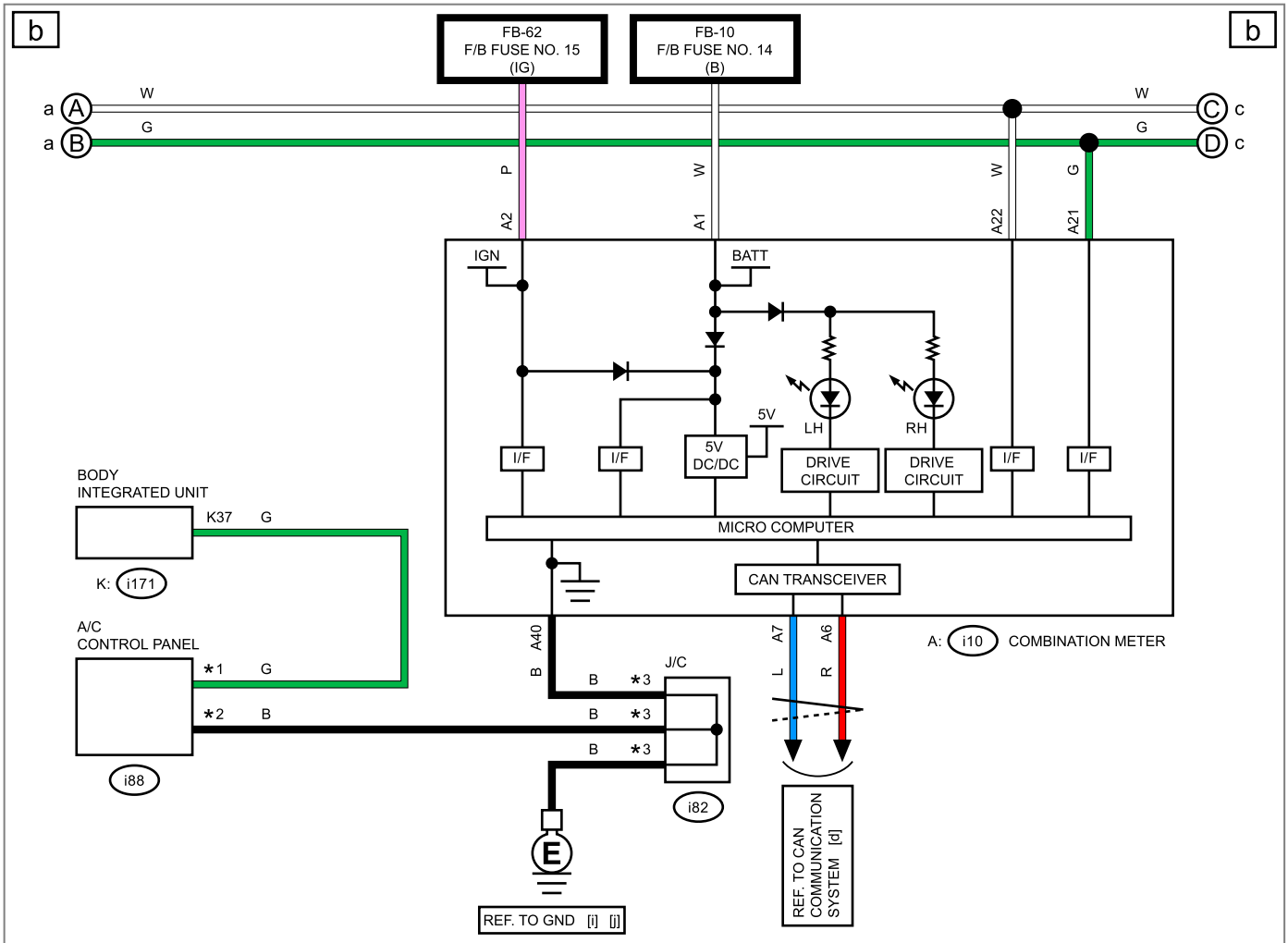
WIRING DIAGRAM



*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : WITH MIRROR TURN
*3 : HALOGEN MODEL : 5
LED MODEL : 8
*4 : HALOGEN MODEL : 4
LED MODEL : 9
*5 : HALOGEN MODEL
*6 : LED MODEL



WI-68695



*1 : MANUAL A/C : 12
AUTO A/C : 26

*2 : MANUAL A/C : 18
AUTO A/C : 10

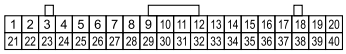
*3 : TERMINAL No. OPTIONAL ARRANGEMENT

*4 : AUTO A/C

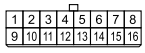
*5 : MANUAL A/C

A: i10 (B)

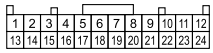
*4 : i88



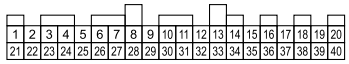
i82



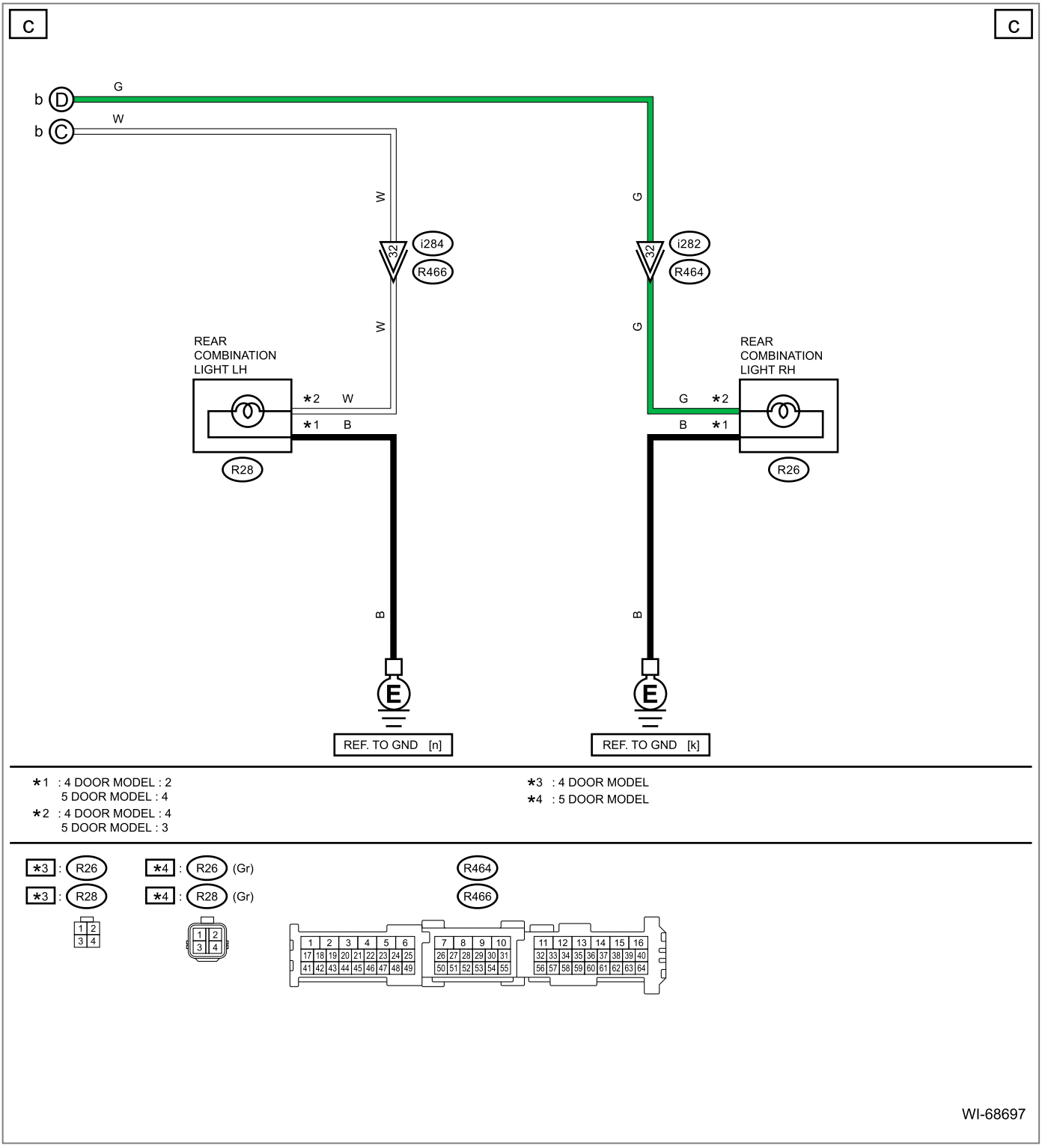
*5 : i88



K: i171



WI-68696



∗1 : 4 DOOR MODEL : 2
5 DOOR MODEL : 4
∗2 : 4 DOOR MODEL : 4
5 DOOR MODEL : 3

∗3 : 4 DOOR MODEL
∗4 : 5 DOOR MODEL

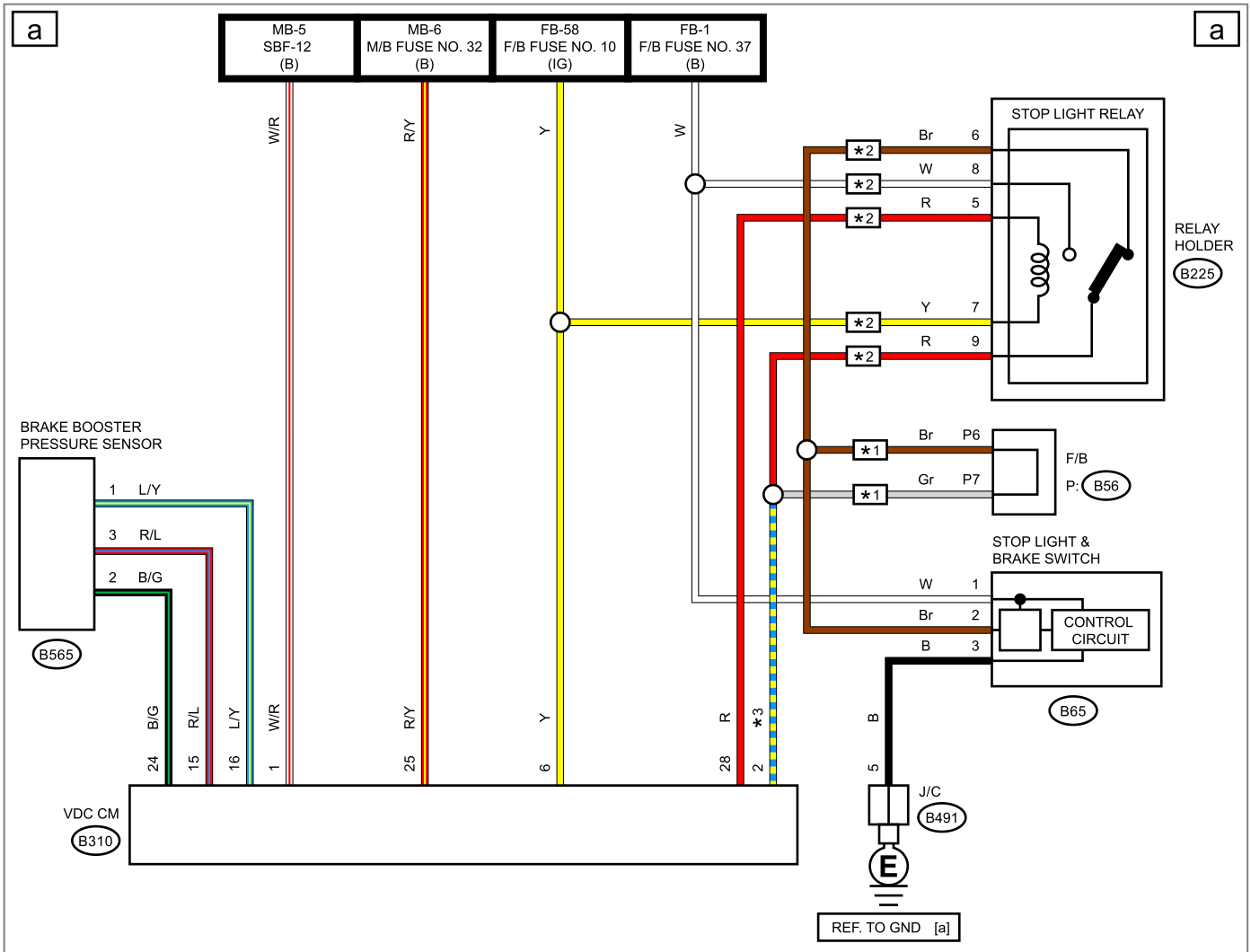
∗3 : R26
∗3 : R28

∗4 : R26 (Gr)
∗4 : R28 (Gr)

R464
R466

WI-68697

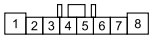
WIRING DIAGRAM



*1 : WITHOUT EyeSight
*2 : WITH EyeSight

*3 : WITHOUT EyeSight : Gr
WITH EyeSight : R

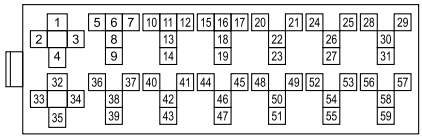
P: B56 (Br)



B65

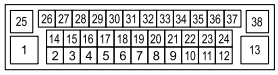


B225 (B)



RELAY HOLDER

B310 (B)



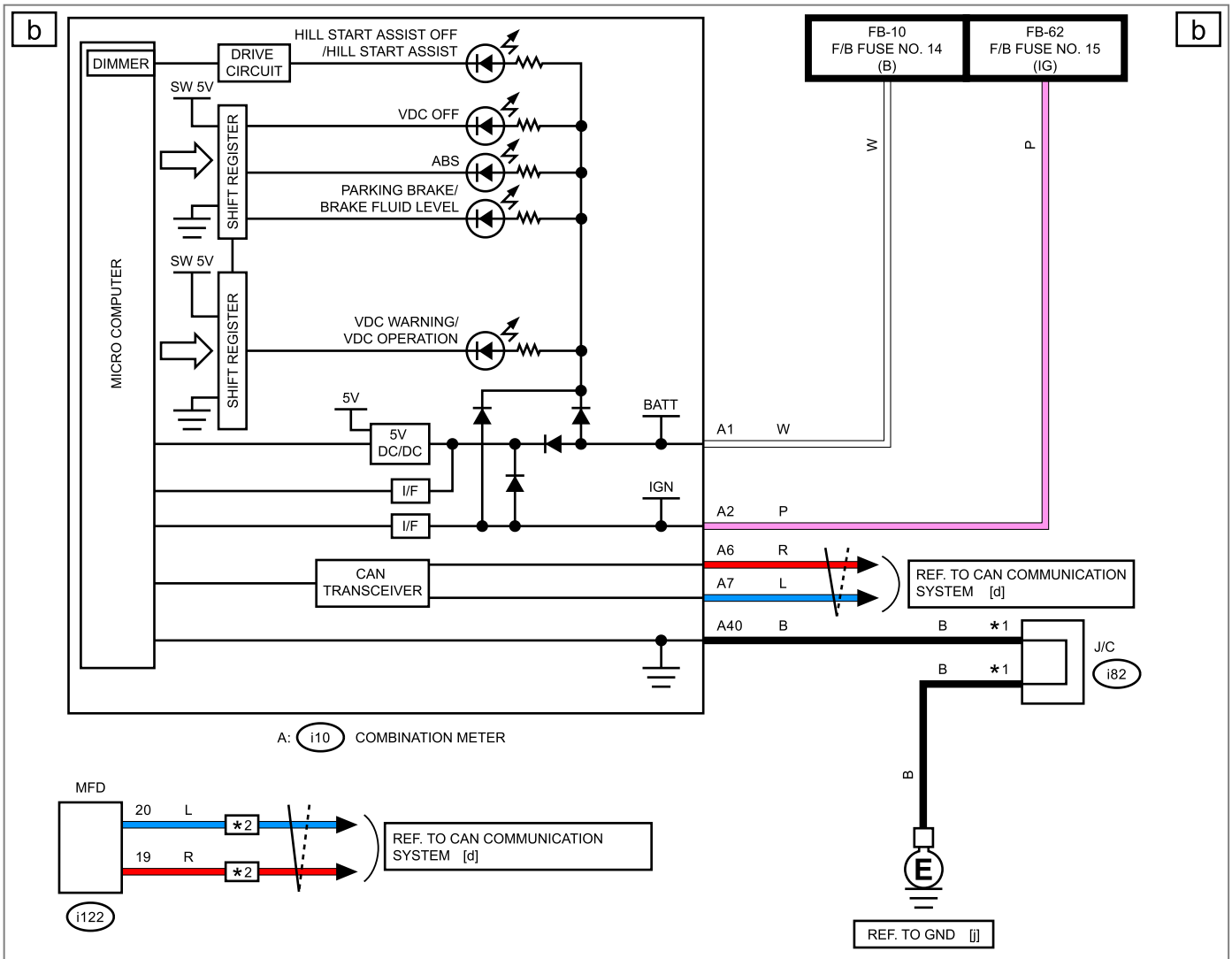
B491



B565 (Gr)



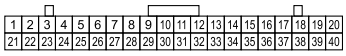
WI-68698



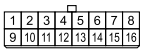
*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH HIGH GRADE MFD

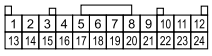
A: i10 (B)



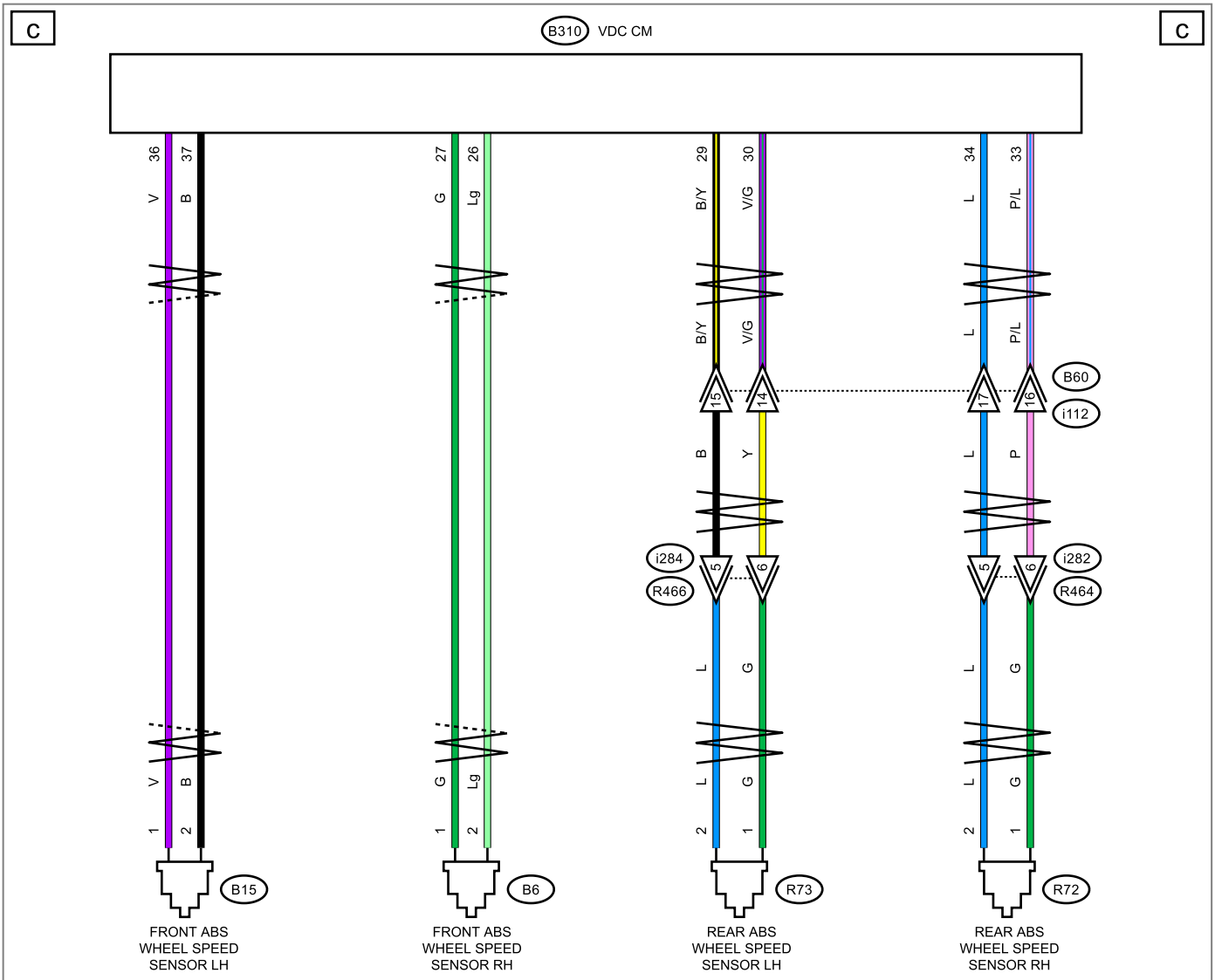
i82

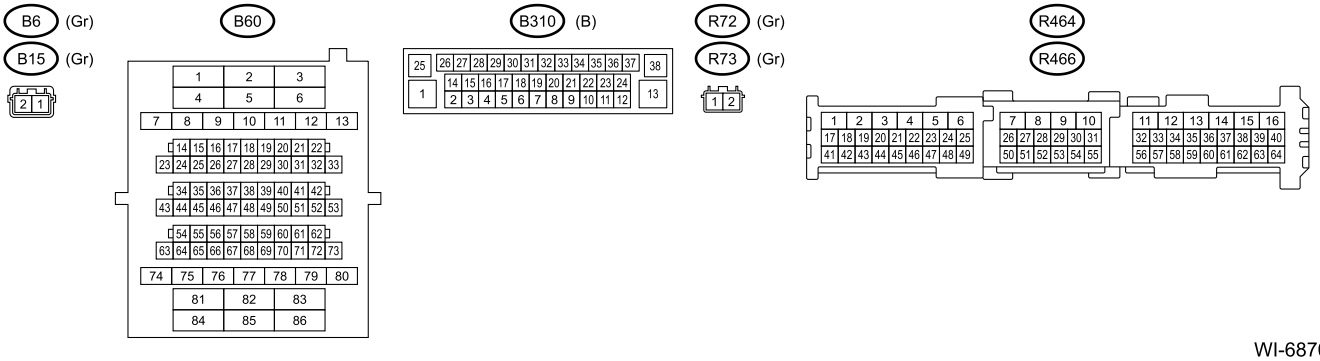


i122

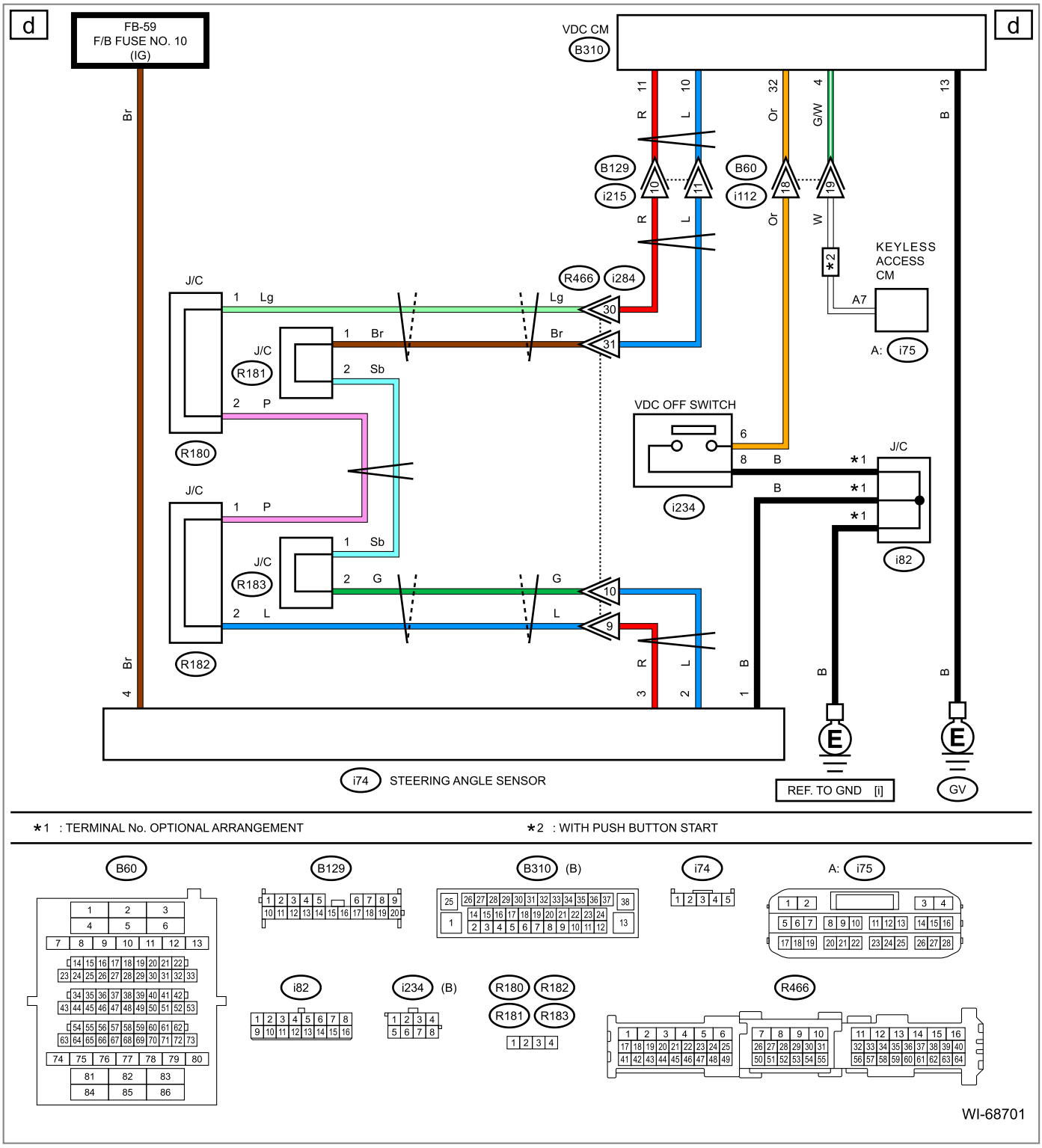


WI-68699


C
B310 VDC CM
C
36 V
37 B
27 G
26 Lg
29 B/Y
30 V/G
34 L
33 P/L
B60
i112
17
16
15
14
B
Y
P
i284
R466
i282
R464
5
6
1 V
2 B
1 G
2 Lg
2 L
1 G
B15
B6
R73
R72
FRONT ABS WHEEL SPEED SENSOR LH
FRONT ABS WHEEL SPEED SENSOR RH
REAR ABS WHEEL SPEED SENSOR LH
REAR ABS WHEEL SPEED SENSOR RH


B6 (Gr)
B15 (Gr)
B60
B310 (B)
R72 (Gr)
R73 (Gr)
R464
R466

WI-68700

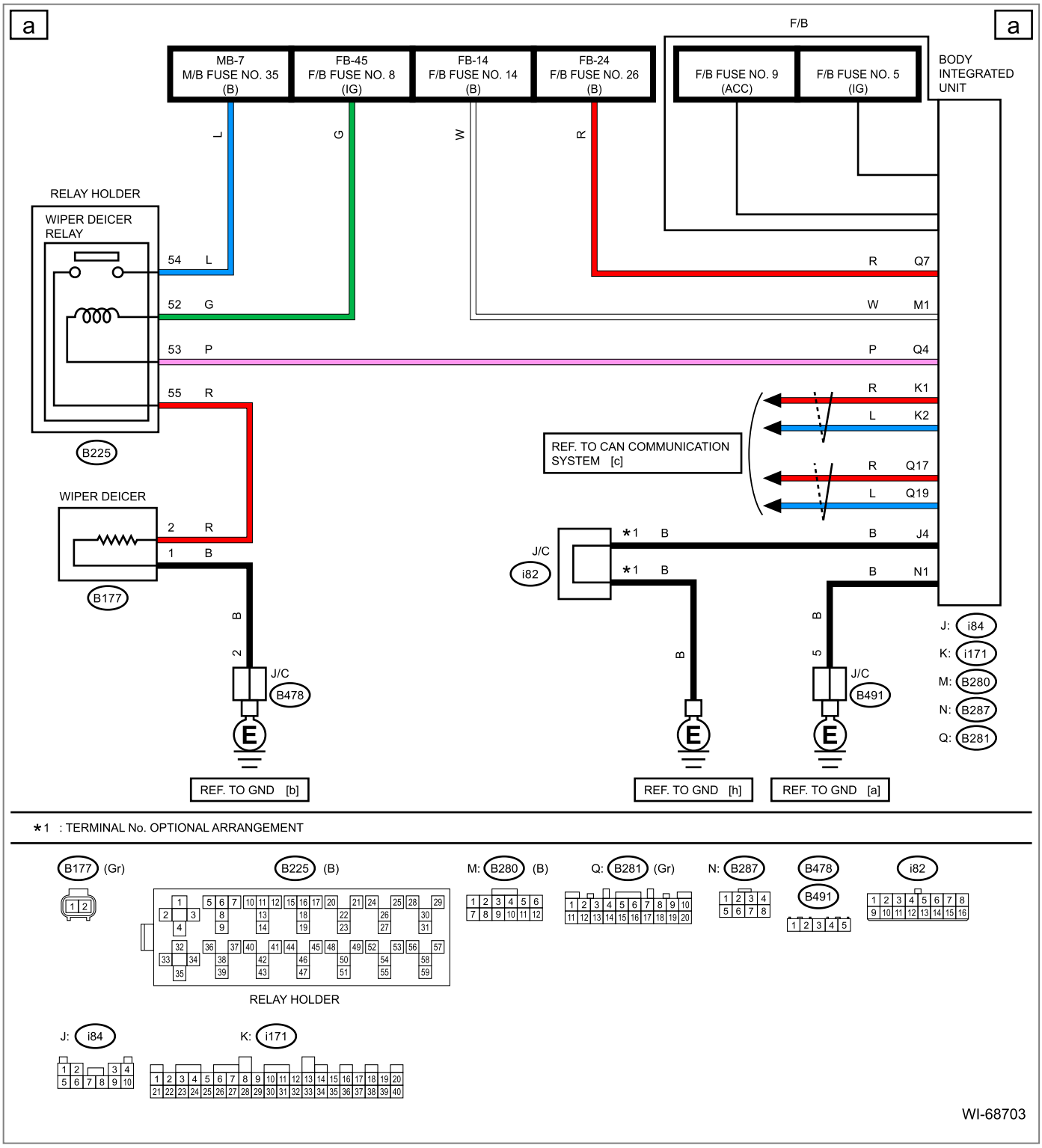


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

*2 : WITH PUSH BUTTON START

WI-68701

WIRING DIAGRAM

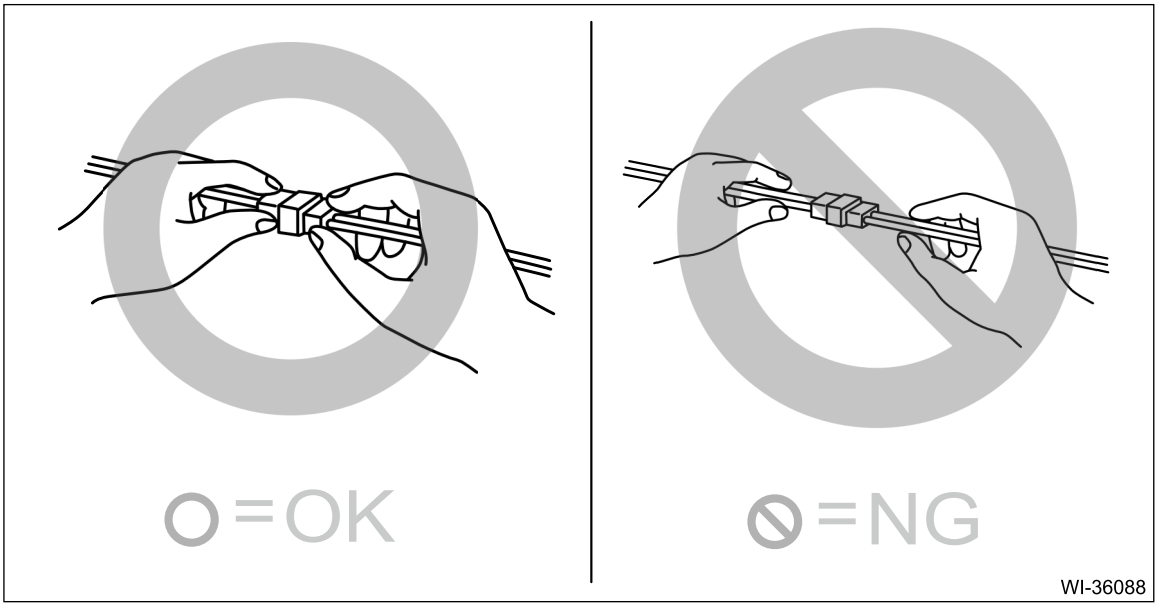


*1 : TERMINAL No. OPTIONAL ARRANGEMENT

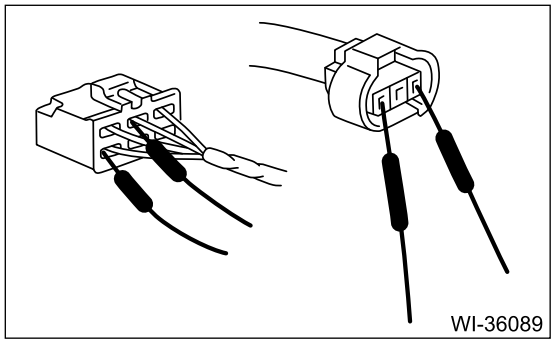
WI-68703

PRECAUTIONS IN TROUBLE DIAGNOSIS AND REPAIR OF ELECTRIC PARTS

1. Always refer to "CAUTION" and "NOTE" of "General Description" in the same models service manual before starting the diagnostics and repair.
2. Always refer to the cautions of each section when diagnosing and repairing each system and component.
3. The battery cable must be disconnected from the negative terminal after the ignition switch is set to the OFF position, unless otherwise required by the diagnostics.
4. When disconnecting a connector, do not pull the harness, but pull while holding the connector housing.



5. Confirm the locking shape completely before disconnecting a connector. In addition, firmly push in the connector until a click sounds when connecting a connector.
6. When checking continuity between connector terminals, or measuring voltage across the terminal and ground, always touch tester probe (s) to terminals from the harness side.
   If the probe is too thick to gain access to the terminal, do not push it in forcibly but use a mini test lead.
7. When measuring the voltage or resistance of individual sensor or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal. Never insert the tapered pin into the terminal at this time. Doing so may cause internal deformation and a malfunction can occur.
8. To check water-proof connectors (which are not measurable from the harness side), touch tester probes on the terminal side and be very careful not to bend or damage the terminals.



9. Securely fasten the harness with clamps and clips so that the harness does not interfere with the body end parts, edges, bolts or screws.

10. When installing a harness and a component, be careful not to catch them on the harness.
11. Sensors, relays, units, etc., are sensitive to strong impacts. Handle them with extra care so that they are not dropped or mishandled.
12. Because the HID headlight uses high voltage, be sure to confirm that the power supply is turned off before diagnostics and repair. Furthermore, do not perform diagnostics and repair with wet hands because there is a possibility of electrical shock.
13. When inspecting the airbag system, in order to avoid malfunction, always refer to “CAUTION” of “General Description” of the airbag system in the same model’s service manual.

PRECAUTIONS WHEN WORKING WITH THE PARTS MOUNTED ON THE VEHICLE

1. Always refer to “CAUTION” and “NOTE” of “General Description” in the same model’s service manual before starting the service.
2. When working under a vehicle which is jacked-up, always be sure to use rigid rack.
3. The parking brake must always be applied during working. Also, in automatic transmission vehicles, keep the select lever set to the P (Parking) range.
4. Be sure the workshop is properly ventilated when running the engine.
5. Be careful not to touch the rotating parts such as a belt or a fan while the engine is operating.
6. Be careful not to touch hot metal parts immediately after the engine has been turned on or off.

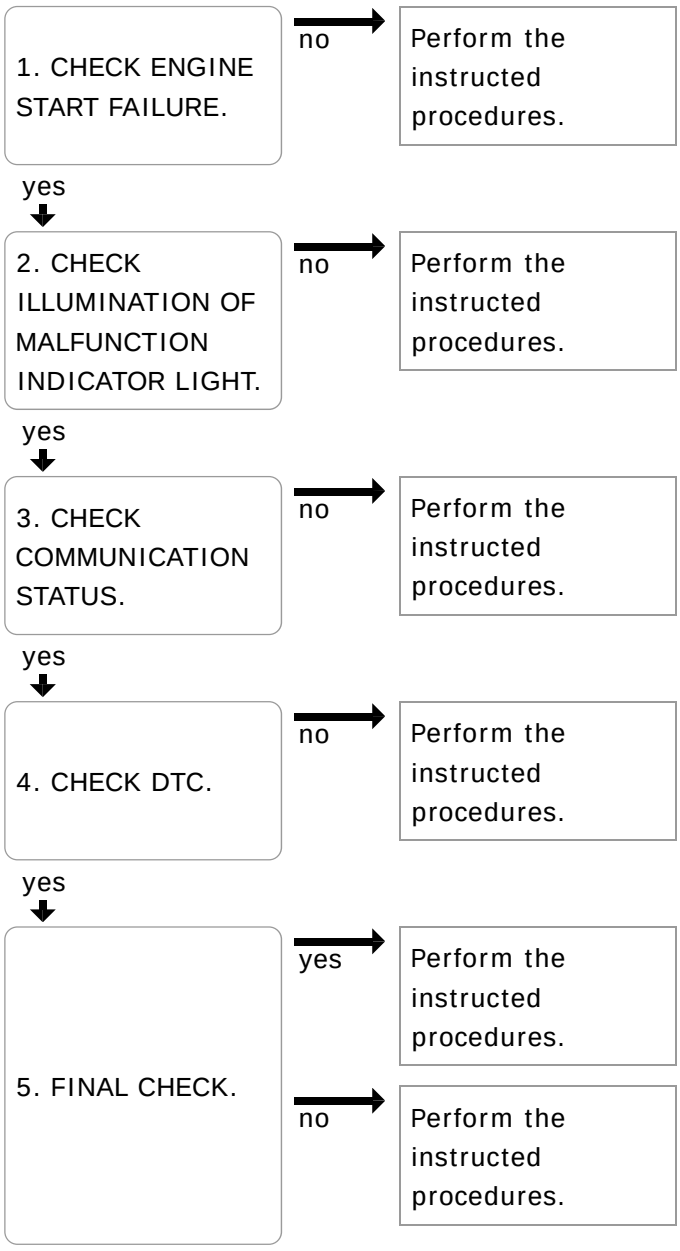
ENGINE (DIAGNOSTICS)(H4DO)

EN(H4DO)(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Work Support
12. All Readiness Diagnostic Code(s)
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. Diagnostics with Phenomenon
16. General Scan Tool

PROCEDURE

1. ENGINE



1. CHECK ENGINE START FAILURE.

1. Ask the customer when and how the trouble occurred using the interview check list. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Check List for Interview>CHECK.
2. Start the engine.

Does the engine start?

Yes	Go to 2.
No	Inspection using “Diagnostics for Engine Starting Failure” Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon.

2. CHECK ILLUMINATION OF MALFUNCTION INDICATOR LIGHT.

Check the illumination status of malfunction indicator light.

Does the malfunction indicator light illuminate?

Yes	Go to 3.
No	Check using “Diagnostics with Phenomenon”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon.

3. CHECK COMMUNICATION STATUS.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor or general scan tool to the data link connector.
3. Turn the ignition switch to ON, and run the Subaru Select Monitor or general scan tool.

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to the “Subaru Select Monitor”.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Does Subaru Select Monitor or general scan tool communicate with vehicle normally?

Yes	Go to 4.
No	Inspection using “Basic Diagnostic Procedure” of LAN system Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is DTC displayed on Subaru Select Monitor or general scan tool?

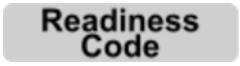
Yes	Record DTC and freeze frame data, then repair the trouble cause. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC). After repair, go to the next step. Go to 5.
No	Repair the related parts. **Note:** **If DTC is not shown on display although the malfunction indicator light illuminates, perform the diagnosis of malfunction indicator light circuit or combination meter. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Warning Light Illumination Pattern.**

5. FINAL CHECK.

1. Connect all connectors.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Read the readiness code of [Engine] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.



5. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC displayed on Subaru Select Monitor or general scan tool?

Yes	Check the connection of connector. If there is no faulty connector, perform the diagnosis for the displayed DTCs. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
No	Finish the diagnosis.

ENGINE (DIAGNOSTICS)(H4DO) > Check List for Interview

CHECK

1. CHECK LIST NO. 1

Check the following item when problem has occurred.

Note:

Use copies of this page for interviewing customers.

Customer's name		Engine No.	
Date of purchase		Fuel type	
Date of repair		Odometer reading	km
V.I.N.			miles
Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Various/Others:		
Ambient air temperature	°C (°F)		
	❑ Hot ❑ Warm ❑ Cool ❑ Cold		
Place	❑ Highway ❑ Suburbs ❑ Inner city ❑ Uphill ❑ Downhill ❑ Rough road ❑ Others:		
Engine temperature	❑ Cold ❑ Warming-up ❑ After warming-up ❑ Any temperature ❑ Others:		
Engine speed	rpm		
Vehicle speed	km/h (MPH)		
Driving conditions	❑ Not affected ❑ At starting ❑ While idling ❑ At racing ❑ While accelerating ❑ While cruising ❑ While decelerating ❑ While turning (RH/LH)		
Headlight	❑ ON / ❑ OFF	Rear defogger	❑ ON / ❑ OFF

Blower	❑ ON / ❑ OFF	Audio	❑ ON / ❑ OFF
A/C compressor	❑ ON / ❑ OFF	Rear entertainment system	❑ ON / ❑ OFF
Radiator fan	❑ ON / ❑ OFF	Car phone	❑ ON / ❑ OFF
Front wiper	❑ ON / ❑ OFF	Wireless device	❑ ON / ❑ OFF
Rear wiper	❑ ON / ❑ OFF		

2. CHECK LIST NO. 2

Check the following item about the vehicle's state when the malfunction indicator light turns on.

Note:

Use copies of this page for interviewing customers.

a) Other warning lights or indicators illuminate: ❑ Yes / ❑ No
❑ Fuel level warning light ❑ Charge warning light ❑ Engine coolant temperature warning light ❑ Oil pressure warning light ❑ ATF temperature warning light or Sport indicator light ❑ Driver's control center differential indicator light ❑ ABS warning light ❑ VDC warning light ❑ Cruise indicator light ❑ SI-CRUISE warning light ❑ Immobilizer indicator light ❑ STEERING warning light ❑ Electronic parking brake warning light ❑ Glow indicator light ❑ Sedimenter warning light ❑ Others:
b) Fuel level
• Lack of fuel: ❑ Yes / ❑ No • Indicator position of fuel gauge: • Experienced running out of fuel: ❑ Yes / ❑ No
c) Intentional connecting or disconnecting of harness connectors or spark plug cords: ❑ Yes / ❑ No
• What:
d) Intentional connecting or disconnecting of hoses: ❑ Yes / ❑ No
• What:
e) Installing of other parts except genuine parts: ❑ Yes / ❑ No
• What: • Where:
f) Occurrence of noise: ❑ Yes / ❑ No
• From where: • What kind:
g) Occurrence of smell: ❑ Yes / ❑ No

- From where:
- What kind:

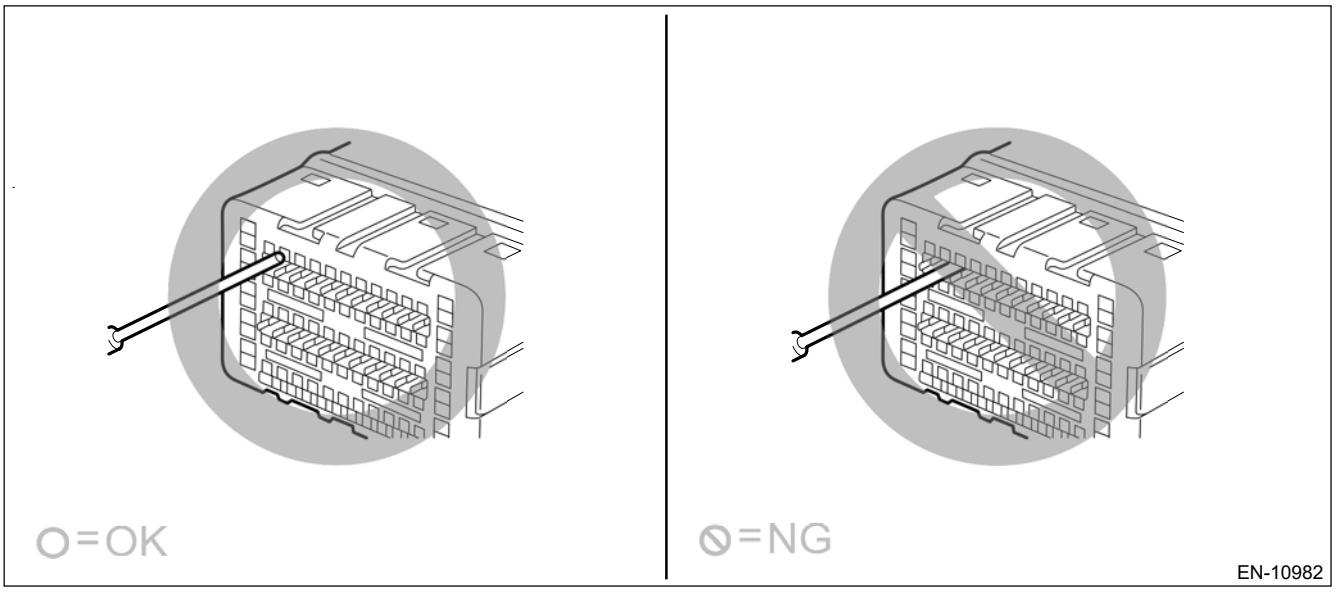
h) Intrusion of water into engine compartment or passenger compartment: ❑ Yes / ❑ No

i) Troubles occurred

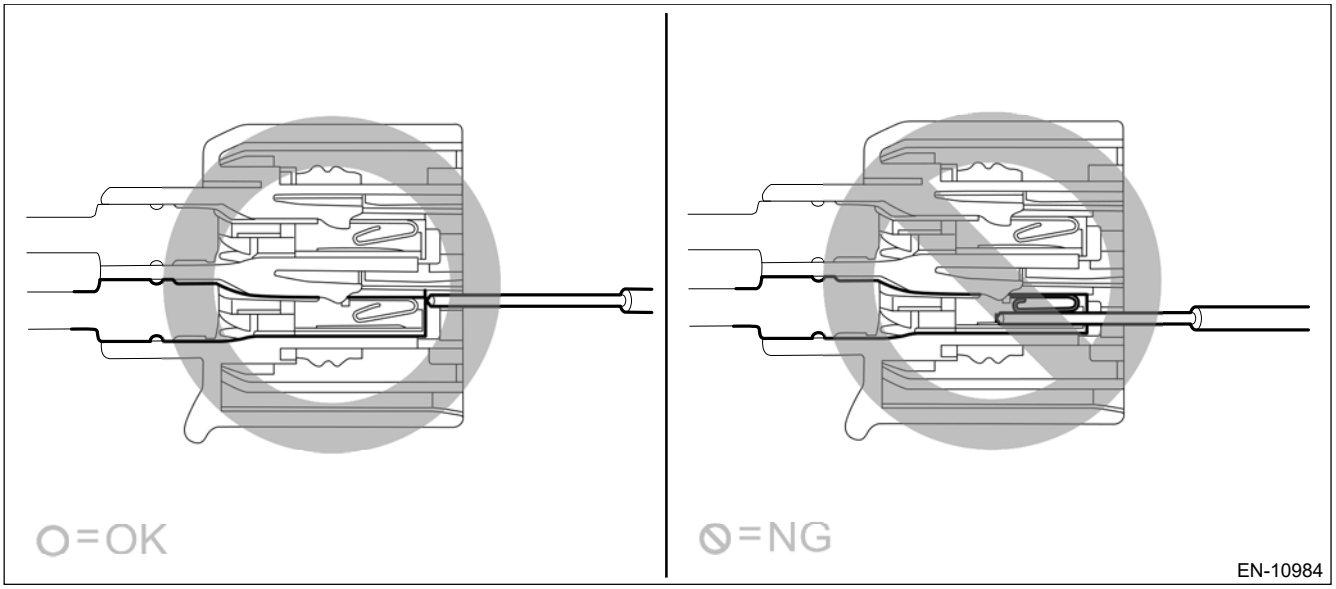
❑ Engine does not start.
❑ Engine stalls during idling.
❑ Engine stalls while driving.
❑ Engine speed decreases.
❑ Engine speed does not decrease.
❑ Rough idling
❑ Poor acceleration
❑ Back fire
❑ After fire
❑ Does not shift.
❑ Excessive shift shock

CAUTION

1. Airbag system wiring harness is routed near the ECM, main relay and fuel pump relay.
   Caution:
   - **Do not use electrical test equipment on the airbag system circuits.**
   - **Be careful not to damage the airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.**
2. Never connect the battery in reverse polarity. Doing so will damage the ECM instantly, and other parts will also be damaged.
3. Do not disconnect the battery cables while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.
4. After connecting the battery terminals, wait for at least 10 seconds before tuning the ignition switch to ON. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
5. When disconnecting the connectors of the electrical components, always be sure to turn the ignition switch to OFF. Perform the Clear Memory after connecting the connectors. Ref. to COMMON(diag)>Clear memory.
6. When measuring the voltage or resistance of individual sensors or all electrical control modules, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal.



Never insert the tapered pin into the terminal because it deforms inside which may lead to a malfunction.



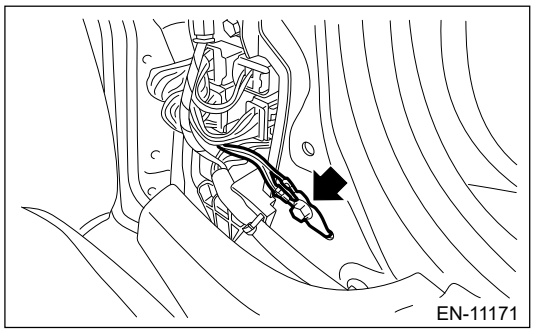
Caution:

When replacing the ECM, be careful not to use the ECM of wrong specification to avoid any damage on the fuel injection system.

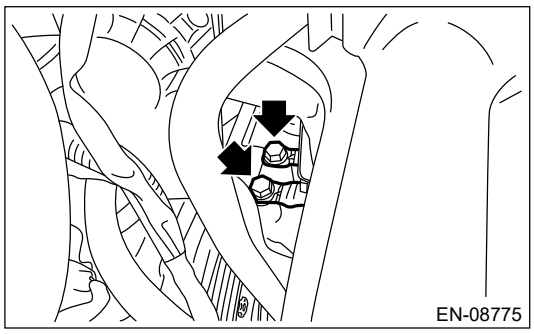
Note:

When replacing the ECM of the models with immobilizer, immobilizer system must be registered. For detailed operation procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER".

7. Take care not to allow water to get into the connectors when servicing or washing the vehicle in rainy weather. Avoid exposure to water even if the connectors are waterproof.
8. Use ECM mounting stud bolts for the grounding point when measuring voltage and resistance inside the passenger compartment.



9. Use the engine ground terminal or engine assembly for the grounding point when measuring the voltage and resistance in engine compartment.



10. All parts related to the engine control system are precision parts. Do not drop or otherwise apply impact. Do not reuse the parts that are dropped accidentally.
11. Observe the following cautions when installing a radio in vehicle.

Caution:

- **The antenna must be kept as far apart as possible from the ECM. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Electrical Component Location>LOCATION > ENGINE UNIT.**
- **The antenna feeder must be placed as far apart as possible from the ECM and engine control system harness.**
- **Carefully adjust the antenna for correct matching.**
- **When mounting a large power type radio, pay special attention to the three items mentioned above.**
- **Incorrect installation of the radio may affect the operation of ECM.**

12. When disconnecting the fuel tube, release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
13. Warning lights may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the rotating speed difference between the front and rear wheels. When engine control system diagnosis is finished, perform the VDC memory clearance procedure of self-diagnosis function. Ref. to COMMON(diag)>Clear memory>OPERATION.

ENGINE (DIAGNOSTICS)(H4DO) > General Description

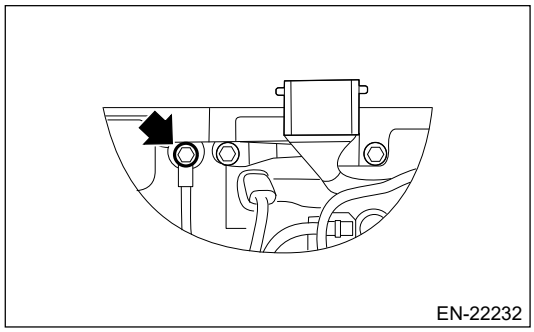
INSPECTION

Before performing diagnostics, check the following item which might affect engine problems.

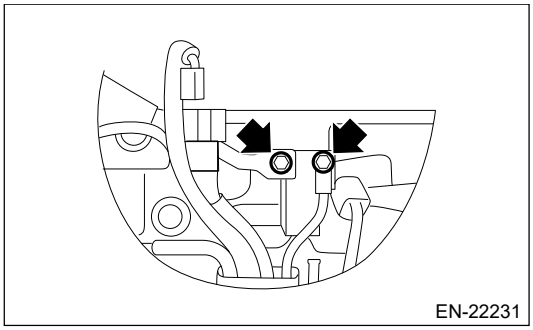
1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.
3. Make sure that the engine ground terminal has no contamination, corrosion or looseness and is properly connected to the engine.

- CVT model



- MT model



2. CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS

1. Clear the memory. Ref. to COMMON(diag)>Clear memory.
2. Perform the reproduction test.
3. Perform visual inspection of the connectors and the respective terminals and check the connection.
4. Check that excessive force is not applied to the wiring harness and connector.

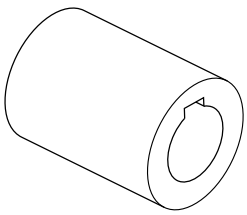
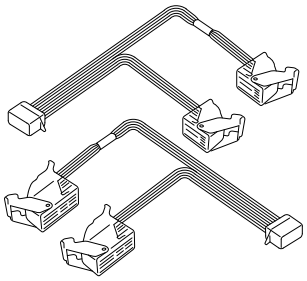
ENGINE (DIAGNOSTICS)(H4DO) > General Description

NOTE

- The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.
- Further, against any failure of sensors that would cause the vehicle to stop running, the fail-safe function is provided to ensure the minimal drivability.
- The OBD system incorporated with the vehicles within this type of engine complies with OBD-II regulations. The OBD system monitors the components and the system malfunction listed in “Engine Section” which affects on emissions.
- When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.
- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction.
- Freeze frame engine condition data are stored until the DTCs are cleared. However when such malfunctions as fuel trim fault and misfire are detected with the freeze frame engine condition data stored, they are rewritten into those related to the fuel trim fault and misfire.
- When the malfunction does not occur again for three consecutive driving cycles*, malfunction indicator light is turned off, but DTC remains at on-board computer.
  *: One driving cycle means the period between the ignition switch ON and the ignition switch OFF after driving.
- When performing diagnosis, connect the Subaru Select Monitor or general scan tool to the vehicle.
- When the ignition is turned ON or the engine is started immediately after replacing the battery or connecting the terminals, DTCs may be detected. Ref. to REPAIR CONTENTS>NOTE > BATTERY. Confirm this by asking the user.

PREPARATION TOOL

1. PREPARATION TOOL

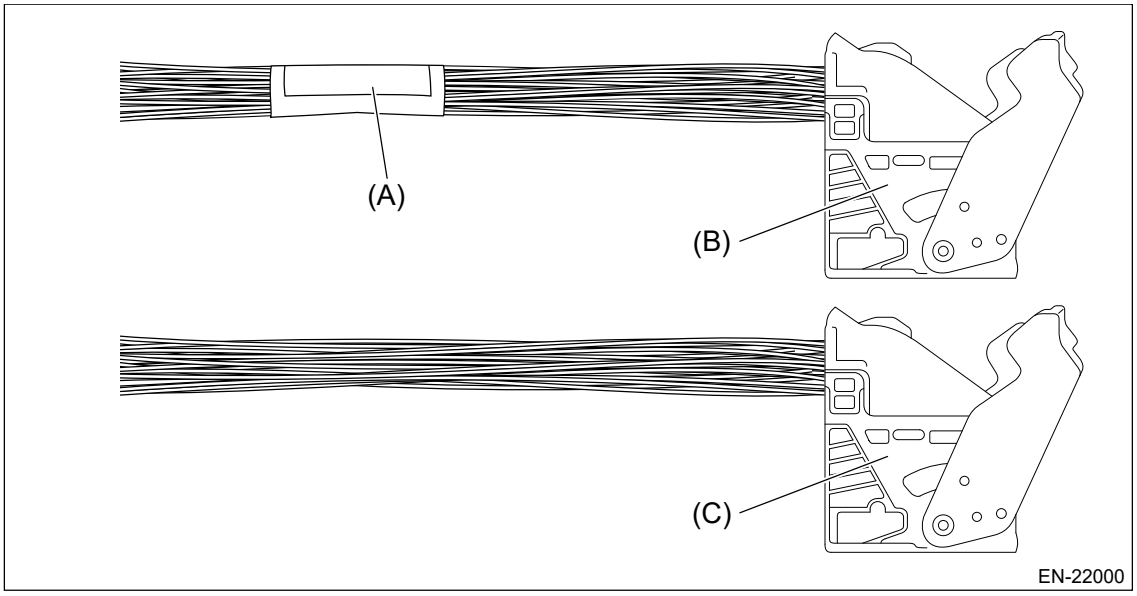
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to “Application help”.**
 ST18252AA000	18252AA000	CRANKSHAFT SOCKET	Used for rotating crankshaft.
 ST18460AA120	18460AA120 (Newly adopted tool)	CHECK BOARD	Used for measuring voltage and resistance of ECM terminals.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

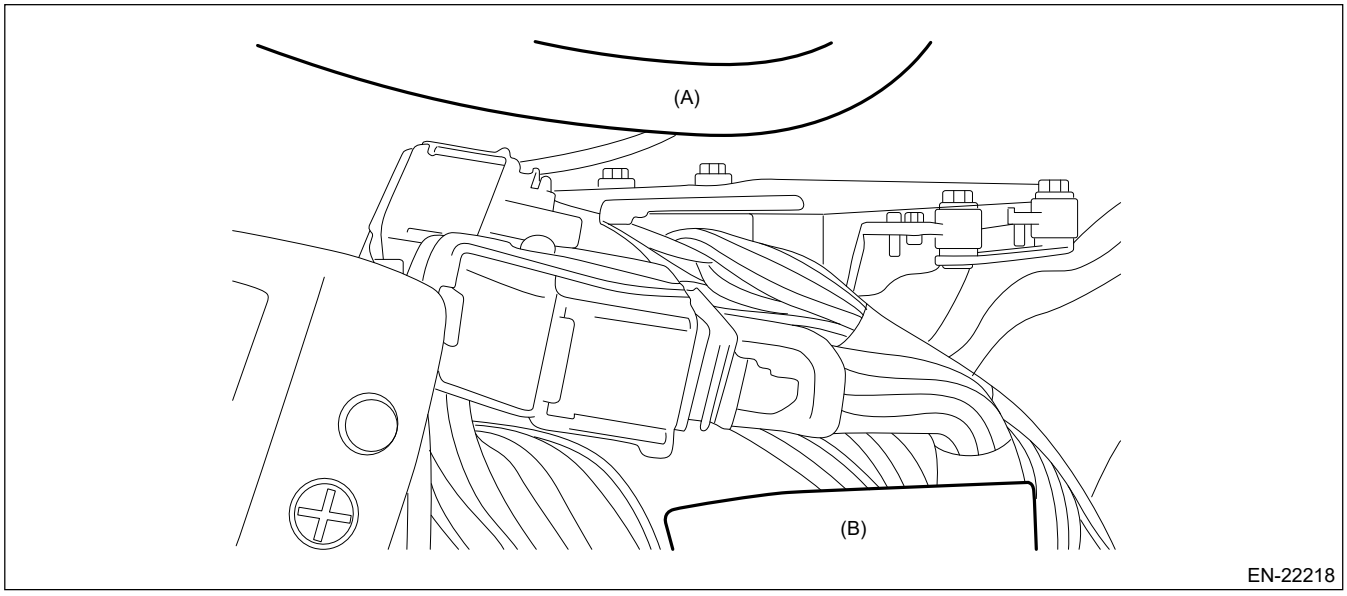
3. HOW TO USE CHECK BOARD

1. Use the check board when measuring the ECM terminal voltage and resistance.
2. Use the connector (B) with part label (A) when measuring the voltage, current and resistance. Connect the connector (C) to the engine control module.



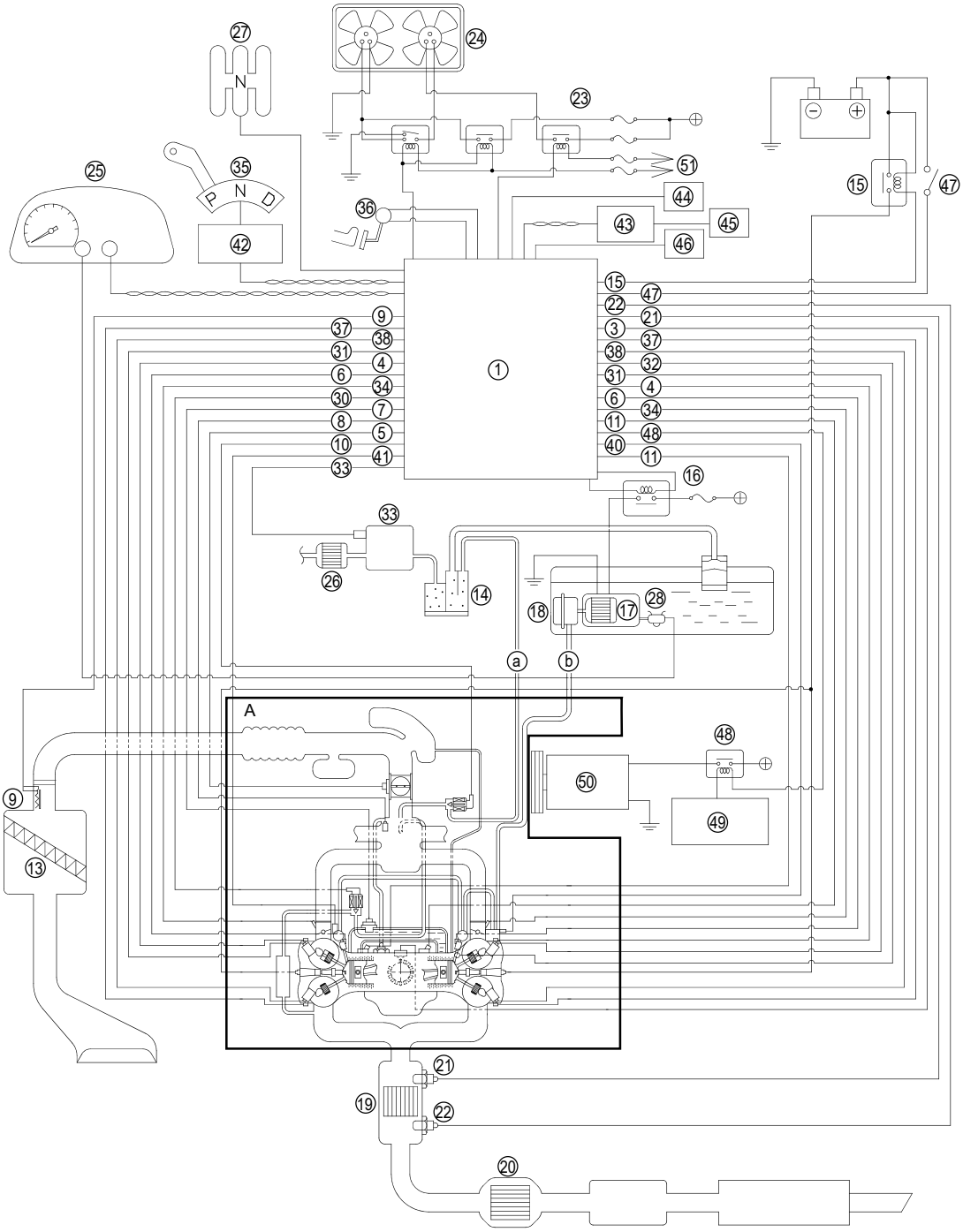
Caution:

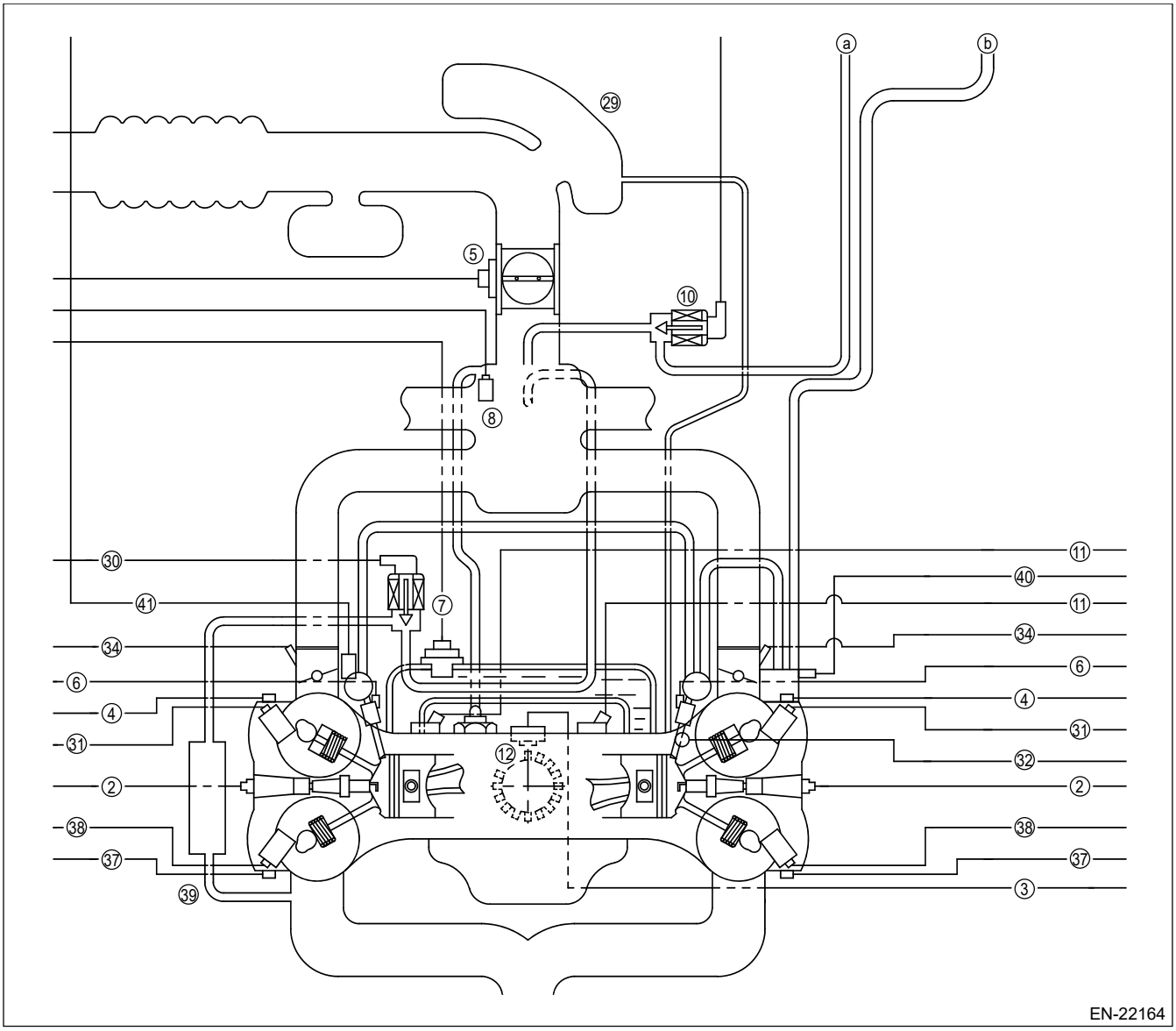
- **If you mistakenly insert a taper pin for measurement into the ECM connector (C), do not use the check board again, otherwise a malfunction may (poor contact, etc.) occur on the vehicle.**
- **Affix the check board to the vehicle using tape (B) so that it may not contact the portion (A).**
- **To prevent damage to the connector, when connecting the connector to ECM, insert the connector straight in until it stops, and while maintaining the position, lock the lever.**



ENGINE (DIAGNOSTICS)(H4DO) > General Description

SYSTEM BLOCK DIAGRAM


N
P N D
A
EN-22163



(1) Engine control module

(2) Ignition coil and Electronic ignition

(3) Crankshaft position sensor

(4) Intake camshaft position sensor

(5) Electronic control throttle

(6) Fuel injector

(7) Engine coolant temperature sensor

(8) Manifold absolute pressure sensor

(18) Fuel pump

(19) Front catalyst

(20) Rear catalyst

(21) Primary oxygen sensor

(22) Secondary oxygen sensor

(23) Radiator fan control Relay

(24) Radiator fan

(25) Malfunction indicator lamp

(35) Inhibitor switch for continuously variable transmission vehicle

(36) Acceleration pedal position sensor

(37) Exhaust camshaft position sensor

(38) Oil control valve for ex-VVT

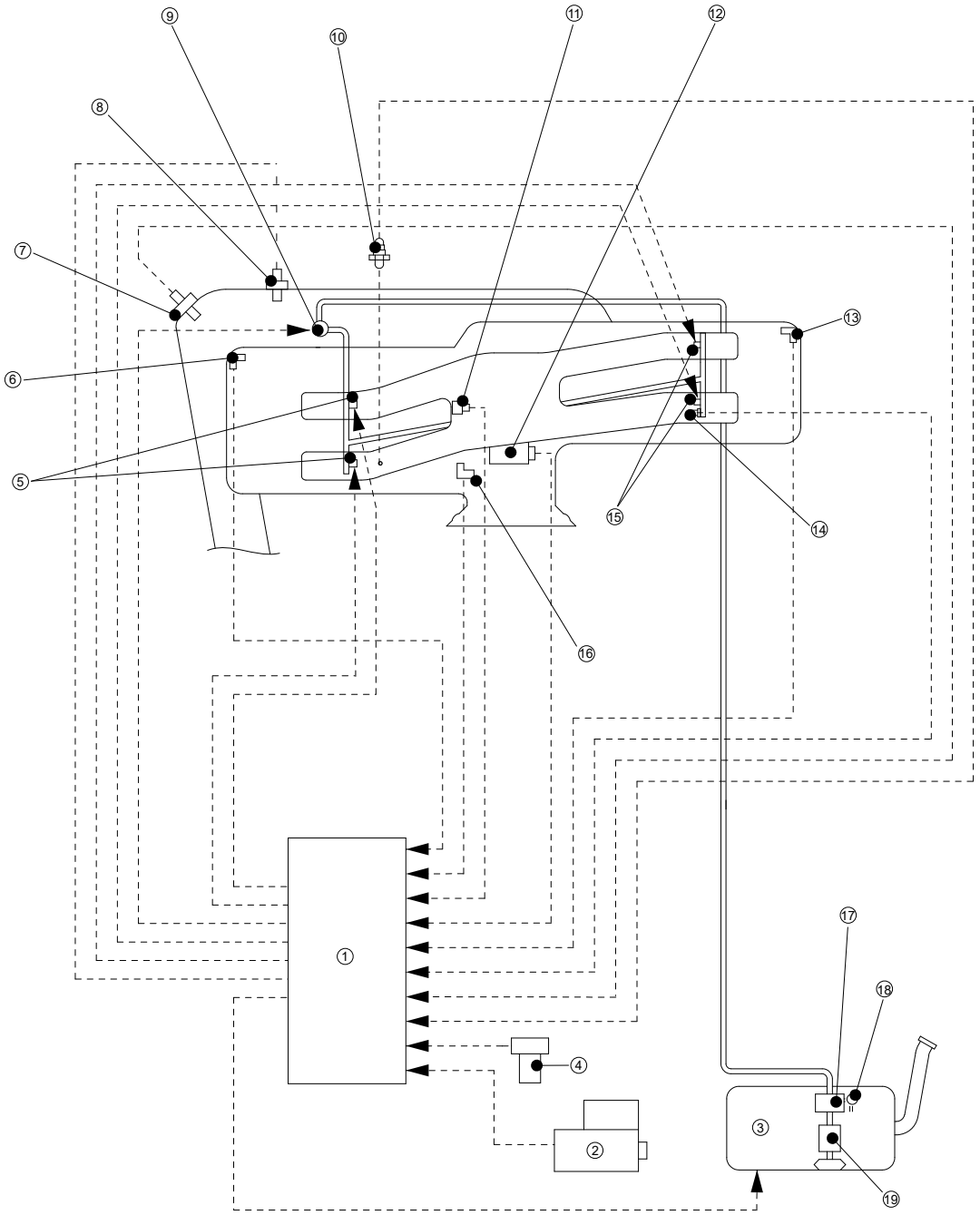
(39) EGR Cooler

(40) High-pressure fuel pump

(41) High-pressure fuel sensor

(42) Transmission control unit

(9) Intake air temperature sensor & Mass airflow sensor
(10) EVAP canister purge valve
(11) Knock sensor
(12) Positive crankcase ventilation valve
(13) Air cleaner
(14) EVAP canister
(15) Ignition relay
(16) Fuel pump relay
(17) Fuel filter
(26) Air filter
(27) Park/Neutral position switch
(28) Fuel level sensor
(29) Resonator chamber
(30) Electronically controlled EGR
(31) Oil control valve for in-VVT
(32) Engine oil temperature sensor
(33) Evaporative leak check module
(34) Tumble generator valve motors and tumble generator valve position switch
(43) ABS unit or VDC unit
(44) T/M control unit (CVT)
(45) Car speed
(46) SELECT MONITOR
(47) Ignition switch
(48) A/C Relay
(49) A/C Control unit
(50) A/C Compressor
(51) IG l

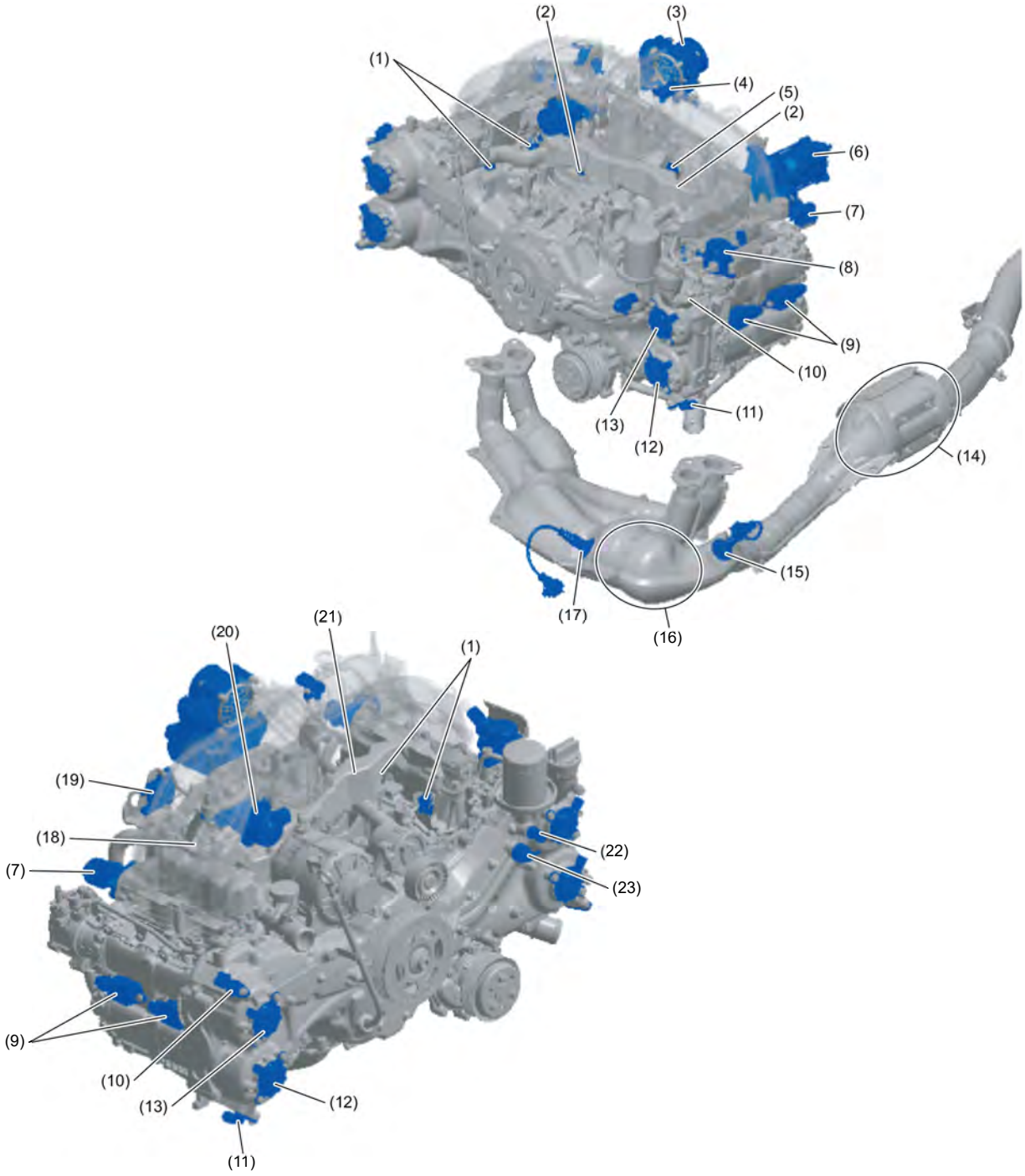


EN-21976

(1) Electronic Control Unit
(2) Starter
(3) Fuel Tank
(4) Air Flow Meter
(5) Direct Fuel Injector
(6) Cam Angle Sensor
(7) Oxygen Sensor
(8) A/F Sensor
(9) High-pressure fuel pump
(10) Coolant Temperature Sensor
(11) Pressure Sensor
(12) Throttle Body
(13) Cam Angle Sensor
(14) Fuel Pressure Sensor
(15) Direct Fuel Injector
(16) Crank Angle Sensor
(17) Fuel Filter
(18) Pressure Regulator
(19) Low Pressure Fuel Pump

LOCATION

1. ENGINE UNIT

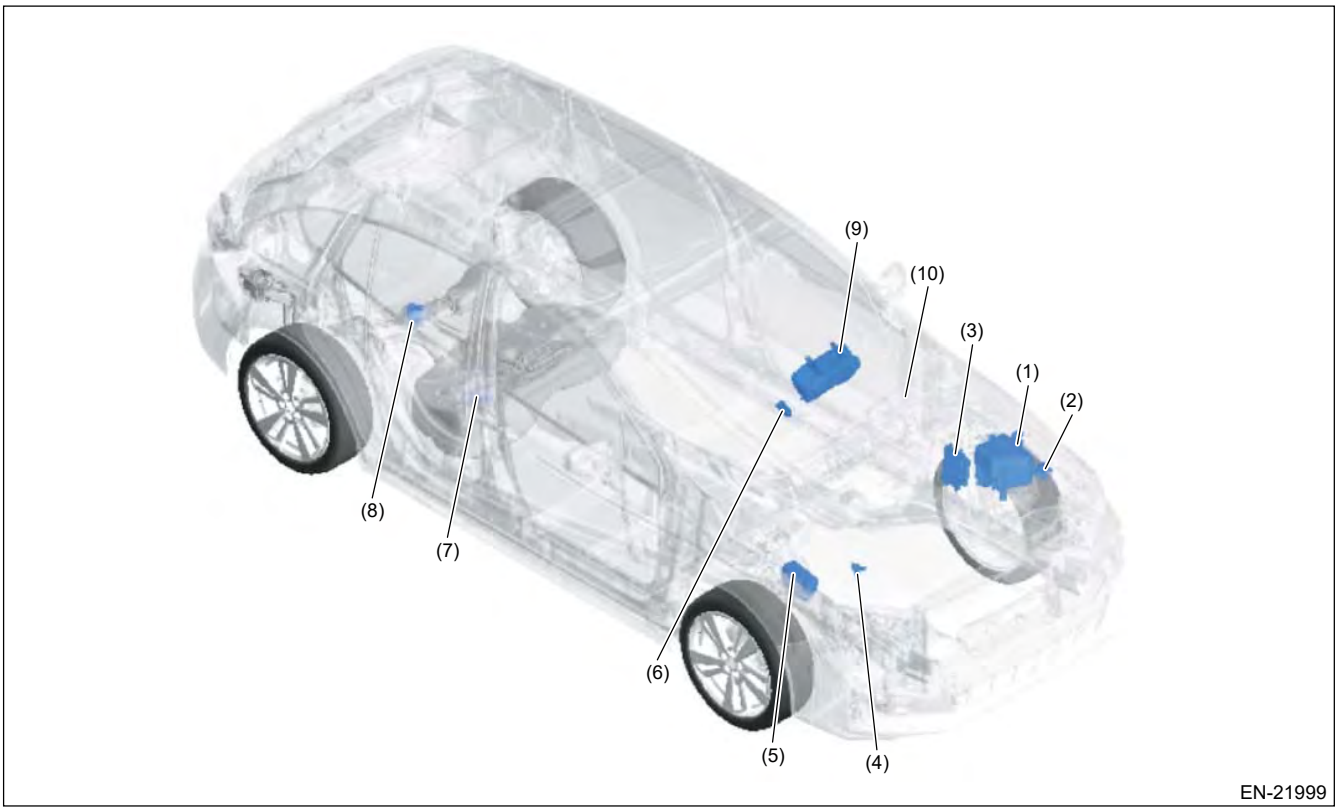


EN-21998

(1) Fuel injector
(2) Knock sensor
(3) Throttle position sensor
(4) Manifold absolute pressure sensor
(9) Ignition coil
(10) Intake camshaft position sensor
(11) Exhaust camshaft position sensor
(12) Exhaust oil control solenoid
(17) Front oxygen (A/F) sensor
(18) Fuel pressure sensor
(19) Purge control solenoid valve
(20) EGR control valve

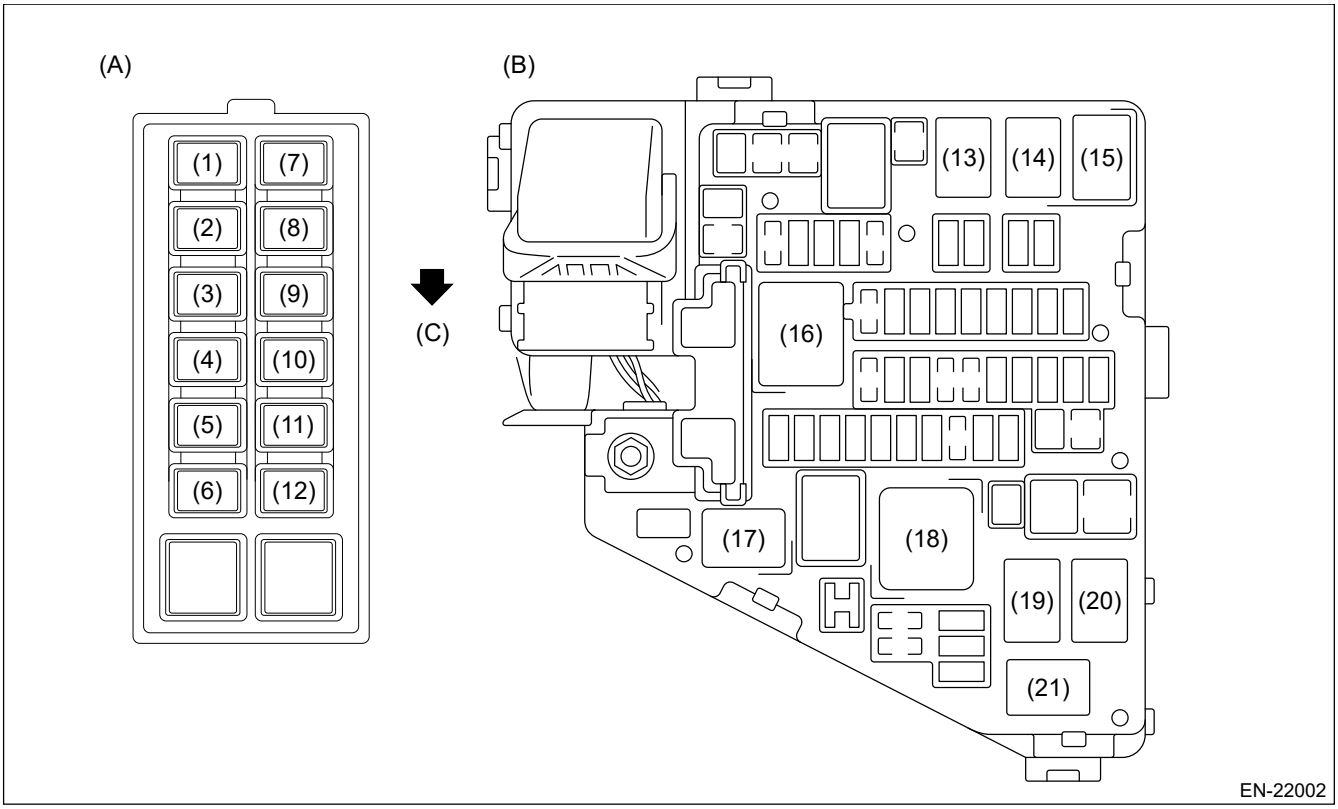
(5) Crankshaft position sensor
(6) Starter
(7) Tumble generator valve actuator
(8) High-pressure fuel pump
(13) Intake oil control solenoid
(14) Rear catalytic converter
(15) Rear oxygen sensor
(16) Front catalytic converter
(21) Engine coolant temperature sensor
(22) Engine oil temperature sensor
(23) Oil pressure sensor

2. BODY



(1) M/B
(2) Battery sensor
(3) Engine control module (ECM)
(4) Air flow sensor
(5) Fuse box
(6) Push button ignition switch
(7) Fuel pump
(8) Leak check valve ASSY
(9) Combination meter
(10) Data link connector

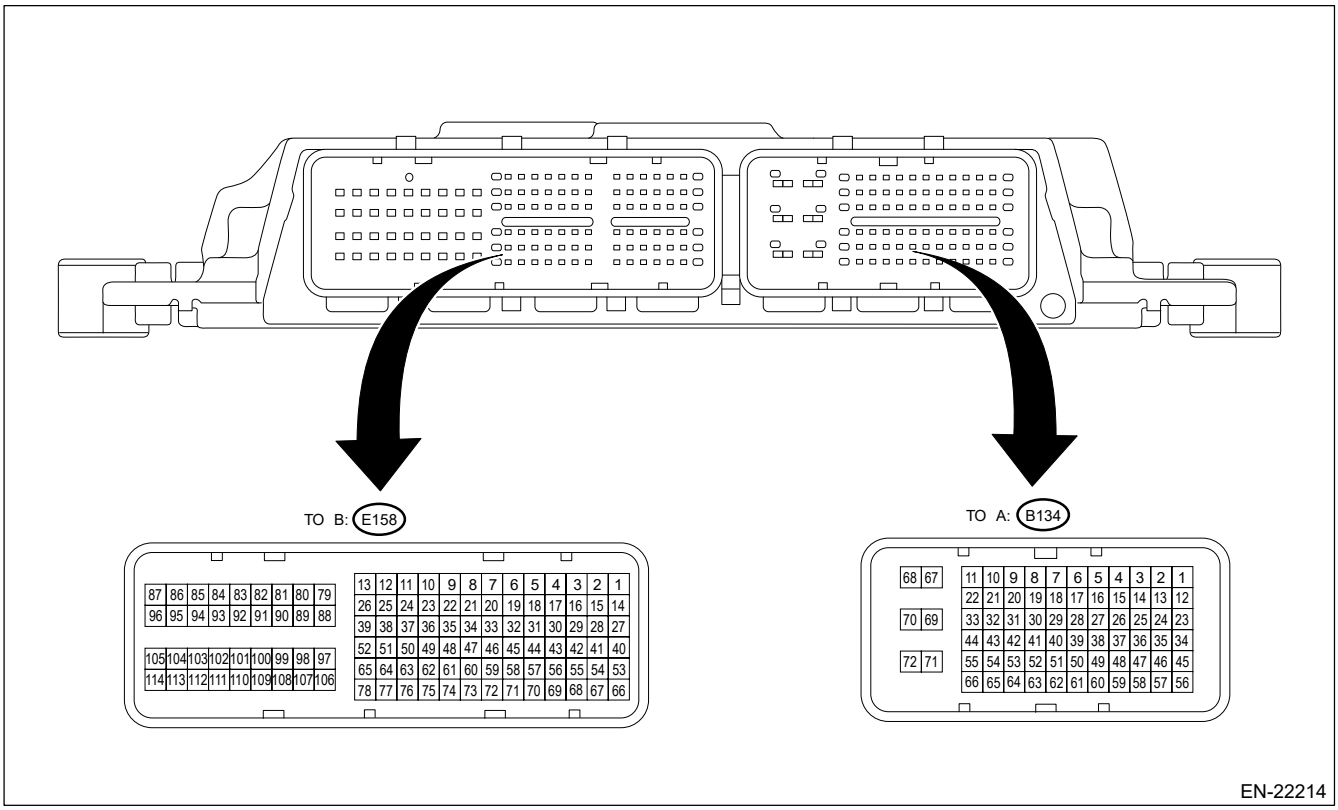
3. FUSE AND RELAY



(A) Relay holder	(B) M/B	(C) Forward
(1) —	(8) —	(15) Fuel pump relay
(2) Sub fan relay	(9) —	(16) Main relay
(3) —	(10) —	(17) Main fan relay 2
(4) —	(11) —	(18) —
(5) —	(12) —	(19) Starter relay
(6) —	(13) —	(20) Starter cut relay
(7) —	(14) —	(21) Main fan relay 1

* Only shows parts required for engine diagnosis.

ELECTRICAL SPECIFICATION



Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
Crankshaft position sensor	(+) signal	E158	66	5	0 or 5	Waveforms 1 and 8
	Power supply	E158	40	5	5	—
	Ground	E158	53	0	0	—
Intake camshaft position sensor RH		E158	78	0 or 5	0 or 5	Waveform 1
Intake camshaft position sensor LH		E158	77	0 or 5	0 or 5	Waveform 1
Exhaust camshaft position sensor RH		E158	65	0 or 5	0 or 5	Waveform 1
Exhaust camshaft position sensor LH		E158	64	0 or 5	0 or 5	Waveform 1
Camshaft position sensor ground		E158	51	0	0	—
Front oxygen	(+) signal	E158	60	2.8 — 3.2	2.8 — 3.2	Waveform 2

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
(A/F) sensor	(−) signal	E158	73	1.3 — 3.1	2.4 — 2.7	Waveform 2
	Heater signal	E158	88	Battery voltage	0 or battery voltage	Waveform 4
	Shield	E158	47	0	0	—
Rear oxygen sensor	(+) signal	B134	33	2.7 — 3.0	Waveform	Waveform 3
	(−) signal	B134	44	1.9 — 2.0	Waveform	Waveform 3
	Heater signal	B134	22	Battery voltage	0 or battery voltage	Waveform 4
Air flow sensor	Signal	B134	32	0 or 5	0 or 5	Waveform 11
	Power supply	B134	53	5	5	—
Intake air temperature sensor signal		B134	43	0.3 — 4.6	0.3 — 4.6	—
Engine coolant temperature sensor signal		E158	45	1 — 1.4	0	—
Engine oil temperature sensor signal		E158	46	1 — 1.4	1 — 1.4	—
Manifold absolute pressure sensor signal		E158	69	3.5 — 4.8	1.4 — 2.1	—
Knock sensor 1	Signal	E158	4	2.4 — 2.6	2.1 — 2.8	—
	Ground	E158	17	0	0	—
Knock sensor 2	Signal	E158	5	2.4 — 2.6	2.4	—
	Ground	E158	18	0	0	—
Knock sensor	Shield	E158	16	0	0	—
Accelerator pedal position sensor	Main signal	B134	66	Fully closed: 0.3 — 1.1 Fully open: 2.3 — 3.8	Fully closed: 0.3 — 1.4 Fully open: 2.4 — 3.8	—
	Main power supply	B134	51	5	5	—
	Main ground	B134	55	0	0	—

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
	Sub signal	B134	64	Fully closed: 0.3 — 1.1 Fully open: 2.3 — 3.8	Fully closed: 0.3 — 1.4 Fully open: 2.3 — 3.8	—
	Sub power supply	B134	52	5	5	—
	Sub ground	B134	65	0	0	—
Tumble generator valve RH	Position signal	E158	28	Waveform	Waveform	Waveform 5
	Motor open	E158	102	Waveform	Waveform	Waveform 5
	Motor closed	E158	111	Waveform	Waveform	Waveform 5
Tumble generator valve LH	Position signal	E158	42	Waveform	Waveform	Waveform 6
	Motor open	E158	101	Waveform	Waveform	Waveform 6
	Motor closed	E158	110	Waveform	Waveform	Waveform 6
Intake oil control solenoid RH		E158	99	Battery voltage	0 or battery voltage	Waveform 7
Intake oil control solenoid LH		E158	100	Battery voltage	0 or battery voltage	Waveform 7
Exhaust oil control solenoid RH		E158	108	Battery voltage	0 or battery voltage	Waveform 7
Exhaust oil control solenoid LH		E158	109	Battery voltage	0 or battery voltage	Waveform 7
Purge control solenoid valve		E158	9	Battery voltage	Battery voltage	Operating: 0
Leak check valve assembly	Switching valve	B134	11	Battery voltage	Battery voltage	Operating: 0
	Pressure sensor	B134	61	1 — 4	1 — 4	When ignition switch is turned to ON: atmospheric pressure
	Vacuum pump	B134	10	Battery voltage	Battery voltage	Operating: 0
Ignition coil	#1	E158	10	0	0 or 5	Waveform 8

Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
	#2	E158	11	0	0 or 5	Waveform 8
	#3	E158	12	0	0 or 5	Waveform 8
	#4	E158	13	0	0 or 5	Waveform 8
Fuel pressure sensor	Signal 1	E158	56	1 — 1.6	1	—
	Signal 2	E158	50	3 — 3.6	3 — 3.6	—
High-pressure fuel pump	(+) signal	E158	105	—	—	—
	(−) signal	E158	114	—	—	—
Fuel injector	#1(+)	E158	87	2 — 3	—	Measurement is prohibited while the engine is running.
	#1(−)	E158	96	2 — 3	—	
	#2(+)	E158	86	2 — 3	—	
	#2(−)	E158	95	2 — 3	—	
	#3(+)	E158	84	2 — 3	—	
	#3(−)	E158	93	2 — 3	—	
	#4(+)	E158	85	2 — 3	—	
	#4(−)	E158	94	2 — 3	—	
EGR control valve	Signal 1	E158	98	0 or battery voltage	0 or battery voltage	—
	Signal 2	E158	97	0 or battery voltage	0 or battery voltage	—
	Signal 3	E158	107	0 or battery voltage	Battery voltage	—
	Signal 4	E158	106	0 or battery voltage	Battery voltage	—
Electronic throttle control sensor	Main signal	E158	29	Approx. 0.7	Approx. 0.6 — 1.2	Fully closed: Approx. 0.6 — 1.2 Fully open: Approx. 3.8 — 4.4
	Sub signal	E158	43	Approx. 1.6	Approx. 1.5 — 1.7	Fully closed: Approx. 1.4 — 2.0 Fully open: Approx. 4.0 — 4.6
	Shield	E158	44	0	0	—
	Motor (+)	E158	83	0 or battery voltage	0 or battery voltage	Drive frequency: 500 Hz Waveform 7

Description	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
Motor (−)	E158	92	0 or battery voltage	0 or battery voltage	Drive frequency: 500 Hz
Power supply	E158	27	5	5	—
Ground	E158	30	0	0	—
A/C relay control	B134	18	ON: 0.5V or less OFF: Battery voltage	ON: 0.5V or less OFF: Battery voltage	Manual A/C model
A/C switch	B134	47	ON: Battery voltage OFF: 0	ON: Battery voltage OFF: 0	Manual A/C model
Blower fan switch	B134	48	ON: 0 OFF: Battery voltage	ON: 0 OFF: Battery voltage	Manual A/C model
A/C middle pressure switch	B134	49	ON: 0 OFF: Battery voltage	ON: 0.5V or less OFF: Battery voltage	Manual A/C model
Self-shutoff relay control	B134	12	0	0	—
Starter relay control	B134	2	Waveform	Battery voltage	Model without push button start Waveform 9 Model with push button start Waveform 10
Starter cut relay control	B134	24	Waveform	Battery voltage	Model without push button start Waveform 9 Model with push button start Waveform 10
Fuel pump relay control	B134	31	Battery voltage	0	ON: 0 OFF: Battery voltage
Main fan relay control	B134	30	Battery voltage	Battery voltage	ON: 0
Sub fan relay control	B134	19	Battery voltage	Battery voltage	ON: 0
Ignition switch	B134	56	Battery voltage	Battery voltage	—
Neutral position switch	B134	39	ON: 0 OFF: Battery voltage	0	—

Description	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
Delivery mode switch	B134	57	Battery voltage	Battery voltage	When fuse is installed: 0
Oil level switch	E158	57	0	0	Oil level LOW: Battery voltage
Starter switch	B134	25	Waveform	Waveform	Model without push button start Waveform 9 Model with push button start Waveform 10
Starter switch 2	B134	27	Waveform	Waveform	Model without push button start Waveform 9 Model with push button start Waveform 10
Accessory cut request	B134	34	Waveform	Waveform	Model with push button start Waveform 10
Engine speed output	B134	17	0	Waveform	Model with push button start Waveform 10
Clutch start switch	B134	37	When clutch pedal is depressed: Battery voltage When clutch pedal is released: 0	When clutch pedal is depressed: Battery voltage When clutch pedal is released: 0	MT model (with push button start)
Clutch switch	B134	28	When clutch pedal is depressed: 0 When clutch pedal is released: Battery voltage	When clutch pedal is depressed: 0 When clutch pedal is released: Battery voltage	MT model
Brake switch 1 (Brake switch)	B134	36	When brake pedal is depressed: 0 When brake pedal is released: Battery voltage	When brake pedal is depressed: 0 When brake pedal is	—

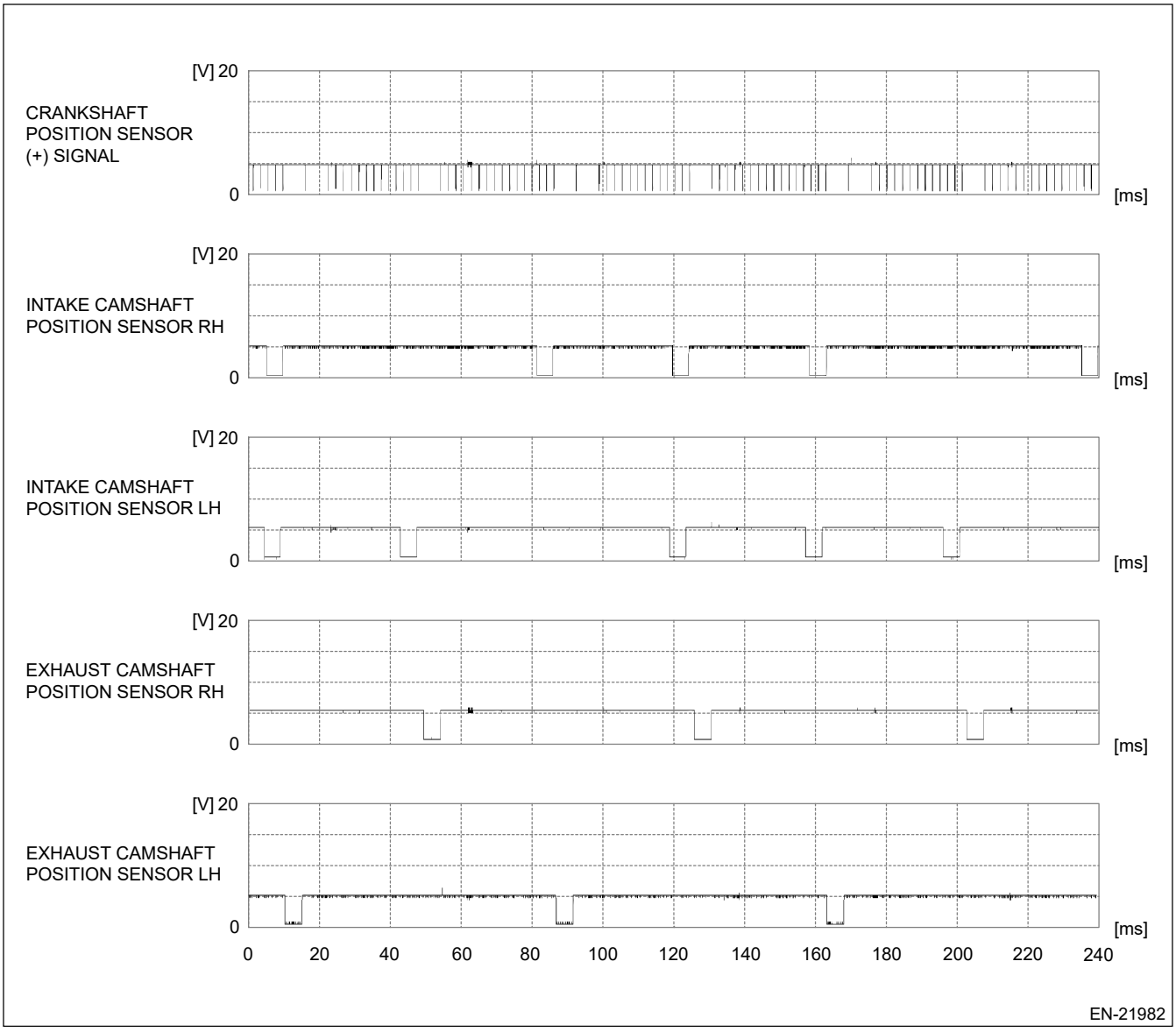
Description		Connector No.	Terminal No.	Signal (V)		Note
				Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
					released: Battery voltage	
Brake switch 2 (Stop light switch)		B134	38	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	When brake pedal is depressed: Battery voltage When brake pedal is released: 0	—
Cruise control main switch		B134	35	ON: 0 OFF: 5	ON: 0 OFF: 5	Model without EyeSight
Cruise control command switch		B134	62	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating SET/COAST: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	When operating nothing: 3.5 — 4.5 When operating RES/ACC: 2.5 — 3.5 When operating SET/COAST: 0.5 — 1.5 When operating CANCEL: 0 — 0.5	Model without EyeSight
LIN communication		B134	5	—	—	—
Immobilizer communication		B134	6	—	—	—
CAN communication	HI	B134	3	—	—	—
	LO	B134	14	—	—	—
Control module power supply		B134	67	Battery voltage	Battery voltage	—
		B134	68	Battery voltage	Battery voltage	—
Backup power supply		B134	1	Battery voltage	Battery voltage	Ignition switch OFF: Battery voltage
Sensor power supply		E158	41	5	5	—
Ground	Body	B134	50	0	0	—
	Sensor	B134	54	0	0	—
		E158	54	0	0	—
	Engine 1	B134	71	0	0	—
	Engine 2	B134	72	0	0	—
	Engine 3	B134	69	0	0	—

Description	Connector No.	Terminal No.	Signal (V)		Note
			Ignition SW ON After warm-up (at engine OFF)	Engine ON After warm-up (at idle)	
Engine 4	B134	70	0	0	—

Note:

- **After engine is warmed up, attach the check board for measurement.**
- **Set the select lever in “P” range or “N” range, or the shift lever in neutral.**
- **Turn the A/C to OFF.**
- **Turn all the accessory switches to OFF.**
- **Waveforms vary depending on a measurement environment and vehicle condition.**
- **Oscilloscope waveform illustrated here is an example for reference. Noise and chattering in waveform are omitted.**

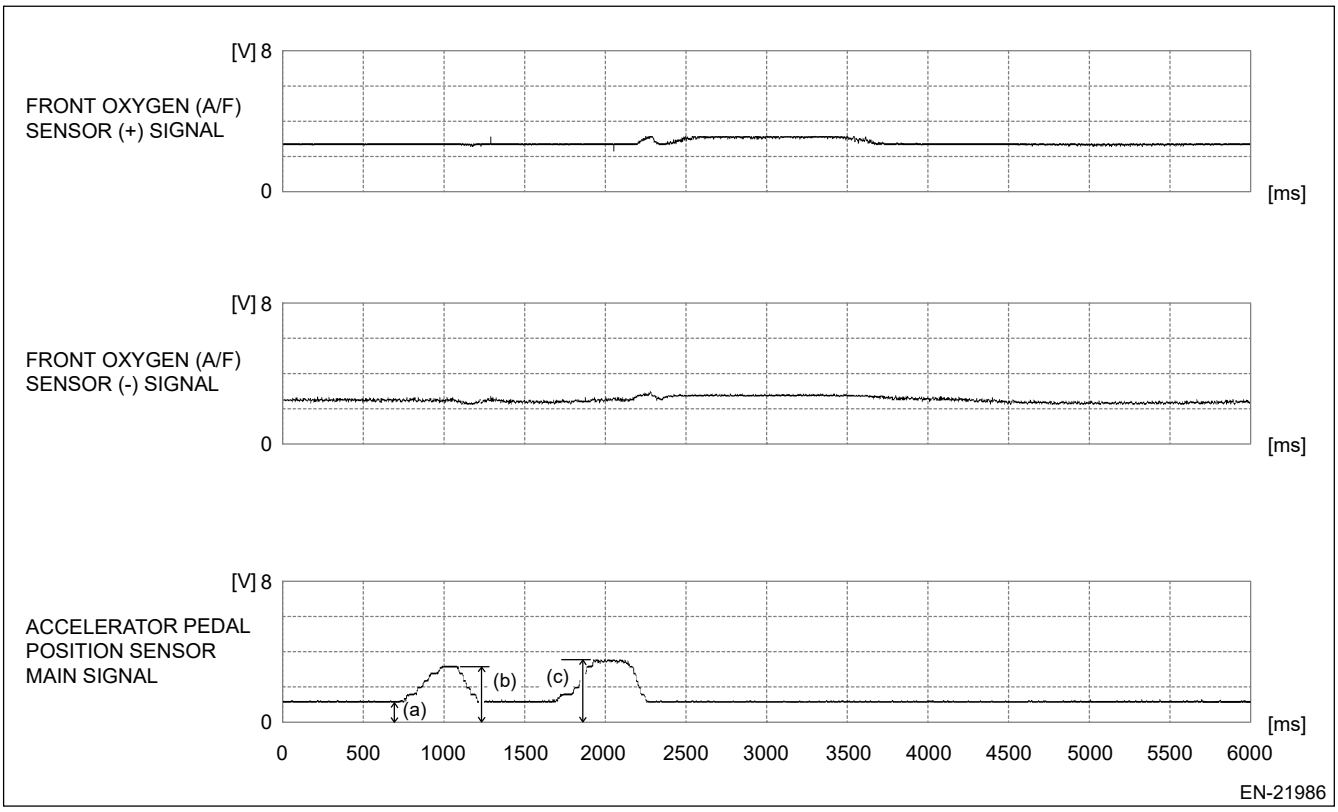
1. Waveform 1



Measured terminal	Crankshaft position sensor (+) signal (E158) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):

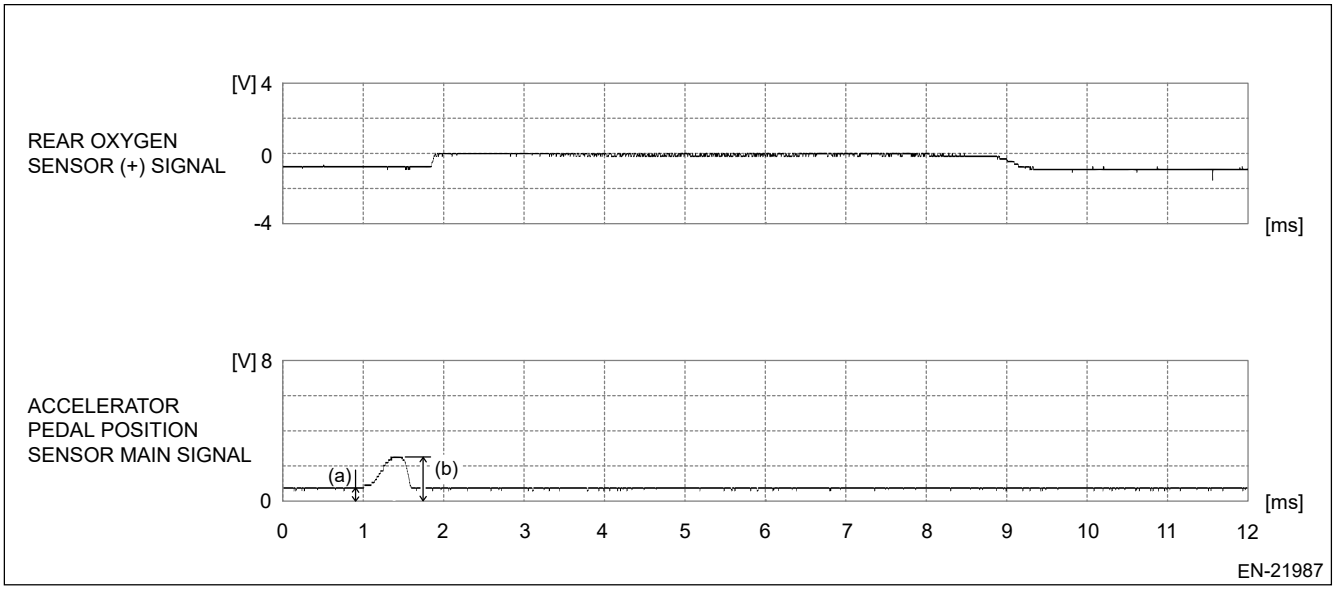
	Intake camshaft position sensor RH (E158) No. 78 (+) — Engine ground 3 (B134) No. 69 (−): Intake camshaft position sensor LH (E158) No. 77 (+) — Engine ground 3 (B134) No. 69 (−): Exhaust camshaft position sensor RH (E158) No. 65 (+) — Engine ground 3 (B134) No. 69 (−): Exhaust camshaft position sensor LH (E158) No. 64 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	While engine idling

2. Waveform 2



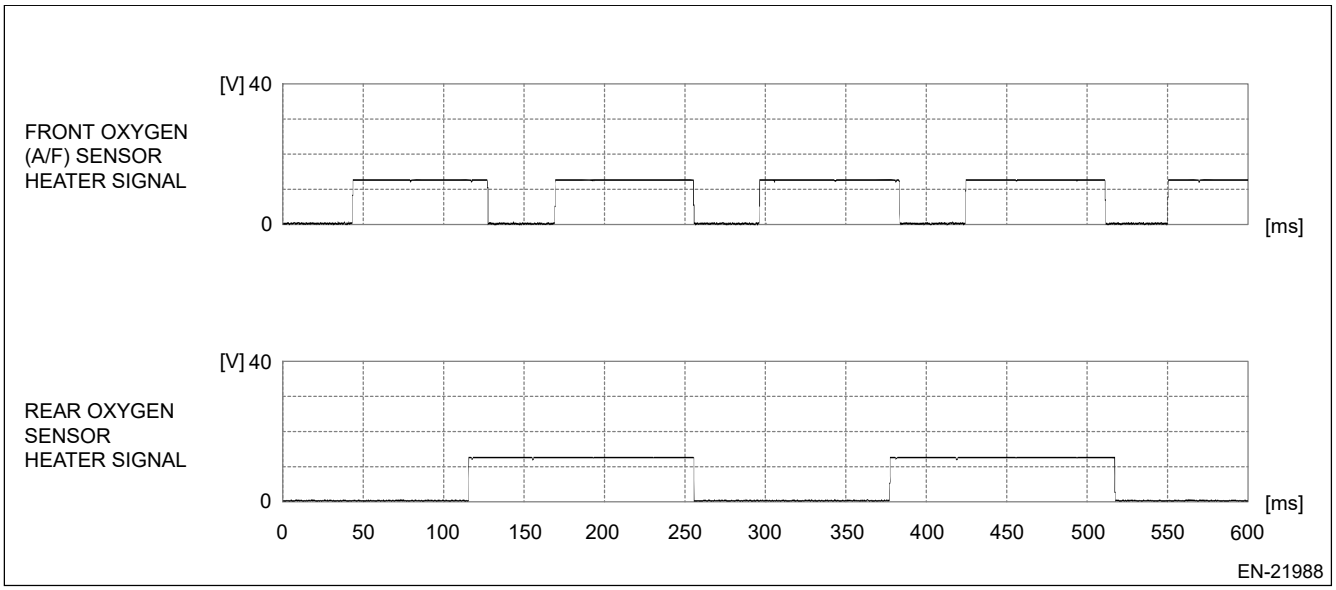
Measured terminal	Front oxygen (A/F) sensor (E158) No. 60 (+) — Engine ground 3 (B134) No. 69 (−):
	Front oxygen (A/F) sensor (E158) No. 73 (−) — Engine ground 3 (B134) No. 69 (−):
	Accelerator pedal position sensor main signal (B134) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	(a) accelerator pedal fully closed (b) accelerator pedal half open (c) accelerator pedal fully opened

3. Waveform 3



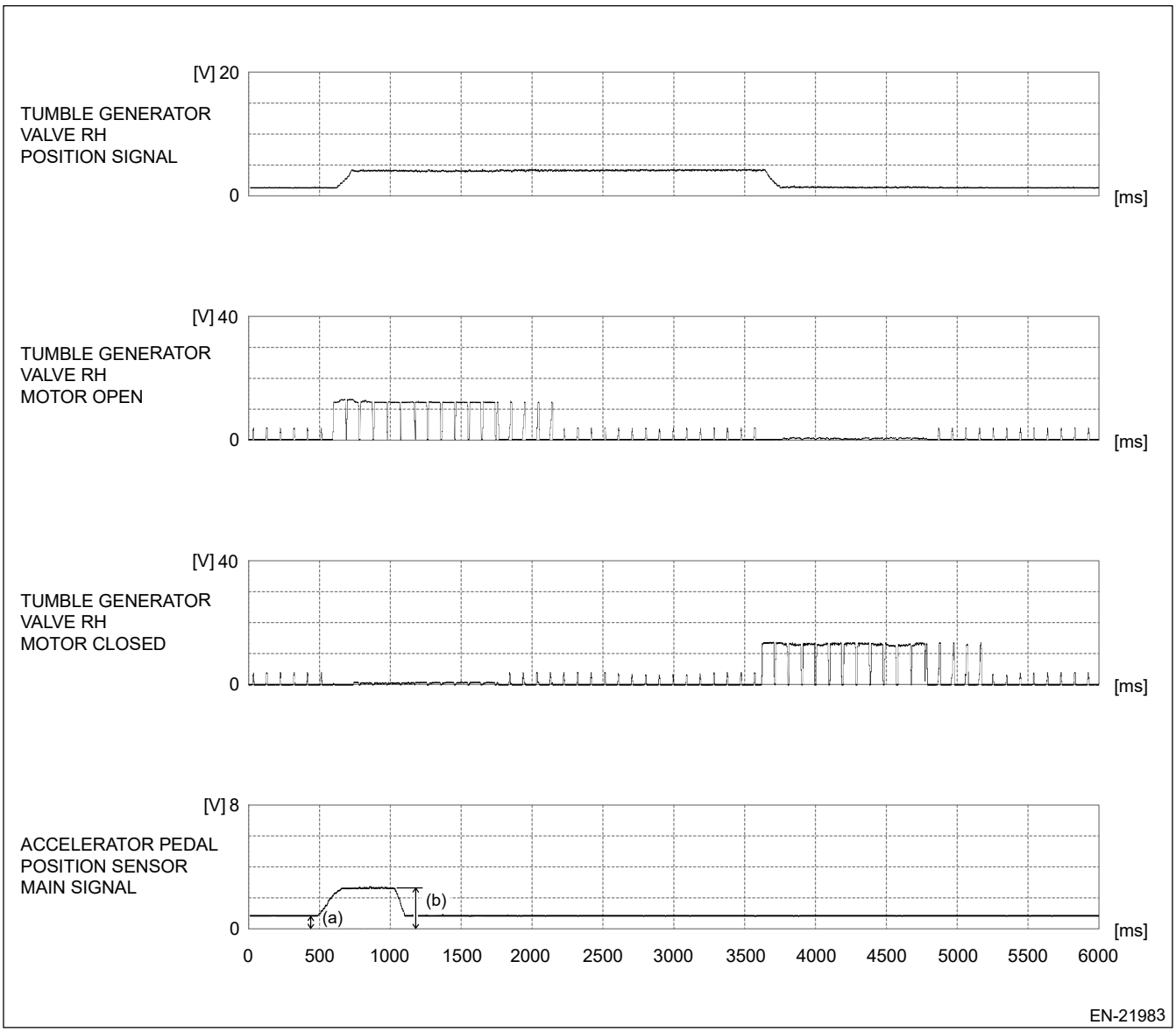
Measured terminal	Rear oxygen sensor (B134) No. 33 (+) — Rear oxygen sensor (B134) No. 44 (−):
	Accelerator pedal position sensor main signal (B134) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	(a) accelerator pedal fully closed (b) accelerator pedal half open (c) accelerator pedal fully opened

4. Waveform 4



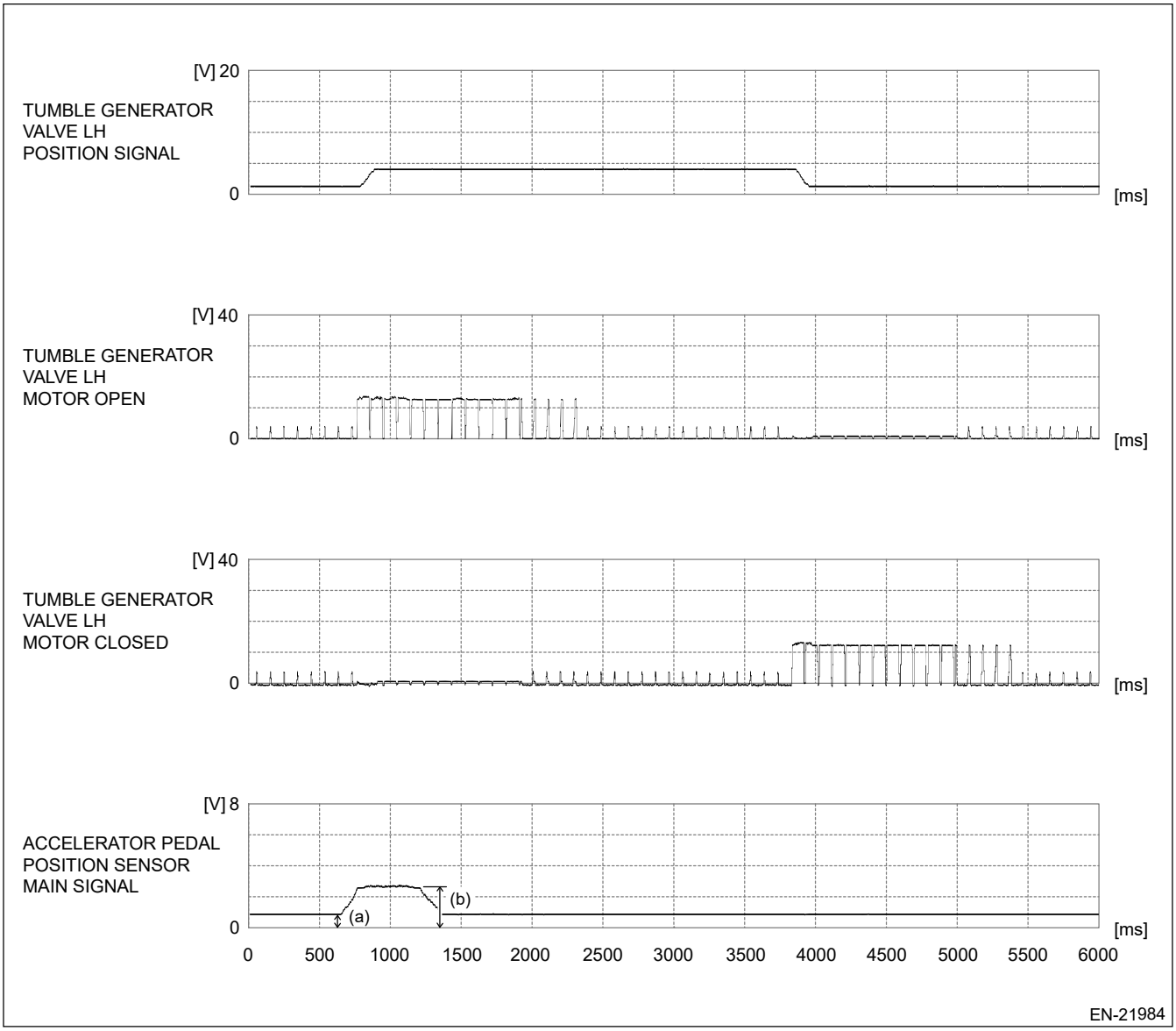
Measured terminal	Front oxygen (A/F) sensor heater (E158) No. 88 (+) — Engine ground 3 (B134) No. 69 (−):
	Rear oxygen sensor heater (B134) No. 22 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	While engine idling

5. Waveform 5



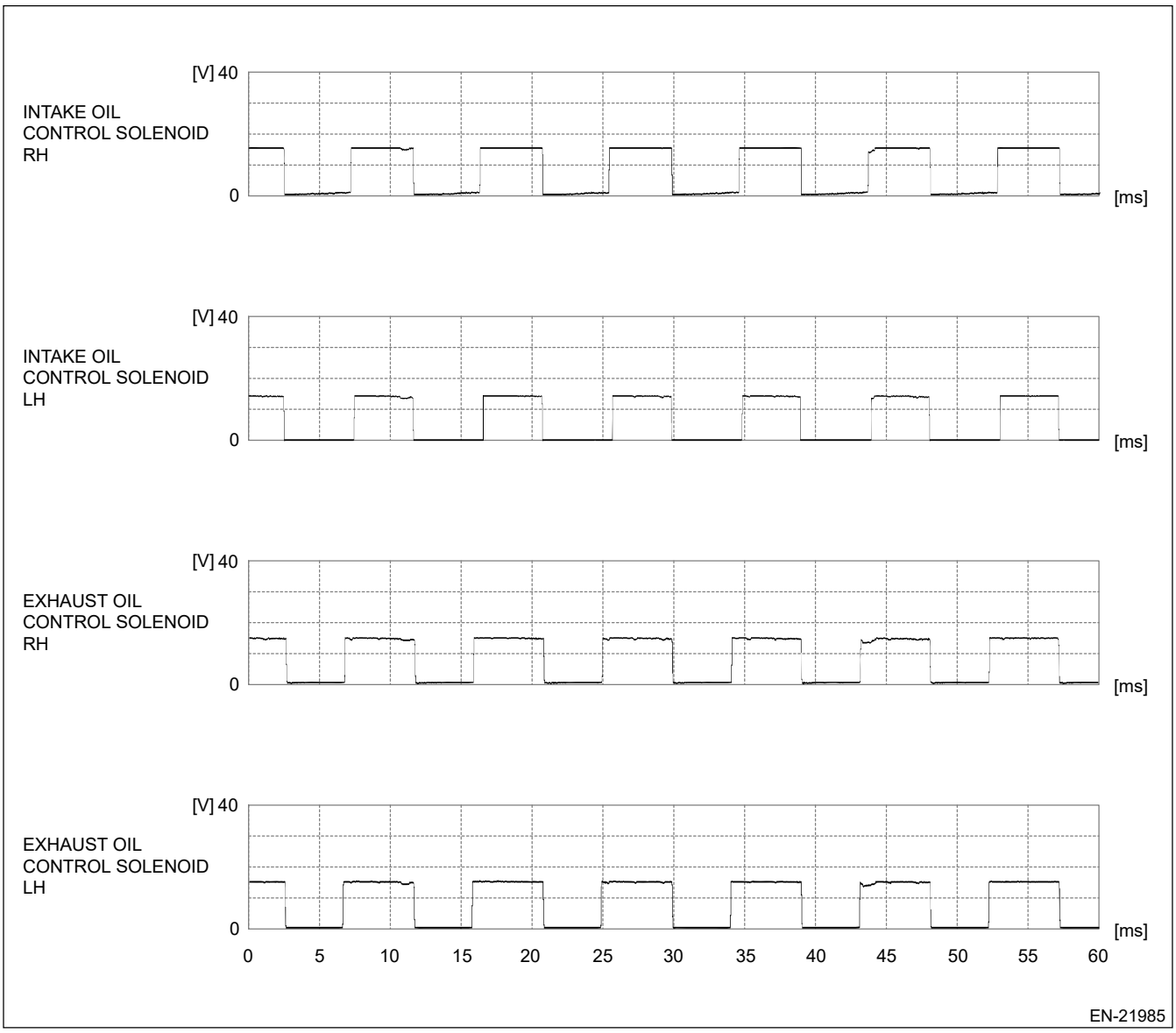
Measured terminal	Tumble generator valve RH position signal (E158) No. 28 (+) — Engine ground 3 (B134) No. 69 (−):
	Tumble generator valve RH motor open (E158) No. 102 (+) — Engine ground 3 (B134) No. 69 (−):
	Tumble generator valve RH motor closed (E158) No. 111 (+) — Engine ground 3 (B134) No. 69 (−):
	Accelerator pedal position sensor main signal (B134) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	(a) Accelerator pedal fully closed (b) Accelerator pedal fully opened

6. Waveform 6



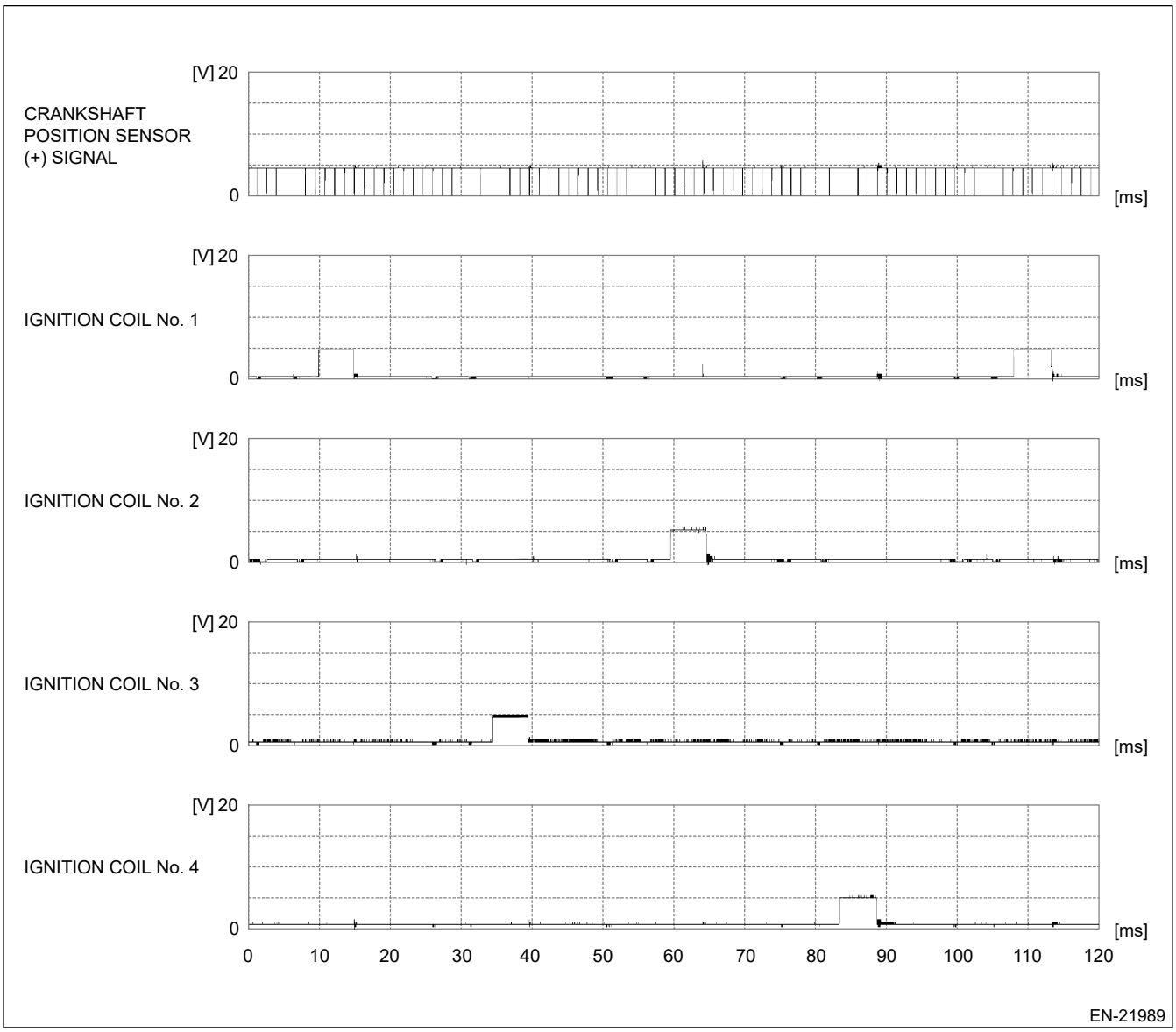
Measured terminal	Tumble generator valve LH position signal (E158) No. 42 (+) — Engine ground 3 (B134) No. 69 (−):
	Tumble generator valve LH motor open (E158) No. 101 (+) — Engine ground 3 (B134) No. 69 (−):
	Tumble generator valve LH motor closed (E158) No. 110 (+) — Engine ground 3 (B134) No. 69 (−):
	Accelerator pedal position sensor main signal (B134) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	(a) Accelerator pedal fully closed (b) Accelerator pedal fully opened

7. Waveform 7



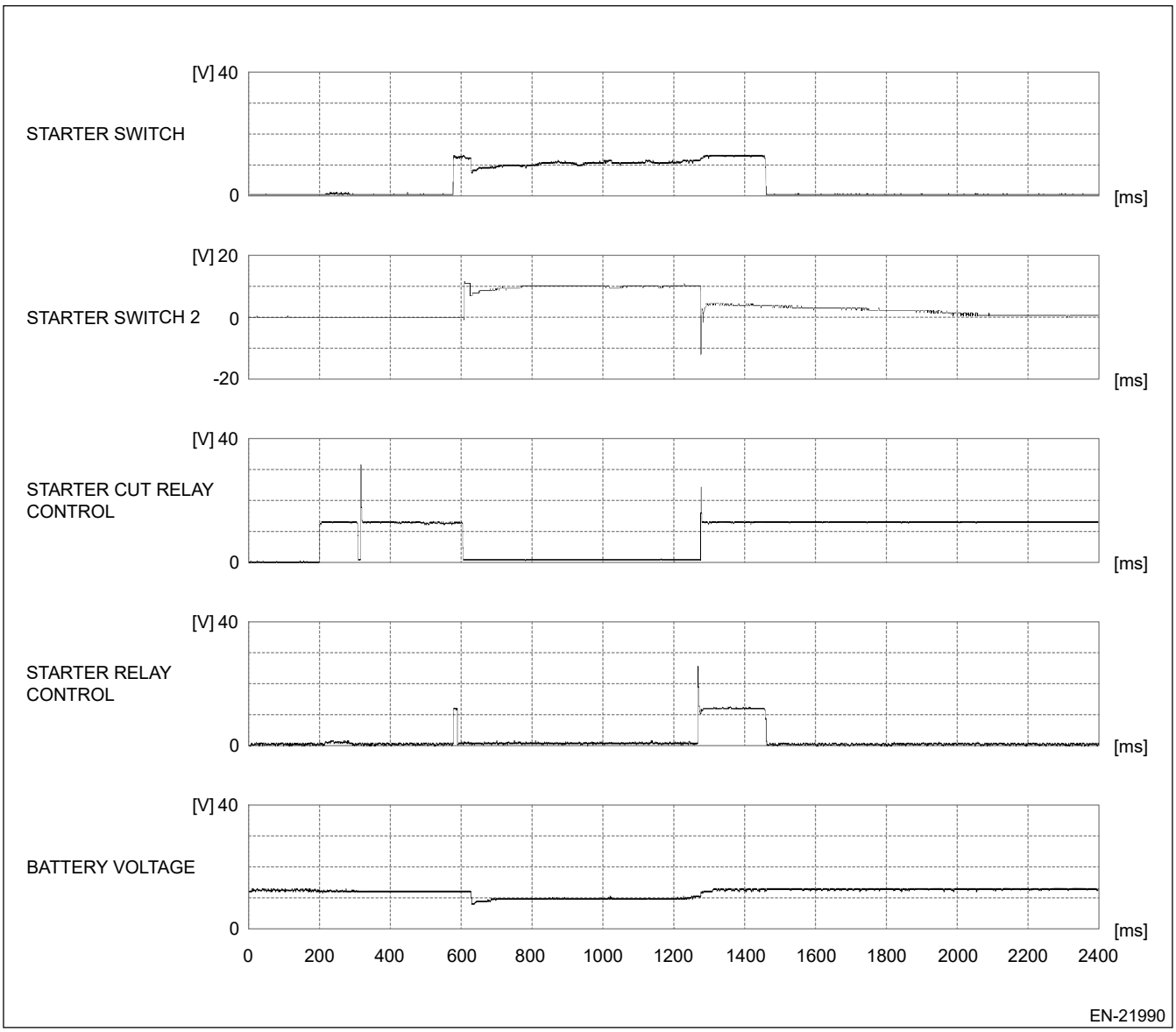
Measured terminal	Intake oil control solenoid RH (E158) No. 99 (+) — Engine ground 3 (B134) No. 69 (−):
	Intake oil control solenoid LH (E158) No. 100 (+) — Engine ground 3 (B134) No. 69 (−):
	Exhaust oil control solenoid RH (E158) No. 108 (+) — Engine ground 3 (B134) No. 69 (−):
	Exhaust oil control solenoid LH (E158) No. 109 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	While engine idling

8. Waveform 8



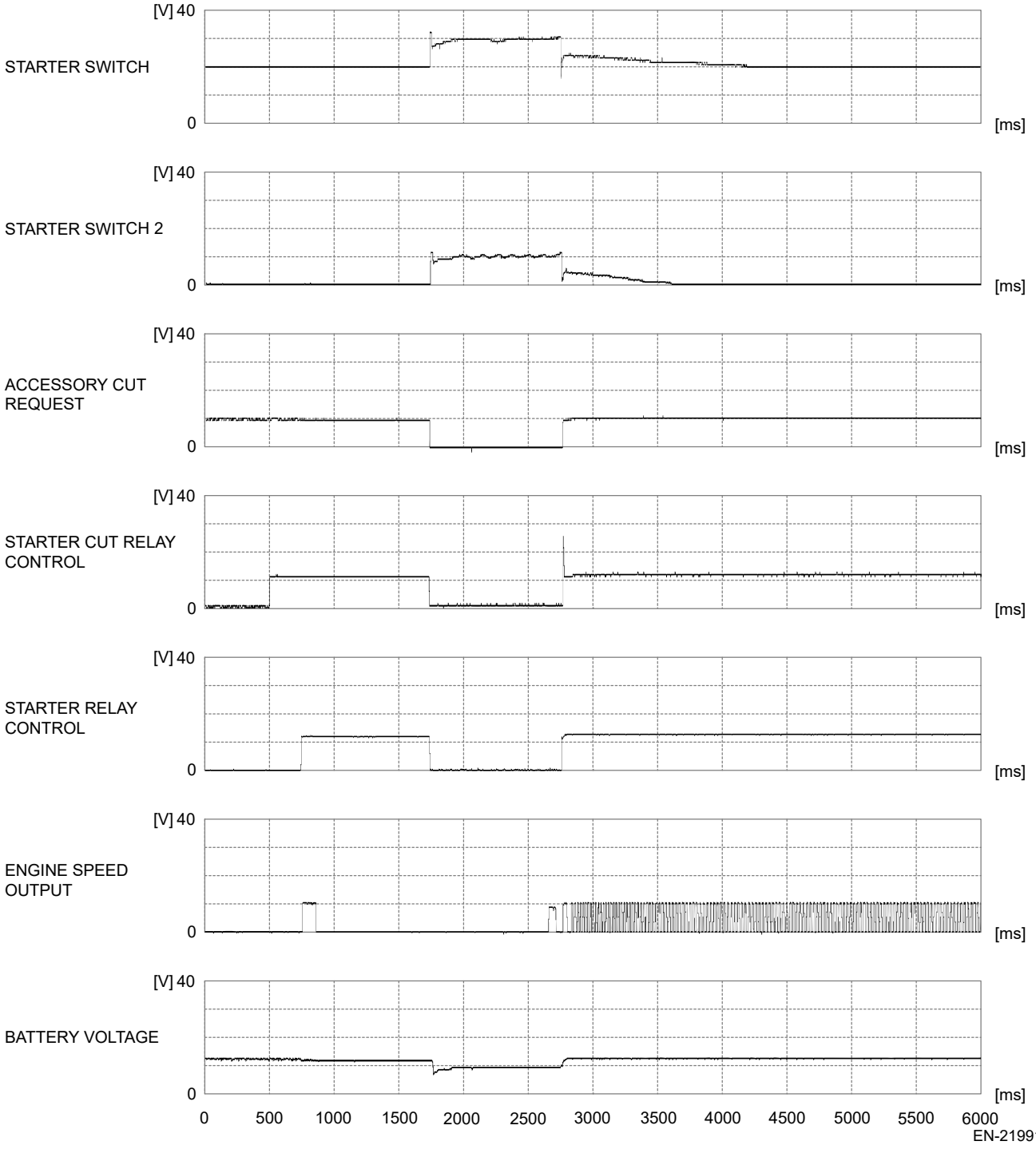
Measured terminal	Crankshaft position sensor (+) signal (E158) No. 66 (+) — Engine ground 3 (B134) No. 69 (−):
	Ignition control #1 (E158) No. 10 (+) — Engine ground 3 (B134) No. 69 (−):
	Ignition control #2 (E158) No. 11 (+) — Engine ground 3 (B134) No. 69 (−):
	Ignition control #3 (E158) No. 12 (+) — Engine ground 3 (B134) No. 69 (−):
	Ignition control #4 (E158) No. 13 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	While engine idling

9. Waveform 9



Measured terminal	Starter switch (B134) No. 25 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter switch 2 (B134) No. 27 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter cut relay control (B134) No. 24 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter relay control (B134) No. 2 (+) — Engine ground 3 (B134) No. 69 (−):
	Battery voltage (Battery terminal) (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	When engine is started

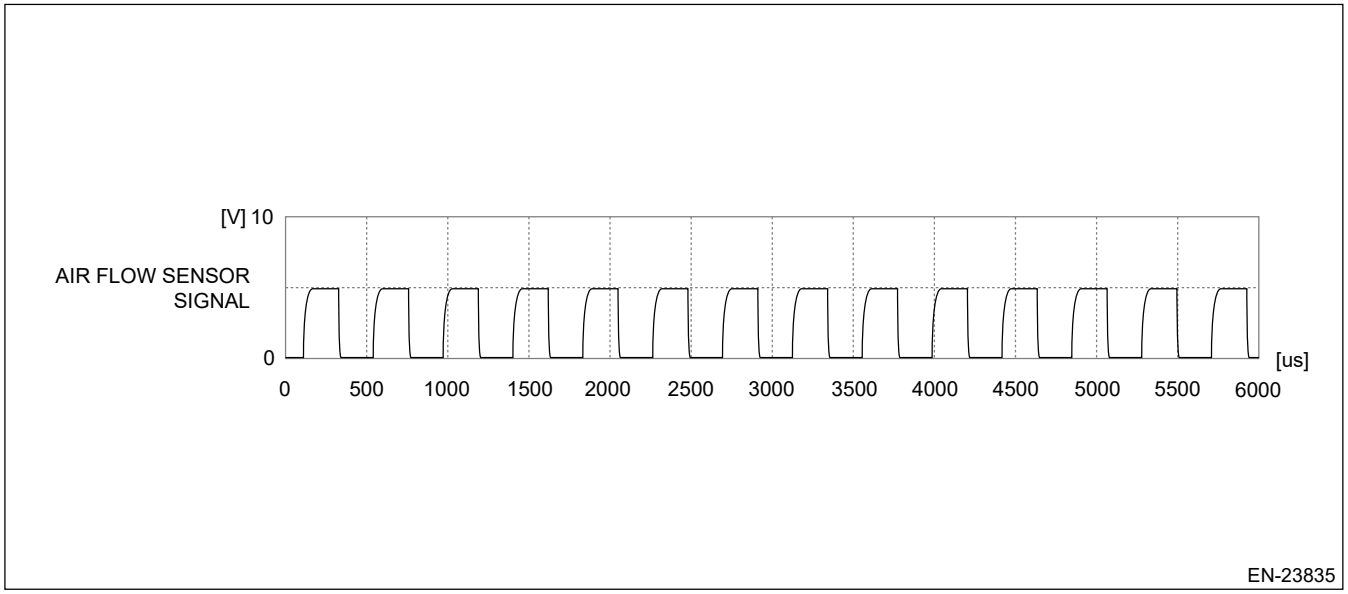
10. Waveform 10



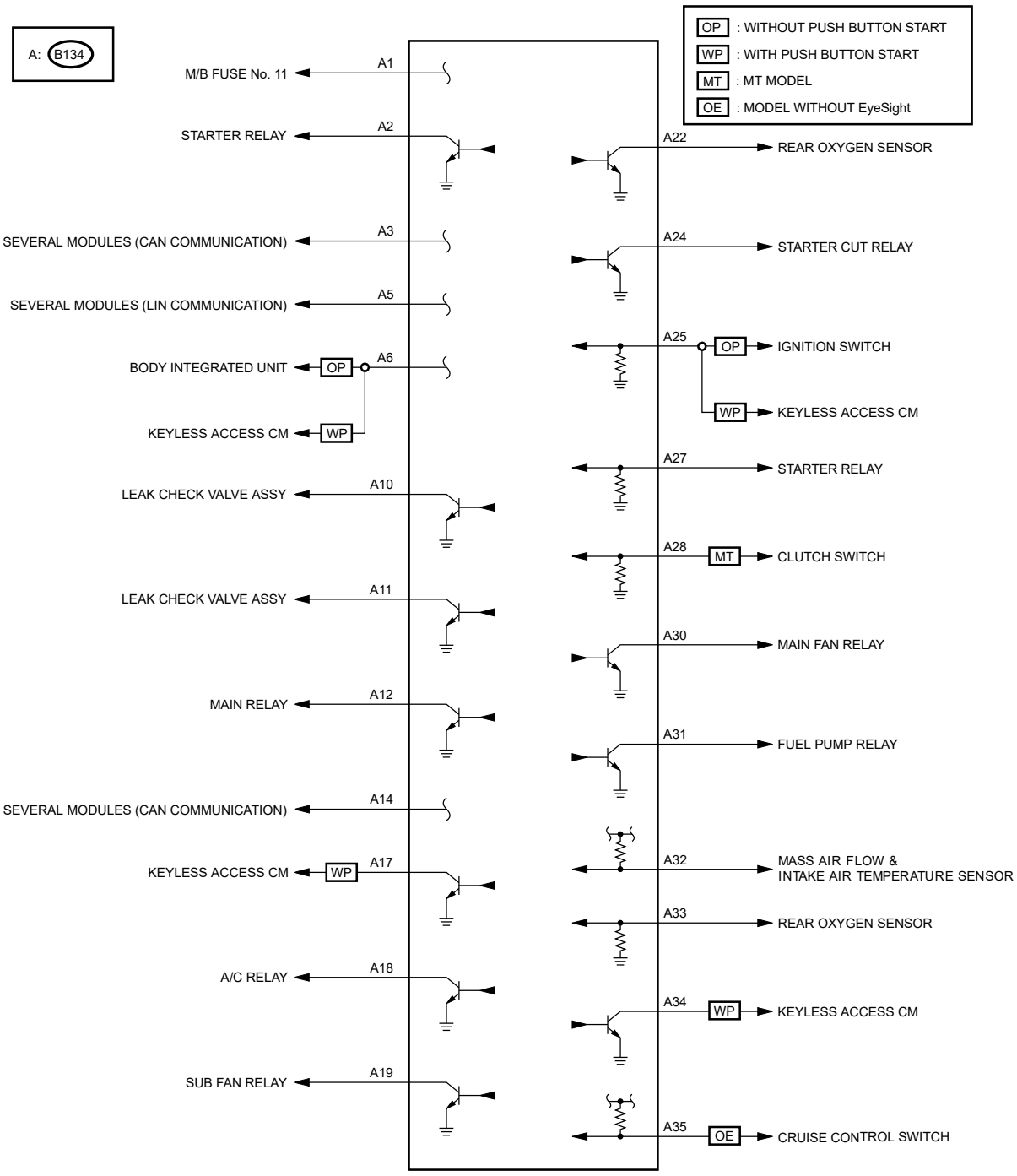
Measured terminal	Starter switch (B134) No. 25 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter switch 2 (B134) No. 27 (+) — Engine ground 3 (B134) No. 69 (−):
	Accessory cut request (B134) No. 34 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter cut relay control (B134) No. 24 (+) — Engine ground 3 (B134) No. 69 (−):
	Starter relay control (B134) No. 2 (+) — Engine ground 3 (B134) No. 69 (−):
	Engine speed output (B134) No. 17 (+) — Engine ground 3 (B134) No. 69 (−):
	Battery voltage (Battery terminal) (+) — Engine ground 3 (B134) No. 69 (−):

Measuring condition	When engine is started

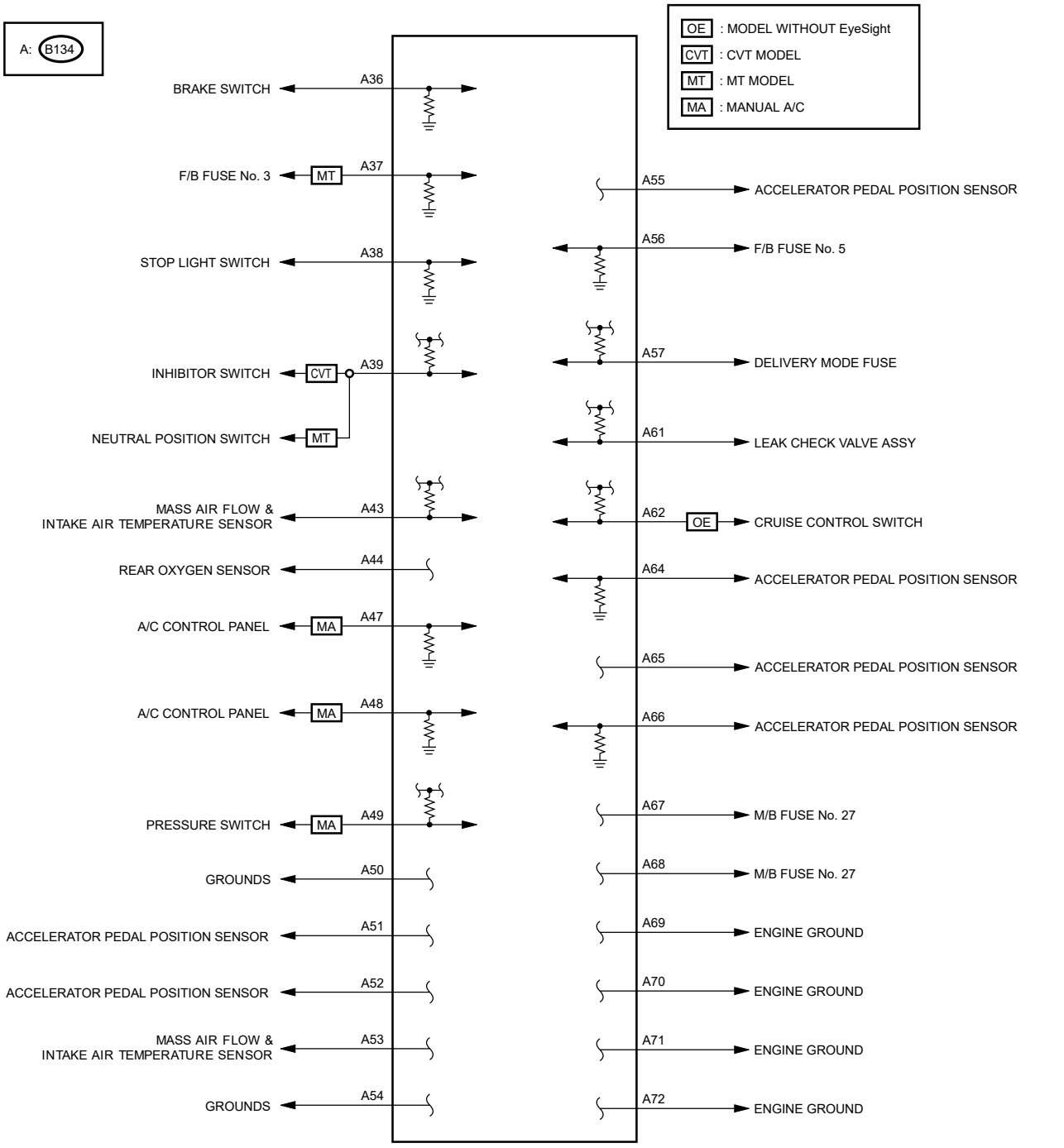
11. Waveform 11



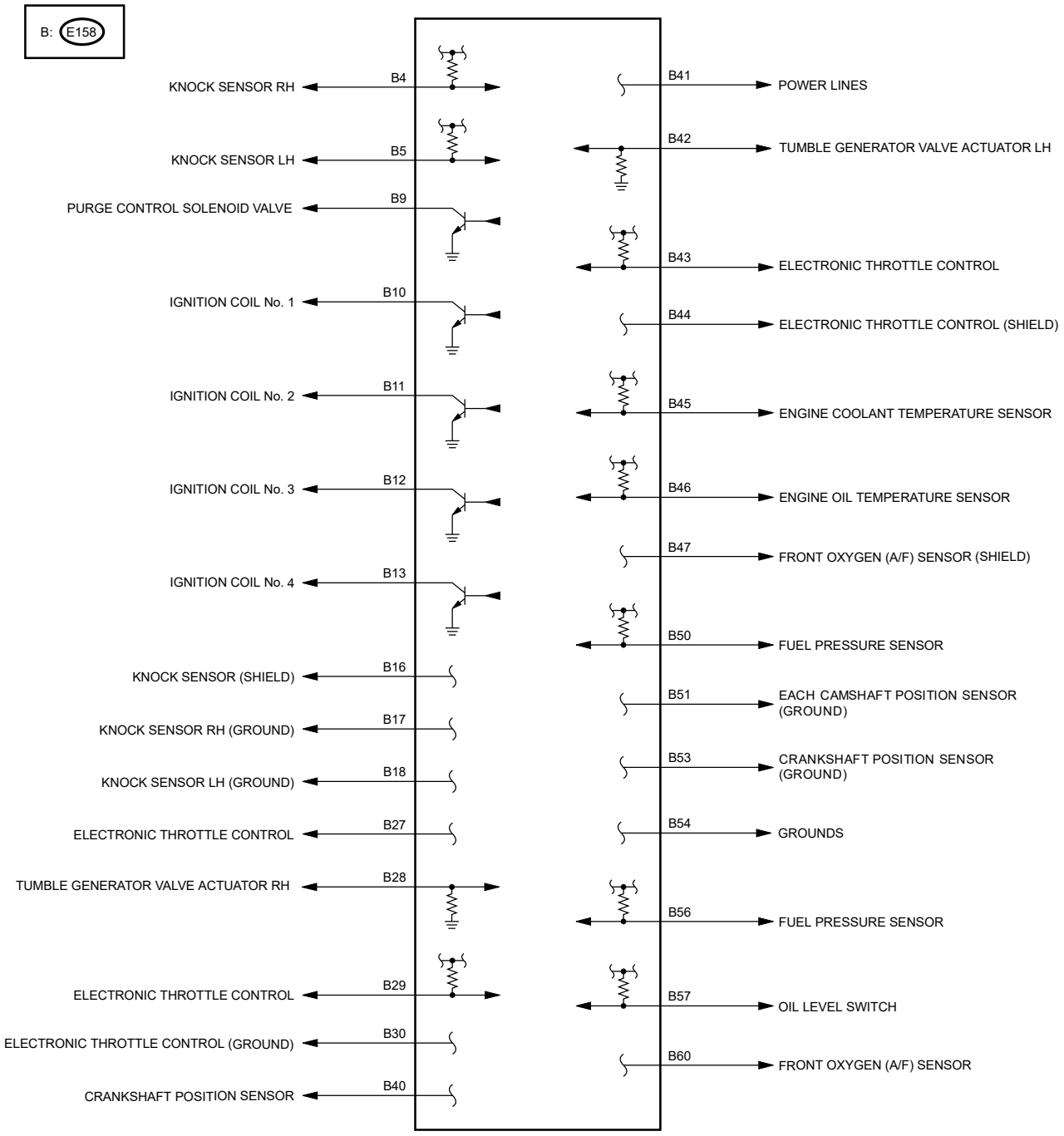
Measured terminal	Air flow sensor signal (B134) No. 32 (+) — Engine ground 3 (B134) No. 69 (−):
Measuring condition	While engine idling


A: B134
OP : WITHOUT PUSH BUTTON START
WP : WITH PUSH BUTTON START
MT : MT MODEL
OE : MODEL WITHOUT EyeSight
M/B FUSE No. 11
A1
STARTER RELAY
A2
SEVERAL MODULES (CAN COMMUNICATION)
A3
SEVERAL MODULES (LIN COMMUNICATION)
A5
BODY INTEGRATED UNIT
OP
A6
KEYLESS ACCESS CM
WP
LEAK CHECK VALVE ASSY
A10
LEAK CHECK VALVE ASSY
A11
MAIN RELAY
A12
SEVERAL MODULES (CAN COMMUNICATION)
A14
KEYLESS ACCESS CM
WP
A17
A/C RELAY
A18
SUB FAN RELAY
A19
A22
REAR OXYGEN SENSOR
A24
STARTER CUT RELAY
A25
OP
IGNITION SWITCH
WP
KEYLESS ACCESS CM
A27
STARTER RELAY
A28
MT
CLUTCH SWITCH
A30
MAIN FAN RELAY
A31
FUEL PUMP RELAY
A32
MASS AIR FLOW &
INTAKE AIR TEMPERATURE SENSOR
A33
REAR OXYGEN SENSOR
A34
WP
KEYLESS ACCESS CM
A35
OE
CRUISE CONTROL SWITCH

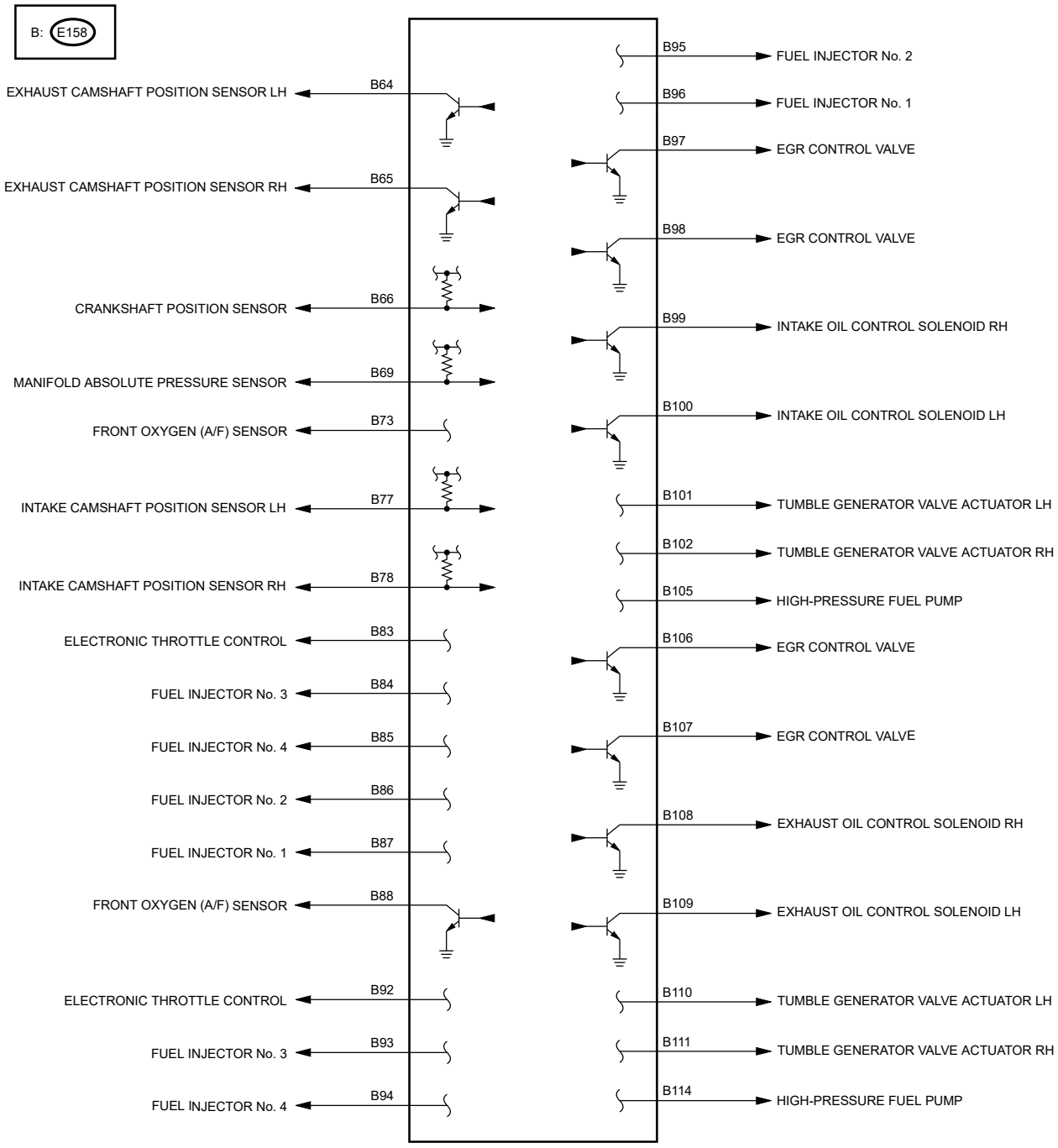
EN-22233


A: B134
OE : MODEL WITHOUT EyeSight
CVT : CVT MODEL
MT : MT MODEL
MA : MANUAL A/C
BRAKE SWITCH
A36
F/B FUSE No. 3
MT
A37
STOP LIGHT SWITCH
A38
INHIBITOR SWITCH
CVT
A39
NEUTRAL POSITION SWITCH
MT
MASS AIR FLOW &
INTAKE AIR TEMPERATURE SENSOR
A43
REAR OXYGEN SENSOR
A44
A/C CONTROL PANEL
MA
A47
A/C CONTROL PANEL
MA
A48
PRESSURE SWITCH
MA
A49
GROUNDS
A50
ACCELERATOR PEDAL POSITION SENSOR
A51
ACCELERATOR PEDAL POSITION SENSOR
A52
MASS AIR FLOW &
INTAKE AIR TEMPERATURE SENSOR
A53
GROUNDS
A54
A55
ACCELERATOR PEDAL POSITION SENSOR
A56
F/B FUSE No. 5
A57
DELIVERY MODE FUSE
A61
LEAK CHECK VALVE ASSY
A62
OE
CRUISE CONTROL SWITCH
A64
ACCELERATOR PEDAL POSITION SENSOR
A65
ACCELERATOR PEDAL POSITION SENSOR
A66
ACCELERATOR PEDAL POSITION SENSOR
A67
M/B FUSE No. 27
A68
M/B FUSE No. 27
A69
ENGINE GROUND
A70
ENGINE GROUND
A71
ENGINE GROUND
A72
ENGINE GROUND

EN-22234


B: E158
KNOCK SENSOR RH
B4
KNOCK SENSOR LH
B5
PURGE CONTROL SOLENOID VALVE
B9
IGNITION COIL No. 1
B10
IGNITION COIL No. 2
B11
IGNITION COIL No. 3
B12
IGNITION COIL No. 4
B13
KNOCK SENSOR (SHIELD)
B16
KNOCK SENSOR RH (GROUND)
B17
KNOCK SENSOR LH (GROUND)
B18
ELECTRONIC THROTTLE CONTROL
B27
TUMBLE GENERATOR VALVE ACTUATOR RH
B28
ELECTRONIC THROTTLE CONTROL
B29
ELECTRONIC THROTTLE CONTROL (GROUND)
B30
CRANKSHAFT POSITION SENSOR
B40
B41
POWER LINES
B42
TUMBLE GENERATOR VALVE ACTUATOR LH
B43
ELECTRONIC THROTTLE CONTROL
B44
ELECTRONIC THROTTLE CONTROL (SHIELD)
B45
ENGINE COOLANT TEMPERATURE SENSOR
B46
ENGINE OIL TEMPERATURE SENSOR
B47
FRONT OXYGEN (A/F) SENSOR (SHIELD)
B50
FUEL PRESSURE SENSOR
B51
EACH CAMSHAFT POSITION SENSOR (GROUND)
B53
CRANKSHAFT POSITION SENSOR (GROUND)
B54
GROUNDS
B56
FUEL PRESSURE SENSOR
B57
OIL LEVEL SWITCH
B60
FRONT OXYGEN (A/F) SENSOR

EN-22235


B: E158
EXHAUST CAMSHAFT POSITION SENSOR LH
B64
EXHAUST CAMSHAFT POSITION SENSOR RH
B65
CRANKSHAFT POSITION SENSOR
B66
MANIFOLD ABSOLUTE PRESSURE SENSOR
B69
FRONT OXYGEN (A/F) SENSOR
B73
INTAKE CAMSHAFT POSITION SENSOR LH
B77
INTAKE CAMSHAFT POSITION SENSOR RH
B78
ELECTRONIC THROTTLE CONTROL
B83
FUEL INJECTOR No. 3
B84
FUEL INJECTOR No. 4
B85
FUEL INJECTOR No. 2
B86
FUEL INJECTOR No. 1
B87
FRONT OXYGEN (A/F) SENSOR
B88
ELECTRONIC THROTTLE CONTROL
B92
FUEL INJECTOR No. 3
B93
FUEL INJECTOR No. 4
B94
B95
FUEL INJECTOR No. 2
B96
FUEL INJECTOR No. 1
B97
EGR CONTROL VALVE
B98
EGR CONTROL VALVE
B99
INTAKE OIL CONTROL SOLENOID RH
B100
INTAKE OIL CONTROL SOLENOID LH
B101
TUMBLE GENERATOR VALVE ACTUATOR LH
B102
TUMBLE GENERATOR VALVE ACTUATOR RH
B105
HIGH-PRESSURE FUEL PUMP
B106
EGR CONTROL VALVE
B107
EGR CONTROL VALVE
B108
EXHAUST OIL CONTROL SOLENOID RH
B109
EXHAUST OIL CONTROL SOLENOID LH
B110
TUMBLE GENERATOR VALVE ACTUATOR LH
B111
TUMBLE GENERATOR VALVE ACTUATOR RH
B114
HIGH-PRESSURE FUEL PUMP

EN-22236

ENGINE (DIAGNOSTICS)(H4DO) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

DTC	Item	Condition	Number of driving cycles on the detecting condition
B1570	ANTENNA	—	1
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	—	1
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	—	1
B1574	KEY COMMUNICATION FAILURE	—	1
B1575	INCORRECT IMMOBILIZER KEY	—	1
B1576	EGI CONTROL MODULE EEPROM	—	1
B1577	IMM CONTROL MODULE EEPROM	—	1
B1578	METER	—	1
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—	1
P0013	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	—	1
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—	1
P0023	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	—	1
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	—	1
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	—	1
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	—	2
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	—	2
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	—	1
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	—	1
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	—	1
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	—	1
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	—	1
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	—	1
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	—	1
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	—	1
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	—	1
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	—	1
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	—	1
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	—	1
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	—	1
P0191	FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1	—	2
P0192	FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1	—	1
P0193	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1	—	1
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	—	1
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	—	1
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	—	1
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	—	1
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	—	1
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	—	1
P0332	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0333	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2	—	1
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	—	1
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—	2
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	—	1
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	—	1
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	—	1
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	—	1
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	—	1
P0365	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1	—	1
P0366	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1	—	1
P0390	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2	—	1
P0391	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2	—	1
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	—	1
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	—	1
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	—	2
P0512	STARTER (SWITCH) REQUEST CIRCUIT	—	1
P0560	SYSTEM VOLTAGE	—	1
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—	1
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—	1
P0606	CONTROL MODULE PROCESSOR	—	1
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	—	1
P0616	STARTER RELAY "A" CIRCUIT LOW	—	1
P0617	STARTER RELAY "A" CIRCUIT HIGH	—	1
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	—	1
P065A	GENERATOR/ALTERNATOR SYSTEM PERFORMANCE	—	1
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	—	2
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	—	1
P081A	STARTER DISABLE CIRCUIT LOW	—	1
P0A3B	GENERATOR/ALTERNATOR OVER TEMPERATURE	—	1
P1160	THROTTLE RETURN SPRING	—	1
P1192	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW	—	1
P1193	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH	—	1
P1235	HIGH PRESSURE FUEL PUMP CIRCUIT	—	1
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	—	1
P2008	TGV CONTROL CIRCUIT/OPEN BANK 1	—	1
P2009	TGV CONTROL CIRCUIT LOW BANK 1	—	1
P2011	TGV CONTROL CIRCUIT/OPEN BANK 2	—	1
P2012	TGV CONTROL CIRCUIT LOW BANK 2	—	1
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	—	1
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	—	1
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	—	1
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	—	1
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	—	1
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	—	1
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	—	1
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	—	1
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	—	1
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	—	1
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	—	1
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	—	1
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	—	1
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	—	1
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	[Engine Coolant Temperature]: 5 — 45°C (41 — 113°F) [Intake Air Temperature]: 5 — 50°C (41 — 122°F)	2
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW		
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—	1
U0073	Control Module Communication Bus Off	—	1
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	—	1
U0101	LOST COMMUNICATION WITH TCM	—	1
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—	1
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—	1
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—	1
U0284	LOST COMMUNICATION WITH ACTIVE GRILLE SHUTTER MODULE "A"	—	1
U0402	INVALID DATA RECEIVED FROM TCM	—	1
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—	1
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE	—	1
U171F	LOST LIN COMMUNICATION WITH GENERATOR	—	1

1. PREPARATION FOR THE INSPECTION MODE

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. After performing the diagnostics and clearing memory, check that no DTC remains. Ref. to COMMON(diag)>Clear memory.

   Note:

   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.

2. SUBARU SELECT MONITOR

1. Clear the memory. Ref. to COMMON(diag)>Clear memory.
2. Read the diagnostic trouble code (DTC) and check that no DTC is displayed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC). After solving the DTC, repeat from step 1).
3. Start the engine, and run the engine at idle for 10 seconds or more.
4. Read the diagnostic trouble code (DTC) and check the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using "Diagnostic Procedure with Diagnostic Trouble Code (DTC)". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC). After solving the DTC, repeat from step 1).

3. GENERAL SCAN TOOL

Note:

For detailed operation procedures, refer to the general scan tool operation manual.

1. Clear the memory. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool>OPERATION > MODE $04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION).
2. Read the diagnostic trouble code (DTC) and check that no DTC is displayed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool>OPERATION > MODE $07 (INITIAL EMISSION-RELATED POWERTRAIN DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC). After solving the DTC, repeat from step 1).

3. Start the engine, and run the engine at idle for 10 seconds or more.
4. Read the diagnostic trouble code (DTC) and check the DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool>OPERATION > MODE $07 (INITIAL EMISSION-RELATED POWERTRAIN DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis using “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC). After solving the DTC, repeat from step 1).

4. INSPECTION MODE A

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Complete diagnosis with inspection mode B or C as well.	1
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Complete diagnosis with inspection mode B or C as well.	1
P0128	COOLANT THERMOSTAT (COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	—	2
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	—	2
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—	2
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—	2
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	—	2
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	—	2
P0171	SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode B or C as well.	2

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0172	SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode B or C as well.	2
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Complete diagnosis with inspection mode B or C as well.	1
P0301	CYLINDER 1 MISFIRE DETECTED	Complete diagnosis with inspection mode B or C as well.	1
P0302	CYLINDER 2 MISFIRE DETECTED	Complete diagnosis with inspection mode B or C as well.	1
P0303	CYLINDER 3 MISFIRE DETECTED	Complete diagnosis with inspection mode B or C as well.	1
P0304	CYLINDER 4 MISFIRE DETECTED	Complete diagnosis with inspection mode B or C as well.	1
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	—	2
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	—	2
P0562	SYSTEM VOLTAGE LOW	—	1
P0563	SYSTEM VOLTAGE HIGH	—	1
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode B or C as well.	2
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode B or C as well.	2

DTC	Item	Condition	Number of driving cycles on the detecting condition
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 — SENSOR 1		2
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 — SENSOR 1		2

Warning:

When performing Inspection Mode A on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

   Note:

   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.
4. Drive for 20 minutes or more at a constant speed of 80 km/h (50 MPH) or more.
5. Stop the vehicle and idle for one minute.
6. Read the readiness code of [Engine Control System] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>All Readiness Diagnostic Code(s).
7. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
8. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

5. INSPECTION MODE B

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Complete diagnosis with inspection mode A or C as well.	1
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Complete diagnosis with	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
		inspection mode A or C as well.	
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL	[Engine Coolant Temperature] at engine starting: Less than −15°C (5°F)	2
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	—	2
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	—	2
P0171	SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode A or C as well.	2
P0172	SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A or C as well.	2
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Complete diagnosis with inspection mode A or C as well.	1
P0301	CYLINDER 1 MISFIRE DETECTED	Complete diagnosis with inspection mode A or C as well.	1
P0302	CYLINDER 2 MISFIRE DETECTED	Complete diagnosis with inspection mode A or C as well.	1
P0303	CYLINDER 3 MISFIRE DETECTED	Complete diagnosis with inspection mode A or C as well.	1
P0304	CYLINDER 4 MISFIRE DETECTED	Complete diagnosis with inspection mode A or C as well.	1
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	—	2
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	—	2
P059A	ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR CIRCUIT	[Ambient Temperature]: 3 — 33°C (37.4— 91.4°F)	1
P059F	ACTIVE GRILLE AIR SHUTTER "A" PERFORMANCE/STUCK OFF		2
P05A0	ACTIVE GRILLE AIR SHUTTER "A" STUCK ON		2
P05A1	ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR MINIMUM/MAXIMUM STOP PERFORMANCE		2
P05A2	ACTIVE GRILLE AIR SHUTTER "A" CONTROL CIRCUIT/OPEN		1
P05A6	ACTIVE GRILLE AIR SHUTTER "A" SUPPLY VOLTAGE CIRCUIT/OPEN		1
P05C0	ACTIVE GRILLE AIR SHUTTER MODULE "A" OVER TEMPERATURE		1
P062D	FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1	—	1
P1261	CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1262	CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1263	CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P1264	CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN	—	1
P162A	STARTER INTERLOCK INTERNAL CIRCUIT	—	1
P2006	TGV CONTROL STUCK CLOSED BANK 1	—	1
P2007	TGV CONTROL STUCK CLOSED BANK 2	—	1
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode A or C as well.	2
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A or C as well.	2

Warning:

When performing Inspection Mode B on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
   Note:
   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.
4. Drive at 10 km/h (6 MPH) or more.
5. Stop the vehicle and idle for ten minutes.
6. Read the readiness code of [Engine Control System] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>All Readiness Diagnostic Code(s).
7. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
8. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

6. INSPECTION MODE C

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	—	2
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	—	2
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	—	1
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	—	1
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—	2
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	—	1
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—	2
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—	2
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	—	2
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	—	2
P0171	SYSTEM TOO LEAN BANK 1	Complete diagnosis with	2

DTC	Item	Condition	Number of driving cycles on the detecting condition
		inspection mode A or B as well.	
P0172	SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A or B as well.	2
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Complete diagnosis with inspection mode A or B as well.	1
P0301	CYLINDER 1 MISFIRE DETECTED	Complete diagnosis with inspection mode A or B as well.	1
P0302	CYLINDER 2 MISFIRE DETECTED	Complete diagnosis with inspection mode A or B as well.	1
P0303	CYLINDER 3 MISFIRE DETECTED	Complete diagnosis with inspection mode A or B as well.	1
P0304	CYLINDER 4 MISFIRE DETECTED	Complete diagnosis with inspection mode A or B as well.	1
P0400	EGR "A" FLOW	—	2
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	—	2
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	—	2
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	—	2
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	—	1
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	—	1
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	—	1
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	—	1
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	—	1
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	—	1

DTC	Item	Condition	Number of driving cycles on the detecting condition
P2004	TGV CONTROL STUCK OPEN BANK 1	—	1
P2005	TGV CONTROL STUCK OPEN BANK 2	—	1
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Complete diagnosis with inspection mode A or B as well.	2
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Complete diagnosis with inspection mode A or B as well.	2
P219C	CYLINDER 1 AIR-FUEL RATIO IMBALANCE	—	2
P219D	CYLINDER 2 AIR-FUEL RATIO IMBALANCE	—	2
P219E	CYLINDER 3 AIR-FUEL RATIO IMBALANCE	—	2
P219F	CYLINDER 4 AIR-FUEL RATIO IMBALANCE	—	2
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	—	2
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	—	2

Warning:

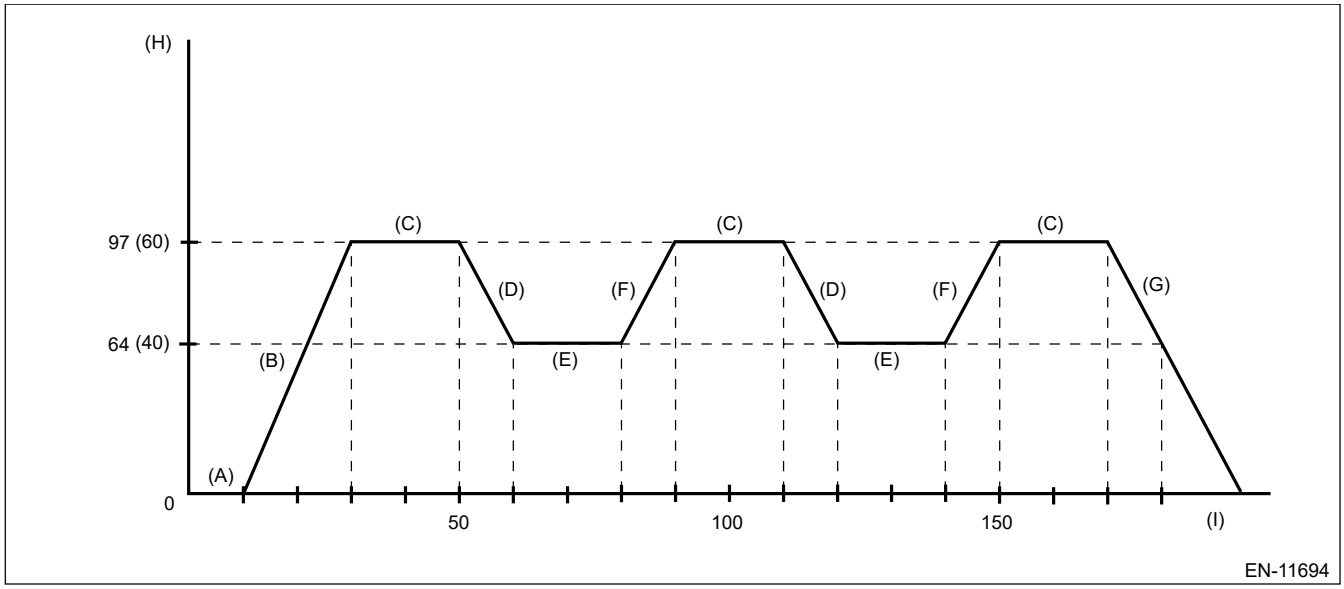
When performing inspection mode C on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

   Note:

   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.
4. Drive according to the drive pattern described below.



(A) Shift the select lever to “P” range or the shift lever to the neutral position, and let the engine idle for 10 seconds or more.	(D) Decelerate with the accelerator pedal fully closed to 64 km/h (40 MPH) or less.	(G) Stop vehicle with the accelerator pedal fully closed.
(B) Accelerate to 97 km/h (60 MPH) or more within 20 seconds.	(E) Drive for 20 seconds or more at 64 km/h (40 MPH) or less.	(H) Vehicle speed km/h (MPH)
(C) Drive for 20 seconds or more at 97 km/h (60 MPH) or more.	(F) Accelerate to 97 km/h (60 MPH) or more within 10 seconds.	(I) Sec.

5. Read the readiness code of [Engine Control System] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>All Readiness Diagnostic Code(s).
6. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
7. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Note:

After driving, use the Subaru Select Monitor to check that “Imbalance Check 3 R” indicates “1” and read the temporary code. If “Imbalance Check 3 R” indicates “0”, the diagnosis has not been completed. In this case, repeat driving until the reading is “1”.

7. INSPECTION MODE F

DTC	Item	Condition	Number of driving cycles on the detecting condition

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.	2

Warning:

When performing Inspection Mode F on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

   Note:

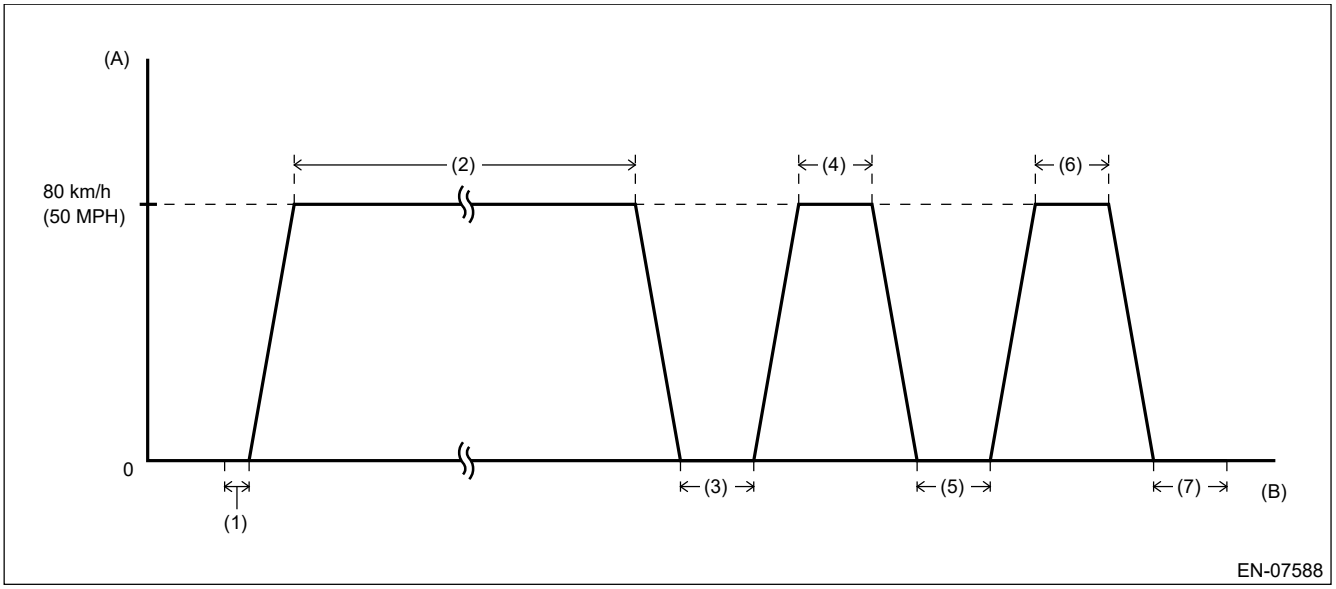
   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.
4. With the ignition switch ON (engine stopped), read the values in [Coolant Temp.] and [Intake Air Temp.].
5. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.

   Condition:

   |Engine coolant temperature — Intake air temperature|≤ 5°C (9°F)

   Note:

   - **If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.**
   - **For CVT models, hold the select lever to “P” range or “N” range at idling, and for MT models, the shift lever in the neutral position at idling.**
6. Drive according to the drive pattern described below.



(A) Vehicle speed
(B) Elapsed time
(1) Idle the engine for 2 minutes or more.
(2) Drive for a total period of 15 minutes or more at a speed of 80 km/h (50 MPH) or more.
(3) Stop the vehicle and idle for 30 seconds or more.
(4) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more.
(5) Stop the vehicle and idle for 30 seconds or more.
(6) Drive for 30 seconds or more at a constant speed of 80 km/h (50 MPH) or more.
(7) Stop the vehicle and idle for 30 seconds.

Note:

- **In pattern (2), it is acceptable to decelerate to less than 80 km/h (50 MPH) or to stop the vehicle depending on the traffic conditions. Drive the vehicle at 80 km/h (50 MPH) or more until the total driving time reaches or exceeds 15 minutes.**
- **There is no given transition time between idling and cruising.**
- **Driving at constant speed only on a downhill causes smaller engine load and may result in failure to obtain a right diagnostic result.**
- **If the ignition switch is turned to OFF during inspection mode F, perform this driving cycle again after satisfying the conditions listed in the table.**

7. Read the readiness code of [Engine Control System] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>All Readiness Diagnostic Code(s).

8. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

9. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

8. INSPECTION MODE H

DTC	Item	Condition	Number of driving cycles on

			the detecting condition
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.	2
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.	2
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	• 6 hours have elapsed since ignition switch is OFF under a completely warmed up condition. • For models with block heater, at least 6 hours must have elapsed without operating the block heater.	2

P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	60 seconds have elapsed since ignition switch is OFF.	2
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	—	2
P050B	COLD START IGNITION TIMING PERFORMANCE	—	2

Diagnostic procedure:

1. With the ignition switch ON (engine stopped), read the values in [Engine Coolant Temperature] and [Intake Air Temperature]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
2. If the values from step 1) satisfy the following conditions, idle the engine for two minutes or more.
   Condition:
   |Engine coolant temperature — Intake air temperature|≤ 5°C (9°F)
   Note:
   - **If the conditions are not satisfied, turn the ignition switch to OFF and wait until the parameters are satisfied.**
   - **For CVT models, hold the select lever to "P" range or "N" range at idling, and for MT models, the shift lever in the neutral position at idling.**
3. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

9. INSPECTION MODE I

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	• [Coolant Temp.] 5 — 45° (41 — 113°F) • [Intake Air Temperature] : 5 — 50°C (41 — 122°F)	2
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)		2
P1451	DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE)		2
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH		1
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE		2
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH		2

Warning:
When performing Inspection Mode I on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Caution:
Be careful of the state of the battery when performing the inspection mode I consecutively. Performing the inspection mode I consecutively without the engine running may cause a low battery voltage and battery discharge.

Note:

- **If it is necessary to perform inspection mode I consecutively, drive the vehicle under the following conditions to release accumulated evaporating gas. Performing the inspection mode I consecutively without starting the engine causes a large amount of evaporating gas to accumulate in the canister, which hinders an accurate diagnosis.**
  - **After engine is warmed up**
  - **Drive for 10 minutes or more at a speed of 48 km/h (30 MPH) or more (duration of drive can be an accumulation)**
- **To obtain an accurate diagnostic result, perform the procedures according to the following points.**
  - **Do not refuel gas immediately before performing inspection mode I. There will be a large amount of evaporating gas immediately after refuel, which may cause a less accurate diagnostic performance.**
  - **Do not shake the vehicle while performing inspection mode I. Shaking the vehicle causes evaporating gas to increase inside the fuel tank, which may cause a less accurate diagnostic performance.**
  - **Do not perform any service operation including installation or removal of parts or connectors while performing inspection mode I. Performing service operation could affect on the functions of related parts, which may cause a less accurate diagnostic performance.**
- **Perform MODE $08 when using a general scan tool.**

Diagnostic procedure:

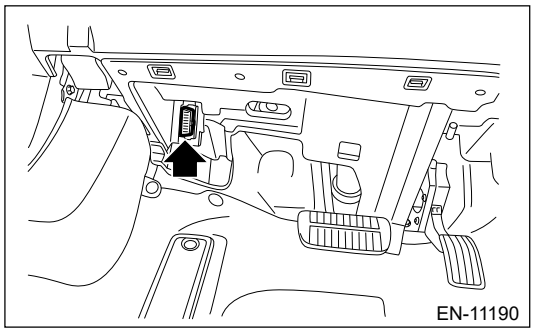
1. Prepare the Subaru Select Monitor kit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL.
2. Prepare PC with Subaru Select Monitor installed.
3. Connect the USB cable to the DST-i and the USB port on the personal computer (dedicated port for the Subaru Select Monitor).

   Note:

   The dedicated port for the Subaru Select Monitor means the USB port which was used to install the Subaru Select Monitor.
4. Connect the diagnosis cable to DST-i.
5. Connect the DST-i to the data link connector located in the lower portion of the instrument panel (on the driver's side).

   Caution:

   Do not connect the scan tools except for Subaru Select Monitor and general scan tool.



6. Start the PC.
7. Turn the ignition switch to ON (engine OFF) and run the "PC application for Subaru Select Monitor".
8. On [Start] display, select [Generic OBDII].
9. On [Select System] display, select [Evaporative System Leak Test].

10. On [Evaporative System Leak Test] display, select [Evaporative System Leak Test].
11. On [Evaporative System Leak Test is running. Press Cancel to exit this function.] display, click the [OK] button to perform evaporative system leak test.
12. When [Conditions have been enabled to control this function. Turn the ignition switch off to terminate the test.] display appears, wait for 30 minutes without clicking the [OK] button.

Caution:

Do not leave the vehicle for an extended period of time after the test is complete. This may cause early deterioration of the battery or discharged battery.

Note:

- **Clicking [OK] button brings [Evaporative System Leak Test] display back, although the test is continuing.**
- **The Subaru Select Monitor screen does not change after the evaporative system leak test is complete or when the test is aborted by turning off the ignition switch.**
- **If [Test conditions are not correct] display appears, use Subaru Select Monitor to check that the values in [Coolant Temp.] and [Intake Air Temp.] satisfy the conditions. If the conditions are satisfied, make the necessary preparation for the inspection mode again.**
  Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE > PREPARATION FOR THE INSPECTION MODE.

13. After 30 minutes passed from the start of step 14), click the [OK] button to return to the [Evaporative System Leak Test] display.
14. Return to the [OBD System] display, and select [OBD Mode test results].
15. Check TID $C1 —$CA of MID $3C in [OBD Mode test results].

Note:

Perform MODE $06 and check when using a general scan tool.

Result of on-board monitor test

Display	Details	REMARKS
$0000 is stored in all Val.	During the evaporative system leak test, the test conditions were not met and the test was canceled.	Once the test conditions are met, perform the test again.
All Val. are stored with values and OK is set to all the results.	Evaporative system leak test is completed correctly.	While the ignition switch is ON, read the pending code using the Subaru Select Monitor.
Some results were no good.	The evaporative system leak test completed successfully but the results were faulty.	While the ignition switch is ON, read the pending code using the Subaru Select Monitor.

16. When the evaporative system leak test is completed correctly, read the pending code with the ignition switch turned to ON position. If the DTC is recorded, check the appropriate DTC. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Note:

- **Perform MODE $07 when using a general scan tool.**
- **The pending code will be cleared by turning ignition switch to OFF.**

10. INSPECTION MODE J

DTC	Item	Condition	Number of

			driving cycles on the detecting condition
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	—	2

Diagnostic procedure:

1. Idle the engine for 15 minutes or more.
2. Turn the ignition switch to OFF.
3. After at least 10 hours passed from the start of step 2), read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

11. INSPECTION MODE N

DTC	Item	Condition	Number of driving cycles on the detecting condition
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	[Engine Coolant Temperature]: 80°C (176°F) or more	2
P0017	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B		2
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A		2
P0019	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B		2

Warning:

When performing Inspection Mode N on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Execute the inspection mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

   Note:

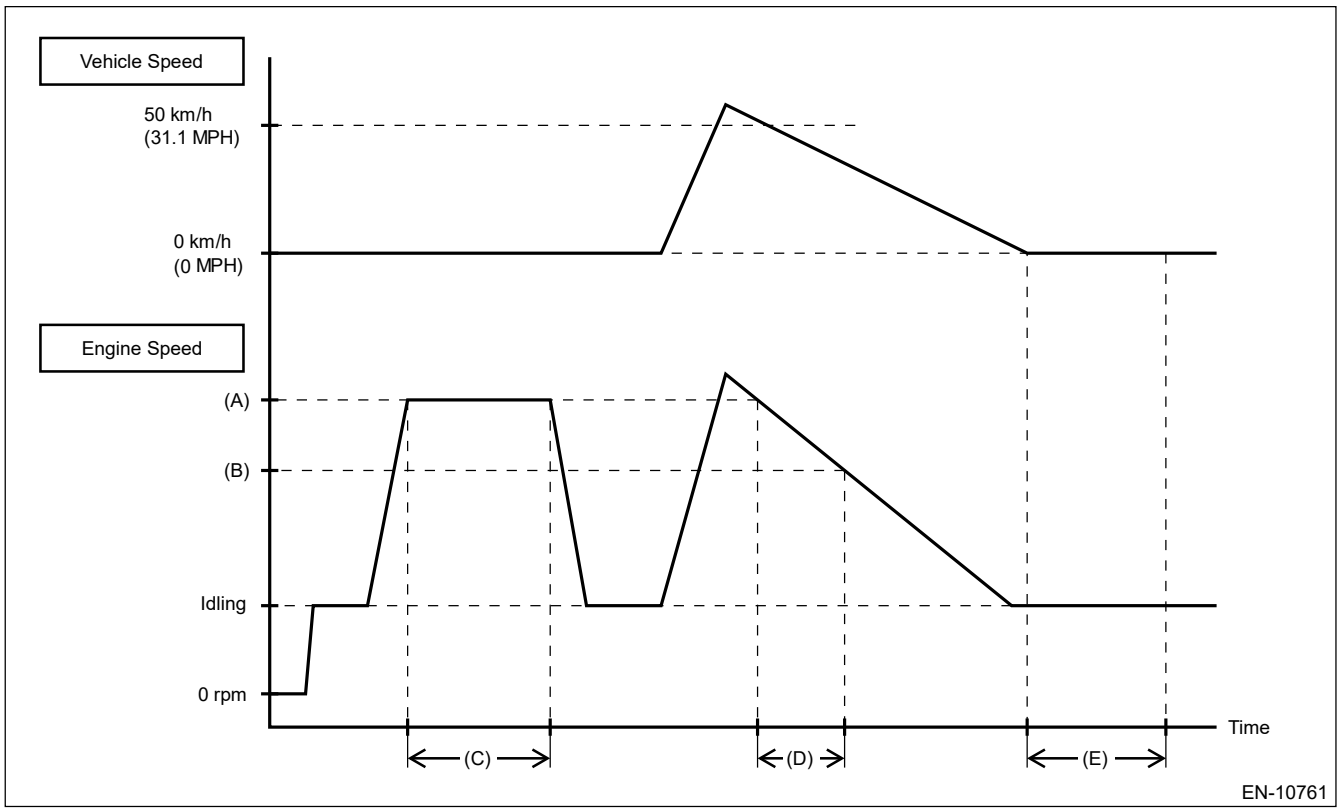
   Perform the inspection mode after warming up the engine except when the engine coolant temperature at engine start is specified.
4. Check the data in condition column of table by using the Subaru Select Monitor or general scan tool.

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

5. While the conditions in the list are satisfied, race the engine at the speed of approx. 2,500 rpm for 40 seconds or more.
6. Start to move the vehicle, then accelerate the vehicle to 50 km/h (31.1 MPH) or more.
7. When the speed reaches 50 km/h (31.1 MPH) or more, release the accelerator pedal, the brake pedal and the clutch pedal (MT model) to decelerate the vehicle without shifting the gear. At this time, select an appropriate gear beforehand so that the engine speed falls within the range from 2500 rpm to 1900 rpm for 5 seconds or more.
   Note:
   - **The vehicle speed does not matter so long as the engine speed can maintain from 2500 rpm to 1900 rpm for 5 seconds or more.**
     Example: On a downhill grade, it can be performed with a low speed gear and at a low vehicle speed.
   - **When it is performed with the electrical load such as the air conditioner, etc. turned OFF or the vehicle driven on a downhill grade, the engine speed decreases slowly. Therefore, the continuous time can be maintained easily.**
8. Bring the vehicle to a stop in a safe place, and idle it for 5 minutes or more.
   Note:
   Driving method while vehicle is driven to a stop at safe place is not restricted.
9. Read the readiness code of [Engine Control System] using Subaru Select Monitor and check that the concerned DTC is completed. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>All Readiness Diagnostic Code(s).
10. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
11. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.
    Note:
    - **For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**
    - **In the step 6), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.**



(A) 2500 rpm
(B) 1900 rpm
(C) 40 seconds or more
(D) 5 seconds or more
(E) 5 minutes or more

12. INSPECTION MODE O

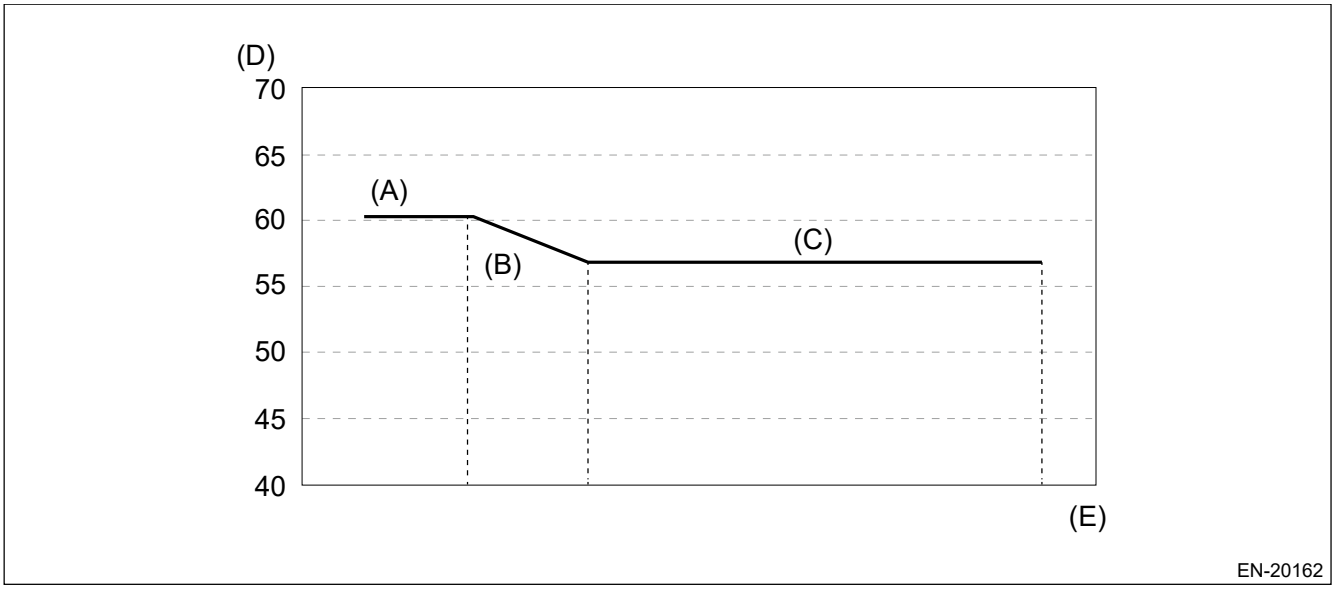
DTC	Item	Condition	Number of driving cycles on the detecting condition
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	—	2

Diagnostic procedure:

Warning:

When performing Inspection Mode O on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

1. Drive according to the drive pattern described below.



(A) Drive the vehicle at 60 km/h (37 MPH) or faster for at least 5 minutes in fully warm-up condition.
(B) Decelerate with the throttle fully closed for at least 3 seconds.
(C) Drive the vehicle at a constant vehicle speed by depressing the accelerator pedal for at least 30 seconds.
(D) Vehicle speed km/h (MPH)
(E) Sec.

2. Park the vehicle on a safe place.
   Note:
   Driving method while vehicle is driven to a stop at safe place is not restricted.
3. With the vehicle idling, read the temporary diagnostic code of DTC using Subaru Select Monitor or general scan tool.
   Note:
   - **For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**
   - **In the step 3), if the DTC is not displayed on the Subaru Select Monitor or general scan tool display screen, the trouble is resolved.**

13. INSPECTION MODE T

DTC	Item	Condition	Number of driving cycles on the detecting condition
P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	—	2
P000B	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 1	—	2
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	—	2
P000D	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 2	—	2

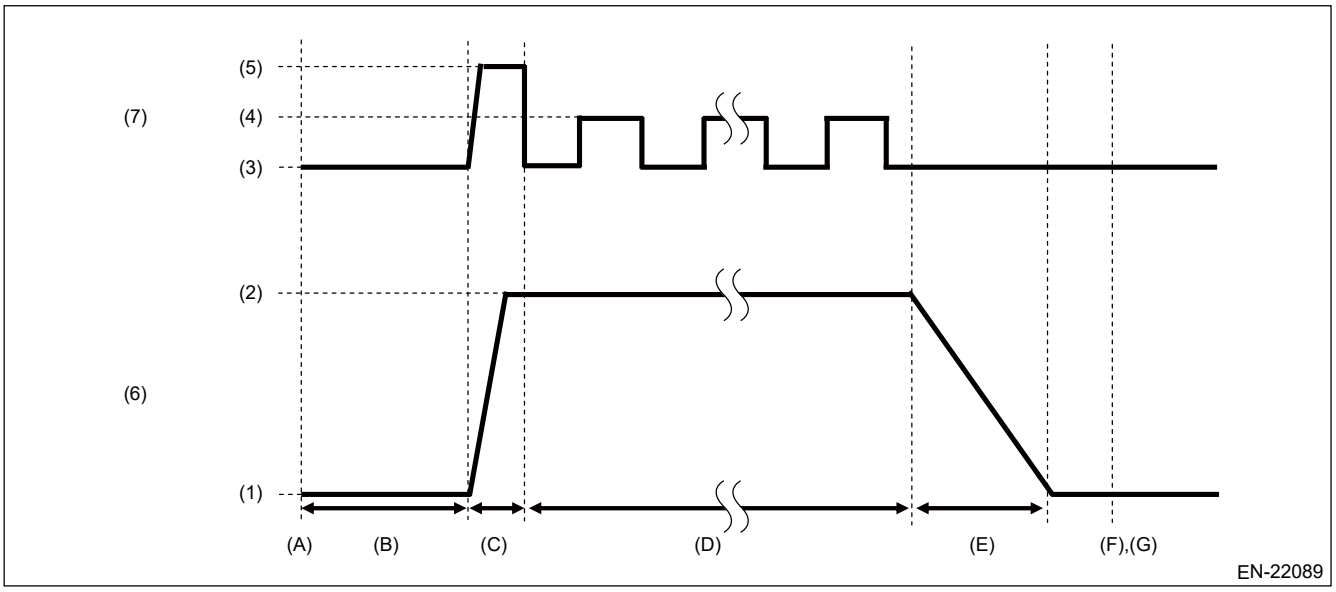
DTC	Item	Condition	Number of driving cycles on the detecting condition
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	—	2
P0014	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	—	2
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	—	2
P0024	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	—	2

Warning:

When performing Inspection Mode T on a public road, pay sufficient attention to the traffic condition and give the highest priority to safe driving.

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3—10.6 US gal, 4.4—8.8 Imp gal)].
2. Using the Subaru Select Monitor, clear the memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
3. Drive according to the drive pattern described below.



(1) 0 km/h
(2) 60 km/h (37.3 MPH)
(3) 0%
(4) 20%
(5) 30 — 60%
(6) Vehicle speed
(7) Accelerator pedal opening angle
(A) Start the engine after warming up (coolant
(D) While maintaining vehicle speed at 60 km/h (37.3 MPH),
(G) Stop the engine.

temperature of 70°C (158°F)).

(B) Idle the engine for at least three minutes.

(C) Accelerate the vehicle to 60 km/h (37.3 MPH).

repeat the accelerator opening angle 0% (5 seconds) ←→ 20% (5 seconds) for 20 minutes or more.

(E) Fully release the accelerator pedal to decelerate the vehicle for at least 5 seconds.

(F) Stop the vehicle. (Driving method while vehicle is driven to a stop at safe place is not restricted)

4. Read the temporary code using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

ENGINE (DIAGNOSTICS)(H4DO) > Warning Light Illumination Pattern

PROCEDURE

1. Activation of malfunction indicator light Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Warning Light Illumination Pattern>ACTIVATION OF MALFUNCTION INDICATOR LIGHT.
↓
2. Malfunction indicator light does not come on Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.
↓
3. Malfunction indicator light does not go off Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF.

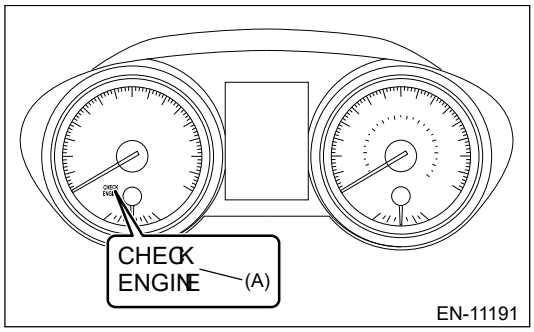
ENGINE (DIAGNOSTICS)(H4DO) > Warning Light Illumination Pattern

ACTIVATION OF MALFUNCTION INDICATOR LIGHT

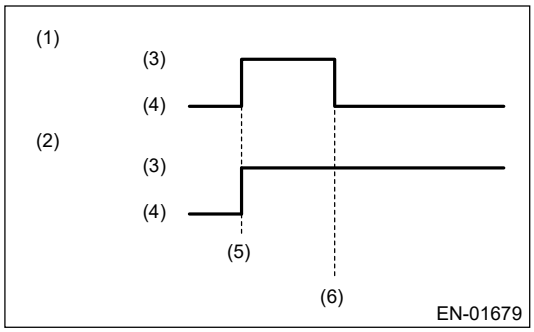
1. When the ignition switch is turned to ON (engine OFF), the malfunction indicator light (A) in the combination meter illuminates.

   Note:

   If the malfunction indicator light does not illuminate, perform diagnostics of the malfunction indicator light circuit or the combination meter circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Warning Light Illumination Pattern>MALFUNCTION INDICATOR LIGHT DOES NOT COME ON.



2. After starting the engine, the malfunction indicator light goes out. If it does not go off, any of the engine and emission control system has malfunction.

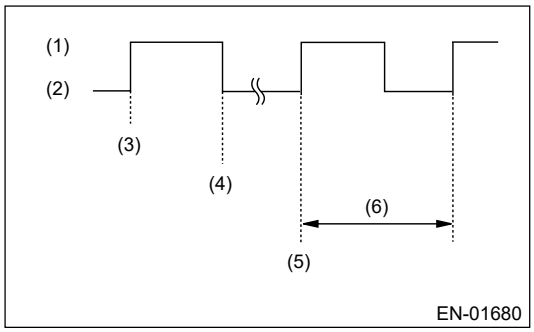


(1) No faulty
(2) Trouble occurs
(3) ON
(4) OFF

(5) Ignition switch ON

(6) Engine start

3. If the diagnostic system detects a misfire which could damage the catalyst, the malfunction indicator light will blink at a cycle of 1 Hz.



(1) ON

(2) OFF

(3) Ignition switch ON

(4) Engine start

(5) Misfire start

(6) 1 second

ENGINE (DIAGNOSTICS)(H4DO) > Warning Light Illumination Pattern

MALFUNCTION INDICATOR LIGHT DOES NOT COME ON

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), malfunction indicator light does not illuminate.

1. CHECK DTC.

Read the DTC of LAN system using the Subaru Select Monitor or a general scan tool. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC for LAN system displayed?

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the meter case assembly of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ENGINE (DIAGNOSTICS)(H4DO) > Warning Light Illumination Pattern

MALFUNCTION INDICATOR LIGHT DOES NOT GO OFF

Diagnosis:
The malfunction indicator light circuit is shorted.
Trouble symptom:
Although malfunction indicator light comes on when the engine runs, DTC is not shown on the Subaru Select Monitor or general scan tool display.

1. CHECK DTC.

Read the DTC of engine or LAN system using the Subaru Select Monitor or a general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC). Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of engine or LAN system displayed? Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC)>LIST. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK COMBINATION METER.

Perform the self-diagnosis for combination meter system. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Does the malfunction indicator light illuminate and go off normally?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the meter case assembly of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ENGINE (DIAGNOSTICS)(H4DO) > Data Monitor

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor>LIST.**

ENGINE (DIAGNOSTICS)(H4DO) > Data Monitor

LIST

Display	Contents	Note (at idling)	REMARKS
Engine Speed	Value calculated from crankshaft position sensor output value.	650 rpm	rpm
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	2.5 g/s	g/s or lb/m
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	0 km/h	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	13%	%
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	0.0%	%
A/F Sensor #1	Actual lambda value calculated from the front oxygen (A/F) sensor output value.	1.0	—
Ignition Timing Advance for #1 Cylinder	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	5.5°	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	96°C	°C or °F
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	0.8%	%
Long Term Fuel Trim (B1)	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	1.6%	%
Learned Ignition Timing	Ignition timing learning value. Advance angle amount or retard angle amount when knocking occurs.	0.0 deg	deg
Mani. Absolute Pressure	Value calculated from the manifold pressure sensor.	32 kPa	kPa, mmHg, inHg or

Display	Contents	Note (at idling)	REMARKS
			psig
Bank 1 - Sensor 2 present at that location	Rear oxygen sensor output voltage value.	0.7V	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	0 deg	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	0 deg	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating properly. Response delays during the transition time.	0 deg	deg
Exh. VVT Retard Ang. R	AVCS retard angle amount for the RH bank on the exhaust side.	0 deg	deg
Ex VVT Retard Target Angle R	AVCS target retard angle amount for the RH bank on the exhaust side. This value is compared with the AVCS retard angle amount R to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	0 deg	deg
Exh. VVT Retard Ang. L	AVCS retard angle amount for the LH bank on the exhaust side.	0 deg	deg
Ex VVT Retard Target Angle L	AVCS target retard angle amount for the LH bank on the exhaust side This value is compared with the AVCS retard angle amount L to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	0 deg	deg
VVT Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the intake side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	29.9°CA	°CA
VVT Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the intake side.	27.7°CA	°CA

Display	Contents	Note (at idling)	REMARKS
	Controls the angle against a standard angle. Deviation learning is performed based on this standard value.		
VVT Ex Initial Position Learning Value #1	AVCS initial position learning value for the RH bank on the exhaust side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	29.9°CA	°CA
VVT Ex Initial Position Learning Value #2	AVCS initial position learning value for the LH bank on the exhaust side. Controls the angle against a standard angle. Deviation learning is performed based on this standard value.	27.7°CA	°CA
Control module voltage	ECM input power supply voltage.	14.176V	V
Target engine speed	ECM target engine speed.	675 rpm	rpm
Number of Cleaning Executions for VVT Self-recovery	Number of times that the intake AVCS oil control valve cleaning is performed.	—	time
Number of Cleaning Executions for Ex VVT Self-recovery	Number of times that the exhaust AVCS oil control valve cleaning is performed.	—	time
Target Equivalence Ratio	Target air fuel ratio (lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	0.996	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	96°C	°C or °F
Intake Air Temp.	Value calculated from the intake air temperature sensor output value.	50°C	°C or °F
Ambient air temperature	Value that ECM estimates by using input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	Ambient air temperature	°C or °F
Ambient Temperature Sensor Signal	Data value of the ambient temperature input to the combination meter via CAN. Ambient temperature used for diagnosis.	—	°C or °F
Ambient Temperature for Control	Data value of the ambient temperature input to the combination meter via CAN. Ambient temperature used for control.	—	°C or °F
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully	15.3%	%

Display	Contents	Note (at idling)	REMARKS
	open is 100%.		
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	14.9%	%
Barometric Pressure	Value calculated from atmospheric pressure sensor output value.	101 kPa	kPa, mmHg, inHg or psig
Mani. Relative Pressure	Value calculated from manifold pressure sensor output value. (Absolute value) (Air intake absolute pressure – Atmospheric pressure)	−69	kPa, mmHg, inHg or psig
Target Throttle Opening Angle	Target throttle opening angle calculated by ECM.	16 deg	deg
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	16 deg	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	0.0%	%
Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value. The value will be approx. 70% at full open.	1.6%	%
Throttle Motor Voltage	Power supply voltage of the throttle motor. Input value to ECM.	14.2V	V
Main-Throttle Sensor	Voltage value of the main throttle position sensor. Input value to ECM.	0.66V	V
Sub-Throttle Sensor	Voltage value of the sub throttle position sensor. Input value to ECM.	1.52V	V
Throttle Motor Duty	Throttle motor control duty ratio. ECM output value.	−14%	%
Main-Accelerator Sensor	Voltage value of the main accelerator pedal position sensor.	0.66V	V

Display	Contents	Note (at idling)	REMARKS
	Input value to ECM.		
Sub-Accelerator Sensor	Voltage value of the sub accelerator pedal position sensor. Input value to ECM.	0.66V	V
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	3.00 g/s	g/s
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	0.00 g/s	g/s
ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	0.55 g/s	g/s
Idle A/C load correct	Air volume correction value when the air conditioner is turned on. ECM corrects the air volume against the target rotation speed when the air conditioner is turned ON.	0.86 g/s	g/s
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	0.10 g/s	g/s
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	0 g/s	g/s
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	3970	kPa
Fuel Rail Pressure B	Fuel pressure sensor output value set to the high pressure fuel line.	4050	kPa

Display	Contents	Note (at idling)	REMARKS
	Input value to ECM.		
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	4000	kPa
Commanded Fuel Rail Pressure B	Target fuel pressure for high pressure fuel line calculated by ECM.	4000	kPa
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	—	%
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	—	Ω
Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	0%	%
CPC Valve Duty Ratio	Purge control solenoid valve control duty ratio. ECM output value.	0%	%
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	0.0 %	%
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	0.0 %	%
ALT Duty	Value calculated by the ECM as an electric power generation voltage. Indicator voltage value from ECM to alternator is under a duty control.	69%	%
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration	High/Mid/Smart	—

Display	Contents	Note (at idling)	REMARKS
	Smart: Mode that maintains target SOC and restrains unnecessary power generation Low (Start): Mode that gradually increases the voltage at start Low (Acceleration): Mode that suppresses power generation load when slightly stronger acceleration was judged Low (Deceleration): Mode that suppresses power generation load when the vehicle is decelerated to stop Neutral: Neutral mode passing through the transition to the next mode from ExHigh		
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	14.0 V	V
Battery Charge/Discharge Current	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	3.6 A	A
Estimated Battery Temperature	Battery temperature input from the battery sensor.	45°C	°C or °F
Remaining battery capacity	Remaining amount of battery estimated by ECM.	89.0%	%
Knocking Correction	Retard angle amount when knocking occurs. Partially learning value of ignition timing learning value.	0.0 deg	deg
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
Fuel system for Bank 2	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	Cl_normal	—
A/F Sensor #1 Current	Front oxygen (A/F) sensor output current value. Input value to ECM.	−0.2 — 0.2 mA	mA
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	50 Ω	Ω
A/F Correction #3	Sub correction value of A/F feedback control.	0.00%	%
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	0 STEP	STEP

Display	Contents	Note (at idling)	REMARKS
Commanded EGR	Target value as EGR setting value calculated by ECM.	0%	%
EGR Error	Percentage of the difference in actual EGR steps as compared to the target EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens more than the target value. When the value is negative: It opens smaller than the target value.	0%	%
TGV Position Sensor R	Tumble generator valve position sensor RH output value. Input value to ECM.	3.12 V	V
TGV Position Sensor L	Tumble generator valve position sensor LH output value. Input value to ECM.	0.82 V	V
TGV Output	Drive signal to tumble generator valve motor. Set to "ON" when the tumble generator valve is activated (when the duty output is other than 0%). ECM output value.	None	—
TGV Drive	Tumble generator valve drive status. Set to "Open" when the tumble generator valve is open. ECM control status.	Closing direction	—
OCV Duty R	Control duty ratio of the intake side oil control solenoid on the RH bank. ECM output value.	40 — 60%	%
OCV Duty L	Control duty ratio of the intake side oil control solenoid on the LH bank. ECM output value.	40 — 60%	%
OCV Current R	Actual current value of the intake side oil control solenoid on the RH bank. Input value to ECM.	550 — 850 mA	mA
OCV Current L	Actual current value of the intake side oil control solenoid on the LH bank. Input value to ECM.	550 — 850 mA	mA
Exh. OCV Duty R	Control duty ratio of the exhaust side oil control solenoid on the RH bank. ECM output value.	40 — 60%	%
Exh. OCV Duty L	Control duty ratio of the exhaust side oil control solenoid on the LH bank. ECM output value.	40 — 60%	%

Display	Contents	Note (at idling)	REMARKS
Exh. OCV Current R	Actual current value of the exhaust side oil control solenoid on the RH bank. Input value to ECM.	550 — 850 mA	mA
Exh. OCV Current L	Actual current value of the exhaust side oil control solenoid on the LH bank. Input value to ECM.	550 — 850 mA	mA
Roughness Monitor #1	#1 cylinder roughness monitor count value.	0	—
Roughness Monitor #2	#2 cylinder roughness monitor count value.	0	—
Roughness Monitor #3	#3 cylinder roughness monitor count value.	0	—
Roughness Monitor #4	#4 cylinder roughness monitor count value.	0	—
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	—	rpm
Active Grille Shutter Position	Pulse count value of active grille shutter position. Fully open: 100% Fully closed: 0%	—	—

Display	Contents	Note (at idling)	REMARKS
Active Grille Shutter Mechanical Break Status	Mechanical error status of the active grille shutter. During the calibration procedure, if a linkage of the active grille shutter is off, calibration is not performed. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Sensor Error Status	Judges a malfunction of the active grille shutter opening angle sensor. Judges the sensor malfunction on the pulse counter. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Voltage Error Status	Judges a malfunction of the power source voltage supplied to the active grille shutter. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Control Circuit Error Status	Judges a malfunction of the active grille shutter internal circuit (drive motor). Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Stuck Error Status	Judges an abnormal stuck of the active grille shutter. Detects the status where the operation failed because of any foreign matter or ice clogging in the active grille shutter.	Normal	—
Active Grille Shutter Temperature Error Status	Detects internal temperature of the active grille shutter. The judgment is performed to check if the temperature is excessively high. Judgment is done by the active grille shutter and the status is sent to ECM.	Normal	—
Active Grille Shutter Communication Error Status	Communication is performed between the active grille shutter and ECM, and judges the abnormality of the communication status.	Normal	—
Active Grille Shutter Position Commanded Status	Active grille shutter drive instruction status Shutter open: Open Shutter closed: Closed	—	—
Active Grille Shutter Calibration in progress	Status of the active grille shutter calibration. Active grille shutter performs the calibration when the ignition is ON. Set to “ON” when the calibration was performed.	OFF	—

Display	Contents	Note (at idling)	REMARKS
Active Grille Shutter Calibration Commanded Status	Commands from ECM to the active grille shutter.	OFF	—
Active Grille Shutter Calibration Status	Status of the active grille shutter calibration. When completed: Completed When not completed: Not completed **Note:** **Always completed when there is no abnormality in the active grille shutter.**	Completed	—
Active Grille Shutter Warning Status	Warning signal of the active grille shutter. When the active grille shutter has a malfunction, signal is sent to the combination meter to illuminate the warning light.	OFF	—
Active Grille Shutter Control Status 1	Status such as operating factors (air conditioner, radiator fan etc.) or frozen judgment of the active grille shutter controlled by the ECM.	—	—
Active Grille Shutter Control Status 2	Status such as operating factors (air conditioner, radiator fan etc.) or frozen judgment of the active grille shutter controlled by the ECM.	—	—
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	—	time
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: “Common” When not synchronized: “Originally”	Common	—
Time Count	Time stamp information. Elapsed time after ignition ON. When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	—	ms
Time Since Engine Start	Elapsed time after starting the engine.	—	sec

Display	Contents	Note (at idling)	REMARKS
Timer after start	Elapsed time after starting the engine. This value is used for control.	—	sec
Accumulation Time After Engine Run	Cumulative time after starting the engine. For models with Auto Start Stop, cumulative time after the first engine start. Time is not accumulated while the engine stops due to the Auto Start Stop system.	—	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	—	°C
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	—	°C
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	—	°C
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	0 min	ms
Start Mask Control Check 1	Information that shows whether the start prohibition control is executed on the engine side when starting. Values other than zero means that the control is executed and the engine start is prohibited.	—	—
IG OFF Elapsed Time	The time the vehicle has been left since the engine stopped. This value can be used to check how long the vehicle has been left with the ignition switch ON after the engine stopped.	—	sec
Distance traveled since DTC(s) cleared	Travel distance after DTC clear.	—	km or mile
Engine run time while MIL is illuminated	Engine operating time from when the malfunction indicator light illuminated till when it went off.	—	min
Engine run time since DTC(s) cleared	Elapsed time after DTC clear.	—	min
Number of Warm-ups since DTC(s) cleared	Number of warm ups after DTC clear. 1 cycle is the time from the cold start till warmed up and stop. (Engine start after a warm-up is not counted.)	—	time

Display	Contents	Note (at idling)	REMARKS
Distance Traveled While MIL is Illuminated	Travel distance after the warning light illuminated.	—	km or mile
Odometer	Value of the total cumulative travel distance that ECM calculates from the vehicle speed separately from the odometer in the combination meter. Small difference from the odometer will be possible, but if there is a big difference, ECM or the combination meter may need to be replaced.	—	km
Maximum Engine Speed at the time of Misfire detection caused by out of Fuel	Maximum engine speed during fuel cut by a fuel run-out judgment.	0	rpm
Maximum Intake Air Amount at the time of Misfire detection caused by out of Fuel	Maximum air amount during fuel cut by a fuel run-out judgment.	0	g/s
Number of Misfire detection caused by out of Fuel	Number of the occurrences of fuel run-out judgment.	0	time
Estimated Total Mileage at the time of first Misfire detection caused by out of Fuel	Estimated cumulative travel distance during fuel cut by a fuel run-out judgment.	0	km or mile
Engine Speed at the time of Detection to avoid Preignition caused by out of Fuel	Engine speed at the time of pre-ignition avoidance judgment when the fuel runs out.	0	rpm
Intake Air Mass at the time of Detection to avoid Preignition caused by out of Fuel	Amount of air at the time of pre-ignition avoidance judgment when the fuel runs out.	0	g/s
Number of Preignition Detection caused by out of Fuel	Number of the occurrences of pre-ignition avoidance judgment when the fuel runs out.	0	time

Display	Contents	Note (at idling)	REMARKS
Estimated Total Mileage at the time of first Detection to avoid Preignition caused by out of Fuel	Estimated cumulative travel distance at the time of the first pre-ignition avoidance judgment when the fuel runs out.	0	km or mile
Fuel Cut Elps Time	Elapsed time after experienced high rotation speed.	0 sec	sec
Memorized Cruise Speed	Cruise control system target vehicle speed. (Set speed)	0 km/h	km/h or MPH
Catalyst Temperature (B1-S1)	Estimated temperature of the front catalytic converter.	305.1°C	°C or °F
Type of fuel currently being utilized by the vehicle	Fuel information recorded in the ECM. Not the fuel information currently used.	GAS	—
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	NEUT	—
Manual Trans Neutral Gear Status	Neutral condition. Information input from the neutral switch. (MT model)	NEUT	—
Evap System Vapor Pressure	Evaporative emission control system pressure value. Pressure sensor output value.	101.43	kPa
Neutral Position Switch	Neutral switch signal. Signal when in neutral (MT) or in P or N range (AT). Input value to ECM.	ON	—
ETC Motor Relay	Drive signal to the electronic throttle motor relay. Set to “ON” when the drive signal is output. ECM output value.	ON	—
Clutch Switch	Clutch switch signal. Set to “ON” when the clutch switch is ON. (MT model) Input value to ECM.	OFF	—
Stop Light Switch	Stop light switch signal. Set to “ON” when the stop light illuminates. Input value to ECM.	OFF (when OFF)	—

Display	Contents	Note (at idling)	REMARKS
Brake Switch	Brake switch signal. Set to “ON” when the brake pedal is depressed. Input value to ECM.	OFF (when OFF)	—
Idle Switch Signal	Idle signal. Set to “Idle” while idling.	ON	—
Ignition Switch	Ignition switch signal. Set to “ON” when the ignition switch is ON.	ON	—
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—
A/C Compressor Signal	A/C compressor drive signal. Set to “ON output” when the drive signal is output. ECM output value.	OFF (when OFF)	—
Radiator Fan Relay #1	Radiator fan relay drive signal. Set to “ON” when the drive signal is output. ECM output value.	OFF (when OFF)	—
Radiator Fan Relay #2	Radiator fan relay drive signal. Set to “ON” when the drive signal is output. ECM output value.	OFF (when OFF)	—
A/C Switch	Air conditioner switch signal. Set to “ON” when the air conditioner switch of the heater control is ON. Input value to ECM.	OFF (when OFF)	—
Variable Load Compressor Torque Value	Load value of the variable capacity air compressor. The value that the air conditioner CM estimates and outputs.	—	Nm
Starter Switch	Starter switch signal. Set to “ON” when the starter is ON. Input value to ECM.	OFF	—
Rear Defogger SW	Rear defogger switch input signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—
Blower Fan SW	Blower fan switch input signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—
Light Switch	Light switch input signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—
Front Fog Light Switch	Front fog light switch input signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—

Display	Contents	Note (at idling)	REMARKS
Wiper Switch	Wiper switch input signal. Set to “ON” when the switch is ON. Input value to ECM.	OFF (when OFF)	—
Delivery Mode Connector	Delivery mode terminal fuse installation status. Shows the status of delivery mode.	OFF	—
Rear O2 Rich Signal	Rear oxygen sensor output value. Displays “Rich” when the air fuel ratio of rear oxygen sensor is rich. Displays “Lean” when the air fuel ratio of rear oxygen sensor is lean.	Rich/Lean	—
Knocking Signal	Knock sensor output signal. Judges if a knocking occurs or not. Input value to ECM.	None	—
Crankshaft Position Sig.	Crankshaft position sensor output signal. Set to “ON” when the engine is running. Input value to ECM.	ON	—
Camshaft Position Sig.	Camshaft position sensor output signal. Set to “ON” when the engine is running. Input value to ECM.	ON	—
Ban of Torque Down	Torque down prohibition notification signal to the vehicle dynamics control (VDC) module. Set to “OFF” when the prohibition signal is output. ECM output value.	ON	—
Request Torque Down VDC	Torque down request signal transmitted from the vehicle dynamics control (VDC) module. Set to “ON” when the request signal is sent. Input value to vehicle dynamics control (VDC) module.	None	—
Torque Permission Signal	Torque down permission notification signal to the transmission control module. Set to “ON” when the permission signal is output. ECM output value.	ON	—
SET/COAST Switch	Cruise control system SET/COAST SW signal. Set to “ON” when the switch is operated. Input value to ECM.	OFF (when OFF)	—
RESUME/ACCEL Switch	Cruise control system RESUME/ACCEL SW signal. Set to “ON” when the switch is operated. Input value to ECM.	OFF (when OFF)	—

Display	Contents	Note (at idling)	REMARKS
Main Switch	Cruise control system main switch signal. Set to “ON” when the switch is operated. Input value to ECM.	OFF (when OFF)	—
distance change SW	Distance change switch signal. Displayed only on models with EyeSight.	OFF (when OFF)	—
CC Cancel SW	Cruise control cancel switch signal of the cruise control system. Set to “ON” when the switch is operated. Input value to ECM.	OFF (when OFF)	—
Fuel Pump Relay	Fuel pump relay drive signal. Set to “ON” when the drive signal is output. ECM output value.	ON output	—
All Cylinders Fuel cut	Status under the fuel injection amount control where the fuel injection is cut off in all cylinders.	OFF	—
Immobilizer Fuel Cut Status	Status where the fuel injection is cut off by the command from immobilizer.	OFF	—
Shift Pattern Demand for Low Water Temperature	Shift pattern request sent from ECM to the transmission CM. When the water temperature is low, shift pattern change to the low speed side is requested to raise the catalyst temperature faster.	OFF	—
Oil level switch	Oil level switch signal. Set to “LOW level” when the amount of engine oil decreases. Input value to ECM.	HIGH level	—
ELCM switching valve	Leak check valve assembly switching valve drive signal. Set to “Close” when closing the switching valve. ECM output value.	Open	—
ELCM pump	Leak check valve assembly pump drive signal. Set to “ON” when the leak check valve assembly decompression pump is activated. ECM output value.	OFF	—
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	900	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	OPEN	—

Display	Contents	Note (at idling)	REMARKS
P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—	—
Trailer signal	Trailer towing status. Signal that indicates the presence of trailer towing is input via the integrated unit.	—	—
Ignition Control Check 1	Detailed status of the engine ignition control information.	90	—
Ignition Control Check 2	Detailed status of the engine ignition control information.	75	—
Alternator control check 1	Detailed status of charge control.	91	—
Alternator control check 2	Detailed status of charge control.	90.1	—
Alternator control check 3	Detailed status of charge control.	10.350	—
Alternator control check 4	Detailed status of charge control.	8.970	—
Alternator control check 5	Detailed status of charge control.	100	—
Alternator control check 6	Detailed status of charge control.	0	—
Alternator control check 7	Detailed status of charge control.	14.2	—
Alternator control check 8	Detailed status of charge control.	64	—
Alternator control check 9	Detailed status of charge control.	0	—
Alternator control check 10	Detailed status of charge control.	2	—
Alternator Mechanical Error Status	Status where alternator is judged as having mechanical trouble.	0	—
Alternator Electrical Output Error Status	Status where alternator is judged as having electric abnormality.	0	—
Alternator High Temperature Error Status	Status where alternator is judged as having high temperature malfunction.	0	—
Alternator Communication Error Status	Status where alternator is judged as having communication failure.	0	—

Display	Contents	Note (at idling)	REMARKS
Regulator Temperature	Alternator regulator temperature value.	—	°C
Imbalance Check 1 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 1 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 1 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 1 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 2 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 2 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 2 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 2 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 3 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Imbalance Check 4 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—	—
Malfunction Indicator Lamp (MIL) Status	Malfunction indicator light illumination status. When judged as abnormal, an illumination command signal is sent from ECM to the combination meter.	OFF	—
Number of DTCs	The number of trouble codes recorded in the ECM.	0	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	Supported	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	Supported	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	0.0%	%

Display	Contents	Note (at idling)	REMARKS
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	1.001	—
A/F Sensor #11	Front oxygen (A/F) sensor output voltage.	2.193V	V
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	1.001	—
A/F Sensor #11	Front oxygen (A/F) sensor current value.	0.00	mA
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	30.6%	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	13.3%	%
Accelerator Pedal Position E	Shows the sub accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	13.3%	%
Relative Accelerator Pedal Position	Accelerator opening angle with a full close point learning value taken into consideration.	0%	%
Misfire monitoring supported	Support status of the misfire diagnosis.	YES	—
Misfire monitoring ready	Status of the misfire diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Fuel system monitoring(Supp)	Support status of the fuel system diagnosis.	YES	—
Fuel system monitoring(Rdy)	Status of the fuel system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Comprehensive component monitoring supported	Support status of the component diagnosis.	YES	—
Comprehensive component monitoring ready	Status of the component diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
Catalyst monitoring supported	Support status of the catalyst diagnosis.	YES	—
Catalyst monitoring ready	Status of the catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—

Display	Contents	Note (at idling)	REMARKS
Heated catalyst monitoring supported	Support status of the heated catalyst diagnosis.	NO	—
Heated catalyst monitoring ready	Status of the heated catalyst diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Supp)	Support status of the evaporative purge system diagnosis.	NO	—
Evaporative purge system(Rdy)	Status of the evaporative purge system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Supp)	Support status of the secondary air system diagnosis.	NO	—
Secondary air system(Rdy)	Status of the secondary air system diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Supp)	Support status of the A/C system refrigerant diagnosis.	NO	—
A/C system refrigerant(Rdy)	Status of the A/C system refrigerant diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring supported	Support status of the oxygen sensor diagnosis.	YES	—
Oxygen sensor(Rdy)	Status of the oxygen sensor diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Supp)	Support status of the oxygen sensor heater diagnosis.	YES	—
O2 Heater Diagnosis(Rdy)	Status of the oxygen sensor heater diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	YES	—
EGR system(Supp)	Support status of the EGR diagnosis.	YES	—

Display	Contents	Note (at idling)	REMARKS
EGR system(Rdy)	Status of the EGR diagnosis. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Misfire monitoring enabled	Shows whether or not the execution condition of misfire diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Misfire monitoring completed	Shows whether or not the continuous misfire diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Fuel system monitoring(Enable)	Shows whether or not the execution condition of fuel system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Fuel system monitoring(Comp)	Shows whether or not the fuel system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Comprehensive component monitoring enabled	Shows whether or not the execution condition of component diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Comprehensive component monitoring completed	Shows whether or not the component diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Catalyst monitoring	Shows whether or not the execution condition of catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
Catalyst monitoring completed	Shows whether or not the catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—

Display	Contents	Note (at idling)	REMARKS
Heated catalyst monitoring	Shows whether or not the execution condition of heated catalyst diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Heated catalyst monitoring completed	Shows whether or not the heated catalyst diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Evaporative purge system(Enable)	Shows whether or not the execution condition of evaporative purge system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Evaporative purge system(Comp)	Shows whether or not the evaporative purge system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Secondary air system(Enable)	Shows whether or not the execution condition of the secondary air system diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
Secondary air system(Comp)	Shows whether or not the secondary air system diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
A/C system refrigerant(Enable)	Shows whether or not the execution condition of A/C system refrigerant diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	N/A	—
A/C system refrigerant(Comp)	Shows whether or not the A/C system refrigerant diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	N/A	—
Oxygen sensor monitoring	Shows whether or not the execution condition of oxygen sensor diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or	YES	—

Display	Contents	Note (at idling)	REMARKS
	is not supported.		
Oxygen sensor monitoring completed	Shows whether or not the oxygen sensor diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
O2 Heater Diagnosis(Enable)	Shows whether or not the execution condition of oxygen heater diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
O2 Heater Diagnosis(Comp)	Shows whether or not the oxygen heater diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
EGR system(Enable)	Shows whether or not the execution condition of EGR diagnosis is met. YES: Diagnosis can be executed. NO or N/A: Diagnosis cannot be executed or is not supported.	YES	—
EGR system(Comp)	Shows whether or not the EGR diagnosis is completed. YES or N/A: Diagnosis is completed or not supported. NO: Diagnosis is not completed.	NO	—
Generic OBDII	Shows the OBD regulation to be followed. This is the information recorded in the ECM, and it does not mean that the unit automatically judges the compliance to the OBD regulations.	OBD/OBD2	—
O2 Sensor Impedance	Rear oxygen sensor element impedance Input value to ECM.	71	ohm
ETC function safety information 1	ETC malfunction information memory 1	0	—
ETC function safety information 2	ETC malfunction information memory 2	0	—
ETC function safety information 3	ETC malfunction information memory 3	0	—
Functional Safety Check 1	Function safety/malfunction information memory 1	0	—
Functional Safety Check 4	Function safety/malfunction information memory 4	0	—

Display	Contents	Note (at idling)	REMARKS
Functional Safety Check 6	Function safety/malfunction information memory 6	0	—
Functional Safety Check 2	Function safety/malfunction information memory 2	0	—
Functional Safety Check 3	Function safety/malfunction information memory 3	0	—
Functional Safety Check 5	Function safety/malfunction information memory 5	0	—
[Functional Safety Check 7]	Function safety/malfunction information memory 7	0	—
Crush Detection Signal	Collision detection signal input value to ECM. ON = Collision detection OFF = Collision not detected	OFF	—
Analytical Engine Speed	Data for analysis	0	rpm
Analytical Load Value	Data for analysis	0	g/rev
Analytical Engine Coolant Temperature	Data for analysis	−40	°C
Analytical Ambient Temperature	Data for analysis	−40	°C
Final Injection Mode	Number of injections to cylinder in one cycle	1 stage injection	—
Split Ratio of Fuel Injection 1	Injection rate at first fuel injection in one cycle	100	%
Split Ratio of Fuel Injection 2	Injection rate at second fuel injection in one cycle	0	%
Split Ratio of Fuel Injection 3	Injection rate at third fuel injection in one cycle	0	%
Split Ratio of Fuel Injection 4	Injection rate at fourth fuel injection in one cycle	0	%
Final valid Injection Quantity	For direct injection engine, fuel injection is performed several times in one cycle. And this is the total injection amount value of that multiple stage injection.	11.25	mm3/st
1st Final Injection Time of Direct Injector	Injection time at first fuel injection in one cycle	2.14	ms
2nd Final Injection Time of Direct Injector	Injection time at second fuel injection in one cycle	0	ms

Display	Contents	Note (at idling)	REMARKS
3rd Final Injection Time of Direct Injector	Injection time at third fuel injection in one cycle	0	ms
4th Final Injection Time of Direct Injector	Injection time at fourth fuel injection in one cycle	0	ms
Starting Timing of 1st final Direct Injection	Timing of starting first fuel injection in one cycle	280	°CA
Starting Timing of 2nd final Direct Injection	Timing of starting second fuel injection in one cycle	0	°CA
Starting Timing of 3rd final Direct Injection	Timing of starting third fuel injection in one cycle	0	°CA
Starting Timing of 4th final Direct Injection	Timing of starting fourth fuel injection in one cycle	0	°CA
Flag Control of Catalyst rapid Warming-up reflect Ignition Timing	Flag that represents the execution status of catalyst warming-up control ON = Under execution OFF = Not executed	ON	—
Analytical Manifold Relative Pressure	Data for analysis	−12.8	kPa
Analytical Ignition Timing Advance for #1 Cylinder	Data for analysis	−64	°CA
Analytical Vehicle Speed	Data for analysis	0	km/h
Analytical Estimated Total Mileage	Data for analysis	0	km
Air conditioner compressor relay output for analysis	Data for analysis	OFF	FLG
Analytical Maximum Number of Ignition Timing Advance	Data for analysis	0	time
Analytical Number of Ignition Timing Advance	Data for analysis	0	time

Display	Contents	Note (at idling)	REMARKS
Analytical Minimum Manifold Negative Pressure	Data for analysis	−12.8	kPa
Analytical Number of Brake Booster Pressure	Data for analysis	0	time
Whole learning compensation value for analysis	Data for analysis	0	—
Current partial learning compensation value for analysis	Data for analysis	−45	—
Analytical Knocking Correction	Data for analysis	−32	deg
Intake air temperature for analysis	Data for analysis	−40	°C
Analytical ISC Learning Value	Data for analysis	−300	g/s
Analytical Idle dirty throttle correct	Data for analysis	−300	g/s
Analytical VVT Advance Angle Amount R	Data for analysis	−50	°CA
Analytical Exhaust VVT Retard Angle R	Data for analysis	−50	°CA
Analytical TGV Drive	Data for analysis	Closing direction	FLG
Analytical Idle Mass Air Flow	Data for analysis	0	g/s
Analytical Brake Booster Relative Pressure	Data for analysis	−12.8	kPa
Analytical Fuel Rail Pressure	Data for analysis	0	kPa
Analytical A/F Sensor #1	Data for analysis	0	—
Completed Flag of Cylinder Discrimination	Flag for completion of cylinder judgment If this flag is not ON, it is possible to judge that the crankshaft position sensor and camshaft position sensor are faulty.	Completed	—

Display	Contents	Note (at idling)	REMARKS
Fuel Increase 1 at the High Temperature Restart	Fuel injection compensation coefficient at restarting with high coolant temperature	0	—
Judgment Flag of Heavy Fuel	Result of heavy mass fuel judgment	Non heavy mass fuel	—
Engine Startup Mode	Mode at engine starting 00 = initial start 01 = Normal restart 02 = Short term engine stall restart 03 = Idling stop restart 04 = Change mind restart	0	—
Current Gear Position	Gear status 00 = P, N range 14 = R range 13 = Auto neutral status 06 = 6th 05 = 5th 04 = 4th 03 = 3rd 02 = 2nd 01 = 1st	0	—
Load Value	Engine load value	25.5	%
Clutch Start SW	Clutch start switch status ON = Clutch depressed status OFF = Clutch not depressed status	0	—
Analytical Barometric Pressure	Data for analysis	0	kPa

ENGINE (DIAGNOSTICS)(H4DO) > Freeze Frame Data

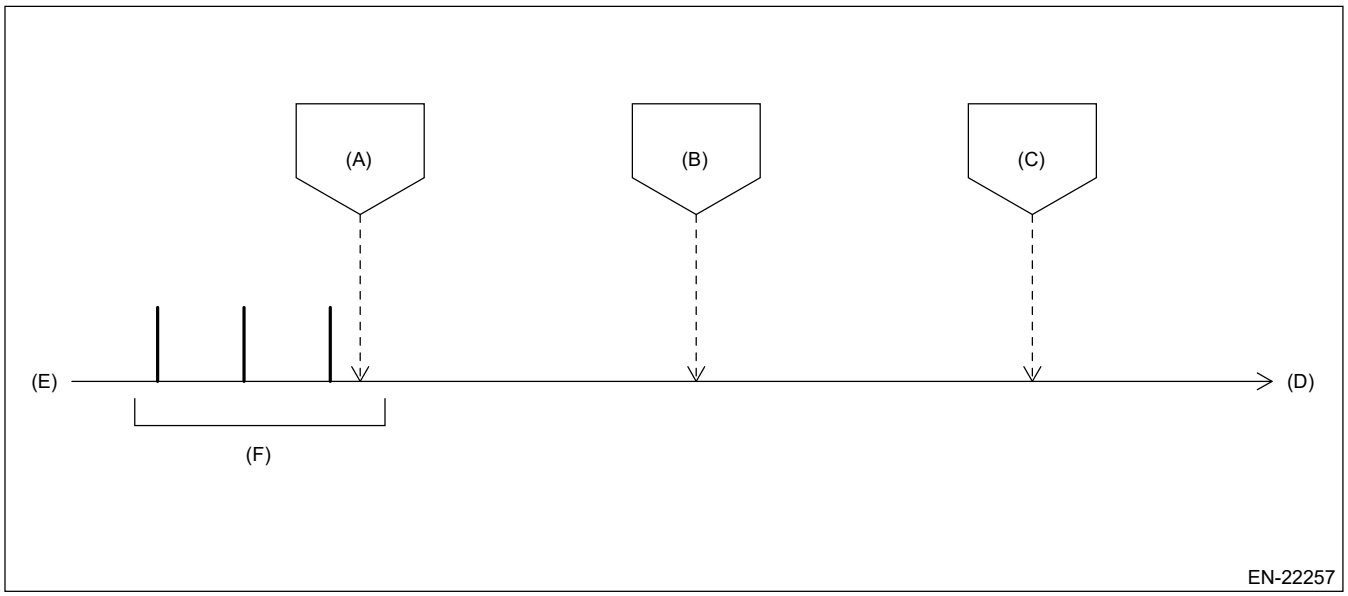
NOTE

1. FREEZE FRAME DATA

ECM records the engine status at detection when it detects DTCs. (Freeze frame data)
Freeze frame data is recorded on up to a second detected DTC, and not recorded on a third detected DTC and later.

Note:

- **As the freeze frame data is recorded with DTC detected, permanent monitoring cannot be performed.**
- **For the first detected DTC, time series freeze frame data is recorded. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data>NOTE > TIME SERIES FREEZE FRAME DATA.**
- **When performing diagnosis, you can utilize the freeze frame data to guess the vehicle status when the DTC was detected.**
- **For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to COMMON(diag)>Freeze Frame Data>OPERATION.**



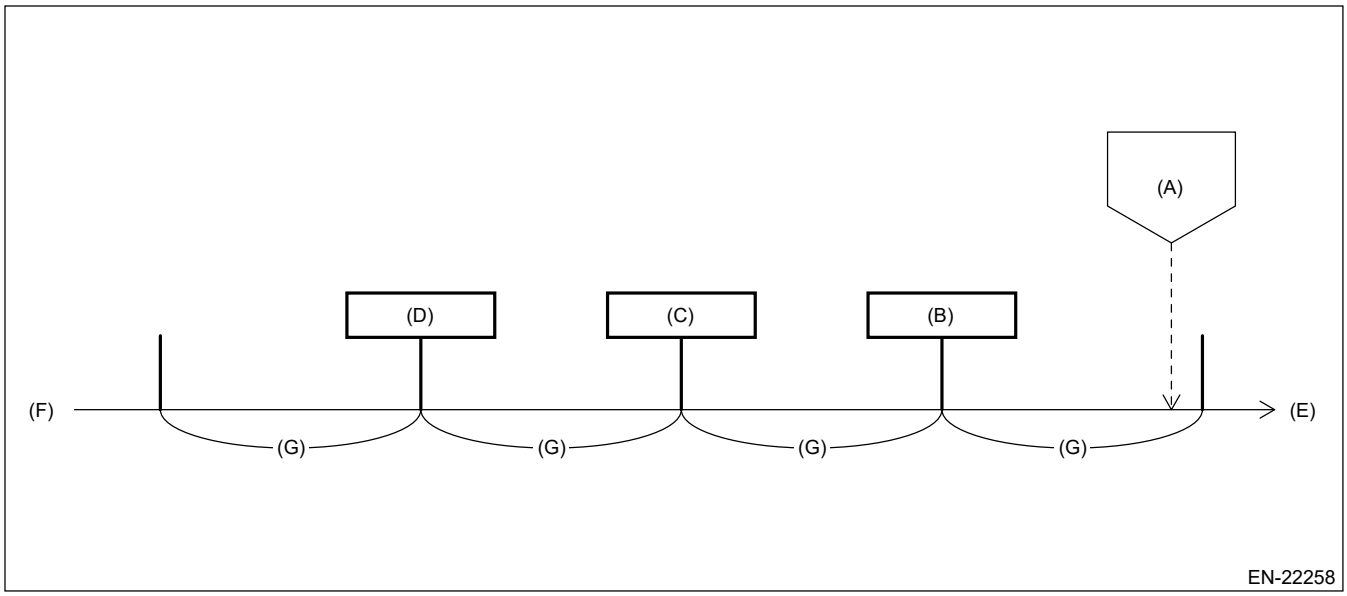
(A) First detected DTC
(B) Second detected DTC
(C) Third detected DTC and later
(D) Current
(E) Past
(F) Time series freeze frame data

2. TIME SERIES FREEZE FRAME DATA

ECM obtains freeze frame data every 0.5 seconds. When DTC is detected, freeze frame data of [Detect], [1 before] [two blocks before] and [three blocks before] is saved. (Time series freeze frame data)

Note:

- **You can utilize the time series freeze frame data for diagnosis by checking the status of data changes three times earlier than the DTC was detected.**
- **For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to COMMON(diag)>Freeze Frame Data>OPERATION.**



(A) [Detect]
(B) [1 before]
(C) [Two blocks before]
(D) [Three blocks before]
(E) Current
(F) Past
(G) 0.5 sec.

ENGINE (DIAGNOSTICS)(H4DO) > Freeze Frame Data

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data>LIST.**

ENGINE (DIAGNOSTICS)(H4DO) > Freeze Frame Data

LIST

Display	Contents	REMARKS
Engine Speed	Value calculated from crankshaft position sensor output value.	rpm
Air Flow Rate from Mass Air Flow Sensor	Value calculated from air flow sensor output value.	g/s or lb/m
Vehicle Speed Sensor	Value calculated from vehicle speed sensor output value.	km/h or MPH
Throttle Opening Angle	Throttle valve opening angle (in percentage) calculated from throttle position sensor output value.	%

Display	Contents	REMARKS
Accel. Opening Angle	Accelerator pedal opening angle (in percentage) calculated from accelerator pedal position sensor output value.	%
Ignition Timing Advance for #1 Cylinder	Ignition timing control value for No. 1 cylinder. Calculated from rotation speed, manifold pressure, intake air temperature, water temperature, and data from knock sensor etc.	°
Coolant Temp.	Value calculated from engine coolant temperature sensor output value.	°C or °F
Short Term Fuel Trim (B1)	Air fuel ratio correction control value for the front oxygen (A/F) sensor.	%
Long Term Fuel Trim (B1)	Air fuel ratio learning control value for the front oxygen (A/F) sensor.	%
Mani. Absolute Pressure	Value calculated from manifold pressure sensor output.	kPa, mmHg, inHg or psig
Bank 1 - Sensor 2 present at that location	Rear oxygen sensor voltage value.	V
VVT Adv. Ang. Amount R	AVCS advance angle amount for the RH bank on the intake side.	deg
VVT Advance Target Angle Amount R	AVCS target advance angle amount for the RH bank on the intake side. This value is compared with the AVCS advance angle amount R to judge if the intake AVCS is operating properly. Response delays during the transition time.	deg
VVT Adv. Ang. Amount L	AVCS advance angle amount for the LH bank on the intake side.	deg
VVT Advance Target Angle Amount L	AVCS target advance angle amount for the LH bank on the intake side. This value is compared with the AVCS advance angle amount L to judge if the intake AVCS is operating properly. Response delays during the transition time.	deg
Exh. VVT Retard Ang. R	AVCS retard angle amount for the RH bank on the exhaust side.	deg
Ex VVT Retard Target Angle R	AVCS target retard angle amount for the RH bank on the exhaust side. This value is compared with the AVCS retard angle amount R to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	deg
Exh. VVT Retard Ang. L	AVCS retard angle amount for the LH bank on the exhaust side.	deg

Display	Contents	REMARKS
Ex VVT Retard Target Angle L	AVCS target retard angle amount for the LH bank on the exhaust side. This value is compared with the AVCS retard angle amount L to judge if the exhaust AVCS is operating properly. Response delays during the transition time.	deg
Control module voltage	ECM input power supply voltage.	V
Target Equivalence Ratio	Target air fuel ratio. (Lambda). It usually becomes 1.0 aiming at a theoretical air fuel ratio.	—
Oil Temperature	Value calculated from the engine oil temperature sensor output value.	°C or °F
Intake Air Temp.	Value calculated from the intake air temperature sensor output value.	°C or °F
Ambient air temperature	Value that ECM estimates by using input values from the engine coolant temperature sensor or the intake air temperature sensor etc.	°C or °F
Ambient Temperature Sensor Signal	Data value of the ambient temperature input from the combination meter via CAN. Ambient temperature used for diagnosis.	°C or °F
Ambient Temperature for Control	Data value of the ambient temperature input from the combination meter via CAN. Ambient temperature used for control.	°C or °F
Calculated LOAD Value	Current rate of air amount. Value assuming that the air amount at the current engine speed with the throttle fully open is 100%.	%
Absolute Load Value	Percentage of current intake air amount against the maximum air intake amount of the engine. For non-turbo engine, the value can be close to 95%, but will never be 100%. For turbo engine, this value may exceed 100% due to a boost pressure.	%
Barometric Pressure	Value calculated from atmospheric pressure sensor output value.	kPa, mmHg, inHg or psig
Actual Throttle Opening Angle	Actual throttle opening angle. Calculated by ECM based on the throttle sensor input value.	deg
Commanded Throttle Actuator Control	Control value of the target throttle opening angle calculated by ECM. Target value of opening angle in percentage when 0% means fully closed and 100% means fully open.	%
Relative Throttle Position	Current throttle opening angle in percentage against the throttle voltage (full range) that has reflected the full close point learning value.	%

Display	Contents		REMARKS
	The value will be approx. 70% at full open.		
Idle Mass Air Flow	Air volume correction value to maintain the target rotation speed in each water temperature. Corrects air volume when the water temperature changes. It includes values of the feedback correction amount and the learning value.	g/s	
Idle Mass Air Flow Feedback correct	Air volume compensation value of ISC as a feedback correction to stabilize the idling speed.	g/s	
ISC Learning Value	Learning control value of ISC. After warming up, learning control is executed to reduce the ISC feedback correction to zero, in order to stabilize the engine speed.	g/s	
Idle A/C load correct	Air volume correction when the air conditioner is turned on. ECM corrects the air volume against the target rotation speed when the air conditioner is turned ON.	g/s	
Electric Load Feedback Val	Air volume correction value when an electric load is turned on. ECM corrects the air volume against the set target rotation speed when the electric load is turned ON.	g/s	
Idle dirty throttle correct	Calculates the ISC learning values on a long-term basis, and judges as an ISC dirty throttle correction when the learning value increases gradually. When carbon or other dirt accumulates on the ISC throttle and make the throttle dirty, air volume decreases when the throttle is fully closed. The ECM increases the amount of compensation air to keep the rotation speed.	g/s	
Fuel Rail Pressure A	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	kPa	
Fuel Rail Pressure B	Fuel pressure sensor output value set to the high pressure fuel line. Input value to ECM.	kPa	
Commanded Fuel Rail Pressure A	Target fuel pressure for high pressure fuel line calculated by ECM.	kPa	
Commanded Fuel Rail Pressure B	Target fuel pressure for high pressure fuel line calculated by ECM.	kPa	
Fuel Level Input	Fuel level sensor output value. Input value to ECM. Total value of main and sub.	%	

Display	Contents		REMARKS
Fuel level resistance	Fuel level sensor resistance value. Input value to ECM.	Ω	
Commanded Evaporative Purge	Evaporative purge rate displayed by the OBD.	%	
Purge Density Learn Value	Leaning value of the evaporation gas density purged from the canister. ECM displays the estimated leaning value.	%	
Evap Purge Flow	Purge ratio when the evaporation gas is purged from the canister. ECM performs a duty drive to the purge solenoid valve. The amount of gas actually purged will vary depending on the vacuum pressure difference before/after the solenoid valve. Purge ratio displayed here shows current purge amount in percentage against the maximum purge amount when the maximum vacuum pressure is applied.	%	
ALT Duty	Value calculated by the ECM as an electric power generation voltage. Indicator voltage value from ECM to alternator is under a duty control.	%	
Alternator control mode	Control mode of the electric power generation voltage by the alternator. Low: Mode that controls the battery charge Mid: Mode where the battery is not charged and discharged High: Mode that fixes the voltage when the battery is charged or when an electric load is turned on ExHigh: Mode where the battery is charged during deceleration Smart: Mode that maintains target SOC and restrains unnecessary power generation Low (Start): Mode that gradually increases the voltage at start Low (Acceleration): Mode that suppresses power generation load when slightly stronger acceleration was judged Low (Deceleration): Mode that suppresses power generation load when the vehicle is decelerated to stop Neutral: Neutral mode passing through the transition to the next mode from ExHigh	—	
Battery Terminal Voltage	Voltage value between battery terminals input from the battery sensor.	V	

Display	Contents	REMARKS
Battery Charge/Discharge Current	Battery charge/discharge current value input from the battery sensor. When the value is positive: The current flows to a direction that the battery is charged. When the value is negative: The current flows to a direction that the battery is discharged.	A
Estimated Battery Temperature	Battery temperature input from the battery sensor.	°C
Remaining battery capacity	Remaining amount of battery estimated by ECM.	%
Fuel system for Bank 1	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	—
Fuel system for Bank 2	Feedback status of air fuel ratio. Open: Feedback is stopped Closed: Feedback control is being performed	—
A/F Sensor #1 Resistance	Value calculated from the front oxygen (A/F) sensor output value.	ohm
No. of EGR steps	Number of EGR valve steps. Number of stepping motor steps. ECM output value.	STEP
Commanded EGR	Target value as EGR setting value calculated by ECM.	%
EGR Error	Percentage of the difference in actual EGR steps as compared to the target EGR steps. Both a positive value and a negative value mean that it doesn't fulfill the target. When the value is positive: It opens more than the target value. When the value is negative: It opens smaller than the target value.	%
TGV Drive	Tumble generator valve drive status. Set to "Open" when the tumble generator valve is open. ECM control status.	—
Cylinder Monitor #1	Calculates the rotation speed between certain angles on the #1 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm
Cylinder Monitor #2	Calculates the rotation speed between certain angles on the #2 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm

Display	Contents		REMARKS
Cylinder Monitor #3	Calculates the rotation speed between certain angles on the #3 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm	
Cylinder Monitor #4	Calculates the rotation speed between certain angles on the #4 cylinder. If the rotation speed is low compared to monitor values of other cylinders, it means that the combustion is not ideal in that cylinder.	rpm	
Active Grille Shutter Position	Pulse count value of active grille shutter position. Fully open: 100% Fully closed: 0%	—	
Active Grille Shutter Mechanical Break Status	Mechanical error status of the active grille shutter. During the calibration procedure, if a linkage of the active grille shutter is off, calibration is not performed. Judgment is done by the active grille shutter and the status is sent to ECM.	—	
Active Grille Shutter Sensor Error Status	Judges a malfunction of the active grille shutter opening angle sensor. Judges the sensor malfunction on the pulse counter. Judgment is done by the active grille shutter and the status is sent to ECM.	—	
Active Grille Shutter Voltage Error Status	Judges a malfunction of the power source voltage supplied to the active grille shutter. Judgment is done by the active grille shutter and the status is sent to ECM.	—	
Active Grille Shutter Control Circuit Error Status	Judges a malfunction of the active grille shutter internal circuit (drive motor). Judgment is done by the active grille shutter and the status is sent to ECM.	—	
Active Grille Shutter Stuck Error Status	Judges an abnormal stuck of the active grille shutter. Detects the status where the operation failed because of any foreign matter or ice clogging in the active grille shutter.	—	
Active Grille Shutter Temperature Error Status	Detects internal temperature of the active grille shutter. The judgment is performed to check if the temperature is excessively high. Judgment is done by the active grille shutter and the status is sent to ECM.	—	
Active Grille Shutter Communication Error	Communication is performed between the active grille shutter and ECM, and judges the abnormality	—	

Display	Contents	REMARKS
Status	of the communication status.	
Active Grille Shutter Position Commanded Status	Active grille shutter drive instruction status Shutter open: Open Shutter closed: Closed	—
Active Grille Shutter Calibration in progress	Status of the active grille shutter calibration. Active grille shutter performs the calibration when the ignition is ON. Set to “ON” when the calibration was performed.	—
Active Grille Shutter Calibration Commanded Status	Commands from ECM to the active grille shutter.	—
Active Grille Shutter Calibration Status	Status of the active grille shutter calibration. When completed: Completed When not completed: Not completed **Note:** **Always completed when there is no abnormality in the active grille shutter.**	—
Active Grille Shutter Warning Status	Warning signal of the active grille shutter. When the active grille shutter has a malfunction, signal is sent to the combination meter to illuminate the warning light.	—
Active Grille Shutter Control Status 1	Status such as operating factors (air conditioner, radiator fan etc.) or frozen judgment of the active grille shutter controlled by the ECM.	—
Active Grille Shutter Control Status 2	Status such as operating factors (air conditioner, radiator fan etc.) or frozen judgment of the active grille shutter controlled by the ECM.	—
Trip Count	Time stamp information. Number of times the ignition is ON since the vehicle was manufactured. The number of ignition ON is also recorded when a trouble code is recorded, so the comparison with that number will show you how many times the ignition has turned on since the diagnostic code was recorded.	time
Count	Time stamp information. Each unit individually counts the elapsed time since the ignition is turned to ON. Master integrated unit and ECM synchronize with the master time. When synchronized: “Common” When not synchronized: “Originally”	—
Time Count	Time stamp information. Elapsed time after ignition ON.	ms

Display	Contents	REMARKS
	When a trouble code is recorded, the elapsed time after ignition ON is also recorded.	
Time Since Engine Start	Elapsed time after starting the engine.	sec
Initial Engine Oil Temp	Oil temperature when starting the engine, which is input to ECM from the oil temperature sensor.	°C
Initial Engine Coolant Temp.	Water temperature when starting the engine, which is input to ECM from the water temperature sensor.	°C
Initial Intake Air Temp.	Intake air temperature when starting the engine, which is input to ECM from the intake air temperature sensor.	°C
Engine Starting Time	Time needed since the cranking started till the judgment of engine start is complete.	ms
Start Mask Control Check 1	Shows whether the start prohibition control is executed on the engine side when the engine is started. Values other than zero means that the control is executed and the engine start is prohibited.	—
IG OFF Elapsed Time	Time the vehicle has been left since the engine stopped. This value can be used to check how long the vehicle has been left with the ignition switch ON after the engine stopped.	sec
Fuel Cut Elps Time	Elapsed time after experienced high rotation speed.	sec
Catalyst Temperature #11	Estimated temperature of the front catalytic converter.	°C or °F
Auto Trans Neutral Drive Status	Neutral condition. Information input from the inhibitor switch. (CVT model)	—
Manual Trans Neutral Gear Status	Neutral condition. Information input from the neutral switch. (MT model)	—
Clutch Switch	Clutch switch signal. Set to “ON” when the clutch switch is ON. (MT model) Input value to ECM.	—
Stop Light Switch	Stop light switch signal. Set to “ON” when the stop light illuminates. Input value to ECM.	—
Idle Switch Signal	Idle signal. Set to “Idle” while idling.	—
Ignition Switch	Ignition switch signal. Set to “ON” when the ignition switch is ON.	—

Display	Contents	REMARKS
A/C Mid Pressure Switch	Air conditioner middle pressure switch signal. Set to “ON” when the switch is ON. Input value to ECM.	—
A/C Compressor Signal	A/C compressor drive signal. Set to “ON” when the drive signal is output. ECM output value.	—
Variable Load Compressor Torque Value	Load value of the variable capacity air compressor. The value that the air conditioner CM estimates and outputs.	N·m
Starter Switch	Starter switch signal. Set to “ON” when the starter is ON. Input value to ECM.	—
AT turbine speed	Turbine rotation speed of the transmission. Turbine rotation speed is input from the transmission CM via CAN. (CVT model)	—
Lock up status	Lock-up status of the transmission. Lock up status is input from the transmission CM via CAN. (CVT model)	—
P/N Signal	P/N status of the transmission. P/N range status is input from the transmission CM via CAN. (CVT model)	—
Trailer signal	Trailer towing status. Signal that indicates the presence of trailer towing is input via the integrated unit.	—
Alternator Mechanical Error Status	Status where alternator is judged as having mechanical trouble.	—
Alternator Electrical Output Error Status	Status where alternator is judged as having electric abnormality.	—
Alternator High Temperature Error Status	Status where alternator is judged as having high temperature malfunction.	—
Alternator Communication Error Status	Status where alternator is judged as having communication failure.	—
Regulator Temperature	Alternator regulator temperature.	°C
Imbalance Check 1 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 1 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 1 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—

Display	Contents	REMARKS
Imbalance Check 1 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #1	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #2	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #3	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 2 #4	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 3 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
Imbalance Check 4 R	Detailed information of diagnosis for dispersion between cylinders. (Compliance with OBD regulations)	—
O2 Sensor #11	Installation status of the front oxygen (A/F) sensor.	—
O2 Sensor #12	Installation status of the rear oxygen sensor.	—
Short term fuel trim #12	Air fuel ratio correction control value of the rear oxygen sensor.	%
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	—
A/F Sensor #11	Front oxygen (A/F) sensor output voltage.	V
A/F Sensor #11	Air fuel ratio calculated from the front oxygen (A/F) sensor output value. (Lambda)	—
A/F Sensor #11	Front oxygen (A/F) sensor current value.	mA
Absolute Throttle Position B	Shows the sub throttle sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Position D	Shows the main accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
Accelerator Pedal Position E	Shows the sub accelerator sensor voltage value in % against the full-range 5 V throttle sensor output voltage.	%
O2 Sensor Impedance		ohm
Crush Detection Signal	Collision detection signal input value to ECM. ON = Collision detection OFF = Collision not	—

Display	Contents	REMARKS
	detected	
Final Injection Mode	Number of injections to cylinder in one cycle	—
Final valid Injection Quantity	For direct injection engine, fuel injection is performed several times in one cycle. And this is the total injection amount value of that multiple stage injection.	mm3/st
Starting Timing of 1st final Direct Injection	Timing of starting first fuel injection in one cycle	°CA
Starting Timing of 2nd final Direct Injection	Timing of starting second fuel injection in one cycle	°CA
Starting Timing of 3rd final Direct Injection	Timing of starting third fuel injection in one cycle	°CA
Starting Timing of 4th final Direct Injection	Timing of starting fourth fuel injection in one cycle	°CA
Completed Flag of Cylinder Discrimination	Flag for completion of cylinder judgment If this flag is not ON, it is possible to judge that the crankshaft position sensor and camshaft position sensor are faulty.	—
Fuel Increase 1 at the High Temperature Restart	Fuel injection compensation coefficient at restarting with high coolant temperature	—
Judgment Flag of Heavy Fuel	Result of heavy mass fuel judgment	—
Engine Startup Mode	Mode at engine starting 00 = initial start 01 = Normal start 02 = Short term engine stall restart 03 = Idling stop restart 04 = Change mind restart	—
Current Gear Position	Gear status 00 = P, N range 14 = R range 13 = Auto neutral status 06 = 6th 05 = 5th 04 = 4th 03 = 3rd 02 = 2nd 01 = 1st	—
Load Value	Engine load value	%
Clutch Start SW	Clutch start switch status ON = Clutch depressed status OFF = Clutch not depressed status	—

ENGINE (DIAGNOSTICS)(H4DO) > Active Test

OPERATION

Caution:

After executing the system operation check mode, clear the memory. Ref. to COMMON(diag)>Clear memory.

Note:

- **∗: After replacing ECM or active grille shutter, be sure to perform this procedure.**
- **For detailed operation procedures, refer to “Application help”.**

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System].
5. On [Select Function] display, select [Active Test].

ENGINE (DIAGNOSTICS)(H4DO) > Active Test

LIST

Active test items	Contents	Execution condition
Fuel Pump Relay	ON/OFF of the fuel pump can be set.	Ignition switch ON (engine OFF)
CPC Solenoid Valve	ON/OFF of the purge control solenoid valve can be set.	
Radiator Fan Relay	ON/OFF of the radiator fan relay can be set.	
ELCM switching valve	ON/OFF of the leak check valve assembly switching valve can be set.	
ELCM pump	ON/OFF of the leak check valve assembly vacuum pump can be set.	
Fuel Pump Control (OFF Drive)	Fuel pump can be set to OFF.	Idling
Fixed Idle Ignition Timing	Idle ignition timing can be set and fixed to 10.0°.	Idling
Idle Speed Control	Idle speed can be set to 500 — 2000 rpm.	Idling
Injection Stop Mode (Injector 1) Injection Stop Mode (Injector 2)	Injector of each cylinder can be set to stop the fuel injection.	Idling

Active test items	Contents	Execution condition
Injection Stop Mode (Injector 3) Injection Stop Mode (Injector 4)		
Injection Quantity Control	The amount of fuel injection can be set to 0 — 20%.	Idling
EGR Valve Control (Step)	EGR control valve can be set to 0 — 255 STEP.	Idling
Alternator control	Alternator control mode can be set to one of the followings: Low mode Middle mode High mode ExHigh mode	Idling
Active Grille Shutter Control	Open ←→ close of the active grille shutter can be set.	• Ignition switch ON (engine OFF) • Experienced 20 seconds or more of the elapsed time after starting engine (when replacing ECM)
Compression monitor	Compression can be measured.	• Ignition switch ON (engine OFF) • Accelerator pedal is fully depressed

ENGINE (DIAGNOSTICS)(H4DO) > Work Support

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select an appropriate function.
7. Perform the procedures shown on the display screen.

Note:

For detailed operation procedures, refer to “Application help”.

ENGINE (DIAGNOSTICS)(H4DO) > Work Support

LIST

Work support item	Contents	REMARKS
Simple Roughness Monitor	Engine speed and misfiring counter for each cylinder can be displayed.	• Calculates in range of engine speed (300 rpm to 2000 rpm) • Interval of data update is 60 ms at minimum (at 2000 rpm)
High-Grade Roughness Monitor (without harness)	Standard deviation, engine speed, etc. can be calculated based on the pulse data of crankshaft position sensor and camshaft position sensor, and the value and graph can also be displayed.	• Calculates in range of engine speed (300 rpm to 2000 rpm) • Interval of data update is 60 ms at minimum (at 2000 rpm)
Entry VIN	V.I.N can be registered.	Ignition switch ON (engine OFF)

ENGINE (DIAGNOSTICS)(H4DO) > All Readiness Diagnostic Code(s)

OPERATION

Note:

- **The readiness code shows self-diagnosis status of each DTC. The DTCs displayed here are either not yet self-diagnosed or self-diagnosed but not completed. After the self-diagnosis is complete, DTC will no longer be displayed regardless of the diagnostic result.**
- **Self-diagnosis is executed every time when the ignition switch is turned to ON. Therefore, even after the self-diagnosis is complete and nothing is displayed on the readiness code display, if you turn the ignition switch to ON again after turning it OFF, some DTCs may be displayed on the readiness code display.**
- **After you repair a DTC and perform the Inspection Mode, use the readiness code to check if the self-diagnosis of the DTC is completed. If the concerned DTC is displayed, the self-diagnosis of the DTC is not complete. Repeat from step 4).**
- **For detailed operation procedures, refer to “Application help”.**

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine Control System], and then select [Next].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [All Readiness Diagnostic Code(s)].

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC)>LIST.**

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Trouble Code (DTC)

LIST

DTC	Item	Note
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM). Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1576	ECM EEPROM	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B1577	IMMOBILIZER CM EEPROM	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.
B1578	METER	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1578 METER.
P000A	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.

DTC	Item	Note
P000B	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1.
P000C	"A" CAMSHAFT POSITION SLOW RESPONSE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2.
P000D	"B" CAMSHAFT POSITION SLOW RESPONSE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000D "B" CAMSHAFT POSITION SLOW RESPONSE BANK 2.
P0010	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.
P0011	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.
P0013	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.
P0014	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.
P0016	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.
P0017	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B.
P0018	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A.
P0019	CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0019 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B.
P0020	"A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL

DTC	Item	Note
		CIRCUIT/OPEN BANK 2.
P0021	"A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.
P0023	"B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0023 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2.
P0024	"B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.
P0030	A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1.
P0031	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1.
P0032	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1.
P0037	A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2.
P0038	A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2.
P0068	MAP/MAF - THROTTLE POSITION CORRELATION	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION.
P0071	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE.
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0073

DTC	Item	Note
		AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH.
P0087	FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0087 FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1.
P0088	FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1.
P0101	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0102	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW.
P0103	MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH.
P0107	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW.
P0108	MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH.
P0111	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1.
P0112	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1.
P0113	INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1.
P0116	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE.
P0117	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW.

DTC	Item	Note
P0118	ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH.
P0122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW.
P0123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH.
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL.
P0128	COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE).
P0131	A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1.
P0132	A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1.
P0134	A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1.
P0137	O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2.
P0138	O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2.
P013A	O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013B	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013B

DTC	Item	Note
	SENSOR 2	O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P013E	O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.
P013F	O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2.
P0141	O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2.
P014C	A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.
P014D	A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P015A	A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.
P015B	A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1.
P0171	SYSTEM TOO LEAN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.
P0172	SYSTEM TOO RICH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0172 SYSTEM TOO RICH BANK 1.
P0191	FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0191 FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1.
P0192	FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0192 FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1.
P0193	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0193

DTC	Item	Note
	1	FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1.
P0196	ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE.
P0197	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW.
P0198	ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0222	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW.
P0223	THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH.
P0300	RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED.
P0301	CYLINDER 1 MISFIRE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.
P0302	CYLINDER 2 MISFIRE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0302 CYLINDER 2 MISFIRE DETECTED.
P0303	CYLINDER 3 MISFIRE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0303 CYLINDER 3 MISFIRE DETECTED.
P0304	CYLINDER 4 MISFIRE DETECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.
P0327	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR.
P0328	KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR.

DTC	Item	Note
P0332	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0332 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2.
P0333	KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0333 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2.
P0335	CRANKSHAFT POSITION SENSOR "A" CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
P0336	CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0340	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.
P0341	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.
P0345	CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.
P0346	CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2.
P0351	IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.
P0352	IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN.
P0353	IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN.
P0354	IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0354 IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN.

DTC	Item	Note
P0365	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.
P0366	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1.
P0390	CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2.
P0391	CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0391 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2.
P0400	EGR "A" FLOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0400 EGR "A" FLOW.
P0420	CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1.
P0441	EVAP SYSTEM (CPC) INCORRECT PURGE FLOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW.
P0451	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE.
P0452	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW.
P0453	EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH.
P0455	EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).
P0456	EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK).
P0458	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT

DTC	Item	Note
		LOW.
P0459	EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH.
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0506	IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED.
P0507	IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED.
P050A	COLD START IDLE CONTROL SYSTEM PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.
P050B	COLD START IGNITION TIMING PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050B COLD START IGNITION TIMING PERFORMANCE.
P0512	STARTER (SWITCH) REQUEST CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT.
P0560	SYSTEM VOLTAGE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0560 SYSTEM VOLTAGE.
P0562	SYSTEM VOLTAGE LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0562 SYSTEM VOLTAGE LOW.
P0563	SYSTEM VOLTAGE HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0563 SYSTEM VOLTAGE HIGH.
P059A	ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P059A ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR CIRCUIT.
P059F	ACTIVE GRILLE AIR SHUTTER "A" PERFORMANCE/STUCK OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P059F ACTIVE GRILLE AIR SHUTTER "A" PERFORMANCE/STUCK OFF.
P05A0	ACTIVE GRILLE AIR SHUTTER "A" STUCK ON	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P05A0 ACTIVE GRILLE AIR SHUTTER "A" STUCK ON.

DTC	Item	Note
P05A1	ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR MINIMUM/MAXIMUM STOP PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P05A1 ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR MINIMUM/MAXIMUM STOP PERFORMANCE.
P05A2	ACTIVE GRILLE AIR SHUTTER "A" CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P05A2 ACTIVE GRILLE AIR SHUTTER "A" CONTROL CIRCUIT/OPEN.
P05A6	ACTIVE GRILLE AIR SHUTTER "A" SUPPLY VOLTAGE CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P05A6 ACTIVE GRILLE AIR SHUTTER "A" SUPPLY VOLTAGE CIRCUIT/OPEN.
P05C0	ACTIVE GRILLE AIR SHUTTER MODULE "A" OVER TEMPERATURE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P05C0 ACTIVE GRILLE AIR SHUTTER MODULE "A" OVER TEMPERATURE.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR.
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR.
P0606	CONTROL MODULE PROCESSOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.
P060A	INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE.
P060B	INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE.
P0616	STARTER RELAY "A" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0616 STARTER RELAY "A" CIRCUIT LOW.
P0617	STARTER RELAY "A" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0617 STARTER RELAY "A" CIRCUIT HIGH.
P062D	FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062D FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1.

DTC	Item	Note
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR.
P065A	GENERATOR/ALTERNATOR SYSTEM PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P065A GENERATOR/ALTERNATOR SYSTEM PERFORMANCE.
P0685	ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN.
P0700	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST).
P081A	STARTER DISABLE CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P081A STARTER DISABLE CIRCUIT LOW.
P0851	PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW.
P0852	PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH.
P0A3B	GENERATOR/ALTERNATOR OVER TEMPERATURE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0A3B GENERATOR/ALTERNATOR OVER TEMPERATURE.
P1160	THROTTLE RETURN SPRING	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1160 THROTTLE RETURN SPRING.
P1192	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1192 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW.
P1193	FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1193 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH.
P1235	HIGH PRESSURE FUEL PUMP CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1235 HIGH PRESSURE FUEL PUMP CIRCUIT.
P1261	CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1262	CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1262 CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

DTC	Item	Note
P1263	CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1263 CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1264	CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1264 CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN.
P1449	EVAP SYSTEM CLOG DETECTED (AIR FILTER)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER).
P1451	EVAP SYSTEM CLOG DETECTED (PIPE)	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE).
P1492	COIL 1 EGR "A" CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.
P1493	COIL 1 EGR "A" CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.
P1494	COIL 2 EGR "A" CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW.
P1495	COIL 2 EGR "A" CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH.
P1496	COIL 3 EGR "A" CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW.
P1497	COIL 3 EGR "A" CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1497 COIL 3 EGR "A" CONTROL CIRCUIT HIGH.
P1498	COIL 4 EGR "A" CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.
P1499	COIL 4 EGR "A" CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.
P1603	ENGINE STALL HISTORY	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.
P1604	STARTABILITY MALFUNCTION	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1604 STARTABILITY MALFUNCTION.

DTC	Item	Note
P162A	STARTER INTERLOCK INTERNAL CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT.
P1C00	BATTERY MONITOR MODULE "A" PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE.
P2004	TGV CONTROL STUCK OPEN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2004 TGV CONTROL STUCK OPEN BANK 1.
P2005	TGV CONTROL STUCK OPEN BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2005 TGV CONTROL STUCK OPEN BANK 2.
P2006	TGV CONTROL STUCK CLOSED BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2006 TGV CONTROL STUCK CLOSED BANK 1.
P2007	TGV CONTROL STUCK CLOSED BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2007 TGV CONTROL STUCK CLOSED BANK 2.
P2008	TGV CONTROL CIRCUIT/OPEN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1.
P2009	TGV CONTROL CIRCUIT LOW BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1.
P2011	TGV CONTROL CIRCUIT/OPEN BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2011 TGV CONTROL CIRCUIT/OPEN BANK 2.
P2012	TGV CONTROL CIRCUIT LOW BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2.
P2016	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.
P2017	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.
P2021	TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2.
P2022	TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2.

DTC	Item	Note
P2096	POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1.
P2097	POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1.
P2101	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.
P2102	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW.
P2103	THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH.
P2109	THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE.
P2119	THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE.
P2122	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW.
P2123	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH.
P2127	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW.
P2128	THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH.
P2135	THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION.

DTC	Item	Note
P2138	THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION.
P2195	A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1.
P2196	A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1.
P219C	CYLINDER 1 AIR-FUEL RATIO IMBALANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.
P219D	CYLINDER 2 AIR-FUEL RATIO IMBALANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219D CYLINDER 2 AIR-FUEL RATIO IMBALANCE.
P219E	CYLINDER 3 AIR-FUEL RATIO IMBALANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219E CYLINDER 3 AIR-FUEL RATIO IMBALANCE.
P219F	CYLINDER 4 AIR-FUEL RATIO IMBALANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219F CYLINDER 4 AIR-FUEL RATIO IMBALANCE.
P2270	O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2.
P2271	O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2.
P2401	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW.
P2402	EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH.
P2404	EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE.

DTC	Item	Note
P2419	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW.
P2420	EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2610	ECM/PCM ENGINE OFF TIMER PERFORMANCE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE.
U0073	CONTROL MODULE COMMUNICATION BUS "A" OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0077	LIN COMMUNICATION BUS "ECM/PCM" OFF	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF.
U0101	LOST COMMUNICATION WITH TCM	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.

DTC	Item	Note
U0284	LOST COMMUNICATION WITH ACTIVE GRILLE SHUTTER MODULE "A"	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0284 LOST COMMUNICATION WITH ACTIVE GRILLE SHUTTER MODULE "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1712	LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1712 LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE.
U171F	LOST LIN COMMUNICATION WITH GENERATOR	Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U171F LOST LIN COMMUNICATION WITH GENERATOR.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1

Note:

For the diagnostic procedure, refer to DTC P0011. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.
Judge NG when the amount of AVCS actual timing advance does not approach to the amount of AVCS target timing advance.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage AVCS control |Target timing advance change amount (per 64 ms)|	10.9 V or more In operation Less than 3.2°CA

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while AVCS is operating.

4. DIAGNOSTIC METHOD

When the differences of target timing advance amount and actual timing advance amount is calculated during AVCS control, and the difference per predetermined time is the specified value or larger.
Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
Σ|(Target position − Actual position)|	More than 4000°CA (bank 1)
Σ|(Target position − Actual position)|	More than 4000°CA (bank 2)

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1

Note:

For the diagnostic procedure, refer to DTC P0014. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.

1. OUTLINE OF DIAGNOSIS

Detect the exhaust AVCS system malfunction.
Judge NG when the amount of exhaust AVCS actual timing advance does not approach the amount of exhaust AVCS target timing advance.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS control	In operation
|Target timing advance change amount (per 64 ms)|	Less than 3.2°CA

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously when the engine speed increases and exhaust AVCS operates.

4. DIAGNOSTIC METHOD

When the differences of target timing advance amount and actual timing advance amount is calculated during exhaust AVCS control, and the difference per predetermined time is the specified value or larger. Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
Σ|(Target position − Actual position)|	More than 4000°CA (bank 1)
Σ|(Target position − Actual position)|	More than 4000°CA (bank 2)

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P000C "A" CAMSHAFT POSITION SLOW RESPONSE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0021. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to P000A. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000A "A" CAMSHAFT POSITION SLOW RESPONSE BANK 1.

DTC P000D "B" CAMSHAFT POSITION SLOW RESPONSE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0024. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to P000B. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P000B "B" CAMSHAFT POSITION SLOW RESPONSE BANK 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

Caution:

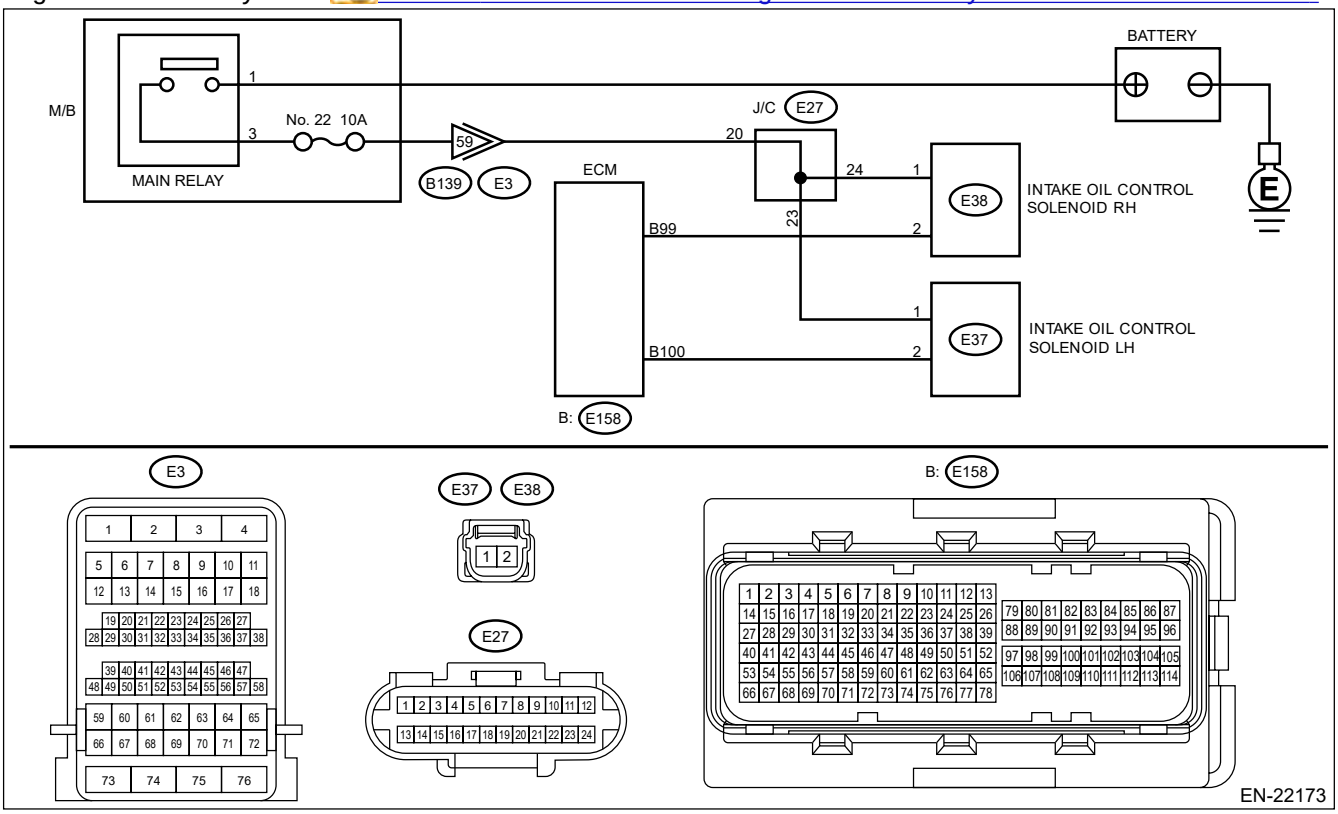
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 99 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

Measure the voltage between intake oil control solenoid RH connector and engine ground.
Connector & terminal
(E38) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 99 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and intake oil control solenoid RH connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E38) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

6. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (OPEN).

Measure the resistance of harness between ECM connector and intake oil control solenoid RH connector.

Connector & terminal

(E158) No. 99 — (E38) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

7. CHECK INTAKE OIL CONTROL SOLENOID RH.

Measure the resistance between intake oil control solenoid RH terminals.

Terminals

No. 1 — No. 2:

Is the resistance 6 — 12 Ω?

Yes	Repair the poor contact of intake oil control solenoid RH connector.
No	Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the oil control solenoid.
Judge as NG when the current is small even though the duty signal is large.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	99.61% or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	Less than 0.306A

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

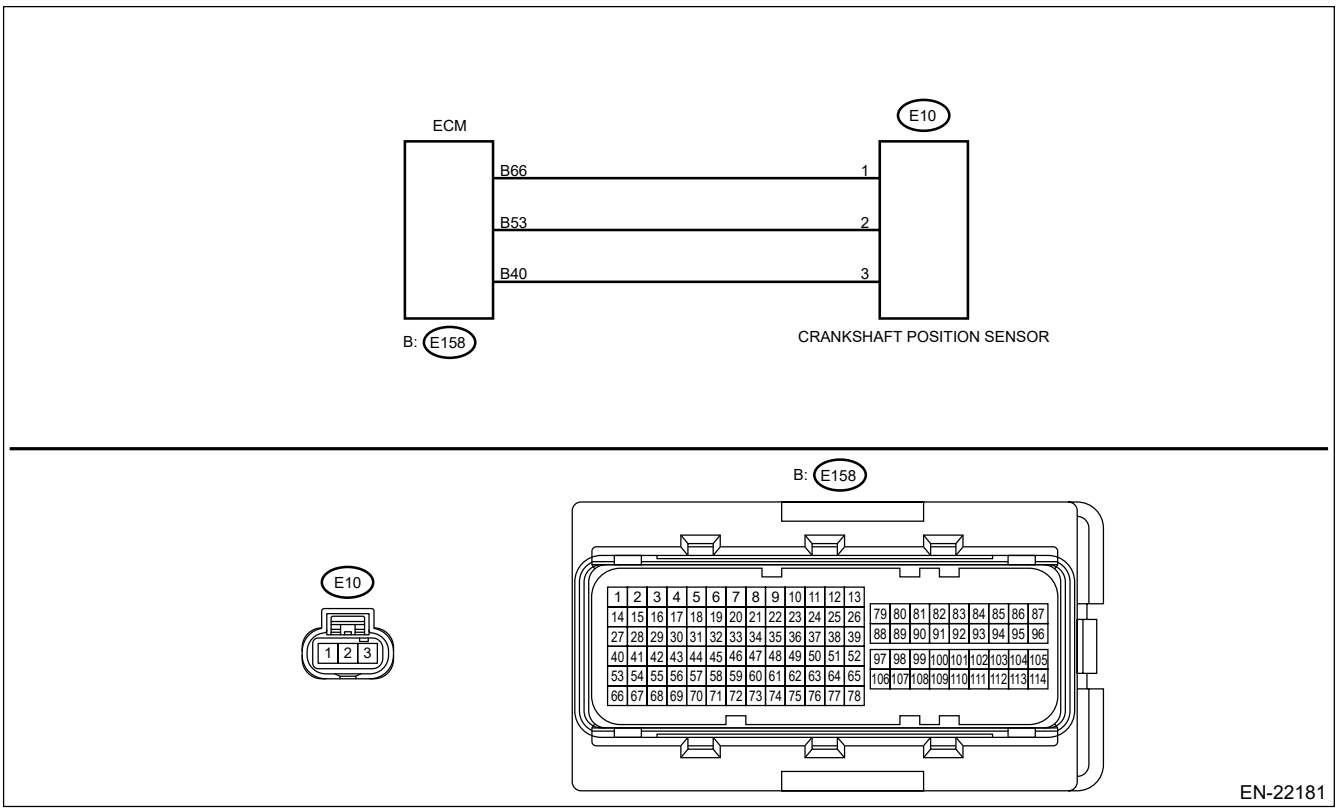
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

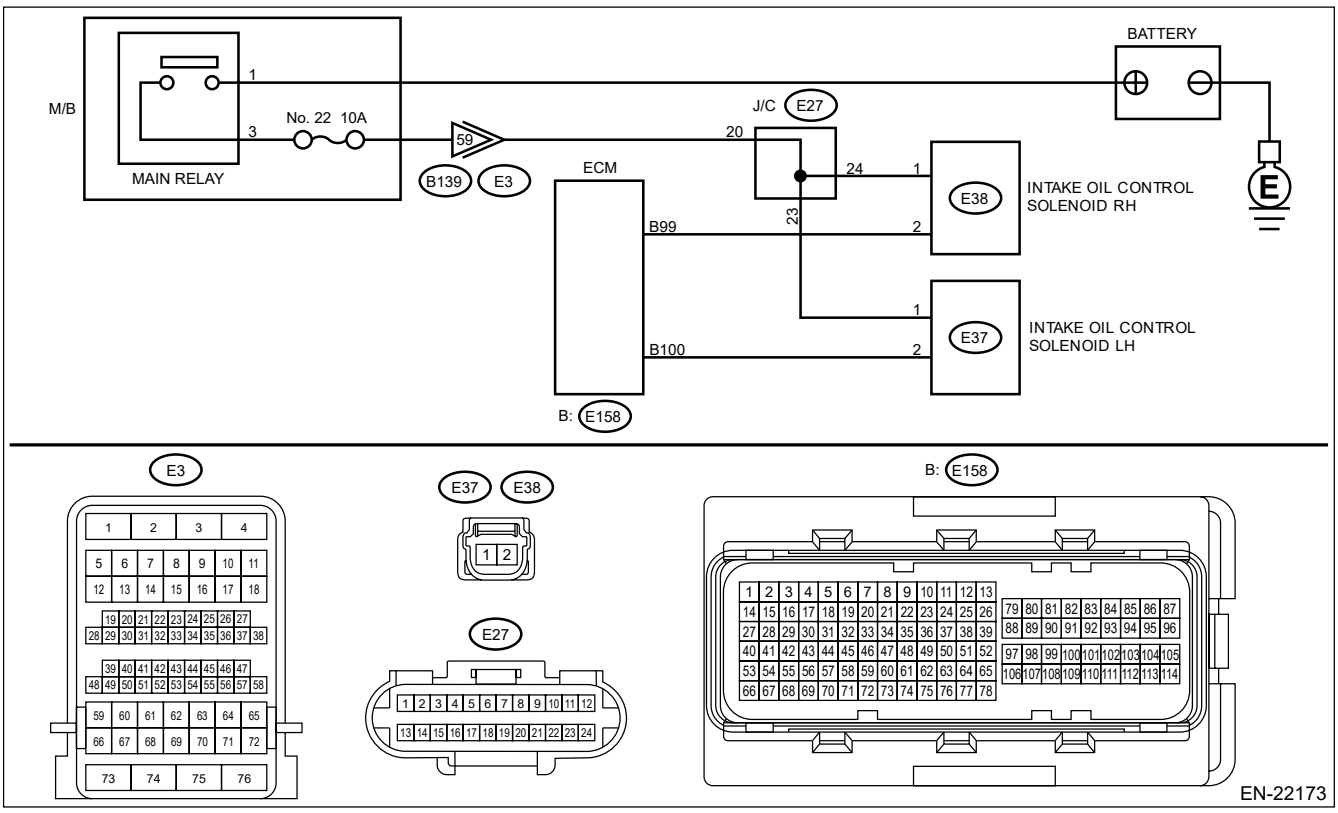
Note:

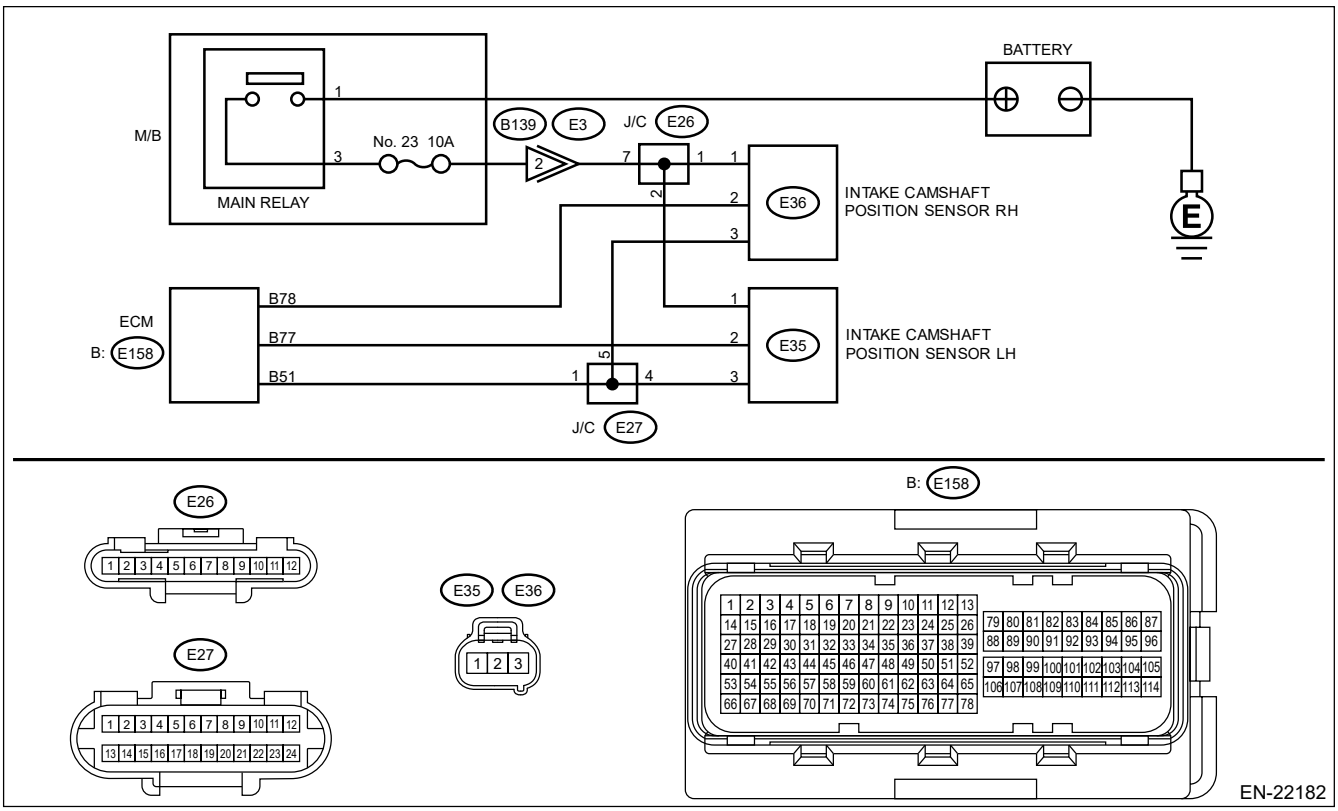
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
E10
B66
B53
B40
1
2
3
B: E158
CRANKSHAFT POSITION SENSOR
B: E158
E10
EN-22181


BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
J/C E27
20
24
1
2
E38
INTAKE OIL CONTROL SOLENOID RH
ECM
B99
23
1
2
E37
INTAKE OIL CONTROL SOLENOID LH
B100
B: E158
E3
E37
E38
E27
B: E158
EN-22173



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC other than P000A and P0011 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 3.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Go to 5.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 14.

5. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 6.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 6.

6. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E158) No. 99 — (E38) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace faulty parts. Go to 14.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E158) No. 78 — (E36) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 14.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 14.

9. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 11.
No	Go to 10.

10. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 11.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 12.

11. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 12.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 12.

12. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 13.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 13.

13. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 14.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 14.

14. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

Caution:

- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

Note:

- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**

4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] 1000 or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Go to 15.

15. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 14.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	End.

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.
Judge NG when the amount of AVCS actual timing advance does not approach to the amount of AVCS target timing advance.

2. EXECUTION CONDITION

- Target error

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
AVCS control	In operation

- Intermediate lock position

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine speed	500rpm or more
Elapsed time after starting the engine	More than 500ms and Value of Map or less

Engine coolant temperature at engine starting °C (°F)	−40 (−40)	−30 (−22)	−20 (−4)	−10 (14)	0 (32)	10 (50)	20 (68)
Elapsed time after starting the engine (ms)	10000	10000	10000	8000	5000	3500	2800

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while AVCS is operating.

4. DIAGNOSTIC METHOD

When the conditions during which the differences of AVCS target timing advance amount and AVCS actual timing advance amount is large continues for certain amount of time.
Judge as NG when the following conditions are established within the predetermined time.

Judgment value

- Target error:

Malfunction Criteria	Threshold Value
|(Target position − Actual position)|	More than 10°CA

- Intermediate lock position:

Malfunction Criteria	Threshold Value
|(Target position − Actual	More than 10°CA

Malfunction Criteria	Threshold Value
position)|	

Time needed for diagnosis:

- Target error: 5000ms
- Intermediate lock position: 2000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

Caution:

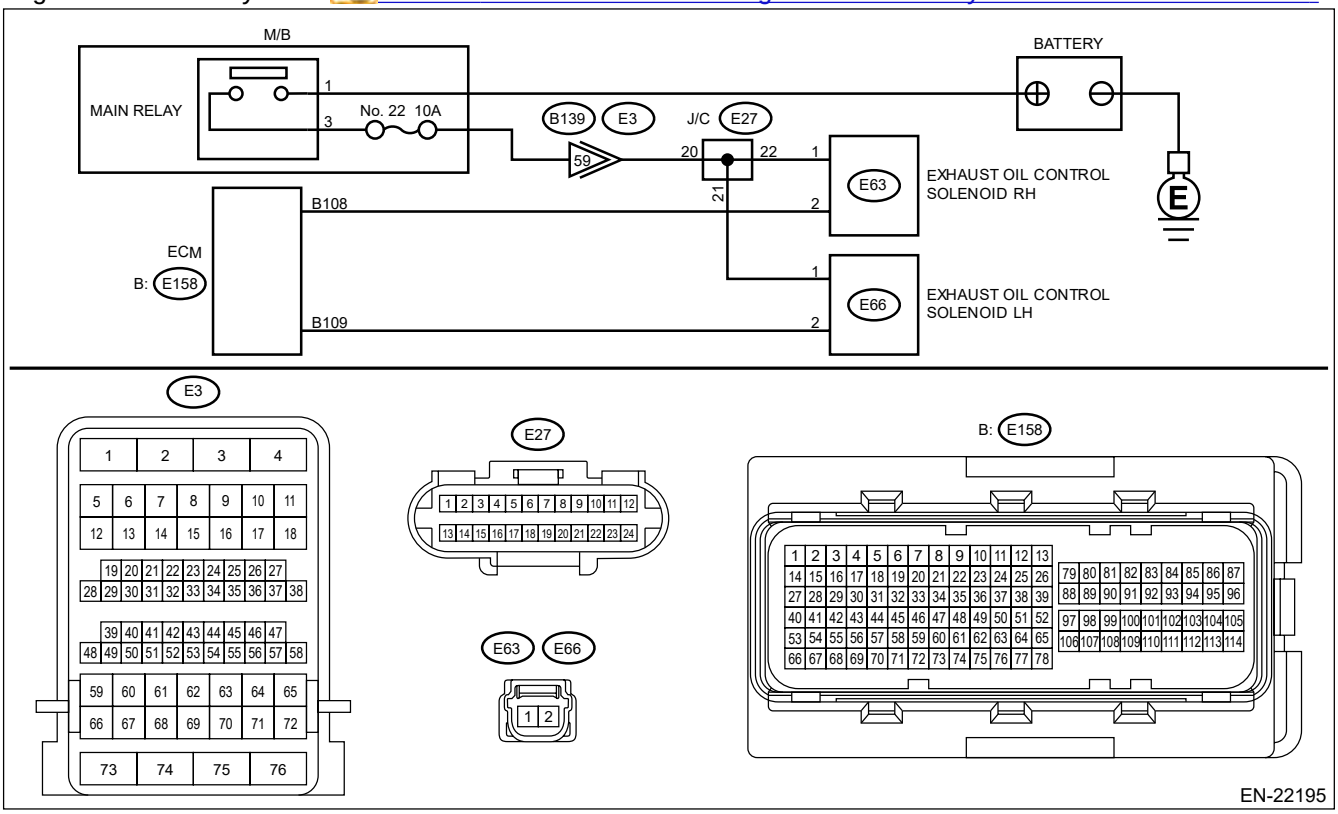
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 108 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.

Measure the voltage between exhaust oil control solenoid RH connector and engine ground.
Connector & terminal
(E63) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 108 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and exhaust oil flow control solenoid valve RH connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Measure the resistance between exhaust oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E63) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

6. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (OPEN).

Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH.

Connector & terminal

(E158) No. 108 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and exhaust oil control solenoid RH connector** • **Poor contact of coupling connector**

7. CHECK EXHAUST OIL CONTROL SOLENOID RH.

Measure the resistance between exhaust oil control solenoid RH terminals.

Terminals

No. 1 — No. 2:

Is the resistance 6 — 12 Ω?

Yes	Repair the poor contact of exhaust oil control solenoid RH connector.
No	Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the oil control solenoid.
Judge as NG when the current is small even though the duty signal is large.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Oil control solenoid control duty	99.61% or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Oil control solenoid control present current	Less than 0.306A

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

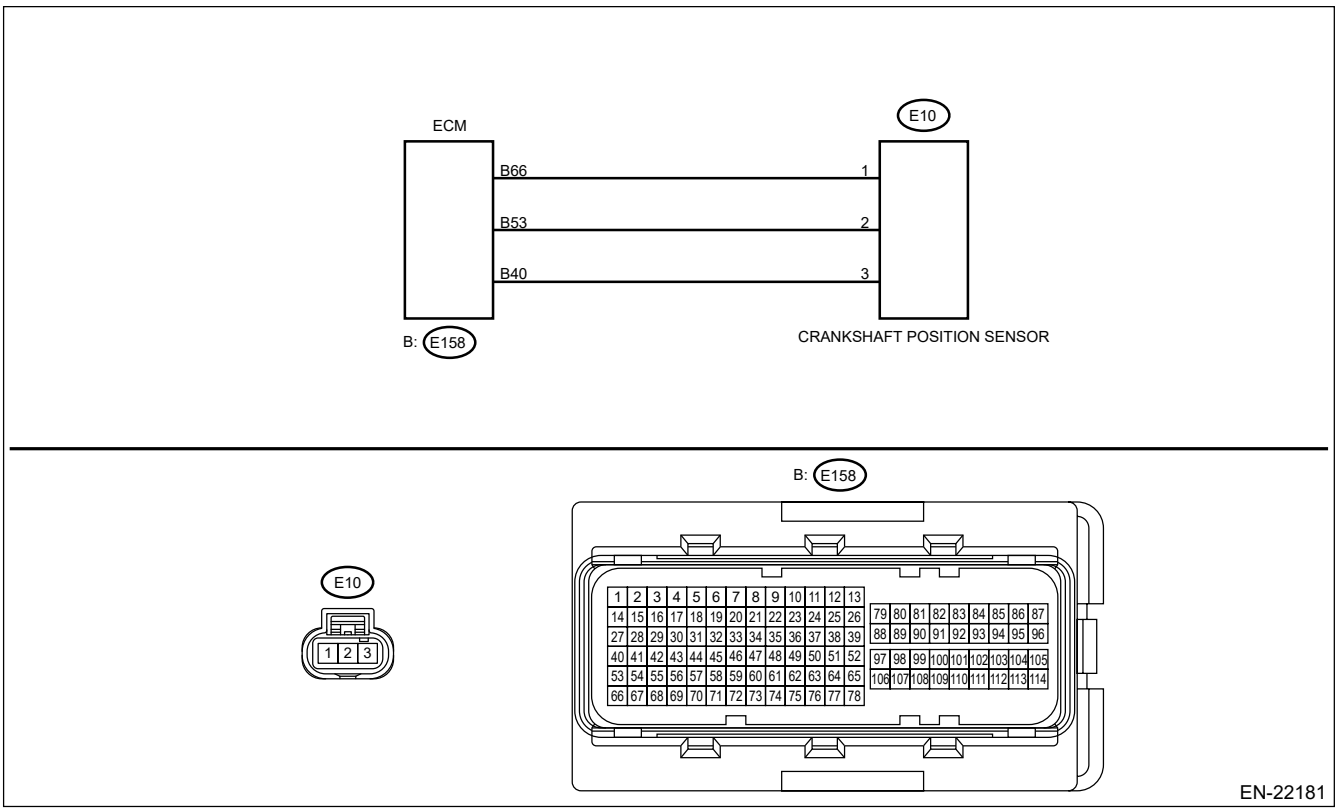
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

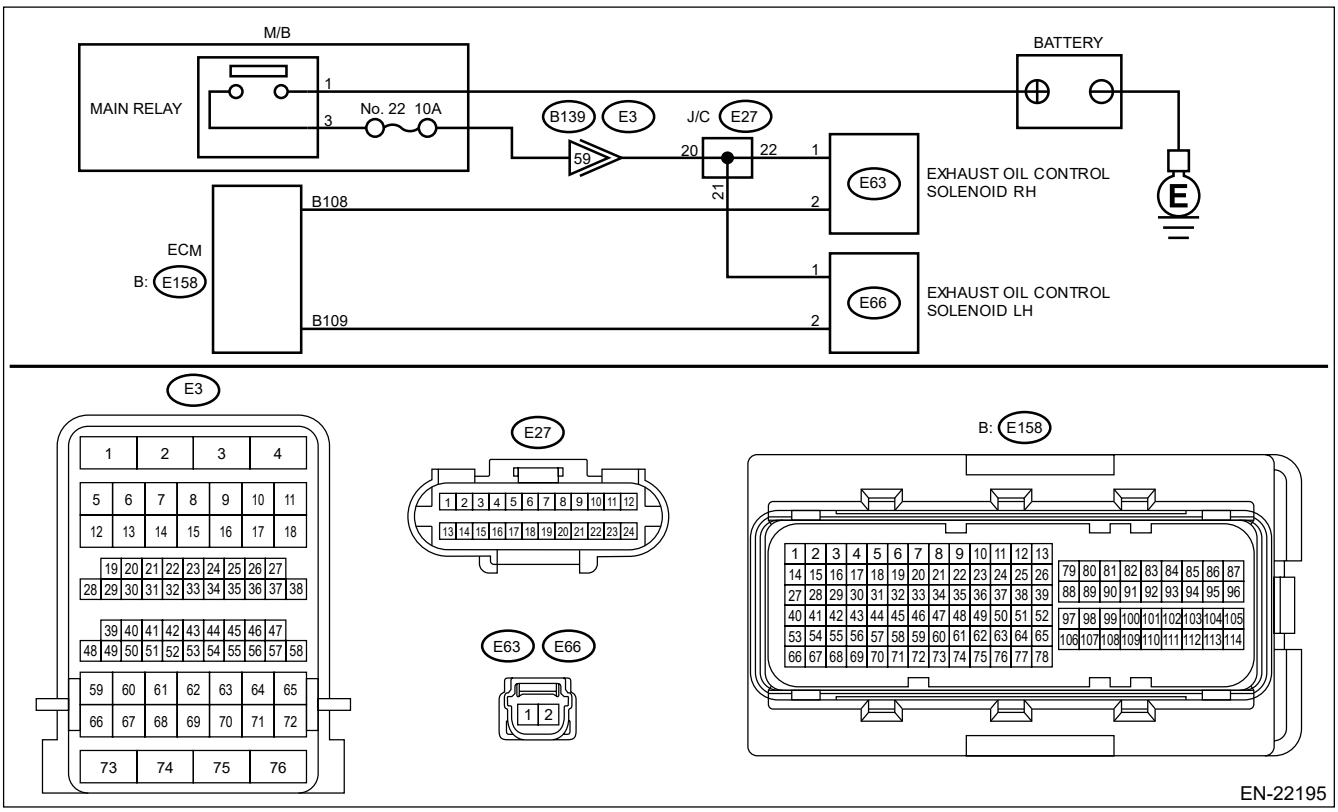
Note:

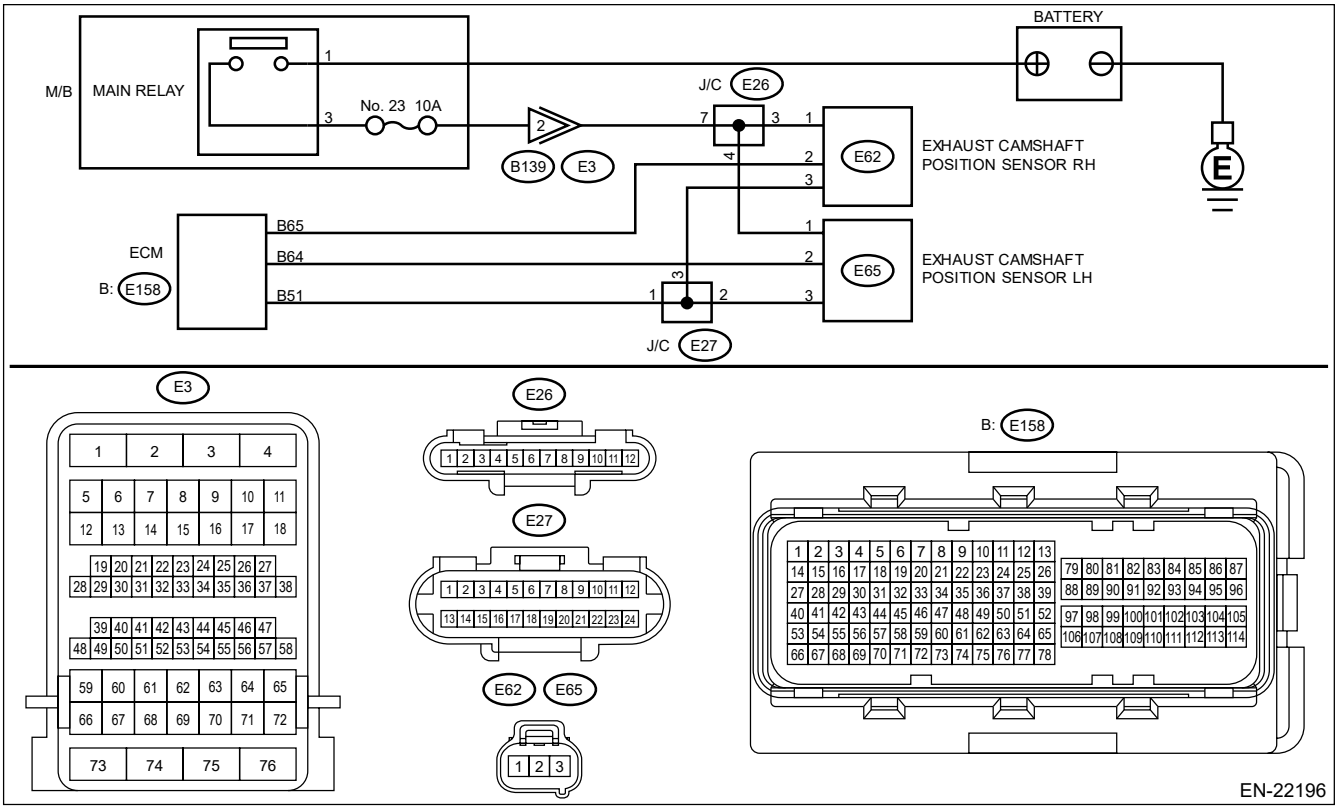
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
E10
B66
B53
B40
1
2
3
B: E158
CRANKSHAFT POSITION SENSOR
B: E158
E10
EN-22181


M/B
MAIN RELAY
No. 22 10A
BATTERY
B139
E3
J/C
E27
59
20
22
21
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
B109
ECM
B: E158
E66
EXHAUST OIL CONTROL SOLENOID LH
E3
E27
E63
E66
B: E158
EN-22195



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC other than P000B and P0014 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 3.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Go to 5.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 14.

5. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 6.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 6.

6. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Measure the resistance between exhaust oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E158) No. 108 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace faulty parts. Go to 14.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust camshaft position sensor RH.
4. Measure the resistance between the exhaust camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E158) No. 65 — (E62) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 14.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 14.

9. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 11.
No	Go to 10.

10. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 11.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 12.

11. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 12.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 12.

12. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 13.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 13.

13. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 14.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 14.

14. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

Caution:

- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

Note:

- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**

4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] 1000 or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Go to 15.

15. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 14.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	End.

1. OUTLINE OF DIAGNOSIS

Detect the exhaust AVCS system malfunction.
Judge as NG when the conditions during which the differences of exhaust AVCS target timing advance amount and exhaust AVCS actual timing advance amount is large continues.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Exhaust AVCS control	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously when the engine speed increases and exhaust AVCS operates.

4. DIAGNOSTIC METHOD

When the conditions during which the differences of exhaust AVCS target timing advance amount and exhaust AVCS actual timing advance amount is large continues for certain amount of time.
Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
|(Target position – Actual position)|	More than 10°CA

Time needed for diagnosis: 10000ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

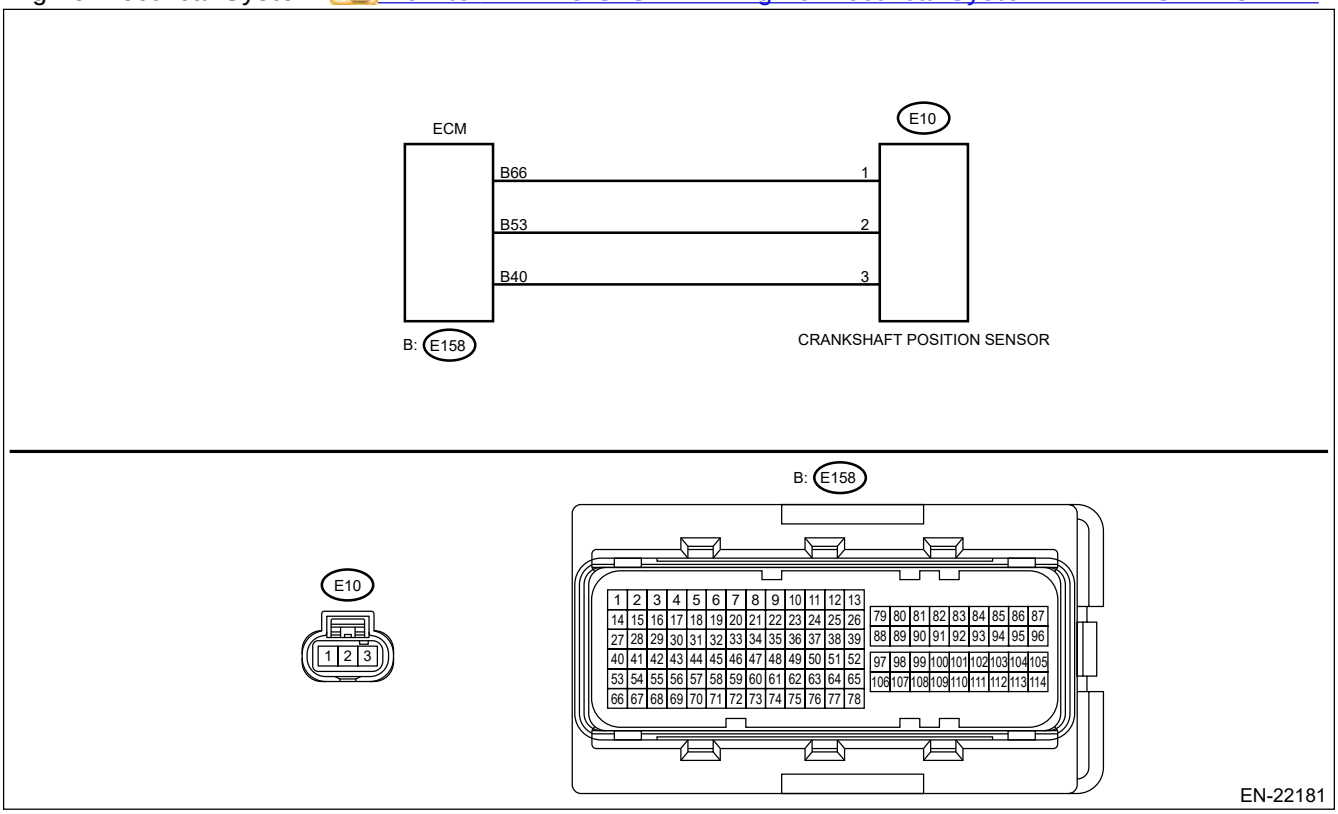
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

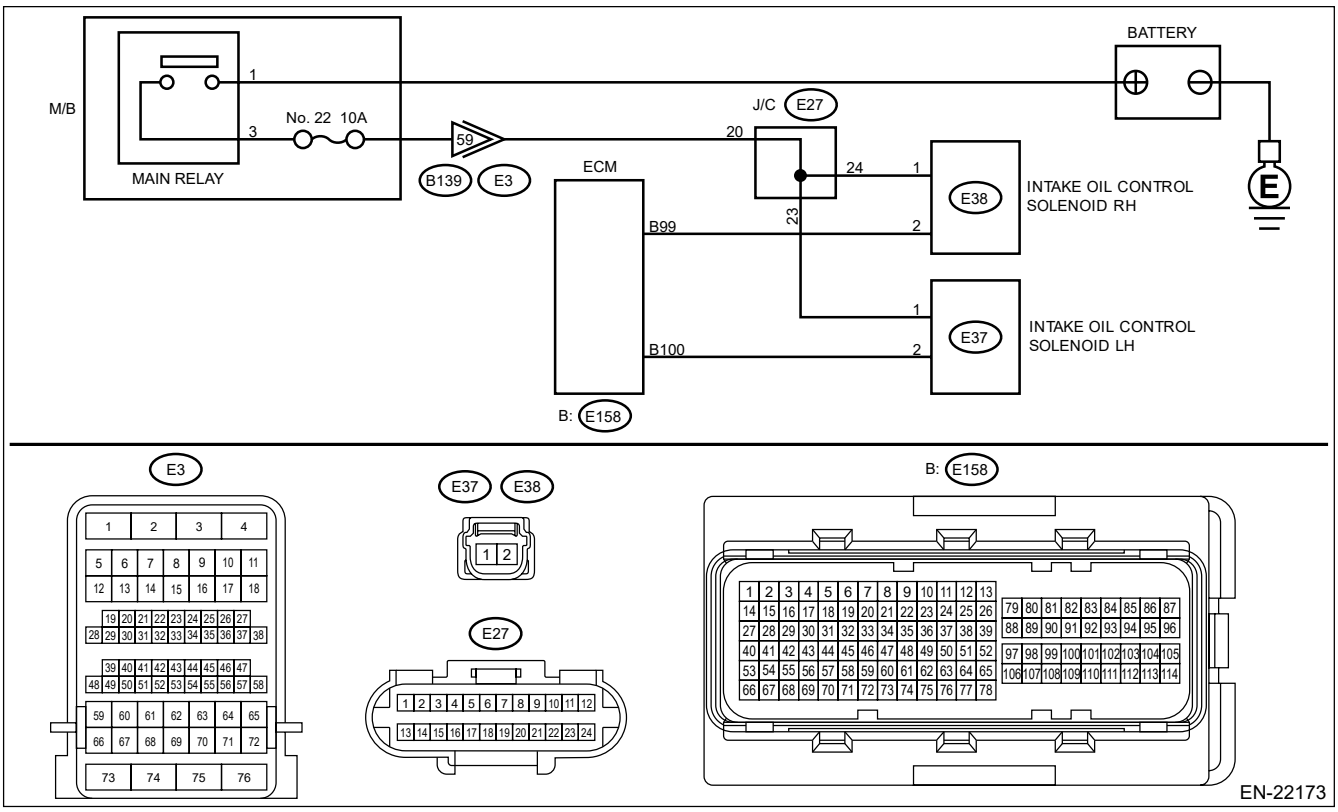
Note:

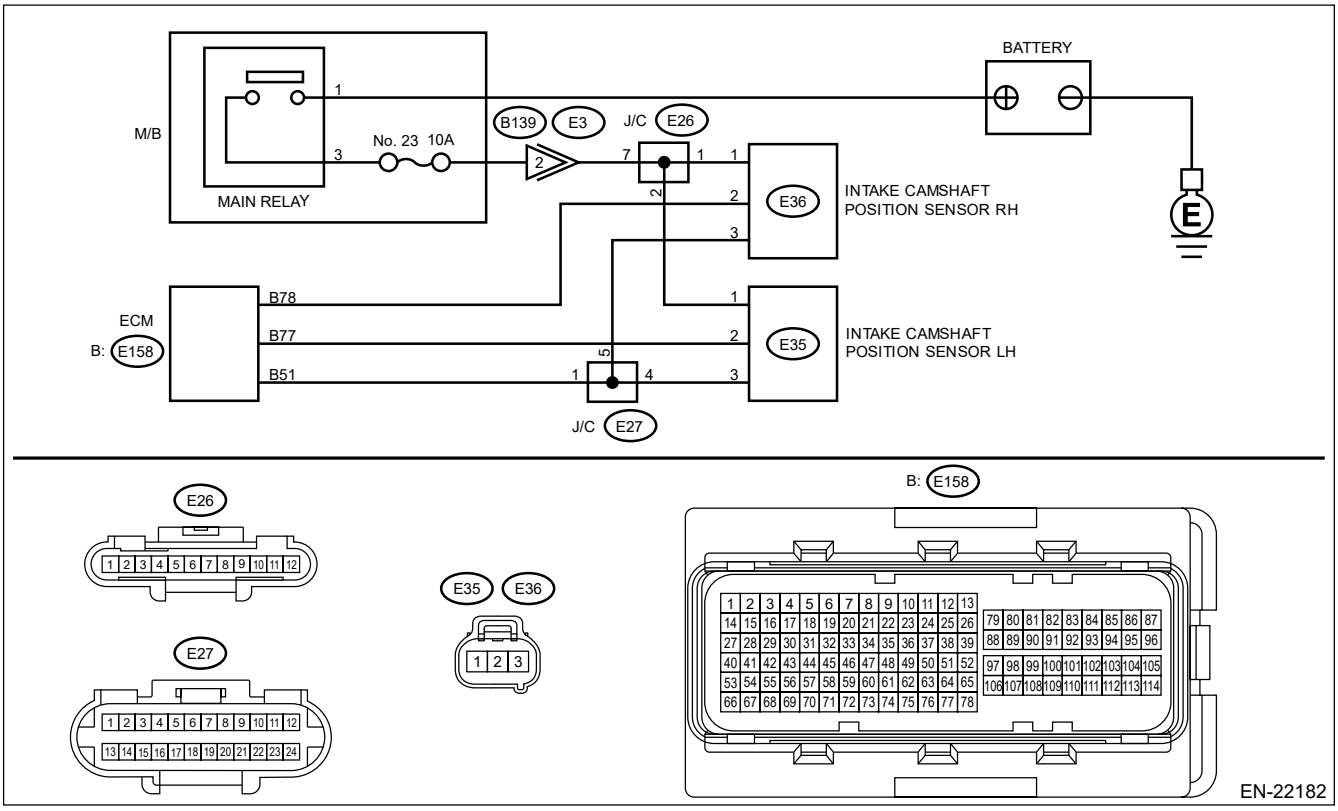
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
J/C
E27
20
24
1
2
23
ECM
B99
B100
E38
E37
INTAKE OIL CONTROL SOLENOID RH
INTAKE OIL CONTROL SOLENOID LH
B: E158
E3
E37
E38
E27
B: E158
EN-22173


BATTERY
M/B
1
3
No. 23 10A
MAIN RELAY
B139
E3
J/C
E26
2
7
1
2
3
E36
INTAKE CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B78
B77
B51
E35
INTAKE CAMSHAFT POSITION SENSOR LH
5
4
J/C
E27
E26
E27
E35
E36
B: E158
EN-22182

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC other than P0016 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.

2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid RH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount R] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount R] within 10 seconds after engine is started.
   Note:
   The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.
8. Record the readings [VVT Adv. Ang. Amount R].
9. Stop the engine.

Is [VVT Adv. Ang. Amount R] out of standard (0 deg) by ±10 deg or more within 10 seconds after starting?

Yes	Repair the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. Go to 15.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Go to 6.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 15.

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 7.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 7.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid RH.
4. Measure the resistance between intake oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E158) No. 99 — (E38) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake camshaft position sensor RH.
4. Measure the resistance between the intake camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E158) No. 78 — (E36) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair or replace faulty parts. Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 12.
No	Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 12.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 13.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 13.

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 14.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 14.

14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 15.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 15.

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Using the Subaru Select Monitor, read the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
4. Read the current value of [VVT Initial Position Learning Value #1].
5. Find the sum value of read [VVT Initial Position Learning Value #1] and [VVT Adv. Ang. Amount R] recorded in step 3.

Is the sum value within standard?
Standard:
45 — 74

Yes	ECM is good; finish the diagnosis.
No	Replace the ECM and perform inspection mode N. When DTC is not displayed, end the diagnosis. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the AVCS system malfunction.
Judge as NG when standard timing advance amount is far from learning angle.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Elapsed time after external load (power steering, neutral position switch) change	3000ms or more
AVCS learning	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting engine and while AVCS is not operating.

4. DIAGNOSTIC METHOD

Judge as NG when the absolute value of the difference between cam signal input position and learning value is out of specification.
Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
|Crankshaft position when camshaft position sensor signal is input – Learning value|	More than 10°CA

Time needed for diagnosis: 1000ms

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Camshaft position sensor signal input position (Bank 1)	Less than 30.12 °CA or More than 89.18 °CA
Camshaft position sensor signal input position (Bank 2)	Less than 29.59 °CA or More than 87.71 °CA

Time needed for diagnosis: 1000ms

Illumination of malfunction indicator light: Illuminates when two consecutive driving cycles with fault occur.

Note:

Initial standard learning value is the value of crank angle initially input at the production plant. And then it will be updated every time normal judgment has been completed. Learning value will not be updated if NG judgment occurs because timing belt or chain derails suddenly in process or because wrong assembly occurs during servicing.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

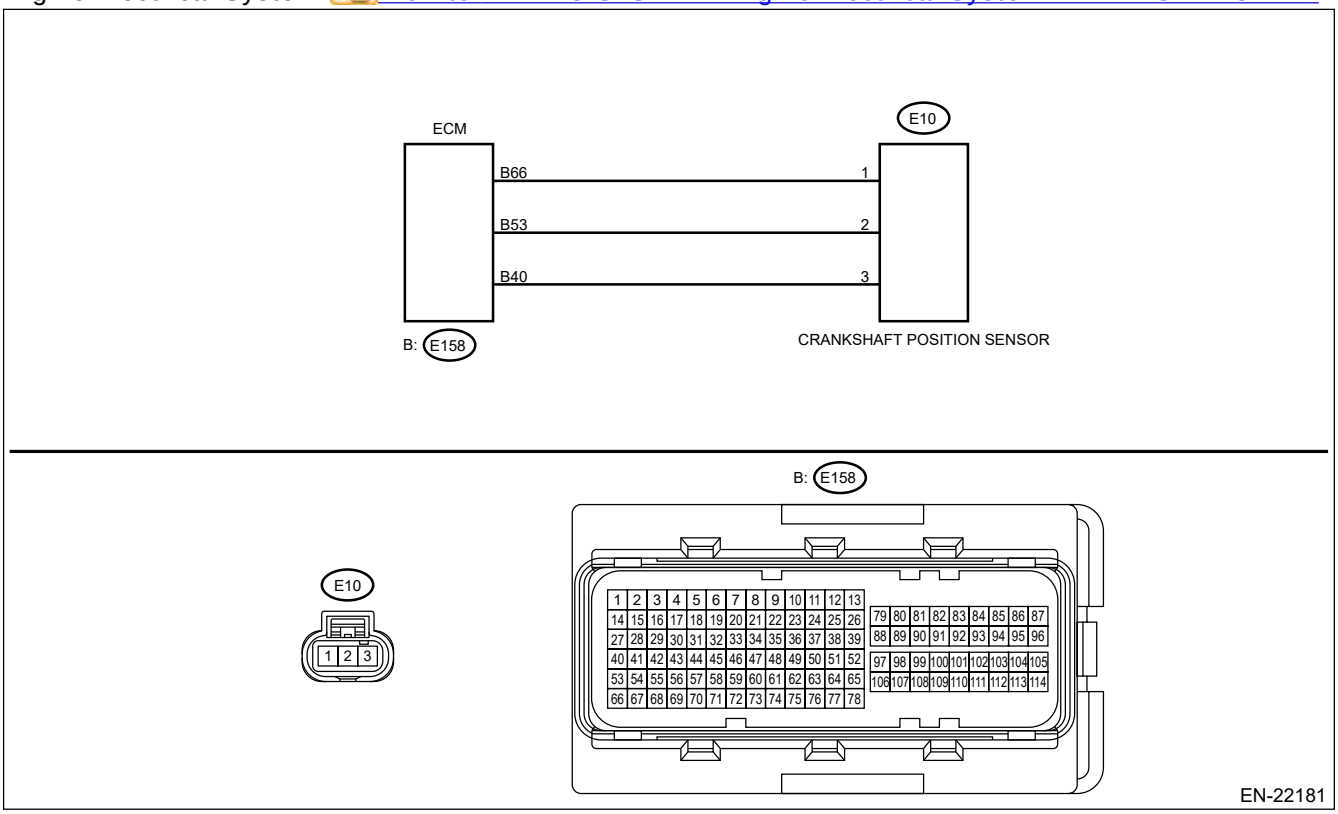
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

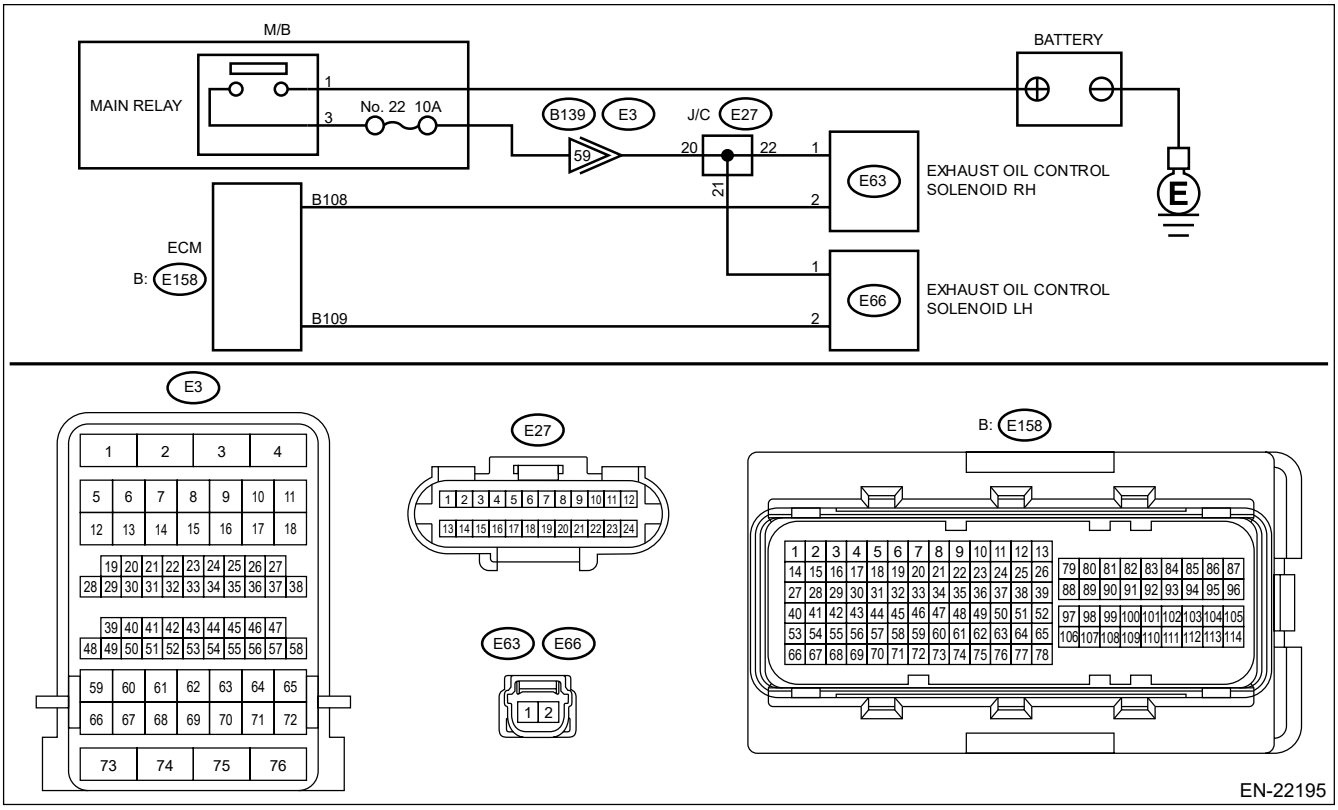
Note:

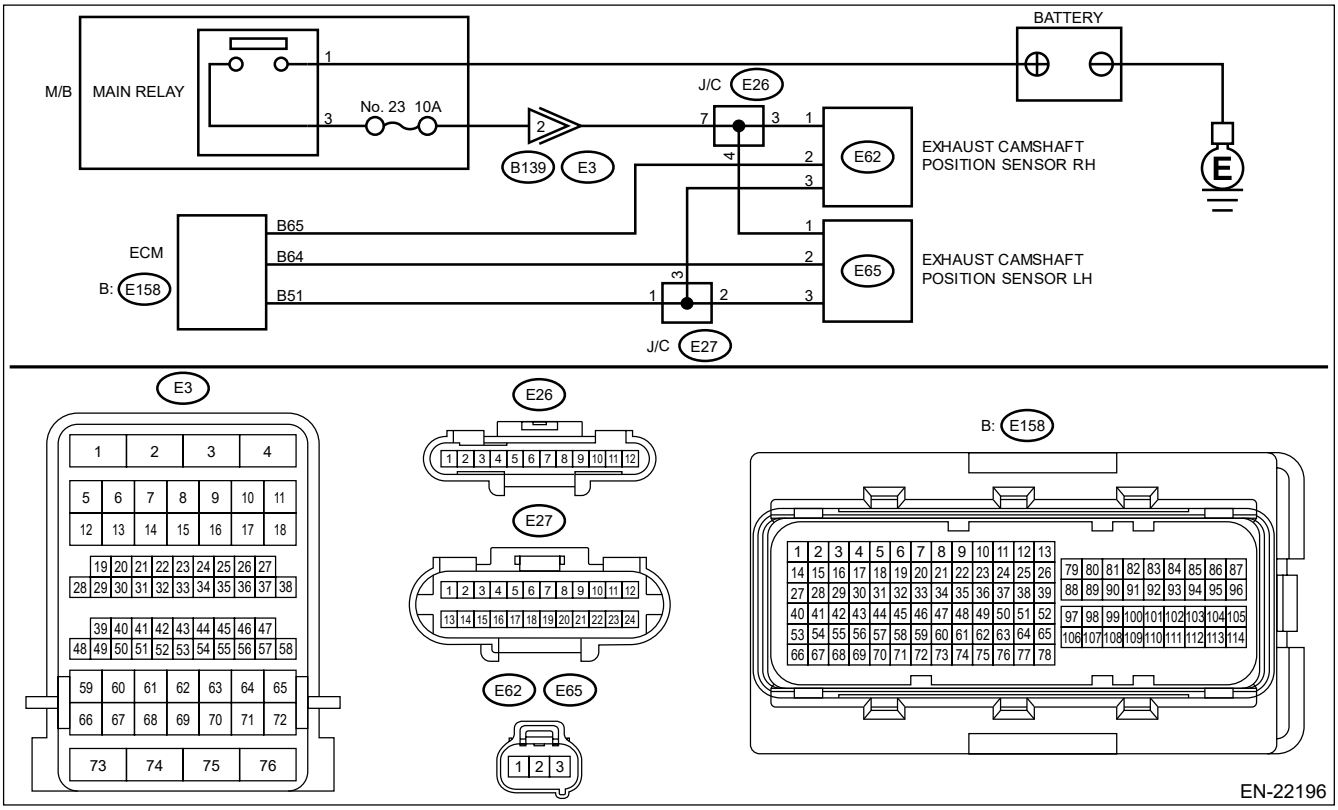
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




M/B
MAIN RELAY
No. 22 10A
BATTERY
B139
E3
J/C
E27
59
20
22
21
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
ECM
B: E158
B109
E66
EXHAUST OIL CONTROL SOLENOID LH
E3
E27
E63
E66
B: E158
EN-22195


M/B
MAIN RELAY
No. 23 10A
BATTERY
J/C
E26
B139
E3
E62
EXHAUST CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B65
B64
B51
E65
EXHAUST CAMSHAFT POSITION SENSOR LH
J/C
E27
E3
E26
E27
E62
E65
B: E158
EN-22196

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC other than P0017 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.

2. Turn the ignition switch to OFF.
3. Disconnect the connector of the exhaust oil control solenoid RH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [Exh. VVT Retard Ang. R] on the data monitor.
6. Start the engine.
7. Read [Exh. VVT Retard Ang. R] within 10 seconds after engine is started.
   Note:
   The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.
8. Record the readings [Exh. VVT Retard Ang. R].
9. Stop the engine.

Is [Exh. VVT Retard Ang. R] out of standard (0 deg) by ±10 deg or more within 10 seconds after starting?

Yes	Repair the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. Go to 15.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 1] of the replaced oil control solenoid 1000 or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 1] 1000 or less, and more than (value of [VVT monitor bank 2] ×1.5+ 100) compared with the value of [VVT monitor bank 2]?

Yes	Go to 6.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 15.

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 7.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 7.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid RH.
4. Measure the resistance between exhaust oil control solenoid RH connector and ECM connector.
   Connector & terminal
   (E158) No. 108 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust camshaft position sensor RH.
4. Measure the resistance between the exhaust camshaft position sensor RH connector and ECM connector.
   Connector & terminal
   (E158) No. 65 — (E62) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair or replace faulty parts. Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 12.
No	Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 12.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 13.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 13.

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 1) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 2).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 14.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 14.

14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 15.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 15.

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Using the Subaru Select Monitor, read the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
4. Read the current value of [VVT Ex Initial Position Learning Value #1].
5. Find the sum value of read [VVT Ex Initial Position Learning Value #1] and [Exh. VVT Retard Ang. R] recorded in step 3.

Is the sum value within standard?
Standard:
73 — 104

Yes	ECM is good; finish the diagnosis.
No	Replace the ECM and perform inspection mode N. When DTC is not displayed, end the diagnosis. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the exhaust AVCS system malfunction.
Judge as NG when standard timing advance amount is far from learning angle.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	18.9 V or more
Elapsed time after external load (power steering, neutral position switch) change	3000ms or more
Exhaust AVCS position learning	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously while the exhaust AVCS is not operating after warming up.

4. DIAGNOSTIC METHOD

Judge as NG when the absolute value of the difference between cam signal input position and learning value is out of specification.
Judgment value

Malfunction Criteria	Threshold Value
<Diagnosis 1> |Crankshaft position when camshaft position sensor signal is input − Learning value|	More than 10°CA
<Diagnosis 2>	
Camshaft position sensor signal input position (Bank 1)	Less than 61.47°CA or More than 118.29°CA
Camshaft position sensor signal input position (Bank 2)	Less than 59.68°CA or More than 117.44°CA

Time needed for diagnosis: 5000ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0018 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR A

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

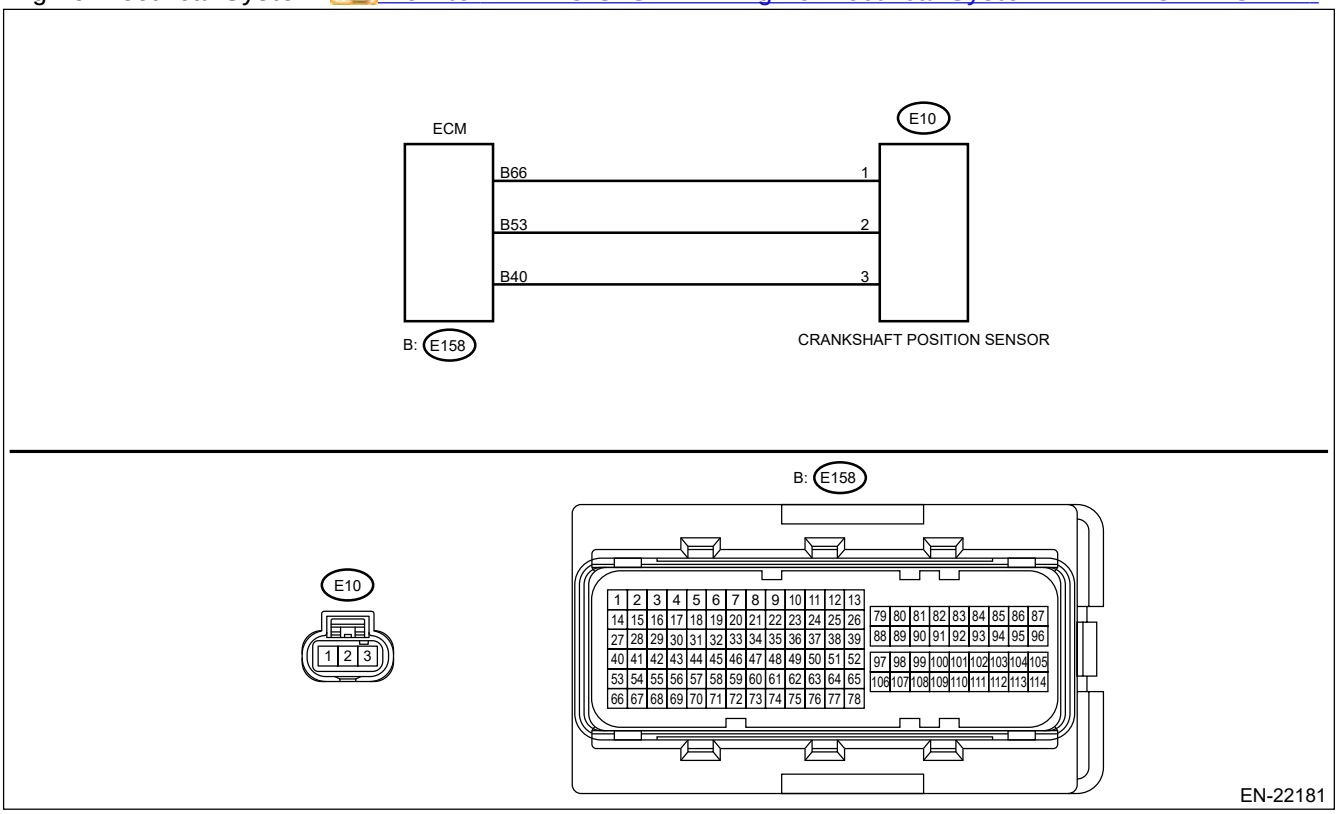
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

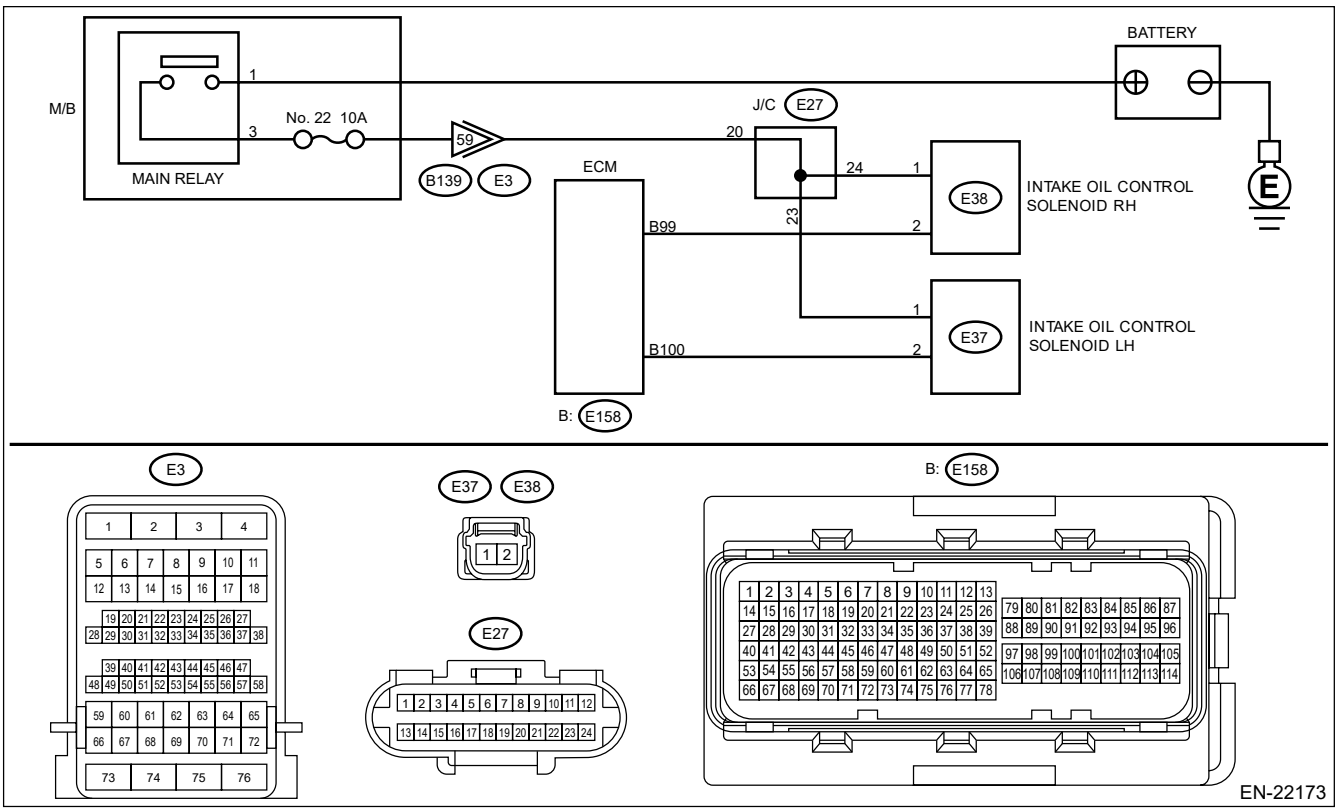
Note:

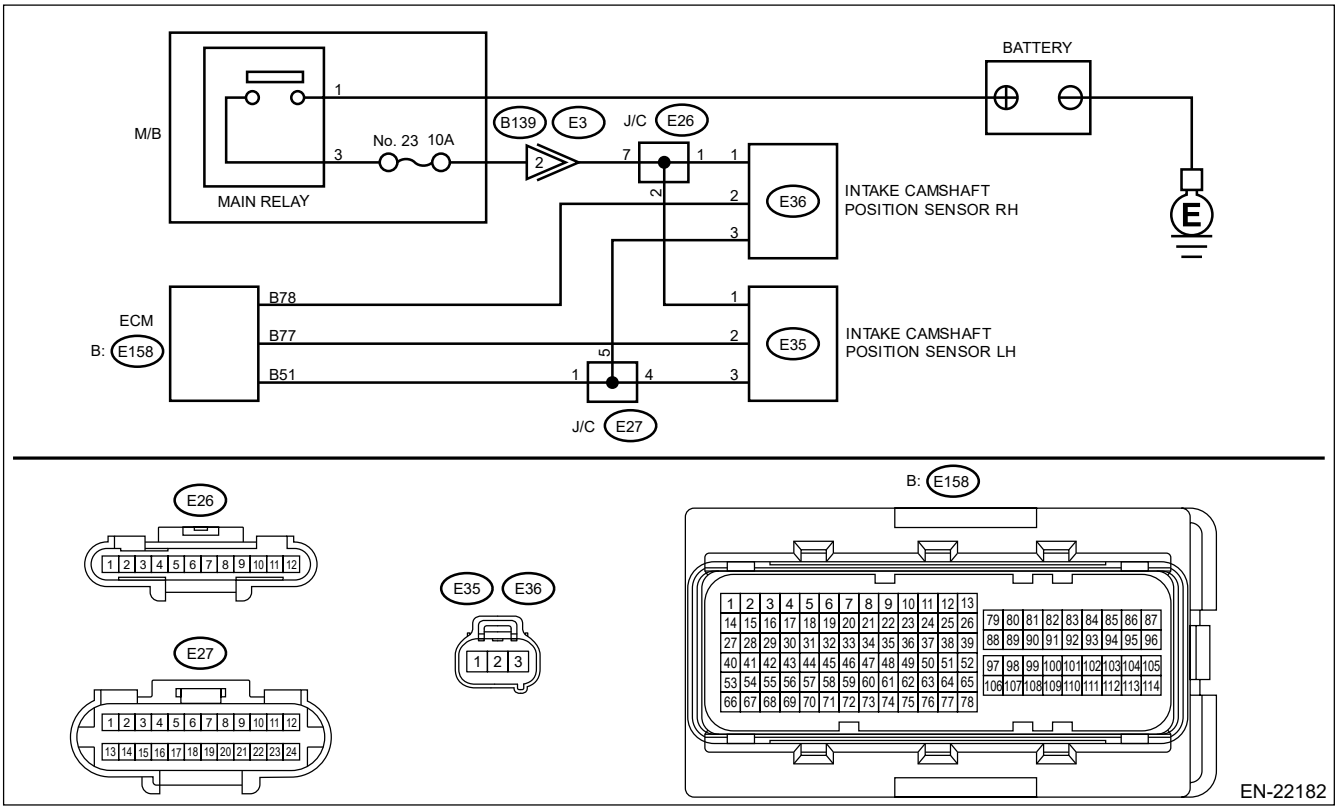
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
J/C
E27
20
24
1
2
23
ECM
B99
B100
E38
E37
INTAKE OIL CONTROL SOLENOID RH
INTAKE OIL CONTROL SOLENOID LH
B: E158
E3
E37
E38
E27
B: E158
EN-22173


BATTERY
M/B
1
3
No. 23 10A
MAIN RELAY
B139
E3
J/C
E26
2
7
1
2
3
E36
INTAKE CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B78
B77
B51
E35
INTAKE CAMSHAFT POSITION SENSOR LH
5
4
J/C
E27
E26
E27
E35
E36
B: E158
EN-22182

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC other than P0018 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.

2. Turn the ignition switch to OFF.
3. Disconnect the connector of the intake oil control solenoid LH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [VVT Adv. Ang. Amount L] on the data monitor.
6. Start the engine.
7. Read [VVT Adv. Ang. Amount L] within 10 seconds after engine is started.
   Note:
   The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.
8. Record the readings [VVT Adv. Ang. Amount L].
9. Stop the engine.

Is [VVT Adv. Ang. Amount L] out of standard (0 deg) by ±10 deg or more within 10 seconds after starting?

Yes	Repair the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. Go to 15.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Go to 6.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 15.

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 7.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 7.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E158) No. 100 — (E37) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E158) No. 77 — (E35) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair or replace faulty parts. Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 12.
No	Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 12.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 13.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 13.

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 14.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 14.

14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 15.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 15.

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Using the Subaru Select Monitor, read the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
4. Read the current value of [VVT Initial Position Learning Value #2].
5. Find the sum value of read [VVT Initial Position Learning Value #2] and [VVT Adv. Ang. Amount L] recorded in step 3.

Is the sum value within standard?
Standard:
45 — 74

Yes	ECM is good; finish the diagnosis.
No	Replace the ECM and perform inspection mode N. When DTC is not displayed, end the diagnosis. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0016. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0016 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR A.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0019 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 2 SENSOR B

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

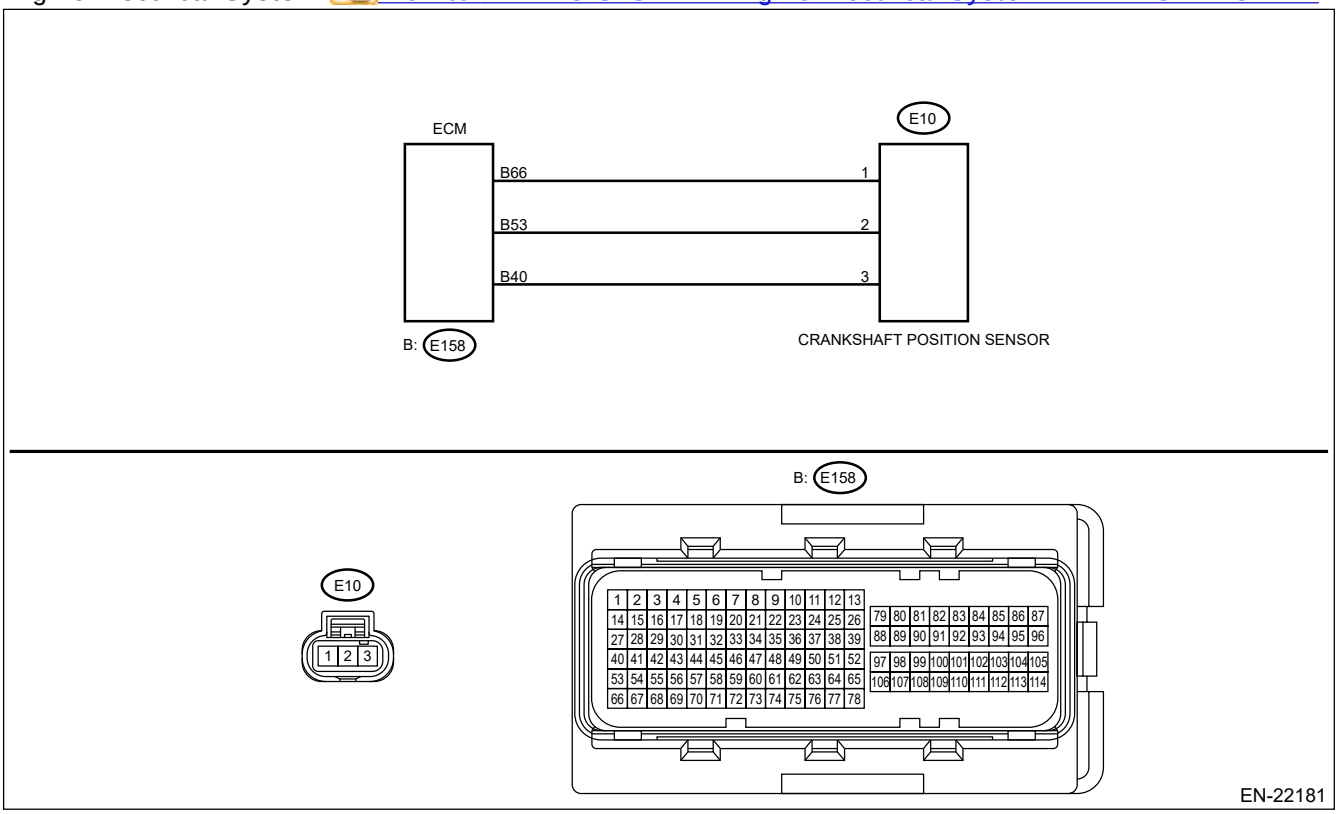
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

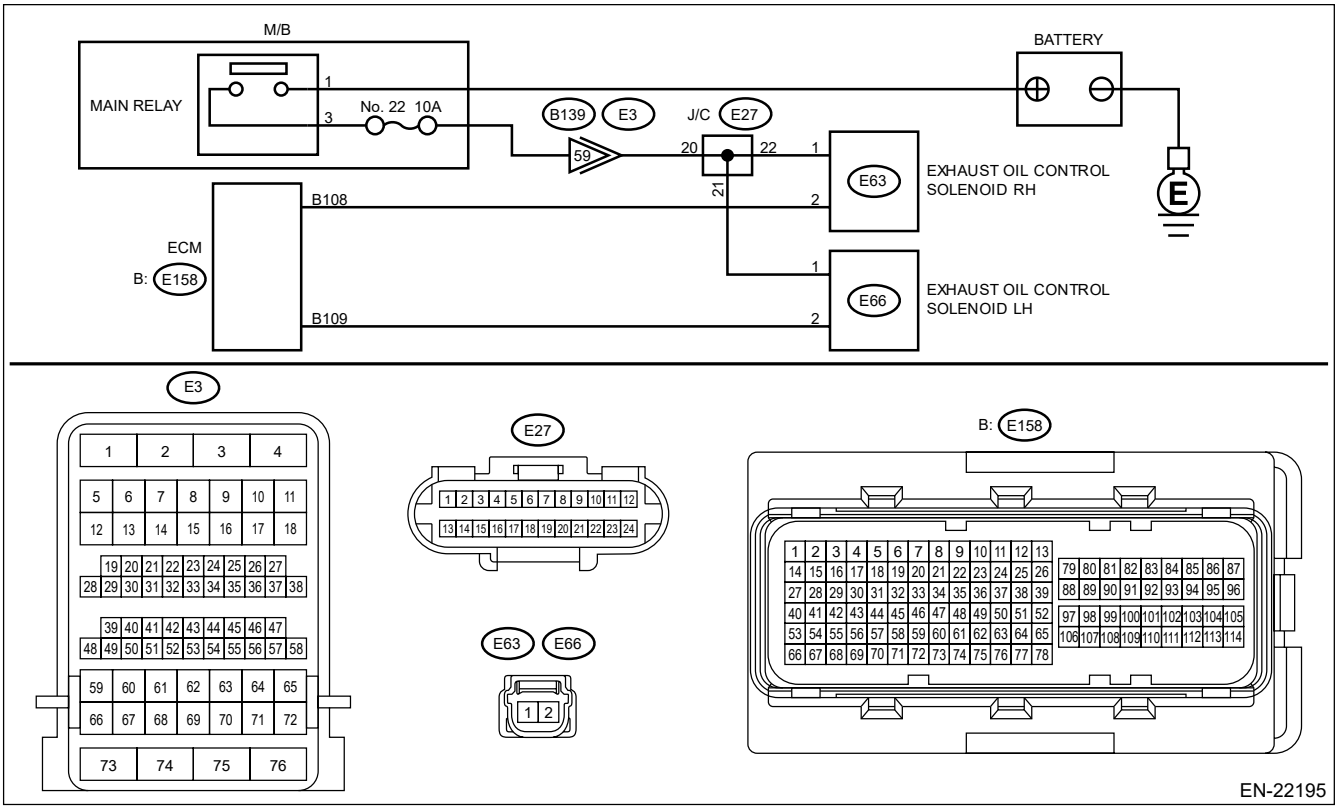
Note:

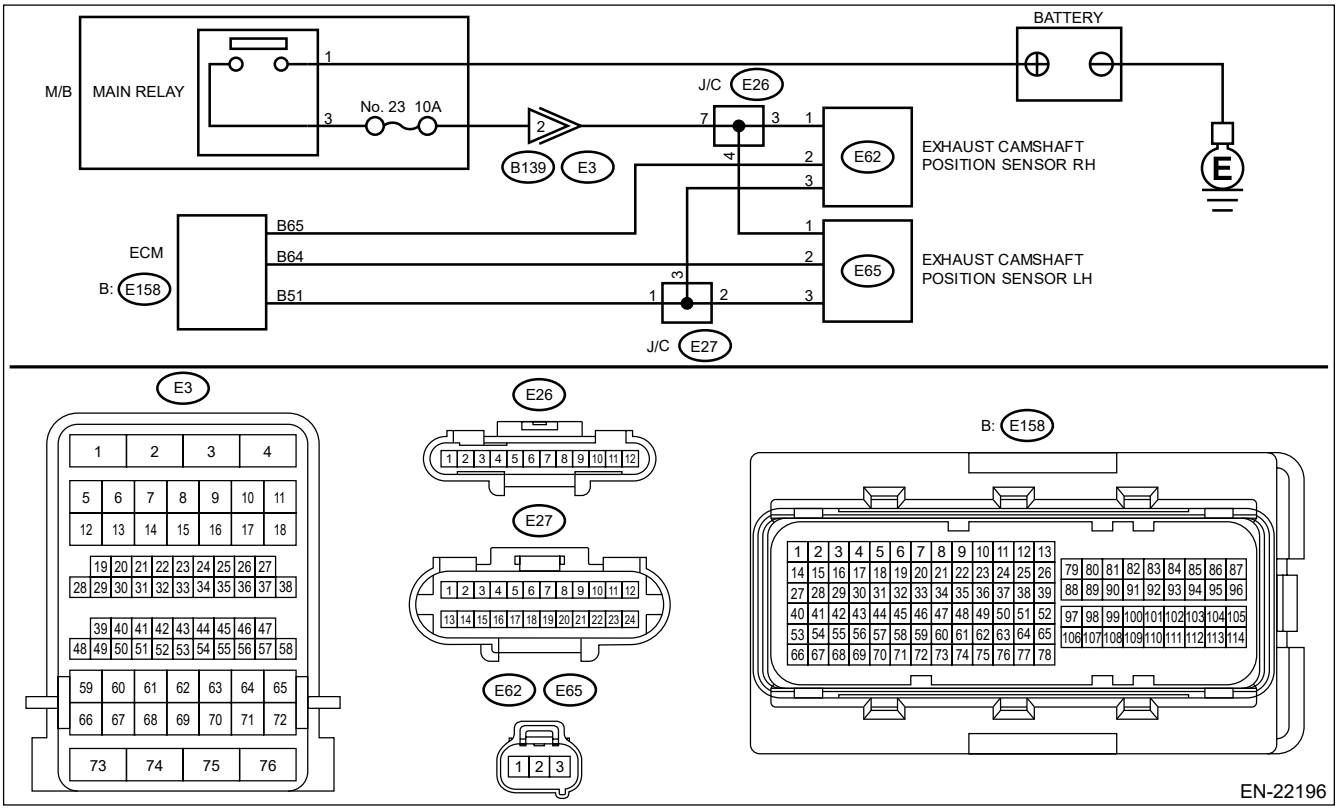
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




M/B
MAIN RELAY
No. 22 10A
BATTERY
B139
E3
J/C
E27
59
20
22
21
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
ECM
B: E158
B109
E66
EXHAUST OIL CONTROL SOLENOID LH
E3
E27
E63
E66
B: E158
EN-22195


M/B
MAIN RELAY
No. 23 10A
BATTERY
J/C
E26
B139
E3
E62
EXHAUST CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B65
B64
B51
E65
EXHAUST CAMSHAFT POSITION SENSOR LH
J/C
E27
E3
E26
E27
E62
E65
B: E158
EN-22196

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC other than P0019 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK TIMING CHAIN.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.

2. Turn the ignition switch to OFF.
3. Disconnect the connector of the exhaust oil control solenoid LH. (DTC will be set but this will not affect the inspection)
4. Turn the ignition switch to ON.
5. Start monitoring [Exh. VVT Retard Ang. L] on the data monitor.
6. Start the engine.
7. Read [Exh. VVT Retard Ang. L] within 10 seconds after engine is started.
   Note:
   The display will indicate [0] by judging the position as standard after 10 seconds elapse since the engine was started.
8. Record the readings [Exh. VVT Retard Ang. L].
9. Stop the engine.

Is [Exh. VVT Retard Ang. L] out of standard (0 deg) by ±10 deg or more within 10 seconds after starting?

Yes	Repair the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. Go to 15.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 4.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Go to 6.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 15.

6. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 7.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 7.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Measure the resistance between exhaust oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E158) No. 109 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 15.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from exhaust camshaft position sensor LH.
4. Measure the resistance between the exhaust camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E158) No. 64 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 15.

9. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair or replace faulty parts. Go to 15.

10. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 12.
No	Go to 11.

11. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 12.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 13.

12. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 13.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 13.

13. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 14.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 14.

14. CHECK OIL PASSAGE FROM OIL PUMP TO OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 15.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 15.

15. CHECK CURRENT DATA (LEARNING VALUE ERROR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Using the Subaru Select Monitor, read the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
4. Read the current value of [VVT Ex Initial Position Learning Value #2].
5. Find the sum value of read [VVT Ex Initial Position Learning Value #2] and [Exh. VVT Retard Ang. L] recorded in step 3.

Is the sum value within standard?
Standard:
73 — 104

Yes	ECM is good; finish the diagnosis.
No	Replace the ECM and perform inspection mode N. When DTC is not displayed, end the diagnosis. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0017. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0017 CRANKSHAFT POSITION - CAMSHAFT POSITION CORRELATION BANK 1 SENSOR B.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0020 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

Caution:

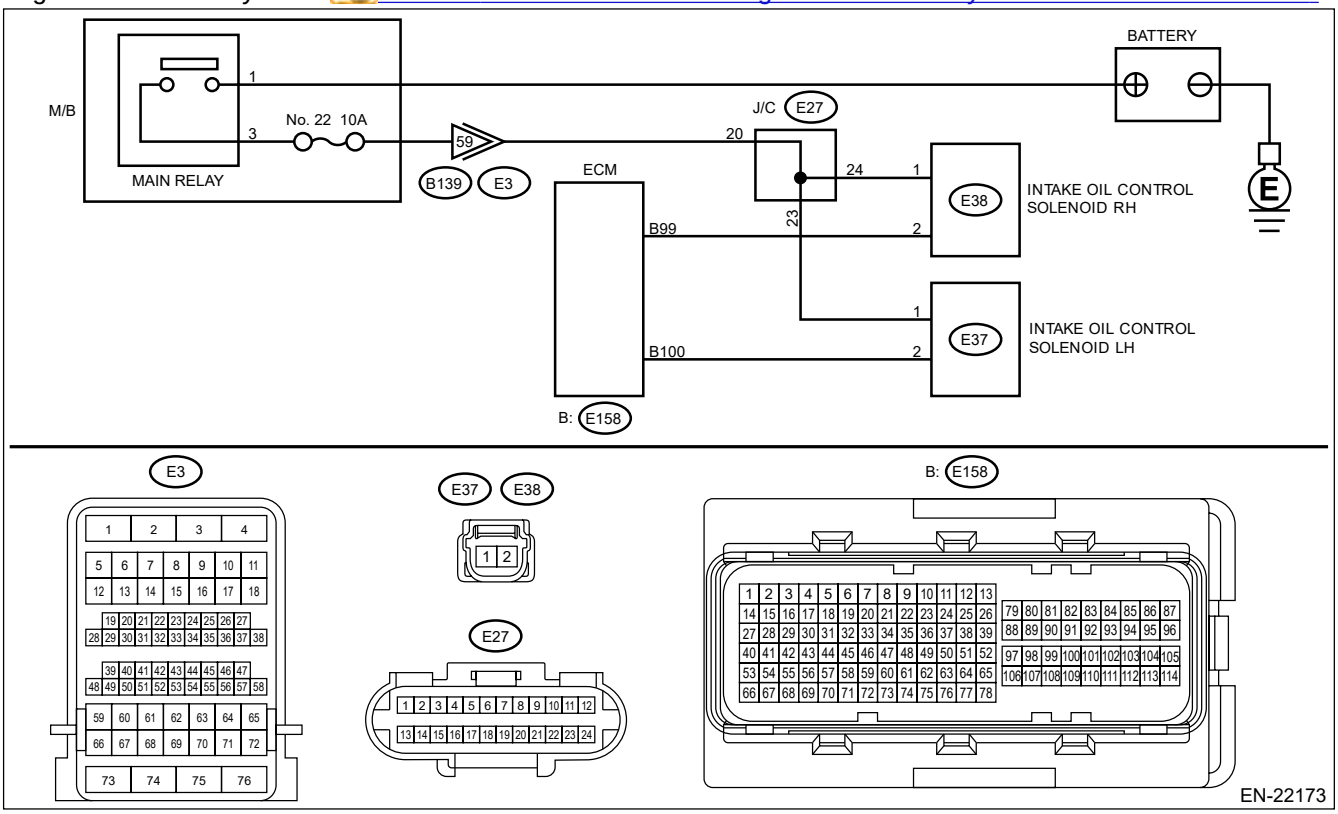
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 100 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.

Measure the voltage between intake oil control solenoid LH connector and engine ground.
Connector & terminal
(E37) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND INTAKE OIL FLOW CONTROL SOLENOID VALVE LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil flow control solenoid valve LH.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 100 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and intake oil flow control solenoid valve LH connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and engine ground.
   Connector & terminal
   (E37) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

6. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (OPEN).

Measure the resistance of harness between ECM connector and intake oil control solenoid LH.

Connector & terminal

(E158) No. 100 — (E37) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

7. CHECK INTAKE OIL CONTROL SOLENOID LH.

Measure the resistance between intake oil control solenoid LH terminals.

Terminals

No. 1 — No. 2:

Is the resistance 6 — 12 Ω?

Yes	Repair the poor contact of intake oil control solenoid LH connector.
No	Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0010. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0010 "A" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.

DTC P0021 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

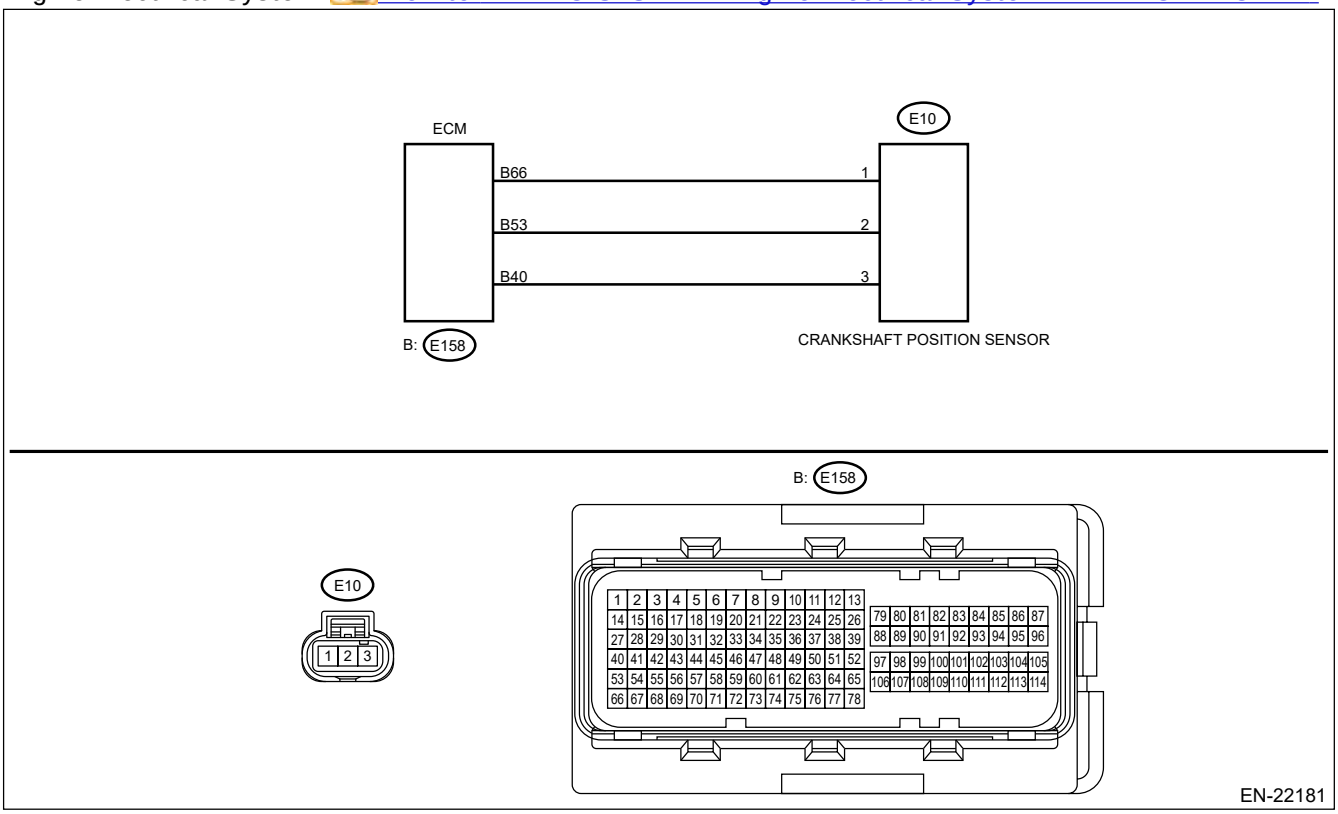
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

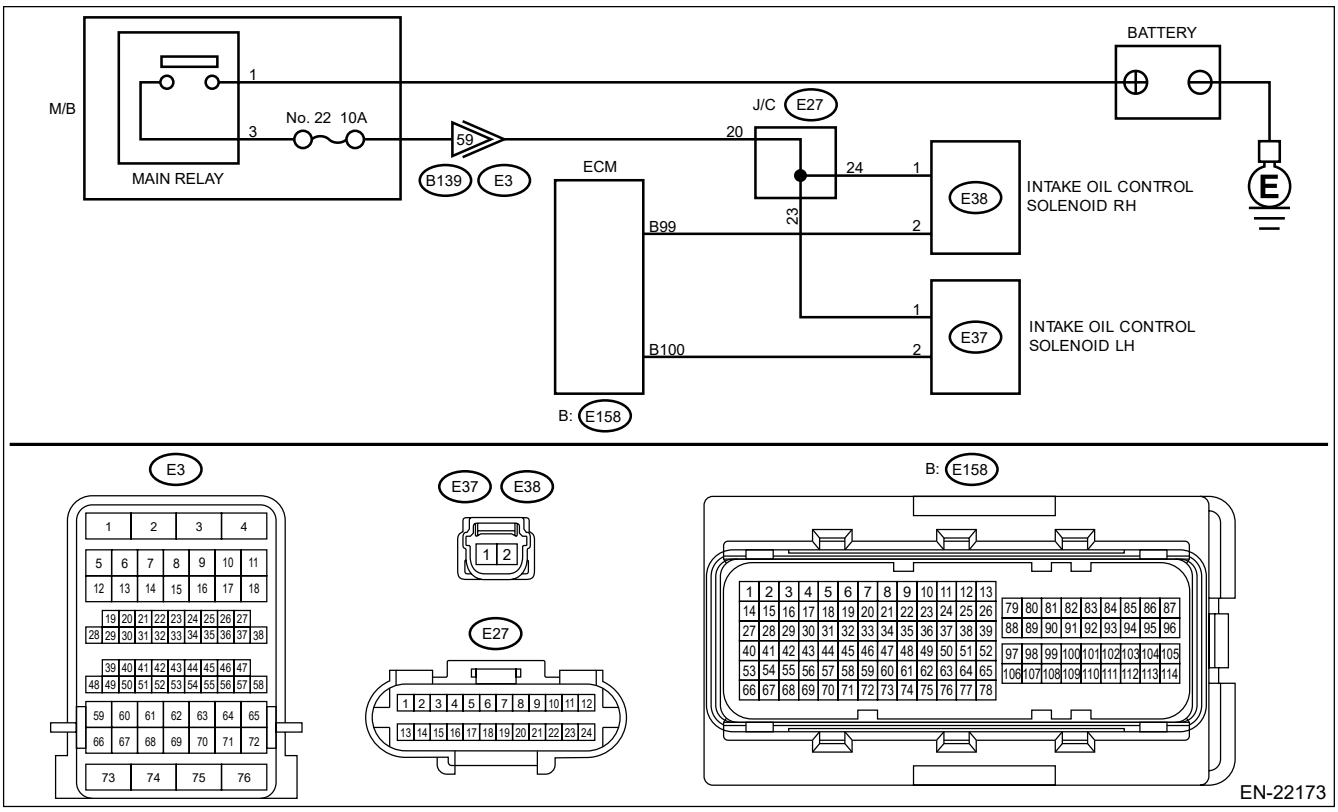
Note:

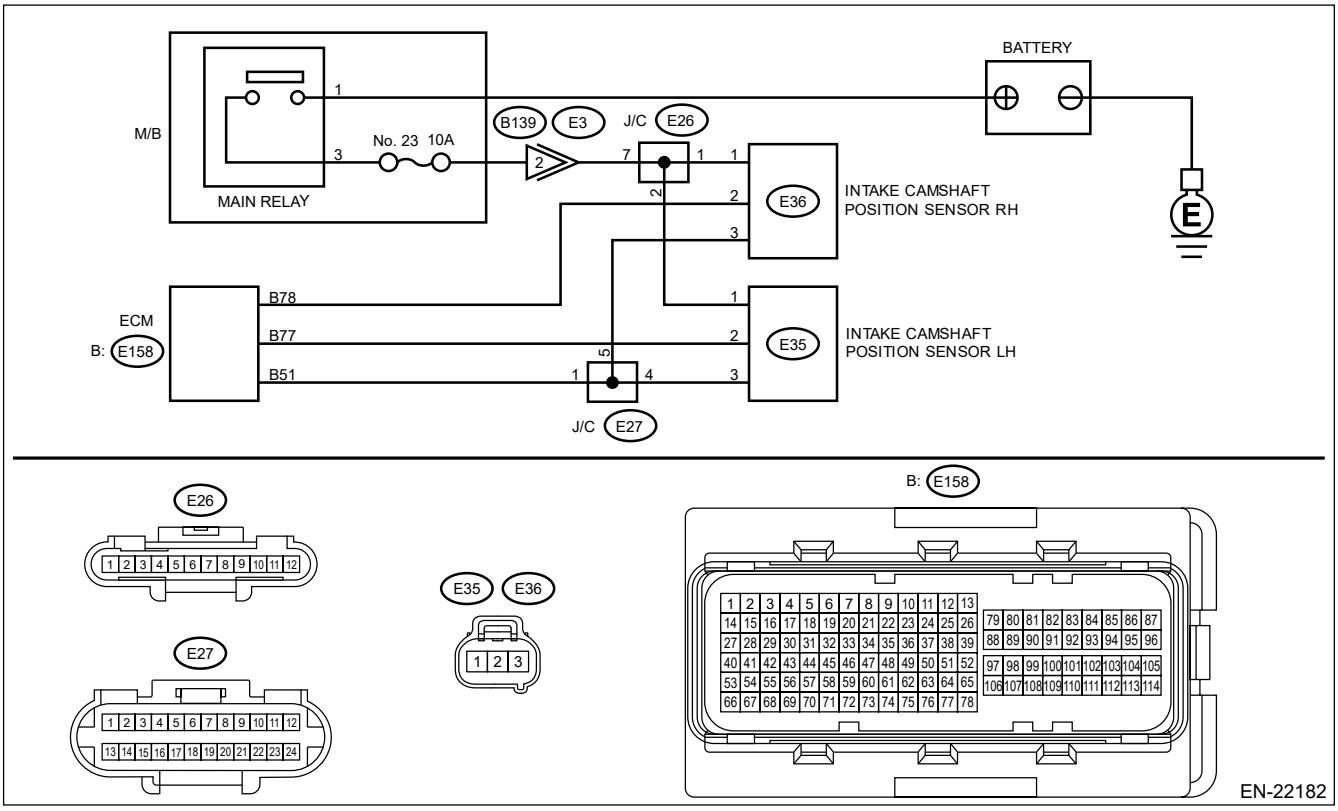
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
J/C
E27
20
24
1
2
23
ECM
B99
B100
E38
E37
INTAKE OIL CONTROL SOLENOID RH
INTAKE OIL CONTROL SOLENOID LH
B: E158
E3
E37
E38
E27
B: E158
EN-22173


BATTERY
M/B
1
3
No. 23 10A
MAIN RELAY
B139
E3
J/C
E26
2
7
1
2
3
E36
INTAKE CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B78
B77
B51
E35
INTAKE CAMSHAFT POSITION SENSOR LH
5
4
J/C
E27
E26
E27
E35
E36
B: E158
EN-22182

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC other than P000C and P0021 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 3.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Go to 5.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 14.

5. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 6.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 6.

6. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the intake oil control solenoid LH.
4. Measure the resistance between intake oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E158) No. 100 — (E37) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace faulty parts. Go to 14.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from intake camshaft position sensor LH.
4. Measure the resistance between the intake camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E158) No. 77 — (E35) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 14.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 14.

9. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 11.
No	Go to 10.

10. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 11.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 12.

11. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 12.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 12.

12. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 13.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 13.

13. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 14.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 14.

14. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

Caution:

- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

Note:

- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**

4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of[VVT monitor bank 2] 1000 or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Go to 15.

15. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 14.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0011. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0011 "A" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0023 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

Caution:

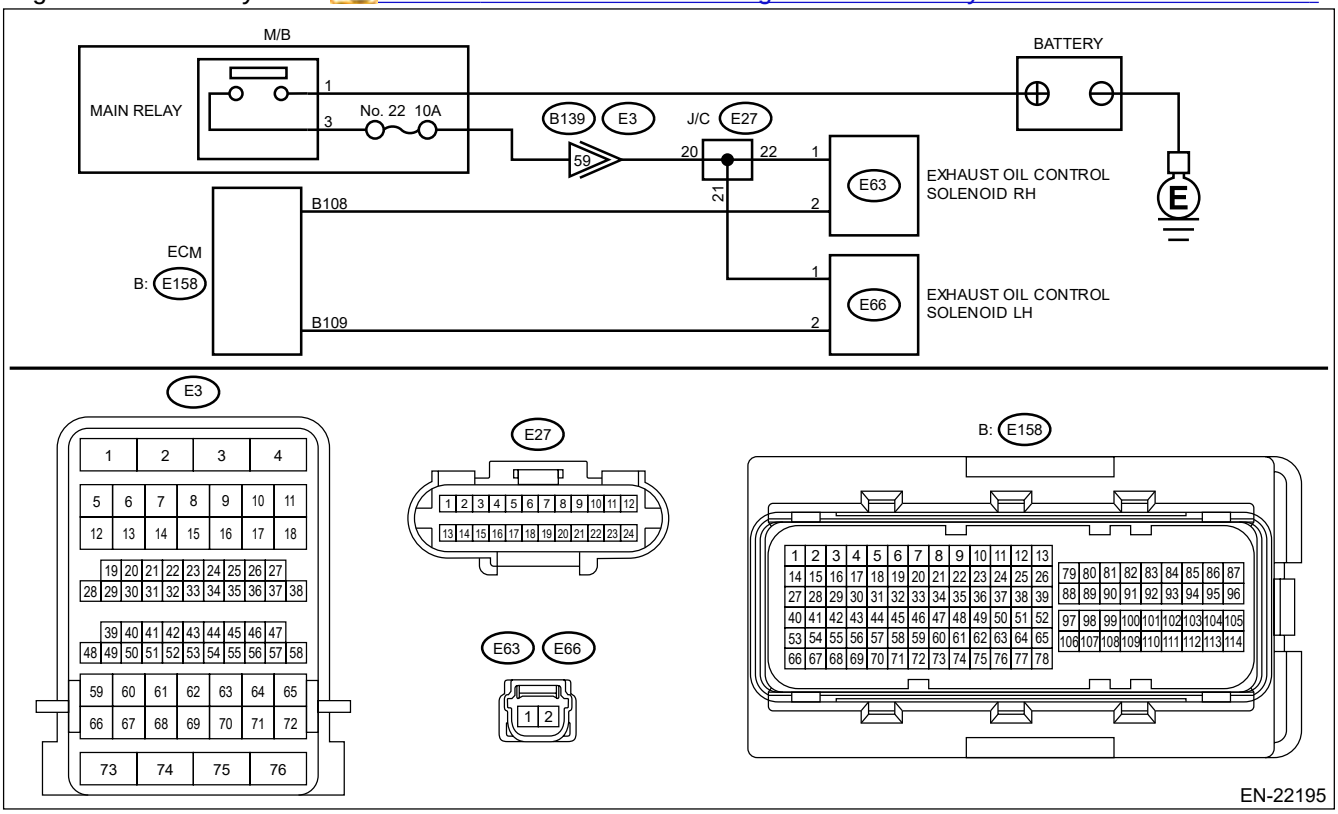
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 109 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.

Measure the voltage between exhaust oil control solenoid LH connector and engine ground.
Connector & terminal
(E66) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 109 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and exhaust oil control solenoid LH connector.
No	Go to 5.

5. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Measure the resistance between exhaust oil control solenoid LH connector and engine ground.
   Connector & terminal
   (E66) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

6. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH (OPEN).

Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH.

Connector & terminal

(E158) No. 109 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and exhaust oil control solenoid LH connector** • **Poor contact of coupling connector**

7. CHECK EXHAUST OIL CONTROL SOLENOID LH.

Measure the resistance between exhaust oil control solenoid LH terminals.

Terminals

No. 1 — No. 2:

Is the resistance 6 — 12 Ω?

Yes	Repair the poor contact of exhaust oil control solenoid LH connector.
No	Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0013. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0013 "B" CAMSHAFT POSITION ACTUATOR CONTROL CIRCUIT/OPEN BANK 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0024 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

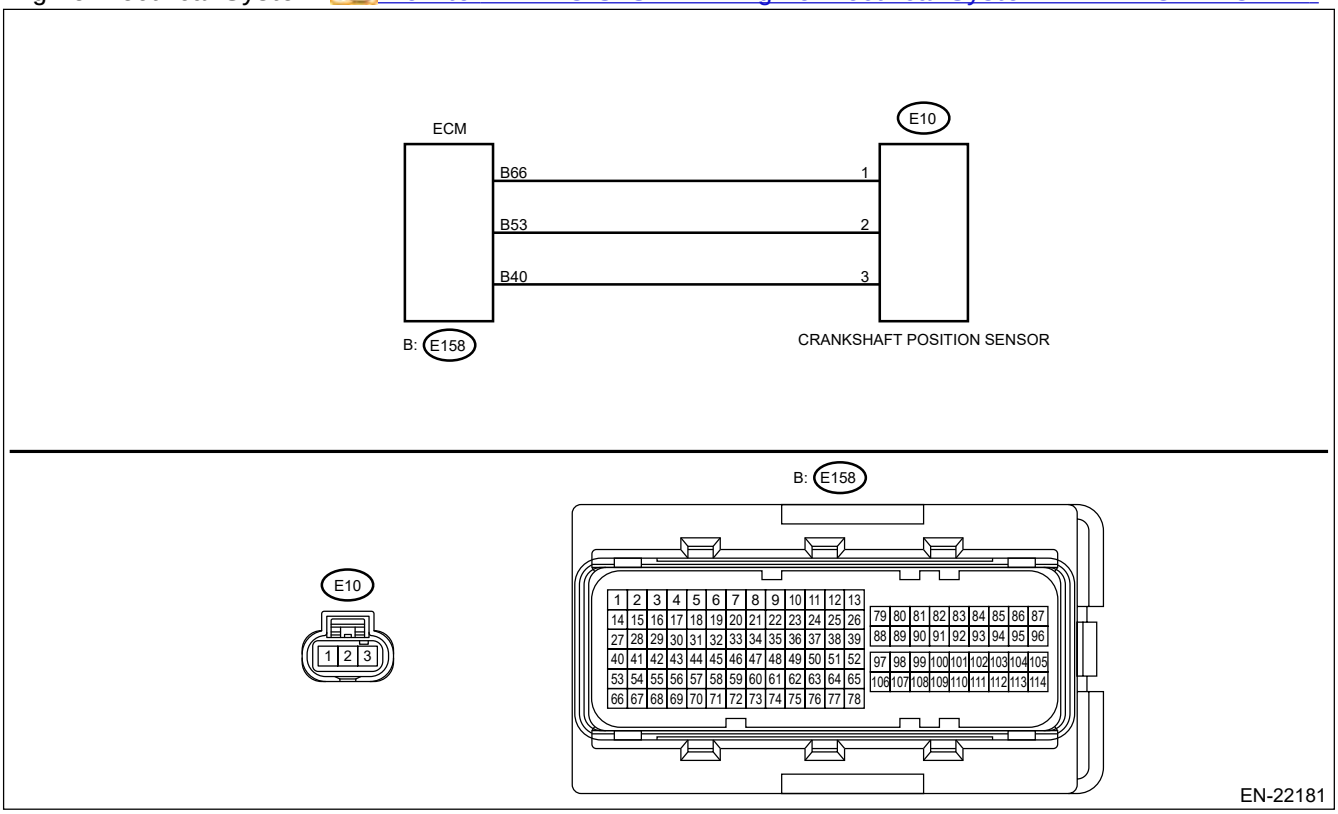
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

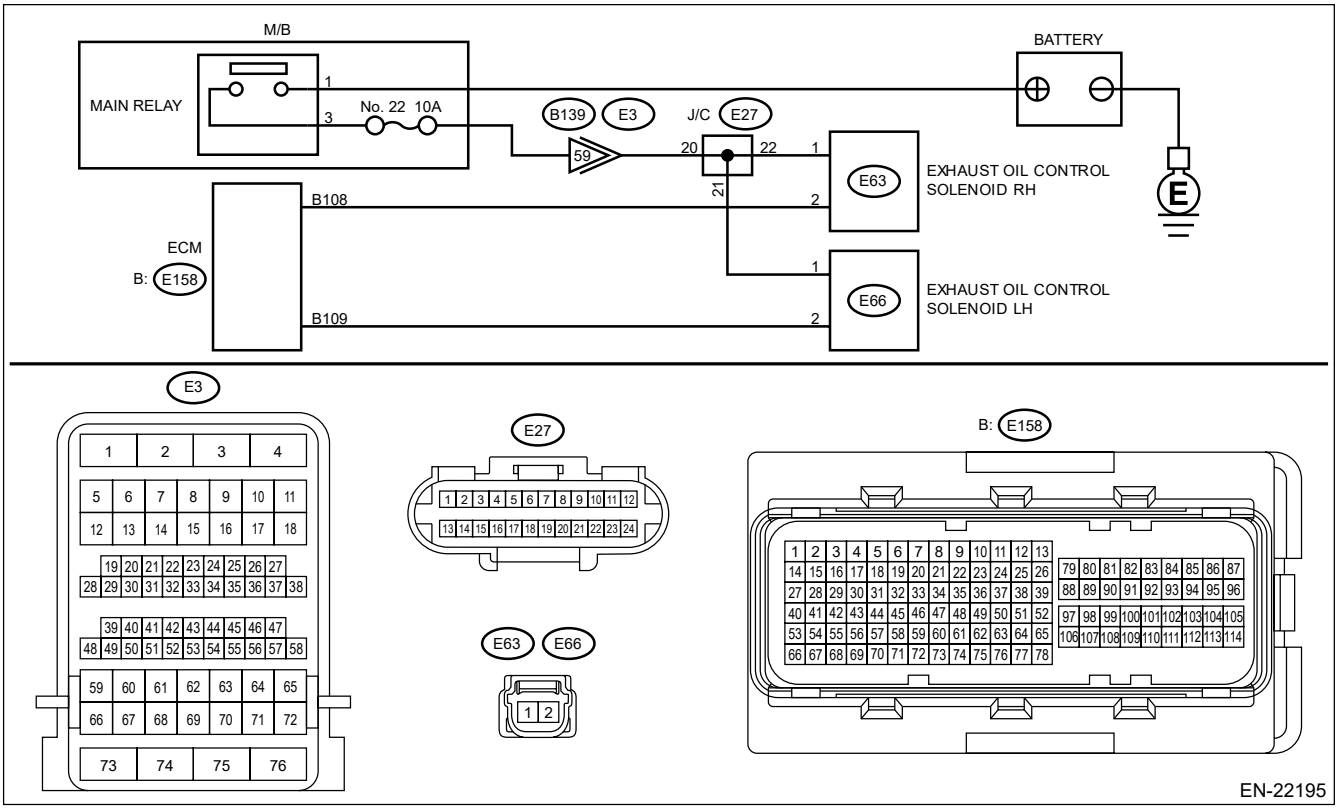
Note:

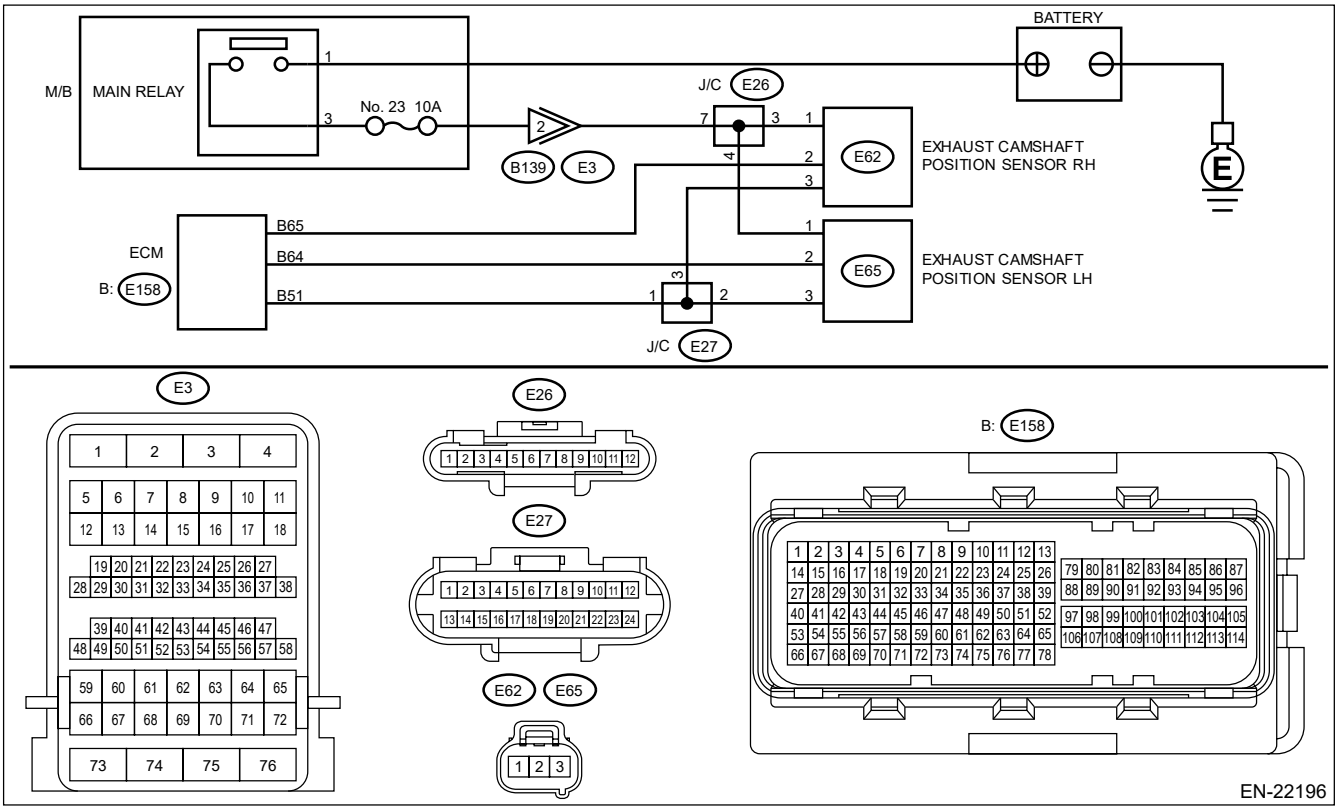
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.




M/B
MAIN RELAY
No. 22 10A
BATTERY
B139
E3
J/C
E27
59
20
22
21
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
ECM
B: E158
B109
E66
EXHAUST OIL CONTROL SOLENOID LH
E3
E27
E63
E66
B: E158
EN-22195


M/B
MAIN RELAY
No. 23 10A
BATTERY
J/C
E26
B139
E3
E62
EXHAUST CAMSHAFT POSITION SENSOR RH
ECM
B: E158
B65
B64
B51
E65
EXHAUST CAMSHAFT POSITION SENSOR LH
J/C
E27
E3
E26
E27
E62
E65
B: E158
EN-22196

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC other than P000D and P0024 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Save the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Go to 2.

2. CHECK ENGINE OIL CONDITION.

Check the engine oil condition.

Note:

Check the following items.

- **Within the specified range in amount**
- **Excessively dirty**
- **Coagulated by additives**
- **Use of oil of specified viscosity**

Is the check result OK?

Yes	Go to 3.
No	Adjust the oil amount, or replace the engine oil and engine oil filter. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 3.

3. CHECK ON-BOARD MONITOR TEST RESULT.

1. Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

   Caution:
   - **Performing inspection mode needs a driver along with a checker who should check the data.**
   - **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

   Note:
   - **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
   - **Always keep on checking the data while reading out the diagnostic value because the diagnostic value is repeatedly updated.**
5. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of [VVT monitor bank 2] of the replaced oil control solenoid 1000 or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK ON-BOARD MONITOR TEST RESULT.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 3.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Go to 5.
No	Idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter. Go to 14.

5. CHECK HARNESS AND CONNECTOR.

Check for a bend, damage and poor contact of harness and connector.

Note:

Check the following items.

- **ECM Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).**
- **Oil control solenoid Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.**
- **Camshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSPECTION.**
- **Crankshaft position sensor Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.**

Is the check result OK?

Yes	Go to 6.
No	Repair or replace faulty parts. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor. Go to 6.

6. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the exhaust oil control solenoid LH.
4. Measure the resistance between exhaust oil control solenoid LH connector and ECM connector.
   Connector & terminal
   (E158) No. 109 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace faulty parts. Go to 14.

7. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from exhaust camshaft position sensor LH.
4. Measure the resistance between the exhaust camshaft position sensor LH connector and ECM connector.
   Connector & terminal
   (E158) No. 64 — (E65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace faulty parts. Go to 14.

8. CHECK HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the crankshaft position sensor.
4. Measure the resistance between the crankshaft position sensor connector and ECM connector.
   Connector & terminal
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair or replace faulty parts. Go to 14.

9. CHECK ENGINE OIL PRESSURE.

Check the engine oil pressure. Ref. to MECHANICAL(H4DO)>Engine Oil Pressure>INSPECTION.

Is the oil pressure of engine oil normal?

Yes	Go to 11.
No	Go to 10.

10. CHECK OIL STRAINER.

Check the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan>INSPECTION.

Does any foreign matter exist at the oil strainer in the oil pan?

Yes	Check and clean inside the oil strainer. Ref. to LUBRICATION(H4DO)>Oil Pan. Go to 11.
No	Replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. **Caution:** **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** Go to 12.

11. CHECK OIL PATH OF CHAIN COVER.

1. Remove the engine from the vehicle. Ref. to MECHANICAL(H4DO)>Engine Assembly>REMOVAL.
2. Check the oil path of the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover>INSPECTION.

Note:

Check the O-rings in the following oil path and also check that no foreign matter exists.

- **Inlet of oil pump**
- **Outlet of oil pump**
- **Each O-ring in the path leading to left/right cylinder head**
- **Oil control solenoid**
- **Foreign matter exists**

Is the check result OK?

Yes	Go to 12.
No	Replace faulty parts. If there is any foreign matter, replace the chain cover. Ref. to MECHANICAL(H4DO)>Chain Cover. Go to 12.

12. CHECK THE CAMSHAFT CONDITION.

1. Remove the timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly>REMOVAL.
2. Rotate the camshaft by hand to compare the rotational resistance of the four.

Note:

Check the following items if there is a clearly faulty condition in the camshaft (bank 2) such as restriction or rotational resistance by comparing it with the rotational resistance of the camshaft (bank 1).

- **Foreign matter attached to camshaft**
- **Damage of camshaft (scratching, galling, wear, etc.)**
- **Check for consequence from improper rotation of cam journal bearing**

Is the check result OK?

Yes	Go to 13.
No	Replace the cam carrier and camshaft. Ref. to MECHANICAL(H4DO)>Cam Carrier. Ref. to MECHANICAL(H4DO)>Camshaft. Go to 13.

13. CHECK OIL PASSAGE BETWEEN OIL PUMP AND OIL CONTROL SOLENOID.

Visually check the following parts of the oil passage from the oil pump to the oil control solenoid to check obvious defectiveness such as foreign matter, clogging, etc.

- Oil passage in cam Carrier
- Oil passage on cylinder head side
- Oil passage at the joint between cam sprocket and camshaft
- Oil passage at the back of sprocket and the end of camshaft when the sprocket is removed

Note:

Refer to removal procedure of cam carrier in service manual. Ref. to MECHANICAL(H4DO)>Cam Carrier>REMOVAL.

Is the check result OK?

Yes	Replace the sprocket. Ref. to MECHANICAL(H4DO)>Cam Sprocket. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** Go to 14.
No	Remove the foreign matter. Replace the cam carrier oil filter (reuse not allowed). Ref. to MECHANICAL(H4DO)>Cam Carrier. **Caution:** • **Overuse of liquid gasket may cause a malfunction when installing the chain cover. Use one specified in the service manual with an appropriate amount (line diameter) of application. Ref. to MECHANICAL(H4DO)>Chain Cover>INSTALLATION.** • **Make sure that the insertion amount of oil filter matches the surface of cam carrier. (Do not over-insert) Ref. to MECHANICAL(H4DO)>Cam Carrier>ASSEMBLY.** **Note:** **After servicing, idle the engine for 5 minutes, and then replace the oil filter and engine oil (flushing). Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT. Ref. to LUBRICATION(H4DO)>Oil Filter.** Go to 14.

14. CHECK ON-BOARD MONITOR TEST RESULT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the inspection mode T. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or general scan tool, read the values in [VVT monitor bank 1] and [VVT monitor bank 2] according to the reading out procedure of MODE$06. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.

Caution:

- **Performing inspection mode needs a driver along with a checker who should check the data.**
- **When performing inspection mode on a public road, pay sufficient attention to the traffic condition and give the highest priority to road safety.**

Note:

- **Perform the inspection mode again without stopping the engine because the diagnosis is not completed yet when the diagnostic value indicates 0.**
- **Keep on checking the data during inspection mode because the diagnostic value is repeatedly updated.**

4. Record the readings [VVT monitor bank 1] and [VVT monitor bank 2].

Is the value of[VVT monitor bank 2] 1000 or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Go to 15.

15. CHECK DTC.

Compare the values of [VVT monitor bank 1] and [VVT monitor bank 2] recorded in step 14.

Is the value of [VVT monitor bank 2] 1000 or less, and more than (value of [VVT monitor bank 1] ×1.5+ 100) compared with the value of [VVT monitor bank 1]?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0014. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0014 "B" CAMSHAFT POSITION - TIMING OVER-ADVANCED OR SYSTEM PERFORMANCE BANK 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0030 A/F / O2 HEATER CONTROL CIRCUIT BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

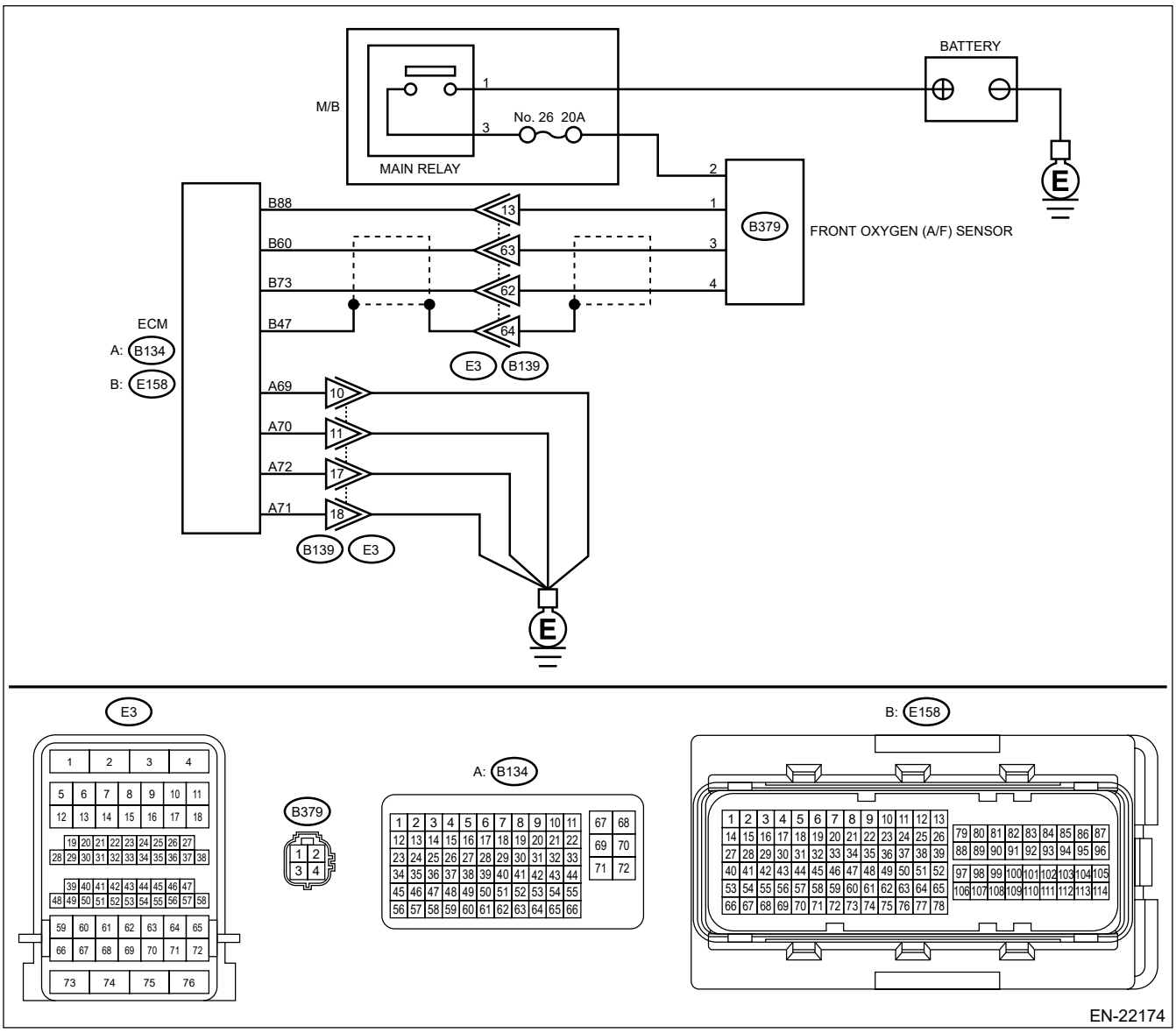
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


BATTERY
M/B
1
3
No. 26 20A
MAIN RELAY
2
B379
FRONT OXYGEN (A/F) SENSOR
B88
B60
B73
B47
13
63
62
64
1
3
4
ECM
A: B134
B: E158
E3
B139
A69
A70
A72
A71
10
11
17
18
B139
E3
E
E3
B379
A: B134
B: E158
EN-22174

1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR CONNECTOR (OPEN).

1. Start and warm up the engine.
2. Turn the ignition switch to OFF.
3. Disconnect the connector from ECM.
4. Disconnect the connectors from front oxygen (A/F) sensor.
5. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 88 — (B379) No. 1:
(E158) No. 60 — (B379) No. 3:
(E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

2. CHECK FRONT OXYGEN (A/F) SENSOR.

Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals

No. 1 — No. 2:

Is the resistance 2 — 3 Ω?

Yes	Go to 3.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

3. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and front oxygen (A/F) sensor connector.

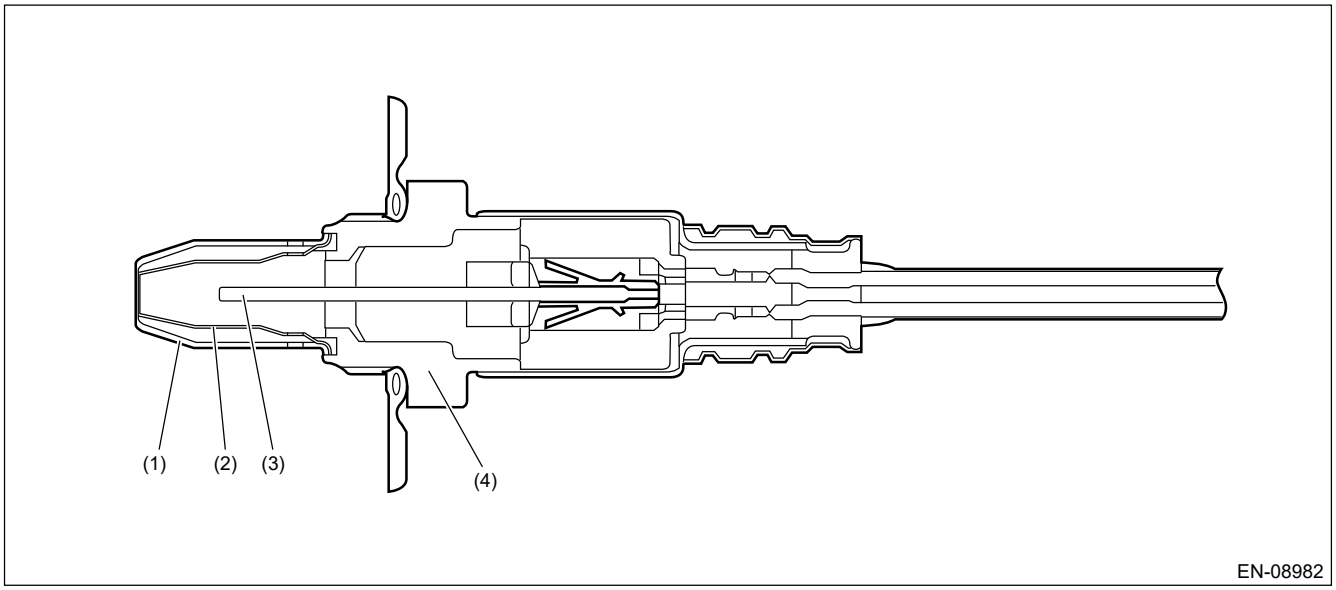
Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect functional errors of the front oxygen (A/F) sensor heater.
Judge as NG when it is determined that the front oxygen (A/F) sensor impedance is large when looking at engine status such as deceleration fuel cut.

2. COMPONENT DESCRIPTION



(1) Element cover (outer)
(2) Element cover (inner)
(3) Sensor element
(4) Sensor housing

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
A/F sensor heater control duty	More than 15%
Elapsed time after returning from the fuel cut	20000ms or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously when 20000ms have elapsed since the fuel cut was initiated after starting the heater control.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front oxygen (A/F) sensor impedance	More than 75Ω

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0031 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 1

DTC detecting condition:

Immediately at fault recognition

Caution:

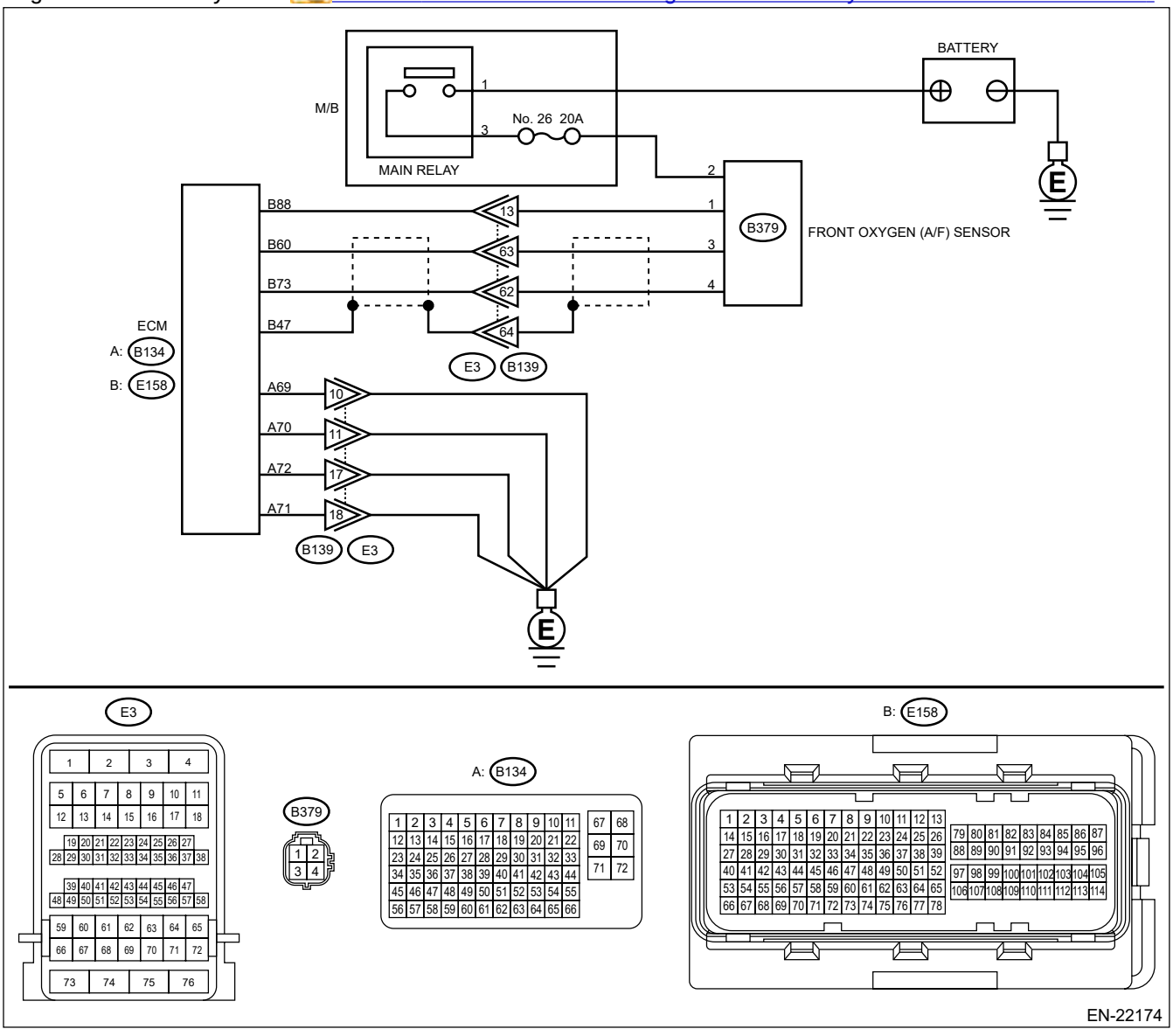
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.
   Connector & terminal
   (B379) No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the power supply line. **Note:** **In this case, repair the following item:** • **Open circuit in harness between A/F, oxygen sensor relay connector and front oxygen (A/F) sensor connector** • **Poor contact of A/F, oxygen sensor relay connector** • **Poor contact of coupling connector** • **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and front oxygen (A/F) sensor connector.
   Connector & terminal
   (E158) No. 88 — (B379) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector** • **Coupling connector**

3. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 4.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Coupling connector**

4. CHECK FRONT OXYGEN (A/F) SENSOR.

Measure the resistance between front oxygen (A/F) sensor terminals.

Terminals

No. 1 — No. 2:

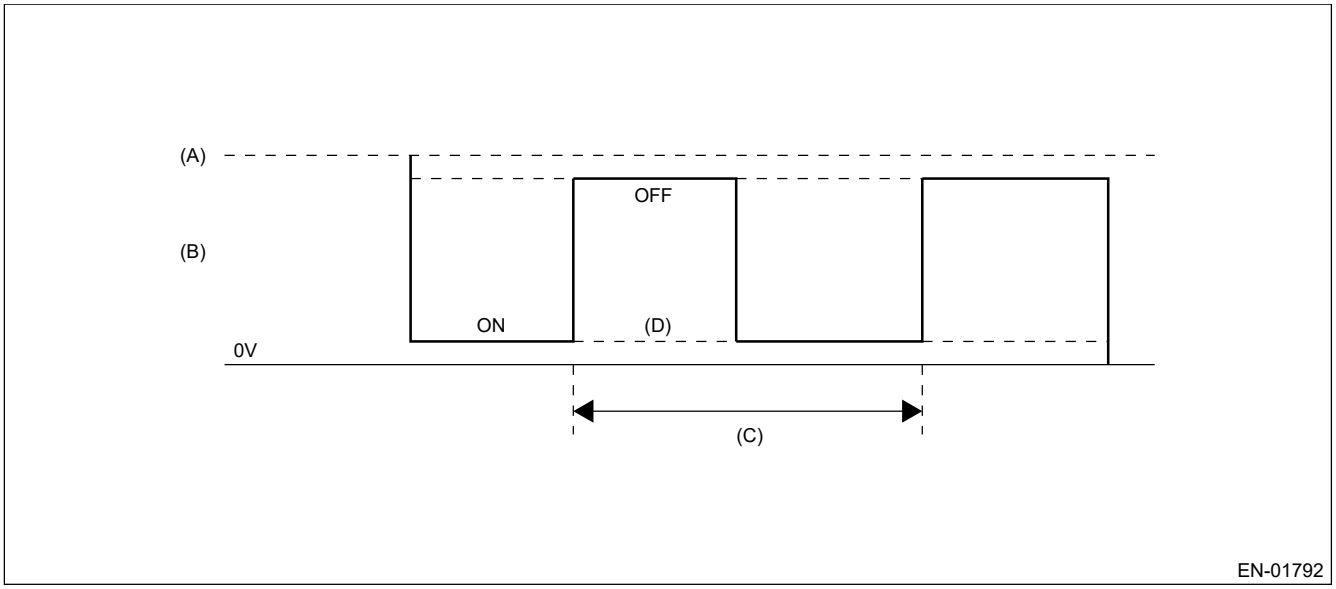
Is the resistance 2 — 3 Ω?

Yes	Repair the poor contact of ECM connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.
The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.
Judge as NG when the terminal voltage remains Low.

2. COMPONENT DESCRIPTION



(A) Battery voltage (B) Front oxygen (A/F) sensor heater output voltage (C) 128 ms

(D) Low error

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Front oxygen (A/F) sensor heater control duty	10.9 V or more Less than 87.5%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 1.3 V

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0032 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 1

DTC detecting condition:

Immediately at fault recognition

Caution:

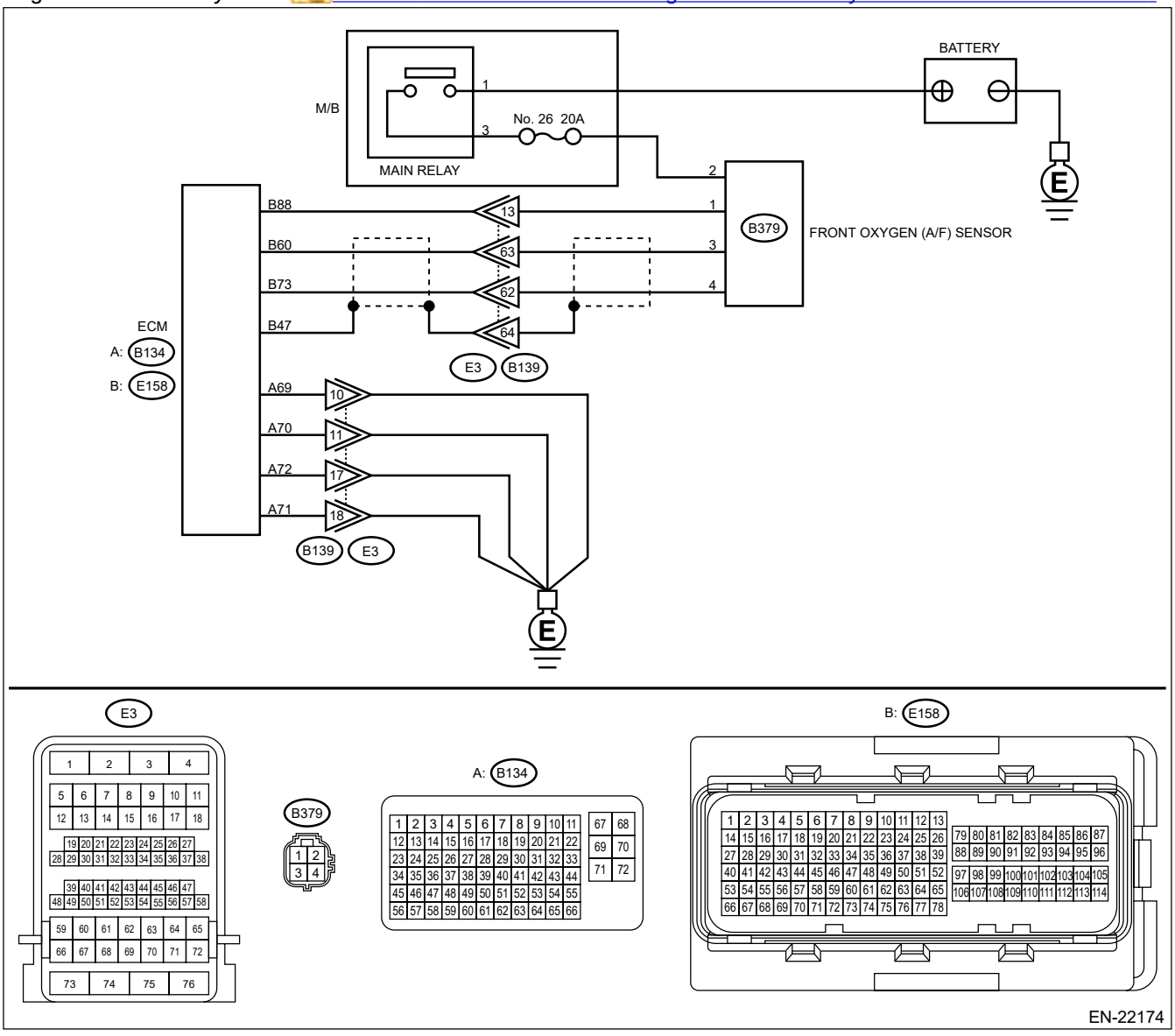
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 88 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector.
No	Go to 2.

2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

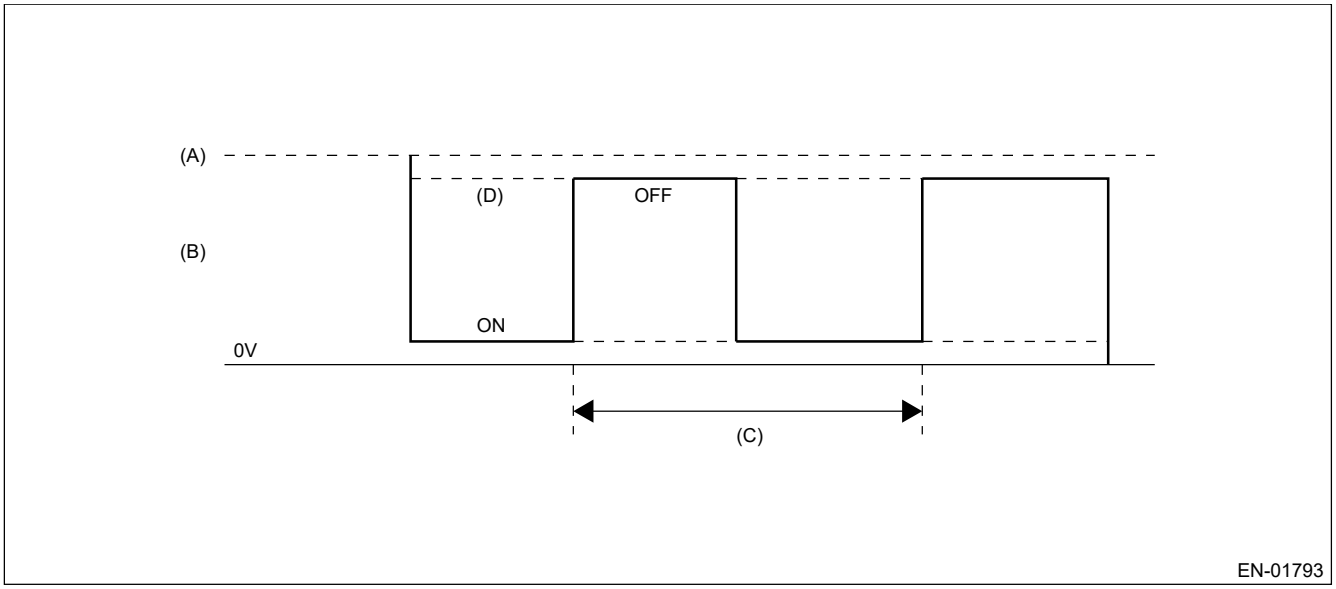
Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect front oxygen (A/F) sensor heater open or short circuit.
The front oxygen (A/F) sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.
Judge as NG when the terminal voltage remains High.

2. COMPONENT DESCRIPTION



(A) Battery voltage (B) Front oxygen (A/F) sensor heater output voltage (C) 128 ms

(D) High error

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Front oxygen (A/F) sensor heater control duty	More than 12.5%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.4 V or more

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

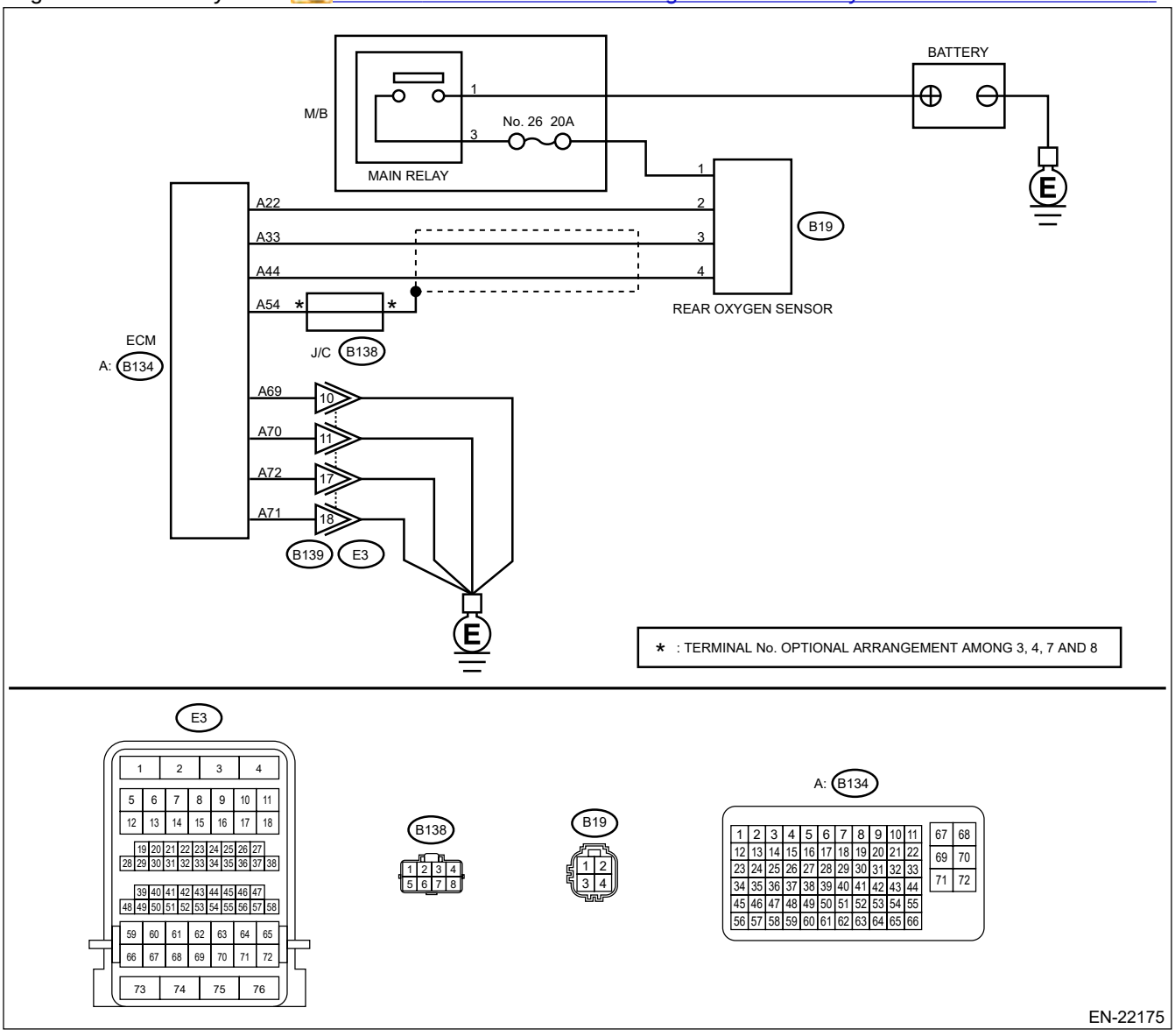
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY TO REAR OXYGEN SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from rear oxygen sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between rear oxygen sensor connector and engine ground.
   Connector & terminal
   (B19) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the power supply line. Or replace the main relay. **Note:** **In this case, repair the following item:** • **Open circuit in harness between A/F, oxygen sensor relay connector and rear oxygen sensor connector** • **Poor contact of A/F, oxygen sensor relay connector** • **Poor contact of coupling connector** • **Malfunction of A/F, oxygen sensor relay**

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and oxygen sensor connector.
   Connector & terminal
   (B134) No. 22 — (B19) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

3. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 4.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Coupling connector**

4. CHECK REAR OXYGEN SENSOR.

Measure the resistance between rear oxygen sensor terminals.

Terminals

No. 2 — No. 1:

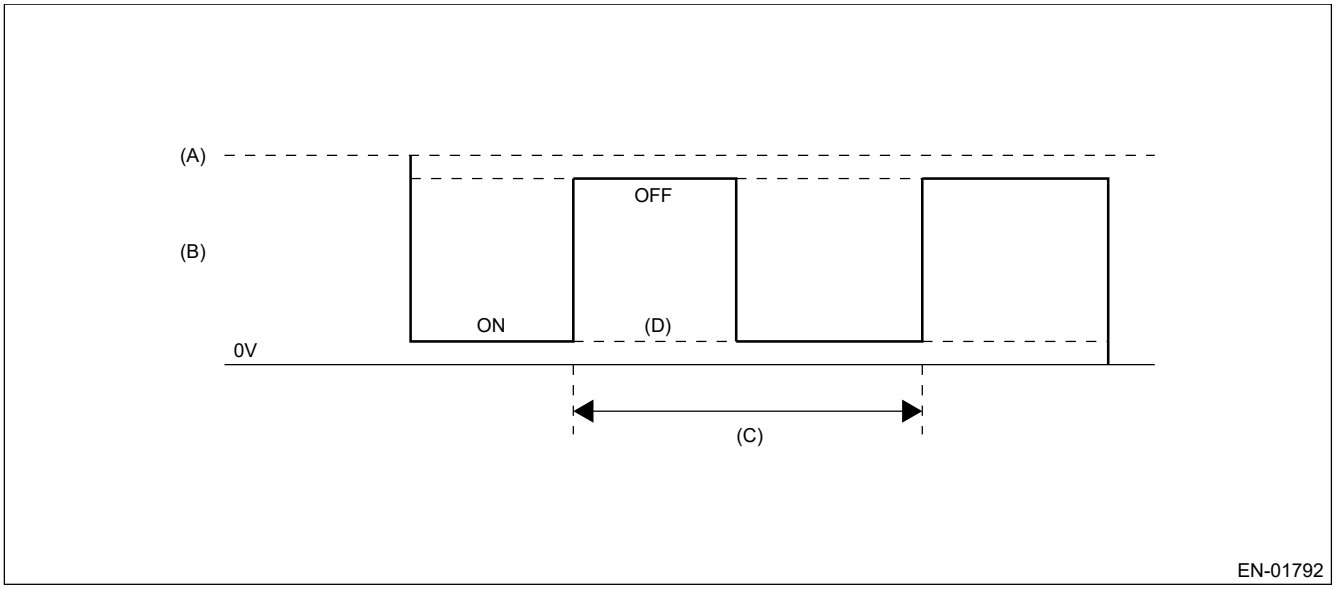
Is the resistance 5 — 7Ω?

Yes	Repair the poor contact of ECM connector.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.
The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.
Judge as NG when the terminal voltage remains Low.

2. COMPONENT DESCRIPTION



(A) Battery voltage (B) Output voltage of the rear oxygen sensor heater (C) 256 ms (cycles)

(D) Low error

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor heater control duty	Less than 75%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Battery voltage × 0.47 or less

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0038 A/F / O2 HEATER CONTROL CIRCUIT HIGH BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

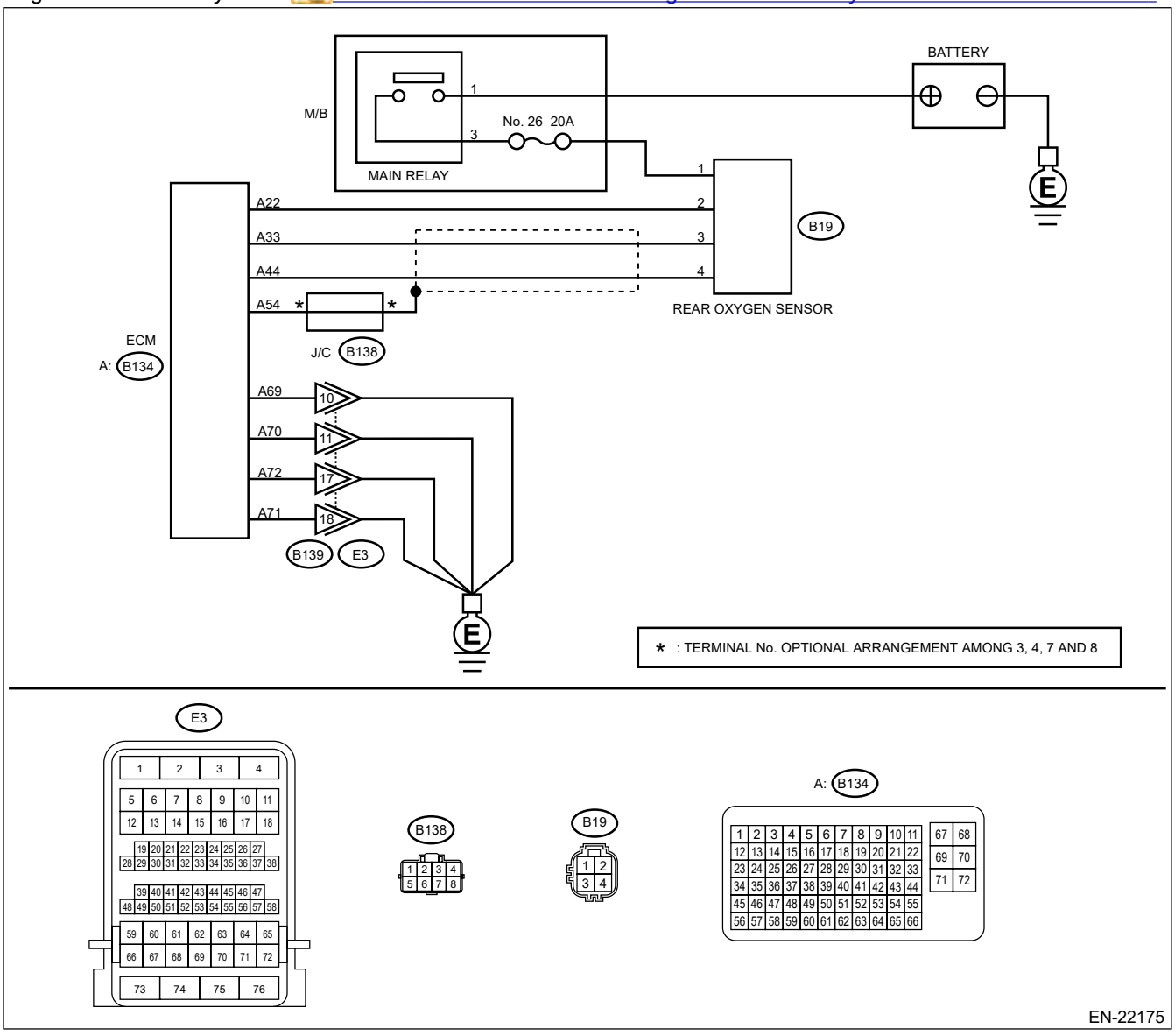
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 22 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and rear oxygen sensor connector.
No	Go to 2.

2. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

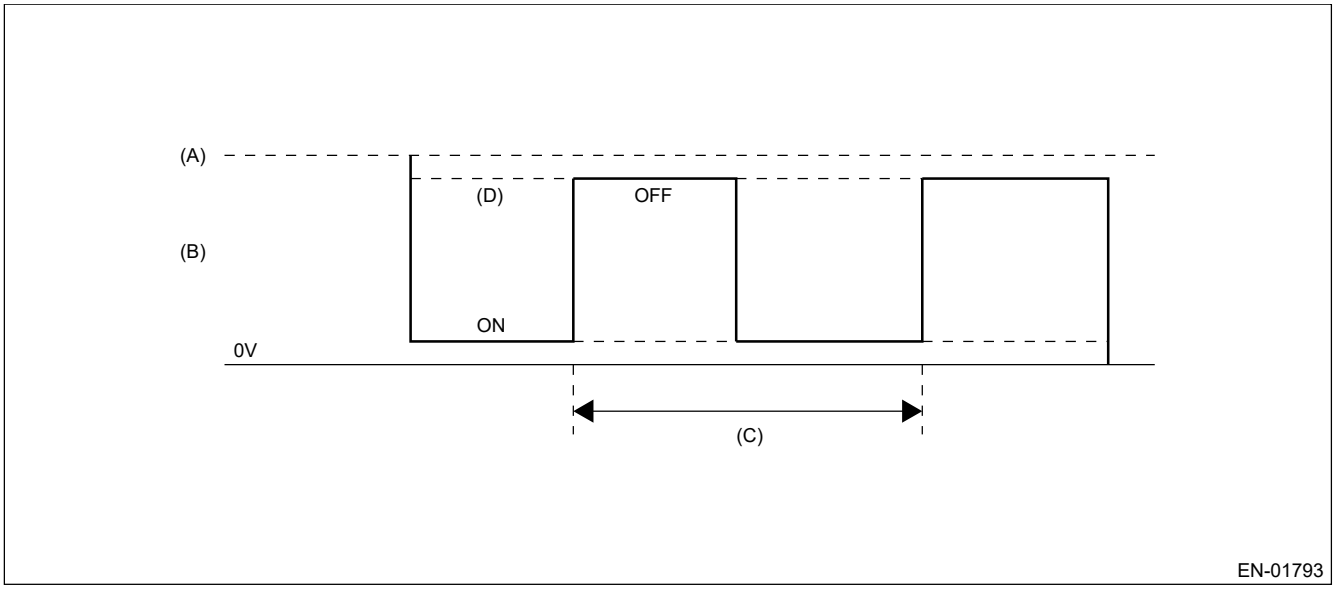
Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the rear oxygen sensor heater open or short circuit.
The rear oxygen sensor heater performs duty control, and the output terminal voltage at ON is 0 V, and the output terminal voltage at OFF is the battery voltage.
Judge as NG when the terminal voltage remains High.

2. COMPONENT DESCRIPTION



(A) Battery voltage

(B) Output voltage of the rear oxygen sensor heater

(C) 256 ms (cycles)

(D) High error

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor heater control duty	25% or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	More than battery voltage × 0.11

Time needed for diagnosis: 2.56 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0068 MAP/MAF - THROTTLE POSITION CORRELATION

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 2.

2. CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure]73.3—106.6 kPa (550 — 800 mmHg, 21.65—31.50 inHg) at ignition ON, and 20.0—46.7 kPa (150 — 350 mmHg, 5.91—13.78 inHg) at idling?

Yes	Go to 3.
No	Replace the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.

3. CHECK THROTTLE OPENING ANGLE.

Using the Subaru Select Monitor or a general scan tool, read the value of [Throttle Opening Angle].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Throttle Opening Angle] less than 5% when throttle is fully closed?

Yes	Go to 4.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.

4. CHECK THROTTLE OPENING ANGLE.

Using the Subaru Select Monitor or a general scan tool, read the value of [Throttle Opening Angle].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Throttle Opening Angle] 85% or more when throttle is fully closed?

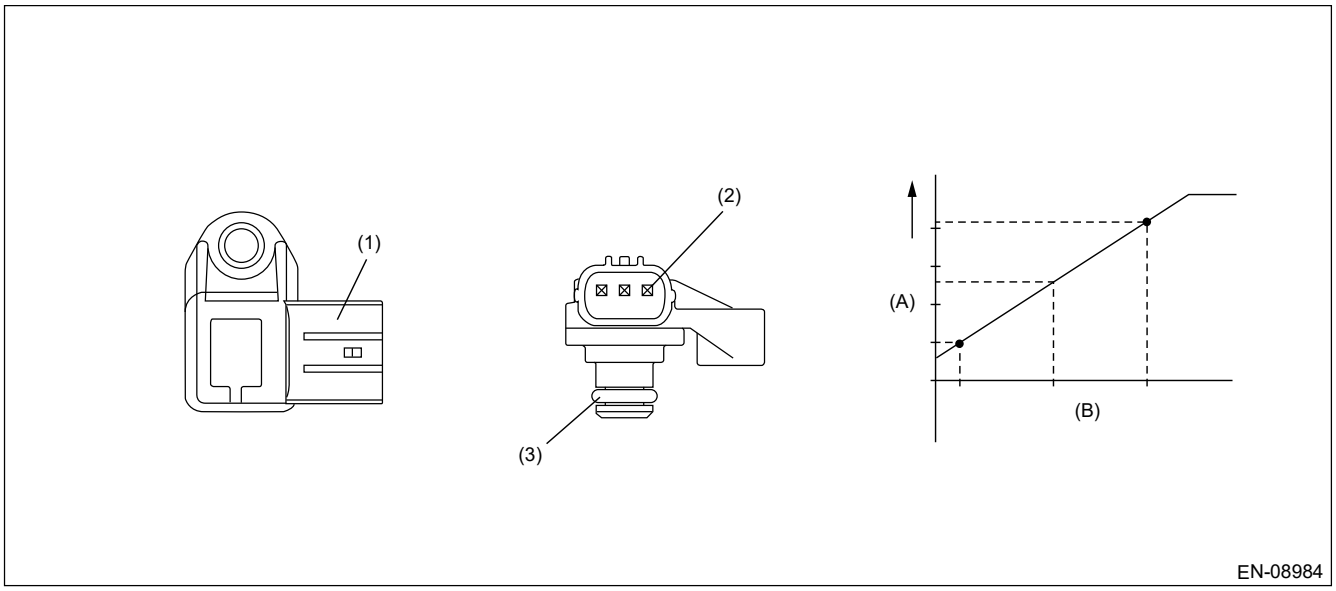
Yes	Replace the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.

1. OUTLINE OF DIAGNOSIS

Detect problems in the intake manifold pressure sensor output properties.
Judge as NG when the intake air pressure AD value is Low whereas it seemed to be High from the

viewpoint of engine condition, or when it is High whereas it seemed to be Low from the engine condition.

2. COMPONENT DESCRIPTION



(A) Output voltage
(B) Absolute pressure
(1) Connector
(2) Terminals
(3) O-ring

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Low	
Engine speed	Less than 4000rpm
Engine load (with atmospheric pressure compensation)	More than 0.56g/rev (0.02oz/rev)
Throttle position	8% or more
High	
Engine speed	500rpm—900rpm
Engine load (with atmospheric pressure compensation)	Less than 0.31g/rev (0.01oz/rev)
Throttle position	Less than 4%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.
If the duration of time while the following conditions are met is longer than the time indicated, judge as

NG.

Judgment value

Malfunction Criteria	Threshold Value
Low	
Output voltage	Less than 2.18V (CVT model) Less than 2.18V (MT model)
High	
Output voltage	2.18V or more

Time needed for diagnosis:

Low side: 5000ms

High side: 5000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0071 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0071 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Ambient Air Temperature].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Current Data Display For HVAC System". Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.
3. Read the change of the value in [Ambient Air Temperature] while heating and cooling the ambient sensor using a hair dryer.

   Data Monitor

   Caution:
   Do not heat the part to the temperature where you cannot touch it with your bare hand in order to prevent burning yourself and protect the part.

Does the value of [Ambient Air Temperature] change between heating and cooling?

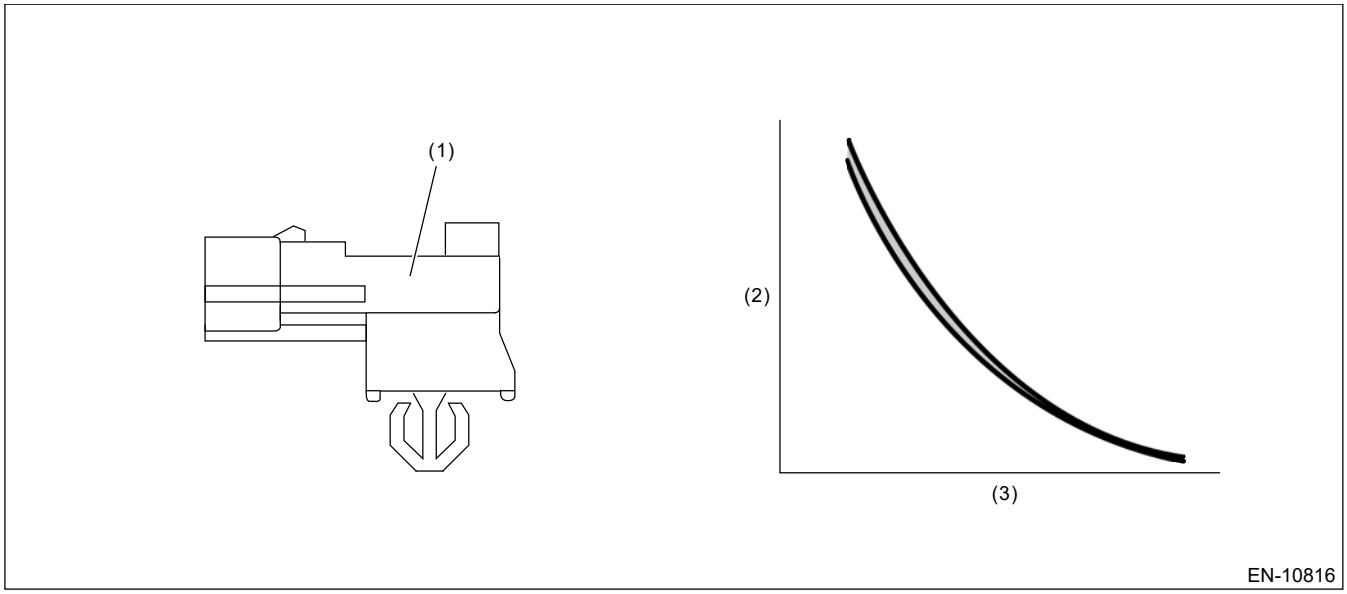
Yes	Repair the poor contact of ECM connector.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of ambient temperature sensor characteristics.
After the engine starts after the specified period of soaking time has elapsed, judge by correlation between ambient temperature sensor value, intake air temperature sensor value and engine coolant temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between ambient air temperature and intake air temperature, ambient air temperature and engine coolant temperature.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



(1) Ambient sensor (2) Resistance value (kΩ) (3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600s or more
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
|Ambient air temperature 30 sec. after engine start − Intake air temperature 30 sec. after engine start|	More than value of Map
|Ambient air temperature at engine start − Engine coolant temperature at engine start|	More than 25°C (45°F)

Map

Ambient temperature °C (°F)	−30 (−22)	45 (113)	60 (140)	80 (176)

Ambient temperature °C (°F)	**−30 (−22)**	**45 (113)**	**60 (140)**	**80 (176)**
|Ambient air temperature 30 sec. after engine start − Intake air temperature 30 sec. after engine start| °C (°F)	20 (36°F)	20 (36°F)	32 (57.6F)	32 (57.6F)

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW

DTC detecting condition:
Immediately at fault recognition

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0073 or P0072 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK COMBINATION METER.

Check the combination meter system. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

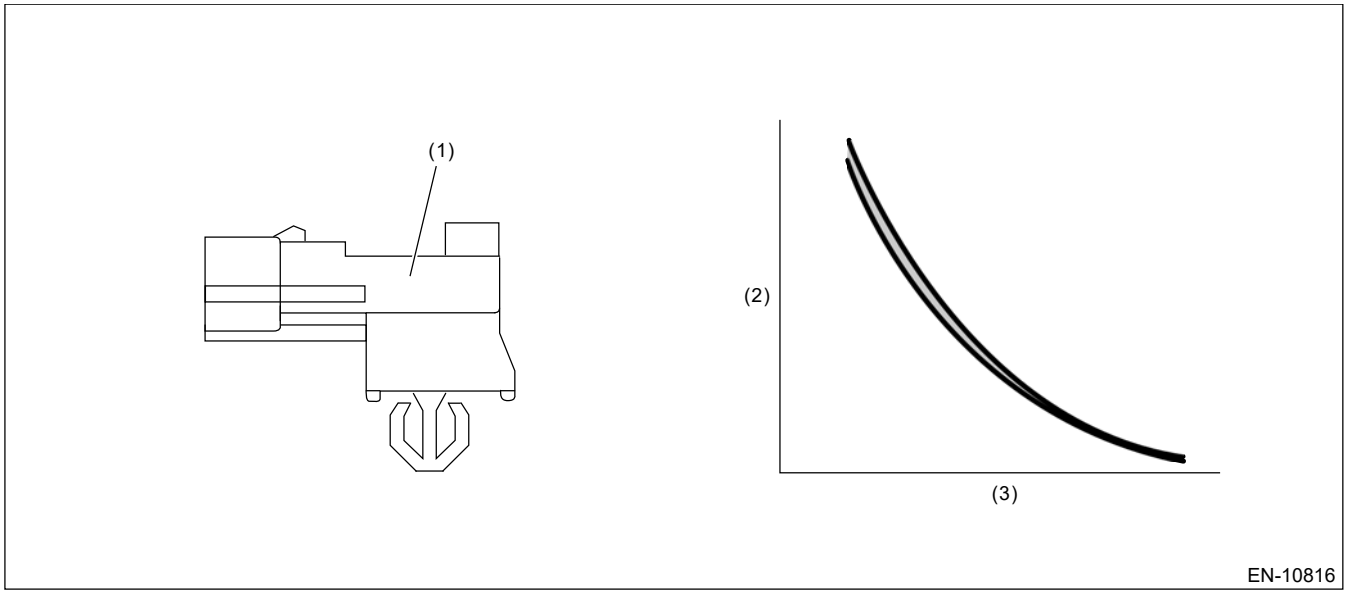
Yes	Repair the poor contact of ECM connector.
No	Repair the combination meter system. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



(1) Ambient sensor (2) Resistance value (kΩ) (3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.42 V

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0073 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" HIGH

Note:

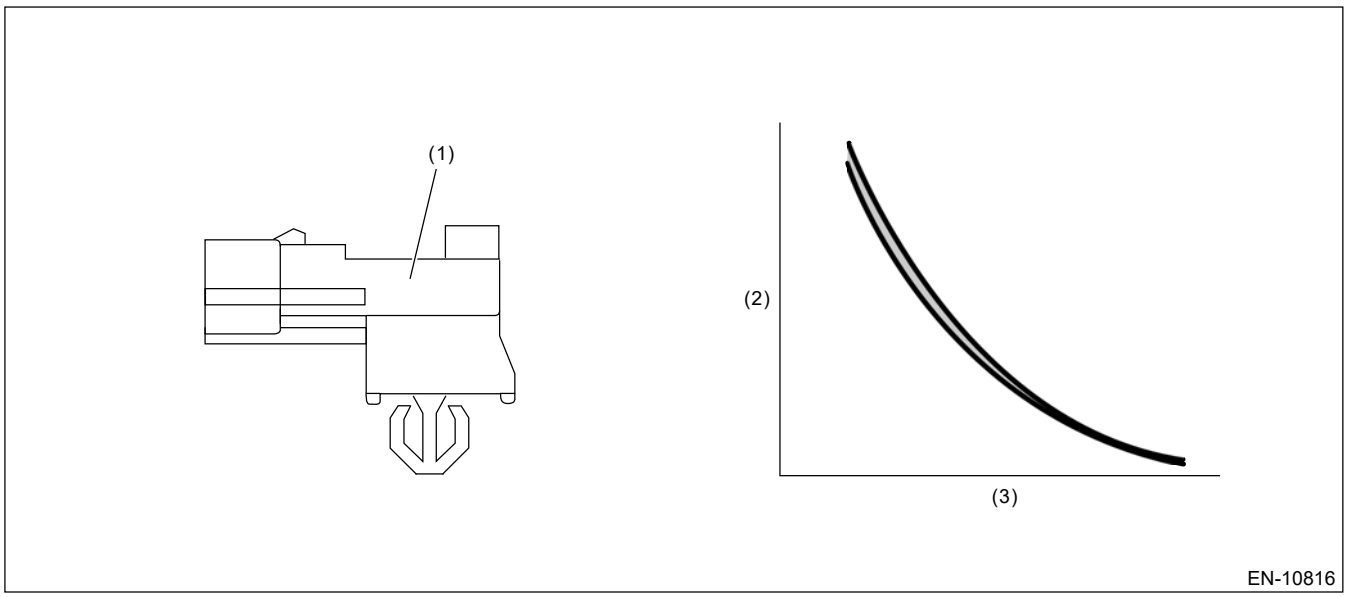
For the diagnostic procedure, refer to DTC P0072. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0072 AMBIENT AIR TEMPERATURE SENSOR CIRCUIT "A" LOW.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of ambient temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

Ambient temperature sensor is connected to combination meter. ECM receives the data of ambient temperature sensor via CAN communication with combination meter.



(1) Ambient sensor (2) Resistance value (kΩ) (3) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	More than 4.88 V

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0087 FUEL RAIL/SYSTEM PRESSURE - TOO LOW BANK 1

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Improper idling
- Poor driving performance
- Poor acceleration

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FOR FUEL DELIVERY LINE LEAKAGE.

Visually check the fuel delivery line for leakage.
Warning:
- **When checking fuel delivery line during engine operation, be very careful so that one's hair, body and clothes do not touch the rotating part in the engine compartment.**
- **If there is fuel leakage, the fuel can be combusted spontaneously by the engine heat, resulting in serious accident. Therefore, take extra care.**
- **Prepare the necessary fire-extinguishing appliance for immediate fire fighting in case of fire.**

Note:
Concerning the section where visible inspection is difficult, the fuel odor provides a good indication of determining the fuel leakage.

Are there leaks from the fuel delivery line?

Yes	Replace the faulty fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0087 displayed? (Current malfunction)

Yes	Go to 3.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

3. CHECK EXPERIENCE OF RUNNING OUT OF FUEL.

Check if there was an experience of running out of fuel using “Check List for Interview”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Check List for Interview>CHECK > CHECK LIST NO. 2.

Has the vehicle experienced running out of fuel?

Yes	Finish the diagnosis. **Note:** **DTC may be stored by running out of fuel.**
No	Go to 4.

4. CHECK FUEL PRESSURE.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value of [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A] when racing the engine.

   Data Monitor

   Note:
   For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Fuel Rail Pressure A] synchronized with that of [Commanded Fuel Rail Pressure A]?

Yes	Go to 5.
No	• The value in [Fuel Rail Pressure A] does not increase: Go to 7. • The value in [Fuel Rail Pressure A] does not change: Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pressure Sensor.

5. CHECK OF FUEL PUMP.

1. Turn the ignition switch to ON. (Engine OFF)
2. On the item [Active Test], select [Fuel Pump Relay] and perform ON/OFF drive.
   Note:
   For detailed operation procedures, refer to “Application help”.
3. Check for operating sound in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Go to 6.
No	Check fuel pump circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

6. CHECK FUEL PRESSURE (LOW PRESSURE SIDE).

Check the fuel pressure on low-pressure side. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.

Is the check result OK?

Yes	Go to 7.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

7. CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE).

1. Start the engine.
2. Using the Subaru Select Monitor, read the change in values of [Fuel Rail Pressure A] when stopping the engine.

   Data Monitor

   Note:
   - **In order to maintain the communication with Subaru Select Monitor, turn the ignition switch to OFF, and immediately turn it to ON.**
   - **For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Does the value of [Fuel Rail Pressure A] decrease rapidly?

Yes	Go to 8.
No	Go to 9.

8. CHECK HIGH-PRESSURE FUEL PUMP.

Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump.

Is the check result OK?

Yes	Go to 9.
No	Replace the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump.

9. CHECK FOR REPRODUCTION OF FAILURE.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the corresponding Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is the same DTC as current diagnosis output?

Yes	Replace the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump. After replacement, go to the next step. Go to 10. **Note:** **When the high-pressure fuel pump has been replaced in step 8, go to the next step without replacing the high-pressure fuel pump. Go to 11.**
No	End.

10. CHECK FOR REPRODUCTION OF FAILURE.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the corresponding Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0087 displayed? (Current malfunction)

Yes	Go to 11.
No	End.

11. CHECK FOR FUEL DELIVERY LINE LEAKAGE (HIGH PRESSURE SIDE).

1. Start the engine.
2. Using the Subaru Select Monitor, read the change in values of [Fuel Rail Pressure A] when stopping the engine.



Note:

- **In order to maintain the communication with Subaru Select Monitor, turn the ignition switch to OFF, and immediately turn it to ON.**
- **For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Does the value of [Fuel Rail Pressure A] decrease rapidly?

Yes	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0088. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1.

DTC P0088 FUEL RAIL/SYSTEM PRESSURE - TOO HIGH BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Poor acceleration

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0088 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK FUEL PRESSURE.

1. Start the engine.
2. Using Subaru Select Monitor, read the value of [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A] while the vehicle is accelerated from the parked state to 60 km/h (37.3 MPH) and stops again.



Caution:

- **Follow traffic rules and give the highest priority to safe driving.**
- **During driving, do not operate or gaze at the Subaru Select Monitor.**
- **Always check the measurement value after bringing the vehicle to a stop in a safe place.**

Note:

- **In order to apply the running load to the vehicle, actually drive the vehicle, and read the measurement value.**
- **For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Is the value of [Fuel Rail Pressure A] synchronized with that of [Commanded Fuel Rail Pressure A]?

Yes	Replace the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>High Pressure Fuel Pump. After replacement, go to the next step. Go to 3.
No	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Pressure Sensor.

3. CHECK FOR REPRODUCTION OF FAILURE.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform the corresponding Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0088 displayed? (Current malfunction)

Yes	Repair the poor contact of ECM connector.
No	End.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of high pressure fuel system function.
Judge as NG when actual pressure is not close to target pressure.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Continuous time after fuel cut	More than 4000ms
Target pressure change every 64 ms	1.9MPa or less

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Actual fuel pressure − Target fuel pressure	Less than −3.5MPa	P0087

Malfunction Criteria	Threshold Value	DTC
Actual fuel pressure – Target fuel pressure	More than 6MPa	P0088

Time needed for diagnosis: 10 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0101 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Improper idling
- Engine stall
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

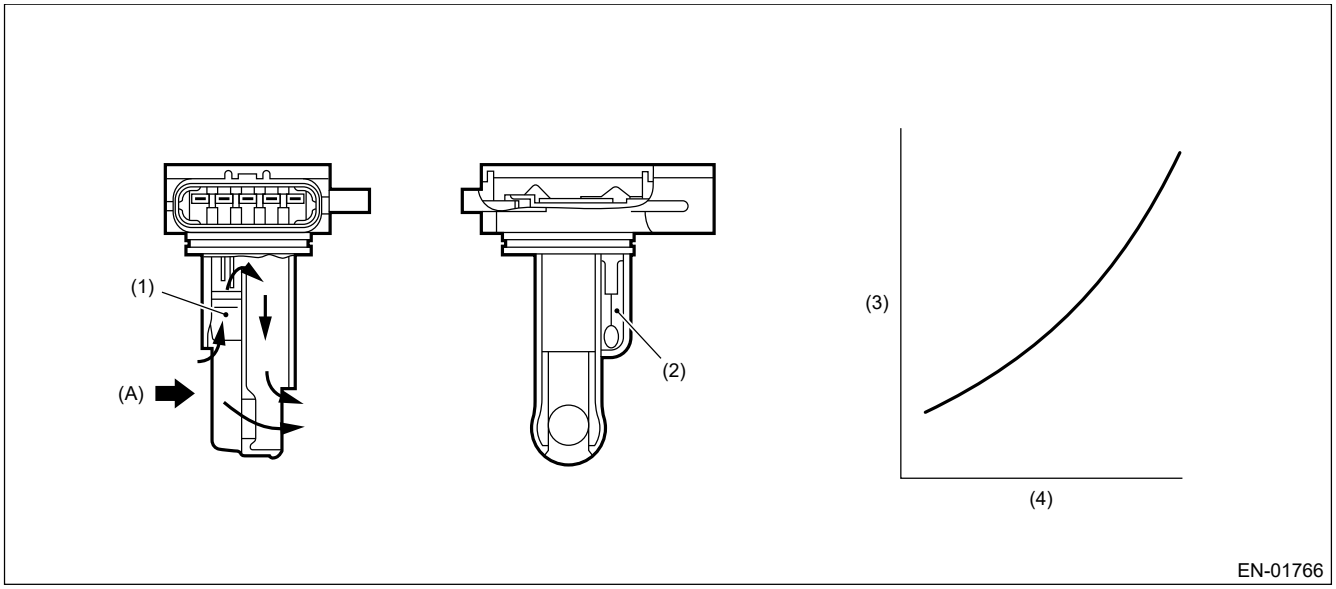
Is DTC P0101 displayed? (Current malfunction)

Yes	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of air flow sensor output properties.
Judge as a low side NG when the air flow voltage indicates a small value regardless of running in a state where the air flow voltage increases. Judge as a high side NG when the air flow voltage indicates a large value regardless of running in a state where the air flow voltage decreases. Judge air flow sensor property NG when the Low side or High side becomes NG.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(3) Voltage (V)

(4) Amount of intake air (kg (lb)/s)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Low	
Engine speed	2000rpm or more
Throttle position	12° or more
Intake manifold pressure (with atmospheric pressure compensation)	74.7kPa (560mm Hg ,22inHg) or more (CVT model) 74.7kPa (560mm Hg ,22inHg) or more (MT model)
High	
Engine speed	500rpm — 900rpm (CVT model) 500rpm — 900rpm (MT model)
Throttle position	Less than 5°
Intake manifold pressure (with atmospheric pressure compensation)	50.7kPa (380mm Hg ,15inHg) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after idling.

5. DIAGNOSTIC METHOD

Judge as NG when Low side or High side becomes NG.
If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Low	
Output voltage	Less than 8.3g/s (0.29oz/s)
High	
Output voltage	8.3g/s (0.29oz/s) or more

Time needed for diagnosis:
Low: 5000ms
High: 5000ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0102 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

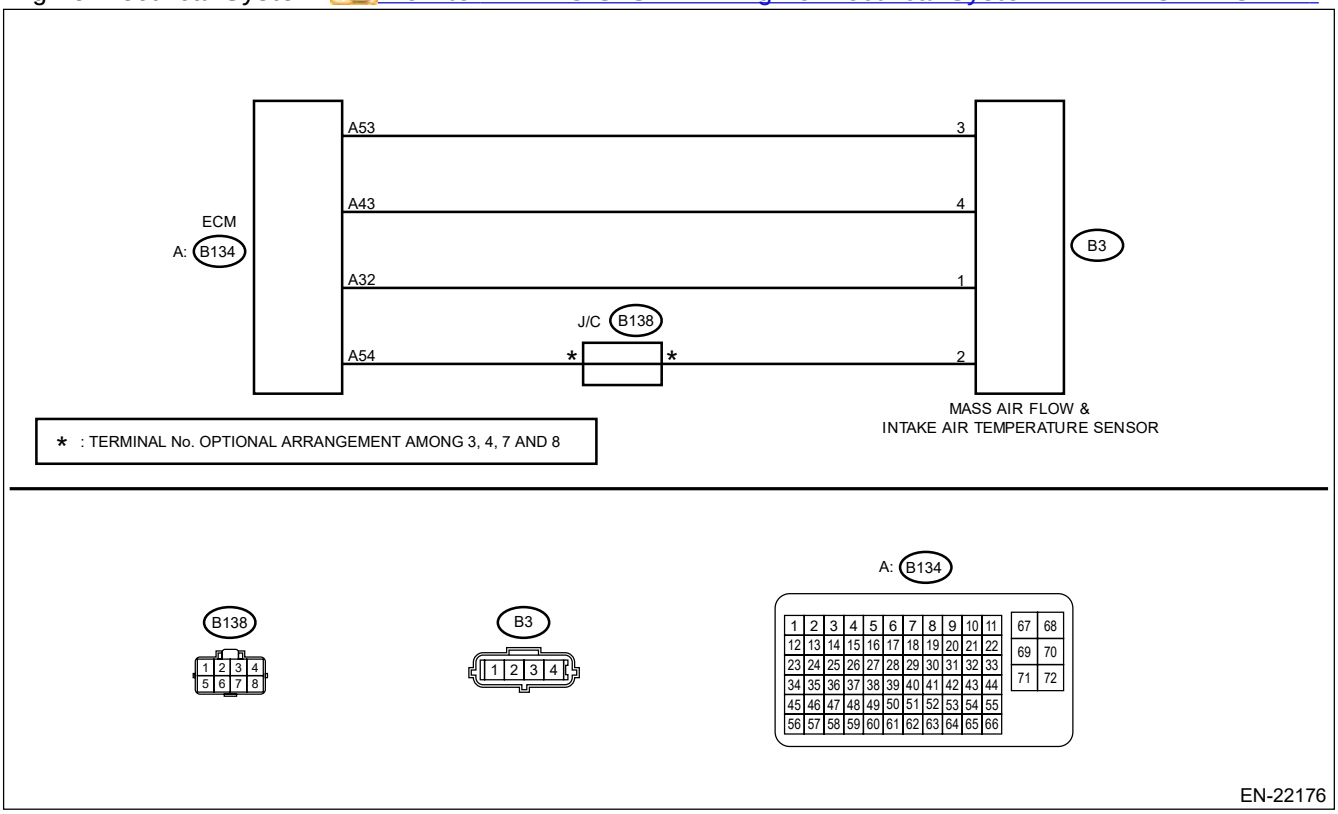
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Mass Air Flow].
   Note:
   For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Mass Air Flow] 0 g/s (0 oz/s)?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK POWER SUPPLY OF MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from the mass air flow and intake air temperature sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between mass air flow and intake air temperature sensor connector and engine ground.
   Connector & terminal
   (B3) No. 3 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between main relay and mass air flow and intake air temperature sensor connector** • **Poor contact of main relay connector**

3. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 53 — (B3) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 53 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

5. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B134) No. 59 (+) — Chassis ground (−):

Is the value of [Air Flow Sensor Voltage] 5 V or more?

Yes	Repair the short circuit of harness to power supply between ECM connector and the mass air flow and intake air temperature sensor connector.
No	Go to 6.

6. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Connect the connector to ECM.
3. Measure the resistance of harness between mass air flow and intake air temperature sensor connector and engine ground.
   Connector & terminal
   (B3) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 7.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Poor contact of ECM connector**

7. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

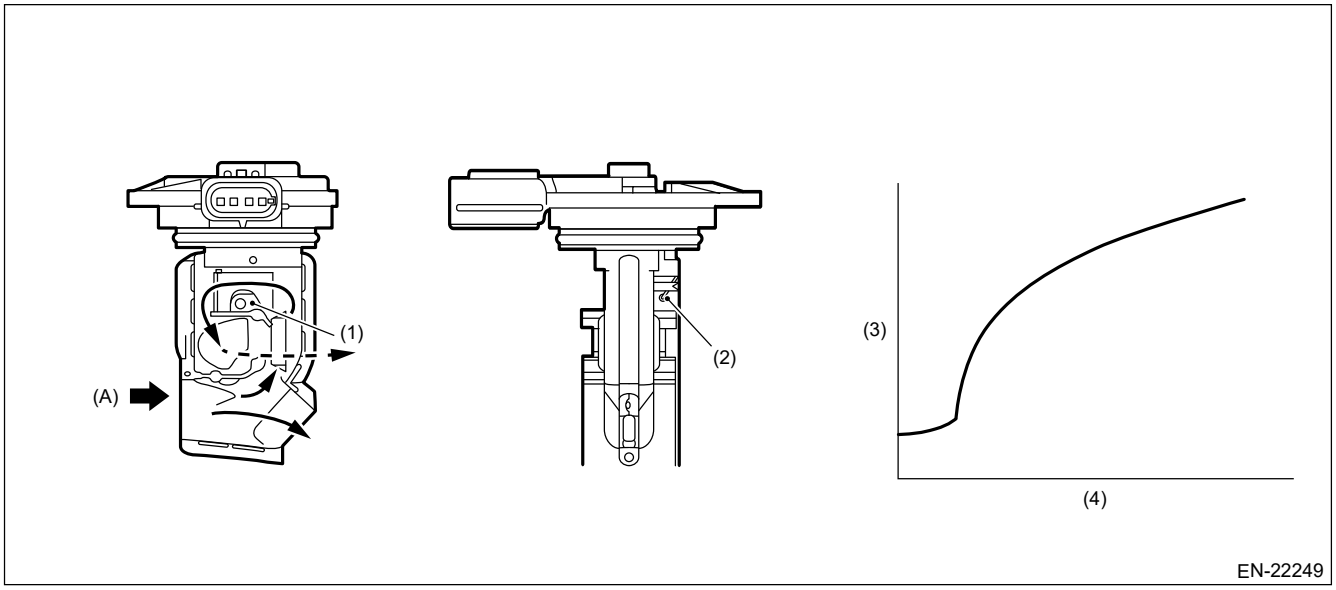
Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes	Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air
(1) Air flow sensor
(2) Intake air temperature sensor
(3) Frequency (kHz)
(4) Amount of intake air (kg (lb)/s)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after ignition state is crank or run	500ms or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
MAF sensor frequency	Less than 1.034kHz

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0103 MASS OR VOLUME AIR FLOW SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

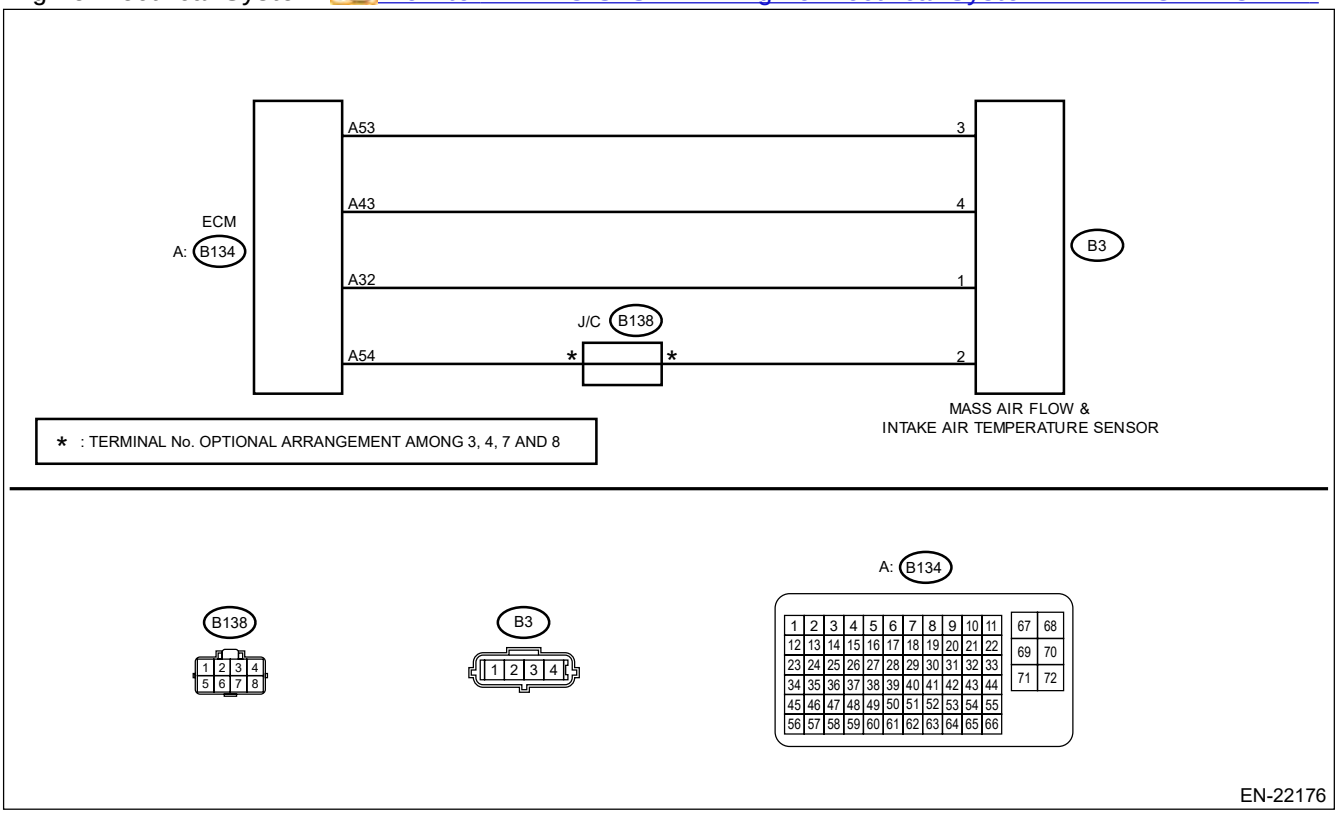
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Air Flow Rate from Mass Air Flow Sensor].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Mass Air Flow]232.32 g/s (8.19 oz/s)?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK FOR POOR CONTACT.

Check for poor contact of mass air flow and intake air temperature sensor connector.

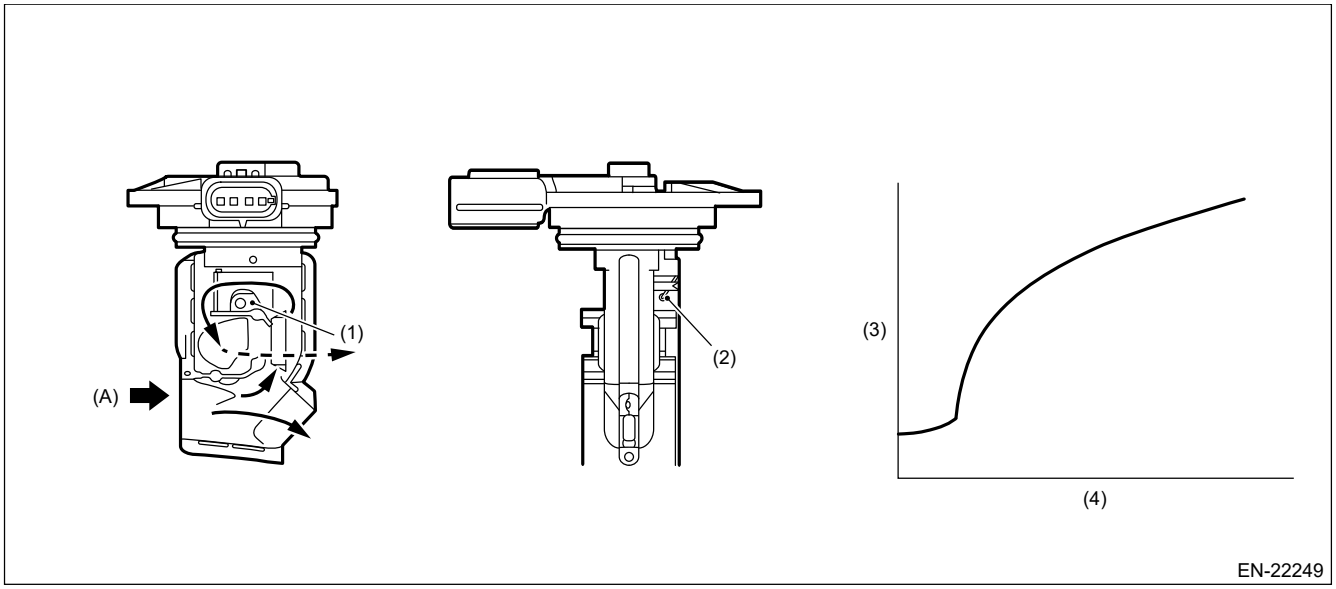
Is there poor contact of mass air flow and intake air temperature sensor connector?

Yes	Repair the poor contact of mass air flow and intake air temperature sensor connector.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuits of the air flow sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Frequency (kHz)

(4) Amount of intake air (kg (lb)/s)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after ignition state is crank or run	500ms or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
MAF sensor frequency	9.207kHz or more

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0107 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Caution:

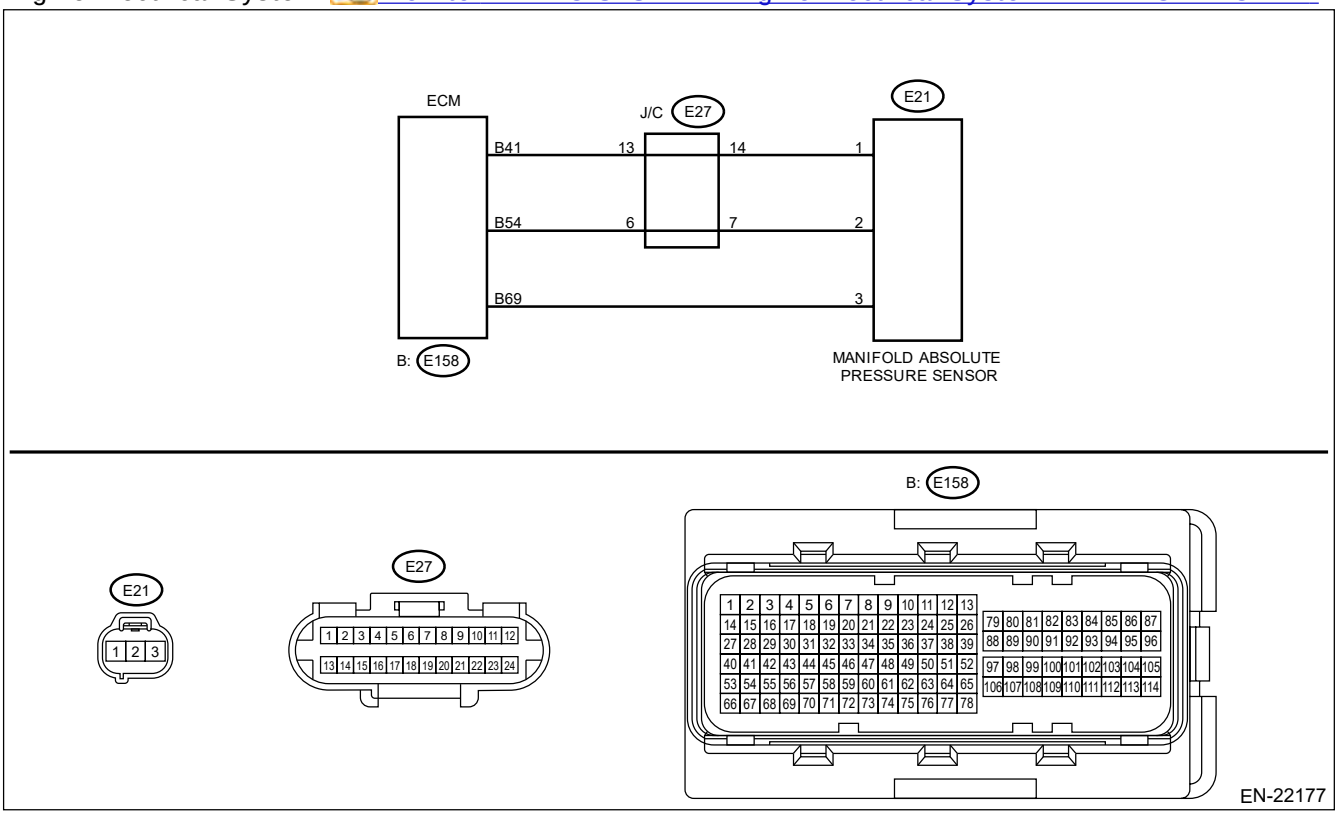
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] less than 13.3 kPa (100 mmHg, 3.94 inHg)?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK POWER SUPPLY OF MANIFOLD ABSOLUTE PRESSURE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from manifold absolute pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between manifold absolute pressure sensor connector and engine ground.
   Connector & terminal
   (E21) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and manifold absolute pressure sensor connector.
   Connector & terminal
   (E158) No. 54 — (E21) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector**

4. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 54 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair short circuit to ground in harness between ECM connector and manifold absolute pressure sensor connector.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and manifold absolute pressure sensor connector.

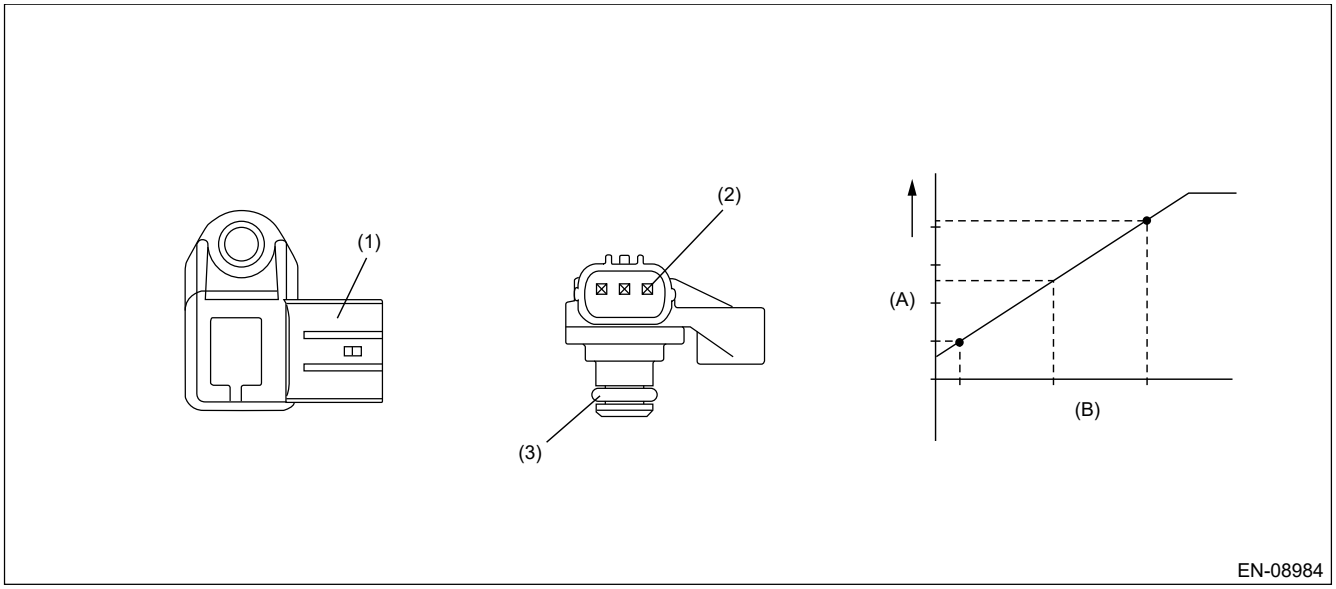
Is there poor contact of ECM or manifold absolute pressure sensor connector?

Yes	Repair the poor contact of ECM or manifold absolute pressure sensor connector.
No	Replace the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of intake manifold pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Output voltage (B) Absolute pressure

(1) Connector (2) Terminals (3) O-ring

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.165V

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0108 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE SENSOR CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Caution:

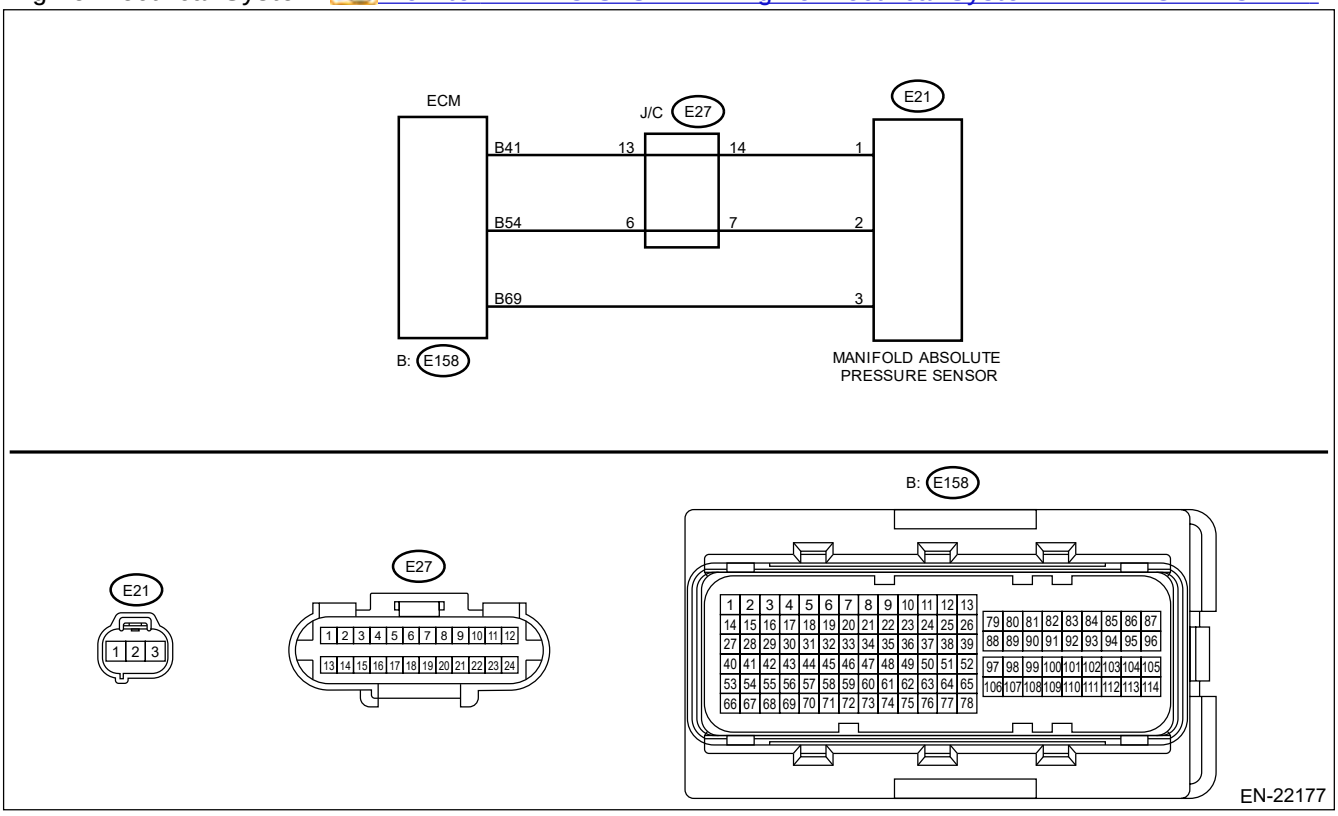
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure]111.5 kPa (836.5 mmHg, 32.93 inHg) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from manifold absolute pressure sensor.
3. Start the engine.
4. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Mani. Absolute Pressure] 125 kPa (937.7 mmHg, 36.92 inHg) or more?

Yes	Repair the short circuit to power in harness between ECM connector and manifold absolute pressure sensor connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between manifold absolute pressure sensor connector and engine ground.

Connector & terminal

(E21) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and manifold absolute pressure sensor connector** • **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.

Check for poor contact of manifold absolute pressure sensor connector.

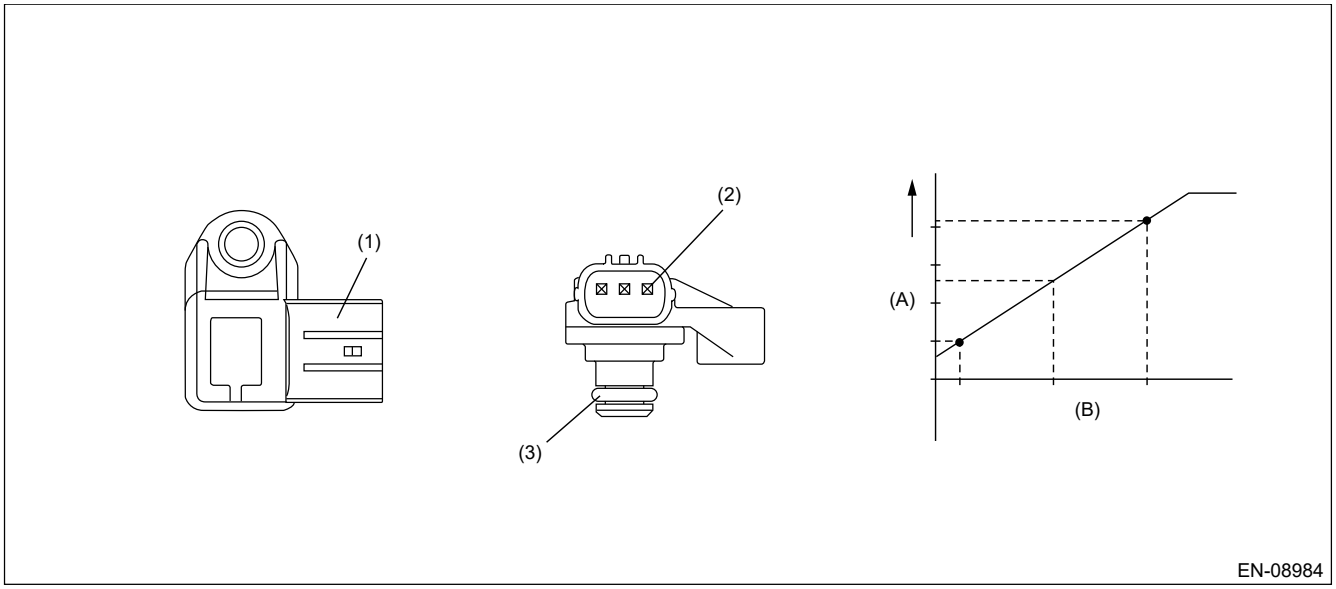
Is there poor contact of manifold absolute pressure sensor connector?

Yes	Repair the poor contact of manifold absolute pressure sensor connector.
No	Replace the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of intake manifold pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Output voltage (B) Absolute pressure

(1) Connector (2) Terminals (3) O-ring

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.523V or more

Time needed for diagnosis: 2000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0111 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE BANK 1

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Improper idling
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ENGINE COOLANT TEMPERATURE.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Data Monitor

Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

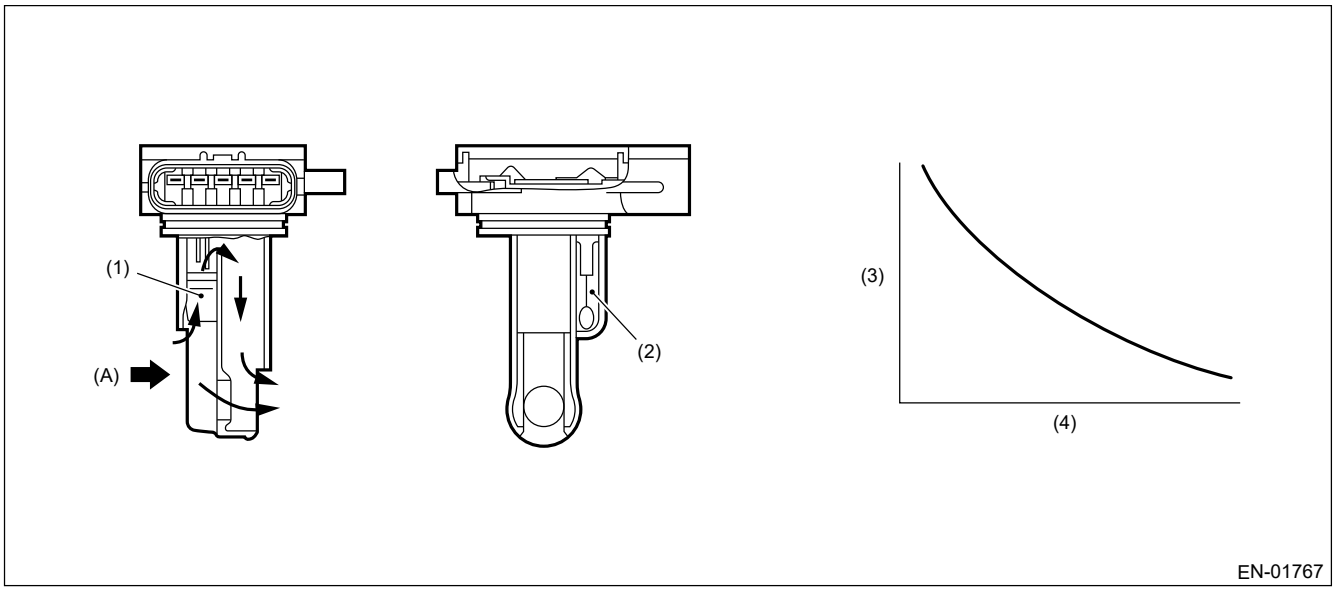
Yes	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.
No	Check for DTC P0125. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the intake air temperature sensor output properties. Using the following two diagnoses, judge as NG when either is NG.
- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between intake air temperature sensor value, engine coolant temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between intake air temperature and engine coolant temperature, intake air temperature and ambient air temperature.
- **Diagnosis 2 (stuck diagnosis):** Judge as NG when intake air temperature does not change under the

driving condition where it should change, considering engine condition.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(3) Resistance value (Ω)

(4) Intake air temperature °C (°F)

(2) Intake air temperature sensor

3. EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600s or more
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine coolant temperature	60°C (140°F) or more
Integrated value of intake air amount	Value of Map 1 or more
Number of experiences under following driving conditions	3time(s)
• Duration of driving condition 1	15s or more

Secondary parameters	Execution condition
Vehicle speed	40km/h (24.9MPH) or more
and	
Amount of intake air	10g/s (0.35oz/s) or more
• Duration of driving condition 2	Value of Map 2 or more
Vehicle speed	Less than value of 4 km/h (2.5 MPH)

Map 1

Engine coolant temperature °C (°F)	−15 (5)	−10 (14)	0 (32)	10 (50)	25 (77)
Integrated value of intake air amount g (oz)	30500 (1075.74)	5500 (193.99)	5500 (193.99)	5500 (193.99)	5500 (193.99)

Map 2

Engine coolant temperature °C (°F)	−30 (−22)	−10 (14)	10 (50)	25 (77)
Duration of driving condition 2 (s)	250	15	15	15

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis when the vehicle speed condition is met after warming up from a cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
|Intake air temperature 30 sec. after engine start − Engine coolant temperature at engine start|	More than value of Map 3

Malfunction Criteria	Threshold Value
|Intake air temperature 30 sec. after engine start − Ambient air temperature 30 sec. after engine start|	More than value of Map 4

Map 3

Ambient temperature °C (°F)	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature 30 sec. after engine start − Engine coolant temperature at engine start| °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Map 4

Ambient temperature °C (°F)	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Intake air temperature 30 sec. after engine start − Ambient air temperature 30 sec. after engine start| °C (°F)	20 (36)	20 (36)	32 (57.6)	32 (57.6)

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage difference between Max. and Min.	Less than 0.02V (Equivalent to approximately 0.5°C (32.9°F) near 25°C (77°F)) (Equivalent to approximately 0.9°C (33.6°F) near −7°C (19.4°))

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0112 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

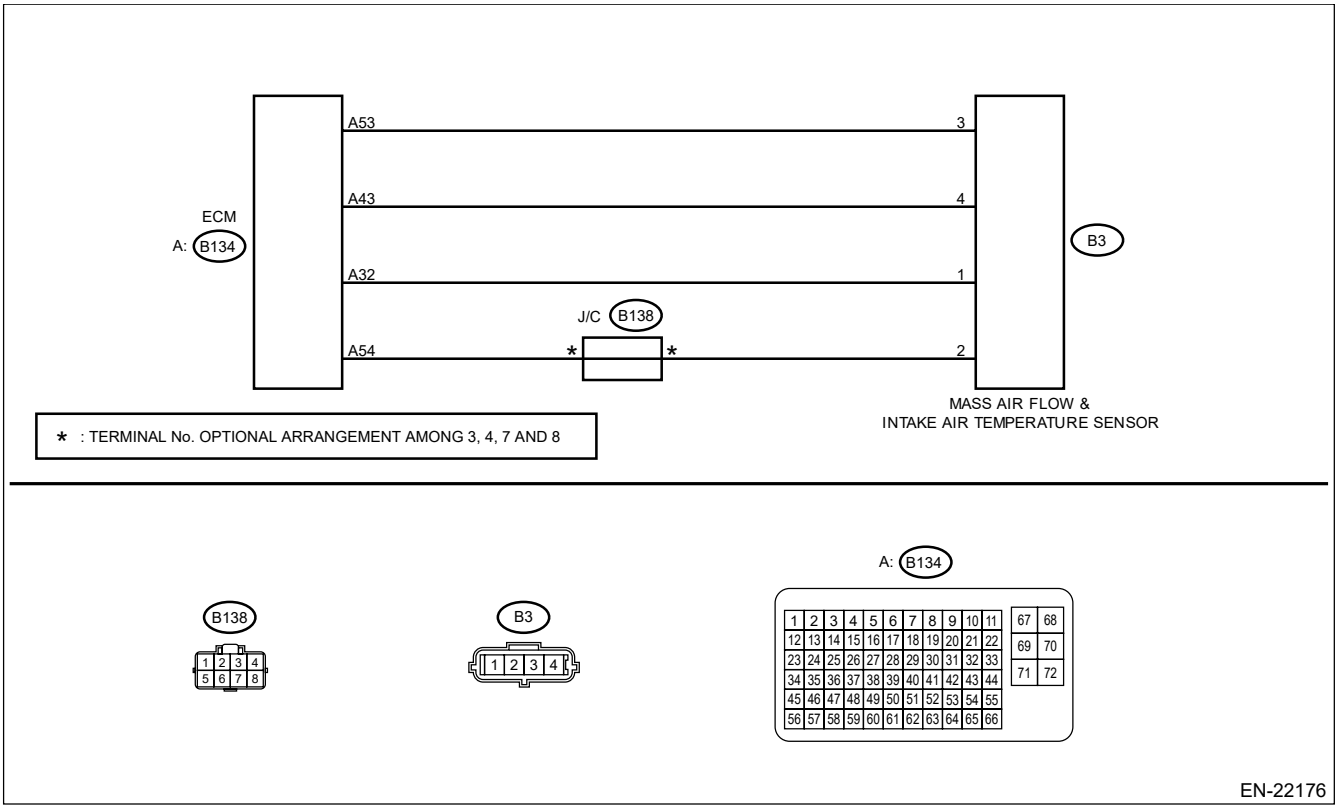
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].



Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Intake Air Temp.] 120°C (248°F) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 32 — Chassis ground:

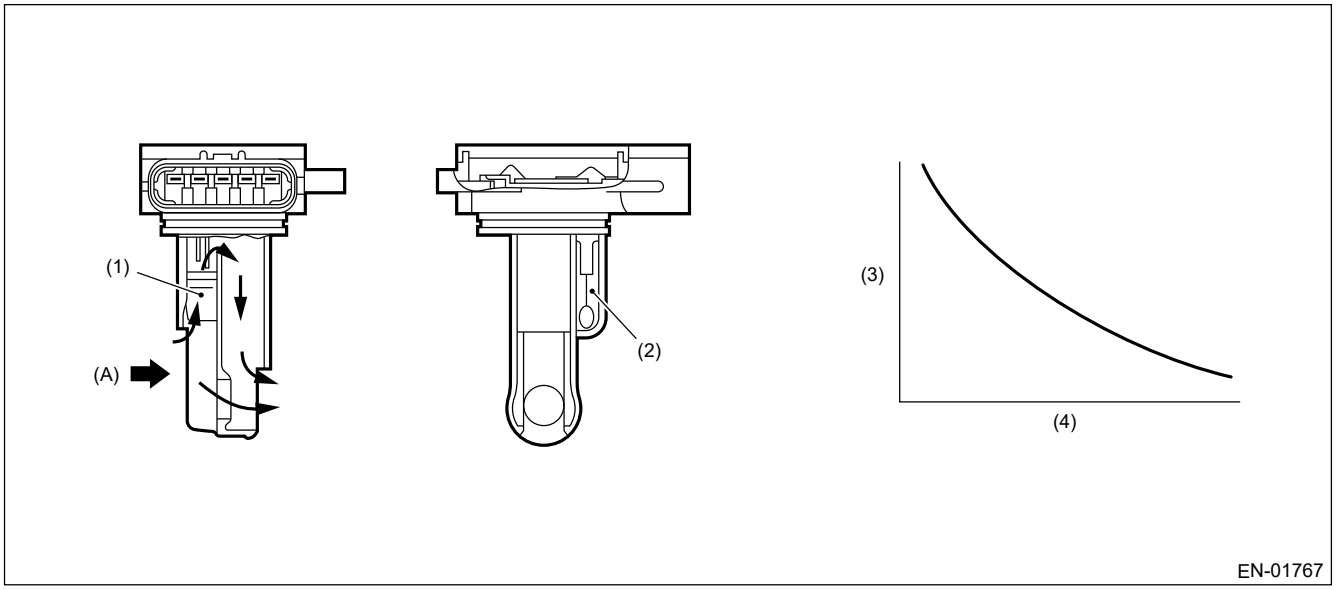
Is the resistance 1 MΩ or more?

Yes	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.
No	Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Resistance value (Ω)

(4) Intake air temperature °C (°F)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.403V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0113 INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

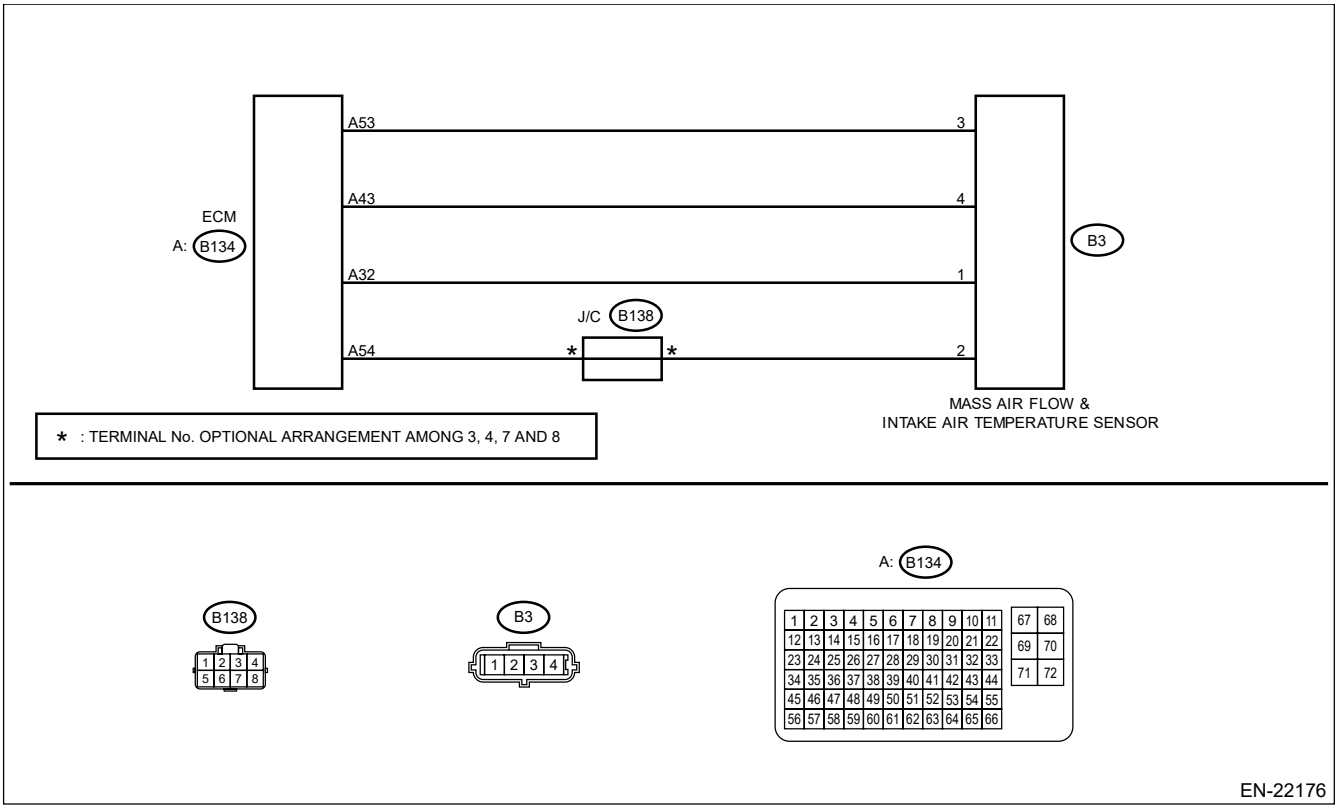
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Intake Air Temp.]−40°C (−40°F) or less?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and mass air flow and intake air temperature sensor connector.

Is there poor contact of ECM or mass air flow and intake air temperature sensor connector?

Yes	Repair the poor contact of ECM or mass air flow and intake air temperature sensor connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the mass air flow and intake air temperature sensor.
4. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 32 — (B3) No. 1:

(B134) No. 54 — (B3) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Poor contact of joint connector**

4. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 32 (+) — Chassis ground (−):

Is the voltage 5 V or more?

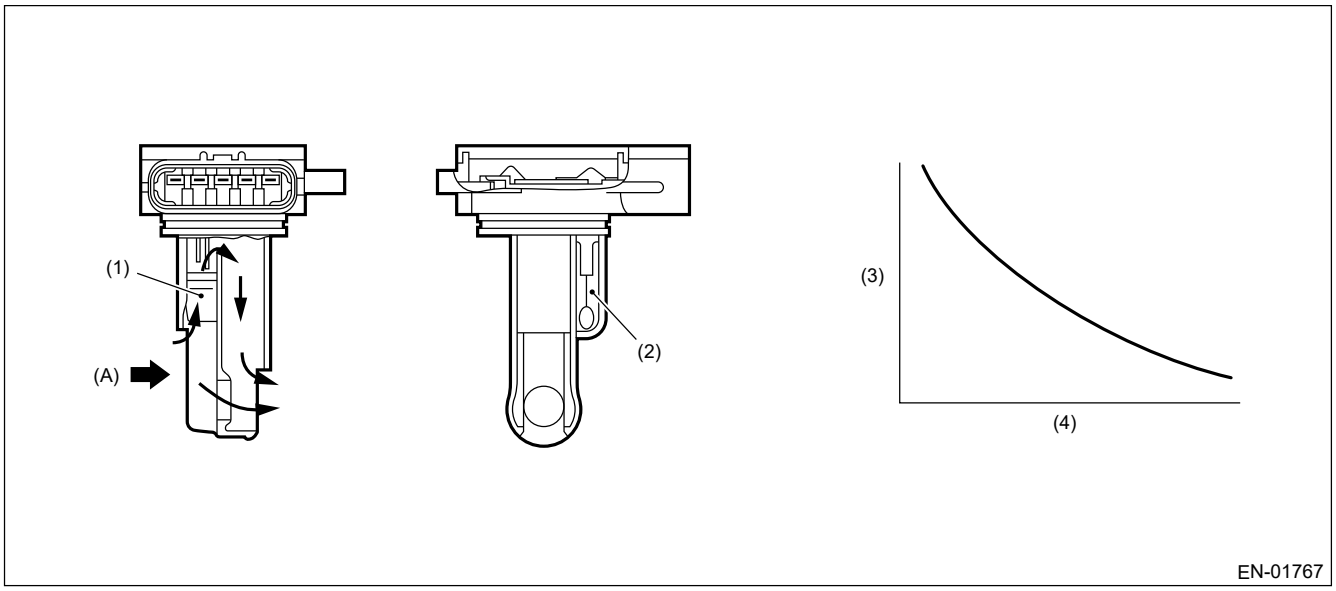
Yes	Repair the short circuit of harness to power supply between ECM connector and the mass air flow and intake air temperature sensor connector.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the intake air temperature sensor.

Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Air

(1) Air flow sensor

(2) Intake air temperature sensor

(3) Resistance value (Ω)

(4) Intake air temperature °C (°F)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.705V or more

Time needed for diagnosis:500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0116 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0116 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Disconnect the connectors from the engine coolant temperature sensor.
2. Measure the resistance between engine coolant temperature sensor terminals when the engine coolant is cold and after warmed up.

   Terminals

   No. 1 — No. 2:

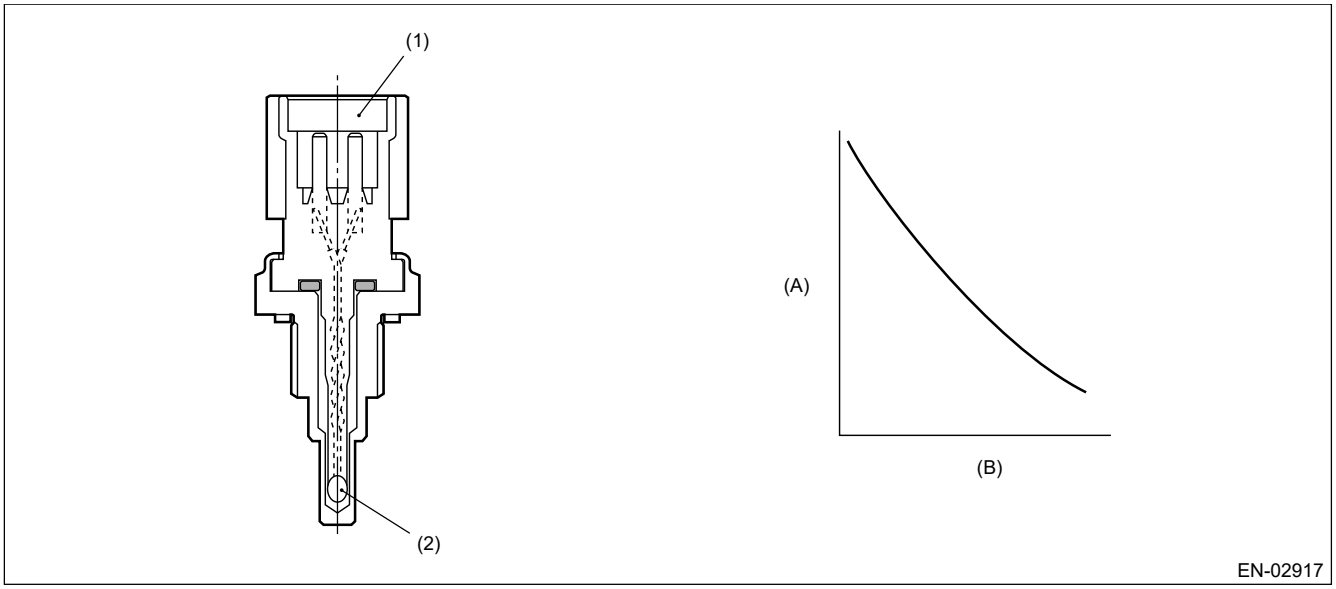
Is the resistance of engine coolant temperature sensor different between when engine coolant is cold and after warmed up?

Yes	Repair the poor contact of ECM connector.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine coolant temperature sensor characteristics.
After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine coolant temperature sensor value, intake air temperature sensor value and ambient temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine coolant temperature and ambient air temperature, engine coolant temperature and intake air temperature.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 v or more
Soaking time	21600s or more
Block heater judgment	Completed
Block heater operation	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
|Engine coolant temperature at	More than value

Malfunction Criteria	Threshold Value
engine start − Intake air temperature 30 sec. after engine start|	of Map
|Engine coolant temperature at engine start − Ambient air temperature at engine start|	More than 25°C(45°F)

Map

Ambient temperature °C (°F)	**−30 (−22)**	**30 (86)**	**45 (113)**	**60 (140)**
|Engine coolant temperature at engine start − Intake air temperature 30 sec. after engine start| °C (°F)	12 (21.6)	12 (21.6)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0117 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Caution:

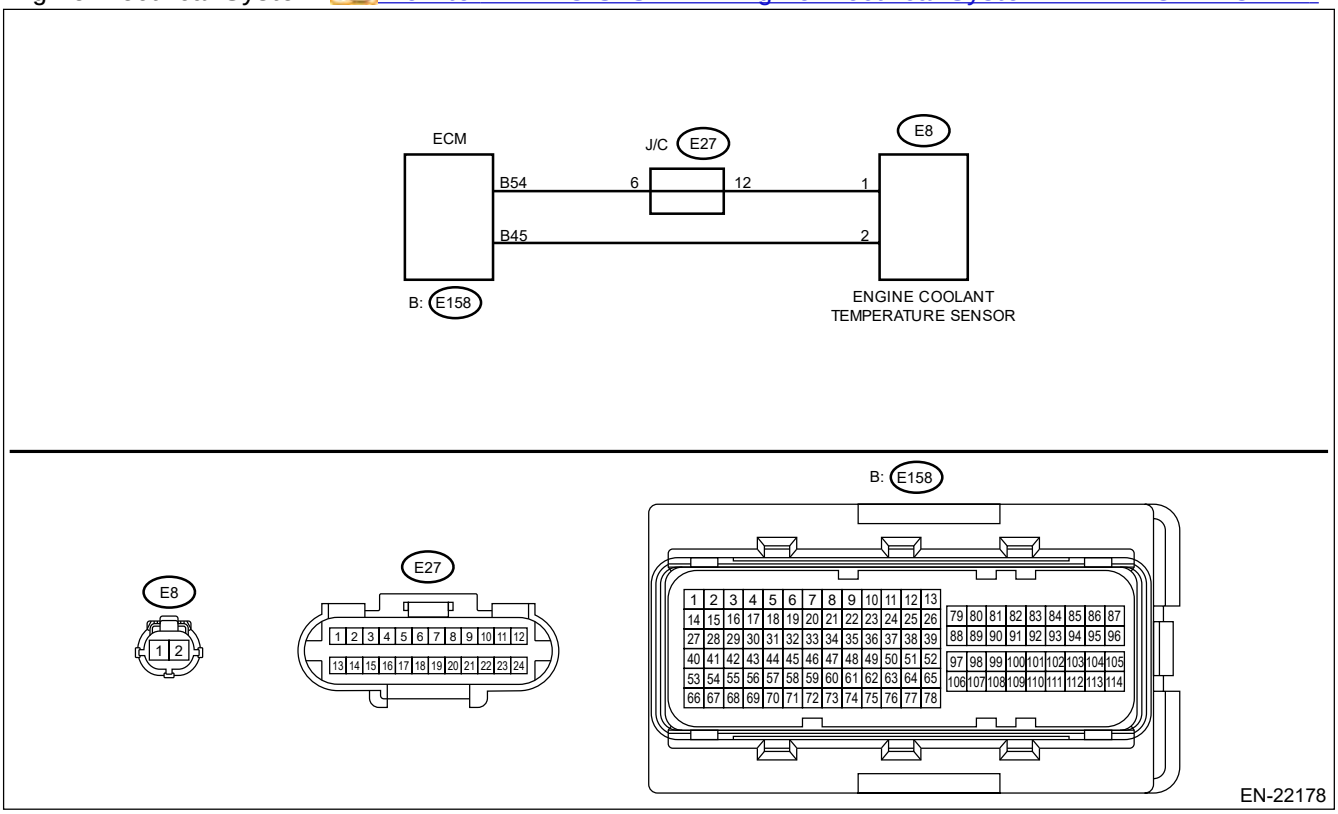
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].



Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 120°C (248°F) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 45 — Chassis ground:

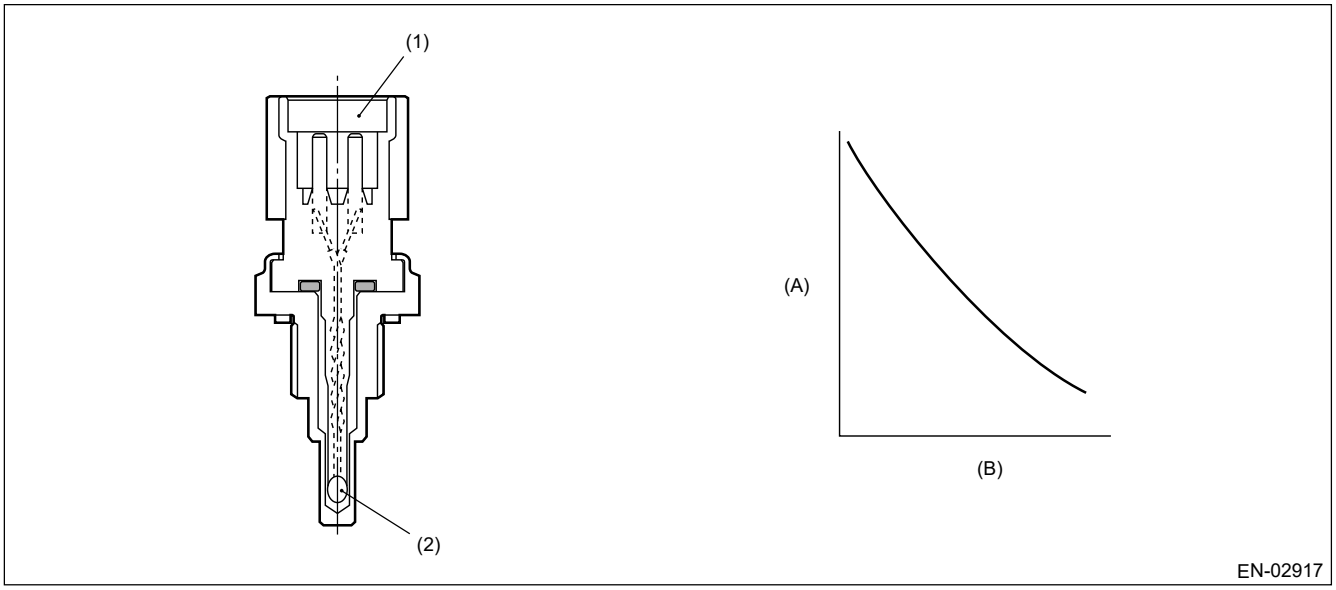
Is the resistance 1 MΩ or more?

Yes	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.351V

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0118 ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Caution:

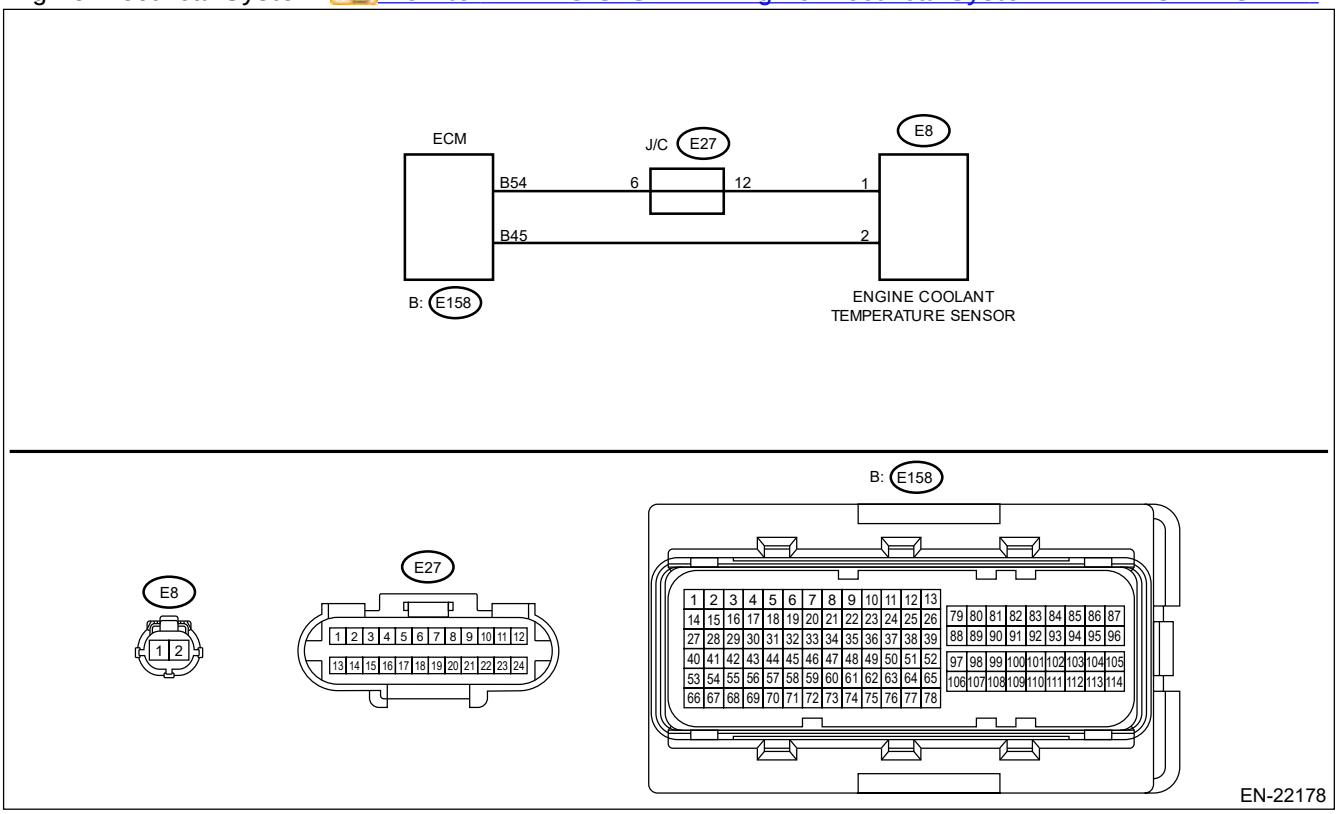
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.]−40°C (−40°F) or less?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and engine coolant temperature sensor connector.

Is there poor contact of ECM or engine coolant temperature sensor connector?

Yes	Repair the poor contact of ECM or engine coolant temperature sensor connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine coolant temperature sensor.
4. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E158) No. 45 — (E8) No. 2:

(E158) No. 54 — (E8) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 45 (+) — Chassis ground (−):

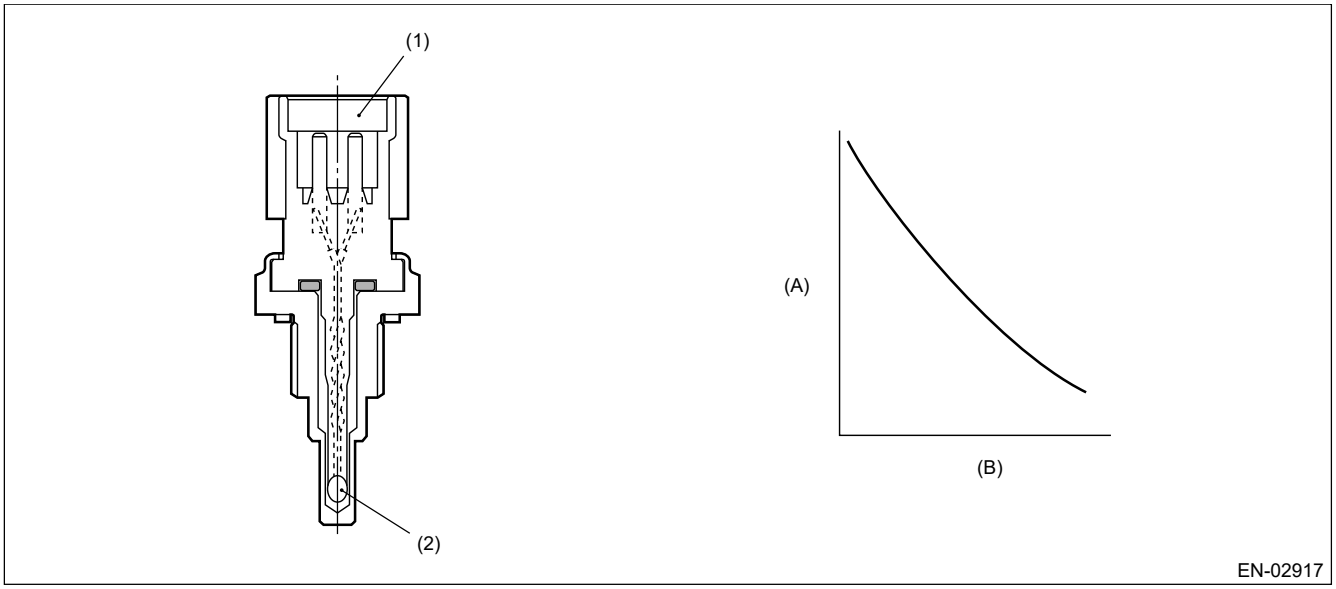
Is the voltage 5 V or more?

Yes	Repair the short circuit of harness to power supply between ECM connector and engine coolant temperature sensor connector.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the engine coolant temperature sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.695V or more

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

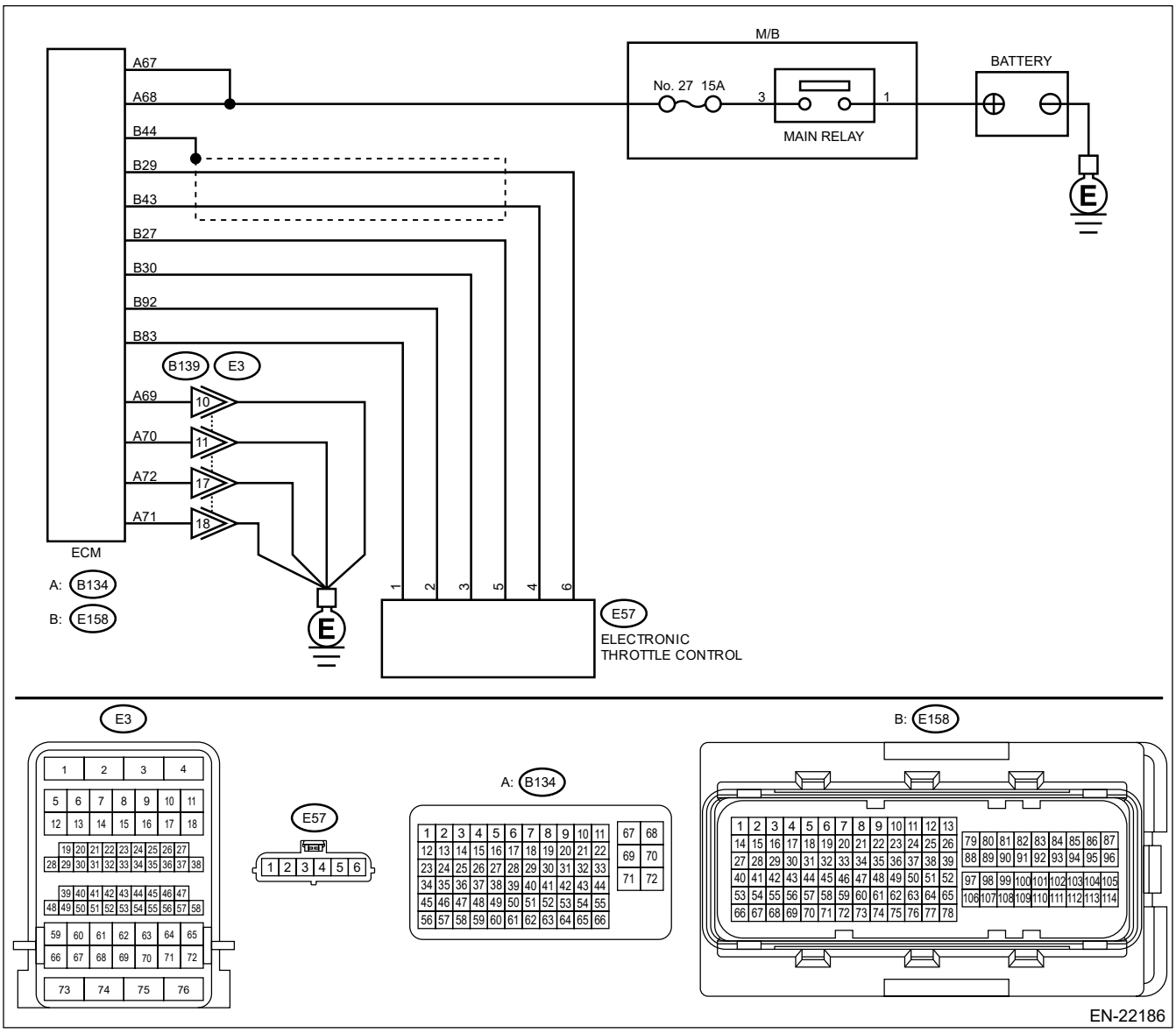
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 27 — Chassis ground:
(E158) No. 29 — Chassis ground:
(E158) No. 29 — (E158) No. 44:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK ECM (INTERNAL SHORT).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 — Engine ground:

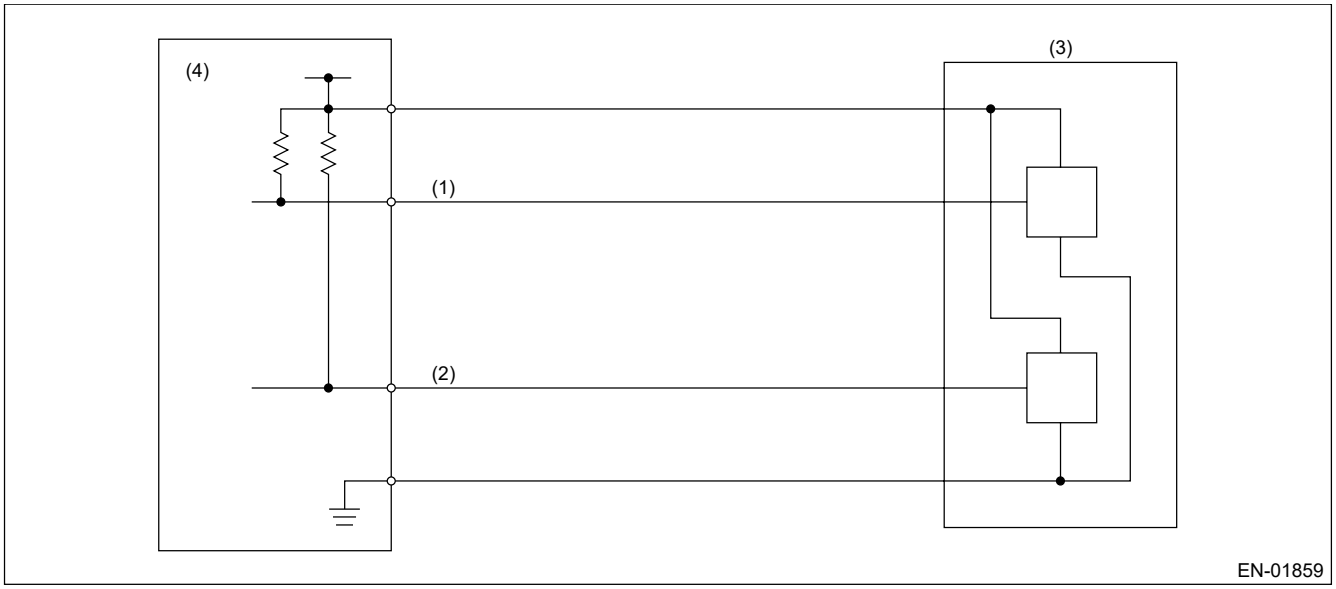
Is the resistance 1 MΩ or more?

Yes	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	0.276V or less

Time needed for diagnosis: 24ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

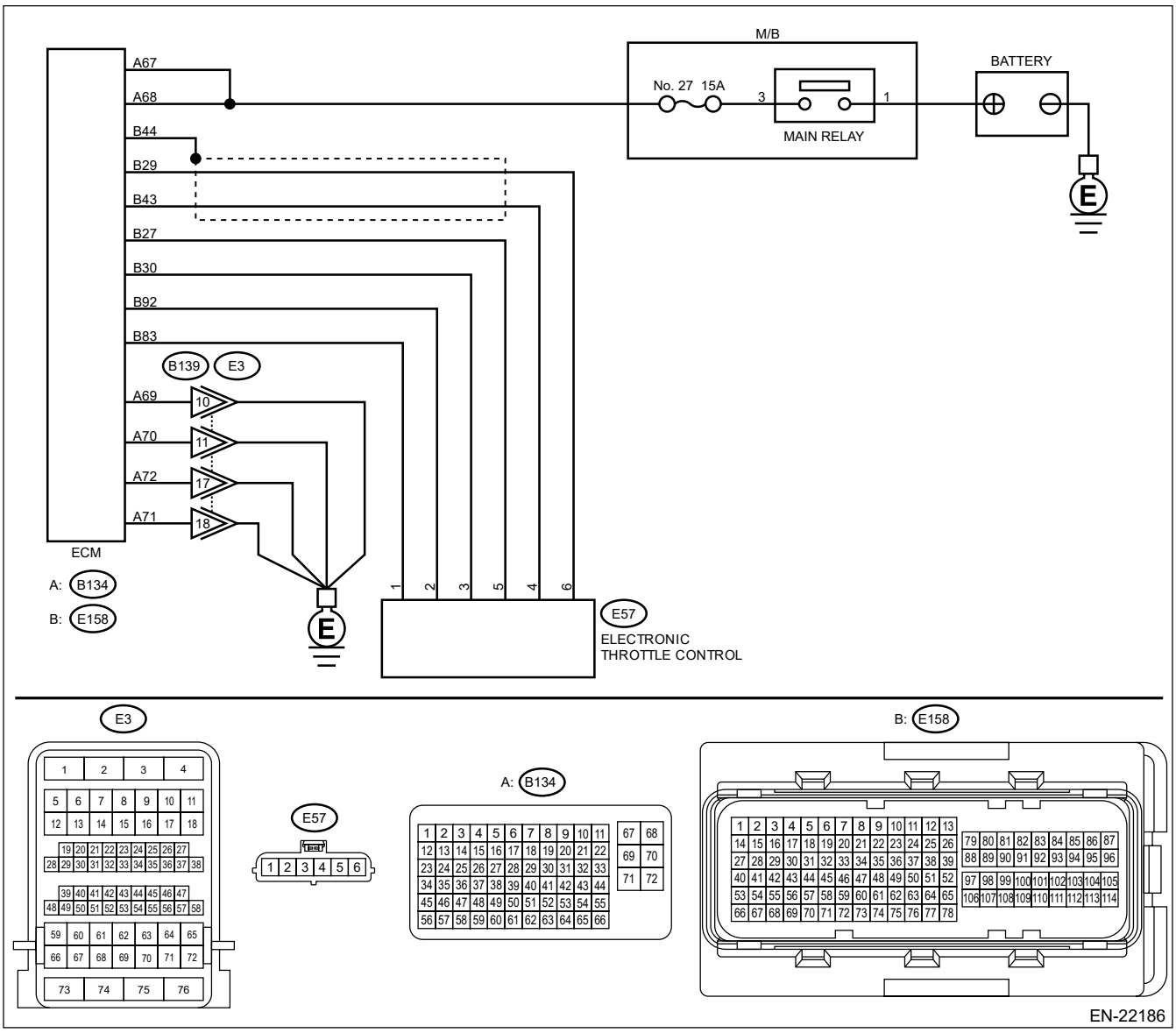
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E158) No. 29 — (E57) No. 6:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 6 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 27 — (E158) No. 29:

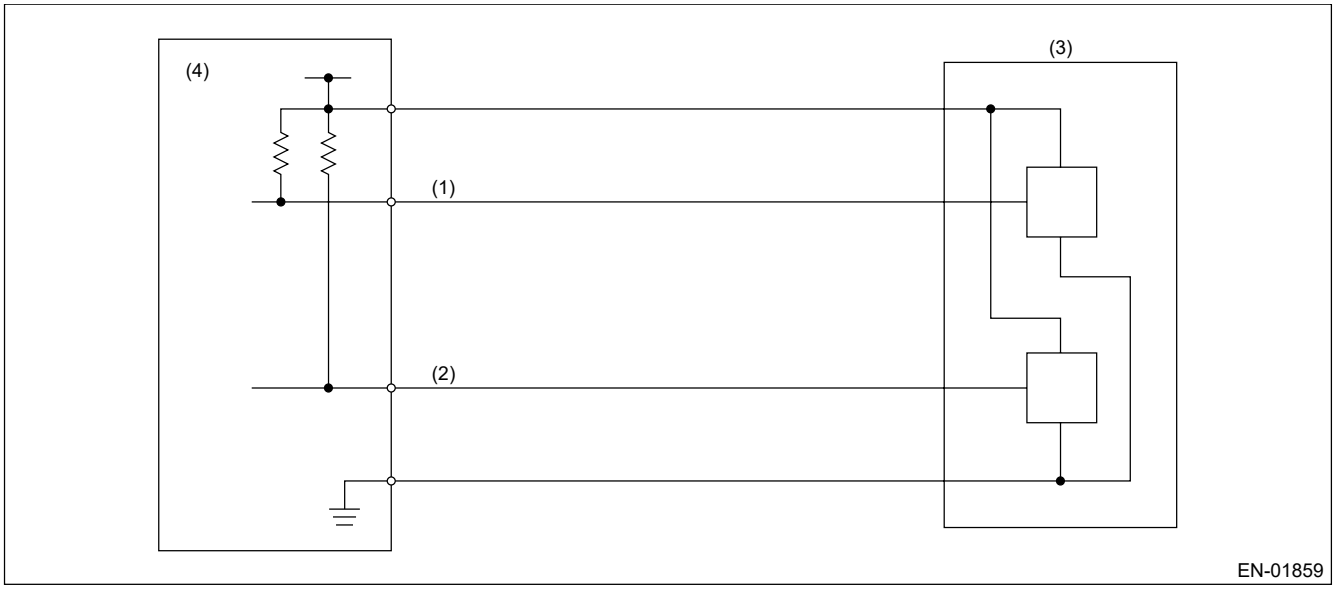
Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.
No	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	4.701V or more

Time needed for diagnosis: 24ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0125 INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED LOOP FUEL CONTROL

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Engine does not return to idle.
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ENGINE COOLANT.

Check the following items:
- Amount of engine coolant
- Engine coolant freeze
- Contamination of engine coolant

Is the check result OK?

Yes	Go to 2.
No	Fill or replace the engine coolant. Ref. to COOLING(H4DO)>Engine Coolant>REPLACEMENT.

2. CHECK THERMOSTAT.

Check the thermostat.

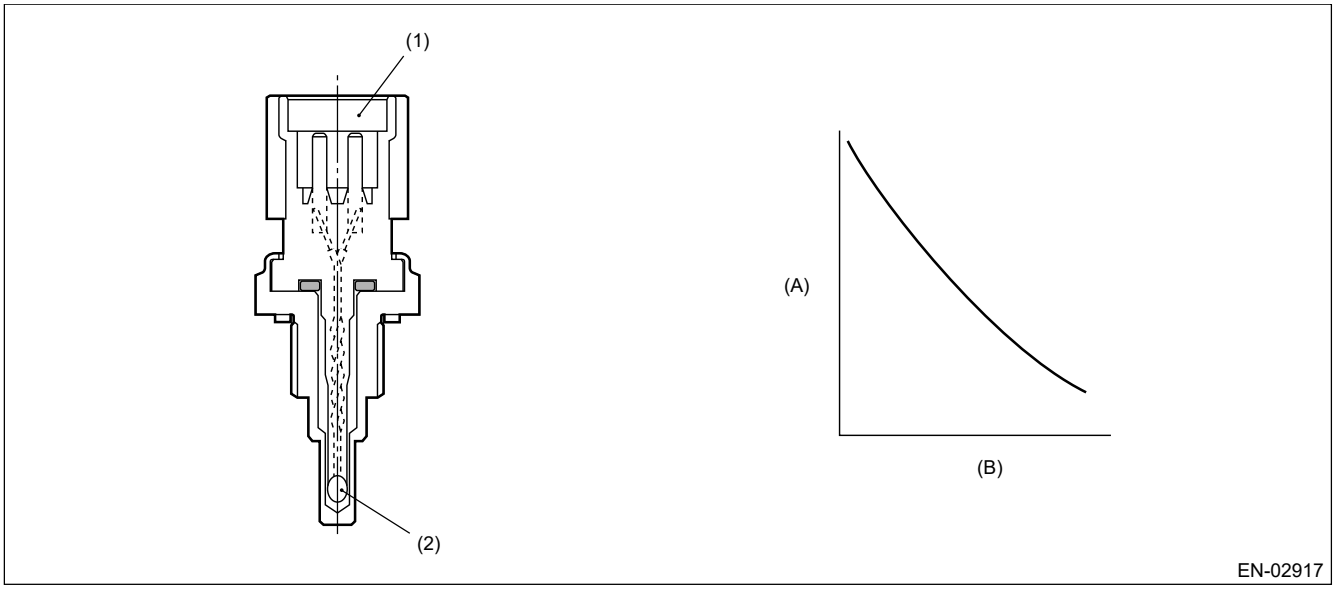
Does the thermostat remain opened?

Yes	Replace the thermostat. Ref. to COOLING(H4DO)>Thermostat.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of engine coolant temperature sensor output property.
Judge as NG when engine coolant temperature does not rise to the specified value after predetermined time has elapsed since engine start.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine speed	500 rpm or more
Engine coolant temperature at engine start	Less than −15°C(5°F)

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after starting the engine from cold condition.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine coolant temperature	Less than −15°C(5°F)
Elapsed time after starting the engine ((Smaller value of either engine coolant temperature and intake air temperature at engine start) −23.3°C (−9.9°F) or more) or	120 s or more

Malfunction Criteria	Threshold Value
(Less than (Smaller value of either engine coolant temperature and intake air temperature at engine start) −23.3°C (−9.9°F))	300 s or more

Time needed for diagnosis: 120 or 300 seconds
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0128 COOLANT THERMOSTAT (ENGINE COOLANT TEMPERATURE BELOW THERMOSTAT REGULATING TEMPERATURE)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Thermostat remains open.
- Coolant temperature rises slowly.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0128 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK ENGINE COOLANT.

Check the engine coolant level.

Is the check result OK?

Yes	Go to 3.
No	Refill the engine coolant. Ref. to COOLING(H4DO)>Engine Coolant.

3. CHECK RADIATOR FAN.

1. Start the engine.
2. While keeping idling for approx. 3 minutes (with accelerator OFF), check the operation of the radiator fan.

Does the radiator fan continuously rotate for 3 minutes or more during idling?

Yes	Repair radiator fan circuit. Ref. to COOLING(H4DO)>Radiator Fan and Fan Motor Assembly.
No	Go to 4.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

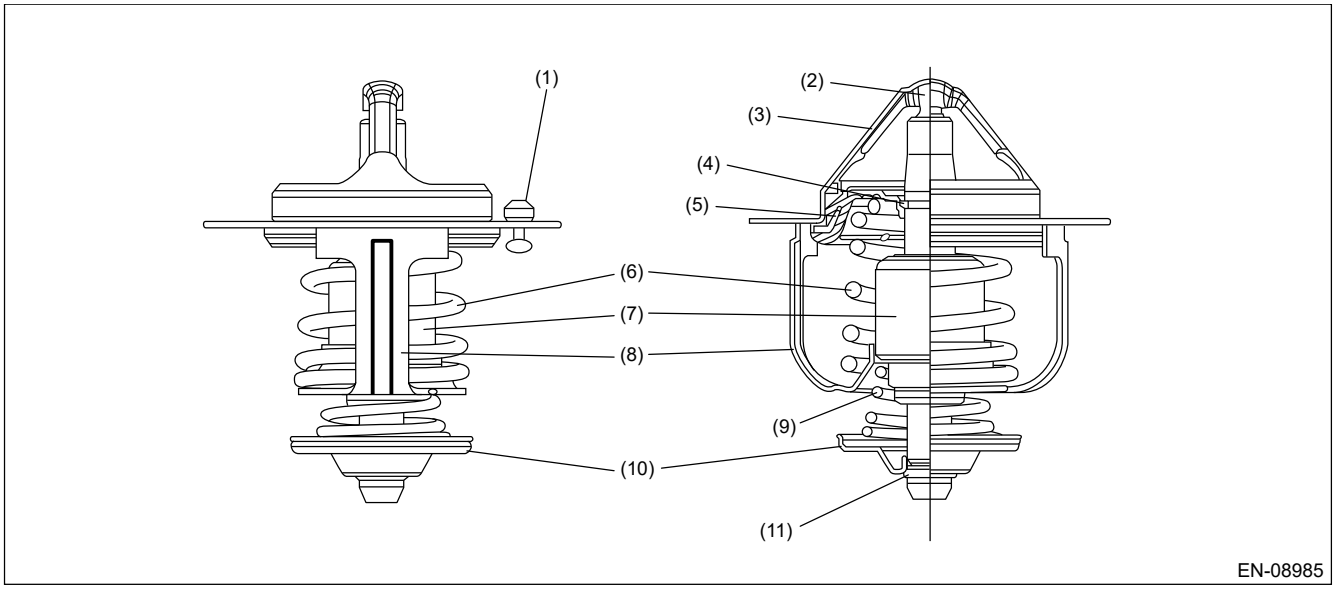
Yes	Replace the thermostat. Ref. to COOLING(H4DO)>Thermostat.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect malfunctions of the thermostat function.
Judge as NG when any one of the following conditions is established.

- When the actual engine coolant temperature does not reach the maximum temperature necessary to perform other OBDII diagnosis and Σ (Estimated engine coolant temperature − actual engine coolant temperature) exceeded the predetermined value. (Judgment 1)
- When the actual engine coolant temperature does not reach the range within −11°C (−19.8°F) from the regulated temperature and Σ (Estimated engine coolant temperature − actual engine coolant temperature) exceeded the predetermined value. (Judgment 2)
- When the difference between the estimated coolant temperature and the actual engine coolant temperature exceeds the predetermined value, and Σ (Estimated engine coolant temperature − actual engine coolant temperature) exceeded the predetermined value. (Judgment 3)

2. COMPONENT DESCRIPTION



(1) Jiggle valve
(2) Piston
(3) Flange
(4) Stop ring
(5) Dust seal
(6) Main spring
(7) Wax element
(8) Frame
(9) Bypass spring
(10) Bypass valve
(11) Stop ring

3. EXECUTION CONDITION

Secondary parameters	Execution condition
<Judgment 1>	
Battery voltage	10.9 V or more
Ambient air temperature	−7°C(19.4°F) or more
Vehicle speed	30km/h (18.6MPH) or more
Estimated coolant temperature	More than value of Map 1
Engine coolant temperature at engine start	Less than 60°C(140°F)
<Judgment 2>	
Battery voltage	10.9 V or more
Ambient air temperature	−7°C(19.4°F) or more
Vehicle speed	30km/h (18.6MPH) or more
Estimated coolant temperature	More than value of Map 2

Secondary parameters	Execution condition
Engine coolant temperature at engine start	Less than 60°C(140°F)
<Judgment 3>	
Battery voltage	10.9 V or more
Ambient air temperature	−7°C(19.4°F) or more
Vehicle speed	30km/h (18.6MPH) or more
Estimated coolant temperature	Value of Map 3 or more
Engine coolant temperature at engine start	Less than 60°C(140°F)

Map 1

Engine coolant temperature at engine starting °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Estimated coolant temperature °C (°F)	60 (140)	60 (140)	60 (140)	60 (140)

Map 2

Engine coolant temperature at engine starting °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Estimated coolant temperature °C (°F)	69.8 (157.6)	78.4 (173.1)	78.4 (173.1)	78.4 (173.1)

Map 3

Engine coolant temperature at engine starting °C (°F)	**−7 (19.4)**	**10 (50)**	**25 (77)**	**30 (86)**
Estimated coolant temperature °C (°F)	50 (122)	66 (150.8)	76 (168.8)	78.4 (173.1)

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after starting the engine.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
When any one of the followings is established:	
<Judgment 1>	
Actual engine coolant temperature and Σ (Estimated engine coolant temperature − actual engine coolant temperature)	Less than value of Map 4 More than value of Map 5
<Judgment 2>	
Actual engine coolant temperature and Σ (Estimated engine coolant temperature − actual engine coolant temperature) *Regulated temperature = 89.5 degrees	Regulated temperature* − Less than value of Map 6 More than value of Map 7
<Judgment 3>	
Estimated engine coolant temperature − actual engine coolant temperature and Σ (Estimated engine coolant temperature − actual engine coolant temperature)	More than value of Map 8 More than value of Map 9

*Regulated temperature = 89.5(195°F)

Map 4

Estimate ambient temperature °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Threshold Value °C (°F)	60 (140)	60 (140)	60 (140)	60 (140)

Map 5

Engine coolant temperature at engine starting	**−7 (19.4)**	**0 (32)**	**8 (46.4)**	**10 (50)**	**30 (86)**	**40 (104)**

°C (°F)						
Threshold Value °C (°F)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1200 (2160)

Map 6

Estimate ambient temperature °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Threshold Value °C (°F)	19.7 (67.5)	11.1 (20)	11.1 (20)	11.1 (20)

Map 7

Engine coolant temperature at engine starting °C (°F)	**−7 (19.4)**	**0 (32)**	**8 (46.4)**	**10 (50)**	**30 (86)**	**35 (95)**
Threshold Value °C (°F)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1500 (2700)

Map 8

Estimate ambient temperature °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Threshold Value °C (°F)	11.1 (20)	11.1 (20)	11.1 (20)	11.1 (20)

Map 9

Engine coolant temperature at engine starting °C (°F)	**−7 (19.4)**	**8 (46.4)**	**10 (50)**	**25 (77)**
Threshold Value °C (°F)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)	1731.6 (3116.9)

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0131 A/F / O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

Immediately at fault recognition

Caution:

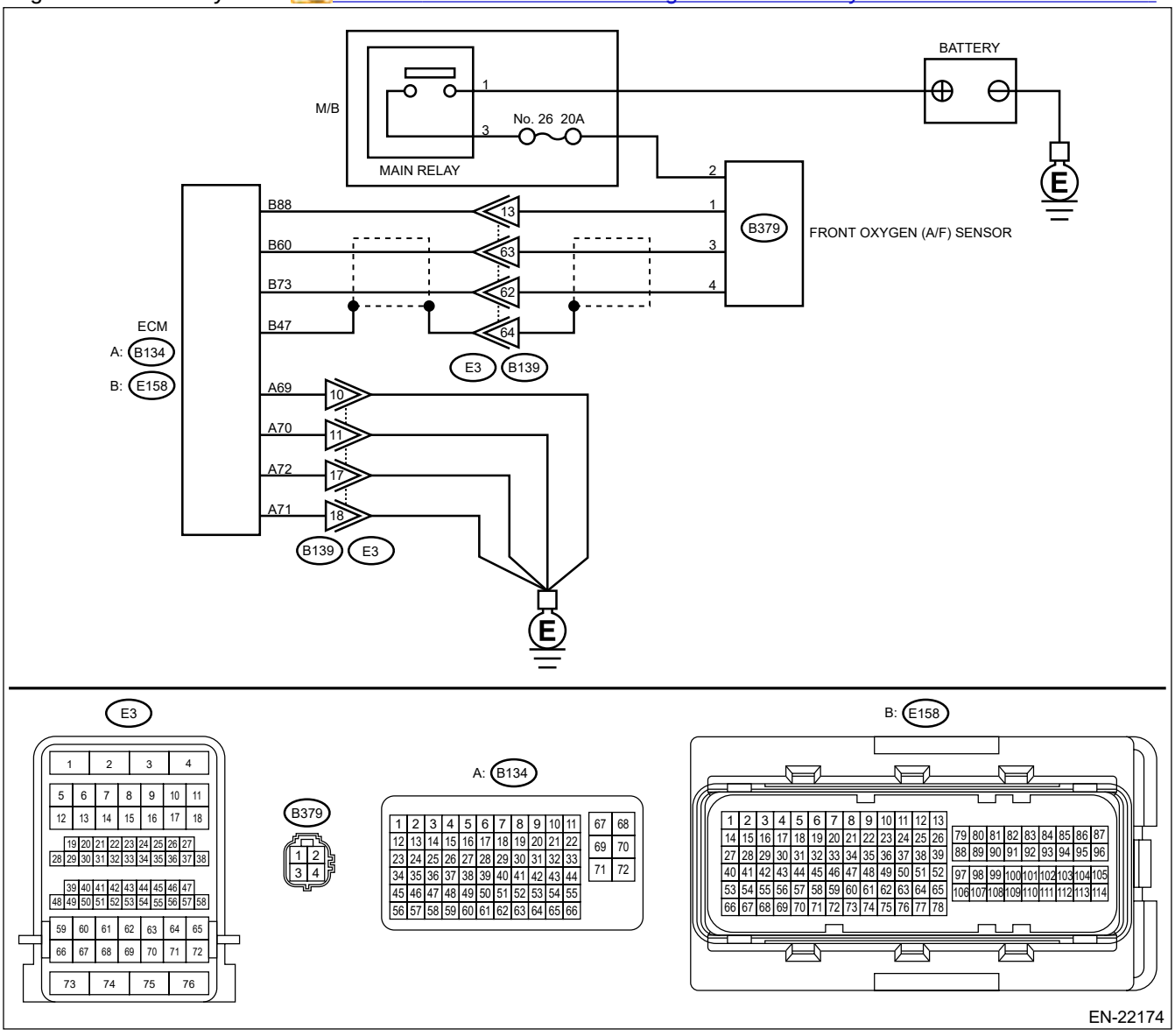
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 — Chassis ground:

(E158) No. 73 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK FOR POOR CONTACT.

Check for poor contact of the front oxygen (A/F) sensor connector.

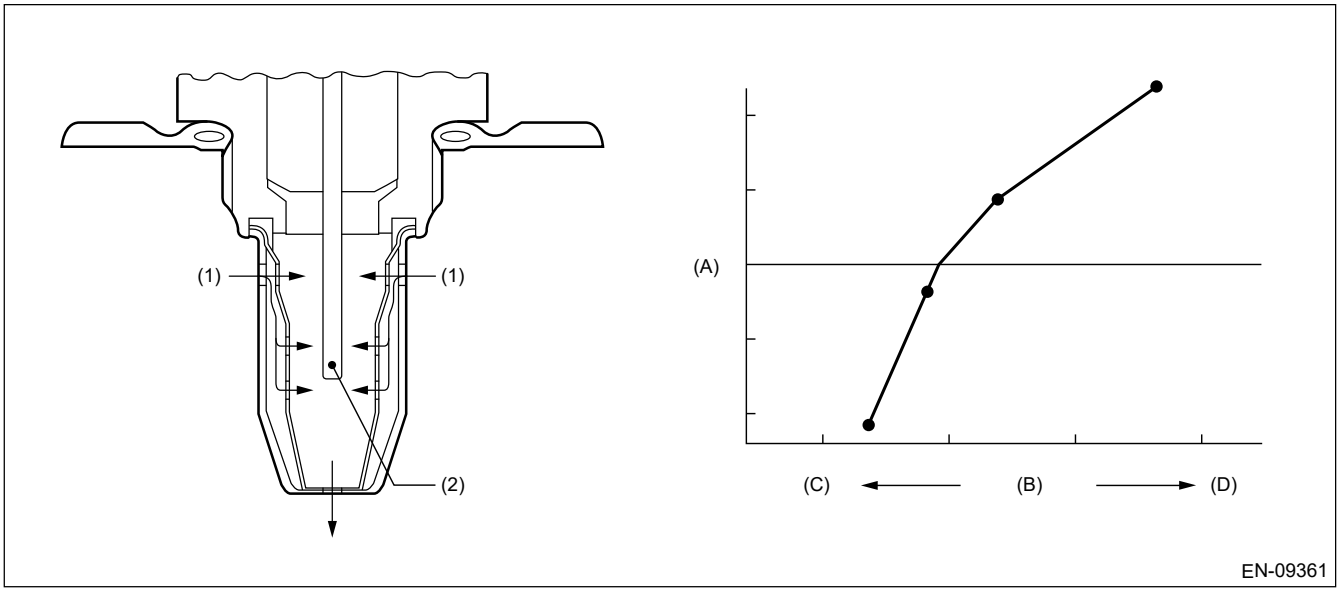
Is there poor contact of front oxygen (A/F) sensor connector?

Yes	Repair the poor contact of front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.
Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich
(D) Lean
(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
1) Input voltage (+) or 2) Input voltage (−) or 3) |Input voltage (+) − Input voltage (−)| and Input voltage (−) 3.6 V — 4.6 V	Less than 0.725V Less than 0.725V Less than 0.15V

Time needed for diagnosis: 1000ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0132 A/F / O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 1

DTC detecting condition:

Immediately at fault recognition

Caution:

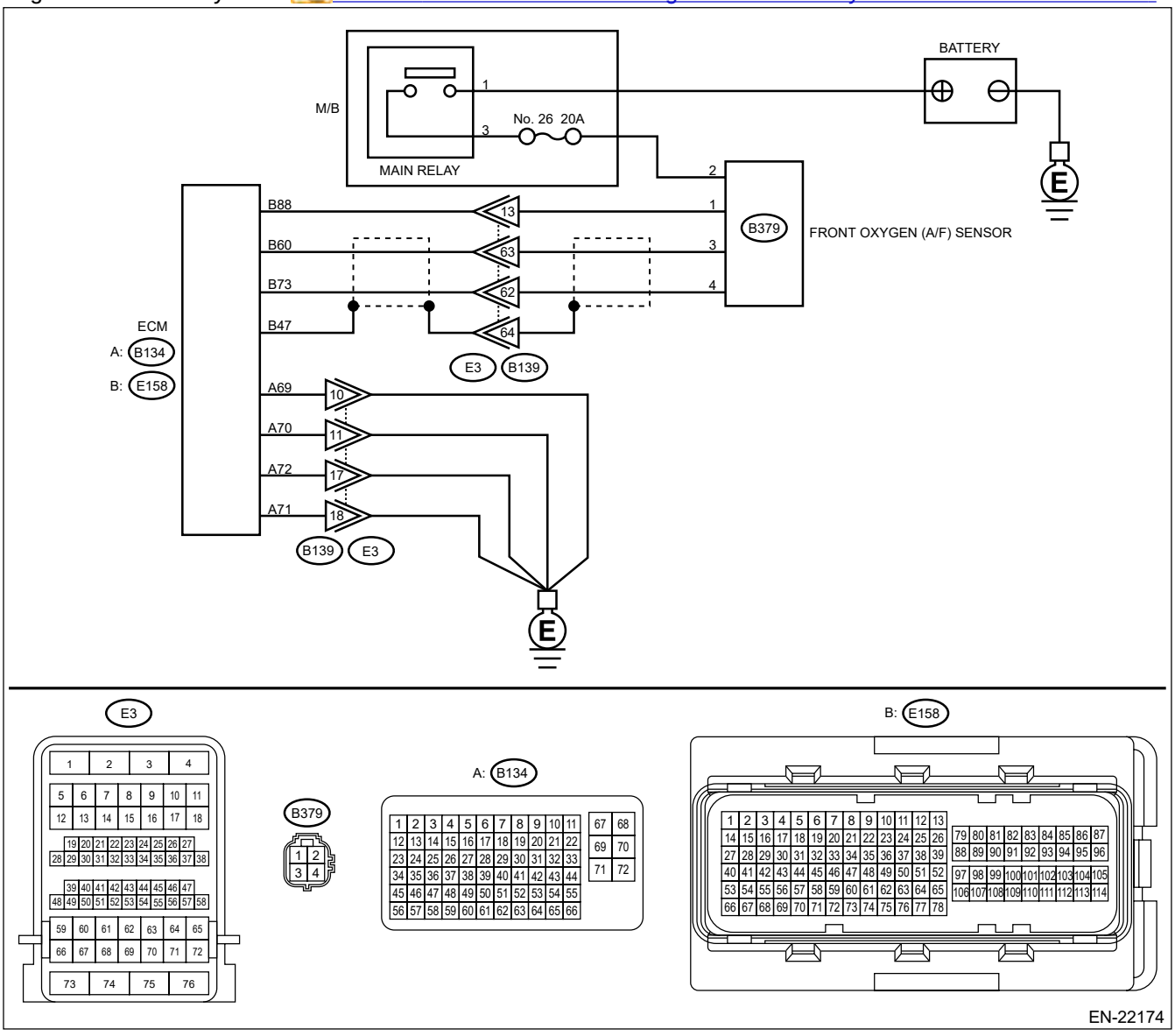
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 (+) — Chassis ground (−):
(E158) No. 73 (+) — Chassis ground (−):

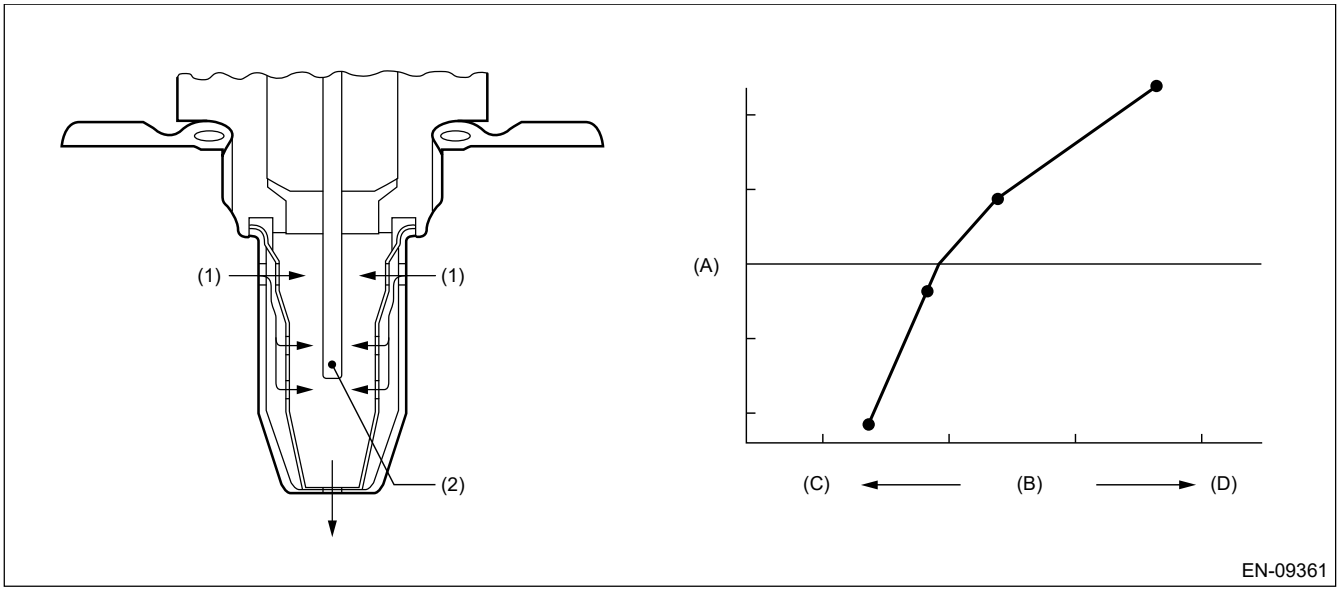
Is the voltage 8 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of sensor.
Judge as NG, when the element voltage is out of the specified range.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich

(D) Lean

(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
(1) Input voltage (+) or (2) Input voltage (−)	More than 4.6V More than 4.6V

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0134 A/F / O2 SENSOR CIRCUIT NO ACTIVITY DETECTED BANK 1 SENSOR 1

DTC detecting condition:

Immediately at fault recognition

Caution:

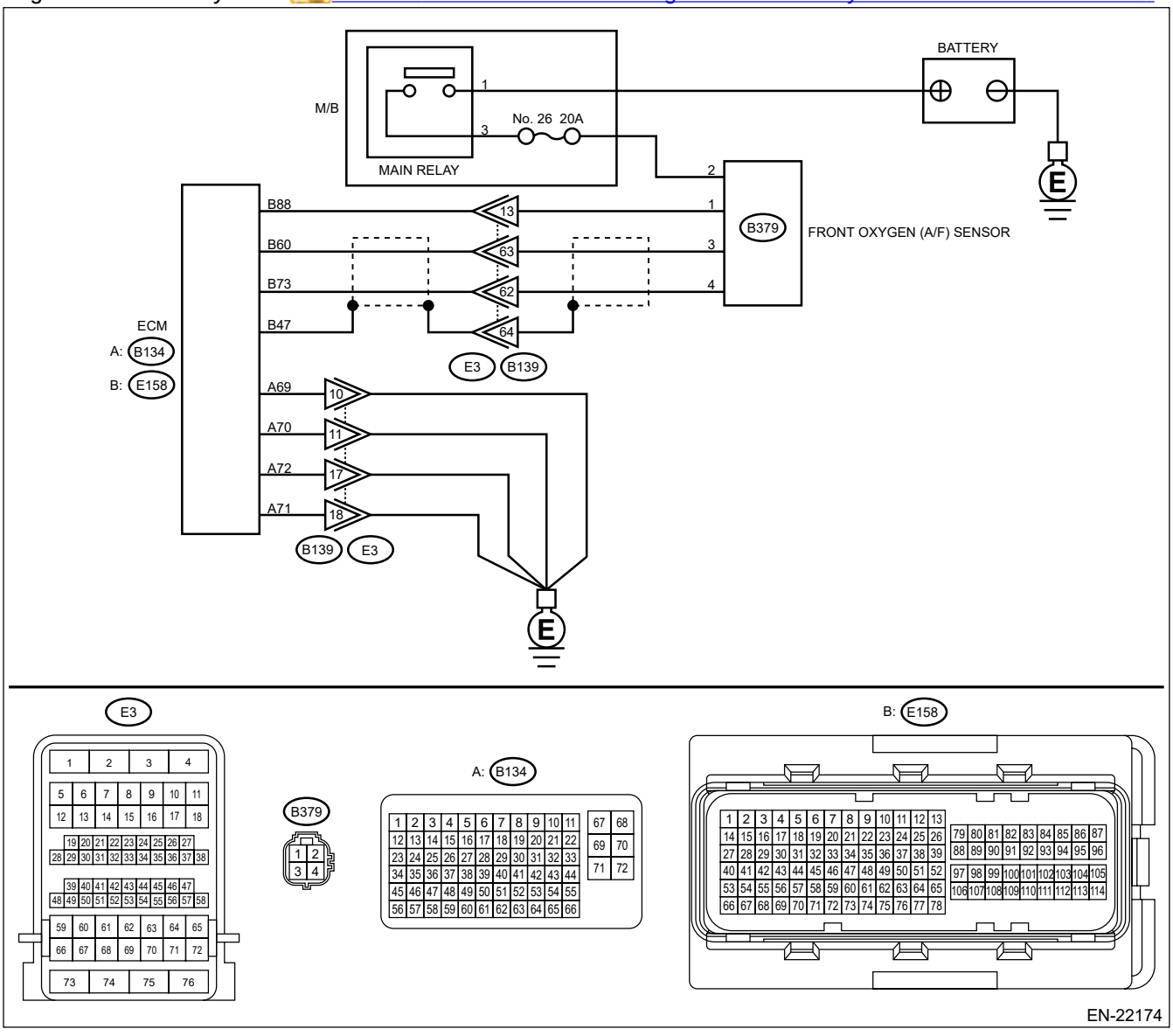
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 60 — (B379) No. 3:

(E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and front oxygen (A/F) sensor connector.

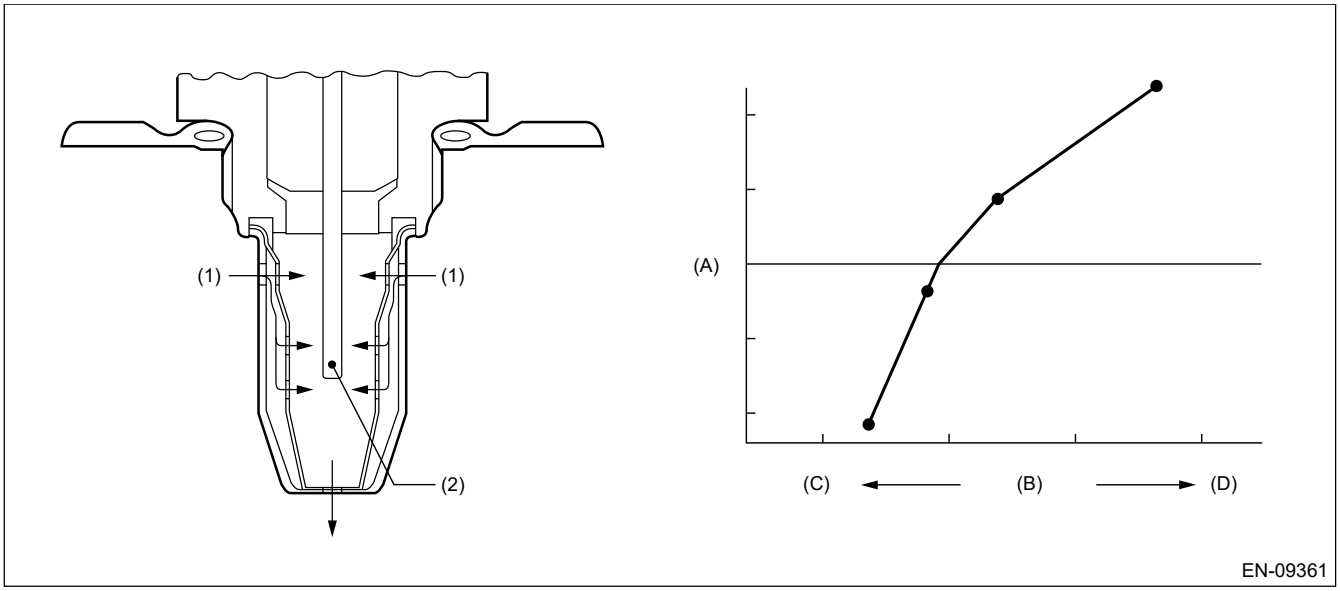
Is there poor contact of ECM or front oxygen (A/F) sensor connector?

Yes	Repair the poor contact of ECM or front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect open circuits of the sensor.
Judge as NG when the impedance of the element is large.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich

(D) Lean

(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Time of heater control duty at 70% or more	36000ms or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Front oxygen (A/F) sensor impedance	More than 450Ω

Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0137 O2 SENSOR CIRCUIT LOW VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

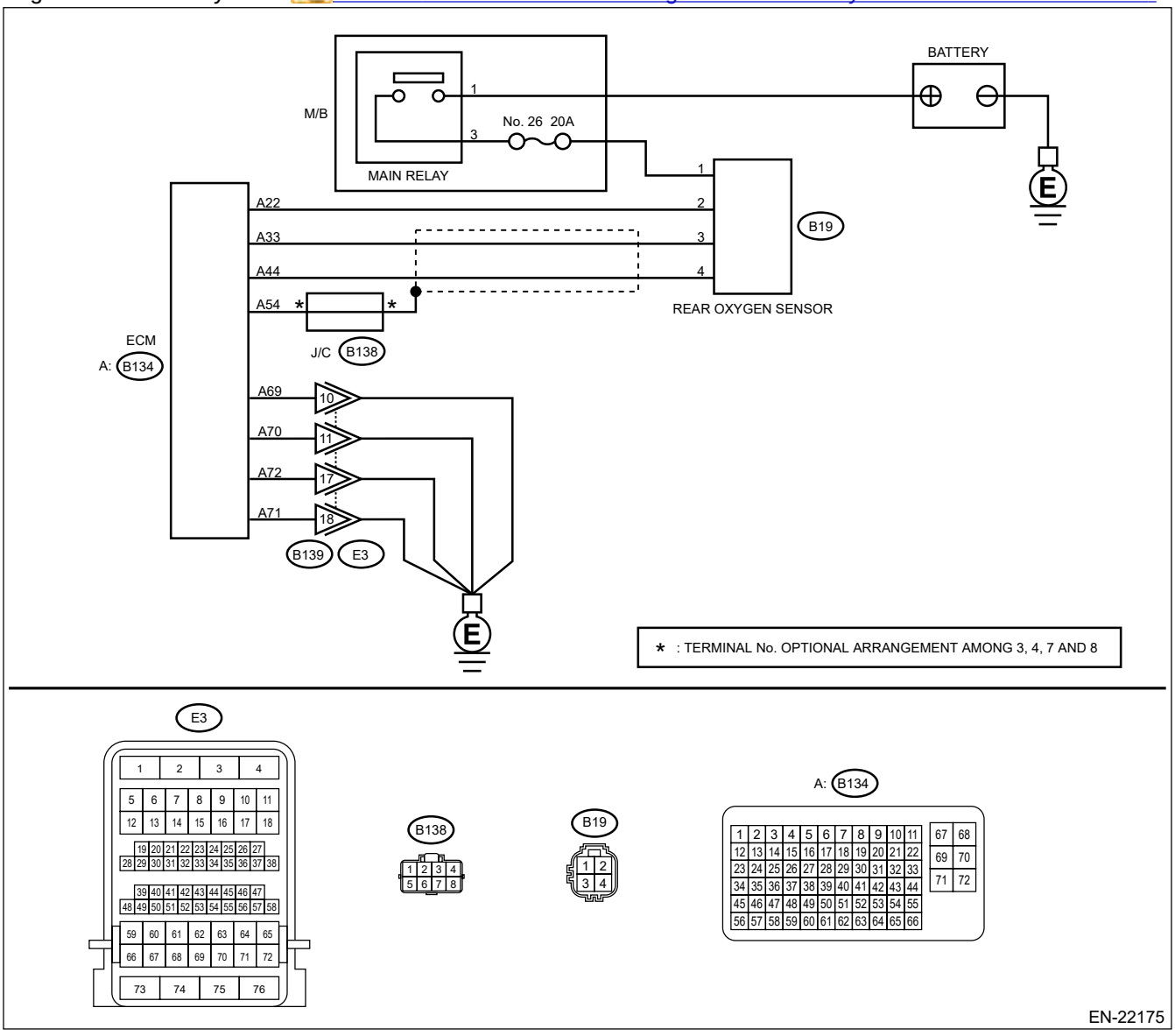
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Keep the engine speed at idle. (One minute)
3. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to the "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.490 V or more?

Yes	Go to 5.
No	Go to 2.

2. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the rear oxygen sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:
   (B134) No. 44 — (B19) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 4 (+) — Chassis ground (−):

Is the voltage 1.8 V or more?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

5. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

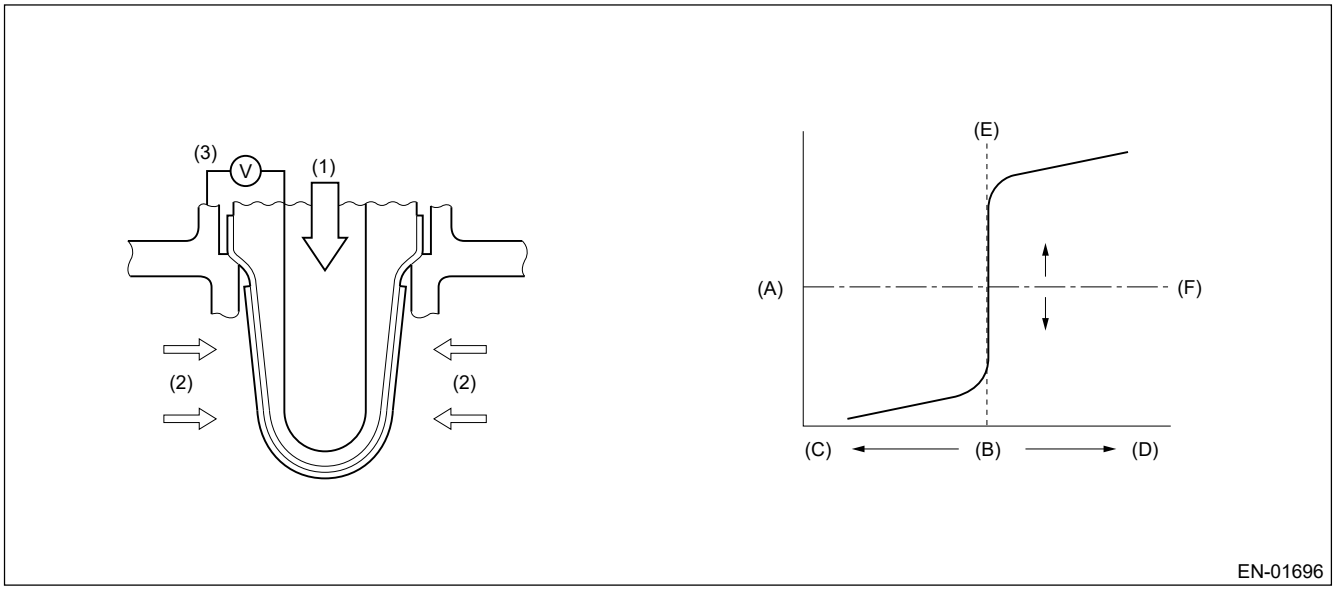
Is there any fault in exhaust system?

Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.

1. OUTLINE OF DIAGNOSIS

Detect for NG of the rear oxygen sensor continuity.
Judge as NG if the rear oxygen sensor voltage is not within the possible range.

2. COMPONENT DESCRIPTION



(A) Electromotive force	(B) Air fuel ratio	(C) Rich
(D) Lean	(E) Theoretical air fuel ratio	(F) Comparative voltage
(1) Atmosphere	(2) Exhaust gas	(3) Electromotive force

3. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Judgment 1	
Battery voltage	10.9 V or more
Judgment 2 . 3	
Battery voltage	10.9 V or more
Estimated secondary oxygen sensor element temperature (Refer to “P0420 General description”)	-500°C(-932°F) o r more
Integrated duty ratio of the secondary oxygen sensor heater operation from engine start	11800% or more
Secondary oxygen sensor offset signal	1.8V or more and 2.2V or less

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Judgment 1: Short to ground	
Secondary oxygen sensor offset signal	Less than 1.8V
Judgment 2: Circuit open	
Impedance of secondary oxygen sensor	1.7V or more
Judgment 3: Out of range	
Secondary oxygen sensor output voltage	Less than −0.22V

Time needed for diagnosis:1000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0138 O2 SENSOR CIRCUIT HIGH VOLTAGE BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

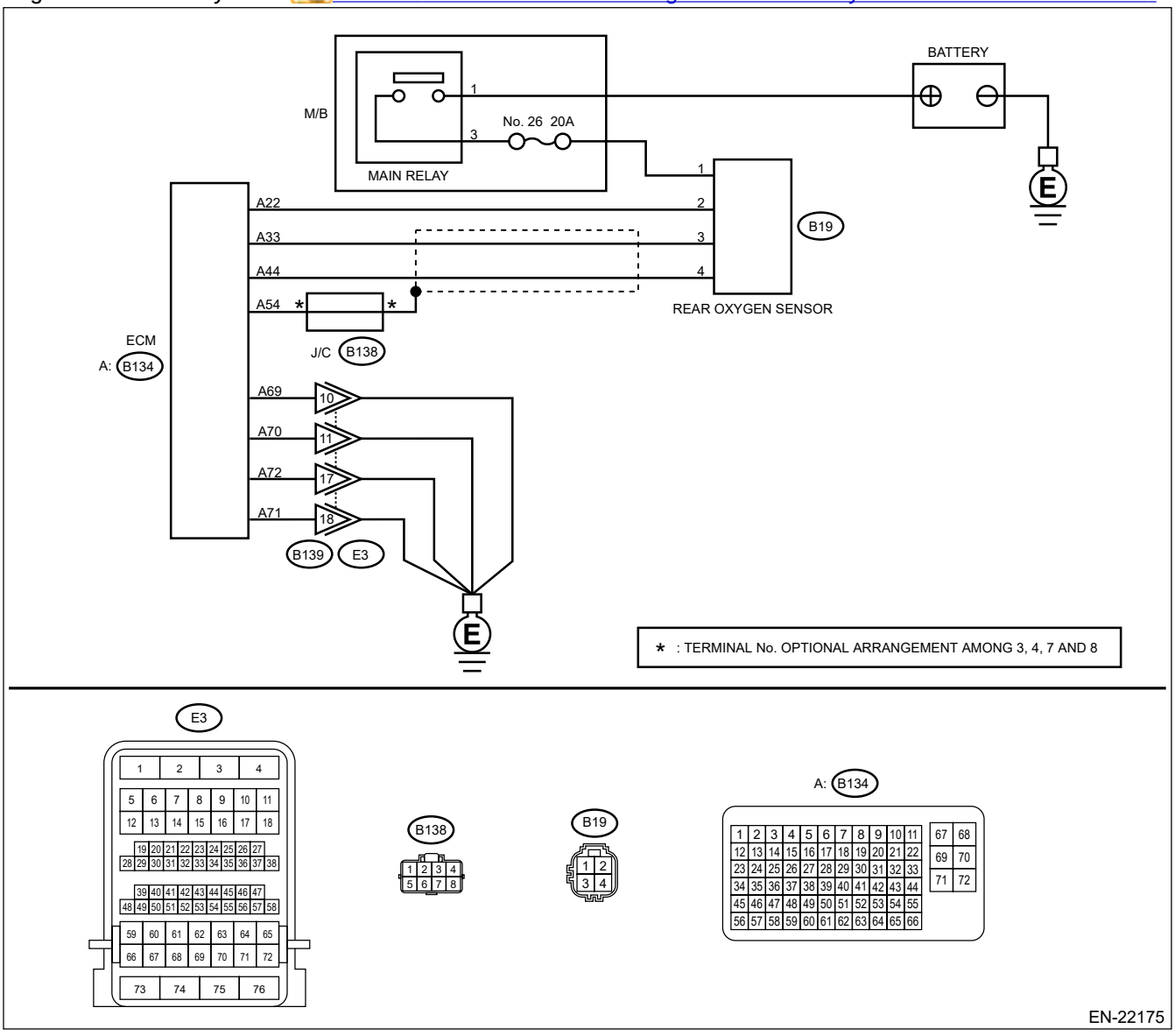
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to the "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.250 V or less?

Yes	Go to 5.
No	Go to 2.

2. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the rear oxygen sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:
   (B134) No. 44 — (B19) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and rear oxygen sensor connector**

4. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 3 (+) — Chassis ground (−):

Is the voltage 2.2 V or less?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.
No	Replace the ECM.

5. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Loose part and improper installation between front oxygen (A/F) sensor and rear oxygen sensor**

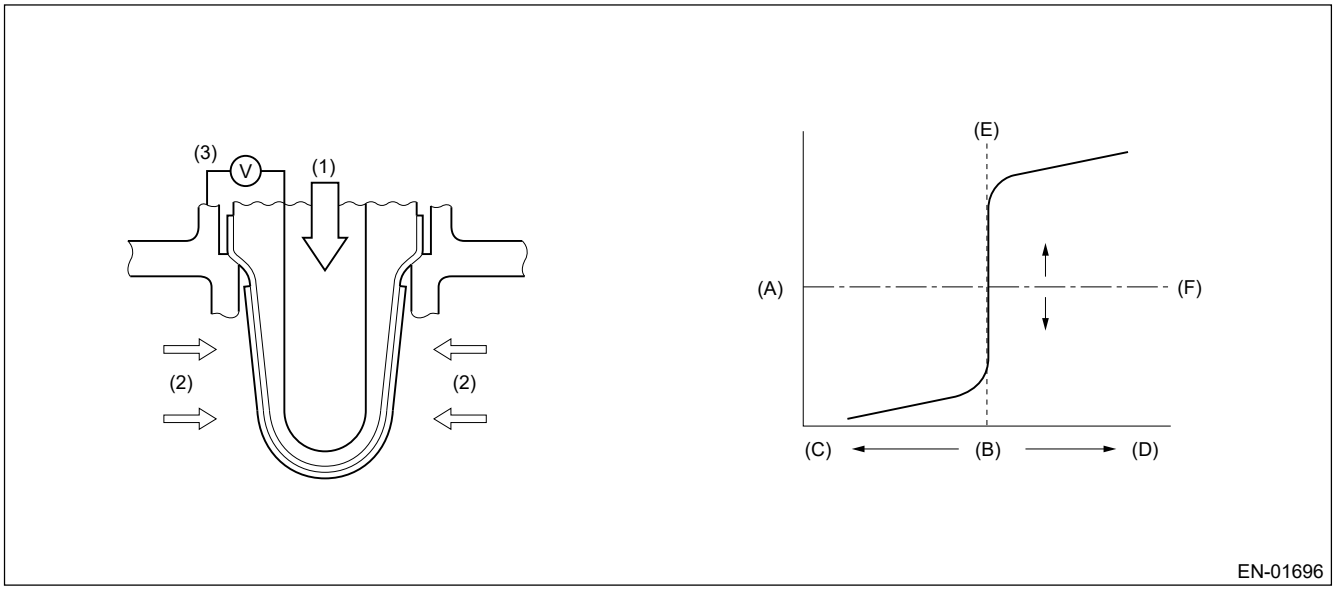
Is there any fault in exhaust system?

Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.

1. OUTLINE OF DIAGNOSIS

Detect for NG of the rear oxygen sensor continuity.
Judge as NG if the rear oxygen sensor voltage is not within the possible range.

2. COMPONENT DESCRIPTION



(A) Electromotive force	(B) Air fuel ratio	(C) Rich
(D) Lean	(E) Theoretical air fuel ratio	(F) Comparative voltage
(1) Atmosphere	(2) Exhaust gas	(3) Electromotive force

3. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Judgment 1: Short to battery	
Secondary oxygen sensor offset signal	More than 2.2V
Judgment 2: Short to battery	
Secondary oxygen sensor signal	More than 3.25V
Judgment 3: Out of range Secondary oxygen sensor output voltage	More than 1.2V

Time needed for diagnosis:1000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

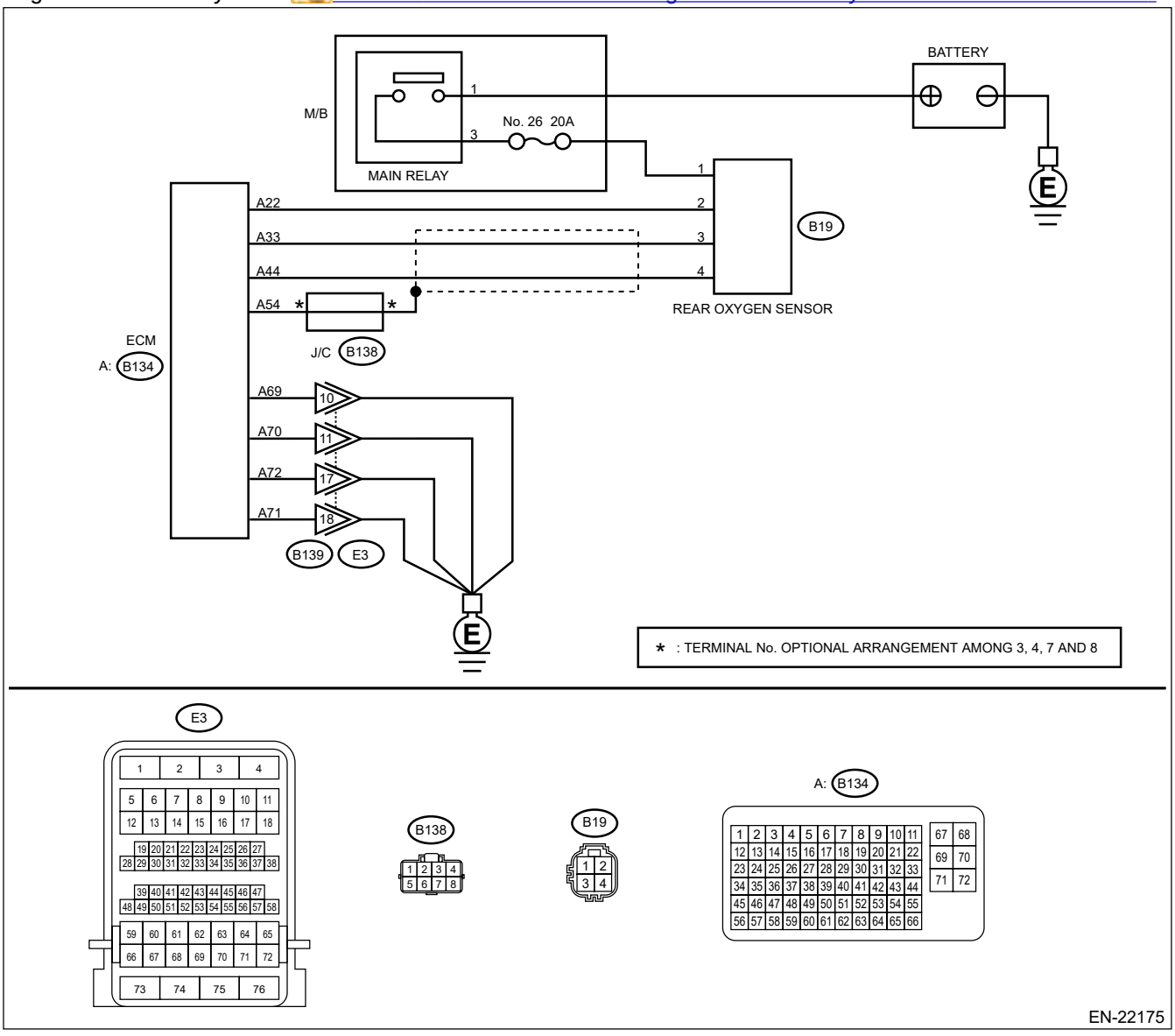
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (SHORT TO GROUND).

Measure the resistance between rear oxygen sensor connector and chassis ground.

Connector & terminal

(B19) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

3. CHECK REAR OXYGEN SENSOR.

Measure the resistance between rear oxygen sensor terminals.

Terminals

No. 3 — No. 4

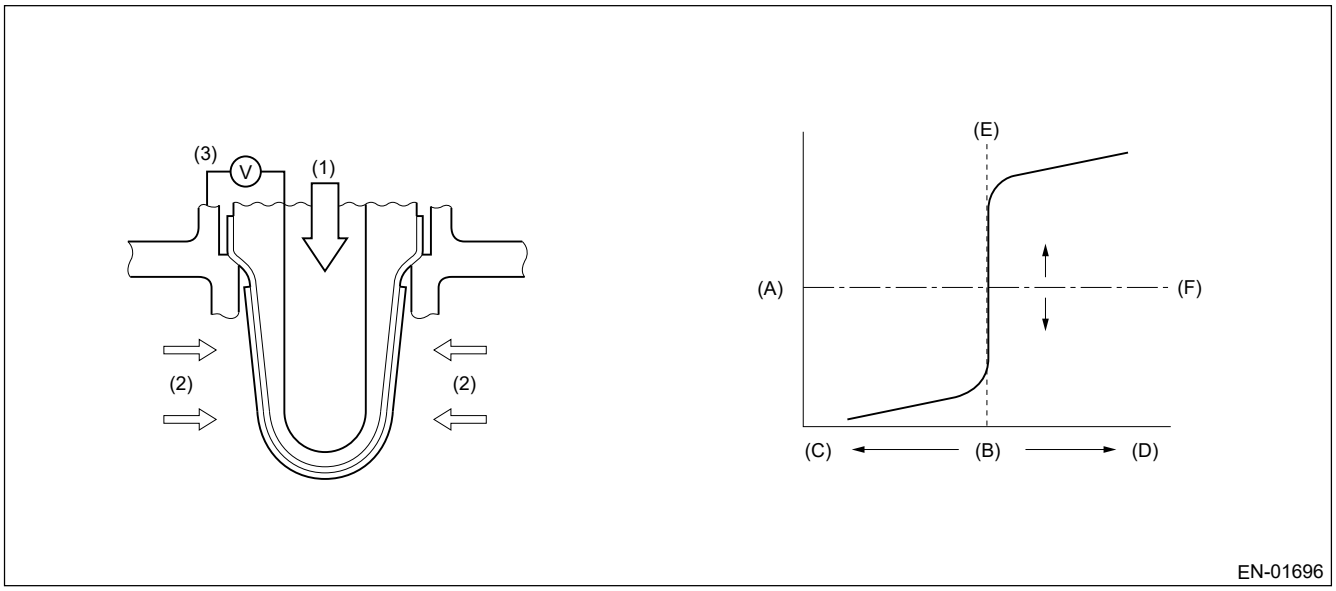
Is the resistance less than 1 Ω?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note: In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

1. OUTLINE OF DIAGNOSIS

Detect the slow response of rich → lean for rear oxygen sensor output.
When the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.
Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

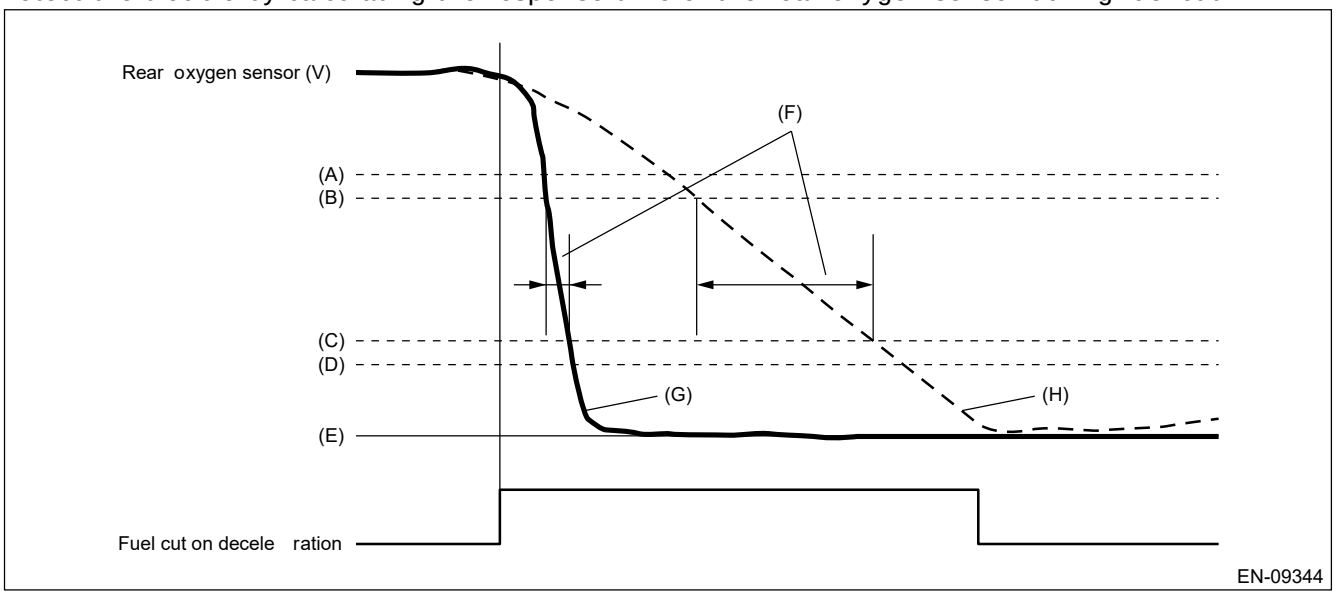
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Current calculation time of the rear oxygen sensor heater after starting	180000ms or more
Rear oxygen sensor voltage when fuel cut starts	0.55V or more
Fuel cut duration	5000ms or more
Estimated temperature of rear oxygen sensor element when fuel cut starts	500°C(932°F) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the deceleration fuel cut is activated from a high and constant speed driving.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor during fuel cut.



(A) 0.55 V
(B) 0.50 V
(C) 0.20 V
(D) 0.15 V
(E) 0 V
(F) Diagnostic parameter
(G) Normal
(H) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.5 V to 0.2 V	More than 500ms

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013B O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

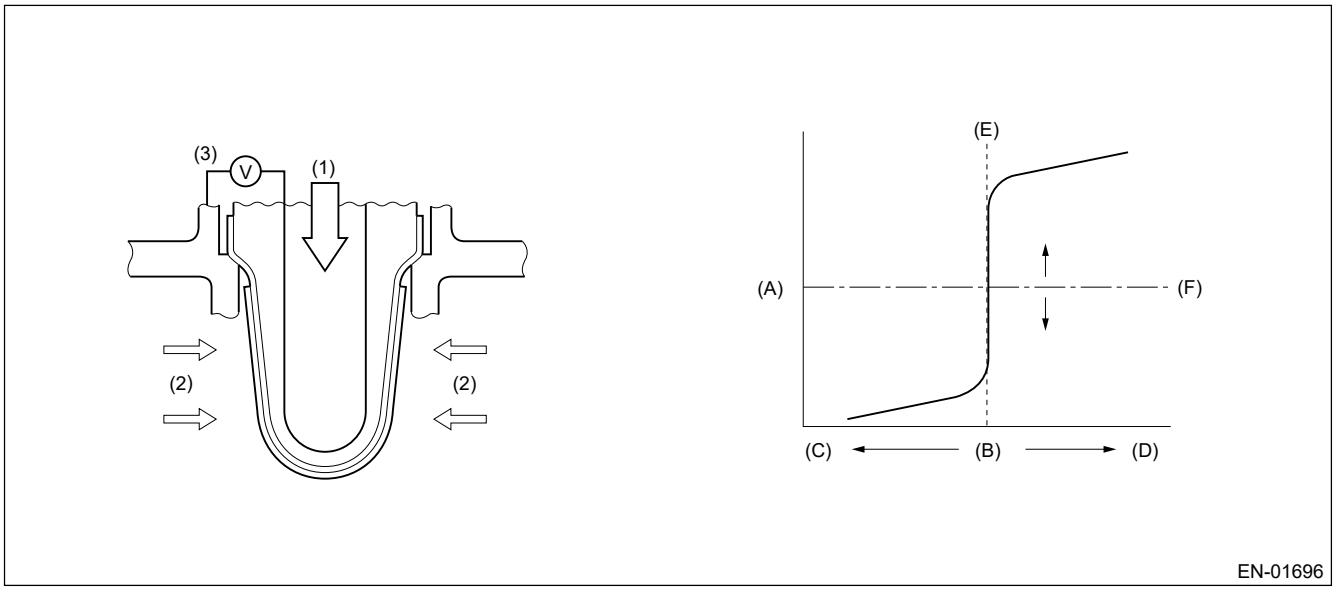
Note:

For the diagnostic procedure, refer to DTC P013A. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of lean → rich for rear oxygen sensor output.
After the deceleration fuel cut has occurred, detect the trouble by calculating the time when the rear oxygen sensor output passes through the predetermined range of voltages.
Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

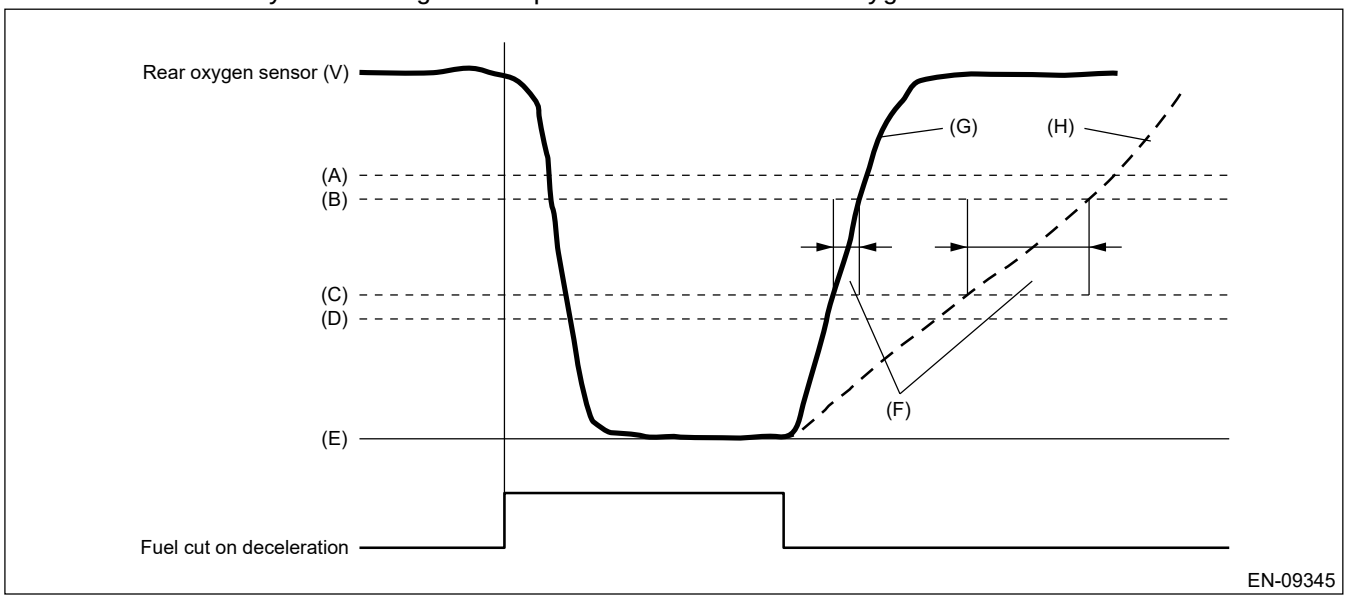
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Main feedback	In operation
(Fuel cut elapsed time	5000ms or more
Fuel cut recovery time thereafter)	3300ms or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once after recovering from a deceleration fuel cut continued for more than predetermined time.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the response time of the rear oxygen sensor after fuel cut.



(A) 0.55 V
(B) 0.50 V
(C) 0.30 V
(D) 0.25 V
(E) 0 V
(F) Diagnostic parameter
(G) Normal
(H) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for rear oxygen sensor voltage to change from 0.2V to 0.5 V	More than 3300ms

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 2

Note:

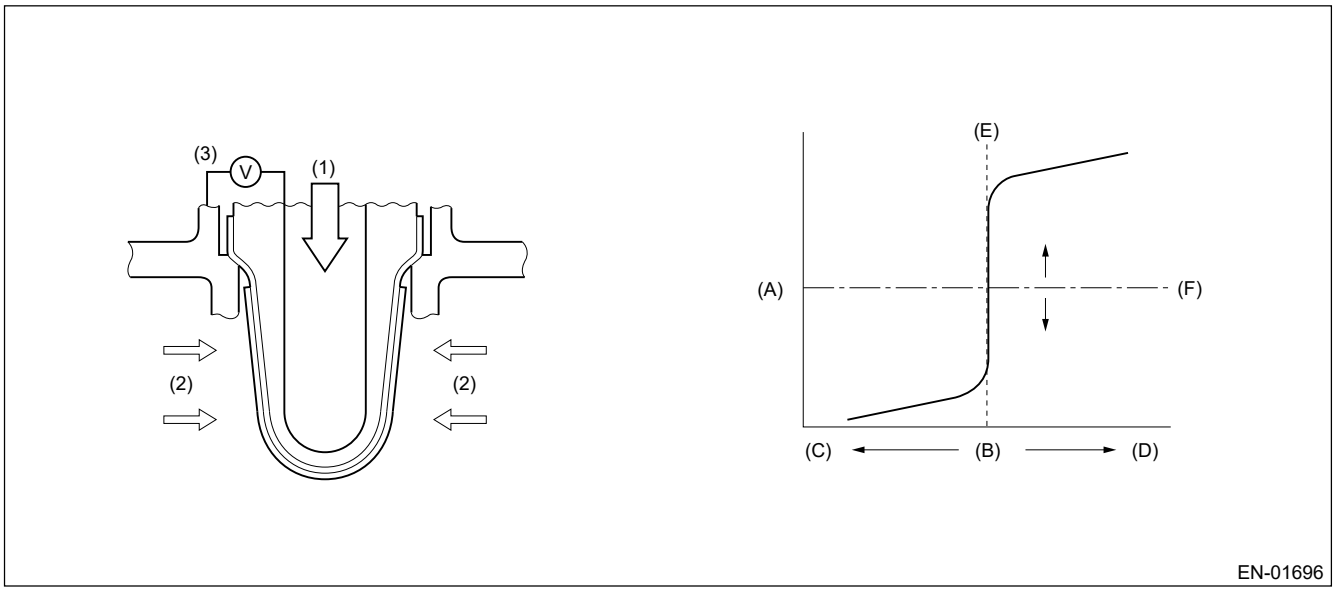
For the diagnostic procedure, refer to DTC P013A. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for rich → lean.

After the deceleration fuel cut has started, detect the trouble by calculating the time when the rear oxygen sensor output decreases to the predetermined voltages.
Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Rich
(D) Lean
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

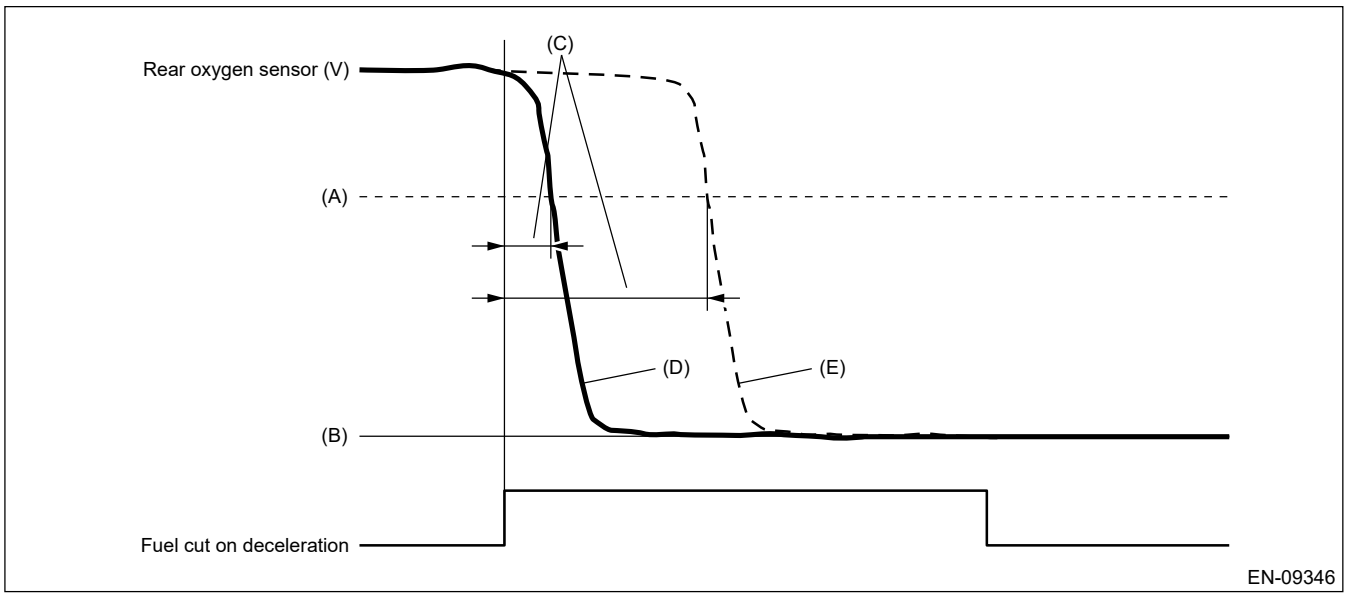
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Rear oxygen sensor voltage when fuel cut starts	0.55V or more
(Fuel cut elapsed time	5000ms
Fuel shut-off function thereafter)	Not in operation
Estimated temperature of rear oxygen sensor element when fuel cut starts	500°C(932°F) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the deceleration fuel cut is activated from a high and constant speed driving.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the beginning of the fuel cut to the beginning of the rear oxygen sensor voltage starting to drop.



(A) 0.5 V (B) 0 V (C) Diagnostic parameter
(D) Normal (E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Time needed for the rear oxygen sensor voltage to change up to 0.5 V after the fuel cut started	More than 3600ms

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P013F O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 2

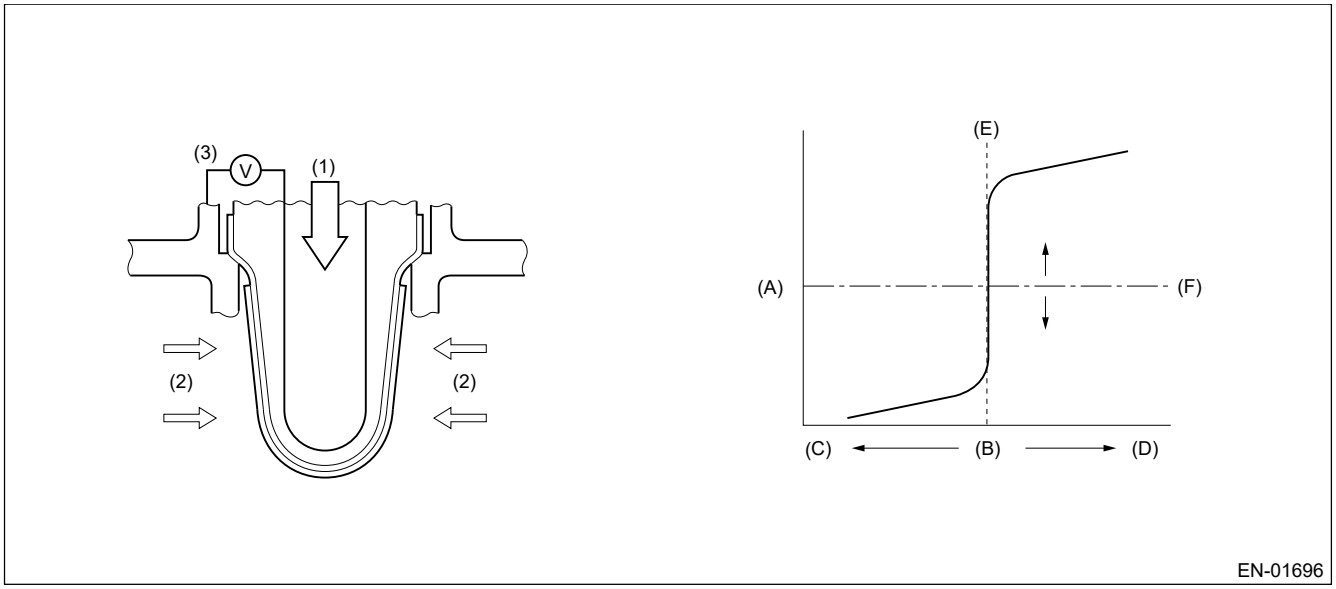
Note:

For the diagnostic procedure, refer to DTC P013A. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P013A O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for lean → rich.
After the deceleration fuel cut has completed, detect the trouble by calculating the time when the rear oxygen sensor output increases to the predetermined voltages.
Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

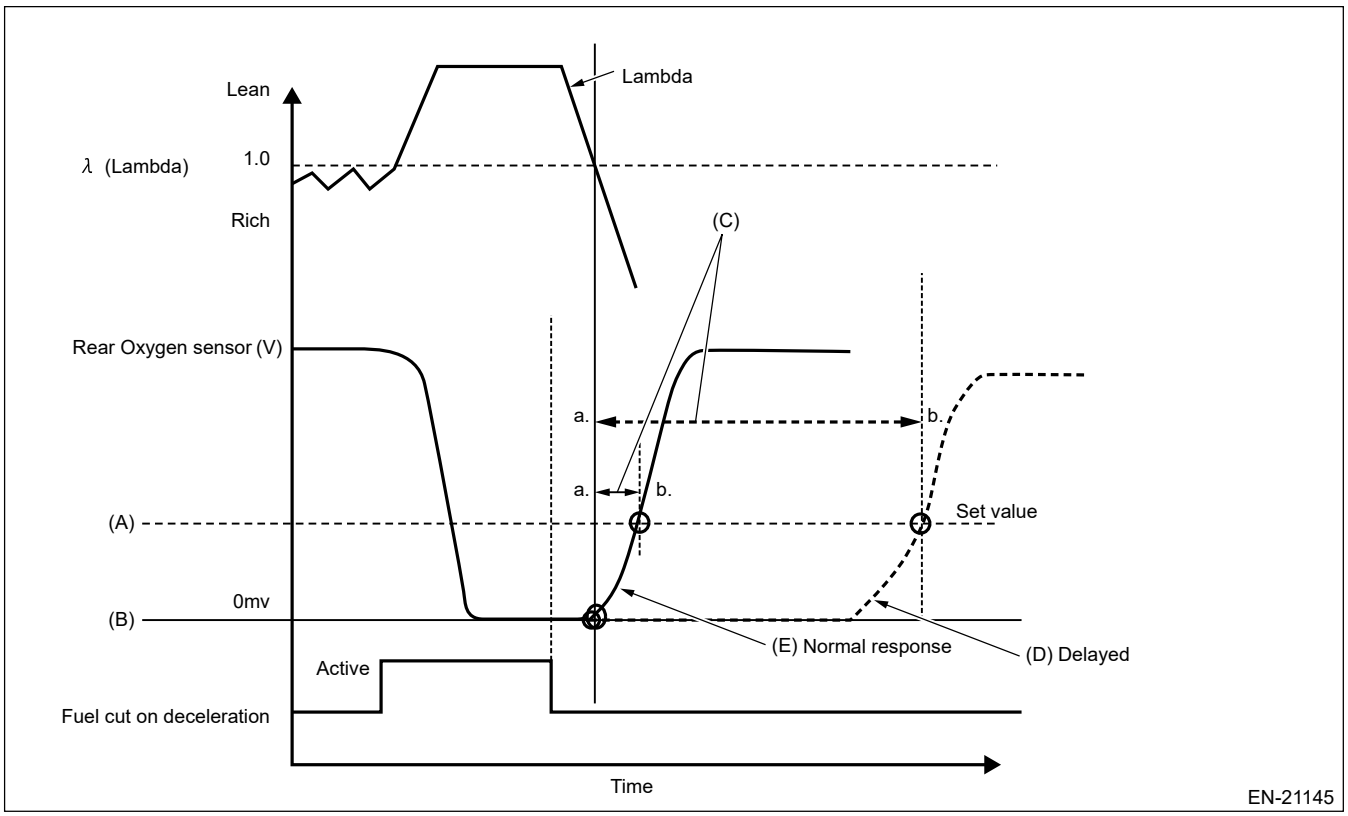
Secondary parameters	Execution condition
Battery voltage	More than 10.9 V
Main feedback	In operation
Rear oxygen sensor voltage when fuel cut ends	Less than 0.15V
(Fuel cut elapsed time	5000ms or more
Fuel shut-off function thereafter)	Not in operation
Estimated element temperature of rear oxygen sensor when fuel cut has completed	500°C(932°F) or more
Amount of intake air	10g/s(0.35oz/s) or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once when recovering from the deceleration fuel cut continued for more than predetermined time with the rear oxygen sensor warmed up sufficiently.

5. DIAGNOSTIC METHOD

Detect the trouble by calculating the time from the completion of the fuel cut to the beginning of the rear oxygen sensor voltage starting to rise.



(A) 0.3 V (B) 0 V (C) Diagnostic parameter

(D) Normal (E) Malfunction

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage value of rear oxygen sensor	Less than 0.2V

Time needed for diagnosis: Value of Map

Amount of intake air g/s (oz/s)	10 (0.35)	12 (0.42)	14 (0.49)	18 (0.63)	22 (0.78)	24 (0.85)
Elapsed time (s)	7.5	6.5	5.5	4.0	2.6	2.0

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0141 O2 SENSOR HEATER CIRCUIT BANK 1 SENSOR 2

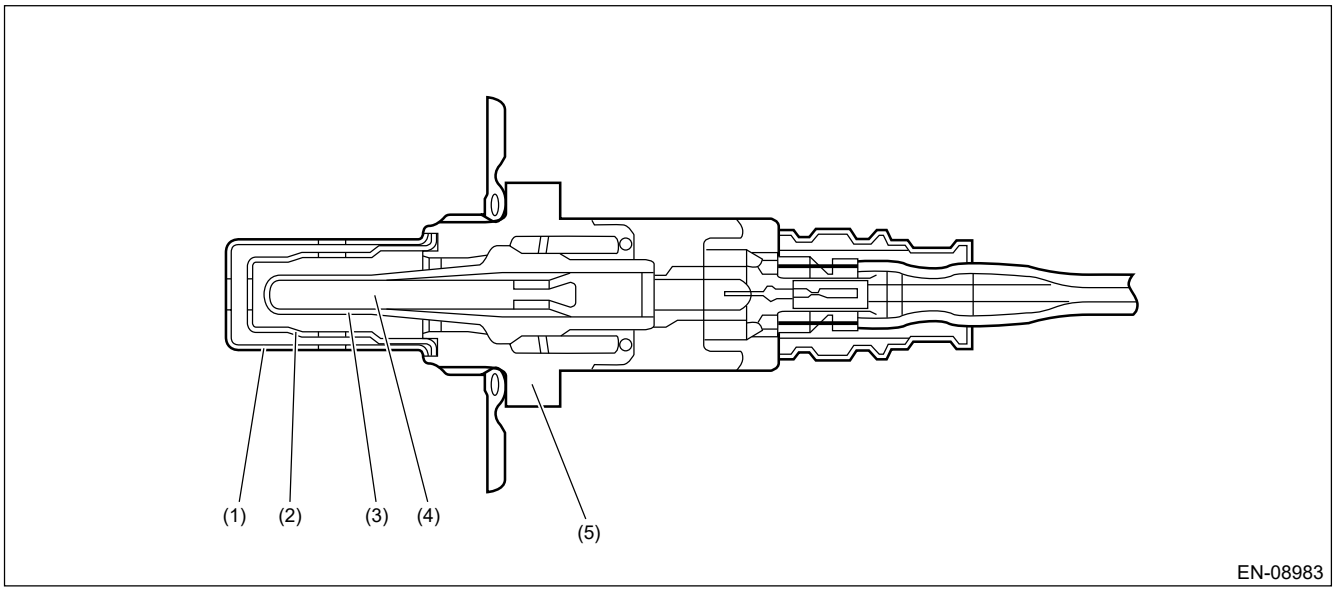
Note:

For the diagnostic procedure, refer to DTC P0037. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0037 A/F / O2 HEATER CONTROL CIRCUIT LOW BANK 1 SENSOR 2.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of the rear oxygen sensor heater.
Judge as NG if it is determined that the rear oxygen sensor impedance is large by observing the engine conditions.

2. COMPONENT DESCRIPTION



(1) Element cover (outer)
(2) Element cover (inner)
(3) Sensor element
(4) Ceramic heater
(5) Sensor housing

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Elapsed time after the heater starts continuity	60000ms or more
Elapsed time after fuel cut	20000ms or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Rear oxygen sensor impedance	More than 110Ω

Time needed for diagnosis: 10000ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK EXHAUST SYSTEM.

Check the exhaust system.

Note:

Check the following items.

- **Loose installation of front portion of exhaust pipe onto cylinder heads**
- **Loose connection between front exhaust pipe and front catalytic converter**
- **Damage of exhaust pipe resulting in a hole**

Is there any fault in exhaust system?

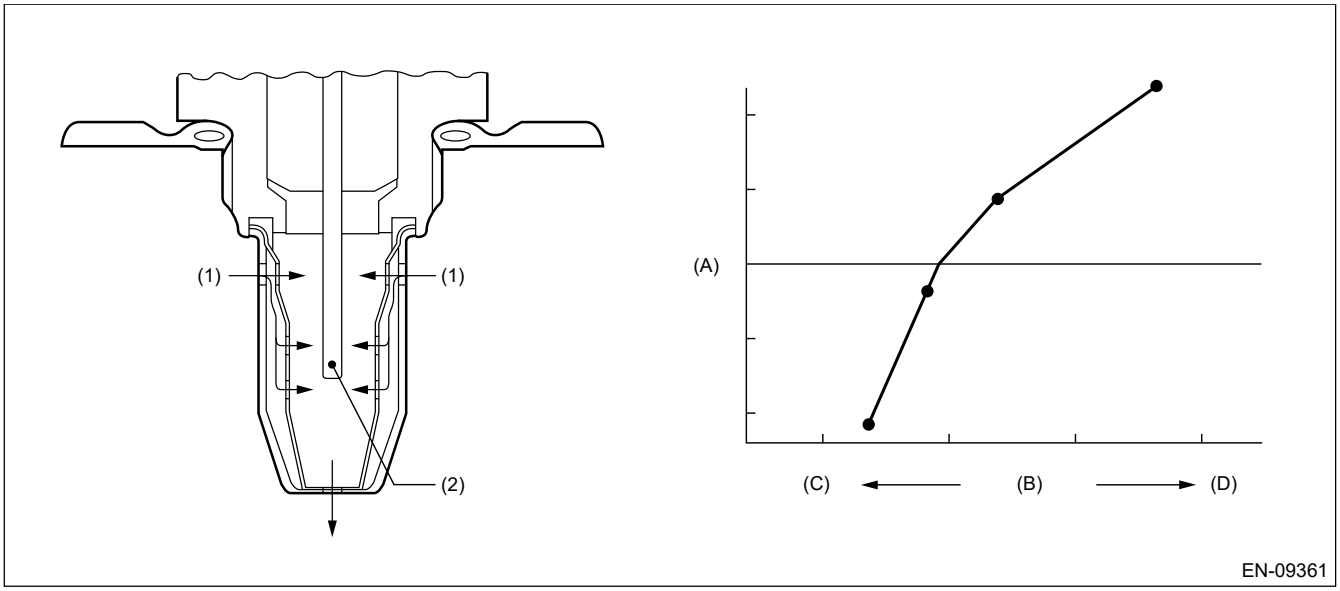
Yes	Repair the exhaust system.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.

For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich

(D) Lean

(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

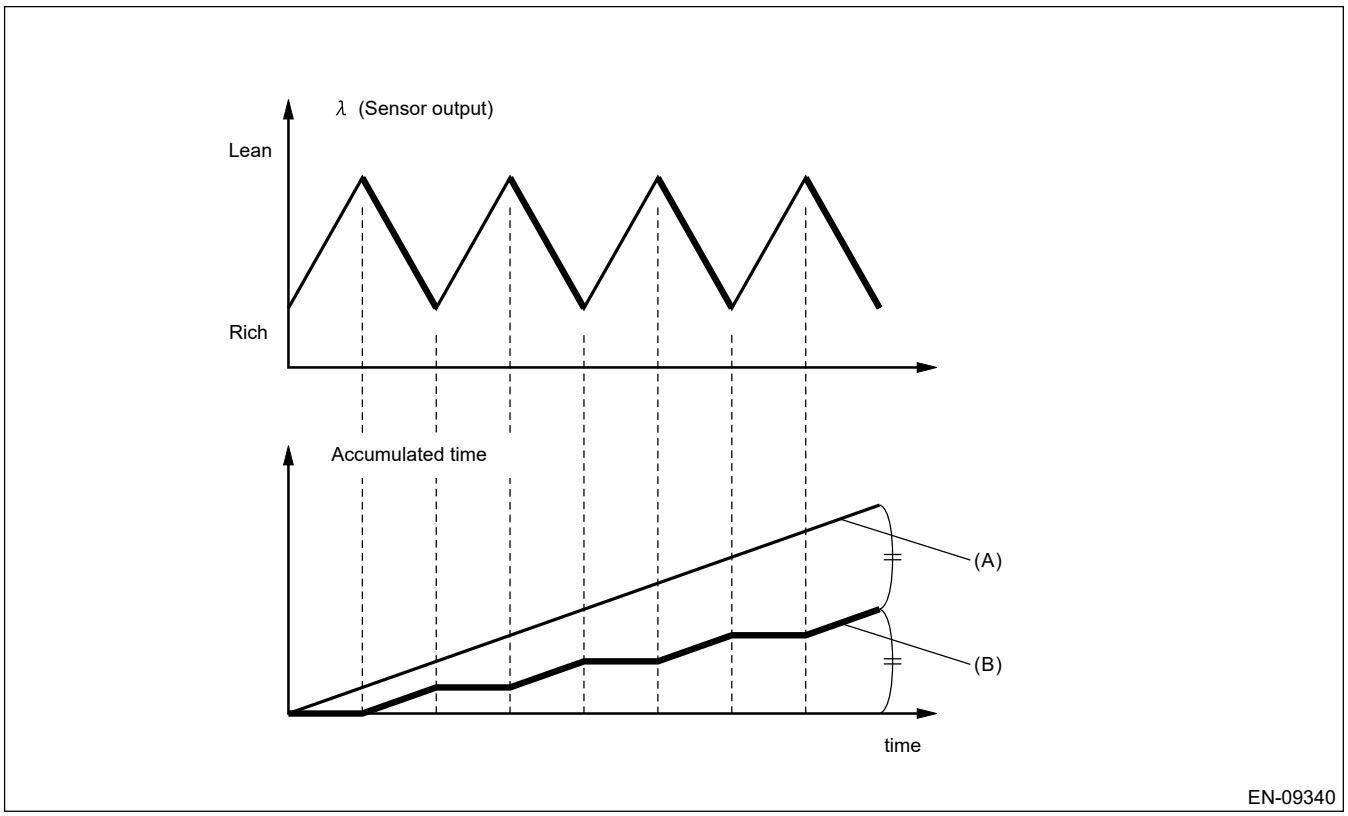
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa(563mmHg,22.2inHg) or more
Time of main feedback operation	3000ms or more
Engine speed	1000rpm or more
Amount of intake air	10g/s(0.35oz/s) or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction by checking “Cumulative value of time when λ changes from lean → rich” in comparison to “Time during which diagnosis is in progress”.



(A) Time during which diagnosis is in progress

(B) Cumulative value of time when λ changes from lean → rich

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
(Cumulative value of time when λ changes from lean → rich) / (Time during which diagnosis is in progress) and	Less than 0.35	P014C
Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean	More than 30ms	
(Cumulative value of time when λ changes from lean → rich) / (Time during which diagnosis is in progress) and Average value of time necessary for λ to inverse the air fuel ratio to Rich → Lean → Rich	More than 0.65 More than 20ms	P014D

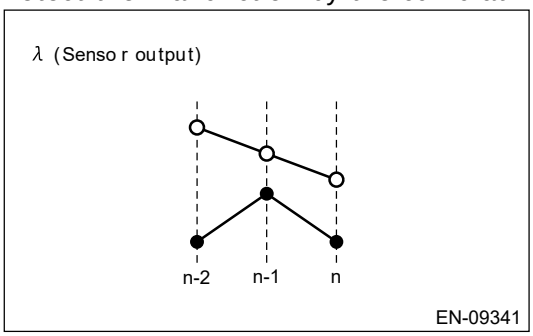
Time needed for diagnosis: 90000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by the cumulative value obtained from the amount of variation in λ change.



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Cumulative value obtained from the amount of variation in λ change	Less than value of Map	P014C and P014D

Map

Cumulative value obtained from the amount of variation in λ	**0.00**	**3.50**
Cumulative value obtained from the amount of variation in λ change	0.00	5.00

Time needed for diagnosis: 90000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P014D A/F / O2 SENSOR SLOW RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P014C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1

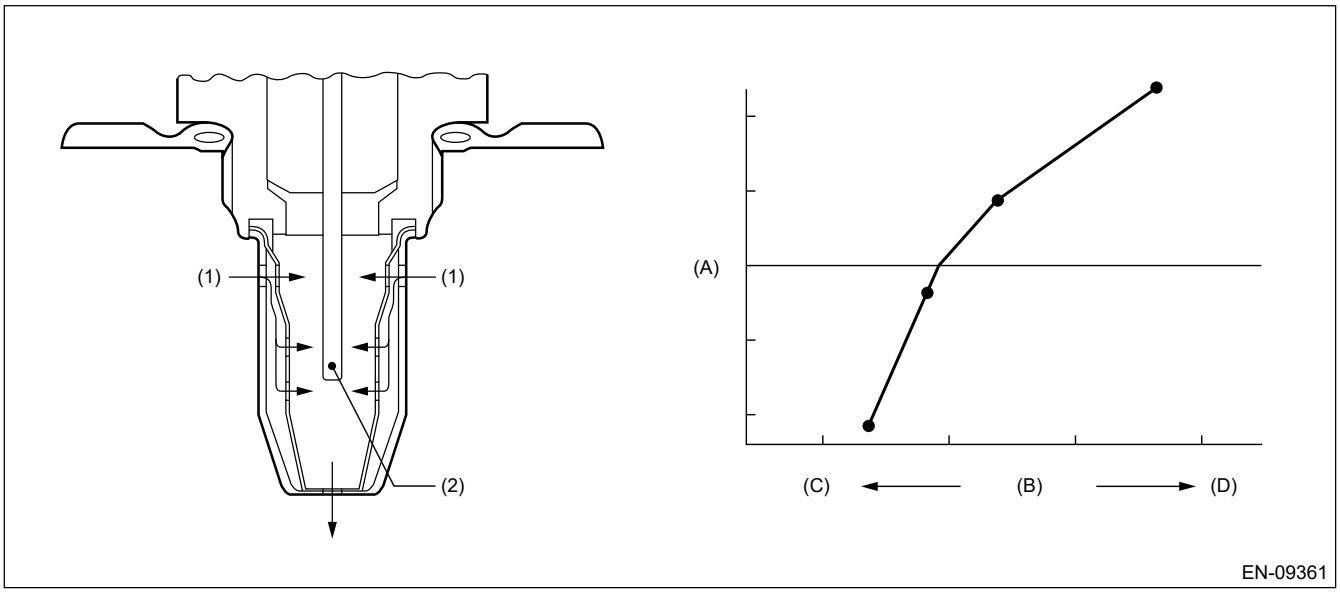
Note:

For the diagnostic procedure, refer to DTC P014C. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

1. OUTLINE OF DIAGNOSIS

Detect the slow response of front oxygen (A/F) sensor.
For diagnosis, detect the trouble by processing the λ waveform in normal driving without forcibly changing the target air fuel ratio.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich
(D) Lean
(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Diagnostic method 1 and 2

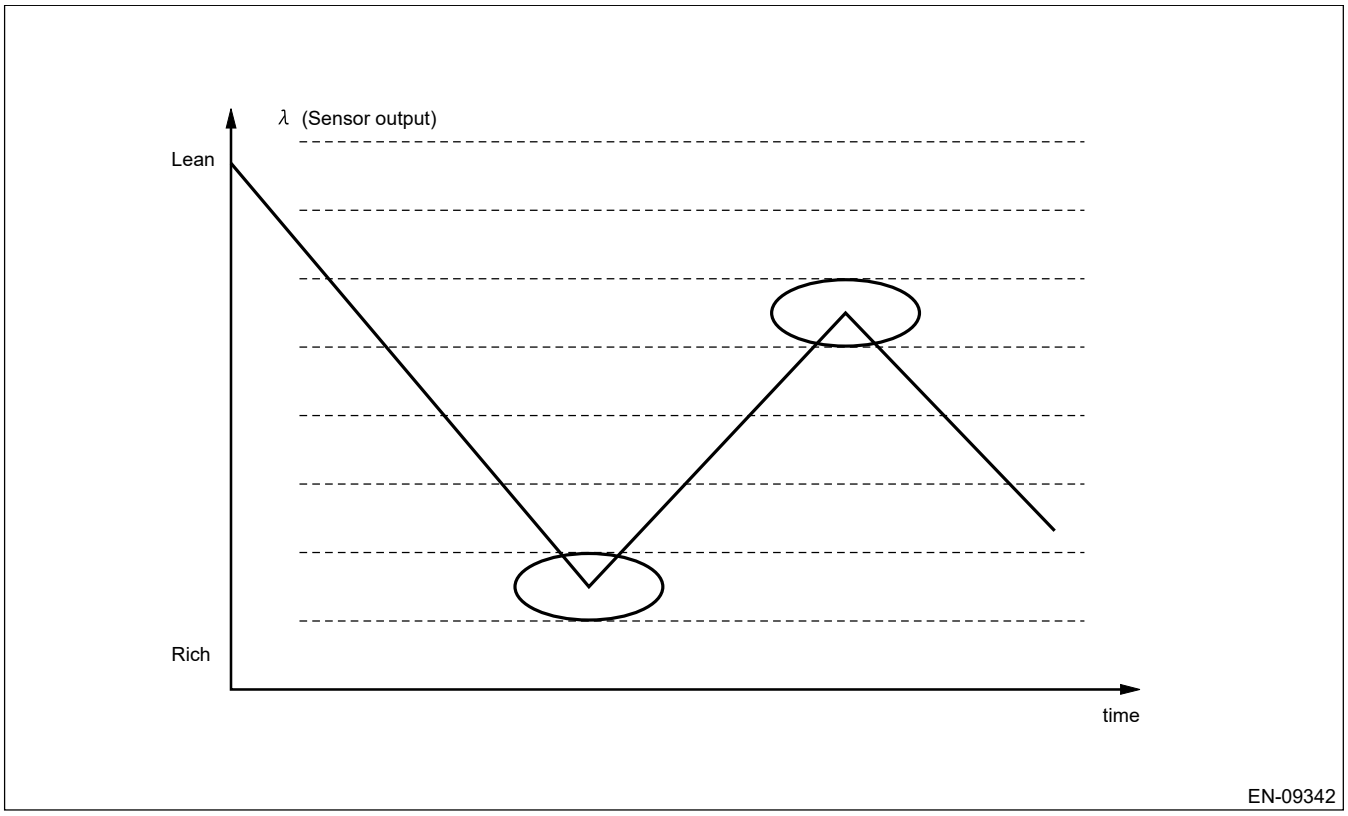
Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa(563mmHg,22.2inHg) or more
Time of main feedback operation	3000ms or more
Engine speed	1000rpm or more
Amount of intake air	10g/s(0.35oz/s) or more

4. GENERAL DRIVING CYCLE

Perform diagnosis only once in a city driving including normal acceleration and deceleration.

5. DIAGNOSTIC METHOD 1

Detect the malfunction depending on the average value of time necessary for λ to inverse the air fuel ratio from “Lean → Rich → Lean” to “Rich → Lean → Rich”.



Judge as NG when the following conditions are established.

Judgment value

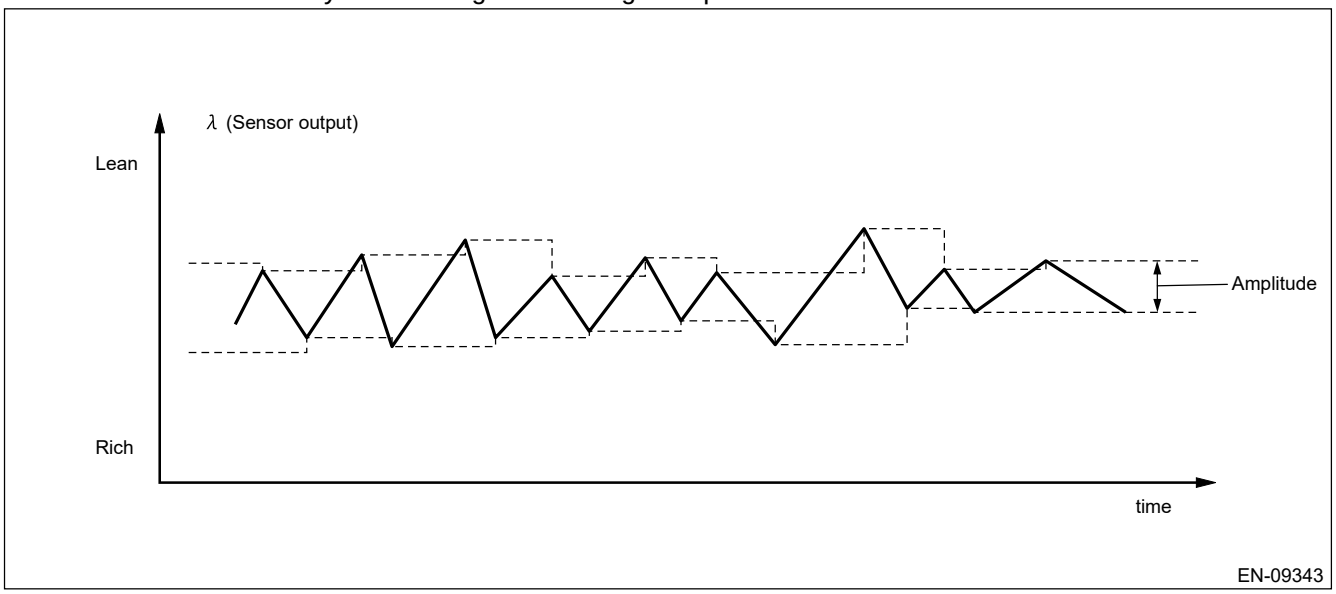
Malfunction Criteria	Threshold Value	DTC
Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean and Average value of time necessary for λ to inverse the air fuel ratio to Lean → Rich → Lean	More than 200ms More than 250ms	P015A
Average value of time necessary for λ to inverse the air fuel ratio to Rich → Lean → Rich and Average value when λ is rich	More than 250ms More than 300ms	P015B

Time needed for diagnosis: 90000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. DIAGNOSTIC METHOD 2

Detect the malfunction by calculating the average amplitude of λ.



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Average value for λ amplitude	More than 0.044 (CVT model) More than 0.044 (MT model)	P015A and P015B

Time needed for diagnosis: 90000 ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P015B A/F / O2 SENSOR DELAYED RESPONSE - LEAN TO RICH BANK 1 SENSOR 1

Note:

For the diagnostic procedure, refer to DTC P014C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P014C A/F / O2 SENSOR SLOW RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P015A. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P015A A/F / O2 SENSOR DELAYED RESPONSE - RICH TO LEAN BANK 1 SENSOR 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0171 SYSTEM TOO LEAN BANK 1

Refer to DTC P0172 for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0172 SYSTEM TOO RICH BANK 1.

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Main feedback	Operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously during the closed loop.

4. DIAGNOSTIC METHOD

Compare the diagnostic value with the threshold value, and if a condition meeting the malfunction criteria continues for 10s × 3time(s) or more, judge that there is a fault in the fuel system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback	Value of Map or more

Map

Amount of air g/s (oz/s)	0(0)	3.2(0.11)	
Threshold Value	1.35	1.35	

Time needed for diagnosis: 10s×3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0172 SYSTEM TOO RICH BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK EXHAUST SYSTEM.

Check the installation condition of exhaust system.

Are there holes or loose bolts on exhaust system?

Yes	Repair the exhaust system.
No	Go to 2.

2. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 3.

3. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 4.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

4. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Data Monitor

Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to the “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes	Go to 5.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

5. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to the “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow]2.0—5.0 g/s (0.26—0.66 lb/m)?

Yes	Go to 6.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

6. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to the “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value −10 — 50°C (−18 — 90°F)?

Yes	Go to 7.
No	Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

7. CHECK PCV VALVE.

Check the PCV valve.

Check that the PCV valve has no deformation, cracks or other damages.

Yes	Repair or replace the PCV valve.
No	Go to 8.

8. CHECK PCV HOSE.

Check the PCV hose.

Check the PCV hose assembly for cracks, damage or looseness.

Yes	Repair or replace the PCV hose.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect fuel system malfunction by the amount of main feedback control.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Main feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously during the closed loop.

4. DIAGNOSTIC METHOD

Compare the diagnostic value (fsobd) with the threshold value, and if a condition meeting the malfunction criteria continues for 10s×3time(s) or more, judge that there is a fault in the fuel system.

Judgment value

Malfunction Criteria	Threshold Value
Offset amount of main feedback compensation	Less than value of Map

Map

Warm-up increase compensation coefficient	0.000	0.100	0.200	0.300	0.400	0.416
Threshold Value	0.65 - 0.000	0.65 - 0.090	0.65 - 0.166	0.65 - 0.233	0.65 - 0.291	0.65 - 0.299

Time needed for diagnosis: 10s×3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0191 FUEL RAIL PRESSURE SENSOR CIRCUIT RANGE/PERFORMANCE BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

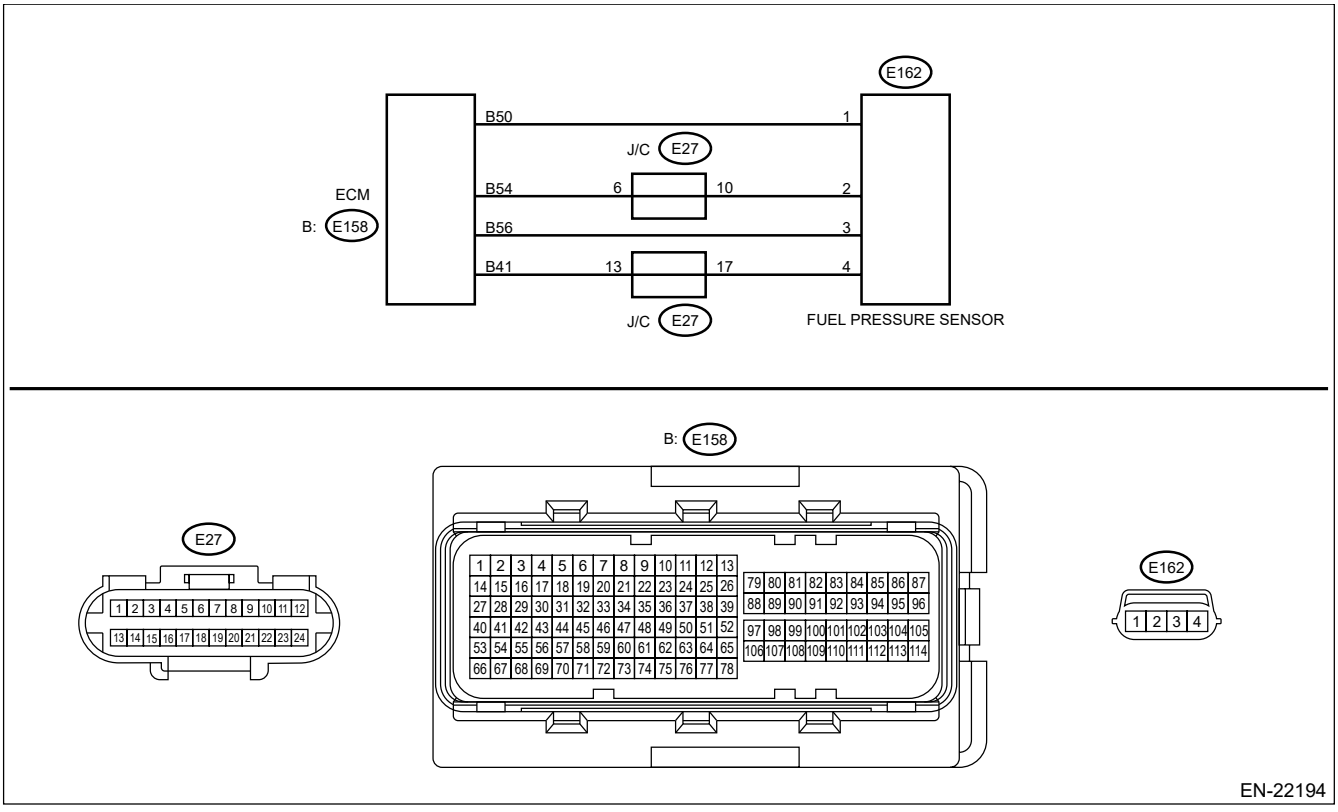
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.

2. Turn the ignition switch to OFF.
3. Start the engine.
4. Read [Fuel Rail Pressure A] and [Fuel Rail Pressure B] on “data monitor” using the Subaru Select Monitor or general scan tool.

Is the difference of the values between [Fuel Rail Pressure A] and [Fuel Rail Pressure B]2.18MPa(16354mmHg, 644 inHg) or more?

Yes	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pressure Sensor.
No	Check permanent non-occurrence of malfunction Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

1. OUTLINE OF DIAGNOSIS

Detect the offset malfunction of the fuel pressure sensor.
Judge as NG when the difference of the relative pressure between the fuel pressure and the barometric pressure is equal to or more than the judgment value when the predetermined conditions are met.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the engine starts after a certain period of soaking time.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
ABS(Main HPFR pressure sensor - Sub HPFR pressure sensor)	2.183MPa (16377 mmHg, 645 inHg)

Malfunction Criteria	Threshold Value
	or more

Time needed for diagnosis:2500ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0192 FUEL RAIL PRESSURE SENSOR CIRCUIT LOW BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

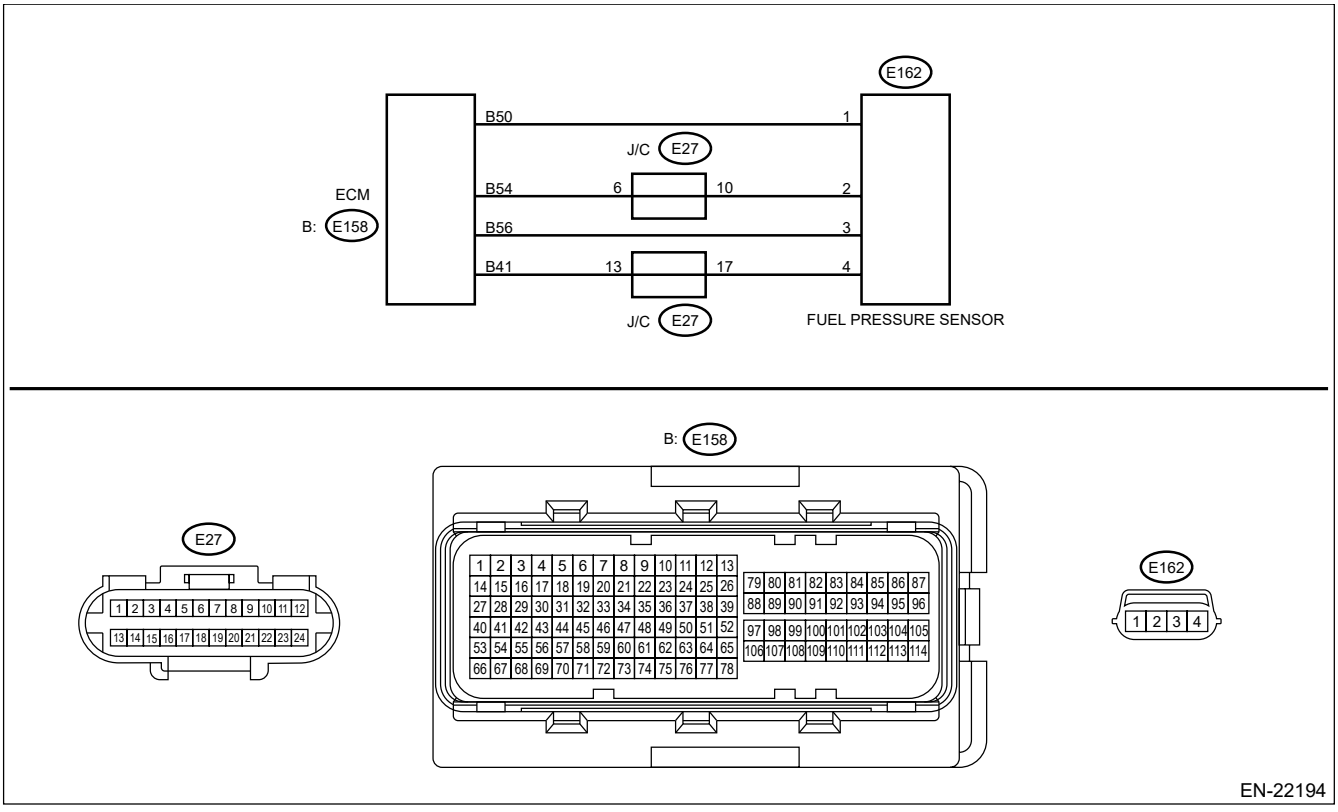
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Start the engine.
4. Read [Fuel Rail Pressure A] on “data monitor” using the Subaru Select Monitor or general scan tool.



Is the value of [Fuel Rail Pressure A] approx. 0MPa (0 mmHg, 0 inHg)?

Yes	Go to 2.
No	Check permanent non-occurrence of malfunction Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

2. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL PRESSURE SENSOR (SHORT TO GROUND).

1. Clear the memory. Ref. to COMMON(diag)>Clear memory.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (E158) No.56 — Chassis ground:
   (E162) No.3 — Chassis ground:

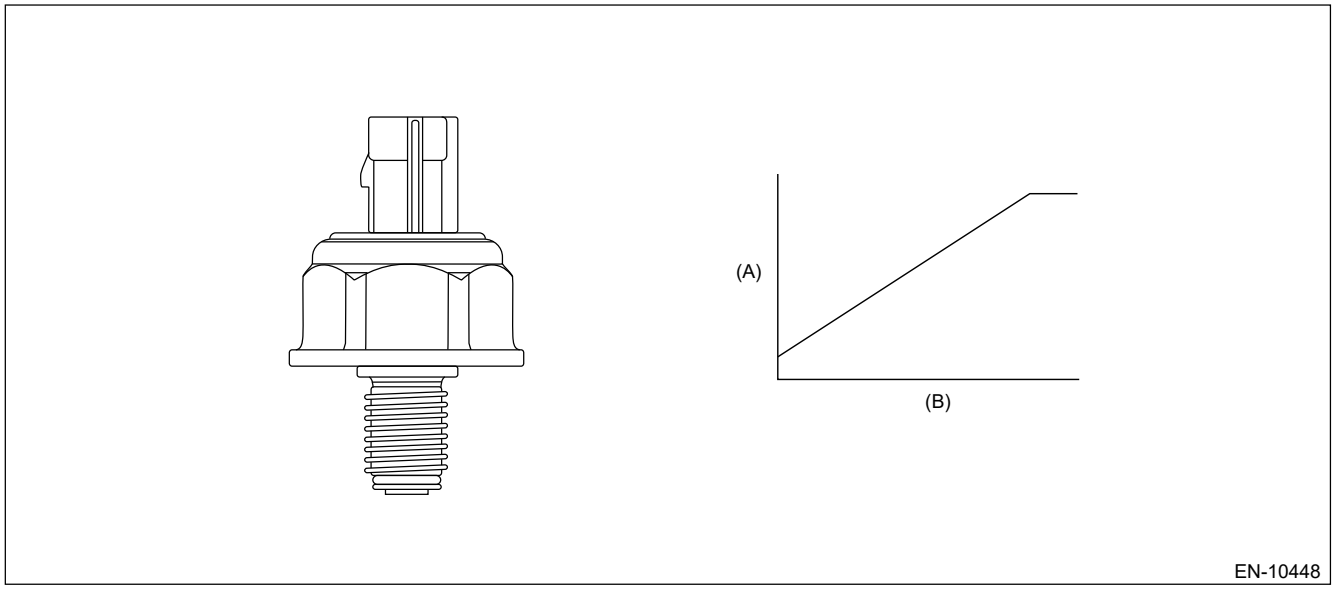
Is the resistance 1 MΩ or more?

Yes	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pressure Sensor.
No	Repairing or replacing the wiring harness or connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the fuel pressure sensor.

2. COMPONENT DESCRIPTION



(A) Output voltage (B) Absolute pressure

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.321V

Time needed for diagnosis:2400ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0193 FUEL RAIL PRESSURE SENSOR CIRCUIT HIGH BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

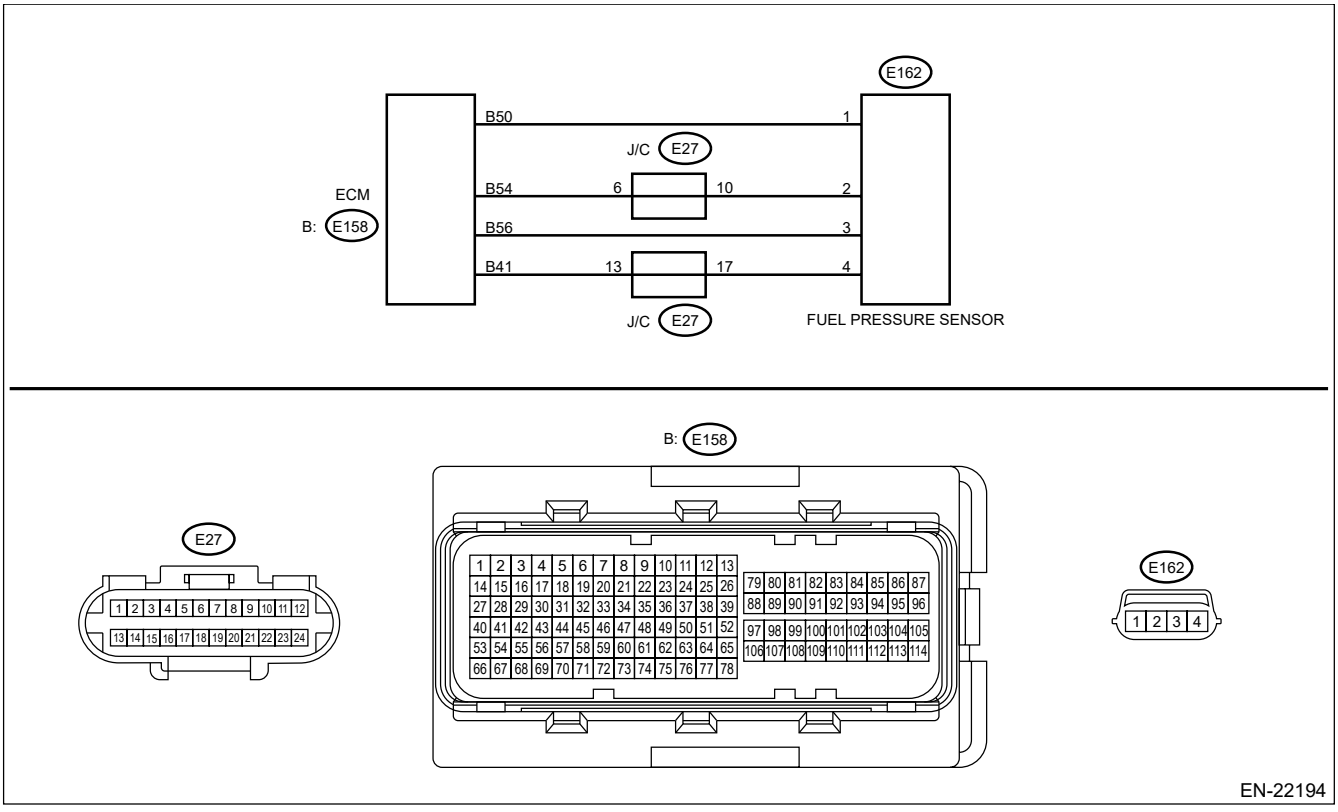
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Read [Fuel Rail Pressure A] on “data monitor” using the Subaru Select Monitor or general scan tool.

Data Monitor

Is the value of [Fuel Rail Pressure A] approx. 25MPa (0 mmHg, 0 inHg)?

Yes	Go to 2.
No	Check permanent non-occurrence of malfunction Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>INSPECTION > CHECK NON-PERMANENT OCCURRENCE MALFUNCTIONS.

2. CHECK VOLTAGE BETWEEN FUEL PRESSURE SENSOR AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector of the fuel pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between the fuel pressure sensor connector and chassis ground.
   Connector & terminal
   (E162) No. 4 (+) — Chassis ground (−):

Is the voltage between 4.5 and 5.5 V?

Yes	Go to 3.
No	Go to 5.

3. CHECK HARNESS AND CONNECTOR BETWEEN ECM AND FUEL PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF. Ref. to COMMON(diag)>Clear memory.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 50 — (E162) No. 1:
(E158) No. 54 — (E162) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repairing or replacing the wiring harness or connector.

4. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to OFF.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 50 (+) — Engine ground (−):
(E162) No. 1 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair or replace the wiring harness or connector.
No	Replace the fuel pressure sensor.

5. CHECK WIRING HARNESS AND CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 41 — (E162) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair or replace the wiring harness or connector.

6. CHECK WIRING HARNESS AND CONNECTOR (SHORT).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the fuel pressure sensor.
3. Measure the resistance between ECM connector and fuel pressure sensor connector.
   Connector & terminal
   (E158) No. 41 — Chassis ground:
   (E162) No. 4 — Chassis ground:

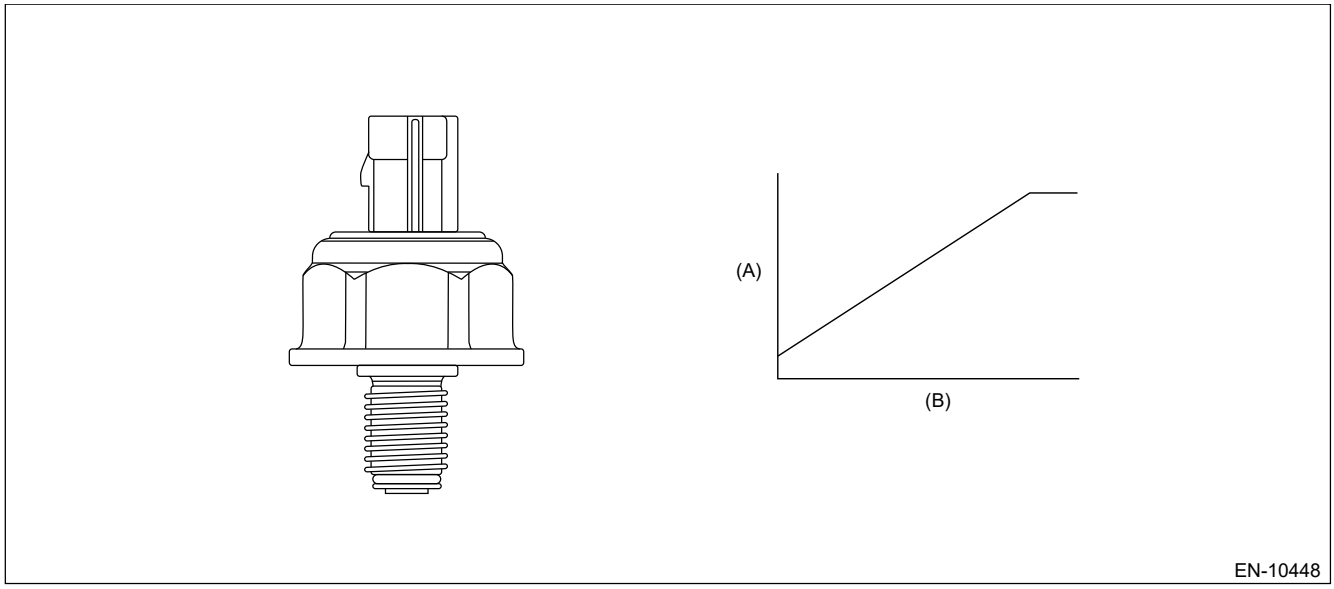
Is the resistance 1 MΩ or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair or replace the wiring harness or connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the fuel pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) Output voltage (B) Absolute pressure

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	3.739V or more

Time needed for diagnosis:2400ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0196 ENGINE OIL TEMPERATURE SENSOR "A" RANGE/PERFORMANCE

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Hard to start
- Improper idling
- Poor driving performance

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

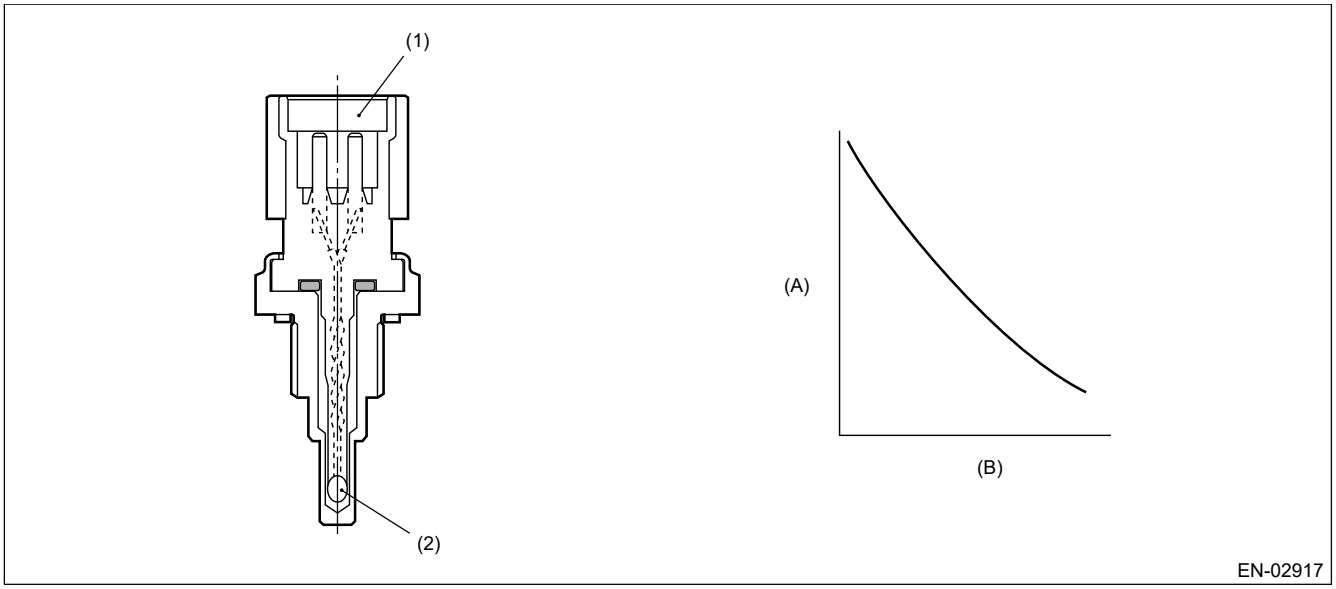
Is DTC P0196 displayed? (Current malfunction)

Yes	Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Oil Temperature Sensor.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the engine oil temperature sensor output properties. Using the following two diagnoses, judge as NG when either is NG.
- **Diagnosis 1 (correlation diagnosis):** After the engine starts after the specified period of soaking time has elapsed, diagnose by correlation between engine oil temperature sensor value, engine coolant temperature sensor value and intake air temperature sensor value. Judge as NG when the differences are both above the specified value by comparing between engine oil temperature and engine coolant temperature, engine oil temperature and intake air temperature.
- **Diagnosis 2 (function diagnosis):** Judge as NG when engine oil temperature does not rise to the specified value regardless of an engine running condition that clears certain conditions.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Soaking time	21600s or more
Block heater judgment	Completed
Block heater operation	Not in operation

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Engine oil temperature at engine starting	Less than 45°C (113°F)
Engine speed	500 rpm or more
Idling ratio	0.5× 100 or less

4. GENERAL DRIVING CYCLE

- **Diagnosis 1:** Perform the diagnosis only once after the engine starts after a certain period of soaking time.
- **Diagnosis 2:** Perform the diagnosis only once after starting the engine from cold condition.

5. DIAGNOSTIC METHOD

Judge as NG when Diagnosis 1 or Diagnosis 2 becomes NG.
If the duration of time while the following conditions are met is longer than the time indicated, judge as

NG.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
|Engine oil temperature at engine start − Engine coolant temperature at engine start|	More than 10°C(18°F)
|Engine oil temperature at engine start − Intake air temperature 30 sec. after engine start|	More than value of Map 1

Map 1

Ambient temperature °C (°F)	−30 (−22)	30 (86)	45 (113)	60 (140)
|Engine oil temperature at engine start − Intake air temperature 30 sec. after engine start| °C (°F)	10 (18)	10 (18)	22 (39.6)	22 (39.6)

Time needed for diagnosis: Less than 1 second

Diagnosis 2

Judgment value

Malfunction Criteria	Threshold Value
Engine oil temperature	Less than 45°C (113°F)
Elapsed time after starting the engine	Value of Map 2 or more

Map 2

		Intake air temperature at engine start °C (°F)							
		−30 (−22)	−20 (−4)	−10 (14)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)
Percentage of time when engine is at stop against time elapsed since engine start	0.0	1620000	1420000	1220000	1040000	860000	680000	500000	320000
	0.3	1620000	1420000	1220000	1040000	860000	680000	500000	320000
	0.6	1620000	1420000	1220000	1040000	860000	680000	500000	320000
	1.0	1620000	1420000	1220000	1040000	860000	680000	500000	320000
ms									

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0197 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Caution:

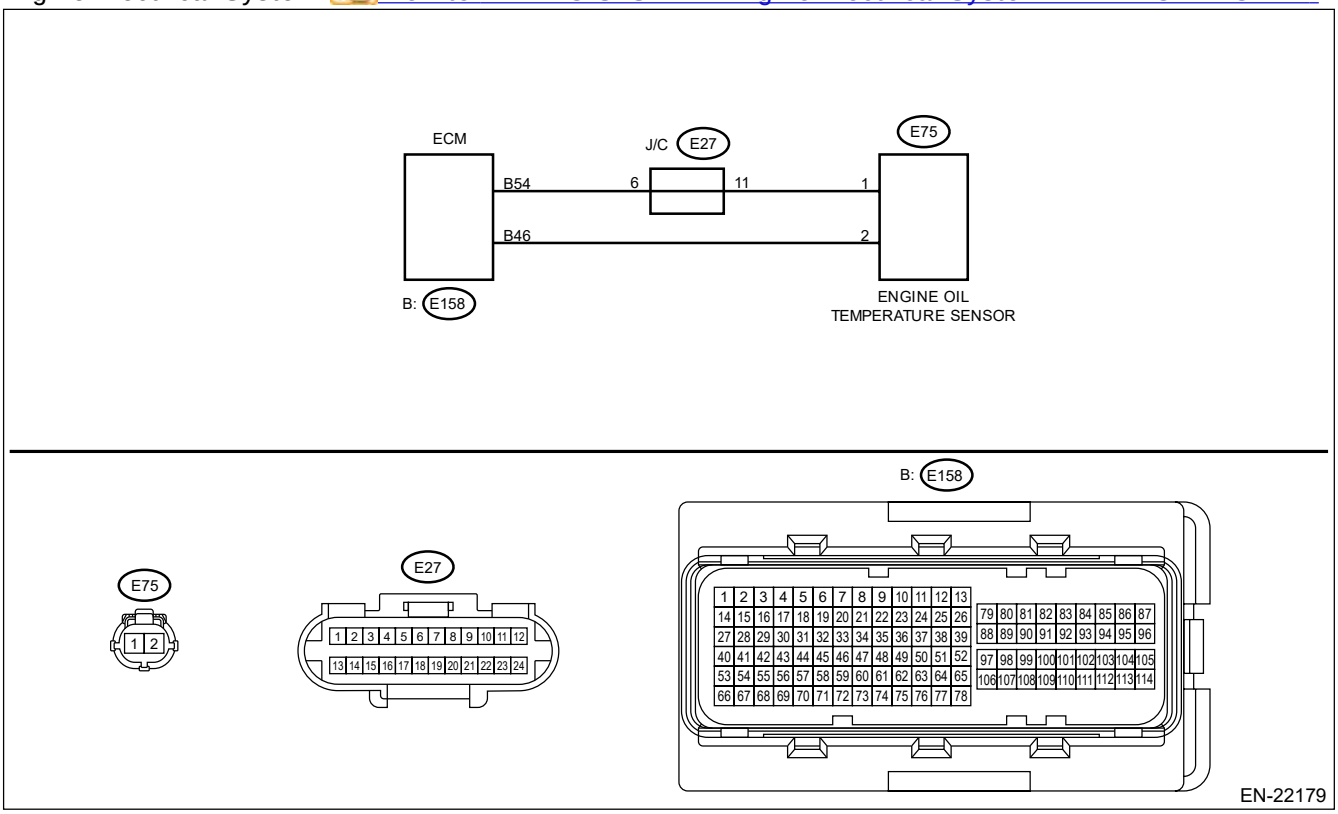
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Engine Oil Temperature].



Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Engine Oil Temperature] 150°C (302°F) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine oil temperature sensor.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal
(E158) No. 46 — Chassis ground:

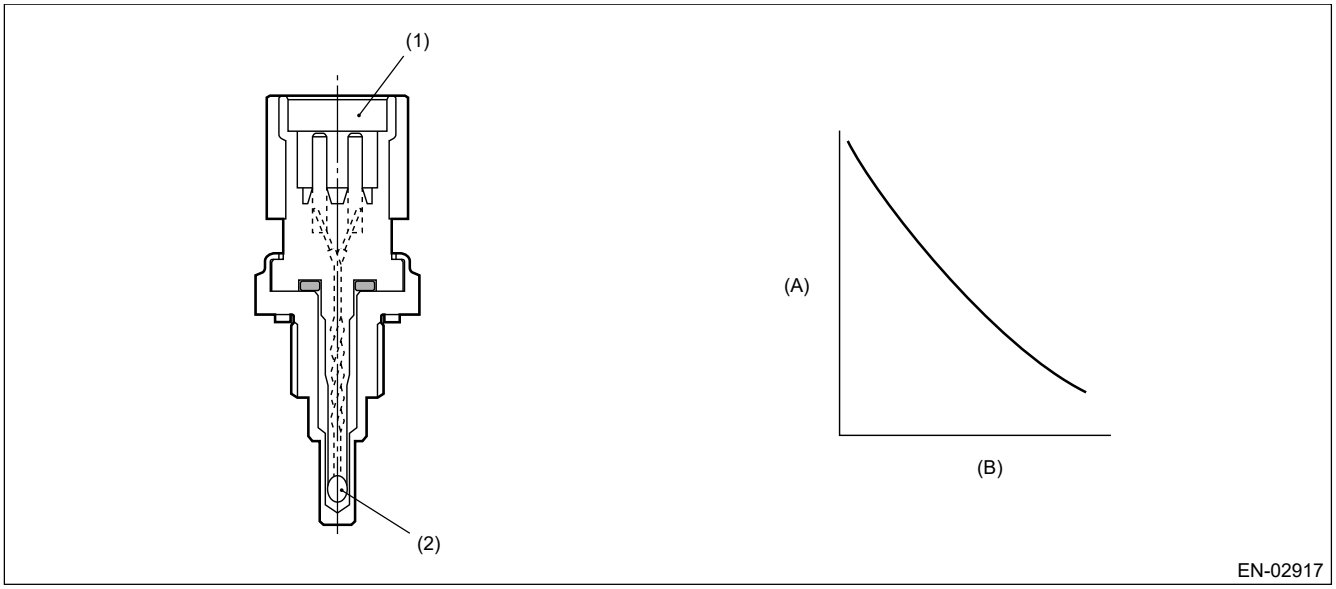
Is the resistance 1 MΩ or more?

Yes	Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Oil Temperature Sensor.
No	Repair the short circuit to ground in the harness between the ECM connector and engine oil temperature sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.205V

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0198 ENGINE OIL TEMPERATURE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Hard to start
- Improper idling
- Poor driving performance

Caution:

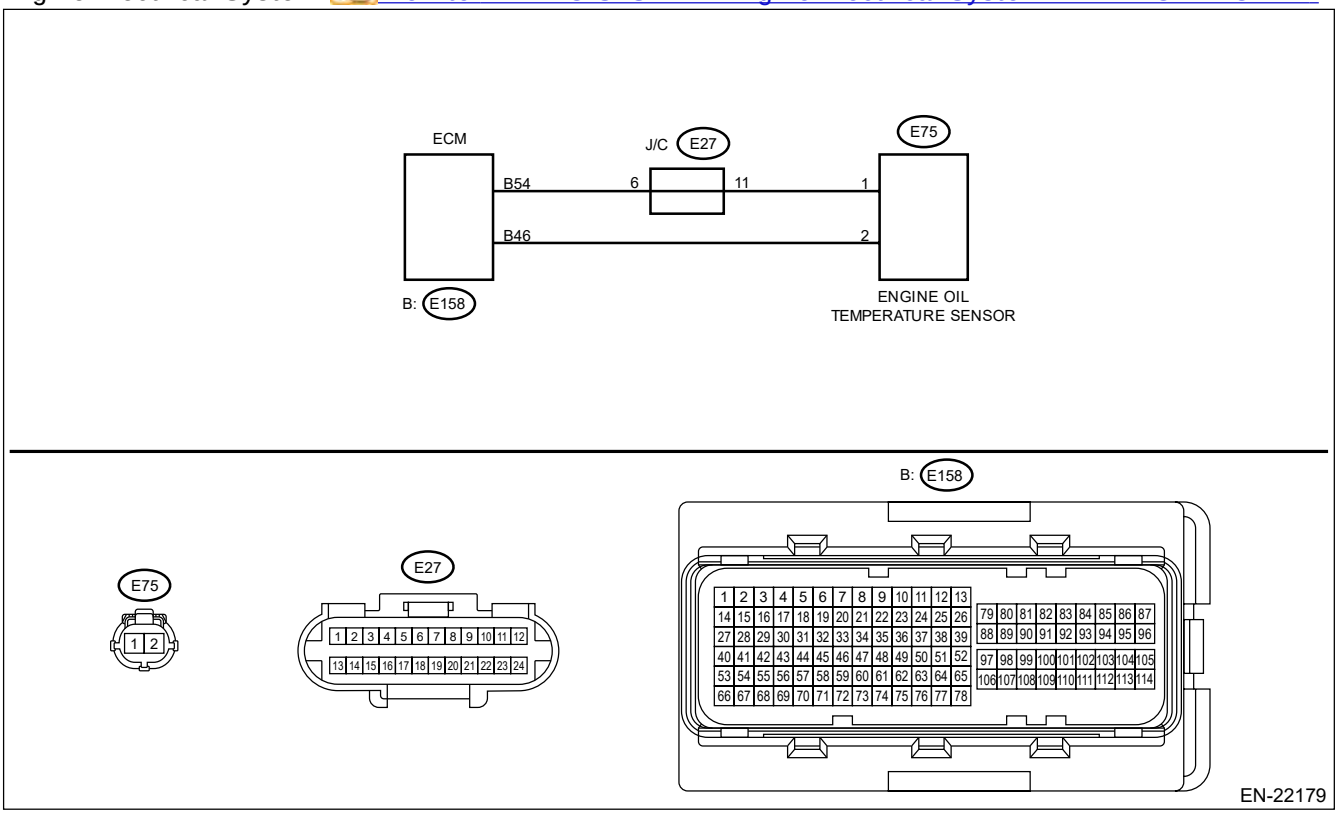
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [Engine Oil Temperature].



Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Engine Oil Temperature]−40°C (−40°F) or less?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK FOR POOR CONTACT.

Check for poor contact between the ECM and engine oil temperature sensor connectors.

Is there poor contact of the ECM or engine oil temperature sensor connectors?

Yes	Repair the poor contact of ECM or engine oil temperature sensor connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from the engine oil temperature sensor.
4. Measure the resistance of the harness between the ECM connector and engine oil temperature sensor connector.

Connector & terminal

(E158) No. 46 — (E75) No. 2:

(E158) No. 54 — (E75) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in the harness between ECM connector and engine oil temperature sensor connector.

4. CHECK HARNESS BETWEEN ECM AND ENGINE OIL TEMPERATURE SENSOR (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 46 (+) — Chassis ground (−):

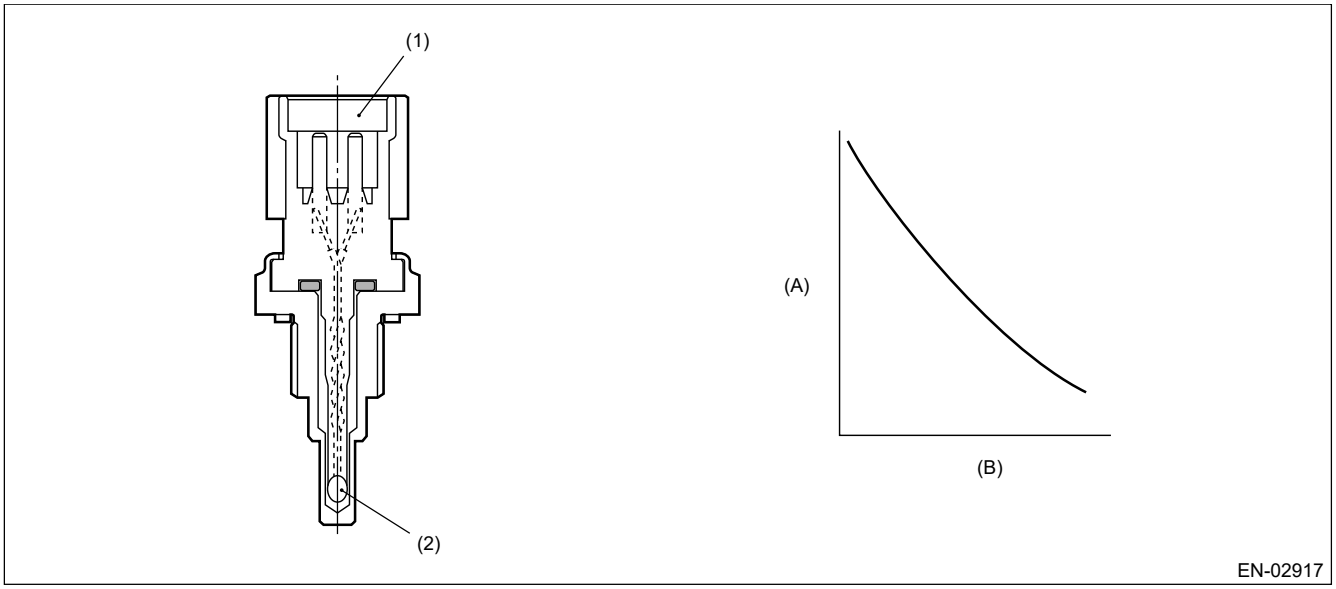
Is the voltage 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and engine oil temperature sensor connector.
No	Replace the engine oil temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Oil Temperature Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the oil temperature sensor.
Judge as NG when outside of the judgment value.

2. COMPONENT DESCRIPTION



(A) Resistance value (kΩ)
(B) Temperature °C (°F)
(1) Connector
(2) Thermistor element

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.695V or more

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0222 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Caution:

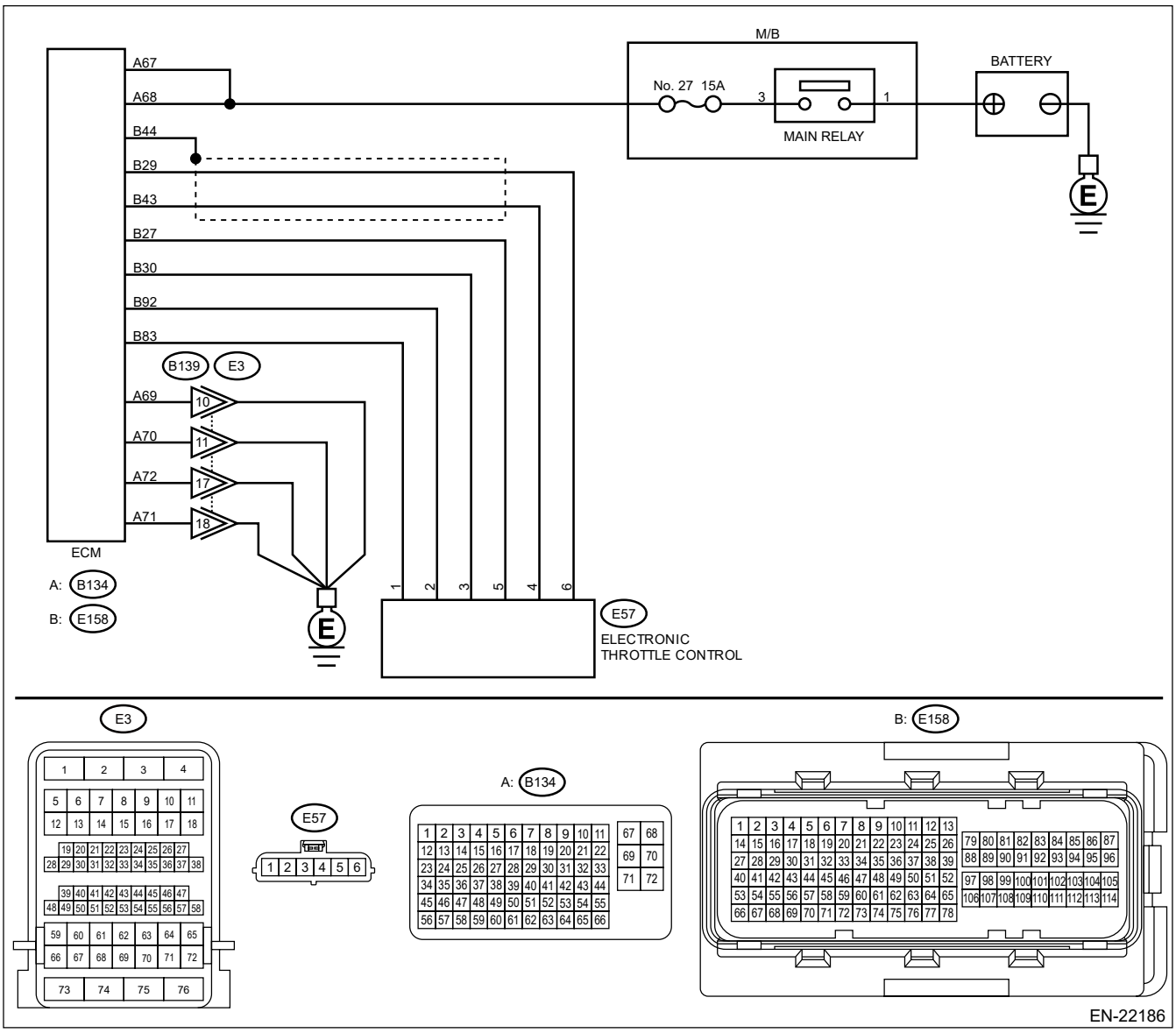
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 29 — Chassis ground:
(E158) No. 43 — Chassis ground:
(E158) No. 43 — (E158) No. 44:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 4 — Engine ground:

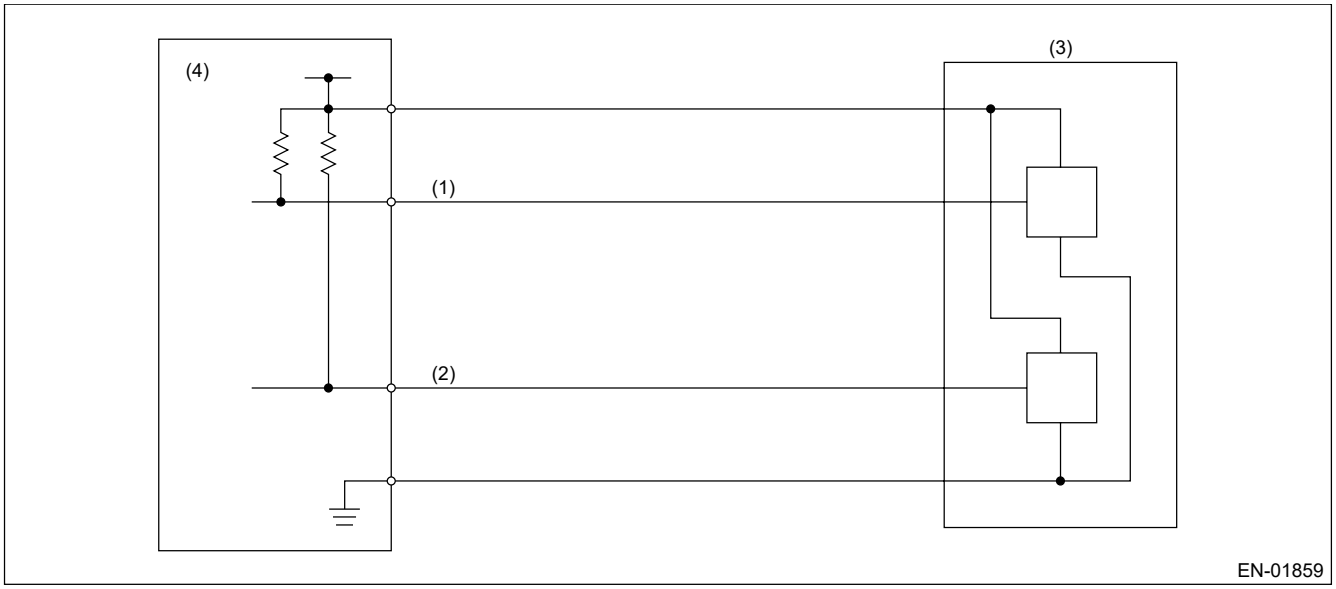
Is the resistance 1 MΩ or more?

Yes	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	1.148V or less

Time needed for diagnosis: 24ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0223 THROTTLE/PEDAL POSITION SENSOR/SWITCH "B" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Caution:

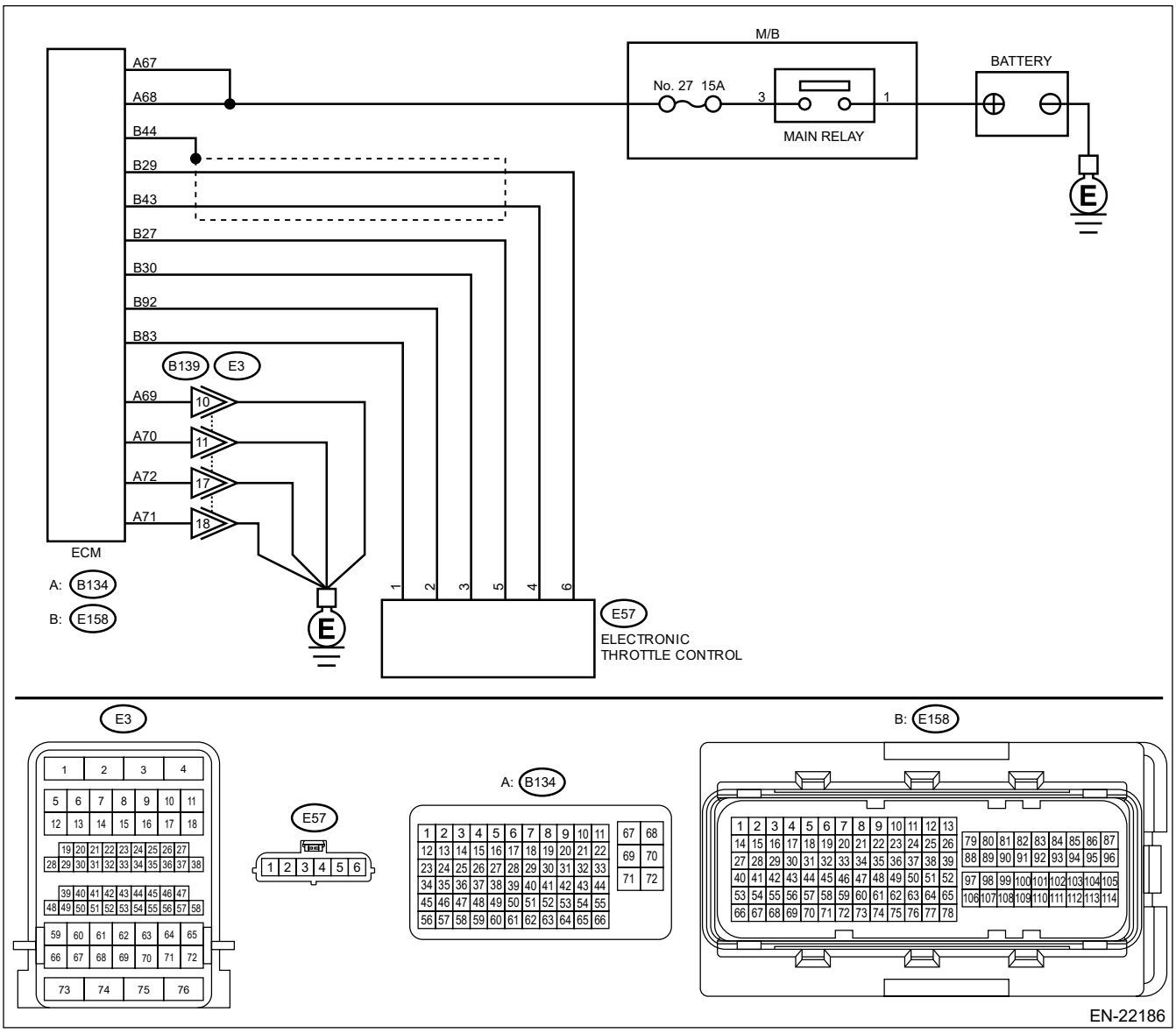
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E158) No. 43 — (E57) No. 4:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector** • **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 27 — (E158) No. 43:

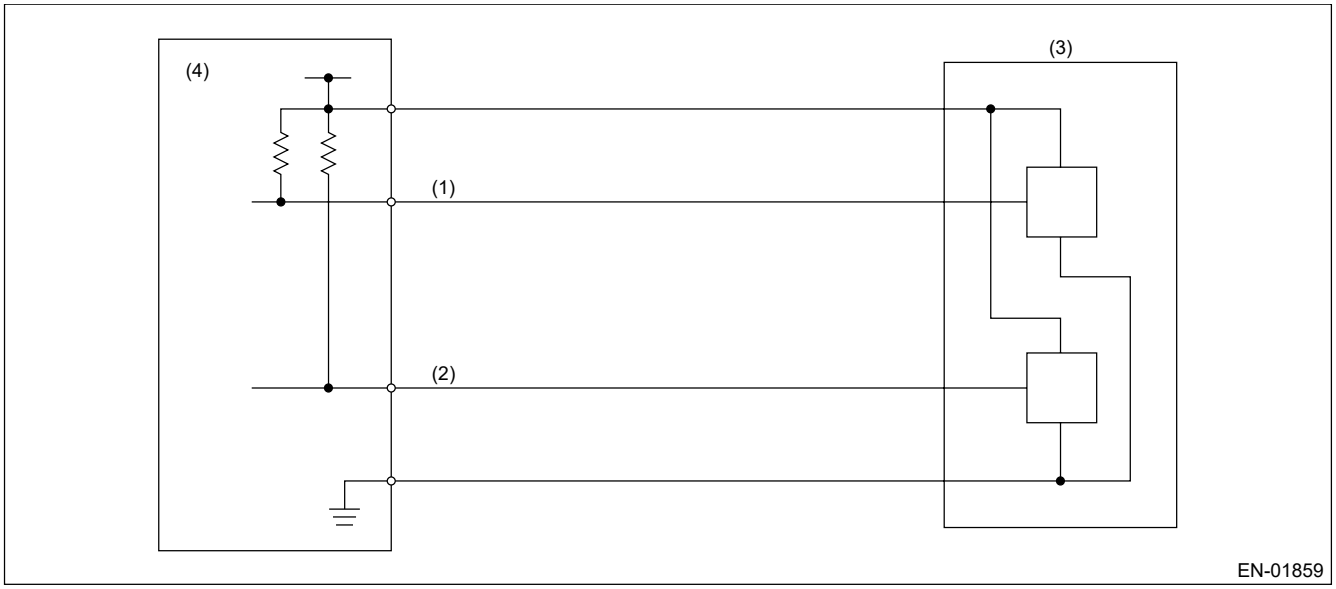
Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.
No	Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of throttle position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	4.785V or more

Time needed for diagnosis: 24ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0300 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stall
- Improper idling
- Rough driving

Caution:

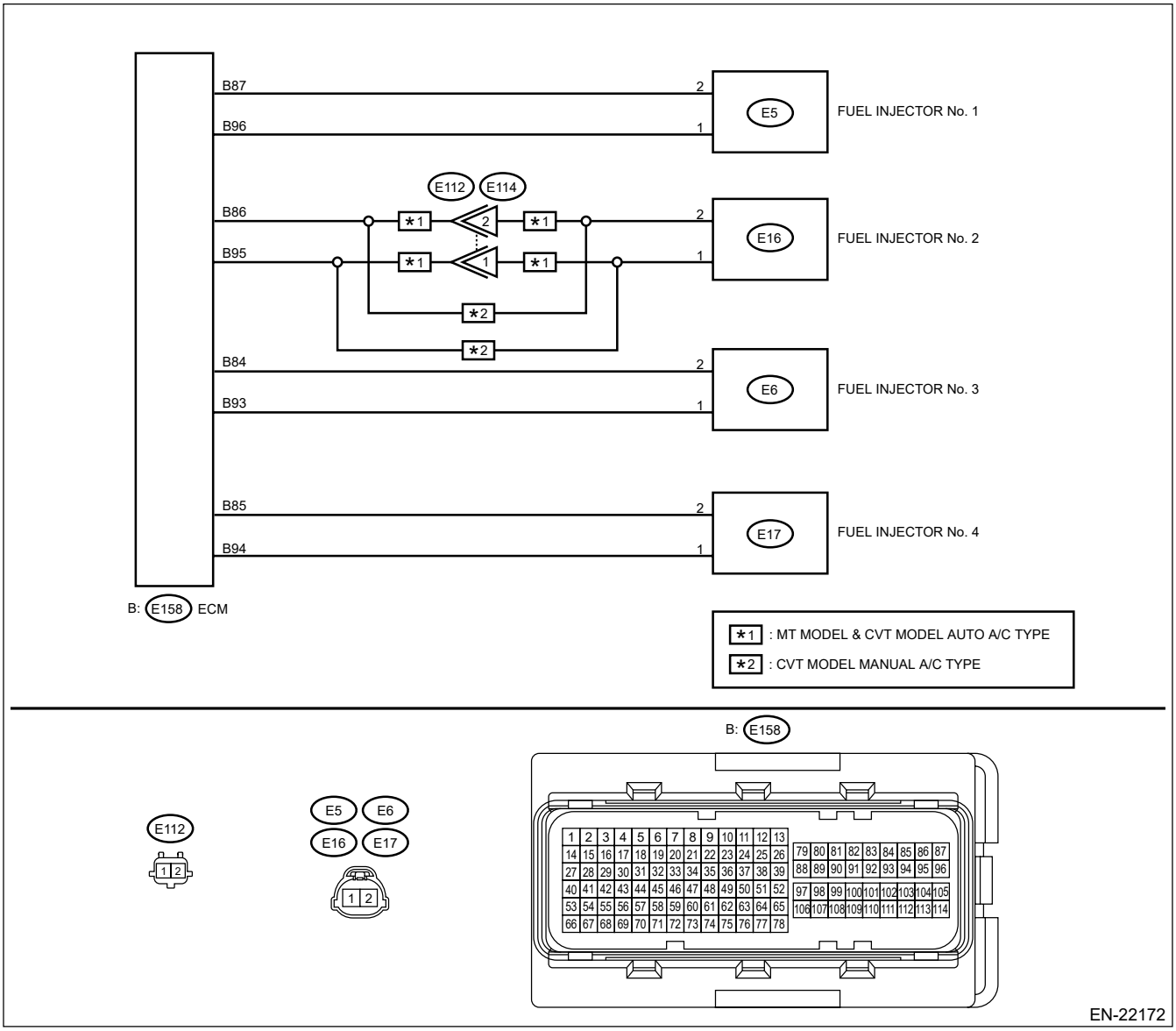
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


B87
B96
B86
B95
B84
B93
B85
B94
2
1
E5
FUEL INJECTOR No. 1
E16
FUEL INJECTOR No. 2
E6
FUEL INJECTOR No. 3
E17
FUEL INJECTOR No. 4
E112
E114
*1
*2
B: E158 ECM
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE
B: E158
E112
E5
E6
E16
E17
EN-22172

1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from all fuel injectors.
4. Measure the resistance between all fuel injector connectors and engine ground.

Connector & terminal

#1 (E5) No. 1 — Engine ground:
#1 (E5) No. 2 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#2 (E16) No. 2 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#3 (E6) No. 2 — Engine ground:
#4 (E17) No. 1 — Engine ground:
#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit to ground in harness between ECM and fuel injector connector.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on all cylinders.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between the ECM and fuel injector connector.

3. CHECK FUEL INJECTOR.

Check all fuel injectors. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 4.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

4. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR/CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and crankshaft position sensor.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes	Tighten the camshaft position sensor or crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.
No	Go to 5.

5. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to MECHANICAL(H4DO)>Cylinder Block.
No	Go to 6.

6. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly.
No	Go to 7.

7. CHECK FUEL LEVEL.

Check the fuel gauge display.

Is the fuel meter indication higher than the “Lower” level?

Yes	Go to 8.
No	Refill the fuel so that the fuel meter indication is higher than the “Lower” level, and proceed to the next step. Go to 8.

8. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.



2. Start the engine, and drive the vehicle at 60 km/h(37.3 MPH) or mare for 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes	Go to 9.
No	Repair the poor contact of connector. **Note:** **In this case, repair the following item:** • **Poor contact of ignition coil connector** • **Poor contact of fuel injector connector on faulty cylinders** • **Poor contact of ECM connector** • **Poor contact of coupling connector** • **Go to 9.**

9. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Is there any fault in air intake system?

Yes	Repair the air intake system. **Note:** **Check the following items.** • **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?** • **Are there cracks or any disconnection of hoses?**
No	Go to 10.

10. CHECK ALL CYLINDERS.

Is there a fault in any cylinder?

Yes	Repair or replace the faulty part of the faulty cylinder. **Note:** **Check the following items.** • **Spark plug** • **Ignition coil** • **Fuel injector** • **Compression** • **Skipping timing chain teeth**
No	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.

DTC P0301 CYLINDER 1 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

1. OUTLINE OF DIAGNOSIS

Detect the presence of misfire occurrence. (Revolution fluctuation method)
Monitoring misfire which influences exhaust deterioration (1.5 times of FTP) and catalyst damage is made obligatory by the law. Misfire affecting these two has two patterns below:

- Intermittent misfire (the same cylinder misfires in random, or different cylinders misfire in random): FTP 1.5 times misfire
- Every time misfire (the same cylinder misfires every time): FTP 1.5 times misfire, catalyst damage misfire

The following detecting methods are adopted for these detection.

1. Intermittent misfire: FTP 1.5 times misfire
   - 180° Interval Difference Method
   - 360° Interval Difference Method
   - 720° Interval Difference Method
2. Misfire every time: FTP 1.5 times misfire, catalyst damage misfire
   - 360° Interval Difference Method

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more
Throttle position change during 16 milliseconds	Less than 21°
Fuel shut-off	Not in operation
Engine speed	450rpm — 6400rpm (CVT model) 500rpm — 6700rpm (MT model)
Intake manifold pressure	More than value of Map 1
Time elapsed after engine start	2 crankshaft revolution or more
Following condition A or B is met	
A: Engine coolant temperature at engine starting	More than -6.7°C (19.4°F)

Secondary parameters	Execution condition
B: Following conditions (b1) and (b2) are met	
(b1) Engine coolant temperature at engine starting	-6.7°C (19.4°F) or less
(b2) Engine coolant temperature	21.1°C (69.8°F) or more

Map 1

- Normal ignition

CVT model without active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
Engine speed (rpm)	700	18.7 (139.9 , 5.5)	22.1 (165.7 , 6.5)	26 (195 , 7.7)
	1200	16.7 (125.4 , 4.9)	20.7 (155.0 , 6.1)	22.5 (169 , 6.7)
	1600	17 (127.9 , 5)	20.3 (152.0 , 6)	22.7 (169.98 , 6.7)
	2400	21 (157.4 , 6.2)	22.8 (170.66 , 6.7)	22.8 (170.66 , 6.7)
	2800	20.5 (153.6 , 6)	24.2 (181.6 , 7.1)	24.7 (185 , 7.3)
	3000	21.2 (158.8 , 6.3)	24.1 (181.0 , 7.1)	24.9 (187.06 , 7.4)
	3200	22.5 (168.6 , 6.6)	24.6 (184.9 , 7.3)	25.8 (193.2823529 , 7.6)
	3600	24.7 (185.4 , 7.3)	26.7 (200.4 , 7.9)	28 (209.9070588 , 8.3)
	4000	25.6 (191.7 , 7.5)	27.7 (207.4 , 8.2)	29.6 (222.0117647 , 8.7)
	4400	27.1 (203.4 , 8)	29.2 (219.2 , 8.6)	31.2 (233.7764706 , 9.2)
	4800	28.7 (215.1 , 8.5)	30.8 (230.9 , 9.1)	32.7 (245.5411765 , 9.7)
	5600	31.8 (238.7 , 9.4)	33.9 (254.5 , 10)	35.9 (269.0705882 , 10.6)
	6000	33.4 (250.4 , 9.9)	35.5 (266.2 , 10.5)	37.4 (280.8352941 , 11.1)
	6400	35 (262.2 , 10.3)	37.1 (278.0 , 10.9)	39 (292.6 , 11.5)
				kPa (mmHg, inHg)

MT model without active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**100.5 (754 , 29.7)**
Engine speed (rpm)	650	21.1 (158.5 , 6.2)	19.9 (149.1 , 5.9)	26.1 (195.4 , 7.7)
	1000	18.8 (141.4 , 5.6)	19.2 (144.2 , 5.7)	24.2 (181.9 , 7.2)
	1200	18.3 (137.2 , 5.4)	18.5 (138.6 , 5.5)	23.5 (176.0 , 6.9)
	1600	18 (135.1 , 5.3)	18.5 (139.1 , 5.5)	23 (172.4 , 6.8)
	2000	17.5 (131.4 , 5.2)	18.2 (136.4 , 5.4)	22.4 (168.0 , 6.6)
	2400	18.3 (137.5 , 5.4)	18.4 (138.3 , 5.4)	22.5 (168.6 , 6.6)

	Barometric pressure kPa (mmHg, inHg)		
	65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**100.5 (754 , 29.7)**
2800	18.8 (141.1 , 5.6)	19.1 (143.4 , 5.6)	22.5 (169.0 , 6.7)
3000	18.7 (140.3 , 5.5)	19.5 (146.5 , 5.8)	22.6 (169.3 , 6.7)
3200	20.1 (150.7 , 5.9)	20.6 (154.6 , 6.1)	24.9 (186.7 , 7.4)
3600	21.9 (164.2 , 6.5)	22.4 (168.2 , 6.6)	26.5 (199.1 , 7.8)
4000	22.3 (167.6 , 6.6)	23 (172.5 , 6.8)	26.9 (201.8 , 7.9)
4400	24.1 (180.9 , 7.1)	24.6 (184.2 , 7.3)	28.7 (215.6 , 8.5)
4800	26 (195.1 , 7.7)	26.8 (200.8 , 7.9)	31.4 (235.1 , 9.3)
5200	28.2 (211.6 , 8.3)	28.9 (217.0 , 8.5)	33.9 (254.4 , 10)
5600	30.2 (226.3 , 8.9)	30.5 (228.6 , 9)	35.9 (269.2 , 10.6)
6000	32.6 (244.9 , 9.6)	33.8 (253.4 , 10)	38.2 (286.2 , 11.3)
6400	37.4 (280.2 , 11)	38.1 (286.1 , 11.3)	41.7 (312.5 , 12.3)

kPa (mmHg, inHg)

CVT model with active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
Engine speed (rpm)	700	19.8 (148.4 , 5.8)	24 (179.9 , 7.1)	26 (195 , 7.7)
	1000	20.4 (153.4 , 6)	22 (165.0 , 6.5)	25.7 (193 , 7.6)
	1200	19.7 (148.1 , 5.8)	21.1 (158.0 , 6.2)	26.7 (200 , 7.9)
	1600	18.4 (138.2 , 5.4)	20.4 (152.8 , 6)	22.9 (172 , 6.8)
	2000	18.9 (141.6 , 5.6)	21.3 (159.5 , 6.3)	22.9 (172.02 , 6.8)
	2400	19.2 (144.2 , 5.7)	21.1 (158.5 , 6.2)	22.8 (170.66 , 6.7)
	2800	20 (149.8 , 5.9)	23.2 (174.0 , 6.9)	25.1 (188 , 7.4)
	3000	19.9 (149.3 , 5.9)	23.3 (174.7 , 6.9)	25.5 (191 , 7.5)
	3200	21.7 (163.1 , 6.4)	24.2 (181.2 , 7.1)	26.6 (199.8823529 , 7.9)
	3600	23.6 (177.4 , 7)	26.3 (197.5 , 7.8)	29.8 (223.6470588 , 8.8)
	4000	24.6 (184.6 , 7.3)	27.9 (209.5 , 8.2)	30.5 (228.4117647 , 9)
	4400	26.2 (196.4 , 7.7)	29.5 (221.3 , 8.7)	32 (240.1764706 , 9.5)
	4800	27.7 (208.1 , 8.2)	31.1 (233.0 , 9.2)	33.6 (251.9411765 , 9.9)
	5200	29.3 (219.9 , 8.7)	32.6 (244.8 , 9.6)	35.2 (263.7058824 , 10.4)
	5600	30.9 (231.7 , 9.1)	34.2 (256.6 , 10.1)	36.7 (275.4705882 , 10.8)
	6000	32.5 (243.4 , 9.6)	35.8 (268.3 , 10.6)	38.3 (287.2352941 , 11.3)
	6400	34 (255.2 , 10)	37.3 (280.1 , 11)	39.9 (299 , 11.8)

kPa (mmHg, inHg)

MT model with active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**100.5 (754 , 29.7)**
Engine speed (rpm)	650	21.1 (158.5 , 6.2)	19.9 (149.1 , 5.9)	26.1 (195.4 , 7.7)
	1000	18.8 (141.4 , 5.6)	19.2 (144.2 , 5.7)	24.2 (181.9 , 7.2)
	1200	18.3 (137.2 , 5.4)	18.5 (138.6 , 5.5)	23.5 (176.0 , 6.9)
	1600	18 (135.1 , 5.3)	18.5 (139.1 , 5.5)	23 (172.4 , 6.8)
	2000	17.5 (131.4 , 5.2)	18.2 (136.4 , 5.4)	22.4 (168.0 , 6.6)
	2400	18.3 (137.5 , 5.4)	18.4 (138.3 , 5.4)	22.5 (168.6 , 6.6)
	2800	18.8 (141.1 , 5.6)	19.1 (143.4 , 5.6)	22.5 (169.0 , 6.7)
	3000	18.7 (140.3 , 5.5)	19.5 (146.5 , 5.8)	22.6 (169.3 , 6.7)
	3200	20.1 (150.7 , 5.9)	20.6 (154.6 , 6.1)	24.9 (186.7 , 7.4)
	3600	21.9 (164.2 , 6.5)	22.4 (168.2 , 6.6)	26.5 (199.1 , 7.8)
	4000	22.3 (167.6 , 6.6)	23 (172.5 , 6.8)	26.9 (201.8 , 7.9)
	4400	24.1 (180.9 , 7.1)	24.6 (184.2 , 7.3)	28.7 (215.6 , 8.5)
	4800	26 (195.1 , 7.7)	26.8 (200.8 , 7.9)	31.4 (235.1 , 9.3)
	5200	28.2 (211.6 , 8.3)	28.9 (217.0 , 8.5)	33.9 (254.4 , 10)
	5600	30.2 (226.3 , 8.9)	30.5 (228.6 , 9)	35.9 (269.2 , 10.6)
	6000	32.6 (244.9 , 9.6)	33.8 (253.4 , 10)	38.2 (286.2 ,11.3)
	6400	37.4 (280.2 , 11)	38.1 (286.1 , 11.3)	41.7 (312.5 , 12.3)
kPa (mmHg, inHg)				

- Idling ignition

  CVT model without active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
Engine speed (rpm)	700	19.8 (148.4 , 5.8)	24 (179.9 , 7.1)	26 (195 , 7.7)
	1000	20.4 (153.4 , 6)	22 (165.0 , 6.5)	25.7 (193 , 7.6)
	1200	19.7 (148.1 , 5.8)	21.1 (158.0 , 6.2)	26.7 (200 , 7.9)
	1600	18.4 (138.2 , 5.4)	20.4 (152.8 , 6)	22.9 (172 , 6.8)
	2000	18.9 (141.6 , 5.6)	21.3 (159.5 , 6.3)	22.9 (172.02 , 6.8)
	2400	19.2 (144.2 , 5.7)	21.1 (158.5 , 6.2)	22.8 (170.66 , 6.7)
	2800	20 (149.8 , 5.9)	23.2 (174.0 , 6.9)	25.1 (188 , 7.4)
	3000	19.9 (149.3 , 5.9)	23.3 (174.7 , 6.9)	25.5 (191 , 7.5)
	3200	21.7 (163.1 , 6.4)	24.2 (181.2 , 7.1)	26.6 (199.8823529 , 7.9)
	3600	23.6 (177.4 , 7)	26.3 (197.5 , 7.8)	29.8 (223.6470588 , 8.8)
	4000	24.6 (184.6 , 7.3)	27.9 (209.5 , 8.2)	30.5 (228.4117647, 9)
	4400	26.2 (196.4 , 7.7)	29.5 (221.3 , 8.7)	32 (240.1764706 , 9.5)
	4800	27.7 (208.1 , 8.2)	31.1 (233.0 , 9.2)	33.6 (251.9411765 , 9.9)
	5200	29.3 (219.9 , 8.7)	32.6 (244.8 , 9.6)	35.2 (263.7058824 , 10.4)

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
	5600	30.9 (231.7 , 9.1)	34.2 (256.6 , 10.1)	36.7 (275.4705882 , 10.8)
	6000	32.5 (243.4 , 9.6)	35.8 (268.3 , 10.6)	38.3 (287.2352941 , 11.3)
	6400	34 (255.2 , 10)	37.3 (280.1 , 11)	39.9 (299 , 11.8)

kPa (mmHg, inHg)

MT model without active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**100.5 (754 , 29.7)**
Engine speed (rpm)	650	21.1 (158.5 , 6.2)	19.9 (149.1 , 5.9)	26 (194.8 , 7.7)
	1000	18.3 (137.5 , 5.4)	17.7 (132.7 , 5.2)	22.5 (168.9 , 6.6)
	1200	17.7 (132.9 , 5.2)	17 (127.9 , 5)	22 (165.2 , 6.5)
	1600	17.4 (130.5 , 5.1)	16.7 (124.9 , 4.9)	21.2 (159.1 , 6.3)
	2000	17.4 (130.4 , 5.1)	17.2 (129.2 , 5.1)	21.4 (160.5 , 6.3)
	2400	18.3 (137.5 , 5.4)	18.2 (136.5 , 5.4)	21.8 (163.6 , 6.4)
	2800	18.8 (141.1 , 5.6)	19.1 (143.0 , 5.6)	21.8 (163.8 , 6.4)
	3000	18.7 (140.3 , 5.5)	19.5 (146.5 , 5.8)	21.3 (160.0 , 6.3)
	3200	20.1 (150.7 , 5.9)	20.6 (154.6 , 6.1)	24.8 (186.1 , 7.3)
	3600	21.9 (164.2 , 6.5)	22.3 (167.0 , 6.6)	26 (195.1 , 7.7)
	4000	22.3 (167.6 , 6.6)	23 (172.5 , 6.8)	25.4 (190.6 , 7.5)
	4400	24.1 (180.9 , 7.1)	24.6 (184.2 , 7.3)	28.1 (210.9 , 8.3)
	4800	26 (194.8 , 7.7)	26.7 (200.0 , 7.9)	30.5 (228.5 , 9)
	5200	28.2 (211.6 , 8.3)	28.7 (215.6 , 8.5)	33 (247.2 , 9.7)
	5600	30.2 (226.3 , 8.9)	30.5 (228.6 , 9)	34.1 (255.6 , 10.1)
	6000	32.6 (244.9 , 9.6)	33.6 (251.9 , 9.9)	35.3 (264.9 , 10.4)
	6400	36.8 (275.8 , 10.9)	38.1 (286.1 , 11.3)	40 (300.3 , 11.8)

kPa (mmHg, inHg)

CVT model with active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
Engine speed (rpm)	700	18.7 (139.9 , 5.5)	22.1 (165.7 , 6.5)	26 (195 , 7.7)
	1000	19.6 (147.3 , 5.8)	22 (165.0 , 6.5)	23.3 (175 , 6.9)
	1200	16.7 (125.4 , 4.9)	20.7 (155.0 , 6.1)	22.5 (169 , 6.7)
	1600	17 (127.9 , 5)	20.3 (152.0 , 6)	22.7 (169.98 , 6.7)
	2000	19.8 (148.2 , 5.8)	22.5 (168.85 , 6.6)	22.5 (168.85 , 6.6)

	Barometric pressure kPa (mmHg, inHg)		
	65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**102.4 (768 , 30.2)**
2400	21 (157.4 , 6.2)	22.8 (170.66 , 6.7)	22.8 (170.66 , 6.7)
2800	20.5 (153.6 , 6)	24.2 (181.6 , 7.1)	24.7 (185 , 7.3)
3000	21.2 (158.8 , 6.3)	24.1 (181.0 , 7.1)	24.9 (187.06 , 7.4)
3200	22.5 (168.6 , 6.6)	24.6 (184.9 , 7.3)	25.8 (193.2823529 , 7.6)
3600	24.7 (185.4 , 7.3)	26.7 (200.4 , 7.9)	28 (209.9070588 , 8.3)
4000	25.6 (191.7 , 7.5)	27.7 (207.4 , 8.2)	29.6 (222.0117647 , 8.7)
4400	27.1 (203.4 , 8)	29.2 (219.2 , 8.6)	31.2 (233.7764706 , 9.2)
4800	28.7 (215.1 , 8.5)	30.8 (230.9 , 9.1)	32.7 (245.5411765 , 9.7)
5200	30.3 (226.9 , 8.9)	32.4 (242.7 , 9.6)	34.3 (257.3058824 , 10.1)
5600	31.8 (238.7 , 9.4)	33.9 (254.5 , 10)	35.9 (269.0705882 , 10.6)
6000	33.4 (250.4 , 9.9)	35.5 (266.2 , 10.5)	37.4 (280.8352941 , 11.1)
6400	35 (262.2 , 10.3)	37.1 (278.0 , 10.9)	39 (292.6 , 11.5)

kPa (mmHg, inHg)

MT model with active grille shutter

		Barometric pressure kPa (mmHg, inHg)		
		65.3 (490 , 19.3)	**73.3 (550 , 21.7)**	**100.5 (754 , 29.7)**
Engine speed (rpm)	650	21.1 (158.5 , 6.2)	19.9 (149.1 , 5.9)	26 (194.8 , 7.7)
	1000	18.3 (137.5 , 5.4)	17.7 (132.7 , 5.2)	22.5 (168.9 , 6.6)
	1200	17.7 (132.9 , 5.2)	17 (127.9 , 5)	22 (165.2 , 6.5)
	1600	17.4 (130.5 , 5.1)	16.7 (124.9 , 4.9)	21.2 (159.1 , 6.3)
	2000	17.4 (130.4 , 5.1)	17.2 (129.2 , 5.1)	21.4 (160.5 , 6.3)
	2400	18.3 (137.5 , 5.4)	18.2 (136.5 , 5.4)	21.8 (163.6 , 6.4)
	2800	18.8 (141.1 , 5.6)	19.1 (143.0 , 5.6)	21.8 (163.8 , 6.4)
	3000	18.7 (140.3 , 5.5)	19.5 (146.5 , 5.8)	21.3 (160.0 , 6.3)
	3200	20.1 (150.7 , 5.9)	20.6 (154.6 , 6.1)	24.8 (186.1 , 7.3)
	3600	21.9 (164.2 , 6.5)	22.3 (167.0 , 6.6)	26 (195.1 , 7.7)
	4000	22.3 (167.6 , 6.6)	23 (172.5 , 6.8)	25.4 (190.6 , 7.5)
	4400	24.1 (180.9 , 7.1)	24.6 (184.2 , 7.3)	28.1 (210.9 , 8.3)
	4800	26 (194.8 , 7.7)	26.7 (200.0 , 7.9)	30.5 (228.5 , 9)
	5200	28.2 (211.6 , 8.3)	28.7 (215.6 , 8.5)	33 (247.2 , 9.7)
	5600	30.2 (226.3 , 8.9)	30.5 (228.6 , 9)	34.1 (255.6 , 10.1)
	6000	32.6 (244.9 , 9.6)	33.6 (251.9 , 9.9)	35.3 (264.9 , 10.4)
	6400	36.8 (275.8 , 10.9)	38.1 (286.1 , 11.3)	40 (300.3 , 11.8)

kPa (mmHg, inHg)

3. GENERAL DRIVING CYCLE

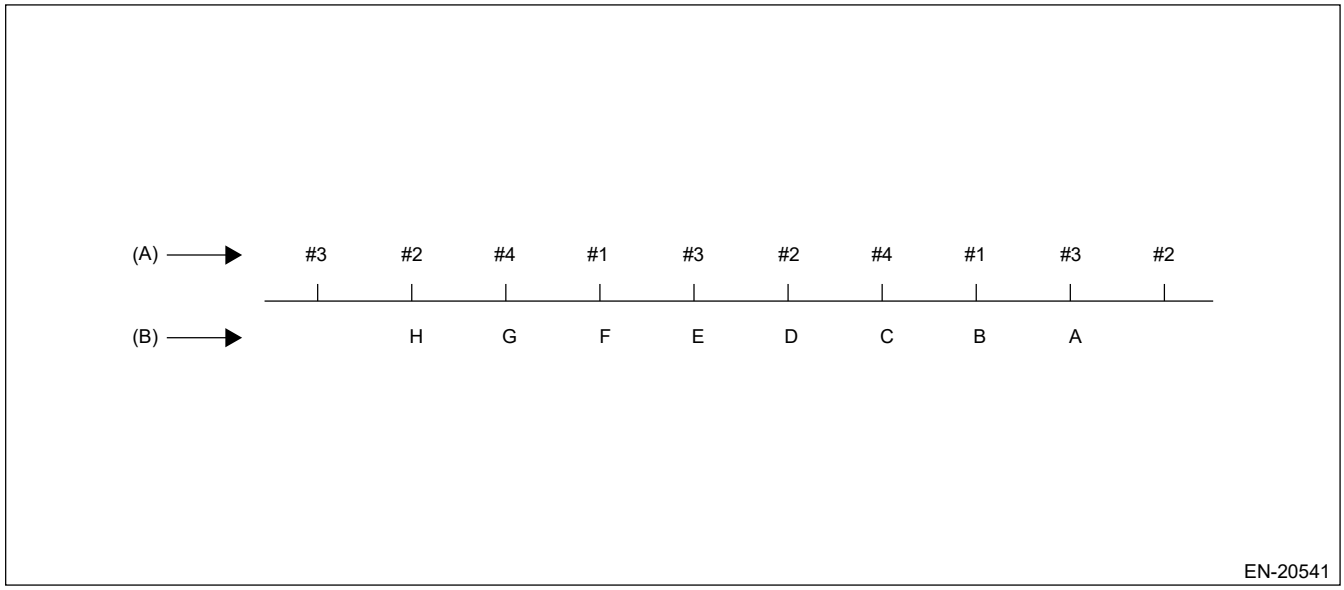
- If conditions are met, it is possible to detect the misfires from idling to high engine speed. However, in case any engine load or breakage occurs, perform with the engine at idle.
- Perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

When a misfire occurs, the engine speed will decrease and the crankshaft position speed will change. Calculate the interval difference value (diagnostic value) from crankshaft position speed by the following formula, and judge whether a misfire is occurring or not comparing the calculated result with judgment value. Count the number of misfires, if the misfire ratio is higher during 1000 revs. or 200 revs., judge corresponding cylinders as NG.

Diagnostic value calculation (Calculate from angle speed) →	**Misfire detection in every single ignition (Compare diagnostic value with judgment value) →**	**NG judgment (Misfire occurrence judgment required by the law) (Compare number of misfire with judgment value)**
	• 180 Degree Interval Difference Method • 360 Degree Interval Difference Method • 720 Degree Interval Difference Method	• FTP 1.5 times misfire NG judgment • NG judgment for catalyst-damaging misfire

As shown in the following figure, pick a cylinder as the standard and name it A. And the former crankshaft position speed is named B, the second former crankshaft position speed is named C, the third is named D, etc.



(A) Ignition order (B) Crankshaft position speed

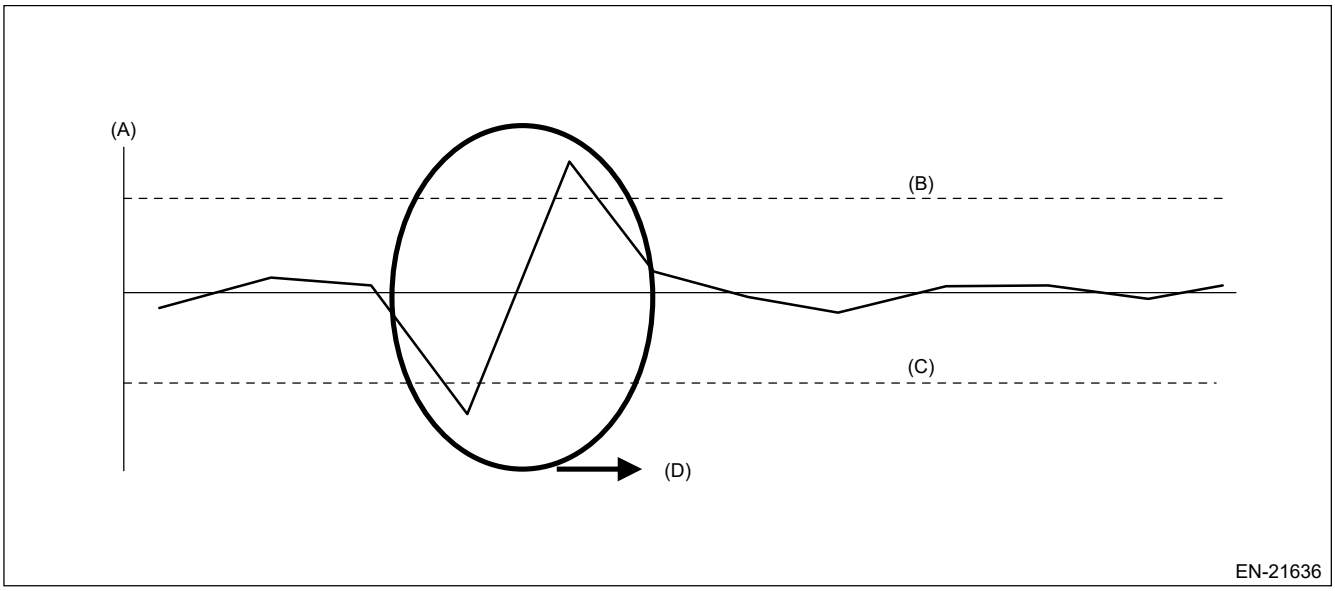
180° INTERVAL DIFFERENCE METHOD

Diagnostic value	**180 degree interval difference = {(C – B) – (G – C)/4} – {(B – A)**

– (F – B) / 4}

Judge as a misfire in the following cases.

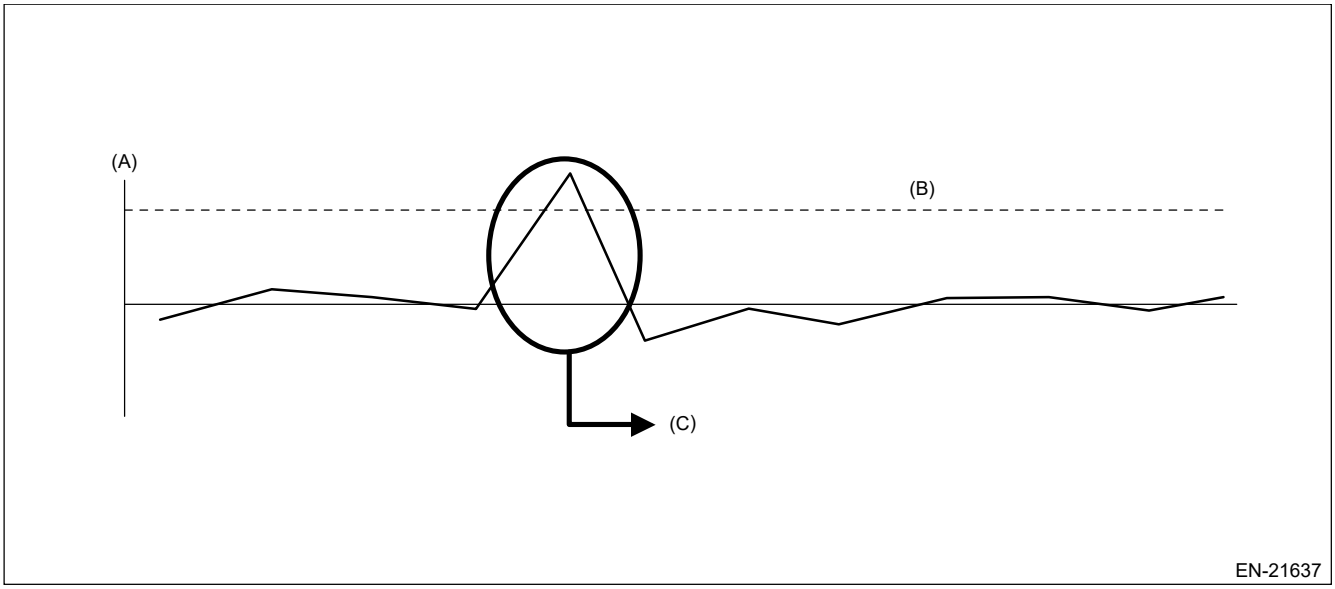
- 180 degree interval difference: More than judgment value of positive side
- 180 degree interval difference: Judgment value of negative side or less
  (Diagnostic value before 180° CA)



(A) 180 degree interval difference
(B) Threshold value (positive number)
(C) Threshold value (negative number)
(D) Judged as misfire

360° INTERVAL DIFFERENCE METHOD

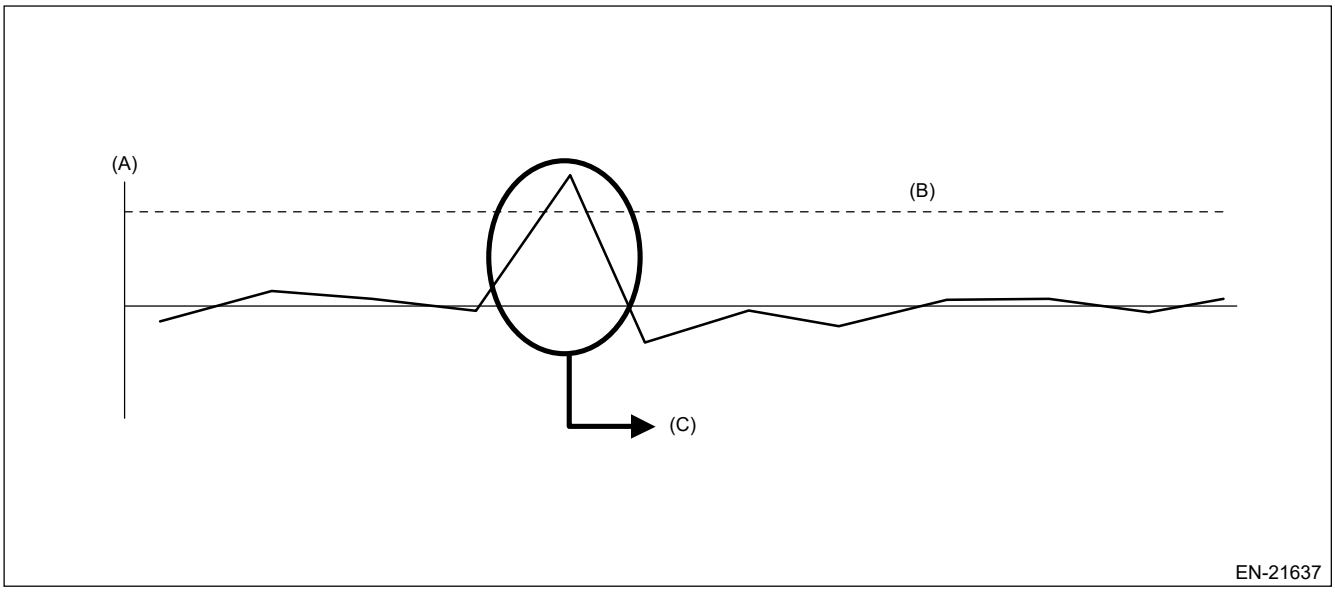
Diagnostic value	360 degree interval difference = (B – A) – (D – C)
Misfire judgment	360 degree interval difference > Judgment value → Judged as misfire



(A) 360 degree interval difference (B) Threshold value (C) Judged as misfire

720° INTERVAL DIFFERENCE METHOD

Diagnostic value	720 degree interval difference = (B – A) – (F – E)
Misfire judgment	720 degree interval difference > Judgment value: → Judged as misfire



(A) 720 degree interval difference (B) Threshold value (C) Judged as misfire

- **FTP 1.5 TIMES MISFIRE (MISFIRE OCCURRENCE LEVEL WHICH INFLUENCES EXHAUST GAS) Judgment value (Judge that malfunction occurs when the misfire ratio is high in 1000 engine revs.)**

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
FTP emission diagnostic value	48×100/2000% in 1000 revs.

Time needed for diagnosis: 1000 engine revs.
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

- **CATALYST-DAMAGING MISFIRE (MISFIRE OCCURRENCE LEVEL THAT WILL DAMAGE CATALYST)**

Judgment value

Malfunction Criteria	Threshold Value
Catalyst-damaging misfire diagnostic value	Value of Map 2 or more

Map 2

CVT model without active grille shutter

		Amount of intake air g/rev (oz/rev)							
		0.2 , (0.01)	0.3 , (0.01)	0.4 , (0.01)	0.5 , (0.02)	0.6 , (0.02)	0.7 , (0.02)	0.8 , (0.03)	0.9 , (0.03)
Engine speed (rpm)	700	90	90	90	90	80	80	80	80
	1000	90	90	90	90	80	80	57	44
	1200	90	90	90	90	90	80	67	57
	1600	90	90	80	80	80	57	44	36
	2000	90	80	80	80	80	57	44	27
	2400	90	80	80	80	80	57	31	36
	2800	80	80	80	80	57	44	44	36
	3200	80	80	57	57	44	36	36	36
	3600	57	57	57	44	44	44	44	44
	4000	57	57	57	36	36	36	44	44
	4400	44	44	44	44	44	44	44	44
	4800	44	44	44	36	36	36	36	36

	Amount of intake air g/rev (oz/rev)							
	0.2 , (0.01)	**0.3 , (0.01)**	**0.4 , (0.01)**	**0.5 , (0.02)**	**0.6 , (0.02)**	**0.7 , (0.02)**	**0.8 , (0.03)**	**0.9 , (0.03)**
5200	36	36	36	36	36	36	36	44

g/rev

MT model without active grille shutter

		Amount of intake air g/rev (oz/rev)							
		0.2 , (0.01)	**0.3 , (0.01)**	**0.4 , (0.01)**	**0.5 , (0.02)**	**0.6 , (0.02)**	**0.7 , (0.02)**	**0.8 , (0.03)**	**0.9 , (0.03)**
Engine speed (rpm)	700	90	90	90	90	80	80	80	80
	1000	90	90	90	90	80	80	57	44
	1200	90	90	90	90	90	80	67	57
	1600	90	90	80	80	80	57	44	36
	2000	90	80	80	80	80	57	44	27
	2400	90	80	80	80	80	57	31	36
	2800	80	80	80	80	57	44	44	36
	3200	80	80	57	57	44	36	36	36
	3600	57	57	57	44	44	44	44	44
	4000	57	57	57	36	36	36	44	44
	4400	44	44	44	44	44	44	44	44
	4800	44	44	44	36	36	36	36	36
	5200	36	36	36	36	36	36	36	44

g/rev

CVT model with active grille shutter

	Amount of intake air g/rev (oz/rev)

		0.2 , (0.01)	0.3 , (0.01)	0.4 , (0.01)	0.5 , (0.02)	0.6 , (0.02)	0.7 , (0.02)	0.8 , (0.03)	0.9 , (0.03)	1 , (0.04)	1.1 , (0.04)
Engine speed (rpm)	700	90	90	90	90	80	80	80	80	80	80
	1000	90	90	90	90	80	80	57	44	80	80
	1200	90	90	90	90	90	80	67	57	57	57
	1600	90	90	80	80	80	57	44	36	44	44
	2000	90	80	80	80	80	57	44	27	44	44
	2400	90	80	80	80	80	57	31	36	36	36
	2800	80	80	80	80	57	44	44	36	36	36
	3200	80	80	57	57	44	36	36	36	36	36
	3600	57	57	57	44	44	44	44	44	44	44
	4000	57	57	57	36	36	36	44	44	44	44
	4400	44	44	44	44	44	44	44	44	44	44
	4800	44	44	44	36	36	36	36	36	36	36
	5200	36	36	36	36	36	36	36	44	44	44
	5600	27	27	27	31	36	36	36	44	44	44
	6000	44	44	44	44	44	44	44	44	36	36
	6400	24	24	24	21	21	21	25	31	31	31

g/rev

MT model with active grille shutter

		Amount of intake air g/rev (oz/rev)									
		0.2 , (0.01)	0.3 , (0.01)	0.4 , (0.01)	0.5 , (0.02)	0.6 , (0.02)	0.7 , (0.02)	0.8 , (0.03)	0.9 , (0.03)	1 , (0.04)	1.1 , (0.04)
Engine speed	700	90	90	90	90	80	80	80	80	80	80

		Amount of intake air g/rev (oz/rev)									
		0.2 , (0.01)	0.3 , (0.01)	0.4 , (0.01)	0.5 , (0.02)	0.6 , (0.02)	0.7 , (0.02)	0.8 , (0.03)	0.9 , (0.03)	1 , (0.04)	1.1 , (0.04)
	1000	90	90	90	90	80	80	57	44	80	80
	1200	90	90	90	90	90	80	67	57	57	57
	1600	90	90	80	80	80	57	44	36	44	44
	2000	90	80	80	80	80	57	44	27	44	44
	2400	90	80	80	80	80	57	31	36	36	36
	2800	80	80	80	80	57	44	44	36	36	36
	3200	80	80	57	57	44	36	36	36	36	36
(rpm)	3600	57	57	57	44	44	44	44	44	44	44
	4000	57	57	57	36	36	36	44	44	44	44
	4400	44	44	44	44	44	44	44	44	44	44
	4800	44	44	44	36	36	36	36	36	36	36
	5200	36	36	36	36	36	36	36	44	44	44
	5600	27	27	27	31	36	36	36	44	44	44
	6000	44	44	44	44	44	44	44	44	36	36
	6400	24	24	24	21	21	21	25	31	31	31
											g/rev

Time needed for diagnosis: 200 engine revs.
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0302 CYLINDER 2 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0303 CYLINDER 3 MISFIRE DETECTED

Note:

For the diagnostic procedure, refer to DTC P0304. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0304 CYLINDER 4 MISFIRE DETECTED.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.

DTC P0304 CYLINDER 4 MISFIRE DETECTED

DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.
- Immediately at fault recognition (A misfire which could damage catalyst occurs.)

Trouble symptom:

- Engine stall
- Improper idling
- Rough driving

Caution:

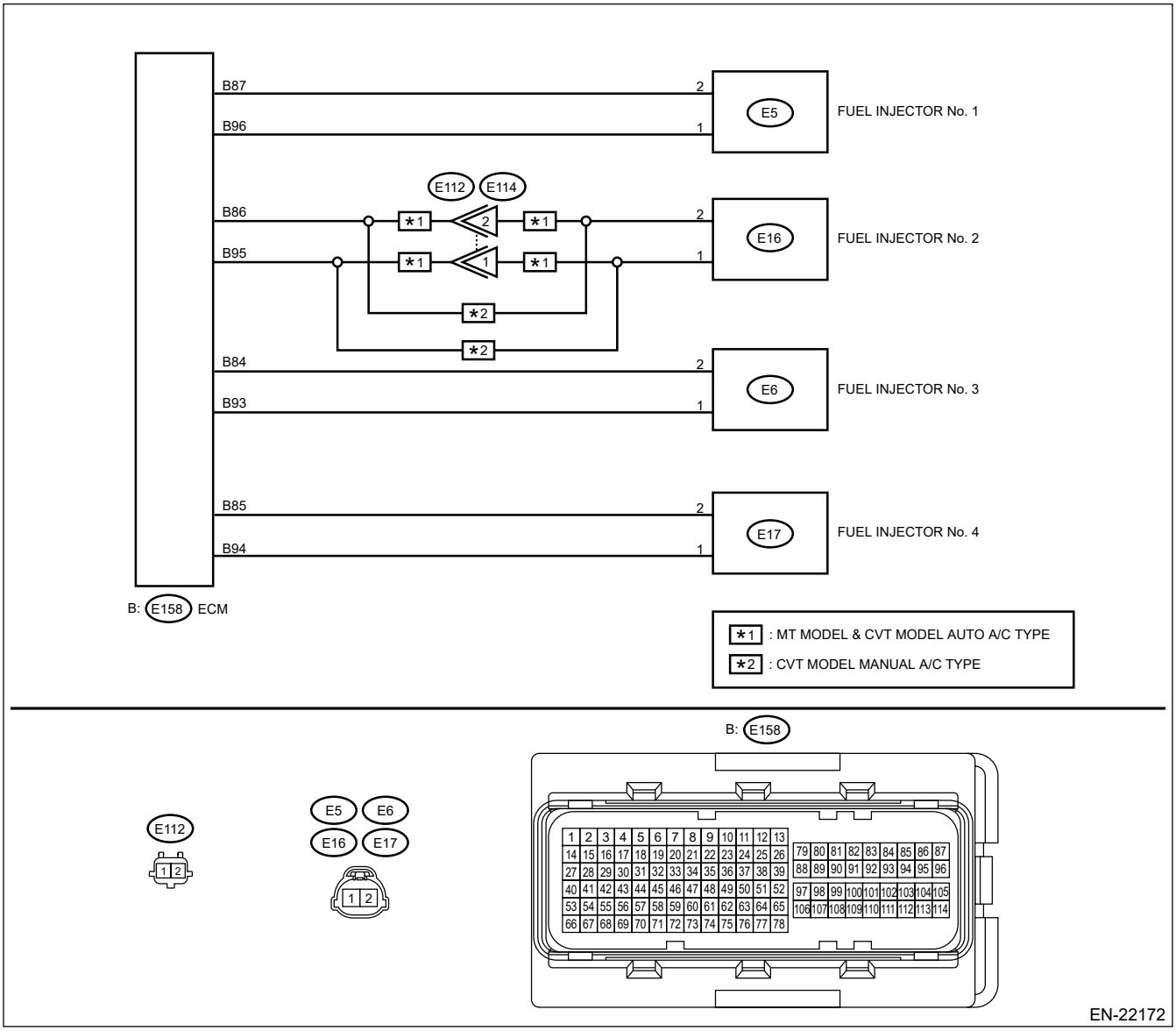
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


B87
B96
B86
B95
B84
B93
B85
B94
2
1
E5
FUEL INJECTOR No. 1
E16
FUEL INJECTOR No. 2
E6
FUEL INJECTOR No. 3
E17
FUEL INJECTOR No. 4
E112
E114
*1
*2
B: E158 ECM
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE
B: E158
E112
E5
E6
E16
E17
EN-22172

1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector on faulty cylinders.
4. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E5) No. 1 — Engine ground:
#1 (E5) No. 2 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#2 (E16) No. 2 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#3 (E6) No. 2 — Engine ground:
#4 (E17) No. 1 — Engine ground:
#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit to ground in harness between ECM and fuel injector connector.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between the ECM and fuel injector connector.

3. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 4.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

4. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and crankshaft position sensor.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes	Install the camshaft position sensor or crankshaft position sensor properly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.
No	Go to 5.

5. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to MECHANICAL(H4DO)>Cylinder Block.
No	Go to 6.

6. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly.
No	Go to 7.

7. CHECK FUEL LEVEL.

Check the fuel gauge display.

Is the fuel meter indication higher than the “Lower” level?

Yes	Go to 8.
No	Refill the fuel so that the fuel meter indication is higher than the “Lower” level, and proceed to the next step. Go to 10.

8. CHECK PCV VALVE.

Check the PCV valve.

Check that the PCV valve has no deformation, cracks or other damages.

Yes	Repair or replace the PCV valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Valve.
No	Go to 9.

9. CHECK PCV HOSE.

Check the PCV hose.

Is the PCV hose assembly free from cracks, damage or looseness?

Yes	Repair or replace the PCV hose. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Hose.
No	Go to 10.

10. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.



2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes	Go to 12.
No	Repair the poor contact of connector. **Note:** **In this case, repair the following item:** • **Poor contact of ignition coil connector** • **Poor contact of fuel injector connector on faulty cylinders** • **Poor contact of ECM connector** • **Poor contact of coupling connector** Go to 11.

11. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Is there any fault in air intake system?

Yes	Repair the air intake system. **Note:** **Check the following items.** • **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?** • **Are there cracks or any disconnection of hoses?**
No	Go to 12.

12. CHECK CYLINDER.

Check the following items for cylinder.
- Spark plug
- Ignition coil
- Fuel injector
- Compression
- Skipping timing chain teeth

Is there any fault in the cylinder?

Yes	Repair or replace faulty parts. **Note:** **Check the following items.** • **Spark plug** • **Ignition coil** • **Fuel injector** • **Compression** • **Skipping timing chain teeth**
No	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0301. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0301 CYLINDER 1 MISFIRE DETECTED.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Knocking occurs

Caution:

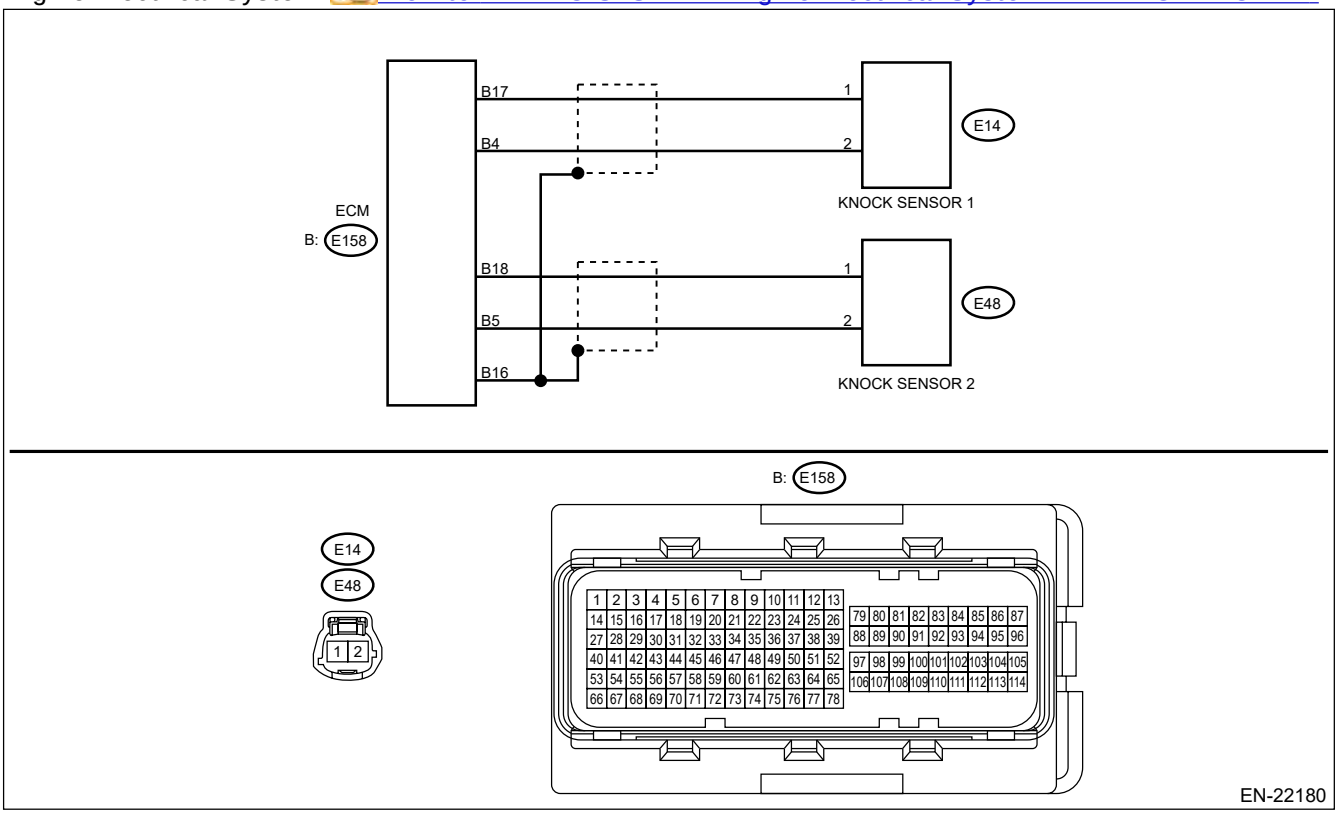
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 17 — (E158) No. 4:

Is the resistance less than 500 kΩ?

Yes	Go to 2.
No	Go to 3.

2. CHECK KNOCK SENSOR.

1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 500 kΩ?

Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Knock Sensor.
No	Repair the short circuit between lines in the harness between the ECM connector and knock sensor connector. **Note:** **The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.**

3. CHECK INPUT SIGNAL OF ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 4 (+) — Chassis ground (−):

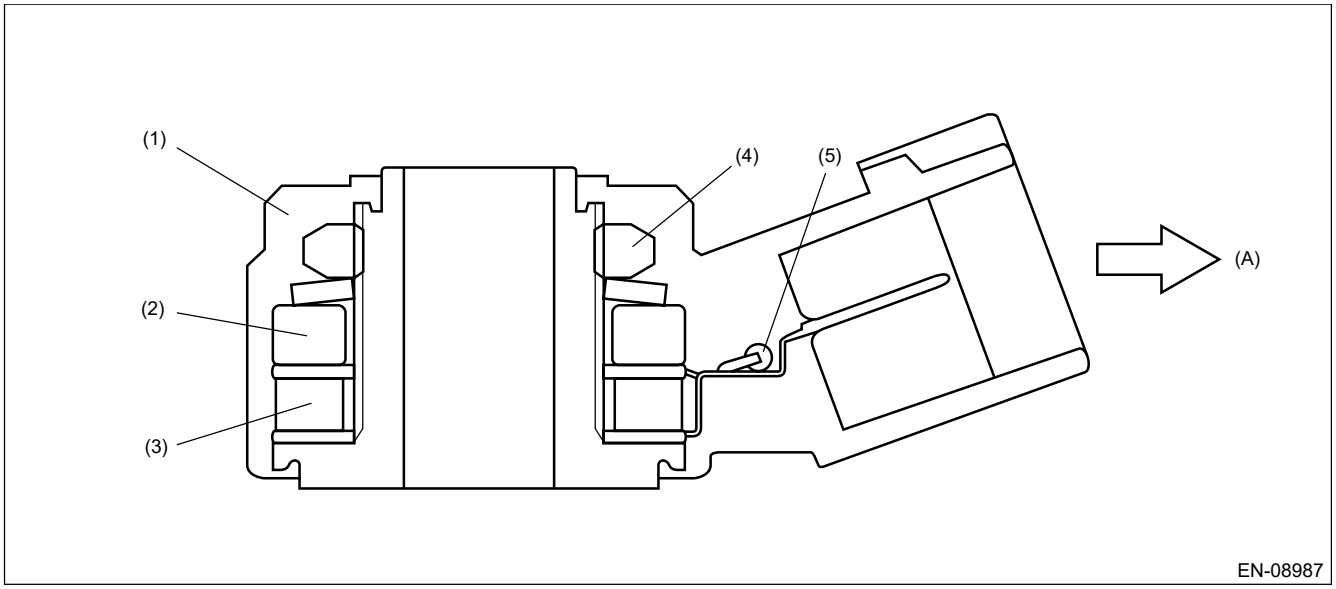
Is the voltage 2 V or more?

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair the short circuit to ground in harness between ECM connector and knock sensor connector. **Note:** **The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.**

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case
(2) Weight
(3) Piezoelectric element
(4) Nut
(5) Resistance

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.248V

Time needed for diagnosis: 1000ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Poor driving performance
- Knocking occurs

Caution:

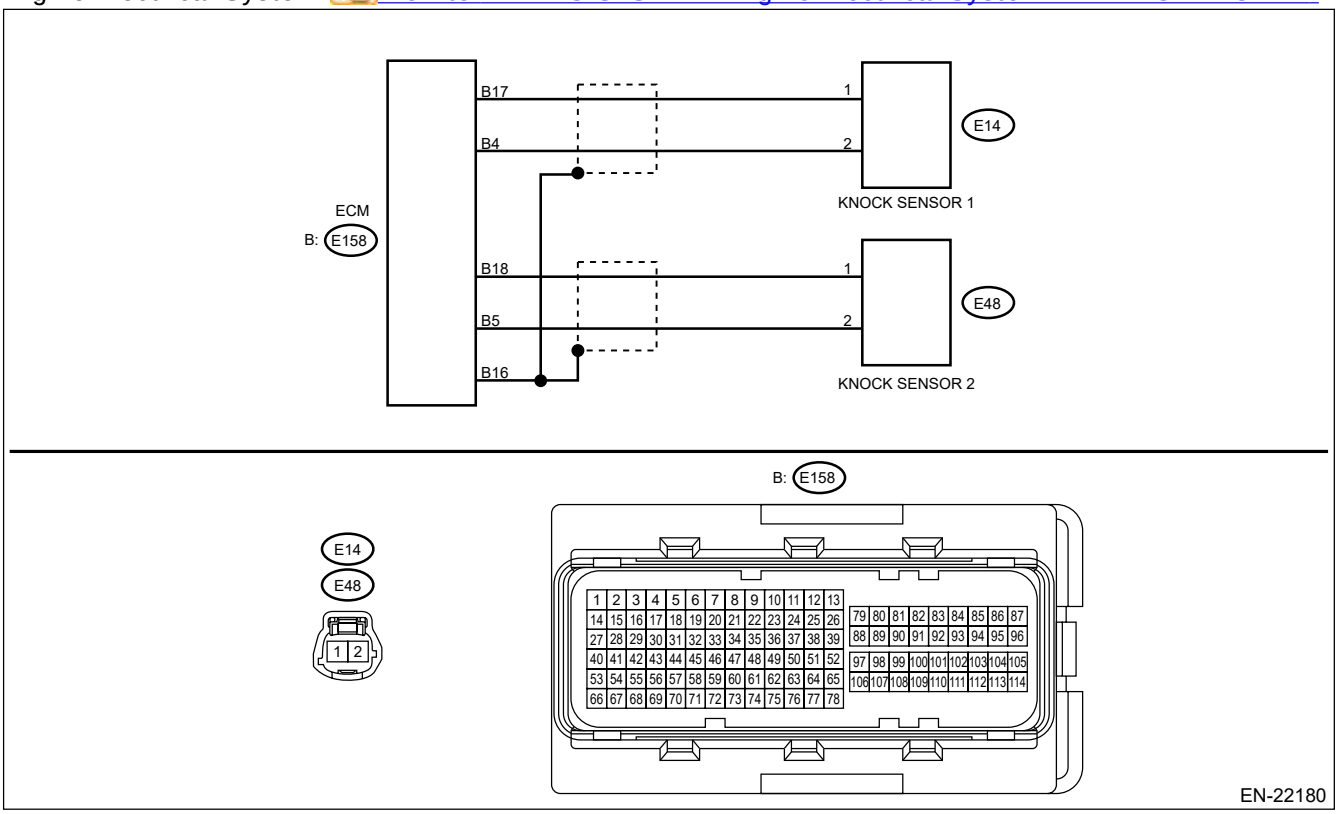
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 17 — (E158) No. 4:

Is the resistance 600 kΩ or more?

Yes	Go to 2.
No	Repair the poor contact of ECM connector.

2. CHECK KNOCK SENSOR.

1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.
   Terminals
   No. 1 — No. 2:

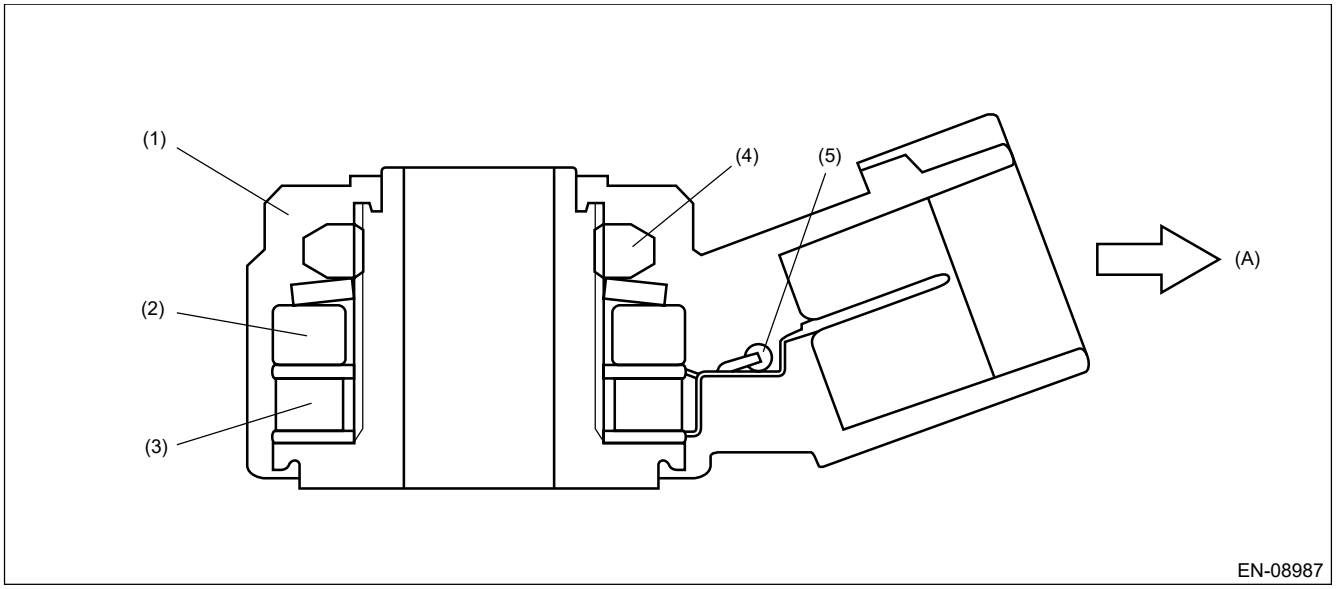
Is the resistance 600 kΩ or more?

Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Knock Sensor.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and knock sensor connector** • **Poor contact of knock sensor connector** • **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of knock sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(A) To knock sensor harness

(1) Case
(2) Weight
(3) Piezoelectric element
(4) Nut
(5) Resistance

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.664V or more

Time needed for diagnosis: 1000ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0332 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT LOW BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Driving performance problem
- Knocking occurs

Caution:

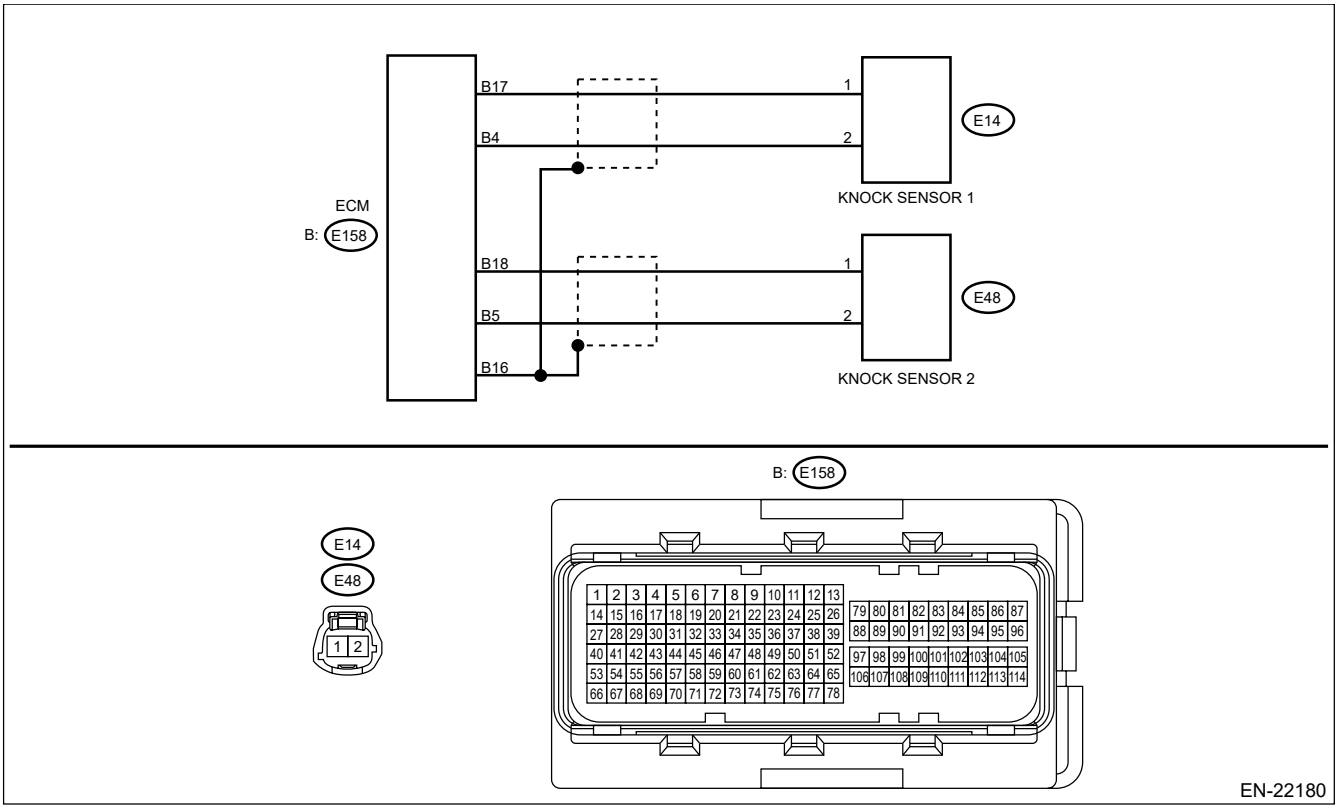
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 18 — (E158) No. 5:

Is the resistance less than 500 kΩ?

Yes	Go to 2.
No	Go to 3.

2. CHECK KNOCK SENSOR.

1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 500 kΩ?

Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Knock Sensor.
No	Repair the short circuit between lines in the harness between the ECM connector and knock sensor connector. **Note:** **The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.**

3. CHECK INPUT SIGNAL OF ECM.

1. Connect the ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 5 (+) — Chassis ground (−):

Is the voltage 2 V or more?

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair the short circuit to ground in harness between ECM connector and knock sensor connector. **Note:** **The harness between both connectors are shielded. Remove the shield and repair the short circuit of harness.**

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0327. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0327 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT LOW BANK 1 OR SINGLE SENSOR.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0333 KNOCK/COMBUSTION VIBRATION SENSOR 2 CIRCUIT HIGH BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Driving performance problem
- Knocking occurs

Caution:

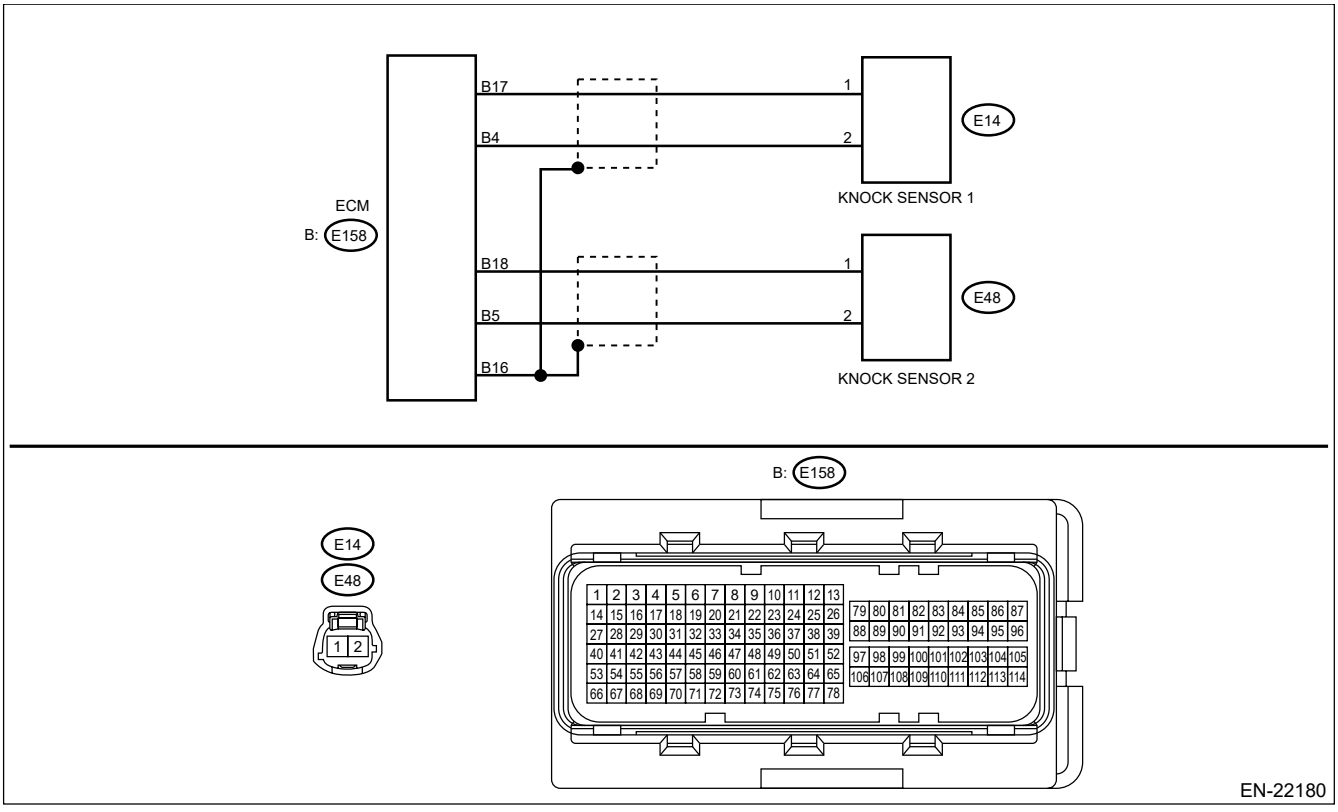
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND KNOCK SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 18 — (E158) No. 5:

Is the resistance 600 kΩ or more?

Yes	Go to 2.
No	Repair the poor contact of ECM connector.

2. CHECK KNOCK SENSOR.

1. Disconnect the connector from the knock sensor.
2. Measure the resistance between knock sensor terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance 600 kΩ or more?

Yes	Replace the knock sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Knock Sensor.
No	Repair the open circuit in harness between ECM connector and knock sensor connector.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0328. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0328 KNOCK/COMBUSTION VIBRATION SENSOR 1 CIRCUIT HIGH BANK 1 OR SINGLE SENSOR.

DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Caution:

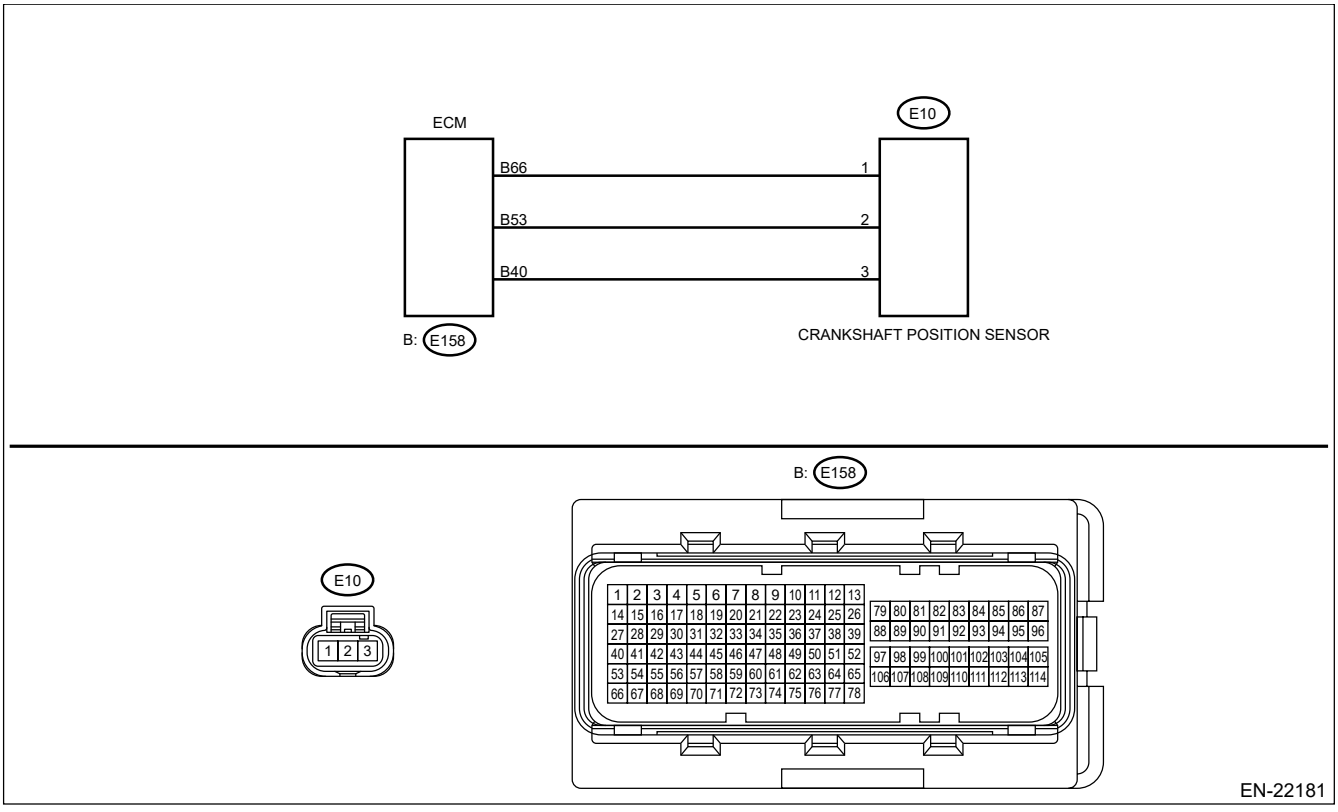
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installation bolt tightened securely?

Yes	Go to 2.
No	Tighten the crankshaft position sensor installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

2. CHECK CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Remove the crankshaft position sensor.
3. Measure the resistance between terminals of crankshaft position sensor.
   Terminals
   No. 1 — No. 2:

Is the resistance between 1 and 4 kΩ?

Yes	Go to 3.
No	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.

3. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.

Connector & terminal

(E158) No. 66 — (E10) No. 1:
(E158) No. 53 — (E10) No. 2:
(E158) No. 40 — (E10) No. 3:

Is the resistance less than 1 Ω?

Yes	Repair the poor contact of ECM and crankshaft position sensor connector.
No	Repair the harness and connector.

Note:

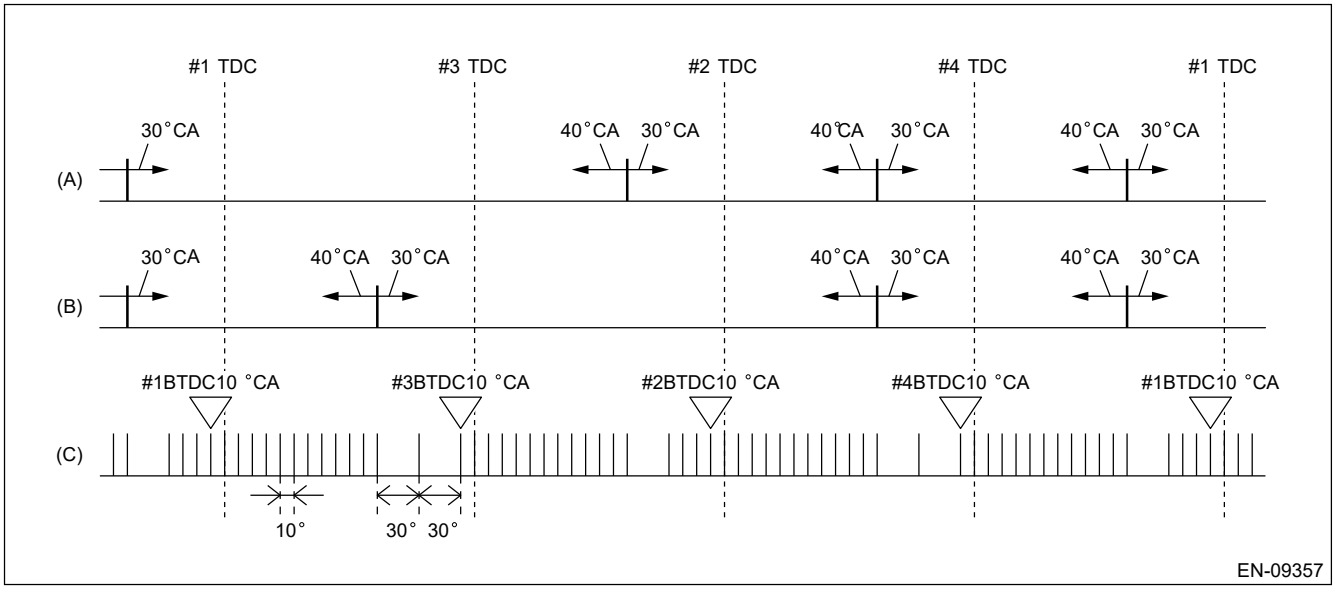
In this case, repair the following item:

- **Open circuit in harness between ECM connector and crankshaft position sensor connector**
- **Poor contact of coupling connector**

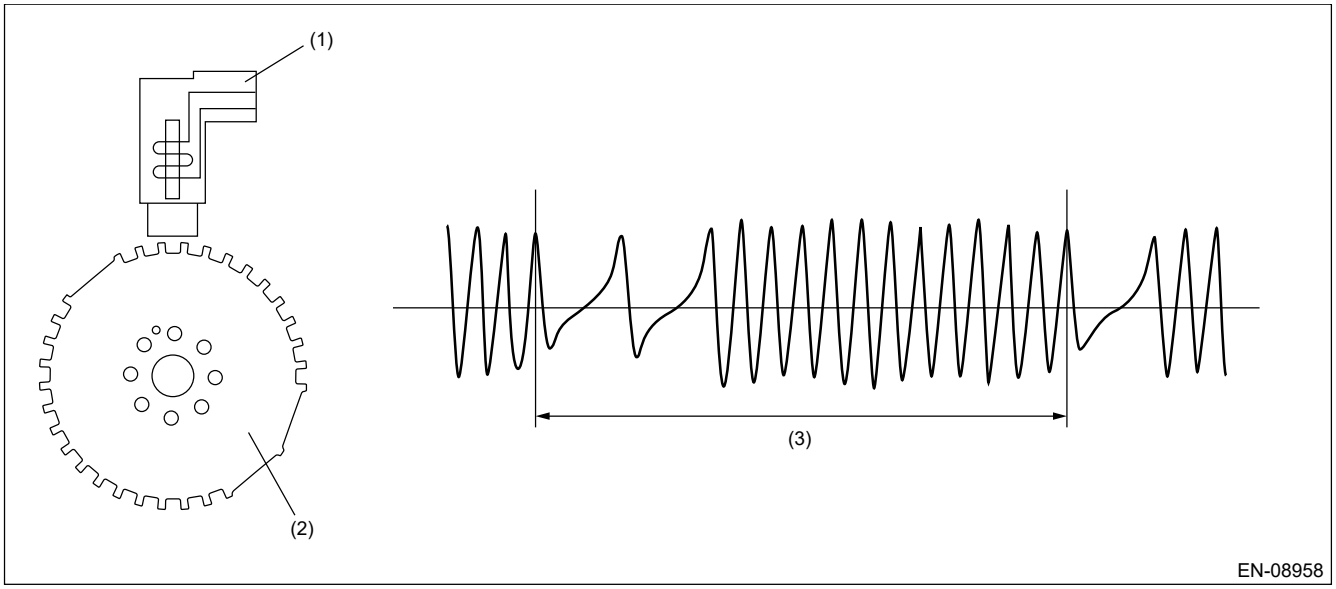
1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the crankshaft position sensor.
Judge as NG when the crank signal is not input even though the starter was rotated.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH) (B) Camshaft signal (LH) (C) Crankshaft signal



(1) Crankshaft position sensor (2) Crankshaft position sensor plate (3) One crankshaft rotation

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of crankshaft position sensor signals during cranking	Equal to 0

Time needed for diagnosis: 3000ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0336 CRANKSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Failure of engine to start

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK CONDITION OF CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installation bolt tightened securely?

Yes	Go to 2.
No	Tighten the crankshaft position sensor installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

2. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate.

Is there crack or damage in the crankshaft position sensor plate teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to MECHANICAL(H4DO)>Cylinder Block.
No	Go to 3.

3. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft, and align alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

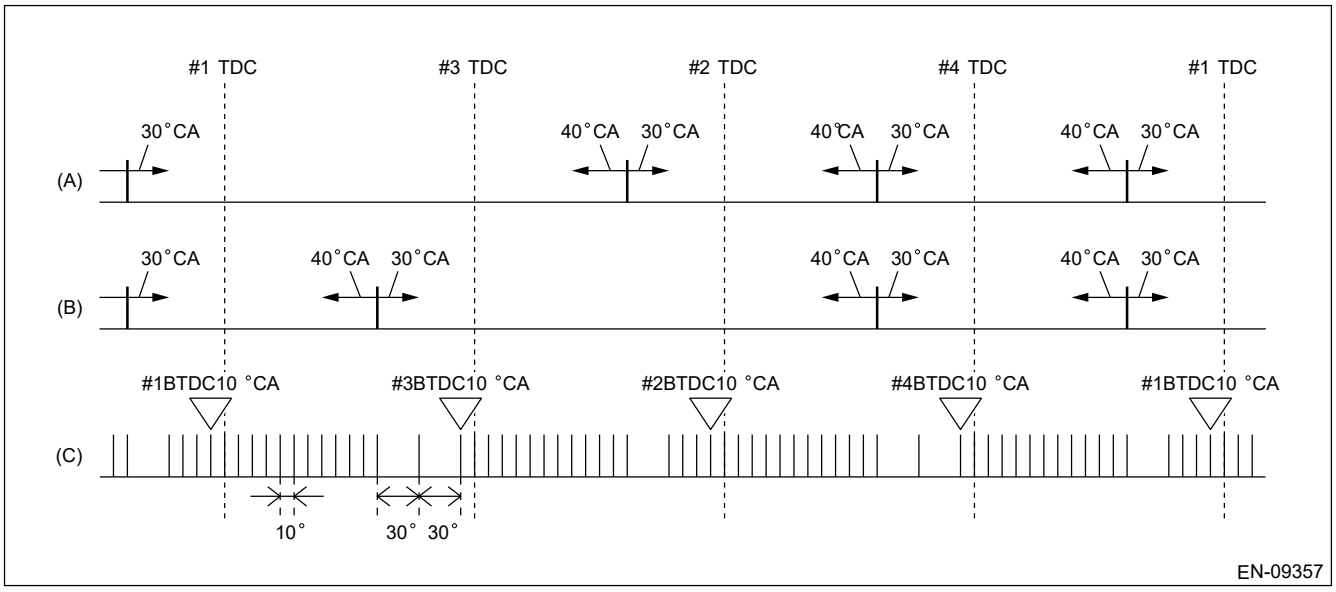
Is the timing chain dislocated from its proper position?

Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly.
No	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.

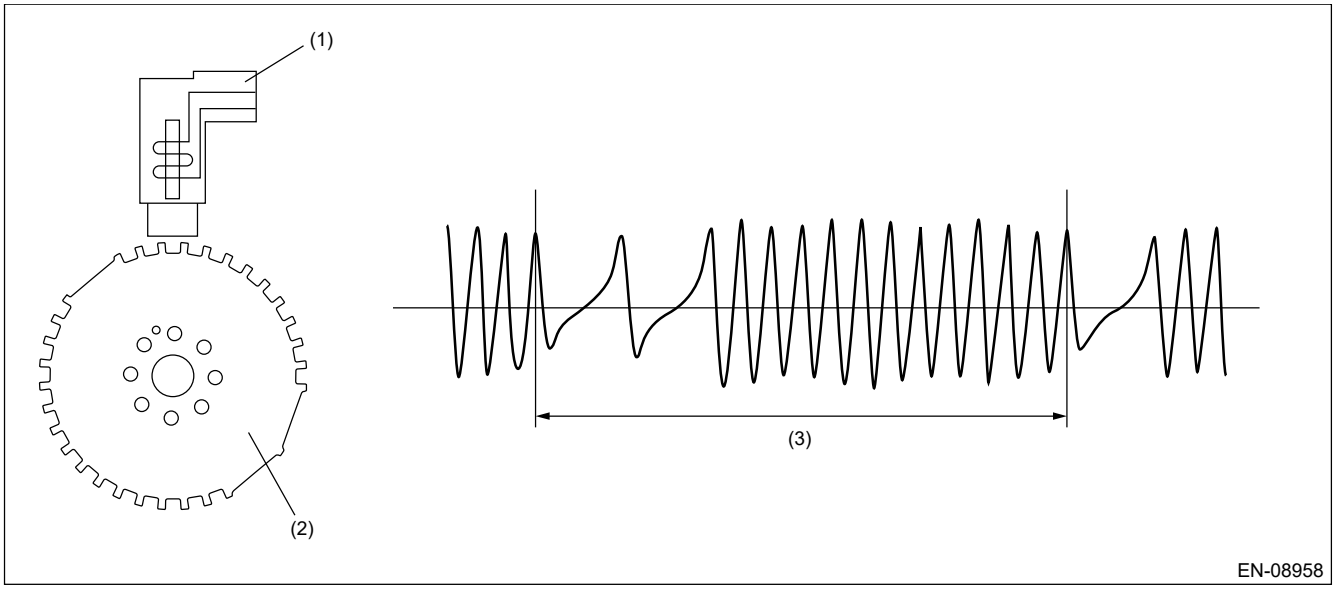
1. OUTLINE OF DIAGNOSIS

Detect for faults in crankshaft position sensor output properties.
Judge as NG when there is a problem in the number of crankshaft signals for every revolution of crankshaft.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH) (B) Camshaft signal (LH) (C) Crankshaft signal



(1) Crankshaft position sensor (2) Crankshaft position sensor plate (3) One crankshaft rotation

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Amount of crank sensor signal during 1 rev of crankshaft	Not equal to 30

Time needed for diagnosis: Engine speed 10engine revs.

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Caution:

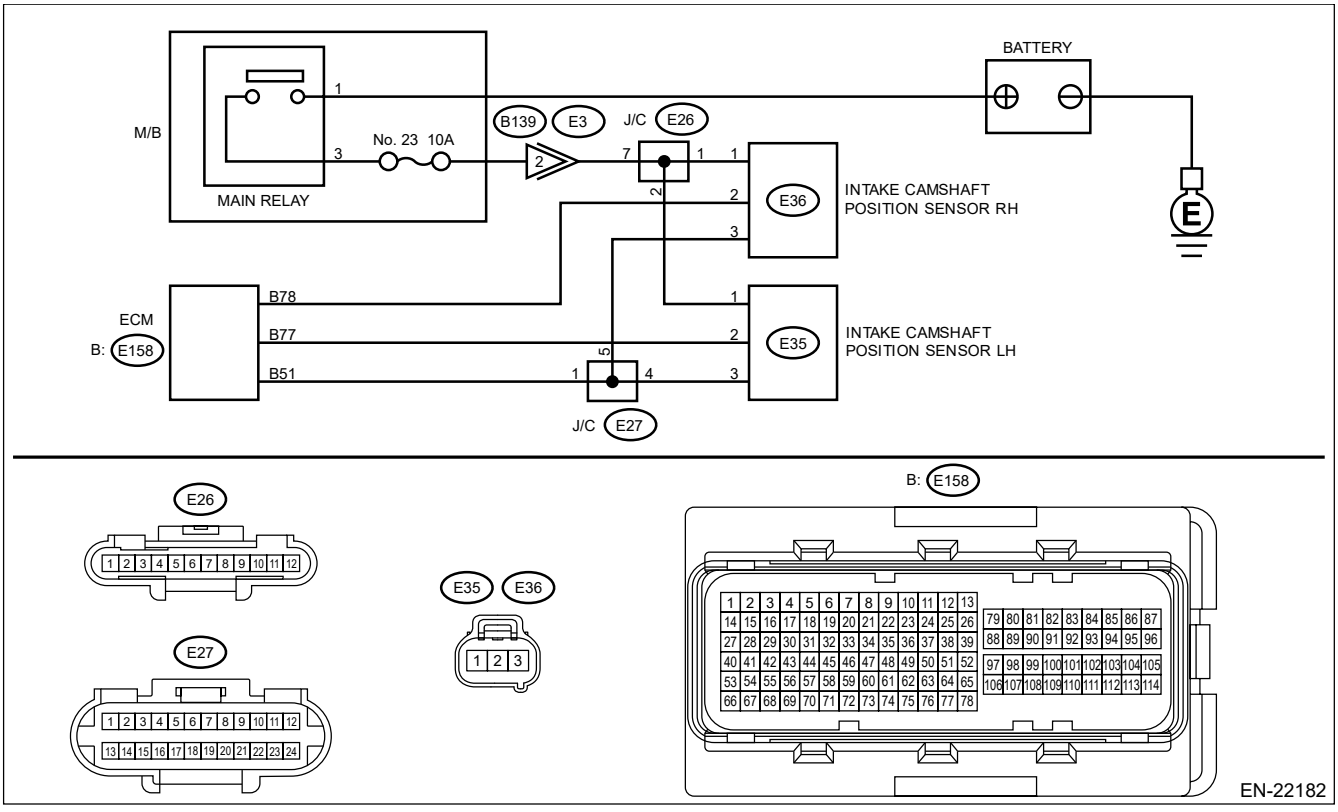
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor connector.

Connector & terminal

(E158) No. 78 — (E36) No. 2:

(E158) No. 51 — (E36) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit in the harness between the ECM connector and camshaft position sensor connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair short circuit to ground in harness between ECM connector and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR (SHORT TO POWER SUPPLY).

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E36) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and camshaft position sensor connector.
No	Go to 5.

5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installation bolt tightened securely?

Yes	Go to 6.
No	Tighten the camshaft position sensor installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Control Module I/O Signal.

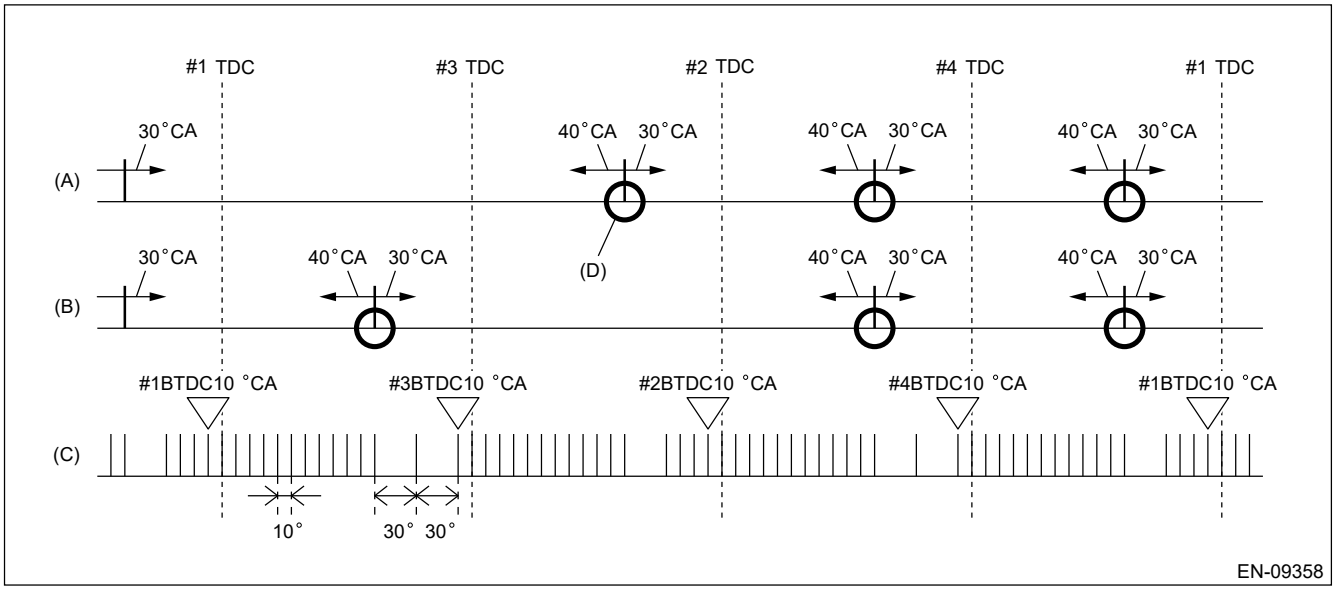
Is there any abnormality in waveform?

Yes	Replace the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of camshaft position sensor connector • Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the camshaft position sensor.
When there is no camshaft position signal input continuously, judge as NG.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)
(B) Camshaft signal (LH)
(C) Crankshaft signal
(D) Camshaft position signal:
When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	8V or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage Elapsed time after starting the engine	8V or more 200ms or more

4. GENERAL DRIVING CYCLE

Diagnosis 1: Perform the diagnosis only once.
Diagnosis 2: Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of camshaft position sensor signals during cranking	Equal to 0

Time needed for diagnosis: 3000ms

Diagnosis 2

Judge as NG if there is no input signal from the camshaft position sensor for 4 ((10time(s)+2)/3) engine revs.

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft sensor signal during 0.5 revs of crankshaft	Equal to 0

Time needed for diagnosis:

Diagnosis 1

3000ms

Diagnosis 2

Engine speed 6 engine revs,

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR

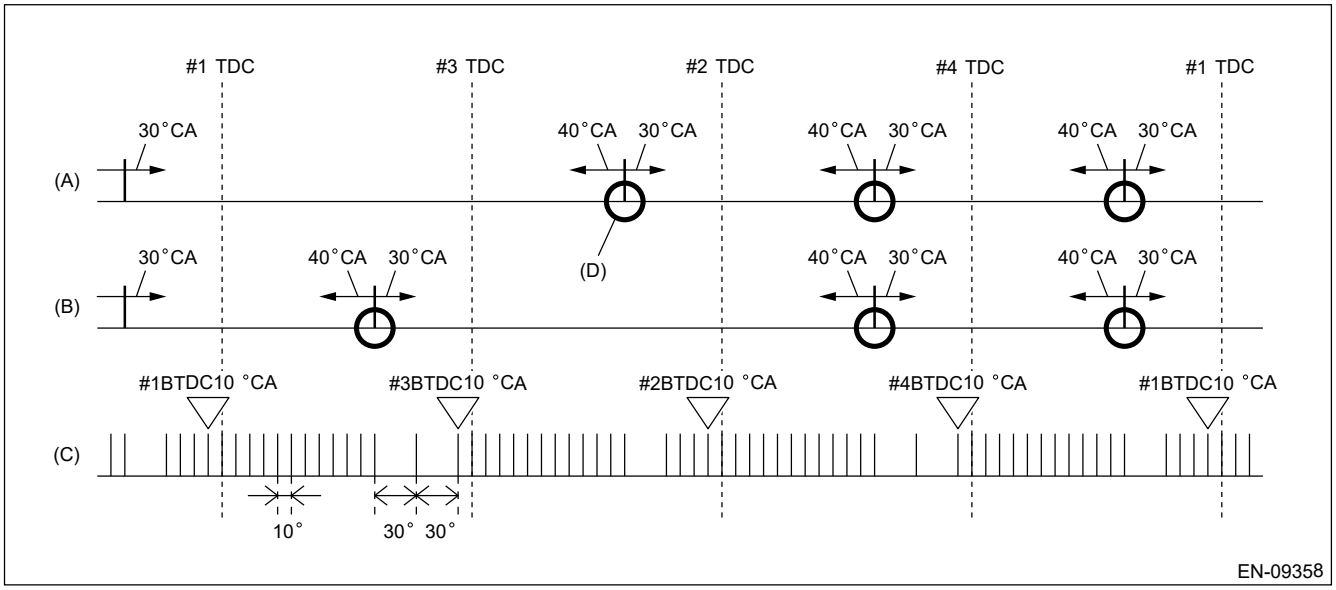
Note:

For the diagnostic procedure, refer to DTC P0340. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of camshaft position sensor property.
Judge as NG when the number of camshaft signals remains abnormal.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)
(B) Camshaft signal (LH)
(C) Crankshaft signal
(D) Camshaft position signal: When normal, there will be 3 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more
Elapsed time after starting the engine	200ms or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the status continues where the number of camshaft position sensor signals in two crankshaft revolutions is other than 3time(s).

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft sensor signal during 2 revs of crankshaft	Not equal to 3time(s)

Time needed for diagnosis: 8 engine revs.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Caution:

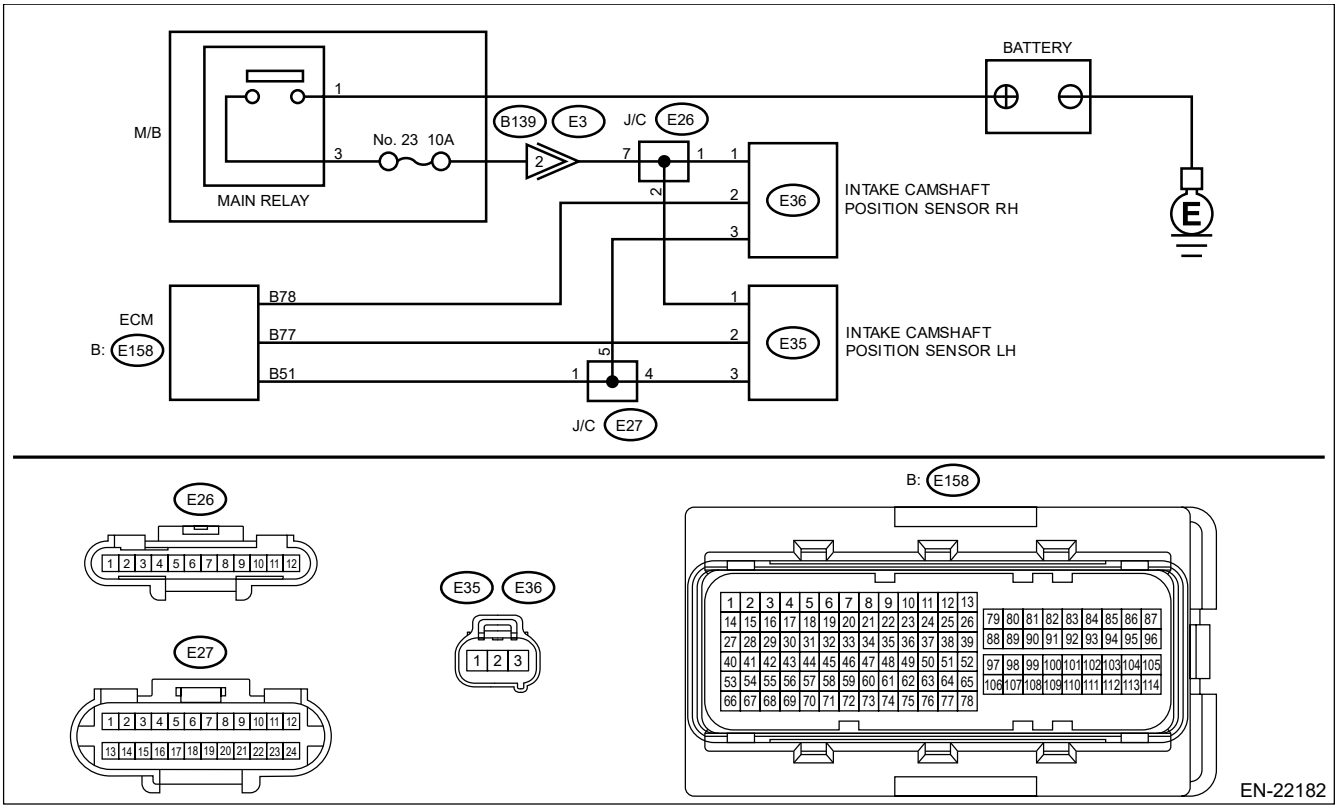
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor connector and engine ground.
   Connector & terminal
   (E35) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor connector.
   Connector & terminal
   (E158) No. 77 — (E35) No. 2:
   (E158) No. 51 — (E35) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit in the harness between the ECM connector and camshaft position sensor connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO GROUND).

Measure the resistance between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair short circuit to ground in harness between ECM connector and camshaft position sensor connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR CONNECTOR (SHORT TO POWER SUPPLY).

Measure the voltage between camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and camshaft position sensor connector.
No	Go to 5.

5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installation bolt tightened securely?

Yes	Go to 6.
No	Tighten the camshaft position sensor installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

6. CHECK CAMSHAFT POSITION SENSOR.

Check the waveform of the camshaft position sensor. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Control Module I/O Signal.

Is there any abnormality in waveform?

Yes	Replace the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of camshaft position sensor connector • Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0340. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0340 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 1 OR SINGLE SENSOR.

DTC P0346 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0345. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0345 CAMSHAFT POSITION SENSOR "A" CIRCUIT BANK 2.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0341. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0341 CAMSHAFT POSITION SENSOR "A" CIRCUIT RANGE/PERFORMANCE BANK 1 OR SINGLE SENSOR.

DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

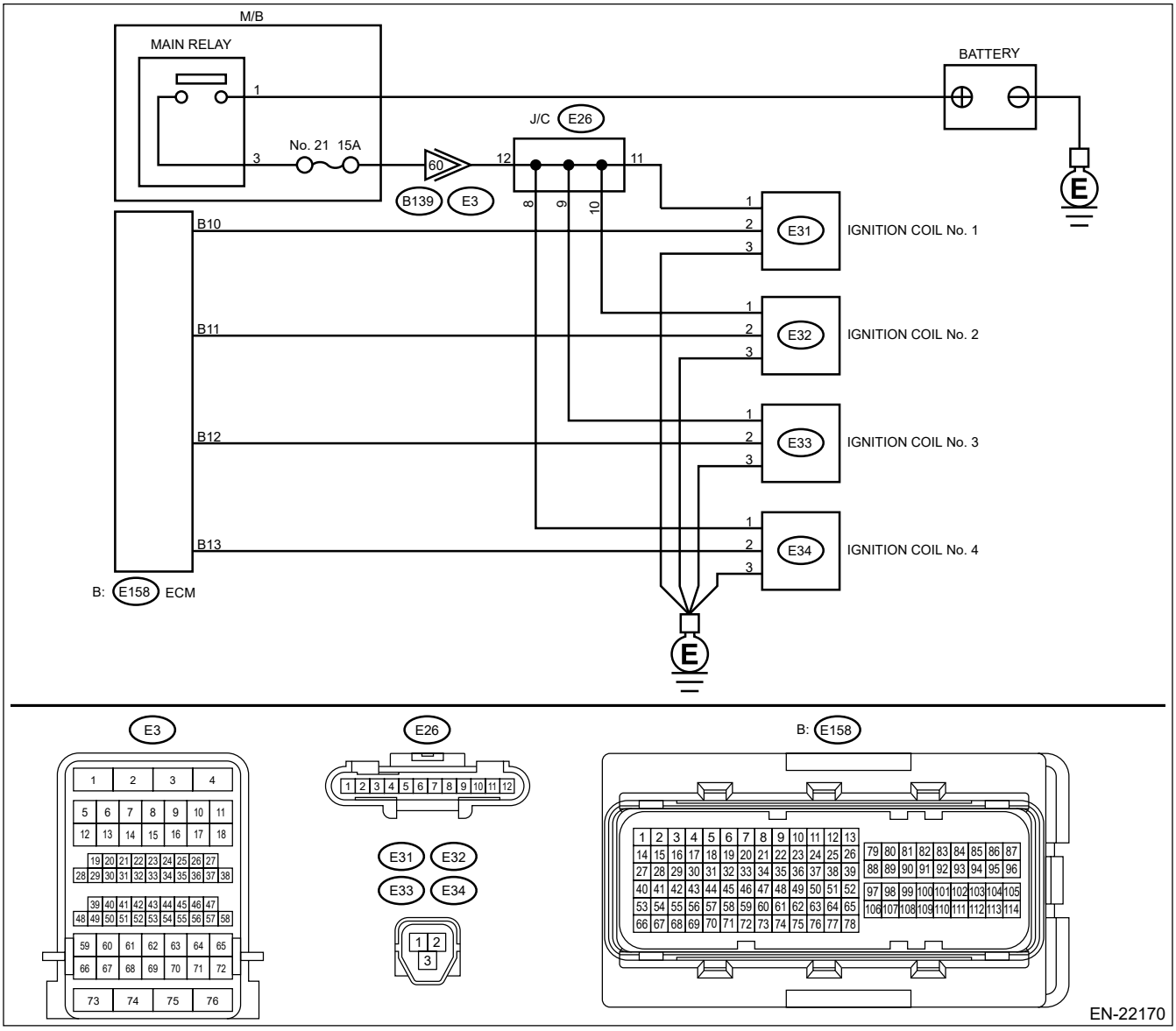
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
MAIN RELAY
1
3
No. 21 15A
BATTERY
J/C E26
60
12
11
B139
E3
8
9
10
B10
B11
B12
B13
E31
E32
E33
E34
IGNITION COIL No. 1
IGNITION COIL No. 2
IGNITION COIL No. 3
IGNITION COIL No. 4
B: E158 ECM
E
E3
E26
B: E158
EN-22170

1. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 1 (+) — Engine ground (−):
DTC P0352; (E32) No. 1 (+) — Engine ground (−):
DTC P0353; (E33) No. 1 (+) — Engine ground (−):
DTC P0354; (E34) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open or short to ground in harness of power supply circuit** • **Blown out of fuse** • **Poor contact of IG relay connector** • **Poor contact of coupling connector** • **Faulty IG relay**

2. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 3 — Engine ground:
DTC P0352; (E32) No. 3 — Engine ground:
DTC P0353; (E33) No. 3 — Engine ground:
DTC P0354; (E34) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

3. CHECK HARNESS BETWEEN ECM AND IGNITION COIL (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between ignition coil connector and engine ground.

Connector & terminal

DTC P0351; (E31) No. 2 — Engine ground:
DTC P0352; (E32) No. 2 — Engine ground:
DTC P0353; (E33) No. 2 — Engine ground:
DTC P0354; (E34) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the ground short circuit of harness between ECM connector and ignition coil connector.

4. CHECK HARNESS BETWEEN ECM AND IGNITION COIL (OPEN).

Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

DTC P0351; (E158) No. 10 — (E31) No. 2:
DTC P0352; (E158) No. 11 — (E32) No. 2:
DTC P0353; (E158) No. 12 — (E33) No. 2:
DTC P0354; (E158) No. 13 — (E34) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit in harness between ECM connector and ignition coil connector.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Go to 6.

6. CHECK SPARK PLUG CONDITION.

1. Remove the spark plug of the corresponding cylinder. Ref. to IGNITION(H4DO)>Spark Plug>REMOVAL.
2. Check the spark plug condition. Ref. to IGNITION(H4DO)>Spark Plug>INSPECTION.

Is the check result OK?

Yes	Replace the ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil.
No	Replace the spark plug. Ref. to IGNITION(H4DO)>Spark Plug.

1. OUTLINE OF DIAGNOSIS

Based on the self-diagnostic result of the ignition coil driving IC, judge the ignition coil driving circuit as normal or abnormal.
The ignition coil driving IC detects “no ignition” status as a malfunction.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Elapsed time after starting the engine	More than 1 s
Engine speed	500 rpm or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.
Judgment value

Malfunction Criteria	Threshold Value
Ignition driving IC information	Trouble

Time needed for diagnosis: 2.56s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0352 IGNITION COIL "B" PRIMARY CONTROL CIRCUIT/OPEN

Note:
For the diagnostic procedure, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0353 IGNITION COIL "C" PRIMARY CONTROL CIRCUIT/OPEN

Note:
For the diagnostic procedure, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0354 IGNITION COIL "D" PRIMARY CONTROL CIRCUIT/OPEN

Note:
For the diagnostic procedure, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P0351. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0351 IGNITION COIL "A" PRIMARY CONTROL CIRCUIT/OPEN.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Caution:

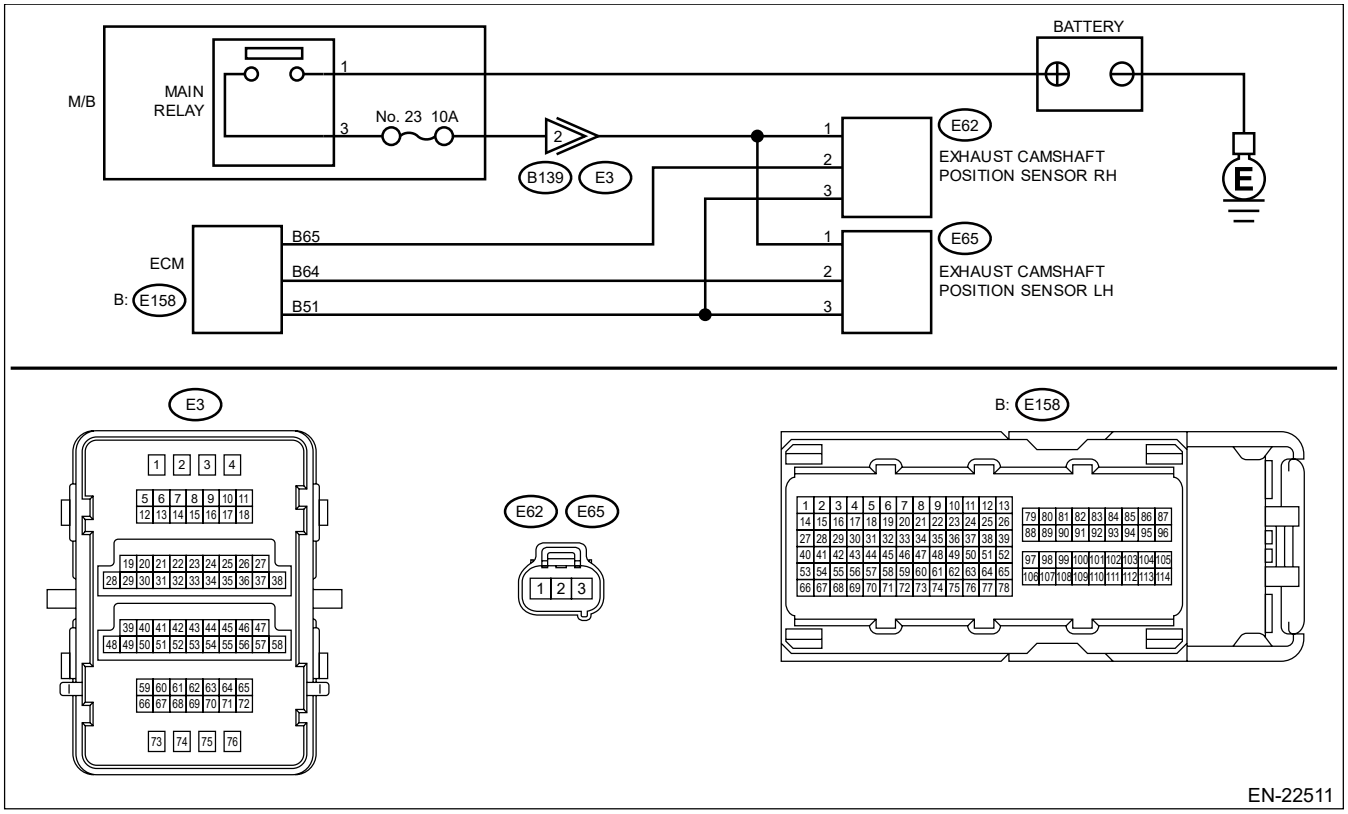
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor RH connector and engine ground.
   Connector & terminal
   (E62) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor RH connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor RH connector.
   Connector & terminal
   (E158) No. 65 — (E62) No. 2:
   (E158) No. 51 — (E62) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit in the harness between the ECM connector and camshaft position sensor RH connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR RH (SHORT TO GROUND).

Measure the resistance between camshaft position sensor RH connector and engine ground.

Connector & terminal

(E62) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair short circuit to ground in harness between ECM connector and camshaft position sensor RH connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR RH (SHORT TO POWER SUPPLY).

Measure the voltage between camshaft position sensor RH connector and engine ground.

Connector & terminal

(E62) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and camshaft position sensor RH connector.
No	Go to 5.

5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR RH.

Check the installation condition of camshaft position sensor RH.

Is the camshaft position sensor RH installation bolt tightened securely?

Yes	Go to 6.
No	Tighten the camshaft position sensor RH installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

6. CHECK CAMSHAFT POSITION SENSOR RH.

Check the waveform of the camshaft position sensor RH. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal.

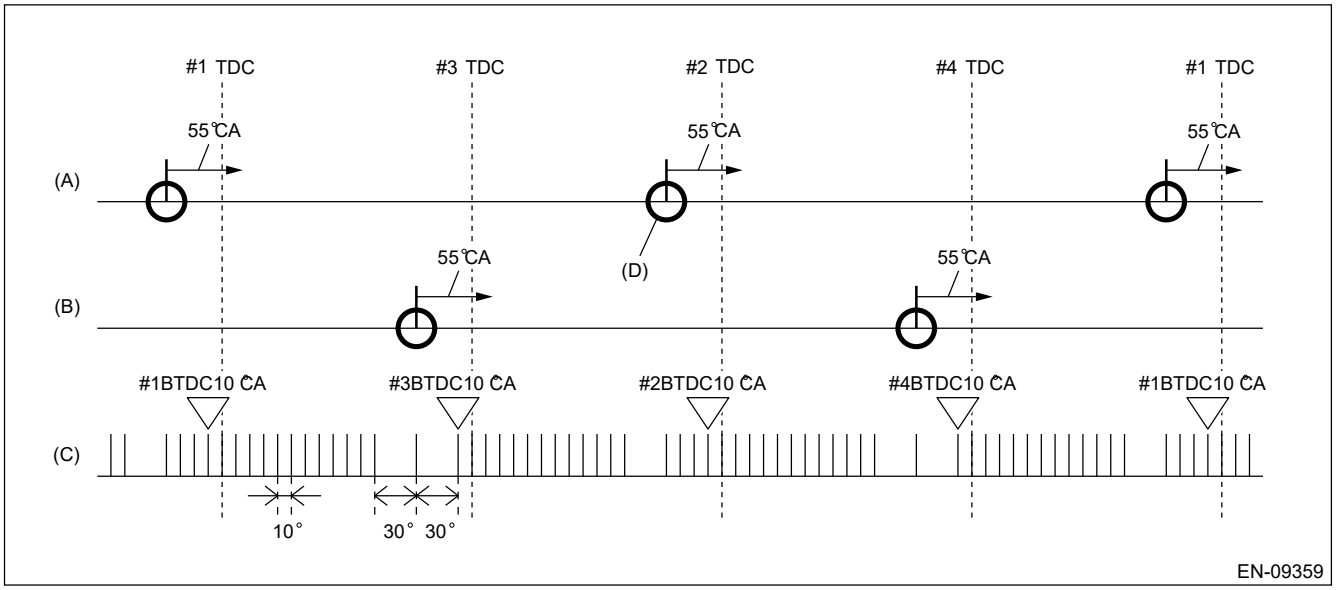
Is there any abnormality in waveform?

Yes	Replace the camshaft position sensor RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of camshaft position sensor RH connector • Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the camshaft position sensor.
When there is no camshaft position signal input continuously, judge as NG.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)
(B) Camshaft signal (LH)
(C) Crankshaft signal
(D) Camshaft position signal:
When normal, there will be 2 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Elapsed time after starting the engine	10.9 V or more 200ms or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

When there is no camshaft position sensor signal input in TDC for 10time(s), judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of exhaust camshaft position sensor pulse during 0.5 crankshaft rev.	Equal to 0

Time needed for diagnosis: Engine speed 6 engine revs,
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1

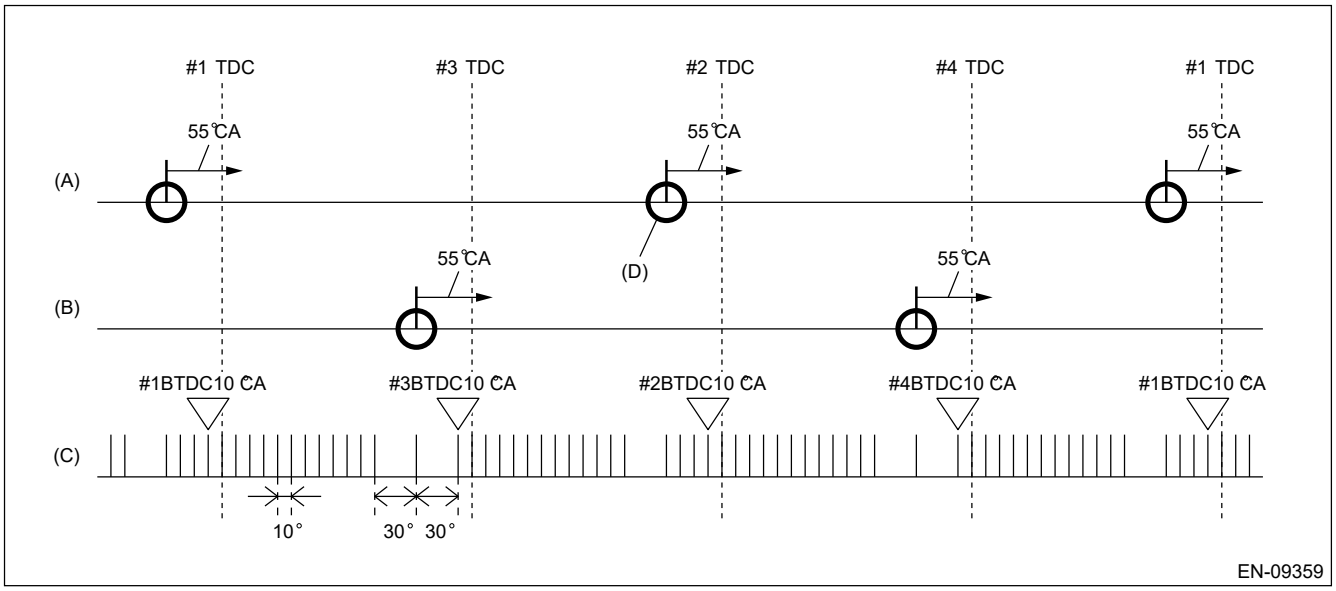
Note:

For the diagnostic procedure, refer to DTC P0365. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of camshaft position sensor property.
Judge as NG when the number of camshaft signals remains abnormal.

2. COMPONENT DESCRIPTION



(A) Camshaft signal (RH)
(B) Camshaft signal (LH)
(C) Crankshaft signal
(D) Camshaft position signal:
When normal, there will be 2 camshaft position signals for every 2 crankshaft revolutions.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Elapsed time after starting the engine	200ms or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the status continues where the number of camshaft position sensor signals in two crankshaft revolutions is other than 2time(s).

Judgment value

Malfunction Criteria	Threshold Value
Amount of camshaft sensor signal during 2 revs of crankshaft	Not equal to 2time(s)

Time needed for diagnosis: Engine speed 8 engine revs,
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Engine stall
- Failure of engine to start

Caution:

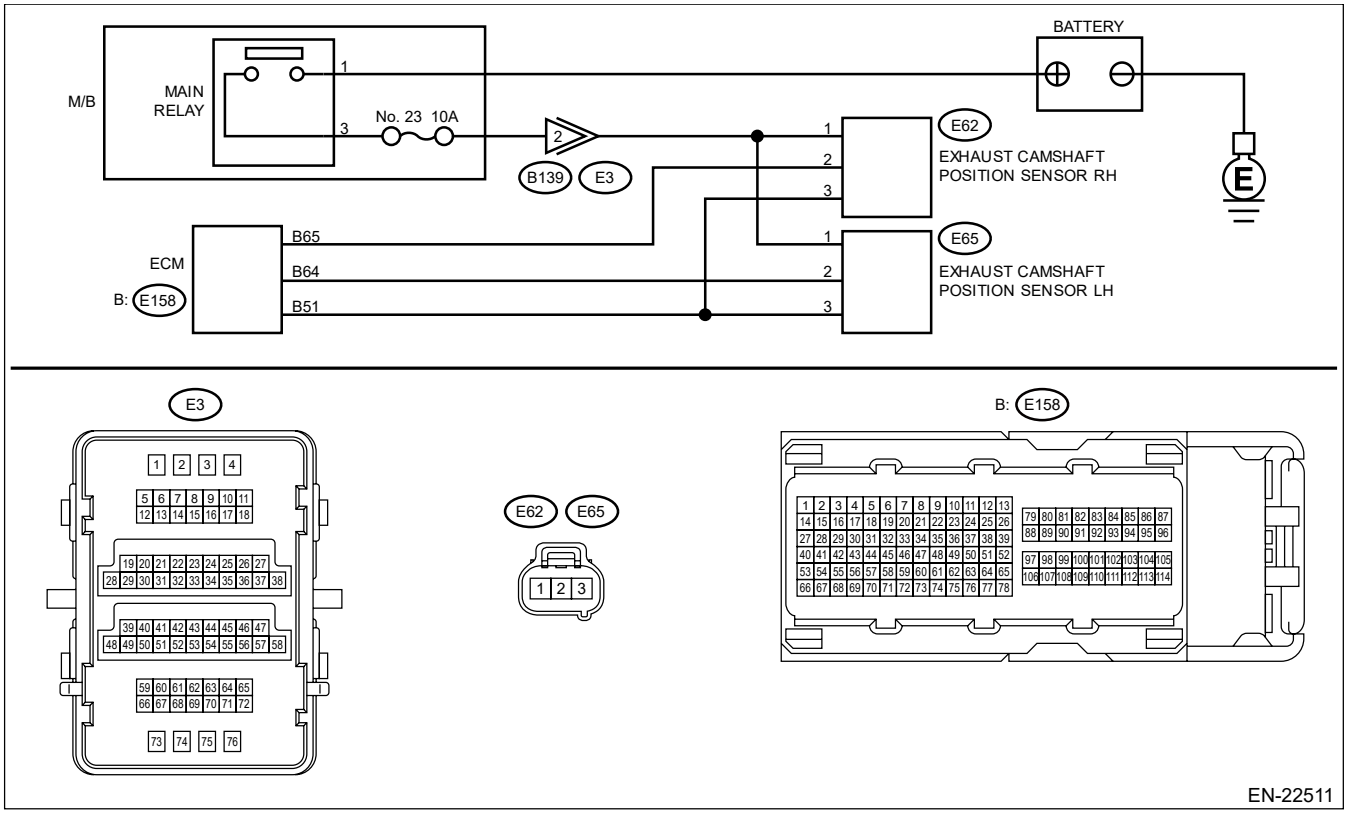
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY OF CAMSHAFT POSITION SENSOR LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from camshaft position sensor LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between camshaft position sensor LH connector and engine ground.
   Connector & terminal
   (E65) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit or short circuit to ground in harness between main relay connector and camshaft position sensor LH connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and camshaft position sensor LH connector.
   Connector & terminal
   (E158) No. 64 — (E65) No. 2:
   (E158) No. 51 — (E65) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit in the harness between the ECM connector and camshaft position sensor LH connector.

3. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR LH (SHORT TO GROUND).

Measure the resistance between camshaft position sensor LH connector and engine ground.

Connector & terminal

(E65) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair short circuit to ground in harness between ECM connector and camshaft position sensor LH connector.

4. CHECK HARNESS BETWEEN ECM AND CAMSHAFT POSITION SENSOR LH (SHORT TO POWER SUPPLY).

Measure the voltage between camshaft position sensor LH connector and engine ground.

Connector & terminal

(E65) No. 2 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and camshaft position sensor LH connector.
No	Go to 5.

5. CHECK CONDITION OF CAMSHAFT POSITION SENSOR LH.

Check the installation condition of camshaft position sensor LH.

Is the camshaft position sensor LH installation bolt tightened securely?

Yes	Go to 6.
No	Tighten the camshaft position sensor LH installation bolt securely. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

6. CHECK CAMSHAFT POSITION SENSOR LH.

Check the waveform of the camshaft position sensor LH. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal.

Is there any abnormality in waveform?

Yes	Replace the camshaft position sensor LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor.
No	Repair the following item. • Poor contact of ECM connector • Poor contact of camshaft position sensor LH connector • Poor contact of coupling connector

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0365. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0365 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 1.

DTC P0391 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 2

Note:

For the diagnostic procedure, refer to DTC P0390. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0390 CAMSHAFT POSITION SENSOR "B" CIRCUIT BANK 2.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0366. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0366 CAMSHAFT POSITION SENSOR "B" CIRCUIT RANGE/PERFORMANCE BANK 1.

DTC P0400 EGR "A" FLOW

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Movement performance problem when engine is low speed
- Improper idling
- Movement performance problem

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Mani. Absolute Pressure].

Data Monitor

Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mani. Absolute Pressure] 53.3 kPa (400 mmHg, 15.75 inHg) or more?

Yes	Make sure that the EGR control valve, manifold absolute pressure sensor and throttle body are installed securely.
No	Go to 2.

2. CHECK EGR CONTROL VALVE.

Remove the EGR control valve.

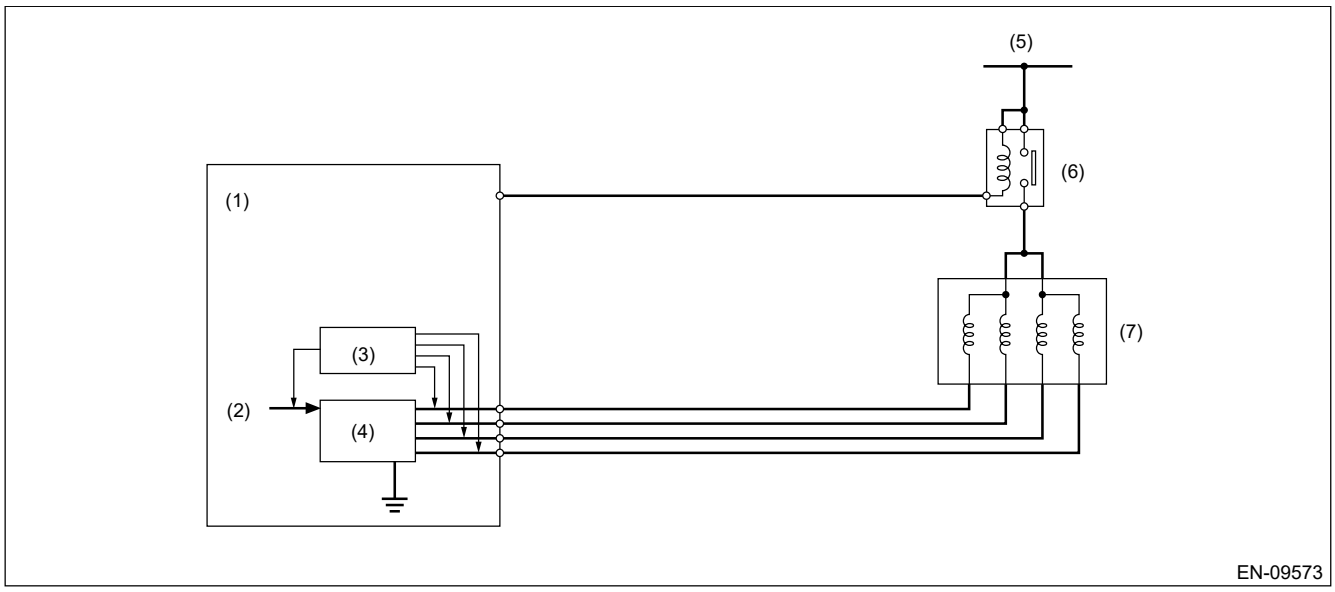
Are there any holes, clogged lines or foreign matters in the EGR system?

Yes	Repair the EGR system.
No	Replace EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Control Valve.

1. OUTLINE OF DIAGNOSIS

Detect EGR system malfunction.
Intake manifold pressure (negative pressure) is constant because the throttle valve is fully closed during deceleration fuel cut. At this time, when the EGR valve is opened/closed, the intake manifold pressure will change. EGR System OK/NG is judged by the range of this change.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Computer unit (CPU)
(3) Detecting circuit
(4) Switch circuit
(5) Battery voltage
(6) Main relay
(7) EGR control valve

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg, 22.2inHg) or more
Intake air temperature	0°C (32°F) or more

Secondary parameters	Execution condition
Engine speed	
(CVT model)	1200 rpm or more and 2500 rpm or less
(MT model)	1400 rpm or more and 5000 rpm or less
Vehicle speed	40km/h (24.9MPH) or more
Fuel cut elapsed time	3000ms or more
Neutral switch	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once during deceleration fuel cut from a vehicle speed of 40km/h (24.9MPH) or more.
Be careful of vehicle speed and engine speed. (Diagnosis will not be completed if the vehicle speed and engine speed conditions become out of specification due to deceleration.)

5. DIAGNOSTIC METHOD

Measure the pressure values when the enable conditions are established, and perform diagnosis by calculating those results.

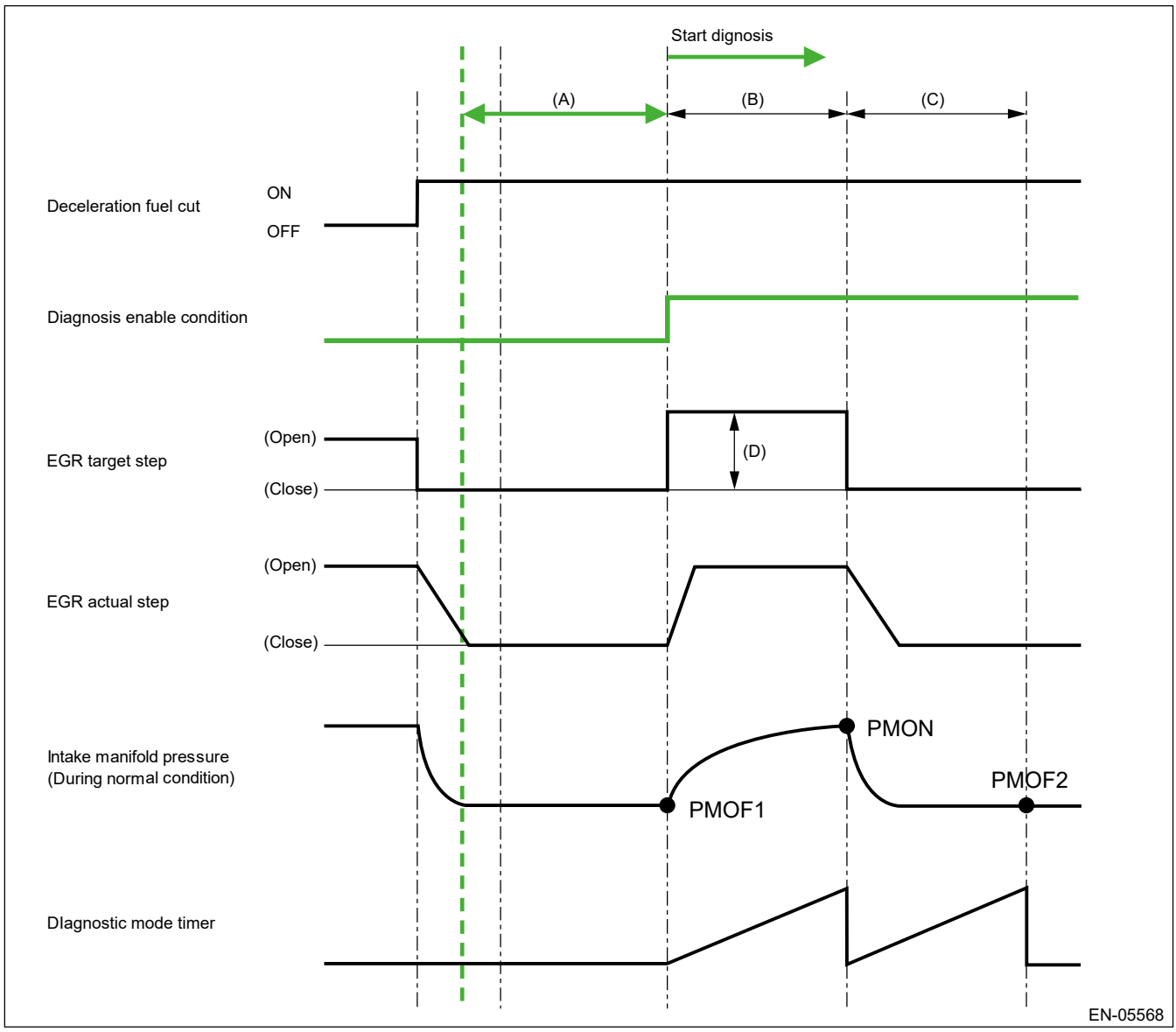
1. Label the intake manifold pressure value as PMOF1, which is observed when enable conditions are established, and set the EGR target step to 15 steps (for CVT model) or 33 steps (for MT model) (open status).
2. Label the intake manifold pressure value as PMON, which is observed after 1000ms have passed since EGR target step was set to 15 steps (for CVT model) or 33 steps (for MT model) (when the enable conditions were established), and set the EGR target step to 0.
3. Label the intake manifold pressure as PMOF2, which is observed after 1000ms has passed since EGR target step was set to 0 (after (1000ms + 1000ms) have passed since the enable conditions were established).

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
PMON − (PMOF1 + PMOF2)/2	Less than 2.5kPa (18.63mm Hg, 0.7inHg)

Time needed for diagnosis: 1000ms × 2
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.



(A) 3000ms (B) 1000ms (C) 1000ms

(D) CVT model: 15 steps
MT model: 33 steps

DTC P0420 CATALYST SYSTEM EFFICIENCY BELOW THRESHOLD BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Idle mixture is out of specifications.

Caution:

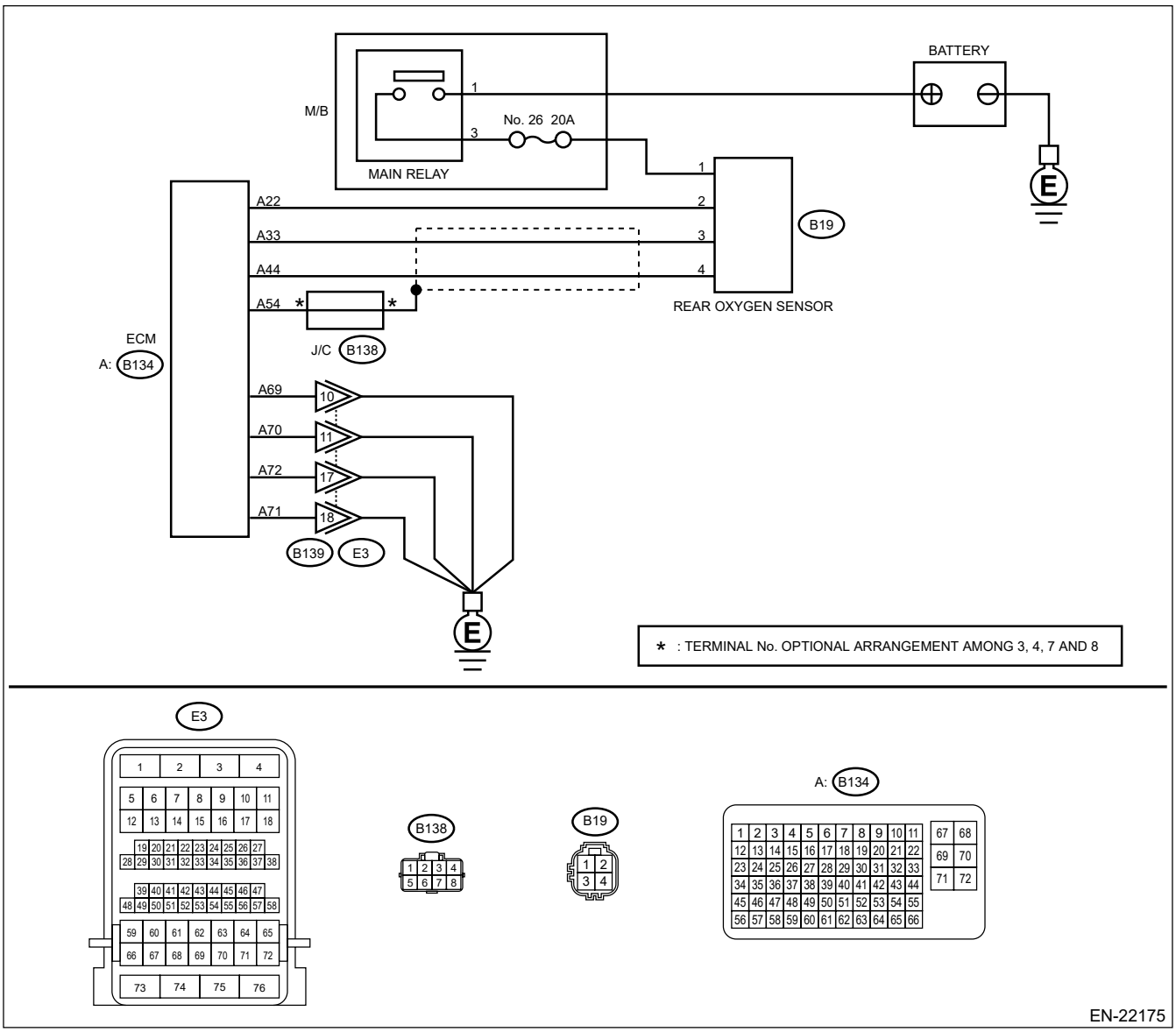
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC AND FREEZE FRAME DATA.

1. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
2. Read the freeze frame data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Scan Tool.
3. Save the displayed DTC and freeze frame data.

Is DTC other than P0420 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Go to 2.

2. CHECK ENGINE OIL CONSUMPTION.

Check the engine oil amount. Ref. to LUBRICATION(H4DO)>Engine Oil.

Is white smoke emitted from the muffler?

Yes	Check the engine, and repair the defective part. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION. After repairing the engine, replace all catalytic converters. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Front Catalytic Converter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Rear Catalytic Converter.
No	Go to 3.

3. CHECK EXHAUST SYSTEM.

Check the following items regarding exhaust system.

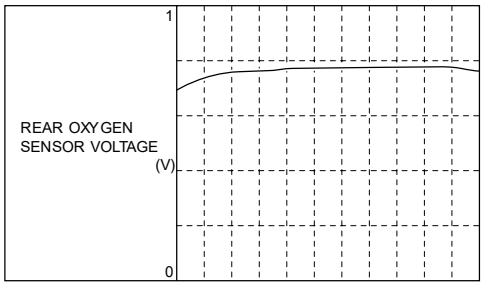
- Loose or detached nut and bolt
- Exhaust gas leakage
- Air suction
- Hole on exhaust pipe

Is there any trouble?

Yes	Repair or replace the exhaust system. Ref. to EXHAUST(H4DO)>General Description.
No	Go to 4.

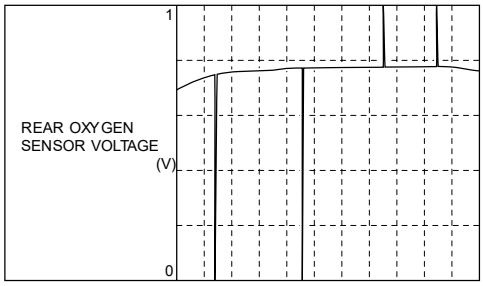
4. CHECK CATALYTIC CONVERTER.

1. Start the engine and warm up completely.
2. Read the waveform data of rear oxygen sensor during idling using Subaru Select Monitor.
3. Check the waveform by waggling the connector between ECM and rear oxygen sensor.
   - At normal condition



EN-06668

   - At abnormal condition (noise input)



EN-06670

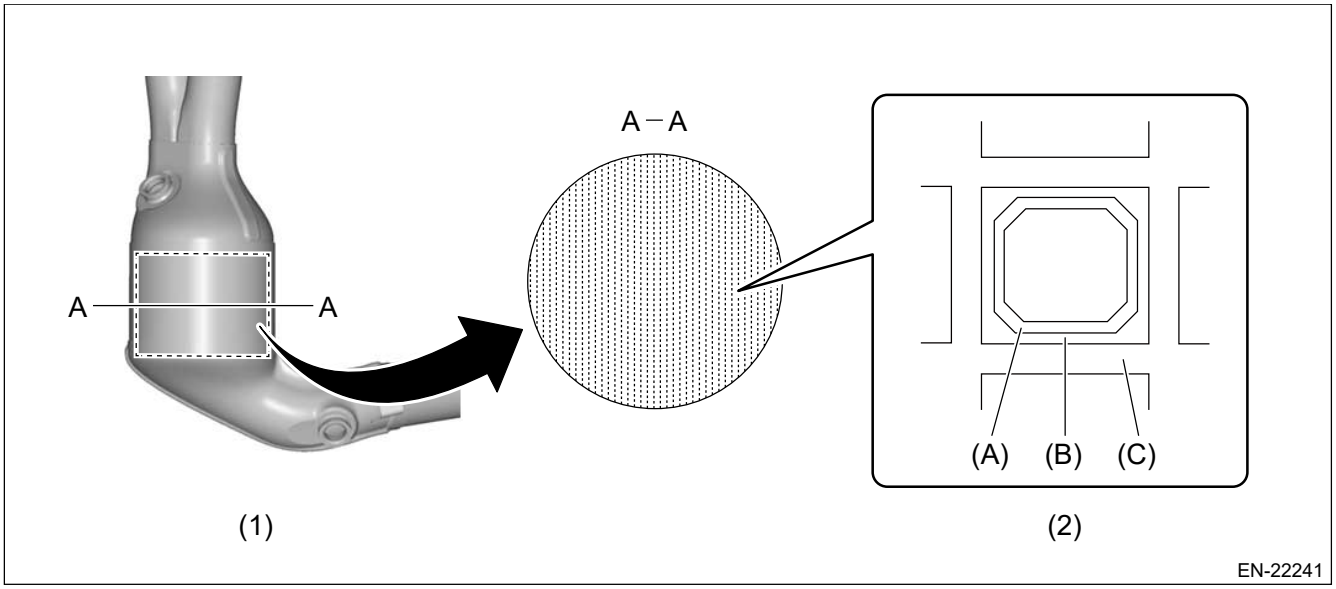
Is an abnormal waveform displayed?

Yes	Connect the connector after checking the following items, and check the waveform again while waggling. • Check the contact point of the connector that caused disturbed waveform. If faulty, repair or replace it. • If any problem is not found, It is possible that a temporary poor contact occurs in the connector.
No	Replace all the catalytic converter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Front Catalytic Converter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Rear Catalytic Converter.

1. OUTLINE OF DIAGNOSIS

To confirm the performance of Three-way Catalytic Converter (TWC), measure Oxygen Storage Capacity (OSC) using A/F sensor and rear oxygen sensor.

2. COMPONENT DESCRIPTION



(1) External view of catalytic converter
(2) Enlarged view of catalyst honeycomb cell
(A) Catalyst layer 1
(B) Catalyst layer 2
(C) Carrier

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg, 22.2inHg) or more
Amount of intake air	Less than 8g/s (0.28oz/s)
Accelerator pedal position	While idling
Rear oxygen output voltage after fuel cut	Less than 0.15V
Estimated catalyst temperature	500°C (932°F) or more
(Integrated intake air amount during fuel cut	18g (0.63oz) or more
Fuel shut-off function thereafter)	Not in operation
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more

4. GENERAL DRIVING CYCLE

When the TWC, the A/F sensor, and the rear oxygen sensor are fully warmed up, perform diagnosis if the following operations are experienced once respectively: a 10-second idling after the deceleration fuel cut for the predetermined time or longer, and a 10-second driving with the accelerator ON after the deceleration fuel cut for the predetermined time or longer.

5. DIAGNOSTIC METHOD

When TWC performance degrade, OSC performance also degrades. A malfunction is detected by diagnosis that estimates OSC performance based on the time and air volume required from the deceleration fuel cut

for the predetermined time or longer until the start of increase in the rear oxygen sensor voltage.

Judgment value

Malfunction Criteria	Threshold Value
Oxygen Storage Capacity (OSC) of Catalytic	Less than 0.15g

Time needed for diagnosis: Less than 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0441 EVAP SYSTEM (CPC) INCORRECT PURGE FLOW

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Improper idling
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0441 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK PURGE CONTROL SOLENOID VALVE.

Operate the purge control solenoid valve using the Subaru Select Monitor.
Note:
For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

Does the purge control solenoid valve operate?

Yes	Go to 3.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Check the evaporative emission control system line.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

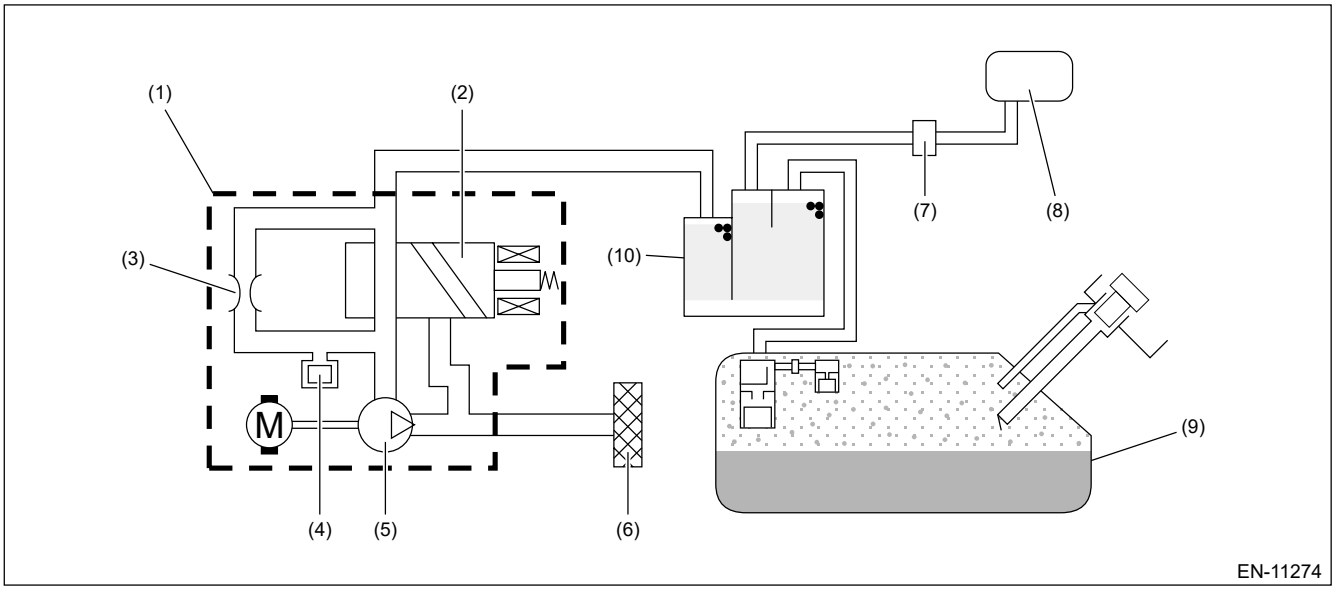
Yes	Repair or replace the hoses or pipes.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

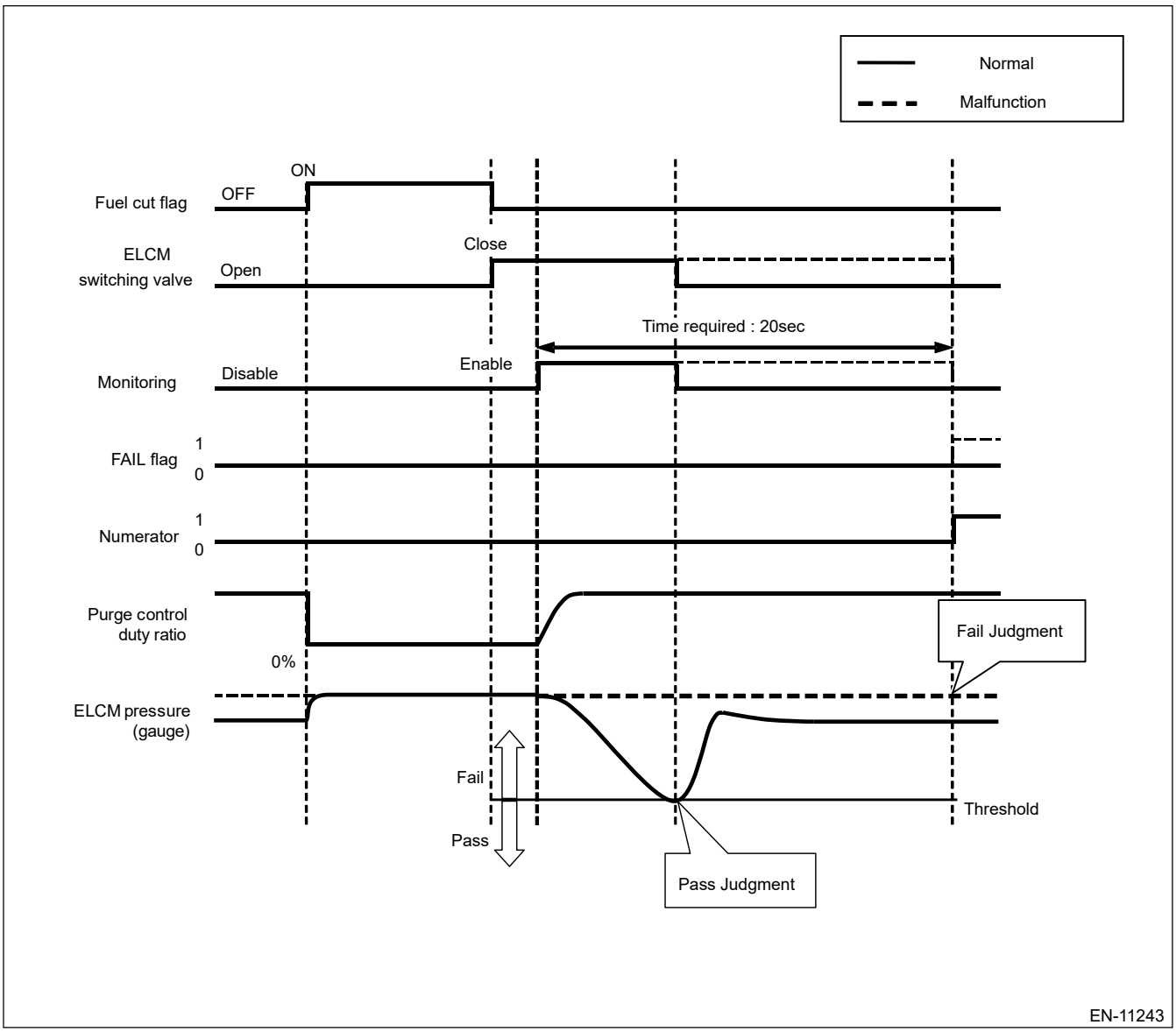
This monitor intrusively performs a functional check to detect incorrect purge flow.The monitor seals the EVAP system (i.e. isolate from atmosphere) by closing the Evaporative Leak Check Module switching valve intrusively after recovering from a fuel cut event. In the case of normal condition, and the commanded purge control duty ratio is more than 0%, Evaporative Leak Check Module pressure (gauge) will decrease due to engine vacuum and reach to the threshold value. However, in the case of malfunction condition (e.g. fuel cap open, purge valve stuck closed, purge line disconnected or blocked), if the Evaporative Leak Check Module pressure (gauge) does not reach the threshold within a predetermined time, the monitor determines a malfunction and stores a fault code.

MALFUNCTION CRITERIA

Evaporative Leak Check Module pressure (gauge) > Threshold



(1) Leak check valve ASSY
(2) Switching valve (closed)
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister



2. EXECUTION CONDITION

Secondary parameters	Execution condition
Time when Evaporative Leak Check Module switching valve is closed	Less than 120000ms
Purge control duty ratio	More than 0%
Preconditions (Condition: Close the intrusive Evaporative Leak Check Module switching valve)	
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa(563mmHg,22.2inHg) or more

Secondary parameters	Execution condition
Cumulative value of purge air amount calculated from engine start	Value of Map or more*
Atmospheric pressure − Intake manifold absolute pressure	6.7kPa(50mmHg, 2inHg) or more
(Elapsed time after fuel cut	1000ms or more
Fuel shut-off function thereafter)	Not in operation
Ambient temperature	−25°C(−13°F) or more

*It takes approximately 2 min at 40 MPH

Map

Ambient temperature °C (°F)	0 (32)	10 (50)	20 (68)	30 (86)	40 (104)	50 (122)
Cumulative value of purge air amount calculated from engine start g (oz)	50 (1.76)	50 (1.76)	50 (1.76)	50 (1.76)	50 (1.76)	50 (1.76)

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once during ordinary driving.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Evaporative Leak Check Module pressure	More than 666.6Pa× −1 (5mmHg×−1,0.2inHg ×−1)

Time needed for diagnosis: 11000ms− 1000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0451 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0451 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor or a general scan tool, read the values of [Evap System Vapor Pressure] and [Intake Manifold Absolute Pressure] to compare with actual atmospheric pressure.

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.
- **To read the actual atmospheric pressure, connect the Subaru Select Monitor or general scan tool to the other known good vehicle.**

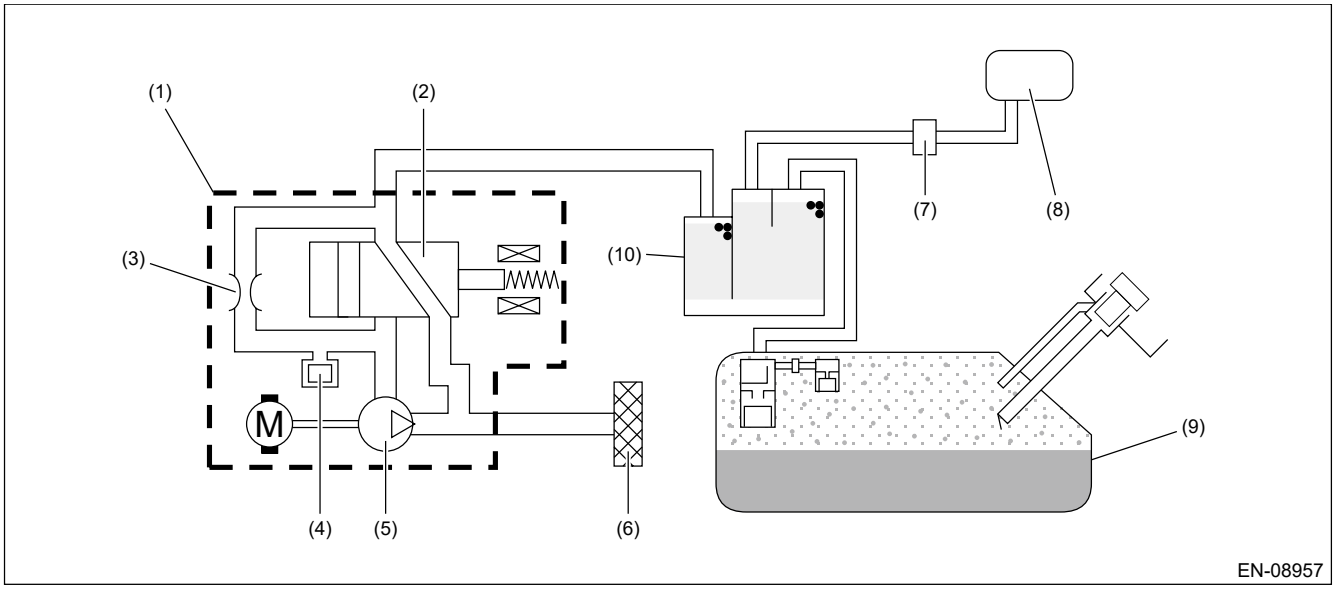
Is the difference with the actual atmospheric pressure 2.53 kPa (18.98 mmHg, 0.75 inHg) or more?

Yes	Replace the part that showed larger deviation from the actual atmospheric pressure than the other. • If deviations in value for [Absolute Evap Sys. Pressure] is larger: Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly. • If deviations in value for [Mani. Absolute Pressure] is larger: Replace the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

1. OUTLINE OF DIAGNOSIS

Detect the output characteristics malfunction of Evaporative Leak Check Module pressure sensor.
Judge as NG when the Evaporative Leak Check Module pressure sensor output value is largely different from the intake manifold pressure when the ignition switch is ON.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Elapsed time after ignition switch to OFF	500ms or more and Less than 60000ms
Soaking time	60s or more
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open
Purge control	Not in operation

4. GENERAL DRIVING CYCLE

Perform the diagnosis once at ignition ON.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
|Evaporative Leak Check Module	More than

Malfunction Criteria	Threshold Value
pressure sensor output value – intake manifold pressure (absolute pressure) when ignition switch is ON|	5.1kPa (37.9mmHg, 1.5inHg)

Time needed for diagnosis: 320ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0452 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Caution:

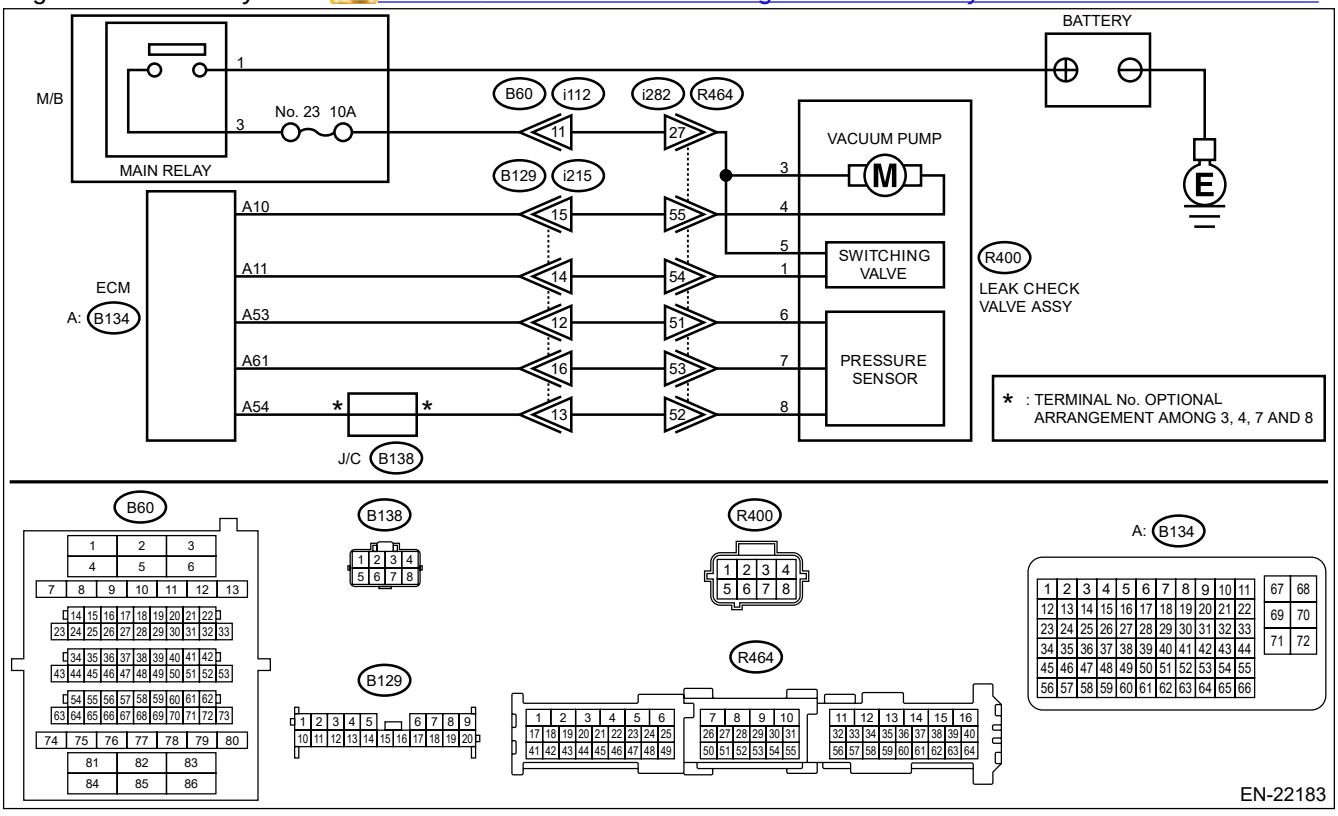
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Barometric Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value in [Barometric Pressure] 34 kPa (255 mmHg, 10 inHg) or less?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.
   Connector & terminal
   (R400) No. 6 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of ECM connector** • **Poor contact of coupling connector**

3. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 61 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

4. CHECK FOR POOR CONTACT.

Check for poor contact of leak check valve assembly connector.

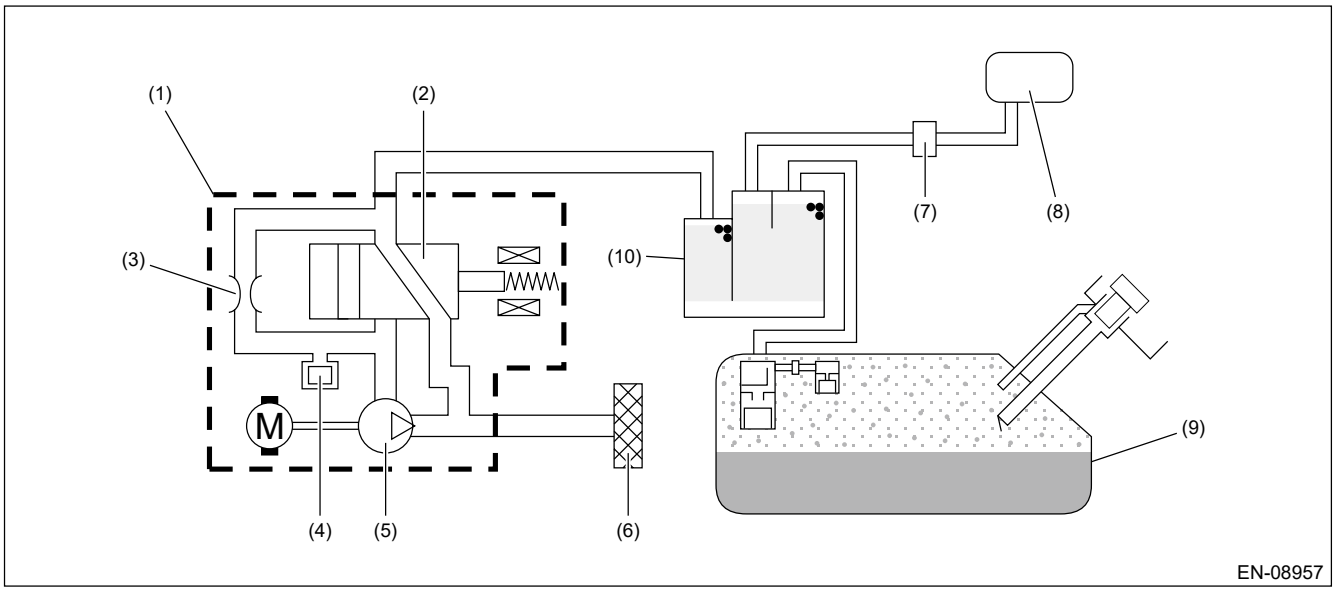
Is there poor contact in the leak check valve assembly connector?

Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch or ECM	ON Powered-on by

Secondary parameters	Execution condition
	Soak timer IC
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.967V

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0453 EVAP SYSTEM (CPC) PRESSURE SENSOR/SWITCH CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Caution:

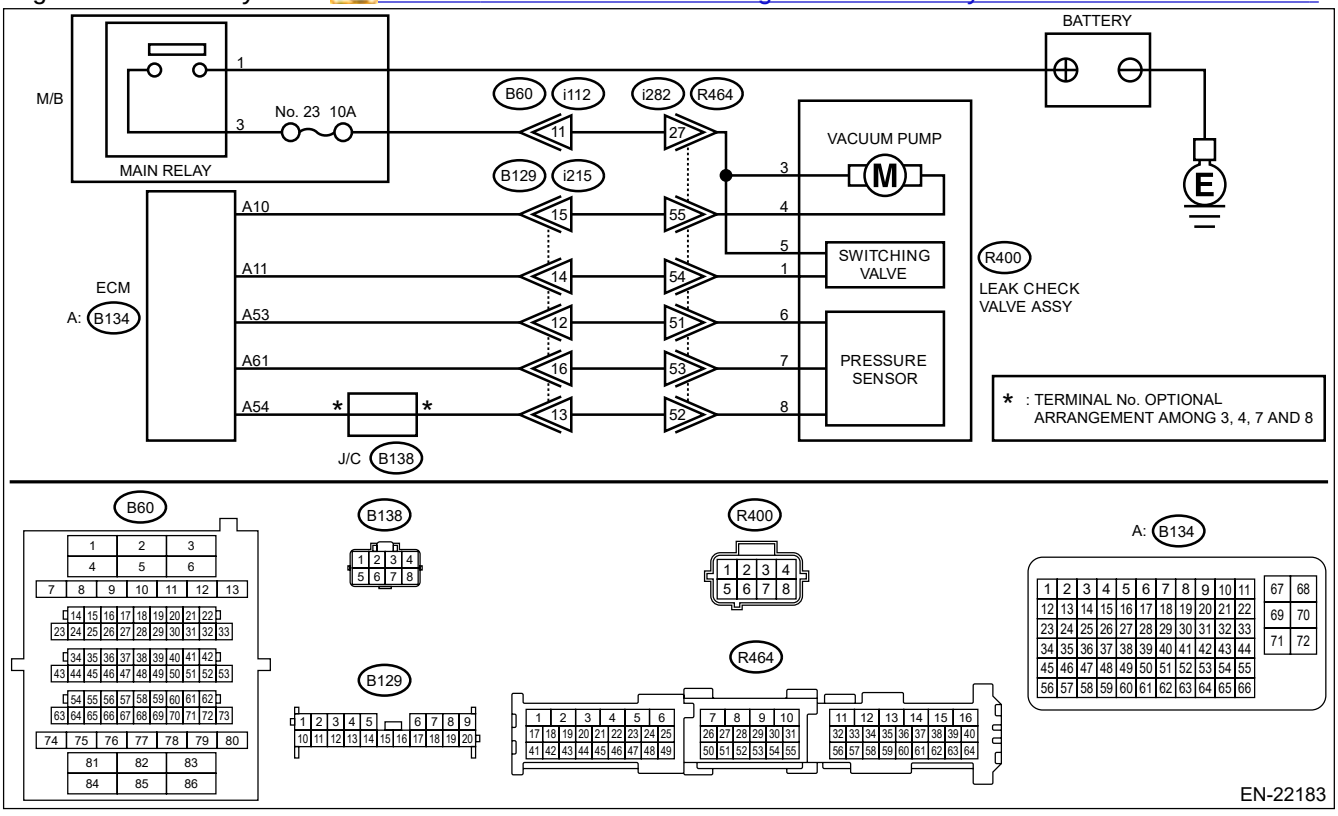
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Barometric Pressure].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Barometric Pressure] 125 kPa (938 mmHg, 36.9 inHg) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

   Connector & terminal

   (B134) No. 61 — (R400) No. 7:

   (B134) No. 54 — (R400) No. 8:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of coupling connector** • **Poor contact of joint connector**

3. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and the leak check valve assembly connector.

Is there poor contact in ECM and the leak check valve assembly connector?

Yes	Repair the poor contact of ECM and the leak check valve assembly connector.
No	Go to 4.

4. CHECK LEAK CHECK VALVE ASSEMBLY.

Check the pressure sensor of the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly>INSPECTION > CHECK PRESSURE SENSOR.

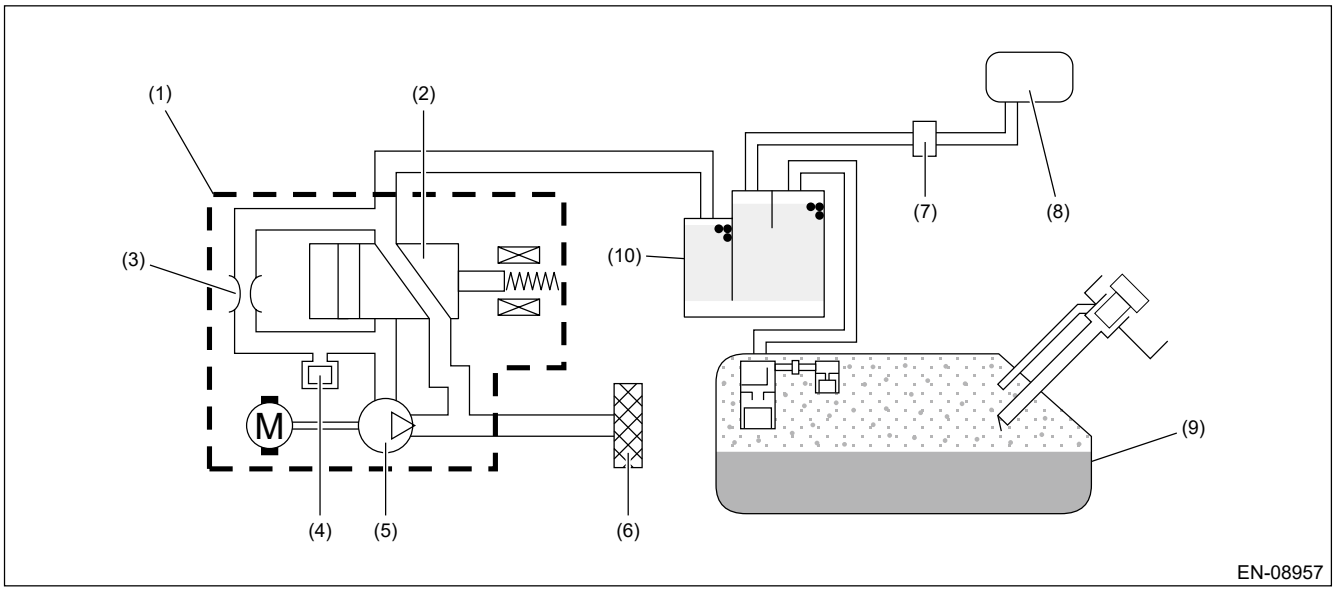
Is the check result OK?

Yes	Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module pressure sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Ignition switch or ECM	ON Powered-on by Soak timer IC
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.128V or more

Time needed for diagnosis: 1000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Fuel odor
- There is a hole of more than 1.0 mm (0.04 in) dia. in evaporation system or fuel tank.
- Fuel filler cap loose or lost

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK FUEL FILLER CAP.

1. Turn the ignition switch to OFF.
2. Check the installation condition of fuel filler cap.

   Note:

   The DTC is stored in memory if fuel filler cap is or was loose or if the cap chain has caught while tightening.

Is the fuel filler cap tightened securely?

Yes	Go to 2.
No	Tighten fuel filler cap securely.

2. CHECK FUEL FILLER CAP.

Check the fuel filler cap.

Is the fuel filler cap genuine?

Yes	Go to 3.
No	Replace with a genuine fuel filler cap.

3. CHECK FUEL FILLER CAP.

Check the gasket of fuel filler cap.

Does the gasket of fuel filler cap has any damage?

Yes	Replace the fuel filler cap. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filler Pipe.
No	Go to 4.

4. CHECK PURGE CONTROL SOLENOID VALVE.

Check air-tightness of the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 5.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

5. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM LINE.

Check the evaporative emission control system line.

Are there holes on the evaporation line?

Yes	Repair or replace the evaporation line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines.
No	Go to 6.

6. CHECK CANISTER.

Check the canister.

Are there holes on the canister?

Yes	Replace the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.
No	Go to 7.

7. CHECK LEAK CHECK VALVE ASSEMBLY.

Check the leak check valve assembly.

Are there damage or holes on the leak check valve assembly?

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.
No	Go to 8.

8. CHECK FUEL TANK.

Remove the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank.

Are there damage or holes on the fuel tank?

Yes	Repair or replace the fuel tank. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank.
No	Go to 9.

9. CHECK ANY OTHER MECHANICAL TROUBLE IN EVAPORATIVE EMISSION CONTROL SYSTEM.

Check the evaporative emission control system.

Are there holes, cracks, clogging, or disconnection, misconnection of hoses or pipes in evaporative emission control system?

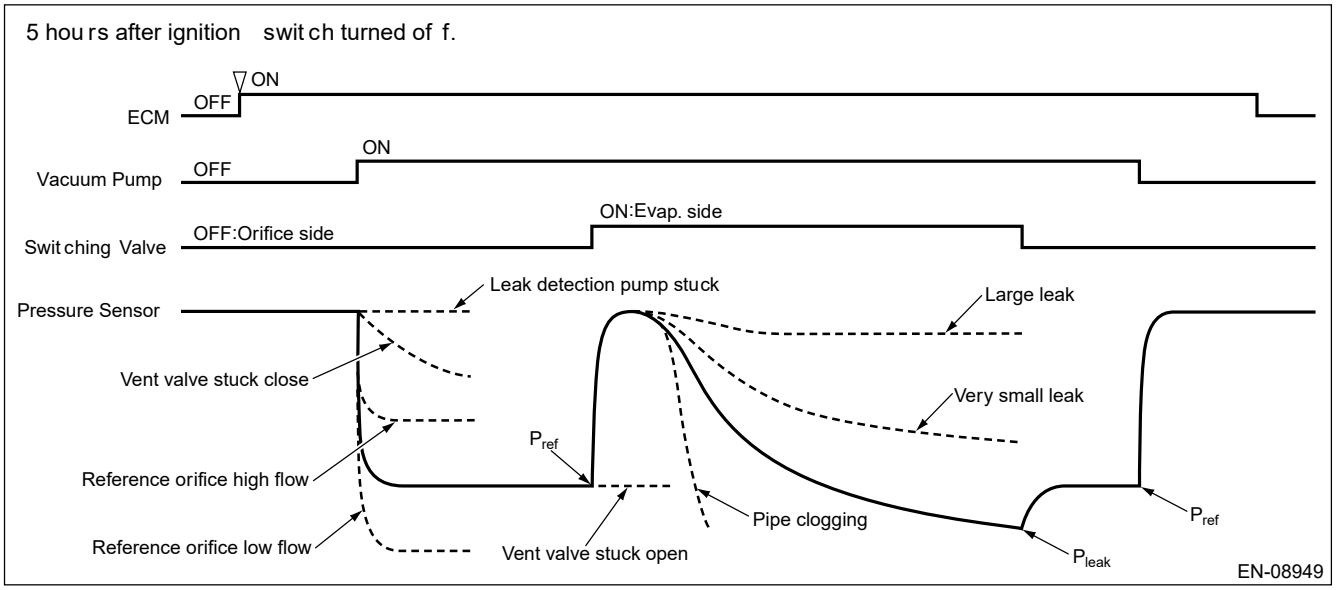
Yes	Repair or replace the hoses or pipes.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

This diagnosis judges whether the Evaporative Leak Check Module operation is normal or not, and whether the evaporative emission system has leak and clogging or not.
To purge the canister, after driving, perform the five hours soaking after ignition switch OFF in order to stabilize the evaporative gas status.* After 5 or 7 or 9.5 hours passed, ECM is activated by soaking timer, and the leak check is started.
Judges whether the Evaporative Leak Check Module operation is normal or not, by measuring the reference pressure status via reference orifice (0.02 inch orifice). Judge as malfunction if the reference pressure is out of specified range. Then, judge whether there is a leak or not, by comparing the pressure (leak pressure) when the reference pressure and the evaporative emission system are in negative pressure condition. Judge as system leak in the evaporative emission system if the leak pressure is higher than reference pressure. Judge as clogging of pipe if the leak pressure becomes lower than the reference pressure within the specified amount of time.
0.02 inch leak and 0.04 inch leak can be distinguished by measuring the leak pressure.
The diagnosis results are stored inside ECM until the engine is started again.
*: When the test conditions are not met in 5 hours, perform diagnosis at elapsed time of 7 hours. When the test conditions are not met in 7 hours, perform diagnosis at elapsed time of 9.5 hours.

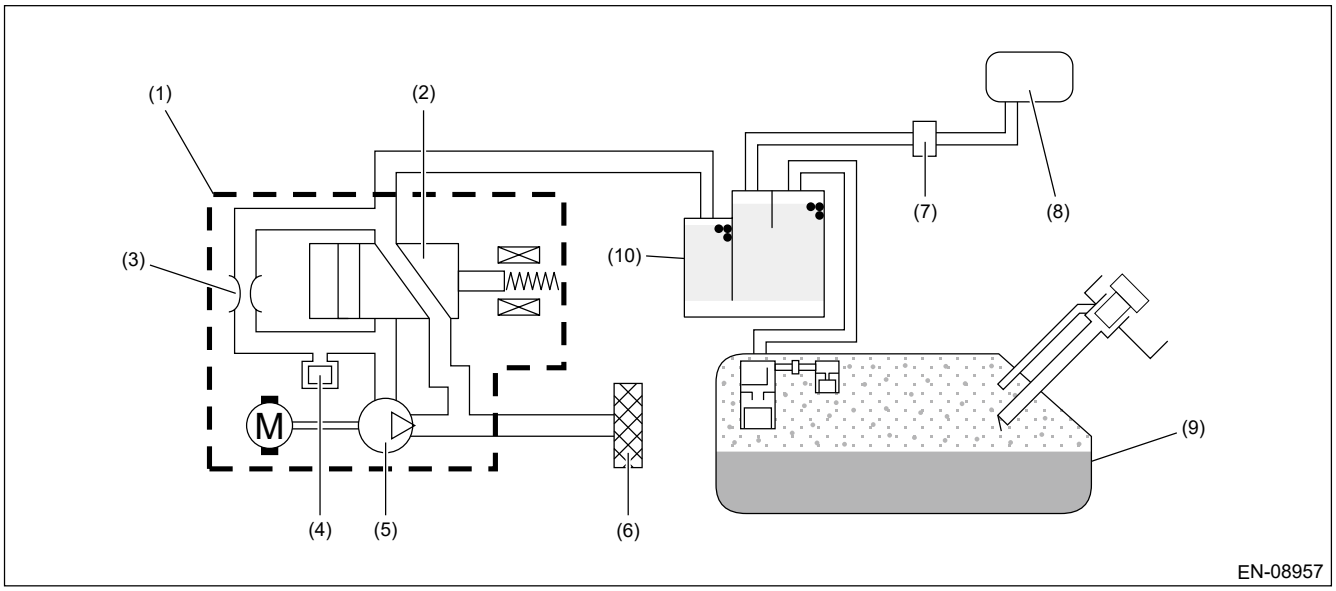
Diagnostic item	
Evaporative Leak Check Module system (leak check valve assembly main body)	Vacuum pump stuck Switching valve stuck to open Switching valve stuck to close Reference orifice flow large Reference orifice flow small
Leak check	Large leak • 0.04 inch leak • Fuel cap loose • Fuel cap off • System malfunction
	Very small leak • 0.02 inch leak
Clogging of pipe	—

OUTLINE OF DIAGNOSIS



2. COMPONENT DESCRIPTION

Evaporative Leak Check Module consists of the pressure sensor, the reference orifice (diameter of 0.02 inch), the vacuum pump which introduces the negative pressure into evaporative emission system, and the switching valve which switches the passage to introduce the negative pressure.



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Battery voltage	10.9V or more
Barometric pressure	75.1kPa(563mmHg, 22.2inHg) or more
Activation of soaking timer	Completed
Intake air temperature	4.4°C(39.9°F) or more
Engine oil temperature	4.4°C(39.9°F) or more
Engine coolant temperature	4.4°C(39.9°F) or more and Less than 45°C(113°F)
Accumulated purge amount during previous driving cycle	Value of Map 1 or more

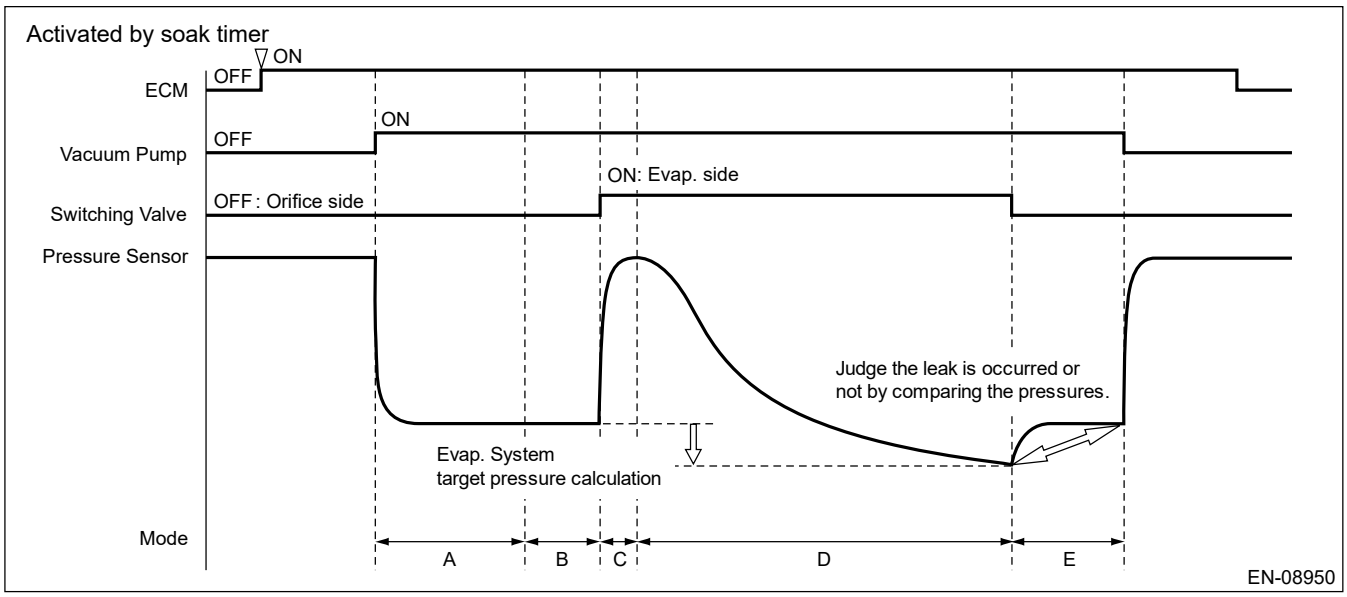
Map 1

Engine coolant temperature °C (°F)	0 (32)	30 (86)	35 (95)	40 (104)	45 (113)
Accumulated purge amount during previous driving cycle g (oz)	45 (1.59)	45 (1.59)	110 (3.88)	165 (5.82)	215 (7.58)

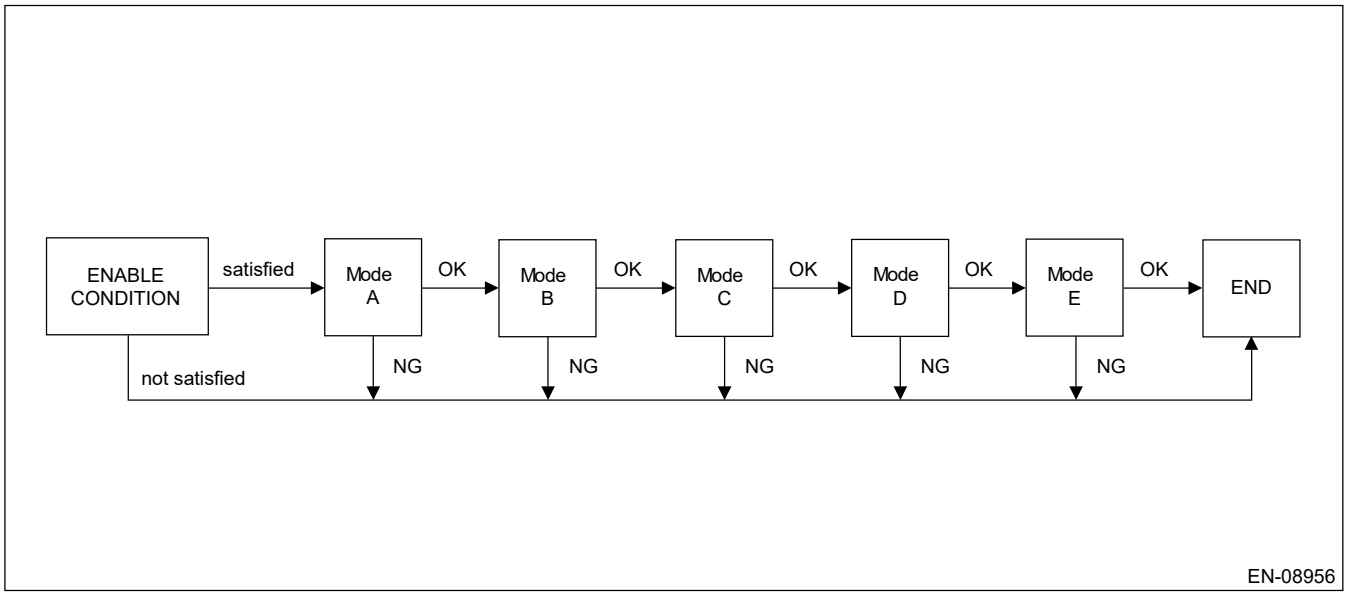
4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when 5 or 7 or 9.5 hours has passed after ignition switch is OFF. For more detail, refer to “OUTLINE OF DIAGNOSIS”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK) > OUTLINE OF DIAGNOSIS.

5. DIAGNOSTIC METHOD



Mode	Explanation of Mode	Diagnosis Period
A	Vacuum pump operation confirmation and characteristics stability	7 s or less & 300 s
B	Measurement of reference pressure for setting the target negative pressure	40 s or less
C	Switching valve operation confirmation	12 s or less
D	Clogging of pipe diagnosis and leak pressure measurement	900 s or less
E	Reference pressure measurement for judgment	40 s or less



MODE A (VACUUM PUMP OPERATION CONFIRMATION AND CHARACTERISTICS STABILITY)

Purpose: Detect the vacuum pump operation trouble.

Judge as NG when the following conditions are established.

Judge as OK if the following conditions are not established, and warm up for five minutes to stabilize the vacuum pump characteristics.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value	More than −224Pa(−1.68mmHg, −0.1inHg)	P2404

MODE B (MEASUREMENT OF REFERENCE PRESSURE FOR SETTING THE TARGET NEGATIVE PRESSURE)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump and orifice malfunctions.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 |Pressure sensor maximum output value − Pressure sensor minimum output value| or Judgment 2	More than 314Pa(2.355mmHg, 0.1inHg)	P2404
Reference pressure for setting the target negative pressure	Less than value of Map 2 or More than value of Map 3	P2404

Map 2

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for setting the target negative pressure kPa (mmHg, inHg)	−4 (−29.79, −1.2)	−4.1 (−30.593,−1.2)	−4.2 (−31.395,−1.2)	−4.3 (−32.19, −1.3)

Map 3

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment kPa (mmHg, inHg)	−0.9 (−7.065, −0.3)	−1 (−7.86, −0.3)	−1.2 (−8.663, −0.3)	−1.3 (−9.465, −0.4)

MODE C (SWITCHING VALVE OPERATION CONFIRMATION)

Purpose: Measure the pressure increase when switching valve is changed from open to close, and detect the stuck to open/close malfunctions of the switching valve.

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Pressure sensor output value − Reference pressure for setting the target negative pressure	Less than 224Pa(1.68mmHg, 0.1inHg)	P2404

MODE D (CLOGGING OF PIPE DIAGNOSIS AND LEAK PRESSURE MEASUREMENT)

1. Clogging of pipe

Purpose: Measure the time required for the evaporative emission system to reach the target negative pressure by the vacuum pump, and detect the clogging of pipe trouble.

Judge as clogging of pipe malfunction if the evaporative emission system reaches to the target negative pressure within the specified time.

2. Leak pressure measurement

Purpose: Measure the pressure (leak pressure) when the evaporative emission system becomes the negative pressure by the vacuum pump.

Store the pressure as a leak pressure while the following conditions are met.

Phase D

Judgment value

Malfunction Criteria	Threshold Value	DTC
Time required to reach to the target negative pressure	25216ms or less	P1451
<Large leak (0.04 inch)>		P0455
Leak pressure	Value of Map 6 or more	
<Very small leak (0.02 inch)>		P0456
Leak pressure	More than 0.018 inch reference pressure (Pa) and Less than value of Map 6	

Map 6

Reference pressure for judgment (Pa)	-4856	-4000	-2750	-1500	-824
Threshold Value (Pa)	-1785	-1463	-991	-520	-265

Formula for threshold value = Reference pressure ×0.377 −0.341

MODE E (MEASUREMENT OF REFERENCE PRESSURE FOR JUDGMENT)

Judgment 1

Purpose: Judge the reference pressure stability.

Judge as NG when the following conditions are established.

Judgment 2

Purpose: Judge whether the reference pressure is within the normal range, and detect the vacuum pump

and orifice malfunctions. Judge the vacuum pump performance stability.
Judge as NG when the following conditions are established.
Judgment 3
Purpose: Judge the presence of evaporative emission system leak.
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Judgment 1 |Pressure sensor maximum output value − Pressure sensor minimum output value| or Judgment 2 Reference pressure for judgment or Judgment 3 |Reference pressure for setting the target negative pressure − Reference pressure for judgment|	More than 314Pa (2.355mmHg, 0.1inHg) Less than value of Map 4 or More than value of Map 5 More than 0.9kPa (7.058mmHg, 0.3inHg)	P2404 P2404 P2404

Map 4

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment kPa (mmHg, inHg)	−4.5 (−34.02, −1.3)	−4.6 (−34.815, −1.4)	−4.7 (−35.618, −1.4)	−4.9 (−36.42, −1.4)

Map 5

Barometric pressure kPa (mmHg, inHg)	70 (525, 20.7)	80 (600, 23.6)	90 (675, 26.6)	100 (750, 29.5)
Reference pressure for judgment kPa (mmHg, inHg)	−0.9 (−6.18, −0.2)	−0.9 (−6.983, −0.3)	−1 (−7.785, −0.3)	−1.1 (−8.58, −0.3)

Time needed for diagnosis: 23 min
At next engine start, confirm whether the enable conditions are satisfied even though refueling has been done during soaking, and determine the malfunction.
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0456 EVAP SYSTEM (CPC) LEAK DETECTED (VERY SMALL LEAK)

Note:

For the diagnostic procedure, refer to DTC P0455. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0458 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT LOW

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

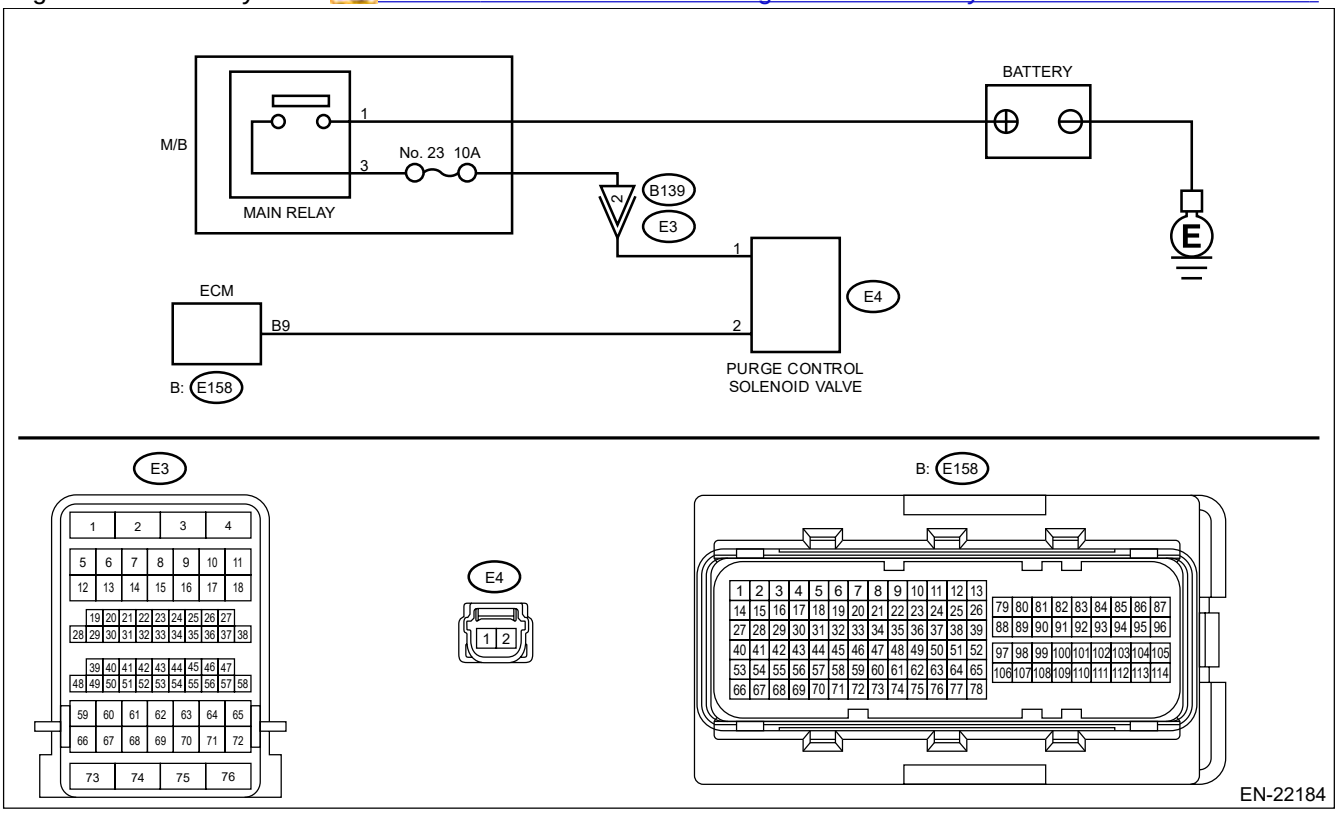
Improper idling

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK OUTPUT SIGNAL OF ECM (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 9 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.**

3. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE (OPEN).

Measure the voltage between purge control solenoid valve connector and engine ground.
Connector & terminal
(E4) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the purge control solenoid valve.
4. Measure the resistance between the purge control solenoid valve connector and engine ground.
   Connector & terminal
   (E4) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and purge control solenoid valve connector.

5. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE (OPEN).

Measure the resistance of harness between ECM connector and purge control solenoid valve.
Connector & terminal
(E158) No. 9 — (E4) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and purge control solenoid valve connector.

6. CHECK PURGE CONTROL SOLENOID VALVE.

1. Remove the purge control solenoid valve.
2. Measure the resistance between purge control solenoid valve terminals.
   Terminals
   No. 1 — No. 2:

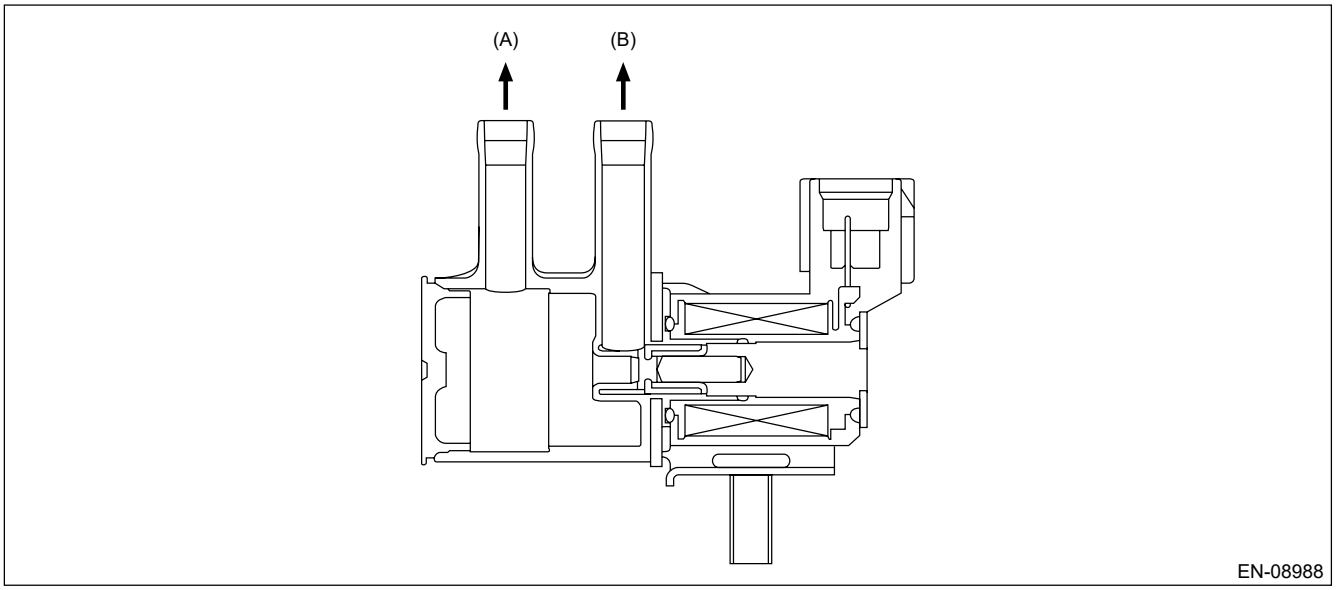
Is the resistance 10 — 100 Ω?

Yes	Repair the poor contact of purge control solenoid valve connector.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.
Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister (B) To intake manifold

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Purge control solenoid valve control duty	Less than 75%

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal output voltage	Battery voltage ×0.47 or less

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0459 EVAP SYSTEM (CPC) PURGE CONTROL VALVE "A" CIRCUIT HIGH

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

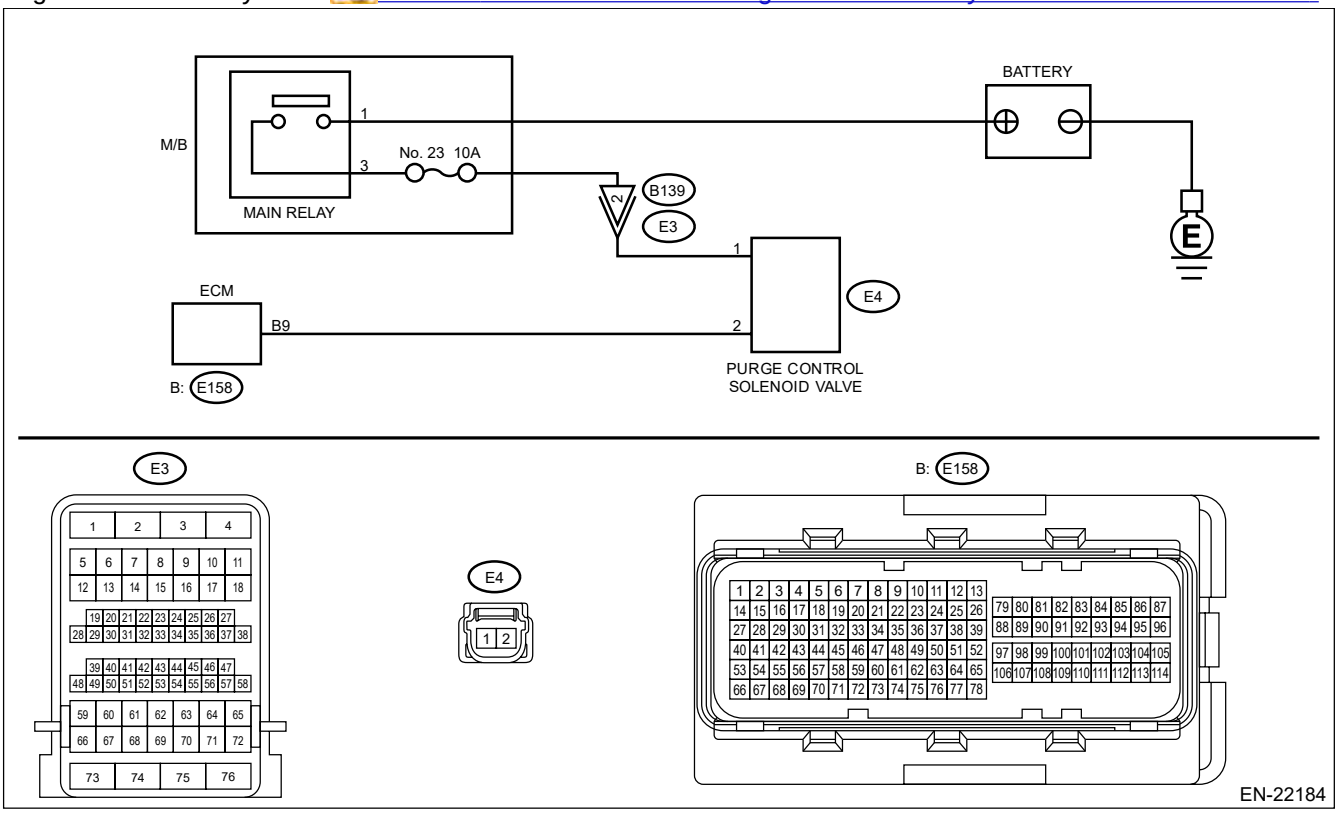
Improper idling

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the purge control solenoid valve.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 9 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and purge control solenoid valve connector.
No	Go to 2.

2. CHECK PURGE CONTROL SOLENOID VALVE.

1. Turn the ignition switch to OFF.
2. Measure the resistance between purge control solenoid valve terminals.
   Terminals
   No. 1 — No. 2:

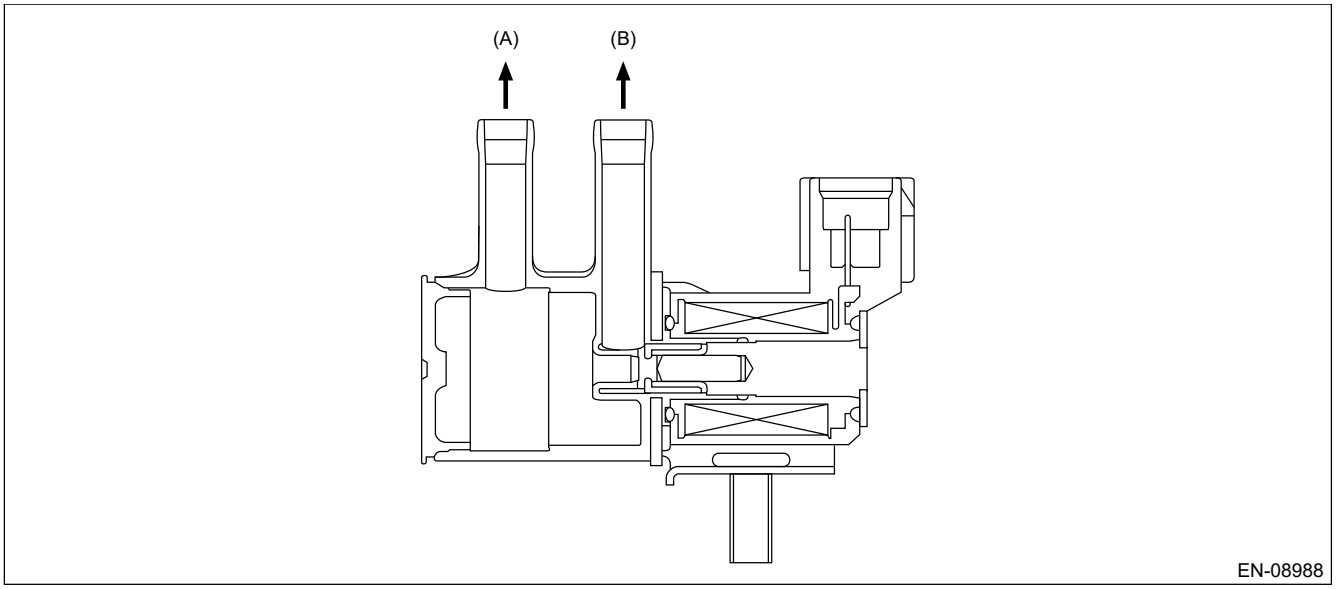
Is the resistance less than 1 Ω?

Yes	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of the purge control solenoid valve.
Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(A) To canister (B) To intake manifold

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Purge control solenoid valve control duty	25% or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Terminal output current	Battery voltage ×0.13 or more

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC OF VDC.

Read the DTC of VDC using the Subaru Select Monitor or a general scan tool.

Is DTC for VDC displayed? (Current malfunction)

Yes	Perform the diagnosis of corresponding DTC using “Diagnostic Trouble Code (DTC)”. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when outside of the judgment value.
Judge NG when the received data from VDCCM&H/U is abnormal vehicle speed, and the vehicle speed data is impossible.

2. COMPONENT DESCRIPTION

Vehicle speed signals are taken in to the VDC control module and hydraulic control unit, and normal/erroneous data of the ABS wheel speed sensor is received by CAN communication from the VDC control module and hydraulic control unit.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Speed of the front wheels received from VDC control module & hydraulic control unit	300km/h (186.4MPH) or more

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0506 IDLE CONTROL SYSTEM RPM - LOWER THAN EXPECTED

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Hard to start the engine.
- Engine does not start.
- Improper idling
- Engine stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0506 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK AIR CLEANER ELEMENT.

1. Turn the ignition switch to OFF.
2. Check the air cleaner element.

Is there excessive clogging on air cleaner element?

Yes	Replace the air cleaner element. Ref. to INTAKE (INDUCTION)(H4DO)>Air Cleaner Element.
No	Go to 3.

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Remove the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body>REMOVAL.
2. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes	Remove foreign matter from electronic throttle control.
No	Perform the diagnosis of DTC P2101. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling. Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg, 22.2inHg) or more
Lambda value (left and right)	0.85 or more and Less than 1.151
Vehicle speed	0 km/h (0 MPH)
Elapsed time after starting the engine	10s or more
Accelerator pedal position	0%
Elapsed time after gear position change (P ←→ D or N ←→ D)	More than 5s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed − Targeted engine speed	Less than −100rpm

Time needed for diagnosis: 15s ×1time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0507 IDLE CONTROL SYSTEM RPM - HIGHER THAN EXPECTED

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
Engine keeps running at higher speed than specified idle speed.
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0507 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK AIR INTAKE SYSTEM.

1. Start and idle the engine.
2. Check the following items.
   - Loose installation of intake manifold and throttle body
   - Cracks of intake manifold gasket and throttle body gasket
   - Disconnection of vacuum hoses

Is there any fault in air intake system?

Yes	Repair air suction and leaks.
No	Go to 3.

3. CHECK ELECTRONIC THROTTLE CONTROL.

1. Turn the ignition switch to OFF.
2. Remove the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body>REMOVAL.
3. Check the electronic throttle control.

Are foreign matter found inside electronic throttle control?

Yes	Remove foreign matter from electronic throttle control.
No	Perform the diagnosis of DTC P2101. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction that actual engine speed is not close to target engine speed during idling. Judge as NG when actual engine speed is not close to target engine speed during idling.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg, 22.2inHg) or more
Lambda value (left and right)	0.85 or more and Less than 1.151
Vehicle speed	0 km/h (0 MPH)
Elapsed time after starting the engine	10s or more
Accelerator pedal position	0%
Elapsed time after gear position change (P ←→ D or N ←→ D)	More than 5s
Cold start diagnosis	Not in operation
Main feedback	In operation
Idle speed control feedback	In operation

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously at idling after warming up engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual engine speed – Targeted engine speed	More than 200rpm

Time needed for diagnosis: 15s×1time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine keeps running at higher speed than specified idle speed.
- Engine keeps running at a lower speed than the specified idle speed.
- Engine stall

Caution:

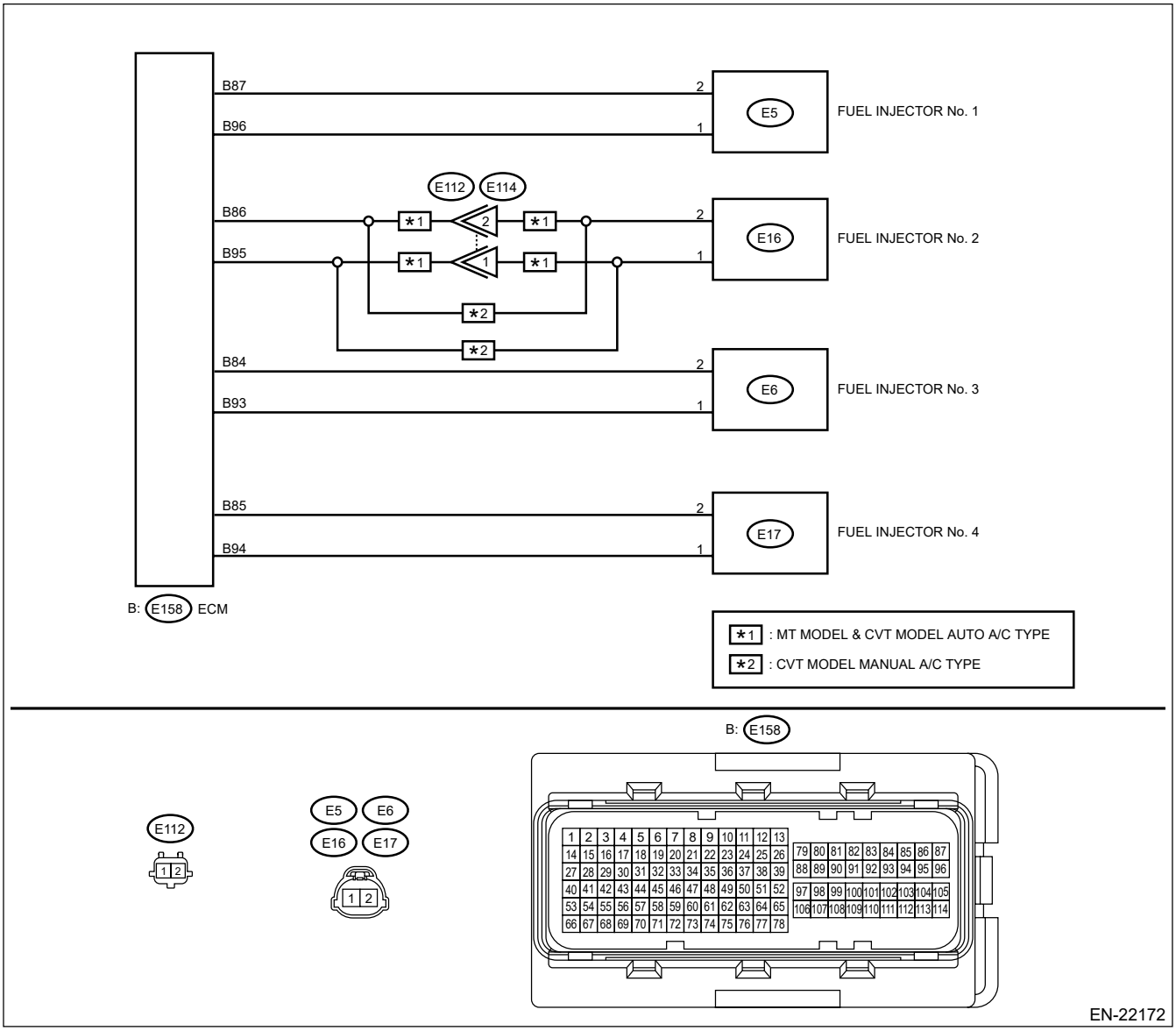
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

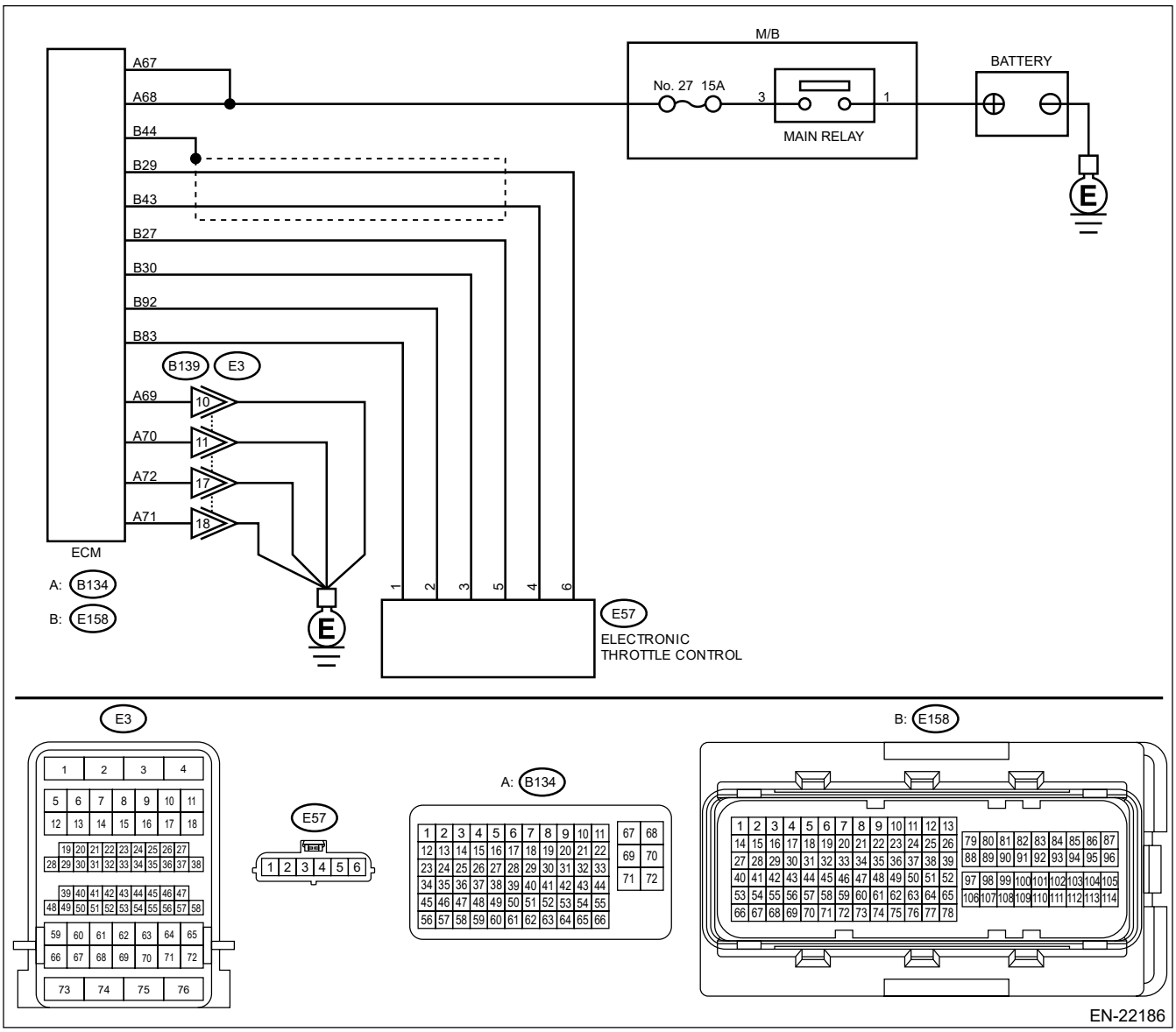
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


B87
B96
B86
B95
B84
B93
B85
B94
2
1
E5
FUEL INJECTOR No. 1
E16
FUEL INJECTOR No. 2
E6
FUEL INJECTOR No. 3
E17
FUEL INJECTOR No. 4
E112
E114
*1
*2
B: E158 ECM
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE
B: E158
E112
E5
E6
E16
E17
EN-22172



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P050A displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK ENGINE OIL.

Check the engine oil amount.

Is there a proper amount of engine oil?

Yes	Go to 3.
No	Replace engine oil. Ref. to LUBRICATION(H4DO)>Engine Oil>REPLACEMENT.

3. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Are there holes or loose bolts on exhaust system?

Yes	Repair the exhaust system.
No	Go to 4.

4. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 5.

5. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 6.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

6. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

Data Monitor

Note:
- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes	Go to 7.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

7. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Air Flow Rate from Mass Air Flow Sensor].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Air Flow Rate from Mass Air Flow Sensor]2.0—5.0 g/s (0.26—0.66 lb/m)?

Yes	Go to 8.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

8. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value −10 — 50°C (−18 — 90°F)?

Yes	Go to 9.
No	Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

9. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector on faulty cylinders.
4. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E5) No. 1 — Engine ground:
#1 (E5) No. 2 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#2 (E16) No. 2 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#3 (E6) No. 2 — Engine ground:
#4 (E17) No. 1 — Engine ground:
#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 10.
No	Repair the short circuit to ground in harness between ECM and fuel injector connector.

10. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 11.
No	Repair the open circuit of the harness between the ECM and fuel injector connector.

11. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 12.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

12. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and crankshaft position sensor.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes	Tighten the camshaft position sensor or crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.
No	Go to 13.

13. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to MECHANICAL(H4DO)>Cylinder Block.
No	Go to 14.

14. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly.
No	Go to 15.

15. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 27 — Chassis ground:
(E158) No. 29 — Chassis ground:
(E158) No. 29 — (E158) No. 44:
(E158) No. 43 — Chassis ground:
(E158) No. 43 — (E158) No. 44:

Is the resistance 1 MΩ or more?

Yes	Go to 16.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

16. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 6 — Engine ground:
   (E57) No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 17.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

17. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E158) No. 29 — (E57) No. 6:
   (E158) No. 43 — (E57) No. 4:
   (E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 18.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and electronic throttle control connector** • **Poor contact of coupling connector**

18. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 19.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector**

19. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 6 (+) — Engine ground (−):
   (E57) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 20.

20. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.

Connector & terminal

(E158) No. 27 — (E158) No. 29:

(E158) No. 27 — (E158) No. 43:

Is the resistance 1 MΩ or more?

Yes	Go to 21.
No	Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

21. CHECK SENSOR OUTPUT.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Data Monitor

Note:

For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Main-Throttle Sensor]0.81—0.87 V?

Yes	Go to 22.
No	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

22. CHECK SENSOR OUTPUT.

Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Sub-Throttle Sensor]1.64—1.70 V?

Yes	Go to 23.
No	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

23. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E158) No. 90 — (E57) No. 31:
   (E158) No. 1 — (E57) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 24.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

24. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 2 (+) — Engine ground (−):
   (E57) No. 1 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 25.

25. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 2 — Engine ground:
   (E57) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 26.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

26. CHECK HARNESS BETWEEN ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 2 — (E57) No. 1:

Is the resistance 1 MΩ or more?

Yes	Go to 27.
No	Repair the short circuit in harness between ECM connector and electronic throttle control connector.

27. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT (OPEN).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 28.
No	Repair the open circuit in harness between ECM connector and engine ground.

28. CHECK ELECTRONIC THROTTLE CONTROL.

Measure the resistance between electronic throttle control terminals.

Terminals

No. 2 —No. 1:

Is the resistance 50 Ω or less?

Yes	Go to 29.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

29. CHECK ELECTRONIC THROTTLE CONTROL.

Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes	Repair the poor contact of ECM connector.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

1. OUTLINE OF DIAGNOSIS

- **When cold, the abnormality in the control of target engine speed increase is detected. (P050A)**
  - Idle speed diagnosis
    Judge as NG when actual engine speed is not close to target engine speed at cold start.
- **Detect malfunctions of the catalyst advanced idling retard angle control. (P050B)**
  Judge as NG when ECM is not controlling the angle properly during catalyst advanced idling retard angle control.
  - Final ignition timing diagnosis
    Judge as NG when actual retard amount is under the specified value at cold start.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
<Idle speed diagnosis>	
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Barometric pressure	75.1kPa (563mmHg,22.2in Hg) or more
Vehicle speed	2km/h (1.2MPH) or less
Throttle position	Less than 0.37°
Integrated value of intake air amount	Less than value of Map 1
Elapsed time after gear position change (P ←→ D or N ←→ D)	2000ms or more
Elapsed time after starting the engine	2000ms or more
<Final ignition timing diagnosis>	
• Idle diagnosis	
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg,22.2in Hg) or more
Vehicle speed	2km/h (1.2MPH) or less
Integrated value of intake air amount	Less than value of Map 2
Elapsed time after gear position change (P ←→ D or N ←→ D)	2000ms or more
Target retard amount in CSERS	Value of Map 3 or less (before top dead center)
• Non-idle diagnosis	
Battery voltage	10.9 V or more
Barometric pressure	75.1kPa (563mmHg,22.2in Hg) or more
Integrated value of intake air amount	Less than value of Map 2
Elapsed time after gear position change (P ←→ D or N ←→ D)	0ms or more
Retard amount	Value of Map 4 or more

Map 1

Engine coolant temperature at engine starting °C (°F)	−40 (−40)	−30 (−22)	−20 (−4)	−10 (14)	0(32)	10(50)	20(68)	30(86)
Integrated value of intake air amount g (oz)	1000 (35.26)	961 (33.9)	923 (32.54)	884 (31.18)	845 (29.82)	807 (28.46)	768 (27.1)	730 (25.74)

Engine coolant temperature at engine starting °C (°F)	40(104)	50(122)	60(140)	70(158)	80(176)	90(194)	100(212)	110(230)
Integrated value of intake air amount g (oz)	691 (24.38)	623 (21.96)	554 (19.54)	485 (17.12)	417 (14.7)	348 (12.28)	279 (9.85)	211 (7.43)

Map 2

Engine coolant temperature at engine starting °C (°F)	−40 (−40)	−30 (−22)	−20 (−4)	−10 (14)	0(32)	10(50)	20(68)	30(86)
Integrated value of intake air amount g (oz)	1000 (35.26)	961 (33.9)	923 (32.54)	884 (31.18)	845 (29.82)	807 (28.46)	768 (27.1)	730 (25.74)

Engine coolant temperature at engine starting °C (°F)	40(104)	50(122)	60(140)	70(158)	80(176)	90(194)	100(212)	110(230)
Integrated value of intake air amount g (oz)	691 (24.38)	623 (21.96)	554 (19.54)	485 (17.12)	417 (14.7)	348 (12.28)	279 (9.85)	211 (7.43)

Map 3

Engine coolant temperature °C (°F)	−40(−40)	−30(−22)	−20(−4)	−10(14)	0(32)	10(50)	20(68)	30(86)	40(104)	50(122)	60(140)
Target retard amount in CSERS (°CA)	14.5	14.5	11.5	9.5	9.5	1.5	−5.5	−5.5	−5.5	−3.5	−1.5

Engine coolant	70(158)	80(176)	90(194)	100(212)	110(230)

temperature °C (°F)						
Target retard amount in CSERS (°CA)	0.5	1.5	1.5	1.5	1.5	

Map 4

		Engine coolant temperature °C (°F)							
		−40(−40)	−30(−22)	−20(−4)	−10(14)	0(32)	10(50)	20(68)	30(86)
Target retard amount in CSERS (g/rev)	0.55	9	9	9	9	9	9	9	9
	0.6	4	4	4	4	4	4	4	4
	0.65	0	0	0	0	0	0	0	0
(°CA)									

		Engine coolant temperature °C (°F)							
		40(104)	50(122)	60(140)	70(158)	80(176)	90(194)	100(212)	110(230)
Target retard amount in CSERS (g/rev)	0.55	9	9	9	8.5	4	4	4	4
	0.6	4	4	4	2	1.5	1.5	1.5	1.5
	0.65	0	0	0	0	0	0	0	0
(°CA)									

3. GENERAL DRIVING CYCLE

Perform the diagnosis at cold start.

4. DIAGNOSTIC METHOD

- **Idle speed diagnosis**

  Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC
Actual engine speed − Target engine speed	Less than −230rpm	P050A

Time needed for diagnosis: 7000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

- **Final ignition timing diagnosis**

  Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value	DTC

Malfunction Criteria	Threshold Value	DTC
Final ignition timing − ignition timing during CSERS* *: • CSERS (Cold Start Emission Reduction Strategy) • Intermediate ignition timing = Base ignition timing − Retard amount	More than value of Map 5	P050B

Map 5

Engine coolant temperature at engine starting °C (°F)	**−40(−40)**	**−30(−22)**	**−20(−4)**	**−10(14)**	**0(32)**	**10(50)**	**20(68)**	**30(86)**	**40(104)**	**50(122)**	**60(140)**
Threshold value (CVT model) (°CA)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Threshold value (MT model) (°CA)	7	7	7	7	7	7	7	7	7	7	7

Time needed for diagnosis:7000ms
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P050B COLD START IGNITION TIMING PERFORMANCE

Note:
For the diagnostic procedure, refer to DTC P050A. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P050A. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P050A COLD START IDLE CONTROL SYSTEM PERFORMANCE.

DTC P0512 STARTER (SWITCH) REQUEST CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

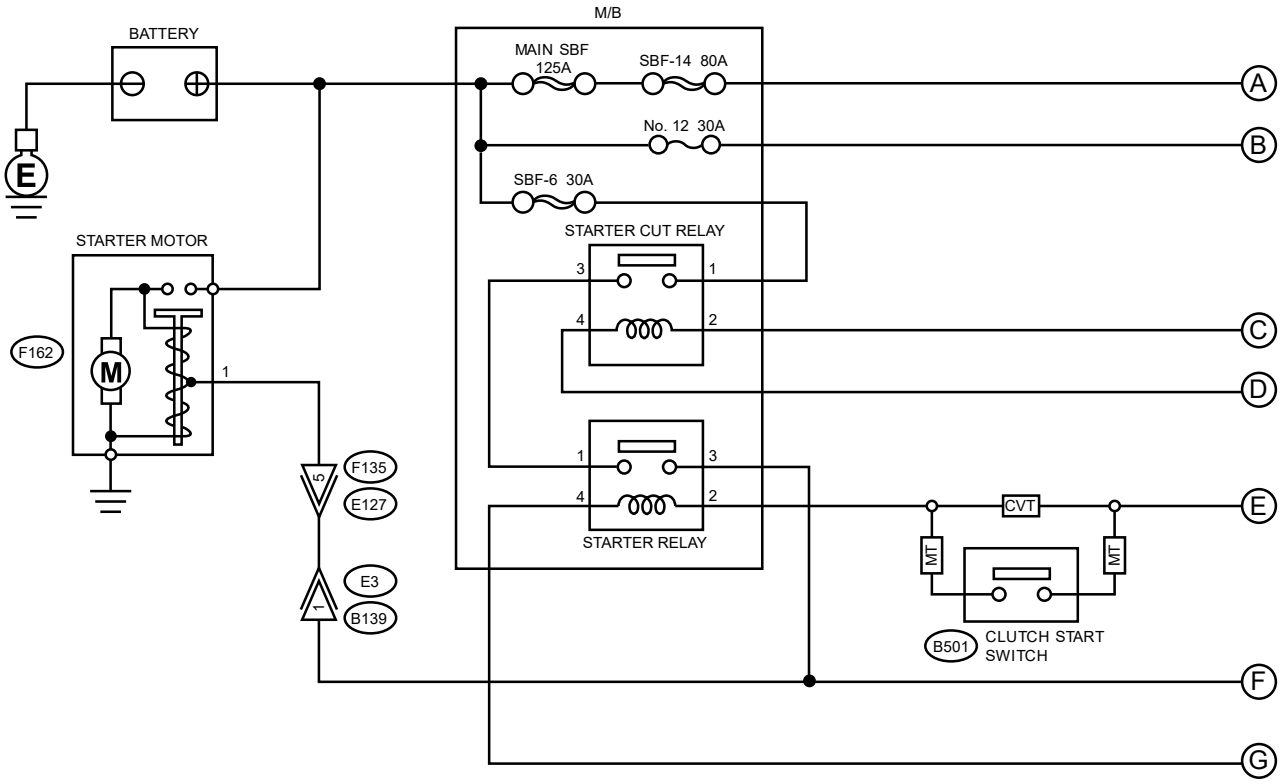
Note:

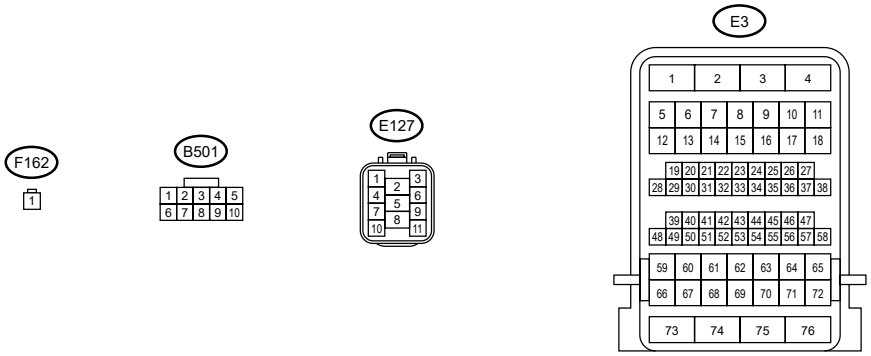
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

- Model without push button start

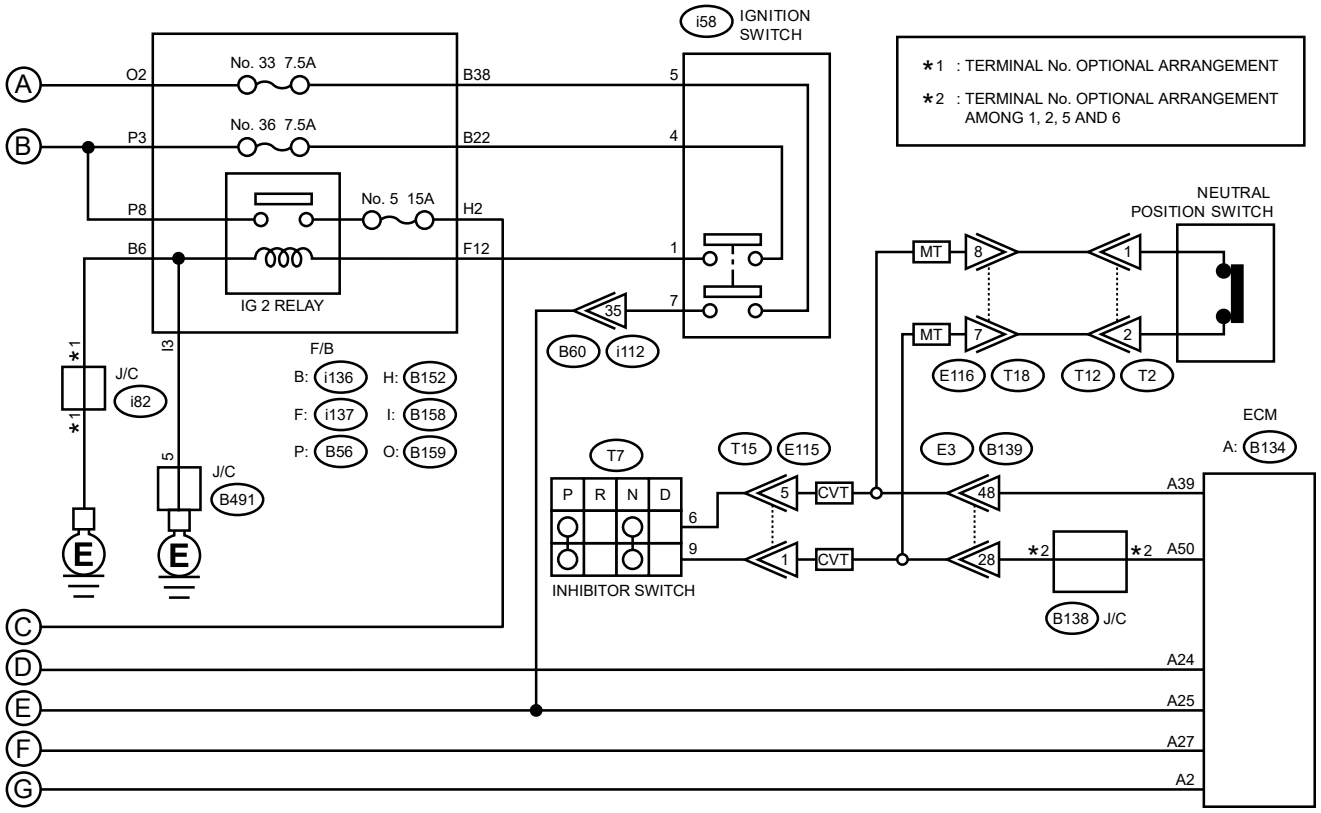
  Wiring diagram:

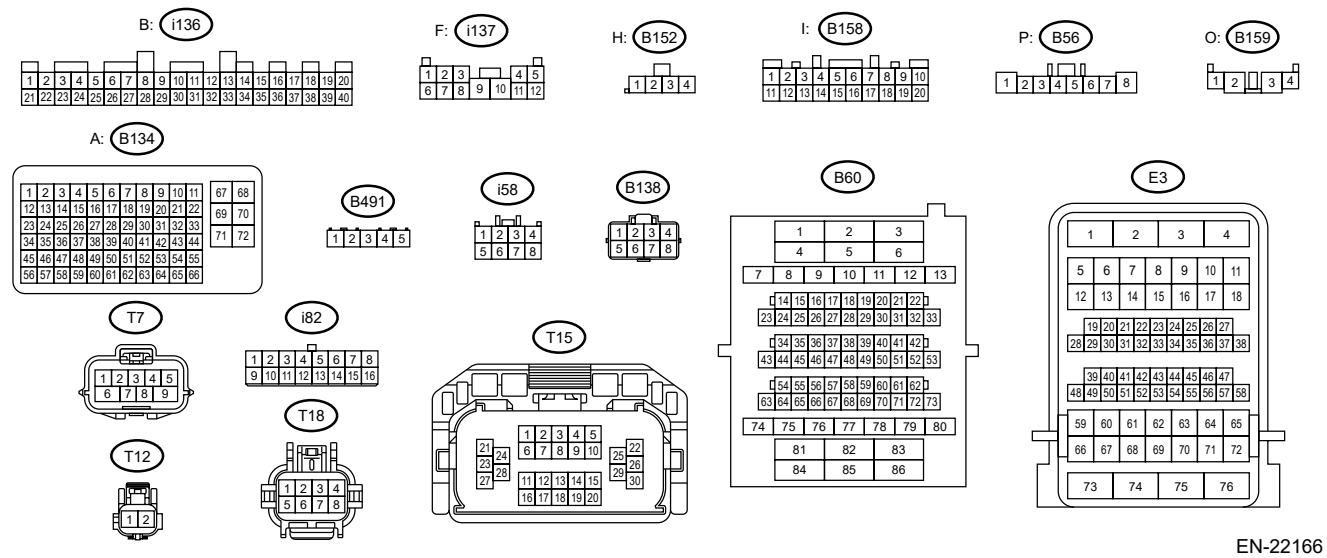
  Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
BATTERY
MAIN SBF
125A
SBF-14 80A
No. 12 30A
SBF-6 30A
STARTER CUT RELAY
STARTER MOTOR
F162
M
1
F135
E127
E3
B139
STARTER RELAY
CVT
MT
MT
B501
CLUTCH START
SWITCH
A
B
C
D
E
F
G


F162
B501
E127
E3

EN-22165


i58 IGNITION SWITCH
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
*2 : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
No. 33 7.5A
No. 36 7.5A
No. 5 15A
IG 2 RELAY
O2
P3
P8
B6
B38
B22
H2
F12
NEUTRAL POSITION SWITCH
MT
E116
T18
T12
T2
F/B
B: i136
F: i137
P: B56
H: B152
I: B158
O: B159
J/C
i82
B491
B60
i112
T7
P R N D
INHIBITOR SWITCH
T15
E115
E3
B139
CVT
ECM
A: B134
A39
A50
A24
A25
A27
A2
B138 J/C


B: i136
F: i137
H: B152
I: B158
P: B56
O: B159
A: B134
B491
i58
B138
B60
E3
T7
i82
T15
T18
T12

EN-22166

1. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Start and idle the engine for three minutes or more.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Is DTC P0512 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, a malfunction may be detected by continuously holding the ignition key at START position.

2. CHECK HARNESS BETWEEN ECM AND STARTER SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 25 (+) — Chassis ground (−):

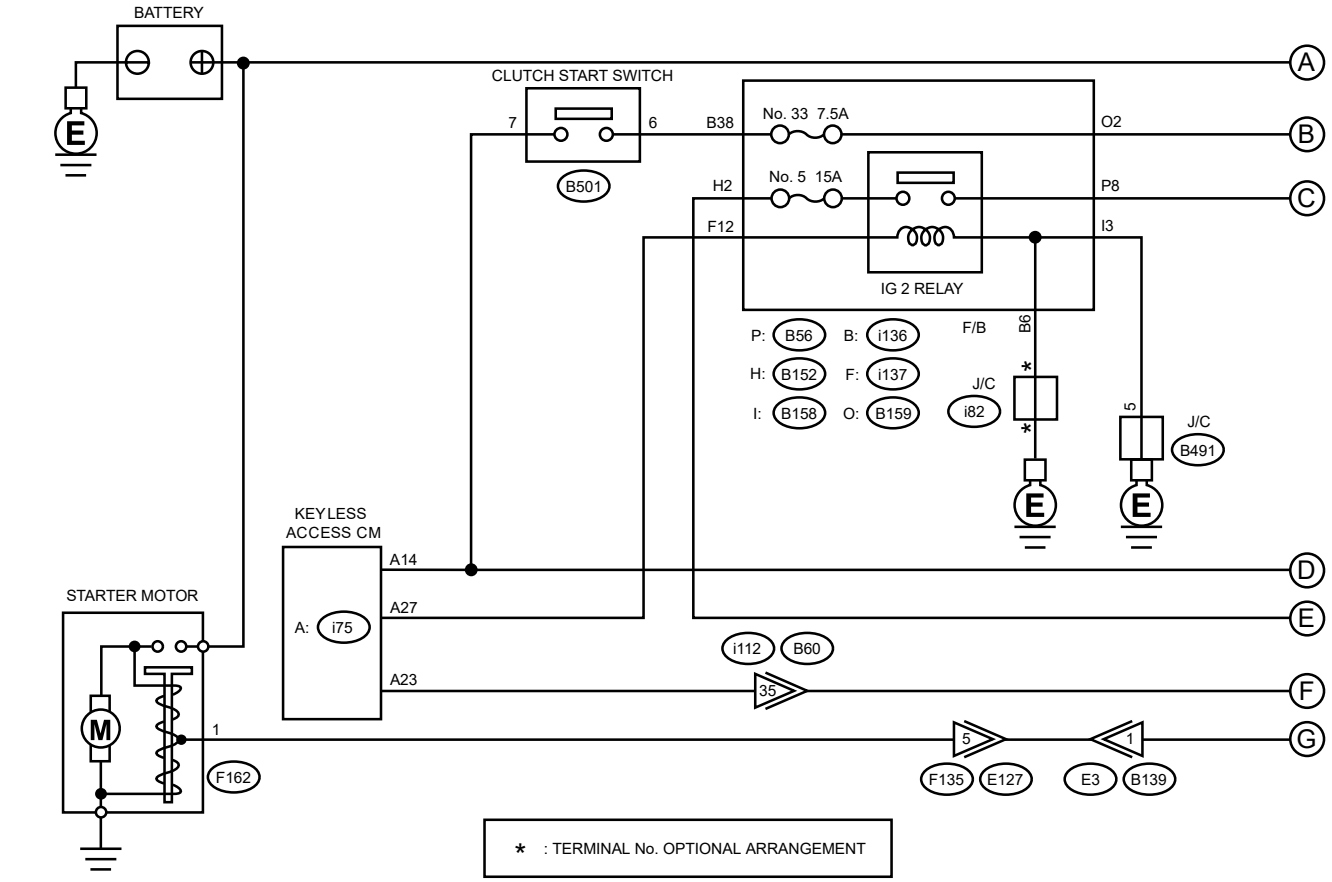
Is the voltage 10 V or more?

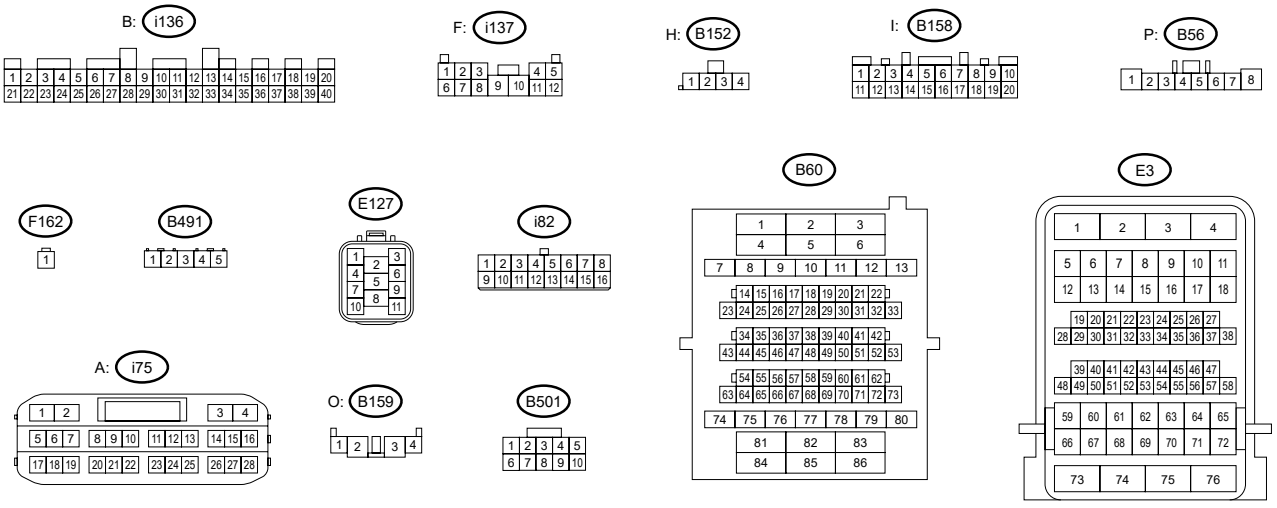
Yes	Repair the short circuit to power supply in harness between ECM connector and starter switch.
No	Repair the poor contact of ECM connector.

- Model with push button start

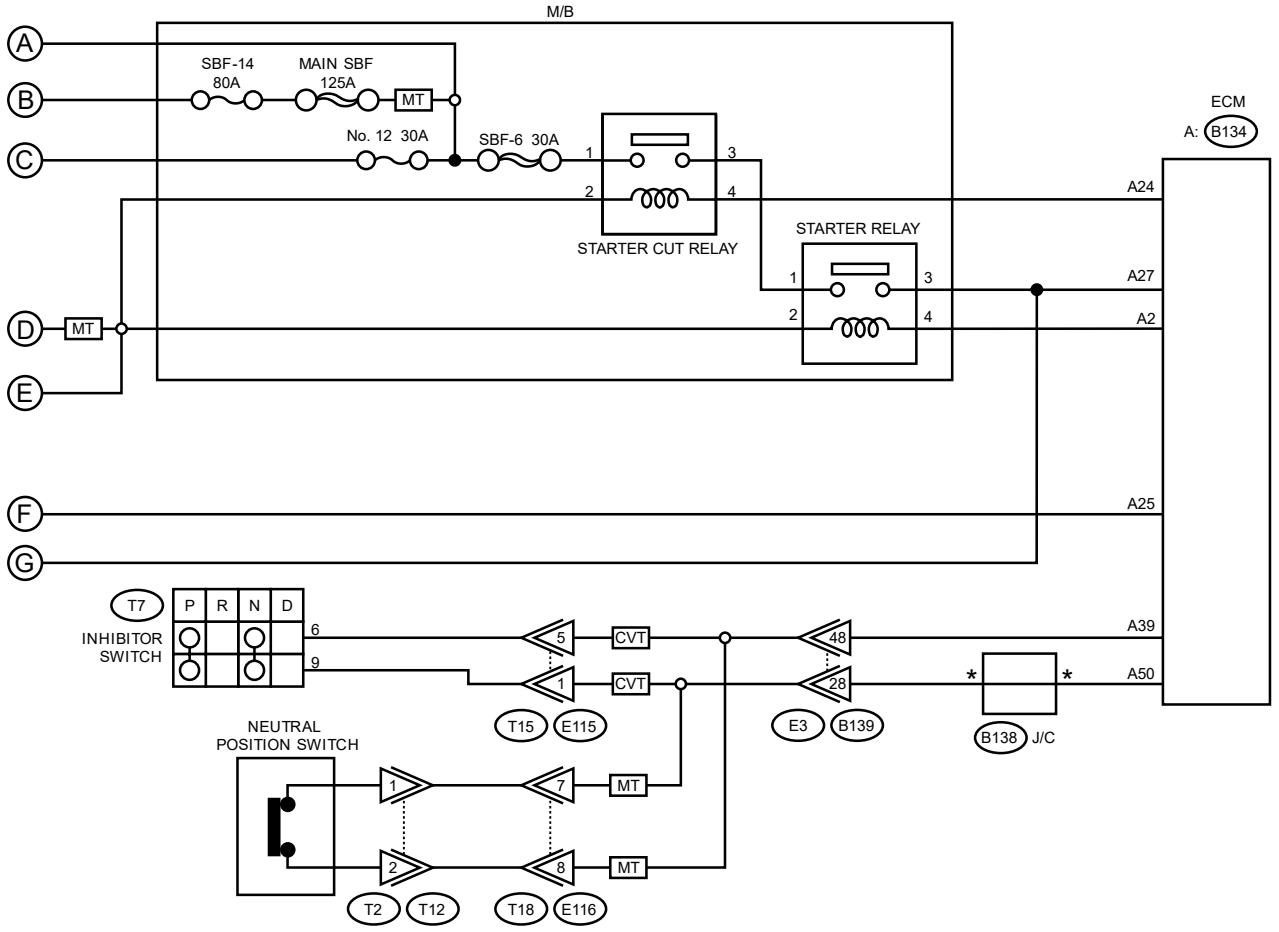
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

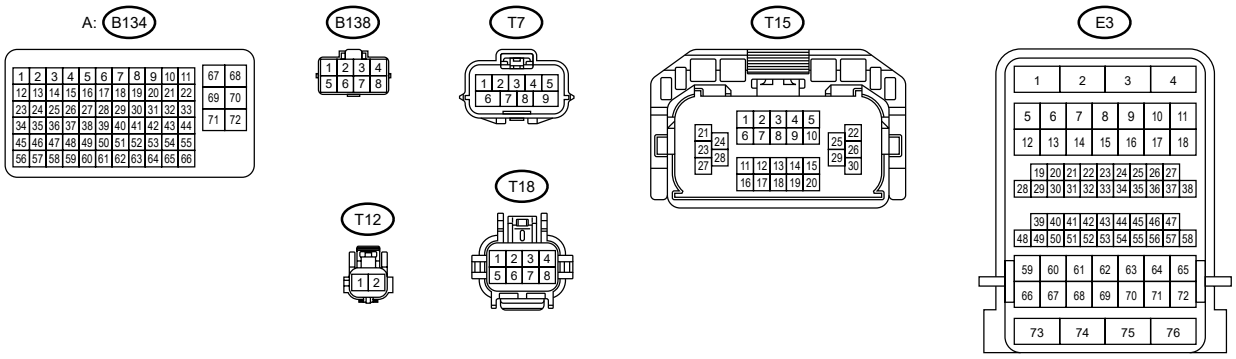

BATTERY
CLUTCH START SWITCH
7
6
B501
B38
No. 33 7.5A
O2
H2
No. 5 15A
P8
F12
I3
IG 2 RELAY
P: B56
B: i136
H: B152
F: i137
I: B158
O: B159
F/B
B6
J/C
i82
5
J/C
B491
KEYLESS ACCESS CM
A14
A27
A23
A: i75
i112
B60
35
STARTER MOTOR
1
F162
5
1
F135
E127
E3
B139
A
B
C
D
E
F
G
* : TERMINAL No. OPTIONAL ARRANGEMENT


B: i136
F: i137
H: B152
I: B158
P: B56
F162
B491
E127
i82
B60
E3
A: i75
O: B159
B501

EN-22167



* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6



EN-22168

1. CHECK PUSH BUTTON IGNITION SWITCH.

Check the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

Is the check result OK?

Yes	Go to 2.
No	Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

2. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Start and idle the engine for three minutes or more.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Is DTC P0512 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

3. CHECK HARNESS BETWEEN ECM AND STARTER RELAY CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 27 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and starter relay connector.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter SW1.
Judge as ON NG when the starter SW 1 signal remains ON.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more
Engine speed	500 rpm or more

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW 1 signal	4 V or more

Time needed for diagnosis: 30000ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0560 SYSTEM VOLTAGE

DTC detecting condition:

Immediately at fault recognition

Caution:

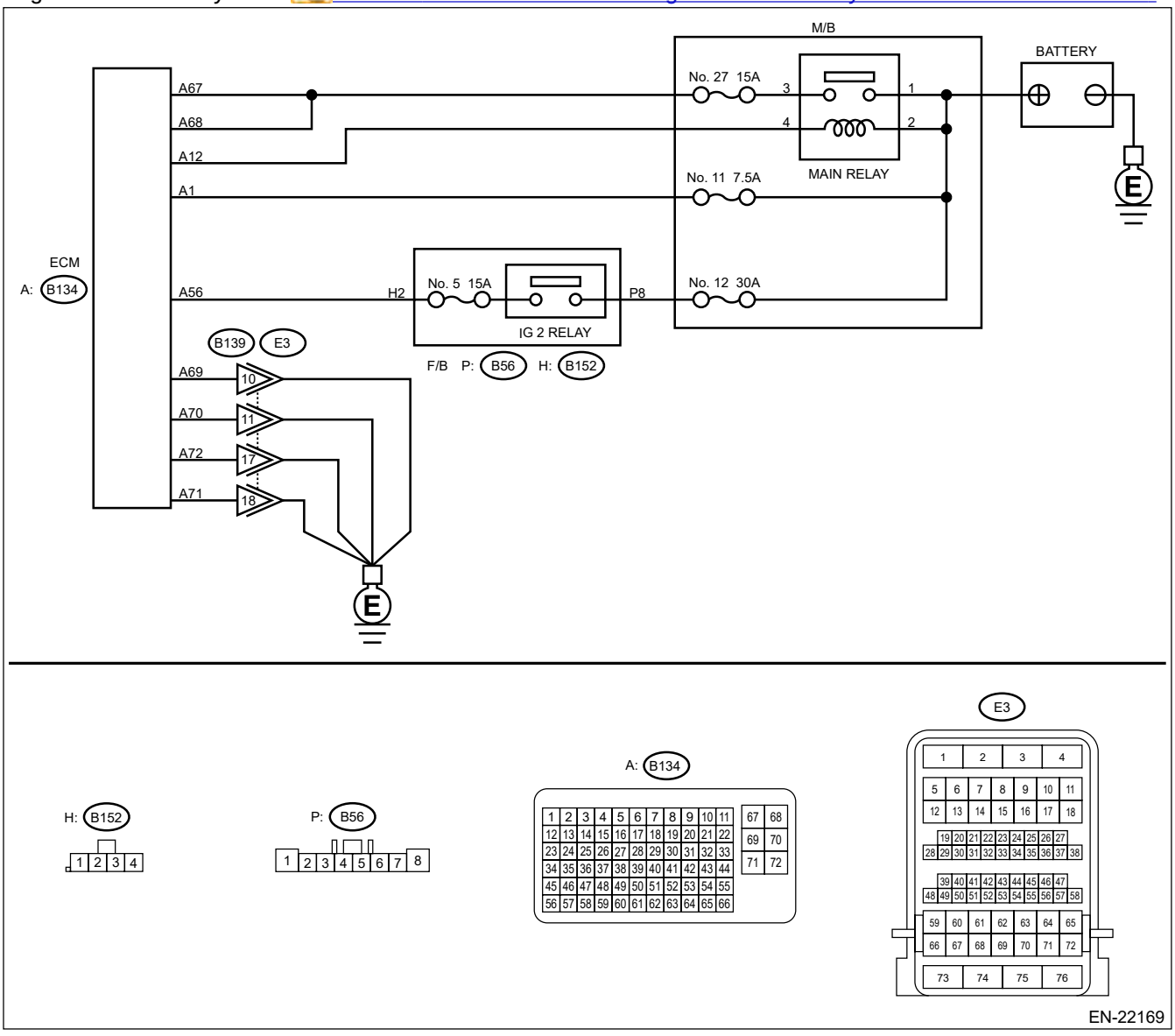
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to OFF.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the poor contact of ECM connector.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND MAIN FUSE BOX (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and battery terminal.

3. CHECK FUSE NO. 11 (MAIN FUSE BOX).

Check the fuse No. 11.

Is the fuse blown out?

Yes	Replace the fuse.
No	Repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit in harness between ECM connector and battery**
- **Poor contact of ECM connector**
- **Poor contact of battery terminal**

1. OUTLINE OF DIAGNOSIS

Detect the open/short circuit of back-up power supply circuit.
Judge as NG when the backup power voltage is low.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of back-up power supply	1.4 V or less

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0562 SYSTEM VOLTAGE LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Charge warning light illuminates.

Caution:

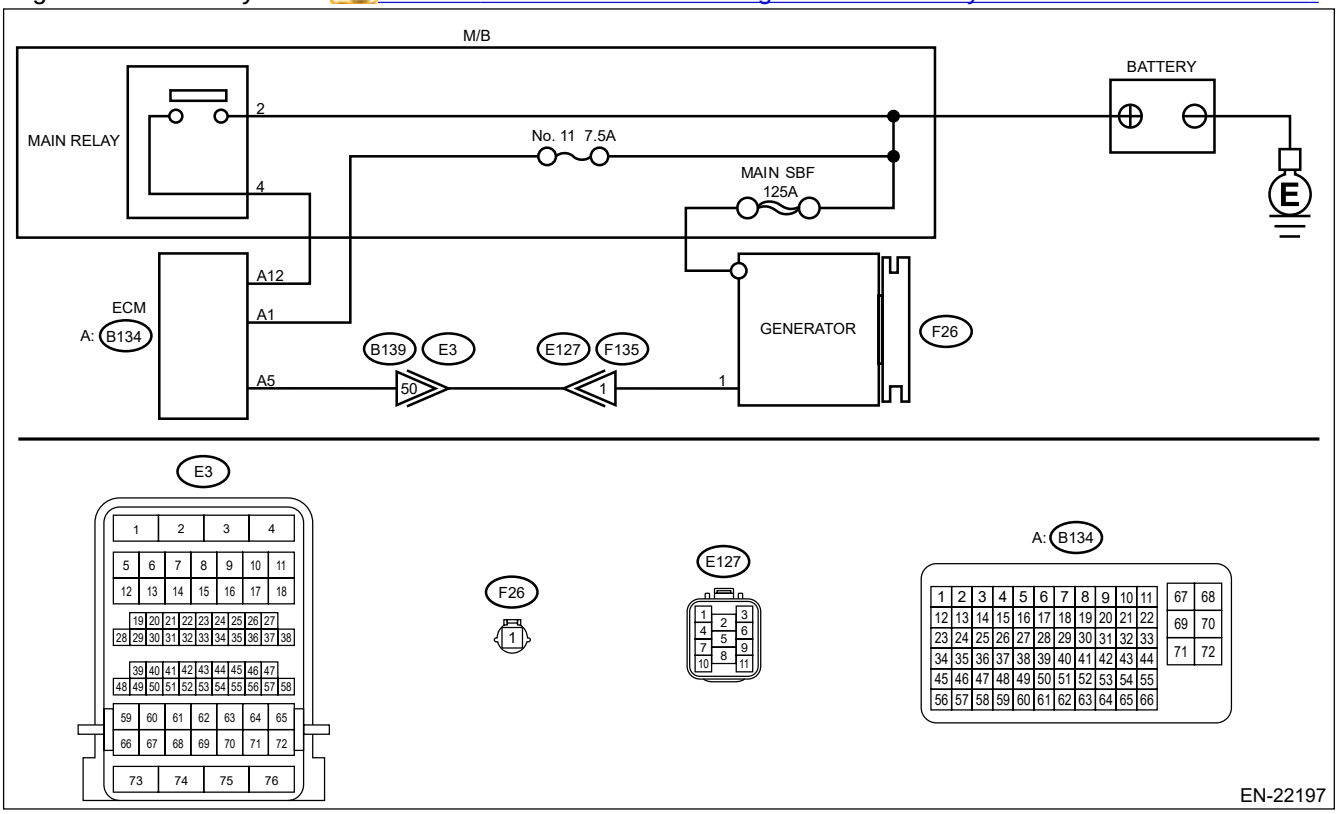
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK GENERATOR.

1. Start the engine.
2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Connector & terminal

Generator terminal B (+) — Chassis ground (−):

Is the voltage 10.8 V or more?

Yes	Go to 2.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.

2. CHECK GENERATOR.

1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and chassis ground.

Connector & terminal

Generator terminal B (+) — Chassis ground (−):

Is the voltage 10.8 V or more?

Yes	Go to 3.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.

3. CHECK BATTERY TERMINAL.

Turn the ignition switch to OFF.

Are the positive and negative battery terminals installed tightly?

Yes	Go to 4.
No	Tighten the clamp of terminal.

4. CHECK INPUT VOLTAGE OF ECM.

1. Run the engine at idle.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 1 (+) — Chassis ground (-):

Is the voltage 10.8 V or more?

Yes	Go to 5.
No	Repair the harness between ECM, battery and main relay.

5. CHECK POOR CONTACT OF CONNECTORS.

Check for a poor contact of connectors between ECM, generator or battery.

Is there poor contact of connectors between ECM, generator or battery?

Yes	Repair the connector.
No	Go to 6.

6. CHECK ECM.

1. Connect all connectors.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is the same DTC as current diagnosis still output?

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.
No	Go to 7.

7. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0562 displayed? (Current malfunction)

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the generator output terminal.
Judge as NG if the battery voltage is out of specification.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Engine speed Final output duty of generator power generation control	1500 rpm or more 50 % or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Battery voltage	Less than 9.8 V

Time needed for diagnosis: 30 seconds

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates.)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0563 SYSTEM VOLTAGE HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Charge warning light illuminates.

Caution:

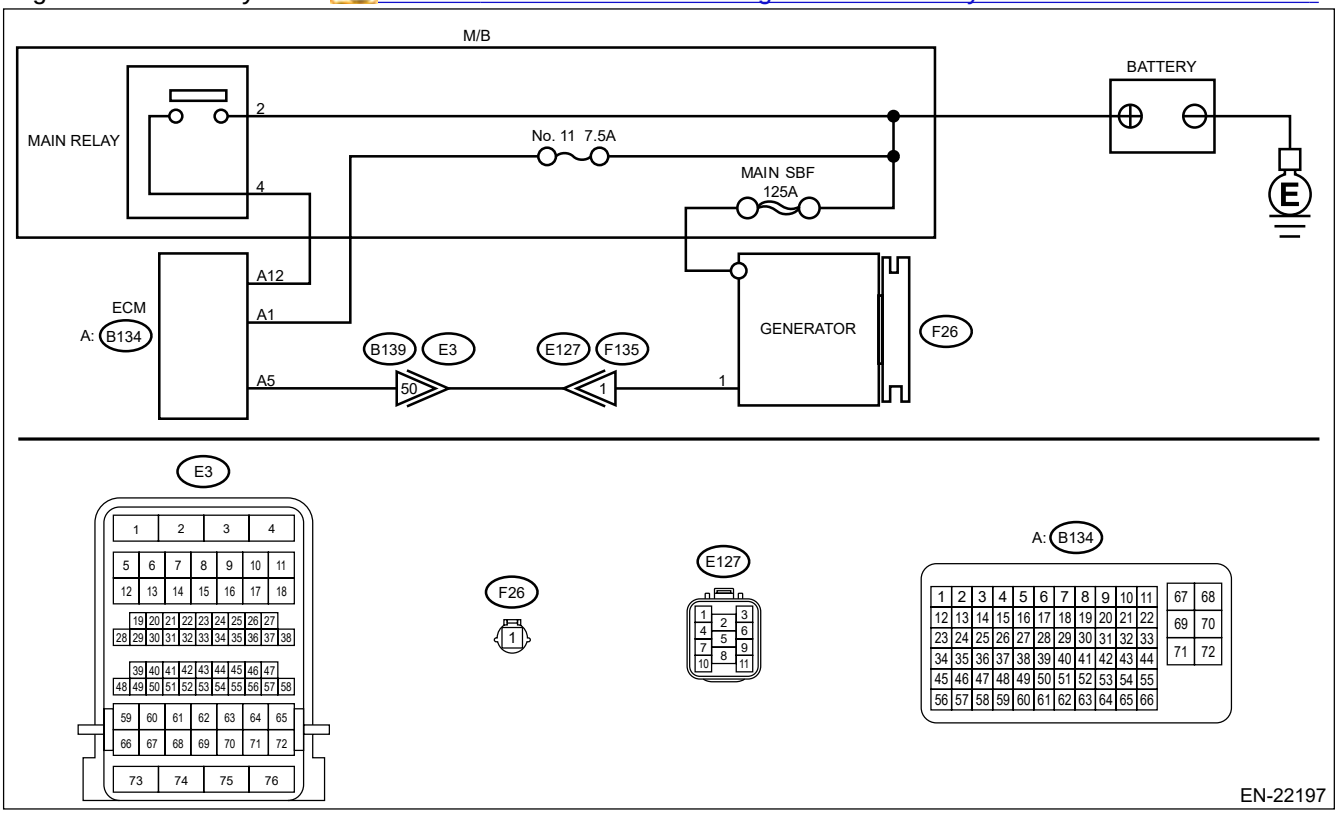
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK GENERATOR.

1. Start the engine.
2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Connector & terminal

Generator terminal B (+) — Chassis ground (−):

Is the voltage less than 16.2 V?

Yes	Go to 2.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.

2. CHECK GENERATOR.

1. Run the engine at 3,000 rpm.
2. Measure the voltage between generator terminal B and chassis ground.

Connector & terminal

Generator terminal B (+) — Chassis ground (−):

Is the voltage less than 16.2 V?

Yes	Go to 3.
No	Repair the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.

3. CHECK BATTERY TERMINAL.

Turn the ignition switch to OFF.

Are the positive and negative battery terminals installed tightly?

Yes	Go to 4.
No	Tighten the clamp of terminal.

4. CHECK INPUT VOLTAGE OF ECM.

1. Run the engine at idle.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 1 (+) — Chassis ground (-):

Is the voltage less than 16.2 V?

Yes	Go to 5.
No	Repair the harness between ECM, battery and main relay.

5. CHECK POOR CONTACT OF CONNECTORS.

Check for a poor contact of connectors between ECM, generator or battery.

Is there poor contact of connectors between ECM, generator or battery?

Yes	Repair the connector.
No	Go to 6.

6. CHECK ECM.

1. Connect all connectors.
2. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Perform the Inspection Mode. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is the same DTC as current diagnosis still output?

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.
No	Go to 7.

7. CHECK DTC DISPLAY.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P0563 displayed? (Current malfunction)

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of the generator output terminal.
Judge as NG if the battery voltage is out of specification.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Engine speed Final output duty of generator power generation control	1500 rpm or more 50% or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Battery voltage	16.2 V or more

Time needed for diagnosis: 30 seconds

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge warning light illuminates)

DTC P059A ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ACTIVE GRILLE SHUTTER.

Check the area around the active grille shutter louver, louver link and actuator.

Is there any abnormality such as a foreign matter adhered or pinched and a frost?

Yes	Remove the foreign matter from the active grille shutter and go to the next step. Go to 2.
No	Go to 2.

2. CHECK ACTIVE GRILLE SHUTTER.

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Check the area around the active grille shutter louver, louver link and actuator.

Is there any damage in each part of the active grille shutter?

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Go to 3.

3. CHECK ACTIVE GRILLE SHUTTER.

1. Turn the ignition switch to OFF, and wait for approx. 30 seconds.
2. Turn the ignition switch to ON.
   Note:
   Make sure that the ambient temperature is equal to or higher than 3°C (37.4°F).
3. Start the engine.
4. Three minutes after starting the engine, perform the operation check for the active grille shutter using the Subaru Select Monitor.
   Note:
   For detailed operation procedures, refer to the "Active Test". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

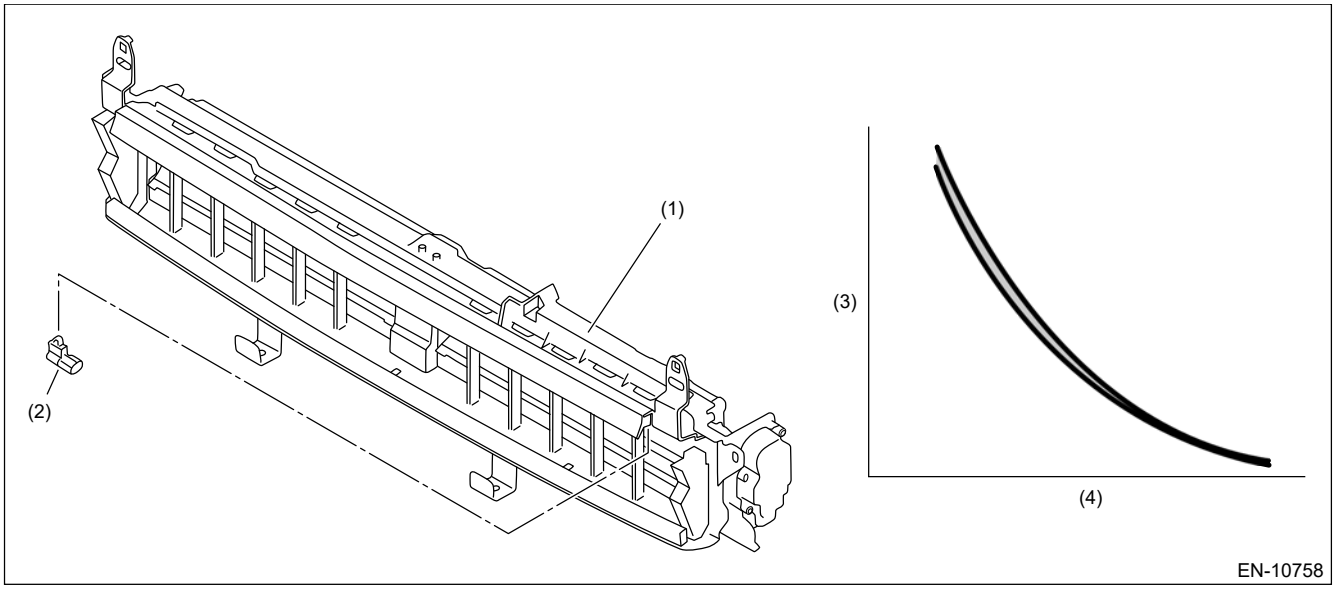
Does the open/close operation finish correctly?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. **Note:** **In this case, it is assumed that the active grille shutter may have temporarily had a foreign matter adhered/pinched or a frost.**
No	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of active grille shutter position sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter

(2) Ambient sensor

(3) Resistance value (kΩ)

(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Command to active grille shutter	10.9 V or more Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Input pulse of the active grille shutter position sensor	Equal to 0

Time needed for diagnosis: 2500 ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P059F ACTIVE GRILLE AIR SHUTTER "A" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P059F displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, it is assumed that the active grille shutter may have temporarily had a foreign matter adhered/pinched or a frost.**

2. CHECK ACTIVE GRILLE SHUTTER.

Check the area around the active grille shutter louver, louver link and actuator.

Is there any abnormality such as a foreign matter adhered or pinched and a frost?

Yes	Remove the foreign matter from the active grille shutter and go to the next step. Go to 3.
No	Go to 3.

3. CHECK ACTIVE GRILLE SHUTTER.

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Check the area around the active grille shutter louver, louver link and actuator.

Is there any damage in each part of the active grille shutter?

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Go to 4.

4. CHECK ACTIVE GRILLE SHUTTER.

1. Turn the ignition switch to ON (engine OFF).
2. Using the Subaru Select Monitor, perform the operation check of the active grille shutter to measure time needed for open or close operation.
   Note:
   For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

Is the time less than 15 seconds?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.
No	Go to 5.

5. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, read the value in [Active Grille Shutter Voltage Error Status].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is [Normal] displayed?

Yes	Go to 6.
No	Check the power supply circuit. If the power supply circuit is normal. replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.

6. CHECK DATA MONITOR.

1. Turn the ignition switch to OFF, and cool down the engine enough.
   Note:
   Cool down the engine unit until it can be easily touched by hand.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor, read the value in [Active Grille Shutter Temperature Error Status].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

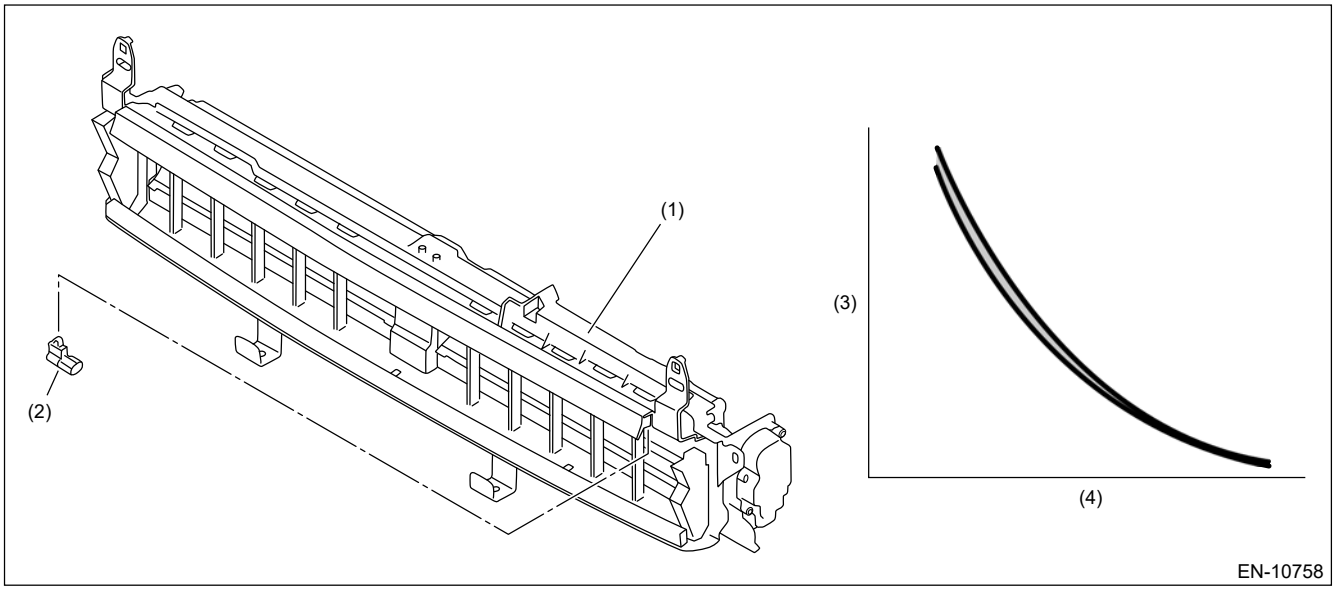
Is [Normal] displayed?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.
No	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of the response to open/close request for the active grille shutter.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter

(2) Ambient sensor

(3) Resistance value (kΩ)

(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Active grille shutter drive	Yes

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Changing rate of the active grille shutter in 15000ms	Less than 94%

Time needed for diagnosis: 15000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P05A0 ACTIVE GRILLE AIR SHUTTER "A" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ACTIVE GRILLE SHUTTER.

Check the area around the active grille shutter louver, louver link and actuator.

Is there any abnormality such as a foreign matter adhered or pinched and a frost?

Yes	Remove the foreign matter from the active grille shutter and go to the next step. Go to 2.
No	Go to 2.

2. CHECK ACTIVE GRILLE SHUTTER.

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Check the area around the active grille shutter louver, louver link and actuator.

Is there any damage in each part of the active grille shutter?

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Go to 3.

3. CHECK ACTIVE GRILLE SHUTTER.

1. Turn the ignition switch to OFF, and wait for approx. 30 seconds.
2. Turn the ignition switch to ON.
3. Perform operation check for the active grille shutter using the Subaru Select Monitor.

Note:
For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

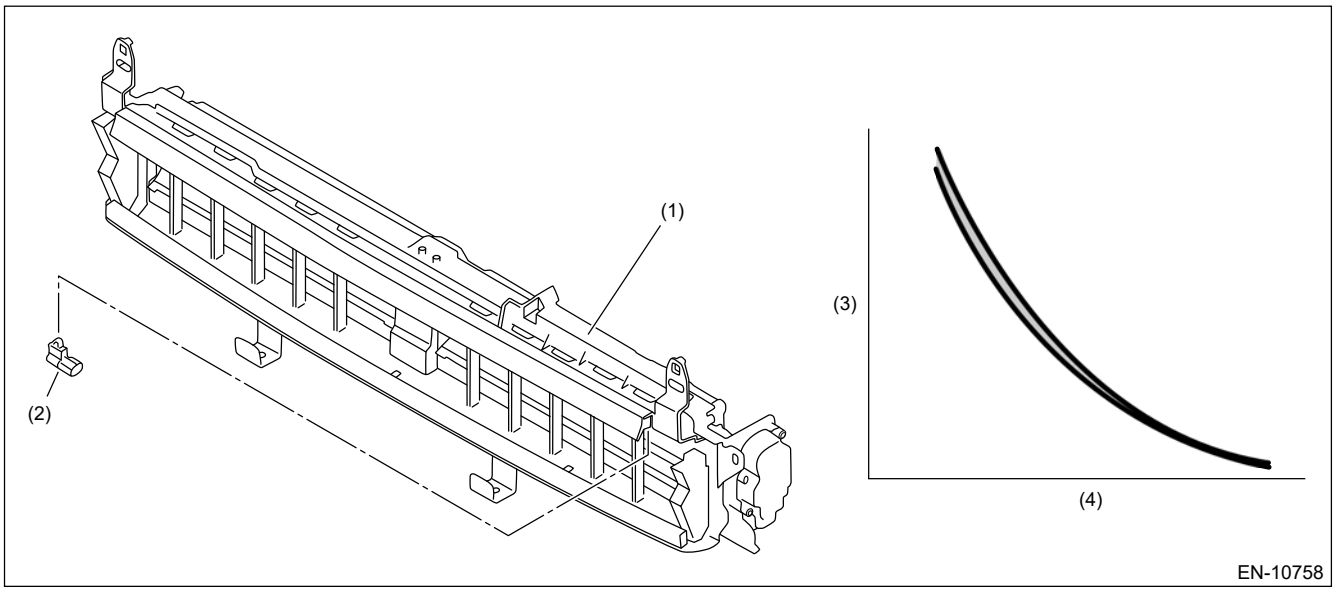
Does the open/close operation finish correctly?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. **Note:** **In this case, it is assumed that the active grille shutter may have temporarily had a foreign matter adhered/pinched or a frost.**
No	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.

1. OUTLINE OF DIAGNOSIS

Detect that open/close operation of the active grille shutter is disabled due to a foreign matter pinched in or other defects.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter
(2) Ambient sensor
(3) Resistance value (kΩ)
(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Command to active grille shutter	10.9 V or more Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Max value of the active grille shutter position sensor (when controlled at power supply ON)	Less than 70 deg

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P05A1 ACTIVE GRILLE AIR SHUTTER "A" POSITION SENSOR MINIMUM/MAXIMUM STOP PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK ACTIVE GRILLE SHUTTER.

Check the area around the active grille shutter louver, louver link and actuator.

Is there any abnormality such as a foreign matter adhered or pinched and a frost?

Yes	Remove the foreign matter from the active grille shutter and go to the next step. Go to 2.
No	Go to 2.

2. CHECK ACTIVE GRILLE SHUTTER.

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the front bumper. Ref. to EXTERIOR/INTERIOR TRIM>Front Bumper>REMOVAL.
3. Check the area around the active grille shutter louver, louver link and actuator.

Is there any damage in each part of the active grille shutter?

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Go to 3.

3. CHECK ACTIVE GRILLE SHUTTER.

1. Turn the ignition switch to OFF, and wait for approx. 30 seconds.
2. Turn the ignition switch to ON.
3. Perform operation check for the active grille shutter using the Subaru Select Monitor.

Note:
For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

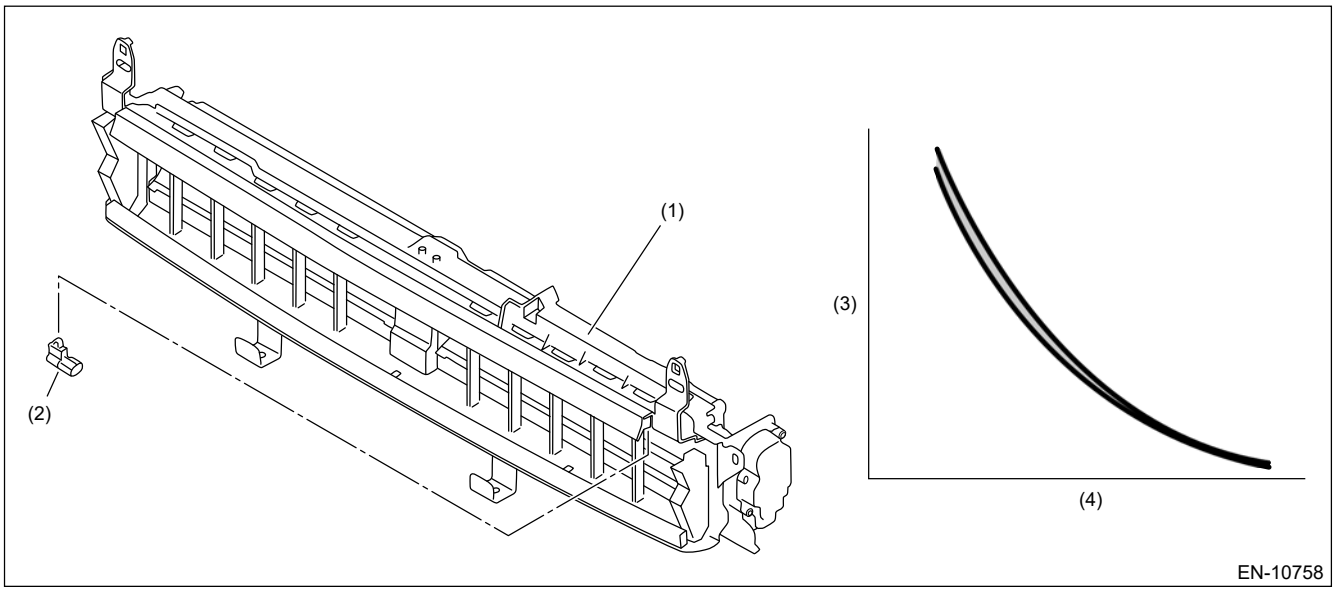
Does the open/close operation finish correctly?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. **Note:** **In this case, it is assumed that the active grille shutter may have temporarily had a foreign matter adhered/pinched or a frost.**
No	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.

1. OUTLINE OF DIAGNOSIS

Detect that the revolution angle goes beyond the defined angle due to the malfunction of the active grille shutter.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter
(2) Ambient sensor
(3) Resistance value (kΩ)
(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Command to active grille shutter	10.9 V or more Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Max value of the active grille shutter position sensor (when controlled at power supply ON)	More than 155 deg

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P05A2 ACTIVE GRILLE AIR SHUTTER "A" CONTROL CIRCUIT/OPEN

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF, and wait for approx. 30 seconds.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



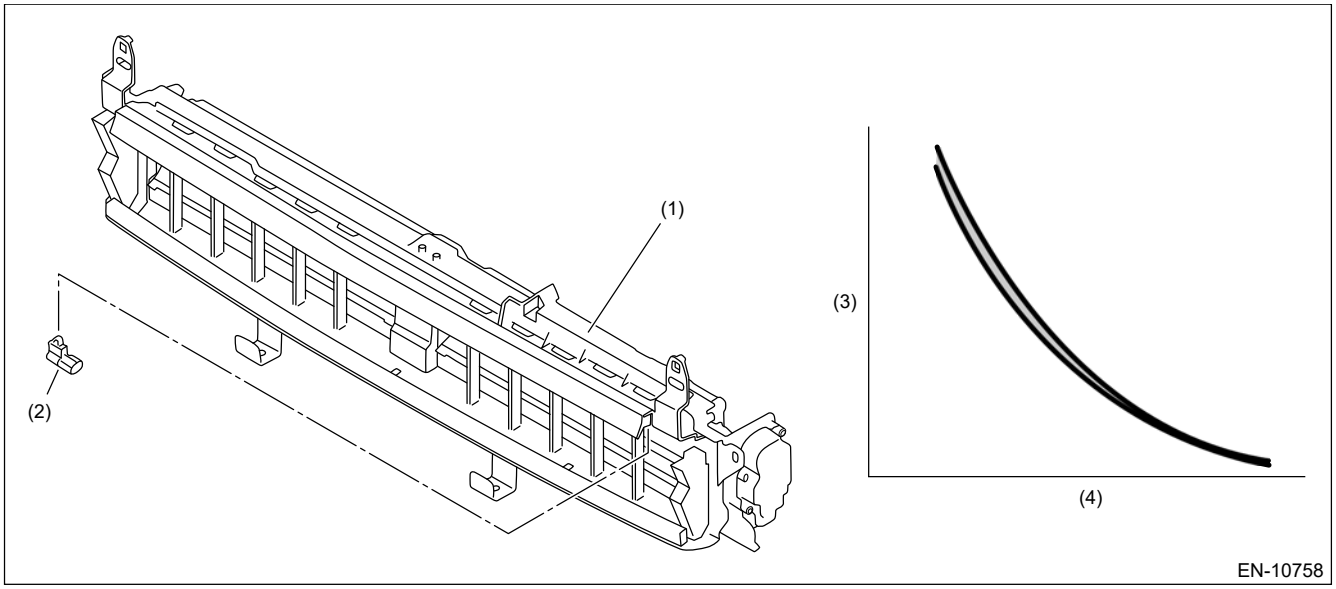
Is DTC P05A2 displayed? (Current malfunction)

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Using the Subaru Select Monitor, perform the operation check for the active grille shutter to make sure that its open and close operation can be completed properly. **Note:** **For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.**

1. OUTLINE OF DIAGNOSIS

Detect for the malfunction of active grille shutter motor circuit.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter

(2) Ambient sensor

(3) Resistance value (kΩ)

(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Diagnosis 2

Secondary parameters	Execution condition
Battery voltage Command to active grille shutter	10.9 V or more Open or Closed

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Diagnosis 1

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Current in the motor circuit during open/close command to the active grille shutter	More than 650 mA

Time needed for diagnosis: 2500ms

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Current in the motor circuit during open/close command to the active grille shutter	Less than 10 mA

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P05A6 ACTIVE GRILLE AIR SHUTTER "A" SUPPLY VOLTAGE CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Caution:

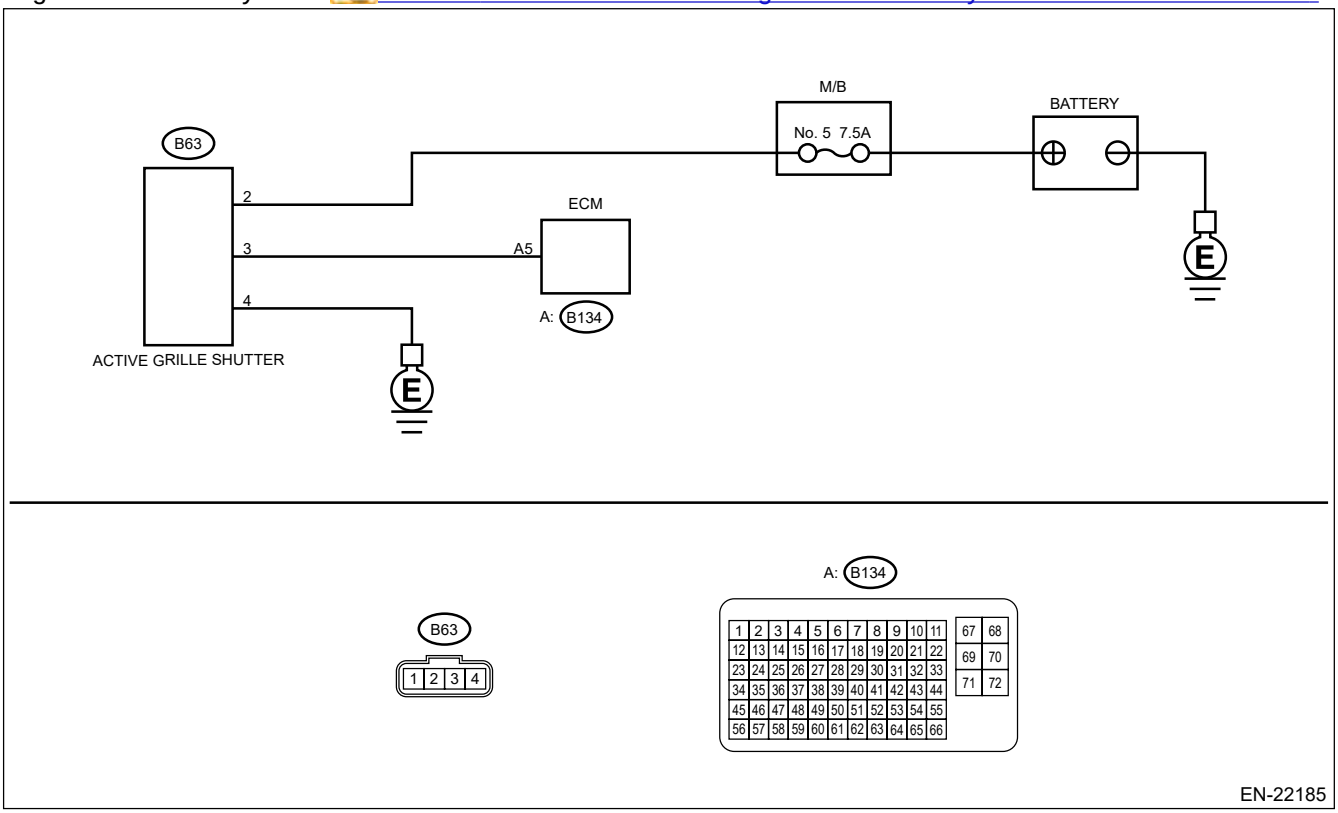
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

1. Turn the ignition switch to OFF, and wait for approx. 30 seconds.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P05A6 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, a temporary drop of battery voltage, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 3.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

3. CHECK ACTIVE GRILLE SHUTTER POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the battery. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Disconnect the connector from the active grille shutter.
4. Measure the voltage between active grille shutter connector and chassis ground.
   Connector & terminal
   (B63) No. 2 (+) — Chassis ground (−):

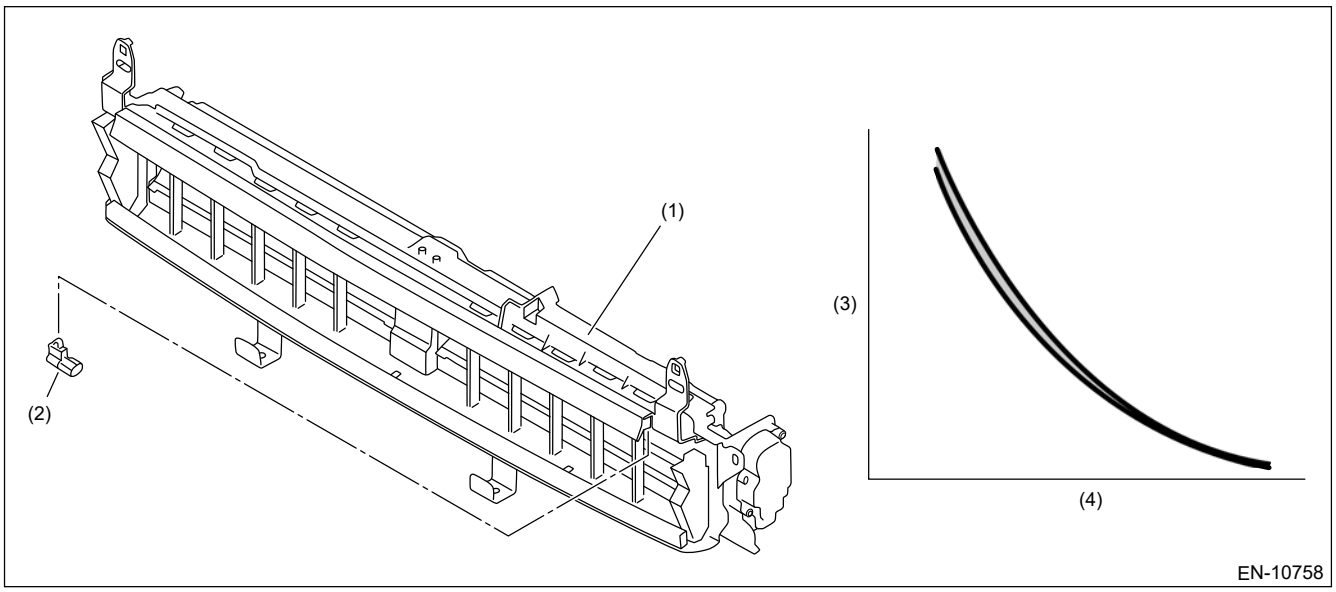
Is the voltage 9 V or more?

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Repair the power supply circuit.

1. OUTLINE OF DIAGNOSIS

Detect the abnormal voltage of active grille shutter power supply.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter
(2) Ambient sensor
(3) Resistance value (kΩ)
(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction judgment flag	1

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Does not illuminate.

DTC P05C0 ACTIVE GRILLE AIR SHUTTER MODULE "A" OVER TEMPERATURE

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

1. Turn the ignition switch to OFF, and cool down the engine enough.
   Note:
   Cool down the engine unit until it can be easily touched by hand.
2. Turn the ignition switch to ON.
3. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



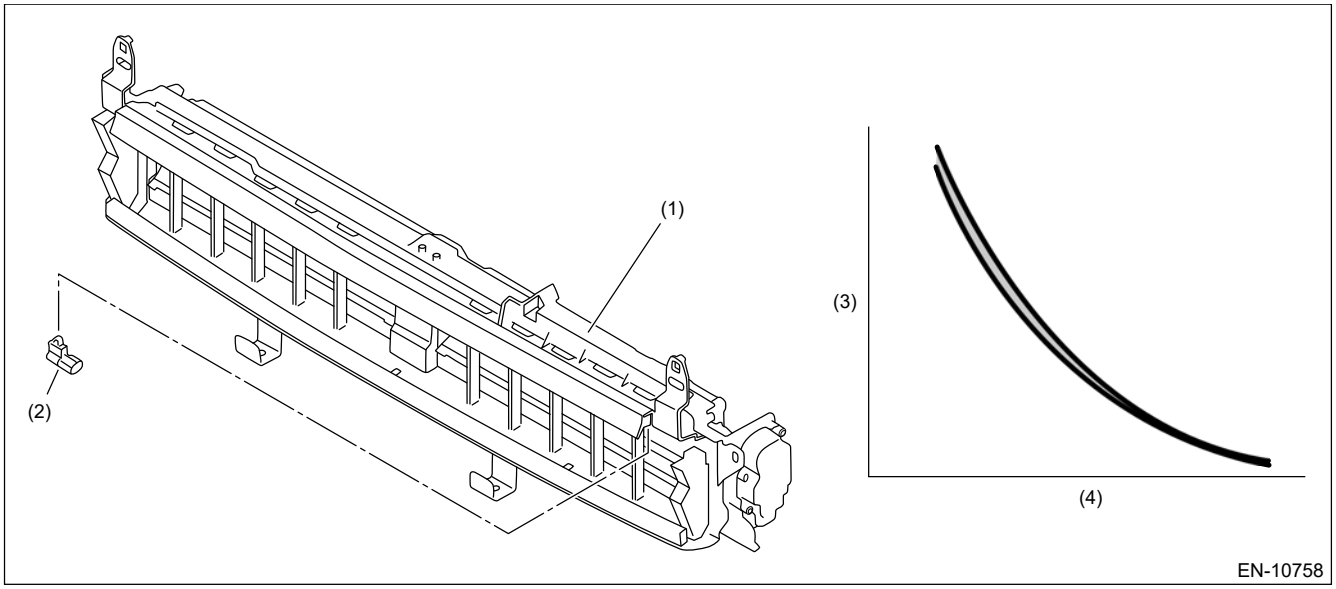
Is DTC P05C0 displayed? (Current malfunction)

Yes	Replace the active grille shutter. Ref. to COOLING(H4DO)>Active Grille Shutter.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. **Note:** **In this case, there may have been a temporary rise of the temperature in the engine compartment.**

1. OUTLINE OF DIAGNOSIS

Detect the abnormal temperature inside the active grille shutter.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Active grille shutter

(2) Ambient sensor

(3) Resistance value (kΩ)

(4) Ambient air temperature (°C (°F))

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction judgment flag	1

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Does not illuminate.

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Engine does not start.
- Engine stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P0604 displayed? (Current malfunction)

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of microcomputer (RAM).
When there is a problem in the CPU normal RAM, judge as NG.
If it is possible to write data to the whole area of RAM in the initial routine, and is possible to read the same data, it is judged as OK, and if not, NG.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Judgment 1 ECM initialization	RUN
Judgment 2 Ignition switch	ON

Diagnosis with the initial routine.

3. GENERAL DRIVING CYCLE

Perform the diagnosis immediately after IG SW ON.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Judgment 1: Write and read test	
Written value to RAM	Not equal to the reading value
Judgment 2: Correcting Code (ECC) check	
Correction error code of check error	Detected

Time needed for diagnosis: 2 times
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

Note:

For the diagnostic procedure, refer to DTC P0606. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when SUM value of ROM is outside the standard value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Judgment 1: Checksum ECM initialization	RUN
Judgment 2: Error Correcting Code (ECC) check	
Ignition switch	ON

Diagnosis with the initial routine.

3. GENERAL DRIVING CYCLE

Perform the diagnosis immediately after IG SW ON.

4. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Judgment value

Malfunction Criteria	Threshold Value
Judgment 1: Checksum SUM value of ROM	Malfunction
Judgment 2: Error Correcting Code (ECC) check Error correcting code check	Malfunction

Time needed for diagnosis: When detected 2 times in row

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0606 CONTROL MODULE PROCESSOR

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

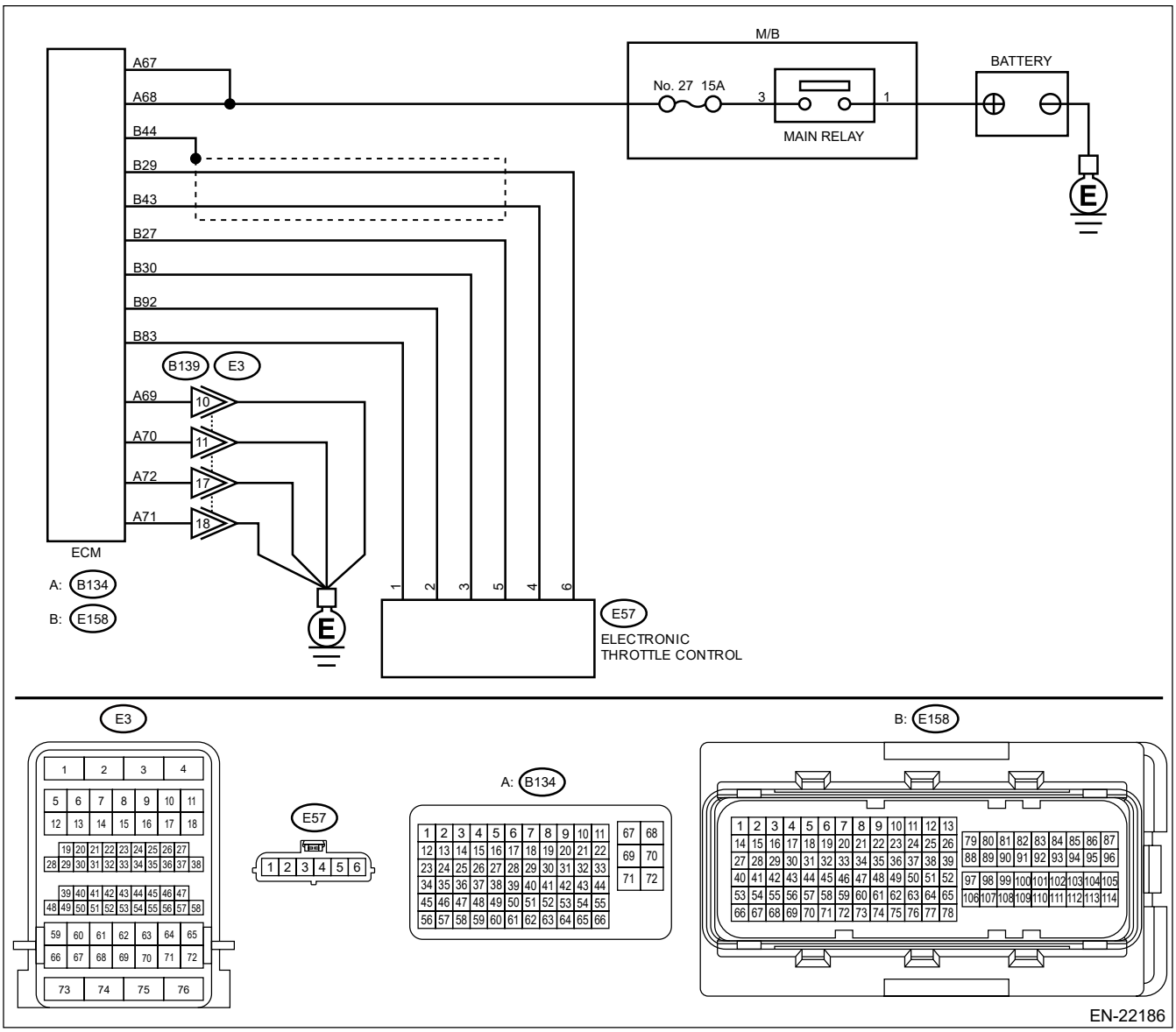
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT VOLTAGE OF ECM (OPEN).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 67 (+) — Chassis ground (−):

(B134) No. 68 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 2.
No	Repair the open or short to ground in the power supply circuit.

2. CHECK INPUT VOLTAGE OF ECM (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 67 (+) — Chassis ground (−):

(B134) No. 68 (+) — Chassis ground (−):

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short to ground in the power supply circuit.

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E158) No. 27 — (E57) No. 5:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK ECM GROUND HARNESS (OPEN).

1. Connect all connectors.
2. Turn the ignition to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 (+) — Chassis ground (−):
(B134) No. 70 (+) — Chassis ground (−):
(B134) No. 71 (+) — Chassis ground (−):
(B134) No. 72 (+) — Chassis ground (−):

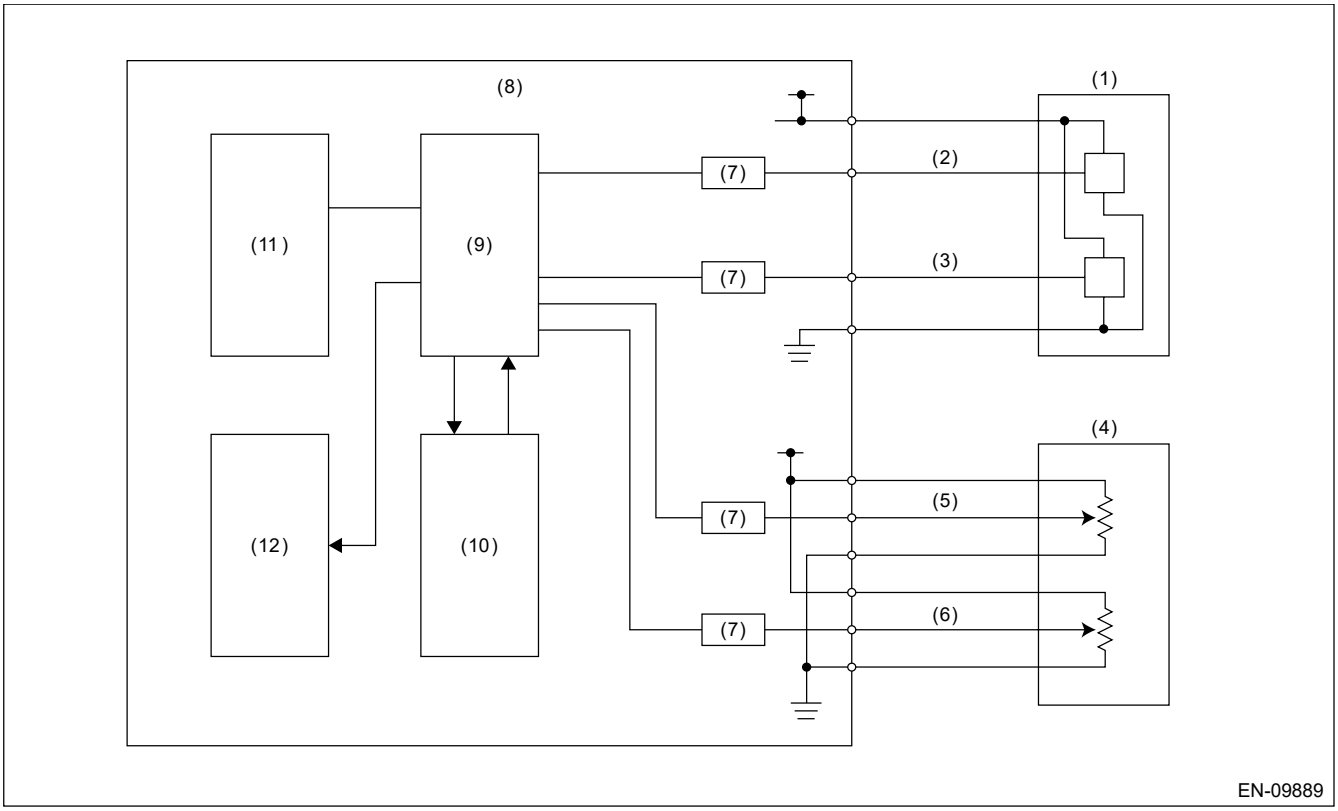
Is the voltage less than 1 V?

Yes	Check the connector for poor contact and check the harness. Replace the ECM if no fault is found. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in ground circuit** • **Loose engine ground terminal**

1. OUTLINE OF DIAGNOSIS

Judge as NG when the CPU operation is abnormal.
(1) Instruction check
(2) Software flow check
(3) Software monitor check
(4) If the output IC operation is abnormal
(5) CAN register check
(6) Disable control module function
(7) self check
(8) Register monitoring
(9) Power monitor

2. COMPONENT DESCRIPTION



(1) Throttle position sensor
(2) Throttle position sensor 1
(3) Throttle position sensor 2
(4) Accelerator pedal position sensor
(5) Accelerator pedal position sensor 1
(6) Accelerator pedal position sensor 2
(7) I/F circuit
(8) Engine control module (ECM)
(9) CPU
(10) Monitoring IC
(11) EEPROM
(12) Output IC

3. EXECUTION CONDITION

Secondary parameters	Execution condition
(1) — 1 Initial routine	ON
(1) — 2 Ignition switch	ON
(2) Ignition switch	ON
(3) Ignition switch	ON
(3) Battery voltage	6 V or more
(3) Electronic throttle control MOSFET	ON
(4) Ignition switch	ON
(5) Initial routine	ON
(6) Battery voltage	6V or more
(6) CPU intentionally sends a motor cut-off command	ON
(7) ECM initialization	RUN

Secondary parameters	Execution condition
(8) Ignition switch	ON
(9) Time elapsed after engine start	1 s or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
(1) Instruction value	Different from expected value
(2) Process flow result	The result and expected value do not match.
(3) High integrated IC motor continuity cut demand	ON
(4) Communication between output driver ICs	Communication failure
(5) Writing value to CAN register	Not equal to the reading value
(6) Absolute throttle position - Absolute throttle position memory when monitoring	1.6 % or more
(7) Data written in CPU	Not equal to expected value
(8) Data written in register	Not equal to the reading value
(9) Diagnostic value Formula when sampling time is 8 ms DV = Σ[(Actual engine power - target engine power) - Map]	1900 kw or more

Map

Vehicle speed km/h (MPH)	0(0)	10 (6.25)	20 (12.5)	30 (18.75)	40(25)	50 (31.25)	60 (37.5)	70.4 (43.75)	80.5(50)	91 (56.25)	101 (62.5)
Engine output (kw)	26	26	26	26	30	40	60	85	120	160	200

Time needed for diagnosis:
(1) — 1: 2 times
(1) — 2:8time(s)
(2): 504ms
(3): 48ms
(4): 2500ms
(5): Less than 1 s
(6): 24ms
(7) 2 times
(8) 64time(s)
(9) Less than 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

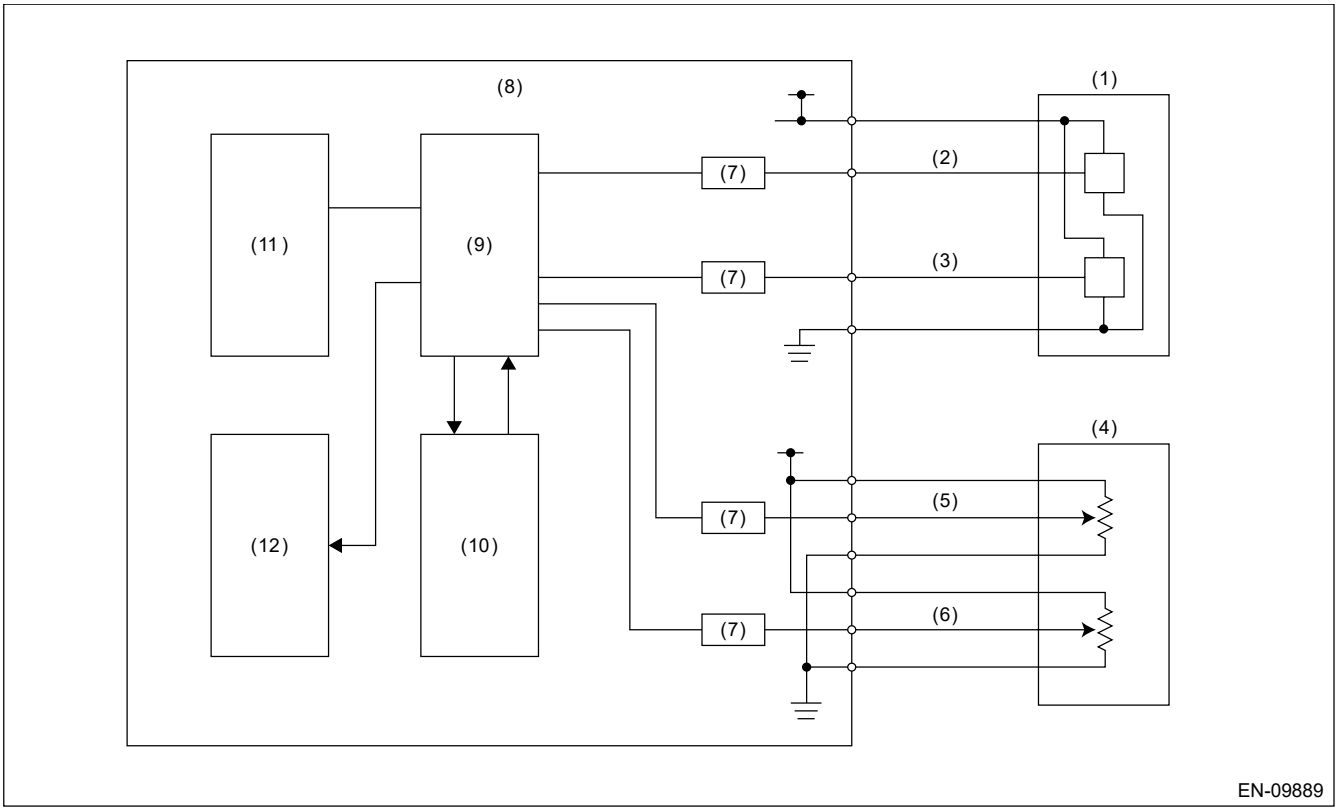
DTC P060A INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE

Note:
For the diagnostic procedure, refer to DTC P0606. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the monitoring IC operation is abnormal.
(1) Monitoring IC Disable (motor continuity cut demand) diagnosis
(2) Monitoring IC register diagnosis
(3) Self test

2. COMPONENT DESCRIPTION



(1) Throttle position sensor
(2) Throttle position sensor 1
(3) Throttle position sensor 2
(4) Accelerator pedal position sensor
(5) Accelerator pedal position sensor 1
(6) Accelerator pedal position sensor 2
(7) I/F circuit
(8) Engine control module (ECM)
(9) CPU
(10) Monitoring IC
(11) EEPROM
(12) Output IC

3. EXECUTION CONDITION

Secondary parameters	Execution condition
(1) Battery voltage	6V or more
(1) When CPU intentionally sends motor continuity cut demand	
(2) Battery voltage	6V or more
(3) ECM initialization	RUN

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when one of the following conditions is established.

Judgment value

Malfunction Criteria	Threshold Value
(1) Main throttle opening angle – Main throttle opening angle at monitoring start	1.6% or more
(2) Monitoring IC register writing value	Not equal to the reading value
(3) Self test	Detect

Time needed for diagnosis:
(1): 24ms
(2): 200 ms
(3): 2 times
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

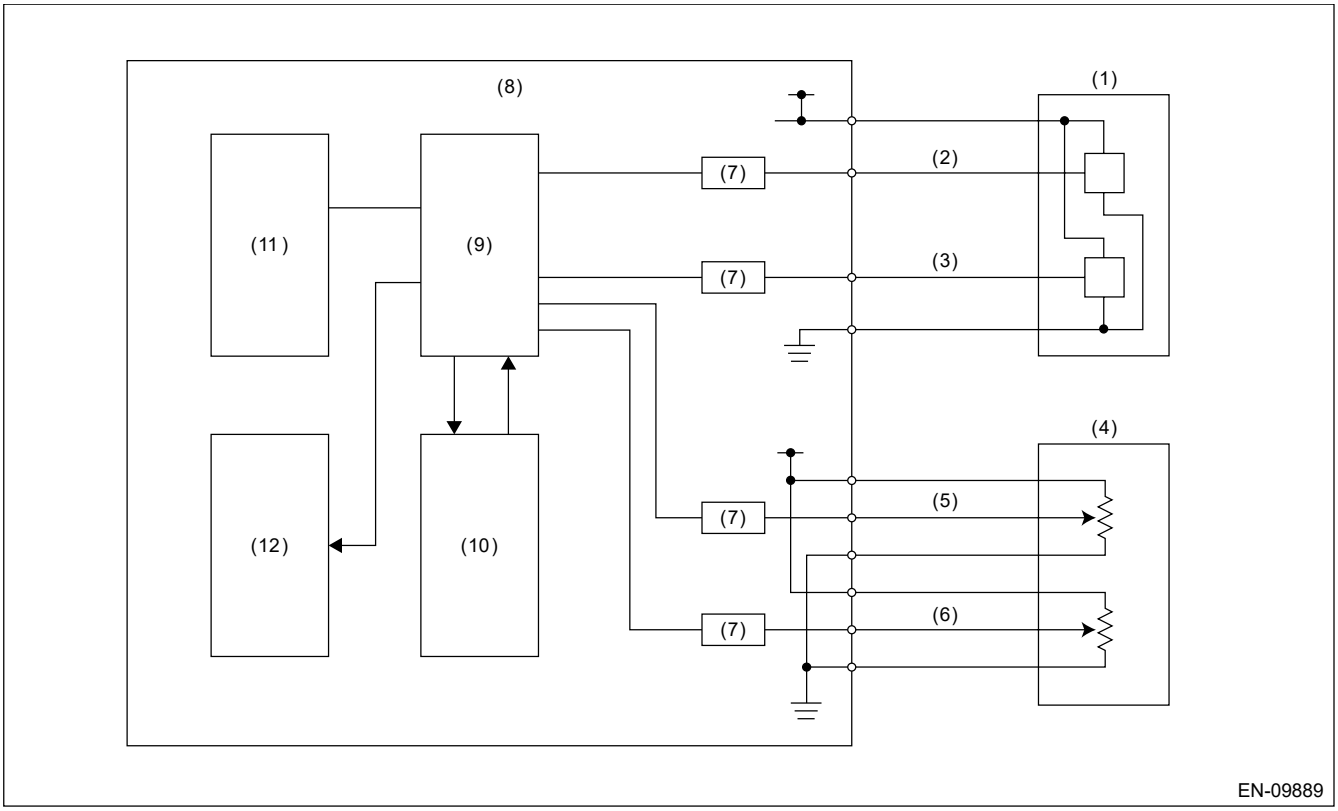
DTC P060B INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE

Note:
For the diagnostic procedure, refer to DTC P0606. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the AD converter operation is abnormal.
(1) Low voltage input test
(2) High voltage input test
(3) Middle voltage input test
(4) Inner power supply voltage check

2. COMPONENT DESCRIPTION



(1) Throttle position sensor
(2) Throttle position sensor 1
(3) Throttle position sensor 2
(4) Accelerator pedal position sensor
(5) Accelerator pedal position sensor 1
(6) Accelerator pedal position sensor 2
(7) I/F circuit
(8) Engine control module (ECM)
(9) CPU
(10) Monitoring IC
(11) EEPROM
(12) Output IC

3. EXECUTION CONDITION

Secondary parameters	Execution condition
(1) Battery voltage	6V or more
(1) Target A/D voltage	Equal to 0 V
(2) Battery voltage	6V or more
(2) Target A/D voltage	Equal to 5 V
(3) Battery voltage	6V or more
(3) Target A/D voltage	Equal to 1.2 V
(4) Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
(1) Monitoring A/D voltage	More than 0.02 V
(2) Monitoring A/D voltage	Less than 4.98 V
(3) Monitoring A/D voltage	Less than 1.1 V or More than 1.4 V
(4) Inner power supply voltage/2	Less than 1.819 V or More than 3 V

Time needed for diagnosis:

(1): 200ms

(2): 200ms

(3): 200ms

(4): 200ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0616 STARTER RELAY "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

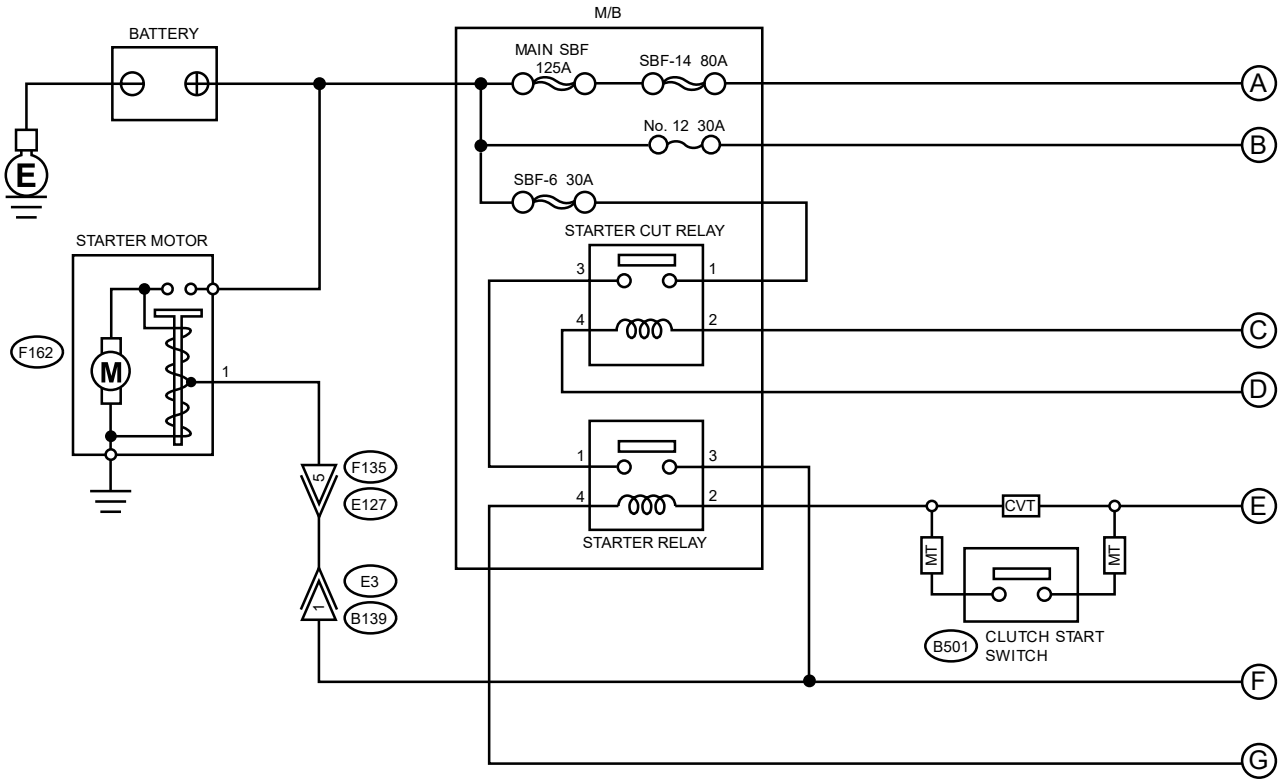
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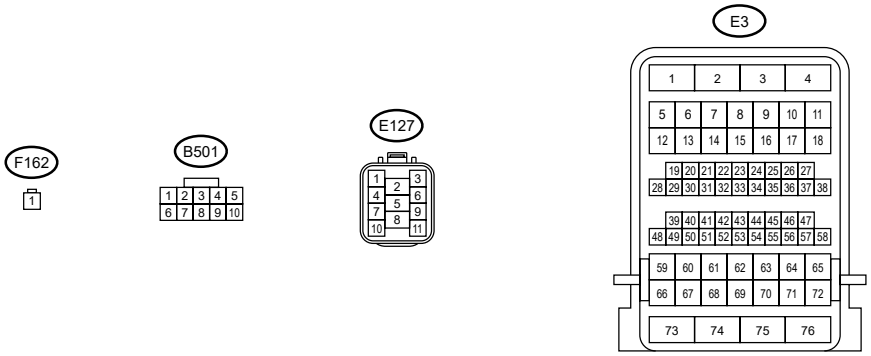
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

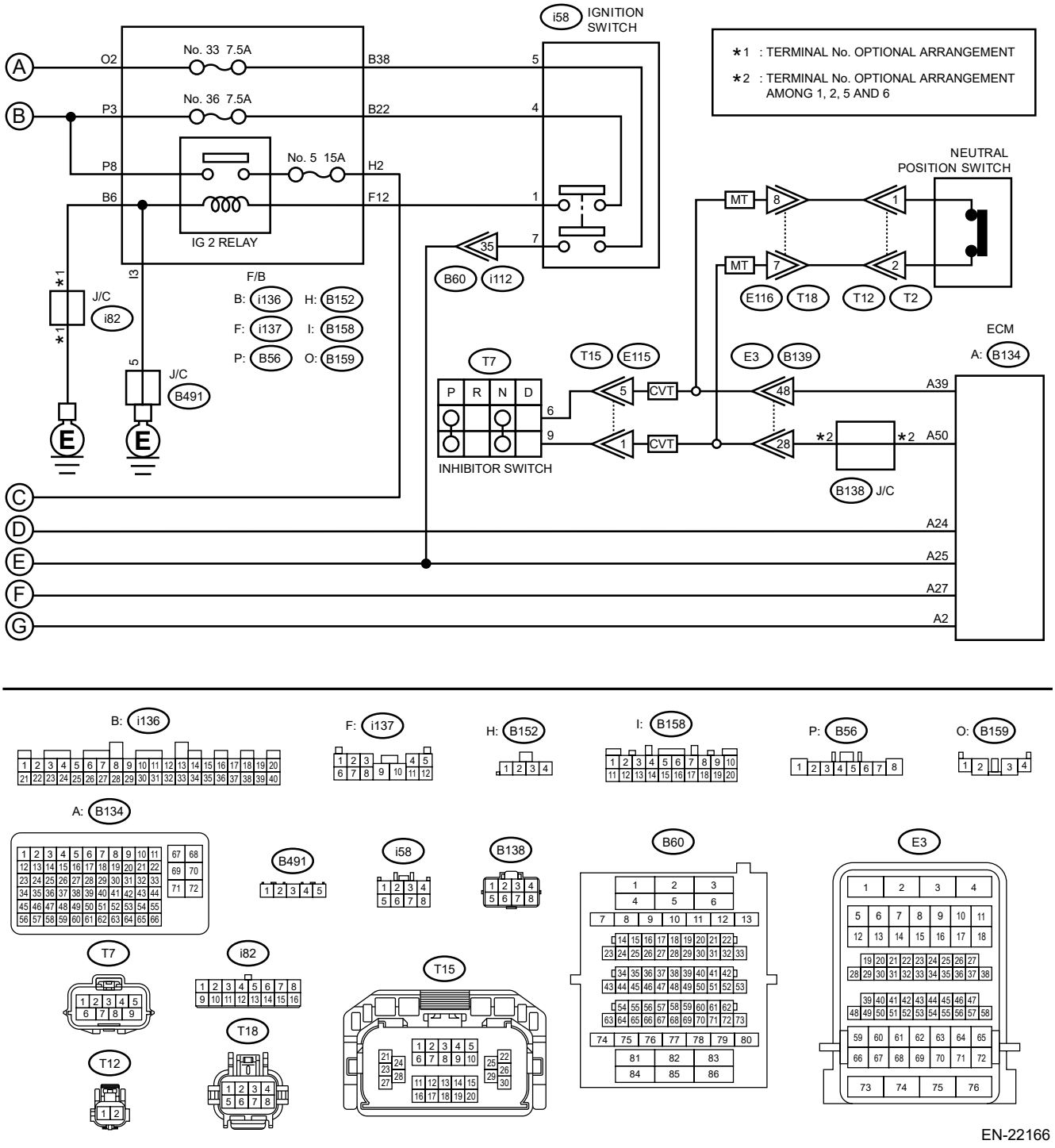
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

- Model without push button start


M/B
BATTERY
MAIN SBF
125A
SBF-14 80A
No. 12 30A
SBF-6 30A
STARTER CUT RELAY
STARTER MOTOR
F162
M
1
F135
E127
E3
B139
STARTER RELAY
CVT
MT
MT
B501
CLUTCH START
SWITCH
A
B
C
D
E
F
G

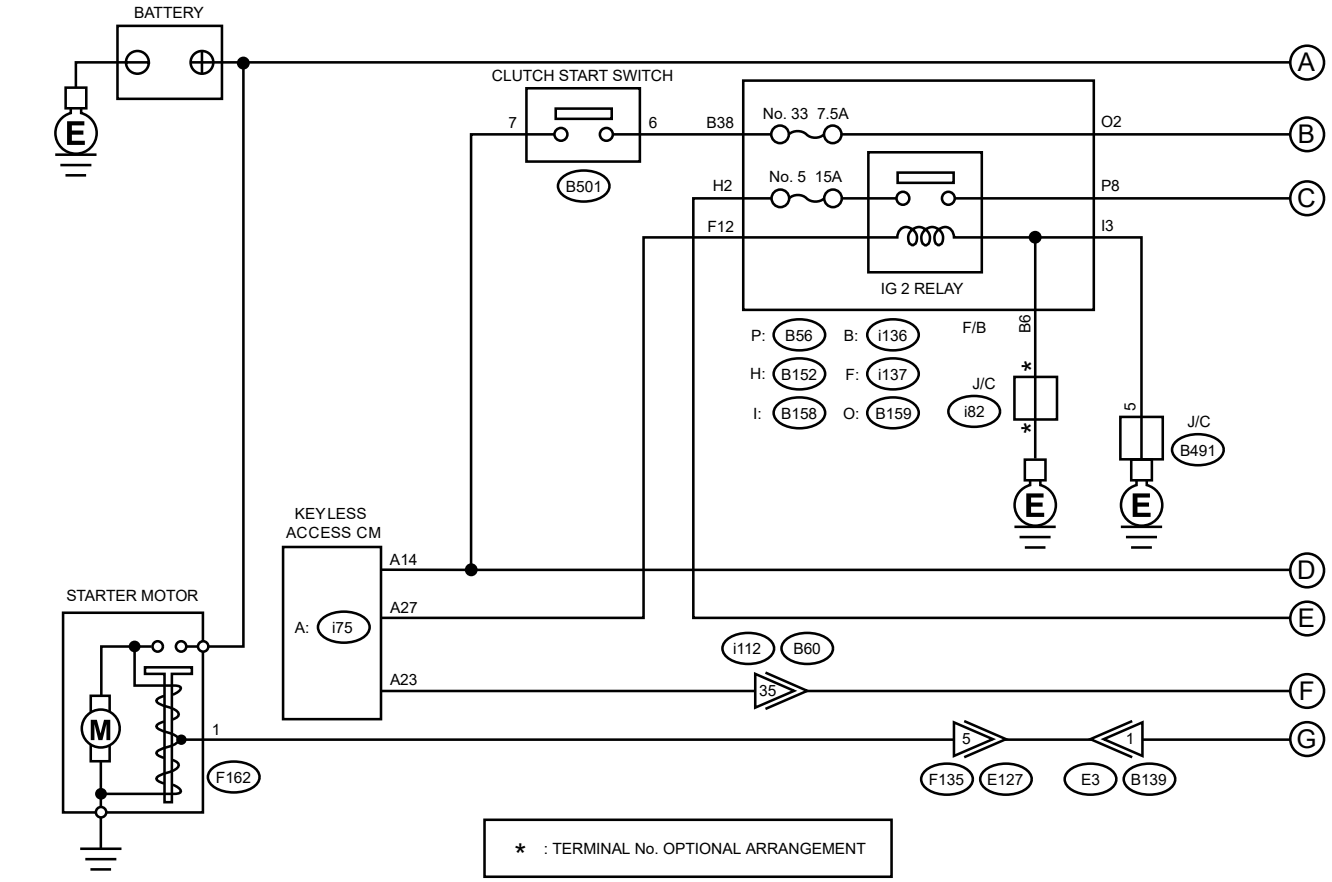

F162
B501
E127
E3

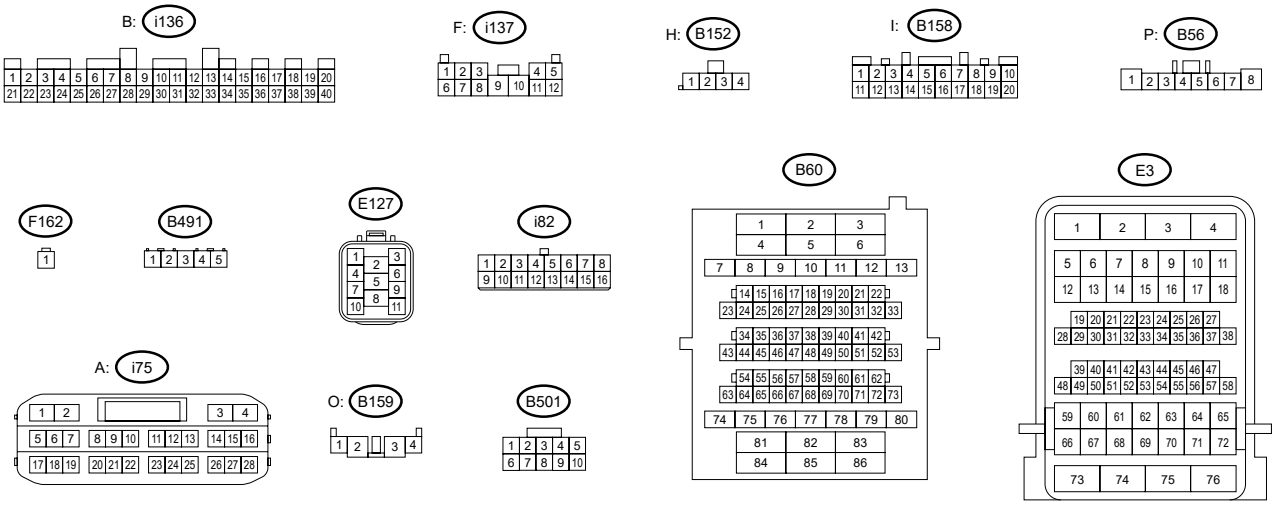
EN-22165



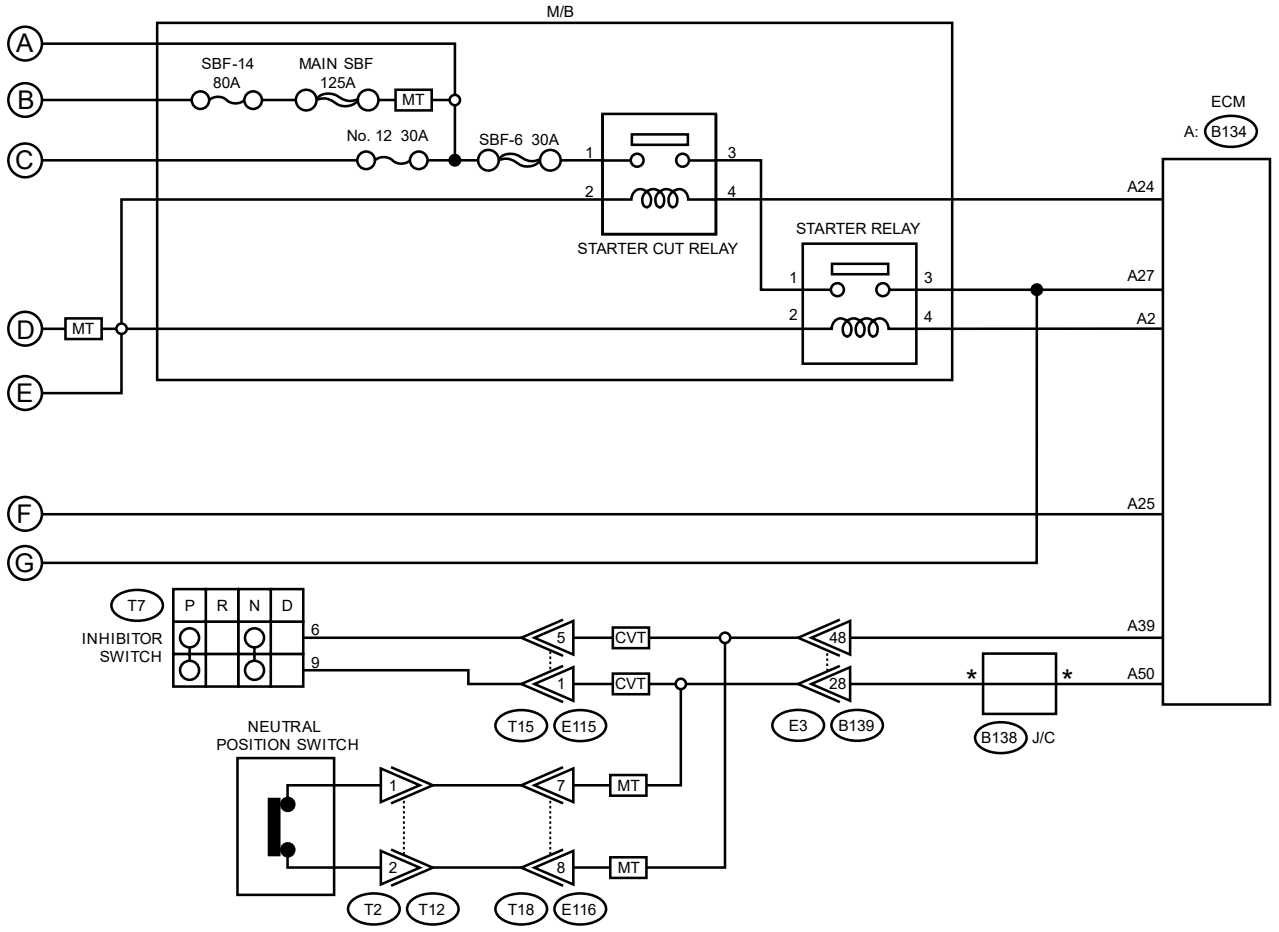
EN-22166

- Model with push button start

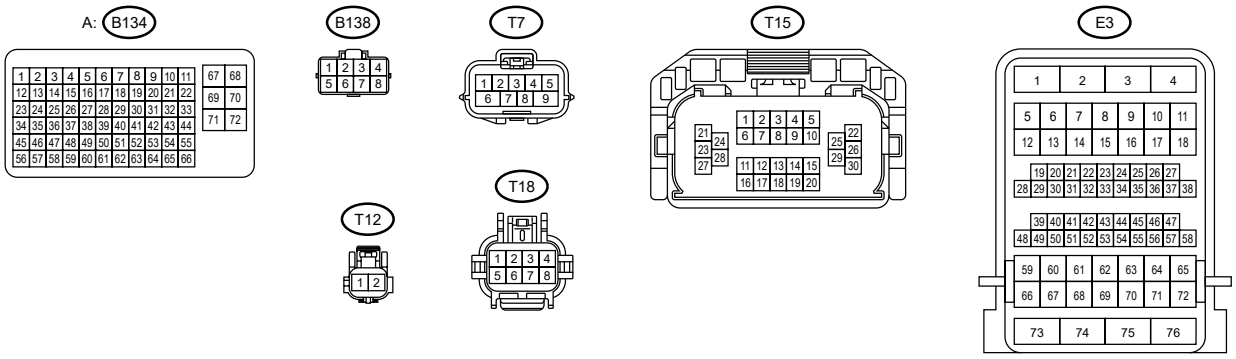

BATTERY
CLUTCH START SWITCH
7
6
B501
B38
No. 33 7.5A
O2
H2
No. 5 15A
P8
F12
I3
IG 2 RELAY
P: B56
B: i136
H: B152
F: i137
I: B158
O: B159
F/B
B6
J/C
i82
5
J/C
B491
KEYLESS ACCESS CM
A14
A27
A23
A: i75
i112
B60
35
STARTER MOTOR
1
F162
5
1
F135
E127
E3
B139
A
B
C
D
E
F
G
* : TERMINAL No. OPTIONAL ARRANGEMENT


B: i136
F: i137
H: B152
I: B158
P: B56
F162
B491
E127
i82
B60
E3
A: i75
O: B159
B501

EN-22167



* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6



EN-22168

1. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter relay.
4. Measure the resistance of harness between ECM connector and starter relay connector.
   Connector & terminal
   (B134) No. 27 — M/B No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and starter relay connector.

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (SHORT TO GROUND).

1. Disconnect the connector from starter motor.
2. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 27 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of ECM connector.
No	Repair the short circuit to ground in harness between ECM connector and starter relay connector.

1. OUTLINE OF DIAGNOSIS

- Model without push button start
  Detect abnormal continuity in the starter SW1.
  Judge as OFF NG when the starter SW 1 signal remains OFF.
- Model with push button start
  Detect abnormal continuity in the starter SW 2.
  Judge as OFF NG when the starter SW 2 signal remains OFF.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more

Secondary parameters	Execution condition
Engine speed	Increases from 0 rpm to 500 rpm or more
Vehicle speed	Less than 1km/h (0.6MPH)
Starter relay command	ON

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as OFF NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW signal of 4 V or more	Not detected

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0617 STARTER RELAY "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

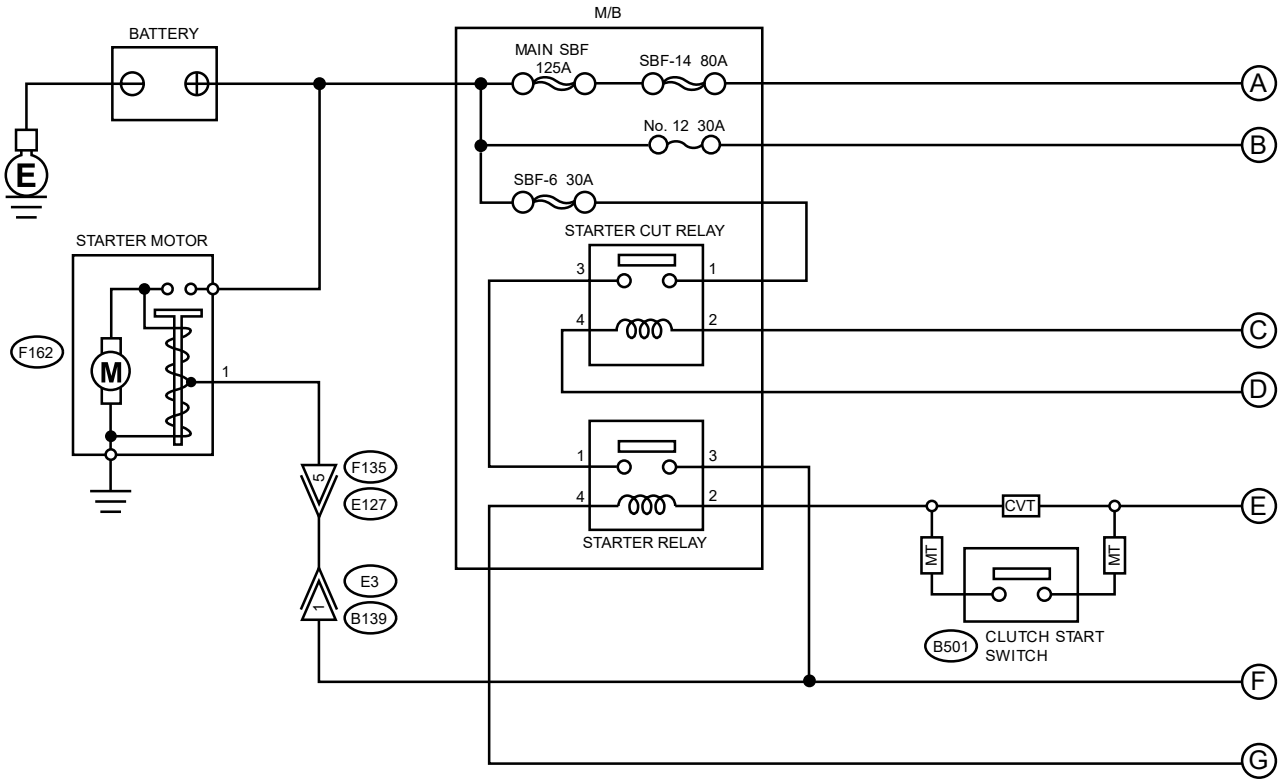
Note:

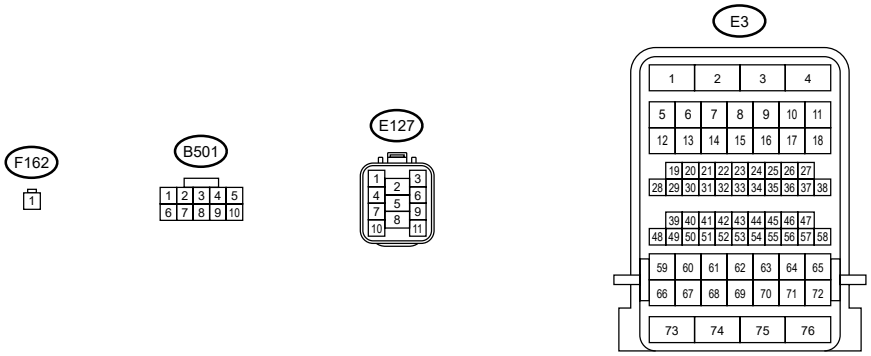
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

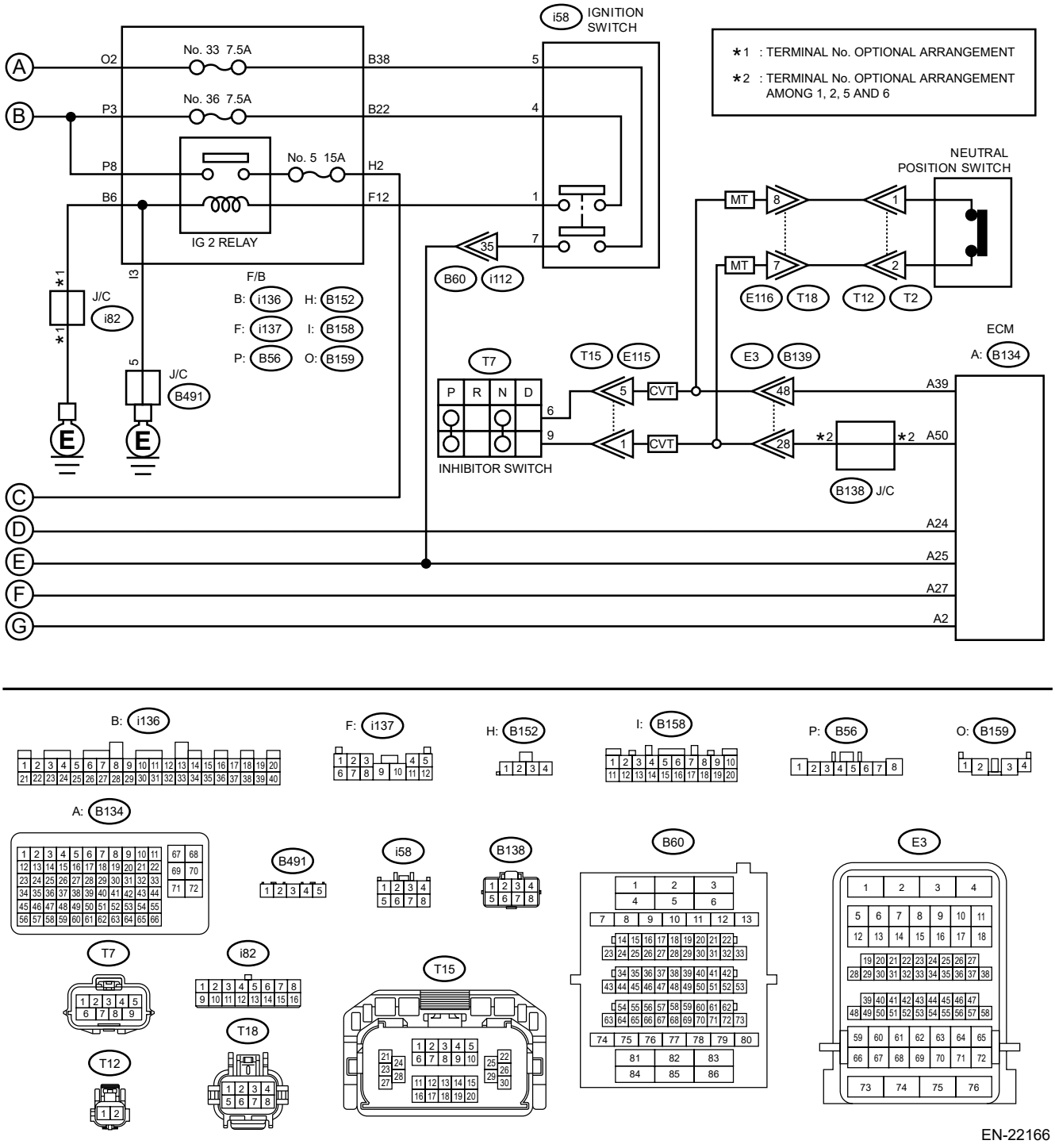
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

- Model without push button start


M/B
BATTERY
MAIN SBF
125A
SBF-14 80A
No. 12 30A
SBF-6 30A
STARTER CUT RELAY
STARTER MOTOR
F162
M
1
F135
E127
E3
B139
STARTER RELAY
CVT
MT
MT
B501
CLUTCH START
SWITCH
A
B
C
D
E
F
G

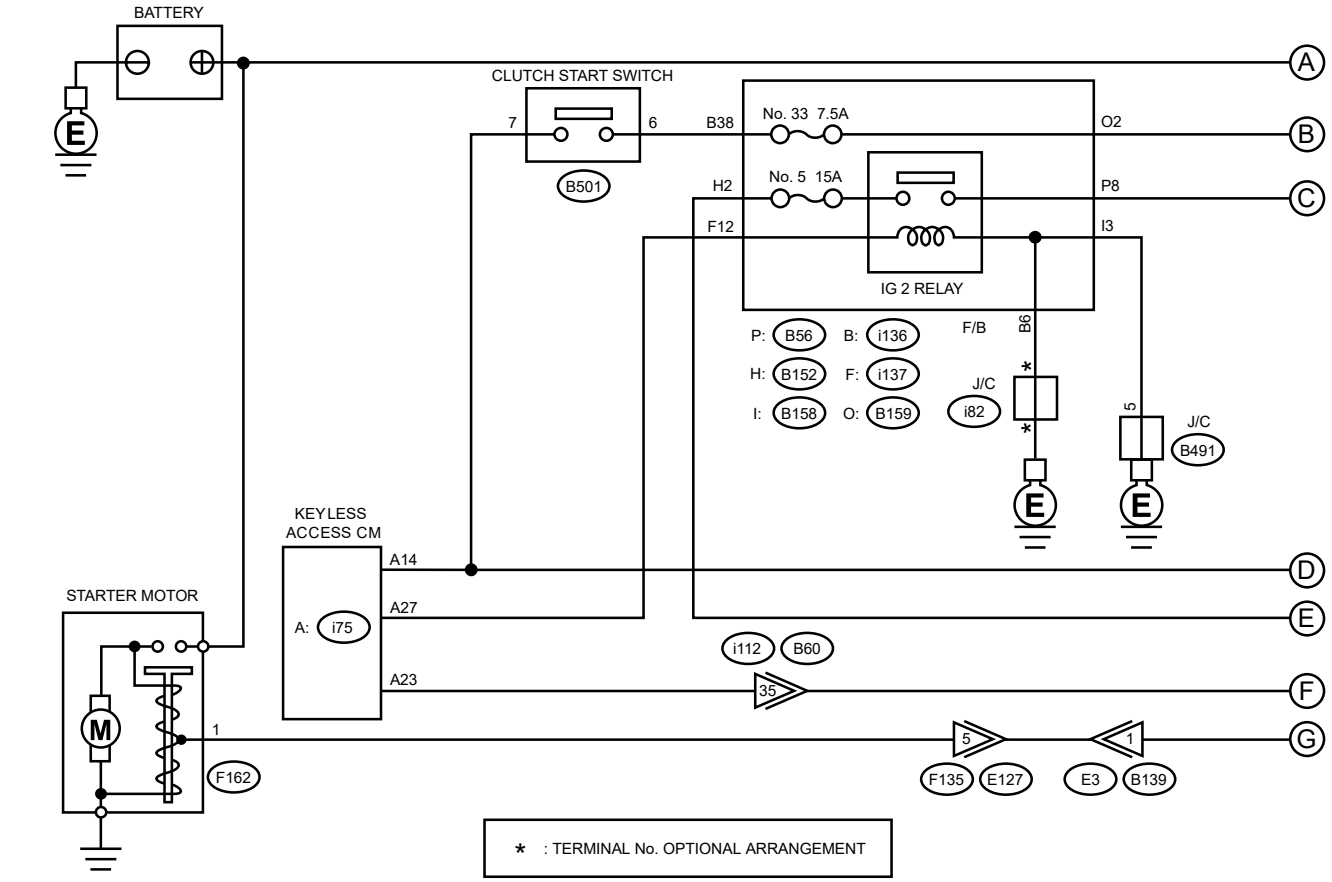

F162
B501
E127
E3

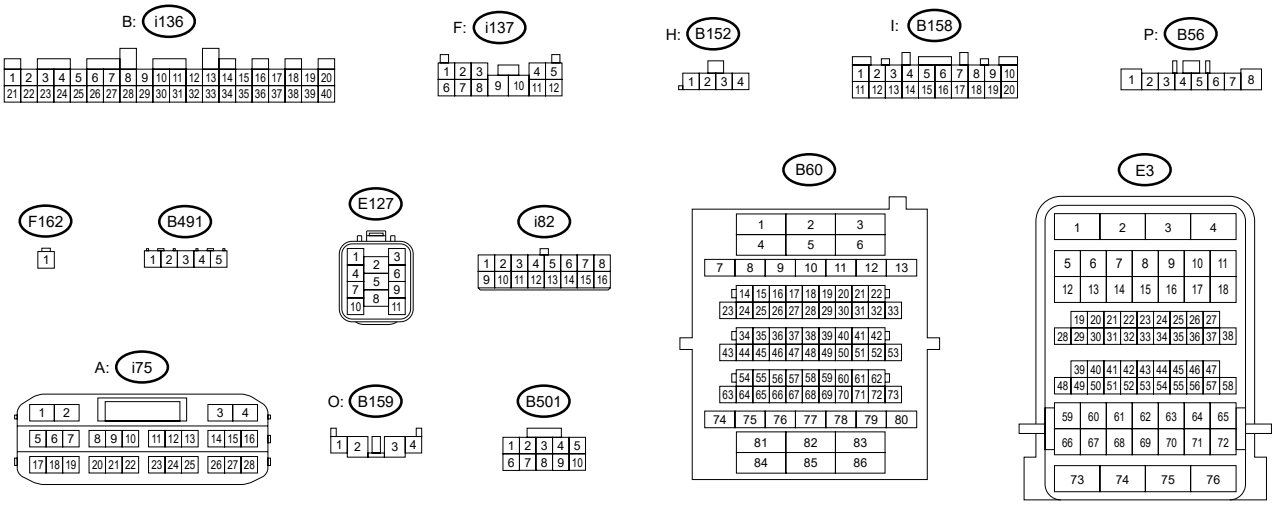
EN-22165



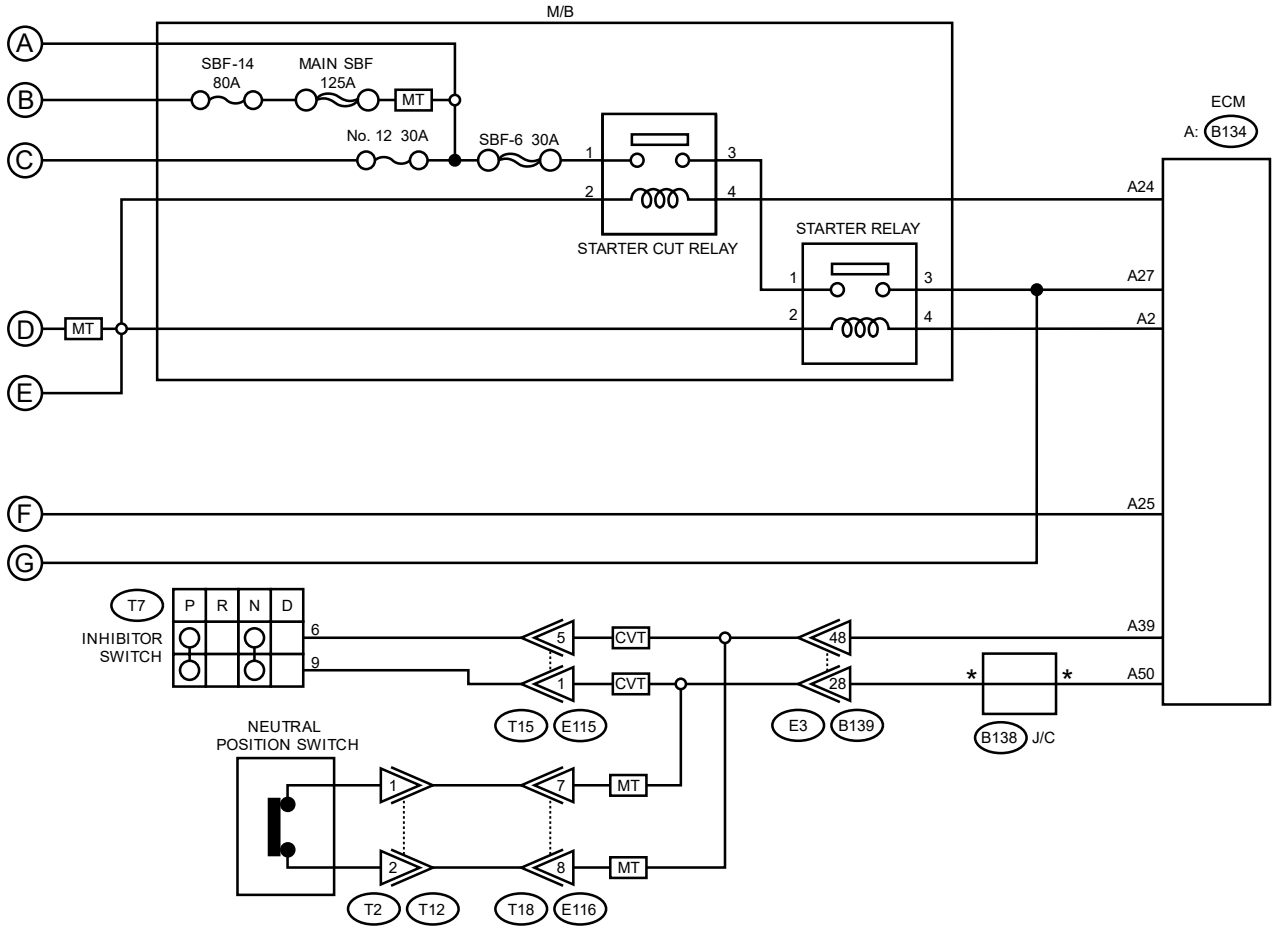
EN-22166

- Model with push button start

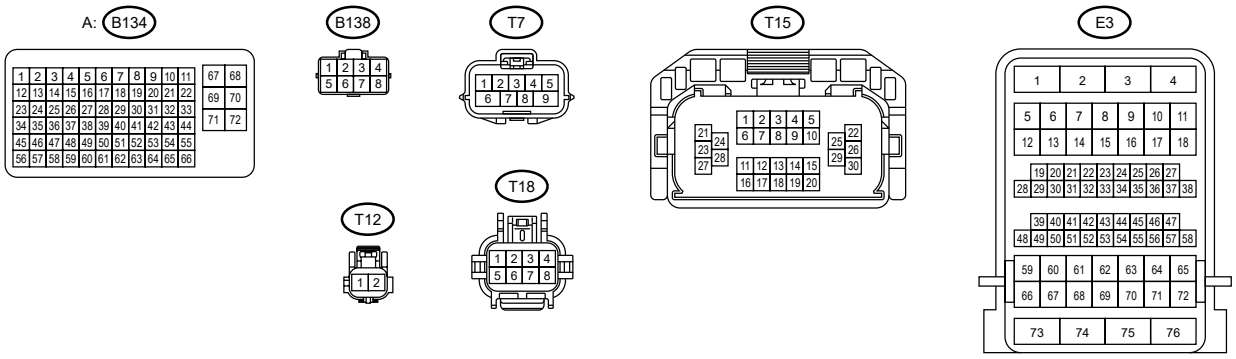

BATTERY
CLUTCH START SWITCH
7
6
B501
B38
No. 33 7.5A
O2
H2
No. 5 15A
P8
F12
I3
IG 2 RELAY
P: B56
B: i136
H: B152
F: i137
I: B158
O: B159
F/B
B6
J/C
i82
5
J/C
B491
KEYLESS ACCESS CM
A14
A27
A23
A: i75
i112
B60
35
STARTER MOTOR
1
F162
5
1
F135
E127
E3
B139
A
B
C
D
E
F
G
* : TERMINAL No. OPTIONAL ARRANGEMENT


B: i136
F: i137
H: B152
I: B158
P: B56
F162
B491
E127
i82
B60
E3
A: i75
O: B159
B501

EN-22167



* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6



EN-22168

1. CHECK DTC.

Read the DTC of engine using the Subaru Select Monitor or a general scan tool. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Is DTC other than P0617 displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND STARTER RELAY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 27 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and starter relay connector.
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

- Model without push button start
  Detect abnormal continuity in the starter SW1.
  Judge as ON NG when the starter SW 1 signal remains ON.
- Model with push button start
  Detect abnormal continuity in the starter SW 2.
  Judge as ON NG when the starter SW 2 signal remains ON.

2. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Battery voltage	8V or more
Engine speed	More than 500 rpm
Starter relay command	OFF

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Starter SW signal	4 V or more

Time needed for diagnosis: 30000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P062D FUEL INJECTOR DRIVER CIRCUIT PERFORMANCE BANK 1

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Engine does not start.
- Engine stall

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P062D displayed?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel injector circuit function.
Judge as NG when ECM with two fuel injectors or more detects any malfunction in the diagnostic items listed below.

Diagnostic item	Malfunction Criteria
Overcurrent	Fuel injector current is high.
Low current	Fuel injector current is low.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Elapsed time after starting the engine	0.1 s or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

CHARGE INCOMPLETE MALFUNCTION

Judgment value

Malfunction Criteria	Threshold Value
Monitoring value of charge voltage inside direct injection drive IC	18 V or less

OVER-CHARGE MALFUNCTION

Judgment value

Malfunction Criteria	Threshold Value
Monitoring value of charge voltage inside direct injection drive IC	80 V or more

Time needed for diagnosis: 0.04 s or more (depending on engine speed)
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

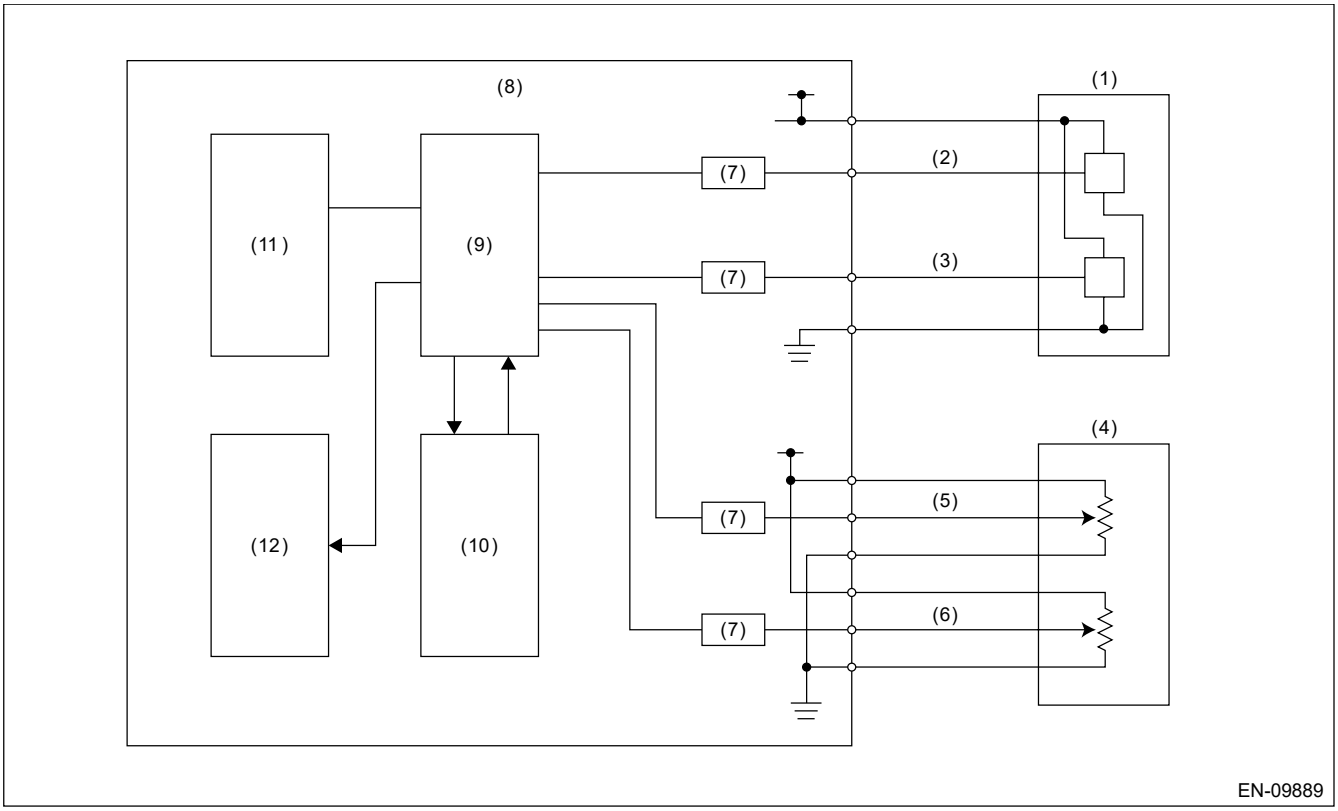
Note:

For the diagnostic procedure, refer to DTC P0606. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0606 CONTROL MODULE PROCESSOR.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the EEPROM operation is abnormal.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor
(2) Throttle position sensor 1
(3) Throttle position sensor 2
(4) Accelerator pedal position sensor
(5) Accelerator pedal position sensor 1
(6) Accelerator pedal position sensor 2
(7) I/F circuit
(8) Engine control module (ECM)
(9) CPU
(10) Monitoring IC
(11) EEPROM
(12) Output IC

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Perform the diagnosis during self shut.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Writing result to EEPROM	Malfunction

Time needed for diagnosis: When detected 2 times

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P065A GENERATOR/ALTERNATOR SYSTEM PERFORMANCE

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.
Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK V-BELT.

Check the V-belt. Ref. to MECHANICAL(H4DO)>V-belt>INSPECTION.

Is the V-belt free from any breakage?

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.
No	Replace the V-belt. Ref. to MECHANICAL(H4DO)>V-belt.

1. OUTLINE OF DIAGNOSIS

Judge as NG when detecting no rotation of the generator (mechanical malfunction such as belt breakage), or internal electrical malfunction.

2. COMPONENT DESCRIPTION

To secure the vehicle power supply, the generator varies the generation amount according to EGI command.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1 LIN communication schedule in progress (mechanical malfunction warning) Diagnosis 2	$01

Secondary parameters	Execution condition
LIN communication schedule in progress (electrical malfunction warning)	$01

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1−1	
Internal malfunction flag of generator (mechanical malfunction warning)	ON
Diagnosis 1−2	
Threshold of engine speed in misjudgment mask at IG ON	More than 1550 rpm
Diagnosis 2	
Internal malfunction flag of generator (electrical malfunction warning)	ON

Time needed for diagnosis: 0ms or more (diagnosis 1−1)
Time needed for diagnosis: 512ms or more (diagnosis 1−2)
Time needed for diagnosis: 0ms or more (diagnosis 2 (with 2000 ms delay inside generator))
Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge light illuminates)

DTC P0685 ECM/PCM POWER RELAY CONTROL CIRCUIT/OPEN

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

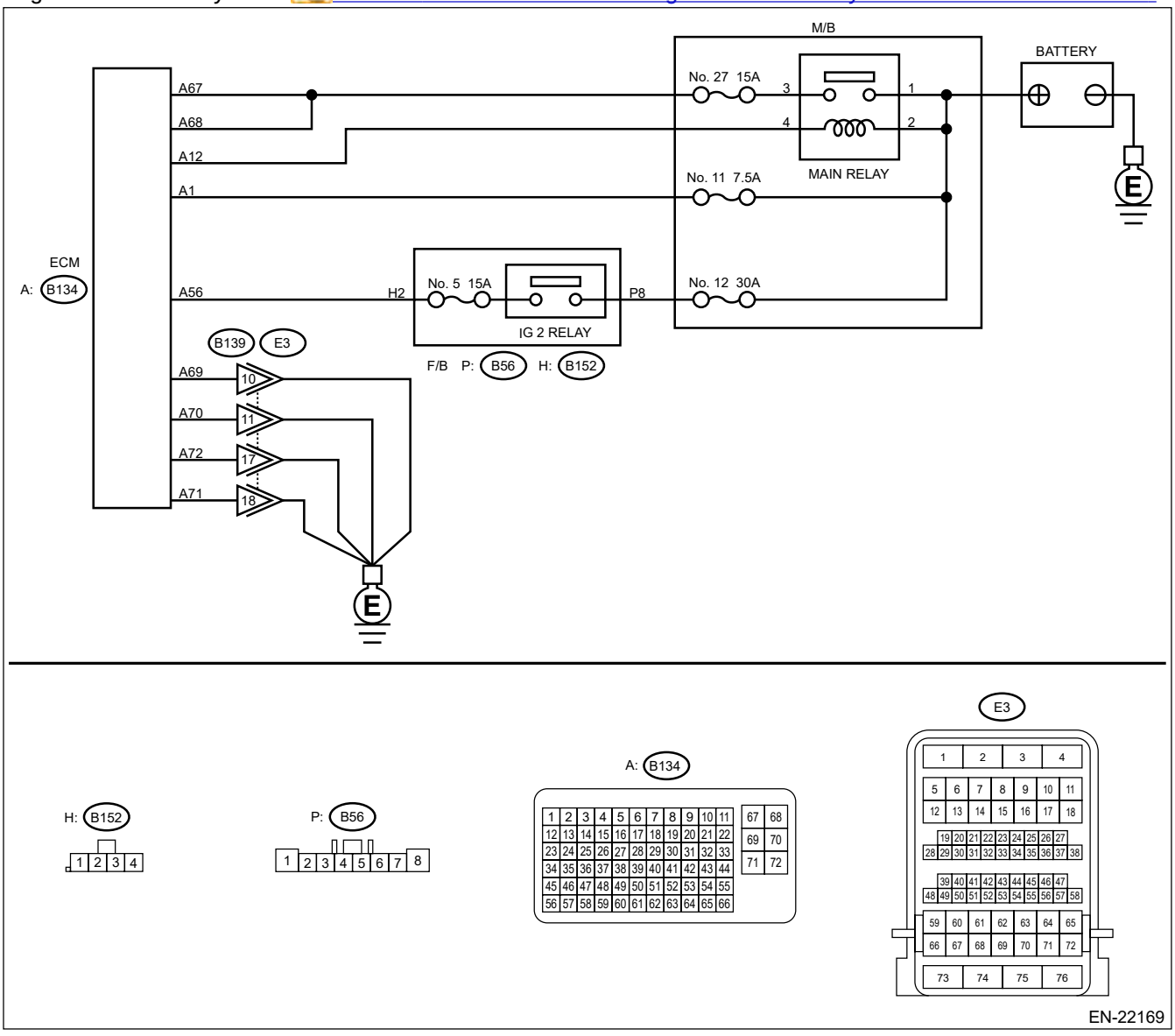
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 2.
No	Connect the ECM connector correctly.

2. CHECK HARNESS BETWEEN ECM AND MAIN RELAY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.

Connector & terminal

(B134) No. 67 (+) — Engine ground (−):

(B134) No. 68 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to power supply in harness between ECM connector and main relay connector** • **Defective main relay**
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND MAIN RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the connector from ECM.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of ECM connector.
No	Repair the short circuit to ground in harness between ECM connector and main relay connector.

1. OUTLINE OF DIAGNOSIS

Detect the main relay stuck to ON.
Judge as NG when ECM keeps operating for more than predetermined time although the main relay does not turn to OFF after ignition switch is turned to OFF.

2. COMPONENT DESCRIPTION

The main relay controls the current in the coil section to switch ON/OFF the ECM by receiving instructions from the ignition switch and Evaporative Leak Check Module.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Main relay	OFF instruction

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the enable conditions are established with the ignition switch OFF → ON.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ECM status	In operation

Time needed for diagnosis: 2500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0700 TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

Note:

For the diagnostic procedure, refer to AT section. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Judge as NG when there is CAN communication with the TCM and there is a MIL lighting request.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
MIL lighting request from TCM	Yes

Time needed for diagnosis: 128ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P081A STARTER DISABLE CIRCUIT LOW

Immediately at fault recognition

Trouble symptom:

Failure of engine to start

Caution:

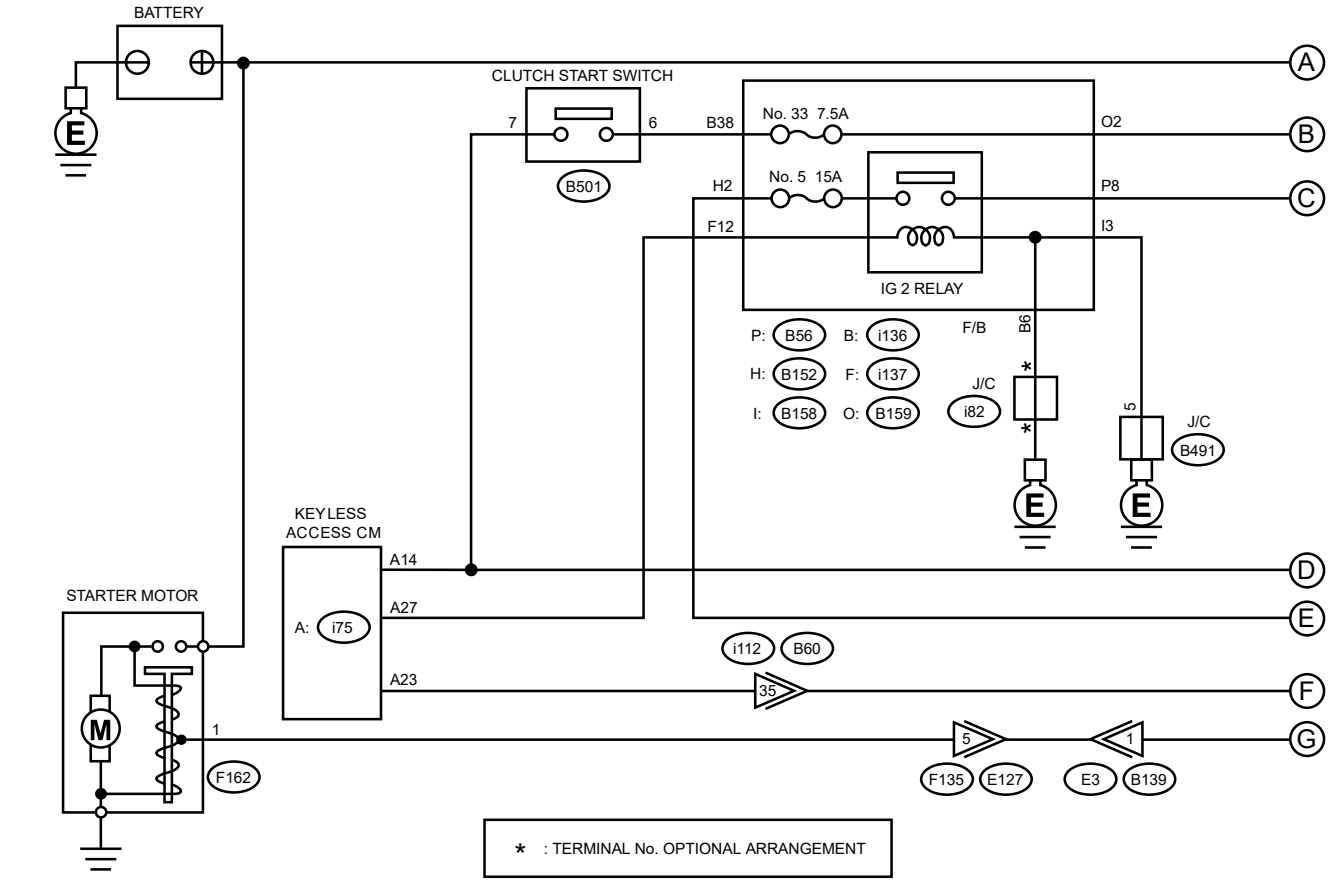
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

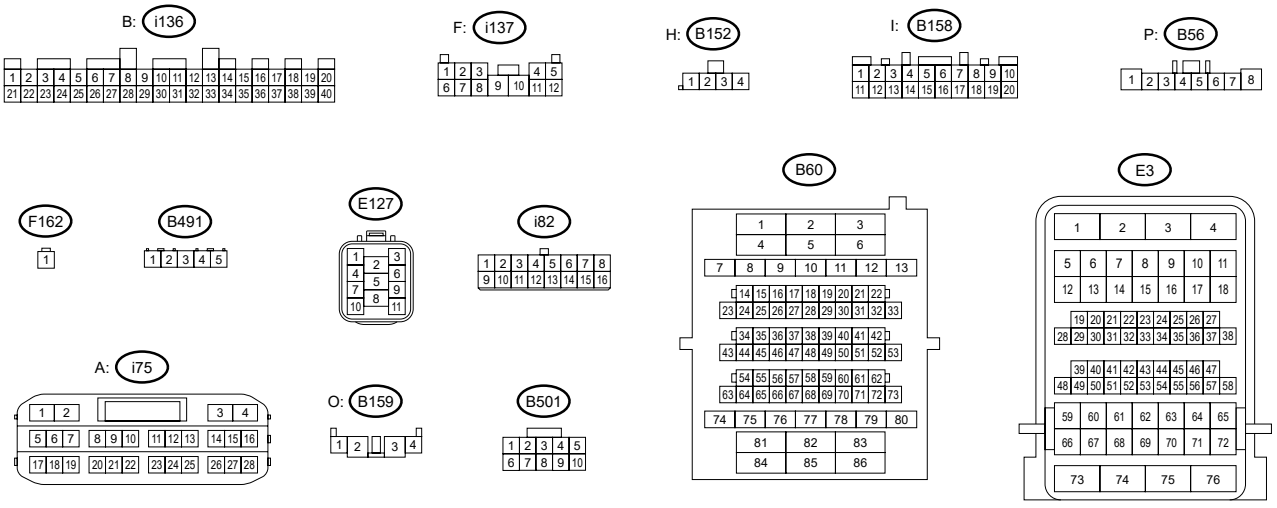
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

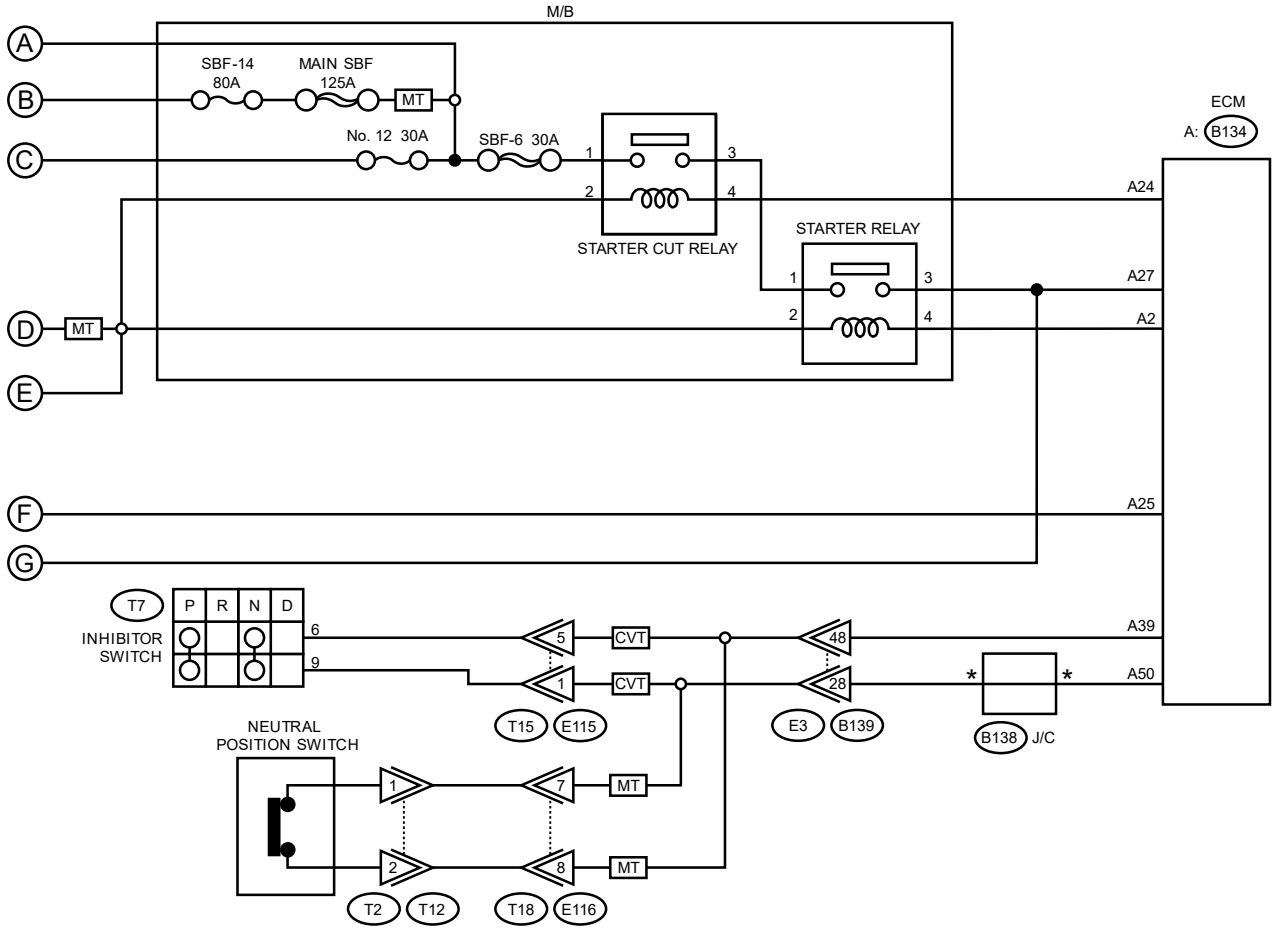
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

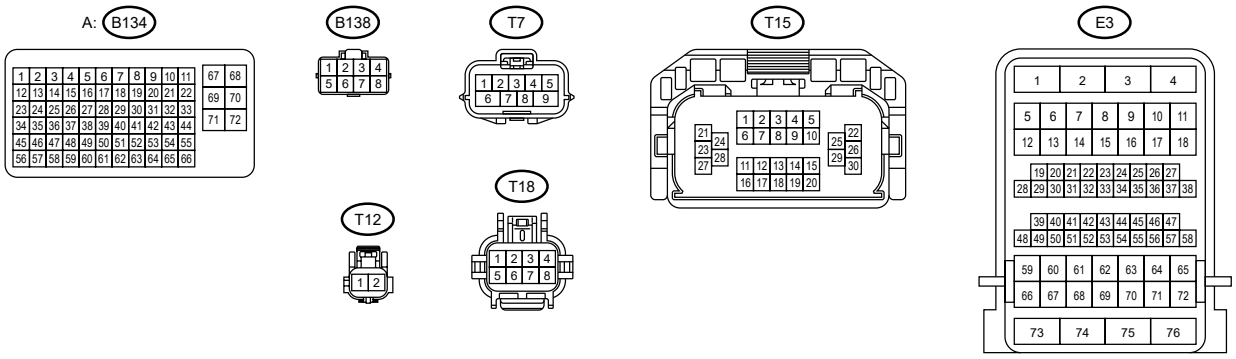

BATTERY
CLUTCH START SWITCH
7
6
B501
B38
No. 33 7.5A
O2
H2
No. 5 15A
P8
F12
I3
IG 2 RELAY
P: B56
B: i136
H: B152
F: i137
I: B158
O: B159
F/B
B6
J/C
i82
5
J/C
B491
KEYLESS ACCESS CM
A14
A27
A23
A: i75
i112
B60
35
STARTER MOTOR
1
F162
5
1
F135
E127
E3
B139
A
B
C
D
E
F
G
* : TERMINAL No. OPTIONAL ARRANGEMENT


B: i136
F: i137
H: B152
I: B158
P: B56
F162
B491
E127
i82
B60
E3
A: i75
O: B159
B501

EN-22167



* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6



EN-22168

1. CHECK HARNESS BETWEEN ECM CONNECTOR AND STARTER CUT RELAY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the starter cut relay.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 24 — Chassis ground:

Is the resistance less than 1 MΩ?

Yes	Go to 2.
No	Repair the short circuit to ground in harness between ECM connector and starter cut relay connector.

2. CHECK HARNESS BETWEEN ECM CONNECTOR AND STARTER CUT RELAY (OPEN).

Measure the resistance of harness between ECM connector and starter cut relay connector.
Connector & terminal
(B134) No. 24 — M/B No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and starter cut relay connector.

3. CHECK STARTER CUT RELAY.

Check the starter cut relay. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Repair the poor contact of ECM connector.
No	Replace the starter cut relay. Ref. to SECURITY AND LOCKS>Relay and Fuse>LOCATION.

1. OUTLINE OF DIAGNOSIS

Detect abnormal continuity in the starter cut relay.
Judge as NG when the starter cut relay output line is open.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	8V or more
Starter cut relay command	OFF

3. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Starter cut relay control voltage	1.7 V or less

Time needed for diagnosis: 2.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0851 PARK/NEUTRAL SWITCH INPUT CIRCUIT LOW

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

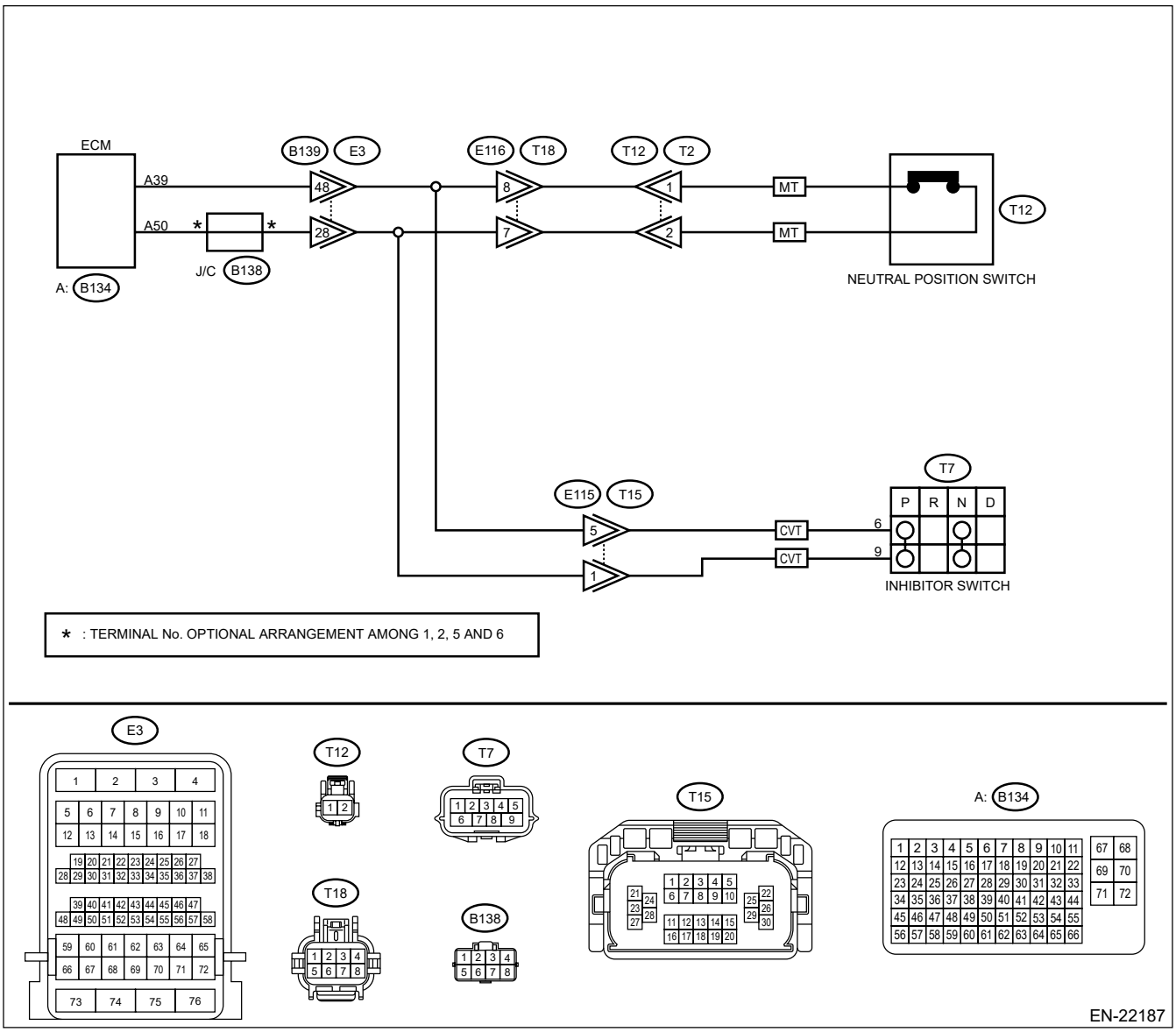
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CVT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK SELECT CABLE.

Check the select cable.

Is there any fault in select cable?

Yes	Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select Cable.
No	Go to 2.

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the select lever in other than “P” range and “N” range.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 39 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the poor contact of ECM connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND TRANSMISSION HARNESS CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from inhibitor switch.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 39 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the inhibitor switch.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to ground in harness between ECM connector and inhibitor switch connector** • **Poor contact of coupling connector**

2. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.
Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

3. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Starter relay feedback voltage	Less than 1.6 V
Data received from TCM	Not equal to “P” range/“N” range

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal	1.2 V or less

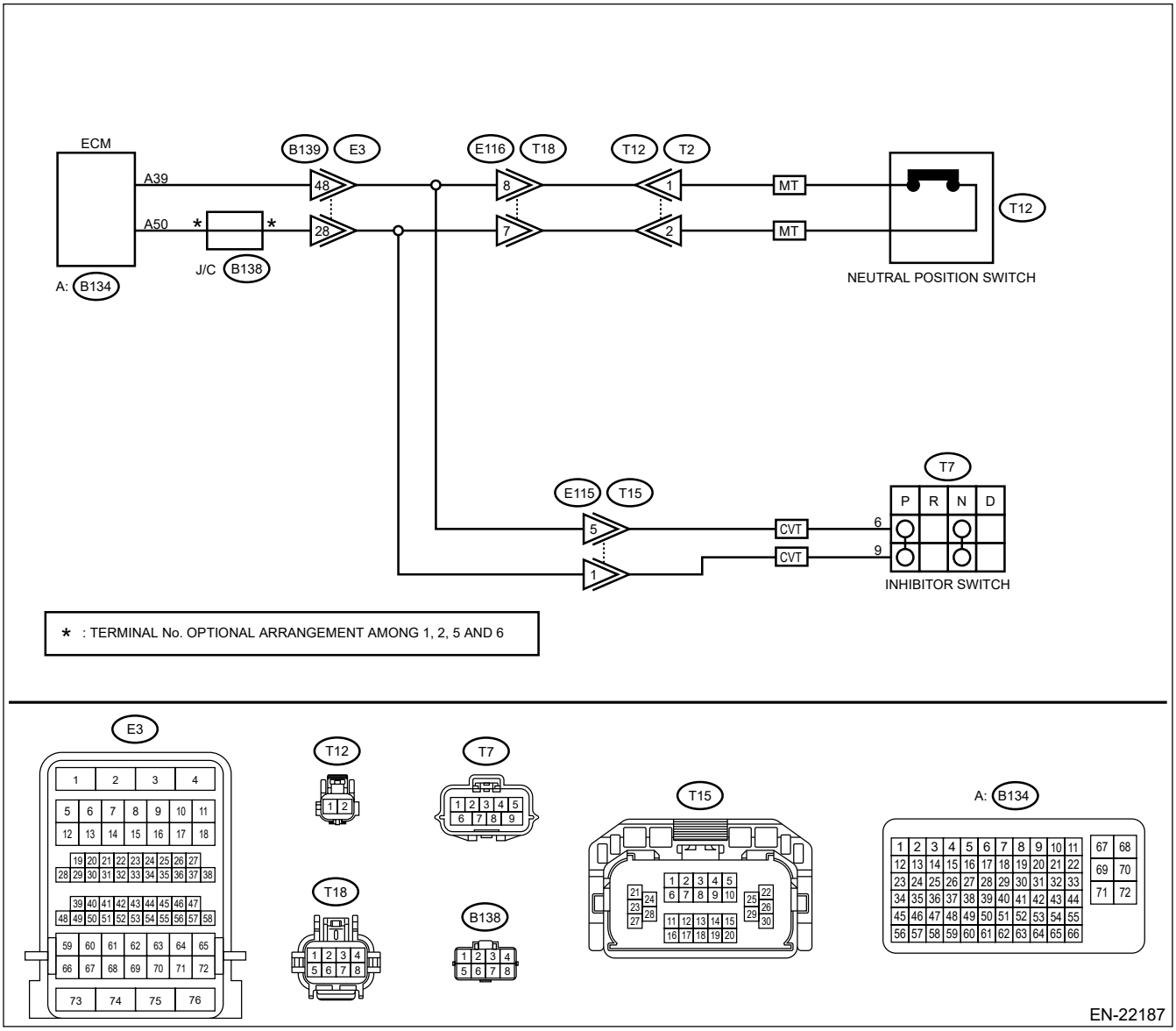
Time needed for diagnosis: 6.4 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. MT model

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the shift lever in a position other than neutral.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 39 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the poor contact of ECM connector.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the neutral position switch.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 39 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.
No	Repair the short circuit to ground in harness between ECM connector and neutral position switch 1 connector.

7. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.
Judge as NG when there is no change in the neutral SW even if the driving shift was applied. (There is neutral SW ON/OFF inversion from the vehicle speed and engine speed.)

8. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
The number of changes from driving condition a) to b)	Equal to 3time(s)
a)	
Vehicle speed	0km/h (0MPH) or less
and	
Engine speed	550rpm or more and 850rpm or less
b)	
Vehicle speed	64km/h (39.8MPH) or more
and	
Engine speed	1550rpm or more and

Secondary parameters	Execution condition
	2100rpm or less

9. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

10. DIAGNOSTIC METHOD

Judge NG when the malfunction criteria below are completed determined times or more after the neutral SW change.

Judgment value

Malfunction Criteria	Threshold Value
Neutral switch output voltage	Battery voltage × 0.19 V or less

Time needed for diagnosis: 3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0852 PARK/NEUTRAL SWITCH INPUT CIRCUIT HIGH

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

Improper idling

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

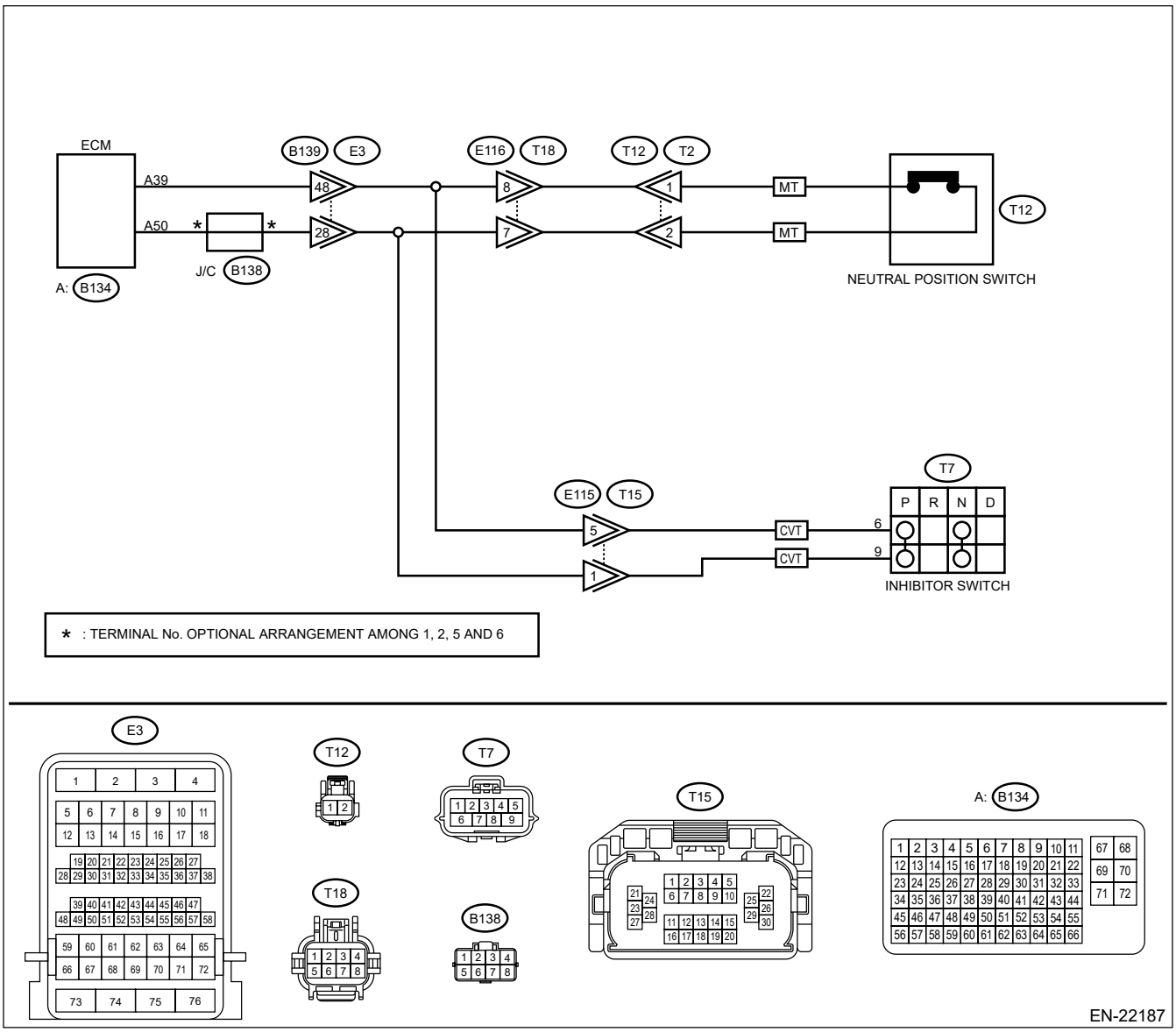
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CVT MODEL

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK SELECT CABLE.

Check the select cable.

Is there any fault in select cable?

Yes	Repair or adjust the select cable. Ref. to CONTROL SYSTEMS>Select Cable.
No	Go to 2.

2. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM and chassis ground with select lever at “P” range and “N” range.
   Connector & terminal
   (B134) No. 39 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Repair the poor contact of ECM connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from inhibitor switch.
4. Measure the resistance of harness between ECM connector and inhibitor switch connector.
   Connector & terminal
   (B134) No. 39 — (T7) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and inhibitor switch connector** • **Poor contact of coupling connector**

4. CHECK INHIBITOR SWITCH GROUND LINE (OPEN).

Measure the resistance of harness between inhibitor switch connector and engine ground.

Connector & terminal

(T7) No. 9 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.
No	Repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between inhibitor switch connector and starter motor ground line**
- **Poor contact of coupling connector**
- **Poor contact of starter motor connector**
- **Poor contact of starter motor ground**
- **Starter motor**

2. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.
Judge as NG when the ECM neutral terminal input differs from the reception data from TCM.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Starter relay feedback voltage	Less than 1.6 V
Data received from TCM	Equal to “P” range/“N” range

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Voltage of the neutral position switch signal	4.5 V or more

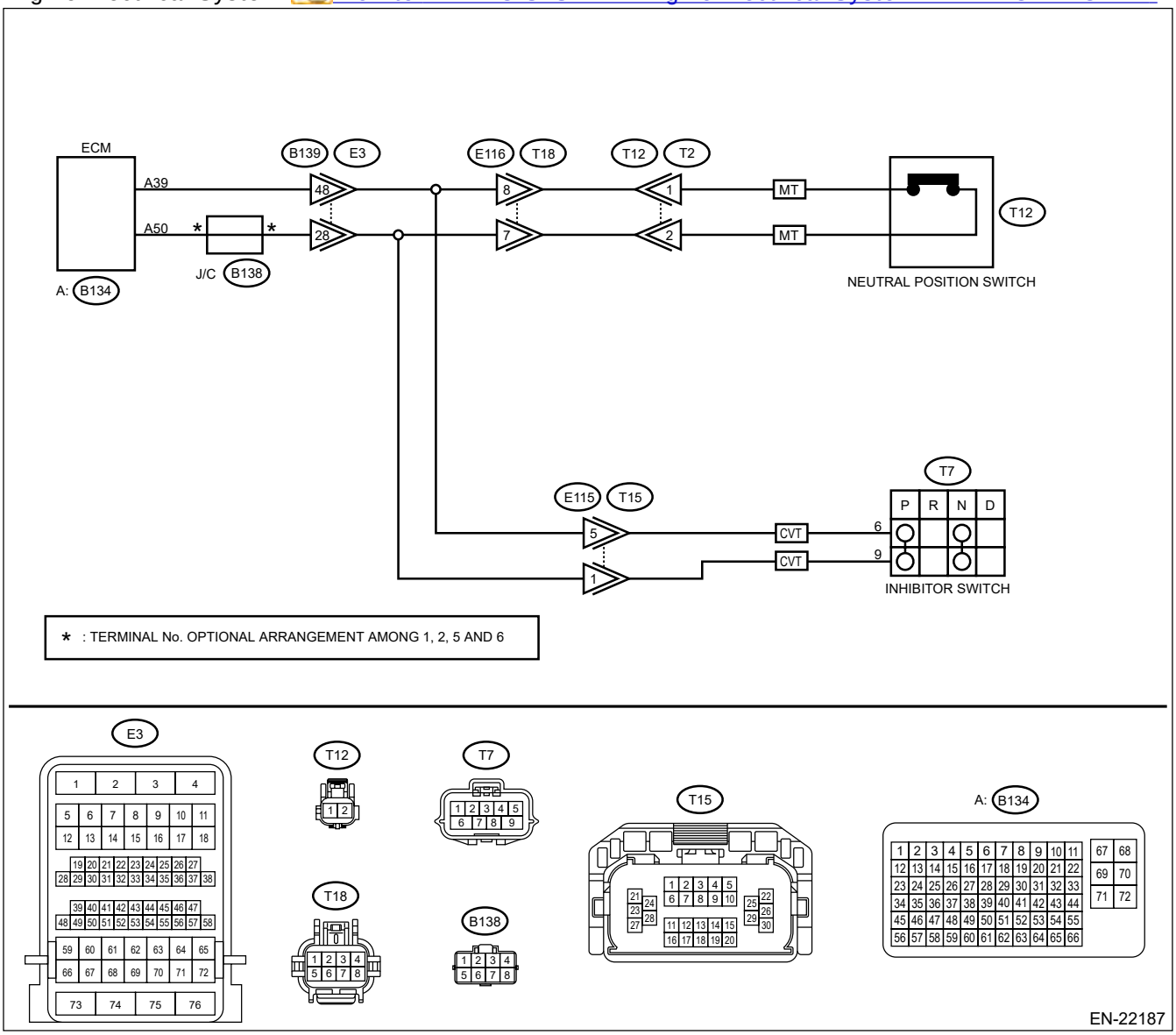
Time needed for diagnosis: 6.4 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

6. MT model

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK INPUT SIGNAL OF ECM.

1. Turn the ignition switch to ON.
2. Place the shift lever in neutral.
3. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Repair the poor contact of ECM connector.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND NEUTRAL POSITION SWITCH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the neutral position switch.
4. Measure the resistance of harness between ECM connector and neutral position switch connector.
   Connector & terminal
   (B134) No. 39 — (T12) No. 1:
   (B134) No. 50 — (T12) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and neutral position switch connector** • **Poor contact of coupling connector**

3. CHECK NEUTRAL POSITION SWITCH.

1. Place the shift lever in neutral.
2. Measure the resistance between neutral position switch terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 1 Ω?

Yes	Repair the poor contact of neutral position switch connector.
No	Replace the neutral position switch. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness>REMOVAL.

7. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of neutral SW.
Judge as NG when there is no change in the neutral SW even if the driving shift was applied. (There is neutral SW ON/OFF inversion from the vehicle speed and engine speed.)

8. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
The number of changes from driving condition a) to b)	Equal to 3time(s)
a)	
Vehicle speed	0km/h (0MPH) or less
and	
Engine speed	550rpm or more and 850rpm or less
b)	
Vehicle speed	64km/h (39.8MPH) or more
and	
Engine speed	1550rpm or more and 2100rpm or less

9. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

10. DIAGNOSTIC METHOD

Judge NG when the malfunction criteria below are completed determined times or more after the neutral SW change.

Judgment value

Malfunction Criteria	Threshold Value
Neutral switch output voltage	Battery voltage × 0.6 V or more

Time needed for diagnosis: 3time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0A3B GENERATOR/ALTERNATOR OVER TEMPERATURE

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
Charge warning light illuminates.
Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK GENERATOR.

Check the generator vent window. Ref. to MECHANICAL(H4DO)>V-belt>INSPECTION.

Is there clogging with foreign objects?

Yes	Eliminate the foreign objects and leave the generator main body intact approx. 20 minutes to cool down.
No	Go to 2.

2. CHECK CHARGE WARNING LIGHT.

1. Turn the ignition switch to OFF and wait for 20 minutes.
2. Start the engine and check the charge warning light.

Does the charge warning light remain on?

Yes	Replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.
No	This is a temporarily overheating of the generator. It is now back to normal state. Check for clogging with foreign objects in the proximate area such as the generator vent window.

1. OUTLINE OF DIAGNOSIS

The overheating detection sensor is integrated as protection of the generator internal parts. If a malfunction is detected, DTCs will be output.

Charge warning light illuminates.

2. COMPONENT DESCRIPTION

To secure the vehicle power supply, the generator varies the generation amount according to EGI command.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
LIN communication schedule in progress	$01

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Secondary parameters	Execution condition
Internal malfunction flag of generator (high temperature malfunction warning)	ON
Monitor value of generator internal temperature	More than 196°C

Time needed for diagnosis: 1024ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs. (Charge light illuminates)

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1160 THROTTLE RETURN SPRING

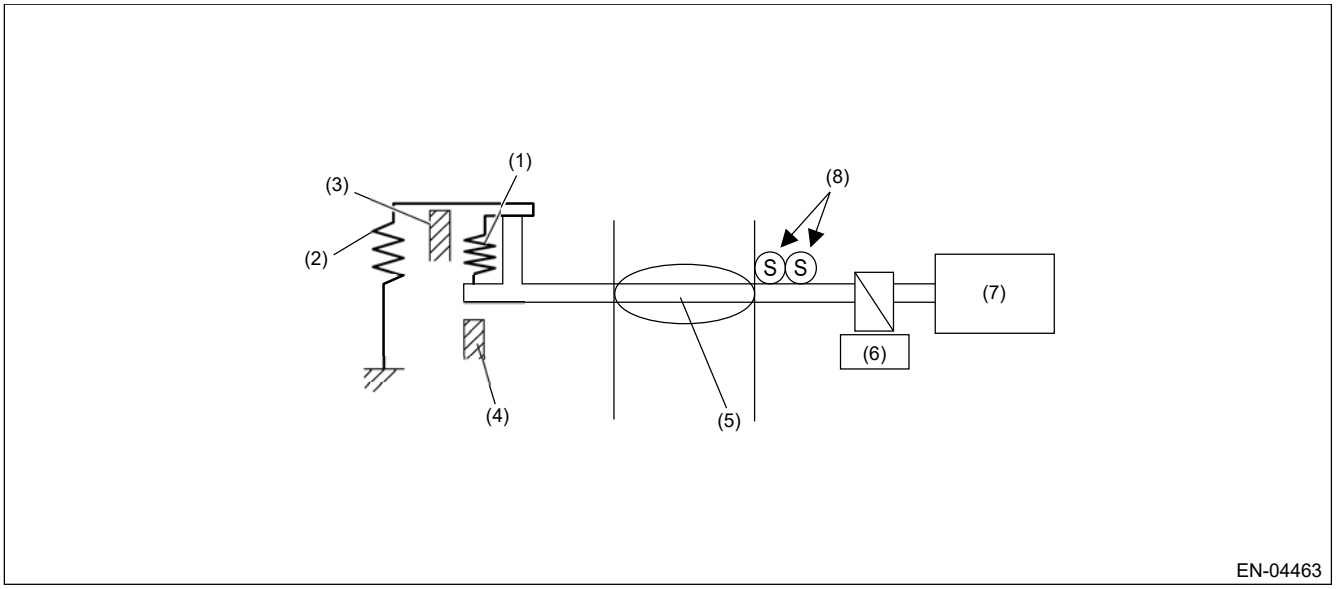
Note:

For the diagnostic procedure, refer to DTC P2101. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the valve is opened more than the default opening angle, but does not move to the close direction with the motor power stopped.

2. COMPONENT DESCRIPTION



(1) Opener spring
(2) Return spring
(3) Intermediate stopper
(4) Full closed stopper
(5) Throttle valve
(6) Gear
(7) DC motor
(8) Main and sub throttle position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	OFF
Battery voltage	6V or more
Elapsed time after motor continuity OFF	Equal to 1.6 s

4. GENERAL DRIVING CYCLE

- Ignition switch ON → OFF
- Ignition switch OFF → ON (Only after clearing memory)

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Change of the opening angle after the motor current is cut OFF Actual throttle position (Main Sensor) at power supply off - Actual throttle position (Main Sensor)	Less than 1.6%

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1192 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

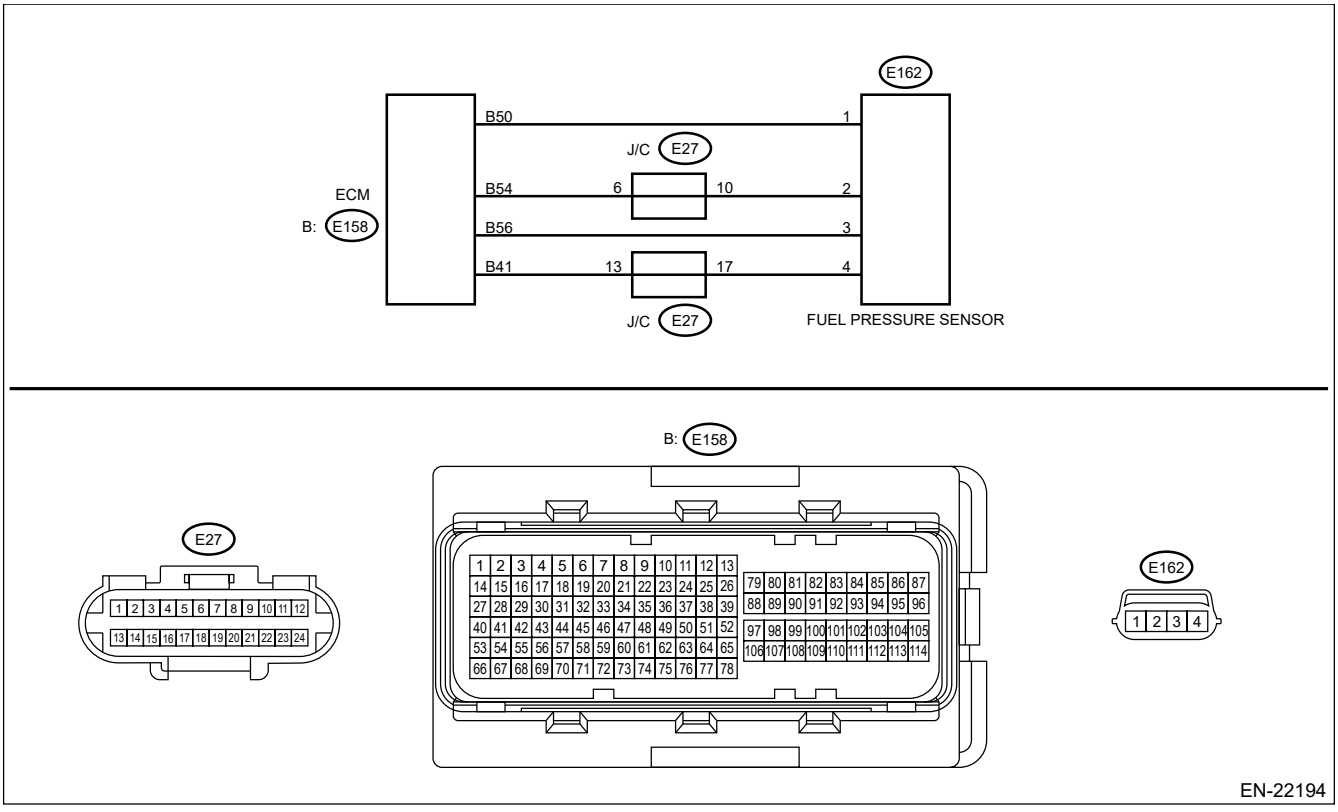
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Clear the memory. Ref. to COMMON(diag)>Clear memory.
2. Turn the ignition to OFF.
3. Start the engine.
4. Using the Subaru Select Monitor or a general scan tool, read the value of [Fuel Rail Pressure B].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Fuel Rail Pressure B] 0 kPa (0 kg/cm^2, 0 psi) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR CONNECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (E158) No. 50 — Chassis ground:
   (E162) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pressure Sensor.
No	Repair or replace the wiring harness or connector.

1. OUTLINE OF DIAGNOSIS

Detect the signal stuck of the fuel pressure sensor.
Judge as NG when the voltage change amount per unit time of the fuel pressure sensor does not exceed the threshold value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.634 V

Time needed for diagnosis:2400ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1193 FUEL RAIL PRESSURE SENSOR "B" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

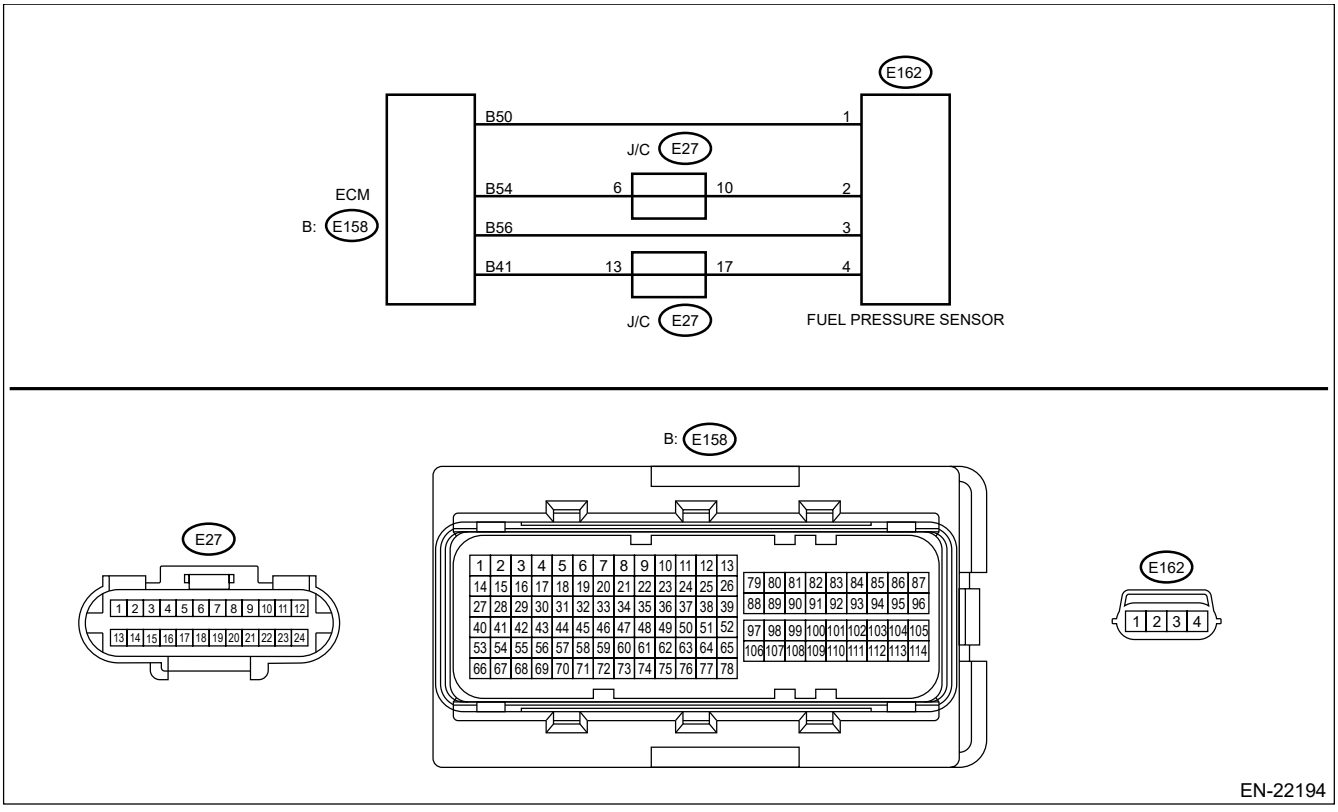
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Fuel Rail Pressure B].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Fuel Rail Pressure B] 25 MPa (254.9 kg/cm^2, 3625 psi) or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK FUEL PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the fuel pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between fuel pressure sensor connector and engine ground.
   Connector & terminal
   (E162) No. 4 (+) — Chassis ground (−):

Is the voltage 4.5 V to 5.5 V?

Yes	Go to 3.
No	Go to 5.

3. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the resistance of harness between ECM connector and fuel pressure sensor connector.
   Connector & terminal
   (E158) No. 50 — (E162) No. 1:
   (E158) No. 54 — (E162) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

4. CHECK ECM AND FUEL PRESSURE SENSOR POWER SUPPLY (SHORT TO POWER SUPPLY).

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 50(+) — Chassis ground (-):
   (E162) No. 1(+) — Chassis ground (-):

Is the resistance 5 V or more?

Yes	Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.
No	Replace the fuel pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Pressure Sensor.

5. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the fuel pressure sensor.
4. Measure the resistance of harness between ECM connector and manifold absolute pressure sensor connector.
   Connector & terminal
   (E158) No. 41 — (E162) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and fuel pressure sensor connector.

6. CHECK HARNESS BETWEEN ECM AND FUEL PRESSURE SENSOR (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Disconnect the connector from the fuel pressure sensor.
3. Measure the resistance between ECM connector and the fuel pressure sensor connector and chassis ground.
   Connector & terminal
   (E158) No. 41 (+) — Chassis ground (-):
   (E162) No. 4 (+) — Chassis ground (-):

Is the resistance 1 MΩ or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the ground short circuit of harness between ECM connector and fuel pressure sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the signal stuck of the fuel pressure sensor.
Judge as NG when the voltage change amount per unit time of the fuel pressure sensor does not exceed the threshold value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.472 V or more

Time needed for diagnosis:2400ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1235 HIGH PRESSURE FUEL PUMP CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

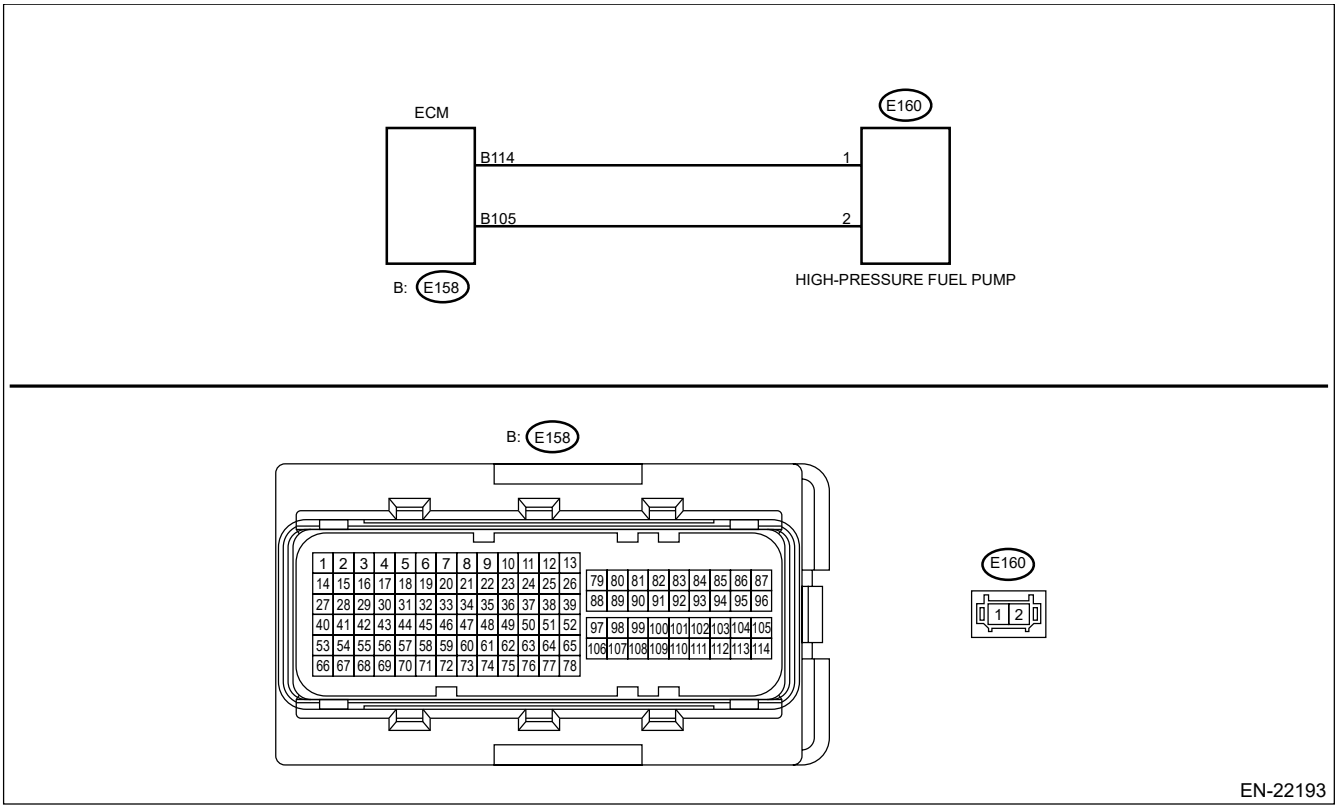
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HIGH-PRESSURE FUEL PUMP.

Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump.

2. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the connector from high-pressure fuel pump.
3. Measure the resistance of harness between ECM connector and high-pressure fuel pump connector.

Connector & terminal

(E158) No. 114 — (E160) No. 1:

(E158) No. 105 — (E160) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit in harness between ECM connector and high-pressure fuel pump connector.

3. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and high-pressure fuel pump connector.

Connector & terminal

(E158) No. 114 — (E160) No. 1:

(E158) No. 105 — (E160) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM connector and high-pressure fuel pump connector.

4. CHECK HARNESS BETWEEN ECM AND HIGH-PRESSURE FUEL PUMP (SHORT TO POWER SUPPLY).

Measure the voltage between high-pressure fuel pump connector and engine ground.

Connector & terminal

(E160) No. 1 — Engine ground:

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and high-pressure fuel pump connector.
No	Go to 5.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

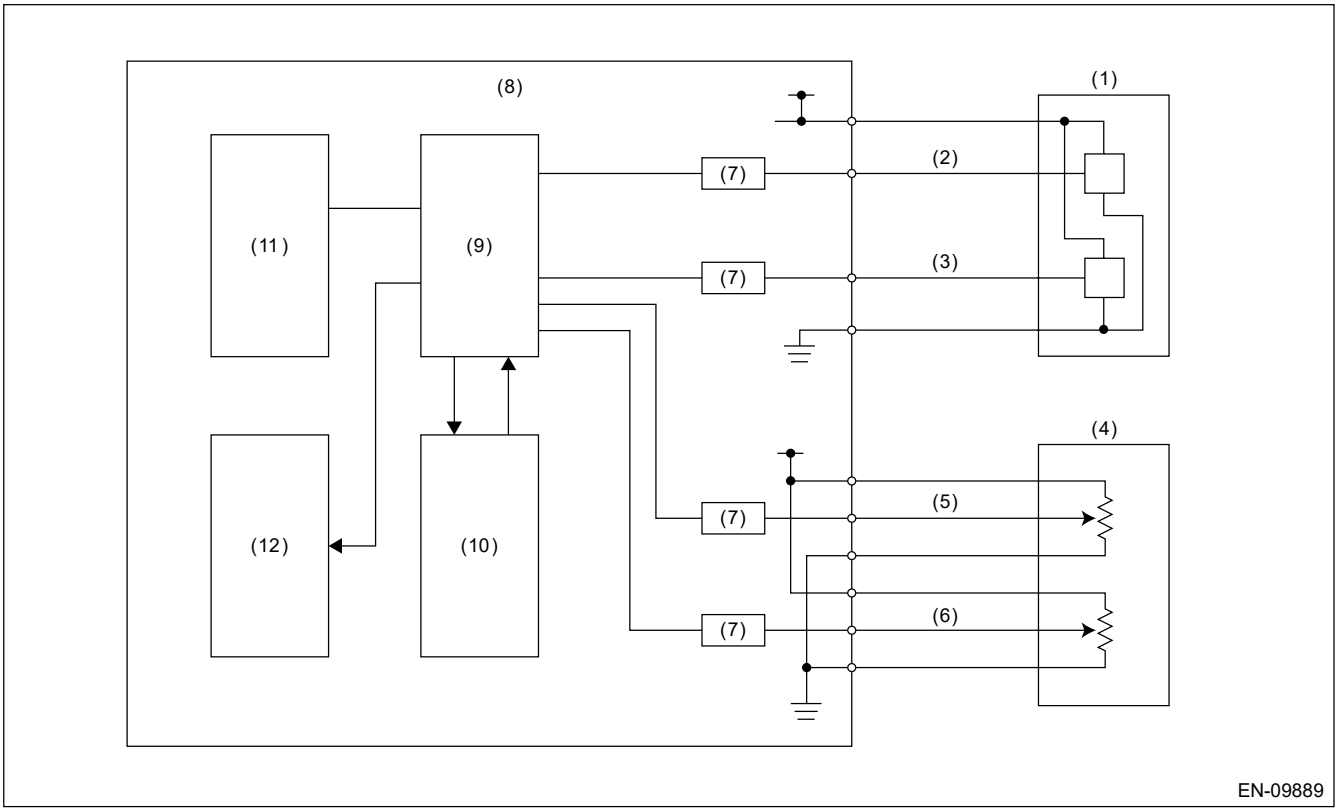
Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Replace the engine control computer. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Engine Control Module (ECM)>REMOVAL.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the CPU operation is abnormal.
(1) Instruction check
(2) Software flow check
(3) Software monitor check
(4) If the output IC operation is abnormal
(5) CAN register check
(6) Control module function check
(7) Software check

2. COMPONENT DESCRIPTION



(1) Throttle position sensor
(2) Throttle position sensor 1
(3) Throttle position sensor 2
(4) Accelerator pedal position sensor
(5) Accelerator pedal position sensor 1
(6) Accelerator pedal position sensor 2
(7) I/F circuit
(8) Engine control module (ECM)
(9) CPU
(10) Monitoring IC
(11) EEPROM
(12) Output IC

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Judgment 1, 2, 5: Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Elapsed time after ignition state is crank or run	0.1 s or more
Fuel pump command	ON
Judgment 3, 4, 6:	
Battery voltage	10.9 V or more
Elapsed time after ignition state is crank or run	0.1 s or more
Fuel pump command	OFF

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

JUDGMENT 1: DIAGNOSIS FOR OPEN CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure pump wrong operation signal (0.2A or less)	ON

JUDGMENT 2: DIAGNOSIS FOR OVERCURRENT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure pump wrong operation signal (14.2A or more)	ON

JUDGMENT 3: DIAGNOSIS FOR GROUND SHORT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure pump wrong operation signal (1 V or less)	ON

JUDGMENT 4: DIAGNOSIS FOR POWER SUPPLY SHORT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure pump wrong operation signal (5 V or more)	ON

JUDGMENT 5: DIAGNOSIS FOR SHORT CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure fuel pump control	Less than 3.92 V

Malfunction Criteria	Threshold Value
voltage	

JUDGMENT 6: DIAGNOSIS FOR POWER SUPPLY SHORT CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
High-pressure fuel pump control voltage	3.92 V or more

Time needed for diagnosis:

Judgment 1, 2, 5: 0.08 s

Judgment 3, 4, 6: 0.04 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Caution:

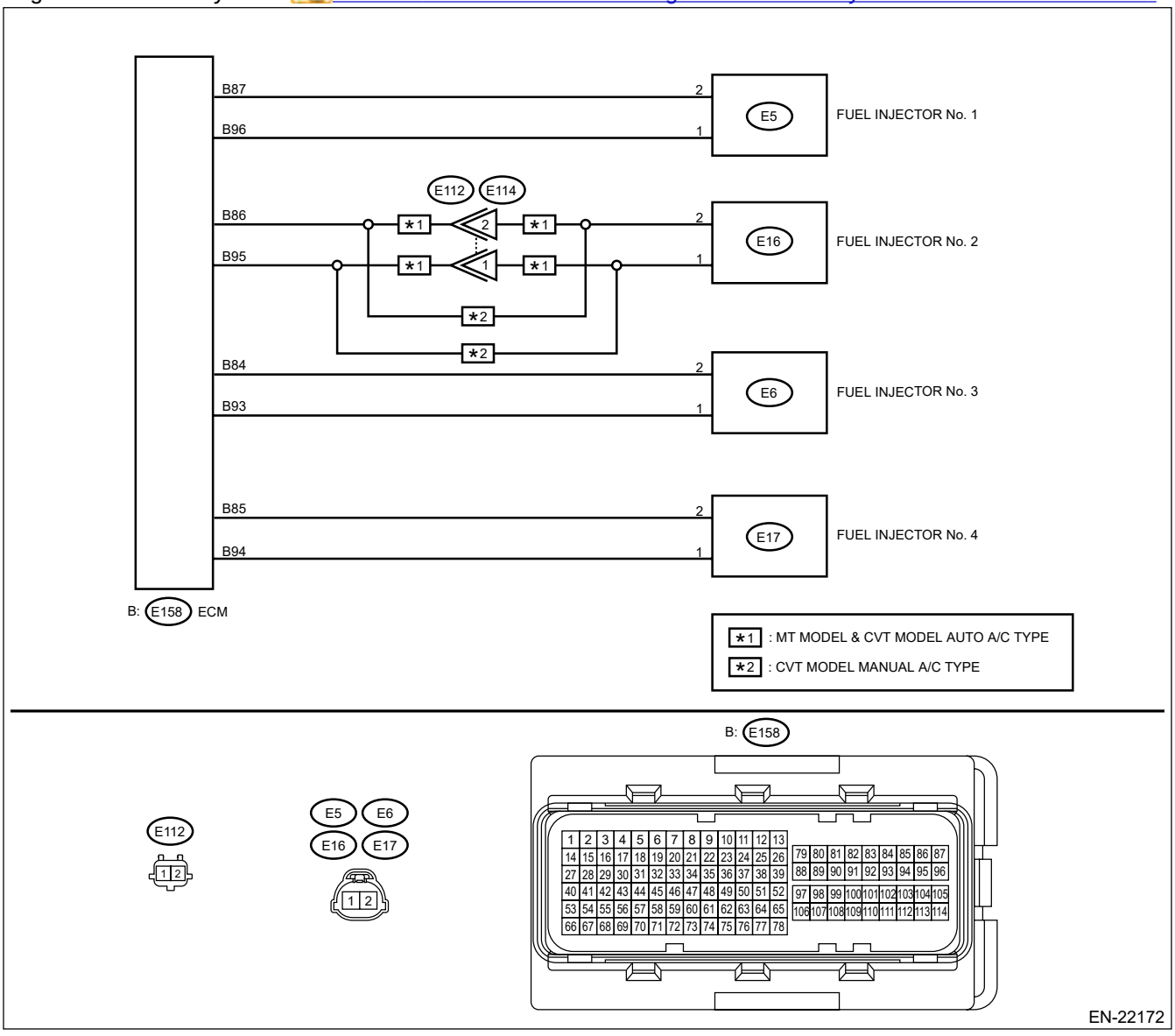
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM terminals on faulty fuel injectors.

Connector & terminal

#1 (E158) No. 87 — (E158) No. 96:
#2 (E158) No. 86 — (E158) No. 95:
#3 (E158) No. 84 — (E158) No. 93:
#4 (E158) No. 85 — (E158) No. 94:

Is the resistance 1.74 — 2.04 Ω (at 20°C (68°F))?

Yes	Go to 2.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between ECM and engine ground on faulty injectors.

Connector & terminal

#1 (E158) No. 87 — Engine ground:
#1 (E158) No. 96 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#4 (E158) No. 85 — Engine ground:
#4 (E158) No. 94 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR.

1. Check the harness between the ECM connector and fuel injector connector.
2. Measure the voltage between ECM connector and engine ground on defective fuel injectors.
   Connector & terminal
   #1 (E158) No. 87 — Engine ground:
   #2 (E158) No. 86 — Engine ground:
   #3 (E158) No. 84 — Engine ground:
   #4 (E158) No. 85 — Engine ground:

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and fuel injector connectors.
No	Go to 4.

4. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 5.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>REMOVAL.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel injector circuit function.
Judge as NG when ECM detects any malfunction in the diagnostic items listed below.

Diagnostic item	Malfunction Criteria
Power supply short	ECM low side terminal voltage of the fuel injector circuit is high.
Ground short	ECM low side terminal voltage of the fuel injector circuit is low.
Open circuit	Fuel injector current is low.
Overcurrent	Fuel injector current is high.
Short circuit	The time when the fuel injector current reaches the target current is short.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Judgment 1, 2, 5	
Battery voltage	10.9 V or more
Elapsed time after ignition state is run or crank	100 ms or more
Fuel injector command	ON
Judgment 3, 4, 6	
Battery voltage	10.9 V or more
Elapsed time after ignition state is run or crank	100 ms or more
Fuel injector command	OFF

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

JUDGMENT 1: DIAGNOSIS FOR OPEN CIRCUIT

Judgment value

Malfunction Criteria	Threshold Value
Operating current	0.2 A or less

JUDGMENT 2: DIAGNOSIS FOR OVERCURRENT

Judgment value

Malfunction Criteria	Threshold Value
Operating current	32.4 A or more

JUDGMENT 3: DIAGNOSIS FOR GROUND SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	1 V or less

JUDGMENT 4: DIAGNOSIS FOR POWER SUPPLY SHORT

Judgment value

Malfunction Criteria	Threshold Value
Terminal voltage	5 V or more

JUDGMENT 5: SHORT CIRCUIT TO GROUND (BETWEEN ECM AND INJECTOR DRIVER)

Judgment value

Malfunction Criteria	Threshold Value
Injector control voltage	Less than 3.92 V

JUDGMENT 6: SHORT CIRCUIT TO POWER SUPPLY (BETWEEN ECM AND INJECTOR DRIVER)

Judgment value

Malfunction Criteria	Threshold Value
Injector control voltage	3.92 V or more

Time needed for diagnosis:
Judgment 1, 2, 5: 0.3 s
Judgment 3, 4, 6: 0.04 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1262 CYLINDER 2 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:
For the diagnostic procedure, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1263 CYLINDER 3 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:
For the diagnostic procedure, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1264 CYLINDER 4 DIRECT FUEL INJECTOR CIRCUIT/OPEN

Note:

For the diagnostic procedure, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1261. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1261 CYLINDER 1 DIRECT FUEL INJECTOR CIRCUIT/OPEN.

DTC P1449 EVAP SYSTEM CLOG DETECTED (AIR FILTER)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P1449 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK CANISTER TUBE ASSEMBLY AND DRAIN TUBE ASSEMBLY BETWEEN CANISTER AND DRAIN FILTER.

Check the canister tube assembly and drain tube assembly between canister and drain filter.

Is the canister tube assembly and/or the drain tube assembly clogged between canister and drain filter?

Yes	Replace the canister tube assembly and/or the drain tube assembly between canister and drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter.
No	Go to 3.

3. CHECK DRAIN FILTER.

Check the drain filter.

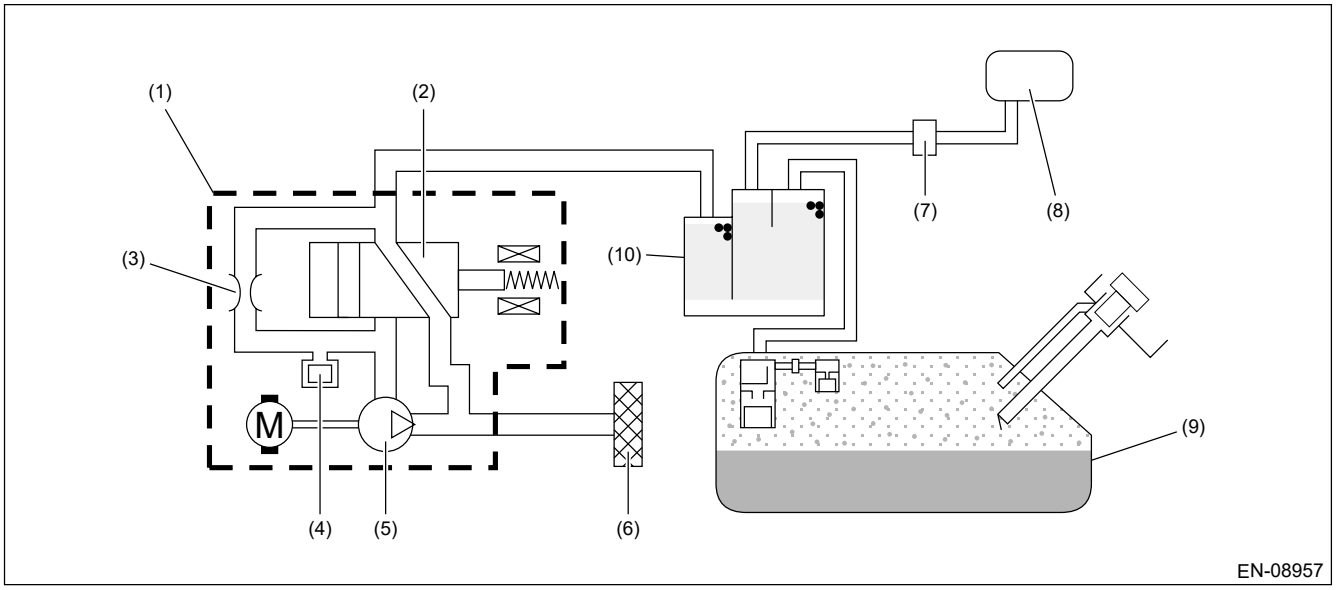
Is the drain filter clogged?

Yes	Replace the drain filter. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Drain Filter.
No	Replace the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.

1. OUTLINE OF DIAGNOSIS

Detect the drain filter clogging by the pressure change during purge introduction.
Judge as drain filter clogging malfunction if the pressure in the evaporative emission system piping suddenly decreases by the purging.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

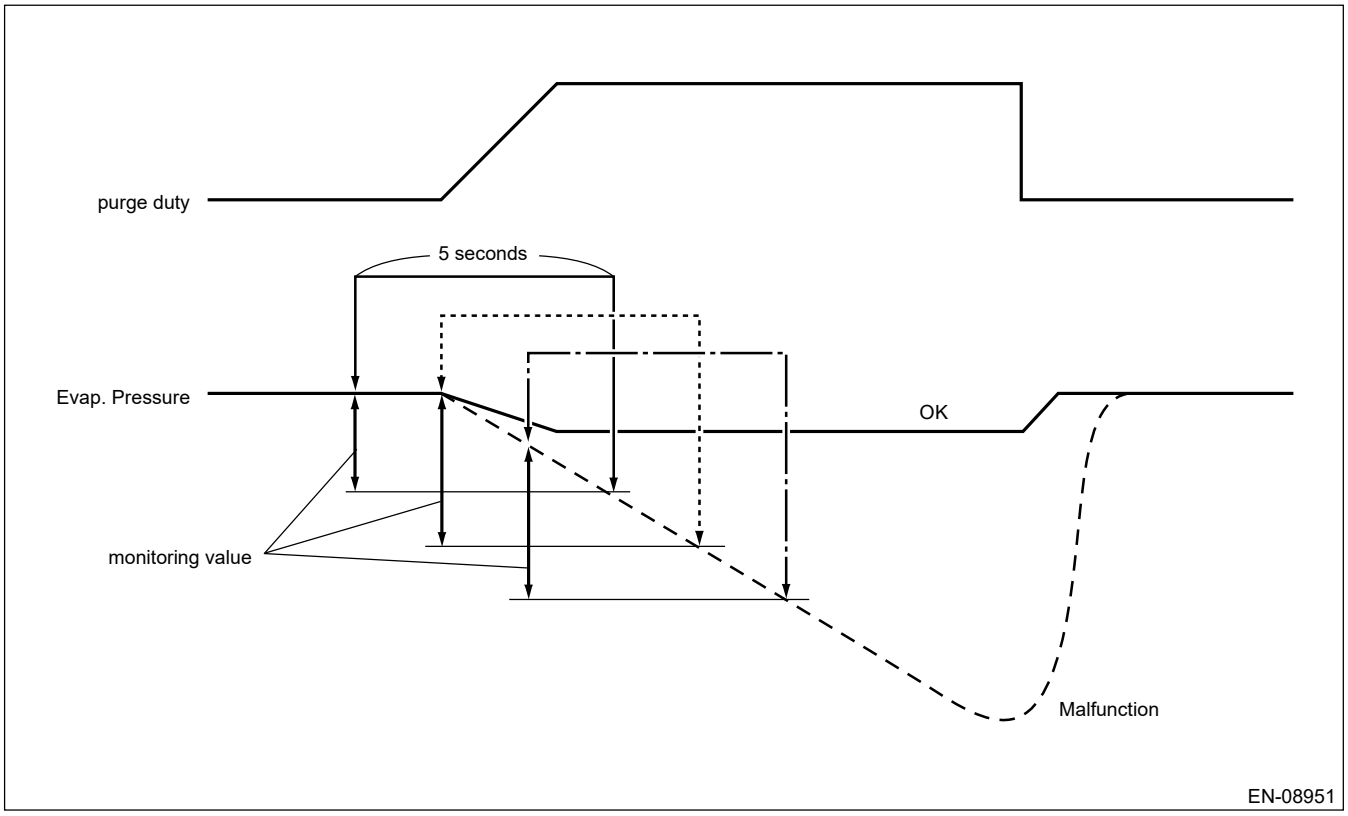
Secondary parameters	Execution condition
Battery voltage	10.9 V or more

Secondary parameters	Execution condition
Elapsed time after starting the engine	20000ms or more
Evaporative Leak Check Module vacuum pump	Not in operation
Evaporative Leak Check Module switching valve	Open

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously when purging is performed after 20000ms have passed since the engine started.

5. DIAGNOSTIC METHOD



Calculate the difference between the Evaporative Leak Check Module pressure sensor output value of 5 seconds ago and the value at the present moment, and if the value is greater than the judgment value, detect as filter clogging trouble and judge as malfunction.
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
|Pressure sensor output value as of 5 seconds ago – Current pressure sensor output value|	More than value of Map

Map

Vehicle speed km/h (MPH)	**0 0**	**20 (12.4)**	**40 (24.9)**	**60 (37.3)**	**80 (49.7)**	**100 (62.1)**	**120 (74.6)**	**300 (186. 4)**
|Pressure sensor output value as of 5 seconds ago − Current pressure sensor output value| Pa (mmHg, inHg)	957.8 (7.184 ,0.3)	957.8 (7.184 , 0.3)	957.8 (7.184 ,0.3)	957.8 (7.184 , 0.3)	957.8 (7.184 , 0.3)	1076. 4(8.07 , 0.3)	1195. 6(8.97 , 0.4)	2253. 3(16.9 0 ,0.7)

Time needed for diagnosis: 1 (2time(s) ×0.512) s
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P1451 EVAP SYSTEM CLOG DETECTED (PIPE)

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DRAIN TUBE BETWEEN CANISTER AND LEAK CHECK VALVE ASSEMBLY.

Check the drain tube between the canister and leak check valve assembly.

Is the drain tube between canister and leak check valve assembly clogged?

Yes	Replace the drain tube between the canister and leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister.
No	Go to 2.

2. CHECK HOSE AND TUBE BETWEEN CANISTER AND FUEL TANK.

Check the hose and tube between the canister and fuel tank.

Are the hose and tube between the canister and fuel tank clogged?

Yes	Replace the hose or tube between the canister and fuel tank. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Tank.
No	Replace the canister. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Canister. After the operation is complete, go to the next step. Go to 3.

3. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform the Inspection Mode I. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE > INSPECTION MODE I.

Is DTC P1451 displayed? (Current malfunction)

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.
No	End.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW

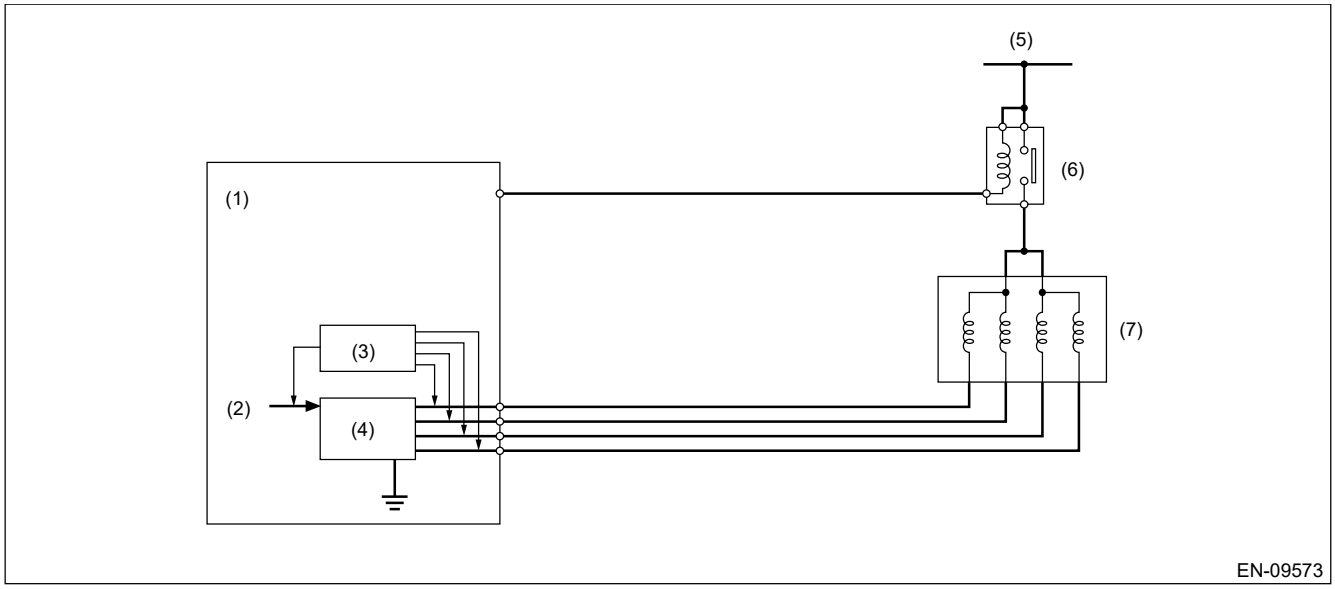
Note:

For the diagnostic procedure, refer to DTC P1498. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Computer unit (CPU)
(3) Detecting circuit
(4) Switch circuit
(5) Battery voltage
(6) Main relay
(7) EGR control valve

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
EGR drive signal	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
EGR terminal voltage	Battery voltage × 0.66 or less

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH

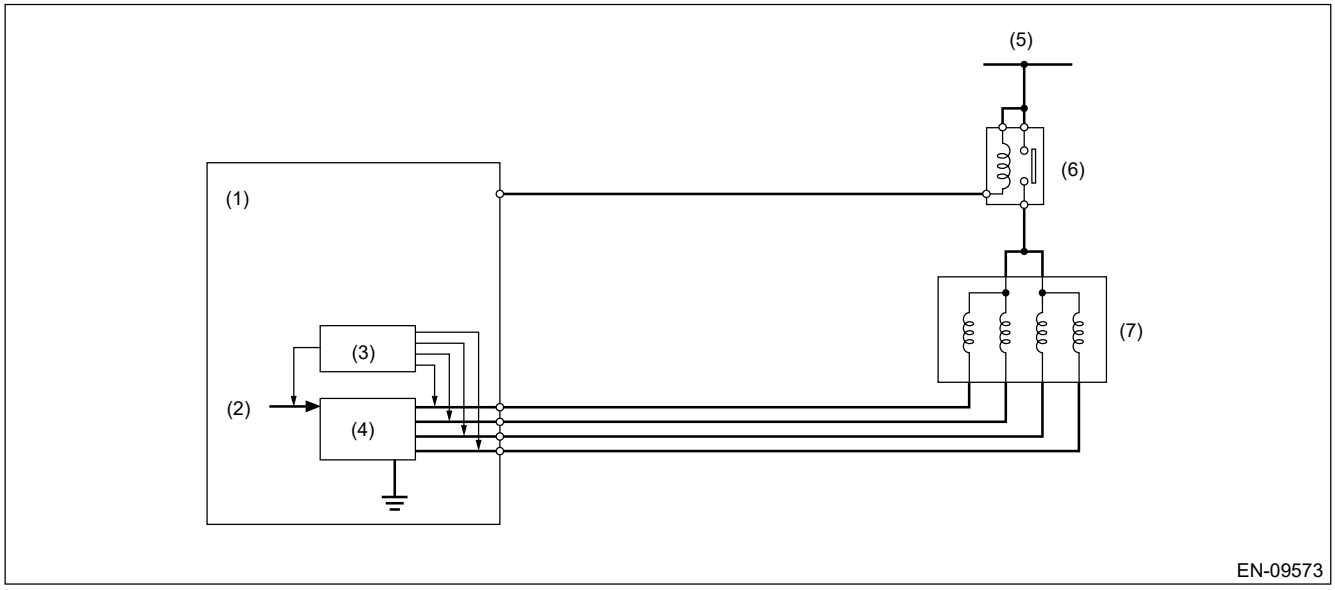
Note:

For the diagnostic procedure, refer to DTC P1499. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.

1. OUTLINE OF DIAGNOSIS

- Detects open or short circuit of EGR.
- Judge as NG when the ECM output level differs from the actual terminal level.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Computer unit (CPU)
(3) Detecting circuit
(4) Switch circuit
(5) Battery voltage
(6) Main relay
(7) EGR control valve

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
EGR drive signal	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
EGR terminal voltage	Battery voltage ×

Malfunction Criteria	Threshold Value
	0.13 or more

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1494 COIL 2 EGR "A" CONTROL CIRCUIT LOW

Note:
For the diagnostic procedure, refer to DTC P1498. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P1492. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1495 COIL 2 EGR "A" CONTROL CIRCUIT HIGH

Note:
For the diagnostic procedure, refer to DTC P1499. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P1493. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1496 COIL 3 EGR "A" CONTROL CIRCUIT LOW

Note:
For the diagnostic procedure, refer to DTC P1498. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P1492. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.

DTC P1497 COIL 3 EGR "A" CONTROL CIRCUIT HIGH

Note:

For the diagnostic procedure, refer to DTC P1499. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1493. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.

DTC P1498 COIL 4 EGR "A" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

Caution:

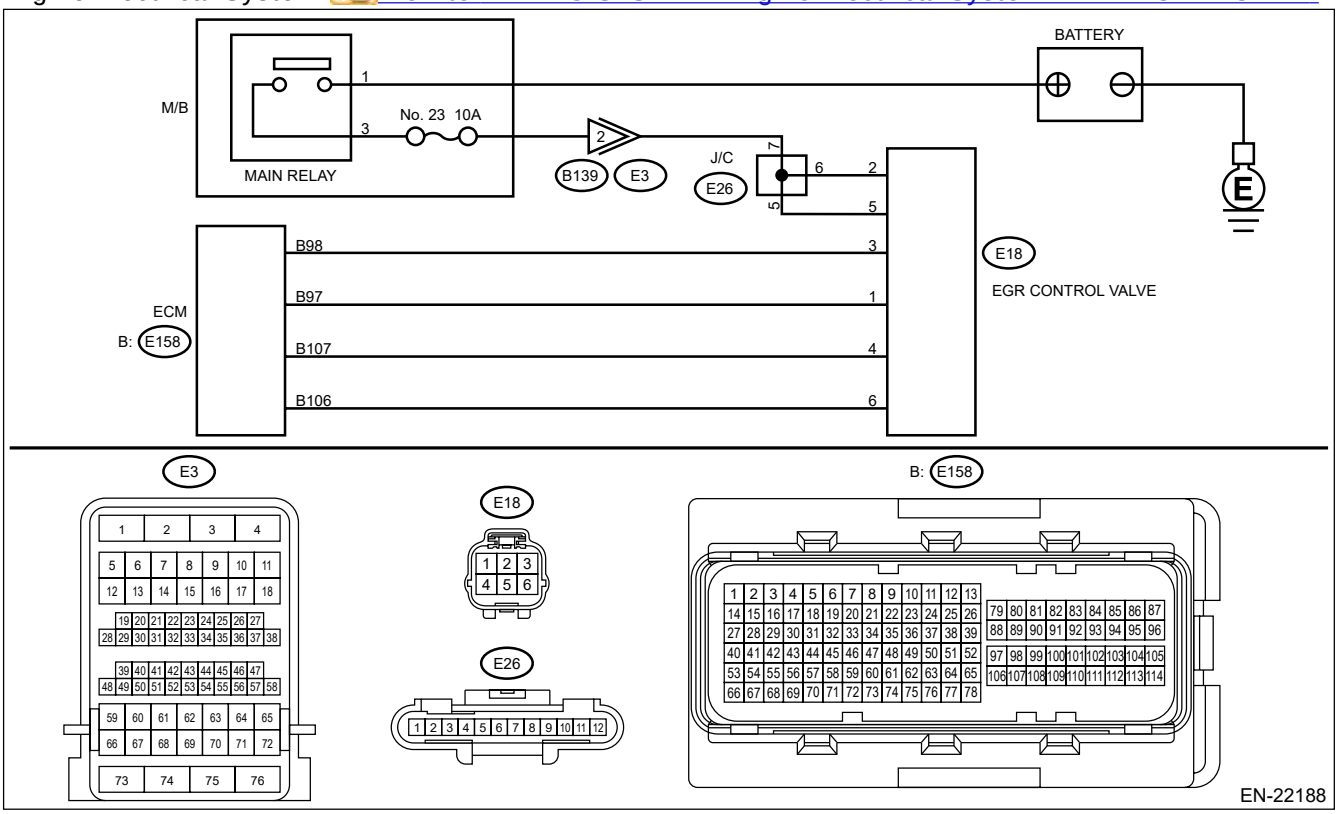
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY TO EGR CONTROL VALVE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the EGR control valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between EGR control valve connector and engine ground.

Connector & terminal

(E18) No. 2 (+) — Engine ground (−):

(E18) No. 5 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between EGR control valve and main relay connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and EGR control valve connector.

Connector & terminal

DTC P1492; (E158) No. 98 — (E18) No. 3:

DTC P1494; (E158) No. 97 — (E18) No. 1:

DTC P1496; (E158) No. 107 — (E18) No. 4:

DTC P1498; (E158) No. 106 — (E18) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between the ECM connector and EGR control valve connector.

3. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE (SHORT TO GROUND).

1. Disconnect the connector from ECM.
2. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

DTC P1492; (E158) No. 98 — Chassis ground:
DTC P1494; (E158) No. 97 — Chassis ground:
DTC P1496; (E158) No. 107 — Chassis ground:
DTC P1498; (E158) No. 106 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair ground short circuit of harness between ECM connector and EGR control valve connector.

4. CHECK FOR POOR CONTACT.

Check for poor contact between ECM connector and EGR control valve connector.

Is there poor contact in ECM or EGR control valve connector?

Yes	Repair the poor contact of ECM or EGR control valve connector.
No	Replace EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Control Valve.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1492. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1492 COIL 1 EGR "A" CONTROL CIRCUIT LOW.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1499 COIL 4 EGR "A" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine breathing

Caution:

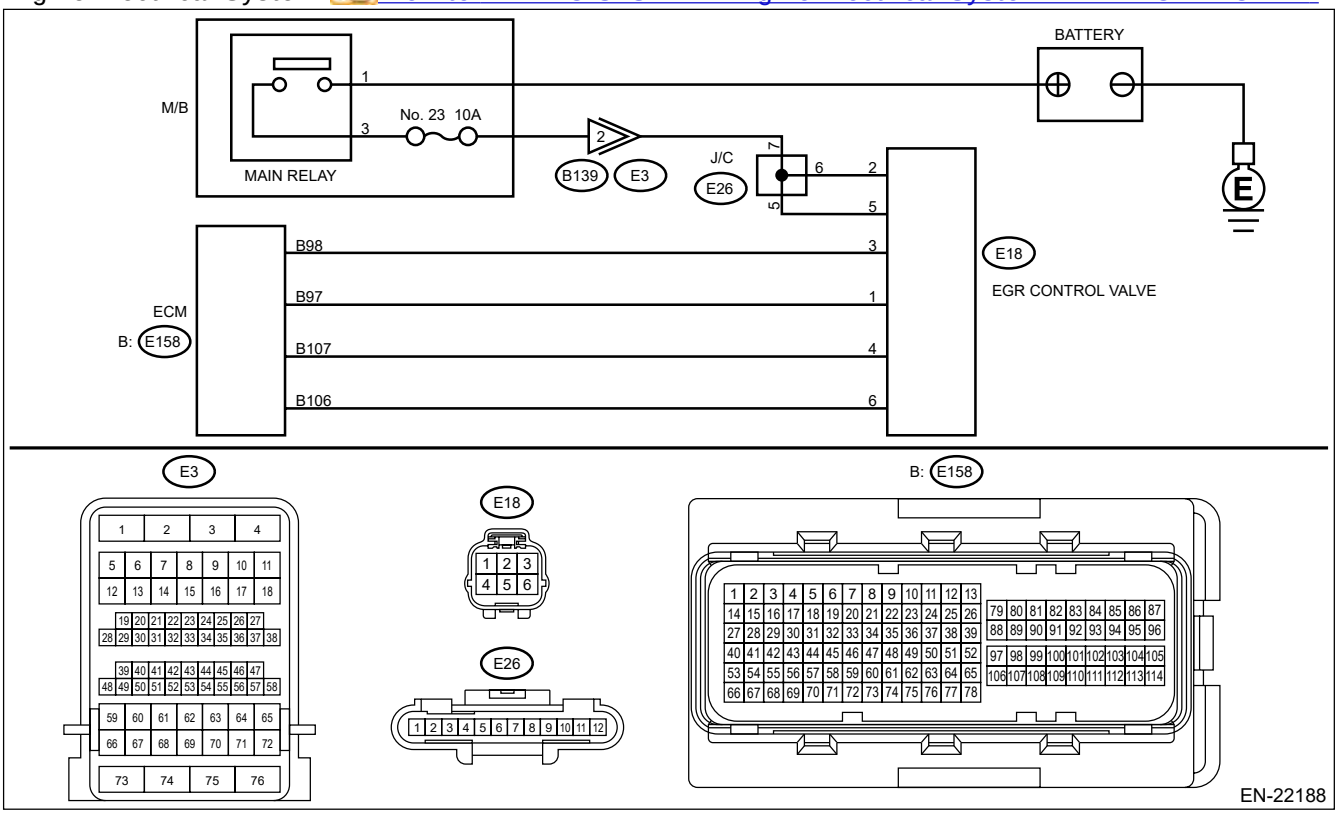
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND EGR CONTROL VALVE (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the EGR control valve.
4. Turn the ignition switch to ON.
5. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

DTC P1493; (E158) No. 98 (+) — Chassis ground (−):
DTC P1495; (E158) No. 97 (+) — Chassis ground (−):
DTC P1497; (E158) No. 107 (+) — Chassis ground (−):
DTC P1499; (E158) No. 106 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power supply in the harness between the ECM connector and EGR control valve connector.
No	Go to 2.

2. CHECK EGR CONTROL VALVE.

Measure the resistance between EGR control valve terminals.

Terminals

DTC P1493; No. 2 — No. 3:
DTC P1495; No. 2 — No. 1:
DTC P1497; No. 5 — No. 4:
DTC P1499; No. 5 — No. 6:

Is the resistance 20 Ω or more?

Yes	Repair the poor contact of ECM connector.
No	Replace EGR control valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>EGR Control Valve.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P1493. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1493 COIL 1 EGR "A" CONTROL CIRCUIT HIGH.

DTC P1603 ENGINE STALL HISTORY

DTC detecting condition:

Immediately at fault recognition

Caution:

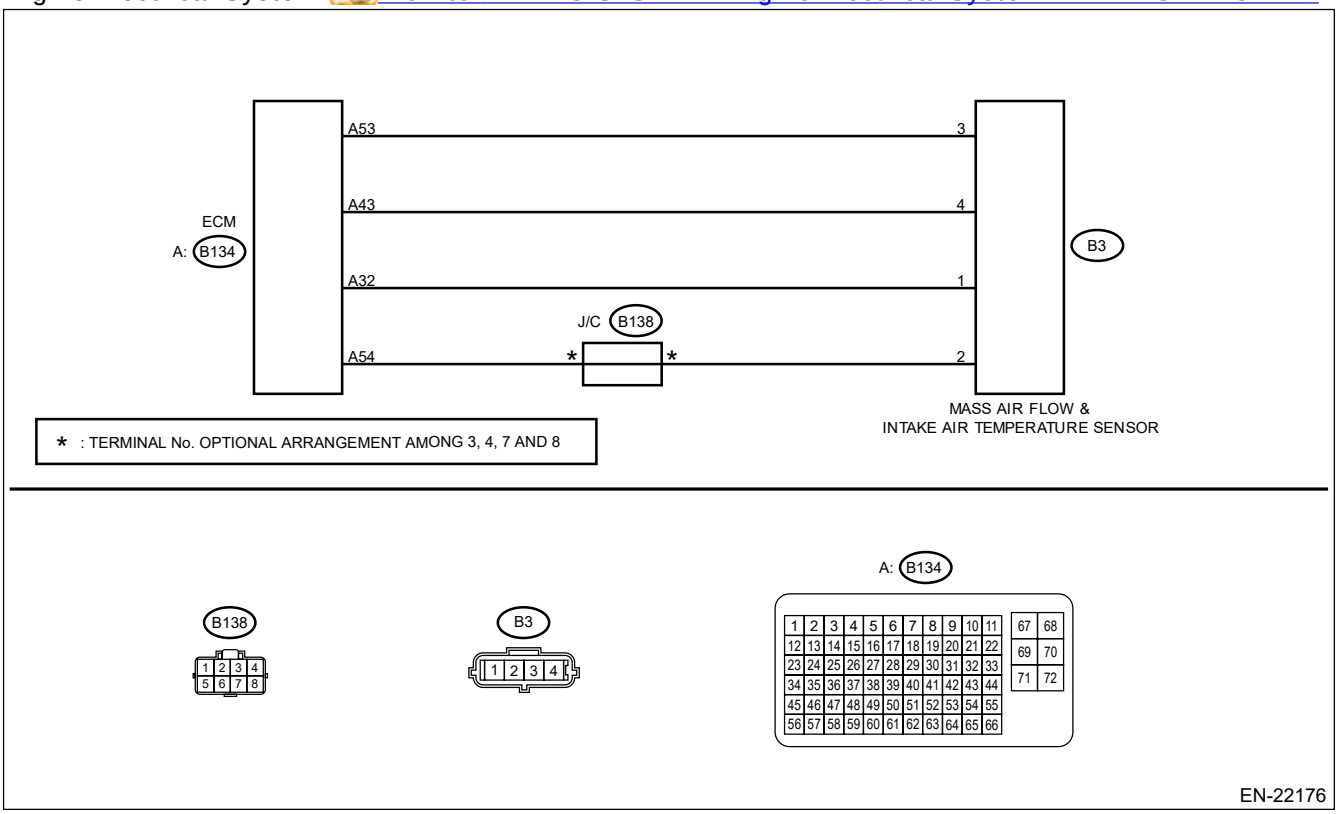
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

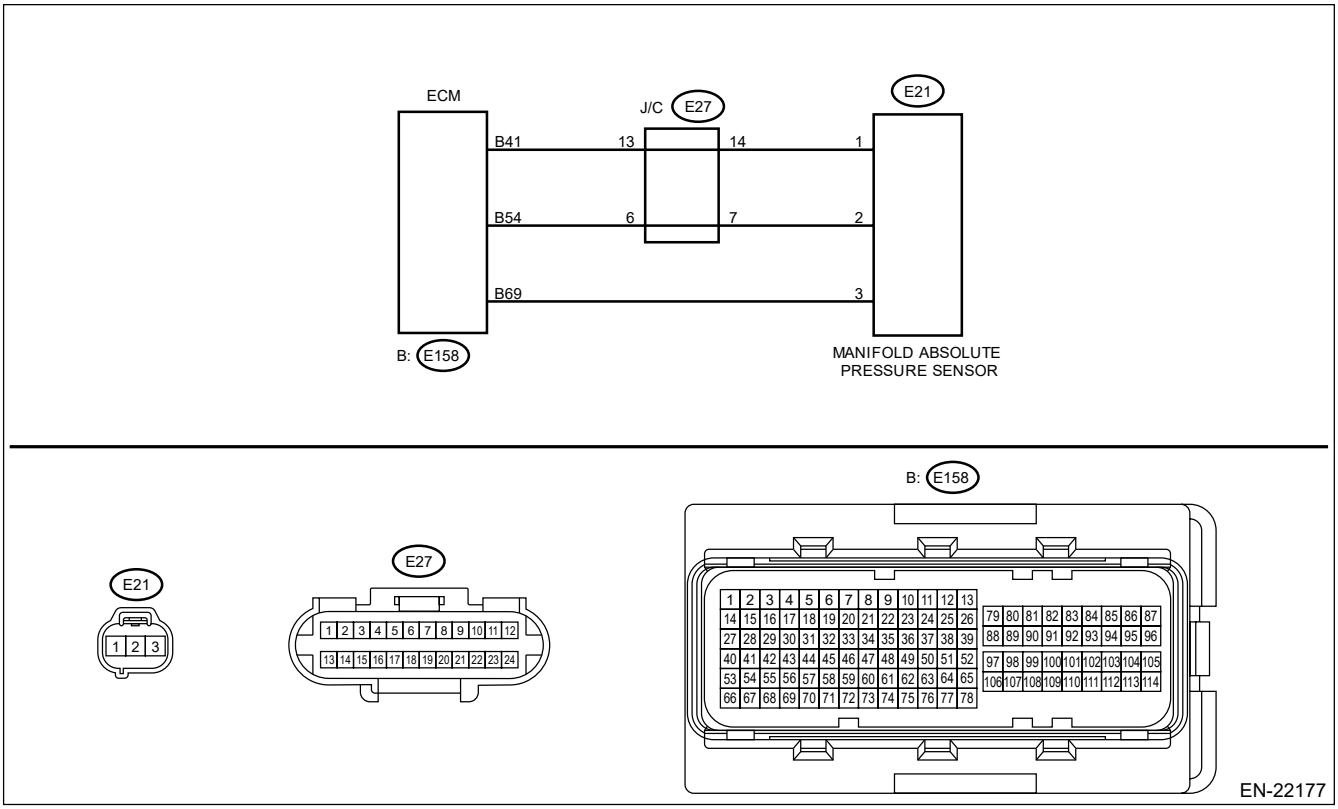
Note:

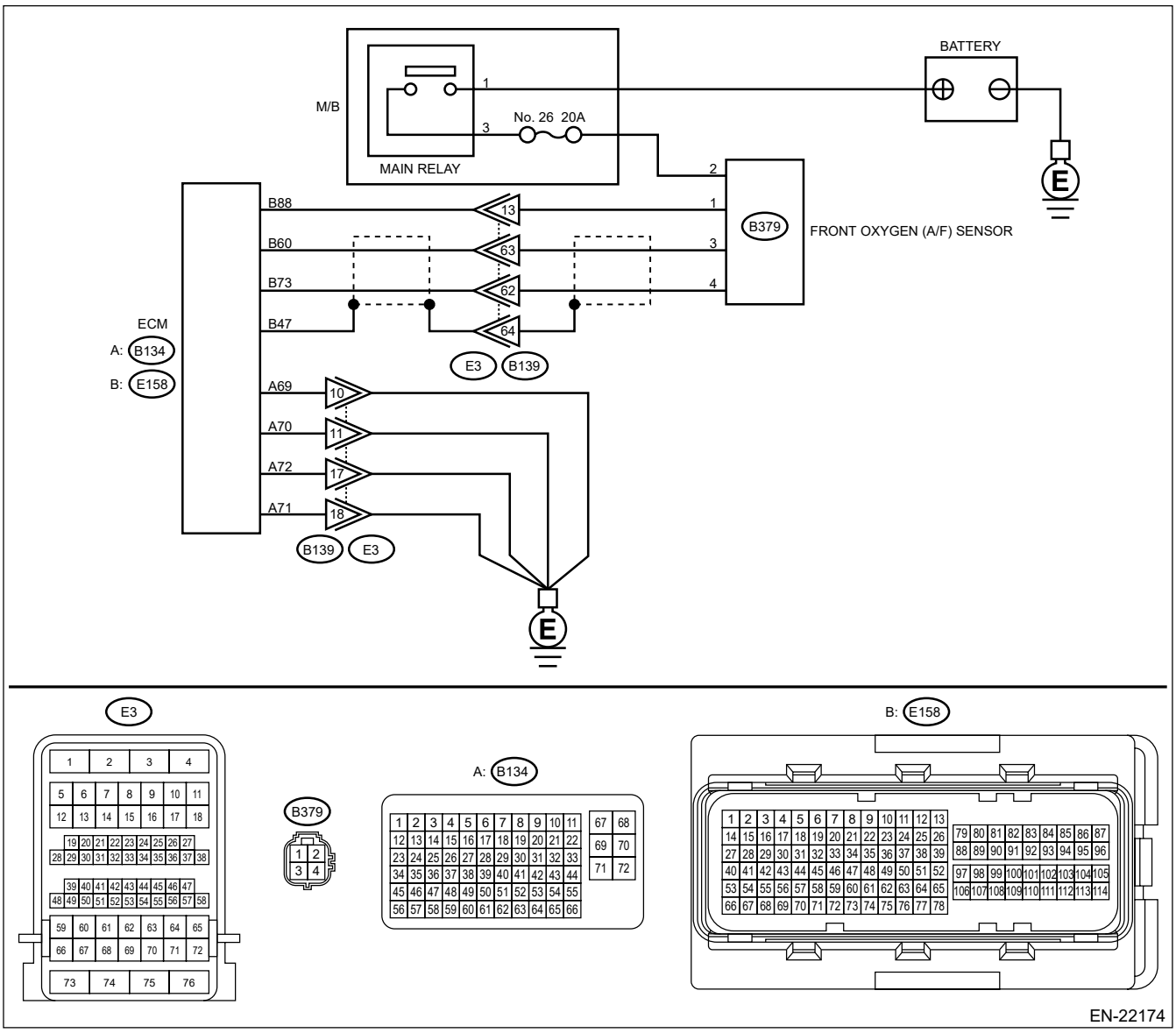
This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user.

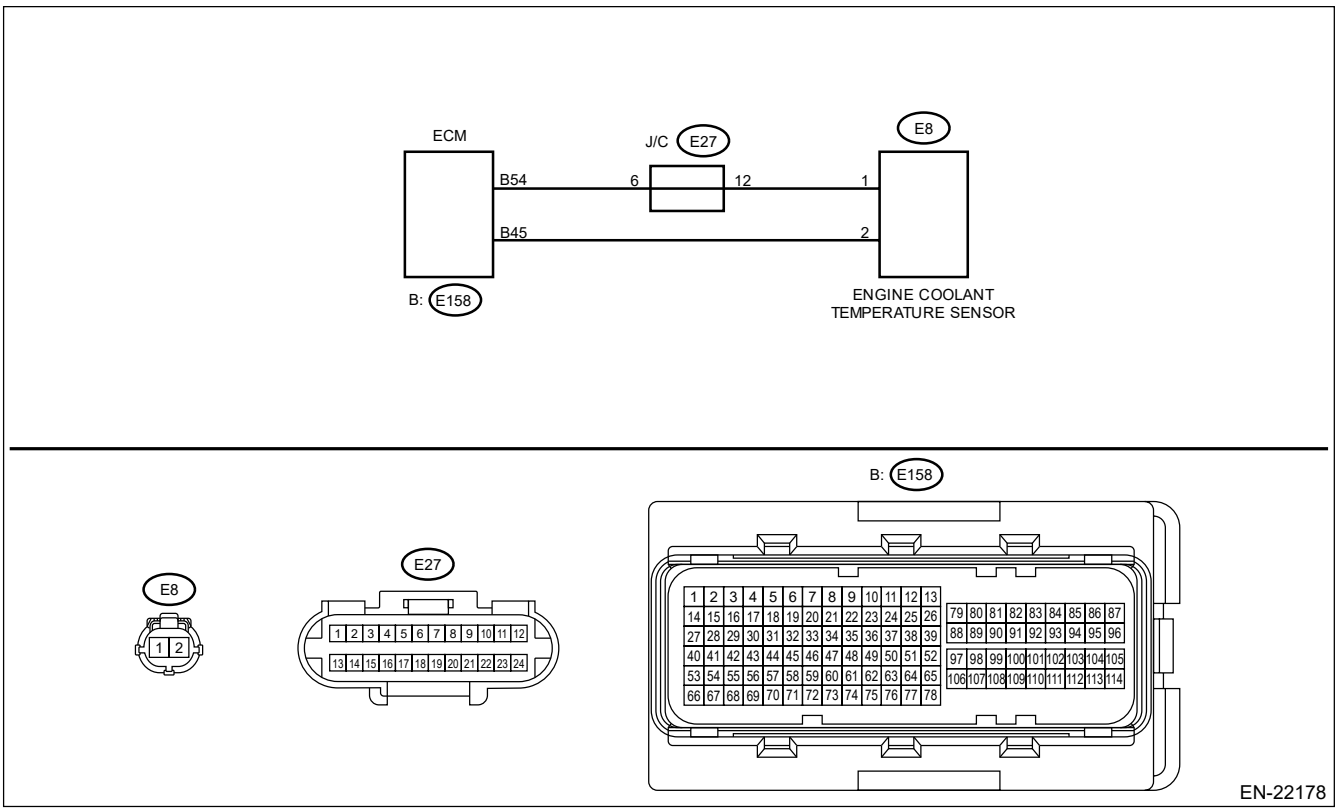
Wiring diagram:

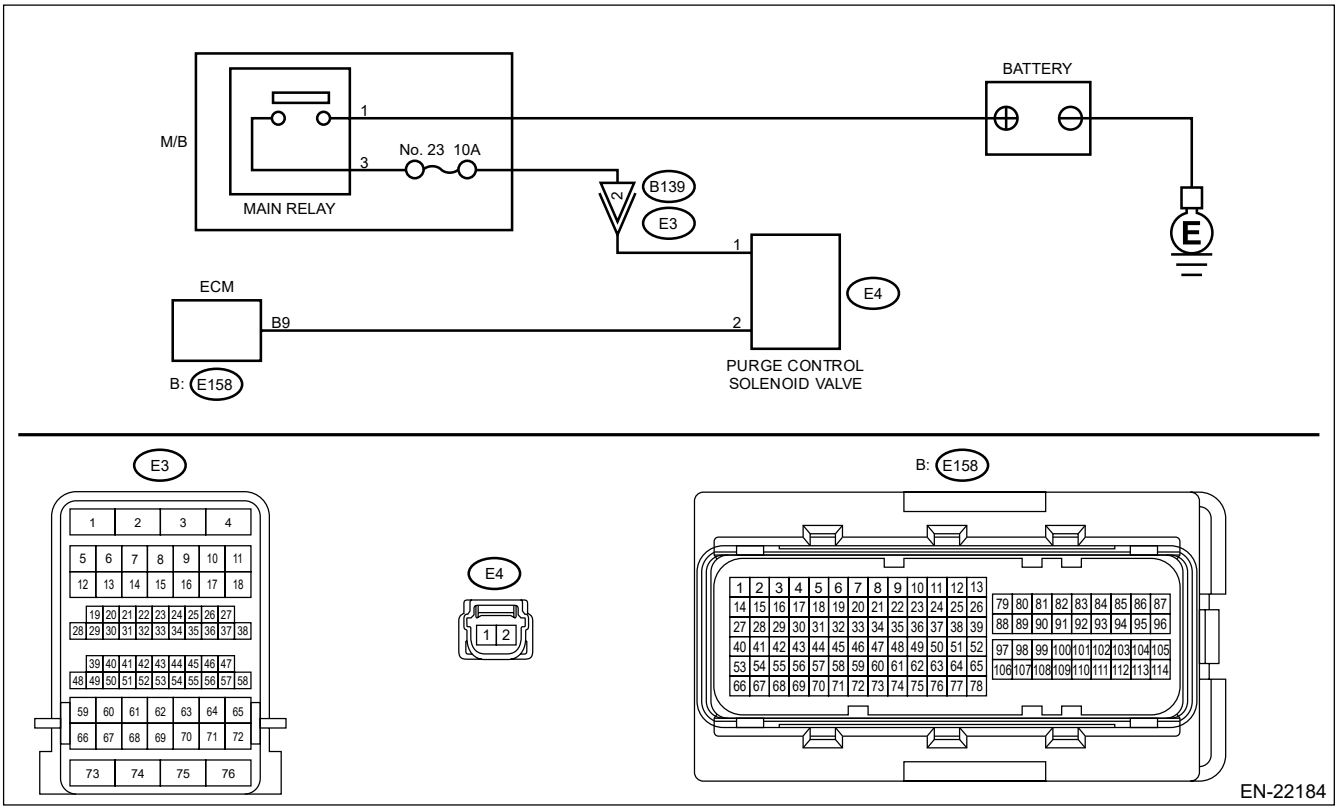
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

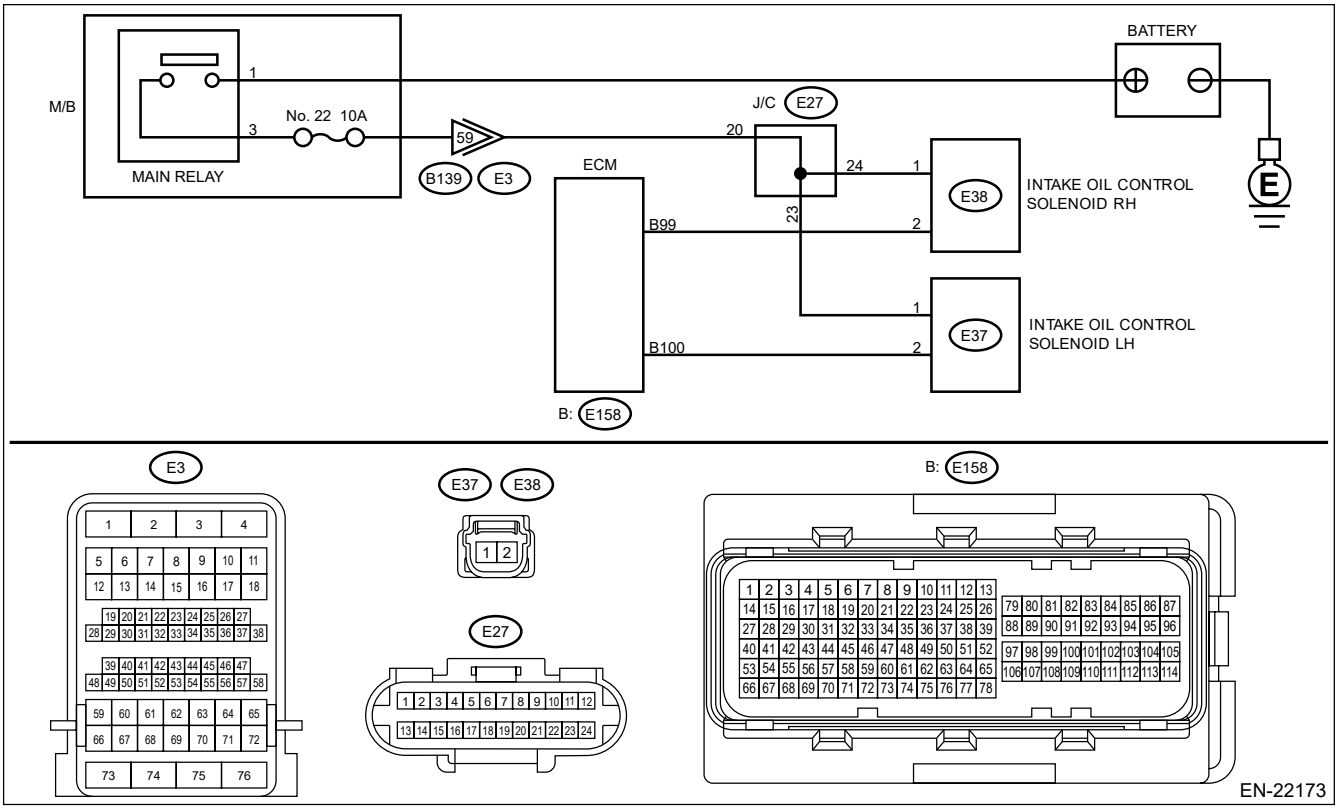


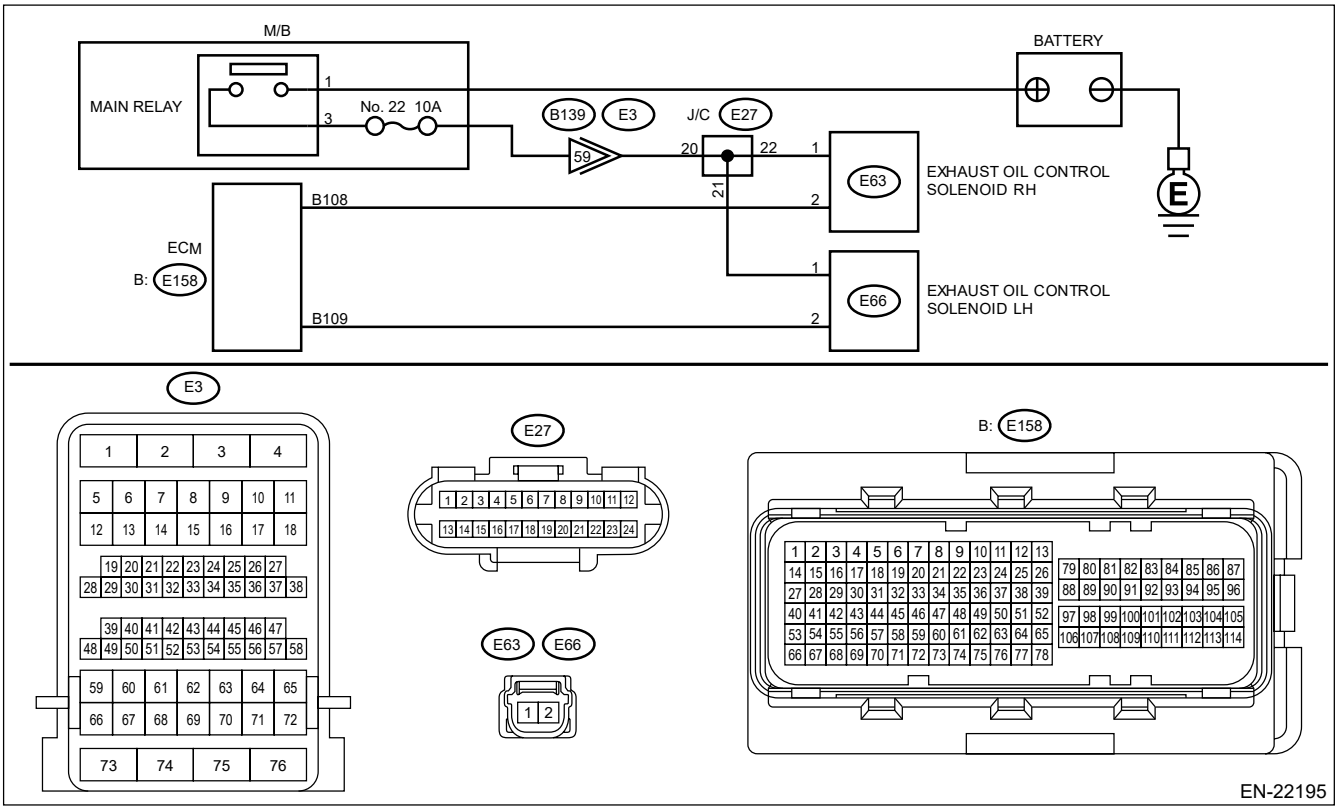

ECM
J/C
E27
E21
B41
13
14
1
B54
6
7
2
B69
3
B:
E158
MANIFOLD ABSOLUTE
PRESSURE SENSOR
B:
E158
E21
1 2 3
E27
1 2 3 4 5 6 7 8 9 10 11 12
13 14 15 16 17 18 19 20 21 22 23 24
1 2 3 4 5 6 7 8 9 10 11 12 13
14 15 16 17 18 19 20 21 22 23 24 25 26
27 28 29 30 31 32 33 34 35 36 37 38 39
40 41 42 43 44 45 46 47 48 49 50 51 52
53 54 55 56 57 58 59 60 61 62 63 64 65
66 67 68 69 70 71 72 73 74 75 76 77 78
79 80 81 82 83 84 85 86 87
88 89 90 91 92 93 94 95 96
97 98 99 100 101 102 103 104 105
106 107 108 109 110 111 112 113 114
EN-22177

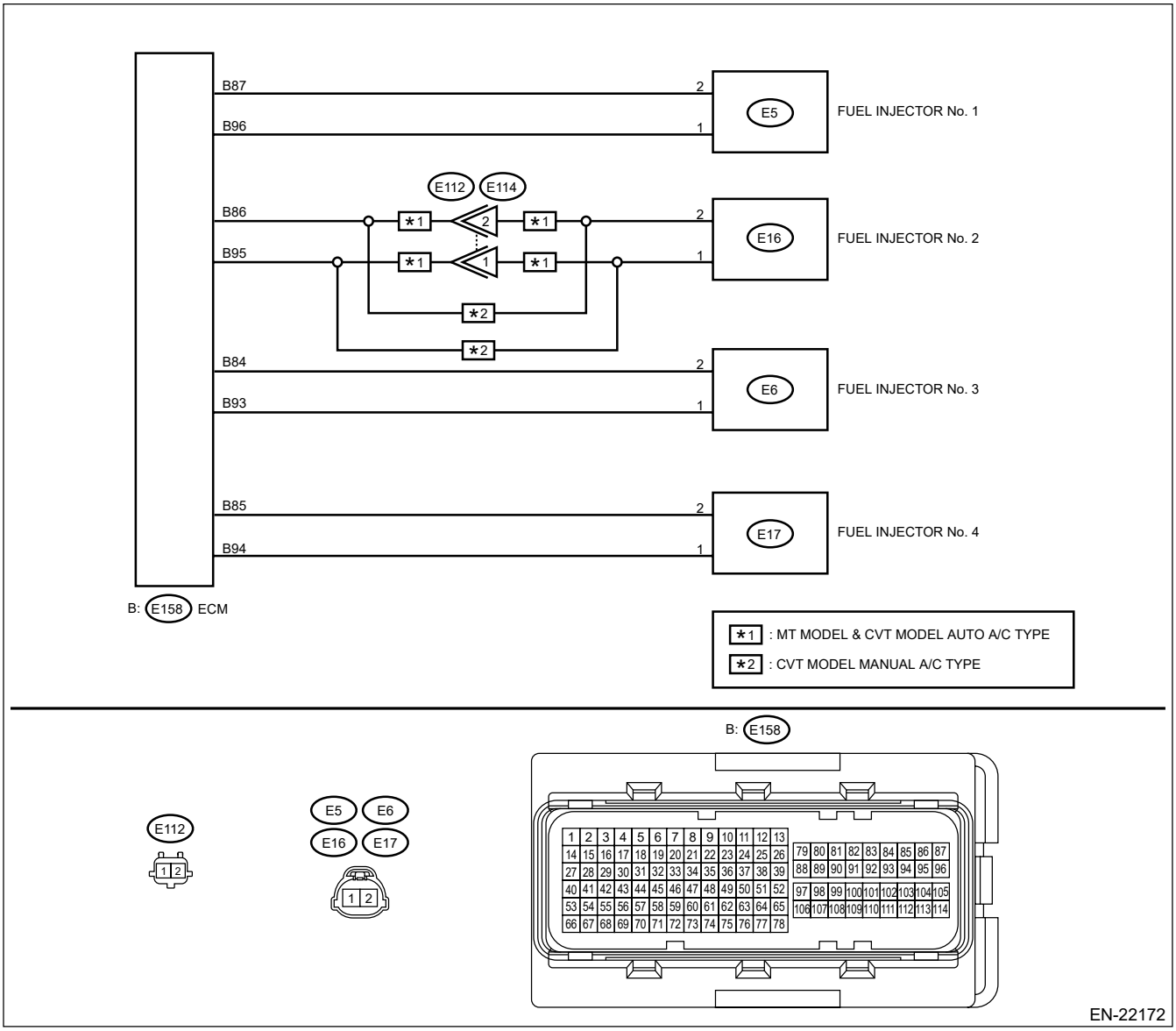

BATTERY
M/B
1
3
No. 26 20A
MAIN RELAY
2
B379
FRONT OXYGEN (A/F) SENSOR
B88
B60
B73
B47
13
63
62
64
1
3
4
ECM
A: B134
B: E158
E3
B139
A69
A70
A72
A71
10
11
17
18
B139
E3
E
E3
B379
A: B134
B: E158
EN-22174


ECM
J/C E27
E8
B54
6
12
1
B45
2
B: E158
ENGINE COOLANT
TEMPERATURE SENSOR
B: E158
E8
E27
EN-22178


BATTERY
M/B
1
3
No. 23 10A
MAIN RELAY
B139
E3
E
1
E4
ECM
B9
2
B: E158
PURGE CONTROL
SOLENOID VALVE
E3
B: E158
E4
EN-22184


BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
ECM
J/C
E27
20
24
1
2
23
E38
INTAKE OIL CONTROL SOLENOID RH
B99
1
2
E37
INTAKE OIL CONTROL SOLENOID LH
B100
B: E158
E3
E37
E38
E27
B: E158
EN-22173


M/B
MAIN RELAY
1
3
No. 22 10A
BATTERY
B139
E3
59
J/C
E27
20
22
1
21
2
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
ECM
B: E158
1
2
E66
EXHAUST OIL CONTROL SOLENOID LH
B109
E3
E27
B: E158
E63
E66
EN-22195


B87
B96
B86
B95
B84
B93
B85
B94
2
1
E5
FUEL INJECTOR No. 1
E16
FUEL INJECTOR No. 2
E6
FUEL INJECTOR No. 3
E17
FUEL INJECTOR No. 4
E112
E114
*1
*2
B: E158 ECM
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE
B: E158
E112
E5
E6
E16
E17
EN-22172

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Note:
For detailed operation procedures, refer to “Diagnostic Trouble Code (DTC)”. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Is DTC P1603 displayed? (Current malfunction)

Yes	Go to 2.
No	Check DTC using “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Fuel Level Input].

Note:
For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Fuel Level Input]16.4% or more?

Yes	Go to 3.
No	Fuel may be run out. If the fault occurs after refueling, continue the diagnosis. Go to 3.

3. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Control module voltage] 11 V or more?

Yes	Go to 4.
No	Check the battery and generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>INSPECTION.

4. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Did you ask the customer about the driving condition and engine speed status when the fault occurred?

Yes	• The engine speed dropped slowly and then the engine stalled during idling or deceleration: Go to 5. • The engine speed dropped rapidly and then the engine stalled during idling or deceleration: Go to 78. • The engine stalled during standing start, acceleration, or constant speed driving: Go to 85.
No	Ask the customer about the driving condition and engine speed status when fault occurred.

5. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)].
   Note:
   For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.
2. Obtain the sum values of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] in each freeze frame data.

Is the sum value of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] within ±15% in each freeze frame data?

Yes	Go to 52.
No	• More than 15% in each freeze frame data: Go to 6. • Less than −15% in any one of freeze frame data: Go to 36.

6. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system. Ref. to INTAKE (INDUCTION)(H4DO)>General Description.
No	Go to 7.

7. CHECK PURGE CONTROL SOLENOID VALVE.

Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Replace the faulty purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

8. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Stop Light Switch].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Stop Light Switch] OFF in all freeze frame data?

Yes	Go to 11.
No	Go to 9.

9. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Read the value of [Short Term Fuel Trim-Bank1] both when the brake pedal is released and depressed using Subaru Select Monitor.

   Data Monitor

   Note:

   For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Does the value of [Short Term Fuel Trim (B1)] with the brake pedal depressed increase by 10% or more compared to when the pedal is released?

Yes	Replace the brake booster. Ref. to BRAKE>Brake Booster.
No	Go to 10.

10. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. While reproducing the faulty condition of the vehicle, read the values of [Short Term Fuel Trim-Bank1] and [Long Term Fuel Trim (B1)] using the Subaru Select Monitor.

   Data Monitor

   Note:
   For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
3. Obtain the sum values of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)].

Is the sum value of [Short Term Fuel Trim (B1)] and [Long Term Fuel Trim (B1)] within ±15%?

Yes	Go to 11.
No	Replace the brake booster. Ref. to BRAKE>Brake Booster.

11. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 12.
No	Repair the ignition system. Ref. to IGNITION(H4DO)>General Description.

12. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [A/F Sensor #1]1.00 or more?

Yes	Go to 17.
No	Go to 13.

13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 14.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

14. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR, AND ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect connectors from ECM, air flow & intake air temperature sensor, and manifold absolute pressure sensor.
3. Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure sensor.

   Connector & terminal

   (B134) No. 53 — (B3) No. 3:

   (B134) No. 54 — (B3) No. 2:

   (B134) No. 32 — (B3) No. 1:

   (B134) No. 43 — (B3) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 15.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Open circuit of harness between ECM connector and manifold absolute pressure sensor** • **Coupling connector**

15. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 32 — Engine ground:

(B134) No. 43 — Engine ground:

(B134) No. 53 — Engine ground:

(B134) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 16.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Ground short circuit of harness between ECM connector and the air flow & intake air temperature sensor connector** • **Ground short circuit of harness between ECM connector and manifold absolute pressure sensor**

16. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the load value, then compare it with the load value listed in “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.



Note:

- **The value of Calculated load value change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Does the load value falls between 90 — 110% of the value described in the list?

Yes	Go to 21.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

17. CHECK FRONT OXYGEN (A/F) SENSOR DATA.

1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Using “Injection Quantity Control” in “Active Test” items, read the value of [A/F Sensor #1] at the increase rate of both 12% and −12%.

Note:

- **Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.**
- **For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.**

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of −12%?

Yes	Go to 21.
No	Go to 18.

18. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(B379) No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 19.
No	Repair the power supply line.

Note:

In this case, repair the following item:

- **Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector**
- **Poor contact of A/F, oxygen sensor relay connector**
- **Poor contact of coupling connector**
- **Malfunction of A/F, oxygen sensor relay**

19. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 88 — (B379) No. 1:
(E158) No. 60 — (B379) No. 3:
(E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 20.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector** • **Coupling connector**

20. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 88 — Engine ground:
(E158) No. 60 — Engine ground:
(E158) No. 73 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 21.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

21. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Engine Coolant Temperature] and [Ambient air temperature].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Coolant Temp.] 120°C (24°F) or more? Or is the value of [Coolant Temp.] 15°C (27°F) or more lower than that of [Ambient Temperature]?

Yes	Go to 22.
No	Go to 25.

22. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the engine coolant temperature sensor normal?

Yes	Go to 23.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

23. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and engine coolant temperature sensor.
3. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E158) No. 54 — (E8) No. 1:

(E158) No. 45 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 24.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

24. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 45 — Engine ground:

(E158) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 25.
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

25. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Evap Purge Flow].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Evap Purge Flow] 0% in all freeze frame data?

Yes	Go to 31.
No	Go to 26.

26. CHECK PURGE CONTROL SOLENOID VALVE.

1. On “Active Test” item, select [CPC Solenoid Valve].

   Note:

   For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.
2. Check if the ventilation changes according to ON/OFF switching operation.

Does the ventilation of purge control solenoid valve change correctly?

Yes	Go to 30.
No	Go to 27.

27. CHECK POWER SUPPLY TO PURGE CONTROL SOLENOID VALVE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the purge control solenoid valve.
3. Turn the ignition switch to ON.
4. Measure the voltage between purge control solenoid valve connector and engine ground.
   Connector & terminal
   (E4) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 28.
No	Repair the power supply circuit.

28. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and purge control solenoid valve connector.
   Connector & terminal
   (E158) No. 9 — (E4) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 29.
No	Repair the open circuit in harness between ECM connector and purge control solenoid valve connector.

29. CHECK HARNESS BETWEEN ECM AND PURGE CONTROL SOLENOID VALVE (SHORT TO GROUND).

Measure the resistance between the purge control solenoid valve connector and engine ground.

Connector & terminal

(E4) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 30.
No	Repair the short circuit to ground in harness between ECM connector and purge control solenoid valve connector.

30. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

31. CHECK OF FUEL PUMP.

1. On “Active Test” item, select [Fuel Pump Relay].

   Note:

   For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.
2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Go to 33.
No	Go to 32.

32. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

33. CHECK FUEL TANK.

Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes	Remove foreign matter from the fuel tank.
No	Go to 34.

34. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 35.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

35. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSPECTION.

36. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 37.
No	Repair the ignition system. Ref. to IGNITION(H4DO)>General Description.

37. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the load value, then compare it with the load value listed in "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Note:

- **The value of Calculated load value change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.**

Is the value of Calculated load value 110% or more of the value described in the list?

Yes	Go to 39.
No	Go to 38.

38. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [A/F Sensor #1].

Note:

For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value in [A/F Sensor #1] less than 1.00?

Yes	Go to 43.
No	Go to 48.

39. CHECK AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE SENSOR.

Check the air flow & intake air temperature sensor and manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor>INSPECTION.

Does the air flow & intake air temperature sensor and manifold absolute pressure sensor operate normally?

Yes	Go to 40.
No	Replace air flow & intake air temperature sensor or manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.

40. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect connectors from ECM, air flow & intake air temperature sensor, and manifold absolute pressure sensor.
3. Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure sensor.

   Connector & terminal

   (B134) No. 53 — (B3) No. 3:

   (B134) No. 54 — (B3) No. 2:

   (B134) No. 43 — (B3) No. 4:

   (B134) No. 32 — (B3) No. 1:

Is the resistance 1 MΩ or more?

Yes	Go to 41.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector** • **Coupling connector**

41. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 53 — Engine ground:

(B134) No. 54 — Engine ground:

(B134) No. 32 — Engine ground:

(B134) No. 43 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 42.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Ground short circuit of harness between ECM connector and the air flow & intake air temperature sensor connector** • **Short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector**

42. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the load value, then compare it with the load value listed in “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.



Note:

- **The value of Calculated load value change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Does the load value falls between 90 — 110% of the value described in the list?

Yes	Go to 43.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

43. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Raise the engine speed up to 2,500rpm and maintain it for approx. three minutes.
3. Release the accelerator pedal and idle the engine.
4. Using “Injection Quantity Control” in “Active Test” items, read the value of [A/F Sensor #1] at the increase rate of both 12% and −12%.

Note:

- **Perform the operation immediately after the engine comes into idling condition, otherwise the front oxygen (A/F) sensor will be cooled.**
- **For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.**

Does the value of [A/F Sensor #1] change to less than 0.88 at the increase rate of 12%, and to 1.12 or more at the rate of −12%?

Yes	Go to 48.
No	Go to 44.

44. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [A/F Sensor #1 Resistance].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [A/F Sensor #1 Resistance] 500 Ω or more?

Yes	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.
No	Go to 45.

45. CHECK POWER SUPPLY TO FRONT OXYGEN (A/F) SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from front oxygen (A/F) sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between front oxygen (A/F) sensor connector and engine ground.

Connector & terminal

(B379) No. 2 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 46.
No	Repair the power supply line. **Note:** **In this case, repair the following item:** • **Open circuit in harness between A/F, oxygen sensor relay and front oxygen (A/F) sensor connector** • **Poor contact of A/F, oxygen sensor relay connector** • **Poor contact of coupling connector** • **Malfunction of A/F, oxygen sensor relay**

46. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 88 — (B379) No. 1:
(E158) No. 60 — (B379) No. 3:
(E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 47.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and front oxygen (A/F) sensor connector** • **Coupling connector**

47. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 88 — Engine ground:
(E158) No. 60 — Engine ground:
(E158) No. 73 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 48.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

48. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Engine Coolant Temperature] and [Ambient air temperature].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Engine Coolant Temperature] 120°C (248°F) or more? Or is the value of [Engine Coolant Temperature] 15°C (27°F) or more lower than that of [Ambient air temperature]?

Yes	Go to 49.
No	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.

49. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 50.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

50. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and engine coolant temperature sensor.
3. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E158) No. 54 — (E8) No. 1:

(E158) No. 45 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 51.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

51. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 45 — Engine ground:

(E158) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

52. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 53.
No	Repair the ignition system. Ref. to IGNITION(H4DO)>General Description.

53. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values of the Freeze Frame Data in [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].
   Note:
   For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.
2. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].
3. Start the engine and warm up completely.
4. Using the Subaru Select Monitor, read the values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct] in current data at normal idling.

   Data Monitor

   Note:
   For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
5. Obtain the sum values of [Idle Mass Air Flow Feedback correct], [ISC Learning Value] and [Idle dirty throttle correct].

Is the sum value of freeze frame data less than 80% of the sum value of current data?

Yes	Go to 54.
No	Go to 56.

54. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system. Ref. to INTAKE (INDUCTION)(H4DO)>General Description.
No	Go to 55.

55. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

- Brake booster: Ref. to BRAKE>Brake Booster>INSPECTION.
- Mass air flow and intake air temperature sensor: Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.
- PCV connector: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Connector>INSPECTION.
- PCV hose: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Hose>INSPECTION.
- PCV hose assembly: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Hose>INSPECTION.
- PCV valve: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>PCV Valve>INSPECTION.
- Purge control solenoid valve: Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 73.
No	Replace the parts if defective.

56. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L], [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R], [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].
   Note:
   For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.
2. Using the Subaru Select Monitor, compare the respective values between the followings: [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R] and [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].

Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes	Go to 73.
No	Diagnose the part that does not synchronize. • Intake RH: Go to 57. • Intake LH: Go to 61. • Exhaust RH: Go to 65. • Exhaust LH: Go to 69.

57. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E38) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 58.
No	Repair the power supply circuit.

58. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH connector.

Connector & terminal

(E158) No. 99 — (E38) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 59.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

59. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid RH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 60.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

60. CHECK INTAKE OIL CONTROL SOLENOID RH.

Check the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the intake cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

61. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.
   Connector & terminal
   (E37) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 62.
No	Repair the power supply circuit.

62. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH connector.

Connector & terminal

(E158) No. 100 — (E37) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 63.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid LH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E37) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 64.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

64. CHECK INTAKE OIL CONTROL SOLENOID LH.

Check the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the intake cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

65. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E63) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 66.
No	Repair the power supply circuit.

66. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH connector.

Connector & terminal

(E158) No. 109 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 67.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

67. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E63) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 68.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

68. CHECK EXHAUST OIL CONTROL SOLENOID RH.

Check the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the exhaust cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

69. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 70.
No	Repair the power supply circuit.

70. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH connector.

Connector & terminal

(E158) No. 108 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 71.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

71. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E66) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 72.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

72. CHECK EXHAUST OIL CONTROL SOLENOID LH.

Check the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the exhaust cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

73. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 74.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

74. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and engine coolant temperature sensor.
3. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E158) No. 54 — (E8) No. 1:

(E158) No. 45 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 75.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector.

75. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 45 — Engine ground:

(E158) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 76.
No	Repair the short circuit to ground in harness between ECM connector and engine coolant temperature sensor connector.

76. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 77.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

77. CHECK MANIFOLD ABSOLUTE PRESSURE SENSOR.

Check the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor>INSPECTION.

Is the check result OK?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Check the manifold absolute pressure sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Manifold Absolute Pressure Sensor.

78. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and fuel injectors.
3. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 79.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

79. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

#1 (E158) No. 96 — Engine ground:
#1 (E158) No. 87 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#4 (E158) No. 94 — Engine ground:
#4 (E158) No. 85 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 80.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

80. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 81.
No	Repair the ignition system. Ref. to IGNITION(H4DO)>General Description.

81. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [A/C Compressor Signal] and [Idle A/C load correct].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Does the value of [A/C Compressor Signal] indicate ON output, and does the value of [Idle A/C load correct] increase?

Yes	Check the air conditioner. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon.
No	Go to 82.

82. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the value in [Electric Load Feedback Val].

   Note:

   For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

2. Compare the value of [Electric Load Feedback Val] with that of [Idle Mass Air Flow], listed under the data monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

   Data Monitor

   Note:

   For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Electric Load Feedback Val] 20% or more to the value of [Idle Mass Air Flow]?

Yes	Check the generator and power assisted system. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator>INSPECTION.
No	Go to 83.

83. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [Vehicle Speed Sensor], [Engine Speed] and [AT turbine speed].
   Note:
   For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is there any freeze frame data indicating that the value of [Vehicle Speed Sensor] is less than 30 km/h (18.6 MPH), and that the difference in values between [Engine Speed] and [AT turbine speed] is less than 100 rpm?

Yes	Repair the CVT. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>General Description.
No	Go to 84.

84. CHECK DTC.

Read all DTCs using the Subaru Select Monitor or a general scan tool.

DTC Check

Note:
For detailed operation procedures, refer to the “Subaru Select Monitor”. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Is DTC of CVT displayed? (Current malfunction)

Yes	Check the appropriate DTC using the “List of Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

85. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Calculated LOAD Value] and [Relative Throttle Position].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Calculated LOAD Value] decreasing while that of [Relative Throttle Position] is increasing?

Yes	Go to 86.
No	Go to 90.

86. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 87.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

87. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM and the mass air flow and intake air temperature sensor.
3. Measure the resistance of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

Connector & terminal

(B134) No. 53 — (B3) No. 3:

(B134) No. 54 — (B3) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 88.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the open circuit and poor contact in the following items.** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Coupling connector**

88. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 53 — Engine ground:

(B134) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 89.
No	Repair the ground short circuit of harness between ECM connector and the mass air flow and intake air temperature sensor connector.

89. CHECK DATA MONITOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor, read the value of [Calculated LOAD Value], then compare it with the load value listed in “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.



Note:

- **The value of Calculated load value change depending on how the engine internal parts settle in. If the value is out of standard, judge it again by comparing the vehicle with another one with the same specifications and similar conditions such as travel distance.**
- **For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.**

Does the load value falls between 90 — 110% of the value described in the list?

Yes	Go to 90.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

90. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and fuel injectors.
3. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 91.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

91. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

#1 (E158) No. 96 — Engine ground:
#1 (E158) No. 87 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#4 (E158) No. 94 — Engine ground:
#4 (E158) No. 85 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 92.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

92. CHECK IGNITION SYSTEM.

Check the ignition system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 93.
No	Repair the ignition system. Ref. to IGNITION(H4DO)>General Description.

93. CHECK OF FUEL PUMP.

1. On “Active Test” item, select [Fuel Pump Relay] and perform ON/OFF drive operation.
   Note:
   For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.
2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Go to 95.
No	Go to 94.

94. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

95. CHECK FUEL TANK.

Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes	Remove foreign matter from the fuel tank.
No	Go to 96.

96. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 97.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

97. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in Fuel Rail Pressure A and Commanded Fuel Rail Pressure A.
Note:
For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value in Fuel Rail Pressure A synchronized with the one in Commanded Fuel Rail Pressure A in all freeze frame data?

Yes	Go to 98.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSPECTION.

98. CHECK ENGINE RUNNING CONDITION.

Check the engine running condition using “Roughness monitor” in the Subaru Select Monitor.
Note:
For detailed operation procedures, refer to “Application help”.

Is there a large difference in the speed between each cylinder?

Yes	It is possible that the compression pressure of the engine is not sufficient. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.
No	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the engine stops except by operating the ignition switch after starting the engine.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Engine condition	After engine starting

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	300 rpm or less

Time needed for diagnosis: 48ms
Malfunction indicator light illumination: Does not illuminate.

DTC P1604 STARTABILITY MALFUNCTION

DTC detecting condition:

Immediately at fault recognition

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

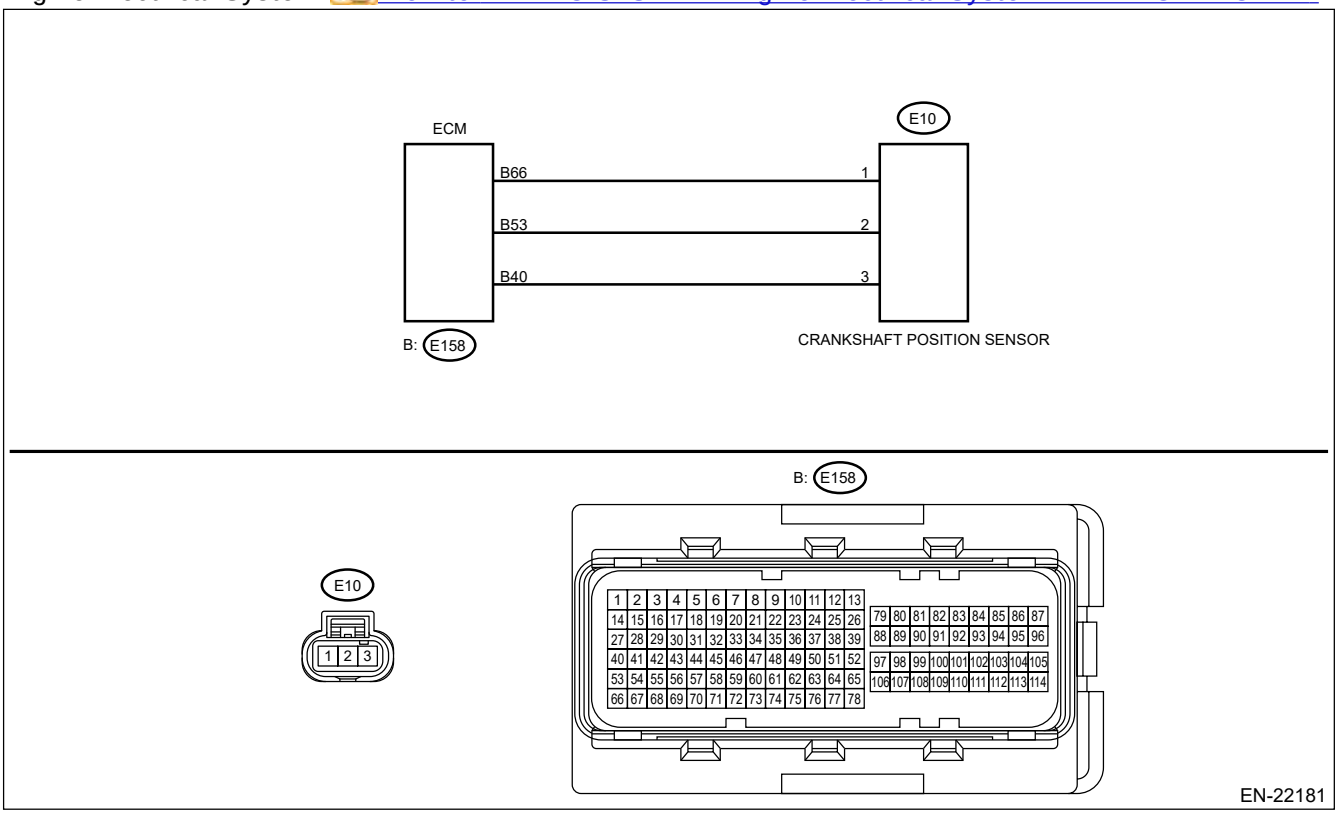
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

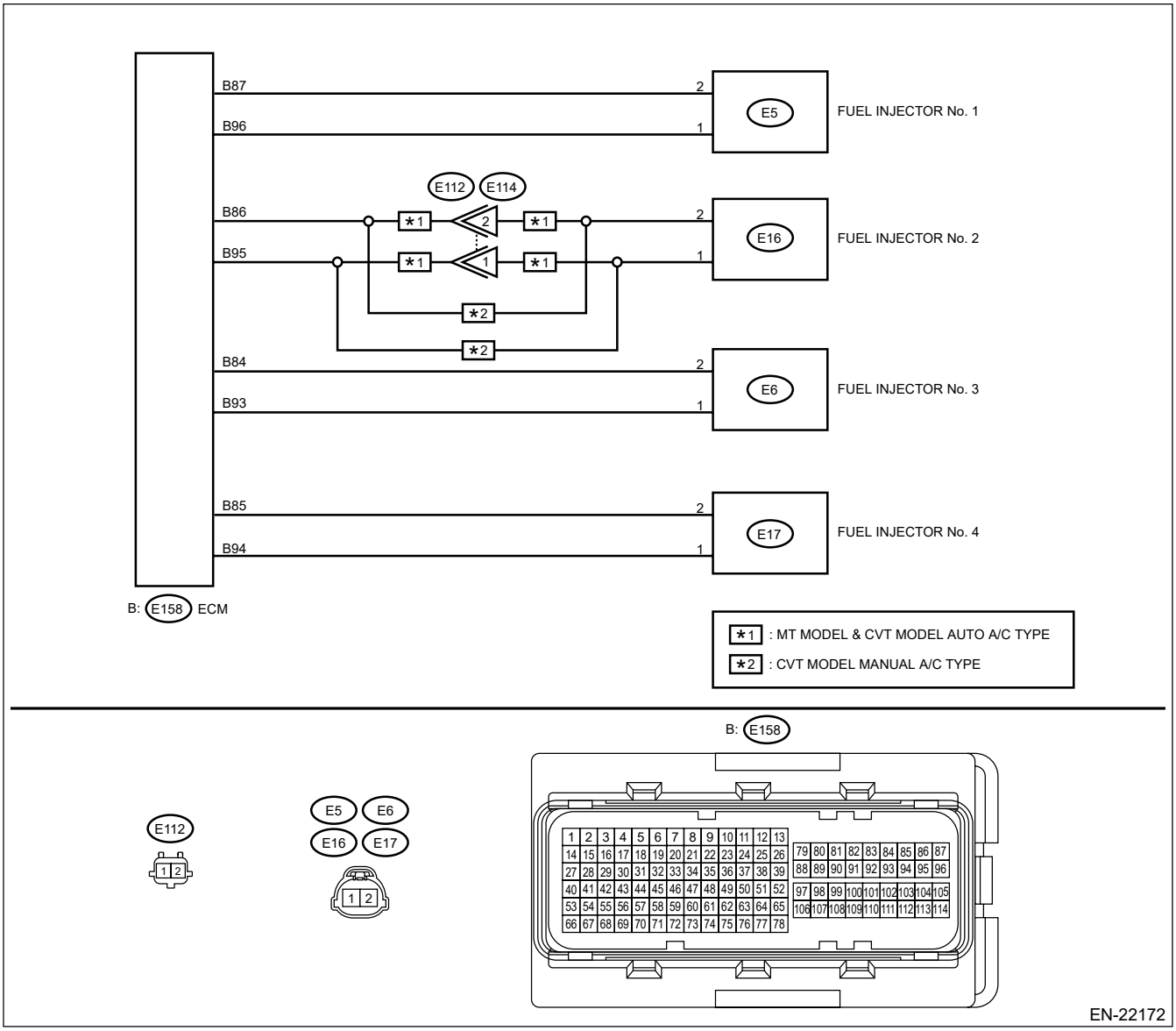
Note:

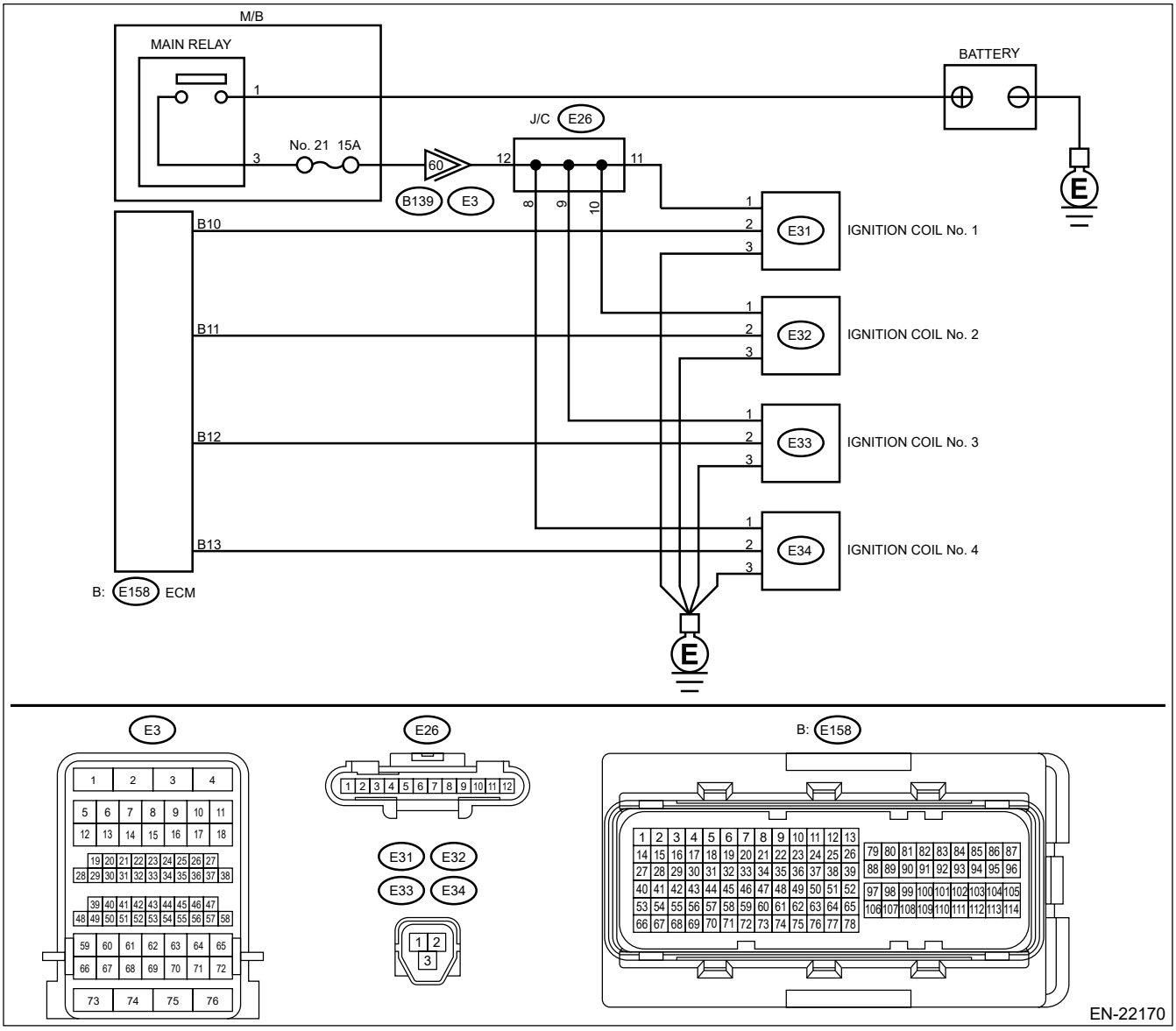
This DTC may be detected even if fault does not occur in the vehicle. If the customer does not ask for inspection, clear memory instead of inspection and return the vehicle to the user. Ref. to COMMON(diag)>Clear memory.

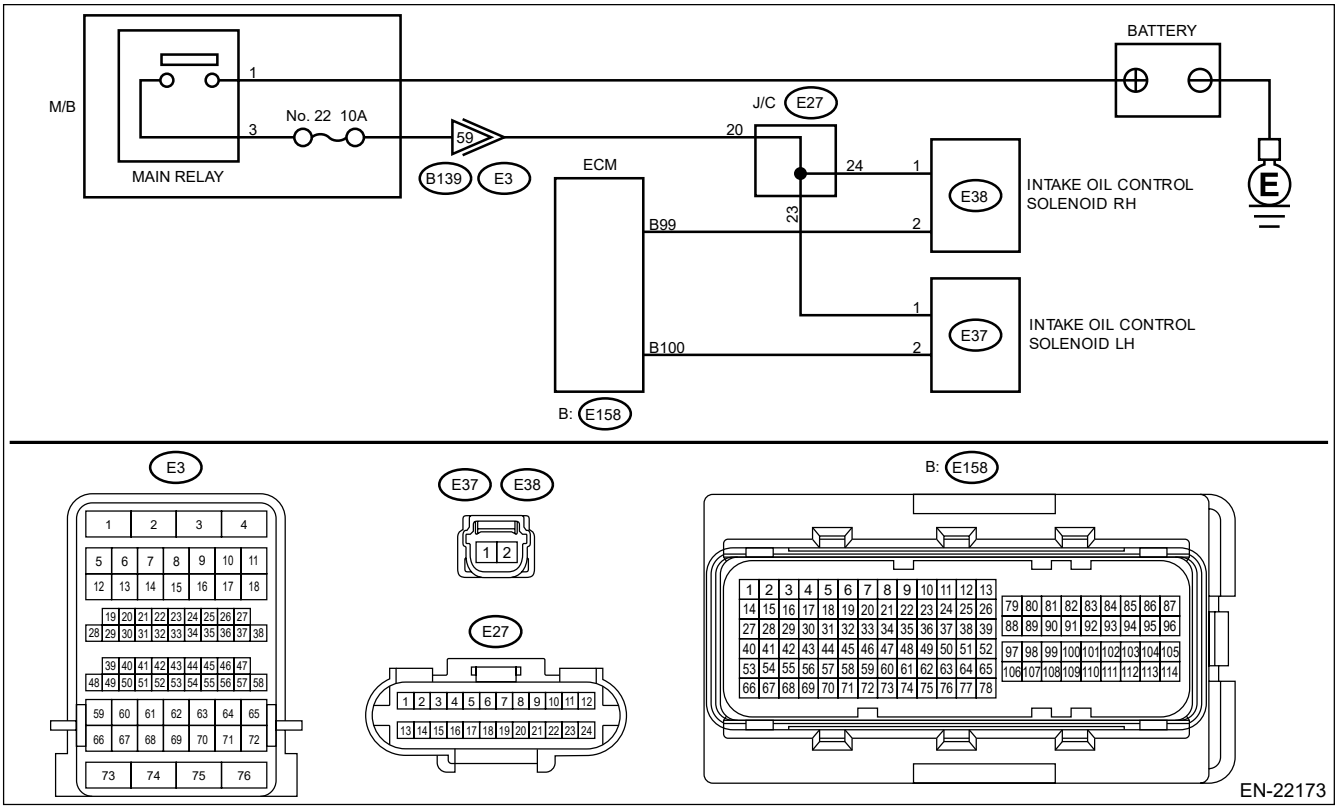
Wiring diagram:

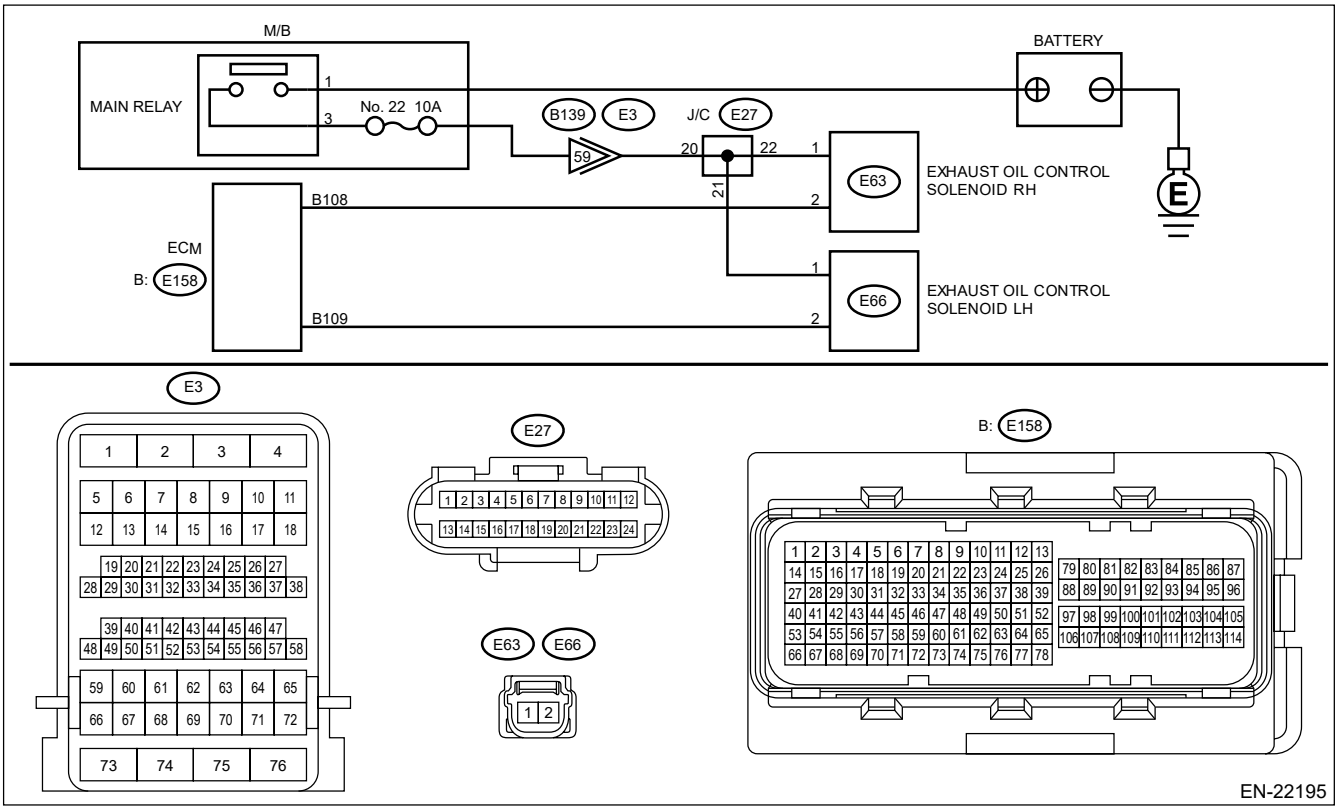
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.

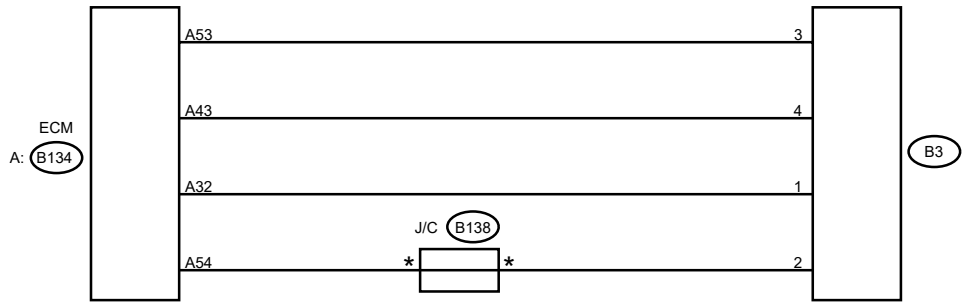



B87
B96
B86
B95
B84
B93
B85
B94
2
1
E5
FUEL INJECTOR No. 1
E16
FUEL INJECTOR No. 2
E6
FUEL INJECTOR No. 3
E17
FUEL INJECTOR No. 4
E112
E114
*1
*2
B: E158 ECM
*1 : MT MODEL & CVT MODEL AUTO A/C TYPE
*2 : CVT MODEL MANUAL A/C TYPE
B: E158
E112
E5
E6
E16
E17
EN-22172

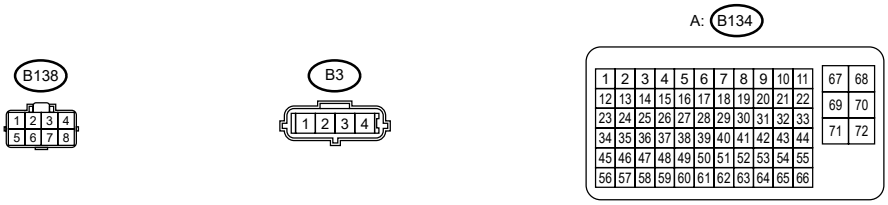

M/B
MAIN RELAY
1
3
No. 21 15A
BATTERY
J/C E26
60
12
11
B139
E3
8
9
10
B10
B11
B12
B13
E31
E32
E33
E34
IGNITION COIL No. 1
IGNITION COIL No. 2
IGNITION COIL No. 3
IGNITION COIL No. 4
B: E158 ECM
E
E3
E26
B: E158
EN-22170


BATTERY
M/B
1
3
No. 22 10A
MAIN RELAY
59
B139
E3
ECM
J/C
E27
20
24
1
2
23
E38
INTAKE OIL CONTROL SOLENOID RH
B99
1
2
E37
INTAKE OIL CONTROL SOLENOID LH
B100
B: E158
E3
E37
E38
E27
B: E158
EN-22173

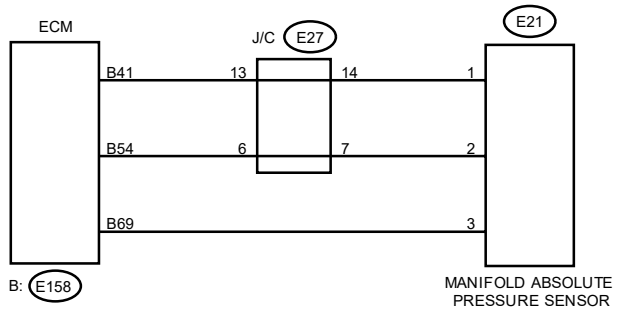

M/B
MAIN RELAY
1
3
No. 22 10A
BATTERY
B139
E3
59
J/C
E27
20
22
1
21
2
E63
EXHAUST OIL CONTROL SOLENOID RH
B108
ECM
B: E158
1
2
E66
EXHAUST OIL CONTROL SOLENOID LH
B109
E3
E27
B: E158
E63
E66
EN-22195

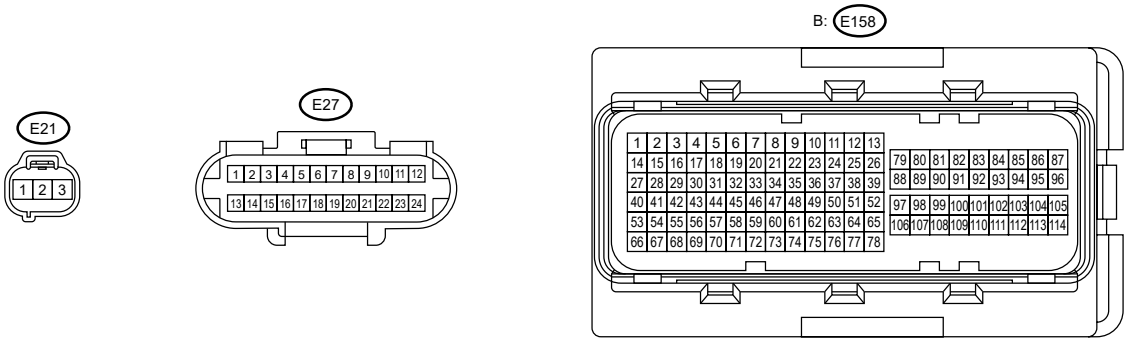


* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 3, 4, 7 AND 8

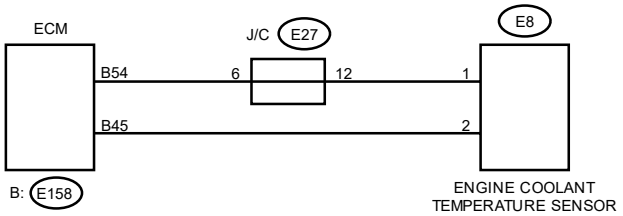


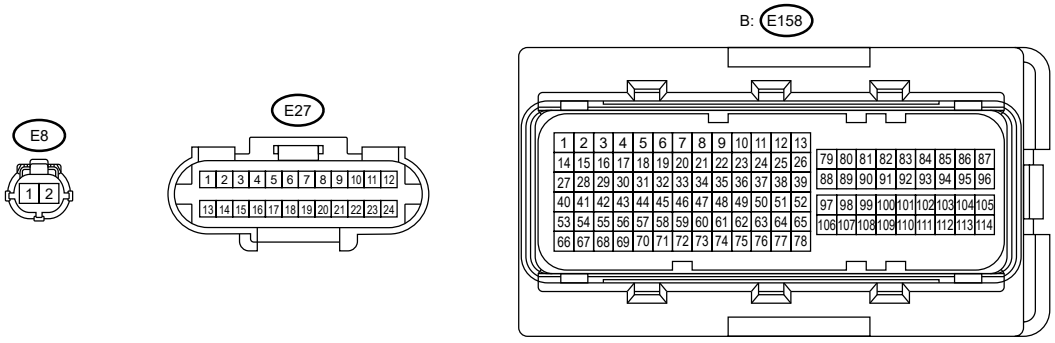
EN-22176



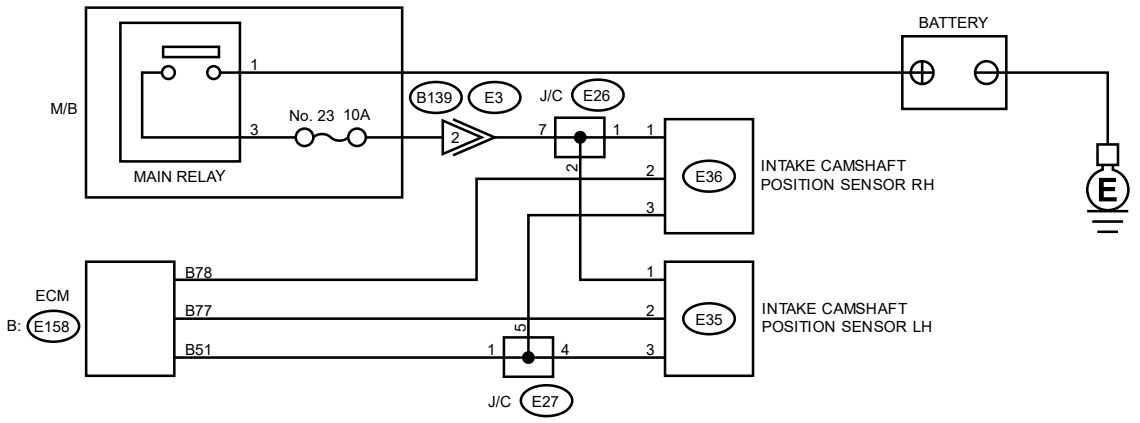


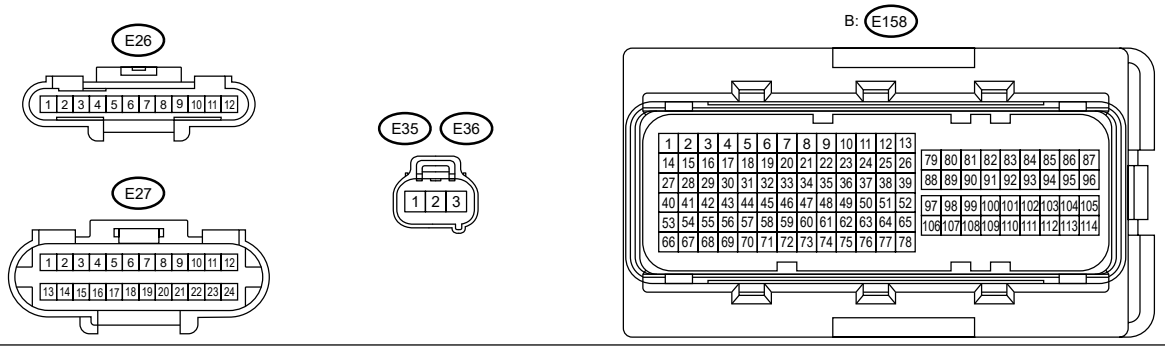
EN-22177



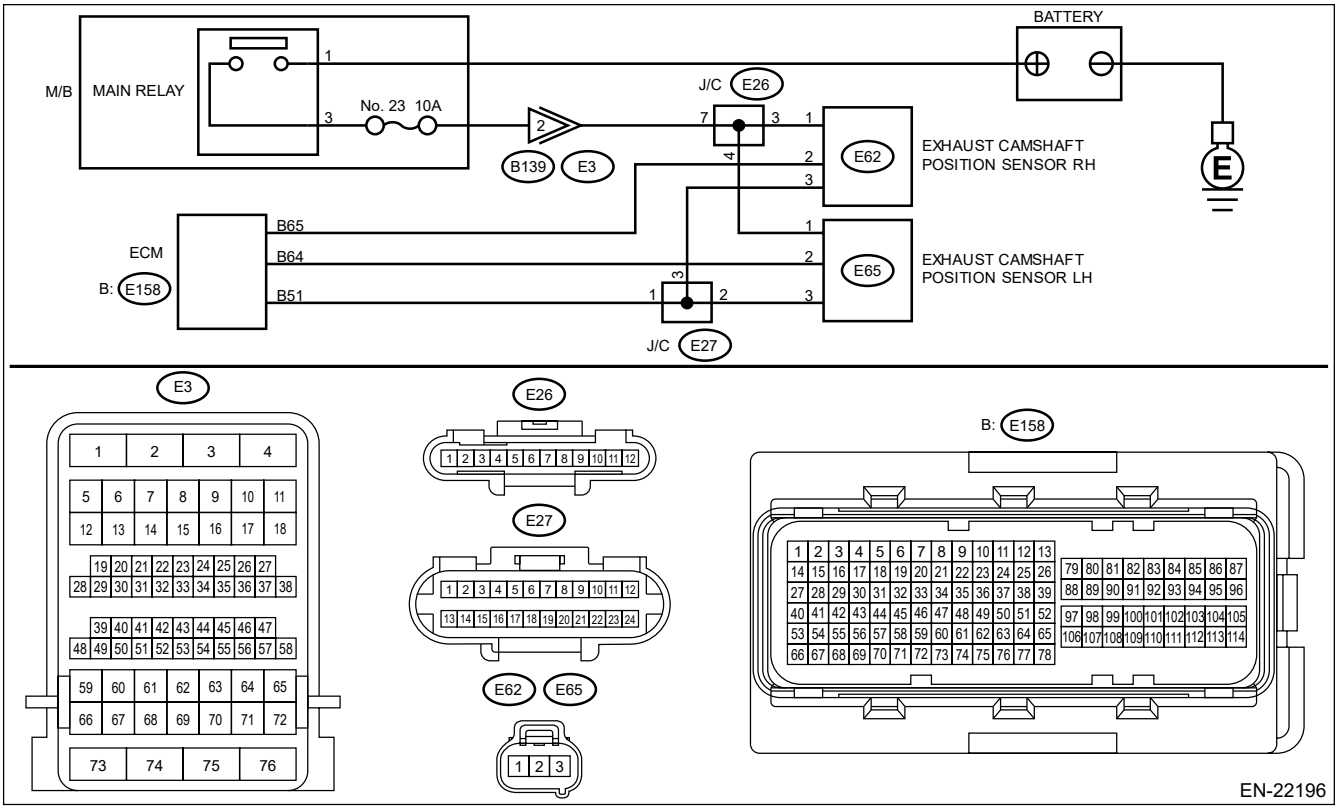


EN-22178





EN-22182



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Note:

For detailed operation procedures, refer to the “Subaru Select Monitor”. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Is DTC P1604 displayed? (Current malfunction)

Yes	Go to 2.
No	Check DTC using “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK IMMOBILIZER.

Check the immobilizer. Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the immobilizer normal?

Yes	Go to 3.
No	Repair the immobilizer. Ref. to IMMOBILIZER (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Is it possible to reproduce the faulty phenomenon or to identify the faulty condition?

Yes	Go to 30.
No	Go to 4.

4. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Engine Speed] and [Control module voltage].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Engine Speed] 0 rpm?

Yes	• When the value of [Control module voltage] is less than 5 V: Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION. • When the value of [Control module voltage] is 5 V or more: Go to 5.
No	• When the value of [Engine Speed] is less than 250 rpm: Go to 12. • When the value of [Engine Speed] is 250 rpm or more: Go to 20.

5. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Control module voltage].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Control module voltage] less than 9 V?

Yes	It is possible that the engine friction is too large. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.
No	• When the value of [Control module voltage] changes in any one of freeze frame data: Go to 6. • When the value of [Control module voltage] does not change in all freeze frame data: Check the starter motor circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.

6. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 7.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

7. CHECK CRANKSHAFT POSITION SENSOR.

Check the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 8.
No	Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.

8. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E10) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 9.
No	Repair the power supply circuit.

9. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.
   Connector & terminal
   (E158) No. 53 — (E10) No. 2:
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

10. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E10) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 11.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

11. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

12. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient air temperature] and [Fuel Pump Duty].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] 15°C (27°F) or more lower than that of [Ambient air temperature]?

Yes	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.
No	• When the value of [Fuel Pump Duty] is 60% or more: Go to 13. • When the value of [Fuel Pump Duty] is less than 60%: Check the fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

13. CHECK OF FUEL PUMP.

1. On “Active Test” item, select [Fuel Pump Relay] and perform ON/OFF drive operation.
   Note:
   For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.
2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Go to 15.
No	Go to 14.

14. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

15. CHECK FUEL TANK.

Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes	Remove foreign matter from the fuel tank.
No	Go to 16.

16. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5 —4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 17.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

17. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?

Yes	Go to 18.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSPECTION.

18. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and fuel injectors.
3. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 19.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

19. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

#1 (E158) No. 96 — Engine ground:
#1 (E158) No. 87 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#4 (E158) No. 94 — Engine ground:
#4 (E158) No. 85 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 29.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

20. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Coolant Temp.], [Ambient air temperature] and [Engine Speed].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Coolant Temp.] 120°C (248°F) or more? Or is the value of [Coolant Temp.] 15°C (27°F) or more lower than that of [Ambient air temperature]?

Yes	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.
No	• When the minimum value of [Engine Speed] is less than 300 rpm: Go to 21. • When the minimum value of [Engine Speed] is 300 rpm or more: It is possible that the engine compression pressure is not sufficient. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.

21. CHECK FUEL INJECTOR.

Check fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is there any deposit in the fuel injectors?

Yes	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.
No	Go to 22.

22. CHECK FUEL TANK.

Check if any foreign matters such as iron powder exist in the fuel tank.

Is there any foreign matter in the fuel tank?

Yes	Remove foreign matter from the fuel tank.
No	Go to 23.

23. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the value in [Coolant Temp.].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value of [Coolant Temp.] 40 — 90°C (104 — 194°F)?

Yes	Go to 25.
No	Go to 24.

24. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.
Note:
If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes	Go to 29.
No	Replace the pressure regulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filter.

25. CHECK FUEL INJECTOR.

1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.
   Note:
   Remove the vacuum hose D between intake manifold and purge solenoid valve B and perform measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL PIPE.

Is the HC concentration less than 4,000 ppm?

Yes	Go to 27.
No	Go to 26.

26. CHECK FUEL INJECTOR.

Check fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 27.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

27. CHECK THROTTLE BODY.

Check throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSPECTION.

Is there any deposit in the throttle body?

Yes	Replace the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.
No	Go to 28.

28. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system. Ref. to INTAKE (INDUCTION)(H4DO)>General Description.
No	Go to 29.

29. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Go to 30.

30. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Does cranking occur?

Yes	• When the engine speed is abnormal during cranking: Go to 37. • When an initial combustion does not occur: Go to 40. • When the engine stalls immediately after engine start: Go to 57. • When the engine takes time to start: Go to 80.
No	Go to 31.

31. CHECK FOR MALFUNCTION OCCURRENCE.

Does the sound occur by a protruding starter pinion gear during cranking?

Yes	• When the starter motor does not rotate: Go to 32. • When the starter motor rotates but does not engage: Go to 34.
No	Go to 35.

32. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 33.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

33. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.

ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSPECTION. **Note:** **It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.**
No	It is possible that the engine friction is too large. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.

34. CHECK STARTER MOTOR.

Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSPECTION.

Is there any wear or damage in the starter pinion gear?

Yes	Repair the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter.
No	CVT model: Replace the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly. MT model: Replace the flexible flywheel. Ref. to CLUTCH SYSTEM>Flywheel.

35. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 36.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

36. CHECK STARTER MOTOR.

Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSPECTION.

Is the check result OK?

Yes	Check the starter motor circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.
No	Repair the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter.

37. CHECK DATA MONITOR.

Using the Subaru Select Monitor, read the value of [Engine Speed] during cranking.

Data Monitor

Note:
For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Engine Speed] 300 rpm or more?

Yes	It is possible that the compression pressure of the engine is not sufficient. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.
No	Go to 38.

38. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 39.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

39. CHECK ENGINE MAIN BODY.

Using the ST, rotate the crankshaft.

ST 18252AA000 CRANKSHAFT SOCKET

Does the crankshaft rotate smoothly?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter>INSPECTION. **Note:** **It is possible that the engine friction increased temporarily. Check if any foreign matter is mixed in engine oil. If a foreign matter is found, check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.**
No	It is possible that the engine friction is too large. Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.

40. CHECK OPERATION OF EACH FUEL INJECTOR.

Using a sound scope, check each fuel injector for operation sound during cranking.

Does the fuel injector emit operating sound?

Yes	Go to 41.
No	Go to 54.

41. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5 —4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 42.
No	Go to 52.

42. CHECK IGNITION CONDITION.

Check the ignition condition. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

Is the check result OK?

Yes	Go to 43.
No	Go to 46.

43. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes	Go to 45.
No	• When the fault occurs in two or three minutes or a long time after the engine is stopped: Go to 44. • When the fault occurrence pattern is inconsistent: Go to 94.

44. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.
Note:
If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes	Go to 94.
No	Replace the pressure regulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filter.

45. CHECK FUEL INJECTOR.

1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.
   Note:
   Remove the vacuum hose D between intake manifold and purge solenoid valve B and perform measurement. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>General Description>COMPONENT > FUEL PIPE.

Is the HC concentration less than 4,000 ppm?

Yes	Go to 94.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

46. CHECK SPARK PLUG.

Check the spark plug. Ref. to IGNITION(H4DO)>Spark Plug>INSPECTION.

Is the check result OK?

Yes	Go to 47.
No	Replace all spark plugs on all cylinders. Ref. to IGNITION(H4DO)>Spark Plug.

47. CHECK DATA MONITOR.

Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Data Monitor

Note:
For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Data Monitor.

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes	It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
No	Go to 48.

48. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (−):
(E32) No. 1 (+) — Engine ground (−):
(E33) No. 1 (+) — Engine ground (−):
(E34) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 49.
No	Check the harness and connector. **Note:** **In this case, repair the following item:** • **Open or short to ground in power supply circuit** • **Poor contact of coupling connector** • **Blown out of fuse**

49. CHECK HARNESS BETWEEN ECM AND IGNITION COIL (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(E158) No. 10 — (E31) No. 2:
(E158) No. 11 — (E32) No. 2:
(E158) No. 12 — (E33) No. 2:
(E158) No. 13 — (E34) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 50.
No	Repair the open circuit in harness between ECM connector and ignition coil connector.

50. CHECK HARNESS BETWEEN ECM AND IGNITION COIL (SHORT TO GROUND).

Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(E158) No. 10 — Engine ground:
(E158) No. 11 — Engine ground:
(E158) No. 12 — Engine ground:
(E158) No. 13 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 51.
No	Repair the ground short circuit of harness between ECM connector and ignition coil connector.

51. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E31) No. 3 — Engine ground:
(E32) No. 3 — Engine ground:
(E33) No. 3 — Engine ground:
(E34) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Replace the ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil. If the fault occurs after servicing, continue the diagnosis.
No	Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

52. CHECK OF FUEL PUMP.

1. On “Active Test” item, select [Fuel Pump Relay] and perform ON/OFF drive operation.
   Note:
   For detailed procedures, refer to “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.
2. Check if operating sound occurs in the fuel pump according to ON/OFF switching operation.

Does the fuel pump emit operating sound?

Yes	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.
No	Go to 53.

53. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT. If the fault occurs after servicing, continue the diagnosis. Go to 94.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

54. CHECK DATA MONITOR.

Using the Subaru Select Monitor, record the value of [Engine Speed] during cranking.

Data Monitor

Note:
For detailed procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Data Monitor.

Does the recorded value of [Engine Speed] contain data of 0 rpm?

Yes	It is possible that temporary fault occurs in the crankshaft position sensor circuit. Check the crankshaft position sensor circuit. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0335 CRANKSHAFT POSITION SENSOR "A" CIRCUIT.
No	Go to 55.

55. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and fuel injectors.
3. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 56.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

56. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

#1 (E158) No. 96 — Engine ground:
#1 (E158) No. 87 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#4 (E158) No. 94 — Engine ground:
#4 (E158) No. 85 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

57. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 58.
No	Go to 78.

58. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system. Ref. to INTAKE (INDUCTION)(H4DO)>General Description.
No	Go to 59.

59. CHECK THROTTLE BODY.

1. Disconnect the ground cable from battery.
2. Disconnect the connector from the throttle body.
3. Check throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSPECTION.

Is the check result OK?

Yes	Go to 60.
No	Replace the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.

60. CHECK THROTTLE BODY.

Check throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body>INSPECTION.

Is there any deposit in the throttle body?

Yes	Replace the throttle body. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.
No	Go to 61.

61. CHECK FREEZE FRAME DATA.

1. Using the Subaru Select Monitor, read the values in [VVT Adv. Ang. Amount R], [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L], [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R], [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].
   Note:
   For detailed operation procedures, refer to "Freeze Frame Data". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.
2. Using the Subaru Select Monitor, compare the respective values between the followings: [VVT Adv. Ang. Amount R] and [VVT Advance Target Angle Amount R], [VVT Adv. Ang. Amount L] and [VVT Advance Target Angle Amount L], [Exh. VVT Retard Ang. R] and [Ex VVT Retard Target Angle R], [Exh. VVT Retard Ang. L] and [Ex VVT Retard Target Angle L].

Does all of the advance angle amount and retard angle amount synchronize with their target values?

Yes	Go to 112.
No	Diagnose the part where there is difference of 10 deg or more. • Intake RH: Go to 62. • Intake LH: Go to 66. • Exhaust RH: Go to 70. • Exhaust LH: Go to 74.

62. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E38) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 63.
No	Repair the power supply circuit.

63. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid RH connector.

Connector & terminal

(E158) No. 99 — (E38) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 64.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid RH connector.

64. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid RH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E38) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 65.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid RH connector.

65. CHECK INTAKE OIL CONTROL SOLENOID RH.

Check the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the intake cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the intake oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

66. CHECK POWER SUPPLY TO THE INTAKE OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake oil control solenoid LH connector and engine ground.
   Connector & terminal
   (E37) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 67.
No	Repair the power supply circuit.

67. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and intake oil control solenoid LH.
   Connector & terminal
   (E158) No. 100 — (E37) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 68.
No	Repair the open circuit in harness between ECM connector and intake oil control solenoid LH connector.

68. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID LH (SHORT TO GROUND).

Measure the resistance between intake oil control solenoid LH connector and engine ground.

Note:
Connect all connectors after measurement.

Connector & terminal
(E37) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 69.
No	Repair the short circuit to ground in harness between ECM connector and intake oil control solenoid LH connector.

69. CHECK INTAKE OIL CONTROL SOLENOID LH.

Check the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the intake cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the intake oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

70. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid RH connector and engine ground.
   Connector & terminal
   (E63) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 71.
No	Repair the power supply circuit.

71. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid RH connector.

Connector & terminal

(E158) No. 109 — (E63) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 72.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid RH connector.

72. CHECK HARNESS BETWEEN ECM AND INTAKE OIL CONTROL SOLENOID RH (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid RH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E63) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 73.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid RH connector.

73. CHECK INTAKE OIL CONTROL SOLENOID RH.

Check the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the exhaust cam sprocket RH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the exhaust oil control solenoid RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

74. CHECK POWER SUPPLY TO THE EXHAUST OIL CONTROL SOLENOID LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust oil control solenoid LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust oil control solenoid LH connector and engine ground.

Connector & terminal

(E66) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 75.
No	Repair the power supply circuit.

75. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and exhaust oil control solenoid LH connector.

Connector & terminal

(E158) No. 108 — (E66) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 76.
No	Repair the open circuit in harness between ECM connector and exhaust oil control solenoid LH connector.

76. CHECK HARNESS BETWEEN ECM AND EXHAUST OIL CONTROL SOLENOID LH (SHORT TO GROUND).

Measure the resistance between exhaust oil control solenoid LH connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E66) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 77.
No	Repair the short circuit to ground in harness between ECM connector and exhaust oil control solenoid LH connector.

77. CHECK EXHAUST OIL CONTROL SOLENOID LH.

Check the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid>INSPECTION.

Is the check result OK?

Yes	Replace the exhaust cam sprocket LH. Ref. to MECHANICAL(H4DO)>Cam Sprocket.
No	Replace the exhaust oil control solenoid LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Oil Control Solenoid.

78. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR, AND ECM AND MANIFOLD ABSOLUTE PRESSURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect connectors from ECM, air flow & intake air temperature sensor, and manifold absolute pressure sensor.
3. Measure the resistance of harness between ECM connector and air flow & intake air temperature sensor connector, and between ECM connector and manifold absolute pressure sensor.

Connector & terminal

(B134) No. 53 — (B3) No. 3:
(B134) No. 54 — (B3) No. 2:
(B134) No. 43 — (B3) No. 4:
(B134) No. 32 — (B3) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 79.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the mass air flow and intake air temperature sensor connector** • **Open circuit of harness between ECM connector and manifold absolute pressure sensor**

79. CHECK HARNESS BETWEEN ECM AND AIR FLOW & INTAKE AIR TEMPERATURE SENSOR AND MANIFOLD ABSOLUTE PRESSURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(B134) No. 53 — Engine ground:

(B134) No. 54 — Engine ground:

(E158) No. 32 — Engine ground:

(E159) No. 43 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Replace air flow & intake air temperature sensor or manifold absolute pressure sensor. If the fault occurs after servicing (s165020), continue the diagnosis. Go to 112.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Ground short circuit of harness between ECM connector and the air flow & intake air temperature sensor connector** • **Ground short circuit of harness between ECM connector and manifold absolute pressure sensor**

80. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 81.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor. If the fault occurs after servicing, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). If the fault still occurs after replacing the ECM, continue the diagnosis. Go to 123.

81. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and engine coolant temperature sensor.
3. Measure the resistance of harness between ECM connector and engine coolant temperature sensor connector.

Connector & terminal

(E158) No. 54 — (E8) No. 1:

(E158) No. 45 — (E8) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 82.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). If the fault still occurs after replacing the ECM, continue the diagnosis. Go to 123.

82. CHECK HARNESS BETWEEN ECM AND ENGINE COOLANT TEMPERATURE SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E158) No. 45 — Engine ground:

(E158) No. 54 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 83.
No	Repair the open circuit of the harness between the ECM connector and engine coolant temperature sensor connector. If the fault occurs after servicing, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). If the fault still occurs after replacing the ECM, continue the diagnosis. Go to 123.

83. CHECK DATA MONITOR.

1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the values in [Long Term Fuel Trim (B1)] and [Barometric Pressure].



Note:
For detailed operation procedures, refer to “Current Data Display For Engine”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Long Term Fuel Trim (B1)]−25 — 25%? And is the value of [Barometric Pressure] 80 kPa (600 mmHg, 23.6 inHg) or more?

Yes	Go to 86.
No	Go to 84.

84. CHECK FOR MALFUNCTION OCCURRENCE.

1. Clear the memory in engine using the Subaru Select Monitor or general scan tool. Ref. to COMMON(diag)>Clear memory.



2. Start the engine.

Does the engine start?

Yes	Go to 85.
No	Go to 86.

85. CHECK IDLE SPEED.

Check the idle speed.

Is the idle speed stable?

Yes	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor. If the fault occurs after servicing, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). If the fault still occurs after replacing the ECM, continue the diagnosis. Go to 123.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector. If the fault occurs after servicing, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). If the fault still occurs after replacing the ECM, continue the diagnosis. Go to 123.

86. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5 —4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 87.
No	Go to 93.

87. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, read the values in [Fuel Rail Pressure A] and [Commanded Fuel Rail Pressure A].

Note:

For detailed operation procedures, refer to “Freeze Frame Data”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

Is the value in [Fuel Rail Pressure A] synchronized with the one in [Commanded Fuel Rail Pressure A] in all freeze frame data?

Yes	Go to 88.
No	Check the high-pressure fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>High Pressure Fuel Pump>INSPECTION.

88. CHECK SPARK PLUG.

Check the spark plug. Ref. to IGNITION(H4DO)>Spark Plug>INSPECTION.

Are all spark plug in all cylinders normal?

Yes	Go to 89.
No	• When spark plugs in some cylinders are faulty: Replace the faulty spark plugs of the cylinders, then check the ignition system and fuel system in the faulty cylinders. Ref. to IGNITION(H4DO)>Spark Plug. If the fault occurs after servicing, continue the diagnosis. Go to 123. • When all spark plugs in all cylinders are faulty: Replace faulty spark plugs in all cylinders. Ref. to IGNITION(H4DO)>Spark Plug. If the fault occurs after servicing, continue the diagnosis. Go to 123.

89. CHECK FOR MALFUNCTION OCCURRENCE.

Check for the condition of fault occurrence.

Does the fault occur only within approx. 15 to 120 minutes after the engine is stopped?

Yes	Go to 91.
No	• When the fault occurs in two or three minutes or a long time after the engine is stopped: Go to 90. • When the fault occurrence pattern is inconsistent: Go to 123.

90. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.
Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
Caution:
Before attaching/detaching a fuel pressure gauge, release the fuel pressure.
Note:
If the engine does not start, measure the fuel pressure five minutes after cranking is completed.

Is the measured value 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes	Go to 123.
No	Replace the pressure regulator. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Filter.

91. CHECK PURGE CONTROL SOLENOID VALVE.

Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 92.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

92. CHECK FUEL INJECTOR.

1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Is the HC concentration less than 4,000 ppm?

Yes	Go to 123.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

93. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT. If the fault occurs after servicing, continue the diagnosis. Go to 123.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

94. CHECK FUEL INJECTOR.

Check fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 95.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

95. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connectors from ECM and fuel injectors.
3. Measure the resistance of harness between ECM connector and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 96.
No	Repair the open circuit of the harness between the ECM connector and fuel injector connector.

96. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

#1 (E158) No. 96 — Engine ground:
#1 (E158) No. 87 — Engine ground:
#2 (E158) No. 95 — Engine ground:
#2 (E158) No. 86 — Engine ground:
#3 (E158) No. 93 — Engine ground:
#3 (E158) No. 84 — Engine ground:
#4 (E158) No. 94 — Engine ground:
#4 (E158) No. 85 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 97.
No	Repair the short circuit to ground in harness between ECM connector and fuel injector connector.

97. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Go to 98.

98. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

99. CHECK CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 100.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

100. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installed correctly?

Yes	Go to 101.
No	Install the camshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

101. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E10) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 102.
No	Repair the power supply circuit.

102. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.
   Connector & terminal
   (E158) No. 53 — (E10) No. 2:
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 103.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

103. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E10) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 104.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

104. CHECK POWER SUPPLY OF INTAKE CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.

Connector & terminal

(E35) No. 1 (+) — Engine ground (−):

(E36) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 105.
No	Repair the harness and connector. **Note:** • **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector** • **Poor contact of coupling connector**

105. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.

Connector & terminal

(E158) No. 77 — (E35) No. 2:
(E158) No. 51 — (E35) No. 3:
(E158) No. 78 — (E36) No. 2:
(E158) No. 51 — (E36) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 106.
No	Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

106. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E35) No. 2 — Engine ground:
(E36) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 107.
No	Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

107. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor connector and engine ground.
   Connector & terminal
   (E62) No. 1 (+) — Engine ground (−):
   (E65) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 108.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between main relay and exhaust camshaft position sensor connector** • **Poor contact of coupling connector**

108. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and exhaust camshaft position sensor connector.
   Connector & terminal
   (E158) No. 65 — (E62) No. 2:
   (E158) No. 51 — (E62) No. 3:
   (E158) No. 64 — (E65) No. 2:
   (E158) No. 51 — (E65) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 109.
No	Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor connector.

109. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E62) No. 2 — Engine ground:

(E65) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 110.
No	Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

110. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Go to 111.

111. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

112. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 113.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

113. CHECK FUEL PRESSURE.

1. Using the Subaru Select Monitor, read the value of [Fuel Rail Pressure A] during cranking.

   Data Monitor

   Note:
   For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
2. Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.

Is the value of [Fuel Rail Pressure A] during cranking 325 — 450 kPa (3.3—4.6 kg/cm^2, 47 — 66 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kg/cm^2, 21 psipsi) or more?

Yes	Go to 114.
No	Go to 122.

114. CHECK DATA MONITOR.

1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long Term Fuel Trim (B1)].

Data Monitor

Note:
For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Data Monitor.

Does the value of [Long Term Fuel Trim (B1)] fall within a range of −15 — 15%?

Yes	Go to 115.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

115. CHECK FOR MALFUNCTION OCCURRENCE.

Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes	It is possible that the fault comes from fuel. Replace fuel.
No	Go to 116.

116. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 117.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

117. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E10) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 118.
No	Repair the power supply circuit.

118. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.
   Connector & terminal
   (E158) No. 53 — (E10) No. 2:
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 119.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

119. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E10) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 120.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

120. CHECK COMPRESSION PRESSURE.

Check the compression pressure. Ref. to MECHANICAL(H4DO)>Compression>INSPECTION.

Is the compression pressure normal?

Yes	Go to 121.
No	Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.

121. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Check the valve timing. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. When the valve timing is normal, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

122. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

123. CHECK FUEL PRESSURE.

1. Using the Subaru Select Monitor, read the value of [Fuel Rail Pressure A] during cranking.

   Data Monitor

   Note:
   For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
2. Measure the fuel pressure five minutes after the engine is stopped. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.

Is the value of [Fuel Rail Pressure A] during cranking 325 — 450 kPa (3.3—4.6 kg/cm^2, 47 — 66 psi), and is the fuel pressure five minutes after engine stop 147 kPa (1.5 kg/cm^2, 21 psi) or more?

Yes	Go to 124.
No	Go to 131.

124. CHECK DATA MONITOR.

1. Turn the ignition switch to ON. (Engine OFF)
2. Using the Subaru Select Monitor, read the value in [Long Term Fuel Trim-Bank1].

Data Monitor

Note:
For detailed procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Data Monitor.

Does the value of [Long Term Fuel Trim-Bank1] fall within a range of −15 — 15%?

Yes	Go to 125.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

125. CHECK FOR MALFUNCTION OCCURRENCE.

Start the engine and check the idling speed.

Is the idling speed stable all time?

Yes	It is possible that the fault comes from fuel. Replace fuel.
No	Go to 126.

126. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 127.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

127. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E10) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 128.
No	Repair the power supply circuit.

128. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.
   Connector & terminal
   (E158) No. 53 — (E10) No. 2:
   (E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 129.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

129. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E10) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 130.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

130. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

131. CHECK OF FUEL PUMP.

Check fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION.

Is the check result OK?

Yes	Go to 132.
No	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.

132. CHECK FUEL PUMP SYSTEM.

Check fuel pump circuit. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

Is the check result OK?

Yes	Go to 133.
No	Repair the fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.

133. CHECK PURGE CONTROL SOLENOID VALVE.

Check the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve>INSPECTION.

Is the check result OK?

Yes	Go to 134.
No	Replace the purge control solenoid valve. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Purge Control Solenoid Valve.

134. CHECK FUEL INJECTOR.

1. After the engine is stopped, scavenge inside of the intake manifold by applying compressed air.
2. Measure the HC concentration inside the intake manifold 15 minutes after scavenging is completed.

Is the HC concentration less than 4,000 ppm?

Yes	Go to 135.
No	Replace the fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

135. CHECK INTAKE VALVE.

Check the intake valve. Ref. to MECHANICAL(H4DO)>Cylinder Head>INSPECTION.

Is there any deposit in the intake valve?

Yes	Clean the intake valve. Ref. to MECHANICAL(H4DO)>Cylinder Head.
No	Go to 136.

136. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

Check the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 137.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

137. CHECK INSTALLATION CONDITION OF CRANKSHAFT POSITION SENSOR.

Check the installation condition of crankshaft position sensor.

Is the crankshaft position sensor installed correctly?

Yes	Go to 138.
No	Install the crankshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.

138. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR.

Check the installation condition of camshaft position sensor.

Is the camshaft position sensor installed correctly?

Yes	Go to 139.
No	Install the camshaft position sensor correctly. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION.

139. CHECK POWER SUPPLY TO CRANKSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the crankshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between crankshaft position sensor connector and engine ground.
   Connector & terminal
   (E10) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 140.
No	Repair the power supply circuit.

140. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and crankshaft position sensor connector.

Connector & terminal

(E158) No. 53 — (E10) No. 2:

(E158) No. 66 — (E10) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 141.
No	Repair the open circuit in the harness between the ECM connector and crankshaft position sensor connector.

141. CHECK HARNESS BETWEEN ECM AND CRANKSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between crankshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E10) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 142.
No	Repair short circuit to ground in harness between ECM connector and crankshaft position sensor connector.

142. CHECK POWER SUPPLY TO INTAKE CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the intake camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between intake camshaft position sensor connector and engine ground.
   Connector & terminal
   (E35) No. 1 (+) — Engine ground (−):
   (E36) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 143.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit or short circuit to ground in harness between main relay connector and intake camshaft position sensor connector** • **Poor contact of coupling connector**

143. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and intake camshaft position sensor connector.
   Connector & terminal
   (E158) No. 77 — (E35) No. 2:
   (E158) No. 51 — (E35) No. 3:
   (E158) No. 78 — (E36) No. 2:
   (E158) No. 51 — (E36) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 144.
No	Repair the open circuit in the harness between ECM connector and intake camshaft position sensor connector.

144. CHECK HARNESS BETWEEN ECM AND INTAKE CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between intake camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E35) No. 2 — Engine ground:

(E36) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 145.
No	Repair short circuit to ground in the harness between ECM connector and intake camshaft position sensor connector.

145. CHECK POWER SUPPLY OF EXHAUST CAMSHAFT POSITION SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the exhaust camshaft position sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between exhaust camshaft position sensor connector and engine ground.

   Connector & terminal

   (E62) No. 1 (+) — Engine ground (−):

   (E65) No. 1 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 146.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between main relay and exhaust camshaft position sensor connector** • **Poor contact of coupling connector**

146. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and exhaust camshaft position sensor connector.

Connector & terminal

(E158) No. 65 — (E62) No. 2:
(E158) No. 51 — (E62) No. 3:
(E158) No. 64 — (E65) No. 2:
(E158) No. 51 — (E65) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 147.
No	Repair the open circuit in the harness between ECM connector and exhaust camshaft position sensor connector.

147. CHECK HARNESS BETWEEN ECM AND EXHAUST CAMSHAFT POSITION SENSOR (SHORT TO GROUND).

Measure the resistance between exhaust camshaft position sensor connector and engine ground.

Note:

Connect all connectors after measurement.

Connector & terminal

(E62) No. 2 — Engine ground:
(E65) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 148.
No	Repair short circuit to ground in the harness between ECM connector and exhaust camshaft position sensor connector.

148. CHECK COMPRESSION PRESSURE.

Check the compression pressure. Ref. to MECHANICAL(H4DO)>Compression>INSPECTION.

Is the compression pressure normal?

Yes	Go to 149.
No	Check the engine. Ref. to MECHANICAL(H4DO)>Symptoms and causes>INSPECTION.

149. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Go to 150.

150. CHECK FOR MALFUNCTION OCCURRENCE.

1. Replace the camshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor.
2. Check that the fault is removed.

Is the fault removed?

Yes	Clear the memory to complete. Ref. to COMMON(diag)>Clear memory.
No	Check the valve timing. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly. When the valve timing is normal, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Judge as NG when the status enters into any one of the followings.

- Although starter signal input is present in ECM, the engine does not start (diagnosis 1)
- Although starter signal input is present in ECM, starting takes more time than it should (diagnosis 1)

- The engine stops immediately after starting except by operating the ignition switch (diagnosis 2)

2. EXECUTION CONDITION

Diagnosis 1

Secondary parameters	Execution condition
Starter signal	ON

Diagnosis 2

Secondary parameters	Execution condition
Elapsed time after starting the engine	2 s or less

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Diagnosis 1

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	Less than 500 rpm

Time needed for diagnosis: 2 — 26 seconds

Diagnosis 2

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	Less than 300 rpm

Time needed for diagnosis: Less than 1 second

Malfunction indicator light illumination: Does not illuminate.

DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

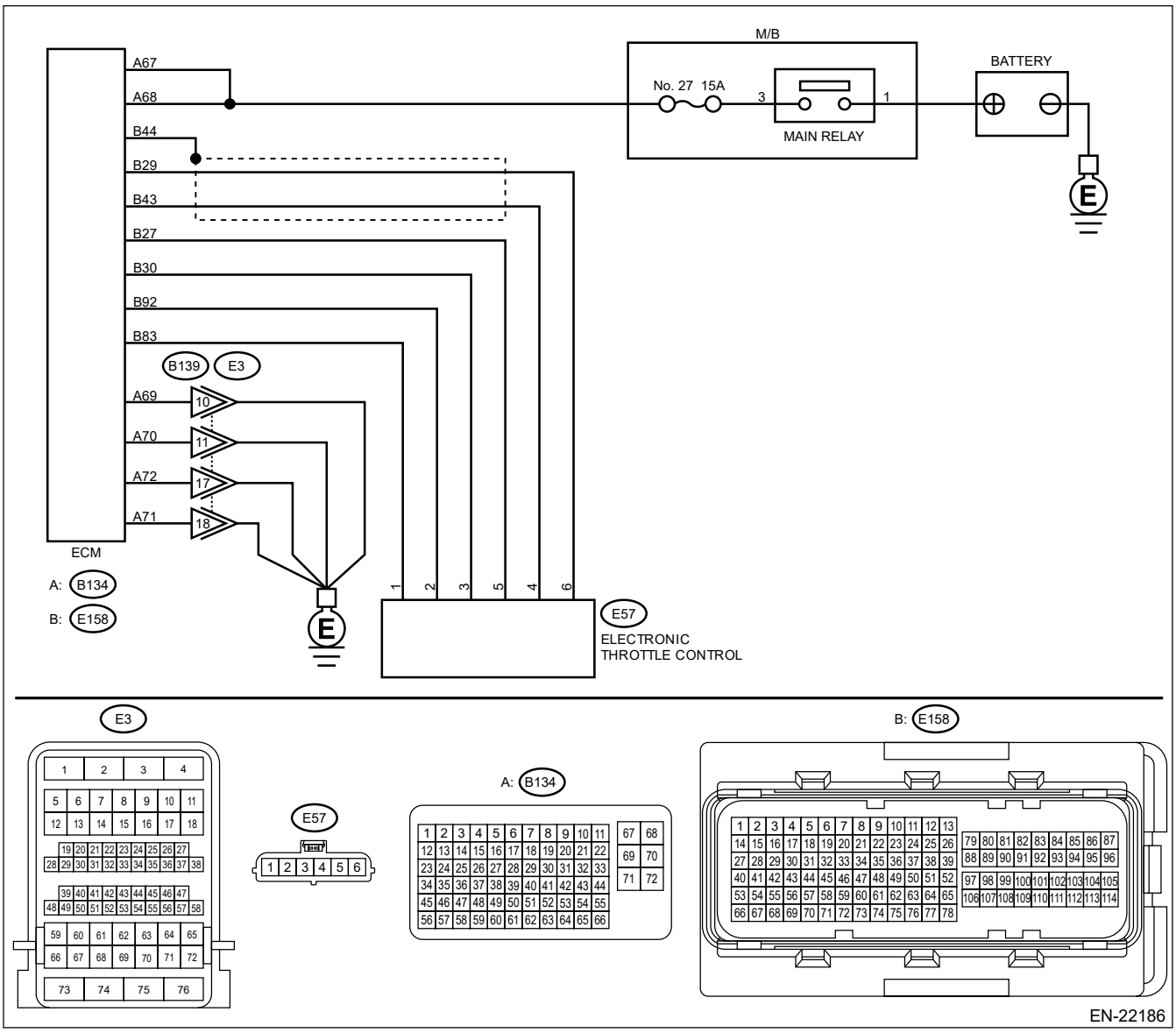
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK INPUT VOLTAGE OF ECM.

1. Disconnect the connector from ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 67 (+) — Chassis ground (−):
(B134) No. 68 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes — Go to 2.

No — Repair the power supply line.

Note:

In this case, repair the following item:

- Open circuit in harness between ECM connector and battery terminal
- Blown out of fuse
- Replace main relay
- Replace M/B

2. CHECK ECM GROUND HARNESS.

1. Connect all connectors.
2. Turn the ignition to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 (+) — Chassis ground (−):
(B134) No. 70 (+) — Chassis ground (−):
(B134) No. 71 (+) — Chassis ground (−):
(B134) No. 72 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes — Go to 3.

No — Repair the harness and connector.

Note:

In this case, repair the following item:

- Open circuit in ground circuit
- Loose engine ground terminal

3. CHECK DTC.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Perform inspection mode using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode.

Is DTC P162A displayed as a readiness code?

Yes	Check the connector for poor contact and check the harness. Replace the ECM if no fault is found. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the monitor value of the starter interlock inner circuit does not correspond to the expected value.

2. COMPONENT DESCRIPTION

Inner circuit to inhibit starter drive operation in drive range

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Interlock inner circuit monitor value	Different from expected value

Time needed for diagnosis: 320 ms

Malfunction indicator light illumination: Does not illuminate even when malfunction occurs.

DTC P1C00 BATTERY MONITOR MODULE "A" PERFORMANCE

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P1C00 displayed? (Current malfunction)

Yes	Replace the battery sensor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery Sensor.
No	Even if DTC is detected, it has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

1. OUTLINE OF DIAGNOSIS

Judge as NG when faulty signal of each part is sent from the battery sensor.

2. COMPONENT DESCRIPTION

The battery sensor monitors the data of battery voltage, current, temperature, etc. ECM receives these data via LIN communication with the battery sensor.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
Receives pulse discharge malfunction	ON
or	
Receives voltage measurement malfunction	ON
or	
Receives current measurement malfunction	ON

Time needed for diagnosis: Less than 1 second
Malfunction indicator light illumination: Does not illuminate.

DTC P2004 TGV CONTROL STUCK OPEN BANK 1

DTC detecting condition:
Immediately at fault recognition

Caution:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2004 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK TUMBLE GENERATOR VALVE RH.

1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes	Clean the tumble generator valve.
No	Replace the tumble generator valve RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.
Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Battery voltage	10.9 V or more
Tumble generator valve “close” signal output time	1600ms or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	71.4° or more

Time needed for diagnosis: 3000ms or more

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2005 TGV CONTROL STUCK OPEN BANK 2

DTC detecting condition:
Immediately at fault recognition

Caution:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2005 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK TUMBLE GENERATOR VALVE LH.

1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes	Clean the tumble generator valve.
No	Replace the tumble generator valve LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.
Judge open fixing malfunction when the opening degree is large even after finishing the tumble generator valve closing driving.

2. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve “close” signal output time	1600ms or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	71.4° or more

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2006 TGV CONTROL STUCK CLOSED BANK 1

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2006 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK TUMBLE GENERATOR VALVE RH.

1. Remove the tumble generator valve assembly RH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes	Clean the tumble generator valve.
No	Replace the tumble generator valve RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.
Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Battery voltage	10.9 V or more
Tumble generator valve “open” signal output time	1600ms or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	Less than 71.4°

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2007 TGV CONTROL STUCK CLOSED BANK 2

DTC detecting condition:
Immediately at fault recognition

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P2007 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK TUMBLE GENERATOR VALVE LH.

1. Remove the tumble generator valve assembly LH.
2. Check the tumble generator valve.

Is there any dirt or clogging with foreign objects in the tumble generator valve?

Yes	Clean the tumble generator valve.
No	Replace the tumble generator valve LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of tumble generator valve motor function.
Judge close fixing malfunction when the opening degree is small even after finishing the tumble generator valve open driving.

2. EXECUTION CONDITION

Secondary parameters	Execution

	condition
Battery voltage	10.9 V or more
Tumble generator valve “open” signal output time	1600ms or more

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Tumble generator valve opening angle	Less than 71.4°

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1

DTC detecting condition:

Immediately at fault recognition

Caution:

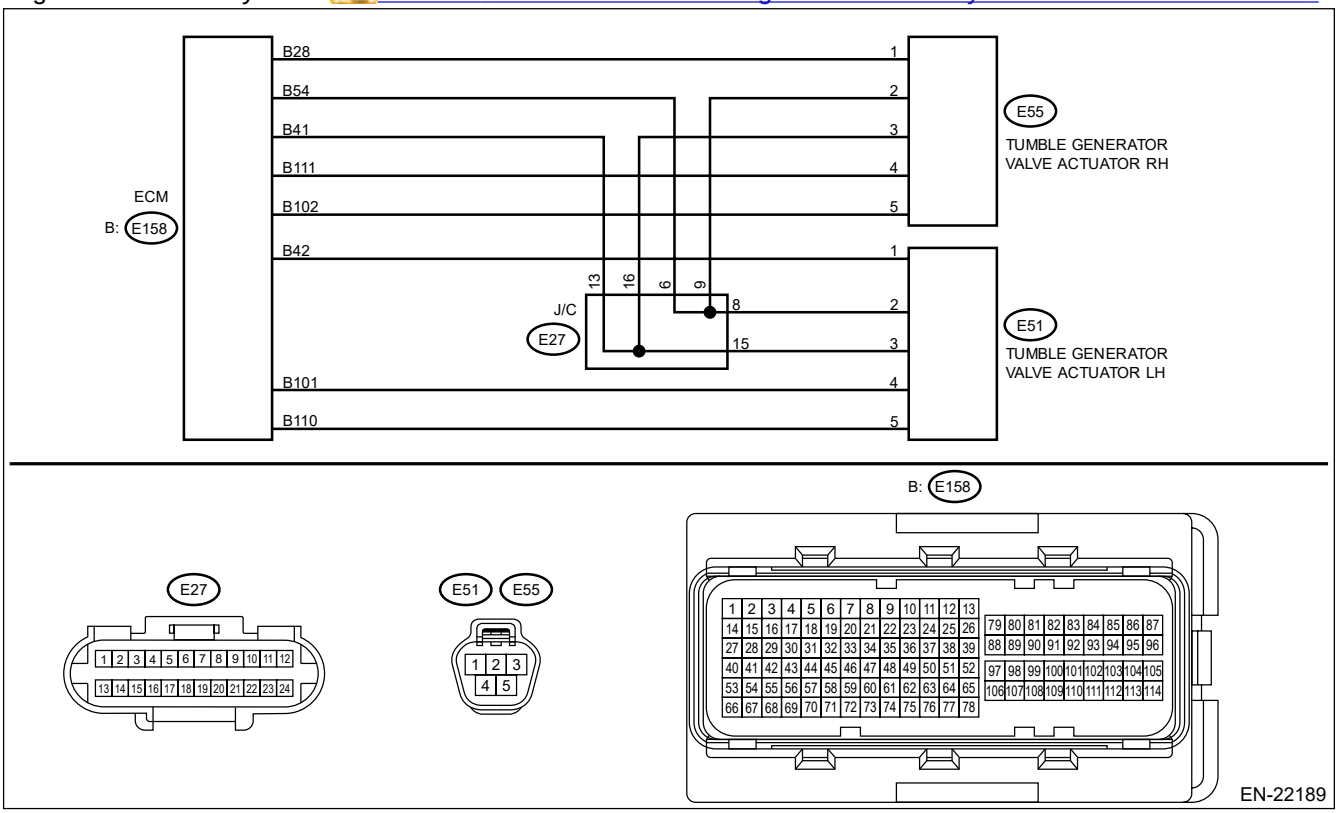
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY RH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from tumble generator valve assembly RH.
4. Measure the resistance of harness between ECM connector and tumble generator valve assembly RH connector.

Connector & terminal

(E158) No. 102 — (E55) No. 5:

(E158) No. 111 — (E55) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve assembly RH connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY RH (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 102 — Chassis ground:

(E158) No. 111 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and tumble generator valve assembly RH connector.

3. CHECK FOR POOR CONTACT.

Check for poor contact of tumble generator valve assembly RH connector.

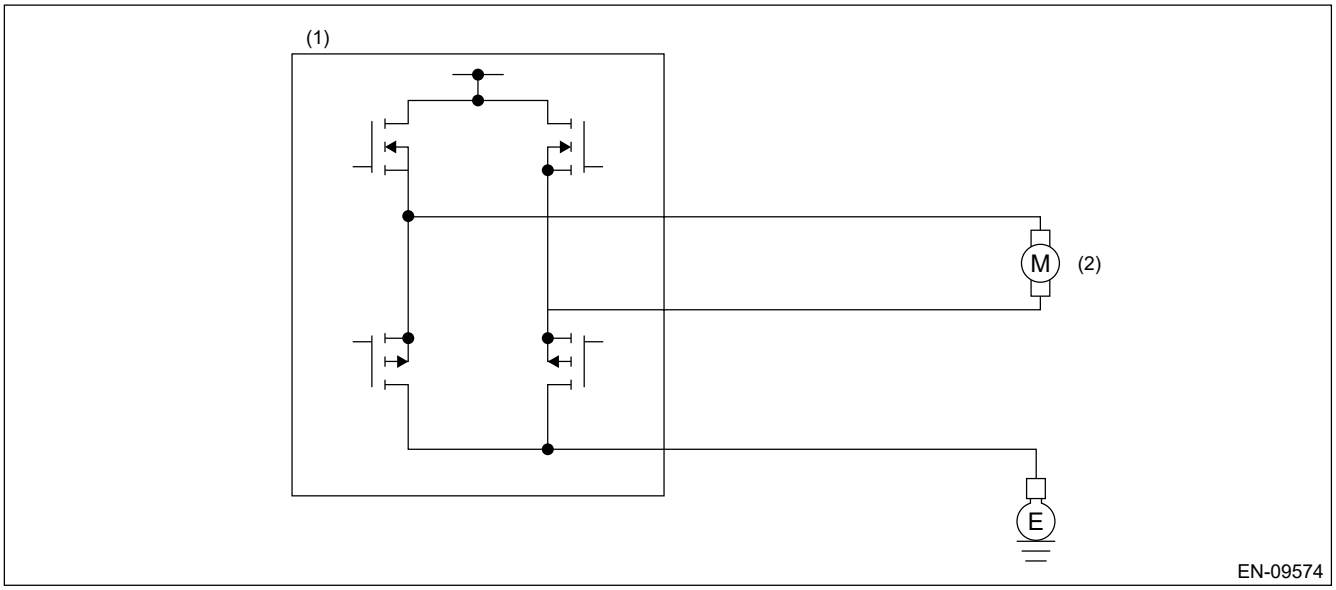
Is there poor contact of the tumble generator valve assembly RH connector?

Yes	Repair the poor contact of tumble generator valve assembly RH connector.
No	Replace the tumble generator valve assembly RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Detect the open circuit of tumble generator valve motor.
Judge as NG when the output voltage remains high when the tumble generator valve motor is not energized.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM) (2) Tumble generator valve

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve drive duty	79.17% or less

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	More than battery voltage × 0.55

Time needed for diagnosis: 1.92s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1

DTC detecting condition:

Immediately at fault recognition

Caution:

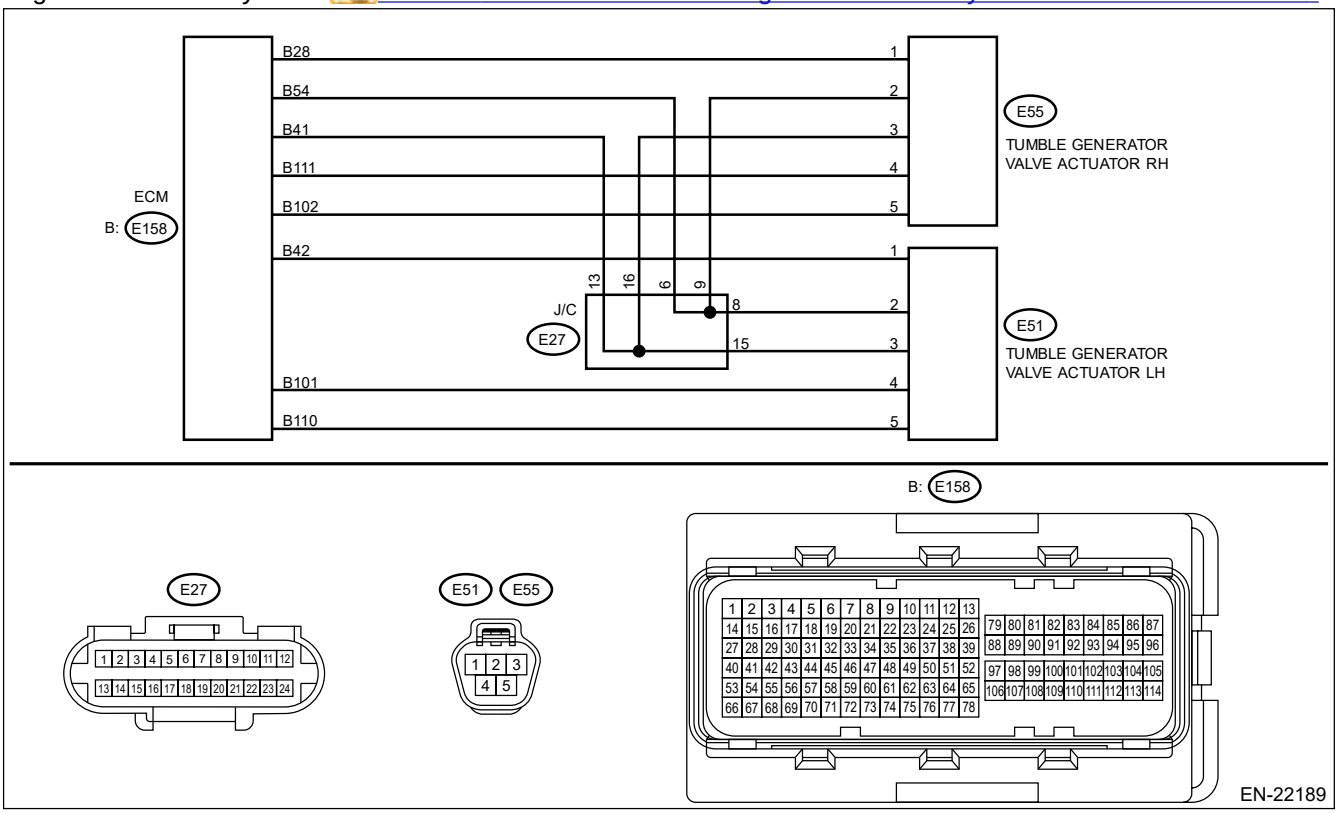
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 111 (+) — Chassis ground (−):

(E158) No. 102 (+) — Chassis ground (−):

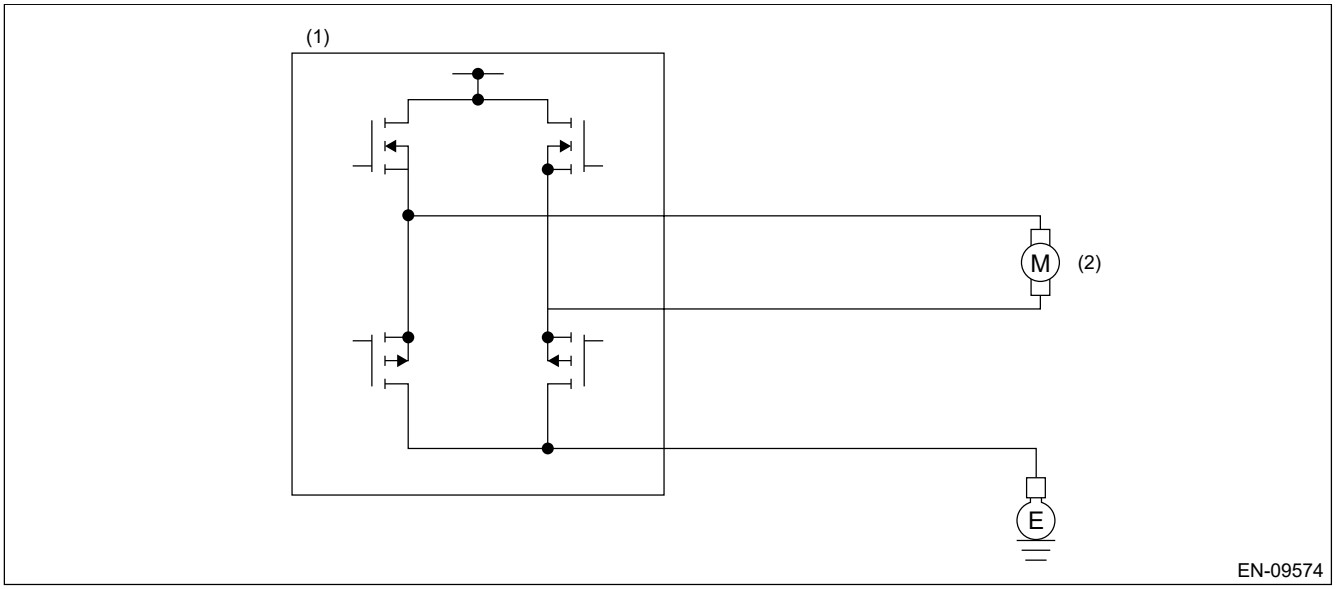
Is the voltage 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator RH connector.
No	Replace the tumble generator valve actuator RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve Actuator.

1. OUTLINE OF DIAGNOSIS

Detect the short circuit of tumble generator valve motor.
Judge as NG when the overcurrent signal is sent from IC after tumble generator valve driving IC diagnosis.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM) (2) Tumble generator valve

3. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Tumble generator valve driving signal	Open or Closed

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from tumble generator valve drive IC	ON

Time needed for diagnosis: 0.96 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2011 TGV CONTROL CIRCUIT/OPEN BANK 2

DTC detecting condition:

Immediately at fault recognition

Caution:

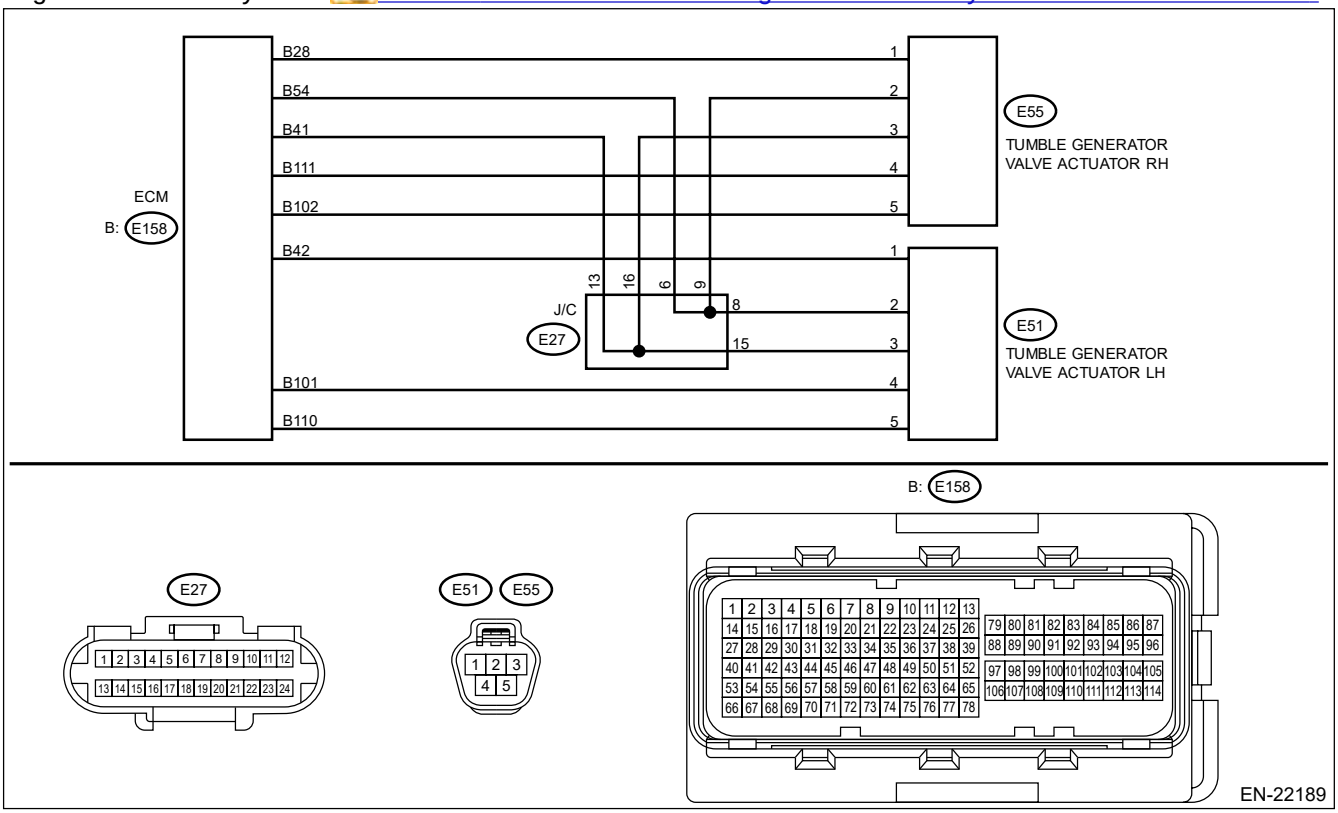
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from tumble generator valve assembly LH.
4. Measure the resistance of harness between ECM connector and tumble generator valve assembly LH connector.

Connector & terminal

(E158) No. 110 — (E51) No. 5:

(E158) No. 101 — (E51) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve assembly LH connector** • **Poor contact of coupling connector**

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ASSEMBLY LH (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 110 — Chassis ground:

(E158) No. 101 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and tumble generator valve assembly LH connector.

3. CHECK FOR POOR CONTACT.

Check for poor contact of tumble generator valve assembly LH connector.

Is there poor contact of the tumble generator valve assembly LH connector?

Yes	Repair the poor contact of tumble generator valve assembly LH connector.
No	Replace the tumble generator valve assembly LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2008. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2008 TGV CONTROL CIRCUIT/OPEN BANK 1.

DTC P2012 TGV CONTROL CIRCUIT LOW BANK 2

DTC detecting condition:

Immediately at fault recognition

Caution:

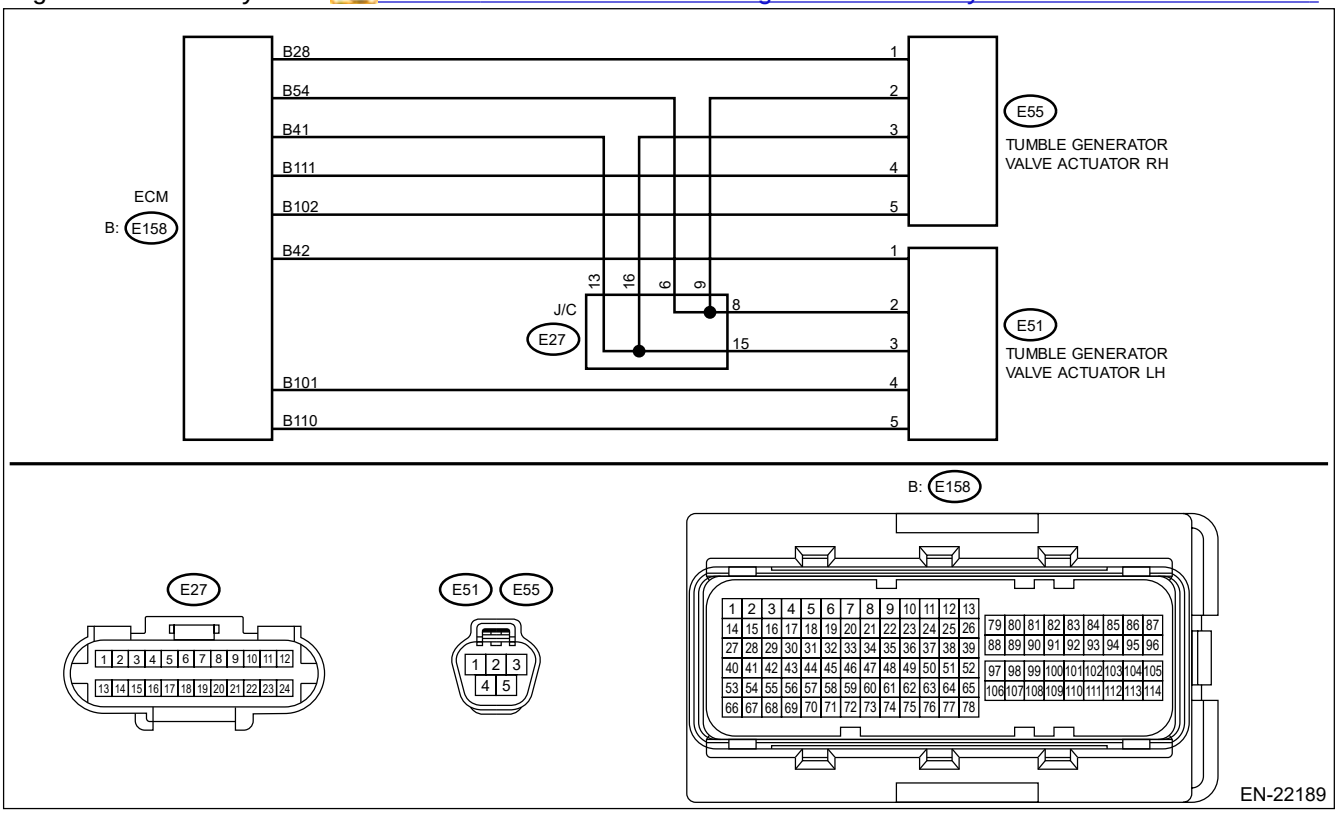
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E158) No. 101 (+) — Chassis ground (−):
   (E158) No. 110 (+) — Chassis ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator LH connector.
No	Replace the tumble generator valve actuator LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve Actuator.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2009. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2009 TGV CONTROL CIRCUIT LOW BANK 1.

DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

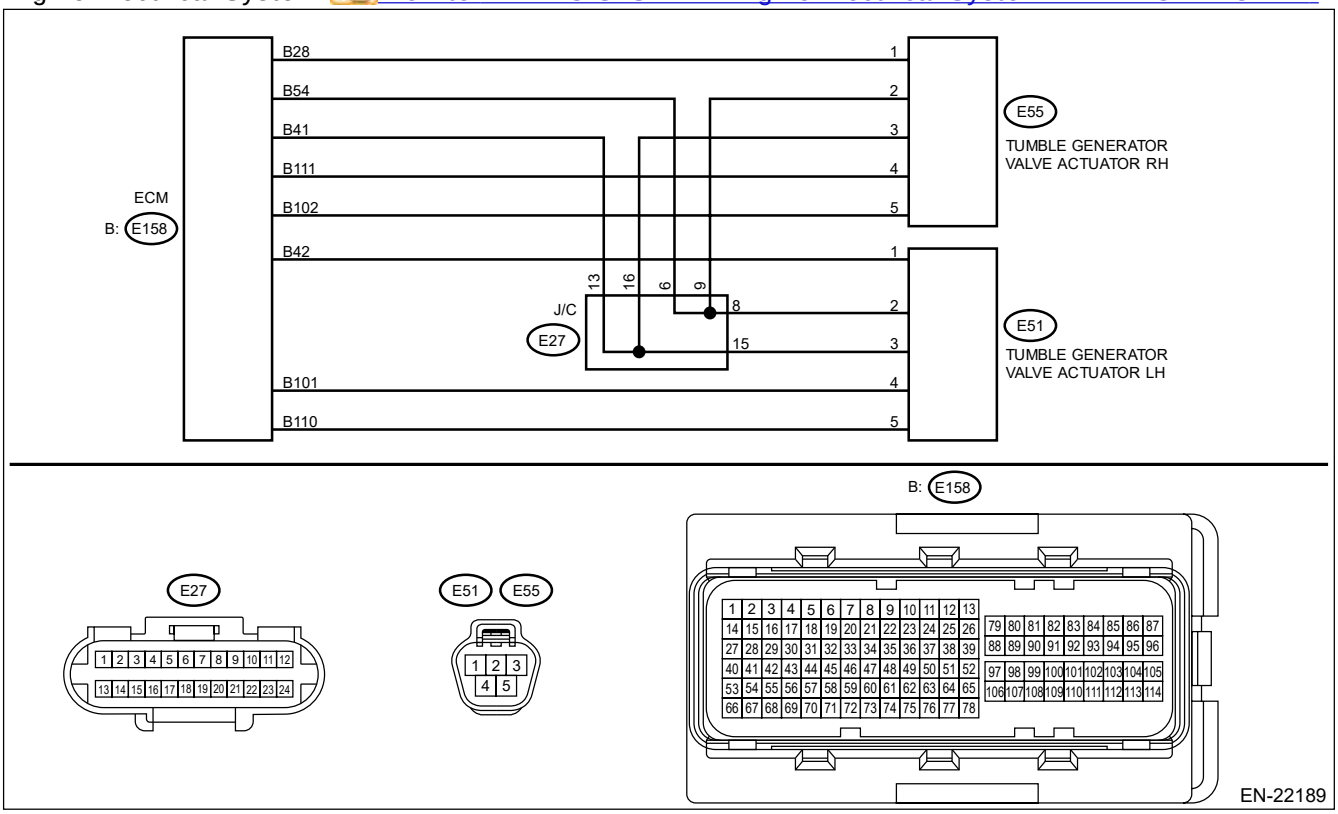
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Data Monitor

Note:
For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor R] less than 0.2 V?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Turn the ignition switch to ON.
4. Measure the voltage between tumble generator valve actuator RH connector and engine ground.
   Connector & terminal
   (E55) No. 3 (+) — Engine ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve actuator RH connector** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and tumble generator valve actuator RH connector.

Connector & terminal

(E158) No. 28 — (E55) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between ECM connector and tumble generator valve actuator RH connector.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH.

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E158) No. 28 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and tumble generator valve actuator RH connector.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and tumble generator valve actuator RH connector.

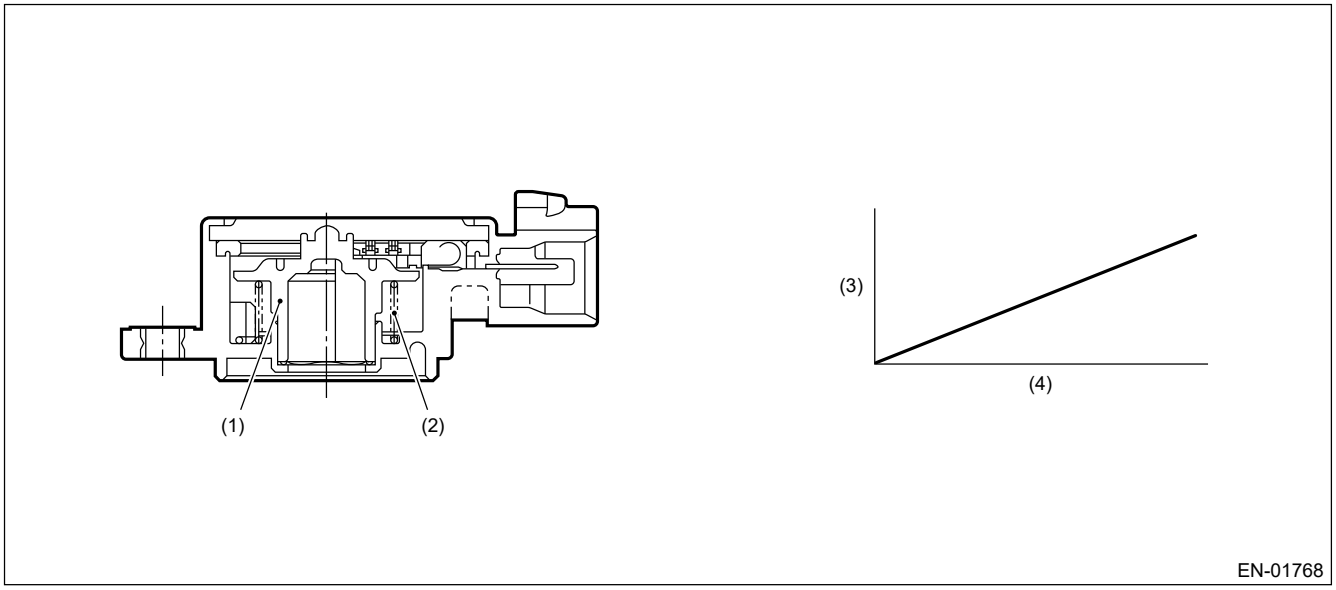
Is there poor contact of ECM or the tumble generator valve actuator RH connector?

Yes	Repair the poor contact of ECM or tumble generator valve actuator RH connector.
No	Replace the tumble generator valve actuator RH.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Rotor
(2) Return spring
(3) Voltage (V)
(4) Tumble generator valve opening angle (°)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	Less than 0.211 V

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

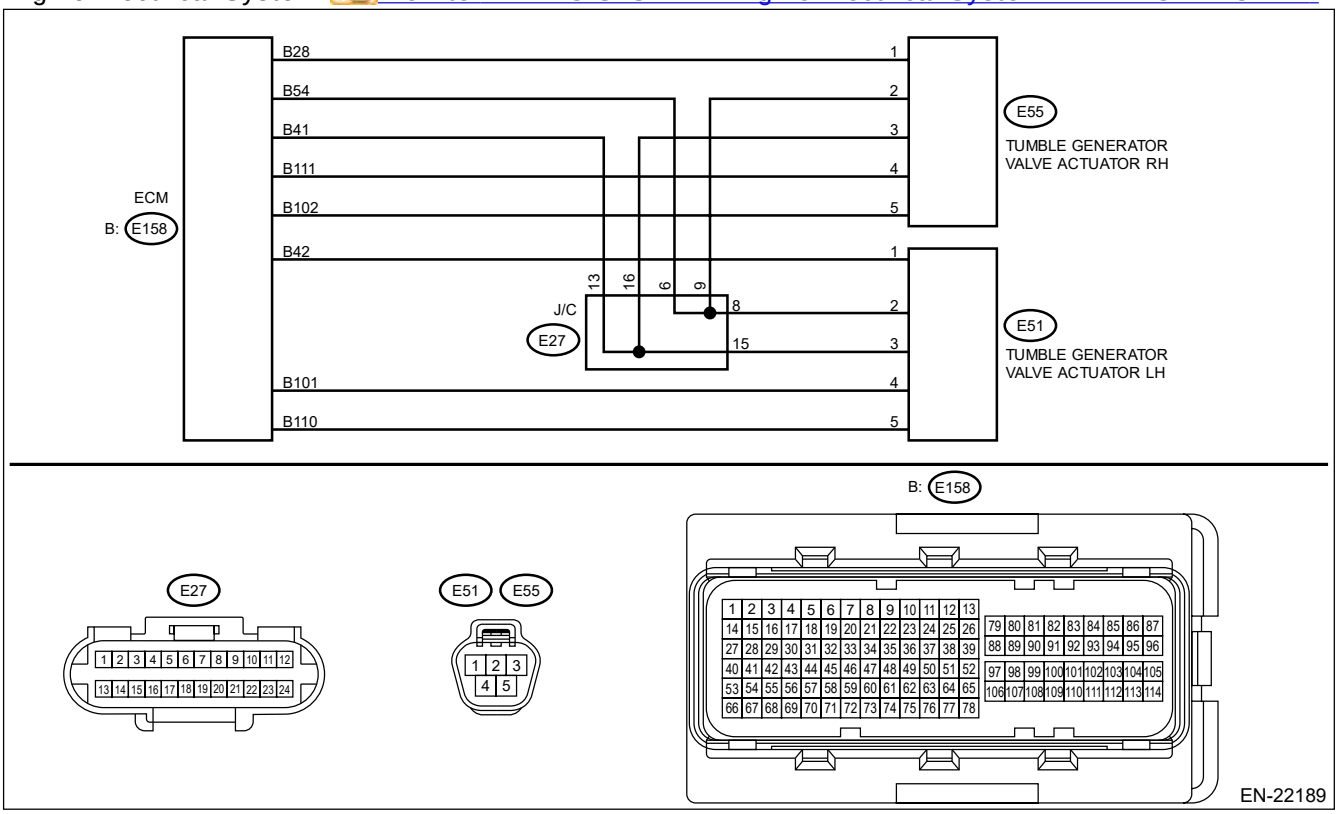
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor R] 5 V or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator RH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor R].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor R] 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator RH connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR RH (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator RH connector and engine ground.

Connector & terminal

(E55) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve actuator RH connector** • **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.

Check for poor contact of tumble generator valve actuator RH connector.

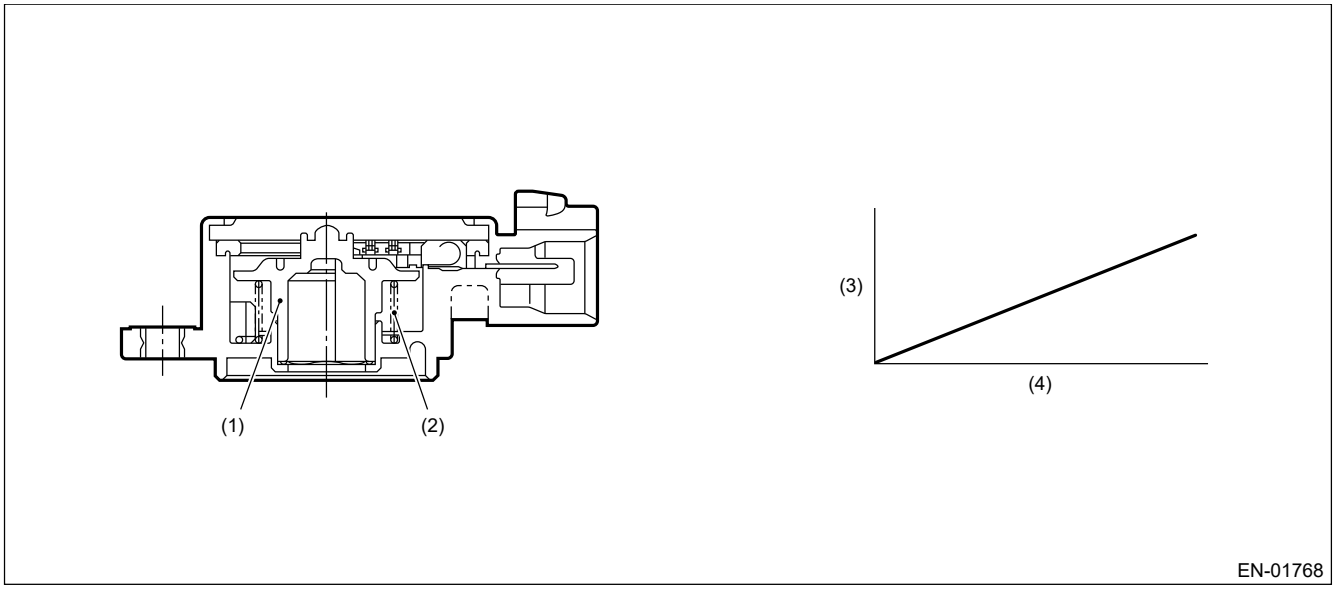
Is there poor contact of the tumble generator valve actuator RH connector?

Yes	Repair the poor contact of tumble generator valve actuator RH connector.
No	Replace the tumble generator valve actuator RH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve Actuator.

1. OUTLINE OF DIAGNOSIS

Detect open or short circuit of tumble generator valve position sensor.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Rotor
(2) Return spring
(3) Voltage (V)
(4) Tumble generator valve opening angle (°)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage	4.76V or more

Time needed for diagnosis: 500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2021 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

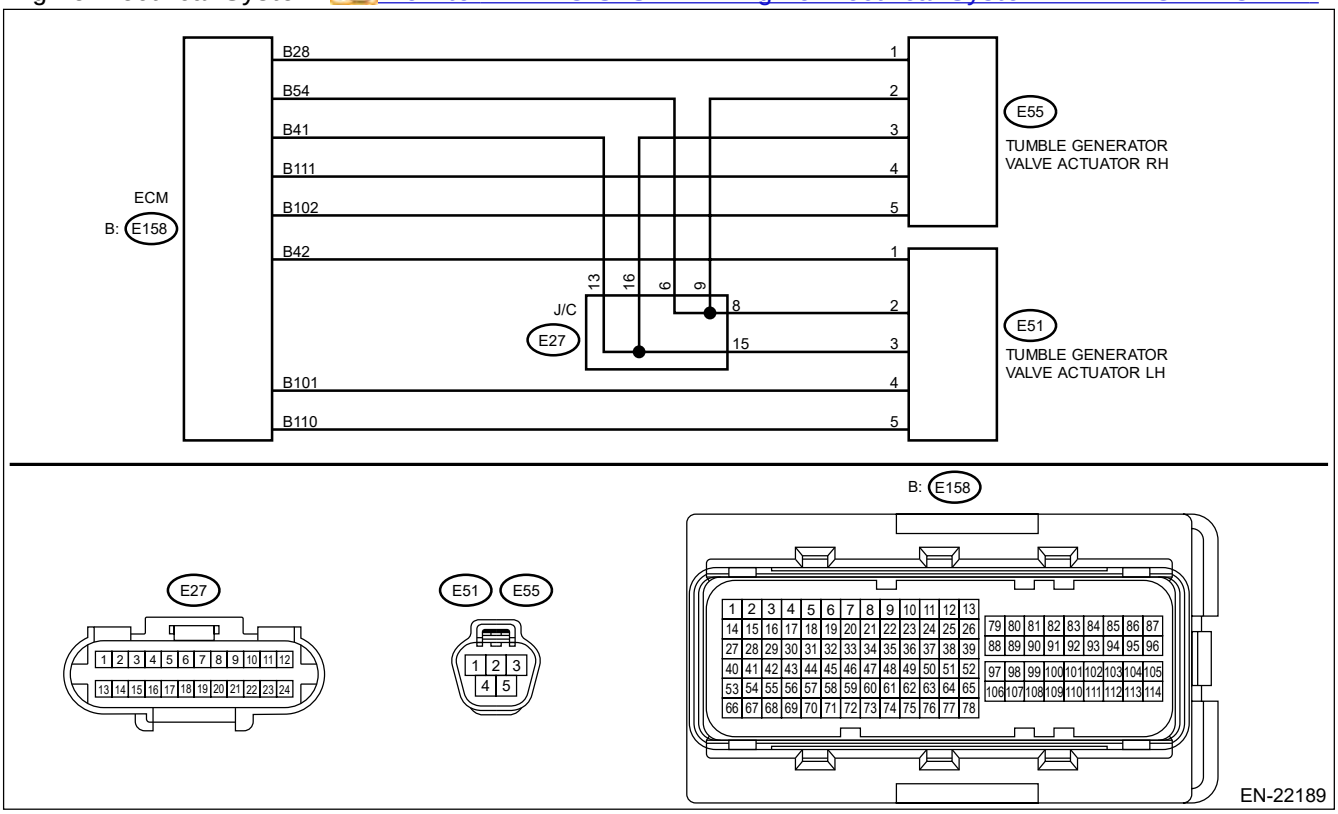
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].



Note:
For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor L] less than 0.2 V?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK POWER SUPPLY OF TUMBLE GENERATOR VALVE ACTUATOR LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator LH.
3. Turn the ignition switch to ON.
4. Measure the voltage between tumble generator valve actuator LH connector and engine ground.
   Connector & terminal
   (E51) No. 3 (+) — Engine ground (-):

Is the voltage 4.5 V or more?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve actuator LH connector** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and tumble generator valve actuator LH connector.

Connector & terminal

(E158) No. 42 — (E51) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between ECM connector and tumble generator valve actuator LH connector.

4. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(E158) No. 42 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and tumble generator valve actuator LH connector.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM and tumble generator valve actuator LH connector.

Is there poor contact of ECM or the tumble generator valve actuator LH connector?

Yes	Repair the poor contact of ECM or tumble generator valve actuator LH connector.
No	Replace the tumble generator valve actuator LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2016. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2016 TGV POSITION SENSOR/SWITCH CIRCUIT LOW BANK 1.

DTC P2022 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 2

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Engine stall
- Poor driving performance

Caution:

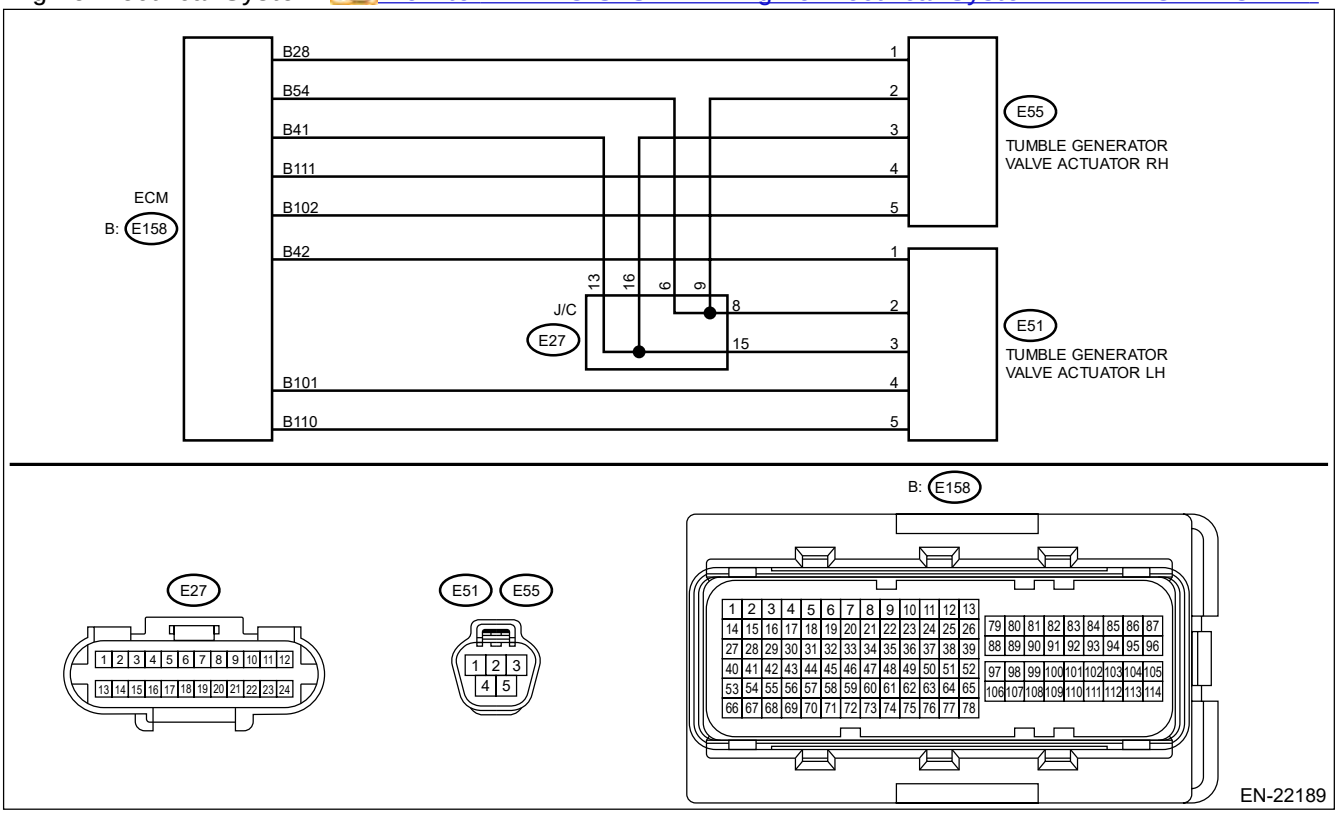
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

1. Start the engine.
2. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor L] 5 V or more?

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from tumble generator valve actuator LH.
3. Start the engine.
4. Using the Subaru Select Monitor, read the value in [TGV Position Sensor L].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [TGV Position Sensor L] 5 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and tumble generator valve actuator LH connector.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND TUMBLE GENERATOR VALVE ACTUATOR LH (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between tumble generator valve actuator LH connector and engine ground.

Connector & terminal

(E51) No. 2 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and tumble generator valve actuator LH connector** • **Poor contact of ECM connector**

4. CHECK FOR POOR CONTACT.

Check for poor contact of tumble generator valve actuator LH connector.

Is there poor contact of the tumble generator valve actuator LH connector?

Yes	Repair the poor contact of tumble generator valve actuator LH connector.
No	Replace the tumble generator valve actuator LH. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Tumble Generator Valve.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P2017. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2017 TGV POSITION SENSOR/SWITCH CIRCUIT HIGH BANK 1.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2096 POST CATALYST FUEL TRIM SYSTEM TOO LEAN BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

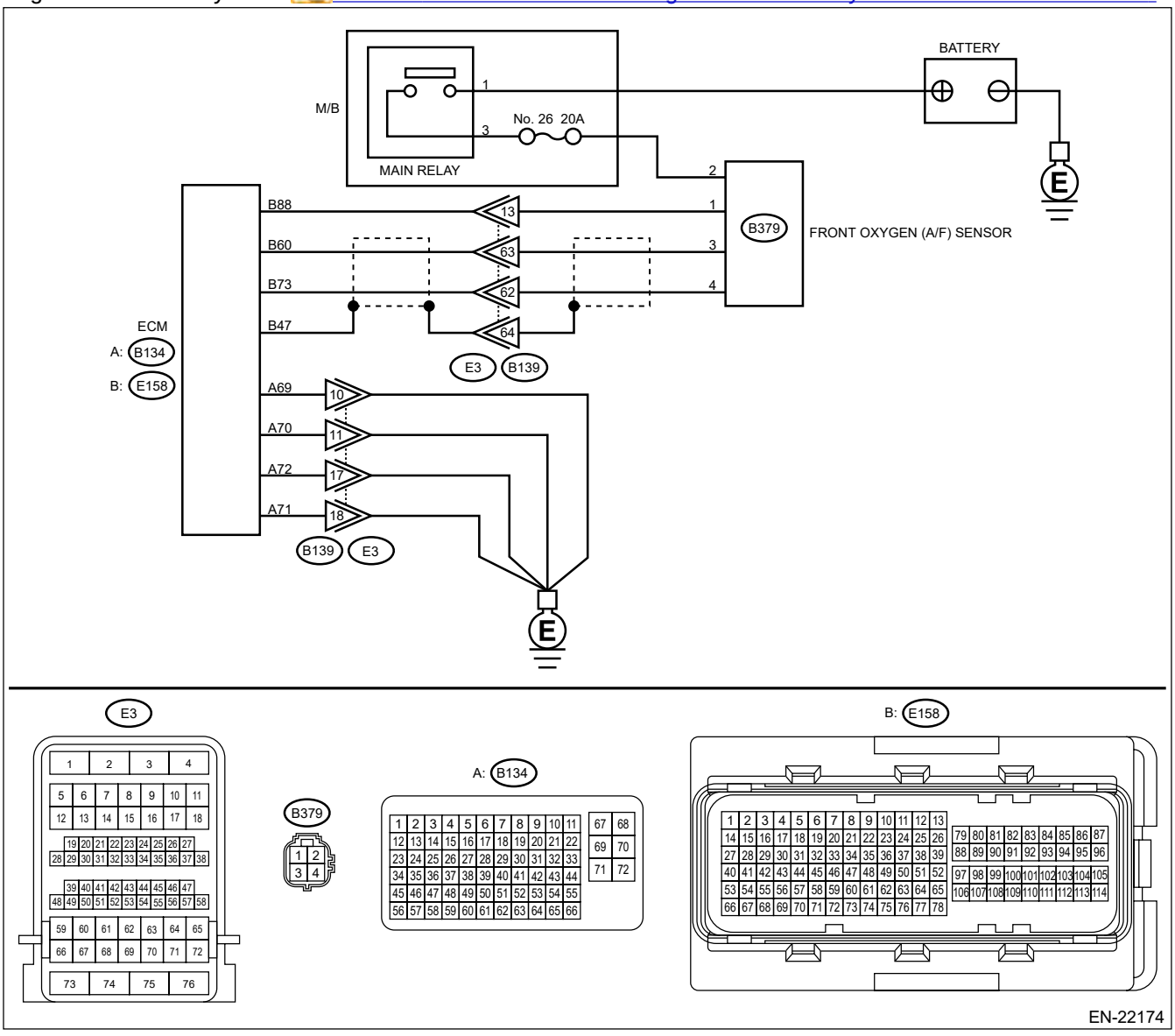
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

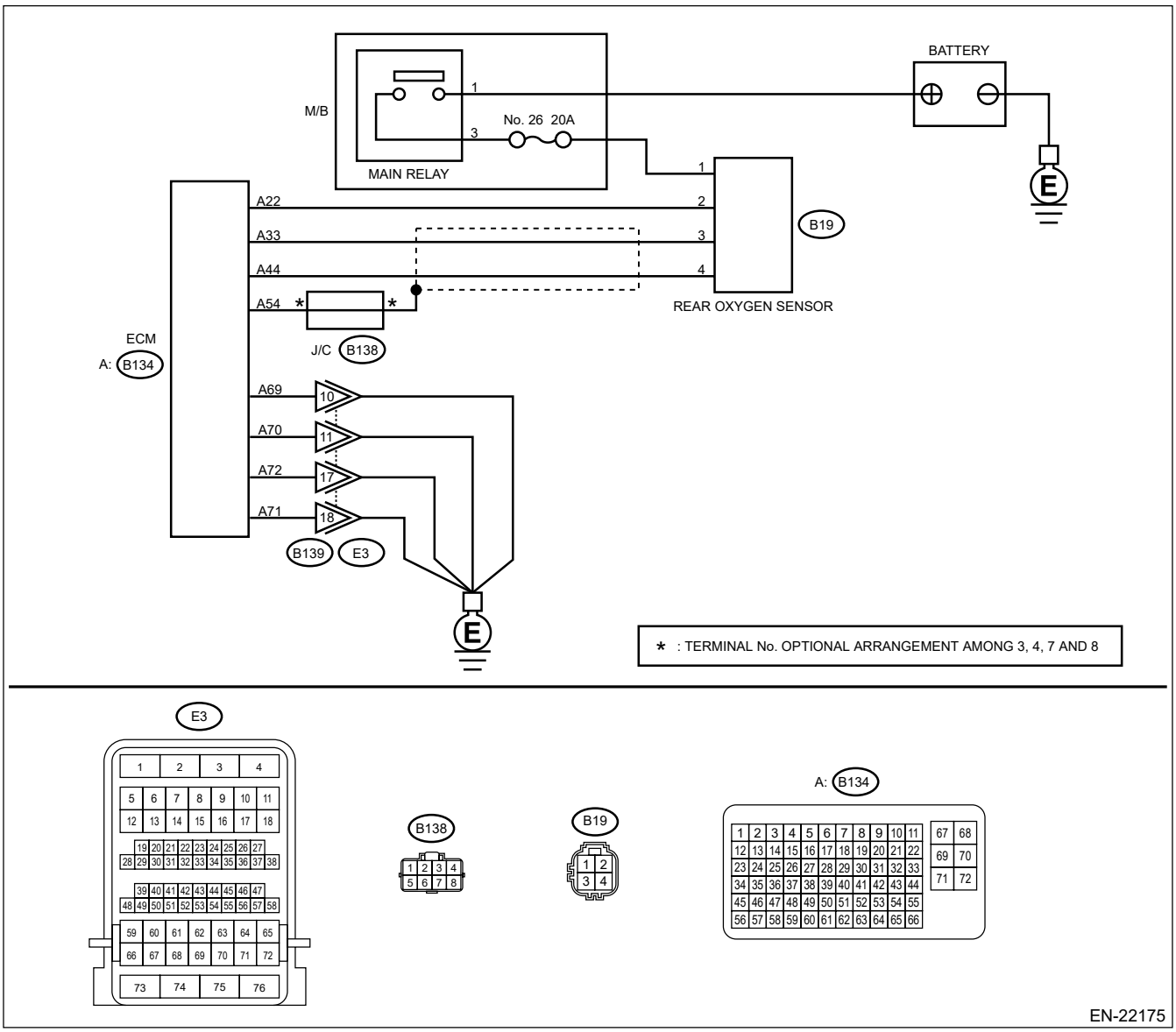
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2096 displayed? (Current malfunction)

Yes	Go to 2.
No	Check DTC using “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

   Connector & terminal

   (E158) No. 60 — (B379) No. 3:

   (E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 — Chassis ground:

(E158) No. 73 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

5. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

   Connector & terminal

   (B379) No. 3 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 7.
No	Go to 6.

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 4.95 V or more?

Yes	Go to 7.
No	Go to 8.

7. CHECK OUTPUT SIGNAL FOR ECM (SHORT TO POWER SUPPLY).

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(B379) No. 3 (+) — Chassis ground (−):

(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 8 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the poor contact of ECM connector.

8. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Are there holes or loose bolts on exhaust system?

Yes	Repair the exhaust system.
No	Go to 9.

9. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 10.

10. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
   Caution:
   Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 11.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

11. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes	Go to 12.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of intake air amount 2.0—5.0 g/s (0.26—0.66 lb/m)?

Yes	Go to 13.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value −10 — 50°C (−18 — 90°F)?

Yes	Go to 14.
No	Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

14. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal. (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.490 V or more?

Yes	Go to 15.
No	Go to 16.

15. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal. (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.250 V or less?

Yes	Go to 17.
No	Go to 16.

16. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the rear oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 18.

17. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] kept at 0.250 V or less for 5 minutes or more?

Yes	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.
No	Go to 18.

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:
   (B134) No. 44 — (B19) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 19.
No	Measure the resistance of harness between ECM connector and rear oxygen sensor connector.

19. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 3 (+) — Chassis ground (−):

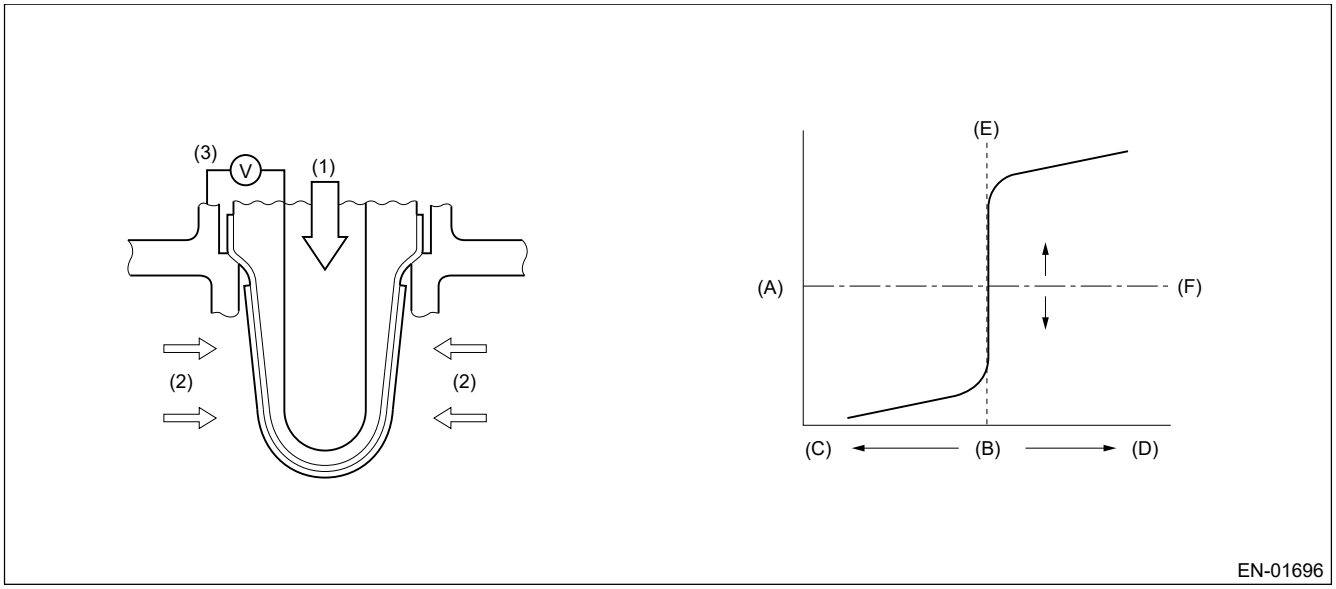
Is the voltage 0.2—0.5 V?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and rear oxygen sensor connector** • **Poor contact of ECM connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.
Control the sub feedback learning and judge as NG when the learning value is in the lean zone.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Sub feedback	In operation
Amount of intake air	10g/s (0.35oz/s) or more
Load change every 0.5 engine revs.	Less than 0.02g/rev (0oz/rev)
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more
Stoichiometric integrated intake air amount	320g (11.29oz) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value (Except for PZEV model)	Less than −0.038 (CVT model) Less than −0.0415 (MT model)
Sub feedback learning value (PZEV model)	Less than −0.038

Time needed for diagnosis: 1s × 1time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2097 POST CATALYST FUEL TRIM SYSTEM TOO RICH BANK 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

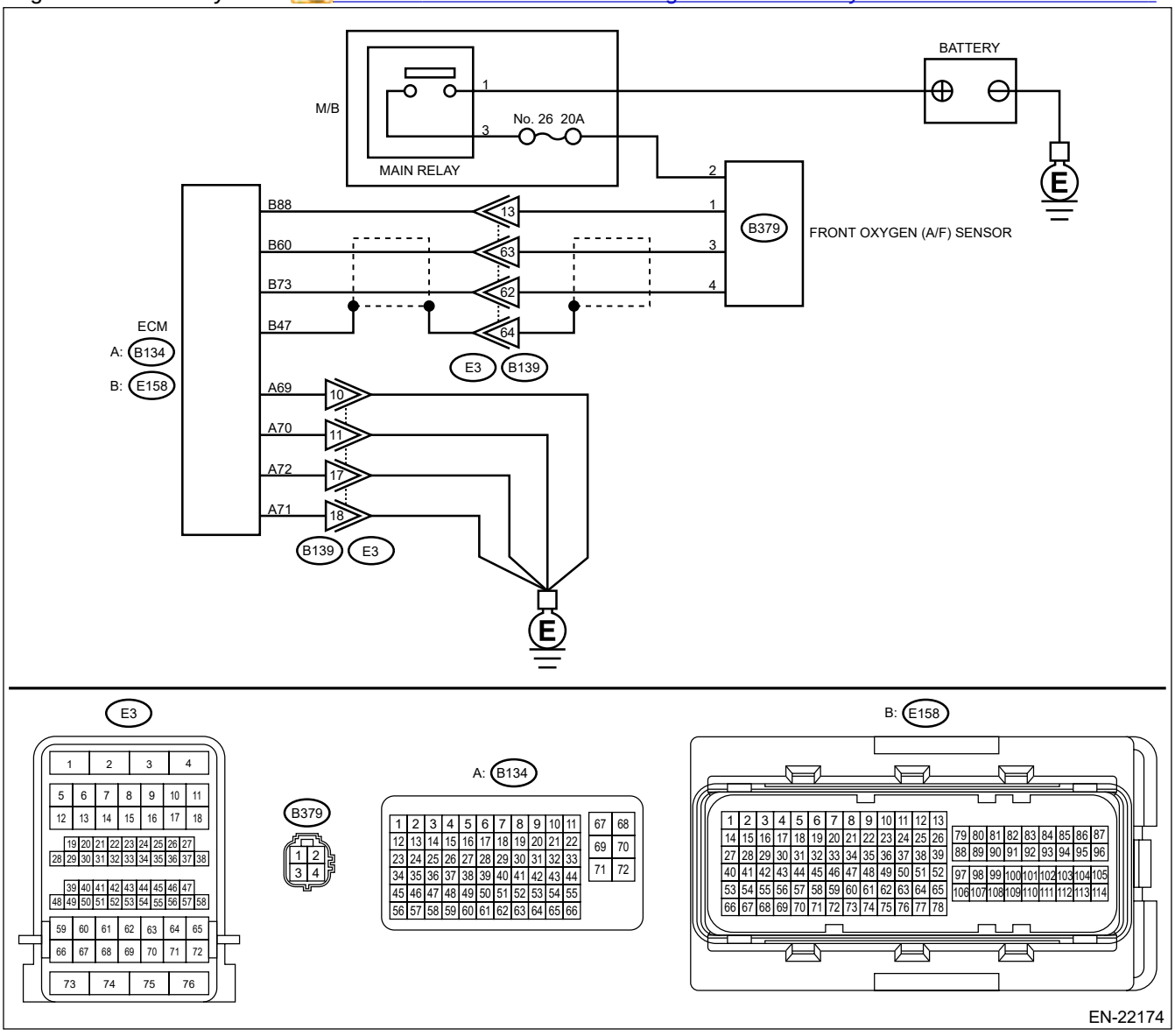
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

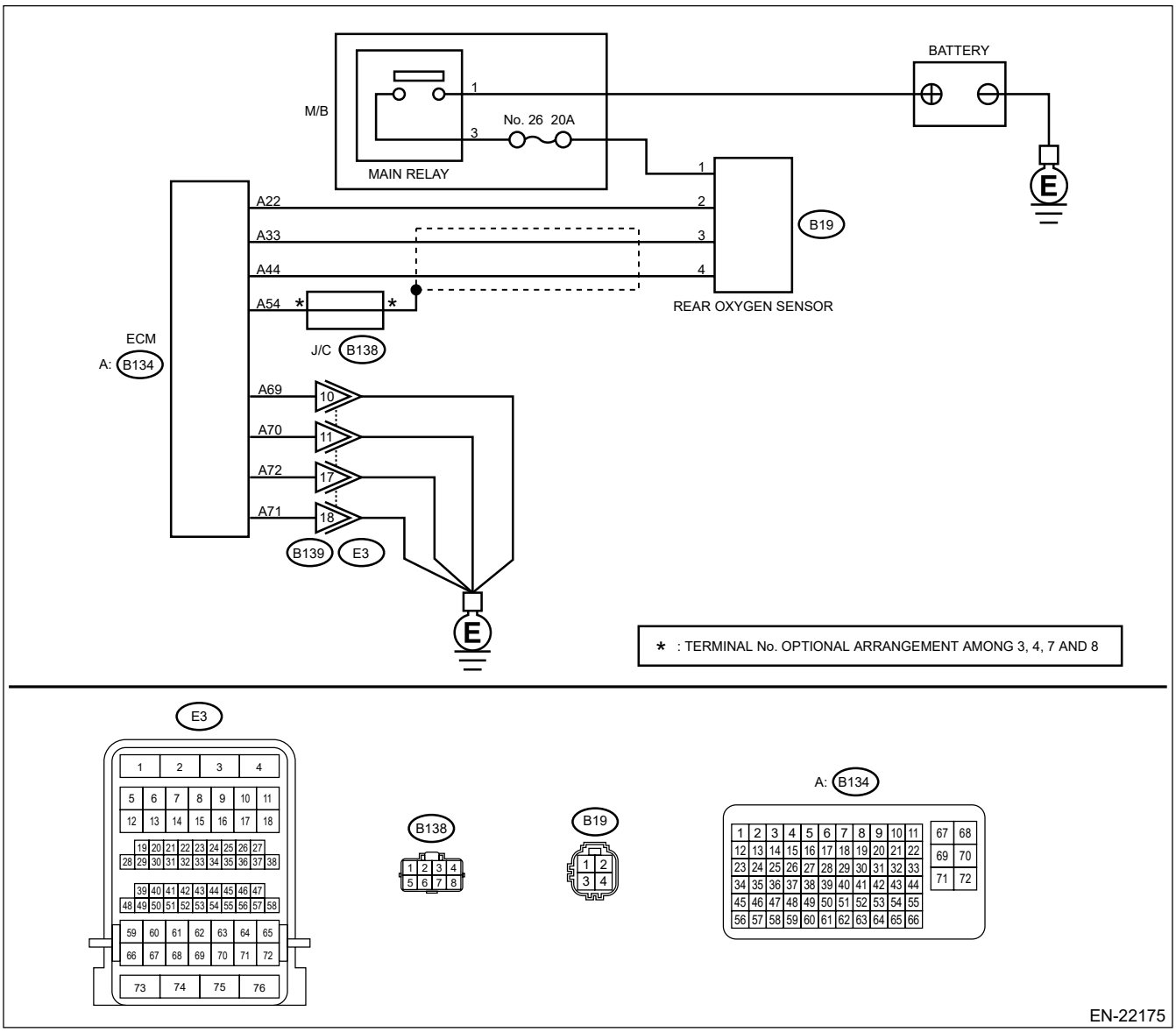
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2097 displayed? (Current malfunction)

Yes	Go to 2.
No	Check DTC using “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

   Connector & terminal

   (E158) No. 60 — (B379) No. 3:

   (E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 — Chassis ground:

(E158) No. 73 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

5. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

   Connector & terminal

   (B379) No. 3 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 7.
No	Go to 6.

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 4.95 V or more?

Yes	Go to 7.
No	Go to 8.

7. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.

Connector & terminal

(B379) No. 3 (+) — Chassis ground (−):

(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 8 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the poor contact of ECM connector.

8. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Are there holes or loose bolts on exhaust system?

Yes	Repair the exhaust system.
No	Go to 9.

9. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 10.

10. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
   Caution:
   Release fuel pressure before removing the fuel pressure gauge.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 11.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

11. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes	Go to 12.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow]2.0—5.0 g/s (0.26—0.66 lb/m)?

Yes	Go to 13.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

13. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value −10 — 50°C (−18 — 90°F)?

Yes	Go to 14.
No	Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

14. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal. (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.490 V or more?

Yes	Go to 15.
No	Go to 16.

15. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal. (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.250 V or less?

Yes	Go to 17.
No	Go to 16.

16. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the rear oxygen sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 18.

17. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the voltage of [Oxygen sensor #12] kept at 0.8 V or more for 5 minutes or more?

Yes	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.
No	Go to 18.

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:
   (B134) No. 44 — (B19) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 19.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

19. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 3 (+) — Chassis ground (−):

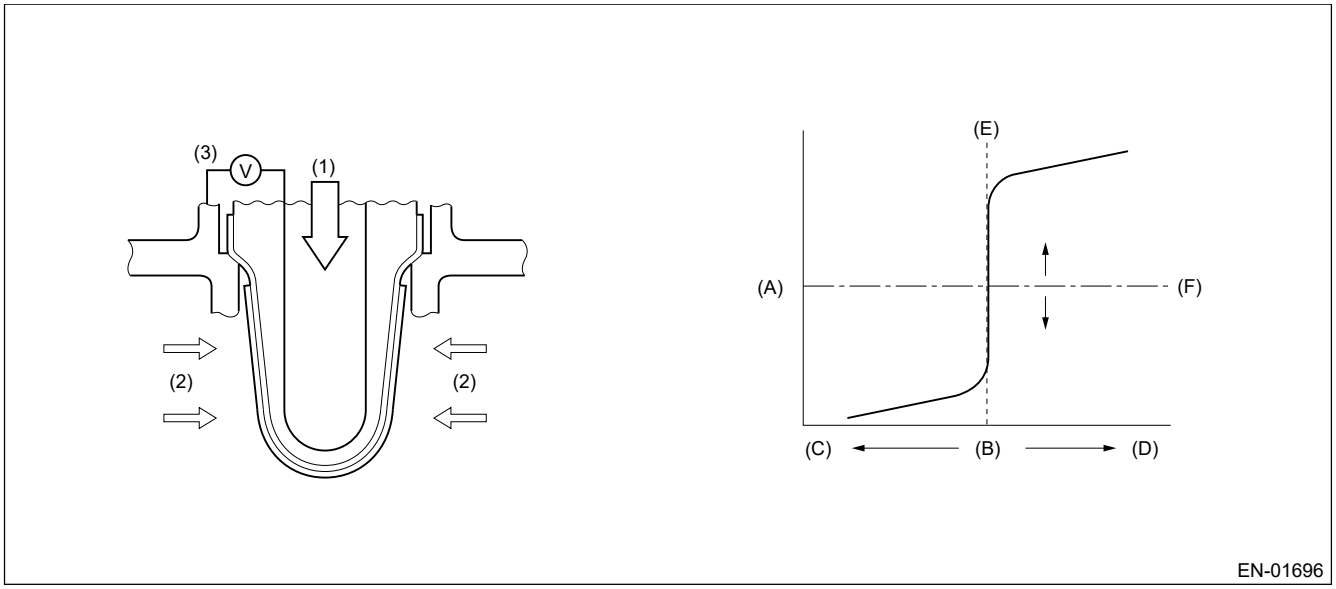
Is the voltage 0.2—0.5 V?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and rear oxygen sensor connector** • **Poor contact of ECM connector**

1. OUTLINE OF DIAGNOSIS

Detect the malfunction of fuel system from the size of the sub feedback learning value.
Sub feedback learning is being performed. When the learning value goes to the rich side, judge as NG.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage
(1) Atmosphere
(2) Exhaust gas
(3) Electromotive force

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Sub feedback	In operation
Amount of intake air	10g/s (0.35oz/s) or more
Load change every 0.5 engine revs.	Less than 0.02g/rev (0oz/rev)
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more
Stoichiometric integrated intake air amount	320g (11.29oz) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sub feedback learning value (Except for PZEV model)	0.033 or more (CVT model) 0.032 or more (MT model)
Sub feedback learning value (PZEV model)	0.033 or more

Time needed for diagnosis: 1s× 1time(s)

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance
- Engine stall

Caution:

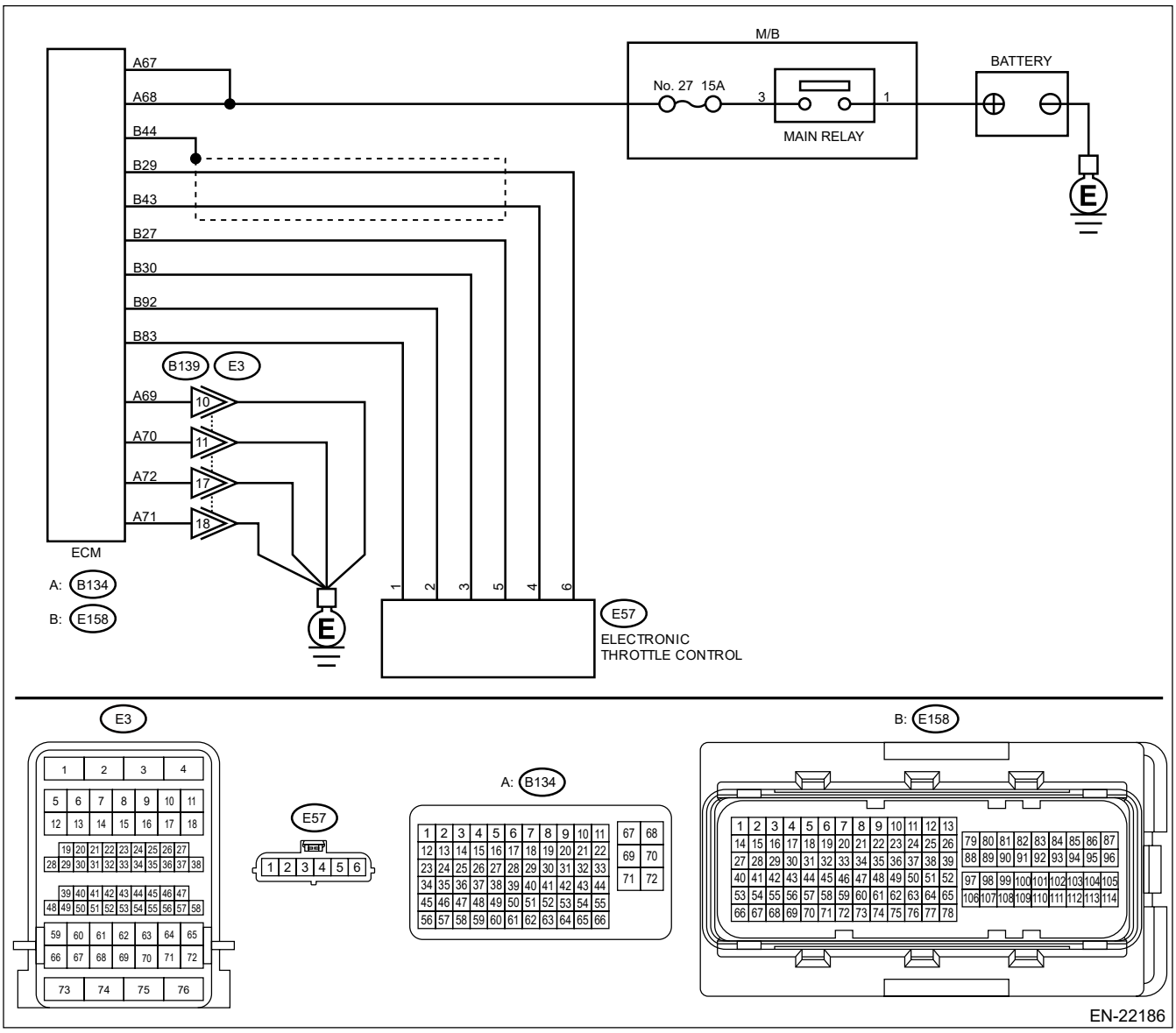
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 27 — Chassis ground:
(E158) No. 29 — Chassis ground:
(E158) No. 29 — (E158) No. 44:
(E158) No. 43 — Chassis ground:
(E158) No. 43 — (E158) No. 44:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK THE SHORT CIRCUIT INSIDE ECM (SHORT TO GROUND).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 — Engine ground:
(E57) No. 4 — Engine ground:

Is the resistance 200 kΩ or more?

Yes	Go to 3.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E158) No. 29 — (E57) No. 6:

(E158) No. 43 — (E57) No. 4:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 5.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector**

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 6 (+) — Engine ground (−):
   (E57) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 6.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 27 — (E158) No. 29:
   (E158) No. 27 — (E158) No. 43:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

7. CHECK SENSOR OUTPUT.

1. Connect all connectors.
2. Start the engine and warm up completely.
3. Stop the engine, and then turn the ignition switch to ON (engine OFF).
4. Using the Subaru Select Monitor, read the value in [Main-Throttle Sensor].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Main-Throttle Sensor] 0.81 — 0.87 V?

Yes	Go to 8.
No	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

8. CHECK SENSOR OUTPUT.

Using the Subaru Select Monitor, read the value in [Sub-Throttle Sensor].

Data Monitor

Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Sub-Throttle Sensor] 1.64 — 1.70 V?

Yes	Go to 9.
No	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

9. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and electronic throttle control connector.
   Connector & terminal
   (E158) No. 92 — (E57) No. 2:
   (E158) No. 83 — (E57) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

10. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO POWER SUPPLY).

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 2 (+) — Engine ground (−):
   (E57) No. 1 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 11.

11. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 2 — Engine ground:

(E57) No. 1 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 12.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

12. CHECK HARNESS FOR ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

Measure the resistance between electronic throttle control connectors.

Connector & terminal

(E57) No. 2 — (E57) No. 1:

Is the resistance 1 MΩ or more?

Yes	Go to 13.
No	Repair the short circuit in harness between ECM connector and electronic throttle control connector.

13. CHECK ELECTRONIC THROTTLE CONTROL GROUND CIRCUIT (OPEN).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:
(B134) No. 70 — Chassis ground:
(B134) No. 71 — Chassis ground:
(B134) No. 72 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 14.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

14. CHECK ELECTRONIC THROTTLE CONTROL.

Measure the resistance between electronic throttle control terminals.

Terminals

No. 2 — No. 1:

Is the resistance 50 Ω or less?

Yes	Go to 15.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

15. CHECK ELECTRONIC THROTTLE CONTROL.

Move the throttle valve to the fully opened and fully closed positions with fingers.
Check that the valve returns to the specified position when releasing fingers.

Does the valve return to the specified position? Standard value: 3 mm (0.12 in) from fully closed position

Yes	Repair the poor contact of ECM connector.
No	Replace the electronic throttle control. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the motor current becomes large or drive circuit is heated.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage Electronic throttle control MOSFET output	6.2V or more ON

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Overcurrent signal from the electronic throttle control drive IC	ON

Time needed for diagnosis: 512ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2102 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT LOW

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Improper idling
- Poor driving performance
- Engine stall

Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2102 displayed? (Current malfunction)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Judge as NG when the electronic throttle control power is not supplied even when ECM sets the electric throttle control throttle power supply SW (MOSFET) to ON.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	11V or more
Electronic throttle control MOSSFET output	ON

3. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Motor power voltage	5V or less

Time needed for diagnosis: 352ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2103 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2103 displayed? (Current malfunction)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

Judge as NG when the electronic throttle control power is supplied even when ECM sets the electric throttle control power supply SW (MOSFET) to OFF.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more
Electronic throttle control MOSFET output	OFF

3. GENERAL DRIVING CYCLE

- When ignition switch ON → OFF
- Ignition switch OFF → ON (only after clearing memory)

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Motor power voltage	5V or more

Time needed for diagnosis: 600ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2109 THROTTLE/PEDAL POSITION SENSOR "A" MINIMUM STOP PERFORMANCE

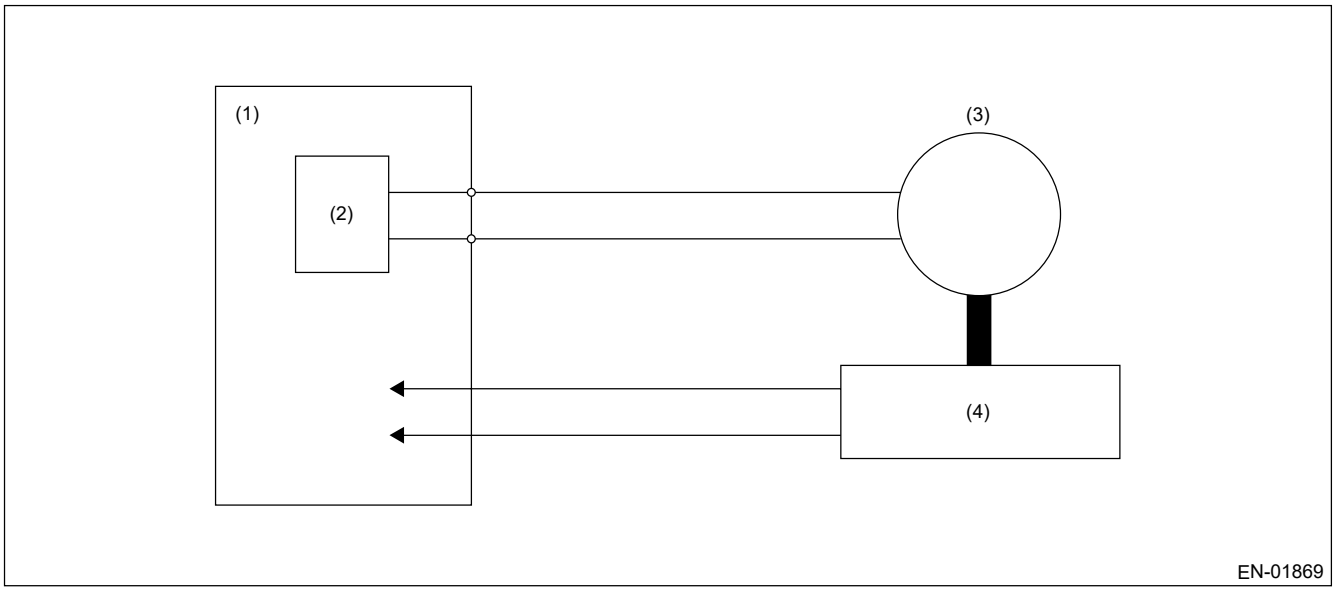
Note:

For the diagnostic procedure, refer to DTC P2101. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when full close point learning cannot conducted or abnormal value is detected.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM) (3) Motor (4) Throttle position sensor
(2) Drive circuit

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis at full closed point learning.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Minimum stop position or Throttle opening angle when the ignition switch is ON – Throttle minimum stop position	Less than 10.036° or More than 19.964° Less than 1.07°

Time needed for diagnosis: 8ms — 80ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2119 THROTTLE ACTUATOR "A" CONTROL THROTTLE BODY RANGE/PERFORMANCE

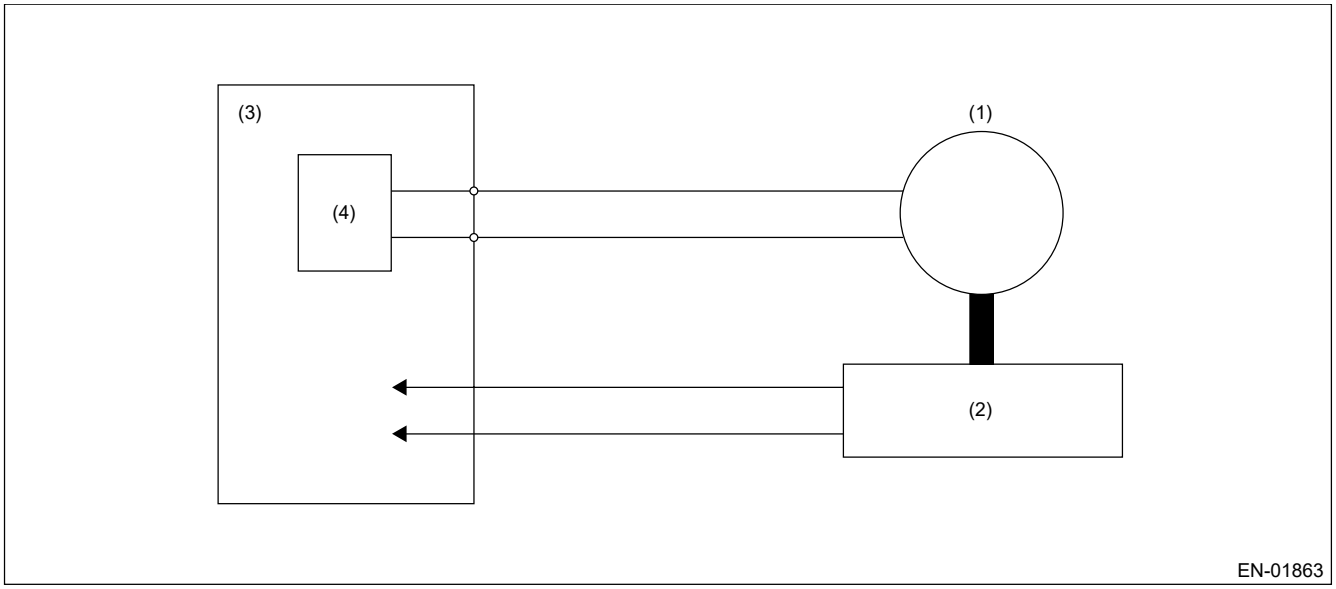
Note:

For the diagnostic procedure, refer to DTC P2101. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2101 THROTTLE ACTUATOR "A" CONTROL MOTOR CIRCUIT RANGE/PERFORMANCE.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the target opening angle and actual opening angle is mismatched or the current to motor is the specified duty or more for specified time continuously.

2. COMPONENT DESCRIPTION



(1) Motor
(2) Throttle position sensor
(3) Engine control module (ECM)
(4) Drive circuit

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6.2V or more
Electronic throttle control MOSFET output	ON

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously when the electronic throttle control is operating.

5. DIAGNOSTIC METHOD

Judge as NG if the criteria below are met.

Diagnosis 1

Judgment value

Malfunction Criteria	Threshold Value
Output duty to drive circuit	95% or more

Time needed for diagnosis:

- Engine speed ≥ 500rpm: 2000ms
- Engine speed < 500rpm: 5000ms

Diagnosis 2

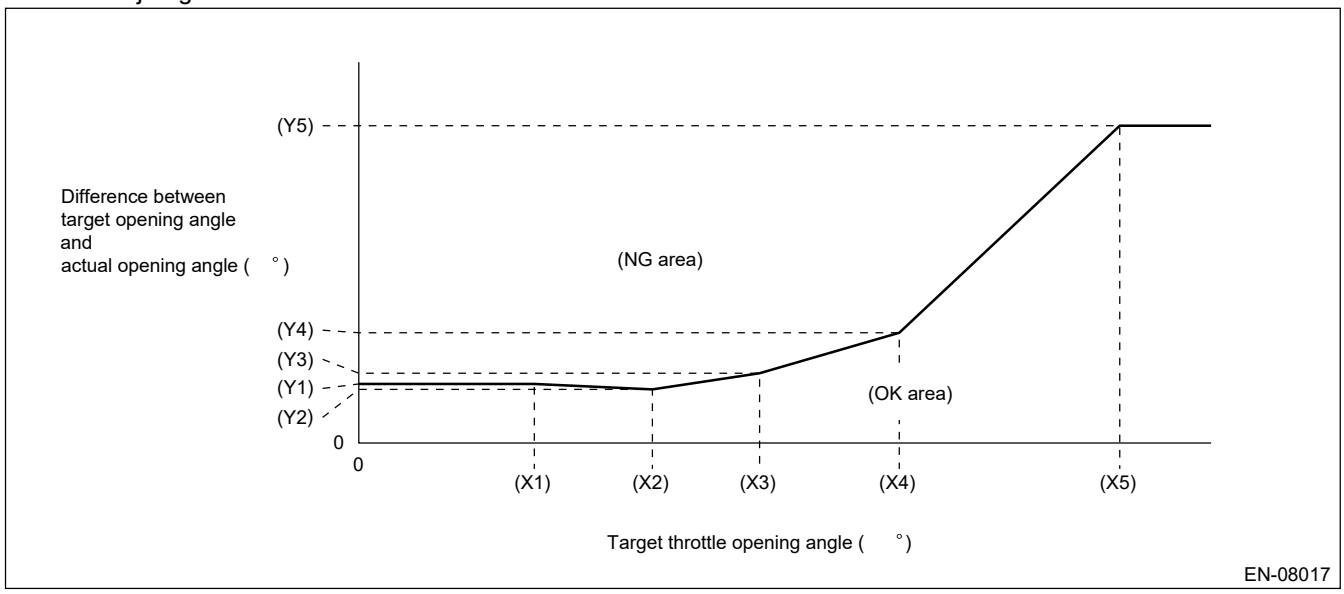
Judgment value

Malfunction Criteria	Threshold Value
Difference between target opening angle and actual opening angle	Within NG range of **Details of judgment value**

Time needed for diagnosis:

- Engine speed ≥ 500rpm: Refer to **Details of judgment time**
- Engine speed < 500rpm: 5000ms

Details of judgment value



(X1) 6.915°
(X2) 11.565°
(X3) 15.785°
(X4) 21.285°
(X5) 29.965°
(Y1) 4.65°
(Y2) 4.22°
(Y3) 5.5°
(Y4) 8.68°
(Y5) 25°

Details of Judgment time



(X1) 8.049999237°
(X2) 9.5°
(X3) 14.5°
(X4) 23.5°
(Y1) 1000ms
(Y2) 400ms
(Y3) 304ms
(Y4) 248ms

Note:

Judgment time when actual opening angle < target opening angle is always 1000 milliseconds.

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2122 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

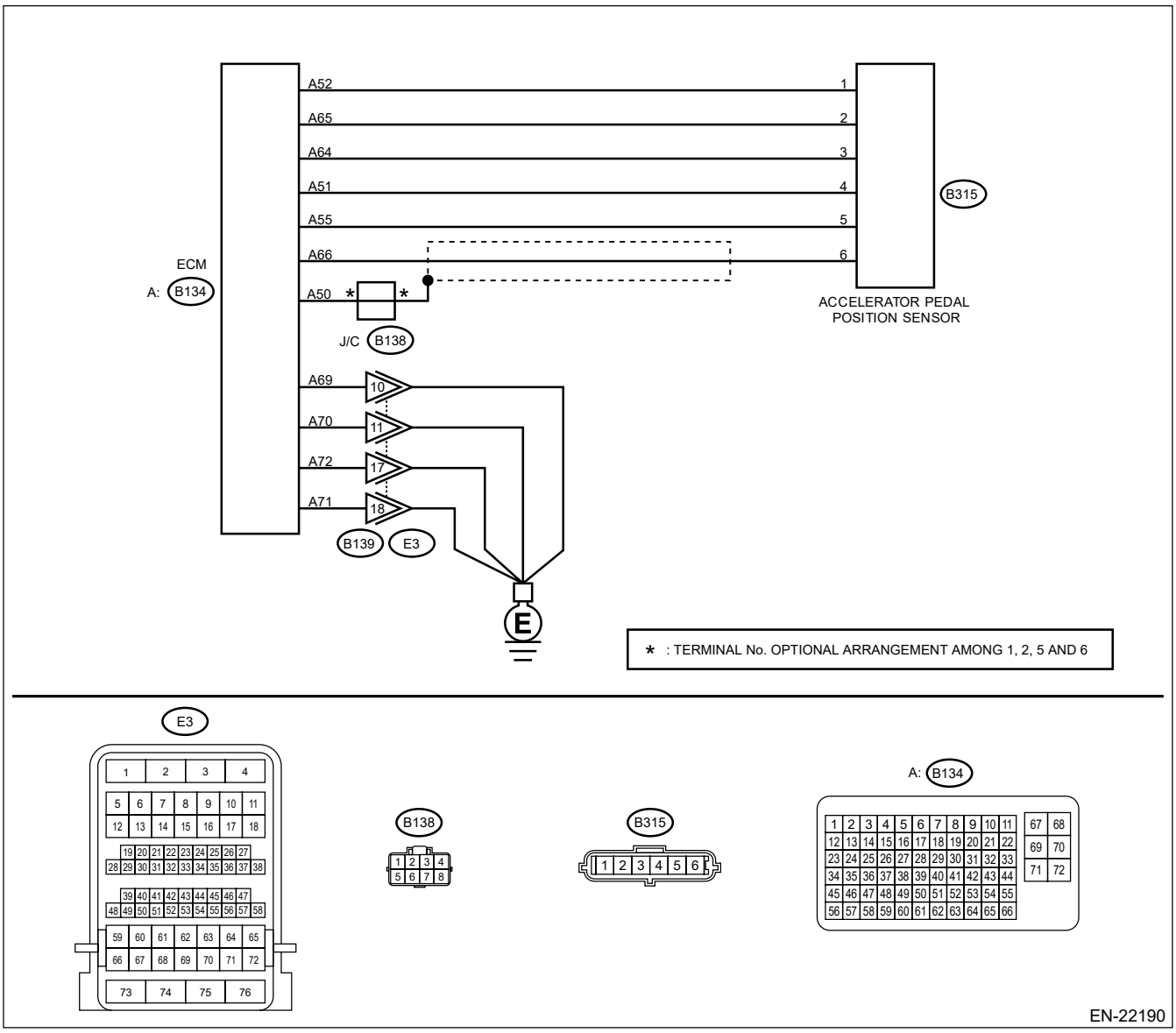
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
A: B134
A52
A65
A64
A51
A55
A66
A50
J/C B138
A69
A70
A72
A71
B139
E3
E
1
2
3
4
5
6
B315
ACCELERATOR PEDAL POSITION SENSOR
10
11
17
18
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
E3
B138
B315
A: B134
EN-22190

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 51 — Chassis ground:
(B134) No. 66 — Chassis ground:
(B134) No. 66 — (B134) No. 50:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector. **Note:** **In this case, repair the following item:** • Short circuit of harness between ECM connector and engine ground • Poor contact of ECM connector • Poor contact of coupling connector

2. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 6 — Chassis ground:

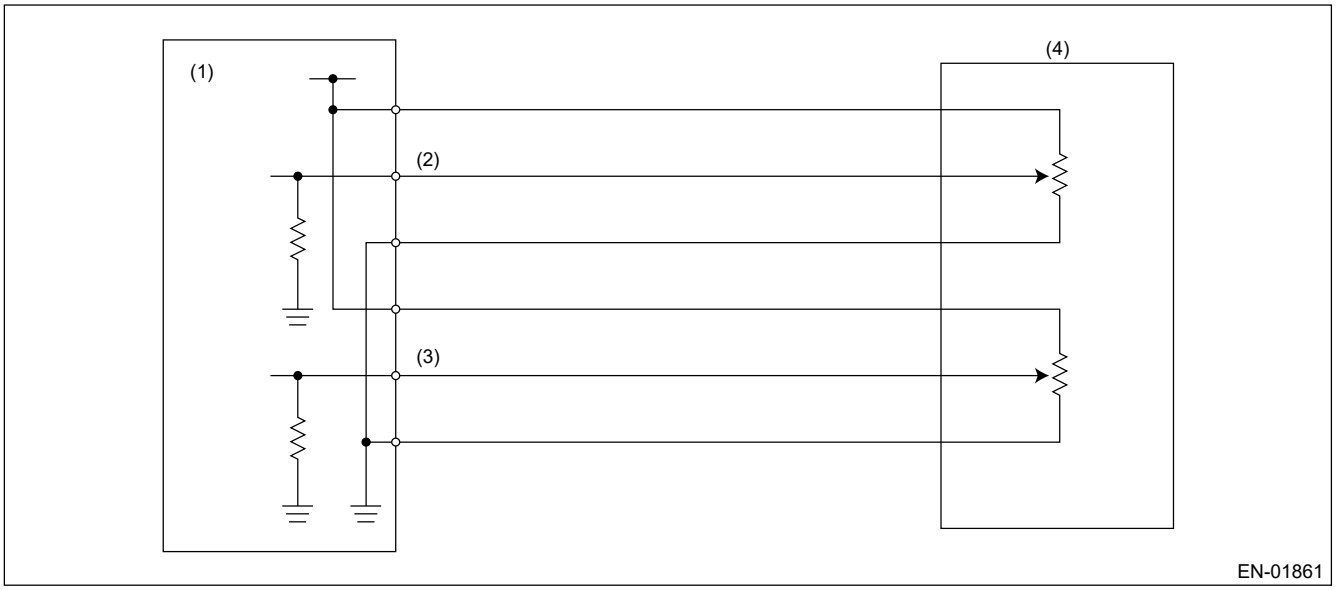
Is the resistance 1 MΩ or more?

Yes	Replace the accelerator pedal. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal.
No	Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	Less than 0.306V

Time needed for diagnosis: 100ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2123 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

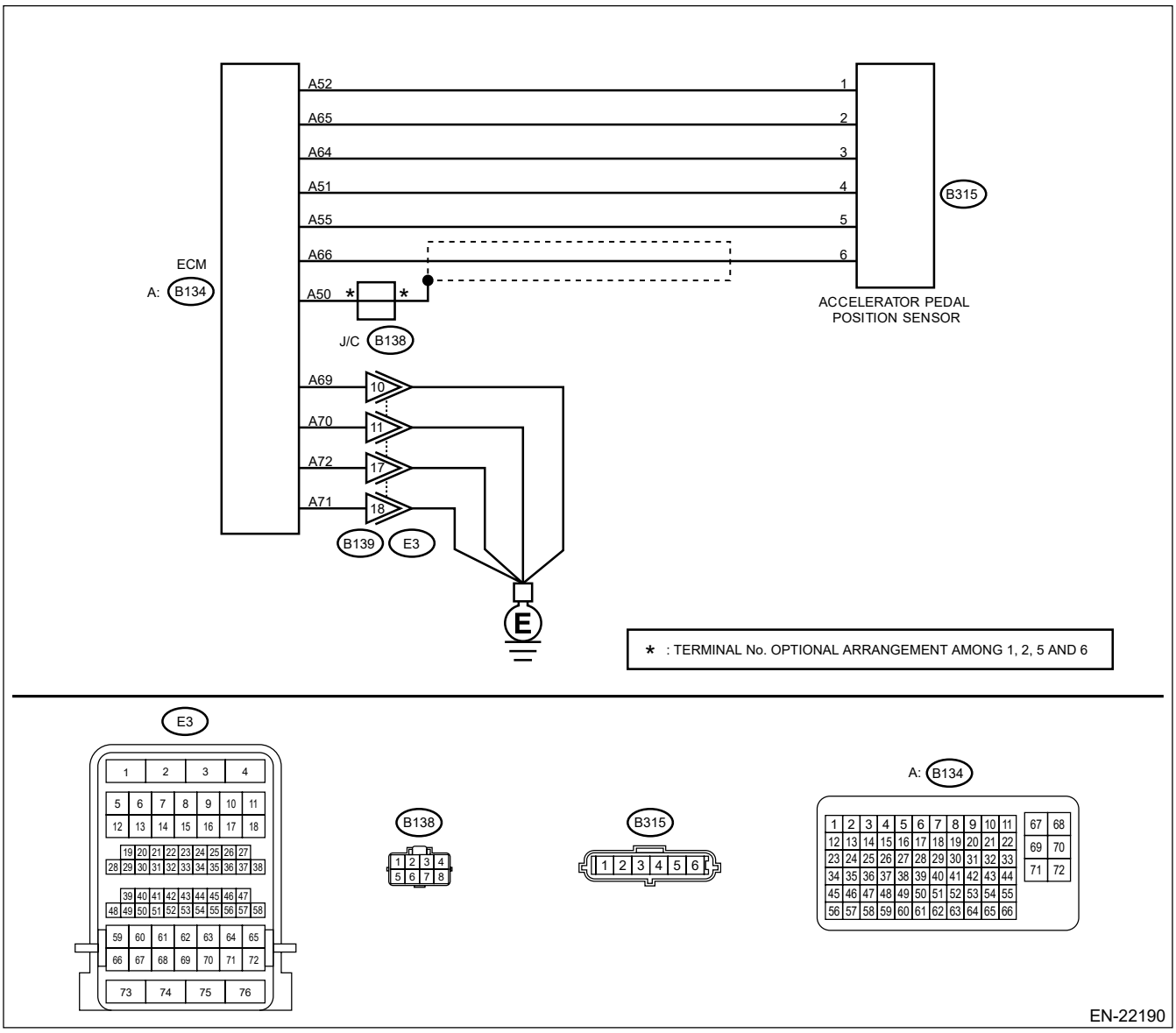
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
A: B134
A52
A65
A64
A51
A55
A66
A50
J/C B138
A69
A70
A72
A71
B139
E3
E
1
2
3
4
5
6
B315
ACCELERATOR PEDAL POSITION SENSOR
10
11
17
18
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
E3
B138
B315
A: B134
EN-22190

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

   Connector & terminal

   (B134) No. 66 — (B315) No. 6:

   (B134) No. 55 — (B315) No. 5:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness between ECM connector and accelerator pedal position sensor connector.

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

   Connector & terminal

   (B315) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B315) No. 6 (+) — Chassis ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (B134) No. 51 — (B134) No. 66:

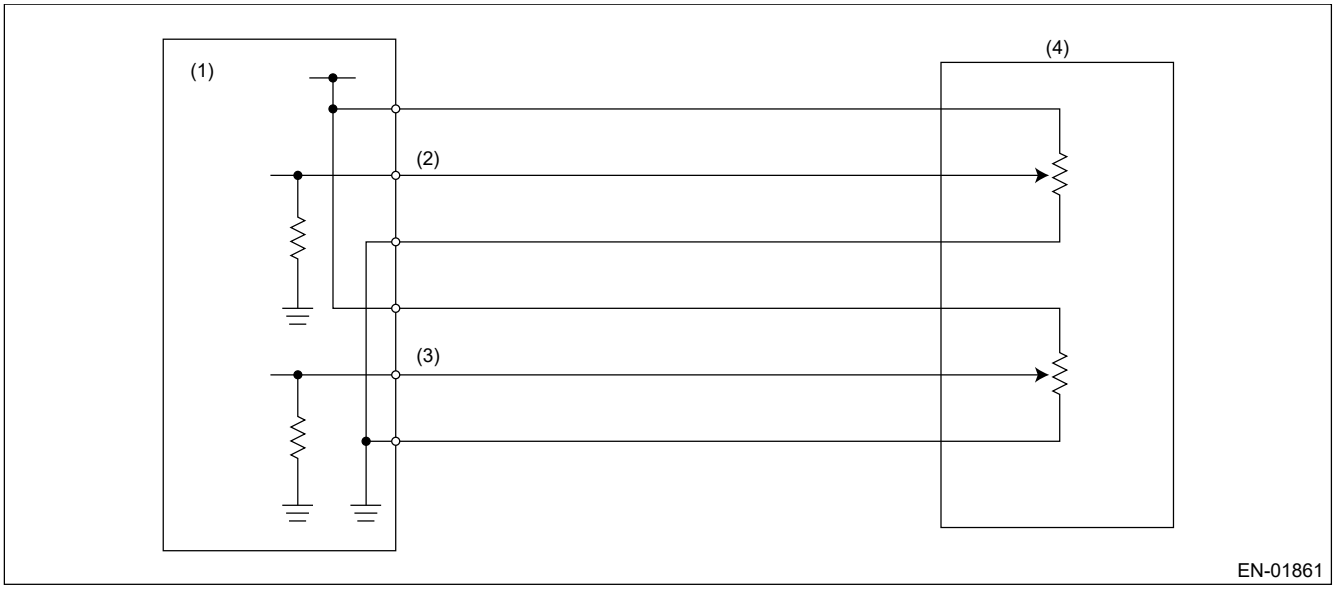
Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal.
No	Repair the short circuit between lines in harness between ECM connector and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 1.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 1 input voltage	4.76V or more

Time needed for diagnosis: 32ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2127 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

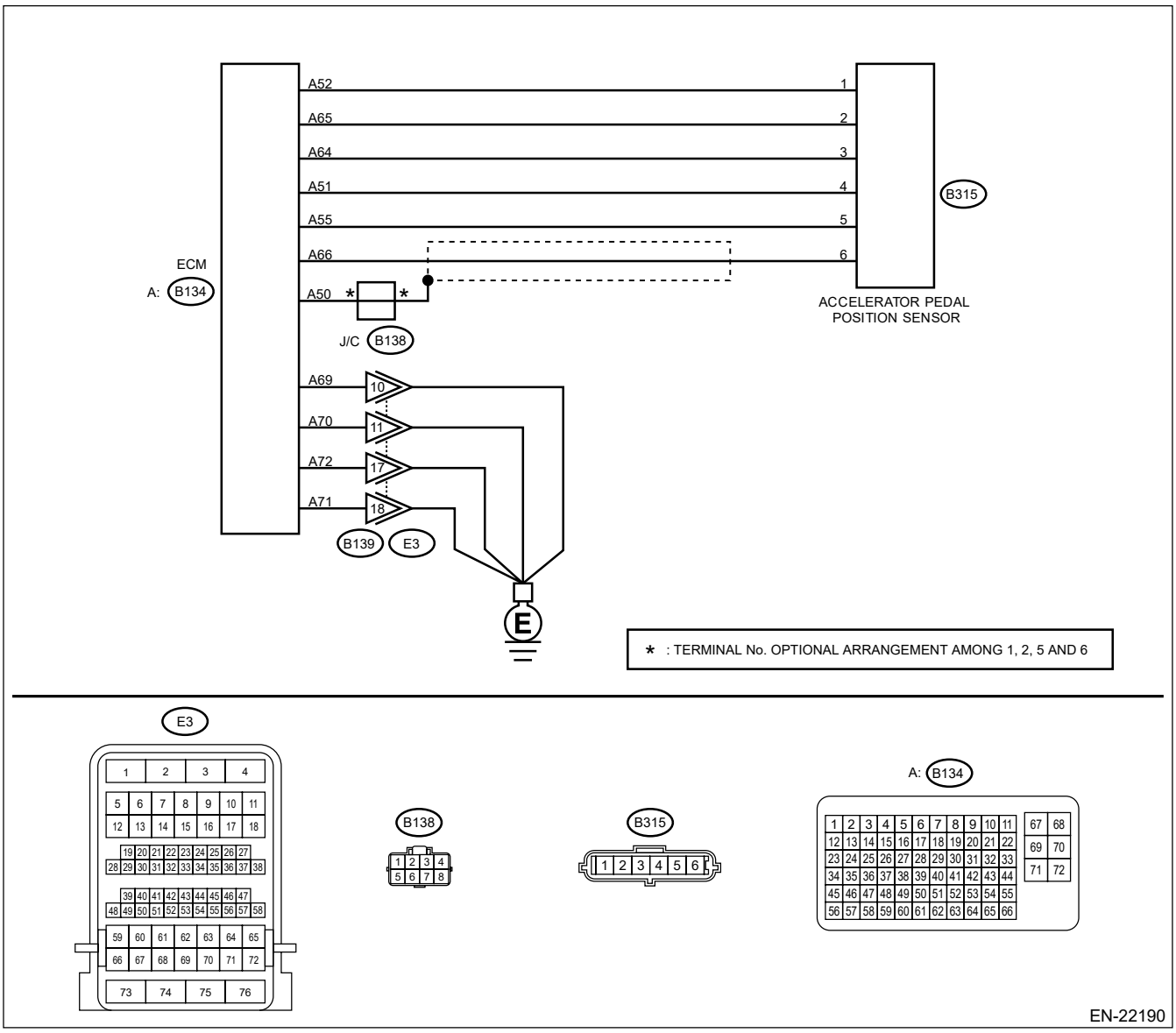
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
A: B134
A52
A65
A64
A51
A55
A66
A50
J/C B138
A69
A70
A72
A71
B139
E3
E
1
2
3
4
5
6
B315
ACCELERATOR PEDAL POSITION SENSOR
10
11
17
18
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
E3
B138
B315
A: B134
EN-22190

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 52 — Chassis ground:
   (B134) No. 64 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector.

2. CHECK SHORT CIRCUIT INSIDE THE ECM.

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B315) No. 3 — Chassis ground:

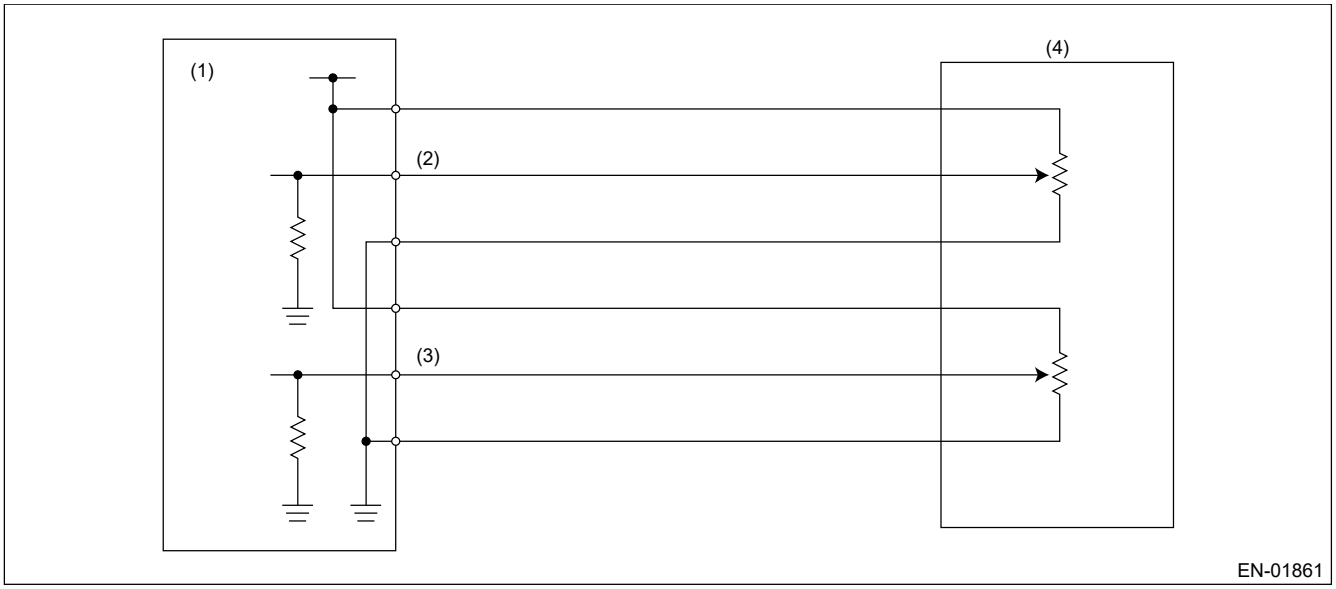
Is the resistance 1 MΩ or more?

Yes	Replace the accelerator pedal. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal.
No	Repair the short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	Less than 0.306V

Time needed for diagnosis: 100ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2128 THROTTLE/PEDAL POSITION SENSOR/SWITCH "E" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

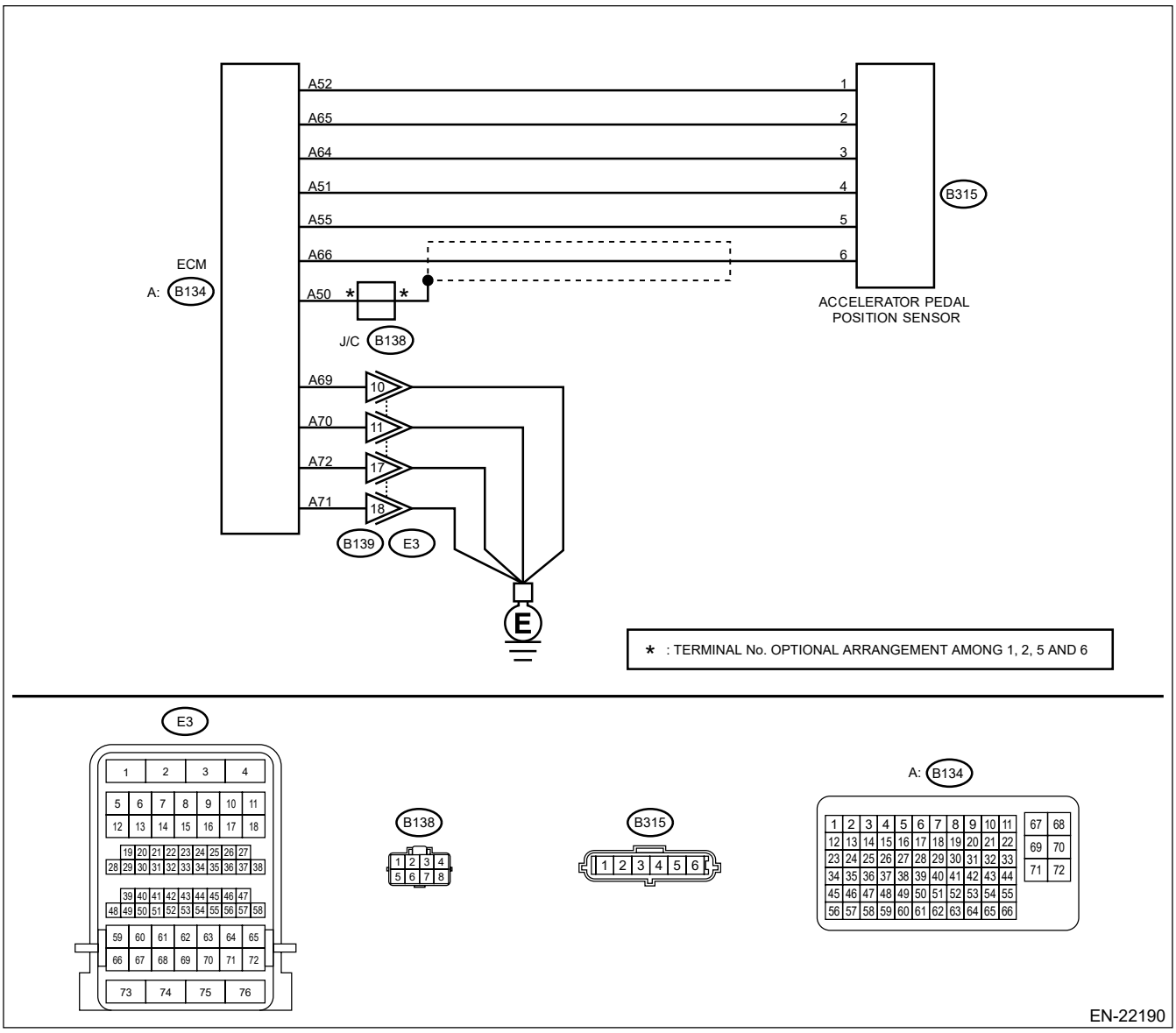
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
A: B134
A52
A65
A64
A51
A55
A66
A50
J/C B138
A69
A70
A72
A71
B139
E3
E
1
2
3
4
5
6
B315
ACCELERATOR PEDAL POSITION SENSOR
10
11
17
18
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
E3
B138
B315
A: B134
EN-22190

1. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the accelerator pedal position sensor.
4. Measure the resistance of harness between ECM connector and accelerator pedal position sensor connector.

   Connector & terminal

   (B134) No. 64 — (B315) No. 3:

   (B134) No. 65 — (B315) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and accelerator pedal position sensor connector** • **Poor contact of joint connector**

2. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between accelerator pedal position sensor connector and chassis ground.

   Connector & terminal

   (B315) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground** • **Poor contact of ECM connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B315) No. 3 (+) — Chassis ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power supply in harness between ECM connector and accelerator pedal position sensor connector.
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (B134) No. 52 — (B134) No. 64:

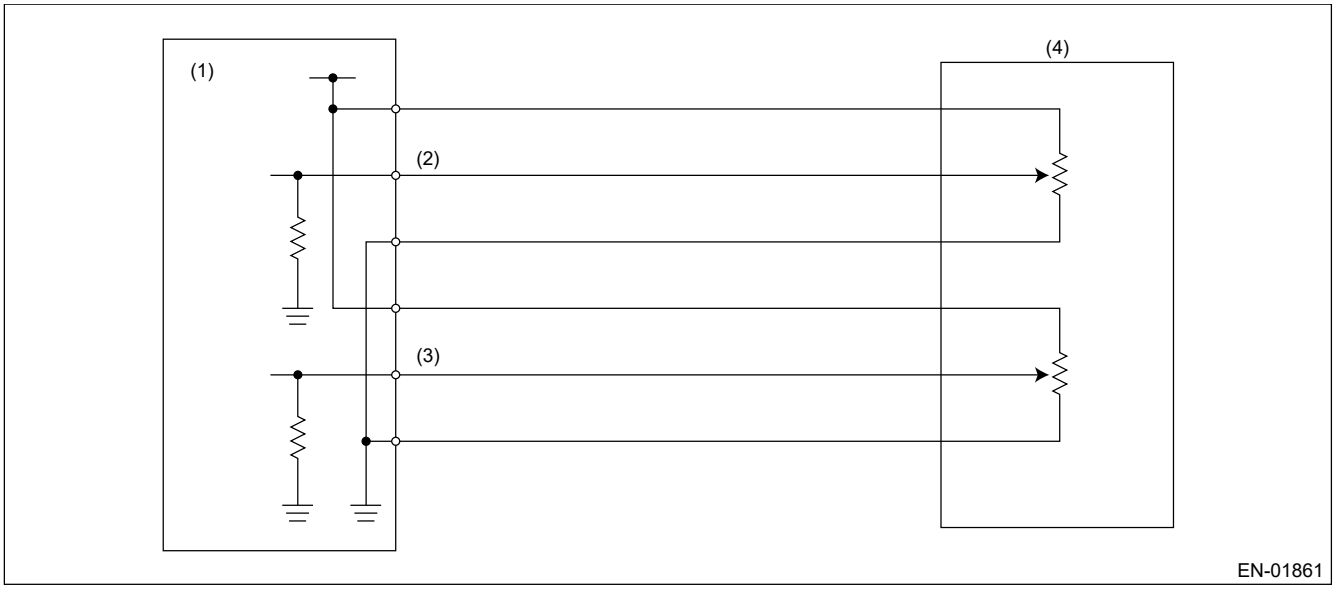
Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of accelerator pedal position sensor connector. Replace the accelerator pedal if defective. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal.
No	Repair the short circuit between lines in harness between ECM connector and accelerator pedal position sensor connector.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit of accelerator pedal position sensor 2.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Sensor 2 input voltage	4.76V or more

Time needed for diagnosis: 100ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2135 THROTTLE/PEDAL POSITION SENSOR/SWITCH "A"/"B" VOLTAGE CORRELATION

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

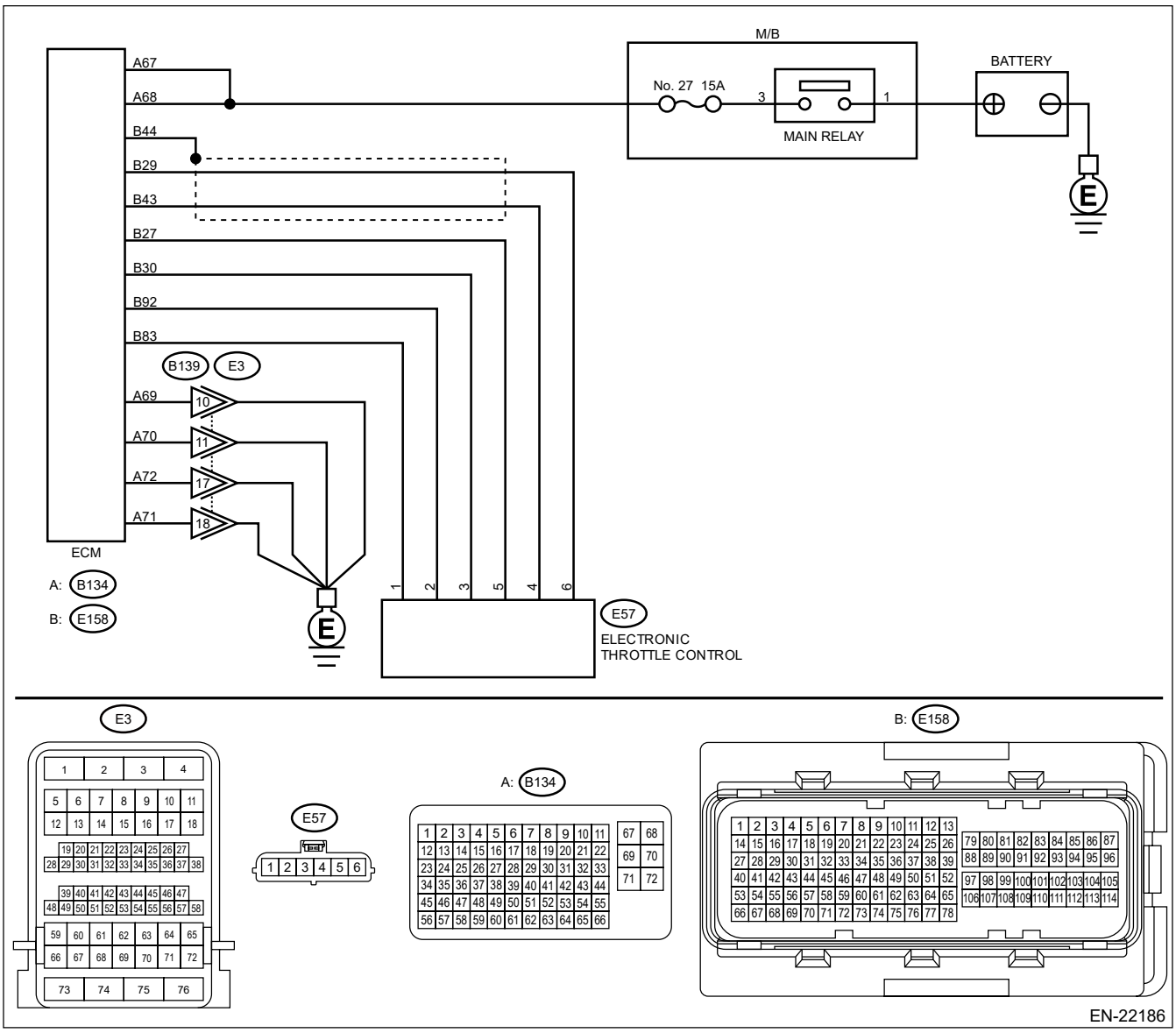
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


M/B
No. 27 15A
3
1
MAIN RELAY
BATTERY
A67
A68
B44
B29
B43
B27
B30
B92
B83
B139
E3
A69
10
A70
11
A72
17
A71
18
ECM
A: B134
B: E158
1
2
3
5
4
6
E57
ELECTRONIC
THROTTLE CONTROL
E3
E57
A: B134
B: E158
EN-22186

1. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from electronic throttle control.
4. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 27 — Chassis ground:
(E158) No. 29 — Chassis ground:
(E158) No. 29 — (E158) No. 44:
(E158) No. 43 — Chassis ground:
(E158) No. 43 — (E158) No. 44:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector.

2. CHECK THE SHORT CIRCUIT INSIDE ECM (SHORT TO GROUND).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 6 — Engine ground:
(E57) No. 4 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the ground short circuit of harness between ECM connector and electronic throttle control connector. Replace the ECM if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

3. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and electronic throttle control connector.

Connector & terminal

(E158) No. 29 — (E57) No. 6:

(E158) No. 43 — (E57) No. 4:

(E158) No. 30 — (E57) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between ECM connector and electronic throttle control connector.

4. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (OPEN).

1. Connect the connector to ECM.
2. Measure the resistance between electronic throttle control connector and engine ground.

Connector & terminal

(E57) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 5.
No	Repair the open circuit in harness between ECM connector and engine ground.

5. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between electronic throttle control connector and engine ground.
   Connector & terminal
   (E57) No. 6 (+) — Engine ground (−):
   (E57) No. 4 (+) — Engine ground (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and electronic throttle control connector.
No	Go to 6.

6. CHECK HARNESS BETWEEN ECM AND ELECTRONIC THROTTLE CONTROL CONNECTOR (SHORT BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors.
   Connector & terminal
   (E158) No. 27 — (E158) No. 29:
   (E158) No. 27 — (E158) No. 43:

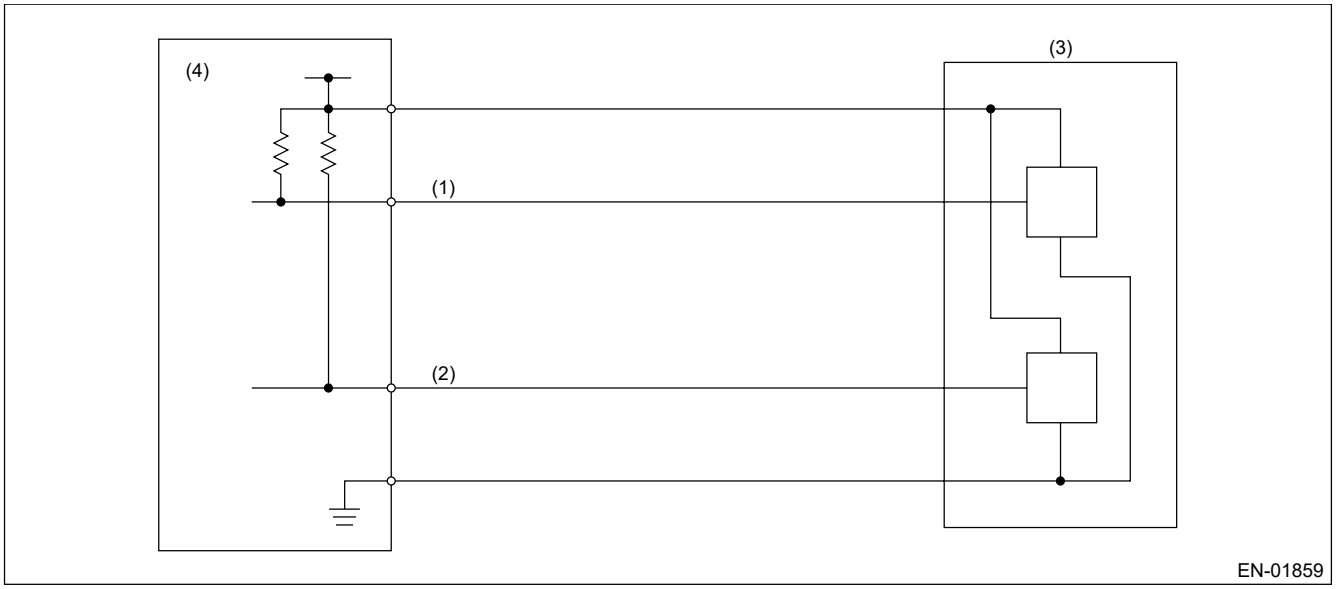
Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of electronic throttle control connector. Replace the electronic throttle control if defective. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Throttle Body.
No	Repair the short circuit between lines in harness between ECM connector and electronic throttle control connector.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of throttle position sensor 1 is different from the throttle position sensor 2.

2. COMPONENT DESCRIPTION



(1) Throttle position sensor 1 signal
(2) Throttle position sensor 2 signal
(3) Throttle position sensor
(4) Engine control module (ECM)

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

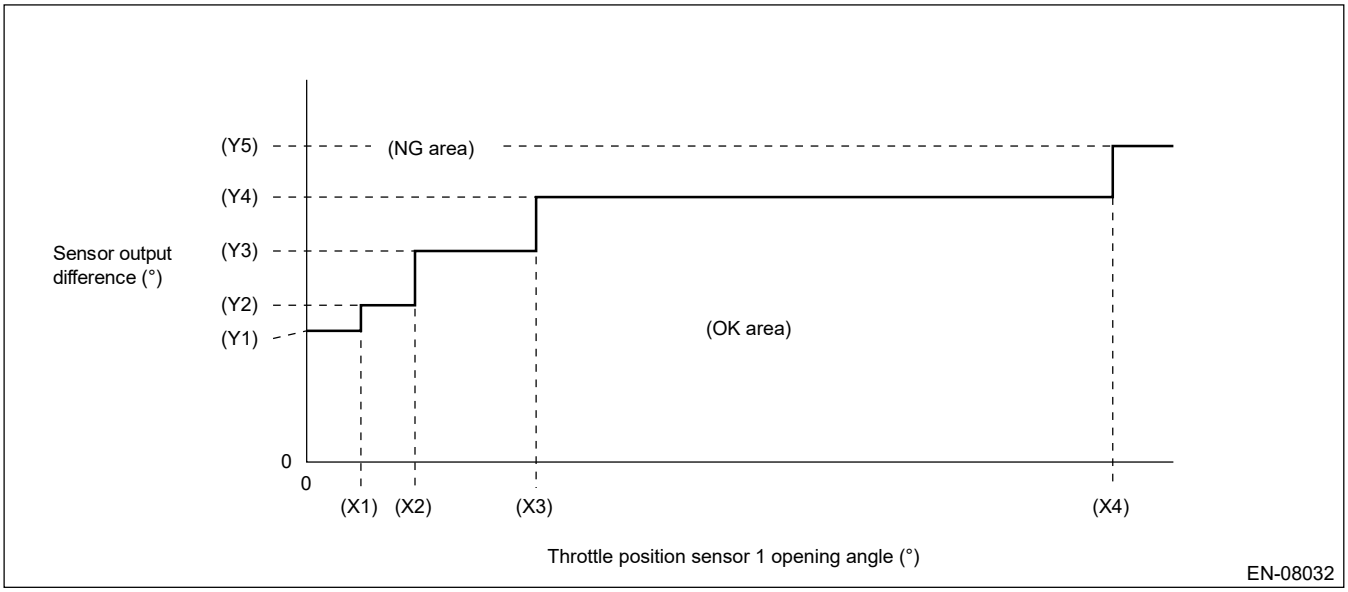
5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal difference between two sensors	Within NG range of **Details of judgment value**

Details of judgment value



(X1) 2.125°
(X2) 4.25°
(X3) 9°
(X4) 31.625°
(Y1) 4.461°
(Y2) 5.461°
(Y3) 7.586°
(Y4) 9.711°
(Y5) 11.711°

Time needed for diagnosis: 212ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2138 THROTTLE/PEDAL POSITION SENSOR/SWITCH "D"/"E" VOLTAGE CORRELATION

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Improper idling
- Poor driving performance

Caution:

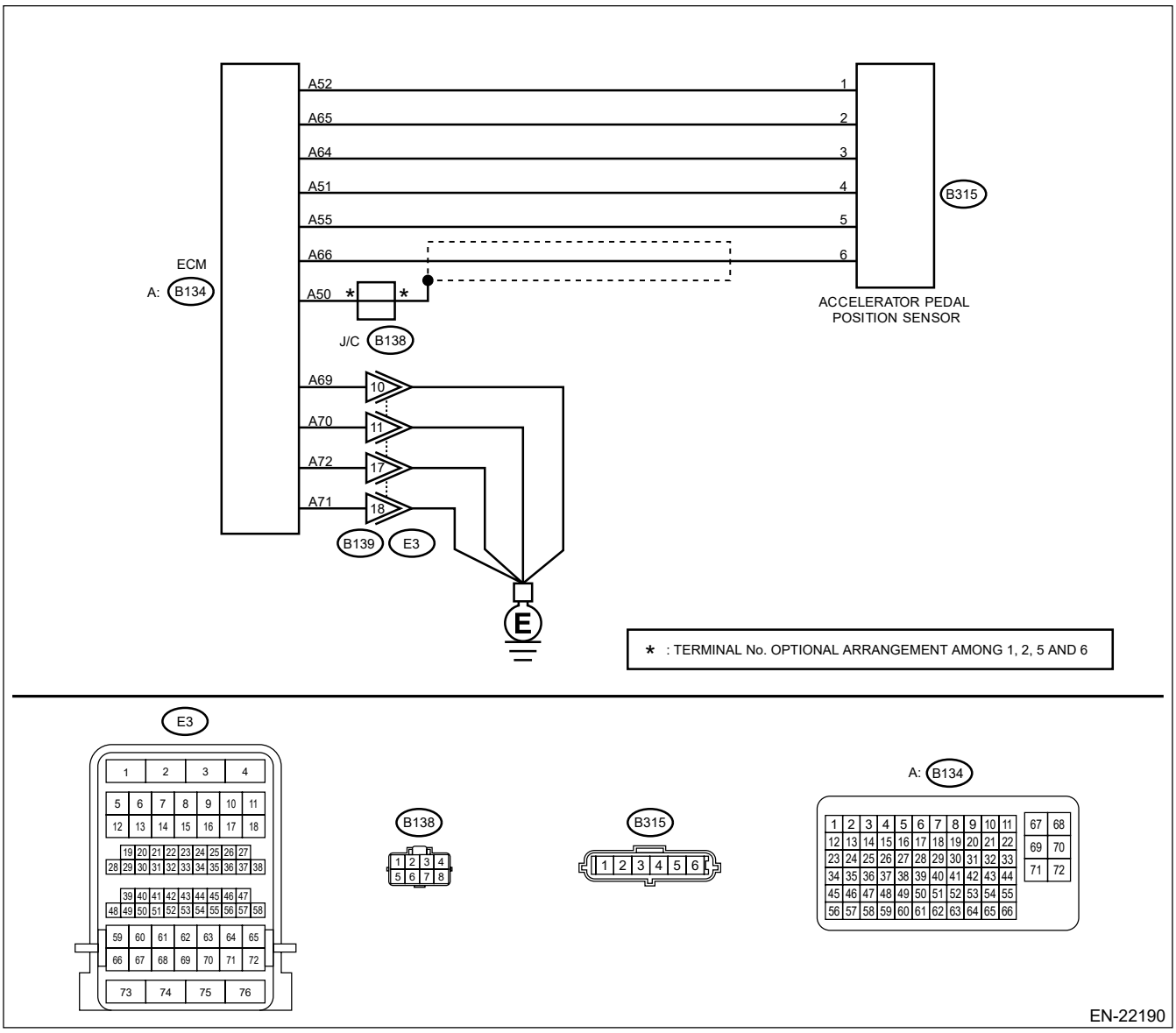
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


ECM
A: B134
A52
A65
A64
A51
A55
A66
A50
J/C B138
A69
A70
A72
A71
B139
E3
E
1
2
3
4
5
6
B315
ACCELERATOR PEDAL POSITION SENSOR
10
11
17
18
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 1, 2, 5 AND 6
E3
B138
B315
A: B134
EN-22190

1. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   Main accelerator pedal position sensor signal
   (B134) No. 66 (+) — Chassis ground (−):
   Sub accelerator pedal position sensor signal
   (B134) No. 64 (+) — Chassis ground (−):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes	Go to 3.
No	Go to 2.

2. CHECK ACCELERATOR PEDAL POSITION SENSOR OUTPUT.

1. Measure the voltage between accelerator pedal position sensor connector and chassis ground.
   Connector & terminal
   (B315) No. 6 (+) — Chassis ground (−):
   (B315) No. 3 (+) — Chassis ground (−):

Is the difference in measured values for the main accelerator pedal position sensor signal and the sub accelerator pedal position sensor signal 0 V?

Yes	Replace the accelerator pedal. Ref. to SPEED CONTROL SYSTEMS(H4DO)>Accelerator Pedal.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and accelerator pedal position sensor connector** • **Short circuit to ground in harness between ECM connector and accelerator pedal position sensor connector**

3. CHECK HARNESS BETWEEN ECM AND ACCELERATOR PEDAL POSITION SENSOR (OPEN).

Measure the resistance of harness between accelerator pedal position sensor connector and chassis ground.

Connector & terminal

(B315) No. 5 — Chassis ground:

(B315) No. 2 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Repair the poor contact of ECM connector.
No	Repair the harness and connector.

Note:

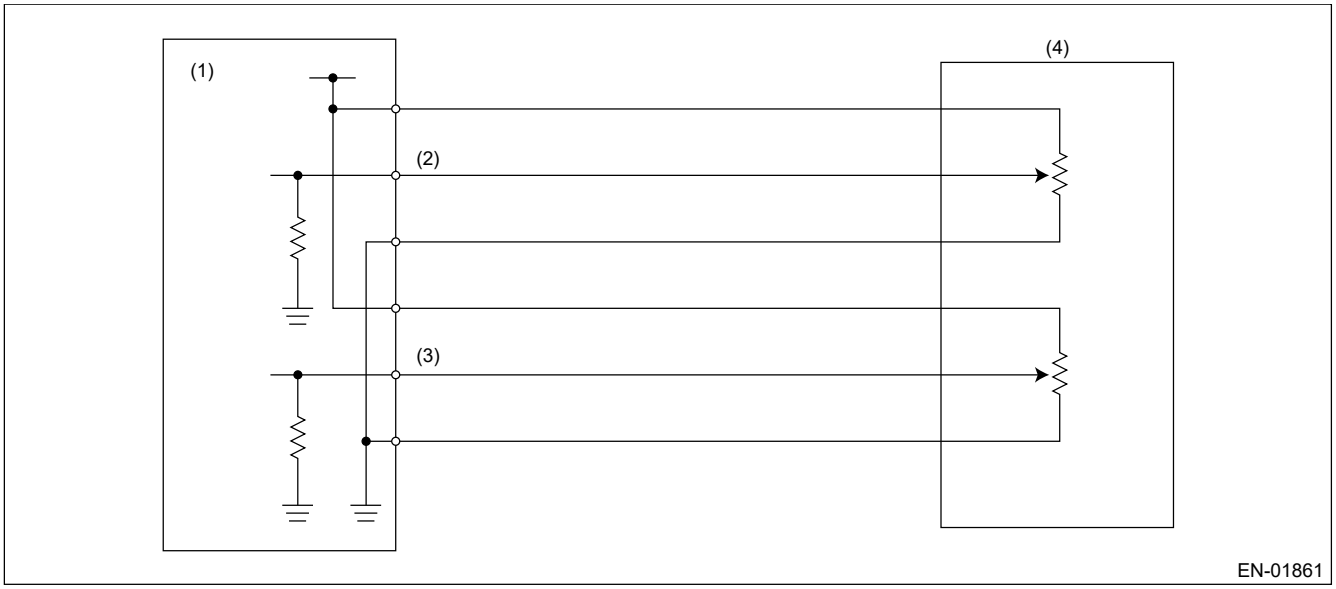
In this case, repair the following item:

- **Open circuit of harness between ECM connector and accelerator pedal position sensor connector**
- **Open circuit of harness between ECM connector and engine ground**
- **Poor contact of ECM connector**
- **Poor contact of joint connector**

1. OUTLINE OF DIAGNOSIS

Judge as NG when the signal level of accelerator pedal position sensor 1 is different from the accelerator pedal position sensor 2.

2. COMPONENT DESCRIPTION



(1) Engine control module (ECM)
(2) Accelerator pedal position sensor 1 signal
(3) Accelerator pedal position sensor 2 signal
(4) Accelerator pedal position sensor

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	6V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

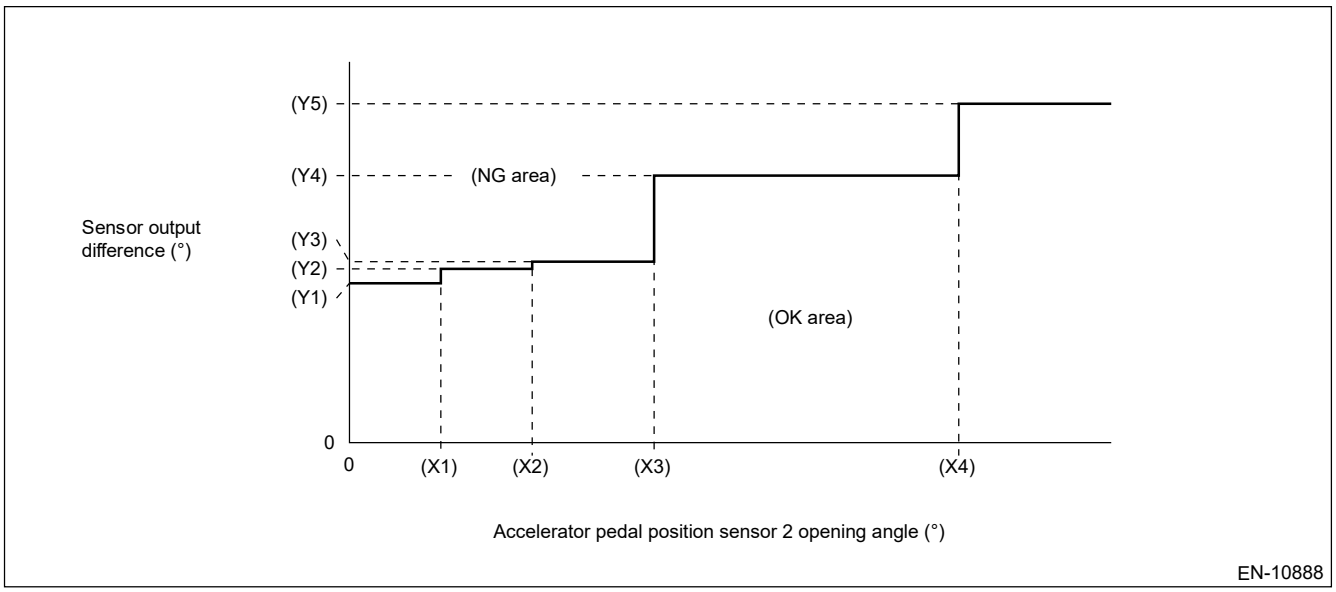
5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal difference between two sensors	Within NG range of **Details of judgment value**

Details of judgment value



(X1) 0.6° (X2) 1.2° (X3) 2°

(X4) 4°

(Y1) 1.465° (Y2) 1.597° (Y3) 1.663°

(Y4) 2.455° (Y5) 3.116°

Time needed for diagnosis: 116ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2195 A/F /O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

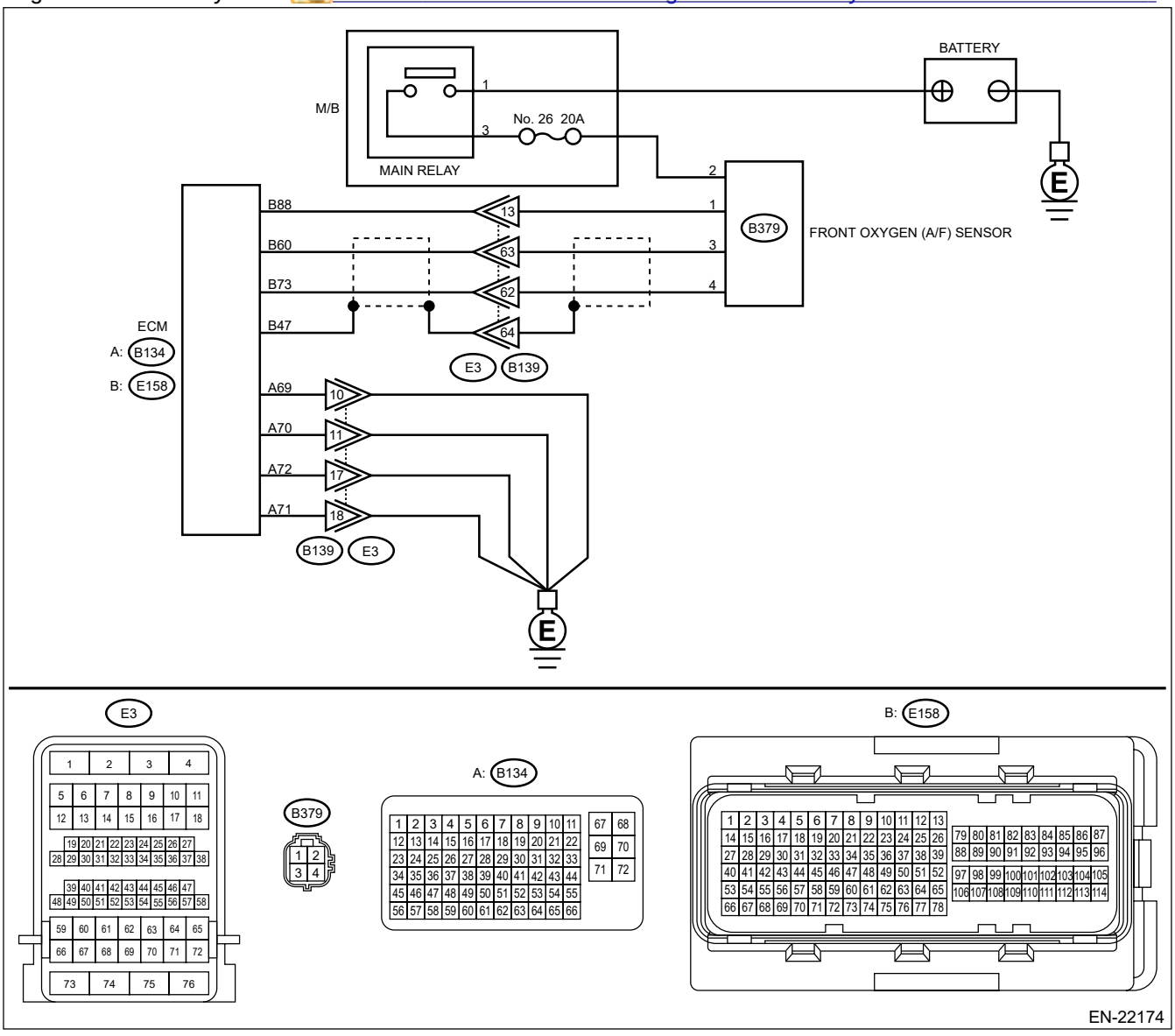
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

   Connector & terminal

   (E158) No. 60 — (B379) No. 3:

   (E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK FOR POOR CONTACT.

Check for poor contact of the front oxygen (A/F) sensor connector.

Is there poor contact of front oxygen (A/F) sensor connector?

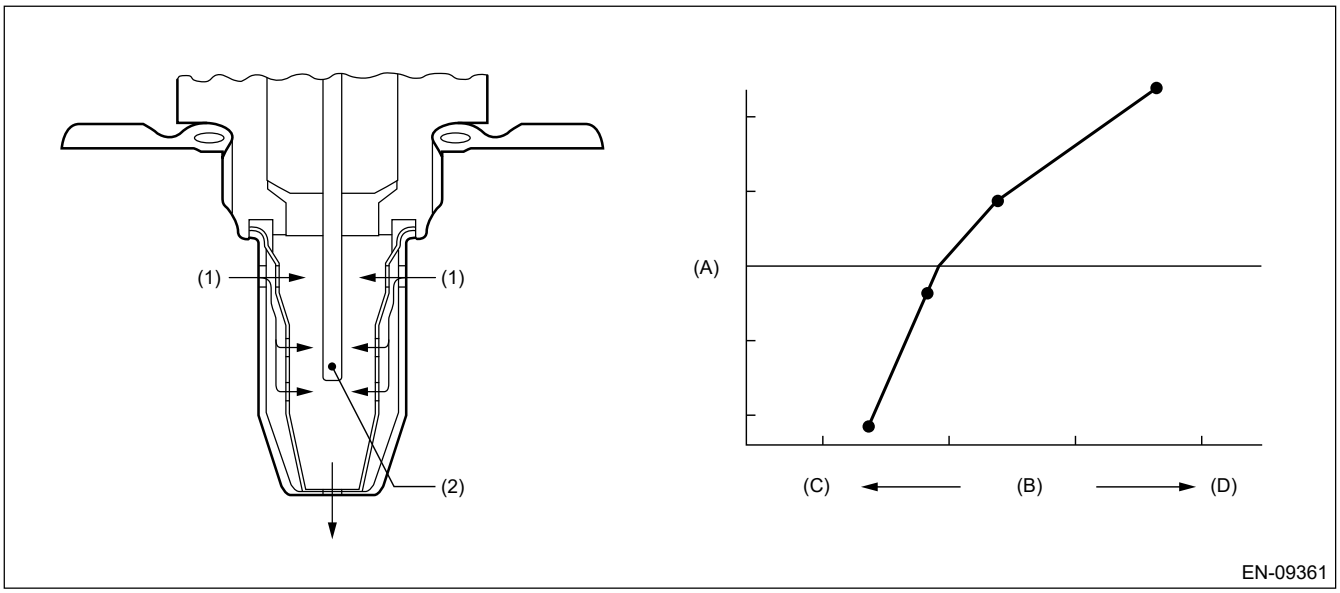
Yes	Repair the poor contact of front oxygen (A/F) sensor connector.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains low.
Judge as NG if the lambda value can be determined as abnormal in accordance with driving conditions such as vehicle speed, intake air amount, and rear oxygen sensor voltage as well as front oxygen (A/F) sensor λ value.

λ value = Actual air fuel ratio/Theoretical air fuel ratio
λ > 1: Lean
λ < 1: Rich

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich
(D) Lean
(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	More than 75060.3Pa (563mmHg,22.2inHg)
Main feedback	In operation
Amount of intake air	6g/s (0.21oz/s) or more
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
λ value	More than 1.15
Output voltage value of rear oxygen sensor	More than 0.7V

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2196 A/F /O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 1

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

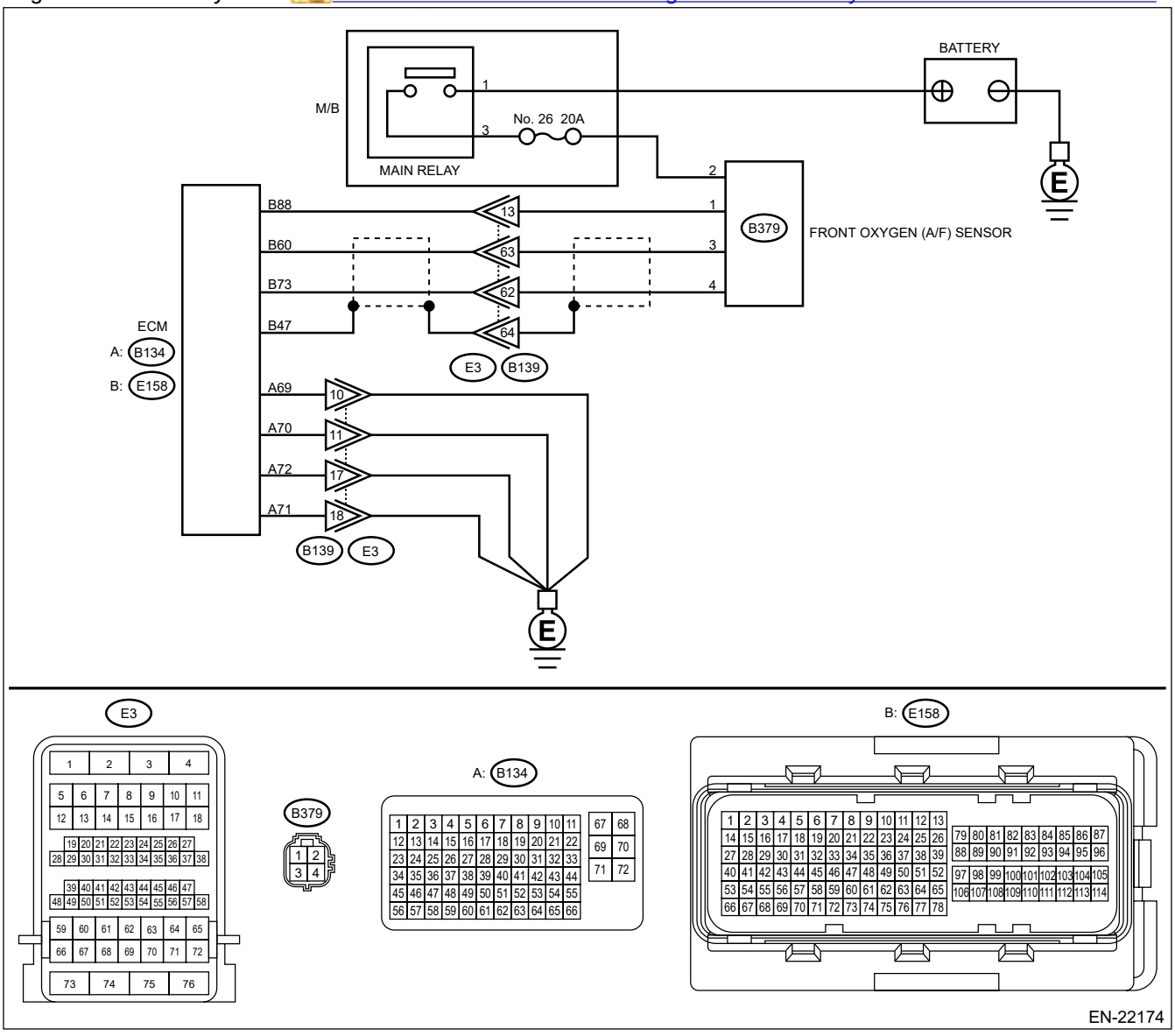
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 — Chassis ground:

(E158) No. 73 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 73 (+) — Chassis ground (−):

Is the voltage 4.95 V or more?

Yes	Go to 5.
No	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.

5. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 (+) — Chassis ground (−):

(E158) No. 73 (+) — Chassis ground (−):

Is the voltage 8 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the poor contact of ECM connector.

1. OUTLINE OF DIAGNOSIS

Detect that λ value remains high.

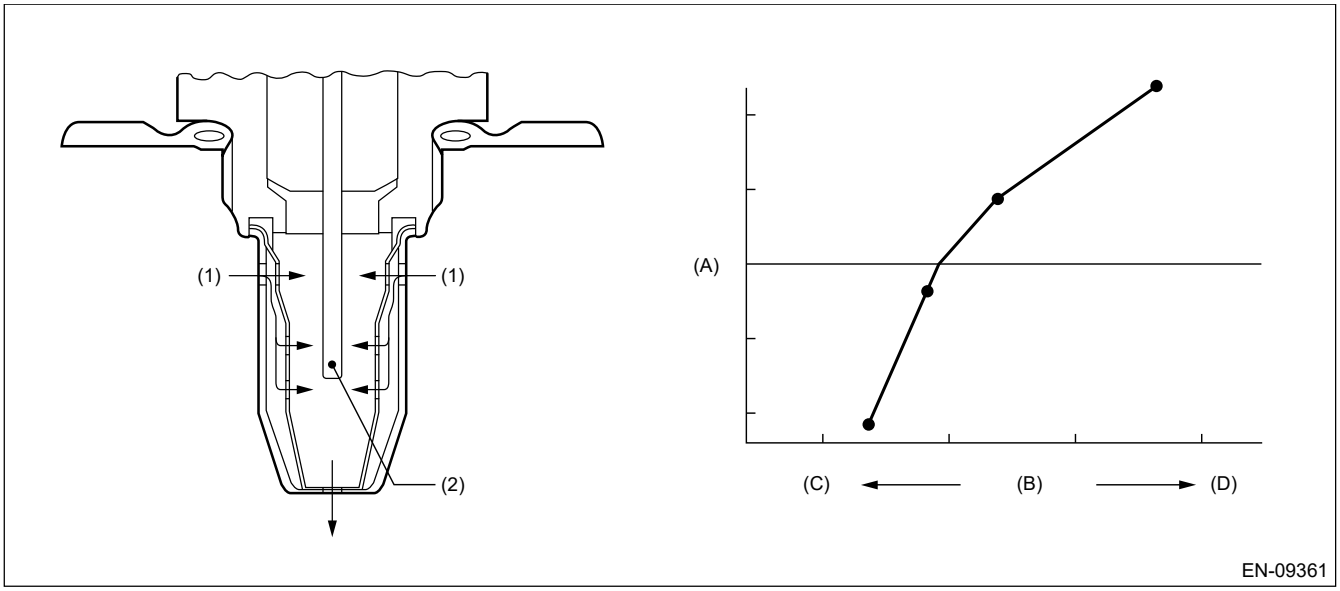
Judge as NG if the lambda value can be determined as abnormal in accordance with driving conditions such as vehicle speed, intake air amount, and rear oxygen sensor voltage as well as front oxygen (A/F) sensor λ value.

λ value = Actual air fuel ratio/Theoretical air fuel ratio

λ > 1: Lean

λ < 1: Rich

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Rich

(D) Lean

(1) Exhaust gas (2) Zirconia element oxygen

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Barometric pressure	More than 75060.3Pa (563mmHg,22.2inHg)
Main feedback	In operation
Amount of intake air	6g/s (0.21oz/s) or more
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
λ value	Less than 0.85
Output voltage value of rear oxygen sensor	Less than 0.2V

Time needed for diagnosis: 10000ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE

DTC detecting condition:

- Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

- Engine stall
- Improper idling

Caution:

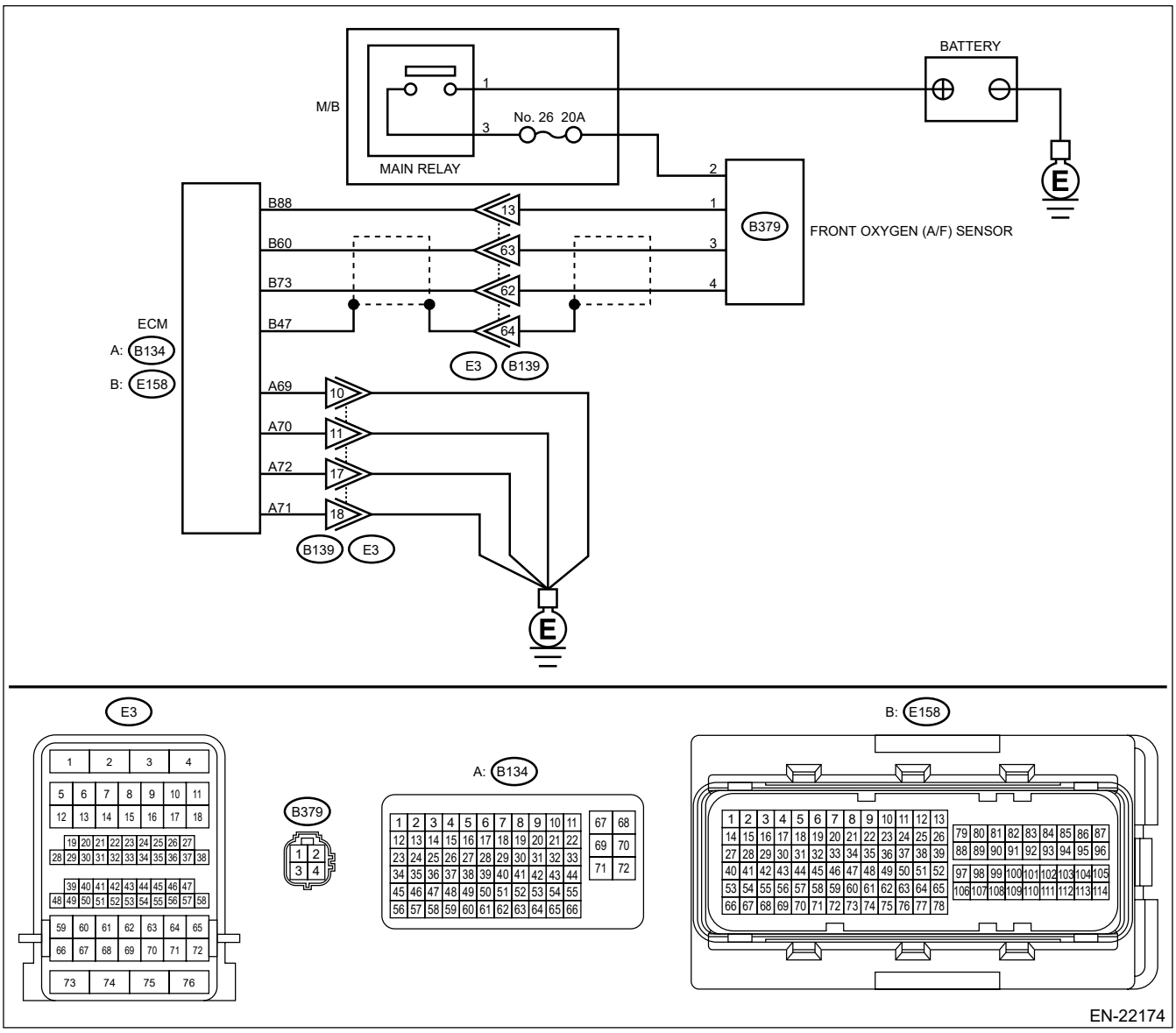
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

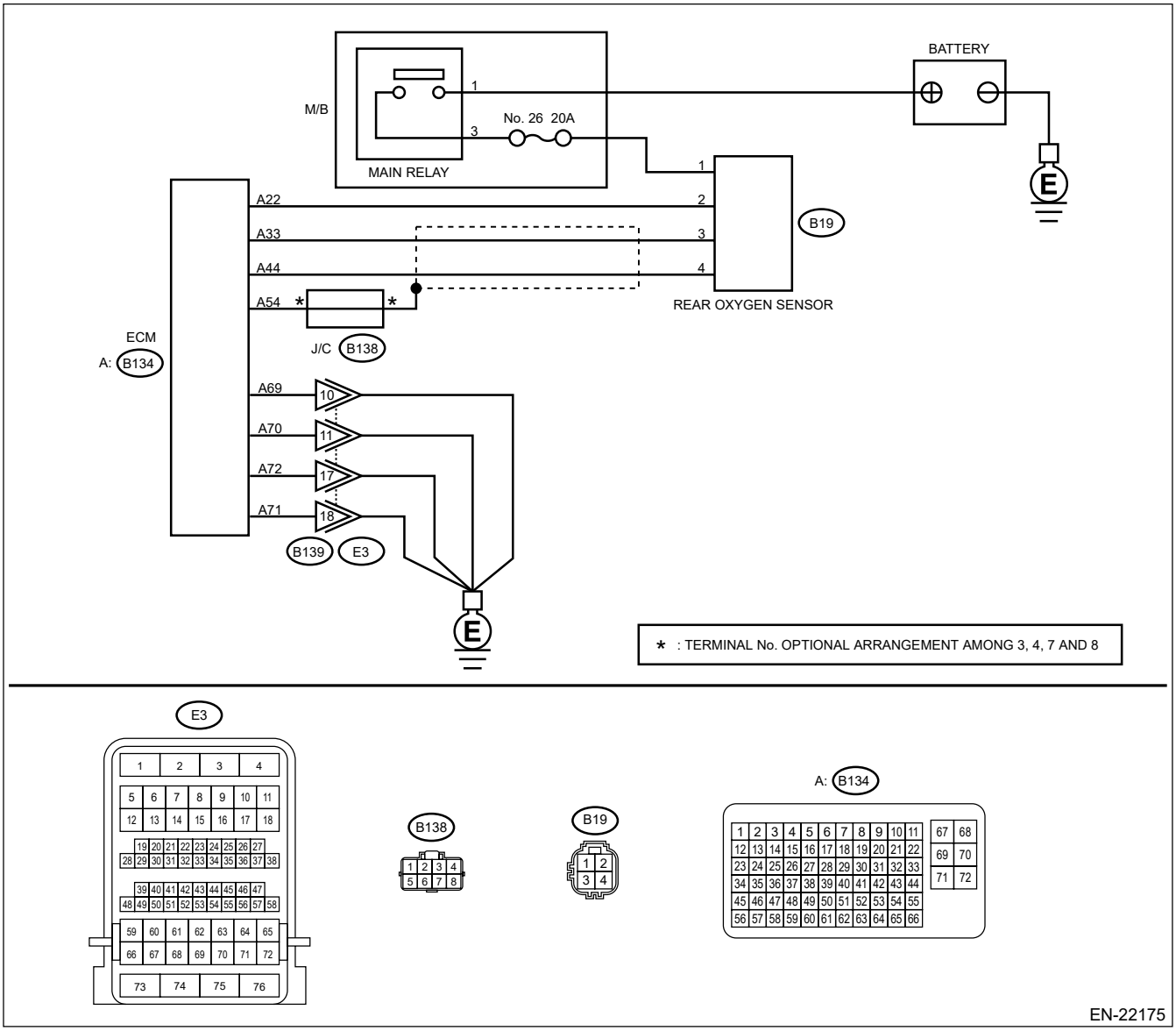
Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

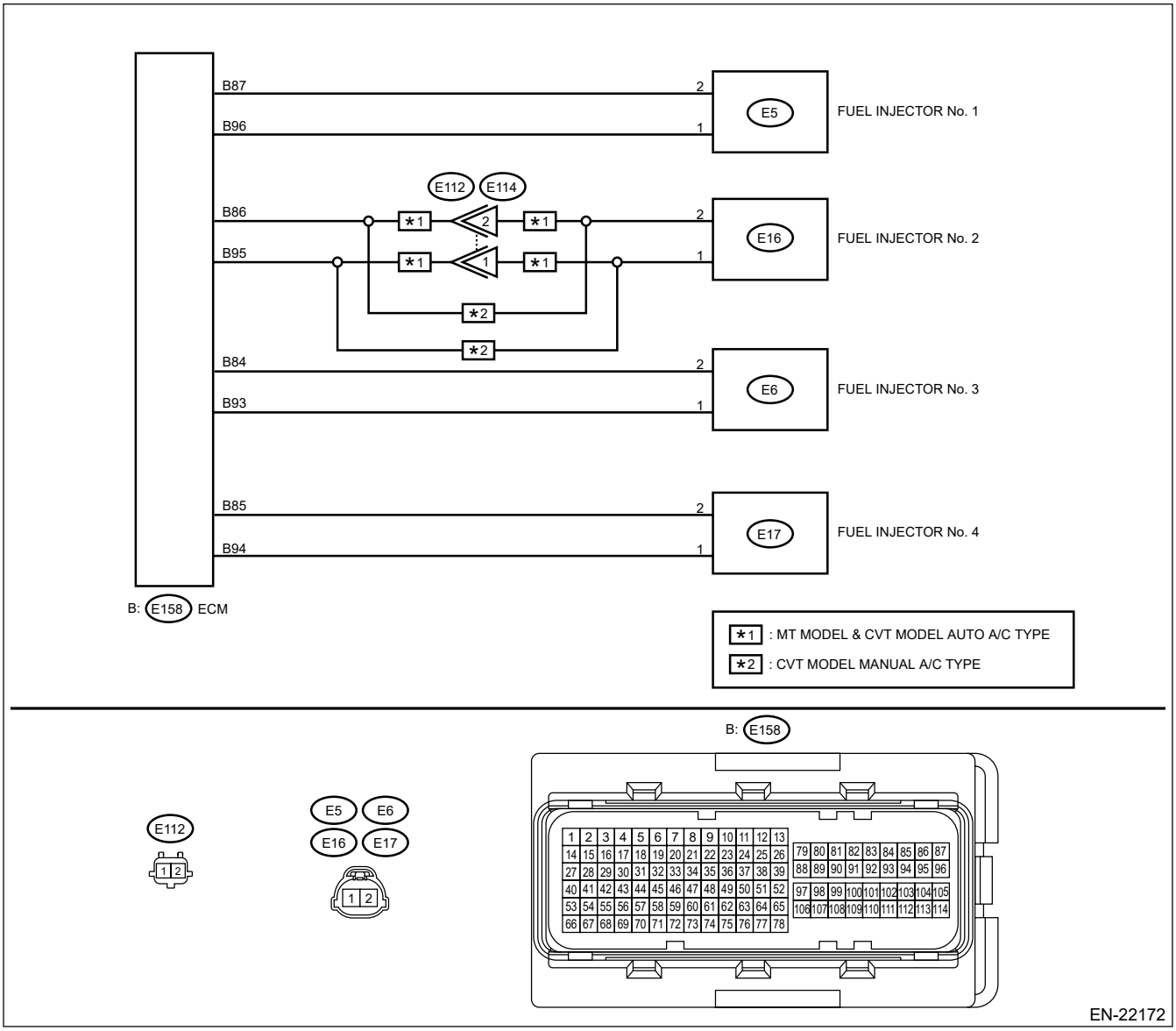
Wiring diagram:

- Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.


BATTERY
M/B
1
3
No. 26 20A
MAIN RELAY
2
B379
FRONT OXYGEN (A/F) SENSOR
B88
B60
B73
B47
13
63
62
64
1
3
4
ECM
A: B134
B: E158
E3
B139
A69
A70
A72
A71
10
11
17
18
B139
E3
E
E3
B379
A: B134
B: E158
EN-22174


BATTERY
M/B
1
3
No. 26 20A
MAIN RELAY
1
2
3
4
B19
REAR OXYGEN SENSOR
A22
A33
A44
A54
*
*
J/C
B138
ECM
A: B134
A69
A70
A72
A71
10
11
17
18
B139
E3
E
E
* : TERMINAL No. OPTIONAL ARRANGEMENT AMONG 3, 4, 7 AND 8
E3
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25 26 27
28 29 30 31 32 33 34 35 36 37 38
39 40 41 42 43 44 45 46 47
48 49 50 51 52 53 54 55 56 57 58
59 60 61 62 63 64 65
66 67 68 69 70 71 72
73 74 75 76
B138
1 2 3 4
5 6 7 8
B19
1 2
3 4
A: B134
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41 42 43 44
45 46 47 48 49 50 51 52 53 54 55
56 57 58 59 60 61 62 63 64 65 66
67 68
69 70
71 72

EN-22175



1. CHECK FRONT OXYGEN (A/F) SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the front oxygen (A/F) sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connectors from front oxygen (A/F) sensor.
4. Measure the resistance of harness between ECM connector and front oxygen (A/F) sensor connector.

Connector & terminal

(E158) No. 60 — (B379) No. 3:

(E158) No. 73 — (B379) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and front oxygen (A/F) sensor connector.

3. CHECK HARNESS BETWEEN ECM AND FRONT OXYGEN (A/F) SENSOR (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(E158) No. 60 — Chassis ground:

(E158) No. 73 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM connector and front oxygen (A/F) sensor connector.

4. CHECK OUTPUT SIGNAL FOR ECM.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.
   Connector & terminal
   (B379) No. 3 (+) — Chassis ground (−):

Is the voltage 4.5 V or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.
Connector & terminal
(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 4.95 V or more?

Yes	Go to 6.
No	Go to 7.

6. CHECK OUTPUT SIGNAL FOR ECM.

Measure the voltage between front oxygen (A/F) sensor connector and chassis ground.
Connector & terminal
(B379) No. 3 (+) — Chassis ground (−):
(B379) No. 4 (+) — Chassis ground (−):

Is the voltage 8 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and front oxygen (A/F) sensor connector. After repair, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the poor contact of ECM connector.

7. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Are there holes or loose bolts on exhaust system?

Yes	Repair the exhaust system.
No	Go to 8.

8. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Are there holes, loose bolts or disconnection of hose on air intake system?

Yes	Repair the air intake system.
No	Go to 9.

9. CHECK FUEL PRESSURE.

Warning:
Place “NO OPEN FLAMES” signs near the working area.
Caution:
Be careful not to spill fuel.

1. Connect the front oxygen (A/F) sensor connector.
2. Measure the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
   Caution:
   Before attaching/detaching a fuel pressure gauge, release the fuel pressure.

Is the measured value 350 — 450 kPa (3.5—4.6 kg/cm^2, 50 — 66 psi)?

Yes	Go to 10.
No	Check the fuel pump and fuel delivery line. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump>INSPECTION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Delivery and Evaporation Lines>INSPECTION.

10. CHECK ENGINE COOLANT TEMPERATURE SENSOR.

1. Start the engine and warm up completely.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Coolant Temp.].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Coolant Temp.] 75°C (167°F) or more?

Yes	Go to 11.
No	Replace the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.

11. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Using the Subaru Select Monitor or a general scan tool, read the value of [Mass Air Flow].



Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Mass Air Flow]2.0—5.0 g/s (0.26—0.66 lb/m)?

Yes	Go to 12.
No	Replace the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

12. CHECK MASS AIR FLOW AND INTAKE AIR TEMPERATURE SENSOR.

1. Start the engine and warm up engine until coolant temperature is higher than 75°C (167°F).
2. For CVT models, set the select lever to “P” range or “N” range, and for MT models, place the shift lever in the neutral position.
3. Turn the A/C switch to OFF.
4. Turn all the accessory switches to OFF.
5. Open the front hood.
6. Measure the ambient temperature.
7. Using the Subaru Select Monitor or a general scan tool, read the value of [Intake Air Temp.].

Data Monitor

Note:

- **SUBARU SELECT MONITOR**
  For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.

Subtract ambient temperature from [Intake Air Temp.]. Is the obtained value −10 — 50°C (−18 — 90°F)?

Yes	Go to 13.
No	Check the mass air flow and intake air temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Mass Air Flow and Intake Air Temperature Sensor.

13. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and keep the engine speed at 3,000 rpm. (2 minutes maximum)
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.490 V or more?

Yes	Go to 14.
No	Go to 15.

14. CHECK REAR OXYGEN SENSOR DATA.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), and rapidly reduce the engine speed from 3,000 rpm.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **Depress the clutch pedal (MT model)**
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12]0.250 V or less?

Yes	Go to 16.
No	Go to 15.

15. CHECK REAR OXYGEN SENSOR CONNECTOR AND COUPLING CONNECTOR.

Check the rear oxygen sensor connector and coupling connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 17.

16. CHECK FRONT OXYGEN (A/F) SENSOR USING REAR OXYGEN SENSOR SIGNAL.

1. Warm up the engine until engine coolant temperature is higher than 75°C (167°F), then keep the engine idling for 5 minutes or more.
2. Using the Subaru Select Monitor or a general scan tool, read the value of [Oxygen sensor #12].

   Data Monitor

   Note:
   - **SUBARU SELECT MONITOR**
     For detailed operation procedures, refer to "Data Monitor". Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
   - **General scan tool**
     For detailed operation procedures, refer to the general scan tool operation manual.

Is the value of [Oxygen sensor #12] kept at 0.250 V or less for 5 minutes or more?

Yes	Replace the front oxygen (A/F) sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Front Oxygen (A/F) Sensor.
No	Go to 17.

17. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 33 — (B19) No. 3:
   (B134) No. 44 — (B19) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 18.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

18. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 3 (+) — Chassis ground (−):

Is the voltage 0.2—0.5 V?

Yes	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Front Oxygen (A/F) Sensor.
No	Go to 19.

19. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector on faulty cylinders.
4. Measure the resistance between fuel injector connector and engine ground on faulty cylinders.

Connector & terminal

#1 (E5) No. 1 — Engine ground:
#1 (E5) No. 2 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#2 (E16) No. 2 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#3 (E6) No. 2 — Engine ground:
#4 (E17) No. 1 — Engine ground:
#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 20.
No	Repair the short circuit to ground in harness between ECM and fuel injector connector.

20. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

Measure the resistance of harness between ECM and fuel injector connector on faulty cylinders.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 21.
No	Repair the open circuit of the harness between the ECM and fuel injector connector.

21. CHECK FUEL INJECTOR.

Check the fuel injector on faulty cylinder. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 22.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

22. CHECK INSTALLATION CONDITION OF CAMSHAFT POSITION SENSOR AND CRANKSHAFT POSITION SENSOR.

Check the installation condition of the camshaft position sensor and crankshaft position sensor.

Is the camshaft position sensor or crankshaft position sensor loosely installed?

Yes	Tighten the camshaft position sensor or crankshaft position sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Camshaft Position Sensor>INSTALLATION. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Crankshaft Position Sensor>INSTALLATION.
No	Go to 23.

23. CHECK CRANKSHAFT POSITION SENSOR PLATE.

Check the crankshaft position sensor plate.

Is the crankshaft position sensor plate rusted or does it have broken teeth?

Yes	Replace the crankshaft position sensor plate. Ref. to MECHANICAL(H4DO)>Cylinder Block.
No	Go to 24.

24. CHECK INSTALLATION CONDITION OF TIMING CHAIN.

Turn the crankshaft using ST, and align the alignment mark on crank sprocket with alignment mark on cylinder block.

ST 18252AA000 CRANKSHAFT SOCKET

Is the timing chain dislocated from its proper position?

Yes	Correct the installation condition of timing chain. Ref. to MECHANICAL(H4DO)>Timing Chain Assembly.
No	Go to 25.

25. CHECK FUEL LEVEL.

Check the fuel gauge display.

Is the fuel meter indication higher than the “Lower” level?

Yes	Go to 26.
No	Refill the fuel so that the fuel meter indication is higher than the “Lower” level, and proceed to the next step. Go to 26.

26. CHECK STATUS OF MALFUNCTION INDICATOR LIGHT.

1. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.



2. Start the engine, and drive the vehicle 10 minutes or more.

Does the malfunction indicator light illuminate or blink?

Yes	Repair the poor contact of connector. **Note:** **In this case, repair the following item:** • **Poor contact of ignition coil connector** • **Poor contact of fuel injector connector on faulty cylinders** • **Poor contact of ECM connector** • **Poor contact of coupling connector**
No	Go to 27.

27. CHECK AIR INTAKE SYSTEM.

Check the installing condition of the air intake system.

Is there any fault in air intake system?

Yes	Repair the air intake system. **Note:** **Check the following items.** • **Are there air leaks or air suction caused by loose or dislocated nuts and bolts?** • **Are there cracks or any disconnection of hoses?**
No	Go to 28.

28. CHECK MISFIRE SYMPTOM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is there only one DTC displayed? (Current malfunction)

Yes	Go to 31.
No	Go to 29.

29. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Are DTCs P0301 and P0303 displayed? (Current malfunction)

Yes	Go to 32.
No	Go to 30.

30. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Are DTCs P0302 and P0304 displayed? (Current malfunction)

Yes	Go to 33.
No	Go to 34.

31. ONLY ONE CYLINDER.

Check the following items for only one cylinder.
- Spark plug
- Ignition coil
- Fuel injector
- Compression

Is there any fault in the cylinder?

Yes	Repair or replace faulty parts. **Note:** **Check the following items.** • **Spark plug** • **Ignition coil** • **Fuel injector** • **Compression**
No	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

32. GROUP OF #1 AND #3 CYLINDERS.

Check the following items for the bank RH (cylinder #1, #3).
- Spark plug
- Ignition coil
- Fuel injector
- Compression
- Skipping timing chain teeth

Are there any faults in #1 and #3 cylinders?

Yes	Repair or replace faulty parts. **Note:** **Check the following items.** • **Spark plug** • **Ignition coil** • **Fuel injector** • **Compression** • **Skipping timing chain teeth**
No	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

33. GROUP OF #2 AND #4 CYLINDERS.

Check the following items for the bank LH (cylinder #2, #4).
- Spark plug
- Ignition coil
- Fuel injector
- Compression
- Skipping timing chain teeth

Are there any faults in #2 and #4 cylinders?

Yes	Repair or replace faulty parts. **Note:** **Check the following items.** • **Spark plug** • **Ignition coil** • **Fuel injector** • **Compression** • **Skipping timing chain teeth**
No	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.

34. CYLINDER AT RANDOM.

1. Start the engine.
2. Check the idling condition.

Is the engine idle rough?

Yes	Go to DTC P0171. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0171 SYSTEM TOO LEAN BANK 1.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.**

1. OUTLINE OF DIAGNOSIS

To detect malfunctions, the diagnostic uses a predictive model, individual cylinder fuel control, and the primary oxygen sensor measurement. The diagnostic does not directly attempt to separate the primary oxygen sensor measurement into individual cylinder contributions, but uses a predictive model to do so.

Individual cylinders STFT are independently adjusted to obtain the moving 720 degree average lambda of all four cylinders using feedback from primary oxygen sensor. If any individual cylinder's STFT is different than the average of the other cylinder's STFT by a calibratable amount, that cylinder will be identified as failing.

MONITOR METHOD

This diagnostic monitor performs a functional check of the fuel system to determine an air-fuel ratio cylinder imbalance, as required by the regulations in Section (e)(6.2.1)(c). This method uses a parameter called "imbalance value" which is calculated for each cylinder. The "imbalance value" is the difference between the individual STFT of the specific cylinder and the average value of the individual STFT of the other three cylinders. These imbalance values are compared to each other in order to determine the "imbalanced cylinder", which is the cylinder with the maximum "imbalance value". A diagnostic value is calculated for the "imbalanced cylinder". When this diagnostic value is more than the predetermined threshold (lean malfunction) or less than the predetermined threshold (rich malfunction), a DTC for the most imbalanced cylinder is determined.

DTC for "Imbalanced cylinder" is following.

P219C: Cylinder 1 Air-Fuel Ratio Imbalance

P219D: Cylinder 2 Air-Fuel Ratio Imbalance

P219E: Cylinder 3 Air-Fuel Ratio Imbalance

P219F: Cylinder 4 Air-Fuel Ratio Imbalance

MALFUNCTION CRITERIA

Rich malfunction (negative) Diagnostic value < Threshold

or

Lean malfunction (positive) Diagnostic value > Threshold

Diagnostic value = "Imbalance value n" of the "Imbalanced cylinder"

(n: Cylinder number (#1 or #2 or #3 or #4))

- Imbalance value n = iSTFTn — Average (other 3 iSTFTs)
  For example: Imbalance value #1 = iSTFT # 1 — (iSTFT # 2+ iSTFT # 3 + iSTFT # 4) /3.
- Imbalanced cylinder: The cylinder with maximum (ABS (Imbalance value #1, #2, #3, #4)) is selected
- iSTFT: Individual cylinder STFT (Refer to the following about the detail)

Individual Cylinder STFT (iSTFT n (k))

Individual cylinder STFT (= iSTFT n (k)) are calculated by integral control and individual cylinder λ deviation u(k) converges to target (no deviation).

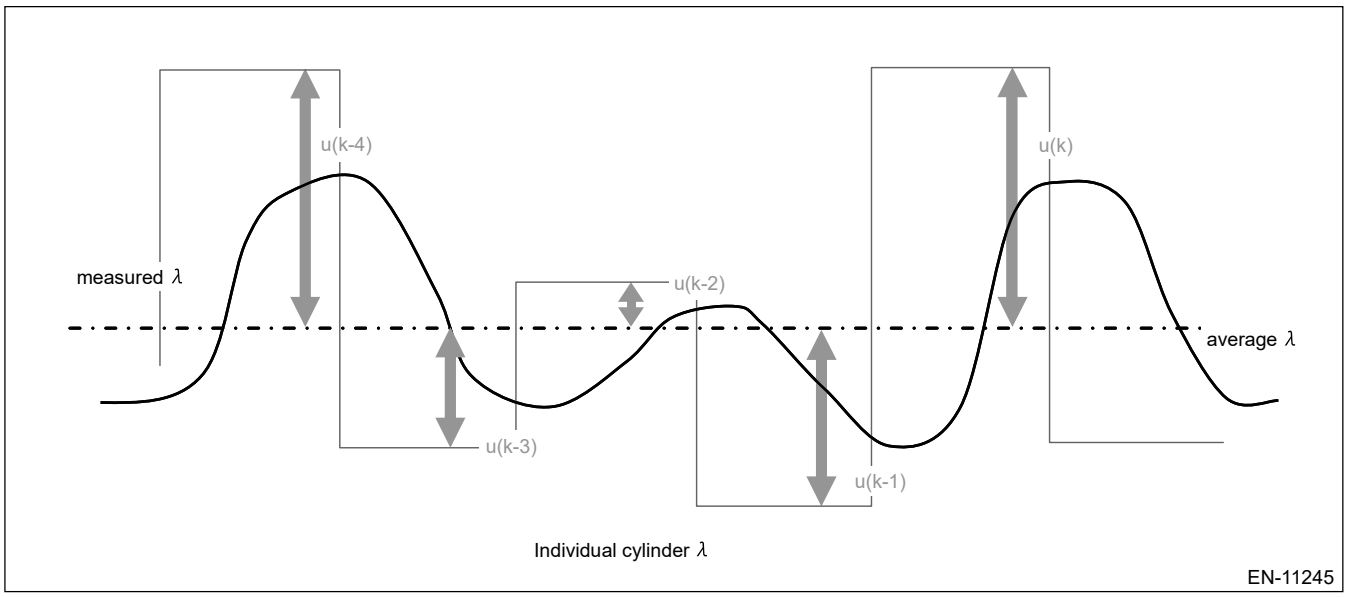
iSTFT n (k) = iSTFT n (k-1) + C(tgt−u(k))

iSTFT n (k) = Individual cylinder STFT

u(k): Estimated individual cylinder λ deviation*

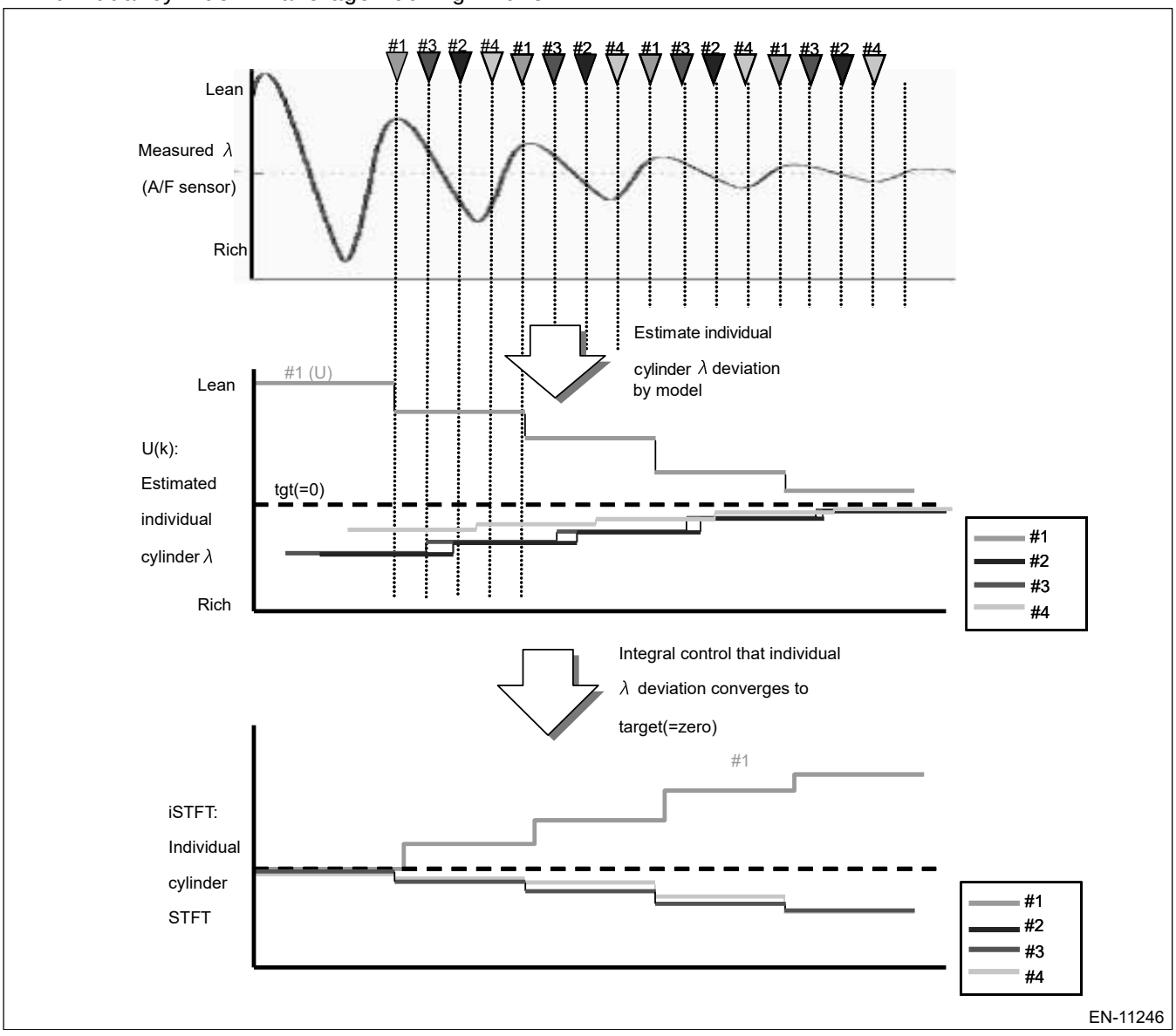
tgt: Target (No deviation = zero)

C: Control gain (negative value)



*individual cylinder λ deviation: u(k)

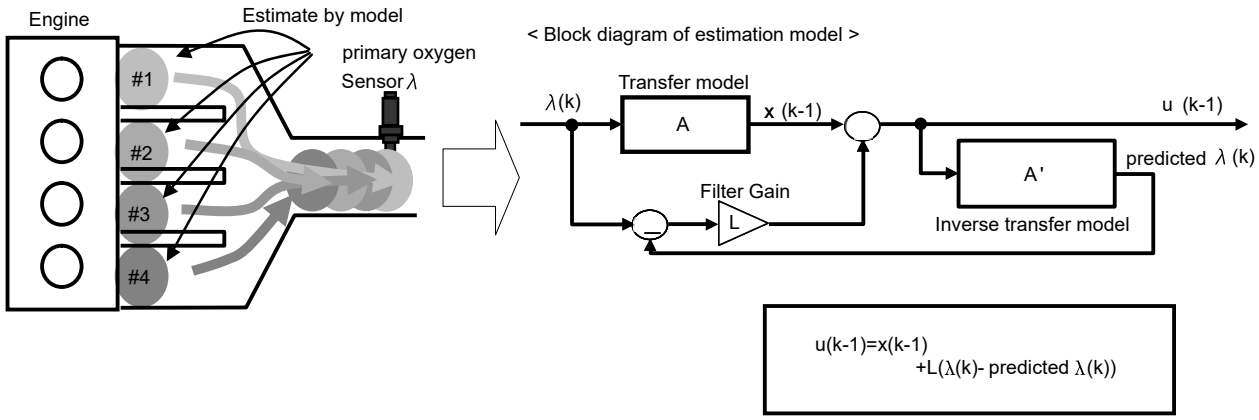
= Individual cylinderλ - averageλ during 720°CA

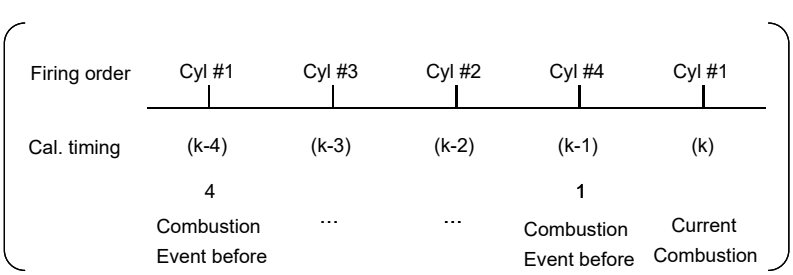


Estimated individual cylinder λ deviation “u(k)” is calculated by model (as described below).

Estimation Model for individual cylinder λ deviation (u(k))

Subaru developed a model for estimating individual cylinder λ deviation* by the output signal of the primary oxygen sensor (mounted on the collector section of the exhaust manifold). This estimation model makes it possible to control cylinder A/F individually. The estimation model is designed as follows.





λ(k) : Measured λ

u(k-1) : Estimated individual cylinder λ deviation (after filter)

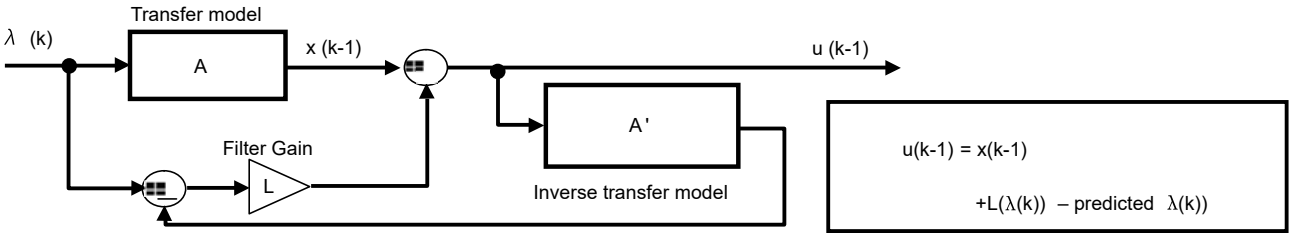
x(k-1) : Estimated individual cylinder λ deviation (before filter)

predicted λ(k): Estimated λ

EN-11247

Model equations for individual cylinder λ deviation (u(k))

“u(k-1)”: Estimated individual cylinder λ deviation is calculated by the following model.



< Model equations >

Transfer model "" A — Measured λ (A/F sensor) → Individual cylinder λ

$$x(k-1) = \frac{(\lambda(k) - a_1\lambda(k-1) - a_2\lambda(k-2) - a_3\lambda(k-3) - a_4\lambda(k-4)}{b_1} - \frac{(b_2x(k-2) + b_3x(k-3) + b_4x(k-4)}{b_1}$$

Inverse transfer model "" A' — Individual cylinder λ → Measured λ (A/F sensor)

$$\text{predicted } \lambda(k) = -(a_1\text{predicted } \lambda(k-1) + a_2\text{predicted } \lambda(k-2) + a_3\text{predicted } \lambda(k-3) + a_4\text{predicted } \lambda(k-4)) + (b_1u(k-1) + b_2u(k-2) + b_3u(k-3) + b_4u(k-4))$$

EN-11248

a1~4, b1~4: Model parameters calibrated by primary oxygen sensor output λ and 'measured' individual cylinder λ.
(These parameters are calibrated and fixed prior to production. However these models are calculating the predicted λ of each cylinder during real world driving.)

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Compensation value status for each cylinder = Integrated time after starting operation* (Refer to Table) * Time is calculated cumulatively (If the secondary parameters are not satisfied for the compensation value status of	400time(s) (12.8 s) or more

Secondary parameters	Execution condition
each cylinder, the integrated time will not be reset)	

Table: Status of each cylinder correction value

Secondary parameters	Execution condition
Main feedback	In operation
Engine speed	1000rpm or more and 4000rpm or less
The following condition of (A) or (B) is established	
•Condition A:	
Engine load	0.7g/rev (0.02oz/rev) or more
and	
Amount of intake air	10g/s (0.35oz/s) or more
•Condition B:	
Engine load	0.6g/rev (0.02oz/rev) or more
and	
Amount of intake air	25g/s (0.88oz/s) or more

3. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

4. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Imbalance value n for imbalance cylinder	More than 0.2 or Less than −0.5 (CVT model) More than 0.2 or Less than −0.5 (MT model)
Imbalance value n = i correction value n - average value (i correction value n of other three cylinders) i compensation value n = Compensation value for each cylinder Imbalance cylinder: Maximum value of cylinder (absolute value (imbalance value n)) (n: Any of cylinder numbers (#1, #2, #3, #4)	

Time needed for diagnosis: 300time(s)
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219D CYLINDER 2 AIR-FUEL RATIO IMBALANCE

Note:
For the diagnostic procedure, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219E CYLINDER 3 AIR-FUEL RATIO IMBALANCE

Note:
For the diagnostic procedure, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P219F CYLINDER 4 AIR-FUEL RATIO IMBALANCE

Note:
For the diagnostic procedure, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC P219C. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P219C CYLINDER 1 AIR-FUEL RATIO IMBALANCE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2270 O2 SENSOR SIGNAL BIASED/STUCK LEAN BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

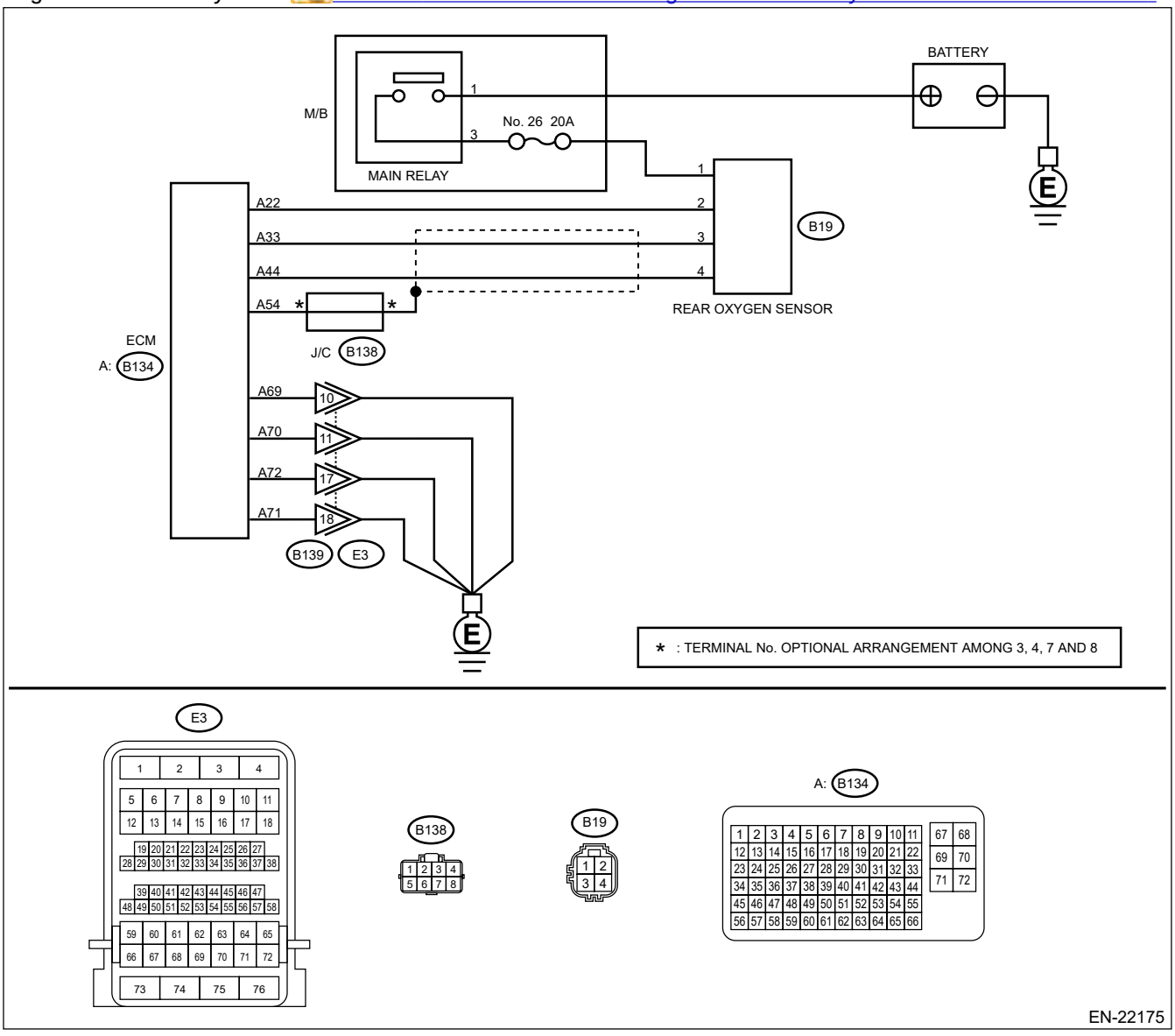
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK REAR OXYGEN SENSOR CONNECTOR.

Check the rear oxygen sensor connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 44 — (B19) No. 4:
   (B134) No. 33 — (B19) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (SHORT TO POWER SUPPLY).

1. Connect the connector to ECM.
2. Turn the ignition switch to ON.
3. Measure the voltage between rear oxygen sensor connector and chassis ground.
   Connector & terminal
   (B19) No. 3 (+) — Chassis ground (−):

Is the voltage 0.15 V or more?

Yes	Repair the short circuit to power in the harness between ECM connector and rear oxygen sensor connector.
No	Go to 4.

4. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Damage (crack, hole etc.) between front oxygen (A/F) sensor and rear oxygen sensor**

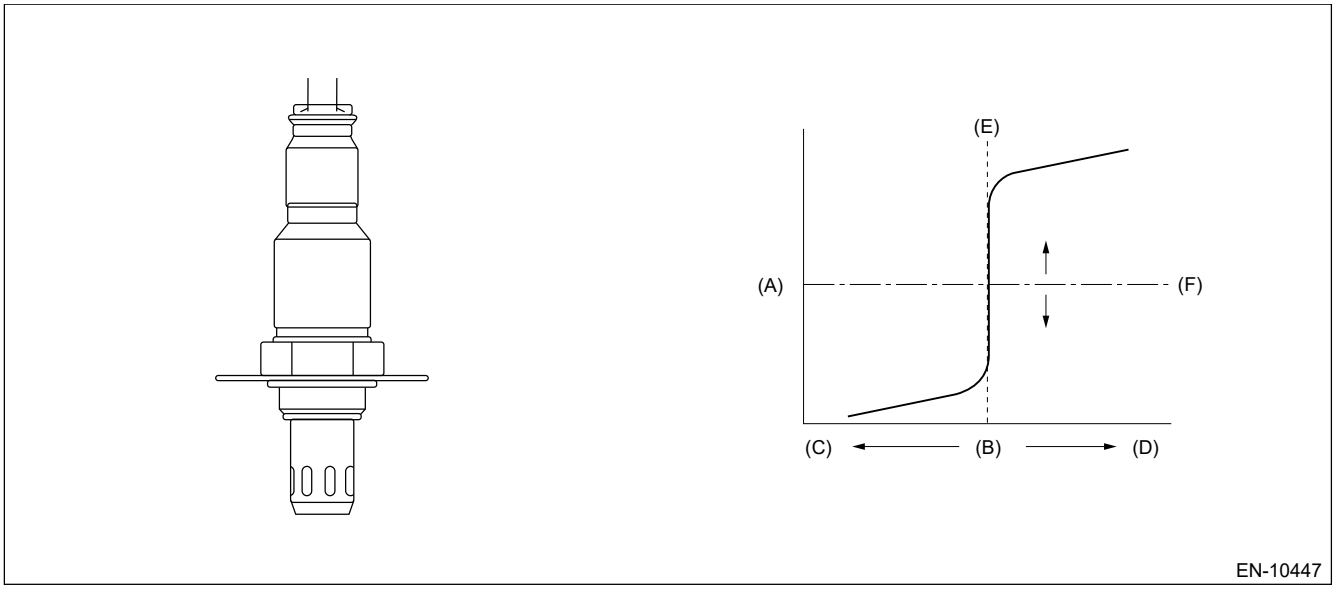
Is there any fault in exhaust system?

Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in lean state.
When rear oxygen sensor voltage remains below the threshold value for predetermined time, diagnosis interrupts target air fuel ratio for control and raises output voltage.
Judge as NG detecting the stuck in lean state when rear oxygen sensor voltage remains below the threshold value even after the interrupt control.

2. COMPONENT DESCRIPTION



(A) Electromotive force (B) Air fuel ratio (C) Lean
(D) Rich (E) Theoretical air fuel ratio (F) Comparative voltage

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V
Sub feedback	In operation
Amount of intake air	10g/s (0.35oz/s) or more
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more
Enable conditions at interrupt control are as follows	
Continuous time when rear oxygen sensor output voltage is less than 0.55V	50g / 10g/s or more
Air fuel ratio reduced from target air fuel ratio	Equal to Value of Map

Map

Output voltage of rear oxygen sensor V	**0.0**	**0.2**	**0.2**	**0.4**	**0.6**
Air fuel ratio reduced from target air fuel ratio %	8	8	4	4	4

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	Less than 0.55V

Time needed for diagnosis: 10g/s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2271 O2 SENSOR SIGNAL BIASED/STUCK RICH BANK 1 SENSOR 2

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

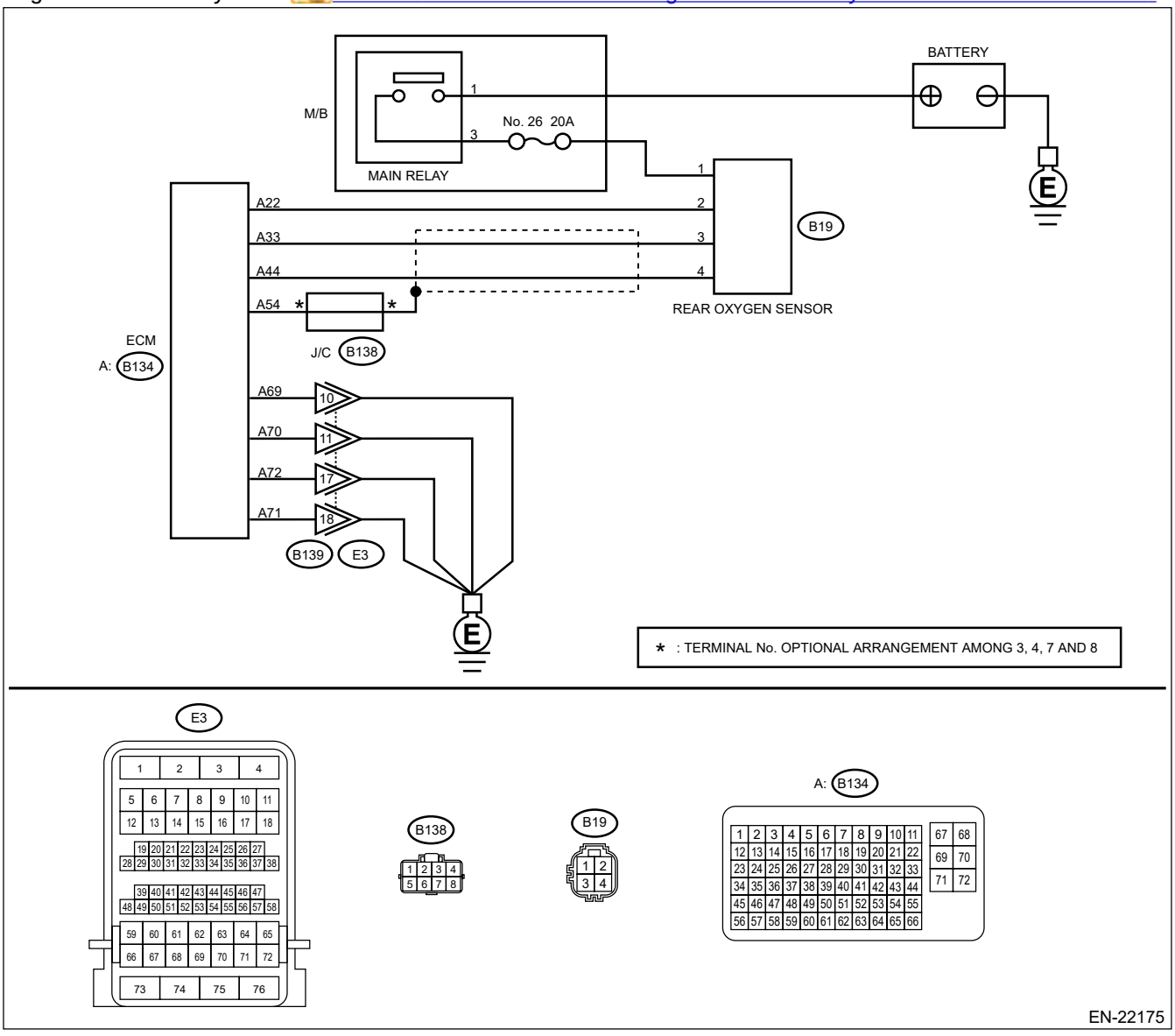
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK REAR OXYGEN SENSOR CONNECTOR.

Check the rear oxygen sensor connector.

Has water entered the connector?

Yes	Completely remove any water inside.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from rear oxygen sensor.
4. Measure the resistance of harness between ECM connector and rear oxygen sensor connector.
   Connector & terminal
   (B134) No. 44 — (B19) No. 4:
   (B134) No. 33 — (B19) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between ECM connector and rear oxygen sensor connector.

3. CHECK HARNESS BETWEEN ECM AND REAR OXYGEN SENSOR (SHORT TO GROUND).

Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 33 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM connector and rear oxygen sensor connector.

4. CHECK EXHAUST SYSTEM.

Check exhaust system parts.

Note:

Check the following items.

- **Looseness and improper fitting of exhaust system parts**
- **Damage (crack, hole etc.) of parts**
- **Damage (crack, hole etc.) between front oxygen (A/F) sensor and rear oxygen sensor**

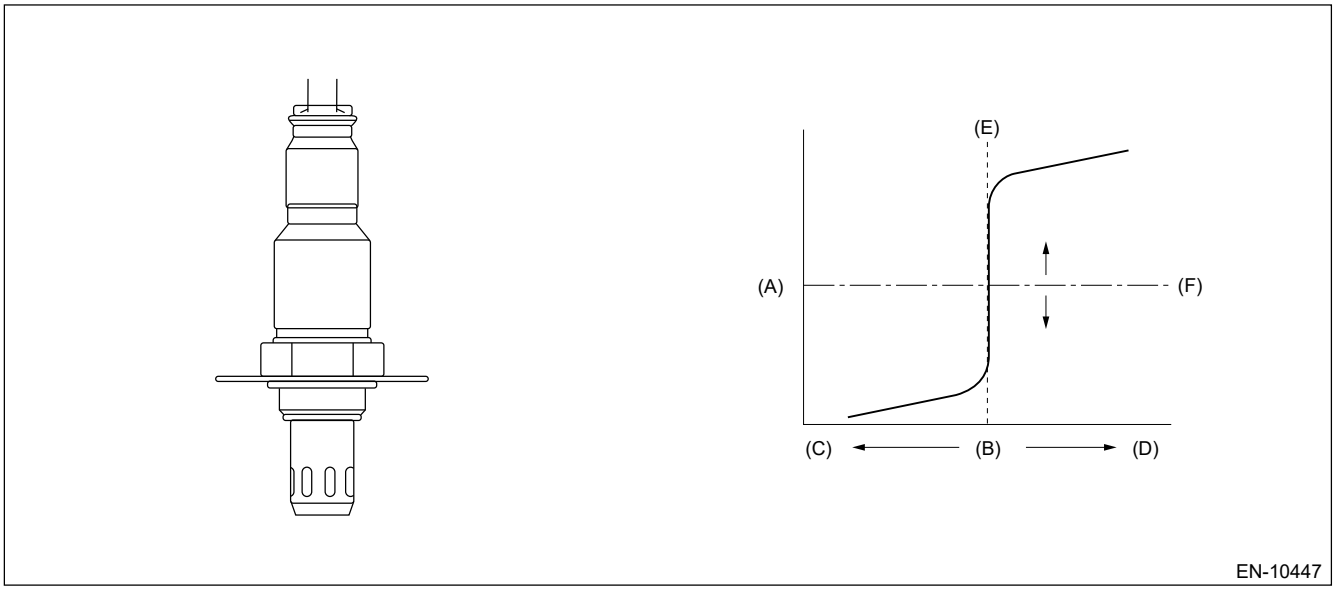
Is there any fault in exhaust system?

Yes	Repair or replace faulty parts.
No	Replace the rear oxygen sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Rear Oxygen Sensor.

1. OUTLINE OF DIAGNOSIS

Detect the stuck of rear oxygen sensor voltage in rich state.
Detect the stuck in rich state and judge as NG if rear oxygen sensor voltage remains above the threshold value for predetermined time.

2. COMPONENT DESCRIPTION



(A) Electromotive force
(B) Air fuel ratio
(C) Lean
(D) Rich
(E) Theoretical air fuel ratio
(F) Comparative voltage

3. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
Battery voltage	10.9 V or more
Fuel cut duration	5000ms or more
Estimated temperature of the rear oxygen sensor element	500°C (932°F) or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Output voltage of rear oxygen sensor	More than 0.15V

Time needed for diagnosis: 500ms

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2401 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Caution:

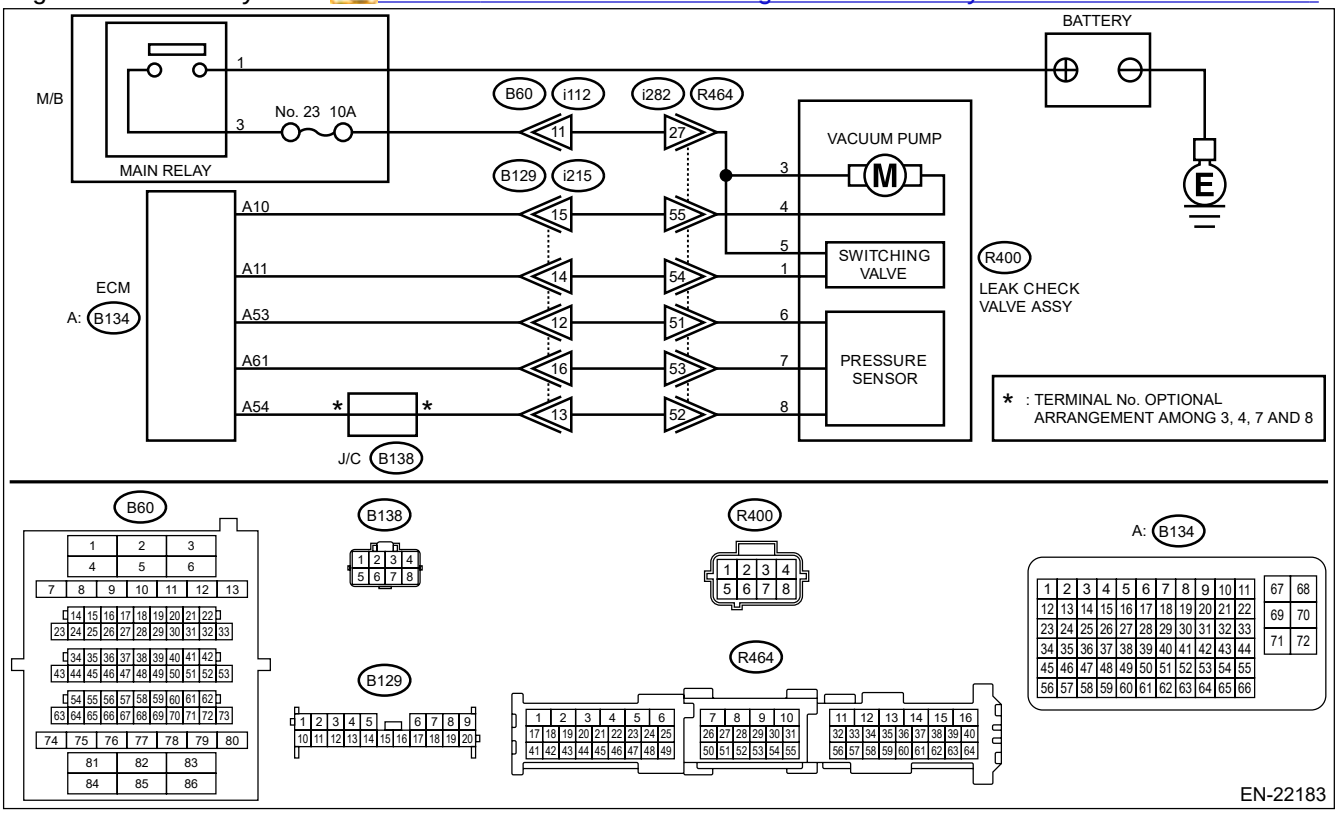
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (E134) No. 10 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.**

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.

Measure the voltage between the leak check valve assembly connector and engine ground.
Connector & terminal
(R400) No. 3 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance between leak check valve assembly and chassis ground.
   Connector & terminal
   (R400) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (OPEN).

Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal
(B134) No. 10 — (R400) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.

Check the vacuum pump of the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly>INSPECTION > CHECK VACUUM PUMP.

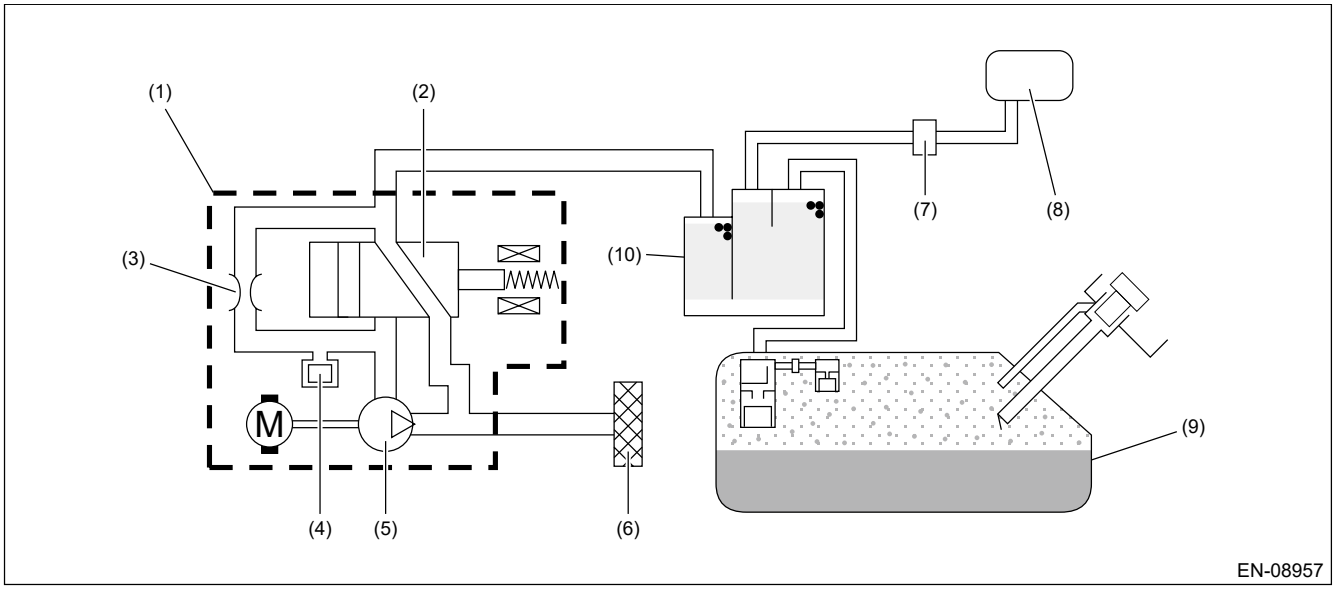
Is the check result OK?

Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON

Secondary parameters	Execution condition
or	
Soak timer	ON
Battery voltage	10.9 V or more
Evaporative Leak Check Module vacuum pump drive signal	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured EVAP system leak detection pump voltage	3 V or less

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2402 EVAP SYSTEM LEAK DETECTION PUMP CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Caution:

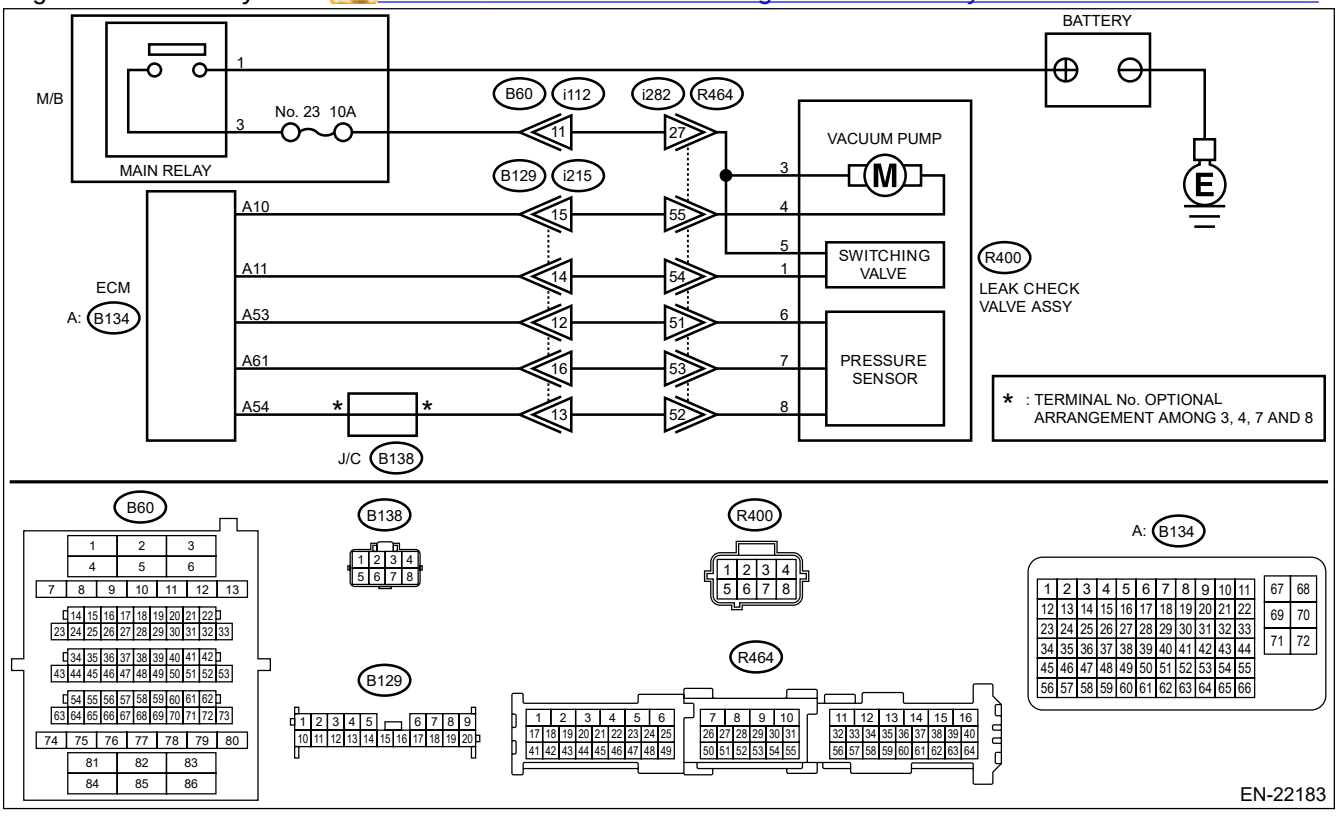
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.
   Connector & terminal
   (R400) No. 4 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.
No	Go to 2.

2. CHECK LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Check the vacuum pump of the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly>INSPECTION > CHECK VACUUM PUMP.

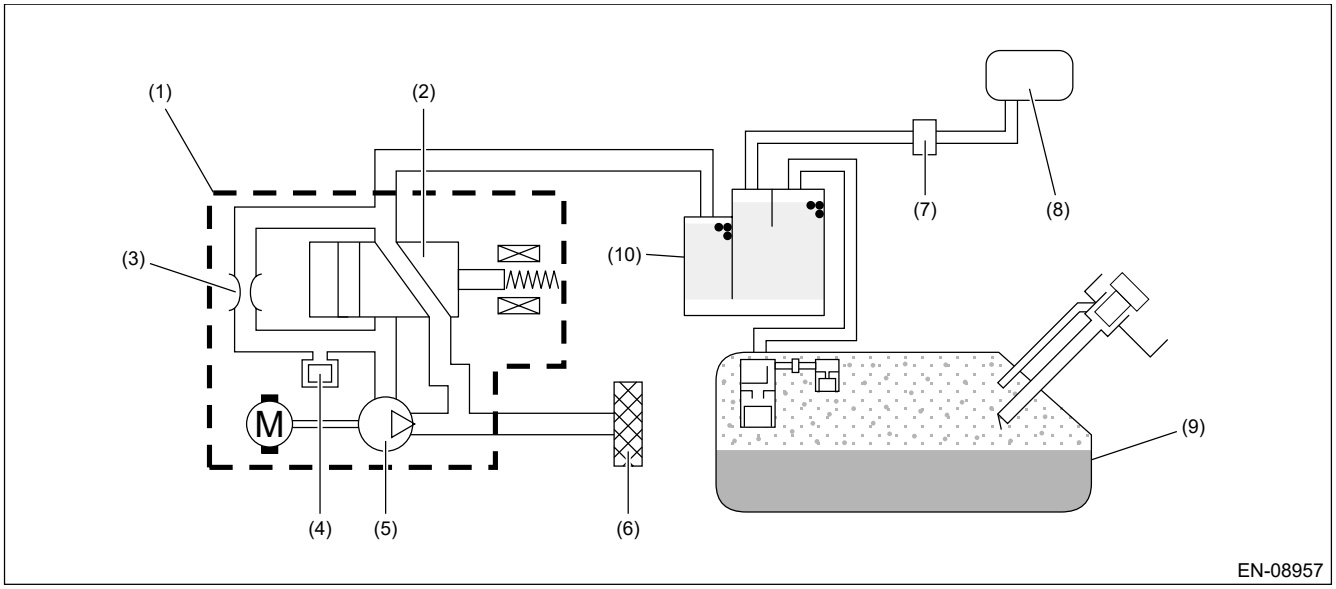
Is the check result OK?

Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module vacuum pump.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch or	ON
Soak timer	ON
Battery voltage	10.9 V or more
Evaporative Leak Check Module vacuum pump drive signal	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis only once after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured EVAP system leak detection pump current	6 A or more

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2404 EVAP SYSTEM LEAK DETECTION PUMP SENSE CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Caution:

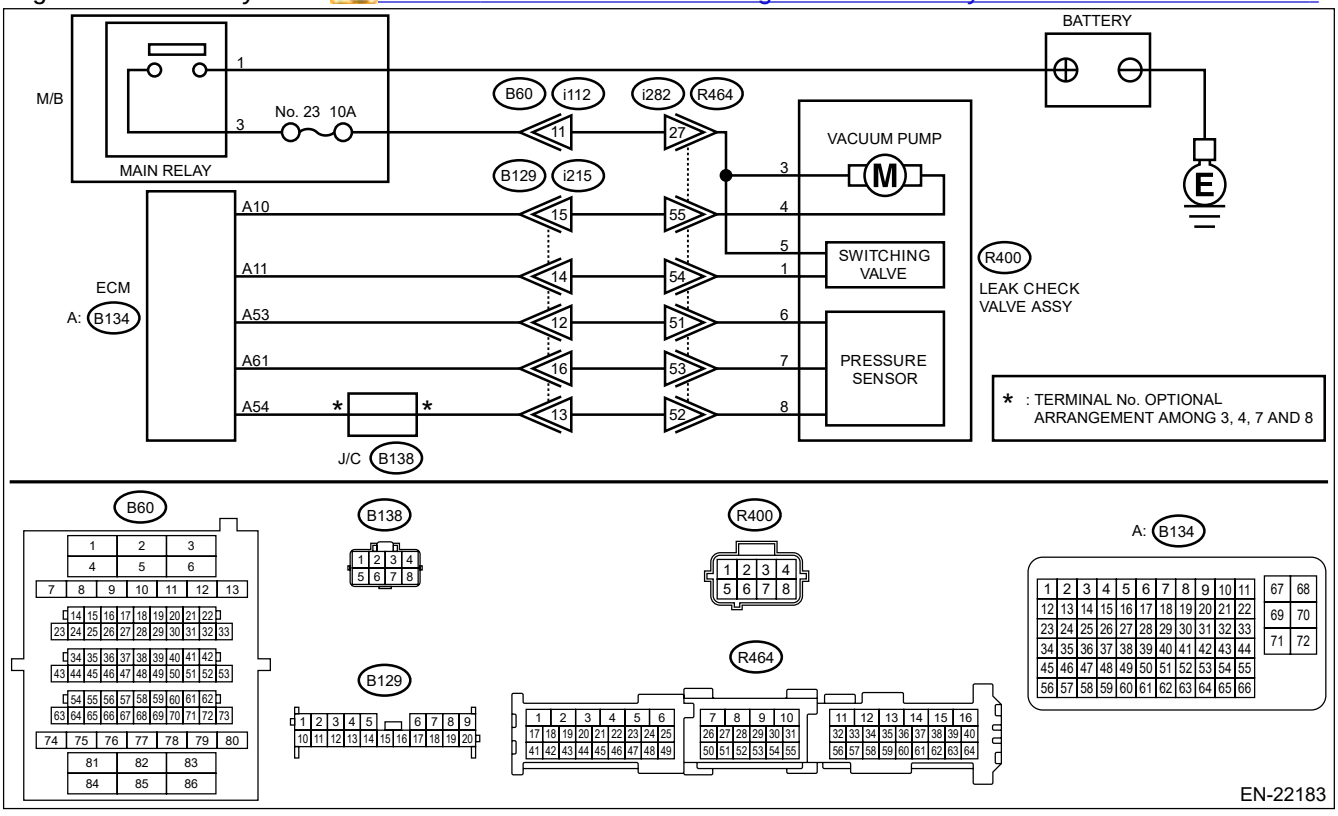
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC P2404 displayed? (Current malfunction)

Yes	Go to 2.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. CHECK LEAK CHECK VALVE ASSEMBLY PUMP.

Using the Subaru Select Monitor, operate the leak check valve assembly pump.

Note:

For detailed operation procedures, refer to the Active Test. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

Does the leak check valve assembly pump operate?

Yes	Go to 6.
No	Go to 3.

3. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.
   Connector & terminal
   (R400) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between the main relay and the leak check valve assembly connector** • **Poor contact of main relay connector** • **Poor contact of coupling connector**

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.
   Connector & terminal
   (B134) No. 10 — (R400) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Measure the resistance of harness between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 10 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.
No	Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

6. CHECK LEAK CHECK VALVE ASSEMBLY SWITCHING VALVE.

Using the Subaru Select Monitor, operate the leak check valve assembly switching valve.

Note:
For detailed operation procedures, refer to the “Active Test”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Active Test.

Does the leak check valve assembly switching valve operate?

Yes	Go to 10.
No	Go to 7.

7. CHECK POWER SUPPLY OF LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between the leak check valve assembly connector and chassis ground.
   Connector & terminal
   (R400) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between the main relay and the leak check valve assembly connector** • **Poor contact of main relay connector** • **Poor contact of coupling connector**

8. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the resistance of harness between ECM connector and the leak check valve assembly connector.
   Connector & terminal
   (B134) No. 11 — (R400) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of coupling connector**

9. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Measure the resistance of harness between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.
No	Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

10. CHECK EVAPORATIVE EMISSION CONTROL SYSTEM.

Perform the Inspection Mode I. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Inspection Mode>PROCEDURE > INSPECTION MODE I.

Is DTC P2404 displayed? (Current malfunction)

Yes	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC P0455. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0455 EVAP SYSTEM (CPC) LEAK DETECTED (LARGE LEAK).

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2419 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Caution:

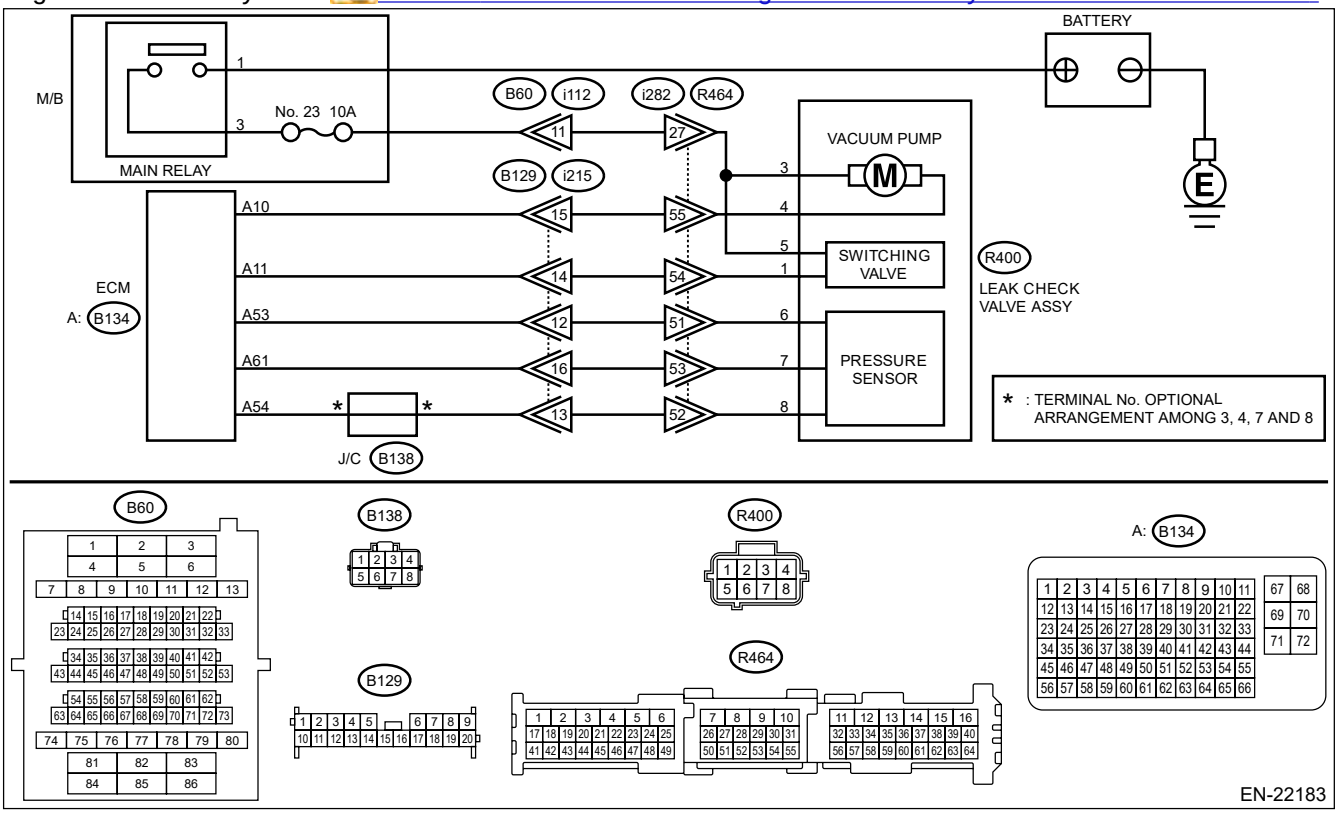
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 10 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Go to 3.

2. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary open or short circuit of harness or temporary poor contact of connector may be the cause.**

3. CHECK POWER SUPPLY TO LEAK CHECK VALVE ASSEMBLY.

Measure the voltage between the leak check valve assembly connector and engine ground.
Connector & terminal
(R400) No. 5 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the leak check valve assembly.
4. Measure the resistance between leak check valve assembly and chassis ground.
   Connector & terminal
   (R400) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and leak check valve assembly connector.

5. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (OPEN).

Measure the resistance of harness between ECM connector and the leak check valve assembly connector.

Connector & terminal
(B134) No. 11 — (R400) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and the leak check valve assembly connector** • **Poor contact of coupling connector**

6. CHECK LEAK CHECK VALVE ASSEMBLY.

Check the switching valve of the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly>INSPECTION > CHECK SWITCHING VALVE.

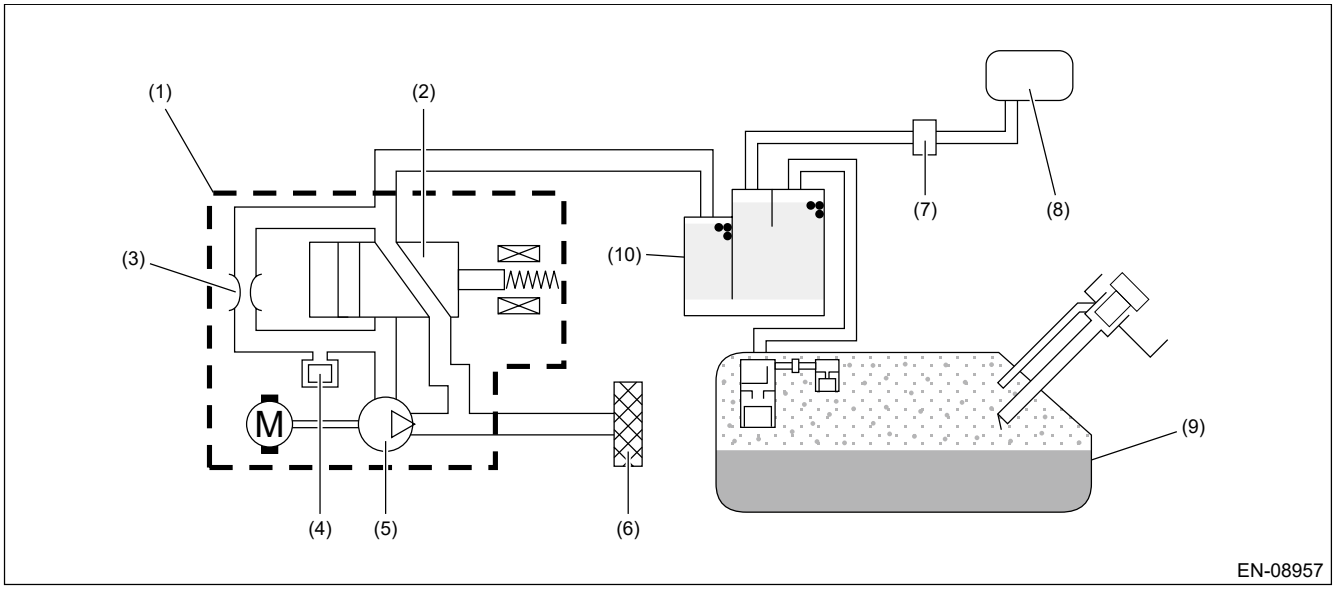
Is the check result OK?

Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch	ON

Secondary parameters	Execution condition
or	
Soak timer	ON
Battery voltage	10.9 or more
Evaporative Leak Check Module switching valve drive signal	OFF

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured EVAP system leak detection pump voltage	3 V or less

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2420 EVAP SYSTEM SWITCHING VALVE CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Caution:

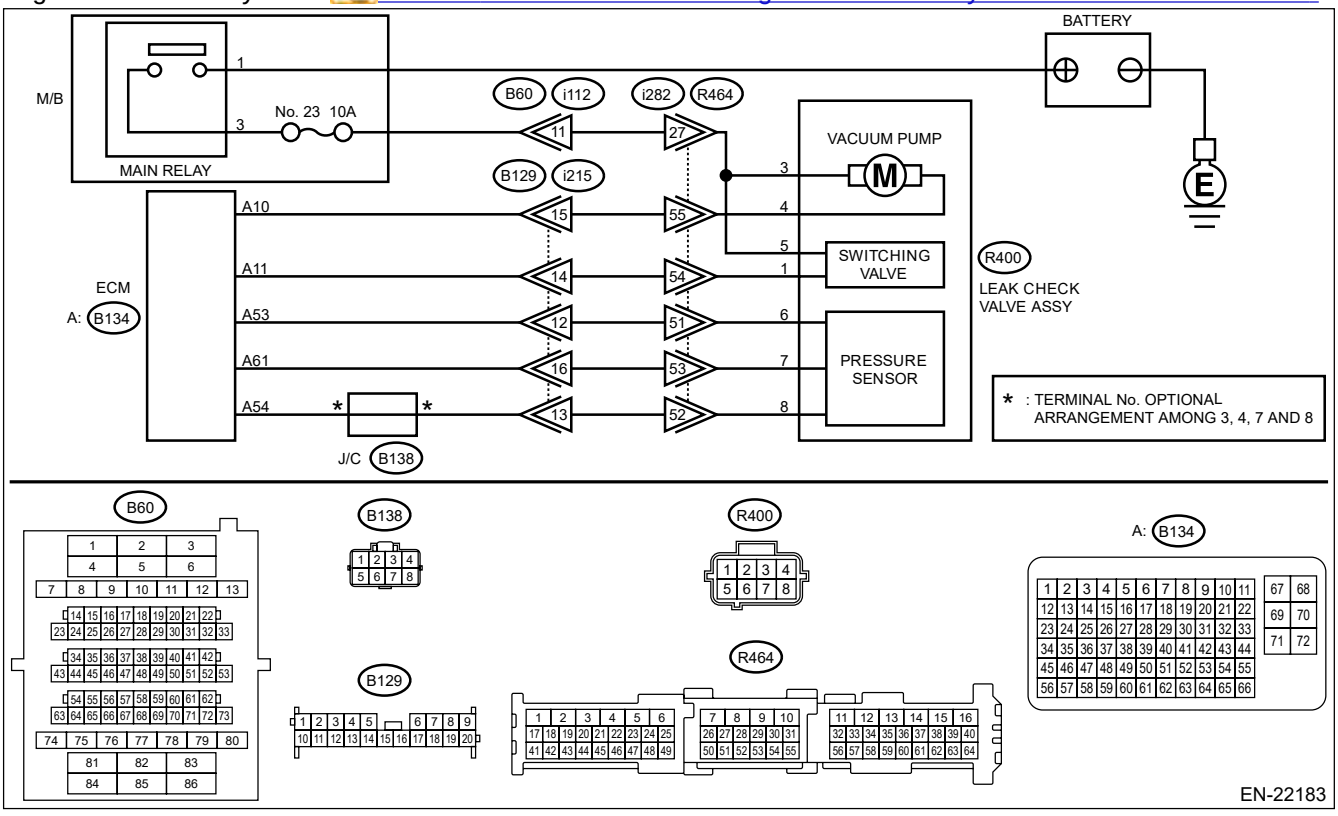
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK HARNESS BETWEEN ECM AND LEAK CHECK VALVE ASSEMBLY (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the leak check valve assembly.
3. Turn the ignition switch to ON.
4. Measure the voltage between leak check valve assembly and chassis ground.
   Connector & terminal
   (R400) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit to power in harness between ECM connector and leak check valve assembly connector.
No	Go to 2.

2. CHECK LEAK CHECK VALVE ASSEMBLY.

1. Turn the ignition switch to OFF.
2. Check the switching valve of the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly>INSPECTION > CHECK SWITCHING VALVE.

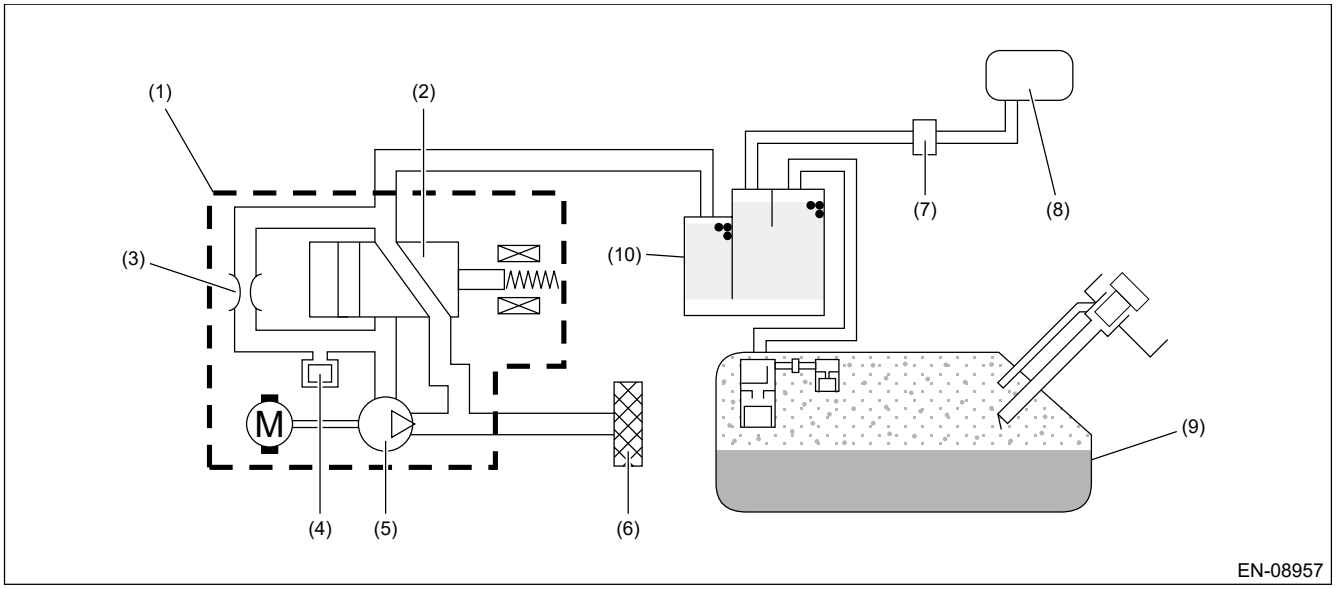
Is the check result OK?

Yes	Repair the poor contact in the leak check valve assembly connector.
No	Replace the leak check valve assembly. Ref. to EMISSION CONTROL (AUX. EMISSION CONTROL DEVICES)(H4DO)>Leak Check Valve Assembly.

1. OUTLINE OF DIAGNOSIS

Detect the open or short circuit in Evaporative Leak Check Module switching valve.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION



(1) Leak check valve ASSY
(2) Switching valve
(3) Reference orifice (0.02 inch orifice)
(4) Pressure sensor
(5) Vacuum pump
(6) Drain filter
(7) Purge control solenoid valve
(8) Intake manifold
(9) Fuel tank
(10) Canister

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Ignition switch or	ON
Soak timer	ON
Battery voltage	10.9 V or more
Evaporative Leak Check Module switching valve drive signal	ON

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured EVAP system leak detection pump current	6 A or more

Time needed for diagnosis: 2500ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper idling

Caution:

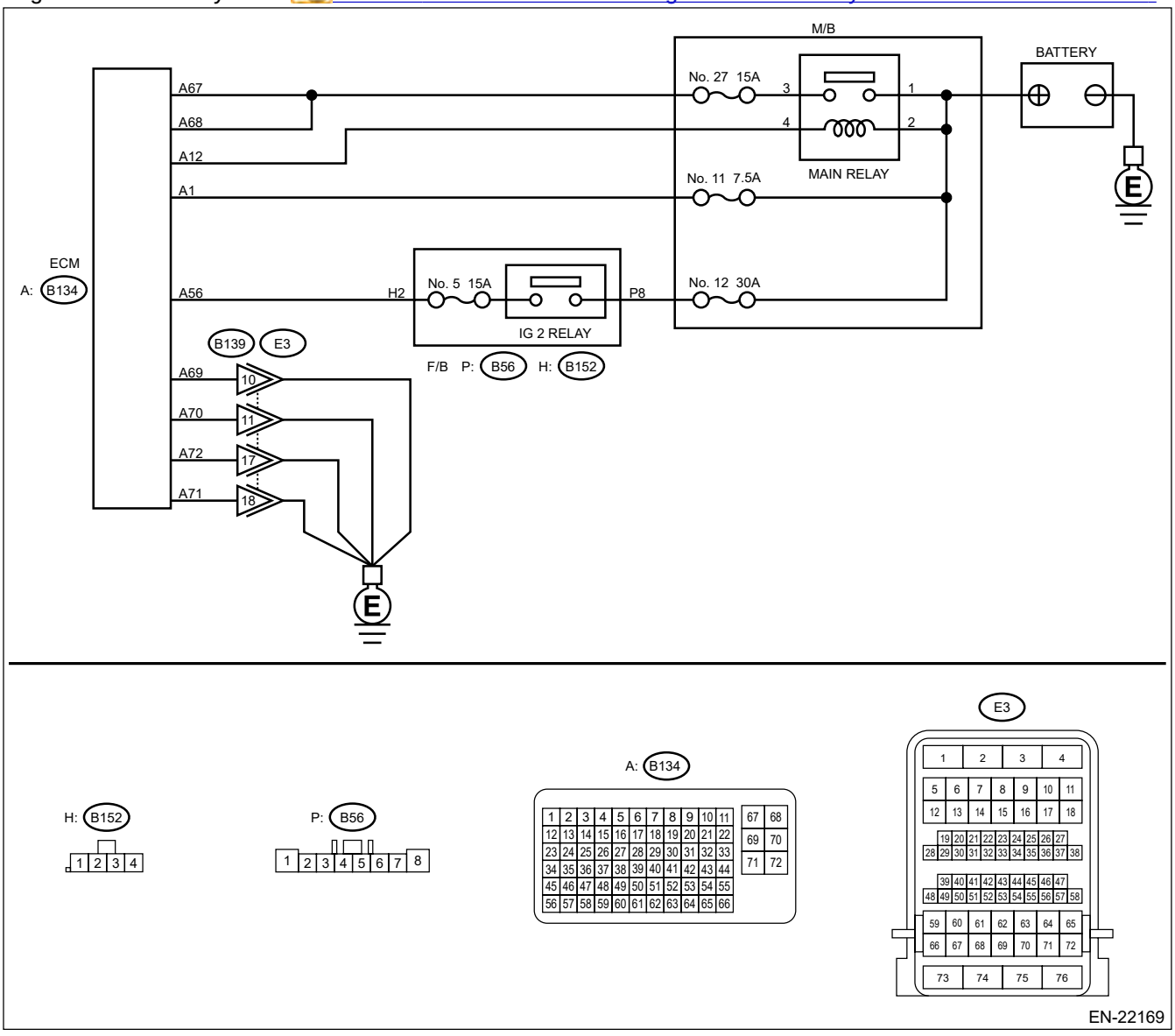
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 2.
No	Connect the ECM connector correctly.

2. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Connect the check board.

ST 18460AA050 CHECK BOARD

3. Measure the voltage between ECM connector and engine ground while wiggling the harness between ECM connector and F/B connector.

Connector & terminal

(B134) No. 24 (+) — Engine ground (−):

Is the voltage 8 V or more all the time?

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, the following items may be the cause of fault.** • **Poor contact of fuse (F/B No. 5)** • **Poor contact of IG2 relay connector** • **Poor contact of IG2 relay**
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Poor contact of fuse (F/B No. 5)** • **Poor contact of IG2 relay connector** • **Poor contact of IG2 relay**

1. OUTLINE OF DIAGNOSIS

Detect instantaneous open in ignition switch input circuit to ECM.
Judge as NG if out of specification.

2. COMPONENT DESCRIPTION

ECM monitors the voltage of the ignition switch input circuit. Judge as ignition switch ON when the voltage is the specified value or more.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9V or more
Engine speed	500rpm or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established within the predetermined time.

Judgment value

Malfunction Criteria	Threshold Value
Number of instantaneous opens in ignition switch input circuit	5time(s) or more

Time needed for diagnosis: 5000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P2610 ECM/PCM ENGINE OFF TIMER PERFORMANCE

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC P2610 displayed? (Current malfunction)

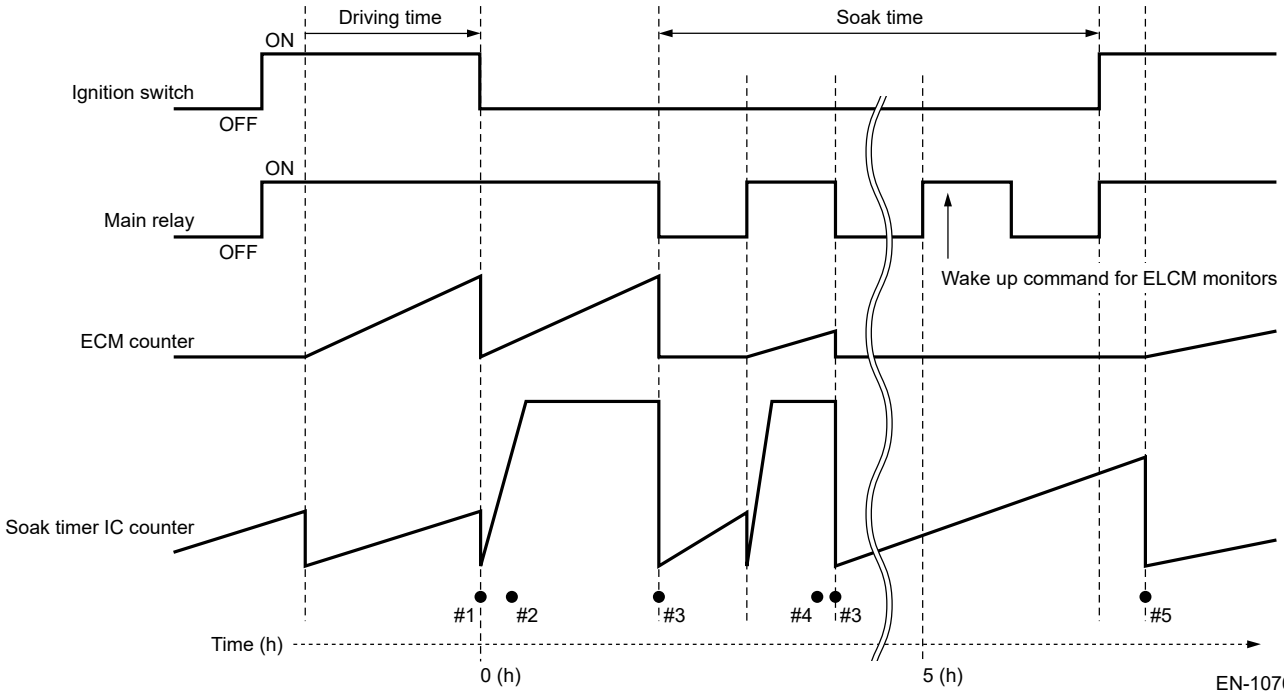
Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM). **Note:** **The soak timer IC is built into the ECM.**
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

1. OUTLINE OF DIAGNOSIS

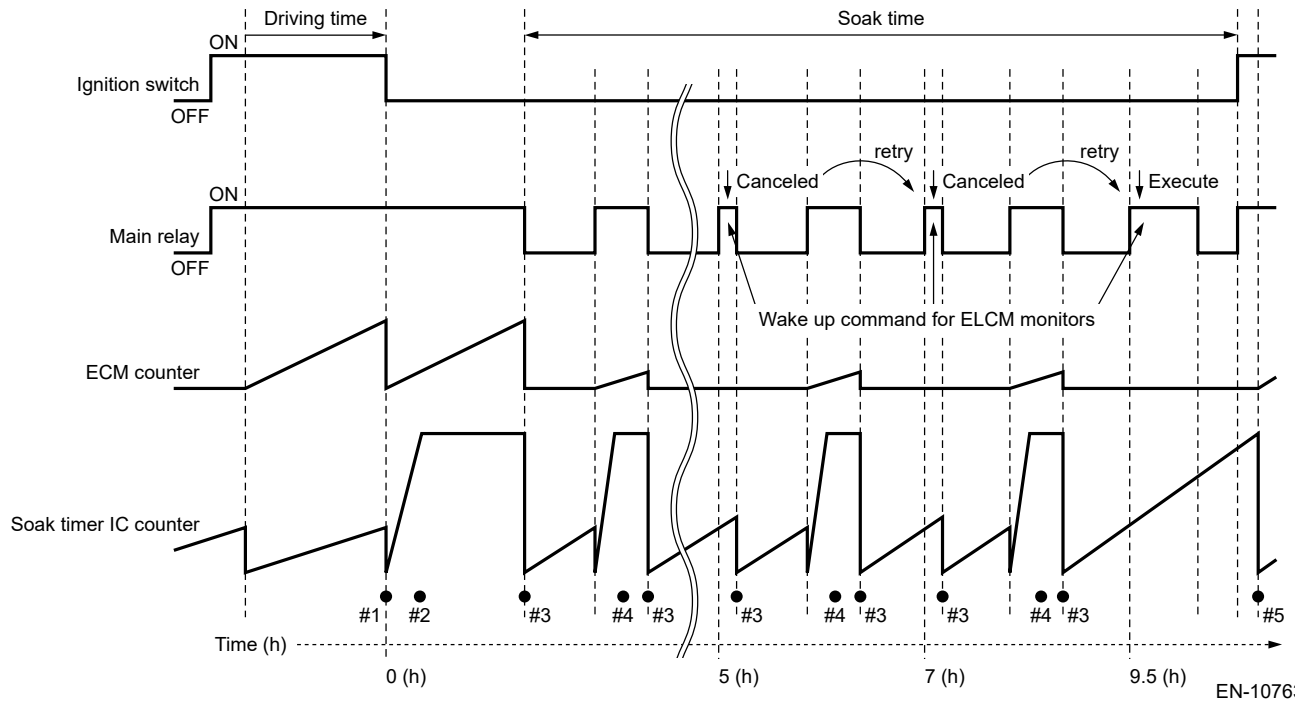
Detect malfunction of soaking timer IC by the five diagnoses below.

Monitor Number	Explanation	Time required for diagnosis
Monitor #1 <Timer diagnosis>	Perform diagnosis of the soaking timer IC accuracy	128 ms
Monitor #2 <Full count diagnosis>	Perform diagnosis of the soaking timer IC counter function	128 ms
Monitor #3 <Soaking timer IC setting diagnosis>	Perform diagnosis of communication between ECM and soaking timer IC	128 ms
Monitor #4 <Timer diagnosis (during soaking)>	Perform diagnosis of the soaking timer IC accuracy during soaking	None
Monitor #5 <Wake-up diagnosis>	Perform diagnosis of wake-up function	None

This is an example of ELCM monitor execution at soak time of 5 hours.



This is an example of ELCM monitor execution at soak time of 9.5 hours.



2. COMPONENT DESCRIPTION

The soak timer IC is built into the ECM.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Monitor#1<Timer diagnosis>	
Battery voltage Ignition switch Elapsed time after starting the engine	10.9 V or more OFF More than 19 s and Less than 61439 seconds
Monitor#2<Full count diagnosis>	
Battery voltage Ignition switch Counter in ECM	10.9 V or more OFF 4 s or more
Monitor#3<Soak timer IC setting diagnosis>	
Battery voltage Ignition switch	10.9 V or more OFF
Monitor#4<Timer diagnosis (during soaking)>	
Battery voltage Ignition switch	10.9 V or more OFF
Monitor#5<Wake-up diagnosis>	
Ignition switch Time in the soaking timer IC	ON More than 3600s

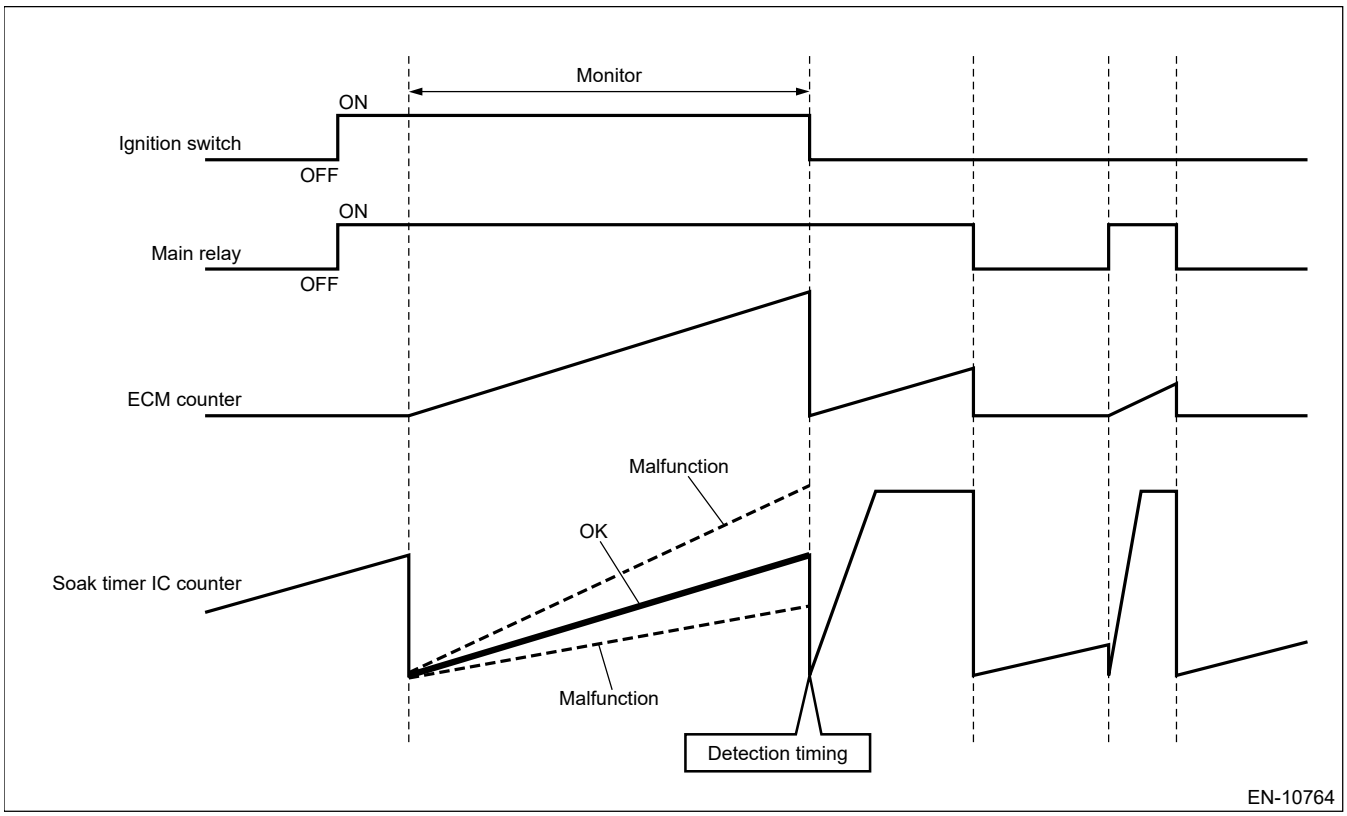
4. GENERAL DRIVING CYCLE

Perform the diagnosis only once when the ignition switch is OFF and when the ignition switch is ON after the soaking of one hour or more.

5. DIAGNOSTIC METHOD

MONITOR#1<TIMER DIAGNOSIS>

Start the count up operation of counters in ECM and in soaking timer IC when the engine is started.
Judge as timer malfunction if the difference between the counter in ECM and counter in soaking timer IC exceeds the allowable limit when the ignition switch is OFF.



Judge as NG when the following conditions are established.

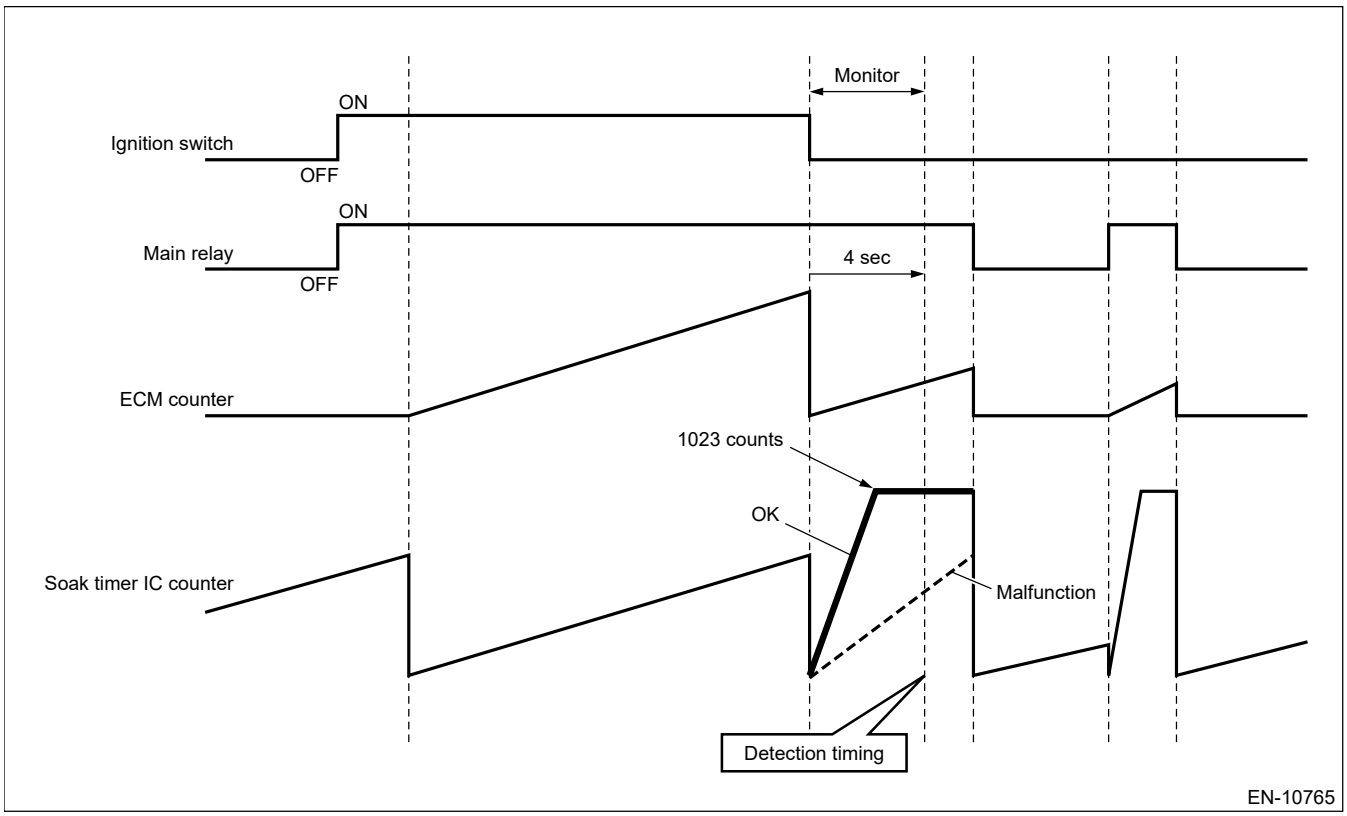
Judgment value

Malfunction Criteria	Threshold Value
|osoaktimcpu – osoaktimic| / osoaktimcpu osoaktimcpu = Counter in ECM osoaktimic = Counter in soaking timer IC	More than 0.24

MONITOR#2<FULL COUNT DIAGNOSIS>

Reset the counter in soaking timer IC and start the count up operation.

Judge as full count diagnosis malfunction if counter in soaking timer IC is not $3FF (1023 count) after 4 seconds.



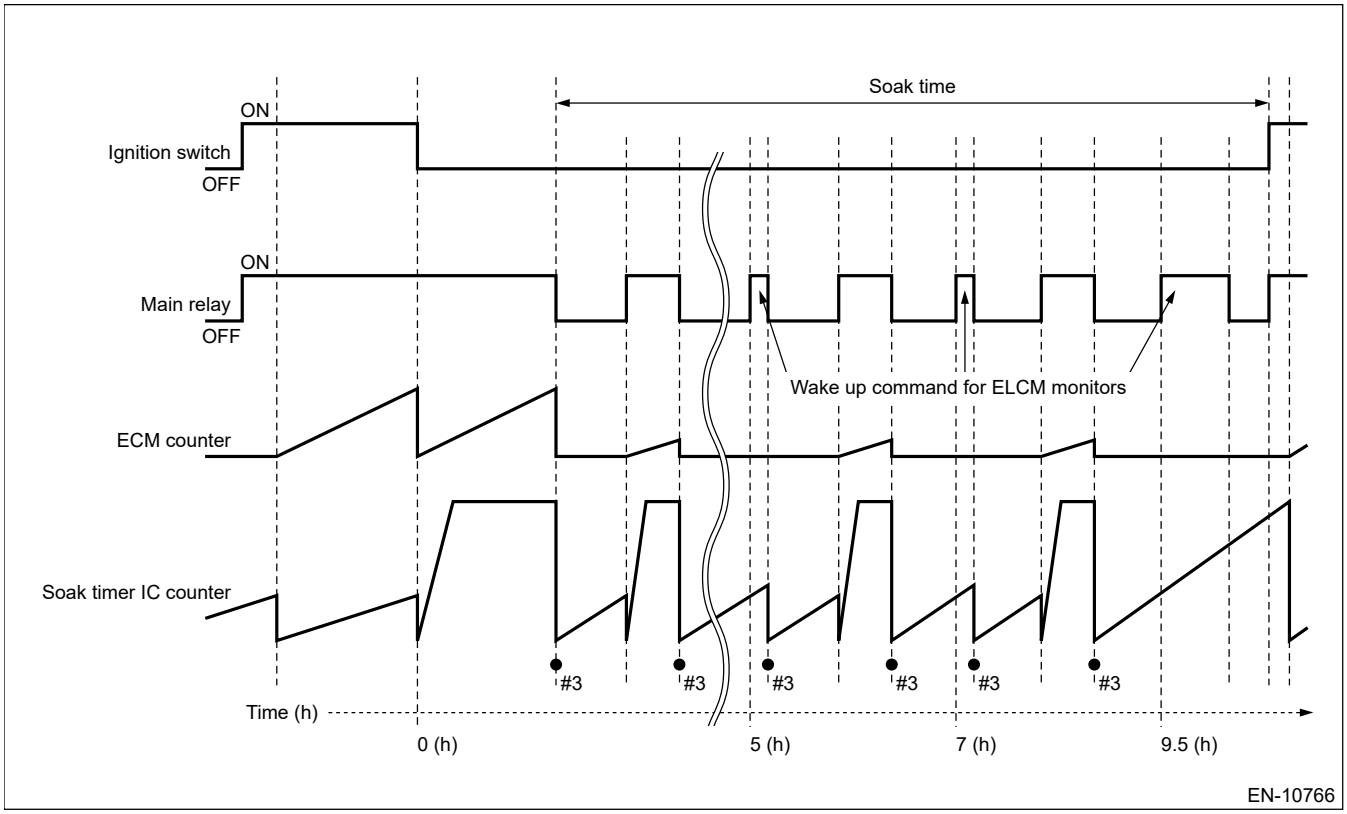
Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
osoakfcntic osoakfcntic = Counter in soaking timer IC	Not equal to $3FF (65535 count)

MONITOR#3<SOAK TIMER IC SETTING DIAGNOSIS>

When setting the activation setting time to soaking timer IC, compare the writing value to soaking timer IC with read out value. Judge as malfunction if the values do not match 3 times in a row.



Judge as NG when the following conditions are established.

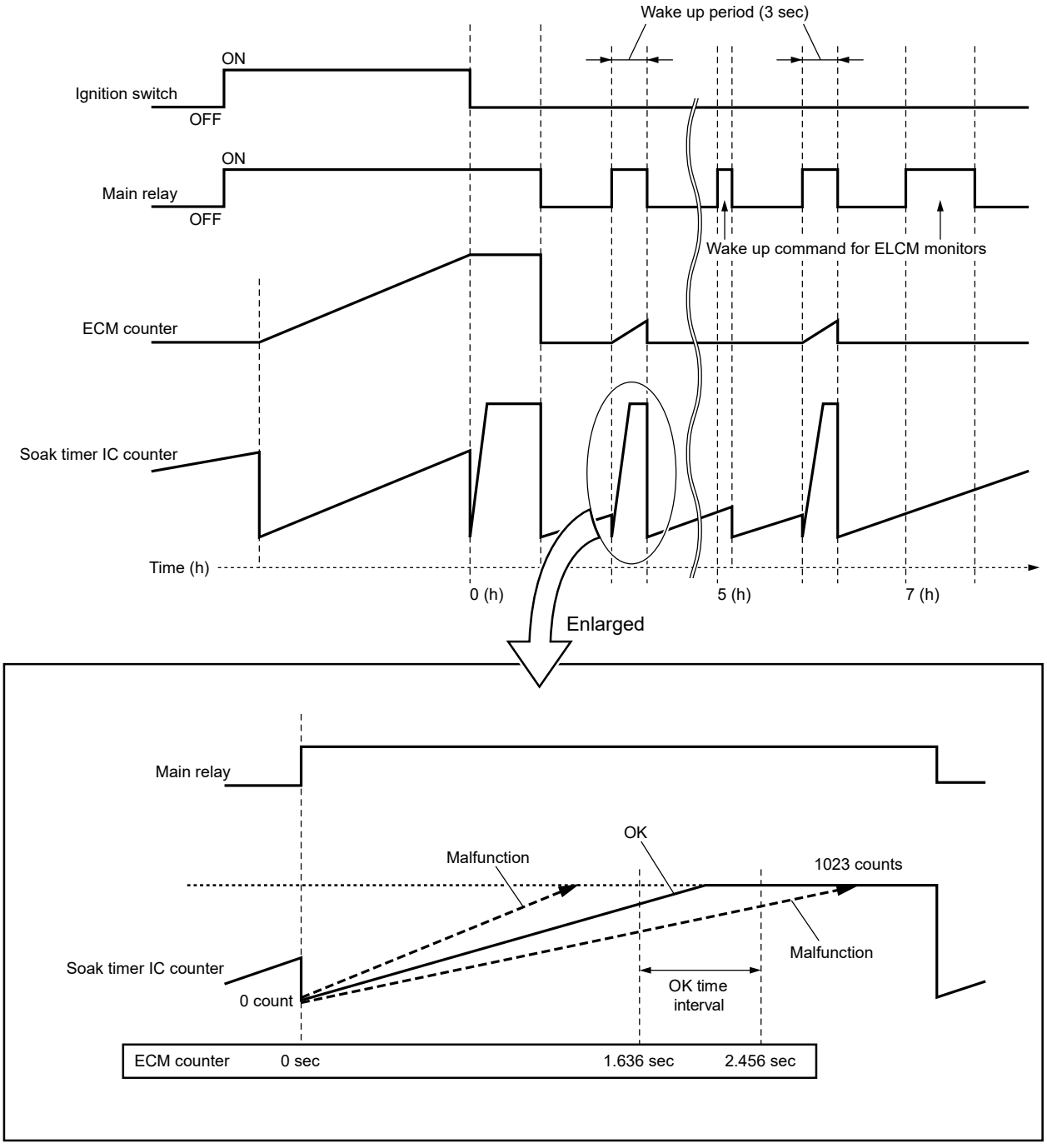
Judgment value

Malfunction Criteria	Threshold Value
Writing value and read out value when setting the soaking timer	Unmatch

MONITOR#4<TIMER DIAGNOSIS (DURING SOAKING)>

Wake-up at the predetermined interval until 5, 7 or 9.5 hours have passed after the ignition switch is OFF, and compare the counter in soaking timer IC with the counter in ECM.

Judge as malfunction if the counter in soaking timer IC is counted up to maximum value (1023 count) when the counter in ECM is 1636 ms, or if the counter in soaking timer IC is not counted up to maximum value (1023 count) when the counter in ECM is 2456 ms.



EN-10767

Judge as NG when the following conditions are established.

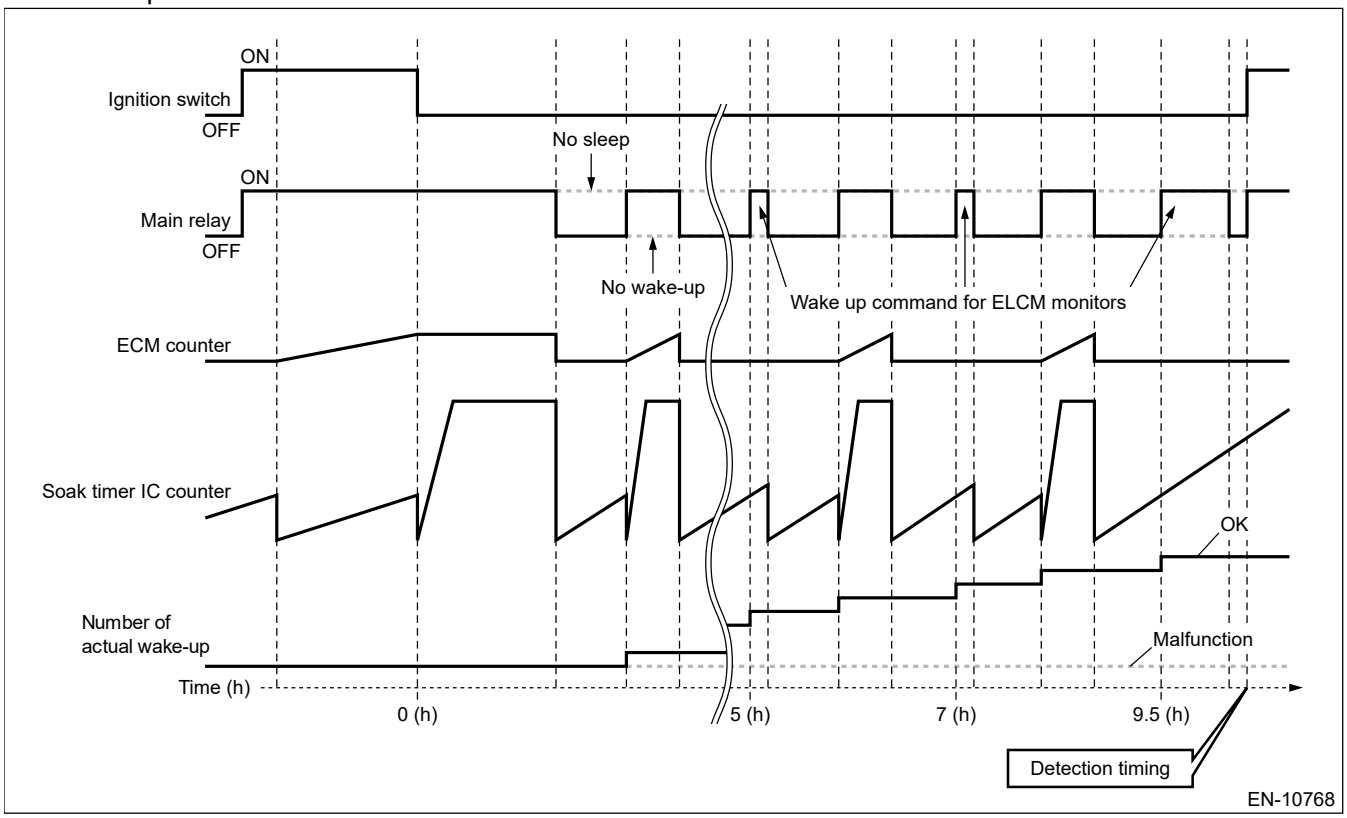
Judgment value

Malfunction Criteria	Threshold Value
When any one of the followings is established:	
• All of the following conditions are established. Counter in ECM	1636 ms or less
Counter in soaking timer IC	Equal to $3FF (65535 count)

Malfunction Criteria	Threshold Value
• All of the following conditions are established.	
Counter in ECM	2456 ms or more
Counter in soaking timer IC	Not equal to $3FF (65535 count)

MONITOR#5<WAKE-UP DIAGNOSIS>

Store the number of wake-up activation when the ECM wakes up by the soaking timer IC.
Next time when the ignition switch is ON, if the number of wake-up activation does not reach the predetermined value even though the counter in soaking timer IC operates 1 hour or more, judge as wake-up malfunction.



Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Number of wake-up	Not equal to wake-up indication count

Time needed for diagnosis:

Monitor#1: 0.128 s
Monitor#2: 0.128 s
Monitor#3: 0.128 s
Monitor#4: 1 s
Monitor#5: 1 s

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:

For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.
Judge as NG when CAN communication failure has occurred.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)
Frame Format: 11 Bit ID Frame (Standard Frame)
Conforms to ISO11898
Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Perform the diagnosis continuously after starting the engine.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
CAN bus condition	Equal to Bus off

Time needed for diagnosis: 1 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0077 LIN COMMUNICATION BUS "ECM/PCM" OFF

DTC detecting condition:

Immediately at fault recognition

Caution:

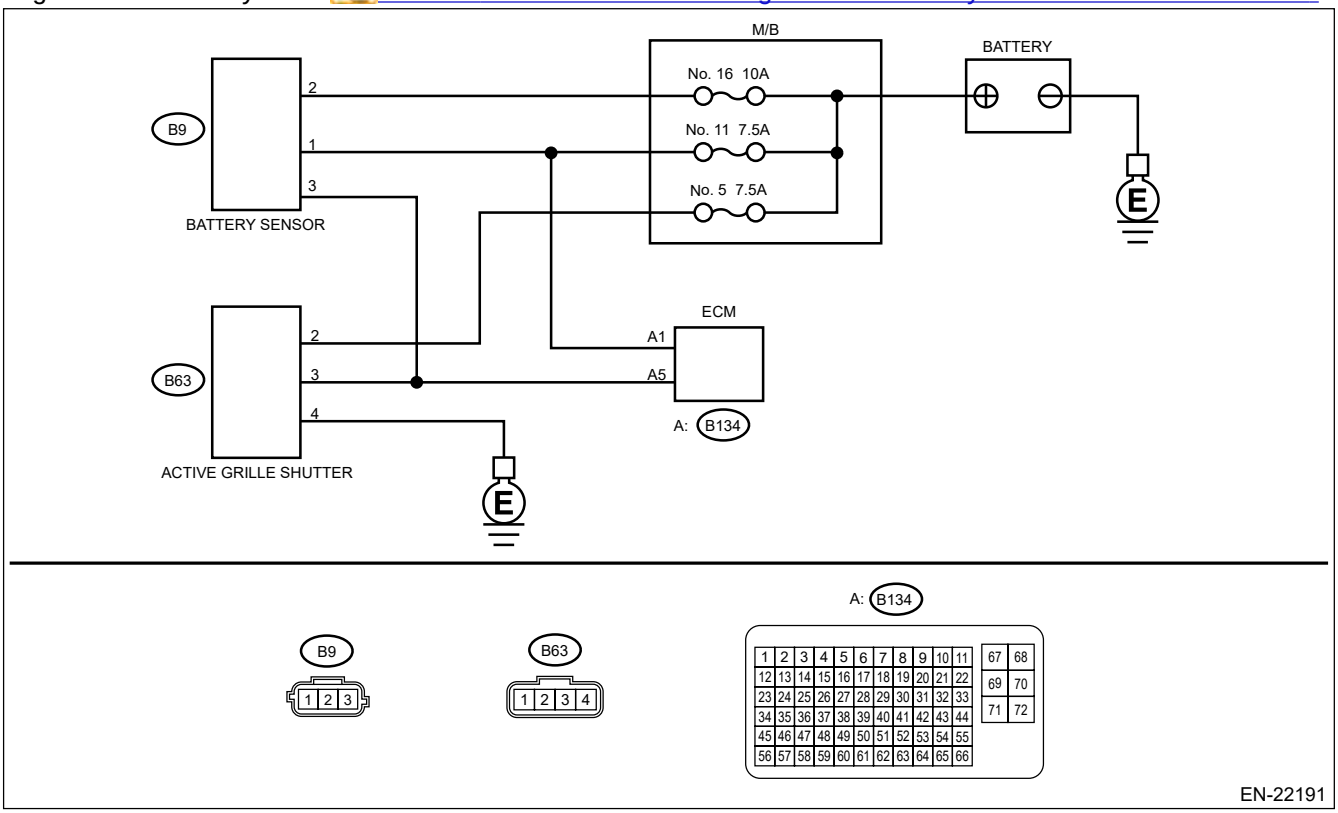
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC U0077 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. Clear the memory using the Subaru Select Monitor or general scan tool. **Note:** • **SUBARU SELECT MONITOR** **For detailed procedures, refer to "Clear memory". Ref. to COMMON(diag)>Clear memory.** • **General scan tool** **For detailed operation procedures, refer to the general scan tool operation manual.**

2. CHECK BETWEEN ECM AND BATTERY SENSOR, AND BETWEEN ECM AND ACTIVE GRILLE SHUTTER (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Disconnect the battery sensor connector.
4. Disconnect the connector of the active grille shutter.
5. Measure the resistance of terminals between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

   Connector & terminal

   (B134) No. 5 — (B9) No. 3:

   (B134) No. 5 — (B63) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and battery sensor connector, and between ECM connector and active grille shutter connector** • **Poor contact of coupling connector**

3. CHECK WIRING HARNESS BETWEEN ECM AND BATTERY SENSOR, AND BETWEEN ECM AND ACTIVE GRILLE SHUTTER (SHORT TO GROUND).

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

4. CHECK WIRING HARNESS BETWEEN ECM AND BATTERY SENSOR, AND BETWEEN ECM AND ACTIVE GRILLE SHUTTER (SHORT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 5 — Chassis ground:

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the short circuit to power supply in harness between ECM connector and battery sensor connector, as well as ECM connector and active grille shutter connector.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Connect the battery sensor connector and ECM connector.
3. Using the Subaru Select Monitor or a general scan tool, perform the clear memory of [Engine].
   Ref. to COMMON(diag)>Clear memory.



4. Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC U0077 displayed? (Current malfunction)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause. Clear the memory using the Subaru Select Monitor or general scan tool.** • SUBARU SELECT MONITOR For detailed procedures, refer to “Clear memory”. Ref. to COMMON(diag)>Clear memory. • General scan tool For detailed operation procedures, refer to the general scan tool operation manual.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG when the data sent/received via LIN communication is abnormal.

2. COMPONENT DESCRIPTION

LIN communication is used to send/receive data between ECM, battery sensor and active grille shutter.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Data sent/received with control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 1.28 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Note:

For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS) >Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.
Judge as NG when CAN communication failure between TCM, VDC CM and combination meter has occurred.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)
Frame Format: 11 Bit ID Frame (Standard Frame)
Conforms to ISO11898
Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
ID received from control module	None

Malfunction Criteria	Threshold Value
connected to CAN	

Time needed for diagnosis: 500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:
For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Note:
For the detection standard, refer to DTC U0101. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:
For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

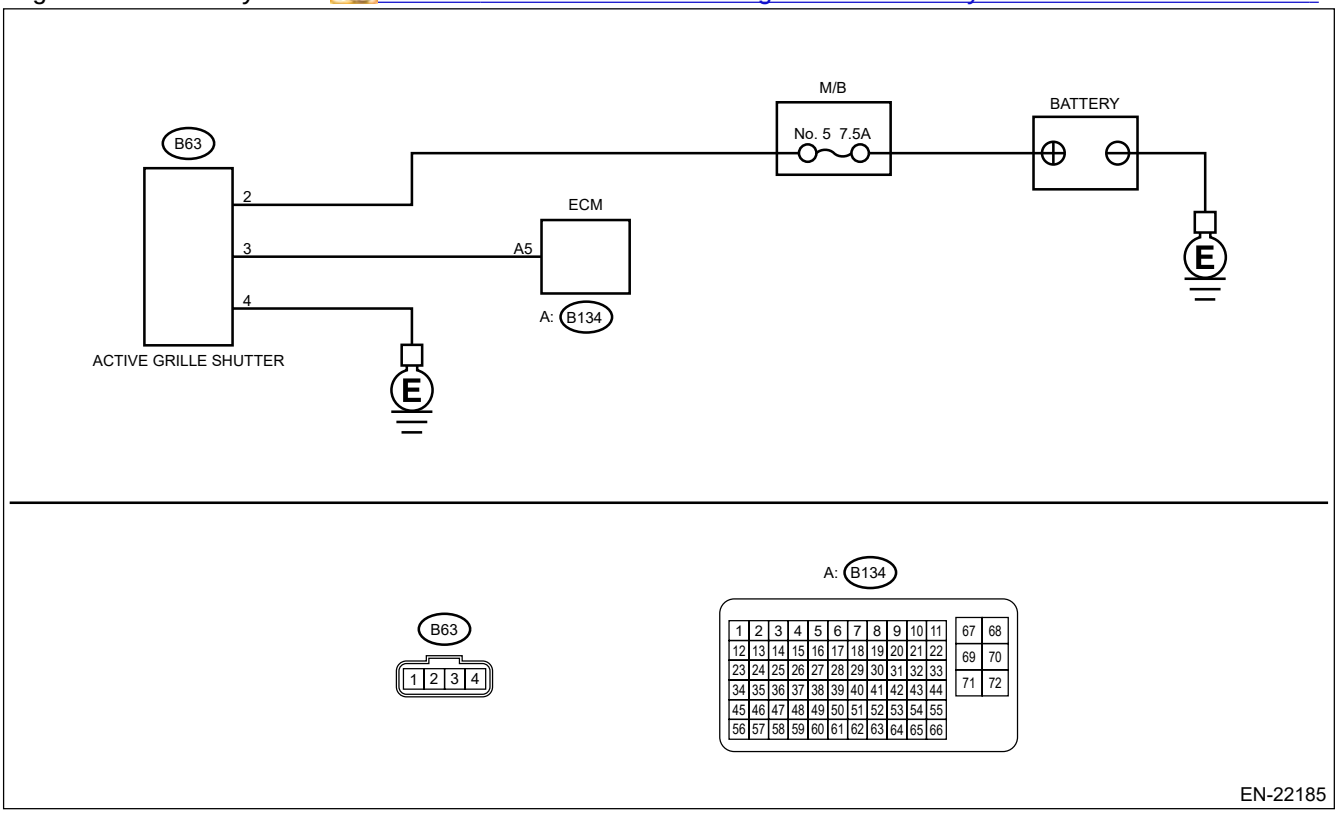
Note:
For the detection standard, refer to DTC U0101. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0284 LOST COMMUNICATION WITH ACTIVE GRILLE SHUTTER MODULE "A"

DTC detecting condition:
Immediately at fault recognition
Caution:
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.
Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC U0284 displayed? (Current malfunction)

Yes	Go to 2.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC for engine displayed?

Yes	Go to 3.
No	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

3. CHECK HARNESS BETWEEN ECM AND ACTIVE GRILLE SHUTTER (SHORT TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the battery.
3. Disconnect the connector from ECM.
4. Disconnect the connector from the active grille shutter.
5. Measure the resistance between active grille shutter connector and chassis ground.
   Connector & terminal
   (B63) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM and active grille shutter connector.

4. CHECK HARNESS BETWEEN ECM AND ACTIVE GRILLE SHUTTER (OPEN).

Measure the resistance of harness between ECM and active grille shutter connector.

Connector & terminal

(B134) No. 5 — (B63) No. 3:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM and active grille shutter connector** • **Poor contact of coupling connector**

5. CHECK ACTIVE GRILLE SHUTTER POWER SUPPLY.

1. Connect the battery.
2. Measure the voltage between active grille shutter connector and chassis ground.

Connector & terminal

(B63) No. 2 (+) — Chassis ground (−):

Is the voltage 9 V or more?

Yes	Go to 6.
No	Repair the power supply circuit.

6. CHECK HARNESS BETWEEN ACTIVE GRILLE SHUTTER AND CHASSIS GROUND.

Measure the resistance of harness between active grille shutter connector and chassis ground.

Connector & terminal

(B63) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the active grille shutter.
No	Repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between active grille shutter connector and chassis ground**
- **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG if LIN communication failure has occurred with the active grille shutter.

2. COMPONENT DESCRIPTION

(Common Specifications)

Communication protocol: LIN 2.0
Communication speed: 19.20 kbps

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data from control modules connected to LIN	None

Time needed for diagnosis: 3000ms

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Note:

For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Detect malfunction of CAN communication.
Judge as NG when data received from TCM, VDC CM and combination meter is not normal.

2. COMPONENT DESCRIPTION

(Common Specifications)

CAN Protocol 2.0B (Active)
Frame Format: 11 Bit ID Frame (Standard Frame)
Conforms to ISO11898
Communication Speed: 500 kbps

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data from control modules connected to CAN	No change

Time needed for diagnosis: 500 ms
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

For the diagnostic procedure, refer to LAN section. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Note:

For the detection standard, refer to DTC U0402. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1712 LOST LIN COMMUNICATION WITH BATTERY "1" MONITOR MODULE

DTC detecting condition:

Immediately at fault recognition

Caution:

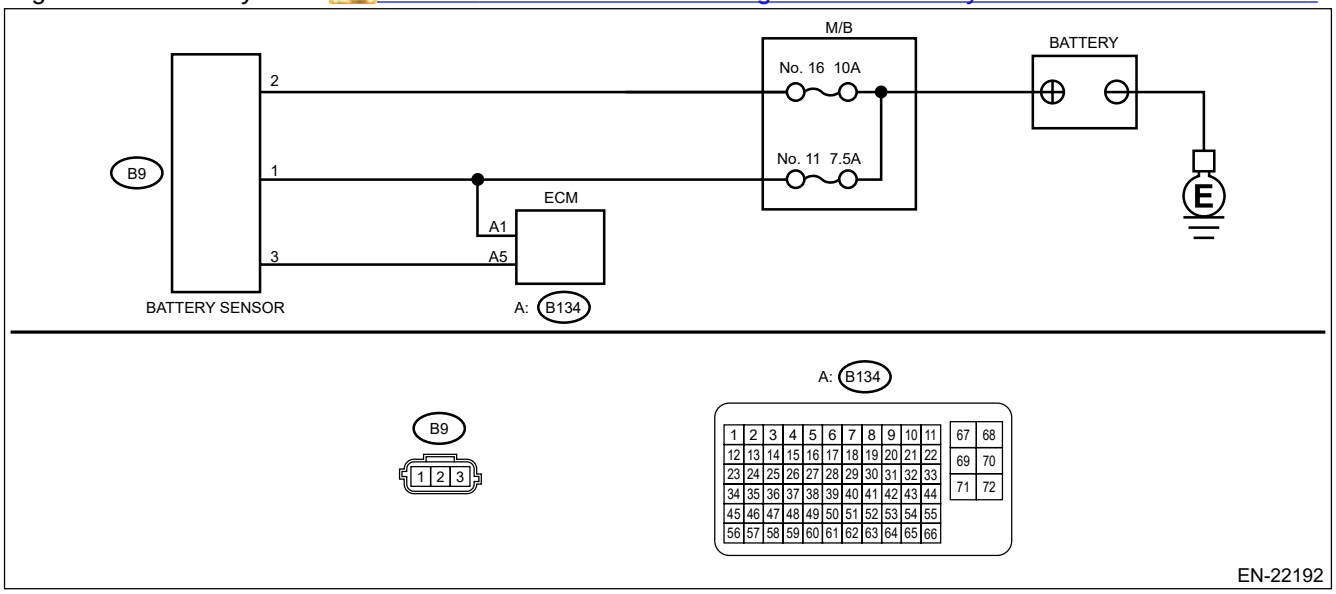
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC U1712 displayed? (Current malfunction)

Yes	Go to 2.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 3.
No	Connect the ECM connector correctly.

3. CHECK HARNESS BETWEEN BATTERY AND BATTERY SENSOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > SAFETY.
3. Disconnect the connector from battery sensor.
4. Disconnect the positive terminal of battery.
5. Measure the resistance of the harness between battery positive cable terminal and battery sensor connector.

   Connector & terminal

   Positive cable terminal — (B9) No. 1:

   Positive cable terminal — (B9) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between battery positive cable terminal and battery sensor connector.

4. CHECK HARNESS BETWEEN ECM AND BATTERY SENSOR (OPEN).

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and battery sensor connector.
   Connector & terminal
   (B9) No. 3 — (B134) No. 5:

Is the resistance less than 1 Ω?

Yes	Repair the poor contact of ECM connector or battery sensor connector.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between ECM connector and battery sensor connector** • **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG when LIN communication failure has occurred with the battery sensor.

2. COMPONENT DESCRIPTION

(Common Specifications)
Communication protocol: LIN 2.0
Communication speed: 19.20 kbps

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously.

5. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Data received from control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 2 seconds
Malfunction indicator light illumination: Does not illuminate.

DTC U171F LOST LIN COMMUNICATION WITH GENERATOR

DTC detecting condition:

Immediately at fault recognition

Caution:

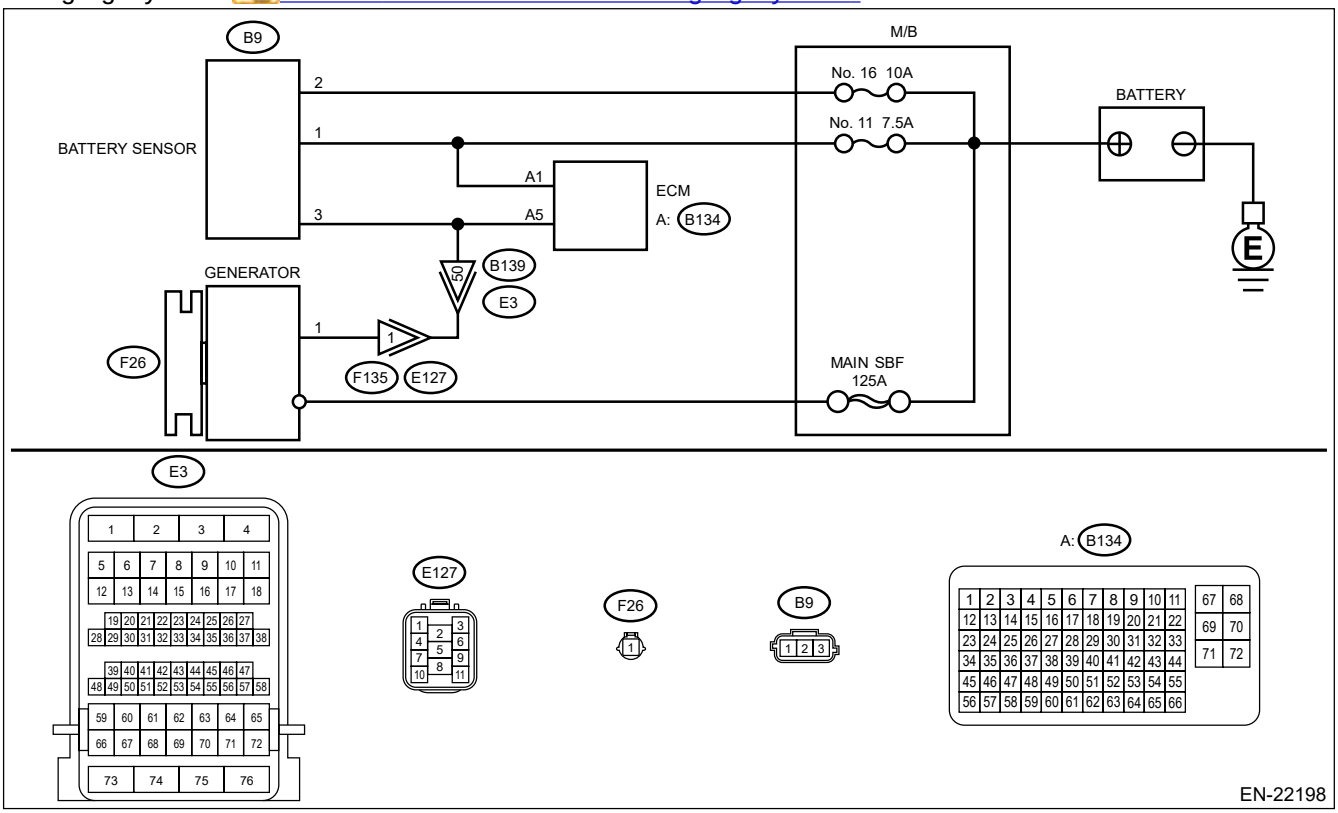
Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Wiring diagram:

Charging System Ref. to WIRING SYSTEM>Charging System.



1. CHECK DTC.

Using the Subaru Select Monitor or a general scan tool, read the DTC of [Engine]. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC U171F displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 3.
No	Connect the ECM connector correctly.

3. CHECK VOLTAGE OF GENERATOR B TERMINAL.

1. Turn the ignition switch to OFF.
2. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
3. Measure the voltage of the generator B terminal.
   Connector & terminal
   Generator B terminal — Engine ground:

Is it battery voltage?

Yes	Go to 4.
No	Check the generator B terminal harness and fuse.

4. CHECK HARNESS BETWEEN ECM AND GENERATOR (OPEN).

1. Disconnect the connector from ECM.
2. Disconnect the LIN communication connector from the generator.
3. Measure the resistance of harness between ECM and generator LIN communication connector.
   Connector & terminal
   (B134) No. 5 — (F26) No. 1:

Is the resistance less than 1 Ω?

Yes	Check the connector for poor contact and check the harness again. If no fault is found, replace the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and generator** • **Poor contact of coupling connector**

1. OUTLINE OF DIAGNOSIS

Detect malfunction of LIN communication.
Judge as NG if LIN communication failure has occurred with the generator.

2. COMPONENT DESCRIPTION

LIN communication is a network used for sending/receiving data between the control modules connected by LIN communication system.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
Battery voltage	10.9 V or more

4. GENERAL DRIVING CYCLE

Always perform the diagnosis continuously after the enable conditions have been established.

5. DIAGNOSTIC METHOD

Judge as NG when the following conditions are established.

Judgment value

Malfunction Criteria	Threshold Value
Data received from control modules connected to LIN	No change or Checksum error

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

LIST

Note:

Malfunction of parts other than those listed is also possible. Ref. to MECHANICAL(H4DO)>Symptoms and causes.

Item		Reference
Engine does not start **Note:** **Perform the diagnosis in the numerical order on the right.**	1 Check fuel level	Check the fuel level.
	2. Inspection of starter motor circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>STARTER MOTOR CIRCUIT.
	3. Inspection of ECM power supply and ground line	Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
	4. Inspection of ignition control system	Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.
	5. Inspection of fuel pump circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
	6. Inspection of fuel injector circuit	Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>FUEL INJECTOR CIRCUIT.
Brake override		Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>CHECK BRAKE OVERRIDE SYSTEM.

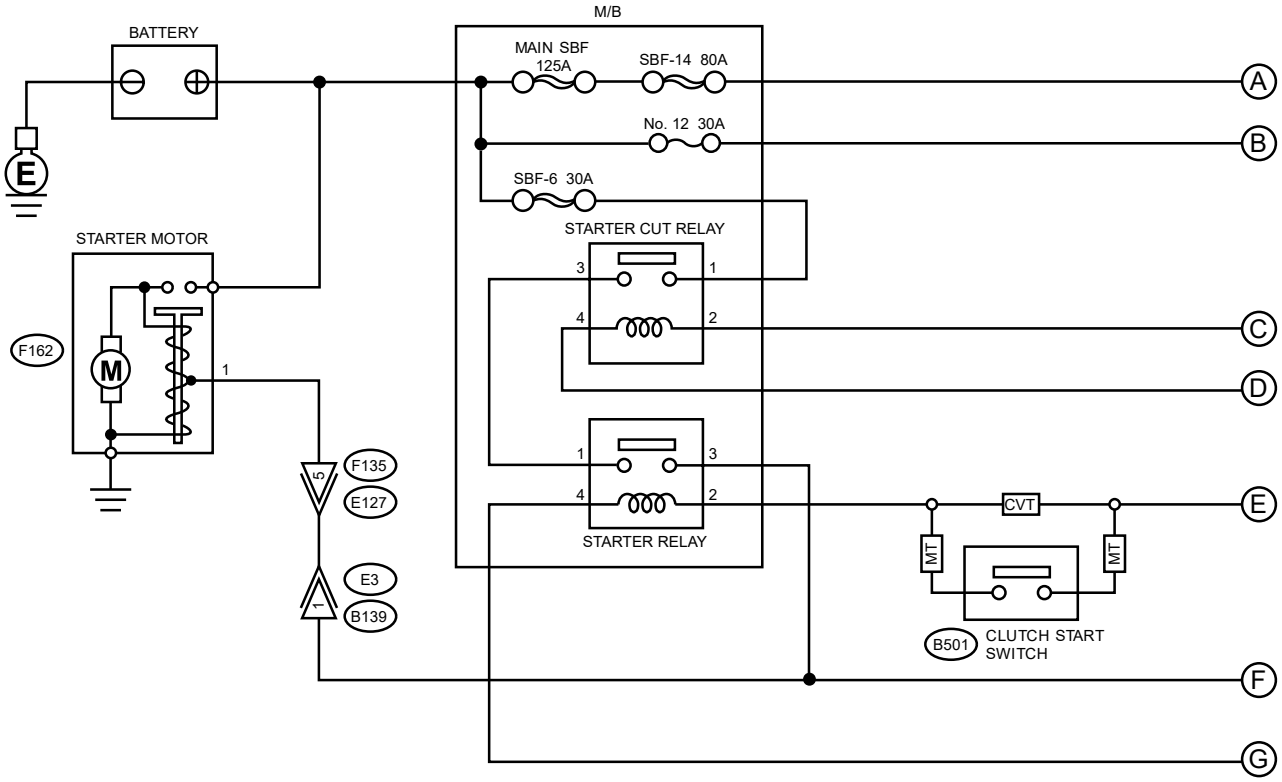
ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

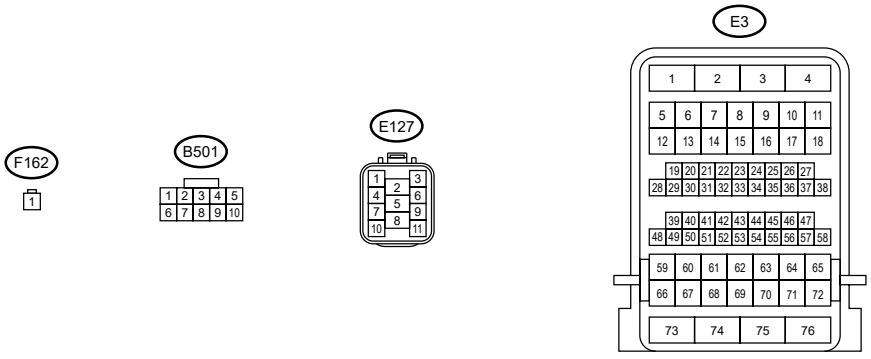
STARTER MOTOR CIRCUIT

1. MODEL WITHOUT PUSH BUTTON START

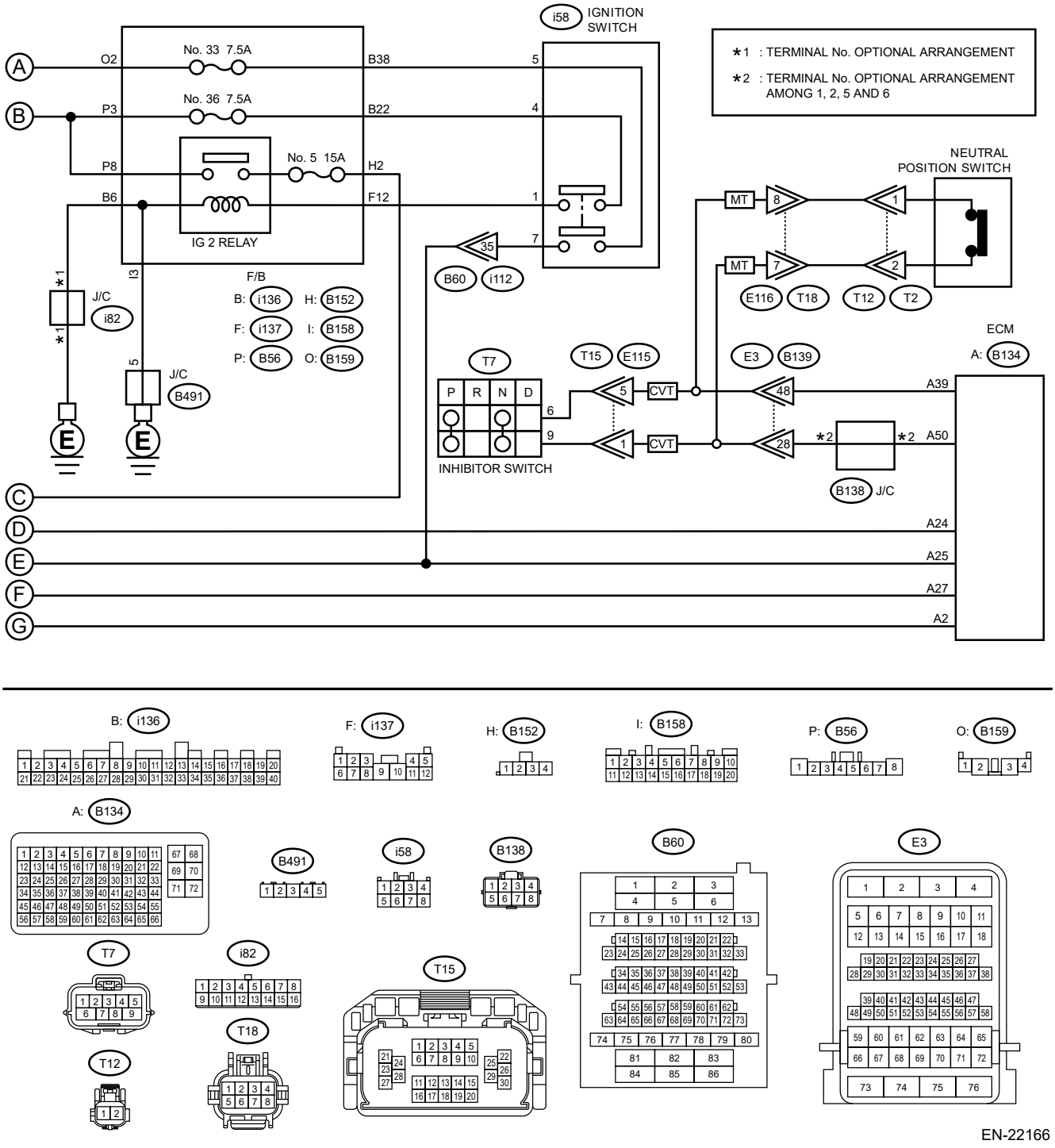
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-22165



EN-22166

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK BATTERY.	no →	Perform the instructed procedures.

yes

2. CHECK OPERATION OF STARTER MOTOR.

no → Go to 4.

yes

3. CHECK DTC.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

4. CHECK INPUT SIGNAL FOR STARTER MOTOR.

yes → Perform the instructed procedures.

no → Go to 5.

5. CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

no → Perform the instructed procedures.

yes

6. CHECK IGNITION SWITCH.

no → Perform the instructed procedures.

yes

7. CHECK INPUT VOLTAGE OF F/B (IG2 RELAY).

no → Perform the instructed procedures.

yes

8. CHECK F/B (IG2 RELAY).

no → Perform the instructed procedures.

yes

9. CHECK VOLTAGE OF F/B (IG2 RELAY) CONNECTOR. → no → Perform the instructed procedures.

yes

10. CHECK M/B (STARTER CUT RELAY). → no → Perform the instructed procedures.

yes

11. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY) CONNECTOR. → no → Perform the instructed procedures.

yes

12. CHECK M/B (STARTER RELAY). → no → Perform the instructed procedures.

yes

13. CHECK INPUT VOLTAGE OF M/B (STARTER RELAY). → no → Perform the instructed procedures.

yes

14. CHECK VOLTAGE OF M/B (STARTER RELAY) CONNECTOR. → no → Perform the instructed procedures.

yes

15. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY) CONNECTOR. → no → Perform the instructed procedures.

yes

16. CHECK TRANSMISSION TYPE.

no → Go to 20.

yes

17. CHECK INHIBITOR SWITCH.

no → Perform the instructed procedures.

yes

18. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

no → Perform the instructed procedures.

yes

19. CHECK NEUTRAL POSITION SWITCH SIGNAL.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

20. CHECK HARNESS BETWEEN STARTER RELAY AND STARTER MOTOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

2. CHECK OPERATION OF STARTER MOTOR.

Check the starter motor operation.

Does the starter motor operate?

Yes	Go to 3.
No	Go to 4.

3. CHECK DTC.

Read the DTC of engine using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Check ignition control system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

4. CHECK INPUT SIGNAL FOR STARTER MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from starter motor.
3. Turn the ignition switch to START.
4. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal

(F162) No. 1 (+) — Engine ground (–):

Note:

- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter.
No	Go to 5.

5. CHECK HARNESS BETWEEN BATTERY AND IGNITION SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition switch.
3. Measure the power supply voltage between ignition switch connector and chassis ground.

Connector & terminal

(i136) No. 38 (+) — Chassis ground (–):

(i136) No. 22 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Check the harnesses and connectors, and repair or replace them if necessary. **Note:** **In this case, repair the following item:** • **Open circuit of harness between battery and ignition switch connector** • **Blown out of fuse** • **Replacement of F/B** • **Replace M/B**

6. CHECK IGNITION SWITCH.

Measure the resistance between ignition switch terminals after turning the ignition switch to START position.

Terminals

No. 4 —No. 1:

No. 5 —No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Replace the ignition switch. Ref. to SECURITY AND LOCKS>Ignition Key Lock>REPLACEMENT.

7. CHECK INPUT VOLTAGE OF F/B (IG2 RELAY).

1. Turn the ignition switch to OFF.
2. Remove the F/B (IG2 relay).
3. Connect the connector to ignition switch.
4. Turn the ignition switch to START position, and measure the voltage between F/B (IG2 relay) connector and chassis ground.

   Connector & terminal

   (i137) No. 12 (+) — Chassis ground (–):

   (B56) No. 8 (+) — Chassis ground (–):

   Note:

   For MT model, depress the clutch pedal.

Is the voltage 10 V or more?

Yes	Go to 8.
No	Check the following item and repair if necessary. • Blown out of fuse • Open circuit or short circuit to ground in harness between F/B (IG2 relay) and ignition switch connector • Poor contact of the clutch start switch connector (MT model) • Clutch start switch trouble (MT model)

8. CHECK F/B (IG2 RELAY).

Check the F/B (IG2 relay). Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION > CHECK RELAY.

Is the check result OK?

Yes	Go to 9.
No	Replace the F/B (IG2 relay).

9. CHECK VOLTAGE OF F/B (IG2 RELAY) CONNECTOR.

1. Turn the ignition switch to START.
2. Measure the voltage between F/B (IG2 relay) connector and engine ground.

Connector & terminal

(B152) No. 2 (+) — Chassis ground (–):

Note:

- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Go to 10.
No	Check the following item and repair if necessary. • Blown out of fuse • Replacement of F/B

10. CHECK M/B (STARTER CUT RELAY).

Measure the resistance between starter cut relay terminals.

Terminals

No. 1 —No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 11.
No	Replace the starter cut relay.

11. CHECK HARNESS BETWEEN ECM AND M/B (STARTER CUT RELAY) CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Turn the ignition switch to START.
4. Measure the voltage of harness between ECM connector and engine ground.

Connector & terminal

(B134) No. 24 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes	Go to 12.
No	Repair or replace the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between M/B (starter relay) and ECM** • **Replace M/B**

12. CHECK M/B (STARTER RELAY).

Check the M/B (starter relay). Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION > CHECK RELAY.

Is the check result OK?

Yes	Go to 13.
No	Replace the F/B (IG2 relay).

13. CHECK INPUT VOLTAGE OF M/B (STARTER RELAY).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Measure the voltage between ECM connector and chassis ground after turning the ignition switch to START position.

Connector & terminal

(B134) No. 2 (+) — Chassis ground (–):

Note:

- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Go to 14.
No	Check the following item and repair if necessary. • Blown out of fuse • Open circuit or short circuit to ground in harness between M/B (starter relay) and ignition switch connector • Poor contact of the clutch start switch connector (MT model) • Clutch start switch trouble (MT model)

14. CHECK VOLTAGE OF M/B (STARTER RELAY) CONNECTOR.

1. Connect the connector to ECM.
2. Turn the ignition switch to START.
3. Measure the voltage between ECM connector and chassis ground.

Connector & terminal

(B134) No. 27 (+) — Chassis ground (–):

Note:

- **For CVT model, place the select lever in "P" range or "N" range.**
- **For MT model, depress the clutch pedal.**

Is the voltage 10 V or more?

Yes	Go to 15.
No	Check the following item and repair if necessary. • Open circuit or short circuit to ground in harness between M/B (starter relay) and ECM • Replace M/B

15. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY) CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Remove the M/B (starter relay).
4. Disconnect the connector from starter motor.
5. Measure the resistance of harness between ECM connector and M/B (starter relay) connector and chassis ground.

Connector & terminal

(B134) No. 2 — Chassis ground:

(B134) No. 27 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 16.
No	Repair the short circuit to ground of harness between ECM connector, starter relay connector and starter motor connector.

16. CHECK TRANSMISSION TYPE.

Check the transmission type.

Is the transmission type CVT?

Yes	Go to 17.
No	Go to 20.

17. CHECK INHIBITOR SWITCH.

1. Place the select lever in “P” range and “N” range.
2. Measure the resistance between inhibitor switch terminals.

Terminals

No. 6 —No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 18.
No	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

18. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and inhibitor switch connector.

Connector & terminal

(B134) No. 39 — (T7) No. 6:

(B134) No. 50 — (T7) No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 19.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and keyless access CM connector** • **Poor contact of coupling connector**

19. CHECK NEUTRAL POSITION SWITCH SIGNAL.

1. Connect all relays and connectors to their proper positions.
2. Using the Subaru Select Monitor, read the value in [Neutral switch].



Note:
For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

3. Turn the ignition to ON.
4. Place the select lever in “P” range or “N” range.

Is [Neutral switch] displayed?

Yes	Check the engine control module (ECM) power supply and ground line. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between inhibitor switch connector and starter motor connector** • **Poor contact of coupling connector**

20. CHECK HARNESS BETWEEN STARTER RELAY AND STARTER MOTOR.

1. Measure the resistance of harness between M/B (starter relay) connector and starter motor.
Connector & terminal
(F162) No. 1 — M/B (starter relay) No. 3:

Is the resistance less than 1 Ω?

Yes	Check the engine control module (ECM) power supply and ground line. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
No	Repair the open circuit of harness between F/B (starter relay) connector and starter motor.

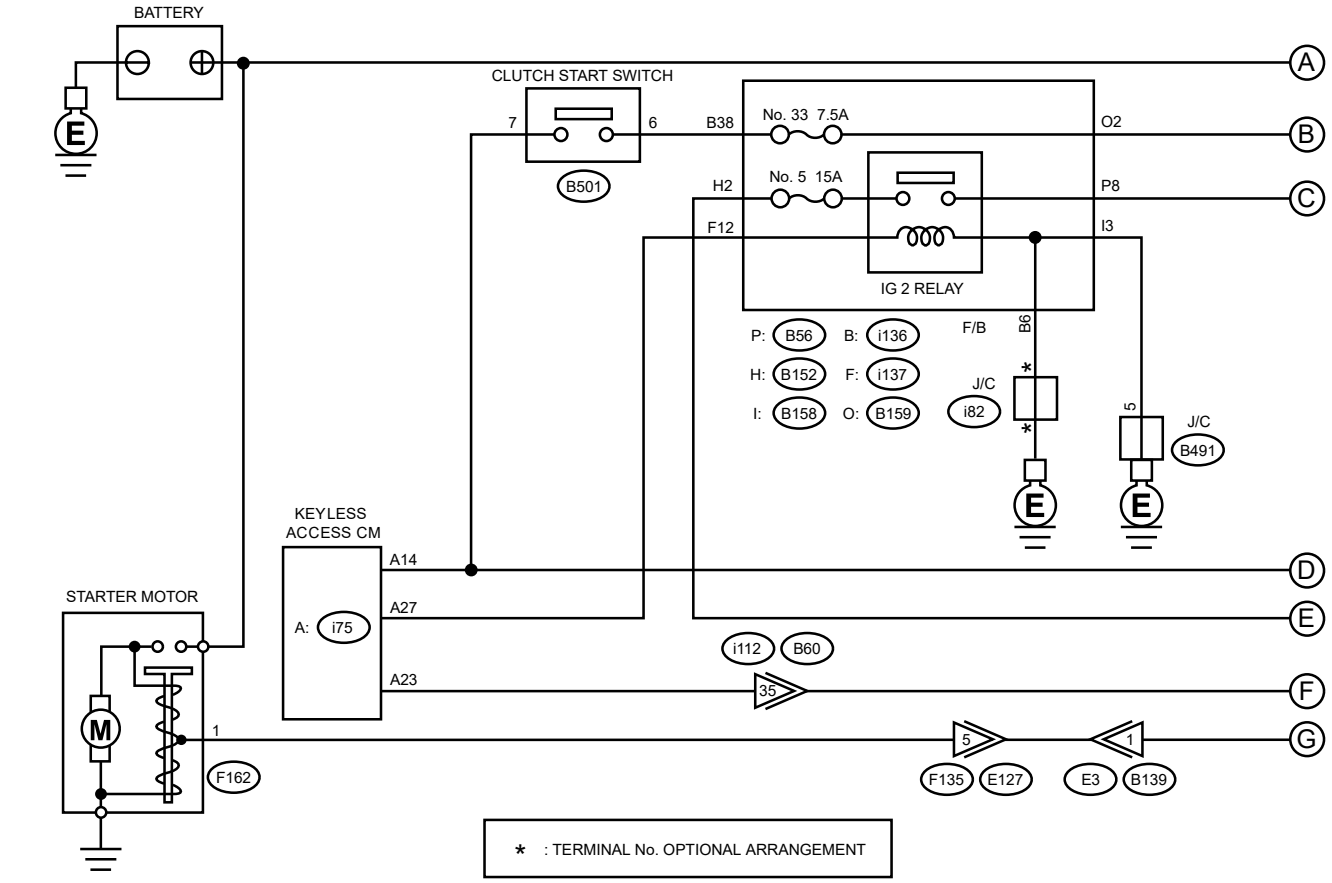
Note:

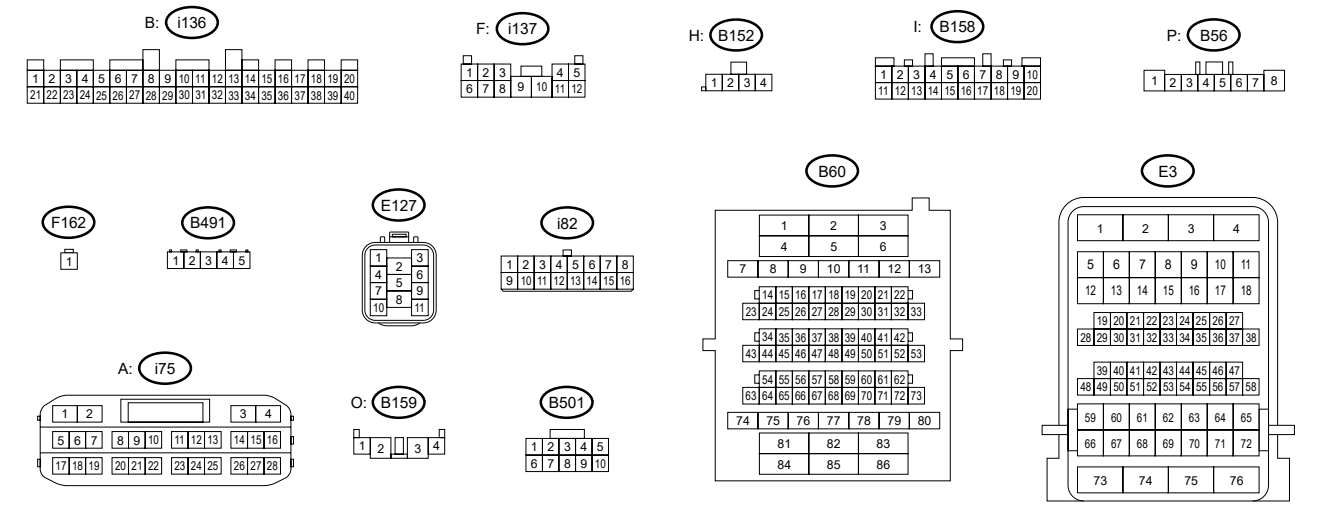
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

2. MODEL WITH PUSH BUTTON START

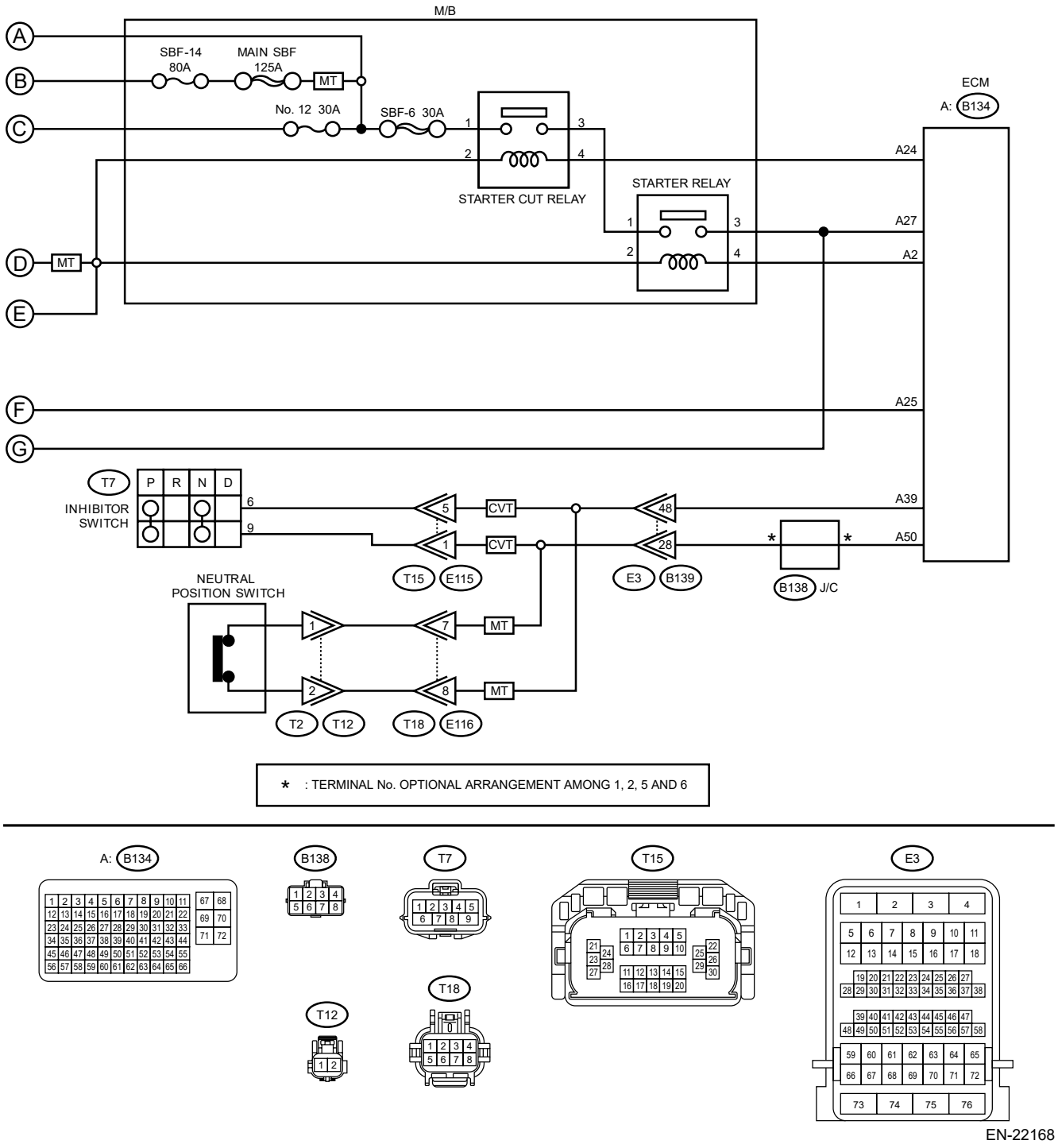
Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.





EN-22167



EN-22168

Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK BATTERY.	no →	Perform the instructed procedures.

yes

2. CHECK OPERATION OF STARTER MOTOR.

no → Go to 4.

yes

3. CHECK DTC.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

4. CHECK PUSH BUTTON IGNITION SWITCH.

no → Perform the instructed procedures.

yes

5. CHECK PUSH BUTTON IGNITION SWITCH.

no → Perform the instructed procedures.

yes

6. CHECK START SWITCH SIGNAL.

yes → Go to 10.

no → Go to 7.

7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

no → Perform the instructed procedures.

yes

8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

no → Perform the instructed procedures.

yes

9. CHECK START SWITCH SIGNAL.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

10. CHECK INPUT SIGNAL FOR STARTER MOTOR.

yes → Perform the instructed procedures.

no → Go to 11.

11. CHECK POWER SUPPLY OF IG2 RELAY.

no → Perform the instructed procedures.

yes

12. CHECK F/B (IG2 RELAY).

no → Perform the instructed procedures.

yes

13. CHECK POWER SUPPLY OF F/B (IG2 RELAY) CONNECTOR.

no → Perform the instructed procedures.

yes

14. CHECK HARNESS BETWEEN F/B (IG2 RELAY) TERMINAL AND CHASSIS GROUND.

no → Perform the instructed procedures.

yes

15. CHECK POWER SUPPLY FOR M/B (STARTER CUT RELAY).
no → Perform the instructed procedures.

yes ↓

16. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.
no → Perform the instructed procedures.

yes ↓

17. CHECK STARTER CUT RELAY.
no → Perform the instructed procedures.

yes ↓

18. CHECK M/B (STARTER RELAY).
no → Perform the instructed procedures.

yes ↓

19. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY) CONNECTOR.
no → Perform the instructed procedures.

yes ↓

20. CHECK INHIBITOR SWITCH.
no → Perform the instructed procedures.

yes ↓

21. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.
no → Perform the instructed procedures.

yes

22. CHECK NEUTRAL POSITION SWITCH SIGNAL.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

2. CHECK OPERATION OF STARTER MOTOR.

Does the starter motor operate?

Yes	Go to 3.
No	Go to 4.

3. CHECK DTC.

Read the DTC of engine using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

Yes	Check the appropriate DTC using the “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Check ignition control system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.

4. CHECK PUSH BUTTON IGNITION SWITCH.

Press the push button ignition switch twice with the ignition OFF (ACC OFF).

Note:

Release the brake pedal.

Does the ignition turn to ON?

Yes	Go to 5.
No	Check the push button start system. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>INSPECTION.

5. CHECK PUSH BUTTON IGNITION SWITCH.

1. Depress the brake pedal.

   Note:

   Shift the select lever to “P” range.
2. Check the push button ignition switch indicator.

Does the indicator turn to green?

Yes	Go to 6.
No	Check the push button start system. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>INSPECTION.

6. CHECK START SWITCH SIGNAL.

1. Using the Subaru Select Monitor, read the waveform in [Starter Switch].

   Data Monitor

   Note:
   For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
2. Press the push button ignition switch once with the brake pedal depressed.

Does a waveform occur in [Starter Switch]?

Yes	Go to 10.
No	Go to 7.

7. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from the keyless access CM.
4. Measure the resistance of harness between ECM connector and keyless access CM.
   Connector & terminal
   (B134) No. 25 — (i75) No. 23:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and keyless access CM connector** • **Poor contact of coupling connector**

8. CHECK HARNESS BETWEEN ECM AND KEYLESS ACCESS CM.

Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 25 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Repair the short circuit to ground in harness between ECM connector and keyless access CM connector.

9. CHECK START SWITCH SIGNAL.

1. Connect the connector to ECM and keyless access CM.
2. Read the waveform of start switch signal using an oscilloscope.
3. Press the push button ignition switch once with the brake pedal depressed.

Connector & terminal

(B134) No. 25 (+) — Chassis ground (–):

Does waveform of the start switch signal occur?

Yes	Repair the poor contact of ECM connector.
No	Repair the poor contact of keyless access CM connector.

10. CHECK INPUT SIGNAL FOR STARTER MOTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from starter motor.
3. Place the select lever in “P” range or “N” range.
4. Press the push button ignition switch once with the brake pedal depressed.
5. Measure the voltage between the starter motor connector and the engine ground.

Connector & terminal

(F162) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes	Check the starter motor. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter.
No	Go to 11.

11. CHECK POWER SUPPLY OF IG2 RELAY.

1. Remove the IG2 relay.
2. Turn the ignition switch to START.
3. Measure the voltage between F/B (IG2 relay) terminal and chassis ground.

Connector & terminal

(B56) No. 8 (+) — Chassis ground (–):

(i137) No. 12 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 12.
No	Check the following item and repair or replace if necessary. • Blown out of fuse (F/B No. 26) • Open circuit or short circuit to ground in harness between F/B (IG2 relay) terminal and power supply circuit • Open circuit or short circuit to ground in harness between F/B (IG2 relay) terminal and keyless access CM • Poor contact of coupling connector • Blown out of fuse

12. CHECK F/B (IG2 RELAY).

1. Remove the F/B (IG2 relay).
2. Check the F/B (IG2 relay). Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION > CHECK RELAY.

Is the resistance less than 1 Ω?

Yes	Go to 13.
No	Replace the IG2 relay. Ref. to SECURITY AND LOCKS>Relay and Fuse.

13. CHECK POWER SUPPLY OF F/B (IG2 RELAY) CONNECTOR.

1. Install the F/B (IG2 relay).
2. Remove the F/B (IG2 relay) connectors (B158) and (i136).
3. Measure the voltage between F/B (IG2 relay) terminal and chassis ground.

Connector & terminal

(B158) No. 3 (+) — Chassis ground (–):

(i136) No. 6 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 14.
No	Replace the F/B unit. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

14. CHECK HARNESS BETWEEN F/B (IG2 RELAY) TERMINAL AND CHASSIS GROUND.

1. Turn the ignition to OFF.
2. Measure the resistance of harness between the F/B (IG2 relay) connectors (B158) and (i136) and the chassis ground.
   Connector & terminal
   (B158) No. 3 — Chassis ground:
   (i136) No. 6 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 15.
No	Repair the open circuit of the harness between F/B (IG2 relay) connector and chassis ground.

15. CHECK POWER SUPPLY FOR M/B (STARTER CUT RELAY).

1. Remove the M/B (starter cut relay).
2. Turn the ignition switch to START.
3. Measure the voltage between M/B (starter cut relay) terminal No. 1 and No. 2 and chassis ground.
   Terminals
   No. 1 (+) — Chassis ground (–):
   No. 2 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 16.
No	Check the following item and repair or replace if necessary. • Blown out of fuse • Open circuit or short circuit to ground in harness between M/B (starter cut relay) connector and F/B connector • Open circuit or short circuit to ground in harness between M/B (starter cut relay) connector and battery

16. CHECK HARNESS BETWEEN ECM AND STARTER CUT RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Remove the starter cut relay.
3. Measure the resistance between ECM connector and chassis ground.

Connector & terminal

(B134) No. 24 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 17.
No	Repair the short circuit to ground in harness between ECM connector and starter cut relay connector.

17. CHECK STARTER CUT RELAY.

Measure the resistance between starter cut relay terminals.

Terminals

No. 1 —No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 18.
No	Replace the starter cut relay. Ref. to SECURITY AND LOCKS>Relay and Fuse.

18. CHECK M/B (STARTER RELAY).

1. Remove the M/B (starter relay).
2. Check the M/B (starter relay).

Is the resistance less than 1 Ω?

Yes	Go to 19.
No	Replace the M/B (starter relay). Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Starter Relay>INSPECTION.

19. CHECK HARNESS BETWEEN ECM AND M/B (STARTER RELAY) CONNECTOR.

1. Remove the M/B (starter relay).
2. Disconnect the connector from ECM.
3. Measure the resistance between ECM connectors (B158) and (B159).
   Connector & terminal
   (B134) No. 27 — M/B (starter relay) No. 3:
   (B158) No. 2 — M/B (starter relay) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 20.
No	Repair the open circuit of harness between ECM connector and M/B (starter relay) connector.

20. CHECK INHIBITOR SWITCH.

1. Place the select lever in “P” range or “N” range.
2. Measure the resistance between inhibitor switch terminals.
   Terminals
   No. 6 —No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 21.
No	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

21. CHECK HARNESS BETWEEN ECM AND INHIBITOR SWITCH CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and inhibitor switch connector.

Connector & terminal

(B134) No. 39 — (T7) No. 6:

(B134) No. 50 — (T7) No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 22.
No	Repair the harness and connector.

Note:

In this case, repair the following item:

- **Open circuit of harness between ECM connector and keyless access CM connector**
- **Poor contact of coupling connector**

22. CHECK NEUTRAL POSITION SWITCH SIGNAL.

1. Connect all relays and connectors to their proper positions.
2. Using the Subaru Select Monitor, read the value in [Neutral switch].

   Data Monitor

   Note:
   For detailed operation procedures, refer to “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.
3. Turn the ignition to ON.
4. Place the select lever in “P” range or “N” range.

Is [Neutral switch] displayed?

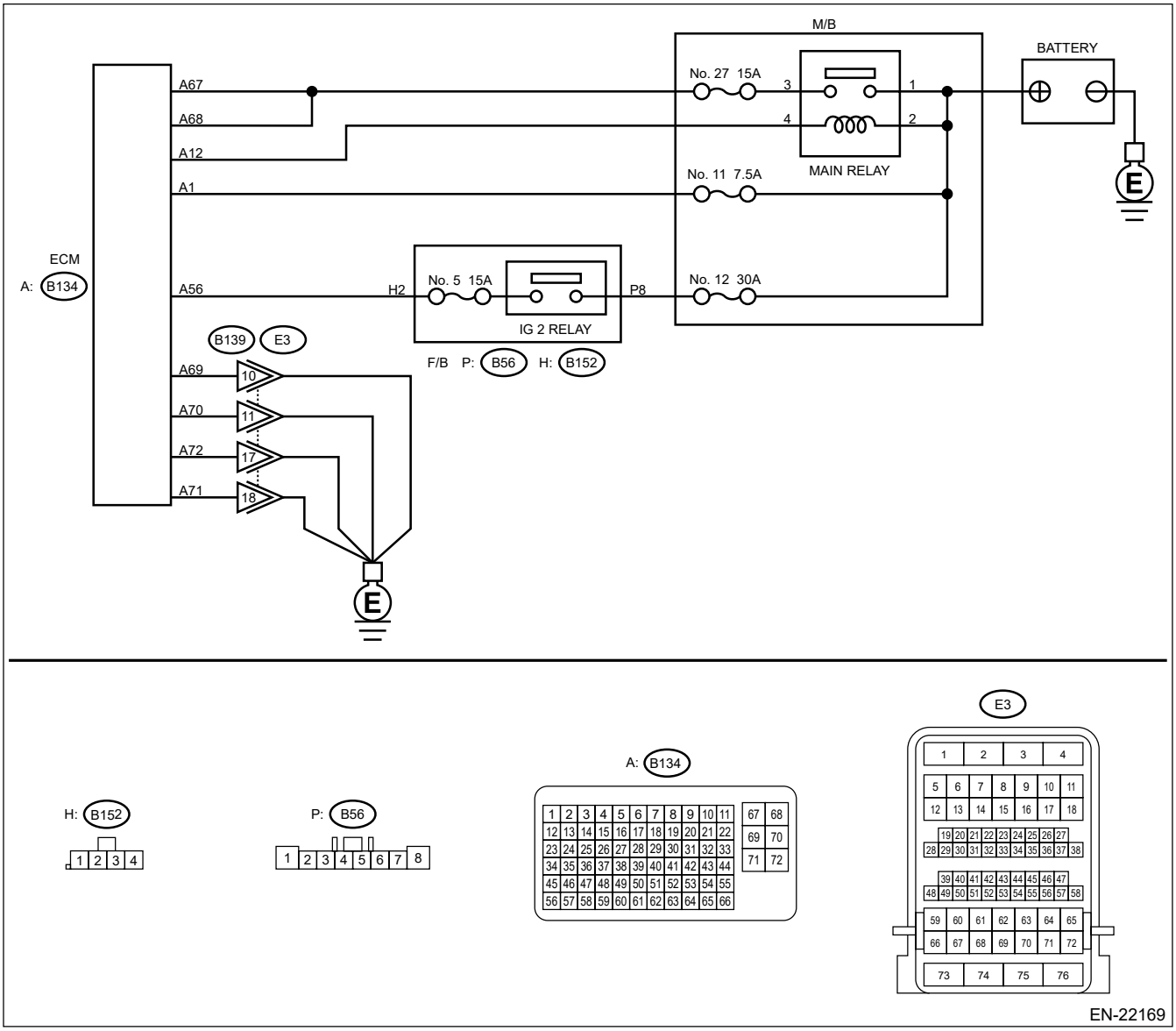
Yes	Check the engine control module (ECM) power supply and ground line. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM).
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between inhibitor switch connector and starter motor connector** • **Poor contact of coupling connector**

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

CHECK POWER SUPPLY AND GROUND LINE OF ENGINE CONTROL MODULE (ECM)

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK M/B (MAIN RELAY).

1. Turn the ignition switch to OFF.
2. Remove the M/B (main relay).
3. Connect the battery to M/B (main relay) terminals No. 2 and No. 4.
4. Measure the resistance between M/B (main relay) terminals.

Terminals

No. 1 — No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Replace the M/B (main relay). Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Main Relay.

2. CHECK GROUND CIRCUIT FOR ECM.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and chassis ground.

Connector & terminal

(B134) No. 69 — Chassis ground:

(B134) No. 70 — Chassis ground:

(B134) No. 71 — Chassis ground:

(B134) No. 72 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and engine ground terminal** • **Poor contact of coupling connector**

3. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 1 (+) — Chassis ground (–):
   (B134) No. 56 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the open or ground short in the harness of power supply circuit.

4. CHECK M/B (MAIN RELAY) INPUT VOLTAGE.

Measure the voltage between M/B (main relay) terminal and chassis ground.
Terminals
No. 1 (+) — Chassis ground (–):
No. 2 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair the open or ground short in the harness of power supply circuit.

5. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to OFF.
2. Install the M/B (main relay).
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 12 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair the open circuit of harness between ECM connector and M/B (main relay) terminal.

6. CHECK INPUT VOLTAGE OF ECM.

1. Turn the ignition switch to OFF.
2. Connect the connector to ECM.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 67 (+) — Chassis ground (–):
   (B134) No. 68 (+) — Chassis ground (–):

Is the voltage 10 V or more?

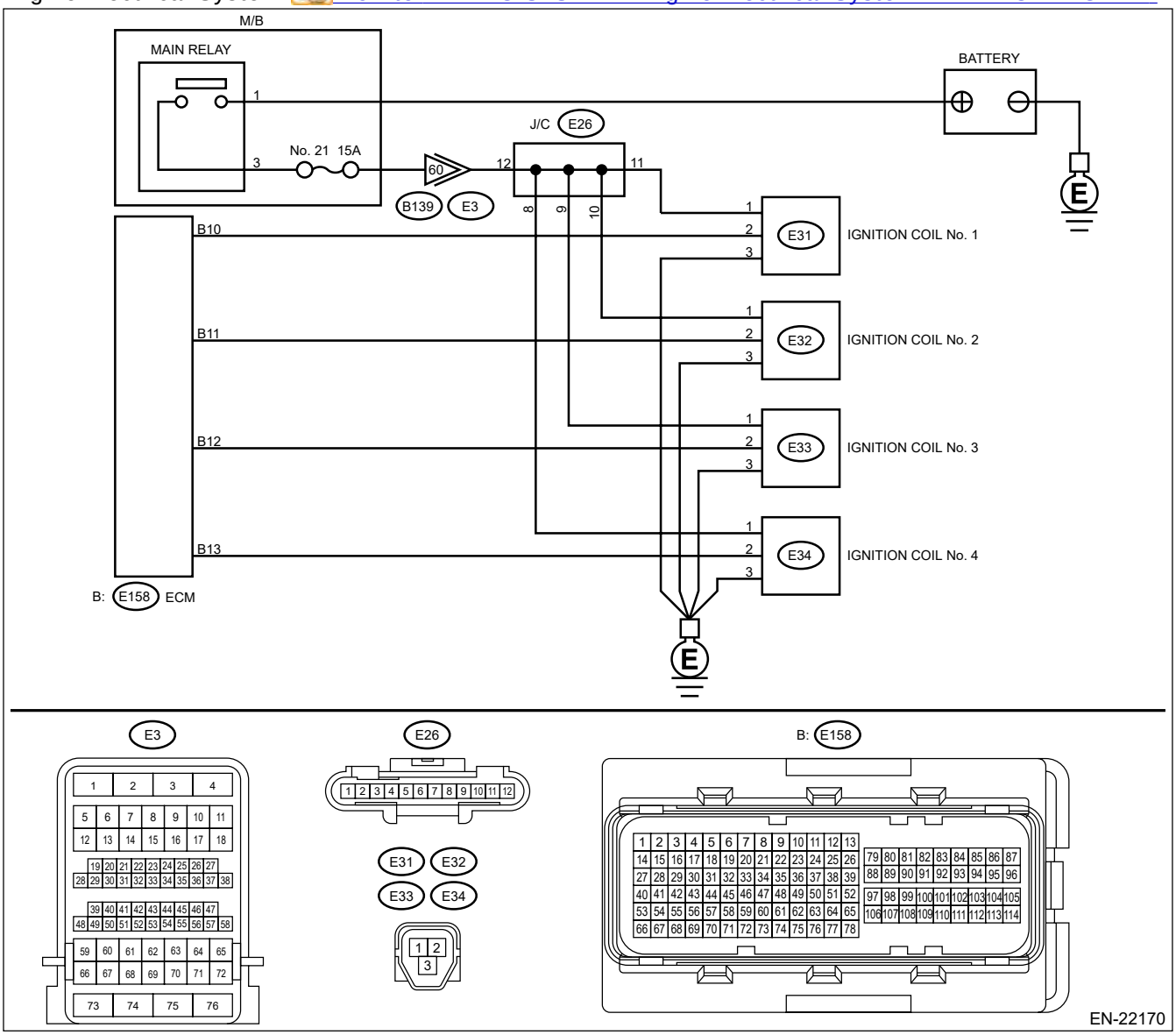
Yes	Check ignition control system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>IGNITION CONTROL SYSTEM.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit of harness between ECM connector and M/B (main relay) connector** • **Poor contact of M/B (main relay) connector** • **Poor contact of ECM connector**

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

IGNITION CONTROL SYSTEM

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK SPARK PLUG CONDITION.

1. Remove the spark plug. Ref. to IGNITION(H4DO)>Spark Plug>REMOVAL.
2. Check the spark plug condition. Ref. to IGNITION(H4DO)>Spark Plug>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the spark plug. Ref. to IGNITION(H4DO)>Spark Plug.

2. CHECK IGNITION SYSTEM FOR SPARKS.

1. Connect the spark plug to ignition coil.
2. Release the fuel pressure. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel>PROCEDURE > RELEASING OF FUEL PRESSURE.
3. Contact the spark plug thread portion to engine.
4. While opening the throttle valve fully, crank the engine to check that spark occurs at each cylinder.

Does spark occur at each cylinder?

Yes	Check fuel pump system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon>FUEL PUMP CIRCUIT.
No	Go to 3.

3. CHECK IGNITION COIL POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ignition coil.
3. Turn the ignition switch to ON.
4. Measure the voltage between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 1 (+) — Engine ground (–):
(E32) No. 1 (+) — Engine ground (–):
(E33) No. 1 (+) — Engine ground (–):
(E34) No. 1 (+) — Engine ground (–):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open or short to ground in harness of power supply circuit** • **Poor contact of coupling connector** • **Blown out of fuse**

4. CHECK HARNESS OF IGNITION COIL GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between ignition coil connector and engine ground.

Connector & terminal

(E31) No. 3 — Engine ground:
(E32) No. 3 — Engine ground:
(E33) No. 3 — Engine ground:
(E34) No. 3 — Engine ground:

Is the resistance less than 5 Ω?

Yes	Go to 5.
No	Repair the open circuit in harness between ignition coil connector and engine grounding terminal.

5. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and ignition coil connector.

Connector & terminal

(E158) No. 10 — (E31) No. 2:
(E158) No. 11 — (E32) No. 2:
(E158) No. 12 — (E33) No. 2:
(E158) No. 13 — (E34) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and ignition coil connector.

6. CHECK HARNESS BETWEEN ECM AND IGNITION COIL CONNECTOR.

Measure the resistance of harness between ECM connector and engine ground.

Connector & terminal

(E158) No. 10 — Engine ground:
(E158) No. 11 — Engine ground:
(E158) No. 12 — Engine ground:
(E158) No. 13 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the ground short circuit of harness between ECM connector and ignition coil connector.

7. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Replace the ignition coil. Ref. to IGNITION(H4DO)>Ignition Coil.

Note:

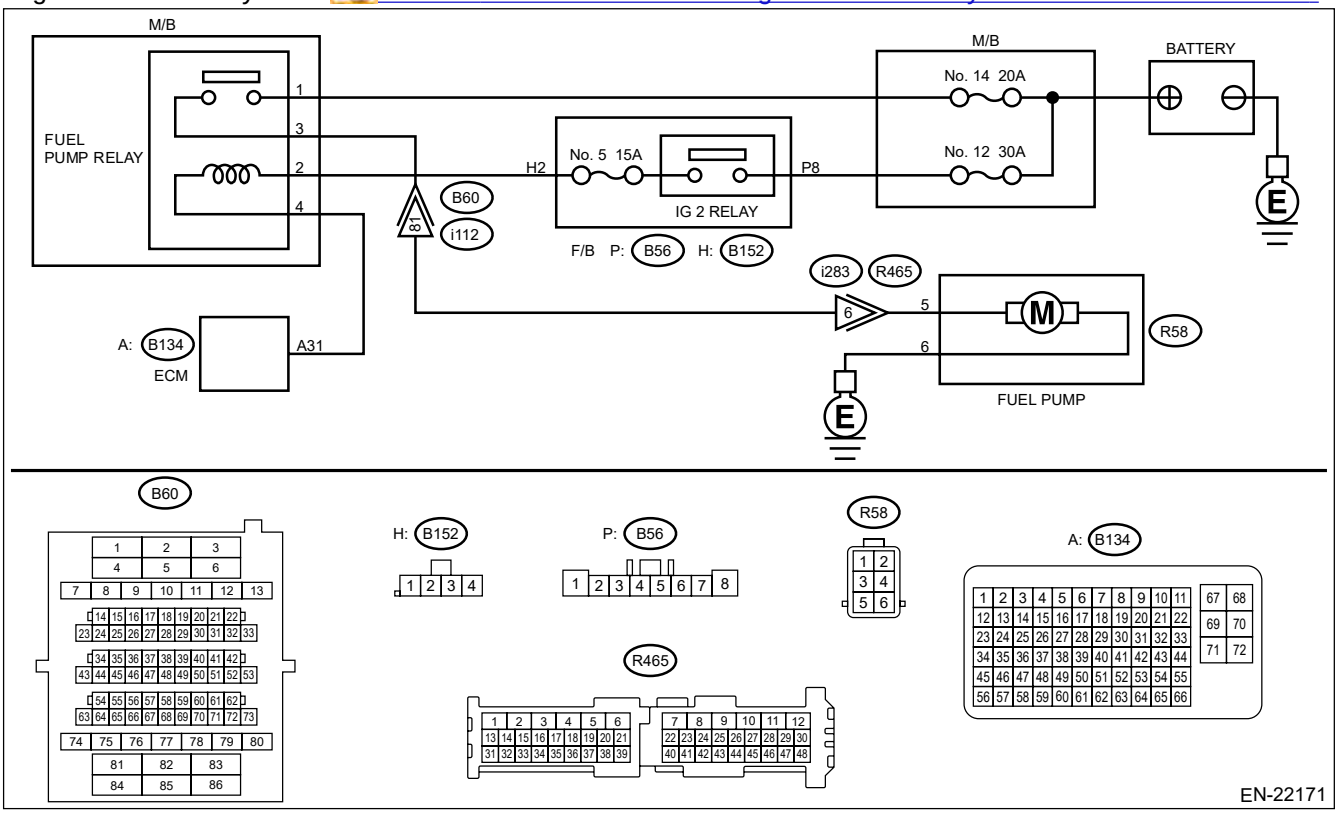
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

FUEL PUMP CIRCUIT

Wiring diagram:

Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

Use the check board when measuring the ECM terminal voltage and resistance. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.

1. CHECK OPERATING SOUND OF FUEL PUMP.

Check if the fuel pump operates for two seconds when turning the ignition switch to ON.

Note:

Fuel pump operation can be executed using the Subaru Select Monitor. Refer to "Active Test" for the procedures. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Active Test.

Does the fuel pump emit operating sound?

Yes	Check the fuel injector circuit. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon>FUEL INJECTOR CIRCUIT.
No	Go to 2.

2. CHECK GROUND CIRCUIT OF FUEL PUMP.

1. Turn the ignition switch to OFF.
2. Remove the fuel pump access hole lid.
3. Disconnect the connector from fuel pump.
4. Measure the resistance of harness between fuel pump and chassis ground.

Connector & terminal

(R58) No. 6 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Go to 3.
No	Repair the open circuit in harness between fuel pump connector and chassis ground terminal.

3. CHECK POWER SUPPLY TO FUEL PUMP.

1. Turn the ignition switch to ON.
2. Measure the voltage of power supply circuit between fuel pump connector and chassis ground.
   Connector & terminal
   (R58) No. 5 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Replace the fuel pump. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Pump.
No	Go to 4.

4. CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between fuel pump connector and fuel pump relay connector.
   Connector & terminal
   (R58) No. 5 — M/B (fuel pump relay) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Open circuit in harness between fuel pump connector and fuel pump relay connector** • **Poor contact of coupling connector**

5. CHECK HARNESS BETWEEN FUEL PUMP AND FUEL PUMP RELAY CONNECTOR.

Measure the resistance of harness between fuel pump connector and fuel pump relay connector.

Connector & terminal

(R58) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit to ground in harness between fuel pump connector and fuel pump relay connector.

6. CHECK FUEL PUMP RELAY.

1. Remove the fuel pump relay.
2. Connect the battery to the fuel pump relay terminals No. 2 and No. 4.
3. Measure the resistance between fuel pump relay terminals.

Terminals

No. 1 — No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Replace the fuel pump relay. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Pump Relay.

7. CHECK HARNESS BETWEEN ECM AND FUEL PUMP RELAY CONNECTOR.

1. Disconnect the connector from ECM.
2. Measure the resistance of harness between ECM connector and fuel pump relay connector.
   Connector & terminal
   (B134) No. 31 — M/B (fuel pump relay) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the open circuit of harness between ECM connector and fuel pump relay connector.

8. CHECK POWER SUPPLY OF FUEL PUMP RELAY.

1. Turn the ignition switch to ON.
2. Measure the voltage between fuel pump relay connector and chassis ground.
   Connector & terminal
   M/B (fuel pump relay) No. 1 (+) — Chassis ground (–):
   M/B (fuel pump relay) No. 3 (+) — Chassis ground (–):

Is the voltage 10 V or more?

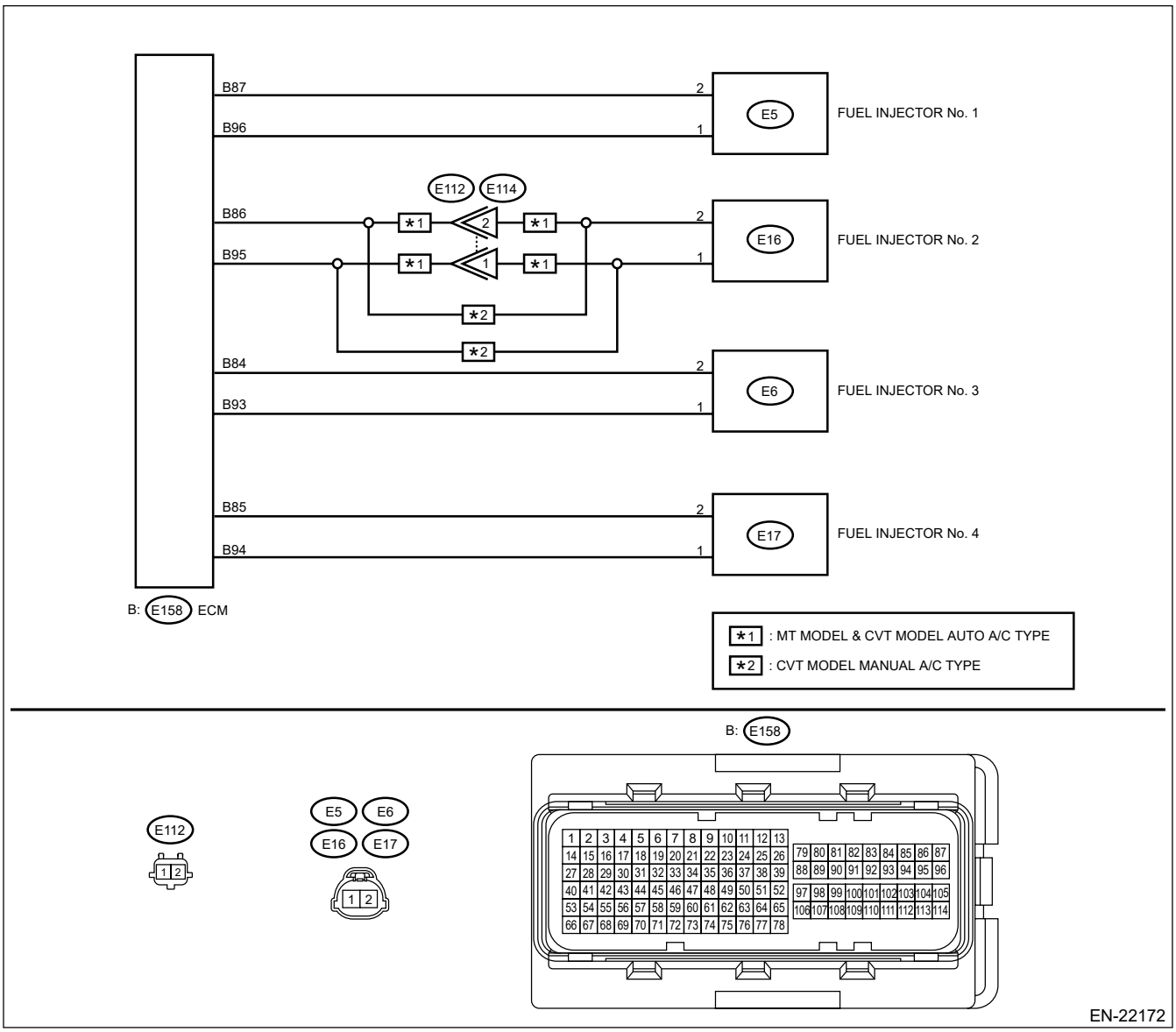
Yes	Repair the poor contact of ECM connector.
No	Repair the open or ground short in the harness of power supply circuit.

Note:
After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

FUEL INJECTOR CIRCUIT

Wiring diagram:
Engine Electrical System Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



Caution:

- **Check or repair only faulty parts.**
- **Use the check board when measuring the ECM terminal voltage and resistance.** **Ref. to ENGINE (DIAGNOSTICS)(H4DO)>General Description>PREPARATION TOOL > HOW TO USE CHECK BOARD.**

1. CHECK OPERATION OF EACH FUEL INJECTOR.

While cranking the engine, check each fuel injector emits operating sound. Use a sound scope or attach a screwdriver to the injector to listen to sounds for this check.

Does the fuel injector emit operating sound?

Yes	Check the fuel pressure. Ref. to MECHANICAL(H4DO)>Fuel Pressure>INSPECTION.
No	Go to 2.

2. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (OPEN).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from ECM.
3. Disconnect the connector from fuel injector.
4. Measure the resistance of harness between ECM and fuel injector connector.

Connector & terminal

#1 (E158) No. 96 — (E5) No. 1:
#1 (E158) No. 87 — (E5) No. 2:
#2 (E158) No. 95 — (E16) No. 1:
#2 (E158) No. 86 — (E16) No. 2:
#3 (E158) No. 93 — (E6) No. 1:
#3 (E158) No. 84 — (E6) No. 2:
#4 (E158) No. 94 — (E17) No. 1:
#4 (E158) No. 85 — (E17) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between the ECM and fuel injector connector.

3. CHECK HARNESS BETWEEN ECM AND FUEL INJECTOR (SHORT TO GROUND).

Measure the resistance between fuel injector connector and engine ground.

Connector & terminal

#1 (E5) No. 1 — Engine ground:
#1 (E5) No. 2 — Engine ground:
#2 (E16) No. 1 — Engine ground:
#2 (E16) No. 2 — Engine ground:
#3 (E6) No. 1 — Engine ground:
#3 (E6) No. 2 — Engine ground:
#4 (E17) No. 1 — Engine ground:
#4 (E17) No. 2 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit to ground in harness between ECM and fuel injector connector.

4. CHECK EACH FUEL INJECTOR.

Check each fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector>INSPECTION.

Is the check result OK?

Yes	Go to 5.
No	Replace the faulty fuel injector. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Injector.

5. CHECK FOR POOR CONTACT.

Check for poor contact of ECM connector.

Is there poor contact of ECM connector?

Yes	Repair the poor contact of ECM connector.
No	Check using “Diagnostics with Phenomenon”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon.

Note:

After the faulty parts are repaired or replaced, perform the final check in Basic Diagnostic Procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

ENGINE (DIAGNOSTICS)(H4DO) > Diagnostics with Phenomenon

CHECK BRAKE OVERRIDE SYSTEM

Caution:

Perform this test in a location where the driving can be checked safely, while paying sufficient attention to the vicinity. While driving, the traffic laws and regulations such as speed limit must always be observed.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector.
3. Turn the ignition switch to ON.
4. Turn the Subaru Select Monitor 4 to ON.
5. Check the DTCs of the system that may be output.



Note:

Read the DTC using Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Is there any DTC output?

Yes	Check DTC using “Diagnostic Trouble Code (DTC)”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
No	Go to 2.

2. READ DATA MONITOR.

Using the Subaru Select Monitor, read the value in [Stop Light Switch].



Note:
For detailed operation procedures, refer to the “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Is the value of [Stop Light Switch] changed to ON/OFF on the data monitor?

Yes	Go to 3.
No	Check the stop light circuit.

3. CHECK BRAKE PEDAL.

Check the brake pedal. Ref. to BRAKE>Brake Pedal>INSPECTION.

Is the brake pedal OK?

Yes	Go to 4.
No	Adjust or replace the brake pedal. Ref. to BRAKE>Brake Pedal.

4. READ DATA MONITOR.

Using the Subaru Select Monitor, read the values in [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] when operating the accelerator pedal from fully closed to fully open.

Data Monitor

Note:

For detailed operation procedures, refer to the “Data Monitor”. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

Does the values of [Accelerator Pedal Pos.#1] and [Accelerator Pedal Pos.#2] continuously change?

Yes	Go to 5.
No	Replace the throttle opening angle sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Throttle Body.

5. READ DATA MONITOR.

Using Subaru Select Monitor, read the value of [Vehicle Speed] when driving at a constant speed of 16.1 Km/h (10 MPH) or 64.4 Km/h (40 MPH).

Data Monitor

Caution:

During the driving test, the traffic laws and regulations such as speed limit must always be observed.

Note:

Use of the data storage function of Subaru Select Monitor allows the data during driving to be stored. The stored data can be checked after the driving.

Does the value of [Vehicle Speed] change widely?

Yes	Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

Note:

- **The value of [Accel. Opening Angle] on the data monitor normally changes according to the value of accelerator sensor No. 1 voltage ratio. (The values do not become the same. For values, refer to Data monitor.)**
- **Even if the voltage difference between [Accel. Opening Angle] and the accelerator sensor No. 1 is large and the value of [Accel. Opening Angle] is not consistent, the corresponding control can be considered to be activated if the value of the accelerator sensor No. 1 voltage ratio is consistent. (Use of the data storage function of Subaru Select Monitor 4 allows the data during driving to be stored. The stored data can be checked after the driving.)**
- **When the customer complains of deceleration feeling when he/she intentionally depresses both the accelerator pedal and the brake pedal, advise them not to depress both pedals. (Example: operating the brake pedal with the left foot while operating the accelerator pedal)**

OPERATION

1. HOW TO USE GENERAL SCAN TOOL

1. Prepare a scan tool (general scan tool) required by SAE J1978.
2. Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side). Ref. to COMMON(diag)>Data Link Connector.
3. Using the general scan tool, call up each data. General scan tool functions consist of:
   (1) MODE $01: Current powertrain diagnostic data
   (2) MODE $02: Powertrain freeze frame data
   (3) MODE $03: Emission-related powertrain DTC
   (4) MODE $04: Clear/Reset emission-related diagnostic information
   (5) MODE $06: Request on-board monitoring test results for intermittently monitored systems
   (6) MODE $07: Initial emission-related powertrain DTC
   (7) MODE $08: Request control for on-board system, test, and component
   (8) MODE $09: Request vehicle information
   (9) MODE $0A Emission-related DTC (with Permanent Status)
4. Read out the data according to repair procedures. (For detailed operation procedures, refer to the general scan tool operation manual.)

Note:

For details concerning DTC, refer to Diagnostic Trouble Code (DTC). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

2. MODE $01 (CURRENT POWERTRAIN DIAGNOSTIC DATA)

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.

A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
$01	Number of emission-related powertrain DTC, and malfunction indicator light status and diagnosis support information	—
$03	Fuel system control status	—
$04	Calculated engine load value	%
$05	Engine coolant temperature	Celsius
$06	Short term fuel trim	%
$07	Long term fuel trim	%
$0B	Intake manifold absolute pressure	kPa
$0C	Engine speed	rpm
$0D	Vehicle speed	MPH
$0E	Ignition timing advance	°
$0F	Intake air temperature	Celsius
$10	Intake air amount	g/s
$11	Throttle valve opening angle	%
$13	Air fuel ratio sensor	—
$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (bank 1 sensor 2)	V and %
$1C	Supporting OBD system	—
$1F	Elapsed time after starting the engine	sec
$21	Travel distance after the malfunction indicator light illuminates	miles
$24	A/F value and A/F sensor output voltage (bank 1 sensor 1)	— and V
$2C	Target EGR	%
$2D	EGR deviation	%
$2E	Evaporative purge	%
$2F	Fuel level	%
$30	Number of warm ups after DTC clear	Time
$31	Travel distance after DTC clear	miles
$33	Barometric pressure	kPa
$34	A/F value and A/F sensor current (bank 1 sensor 1)	— and mA
$3C	Catalyst temperature #1	Celsius
$41	Diagnostic monitor of each drive cycle	—
$42	ECM power voltage	V
$43	Absolute load	%
$44	A/F target lambda	—
$45	Relative throttle opening angle	%

PID	Data	Unit of measure
$46	Ambient temperature	Celsius
$47	Absolute throttle opening angle 2	%
$49	Absolute accelerator opening angle 1	%
$4A	Absolute accelerator opening angle 2	%
$4C	Target throttle opening angle	%
$4D	Engine operating time while malfunction indicator lit	min
$4E	Elapsed time after DTC clear	min
$51	Fuel used	—
$53	ELCM pressure	kPa
$56	Learning value of sub feedback compensation level	—
$5A	Relative accelerator opening angle	%
$5C	Engine oil temperature	Celsius
$65	Neutral status	—

Note:

Refer to general scan tool manufacturer's operation manual to access current powertrain diagnostic data (MODE $01).

3. MODE $02 (POWERTRAIN FREEZE FRAME DATA)

Refer to data denoting the operating condition when trouble is detected by on-board diagnosis system. A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
$02	DTC that caused freeze frame data to be stored	—
$03	Fuel system control status	—
$04	Calculated engine load value	%
$05	Engine coolant temperature	Celsius
$06	Short term fuel trim (bank 1 sensor 1)	%
$07	Long term fuel trim (bank 1 sensor 1)	%
$0B	Intake manifold absolute pressure	kPa
$0C	Engine speed	rpm
$0D	Vehicle speed	MPH
$0E	Ignition timing advance	°
$0F	Intake air temperature	Celsius
$10	Intake air amount	g/s
$11	Throttle valve opening angle	%
$13	Air fuel ratio sensor	—
$15	Oxygen sensor output voltage and short term fuel trim associated with oxygen sensor (bank 1 sensor 2)	V and %
$1C	Supporting OBD system	—

PID	Data	Unit of measure
$1F	Elapsed time after starting the engine	sec
$2C	Target EGR	%
$2D	EGR deviation	%
$2E	Evaporative purge	%
$2F	Fuel level	%
$33	Barometric pressure	kPa
$42	ECM power voltage	V
$43	Absolute load	%
$44	A/F target lambda	—
$45	Relative throttle opening angle	%
$46	Ambient temperature	Celsius
$47	Absolute throttle opening angle 2	%
$49	Absolute accelerator opening angle 1	%
$4A	Absolute accelerator opening angle 2	%
$4C	Target throttle opening angle	%
$51	Applicable fuel	—
$65	Neutral status	—

Note:

Refer to general scan tool manufacturer's operation manual to access freeze frame data (MODE $02).

4. MODE $03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to "Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

5. MODE $04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION)

Refer to the mode used to clear or reset emission-related diagnostic information.

Note:

- **Refer to the manufacturer's operation manual for the general scan tool to clear the emission-related diagnostic information (MODE $04).**
- **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**

6. MODE $06 (REQUEST ON-BOARD MONITORING TEST RESULTS FOR INTERMITTENTLY MONITORED SYSTEMS)

OPERATION

1. On [Start] display, select [OBD requirements to which vehicle or engine is certified].
2. On [Main Menu] display, select [Each System] and then [Enter].
3. On [Select System] display, select [ECM-Engine Control] and then select [Enter].
4. On [Select Function] display, select [On-board monitor test result].

Refer to diagnostic value of troubleshooting and data of test limit indicated on the support data bit

sequence table. A list of the support data is shown in the table 1.

Note:

- **Subaru Select Monitor**
  For detailed operation procedures, refer to “Application help”.
- **General scan tool**
  For detailed operation procedures, refer to the general scan tool operation manual.
- **Some items are not displayed according to the specifications.**
- **List of measurement items for each DTC of “VVT monitor bank 1” and “VVT monitor bank 2”**
  A list of the measurement items is shown in the table 2. (This is used for a check of on-board monitor test result of DTC P000A, P000B, P000C, P000D, P0011, P0014, P0016, P0017, P0018, P0019, P0021 and P0024).

Table 1

OBDMID	TID	SID	Diagnostic item
$01	$84	$1E	A/F sensor range failure (Bank 1 Sensor 1)
	$85	$1E	
	$86	$20	A/F sensor response failure (Bank 1 Sensor 1)
	$91	$20	
	$92	$10	
	$A3	$20	
	$A4	$10	
	$AC	$10	
	$AD	$10	
	$AE	$10	
	$AF	$10	
	$CD	$20	
	$CF	$20	
	$DF	$10	
$02	$07	$0B	Oxygen sensor drop failure (Bank 1 Sensor 2)
	$08	$0B	
	$A5	$0B	
	$05	$10	Oxygen sensor response failure (Bank 1 Sensor 2)
	$06	$10	
	$BD	$10	
	$D1	$10	Oxygen sensor delay failure (Bank 1 Sensor 2)
	$D2	$01	
$21	$89	$20	Catalyst deterioration diagnosis (Bank 1)
$31	$8A	$FD	EGR system diagnosis
$35	$8B	$9D	VVT monitor bank 1
	$8C	$9D	
	$D3	$9D	
	$D5	$9D	
$36	$8B	$9D	VVT monitor bank 2

OBDMID	TID	SID	Diagnostic item
	$8C	$9D	
	$D3	$9D	
	$D5	$9D	
$3C	$C1	$FE	Evaporative emission control system (0.02 inch leak)
	$C2	$FE	
	$C3	$FE	
	$C4	$FE	
	$C5	$FE	
	$C6	$35	
	$C7	$FE	
	$C8	$FE	
	$C9	$FE	
	$CA	$FE	
$3D	$E2	$FE	ELCM purge flow
$41	$9B	$14	A/F sensor heater characteristics failure (Bank 1 Sensor 1)
$42	$E5	$14	A/F sensor heater characteristics
$A1	$0B	$24	Misfire monitoring (all cylinders)
	$0C	$24	
$A2	$0B	$24	Misfire monitoring (#1 cylinder)
	$0C	$24	
$A3	$0B	$24	Misfire monitoring (#2 cylinder)
	$0C	$24	
$A4	$0B	$24	Misfire monitoring (#3 cylinder)
	$0C	$24	
$A5	$0B	$24	Misfire monitoring (#4 cylinder)
	$0C	$24	

Table 2

OBDMID	TID	SID	Diagnostic item		
$35	$8B	$9D	+	Intake	VVT monitor bank 1 (RH)
	$8C	$9D	–		
	$8D	$9D	+	Exhaust	
	$8E	$9D	–		
$36	$8B	$9D	+	Intake	VVT monitor bank 2 (LH)
	$8C	$9D	–		
	$8D	$9D	+	Exhaust	
	$8E	$9D	–		

7. MODE $07 (INITIAL EMISSION-RELATED POWERTRAIN DTC)

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

8. MODE $08 (REQUEST CONTROL FOR ON-BOARD SYSTEM, TEST, AND COMPONENT)

Perform “Active Test” of the on-board system.

9. MODE $09 (REQUEST VEHICLE INFORMATION)

Refer to the data of the vehicle specification.

10. MODE $0A (EMISSION-RELATED DTC (WITH PERMANENT STATUS))

Refer to “Diagnostic Trouble Code (DTC)” for information about data denoting emission-related DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

TRANSMISSION (DIAGNOSTICS)

TM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Transmission Control Module (TCM) I/O Signal
6. Inspection Mode
7. AT OIL TEMP Warning Light Display
8. AWD Warning Light Display
9. Diagnostic Procedure for Subaru Select Monitor Communication
10. Data Monitor
11. Freeze Frame Data
12. Active Test
13. Learning Control
14. Diagnostic Trouble Code (DTC)
15. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
16. Diagnostic Procedure without Diagnostic Trouble Code (DTC)
17. Diagnostics with Phenomenon
18. General Scan Tool

TRANSMISSION (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the interview check list. Ref. to TRANSMISSION (DIAGNOSTICS)>Check List for Interview.
2. Before performing diagnostics, check the following items which might affect CVT problems.
   - General inspection Ref. to TRANSMISSION (DIAGNOSTICS)>General Description>INSPECTION.
   - Disconnection of harness connector
   - Visual check for harness damage
   - Oil leakage
   - Stall speed test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Stall Test.
   - Secondary pressure test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure (Line Pressure) Test.
   - Transfer clutch pressure test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transfer Clutch Pressure Test.
   - Time lag test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Time Lag Test.
   - Road test Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Road Test.
   - Inhibitor switch Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

Is the check result OK?

Yes	Go to 2.
No	Repair the items which may be affecting the CVT trouble.

2. CHECK AT OIL TEMP LIGHT.

Turn the ignition switch to ON and wait for at least 2 seconds.

Does the AT OIL TEMP light illuminate?

Yes	Go to 3.
No	Check the AT OIL TEMP light.

3. CHECK AT OIL TEMP LIGHT.

Start the engine and wait for 2 seconds or more.

Does the AT OIL TEMP light blink?

Yes	Go to 4.
No	Go to 5.

4. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Note:

If the communication function of Subaru Select Monitor cannot be executed normally, check the communication circuit. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>COMMUNICATION FOR INITIALIZING IMPOSSIBLE.

Are any DTCs displayed?

Yes	Record the DTC, time stamp and freeze frame data. Go to 6.
No	Go to 5.

5. PERFORM GENERAL DIAGNOSTICS.

1. Inspect using “Diagnostic Procedure without Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure without Diagnostic Trouble Code (DTC).
2. Inspect using “Diagnostics with Phenomenon”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostics with Phenomenon.
3. Perform the road test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Road Test.
4. Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Go to 6.
No	Finish the diagnosis.

6. PERFORM DIAGNOSIS.

1. Inspect by referring to “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
   Note:
   For the DTC table, refer to “Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair the trouble cause.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Inspect by referring to “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
No	Finish the diagnosis.

TRANSMISSION (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following items when a problem has occurred.

Note:

Use copies of this page for interviewing customers.

Customer's name			
Date of purchase			
Date of repair			
Transmission model	Transmission	Chassis number	
Odometer reading	km (miles)		
Frequency	❑ Continuous ❑ Intermittent (times/day)		
Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others ( )		
Place	❑ Highland ❑ Suburbs ❑ Inner city ❑ Uphill ❑ Downhill ❑ Rough road ❑ Others ( )		
Ambient air temperature	❑ Hot ❑ Warm ❑ Cool ❑ Cold		
Vehicle speed	km/h (MPH)		
AT OIL TEMP light	❑ Blinks continuously	❑ Does not blink	
Select lever position	❑ P ❑ R ❑ N ❑ D ❑ Manual mode		
Driving condition	❑ Not affected ❑ At racing ❑ While decelerating	❑ At starting ❑ While accelerating ❑ While turning (❑ RH / ❑ LH)	❑ While idling ❑ When cruising (Vehicle speed km/h) ❑ Immediately after starting the engine
Manual mode	❑ ON ❑ OFF		
Symptoms	❑ Vehicle does not move (❑ Any position ❑ Particular position)		
	❑ Vehicle does not move (no load racing condition as in N range)		
	❑ Vehicle does not move (engine speed does not increase, felt as stall condition)		
	❑ Noise or vibration (Specifically:)		
	❑ Shock felt at N → D selection (seconds after shifting, when engine cold or after warm-up)		
	❑ Shock felt at N → R selection (seconds after shifting, when engine cold or after warm-up)		
	❑ Shifting is wrong (Specifically:)		
	❑ Shock or judder during driving		

- ❑ Fails to accelerate
- ❑ Engine speed increases abruptly during driving
- ❑ Shock or judder during standing start
- ❑ Select lever does not move
- ❑ Others

( )

TRANSMISSION (DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

2. CONTROL MODULE

1. The TCM connector is waterproof. When measuring the TCM connector terminal voltage, or the resistance between the terminals, use the check board.
2. When measuring the voltage or resistance of individual sensors, use a tapered pin with a diameter of 0.6 mm (0.024 in) or less and touch it to the tip of terminal. Never insert the tapered pin into the terminal because it deforms inside which may lead to malfunction.

   Caution:

   If a taper pin or the like has been inserted into the connector terminal, replace the connector.

TRANSMISSION (DIAGNOSTICS) > General Description

INSPECTION

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

2. TRANSMISSION GROUND

Make sure that the ground terminal bolt is tightened securely.

3. OPERATION OF SELECT LEVER

Make sure there is no noise, dragging or contact pattern in each select lever range.

Warning:

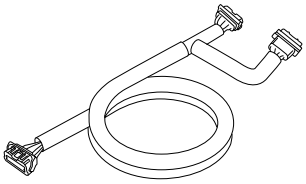
Stop the engine while checking operation of the select lever.

TRANSMISSION (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

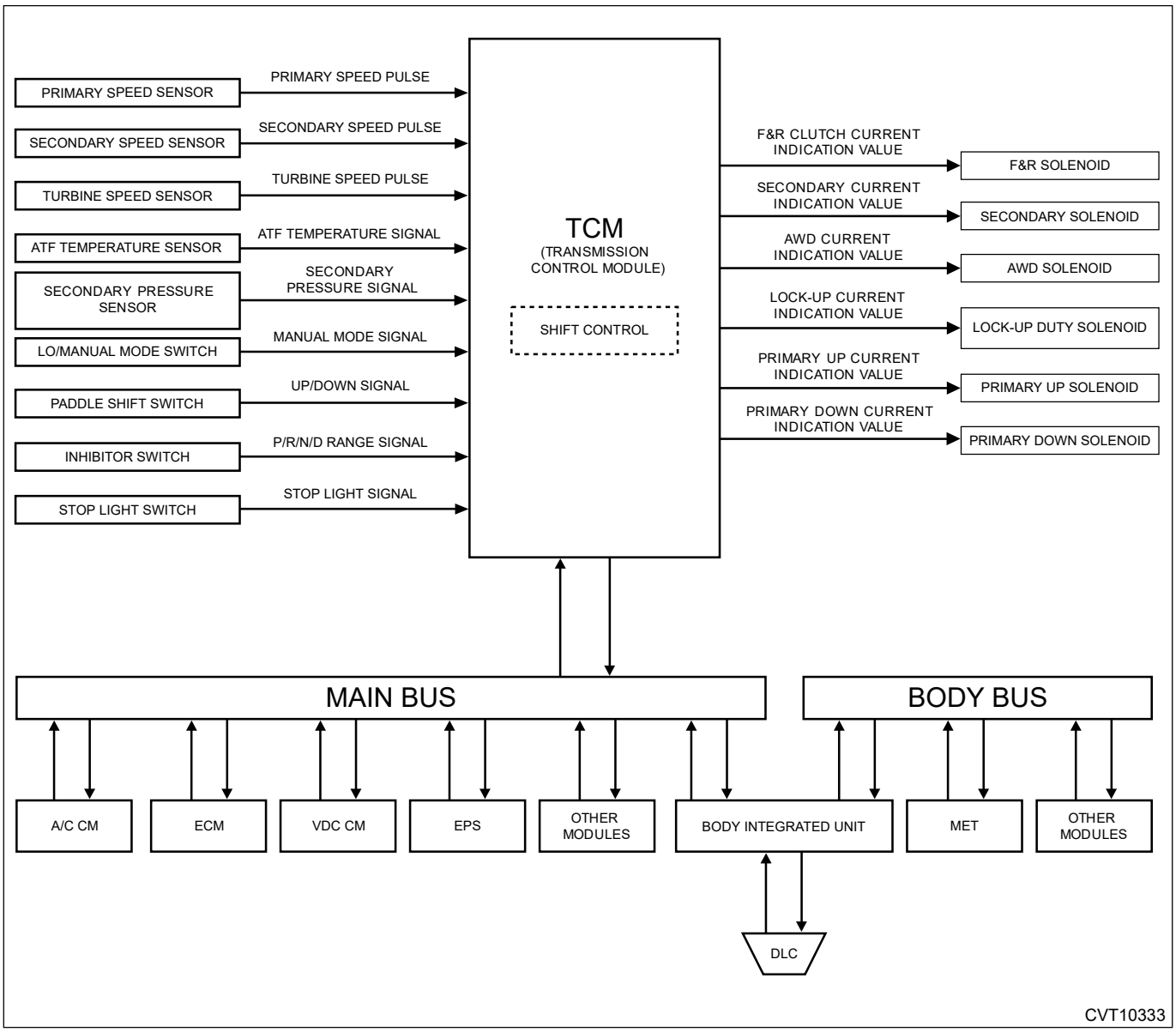
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to “Application help”.**
 ST18460AA040	18460AA040	CHECK BOARD	Used for measuring voltage and resistance of TCM terminals.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

TRANSMISSION (DIAGNOSTICS) > General Description

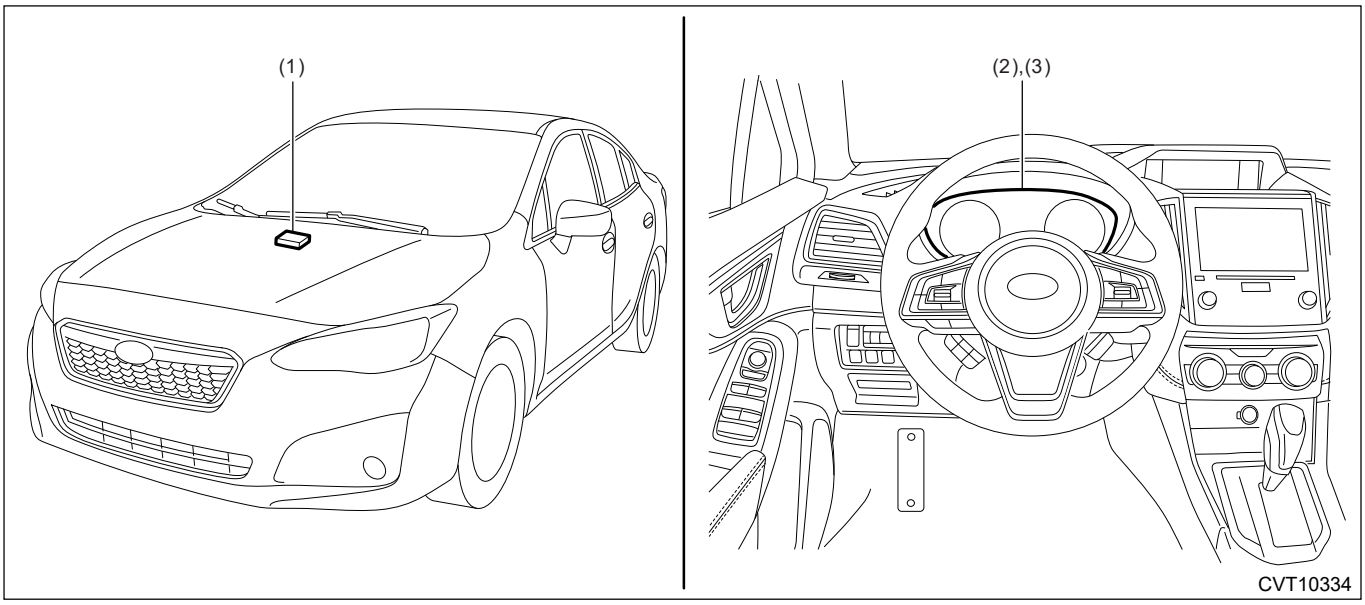
SYSTEM BLOCK DIAGRAM


PRIMARY SPEED SENSOR
PRIMARY SPEED PULSE
SECONDARY SPEED SENSOR
SECONDARY SPEED PULSE
TURBINE SPEED SENSOR
TURBINE SPEED PULSE
ATF TEMPERATURE SENSOR
ATF TEMPERATURE SIGNAL
SECONDARY PRESSURE SENSOR
SECONDARY PRESSURE SIGNAL
LO/MANUAL MODE SWITCH
MANUAL MODE SIGNAL
PADDLE SHIFT SWITCH
UP/DOWN SIGNAL
INHIBITOR SWITCH
P/R/N/D RANGE SIGNAL
STOP LIGHT SWITCH
STOP LIGHT SIGNAL
TCM
(TRANSMISSION CONTROL MODULE)
SHIFT CONTROL
F&R CLUTCH CURRENT INDICATION VALUE
F&R SOLENOID
SECONDARY CURRENT INDICATION VALUE
SECONDARY SOLENOID
AWD CURRENT INDICATION VALUE
AWD SOLENOID
LOCK-UP CURRENT INDICATION VALUE
LOCK-UP DUTY SOLENOID
PRIMARY UP CURRENT INDICATION VALUE
PRIMARY UP SOLENOID
PRIMARY DOWN CURRENT INDICATION VALUE
PRIMARY DOWN SOLENOID
MAIN BUS
BODY BUS
A/C CM
ECM
VDC CM
EPS
OTHER MODULES
BODY INTEGRATED UNIT
MET
OTHER MODULES
DLC
CVT10333

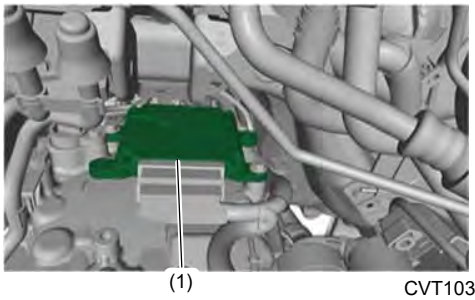
TRANSMISSION (DIAGNOSTICS) > Electrical Component Location

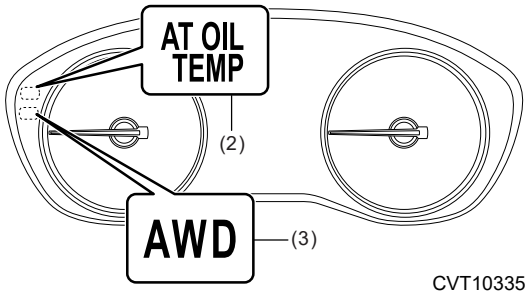
LOCATION

1. CONTROL MODULE•WARNING LIGHT

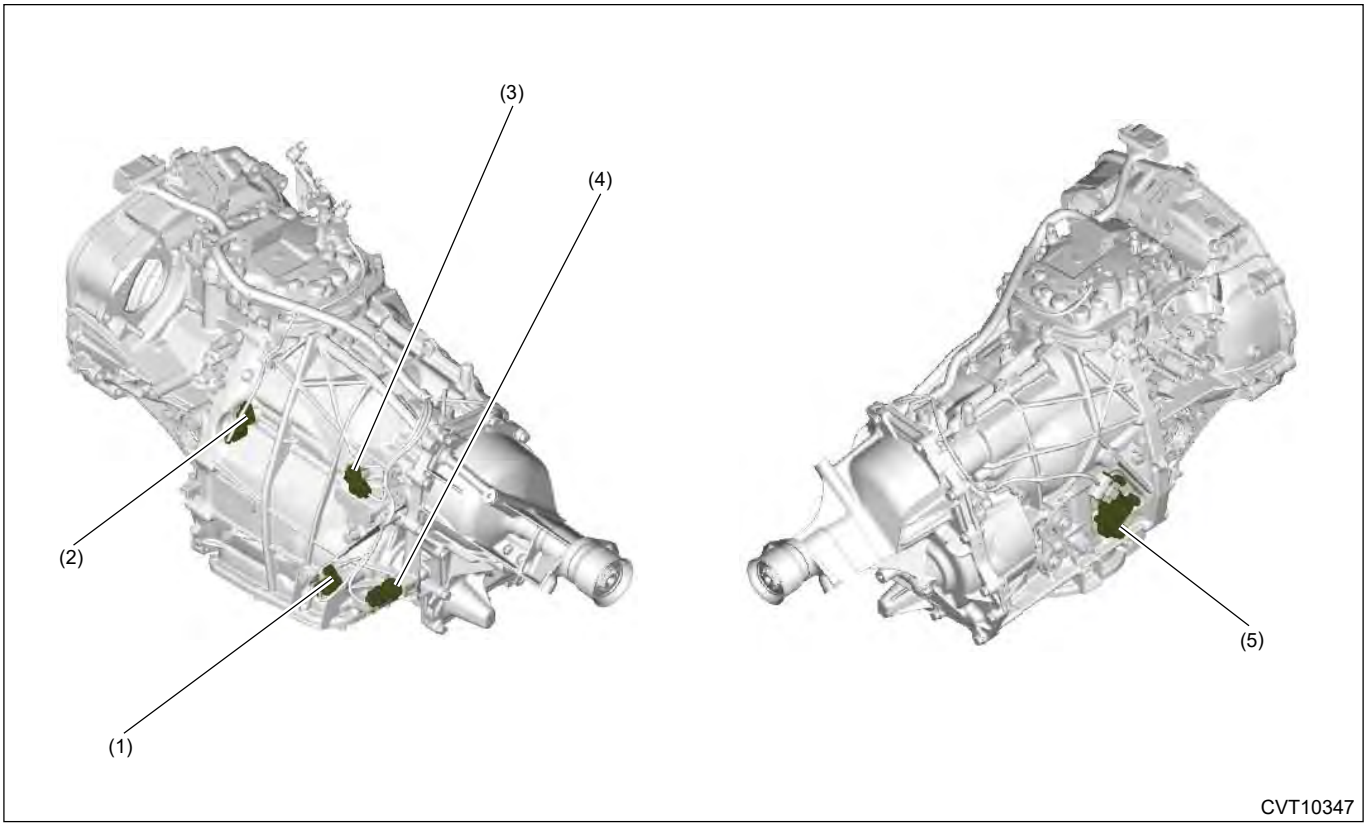


(1) TCM (2) AT OIL TEMP light (3) AWD light





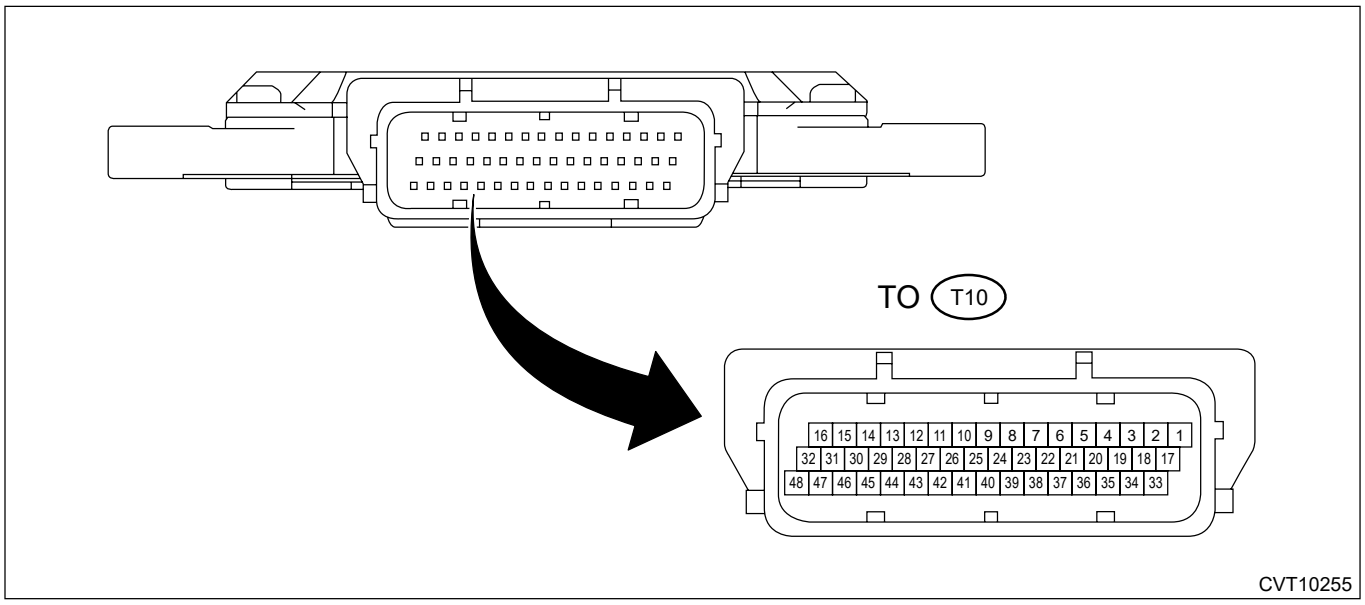
2. SENSOR•INHIBITOR SWITCH



(1) Secondary speed sensor
(2) Turbine speed sensor
(3) Primary speed sensor
(4) Secondary pressure sensor
(5) Inhibitor switch

TRANSMISSION (DIAGNOSTICS) > Transmission Control Module (TCM) I/O Signal

ELECTRICAL SPECIFICATION



Caution:

Use the check board when measuring the TCM terminal.

Note:

Measure after warming up.

Terminal No.	Remarks	Measuring condition	Standard	Note
1 ←→ Chassis ground	ATF temperature sensor GND	Always	0 V	—
2 ←→ Chassis ground	Secondary pressure sensor GND	Always	0 V	—
5 ←→ 2	Secondary pressure sensor	Ignition switch ON, engine OFF	Approx. 0.5 V (0 MPa)	Value increases with increase of engine load. (0.5 — 4.5 V)
		Engine ON and idle	Approx. 1.0 V (1.0 MPa)	
6 ←→ 1	ATF temperature sensor	ATF temperature at 20°C (68°F)	Approx. 2.5 V	Approx. 2.5 kΩ
		ATF temperature at 80°C (176°F)	Approx. 0.7 V	Approx. 330 Ω
8 ←→ 26 or 42	Main power supply	Ignition switch ON	Battery voltage	—
12 ←→ 26 or 42	Turbine speed sensor	Engine ON, “P” or “N” range	0 or 5 V	Refer to the waveform (sensor)
13 ←→ 26 or 42	Secondary speed sensor	While driving	0 or 5 V	Refer to the waveform (sensor)

Terminal No.	Remarks	Measuring condition	Standard	Note
14 ←→ 26 or 42	Primary speed sensor	While driving	0 or 5 V	Refer to the waveform (sensor)
15 ←→ 26 or 42	Lock-up duty solenoid	Lock-up ON	Refer to the waveform (solenoid (5))	Resistance: Approx. 10 — 13.5Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
16 ←→ 26 or 42	F&R solenoid	Engine ON	Refer to the waveform (solenoid (1))	Resistance: Approx. 4 — 6 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
18 ←→ 26 or 42	Manual mode DOWN switch	Ignition switch ON, Manual mode down switch ON	0 V	—
		Ignition switch ON, Manual mode down switch OFF	Battery voltage	
19 ←→ 26 or 42	Manual mode UP switch	Ignition switch ON, Manual mode up switch ON	0 V	—
		Ignition switch ON, Manual mode up switch OFF	Battery voltage	
20 ←→ 26 or 42	Lo/Manual mode switch	Ignition switch ON, L range switch/Manual mode switch ON	0 V	—
		Ignition switch ON, L range switch/Manual mode switch OFF	Battery voltage	
24 ←→ 26 or 42	Main power supply	Ignition switch ON	Battery voltage	—
26 ←→ Chassis ground	GND	Always	0 V	—
29 ←→ 26 or 42	Stop light switch	Stop light switch ON	Battery voltage	—
		Stop light switch OFF	0 V	

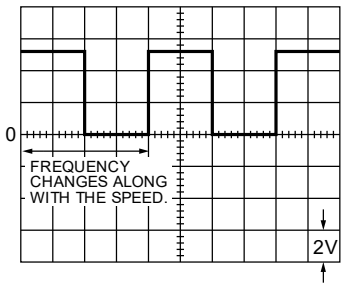
Terminal No.	Remarks	Measuring condition	Standard	Note
30 ←→ 26 or 42	Primary DOWN solenoid	Engine ON, while DOWN shifting	Refer to the waveform (solenoid (4))	Resistance: Approx. 10 — 13.5Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
32 ←→ 26 or 42	Secondary solenoid	Engine ON	Refer to the waveform (solenoid (2))	Resistance: Approx. 5 — 7 Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
33 ←→ 2	Secondary pressure sensor power supply output	Ignition switch ON	5 V	—
34 ←→ 26 or 42	Backup power supply	Always	Battery voltage	—
35 ←→ 26 or 42	D range switch	Ignition switch ON, D range	0 V	—
		Ignition switch ON, other than D range	Battery voltage	
36 ←→ 26 or 42	N range switch	Ignition switch ON, N range	0 V	—
		Ignition switch ON, other than N range	Battery voltage	
37 ←→ 26 or 42	R range switch	Ignition switch ON, R range	0 V	—
		Ignition switch ON, other than R range	Battery voltage	
38 ←→ 26 or 42	P range switch	Ignition switch ON, P range	0 V	—
		Ignition switch ON, other than P range	Battery voltage	
40 ←→ 26 or 42	Main power supply	Ignition switch ON	Battery voltage	—
41 ←→ 26 or 42	Ignition switch	Ignition switch ON	Battery voltage	—
42 ←→ Chassis ground	GND	Always	0 V	—

Terminal No.	Remarks	Measuring condition	Standard	Note
43	CAN communication line (+)	—	—	—
44	CAN communication line (−)	—	—	—
47 ←→ 26 or 42	Primary UP solenoid	Engine ON, while UP shifting	Refer to the waveform (solenoid (3))	Resistance: Approx. 10 — 13.5Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
48 ←→ 26 or 42	AWD solenoid	Engine ON, “P” or “N” range	Refer to the waveform (solenoid (6))	Resistance: Approx. 2 — 4.5Ω Resistance value at 20°C (68°F). Value is higher as the temperature increase.
		Engine ON, “D” range, brake ON	Refer to the waveform (solenoid (7))	

TRANSMISSION (DIAGNOSTICS) > Transmission Control Module (TCM) I/O Signal

WAVEFORM

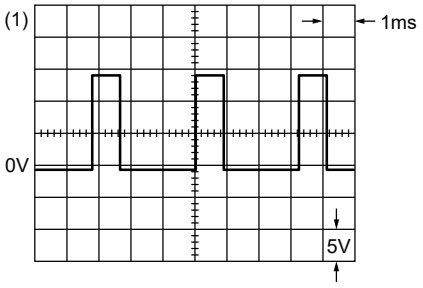
1. SENSOR



AT-04690

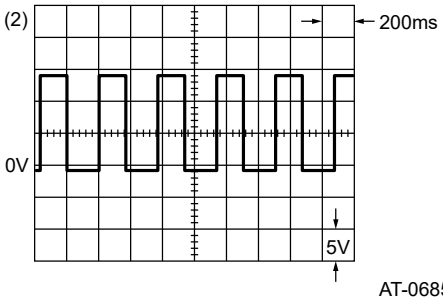
2. SOLENOID

(1)



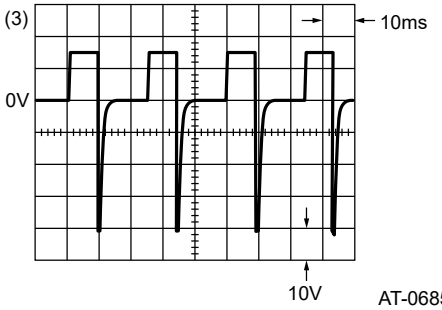
AT-06855

(2)



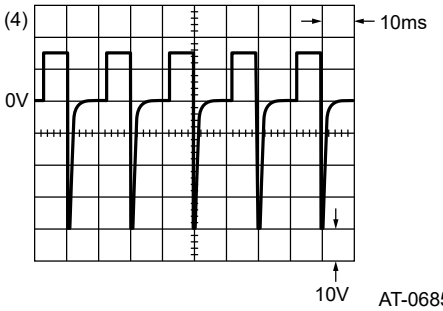
AT-06851

(3)



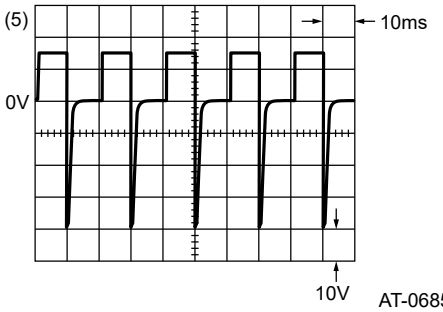
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(4)



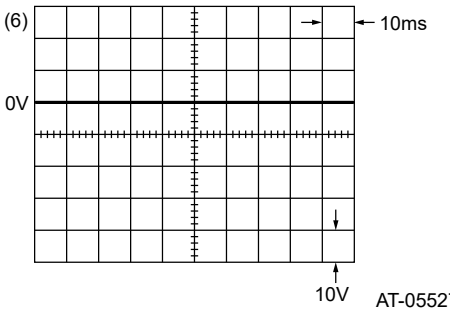
AT-06850

(5)



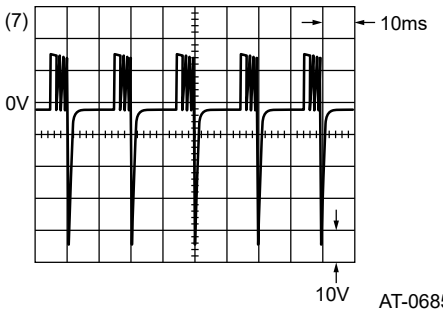
AT-06853

(6)

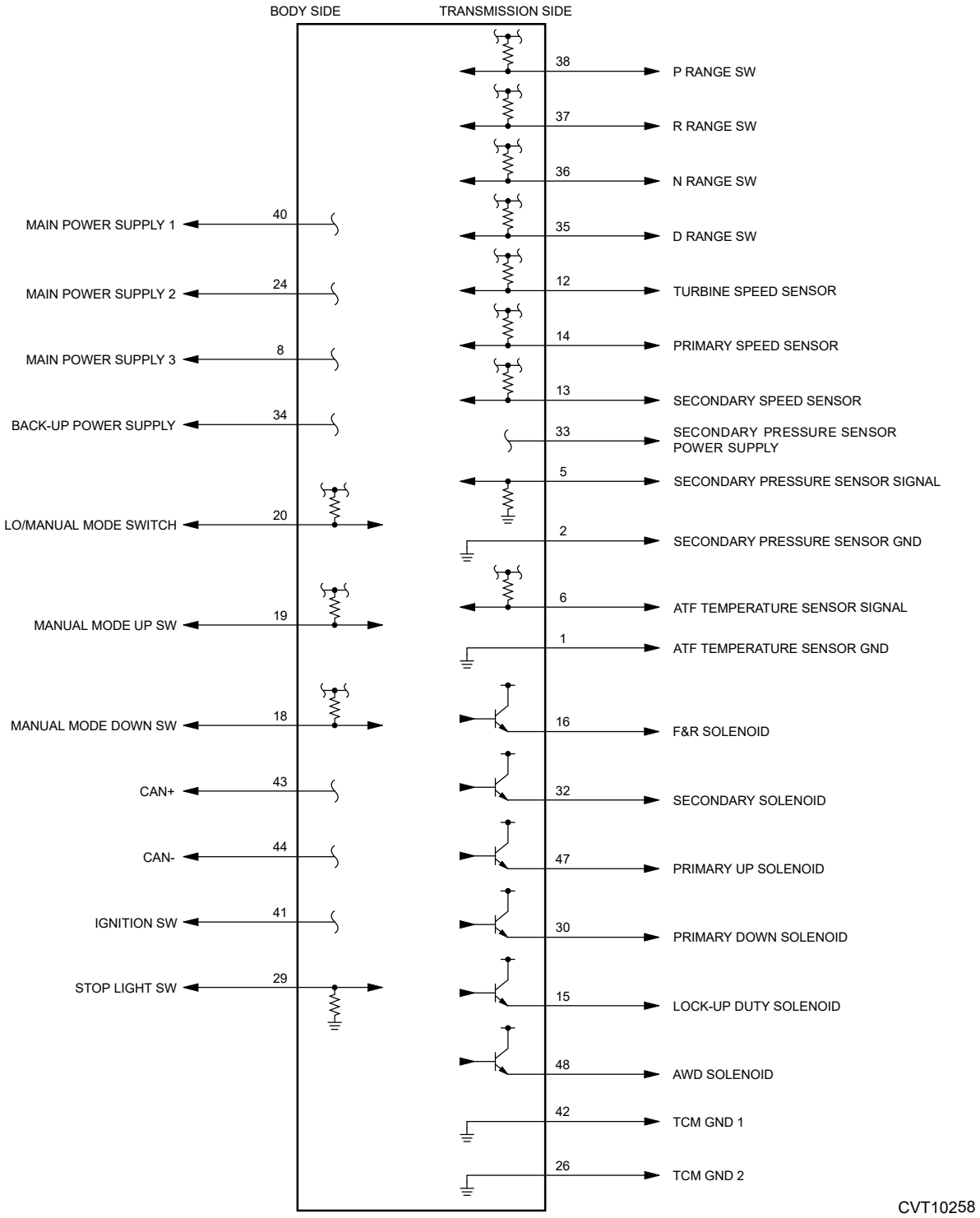


AT-05527

(7)



AT-06854


BODY SIDE
TRANSMISSION SIDE
38
P RANGE SW
37
R RANGE SW
36
N RANGE SW
40
MAIN POWER SUPPLY 1
35
D RANGE SW
24
MAIN POWER SUPPLY 2
12
TURBINE SPEED SENSOR
8
MAIN POWER SUPPLY 3
14
PRIMARY SPEED SENSOR
34
BACK-UP POWER SUPPLY
13
SECONDARY SPEED SENSOR
33
SECONDARY PRESSURE SENSOR POWER SUPPLY
5
SECONDARY PRESSURE SENSOR SIGNAL
20
LO/MANUAL MODE SWITCH
2
SECONDARY PRESSURE SENSOR GND
6
ATF TEMPERATURE SENSOR SIGNAL
19
MANUAL MODE UP SW
1
ATF TEMPERATURE SENSOR GND
18
MANUAL MODE DOWN SW
16
F&R SOLENOID
43
CAN+
32
SECONDARY SOLENOID
44
CAN-
47
PRIMARY UP SOLENOID
41
IGNITION SW
30
PRIMARY DOWN SOLENOID
29
STOP LIGHT SW
15
LOCK-UP DUTY SOLENOID
48
AWD SOLENOID
42
TCM GND 1
26
TCM GND 2
CVT10258

TRANSMISSION (DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. PREPARATION FOR THE INSPECTION MODE

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. After performing the diagnostics and clearing memory, check that no DTC remains.

Note:

Perform the inspection mode after warming up the engine except when the ATF temperature at engine start is specified.

2. INSPECTION MODE A

DTC	Item	Condition
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	—
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	—
P0613	TCM PROCESSOR	—
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	Perform inspection mode A twice
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW	—
P0842	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW	—
P0843	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH	—
P0890	TCM POWER RELAY SENSE CIRCUIT LOW	—
P0962	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW	—
P0963	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH	—
P0966	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW	—
P0967	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH	—
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	—
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	After inspection mode A is done, perform inspection mode C

Diagnostic procedure:

1. Start the engine.
2. Depress the brake pedal and move the select lever to each range at an interval of five seconds.

Note:

Move the select lever in the following order: “P” → “R” → “N” → “D” → “N” → “R” → “P”.

3. INSPECTION MODE B

DTC	Item	Condition
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—

Diagnostic procedure:

1. Start the engine under condition that ATF temperature is at 20°C (68°F) or below.
2. Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)

Note:

Repeat two or more driving cycles in this driving pattern.

4. INSPECTION MODE C

DTC	Item	Condition
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	—
P0716	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE	—
P0717	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL	—
P0970	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW	—
P0971	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH	—
P0973	SHIFT SOLENOID "A" CONTROL CIRCUIT LOW	—
P0974	SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH	—
P0976	SHIFT SOLENOID "B" CONTROL CIRCUIT LOW	—
P0977	SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH	—
P2746	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE	—
P2747	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL	—
P2750	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE	—

DTC	Item	Condition
P2751	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL	—
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	After inspection mode A is done, perform inspection mode C
P2764	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW	—

Diagnostic procedure:

1. Start the engine.
2. Accelerate slowly to a legal speed, and then decelerate slowly to a stop.

5. INSPECTION MODE D

DTC	Item	Condition
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH	—
P0730	INCORRECT GEAR RATIO	—
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0747	PRESSURE CONTROL SOLENOID "A" STUCK ON	Perform inspection mode D twice
P0751	SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0752	SHIFT SOLENOID "A" STUCK ON	Perform inspection mode D twice
P0756	SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0757	SHIFT SOLENOID "B" STUCK ON	Perform inspection mode D twice
P0776	PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P0841	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE	—
P0961	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE	—
P0965	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE	—
P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF	Perform inspection mode D twice
P2758	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT	Perform inspection mode D twice

DTC	Item	Condition
	STUCK ON	

Diagnostic procedure:

1. Start the engine.
2. Drive in any driving pattern for 20 minutes. (Include driving at a constant legal speed (for 20 seconds) at least once.)

6. INSPECTION MODE E

DTC	Item	Condition
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	—
P162B	WARNING INDICATOR REQUEST	—
U0073	CONTROL MODULE COMMUNICATION BUS OFF	—
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	—
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	—
U1235	LOST COMMUNICATION WITH EyeSight	—
U1433	INVALID DATA RECEIVED FROM EyeSight	—

Diagnostic procedure:

1. Start the engine.

7. INSPECTION MODE F

DTC	Item	Condition
P0705	TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)	—

Diagnostic procedure:

1. Start the engine.
2. Depress the brake pedal and move the select lever to each range at an interval of five seconds.
   Note:
   Move the select lever in the following order: “P” → “R” → “N” → “D”.
3. Maintain the engine speed to 2,000 rpm for five seconds or more.

8. INSPECTION MODE G

DTC	Item	Condition
P0708	TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH	—

Diagnostic procedure:

1. Start the engine.
2. Drive for three seconds at 16 km/h (10 MPH).
   Note:
   Drive in “D” range and “R” range.

9. INSPECTION MODE H

DTC	Item	Condition
P0719	BRAKE SWITCH "B" CIRCUIT LOW	—
P0724	BRAKE SWITCH "B" CIRCUIT HIGH	—
P0951	AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE	—
P1603	ENGINE STALL HISTORY	—
P170A	L-RANGE SWITCH	—

Diagnostic procedure:

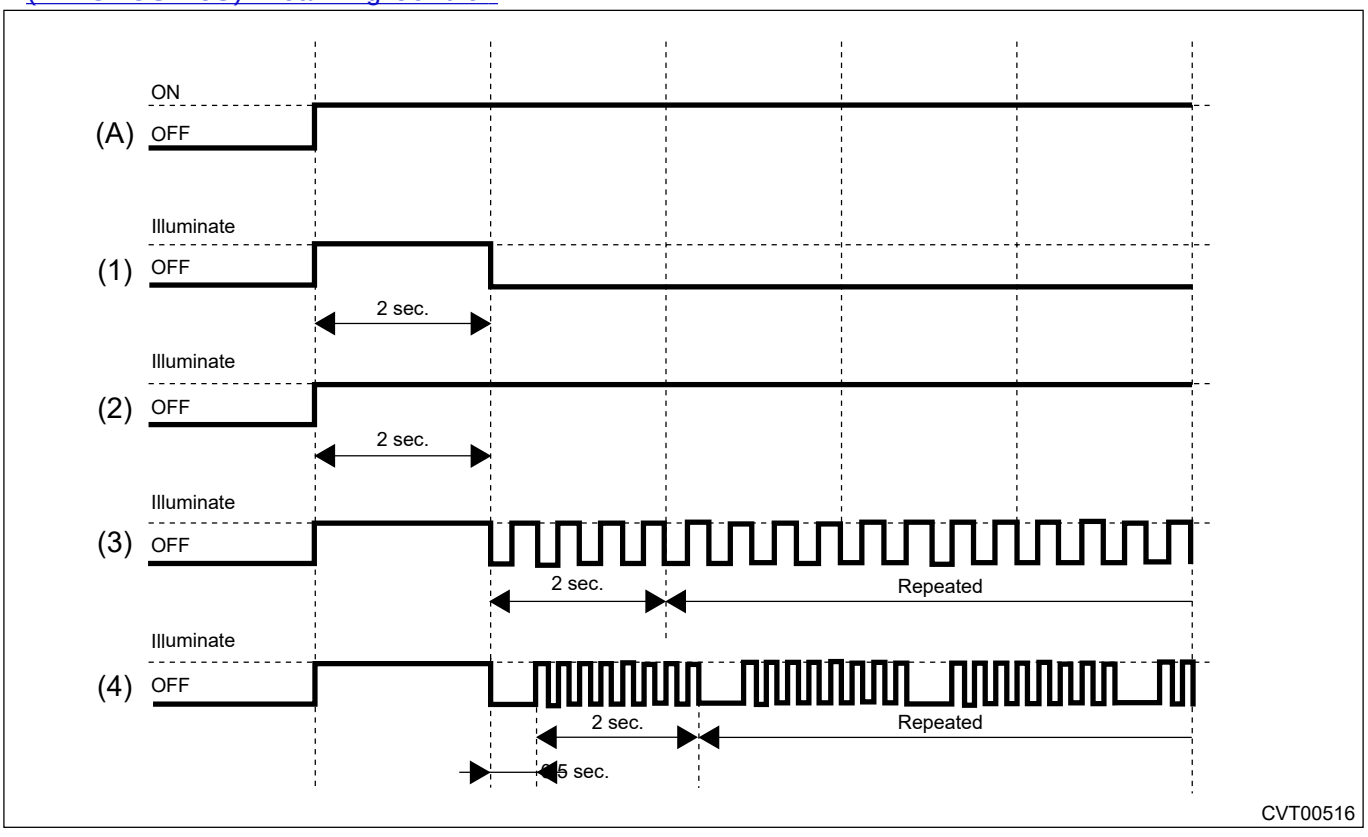
1. Start the engine.
2. Operate the stop light switch or the manual mode switch.
   Note:
   Drive in “D” range and “R” range.
3. Read the data of the stop light switch or the manual mode switch using the Subaru Select Monitor. Or measure the terminal voltage.

TRANSMISSION (DIAGNOSTICS) > AT OIL TEMP Warning Light Display

OPERATION

The AT OIL TEMP light illuminates or blinks, when the ATF temperature is high and malfunction occurs in CVT.

- At normal condition
  After turning the ignition switch to ON, illuminates for 2 seconds then goes off.
- When ATF temperature is high
  AT OIL TEMP light illuminates when the ATF temperature is abnormally high with the ignition switch ON.
- When malfunction is detected
  AT OIL TEMP light blinks at 2 Hz when the TCM detects the malfunction of CVT with the ignition switch ON. In this case, inspect using “Diagnostic Procedure with Diagnostic Trouble Code (DTC)”. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
- When AT learning is not finished
  AT OIL TEMP light repeats “Blinking at 4 Hz → Turning OFF” when the AT learning is not completed with the ignition switch ON. In this case, perform the “Learning”. Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control.



(A) Ignition switch condition

(1) At normal condition

(2) When ATF temperature is high

(3) When malfunction is detected

(4) When AT learning is not finished

If the AT OIL TEMP light does not illuminate, or illumination patterns are not as above, check the AT OIL TEMP light circuit. Ref. to TRANSMISSION (DIAGNOSTICS)>AT OIL TEMP Warning Light

Display > INSPECTION.

TRANSMISSION (DIAGNOSTICS) > AT OIL TEMP Warning Light Display

INSPECTION

Diagnosis:

- CAN communication is lost with the combination meter.
- Combination meter malfunction
- TCM is in special control mode.
- AT learning is not finished.

Trouble symptom:

- When the ignition switch is turned to ON, the AT OIL TEMP light does not illuminate.
- AT OIL TEMP light remains lit after engine start.

1. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC U0155 or U0423 displayed?

Yes	Perform the self-diagnosis of combination meter.
No	Go to 2.

2. CHECK DTC.

Check the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are DTCs other than U0155 and U0423 displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Using the Subaru Select Monitor, read DTC of combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK AT OIL TEMP LIGHT.

Turn the ignition switch to ON.

Does AT OIL TEMP light illuminate and then go off in 2 seconds?

Yes	Go to 5.
No	Perform the self-diagnosis of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

5. CHECK AT OIL TEMP LIGHT.

Start the engine.

Does the AT OIL TEMP light go off?

Yes	Current condition is normal. Go back to Basic Diagnostic Procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 6.

6. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 7.

7. CHECK TCM.

Read the data of [ATF Temperature Lamp] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is “ON” displayed?

Yes	Go to 8.
No	Perform the self-diagnosis of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

8. CHECK TCM.

Read the data of [ATF Temp.] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is the display 130°C or more?

Yes	Go to 9.
No	Check the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

9. CHECK ATF TEMPERATURE.

Check the real fluid temperature from the transmission case surface temperature.

Does it clearly differ from the [ATF Temp.] displayed on Subaru Select Monitor?

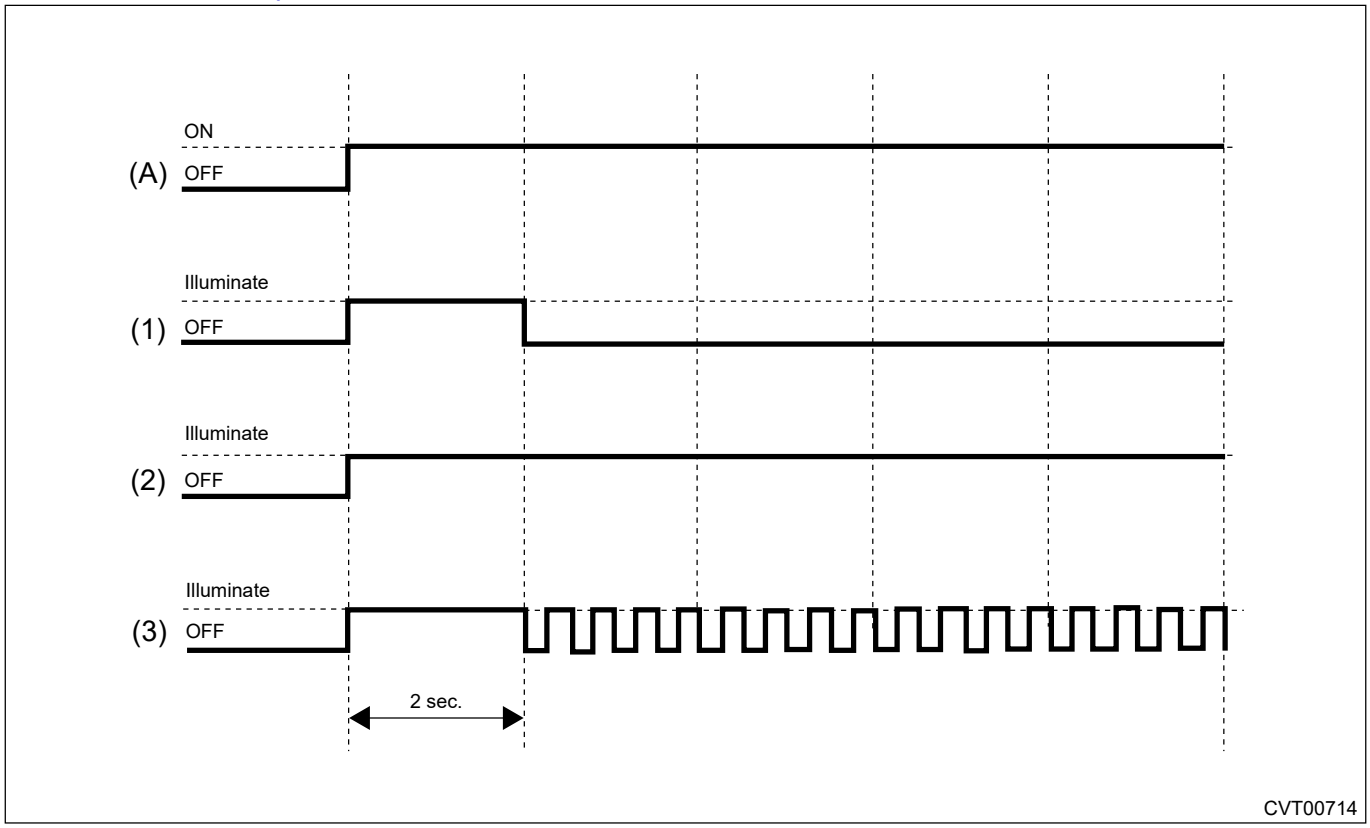
Yes	Perform the diagnosis according to DTC P0712. If there is no problem, perform the diagnosis according to DTC P0713.
No	When ATF temperature can be judged as actually high, perform the diagnosis again after the ATF temperature lowers.

TRANSMISSION (DIAGNOSTICS) > AWD Warning Light Display

OPERATION

AWD light illuminates or blinks, when the AWD is in special control condition and AWD has malfunction.

- At normal condition
  After turning the ignition switch to ON, illuminates for 2 seconds then goes off.
- When FF mode is selected
  AWD light illuminates when the AWD ON/OFF switching function is set to “FF mode” with the ignition switch ON.
- When malfunction is detected
  AWD light blinks at 2 Hz when any of the following malfunctions are detected with the ignition switch ON.
  1. When tire with different diameter is installed, or air pressure of any of four wheels is excessively low.
  2. When “Rear differential inspection mode” is judged as NG Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.



(A) Ignition switch condition

(1) At normal condition (2) When FF mode is selected (3) When malfunction is detected

If the AWD light does not illuminate, or illumination patterns are not as above, check the AWD light circuit. Ref. to TRANSMISSION (DIAGNOSTICS)>AWD Warning Light Display>INSPECTION.

TRANSMISSION (DIAGNOSTICS) > AWD Warning Light Display

INSPECTION

Diagnosis:

- CAN communication is lost with the combination meter.
- Combination meter malfunction
- TCM is in AWD special control mode.

Trouble symptom:

- When the ignition switch is turned to ON, the AWD light does not illuminate.
- AWD light remains lit after engine start.
- AWD light is blinking immediately after engine start.

1. CHECK TCM.

Check the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0155 or U0423 displayed?

Yes	Perform the self-diagnosis of combination meter.
No	Go to 2.

2. CHECK TCM.

Check the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are DTCs other than U0155 and U0423 displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Using the Subaru Select Monitor, read DTC of combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK AWD LIGHT.

Turn the ignition switch to ON.

Does AWD light illuminate and then go off in 2 seconds?

Yes	Go to 5.
No	Perform the self-diagnosis of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

5. CHECK AWD LIGHT.

Start the engine.

Does the AWD light go off?

Yes	Current condition is normal. Go back to Basic Diagnostic Procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 6.

6. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 7.

7. CHECK AWD LIGHT.

Check the display of AWD light after engine start.

Is AWD light illuminating?

Yes	Go to 9.
No	Go to 8.

8. CHECK AWD LIGHT.

Check the display of AWD light after engine start.

Is AWD light blinking at 2 Hz?

Yes	Go to 10.
No	Go to 11.

9. CHECK AWD ON/OFF SWITCHING FUNCTION.

Using the Subaru Select Monitor, select [AWD ON/OFF switching mode] on the [Work Support] display, and check the current mode. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>AWD ON/OFF Switching Mode.

Is the message [At present, the vehicle is in AWD. Switch to FF?] displayed?

Yes	Go to 11.
No	If the message [At present, the vehicle is in FF. Switch to AWD?] is displayed, select “OK”, and switch to AWD mode.

10. CHECK REAR DIFFERENTIAL.

Using the Subaru Select Monitor, select and check [Rear differential inspection mode] on the [Work Support] display. Ref. to DIFFERENTIALS>Rear Differential Inspection Mode.

Does AWD light go off after inspection is finished normally?

Yes	Current condition is normal. Go back to Basic Diagnostic Procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 11.

11. CHECK COMBINATION METER.

Perform the self-diagnosis of combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is there any trouble with the combination meter?

Yes	Repair the combination meter.
No	Check the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Diagnosis:

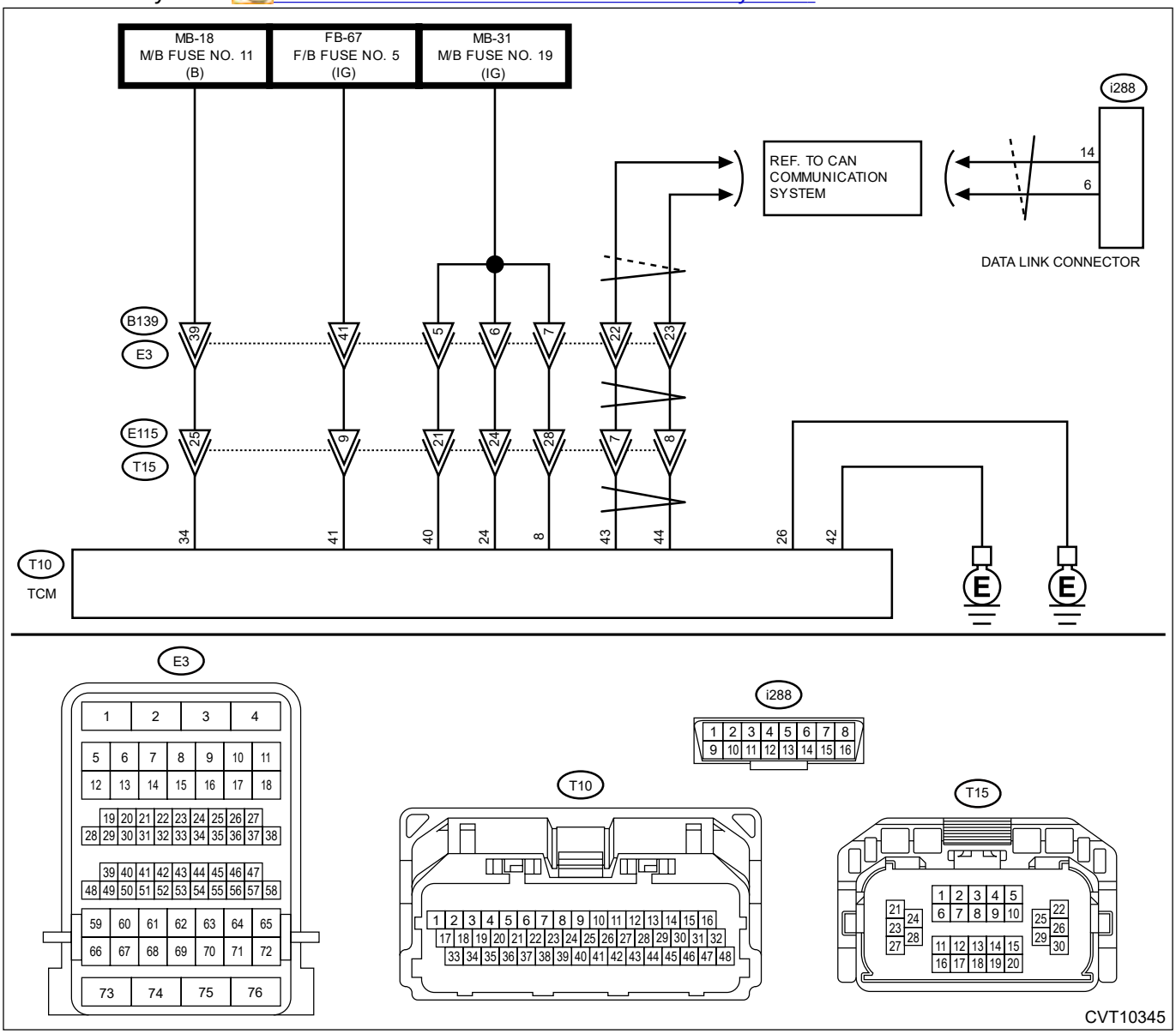
Defective harness connector

Trouble symptom:

Subaru Select Monitor communication failure

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



Caution:

Use the check board when measuring the TCM terminal voltage and resistance.

1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes	Go to 2.
No	Turn the ignition switch to ON, and select the transmission using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes	Go to 3.
No	Charge or replace the battery.

3. CHECK BATTERY TERMINAL.

Is there poor contact at battery terminal?

Yes	Replace or tighten the battery terminal.
No	Go to 4.

4. CHECK INSTALLATION OF TCM CONNECTOR.

Turn the ignition switch to OFF.

Is the TCM connector inserted into the TCM until the clamp locks?

Yes	Go to 5.
No	Insert the TCM connector to TCM.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.



Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to transmission system can be executed normally.

Is the [Select Function] screen displayed?

Yes	Check DTC of TCM. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Turn the ignition switch to ON. (Engine OFF)
4. Measure the ignition power supply voltage between TCM connector and chassis ground.

Connector & terminal

(T10) No. 8 (+) — Chassis ground (−):
(T10) No. 24 (+) — Chassis ground (−):
(T10) No. 34 (+) — Chassis ground (−):
(T10) No. 40 (+) — Chassis ground (−):
(T10) No. 41 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 8.
No	Repair the open circuit of harness between TCM and battery.

8. CHECK HARNESS CONNECTOR BETWEEN TCM AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Measure the resistance of harness between TCM connector and chassis ground.

Connector & terminal

(T10) No. 26 — Chassis ground:
(T10) No. 42 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the open circuit of the TCM ground circuit and poor contact of connector.

9. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of control module power supply, ground circuit and data link connector?

Yes	Repair the connector.
No	Check the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

TRANSMISSION (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor>LIST.**

TRANSMISSION (DIAGNOSTICS) > Data Monitor

LIST

Item	Remarks	Unit of measure
Engine Speed	Engine speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed calculated by the TCM using signals from the turbine speed sensor.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the secondary axis rotation speed.	km/h or MPH
ATF Temperature	Value calculated from the ATF temperature sensor output value. ATF temperature of the control valve section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Pulley Speed	Primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor.	rpm
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF

Item	Remarks	Unit of measure
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual Current	Actual current value of the secondary solenoid. TCM output value.	mA
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control Module Voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output value.	%
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range Signal	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF
R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
L-range	L range signal. Set to ON when the select lever is in the L range gate. TCM input value.	ON or OFF
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Tiptronic Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (−) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF

Item	Remarks	Unit of measure
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor.	V
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature warning light illuminates. TCM output value.	ON or OFF
AT learning	AT initial learning completion status. AT oil temperature warning light blinks at 4 Hz when the learning is not completed. TCM output value.	Completed or not completed
Ignition SW ON Count	Number of times the ignition is turned ON since the vehicle was manufactured.	time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original counter. “Common” means the integrated unit, and “Originally” means that the original counter is used.	—
Time Count	Shows the elapsed time after turning ON the ignition.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (line pressure) detected by the secondary pressure sensor.	MPa
System Voltage	Power supply voltage supplied to the backup power supply (≈ battery voltage).	V

TRANSMISSION (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Freeze Frame Data>LIST.**

TRANSMISSION (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Remarks	Unit of measure
Engine Speed	Engine speed signal transmitted from the ECM. Calculated from crankshaft position sensor signal. TCM input value.	rpm
Turbine Revolution Speed	Turbine rotation speed calculated by the TCM using signals from the turbine speed sensor.	rpm
Accel. Opening Angle	Accelerator pedal opening angle transmitted from the ECM. Value calculated from the accelerator pedal position sensor output. TCM input value.	%
Front Wheel Speed	Front wheel speed calculated from the secondary axis rotation speed.	km/h or MPH
ATF Temperature	Value calculated from the ATF temperature sensor output value. ATF temperature of the control valve section.	°C or °F
Lock Up Duty Ratio	Lock-up duty solenoid control duty ratio. TCM output value.	%
Transfer Duty Ratio	Transfer duty solenoid control duty ratio. TCM output value.	%
Actual Gear Ratio	Current gear ratio (rotation ratio of the pulley) calculated from the primary pulley axis rotation speed and the secondary pulley axis rotation speed.	—
Primary Pulley Speed	Primary pulley rotation speed calculated by the TCM using signals from the primary speed sensor.	rpm
Secondary Rev Speed	Secondary pulley rotation speed calculated by the TCM using signals from the secondary speed sensor.	rpm
Stop Light Switch	Stop light SW signal. Set to ON when the brake pedal is depressed. TCM input value.	ON or OFF

Item	Remarks	Unit of measure
Secondary Set Current	Value of the indicator current for controlling the secondary solenoid calculated by the TCM.	mA
Secondary Actual Current	Actual current value of the secondary solenoid. TCM output value.	mA
Commanded Forward & Reverse Linear Solenoid Current	Value of the indicator current for controlling the F&R linear solenoid calculated by the TCM.	mA
Actual Forward & Reverse Linear Solenoid Current	Actual current value of the F&R linear solenoid. TCM output value.	mA
Control Module Voltage	Battery voltage. TCM input value.	V
Primary UP Duty	Primary UP solenoid control duty ratio. TCM output value.	%
Primary DOWN Duty	Primary DOWN solenoid control duty ratio. TCM output value.	%
P Range Signal	Inhibitor SW signal. Set to ON when the select lever is in P range. TCM input value.	ON or OFF
R Range Signal	Inhibitor SW signal. Set to ON when the select lever is in R range. TCM input value.	ON or OFF
N Range	Inhibitor SW signal. Set to ON when the select lever is in N range. TCM input value.	ON or OFF
D Range	Inhibitor SW signal. Set to ON when the select lever is in D range. TCM input value.	ON or OFF
Shift step in Manu. mode	Gear shift position in manual mode or in multi-stage shifting mode. TCM output value.	—
Tiptronic Mode Switch	Manual mode SW signal. Set to ON when the select lever is in the manual shift gate. TCM input value.	ON or OFF
Up Switch	Status of the paddle shift up SW. Set to ON when the plus (+) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
Down Switch	Status of the paddle shift down SW. Set to ON when the minus (−) side of the steering wheel paddle shift is pulled. TCM input value.	ON or OFF
secondary pressure sensor voltage.	Voltage value after an analog/digital conversion is done inside the TCM using the signal input from the secondary pressure sensor.	V

Item	Remarks	Unit of measure
ATF Temp sensor voltage.	Sensor voltage value input from the ATF temperature sensor to the TCM. TCM input value.	V
Diagnosis Lamp	Transmission failure detection status. Set to ON when a failure is detected. AT oil temperature warning light blinks at 2 Hz. TCM output value.	ON or OFF
ATF Temperature Lamp	ATF high temperature detection status. Set to ON when high temperature is detected. ATF temperature warning light illuminates. TCM output value.	ON or OFF
Ignition SW ON Count	Number of times the ignition is turned ON since the vehicle was manufactured.	time
Count	Shows whether the elapsed time counter after turning ON the ignition switch is synchronized with the integrated unit (master unit) or an original counter. “Common” means the integrated unit, and “Originally” means that the original counter is used.	—
Time Count	Shows the elapsed time after turning ON the ignition.	ms
Actual Secondary Pressure	Pressure value applied to the secondary pulley cylinder (line pressure) detected by the secondary pressure sensor.	MPa
System Voltage	Power supply voltage supplied to the backup power supply (≈ battery voltage).	V

TRANSMISSION (DIAGNOSTICS) > Active Test

OPERATION

Caution:

- **Be sure to perform the active test while the engine is not running.**
- **After executing the active test, perform the memory clear. Ref. to COMMON(diag)>Clear memory.**

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select [Active Test].

TRANSMISSION (DIAGNOSTICS) > Active Test

LIST

Item	Remarks	Unit used in operation	Execution condition
F&R Clutch Solenoid	Forcibly operate the F&R clutch solenoid that controls engagement/disengagement states of the forward/reverse clutches. Check if it operates normally by listening to the operating sound.	100 mA	When all of the following conditions are met: • P range • Ignition switch is ON (engine stops) • Battery voltage 10.9 V or more
Secondary Solenoid	Forcibly operate the secondary solenoid that controls the pressure (line pressure) applied to the secondary pulley cylinder. Check if it operates normally by listening to the operating sound.	100 mA	
Primary Down Solenoid	Forcibly operate the primary DOWN solenoid that controls the pressure applied to the primary pulley cylinder to the decrease side. Check if it operates normally by listening to the operating sound.	10%	
Primary Up Solenoid	Forcibly operate the primary UP solenoid that controls the pressure applied to the primary pulley cylinder to the increase side. Check if it operates normally by listening to the operating sound.	10%	

Item	Remarks	Unit used in operation	Execution condition
AWD Solenoid	Forcibly operate the AWD solenoid that controls engagement/disengagement states of the transfer clutch. Check if it operates normally by listening to the operating sound.	10%	
Lock-Up Duty Solenoid	Forcibly operate the lockup duty solenoid that controls engagement/disengagement states of the lockup clutch. Check if it operates normally by listening to the operating sound.	10%	

TRANSMISSION (DIAGNOSTICS) > Learning Control

GENERAL DESCRIPTION

- Follow the messages displayed on the Subaru Select Monitor when working.
- When the following work is performed, perform learning work for the transmission.
  Replacement of TCM/Replacement or disassembly of transmission assembly/Replacement of control valve body/Clearing AT leaning value is executed.

TRANSMISSION (DIAGNOSTICS) > Learning Control

PROCEDURE

1. PREPARATION FOR LEARNING

1. Warm up or cool down until the ATF temperature displayed on the Subaru Select Monitor is 40 — 65°C (104 — 149°F).
2. After stopping the vehicle, shift the select lever to “P” range.
3. Fully apply the parking brake.
4. Lift up the vehicle.
   Caution:
   While working, be sure to keep the lower edge of the tires 30 cm or more above the ground as vehicle will vibrate.
5. Connect the Subaru Select Monitor to data link connector.
6. Turn the ignition switch to ON.
7. Turn off all switches causing an electrical load, such as headlights, A/C, seat heater and rear defogger, etc.

2. SIMPLE LEARNING

Note:
Simple learning is performed with the vehicle lifted, without actually running the vehicle.
Caution:
Do not turn the power of the Subaru Select Monitor OFF during work, and do not disconnect the data link connector.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Transmission].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [AT learning mode].
7. Follow the messages displayed on the screen when working.
8. When [AT learning normally ended.] is displayed, simple AT learning is completed.

Note:

- **If communication error occurs during learning, retry the “AT learning mode” from the beginning.**
- **If the message [Execute AT learning again after fixing troubles of the vehicle] is displayed during learning, select [OK] and display the DTC list. After repairing the locations indicated by the DTC, start the “AT learning mode” over from the beginning.**
- **When communication error occurs during learning, select lever does not shift occasionally. If select lever does not shift, turn the ignition switch to OFF before operating the select lever.**
- **If the message [AT learning ended abnormally. Try again from the beginning.] is displayed, start the “AT learning mode” over from the beginning.**

Display	Main causes for abnormal termination
[AT learning ended abnormally. Try again from the beginning.]	• Fault is detected during AT learning. • The accelerator pedal is depressed during AT learning. • An unspecified operation was performed during AT learning • ATF temperature becomes out of specification during AT learning. • Battery voltage is low. • The malfunction indicator light is lit. • Parking brake not applied strongly enough. • Brake pedal is not fully depressed. • Abnormal idle speed increase, etc.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to “COMMON (diag)”. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

TRANSMISSION (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Item	Reference
P0500	VEHICLE SPEED SENSOR "A" CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT.
P0604	INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR.
P0605	INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR.
P0613	TCM PROCESSOR	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0613 TCM PROCESSOR.
P062F	INTERNAL CONTROL MODULE EEPROM ERROR	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR.
P0705	TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0705 TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT).
P0708	TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0708 TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH.
P0711	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0711 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0712	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW.

Code	Item	Reference
P0713	TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH.
P0716	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0716 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE.
P0717	INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0717 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL.
P0719	BRAKE SWITCH "B" CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW.
P0724	BRAKE SWITCH "B" CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH.
P0730	INCORRECT GEAR RATIO	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0730 INCORRECT GEAR RATIO.
P0746	PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF.
P0747	PRESSURE CONTROL SOLENOID "A" STUCK ON	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON.
P0751	SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF.
P0752	SHIFT SOLENOID "A" STUCK ON	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0752 SHIFT SOLENOID "A" STUCK ON.
P0756	SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF.
P0757	SHIFT SOLENOID "B" STUCK ON	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0757 SHIFT SOLENOID "B" STUCK ON.
P0776	PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK

Code	Item	Reference
	OFF	OFF.
P0801	REVERSE INHIBIT CONTROL CIRCUIT/OPEN	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0801 REVERSE INHIBIT CONTROL CIRCUIT/OPEN.
P0841	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.
P0842	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0842 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW.
P0843	TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH.
P0890	TCM POWER RELAY SENSE CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW.
P0951	AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.
P0961	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE.
P0962	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0962 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW.
P0963	PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0963 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH.
P0965	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0965 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE.
P0966	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0966 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT

Code	Item	Reference
		LOW.
P0967	PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0967 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH.
P0970	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0970 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW.
P0971	PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH.
P0973	SHIFT SOLENOID "A" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0973 SHIFT SOLENOID "A" CONTROL CIRCUIT LOW.
P0974	SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0974 SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH.
P0976	SHIFT SOLENOID "B" CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0976 SHIFT SOLENOID "B" CONTROL CIRCUIT LOW.
P0977	SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH.
P1603	ENGINE STALL HISTORY	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.
P162B	WARNING INDICATOR REQUEST	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162B WARNING INDICATOR REQUEST.
P170A	L-RANGE SWITCH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P170A L-RANGE SWITCH.
P2530	IGNITION SWITCH RUN POSITION CIRCUIT	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT.
P2746	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2746 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE.

Code	Item	Reference
P2747	INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL.
P2750	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2750 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE.
P2751	INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL.
P2757	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2757 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF.
P2758	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON.
P2763	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2763 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH.
P2764	TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140

Code	Item	Reference
	MODULE	LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

DTC P0500 VEHICLE SPEED SENSOR "A" CIRCUIT

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
VDC does not operate.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

Read the DTC of VDC system using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Repair the poor contact of connector and harness between VDCCM&H/U and wheel speed sensor.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of VDC wheel speed sensor.
- Judge as NG when the wheel speed sensor normal status signal from VDC is cleared.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10.9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Vehicle speed (front wheel) from vehicle dynamics control (VDC) module	186.4 MPH or more

Malfunction Criteria	Threshold Value
Note: **The vehicle dynamics control detects malfunction if either of front wheel speed sensors does not output a signal and the other vehicle speed sensor output signal is above 7.46 MPH**	

Time needed for diagnosis: 2.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0604 INTERNAL CONTROL MODULE RANDOM ACCESS MEMORY (RAM) ERROR

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
TCM RAM is faulty.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P0604 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in RAM area of the TCM.
- Judge as NG when the consistency in the RAM area is lost.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
Error Correcting Code (ECC) check error	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0605 INTERNAL CONTROL MODULE READ ONLY MEMORY (ROM) ERROR

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
TCM ROM is faulty.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P0605 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction in ROM area of the TCM.
- Judge as NG when the consistency in the RAM area is lost.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
Error Correcting Code (ECC) check error	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0613 TCM PROCESSOR

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
TCM processor error
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P0613 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

- TCM processor error is detected.
- Judge as NG when control failure is caused by TCM processor error.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
TCM Processor error	Detect

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P062F INTERNAL CONTROL MODULE EEPROM ERROR

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
TCM EEPROM is faulty.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P062F displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Current condition is normal. Check for interference from noise, etc.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the malfunction in EEPROM area of the TCM.
- Judge as NG if an attempt to write to EEPROM area failed.

Diagnosis 2
- Detect the malfunction in EEPROM area of the TCM.
- Judge as NG when the consistency in the EEPROM area is lost.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1 12 V battery system voltage	9 V or more
Diagnosis 2 12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1 Writing-check (EEPROM)	Error
Diagnosis 2 Checksum (EEPROM)	Error

Time needed for diagnosis: Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0705 TRANSMISSION RANGE SENSOR "A" CIRCUIT (PRNDL INPUT)

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Shift characteristics are erroneous.
- The range position of the select lever and the position of shift indicator display do not match.

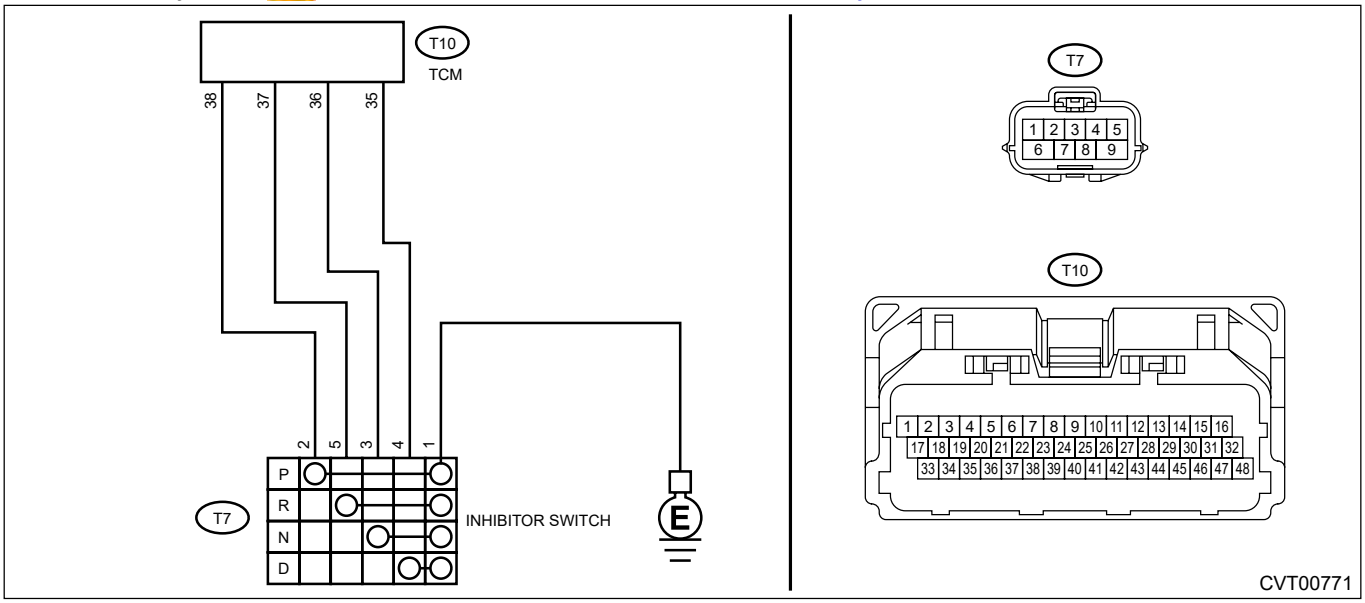
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, read the data of [P Range], [R Range Signal], [N Range] and [D Range Signal] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is display “OFF” for the range other than corresponding range?

Yes	Go to 4.
No	Go to 2.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the inhibitor switch connector.
4. Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(T10) No. 38 — Chassis ground:
(T10) No. 37 — Chassis ground:
(T10) No. 36 — Chassis ground:
(T10) No. 35 — Chassis ground:

Is each resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit of transmission harness.

3. CHECK INHIBITOR SWITCH.

Move the select lever to each range, and measure the resistance between inhibitor switch terminals.

Terminals

No. 2 — No. 1:
No. 5 — No. 1:
No. 3 — No. 1:
No. 4 — No. 1:

Is the resistance other than corresponding range 1 MΩ or more?

Yes	Go to 4.
No	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

4. CHECK FOR POOR CONTACT.

Is there poor contact between TCM, inhibitor switch, transmission ground?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of Range Switch.
- Judge as NG if more than one input of Range Switch are detected.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value

Malfunction Criteria	Threshold Value
Two or more transmission range switches ON	True

Note:

“Transmission range switch ON” is defined as transmission range switch input voltage 1.7 V or less.

Time needed for diagnosis: 3 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0708 TRANSMISSION RANGE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Shift characteristics are erroneous.
- The range position of the select lever and the position of shift indicator display do not match.

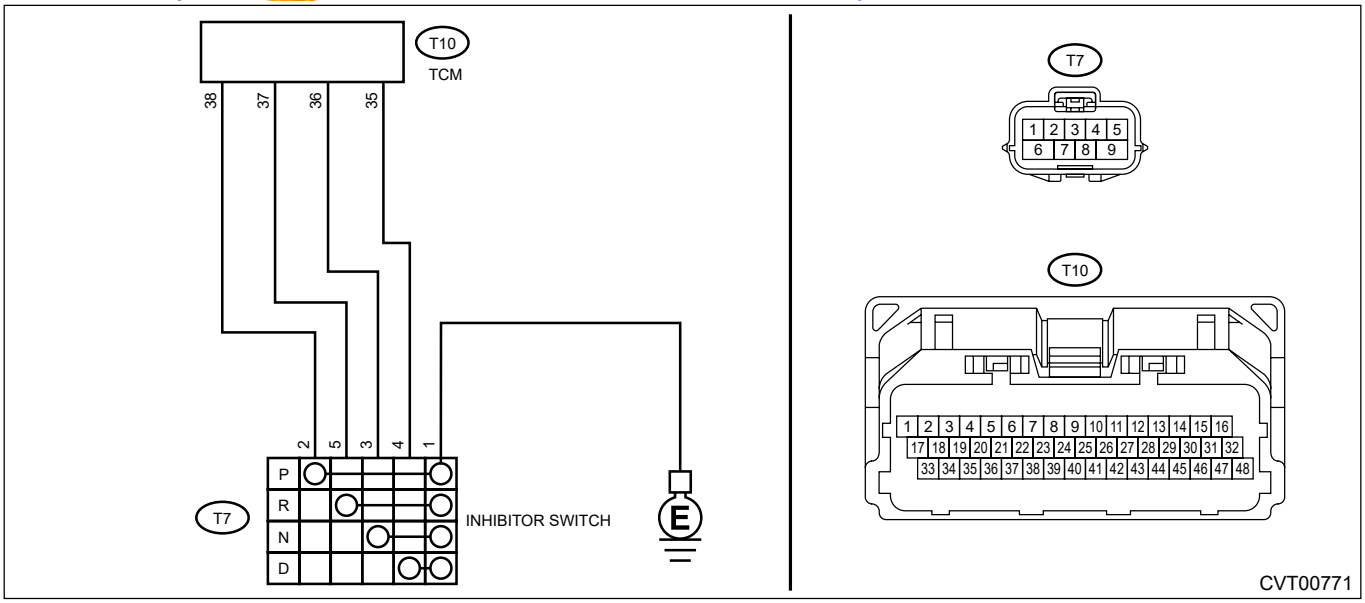
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Move the select lever to each range, read the data of [P Range], [R Range Signal], [N Range] and [D Range Signal] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is the display of the corresponding range “ON”?

Yes	Go to 6.
No	Go to 2.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the inhibitor switch connector.
4. Measure the resistance of the harness between TCM connector and inhibitor switch connector.
   Connector & terminal
   (T10) No. 38 — (T7) No. 2:
   (T10) No. 37 — (T7) No. 5:
   (T10) No. 36 — (T7) No. 3:
   (T10) No. 35 — (T7) No. 4:

Is each resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of transmission harness.

3. CHECK HARNESS.

Measure the resistance of harness between inhibitor switch connector and transmission ground.

Connector & terminal

(T7) No. 1 — Transmission ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness.

4. CHECK INHIBITOR SWITCH.

Move the select lever to each range, and measure the resistance between inhibitor switch terminals.

Connector & terminal

No. 2 — No. 1:
No. 5 — No. 1:
No. 3 — No. 1:
No. 4 — No. 1:

Is the resistance of the corresponding range less than 1 MΩ?

Yes	Go to 5.
No	Replace the inhibitor switch. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.

5. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between inhibitor switch connector and chassis ground.

Connector & terminal

(T7) No. 2 (+) — Chassis ground (−):
(T7) No. 5 (+) — Chassis ground (−):
(T7) No. 3 (+) — Chassis ground (−):
(T7) No. 4 (+) — Chassis ground (−):

Is each voltage less than 1 V?

Yes	Go to 6.
No	Repair the harness which outputs 1 V or more.

6. CHECK FOR POOR CONTACT.

Is there poor contact between TCM, inhibitor switch, transmission ground?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of Range Switch.
- Judge as NG if there is no input from all Range Switches.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from secondary pulley shaft speed)	6 MPH or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
All transmission range switches OFF	True

Malfunction Criteria	Threshold Value

Note:
“Transmission range switch OFF” is defined as transmission range switch input voltage 3.4 V or more.

Time needed for diagnosis: 3 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0711 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
Detected when two consecutive driving cycles with fault occur.
Trouble symptom:
- Excessive shift shock
- Shift characteristics malfunction

Note:
For the diagnostic procedure, perform the diagnosis according to DTC P0712 and P0713.
Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW.
Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Judge the malfunction of oil temperature sensor characteristics (stuck to low temperature side).
- Judge as NG if the amount of oil temperature change since ignition ON is equal to or below the predetermined value.

Diagnosis 2
- Judge the malfunction of oil temperature sensor characteristics (stuck to high temperature side).
- Judge as malfunction when the difference between engine coolant temperature and CVT oil temperature is equal to or more than specified value at starting.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1	
12 V battery system voltage (The timer is held when the following conditions are not satisfied.)	10 V or more
Transmission range	Drive
Vehicle speed (calculated from secondary pulley shaft speed)	21.7 MPH or more

Secondary parameters	Execution condition
Diagnosis 2	
12 V battery system voltage	10 V or more
Soak time (received from ECM)	21600 s or more
(Engine speed	400 rpm or more
for time)	300 s or more

Note:

The monitor detects TFT sensor stuck high after the elapse of 300 seconds required for ECT sensor diagnosis. It is necessary to avoid misdiagnosis of P0711 caused by a malfunctioning ECT sensor.

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1 Absolute change of measured Transmission fluid temperature sensor input voltage Transmission fluid temperature	 Less than 0.049 V Less than 20 degC
Diagnosis 2 Transmission fluid temperature at engine start − Engine coolant temperature at engine start	 Exceeds 18 degC

Time needed for diagnosis:

- **Diagnosis 1:** 600 s
- **Diagnosis 2:** Immediately

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0712 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

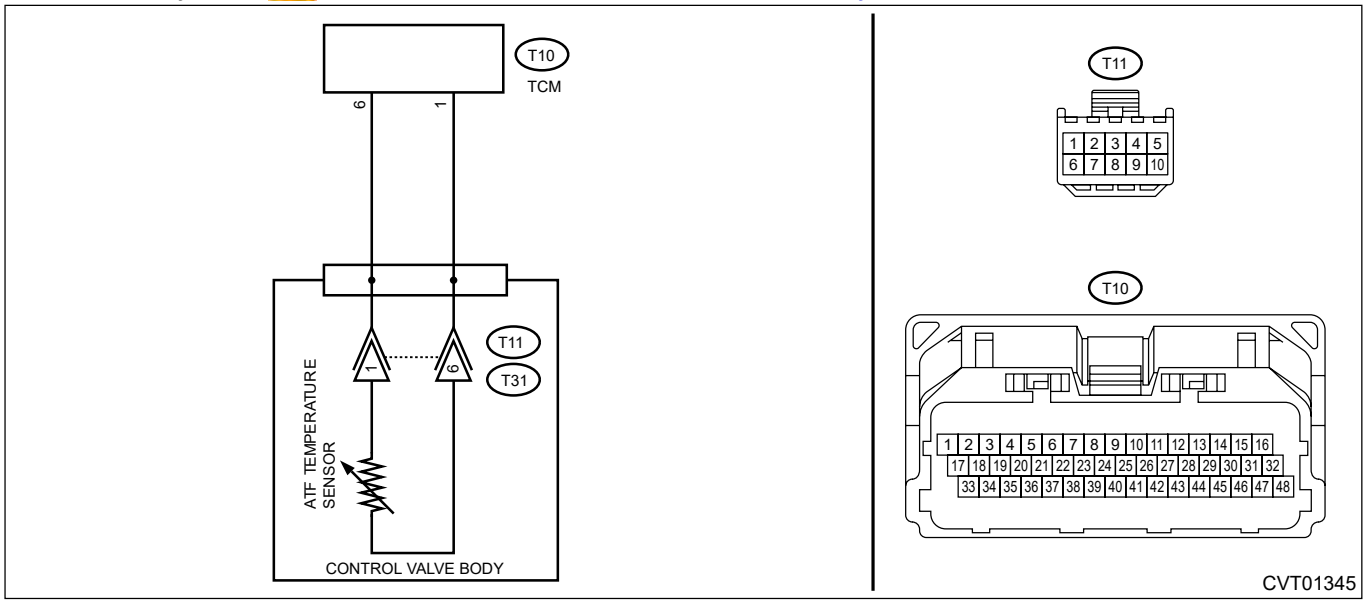
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance of harness between TCM connector and chassis ground.

Connector & terminal

(T10) No. 1 — Chassis ground:

(T10) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Go to 2.

2. CHECK HARNESS INSIDE TRANSMISSION.

Caution:

Start work after ATF cools down.

1. Remove the transmission valve cover.
2. Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Go to 3.

3. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between TCM connectors.

Connector & terminal

(T10) No. 1 — No. 6:

Note:

Perform the measurements using multiple oil temperatures.

Is resistance as follows?

Fluid temperature 0°C → Approx. 6.0 kΩ

Fluid temperature 20°C → Approx. 2.5 kΩ

Fluid temperature 80°C → Approx. 330 Ω

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of oil temperature sensor.
- Judge as NG if the voltage detected by the oil temperature sensor is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage (Transmission fluid temperature)	Less than 0.117 V (Exceeds 146 degC)

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0713 TRANSMISSION FLUID TEMPERATURE SENSOR "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Excessive shift shock
- Shift characteristics malfunction

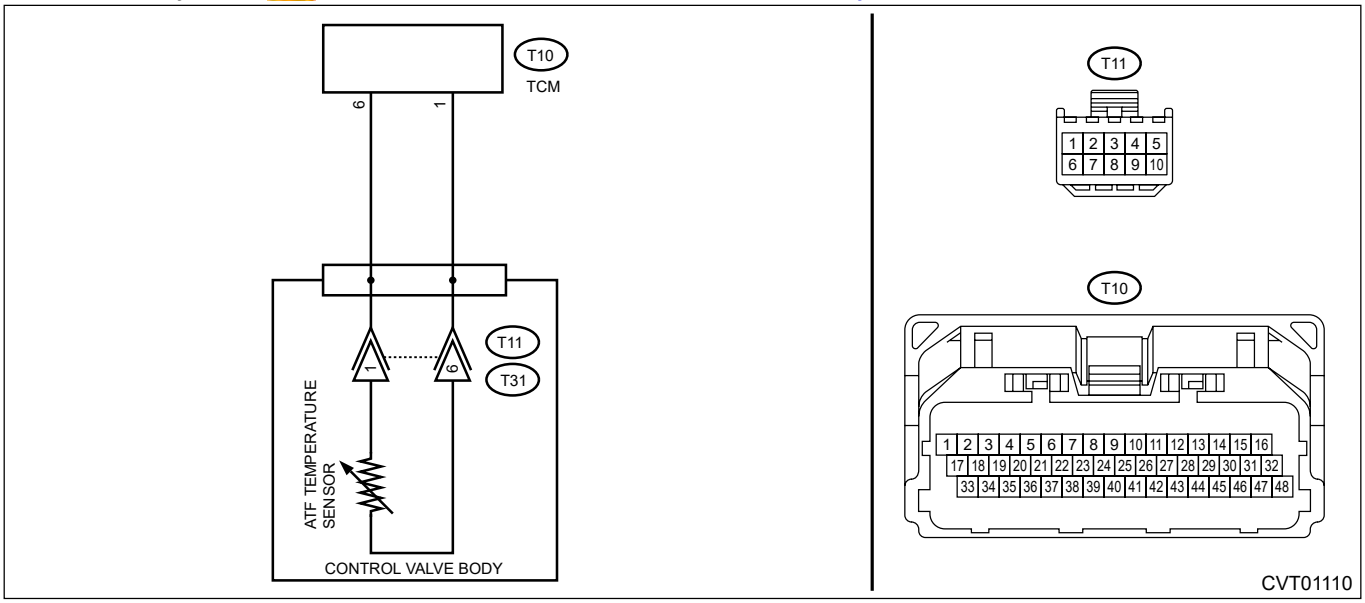
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (T10) No. 6 (+) — (T10) No. 1 (−):

Is the voltage 5 V or more?

Yes	Repair the short circuit of harness.
No	Go to 2.

2. CHECK ATF TEMPERATURE SENSOR.

1. Turn the ignition switch to OFF.
2. Measure the resistance between TCM connector terminals.
   Connector & terminal
   (T10) No. 1 — No. 6:

Is the resistance 1 MΩ or more?

Yes	Repair the open circuit of transmission harness.
No	Go to 3.

3. CHECK ATF TEMPERATURE SENSOR.

1. Connect the connector to TCM.
2. Start the engine.
3. Warm up until the ATF temperature exceeds 50°C (122°F).
4. Turn the ignition switch to OFF.
5. Disconnect the TCM connector.
6. Measure the resistance between TCM connector terminals.

Connector & terminal

(T10) No. 1 — No. 6:

Is the resistance 650 — 990 Ω?

Yes	Go to 4.
No	Go to 6.

4. CHECK ATF TEMPERATURE SENSOR.

Measure the resistance between TCM connector terminals.

Connector & terminal

(T10) No. 1 — No. 6:

Does the resistance value increase gradually while the ATF temperature decreases?

Yes	Go to 5.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

5. CHECK INPUT SIGNAL FOR TCM.

1. Connect the connector to TCM.
2. Turn the ignition switch to ON. (Do not start engine.)
3. Read the data of [ATF Temp.] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Does the ATF temperature gradually decrease?

Yes	Check for poor contact of the ATF temperature sensor and TCM connector harness, and repair the defective part.
No	Go to 6.

6. CHECK FOR POOR CONTACT.

Is there poor contact of ATF temperature sensor circuit?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the oil temperature sensor 5 V system.
- Judge as NG if the voltage detected by the oil temperature sensor is higher than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Vehicle speed (calculated from secondary pulley speed)	6.3 MPH or more
Above condition satisfied for	50 s or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured Transmission fluid temperature sensor input voltage (Transmission fluid temperature)	More than 4.507 V (Less than − 52 degC)

Time needed for diagnosis: 1 second
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0716 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- No lock-up occurs.
- Shock occurs when selecting shift position.
- Shift control malfunction

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P0716, is DTC U0122 or U0416 displayed?

Yes	Perform the diagnosis according to DTCs other than P0716. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Perform the diagnosis according to DTC P0717. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0717 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of turbine speed sensor signal characteristics.
- Judge as NG if the turbine speed against the engine speed is outside the possible range considering the hardware capabilities.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	**Threshold Value**
Measured turbine shaft speed	Less than rpm values in Table 1

Table 1

Engine speed (rpm)	3700	3227	2755	2282	1856	1519	1213	956
Measured turbine shaft speed (rpm)	0	500	1000	1500	2000	2500	3000	3500

Engine speed (rpm)	786	713	651	601	569	544	520
Measured turbine shaft speed (rpm)	4000	4500	5000	5500	6000	6500	7000

Time needed for diagnosis: 10 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0717 INPUT/TURBINE SHAFT SPEED SENSOR "A" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

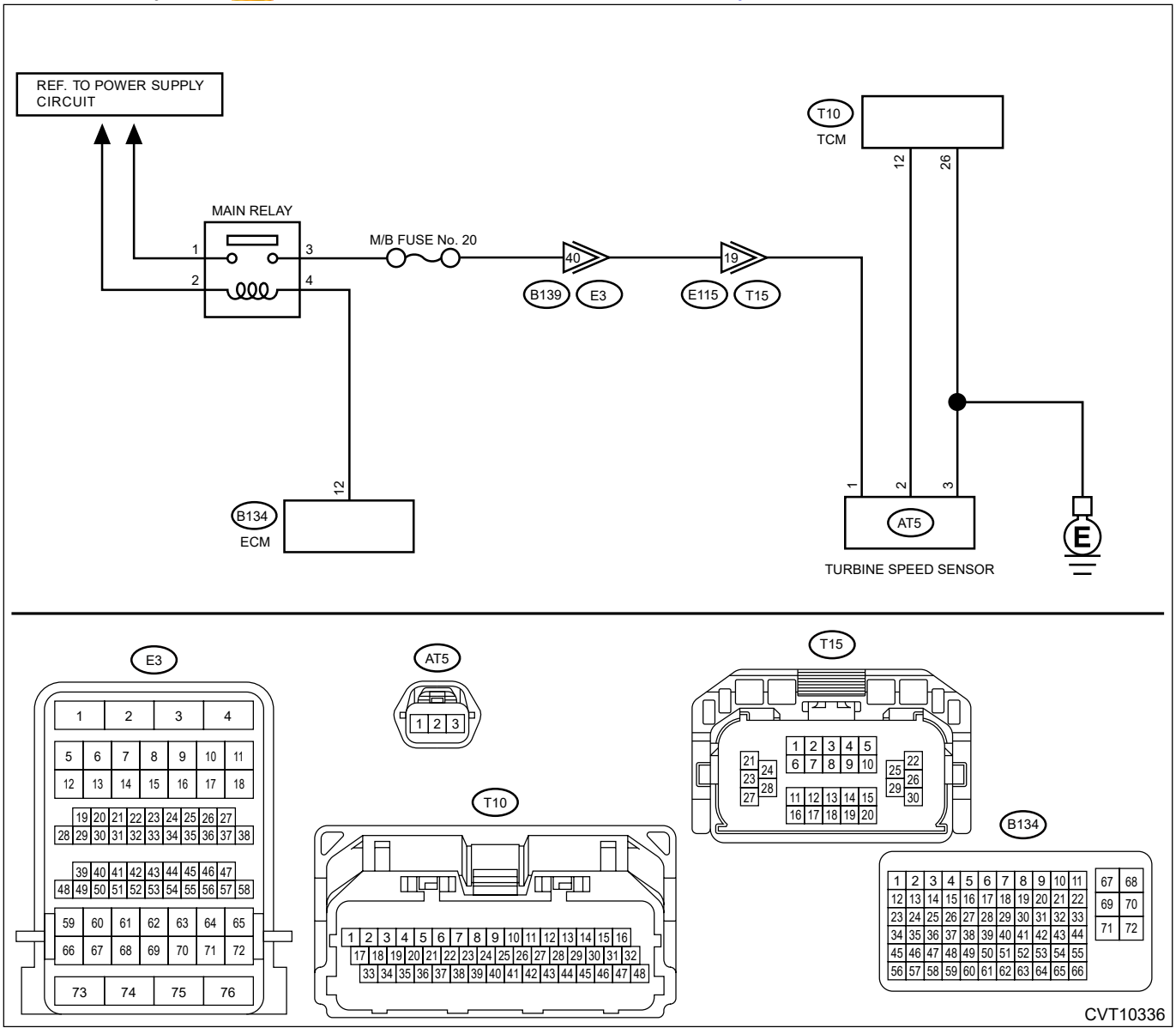
- Standing start problems
- Shock occurs when engaging the lockup clutch.
- Shock occurs when selecting shift position.

Caution:

- **Use the check board when measuring the TCM/ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the M/B fuse No. 20.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 3.
No	Connect the ECM connector correctly.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T15) No. 19 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to power supply of harness between transmission connector and main relay connector** • **Defective main relay**
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and main relay connector.

5. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the turbine speed sensor connector.
4. Measure the resistance between TCM connector and turbine speed sensor connector.

Connector & terminal

(T10) No. 12 — (AT5) No. 2:

(T10) No. 26 — (AT5) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(T10) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E115, T15)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector and chassis ground.

   Connector & terminal

   (E115) No. 19 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 8.
No	Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Read the data of [Turbine Revolution Speed] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Does the value of [Turbine Revolution Speed] change according to the engine speed?

Yes	Current condition is normal. Repair the poor contacts of harnesses of turbine speed sensor and transmission connector.
No	Go to 9.

9. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the turbine speed sensor connector.
4. Measure the resistance between transmission connector and turbine speed sensor connector.
   Connector & terminal
   (T15) No. 19 — (AT5) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Replace the transmission harness.

10. CHECK TURBINE SPEED SENSOR.

1. Turn the ignition switch to OFF.
2. Replace the turbine speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Turbine Speed Sensor.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P0717 displayed?

Yes	Go to 11.
No	The original turbine speed sensor is defective.

11. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Replace the main relay.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P0717 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	The original main relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect the no input signal from the turbine speed sensor.
- Judge as NG if there is no input signal from the turbine speed sensor, while the primary speed sensor on the same shaft has the input signal with the forward/reverse clutch engaged.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more
Transmission range	Drive or Reverse
Measured primary pulley shaft speed	500 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured turbine shaft speed	0 rpm

Time needed for diagnosis: 0.6 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0719 BRAKE SWITCH "B" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Gear is not shifted down when climbing a hill or driving down a hill.

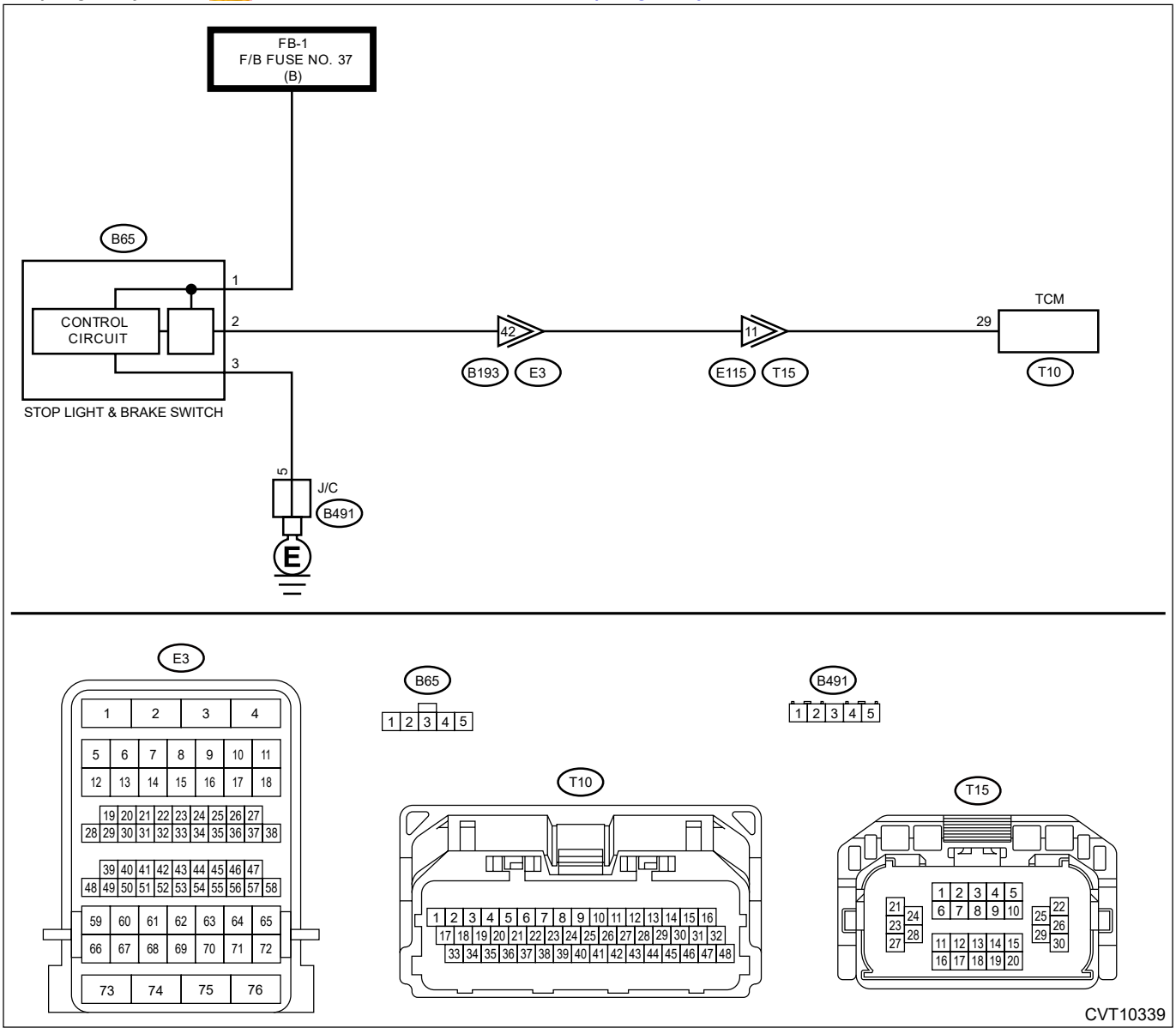
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

Stop light system Ref. to WIRING SYSTEM>Stop Light System.



1. CHECK FUSE (NO. 37).

1. Turn the ignition switch to OFF.
2. Remove the fuse (No. 37).
3. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse (No. 37). If the new fuse (No. 37) has blown out easily, repair the short circuit of harness between the fuse (No. 37) and stop light switch.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the stop light switch connector.
4. Measure the resistance between TCM connector and stop light switch connector.
   Connector & terminal
   (T10) No. 29 — (B65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS.

Measure the resistance between the stop light switch connector and fuse (No. 37).
Connector & terminal
(B65) No. 1 — fuse (No. 37):

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness.

4. CHECK INPUT SIGNAL FOR TCM.

1. Install the fuse (No. 37).
2. Connect the stop light switch connector.
3. Depress the brake pedal.
4. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 29 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch.

5. CHECK INPUT SIGNAL FOR TCM.

1. Connect the TCM connector.
2. With brake pedal depressed, read the data of [Stop Light Switch] using Subaru Select Monitor.
   Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is “ON” displayed?

Yes	Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.
No	Go to 6.

6. CHECK FOR POOR CONTACT.

Is there poor contact in the stop light switch input signal circuit?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect no input from the brake signal.
- Judge as NG if a predetermined number of deceleration occurs while the cruise control is set to OFF and the brake is OFF.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Cruise control	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of times that vehicle speed changes from 30 km/h to 1 km/h while the brake SW is OFF	Exceeds 10 counts.

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Does not illuminate.

DTC P0724 BRAKE SWITCH "B" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Gear is not shifted down when climbing a hill or driving down a hill.

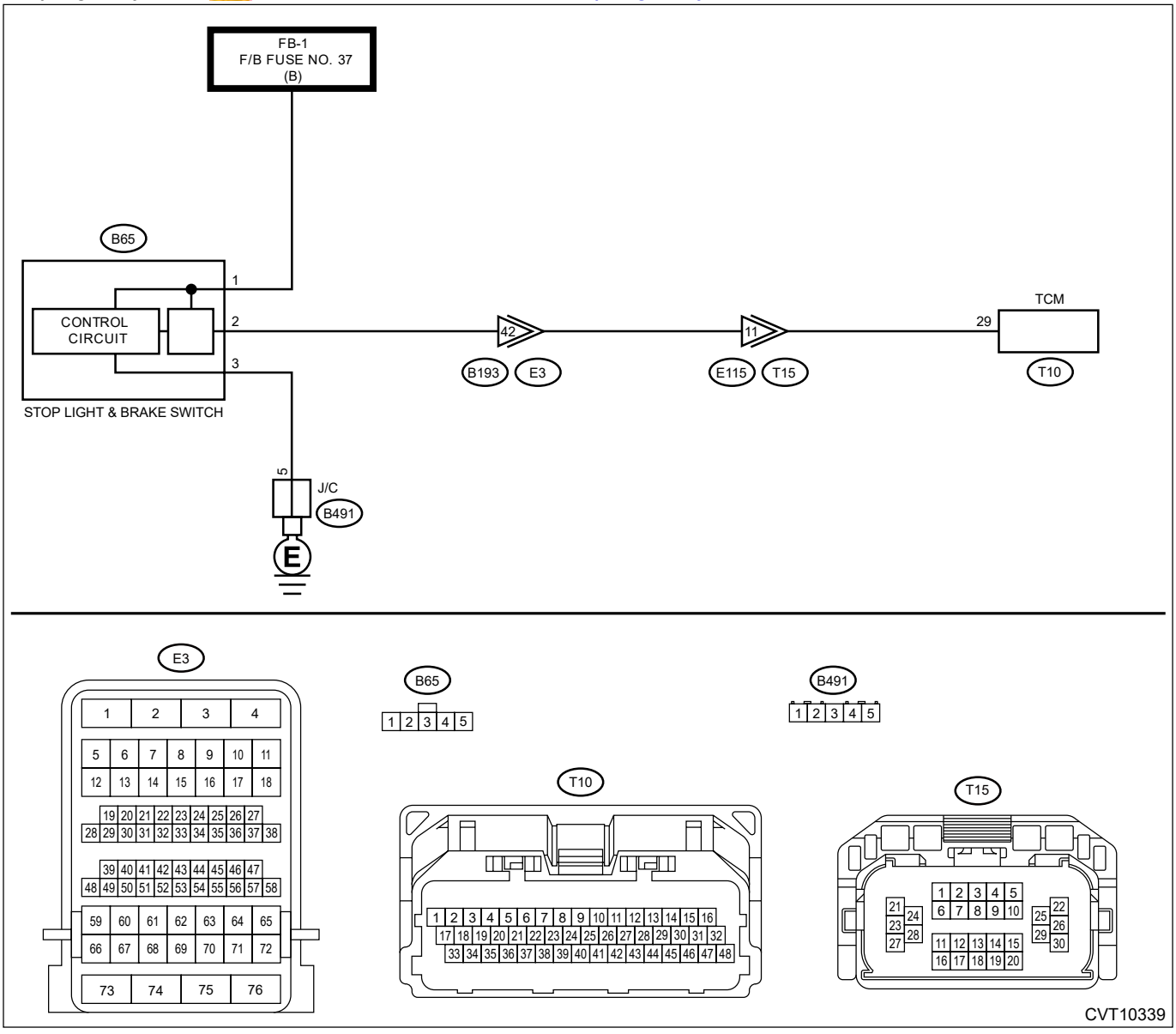
Caution:

Use CHECK BOARD when measuring the TCM terminal voltage and resistance.

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

Stop light system Ref. to WIRING SYSTEM>Stop Light System.



1. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Measure the resistance between stop light switch.

Connector & terminal

(B65) No. 1 — No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch.

2. CHECK HARNESS.

1. Disconnect the TCM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(T10) No. 29 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the short circuit of harness.
No	Go to 3.

3. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Read the data of [Stop Light Switch] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is “OFF” displayed?

Yes	Current condition is normal. Check for poor contact in connectors or harnesses, and repair the defective part.
No	Go to 4.

4. CHECK FOR POOR CONTACT.

Is there poor contact in the stop light switch input signal circuit?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect the brake signal stuck to ON.
- Judge as NG if a predetermined number of acceleration occurs while the cruise control is set to OFF and the brake is ON.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Cruise control	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Number of times that vehicle speed changes from 1 km/h to 30	Exceeds 10 counts.

Malfunction Criteria	Threshold Value
km/h while the brake SW is ON	

Time needed for diagnosis Immediately
Malfunction indicator light illumination: Does not illuminate.

DTC P0730 INCORRECT GEAR RATIO

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK TRANSMISSION FLUID.

Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 2.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

2. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 3.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

3. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 4.
No	Perform the diagnosis according to DTC P0841. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.

4. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 1.5 — 2.6?

Yes	Go to 5.
No	Go to 6.

5. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep the constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 0.5 — 0.9?

Yes	Go to 6.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

6. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0730 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the abnormality in transmission gear ratio control function.
- Judge as NG if a discrepancy between the transmission target gear ratio (as internal data) and the actual gear ratio becomes the specified value or more. (Compare the value of “Gear Ratio Target × Secondary pulley speed ≈ Target primary speed equivalent value” with the value of primary pulley speed sensor.)

2. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	400 rpm or more
Transmission range	Drive

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ABS* (Target primary pulley shaft speed – Measured primary pulley shaft speed)	600 rpm or more
(Commanded duty of shift up pressure control solenoid valve	90% or more
or	
Commanded duty of shift down pressure control solenoid valve)	90% or more

* ABS: Absolute value

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0746 PRESSURE CONTROL SOLENOID "A" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

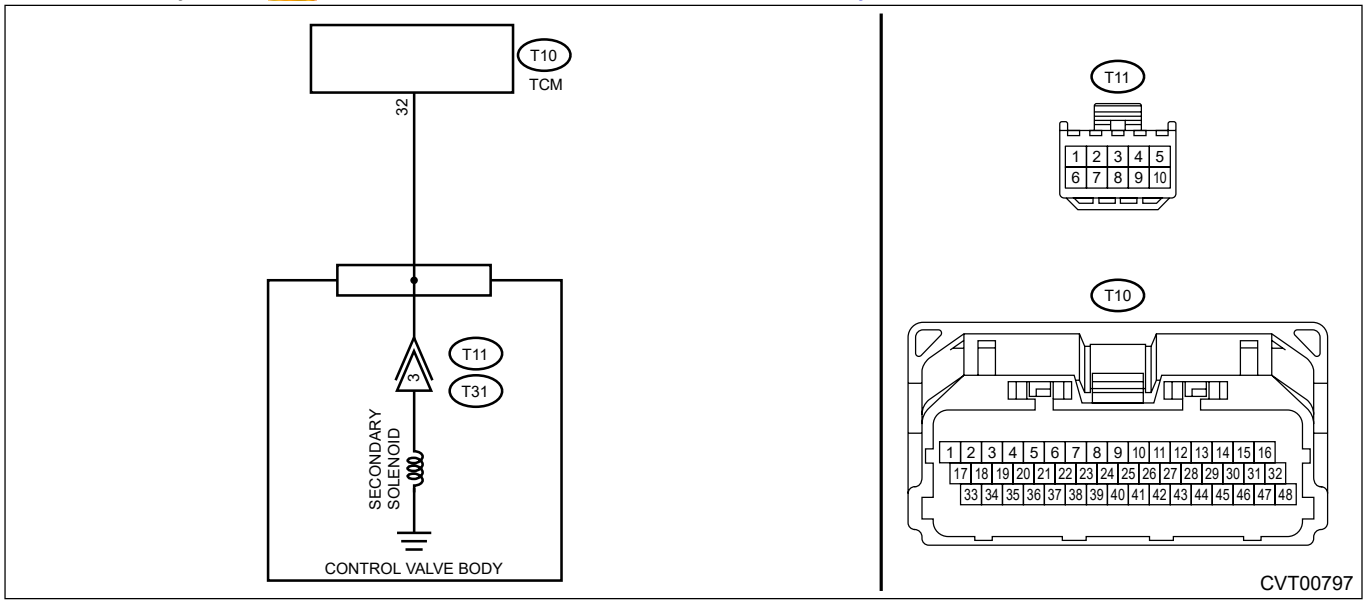
- Shift control malfunction
- CVT chain slippage

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P0746, is any of the DTCs P0842, P0843, P0962 and P0963 displayed?

Yes	Perform the diagnosis according to DTCs other than P0746. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes	Go to 5.
No	Go to 3.

3. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 32 — Transmission body:

Is the resistance approximately 5 — 7 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

8. CHECK INPUT SIGNAL FOR TCM.

1. Keep the engine speed at 3,000 rpm.
2. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [Actual Secondary Pressure] higher than that of step 7? Does the value change according to the engine speed? And is the value 1.5 — 2.5 MPa?

Yes	Go to 9.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

9. CHECK TCM INPUT SIGNAL (STALL TEST).

1. Apply the parking brake.
2. Set the select lever to “D” range.
3. Depress the brake pedal firmly.
4. Slowly open the accelerator fully, and stabilize the engine speed.
5. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Caution:
Do not perform a stall test for over 5 seconds at a time.

Is [Actual Secondary Pressure] higher than that of step 8? Does the value change according to the engine speed? And is the value 4.5 — 6.0 MPa?

Yes	Go to 10.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0746 displayed?

Yes	Perform the secondary pressure test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure (Line Pressure) Test.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to low pressure side).
- Judge as NG if the target line pressure − actual line pressure becomes the predetermined value or more, while the actual line pressure is equal to or more than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Measured line pressure control solenoid valve current	0.78 A or less

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure	Less than Map1 kPa

Map 1

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	– 40	0	0	324	361	457	551	687
	– 20	0	0	308	349	436	526	655
	0	0	0	293	337	415	501	623
	20	0	0	278	325	394	476	591
	40	0	0	262	314	373	451	558
	60	0	0	247	302	352	427	526
	80	0	0	249	286	344	418	511
	100	0	0	255	291	334	419	499
	120	0	0	249	283	324	402	474
	140	0	0	242	276	313	386	449

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	– 40	823	960	1096	1232	1396	1505	1641
	– 20	784	913	1042	1171	1300	1429	1558
	0	744	866	988	1109	1231	1353	1474
	20	705	819	933	1048	1162	1276	1391
	40	665	772	879	986	1093	1200	1307
	60	626	725	825	924	1024	1124	1223
	80	603	696	788	880	973	1065	1158
	100	580	660	741	821	902	982	1062
	120	546	618	690	762	834	905	977
	140	512	576	639	702	765	829	892

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

DTC P0747 PRESSURE CONTROL SOLENOID "A" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

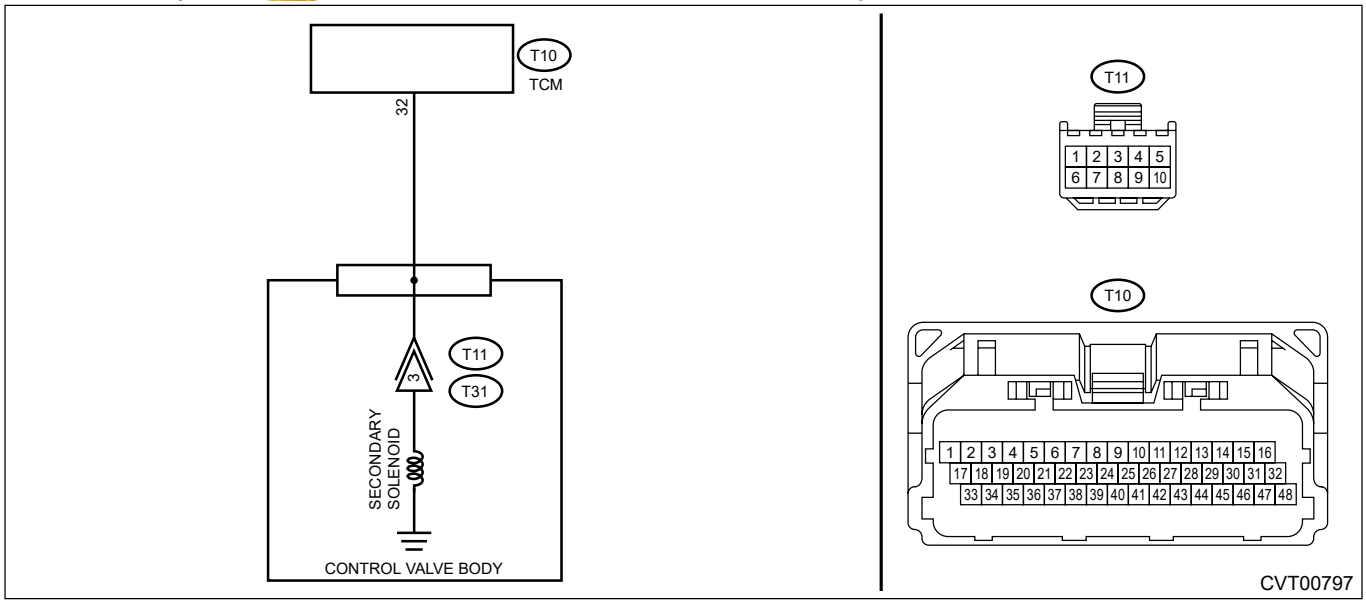
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P0747, is any of the DTCs P0842, P0843, P0962 and P0963 displayed?

Yes	Perform the diagnosis according to DTCs other than P0747. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes	Go to 5.
No	Go to 3.

3. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 32 — Transmission body:

Is the resistance approximately 5 — 7 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

8. CHECK INPUT SIGNAL FOR TCM.

1. Keep the engine speed at 3,000 rpm.
2. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [Actual Secondary Pressure] higher than that of step 7? Does the value change according to the engine speed? And is the value 1.5 — 2.5 MPa?

Yes	Go to 9.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

9. CHECK TCM INPUT SIGNAL (STALL TEST).

1. Apply the parking brake.
2. Set the select lever to “D” range.
3. Depress the brake pedal firmly.
4. Slowly open the accelerator fully, and stabilize the engine speed.
5. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Caution:
Do not perform a stall test for over 5 seconds at a time.

Is [Actual Secondary Pressure] higher than that of step 8? Does the value change according to the engine speed? And is the value 4.5 — 6.0 MPa?

Yes	Go to 10.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0747 displayed?

Yes	Perform the secondary pressure test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure (Line Pressure) Test.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid and hydraulic circuit (stuck to high pressure side).
- Judge as NG if “Target line pressure − Actual line pressure” becomes the predetermined value or less, while the actual line pressure is equal to or more than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Measured line pressure control solenoid valve current	0.5 A or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure	Exceeds Map1 kPa.

Map 1

		Engine speed (rpm)						
		0	500	1000	1500	2000	2500	3000
Transmission fluid temperature (degC)	– 40	25600	25600	5790	5800	5807	5746	5766
	– 20	25600	25600	5698	5721	5742	5706	5730
	0	25600	25600	5606	5642	5678	5665	5694
	20	25600	25600	5514	5563	5613	5624	5659
	40	25600	25600	5392	5485	5549	5583	5623
	60	25600	25600	4763	5406	5484	5543	5587
	80	25600	25600	3063	5316	5419	5500	5535
	100	25600	25600	2223	4815	5348	5415	5466
	120	25600	25600	1533	3738	5166	5237	5286
	140	25600	25600	842	2661	4985	5059	5107

		Engine speed (rpm)						
		3500	4000	4500	5000	5500	6000	6500
Transmission fluid temperature (degC)	– 40	5789	5809	5829	5849	5869	5889	5909
	– 20	5758	5783	5808	5833	5858	5883	5908
	0	5727	5757	5787	5817	5847	5877	5907
	20	5696	5731	5766	5801	5836	5871	5906
	40	5664	5704	5744	5784	5824	5864	5904
	60	5633	5678	5723	5768	5813	5858	5903
	80	5571	5618	5666	5713	5761	5808	5856
	100	5509	5559	5609	5659	5709	5759	5809
	120	5340	5390	5440	5490	5540	5590	5640
	140	5172	5222	5272	5322	5372	5422	5472

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

DTC P0751 SHIFT SOLENOID "A" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

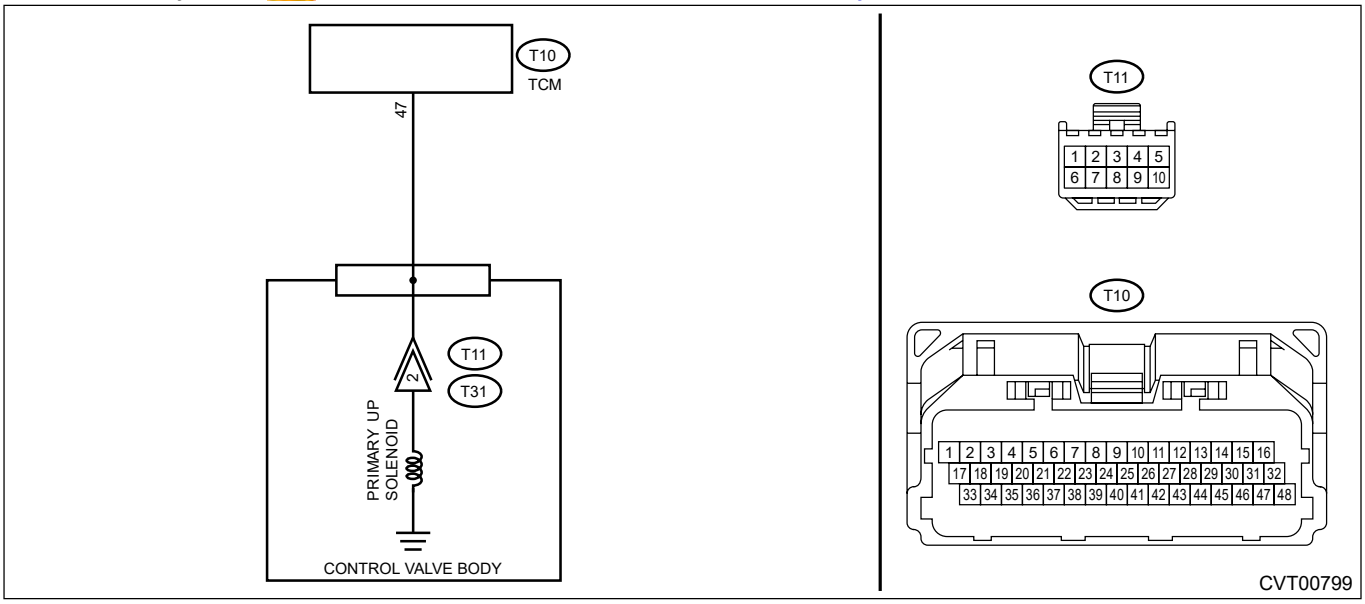
- Shift control malfunction
- Engine speed increases abruptly.

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0751, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P0751. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary UP solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 5.
No	Go to 3.

3. CHECK PRIMARY UP SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 47 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

   Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 1.5 — 2.6?

Yes	Go to 9.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 0.5 — 0.9?

Yes	Go to 10.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Perform a drive check based on the “Inspection Mode”. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0751 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	Exceeds 1 1.5 and Less than 2.684

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed*

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	Exceeds −0.08
Commanded duty of shift up pressure control solenoid	90% or more

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0752 SHIFT SOLENOID "A" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

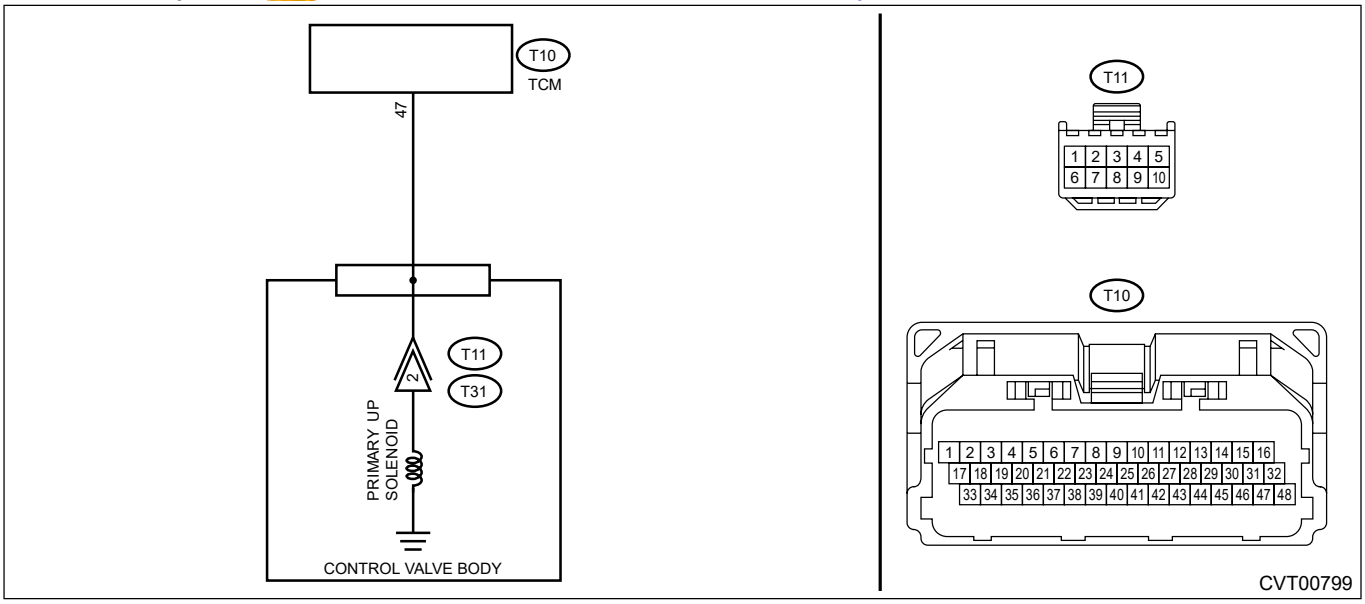
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0752, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P0752. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PRIMARY UP SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary UP solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 5.
No	Go to 3.

3. CHECK PRIMARY UP SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 47 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Data Monitor

Is [Actual Gear Ratio] 1.5 — 2.6?

Yes	Go to 9.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Data Monitor

Is the [Actual Gear Ratio] 0.5 — 0.9?

Yes	Go to 10.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0752 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift-up fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
- Judge as NG if the amount of gear rate change per second is within the predetermined value, even though the down-shift command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	Less than 0.5

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	Exceeds −0.08 and Less than 0.08
Commanded duty of shift down pressure control solenoid	Exceeds 80%.

Time needed for diagnosis: 1 second

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

DTC P0756 SHIFT SOLENOID "B" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

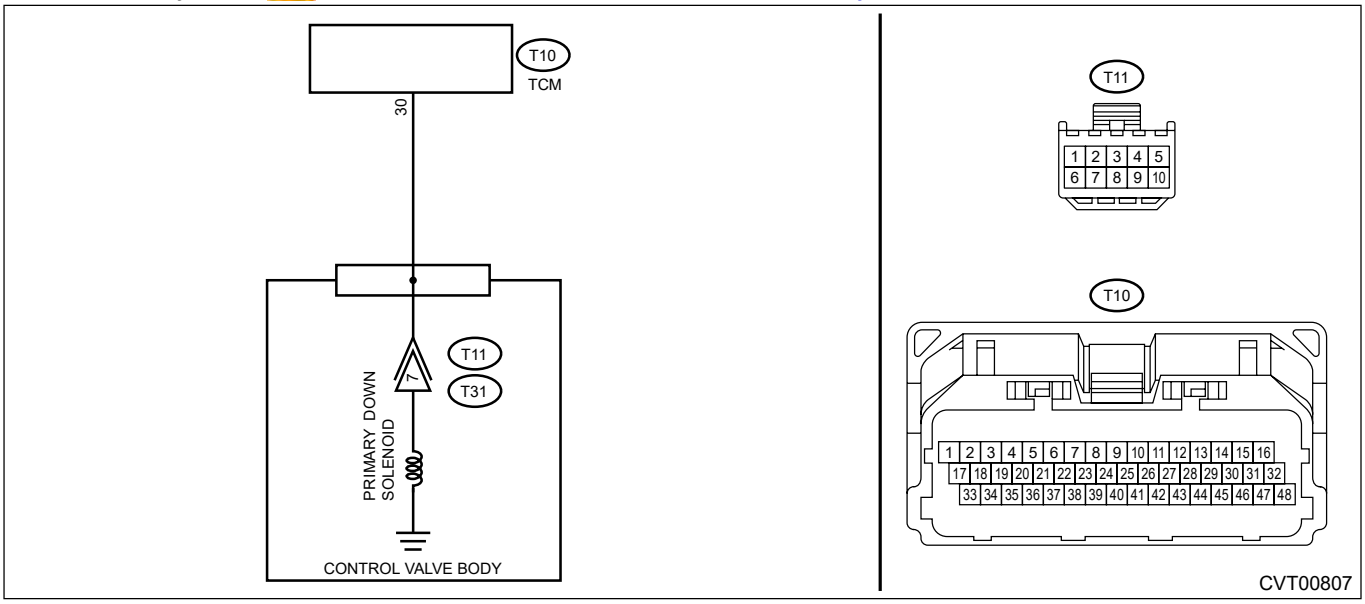
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0756, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P0756. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary DOWN solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 5.
No	Go to 3.

3. CHECK PRIMARY DOWN SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 30 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

   Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 1.5 — 2.6?

Yes	Go to 9.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 0.5 — 0.9?

Yes	Go to 10.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0756 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the amount of gear rate change per second is within the predetermined value, even though the down-shift command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift up pressure control solenoid	0%
Actual pulley ratio*	0.382 or more and 2.683 or less

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	Exceeds −0.08 and Less than 0.08
Commanded duty of shift down pressure control solenoid	Exceeds 80%.

Time needed for diagnosis: 1 second
Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P0757 SHIFT SOLENOID "B" STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

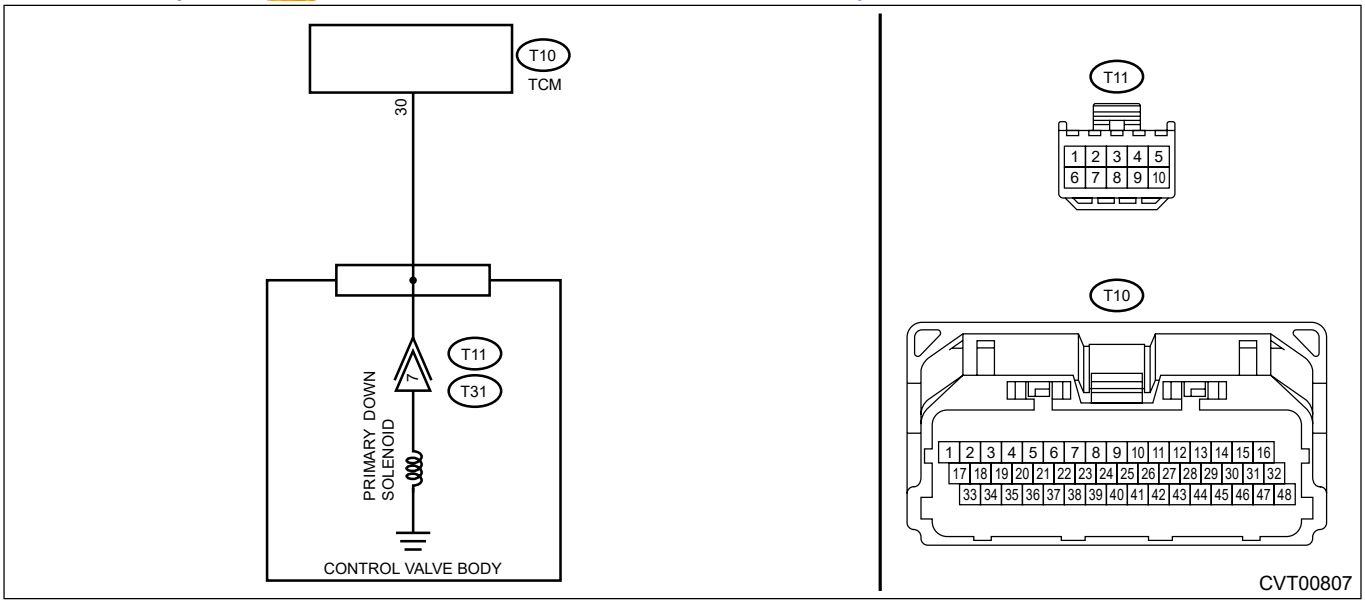
- Vibration occurs at shift change.
- Shift control malfunction

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0757, is any of the DTCs P0973, P0974, P0976, P0977, P2747 and P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P0757. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK PRIMARY DOWN SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the primary DOWN solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 5.
No	Go to 3.

3. CHECK PRIMARY DOWN SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 30 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

   Data Monitor

Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

8. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Release the brake pedal to stabilize the engine speed and front wheel speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 1.5 — 2.6?

Yes	Go to 9.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

9. CHECK INPUT SIGNAL FOR TCM.

1. Set the select lever to “D” range.
2. Slowly increase the speed to 40 km/h (25 MPH) and keep to a constant speed.
3. Read the data of [Actual Gear Ratio] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Gear Ratio] 0.5 — 0.9?

Yes	Go to 10.
No	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

10. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0757 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift-down fluid pressure control solenoid and hydraulic circuit characteristics (stuck to high pressure side).
- Judge as NG if the amount of gear rate change per second is equal to or larger than the predetermined value, even though the up-shift command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Commanded duty of shift down pressure control solenoid	0%
Actual pulley ratio*	0.382 or more and 2.683 or less

* Actual pulley ratio: Measured primary pulley shaft speed / Measured secondary pulley shaft speed

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Actual pulley ratio change for 1 second	Exceeds 0.04
Commanded duty of shift up pressure control solenoid	Exceeds 50%.

Time needed for diagnosis: 1 s × 10 times

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving

cycles.

DTC P0776 PRESSURE CONTROL SOLENOID "B" PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

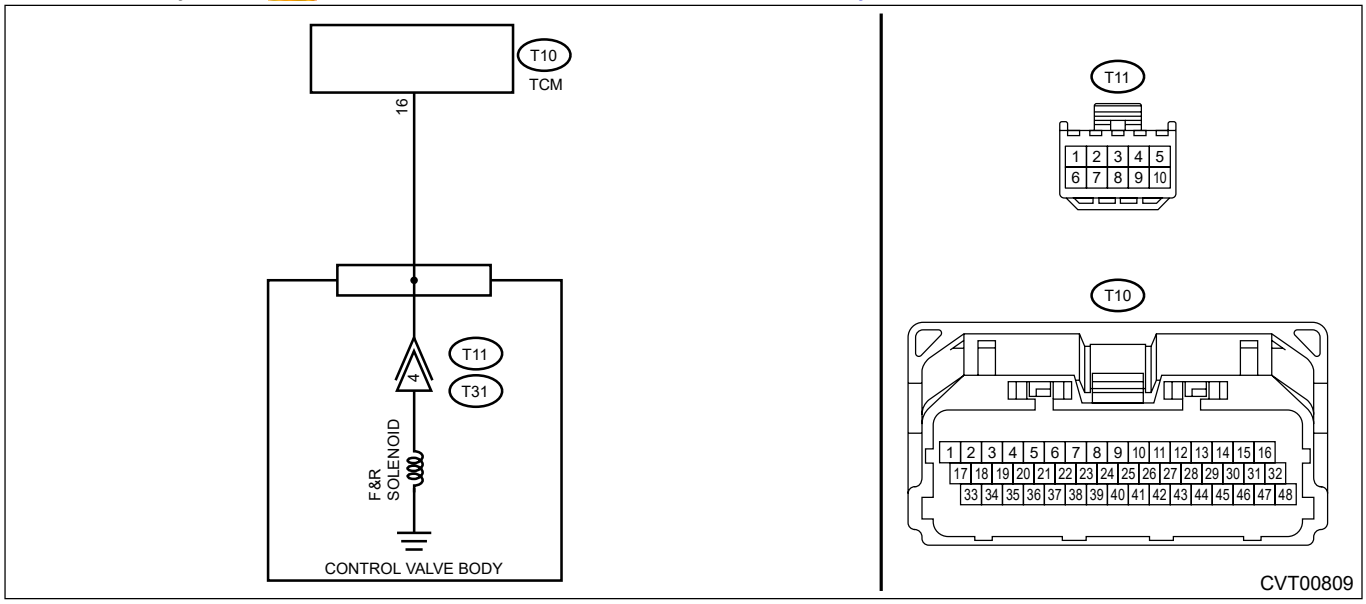
- Engine speed increases abruptly, and can not accelerate.
- Excessive slippage is felt.

Caution:

- **Use the check board when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P0776, is any of the DTC P0717, P0966, P0967 or P2747 displayed?

Yes	Perform the diagnosis according to DTCs other than P0776. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK F&R SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the F&R solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 500 mA appear repeatedly during forced operation, and does operating sound emit during indicating 500 mA?

Yes	Go to 5.
No	Go to 3.

3. CHECK F&R SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 16 — Transmission body:

Is the resistance approximately 4 — 6 Ω? (when cold)

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS.

Check the transmission harness. (Open circuit, short circuit to power supply, short circuit to ground, and poor contact)

Is the check result OK?

Yes	Go to 7.
No	Repair the harness.

5. CHECK TRANSMISSION FLUID.

1. Connect the TCM connector.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

6. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 7.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

7. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 8.
No	Perform the diagnosis according to DTC P0841. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.

8. STALL TEST.

Perform the stall test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Stall Test.

Is the result of the stall test OK?

Yes	Go to 9.
No	Replace the transmission assembly if the stall speed is higher than the standard value of the stall test. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.

9. DRIVING CHECK BY INSPECTION MODE.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to TRANSMISSION (DIAGNOSTICS)>Inspection Mode.

Does the AT OIL TEMP light blink and is DTC P0776 displayed?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid and hydraulic circuit characteristics (stuck to low pressure side).
- Judge as NG if the value calculated by “turbine speed – primary pulley speed” becomes the predetermined value or more, even though the forward/reverse clutch is engaged.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	10 V or more
Transmission range	Drive
Measured turbine shaft speed	100 rpm or more
Measured primary pulley shaft speed	100 rpm or more
Commanded forward & reverse clutch pressure control solenoid current	Less than 0.9 A
Engine speed	400 rpm or more
Diagnosis 2	
12 V battery system voltage	10 V or more
Transmission range	Drive
Measured primary pulley shaft speed	Less than 100 rpm
Commanded forward & reverse clutch pressure control solenoid current	Less than 0.9 A
Accelerator pedal position (from ECM)	Exceeds 6%.
Engine speed	400 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as

NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1 ABS* (Measured turbine shaft speed – Measured primary pulley shaft speed)	Exceeds rpm values in Table 1
Diagnosis 2 Measured turbine shaft speed	Exceeds 2000 rpm

*ABS: Absolute value

Table 1

Vehicle speed (MPH)	0	13	25	38	50	63	75
ABS (Measured turbine shaft speed – Measured primary pulley shaft speed) (rpm)	150	100	100	100	100	100	100

Vehicle speed (MPH)	88	100	113	125	138	150	159
ABS (Measured turbine shaft speed – Measured primary pulley shaft speed) (rpm)	100	100	100	100	100	100	100

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P0801 REVERSE INHIBIT CONTROL CIRCUIT/OPEN

DTC detecting condition:

Immediately at fault recognition

Note:

For diagnostic procedures, refer to “BODY CONTROL SYSTEM (DIAGNOSTICS)”. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1016 SHIFT LOCK CIRCUIT.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of shift lock solenoid or circuit.
- Judge as NG if abnormal signal from the integrated unit is received, when bus off is not detected and there is no trouble in CAN between the integrated unit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Shift lock solenoid system circuit abnormal (received from BIU)	ON

Time needed for diagnosis: 1 second
Malfunction indicator light illumination: Does not illuminate.

DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

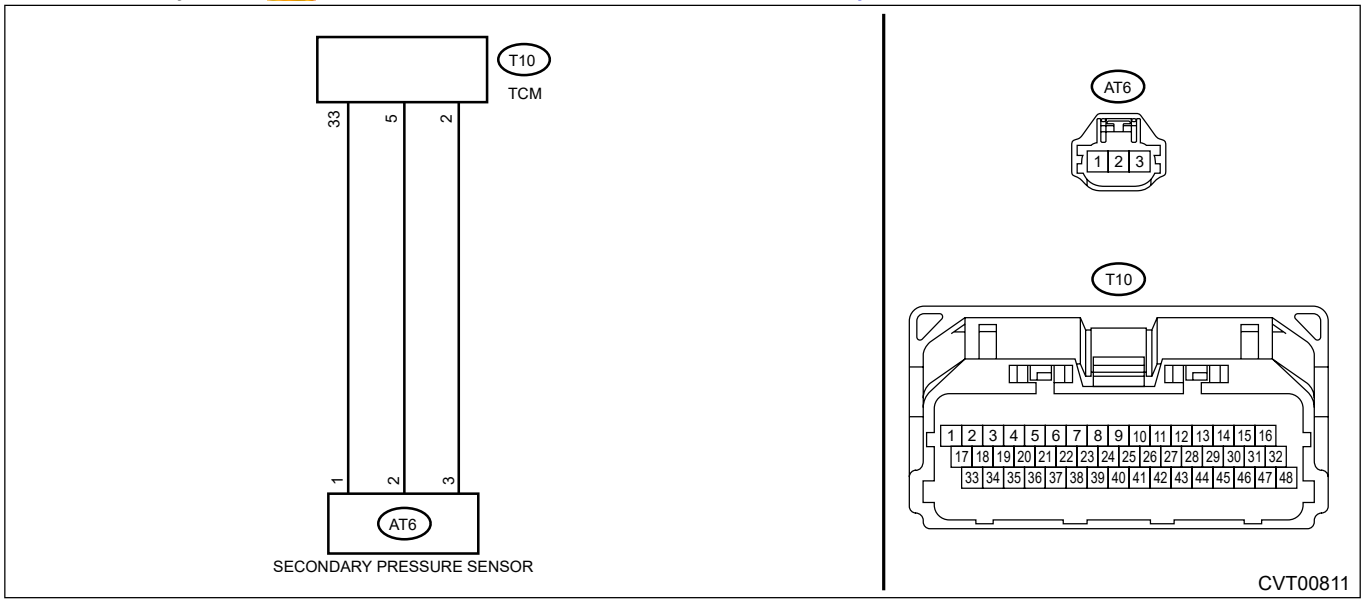
- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Caution:

- **Before performing diagnosis, record the freeze frame data.**
- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are DTCs other than P0841 displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST. After the diagnosis, start the engine, and drive for 20 minutes in any driving pattern. (Include driving at a constant legal speed (for 20 seconds) at least once.) Read the DTC, and if P0841 alone is detected, Go to 2.
No	Go to 2.

2. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to ON.
2. Read the data of [secondary pressure sensor voltage.] using Subaru Select Monitor. (While shaking the secondary pressure sensor harness) Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is the value of [secondary pressure sensor voltage.] 0.39 — 0.61 V?

Yes	Go to 10.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary pressure sensor connector.
4. Measure the resistance between TCM connector and secondary pressure sensor connector.

Connector & terminal

(T10) No. 2 — (AT6) No. 3:
(T10) No. 5 — (AT6) No. 2:
(T10) No. 33 — (AT6) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness.

4. CHECK HARNESS.

Measure the resistance between TCM connectors.

Connector & terminal

(T10) No. 2 — (T10) No. 33:
(T10) No. 5 — (T10) No. 2:
(T10) No. 33 — (T10) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit of harness.

5. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.

Connector & terminal

(T10) No. 2 — Transmission body:

(T10) No. 5 — Transmission body:

(T10) No. 33 — Transmission body:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit of harness.

6. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connectors.

Connector & terminal

(T10) No. 33 (+) — (T10) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 7.
No	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

7. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Turn the ignition switch to OFF.
2. Connect the secondary pressure sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connectors.
   Connector & terminal
   (T10) No. 33 (+) — (T10) No. 2 (−):

Is the voltage 4.6 — 5.4 V?

Yes	Go to 8.
No	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure Sensor.

8. CHECK SECONDARY PRESSURE SENSOR OUTPUT.

Measure the voltage between TCM connectors.
Connector & terminal
(T10) No. 5 (+) — (T10) No. 2 (−):

Is the voltage 0.39 — 0.61 V?

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 9.

9. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary pressure sensor connector.
4. Check the TCM connector (T10) and the secondary pressure sensor connector (AT6).

Is there any fault in the TCM connector or the secondary pressure connector?

Yes	Repair the connector, or replace harness.
No	Go to 10.

10. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 11.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT. Go to 11.

11. CHECK INPUT SIGNAL FOR TCM.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal and move the select lever to each range at an interval of five seconds.

   Note:

   Move the select lever in the following order: "P" → "R" → "N" → "D" → "N" → "R" → "P".
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Go to 12.
No	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure Sensor.

12. CHECK INPUT SIGNAL FOR TCM.

1. Shift the select lever to “P” range.
2. Keep the engine speed at 3,000 rpm.
3. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 1.5 — 2.5 MPa? And is the difference between the actual oil pressure and the value measured in Step 11 0.2 MPa or more?

Yes	Go to 13.
No	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure Sensor.

13. CHECK FREEZE FRAME DATA.

1. Turn the ignition switch to OFF.
2. Check the recorded freeze frame data.

Was the detected symptom low-voltage malfunction? Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE > CLASSIFICATION OF SYMPTOM USING FREEZE FRAME DATA.

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Go to 14.

14. CHECK TCM INPUT SIGNAL (STALL TEST).

1. Lift up the vehicle.
2. Start the engine.
3. Apply the parking brake.
4. Set the select lever to “D” range.
5. Depress the brake pedal firmly.
6. Slowly open the accelerator fully, and stabilize the engine speed.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 4.5 — 6.0 MPa?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Go to 15.

15. CHECK INPUT SIGNAL FOR TCM.

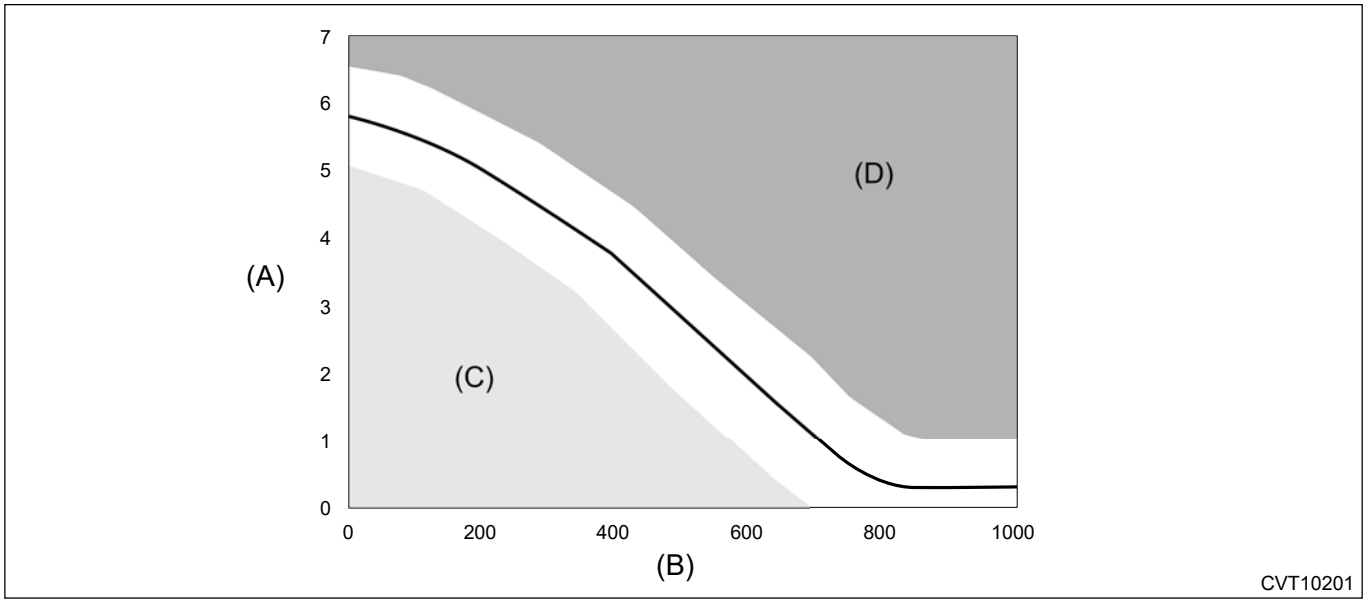
Check the [Actual Secondary Pressure] in step 14.

Is the value of [Actual Secondary Pressure] 4.5 MPa or less?

Yes	Replace the transmission assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Automatic Transmission Assembly.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. CLASSIFICATION OF SYMPTOM USING FREEZE FRAME DATA

Apply the values of [Actual Secondary Pressure] and [Secondary Actual Current] recorded in the freeze frame data onto the graph shown in the following figure, and judge if either low-voltage malfunction or high-voltage malfunction occurs.



(A) Actual secondary pressure (MPa)

(B) Secondary actual current (mA)

(C) Low-voltage malfunction

(D) High-voltage malfunction

Note:

Symptom that the DTC P0841 illuminates can be classified into 2 patterns.

- **Low-voltage malfunction: detected due to insufficient oil pressure**
- **High-voltage malfunction: detected due to excessive oil pressure**

2. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure control function.
- Judge as NG if a discrepancy between the target secondary oil pressure (as internal data) and the detected value of the secondary oil pressure sensor becomes the specified value or more.

3. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	At or more than rpm values in Table 1

Table 1

Target line pressure (kPa)	0	500	1000	1500	2000	3000	4000	5000	6000
Engine speed (rpm)	140	720	979	1125	1235	1450	1670	1929	2100

4. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ABS* (Target line pressure − Measured line pressure)	500 kPa or more

*ABS * Absolute value

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0842 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

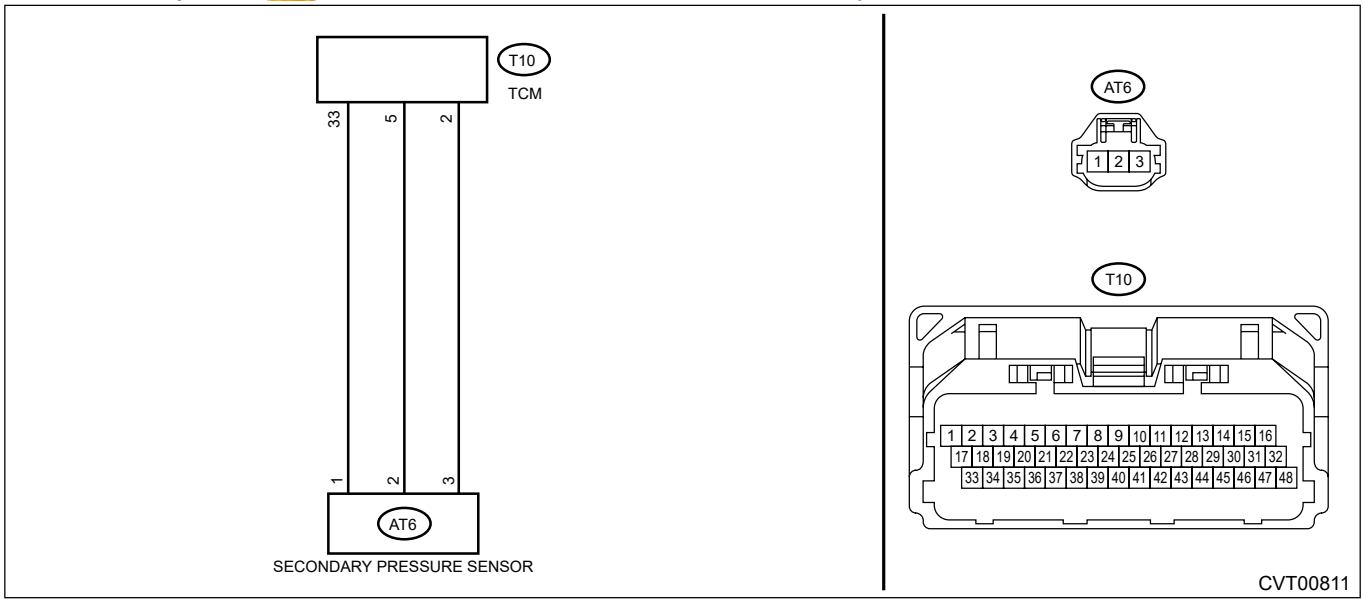
Shift characteristics malfunction

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. Start the engine.
2. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
3. Depress the brake pedal, and shift the select lever to “D” range.
4. Shift the select lever to “P” range.
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the transmission connector.
4. Measure the resistance between TCM connector and transmission connectors.

Connector & terminal

(T10) No. 2 — (AT6) No. 3:
(T10) No. 5 — (AT6) No. 2:
(T10) No. 33 — (AT6) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(T10) No. 5 — Chassis ground:

(T10) No. 33 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit of harness.

4. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Connect the TCM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between secondary pressure sensor connector terminals.

   Connector & terminal

   (AT6) No. 1 (+) — (AT6) No. 3 (−):

Is the voltage 4.5 V or more?

Yes	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure Sensor. If the replacement of the sensor do not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect the ground short circuit of the transmission line pressure sensor.
- Judge as NG if the voltage detected by the transmission line pressure sensor is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure sensor input voltage (Line pressure)	Less than 0.195 V (Less than − 574 kPa)

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0843 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

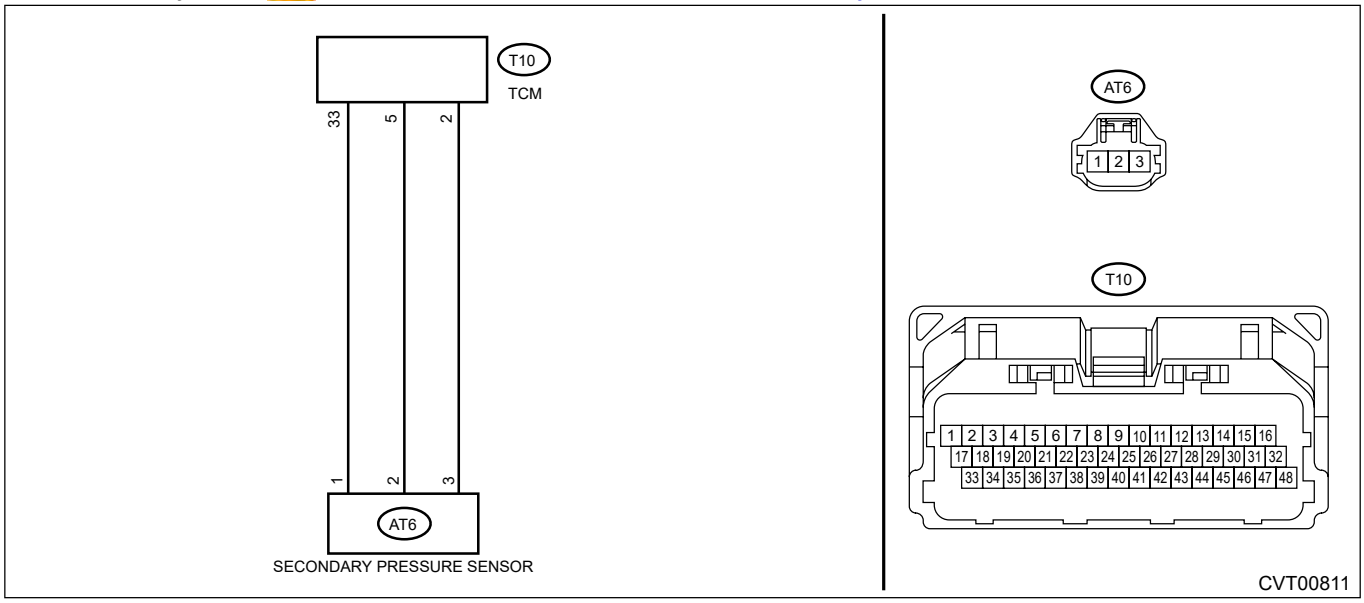
Shift characteristics malfunction

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. Start the engine.
2. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
3. Depress the brake pedal, and shift the select lever to “D” range.
4. Shift the select lever to “P” range.
5. Stabilize the engine speed at idle.
6. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary pressure sensor connector.
4. Turn the ignition switch to ON.
5. Measure the voltage between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 5 (+) — Chassis ground (−):

   (T10) No. 33 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Measure the resistance between TCM connector terminals.
   Connector & terminal
   (T10) No. 5 — (T10) No. 33:

Is the resistance less than 1 Ω?

Yes	Repair the short circuit of harness.
No	Go to 4.

4. CHECK POWER SUPPLY FOR SECONDARY PRESSURE SENSOR.

1. Connect the TCM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between secondary pressure sensor connector terminals.
   Connector & terminal
   (AT6) No. 1 (+) — (AT6) No. 3 (−):

Is the voltage 4.5 V or more?

Yes	Replace the secondary pressure sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Pressure Sensor. If the replacement of the sensor do not eliminate the malfunction, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission line pressure sensor 5 V system.
- Judge as NG if the voltage detected by the transmission line pressure sensor is higher than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured line pressure sensor input voltage (Line pressure)	More than 4.883 V (Exceeds 8200 kPa)

Time needed for diagnosis: 1.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0890 TCM POWER RELAY SENSE CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

Improper gear shifting

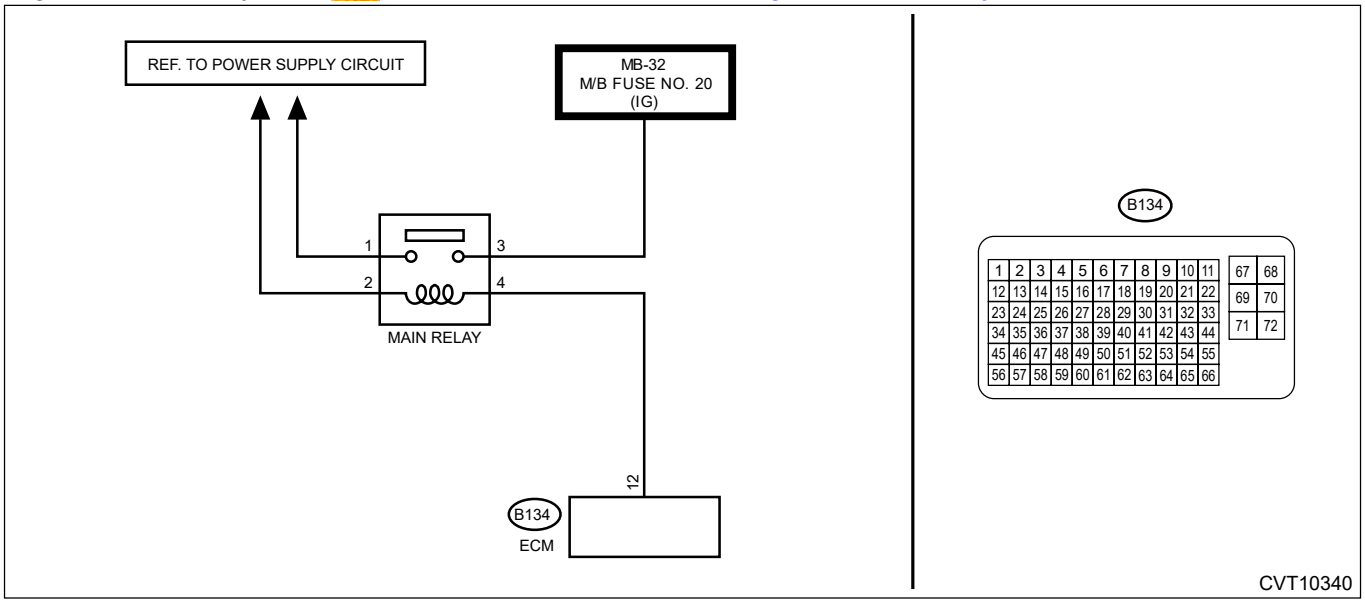
Caution:

- **Use CHECK BOARD when measuring the ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

Power supply circuit Ref. to WIRING SYSTEM>Power Supply Circuit>WIRING DIAGRAM.

Engine electrical system Ref. to WIRING SYSTEM>Engine Electrical System>WIRING DIAGRAM.



1. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 2.
No	Connect the ECM connector correctly.

2. CHECK HARNESS BETWEEN M/B FUSE AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between M/B fuse and engine ground.
   Connector & terminal
   (M/B fuse) No. 20 (+) — Engine ground (−):

Is the voltage 10 V or more?

Yes	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to power supply of harness between M/B fuse and main relay connector** • **Defective main relay**
No	Go to 3.

3. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B134) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Repair the poor contact of ECM connector.
No	Repair the short circuit to ground in harness between ECM connector and main relay connector.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission fluid pressure solenoid drive power supply relay circuit.
- Judge as NG if the transmission fluid pressure solenoid drive power supply voltage is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Ignition state	Run or Crank

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured TCM input voltage which is supplied from 12 V battery system through the TCM Power Relay	Less than 2 V

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

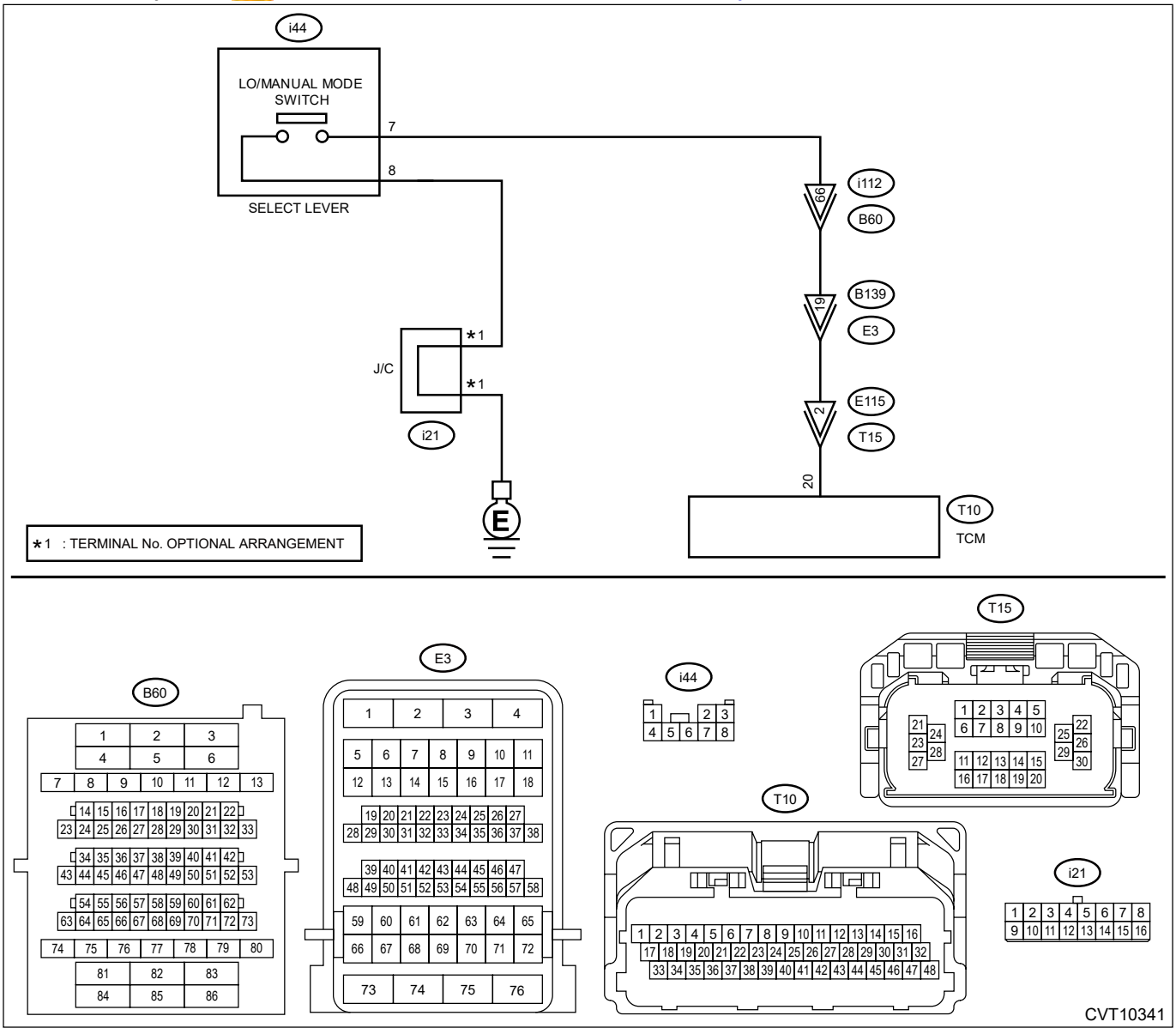
Manual mode can not be set.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure.** **Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the manual mode switch connector.
3. Measure the resistance between manual mode switch connector and chassis ground.
   Connector & terminal
   (i44) No. 8 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness.

2. CHECK MANUAL MODE SWITCH.

Measure the resistance between manual mode switch terminals.
Terminals
No. 7 — No. 8:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the select lever assembly. Ref. to CONTROL SYSTEMS>Select Lever.

3. CHECK MANUAL MODE SWITCH.

1. Shift the select lever to manual mode.
2. Measure the resistance between manual mode switch terminals.
   Terminals
   No. 7 — No. 8:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Replace the select lever assembly. Ref. to CONTROL SYSTEMS>Select Lever.

4. CHECK HARNESS.

1. Disconnect the TCM connector.
2. Measure the resistance between TCM connector and manual mode switch connector.
   Connector & terminal
   (T10) No. 20 — (i44) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit of harness or poor contact of connector.

5. CHECK HARNESS.

Measure the resistance between manual mode switch connector and chassis ground.
Connector & terminal
(i44) No. 7 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair the short circuit of harness.

6. CHECK INPUT SIGNAL FOR TCM.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Set the select lever to “D” range.
4. Read the data of [Tiptronic Mode Switch] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Does [Tiptronic Mode Switch] display “ON” with select lever in manual mode, and “OFF” with select lever in other than manual mode?

Yes	Current condition is normal.
No	Go to 7.

7. CHECK FOR POOR CONTACT.

Is there poor contact of the manual mode switch circuit?

Yes	Repair the poor contact.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short (ground-fault) in manual SW circuit.
- Judge as NG if the manual SW is ON in P, R or N range.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
D range SW	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Manual SW	ON

Time needed for diagnosis: 5 s
Malfunction indicator light illumination: Does not illuminate.

DTC P0961 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

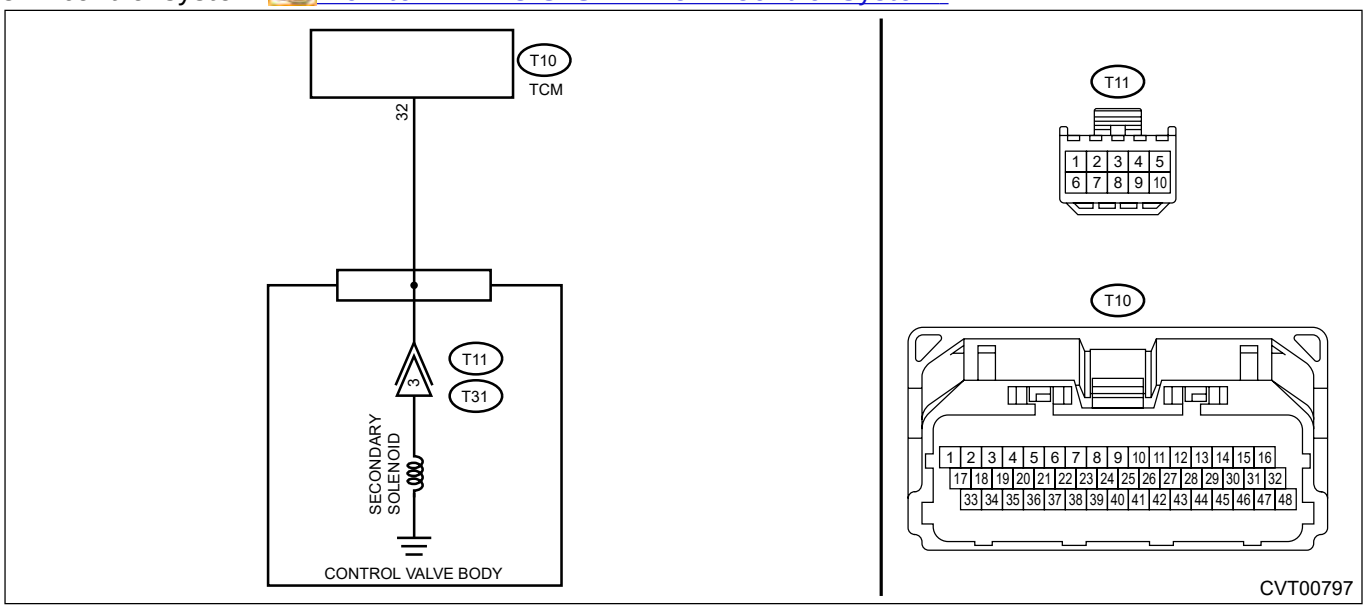
- Acceleration is poor during standing start.
- Shift control malfunction
- Engine speed increases abruptly.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0961, is DTC P0962 or P0963 displayed?

Yes	Perform the diagnosis according to DTCs other than P0961. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SECONDARY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the secondary solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Is 300 → 500 → 700 mA indicated at forced operation, and does [Secondary Actual Current] follow [Secondary Set Current]?

Yes	Go to 3.
No	Go to 4.

3. CHECK FOR POOR CONTACT.

Check for poor contact of harness and connector between TCM and secondary solenoid.

Is there poor contact?

Yes	Repair the poor contact of harness and connector.
No	Recheck the poor contact of harness and connector. Replace the TCM if no fault is found. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

4. CHECK SECONDARY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Measure the resistance between transmission connector and transmission body.
   Connector & terminal
   (T10) No. 32 — Transmission body:

Is the resistance approximately 5 — 7 Ω? (when cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Repair or replace the harness.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of transmission line pressure solenoid drive circuit.
- Judge as NG when the deviation between target current and actual current of the transmission line pressure solenoid becomes equal to or larger than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ABS* (Target line pressure control solenoid valve current − Measured line pressure control solenoid valve current)	Exceeds 0.2 A
Measured line pressure control solenoid valve current	Exceeds 1.05 A and 1.6 A or less

* ABS: Absolute value

Time needed for diagnosis: 1.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0962 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

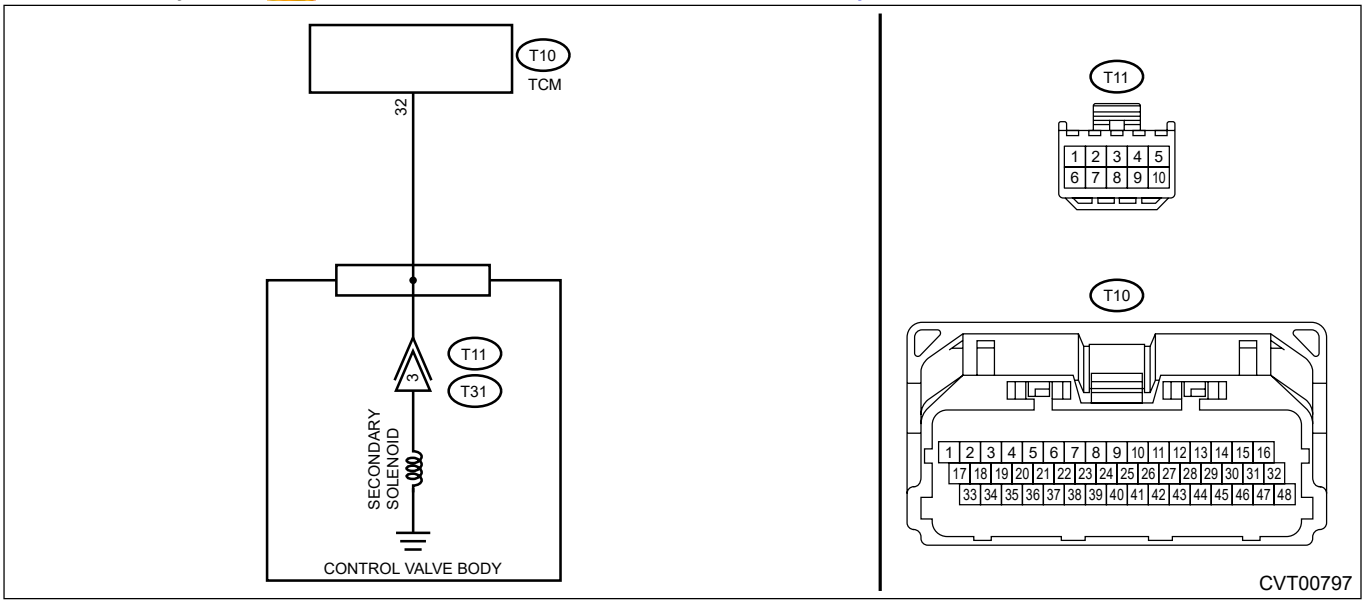
- Engine speed increases abruptly, and can not start.
- Engine speed increases abruptly during driving.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at “N” range.
2. Using Subaru Select Monitor, read the data of [Secondary Set Current] and [Secondary Actual Current]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Do [Secondary Set Current] and [Secondary Actual Current] almost match?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 32 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK SECONDARY SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 32 — Transmission body:

Is the resistance approximately 5 — 7 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the transmission line pressure solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission line pressure solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON

Malfunction Criteria	Threshold Value
As defined by: Measured line pressure control solenoid valve current is 1.6 A or more	

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0963 PRESSURE CONTROL SOLENOID "A" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

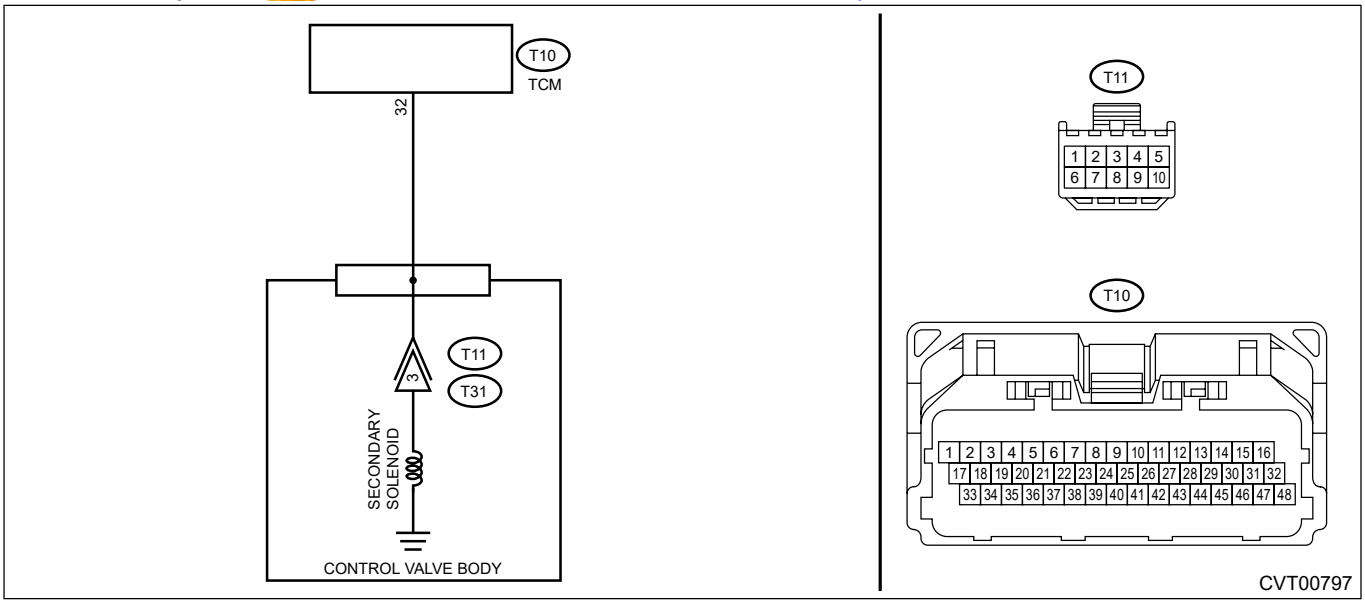
- Engine speed increases abruptly, and can not start.
- Engine speed increases abruptly during driving.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at “N” range.
2. Using Subaru Select Monitor, read the data of [Secondary Set Current] and [Secondary Actual Current]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Do [Secondary Set Current] and [Secondary Actual Current] almost match?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and transmission connectors.
   Connector & terminal
   (T10) No. 32 — (T11) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 32 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 4.
No	Repair the short circuit of harness.

4. CHECK SECONDARY SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 32 — Transmission body:

Is the resistance approximately 5 — 7 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 5.

5. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the transmission line pressure solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission line pressure solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded line pressure control solenoid valve current	0.2 A or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured line pressure control solenoid valve current is less than 5.9 mA	ON

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0965 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

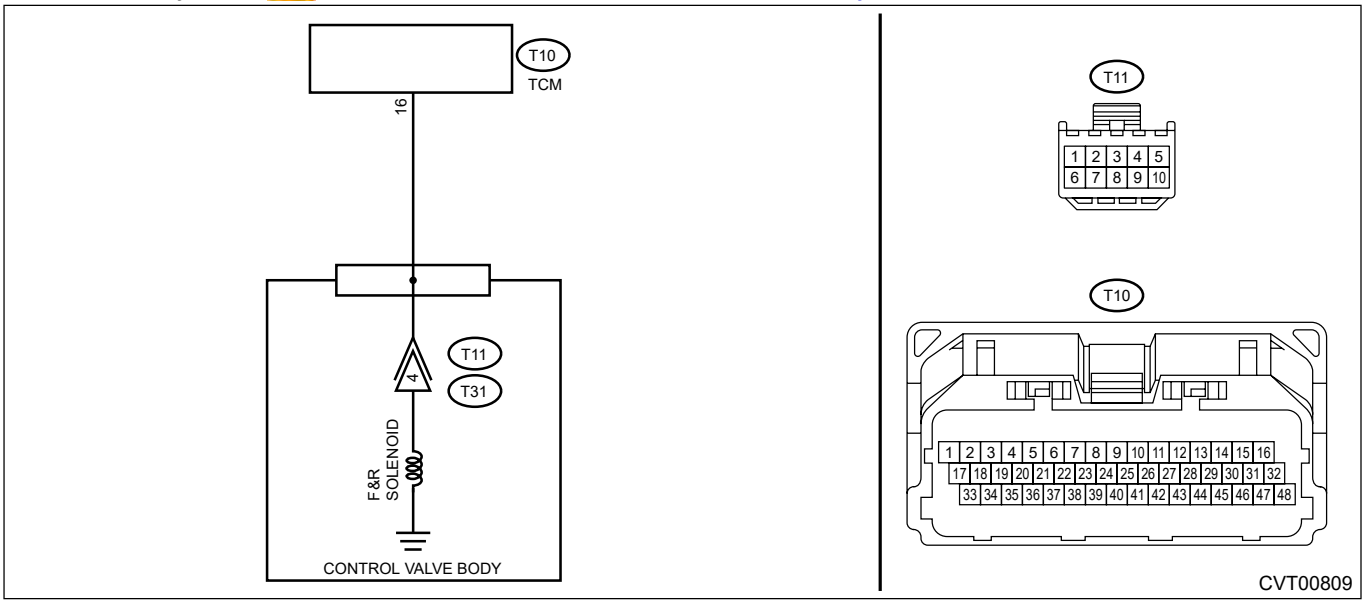
- Engine speed increases abruptly, and can not accelerate.
- Excessive slippage is felt.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Besides DTC P0965, is any of the DTC P0717, P0966, P0967 or P2747 displayed?

Yes	Perform the diagnosis according to DTCs other than P0965. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK F&R SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the F&R solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Is 300 → 500 → 700 mA indicated at forced operation, and does [Actual Forward & Reverse Linear Solenoid Current] follow [Commanded Forward & Reverse Linear Solenoid Current]?

Yes	Go to 3.
No	Go to 4.

3. CHECK FOR POOR CONTACT.

Check for poor contact of harness and connector between TCM and F&R solenoid.

Is there poor contact?

Yes	Repair the poor contact of harness and connector.
No	Recheck the poor contact of harness and connector. Replace the TCM if no fault is found. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

4. CHECK F&R SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 16 — Transmission body:

Is the resistance approximately 4 — 6 Ω? (when cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Repair or replace the harness.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
- Judge as NG when the deviation between set current and actual current of the transmission forward/reverse clutch pressure solenoid drive circuit becomes equal to or larger than the predetermined value.

Diagnosis 2

- Detect the malfunction of transmission forward/reverse clutch pressure solenoid drive circuit characteristics.
- Judge as NG when the transmission forward/reverse clutch pressure solenoid drive current is within the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1 12 V battery system voltage	9 V or more
Diagnosis 2 12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1 ABS* (Target forward & reverse clutch pressure control solenoid	Exceeds 0.2 A

Malfunction Criteria	Threshold Value
current – Measured forward & reverse clutch pressure control solenoid current)	
Diagnosis 2	
Measured forward & reverse clutch pressure control solenoid current	Exceeds 1.08 A and 1.6 A or less

* ABS: Absolute value

Time needed for diagnosis: 1.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0966 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

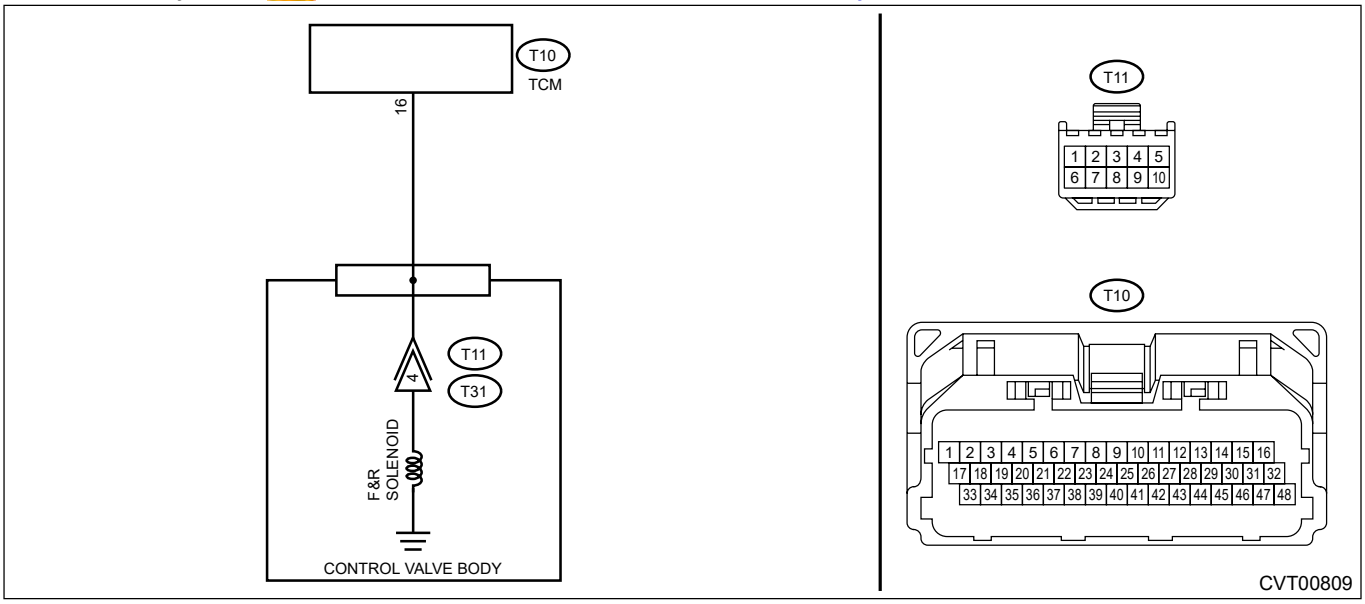
Excessive shift shock

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at “D” range.
2. Using Subaru Select Monitor, read the data of [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Do [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current] almost match?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK F&R SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 16 — Transmission body:

Is the resistance approximately 4 — 6 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the short circuit to ground in transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the transmission forward/reverse clutch pressure solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC	ON

Malfunction Criteria	Threshold Value
As defined by: Measured forward & reverse clutch pressure control solenoid current exceeds 1.6 A	

Time needed for diagnosis: 1 second
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0967 PRESSURE CONTROL SOLENOID "B" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

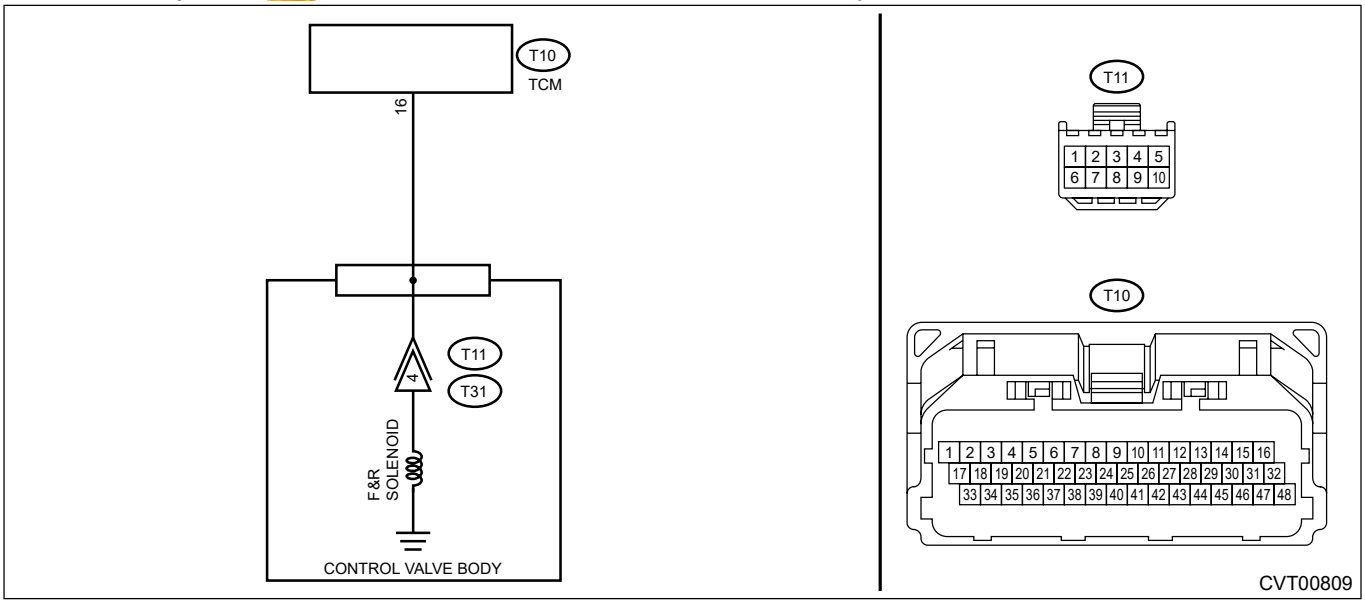
Engine speed increases abruptly, and can not start.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK INPUT SIGNAL FOR TCM.

1. After driving with warm up condition, park the vehicle while depressing the brake pedal at “D” range.
2. Using Subaru Select Monitor, read the data of [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current]. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Do [Commanded Forward & Reverse Linear Solenoid Current] and [Actual Forward & Reverse Linear Solenoid Current] almost match?

Yes	Check for poor contact of connector.
No	Go to 2.

2. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and control valve body connector.
   Connector & terminal
   (T10) No. 16 — (T11) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 16 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 4.
No	Repair the short circuit of harness.

4. CHECK F&R SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 16 — Transmission body:

Is the resistance approximately 4 — 6 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 5.

5. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect open circuit or power supply-output short circuit in the transmission forward/reverse clutch pressure solenoid circuit.
- Judge as NG if the transmission forward/reverse clutch pressure solenoid drive current is lower than the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Target forward & reverse clutch pressure control solenoid current	0.1 A or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured forward & reverse clutch pressure control solenoid current less than 5.9 mA	ON

Time needed for diagnosis: 1 second
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0970 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

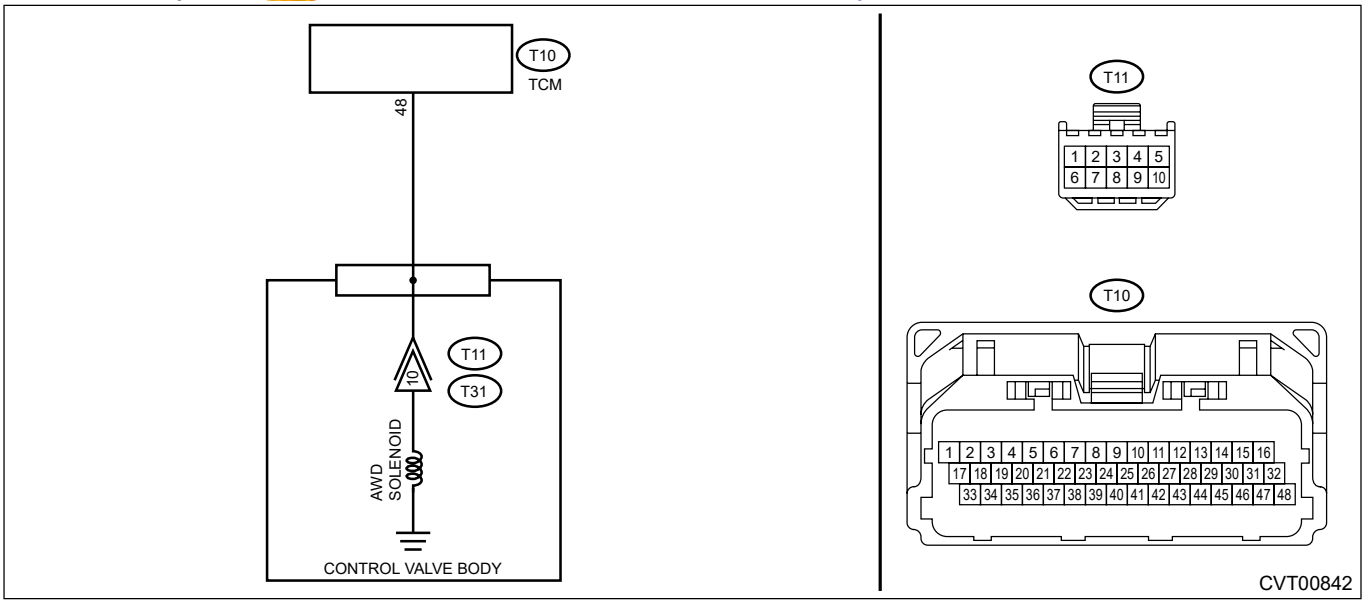
Drivability getting worse.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:
Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.
   Connector & terminal
   (T10) No. 48 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit of harness.

2. CHECK AWD SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 48 — Transmission body:

Is the resistance approximately 2 — 4.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 3.

3. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short in transfer solenoid circuit.
- Judge as NG if a ground short circuit is detected more than 10 times via the detection circuit for the transfer solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Target duty cycle	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction signal from solenoid driver IC	10 counts or more

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Does not illuminate.

DTC P0971 PRESSURE CONTROL SOLENOID "C" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

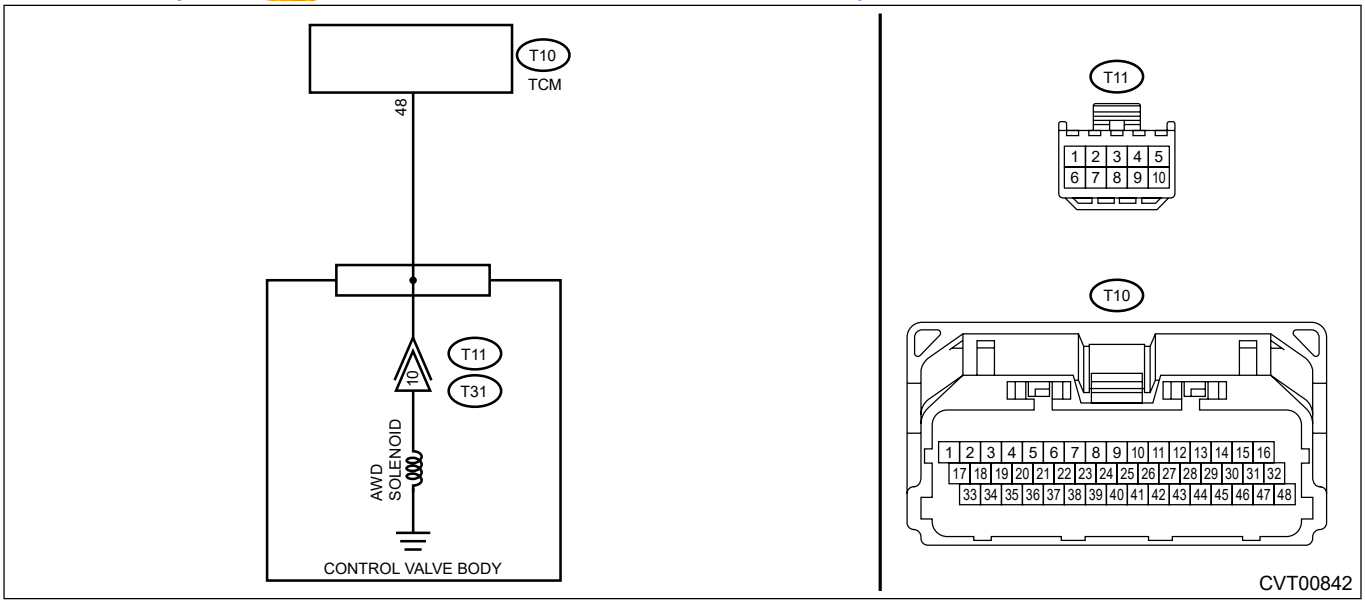
- Tight corner braking phenomenon occurs.
- Drivability getting worse.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and control valve body connector.

   Connector & terminal

   (T10) No. 48 — (T11) No. 10:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 48 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK AWD SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 48 — Transmission body:

Is the resistance approximately 2 — 4.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect open circuit or power supply-output short circuit in the transfer solenoid circuit.
- Judge as NG if an open circuit or a short circuit to ground is detected more than 10 times via the detection circuit in the transfer solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Target duty cycle	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Malfunction signal from solenoid driver IC	10 counts or more

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Does not illuminate.

DTC P0973 SHIFT SOLENOID "A" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

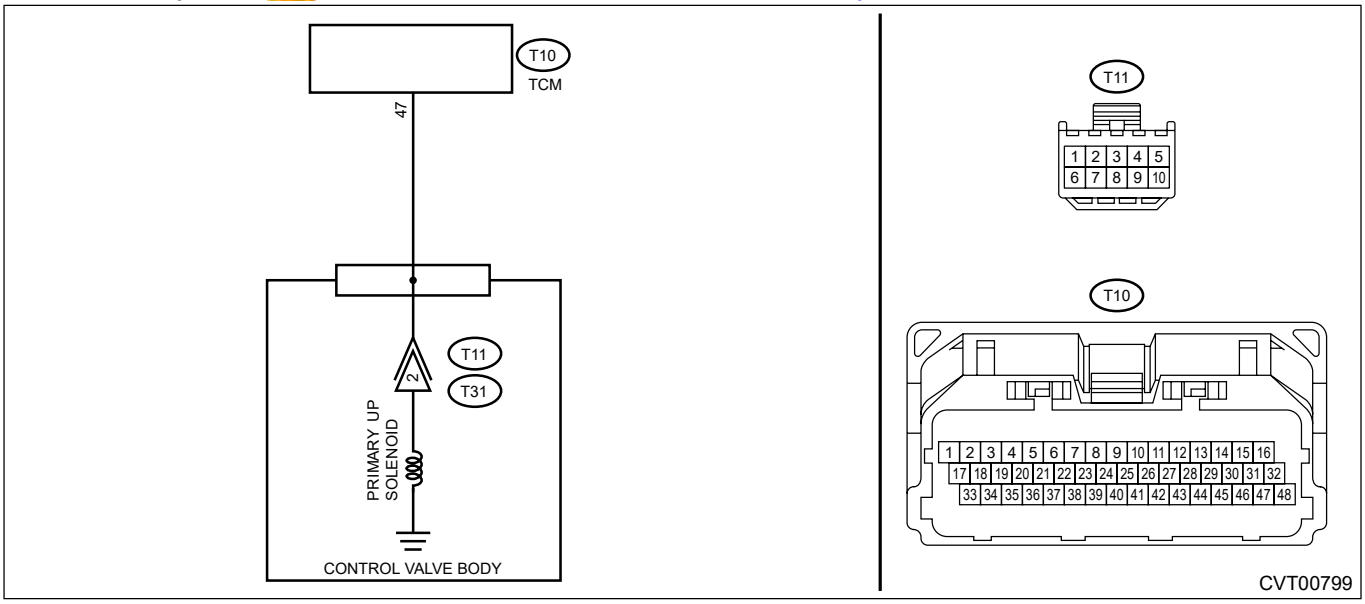
Gear is not changed. (No up-shift)

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 47 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit of harness.

2. CHECK PRIMARY UP SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.

   Connector & terminal

   (T10) No. 47 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 3.

3. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-up fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift up pressure control solenoid	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured shift up pressure control solenoid voltage 0.8 V or less	ON

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0974 SHIFT SOLENOID "A" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

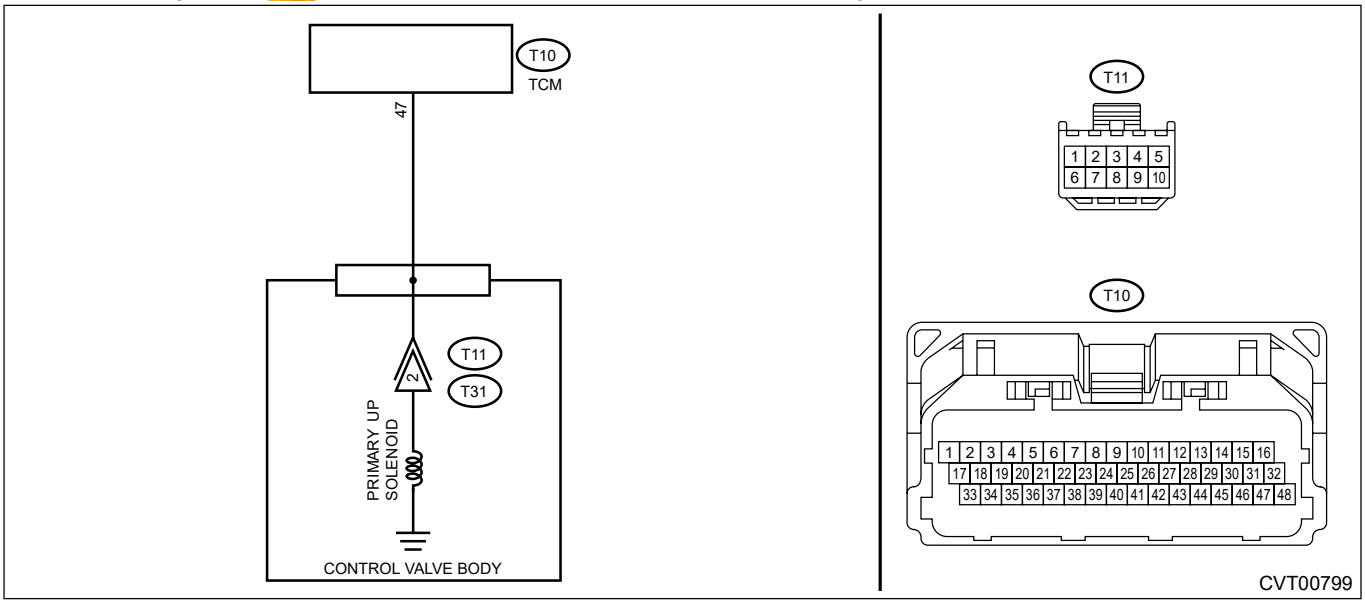
Gear is not changed. (No up-shift)

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and control valve body connector.

   Connector & terminal

   (T10) No. 47 — (T11) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 47 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK PRIMARY UP SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 47 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-up fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-up fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift up pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured shift up pressure control solenoid voltage 2.5 V or more	ON

Time needed for diagnosis: 0.2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0976 SHIFT SOLENOID "B" CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

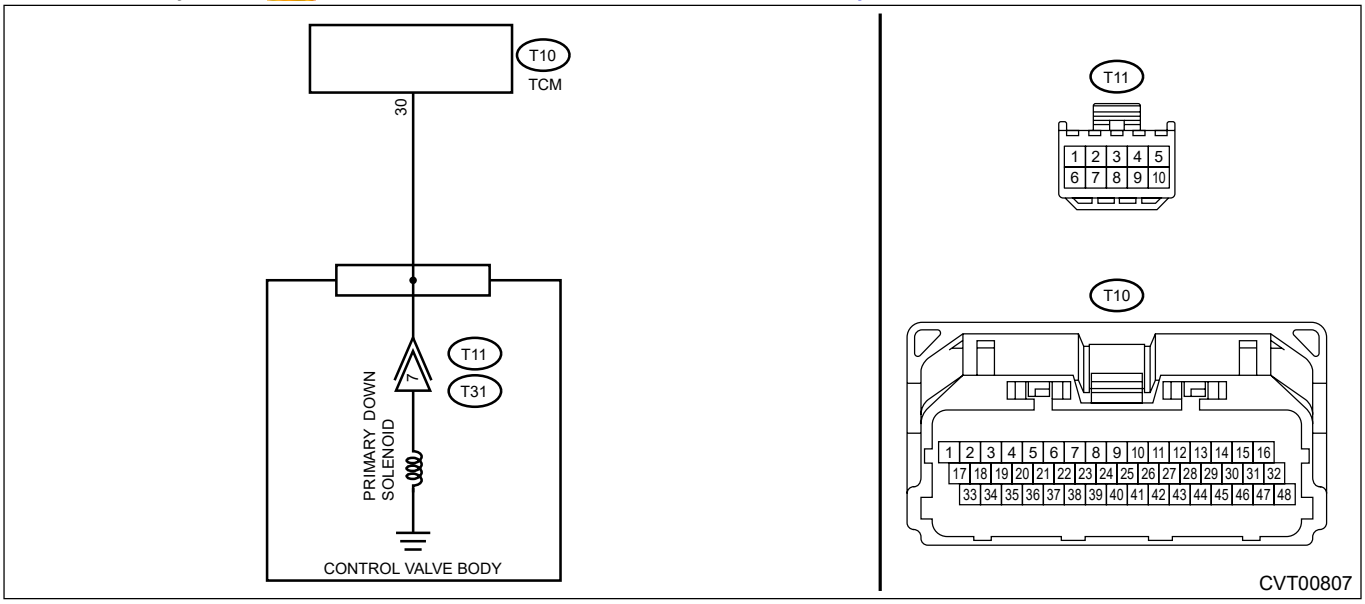
Gear is not changed. (No down-shift)

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 30 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit of harness.

2. CHECK PRIMARY DOWN SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.

   Connector & terminal

   (T10) No. 30 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 3.

3. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-down fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift down pressure control solenoid	100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured shift down pressure control solenoid voltage 0.8 V or less	ON

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P0977 SHIFT SOLENOID "B" CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

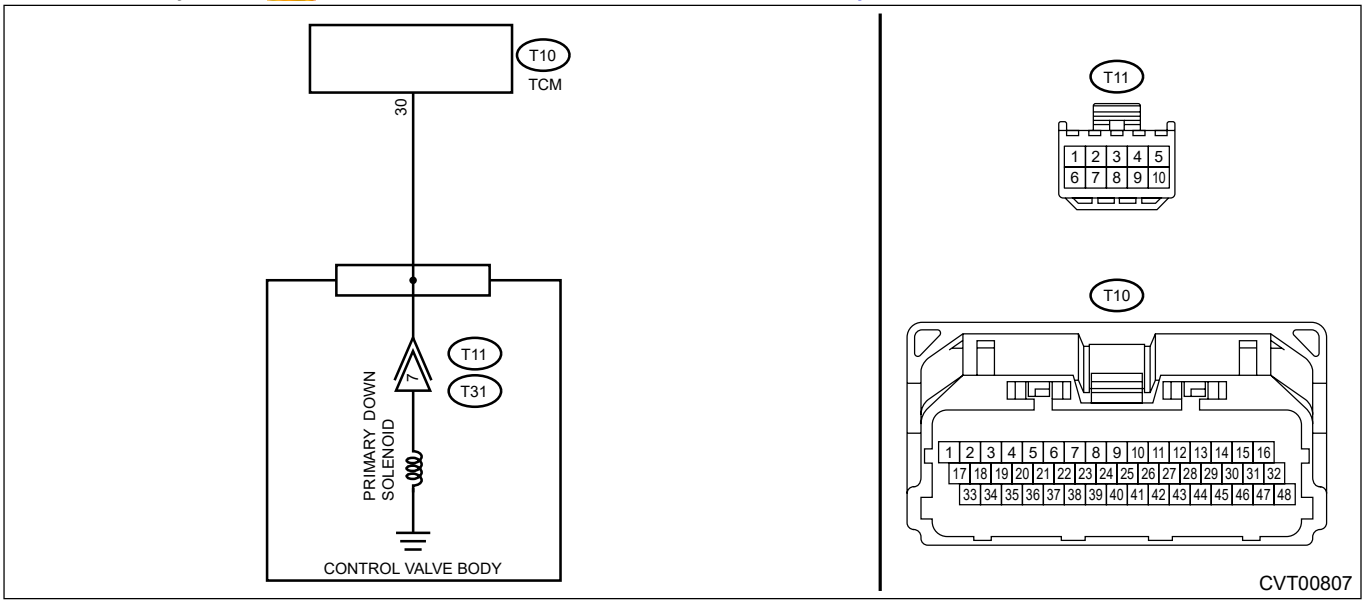
Gear is not changed. (No down-shift)

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and control valve body connector.

   Connector & terminal

   (T10) No. 30 — (T11) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 30 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK PRIMARY DOWN SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 30 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the shift-down fluid pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the shift-down fluid pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of shift down pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured shift down pressure control solenoid voltage 2.5 V or more	ON

Time needed for diagnosis: 0.2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P1603 ENGINE STALL HISTORY

Note:
Refer to "ENGINE (DIAGNOSTICS)" for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P1603 ENGINE STALL HISTORY.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Judge as NG when the engine stops except by operating the ignition switch after starting the engine.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Engine condition	After engine starting

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Engine speed	Less than 300 rpm

Time needed for diagnosis: Immediately
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P162B WARNING INDICATOR REQUEST

Note:

Refer to “ENGINE (DIAGNOSTICS)” for diagnostic procedure. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P162A STARTER INTERLOCK INTERNAL CIRCUIT.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

Judge as NG when an abnormal signal is received from the engine.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
None	

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Request for malfunction indicator light illumination from engine	ON

Time needed for diagnosis: 1 s

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC P170A L-RANGE SWITCH

Note:

Refer to “DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE” for diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect the GND-output short (ground-fault) in manual SW circuit.
- Judge as NG if the manual SW is ON in P, R or N range.

2. EXECUTION CONDITION

Secondary parameters	Execution condition

Secondary parameters	Execution condition
D range SW	OFF

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
L range SW	ON

Time needed for diagnosis: 5 s

Malfunction indicator light illumination: Does not illuminate.

DTC P2530 IGNITION SWITCH RUN POSITION CIRCUIT

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

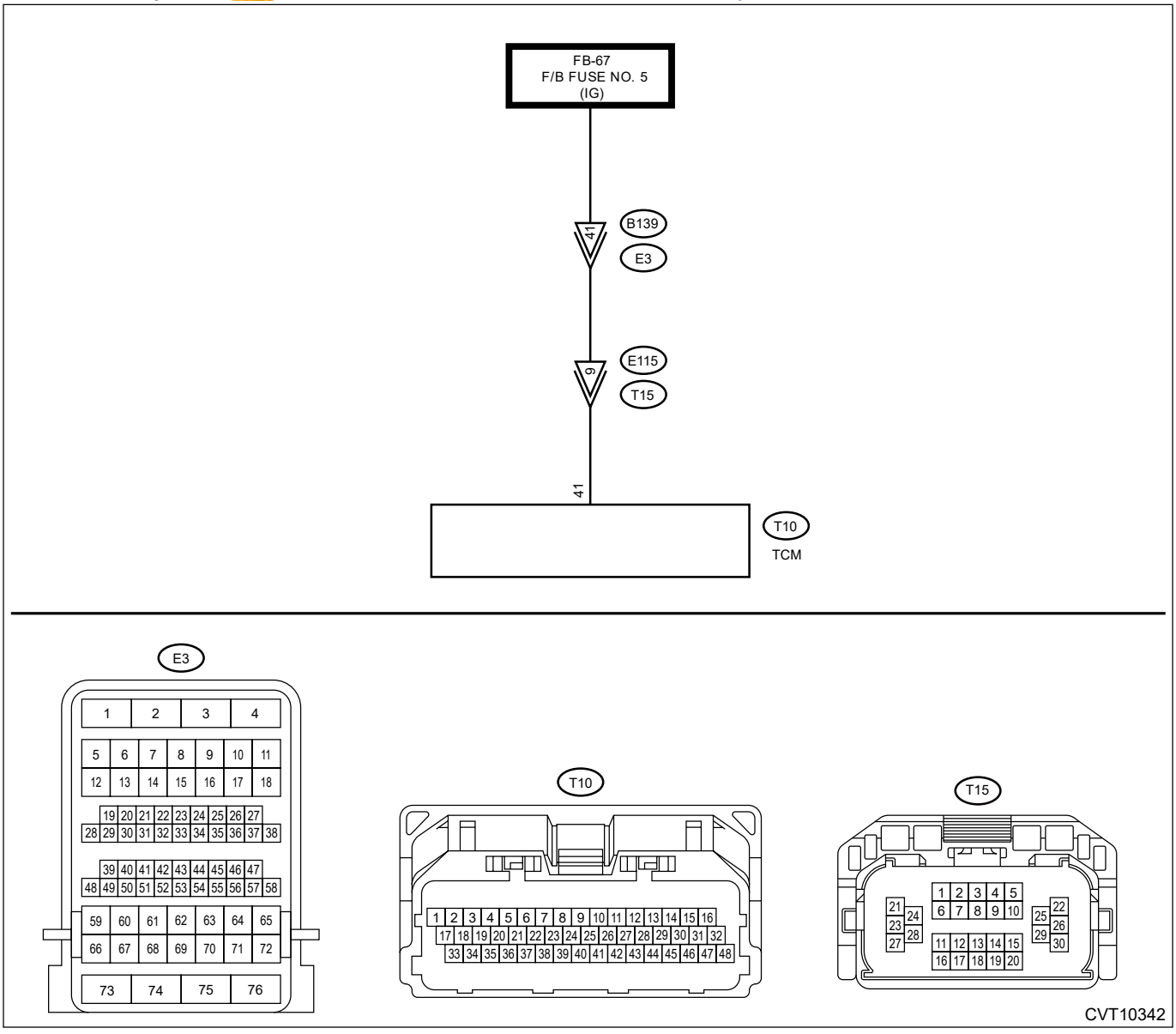
Faulty TCM operation

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK CONNECTOR.

Check the installing condition of TCM connector.

Is the TCM connector installed properly?

Yes	Go to 2.
No	Install the TCM connector.

2. CHECK INPUT VOLTAGE OF TCM.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between TCM connector and chassis ground. (While wiggling the harness)

Connector & terminal

(T10) No. 41 (+) — Chassis ground (−):

Is the voltage 8 V or more?

Yes	Even if DTC is detected, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, the following items may be the cause of fault.** • Open circuit or short circuit to ground of harness between TCM connector and ignition switch connector (IG relay 1 connector for model with push button start) • Poor contact of ignition switch connector (IG relay 1 connector for model with push button start) • Poor contact of ignition switch (IG relay 1 for model with push button start)
No	Repair the harness and connector. **Note:** **In this case, repair the following item:** • Open circuit or short circuit to ground of harness between TCM connector and ignition switch connector (IG relay 1 connector for model with push button start) • Poor contact of ignition switch connector (IG relay 1 connector for model with push button start) • Poor contact of ignition switch (IG relay 1 for model with push button start)

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of ignition SW circuit.

- Judge as NG if the ignition SW signals are lost 5 times or more even though the engine is ON.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10.9 V or more
Engine speed	400 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Count of temporarily discontinuous input of ignition switch	5 counts or more

Time needed for diagnosis: 5 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2746 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Standing start problems
- Shock occurs when engaging the lockup clutch.
- Shock occurs when selecting shift position.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P2746, is DTC P2747 or P2751 displayed?

Yes	Perform the diagnosis according to DTCs other than P2746. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Perform the diagnosis according to DTC P2747. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL.

1. OUTLINE OF DIAGNOSIS

Diagnosis 1
- Detect the malfunction of primary speed sensor signal characteristics.
- Judge as NG if the primary speed, compared with the speeds of other parts, is outside the possible range considering the hardware capabilities.

Diagnosis 2
- Detect the malfunction of primary speed sensor signal characteristics.
- Judge as NG if the primary speed exceeds the predetermined value.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
Diagnosis 1	
12 V battery system voltage	9 V or more
Transmission range	Drive or Reverse

Secondary parameters	Execution condition
(Measured turbine shaft speed / Measured secondary pulley shaft speed)	0.38 or more and 2.68 or less
Diagnosis 2	
12 V battery system voltage	9 V or more
Transmission range	Drive or Reverse
(Measured turbine shaft speed / Measured secondary pulley shaft speed)	0.38 or more and 2.68 or less

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Diagnosis 1 (Measured primary pulley shaft speed / Measured secondary pulley shaft speed)	Less than 0.34 or Exceeds 2.95
Diagnosis 2 Measured primary pulley shaft speed	Exceeds 7140 rpm

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2747 INTERMEDIATE SHAFT SPEED SENSOR "B" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

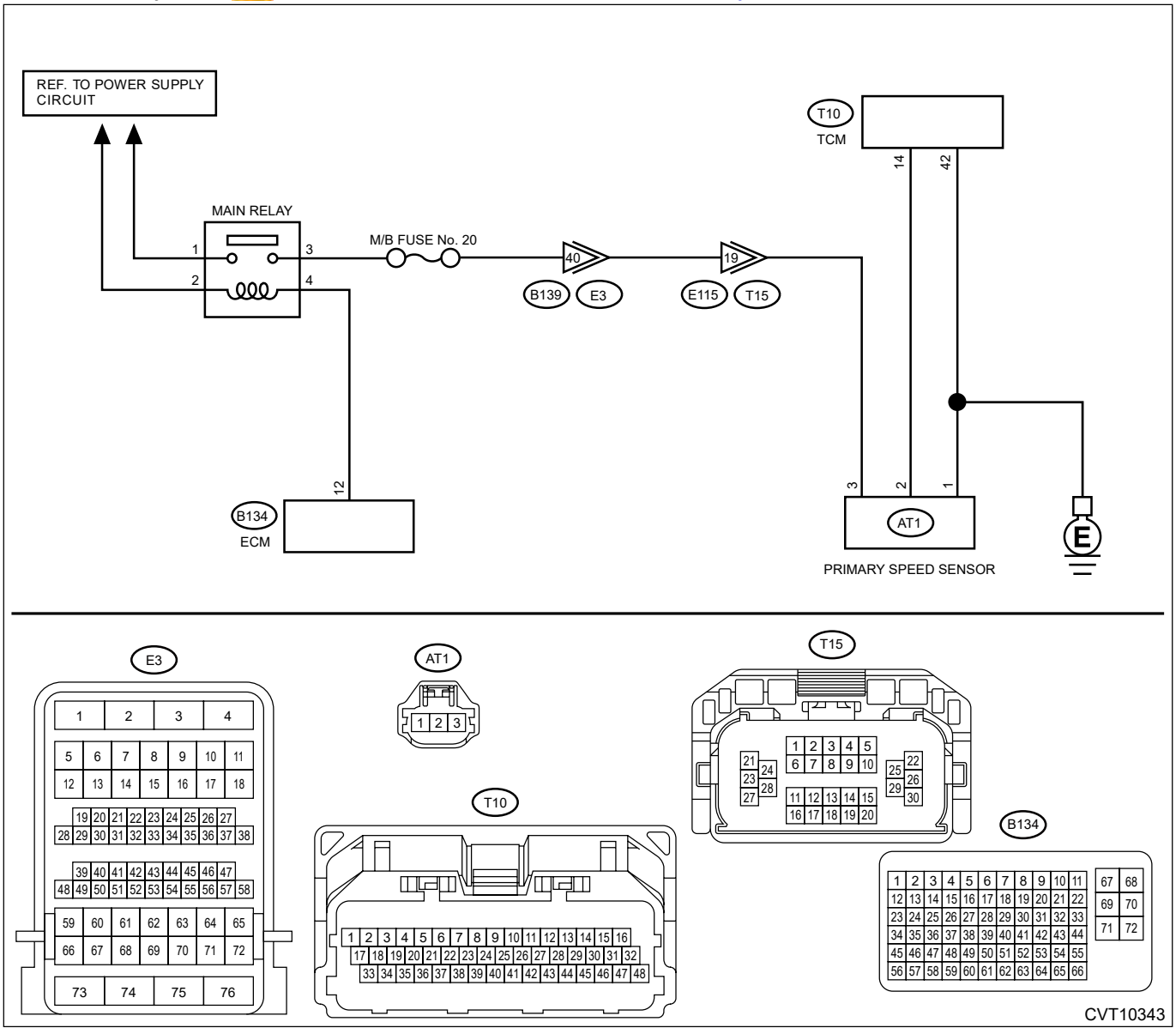
- Standing start problems
- Shock occurs when engaging the lockup clutch.
- Shock occurs when selecting shift position.

Caution:

- **Use CHECK BOARD when measuring the TCM•ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the M/B fuse No. 20.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 3.
No	Connect the ECM connector correctly.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T15) No. 19 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to power supply of harness between transmission connector and main relay connector** • **Defective main relay**
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and main relay connector.

5. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the primary speed sensor connector.
4. Measure the resistance between TCM connector and the primary speed sensor connector.

Connector & terminal

(T10) No. 14 — (AT1) No. 2:

(T10) No. 42 — (AT1) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness.

6. CHECK HARNESS.

Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(T10) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E115, T15)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector terminals.

   Connector & terminal

   (E115) No. 19 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 8.
No	Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to “D” range.
6. Read the data of [Primary Rev Speed] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Does the value of [Primary Rev Speed] change according to the [Turbine Revolution Speed]?

Yes	Current condition is normal. Repair the poor contacts of harnesses of primary speed sensor and transmission connector.
No	Go to 9.

9. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the primary speed sensor connector.
4. Measure the resistance between transmission connector and primary speed sensor connector.
   Connector & terminal
   (T15) No. 19 — (AT1) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Replace the transmission harness.

10. CHECK PRIMARY SPEED SENSOR.

1. Turn the ignition switch to OFF.
2. Replace the primary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Primary Speed Sensor.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P2747 displayed?

Yes	Go to 11.
No	The original primary speed sensor is defective.

11. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Replace the main relay.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P2747 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	The original main relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect no input signal from the primary speed sensor.
- Judge as NG if there is no input signal from the primary pulley speed sensor, while the secondary pulley speed sensor has the input signal although the primary and secondary pulleys are interlocked via the chain.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Measured secondary pulley shaft speed	500 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured primary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2750 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT RANGE/PERFORMANCE

DTC detecting condition:
Immediately at fault recognition
Trouble symptom:
- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Besides DTC P2750, is any of the DTC P2751, U0122 or U0416 displayed?

Yes	Perform the diagnosis according to DTCs other than P2750. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Perform the diagnosis according to DTC P2751. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of the secondary speed sensor characteristics.
- Judge as NG if the deviation of vehicle speed between VDC and the secondary speed sensor becomes the predetermined value or more.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Vehicle speed (calculated from wheel speed sensor)	5 MPH or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
ABS* (Vehicle speed (calculated from secondary pulley shaft speed) − Vehicle speed (calculated from wheel speed sensor))	Exceeds 10 MPH

* ABS: Absolute value

Time needed for diagnosis: 5 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2751 INTERMEDIATE SHAFT SPEED SENSOR "C" CIRCUIT NO SIGNAL

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

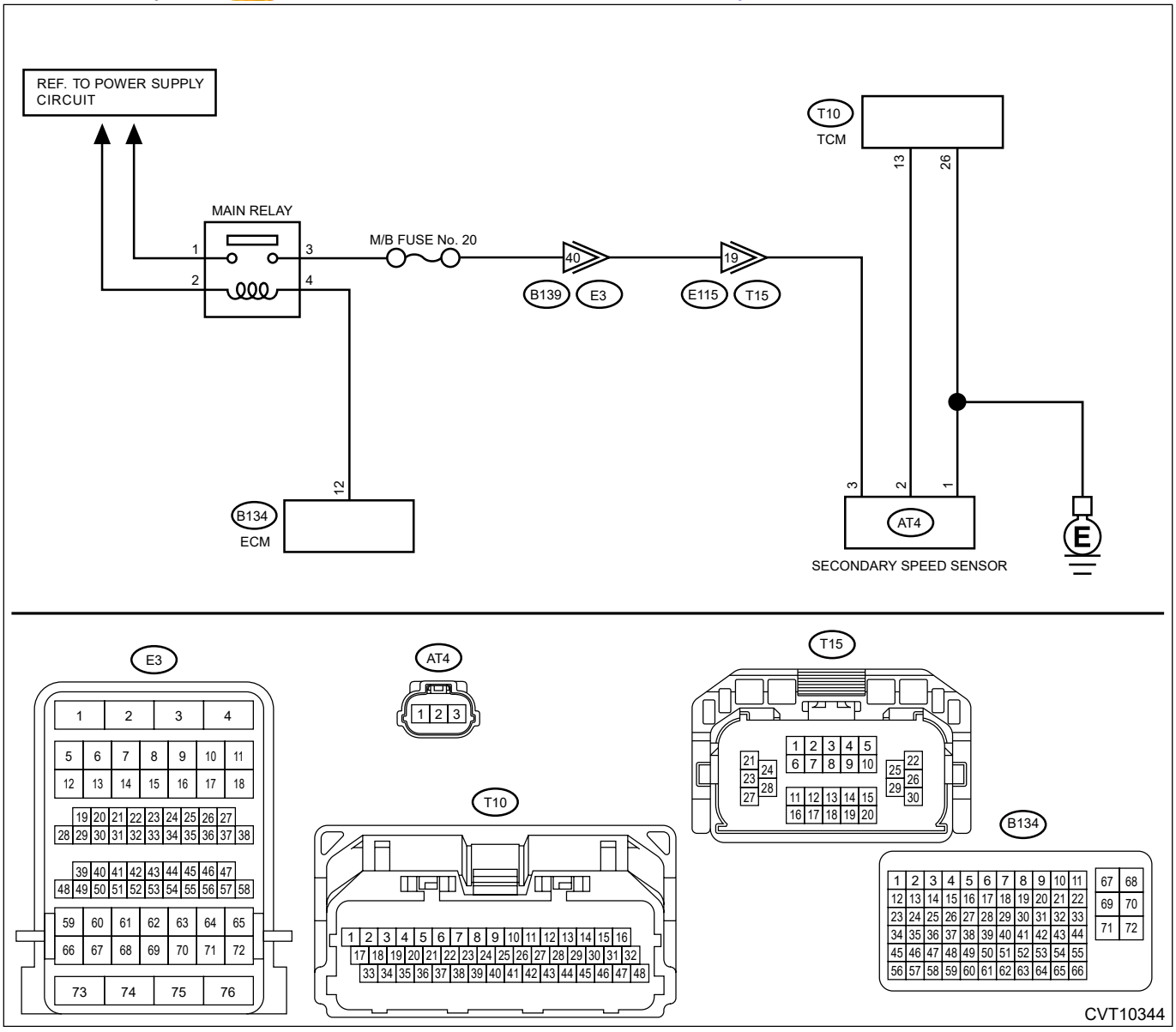
- Shifting shock is felt.
- Acceleration is poor during standing start.
- Shift control malfunction

Caution:

- **Use CHECK BOARD when measuring the TCM•ECM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the M/B fuse No. 20.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit of harness.

2. CHECK ECM CONNECTOR.

Check the connecting condition of ECM connector.

Is the ECM connector correctly connected?

Yes	Go to 3.
No	Connect the ECM connector correctly.

3. CHECK HARNESS BETWEEN TRANSMISSION CONNECTOR AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Measure the voltage between transmission connector and chassis ground.
   Connector & terminal
   (T15) No. 19 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the harness and connector. **Note:** **In this case, repair the following item:** • **Short circuit to power supply of harness between transmission connector and main relay connector** • **Defective main relay**
No	Go to 4.

4. CHECK HARNESS BETWEEN ECM AND MAIN RELAY CONNECTOR.

1. Turn the ignition switch to OFF.
2. Remove the main relay.
3. Disconnect the ECM connector.
4. Measure the resistance between the ECM connector and engine ground.

Connector & terminal

(B134) No. 12 — Engine ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short circuit to ground in harness between ECM connector and main relay connector.

5. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Disconnect the secondary speed sensor connector.
4. Measure the resistance between TCM connector and the secondary speed sensor connector.

Connector & terminal

(T10) No. 13 — (AT4) No. 2:

(T10) No. 26 — (AT4) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness.

6. HARNESS AND INSPECTION.

Measure the resistance between TCM connector and chassis ground.

Connector & terminal

(T10) No. 13 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the short circuit of harness.

7. CHECK TRANSMISSION HARNESS.

1. Install the fuse.
2. Connect the TCM connector.
3. Disconnect the transmission connector. (E115, T15)
4. Turn the ignition switch to ON.
5. Measure the voltage between transmission connector terminals.

   Connector & terminal

   (E115) No. 19 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 8.
No	Repair the open circuit of harness or poor contact of connector.

8. CHECK INPUT SIGNAL FOR TCM.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Lift up the vehicle.
4. Start the engine.
5. Set the select lever to “D” range.
6. Read the data of [Secondary Rev Speed] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

   Data Monitor

Does the value of [Secondary Rev Speed] change according to the [Front Wheel Speed]?

Yes	Current condition is normal. Repair the poor contacts of harnesses of secondary speed sensor and transmission connector.
No	Go to 9.

9. CHECK TRANSMISSION HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the transmission connector.
3. Disconnect the secondary speed sensor connector.
4. Measure the resistance between transmission connector and secondary speed sensor connector.

   Connector & terminal

   (T15) No. 19 — (AT4) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Replace the transmission harness.

10. CHECK SECONDARY SPEED SENSOR.

1. Turn the ignition switch to OFF.
2. Replace the secondary speed sensor. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Secondary Speed Sensor.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P2751 displayed?

Yes	Go to 11.
No	The original secondary speed sensor is defective.

11. CHECK MAIN RELAY.

1. Turn the ignition switch to OFF.
2. Replace the main relay.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC P2751 displayed?

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	The original main relay is defective.

1. OUTLINE OF DIAGNOSIS

- Detect the no input signal from the secondary speed sensor.
- Judge as NG if there is no input signal from the secondary pulley speed sensor, while the primary pulley speed sensor has the input signal although the primary and secondary pulleys are interlocked via the chain.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Transmission range	Drive or Reverse
Measured primary pulley shaft speed	1000 rpm or more

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Measured secondary pulley shaft speed	0 rpm

Time needed for diagnosis: 0.5 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2757 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT PERFORMANCE/STUCK OFF

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

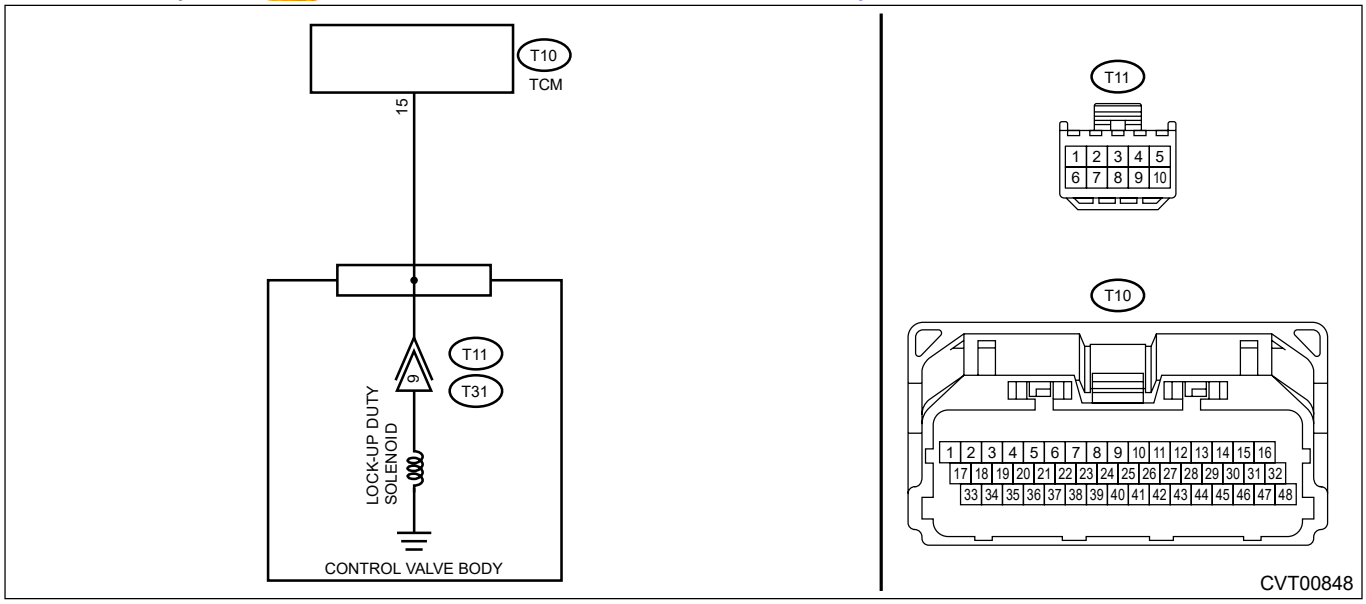
No lock-up occurs.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC other than DTC P2757 displayed?

Yes	Perform the diagnosis according to DTCs other than P2757. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the lock-up duty solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 6.
No	Go to 3.

3. CHECK LOCK-UP DUTY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 15 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Go to 4.

4. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Remove the transmission valve cover.
2. Disconnect the control valve body connector.
3. Measure the resistance between TCM connector and control valve body connector.

Connector & terminal

(T10) No. 15 — (T11) No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit of harness.

5. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.

Connector & terminal

(T10) No. 15 — Control valve body:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Repair the short circuit of harness.

6. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 7.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

7. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

Is the check result OK?

Yes	Go to 8.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>CONDITION CHECK.

8. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body. Go to 9.
No	Perform the diagnosis according to DTC P0841. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.

9. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Start the engine.
4. Warm up until the ATF temperature exceeds 50°C.
5. Drive the vehicle for one minute or more while keeping such constant speed that [Lock Up Duty Ratio] is 70% or more, and [Front Wheel Speed] is 40 km/h (25 MPH) or more, which are displayed on the Subaru Select Monitor.
6. Turn the ignition switch to OFF.
7. Start the engine.
8. Perform the procedure in step 5) again.
9. Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Does the AT OIL TEMP light blink and is DTC P2757 displayed?

Yes	Replace the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to low pressure side).
- Judge as NG if the deviation between engine speed and turbine speed becomes equal to or larger than the predetermined value, even though the lock-up command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Transmission range	Drive
Commanded duty of torque converter clutch pressure control solenoid	95% or more
Measured turbine shaft speed	Exceeds rpm values in Table 1

Table 1

Engine speed (rpm)	3700	3727	3755	3782	3856	4019	4213	4456
Measured turbine shaft speed (rpm)	0	500	1000	1500	2000	2500	3000	3500

Engine speed (rpm)	4786	5213	5651	6101	6569	7044	7520
Measured turbine shaft speed (rpm)	4000	4500	5000	5500	6000	6500	7000

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	**Threshold Value**
ABS* (Engine speed – Measured turbine shaft speed)	Exceeds rpm values in Table 2

* ABS: Absolute value

Table 2

Engine speed (rpm)	0	500	1000	1500	2000	2500	3000	3500
ABS (Engine speed – Measured turbine shaft speed) (rpm)	200	200	200	200	200	200	200	200

Engine speed (rpm)	4000	4500	5000	5500	6000	6500	7000
ABS (Engine speed – Measured turbine shaft speed) (rpm)	200	200	200	200	200	200	200

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2758 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT STUCK ON

DTC detecting condition:

Detected when two consecutive driving cycles with fault occur.

Trouble symptom:

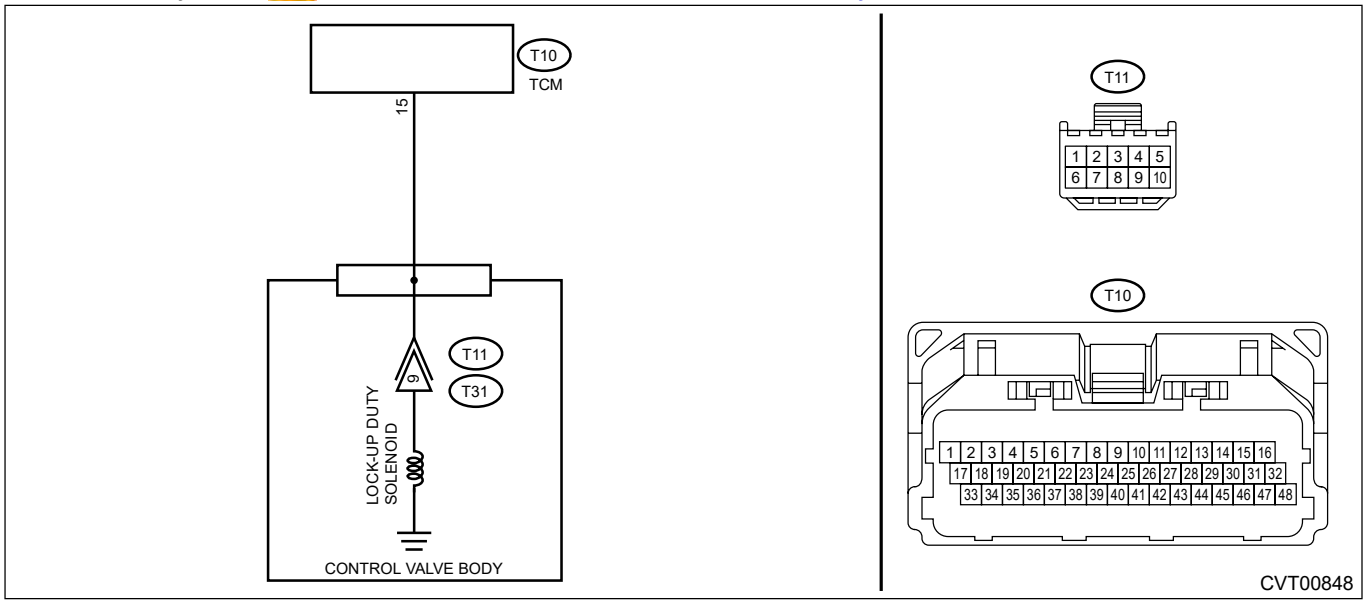
The engine stalls when the vehicle is stopped.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC other than DTC P2758 displayed?

Yes	Perform the diagnosis according to DTCs other than P2758. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LOCK-UP DUTY SOLENOID (ACTIVE TEST).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform forced operation of the lock-up duty solenoid. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

Does the indication of 0 → 50% appear repeatedly during forced operation, and does operating sound emit during indicating 50%?

Yes	Go to 6.
No	Go to 3.

3. CHECK LOCK-UP DUTY SOLENOID.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 15 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Go to 4.

4. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Remove the transmission valve cover.
2. Disconnect the control valve body connector.
3. Measure the resistance between TCM connector and control valve body connector.

Connector & terminal

(T10) No. 15 — (T11) No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit of harness.

5. CHECK HARNESS.

Measure the resistance between TCM connector and transmission body.

Connector & terminal

(T10) No. 15 — Control valve body:

Is the resistance 1 MΩ or more?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.
No	Repair the short circuit of harness.

6. CHECK TRANSMISSION FLUID.

1. Connect all connectors.
2. Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

Is the check result OK?

Yes	Go to 7.
No	Adjust the amount of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF>ADJUSTMENT.

7. CHECK TRANSMISSION FLUID.

Check the condition of ATF. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF.

Is the check result OK?

Yes	Go to 8.
No	Check according to the “Corrective action” of ATF (CVTF) “CONDITION CHECK”. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>CVTF.

8. CHECK INPUT SIGNAL FOR TCM.

1. Lift up the vehicle.
2. Start the engine.
3. Warm up until the ATF temperature reaches to 40 — 70°C (104 — 158°F).
4. Depress the brake pedal, and shift the select lever to “D” range.
5. Shift the select lever to “P” range.
6. Stabilize the engine speed at idle.
7. Read the data of [Actual Secondary Pressure] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is [Actual Secondary Pressure] 0.5 — 1.5 MPa?

Yes	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body. Go to 9.
No	Perform the diagnosis according to DTC P0841. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0841 TRANSMISSION FLUID PRESSURE SENSOR/SWITCH "A" CIRCUIT RANGE/PERFORMANCE.

9. DRIVING CHECK FOR LOCK-UP CONDITION.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Start the engine.
4. Warm up until the ATF temperature exceeds 50°C.
5. Drive the vehicle for one minute or more while keeping such constant speed that [Lock Up Duty Ratio] is 0%, and [Front Wheel Speed] is 5 km/h (3 MPH) or less, which are displayed on the Subaru Select Monitor.
6. Turn the ignition switch to OFF.
7. Start the engine.
8. Perform the procedure in step 5) again.
9. Read the DTC using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Does the AT OIL TEMP light blink and is DTC P2758 displayed? Or does the engine stall?

Yes	Replace the torque converter assembly. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Torque Converter Assembly.
No	Current condition is normal. It is possible that temporary poor contact occurs.

1. OUTLINE OF DIAGNOSIS

- Detect the malfunction of lock-up fluid pressure control solenoid, and hydraulic circuit, or drive circuit characteristics (stuck to high pressure side).
- Judge as NG if the deviation between engine speed and turbine speed becomes equal to or smaller than the predetermined value, even though the lock-up release command is issued.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Engine speed	1000 rpm or more
Transmission range	Drive
Engine torque	Exceeds N•m values in Table 1
Commanded duty of torque converter clutch pressure control solenoid	0%

Table 1

		Engine coolant temperature (degC)							
		– 40	– 20	0	20	40	60	80	100
Vehicle speed (calculated from measured secondary pulley shaft speed sensor) (MPH)	0	144	130	116	102	88	74	74	74
	13	150	141	127	113	99	85	84	84
	25	150	150	143	129	115	101	101	101
	38	150	150	150	150	144	130	130	130
	50	150	150	150	150	150	150	150	150

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	**Threshold Value**
ABS* (Engine speed – Measured turbine shaft speed)	Less than rpm values in Table 2

* ABS: Absolute value

Table 2

Engine speed (rpm)	0	500	1000	1500	2000	2500	3000	3500
ABS* (Engine speed – Measured turbine shaft speed) (rpm)	0	0	50	50	50	50	50	50

Engine speed (rpm)	4000	4500	5000	5500	6000	6500	7000
ABS* (Engine speed – Measured turbine shaft speed) (rpm)	50	50	50	50	50	50	50

Time needed for diagnosis: 10 seconds

Malfunction indicator light illumination: Illuminates when malfunction occurs in 2 continuous driving cycles.

DTC P2763 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT HIGH

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

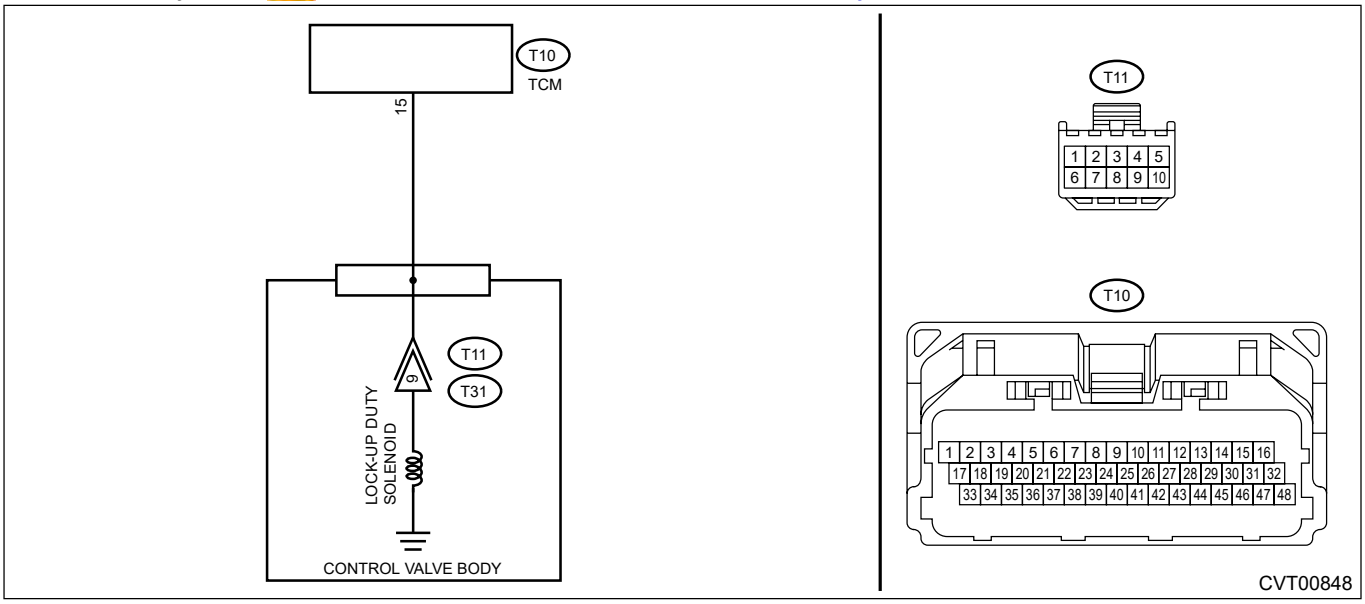
- No lock-up occurs.
- Engine stalls.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and control valve body connector.

Connector & terminal

(T10) No. 15 — (T11) No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair the open circuit of harness.

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between TCM connector and chassis ground.

Connector & terminal

(T10) No. 15 (+) — Chassis ground (−):

Is the voltage approx. 0 V?

Yes	Go to 3.
No	Repair the short circuit of harness.

3. CHECK LOCK-UP DUTY SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.
   Connector & terminal
   (T10) No. 15 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 4.

4. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect short circuit to power supply or open circuit of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	9 V or more
Commanded duty of torque converter clutch pressure control solenoid	0%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured torque converter clutch pressure control solenoid voltage 2.5 V or more	ON

Time needed for diagnosis: 0.2 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC P2764 TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW

DTC detecting condition:

Immediately at fault recognition

Trouble symptom:

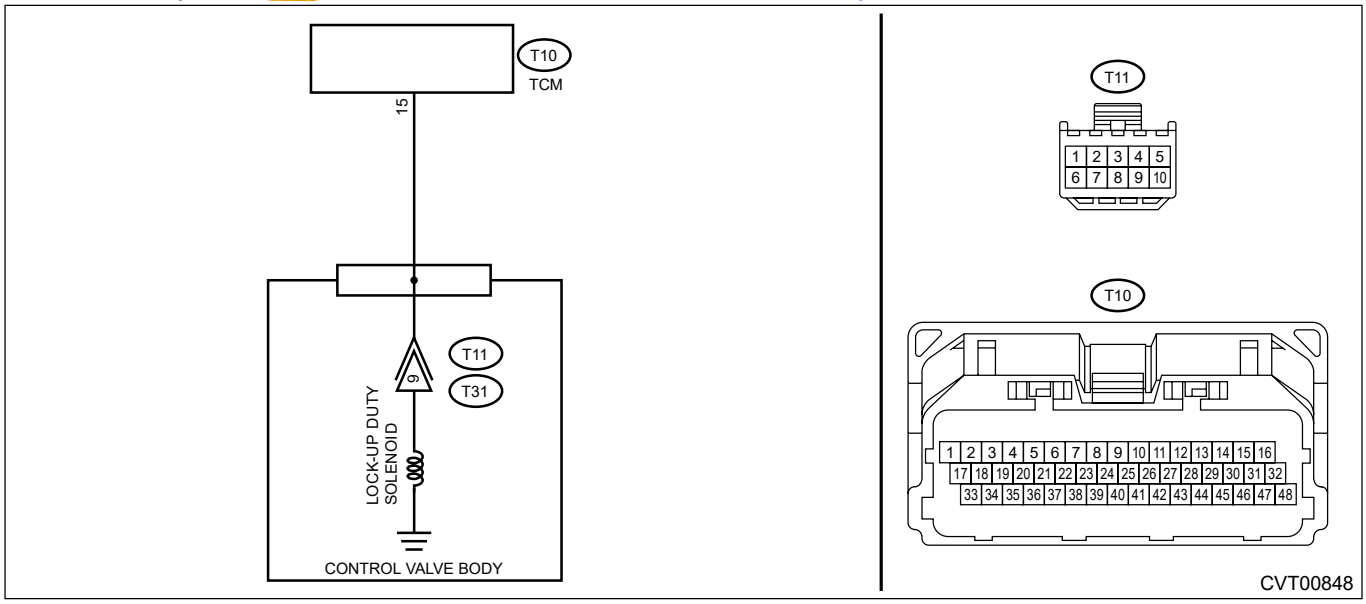
No lock-up occurs.

Caution:

- **Use CHECK BOARD when measuring the TCM terminal voltage and resistance.**
- **After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.**

Wiring diagram:

CVT control system Ref. to WIRING SYSTEM>CVT Control System.



1. CHECK HARNESS.

Caution:

Start work after ATF cools down.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Remove the transmission valve cover.
4. Disconnect the control valve body connector.
5. Measure the resistance between TCM connector and chassis ground.

   Connector & terminal

   (T10) No. 15 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 2.
No	Repair the short circuit of harness.

2. CHECK LOCK-UP DUTY SOLENOID.

1. Connect the connector for control valve body.
2. Measure the resistance between TCM connector and transmission body.

   Connector & terminal

   (T10) No. 15 — Transmission body:

Is the resistance approximately 10 — 13.5 Ω? (when cold)

Yes	Check for poor contact of connector, and if no fault is found, replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Go to 3.

3. CHECK HARNESS INSIDE TRANSMISSION.

Check for the harness pinch, damage.

Is there any fault in the harness?

Yes	Replace the transmission harness.
No	Replace the control valve body. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Control Valve Body.

1. OUTLINE OF DIAGNOSIS

- Detect the ground short of the lock-up clutch pressure control solenoid drive circuit.
- Judge as NG when an abnormal signal is received from the solenoid driver IC of the lock-up clutch pressure control solenoid drive circuit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage Commanded duty of torque converter clutch pressure control solenoid	9 V or more 100%

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
Signal of malfunction from solenoid driver IC As defined by: Measured torque converter clutch pressure control solenoid voltage 0.8 V or less	ON

Time needed for diagnosis: 0.2 s

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure has occurred.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN bus condition	Bus off

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.

- Judge as NG when CAN communication failure occurs with the ECM.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from ECM	Lost

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:
Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the VDC CM.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Lost

Time needed for diagnosis: 0.5 s
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the body integrated unit.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Lost

Time needed for diagnosis: 4 seconds
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the combination meter.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from combination meter	Lost

Time needed for diagnosis: 4 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the A/C control panel.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Lost

Time needed for diagnosis: 2 seconds
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from ECM is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from ECM	Did not change

Time needed for diagnosis: 2 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from VDC CM is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from Vehicle Dynamics Control Module	Did not change

Time needed for diagnosis: 2 seconds
Malfunction indicator light illumination: Illuminates as soon as a malfunction occurs.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
Caution:
After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from the body integrated unit is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from BIU	Freeze

Time needed for diagnosis: 5 seconds
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from the combination meter is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from combination meter	Freeze

Time needed for diagnosis: 5 seconds
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from the A/C control panel is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from A/C control panel	Freeze

Time needed for diagnosis: 2.5 s
Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when CAN communication failure occurs with the stereo camera.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Lost

Time needed for diagnosis: 2 seconds

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:

Refer to “LAN SYSTEM (DIAGNOSTICS)” for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Caution:

After servicing or replacing faulty parts, perform the last step of the basic diagnostic procedure. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

1. OUTLINE OF DIAGNOSIS

- Detect malfunction of CAN communication.
- Judge as NG when data received from the stereo camera is not normal.

2. EXECUTION CONDITION

Secondary parameters	Execution condition
12 V battery system voltage	10 V or more
Measured turbine shaft speed	Exceeds 0 rpm
or	
Transmission range	Drive or Reverse

3. DIAGNOSTIC METHOD

If the duration of time while the following conditions are met is longer than the time indicated, judge as NG.

Judgment value

Malfunction Criteria	Threshold Value
CAN data from stereo camera	Freeze

Time needed for diagnosis: 2.5 s

Malfunction indicator light illumination: Does not illuminate.

TRANSMISSION (DIAGNOSTICS) > Diagnostic Procedure without Diagnostic Trouble Code (DTC)

CHECK SHIFT INDICATOR

Diagnosis:

- CAN communication is abnormal with the combination meter.
- Combination meter malfunction

Trouble symptom:

- Shift indicator does not display or remains displayed.
- Shift indicator display does not change.

1. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC U0423 or U0155 displayed?

Yes	Perform the self-diagnosis of combination meter.
No	Go to 2.

2. CHECK DTC.

Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are DTCs other than U0155 and U0423 displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Using the Subaru Select Monitor, read DTC of combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK TCM.

1. Operate the + side of the paddle shift switch.
2. Read the data of [Up Switch] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Does it change between ON and OFF according to the operation?

Yes	Go to 5.
No	Check for poor contact between TCM and paddle shift UP switch, and repair the defective part.

5. CHECK TCM.

1. Operate the – side of the paddle shift switch.
2. Read the data of [Down Switch] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Does it change between ON and OFF according to the operation?

Yes	Go to 6.
No	Check for poor contact between TCM and paddle shift down switch, and repair the defective part.

6. CHECK TCM.

1. Turn the ignition switch OFF, then turn it ON again.
2. Shift the select lever to manual mode.
3. Read the data of [Shift step in Manu. mode] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is “1” displayed?

Yes	Go to 7.
No	Perform the diagnosis according to DTC P0951. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC P0951 AUTO SHIFT MANUAL CONTROL CIRCUIT RANGE/PERFORMANCE.

7. CHECK TCM.

1. Shift up the select lever.
2. Read the data of [Shift step in Manu. mode] using Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Data Monitor.



Is “2” displayed?

Yes	Current condition is normal.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

INSPECTION

Symptoms	Faulty parts
Engine stalls when driving in “D” or “R” range, or selecting “N” → “D”, “N” → “R”.	• Control valve • Engine control system
While driving in “D” range, vibration occurs immediately before the stop or engine stalls.	• Control valve • Torque converter
Vehicle cannot shift while driving in “D” range.	• Control valve • TCM • Shift mechanism • Power supply system
Excessive shock when selecting “N” → “D”, and “N” → “R”.	• Control valve • TCM • F&R clutch pack • ATF deterioration or lack
Excessive shock at standing start in “D” range.	• Control valve • TCM • F&R clutch pack • ATF deterioration or lack
Engine speed increases abruptly during driving in “D” or “R” range.	• Control valve • Secondary pressure sensor • F&R clutch pack • ATF deterioration or lack
Vehicle can not start when depressing the accelerator pedal in “D” or “R” range, or acceleration is very poor. (without abrupt engine increase)	• Control valve • F&R clutch pack • Shift mechanism • Parking mechanism • Engine control system • Power supply system
Shift indicator in combination meter displays the position which differs from select lever position.	• Inhibitor switch • Select cable related • Combination meter
Manual mode enters even though the select lever and paddle shift switch is not operated.	• Manual mode switch • Paddle shift switch • Select lever • TCM
Engine speed increases abruptly in “D” or “R” range, vehicle can not start.	• F&R clutch pack • Select cable related
Manual mode can not be set	• Select lever • TCM

OPERATION

1. HOW TO USE GENERAL SCAN TOOL

1. Prepare a scan tool (general scan tool) required by SAE J1978.
2. Connect the general scan tool to data link connector located in the lower portion of the instrument panel (on the driver's side). Ref. to COMMON(diag)>Data Link Connector.
3. Using the general scan tool, call up each data. General scan tool functions consist of:
   (1) MODE $01: Current powertrain diagnostic data
   (2) MODE $02: Powertrain freeze frame data
   (3) MODE $03: Emission-related powertrain DTC
   (4) MODE $04: Clear/Reset emission-related diagnostic information
   (5) MODE $07: Initial emission-related powertrain DTC
   (6) MODE $09: Request vehicle information
   (7) MODE $0A: Emission-related DTC
4. Read out the data according to repair procedures. (For detailed operation procedures, refer to the general scan tool operation manual.)

Note:

For details concerning DTC, refer to "Diagnostic Trouble Code (DTC)". Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

2. MODE $01 (CURRENT POWERTRAIN DIAGNOSTIC DATA)

Refer to data denoting the current operating condition of analog input/output, digital input/output or the powertrain system.
A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
$01	Number of emission-related powertrain DTC, and malfunction indicator light status and diagnosis support information	—
$21	Travel distance after the malfunction indicator light illuminates	km/miles

Note:

Refer to general scan tool manufacturer's operation manual to access the present powertrain diagnostic data (MODE $01).

3. MODE $02 (POWERTRAIN FREEZE FRAME DATA)

Refer to data denoting the operating condition when trouble is detected by on-board diagnosis system.
A list of the support data and PID (Parameter Identification) codes are shown in the following table.

PID	Data	Unit of measure
$02	DTC that caused freeze frame data to be stored	—
$05	Engine coolant temperature	Celsius
$0C	Engine speed	rpm
$0D	Vehicle speed	km/h or MPH

Note:

Refer to general scan tool manufacturer's operation manual to access freeze frame data (MODE $02).

4. MODE $03 (EMISSION-RELATED POWERTRAIN DTC)

Refer to "Diagnostic Trouble Code (DTC)" for information about data denoting emission-related powertrain DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

5. MODE $04 (CLEAR/RESET EMISSION-RELATED DIAGNOSTIC INFORMATION)

Refer to the mode used to clear or reset emission-related diagnostic information.

Note:

- **Refer to the manufacturer's operation manual for the general scan tool to clear the emission-related diagnostic information (MODE $04).**
- **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**

6. MODE $07 (INITIAL EMISSION-RELATED POWERTRAIN DTC)

Refer to the data of DTC (pending code) for troubleshooting result about emission in the first time.

7. MODE $09 (REQUEST VEHICLE INFORMATION)

Refer to the data of the vehicle specification.

8. MODE $0A (EMISSION-RELATED DTC)

Refer to "Diagnostic Trouble Code (DTC)" for information about data denoting emission-related DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

BRAKE CONTROL (DIAGNOSTICS)

BC(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Work Support
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
14. General Diagnostic Table

BRAKE CONTROL (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:
Remove foreign matter (dust, water, oil etc.) from the VDCCM&H/U connector during removal and installation.

1. CHECK PRE-INSPECTION.

1. Ask the customer when and how the trouble occurred using the interview check list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Check List for Interview.
2. Before performing diagnostics, check the component which might affect VDC or parking brake system problems. Ref. to BRAKE CONTROL (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Repair or replace each component.

2. CHECK INDICATION OF DTC.

1. Turn the ignition switch to ON.
2. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Note:
If the communication function of the Subaru Select Monitor cannot be executed properly, check the communication circuit. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION > COMMUNICATION FOR INITIALIZING IMPOSSIBLE.

Are any DTCs displayed?

Yes	Record the DTC, time stamp and freeze frame data. Go to 4.
No	Go to 3.

3. PERFORM GENERAL DIAGNOSTICS.

1. Perform the inspection by referring to "General Diagnostic Table". Ref. to BRAKE CONTROL (DIAGNOSTICS)>General Diagnostic Table>INSPECTION.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



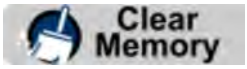
5. Check that the DTC is not displayed.

Do the VDC warning light & VDC indicator light, VDC OFF indicator light and ABS warning light go off after starting the engine?

Yes	Finish the diagnosis.
No	Check the combination meter circuit. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>ABS WARNING LIGHT DOES NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>VDC OFF INDICATOR LIGHT DOES NOT GO OFF.

4. PERFORM DIAGNOSIS.

1. Refer to "Diagnostic Trouble Code (DTC)".
   Note:
   For the DTC list, refer to "Diagnostic Trouble Code (DTC)". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Correct the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.

4. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
5. Check that the DTC is not displayed.

Is DTC displayed?

Yes	Repeat step 4 until DTC is not shown.
No	Finish the diagnosis.

BRAKE CONTROL (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following item about the vehicle’s state.

1. STATE OF ABS WARNING LIGHT

<table>
<tr><td>ABS warning light illuminates.</td><td colspan="3">❑ Always
❑ Sometimes
❑ Only once
❑ Does not illuminate
• When/How long does it illuminate?</td></tr>
<tr><td>Ignition key position</td><td colspan="3">❑ LOCK
❑ ACC
❑ ON (before starting engine)
❑ START
❑ ON (after starting engine, engine is running)
❑ ON (after starting engine, engine is at a standstill)</td></tr>
<tr><td rowspan="11">Timing</td><td colspan="3">❑ Immediately after turning the ignition switch to ON
❑ Immediately after turning the ignition switch to START</td></tr>
<tr><td rowspan="2">❑ While accelerating</td><td colspan="2">—</td><td>km/h</td></tr>
<tr><td colspan="2">—</td><td>MPH</td></tr>
<tr><td>❑ While driving at a constant speed</td><td>km/h</td><td>MPH</td></tr>
<tr><td rowspan="2">❑ While decelerating</td><td colspan="2">—</td><td>km/h</td></tr>
<tr><td colspan="2">—</td><td>MPH</td></tr>
<tr><td rowspan="2">❑ When turning to the right</td><td>Steering angle:</td><td>deg</td></tr>
<tr><td>Steering time:</td><td>Sec.</td></tr>
<tr><td rowspan="2">❑ When turning to the left</td><td>Steering angle:</td><td>deg</td></tr>
<tr><td>Steering time:</td><td>Sec.</td></tr>
<tr><td colspan="3">❑ When other electrical parts are operating</td></tr>
<tr><td colspan="3">• Part name:
• Operating condition:</td></tr>
</table>

2. STATE OF VDC WARNING LIGHT & VDC INDICATOR LIGHT

<table>
<tr><td>VDC warning light & VDC indicator light illuminates.</td><td>❑ Always
❑ Sometimes
❑ Only once
❑ Does not illuminate
• When/How long does it illuminate?</td></tr>
<tr><td>Ignition key position</td><td>❑ LOCK
❑ ACC
❑ ON (before starting engine)
❑ START</td></tr>
</table>

Timing	❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill) ❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating • Part name: • Operating condition:		

3. STATE OF VDC OFF INDICATOR LIGHT

VDC OFF indicator light illuminates.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?		
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)		
Timing	❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.

❑ When other electrical parts are operating

• Part name:
• Operating condition:

4. STATE OF BRAKE WARNING LIGHT

<table>
<tr><td>Brake warning light illuminates/goes off/blinks.</td><td colspan="3">❑ Always
❑ Sometimes
❑ Only once
❑ Does not illuminate
❑ Does not go off
❑ Blinks
• When/How long does illuminate/go off/blink?</td></tr>
<tr><td>Ignition key position</td><td colspan="3">❑ LOCK
❑ ACC
❑ ON (before starting engine)
❑ START
❑ ON (after starting engine, engine is running)
❑ ON (after starting engine, engine is at a standstill)</td></tr>
<tr><td rowspan="10">Timing</td><td colspan="3">❑ Immediately after turning the ignition switch to ON
❑ Immediately after turning the ignition switch to START</td></tr>
<tr><td rowspan="2">❑ While accelerating</td><td colspan="2">—</td><td>km/h</td></tr>
<tr><td colspan="2">—</td><td>MPH</td></tr>
<tr><td>❑ While driving at a constant speed</td><td>km/h</td><td>MPH</td></tr>
<tr><td rowspan="2">❑ While decelerating</td><td colspan="2">—</td><td>km/h</td></tr>
<tr><td colspan="2">—</td><td>MPH</td></tr>
<tr><td rowspan="2">❑ When turning to the right</td><td>Steering angle:</td><td>deg</td></tr>
<tr><td>Steering time:</td><td>Sec.</td></tr>
<tr><td rowspan="2">❑ When turning to the left</td><td>Steering angle:</td><td>deg</td></tr>
<tr><td>Steering time:</td><td>Sec.</td></tr>
<tr><td colspan="3">❑ When other electrical parts are operating</td></tr>
<tr><td colspan="3">• Part name:
• Operating condition:</td></tr>
</table>

5. HILL START ASSIST WARNING LIGHT STATUS

Hill start assist warning light illuminates.	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate • When/How long does it illuminate?
Ignition key position	❑ LOCK ❑ ACC ❑ ON (before starting engine)

Timing	❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill) ❑ Immediately after turning the ignition switch to ON ❑ Immediately after turning the ignition switch to START		
	❑ While accelerating	—	km/h
		—	MPH
	❑ While driving at a constant speed	km/h	MPH
	❑ While decelerating	—	km/h
		—	MPH
	❑ When turning to the right	Steering angle:	deg
		Steering time:	Sec.
	❑ When turning to the left	Steering angle:	deg
		Steering time:	Sec.
	❑ When other electrical parts are operating • Part name: • Operating condition:		

6. CONDITIONS UNDER WHICH TROUBLE OCCURS

Environment	a) Weather	❑ Fine ❑ Cloudy ❑ Rainy ❑ Snowy ❑ Others:
	b) Ambient temperature	°C (°F)
	c) Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Uphill ❑ Downhill ❑ Paved road ❑ Gravel road ❑ Muddy road ❑ Sandy place ❑ Straight road ❑ Sharp curve ❑ Gentle curve ❑ S-curve ❑ Road with a slope on both sides ❑ Others:

	d) Road surface	❑ Dry ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Frozen slope ❑ Others:	
Condition	a) Brakes	Deceleration:	G
		❑ Continuous / ❑ intermittent	
	b) Accelerator	Acceleration:	G
		❑ Continuous / ❑ intermittent	
	c) Vehicle speed	km/h	MPH
		❑ Advancing ❑ While accelerating ❑ While decelerating ❑ At low speed ❑ When turning ❑ Others:	
	d) Tire inflation pressure	Front RH tire:	kPa
		Front LH tire:	kPa
		Rear RH tire:	kPa
		Rear LH tire:	kPa
	e) Degree of wear	Front RH tire:	mm (in)
		Front LH tire:	mm (in)
		Rear RH tire:	mm (in)
		Rear LH tire:	mm (in)
	f) Steering wheel	❑ Sharp turning ❑ Gentle turning ❑ Straight forward motion ❑ Gentle return ❑ Sharp return	
	g) Tire/Wheel size	❑ Specified size ❑ Except specification ( )	
	h) Tire variation	❑ Summer tire ❑ Studless tire (brand:)	

i) Tire chain is attached: ❑ Yes / ❑ No

j) Using T-type tires: ❑ Yes / ❑ No

k) Condition of suspension alignment:

l) Load condition:

m) Repaired parts are used: ❑ Yes / ❑ No

• Contents:

n) Others:

BRAKE CONTROL (DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

Airbag system wiring harness is routed near the ABS wheel speed sensor and VDCCM&H/U.

Caution:

- **Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.**
- **Be careful not to damage the airbag system wiring harness when servicing the ABS wheel speed sensor and VDCCM&H/U.**

BRAKE CONTROL (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might affect VDC problems.

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

2. GROUND

Check the installation of the ground bolt for VDC.

3. BRAKE FLUID

1. Check the brake fluid level.
2. Check the brake fluid for leaks.

4. HYDRAULIC UNIT

Check the hydraulic unit.

- When using the brake tester Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>INSPECTION > CHECKING THE HYDRAULIC UNIT ABS OPERATION WITH THE BRAKE TESTER.
- When not using the brake tester Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>INSPECTION > CHECKING THE HYDRAULIC UNIT ABS OPERATION BY PRESSURE GAUGE.

5. BRAKE DRAG

Check for brake drag.

6. BRAKE PAD AND ROTOR

Check the brake pad and rotor.

- Front Ref. to BRAKE>Front Brake Pad>INSPECTION. Ref. to BRAKE>Front Disc Rotor>INSPECTION.
- Rear Ref. to BRAKE>Rear Brake Pad>INSPECTION. Ref. to BRAKE>Rear Disc Rotor>INSPECTION.

7. PARKING BRAKE ASSEMBLY

Check the parking brake assembly. Ref. to PARKING BRAKE>General Description>COMPONENT.

8. TIRES

Check the tire specifications, tire wear and air pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.

BRAKE CONTROL (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

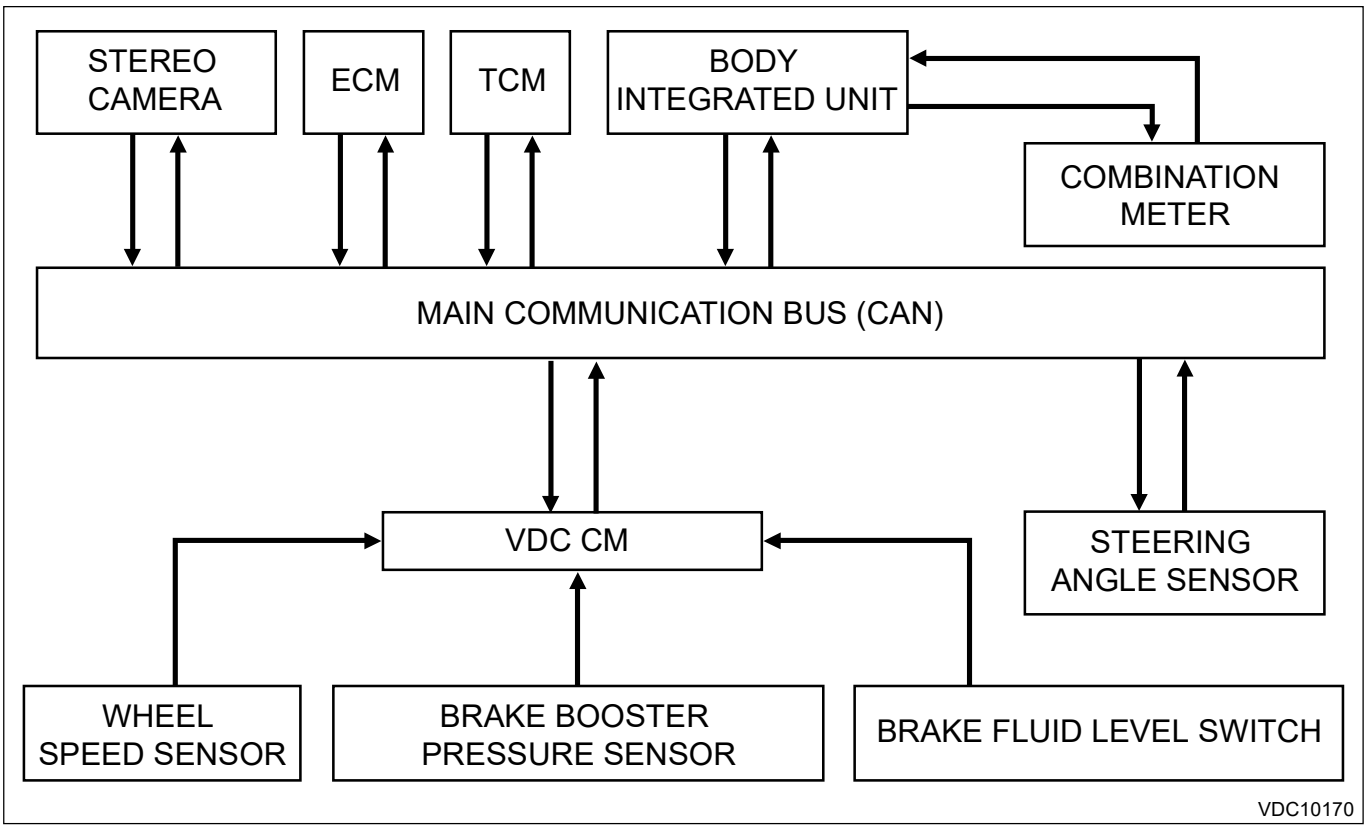
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

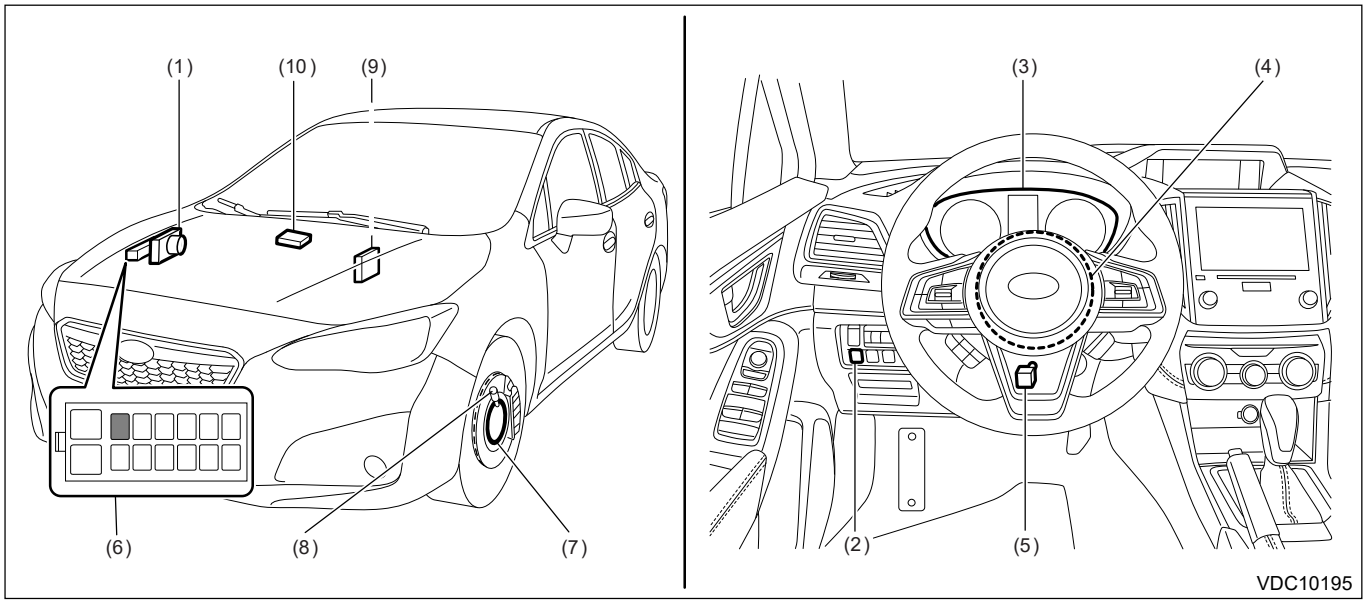
BRAKE CONTROL (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM


STEREO CAMERA
ECM
TCM
BODY INTEGRATED UNIT
COMBINATION METER
MAIN COMMUNICATION BUS (CAN)
VDC CM
STEERING ANGLE SENSOR
WHEEL SPEED SENSOR
BRAKE BOOSTER PRESSURE SENSOR
BRAKE FLUID LEVEL SWITCH
VDC10170

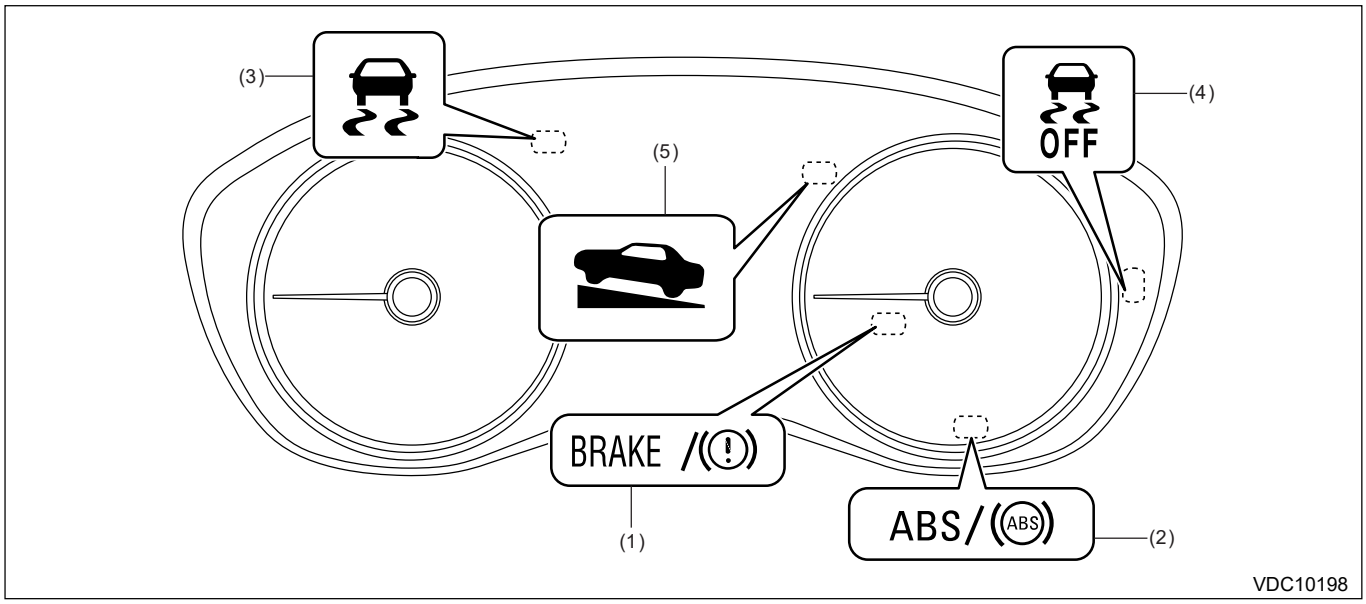
BRAKE CONTROL (DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) VDC control module and hydraulic control unit (VDCCM&H/U)
(2) VDC OFF switch
(3) Combination meter
(4) Steering angle sensor
(5) Stop light and brake switch
(6) Stop light relay
(7) Magnetic encoder
(8) ABS wheel speed sensor
(9) Engine control module
(10) Transmission control module (TCM)

Combination meter



(1) Brake warning light (EBD warning light)
(3) VDC warning light & VDC indicator light
(5) Hill start assist warning light / hill start assist OFF indicator

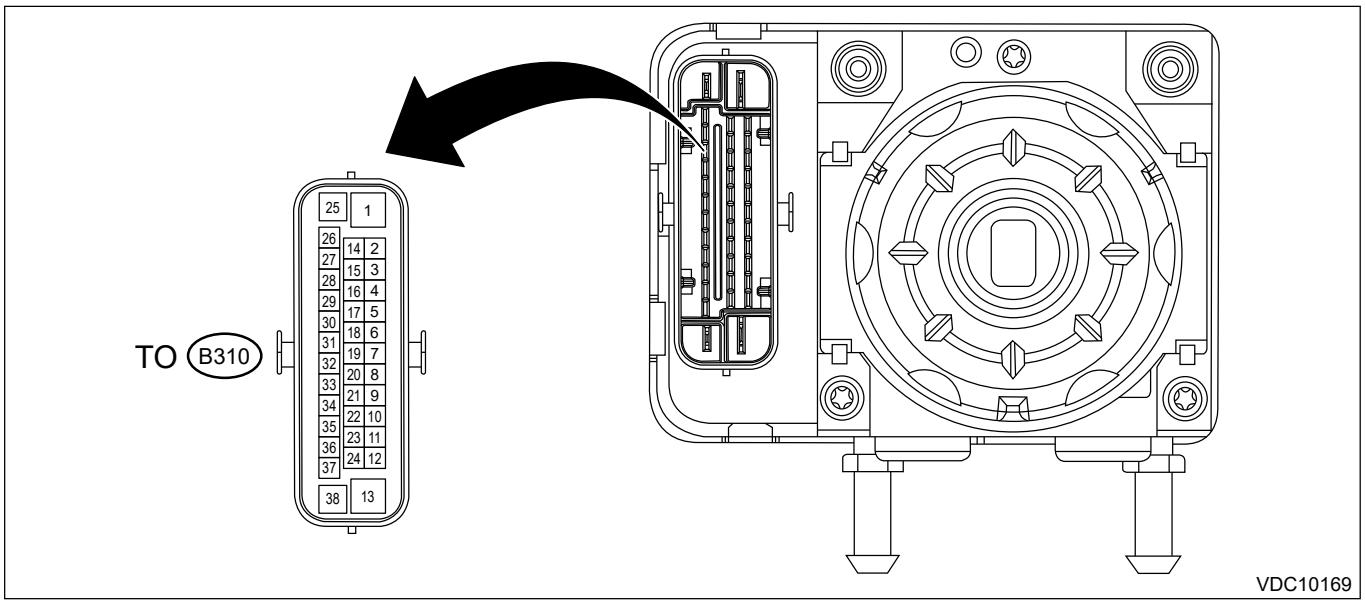
light

(2) ABS warning light

(4) VDC OFF indicator light

BRAKE CONTROL (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Note:

- **Terminal numbers in VDCCM&H/U connector (on the control module side) are shown in the figure.**
- **When the connector is removed from the VDCCM&H/U, the brake warning light (EBD warning light), ABS warning light, VDC warning light & VDC indicator light, VDC OFF indicator light, and the hill start assist warning light illuminate.**

Terminal No.	Content	Measuring condition	Standard
(B310) No. 1 ←→ Chassis ground	VDC pump motor power supply	Always	Battery voltage
(B310) No. 2 ←→ Chassis ground	Stop light switch	Brake pedal operation	Brake ON: Battery voltage Brake OFF: Ground
(B310) No. 4	VSO PIN output	—	—
(B310) No. 6 ←→ Chassis ground	Ignition power supply	Ignition switch: ON	Ignition power supply voltage
(B310) No. 10	CAN-L	—	—
(B310) No. 11	CAN-H	—	—
(B310) No. 13	Ground	—	—
(B310) No. 15	Brake booster pressure sensor output signal	—	—
(B310) No. 16 ←→ Chassis ground	Brake booster pressure sensor power supply	Ignition switch: ON	4.85 — 5.15 V
(B310) No. 24	Brake booster pressure sensor GND	—	—
(B310) No. 25 ←→ Chassis ground	VDCCM power supply	Always	Battery voltage
(B310) No. 26	FR wheel speed sensor GND	—	—
(B310) No. 27	FR wheel speed sensor signal	—	—
(B310) No. 28 ←→ Chassis ground	Stop light relay	Ignition switch: ON	Ignition power supply voltage
(B310) No. 29	RL wheel speed sensor signal	—	—
(B310) No. 30	RL wheel speed sensor GND	—	—
(B310) No. 32 ←→ Chassis ground	VDC OFF switch	VDC OFF switch operation	Switch ON: 1 Ω or less Switch OFF: 1 MΩ or more
(B310) No. 33	RR wheel speed sensor GND	—	—
(B310) No. 34	RR wheel speed sensor signal	—	—
(B310) No. 35 ←→ Chassis ground	Brake fluid level switch	Ignition switch: ON	6 V or more
(B310) No. 36	FL wheel speed sensor signal	—	—
(B310) No. 37	FL wheel speed sensor GND	—	—

BRAKE CONTROL (DIAGNOSTICS) > Inspection Mode

PROCEDURE

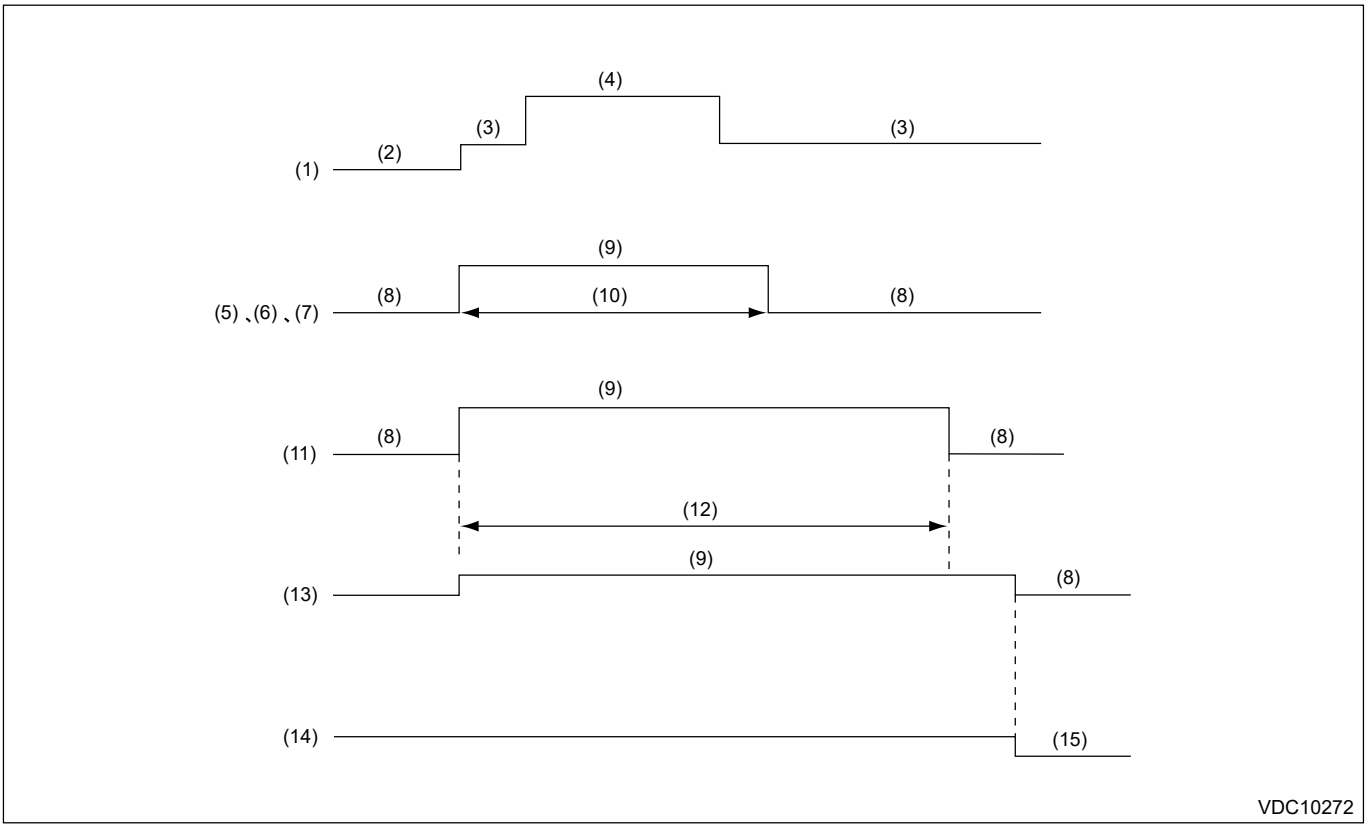
1. Reproduce the malfunction occurrence condition as much as possible.
2. Drive the vehicle at least ten minutes.

Note:

Make sure the vehicle is not dragged to one side under usual driving condition.

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION



(1) Ignition switch	(6) VDC OFF indicator light	(11) VDC warning light & VDC indicator light
(2) OFF	(7) Hill start assist warning light	(12) 2 seconds or more
(3) ON	(8) Light OFF	(13) Brake warning light (EBD warning light)
(4) Engine start	(9) Light ON	(14) Parking brake
(5) ABS warning light	(10) 2 seconds	(15) Released

Note:

Hill start assist warning light always illuminates when the hill start assist is in the OFF mode.

1. When warning lights or indicator lights do not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2. When the warning lights or indicator lights remain constantly OFF, check the combination meter circuit. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>EBD WARNING LIGHT, ABS WARNING, VDC OFF INDICATOR LIGHT, VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT COME ON. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>HILL START ASSIST WARNING LIGHT DOES NOT COME ON.
3. When the ABS warning light, VDC OFF indicator light, VDC warning light & VDC indicator light, and hill start assist warning light do not go off, check the combination meter circuit or CAN communication circuit. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination

Pattern>ABS WARNING LIGHT DOES NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>VDC OFF INDICATOR LIGHT DOES NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern>HILL START ASSIST WARNING LIGHT DOES NOT GO OFF.

Note:

- **Even when the ABS warning light and the VDC warning light & VDC indicator light do not go off in 2 seconds after illuminating, the ABS and VDC functions are normal if the warning lights go off while the vehicle is driven. However, while these lights are on, the functions with their warning lights illuminated do not operate.**
- **It may take several minutes before the VDC warning light & VDC indicator light goes off, if the vehicle is parked under low temperature for a specified time. This is not defective because it is resulted from low engine coolant temperature. Perform the Clear Memory Mode because DTC may be recorded at this time. Ref. to COMMON(diag)>Clear memory.**
- **With the vehicle jack-up/lift-up or set on free rollers, when the wheels lock or spin after starting the engine, ABS warning light, and VDC warning light & VDC indicator light may illuminate because VDCCM&H/U detects the abnormal conditions from ABS wheel speed sensor or longitudinal G sensor. In this case, this is not a malfunction. Clear the memory. Ref. to COMMON(diag)>Clear memory.**

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

EBD WARNING LIGHT, ABS WARNING, VDC OFF INDICATOR LIGHT, VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT COME ON

Detecting condition:
Defective combination meter
Trouble symptom:
When the ignition switch is turned to ON (engine OFF), brake warning light (EBD warning light), ABS warning light, VDC OFF indicator light, and VDC warning light & VDC indicator light do not illuminate.
Note:
When pressing the VDC OFF switch for 30 seconds or more, the VDC OFF indicator light goes off and cannot operate any more. When turning the ignition switch from OFF to ON, the OFF operation enabled status is restored.

1. CHECK OTHER INDICATOR LIGHT.

Turn the ignition switch to ON.

Immediately after the ignition switch is turned to ON, do all the indicator lights for VDC system and others illuminate?

Yes	Go to 2.
No	Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

2. CHECK VDCCM.

Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine stopped. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Data Monitor

Immediately after the ignition switch is turned to ON, is the [EBD Warning Light] ON?

Yes	Go to 3.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

3. CHECK VDCCM.

Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine stopped. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Data Monitor

Immediately after the ignition switch is turned to ON, is the [ABS Warning Lamp] ON?

Yes	Go to 4.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

4. CHECK VDCCM.

Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine stopped. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Data Monitor

Immediately after the ignition switch is turned to ON, is the [VDC-OFF Light] ON?

Yes	Go to 5.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

5. CHECK VDCCM.

Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine stopped. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.



Immediately after the ignition switch is turned to ON, is the [VDC Warning Lamp] ON?

Yes	Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

HILL START ASSIST WARNING LIGHT DOES NOT COME ON

Detecting condition:
Defective combination meter
Trouble symptom:
When the ignition switch is turned to ON (engine OFF), hill start assist warning light does not illuminate.

1. CHECK OTHER INDICATOR LIGHT.

Turn the ignition switch to ON. (Engine OFF)

Do other indicator lights illuminate?

Yes	Go to 2.
No	Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

2. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

ABS WARNING LIGHT DOES NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective engine
- Defective CAN communication

Trouble symptom:

ABS warning light does not go off when starting the engine.

1. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM.

Display the data monitor of VDCCM using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.



Is [ABS Warning Lamp] ON?

Yes	Go to 3.
No	Go to 5.

3. CHECK WARNING LIGHT.

1. Save the freeze frame data. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



Does the ABS warning light go off?

Yes	Normal. Perform the Inspection Mode to check that the light does not turn ON again.
No	Go to 4.

4. READ DTC.

After driving the vehicle at 40 km/h (25 MPH) or more, read DTCs using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>LIST.
No	Go to 6.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U.
No	Replace the VDCCM&H/U. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

VDC WARNING LIGHT AND VDC INDICATOR LIGHT DO NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective engine
- Defective CAN communication

Trouble symptom:

VDC warning light and VDC indicator light do not go off when starting the engine.

1. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM.

Display the data monitor of VDCCM using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [VDC Warning Lamp] ON?

Yes	Go to 3.
No	Go to 5.

3. CHECK WARNING LIGHT.

1. Save the freeze frame data. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



Does the VDC warning light & VDC operation indicator light go off?

Yes	Normal. Perform the Inspection Mode to check that the light does not turn ON again.
No	Go to 4.

4. READ DTC.

After driving the vehicle at 40 km/h (25 MPH) or more, read DTCs using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Replace the VDCCM only. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

HILL START ASSIST WARNING LIGHT DOES NOT GO OFF

Detecting condition:

- Defective combination meter
- Defective CAN communication

Trouble symptom:

Hill start assist warning light does not go off when starting the engine.

1. CHECK HILL START ASSIST MODE.

Check hill start assist mode.

Is the hill start assist OFF?

Yes	Normal.
No	Go to 2.

2. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

VDC OFF INDICATOR LIGHT DOES NOT GO OFF

Detecting condition:

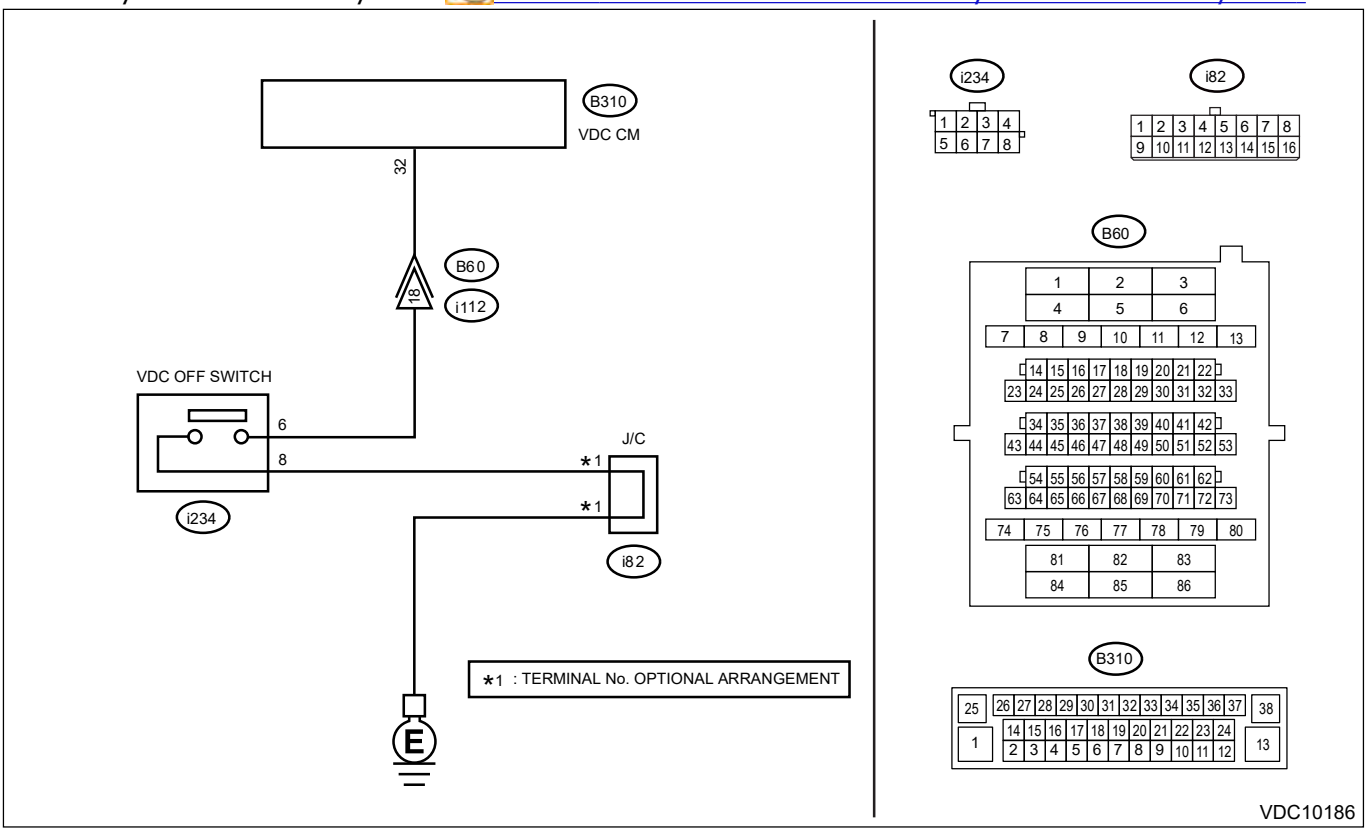
- Defective combination meter
- Defective CAN communication
- VDC OFF switch is shorted.

Trouble symptom:

VDC OFF indicator light does not go off when starting the engine.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDC OFF SWITCH.

Connect the Subaru Select Monitor, and display the data monitor of VDCCM with the engine started. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.



Does [OFF SW Signal] change according to operation of VDC OFF switch?

Yes	Go to 5.
No	Go to 3.

3. CHECK VDC OFF SWITCH.

Remove and check VDC OFF switch. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC OFF Switch.

Is the check result OK?

Yes	Go to 4.
No	Replace the VDC OFF switch.

4. CHECK VDC OFF SWITCH CIRCUIT.

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 32 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Check the VDC OFF switch circuit.
No	Go to 5.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

BRAKE CONTROL (DIAGNOSTICS) > Warning Light Illumination Pattern

BRAKE WARNING LIGHT DOES NOT GO OFF

Detecting condition:

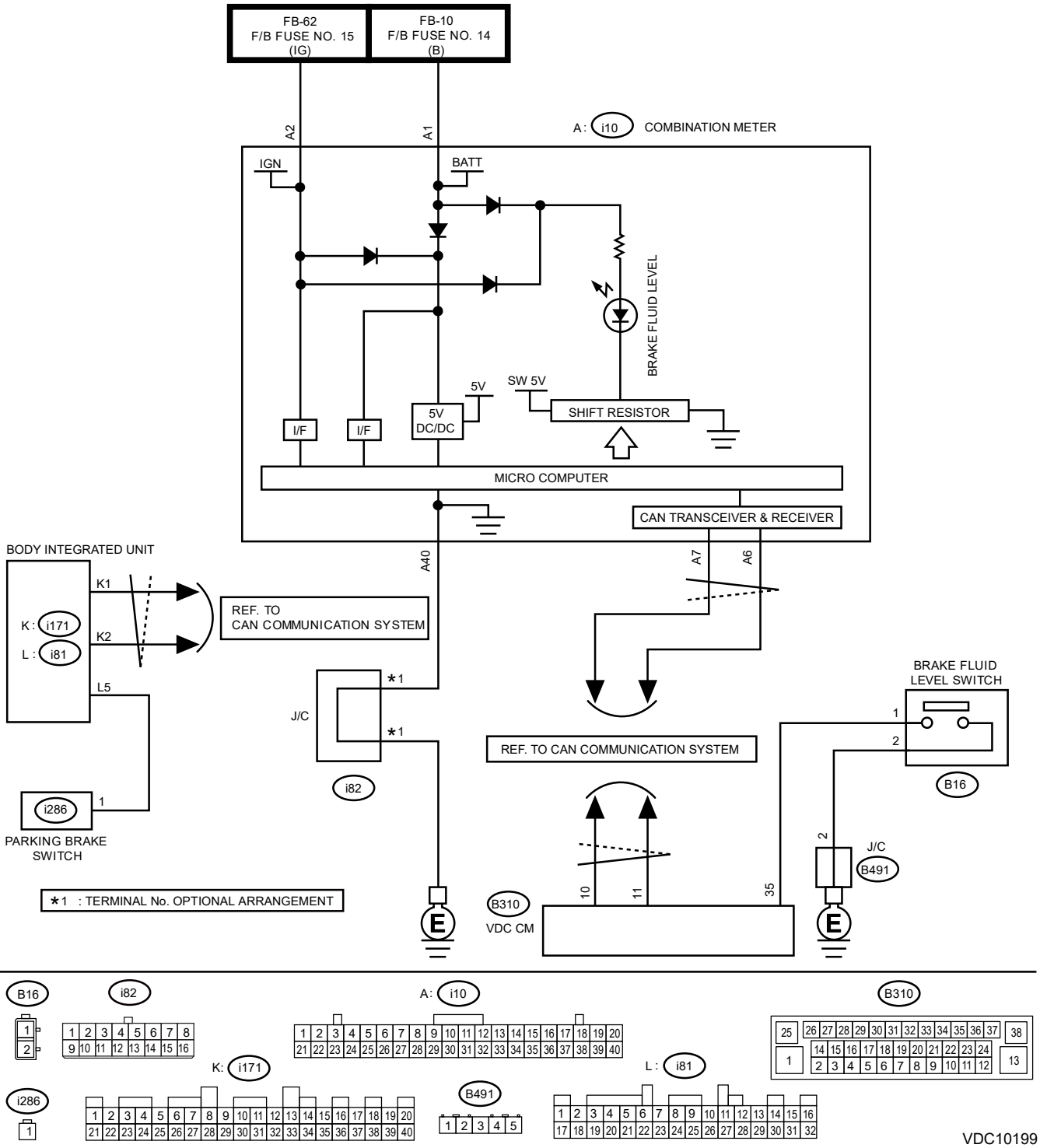
- Brake warning light circuit is shorted.
- Defective sensor/connector
- Defective CAN communication

Trouble symptom:

Brake warning light does not go off after starting the engine.

Wiring diagram:

Parking brake / brake fluid level warning light system Ref. to WIRING SYSTEM>Parking Brake / Brake Fluid Level Warning Light System.


FB-62
F/B FUSE NO. 15
(IG)
FB-10
F/B FUSE NO. 14
(B)
A2
A1
A : i10 COMBINATION METER
IGN
BATT
BRAKE FLUID LEVEL
5V
SW 5V
5V
DC/DC
SHIFT RESISTOR
I/F
I/F
MICRO COMPUTER
CAN TRANSCEIVER & RECEIVER
BODY INTEGRATED UNIT
K1
K2
L5
K : i171
L : i81
REF. TO
CAN COMMUNICATION SYSTEM
A40
A7
A6
*1
J/C
*1
i82
REF. TO CAN COMMUNICATION SYSTEM
BRAKE FLUID
LEVEL SWITCH
1
2
B16
i286
1
PARKING BRAKE
SWITCH
2
J/C
B491
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
10
11
35
B310
VDC CM
E
E

B16
i82
A: i10
B310
K: i171
L : i81
i286
B491

VDC10199

1. CHECK INSTALLATION OF VDCCM&H/U CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check that the VDCCM&H/U connector is inserted until it is locked by clamp.

Is the connector firmly inserted?

Yes	Go to 2.
No	Insert the VDCCM&H/U connector until it is locked by clamp.

2. READ DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK BRAKE FLUID AMOUNT.

Check the amount of brake fluid in the reservoir tank of master cylinder.

Does the level of the brake fluid amount fall between the lines of “MAX” and “MIN”?

Yes	Go to 5.
No	Replenish brake fluid to the specified value.

5. CHECK BRAKE FLUID LEVEL SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the level switch connector (B16) from master cylinder.
3. Measure the resistance between master cylinder terminals.

Terminals

No. 1 — No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Replace the master cylinder. Ref. to BRAKE>Master Cylinder.

6. CHECK GROUND SHORT OF HARNESS.

1. Disconnect the connector from VDCCM.
2. Measure the resistance between VDCCM connector and chassis ground.

Connector & terminal

(B310) No. 35 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair the harness between VDCCM and brake fluid level switch.

7. CHECK PARKING BRAKE SWITCH.

1. Disconnect the connector (i286) from parking brake switch.
2. Release the parking brake.
3. Measure the resistance between parking brake switch terminal and chassis ground.

Is the resistance 1 MΩ or more?

Yes	Go to 8.
No	Replace the parking brake switch.

8. CHECK GROUND SHORT OF HARNESS.

1. Disconnect the connector (i81) from body integrated unit.
2. Measure the resistance between body integrated unit connector and chassis ground.
   Connector & terminal
   (i81) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Repair the harness between body integrated unit and parking brake switch.

9. CHECK POOR CONTACT OF CONNECTOR.

Check for poor contact of all connectors.

Is there poor contact?

Yes	Repair the connector.
No	Go to 10.

10. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Detecting condition:

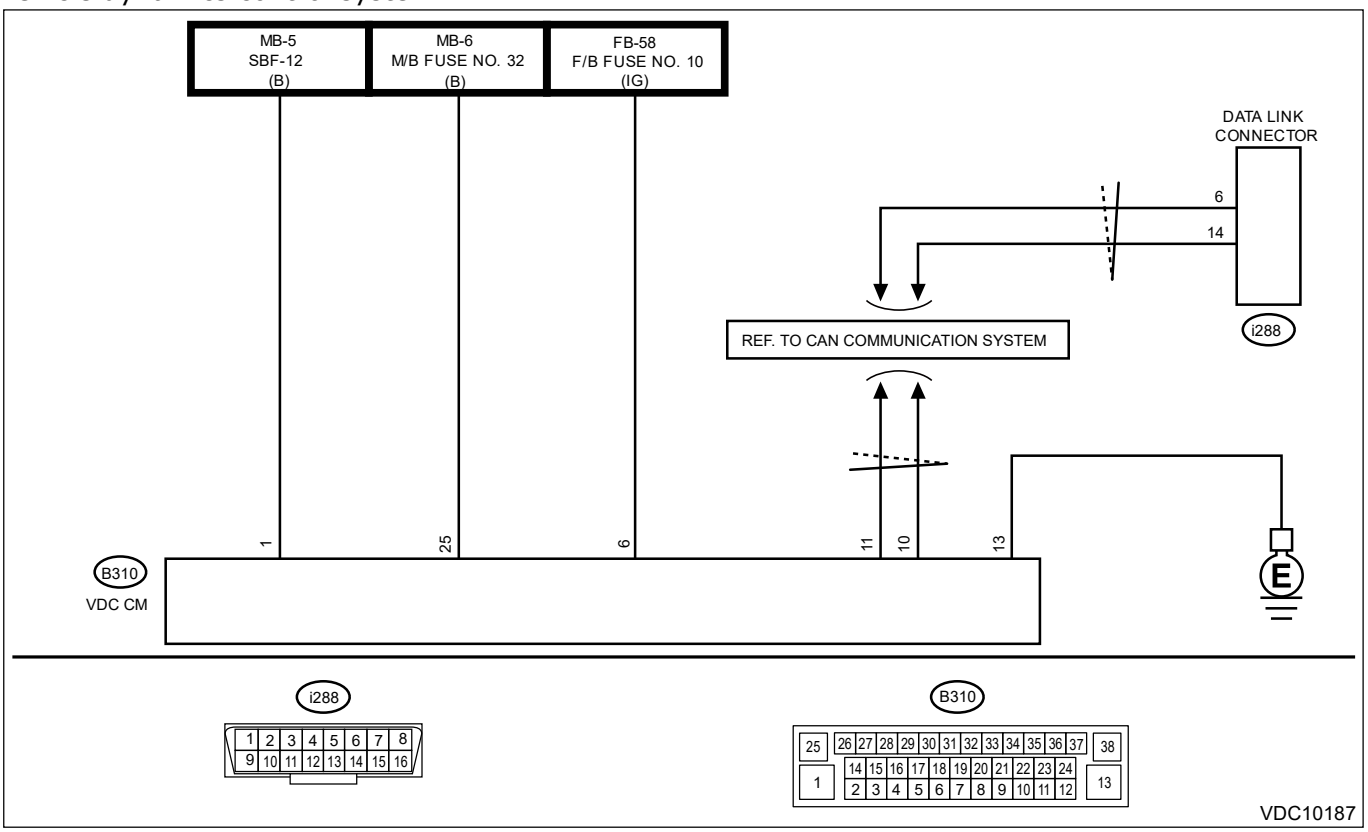
Defective harness connector

Trouble symptom:

Communication is impossible between VDC and Subaru Select Monitor.

WIRING DIAGRAM:

Vehicle dynamics control system



1. CHECK IGNITION SWITCH.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK BATTERY.	no →	Perform the instructed procedures.
yes ↓		

3. CHECK BATTERY TERMINAL.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK INSTALLATION OF VDCCM&H/U CONNECTOR.

no → Perform the instructed procedures.

yes ↓

5. CHECK LAN SYSTEM.

yes → Perform the instructed procedures.

no → Go to 6.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

yes → Perform the instructed procedures.

no → Go to 7.

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.

no → Perform the instructed procedures.

yes ↓

8. CHECK POWER SUPPLY CIRCUIT.

no → Perform the instructed procedures.

yes ↓

9. CHECK HARNESS CONNECTOR BETWEEN VDCCM&H/U AND CHASSIS GROUND.

no → Perform the instructed procedures.

yes ↓

10. CHECK POOR CONTACT OF CONNECTOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes	Go to 2.
No	Turn the ignition switch to ON, and select Brake Control using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes	Go to 3.
No	Charge or replace the battery.

3. CHECK BATTERY TERMINAL.

Is there poor contact at battery terminal?

Yes	Replace or tighten the battery terminal.
No	Go to 4.

4. CHECK INSTALLATION OF VDCCM&H/U CONNECTOR.

Turn the ignition switch to OFF.

Is the VDCCM&H/U connector inserted into VDCCM&H/U until the clamp locks onto it?

Yes	Go to 5.
No	Insert VDCCM&H/U connector into VDCCM&H/U.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to VDC system can be executed normally.

Is the [Select Function] screen displayed?

Yes	Check the DTC in VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor to another vehicle to check whether the communication for initializing can be executed normally.

Does the Subaru Select Monitor communicate normally?

Yes	Go to 8.
No	Repair or replace the Subaru Select Monitor.

8. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON. (Engine OFF)
2. Measure the ignition power supply voltage between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 1 (+) — Chassis ground (−):
   (B310) No. 6 (+) — Chassis ground (−):
   (B310) No. 25 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 9.
No	Repair open circuit in harness between VDCCM&H/U and battery.

9. CHECK HARNESS CONNECTOR BETWEEN VDCCM&H/U AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance of harness between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of VDCCM&H/U ground circuit and poor contact of connector.

10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of control module power supply, ground circuit and data link connector?

Yes	Repair the connector.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

BRAKE CONTROL (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor>LIST.**

BRAKE CONTROL (DIAGNOSTICS) > Data Monitor

LIST

Item	Remarks	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	time	—
Count	Counter	—	—
Time Count	Elapsed time after ignition switch is turned to ON	ms	—
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH	km/h	—
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH	km/h	—
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH	km/h	—
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH	km/h	—
Steering Angle Sensor	Steering angle detected by steering angle sensor	deg	—
Yaw Rate Sensor	Angle of the vehicle detected by yaw rate sensor	deg/s	—
Pressure Sensor Output	Brake fluid pressure detected by pressure sensor	MPa	—
Longitudinal G Sensor	Vehicle longitudinal acceleration detected by longitudinal G sensor	m/s^2	—
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor	m/s^2	—
Power Supply Voltage	Voltage supplied to VDCCM&H/U	V	—
M. Relay monitor Voltage	Voltage applied to the motor relay	V	—
FL wheel cylinder pressure sensor output	FL wheel cylinder brake fluid pressure detected by pressure sensor (model with EyeSight)	MPa	—
FR wheel cylinder pressure sensor output	FR wheel cylinder brake fluid pressure detected by pressure sensor (model with EyeSight)	MPa	—

Item	Remarks	Standard/Unit	Note
Brake Booster Gauge Sensor Output	Vacuum pressure value inside brake booster measured by VDC (difference from atmospheric pressure)	kPa	—
Motor Relay Signal	Motor relay drive signal	ON or OFF	—
Valve Relay Signal	Valve relay drive signal	ON or OFF	—
EBD Warning Light	Signal for ON operation (illumination) of EBD warning light	ON or OFF	—
ABS Warning Lamp	Signal for ON operation (illumination) of ABS warning light	ON or OFF	—
VDC Warning Lamp	Signal for ON operation (illumination) of VDC warning light	ON or OFF	—
EBD Control Flag	Flag of EBD control activation status	ON or OFF	—
ABS Control Flag	Flag of ABS control activation status	ON or OFF	—
TCS Control Flag	Flag of TCS control activation status	ON or OFF	—
VDC Control Flag	Flag of VDC control activation status	ON or OFF	—
E/G Torque Down Control Stop Flag	Flag of engine control command signal	1 or 0	—
Stop-lamp relay drive signal	Brake light relay drive signal	ON or OFF	—
E/G torques up Control Stop Flag	Flag of engine control command signal	1 or 0	—
Brake Negative Pressure Warning	Signal for illuminating warning light for brake vacuum pressure fault	1 or 0	—
OHB Control Flag	Flag of OHB* operation status	1 or 0	—
OHB Operation Number	Number of OHB* control activation time	time	—
HSA warning light	Signal for illuminating warning light for HSA failure	1 or 0	—
VDC Normality Checking Flag	Flag of pre-collision function OFF status during VDC normality confirmation	1 or 0	—
Hill Descent Control State	HDC control activation status (model with HDC)	OFF or Standby, or Active or Unstable	—
Vectoring control flag	Activation status flag of brake-based torque vectoring control	ON or OFF	—
Brake Fluid Level Warning Lamp	Signal for illuminating brake fluid level warning light	ON or OFF	—
HSA OFF Lamp	Signal for illuminating indicator at HSA OFF	ON or OFF	—
VDC-OFF Light	OF/OFF status of VDC OFF indicator light	ON or OFF	—
OFF SW Signal	Operation status of VDC OFF switch	ON or OFF	—

Item	Remarks	Standard/Unit	Note
Brake Light Switch	Brake ON/OFF status	ON or OFF	—
Clutch switch	Clutch ON/OFF status (MT model)	ON or OFF	—
Reverse Signal	Reverse gear ON/OFF status	ON or OFF	—
Fluid Switch State	Recognition status of fluid level switch	ON or OFF	—
Actual Engine Torque	Engine torque	N·m	—
Ambient Temp Sensor	Ambient temperature	°C	—

*: OHB = Optimized Hydraulic Brake (brake assist function when vacuum pressure drops)

BRAKE CONTROL (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data>LIST.**

BRAKE CONTROL (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Remarks	Standard/Unit	Note
Trip Count	Total number of ignition switch ON	time	—
Count	Counter	—	—
Time Count	Elapsed time after ignition switch is turned to ON	ms	—
FR Wheel Speed	Wheel speed detected by front ABS wheel speed sensor RH	km/h	—
FL Wheel Speed	Wheel speed detected by front ABS wheel speed sensor LH	km/h	—
RR Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor RH	km/h	—
RL Wheel Speed	Wheel speed detected by rear ABS wheel speed sensor LH	km/h	—
Vehicle Speed	Vehicle speed	km/h	—
Steering Angle Sensor	Steering angle detected by steering angle sensor	deg	—
Yaw Rate Sensor	Angle of the vehicle detected by yaw rate sensor	deg/s	—
Pressure Sensor Output	Brake fluid pressure detected by pressure sensor	MPa	—
Longitudinal G Sensor	Vehicle longitudinal acceleration detected by longitudinal G sensor	m/s^2	—
Lateral G Sensor	Vehicle lateral acceleration detected by lateral G sensor	m/s^2	—
Power Supply Voltage	Voltage supplied to VDCCM&H/U	V	—
Acceleration Pedal Position	Accelerator pedal opening angle	%	—
Engine Speed	Engine speed	rpm	—
FL wheel cylinder pressure sensor output	FL wheel cylinder brake fluid pressure detected by pressure sensor (model with EyeSight)	MPa	—

Item	Remarks	Standard/Unit	Note
FR wheel cylinder pressure sensor output	FR wheel cylinder brake fluid pressure detected by pressure sensor (model with EyeSight)	MPa	—
Eyesight Request Pressure	Requested fluid pressure when braking command is sent from EyeSight to VDC	MPa	—
Brake Booster Gauge Sensor Output	Vacuum pressure value inside brake booster measured by VDC (difference from atmospheric pressure)	kPa	—
Steering Angle Flag	Absolute angle status of steering angle sensor	Recognition in progress or failed	—
EBD Control Flag	Flag of EBD control activation status	ON or OFF	—
ABS Control Flag	Flag of ABS control activation status	ON or OFF	—
TCS Control Flag	Flag of TCS control activation status	ON or OFF	—
VDC Control Flag	Flag of VDC control activation status	ON or OFF	—
E/G Torque Down Control Stop Flag	Flag of engine control command signal	1 or 0	—
Stop-lamp relay drive signal	Brake light relay drive signal	ON or OFF	—
E/G torques up Control Stop Flag	Flag of engine control command signal	1 or 0	—
Brake Negative Pressure Warning	Signal for illuminating warning light for brake vacuum pressure fault	1 or 0	—
OHB Control Flag	Flag of OHB* control activation status	1 or 0	—
OHB Operation Number	Number of OHB* control activation time	time	—
VDC Normality Checking Flag	Flag of pre-collision function OFF status during VDC normality confirmation	1 or 0	—
Hill Descent Control State	HDC control activation status (model with HDC)	OFF or Standby, or Active or Unstable	—
Vectoring control flag	Activation status flag of brake-based torque vectoring control	ON or OFF	—
Brake Fluid Level Warning Lamp	Signal for illuminating brake fluid level warning light	ON or OFF	—
HSA OFF Lamp	Signal for illuminating indicator at HSA OFF	ON or OFF	—
OFF Switch Detection	Operation status of VDC OFF switch	ON or OFF	—
Brake Light Switch	Brake ON/OFF status	ON or OFF	—
Clutch switch	Clutch ON/OFF status (MT model)	ON or OFF	—
Reverse Signal	Reverse gear ON/OFF status	ON or OFF	—

Item	Remarks	Standard/Unit	Note
Detailed DTC(s)	Further categorization of diagnosis code	—	—
Clutch stroke sensor	Pedal stroke amount detected by the clutch stroke sensor (MT model)	%	—
Clutch engagement point	Meet position of the clutch stroke sensor (MT model)	%	—
Actual Engine Torque	Engine torque	N·m	—
Ambient Temp Sensor	Ambient temperature	°C	—

*: OHB = Optimized Hydraulic Brake (brake assist function when vacuum pressure drops)

BRAKE CONTROL (DIAGNOSTICS) > Work Support

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Brake Control].
5. On [Select Function] display, select [Work Support].

BRAKE CONTROL (DIAGNOSTICS) > Work Support

LIST

Work support item	Remarks	Reference
ABS Sequence Control Mode	Operate the valve and pump motor continuously to perform the ABS sequence control.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>ABS Sequence Control.
VDC Function Check Mode	Operate the valve and pump motor continuously to perform the VDC sequence control.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Sequence Control.
Brake Lamp Lighting Operation	Forcibly activate the brake light relay to illuminate the brake light.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Brake Lamp Relay>OPERATION > BRAKE LAMP LIGHTING OPERATION MODE BY SUBARU SELECT MONITOR.
VSC(VDC) Centering Mode	Set the steering angle sensor neutral position, and the lateral G sensor and longitudinal G sensor 0 (zero) point.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.
Reading of parameter: ECM to SSM	Read VDCCM parameter data.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM

Work support item	Remarks	Reference
		PARAMETER READING.
Writing of parameter: SSM to ECM	Write the parameter data to the VDCCM.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER WRITING.
Selection of Parameter	Select and register parameters in the VDCCM.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.
Confirm on parameter	Parameters registered in the VDCCM are displayed.	Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Item	Reference
C1211	FRONT RIGHT ABS SENSOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1211 FRONT RIGHT ABS SENSOR CIRCUIT.
C1212	FRONT RIGHT ABS SENSOR SIGNAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1212 FRONT RIGHT ABS SENSOR SIGNAL.
C1221	FRONT LEFT ABS SENSOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1221 FRONT LEFT ABS SENSOR CIRCUIT.
C1222	FRONT LEFT ABS SENSOR SIGNAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1222 FRONT LEFT ABS SENSOR SIGNAL.
C1231	REAR RIGHT ABS SENSOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1231 REAR RIGHT ABS SENSOR CIRCUIT.
C1232	REAR RIGHT ABS SENSOR SIGNAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1232 REAR RIGHT ABS SENSOR SIGNAL.
C1241	REAR LEFT ABS SENSOR CIRCUIT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.
C1242	REAR LEFT ABS SENSOR SIGNAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.

Code	Item	Reference
C1311	FR HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1311 FR HOLD VALVE.
C1312	FR PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1312 FR PRESSURE REDUCING VALVE.
C1321	FL HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1321 FL HOLD VALVE.
C1322	FL PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1322 FL PRESSURE REDUCING VALVE.
C1331	RR HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1331 RR HOLD VALVE.
C1332	RR PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1332 RR PRESSURE REDUCING VALVE.
C1341	RL HOLD VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1341 RL HOLD VALVE.
C1342	RL PRESSURE REDUCING VALVE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1342 RL PRESSURE REDUCING VALVE.
C1351	NORMAL OPENING VALVE 1	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1351 NORMAL OPENING VALVE 1.
C1352	NORMAL OPENING VALVE 2	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1352 NORMAL OPENING VALVE 2.
C1361	NORMAL CLOSING VALVE 1	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1361 NORMAL CLOSING VALVE 1.
C1362	NORMAL CLOSING VALVE 2	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING

Code	Item	Reference
		VALVE 2.
C1411	ELECTRICAL CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1411 ELECTRICAL CONTROL MODULE.
C1412	SELECTED PARAMETER	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1412 SELECTED PARAMETER.
C1413	POWER SUPPLY VOLTAGE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1413 POWER SUPPLY VOLTAGE.
C1422	VDC INTERRUPTION FOR ENGINE CONVENIENCE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1422 VDC INTERRUPTION FOR ENGINE CONVENIENCE.
C1423	DIFFERENT ECU SPECIFICATIONS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1423 DIFFERENT ECU SPECIFICATIONS.
C1424	ECM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1424 ECM.
C1431	AT	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1431 AT.
C1432	DIFFERENT ECU SPECIFICATIONS	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1432 DIFFERENT ECU SPECIFICATIONS.
C1511	VALVE RELAY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1511 VALVE RELAY.
C1521	MOTOR RELAY	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1521 MOTOR RELAY.
C1531	BLS OFF STUCK	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1531 BLS OFF STUCK.
C1532	BLS ON STUCK	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1532 BLS ON STUCK.

Code	Item	Reference
C1571	BRAKE LAMP RELAY OFF STUCK	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1571 BRAKE LAMP RELAY OFF STUCK.
C1581	BRAKE BOOST NEGATIVE PRESSURE ABNORMAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1581 BRAKE BOOST NEGATIVE PRESSURE ABNORMAL.
C1711	STEERING ANGLE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1711 STEERING ANGLE SENSOR.
C1721	YAW RATE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1721 YAW RATE SENSOR.
C1732	LATERAL G SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1732 LATERAL G SENSOR.
C1733	LONGITUDINAL G SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1733 LONGITUDINAL G SENSOR.
C1741	PRESSURE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1741 PRESSURE SENSOR.
C1742	WHEEL CYLINDER PRESSURE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1742 WHEEL CYLINDER PRESSURE SENSOR.
C1751	BRAKE BOOST GAUGE SENSOR	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1751 BRAKE BOOST GAUGE SENSOR.
C1811	SYSTEM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1811 SYSTEM.
C1821	BRAKE TEMPERATURE ABNORMAL	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1821 BRAKE TEMPERATURE ABNORMAL.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE

Code	Item	Reference
		COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0428	INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA

Code	Item	Reference
		RECEIVED FROM STEERING ANGLE SENSOR MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1211 FRONT RIGHT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1221 FRONT LEFT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1231 REAR RIGHT ABS SENSOR CIRCUIT

Note:

For the diagnostic procedure, refer to "DTC C1241 REAR LEFT ABS SENSOR CIRCUIT". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1241 REAR LEFT ABS SENSOR CIRCUIT.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1241 REAR LEFT ABS SENSOR CIRCUIT

DTC detecting condition:

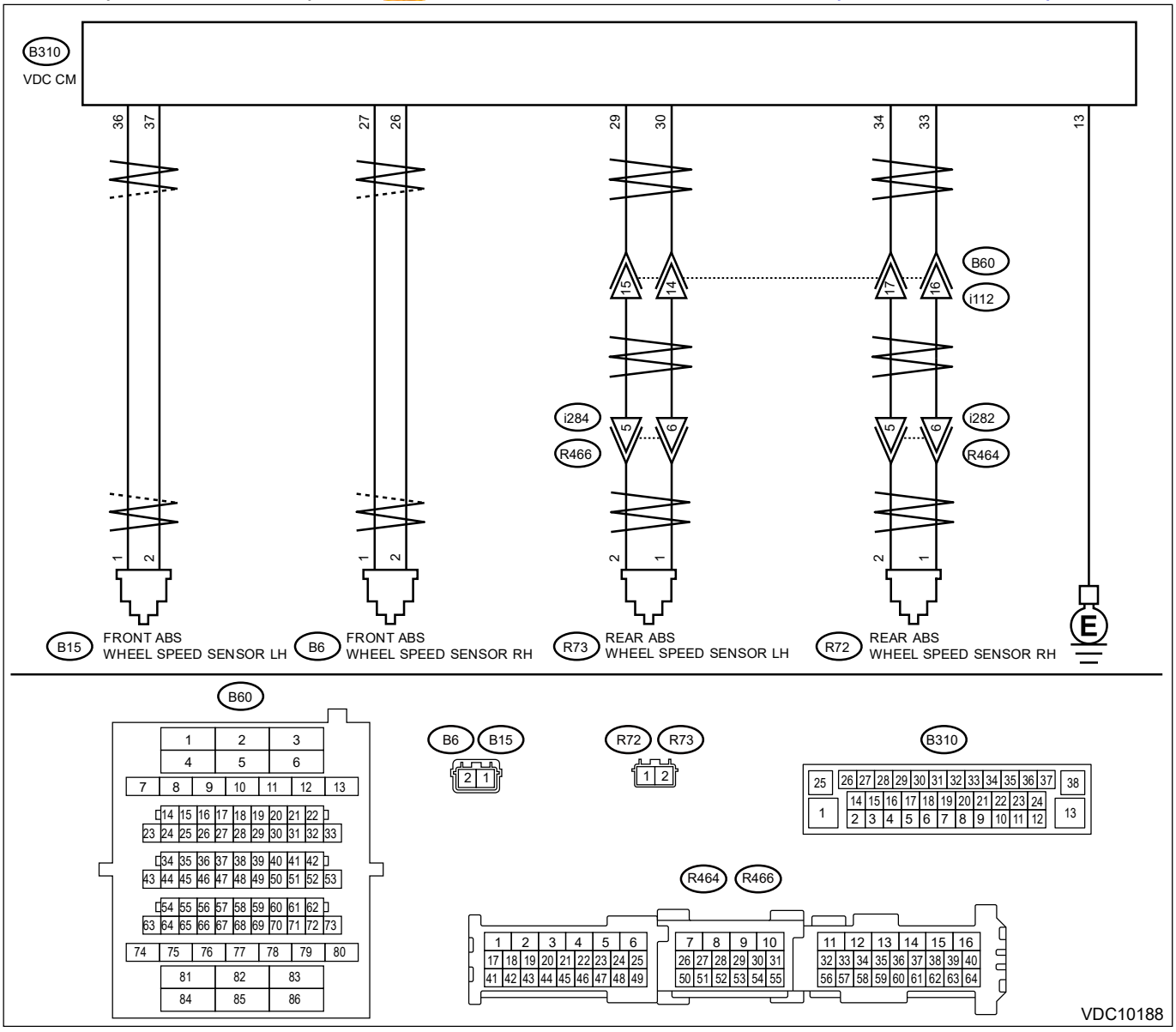
Judge as malfunction when the current value of the wheel speed sensor is out of normal range for a predetermined time or more.

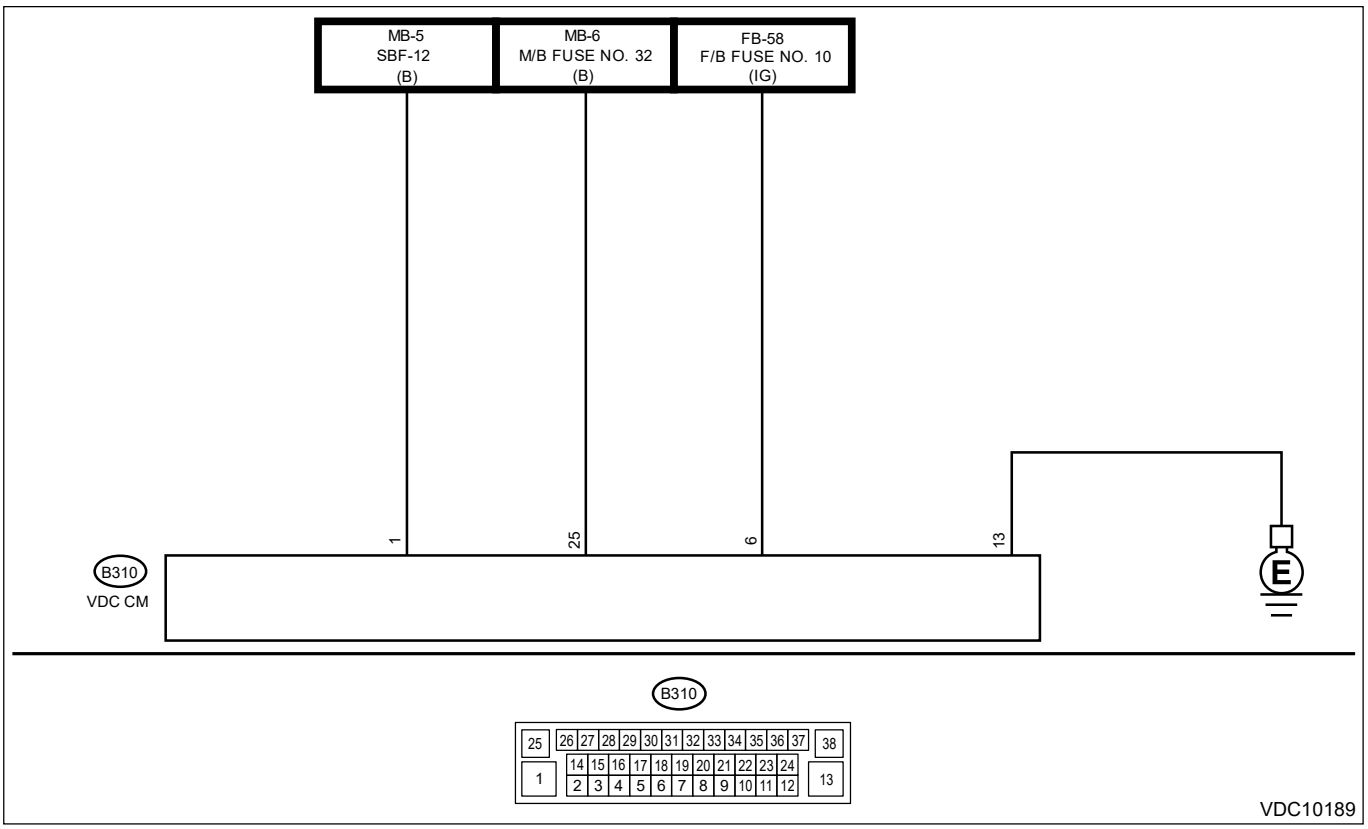
Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.





Note:

This DTC may be stored when the wheel speed sensor connector is disconnected regardless of the ignition switch condition (ON/OFF). Perform the Clear Memory Mode after diagnosis if a DTC is recorded. Ref. to COMMON(diag)>Clear memory.

1. CHECK POOR CONTACT OF CONNECTOR.

Check if there is poor contact between VDCCM&H/U and ABS wheel speed sensor.

Is there poor contact?

Yes	Repair the connector.
No	Go to 2.

2. CHECK HARNESS CONNECTOR BETWEEN VDCCM&H/U AND ABS WHEEL SPEED SENSOR (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector (B310) from the VDCCM&H/U.
3. Disconnect the connector from ABS wheel speed sensor.
4. Measure the resistance between VDCCM&H/U connector and ABS wheel speed sensor connector.

Connector & terminal

DTC C1211

(B310) No. 27 — (B6) No. 1:
(B310) No. 26 — (B6) No. 2:

DTC C1221

(B310) No. 36 — (B15) No. 1:
(B310) No. 37 — (B15) No. 2:

DTC C1231

(B310) No. 33 — (R72) No. 1:
(B310) No. 34 — (R72) No. 2:

DTC C1241

(B310) No. 30 — (R73) No. 1:
(B310) No. 29 — (R73) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness connector between VDCCM&H/U and ABS wheel speed sensor.

3. CHECK GROUND SHORT OF HARNESS.

Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

DTC C1211

(B310) No. 26 — Chassis ground:

DTC C1221

(B310) No. 37 — Chassis ground:

DTC C1231

(B310) No. 33 — Chassis ground:

DTC C1241

(B310) No. 30 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the harness connector between VDCCM&H/U and ABS wheel speed sensor.

4. CHECK ABS WHEEL SPEED SENSOR POWER SUPPLY CIRCUIT.

1. Connect the VDCCM&H/U connector.
2. Connect the ABS wheel speed sensor connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between ABS wheel speed sensor connector and chassis ground.

Connector & terminal

DTC C1211

(B6) No. 1 (+) — Chassis ground (−):

DTC C1221

(B15) No. 1 (+) — Chassis ground (−):

DTC C1231

(R72) No. 2 (+) — Chassis ground (−):

DTC C1241

(R73) No. 2 (+) — Chassis ground (−):

Is the voltage 5 — 16 V?

Yes	Go to 6.
No	Go to 5.

5. CHECK VDCCM&H/U POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the VDCCM&H/U connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between VDCCM&H/U connector terminals.
   Connector & terminal
   (B310) No. 1 (+) — (B310) No. 13 (−):
   (B310) No. 6 (+) — (B310) No. 13 (−):
   (B310) No. 25 (+) — (B310) No. 13 (−):

Is the voltage 10 — 15 V?

Yes	Go to 6.
No	Check the generator, battery and VDCCM&H/U power supply circuit.

6. CHECK ABS WHEEL SPEED SENSOR SIGNAL.

1. Prepare an oscilloscope.
2. Check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

Is the pattern the same waveform as shown in the figure?

Yes	Go to 7.
No	Replace the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor.

7. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1212 FRONT RIGHT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1222 FRONT LEFT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1232 REAR RIGHT ABS SENSOR SIGNAL

Note:

For the diagnostic procedure, refer to "DTC C1242 REAR LEFT ABS SENSOR SIGNAL". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1242 REAR LEFT ABS SENSOR SIGNAL.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1242 REAR LEFT ABS SENSOR SIGNAL

DTC detecting condition:

- A fault is detected if the time of decompression or hold exceeds the predetermined time.
- A fault is detected if noise of the wheel speed sensor signal is detected.
- A fault is detected if the wheel speed sensor signal is lost, or the wheel speed sensor signal continuously indicates significantly low speed by calculating the difference between maximum speed and minimum speed among the four wheels.
- A fault is detected if the wheel speed sensor signal continuously indicates excessively high or low speed.
- A fault is detected if the wheel speed sensor signal changes irregularly.
- A fault is detected if the wheel speed sensor signal drops cyclically.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Note:

This DTC may be stored when the wheel speed sensor connector is disconnected regardless of the ignition switch condition (ON/OFF). Perform the Clear Memory Mode after diagnosis if a DTC is recorded. **Ref. to COMMON(diag)>Clear memory.**

1. CHECK ABS WHEEL SPEED SENSOR AND FREEZE FRAME DATA USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, check the freeze frame data when DTC is detected. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Compare [FR Wheel Speed], [FL Wheel Speed], [RR Wheel Speed] and [RL Wheel Speed] to determine a sensor that is not indicating the same value.
3. Check the data monitor of the wheel speed sensor that is not indicating the same value. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.



Does the speed indicated on the current data change in response to the speedometer reading during acceleration/deceleration when the steering wheel is in the straight-ahead position? And, are the values on the freeze frame data of the vehicle speed from the four wheels indicated as almost identical?

Yes	Go to 2.
No	Go to 7.

2. CHECK POOR CONTACT OF CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check for poor contact of the connector between VDCCM&H/U and ABS wheel speed sensor.

Is there poor contact of connectors between VDCCM&H/U and ABS wheel speed sensor?

Yes	Repair the connector.
No	Go to 3.

3. CHECK CAUSE OF SIGNAL NOISE.

Make sure the radio wave devices and electronic components are installed correctly.

Are the radio wave devices and electronic components installed correctly?

Yes	Go to 4.
No	Install the radio wave devices and electronic components properly.

4. CHECK CAUSE OF SIGNAL NOISE.

Check if the noise sources (such as an antenna) are installed near the sensor harness.

Are noise sources installed?

Yes	Install the noise sources apart from sensor harness.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

7. CHECK INSTALLATION OF ABS WHEEL SPEED SENSOR.

Are the ABS wheel speed sensor installation bolts tightened to 7.5 N·m (0.76 kgf-m, 5.5 ft-lb)?

Yes	Go to 8.
No	Tighten the ABS wheel speed sensor installation bolts.

8. CHECK ABS WHEEL SPEED SENSOR SIGNAL.

1. Prepare an oscilloscope.
2. Check the ABS wheel speed sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor>INSPECTION > CHECK ABS WHEEL SPEED SENSOR UNIT.

Does the oscilloscope indicate the waveform pattern as shown in the figure when the tires are turning? Or does the oscilloscope indication repeat the waveform pattern like shown in the figure when the tire is slowly turned in equal speed for one rotation or more?

Yes	Go to 10.
No	Go to 9.

9. CHECK ABS WHEEL SPEED SENSOR OR MAGNETIC ENCODER.

Are there foreign matters adhered to the tip of ABS wheel speed sensor or magnetic encoder? Or is there any breakage or damage?

Yes	Remove dirt thoroughly. Also replace the ABS wheel speed sensor or magnetic encoder as a unit with hub unit bearing if it is broken or damaged.
No	Go to 10.

10. CHECK CAUSE OF SIGNAL NOISE.

Make sure the radio wave devices and electronic components are installed correctly.

Are the radio wave devices and electronic components installed correctly?

Yes	Go to 11.
No	Install the radio wave devices and electronic components properly.

11. CHECK CAUSE OF SIGNAL NOISE.

Check if the noise sources (such as an antenna) are installed near the sensor harness.

Are noise sources installed?

Yes	Install the noise sources apart from sensor harness.
No	Go to 12.

12. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Go to 13.
No	Go to 14.

13. CHECK FREEZE FRAME DATA OF ABS WHEEL SPEED SENSOR USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select Freeze frame data. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Freeze Frame Data.
2. Read the ABS wheel speed sensor output.

Is the ABS wheel speed sensor output different compared with other wheels?

Yes	Replace the ABS wheel speed sensor which has a difference. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Front ABS Wheel Speed Sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Rear ABS Wheel Speed Sensor.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

14. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference. **Note:** **Though the ABS warning light may remain on at this time, this is normal. Drive the vehicle at 40 km/h (25 MPH) or more in order to turn ABS warning light off. Be sure to drive the vehicle and check that the warning light goes off.**

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1311 FR HOLD VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1312 FR PRESSURE REDUCING VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1321 FL HOLD VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1322 FL PRESSURE REDUCING VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1331 RR HOLD VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1332 RR PRESSURE REDUCING VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1341 RL HOLD VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1342 RL PRESSURE REDUCING VALVE

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1351 NORMAL OPENING VALVE 1

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1352 NORMAL OPENING VALVE 2

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1361 NORMAL CLOSING VALVE 1

Note:

For the diagnostic procedure, refer to "DTC C1362 NORMAL CLOSING VALVE 2 MALFUNCTION". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1362 NORMAL CLOSING VALVE 2.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1362 NORMAL CLOSING VALVE 2

DTC detecting condition:

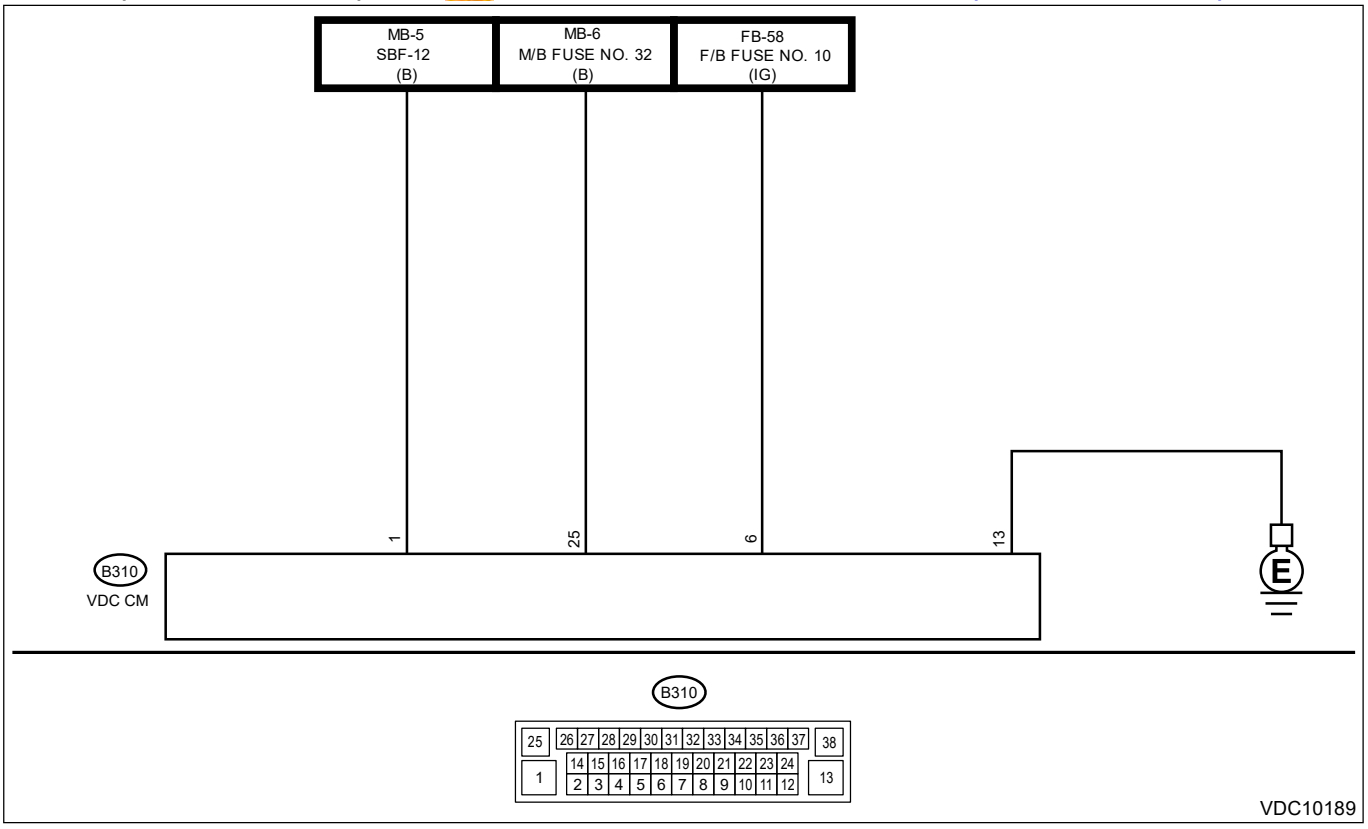
A fault is detected if electrical malfunction judgment is generated for VDCH/U solenoid valve.

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Run the engine at idle.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 1 (+) — Chassis ground (−):
   (B310) No. 6 (+) — Chassis ground (−):
   (B310) No. 25 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 2.
No	Repair the power supply circuit including the battery.

2. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair the VDCCM&H/U ground harness.

3. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 4.

4. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 5.

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1411 ELECTRICAL CONTROL MODULE

DTC detecting condition:

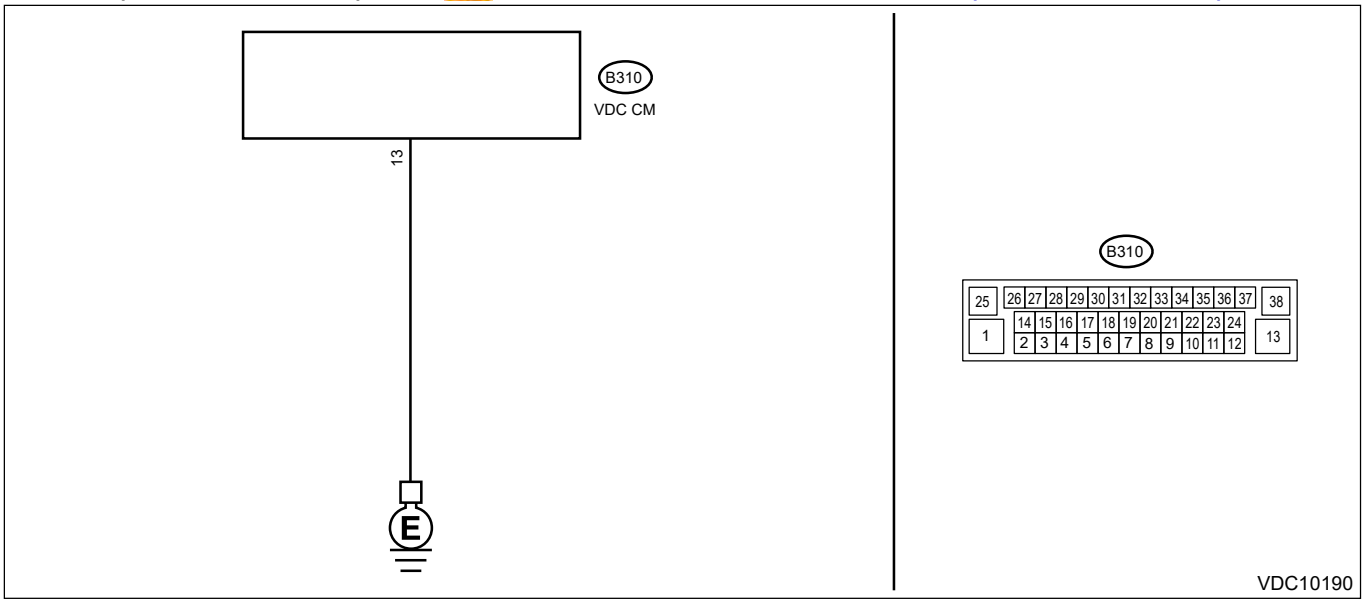
Judge as malfunction when ECM internal malfunction is detected.

Trouble symptom:

- ABS does not operate sometimes.
- EBD does not operate sometimes.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance between VDCCM&H/U and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Repair the VDCCM&H/U ground harness.

2. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of the connector between the battery, ignition switch and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 3.

3. CHECK CAUSE OF SIGNAL NOISE.

Are the radio wave devices and electronic components installed correctly?

Yes	Go to 4.
No	Install the radio wave devices and electronic components properly.

4. CHECK CAUSE OF SIGNAL NOISE.

Is there a noise source (such as an antenna) installed near the sensor harness and VDCCM?

Yes	Install the noise sources apart from sensor harness and VDCCM.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1412 SELECTED PARAMETER

DTC detecting condition:

- A fault is detected if abnormal set value is found on the vehicle model that were given some parameters.
- A fault is detected if 0 point setting compensation of the sensor is not yet performed.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Note:

When the VDCCM&H/U is replaced, this DTC may be stored.

1. CHECK VDCCM&H/U IDENTIFICATION SYMBOL.

Check the identification symbol attached on the H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.

Is the identification symbol correct?

Yes	Go to 2.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

2. CHECK PARAMETER SELECTED IN VDCCM.

Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes	Go to 3.
No	Select and register the correct parameter. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.

3. CHECK SPECIFICATIONS OF OTHER CONTROL MODULES.

Check the specifications of ECM and TCM.

Are the specifications of ECM and TCM the same as vehicle specification?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the ECM and TCM. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Engine Control Module (ECM). Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1413 POWER SUPPLY VOLTAGE

DTC detecting condition:

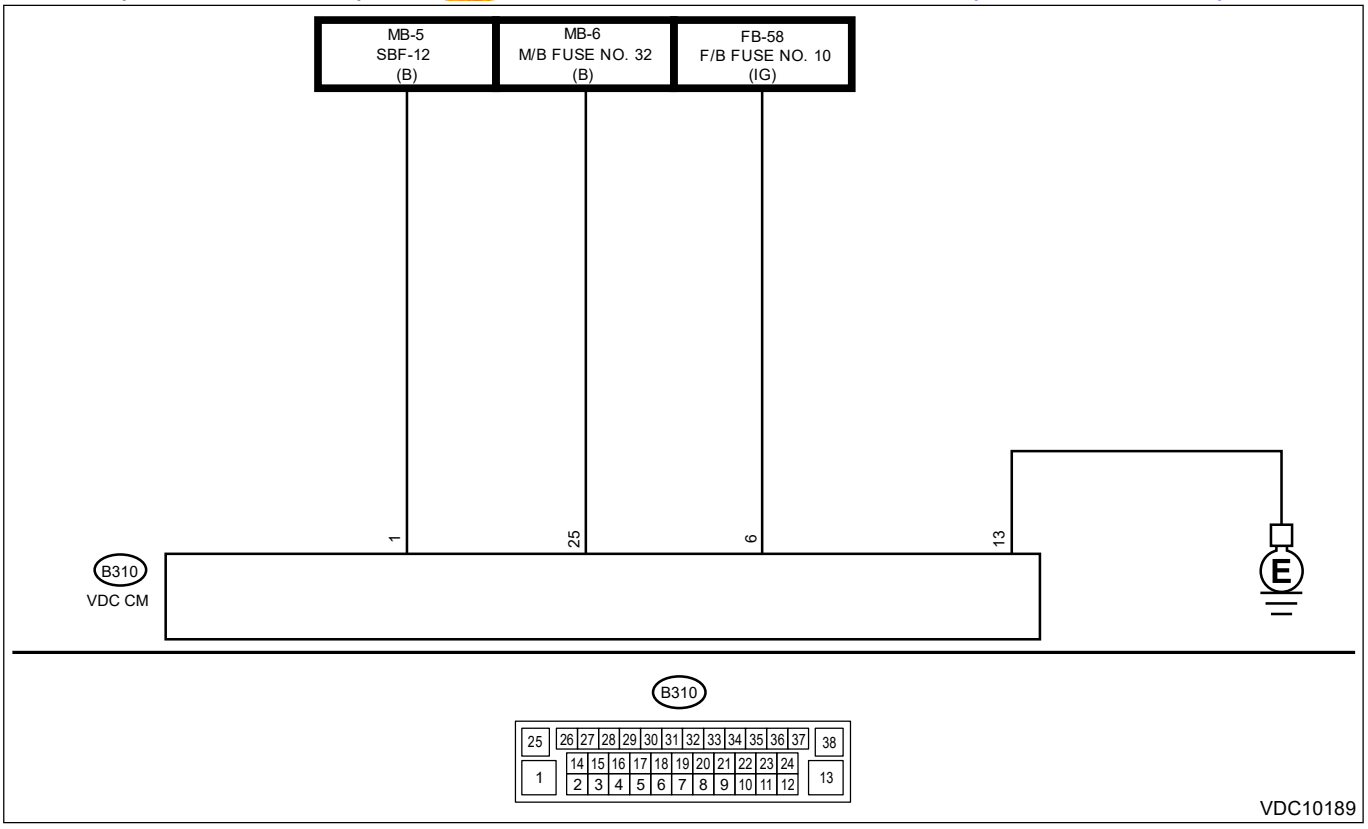
A fault is detected if the power supply voltage is out of normal range for a predetermined time or more.

Trouble symptom:

- ABS does not operate.
- EBD may not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



Note:

Warning lights go off if voltage returns.

1. CHECK GENERATOR.

1. Start the engine.
2. Run the engine at idle after warming up.
3. Measure the voltage between generator terminal B and chassis ground.

Terminals

Generator terminal B (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 2.
No	Repair the generator.

2. CHECK BATTERY TERMINAL.

Turn the ignition switch to OFF.

Are the positive and negative battery terminals clamped tightly?

Yes	Go to 3.
No	Install the battery terminal correctly.

3. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Disconnect the connector from the VDCCM&H/U.
2. Run the engine at idle.
3. Operate devices such as headlights, air conditioner, rear defogger, etc. which produce an electrical load.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 1 (+) — Chassis ground (−):
   (B310) No. 6 (+) — Chassis ground (−):
   (B310) No. 25 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the VDCCM&H/U ground harness circuit.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 6.

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1422 VDC INTERRUPTION FOR ENGINE CONVENIENCE

DTC detecting condition:
A fault is detected if engine control prohibition flag from ECM is received.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.

Note:

The warning light goes off if the engine control prohibition flag from ECM returns normally.

1. CHECK COOPERATION CONTROL FEASIBILITY OF ECM USING SUBARU SELECT MONITOR.

1. Start the engine, and run the engine at idle approximately 5 minutes.
2. Using the Subaru Select Monitor, select Data monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Check [E/G Torque Down Control Stop Flag] on the display screen.



Is "1" displayed in [E/G Torque Down Control Stop Flag]?

Yes	Go to 4.
No	Go to 2.

2. CHECK WARNING LIGHT.

Check whether the VDC warning light illuminates after driving for 1 minute or more at a speed of 10 km/h (6 MPH) or more.

Does the VDC warning light illuminate?

Yes	Go to 3.
No	VDC is normal. Clear the memory. Ref. to COMMON(diag)>Clear memory. **Note:** **DTC may be recorded if cranking is performed during driving.**

3. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of ECM connector?

Yes	Repair the connector.
No	Go to 4.

4. CHECK DTC OF ECM.

Read the DTC relating the ECM using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1423 DIFFERENT ECU SPECIFICATIONS

DTC detecting condition:

A fault is detected if the vehicle type information obtained from ECM via communication is different from the parameter setting information.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Note:

When parameter selection for VDCCM is improper, this DTC may be memorized.

1. CHECK VDCCM&H/U IDENTIFICATION SYMBOL.

Check the identification symbol attached on the H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>SPECIFICATION.

Is the identification symbol correct?

Yes	Go to 2.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

2. CHECK PARAMETER SELECTED IN VDCCM.

Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER CHECK.

Does the parameter registered in the VDCCM match the relevant vehicle?

Yes	CVT model: Go to 3. MT model: Go to 5.
No	Select and register the correct parameter. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>MAINTENANCE MODE > VDCCM PARAMETER SELECTION.

3. CHECK TCM SPECIFICATION.

Check the TCM specification.

Is the specification of TCM same as vehicle specification?

Yes	Go to 4.
No	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).

4. CHECK CVT SYSTEM.

1. Start the engine.
2. Using the Subaru Select Monitor, read DTC of CVT system. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of CVT system displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK ECM SPECIFICATION.

Check the ECM specification.

Is the specification of ECM same as vehicle specification?

Yes	Go to 6.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

6. CHECK ENGINE SYSTEM.

1. Start the engine.
2. Read the DTC of engine system using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is engine system DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 7.

7. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1424 ECM

DTC detecting condition:
A fault is detected if malfunction judgment flag for the engine system is received from ECM for a predetermined time or more.
Trouble symptom:
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. CHECK ECM.

1. Start the engine.
2. Read the DTC relating the ECM using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1431 AT

DTC detecting condition:

A fault is detected if malfunction flag is received from TCM.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. CHECK TCM.

1. Start the engine.
2. Read the DTC relating the TCM using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. After turning the ignition switch to ON for approx. 10 seconds, turn it to OFF.
3. Turn the ignition switch to ON again.
4. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
6. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 3.

3. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1432 DIFFERENT ECU SPECIFICATIONS

Note:

For the diagnostic procedure, refer to "DTC C1423 DIFFERENT ECU SPECIFICATIONS". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1423 DIFFERENT ECU SPECIFICATIONS.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1511 VALVE RELAY

DTC detecting condition:

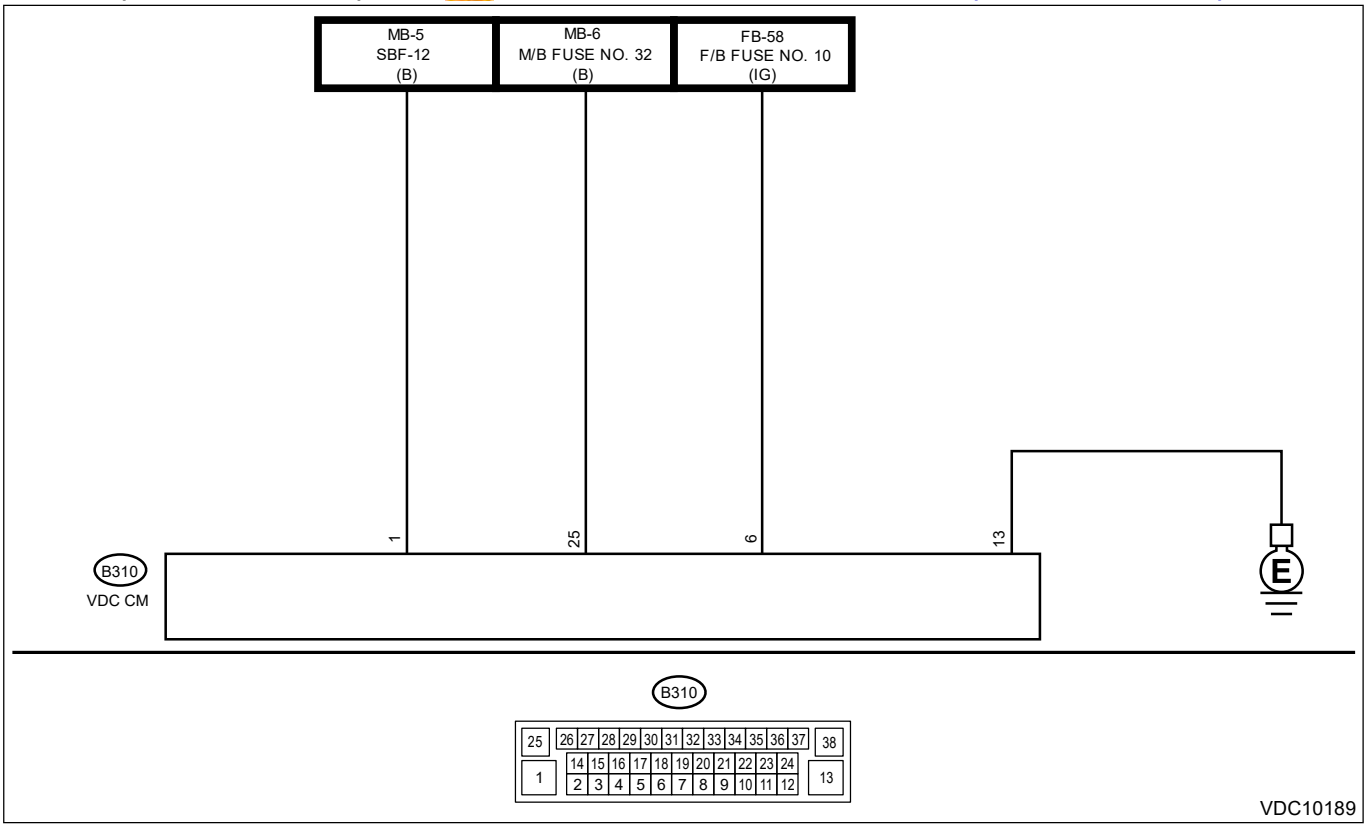
A fault is detected if valve relay drive voltage failure is detected.

Trouble symptom:

- ABS does not operate.
- EBD does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Run the engine at idle.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 6 (+) — Chassis ground (−):

(B310) No. 25 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 2.
No	Repair the power supply circuit.

2. CHECK VDCCM&H/U INPUT VOLTAGE.

Calculate the voltage difference measured in step 1.
A: (B310) No. 6 (+) — Chassis ground (−):
B: (B310) No. 25 (+) — Chassis ground (−):

Is the voltage difference between A and B 2 V or more?

Yes	Repair the power supply circuit.
No	Go to 3.

3. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair the VDCCM&H/U ground harness.

4. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1521 MOTOR RELAY

DTC detecting condition:

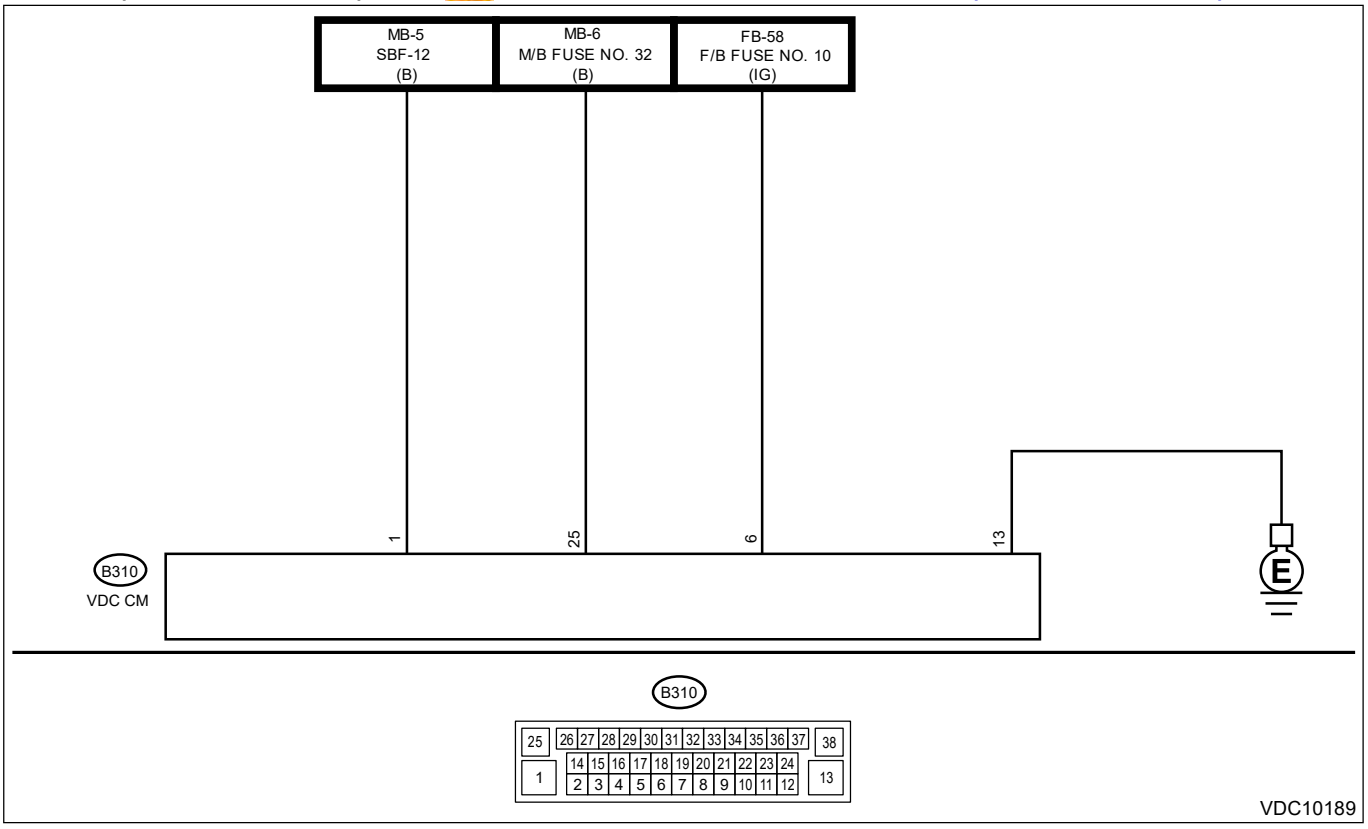
A fault is detected if the pump motor supply voltage becomes significantly low when the pump motor is not driven.

Trouble symptom:

- ABS does not operate sometimes.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK VDCCM&H/U INPUT VOLTAGE.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Turn the ignition switch to ON.
4. Measure the voltage between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 1 (+) — Chassis ground (−):
   (B310) No. 6 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 2.
No	Repair the VDCCM&H/U power supply circuit.

2. CHECK VDCCM&H/U INPUT VOLTAGE.

Calculate the voltage difference measured in step 1.
A: (B310) No. 1 (+) — Chassis ground (−):
B: (B310) No. 6 (+) — Chassis ground (−):

Is the voltage difference between A and B 2 V or more?

Yes	Repair the power supply circuit.
No	Go to 3.

3. CHECK INSTALLATION OF VDCCM&H/U GROUND.

Is the VDCCM&H/U ground terminal installation bolt installed correctly?

Yes	Go to 4.
No	Install the VDCCM&H/U ground terminal installation bolt correctly.

4. CHECK VDCCM&H/U GROUND CIRCUIT (CHECK FOR OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.
   Connector & terminal
   (B310) No. 13 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the VDCCM&H/U ground harness.

5. CHECK VDCCM&H/U MOTOR RELAY.

Measure the resistance between VDCCM&H/U terminals.
Terminals
No. 1 — No. 13:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

6. CHECK POOR CONTACT OF CONNECTORS.

Turn the ignition switch to OFF.

Is there poor contact of connector between generator, battery and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 7.

7. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1531 BLS OFF STUCK

1. MODELS WITHOUT EYESIGHT

DTC detecting condition:

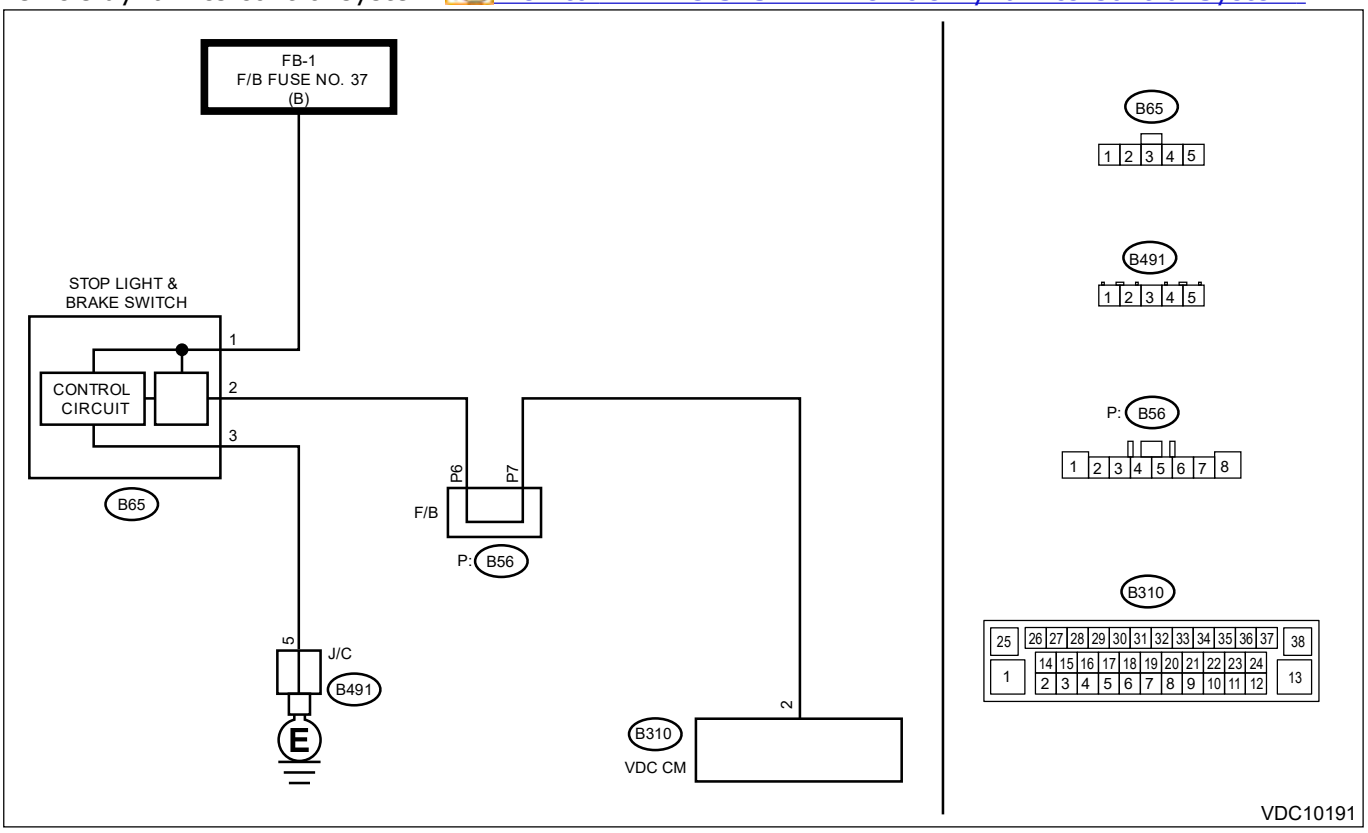
A fault is detected if stop light switch signal is OFF for a predetermined time or more with the pressure signal of the pressure sensor high.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.

WIRING DIAGRAM:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK STOP LIGHT SWITCH UNIT.	no →	Perform the instructed procedures.

yes

3. CHECK STOP LIGHT POWER SUPPLY.

no → Perform the instructed procedures.

yes

4. CHECK STOP LIGHT SWITCH HARNESS.

no → Perform the instructed procedures.

yes

5. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → Go to 6.

6. CHECK VDCCM&H/U.

yes → Perform the instructed procedures.

no → Go to 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.

Check the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSPECTION > INSPECT THE SPECIFIED POSITION.

Is the check result OK?

Yes	Go to 2.
No	Adjust the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSTALLATION.

2. CHECK STOP LIGHT SWITCH UNIT.

Perform the inspection of stop light switch unit. Ref. to BRAKE>Stop Light Switch>INSPECTION > CHECK OUTPUT.

Is the check result OK?

Yes	Go to 3.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch.

3. CHECK STOP LIGHT POWER SUPPLY.

Measure the voltage between stop light switch terminal and chassis ground.

Connector & terminal

(B65) No. 1 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 4.
No	Repair the stop light power supply circuit.

4. CHECK STOP LIGHT SWITCH HARNESS.

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U and stop light switch.
   Connector & terminal
   (B65) No. 2 — (B310) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the stop light switch circuit.

5. CHECK POOR CONTACT OF CONNECTORS.

Is there poor contact of connector between stop light switch and VDCCM&H/U?

Yes	Repair the connector.
No	Go to 6.

6. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 7.

7. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

2. MODELS WITH EYESIGHT

DTC detecting condition:

A fault is detected if stop light switch signal is OFF for a predetermined time or more with the pressure signal of the pressure sensor high.

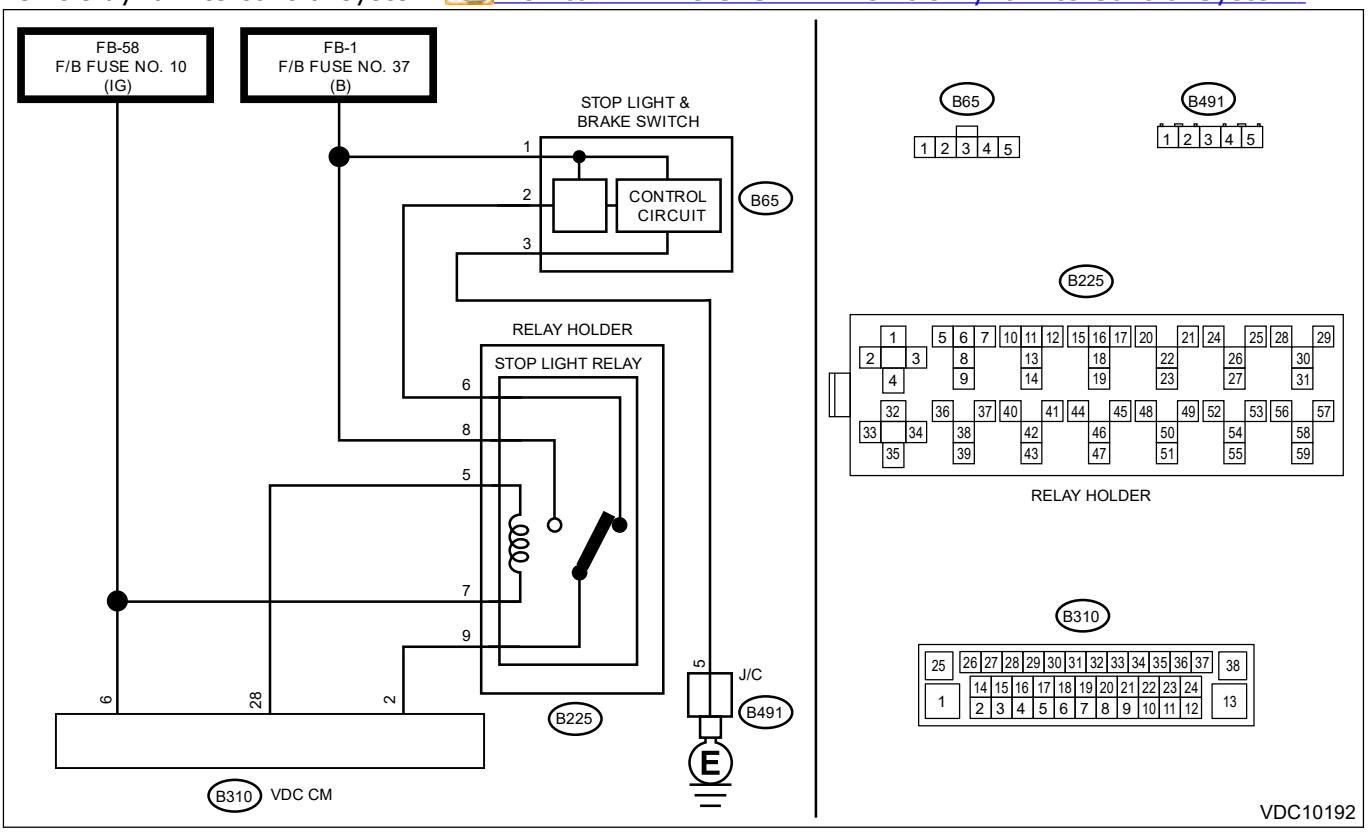
Trouble symptom:

- VDC does not operate.

- Hill start assist does not operate.
- EyeSight does not operate.

WIRING DIAGRAM:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK STOP LIGHT SWITCH UNIT.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK STOP LIGHT RELAY.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK VDCCM&H/U CONNECTOR.

yes → Perform the instructed procedures.

no → Go to 5.

5. CHECK STOP LIGHT SWITCH CIRCUIT (CHECK FOR OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

6. CHECK STOP LIGHT SWITCH CIRCUIT.

no → Perform the instructed procedures.

yes ↓

7. CHECK VDCCM&H/U.

yes → Perform the instructed procedures.

no → Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK INSTALLATION POSITION OF STOP LIGHT SWITCH.

1. Check the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSPECTION > INSPECT THE SPECIFIED POSITION.

Is the check result OK?

Yes	Go to 2.
No	Adjust the installation position of the stop light switch. Ref. to BRAKE>Stop Light Switch>INSTALLATION.

2. CHECK STOP LIGHT SWITCH UNIT.

Perform the inspection of stop light switch unit. Ref. to BRAKE>Stop Light Switch>INSPECTION > CHECK OUTPUT.

Is the check result OK?

Yes	Go to 3.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch.

3. CHECK STOP LIGHT RELAY.

Measure the resistance of stop light relay terminals.

Terminals

No. 6 — No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

4. CHECK VDCCM&H/U CONNECTOR.

Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes	Repair the VDCCM&H/U connector.
No	Go to 5.

5. CHECK STOP LIGHT SWITCH CIRCUIT (CHECK FOR OPEN CIRCUIT).

Measure the resistance of stop light switch circuit.

Connector & terminal

(B310) No. 2 — (B225) No. 9:

(B65) No. 2 — (B225) No. 6:

(B65) No. 1 — (F/B fuse) No. 37:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the stop light switch circuit.

6. CHECK STOP LIGHT SWITCH CIRCUIT.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between brake light relay and chassis ground.

   Connector & terminal

   (B225) No. 9 (+) — Chassis ground (−):

Is the voltage 10 V or more when the stop light switch is ON (when pedal is depressed)?

Yes	Go to 7.
No	Repair the stop light switch circuit.

7. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1532 BLS ON STUCK

1. MODELS WITHOUT EYESIGHT

DTC detecting condition:

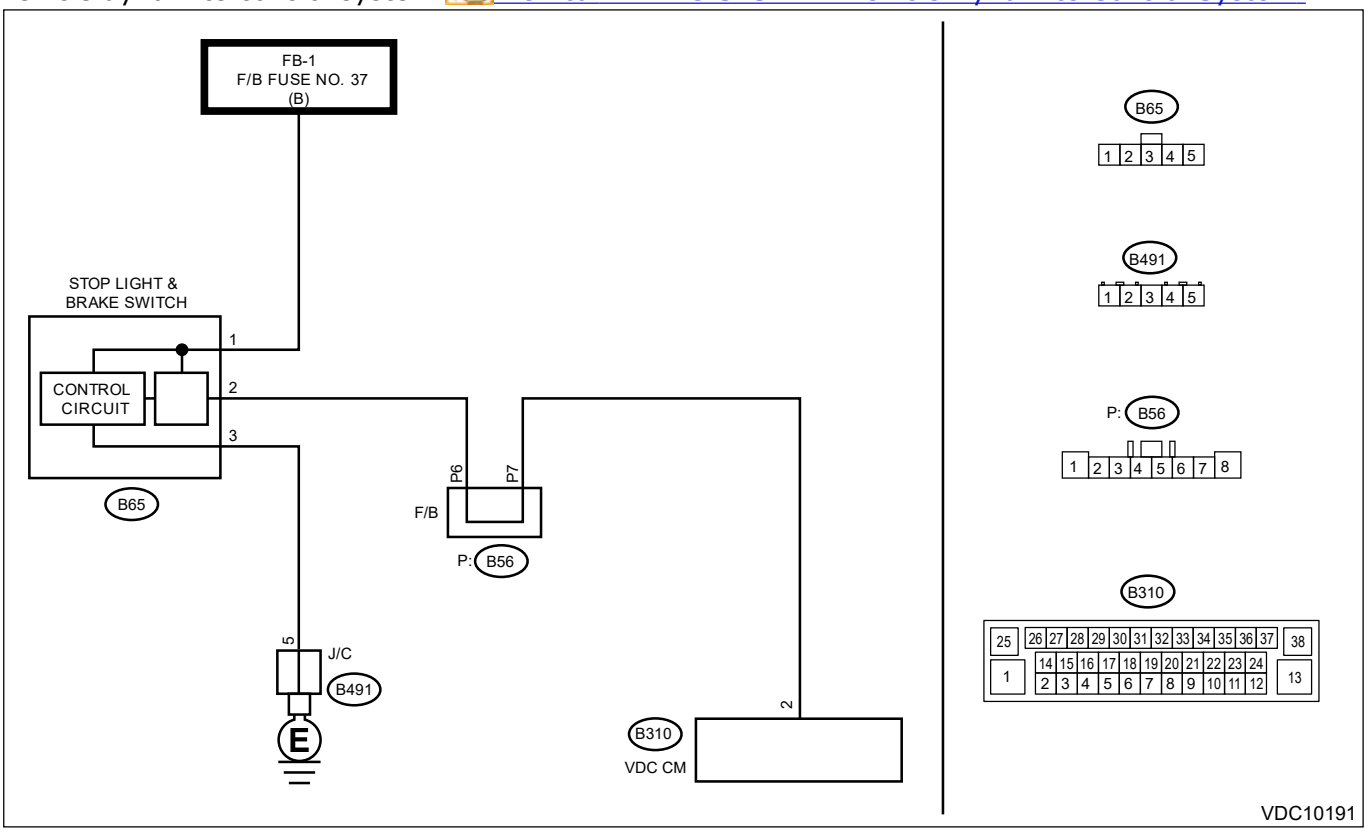
- A fault is detected if a change of the vehicle speed from high to low occurs for a predetermined number of times or more, while a change of the stop light switch from OFF to ON is not detected.
- A fault is detected if stop light switch ON status continues for long time while the vehicle speed is at the predetermined speed or higher.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.

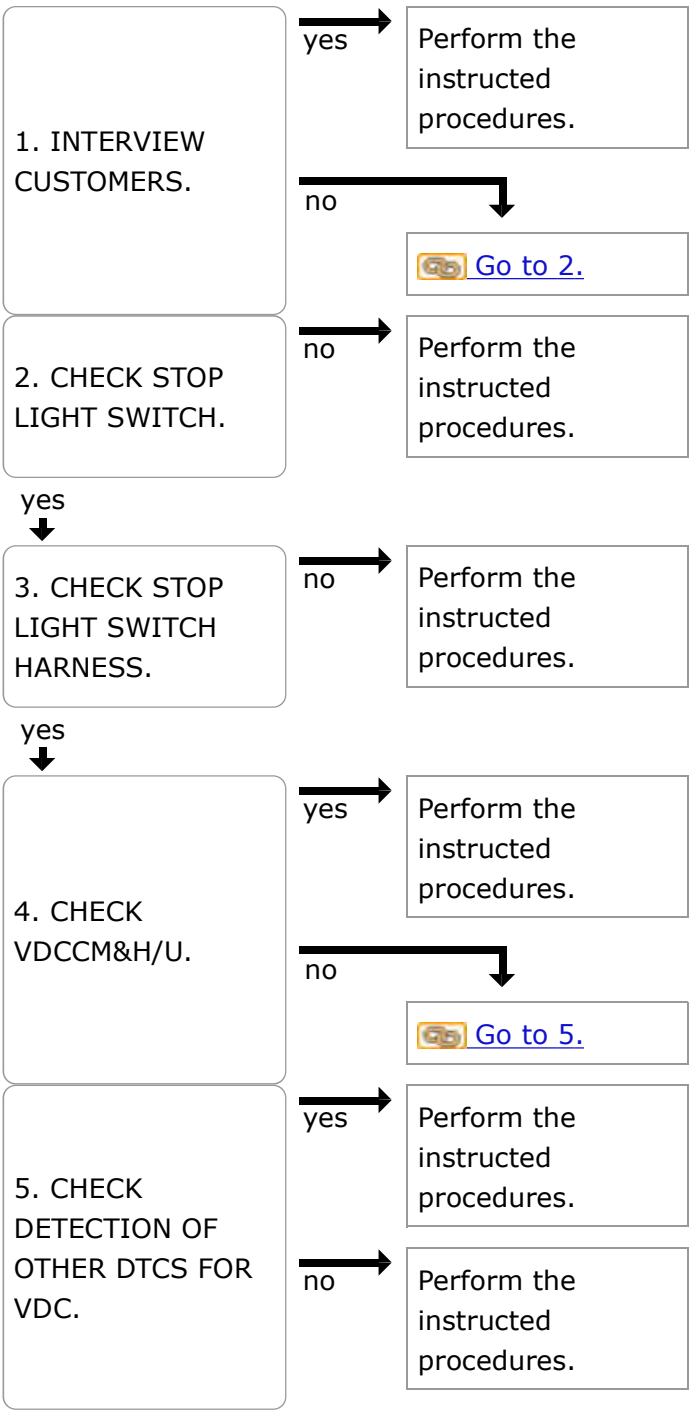
WIRING DIAGRAM:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



Note:

If the pressure sensor is defective, this DTC may probably be stored in addition to pressure sensor malfunction.


1. INTERVIEW CUSTOMERS.
yes
Perform the instructed procedures.
no
Go to 2.
2. CHECK STOP LIGHT SWITCH.
no
Perform the instructed procedures.
yes
3. CHECK STOP LIGHT SWITCH HARNESS.
no
Perform the instructed procedures.
yes
4. CHECK VDCCM&H/U.
yes
Perform the instructed procedures.
no
Go to 5.
5. CHECK DETECTION OF OTHER DTCS FOR VDC.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. INTERVIEW CUSTOMERS.

Make sure that the operation was performed in which accelerator pedal and brake pedal were depressed simultaneously (with depressing brake pedal with left foot).

Were the acceleration pedal and brake pedal depressed simultaneously?

Yes	System is normal. (DTC may be recorded if the brake pedal is always depressed while driving.)
No	Go to 2.

2. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Measure the resistance of stop light switch terminals.

Terminals

No. 1 — No. 2:

Is the resistance 1 MΩ or more when stop light switch is OFF (when pedal is not depressed)?

Yes	Go to 3.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch.

3. CHECK STOP LIGHT SWITCH HARNESS.

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U connector and chassis ground.

Connector & terminal

(B310) No. 2 — Chassis ground:

Is the resistance less than 1 MΩ?

Yes	Go to 4.
No	Repair the stop light switch circuit.

4. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 5.

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

2. MODELS WITH EYESIGHT

DTC detecting condition:

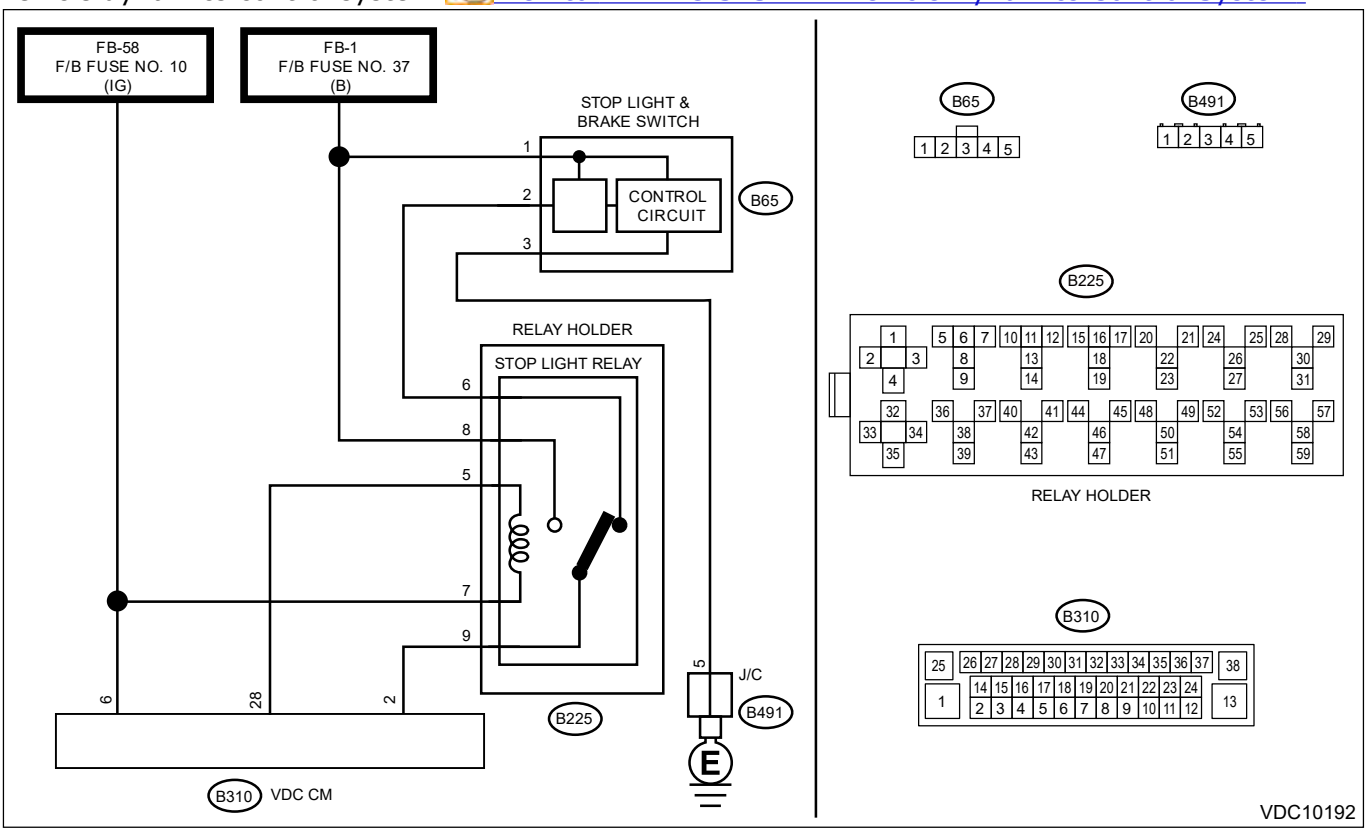
- A fault is detected if a change of the vehicle speed from high to low occurs for a predetermined number of times or more, while a change of the stop light switch from OFF to ON is not detected.
- A fault is detected if stop light switch ON status continues for long time while the vehicle speed is at the predetermined speed or higher.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate.

WIRING DIAGRAM:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



Note:

If the pressure sensor is defective, this DTC may probably be stored in addition to pressure sensor malfunction.

1. INTERVIEW CUSTOMERS.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK STOP LIGHT RELAY.	yes →	Perform the instructed procedures.
	no →	Go to 3.

3. CHECK VDCCM&H/U CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK STOP LIGHT SWITCH CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Go to 5.
5. CHECK VDCCM&H/U.	yes →	Perform the instructed procedures.
	no →	Go to 6.
6. CHECK DETECTION OF OTHER DTCS FOR VDC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. INTERVIEW CUSTOMERS.

Make sure that the operation was performed in which accelerator pedal and brake pedal were depressed simultaneously (with depressing brake pedal with left foot).

Were the acceleration pedal and brake pedal depressed simultaneously?

Yes	System is normal. (DTC may be recorded if the brake pedal is always depressed while driving.)
No	Go to 2.

2. CHECK STOP LIGHT RELAY.

1. Turn the ignition switch to OFF.
2. Measure the resistance of stop light relay terminals.
   Terminals
   No. 8 — No. 9:

Is the resistance less than 1 Ω?

Yes	Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.
No	Go to 3.

3. CHECK VDCCM&H/U CONNECTOR.

Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes	Repair the VDCCM&H/U connector.
No	Go to 4.

4. CHECK STOP LIGHT SWITCH CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between stop light relay and chassis ground.
   Connector & terminal
   (B225) No. 9 (+) — Chassis ground (−):

Is the voltage 10 V or more when the stop light switch is OFF (when pedal is not depressed)?

Yes	Repair the stop light switch circuit.
No	Go to 5.

5. CHECK VDCCM&H/U.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1571 BRAKE LAMP RELAY OFF STUCK

DTC detecting condition:

A fault is detected if the stop light relay operation request were compared with the feedback signal and detected as follows:

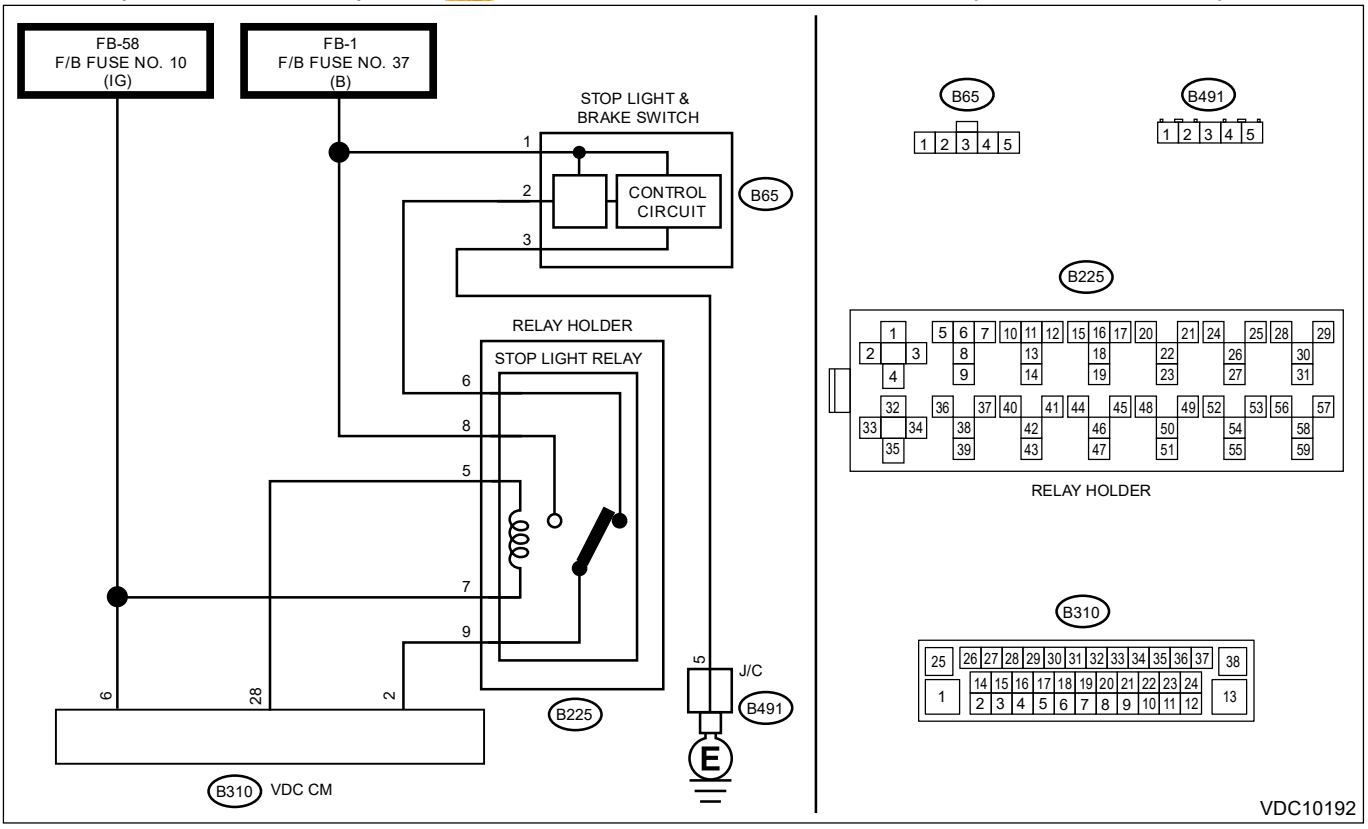
- The feedback signal is OFF.
- The stop light relay operation request is ON.

Trouble symptom:

- EyeSight does not operate. (Models with EyeSight)
- Brake lights do not illuminate sometimes.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs related to the stop light switch displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK STOP LIGHT RELAY.

1. Turn the ignition switch to OFF.
2. Remove the stop light relay.
3. Measure the resistance between stop light relay terminals No. 5 — No. 7 when the battery voltage is applied.
   Terminals
   No. 8 — No. 9:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Replace the stop light relay. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Relay and Fuse.

3. CHECK VDCCM&H/U CONNECTOR.

Disconnect the connector from the VDCCM&H/U.

Is there poor contact or damage of the VDCCM&H/U connector?

Yes	Repair the VDCCM&H/U connector.
No	Go to 4.

4. CHECK STOP LIGHT SWITCH CIRCUIT.

Measure the resistance between the stop light relay and the fuse.

Connector & terminal

(B225) No. 8 — (F/B fuse) No. 37:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit in the power supply circuit including the fuse.

5. CHECK STOP LIGHT SWITCH CIRCUIT.

1. Connect all connectors.
2. Turn the ignition switch to ON.
3. Measure the voltage between stop light relay and chassis ground.

   Connector & terminal

   (B225) No. 8 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair or replace the open circuit in the power supply circuit including the fuse.

6. CHECK STOP LIGHT RELAY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Remove the stop light relay.
3. Turn the ignition switch to ON.
4. Measure the voltage between stop light relay and chassis ground.

Connector & terminal

(B225) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair the stop light relay circuit.
No	Go to 7.

7. CHECK STOP LIGHT RELAY CIRCUIT.

Measure the voltage between stop light relay and chassis ground.

Connector & terminal

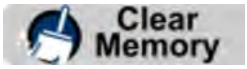
(B225) No. 7 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the ignition power supply circuit.

8. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Connect all connectors and relays.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 9.

9. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1581 BRAKE BOOST NEGATIVE PRESSURE ABNORMAL

DTC detecting condition:
This malfunction is stored if vacuum pressure value inside brake booster drops below the normal pressure and stays for a specific period of time.
Trouble symptom:
Brake pedal becomes heavier. (Brake assist function is activated when vacuum pressure drops.)

1. CHECK DTC.

1. Start the engine.
2. Warm up for at least three minutes.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C1581 a current malfunction?

Yes	Go to 2.
No	Currently, it is normal. It results from a temporary vacuum pressure drop.

2. CHECK OUTPUT OF BRAKE BOOSTER PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
2. Read [Brake Booster Gauge Sensor Output] indicated on the display screen.



Is [Brake Booster Gauge Sensor Output] −20 kPa or more?

Yes	Go to 3.
No	Currently, it is normal. It results from a temporary vacuum pressure drop.

3. CHECK OUTPUT OF BRAKE BOOSTER PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

Using Subaru Select Monitor, read [Brake Booster Gauge Sensor Output] while depressing the brake pedal several times.

Data Monitor

Does the value of [Brake Booster Gauge Sensor Output] change along with the operation?

Yes	Currently, it is normal. It results from a temporary vacuum pressure drop.
No	Go to 4.

4. CHECK BRAKE VACUUM SYSTEM.

1. Check for connections and air tightness of brake vacuum system (between brake booster and intake manifold).
2. Check for connections and air tightness of brake vacuum system (between brake booster and brake vacuum pump).

Are there any air leaks in the brake vacuum system?

Yes	Repair the air leak in the brake vacuum system.
No	Replace the brake booster. Ref. to BRAKE>Brake Booster.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1711 STEERING ANGLE SENSOR

DTC detecting condition:

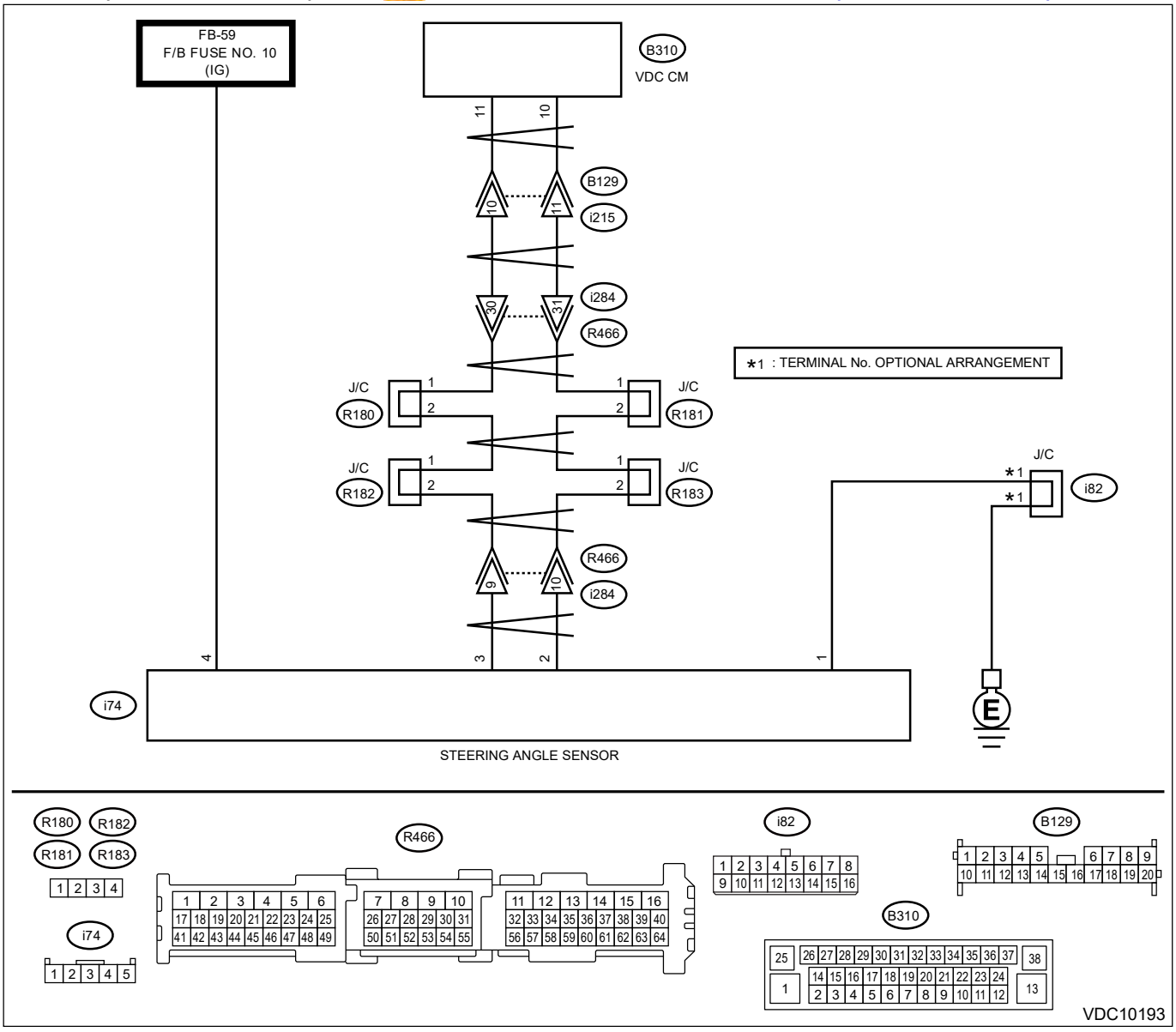
- A fault is detected if the sensor signal value is not correct.
- A fault is detected if the yaw rate sensor signal / lateral G sensor signal change while the sensor signal of steering angle sensor indicates a constant value.
- A fault is detected if the communication status of steering angle sensor is abnormal.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK POWER SUPPLY FOR STEERING ANGLE SENSOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from steering angle sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between steering angle sensor and chassis ground.
   Connector & terminal
   (i74) No. 4 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 2.
No	Repair the steering angle sensor power supply circuit including the fuse.

2. CHECK GROUND CIRCUIT OF STEERING ANGLE SENSOR (CHECK FOR OPEN CIRCUIT).

Measure the resistance between steering angle sensor and chassis ground.
Connector & terminal
(i74) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair ground circuit in the steering angle sensor.

3. CHECK STEERING ANGLE SENSOR HARNESS (CHECK FOR OPEN CIRCUIT).

1. Disconnect the connector from the VDCCM&H/U.
2. Measure the resistance between VDCCM&H/U and steering angel sensor.

Connector & terminal

(i74) No. 2 — (B310) No. 10:

(i74) No. 3 — (B310) No. 11:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the harness between the steering angle sensor and VDCCM&H/U.

4. CHECK GROUND SHORT CIRCUIT OF STEERING ANGLE SENSOR HARNESS.

Measure the resistance between steering angle sensor and chassis ground.

Connector & terminal

(i74) No. 2 — Chassis ground:

(i74) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the harness between the steering angle sensor and VDCCM&H/U.

5. CHECK STEERING WHEEL.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Check the steering wheel for deviation from center.

Is the deviation from the center of steering wheel less than 5°?

Yes	Go to 6.
No	Perform the centering adjustment of steering wheel, and perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

6. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Adjust steering wheel to the center position.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Steering Angle Sensor] indicated on the display screen.

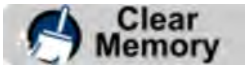


Is the value of [Steering Angle Sensor] −10° — 10°?

Yes	Perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE. Go to 7.
No	Check the installation of the steering wheel and steering angle sensor.

7. CHECK STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Turn the ignition switch to OFF.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.
No	Go to 8.

8. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1721 YAW RATE SENSOR

DTC detecting condition:

- A fault is detected if the sensor signal value is not correct.
- A fault is detected if the steering angle sensor signal / lateral G sensor signal change while the yaw rate sensor signal indicates a constant value.
- A fault is detected if the communication status of yaw rate sensor is abnormal.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. INTERVIEW CUSTOMERS.

Check if the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).

Did the vehicle run the road with banks or sandy surface (which does not mean a dirt road)?

Yes	VDCCM&H/U may record DTC when the vehicle ran the road with banks or sandy surface (which does not mean a dirt road).
No	Go to 2.

2. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?
Is the bracket deformation-free?
Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes	Go to 3.
No	Repair the defective part. • Install VDCCM&H/U properly. • Replace the bracket if faulty. • Tighten the VDCCM&H/U installation bolt. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U). Go to 3.

3. CHECK OUTPUT OF YAW RATE & G SENSOR WITH SUBARU SELECT MONITOR.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
4. Read [Yaw Rate Sensor] indicated on the display screen.



Is the reading of [Yaw Rate Sensor] −4 — 4 deg/s?

Yes	Go to 4.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

4. CHECK OUTPUT OF STEERING ANGLE SENSOR WITH SUBARU SELECT MONITOR.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
4. Read [Steering Angle Sensor] indicated on the display screen.

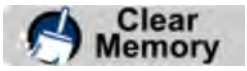


Is the value of [Steering Angle Sensor] −10 — 10°?

Yes	Go to 5.
No	Perform the centering adjustment of steering wheel.

5. CHECK VDCCM&H/U.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1732 LATERAL G SENSOR

DTC detecting condition:

- A fault is detected if the sensor signal value is not correct.

- A fault is detected if the steering angle sensor signal / yaw rate sensor signal change while the lateral G sensor signal indicates a constant value.
- A fault is detected if the communication status of lateral G sensor is abnormal.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?
Is the bracket deformation-free?
Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes	Go to 2.
No	Repair the defective part. • Install VDCCM&H/U properly. • Replace the bracket if faulty. • Tighten the VDCCM&H/U installation bolt. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U). Go to 2.

2. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Park the vehicle straight on a level surface.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Steering Angle Sensor] indicated on the display screen.



Is the value of [Steering Angle Sensor] −10 — 10°?

Yes	Go to 3.
No	Check the installation of steering angle sensor.

3. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Park the vehicle straight on a level surface.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.



Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] −2 — 2 m/s^2?

Yes	Go to 4.
No	Recheck from step 1, and if the problem is not solved, Go to 7.

4. SET 0 POINT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Work Support". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Work Support.
2. Perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

Is 0 point setting successful?

Yes	Go to 5.
No	Recheck from step 1, and when the 0 point setting is not possible, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

5. PERFORM DRIVING TEST.

Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does the ABS warning light or VDC warning light illuminate during driving?
Does ABS or VDC operate abnormally?

Yes	Recheck from step 1, and when the warning lights illuminate or improperly operate, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 6.

6. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.



Are the values of [Lateral G Sensor] and [Longitudinal G Sensor] −1.5 — 1.5 m/s^2?

Yes	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.
No	Recheck from step 1, and if the problem is not solved, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

7. CHECK OUTPUT OF LATERAL G SENSOR AND LONGITUDINAL G SENSOR WITH SUBARU SELECT MONITOR.

1. Remove the VDCCM&H/U installation bolt and bracket.
2. Keep VDCCM&H/U in a horizontal position.
3. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
4. Read [Lateral G Sensor] and [Longitudinal G Sensor] indicated on the display screen.



When the VDCCM & H/U is in a horizontal position, are the values of [Lateral G Sensor] and [Longitudinal G Sensor] −1.5 — 1.5 m/s^2?

Yes	Check the bracket and brake pipe, and install VDCCM&H/U in a horizontal position to the vehicle.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1733 LONGITUDINAL G SENSOR

DTC detecting condition:

- A fault is detected if the communication status of longitudinal G sensor is abnormal.
- A fault is detected if malfunction judgment is generated by self-diagnosis test of the longitudinal G sensor.
- A fault is detected if the longitudinal G sensor signal is out of normal range.
- A fault is detected if the longitudinal G sensor compensation value is out of normal range.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

Note:

For the diagnostic procedure, refer to "DTC C1732 LATERAL G SENSOR". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C1732 LATERAL G SENSOR.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1741 PRESSURE SENSOR

DTC detecting condition:

- A fault is detected if the fluid pressure signal in master cylinder are out of normal range.
- A fault is detected if the condition that supply voltage for the fluid pressure sensor is out of normal judgment range continues for predetermined time.
- A fault is detected if the communication status of fluid pressure sensor is abnormal.
- A fault is detected if the data of fluid pressure sensor is abnormal.
- A fault is detected if the offset value of fluid pressure sensor signal exceeds a predetermined judgment value.

Trouble symptom:

- ABS does not operate.
- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. CHECK STOP LIGHT SWITCH CIRCUIT AND INSTALLATION CONDITION.

Check the stop light switch circuit and the installation condition.

Is the check result OK?

Yes	Go to 2.
No	Repair the stop light switch circuit or correct the installation condition. **Note:** **If there is malfunction in the stop light circuit, DTC may be recorded in the memory.**

2. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
2. Read [Pressure Sensor] indicated on the display screen.



With the brake pedal released, is the value of [Pressure Sensor] 0 — 11 bar?

Yes	Go to 3.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

3. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
2. Read [Pressure Sensor] indicated on the display screen.



When the brake pedal is operated, do the value of [Pressure Sensor] change in accordance with the brake pedal?

Yes	Go to 4.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

4. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 5.

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1742 WHEEL CYLINDER PRESSURE SENSOR

DTC detecting condition:

- A fault is detected if the condition that supply voltage for the fluid pressure sensor is out of normal judgment range continues for predetermined time.
- A fault is detected if the communication status of fluid pressure sensor is abnormal.
- A fault is detected if the data of fluid pressure sensor is abnormal.
- A fault is detected if the offset value of fluid pressure sensor signal exceeds a predetermined judgment value.
- A fault is detected if a difference between fluid pressures for the wheels exceeds a predetermined judgment value.
- A fault is detected if master cylinder pressure and fluid pressures for the wheels exceed predetermined judgment values.

Trouble symptom:

EyeSight does not operate. (Models with EyeSight)

1. CHECK STOP LIGHT SWITCH CIRCUIT AND INSTALLATION CONDITION.

Check the stop light switch circuit and the installation condition.

Is the check result OK?

Yes	Go to 2.
No	Repair the stop light switch circuit or correct the installation condition.

2. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
2. Read [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] indicated on the display screen.



With the brake pedal released, are the values of [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] 0 — 11 bar?

Yes	Go to 3.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

3. CHECK OUTPUT OF PRESSURE SENSOR WITH SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
2. Read [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] indicated on the display screen.



When the brake pedal is operated, do the values of [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] change in accordance with the brake pedal? In addition, is the difference between [FL Wheel Cylinder Pressure Sensor Output] and [FR Wheel Cylinder Pressure Sensor Output] values less than 10 bar?

Yes	Go to 4.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

4. CHECK VDCCM&H/U.

1. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is the same DTC displayed?

Yes	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 5.

5. CHECK DETECTION OF OTHER DTCS FOR VDC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1751 BRAKE BOOST GAUGE SENSOR

DTC detecting condition:

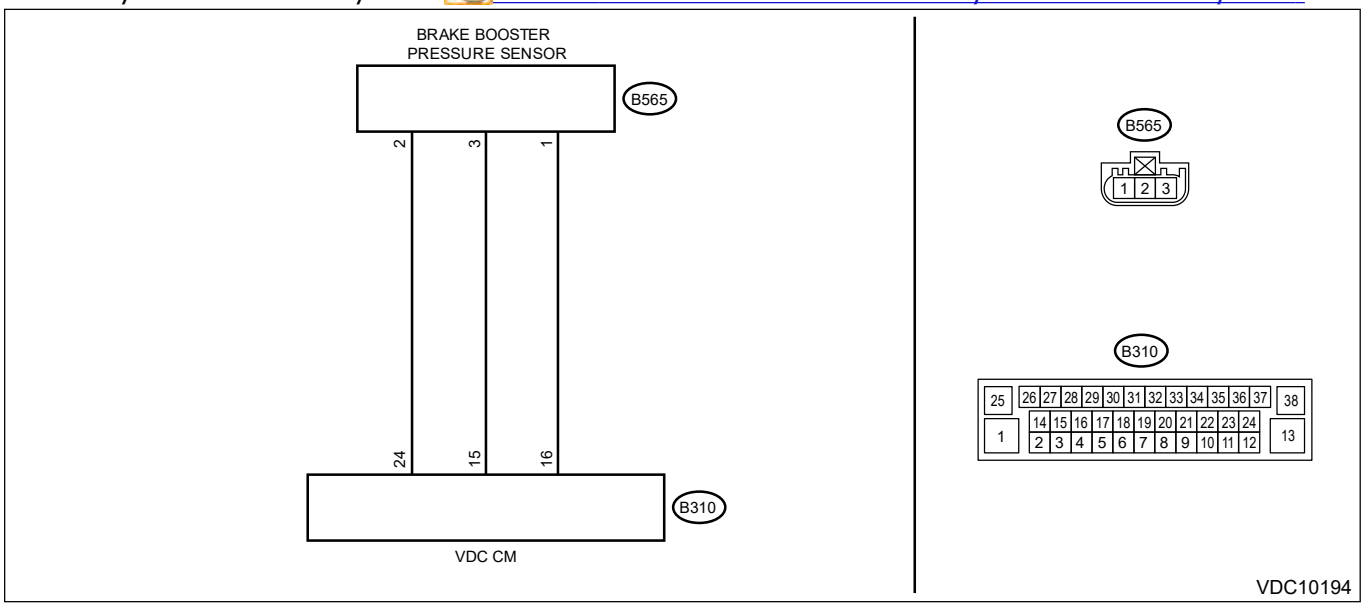
- A fault is detected if the power supply to the brake vacuum pressure sensor is abnormal.
- A fault is detected if the communication signal from the brake vacuum pressure sensor is abnormal.

Trouble symptom:

Brake assist function is not activated when vacuum pressure drops.

Wiring diagram:

Vehicle dynamics control system Ref. to WIRING SYSTEM>Vehicle Dynamics Control System.



1. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the brake booster pressure sensor.
3. Turn the ignition switch to ON.
4. Measure the voltage between brake booster pressure sensor connector terminals.

Connector & terminal

(B565) No. 1 (+) — (B565) No. 2 (−):

Is the voltage 4.9 — 5.1 V?

Yes — Go to 3.

No — Go to 2.

2. CHECK BRAKE BOOSTER PRESSURE SENSOR POWER SUPPLY SYSTEM.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the VDCCM&H/U.
3. Measure the resistance between the VDCCM&H/U and the brake booster pressure sensor connector.

Connector & terminal

(B310) No. 16 — (B565) No. 1:
(B310) No. 24 — (B565) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the harness connector between the VDCCM&H/U and the brake booster pressure sensor.

3. CHECK BRAKE BOOSTER PRESSURE SENSOR SIGNAL SYSTEM.

Measure the resistance between the VDCCM&H/U connector and the brake booster pressure sensor.

Connector & terminal

(B310) No. 15 — (B565) No. 3:

Is the resistance less than 1 Ω?

Yes	Replace the brake booster. Ref. to BRAKE>Brake Booster.
No	Repair the harness connector between the VDCCM&H/U and the brake booster pressure sensor.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1811 SYSTEM

DTC detecting condition:

A fault is detected if VDC control status continues for 15 seconds or more.

Trouble symptom:

- VDC does not operate.
- Hill start assist does not operate.
- EyeSight does not operate. (Models with EyeSight)

1. CHECK INSTALLATION OF VDCCM&H/U.

Is VDCCM&H/U installed properly without being tilted?
Is the bracket deformation-free?
Are the VDCCM&H/U installation bolts installed without missing or getting loose?

Yes	Go to 2.
No	Repair the defective part. • Install VDCCM&H/U properly. • Replace the bracket if faulty. • Tighten the VDCCM&H/U installation bolt. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>General Description>COMPONENT > VDC CONTROL MODULE AND HYDRAULIC CONTROL UNIT (VDCCM&H/U). Go to 2.

2. CHECK STEERING WHEEL.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Check the steering wheel for deviation from center.

Is the deviation from the center of steering wheel less than 5°?

Yes	Go to 3.
No	Perform the centering adjustment of steering wheel, and perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE. Go to 3.

3. CHECK OUTPUT OF STEERING ANGLE SENSOR USING SUBARU SELECT MONITOR.

1. Adjust steering wheel to the center position.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Steering Angle Sensor] indicated on the display screen.



Is the value of [Steering Angle Sensor] −10° — 10°?

Yes	Go to 4.
No	Check the installation of the steering wheel and steering angle sensor, and correct the installation if it is improper. If the installation condition is correct, replace the sensor.

4. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Drive the vehicle on a flat road.
2. Park the vehicle straight.
3. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
4. Read [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] indicated on the display screen.



Is the reading of each sensor following value?
[Lateral G Sensor]: −2 — 2 m/s^2
[Longitudinal G Sensor]: −2 — 2 m/s^2
[Yaw Rate Sensor]: −4 — 4 deg/s

Yes	Go to 5.
No	Recheck from step 1, and if the problem is not solved, Go to 8.

5. SET 0 POINT SETTING OF LONGITUDINAL G SENSOR USING SUBARU SELECT MONITOR.

1. Using the Subaru Select Monitor, select "Work Support". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Work Support.
2. Perform the VDC sensor midpoint setting mode. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.

Is 0 point setting successful?

Yes	Go to 6.
No	Recheck from step 1, and when the 0 point setting is not possible, replace the VDCCM&H/U and steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U). Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.

6. PERFORM DRIVING TEST.

Ref. to BRAKE CONTROL (DIAGNOSTICS)>Inspection Mode.

Does the ABS warning light or VDC warning light illuminate during driving?
Does ABS or VDC operate abnormally?

Yes	Recheck from step 1, and when the warning lights illuminate or improperly operate, replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Go to 7.

7. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Park the vehicle on a level surface.
2. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
3. Read [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] indicated on the display screen.



Is the reading of each sensor following value?
[Lateral G Sensor]: −2 — 2 m/s^2
[Longitudinal G Sensor]: −2 — 2 m/s^2
[Yaw Rate Sensor]: −4 — 4 deg/s

Yes	Currently, it is normal. There may have been a temporary poor contact in the harness and connector or a temporary noise interference.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

8. CHECK OUTPUT OF SENSORS USING SUBARU SELECT MONITOR.

1. Remove the VDCCM&H/U installation bolt and bracket.
2. Keep VDCCM&H/U in a horizontal position.
3. Using the Subaru Select Monitor, select "Data monitor". Ref. to BRAKE CONTROL (DIAGNOSTICS)>Data Monitor.
4. Read [Lateral G Sensor], [Longitudinal G Sensor], and [Yaw Rate Sensor] indicated on the display screen.



When VDCCM&H/U is in a horizontal position, is the reading of each sensor following value?
[Lateral G Sensor]: −1.5 — 1.5 m/s^2
[Longitudinal G Sensor]: −1.5 — 1.5 m/s^2
[Yaw Rate Sensor]: −4 — 4 deg/s

Yes	Check the bracket and brake pipe, and install VDCCM&H/U in a horizontal position to the vehicle.
No	Replace the VDCCM&H/U. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C1821 BRAKE TEMPERATURE ABNORMAL

DTC detecting condition:
This code is recorded if the conditions for control intervention are met when estimated value of temperature under braking is above certain threshold.
Trouble symptom:
- Traction control does not operate.
- Active torque vectoring does not operate.

1. CHECK DTC.

Read the DTC using Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C1821 a current malfunction?

Yes	Stop the vehicle and turn off the engine until the DTC becomes a past malfunction.
No	It results from a temporal increase in brake temperature. Check the brake pads, disc rotors, and brake fluid.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

BRAKE CONTROL (DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Symptoms		Main probable cause	Other probable cause
Poor brake performance	Long braking/stopping distance	• VDCCM&H/U • Brake pad • Aeration to brake line • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections	• Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Master cylinder • Brake caliper • Disc rotor • Brake pipe • Brake booster
	Wheel lock	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Incorrect wiring or piping connections	• Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake caliper • Brake pipe
	Brake drag	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake • Axle and wheels • Brake pedal play	• Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Brake pipe
	Long brake pedal stroke	• Aeration to brake line • Brake pedal play	• VDCCM&H/U • Master cylinder • Brake caliper • Brake pad • Brake pipe • Brake booster
	Vehicle vertical pitching	• VDCCM&H/U • Road surface (uneven) • Suspension play or fatigue (reduced damping) • Incorrect wiring or piping connections	• Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U.
Poor brake performance	Unstable or uneven braking	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Brake caliper	• Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position

Symptoms		Main probable cause	Other probable cause
		• Brake pad • Road surface (uneven) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections	• Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Master cylinder • Disc rotor • Brake pipe • Axle and wheels • Road with crowns or banks • Suspension play or fatigue (reduced damping)
Vibration or noise • When braking suddenly	Excessive brake pedal vibration	• Road surface (uneven) • Incorrect wiring or piping connections	• VDCCM&H/U • Brake booster • Suspension play or fatigue (reduced damping)
• When acceleratin g suddenly	Noise from VDCH/U	• VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Brake pipe	• VDCCM&H/U • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U.
• While driving on a slippery road	Noise from the front side of vehicle	• VDCCM&H/U (mount bushing) • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Brake pad • Disc rotor • Brake pipe • Brake booster • Suspension play or fatigue (reduced damping)	• Axle and wheels • Tire specifications, tire wear and air pressures
	Noise from the rear side of vehicle	• Defective ABS wheel speed sensor or sensor gap • Brake caliper • Brake pad • Disc rotor • Parking brake • Brake pipe • Suspension play or fatigue (reduced damping)	• Axle and wheels • Tire specifications, tire wear and air pressures
Engine does not accelerate or goes into a stall when accelerating suddenly or driving on a slippery surface.		• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Master cylinder • Brake caliper • Parking brake	• Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Brake pipe

Symptoms		Main probable cause	Other probable cause
		• Incorrect wiring or piping	
Poor change-direction-operation stability of TCS	Deviation to right or left direction	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake caliper • Brake pad • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections	• Disc rotor • Brake pipe • Axle and wheels • Suspension play or fatigue (reduced damping)
	Vehicle spin	• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Brake pad • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections	• Brake caliper • Brake pipe
Steering wheel drag while driving		• VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Incorrect wiring or piping connections	• Brake caliper • Brake pad • Disc rotor • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Suspension play or fatigue (reduced damping) • Tire specifications, tire wear and air pressures

Symptoms	Main probable cause	Other probable cause
VDC operates while driving normally.	• Power steering system • VDCCM&H/U • Defective ABS wheel speed sensor or sensor gap • Defective steering angle sensor or improper neutral position • Defective yaw rate & G sensor or improper installation of VDCCM&H/U. • Wheel alignment • Road surface (uneven) • Road with crowns or banks • Suspension play or fatigue (reduced damping) • Tire specifications, tire wear and air pressures • Incorrect wiring or piping connections • Power steering system	
VDC OFF indicator light does not illuminate when the VDC OFF switch is depressed. **Note:** **When pressing VDC OFF switch for 30 seconds or more, VDC OFF indicator light goes off and cannot operate any more. When turning the ignition switch from OFF to ON, the previous status is restored.**	• Harness • Combination meter • VDC OFF switch	

POWER STEERING (DIAGNOSTICS)

PS(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

POWER STEERING (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

- **The power steering control module continues to operate after the engine stops and calculate the temperature in the control module. Therefore, before starting service of the power steering system which requires disconnection of the connector, stop the engine and allow approx. 30 minutes until the control module becomes cold.**
- **Before removal or installation, be sure to remove any foreign matter (dust, moisture, oil, etc.) from the power steering control module connector.**
- **Be sure to record the malfunction information obtained via DTC check.**
- **Do not perform the clear memory until the repair or replacement of faulty parts is completed.**
- **If a problem (connector terminal with foreign matter, etc.) is found, record the faulty part (take a photo • store the foreign matter, etc.).**

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to POWER STEERING (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to POWER STEERING (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK WARNING LIGHT.

Check the lighting condition of STEERING warning light in the combination meter.

Does the STEERING warning light illuminate?

Yes	Go to 4.
No	Currently, it is normal.

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Power Steering System].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 5.
No	Check the communication circuit. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

5. CHECK DTC.

Read the DTC of [Power Steering System] using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are DTC, time stamp and freeze frame data displayed?

Yes	Record the DTC, time stamp and freeze frame data. Go to 7.
No	Go to 6.

6. PERFORM GENERAL DIAGNOSTICS.

1. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
2. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



3. Check that the DTC is not displayed.

Does the STEERING warning light illuminate at ignition switch ON, and turn off two seconds after the engine is started?

Yes	Finish the diagnosis.
No	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.

7. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs.
2. Repair or replace the faulty parts.
3. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
4. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed in current malfunction?

Yes	Repeat step 7 until DTC is not shown.
No	Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Check List for Interview

CHECK

Check the following items regarding condition of the vehicle.

1. TROUBLE STATUS

Phenomenon of the vehicle	❑ Steering is heavy ❑ Steering is not smooth ❑ Steering is unstable (wondering) ❑ Steering does not return to center ❑ Steering is not straight
	❑ Steering force required is not the same for right and left turn ❑ Steering force required is not even ❑ Steering is too light
	❑ Noise ❑ Vibration ❑ STEERING warning light illuminates ❑ Others
Frequency	❑ Always ❑ Sometimes ❑ Immediately after starting the engine ❑ Only once ❑ Others
	❑Recovers after leaving it for minutes
Steering wheel operation	❑ Dry steering ❑ When turning ❑ Quick steering ❑ Slow steering ❑ Returning the steering wheel ❑ End abutting
	❑ Releasing the steering wheel ❑ Only supporting the steering wheel by hand ❑ Repetitive dry steering ❑ Beginning of steering
Steering wheel status / direction	❑ Around center position ❑ Near end of lock to lock
	❑ When turning the steering to right ❑ When turning the steering to left ❑ Both to right and to left ❑ (1) Steering angle: degrees ❑ (2) Maneuvering time: minutes
	❑ Slow steering ❑ Quick steering ❑ While holding the steering

	❑ When repeating the dry wheel operation
Vehicle speed	❑ Stall 0 km/h (0 MPH) ❑ Very low speed — 20 km/h (— 12 MPH) ❑ Low speed — 40 km/h (— 25 MPH) ❑ Medium speed — 80 km/h (— 50 MPH) ❑ High speed — 80 km/h or more (— 50 MPH or more)
	❑ At starting ❑ While accelerating ❑ While decelerating ❑ When accelerating rapidly ❑ When decelerating rapidly
	❑ Others
Engine speed	❑ Idling ❑ (1) Near rpm ❑ (2) rpm — rpm ❑ (3) rpm or more • less

2. STATE OF STEERING WARNING LIGHT

STEERING warning light illuminates	❑ Always ❑ Sometimes ❑ Only once ❑ Does not illuminate ❑ Others
Ignition key position	❑ LOCK ❑ ACC ❑ ON (when starting engine) ❑ START ❑ ON (when starting engine, while engine is running) ❑ ON (when starting engine, when engine is at a standstill)
Timing	❑ Immediately after turning the ignition ON ❑ Immediately after turning the ignition to START
	❑ While idling ❑ While Auto Start Stop ❑ When reversing ❑ While accelerating ❑ While decelerating ❑ When cruising at — km/h (MPH)
	❑ When other electronic parts are in operation (part name: operation condition:)

3. ENVIRONMENT

a) Weather	❑ Fine ❑ Cloudy ❑ Rainy

	❑ Snowy ❑ Others:
b) Outside temperature	❑ °C (°F)
c) Road	❑ Inner city ❑ Suburbs ❑ Highway ❑ Local street ❑ Alley way ❑ Private road ❑ Parking lot ❑ Mountain road ❑ Paved road ❑ Unpaved road ❑ Gravel road ❑ Sandy place ❑ Muddy road ❑ Concrete road ❑ Stone pavement ❑ Racetrack ❑ Others:
d) Road surface	❑ Dry ❑ Wet ❑ Covered with fresh snow ❑ Covered with hardened snow ❑ Others:
e) Tire	❑ Tire chain ❑ Studless tire ❑ T-type tire (front RH, front LH, rear RH, rear LH)
f) Tire inflation pressure	Front RH: kPa Front LH: kPa Rear RH: kPa Rear LH: kPa
g) Degree of wear	Front RH: mm (in) Front LH: mm (in) Rear RH: mm (in) Rear LH: mm (in)
h) Genuine part	❑ Yes ❑ No Record after-market parts if any. (Steering wheel, audio, tires, and similar parts)
i) Condition of suspension alignment	
j) Electrical load conditions	❑ Audio ❑ Air conditioner ❑ Others
k) Loaded state	Condition:

l) Repair parts ❑ None
❑ Provided
Contents:

m) Others

POWER STEERING (DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

Caution:

- **Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.**
- **Be careful not to damage the airbag system wiring harness.**

POWER STEERING (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might be affecting the power steering problem.

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

2. TIRES

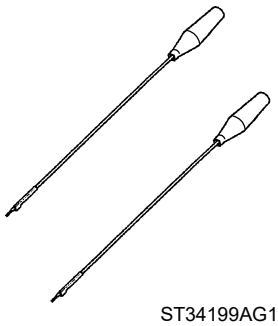
Check the tire specifications, tire wear and air pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.

POWER STEERING (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

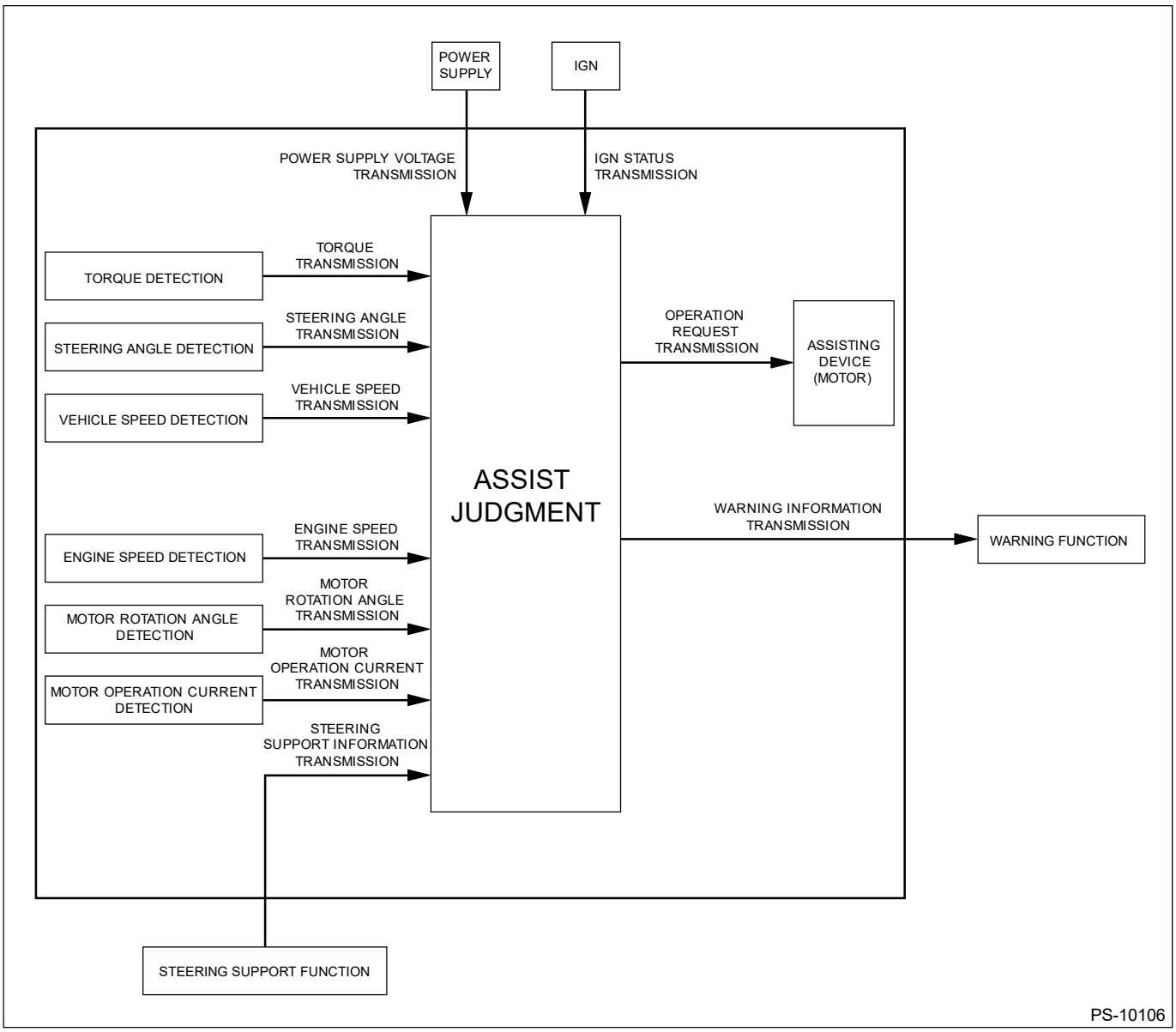
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST34199AG100	34199AG100	SPECIAL TOOL HARNESS	Used for troubleshooting the electrical system.

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Oscilloscope	Used for measuring the sensor.
DST-i	Used together with Subaru Select Monitor 4.

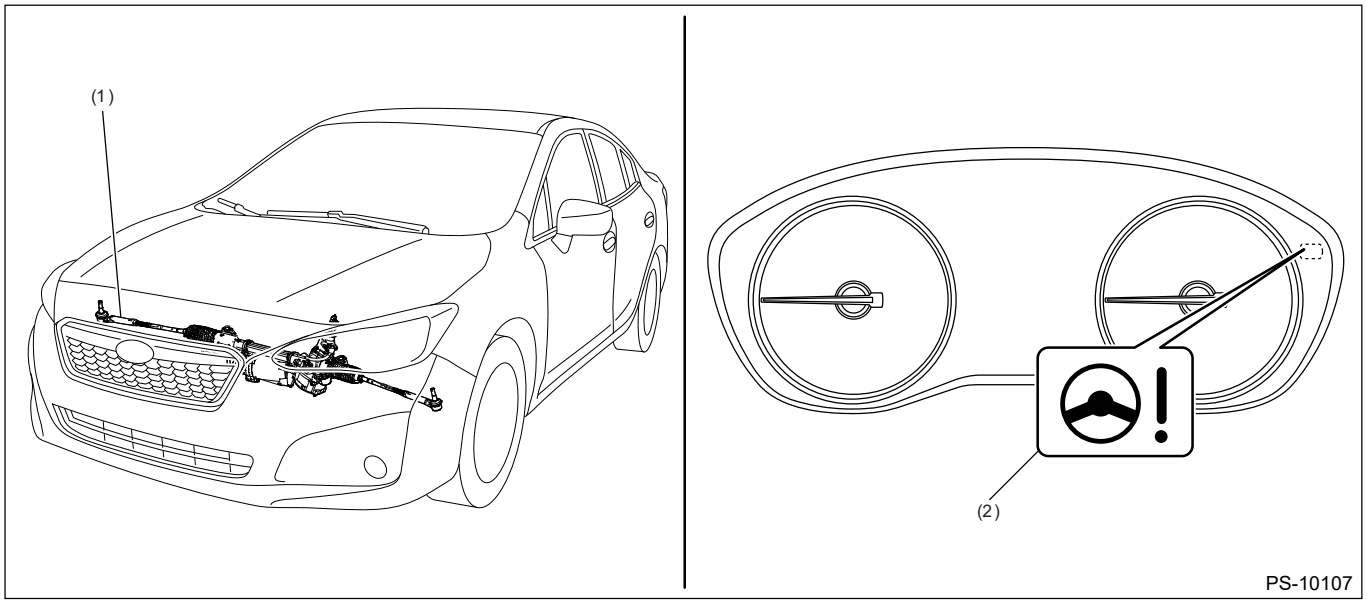
POWER STEERING (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM


POWER SUPPLY
IGN
POWER SUPPLY VOLTAGE TRANSMISSION
IGN STATUS TRANSMISSION
TORQUE DETECTION
TORQUE TRANSMISSION
STEERING ANGLE DETECTION
STEERING ANGLE TRANSMISSION
VEHICLE SPEED DETECTION
VEHICLE SPEED TRANSMISSION
ASSIST JUDGMENT
OPERATION REQUEST TRANSMISSION
ASSISTING DEVICE (MOTOR)
WARNING INFORMATION TRANSMISSION
WARNING FUNCTION
ENGINE SPEED DETECTION
ENGINE SPEED TRANSMISSION
MOTOR ROTATION ANGLE DETECTION
MOTOR ROTATION ANGLE TRANSMISSION
MOTOR OPERATION CURRENT DETECTION
MOTOR OPERATION CURRENT TRANSMISSION
STEERING SUPPORT INFORMATION TRANSMISSION
STEERING SUPPORT FUNCTION
PS-10106

POWER STEERING (DIAGNOSTICS) > Electrical Component Location

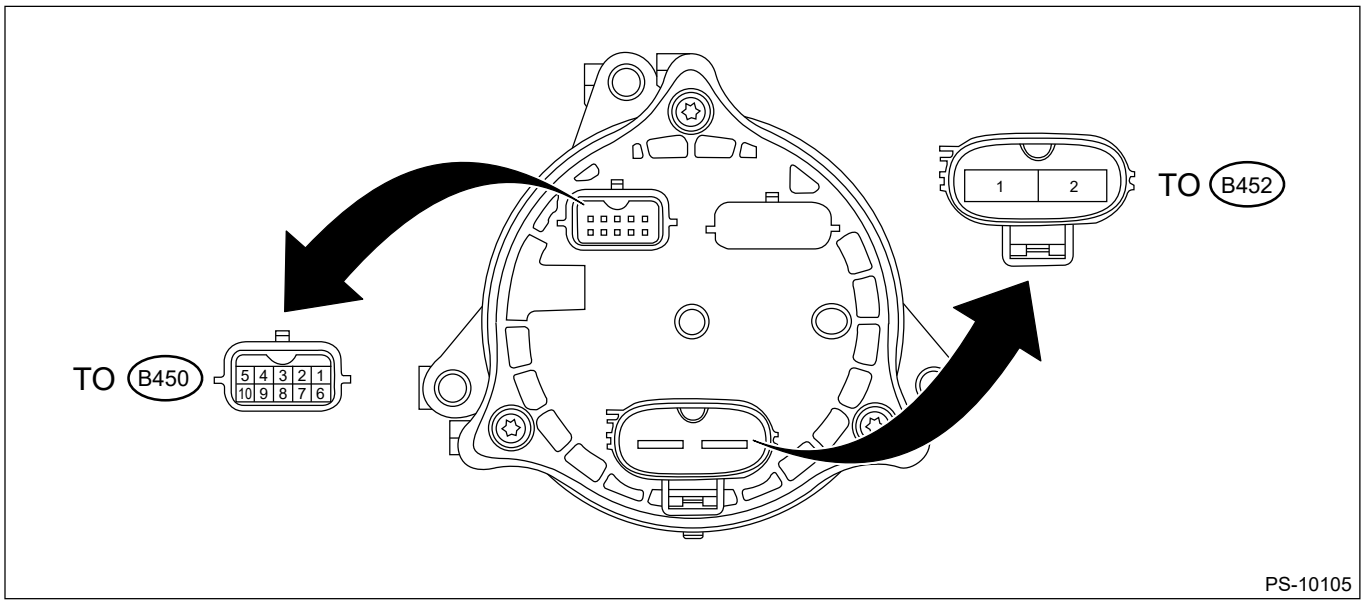
LOCATION



(1) Steering gearbox (including power steering control module)
(2) STEERING warning light

POWER STEERING (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Connector No.	Terminal No.	Contents	Measuring condition	Standard
B450	1	Ignition power supply	Ignition SW: ON Measurement between (B450) No. 1 — (B452) No. 1	9 — 16 V
B450	6	CAN communication	Digital signal; can not be measured	—
B450	7	CAN communication	Digital signal; can not be measured	—
B452	1	Ground	Always Measurement between (B452) No. 1 — (B452) No. 2	10 — 16 V
B452	2	Battery power supply		

POWER STEERING (DIAGNOSTICS) > Inspection Mode

PROCEDURE

1. Turn the ignition switch to OFF for 5 seconds or more.
2. Start the engine.
3. Idle the engine for five seconds or more.
4. Operate the steering wheel from side to side.
5. Reproduce the malfunction occurrence condition as much as possible.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

- When the ignition switch is turned to ON (engine OFF), the STEERING warning light illuminates.
- After starting the engine, the STEERING warning light goes out. If it does not go off, a malfunction occurs in electric power steering • combination meter.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

STEERING WARNING LIGHT DOES NOT COME ON

1. POWER STEERING ASSIST ENABLED

Detecting condition:

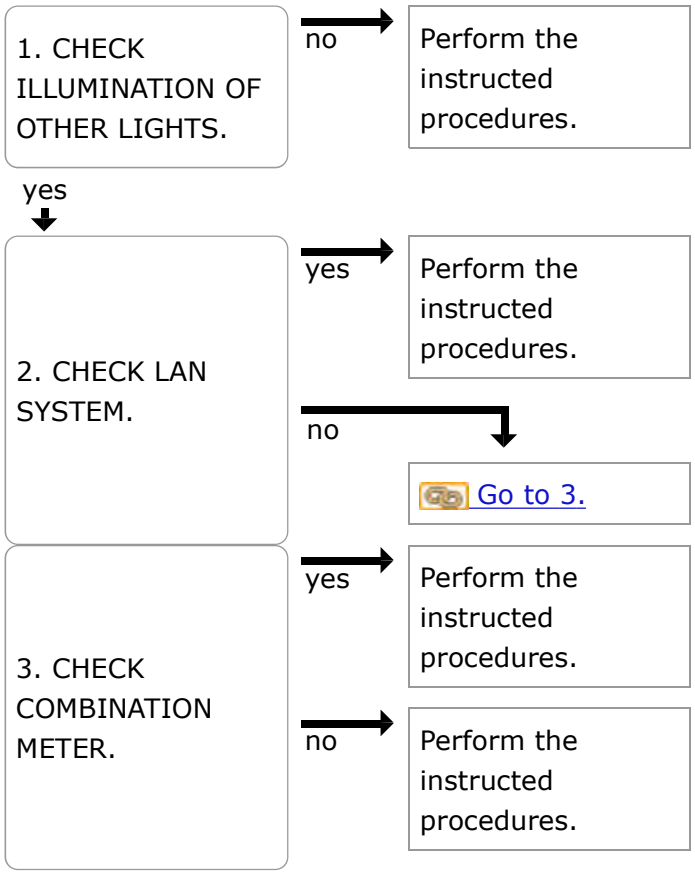
- Defective combination meter
- Defective harness

Trouble symptom:

When the ignition switch is turned to ON (engine OFF), the STEERING warning light does not illuminate.

Note:

It is operating normally if the warning light illuminates when the ignition switch is turned to ON (engine OFF), and turns off approximately two seconds after engine start.



1. CHECK ILLUMINATION OF OTHER LIGHTS.

Turn the ignition switch to ON. (Engine OFF)

Do other warning lights illuminate?

Yes	Go to 2.
No	Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>INSPECTION.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Current condition is normal.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

2. POWER STEERING ASSIST DISABLED

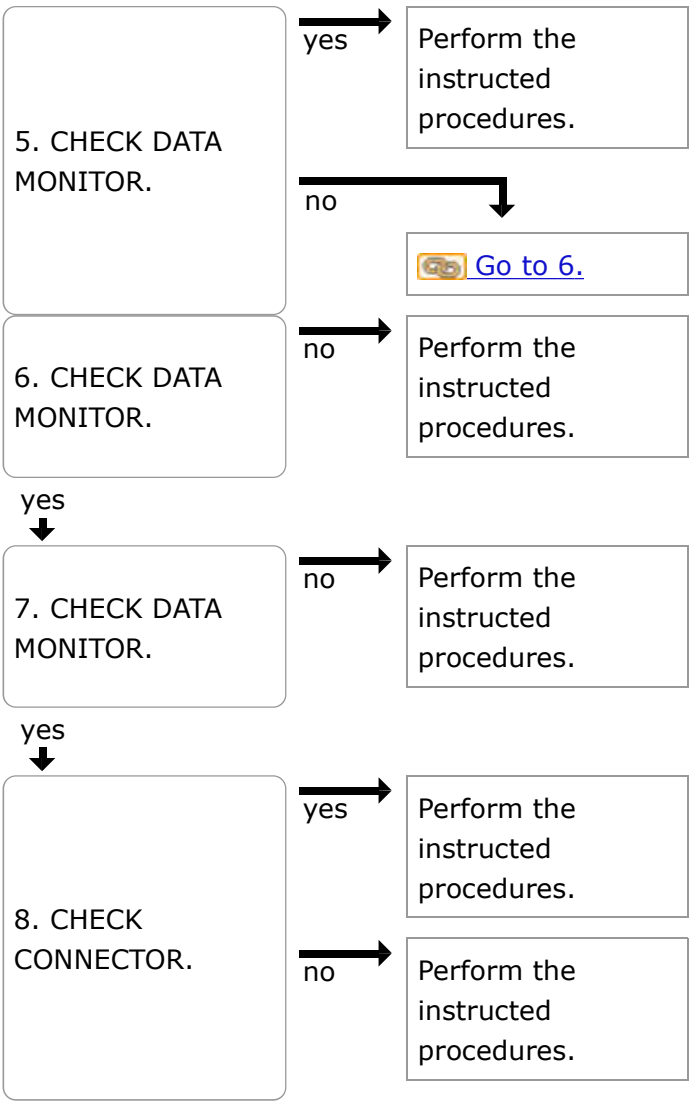
Detecting condition:
CAN communication error (engine rpm signal not received)
Trouble symptom:
- Not assisted due to power supply voltage failure.

- The STEERING warning light is normal but there is no power steering assist (steering feels heavy).

Note:

- **During driving, the assist system will not be activated when the ignition voltage drops.**
- **Power steering assist is not started unless both of the ignition switch ON signal and the engine speed signal are input.**
- **In any of the following cases, the power steering assist is limited and steering wheel operation may become heavy.**
  If the steering wheel is held to an end for a long time, or the steering wheel turning to right and left at slow speed is repeated during parking, the assist limitation (overheat protection control) may operate to prevent failures by overheat.
  In this case, by stopping the engine for approx. 30 minutes for cooling, the assist will start operating. While assist limitation (overheat protection control) is in active, [Limited Assist] is displayed in [EPS Status] in the Subaru Select Monitor "Data Monitor".
- **History can be confirmed on [ECU Overheat Protection] or [IGN count from overheating protection (most recent)] of "Data Monitor".**
- **The overheat protection control system is normal operation, therefore, the STEERING warning light will not come on and there will be no DTC displayed.**
- **If the power steering system connector is disconnected while cooling under the overheat protection control, different DTC may be recorded. If there is no DTC and assist limitation is in active, stop the engine for approx. 10 minutes for cooling.**

1. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK BATTERY TERMINAL AND FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK BATTERY TERMINAL AND FUSE.

Check the battery terminals and the fuse.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace faulty parts.

3. CHECK DTC.

Read the DTC of VDC system using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC related to VDC system or ignition power supply system displayed?

Yes	Perform the diagnosis according to DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK DATA MONITOR.

1. Start the engine.
2. Display the data monitor [Engine Speed] of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.



Is [Engine Speed] the same as that in the combination meter?

Yes	Go to 5.
No	Check the CAN communication. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

5. CHECK DATA MONITOR.

Display the data monitor [EPS Status] of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

Data Monitor

Is [Assist limitation] displayed?

Yes	It is possible that temporary assist limitation has occurred due to overheat protection. Stop the engine for approx. 30 minutes, and check again.
No	Go to 6.

6. CHECK DATA MONITOR.

1. Display the data monitor [Torque sensor main output] and [Torque sensor sub output] of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

   Data Monitor

2. Move the steering wheel to the left and right.

Do the values of [Torque sensor main output] and [Torque sensor sub output] change along with the operation?

Yes	Go to 7.
No	Check for poor contact of the torque sensor connector.

7. CHECK DATA MONITOR.

Display the data monitor [IG voltage] of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.



Is [IG voltage] stable? (While wiggling the harness)

Yes	Go to 8.
No	Check the ignition switch and IG voltage harness, and repair the defective part.

8. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (B204).

Are there any damages to terminal or other parts either on the power steering control module side or on the connector side?

Yes	Repair the terminal.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Warning Light Illumination Pattern

STEERING WARNING LIGHT DOES NOT GO OFF

Detecting condition:

- Defective combination meter
- Open circuit of harness

Trouble symptom:

When starting the engine, the STEERING warning light continues to illuminate.

1. CHECK DTC.

Read the DTC of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis according to DTC. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter System>OPERATION > SELF-DIAGNOSIS DISPLAY MODE.

Is the check result OK?

Yes	Replace the steering box. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Detecting condition:

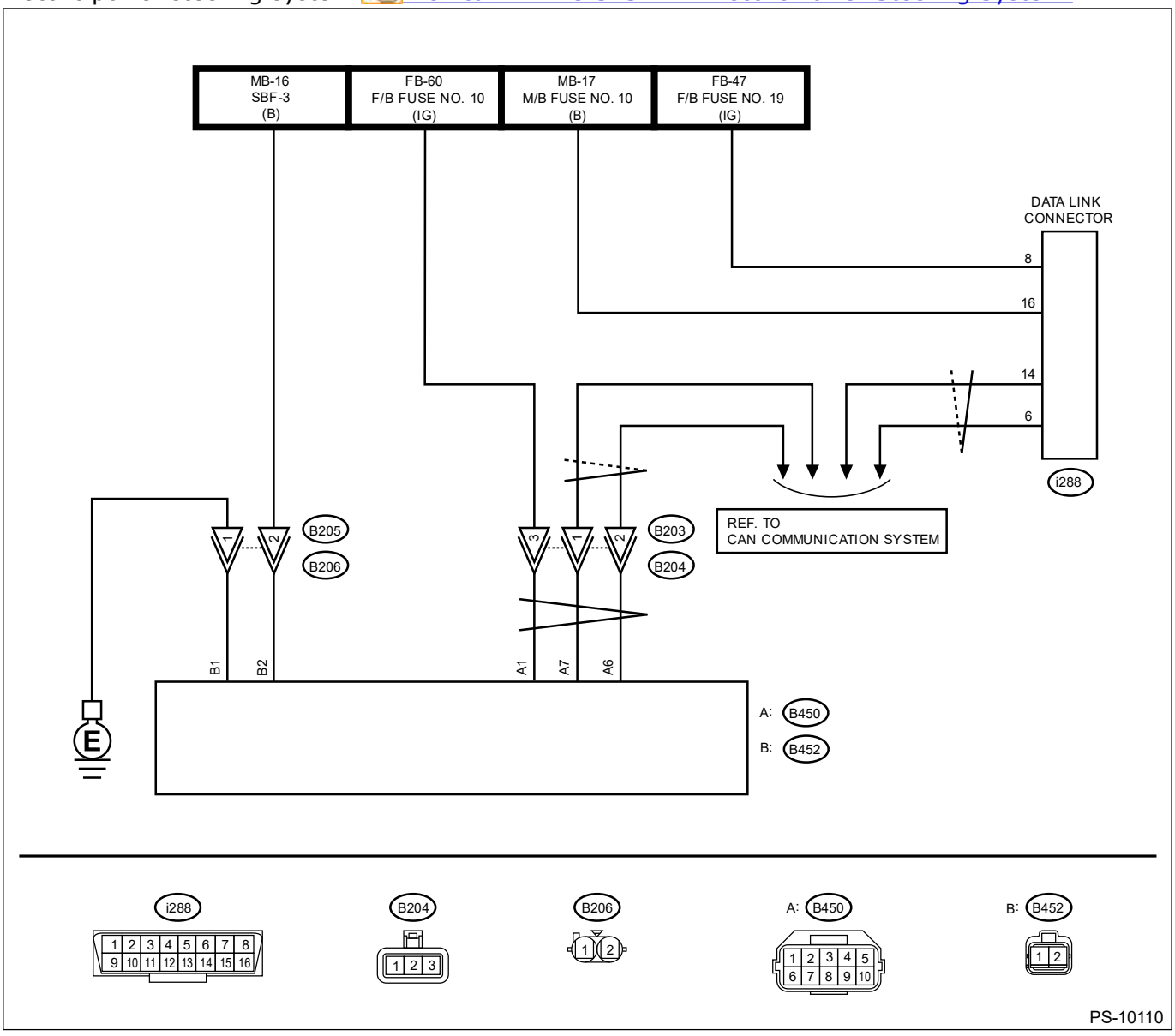
- Defective harness connector
- Defective power steering control module

Trouble symptom:

- Communication is impossible between the power steering control module and Subaru Select Monitor.
- After starting the engine, the STEERING warning light does not illuminate but steering effort is heavy.

Wiring diagram:

Electric power steering system Ref. to WIRING SYSTEM>Electric Power Steering System.



1. CHECK IGNITION SWITCH.
no → Perform the instructed procedures.
yes ↓

2. CHECK BATTERY.
no → Perform the instructed procedures.
yes ↓

3. CHECK BATTERY TERMINAL.
yes → Perform the instructed procedures.
no → Go to 4.

4. CHECK POWER STEERING CONTROL MODULE CONNECTOR INSTALLATION.
no → Perform the instructed procedures.
yes ↓

5. CHECK LAN SYSTEM.
yes → Perform the instructed procedures.
no → Go to 6.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.
yes → Perform the instructed procedures.
no → Go to 7.

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.
no → Perform the instructed procedures.

yes

8. CHECK POWER SUPPLY CIRCUIT.

no → Perform the instructed procedures.

yes

9. CHECK HARNESS CONNECTOR BETWEEN POWER STEERING CONTROL MODULE AND CHASSIS GROUND.

no → Perform the instructed procedures.

yes

10. CHECK POOR CONTACT OF CONNECTOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK IGNITION SWITCH.

Is the ignition switch ON?

Yes	Go to 2.
No	Turn the ignition switch to ON, and select the power steering using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Measure the battery voltage.

Is the voltage 11 V or more?

Yes	Go to 3.
No	Charge or replace the battery.

3. CHECK BATTERY TERMINAL.

Is there poor contact at battery terminal?

Yes	Replace or tighten the battery terminal.
No	Go to 4.

4. CHECK POWER STEERING CONTROL MODULE CONNECTOR INSTALLATION.

Turn the ignition switch to OFF.

Is the power steering control module connector inserted into the power steering control module until the clamp locks?

Yes	Go to 5.
No	Insert the power steering control module connector into the power steering control module.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is there any fault in LAN system?

Yes	Perform the diagnosis according to DTC for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to electric power steering system can be executed normally.

Is the [Select Function] screen displayed?

Yes	Check DTC of electric power steering system. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 7.

7. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor to another vehicle to check whether the communication for initializing can be executed normally.

Does the Subaru Select Monitor communicate normally?

Yes	Go to 8.
No	Repair or replace the Subaru Select Monitor.

8. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON. (Engine OFF)
2. Measure the ignition power supply voltage between the power steering control module connector and chassis ground.
   Connector & terminal
   (B204) No. 3 (+) — Chassis ground (−):
   (B206) No. 2 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 9.
No	Repair the open circuit in the harness between the power steering control module and the battery.

9. CHECK HARNESS CONNECTOR BETWEEN POWER STEERING CONTROL MODULE AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from the power steering control module.
3. Measure the resistance of harness between power steering control module connector and chassis ground.
   Connector & terminal
   (B206) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of the power steering control module ground circuit and the poor contact of connector.

10. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of power steering control module power supply, ground circuit and data link connector?

Yes	Repair the connector.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor>LIST.**

POWER STEERING (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Power current	Primary current recognized by power steering CM	−128 — 127 A	-
Vehicle Speed	Vehicle speed	0 — 255 km/h	-
Engine Speed	Engine speed	0 — 12750 rpm	-
CU Sensing Current(q)	q axis current recognized by power steering CM	−128 — 127 A	-
Motor Current(U)	U axis current recognized by power steering CM	−128 — 127 A	-
Motor Current(V)	V axis current recognized by power steering CM	−128 — 127 A	-
Motor angular speed	Motor rotational speed (rpm)	−4096 — 4064 rpm	-
ECM Temperature	Power steering CM inner temperature	−50 — 205 °C	-
Power Supply Voltage	Voltage supplied to power steering CM	0 — 25.5 V	-
Torque Sensor Power Supply	Voltage supplied to torque sensor	0 — 10.2 V	-
IG Voltage	IGN voltage recognized by power steering CM	0 — 25.5 V	-
CAN bus status	CAN bus status	Active/Passive/Bus Off	-
EPS operating condition	EPS assist status	Normal/Assist Stop/Assist Restricted	-
CU Target current(q)	q axis indicator current from power steering CM to motor	−128 — 127 A	-
Assist Map	Assist MAP specification used for control	MAP1/MAP2/MAP3	-
Overheating protection intervention history	Number of interventions to the overheat protection control	0 — 250 times	-
IG Count after ECU Overheat Protection(latest)	IGN SW ON number at the last intervention to overheat protection control	0 — 65000 times	-

IG Count after ECU Overheat Protection(Previous)	IGN SW ON number at the second last intervention to overheat protection control	0 — 65000 times	-
IG Count after ECU Overheat Protection(Before Previous)	IGN SW ON number at the third last intervention to overheat protection control	0 — 65000 times	-
Assist restriction history (voltage malfunction)	Number of the intervention of assist restriction control due to voltage failure	0 — 250 times	-
IG OFF Number while Driving	IGN SW OFF number while driving	0 — 250 times	-
Torque sensor main output	Torque sensor (main) output value	−15.36 — 15.24 N·m	-
Torque sensor sub output	Torque sensor (sub) output value	−15.36 — 15.24 N·m	-
Steering Angle	Steering wheel rotational angle	−640 — 640 deg	-

POWER STEERING (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Freeze Frame Data>LIST.**

POWER STEERING (DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Power current	Primary current recognized by power steering CM	−128 — 127 A	-
Vehicle Speed	Vehicle speed	0 — 255 km/h	-
Engine Speed	Engine speed	0 — 12750 rpm	-
CU Sensing Current(q)	q axis current recognized by power steering CM	−128 — 127 A	-
Motor Current(U)	U axis current recognized by power steering CM	−128 — 127 A	-
Motor Current(V)	V axis current recognized by power steering CM	−128 — 127 A	-
Motor angular speed	Motor rotational speed (rpm)	−4096 — 4064 rpm	-
ECM Temperature	Power steering CM inner temperature	−50 — 205 °C	-
Power Supply Voltage	Voltage supplied to power steering CM	0 — 25.5 V	-
Torque Sensor Power Supply	Voltage supplied to torque sensor	0 — 10.2 V	-
IG Voltage	IGN voltage recognized by power steering CM	0 — 25.5 V	-
CAN bus status	CAN bus status	Active/Passive/Bus Off	-
EPS operating condition	EPS assist status	Normal/Assist Stop/Assist Restricted	-
CU Target current(q)	q axis indicator current from power steering CM to motor	−128 — 127 A	-
Assist Map	Assist MAP specification used for control	MAP1/MAP2/MAP3	-
Overheating protection intervention history	Number of interventions to the overheat protection control	0 — 250 times	-
IG Count after ECU Overheat Protection(latest)	IGN SW ON number at the last intervention to overheat protection control	0 — 65000 times	-

IG Count after ECU Overheat Protection(Previous)	IGN SW ON number at the second last intervention to overheat protection control	0 — 65000 times	-
IG Count after ECU Overheat Protection(Before Previous)	IGN SW ON number at the third last intervention to overheat protection control	0 — 65000 times	-
Assist restriction history (voltage malfunction)	Number of the intervention of assist restriction control due to voltage failure	0 — 250 times	-
IG OFF Number while Driving	IGN SW OFF number while driving	0 — 250 times	-
Torque sensor main output	Torque sensor (main) output value	−15.36 — 15.24 N·m	-
Torque sensor sub output	Torque sensor (sub) output value	−15.36 — 15.24 N·m	-
Steering Angle	Steering wheel rotational angle	−640 — 640 deg	-

POWER STEERING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

POWER STEERING (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Item	Reference
None	No display	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
	[Assist limitation] is displayed on the data monitor [EPS operating condition].	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
	The data monitor [Overheating protection intervention history] indicates at least 1 time.	Ref. to POWER STEERING (DIAGNOSTICS)>Warning Light Illumination Pattern>STEERING WARNING LIGHT DOES NOT GO OFF.
C2511	TORQUE SENSOR MAIN	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2511 TORQUE SENSOR MAIN.
C2512	TORQUE SENSOR SUB	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2512 TORQUE SENSOR SUB.
C2513	TORQUE SENSOR MUCH TOLERANCE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2513 TORQUE SENSOR MUCH TOLERANCE.
C2514	TORQUE SENSOR POWER SUPPLY	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2514 TORQUE SENSOR POWER SUPPLY.
C2521	MOTOR MALFUNCTION	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 MOTOR MALFUNCTION.

Code	Item	Reference
C2522	RESOLVER SENSOR	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2522 RESOLVER SENSOR.
C2531	CONTROL MODULE CPU	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2531 CONTROL MODULE CPU.
C2532	CONTROL MODULE PERIPHERAL CIRCUIT	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2532 CONTROL MODULE PERIPHERAL CIRCUIT.
C2533	CONTROL MODULE BOARD TEMPERATURE SENSOR	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2533 CONTROL MODULE BOARD TEMPERATURE SENSOR.
C2541	VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR.
C2543	ERROR PASSIVE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2543 ERROR PASSIVE.
C2544	AUTO START STOP SYSTEM	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2544 AUTO START STOP SYSTEM .
C2545	EYESIGHT SYSTEM	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2545 EYESIGHT SYSTEM .
C2546	EYESIGHT VALUE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2546 EYESIGHT VALUE .
C2547	EYESIGHT CHECK SUM	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2547 EYESIGHT CHECK SUM .

Code	Item	Reference
C2551	POWER SUPPLY RELAY	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2551 POWER SUPPLY RELAY.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U1120	LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with

Code	Item	Reference
		Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1469	INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE	Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2511 TORQUE SENSOR MAIN

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2512 TORQUE SENSOR SUB

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2513 TORQUE SENSOR MUCH TOLERANCE

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2514 TORQUE SENSOR POWER SUPPLY

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2521 MOTOR MALFUNCTION

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2522 RESOLVER SENSOR

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2531 CONTROL MODULE CPU

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2532 CONTROL MODULE PERIPHERAL CIRCUIT

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2533 CONTROL MODULE BOARD TEMPERATURE SENSOR

Caution:

Do not perform the clear memory after checking DTCs.

Note:

When this code is displayed, replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2541 VEHICLE DYNAMICS CONTROL MODULE VEHICLE SPEED SENSOR

DTC detecting condition:
When VDCCM reception failure (related to vehicle speed sensor) is detected after the ignition switch is ON.

Trouble symptom:
The steering wheel operation feels heavy.

1. CHECK DTC.

Read the DTC of VDC system using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC related to VDC system or vehicle speed signal system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK VEHICLE SPEED SIGNAL.

1. Display the data monitor [Vehicle Speed] of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Data Monitor.

   Data Monitor

2. Lift up the vehicle (so that the wheels turn freely), start the engine, and raise engine speed in gear.
   Caution:
   Be careful that no one is near the spinning tires and nothing gets caught in them.
3. Check for whether the data changes according to vehicle speed.

Is the data in sync with the vehicle speed?

Yes	It is possible that temporary poor communication occurs. Clear the memory. Ref. to COMMON(diag)>Clear memory.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2543 ERROR PASSIVE

DTC detecting condition:

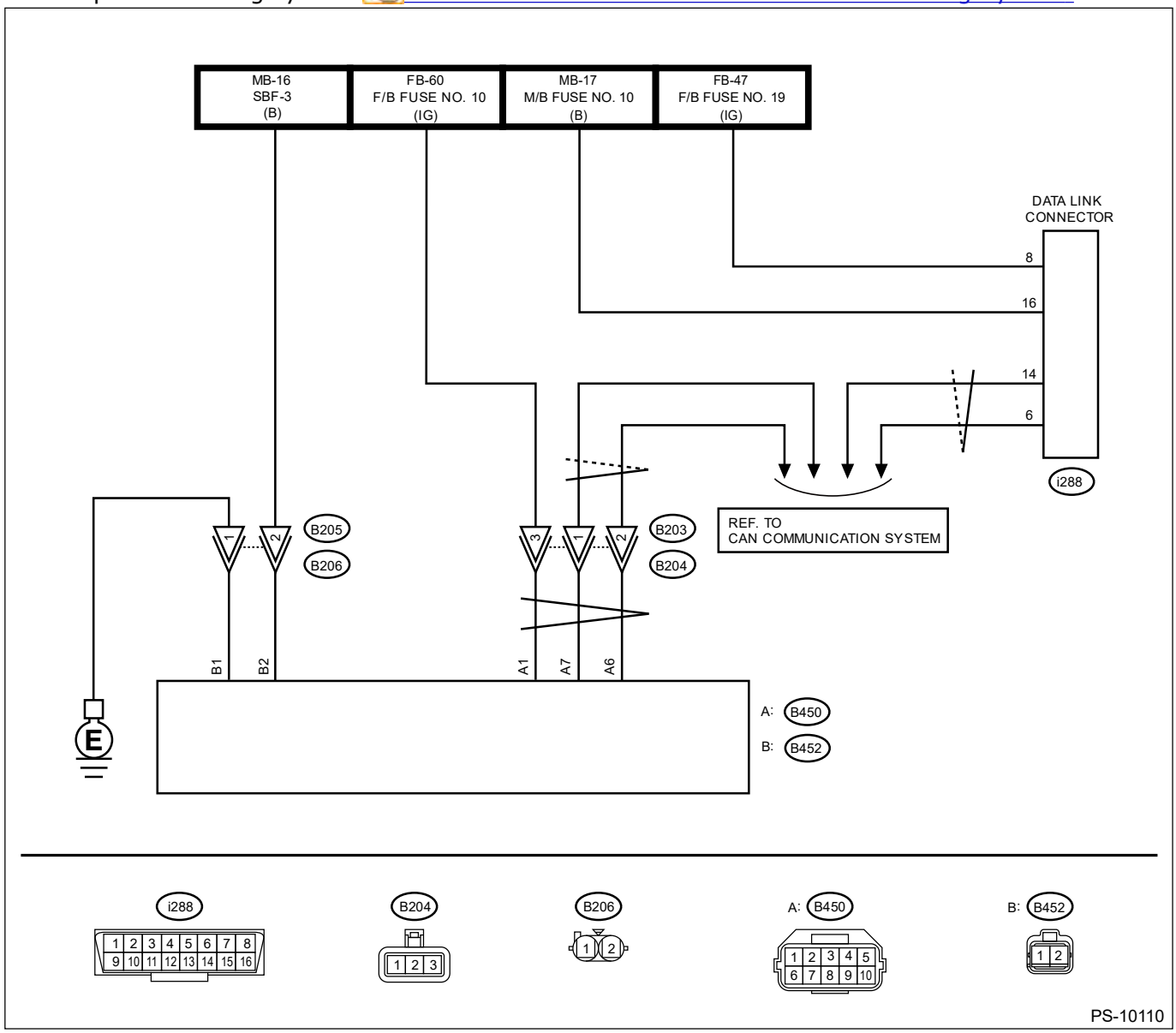
When send/receive failure of CAN communication is detected after the ignition switch is ON.

Trouble symptom:

The steering wheel operation feels heavy.

Wiring diagram:

Electric power steering system Ref. to WIRING SYSTEM>Electric Power Steering System.



1. CHECK PERIPHERALS.

Check the data link connector.

Is any other electrical part connected to the data link connector or harness?

Yes	Disconnect the connection of electrical parts and perform inspection again.
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK DTC.

Read the DTC of the power steering control module using the Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC C2543 displayed in current malfunction?

Yes	Go to 4.
No	System is normal. Temporary interference from noise is a possible cause. Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

4. CHECK CONNECTOR.

Check the connecting condition of connector.

Is the connector firmly installed?

Yes	Go to 5.
No	Install the connector, and check again.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the connector (B204).

Is there crimped or spread portion in connector terminal on vehicle harness side and power steering control module side?

Yes	Repair or replace faulty parts.
No	Go to 6.

6. CHECK HARNESS.

Check the harness related to CAN communication system.

Is there any fault in the harness?

Yes	Repair or replace the harness.
No	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2544 AUTO START STOP SYSTEM

DTC detecting condition:

- When a failure of CAN communication is detected after the ignition switch is ON.
- When the power steering control module has a detection error after the ignition switch is ON.

Trouble symptom:
DTC C2544 is stored in the power steering control module.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK POWER STEERING CONTROL MODULE.

1. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
2. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C2544 displayed in current malfunction?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2545 EYESIGHT SYSTEM

DTC detecting condition:
When the EyeSight system fail flag from stereo camera is received after the ignition switch is ON.
Trouble symptom:
EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Yes	Repair the poor contact of connector.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read DTC of the EyeSight system. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK POWER STEERING CONTROL MODULE.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C2545 displayed in current malfunction?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2546 EYESIGHT VALUE

DTC detecting condition:
When the steering support indication value from stereo camera is out of range after the ignition switch is ON.
Trouble symptom:
EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Yes	Repair the poor contact of connector.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read DTC of the EyeSight system. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK POWER STEERING CONTROL MODULE.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C2546 displayed in current malfunction?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2547 EYESIGHT CHECK SUM

DTC detecting condition:
When check sum error of EyeSight transmission data is detected after the ignition switch is ON.
Trouble symptom:
EyeSight steering support function does not operate.

1. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of the stereo camera connector?

Yes	Repair the poor contact of connector.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read DTC of the EyeSight system. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of EyeSight system displayed?

Yes	Perform the diagnosis according to the DTC. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system using the Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is DTC of CAN communication displayed?

Yes	Perform the diagnosis according to DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK POWER STEERING CONTROL MODULE.

1. Connect all connectors.
2. Execute the inspection mode. Ref. to POWER STEERING (DIAGNOSTICS)>Inspection Mode.
3. Read the DTC using Subaru Select Monitor. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC C2547 displayed in current malfunction?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	It results from a temporary noise interference. Clear the memory to complete the diagnosis. Ref. to COMMON(diag)>Clear memory.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2551 POWER SUPPLY RELAY

DTC detecting condition:

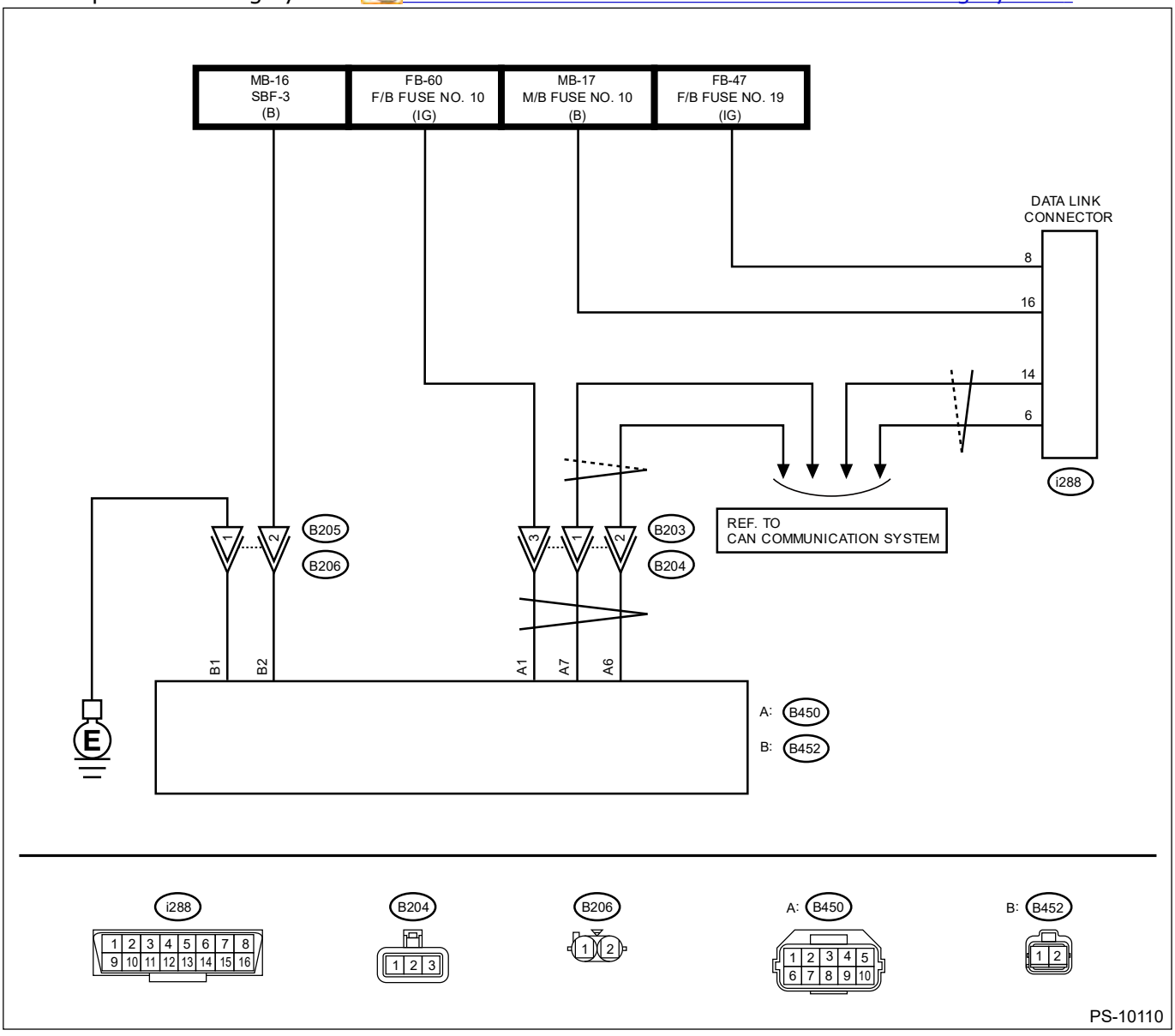
- When short malfunction of power supply relay is detected at initial check.
- When power supply voltage failure is detected after the ignition switch is ON.
- When power supply voltage drop is detected with 500 rpm engine speed reception.

Trouble symptom:

- The steering wheel operation feels heavy.
- STEERING warning light illuminates.

Wiring diagram:

Electric power steering system Ref. to WIRING SYSTEM>Electric Power Steering System.



Note:

If power supply voltage failure exists at the vehicle side, the warning light goes off if the normal voltage returns.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK BATTERY TERMINAL AND FUSE.

Check the battery terminals and the fuse.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace faulty parts.

3. CHECK WIRING HARNESS.

1. Disconnect the connector. (B205, B206)
2. Turn the ignition switch to ON.
3. Using a tester and special tool harness, check the voltage between terminals.
   Connector & terminal
   (B205) No. 2 (+) — Chassis ground (−):

Is the voltage 12 V or more?

Yes	Go to 4.
No	Repair the open circuit of harness or the poor contact of connector between the power steering control module and the battery.

4. CHECK GROUND CIRCUIT.

1. Turn the ignition switch to OFF.
2. Using a tester and special tool harness, check the resistance between terminals.
   Connector & terminal
   (B205) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit or poor contact of the harness between the power steering control module and chassis ground.

5. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the power steering control module connector (B452).
3. Using a tester and special tool harness, check the resistance between harness terminals.
   Connector & terminal
   (B206) No. 1 — (B452) No. 1:
   (B206) No. 2 — (B452) No. 2:

Is the resistance less than 1 Ω?

Yes	Replace the steering gearbox. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Electric Power Steering Gearbox.
No	Repair or replace the harness.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

POWER STEERING (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1469 INVALID DATA RECEIVED FROM AUTOSTART STOP CONTROL MODULE

Note:
Refer to "LAN SYSTEM (DIAGNOSTICS)" for diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

TIRE PRESSURE MONITOR(DIAGNOSTICS)

TPM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Register Transmitter (ID)
10. Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

Remove foreign matter (dust, water, oil, etc.) from the TPMS & keyless entry CM connector or TPMS CM connector during removal and installation.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Tire Pressure Monitor].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, and Go to 5.
No	The system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis according to the displayed DTC. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle’s state.

<table>
<tr><td colspan="4">Tire Pressure Monitor Check List for Interview Date of Vehicle Bring-in Year Month Day</td></tr>
<tr><td colspan="2" rowspan="2">Customer’s name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine
•Cloudy•Rain•Snow•Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

CAUTION

1. SRS AIRBAG SYSTEM

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

2. TPMS & KEYLESS ENTRY CM OR TPMS CM

- If the transmitter is replaced, ID registration for the transmitter is required. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID)>OPERATION.
- When adjusting tire pressure indoors in winter, there is a big temperature difference between the indoor facilities and outside. Once the car is outside where the temperature is lower, the air pressure in the tires will drop, causing the tire pressure warning light to illuminate, even if the pressure in the tires was adjusted to standard values indoors. To avoid this, it is necessary to adjust the tire pressure to the high side in consideration of the difference in temperature between inside and outside according to the following table.
- P205/55R16

Temperature °C (°F)	**Indoor temperature**	**15.5 (60)**		
	Ambient air temperature	**−1 (30)**	**−12 (10)**	**−23 (−10)**
Air pressure kPa (psi)	Front	230 (33)	245 (35)	260 (37)
	Rear	220 (32)	235 (34)	250 (36)

- 205/50R17

Temperature °C (°F)	**Indoor temperature**	**15.5 (60)**		
	Ambient air temperature	**−1 (30)**	**−12 (10)**	**−23 (−10)**
Air pressure kPa (psi)	Front	230 (33)	245 (35)	260 (37)
	Rear	220 (32)	235 (34)	250 (36)

- P225/40R18

Temperature °C (°F)	**Indoor temperature**	**15.5 (60)**		
	Ambient air temperature	**−1 (30)**	**−12 (10)**	**−23 (−10)**
Air pressure kPa (psi)	Front	230 (33)	245 (35)	260 (37)
	Rear	220 (32)	235 (34)	260 (36)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following item which might affect the quality of the tire pressure monitoring system.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the fuse condition. Ref. to SECURITY AND LOCKS>Relay and Fuse.
   Make sure that ampere of the fuse is setting value, and it is not blown out.
3. Inspect that the tire pressure is within the specification while the tire is cool. (Refer to Tire Caution Label.)
4. Check the tires for damage or the insertion of foreign matters.
5. Check the connecting condition of harness and harness connector.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

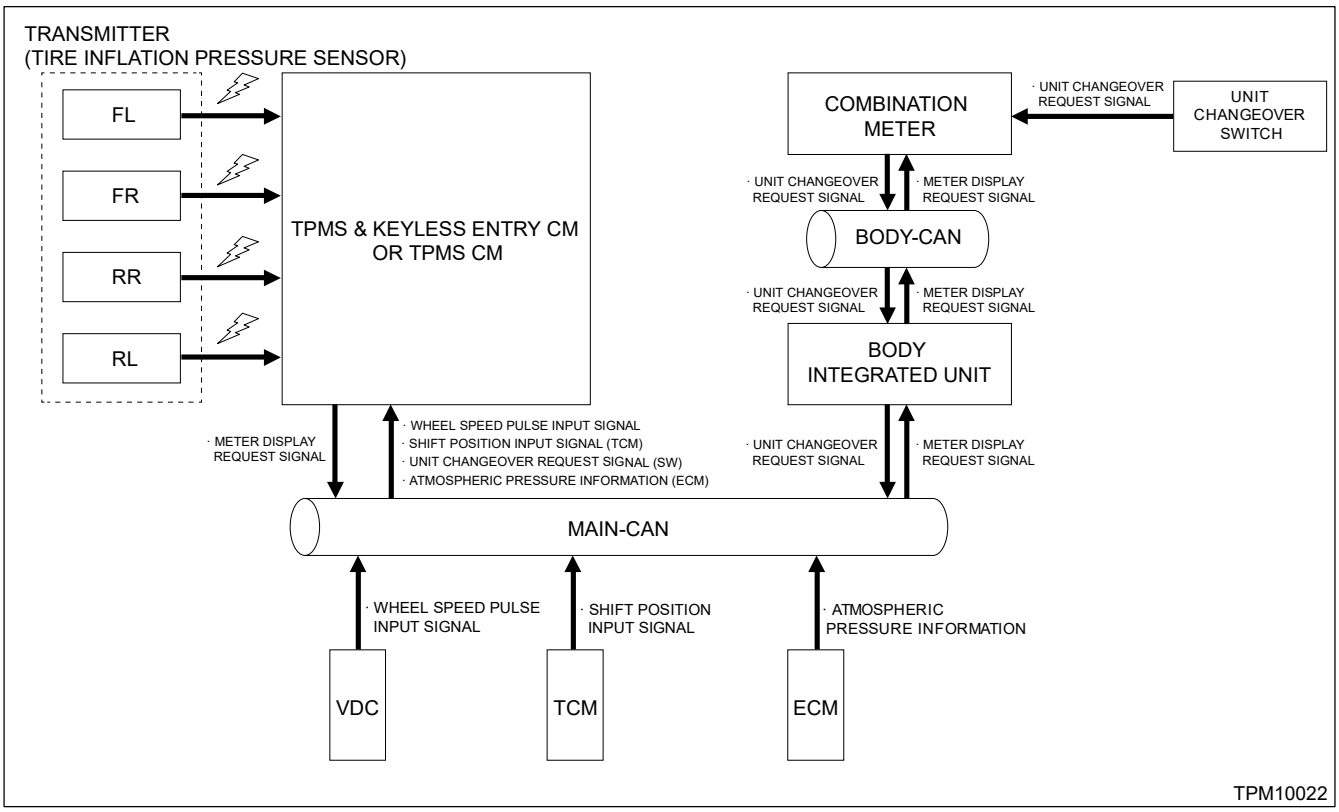
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Transmitter registration tool	Used to register the transmitter ID. Manufacturer: Latest model of ATEQ Corp. Or, use an ATEQ model with the updated software compatible with Generation6 transmitter. **Note: For details of the software update, registration procedures and retailers, contact ATEQ in your country.**
DST-i	Used together with Subaru Select Monitor 4.

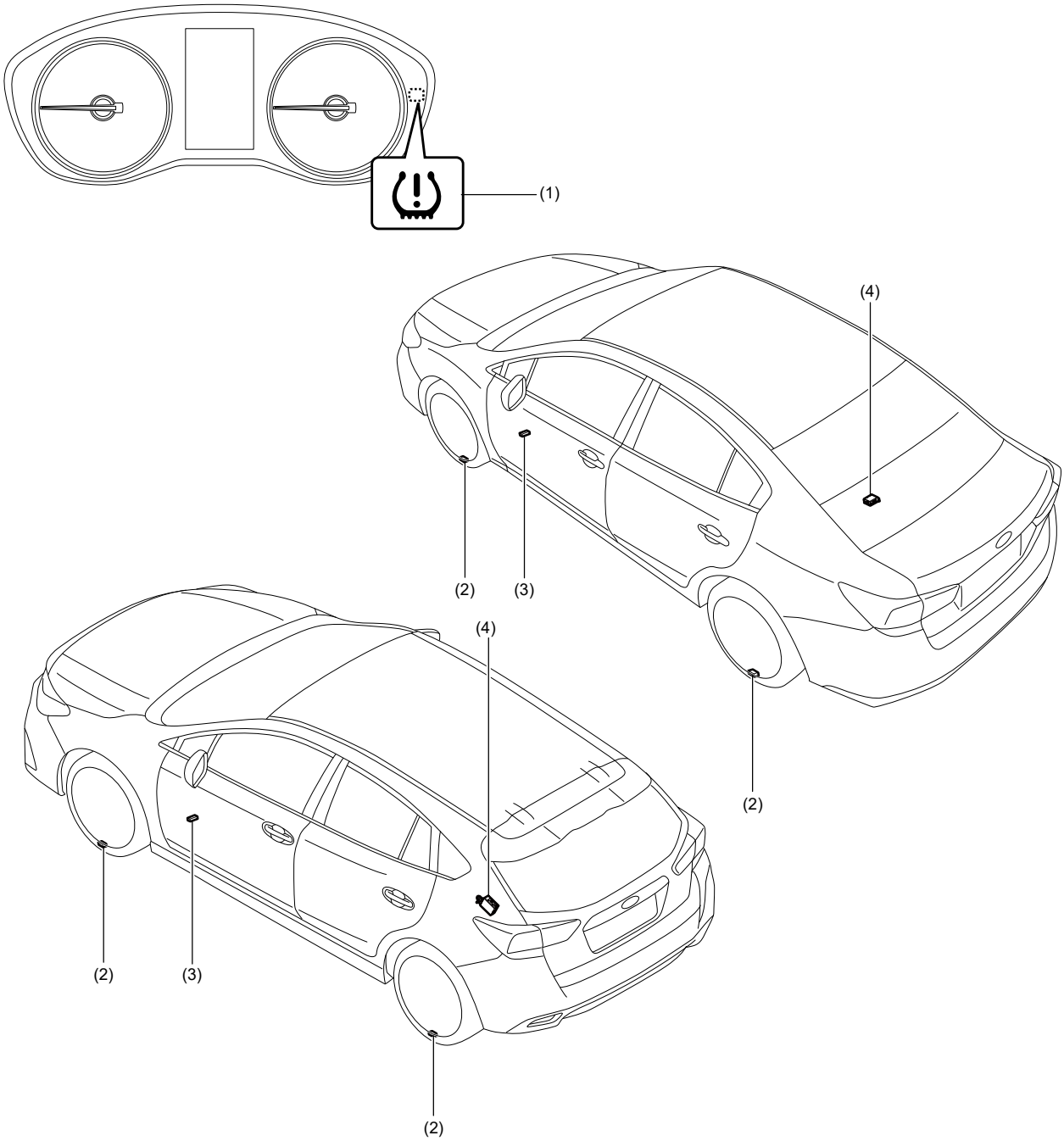
TIRE PRESSURE MONITOR(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM


TRANSMITTER
(TIRE INFLATION PRESSURE SENSOR)
FL
FR
RR
RL
TPMS & KEYLESS ENTRY CM
OR TPMS CM
COMBINATION
METER
· UNIT CHANGEOVER
REQUEST SIGNAL
UNIT
CHANGEOVER
SWITCH
· UNIT CHANGEOVER
REQUEST SIGNAL
· METER DISPLAY
REQUEST SIGNAL
BODY-CAN
· UNIT CHANGEOVER
REQUEST SIGNAL
· METER DISPLAY
REQUEST SIGNAL
BODY
INTEGRATED UNIT
· METER DISPLAY
REQUEST SIGNAL
· WHEEL SPEED PULSE INPUT SIGNAL
· SHIFT POSITION INPUT SIGNAL (TCM)
· UNIT CHANGEOVER REQUEST SIGNAL (SW)
· ATMOSPHERIC PRESSURE INFORMATION (ECM)
· UNIT CHANGEOVER
REQUEST SIGNAL
· METER DISPLAY
REQUEST SIGNAL
MAIN-CAN
· WHEEL SPEED PULSE
INPUT SIGNAL
· SHIFT POSITION
INPUT SIGNAL
· ATMOSPHERIC
PRESSURE INFORMATION
VDC
TCM
ECM
TPM10022

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Electrical Component Location

LOCATION



TPM10019

(1) Tire pressure warning light

(2) Transmitter (tire inflation pressure sensor)

(3) Data link connector

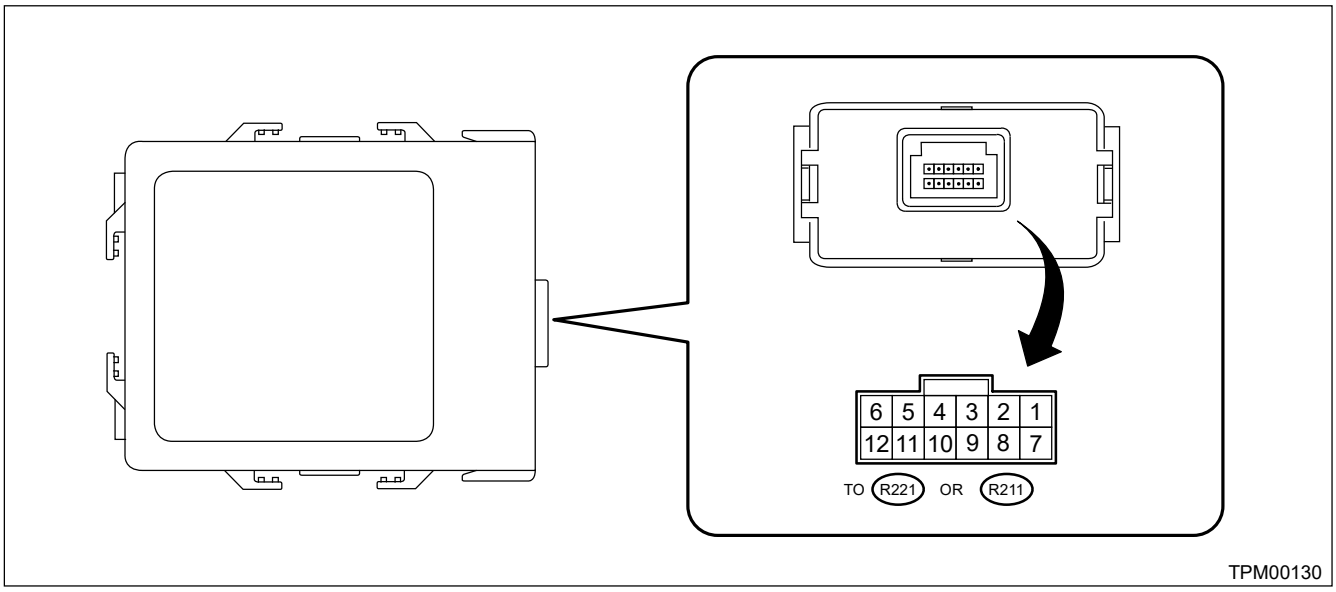
(4) TPMS & keyless entry CM*1 or TPMS CM*2

*1: Without keyless access with push button start system

*2: With keyless access with push button start system

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(R221) or (R211) No. 1	CAN-L	Digital signal; can not be measured	—
(R221) or (R211) No. 2	CAN-H	Digital signal; can not be measured	—
(R221) or (R211) No. 3	—	—	—
(R221) or (R211) No. 4	—	—	—
(R221) or (R211) No. 5	—	—	—
(R221) or (R211) No. 6 ←→ Chassis ground	Ignition power supply	When ignition switch is ON	9 — 16 V
(R221) or (R211) No. 7 ←→ Chassis ground	GND	Always	1 Ω or less
(R221) or (R211) No. 8	—	—	—
(R221) or (R211) No. 9	—	—	—
(R221) or (R211) No. 10	—	—	—
(R221) or (R211) No. 11	—	—	—
(R221) or (R211) No. 12 ←→ Chassis ground	Battery power supply	Always	9 — 16 V

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Inspection Mode

PROCEDURE

Reproduce the malfunction occurrence condition as much as possible. Drive the vehicle at 40 km/h (25 MPH) or faster for at least ten minutes.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Detecting condition:

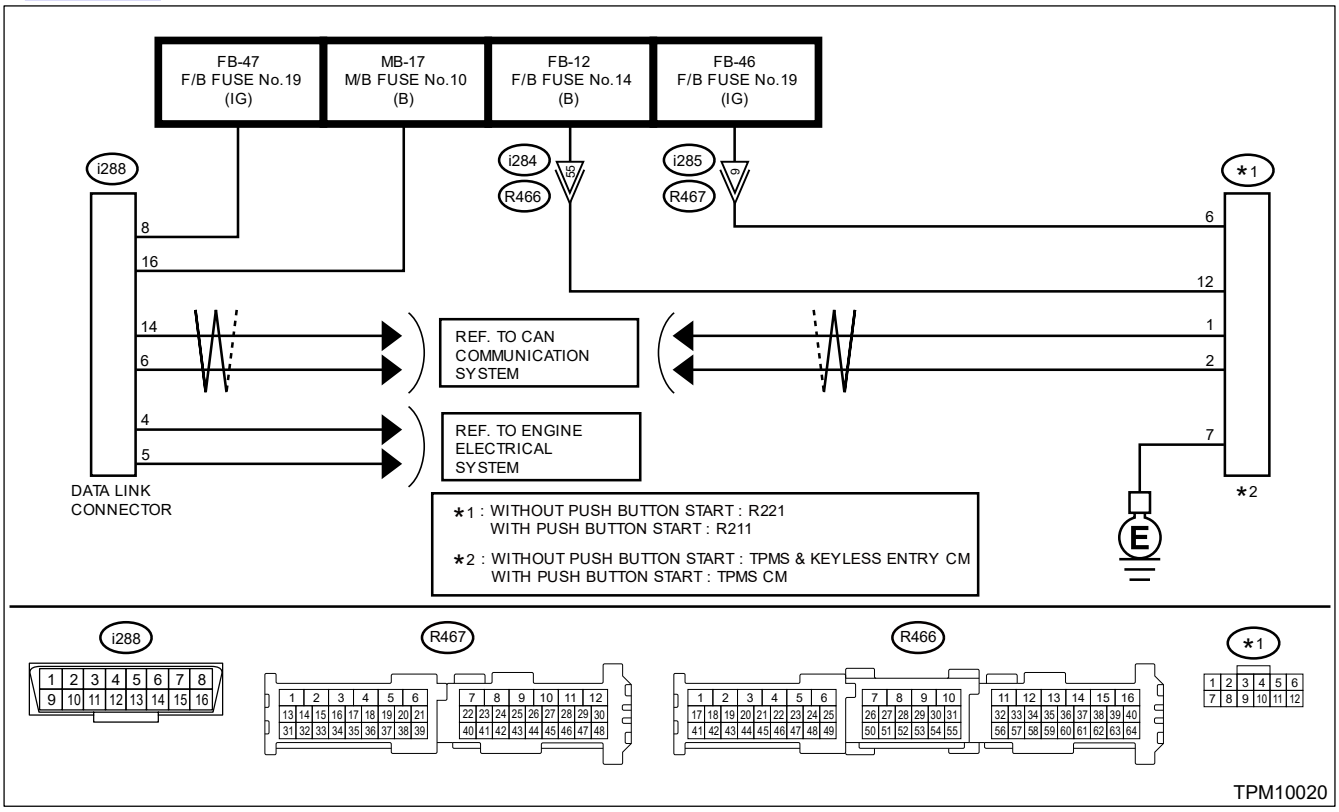
- Defective harness
- Power supply circuit malfunction
- Defective TPMS & keyless entry CM or TPMS CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

- TPMS system Ref. to WIRING SYSTEM>Keyless Entry System.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY CIRCUIT.

Connect DST-i to data link connector.

Does DST-i turn ON?

Yes	Go to 4.
No	Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 8 (+) — Chassis ground (−):
   (i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the power supply circuit. **Note:** **In this case, repair the following item:** • **Open or ground short circuit of harness between battery and data link connector** • **Blown out of fuse**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 4 — Chassis ground:
   (i288) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, go to 4.
No	Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and establish communication between the Subaru Select Monitor and vehicle.

Is communication possible?

Yes	Go to 5.
No	Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is LAN system OK?

Yes	Go to 6.
No	Perform the inspection according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check for poor contact of TPMS & keyless entry CM or TPMS CM connector, data link connector, or intermediate connector.

Is the connector OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove a fuse from the fuse box.
3. Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the fuse OK?

Yes	Go to 8.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the TPMS & keyless entry CM or TPMS CM connector and fuse.

8. CHECK TPMS & KEYLESS ENTRY CM OR TPMS CM CONNECTOR POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the connector of the TPMS & keyless entry CM or TPMS CM.
2. Turn the ignition switch to ON.
3. Measure the voltage between TPMS & keyless entry CM or TPMS CM connector and chassis ground.

Connector & terminal

Without keyless access with push button start system

(R221) No. 6 (+) — Chassis ground (−):

(R221) No. 12 (+) — Chassis ground (−):

With keyless access with push button start system

(R211) No. 6 (+) — Chassis ground (−):

(R211) No. 12 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 9.
No	Check for open or short circuit in the harness between TPMS & keyless entry CM or TPMS CM connector and fuse.

9. CHECK TPMS & KEYLESS ENTRY CM OR TPMS CM GROUND CIRCUIT (OPEN).

Measure the resistance of harness between TPMS & keyless entry CM or TPMS CM connector and chassis ground.

Connector & terminal

Without keyless access with push button start system

(R221) No. 7 — Chassis ground:

With keyless access with push button start system

(R211) No. 7 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor>LIST.**

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Data Monitor

LIST

Item	Content / display range	Standard	Note
FL Tire status	Status of the front left transmitter	00000000 — 11111111	For details, refer to the Notes in the margin.
FR Tire status	Status of the front right transmitter		
RR Tire status	Status of the rear right transmitter		
RL Tire status	Status of the rear left transmitter		
FL Tire air pressure	Value converted to tire pressure from data delivered from transmitter is displayed. (The figure may differ from the actual measured values.)	0 — 351.645 kPa	—
FR Tire air pressure		0 — 351.645 kPa	—
RR Tire air pressure		0 — 351.645 kPa	—
RL Tire air pressure		0 — 351.645 kPa	—
Vehicle Speed Sensor	Vehicle speed signal which is input in control module	0 — 255 km/h	—
Pressure warning	Threshold where tire pressure warning light illuminates	0 — 351.645 kPa	—
Return pressure	Threshold where tire pressure warning light goes out	0 — 351.645 kPa	—
Transmitter power supply	Transmitter power supply status	ON MODE/OFF	—
INDICATOR LAMP	Status of tire pressure warning light	ON/OFF	—
FL Registered ID	ID of the front left transmitter	0 — 16777215	
FR Registered ID	ID of the front right transmitter	0 — 16777215	
RR Registered ID	ID of the rear right transmitter	0 — 16777215	
RL Registered ID	ID of the rear left transmitter	0 — 16777215	

Item	Content / display range	Standard	Note
Latest reception ID	Previous reception ID	0 — 16777215	**Note:** **During ID registration such as when replacing valves, valve IDs displayed on the unit body in hexadecimal format are converted into decimal number and displayed in the data monitor.**
Reception ID one ahead	Second latest reception ID	0 — 16777215	
Before reception ID2	Third latest reception ID	0 — 16777215	
Before reception ID3	Fourth latest reception ID	0 — 16777215	

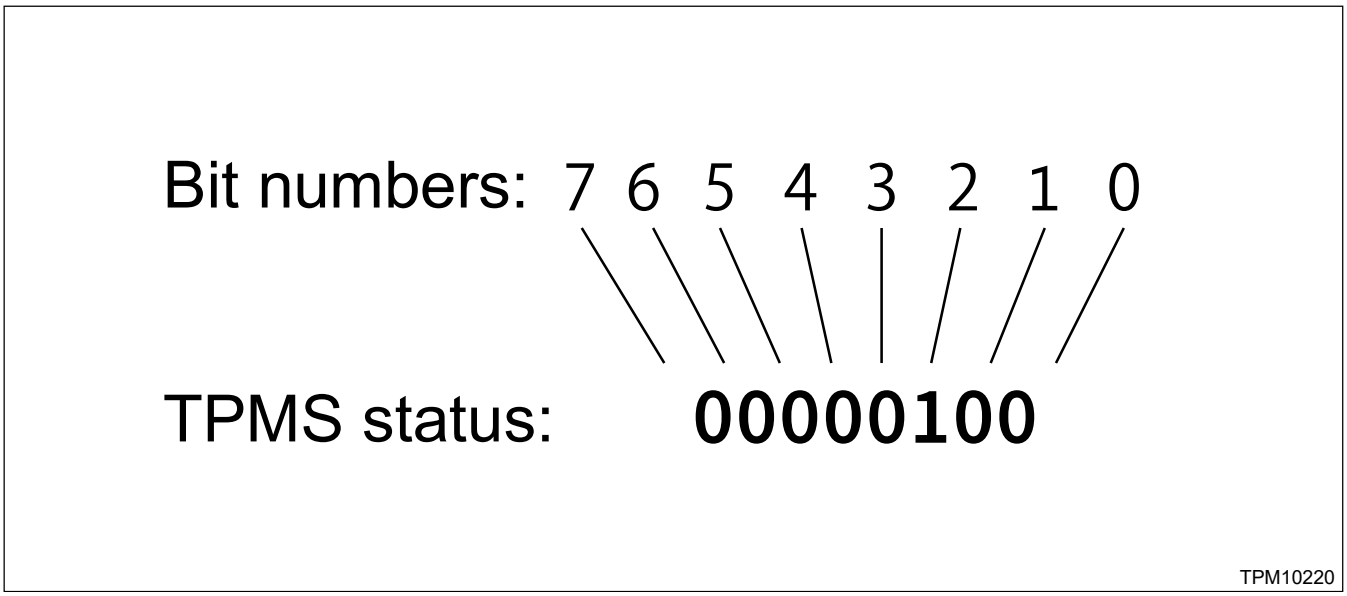
Note:

BIt	Data	Condition	
7	Low Battery	Shows the remaining battery level.	0: Normal 1: Low level
6	Sensor Fail	Shows the malfunction of TPMS.	0: Normal 1: Malfunctioning
5	LF Response	Shows the responding transmission to the LF signal.	0: Transmission for other than LF response 1: Transmission for LF response
4	PAL Condition	Shows the status of position information.	0: Position detection finished 1: Position detection in progress
3	Rolling Detection	Shows the status of tire rotation detection.	0: Tire stop status detected 1: Tire rotation status detected
2-0	Status code	Shows the status in valve transmission.	0: Responding to the LF signal “Learn LF” 1: Detecting the change in tire pressure 2: — 3: Responding to the LF signal “Entering off LF” 4: Position detection is in progress (transmission timing is synchronized with tire rotation) 5: Position detection is in progress (transmission timing is not synchronized with tire rotation) 6: Normal driving status (position detection mode is ended) 7: Detecting the completion of change in tire pressure

Conversion of Bit2-0

	SSM display
0	000
1	001
2	010

	SSM display
3	011
4	100
5	101
6	110
7	111



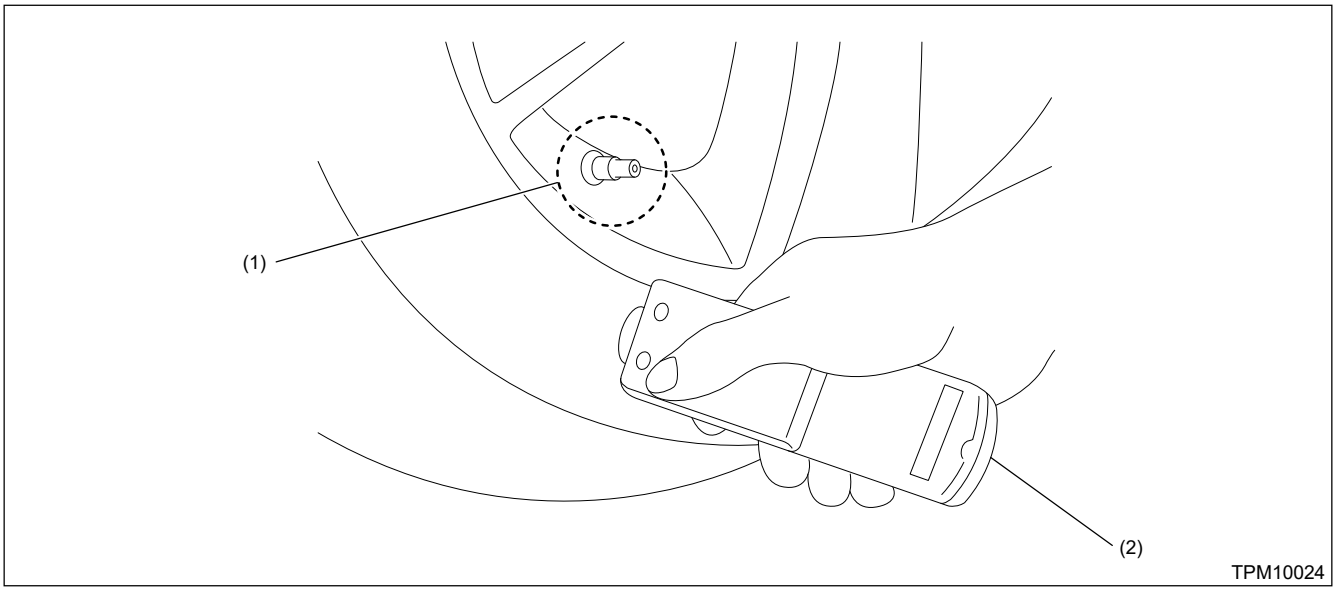
TIRE PRESSURE MONITOR(DIAGNOSTICS) > Register Transmitter (ID)

OPERATION

Perform the registration procedure of the transmitter in the following cases:
- Transmitter is replaced.
- TPMS & keyless entry CM or TPMS CM is replaced.

Note:
- **If registration of the transmitter ID is not possible after two attempts, replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.**
- **During the registration, turn the ignition switch to OFF and end the Subaru Select Monitor. Or if the registration is not performed for 5 minutes or more, the registration mode is cancelled.**
- **When rotating tires, there is no affect on the performance or functions of the tire pressure monitoring control module even if the transmitter (ID) is not registered, however, the tire position displayed on the Subaru Select Monitor will be incorrect.**

1. Adjust all tire pressures to the specifications.
2. Connect the Subaru Select Monitor and select [Diagnosis] on [Start] display.
3. On [Vehicle selection] display, input the target vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Tire Pressure Monitor], and then select [Enter].
6. On [Select Function] display, select [Work Support].
7. On [Work Support] display, select [ID registration].
8. When [ID registration mode When execute Registered ID is deleted Continue?] is displayed, select [OK].
9. Contact the transmitter registration tool to the side wall area near the air valve on the front left tire, and press the switch. The transmitter ID is sent to the TPMS & keyless entry CM or TPMS CM. (At this time, the tire pressure warning light blinks to confirm that the registration has started.)



(1) Air valve (transmitter)
(2) Transmitter registration tool

Note:

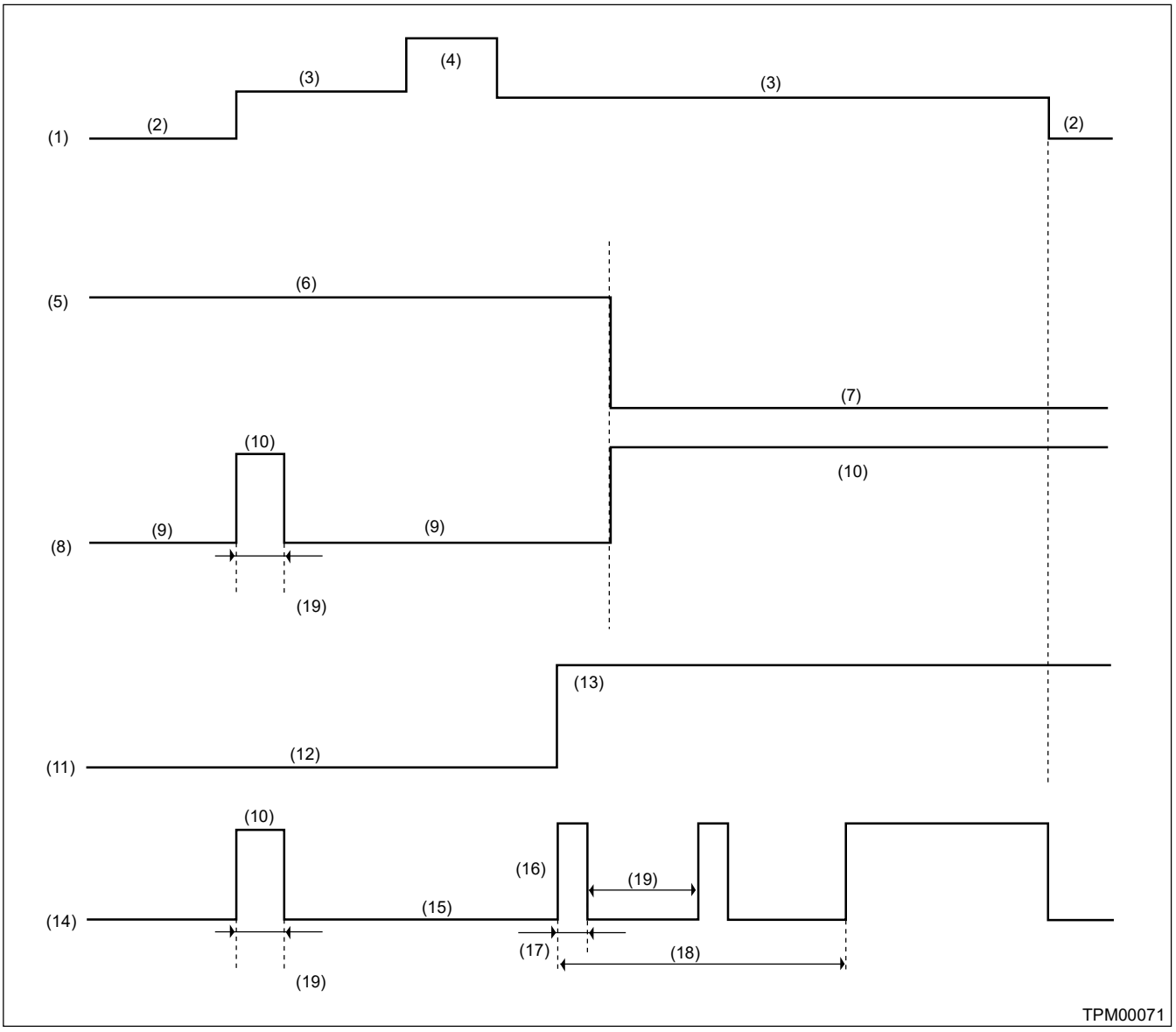
- **The registration order of transmitter ID is not specified.**
- **The transmitter registration tool is used by touching the side wall area near the transmitter.**
- **When registration of each tire is completed, [ID registration completed] is displayed on the Select Monitor screen.**
- **If registration procedure stop in the halfway (turning ignition switch to OFF, wrong registration order, etc), proceed from step 5).**

10. When ID registration is completed, the tire pressure warning light remains lit for approximately 2 seconds, to end the registration. Switch the screen to [Data Monitor] of Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.

11. Check the transmitter ID that was registered, then perform a driving test. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

INSPECTION



(1) Ignition switch
(2) OFF
(3) ON
(4) Start
(5) Tire inflation pressure condition
(6) Meet the specification
(7) Less than standard value (For the pressure warning level, refer to "Data monitor".
(8) Tire inflation pressure warning light (pressure condition)
(9) Light OFF
(10) Light ON
(11) System status
(12) Normal
(13) Malfunction
(14) Tire inflation pressure warning light (system condition)
(15) Light OFF
(16) Blink
(17) 1 second
(18) Blinks 25 times
(19) 2 seconds

Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.)

1. When the tire pressure warning light does not illuminate in accordance with this illumination pattern, there must be an electrical malfunction.
2. If the tire pressure warning light does not go off, check the TPMS & keyless entry CM or TPMS CM/warning light circuit and the combination meter circuit. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern>TIRE PRESSURE WARNING LIGHT DOES NOT COME OFF.

Note:

If the problem is fixed while driving at approximately 40 km/h (25 MPH) after the tire pressure warning light blinks/lights, the warning light goes out and the tire pressure monitor system operates normally. (If there is a decrease in tire pressure, or a malfunction of the system, the malfunction history is displayed.)

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT DOES NOT COME ON

Detecting condition:

Defective combination meter

Trouble symptom:

When the ignition switch is turned to ON, the tire pressure warning light does not turn on (for approx. 2 seconds).

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK COMBINATION METER.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [TPMS warning]

Does the tire pressure warning light illuminate?

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT DOES NOT COME OFF

Detecting condition:

- Defective combination meter
- Tires pressure drop
- Transmitter ID not registered

Trouble symptom:

Tire pressure warning light remains illuminating after engine starts.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK TRANSMITTER (ID).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



- [FL Registered ID]
- [FR Registered ID]
- [RR Registered ID]
- [RL Registered ID]

Is the transmitter ID registered?

Yes	Go to 3.
No	Register the transmitter ID. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID)>OPERATION.

3. CHECK TRANSMITTER DATA OUTPUT.

1. Start the engine.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



- [INDICATOR LAMP]
- [FR Registered ID]
- [RR Registered ID]
- [RL Registered ID]

Is [ON] displayed?

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Tire Pressure Warning Light / Trouble Indicator Light Illumination Pattern

TIRE PRESSURE WARNING LIGHT IS 25 TIMES BLINKING AND TURN ON

Detecting condition:

- Defective TPMS & keyless entry CM or TPMS CM
- Defective harness
- Transmitter is faulty.

Trouble symptom:

Every time the engine starts, tire pressure warning light blinks 25 times and then illuminates.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK LAN COMMUNICATION.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Perform the inspection according to the diagnosis for LAN system.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
C2021	FL TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2021 FL TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2022	FR TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2022 FR TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2023	RR TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2023 RR TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2024	RL TIRE AIR PRESSURE DECREASE NORMAL MODE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.
C2121	FL TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2121 FL TRANSMITTER NO DATA.
C2122	FR TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2122 FR TRANSMITTER NO DATA.
C2123	RR TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2123 RR TRANSMITTER NO DATA.
C2124	RL TRANSMITTER NO DATA	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 RL TRANSMITTER NO DATA.

Code	Description & trouble part	Reference
C2221	FL TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2221 FL TRANSMITTER PRESSURE DATA ABNORMAL.
C2222	FR TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2222 FR TRANSMITTER PRESSURE DATA ABNORMAL.
C2223	RR TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2223 RR TRANSMITTER PRESSURE DATA ABNORMAL.
C2224	RL TRANSMITTER PRESSURE DATA ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL.
C2321	FL TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2321 FL TRANSMITTER STATUS ABNORMAL.
C2322	FR TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2322 FR TRANSMITTER STATUS ABNORMAL.
C2323	RR TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2323 RR TRANSMITTER STATUS ABNORMAL.
C2324	RL TRANSMITTER STATUS ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.
C2421	FL TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2421 FL TRANSMITTER BATTERY VOLTAGE DECREASE.
C2422	FR TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2422 FR TRANSMITTER BATTERY VOLTAGE DECREASE.
C2423	RR TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2423 RR TRANSMITTER BATTERY VOLTAGE DECREASE.

Code	Description & trouble part	Reference
C2424	RL TRANSMITTER BATTERY VOLTAGE DECREASE	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.
C2521	SPEED ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2521 SPEED ABNORMAL.
C2821	WHEEL POSITION SENSING ABNORMAL	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2821 WHEEL POSITION SENSING ABNORMAL.
C2921	ID REGISTRATION ERROR	Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2921 ID REGISTRATION ERROR.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2021 FL TIRE AIR PRESSURE DECREASE NORMAL MODE

Note:

Refer to DTC C2024 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2022 FR TIRE AIR PRESSURE DECREASE NORMAL MODE

Note:

Refer to DTC C2024 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2023 RR TIRE AIR PRESSURE DECREASE NORMAL MODE

Note:

Refer to DTC C2024 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2024 RL TIRE AIR PRESSURE DECREASE NORMAL MODE

DTC DETECTING CONDITION:

Inflation pressure of tires dropped below the specified value.

Note:

For the specifications, refer to [Data monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.

Trouble symptom:

Tire pressure warning light illuminates.

Caution:

When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.

1. CHECK TIRES.

Lift up the vehicle and check for damage in the tires.

Are there cracks or damage?

Yes	Replace the tire.
No	Go to 2.

2. CHECK TIRES.

Check the tire air pressure.

Is the tire pressure in the specifications?

Yes	Go to 3.
No	Adjust the air pressure.

3. CHECK TRANSMITTER DATA.

1. Drive at 40 km/h (25 MPH) or more.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



- [FL Tire air pressure]
- [FR Tire air pressure]
- [RR Tire air pressure]
- [RL Tire air pressure]

Is there a transmitter with different display?

Yes	Replace the transmitter (tire pressure sensor) with different display. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Go to 4.

4. PERFORM DRIVING TEST.

1. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON(diag)>Clear memory.



2. Perform a driving test. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode>PROCEDURE.
3. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is C2021, C2022, C2023 or C2024 displayed? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Even if the DTC is displayed, the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2121 FL TRANSMITTER NO DATA

Note:

Refer to DTC C2124 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2122 FR TRANSMITTER NO DATA

Note:

Refer to DTC C2124 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2123 RR TRANSMITTER NO DATA

Note:

Refer to DTC C2124 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2124 RL TRANSMITTER NO DATA.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2124 RL TRANSMITTER NO DATA

DTC DETECTING CONDITION:

Detected when no data is received from each transmitter for 8 minutes or more at a vehicle speed of 40 km/h (25 MPH) or more. (Timer is not cleared when the vehicle speed becomes lower than 40 km/h halfway.)

Trouble symptom:

Tire pressure warning light blinks 25 times and then illuminates.

Caution:

When driving vehicle to perform driving test, there should be always 2 persons (driver and checker) to check.

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as current malfunction?

Yes	Go to 2.
No	When DTC is displayed as “Past faults”, the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

2. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 3.
No	Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes	Go to 4.
No	Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 5.
No	Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes	Go to 6.
No	Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 7.
No	Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes	Go to 8.
No	Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 9.
No	Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes	Go to 10.
No	Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes	Go to 11.
No	Go to 2.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes	Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the transmitter showing the latest ID that is not included in the registered IDs. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2221 FL TRANSMITTER PRESSURE DATA ABNORMAL

Note:

Refer to DTC C2224 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2222 FR TRANSMITTER PRESSURE DATA ABNORMAL

Note:

Refer to DTC C2224 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2223 RR TRANSMITTER PRESSURE DATA ABNORMAL

Note:

Refer to DTC C2224 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2224 RL TRANSMITTER PRESSURE DATA ABNORMAL

DTC DETECTING CONDITION:

Detected when error data is received from each transmitter at a vehicle speed of 40 km/h (25 MPH) or more.

- When comparing the data from each transmitter to the previous data, the change is large.
- The pressure exceeds what the transmitter can measure. (Excessive pressure)

Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as current malfunction?

Yes	Go to 2.
No	When DTC is displayed as “Past faults”, the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

2. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 3.
No	Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes	Go to 4.
No	Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 5.
No	Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes	Go to 6.
No	Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 7.
No	Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes	Go to 8.
No	Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 9.
No	Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes	Go to 10.
No	Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes	Go to 11.
No	Go to 2.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes	Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the transmitter showing the latest ID that is not included in the registered IDs. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2321 FL TRANSMITTER STATUS ABNORMAL

Note:

Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2322 FR TRANSMITTER STATUS ABNORMAL

Note:

Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2323 RR TRANSMITTER STATUS ABNORMAL

Note:

Refer to DTC C2324 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2324 RL TRANSMITTER STATUS ABNORMAL.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2324 RL TRANSMITTER STATUS ABNORMAL

Detected when error data is received from each transmitter at a vehicle speed of 40 km/h (25 MPH) or more.

DTC DETECTING CONDITION:

Unexpected function codes received from each transmitter.

Trouble symptom:

Tire pressure warning light blinks 25 times and then illuminates.

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as current malfunction?

Yes	Go to 2.
No	When DTC is displayed as “Past faults”, the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

2. START FRONT LEFT TRANSMITTER.

1. Connect the Subaru Select Monitor and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check [Data monitor] of [Tire Pressure Monitor]. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Data Monitor.



3. Use the transmitter registration tool and transmit the ID from the front left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 3.
No	Replace the front left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

3. CHECK FRONT LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [FL Registered ID].

Are the two IDs same?

Yes	Go to 4.
No	Record [Latest reception ID] as the front left. Go to 4.

4. START FRONT RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the front right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 5.
No	Replace the front right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

5. CHECK FRONT RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [FR Registered ID].

Are the two IDs same?

Yes	Go to 6.
No	Record [Latest reception ID] as the front right. Go to 6.

6. START REAR RIGHT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear right transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 7.
No	Replace the rear right transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

7. CHECK REAR RIGHT TRANSMITTER ID.

Compare the ID on the latest ID display with [RR Registered ID].

Are the two IDs same?

Yes	Go to 8.
No	Record [Latest reception ID] as the rear right. Go to 8.

8. START REAR LEFT TRANSMITTER.

Use the transmitter registration tool and transmit the ID from the rear left transmitter to check [Latest reception ID].

Is [Latest reception ID] updated?

Yes	Go to 9.
No	Replace the rear left transmitter. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

9. CHECK REAR LEFT TRANSMITTER ID.

Compare the ID on the latest ID display with [RL Registered ID].

Are the two IDs same?

Yes	Go to 10.
No	Record [Latest reception ID] as the rear left. Go to 10.

10. CHECK MALFUNCTION TRANSMITTER.

Is ID recorded by this procedure?

Yes	Go to 11.
No	Replace the transmitter indicated by DTC. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

11. CHECK MALFUNCTION TRANSMITTER.

Check the registered ID of the transmitter indicated by DTC.

Is there checked ID in the record?

Yes	Replace the transmitter of the recorded position. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the transmitter indicated by DTC. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2421 FL TRANSMITTER BATTERY VOLTAGE DECREASE

Note:

Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2422 FR TRANSMITTER BATTERY VOLTAGE DECREASE

Note:

Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2423 RR TRANSMITTER BATTERY VOLTAGE DECREASE

Note:

Refer to DTC C2424 for diagnostic procedure. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2424 RL TRANSMITTER BATTERY VOLTAGE DECREASE

DTC DETECTING CONDITION:

Detected when power supply voltage failure signal is received from each transmitter.

Trouble symptom:

Tire pressure warning light blinks 25 times and then illuminates.

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as current malfunction?

Yes	Go to 2.
No	When DTC is displayed as "Past faults", the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

2. CHECK TRANSMITTER.

1. Replace all transmitters and register their IDs. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID)>OPERATION.
2. Using the Subaru Select Monitor, perform the clear memory of [Tire Pressure Monitor]. Ref. to COMMON(diag)>Clear memory.



3. Perform the Inspection Mode. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Inspection Mode.

Is the fault eliminated?

Yes	Internal battery of the transmitter had worn out.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2521 SPEED ABNORMAL

DTC DETECTING CONDITION:

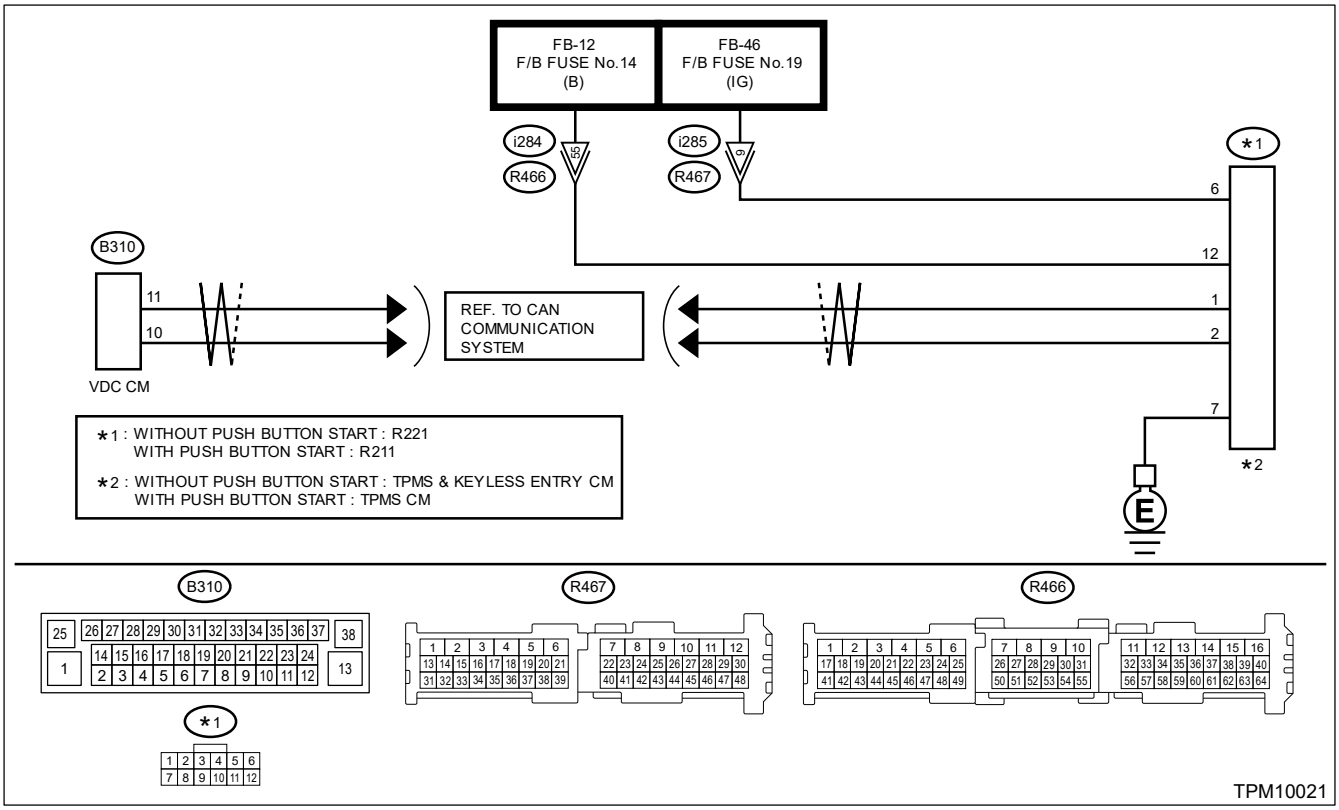
Detected when transmitter normal signal is received at a vehicle speed of less than 6 km/h (4 MPH).

Trouble symptom:

Tire pressure warning light blinks 25 times and then illuminates.

Wiring diagram:

Tire Pressure Monitoring System Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.



1. CHECK LAN COMMUNICATION.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK VDC.

Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the VDC diagnosis.

3. CHECK CONNECTOR.

Check each connector.

Is there poor contact or any other faults?

Yes	Repair the connector.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2821 WHEEL POSITION SENSING ABNORMAL

DTC DETECTING CONDITION:
When the position detection does not finish and fails 10 times in a row.
Trouble symptom:
Pressure monitor display of the combination meter indicates "—".

1. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as current malfunction?

Yes	Go to 2.
No	When DTC is displayed as "Past faults", the system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

2. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any DTC other than DTC C2821 displayed as current malfunction?

Yes	Perform the diagnosis for DTCs other than the displayed DTC C2821. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC displayed as current malfunction?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK TCM.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 5.

5. CHECK CONNECTOR.

Check each connector.

Is there poor contact or any other faults?

Yes	Repair the connector.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

TIRE PRESSURE MONITOR(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC C2921 ID REGISTRATION ERROR

DTC detecting condition:
When the ID registration failed.
Trouble symptom:
Tire pressure warning light blinks 25 times and then illuminates.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any of DTCs other than DTC C2921 displayed as "Current malfunction" or "Past malfunction"?

Yes	Perform the diagnosis for the displayed DTCs other than DTC C2921. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST. **Note:** **When any of DTCs C2121 — C2124 is displayed as past malfunction, perform from step 2 of the diagnosis for DTCs C2121 — C2124.**
No	Go to 2.

2. REPRODUCTION OF FAILURE.

1. Perform the drive test.
   Drive the vehicle at 40 km/h (25 MPH) or faster for at least 10 minutes.
   Note:
   Drive until the tire status Bit 4 (PAL Condition) becomes "0".
2. Read the DTC of [Tire Pressure Monitor] using the Subaru Select Monitor. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed as "Current malfunction"?

Yes	Go to 3.
No	When DTC is displayed as "Past malfunction", the system has returned to a normal condition at this time. **Note:** **In this case, there may be temporary poor communication due to radio wave environment inside/outside the vehicle.**

3. ID REGISTRATION.

Register the ID. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Register Transmitter (ID).

Can the ID be registered?

Yes	Go to 2.
No	Replace the TPMS & keyless entry CM or TPMS CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.

AIR CONDITIONER(DIAGNOSTICS)

AC(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
14. Diagnostics with Phenomenon

AIR CONDITIONER(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Note:

When the sunload sensor check is performed indoors or in the shade, it could be diagnosed as sensor having an open circuit. Always perform the inspection in direct sunlight.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Air Conditioner].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

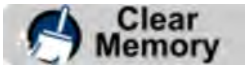
DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

AIR CONDITIONER(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">A/C Check List for Interview Brought in on: MM/DD/YY</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>DTC</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

AIR CONDITIONER(DIAGNOSTICS) > General Description

CAUTION

1. AIR CONDITIONER

- Do not disconnect the battery cables while the engine is running.
  A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as A/C control panel etc.
- Before disconnecting the connectors of sensors and the A/C control panel, be sure to turn off the ignition switch.
  A/C control module may be damaged.
- A/C-related parts are precision parts, so do not let them fall.
- When removing A/C related parts, refer to Cautions for A/Cs. Ref. to AIR CONDITIONER>General Description>CAUTION.

2. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

AIR CONDITIONER(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect the A/C problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.
3. Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

AIR CONDITIONER(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

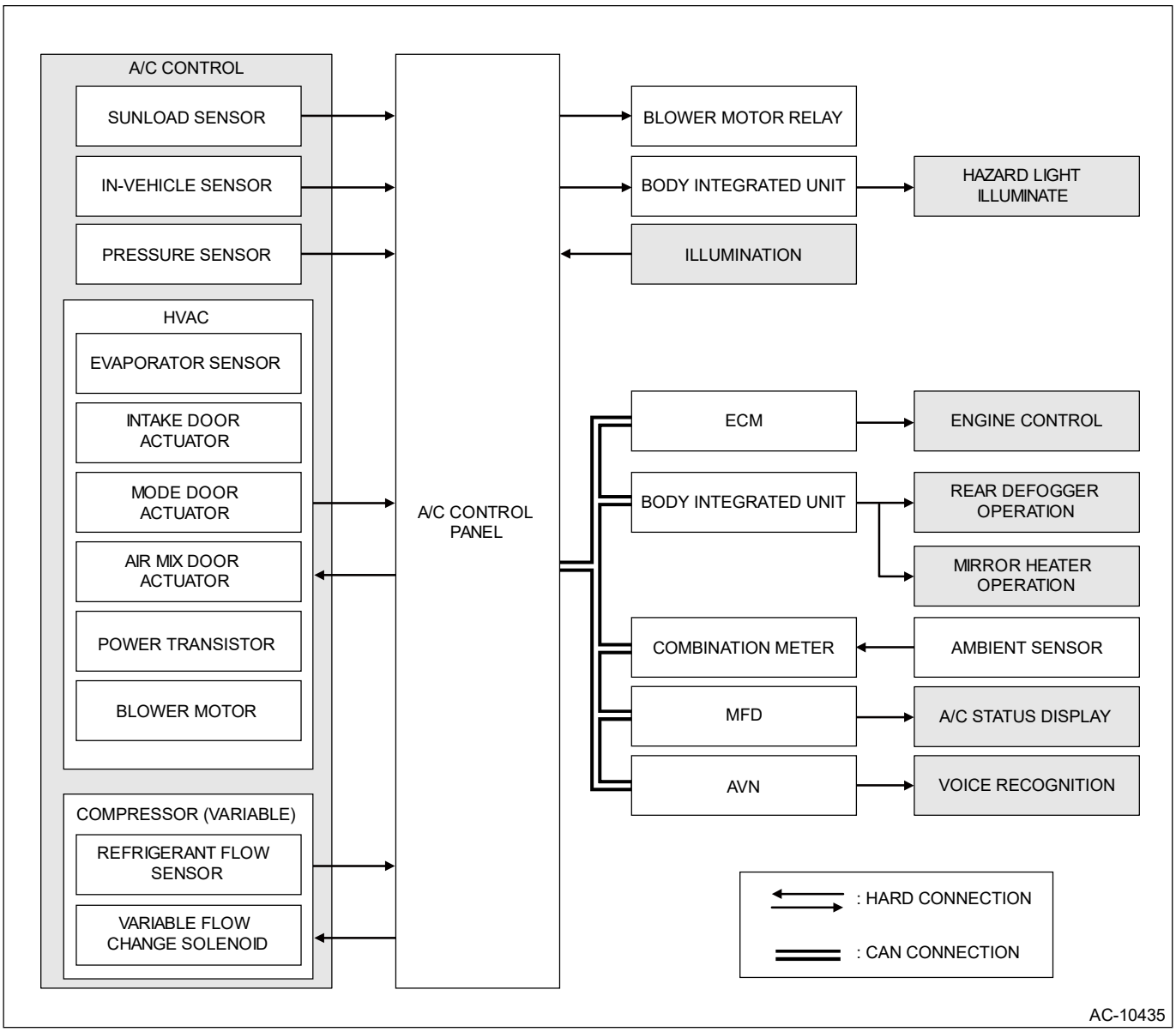
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

AIR CONDITIONER(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

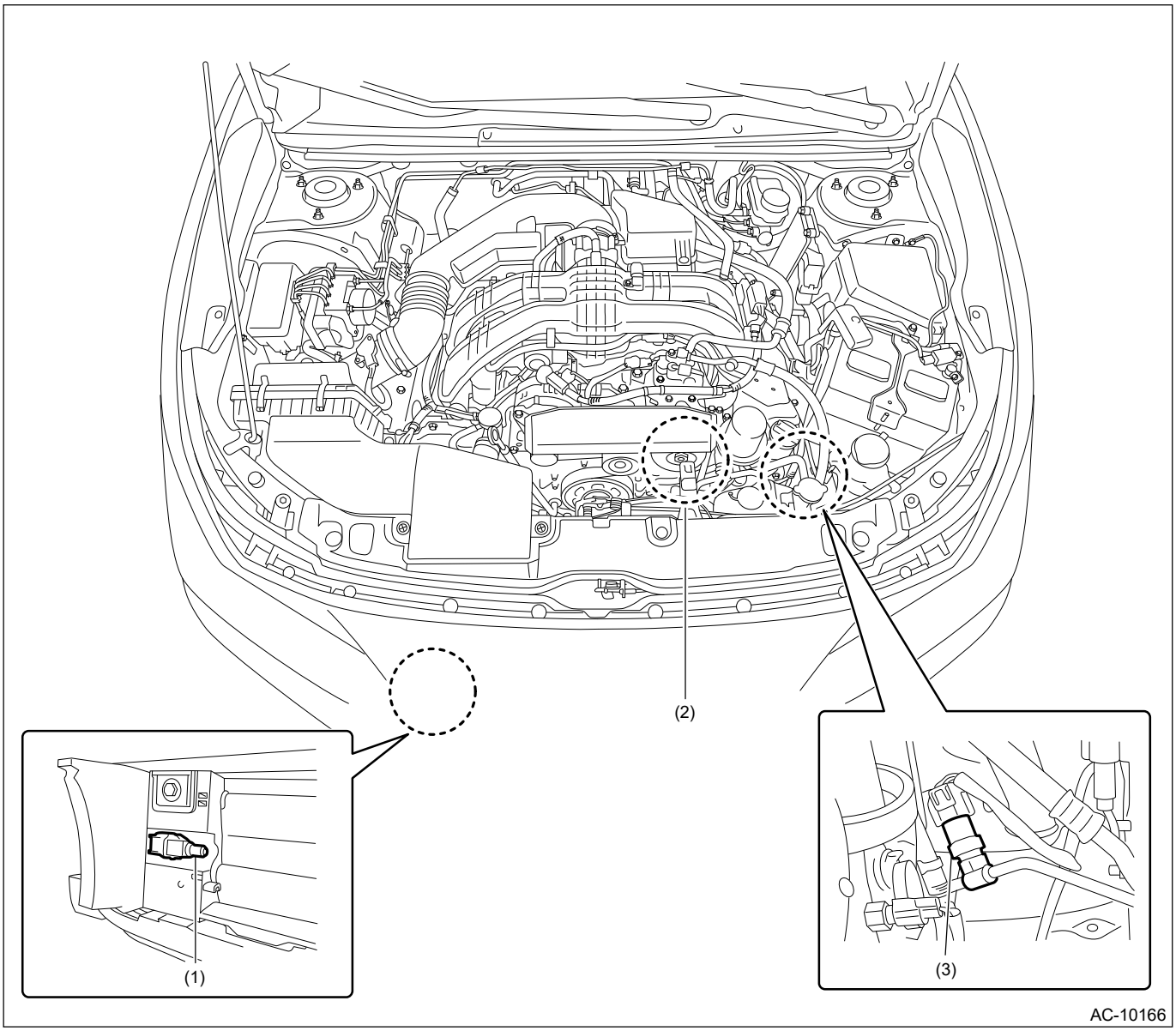
- A/C control & status display
  Using the CAN communication, perform A/C control from vehicle information and each sensor value to actuate the A/C system device. Also display A/C status on MFD by CAN output of A/C status.
- Hazard is ON
  Output hazard switch signals to body integrated unit. The control of hazard illumination is carried out via body integrated unit.
- Illumination
  Adjust the A/C control panel lighting according to input (body integrated unit & combination meter).
- Engine control
  Transmit the A/C status via CAN for engine control.
- Rear defogger operation
  Output switch signals to body integrated unit. The control of rear defogger operation is carried out via body integrated unit.
- Mirror heater operation
  Output switch signals to body integrated unit. The control of mirror heater operation is carried out via body integrated unit.
- Voice recognition
  Change the A/C setting according to voice input in combination with AVN.


A/C CONTROL
SUNLOAD SENSOR
IN-VEHICLE SENSOR
PRESSURE SENSOR
HVAC
EVAPORATOR SENSOR
INTAKE DOOR ACTUATOR
MODE DOOR ACTUATOR
AIR MIX DOOR ACTUATOR
POWER TRANSISTOR
BLOWER MOTOR
COMPRESSOR (VARIABLE)
REFRIGERANT FLOW SENSOR
VARIABLE FLOW CHANGE SOLENOID
A/C CONTROL PANEL
BLOWER MOTOR RELAY
BODY INTEGRATED UNIT
HAZARD LIGHT ILLUMINATE
ILLUMINATION
ECM
ENGINE CONTROL
BODY INTEGRATED UNIT
REAR DEFOGGER OPERATION
MIRROR HEATER OPERATION
COMBINATION METER
AMBIENT SENSOR
MFD
A/C STATUS DISPLAY
AVN
VOICE RECOGNITION
: HARD CONNECTION
: CAN CONNECTION
AC-10435

AIR CONDITIONER(DIAGNOSTICS) > Electrical Component Location

LOCATION

1. ENGINE COMPARTMENT

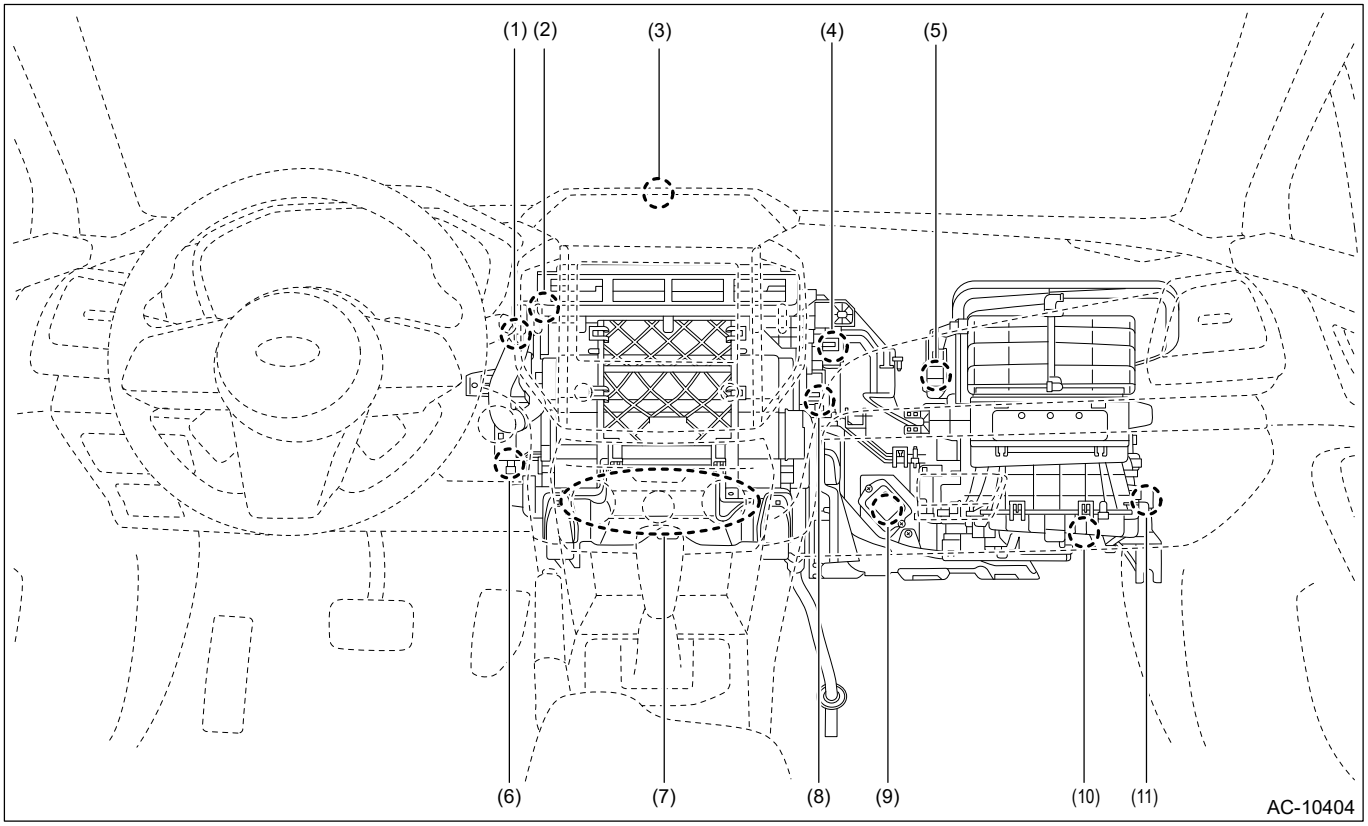


(1) Ambient sensor

(2) A/C compressor
(Refrigerant flow sensor,
variable flow change solenoid)

(3) Pressure sensor

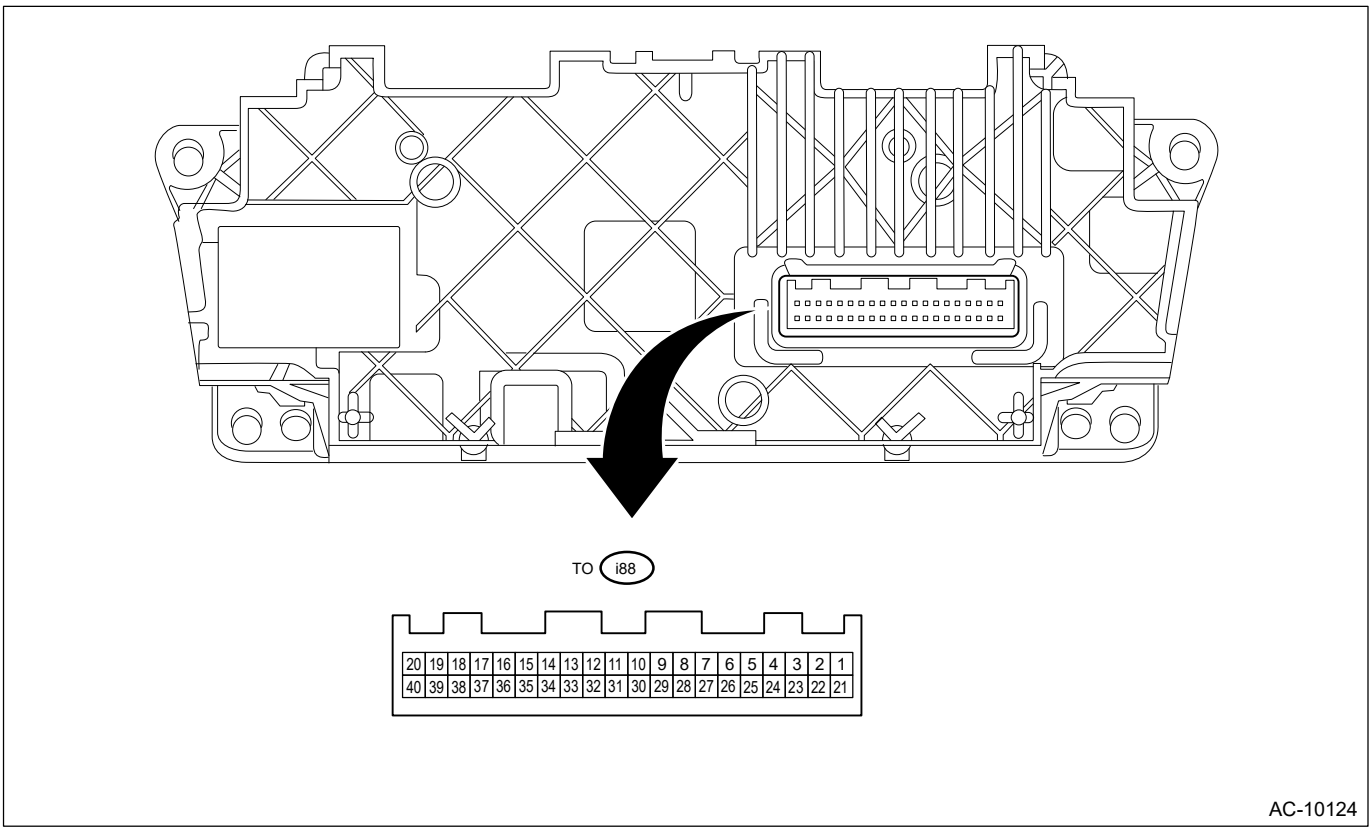
2. COMPARTMENT



(1) In-vehicle sensor
(2) Air mix door actuator LH*1
(3) Sunload sensor
(4) Mode door actuator
(5) Intake door actuator
(6) Evaporator sensor
(7) A/C control panel
(8) Air mix door actuator*2 or air mix door actuator RH*1
(9) Power transistor
(10) Blower motor
(11) Blower motor relay

*1: With left/right independent air conditioning function
*2: Without left/right independent air conditioning function

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(i88) No. 1 (+) ←→ (i88) No. 2 (−)	Air mix door actuator RH drive signal (HOT)*1	While operating to HOT side	While operating: 12 V While not operating: 0 V
(i88) No. 2 (+) ←→ (i88) No. 1 (−)	Air mix door actuator RH drive signal (COOL)*1	While operating to COOL side	While operating: 12 V While not operating: 0 V
(i88) No. 3 (+) ←→ (i88) No. 4 (−)	Air mix door actuator LH drive signal (HOT)*1 Or air mix door actuator drive signal (HOT)*2	While operating to HOT side	While operating: 12 V While not operating: 0 V
(i88) No. 4 (+) ←→ (i88) No. 3 (−)	Air mix door actuator LH drive signal (COOL)*2 Air mix door actuator drive signal (COOL)*2	While operating to COOL side	While operating: 12 V While not operating: 0 V
(i88) No. 5 (+) ←→ (i88) No. 6 (−)	Intake door actuator drive signal (RECIRC)	While operating to RECIRC side	While operating: 12 V While not operating: 0 V

Terminal No.	Contents	Measuring condition	Standard
(i88) No. 6 (+) ←→ (i88) No. 5 (−)	Intake door actuator drive signal (FRESH)	While operating to FRESH side	While operating: 12 V While not operating: 0 V
(i88) No. 7	—	—	—
(i88) No. 8	CAN-H (CAN communication line)	Digital signal; can not be measured	—
(i88) No. 9	CAN-L (CAN communication line)	Digital signal; can not be measured	—
(i88) No. 10 ←→ Chassis ground	GND	Always	Resistance: 1 Ω or less
(i88) No. 11 ←→ Chassis ground (−)	Variable compressor solenoid valve drive signal	Ignition switch: ON Blower switch: ON A/C switch: ON	2 V — 12 V
(i88) No. 12 (+) ←→ Chassis ground (−)	In-vehicle sensor	Ignition switch: ON	25°C (77°F): Approx. 1.5 V 40°C (104°F): Approx. 1.0 V
(i88) No. 13 (+) ←→ Chassis ground (−)	Sunload sensor	Ignition switch: ON Sunlight is contacting sensor	With sunload: Less than 4.9 V Without sunload: 0 V
(i88) No. 14 (+) ←→ Chassis ground (−)	Evaporator sensor	Ignition switch: ON	1 — 4.5 V (changes depending on temperature after through evaporator)
(i88) No. 15 (+) ←→ Chassis ground (−)	Flow sensor	Ignition switch: ON Blower switch: ON A/C switch: ON	0.3 V — 4.7 V
(i88) No. 16 (+) ←→ Chassis ground (−)	Sensor and actuator power supply	Ignition switch: ON	5 V
(i88) No. 17	—	—	—
(i88) No. 18 (+) ←→ Chassis ground (−)	Blower motor voltage feedback	Ignition switch: ON Blower switch: ON	0 — 16 V
(i88) No. 19 (+) ←→ Chassis ground (−)	ACC power supply	Ignition switch: ACC	Battery voltage

Terminal No.	Contents	Measuring condition	Standard
(i88) No. 20 (+) ←→ Chassis ground (−)	Ignition power supply	Ignition switch: ON	Battery voltage
(i88) No. 21	—	—	—
(i88) No. 22	—	—	—
(i88) No. 23(+) ←→ (i88) No. 24(−)	Mode door actuator drive output (DEF)	While operating to DEF side	While operating: 12 V While not operating: 0 V
(i88) No. 24 (+) ←→ (i88) No. 23 (−)	Mode door actuator drive output (FACE)	While operating to FACE side	While operating: 12 V While not operating: 0 V
(i88) No. 25	—	—	—
(i88) No. 26(+) ←→ Chassis ground (−)	Hazard switch	Hazard switch: ON	Switch OFF: Battery voltage Switch ON: 0 V
(i88) No. 27	—	—	—
(i88) No. 28 ←→ Chassis ground (−)	Blower relay drive output	Ignition switch: ON Blower switch: ON	0.7 V or less
(i88) No. 29 (+) ←→ Chassis ground (−)	Illumination signal (−)	Illumination: ON	Battery voltage
(i88) No. 30 ←→ Chassis ground (−)	Sensor GND	Always	1 V or less
(i88) No. 31(+) ←→ Chassis ground (−)	Pressure sensor	Ignition switch: ON	0.5 V — 4.9 V
(i88) No. 32(+) ←→ Chassis ground (−)	Intake door actuator position signal	Ignition switch: ON FRESH/RECIRC door: RECIRC position	4.5 V
		Ignition switch: ON FRESH/RECIRC door: FRESH position	1.9 V
(i88) No. 33 (+) ←→ Chassis ground (−)	Mode door actuator position signal	Ignition switch: ON Mode door: FACE position	4.5 V
		Ignition switch: ON Mode door: DEF position	0.5 V
(i88) No. 34 (+) ←→ Chassis	Air mix door actuator RH position signal*1	Ignition switch: ON Air mix door: Maximum cool	4.5 V

Terminal No.	Contents	Measuring condition	Standard
ground (−)		position	
		Ignition switch: ON Air mix door: Maximum hot position	0.5 V
(i88) No. 35 (+) ←→ Chassis ground (−)	Air mix door actuator LH position signal*1 Or air mix door actuator position signal*2	Ignition switch: ON Air mix door: Maximum cool position	4.5 V
		Ignition switch: ON Air mix door: Maximum hot position	0.5 V
(i88) No. 36	—	—	—
(i88) No. 37	—	—	—
(i88) No. 38 (+) ←→ Chassis ground (−)	Blower motor control signal	Ignition switch: ON Blower switch: ON	5 V — 9 V
(i88) No. 39 (+) ←→ Chassis ground (−)	Illumination signal (+)	Illumination switch ON	Battery voltage
(i88) No. 40 (+) ←→ Chassis ground (−)	Battery power supply	Always	Battery voltage

*1: With left/right independent air conditioning function

*2: Without left/right independent air conditioning function

AIR CONDITIONER(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B1430	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN	—
B1431	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B1432	AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)	—
B1433	AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)	—
B1434	EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN	—
B1435	EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B1436	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)	—
B1437	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)	—
B1438	MODE DOOR ACTUATOR CIRCUIT OPEN	—
B1439	MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	—
B1440	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)	—
B1441	AIR MIX DOOR ACTUATOR CIRCUIT STUCK (PASSENGER)	—
B1442	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)	—
B1443	MODE DOOR ACTUATOR CIRCUIT STUCK	—
B1446	AIR MIX DOOR ACTUATOR CIRCUIT STUCK (DRIVER)	—
B14B1	SEAT HEATER THERMISTOR CIRCUIT OPEN (DRIVER)	—
B14B2	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (DRIVER)	—

DTC	Item	Note
B14B3	SEAT HEATER THERMISTOR CIRCUIT OPEN (PASSENGER)	—
B14B4	SEAT HEATER THERMISTOR CIRCUIT SHORT-CIRCUIT (PASSENGER'S)	—
B14E9	INTAKE DOOR ACTUATOR CIRCUIT OPEN	—
B14EA	INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	—
B14EB	INTAKE DOOR ACTUATOR STUCK	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Turn the ignition switch to ON and then leave it for 20 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

2. INSPECTION MODE 2

DTC	Item	Note
B14A1	SUNLOAD SENSOR CIRCUIT LOW/OPEN	—
B14A2	SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Park the vehicle in the place subjected to direct sunlight.
4. Turn the ignition switch to ON and then leave it for 1 second or more.
5. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

3. INSPECTION MODE 3

DTC	Item	Note
B14A3	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN	—
B14A4	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT	—
B14A5	REFRIGERANT FLOW SENSOR CIRCUIT OPEN	—
B14A6	REFRIGERANT FLOW SENSOR CIRCUIT SHORT-CIRCUIT	—
B14A7	VARIABLE SOLENOID VALVE CIRCUIT	—
B14A8	COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Air Conditioner]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Perform [Variable compressor break-in drive]. Ref. to AIR CONDITIONER>Compressor.
4. Using the Subaru Select Monitor, read the DTC of [Air Conditioner] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:

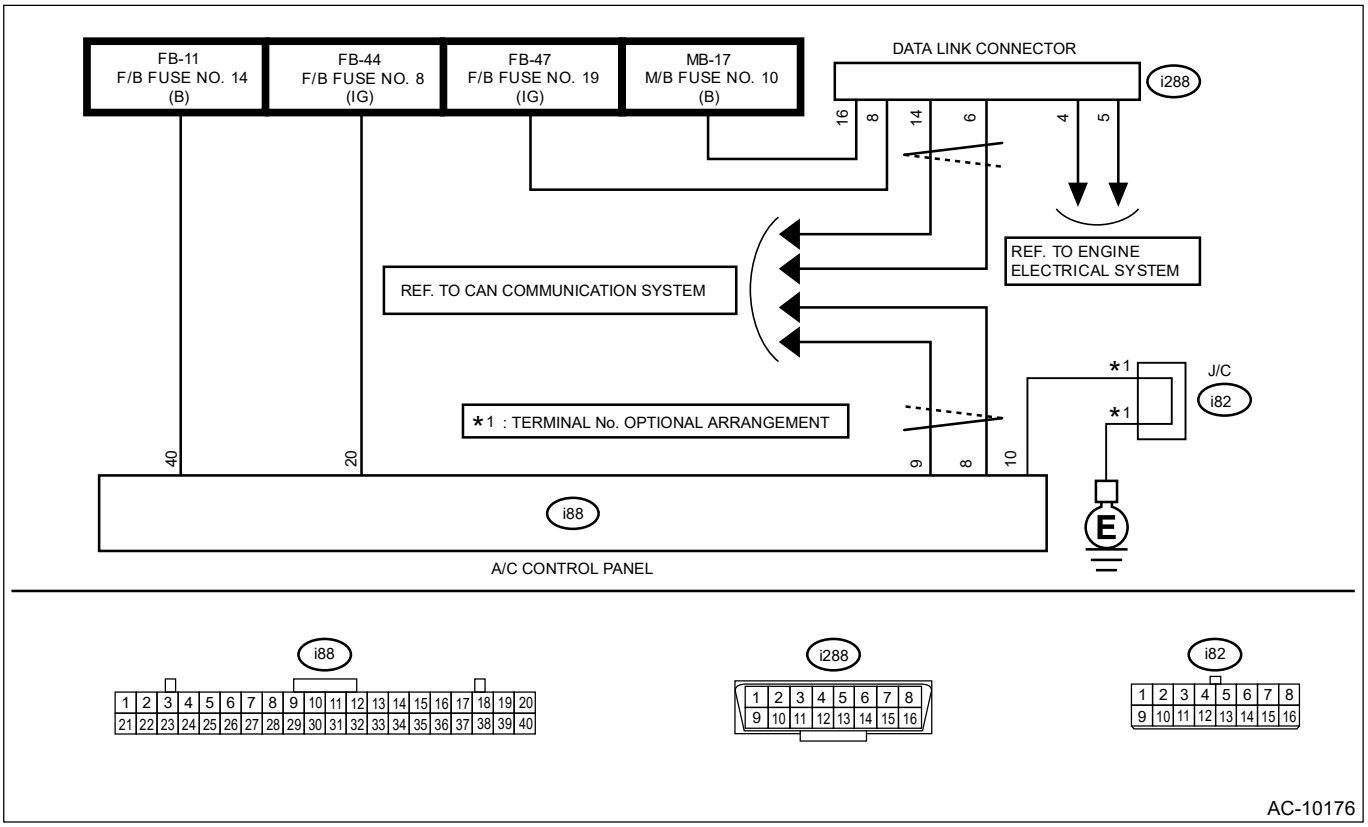
Cannot communicate with [Air Conditioner].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

WIRING DIAGRAM:

- Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY CIRCUIT.

Connect DST-i to data link connector.

Does DST-i turn ON?

Yes	Go to 4.
No	Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 8 (+) — Chassis ground (−):
   (i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the power supply circuit. **Note:** **In this case, repair the following item:** • **Open or ground short circuit of harness between battery and data link connector** • **Blown out of fuse (M/B No. 10, F/B No. 19)**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 4 — Chassis ground:
   (i288) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, go to 4.
No	Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and perform communication between the Subaru Select Monitor and vehicle.

Is communication possible?

Yes	Go to 5.
No	Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Repair it according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check poor contact of A/C control panel connector and data link connector.

Is the check result OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuses No. 8 and No. 14 from main fuse box.
3. Check the fuse.

Is the check result OK?

Yes	Go to 8.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the A/C control panel and fuse.

8. CHECK A/C CONTROL PANEL POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the A/C control panel connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between A/C control panel connector and chassis ground.

Connector & terminal

(i88) No. 20 (+) — Chassis ground (−):

(i88) No. 40 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 9.
No	Check for open or short circuit in the harness between A/C control panel and fuse.

9. CHECK A/C CONTROL PANEL GROUND CIRCUIT (OPEN).

Measure the resistance of harness between A/C control panel and chassis ground.

Connector & terminal

(i88) No. 10 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
In-vehicle Sensor Temperature	Display the in-vehicle sensor value.	-72.47 — 193.82 °C	—
Refrigerant Pressure	Display the pressure sensor value.	0 — 3.29 Mpa	With variable compressor
Refrigerant Flow	Display the flow sensor value.	0 — 327.67 kg/h	With variable compressor
Quantity of Sunload	Display the sunload sensor value.	0 — 4448 W/m^2	—
Heater Water Temperature	Display the engine coolant temperature. (CAN information)	−40.00 — 214 °C	—
Heater Control Panel Setting Value (Driver's)	Display the set temperature of the A/C control panel on driver's seat side.	15 — 90	—
Heater Control Panel Setting Value (Passenger's)	Display the set temperature of the A/C control panel on passenger's seat side.	15 — 90	With left/right independent air conditioning function
Blower outlet request temperature (Driver's)	Display the inner set value of the A/C control panel.	−327.68 — 327.67 °C	—
Blower outlet request temperature (Passenger's)	Display the inner set value of the A/C control panel.	−327.68 — 327.67 °C	With left/right independent air conditioning function
Air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator position information.	−32.68 — 133.33 %	—
Air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function

Item	Contents	Standard/Unit	Note
Mode Door Actuator Position	Display the mode door actuator position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position	Display the intake door actuator position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (driver's side)	Display the driver’s seat air mix door actuator target position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (passenger's side)	Display the passenger’s seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function
Mode Door Actuator Position Target	Display the mode door actuator target position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position Target	Display the intake door actuator target position information.	−32.68 — 133.33 %	—
Blower Fan Level	Display the blower fan motor speed level.	0 — 255	—
Ambient Air Temperature	Display the ambient sensor value. (CAN information)	-40 — 80 °C	—
Compressor operation status	Display the operation status of the compressor.	OFF / ON	—
Blower Fan Operating Condition	Display the operation status of the blower fan.	MANU/AUTO	—
A/C Operating Condition	Display the operation status of the compressor.	MANU/AUTO	—
Fresh/Recircle Air Operating Condition	Display the operation status of the FRESH/RECIRC.	MANU/AUTO	—
Mode Operating Condition	Display the operation status of the blow vents.	MANU/AUTO	—
Rear Defogger	Display the operation status of the rear defogger switch.	OFF / ON	—

Item	Contents	Standard/Unit	Note
Engine Speed	Display the engine speed. (CAN information)	0 — 32767 rpm	—
Vehicle Speed Sensor	Display the vehicle speed. (CAN information)	0 — 300 km/h	—
Evaporator Temperature	Display the evaporator sensor value.	−82.48 — 153.55 °C	—
Evaporator Temperature Target	Display the evaporator target temperature.	0 — 20 °C	—
Variable Flow Change Solenoid Duty	Display Duty value of the variable flow change solenoid valve.	0 — 100%	With variable compressor
Variable Load Compressor Torque Value	Display the estimated load torque value of the variable compressor.	0 — 100 Nm	With variable compressor
Blower outlet Door Request Temperature	Display the blow vents target temperature.	−327.68 — 327.67 °C	—
Accelerator Pedal Angle	Display the acceleration opening angle. (CAN information)	0 — 100%	—
[Request Compressor Speed during Idling]	Display the request compressor rotational speed at idling.	650 — 1425 rpm	—
Request engine speed	Display the request engine speed.	0: No Demand 1: Cooler H 2: Heater H 3: Cooler L 4: Heater L 5: Heater M 6: Heater LL	—
Discharge pressure	Display the discharging pressure from the compressor.	0 — 5 MPa	With variable compressor
Intake pressure	Display the suction pressure from the compressor.	−0.1 — 1.5 MPa	With variable compressor

AIR CONDITIONER(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Freeze Frame Data>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
In-vehicle Sensor Temperature	Display the in-vehicle sensor value.	-72.47 — 193.82 °C	—
Refrigerant Pressure	Display the pressure sensor value.	0 — 3.29 Mpa	With variable compressor
Refrigerant Flow	Display the flow sensor value.	0 — 327.67 kg/h	With variable compressor
Quantity of Sunload	Display the sunload sensor value.	0 — 4448 W/m^2	—
Heater Water Temperature	Display the engine coolant temperature. (CAN information)	−40.00 — 214 °C	—
Heater Control Panel Setting Value (Driver's)	Display the set temperature of the A/C control panel on driver's seat side.	15 — 90	—
Heater Control Panel Setting Value (Passenger's)	Display the set temperature of the A/C control panel on passenger's seat side.	15 — 90	With left/right independent air conditioning function
Blower outlet request temperature (Driver's)	Display the inner set value of the A/C control panel.	−327.68 — 327.67 °C	—
Blower outlet request temperature (Passenger's)	Display the inner set value of the A/C control panel.	−327.68 — 327.67 °C	With left/right independent air conditioning function
Air mix door actuator position (driver's side)	Display the driver's seat air mix door actuator position information.	−32.68 — 133.33 %	—
Air mix door actuator position (passenger's side)	Display the passenger's seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function

Item	Contents	Standard/Unit	Note
Mode Door Actuator Position	Display the mode door actuator position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position	Display the intake door actuator position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (driver's side)	Display the driver’s seat air mix door actuator target position information.	−32.68 — 133.33 %	—
Target air mix door actuator position (passenger's side)	Display the passenger’s seat air mix door actuator position information.	−32.68 — 133.33 %	With left/right independent air conditioning function
Mode Door Actuator Position Target	Display the mode door actuator target position information.	−32.68 — 133.33 %	—
Fresh/Recircle Air Door Actuator Position Target	Display the intake door actuator target position information.	−32.68 — 133.33 %	—
Blower Fan Level	Display the blower fan motor speed level.	0 — 255	—
Ambient Air Temperature	Display the ambient sensor value. (CAN information)	-40 — 80 °C	—
Compressor operation status	Display the operation status of the compressor.	OFF / ON	—
Blower Fan Operating Condition	Display the operation status of the blower fan.	MANU/AUTO	—
A/C Operating Condition	Display the operation status of the compressor.	MANU/AUTO	—
Fresh/Recircle Air Operating Condition	Display the operation status of the FRESH/RECIRC.	MANU/AUTO	—
Mode Operating Condition	Display the operation status of the blow vents.	MANU/AUTO	—
Rear Defogger	Display the operation status of the rear defogger switch.	OFF / ON	—

Item	Contents	Standard/Unit	Note
Engine Speed	Display the engine speed. (CAN information)	0 — 32767 rpm	—
Vehicle Speed Sensor	Display the vehicle speed. (CAN information)	0 — 300 km/h	—
Evaporator Temperature	Display the evaporator sensor value.	−82.48 — 153.55 °C	—
Evaporator Temperature Target	Display the evaporator target temperature.	0 — 20 °C	—
Variable Flow Change Solenoid Duty	Display Duty value of the variable flow change solenoid valve.	0 — 100%	With variable compressor
Variable Load Compressor Torque Value	Display the estimated load torque value of the variable compressor.	0 — 100 Nm	With variable compressor
Blower outlet Door Request Temperature	Display the blow vents target temperature.	−327.68 — 327.67 °C	—
Accelerator Pedal Angle	Display the acceleration opening angle. (CAN information)	0 — 100%	—
Request Compressor Speed during Idling	Display the request compressor rotational speed at idling.	650 — 1425 rpm	—
Request engine speed	Display the request engine speed.	0: No Demand 1: Cooler H 2: Heater H 3: Cooler L 4: Heater L 5: Heater M 6: Heater LL	—
Discharge pressure	Display the discharging pressure from the compressor.	0 — 5 MPa	With variable compressor
Intake pressure	Display the suction pressure from the compressor.	−0.1 — 1.5 MPa	With variable compressor

AIR CONDITIONER(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Air Conditioner], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on active tests, refer to the list.** **Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Active Test

LIST

Note:

If not equipped (based on area or condition), some items are not displayed.

Active test items	Range	Contents	Execution condition
In-vehicle Air Temperature setting	−72.47 — 193.82 °C	Set in-vehicle sensor readings. Adjusting the in-vehicle sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Ambient Air Temperature Setting	-40 — 80 °C	Set ambient sensor readings. Adjusting the ambient sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Quantity of Sunload Setting	0 — 4448 W/m^2	Set sunload sensor readings. Adjusting the sunload sensor value to use for A/C control is useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Heater Water Temperature Setting	-40 — 214 °C	Set coolant temperature sensor readings. Adjusting the coolant temperature sensor value to use for A/C control is useful for reproduction test in faulty events.	Engine ON

Active test items	Range	Contents	Execution condition
AUTO switch mode setting	ON	Transmit ON signal of AUTO switch contact. By operating A/C with the signal, it is possible to judge whether the control is faulty or the switch (A/C control panel) is faulty.	Ignition switch ON **Note:** **Engine ON is recommended.**
Air mix door actuator target open (driver's side)	0 — 100%	Set the driver's seat air mix door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Air mix door actuator target open (passenger's side)	0 — 100%	Set the passenger's seat air mix door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Fresh/Rec Air Dr Act Trgt Open Angle	0 — 100%	Set the intake door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Mode Door Actuator Opening Angle Target	0 — 100%	Set the mode door actuator opening angle. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** **Engine ON is recommended.**
Blower Fan Level Setting	0 — 100 **Note:** **Input up to 255 is possible, but 100 — 255 is the same.**	Set the blower fan level. Useful for reproduction test in faulty events.	Ignition switch ON **Note:** • **Engine ON is recommended.** • **Compressor OFF is needed to set the level to 0.**
A/C Change Setting	ON/OFF	Set the compressor operation request. Useful for reproduction test in faulty events. **Note:** **Active test error may occur for the protection control of the engine or compressor.**	• Engine ON • Blower ON

Active test items	Range	Contents	Execution condition
Rear Defogger Setting	ON/OFF	Transmit the rear defogger switch contact signal. By operating A/C with the signal, it is possible to judge whether the control is faulty or the switch (A/C control panel) is faulty.	Ignition switch ON **Note:** **Engine ON is recommended.**
Variable Flow Change Solenoid Duty	0 — 100%	Set Duty value of variable flow change solenoid valve. Useful for reproduction test in faulty events.	• Engine ON • Compressor ON • Blower ON

AIR CONDITIONER(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Air Conditioner], and then select [Enter].
5. On [Select Function] display, select [Customize].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on customization, refer to the list.** **Ref. to AIR CONDITIONER(DIAGNOSTICS)>Customize>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Note
Fresh/Recircle Air Door Auto Mode	AUTO	AUTO	When AUTO mode is actuated, inlet switching is also automatically operated.
		MANU	Even when AUTO mode is actuated, inlet switching is not automatically operated. (Switching can only be manually operated)
Compressor auto mode	AUTO	AUTO	When AUTO mode is actuated, compressor is also automatically operated.
		MANU	Even when AUTO mode is actuated, compressor is not automatically operated. (Switching can only be manually operated)
Setting temperature shift	0	-3	Adjust the A/C target value relative to the set temperature.
		-2	
		-1	
		0	
		+1	
		+2	
		+3	
Mode/VentII	ON	ON	When AUTO mode is operated, VENT II mode (upper wind: large, lower wind: small) is present.
		OFF	When AUTO mode is operated, VENT II mode (upper wind: large, lower wind: small) is absent.

Item	Initial setting value	Setting value	Note
Mode/All Flow	ON	ON	When AUTO mode is operated, all-flow mode (wind comes from all blower vents) is present.
		OFF	When AUTO mode is operated, all-flow mode (wind comes from all blower vents) is absent.
Mode/HeatIII	ON	ON	When AUTO mode is operated, HEAT III mode (footwell/DEF ratio is different) is present.
		OFF	When AUTO mode is operated, HEAT III mode (footwell/DEF ratio is different) is absent.
Release Max A/C by Mode Sw	ON	ON	When the mode switch is operated in MAX A/C status, MAX A/C status is deactivated.
		OFF	Even when the mode switch is operated in MAX A/C status, MAX A/C status is not deactivated.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B1430	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1430 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN.
B1431	IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1431 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT.
B1432	AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1432 AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER).
B1433	AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1433 AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER).
B1434	EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1434 EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN.
B1435	EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1435 EVAPORATOR

Code	Description & trouble part	Reference
		TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT.
B1436	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1436 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER).
B1437	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1437 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER).
B1438	MODE DOOR ACTUATOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN.
B1439	MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
B1440	AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1440 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER).
B1441	AIR MIX DOOR ACTUATOR CIRCUIT STUCK (PASSENGER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1441 AIR MIX DOOR ACTUATOR CIRCUIT STUCK (PASSENGER).
B1442	AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1442 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER).
B1443	MODE DOOR ACTUATOR CIRCUIT STUCK	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

Code	Description & trouble part	Reference
		Code (DTC)>DTC B1443 MODE DOOR ACTUATOR CIRCUIT STUCK.
B1446	AIR MIX DOOR ACTUATOR CIRCUIT STUCK (DRIVER)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1446 AIR MIX DOOR ACTUATOR CIRCUIT STUCK (DRIVER).
B14A1	SUNLOAD SENSOR CIRCUIT LOW/OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN. **Note:** **When the sunload sensor inspection is performed indoors or in the shade, it may be diagnosed as having an open circuit due to an insufficient light volume. In this case, check the sunload sensor at a location exposed to direct sunlight.**
B14A2	SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT. **Note:** **When the sunload sensor inspection is performed indoors or in the shade, it may be diagnosed as having an open circuit due to an insufficient light volume. In this case, check the sunload sensor at a location exposed to direct sunlight.**
B14A3	REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN.
B14A4	REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A4 REFRIGERANT

Code	Description & trouble part	Reference
		PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT .
B14A5	REFRIGERANT FLOW SENSOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A5 REFRIGERANT FLOW SENSOR CIRCUIT OPEN.
B14A6	REFRIGERANT FLOW SENSOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A6 REFRIGERANT FLOW SENSOR CIRCUIT SHORT-CIRCUIT .
B14A7	VARIABLE SOLENOID VALVE CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A7 VARIABLE SOLENOID VALVE CIRCUIT.
B14A8	COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A8 COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT.
B14E9	INTAKE DOOR ACTUATOR CIRCUIT OPEN	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN.
B14EA	INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
B14EB	INTAKE DOOR ACTUATOR STUCK	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.

Code	Description & trouble part	Reference
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

Code	Description & trouble part	Reference
		Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1430 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT OPEN

DTC detecting condition:

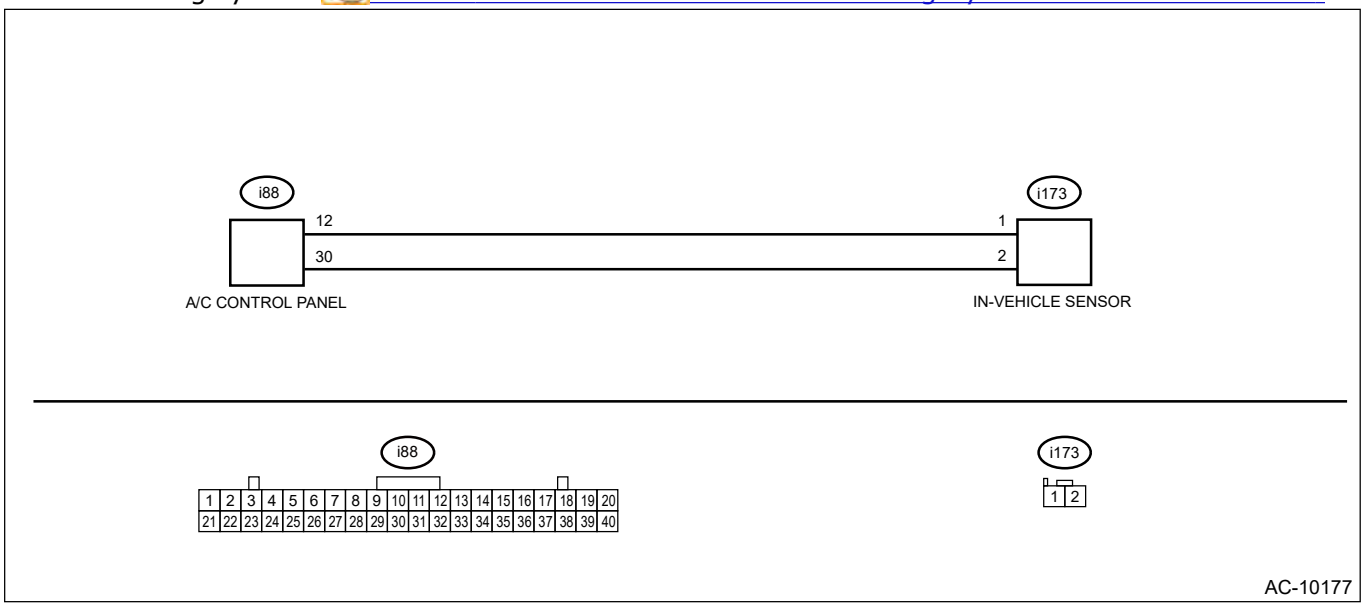
In-vehicle sensor circuit is open.

Trouble symptom:

In-vehicle air temperature is falsely recognized as 25°C (77°F), and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and in-vehicle sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1430 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK IN-VEHICLE SENSOR.

1. Disconnect the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).
2. Short the connector i173.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1431 displayed? (Current malfunction)

Yes	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in-vehicle sensor connector.
   Connector & terminal
   (i173) No. 1 (+) — (i173) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between the A/C control panel connector and in-vehicle sensor connector.
   Connector & terminal
   (i173) No. 1 — (i88) No. 12:
   (i173) No. 2 — (i88) No. 30:

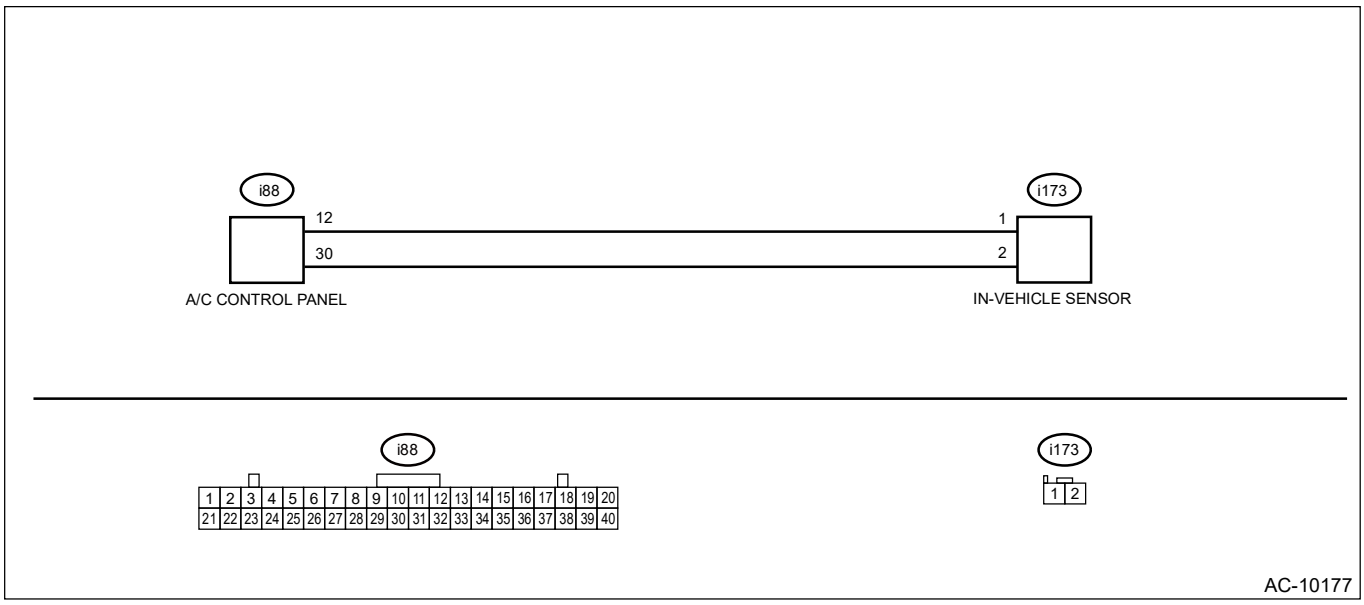
Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1431 IN-VEHICLE (POST EVAPORATOR) TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:
In-vehicle sensor circuit is shorted.
Trouble symptom:
In-vehicle air temperature is falsely recognized as 25°C (77°F), and the compartment temperature is adjusted.
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel and in-vehicle sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1431 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK IN-VEHICLE SENSOR.

1. Disconnect the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1430 displayed? (Current malfunction)

Yes	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between terminals in in-vehicle sensor connector.
   Connector & terminal
   (i173) No. 1 (+) — (i173) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between terminals in in-vehicle sensor connector.
   Connector & terminal
   (i173) No. 1 — (i173) No. 2:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1432 AMBIENT TEMPERATURE SENSOR CIRCUIT OPEN (AIR-CONDITIONER)

DTC detecting condition:

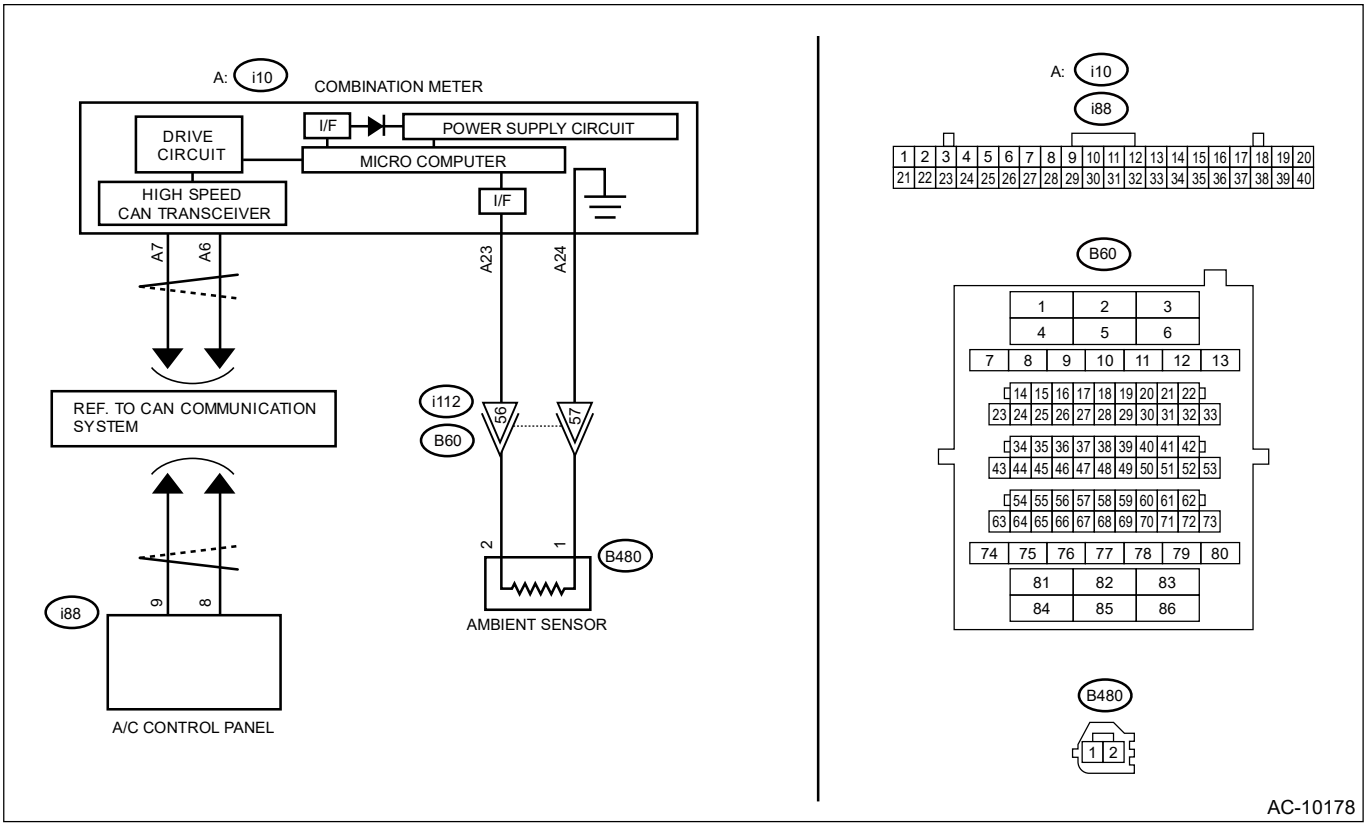
- Ambient sensor to combination meter circuit is open.
- Data to be received from the combination meter via CAN communication do not arrive.

Trouble symptom:

- Defective ambient temperature display
- Ambient temperature is falsely recognized as 25°C, (77F) and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check the connecting conditions of combination meter connector and ambient sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1432 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK AMBIENT SENSOR.

1. Disconnect the ambient sensor.
2. Short the connector B480.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1433 displayed? (Current malfunction)

Yes	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in ambient sensor connector.
   Connector & terminal
   (B480) No. 1 (+) — No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the combination meter.
2. Using a tester, check the continuity between combination meter connector and ambient sensor connector.

   Connector & terminal

   (B480) No. 1 — (i10) No. 24:

   (B480) No. 2 — (i10) No. 23:

Is there continuity?

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1433 AMBIENT TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT (AIR-CONDITIONER)

DTC detecting condition:

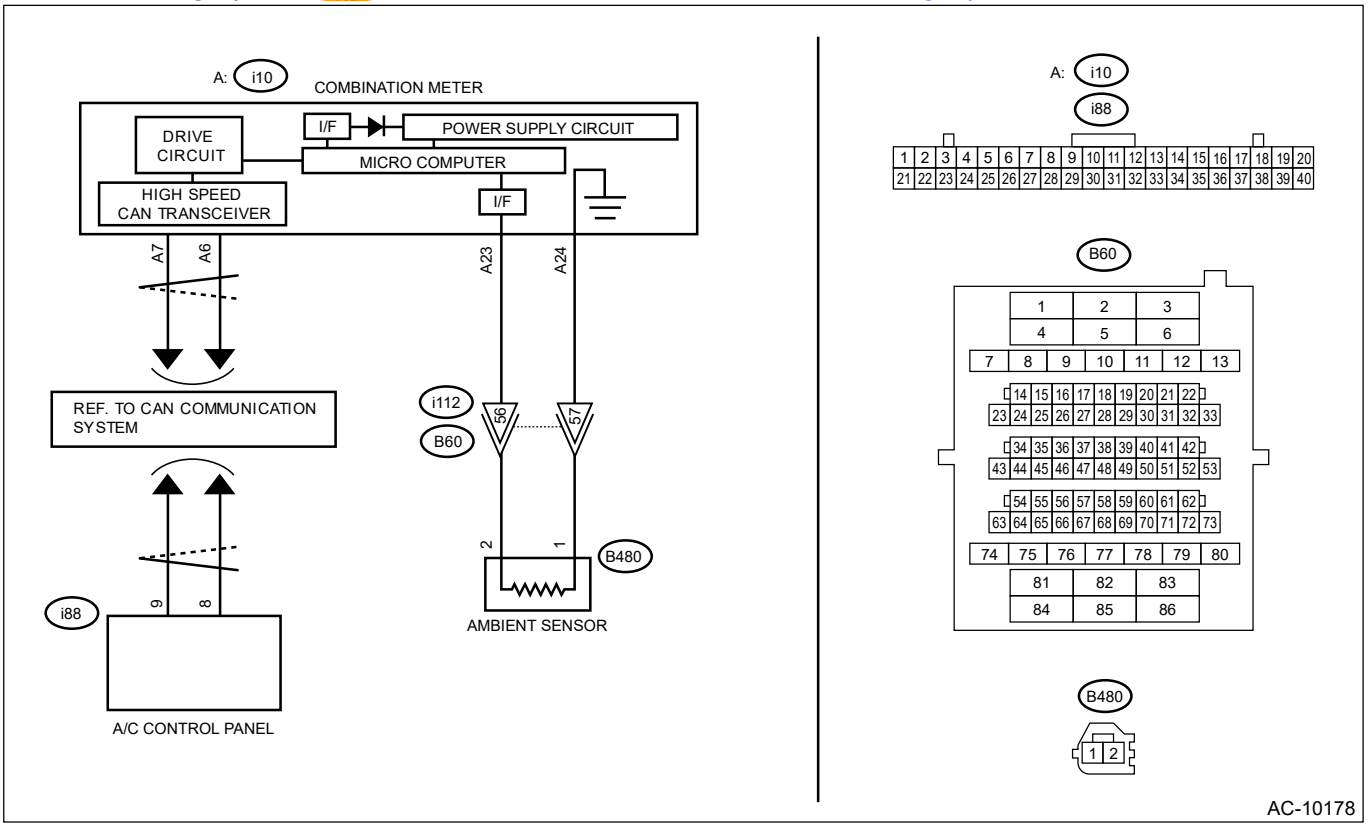
- Ambient sensor to combination meter circuit is shorted.
- Data to be received from the combination meter via CAN communication do not arrive.

Trouble symptom:

- Defective ambient temperature display
- Ambient temperature is falsely recognized as 25°C, (77F) and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check the connecting conditions of combination meter connector and ambient sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1433 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK AMBIENT SENSOR.

1. Disconnect the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1432 displayed? (Current malfunction)

Yes	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between terminals in ambient sensor connector.
   Connector & terminal
   (B480) No. 1 (+) — (B480) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the combination meter.
2. Using a tester, check the continuity between terminals in ambient sensor connector.
   Connector & terminal
   (B480) No. 1 — (B480) No. 2:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1434 EVAPORATOR TEMPERATURE SENSOR CIRCUIT OPEN

DTC detecting condition:

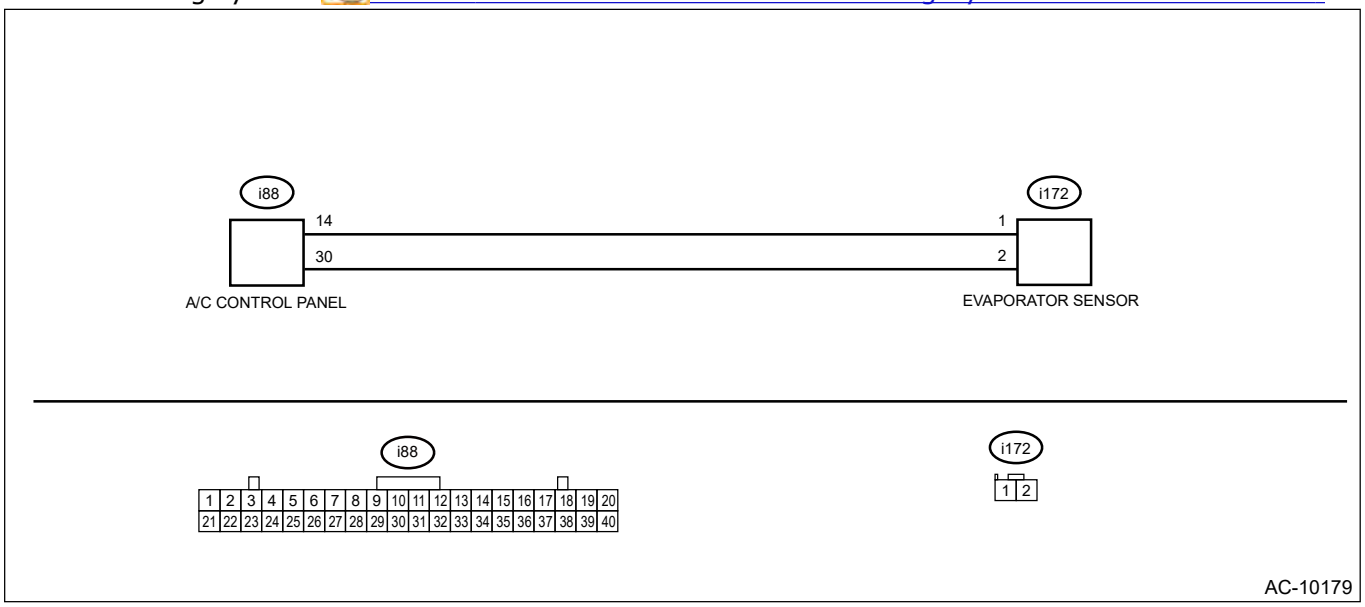
Evaporator sensor circuit is open.

Trouble symptom:

- Compressor does not operate.
- Evaporator temperature is falsely recognized as low, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and evaporator sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1434 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK EVAPORATOR SENSOR.

1. Disconnect the evaporator sensor.
2. Short the i172 connector.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1435 displayed? (Current malfunction)

Yes	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in evaporator sensor connector.
   Connector & terminal
   (i172) No. 1 (+) — (i172) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and evaporator sensor connector terminals.
   Connector & terminal
   (i172) No. 1 — (i88) No. 14:
   (I172) No. 2 — (i88) No. 30:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1435 EVAPORATOR TEMPERATURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

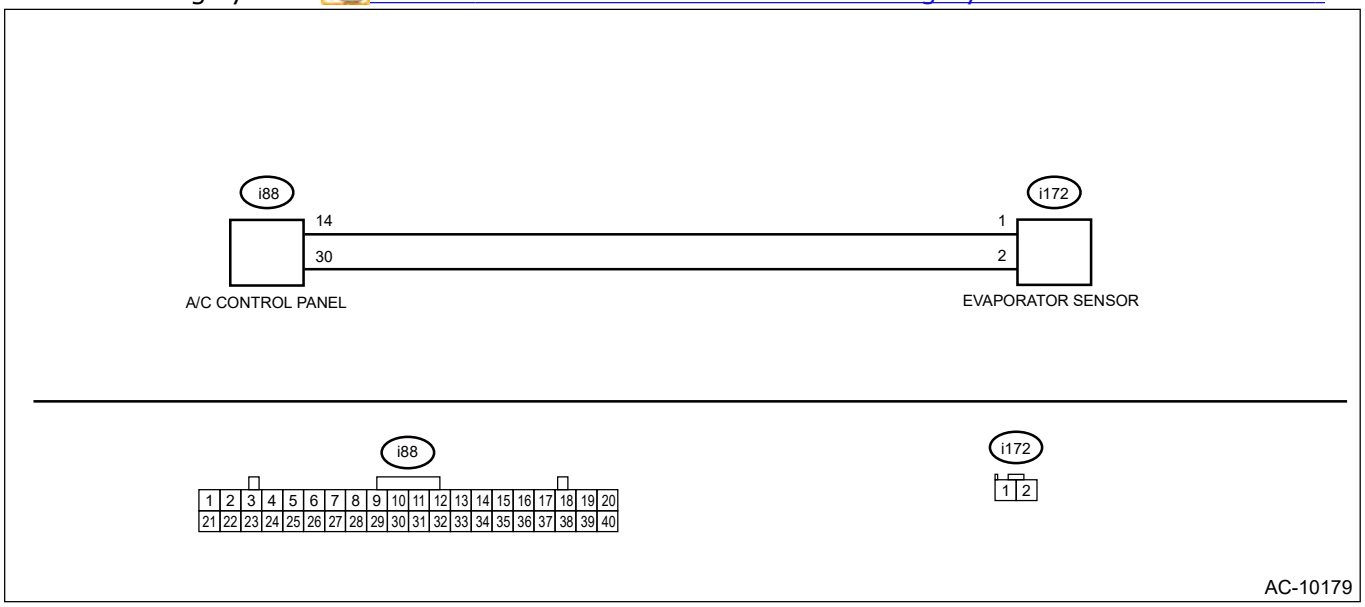
Evaporator sensor circuit is shorted.

Trouble symptom:

- Compressor does not operate. (Variable compressor)
- Evaporator temperature is falsely recognized as low, and the compartment temperature is adjusted.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and evaporator sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1435 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK EVAPORATOR SENSOR.

1. Disconnect the evaporator sensor.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1434 displayed? (Current malfunction)

Yes	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between terminals in evaporator sensor connector.
   Connector & terminal
   (i172) No. 1 (+) — (i172) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between terminals in evaporator sensor connector.
   Connector & terminal
   (i172) No. 1 — (i172) No. 2:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1436 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (PASSENGER)

DTC detecting condition:

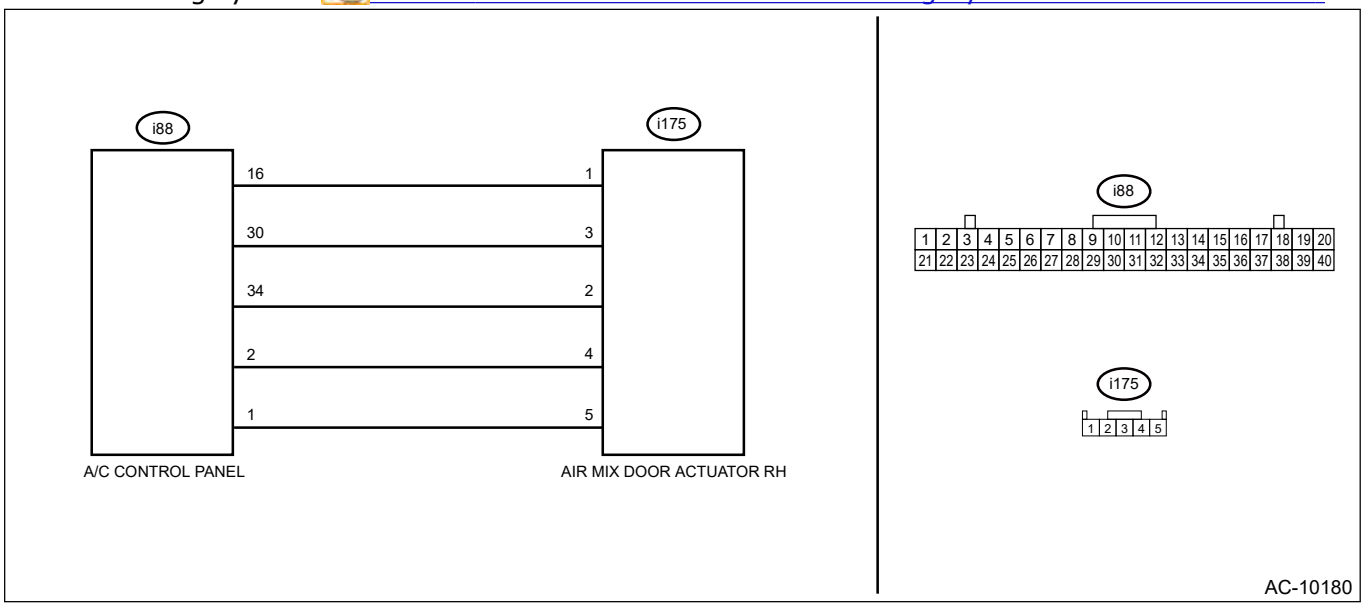
Air mix door actuator potentiometer circuit is open.

Trouble symptom:

Temperature of the passenger’s side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator RH connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1436 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Disconnect the air mix door actuator RH.
2. Short No. 2 and No. 3 of connector i175.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1437 displayed? (Current malfunction)

Yes	Replace the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Measure the voltage between air mix door actuator RH connector terminals using a tester.
   Connector & terminal
   (i175) No. 1 (+) — (i175) No. 3 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and air mix door actuator RH connector terminals.
   Connector & terminal
   (i175) No. 1 — (i88) No. 16:
   (i175) No. 2 — (i88) No. 34:
   (i175) No. 3 — (i88) No. 30:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1437 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (PASSENGER)

DTC detecting condition:

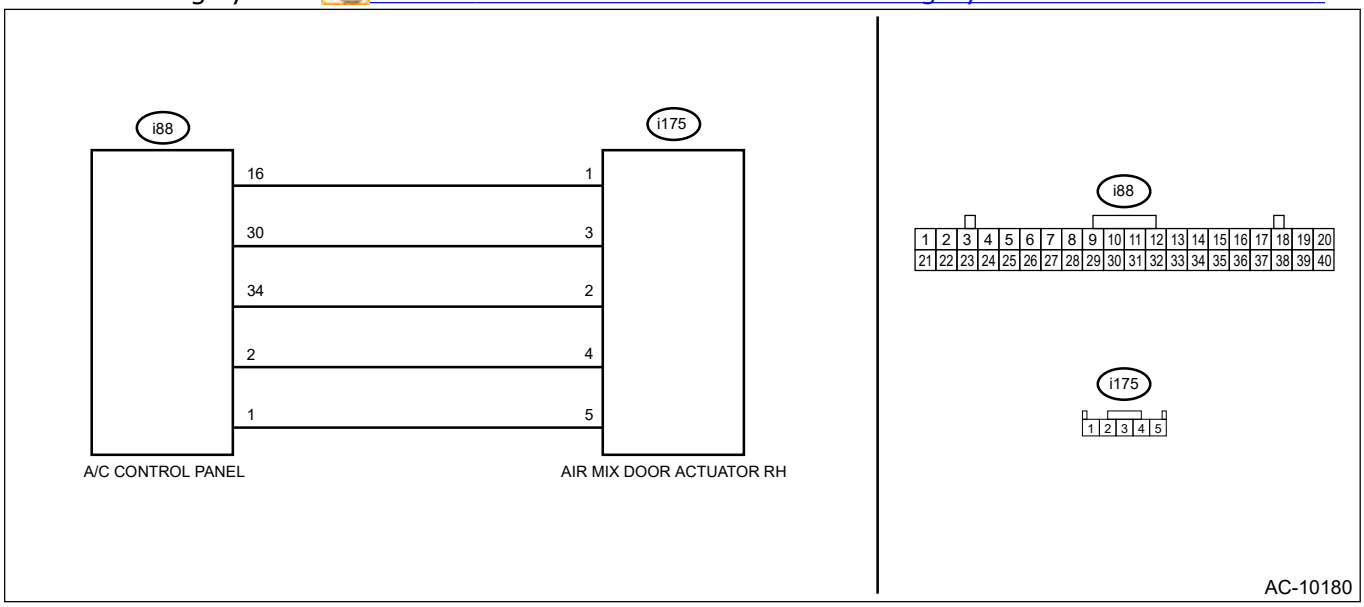
Air mix door actuator potentiometer circuit is shorted.

Trouble symptom:

Temperature of the passenger’s side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator RH connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1437 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Disconnect the air mix door actuator RH.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1436 displayed? (Current malfunction)

Yes	Replace the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between air mix door actuator RH connector terminals using a tester.
   Connector & terminal
   (i175) No. 1 (+) — (i175) No. 3 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between terminals in air mix door actuator RH connector and between air mix door actuator RH connector and chassis ground.
   Connector & terminal
   (i175) No. 2 — (i175) No. 3:
   (i175) No. 2 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN

DTC detecting condition:

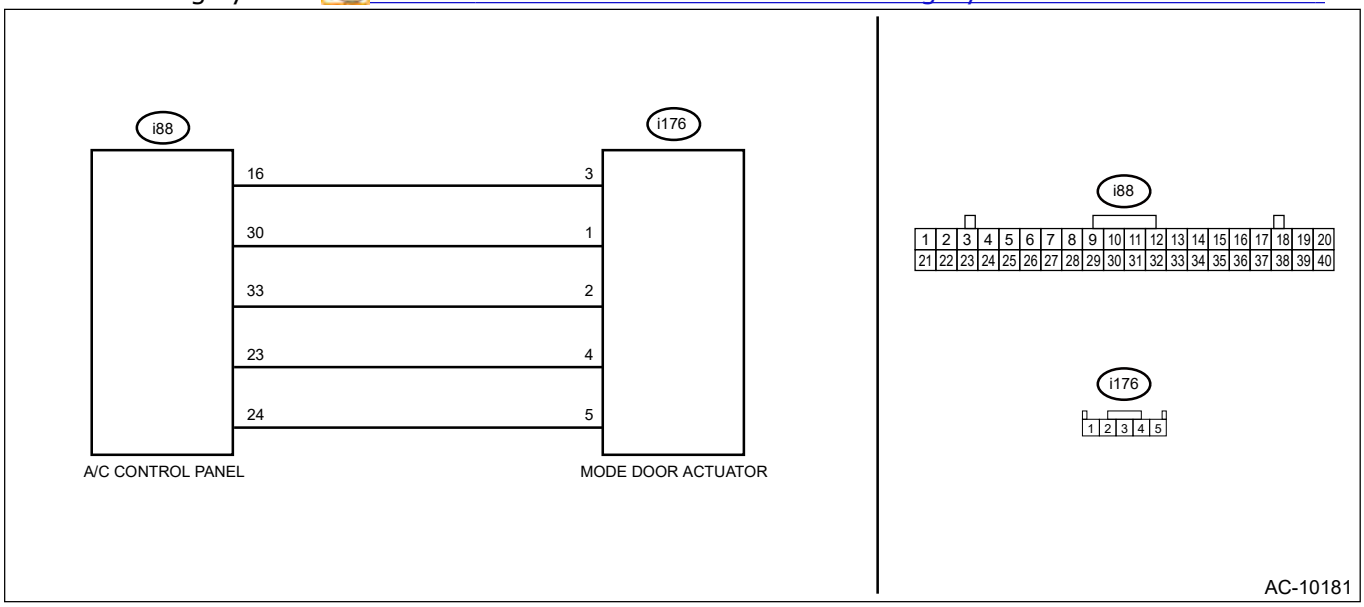
Mode door actuator potentiometer circuit is open.

Trouble symptom:

Vent does not change.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and mode door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1438 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Disconnect the mode door actuator.
2. Short No. 1 and No. 2 of (i176) connector.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1439 displayed? (Current malfunction)

Yes	Replace the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Measure the voltage between mode door actuator connector terminals using a tester.
   Connector & terminal
   (i176) No. 3 (+) — (i176) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and mode door actuator connector terminals.
   Connector & terminal
   (i176) No. 1 — (i88) No. 30:
   (i176) No. 2 — (i88) No. 33:
   (i176) No. 3 — (i88) No. 16

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

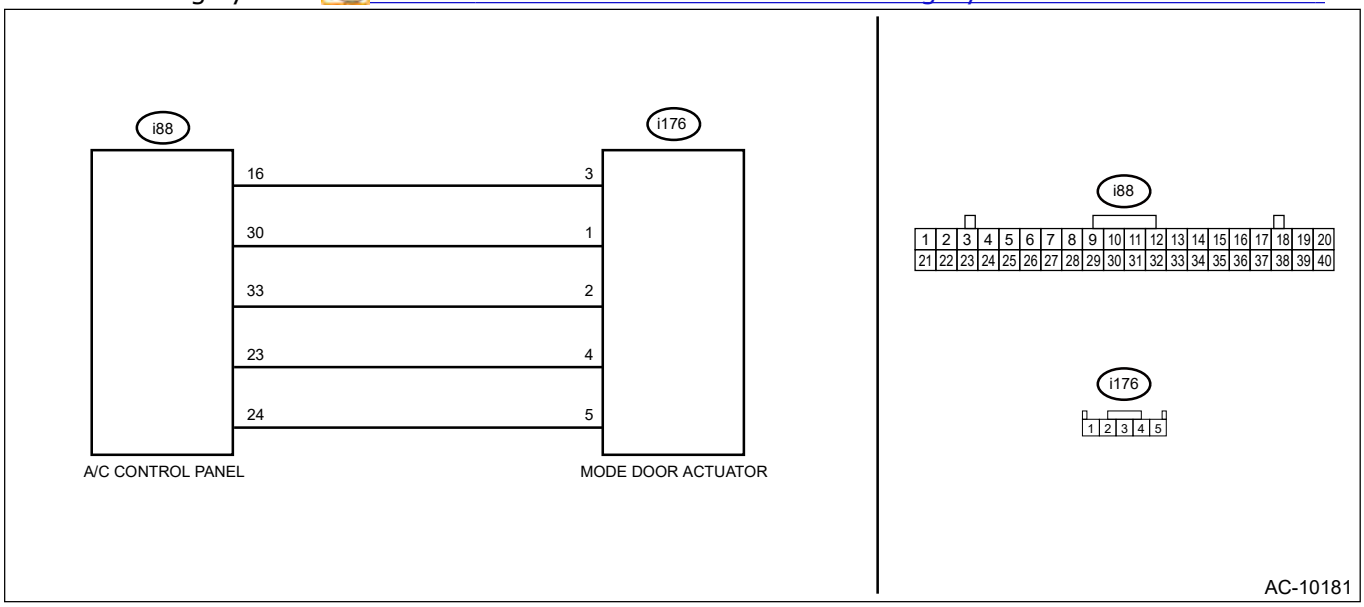
Mode door actuator potentiometer circuit is shorted.

Trouble symptom:

Vent does not change.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and mode door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1439 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Disconnect the connector from the mode door actuator.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1438 displayed? (Current malfunction)

Yes	Replace the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.
No	Go to 3.

3. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between terminals in mode door actuator connector and between mode door actuator connector and chassis ground.

Connector & terminal

(i176) No. 2 — (i176) No. 1:

(i176) No. 2 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1440 AIR MIX DOOR ACTUATOR CIRCUIT OPEN (DRIVER)

DTC detecting condition:

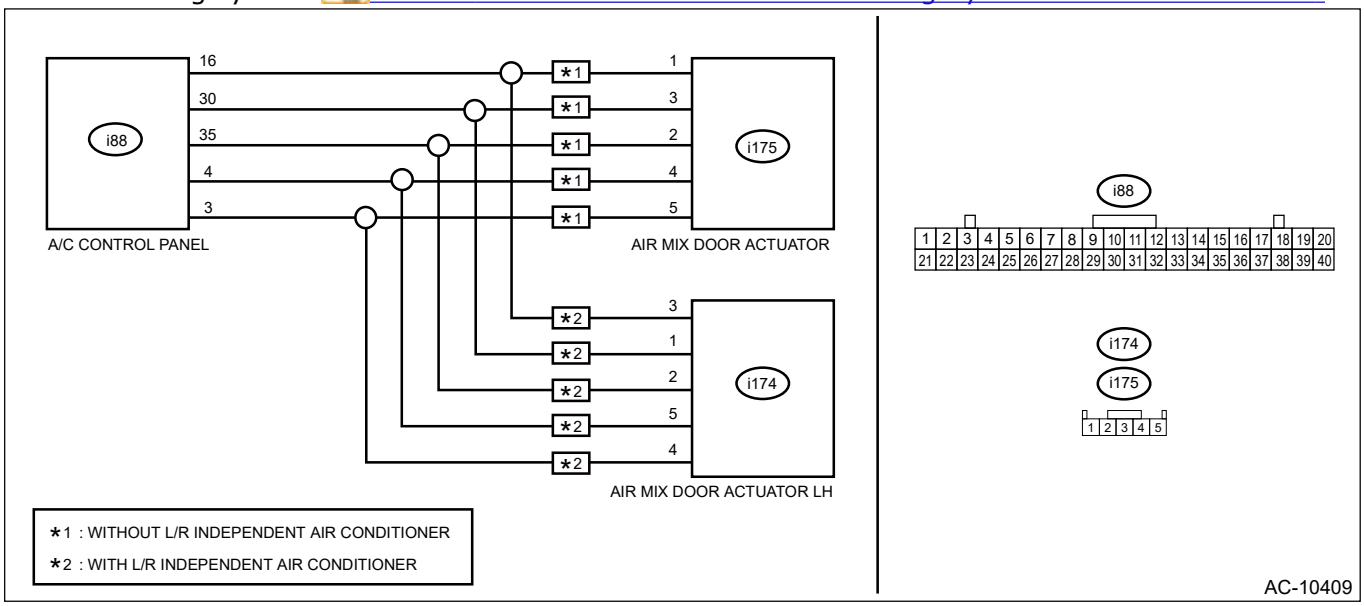
Air mix door actuator potentiometer circuit is open.

Trouble symptom:

- Temperature cannot be adjusted for model without left/right independent air conditioner.
- Temperature of the driver's side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator LH connector (with left/right independent air conditioner) or air mix door actuator connector (without left/right independent air conditioner).
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Disconnect the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function).
2. For model with left/right independent air conditioner, short No. 2 and No. 1 of connector i174. For model without left/right independent air conditioner, short No. 2 and No. 3 of connector i175.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1442 displayed? (Current malfunction)

Yes	Replace the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in the air mix door actuator LH connector (with left/right independent air conditioning function) or air mix door actuator connector (without left/right independent air conditioning function).
   Connector & terminal
   With left/right independent air conditioning function
   (i174) No. 3 (+) — (i174) No. 1 (−):
   Without left/right independent air conditioning function
   (i175) No. 1 (+) — (i175) No. 3 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator connector (without left/right independent air conditioning function) terminals.
   Connector & terminal
   With left/right independent air conditioning function
   (i174) No. 3 — (i88) No. 16:
   (i174) No. 1 — (i88) No. 30:
   (i174) No. 2 — (i88) No. 35:
   Without left/right independent air conditioning function
   (i175) No. 1 — (i88) No. 16:
   (i175) No. 3 — (i88) No. 30:
   (i175) No. 2 — (i88) No. 35:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1441 AIR MIX DOOR ACTUATOR CIRCUIT STUCK (PASSENGER)

DTC detecting condition:

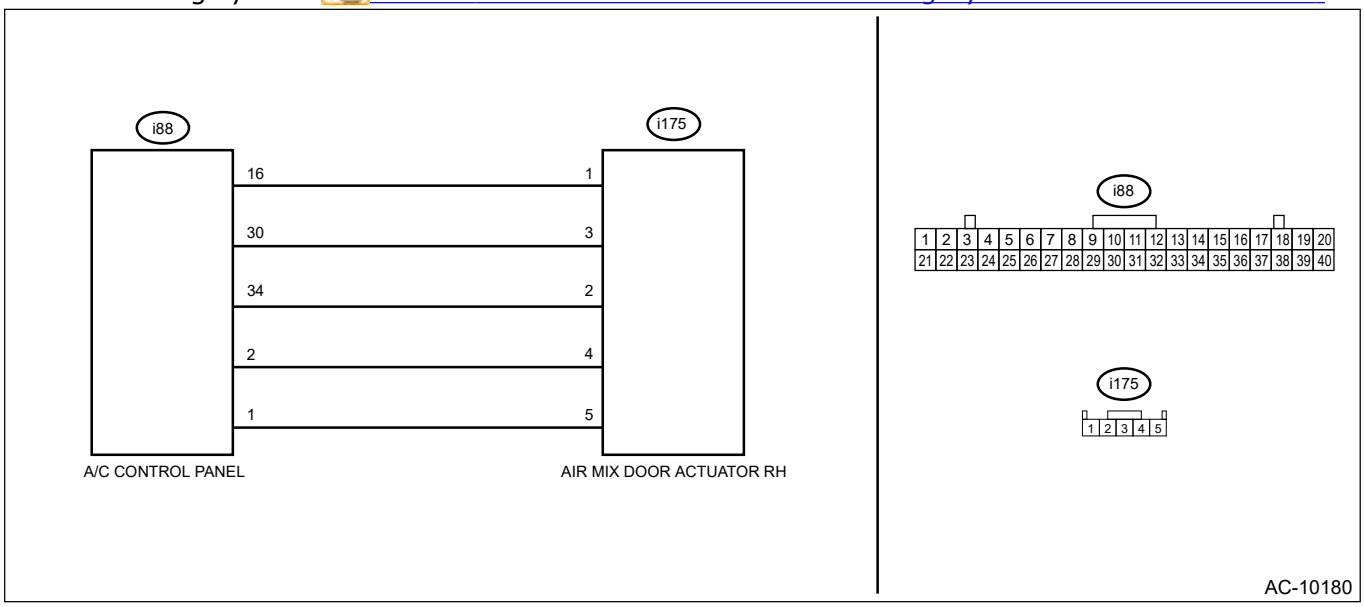
Air mix door actuator is locked.

Trouble symptom:

Temperature of the passenger’s side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator RH connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1441 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test.

- [Air mix door actuator target open (passenger's side)]

Did the actuator move to the specified target opening angle?

Yes	Air mix door actuator circuit is normal.
No	Go to 3.

3. CHECK HARNESS.

1. Disconnect the air mix door actuator RH connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between air mix door actuator RH connector terminals using a tester.
   Connector & terminal
   (i175) No. 1 (+) — (i175) No. 3 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open, short circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and air mix door actuator RH connector terminals.
   Connector & terminal
   (i175) No. 1 — (i88) No. 16:
   (i175) No. 3 — (i88) No. 30:
   (i175) No. 2 — (i88) No. 34:
   (i175) No. 4 — (i88) No. 2:
   (i175) No. 5 — (i88) No. 1:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK AIR MIX DOOR ACTUATOR RH.

Check the air mix door actuator RH parts. Ref. to AIR CONDITIONER>Air Mix Door Actuator.

Is the air mix door actuator RH normal?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the air mix door actuator RH. Ref. to AIR CONDITIONER>Air Mix Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1442 AIR MIX DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT (DRIVER)

DTC detecting condition:

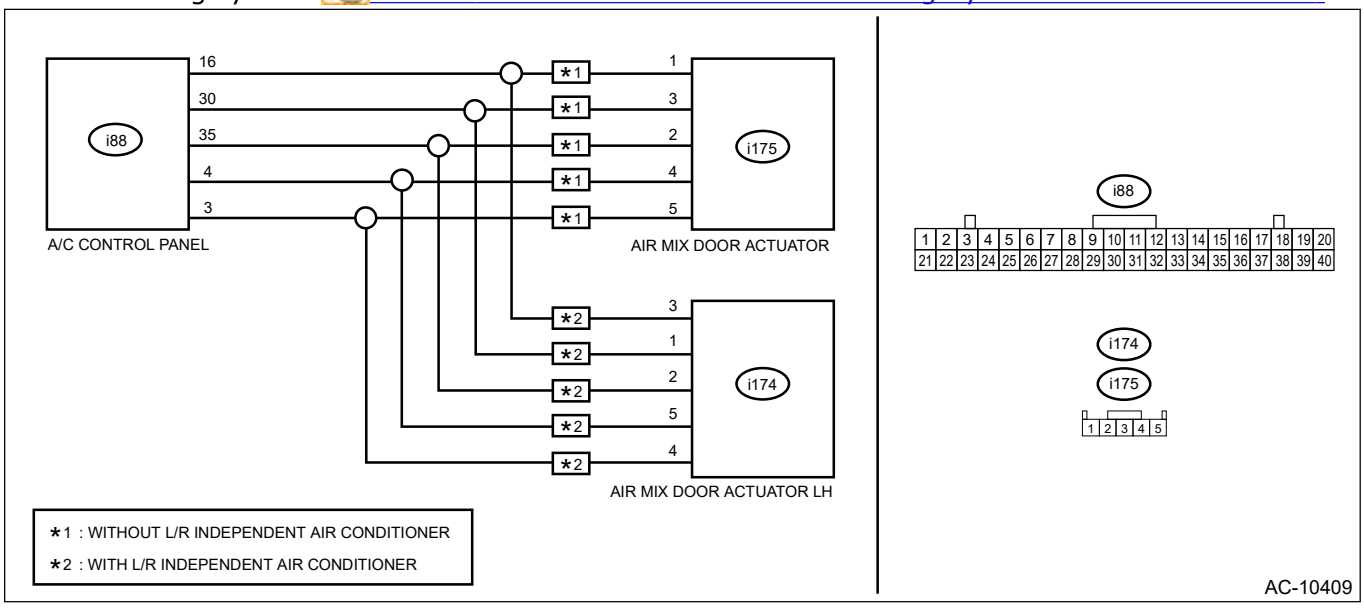
Air mix door actuator potentiometer circuit is shorted.

Trouble symptom:

- Temperature cannot be adjusted for model without left/right independent air conditioner.
- Temperature of the driver’s side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator LH connector (with left/right independent air conditioner) or air mix door actuator connector (without left/right independent air conditioner).
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1442 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK AIR MIX DOOR ACTUATOR LH.

1. Disconnect the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function).
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440 displayed? (Current malfunction)

Yes	Replace the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.
No	Go to 3.

3. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Disconnect the connector from the A/C control panel.
2. For model with left/right independent air conditioner, check the continuity between terminals in air mix door actuator LH connector and between air mix door actuator LH connector and chassis ground using a tester. For model without left/right independent air conditioner, check the continuity between terminals in air mix door actuator connector and between air mix door actuator connector and chassis ground.

Connector & terminal

With left/right independent air conditioning function

(i174) No. 2 — (i174) No. 1:

(i174) No. 2 — Chassis ground:

Without left/right independent air conditioning function

(i175) No. 2 — (i175) No. 3:

(i175) No. 2 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1443 MODE DOOR ACTUATOR CIRCUIT STUCK

DTC detecting condition:

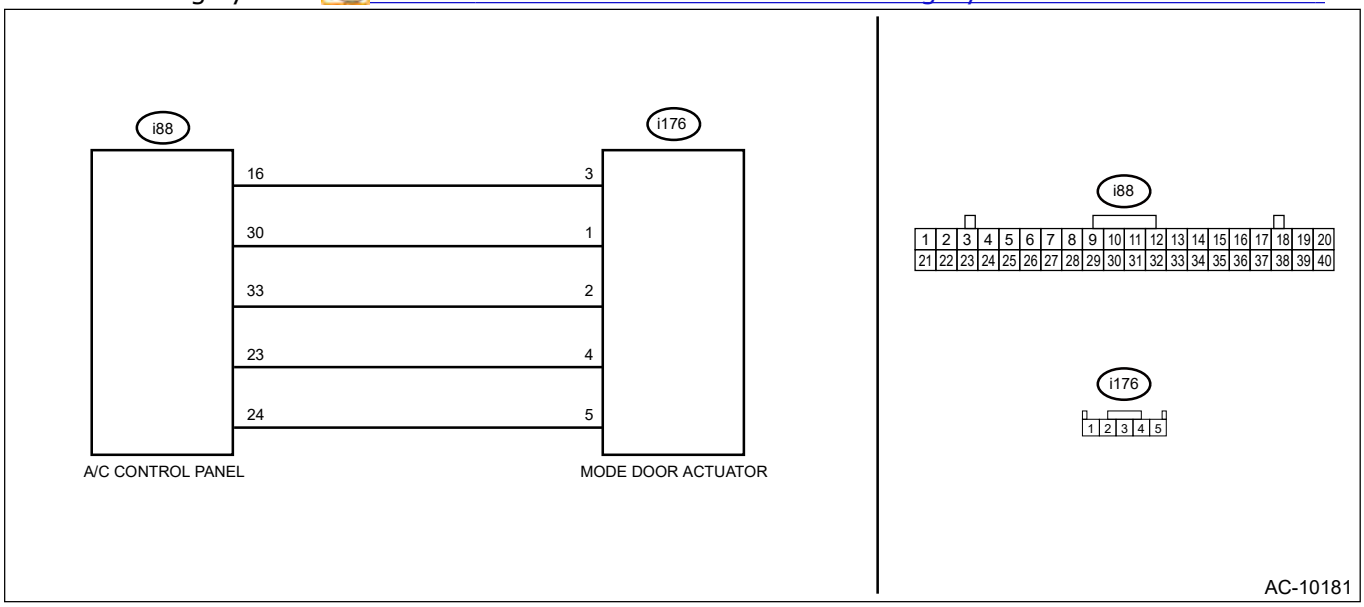
Mode door actuator is locked.

Trouble symptom:

Vent does not change.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and mode door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1443 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test.

- [Mode Door Actuator Opening Angle Target]

Did the mode door actuator move to the specified target opening angle?

Yes	Mode door actuator circuit is normal.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between mode door actuator connector terminals using a tester.
   Connector & terminal
   (i176) No. 3 (+) — (i176) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open, short circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and mode door actuator connector terminals.
   Connector & terminal
   (i176) No. 3 — (i88) No. 16:
   (i176) No. 1 — (i88) No. 30:
   (i176) No. 2 — (i88) No. 33:
   (i176) No. 4 — (i88) No. 23:
   (i176) No. 5 — (i88) No. 24:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK MODE DOOR ACTUATOR.

Check the mode door actuator parts. Ref. to AIR CONDITIONER>Mode Door Actuator.

Is the mode door actuator OK?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the mode door actuator. Ref. to AIR CONDITIONER>Mode Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1446 AIR MIX DOOR ACTUATOR CIRCUIT STUCK (DRIVER)

DTC detecting condition:

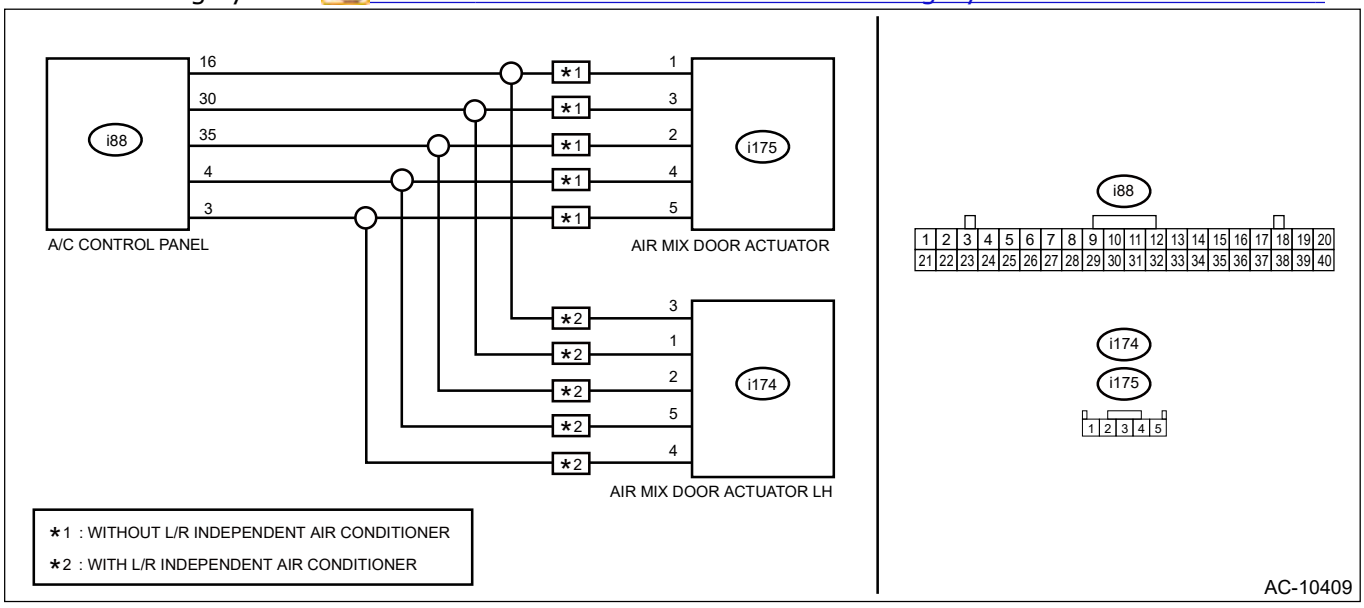
- Air mix door actuator is locked.
- The potentiometer value of the actuator does not change.

Trouble symptom:

- Temperature cannot be adjusted for model without left/right independent air conditioner.
- Temperature of the driver’s side cannot be adjusted for model with left/right independent air conditioner.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and air mix door actuator LH connector (with left/right independent air conditioner) or air mix door actuator connector (without left/right independent air conditioner).
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1446 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test.

- [Air mix door actuator target open (driver's side)]

Does the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function) move to the set target opening angle?

Yes	The circuit of the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function) is normal.
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between terminals in the air mix door actuator LH connector (with left/right independent air conditioning function) or air mix door actuator connector (without left/right independent air conditioning function).

Connector & terminal

With left/right independent air conditioning function

(i174) No. 3 (+) — (i174) No. 1 (−):

Without left/right independent air conditioning function

(i175) No. 1 (+) — (i175) No. 3 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open, short circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator connector (without left/right independent air conditioning function) terminals.

Connector & terminal

With left/right independent air conditioning function

(i174) No. 3 — (i88) No. 16:
(i174) No. 1 — (i88) No. 30:
(i174) No. 2 — (i88) No. 35:
(i174) No. 5 — (i88) No. 4:
(i174) No. 4 — (i88) No. 3:

Without left/right independent air conditioning function

(i175) No. 1 — (i88) No. 16:
(i175) No. 3 — (i88) No. 30:
(i175) No. 2 — (i88) No. 35:
(i175) No. 4 — (i88) No. 4:
(i175) No. 5 — (i88) No. 3:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK AIR MIX DOOR ACTUATOR LH.

Check the parts of the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.

Is the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function) normal?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the air mix door actuator LH (with left/right independent air conditioning function) or air mix door actuator (without left/right independent air conditioning function). Ref. to AIR CONDITIONER>Air Mix Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A1 SUNLOAD SENSOR CIRCUIT LOW/OPEN

DTC detecting condition:

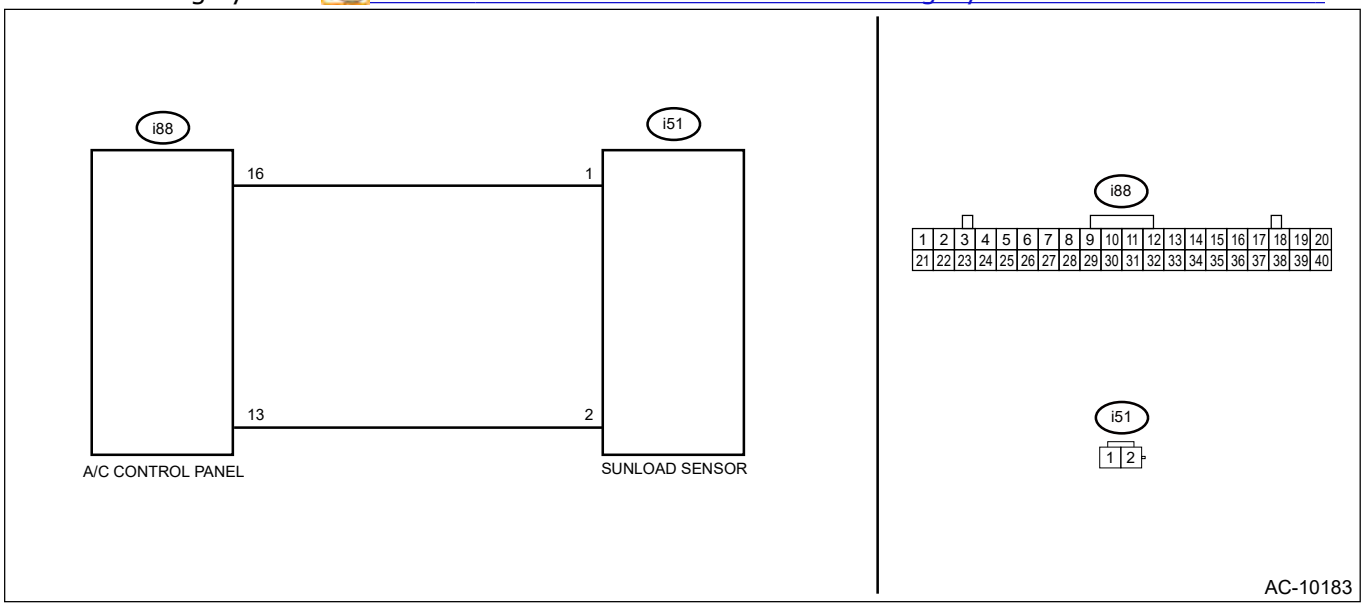
Open circuit in the sunload sensor is detected for 3 seconds or more. (Displayed for current malfunction)

Trouble symptom:

Operation is performed as no sunload.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Note:

When the sunload sensor check is performed indoors or in the shade, it could be diagnosed as having an open circuit. Always check the sunload sensor in direct sunlight.

1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and sunload sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A1 displayed?

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SUNLOAD SENSOR.

1. Disconnect the sunload sensor.
2. Short the connector.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A2 displayed?

Yes	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in sunload sensor connector.
   Connector & terminal
   (i51) No. 1 (+) — No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between sunload sensor and A/C control panel connector terminals.
   Connector & terminal
   (i51) No. 1 — (i88) No. 16:
   (i51) No. 2 — (i88) No. 13:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A2 SUNLOAD SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

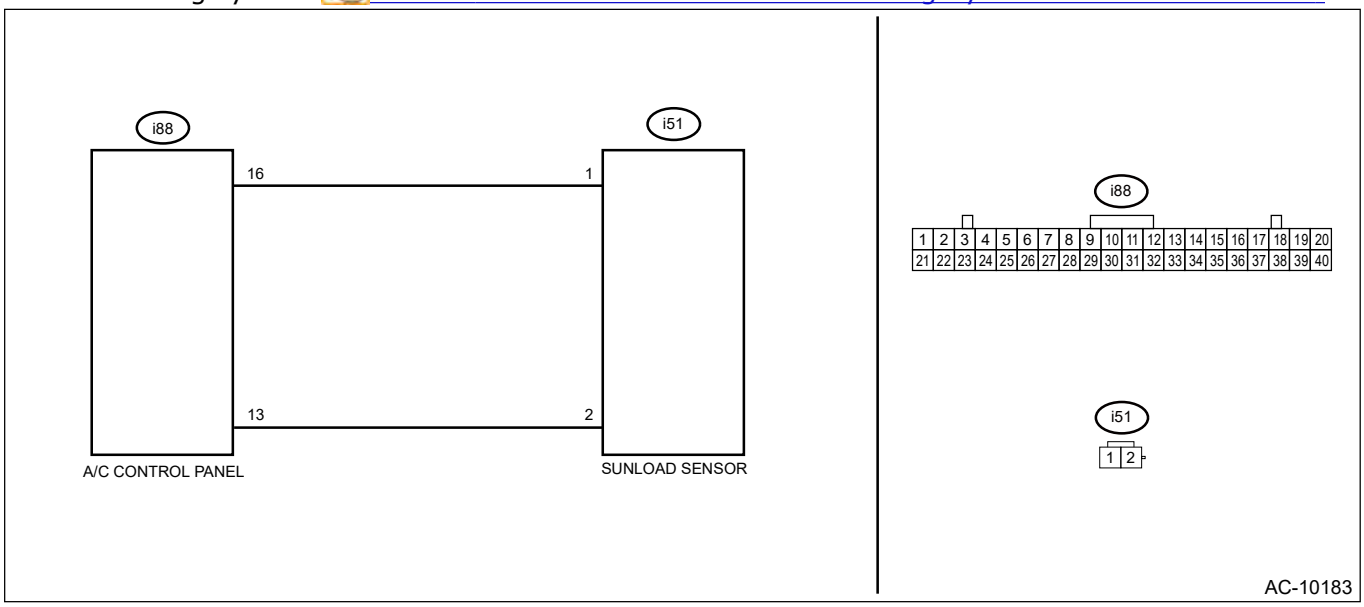
Short circuit in the sunload sensor is detected for 3 seconds or more.

Trouble symptom:

Operation is performed as no sunload.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and sunload sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B14A2 displayed?

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SUNLOAD SENSOR.

1. Disconnect the sunload sensor.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A1 displayed?

Yes	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).
No	Go to 3.

3. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between terminals in sunload sensor connector.
   Connector & terminal
   (i51) No. 1 (+) — (i51) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Check the connection of the sunload sensor circuit.
No	Go to 4.

4. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between terminals in sunload sensor connector.
   Connector & terminal
   (i51) No. 1 — (i51) No. 2:

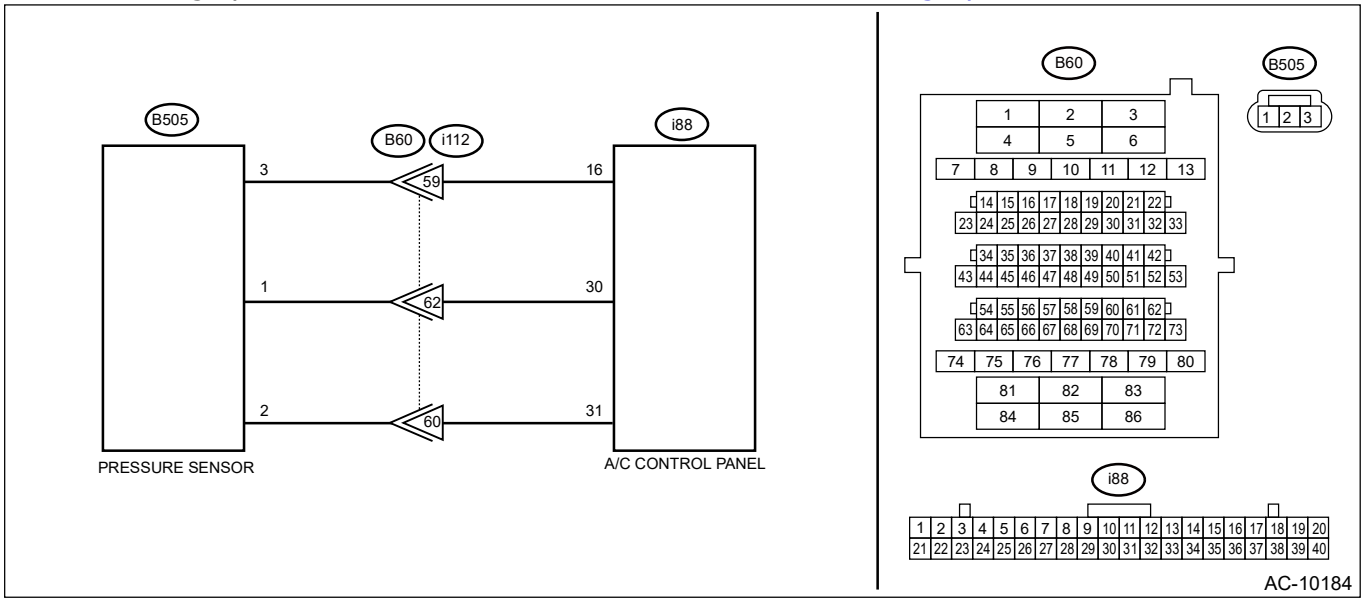
Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN

DTC detecting condition:
Refrigerant pressure sensor circuit is open.
Trouble symptom:
Compressor does not operate. (Variable compressor)
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector, refrigerant pressure sensor connector and coupling connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A3 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK PRESSURE SENSOR.

1. Disconnect the refrigerant pressure sensor.
2. Short No. 1 and No. 2 of connector B505.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A4 displayed? (Current malfunction)

Yes	Replace the refrigerant pressure sensor. Ref. to AIR CONDITIONER>Pressure Sensor.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in refrigerant pressure sensor connector.

Connector & terminal

(B505) No. 3 (+) — (B505) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and refrigerant pressure sensor connector terminals.

Connector & terminal

(B505) No. 1 — (i88) No. 30:
(B505) No. 2 — (i88) No. 31:
(B505) No. 3 — (i88) No. 16:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A4 REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

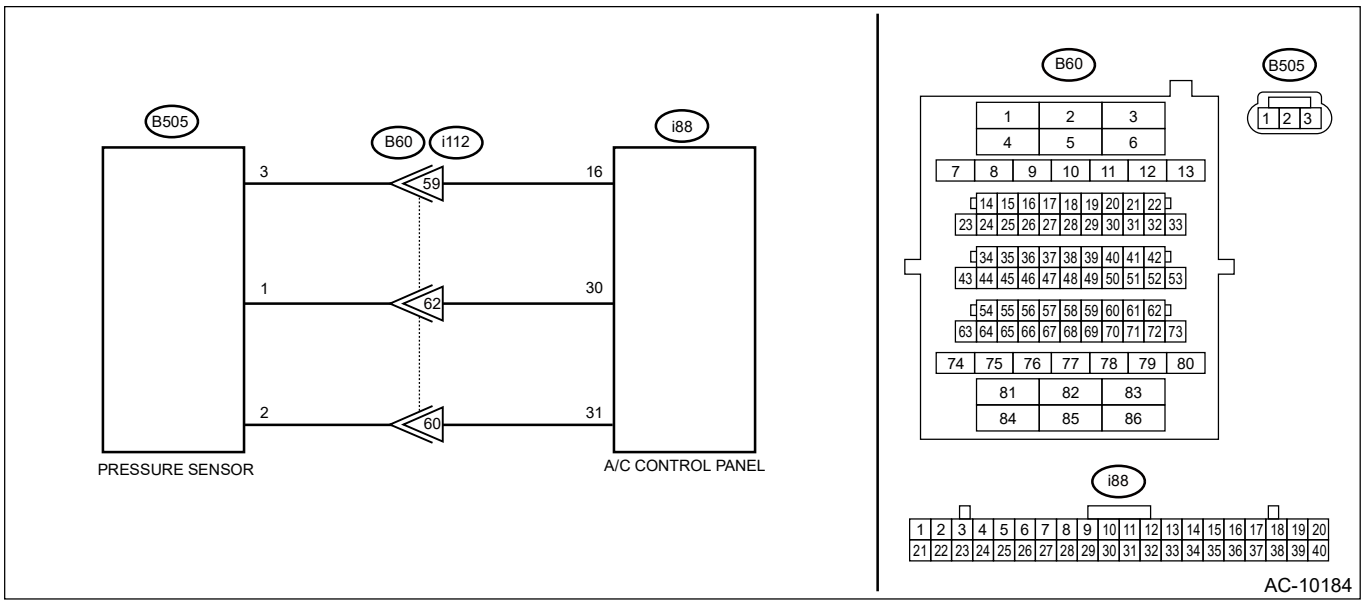
Refrigerant pressure sensor circuit is shorted.

Trouble symptom:

Compressor does not operate. (Variable compressor)

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector, refrigerant pressure sensor connector and coupling connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B14A4 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK REFRIGERANT PRESSURE SENSOR.

1. Disconnect the refrigerant pressure sensor.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A3 displayed? (Current malfunction)

Yes	Replace the refrigerant pressure sensor. Ref. to AIR CONDITIONER>Pressure Sensor.
No	Go to 3.

3. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between the terminals in refrigerant pressure sensor connector and between refrigerant pressure sensor connector and chassis ground.
   Connector & terminal
   (B505) No. 1 — (B505) No. 2:
   (B505) No. 2 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A5 REFRIGERANT FLOW SENSOR CIRCUIT OPEN

DTC detecting condition:

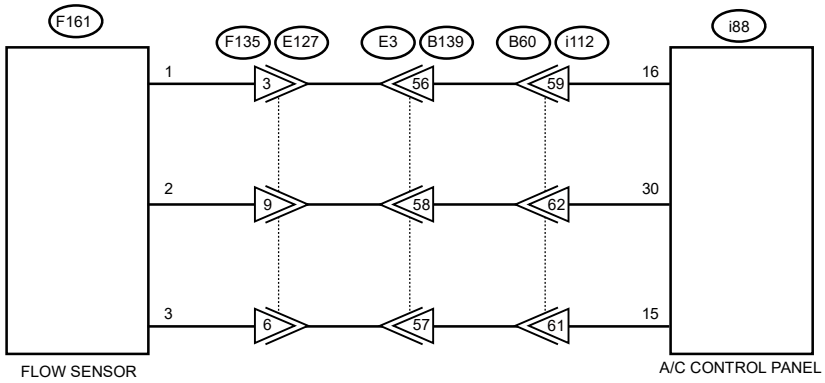
- The voltage of the refrigerant flow sensor signal line becomes 4.7 V or more.
- Open circuit in refrigerant flow sensor

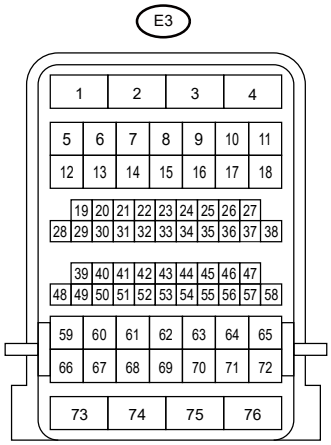
Trouble symptom:

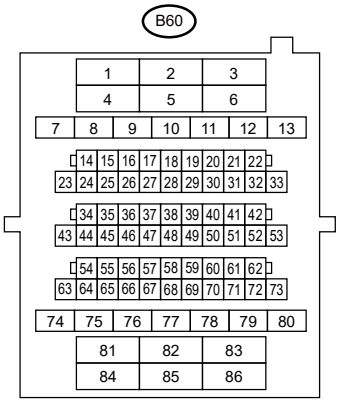
A/C does not function because refrigerant flow amount cannot be measured.

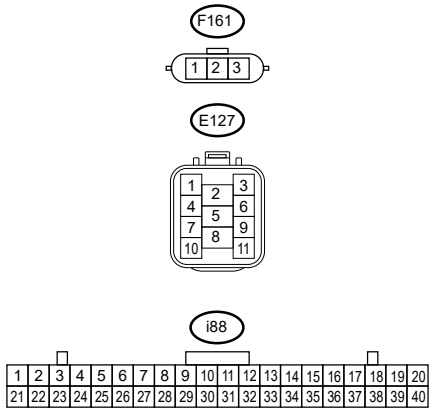
Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.









AC-10185

1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector, refrigerant flow sensor connector and coupling connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A5 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK REFRIGERANT FLOW SENSOR.

1. Disconnect the refrigerant flow sensor connector.
2. Short No. 2 and No. 3 of the refrigerant flow sensor connector (F161).
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A6 displayed? (Current malfunction)

Yes	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.
No	Go to 3.

3. CHECK HARNESS.

1. Restore the temporary shorted lines made in step 2.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between terminals in refrigerant flow sensor connector.
   Connector & terminal
   (F161) No. 1 (+) — (F161) No. 2 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the A/C control panel connector.
2. Using a tester, check the continuity between A/C control panel connector and refrigerant flow sensor connector terminals.
   Connector & terminal
   (F161) No. 3 — (i88) No. 26:
   (F161) No. 2 — (i88) No. 18:
   (F161) No. 1 — (i88) No. 12:

Is there continuity?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A6 REFRIGERANT FLOW SENSOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

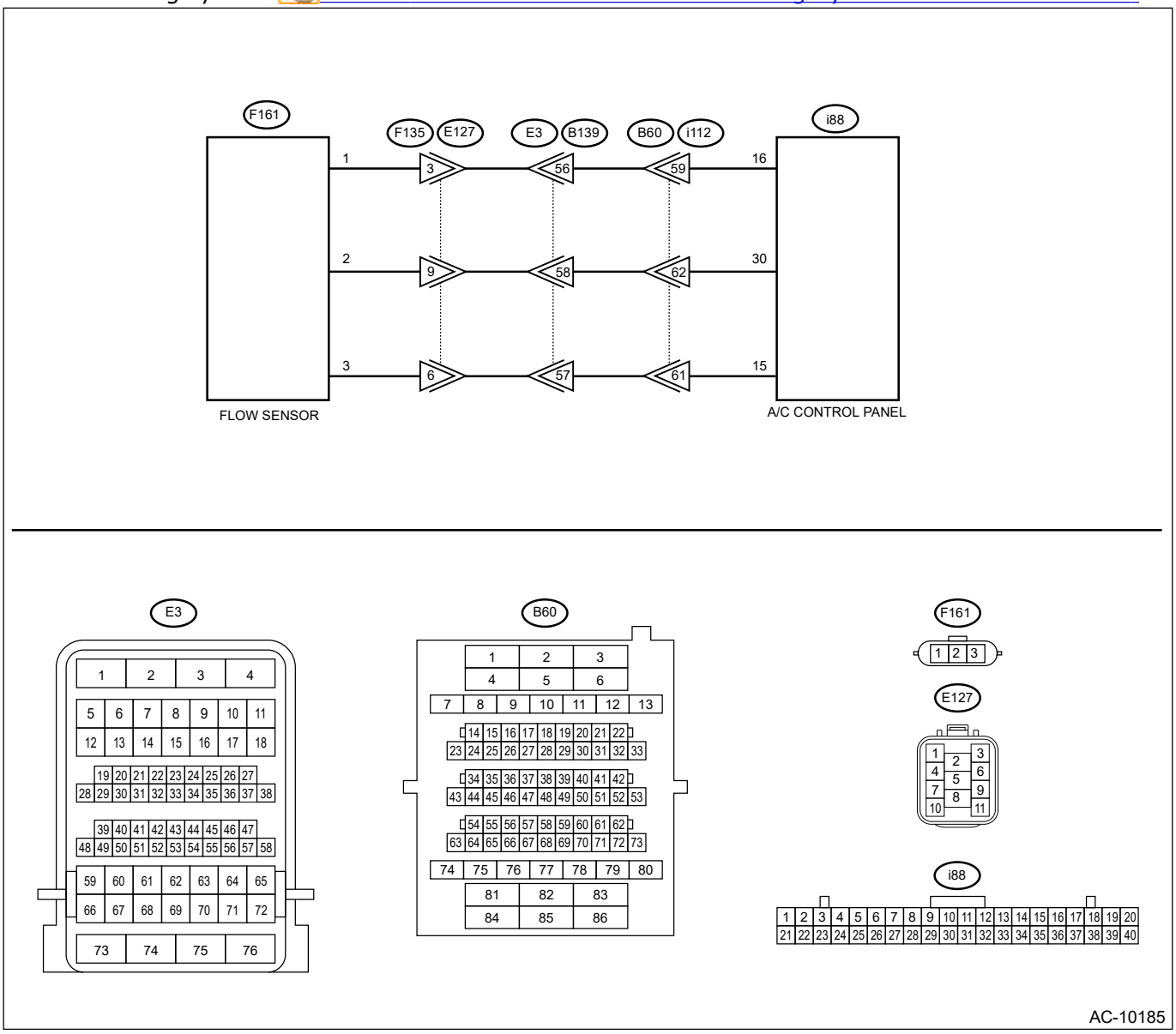
- The voltage of the refrigerant flow sensor signal line becomes 0.3 V or less.
- Short-circuit in refrigerant flow sensor

Trouble symptom:

A/C does not function because refrigerant flow amount cannot be measured.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector, refrigerant flow sensor connector and coupling connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A6 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK REFRIGERANT FLOW SENSOR.

1. Disconnect the refrigerant flow sensor connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A5 displayed? (Current malfunction)

Yes	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.
No	Go to 3.

3. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

1. Disconnect the A/C control panel connector.
2. Using a tester, check the continuity between the terminals in refrigerant flow sensor connector and between refrigerant flow sensor connector and chassis ground.

   Connector & terminal

   (F161) No. 2 — (F161) No. 3:

   (F161) No. 3 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A7 VARIABLE SOLENOID VALVE CIRCUIT

DTC detecting condition:

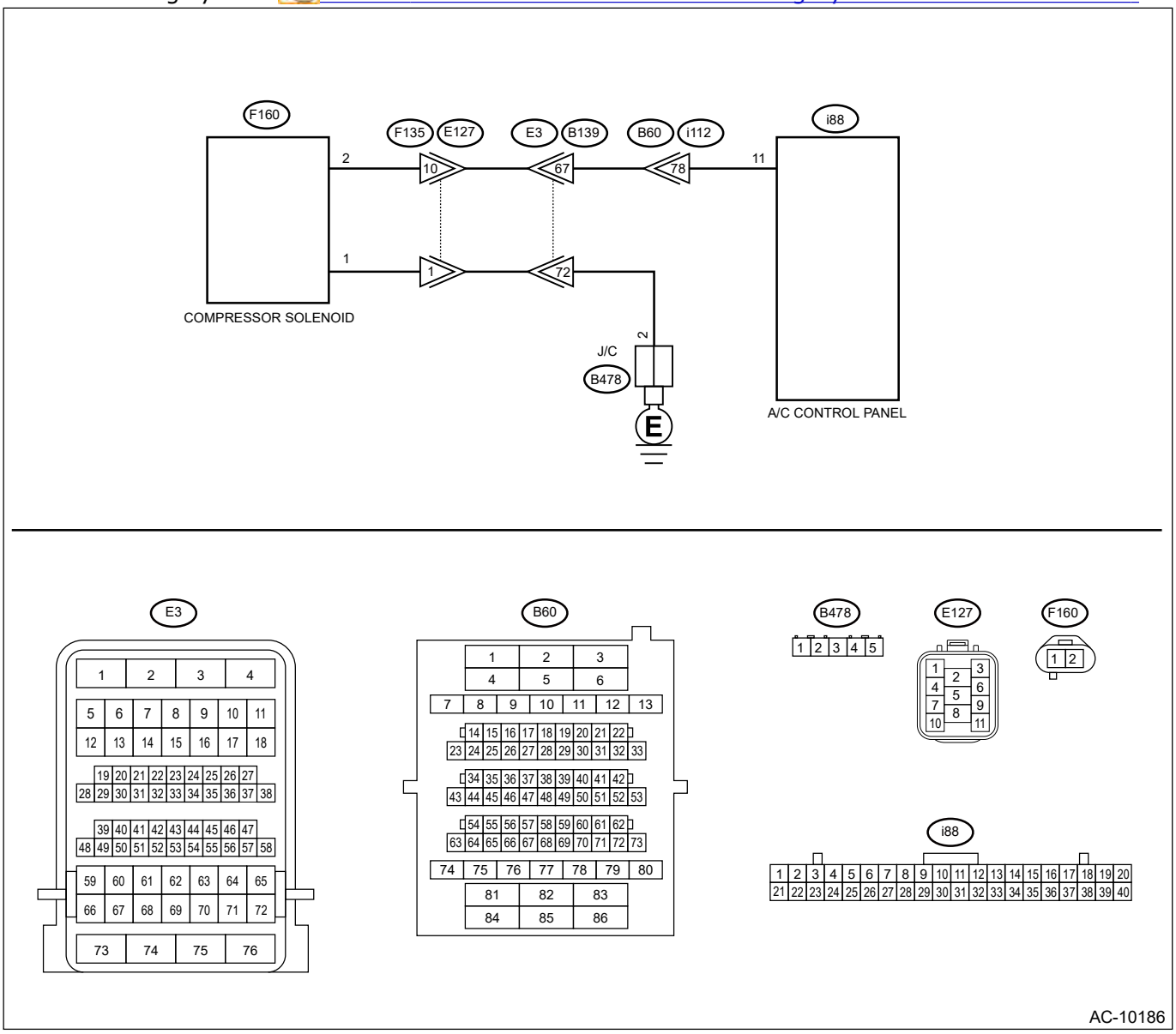
Variable flow change solenoid valve circuit is open or shorted.

Trouble symptom:

Refrigerant pressure cannot be changed.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel connector and variable flow change solenoid connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14A7 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. ACTIVE TEST.

1. Attach the manifold gauge.
2. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test.
   - Variable Flow Change Sol Duty Setting

Did the variable flow change solenoid operate to the specified target, and the pressure change?

Yes	Variable flow change solenoid circuit is normal.
No	Go to 3.

3. CHECK VARIABLE FLOW CHANGE SOLENOID.

1. Disconnect the variable flow change solenoid connector.
2. Using a tester, measure the resistance between terminals of the solenoid.
   Terminals
   (Compressor solenoid side) No. 1 — No. 2:

Is the resistance 10 — 12 Ω?

Yes	Go to 4.
No	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the A/C control panel connector.
2. Using a tester, check for continuity between the harness terminals.
   Connector & terminal
   (F160) No. 2 — (i88) No. 11:
   (F160) No. 1 — Chassis ground:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, check for continuity between the harness terminals.

Connector & terminal

(F160) No. 2 — Chassis ground:

(F160) No. 1 — (F160) No. 2:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14A8 COMPRESSOR BREAK-IN MALFUNCTION LOW REFRIGERANT

DTC detecting condition:

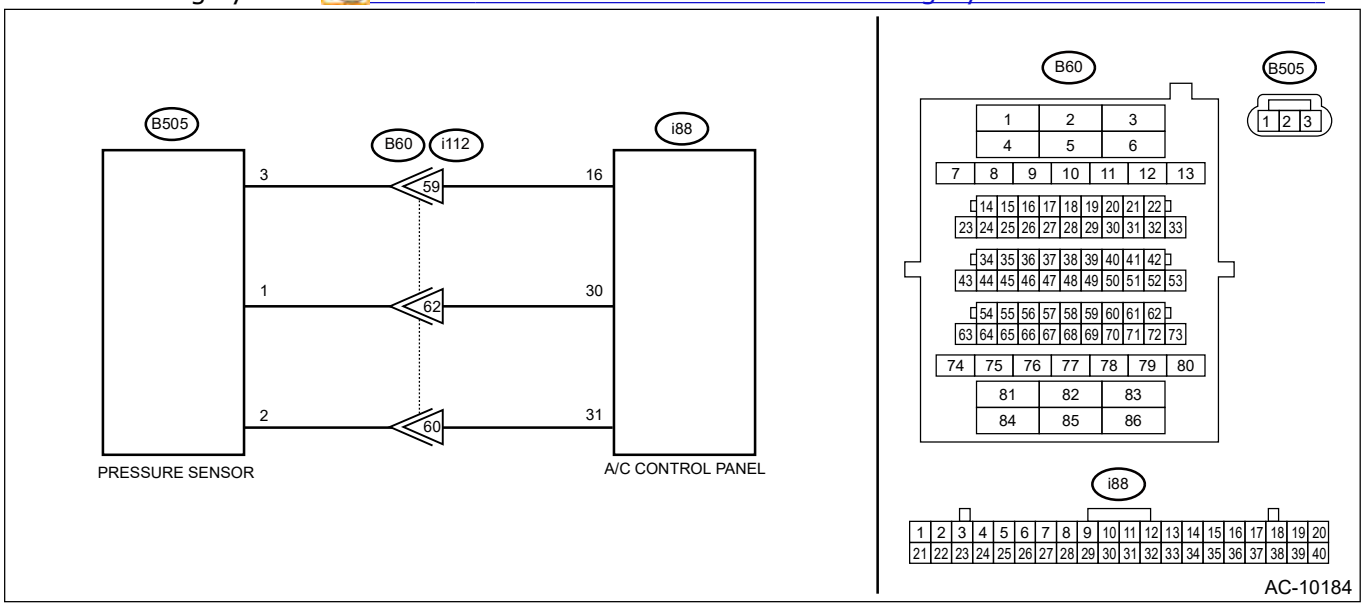
- Compressor was operated while refrigerant was low.
- Compressor was operated while refrigerant pressure was extremely low.
- Judgment is made only when the delivery mode fuse is installed.

Trouble symptom:

A/C does not operate.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK AMOUNT OF REFRIGERANT.

Check the refrigerant pressure and filling amount. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the filling amount a standard value?

Yes	Check that DTC B14A3 (open circuit malfunction) or B14A4 (short circuit malfunction) is recorded, and if either one of these DTCs is recorded, perform the diagnosis according to the DTC. If nothing is recorded, replace the compressor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A3 REFRIGERANT PRESSURE SENSOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A4 REFRIGERANT PRESSURE SENSOR CIRCUIT SHORT-CIRCUIT . Ref. to AIR CONDITIONER>Compressor.
No	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN

DTC detecting condition:

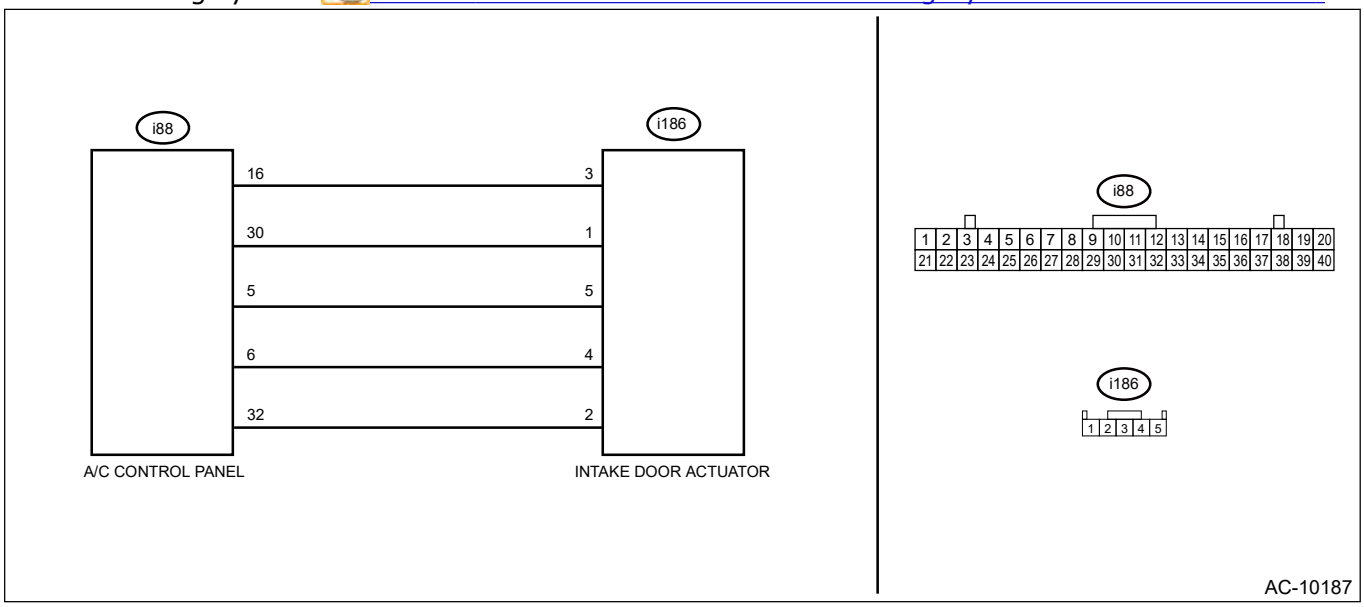
Intake door actuator potentiometer circuit is open.

Trouble symptom:

FRESH/RECIRC does not operate.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel and intake door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B14E9 displayed?

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Measure the voltage between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 3 (+) — (i186) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Check the continuity between terminals in intake door actuator connector using a tester.
   Connector & terminal
   (i186) No. 3 — (i88) No. 16:
   (i186) No. 1 — (i88) No. 30:
   (i186) No. 5 — (i88) No. 5:
   (i186) No. 4 — (i88) No. 6:
   (i186) No. 2 — (i88) No. 32:

Is there continuity?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 2 (+) — (i186) No. 1 (−):

Is the voltage 0.5 — 4.5 V?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Go to 5.

5. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Measure the resistance between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 2 — (i186) No. 3:

Is the resistance less than 1 Ω?

Yes	Repair or replace the short circuit of the harness.
No	Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT

DTC detecting condition:

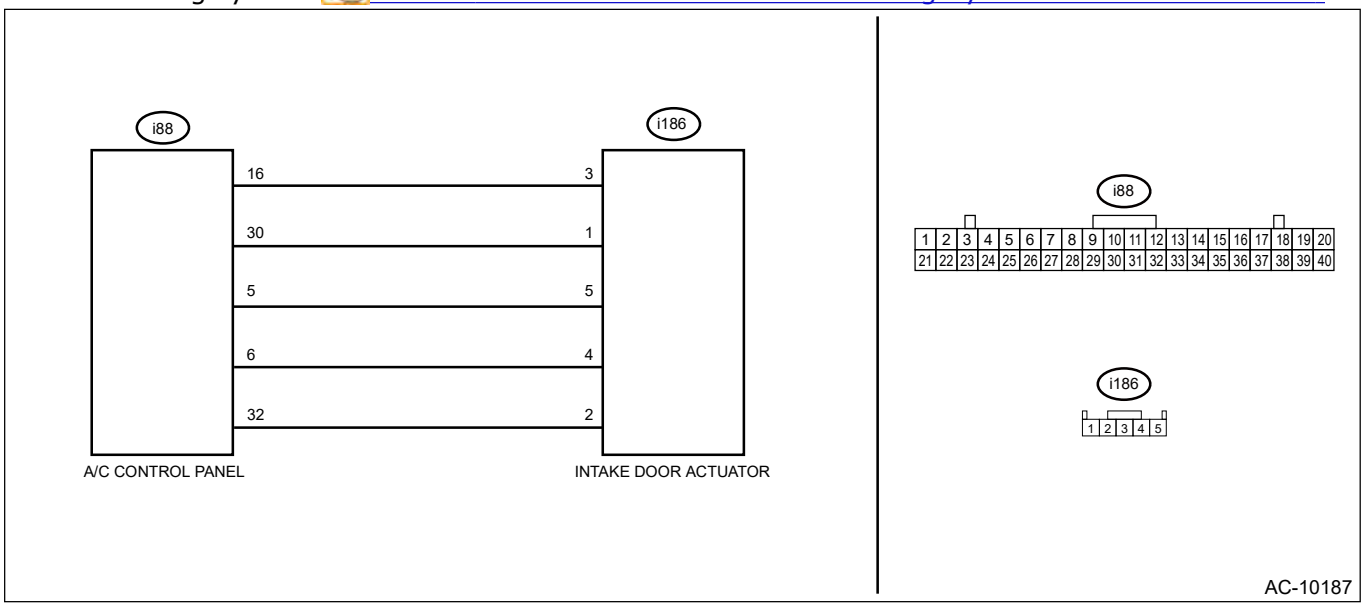
Intake door actuator potentiometer circuit is shorted.

Trouble symptom:

FRESH/RECIRC does not operate.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel and intake door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B14EA displayed?

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 3 (+) — (i186) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Check the continuity between terminals in intake door actuator connector using a tester.
   Connector & terminal
   (i186) No. 1 — (i88) No. 30:
   (i186) No. 2 — (i88) No. 32:
   (i186) No. 3 — (i88) No. 16:

Is there continuity?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK ACTUATOR.

1. Turn the ignition switch to ON.
2. Measure the voltage between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 2 (+) — (i186) No. 1 (−):

Is the voltage 0.5 — 4.5 V?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Go to 5.

5. CHECK HARNESS (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF.
2. Measure the resistance between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 2 — (i186) No. 1:

Is the resistance less than 1 Ω?

Yes	Repair or replace the short circuit of the harness.
No	Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B14EB INTAKE DOOR ACTUATOR STUCK

DTC detecting condition:

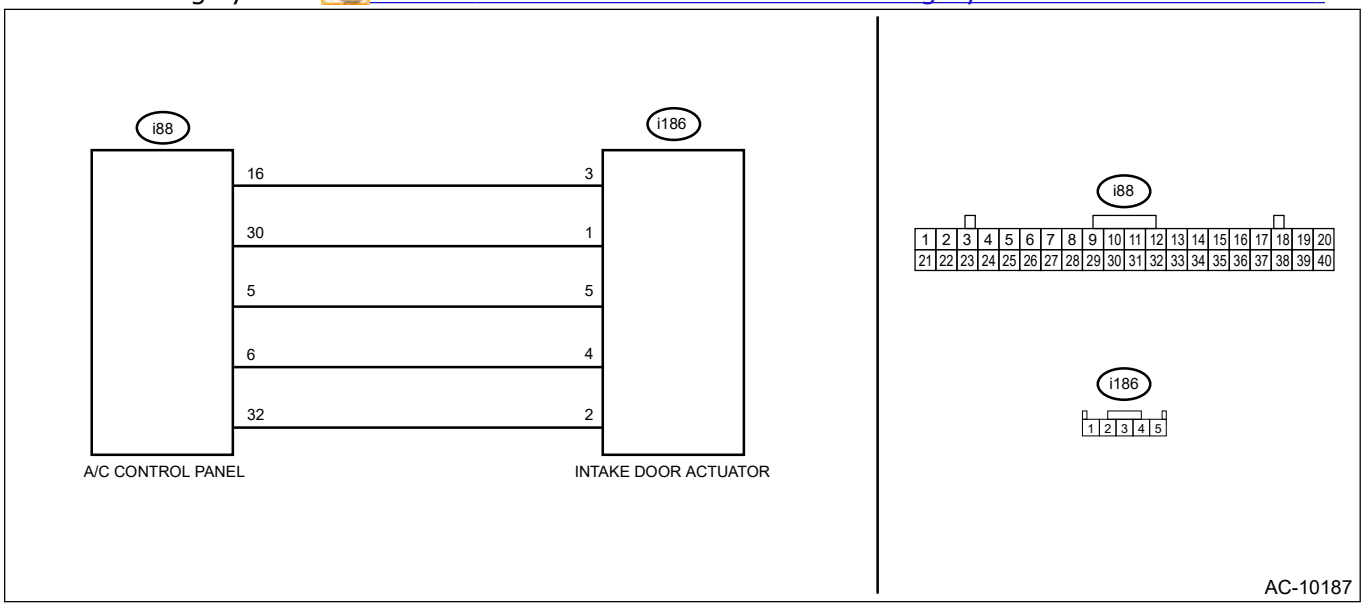
- Intake door actuator is locked.
- The potentiometer value of the intake door actuator does not change.

Trouble symptom:

FRESH/RECIRC does not operate.

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK CONNECTOR.

1. Check connecting condition of the A/C control panel and intake door actuator connector.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14EB displayed?

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Active Test.

- [Fresh/Rec Air Dr Act Trgt Open Angle]

Did the actuator move to the specified target opening angle?

Yes	Intake door actuator circuit is normal.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to ON.
2. Measure the voltage between intake door actuator connector terminals using a tester.
   Connector & terminal
   (i186) No. 3 (+) — (i186) No. 1 (−):

Is the voltage 4.5 — 5.0 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the connector from the A/C control panel.
2. Using a tester, check the continuity between A/C control panel connector and intake door actuator connector terminals.
   Connector & terminal
   (i186) No. 1 — (i88) No. 30:
   (i186) No. 2 — (i88) No. 32:
   (i186) No. 3 — (i88) No. 16:
   (i186) No. 4 — (i88) No. 6:
   (i186) No. 5 — (i88) No. 5:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK INTAKE DOOR ACTUATOR.

Check the intake door actuator parts. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

Is the actuator normal?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the intake door actuator. Ref. to AIR CONDITIONER>FRESH/RECIRC Door Actuator.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

No CAN data is received from ECM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

No CAN data is received from TCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

No CAN data is received from VDC CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

No CAN data is received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

No CAN data is received from combination meter.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Received error CAN data from ECM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Received error CAN data from TCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Received error CAN data from VDC CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Error CAN data is received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Received error CAN data from combination meter.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIR CONDITIONER(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

1. Perform diagnosis according to the diagnosis procedure for the corresponding symptom listed in the symptom table.
2. If there are multiple symptoms, perform the diagnosis in the symptom sequence (1 → 2 → ... → 13).

1. SYMPTOM TABLE

Symptoms		Diagnosis procedure
1	Nothing is displayed on the screen or indicators do not illuminate.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > NOTHING IS DISPLAYED ON THE SCREEN OR INDICATORS DO NOT ILLUMINATE.
2	Air conditioner does not stop even when the OFF switch is pressed.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR CONDITIONER DOES NOT STOP EVEN WHEN THE OFF SWITCH IS PRESSED.
3	The windshield glass is not cleared even when the DEF switch is pressed.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF SWITCH IS PRESSED.
4	Cold air not emitted.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR NOT EMITTED.
5	Warm air not emitted.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WARM AIR NOT EMITTED.
6	Compartment temperature is excessively lower than setting temperature.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COMPARTMENT TEMPERATURE IS EXCESSIVELY LOWER THAN SETTING TEMPERATURE.
7	Compartment temperature is excessively higher than setting temperature.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COMPARTMENT TEMPERATURE IS EXCESSIVELY HIGHER THAN SETTING TEMPERATURE.
8	Air does not come out, or airflow capacity is insufficient. (Blower motor does not rotate.)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with

	Symptoms	Diagnosis procedure
		Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.
9	Air goes out of control. (Blower motor rotates at high speed.)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.
10	Cold air does not come out even when the A/C switch is pressed. The glass cannot be defogged. (Compressor does not operate.)	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE)).
11	Unable to switch suction vents.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.
12	Unable to switch blow vents.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH VENTS.
13	Illumination does not come on, or cannot dim.	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ILLUMINATION DOES NOT COME ON OR CANNOT DIM.

INSPECTION

1. NOTHING IS DISPLAYED ON THE SCREEN OR INDICATORS DO NOT ILLUMINATE

Trouble symptom:

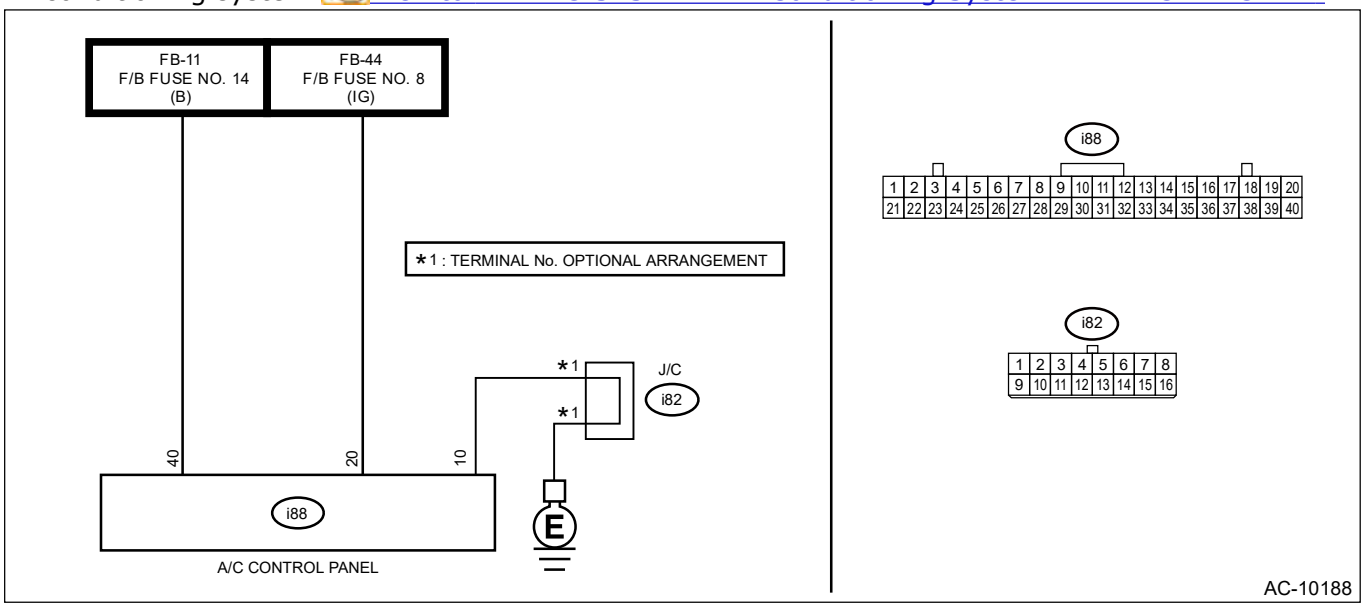
- When the AUTO button is pressed with IGN ON, nothing is displayed on the screen or indicators do not illuminate.
- Self diagnosis using A/C control panel does not operate.

Trouble causes:

- A/C control panel power supply circuit failure
- CAN communication failure

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK CONNECTOR.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK A/C CONTROL PANEL POWER SUPPLY CIRCUIT (OPEN OR SHORT).
→ no → Perform the instructed procedures.

yes ↓

4. CHECK A/C CONTROL PANEL GROUND CIRCUIT (OPEN).
→ no → Perform the instructed procedures.

yes ↓

5. CHECK FOR POOR CONTACT.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the fuses No. 8 and 14 from fuse & relay box.
3. Check the condition of fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the fuse — A/C control panel.

2. CHECK CONNECTOR.

Check poor contact of A/C control panel connector and coupling connector.

Is the check result OK?

Yes	Go to 3.
No	Repair the connector.

3. CHECK A/C CONTROL PANEL POWER SUPPLY CIRCUIT (OPEN OR SHORT).

1. Remove the A/C control panel.
2. Disconnect the A/C control panel connector.
3. Measure the voltage between A/C control panel connector terminal and chassis ground after turning the ignition switch to ON.

Connector & terminal

(i88) No. 20 (+) — Chassis ground (−):

(i88) No. 40 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Check for open or short circuit in the harness between A/C control panel and fuse.

4. CHECK A/C CONTROL PANEL GROUND CIRCUIT (OPEN).

Measure the resistance of harness between A/C control panel and chassis ground after turning the ignition switch to OFF.

Connector & terminal

(i88) No. 10 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the harness for ground line.

5. CHECK FOR POOR CONTACT.

Check poor contact of A/C control panel connector.

Is the check result OK?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair the connector.

2. AIR CONDITIONER DOES NOT STOP EVEN WHEN THE OFF SWITCH IS PRESSED

Trouble symptom:

Even when the OFF switch is pressed, the blower fan does not turn off, the inlet opening remains in FRESH mode, and the compressor does not turn off.

Trouble causes:

- CAN communication failure
- A/C control panel failure
- Blower motor failure
- Intake door actuator failure
- Compressor failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK BLOWER MOTOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK INTAKE DOOR ACTUATOR.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK COMPRESSOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Press the OFF switch of the A/C control panel.
3. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Blower Fan Level]
- [Variable Flow Change Solenoid Duty] (variable A/C model)
- [Fresh/Recircle Air Door Actuator Position Target]

Does [Blower Fan Level] indicate 0, [Variable Flow Change Solenoid Duty] indicate 0%, and [Fresh/Recircle Air Door Actuator Position Target] indicate 100%?

Yes	Go to 2.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

2. CHECK BLOWER MOTOR.

With the OFF switch pressed, check the blower motor operation.

Is the blower motor stopped?

Yes	Go to 3.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.

3. CHECK INTAKE DOOR ACTUATOR.

With the OFF switch pressed, check the FRESH/RECIRC door operation.

Does the FRESH/RECIRC door set to FRESH?

Yes	Go to 4.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

4. CHECK COMPRESSOR.

With the OFF switch pressed, check the compressor operation.

Is the compressor stopped?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE)).

3. THE WINDSHIELD GLASS IS NOT CLEARED EVEN WHEN THE DEF SWITCH IS PRESSED

Trouble symptom:

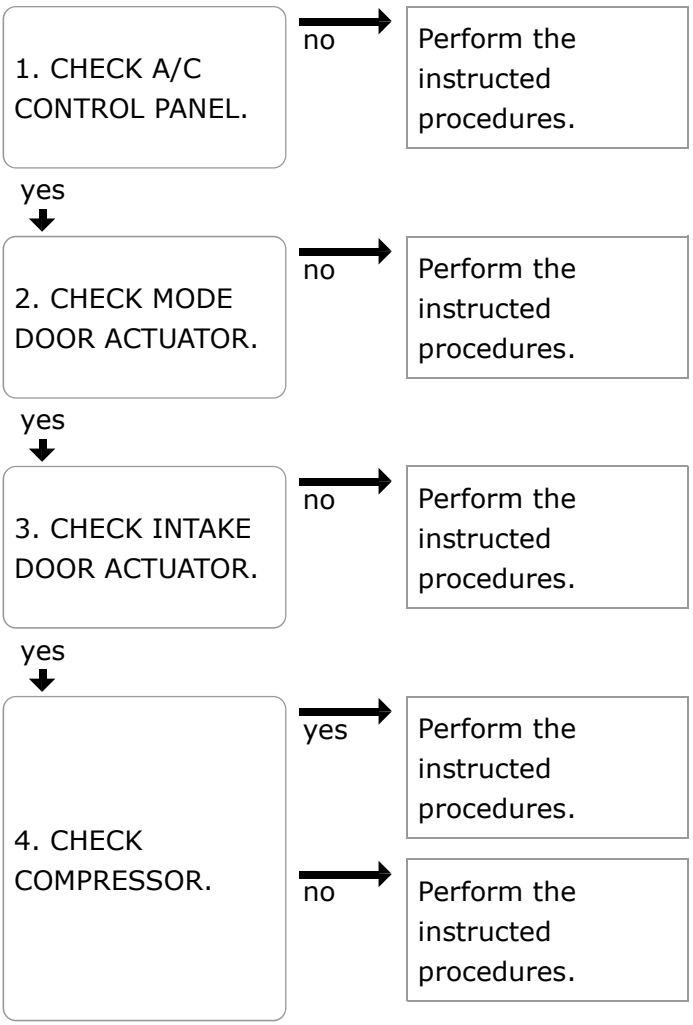
Defroster indicator does not illuminate, outlet opening does not switch to DEF, compressor does not switch to ON, and inlet opening does not switch to FRESH, when pressing the DEF switch.

Trouble causes:

- CAN communication failure
- A/C control panel failure
- Mode door actuator failure
- Compressor failure
- Intake door actuator failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.


1. CHECK A/C CONTROL PANEL.
no
Perform the instructed procedures.
yes
2. CHECK MODE DOOR ACTUATOR.
no
Perform the instructed procedures.
yes
3. CHECK INTAKE DOOR ACTUATOR.
no
Perform the instructed procedures.
yes
4. CHECK COMPRESSOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Press the DEF switch of the A/C control panel.
3. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Mode Door Actuator Position Target]
- [Variable Flow Change Solenoid Duty] (variable A/C model)
- [Fresh/Recircle Air Door Actuator Position Target]

Does [Mode Door Actuator Position Target] indicate 100%, [Variable Flow Change Solenoid Duty] indicate 0% or more, and [Fresh/Recircle Air Door Actuator Position Target] indicate 100%?

Yes	Go to 2.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

2. CHECK MODE DOOR ACTUATOR.

With the DEF switch ON, check the mode door operation.

Does the air come out from the DEF outlet opening?

Yes	Go to 3.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH VENTS.

3. CHECK INTAKE DOOR ACTUATOR.

With the DEF switch ON, check the FRESH/RECIRC door operation.

Is FRESH/RECIRC switch turned to “FRESH”?

Yes	Go to 4.
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

4. CHECK COMPRESSOR.

With the DEF switch ON, check the compressor operation.

Does the compressor operate?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE)).

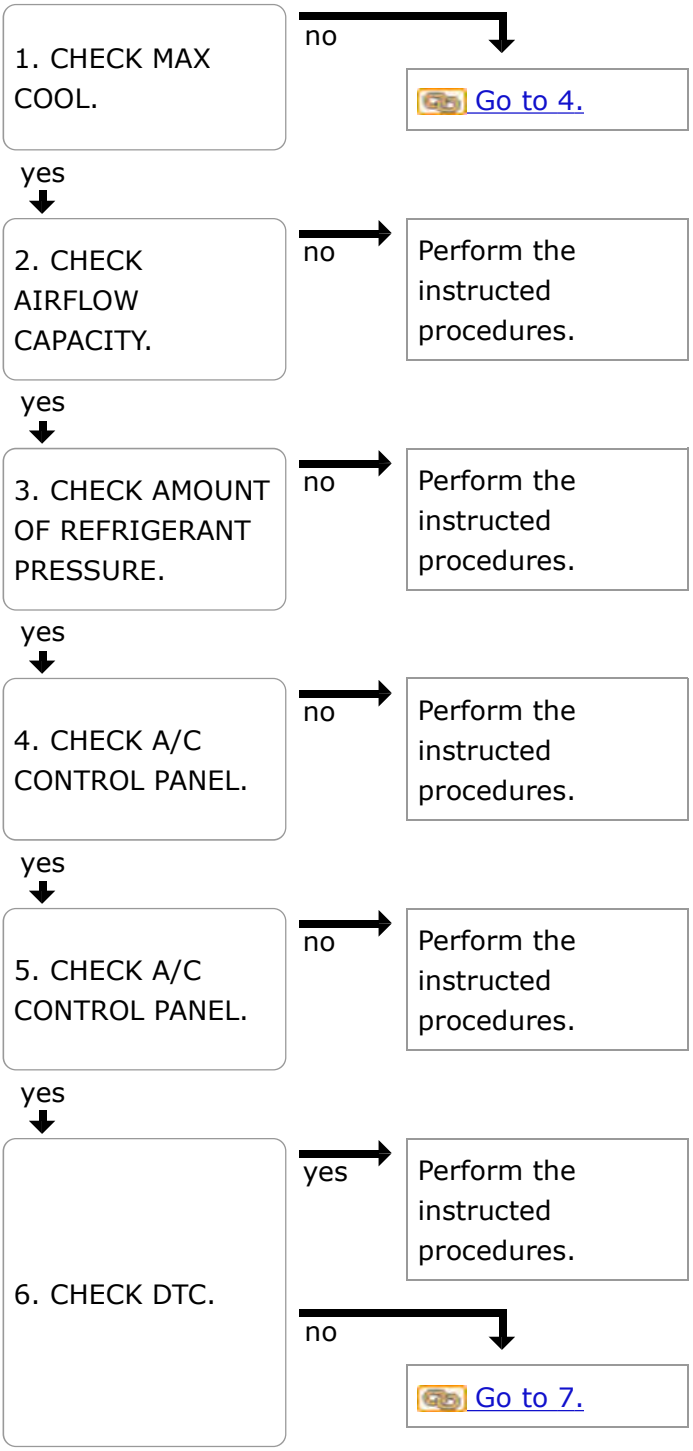
4. COLD AIR NOT EMITTED

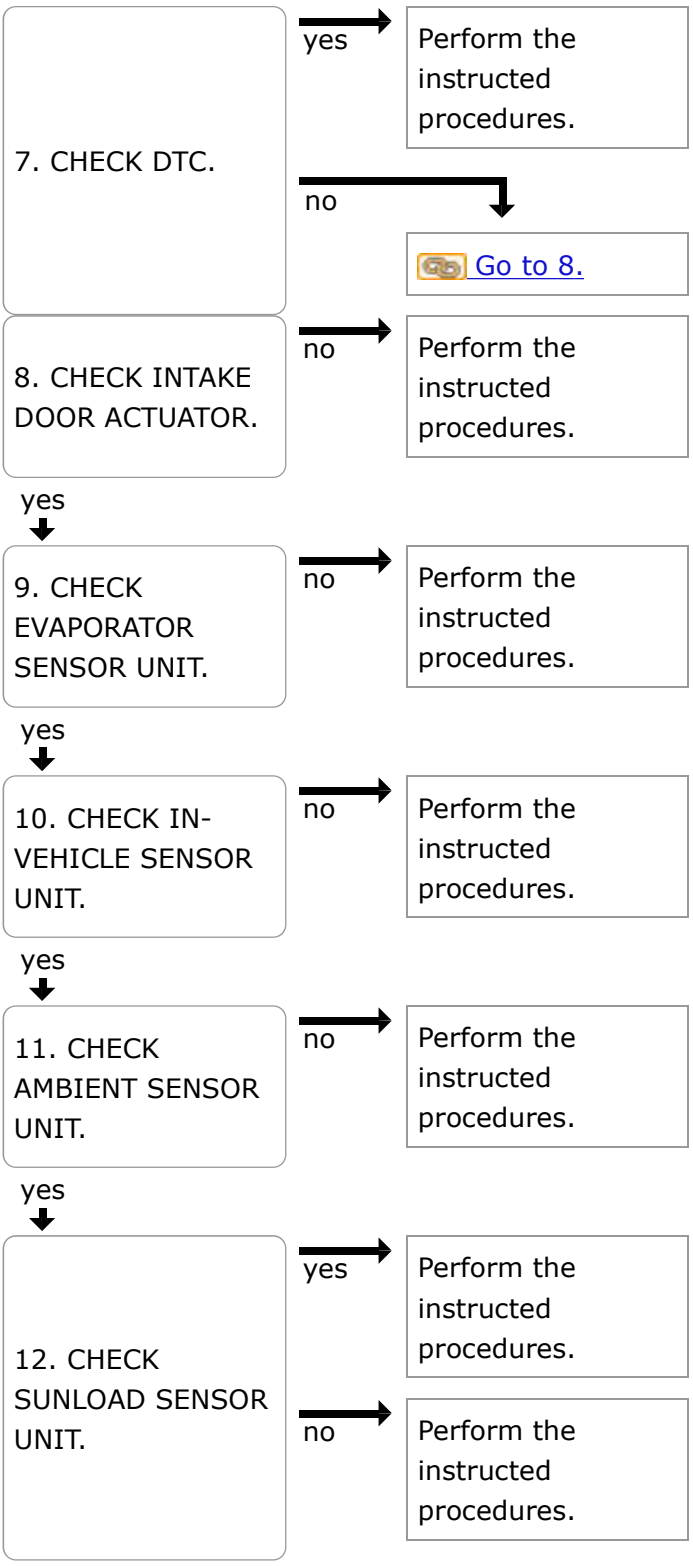
Trouble symptom:
Cold air not emitted.
Trouble causes:
- Airflow capacity failure
- Refrigerant pressure failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure

- Sunload sensor failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.




7. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK INTAKE DOOR ACTUATOR.
no
Perform the instructed procedures.
yes
9. CHECK EVAPORATOR SENSOR UNIT.
no
Perform the instructed procedures.
yes
10. CHECK IN-VEHICLE SENSOR UNIT.
no
Perform the instructed procedures.
yes
11. CHECK AMBIENT SENSOR UNIT.
no
Perform the instructed procedures.
yes
12. CHECK SUNLOAD SENSOR UNIT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK MAX COOL.

Set the A/C control panel dials as follows.
Temperature control dial: MAX COOL
FRESH/RECIRC switch: RECIRC
Mode switch or mode dial: VENT
A/C switch: ON

Does it fail to blow the cold air?

Yes	Go to 2.
No	Go to 4.

2. CHECK AIRFLOW CAPACITY.

Check the airflow capacity. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.

Is the check result OK?

Yes	Go to 3.
No	Perform repair according to inspection procedure.

3. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes	Go to 4.
No	Perform repair according to refrigerant pressure inspection.

4. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60"*1?
(*1: For the 72°F center specification. For the 25°C center specification, the value is 18)

Yes	Go to 5.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

5. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "85"*2?
(*2: For the 72°F center specification. For the 25°C center specification, the value is 32)

Yes	Go to 6.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 7.

7. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 8.

8. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

Is the check result OK?

Yes	Go to 9.
No	Check the intake door actuator. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

9. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 10.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

10. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 11.
No	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

11. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 12.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

12. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

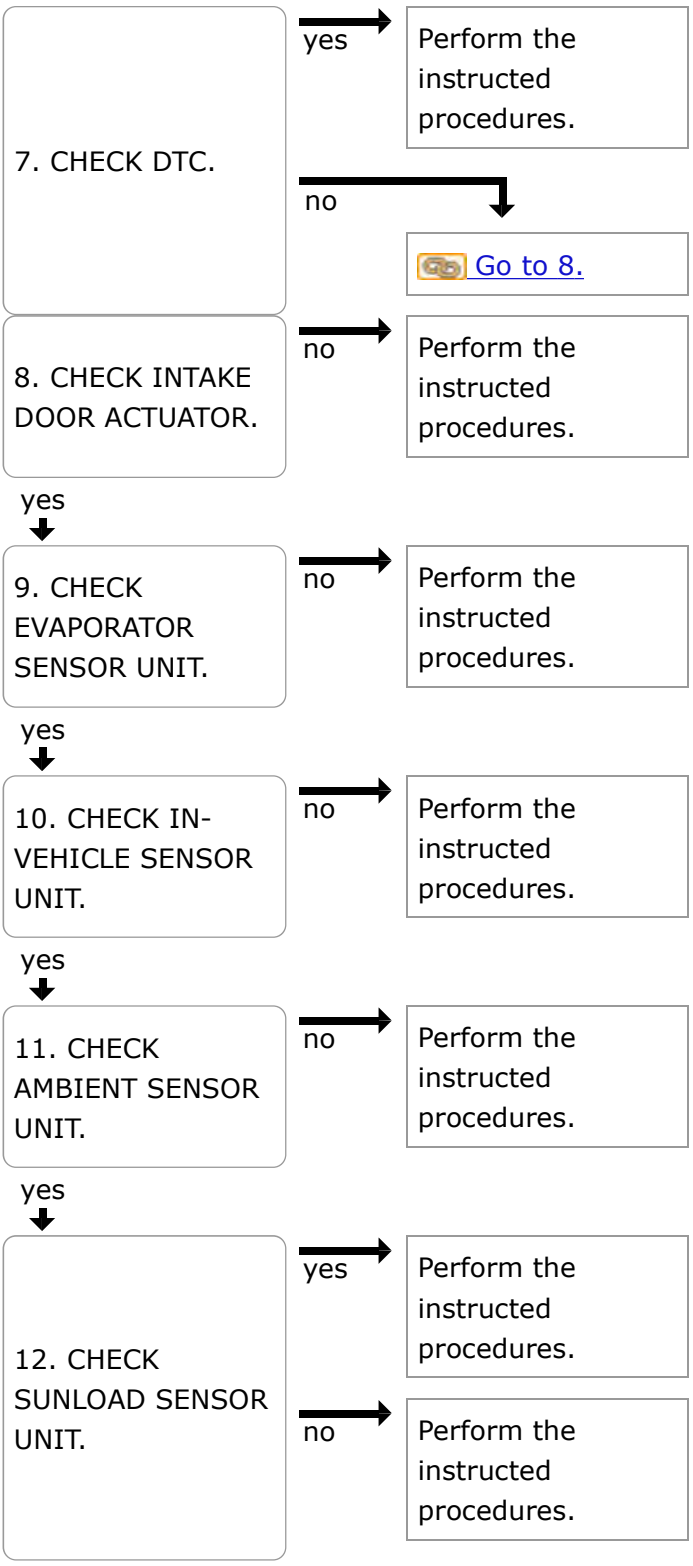
5. WARM AIR NOT EMITTED

Trouble symptom:
Warm air not emitted.
Trouble causes:
- Airflow capacity failure
- Coolant level failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK MAX HOT.
   - no → Go to 4.
   - yes ↓
2. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK ENGINE COOLANT.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
6. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 7.


7. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK INTAKE DOOR ACTUATOR.
no
Perform the instructed procedures.
yes
9. CHECK EVAPORATOR SENSOR UNIT.
no
Perform the instructed procedures.
yes
10. CHECK IN-VEHICLE SENSOR UNIT.
no
Perform the instructed procedures.
yes
11. CHECK AMBIENT SENSOR UNIT.
no
Perform the instructed procedures.
yes
12. CHECK SUNLOAD SENSOR UNIT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK MAX HOT.

Set the A/C control panel dials as follows.
Temperature control dial: MAX HOT
FRESH/RECIRC switch: FRESH
Mode switch or mode dial: HEAT
A/C switch: OFF

Does it fail to blow the hot air?

Yes	Go to 2.
No	Go to 4.

2. CHECK AIRFLOW CAPACITY.

Check the airflow capacity. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT.

Is the check result OK?

Yes	Go to 3.
No	Perform repair according to inspection procedure.

3. CHECK ENGINE COOLANT.

Check engine coolant amount.

Is the engine coolant level within the specification?

Yes	Go to 4.
No	Fill engine coolant. If there is coolant leakage, repair the leaks according to Engine Cooling System Trouble in General. Ref. to COOLING(H4DO)>Engine Cooling System Trouble in General.

4. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60"*1?
(*1: For the 72°F center specification. For the 25°C center specification, the value is 18)

Yes	Go to 5.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

5. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "85"*2?
(*2: For the 72°F center specification. For the 25°C center specification, the value is 32)

Yes	Go to 6.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 7.

7. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 8.

8. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

Is the check result OK?

Yes	Go to 9.
No	Check the intake door actuator. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

9. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 10.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

10. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 11.
No	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

11. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 12.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

12. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

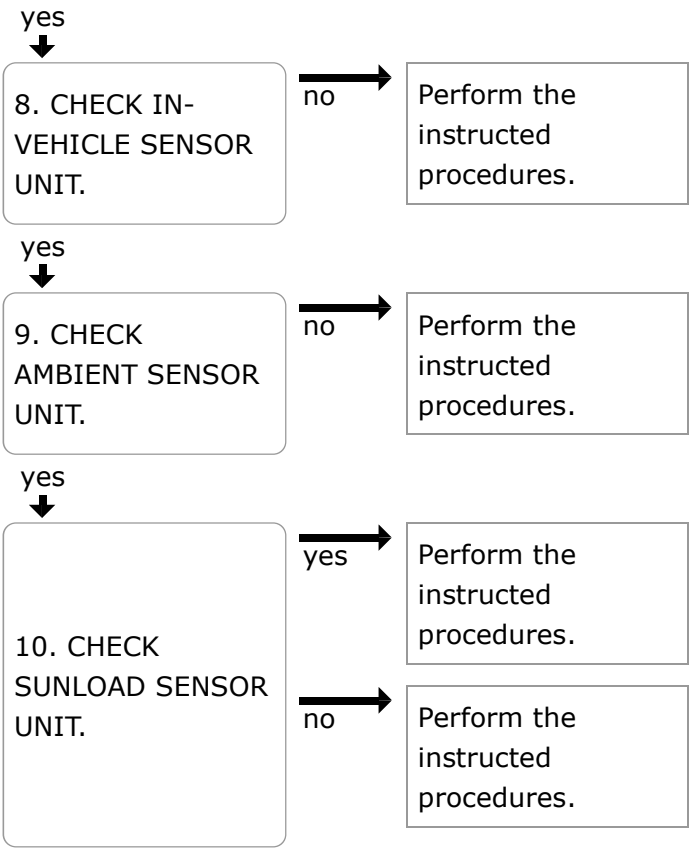
6. COMPARTMENT TEMPERATURE IS EXCESSIVELY LOWER THAN SETTING TEMPERATURE

Trouble symptom:
Compartment temperature is excessively lower than setting temperature.
Trouble causes:
- Large airflow capacity
- Refrigerant pressure failure
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK AMOUNT OF REFRIGERANT PRESSURE.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 6.
6. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 7.
7. CHECK EVAPORATOR SENSOR UNIT.
   - no → Perform the instructed procedures.



1. CHECK AIRFLOW CAPACITY.

Check the airflow capacity. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.

Is the check result OK?

Yes	Go to 2.
No	Perform repair according to inspection procedure.

2. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes	Go to 3.
No	Perform repair according to refrigerant pressure inspection.

3. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60"*1?
(*1: For the 72°F center specification. For the 25°C center specification, the value is 18)

Yes	Go to 4.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

4. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "85"*2?
(*2: For the 72°F center specification. For the 25°C center specification, the value is 32)

Yes	Go to 5.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

5. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 6.

6. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 7.

7. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 8.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator.

8. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 9.
No	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

9. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 10.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

10. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

7. COMPARTMENT TEMPERATURE IS EXCESSIVELY HIGHER THAN SETTING TEMPERATURE

Trouble symptom:

Compartment temperature is excessively higher than setting temperature.

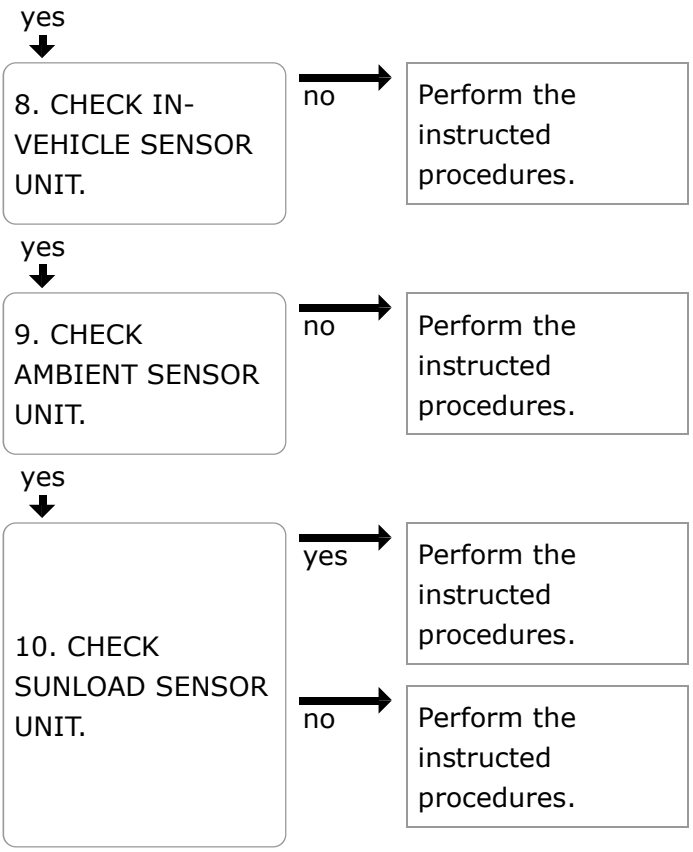
Trouble causes:

- Large airflow capacity
- CAN communication failure
- A/C control panel failure
- Air mix actuator RH failure
- Air mix actuator LH failure (only with left/right independent air conditioning function)
- Intake door actuator failure
- Evaporator sensor failure
- In-vehicle sensor failure
- Ambient sensor failure
- Sunload sensor failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 5.
5. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 6.
6. CHECK INTAKE DOOR ACTUATOR.
   - no → Perform the instructed procedures.
   - yes ↓
7. CHECK EVAPORATOR SENSOR UNIT.
   - no → Perform the instructed procedures.



1. CHECK AIRFLOW CAPACITY.

Check the airflow capacity. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AIR GOES OUT OF CONTROL.

Is the check result OK?

Yes	Go to 2.
No	Perform repair according to inspection procedure.

2. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX COOL.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "60"*1?
(*1: For the 72°F center specification. For the 25°C center specification, the value is 18)

Yes	Go to 3.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

3. CHECK A/C CONTROL PANEL.

1. Turn the temperature control dials (driver's side) and (passenger's side) to MAX HOT.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Heater Control Panel Setting Value (Driver's)]
- [Heater Control Panel Setting Value (Passenger's)]

Do [Heater Control Panel Setting Value (Driver's)] and [Heater Control Panel Setting Value (Passenger's)] indicate "85"*2?
(*2: For the 72°F center specification. For the 25°C center specification, the value is 32)

Yes	Go to 4.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

4. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX COOL and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 5.

5. CHECK DTC.

1. Turn the ignition switch to ON.
2. Turn the temperature control dial at MAX HOT and leave for 16 seconds or more. (For vehicles with left/right independent air conditioner, perform setting on both sides.)
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1440, B1442, B1446, B1436, B1437, B1441, B1448, B1449 or B144A.
No	Go to 6.

6. CHECK INTAKE DOOR ACTUATOR.

Visually check the intake door actuator operation.

Is the check result OK?

Yes	Go to 7.
No	Check the intake door actuator. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > UNABLE TO SWITCH SUCTION VENTS.

7. CHECK EVAPORATOR SENSOR UNIT.

Perform the inspection of evaporator sensor unit. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 8.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

8. CHECK IN-VEHICLE SENSOR UNIT.

Check in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

Is the check result OK?

Yes	Go to 9.
No	Replace the in-vehicle sensor. Ref. to AIR CONDITIONER>In-Vehicle Sensor (Auto A/C Model).

9. CHECK AMBIENT SENSOR UNIT.

Check the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 10.
No	Replace the ambient sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

10. CHECK SUNLOAD SENSOR UNIT.

Check the sunload sensor unit. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the sunload sensor. Ref. to AIR CONDITIONER>Sunload Sensor (Auto A/C Model).

8. AIR DOES NOT COME OUT, OR AIRFLOW CAPACITY IS INSUFFICIENT

Trouble symptom:

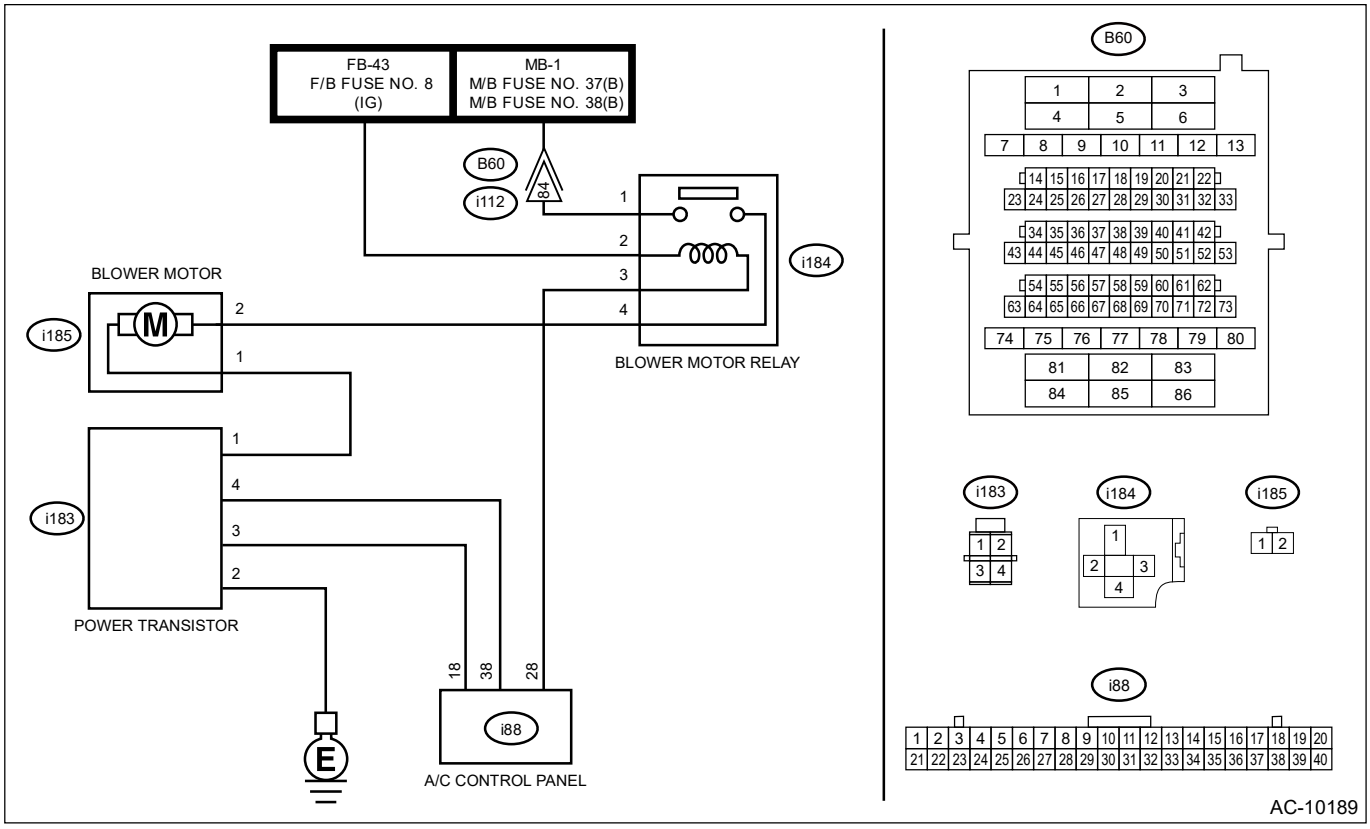
- Airflow capacity is insufficient.
- Air does not come out when operating the fan dial.

Trouble causes:

- Airflow capacity failure
- CAN communication failure
- A/C control panel failure
- Blower motor failure

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK A/C CONTROL PANEL.
   - no → Go to 5.
   - yes ↓
2. CHECK AIRFLOW CAPACITY.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK A/C FILTER.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK EACH DUCT.
   - no → Perform the instructed procedures.

yes

5. CHECK A/C CONTROL PANEL. → no → Perform the instructed procedures.

yes

6. CHECK A/C CONTROL PANEL. → no → Perform the instructed procedures.

yes

7. CHECK CONNECTOR. → no → Perform the instructed procedures.

yes

8. CHECK FUSE. → no → Perform the instructed procedures.

yes

9. CHECK BLOWER MOTOR RELAY ON SIGNAL. → no → Perform the instructed procedures.

yes

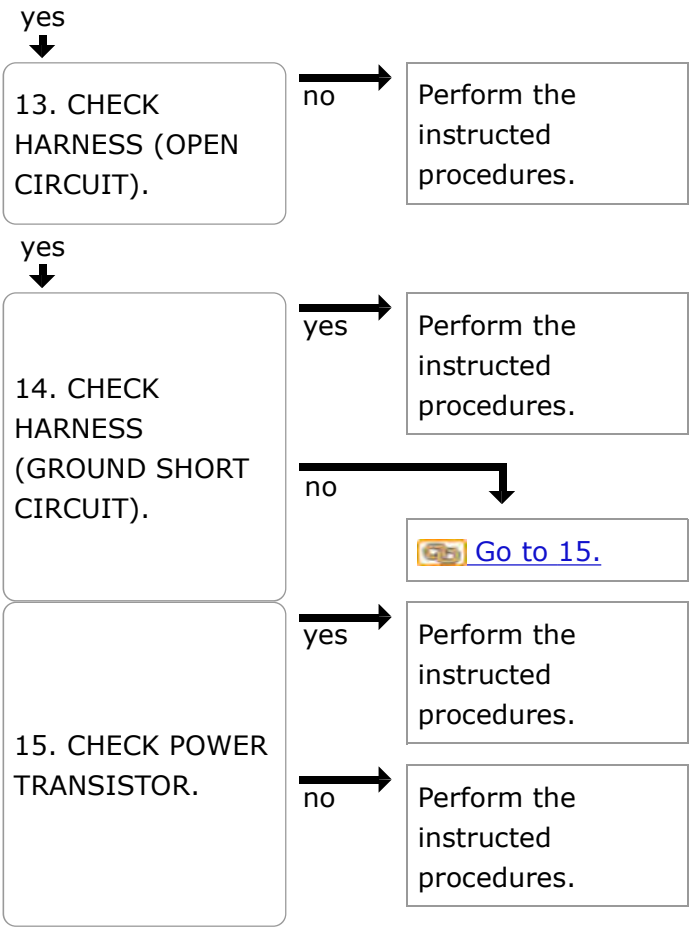
10. CHECK BLOWER MOTOR RELAY ON SIGNAL. → no → Perform the instructed procedures.

yes

11. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT. → no → Perform the instructed procedures.

yes

12. CHECK BLOWER MOTOR UNIT. → no → Perform the instructed procedures.


yes
13. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
14. CHECK HARNESS (GROUND SHORT CIRCUIT).
yes
Perform the instructed procedures.
no
Go to 15.
15. CHECK POWER TRANSISTOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Air mix door actuator position (driver's side)]
   - [Air mix door actuator position (passenger's side)]
   - [Blower Fan Level]
2. Turn the temperature control dial at MAX COOL and increase and decrease the A/C control panel fan dial. (For vehicles with left/right independent air conditioner, perform setting on both sides.)

Do [Air mix door actuator position (driver's side)] and [Air mix door actuator position (passenger's side)] indicate "0%"? Also, does [Blower Fan Level] increase or decrease in accordance with the fan dial operation?

Yes	Go to 2.
No	Go to 5.

2. CHECK AIRFLOW CAPACITY.

Turn the temperature control dial to LO (both dials for the models equipped with left/right independent air conditioning function), A/C control panel fan dial to MAX and FRESH/RECIRC switch to RECIRC.

Is the airflow capacity insufficient for the same model?

Yes	Go to 3.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK A/C FILTER.

Check the A/C filter. Ref. to AIR CONDITIONER>A/C Filter.

Is the check result OK?

Yes	Go to 4.
No	Clean or replace the A/C filter. Ref. to AIR CONDITIONER>A/C Filter.

4. CHECK EACH DUCT.

Check each duct joint for disconnection or clogging.

Is the check result OK?

Yes	Go to 5.
No	Repair the faulty duct.

5. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Turn the fan dial to the maximum position.
3. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Blower Fan Level]

Does [Blower Fan Level] indicate “7”?

Yes	Go to 6.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

6. CHECK A/C CONTROL PANEL.

1. Turn the fan dial to the minimum position.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Blower Fan Level]

Does [Blower Fan Level] indicate "1"?

Yes	Go to 7.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

7. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes	Go to 8.
No	Repair the connector.

8. CHECK FUSE.

1. Remove the fuse No. 8 from fuse & relay box and the fuses No. 37 and No. 38 from the main fuse box.
2. Check the condition of fuse.

Is the check result OK?

Yes	Go to 9.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the pressure switch and fuse.

9. CHECK BLOWER MOTOR RELAY ON SIGNAL.

1. Stop the engine.
2. Turn the fan dial OFF.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the A/C control panel connector (i88) and chassis ground.
   Connector & terminal
   (i88) No. 28 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 10.
No	• Check for open or short circuit in the harness between fuse and ECM. • Check the blower relay connector and relay unit. Ref. to AIR CONDITIONER>Relay and Fuse.

10. CHECK BLOWER MOTOR RELAY ON SIGNAL.

1. Start the engine.
2. Turn the fan dial to ON.
3. Using a tester, measure the voltage between the A/C control panel connector (i88) and chassis ground.
   Connector & terminal
   (i88) No. 28 (+) — Chassis ground (−):

Is the voltage 0 V?

Yes	Go to 11.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

11. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Turn the fan dial to ON.
3. Use a tester to measure the voltage between the blower motor connector (i185) and chassis ground.

Connector & terminal

(i185) No. 2 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 12.
No	• Check the blower motor power supply line harness for open circuit or connector disconnection. • Check the blower relay connector and relay unit. Ref. to AIR CONDITIONER>Relay and Fuse.

12. CHECK BLOWER MOTOR UNIT.

Check the blower motor. Ref. to AIR CONDITIONER>Blower Motor.

Is the check result of the blower motor OK?

Yes	Go to 13.
No	Replace the blower motor. Ref. to AIR CONDITIONER>Blower Motor.

13. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power transistor and A/C control panel connector.
2. Using a tester, measure the resistance between harness terminals.

Connector & terminal

(i183) No. 1 — (i185) No. 1:
(i183) No. 4 — (i88) No. 38:
(i183) No. 3 — (i88) No. 18:
(i183) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 14.
No	Repair or replace the open circuit of harness.

14. CHECK HARNESS (GROUND SHORT CIRCUIT).

Use a tester to measure the harness resistance between the power transistor connector and chassis ground.

Connector & terminal

(i183) No. 4 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Repair or replace the short circuit of the harness.
No	Go to 15.

15. CHECK POWER TRANSISTOR.

Replace the power transistor with a properly functioning part.

Does the blower motor rotate?

Yes	Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

9. AIR GOES OUT OF CONTROL

Trouble symptom:

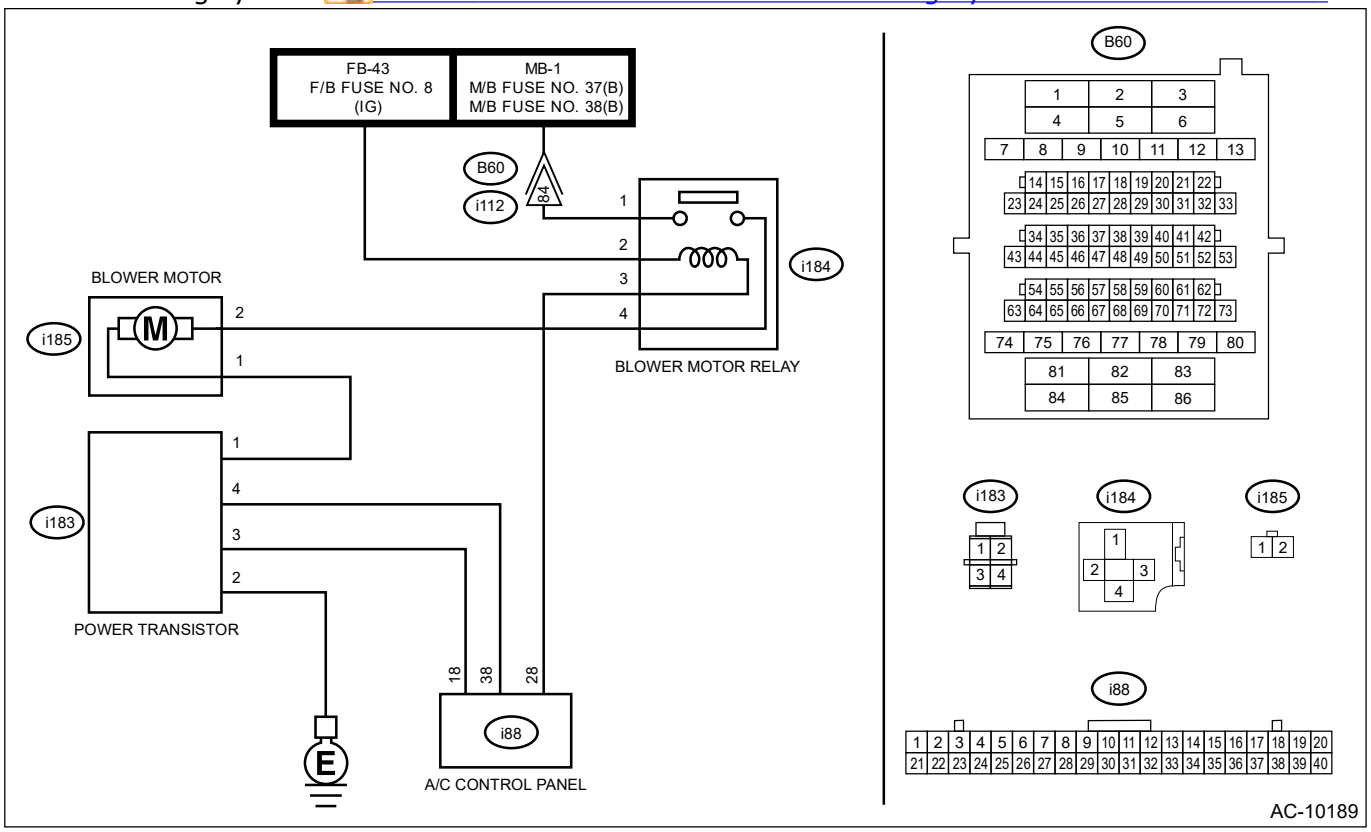
- The blower rotates even though the blower switch is not turned on.
- The blower motor continues to rotate at high speed. (Not adjustable.)

Trouble causes:

- Airflow capacity failure
- CAN communication failure
- A/C control panel failure
- Blower motor failure

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

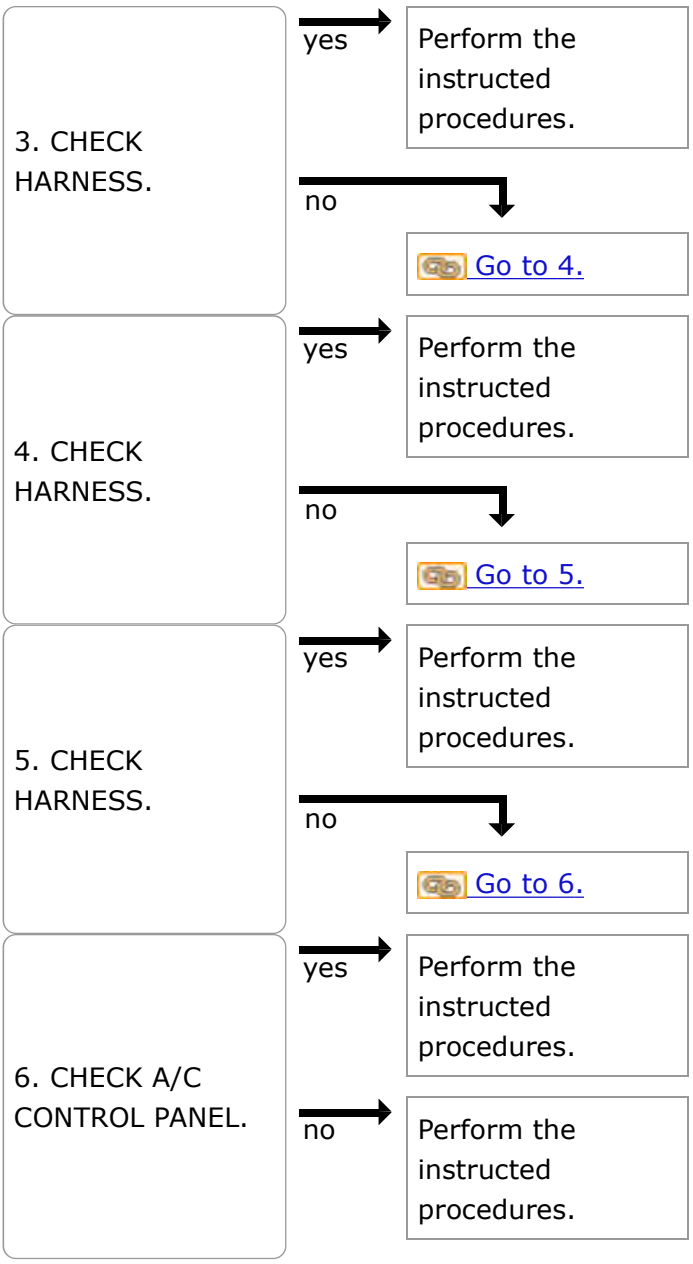
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK A/C CONTROL PANEL.	no →	Perform the instructed procedures.

yes ↓

2. CHECK A/C CONTROL PANEL.	no →	Perform the instructed procedures.

yes ↓


3. CHECK HARNESS.
yes
Perform the instructed procedures.
no
Go to 4.
4. CHECK HARNESS.
yes
Perform the instructed procedures.
no
Go to 5.
5. CHECK HARNESS.
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK A/C CONTROL PANEL.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Turn the fan dial to the maximum position.
3. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Blower Fan Level]

Does [Blower Fan Level] indicate “7”?

Yes	Go to 2.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

2. CHECK A/C CONTROL PANEL.

1. Turn the fan dial to the minimum position.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Blower Fan Level]

Does [Blower Fan Level] indicate “1”?

Yes	Go to 3.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

3. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the power transistor connector.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.

Connector & terminal

(i183) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Repair or replace the short circuit of the harness between blower motor and power transistor.
No	Go to 4.

4. CHECK HARNESS.

1. Remove the A/C control panel.
2. Turn the ignition switch to ON.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.

Connector & terminal

(i183) No. 4 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Repair or replace the short circuit of the harness between A/C control panel and power transistor.
No	Go to 5.

5. CHECK HARNESS.

1. Connect the disconnected connectors.
2. Turn the ignition switch to ON.
3. Use a tester to measure the voltage between the power transistor connector and chassis ground.
   Connector & terminal
   (i183) No. 4 (+) — Chassis ground (−):

Is the voltage approx. 9.6 V when fan dial in 1st, and approx. 2.7 V when fan dial in 6th?

Yes	Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.
No	Go to 6.

6. CHECK A/C CONTROL PANEL.

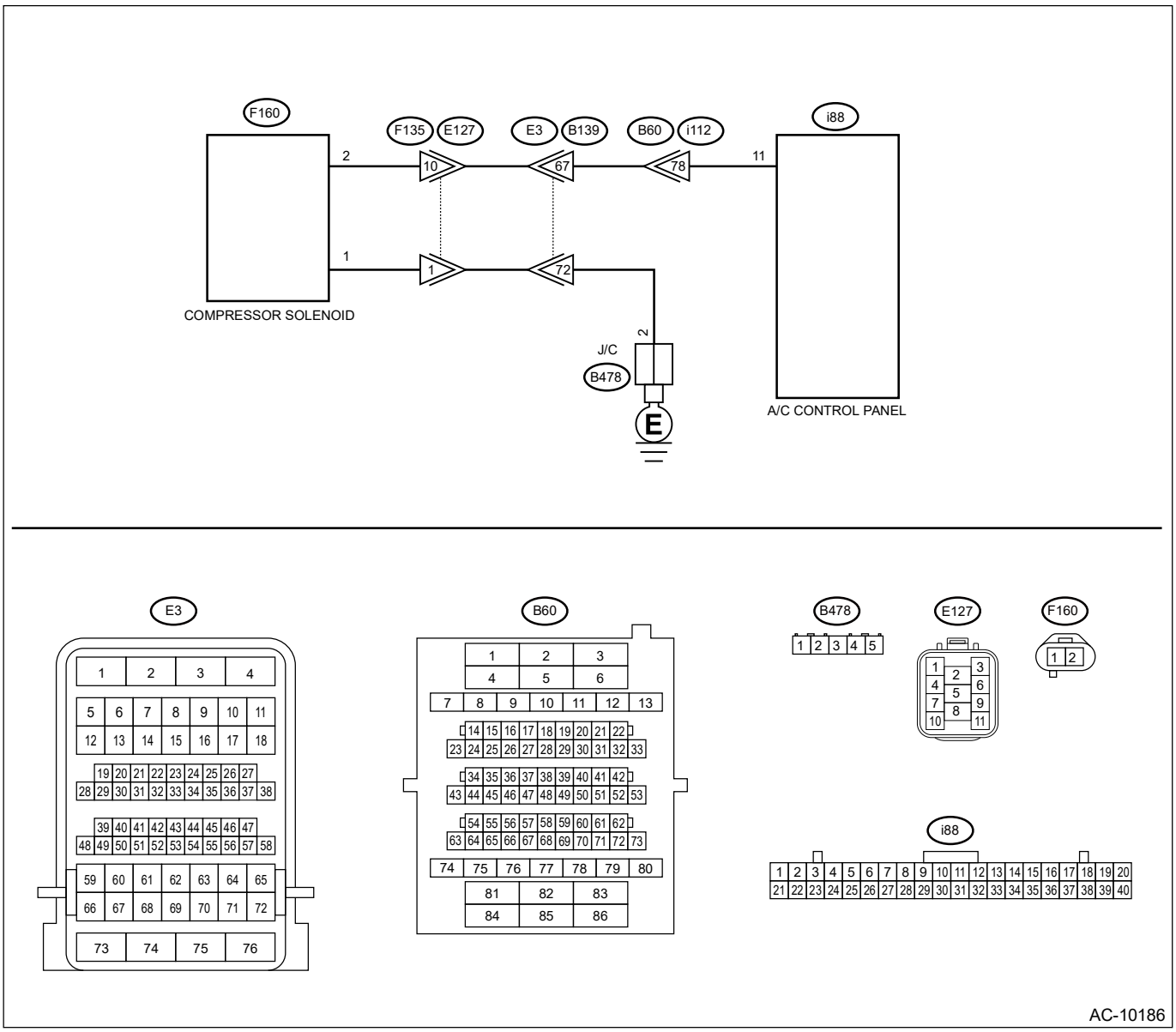
1. Turn the fan dial OFF.
2. Disconnect the power transistor connector.
3. Use a tester to measure the resistance between the power transistor connector and chassis ground.
   Connector & terminal
   (i183) No. 4 — Chassis ground:

When the fan dial is OFF and other than OFF, does the resistance change?

Yes	Replace the power transistor. Ref. to AIR CONDITIONER>Power Transistor.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

10. COLD AIR DOES NOT COME OUT EVEN WHEN THE A/C SWITCH IS PRESSED. THE GLASS CANNOT BE DEFOGGED. (COMPRESSOR DOES NOT OPERATE. (VARIABLE))

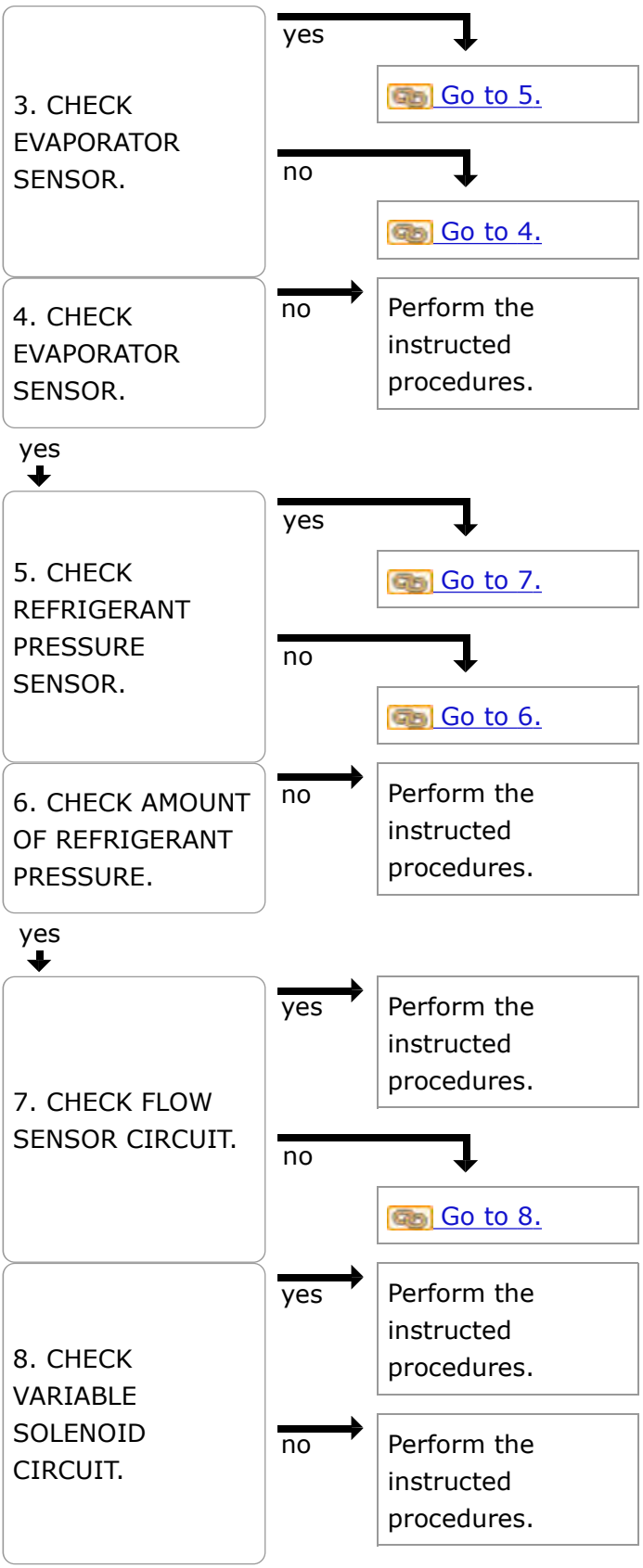
Trouble symptom:
Compressor does not operate even when the A/C switch is turned on and the fan switch is set to LO — HI.
Trouble causes:
Compressor failure
Wiring diagram:
Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK VARIABLE FLOW CHANGE SOLENOID DUTY VALUE.
   - yes → Go to 7.
   - no → Go to 3.


3. CHECK EVAPORATOR SENSOR.
yes
Go to 5.
no
Go to 4.
4. CHECK EVAPORATOR SENSOR.
no
Perform the instructed procedures.
yes
5. CHECK REFRIGERANT PRESSURE SENSOR.
yes
Go to 7.
no
Go to 6.
6. CHECK AMOUNT OF REFRIGERANT PRESSURE.
no
Perform the instructed procedures.
yes
7. CHECK FLOW SENSOR CIRCUIT.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK VARIABLE SOLENOID CIRCUIT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Leave the vehicle under the condition at ambient temperature of 15°C (59°F) or more.
2. Turn the ignition switch to ON.
3. Set the fan switch to maximum position.
4. Press the A/C switch.

Is A/C indicator displayed on the A/C control panel? (Current malfunction)

Yes	Go to 2.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

2. CHECK VARIABLE FLOW CHANGE SOLENOID DUTY VALUE.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Variable Flow Change Solenoid Duty]

Does the display indicate the value greater than zero?

Yes	Go to 7.
No	Go to 3.

3. CHECK EVAPORATOR SENSOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Evaporator Temperature]

Does the display indicate −0.5 degree or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK EVAPORATOR SENSOR.

Check the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

Is the check result OK?

Yes	Go to 5.
No	Replace the evaporator sensor. Ref. to AIR CONDITIONER>Evaporator Sensor.

5. CHECK REFRIGERANT PRESSURE SENSOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Refrigerant Pressure]

Does the display indicate 0.21 Mpa — 3.03 Mpa?

Yes	Go to 7.
No	Go to 6.

6. CHECK AMOUNT OF REFRIGERANT PRESSURE.

Check the refrigerant pressure. Ref. to AIR CONDITIONER>Refrigerant Pressure with Manifold Gauge Set.

Is the check result OK?

Yes	Go to 7.
No	Perform repair according to refrigerant pressure inspection.

7. CHECK FLOW SENSOR CIRCUIT.

1. Turn the ignition switch to ON.
2. Wait at least 1 second.
3. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



Is DTC B14A5 or B14A6 displayed? (Current malfunction)?

Yes	Perform the diagnosis for the displayed DTC B14A5 or B14A6. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A5 REFRIGERANT FLOW SENSOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14A6 REFRIGERANT FLOW SENSOR CIRCUIT SHORT-CIRCUIT .
No	Go to 8.

8. CHECK VARIABLE SOLENOID CIRCUIT.

1. Start the engine.
2. Turn the A/C switch to ON.
3. Set the fan switch to maximum position.
4. Set the temperature control switch to LO, and wait for 30 seconds or more.
5. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



Is DTC B14A7 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B14A7.
No	Replace the compressor. Ref. to AIR CONDITIONER>Compressor.

11. UNABLE TO SWITCH SUCTION VENTS

Trouble symptom:

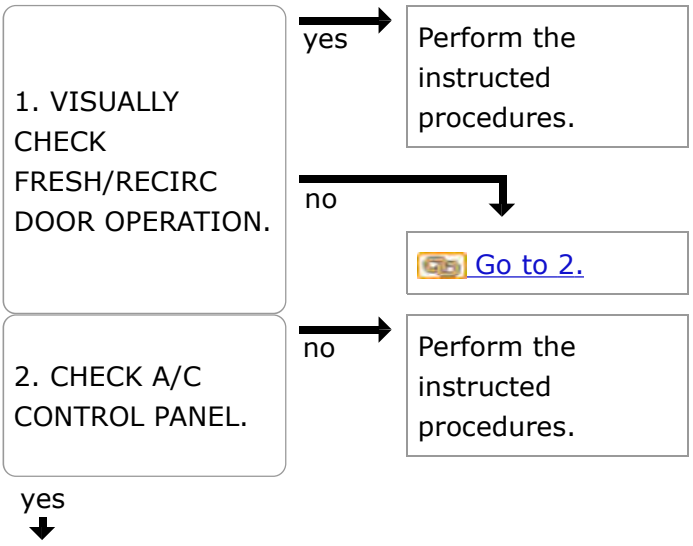
Even when the FRESH/RECIRC switch is pressed, the inlet opening does not switch to RECIRC → FRESH or FRESH → RECIRC.

Trouble causes:

Intake door actuator failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.



3. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. VISUALLY CHECK FRESH/RECIRC DOOR OPERATION.

1. Remove the glove box. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL.
2. Operate the FRESH/RECIRC switch, and visually check the intake door operation.

Does the intake door operate normally? Is the position between the intake door and intake door case sealed completely?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Fresh/Recircle Air Door Actuator Position Target]

3. Operate the FRESH/RECIRC switch.

Does [Fresh/Recircle Air Door Actuator Position Target] indicate 0 ←→ 100?

Yes	Go to 3.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

3. CHECK DTC.

1. Turn the FRESH/RECIRC switch to RECIRC, and leave for 16 seconds or more.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14E9, B14EA or B14EB displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B14E9, B14EA, or B14EB. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.
No	Go to 4.

4. CHECK DTC.

1. Turn the FRESH/RECIRC switch to FRESH, and leave for 16 seconds or more.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B14E9, B14EA or B14EB displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B14E9, B14EA, or B14EB. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14E9 INTAKE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EA INTAKE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B14EB INTAKE DOOR ACTUATOR STUCK.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

12. UNABLE TO SWITCH VENTS

Trouble symptom:

- Unable to switch blow vents.
- Outlet opening does not switch in the sequence of FACE → B/L → FOOT → F/D after operating the mode switch or mode dial.

Trouble causes:

Mode actuator failure

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK A/C CONTROL PANEL.
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK A/C CONTROL PANEL.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Air Conditioner]. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Data Monitor.



- [Mode Door Actuator Position Target]

3. Operate the mode change switch.

Does the value of [Mode Door Actuator Position Target] change along with the operation?

Yes	Go to 2.
No	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.

2. CHECK DTC.

1. Set the mode change switch to DEF, and wait for 16 seconds or more.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1438 or B1439 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1438 or B1439. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
No	Go to 3.

3. CHECK DTC.

1. Set the mode change switch to VENT, and wait for 16 seconds or more.
2. Read the DTC of [Air Conditioner] using the Subaru Select Monitor. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1438 or B1439 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1438 or B1439. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1438 MODE DOOR ACTUATOR CIRCUIT OPEN. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1439 MODE DOOR ACTUATOR CIRCUIT SHORT-CIRCUIT.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

13. ILLUMINATION DOES NOT COME ON OR CANNOT DIM

Trouble symptom:

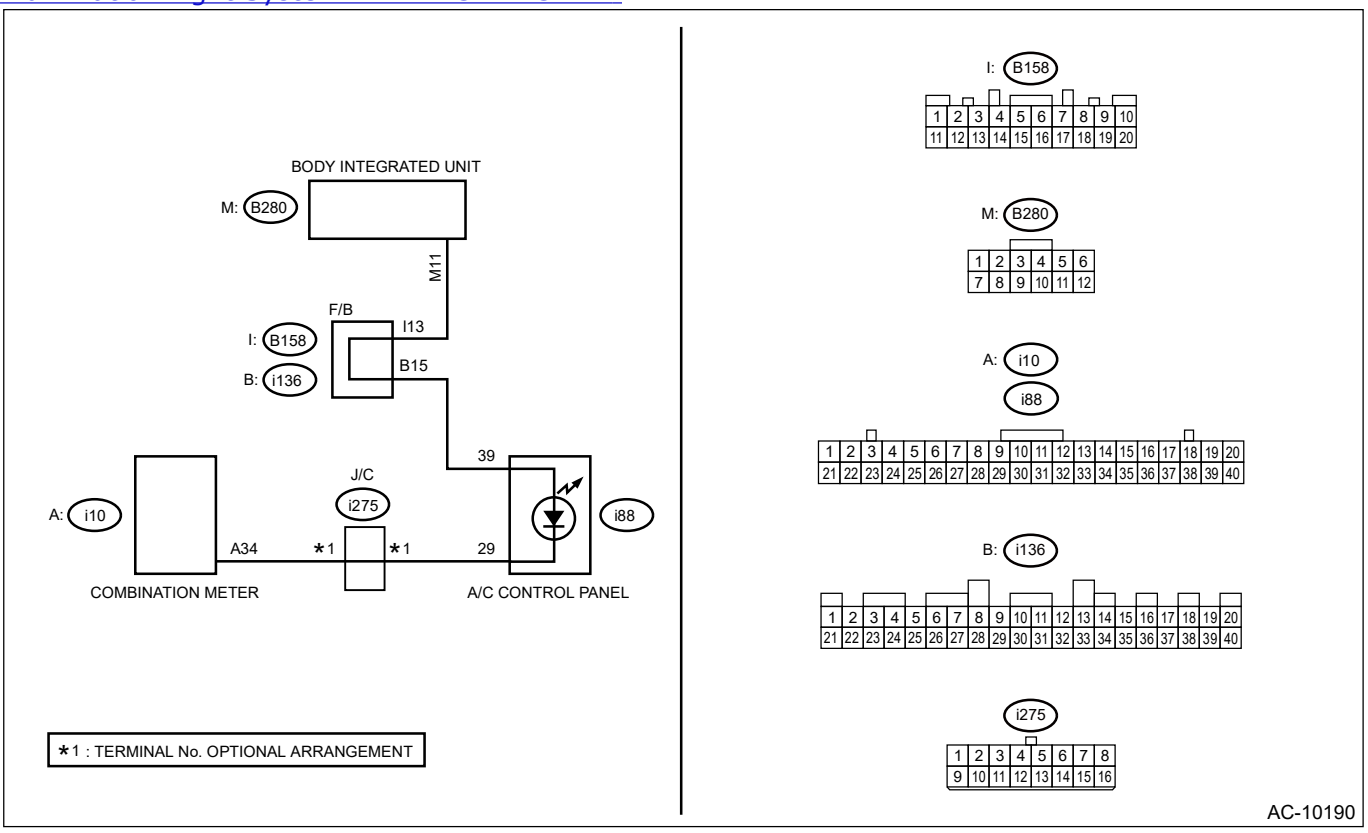
Even when the lighting switch is operated, the illumination does not come on. Even when the illumination control is operated, the illumination does not dim.

Trouble symptom:

Open circuit in illumination circuit

Wiring diagram:

Clearance Light and Illumination Light System Ref. to WIRING SYSTEM>Clearance Light and Illumination Light System>WIRING DIAGRAM.



Caution:

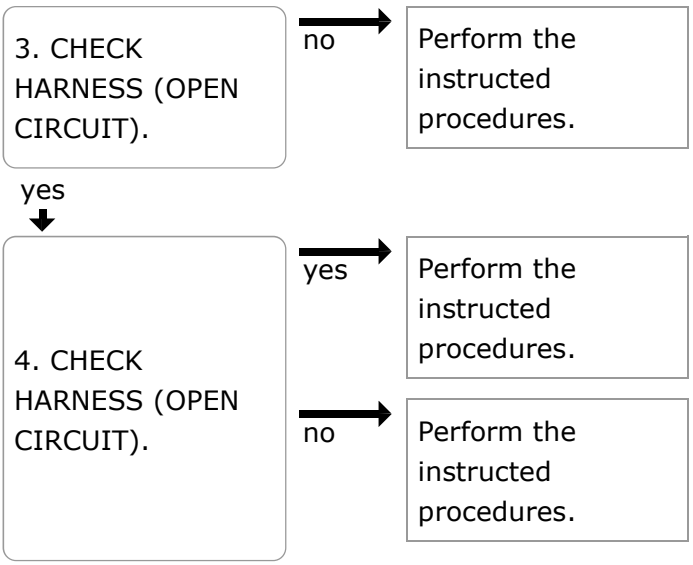
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIR CONDITIONER(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK ILLUMINATION.	no →	Perform the instructed procedures.

yes ↓

2. CHECK CONNECTOR.	no →	Perform the instructed procedures.

yes ↓



1. CHECK ILLUMINATION.

Make sure that all illuminations except A/C come on.

Do other illuminations come on?

Yes	Go to 2.
No	Check the illumination circuit. Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System>INSPECTION.

2. CHECK CONNECTOR.

Check for poor contact of connector.

Is the check result OK?

Yes	Go to 3.
No	Repair the connector.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the lighting switch to ON.
2. Using a tester, measure the voltage between the A/C control panel connector and chassis ground.
   Connector & terminal
   (i88) No. 39 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the lighting switch to OFF.
2. Measure the resistance between A/C control panel connector and combination meter connector.
   Connector & terminal
   (i88) No. 29 — (i10) No. 34:

Is the resistance less than 10 Ω?

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Repair or replace the open circuit of harness.

AIRBAG(DIAGNOSTICS)

AB(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Event Record Data
12. Batch save of Event record data
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

AIRBAG(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to AIRBAG(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. CHECK WARNING LIGHT.

Check whether the airbag warning light in the combination meter is lit.

Does the airbag warning light illuminate?

Yes	Go to 3.
No	Check the illuminating pattern of the airbag warning light. If no fault is found, it is normal at present. Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Airbag].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

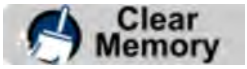
DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Currently, it is normal.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Airbag Check List for Interview Brought in on: MM/DD/YY</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>DTC</td><td colspan="3"></td></tr>
<tr><td>Condition of warning light</td><td colspan="3">❑Normal (After turning the ignition switch to ON, lit for approximately 6 seconds and goes off.)
❑Remains ON
❑Remains OFF</td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

AIRBAG(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Before performing diagnosis, refer to “CAUTION” in “General Description” in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

AIRBAG(DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnostics, check the following item which might affect airbag system problems.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.

PREPARATION TOOL

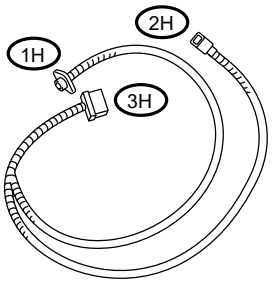
Caution:
To measure the voltage and resistance of airbag system component, be sure to use the specified test harness.

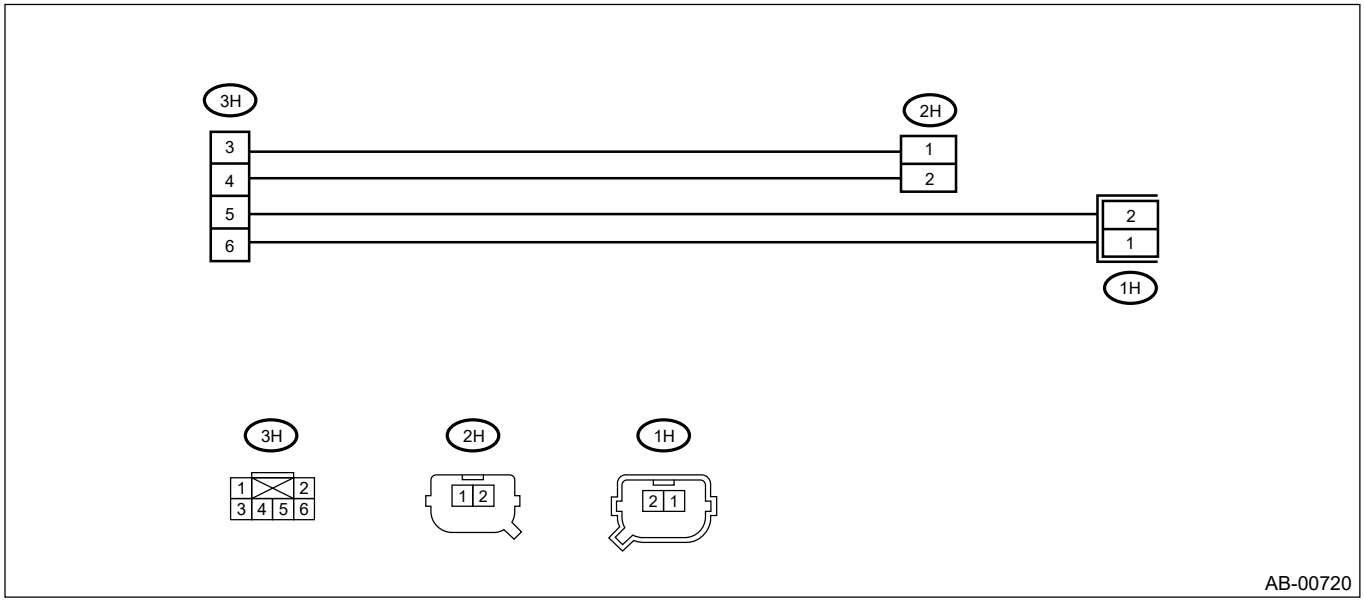
1. SPECIAL TOOL

- Subaru Select Monitor

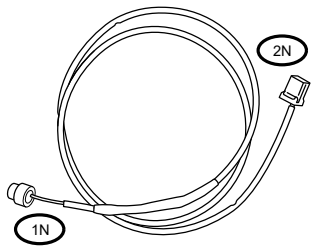
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

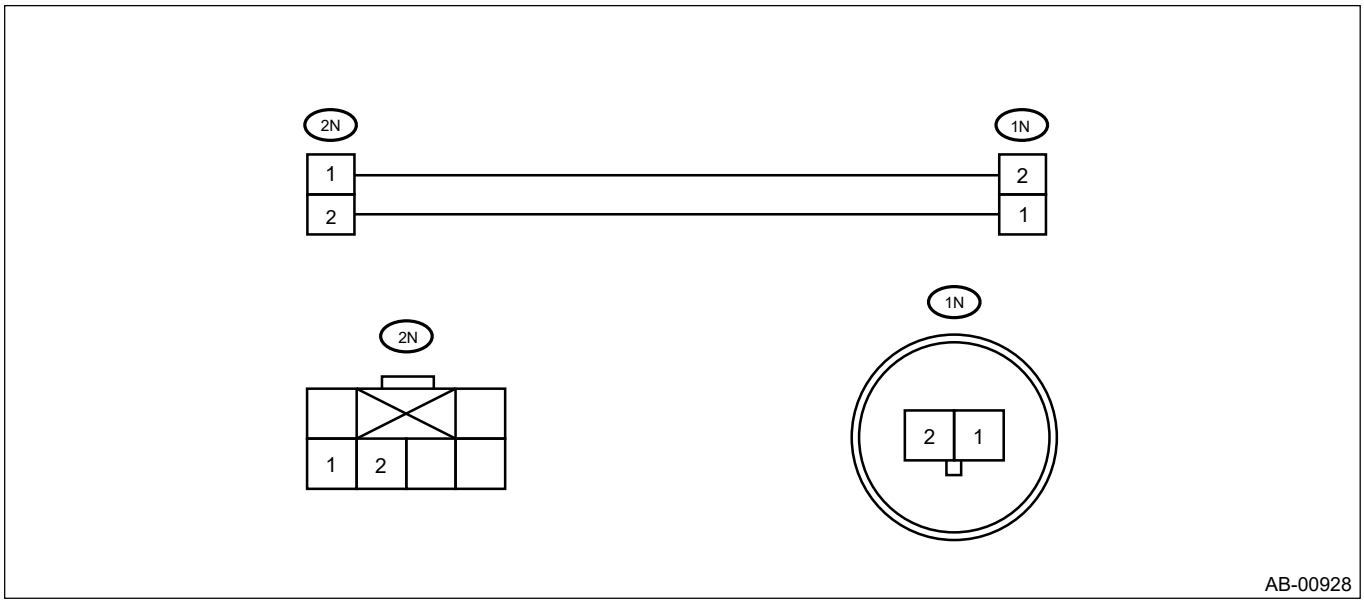
- TEST HARNESS H

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FA030	98299FA030	TEST HARNESS H	Used when measuring voltage and resistance of front sub sensor and front door impact sensor.



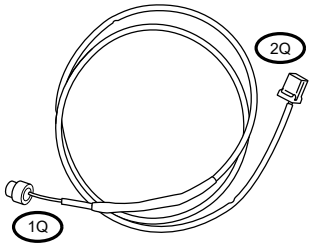
- TEST HARNESS N

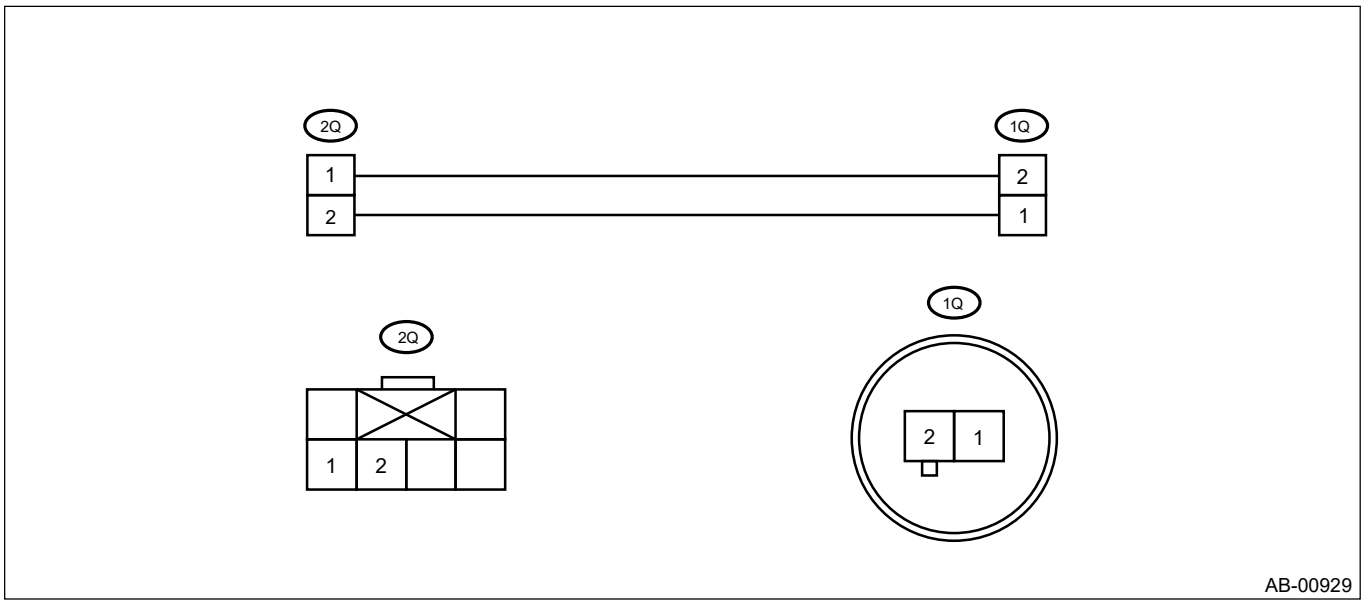
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA000	98299SA000	TEST HARNESS N	Used when measuring voltage and resistance of driver's airbag module, driver's knee airbag module, seat belt pretensioner and curtain airbag module.



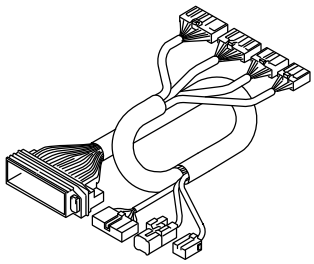
- TEST HARNESS Q

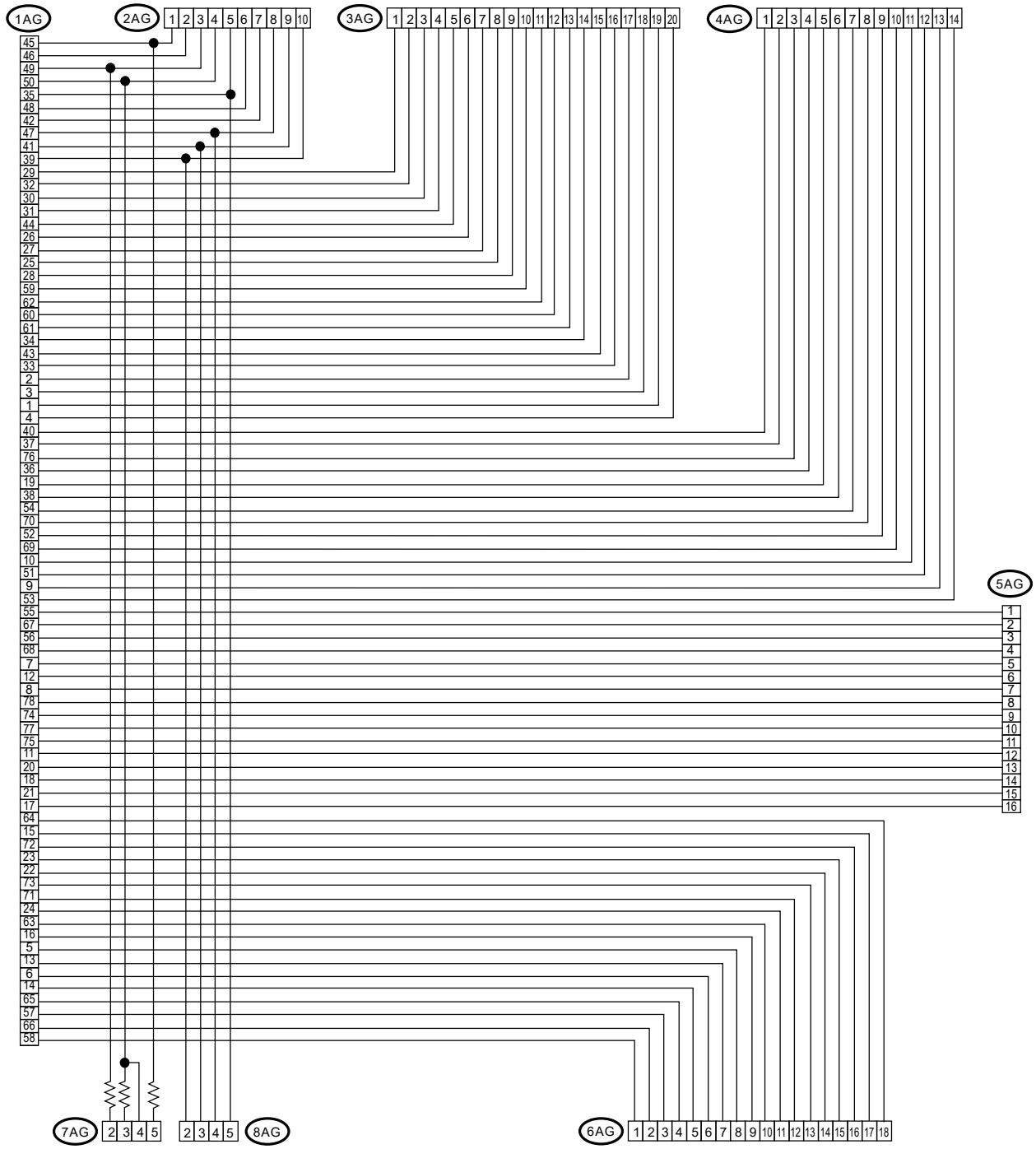
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299SA040	98299SA040	TEST HARNESS Q	Used when measuring voltage and resistance of driver’s airbag module.

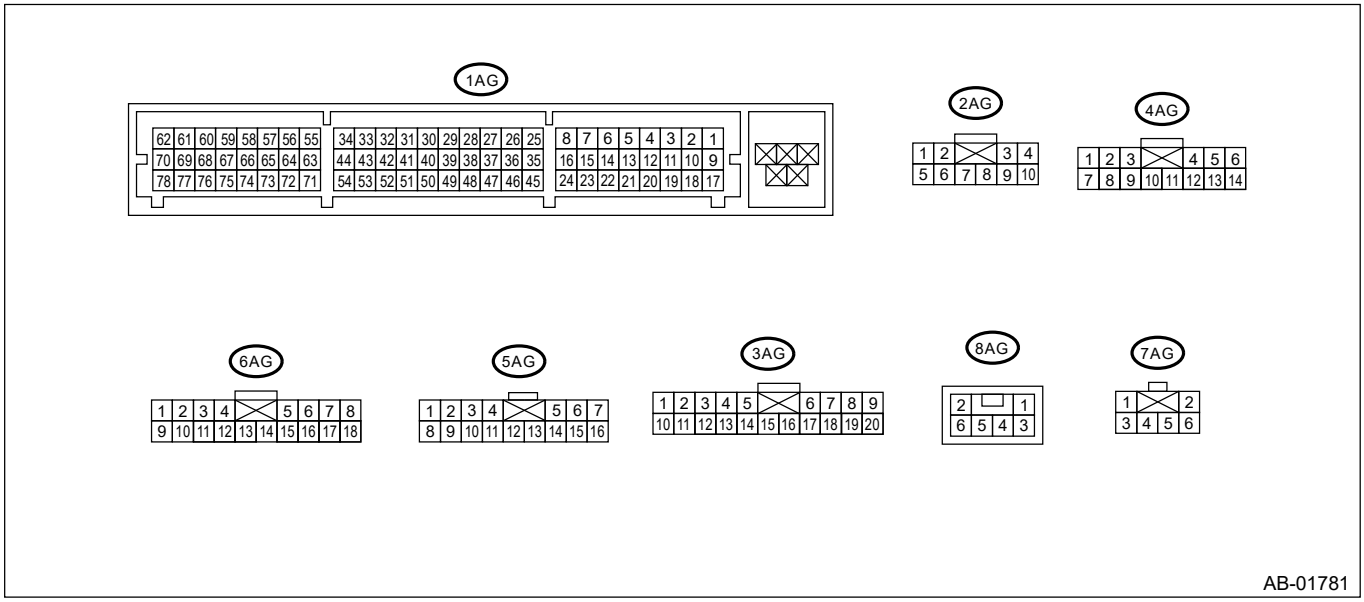


- TEST HARNESS AG

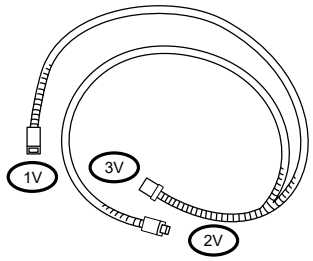
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG070	98299AG070	TEST HARNESS AG	Used when measuring voltage and resistance of airbag control module.

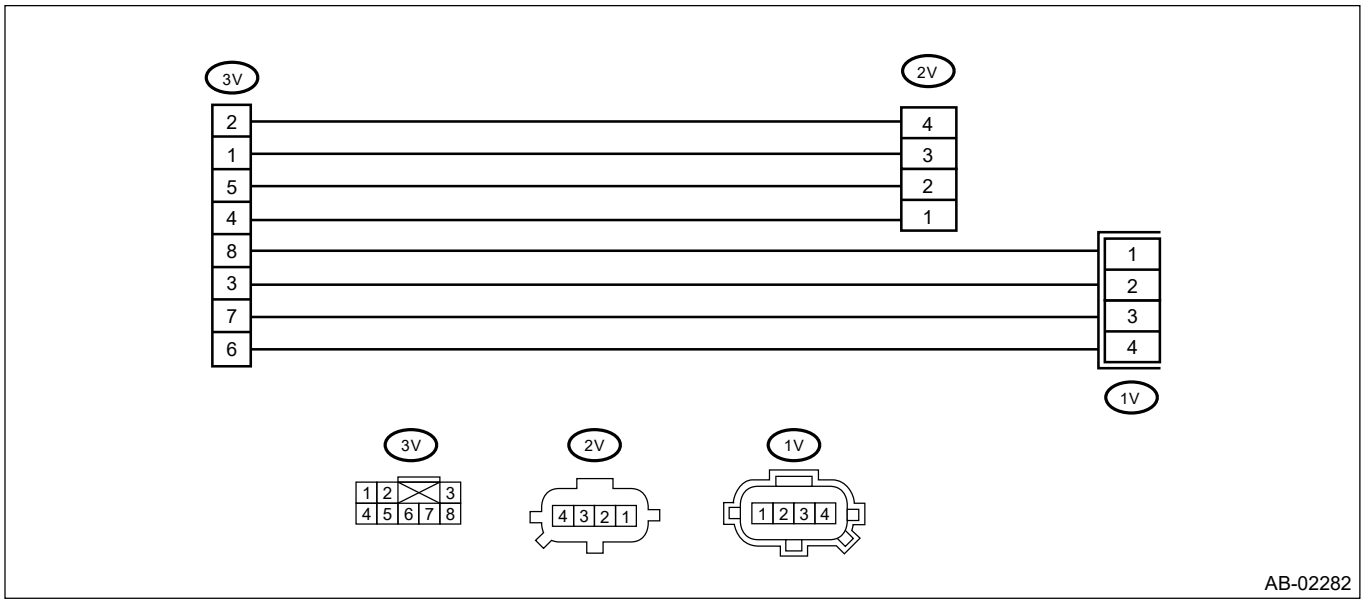

1AG
2AG
1 2 3 4 5 6 7 8 9 10
3AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
4AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14
5AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
45 46 49 50 35 48 42 47 41 39 29 32 30 31 44 26 27 25 28 59 62 60 61 34 43 33 2 3 1 4 40 37 76 36 19 38 54 70 52 69 10 51 9 53 55 67 56 68 7 12 8 78 74 77 75 11 20 18 21 17 64 15 72 23 22 73 71 24 63 16 5 13 6 14 65 57 66 58
7AG
2 3 4 5
2 3 4 5
8AG
6AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

AB-01902



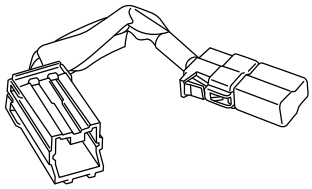
• TEST HARNESS V

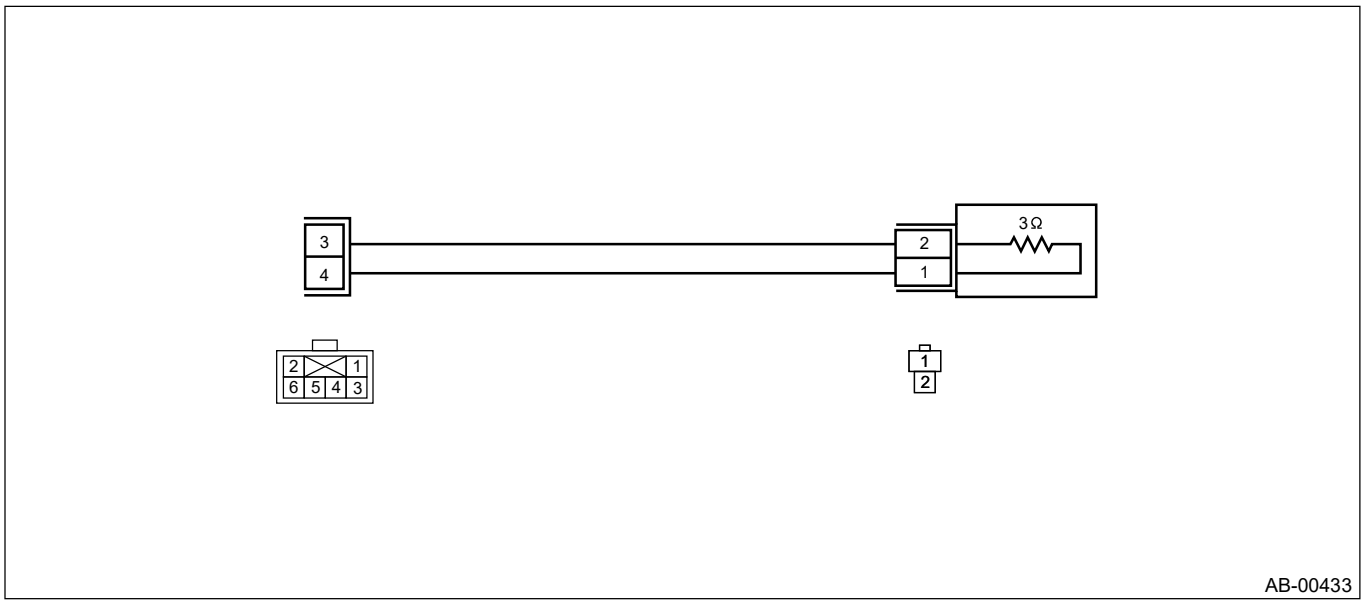
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG010	98299AG010	TEST HARNESS V	Used when measuring voltage and resistance of side airbag sensor and curtain airbag sensor.



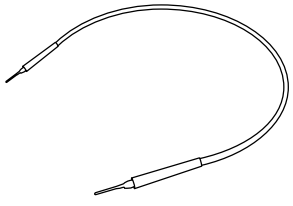
• AIRBAG RESISTOR

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299PA040	98299PA040	AIRBAG RESISTOR	Used in replacement of airbag module for which resistance value is same as airbag module. Two STs are required for diagnosis of two-stage inflator type airbag module.

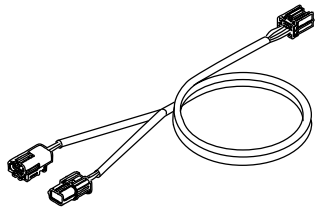


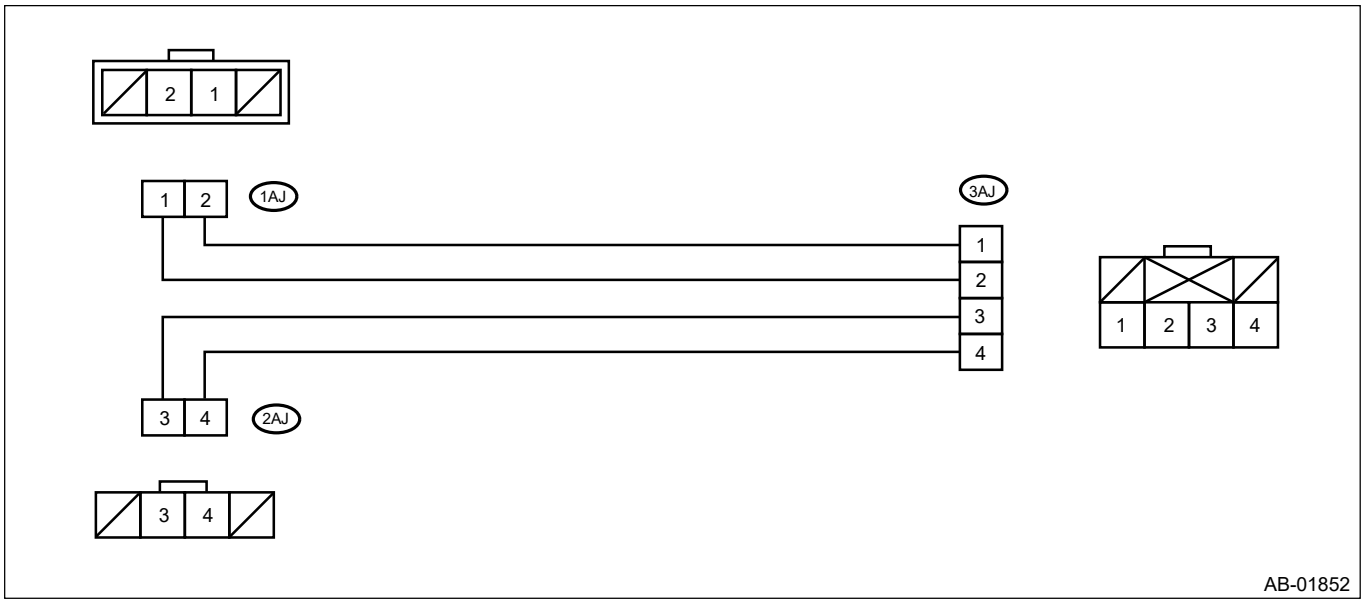
- TEST HARNESS AT

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299CA020	98299CA020	TEST HARNESS AT	Used when measuring power supply and resistance of side airbag harness. Two sets may be required.



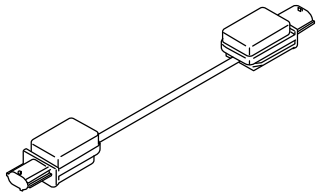
- TEST HARNESS AJ

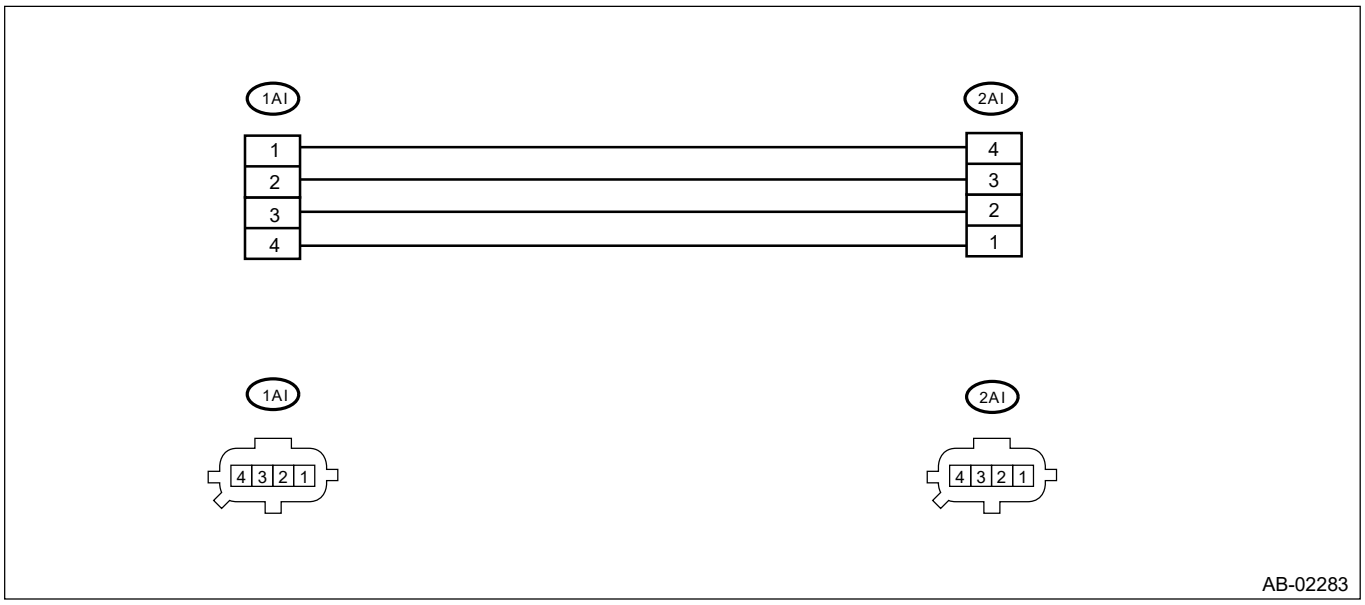
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299FG000	98299FG000	TEST HARNESS AJ	Used when measuring power supply and resistance of side airbag harness.



- TEST HARNESS AI

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG090	98299AG090	TEST HARNESS AI	• Used for diagnoses of side airbag sensor and curtain airbag sensor. • Used together with test harness V.

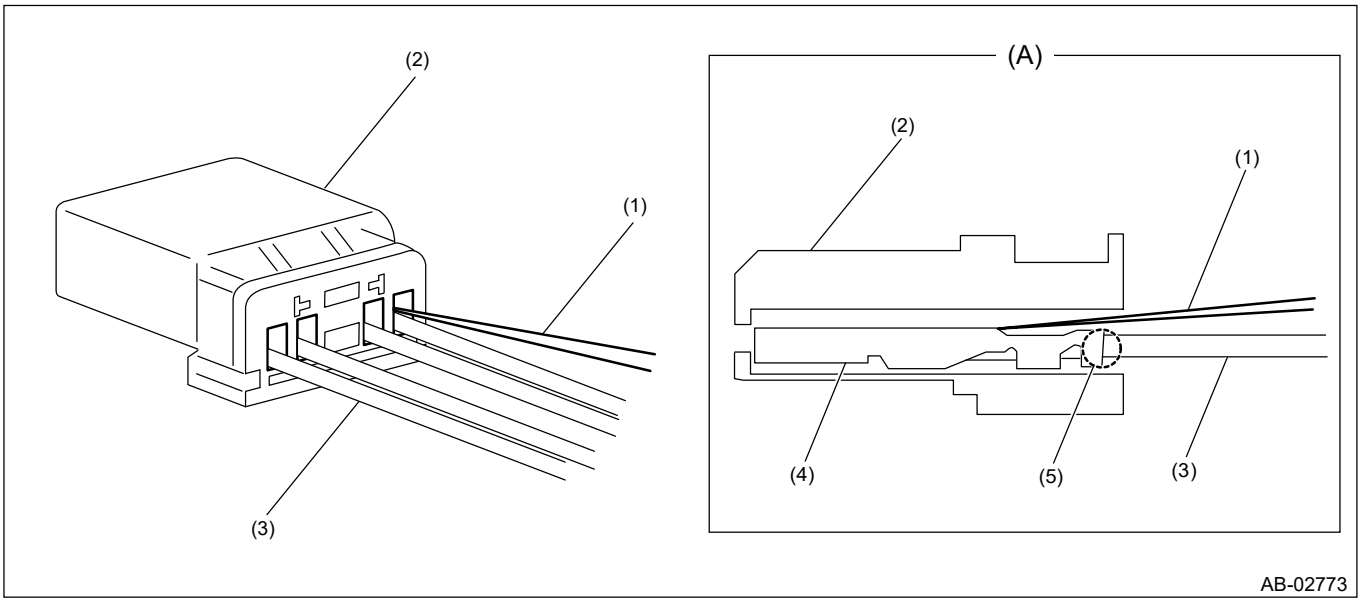


2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Probe	Used when measuring voltage and resistance of passenger’s airbag module.
DST-i	Used together with Subaru Select Monitor 4.

3. HOW TO USE PROBE

Insert the probe into the harness hole, and contact it with the terminal.



(A) Cross section

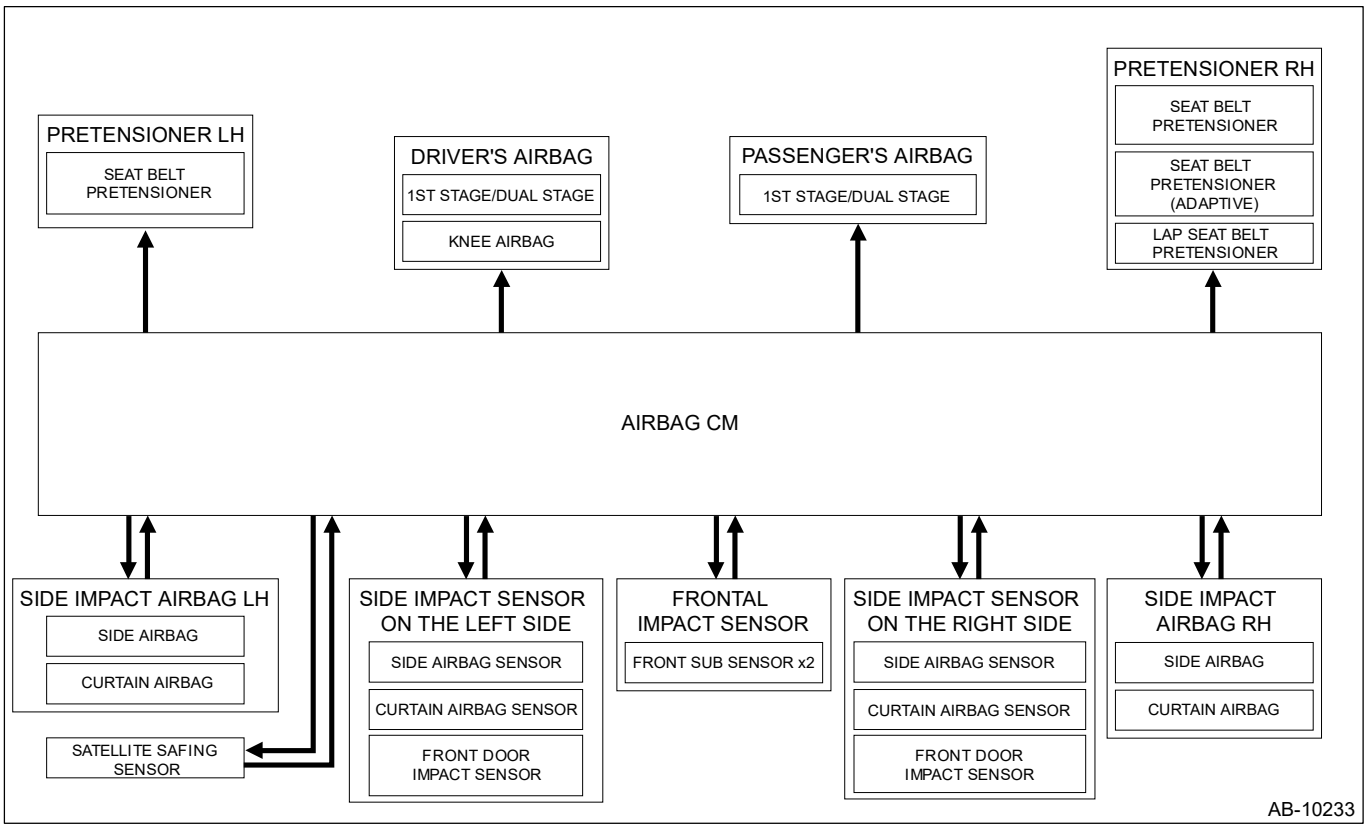
(1) Probe
(2) Connector (housing)
(3) Harness
(4) Terminal
(5) Connection

Caution:

- **Do not insert the probe forcibly.**
- **Be careful not to contact it to the connection (5) between the terminal and harness. (Harness will come off easily from connector if doing so.)**

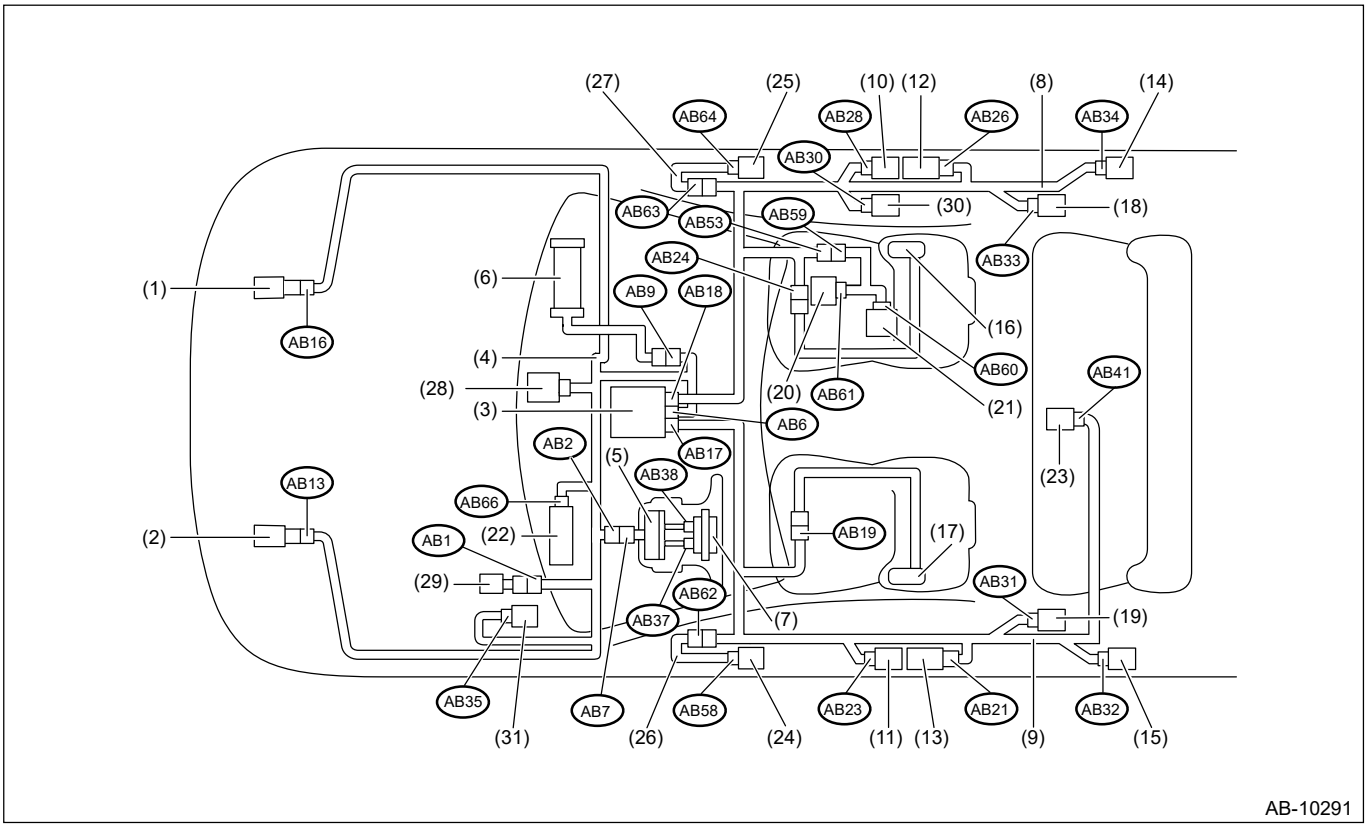
AIRBAG(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM


PRETENSIONER LH
SEAT BELT PRETENSIONER
DRIVER'S AIRBAG
1ST STAGE/DUAL STAGE
KNEE AIRBAG
PASSENGER'S AIRBAG
1ST STAGE/DUAL STAGE
PRETENSIONER RH
SEAT BELT PRETENSIONER
SEAT BELT PRETENSIONER (ADAPTIVE)
LAP SEAT BELT PRETENSIONER
AIRBAG CM
SIDE IMPACT AIRBAG LH
SIDE AIRBAG
CURTAIN AIRBAG
SATELLITE SAFING SENSOR
SIDE IMPACT SENSOR ON THE LEFT SIDE
SIDE AIRBAG SENSOR
CURTAIN AIRBAG SENSOR
FRONT DOOR IMPACT SENSOR
FRONTAL IMPACT SENSOR
FRONT SUB SENSOR x2
SIDE IMPACT SENSOR ON THE RIGHT SIDE
SIDE AIRBAG SENSOR
CURTAIN AIRBAG SENSOR
FRONT DOOR IMPACT SENSOR
SIDE IMPACT AIRBAG RH
SIDE AIRBAG
CURTAIN AIRBAG
AB-10233

AIRBAG(DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Front sub sensor RH
(2) Front sub sensor LH
(3) Airbag control module
(4) Airbag main harness
(5) Roll connector
(6) Passenger's airbag inflator
(7) Driver's airbag inflator
(8) Airbag rear harness RH
(9) Airbag rear harness LH
(10) Side airbag sensor RH
(11) Side airbag sensor LH
(12) Seat belt pretensioner RH
(13) Seat belt pretensioner LH
(14) Curtain airbag sensor RH
(15) Curtain airbag sensor LH
(16) Side airbag inflator RH
(17) Side airbag inflator LH
(18) Curtain airbag inflator RH
(19) Curtain airbag inflator LH
(20) Occupant detection control module
(21) Buckle switch (RH)
(22) Knee airbag module
(23) Satellite safing sensor
(24) Front door impact sensor LH
(25) Front door impact sensor RH
(26) Door harness LH
(27) Door harness RH
(28) Data communication module
(29) Data link connector
(30) Lap seat belt pretensioner RH
(31) Fuse box

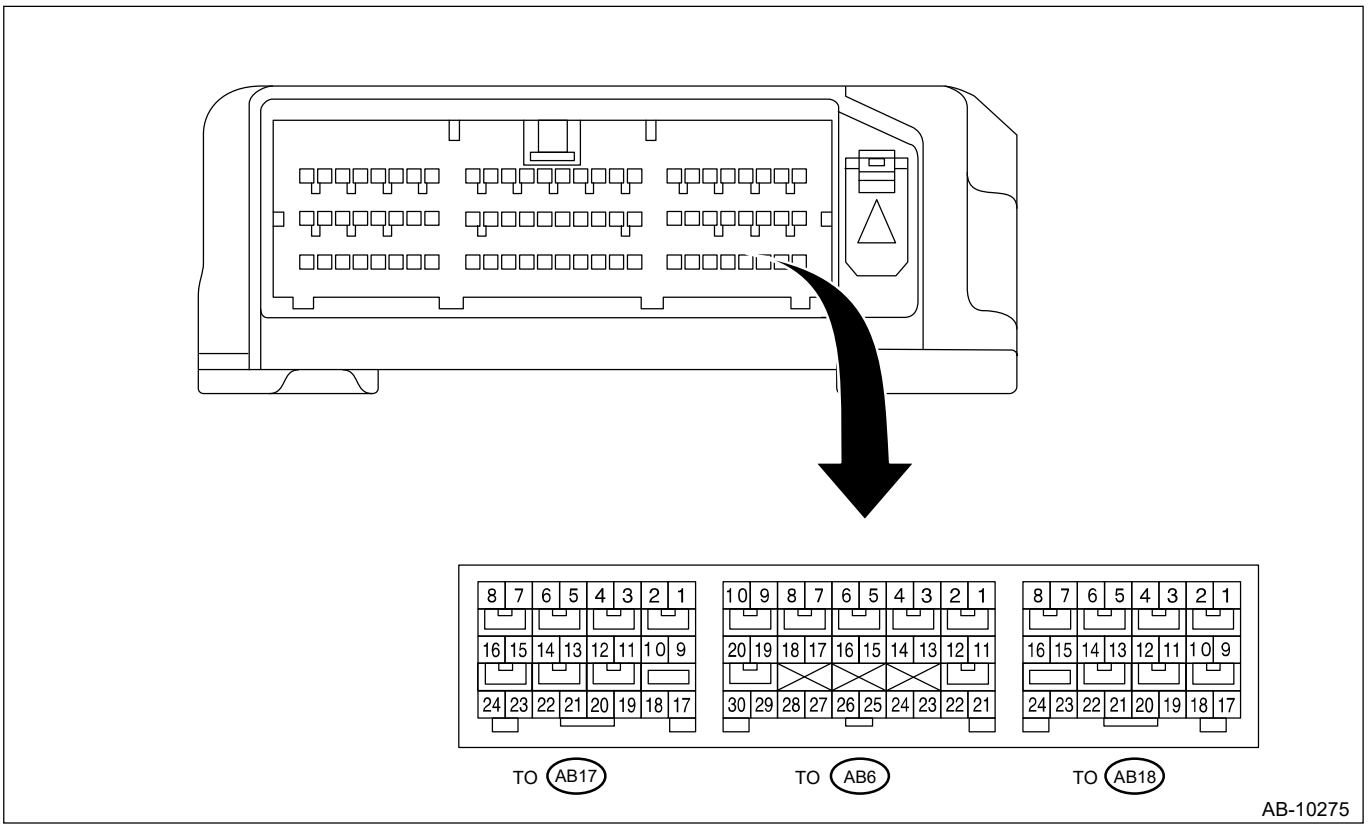
Connector No.	(AB1)	(AB2)	(AB6)	(AB7)	(AB9)	(AB13)	(AB16)	(AB17)	(AB18)	(AB19)	(AB21)	(AB23)
Pin	3	4	30	4	4	2	2	24	24	2	2	4
Color	★	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Black	Yellow
Male/Female	Female	Female	Female	Male	Female	Female	Female	Female	Female	Female	Female	Female

Connector No.	(AB24)	(AB26)	(AB28)	(AB30)	(AB31)	(AB32)	(AB33)	(AB34)	(AB35)	(AB37)	(AB38)	(AB41)
Pin	2	4	4	2	2	4	2	4	2	2	2	2
Color	Yellow	Black	Yellow	Yellow	Black	Yellow	Black	Yellow	★	Orange	Black	Yellow
Male/Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female	Female

Connector No.	(AB53)	(AB58)	(AB59)	(AB60)	(AB61)	(AB62)	(AB63)	(AB64)	(AB66)			
Pin	6	2	6	2	12	2	2	2	2			
Color	Black	Yellow	Black	Yellow	Black	Yellow	Yellow	Yellow	Yellow			
Male/Female	Female	Female	Male	Male	Female	Female	Female	Female	Female			

★: White or natural color

ELECTRICAL SPECIFICATION



- Terminal numbers in airbag control module connector are shown in the figure.
- The airbag warning light illuminates when the connector is removed from the airbag control module.

Contents		Terminal No.	Measuring condition	Standard
Passenger's airbag module, 2nd stage	+	(AB6) No. 1	—	—
	–	(AB6) No. 2		
Passenger's airbag module, 1st stage	+	(AB6) No. 4	—	—
	–	(AB6) No. 3		
Driver's airbag module, 1st stage	+	(AB6) No. 5	—	—
	–	(AB6) No. 6		
Driver's airbag module, 2nd stage	+	(AB6) No. 8	—	—
	–	(AB6) No. 7		
Driver's knee airbag module	+	(AB6) No. 9	—	—
	–	(AB6) No. 10		
CAN-H		(AB6) No. 13	—	—
Batch operation tool for disposal		(AB6) No. 16	—	—
Ignition switch power supply		(AB6) No. 21	—	—
CAN-L		(AB6) No. 22	—	—
Telematics communication line (collision detection signal)		(AB6) No. 24	—	—

Contents		Terminal No.	Measuring condition	Standard
GND		(AB6) No. 25	—	—
GND		(AB6) No. 26	—	—
Front sub sensor RH	+	(AB6) No. 29	—	—
	−	(AB6) No. 27		
Front sub sensor LH	+	(AB6) No. 30	—	—
	−	(AB6) No. 28		
Curtain airbag module RH	+	(AB17) No. 1	—	—
	−	(AB17) No. 2		
Seat belt pretensioner RH	+	(AB17) No. 4	—	—
	−	(AB17) No. 3		
Seat belt pretensioner RH (adaptive)	+	(AB17) No. 5	—	—
	−	(AB17) No. 6		
Side airbag module RH	+	(AB17) No. 8	—	—
	−	(AB17) No. 7		
Lap seat belt pretensioner RH	+	(AB17) No. 13	—	—
	−	(AB17) No. 14		
Occupant detection control module	+	(AB17) No. 16	—	—
	−	(AB17) No. 24		
Side airbag sensor RH Curtain airbag sensor RH Front door impact sensor RH	+	(AB17) No. 17	—	—
	−	(AB17) No. 18		
Side airbag module LH	+	(AB18) No. 1	—	—
	−	(AB18) No. 2		
Seat belt pretensioner LH	+	(AB18) No. 5	—	—
	−	(AB18) No. 6		
Curtain airbag module LH	+	(AB18) No. 8	—	—
	−	(AB18) No. 7		
Satellite safing sensor	+	(AB18) No. 21	—	—
	−	(AB18) No. 22		
Side airbag sensor LH Curtain airbag sensor LH Front door impact sensor LH	+	(AB18) No. 24	—	—
	−	(AB18) No. 23		

AIRBAG(DIAGNOSTICS) > Inspection Mode

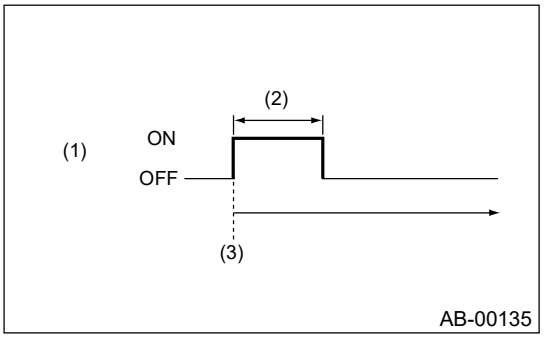
PROCEDURE

Turn the ignition switch to ON, and wait for 6 seconds or more.

AIRBAG(DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

Turn the ignition switch to ON, and confirm that the airbag warning light remains on for approx. 6 seconds then turns off afterwards.



(1) Airbag warning light
(2) Approx. 6 seconds
(3) Ignition switch ON

AIRBAG(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT DOES NOT ILLUMINATE

Detecting condition:

- Airbag warning light is faulty.
- Airbag control module to combination meter circuit is shorted or open.
- Grounding circuit is faulty.
- Airbag control module is faulty.
- Connector connection is improper.
- Connections of (AB6, AB17, AB18) to airbag control module are improper.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK FOR POOR CONTACT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check the connection status of airbag CM connector.

Is there poor contact of connector?

Yes	Reconnect the connector. Or repair the connector.
No	Go to 3.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Repair it according to COMBINATION METER (DIAGNOSTICS). Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

AIRBAG(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:

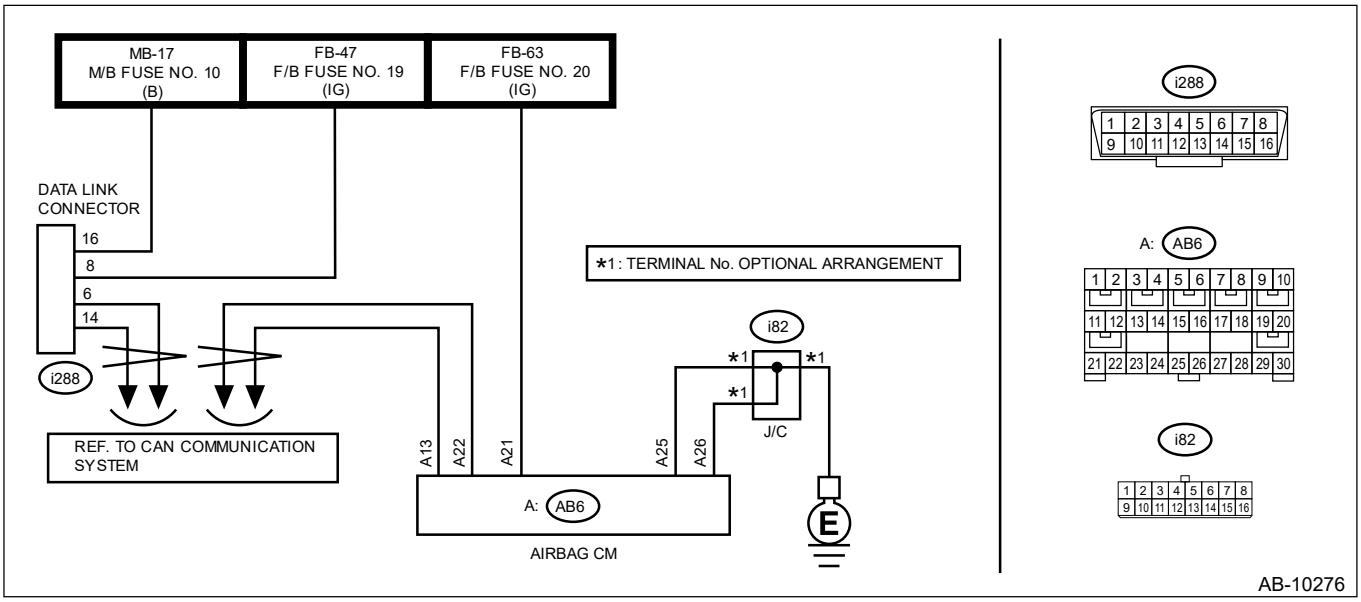
For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT COME ON". Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:
Cannot communicate with [Airbag].
DTC detecting condition:
- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

WIRING DIAGRAM:
- Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK BODY INTEGRATED UNIT AND SUBARU SELECT MONITOR COMMUNICATION.

Connect the Subaru Select Monitor, and check for the communication with [Body Control].

Is the check result OK?

Yes	Go to 5.
No	Go to 2.

2. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle, and check for the communication.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the Subaru Select Monitor.

3. CHECK DATA LINK CONNECTOR.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 16 (+) — Chassis ground (−):
   (i288) No. 8 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Inspect the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 4.

4. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove a fuse in the data link connector and visually check the fuse.

Is the check result OK?

Yes	Repair the harness between the battery and the data link connector.
No	Replace the fuse. If the fuse is blown out again, check the power supply circuit.

5. CHECK AIRBAG CONTROL MODULE CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Confirm that the connectors of airbag control module (AB6, AB17, AB18) are securely connected.

Is the check result OK?

Yes	Go to 6.
No	Connect the connector of the airbag control module.

6. CHECK FUSE.

Remove fuse No. 20 from the fuse & relay box, and perform visual inspection.

Is the check result OK?

Yes	Go to 7.
No	Replace the fuse. If the fuse is blown out again, check the power supply circuit.

7. CHECK AIRBAG CM POWER SUPPLY CIRCUIT.

1. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
2. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
3. Turn the ignition switch to ON.
4. Measure the voltage between connector (2AG) in the test harness AG and chassis ground.
   Connector & terminal
   (2AG) No. 4 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the harness between the airbag control module and the battery. Or replace the airbag main harness along with the bulkhead harness.

8. CHECK BETWEEN AIRBAG CONTROL MODULE AND CHASSIS GROUND (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between connector (2AG) in the test harness AG and chassis ground.
   Connector & terminal
   (2AG) No. 4 — Chassis ground:
   (2AG) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the harness between the airbag control module and the chassis ground. Or replace the airbag main harness along with the bulkhead harness.

9. CHECK POOR CONTACT OF CONNECTOR.

Is there poor contact of control module power supply, ground line and data link connector?

Yes	Repair the connector. (Replace the harness without repairing the airbag system connector.)
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Data Monitor>LIST.**

AIRBAG(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Record • display the number of turning the ignition switch to ON.	time	—
Count	—	—	—
Time Count	Record • display the time elapsed after turning the ignition switch to ON.	ms	—
Belt Buckle Switch RH	Display the status of passenger's seat buckle switch.	When passenger's seat belt is worn: OFF When passenger's seat belt is not worn: Not Buckled	—
Passenger Occupant Status	Display the status of passenger seat's occupant.	When occupant is adult: Adult When occupant is child: Child When unoccupied or child restraint seat is installed: Empty or CRS	—
Passenger Airbag Status	Display the status of passenger seat's airbag.	Ignition possible: ON Ignition impossible: OFF	—

AIRBAG(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Freeze Frame Data>LIST.**

AIRBAG(DIAGNOSTICS) > Freeze Frame Data

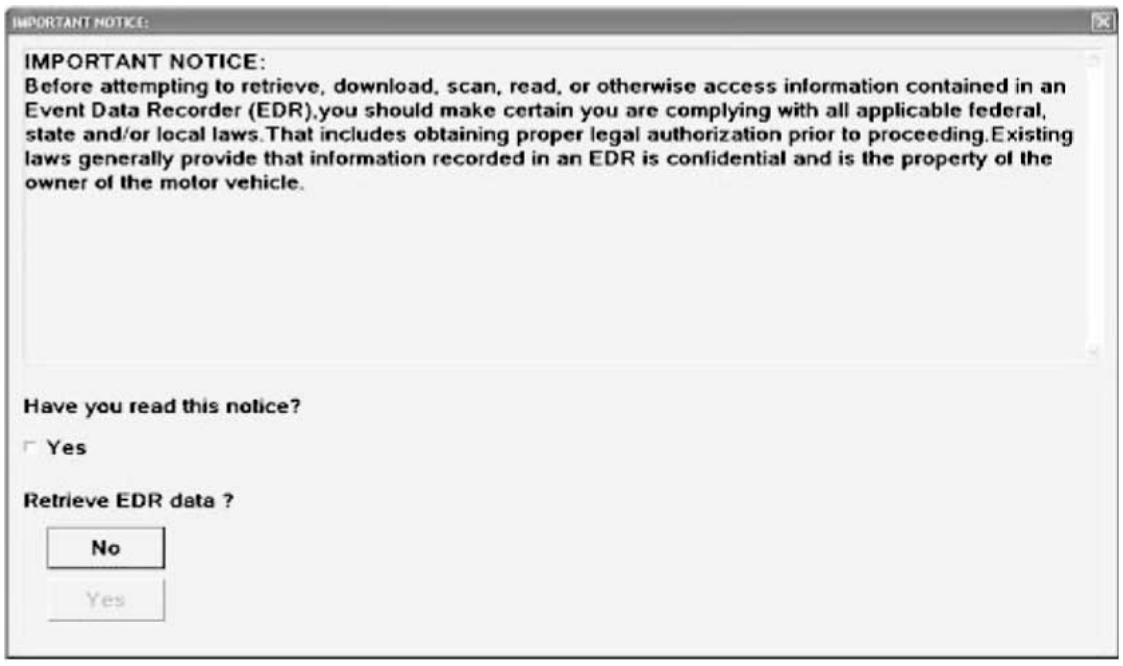
LIST

Item	Contents	Standard/Unit	Note
Trip Count	Record • display the number of turning the ignition switch to ON.	time	—
Count	—	—	—
Time Count	Record • display the time elapsed after turning the ignition switch to ON.	ms	—

AIRBAG(DIAGNOSTICS) > Event Record Data

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Airbag] display, select [Work Support].
6. On [[Work Support item]] display, select [Event Record Data]. After it is selected, [IMPORTANT NOTICE] screen is displayed.
7. After checking the content of [IMPORTANT NOTICE], click the checkbox for “Yes”.
8. If the applicable law is not violated, click the [Yes] button to display the EDR data.

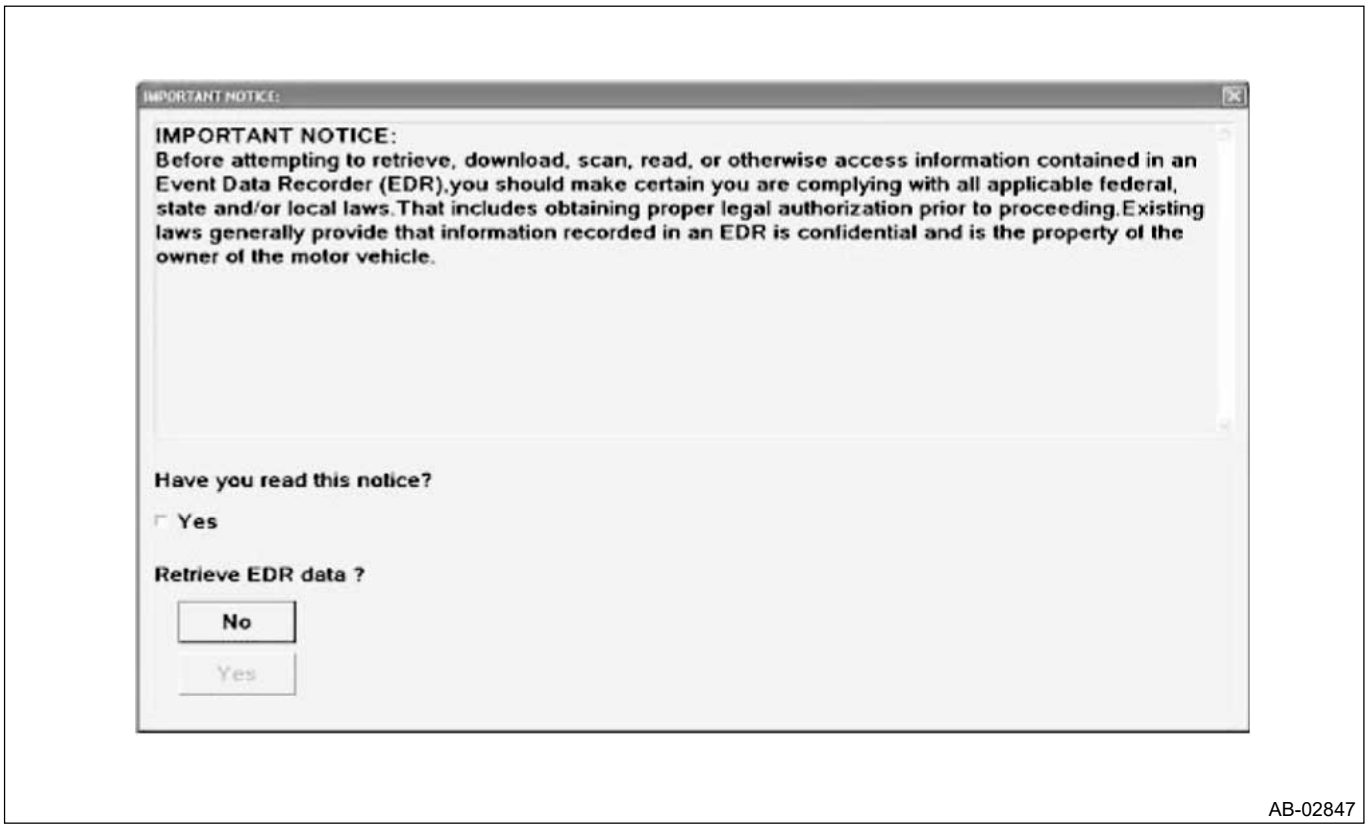


9. Select the items to be checked from each event record data.
10. Select the record data to be checked from each record data.
11. The selected record data is displayed. When no EDR data is recorded, [Event Record Data is not recorded] will be displayed.
12. Select [Exit] to return to each event record data screen.

AIRBAG(DIAGNOSTICS) > Batch save of Event record data

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Airbag], and then select [Enter].
5. On [Airbag] display, select [Work Support].
6. On [[Work Support item]] display, select [Batch save of Event record data]. After it is selected, [IMPORTANT NOTICE] screen is displayed.
7. After checking the content of [IMPORTANT NOTICE], click the checkbox for “Yes”.
8. If the applicable law is not violated, click the [Yes] button to display the EDR data.



9. Specify the destination for the event record data to save the data there.
10. After saving the file, click the [OK] button to return the menu screen.

AIRBAG(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

AIRBAG(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B1000	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.
B1003	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1003 AIRBAG ECU MALFUNCTION.
B1105	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1105 AIRBAG ECU MALFUNCTION.
B1106	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1106 AIRBAG ECU MALFUNCTION.
B1115	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1115 AIRBAG ECU MALFUNCTION.
B1116	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1116 AIRBAG ECU MALFUNCTION.
B1117	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

Code	Description & trouble part	Reference
		(DTC)>DTC B1117 AIRBAG ECU MALFUNCTION.
B1118	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1118 AIRBAG ECU MALFUNCTION.
B1120	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1120 AIRBAG ECU MALFUNCTION.
B1121	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1121 AIRBAG ECU MALFUNCTION.
B1125	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1125 AIRBAG ECU MALFUNCTION.
B1126	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1126 AIRBAG ECU MALFUNCTION.
B1145	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1145 AIRBAG ECU MALFUNCTION.
B1146	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1146 AIRBAG ECU MALFUNCTION.
B1170	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1170 AIRBAG ECU MALFUNCTION.

Code	Description & trouble part	Reference
B1185	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1185 AIRBAG ECU MALFUNCTION.
B1195	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1195 AIRBAG ECU MALFUNCTION.
B1196	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1196 AIRBAG ECU MALFUNCTION.
B1199	AIRBAG ECU MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1199 AIRBAG ECU MALFUNCTION.
B11E0	ROLLOVER DEPLOYMENT HISTORY	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11E0 ROLLOVER DEPLOYMENT HISTORY.
B11F0	DISPOSAL PROCESS COMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F0 DISPOSAL PROCESS COMPLETE.
B11F2	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F2 FRONT IMPACT DEPLOYMENT.
B11F3	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F3 FRONT IMPACT DEPLOYMENT.
B11F4	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F4 FRONT IMPACT

Code	Description & trouble part	Reference
		DEPLOYMENT.
B11F5	FRONT IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F5 FRONT IMPACT DEPLOYMENT.
B11F7	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.
B11F8	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F8 SIDE IMPACT DEPLOYMENT.
B11F9	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F9 SIDE IMPACT DEPLOYMENT.
B11FA	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FA SIDE IMPACT DEPLOYMENT.
B11FB	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FB SIDE IMPACT DEPLOYMENT.
B11FC	SIDE IMPACT DEPLOYMENT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11FC SIDE IMPACT DEPLOYMENT.
B1610	FRONT SUB SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1610 FRONT SUB SENSOR RH FAILURE.
B1612	FRONT SUB SENSOR RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic

Code	Description & trouble part	Reference
		Procedure with Diagnostic Trouble Code (DTC)>DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION.
B1613	FRONT SUB SENSOR RH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR.
B1615	FRONT SUB SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1615 FRONT SUB SENSOR LH FAILURE.
B1617	FRONT SUB SENSOR LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION.
B1618	FRONT SUB SENSOR LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR.
B1620	SIDE AIRBAG SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1620 SIDE AIRBAG SENSOR RH FAILURE.
B1622	SIDE AIRBAG SENSOR RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION.
B1623	SIDE AIRBAG SENSOR RH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
B1625	SIDE AIRBAG SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1625 SIDE AIRBAG SENSOR LH FAILURE.

Code	Description & trouble part	Reference
B1627	SIDE AIRBAG SENSOR LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION.
B1628	SIDE AIRBAG SENSOR LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
B1630	CURTAIN AIRBAG SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1630 CURTAIN AIRBAG SENSOR RH FAILURE.
B1632	CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION.
B1633	CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
B1635	CURTAIN AIRBAG SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE.
B1637	CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION.
B1638	CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
B1642	SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1642 SIDE SATELLITE

Code	Description & trouble part	Reference
		SENSOR BUS RH LOST COMMUNICATION.
B1643	SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR.
B1647	SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION.
B1648	SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR.
B1650	OCCUPANT DETECTION SYSTEM MALFUNCTION	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.
B1655	FRONT BUCKLE SWITCH RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.
B1661	PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1661 PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE.
B1675	SATELLITE SAFING SENSOR FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1675 SATELLITE SAFING SENSOR FAILURE.
B1676	LOST COMMUNICATION WITH SATELLITE SAFING SENSOR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1676 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR.
B1677	SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic

Code	Description & trouble part	Reference
		Procedure with Diagnostic Trouble Code (DTC)>DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE.
B1690	DOOR SENSOR RH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1690 DOOR SENSOR RH FAILURE.
B1692	LOST COMMUNICATION WITH DOOR SENSOR RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH.
B1693	DOOR SENSOR RH INITIALIZATION INCOMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.
B1695	DOOR SENSOR LH FAILURE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1695 DOOR SENSOR LH FAILURE.
B1697	LOST COMMUNICATION WITH DOOR SENSOR LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH.
B1698	DOOR SENSOR LH INITIALIZATION INCOMPLETE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.
B16F2	FRONT SUB SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F2 FRONT SUB SENSOR RH RECOGNITION ERROR.
B16F3	FRONT SUB SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR.

Code	Description & trouble part	Reference
B16F4	SIDE AIRBAG SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F4 SIDE AIRBAG SENSOR RH RECOGNITION ERROR.
B16F5	SIDE AIRBAG SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F5 SIDE AIRBAG SENSOR LH RECOGNITION ERROR.
B16F6	CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F6 CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR.
B16F7	CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR.
B16F8	SATELLITE SAFING SENSOR RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR.
B16F9	DOOR SENSOR RH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR.
B16FA	DOOR SENSOR LH RECOGNITION ERROR	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B16FA DOOR SENSOR LH RECOGNITION ERROR.
B1800	SHORT IN DRIVER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1800 SHORT IN DRIVER'S AIRBAG.
B1801	OPEN IN DRIVER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1801 OPEN IN DRIVER'S

Code	Description & trouble part	Reference
		AIRBAG.
B1802	SHORT IN DRIVER'S AIRBAG (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND).
B1803	SHORT IN DRIVER'S AIRBAG (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1803 SHORT IN DRIVER'S AIRBAG (TO +B).
B1805	SHORT IN PASSENGER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1805 SHORT IN PASSENGER'S AIRBAG.
B1806	OPEN IN PASSENGER'S AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1806 OPEN IN PASSENGER'S AIRBAG.
B1807	SHORT IN PASSENGER'S AIRBAG (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1807 SHORT IN PASSENGER'S AIRBAG (TO GROUND).
B1808	SHORT IN PASSENGER'S AIRBAG (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO +B).
B1810	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.
B1811	OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1811 OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP.
B1812	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic

Code	Description & trouble part	Reference
		Procedure with Diagnostic Trouble Code (DTC)>DTC B1812 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND).
B1813	SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1813 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B).
B1815	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1815 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP.
B1816	OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1816 OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP.
B1817	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1817 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND).
B1818	SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1818 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B).
B1820	SHORT IN SIDE AIRBAG RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1820 SHORT IN SIDE AIRBAG RH.
B1821	OPEN IN SIDE AIRBAG RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1821 OPEN IN SIDE AIRBAG RH.

Code	Description & trouble part	Reference
B1822	SHORT IN SIDE AIRBAG RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1822 SHORT IN SIDE AIRBAG RH (TO GROUND).
B1823	SHORT IN SIDE AIRBAG RH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1823 SHORT IN SIDE AIRBAG RH (TO +B).
B1825	SHORT IN SIDE AIRBAG LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1825 SHORT IN SIDE AIRBAG LH.
B1826	OPEN IN SIDE AIRBAG LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1826 OPEN IN SIDE AIRBAG LH.
B1827	SHORT IN SIDE AIRBAG LH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1827 SHORT IN SIDE AIRBAG LH (TO GROUND).
B1828	SHORT IN SIDE AIRBAG LH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1828 SHORT IN SIDE AIRBAG LH (TO +B).
B1830	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1830 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1831	OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1831 OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT.
B1832	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1832 SHORT IN CURTAIN

Code	Description & trouble part	Reference
		AIRBAG RH SQUIB CIRCUIT (TO GROUND).
B1833	SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1833 SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT (TO +B).
B1835	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1835 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1836	OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1836 OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT.
B1837	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1837 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND).
B1838	SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1838 SHORT IN CURTAIN SHIELD AIRBAG LH SQUIB CIRCUIT (TO +B).
B1860	SHORT IN DRIVER'S KNEE AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1860 SHORT IN DRIVER’S KNEE AIRBAG.
B1861	OPEN IN DRIVER'S KNEE AIRBAG	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1861 OPEN IN DRIVER’S KNEE AIRBAG.
B1862	SHORT IN DRIVER'S KNEE AIRBAG (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1862 SHORT IN DRIVER’S KNEE AIRBAG (TO GROUND).

Code	Description & trouble part	Reference
B1863	SHORT IN DRIVER'S KNEE AIRBAG (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1863 SHORT IN DRIVER'S KNEE AIRBAG (TO +B).
B1900	SHORT IN FRONT P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1900 SHORT IN FRONT P/T RH.
B1901	OPEN IN FRONT P/T RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1901 OPEN IN FRONT P/T RH.
B1902	SHORT IN FRONT P/T RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1902 SHORT IN FRONT P/T RH (TO GROUND).
B1903	SHORT IN FRONT P/T RH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1903 SHORT IN FRONT P/T RH (TO +B).
B1905	SHORT IN FRONT P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1905 SHORT IN FRONT P/T LH.
B1906	OPEN IN FRONT P/T LH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1906 OPEN IN FRONT P/T LH.
B1907	SHORT IN FRONT P/T LH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1907 SHORT IN FRONT P/T LH (TO GROUND).
B1908	SHORT IN FRONT P/T LH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1908 SHORT IN FRONT P/T LH (TO +B).

Code	Description & trouble part	Reference
B1910	SHORT IN FRONT P/T RH(ADAPTIVE)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1910 SHORT IN FRONT P/T RH(ADAPTIVE).
B1911	OPEN IN FRONT P/T RH (ADAPTIVE)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1911 OPEN IN FRONT P/T RH (ADAPTIVE).
B1912	SHORT IN FRONT P/T RH(ADAPTIVE/TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1912 SHORT IN FRONT P/T RH(ADAPTIVE/TO GROUND).
B1913	SHORT IN FRONT P/T RH(ADAPTIVE/TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1913 SHORT IN FRONT P/T RH(ADAPTIVE/TO +B).
B19F0	SHORT IN FRONT P/T 2 RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F0 SHORT IN FRONT P/T 2 RH.
B19F1	OPEN IN FRONT P/T 2 RH	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F1 OPEN IN FRONT P/T 2 RH.
B19F2	SHORT IN FRONT P/T 2 RH (TO GROUND)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F2 SHORT IN FRONT P/T 2 RH (TO GROUND).
B19F3	SHORT IN FRONT P/T 2 RH (TO +B)	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B19F3 SHORT IN FRONT P/T 2 RH (TO +B).
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE

Code	Description & trouble part	Reference
		COMMUNICATION BUS OFF.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1000 AIRBAG ECU MALFUNCTION

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Airbag ECM inner circuit malfunction
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any of B1000, B1003, B1105, B1106, B1115, B1116, B1117, B1118, B1120, B1121, B1125, B1126, B1145, B1146, B1170, B1185, B1195, B1196 or B1199 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1003 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1103, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1105 AIRBAG ECU MALFUNCTION

Note:
For details on DTC B1105, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1106 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1106, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1115 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1115, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1116 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1116, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1117 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1117, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1118 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1118, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1120 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1120, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1121 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1121, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1125 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1125, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1126 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1126, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1145 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1145, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1146 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1146, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1170 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1170, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1185 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1185, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1195 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1195, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1196 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1196, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1199 AIRBAG ECU MALFUNCTION

Note:

For details on DTC B1199, refer to DTC B1000. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11E0 ROLLOVER DEPLOYMENT HISTORY

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

This DTC is indicated when the curtain airbag module and the seat belt pretensioner are deployed.

Once this DTC is displayed, the memory cannot be cleared. Replace the following parts.

- Airbag control module Ref. to AIRBAG SYSTEM>Airbag Control Module.
- Curtain airbag module Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
- Front outer seat belt with pretensioner Ref. to SEAT BELT SYSTEM>Front Seat Belt.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F0 DISPOSAL PROCESS COMPLETE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Airbag disposal is completed with ISO collective disposal tool.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B11F0 displayed? (Current malfunction)

Yes	Replace the airbag control module.
No	Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F2 FRONT IMPACT DEPLOYMENT

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
This DTC is indicated when the front airbag module and the pretensioner are deployed.
Once this DTC is displayed, the memory cannot be cleared. Therefore replace the following parts.

- Airbag control module Ref. to AIRBAG SYSTEM>Airbag Control Module.
- Driver's airbag module Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
- Passenger's airbag module Ref. to AIRBAG SYSTEM>Passenger's Airbag Module.
- Driver's knee airbag module Ref. to AIRBAG SYSTEM>Knee Airbag Module.
- Front sub sensor of both sides Ref. to AIRBAG SYSTEM>Front Sub Sensor.
- Front outer seat belt with pretensioner of both sides Ref. to SEAT BELT SYSTEM>Front Seat Belt.
- Steering roll connector Ref. to AIRBAG SYSTEM>Roll Connector.
- Occupant detection system (passenger's seat cushion & frame assembly) Ref. to SEATS>Front Seat.
- Curtain airbag module on both sides (when activated) Ref. to AIRBAG SYSTEM>Curtain Airbag Module.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F3 FRONT IMPACT DEPLOYMENT

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
This DTC is indicated when the front airbag module and the pretensioner are deployed.
Once this DTC is displayed, the memory cannot be cleared. Therefore replace the following parts.

- Airbag control module Ref. to AIRBAG SYSTEM>Airbag Control Module.
- Driver's airbag module Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
- Passenger's airbag module Ref. to AIRBAG SYSTEM>Passenger's Airbag Module.
- Driver's knee airbag module Ref. to AIRBAG SYSTEM>Knee Airbag Module.
- Front sub sensor of both sides Ref. to AIRBAG SYSTEM>Front Sub Sensor.
- Front outer seat belt with pretensioner of both sides Ref. to SEAT BELT SYSTEM>Front Seat Belt.
- Steering roll connector Ref. to AIRBAG SYSTEM>Roll Connector.
- Occupant detection system (passenger's seat cushion & frame assembly) Ref. to SEATS>Front Seat.
- Curtain airbag module on both sides (when activated) Ref. to AIRBAG SYSTEM>Curtain Airbag Module.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F4 FRONT IMPACT DEPLOYMENT

Note:
For details on DTC B11F4, refer to DTC B11F3. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F3 FRONT IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F5 FRONT IMPACT DEPLOYMENT

Note:
For details on DTC B11F5, refer to DTC B11F3. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F3 FRONT IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F7 SIDE IMPACT DEPLOYMENT

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
This DTC is displayed when the side airbag module and curtain airbag module are deployed.
Once this DTC is displayed, the memory cannot be cleared. Replace the following parts.

- Airbag control module Ref. to AIRBAG SYSTEM>Airbag Control Module.
- Side airbag module (operating side) Ref. to AIRBAG SYSTEM>Side Airbag Module.
- Side airbag sensor (operating side) Ref. to AIRBAG SYSTEM>Side Airbag Sensor.
- Curtain airbag module (operating side) Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
- Curtain airbag sensor (operating side) Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.
- Satellite safing sensor Ref. to AIRBAG SYSTEM>Satellite Safing Sensor.

- Front door impact sensor (operating side) Ref. to AIRBAG SYSTEM>Front Door Impact Sensor.
- Front outer seat belt with pretensioner on the collision side (when activated) Ref. to SEAT BELT SYSTEM>Front Seat Belt.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F8 SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11F8. refer to DTC B11F7. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11F9 SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11F9, refer to DTC B11F7. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FA SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FA, refer to DTC B11F7. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FB SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FB, refer to DTC B11F7. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B11FC SIDE IMPACT DEPLOYMENT

Note:

For details on DTC B11FC, refer to DTC B11F7. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B11F7 SIDE IMPACT DEPLOYMENT.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1610 FRONT SUB SENSOR RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Front sub sensor RH is faulty.
If DTC B1610 is displayed, the circuit within the front sub sensor RH is faulty.
Replace the front sub sensor RH. Ref. to AIRBAG SYSTEM>Front Sub Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1612 FRONT SUB SENSOR RH LOST COMMUNICATION

Note:

For details on DTC B1612, refer to DTC B1613. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1613 FRONT SUB SENSOR RH INITIALIZATION ERROR

Diagnosis start condition:

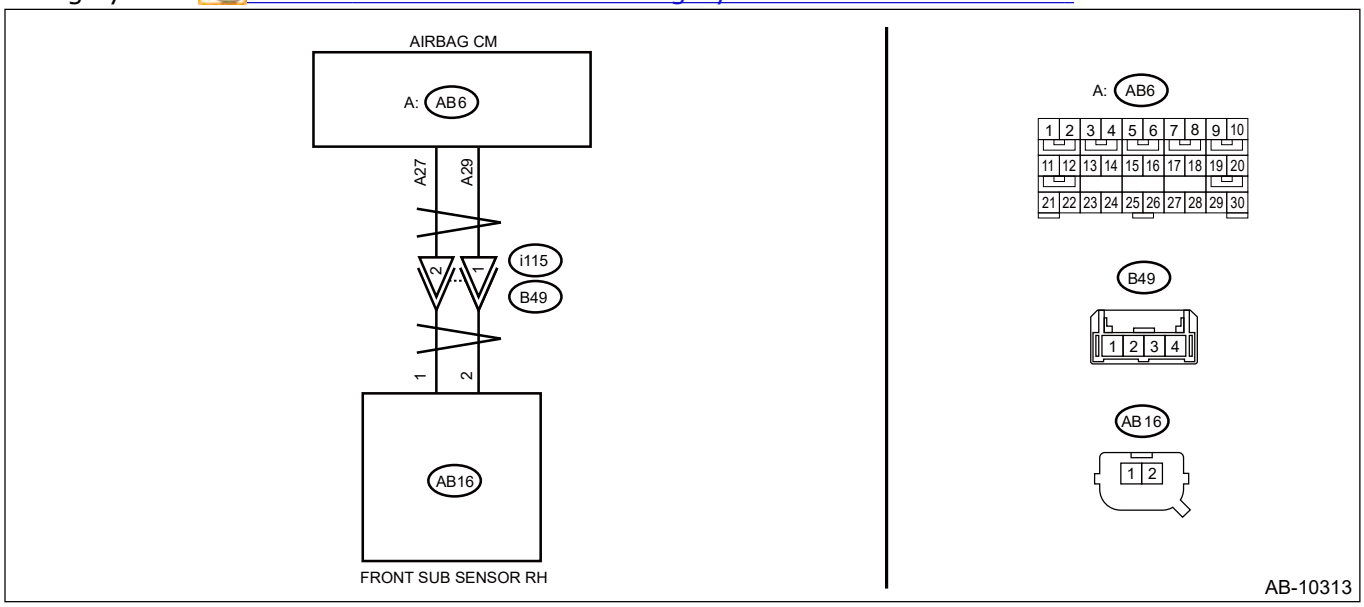
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of front sensor bus RH
- Front sub sensor RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB6, AB16) between the airbag control module and the front sub sensor RH.

Is there poor contact?

Yes	Replace the airbag main harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connectors (AB7) and (AB2).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connector (AB66) from knee airbag module.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Disconnect the connector (AB16) from the front sub sensor RH, and then connect the connector (1H) in the test harness H to connector (AB16).
8. Measure the resistance between connector (4AG) in the test harness AG and connector (3H) in the test harness H.

   Connector & terminal

   (4AG) No. 14 — (3H) No. 5:

   (4AG) No. 12 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS RH).

Measure the resistance between connector (4AG) in the test harness AG and chassis ground, and the resistance between connector (4AG) terminals in the test harness AG.

Connector & terminal

(4AG) No. 12 — Chassis ground:

(4AG) No. 14 — Chassis ground:

(4AG) No. 12 — (4AG) No. 14:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1613 displayed? (Current malfunction)

Yes	Replace the front sub sensor RH. Ref. to AIRBAG SYSTEM>Front Sub Sensor>REMOVAL. Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1615 FRONT SUB SENSOR LH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Front sub sensor LH is faulty.

If DTC B1615 is displayed, the circuit within the front sub sensor LH is faulty.

Replace the front sub sensor LH. Ref. to AIRBAG SYSTEM>Front Sub Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1617 FRONT SUB SENSOR LH LOST COMMUNICATION

Note:

For details on DTC B1617, refer to DTC B1618. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR.

DTC B1618 FRONT SUB SENSOR LH INITIALIZATION ERROR

Diagnosis start condition:

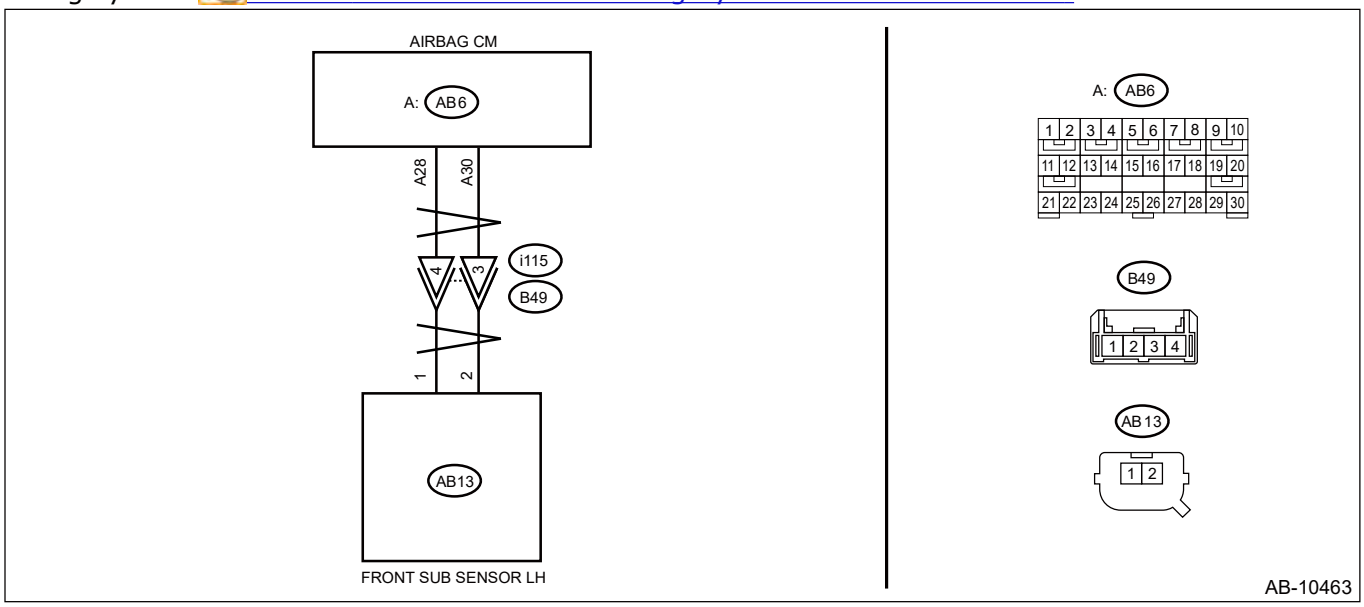
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of front sensor bus LH
- Front sub sensor LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB6, AB13) between the airbag control module and the front sub sensor LH.

Is there poor contact?

Yes	Replace the airbag main harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connectors (AB7) and (AB2).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connector (AB66) from knee airbag module.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Disconnect the connector (AB13) from the front sub sensor LH, and then connect the connector (1H) in the test harness H to connector (AB13).
8. Measure the resistance between connector (4AG) in the test harness AG and connector (3H) in the test harness H.

   Connector & terminal

   (4AG) No. 7 — (3H) No. 5:

   (4AG) No. 9 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG MAIN HARNESS (FRONT SENSOR BUS LH).

Measure the resistance between connector (4AG) in the test harness AG and chassis ground, and the resistance between connector (4AG) terminals in the test harness AG.

Connector & terminal

(4AG) No. 7 — Chassis ground:

(4AG) No. 9 — Chassis ground:

(4AG) No. 7 — (4AG) No. 9:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1618 displayed? (Current malfunction)

Yes	Replace the front sub sensor RH. Ref. to AIRBAG SYSTEM>Front Sub Sensor>REMOVAL. Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1620 SIDE AIRBAG SENSOR RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Side airbag sensor RH is faulty.

When DTC B1620 is displayed, the circuit within the side airbag sensor RH is faulty.

Replace the side airbag sensor RH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION

Note:

For details on DTC B1622, refer to DTC B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR

Diagnosis start condition:

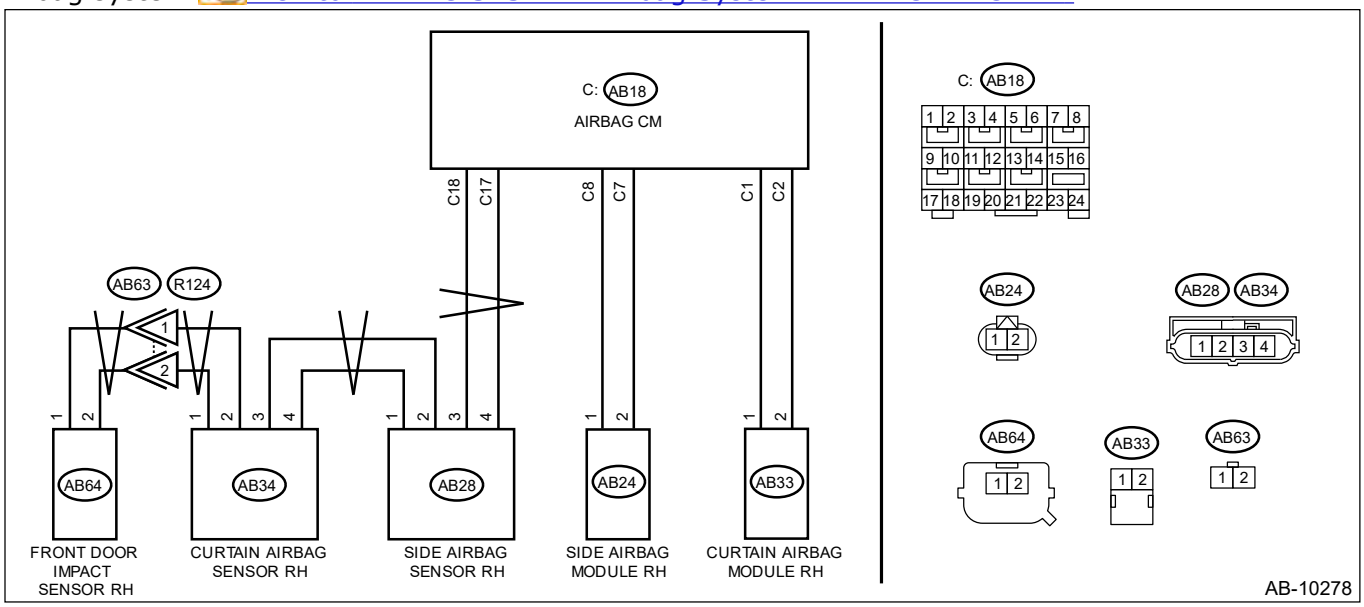
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of side sensor bus RH.
- Side airbag sensor RH and curtain airbag sensor RH are faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the side airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB33) from curtain airbag module RH.
4. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
5. Disconnect the connector (AB24) of side airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Disconnect the connector (AB28) from side airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB28).
9. Measure the resistance between connector (5AG) in the test harness AG and connector (3V) in the test harness V.

   Connector & terminal

   (5AG) No. 14 — (3V) No. 1:

   (5AG) No. 16 — (3V) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

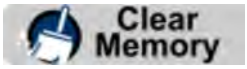
(3V) No. 1 — Chassis ground:
(3V) No. 2 — Chassis ground:
(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1623 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. REPLACE SIDE AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor RH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1623 displayed? (Current malfunction)

Yes	Replace the curtain airbag sensor RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL. Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1625 SIDE AIRBAG SENSOR LH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Side airbag sensor LH is faulty.
When DTC B1625 is displayed, the circuit within the side airbag sensor LH is faulty.
Replace the side airbag sensor LH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION

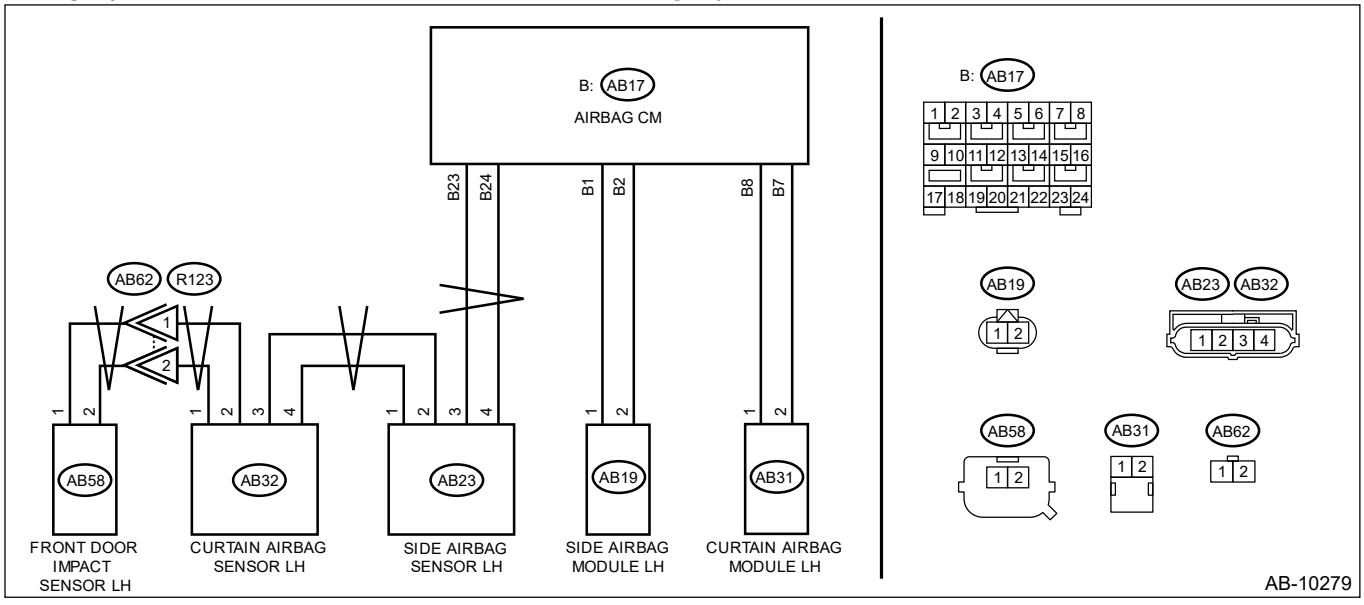
Note:
For details on DTC B1627, refer to DTC B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Open or short circuit in harness of side sensor bus LH.
- Side airbag sensor LH and curtain airbag sensor LH are faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the side airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) of the side airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Disconnect the connector (AB23) from side airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB23).
8. Measure the resistance between connector (5AG) in the test harness AG and connector (3V) in the test harness V.

   Connector & terminal

   (5AG) No. 8 — (3V) No. 2:

   (5AG) No. 10 — (3V) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

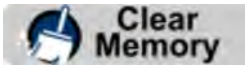
(3V) No. 1 — Chassis ground:
(3V) No. 2 — Chassis ground:
(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1628 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. REPLACE SIDE AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor LH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1628 displayed? (Current malfunction)

Yes	Replace the curtain airbag sensor LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL. Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1630 CURTAIN AIRBAG SENSOR RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Curtain airbag sensor RH is faulty.
If DTC B1630 is displayed, the circuit within the curtain airbag sensor RH is faulty.
Replace the curtain airbag sensor RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION

Note:

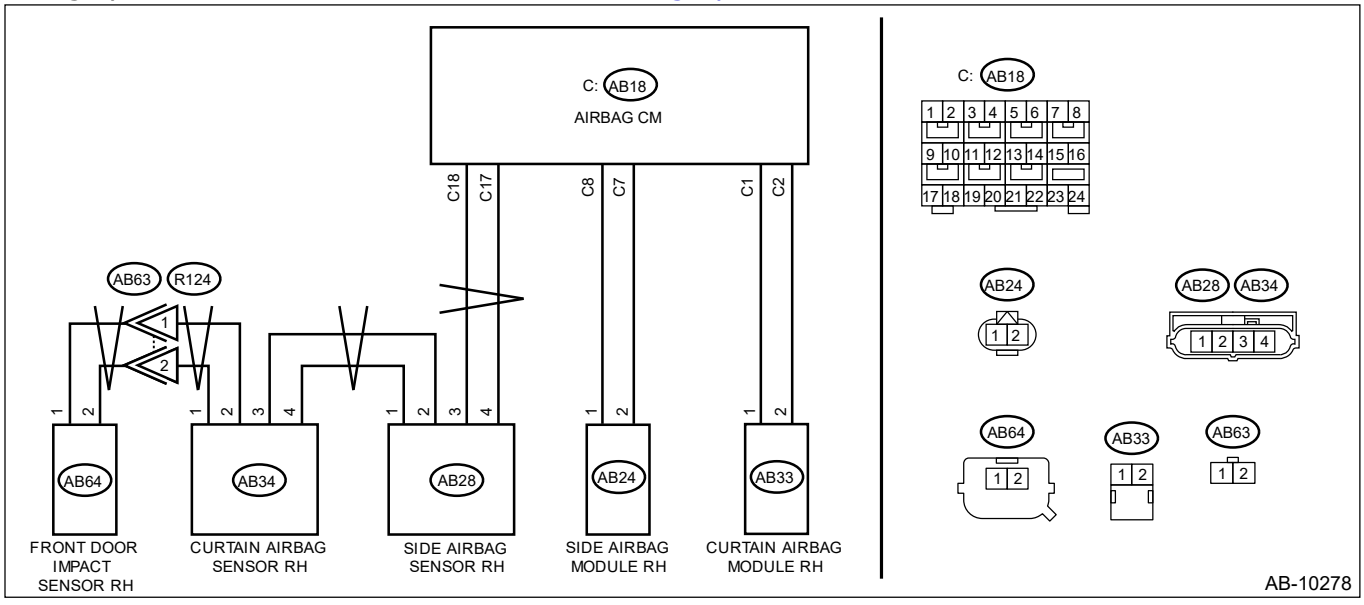
For details on DTC B1632, refer to DTC B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Open or short circuit in harness of side sensor bus RH.
- Side airbag sensor RH and curtain airbag sensor RH are faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1622 or B1623 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the door sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR RH AND CURTAIN AIRBAG SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connector (AB24) of side airbag module RH.
6. Disconnect the connector (AB28) of side airbag sensor RH.
7. Connect the connector (AB28) of side airbag sensor RH and the connector (1AI) in the test harness AI.
8. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
9. Disconnect the connector (AB34) from curtain airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB34).
10. Measure the resistance between connector (3V) terminals in the test harness V.

Connector & terminal

(3V) No. 2 — (3V) No. 6:

(3V) No. 1 — (3V) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) in test harness V.

Connector & terminal

(3V) No. 2 — Chassis ground:

(3V) No. 1 — Chassis ground:

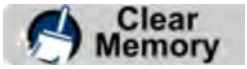
(3V) No. 2 — (3V) No. 1:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Replace the airbag rear harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor.



Is DTC B1633 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 8.

6. REPLACE CURTAIN AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1633 displayed? (Current malfunction)

Yes	Go to 7.
No	Go to 8.

7. REPLACE SIDE AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor RH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1633 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 8.

8. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1635 CURTAIN AIRBAG SENSOR LH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Curtain airbag sensor LH is faulty.
If DTC B1635 is displayed, the circuit within the curtain airbag sensor LH is faulty.
Replace the curtain airbag sensor LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION

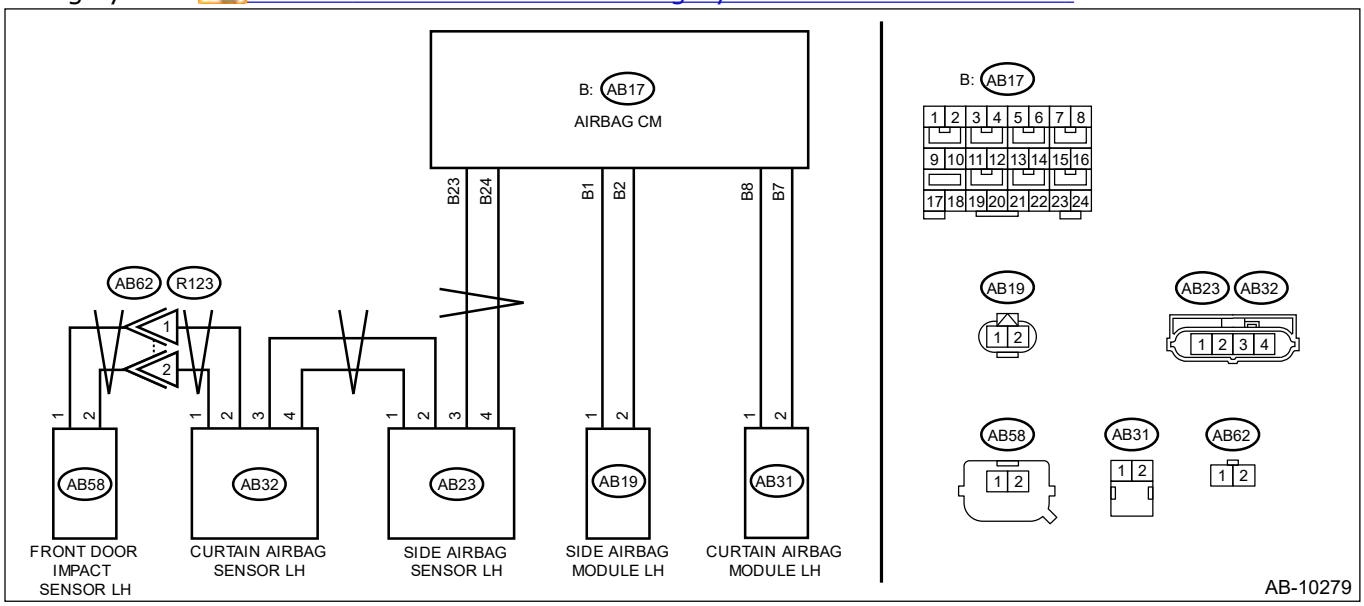
Note:
For details on DTC B1637, refer to DTC B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Open or short circuit in harness of side sensor bus LH.
- Side airbag sensor LH and curtain airbag sensor LH are faulty.
- Airbag control module is faulty.

Wiring diagram:
Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1627 or B1628 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the door sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR LH AND CURTAIN AIRBAG SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) of the side airbag module LH.
5. Disconnect the connector (AB23) in the side airbag sensor LH.
6. Connect the connector (AB23) of side airbag sensor LH and the connector (1AI) in the test harness AI.
7. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
8. Disconnect the connector (AB32) from curtain airbag sensor LH, and connect to the connector (2V) in test harness V.
9. Measure the resistance between connector (3V) terminals in the test harness V.

Connector & terminal

(3V) No. 2 — (3V) No. 6:

(3V) No. 1 — (3V) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) in test harness V.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Replace the airbag rear harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1638 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 8.

6. REPLACE CURTAIN AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1638 displayed? (Current malfunction)

Yes	Go to 7.
No	Go to 8.

7. REPLACE SIDE AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor LH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1638 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 8.

8. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1642 SIDE SATELLITE SENSOR BUS RH LOST COMMUNICATION

Diagnosis start condition:

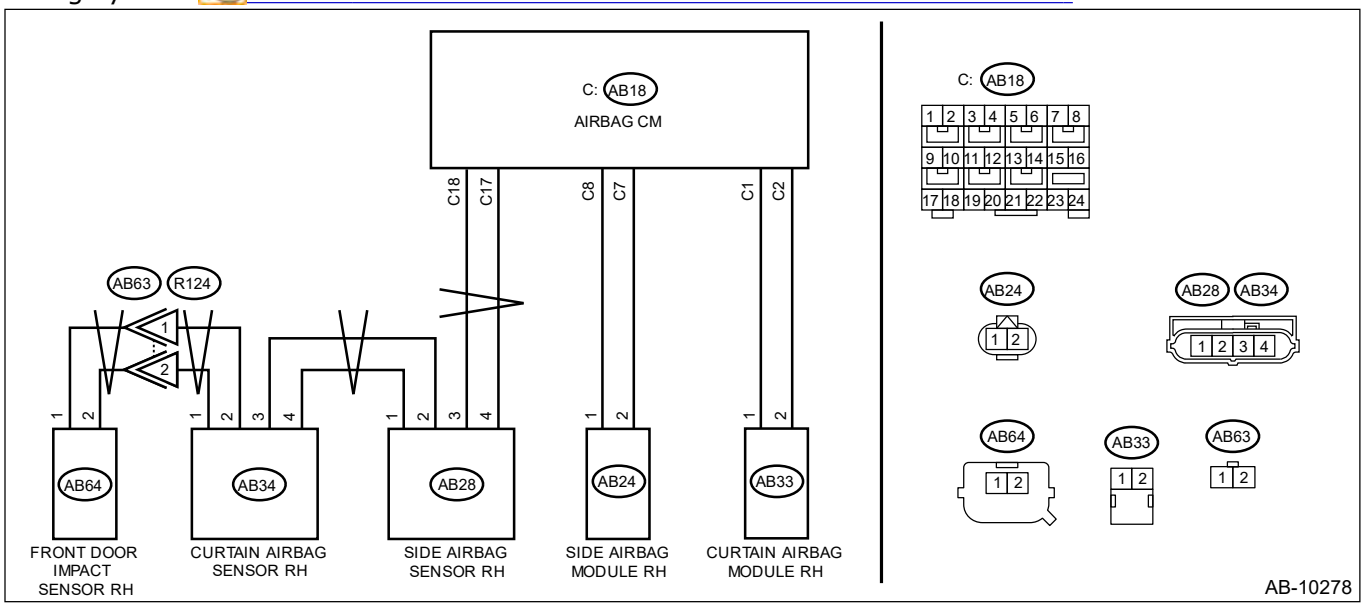
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of side sensor bus RH.
- Side airbag sensor RH is faulty.
- Curtain airbag sensor RH is faulty.
- Front door impact sensor RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Ground Circuit>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1622 or B1623 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1632 or B1633 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1632 or B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1692 or B1693 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1692 or B1693. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connector (AB24) of side airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Disconnect the connector (AB28) from side airbag sensor RH.
9. Connect the connector (2V) in the test harness V to the connector (AB28).
10. Measure the resistance between connector (5AG) in the test harness AG and connector (3V) in the test harness V.

Connector & terminal

(5AG) No. 14 — (3V) No. 1:

(5AG) No. 16 — (3V) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR RH).

1. Disconnect the connector (2V) in the test harness V from the connector (AB28) of side airbag sensor RH.
2. Connect the connector (AB28) of side airbag sensor RH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB34) from curtain airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB34).
5. Measure the resistance between connector (3V) terminals in the test harness V.

Connector & terminal

(3V) No. 2 — (3V) No. 6:

(3V) No. 1 — (3V) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 8.
No	Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 2 — Chassis ground:

(3V) No. 1 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND DOOR SENSOR RH).

1. Disconnect the connector (AB64) from the front door impact sensor RH, and connect the connector (1H) in the test harness H to connector (AB64).
2. Measure the resistance between connector (3V) in the test harness V and connector (3H) in the test harness H.

Connector & terminal

(3V) No. 4 — (3H) No. 5:
(3V) No. 5 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:
(3V) No. 5 — Chassis ground:
(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 11.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 12.
No	Go to 15.

12. REPLACE SIDE AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor RH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 13.
No	Go to 15.

13. REPLACE CURTAIN AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 14.
No	Go to 15.

14. REPLACE FRONT DOOR IMPACT SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor RH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 15.

15. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1643 SIDE SATELLITE SENSOR BUS RH INITIALIZATION ERROR

Diagnosis start condition:

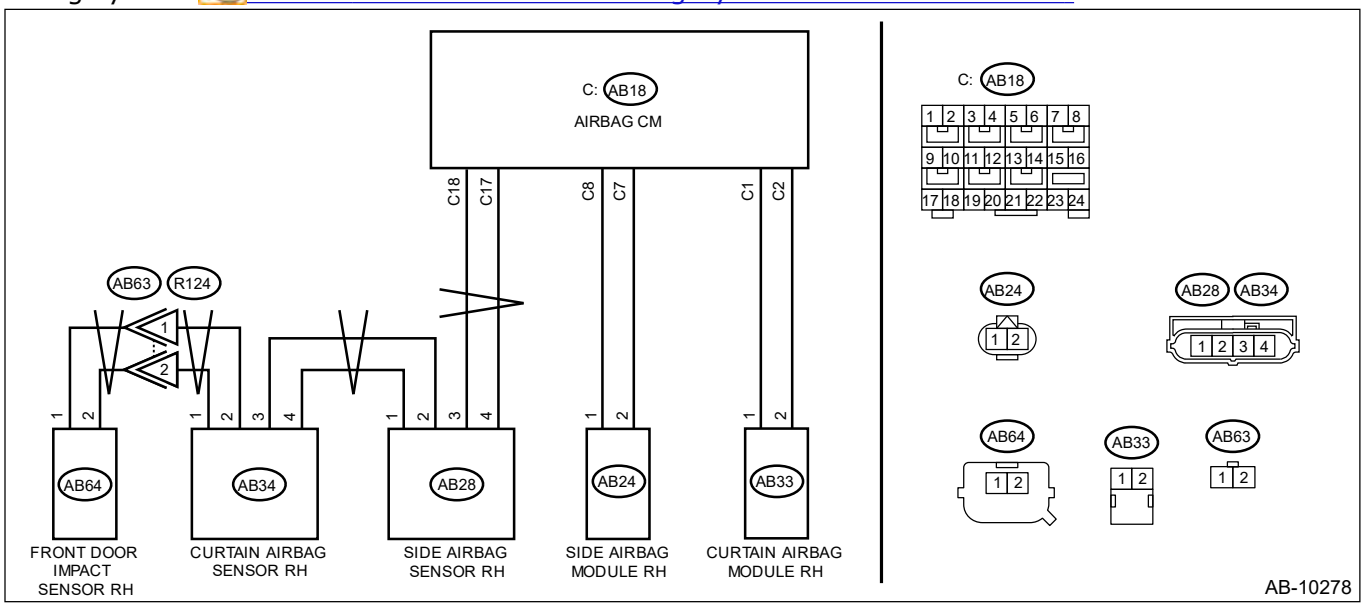
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag sensor harness RH short • GND short • BATT short.
- Curtain airbag sensor harness RH short • GND short • BATT short.
- Airbag door sensor harness RH short • GND short • BATT short.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1622 or B1623 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1632 or B1633 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1632 or B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1692 or B1693 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1692 or B1693. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connector (AB24) of side airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Disconnect the connector (AB28) from side airbag sensor RH.
9. Connect the connector (2V) in the test harness V to the connector (AB28).
10. Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals.

Connector & terminal

(3V) No. 1 — Chassis ground:
(3V) No. 2 — Chassis ground:
(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR RH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 1 (+) — Chassis ground (−):
(3V) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 7.
No	Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR RH).

1. Disconnect the connector (2V) in the test harness V from the connector (AB28) of side airbag sensor RH.
2. Connect the connector (AB28) of side airbag sensor RH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB34) from curtain airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB34).
5. Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

   Connector & terminal

   (3V) No. 1 — Chassis ground:

   (3V) No. 2 — Chassis ground:

   (3V) No. 1 — (3V) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 8.
No	Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR RH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 1 (+) — Chassis ground (−):

(3V) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 9.
No	Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND DOOR SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:

(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 10.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND FRONT DOOR IMPACT SENSOR RH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 4 (+) — Chassis ground (−):

(3V) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 11.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 12.
No	Go to 15.

12. REPLACE SIDE AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor RH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 13.
No	Go to 15.

13. REPLACE CURTAIN AIRBAG SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 14.
No	Go to 15.

14. REPLACE FRONT DOOR IMPACT SENSOR RH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor RH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 15.

15. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1647 SIDE SATELLITE SENSOR BUS LH LOST COMMUNICATION

Diagnosis start condition:

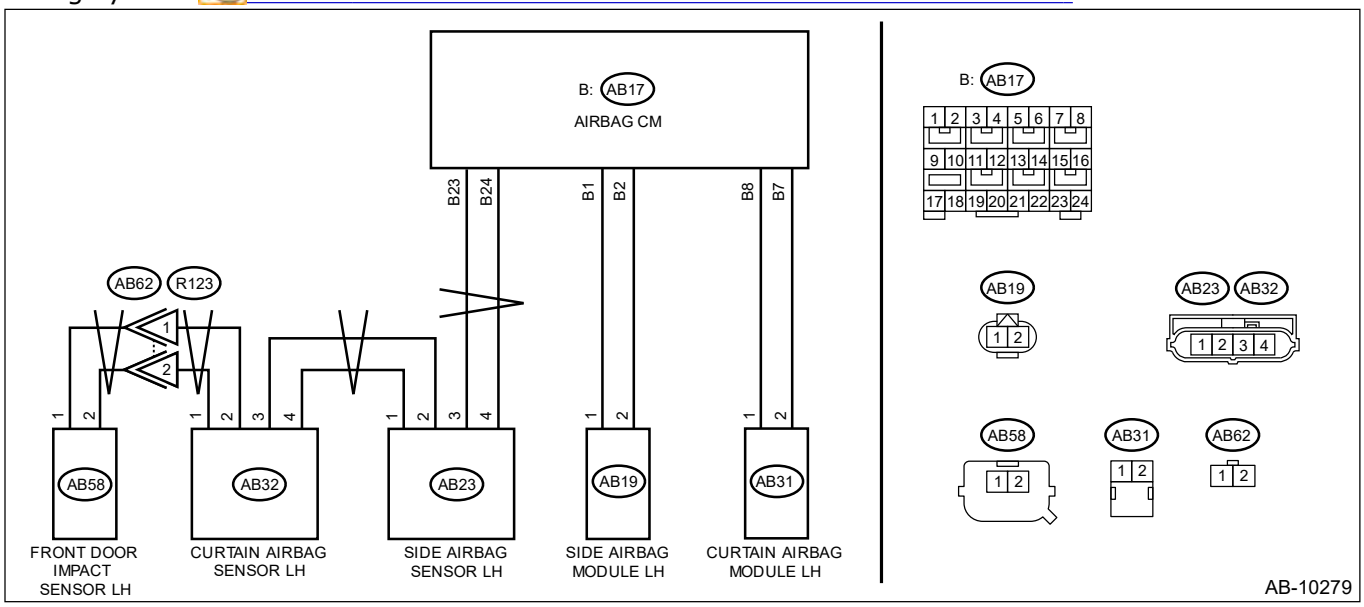
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of side sensor bus LH.
- Side airbag sensor LH is faulty.
- Curtain airbag sensor LH is faulty.
- Front door impact sensor LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Ground Circuit>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1627 or B1628 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1637 or B1638 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1637 or B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1697 or B1698 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1697 or B1698. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) of the side airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Disconnect the connector (AB23) from the side airbag sensor LH.
8. Connect the connector (2V) in the test harness V to the connector (AB23).
9. Measure the resistance between connector (5AG) in the test harness AG and connector (3V) in the test harness V.

   Connector & terminal

   (5AG) No. 10 — (3V) No. 1:

   (5AG) No. 8 — (3V) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals.

Connector & terminal

(3V) No. 1 — Chassis ground:

(3V) No. 2 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR LH).

1. Disconnect the connector (2V) in the test harness V from the connector (AB23) of side airbag sensor LH.
2. Connect the connector (AB23) of side airbag sensor LH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB32) from curtain airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB32).
5. Measure the resistance between connector (3V) terminals in the test harness V.

Connector & terminal

(3V) No. 2 — (3V) No. 6:

(3V) No. 1 — (3V) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 8.
No	Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 2 — Chassis ground:

(3V) No. 1 — Chassis ground:

(3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND DOOR SENSOR LH).

1. Disconnect the connector (AB58) from the front door impact sensor LH, and connect the connector (1H) in the test harness H to connector (AB58).
2. Measure the resistance between connector (3V) in the test harness V and connector (3H) in the test harness H.

Connector & terminal

(3V) No. 4 — (3H) No. 5:
(3V) No. 5 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND DOOR SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:
(3V) No. 5 — Chassis ground:
(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 11.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1647 displayed? (Current malfunction)

Yes	Go to 12.
No	Go to 15.

12. REPLACE SIDE AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor LH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1647 displayed? (Current malfunction)

Yes	Go to 13.
No	Go to 15.

13. REPLACE CURTAIN AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1647 displayed? (Current malfunction)

Yes	Go to 14.
No	Go to 15.

14. REPLACE FRONT DOOR IMPACT SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor LH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1647 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 15.

15. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1648 SIDE SATELLITE SENSOR BUS LH INITIALIZATION ERROR

Diagnosis start condition:

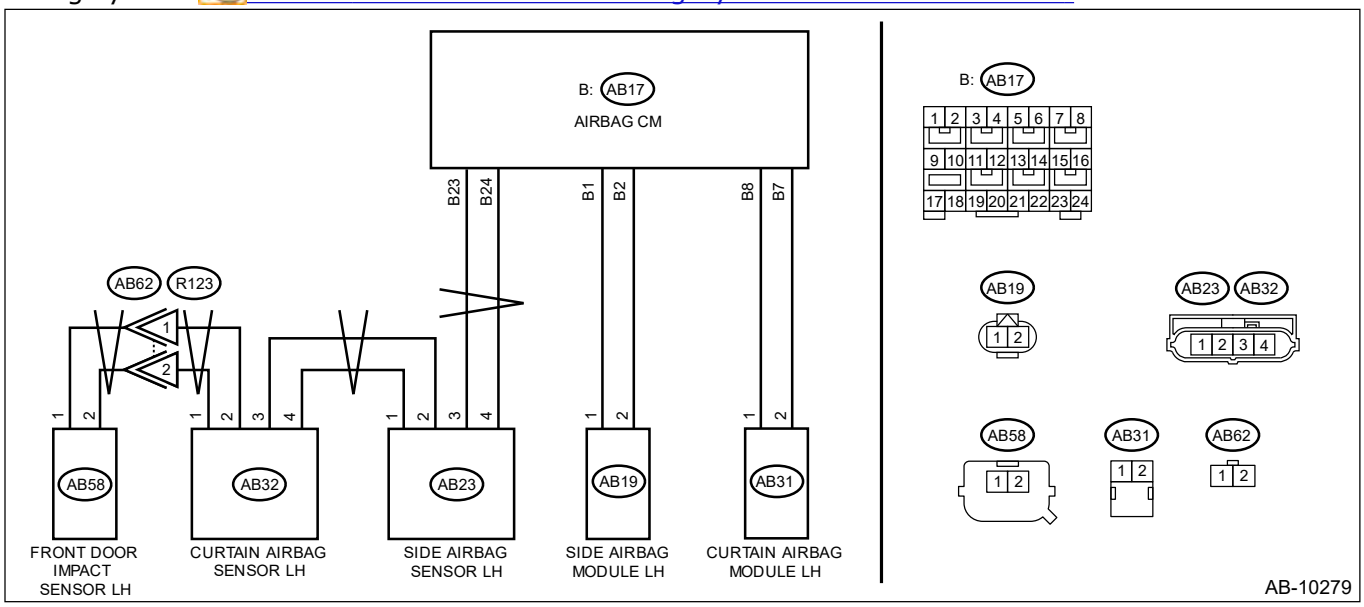
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag sensor harness LH short • GND short • BATT short.
- Curtain airbag sensor harness LH short • GND short • BATT short.
- Front door impact sensor harness LH short • GND short • BATT short.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1627 or B1628 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1637 or B1638 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1637 or B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1697 or B1698 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1697 or B1698. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness and the door harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) of the side airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Disconnect the connector (AB23) from the side airbag sensor LH.
8. Connect the connector (2V) in the test harness V to the connector (AB23).
9. Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals.

   Connector & terminal

   (3V) No. 1 — Chassis ground:

   (3V) No. 2 — Chassis ground:

   (3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SIDE AIRBAG SENSOR LH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 1 (+) — Chassis ground (−):

(3V) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 7.
No	Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR LH).

1. Disconnect the connector (2V) in the test harness V from the connector (AB23) of side airbag sensor LH.
2. Connect the connector (AB23) of side airbag sensor LH and the connector (1AI) in the test harness AI.
3. Connect the connector (2AI) in the test harness AI and the connector (1V) in the test harness V.
4. Disconnect the connector (AB32) from curtain airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB32).
5. Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

   Connector & terminal

   (3V) No. 1 — Chassis ground:

   (3V) No. 2 — Chassis ground:

   (3V) No. 1 — (3V) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 8.
No	Replace the airbag rear harness along with body harness.

8. CHECK AIRBAG REAR HARNESS (BETWEEN SIDE AIRBAG SENSOR AND CURTAIN AIRBAG SENSOR LH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 1 (+) — Chassis ground (−):

(3V) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 9.
No	Replace the airbag rear harness along with body harness.

9. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND DOOR SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:

(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 10.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

10. CHECK AIRBAG REAR HARNESS AND DOOR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).

Measure the voltage between connector (3V) in the test harness V and chassis ground.

Connector & terminal

(3V) No. 4 (+) — Chassis ground (−):

(3V) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 11.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

11. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 12.
No	Go to 15.

12. REPLACE SIDE AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor LH. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 13.
No	Go to 15.

13. REPLACE CURTAIN AIRBAG SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Go to 14.
No	Go to 15.

14. REPLACE FRONT DOOR IMPACT SENSOR LH AND CHECK AIRBAG CONTROL MODULE AFTER REPLACEMENT.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor LH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.
3. Connect all connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1642 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 15.

15. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION

Note:

Refer to "Occupant Detection System" for details on DTC B1650. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1655 FRONT BUCKLE SWITCH RH FAILURE

Note:

Refer to "Occupant Detection System" for details on DTC B1655. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.

DTC B1661 PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Passenger’s airbag indicator failure received (CAN signal from combination meter)

Note:

Perform the diagnosis for combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1675 SATELLITE SAFING SENSOR FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Satellite safing sensor is faulty.
- Airbag control module is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE SATELLITE SAFING SENSOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the satellite safing sensor with a genuine sensor. Ref. to AIRBAG SYSTEM>Satellite Safing Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1676 LOST COMMUNICATION WITH SATELLITE SAFING SENSOR

Note:
For details on DTC B1676, refer to DTC B1677. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1677 SATELLITE SAFING SENSOR INITIALIZATION INCOMPLETE

Diagnosis start condition:

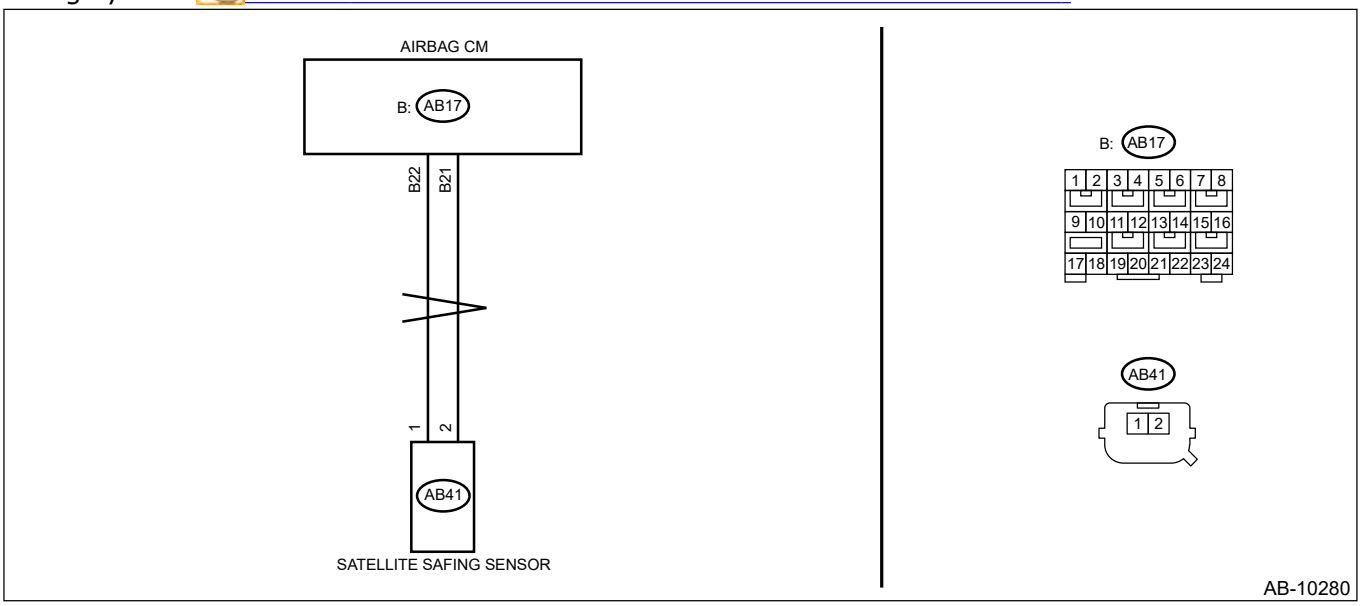
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of satellite safing sensor
- Satellite safing sensor is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Ground Circuit>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors (AB18, AB41) between the airbag control module and the satellite safing sensor.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SATELLITE SAFING SENSOR).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connectors (AB21, AB26) from seat belt pretensioner.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connectors (AB31, AB33) from curtain airbag module.
5. Disconnect connectors (AB19) and (AB24) from the side airbag module.
6. Disconnect the connectors (AB17, AB6, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Disconnect the connector (AB41) from the satellite safing sensor and connect to the test harness H connector (1H).
9. Measure the resistance between connector in the test harness AG and connector in the test harness H.

   Connector & terminal

   (5AG) No. 15 — (3H) No. 5:

   (6AG) No. 14 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG REAR HARNESS (BETWEEN AIRBAG CONTROL MODULE AND SATELLITE SAFING SENSOR).

Measure the resistance between connectors (5AG) and (6AG) in the test harness AG and chassis ground, and the resistance between the connectors (5AG) and (6AG) in the test harness AG.

Connector & terminal

(5AG) No. 15 — Chassis ground:

(6AG) No. 14 — Chassis ground:

(5AG) No. 15 — (6AG) No. 14:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1677 displayed? (Current malfunction)

Yes	Replace the satellite safing sensor. Ref. to AIRBAG SYSTEM>Satellite Safing Sensor>REMOVAL. Replace the airbag control module if not operating normally even after replacing the sensor. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1690 DOOR SENSOR RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Front door impact sensor RH is faulty.

If DTC B1690 is displayed, the circuit within the front door impact sensor RH is faulty.

Replace the front door impact sensor RH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1692 LOST COMMUNICATION WITH DOOR SENSOR RH

Note:

For details on DTC B1692, refer to DTC B1693. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1693 DOOR SENSOR RH INITIALIZATION INCOMPLETE

Diagnosis start condition:

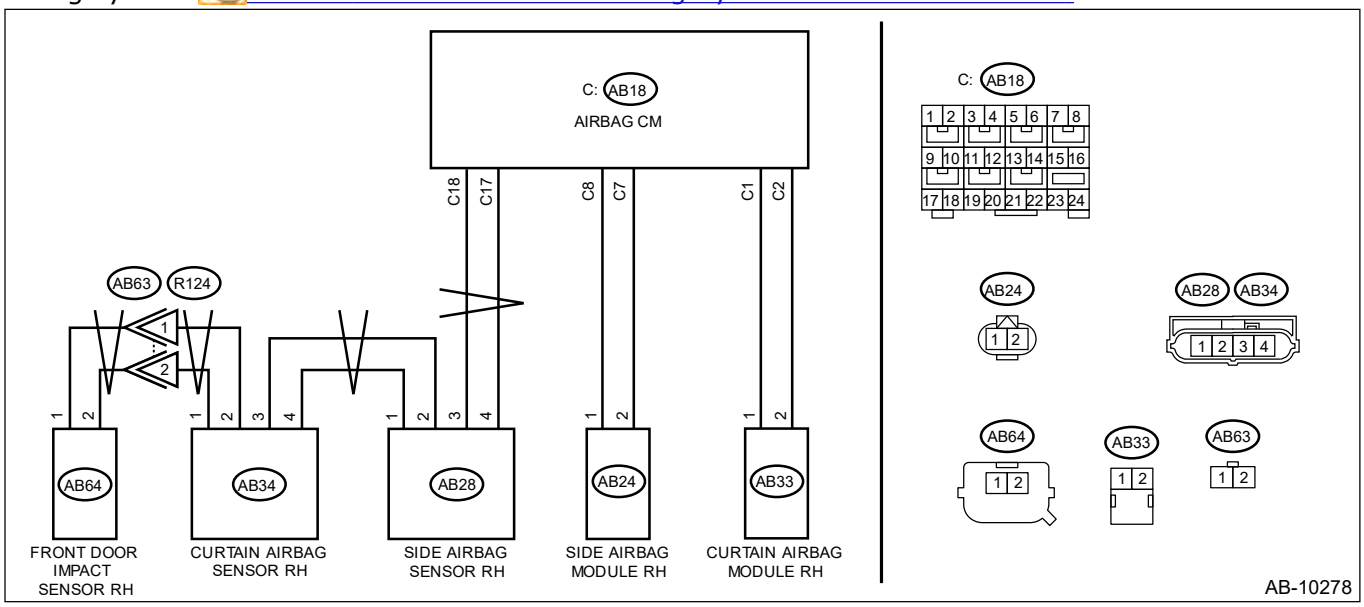
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of side sensor bus RH.
- Front door impact sensor RH is faulty.
- Curtain airbag sensor RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1622 or B1623 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1622 or B1623. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1622 SIDE AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1623 SIDE AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor.



Is DTC B1632 or B1633 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1632 or B1633. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1632 CURTAIN AIRBAG SENSOR RH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1633 CURTAIN AIRBAG SENSOR RH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is [AIRBAG ECU MALFUNCTION] or B1690 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed [AIRBAG ECU MALFUNCTION] or B1690. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1690 DOOR SENSOR RH FAILURE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND DOOR SENSOR RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connector (AB24) from side airbag module RH.
6. Disconnect the connector (AB34) from curtain airbag sensor RH, and connect the connector (2V) in test harness V to connector (AB34).
7. Disconnect the connector (AB64) from the front door impact sensor RH, and connect the connector (1H) in the test harness H to connector (AB64).
8. Measure the resistance between connector (3V) in the test harness V and connector (3H) in the test harness H.

   Connector & terminal

   (3V) No. 4 — (3H) No. 5:

   (3V) No. 5 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR RH AND DOOR SENSOR RH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:

(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Check the door harness, and if any fault is found, replace the harness. If there is no fault, replace the airbag rear harness together with body harness.

7. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1692 or B1693 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 8.

8. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1695 DOOR SENSOR LH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Front door impact sensor LH is faulty.

If DTC B1695 is displayed, the circuit within the front door impact sensor LH is faulty.
Replace the front door impact sensor LH. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1697 LOST COMMUNICATION WITH DOOR SENSOR LH

Note:

For details on DTC B1697, refer to DTC B1698. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1698 DOOR SENSOR LH INITIALIZATION INCOMPLETE

Diagnosis start condition:

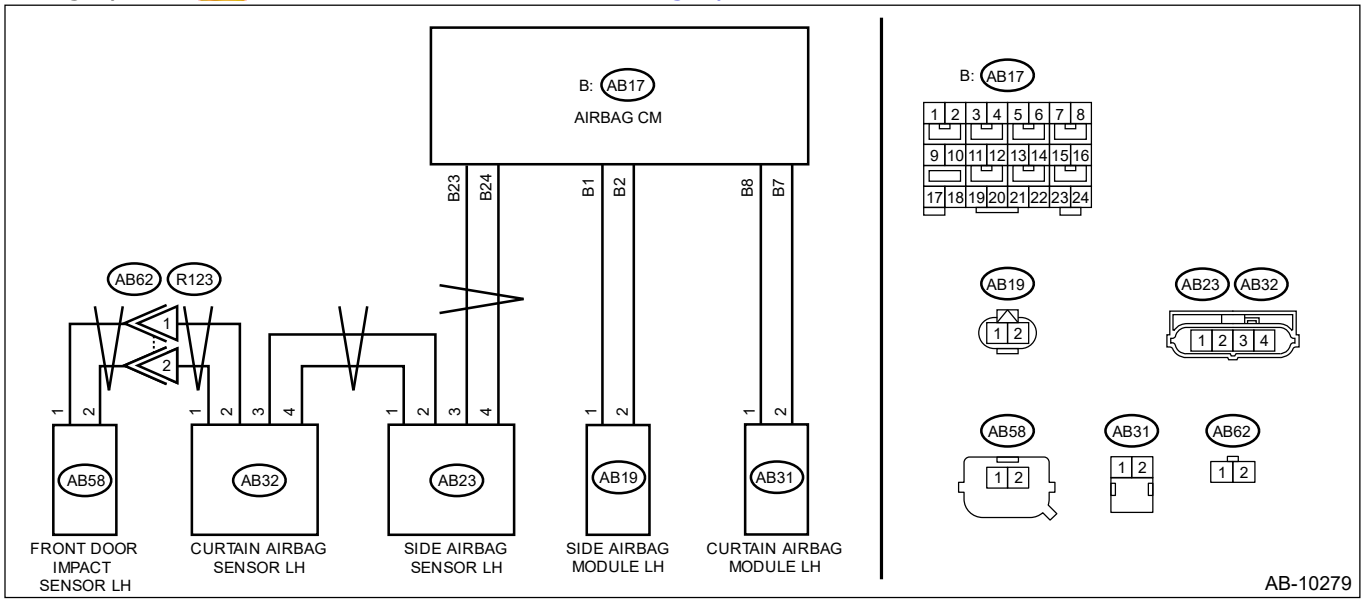
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Open or short circuit in harness of side sensor bus LH.
- Front door impact sensor LH is faulty.
- Curtain airbag sensor LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1627 or B1628 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1627 or B1628. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1627 SIDE AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1628 SIDE AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1637 or B1638 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1637 or B1638. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1637 CURTAIN AIRBAG SENSOR LH LOST COMMUNICATION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1638 CURTAIN AIRBAG SENSOR LH INITIALIZATION ERROR.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is [AIRBAG ECU MALFUNCTION] or B1690 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed [AIRBAG ECU MALFUNCTION] or B1695. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1695 DOOR SENSOR LH FAILURE.
No	Go to 4.

4. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the front door impact sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness.
No	Go to 5.

5. CHECK AIRBAG REAR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB31) from curtain airbag module LH.
4. Disconnect the connector (AB19) from side airbag module LH.
5. Disconnect the connector (AB32) from curtain airbag sensor LH, and connect the connector (2V) in test harness V to connector (AB32).
6. Disconnect the connector (AB58) from the front door impact sensor LH, and connect the connector (1H) in the test harness H to connector (AB58).
7. Measure the resistance between connector (3V) in the test harness V and connector (3H) in the test harness H.

   Connector & terminal

   (3V) No. 4 — (3H) No. 5:

   (3V) No. 5 — (3H) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Replace the airbag rear harness along with body harness.

6. CHECK AIRBAG REAR HARNESS (BETWEEN CURTAIN AIRBAG SENSOR LH AND FRONT DOOR IMPACT SENSOR LH).

Measure the resistance between connector (3V) in test harness V and chassis ground, and the resistance between connector (3V) terminals in test harness V.

Connector & terminal

(3V) No. 4 — Chassis ground:

(3V) No. 5 — Chassis ground:

(3V) No. 4 — (3V) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Replace the airbag rear harness along with body harness.

7. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1697 or B1698 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 8.

8. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F2 FRONT SUB SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Front sub sensor RH is wrongly installed.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE FRONT SUB SENSOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front sub sensor RH with a genuine sensor. Ref. to AIRBAG SYSTEM>Front Sub Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F3 FRONT SUB SENSOR LH RECOGNITION ERROR

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Front sub sensor LH is wrongly installed.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE FRONT SUB SENSOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front sub sensor LH with a genuine sensor. Ref. to AIRBAG SYSTEM>Front Sub Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F4 SIDE AIRBAG SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Side airbag sensor RH is misinstalled.
- Airbag CM is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE SIDE AIRBAG SENSOR RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Replace the side airbag sensor RH with a genuine sensor. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F5 SIDE AIRBAG SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Side airbag sensor LH is misinstalled.
- Airbag CM is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE SIDE AIRBAG SENSOR LH.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the side airbag sensor LH with a genuine sensor. Ref. to AIRBAG SYSTEM>Side Airbag Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F6 CURTAIN AIRBAG SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Curtain airbag sensor RH is misinstalled.
- Airbag CM is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE CURTAIN AIRBAG SENSOR RH.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor RH with a genuine sensor. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F7 CURTAIN AIRBAG SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Curtain airbag sensor LH is misinstalled.
- Airbag CM is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE CURTAIN AIRBAG SENSOR LH.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the curtain airbag sensor LH with a genuine sensor. Ref. to AIRBAG SYSTEM>Curtain Airbag Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

DTC B16F8 SATELLITE SAFING SENSOR RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Satellite safing sensor is misinstalled.
- Airbag control module is faulty.

1. REPLACE SATELLITE SAFING SENSOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the satellite safing sensor with a genuine sensor. Ref. to AIRBAG SYSTEM>Satellite Safing Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16F9 DOOR SENSOR RH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Front door impact sensor RH is misinstalled.
- Airbag control module is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE FRONT DOOR IMPACT SENSOR RH.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor RH with a genuine sensor. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B16FA DOOR SENSOR LH RECOGNITION ERROR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Front door impact sensor LH is misinstalled.
- Airbag control module is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. REPLACE FRONT DOOR IMPACT SENSOR LH.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Replace the front door impact sensor LH with a genuine sensor. Ref. to AIRBAG SYSTEM>Front Door Impact Sensor>REMOVAL.

Does the warning light go off?

Yes	Finish the diagnosis.
No	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1800 SHORT IN DRIVER'S AIRBAG

Diagnosis start condition:

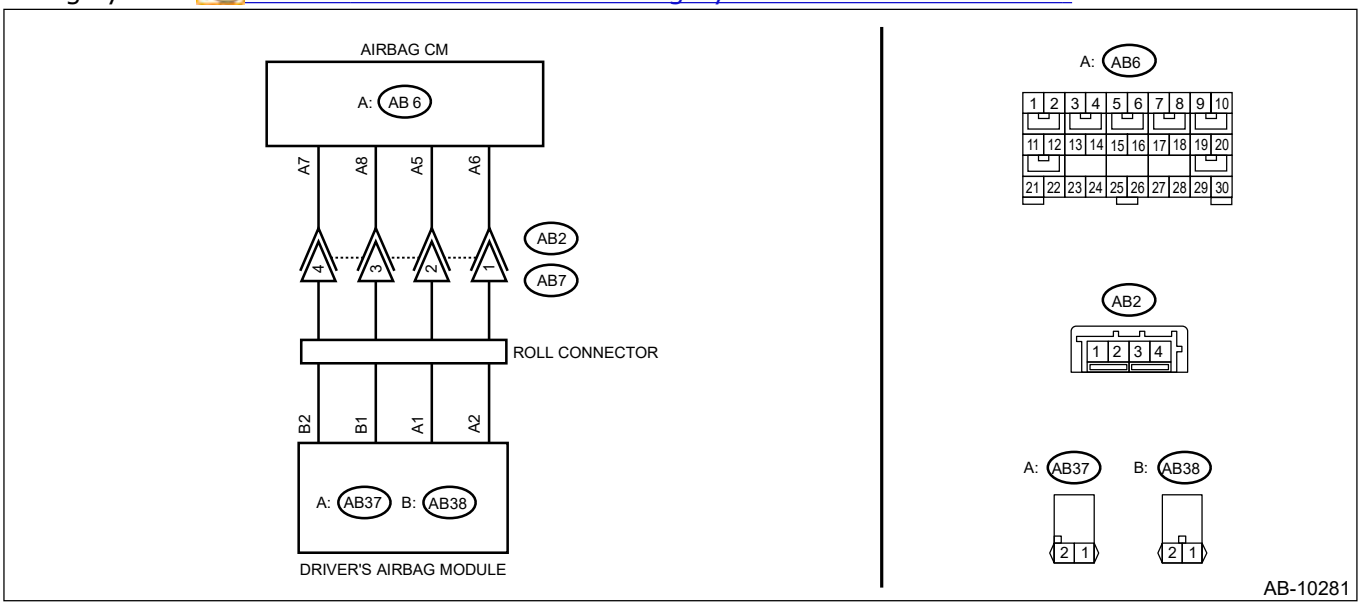
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted.
- Airbag module harness (driver's side) circuit is shorted.
- Roll connector circuit is shorted.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the console front panel and disconnect the connector (AB9).
3. Disconnect the driver's knee airbag module connector (AB66).
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
2. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 1 — (3AG) No. 3:

Is the resistance 1 MΩ or more?

Yes	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1800 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1801 OPEN IN DRIVER'S AIRBAG

Diagnosis start condition:

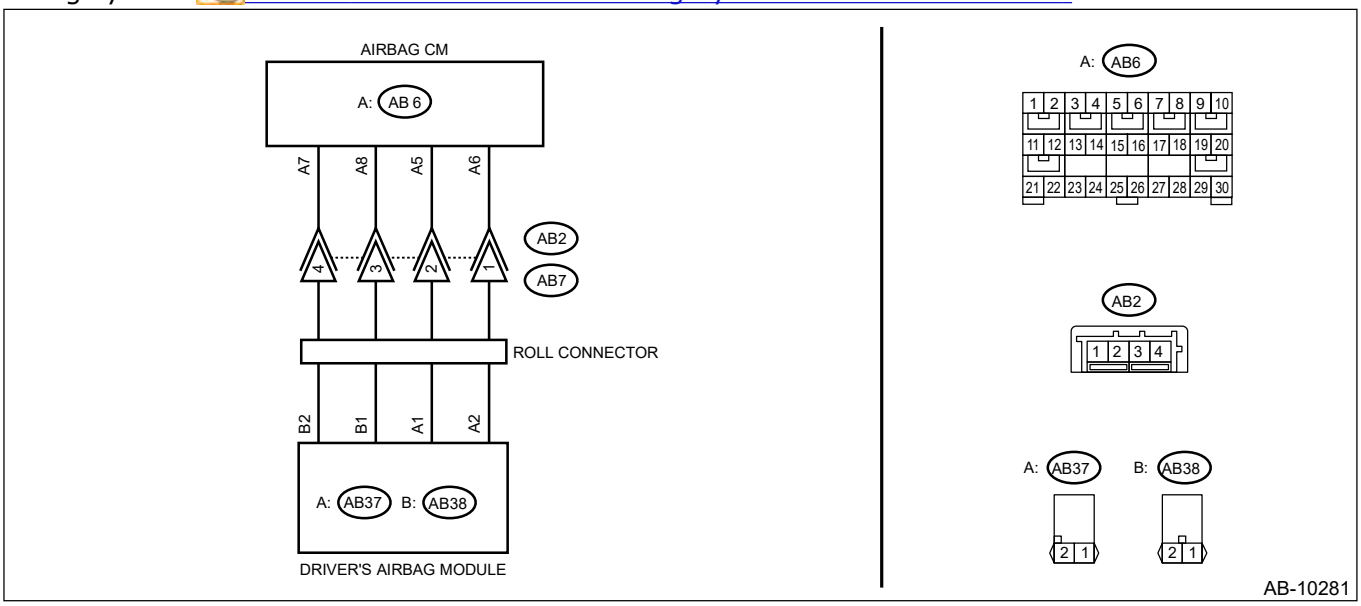
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (driver's side) circuit is open.
- Roll connector is open.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the console front panel and disconnect the connector (AB9).
3. Disconnect the driver's knee airbag module connector (AB66).
4. Disconnect the airbag resistor from the connector (2N) in test harness N.
5. Disconnect the airbag resistor from the connector (2Q) of test harness Q.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Go to 4.

4. CHECK ROLL CONNECTOR.

1. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
2. Measure the resistance between connector (2Q) terminals in test harness Q.
   Connector & terminal
   (2Q) No. 1 — (2Q) No. 2:

Is the resistance less than 10 Ω?

Yes	Replace the airbag main harness along with body harness.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1801 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

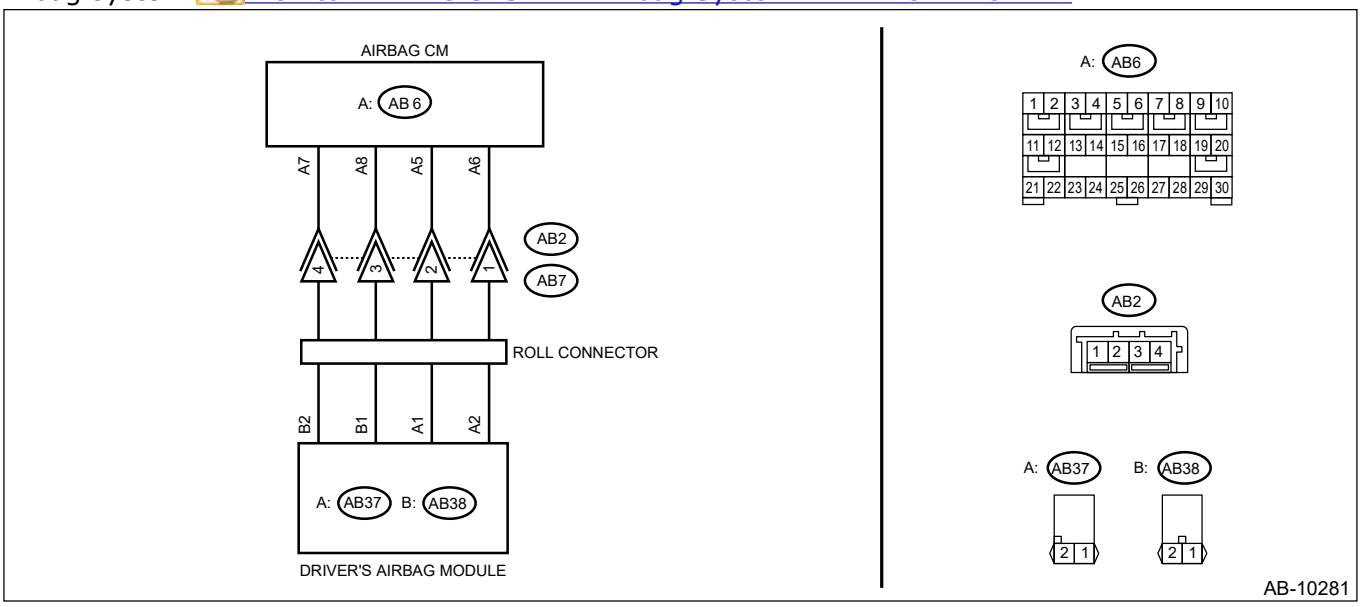
DTC B1802 SHORT IN DRIVER'S AIRBAG (TO GROUND)

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Airbag main harness circuit is shorted to ground.

- Airbag module harness (driver’s side) circuit is shorted to ground.
- Roll connector circuit is shorted to ground.
- Driver’s airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver’s airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
3. Disconnect the driver's knee airbag module connector (AB66).
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Measure the resistance between connector (2Q) in the test harness Q and chassis ground.
   Connector & terminal
   (2Q) No. 1 — Chassis ground:
   (2Q) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Disconnect the test harness N from connector (AB38).
2. Disconnect the test harness Q from connector (AB37).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
6. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.

Connector & terminal

(3AG) No. 1 — Chassis ground:

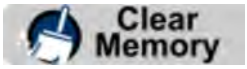
(3AG) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1802 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1803 SHORT IN DRIVER'S AIRBAG (TO +B)

Diagnosis start condition:

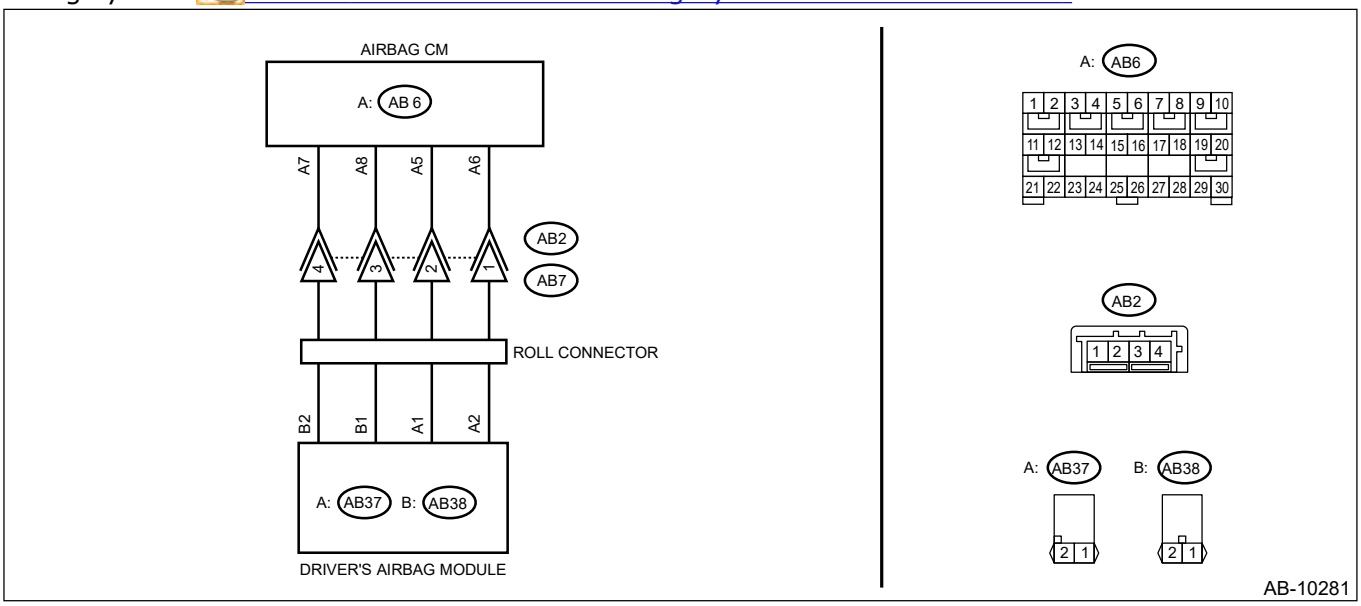
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Airbag module harness (driver's side) circuit is shorted to power supply.
- Roll connector circuit is shorted to power supply.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
3. Disconnect the driver's knee airbag module connector (AB66).
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Measure the voltage between connector (2Q) in the test harness Q and chassis ground.
   Connector & terminal
   (2Q) No. 1 (+) — Chassis ground (−):
   (2Q) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Disconnect the test harness N from connector (AB38).
2. Disconnect the test harness Q from connector (AB37).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
6. Connect the battery ground terminal and turn the ignition switch to ON.
7. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 1 (+) — Chassis ground (−):
   (3AG) No. 3 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1803 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1805 SHORT IN PASSENGER'S AIRBAG

Diagnosis start condition:

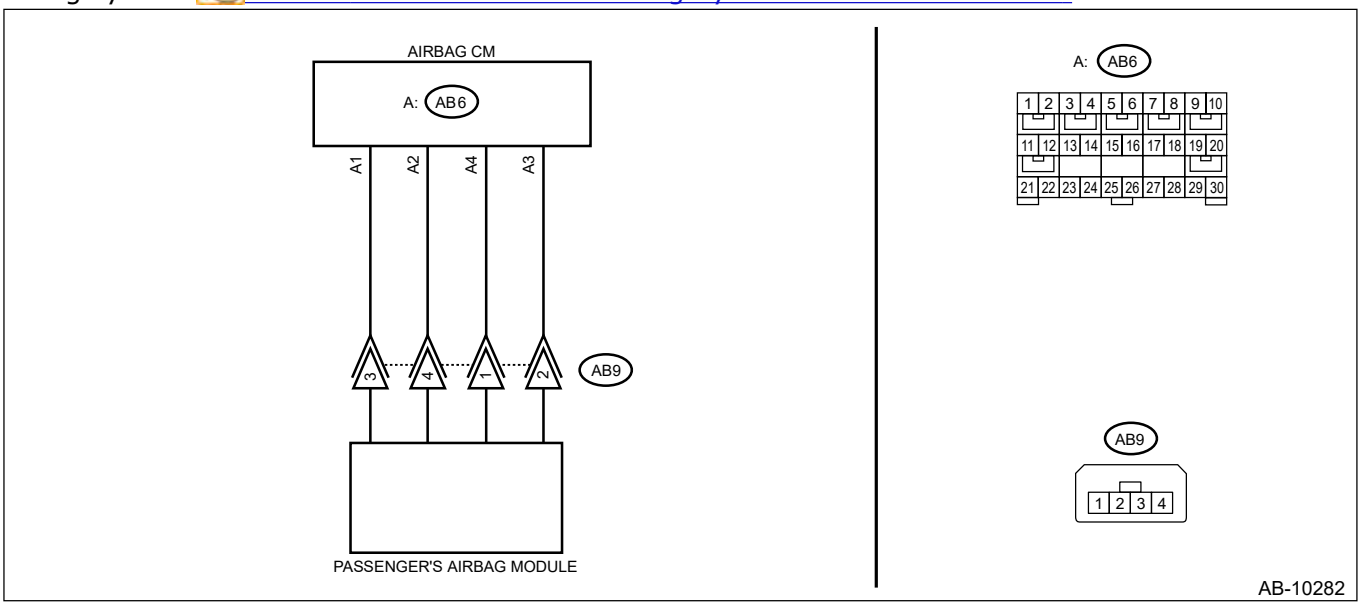
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted.
- Airbag module harness circuit (passenger's side) is shorted.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connectors (AB6, AB17, AB18) to the connector (1AG) in the test harness AG, and disengage the short mechanism of the connectors (AB6, AB17, AB18).
6. Disconnect the passenger's airbag module connector (AB9).
7. Using a probe, measure the resistance between the terminals of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 1 — (AB9) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Disconnect the test harness AG from the connectors (AB6, AB17, AB18).
2. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
3. Connect the connectors (AB7) and (AB2).
4. Connect the connector (AB66) to the driver's knee airbag module.
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1805 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1805 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1806 OPEN IN PASSENGER'S AIRBAG

Diagnosis start condition:

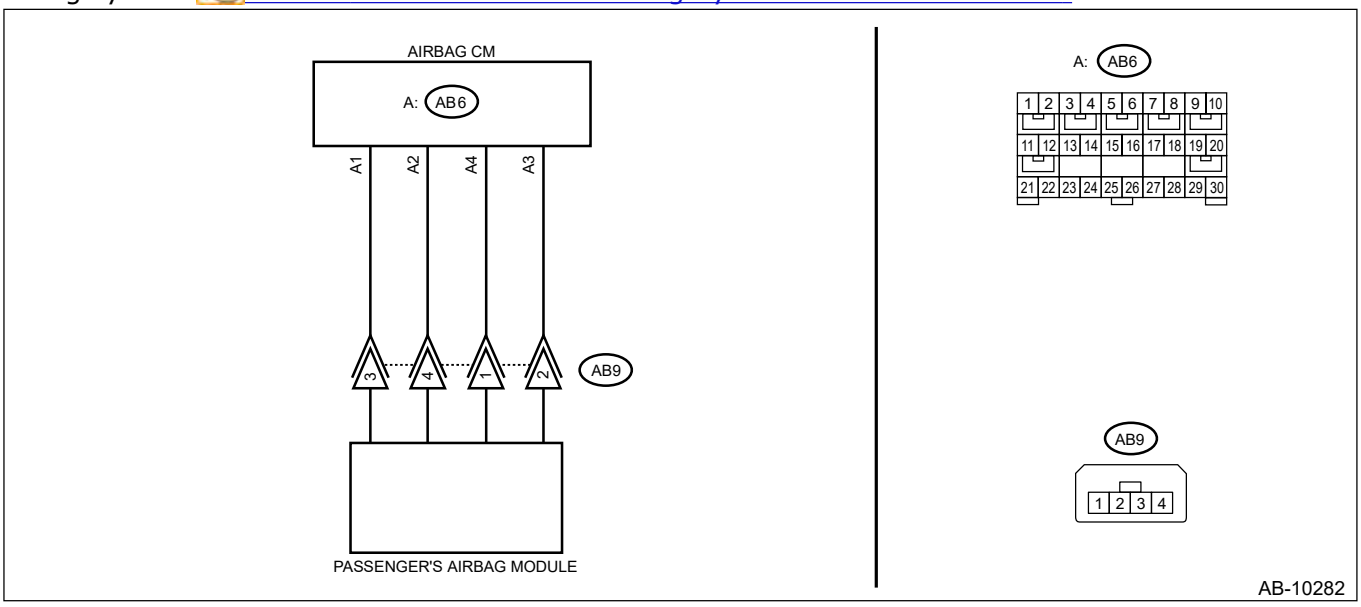
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (passenger's side) circuit is open.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the resistance between the terminals of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 1 — (AB9) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connectors (AB7) and (AB2).
3. Connect the connector (AB66) to the driver's knee airbag module.
4. Using a probe, short the terminals No. 1 and No. 2 of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When shorting the terminals, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 1 — (AB9) No. 2:
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1806 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the ground cable to battery.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1806 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1807 SHORT IN PASSENGER'S AIRBAG (TO GROUND)

Diagnosis start condition:

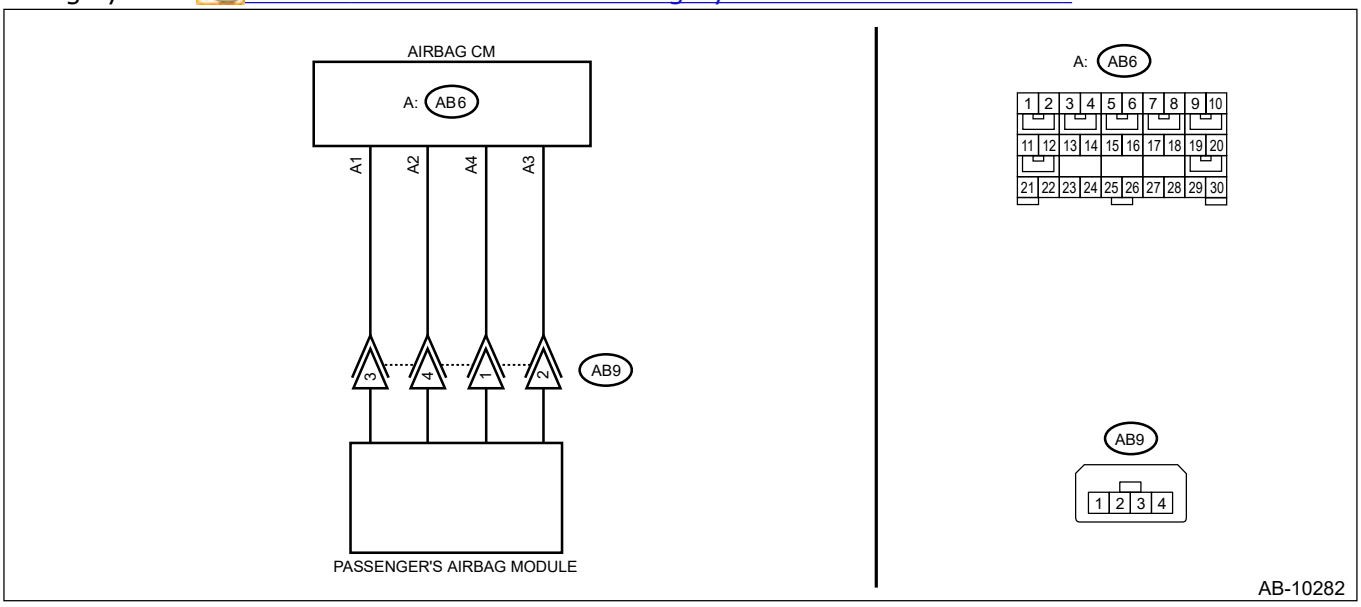
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to ground.
- Airbag module harness (passenger's side) circuit is shorted to ground.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the resistance between the connector (AB9) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 1 — Chassis ground:

   (AB9) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connectors (AB7) and (AB2).
3. Connect the connector (AB66) to the driver's knee airbag module.
4. Connect the battery ground terminal and turn the ignition switch to ON.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1807 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1807 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1808 SHORT IN PASSENGER'S AIRBAG (TO +B)

Diagnosis start condition:

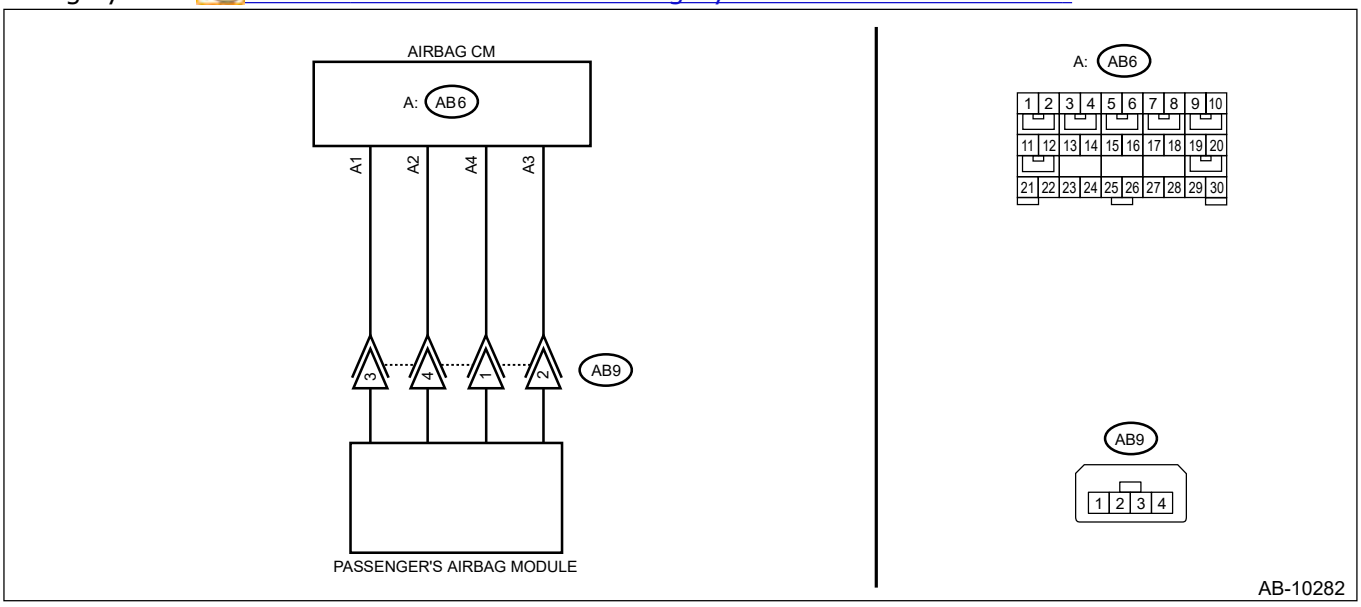
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Airbag module harness (passenger's side) circuit is shorted to power supply.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the voltage between the connector (AB9) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the voltage, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 1 (+) — Chassis ground (−):

   (AB9) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
3. Connect the connectors (AB7) and (AB2).
4. Connect the connector (AB66) to the driver's knee airbag module.
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1808 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1808 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1810 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP

Diagnosis start condition:

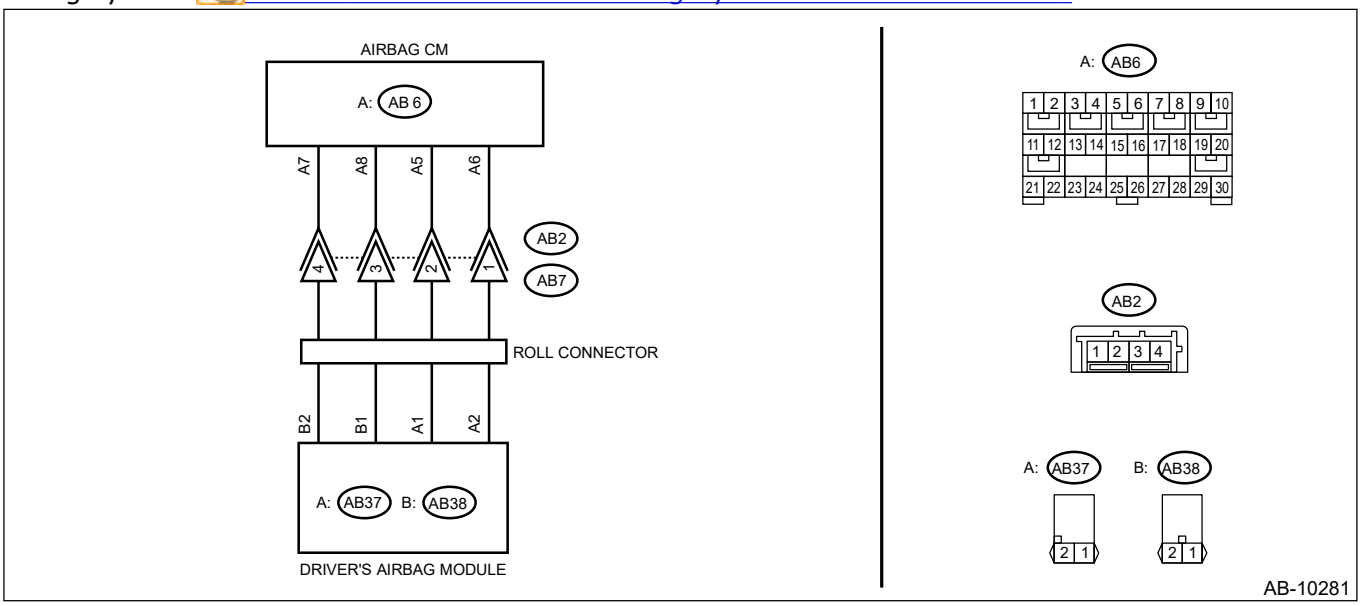
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted.
- Airbag module harness (driver's side) circuit is shorted.
- Roll connector circuit is shorted.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the console front panel and disconnect the connector (AB9).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (2N) terminals in test harness N.
   Connector & terminal
   (2N) No. 1 — (2N) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
2. Disconnect the test harness Q from connector (AB37).
3. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 2 — (3AG) No. 4:

Is the resistance 1 MΩ or more?

Yes	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1810 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1811 OPEN IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP

Diagnosis start condition:

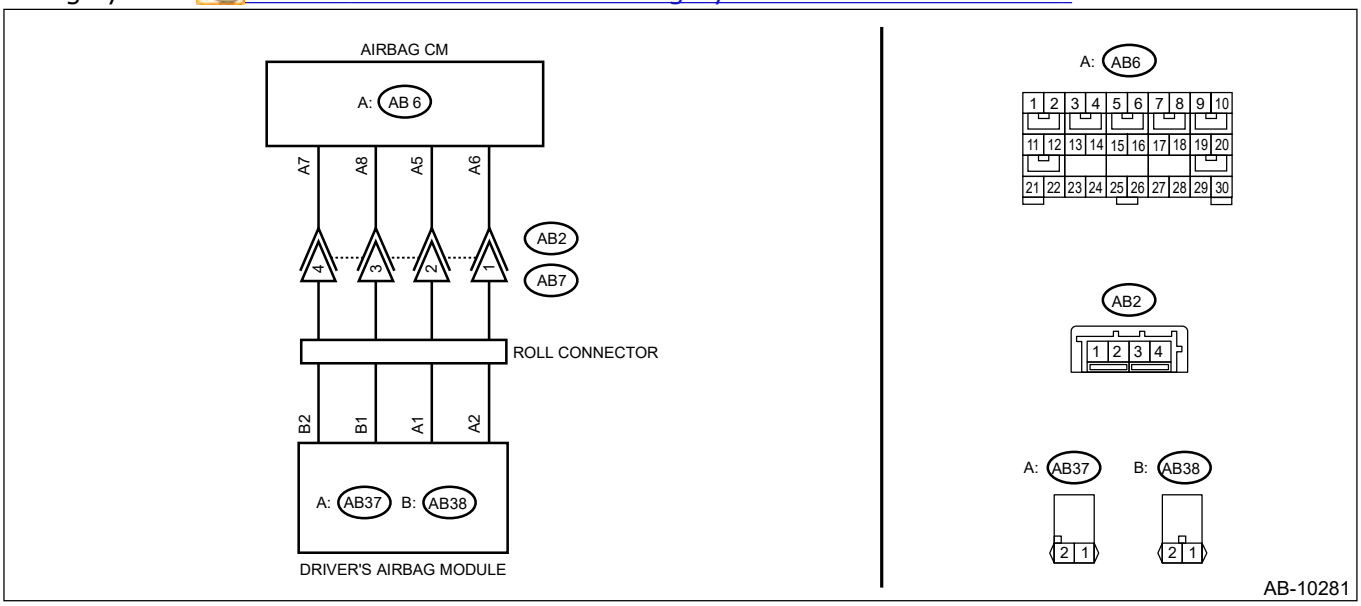
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (driver's side) circuit is open.
- Roll connector circuit is open.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR AND AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the console front panel and disconnect the connector (AB9).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N.
5. Disconnect the airbag resistor from the connector (2Q) of test harness Q.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Measure the resistance between connector (2N) terminals in test harness N.
   Connector & terminal
   (2N) No. 1 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Go to 4.

4. CHECK ROLL CONNECTOR.

1. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
2. Measure the resistance between connector (2N) terminals in test harness N.
   Connector & terminal
   (2N) No. 1 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Replace the airbag main harness along with body harness.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1811 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

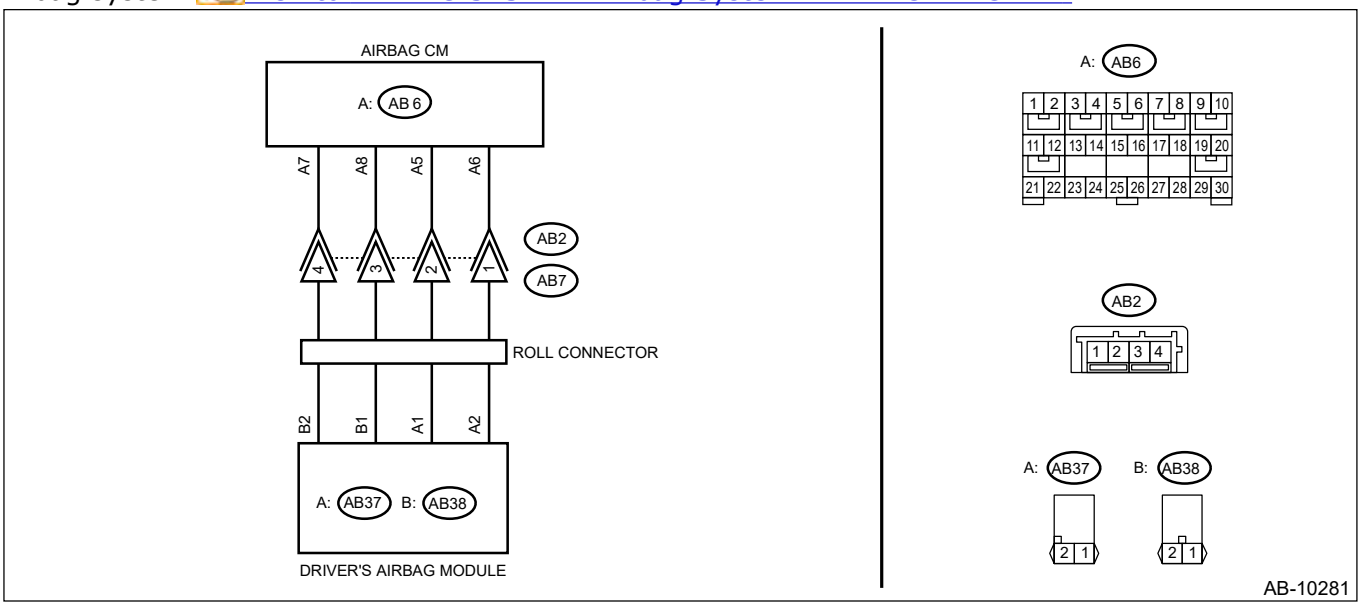
DTC B1812 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Airbag main harness circuit is shorted to ground.

- Airbag module harness (driver’s side) circuit is shorted to ground.
- Roll connector circuit is shorted to ground.
- Driver’s airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver’s airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Measure the resistance between connector (2N) in the test harness N and chassis ground.
   Connector & terminal
   (2N) No. 1 — Chassis ground:
   (2N) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Disconnect the test harness N from connector (AB38).
2. Disconnect the test harness Q from connector (AB37).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
6. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.

Connector & terminal

(3AG) No. 2 — Chassis ground:

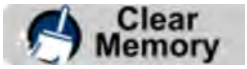
(3AG) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1812 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1813 SHORT IN DRIVER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)

Diagnosis start condition:

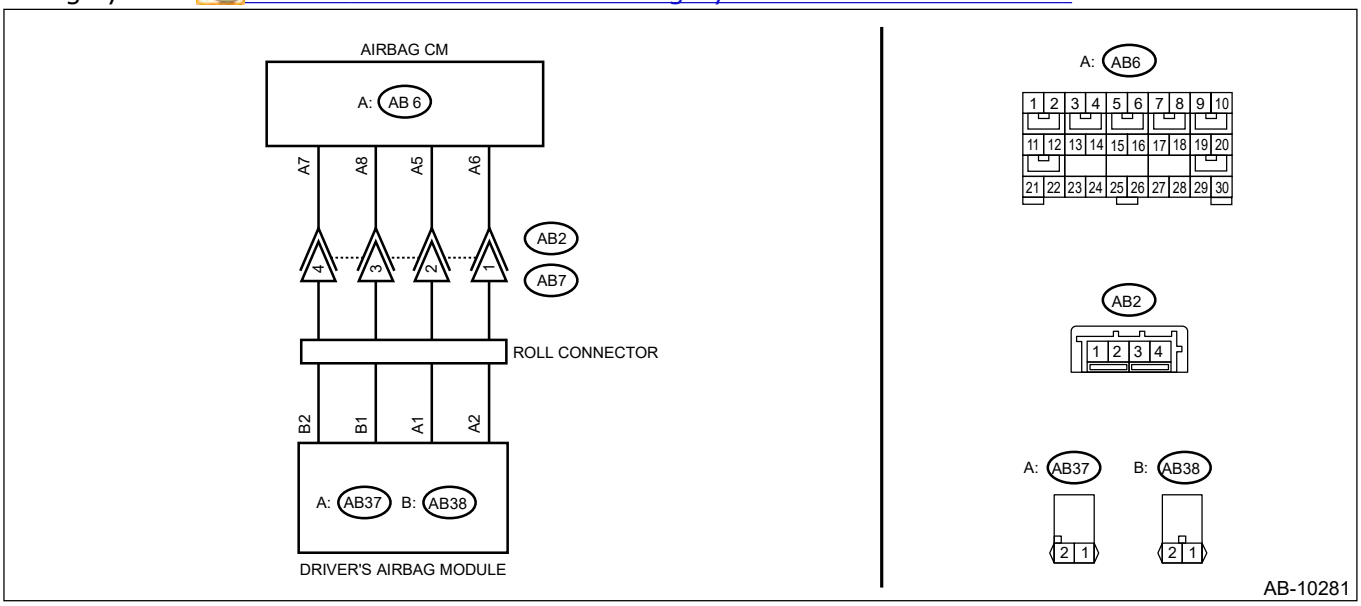
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Airbag module harness (driver's side) circuit is shorted to power supply.
- Roll connector is shorted to power supply.
- Driver's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Prior to starting work, prepare two AIRBAG RESISTORs (98299PA040).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the driver's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK DRIVER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the driver's airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB38).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the connector (1Q) in the test harness Q to connector (AB37).
6. Connect the airbag resistor to the connector (2Q) in the test harness Q.
7. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module.
No	Go to 3.

3. CHECK ROLL CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the airbag resistor from the connector (2N) in test harness N and from the connector (2Q) in test harness Q.
5. Measure the voltage between connector (2N) in the test harness N and chassis ground.
   Connector & terminal
   (2N) No. 1 (+) — Chassis ground (−):
   (2N) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the roll connector. Ref. to AIRBAG SYSTEM>Roll Connector.

4. CHECK AIRBAG MAIN HARNESS (DRIVER'S AIRBAG HARNESS).

1. Disconnect the test harness N from connector (AB38).
2. Disconnect the test harness Q from connector (AB37).
3. Remove the console front panel and disconnect the connector (AB9).
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
6. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 2 (+) — Chassis ground (−):
   (3AG) No. 4 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the airbag main harness along with body harness.

5. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1813 displayed?

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 6.

6. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1815 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP

Diagnosis start condition:

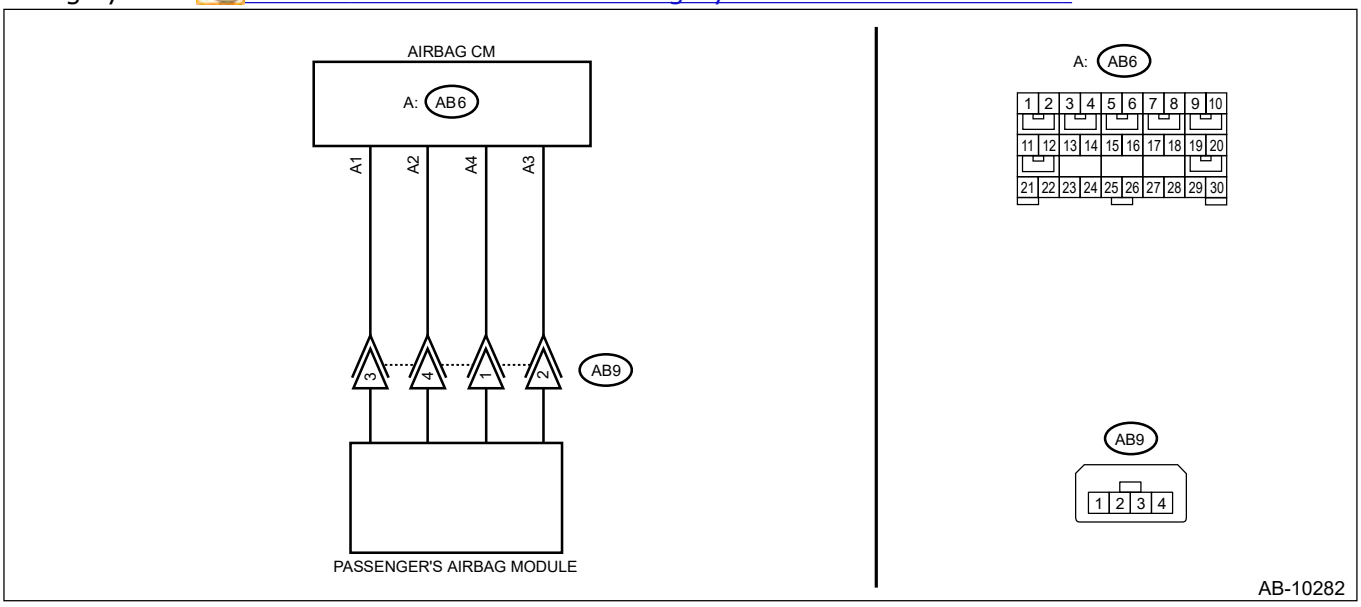
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted.
- Airbag module harness circuit (passenger's side) is shorted.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Connect the connectors (AB6, AB17, AB18) to the connector (1AG) in the test harness AG, and disengage the short mechanism of the connectors (AB6, AB17, AB18).
6. Disconnect the passenger's airbag module connector (AB9).
7. Using a probe, measure the resistance between the terminals of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 3 — (AB9) No. 4:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Disconnect the test harness AG from the connectors (AB6, AB17, AB18).
2. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
3. Connect the connectors (AB7) and (AB2).
4. Connect the connector (AB66) to the driver's knee airbag module.
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1815 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1815 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1816 OPEN IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP

Diagnosis start condition:

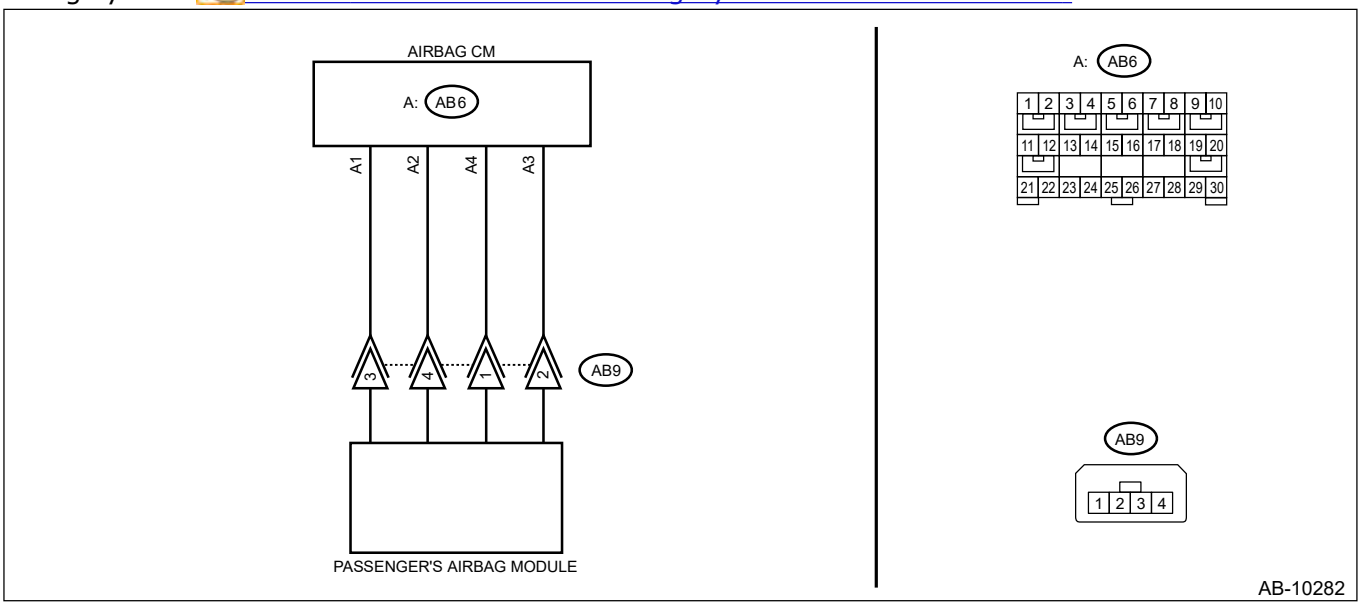
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is open.
- Airbag module harness (passenger's side) circuit is open.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the resistance between the terminals of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 3 — (AB9) No. 4:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connectors (AB7) and (AB2).
3. Connect the connector (AB66) to the driver's knee airbag module.
4. Using a probe, short the terminals No. 3 and No. 4 of connector (AB9). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When shorting the terminals, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 3 — (AB9) No. 4:
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC B1816 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1816 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1817 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP (TO GROUND)

Diagnosis start condition:

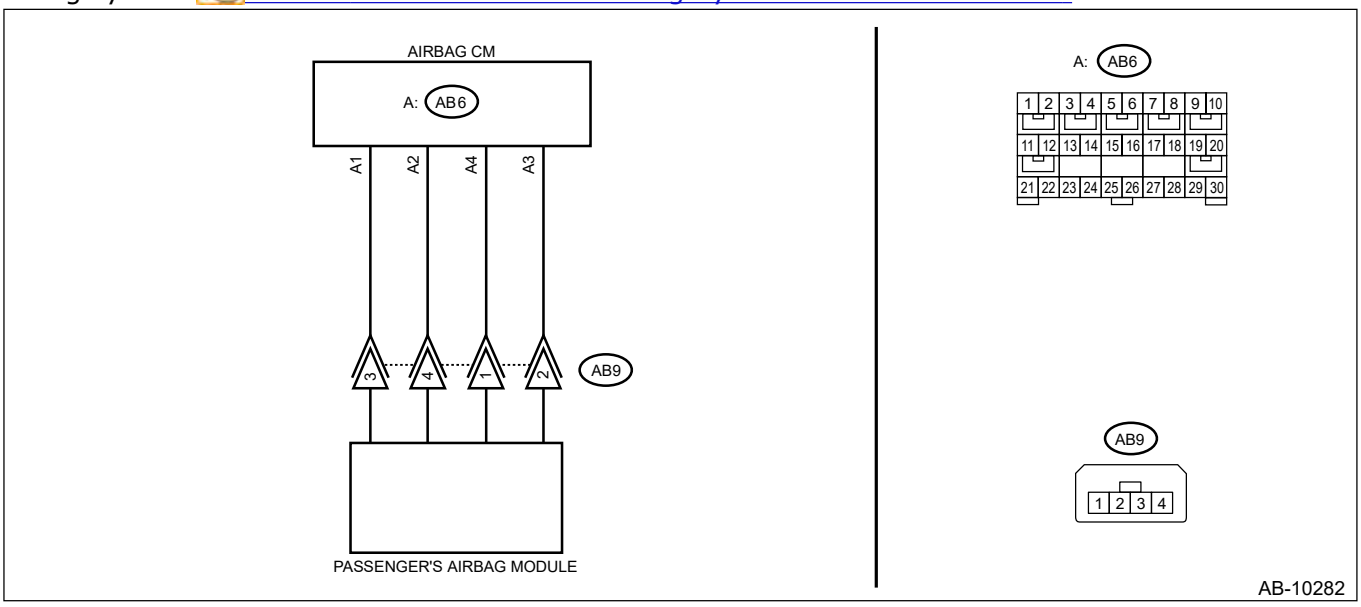
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to ground.
- Airbag module harness (passenger's side) circuit is shorted to ground.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the resistance between the connector (AB9) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 3 — Chassis ground:

   (AB9) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connectors (AB7) and (AB2).
3. Connect the connector (AB66) to the driver's knee airbag module.
4. Connect the battery ground terminal and turn the ignition switch to ON.
5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1817 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1817 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1818 SHORT IN PASSENGER'S AIRBAG DUAL STAGE - 2ND STEP CIRCUIT (TO +B)

Diagnosis start condition:

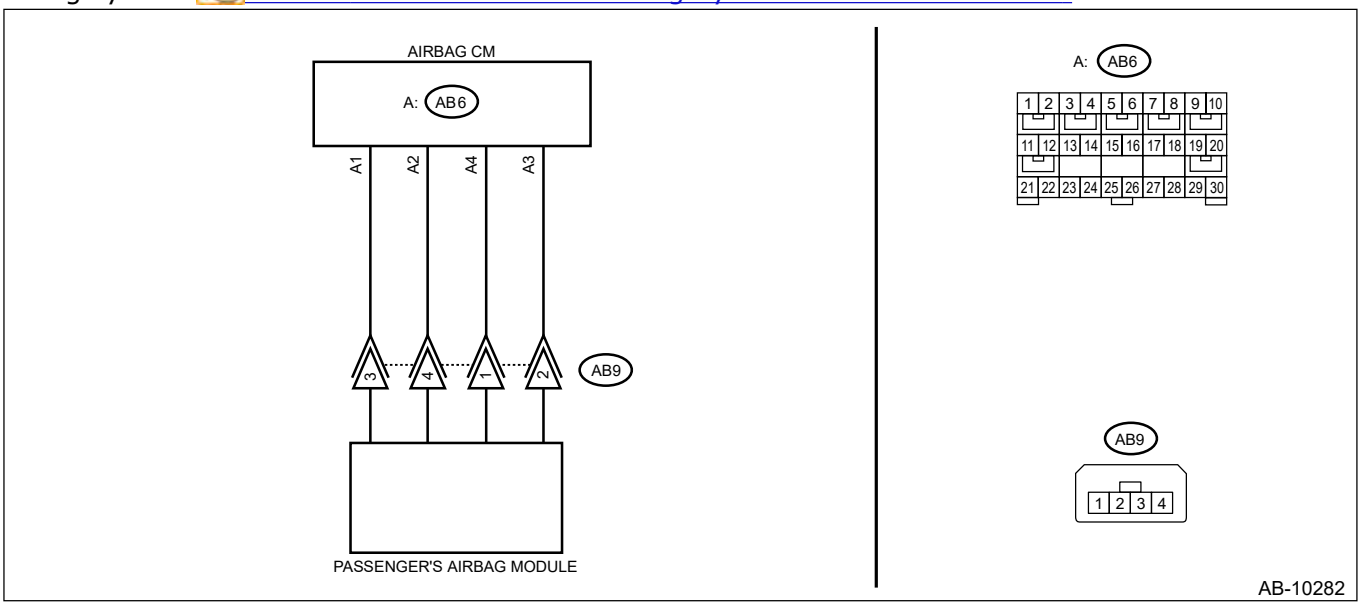
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Airbag module harness (passenger's side) circuit is shorted to power supply.
- Passenger's airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the passenger's airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK AIRBAG MAIN HARNESS (PASSENGER'S AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB7) and (AB2).
3. Disconnect the connector (AB66) from the driver's knee airbag module.
4. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
5. Disconnect the passenger's airbag module connector (AB9).
6. Using a probe, measure the voltage between the connector (AB9) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the voltage, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB9) No. 3 (+) — Chassis ground (−):

   (AB9) No. 4 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag main harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
3. Connect the connectors (AB7) and (AB2).
4. Connect the connector (AB66) to the driver's knee airbag module.
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1818 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module>REMOVAL.
No	Go to 4.

4. CHECK PASSENGER'S AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the passenger's airbag module connector (AB9).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1818 displayed? (Current malfunction)

Yes	Replace the passenger's airbag module. Ref. to AIRBAG SYSTEM>Passenger's Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1820 SHORT IN SIDE AIRBAG RH

Diagnosis start condition:

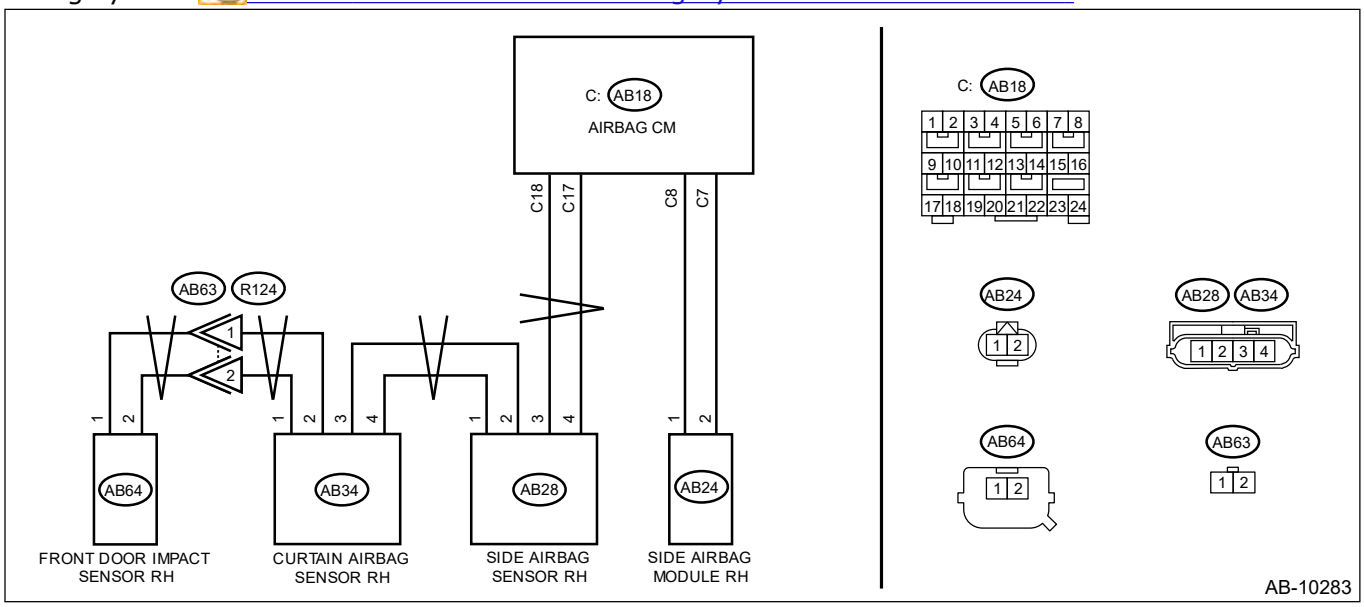
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness RH circuit is shorted.
- Side airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module RH and the side airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS RH) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB22) from seat cushion airbag module RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the connector (AB33) from curtain airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between terminals of connector (AB24) of side airbag module RH.

Caution:

Connect the terminal in test harness AT to connector (AB24) terminal, and apply the tester to test harness AT. Two sets of test harness AT are required.

Connector & terminal

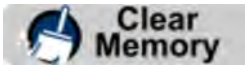
(AB24) No. 1 — (AB24) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module RH connector (AB24).
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1820 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1820 displayed? (Current malfunction)

Yes	Replace the side airbag module RH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1821 OPEN IN SIDE AIRBAG RH

Diagnosis start condition:

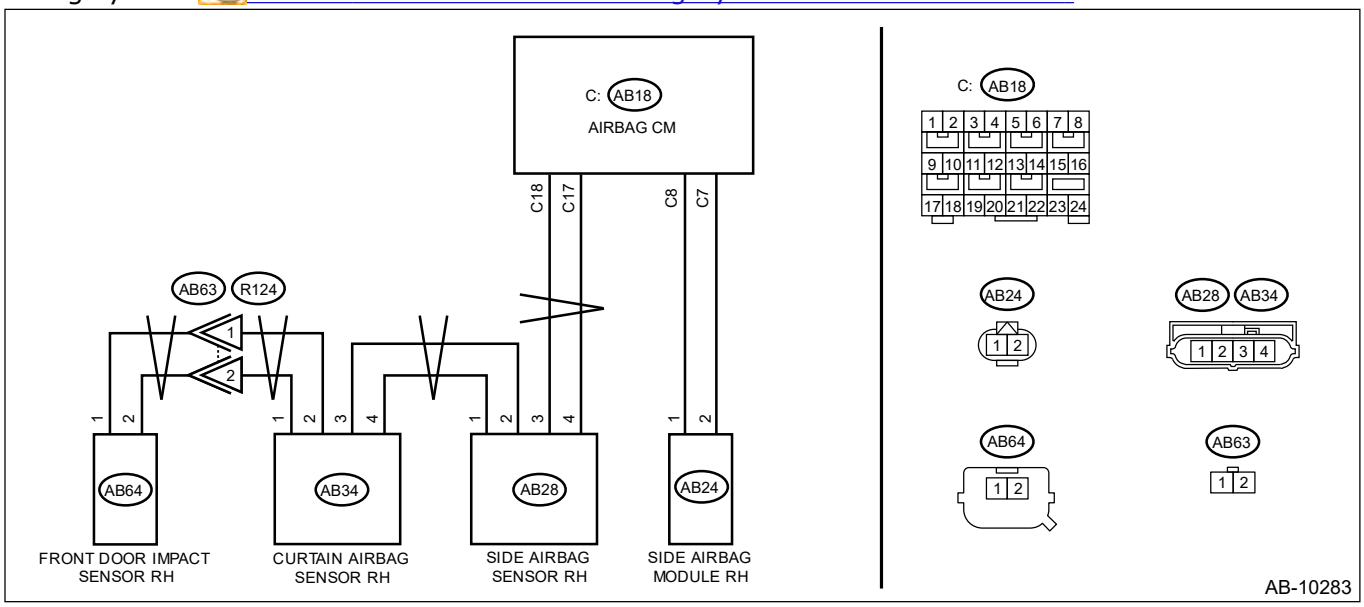
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness RH circuit is open.
- Side airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module RH and the side airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS RH) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the connector (AB33) from curtain airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Measure the resistance between terminals of connector (AB24) of side airbag module RH.

Caution:

Connect the terminal in test harness AT to connector (AB24) terminal, and apply the tester to test harness AT. Two sets of test harness AT are required.

Connector & terminal

(AB24) No. 1 — (AB24) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module RH connector (AB24).
2. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB24).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1821 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1821 displayed? (Current malfunction)

Yes	Replace the side airbag module RH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1822 SHORT IN SIDE AIRBAG RH (TO GROUND)

Diagnosis start condition:

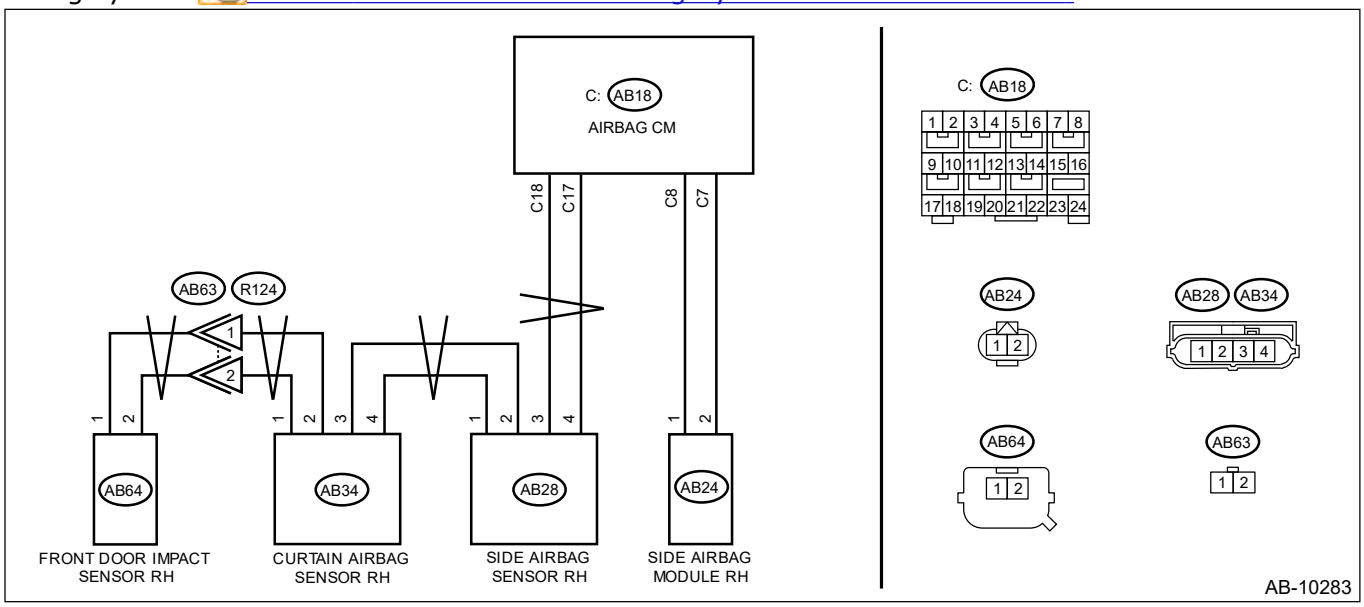
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness RH circuit is shorted to ground.
- Side airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module RH and the side airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS RH) (SHORTED TO GROUND).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connector (AB24) from side airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (AB24) of side airbag module RH and chassis ground.

Caution:

Connect the terminal in test harness AT to connector (AB24) terminal, and apply the tester to test harness AT.

Connector & terminal

(AB24) No. 1 — Chassis ground:

(AB24) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module RH connector (AB24).
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1822 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1822 displayed? (Current malfunction)

Yes	Replace the side airbag module RH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1823 SHORT IN SIDE AIRBAG RH (TO +B)

Diagnosis start condition:

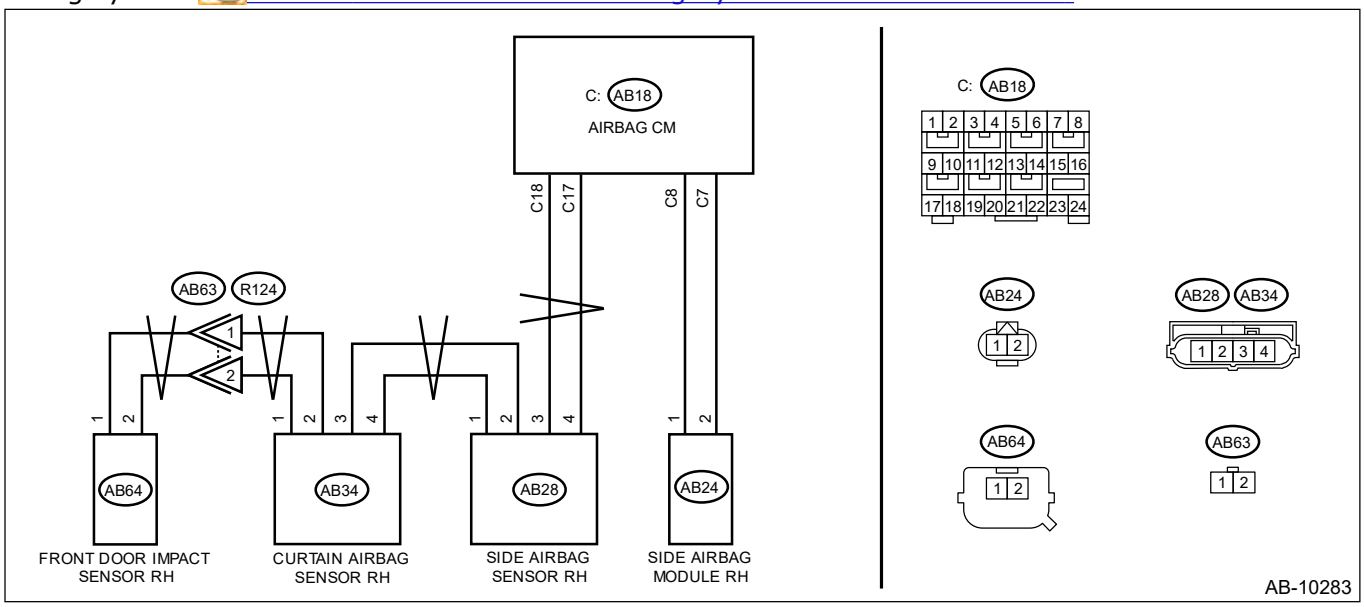
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness RH is shorted to power supply.
- Side airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module RH and the side airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS RH) (SHORTED TO POWER SUPPLY).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the connector (AB33) from curtain airbag module RH.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Measure the voltage between connector (AB24) of side airbag module RH and chassis ground.

Caution:

Connect the terminal in test harness AT to connector (AB24) terminal, and apply the tester to test harness AT.

Connector & terminal

(AB24) No. 1 (+) — Chassis ground (−):

(AB24) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	 Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module RH connector (AB24).
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

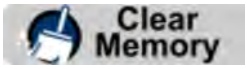


Is DTC B1823 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1823 displayed? (Current malfunction)

Yes	Replace the side airbag module RH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1825 SHORT IN SIDE AIRBAG LH

Diagnosis start condition:

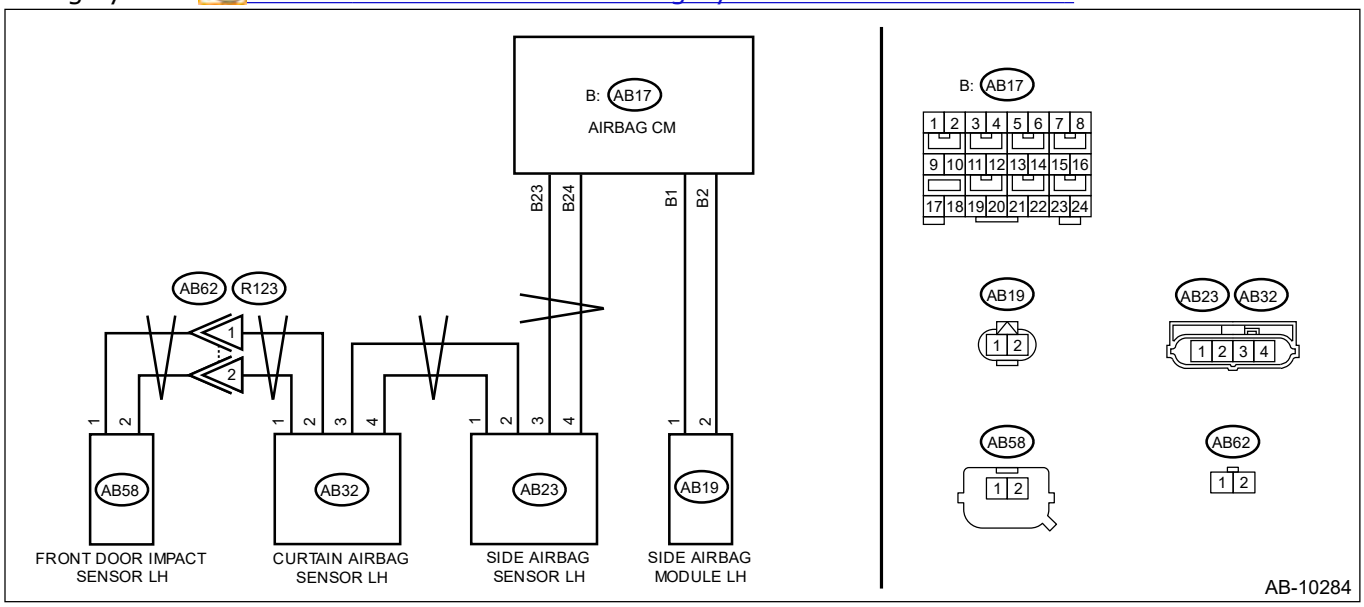
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness LH circuit is shorted.
- Side airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module LH and the side airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS LH) (SHORTED BETWEEN LINES).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between terminals of connector (AB19) of side airbag module LH.

Caution:

Connect the terminal in test harness AT to connector (AB19) terminal, and apply the tester to test harness AT. Two sets of test harness AT are required.

Connector & terminal

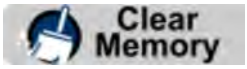
(AB19) No. 1 — (AB19) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module LH connector (AB19).
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1825 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1825 displayed? (Current malfunction)

Yes	Replace the side airbag module LH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1826 OPEN IN SIDE AIRBAG LH

Diagnosis start condition:

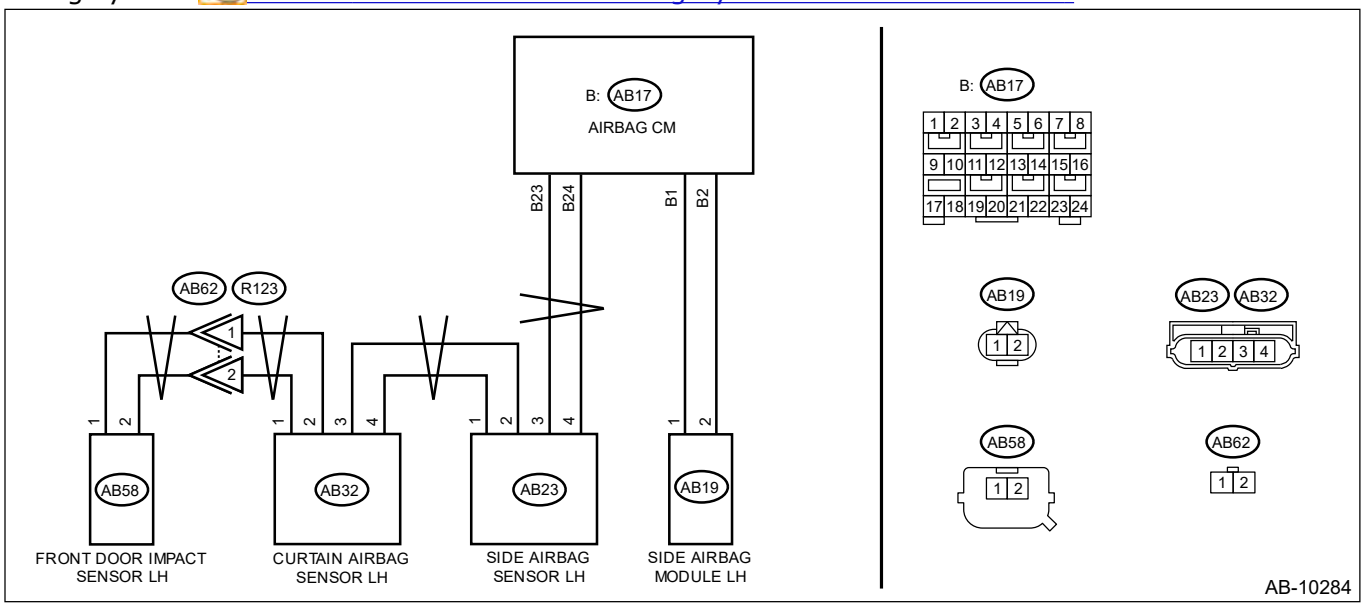
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness LH circuit is open.
- Side airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Note:

Before starting work, prepare two sets of TEST HARNESS AT (98299CA020).

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module LH and the side airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS LH) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Measure the resistance between terminals of connector (AB19) of side airbag module LH.

Caution:

Connect the terminal in test harness AT to connector (AB19) terminal, and apply the tester to test harness AT. Two sets of test harness AT are required.

Connector & terminal

(AB19) No. 1 — (AB19) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module LH connector (AB19).
2. Using test harness AT, short the terminals No. 1 and No. 2 of connector (AB19).
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1826 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1826 displayed? (Current malfunction)

Yes	Replace the side airbag module LH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1827 SHORT IN SIDE AIRBAG LH (TO GROUND)

Diagnosis start condition:

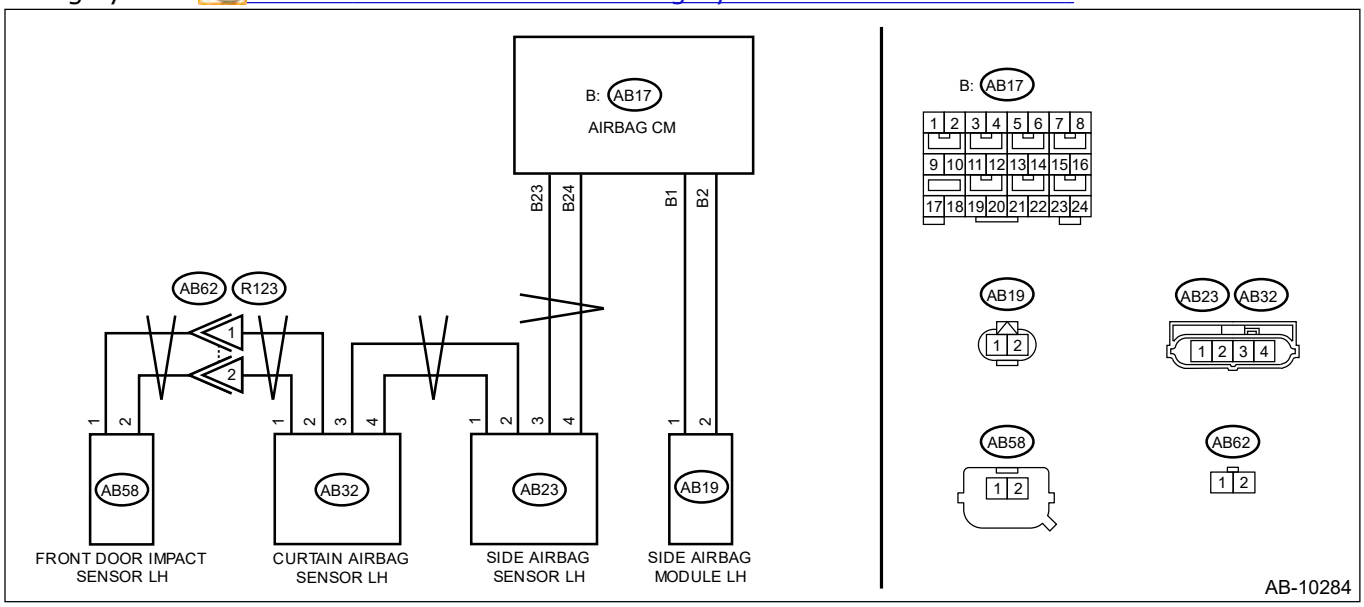
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness LH circuit is shorted to ground.
- Side airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module LH and the side airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS LH) (SHORTED TO GROUND).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Measure the resistance between connector (AB19) of side airbag module LH and chassis ground.

   Caution:

   Connect the terminal in test harness AT to connector (AB19) terminal, and apply the tester to test harness AT.

   Connector & terminal

   (AB19) No. 1 — Chassis ground:

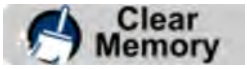
   (AB19) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module LH connector (AB19).
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1827 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1827 displayed? (Current malfunction)

Yes	Replace the side airbag module LH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1828 SHORT IN SIDE AIRBAG LH (TO +B)

Diagnosis start condition:

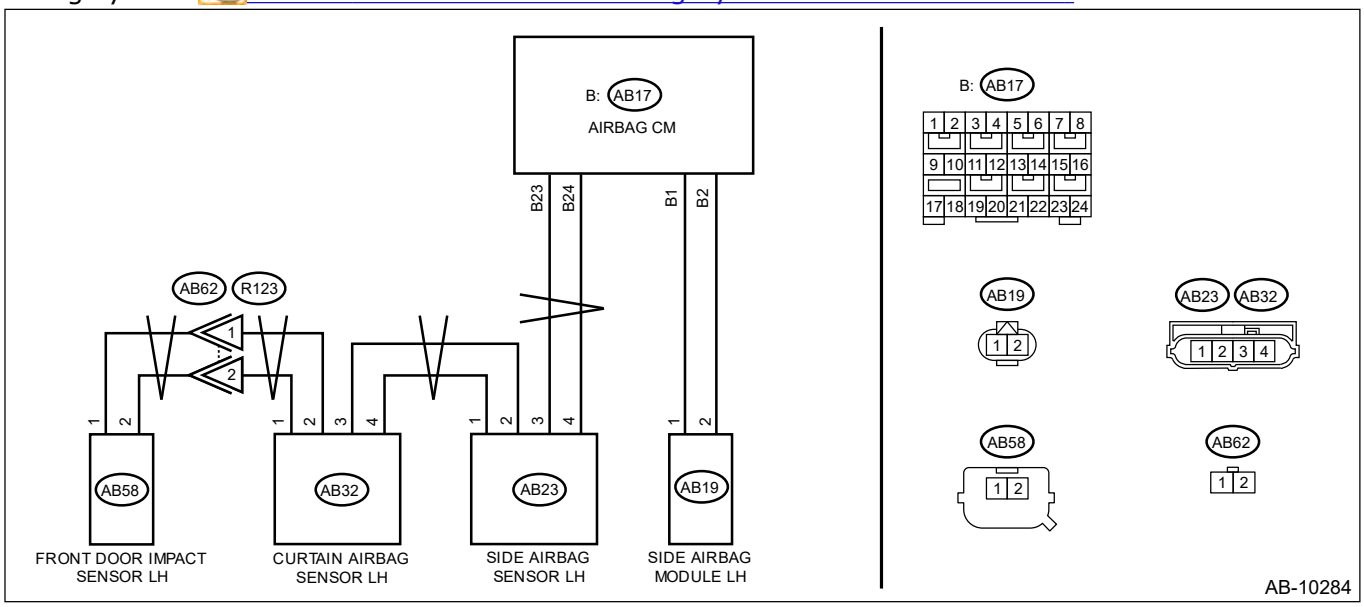
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Side airbag harness LH is shorted to power supply.
- Side airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, side airbag module LH and the side airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG MODULE HARNESS LH) (SHORTED TO POWER SUPPLY).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Measure the voltage between connector (AB19) of side airbag module LH and chassis ground.

Caution:

Connect the terminal in test harness AT to connector (AB19) terminal, and apply the tester to test harness AT.

Connector & terminal

(AB19) No. 1 (+) — Chassis ground (−):

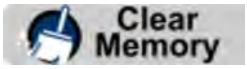
(AB19) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors other than side airbag module LH connector (AB19).
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1828 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SIDE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1828 displayed? (Current malfunction)

Yes	Replace the side airbag module LH. Ref. to AIRBAG SYSTEM>Side Airbag Module>REMOVAL.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1830 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT

Diagnosis start condition:

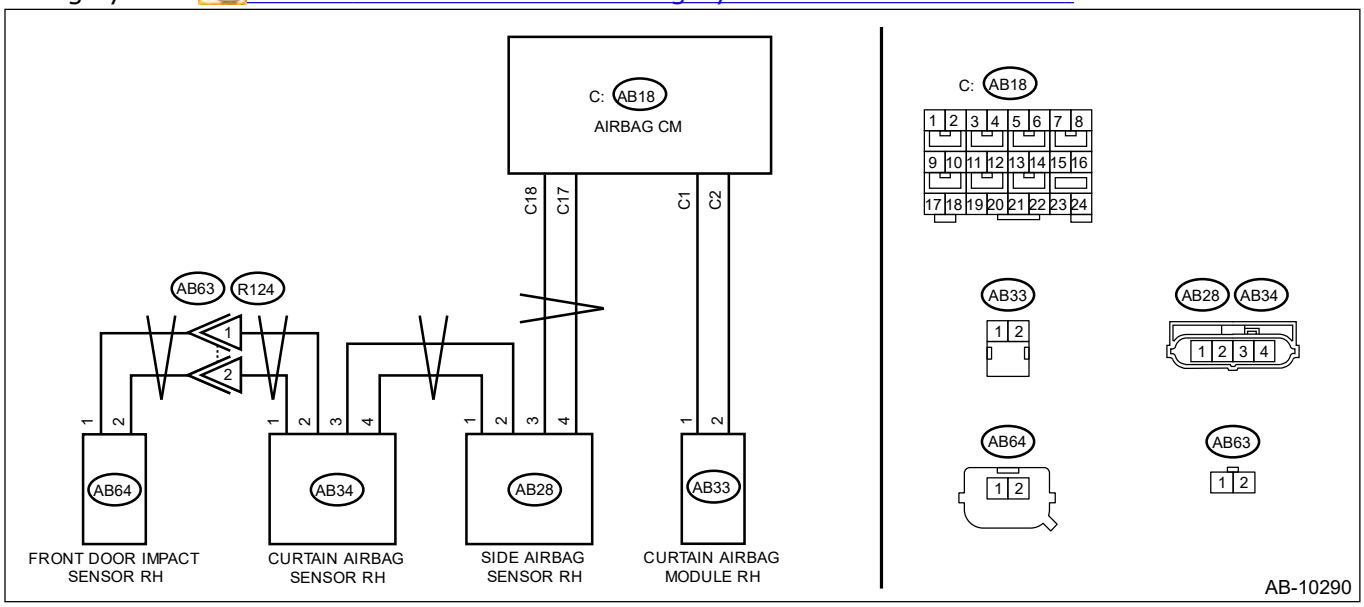
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness RH circuit is shorted.
- Curtain airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module RH and the curtain airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB33) from curtain airbag module RH.
3. Connect the connector (1N) in the test harness N to the connector (AB33).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the curtain airbag module RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the airbag resistor from test harness N.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 17 — (3AG) No. 19:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1830 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1831 OPEN IN CURTAIN AIRBAG RH SQUIB CIRCUIT

Diagnosis start condition:

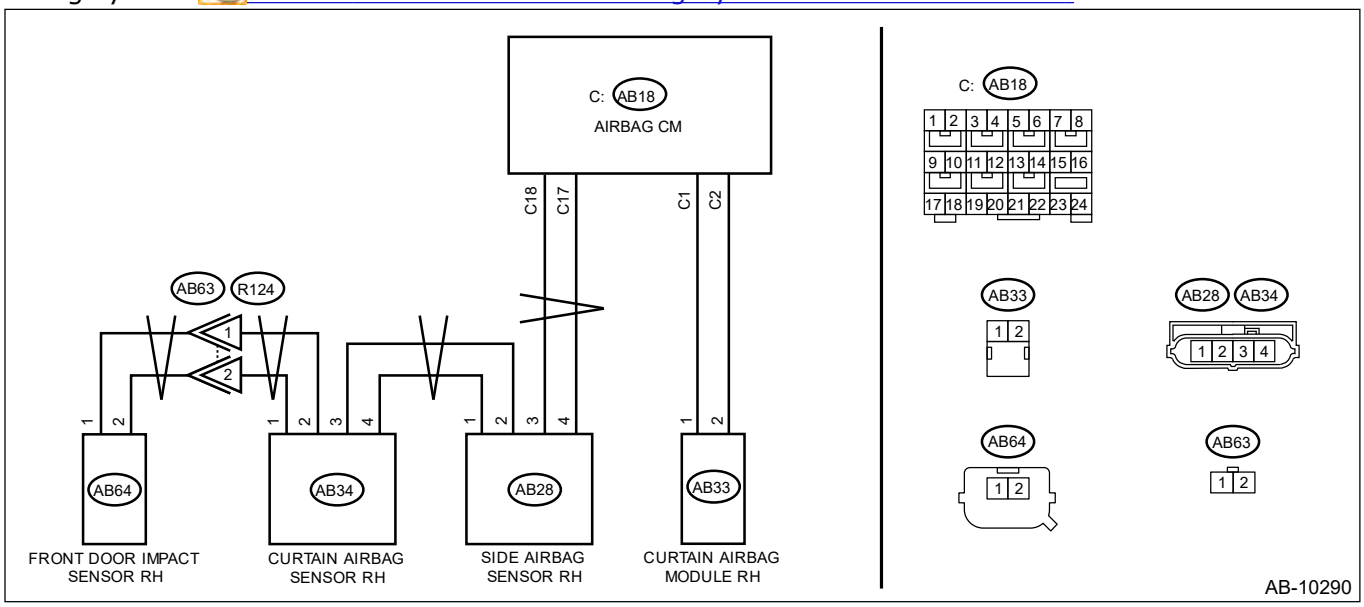
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness RH circuit is open.
- Curtain airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module RH and the curtain airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB33) from curtain airbag module RH.
3. Connect the connector (1N) in the test harness N to the connector (AB33).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the curtain airbag module RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the airbag resistor from test harness N.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (3AG) in the test harness AG and connector (2N) in the test harness N.

   Connector & terminal

   (3AG) No. 19 — (2N) No. 1:

   (3AG) No. 17 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1831 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1832 SHORT IN CURTAIN AIRBAG RH SQUIB CIRCUIT (TO GROUND)

Diagnosis start condition:

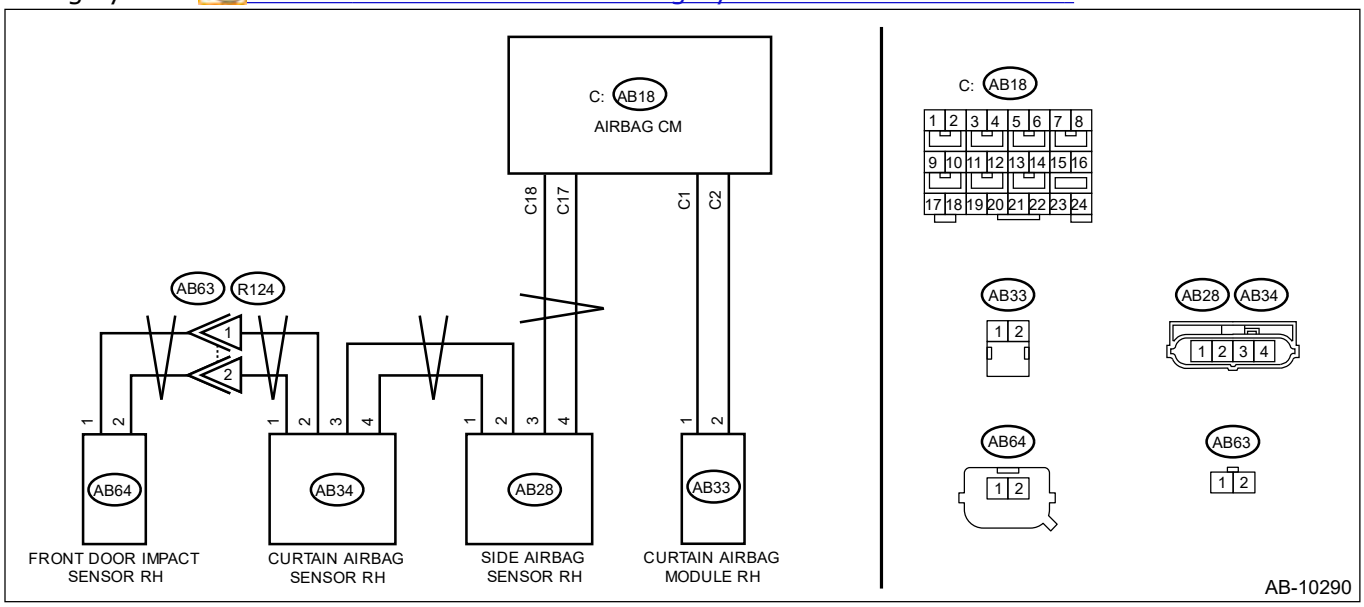
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness RH circuit is shorted to ground.
- Curtain airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module RH and the curtain airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB33), and connect the connector (1N) in test harness N to connector (AB33).
3. Connect the airbag resistor to the connector (2N) of test harness N.
4. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the curtain airbag module RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the airbag resistor from test harness N.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 17 — Chassis ground:
   (3AG) No. 19 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1832 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1833 SHORT IN CURTAIN SHIELD AIRBAG RH SQUIB CIRCUIT (TO +B)

Diagnosis start condition:

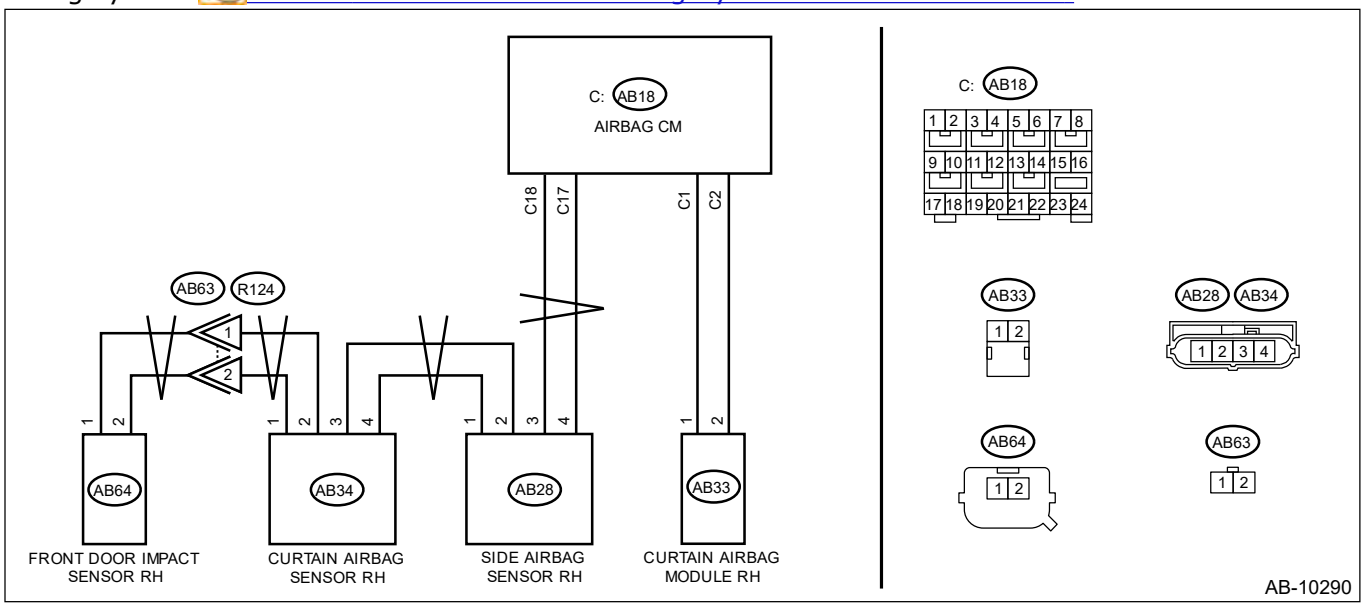
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness RH is shorted to power supply.
- Curtain airbag module RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module RH and the curtain airbag sensor RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB33), and connect the connector (1N) in test harness N to connector (AB33).
3. Connect the airbag resistor to the connector (2N) of test harness N.
4. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the curtain airbag module RH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
4. Disconnect the connector (AB24) from side airbag module RH.
5. Disconnect the airbag resistor from test harness N.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Connect the battery ground terminal and turn the ignition switch to ON.
9. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.

Connector & terminal

(3AG) No. 17 (+) — Chassis ground (−):

(3AG) No. 19 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1833 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1835 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT

Diagnosis start condition:

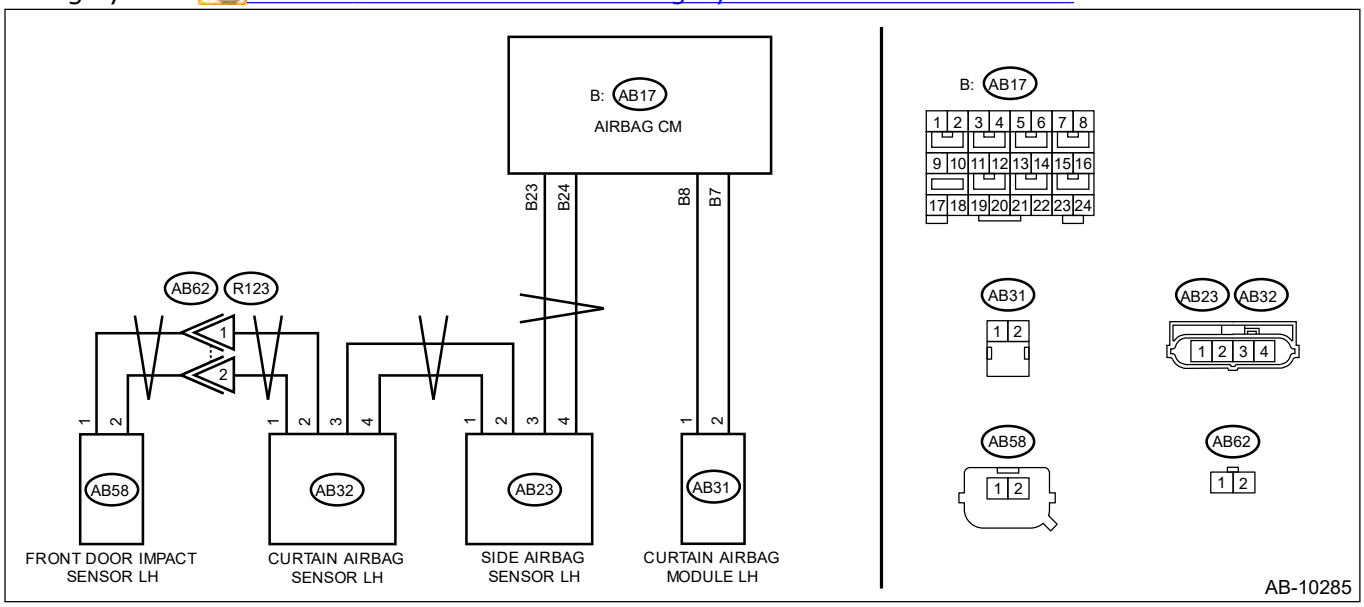
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness LH circuit is shorted.
- Curtain airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module LH and the curtain airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB31) from curtain airbag module LH.
3. Connect the connector (1N) in the test harness N to the connector (AB31).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the curtain airbag module LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the airbag resistor from test harness N.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 11 — (3AG) No. 13:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1835 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1836 OPEN IN CURTAIN AIRBAG LH SQUIB CIRCUIT

Diagnosis start condition:

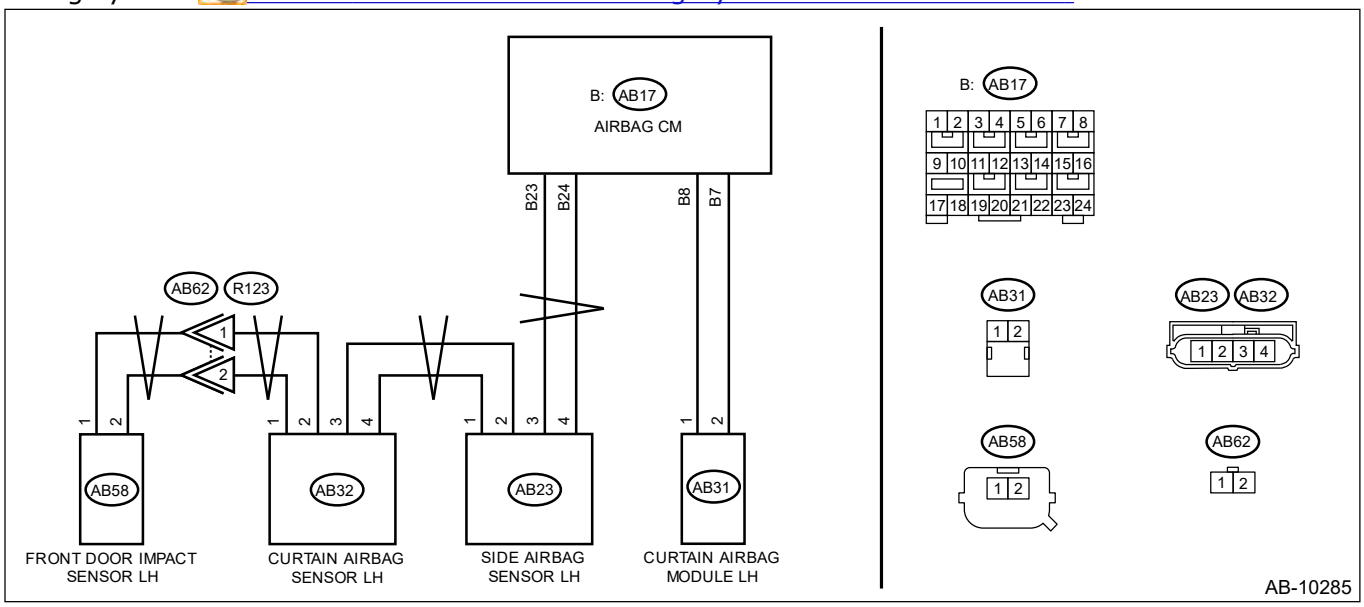
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness LH circuit is open.
- Curtain airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module LH and the curtain airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB31) from curtain airbag module LH.
3. Connect the connector (1N) in the test harness N to the connector (AB31).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the curtain airbag module LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the airbag resistor from test harness N.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and connector (2N) in the test harness N.

   Connector & terminal

   (3AG) No. 11 — (2N) No. 2:

   (3AG) No. 13 — (2N) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1836 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1837 SHORT IN CURTAIN AIRBAG LH SQUIB CIRCUIT (TO GROUND)

Diagnosis start condition:

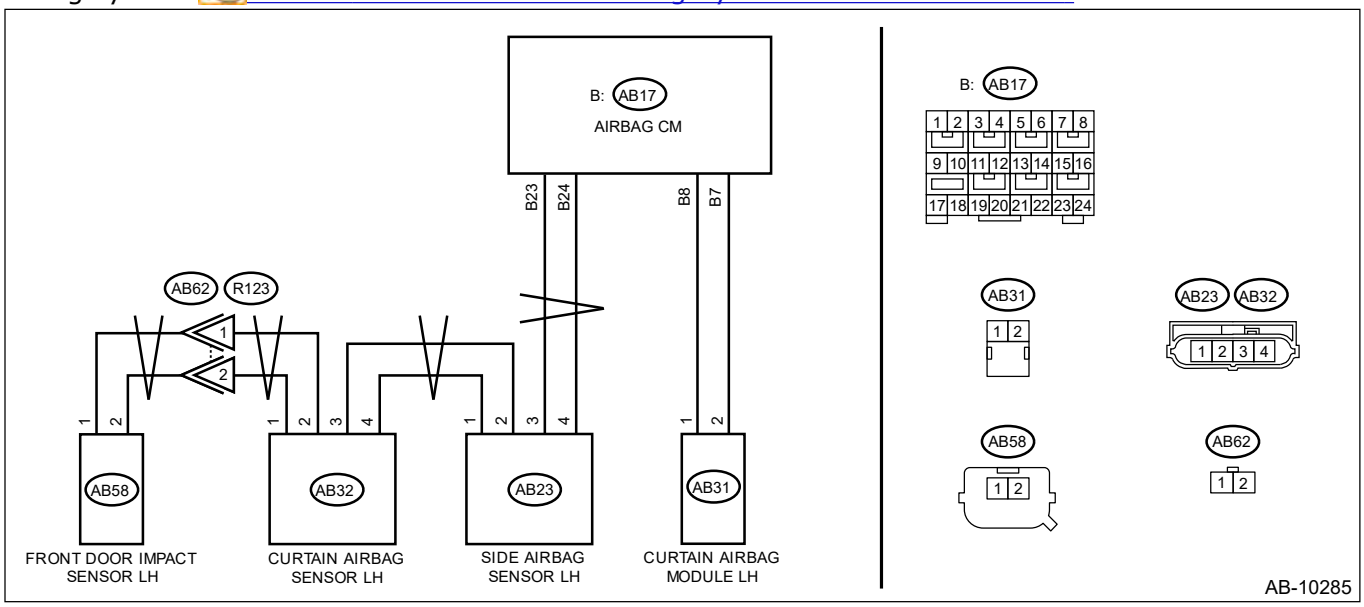
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness LH circuit is shorted to ground.
- Curtain airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module LH and the curtain airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB31), and connect the connector (1N) in test harness N to connector (AB31).
3. Connect the airbag resistor to the connector (2N) of test harness N.
4. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the curtain airbag module LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the airbag resistor from test harness N.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 11 — Chassis ground:
   (3AG) No. 13 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1837 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1838 SHORT IN CURTAIN SHIELD AIRBAG LH SQUIB CIRCUIT (TO +B)

Diagnosis start condition:

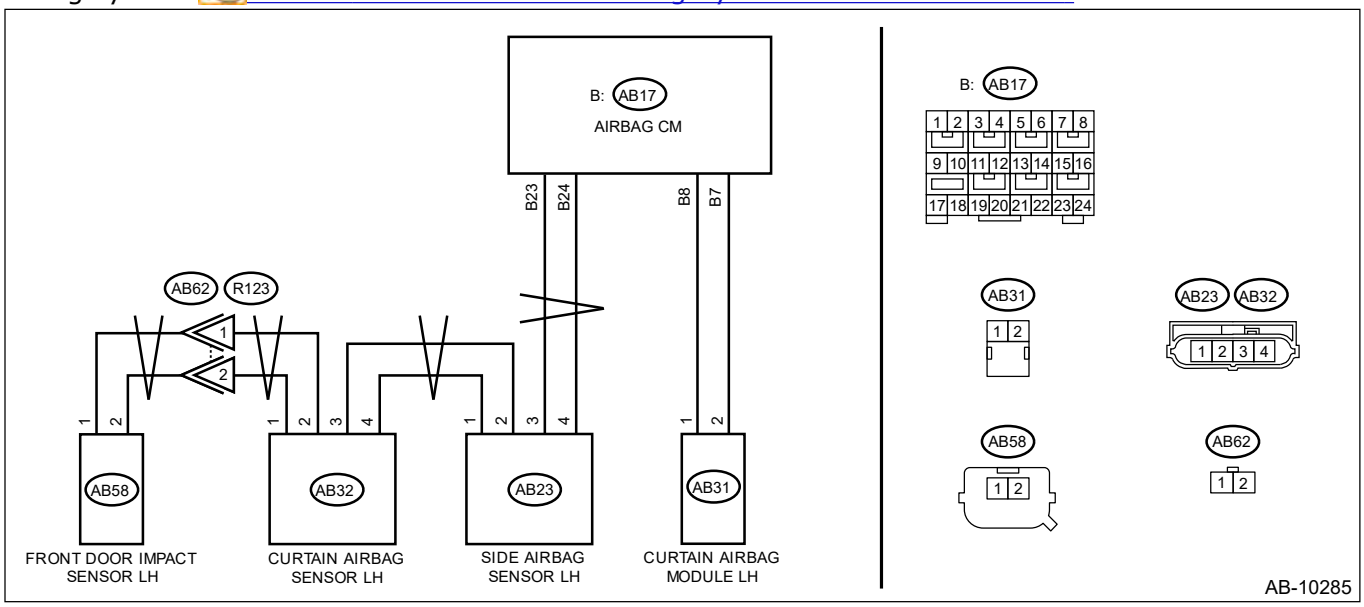
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Curtain airbag harness LH is shorted to power supply.
- Curtain airbag module LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module, curtain airbag module LH and the curtain airbag sensor LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK CURTAIN AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB31), and connect the connector (1N) in test harness N to connector (AB31).
3. Connect the airbag resistor to the connector (2N) of test harness N.
4. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the curtain airbag module LH. Ref. to AIRBAG SYSTEM>Curtain Airbag Module.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (CURTAIN AIRBAG MODULE HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the airbag resistor from test harness N.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Connect the battery ground terminal and turn the ignition switch to ON.
8. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 11 (+) — Chassis ground (−):
   (3AG) No. 13 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1838 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1860 SHORT IN DRIVER'S KNEE AIRBAG

Diagnosis start condition:

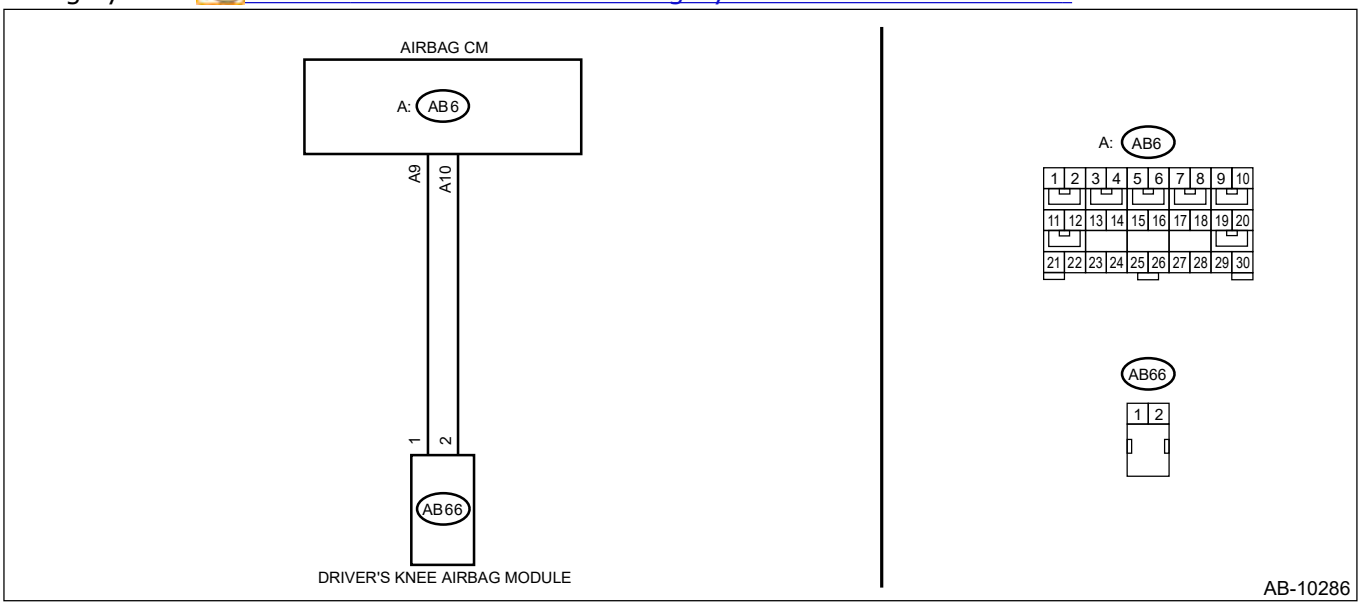
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted.
- Knee airbag module harness circuit is shorted.
- Knee airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the knee airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK KNEE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB66) from knee airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB66).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
No	Go to 3.

3. CHECK AIRBAG MAIN HARNESS (KNEE AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
4. Remove the console front panel and disconnect the connector (AB9).
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 14 — (3AG) No. 16:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1860 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1861 OPEN IN DRIVER'S KNEE AIRBAG

Diagnosis start condition:

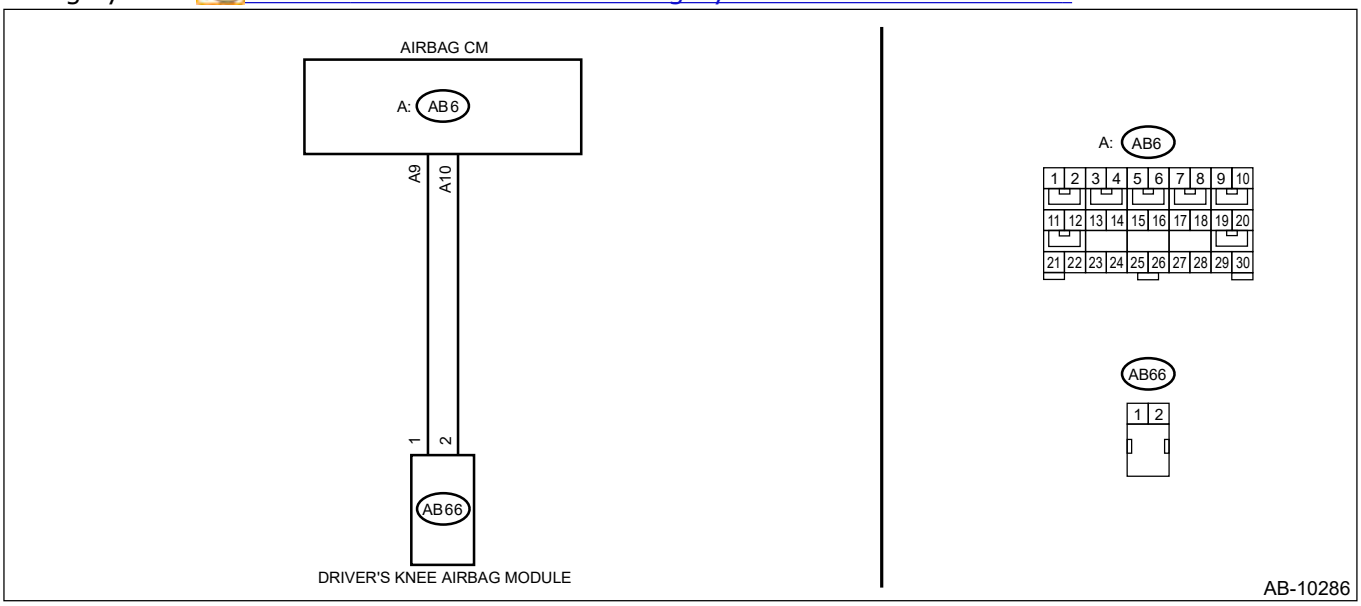
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is open.
- Knee airbag module harness circuit is open.
- Knee airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the knee airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK KNEE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB66) from knee airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB66).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
No	Go to 3.

3. CHECK AIRBAG MAIN HARNESS (KNEE AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
4. Remove the console front panel and disconnect the connector (AB9).
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and connector (2N) in the test harness N.

   Connector & terminal

   (3AG) No. 14 — (2N) No. 1:

   (3AG) No. 16 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1861 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1862 SHORT IN DRIVER'S KNEE AIRBAG (TO GROUND)

Diagnosis start condition:

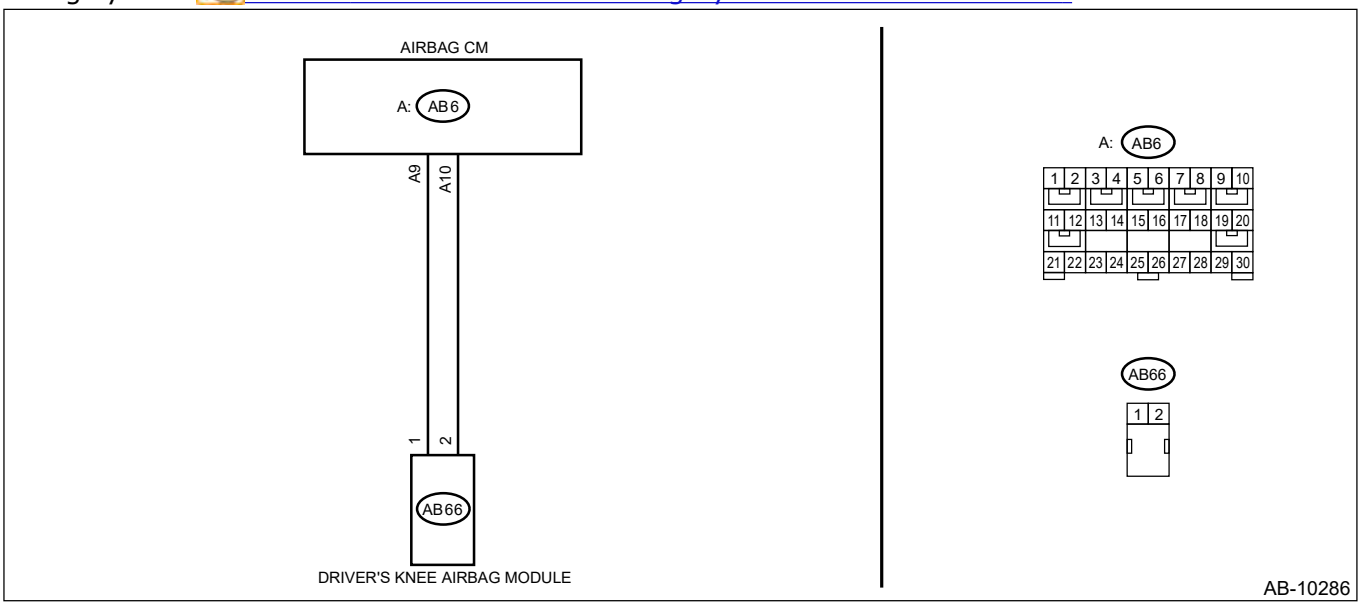
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to ground.
- Knee airbag module harness circuit is shorted to ground.
- Knee airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the knee airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK KNEE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB66) from knee airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB66).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
No	Go to 3.

3. CHECK AIRBAG MAIN HARNESS (KNEE AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
4. Remove the console front panel and disconnect the connector (AB9).
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 14 — Chassis ground:
   (3AG) No. 16 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1862 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1863 SHORT IN DRIVER'S KNEE AIRBAG (TO +B)

Diagnosis start condition:

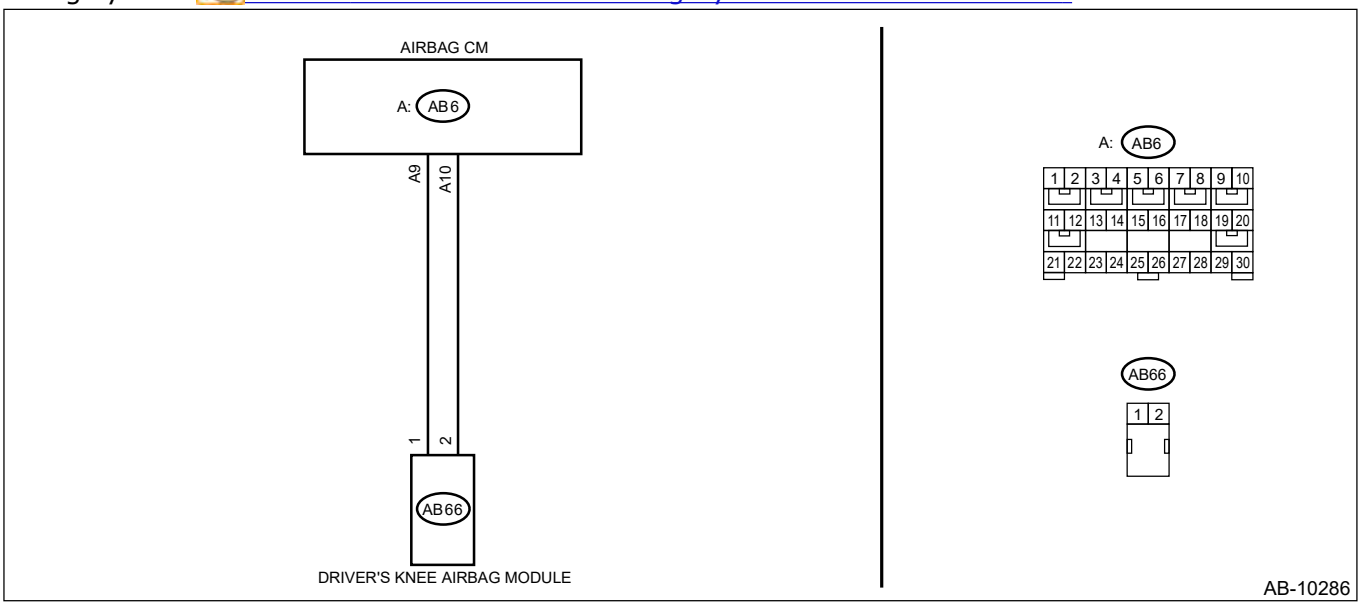
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Airbag main harness circuit is shorted to power supply.
- Knee airbag module harness circuit is shorted to power supply.
- Knee airbag module is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the knee airbag module.

Is there poor contact?

Yes	Replace the airbag harness.
No	Go to 2.

2. CHECK KNEE AIRBAG MODULE.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB66) from knee airbag module.
3. Connect the connector (1N) in the test harness N to the connector (AB66).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the knee airbag module. Ref. to AIRBAG SYSTEM>Knee Airbag Module>REMOVAL.
No	Go to 3.

3. CHECK AIRBAG MAIN HARNESS (KNEE AIRBAG HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Remove the instrument panel lower cover and column cover, and disconnect the connector (AB7) from (AB2).
4. Remove the console front panel and disconnect the connector (AB9).
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Connect the battery ground terminal and turn the ignition switch to ON.
8. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 14 (+) — Chassis ground (-):
   (3AG) No. 16 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the airbag main harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1863 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

DTC B1900 SHORT IN FRONT P/T RH

Diagnosis start condition:

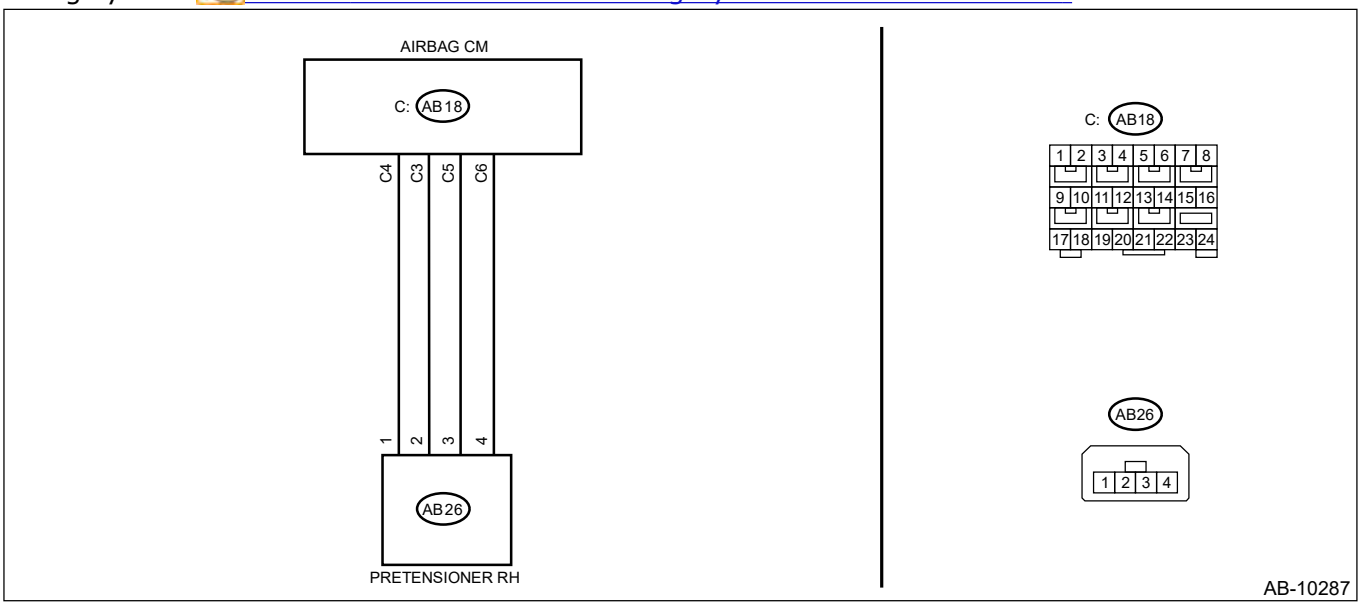
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH circuit is shorted.
- Pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB24) from side airbag module RH.
3. Disconnect the connector (AB33) from curtain airbag module RH.
4. Disconnect the connector (AB26) from seat belt pretensioner RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Using a probe, measure the resistance between the terminals of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

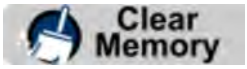
   (AB26) No. 1 — (AB26) No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1900 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1900 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1901 OPEN IN FRONT P/T RH

Diagnosis start condition:

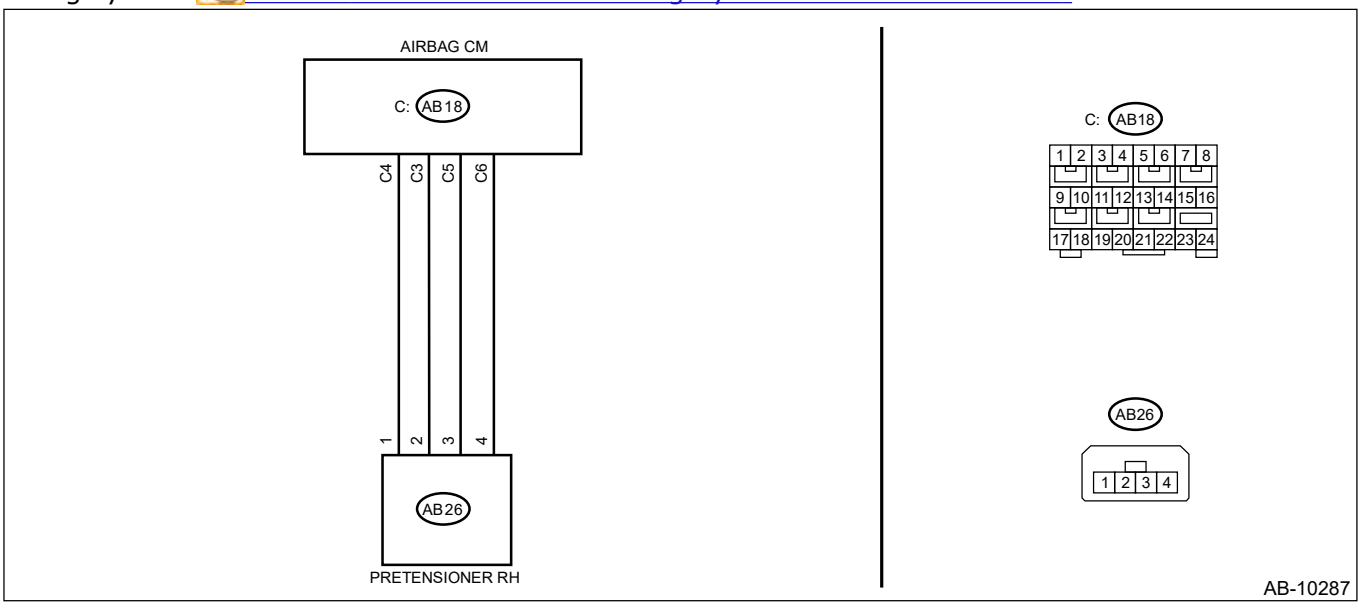
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH circuit is open.
- Pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB24) from side airbag module RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Using a probe, measure the resistance between the terminals of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 1 — (AB26) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connector (AB24) to side airbag module RH.
3. Connect the connector (AB33) to curtain airbag module RH.
4. Using a probe, short the terminals No. 1 and No. 2 of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When shorting the terminals, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 1 — (AB26) No. 2:
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B1901 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect the connector (AB26) of seat belt pretensioner RH.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1901 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1902 SHORT IN FRONT P/T RH (TO GROUND)

Diagnosis start condition:

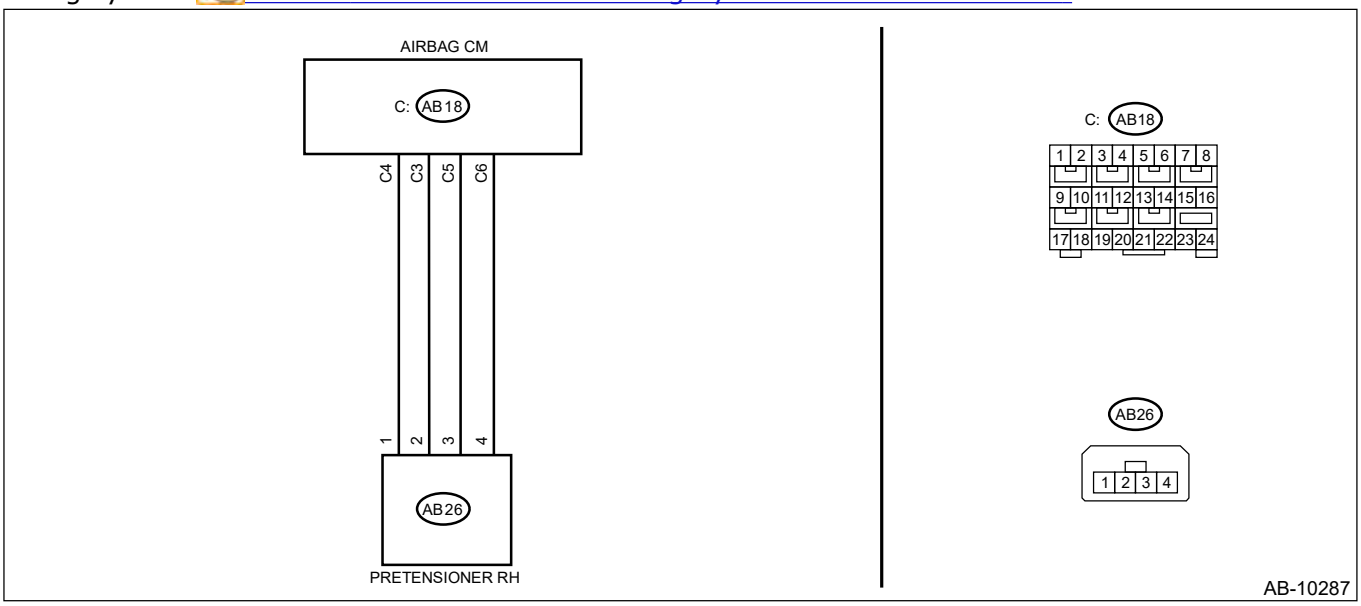
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH circuit is shorted to ground.
- Pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB24) from side airbag module RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Using a probe, measure the resistance between the connector (AB26) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 1 — Chassis ground:

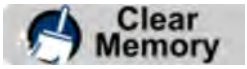
   (AB26) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1902 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1902 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1903 SHORT IN FRONT P/T RH (TO +B)

Diagnosis start condition:

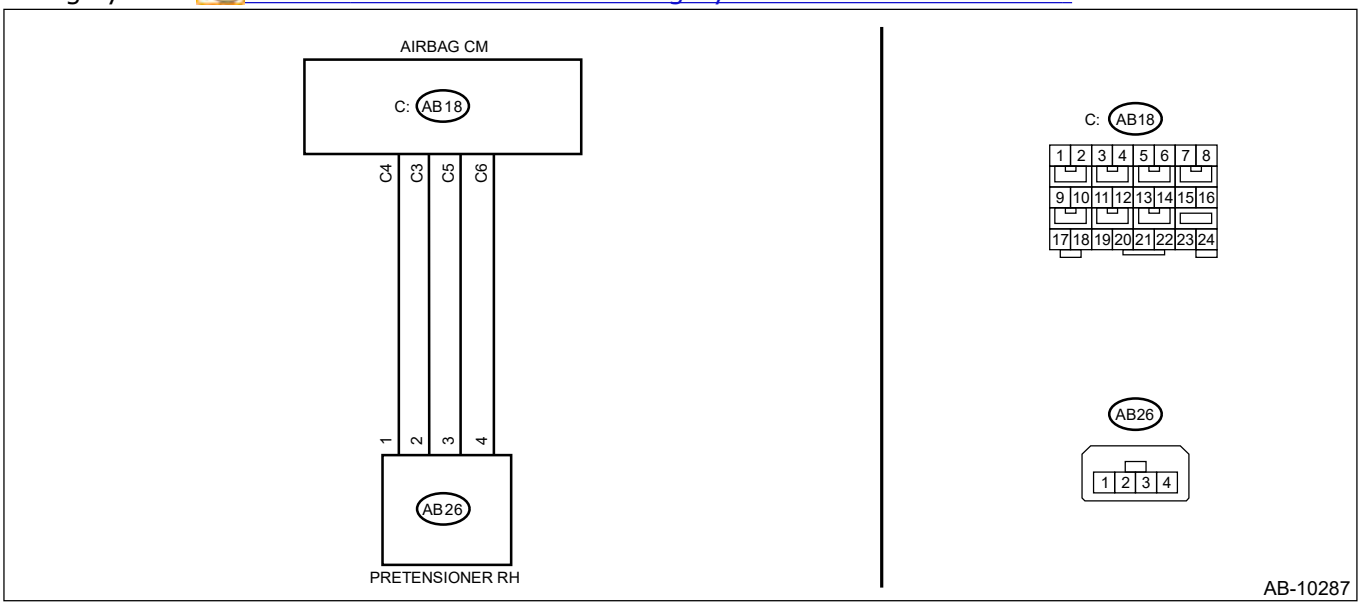
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH circuit is shorted to power supply.
- Pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Disconnect the connector (AB24) from side airbag module RH.
3. Disconnect the connector (AB26) from seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Using a probe, measure the voltage between the connector (AB26) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 1 (+) — Chassis ground (−):

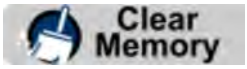
   (AB26) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1903 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1903 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1905 SHORT IN FRONT P/T LH

Diagnosis start condition:

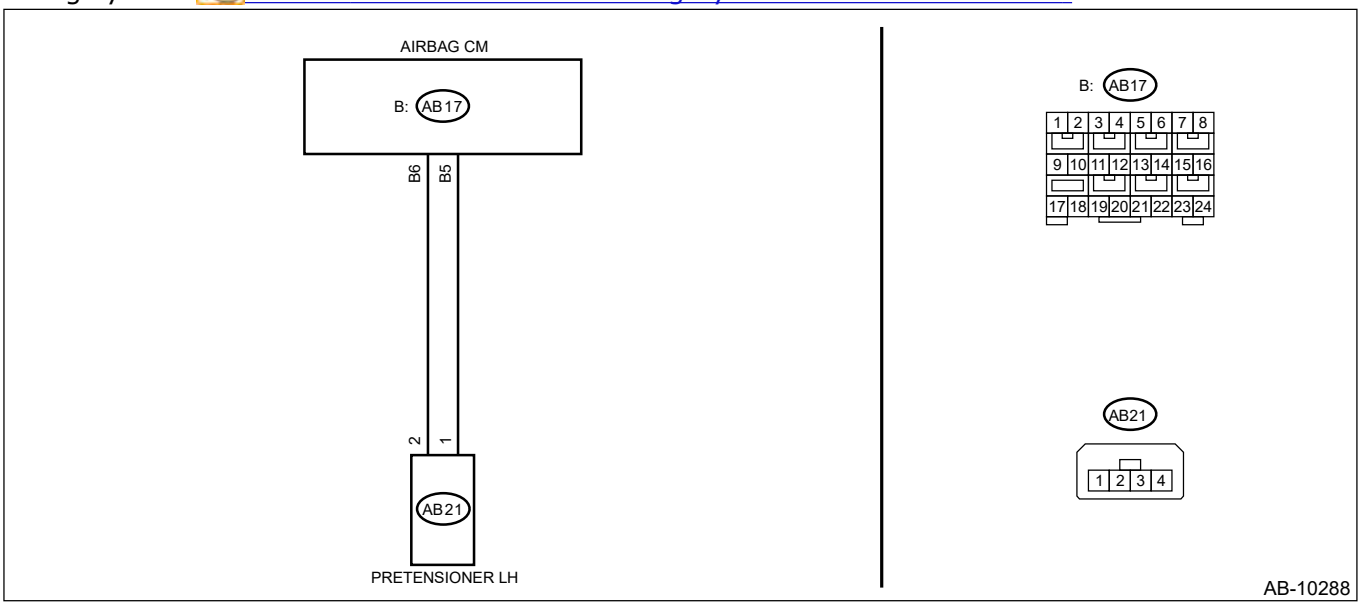
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness LH circuit is shorted.
- Pretensioner LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Connect the connector (1N) in the test harness N to the connector (AB21).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the seat belt pretensioner LH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from the connector (2N) of test harness N.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) terminals in test harness AG.
   Connector & terminal
   (3AG) No. 10 — (3AG) No. 12:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1905 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1906 OPEN IN FRONT P/T LH

Diagnosis start condition:

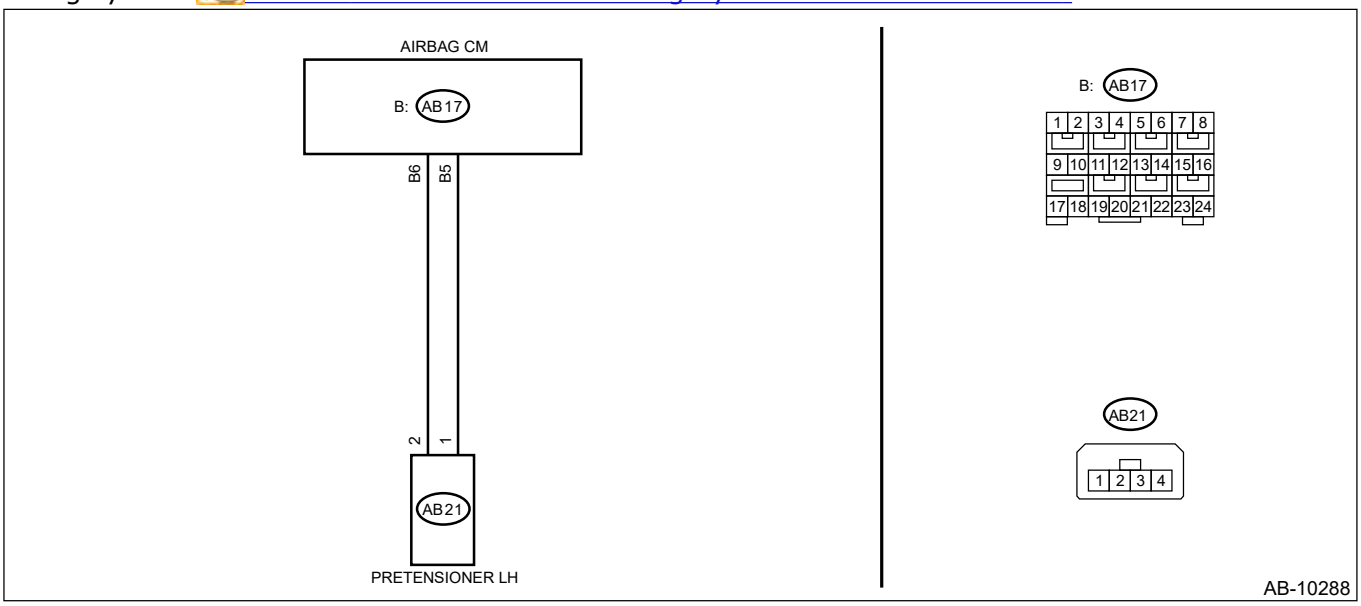
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness LH circuit is open.
- Pretensioner LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Connect the connector (1N) in the test harness N to the connector (AB21).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the seat belt pretensioner LH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from the connector (2N) of test harness N.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and connector (2N) in the test harness N.

   Connector & terminal

   (3AG) No. 10 — (2N) No. 1:

   (3AG) No. 12 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1906 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1907 SHORT IN FRONT P/T LH (TO GROUND)

Diagnosis start condition:

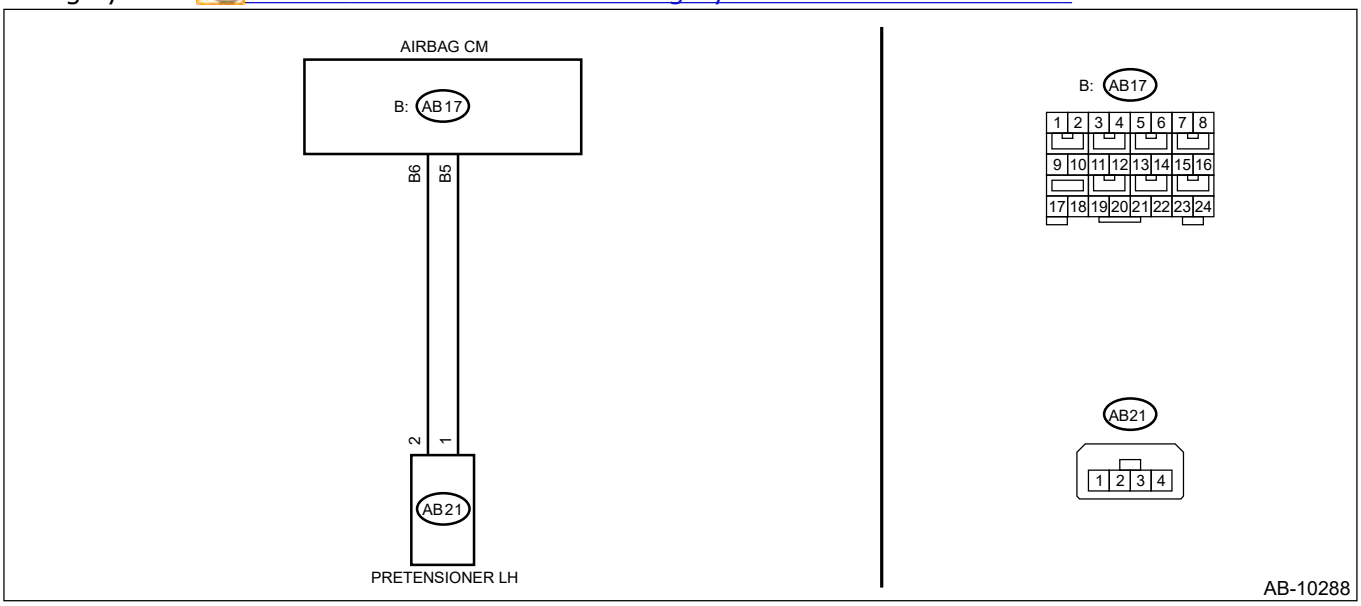
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness LH circuit is shorted to ground.
- Pretensioner LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Connect the connector (1N) in the test harness N to the connector (AB21).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the seat belt pretensioner LH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from the connector (2N) of test harness N.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Measure the resistance between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 10 — Chassis ground:
   (3AG) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1907 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1908 SHORT IN FRONT P/T LH (TO +B)

Diagnosis start condition:

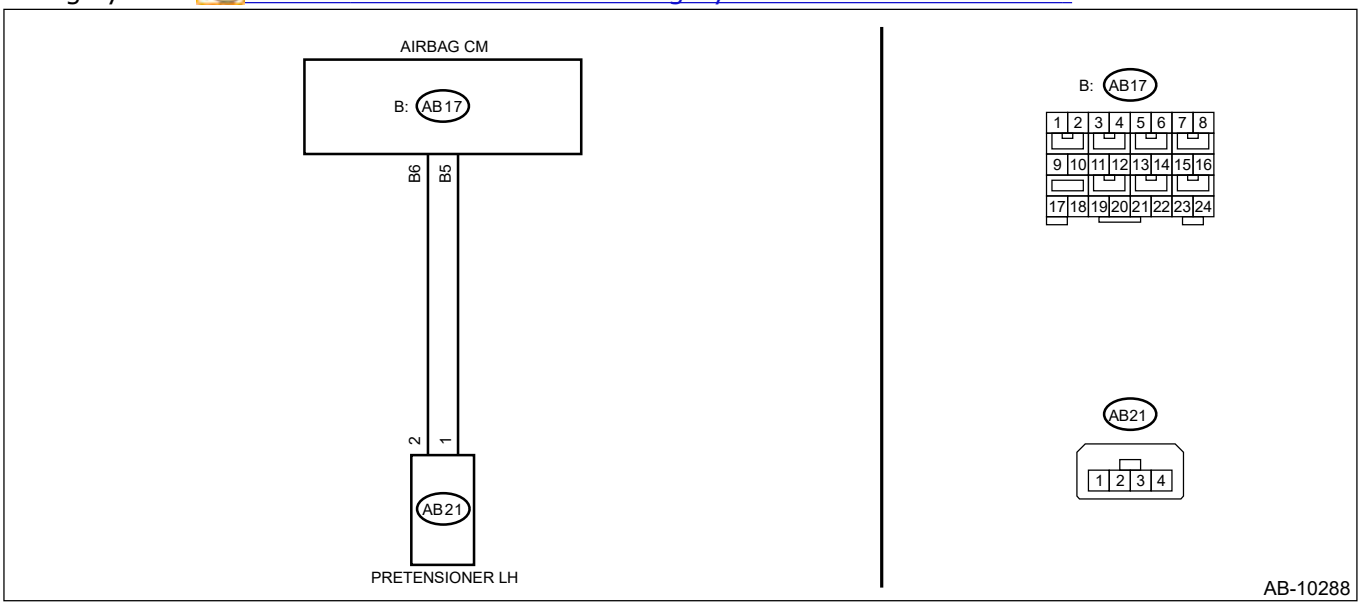
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness LH circuit is shorted to power supply.
- Pretensioner LH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner LH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB21) from seat belt pretensioner LH.
3. Connect the connector (1N) in the test harness N to the connector (AB21).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for six seconds and go off?

Yes	Replace the seat belt pretensioner LH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (PRETENSIONER HARNESS LH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from the connector (2N) of test harness N.
3. Disconnect the connector (AB19) from side airbag module LH.
4. Disconnect the connector (AB31) from curtain airbag module LH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Connect the battery ground terminal and turn the ignition switch to ON.
8. Measure the voltage between connector (3AG) in the test harness AG and chassis ground.
   Connector & terminal
   (3AG) No. 10 (+) — Chassis ground (−):
   (3AG) No. 12 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1908 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1910 SHORT IN FRONT P/T RH(ADAPTIVE)

Diagnosis start condition:

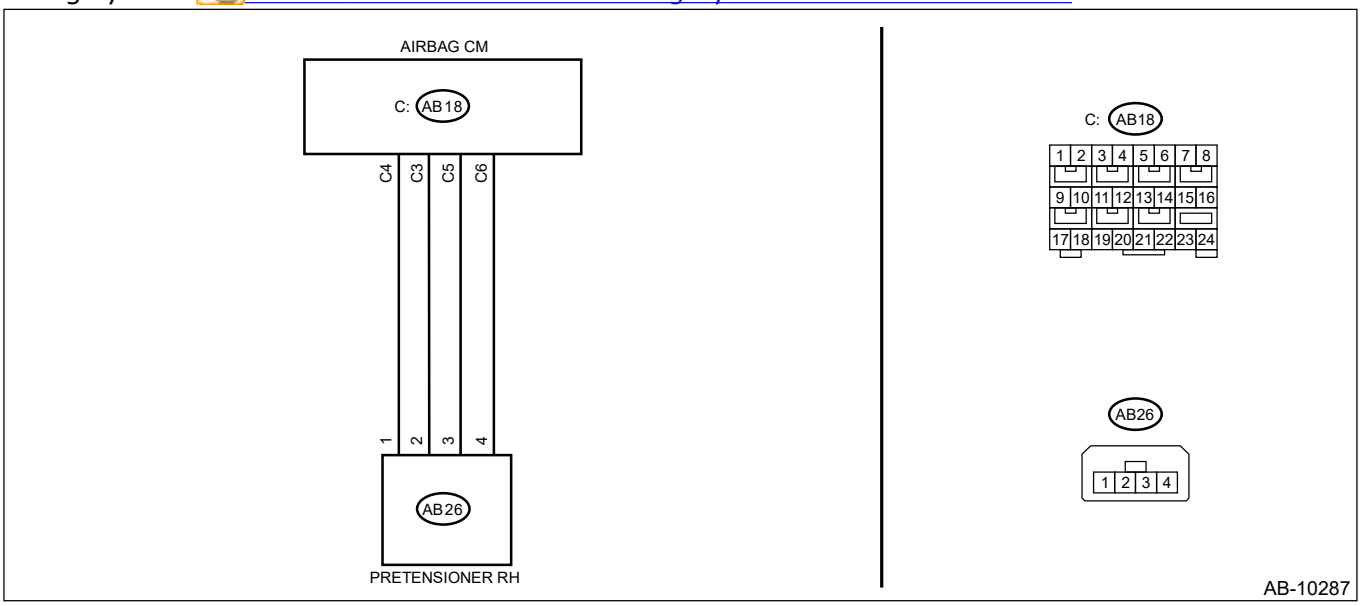
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH (adaptive) circuit is shorted.
- Pretensioner RH (adaptive) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB24) from side airbag module RH.
3. Disconnect the connector (AB33) from curtain airbag module RH.
4. Disconnect the connector (AB26) from seat belt pretensioner RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Using a probe, measure the resistance between the terminals of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

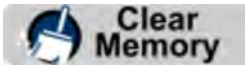
   (AB26) No. 3 — (AB26) No. 4:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1910 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1910 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed?

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1911 OPEN IN FRONT P/T RH (ADAPTIVE)

Diagnosis start condition:

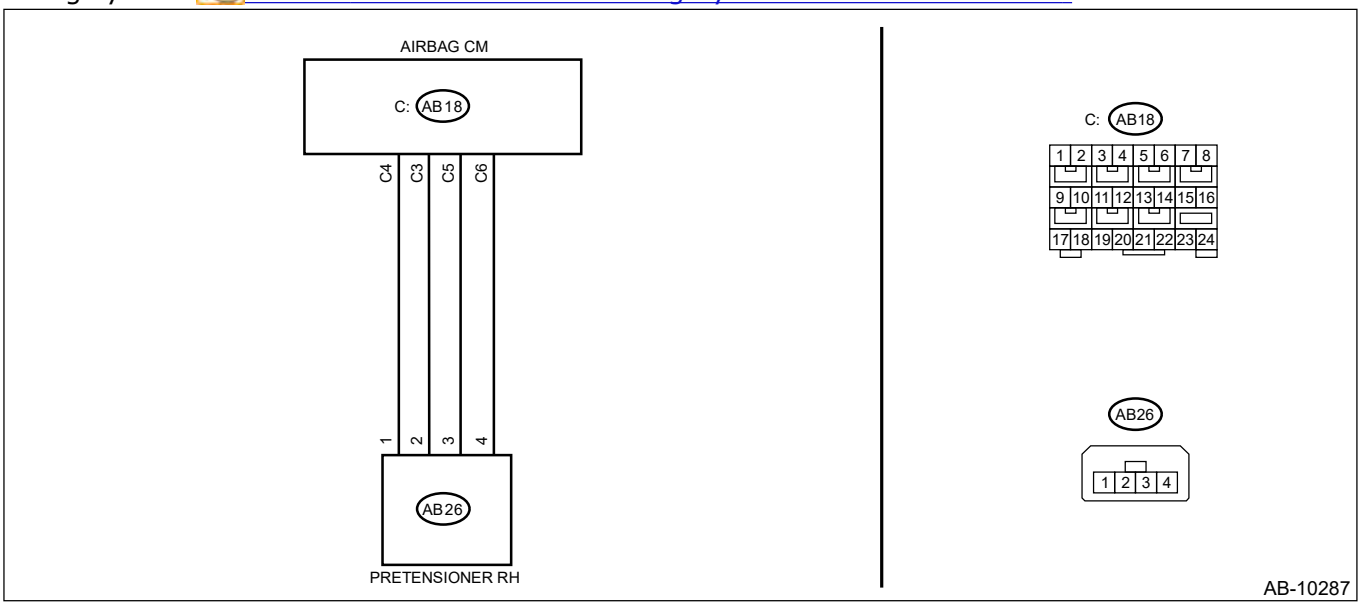
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH (adaptive) circuit is open.
- Pretensioner RH (adaptive) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB24) from side airbag module RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
7. Using a probe, measure the resistance between the terminals of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 3 — (AB26) No. 4:

Is the resistance less than 10 MΩ?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect the connectors (AB6, AB17, AB18) and the airbag control module.
2. Connect the connector (AB24) to side airbag module RH.
3. Connect the connector (AB33) to curtain airbag module RH.
4. Using a probe, short the terminals No. 3 and No. 4 of connector (AB26). Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When shorting the terminals, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 3 — (AB26) No. 4:
5. Connect the battery ground terminal and turn the ignition switch to ON.
6. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
7. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B1911 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect the connector (AB26) of seat belt pretensioner RH.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1911 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1912 SHORT IN FRONT P/T RH(ADAPTIVE/TO GROUND)

Diagnosis start condition:

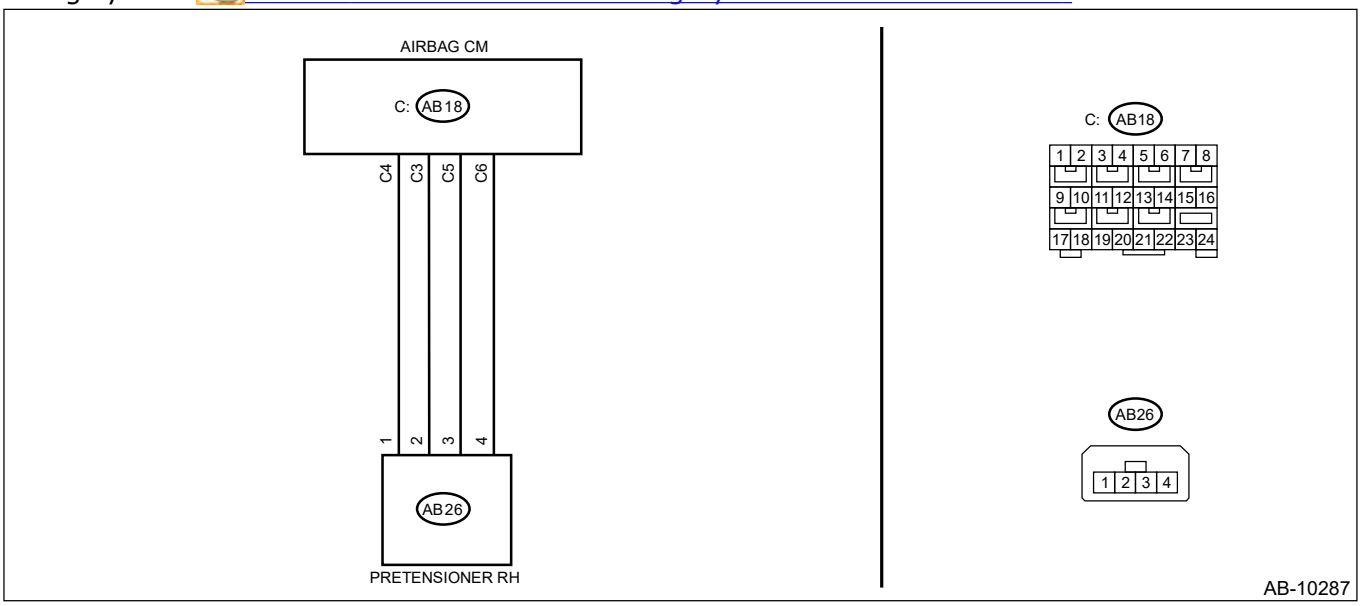
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH (adaptive) circuit is shorted to ground.
- Pretensioner RH (adaptive) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB26) from seat belt pretensioner RH.
3. Disconnect the connector (AB24) from side airbag module RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Using a probe, measure the resistance between the connector (AB26) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 3 — Chassis ground:

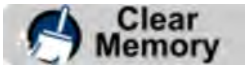
   (AB26) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1912 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1912 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1913 SHORT IN FRONT P/T RH(ADAPTIVE/TO +B)

Diagnosis start condition:

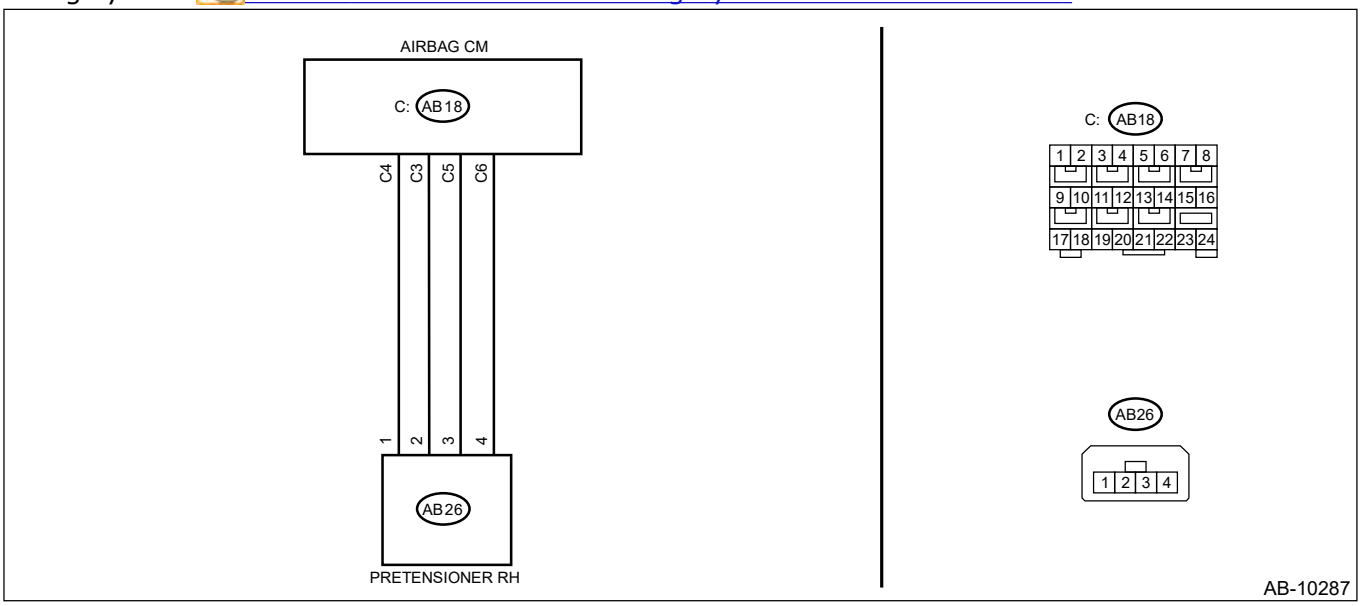
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Seat belt pretensioner harness RH (adaptive) circuit is open.
- Pretensioner RH (adaptive) is faulty.
- Pretensioner harness RH (adaptive) is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK AIRBAG REAR HARNESS (SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB24) from side airbag module RH.
3. Disconnect the connector (AB26) from seat belt pretensioner RH.
4. Disconnect the connector (AB33) from curtain airbag module RH.
5. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
6. Using a probe, measure the voltage between the connector (AB26) and chassis ground. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL > HOW TO USE PROBE.

   Caution:

   When measuring the resistance, make sure that the probe is inserted from the back side (harness side) of the connector. Also, do not insert the probe forcibly.

   Connector & terminal

   (AB26) No. 3 (+) — Chassis ground (−):

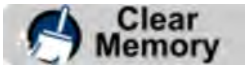
   (AB26) No. 4 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Replace the airbag rear harness along with body harness.

3. CHECK AIRBAG CONTROL MODULE.

1. Connect all the connectors other than (AB26) of seat belt pretensioner RH.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1913 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 4.

4. CHECK SEAT BELT PRETENSIONER RH.

1. Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more.
2. Connect all connectors.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



5. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
6. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1913 displayed? (Current malfunction)

Yes	Replace the seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B19F0 SHORT IN FRONT P/T 2 RH

Diagnosis start condition:

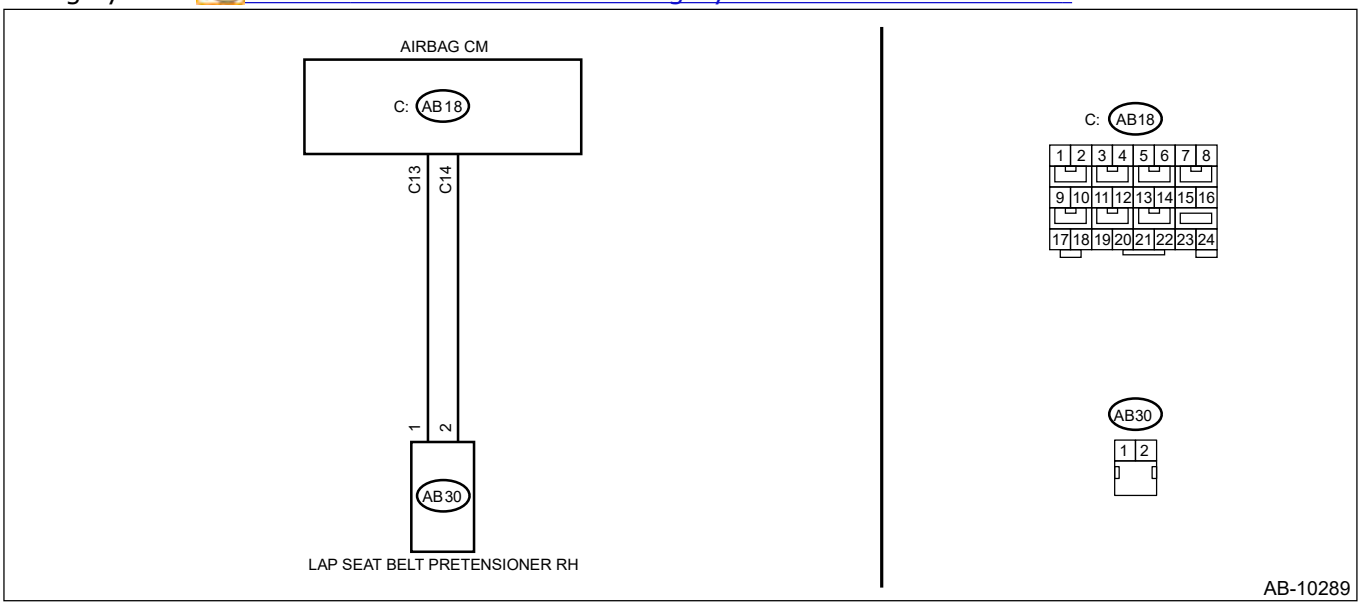
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Lap seat belt pretensioner harness RH circuit is shorted.
- Lap seat belt pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the lap seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK LAP SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
3. Connect the connector (1N) in the test harness N to the connector (AB30).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the lap seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (LAP SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Disconnect the connector (AB31) from curtain airbag module RH.
4. Disconnect the connector (AB19) from side airbag module RH.
5. Disconnect the connector (AB21) from seat belt pretensioner.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (6AG) terminals in test harness AG.
   Connector & terminal
   (6AG) No. 7 — (6AG) No. 5:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B19F0 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B19F1 OPEN IN FRONT P/T 2 RH

Diagnosis start condition:

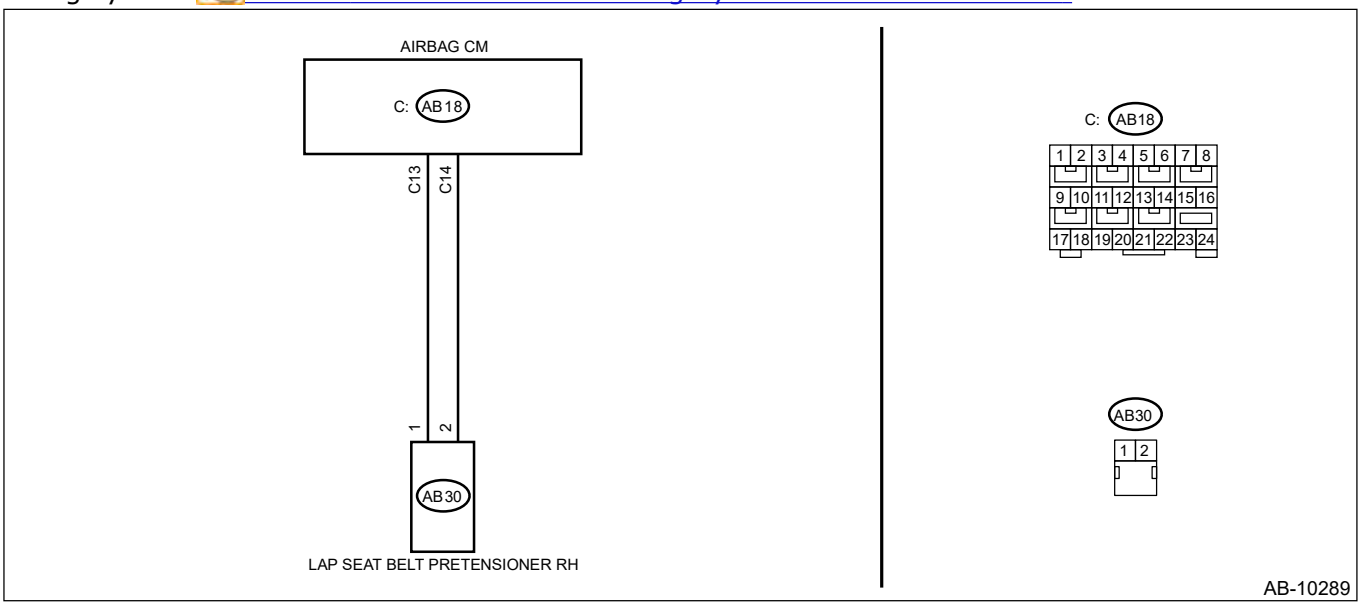
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Lap seat belt pretensioner harness RH circuit is open.
- Lap seat belt pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the lap seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK LAP SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
3. Connect the connector (1N) in the test harness N to the connector (AB30).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the lap seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (SIDE AIRBAG HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Disconnect the connector (AB31) from curtain airbag module RH.
4. Disconnect the connector (AB19) from side airbag module RH.
5. Disconnect the connector (AB21) from seat belt pretensioner.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (6AG) in the test harness AG and connector (2N) in the test harness N.

   Connector & terminal

   (6AG) No. 7 — (2N) No. 1:

   (6AG) No. 5 — (2N) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B19F1 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B19F2 SHORT IN FRONT P/T 2 RH (TO GROUND)

Diagnosis start condition:

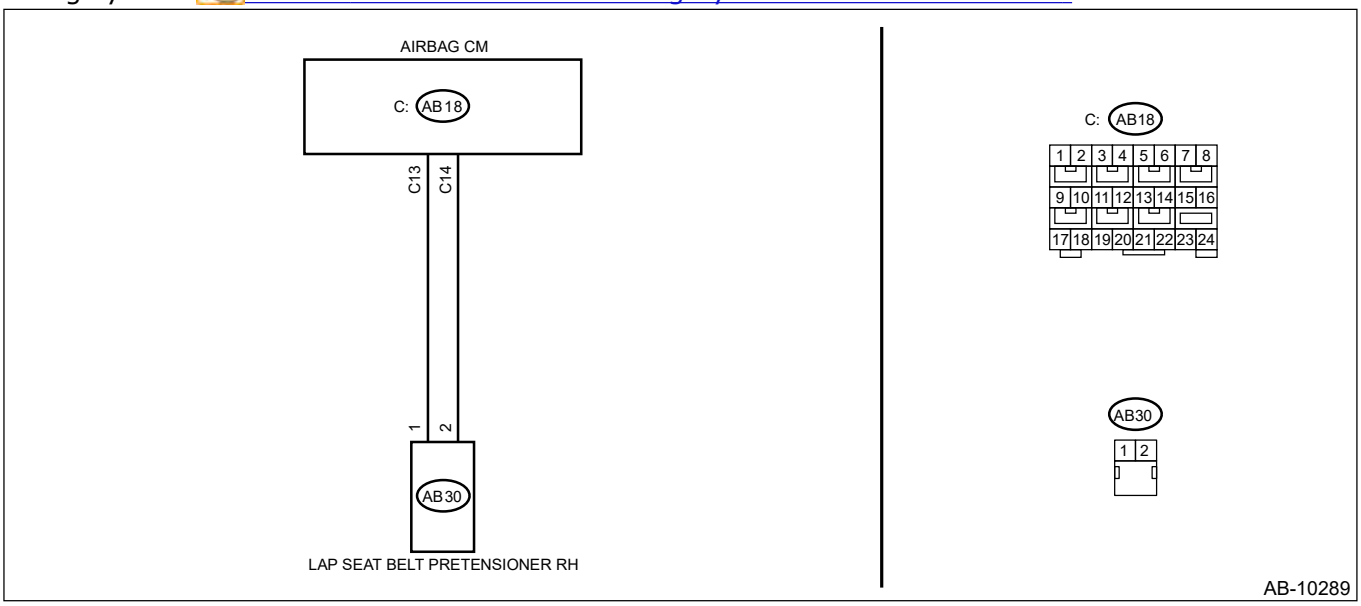
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Lap seat belt pretensioner harness RH circuit is shorted to ground.
- Lap seat belt pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the lap seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK LAP SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
3. Connect the connector (1N) in the test harness N to the connector (AB30).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the lap seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (LAP SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Disconnect the connector (AB31) from curtain airbag module RH.
4. Disconnect the connector (AB19) from side airbag module RH.
5. Disconnect the connector (AB21) from seat belt pretensioner.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Measure the resistance between connector (6AG) in the test harness AG and chassis ground.
   Connector & terminal
   (6AG) No. 7 — Chassis ground:
   (6AG) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B19F2 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B19F3 SHORT IN FRONT P/T 2 RH (TO +B)

Diagnosis start condition:

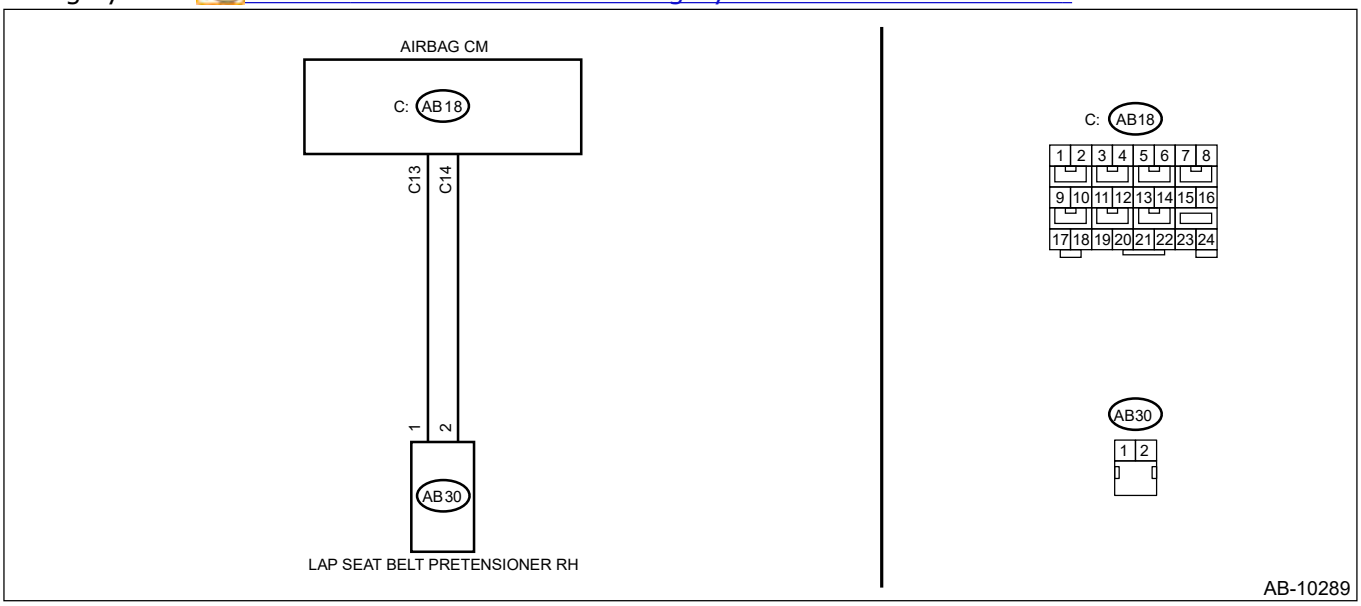
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Lap seat belt pretensioner harness RH circuit is shorted to power supply.
- Lap seat belt pretensioner RH is faulty.
- Airbag control module is faulty.

Wiring diagram:

Airbag system Ref. to WIRING SYSTEM>Airbag System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact of the connectors between the airbag control module and the lap seat belt pretensioner RH.

Is there poor contact?

Yes	Replace the airbag rear harness along with body harness.
No	Go to 2.

2. CHECK LAP SEAT BELT PRETENSIONER.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB30) from the lap seat belt pretensioner RH.
3. Connect the connector (1N) in the test harness N to the connector (AB30).
4. Connect the airbag resistor to the connector (2N) of test harness N.
5. Connect the battery ground terminal and turn the ignition switch to ON.

Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the lap seat belt pretensioner RH. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.
No	Go to 3.

3. CHECK AIRBAG REAR HARNESS (LAP SEAT BELT PRETENSIONER HARNESS RH).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the airbag resistor from test harness N.
3. Disconnect the connector (AB31) from curtain airbag module RH.
4. Disconnect the connector (AB19) from side airbag module RH.
5. Disconnect the connector (AB21) from seat belt pretensioner.
6. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
7. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
8. Connect the battery ground terminal and turn the ignition switch to ON.
9. Measure the voltage between connector (6AG) in the test harness AG and chassis ground.

Connector & terminal

(6AG) No. 7 (+) — Chassis ground (−):

(6AG) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Replace the airbag rear harness along with body harness.

4. CHECK AIRBAG CONTROL MODULE.

1. Connect all connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Airbag]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to AIRBAG(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B19F3 displayed? (Current malfunction)

Yes	Replace the airbag control module. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Go to 5.

5. CHECK FOR ANY OTHER DTC ON DISPLAY.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any other DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for other displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Finish the diagnosis.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Diagnosis start condition:
Ignition voltage remains at 10 V or more for 1 second.
DTC detecting condition:
Detected when malfunction occurs in CAN line.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:

Detected when CAN data from VDC CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:

Detected when CAN data from combination meter does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:

Detected when CAN data from VDC CM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

AIRBAG(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

DTC detecting condition:

Detected when CAN data from combination meter is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

OCCUPANT DETECTION(DIAGNOSTICS)

OD(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Airbag Connector
6. Control Module I/O Signal
7. Inspection Mode
8. Warning Light Illumination Pattern
9. Diagnostic Procedure for Subaru Select Monitor Communication
10. Data Monitor
11. Rezero
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

OCCUPANT DETECTION(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Airbag].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1650 or B1655 displayed? (Current malfunction)

Yes	Record the DTC, and Go to 7.
No	Go to 5.

5. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Occupant Detection].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 6.
No	Check the communication circuit. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

6. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, and Go to 7.
No	Currently, it is normal.

7. PERFORM DIAGNOSIS.

1. Perform the diagnosis according to the displayed DTC.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Airbag] or [Occupant Detection]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Inspection Mode.
5. Using the Subaru Select Monitor, read the DTCs of [Airbag] or [Occupant Detection]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 7 until DTC is not shown.
No	Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="5">Occupant Detection Check List for Interview　　Date of Vehicle Bring-in　　Year　　Month　　Day</td></tr>
<tr><td colspan="3" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year　　Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="5">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td colspan="4">Year　　Month　　Date</td></tr>
<tr><td rowspan="5">Condition of trouble occurrence
(How the trouble occurs)</td><td>Weather</td><td colspan="3">❑Fine ❑Cloudy ❑Rainy ❑Snowy ❑Others
(　　)</td></tr>
<tr><td>Temperature</td><td colspan="3">　　°C (°F) —　　°C (°F)</td></tr>
<tr><td>Vehicle status</td><td colspan="3">❑Starting
❑Idling
❑Driving
❑Constant speed　　km/h (MPH)
❑Acceleration　　km/h (MPH) —　　km/h (MPH)
❑Deceleration　　km/h (MPH) —　　km/h (MPH)
❑Turning　　km/h (MPH)
❑Other:</td></tr>
<tr><td>Road conditions</td><td colspan="3">❑Local street
❑Highway
❑Major arterial road
❑Limited highway
❑Other:</td></tr>
<tr><td>Road surface condition</td><td colspan="3">❑Flat road
❑Uphill
❑Downhill
❑Gravel road
❑Drying
❑Wet
❑Covered with fresh snow</td></tr>
</table>

		❑Covered with hardened snow ❑Frozen ❑Other:
	Seat slide position	
	Seat reclining position	
	How often	❑Always ❑Sometimes ❑ times per day ❑ times per week ❑ times per month ❑Dirt road (only once in the past)
Generation timing	Example: It occurs about 30 minutes after driving.	
Accessory installation condition	❑Child restraint seat ❑ISO FIX ❑Seat belt fixed ❑Other: ❑Passenger’s seat cover ❑Other:	
Seat slide operation	❑Smooth ❑Dragged ❑Does not move ❑Other:	
Seat reclining operation	❑Smooth ❑Dragged ❑Does not move ❑Other:	
Situation inside seat back pocket	❑Heavy object is in ( ) ❑No heavy object is in	
Situation around seat	❑Foreign matter exists ( ) ❑No foreign matter exists	
Situation under seat	❑Foreign matter exists ( ) ❑No foreign matter exists	
Airbag warning light status	❑Normal (After turning the ignition switch to ON, illuminates for approximately 6 seconds and goes off.) ❑Remains ON ❑Remains OFF	
Passengers airbag ON/OFF indicator status	❑Normal (After turning the ignition switch to ON, illuminates for 6 seconds then goes off for 2 seconds, and either ON (adult) or OFF (children/unoccupied) illuminates.) ❑Both remain ON ❑Both remain OFF	

Diagnostic trouble code	[Airbag]	❑None ❑ON ( ) ❑Select monitor communication impossible	
	[Occupant Detection]	❑None ❑ON ( ) ❑Select monitor communication impossible	
Trouble condition	❑Passenger’s airbag indicator indicates OFF even when an adult occupies the passenger’s seat. ❑Passenger’s airbag indicator indicates ON even when a child restraint seat is installed on the passenger’s seat. ❑Other:		
Load sensor output at empty seat (Data monitor value) **Note:** **When measuring sensor output, adjust the seat to the same position as in system adjustment.**	Front left		kg (lb)
	Front right		kg (lb)
	Rear left		kg (lb)
	Rear right		kg (lb)
	Total load		kg (lb)
Load sensor output at loading an inspection weight (Data monitor value) **Note:** **When measuring sensor output, adjust the seat to the same position as in system adjustment.**	Front left		kg (lb)
	Front right		kg (lb)
	Rear left		kg (lb)
	Rear right		kg (lb)
	Total load		kg (lb)
Vehicle bring-in history information			

OCCUPANT DETECTION(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Before performing diagnosis, refer to "CAUTION" in "General Description" in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. OCCUPANT DETECTION SYSTEM

1. When any of the following operation has been done, be sure to perform [Rezeroing] of occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.
   - Replacing occupant detection system
   - Removing and disassembling passenger's seat
   - Loosening passenger's seat bolt
2. The load sensor of the occupant detection system (passenger seat only) is fixed to the cushion frame assembly. Never remove the load sensor from the cushion frame assembly.
3. The cushion pad, cushion cover, occupant detection control module and seat harness can be replaced as a single unit. When the cushion frame assembly is replaced, the occupant detection control module, seat harness and load sensor are assembled. When replacing the cushion frame assembly, do not touch the load sensor to avoid electrical damage.
4. If the seat cushion cover is removed, make sure to replace the hang wire on the seat cushion side with a new wire.
5. Never connect the battery in reverse polarity. Occupant detection system may be destroyed instantly.
6. Do not disconnect the battery cables while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as occupant detection control module.
7. Before disconnecting the connectors of each sensor and control module, be sure to turn the ignition switch to OFF and wait for 60 seconds or more. Occupant detection control module may be damaged.
8. Every occupant detection system-related part is a precision part. Do not drop them.
9. Do not use electrical test equipment on wiring harness and connector circuits of the airbag system.
10. Be careful not to damage the airbag system wiring harness when servicing the occupant detection system.
11. Refer to CAUTION in Airbag System when repairing the occupant detection system. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

OCCUPANT DETECTION(DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnostics, check the following item which might affect occupant detection system problems.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.

OCCUPANT DETECTION(DIAGNOSTICS) > General Description

PREPARATION TOOL

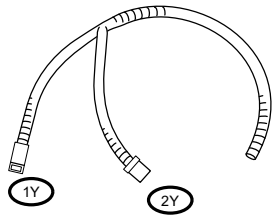
Caution:
To measure the voltage and resistance of airbag system and occupant detection system components, be sure to use the specified test harness.

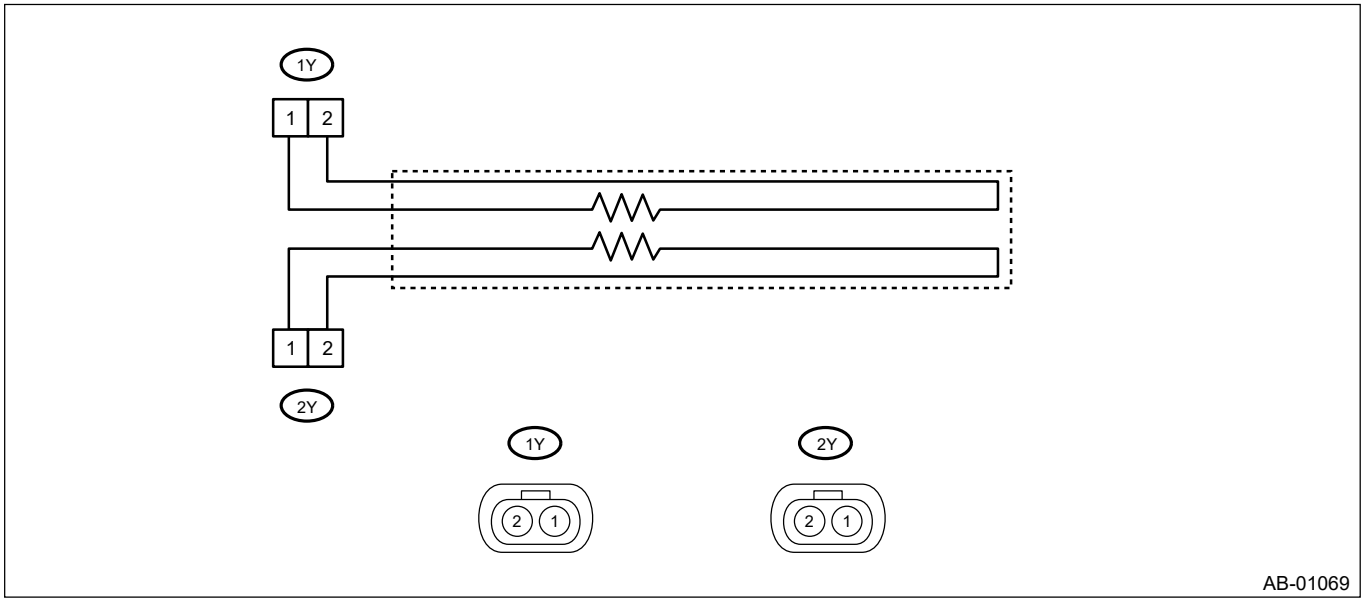
1. SPECIAL TOOL

- Subaru Select Monitor

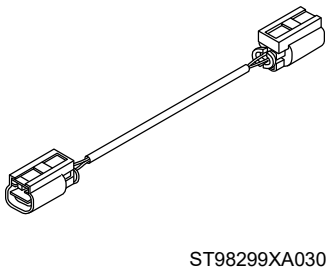
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

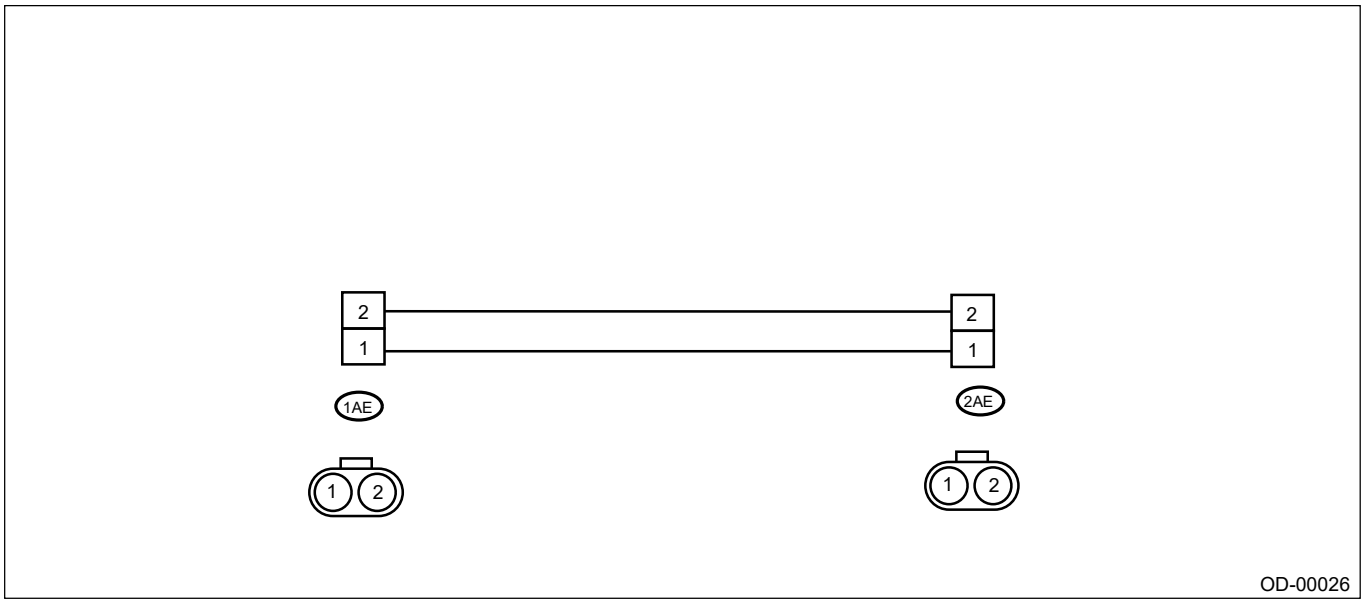
- TEST HARNESS Y

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG040	98299AG040	TEST HARNESS Y	Used for troubleshooting seat belt buckle switch.



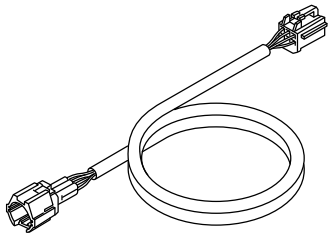
- TEST HARNESS AE

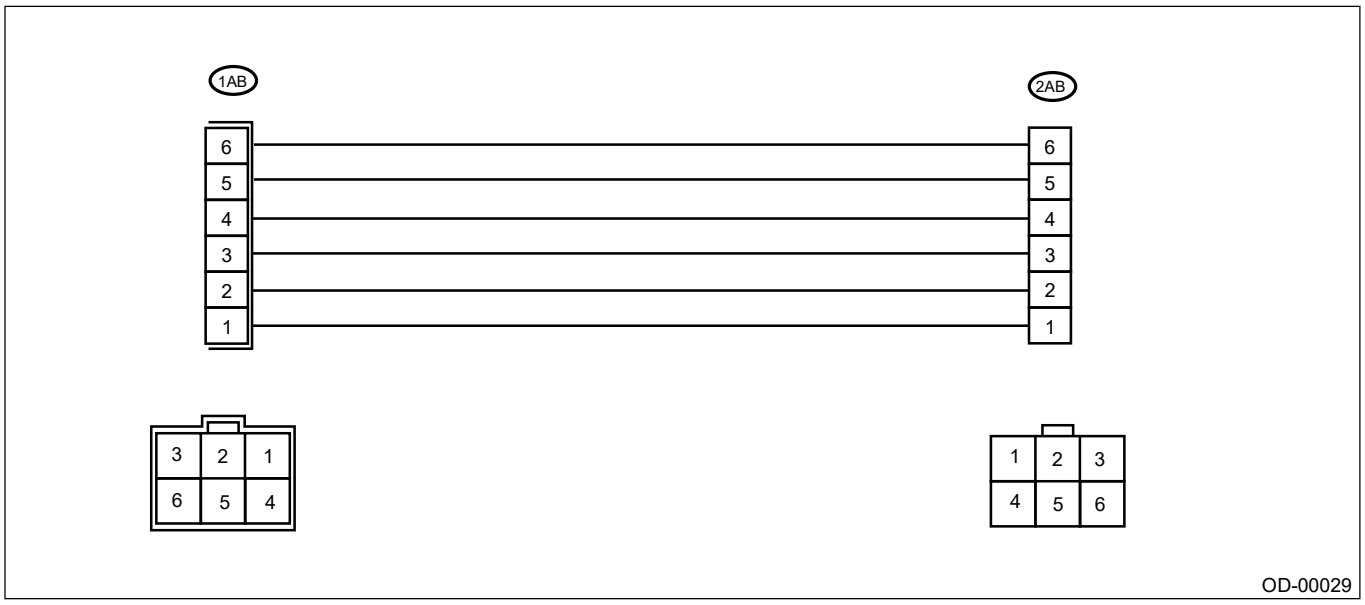
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA030	98299XA030	TEST HARNESS AE	TEST HARNESS Y adapter harness. Used for troubleshooting seat belt buckle switch.



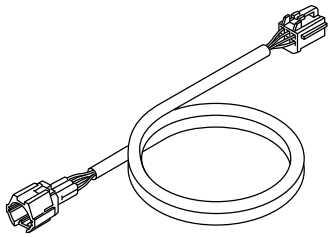
- TEST HARNESS AB

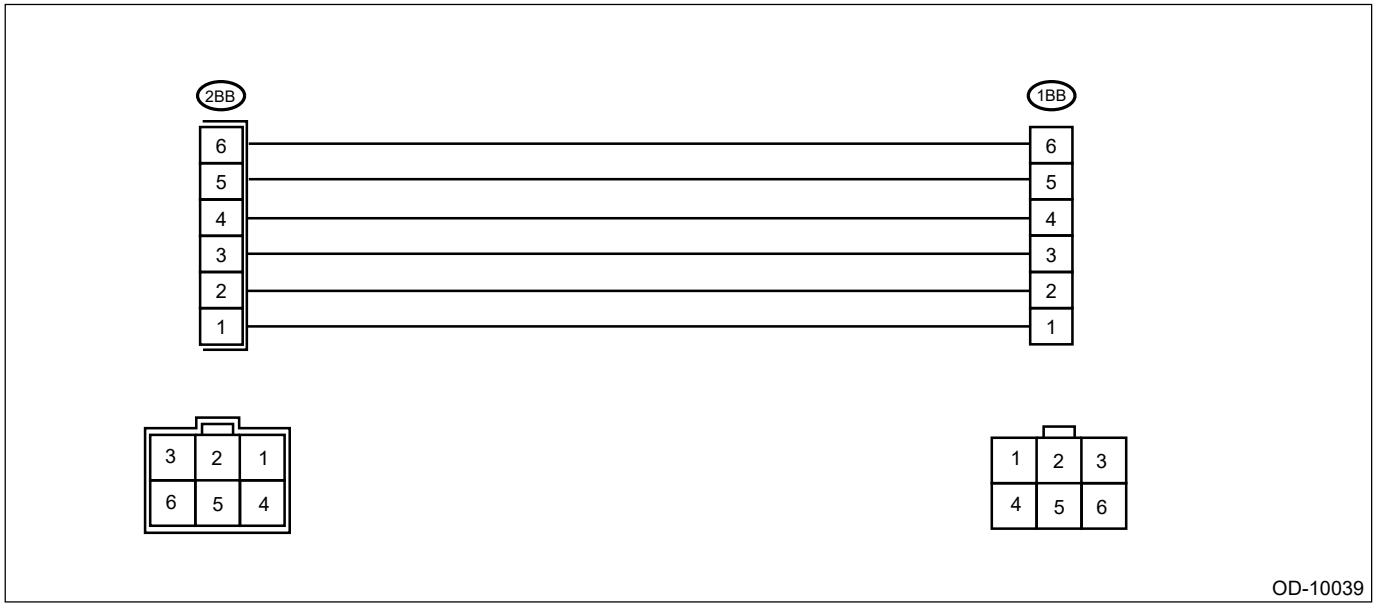
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA000	98299XA000	TEST HARNESS AB	Used when measuring voltage and resistance of occupant detection system.

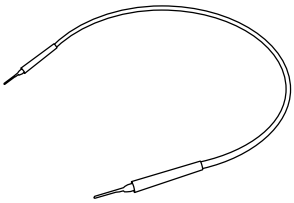


- TEST HARNESS BB

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299XA000	98299FL020 (Newly adopted tool)	TEST HARNESS BB	Used when measuring voltage and resistance of occupant detection system.



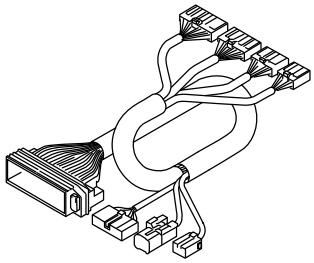
• TEST HARNESS BC

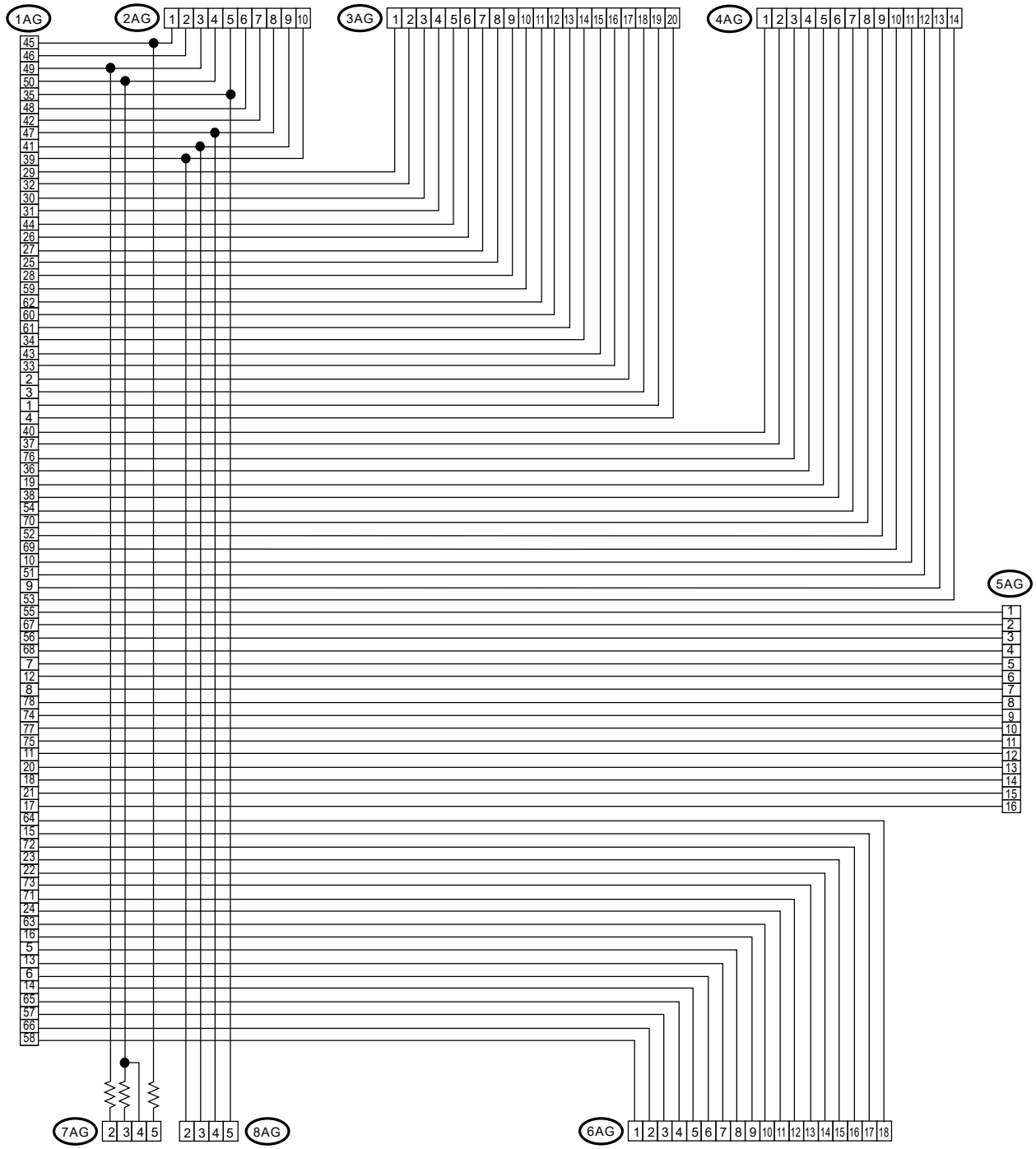
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AL020	98299FL030 (Newly adopted tool)	TEST HARNESS BC	Used when measuring voltage and resistance of occupant detection system. Two sets may be required.



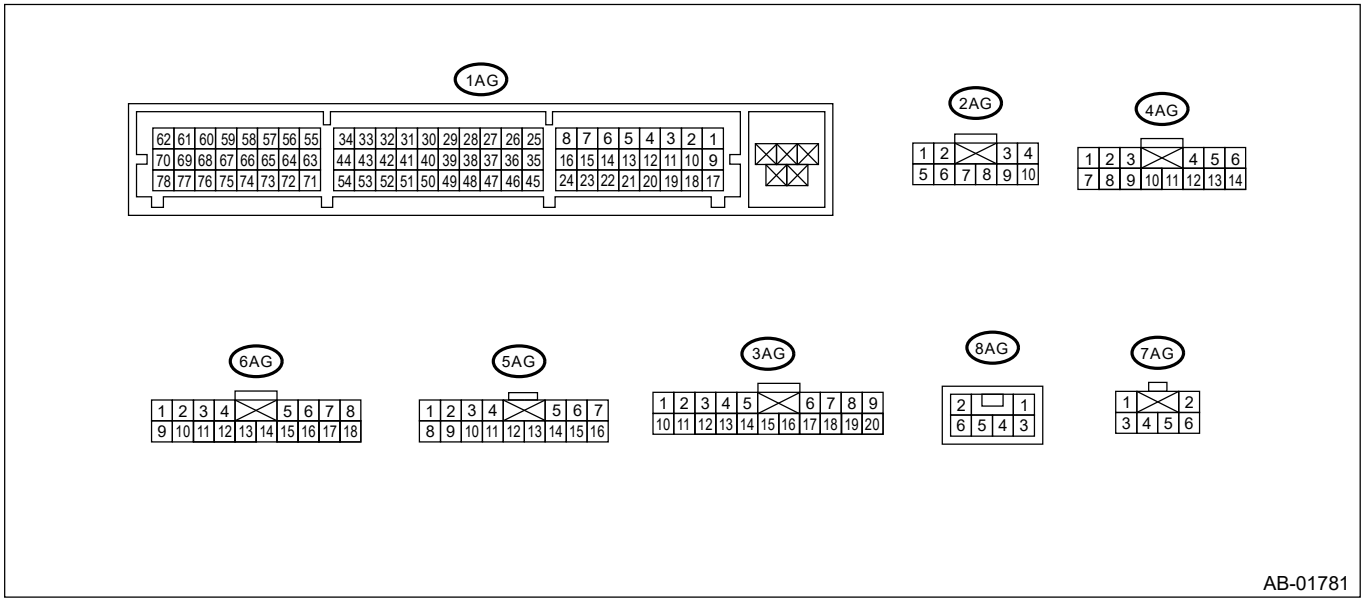
• TEST HARNESS AG

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

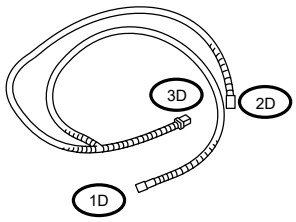
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG070	98299AG070	TEST HARNESS AG	Used when measuring voltage and resistance of airbag control module.

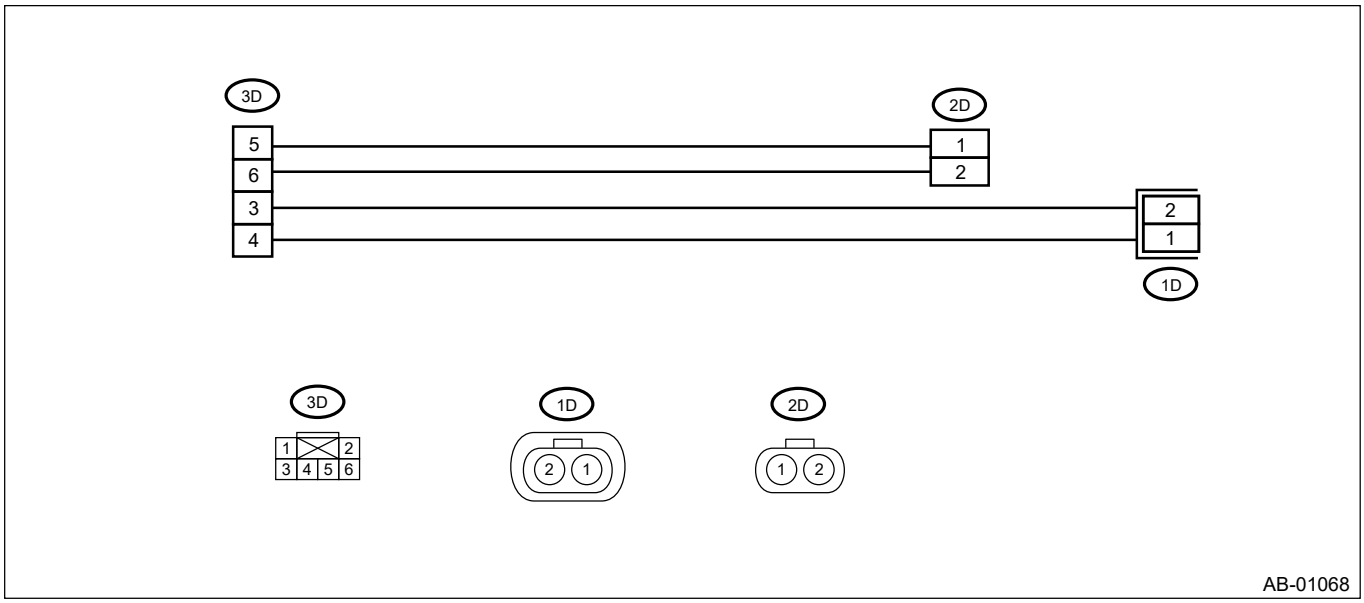

1AG
2AG
1 2 3 4 5 6 7 8 9 10
3AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
4AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14
5AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
45 46 49 50 35 48 42 47 41 39 29 32 30 31 44 26 27 25 28 59 62 60 61 34 43 33 2 3 1 4 40 37 76 36 19 38 54 70 52 69 10 51 9 53 55 67 56 68 7 12 8 78 74 77 75 11 20 18 21 17 64 15 72 23 22 73 71 24 63 16 5 13 6 14 65 57 66 58
7AG
2 3 4 5
2 3 4 5
8AG
6AG
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

AB-01902



- TEST HARNESS D

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST98299AG060	98299AG060	TEST HARNESS D	Used for troubleshooting seat belt buckle switch.

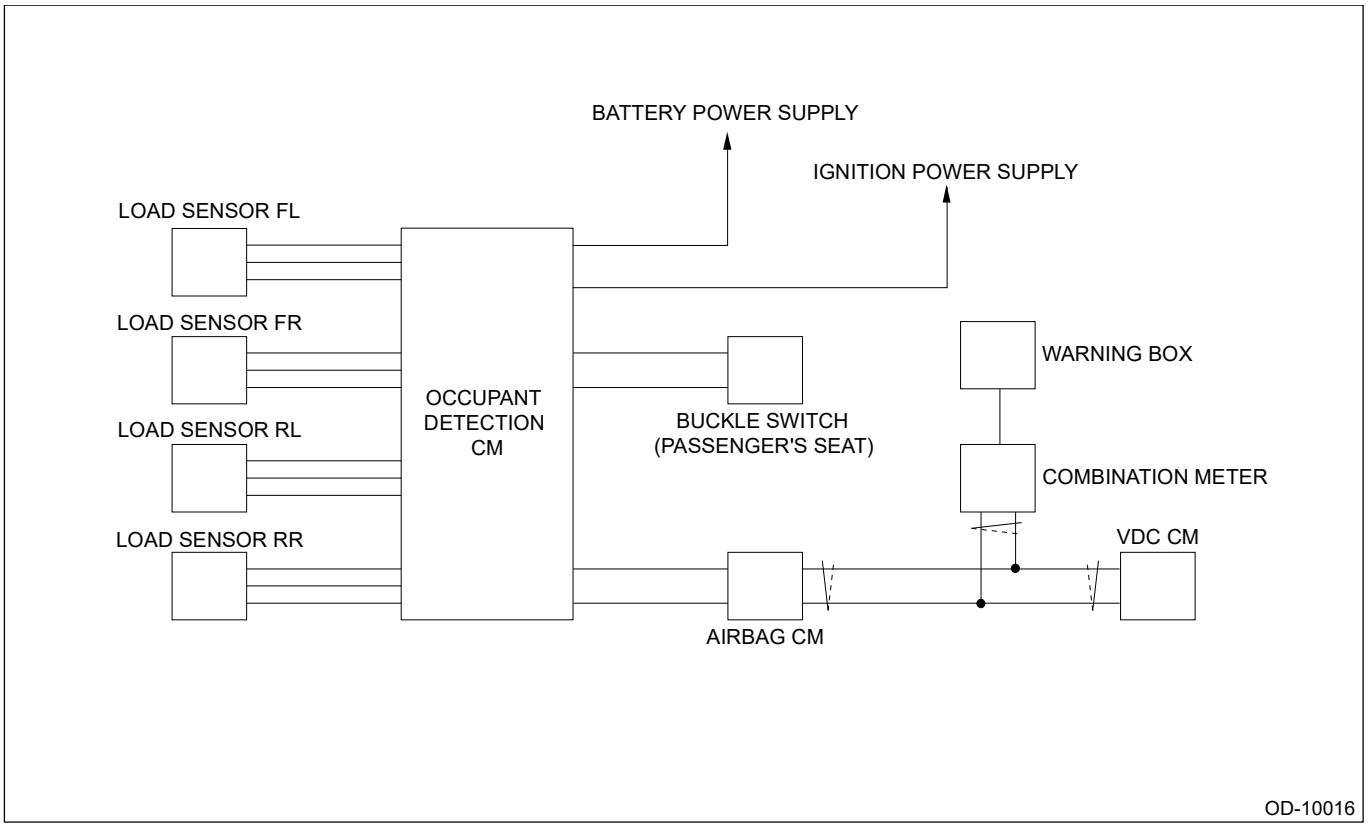


2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Inspection weight	Used for sensitivity inspection after Rezero operation. Prepare an inspection weight of 30 to 40 kg in total. If it is a weight of which the accuracy has been verified (within ±0.5%), there is no need of measuring the actual value using a digital scale. **Note:** **The combination of 98399AG000 and 98399AG010 (total weight: 35.812 kg) can be used.**
Digital scale	Used only for sensitivity inspection after Rezero operation, using an inspection weight of which the actual weight is not verified or unknown.

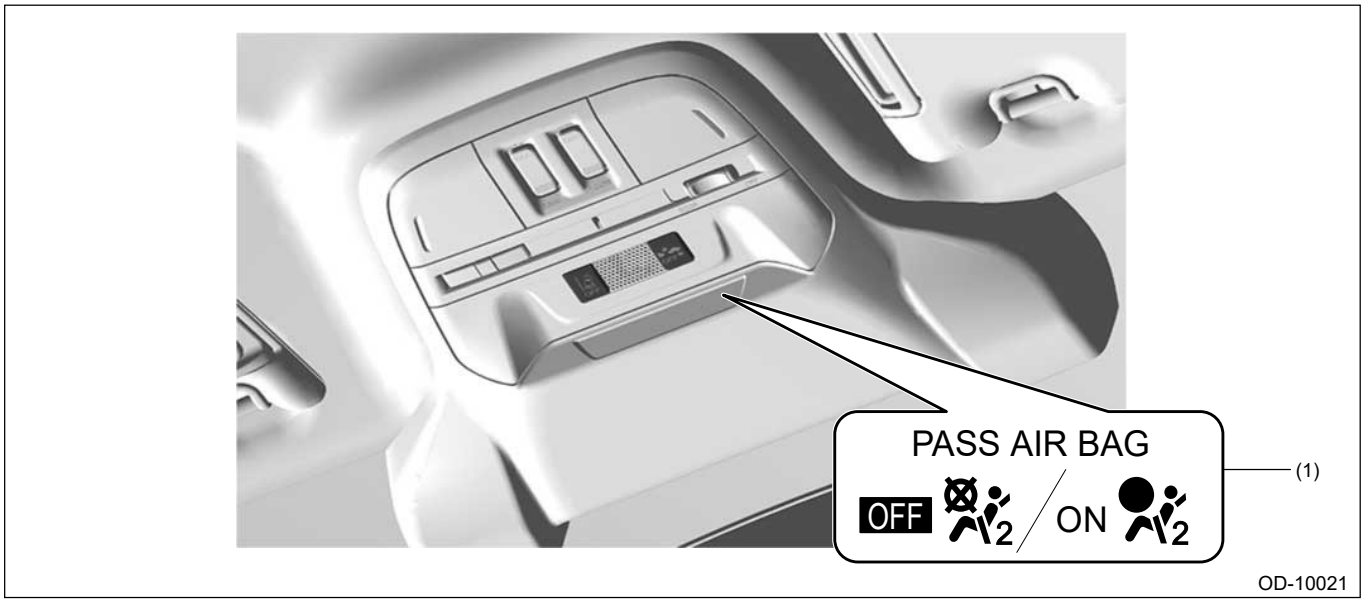
OCCUPANT DETECTION(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

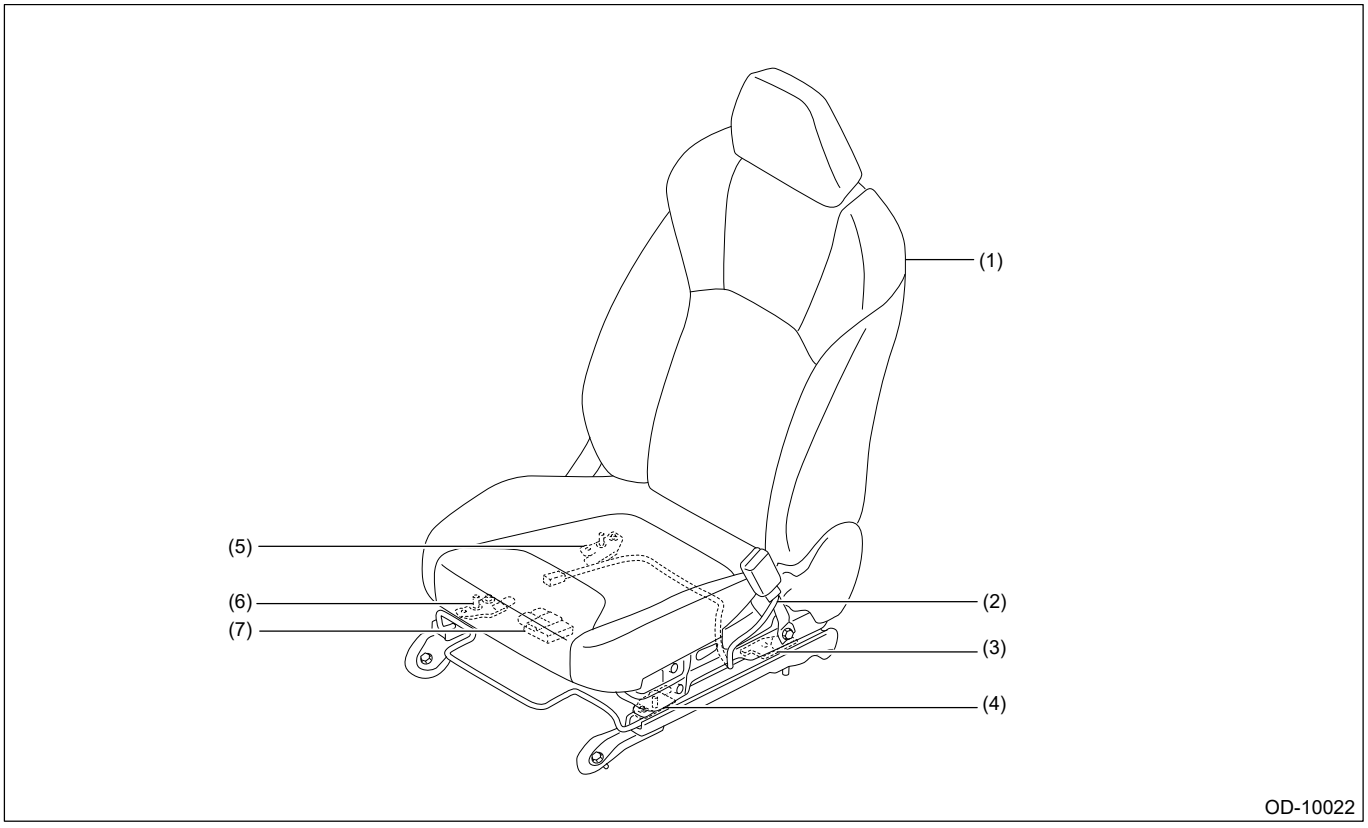


OCCUPANT DETECTION(DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Airbag ON/OFF indicator



(1) Passenger's seat
(2) Buckle switch
(3) Load sensor 3 (RL)
(4) Load sensor 1 (FL)
(5) Load sensor 4 (RR)
(6) Load sensor 2 (FR)
(7) Occupant detection control module

PROCEDURE

1. OCCUPANT DETECTION SYSTEM (BETWEEN AIRBAG REAR HARNESS AND SEAT HARNESS)

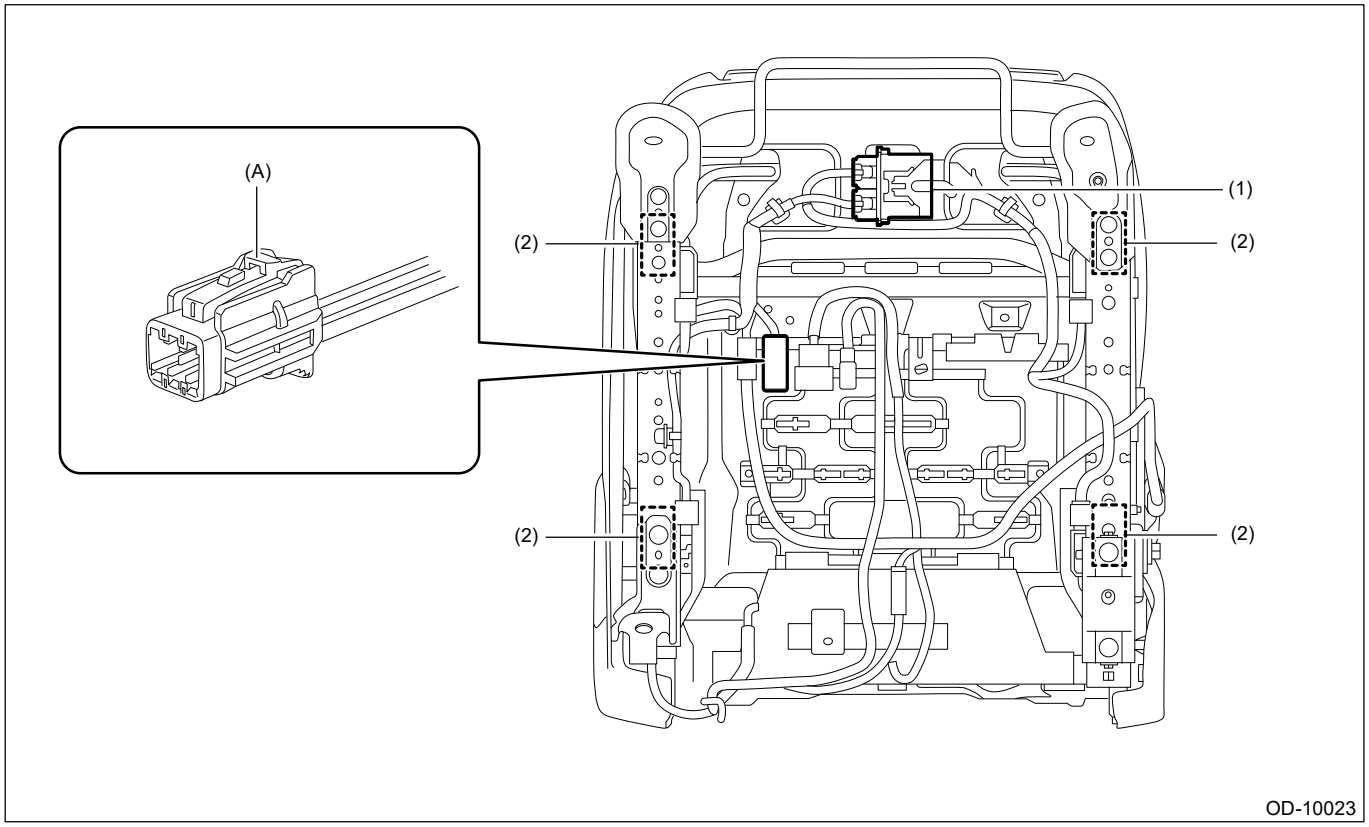
1. How to disconnect:

Press the lock arm (A) and disconnect the connector.

Caution:

When pulling the slide lock or disconnecting connector, be sure to hold the connector, not the harness.

- Back face of passenger's seat



(A) Lock arm

(1) Occupant detection control module

(2) Load sensor

2. How to connect:

Holding the connector, push it in securely until a clicking sound is heard.

Caution:

Be sure to insert the connector in until it is locked. Then pull it gently to make sure that it is locked.

2. AIRBAG CONTROL MODULE

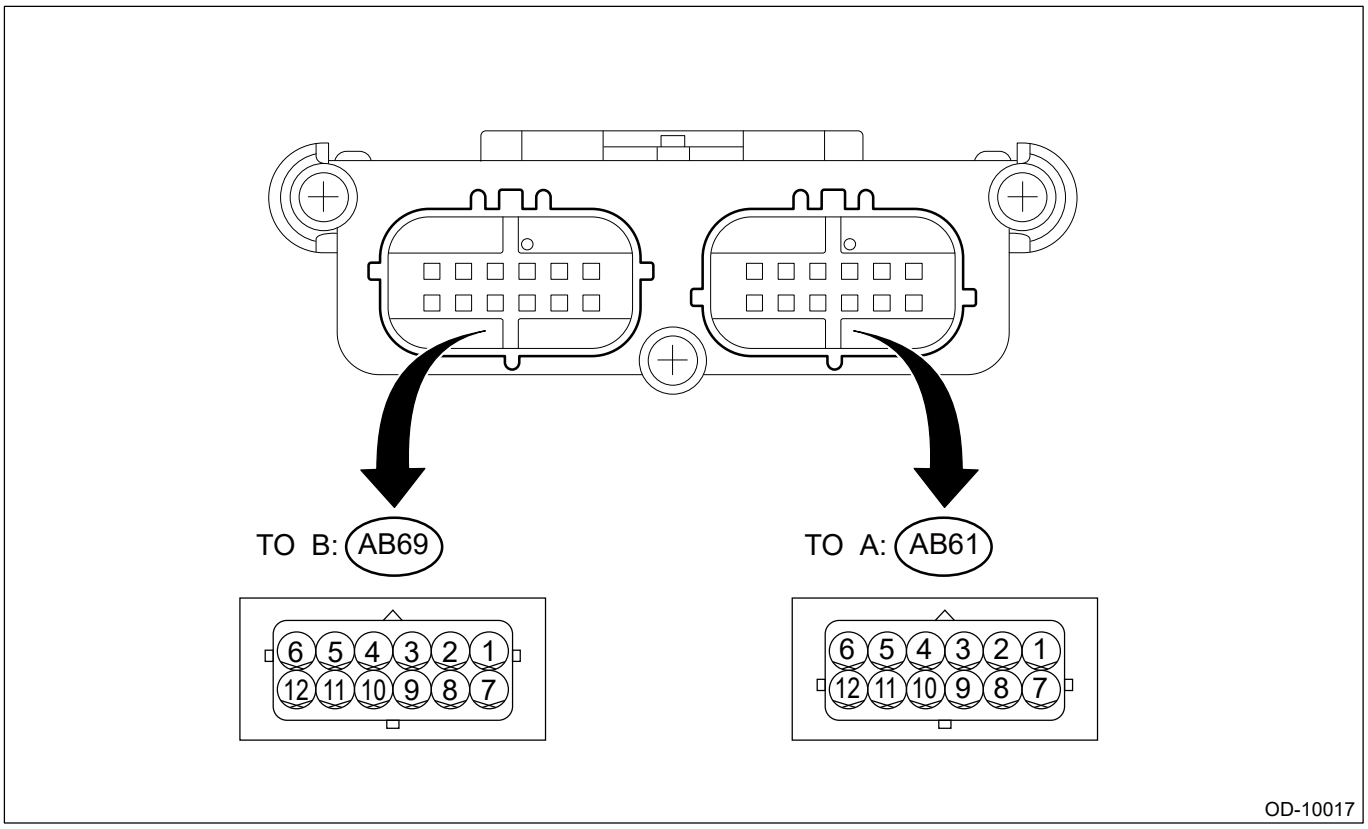
Refer to the airbag system section. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > AIRBAG CONTROL MODULE.

3. BUCKLE SWITCH RH

Refer to the airbag system section. Ref. to AIRBAG SYSTEM>Airbag Connector>PROCEDURE > BUCKLE SWITCH RH.

OCCUPANT DETECTION(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(AB61) No. 1(+) ←→ Chassis ground (−)	Battery power supply	Always	Battery voltage
(AB61) No. 2	Airbag CM communication (+)	—	—
(AB61) No. 3	Airbag CM communication (−)	—	—
(AB61) No. 4	—	—	—
(AB61) No. 5	Buckle switch (−)	—	—
(AB61) No. 6	—	—	—
(AB61) No. 7(+) ←→ Chassis ground (−)	Ignition power supply	When ignition switch is ON	Battery voltage
(AB61) No. 8	—	—	—
(AB61) No. 9(+) ←→ Chassis ground (−)	Buckle switch (+)	Buckle not engaged → Buckle engaged	3.8 — 24 → 3.8 — 16 V
(AB61) No. 10	—	—	—
(AB61) No. 11	—	—	—
(AB61) No. 12	—	—	—
(AB69) No. 1	Load sensor 1 (FL) GND	—	—

Terminal No.	Contents	Measuring condition	Standard
(AB69) No. 2	Load sensor 2 (FR) GND	—	—
(AB69) No. 3	Load sensor 3 (RL) GND	—	—
(AB69) No. 4	Load sensor 4 (RR) GND	—	—
(AB69) No. 5	Load sensor 3 (RL) power supply	When ignition switch is ON	4.9 — 5.1 V
(AB69) No. 6	Load sensor 4 (RR) power supply	When ignition switch is ON	4.9 — 5.1 V
(AB69) No. 7	Load sensor 1 (FL) signal	—	—
(AB69) No. 8	Load sensor 2 (FR) signal	—	—
(AB69) No. 9	Load sensor 3 (RL) signal	—	—
(AB69) No. 10	Load sensor 4 (RR) signal	—	—
(AB69) No. 11(+) ←→ Chassis ground (−)	Load sensor 1 (FL) power supply	When ignition switch is ON	4.9 — 5.1 V
(AB69) No. 12(+) ←→ Chassis ground (−)	Load sensor 2 (FR) power supply	When ignition switch is ON	4.9 — 5.1 V

OCCUPANT DETECTION(DIAGNOSTICS) > Inspection Mode

PROCEDURE

Recreate the circumstance by referring to the conditions described in the checklist.

OCCUPANT DETECTION(DIAGNOSTICS) > Warning Light Illumination Pattern

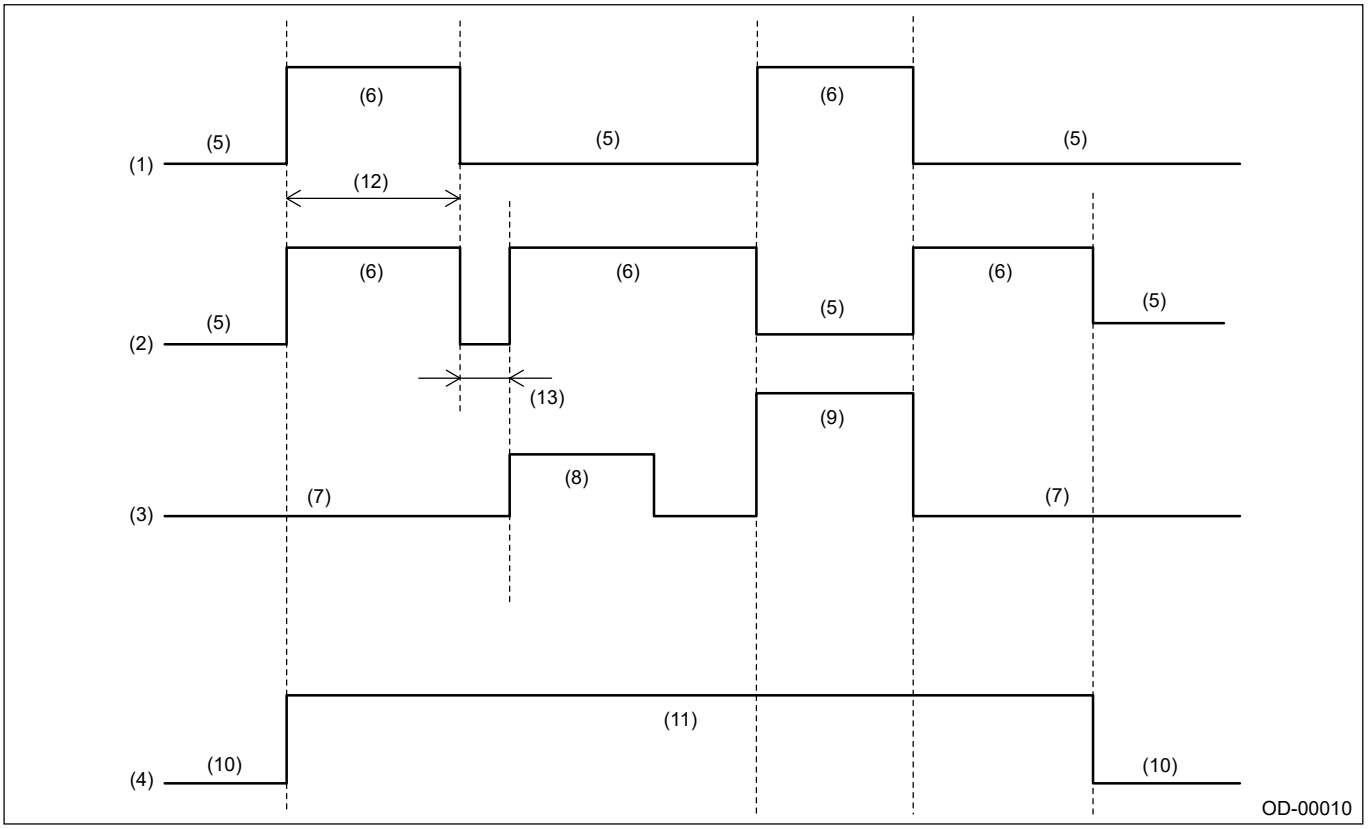
INSPECTION

1. AIRBAG WARNING LIGHT

Note:

Refer to AIRBAG (DIAGNOSTICS). Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern.

2. PASSENGER'S AIRBAG ON/OFF INDICATOR



(1) Passenger's airbag ON indicator light	(6) Light ON	(10) OFF
(2) Passenger's airbag OFF indicator light	(7) Empty	(11) ON
(3) Occupant seating	(8) Child	(12) Approx. 6 seconds
(4) Ignition switch	(9) Adult	(13) Approx. 2 seconds
(5) Light OFF		

OCCUPANT DETECTION(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT DOES NOT ILLUMINATE

1. AIRBAG WARNING LIGHT

Note:
Refer to AIRBAG (DIAGNOSTICS). Ref. to AIRBAG(DIAGNOSTICS)>Warning Light Illumination Pattern.

2. PASSENGER'S AIRBAG ON/OFF INDICATOR

Detecting condition:

- Passenger's airbag ON/OFF indicator malfunction
- Airbag control module to combination meter circuit is shorted or open.
- Grounding circuit is faulty.
- Connector connection is improper.
- Airbag control module is faulty.
- Occupant detection control module is faulty.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1661 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B1661. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1661 PASSENGER'S AIRBAG ON/OFF INDICATOR FAILURE.
No	Go to 2.

2. CHECK WARNING BOX.

Check for poor contact of the warning box connector.

Is there poor contact of connector?

Yes	Repair or replace the poor contact.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any DTC other than DTC B1661 displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. REZERO.

Perform [Rezero]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

Does the passenger's airbag indicator illuminate?

Yes	Finish the diagnosis.
No	Replace the cushion frame assembly. Ref. to SEATS>Front Seat>DISASSEMBLY.

OCCUPANT DETECTION(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:

For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT ILLUMINATE." Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

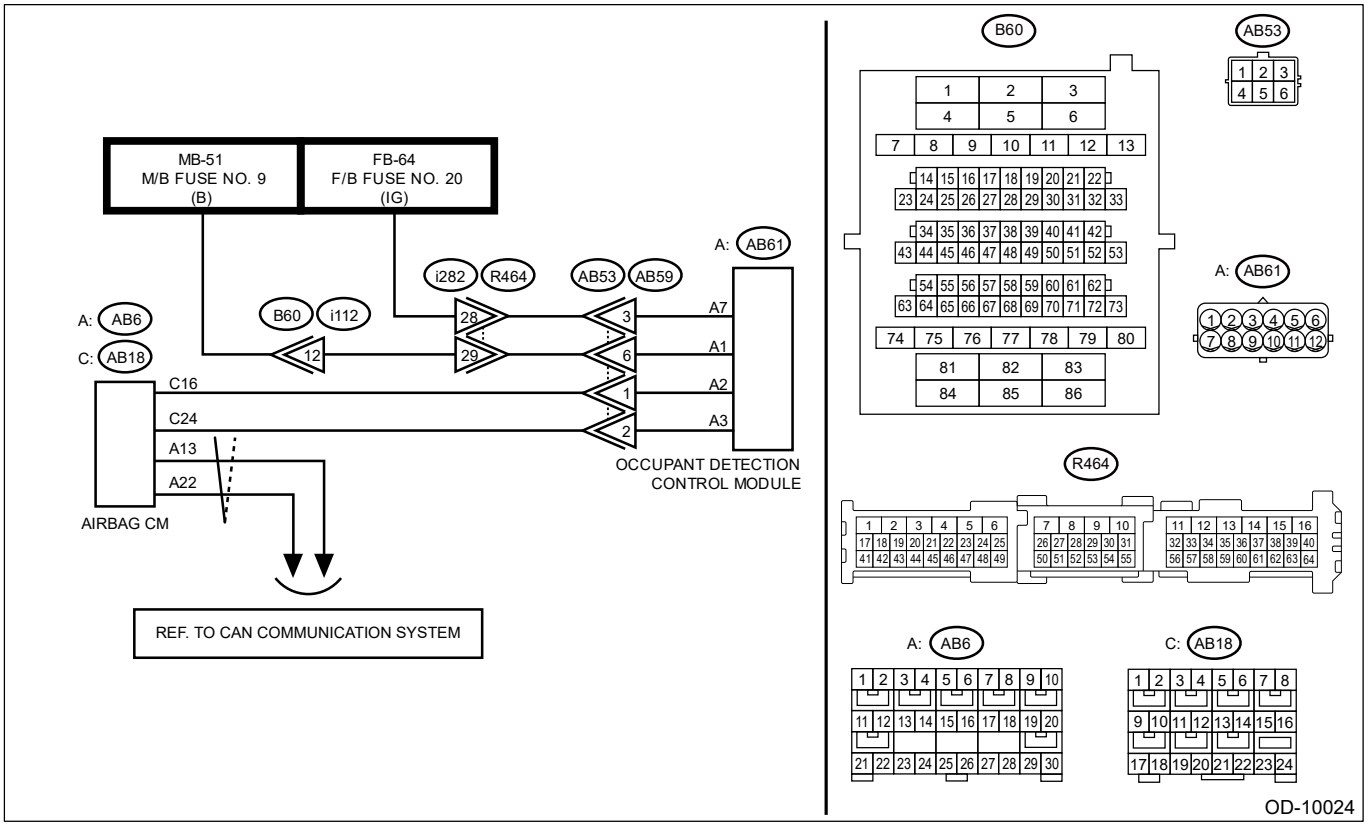
INSPECTION

1. COMMUNICATION WITH [Airbag] IS IMPOSSIBLE

Detecting condition:
Defective harness connector
Trouble symptom:
Communication is impossible between [Airbag] and Subaru Select Monitor.
Note:
Refer to AIRBAG (DIAGNOSTICS). Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

2. COMMUNICATION WITH [Occupant Detection] IS IMPOSSIBLE

Note:
The occupant detection system communicates with the Subaru Select Monitor via the airbag control module.
Detecting condition:
Defective harness connector between airbag control module and occupant detection control module
Trouble symptom:
Communication is impossible between the airbag control module and the occupant detection control module.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.
Note:
Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



1. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether the communication with [Airbag] can be executed normally.

Is communication with [Airbag] possible?

Yes	Go to 5.
No	Go to 2.

2. CHECK SUBARU SELECT MONITOR COMMUNICATION.

Using the Subaru Select Monitor, check whether the communication with [Body Control] can be executed normally.

Is communication with [Body Control] possible?

Yes	Refer to AIRBAG (DIAGNOSTICS). Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.
No	Go to 3.

3. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle to check whether the communication can be executed normally.

Does the Subaru Select Monitor communicate?

Yes	Go to 4.
No	Repair or replace the Subaru Select Monitor.

4. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.

Check for malfunction in harness between data link connector and body integrated unit on vehicle to be diagnosed.

Is the check result OK?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair or replace the faulty harness.

5. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (OPEN CIRCUIT IN IGNITION POWER SUPPLY).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and leave it for 60 seconds or more.
2. Disconnect the connector (AB61) of occupant detection control module.
3. Connect the battery ground terminal and turn the ignition switch to ON.
4. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 7 (+) — Chassis ground (−):

Is the voltage 11 V or more?

Yes	Go to 7.
No	Go to 6.

6. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (OPEN CIRCUIT IN IGNITION POWER SUPPLY).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and leave it for 60 seconds or more.
2. Disconnect the connector (AB59) of seat harness.
3. Connect the connector (1AB) in the test harness AB to the connector (AB53).
4. Connect the battery ground terminal and turn the ignition switch to ON.
5. Using a tester, measure the voltage between connector (2AB) in test harness AB and chassis ground.

   Connector & terminal

   (2AB) No. 3 (+) — Chassis ground (−):

Is the voltage 11 V or more?

Yes	Replace the seat harness.
No	Check rear harness, bulkhead wiring harness, instrument panel wiring harness in this order, and replace the faulty harness.

7. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (SHORT CIRCUIT IN IGNITION POWER SUPPLY).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and leave it for 60 seconds or more.
2. Using a tester, measure the resistance between occupant detection control module connectors.

Caution:

Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB61) No. 7 — (AB61) No. 1 — 12 (except for No. 7):

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Go to 8.

8. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (SHORT CIRCUIT IN IGNITION POWER SUPPLY).

1. Disconnect the connector (AB59) of seat harness.
2. Connect the connector (1AB) in the test harness AB to the connector (AB53).
3. Using a tester, measure the resistance between terminals in test harness AB connector (2AB).

Connector & terminal

(2AB) No. 3 — (2AB) No. 1 — 6 (except for No. 3):

Is the resistance 1 MΩ or more?

Yes	Replace the seat harness.
No	Check rear harness, bulkhead wiring harness, instrument panel wiring harness in this order, and replace the faulty harness.

9. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (OPEN CIRCUIT IN GROUND).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB6, AB17, AB18) from airbag CM.
3. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
4. Using a tester, measure the resistance in harness between occupant detection control module connector and connector (6AG) in test harness AG.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 2 — (6AG) No. 9:

   (AB61) No. 3 — (6AG) No. 11:

Is the resistance less than 10 Ω?

Yes	Go to 11.
No	Go to 10.

10. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (OPEN CIRCUIT IN GROUND).

1. Disconnect the connector (AB59) of seat harness.
2. Connect the connector (1AB) in the test harness AB to the connector (AB53).
3. Using a tester, measure the resistance between the test harness AB connector (2AB) and the test harness AG connector (6AG).

   Connector & terminal

   (2AB) No. 1 — (6AG) No. 9:

   (2AB) No. 2 — (6AG) No. 11:

Is the resistance less than 10 Ω?

Yes	Replace the seat harness.
No	Check rear harness, bulkhead wiring harness, instrument panel wiring harness in this order, and replace the faulty harness.

11. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (SHORT CIRCUIT IN GROUND).

Using a tester, measure the resistance between connectors in test harness AG.

Connector & terminal

(6AG) No. 9 — All terminals in test harness AG (except for (6AG) No. 9):

(6AG) No. 11 — All terminals in test harness AG (except for (6AG) No. 11):

Is the resistance 1 MΩ or more?

Yes	Go to 13.
No	Go to 12.

12. CHECK HARNESS IN OCCUPANT DETECTION CONTROL MODULE (SHORT CIRCUIT IN GROUND).

1. Disconnect the connector (AB59) of seat harness.
2. Using a tester, measure the resistance between connectors in test harness AG.

   Connector & terminal

   (6AG) No. 9 — All terminals in test harness AG (except for (6AG) No. 9):

   (6AG) No. 11 — All terminals in test harness AG (except for (6AG) No. 11):

Is the resistance 1 MΩ or more?

Yes	Replace the seat harness.
No	Check rear harness, bulkhead wiring harness, instrument panel wiring harness in this order, and replace the faulty harness.

13. CHECK FOR POOR CONTACT.

Check for poor contact of connector of occupant detection system.

Is the check result OK?

Yes	Replace the occupant detection control module.
No	Repair or replace the connector. (Replace the harness without repairing the airbag system connector.)

OCCUPANT DETECTION(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Data Monitor>LIST.**

OCCUPANT DETECTION(DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Contents	Standard/Unit	Note
Front Passenger Seat Status	Display the status of passenger seat's occupant.	When status is not confirmed: Unknown When the seat is unoccupied or when child restraint seat is installed: Empty or Child When occupant is adult: Adult or Child	—
Front Passenger Seatbelt Status	Display the status of passenger's seat buckle switch.	When status is not confirmed or when buckle switch is faulty: Unknown or fault When buckle switch is not engaged: Unbelted When buckle switch is engaged: Belted	—
Front-Left Sensor Load Value	Load value of occupant detection sensor is displayed.	−75.85 — 104.73 kg	—
Front-Right Sensor Load Value	Load value of occupant detection sensor is displayed.	−75.85 — 104.73 kg	—

Items to be displayed	Contents	Standard/Unit	Note
Rear-Left Sensor Load Value	Load value of occupant detection sensor is displayed.	−75.85 — 104.73 kg	—
Rear-Right Sensor Load Value	Load value of occupant detection sensor is displayed.	−75.85 — 104.73 kg	—
Total Load Value	Total load value of occupant detection sensor is displayed.	−303.40 — 418.94 kg	Set the weight for sensitivity inspection, and check that the load value is nearly equal to it.
Check1	Information for development	—	Not used.

OCCUPANT DETECTION(DIAGNOSTICS) > Rezero

OPERATION

Note:

When any of the following operation has been done, be sure to perform [Rezeroing] of occupant detection system. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

- **Replacing occupant detection system**
- **Removing and disassembling passenger's seat**
- **Loosening passenger's seat bolt**

Caution:

[Rezero] operation must be completed thoroughly.

1. Park empty vehicle on a level surface.
2. Check that all harness and connectors are connected.
3. Check the following items to adjust the condition of the vehicle.
   - Adjust the seat backrest to be fully upright. (For models with power seats, press the power seat button until the backrest comes to a stop.)
   - Do not place anything on the top of the seat cushion.
   - Sit on the seat cushion to smooth the seat surface.
   - Check that the passenger's seat belt is not inserted into the buckle, not tense or not stuck.
   - Check that ambient temperature is in a range from 0 — 40°C (32 — 104°F).
4. Connect the Subaru Select Monitor.
5. Turn the ignition switch to OFF, then turn it to ON again.

   Note:

   - **This operation is performed to readjust the standard of occupant detection sensor.**
   - **Do not touch the seat until the Rezero is completed. If you have touched the seat even if only once, perform operations from the step 3) again.**
6. On [Start] display, select [Diagnosis].
7. On [Vehicle selection] display, input the target vehicle information and select [OK].
8. On [Main Menu] display, select [Each System].
9. On [Select System] display, select [Occupant Detection].
10. On [Occupant Detection] display, select [DTC].
11. – After replacement of passenger's seat

    Check that no DTC other than DTC B178C is displayed in current malfunction. When B178B is recorded, this means that [Rezero] for passenger's seat was not performed at seat factory. In this case, replace the passenger's seat. When any other DTC is displayed, perform the diagnosis according to the DTC.

    – After replacement of the occupant detection control module

    Check that no DTC other than DTC B178B and B178C is displayed in current malfunction. When DTC other than B178B and B178C is displayed, perform the diagnosis according to the DTC.

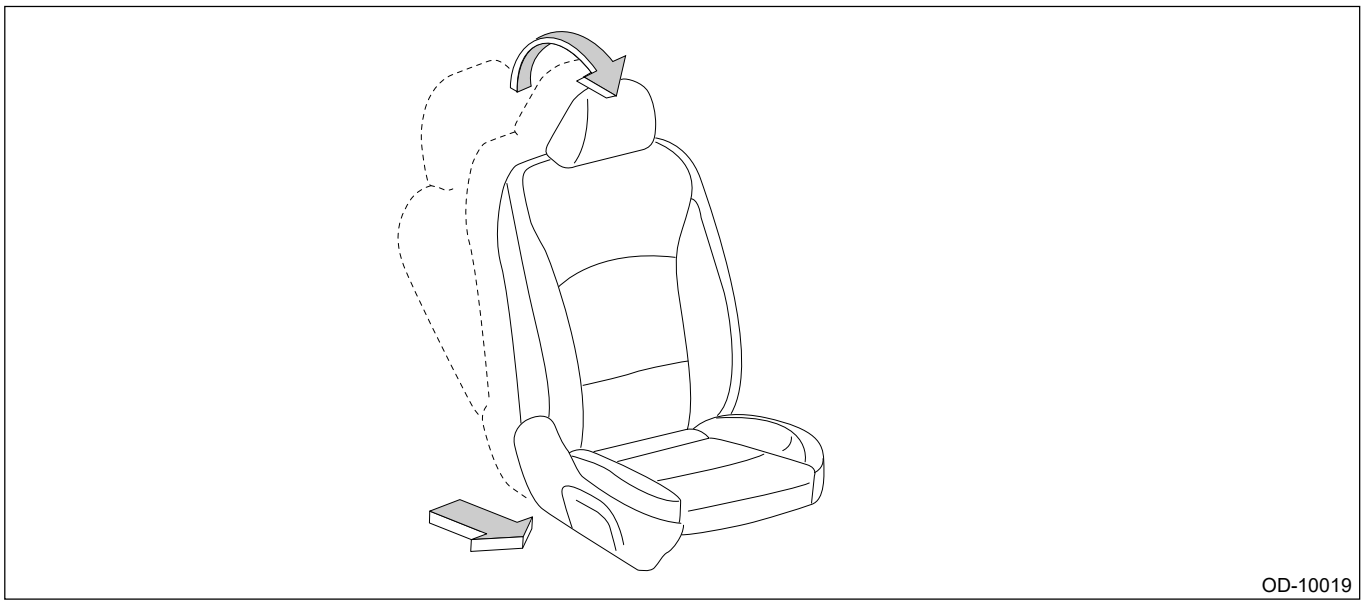
    – When collision detection DTC is recorded

    Check that no DTC other than DTC B1783, B1784, B1785 and B1786 is displayed in current malfunction. Perform the diagnosis according to the DTC.
12. On [Occupant Detection] display, select [Work Support].
13. On [Work Support] display, select [Rezero].
14. After [See service manual. And check vehicle condition for successfully completing.] is displayed on

the screen, check the vehicle condition and select [Next].

15. When [Rezero] is performed after replacing the occupant detection control module and passenger's seat, [Calibration error has occurred. See service manual.] is displayed on the screen. In this case, check the replacement status described in step 11, and select [Next].

16. [Rezeroing Adjust the passenger seat to the condition shown in service manual.] is displayed on the screen. Slide the passenger's seat all the way to the front, check that the backrest is adjusted to the most upright position, and select [Next].



17. When [Rezeroing Unbelt the passenger seatbelt.] is displayed, make sure the passenger's seatbelt is disconnected from the buckle and select [Next].

18. When [Rezeroing Confirm ambient temperature Between 0 and 40°C. (32 and 104°F)] is displayed on the screen, check that ambient temperature at the seat is in a range from 0 — 40°C (32 — 104°F) and select [Next].

19. When [Rezeroing Empty the passenger seat. Turn ignition OFF, and within 10 seconds, turn ignition ON again.] is displayed on the screen, turn the ignition switch to OFF and then ON again while the passenger's seat is empty, make sure that airbag OFF indicator illuminates and airbag ON indicator does not illuminate, and then select [Next].

Note:

After selecting [Next], [In process... Please wait for a while without touching vehicle.] is displayed. Do not touch or rock the vehicle while the message is displayed.

20. When the sensor rezero adjustment is complete successfully, [Rezeroing is successfully completed. Press "OK" to END.] is displayed. Select [OK].

Note:

- **When [Rezeroing is Unsuccessful.] is displayed during sensor rezero adjustment, select [OK] and perform the process according to the displayed error code. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero>LIST.**
- **When [Diagnostic code check. Some troubles occur. See service manual. Press "OK" to END.] is displayed during sensor rezero adjustment, select [OK] and read DTC of [Occupant Detection]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).**
  When DTC is displayed, perform the diagnosis according to the DTC, and then perform sensor rezero adjustment. When DTC is not displayed, check the seat and vehicle status and then perform the sensor rezero adjustment again. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

21. [Next, execute sensor sensitivity check.] is displayed on the screen. Select [OK].

22. After [See service manual. And check vehicle condition for successfully completing.] is displayed on the screen, check the vehicle condition.

23. After [Sensitivity check Adjust the passenger seat to the condition shown in service manual.] is displayed on the screen, check that the passenger's seat does not change from the state confirmed in step 16), and select [Next].

24. When [Sensitivity check Unbelt the passenger seatbelt.] is displayed, make sure the passenger's seatbelt is disconnected from the buckle and select [Next].

25. When [Sensitivity check Confirm ambient temperature Between 0 and 40°C. (32 and 104° F)] is displayed on the screen, check that ambient temperature at the seat is in a range from 0 — 40°C (32 — 104°F) and select [Next].

26. When [Sensitivity check Empty the passenger seat.] is displayed on the screen, make sure the passenger's seat is empty and select [Next].

27. After [According to service manual, prepare the weight / SST whose mass is prescribed for sensitivity check, or measure mass of the weight by high-precision electronic scale] is displayed on the screen, prepare an inspection weight of 30 kg to 40 kg in total, and check that there is no dirt or foreign matter on it.

- If the prepared inspection weight is a weight of which the accuracy has been verified (within ±0.5%), only record the total weight since there is no need of measuring the actual value using a digital scale.
- If the weight value of prepared weight is not verified or the accuracy is unknown, prepare a digital scale and make sure that there is no dirt or foreign matter on it and that the indication is 0 g (kg) when the power is turned on. Then measure and record the total value.

Then select [OK].

Note:

If 98399AG000 and 98399AG010 are used together, also check that there is no dirt, foreign matter or damage on them, but there is no need of measuring.

28. When [Input the total mass value of the prepared weight / SST, or input the measured value of measuring the weight. (Unit: kg)] is displayed on the screen, input the total mass of weight recorded in step 27) and select [Enter].

Note:

If 98399AG000 and 98399AG010 are used together, input the total specified weight value: 35.812 kg.

29. After [Prepare•mass value of the measured weight] is displayed on the screen, check the input value and select [OK].
30. After [Put the prepared weight on the seat according to service manual.] is displayed on the screen, set the inspection weight on the center of passenger's seat surface, and select [OK].
    Note:
    After selecting [OK], [In process... Please wait for a while without touching vehicle.] is displayed. Do not touch or rock the vehicle while the message is displayed.
31. When [Sensitivity check is finished. Read Value : **** kg The mass of weight : **** kg] is displayed on the screen, select [OK] and turn the ignition switch OFF to exit.
32. When [Sensitivity check fail. See service manual. Press "OK" to END.] is displayed during sensor sensitive inspection, select [OK] and perform the operation from the beginning. If failure, error code is displayed. Check the error code and fix it. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

OCCUPANT DETECTION(DIAGNOSTICS) > Rezero

LIST

Code	Contents	Causes	Action to take
0020H	Timeout due to unstable load	Occupant detection control module judged the current situation as error because the over-specified load change occurred during rezeroing.	Perform rezeroing again at a stable place where vehicle vibration hardly occurs.
0021H	FL sensor upper limit error	Rezeroing cannot be executed because the load value of FL sensor exceeds the upper limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0022H	FL sensor lower limit error	Rezeroing cannot be executed because the load value of FL sensor exceeds the lower limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0023H	FR sensor upper limit error	Rezeroing cannot be executed because the load value of FR sensor exceeds the upper limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0024H	FR sensor lower limit error	Rezeroing cannot be executed because the load value of FR sensor exceeds the lower limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front

Code	Contents	Causes	Action to take
			Seat.
0025H	RL sensor upper limit error	Rezeroing cannot be executed because the load value of RL sensor exceeds the upper limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0026H	RL sensor lower limit error	Rezeroing cannot be executed because the load value of RL sensor exceeds the lower limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0027H	RR sensor upper limit error	Rezeroing cannot be executed because the load value of RR sensor exceeds the upper limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0028H	RR sensor lower limit error	Rezeroing cannot be executed because the load value of RR sensor exceeds the lower limit of rezero adjustment range.	Check that the seat is in proper position and fixed securely, and perform rezeroing again. If the same code appears again, replace the seat assembly. Ref. to SEATS>Front Seat.
0029H	Sensor malfunction	Rezeroing cannot be performed due to sensor malfunction during rezeroing.	Read the DTC of [Occupant Detection] Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)., and perform the diagnosis for the displayed DTCs. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
0030H	Memory access error	Rezeroing cannot be performed due to data flash malfunction during rezeroing.	Read the DTC of [Occupant Detection] Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)., and perform the diagnosis for the displayed DTCs. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B1650	OCCUPANT DETECTION SYSTEM MALFUNCTION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.
B1655	FRONT BUCKLE SWITCH RH FAILURE	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1655 FRONT BUCKLE SWITCH RH FAILURE.
B1771	BUCKLE SWITCH	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1771 BUCKLE SWITCH.
B177F	FRONT LEFT OCCUPANT DETECTION SENSOR	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B177F FRONT LEFT OCCUPANT DETECTION SENSOR.
B1780	FRONT RIGHT OCCUPANT DETECTION SENSOR	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1780 FRONT RIGHT OCCUPANT DETECTION SENSOR.
B1781	REAR LEFT OCCUPANT DETECTION SENSOR	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1781 REAR LEFT OCCUPANT DETECTION SENSOR.
B1782	REAR RIGHT OCCUPANT DETECTION SENSOR	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1782 REAR RIGHT

Code	Description & trouble part	Reference
		OCCUPANT DETECTION SENSOR.
B1783	FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1784	FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1784 FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1785	REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1785 REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1786	REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1786 REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION.
B1787	VEHICLE SPEED INFORMATION	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1787 VEHICLE SPEED INFORMATION.
B1788	OCCUPANT DETECTION SENSOR POWER SUPPLY	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY.
B1789	+B POWER SUPPLY	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1789 +B POWER SUPPLY.
B178A	ECU INTERNAL CIRCUIT FAULT	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178A ECU INTERNAL CIRCUIT FAULT.

Code	Description & trouble part	Reference
B178B	SEAT FACTORY CALIBRATION UNCOMPLETED	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178B SEAT FACTORY CALIBRATION UNCOMPLETED.
B178C	VEHICLE FACTORY CALIBRATION UNCOMPLETED	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B178C VEHICLE FACTORY CALIBRATION UNCOMPLETED.
B1795	OCCUPANT DETECTION MODULE INTERNAL CIRCUIT	Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION

Diagnosis start condition:

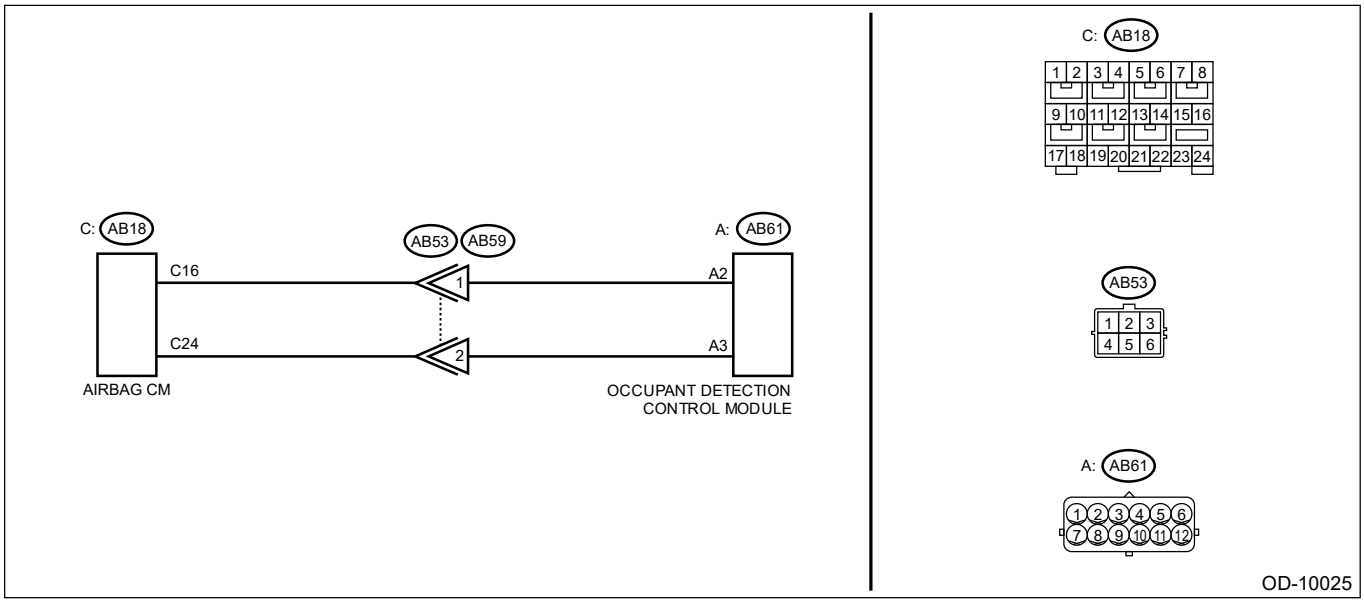
When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- Occupant detection sensor is faulty.
- Occupant detection control module is faulty.
- Seat harness is defective.
- Fuse is blown.
- Rear airbag harness is faulty.

Wiring diagram:

Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any DTC other than DTC B1650 displayed? (Current malfunction)

Yes	Perform the diagnosis for displayed DTC other than DTC B1650.
No	Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB61) from occupant detection control module.
3. Disconnect the connector (AB59) of seat harness and rear harness.
4. Connect the connector (1BB) in the test harness BB to the connector (AB59).
5. Using a tester, measure the resistance between occupant detection control module connector and connector (2BB) in test harness BB.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 2 — (2BB) No. 1:

   (AB61) No. 3 — (2BB) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the seat harness. After replacement, if DTC B1650 is displayed, Go to 5.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB61) No. 2 — All terminals other than (AB61) No. 2:
(AB61) No. 3 — All terminals other than (AB61) No. 3:
(AB61) No. 2 — Chassis ground:
(AB61) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the seat harness. After repairing, if DTC B1650 is displayed, Go to 4.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 2 (+) — Chassis ground (−):
   (AB61) No. 3 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the seat harness. After repairing, if DTC B1650 is displayed, Go to 4.

5. CHECK REAR HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
3. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
4. Connect the connector (1AB) in the test harness AB to the connector (AB53).
5. Measure the resistance between connector (6AG) in the test harness AG and connector (2AB) in the test harness AB.

   Connector & terminal

   (2AB) No. 1 — (6AG) No. 9:

   (2AB) No. 2 — (6AG) No. 11:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Replace the rear harness. After replacement, if DTC B1650 is displayed, replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.

6. CHECK REAR HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Measure the resistance between connector (6AG) in the test harness AG and chassis ground, and between connectors in the test harness AG.

Connector & terminal

(6AG) No. 9 — All terminals in test harness AG (except for (6AG) No. 9):

(6AG) No. 11 — All terminals in test harness AG (except for (6AG) No. 11):

(6AG) No. 9 — Chassis ground:

(6AG) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Replace the rear harness. After repairing, if DTC B1650 is displayed, replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.

7. CHECK REAR HARNESS (BATTERY SHORT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Using a tester, measure the voltage between connector (6AG) in test harness AG and chassis ground.
   Connector & terminal
   (6AG) No. 9 (+) — Chassis ground (−):
   (6AG) No. 11 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Replace the rear harness. After repairing, if DTC B1650 is displayed, replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1655 FRONT BUCKLE SWITCH RH FAILURE

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Buckle switch RH failure (open, short, unit failure), seat harness malfunction (open, short), occupant detection system failure
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC for [Airbag ECU Malfunction] displayed? (Current malfunction)

Yes	Perform the diagnosis for [Airbag ECU Malfunction]. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1000 AIRBAG ECU MALFUNCTION.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1650 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B1650. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1650 OCCUPANT DETECTION SYSTEM MALFUNCTION.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1771 displayed? (Current malfunction)

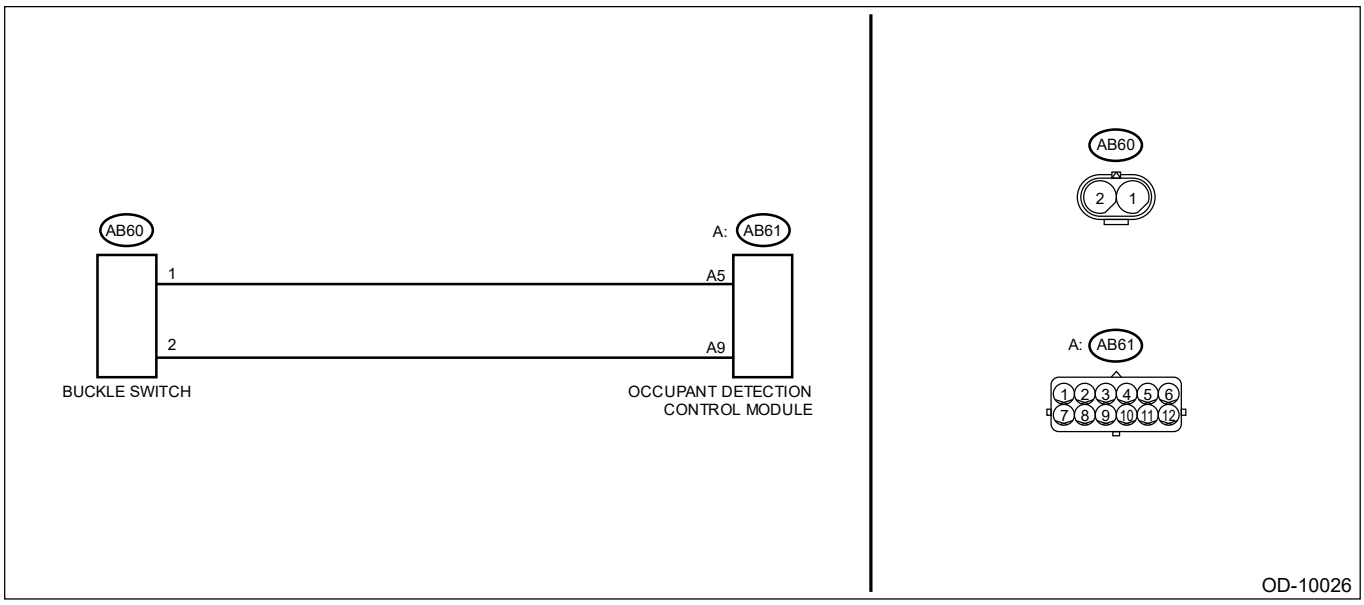
Yes	Perform the diagnosis of DTC B1771. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1771 BUCKLE SWITCH.
No	Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1771 BUCKLE SWITCH

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Open circuit, ground short circuit or short circuit to power supply in buckle switch harness
- Buckle switch malfunction (Communication circuit failure)
- Occupant detection control module buckle communication circuit malfunction

Trouble symptom:
Communication fails between occupant detection control module and buckle switch.
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

PBCU DTC Check

Is any of DTC B177F, B1800, B1801, B1782, B1788, B178A or B1795 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B177F, B1800, B1801, B1782, B1788, B178A or B1795.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1655 displayed? (Current malfunction)

Yes	Go to 3.
No	Replace the occupant detection control module.

3. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB61) from occupant detection control module.
3. Disconnect the connector (AB60) from the passenger's buckle switch.
4. Connect the connector (2D) in the test harness D to the connector (AB60).
5. Using a tester, measure the resistance between occupant detection control module connector and connector (3D) in test harness D.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 5 — (3D) No. 5:

   (AB61) No. 9 — (3D) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Replace the seat harness.

4. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB61) No. 5 — All terminals other than (AB61) No. 5:
(AB61) No. 9 — All terminals other than (AB61) No. 9:
(AB61) No. 5 — Chassis ground:
(AB61) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Replace the seat harness.

5. CHECK SEAT HARNESS (BATTERY SHORT).

1. Connect the battery ground terminal and turn the ignition switch to ON.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

   Caution:

   Connect the terminal in test harness BC to connector (AB61) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB61) No. 5 (+) — Chassis ground (-):
   (AB61) No. 9 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Replace the seat harness.

6. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check for poor contact in occupant detection control module connector and passenger's buckle switch connector.

Is the check result OK?

Yes	Go to 7.
No	Repair or replace the poor contact part.

7. CHECK PASSENGER'S SEAT BUCKLE SWITCH.

1. Disconnect the test harness D and test harness BC.
2. Connect the occupant detection control module connector.
3. Connect the test harness AE and test harness connector Y to buckle switch connector (AB60).
4. Connect the battery ground terminal and turn the ignition switch to ON.

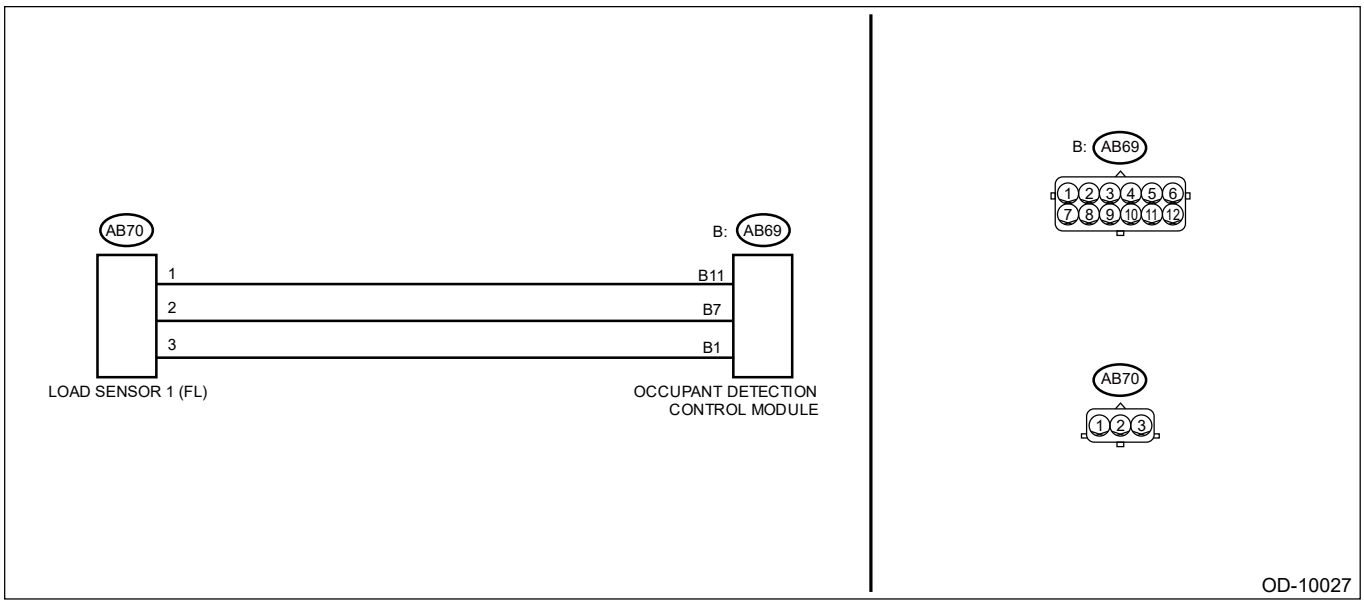
Does the airbag warning light illuminate for 6 seconds and go off?

Yes	Replace the buckle switch. Ref. to SEAT BELT SYSTEM>Front Seat Belt>REMOVAL > SEAT BELT OUTER - FRONT.
No	Replace the occupant detection control module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B177F FRONT LEFT OCCUPANT DETECTION SENSOR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Occupant detection sensor malfunction
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any of DTC B1771, B1788, B178A or B1795 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1771, B1788, B178A or B1795. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB69) from occupant detection control module.
3. Disconnect connector (AB70) from the load sensor FL.
4. Using a tester, measure the resistance between occupant detection control module connector and load sensor FL connector.

Caution:

Connect the terminal in test harness BC to connector (AB69) and connector (AB70) terminals, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 1 — (AB70) No. 3:
(AB69) No. 7 — (AB70) No. 2:
(AB69) No. 11 — (AB70) No. 1:

Is the resistance less than 10 Ω?

Yes	 Go to 3.
No	Replace the seat harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 1 — All terminals other than (AB69) No. 1:
(AB69) No. 7 — All terminals other than (AB69) No. 7:
(AB69) No. 11 — All terminals other than (AB69) No. 11:
(AB69) No. 1 — Chassis ground:
(AB69) No. 7 — Chassis ground:
(AB69) No. 11 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the seat harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Connect the battery ground terminal and turn the ignition switch to ON.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

   Caution:

   Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB69) No. 1 (+) — Chassis ground (-):
   (AB69) No. 7 (+) — Chassis ground (-):
   (AB69) No. 11 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the seat harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check for poor contact in occupant detection control module connector and load sensor connector.
3. Disconnect the test harness BC, and connect all the connectors.
4. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



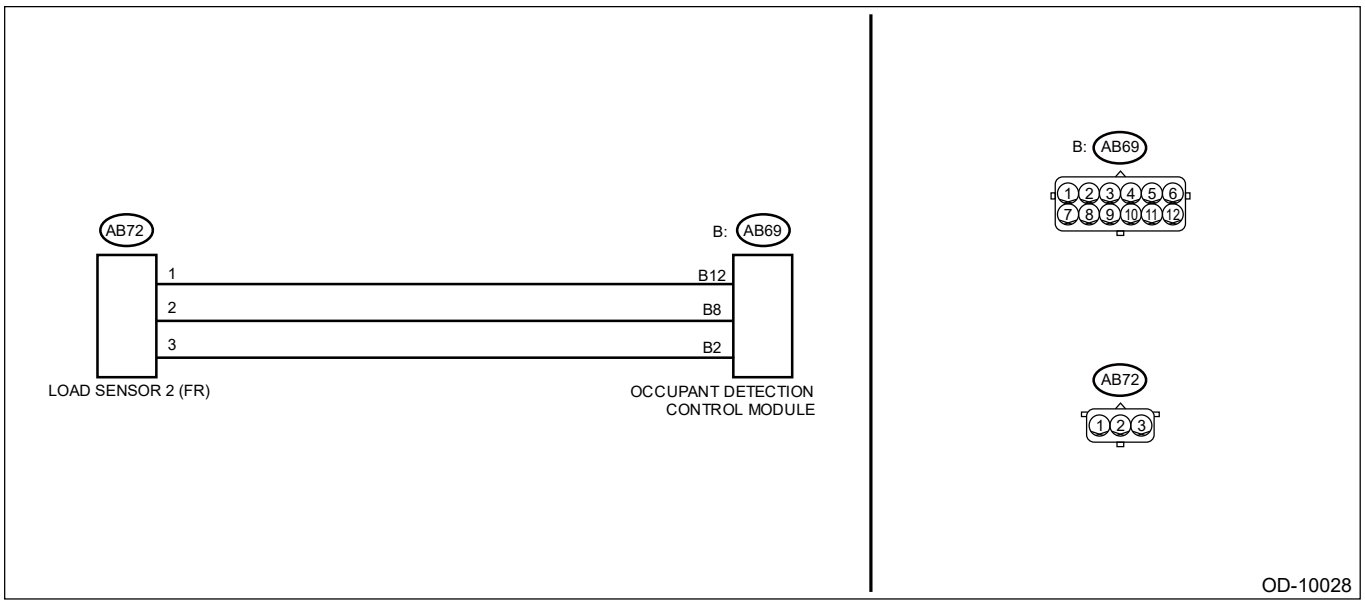
Is DTC B177F displayed? (Current malfunction)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1780 FRONT RIGHT OCCUPANT DETECTION SENSOR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Occupant detection sensor malfunction
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any of DTC B1771, B1788, B178A or B1795 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1771, B1788, B178A or B1795. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB69) from occupant detection control module.
3. Disconnect connector (AB72) from the load sensor FR.
4. Using a tester, measure the resistance between occupant detection control module connector and load sensor FR connector.

Caution:

Connect the terminal in test harness BC to connector (AB69) and connector (AB72) terminals, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 2 — (AB72) No. 3:
(AB69) No. 8 — (AB72) No. 2:
(AB69) No. 12 — (AB72) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the seat harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 2 — All terminals other than (AB69) No. 2:
(AB69) No. 8 — All terminals other than (AB69) No. 8:
(AB69) No. 12 — All terminals other than (AB69) No. 12:
(AB69) No. 2 — Chassis ground:
(AB69) No. 8 — Chassis ground:
(AB69) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the seat harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Connect the battery ground terminal and turn the ignition switch to ON.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

   Caution:

   Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

   Connector & terminal

   (AB69) No. 2 (+) — Chassis ground (−):
   (AB69) No. 8 (+) — Chassis ground (−):
   (AB69) No. 12 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the seat harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check for poor contact in occupant detection control module connector and load sensor connector.
3. Disconnect the test harness BC, and connect all the connectors.
4. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



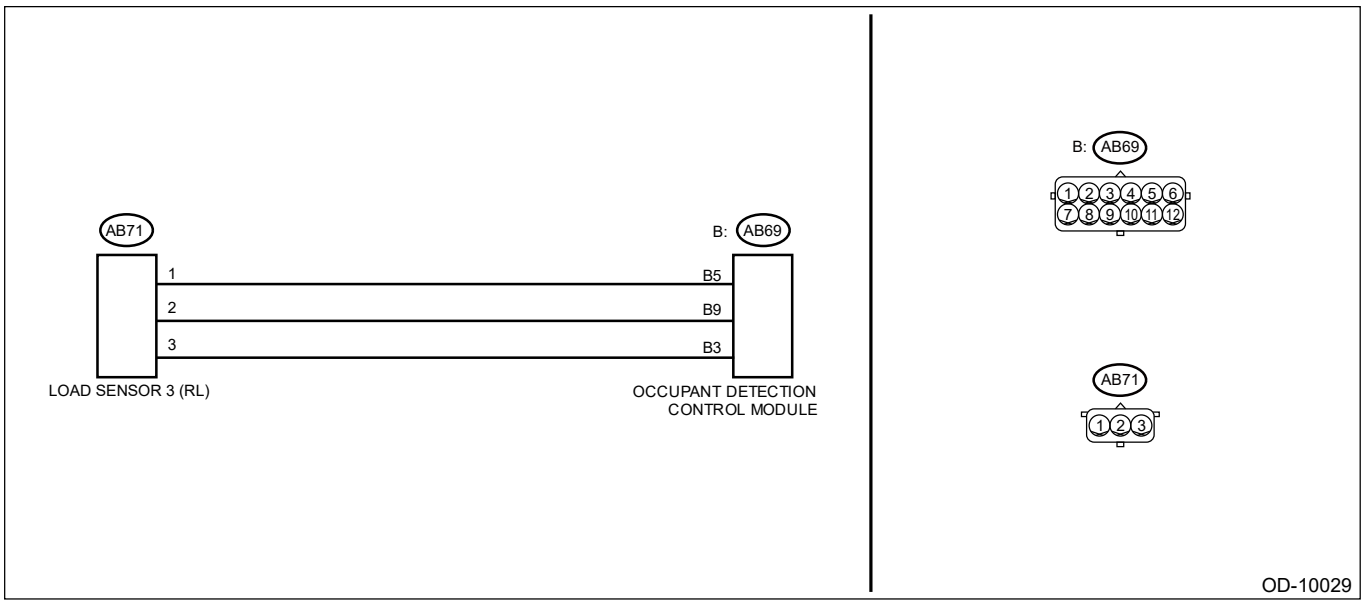
Is DTC B1780 displayed? (Current malfunction)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1781 REAR LEFT OCCUPANT DETECTION SENSOR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Occupant detection sensor malfunction
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any of DTC B1771, B1788, B178A or B1795 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1771, B1788, B178A or B1795. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB69) from occupant detection control module.
3. Disconnect connector (AB71) from the load sensor RL.
4. Using a tester, measure the resistance between occupant detection control module connector and load sensor RL connector.

Caution:

Connect the terminal in test harness BC to connector (AB69) and connector (AB71) terminals, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 3 — (AB71) No. 3:
(AB69) No. 9 — (AB71) No. 2:
(AB69) No. 5 — (AB71) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the seat harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 3 — All terminals other than (AB69) No. 3:
(AB69) No. 9 — All terminals other than (AB69) No. 9:
(AB69) No. 5 — All terminals other than (AB69) No. 5:
(AB69) No. 3 — Chassis ground:
(AB69) No. 9 — Chassis ground:
(AB69) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the seat harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Connect the battery ground terminal and turn the ignition switch to ON.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 3 (+) — Chassis ground (−):
(AB69) No. 9 (+) — Chassis ground (−):
(AB69) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the seat harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check for poor contact in occupant detection control module connector and load sensor connector.
3. Disconnect the test harness BC, and connect all the connectors.
4. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



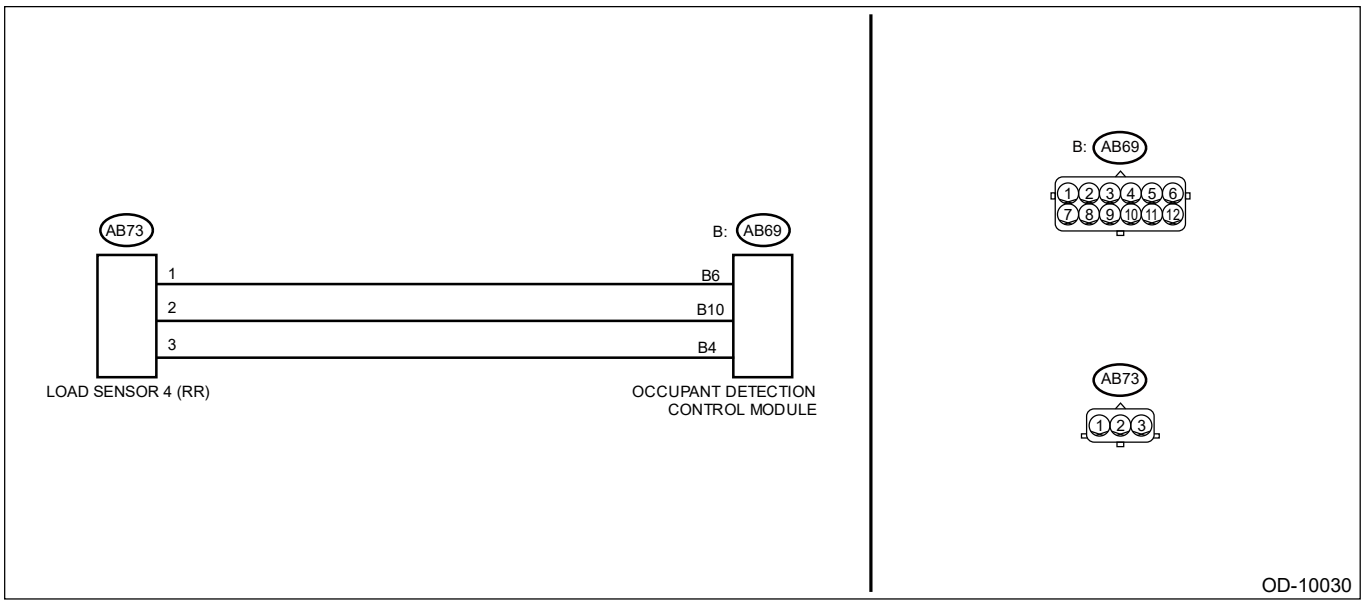
Is DTC B1781 displayed? (Current malfunction)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1782 REAR RIGHT OCCUPANT DETECTION SENSOR

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Occupant detection sensor malfunction
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is any of DTC B1771, B1788, B178A or B1795 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1771, B1788, B178A or B1795. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB69) from occupant detection control module.
3. Disconnect connector (AB73) from the load sensor RR.
4. Using a tester, measure the resistance between occupant detection control module connector and load sensor RR connector.

Caution:

Connect the terminal in test harness BC to connector (AB69) and connector (AB73) terminals, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 4 — (AB73) No. 3:
(AB69) No. 10 — (AB73) No. 2:
(AB69) No. 6 — (AB73) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Replace the seat harness.

3. CHECK SEAT HARNESS (SHORTED BETWEEN LINES AND SHORTED TO GROUND).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB69) No. 4 — All terminals other than (AB69) No. 4:
(AB69) No. 10 — All terminals other than (AB69) No. 10:
(AB69) No. 6 — All terminals other than (AB69) No. 6:
(AB69) No. 4 — Chassis ground:
(AB69) No. 10 — Chassis ground:
(AB69) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the seat harness.

4. CHECK SEAT HARNESS (BATTERY SHORT).

1. Connect the battery ground terminal and turn the ignition switch to ON.
2. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

Caution:

Connect the terminal in test harness BC to connector (AB69) and connector (AB73) terminals, and apply the tester to test harness BC.

Connector & terminal

(AB69) No. 4 (+) — Chassis ground (−):
(AB69) No. 10 (+) — Chassis ground (−):
(AB69) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Replace the seat harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Check for poor contact in occupant detection control module connector and load sensor connector.
3. Disconnect the test harness BC, and connect all the connectors.
4. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1782 displayed? (Current malfunction)

Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Finish the diagnosis.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Load sensor detects a collision.
Trouble symptom:
Occupant judgment of occupant detection control module stops.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK AIRBAG SYSTEM OPERATION.

Check the operation status of the airbag system.

Is there any airbag system operated?

Yes	Replace the seat assembly. Ref. to SEATS>Front Seat. Perform inspection referring to inspection part after collision. Ref. to AIRBAG SYSTEM>Inspection Locations after a Collision.
No	Go to 2.

2. PERFORM [Rezero].

Perform [Rezero]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.

Is [Rezero] completed?

Yes	Go to 3.
No	Perform operation according to an error code displayed when [Rezero] fails. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero>LIST.

3. CHECK OCCUPANT DETECTION CONTROL MODULE.

1. Using the Subaru Select Monitor, perform the clear memory of [Occupant Detection]. Ref. to COMMON(diag)>Clear memory.



2. Execute the inspection mode. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Inspection Mode.
3. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1783, B1784, B1785 or B1786 displayed? (Current malfunction)

Yes	Replace the occupant detection control module.
No	Currently, it is normal.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1784 FRONT RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Note:

For details on DTC B1784, refer to DTC B1783. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1785 REAR LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Note:

For details on DTC B1785, refer to DTC B1783. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1786 REAR RIGHT OCCUPANT DETECTION SENSOR COLLISION DETECTION

Note:

For details on DTC B1786, refer to DTC B1783. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1783 FRONT LEFT OCCUPANT DETECTION SENSOR COLLISION DETECTION.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1787 VEHICLE SPEED INFORMATION

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- VDC malfunction
- CAN communication failure
- Occupant detection control module malfunction

Trouble symptom:

Occupant judgment of occupant detection control module stops.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1787 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

DTC Check

Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
No	Go to 3.

3. CHECK VDC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC related to vehicle speed displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Replace the occupant detection control module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
Occupant detection control module malfunction
Trouble symptom:
Occupant judgment of occupant detection control module stops.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any of DTC 177F, B1780, B1781 or B1782 displayed? (Current malfunction)

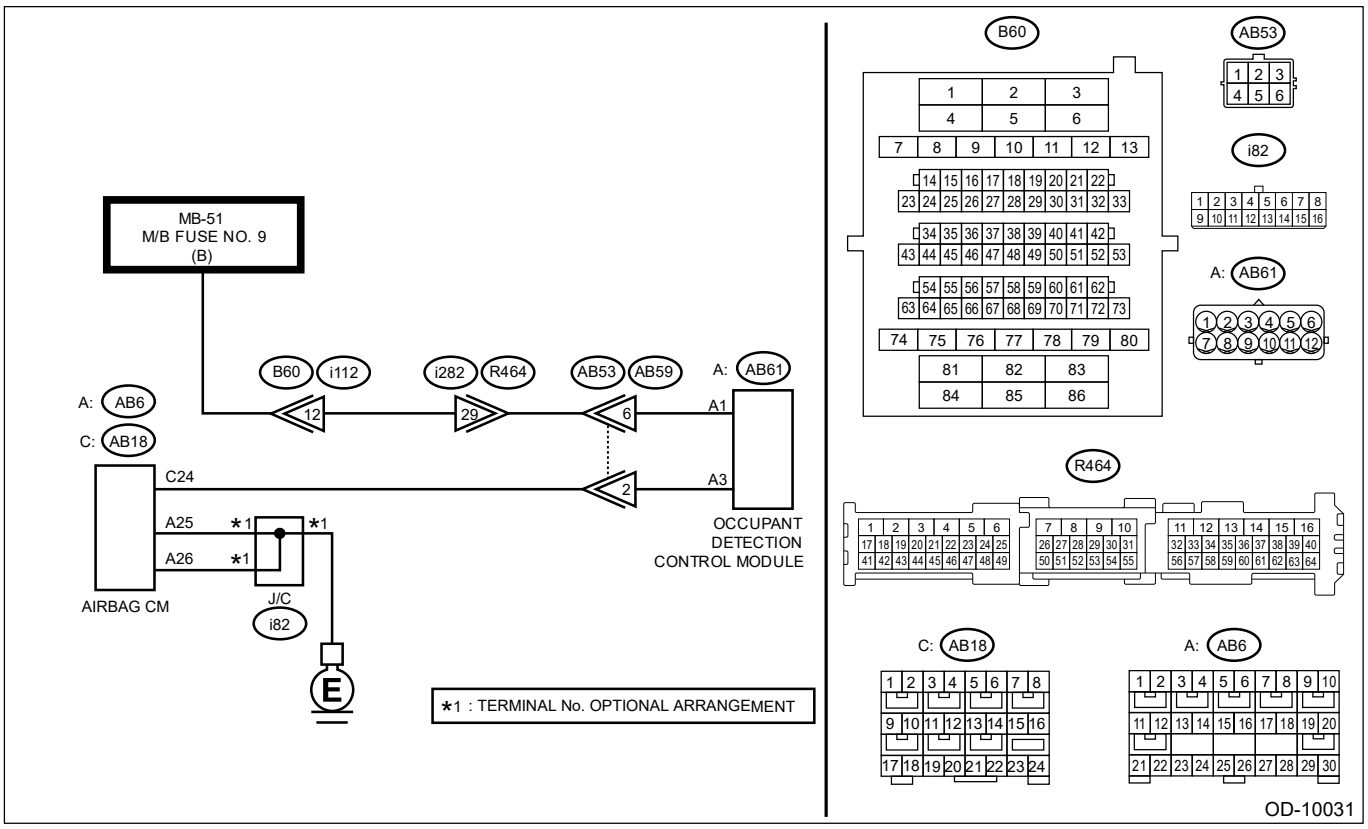
Yes	Replace the cushion frame assembly. Ref. to SEATS>Front Seat.
No	Replace the occupant detection control module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1789 +B POWER SUPPLY

Diagnosis start condition:
When the ignition voltage is 10 V — 16 V
DTC detecting condition:
- Poor contact in harness between occupant detection CM and battery
- Battery malfunction
- Occupant detection control module malfunction

Trouble symptom:
Occupant judgment of occupant detection control module stops.
Wiring diagram:
Occupant detection system Ref. to WIRING SYSTEM>Occupant Detection System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

Note:

Before starting work, prepare two sets of TEST HARNESS BC (98299FL030).

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK FUSE.

Check the fuse of occupant detection control module.

Is the fuse OK?

Yes	Go to 3.
No	Replace the fuse. If the replaced fuse blows out easily, repair or replace the short circuit in the harness between battery and occupant detection control module.

3. CHECK OCCUPANT DETECTION CONTROL MODULE CONNECTOR.

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Confirm that the connector of the occupant detection control module (AB61) is securely connected.

Is the connector of the occupant detection control module securely connected?

Yes	Go to 4.
No	Reconnect the connector of the occupant detection control module.

4. CHECK HARNESS (OPEN CIRCUIT BETWEEN BATTERY AND OCCUPANT DETECTION CONTROL MODULE).

1. Disconnect the connector (AB61) of occupant detection control module.
2. Connect the battery ground terminal and turn the ignition switch to ON.
3. Using a tester, measure the voltage between occupant detection control module connector and chassis ground.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

Connector & terminal

(AB61) No. 1 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Go to 5.

5. CHECK HARNESS (OPEN CIRCUIT BETWEEN BATTERY AND REAR HARNESS).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Disconnect the connector (AB59) of seat harness.
3. Connect the connector (1AB) in the test harness AB to the connector (AB53).
4. Connect the battery ground terminal and turn the ignition switch to ON.
5. Using a tester, measure the voltage between connector (2AB) in test harness AB and chassis ground.

Connector & terminal

(2AB) No. 6 (+) — Chassis ground (-):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Check rear harness, instrument panel wiring harness, bulkhead wiring harness in this order, and replace the faulty harness.

6. CHECK SEAT HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect the connector (1BB) in the test harness BB to the connector (AB59).
3. Using a tester, measure the resistance between occupant detection control module connector and connector (2BB) in test harness BB.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

Connector & terminal

(AB61) No. 1 — (2BB) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Replace the seat harness.

7. CHECK SEAT HARNESS (SHORT).

Using a tester, measure the resistance between occupant detection control module connector and chassis ground, and between occupant detection control module connector terminals.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC. Two sets of test harness BC are required.

Connector & terminal

(AB61) No. 1 — Chassis ground:

(AB61) No. 1 — All terminals other than (AB61) No. 1:

Is the resistance 1 MΩ or more?

Yes	Go to 8.
No	Replace the seat harness.

8. CHECK HARNESS (OPEN CIRCUIT BETWEEN OCCUPANT DETECTION CONTROL MODULE AND GROUND).

1. Turn the ignition switch to OFF, disconnect the battery ground terminal, and wait 60 seconds or more.
2. Connect all the connectors other than (AB61) of occupant detection control module.
3. Using a tester, measure the resistance between occupant detection control module connector (AB61) and chassis ground.

Caution:

Connect the terminal in test harness BC to connector (AB69) terminal, and apply the tester to test harness BC.

Connector & terminal

(AB61) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 11.
No	Go to 9.

9. CHECK HARNESS (OPEN CIRCUIT BETWEEN REAR HARNESS AND GROUND).

1. Disconnect the connector (AB59) of seat harness.
2. Connect the connector (1AB) in the test harness AB to the connector (AB53).
3. Using a tester, measure the resistance between connector (2AB) in test harness AB and chassis ground.

Connector & terminal

(2AB) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the seat harness.
No	Go to 10.

10. CHECK HARNESS (OPEN CIRCUIT BETWEEN AIRBAG CM AND GROUND).

1. Disconnect the connectors (AB6, AB17, AB18) from airbag control module.
2. Connect the connector (1AG) in the test harness AG to the connectors (AB6, AB17, AB18).
3. Using a tester, measure the resistance between connector (2AG) in test harness AG and chassis ground.

Connector & terminal

(2AG) No. 4 — Chassis ground:

(2AG) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 11.
No	Check for poor contact in grounding point. If faulty, repair it.

11. CHECK POOR CONTACT OF CONNECTORS.

Check for poor contact in the connector of the occupant detection control module.

Is there poor contact?

Yes	Repair or replace the connector. (Replace the harness without repairing the airbag system connector.)
No	Replace the occupant detection control module.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B178A ECU INTERNAL CIRCUIT FAULT

Note:

For details on DTC B178A, refer to DTC B1788. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B178B SEAT FACTORY CALIBRATION UNCOMPLETED

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

Sensor rezero adjustment was not performed at seat factory.

Note:

This DTC is detected only when replacing the occupant detection control module. When this DTC is detected at replacement of passenger's seat, this means that [Rezeroing] for the passenger's seat assembly was not performed at seat factory before shipping. In this case, replace the passenger's seat assembly.

Trouble symptom:

Occupant judgment of occupant detection control module stops.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK OPERATION.

Confirm which one was replaced, occupant detection control module or passenger's seat.

Is it the occupant detection control module that was replaced?

Yes	Perform [Rezeroing]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.
No	Replace the passenger's seat assembly.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B178C VEHICLE FACTORY CALIBRATION UNCOMPLETED

Diagnosis start condition:

When the ignition voltage is 10 V — 16 V

DTC detecting condition:

- [Rezeroing] for the occupant detection system was not performed at vehicle factory.
- [Rezeroing] was not performed after replacing the occupant detection control module.
- [Rezeroing] was not performed after replacing the passenger's seat assembly.

Trouble symptom:

Occupant judgment of occupant detection control module stops.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>General Description>CAUTION.

1. PERFORM [Rezeroing].

1. Perform [Rezeroing]. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Rezero.
2. Using the Subaru Select Monitor, perform the clear memory of [Occupant Detection]. Ref. to COMMON(diag)>Clear memory.



3. Execute the inspection mode. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Inspection Mode.
4. Read the DTC of [Occupant Detection] using the Subaru Select Monitor. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B178C displayed? (Current malfunction)

Yes	Replace the occupant detection control module.
No	[Rezeroing] was not performed.

OCCUPANT DETECTION(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1795 OCCUPANT DETECTION MODULE INTERNAL CIRCUIT

Note:

For details on DTC B1795, refer to DTC B1788. Ref. to OCCUPANT DETECTION(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1788 OCCUPANT DETECTION SENSOR POWER SUPPLY.

CRUISE CONTROL (DIAGNOSTICS)

CC(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Diagnostic Procedure for Subaru Select Monitor Communication
7. Real-time Diagnosis
8. Cancel Code
9. Diagnostic Procedure with Cancel Code
10. Diagnostics with Phenomenon

CRUISE CONTROL (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. CHECK MALFUNCTION INDICATOR LIGHT.

Make sure the malfunction indicator light illuminates.

Does the malfunction indicator light illuminate?

Yes	Go to 6.
No	Go to 3.

3. CHECK CRUISE INDICATOR LIGHT.

Make sure the cruise indicator light blinks.

Does the cruise indicator light blink?

Yes	Go to 8.
No	Go to 4.

4. CHECK CRUISE SWITCH OPERATION.

Check the CRUISE switch operation. (Check the illumination of the CRUISE indicator.)

Is the CRUISE switch turned to ON? (Does the CRUISE indicator illuminate?)

Yes	Go to 5.
No	Go to phenomenon 1. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

5. CHECK CRUISE CONTROL SET OPERATION.

Check the cruise control setting operation.

Can the cruise control be set while driving at 40 km/h (25 MPH) or more?

Yes	Go to 9.
No	Go to 8.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC related to engine or ABS/VDC displayed? (Current malfunction)

Yes	Record the DTC. Go to 7.
No	Go to phenomenon 2. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

7. CHECK FREEZE FRAME DATA.

Using the Subaru Select Monitor, check the Freeze Frame Data or Information in Trouble State.

Was the Freeze Frame Data or Information in Trouble State recorded?

Yes	Record the data. Perform the inspection according to the engine or ABS/VDC related DTC.
No	Perform the inspection according to the engine or ABS/VDC related DTC.

8. CHECK CANCEL CODE.

Read the cancel codes using the Subaru Select Monitor. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Cancel Code.

Note:

- **Do not turn the ignition switch to OFF after the cruise control is deactivated.**
- **Do not operate the cruise control command switch after the cruise control is deactivated.**

If the above is performed, the cancel code will be cleared.

Is a cancel code displayed?

Yes	Perform the diagnosis according to the cancel code. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Cancel Code>LIST.
No	Go to 9.

9. INSPECTION OF SET INDICATOR.

Check the illumination of the SET indicator.

Does the SET indicator illuminate?

Yes	Go to 10.
No	Go to phenomenon 3. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

10. CHECK VEHICLE SPEED IS HELD WITHIN SET SPEED.

Make sure the vehicle speed is held within set speed.

Is the vehicle speed kept within the setting speed ±3 km/h (±2 MPH)? (Confirm that on a level road.)

Yes	Go to 11.
No	Go to phenomenon 4. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

11. CHECK RES/+ OPERATION.

Check the RES/+ switch operation.

Does the vehicle speed increase or return to set speed after RES/+ switch has been pressed?

Yes	Go to 12.
No	Go to phenomenon 5. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

12. CHECK SET/− OPERATION.

Check the SET/− switch operation.

Does the vehicle speed decrease after SET/− switch has been pressed?

Yes	Go to 13.
No	Go to phenomenon 6. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

13. CANCEL OPERATION CHECK.

Check the CANCEL switch operation.

Is the cruise control released after CANCEL switch has been pressed?

Yes	Go to 14.
No	Go to phenomenon 7. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

14. CHECK CRUISE CONTROL RELEASE OPERATION.

Check the cruise control release operation.

Is the cruise control released after brake pedal has been depressed?

Yes	Go to 15.
No	Go to phenomenon 8. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

15. CHECK CRUISE CONTROL RELEASE OPERATION.

Check the cruise control release operation.

Is the cruise control released after shifting to the neutral position?

Yes	Go to 16.
No	Go to phenomenon 9. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

16. CHECK CRUISE CONTROL RELEASE OPERATION.

Check the cruise control release operation.

Is the cruise control released after depressing the clutch pedal?

Yes	Finish the diagnosis.
No	Go to phenomenon 10. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>DIAGNOSTIC PROCEDURE WITH PHENOMENON.

CRUISE CONTROL (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Cruise Control Check List for Interview Date of Vehicle Bring-in Year Month Day</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

CRUISE CONTROL (DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. CRUISE CONTROL

- When performing the entire diagnosis or cruise control diagnosis, first start the engine and wait until initial illumination of the ABS/VDC warning light completes. (If you start the diagnostics before performing the above procedures, the cancel code "43" is recorded and CRUISE indicator does not illuminate even though the CRUISE switch is pressed.)
- When performing diagnosis, observe the legal speed limit on the road.
- The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.
- Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.
- When removing the parts related to cruise control, refer to the caution of the cruise control system. Ref. to CRUISE CONTROL SYSTEM>General Description>CAUTION.

CRUISE CONTROL (DIAGNOSTICS) > General Description

GENERAL DESCRIPTION

The on-board diagnosis function of the cruise control system uses Subaru Select Monitor.
The on-board diagnosis function operates in two categories, which are used depending on the type of problems.

1. Cruise Control Cancel Conditions Diagnosis:
   (1) This category of diagnosis requires actual vehicle driving in order to determine the cause, as when cruise speed is cancelled during driving although cruise cancel condition is not entered.
   (2) Cruise control memory in ECM stores the cancel code which occurred during driving. When there are multiple cancel code, they are shown on the Subaru Select Monitor.
   Caution:
   - **In the cruise control memory, not only the cruise control "cancel" occurred (although the "cancel" operation is not entered by the driver), but also the "cancel" condition input by the driver is stored.**
   - **The latest memory content (latest code) is cleared when ignition switch is turned to OFF. However, memory contents set by the diagnosis of faulty switches related to the system and cruise control will remain as trouble history (memory code) after the ignition switch is turned to OFF.**
2. Real-time diagnosis:
   Real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.
   (1) Vehicle cannot be driven at cruise speed when the problem occurs in the cruise control system or relevant circuits.
   (2) Monitor the signal conditions from switches and sensors.

CRUISE CONTROL (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might affect cruise control problems.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.

CRUISE CONTROL (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

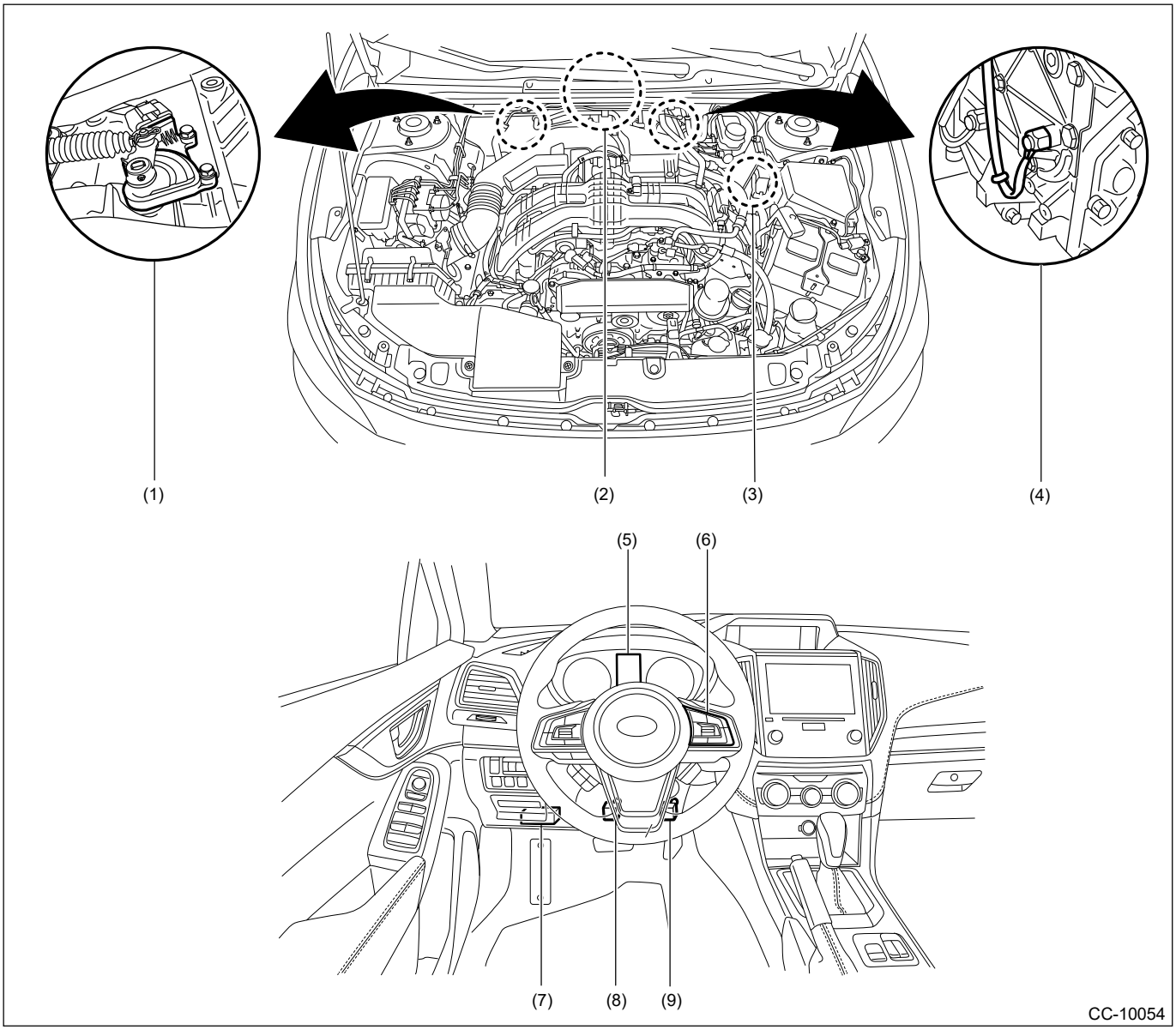
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used for Subaru Select Monitor 4.

CRUISE CONTROL (DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Inhibitor switch (CVT model)
(2) Transmission control module (TCM) (CVT model)
(3) Engine control module (ECM)
(4) Neutral position switch (MT model)
(5) Cruise indicator light and cruise set indicator light
(6) Cruise control command switch
(7) Data link connector
(8) Clutch switch (MT model)
(9) Stop light & brake switch

ELECTRICAL SPECIFICATION

For details on the input/output signals for the engine control module, refer to ENGINE (DIAGNOSTICS).

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:

Cannot communicate with [Engine Control System].

Detecting condition:

- Defective connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Note:

For diagnostic procedure, refer to the diagnosis for the engine.

CRUISE CONTROL (DIAGNOSTICS) > Real-time Diagnosis

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine], and then select [Next].
5. On [Select Function] display, select [Data Monitor].
6. Make sure that normal display is shown when operated as follows:
   - Depress and release the brake pedal. (Stop light switch and brake switch are turned ON.)
   - Turn the “CRUISE” switch to ON.
   - Turn the “CANCEL” switch to ON.
   - Turn the “SET/−” switch to ON.
   - Turn the “RES/+” switch to ON.
   - Depress or release the clutch switch.
   - Place the shift lever in any position other than neutral.

   Note:

   For detailed operation procedures, refer to “Application help”.

CRUISE CONTROL (DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Engine], and then select [Next].
5. Drive vehicle at 40 km/h (25 MPH) or more and set the cruise control.

   Note:

   When performing the entire diagnosis or cruise control diagnosis, first start the engine and wait until initial illumination of the ABS/VDC warning light completes. (If you start the diagnostics before performing the above procedures, the cancel code "43" is recorded and CRUISE indicator does not illuminate even though the CRUISE switch is pressed.)

   Caution:

   - **When performing diagnosis, observe the legal speed limit on the road.**
   - **The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.**
   - **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**
6. When the set speed is canceled by itself (without any cancel operations such as applying brake) or when the cruise control could not be set by performing the setting operation, selecting the [Cancel Code] on the engine malfunction diagnosis screen will display the cancel code on the select monitor display.

   Note:

   The [Current] and [The past] are contained in the cancel code. The latest code recognized during current test drive is displayed in [Current]. Cancel codes resulting from fault diagnosis of switches relating to the system and cruise control are also displayed in [The past].
7. Perform the clear memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory>OPERATION.

   Cancel codes for switches relating to the system and cruise control are deleted by clearing memory on [Engine]. Ref. to COMMON(diag)>Clear memory>OPERATION.

   Note:

   - **The latest code will be cleared by turning ignition switch to OFF.**
   - **For detailed operation procedures, refer to "Application help".**
   - **For details on cancel codes, refer to List of Cancel Code. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Cancel Code>LIST.**

CRUISE CONTROL (DIAGNOSTICS) > Cancel Code

LIST

1. LIST OF CANCEL CODE

Note:

- **The cancel code is registered even when cancel is performed intentionally by the driver.**
- **Cancel codes are cleared if the ignition switch is turned to OFF.**
- **If a different cancel code is input after a cancel code (latest code) has been input, the latest code is overwritten.**
- **If the cruise indicator light is flashing, a malfunction is occurring in the system or cruise control related switch. The cancel code at this time is saved even after ignition switch is OFF as a memory code of a past malfunction.**
- **To display a cancel code, use the Subaru Select Monitor to read the code after the cruise control is deactivated during a driving test.**

Code	Description & trouble part	Reference
11	Main switch	This code is displayed without operating the CRUISE switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
12	Stop & Brake switch	This code is displayed without depressing the brake pedal. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12.
13	Clutch switch	This code is displayed without depressing the clutch pedal. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13.
14	Neutral switch	This code is displayed without shifting to neutral position. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14.
15	Cancel switch	This code is displayed without operating the cancel switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>15.
16	Ignition switch	This code is displayed without operating the ignition switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>16.
21	Abnormality of switches when Ignition switch on	This code is displayed when the ignition switch is turned to ON without operating the cruise control command switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>21.
22	Abnormality of change in vehicle speed	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
24	Abnormality of switches related to cruise control	This code is displayed with normal operation. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>24.
31	Abnormal engine speed Signal	Cruise in 2nd shift position or more. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>31.

Code	Description & trouble part	Reference
32	Cruse Control out of Range	This code is displayed, though the vehicle speed is increased to the speed available for cruise set and set operation was performed again. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>32.
34	Prohibition of cruise control at continuing big Accel. angle	This code is displayed when driving for a long period of time at higher speed than appropriate cruise set vehicle speed by operating accelerator pedal. In this case, the cruise setting is deactivated. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>34.
35	Prohibition of cruise control at vehicle speed F/B malfunction	This code is displayed when driving condition is not suitable for cruise control. Eliminate the probable cause, and perform the cruise set operation again. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>35.
41	VDC/TCS Operating	This code is displayed when driving condition is not suitable for cruise control. Eliminate the probable cause, and perform the cruise set operation again. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>41.
43	ABS/VDC Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>43.
44	Body Integrated unit Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>44.
45	Meter Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>45.
49	TCM Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>49.
61	Brake Switch Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>61.
62	Neutral Switch Failure	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>62.
63	Abnormality 1 of change in vehicle speed	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>63.
64	Engine Sensor Failure 1	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>64.
65	Abnormality 1 of switches related to cruise control	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>65.
66	Cruise Control Calculation Error	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>66.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

11

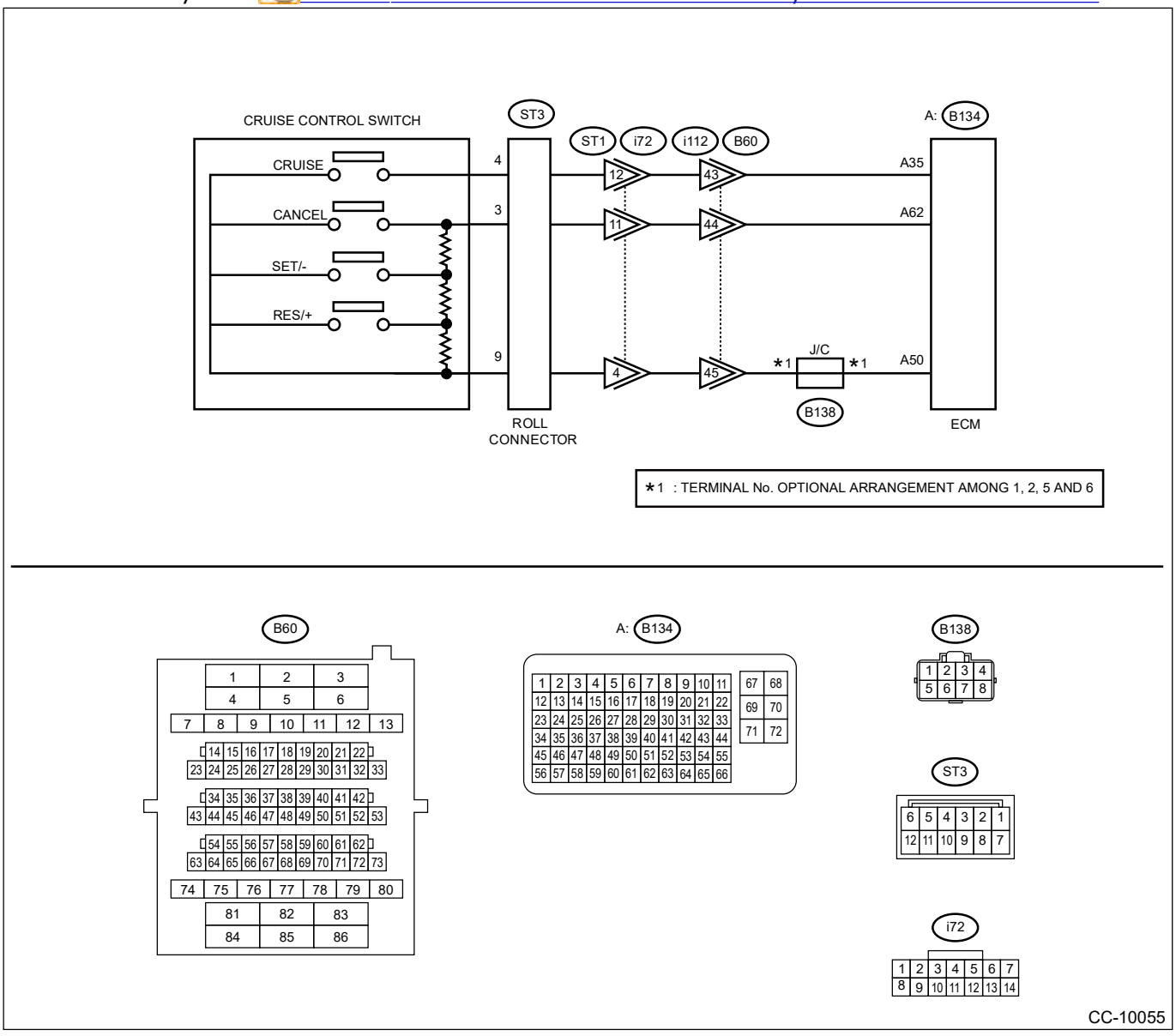
When CRUISE switch is pressed, or a malfunction related to CRUISE switch occurs, this is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Wiring diagram:

Cruise control system Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CRUISE CONTROL COMMAND SWITCH CIRCUIT.

1. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
2. Disconnect the cruise control command switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between connector terminal and chassis ground.
   Connector & terminal
   (ST3) No. 3 (+) — Chassis ground (−):
   (ST3) No. 4 (+) — Chassis ground (−):

Is the voltage 5 V or more?

Yes	Go to 2.
No	Check the harness between cruise control command switch and ECM, and the steering roll connector for open or short circuit, or for poor contact.

2. CHECK CRUISE CONTROL COMMAND SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between cruise control command switch connector and chassis ground.
   Connector & terminal
   (ST3) No. 9 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Check for open circuit between cruise control command switch, ECM, and chassis ground and check the ECM.

3. PERFORM UNIT INSPECTION OF CRUISE CONTROL COMMAND SWITCH.

Measure the resistance between switch terminals when the cruise control command switch is not depressed.

Terminals

No. 3 — No. 9:

Is the resistance approx. 4 kΩ?

Yes	Go to 4.
No	Replace the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.

4. PERFORM UNIT INSPECTION OF CANCEL SWITCH.

1. Turn the ignition switch to OFF.
2. Remove the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.
3. Measure the resistance between switch terminals with the CANCEL switch pressed.

   Terminals

   No. 3 — No. 9:

Is the resistance approx. less than 1 Ω when the CANCEL switch is pressed?

Yes	Go to 5.
No	Replace the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.

5. PERFORM UNIT INSPECTION OF SET/− SWITCH.

Measure the resistance between the switch terminals with the SET/− switch pressed.

Terminals

No. 3 — No. 9:

Is the resistance approx. 250 Ω when the SET/− switch is pressed?

Yes	Go to 6.
No	Replace the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.

6. CHECK RES/+ SWITCH CIRCUIT.

Measure the resistance between the switch terminals with the RES/+ switch pressed.

Terminals

No. 3 — No. 9:

Is the resistance approx. 1,500 Ω when the RES/+ switch is pressed?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

12

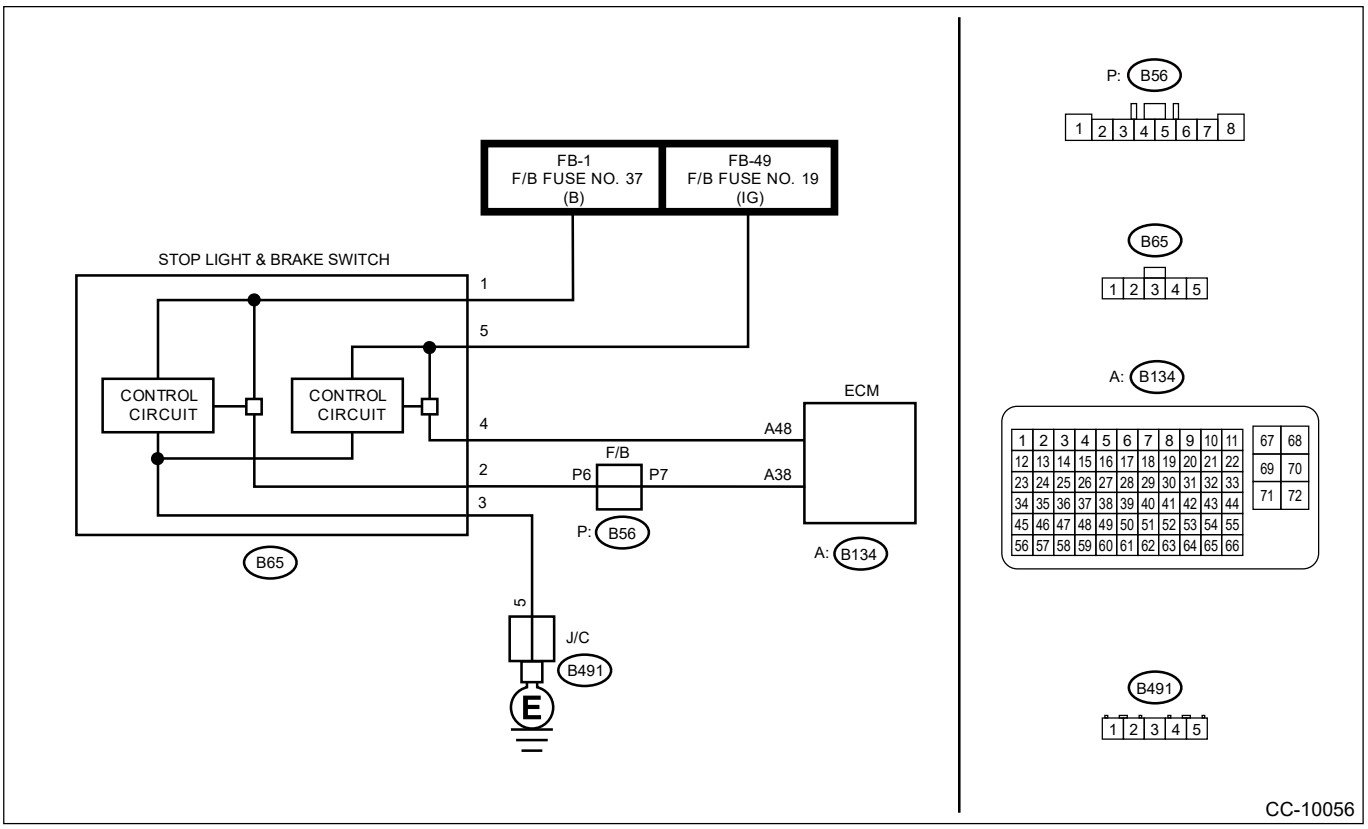
Detected when the brake pedal is depressed, or the error related to the stop light & brake switch occurred.

Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

Wiring diagram:

Cruise control system Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. PERFORM UNIT INSPECTION OF STOP LIGHT & BRAKE SWITCH.

Check the stop light & brake switch. Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.

Are the check results for the stop light & brake switch unit, and installation position OK?

Yes	Go to 2.
No	Replace the stop light & brake switch. Or adjust the installation position.

2. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light & brake switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the stop light & brake switch connector and chassis ground.
   Connector & terminal
   (B65) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	• Check fuse No. 37 (fuse & relay box). • Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

3. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

Measure the voltage between the stop light & brake switch connector and chassis ground.
Connector & terminal
(B65) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	• Check fuse No. 19 (fuse & relay box). • Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

4. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance between the ECM connector and stop light & brake switch connector.
   Connector & terminal
   (B65) No. 4 — (B134) No. 48:
   (B65) No. 2 — (B134) No. 38:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the harness.

5. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Connect the stop light & brake switch connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground both when the brake pedal is depressed and when not depressed.
   Connector & terminal
   (B134) No. 48 (+) — Chassis ground (−):
   (B134) No. 38 (+) — Chassis ground (−):

Does the voltage appear in (B134) No. 42 when the brake pedal is depressed? (0 V when the brake pedal is not depressed)
Does the voltage appear in (B134) No. 44 when the brake pedal is not depressed? (0 V when the brake pedal is depressed)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the stop light & brake switch. Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

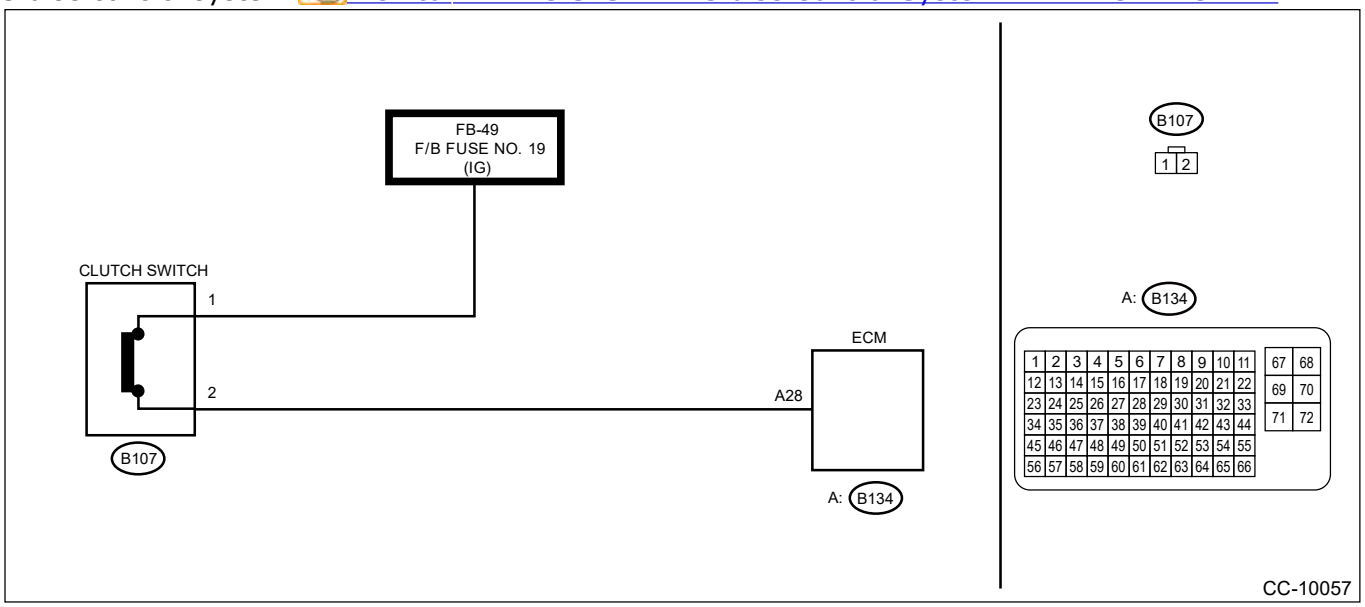
13

Detected when clutch pedal is depressed or malfunction related to clutch switch occurs.
Trouble symptom:
- Cruise control cannot be set.

- Cruise control cannot be released.

Wiring diagram:

Cruise control system Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. PERFORM UNIT INSPECTION OF CLUTCH SWITCH.

Check the clutch switch. Ref. to CRUISE CONTROL SYSTEM>Clutch Switch.

Is the check result of the clutch switch unit and installation position OK?

Yes	Go to 2.
No	Replace the clutch switch. Or adjust the installation position.

2. CHECK CLUTCH SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the clutch switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between the clutch switch connector and chassis ground.
   Connector & terminal
   (B107) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	• Check the fuse No. 19 (fuse & relay box). • Check open or shorted circuit of harness between clutch switch and fuse & relay box.

3. CHECK CLUTCH SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance between clutch switch connector and ECM connector.
   Connector & terminal
   (B107) No. 2 — (B134) No. 28:

Is the resistance less than 10 Ω?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Repair the harness.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

14

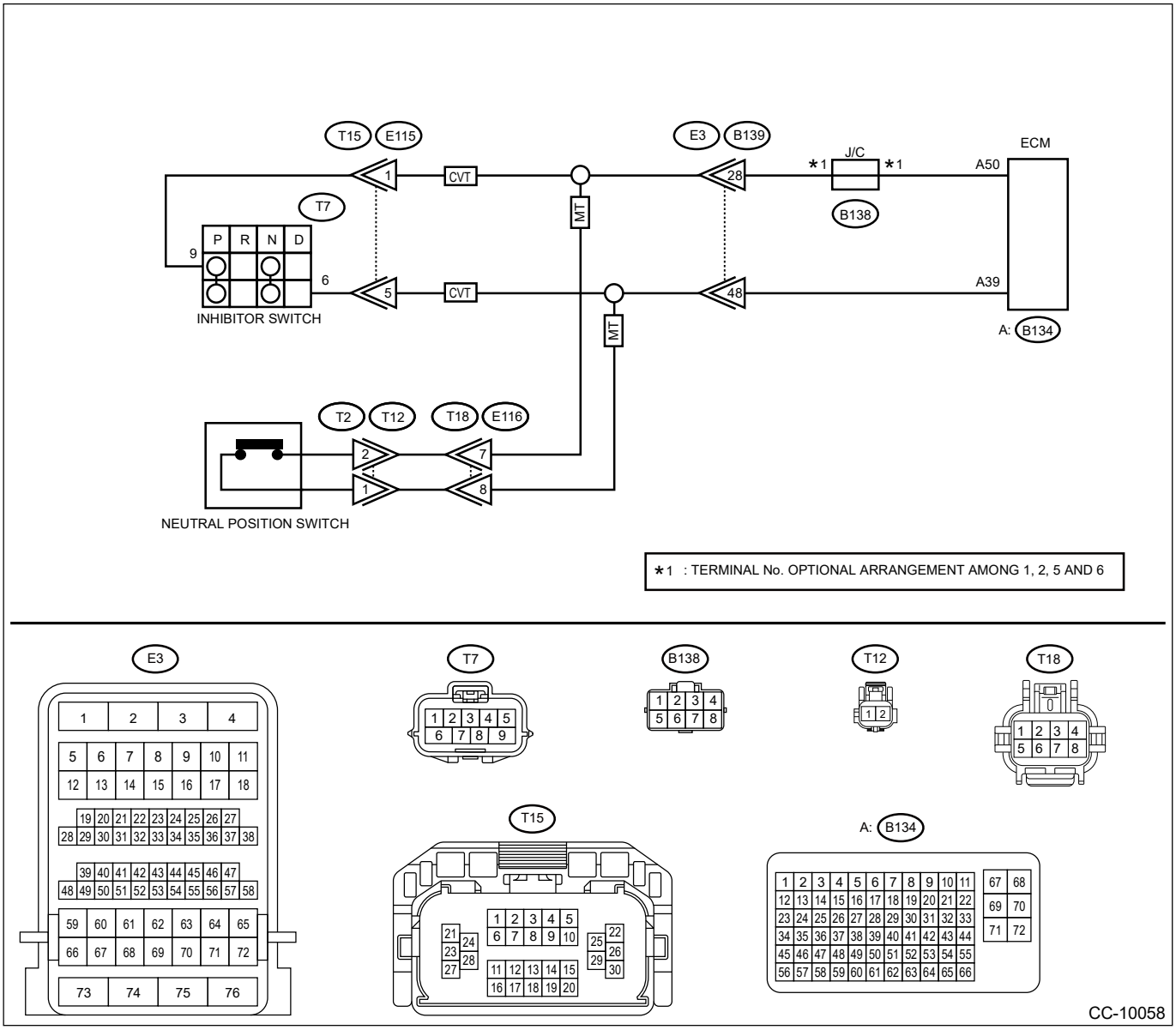
Detected when the select lever is shifted to the neutral position, or when an error related to the neutral position switch occurs.

Trouble symptom:

Cruise control cannot be set.

Wiring diagram:

Cruise control system Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK TRANSMISSION TYPE.

Is the transmission type CVT?

Yes	Go to 2.
No	Go to 5. (MT model)

2. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the inhibitor switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between inhibitor switch connector and chassis ground.
   Connector & terminal
   (T7) No. 6 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Check for open or short circuit in the harness between inhibitor switch connector and ECM.

3. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance between inhibitor switch connector and ECM.
   Connector & terminal
   (T7) No. 9 — (B134) No. 50:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair the harness.

4. PERFORM UNIT INSPECTION OF INHIBITOR SWITCH.

Remove and check the inhibitor switch. Ref. to CRUISE CONTROL SYSTEM>Inhibitor Switch.

Is the inhibitor switch OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the inhibitor switch.

5. CHECK NEUTRAL POSITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the neutral position switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between neutral position switch connector and chassis ground.
   Connector & terminal
   (T12) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Check for open or short in the harness between neutral position switch and ECM.

6. CHECK NEUTRAL POSITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance between neutral position switch connector and ECM.
   Connector & terminal
   (T12) No. 2 — (B134) No. 50:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Repair the harness.

7. PERFORM UNIT INSPECTION OF NEUTRAL POSITION SWITCH.

Remove and check the neutral position switch. Ref. to CRUISE CONTROL SYSTEM>Neutral Position Switch.

Is the neutral position switch OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the neutral position switch.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

15

Detected when CANCEL switch is pressed or malfunction related to CRUISE switch occurs.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.

Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

16

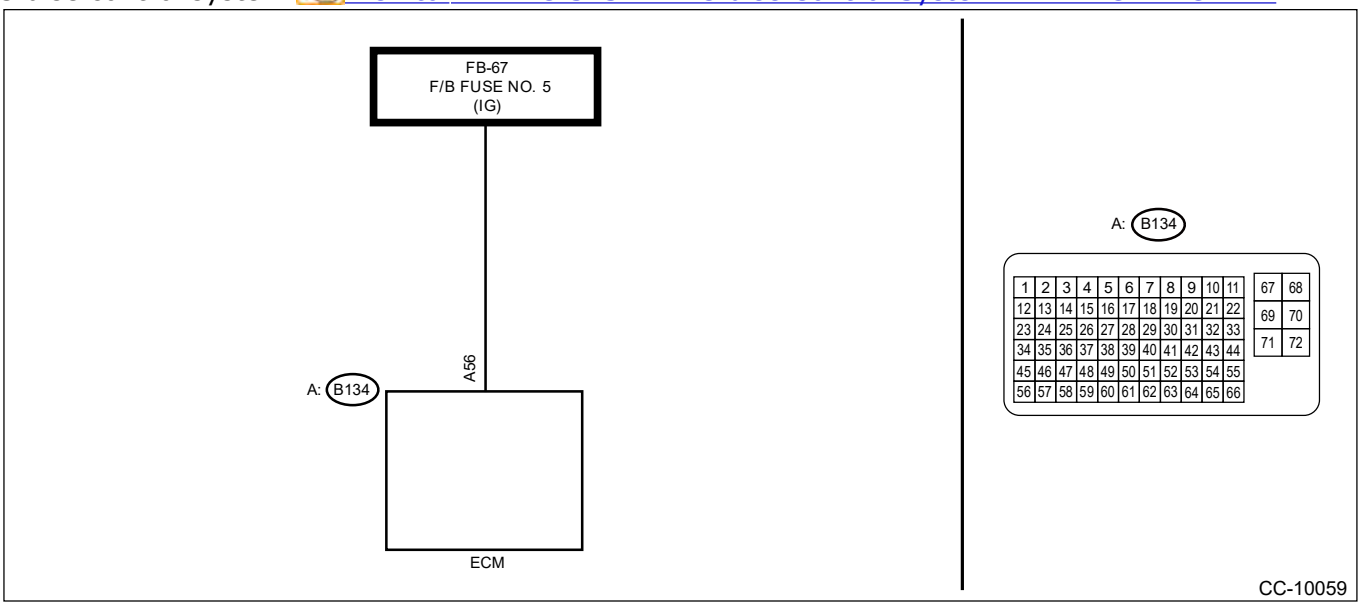
Detected when ignition switch is turned to OFF or malfunction related to the ignition switch occurs.

Trouble symptom:

Cruise control cannot be set.

Wiring diagram:

Cruise control system Ref. to WIRING SYSTEM>Cruise Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK IGNITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between ECM connector and chassis ground.
   Connector & terminal
   (B134) No. 56 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Check for poor contact of ECM connector.
No	• Check fuse No. 5 (fuse & relay box). • Check the harness for open or short circuit between ignition switch and ECM.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

21

Cruise control command switch malfunction is detected.
Trouble symptom:
- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

22

Malfunction related to vehicle speed sensor is detected.
Diagnosis:
Open or short circuit in the vehicle speed sensor system.
Trouble symptom:
Cruise control cannot be set. (Cancelled immediately.)
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK ABS OR VDC WARNING LIGHT.

1. Turn the ignition switch to ON.
2. After the initial operation of the combination meter finished, check if the ABS or VDC warning light stays illuminated.

Does the warning light stay illuminated?

Yes	Check the VDCCM. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 2.

2. CHECK DTC OF LAN COMMUNICATION CIRCUIT.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC displayed?

Yes	Perform inspection according to the displayed DTC.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

24

Switch malfunction related to cruise control is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.

Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

31

Malfunction related to engine speed signal is detected.

Abnormal increase of engine speed is detected.

Gear is placed in 1st (only for MT vehicles) or Reverse position.
Drive with the gear in 2nd position or higher, and perform the cruise setting again. It is normal if the cancel code is not detected.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

32

Detected outside the system operation vehicle speed range.
Increase the vehicle speed to the speed available for cruise set and perform the cruise set operation again.
If the cancel code is detected even when the cruise setting is performed again, perform the diagnosis for 22.
Refer to 22 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

34

The vehicle was driven at higher speed than the set vehicle speed for a long time (approximately 10 minutes) during cruise driving.
The cancel code is detected when the vehicle was driven for a long time at the higher speed than the speed available for cruise set through the accelerator operation.
Perform the cruise setting again. It is normal if the cancel code is not detected.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

35

Detected when the vehicle speed feedback is not possible.
Set vehicle speed cannot be maintained because of some reasons (steep uphill, parking brake forgotten to be returned to the home position, etc.) during cruise driving.
The cancel code is detected when the driving condition is not suitable for cruise control.
Eliminate the probable cause, and perform the cruise set operation again.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

41

VDC/TCS/EPB is operated.
Vehicle dynamics control (VDC) or TCS/EPB is operated during cruise driving or cruise setting. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

43

- Detected that part or all of the functions of ABS/VDC are not able to function.
  Detected that part or all of the functions of ABS/VDC are not able to function during cruise driving or cruise set operation. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.
- CRUISE indicator does not illuminate even though you pressed the CRUISE switch before starting the

engine.
Detected when the CRUISE switch is pressed during the initial diagnosis of ABS/VDC. It is normal if the CRUISE indicator illuminates when you press the CRUISE switch again after starting the engine and confirming that the initial illumination of the ABS/VDC warning light has been ended.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

44

Body integrated unit malfunction is detected.
Body integrated unit malfunction is detected during cruise driving or cruise setting operation.
Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

45

Combination meter malfunction is detected.
Combination meter malfunction is detected during cruise driving or cruise setting operation.
Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

49

Automatic transmission malfunction is detected.
Automatic transmission malfunction is detected during cruise driving or cruise setting operation. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

61

Malfunction in the stop light & brake switch is detected.
Trouble symptom:
- Cruise control cannot be set.
- Cruise control cannot be released.

Refer to 12 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

62

Neutral position switch malfunction is detected.
Trouble symptom:
Cruise control cannot be set.
Refer to 14 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

63

Malfunction of vehicle speed signal variation is detected.
Trouble symptom:
Cruise control cannot be set. (Cancelled immediately.)
Refer to 22 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
Note:
This cancel code may be detected when the vehicle suddenly started with VDC OFF on low μ road surface. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

64

- Malfunction related to engine is detected.
- Abnormal decrease in engine speed is detected during cruise driving.

If the malfunction indicator light remains on or blinks, perform the diagnosis for engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.
If the malfunction indicator is not remaining on/blinking, this cancel code may be detected due to malfunction of the ECM. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal. (Temporary malfunction)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

65

Cruise control command switch malfunction is detected.
When the command switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.
Trouble symptom:
- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.
Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

66

- Cruise control calculation malfunction is detected.
- Abnormal increase in target cruising vehicle speed is detected.
- Abnormal condition is detected in which cruise control is not deactivated even after the brake pedal is depressed.

If the malfunction indicator light remains on or blinks, perform the diagnosis for engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.
If the malfunction indicator is not remaining on/blinking, this cancel code may be detected due to malfunction of the ECM. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal. (Temporary malfunction)

CRUISE CONTROL (DIAGNOSTICS) > Diagnostics with Phenomenon

DIAGNOSTIC PROCEDURE WITH PHENOMENON

Phenomenon		Check Item	Note
1	CRUISE switch is not turned ON. (CRUISE indicator does not illuminate.) Or cruise control was canceled without operating the CRUISE switch.	(1) Perform cruise cancel conditions diagnosis.	Perform the diagnosis according to displayed cancel code.
		(2) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(3) Check the cruise control command switch.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
		(4) Check the CRUISE indicator.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.
2	Cruise control cannot be set. Or cruise control is cancelled without releasing operation.	(1) Perform cruise cancel conditions diagnosis.	Perform the diagnosis according to displayed cancel code.
		(2) Perform the real-time diagnosis.	Check the input signal of cruise control system.
		(3) Check the cruise control command switch.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
		(4) Check stop light switch and brake switch.	Ref. to BRAKE>Stop Light Switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12.
		(5) Check clutch switch.	Ref. to CLUTCH SYSTEM>Clutch Switch. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13.
		(6) Check the neutral position switch.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>62.
		(7) Check vehicle speed sensor.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
3	SET indicator does not illuminate.	Check the SET indicator.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostics with Phenomenon>CHECK CRUISE INDICATOR

	Phenomenon	Check Item	Note
			LIGHT AND CRUISE SET INDICATOR LIGHT.
4	Vehicle speed is not held within set speed ±3 km/h (±2 MPH).	Check the vehicle speed sensor.	Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>22.
5	Vehicle speed does not increase or does not return to set speed after RES/+ switch has been pressed.	(1) Perform the real-time diagnosis. (2) Check the RES/+ switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
6	Vehicle speed does not decrease after SET/− switch has been pressed.	(1) Perform the real-time diagnosis. (2) Check the SET/− switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
7	Cruise control is not released after CANCEL switch has been pressed.	(1) Perform the real-time diagnosis. (2) Check the CANCEL switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>11.
8	Cruise control is not released after brake pedal has been depressed.	(1) Perform the real-time diagnosis. (2) Check stop light switch and brake switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>12. Ref. to BRAKE>Stop Light Switch>INSTALLATION.
9	Cruise control is not released after shifting to the neutral position.	(1) Perform the real-time diagnosis. (2) Check the neutral position switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>14. Ref. to CRUISE CONTROL SYSTEM>Neutral Position Switch.
10	Cruise control is not released after clutch pedal has been depressed.	(1) Perform the real-time diagnosis. (2) Check clutch switch.	Check the input signal of cruise control system. Ref. to CRUISE CONTROL (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>13. Ref. to CLUTCH SYSTEM>Clutch Switch>INSTALLATION > CLUTCH SWITCH.

CRUISE CONTROL (DIAGNOSTICS) > Diagnostics with Phenomenon

CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT

Trouble symptom:
Cruise control can be set, but the CRUISE indicator and SET indicator do not illuminate.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to CRUISE CONTROL (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CRUISE INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.

Using the Subaru Select Monitor, perform [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.
- [CRUISE indicator]
- [SET indicator]

Do the CRUISE & SET indicators illuminate?

Yes	Go to 2.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is LAN system OK?

Yes	Perform the inspection according to the diagnosis for LAN system.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

EyeSight (DIAGNOSTICS)

ES(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Real-time Diagnosis
12. Clear Active Lane Keep System Learning Value
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. EyeSight HALT Code
16. ACC Cancel Code(s) Display
17. Lane Departure Prevention Assist Deactivate Code(s) Display
18. ECM Cancel Code(s) Display
19. Diagnostic Procedure with ECU Cancel Code
20. Diagnostics with Phenomenon

PROCEDURE

Caution:

- **Start the diagnosis after the engine has started. (Cruise control main switch does not turn on even if it is pressed before the engine starts.)**
- **When performing diagnosis, observe the legal speed limit on the road.**
- **ECM cancel code, ACC cancel code and lane keep assist code are not the diagnostic trouble codes (DTCs). These codes will also appear when the cruise control or the active lane keep is cancelled by the driver's operation. Do not confuse them.**
- **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**
- **Be sure to record the following data before performing the Clear Memory. (Data must be obtained before inspection because the Clear Memory operation deletes previous faults and temporary stop history.)**
  - **– All diagnostic trouble codes (DTCs)**
  - **– DTC of stereo camera (current malfunction, past malfunction)**
  - **– Freeze frame data of stereo camera**
  - **– ACC cancel code of stereo camera**
  - **– Lane keep assist code of stereo camera**
  - **– EyeSight temporary stop code of stereo camera**
  - **– Data monitor of stereo camera**
    (To obtain the data concerning camera adjustment information, previous trouble or temporary stop history, all data must be measured for two — three seconds after the engine has started.)
- **When a temporary stop occurs, stereo camera may be affected by a small amount of dirt that would not be perceived by the driver. In this case, cleaning the windshield glass is effective. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.**

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to EyeSight (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [EyeSight].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to EyeSight (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

EyeSight (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

Writer/Inspector	Writer's name		
	Inspector's Name		
Vehicle information	Car accessory equipment condition	Car accessory is installed to the windshield glass.	No/Yes (Position:)
		Other	No/Yes (Accessory's name:)
	Is there any modification for the following items?	Suspension?	Not changed / Changed (Specifically:)
		Headlight?	Not changed / Changed (Specifically:)
		Tire size?	Not changed / Changed (Specifically:)
		Front wiper?	Not changed / Changed (Specifically:)
	How is the condition around camera?	Is there any scratch or damage on the windshield glass?	No/Yes (Specifically:)
		Are antennas, etc. attached on the prohibited area?	No/Yes (Specifically:)
		Is wide mirror or accessory attached?	No/Yes (Specifically:)
	How is the surface condition of the windshield glass?	Presence of oil film, fogging, dirt and/or glass coating	No/Yes (Specifically:)
	How is the condition of the dashboard?	Is there anything that can be easily reflected against the windshield glass on the dashboard?	No/Yes (Specifically:)
	How is the deterioration of the wiper?	Does any streak or uneven wiping area remain in front of the camera?	No/Yes (Specifically:)

	How is the condition of the tire?	Is there any wear? Is there any excessive wear difference?	No/Yes (Specifically:)
		Is the air pressure proper?	Proper/Improper (Specifically:)
	How is the condition of the camera lens filter?	Is there finger print adhesion or cracks on the lens filter?	No/Yes (Specifically:)
Description of malfunction	What kind of malfunction has been detected?	Failure/temporary stop/faulty operation of adaptive cruise control/faulty operation of pre-collision brake/other faulty operations	
	What kind of DTC and/or cancel code is displayed?		
	How is the meter display?	EyeSight warning light	Off/On/Blink
		Pre-collision brake OFF indicator light	Off/On
		Lane departure warning OFF indicator light	Off/On
		Multi information display	• {Temporary stop Camera view defectiveness} • {Temporary stop Camera temperature range outside} • {Temporary stop}

Occurrence conditions	Occurrence date		Occurrence location	
	Vehicle speed at occurrence	Approx. km/h (MPH)	Occurrence timing	During driving / during stopping / continues after engine has started
	Road type	Express way / limited highway / main highway / general road	Weather	Fine/cloudy/rainy/snowy/other
	Road condition ①	Dry/slippery (Rainy • compacted snow • icy road)	Ambient air temperature	Approx. ° C(°F)
	Road condition ②	Asphalt / gravel / earth and sand / other	Position of solar radiation	Described in the detailed chart when the weather is fine.

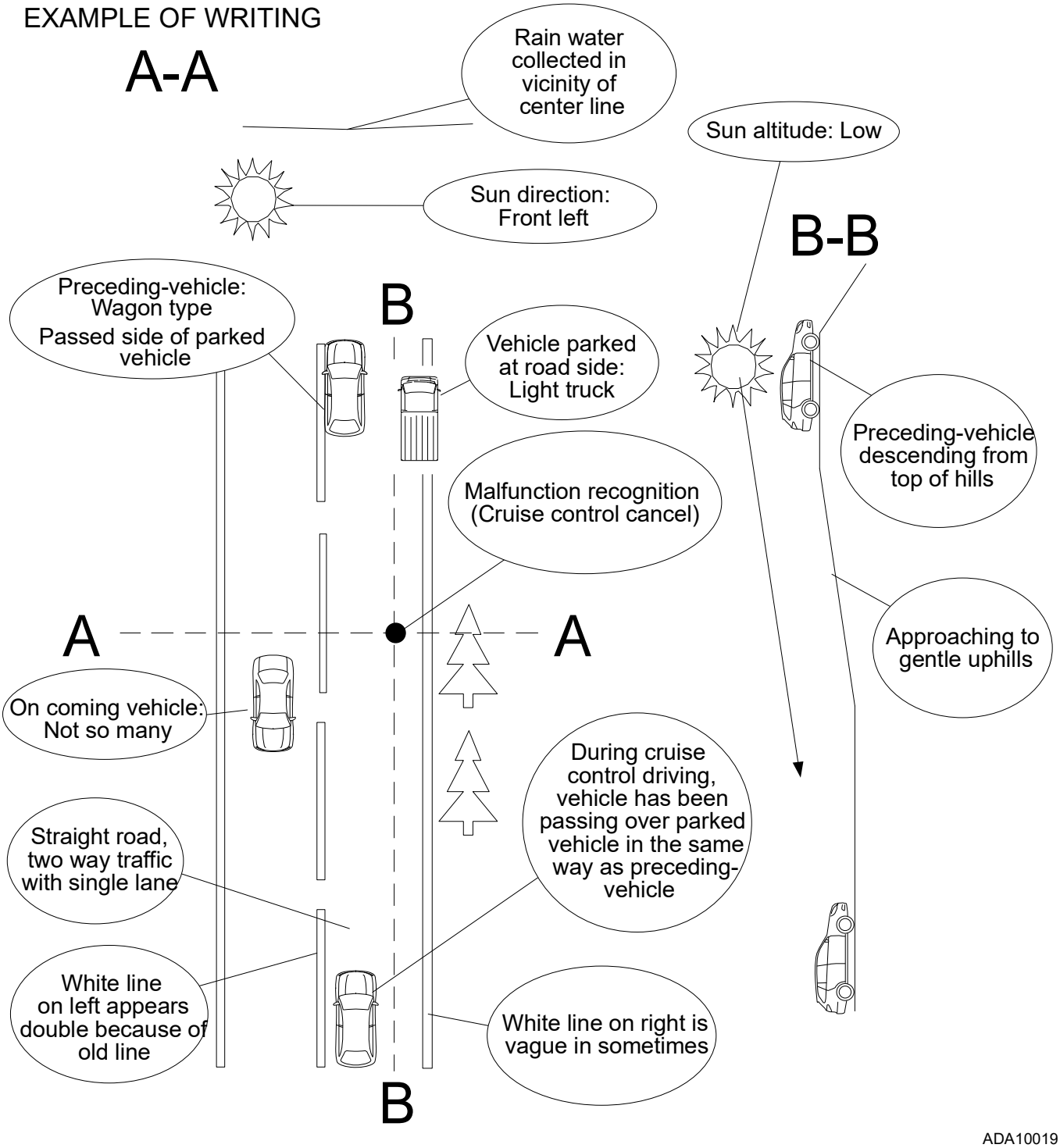
Road shape	Uphill / downhill / bank / roll / uneven surface	Time elapsed after engine start	Immediately after engine start/within 5 minutes after engine start/more than 5 minutes after engine start
Wiper operation status	OFF/INT /LO/HI/AUTO	Light on status	Off / LO On / HI On
Curb weight	Number of passengers: ( ), Did the vehicle carry heavy load? (No/Yes (Approx. kg))		
Detailed chart (Refer to the example of description.)			

In case of malfunction caused by temporary stop or faulty operation, describe the details by referring to the example below so that the following conditions can be recognized. (Images taken with a digital camera, etc. are acceptable.)

- Road shape (straight, curve, tunnel, number of lane, etc.)
- Road grade and it’s change
- Presence of white line, guardrails and/or side wall (degree of clarity)
- Position of the sun
- Presence and shape of preceding vehicle, oncoming vehicle, vehicle running on the next lane or pedestrian

- Presence and shape of surrounding building or structure
- Traveled course of own vehicle and preceding vehicle

EXAMPLE OF WRITING



ADA10019

EyeSight (DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. EYESIGHT

- Do not hold the camera unit of the stereo camera.
- Do not touch the lens on the stereo camera.
- Do not clean the lens of the stereo camera.
- When cleaning the windshield glass, use care so that the glass cleaner, etc. does not come in contact with the lens of the stereo camera.
- Do not make an impact or apply excessive force to the stereo camera.
- Do not disassemble the stereo camera.
- Do not change the installation position of the stereo camera or do not modify the surrounding structure.
- If the stereo camera or windshield glass is removed or replaced, always adjust or check the stereo camera.
- When lifting up the vehicle to rotate the tires, turn off the pre-crash function.
- Stereo camera axis may be displaced even in a minor collision. So be sure to adjust the stereo camera even when the EyeSight warning light is not illuminated or when the "Stereo Camera Temporary Stop" is not displayed on the multi-information display.
- When removing the stereo camera cover assembly, cover it with a copy paper or similar dust-free paper to avoid any interference to the camera lens, and tape the paper while being careful not to let the adhesive surface contact the glass surface. Be sure to remove the paper after the procedure. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > General Description

GENERAL DESCRIPTION

For on-board diagnosis function of the EyeSight, use the Subaru Select Monitor.
The on-board diagnosis function operates in three categories, which are used depending on the type of problems.

1. Diagnosis with diagnostic trouble code (DTC):
   When the electrical failure occurs in the EyeSight, DTC is detected from the stereo camera. If the DTC is detected, the relevant DTC is displayed by illuminating or blinking the EyeSight warning light. To check the details concerning the DTC, use the Subaru Select Monitor.
2. Diagnosis with cancel code and lane keep assist code:
   (1) This category of diagnosis requires actual driving of the vehicle in order to determine the cause in such a case when the set speed is cancelled during cruise control driving or the control is cancelled during active lane keep driving although any cancel condition is not entered.
   (2) With ECM cancel code and stereo camera ACC cancel code, cancel condition (Code No.) is stored when detected during cruise control driving. With lane keep assist code of stereo camera, cancel condition (Code No.) is stored if active lane keeping does not operate or if control cancel occurs

during active lane keep driving.

Caution:

- **With ECM cancel code, not only the cruise control "cancel" occurred (although the driver does not input the "cancel" operation), but also the "cancel" condition input by the driver is stored.**
- **The latest memory contents of the ECM cancel code (latest code) is cleared when the ignition switch is turned to OFF. However, memory contents set by the diagnosis of faulty switches related to the system and cruise control will remain as trouble history (memory code) after the ignition switch is turned to OFF.**

3. Real-time diagnosis:

Real-time diagnosis function is used to determine whether or not the input signal system is in good order, according to signal emitted from switches, sensors, etc.

(1) Vehicle cannot be driven at cruise speed when the problem occurs in the cruise control system or relevant circuits.

(2) Monitor the signal conditions from switches and sensors.

INSPECTION

1. BATTERY

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

2. WINDSHIELD GLASS AND DASHBOARD

Remove the windshield glass and dashboard in front of the stereo camera. Ref. to CAUTION > CHECK WINDSHIELD GLASS INCLUDING PROHIBITED AREA FOR MODEL WITH HBA AND EYESIGHT.

3. REAR VIEW MIRROR

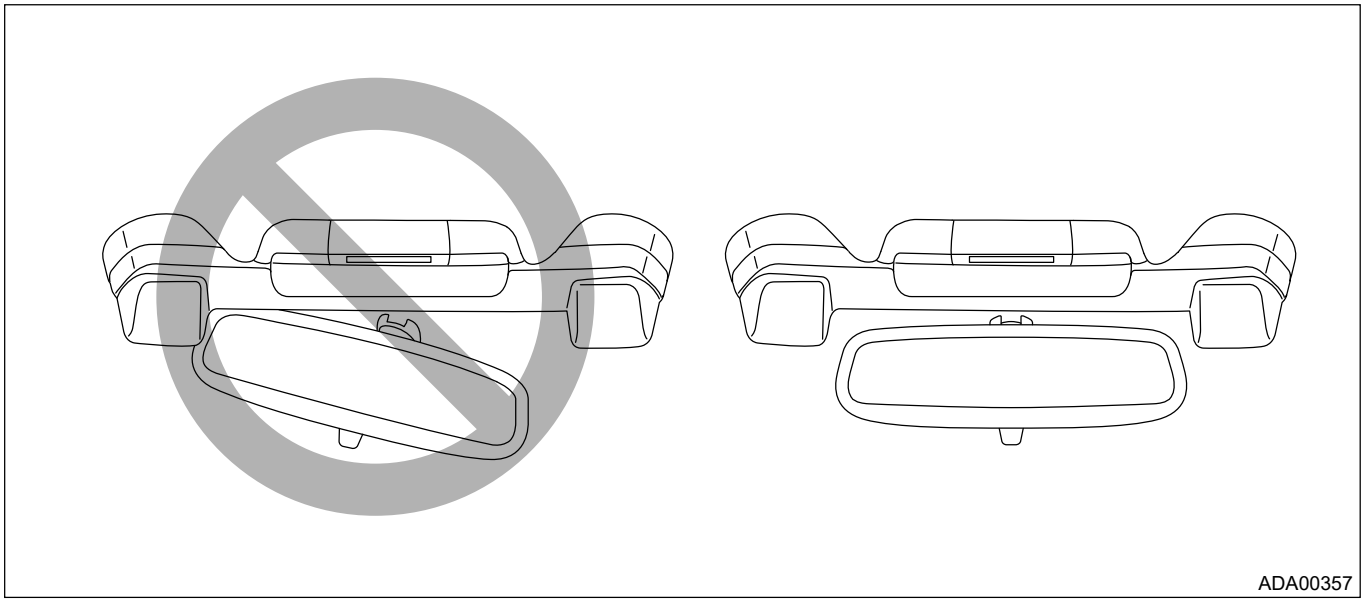
Check the rear view mirror condition.

Standard:

The rear view mirror other than genuine parts shall not be used. (Wide mirrors shall not be used)

The visibility of the stereo camera shall not be blocked.

— This will affect the visibility of the stereo camera, causing the system not to operate correctly.



4. FRONT WIPER

Check the wiping condition of windshield glass.

Standard:

Use Subaru genuine part only for wiper blade body and blade rubber.

— Using the part other than genuine part will affect the recognition of the stereo camera, which may cause the function not to operate correctly.

Do not continue to use damaged blade rubber.

— The windshield glass may be damaged. If the wiping performance decreases or any distinct streak is found, replace it as soon as possible.

Note:

Clean the windshield glass if there is an oil film or any dirt on the surface.

5. TIRE INFLATION PRESSURE

Check the tire air pressure.

Standard:

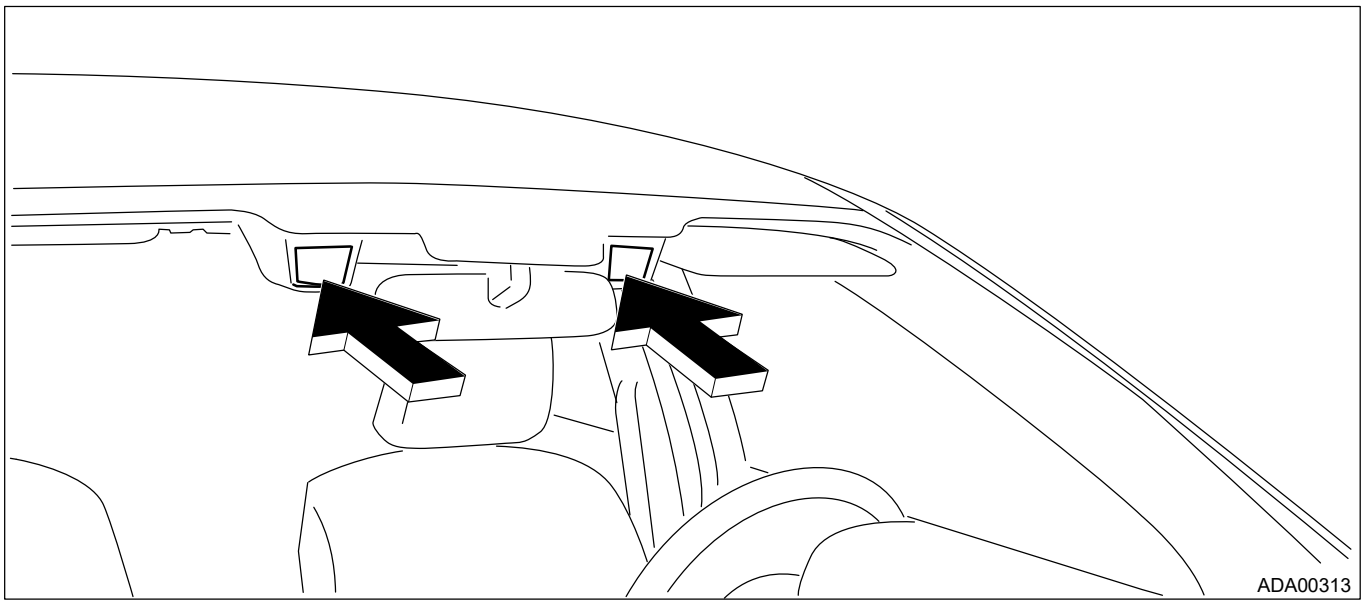
Adjust to the specified air pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.

Do not install worn tire or tires with excessive wear difference.

Install tires with specified size.

6. STEREO CAMERA

Through the windshield glass, check if there are any fingerprints or faults such as crack found on lens filters at the left and right camera lenses of the stereo camera.



Note:

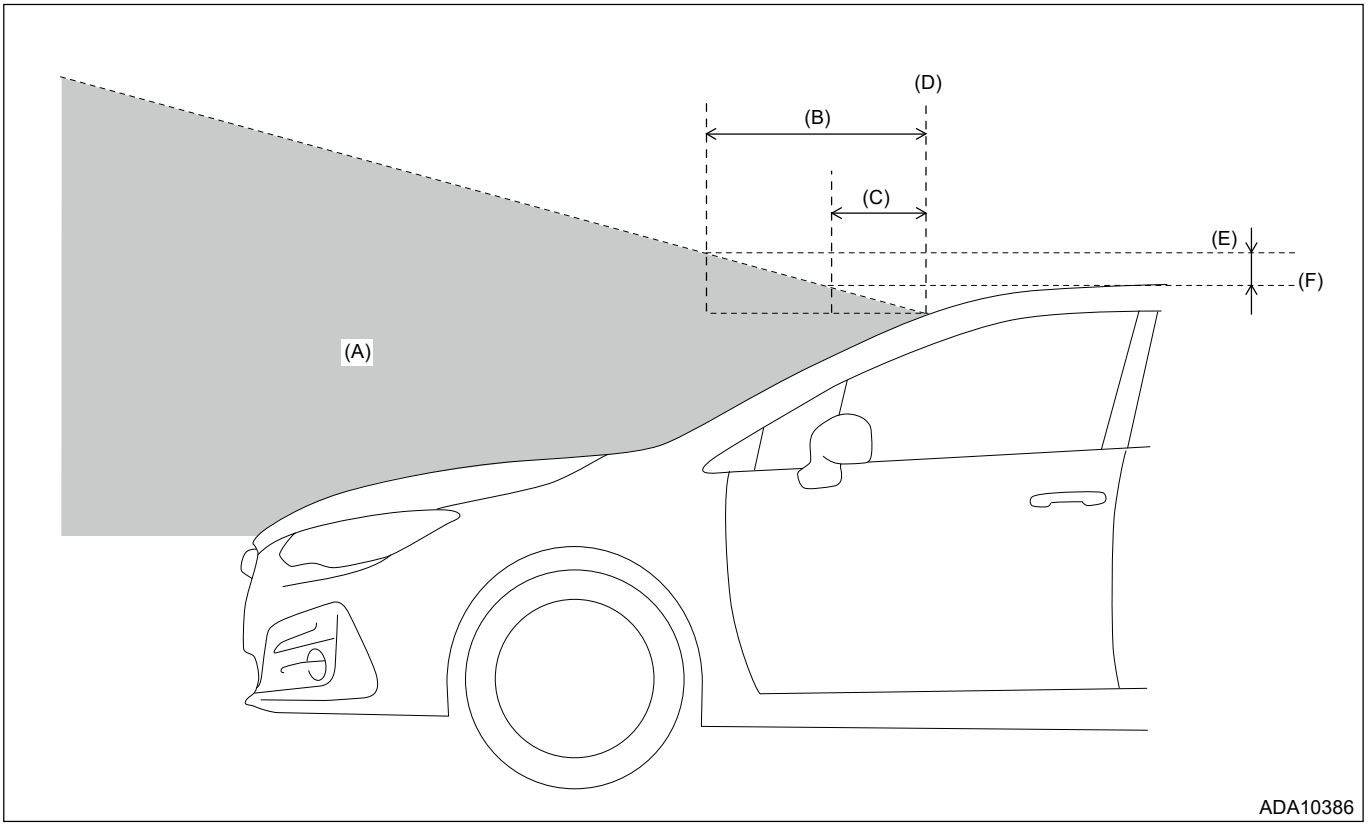
- **Do not remove the camera or camera cover to check the lens.**
- **When spider's web or insects are found within the camera view or inside the lens hood, remove it by blowing air etc. while taking care not to touch the lens surface. Do not use a hand or a cloth.**
- **Thin and uniform adhesion of dust, dirt or tobacco stains to the lens filter surface resulting from normal use will not be an obstacle. Do not attempt to clean in such cases.**
- **If an oil film such as a fingerprint or any excessive dirt adheres, or if the lens filter cracks, replace the stereo camera. Ref. to EyeSight>Stereo Camera.**
- **If the fingerprint adhesions or cracks occur on the lens filter, the following failures may arise.**
  - **The vehicle may not be able to detect the preceding vehicle or obstacle due to the effects of the headlight of the oncoming vehicle.**
  - **The vehicle may not be able to detect the preceding vehicle or obstacle due to the effects of the brake light operation of the preceding vehicle.**
  - **All the functions of the EyeSight may be suspended by the self-diagnosis function equipped with the camera.**
  - **When the lens filter is broken, the vehicle may not be able to detect the preceding vehicle or obstacle all day and all night.**
- **Do not clean the lens filter with any cleaner. It is quite difficult to uniformly clean both of the right and left lenses, and such an attempt just ends up spreading dirt and will cause problems as same as those from oil film.**

7. LOAD ON THE ROOF

Check that load on the roof is not sticking out to the front of the stereo camera.

Standard:

The load on the roof is placed outside the prohibited area (A) shown in the figure below.



(A) Prohibited area
(B) 880 mm (34.6 in)
(C) 520 mm (20.5 in)
(D) Windshield glass upper end
(E) 100 mm (3.9 in)
(F) Highest surface of the roof

EyeSight (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

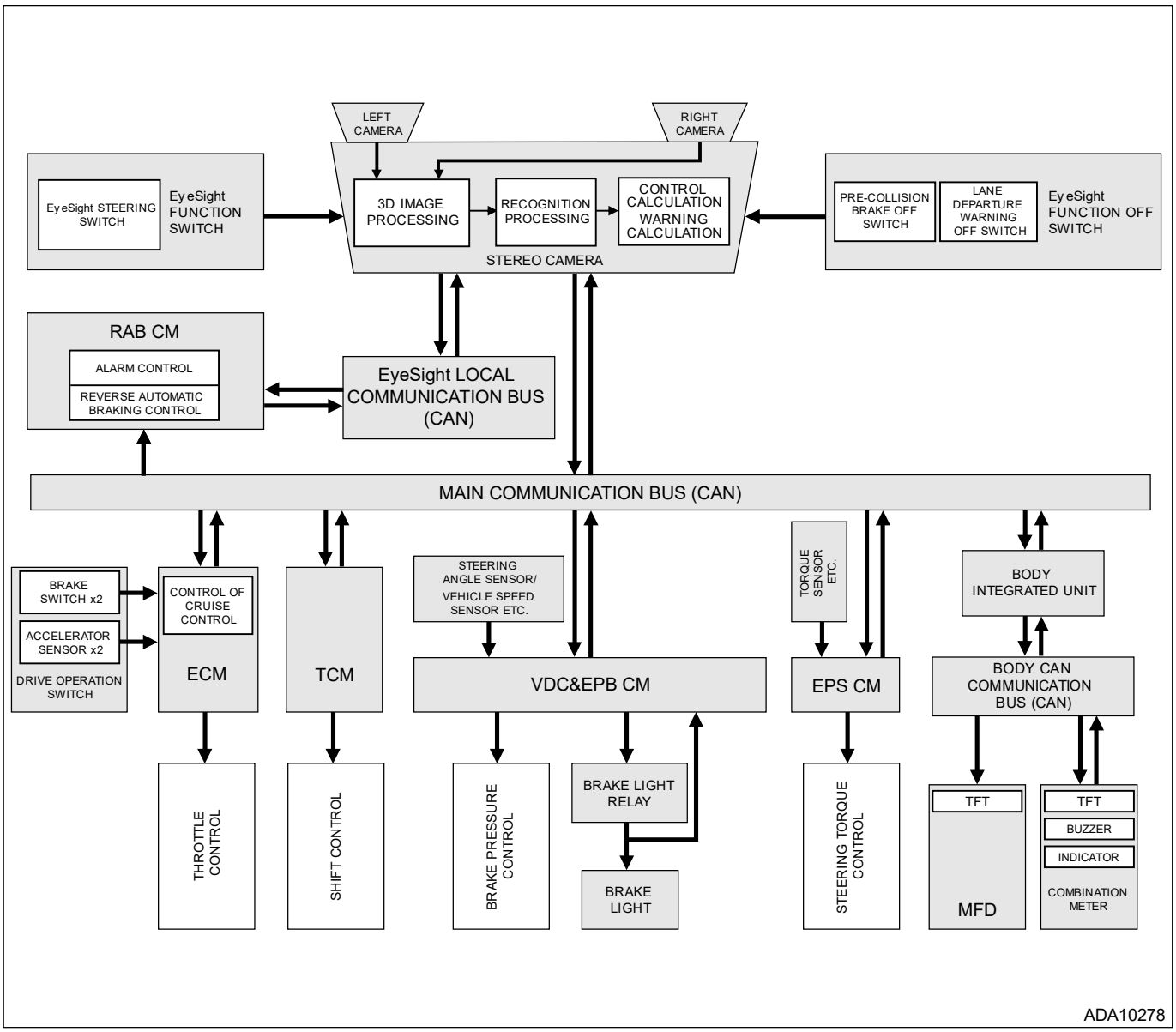
TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
Masking tape	Used for removing and installing stereo camera cover assembly.
DST-i	Used together with Subaru Select Monitor 4.

EyeSight (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

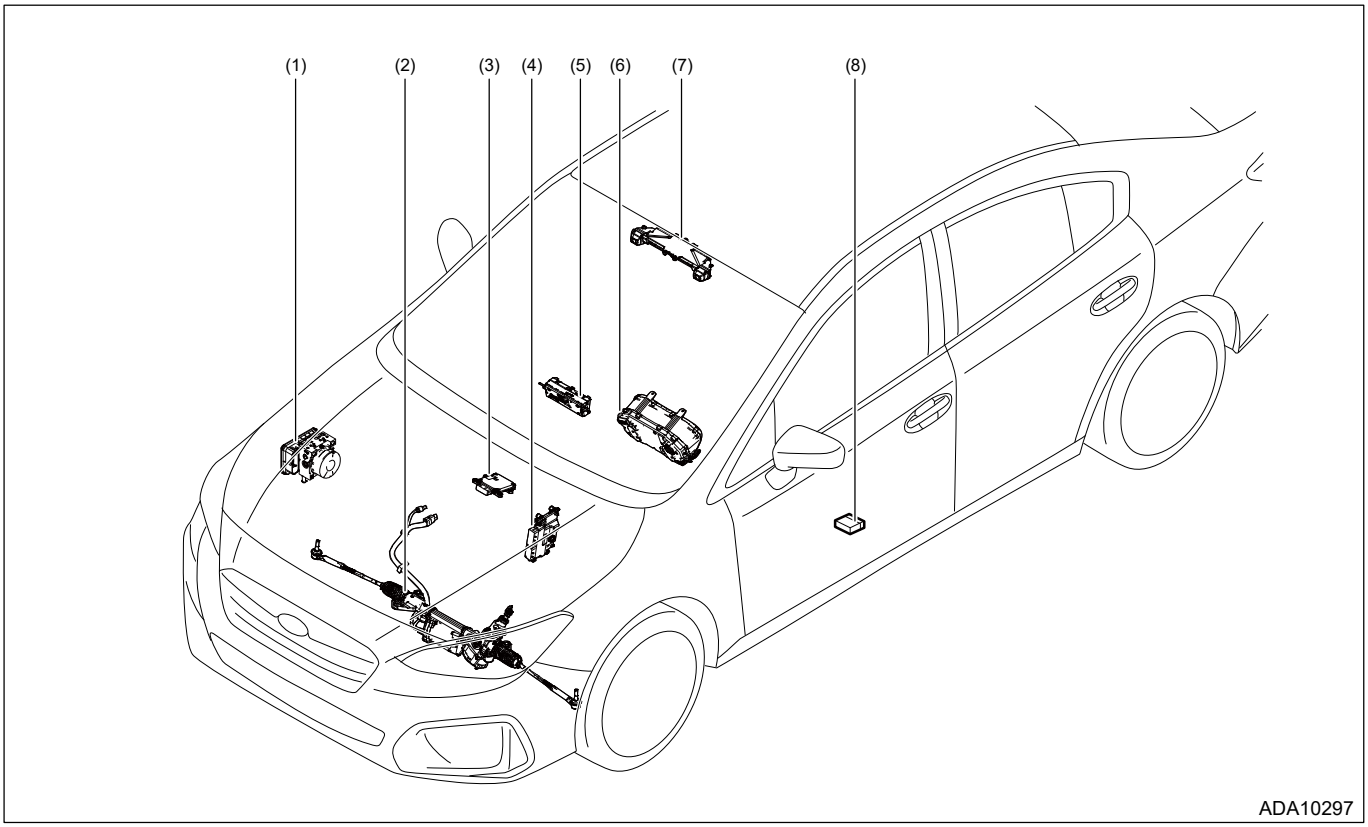
Main signals used between stereo camera and relevant CM

- Due to the presence of the RAB function, the connection between the stereo camera and the RAB CM are made via local communication line.
- The connection between the combination meter and the MFD are made from body integrated unit via body CAN.

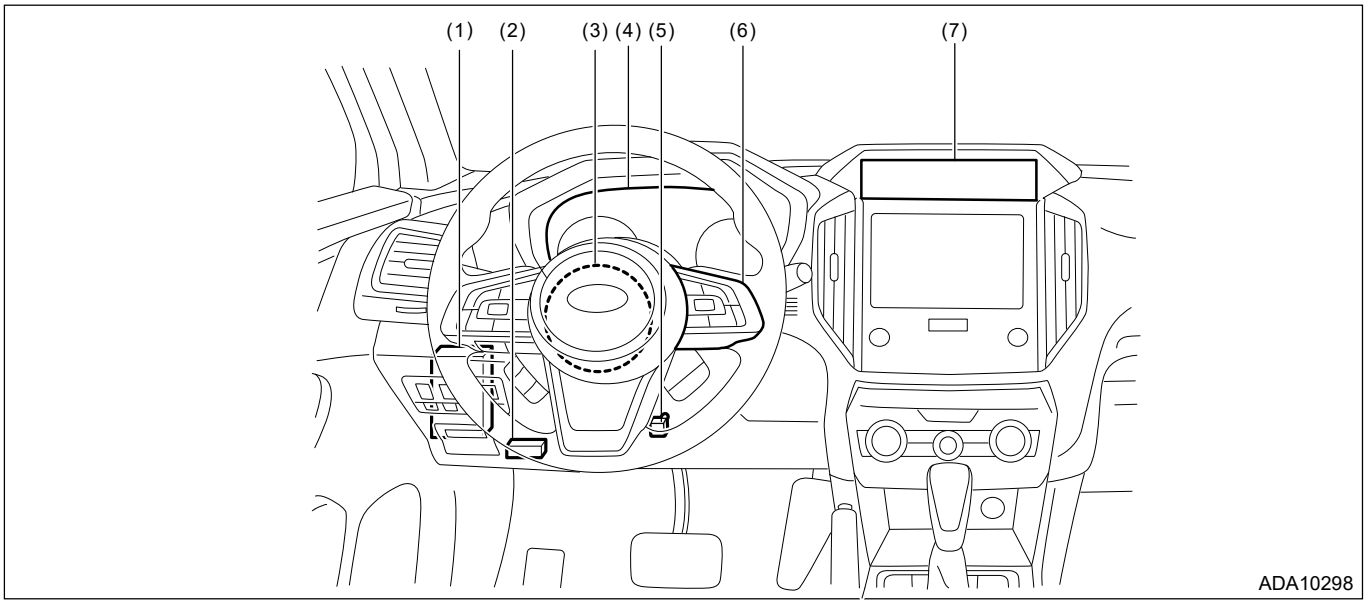

LEFT CAMERA
RIGHT CAMERA
EyeSight STEERING SWITCH
EyeSight FUNCTION SWITCH
3D IMAGE PROCESSING
RECOGNITION PROCESSING
CONTROL CALCULATION
WARNING CALCULATION
STEREO CAMERA
PRE-COLLISION BRAKE OFF SWITCH
LANE DEPARTURE WARNING OFF SWITCH
EyeSight FUNCTION OFF SWITCH
RAB CM
ALARM CONTROL
REVERSE AUTOMATIC BRAKING CONTROL
EyeSight LOCAL COMMUNICATION BUS (CAN)
MAIN COMMUNICATION BUS (CAN)
BRAKE SWITCH x2
ACCELERATOR SENSOR x2
DRIVE OPERATION SWITCH
CONTROL OF CRUISE CONTROL
ECM
TCM
STEERING ANGLE SENSOR/ VEHICLE SPEED SENSOR ETC.
VDC&EPB CM
TORQUE SENSOR ETC.
EPS CM
BODY INTEGRATED UNIT
BODY CAN COMMUNICATION BUS (CAN)
THROTTLE CONTROL
SHIFT CONTROL
BRAKE PRESSURE CONTROL
BRAKE LIGHT RELAY
BRAKE LIGHT
STEERING TORQUE CONTROL
TFT
MFD
TFT
BUZZER
INDICATOR
COMBINATION METER
ADA10278

EyeSight (DIAGNOSTICS) > Electrical Component Location

LOCATION

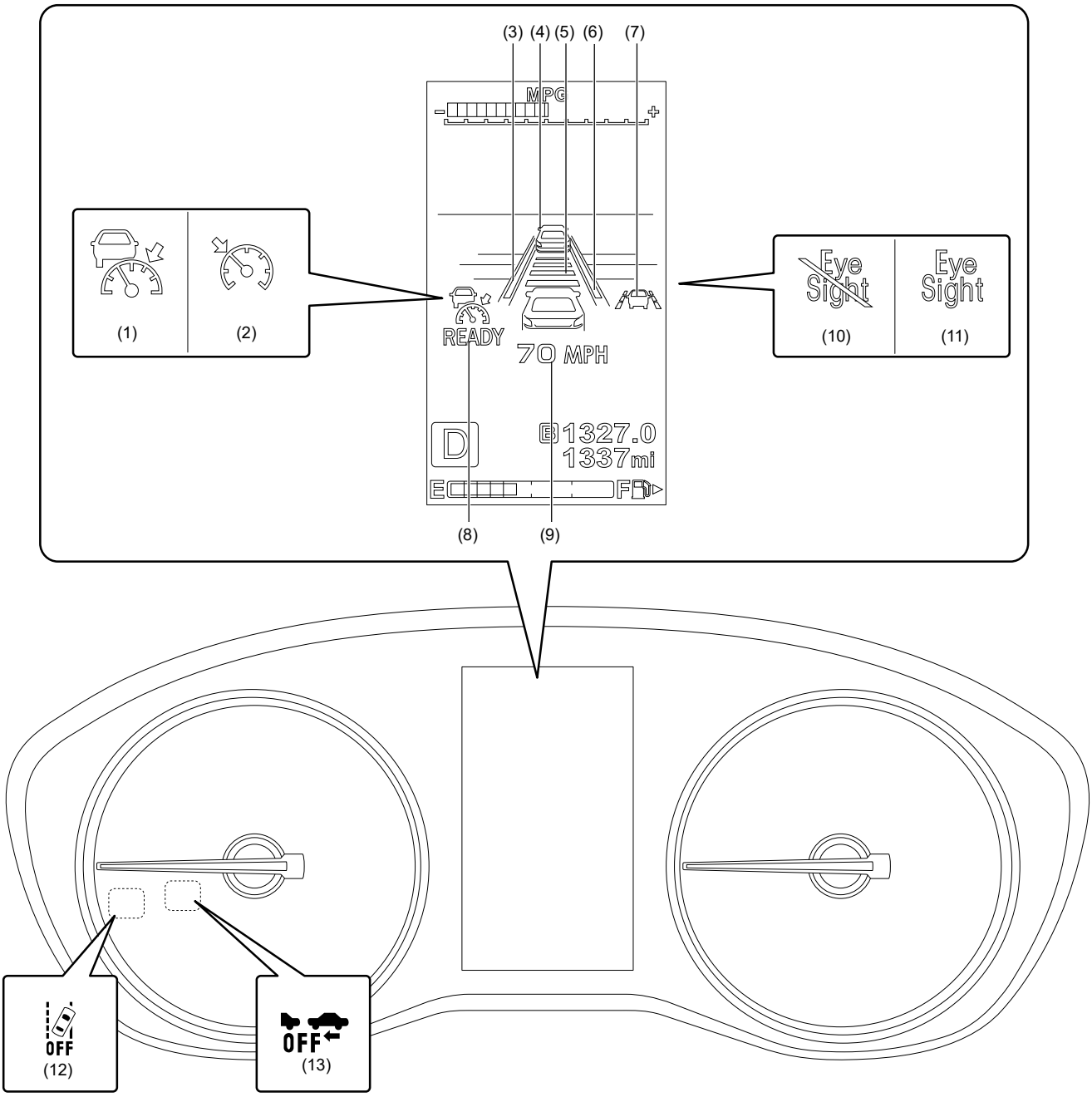


(1) VDC CM
(2) EPS CM
(3) TCM
(4) ECM
(5) MFD
(6) Combination meter
(7) Stereo camera
(8) RAB CM



(1) Body integrated unit
(2) Data link connector
(4) Combination meter
(5) Stop light and brake switch
(6) EyeSight steering switch
(7) MFD

(3) Steering angle sensor



ADA10387

(1) Adaptive cruise display

(2) Conventional cruise display

(3) Lane indicator (left)

(6) Lane indicator (right)

(7) Lane keep display

(8) READY indicator

(10) EyeSight temporary stop indicator

(11) EyeSight warning indicator

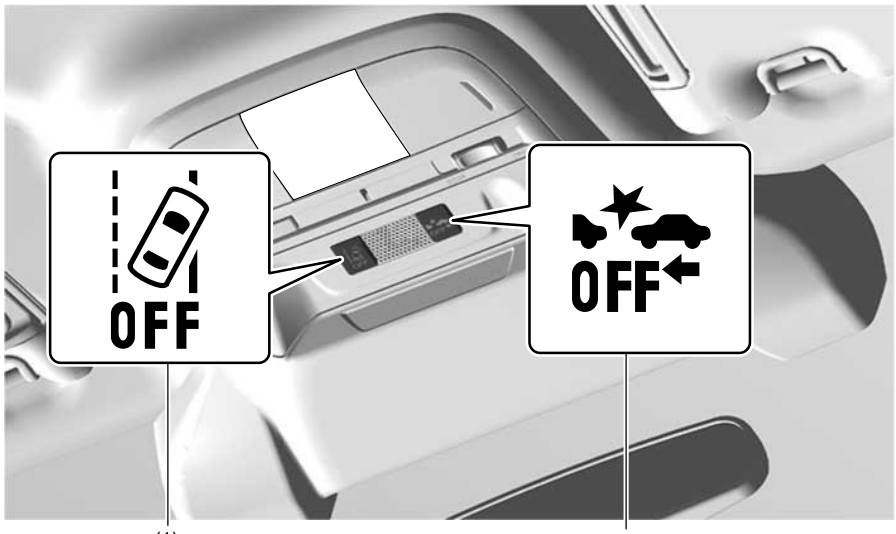
(12) Lane departure warning OFF indicator light

(4) Preceding vehicle indicator

(5) Following distance setting indicator

(9) Set vehicle speed display

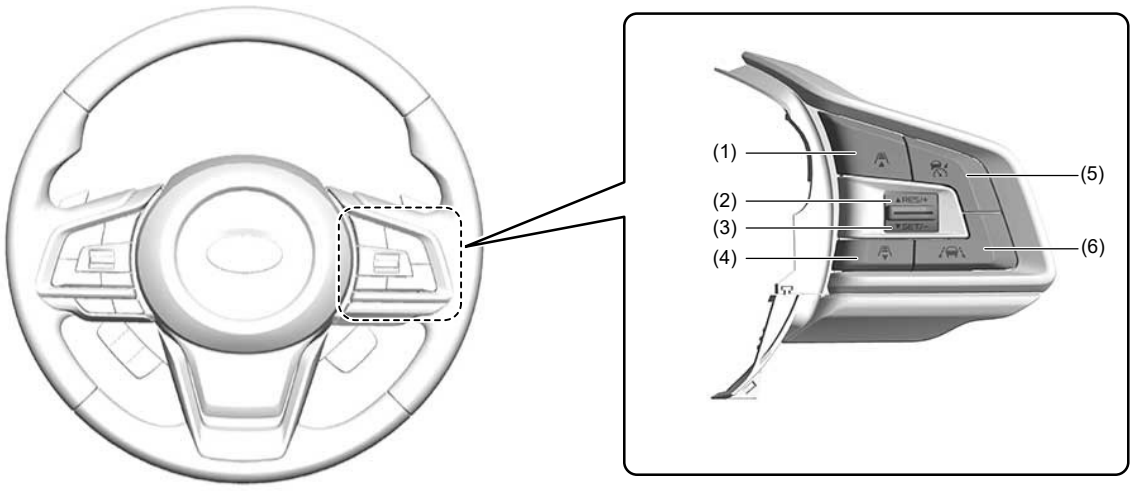
(13) Pre-collision brake OFF indicator light



ADA10286

(1) Lane departure warning OFF switch

(2) Pre-collision brake OFF switch



ADA10287

(1) Following distance setting switch (+)

(2) RES/+ (resume/plus) switch

(3) SET/- (set/minus) switch

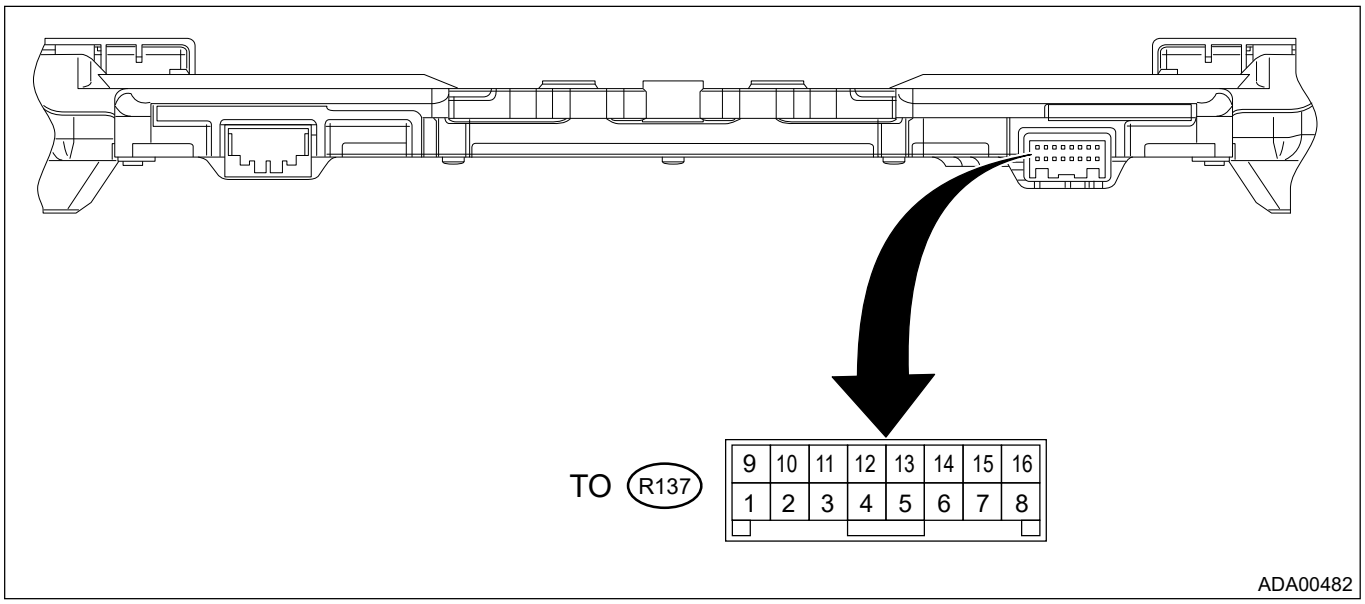
(4) Following distance setting switch (-)

(5) CRUISE switch

(6) Lane keep switch

EyeSight (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Content	Measuring condition	Standard
(R137) No. 1 ←→ Chassis ground	Local CAN-H (RAB communication line)	Always	1 kΩ or more
(R137) No. 2 ←→ Chassis ground	Local CAN-L (RAB communication line)	Always	1 kΩ or more
(R137) No. 3	—	—	—
(R137) No. 4	—	—	—
(R137) No. 5	—	—	—
(R137) No. 6 ←→ Chassis ground	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 — 16 V
(R137) No. 7 ←→ Chassis ground	GND	Always	Less than 1 Ω
(R137) No. 8 ←→ Chassis ground	Battery power supply	Always	9 — 16 V
(R137) No. 9 ←→ Chassis ground	Main CAN-L	Always	1 kΩ or more
(R137) No. 10 ←→ Chassis ground	Main CAN-H	Always	1 kΩ or more
(R137) No. 11	—	—	—
(R137) No. 12 ←→ Chassis ground	Pre-collision brake OFF switch input	Pre-collision brake OFF switch OFF → ON	Approx. 1 kΩ or more → less than 1 Ω
(R137) No. 13 ←→ Chassis ground	Lane departure warning OFF switch input	Lane departure warning OFF switch OFF → ON	Approx. 1 kΩ or more → less than 1 Ω

Terminal No.	Content	Measuring condition	Standard
(R137) No. 14 ←→ (R137) No. 15	EyeSight steering switch input	ALL OFF (no switch operation)	3.6 V — 4.5 V
		ALL OFF → CRUISE ON	0.0 V — 0.5 V
		ALL OFF → SET/− ON	3.6 V — 4.5 V
		ALL OFF → RES/+ ON	3.6 V — 4.5 V
		ALL OFF → lane keep switch ON	1.6 V — 2.5 V
		ALL OFF → following distance (+) ON	3.6 V — 4.5 V
		ALL OFF → following distance (−) ON	3.6 V — 4.5 V
(R137) No. 15 ←→ Chassis ground	EyeSight steering switch GND	Always	Less than 1 Ω
(R137) No. 16 ←→ (R137) No. 15	EyeSight steering switch input	ALL OFF (no switch operation)	3.6 V — 4.5 V
		ALL OFF → CRUISE ON	3.6 V — 4.5 V
		ALL OFF → SET/− ON	0.6 V — 1.5 V
		ALL OFF → RES/+ ON	2.6 V — 3.5 V
		ALL OFF → lane keep switch ON	3.6 V — 4.5 V
		ALL OFF → following distance (+) ON	1.6 V — 2.5 V
		ALL OFF → following distance (−) ON	0.0 V — 0.5 V

EyeSight (DIAGNOSTICS) > Inspection Mode

PROCEDURE

Turn the ignition switch to ON, wait for 10 seconds or more.
(This is the duration of time during which the EyeSight starts and prohibits diagnosis)

EyeSight (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

- EyeSight warning indicator (yellow).
  - Illuminates or blinks when error occurs in EyeSight system.
- EyeSight temporary stop indicator light (white)
  - Illuminates when EyeSight system is stopped temporarily.
  - When the ignition switch is on, it illuminates if the cruise control main switch or the lane keep switch is depressed within approximately 7 seconds after the engine starts, and goes off when approximately 7 seconds have elapsed since the engine started.
- Lane departure warning OFF indicator light
  - Illuminates when the lane departure warning and the sway warning are OFF.
  - Illuminates when the ignition switch is turned ON, and in approximately 7 seconds after engine starts, and it goes off or illuminates depending on the current status (ON or OFF).
- Pre-collision brake OFF indicator light
  - Illuminates when pre-collision brake, AT rapid start prevention control are OFF.
  - Illuminates when the ignition switch is turned ON, and goes off in approximately 7 seconds since the engine started.

Note:

- **When warning indicators and/or indicators are faulty, refer to Diagnostics with Phenomenon.** **Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Communication error with stereo camera

Detecting condition:

- Defective connector
- Power supply circuit malfunction
- Defective stereo camera
- Defective CAN system
- Defective Subaru Select Monitor

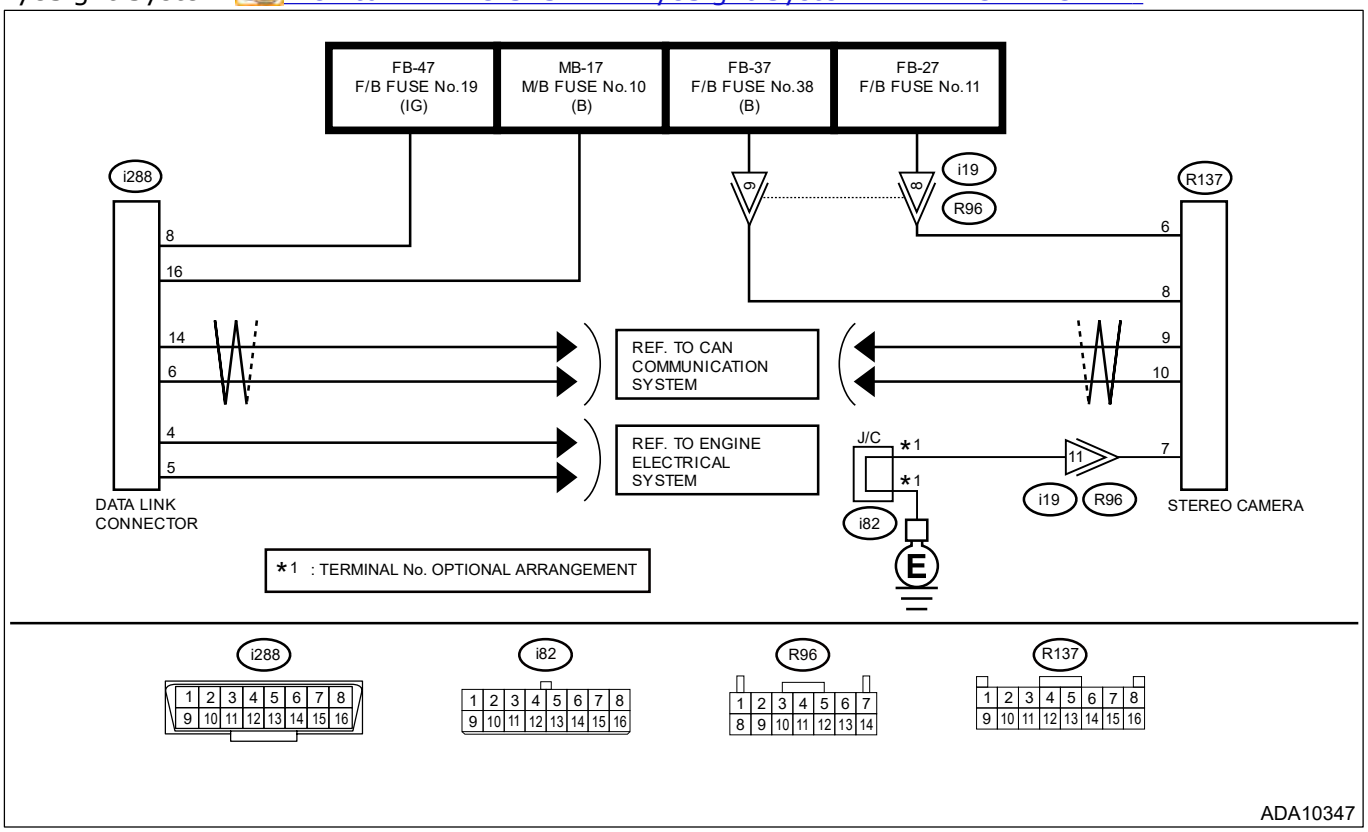
Trouble symptom:

- EyeSight warning light blinks.

Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to another vehicle.
2. Check communication condition between Subaru Select Monitor and vehicle.

Is communication performed normally?

Yes	Go to 2.
No	Subaru Select Monitor unit or diagnosis cable is faulty.

2. CHECK COMMUNICATION FOR INITIALIZING ERROR.

Perform the communication for initializing with each module by connecting the Subaru Select Monitor. (For systems whose module can communicate with diagnostic devices)

Note:

By performing [CAN bus check], confirmation of minimal connection modules is possible. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN bus check.

Is the communication possible with all modules?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	When the communication fails with all modules, Go to 3. When the communication fails with particular module only, perform the inspection using the check sheet of communication for initializing. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION > CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING.

3. CHECK DATA LINK CONNECTOR (OPEN CIRCUIT).

Use a tester to check for continuity in the ground circuit.

Connector & terminal

(i288) No. 4 — Chassis ground:

(i288) No. 5 — (B134) No. 50:

Is there continuity?

Yes	Go to 4.
No	Repair or replace the open circuit.

4. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Using a tester, check the power supply of data link connector.

Connector & terminal

(i288) No. 8 (+) — Chassis ground (−):

(i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Check the power supply circuits to the data link connector. (including the fuses)

EyeSight (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to EyeSight (DIAGNOSTICS)>Data Monitor>LIST.**

EyeSight (DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Content	Standard/Unit	Note
Camera ID	Display of serial No. inside the stereo camera	—	—
Control Software Version	Control software version	—	—
Recognition software version	Recognition software version	—	—
Model registration information	Display of displacement and vehicle model	—	—
ECU Power Supply Voltage (IG)	Display of input voltage of stereo camera	V	—
Initial Aiming Completion Status	Initial aiming completion flag	Exit (After factory shipping, when stereo camera is replaced or adjusted, [Not Finish] is displayed.)	—
Aiming Completion Status	Aiming completion flag	Not Finish (After factory shipping, when stereo camera is replaced or adjusted, [Exit] is displayed.)	—
Trip Count	Total count of ignition switch ON	Time	—
Trip Meter	Odometer value	• km • mile	—
Engine Speed	Engine speed	rpm	—
Accel. Opening Angle	Acceleration opening angle signal	%	—
ETC Throttle angle signal	Electronic throttle control opening angle signal	%	—

Items to be displayed	Content	Standard/Unit	Note
Steering Angle Sensor Value (Right +) (Left -)	Steering angle sensor value signal	deg	—
Longitudinal G Sensor Value (Deceleration +) (Acceleration -)	Longitudinal acceleration	m/s^2	—
Brake Fluid Target Pressure	Target value of brake fluid pressure	MPa	—
Master Cylinder Actual Fluid Pressure	Brake pressure	MPa	—
Right Front Wheel W/C Actual Fluid Pressure	Right front wheel cylinder fluid pressure	MPa	—
Left Front Wheel W/C Actual Fluid Pressure	Left front wheel cylinder fluid pressure	MPa	—
Target torque	Target torque command signal	Nm	—
Engine Torque	Actual engine shaft torque value	Nm	—
AT rapid start prevention, engine torque down command value	AT false start prevention control, engine torque down command value Or AT false start (reverse) prevention control, engine torque down command value	Nm	—
Warning Code(Beep)	Warning code (with alarm)	• No alarm • Pre-Collision Brake (2nd Braking) • Pre-Collision Brake(1st Braking) or Brake More Warning or F... • Reverse Throttle Override Control(Speed Limits Warning) • Reverse Throttle Override Control(Definitely Stepping Warning) • Red Light Signal Alarm • Pre-Collision Brake	—

Items to be displayed	Content	Standard/Unit	Note
		(Stopped Warning) • Lane Departure Warning (Right) • Lane Departure Warning (Left) • Lane Sway Warning • Lead Vehicle Start Alert • Notification Sound(HALT/FAIL /Function OFF) • Detection/Lost of Vehicle Beep • ACC Cancel • L_Keep Cancel	
Brake SW Input	Brake switch signal status	• OFF • ON	—
Brake Lamp SW (BIU)	Brake light switch signal status	• OFF • ON	—
Brake Lamp SW (VDC)	Brake light switch status	• OFF • ON	—
Current Gear Position	Current gear position signal	• P • R • Auto N • 6 • 5 • 4 • 3 • 2 • 1 • N	—
SI Drive mode	SI-DRIVE mode (display)	• Light Off • S# • I • S	—
Trip Count [count]	Number of ignition ON	Time	—
Count	Original counts identification information	—	—
Time Count [msec]	Elapsed time after ignition switch is turned to ON	ms	—
Automatic adjustment status	Automatic adjustment status	—	—

Items to be displayed	Content	Standard/Unit	Note
Lane recognition status	Display of lane recognition status	• Other than following: 00 • Recognizing traffic lanes on both sides at 40 km/h or more: 03 • Recognizing traffic lanes on both sides at 65 km/h or more (ALK recognition standby): 05	—
Preceding vehicle distance	Display of distance from preceding vehicle	m	—
EyeSight Temporary 0 Count	Occurrence count of EyeSight temporary stop 0	Time	Refer to the LIST OF CONTENTS FOR CAMERA TEMPORARY STOP. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST > LIST OF CONTENTS FOR CAMERA TEMPORARY STOP.
EyeSight Temporary 1 Count	Occurrence count of EyeSight temporary stop 1	Time	
EyeSight Temporary 2 Count	Occurrence count of EyeSight temporary stop 2	Time	
EyeSight Temporary 3 Count	Occurrence count of EyeSight temporary stop 3	Time	
EyeSight Temporary 4 Count	Occurrence count of EyeSight temporary stop 4	Time	
EyeSight Temporary 5 Count	Occurrence count of EyeSight temporary stop 5	Time	
EyeSight Temporary 6 Count	Occurrence count of EyeSight temporary stop 6	Time	
EyeSight Temporary 7 Count	Occurrence count of EyeSight temporary stop 7	Time	
EyeSight Temporary 8 Count	Occurrence count of EyeSight temporary stop 8	Time	
EyeSight Temporary 9 Count	Occurrence count of EyeSight temporary stop 9	Time	
EyeSight Temporary 10 Count	Occurrence count of EyeSight temporary stop 10	Time	
EyeSight Temporary 11 Count	Occurrence count of EyeSight temporary stop 11	Time	
EyeSight Temporary 12 Count	Occurrence count of EyeSight temporary stop 12	Time	
EyeSight Temporary 13 Count	Occurrence count of EyeSight temporary stop 13	Time	

Items to be displayed	Content	Standard/Unit	Note
EyeSight Temporary 14 Count	Occurrence count of EyeSight temporary stop 14	Time	
EyeSight Temporary 15 Count	Occurrence count of EyeSight temporary stop 15	Time	
EyeSight Temporary 16 Count	Occurrence count of EyeSight temporary stop 16	Time	
EyeSight Temporary 17 Count	Occurrence count of EyeSight temporary stop 17	Time	
EyeSight Temporary 18 Count	Occurrence count of EyeSight temporary stop 18	Time	
EyeSight Temporary 19 Count	Occurrence count of EyeSight temporary stop 19	Time	
EyeSight Temporary 20 Count	Occurrence count of EyeSight temporary stop 20	Time	
EyeSight Temporary 21 Count	Occurrence count of EyeSight temporary stop 21	Time	
EyeSight Temporary 22 Count	Occurrence count of EyeSight temporary stop 22	Time	
EyeSight Temporary 23 Count	Occurrence count of EyeSight temporary stop 23	Time	
EyeSight Temporary 24 Count	Occurrence count of EyeSight temporary stop 24	Time	
EyeSight Temporary 25 Count	Occurrence count of EyeSight temporary stop 25	Time	
EyeSight Temporary 26 Count	Occurrence count of EyeSight temporary stop 26	Time	
EyeSight Temporary 27 Count	Occurrence count of EyeSight temporary stop 27	Time	
EyeSight Temporary 28 Count	Occurrence count of EyeSight temporary stop 28	Time	
EyeSight Temporary 29 Count	Occurrence count of EyeSight temporary stop 29	Time	
EyeSight Temporary 30 Count	Occurrence count of EyeSight temporary stop 30	Time	
EyeSight Temporary 31 Count	Occurrence count of EyeSight temporary stop 31	Time	
Camera Failure Check 1	Camera failure supplementary information	—	—
Camera Failure Check 2			

Items to be displayed	Content	Standard/Unit	Note
Camera Failure Check 3			
Camera Failure Check 4			
Camera Failure Check 5			
Cruise Control Main Status (ECM→EyeSight)	Status of the cruise control main switch (cruise switch)	• OFF • ON	—
Cruise Control Main Display (ECM→EyeSight)	CRUISE indicator ON request signal	• Light Off • Light On	—
Main Cruise Control Display (EyeSight→Combination Meter)	CRUISE indicator ON signal	• Light Off • ON(White) • ON(Green) • Green Flashing	—
Cruise Control SW (EyeSight→ECM)	Status of the EyeSight steering switch (EyeSight → ECM)	• OFF • Main ON • SET/- (Deep) ON • RES/+ (Deep) ON • Cancel ON • Open	—
Cruise Control SW Voltage (Port14)	Cruise control switch input voltage value on Port 14	V	Normal range of the voltage value when each switch is operated Refer to Control Module I/O Signal (R137) No. 14 ←→ (R137) No. 15. Ref. to EyeSight (DIAGNOSTICS)>Control Module I/O Signal.

Items to be displayed	Content	Standard/Unit	Note
Cruise Control SW Voltage (Port16)	Cruise control switch input voltage value on Port 16	V	Normal range of the voltage value when each switch is operated Refer to Control Module I/O Signal (R137) No. 16 ←→ (R137) No. 15. Ref. to EyeSight (DIAGNOSTICS)>Control Module I/O Signal.
Cruise Control Set Status (ECM→EyeSight)	Status of the cruise control set status	• Release • Set	—
Cruise Control Mode	Cruise control mode signal	• ACC Mode • CC Mode	—
Pre-Collision Brake OFF Display Signal	Pre-collision brake OFF indicator light illumination command signal	• OFF • ON	—
Pre-Collision Brake OFF SW	Pre-collision brake OFF switch status	• OFF • ON • Open Load	—
Pre-crash brake function	ON/OFF status of pre-collision brake function	• OFF • ON	—
Lane Departure Warning Display Signal	Lane departure warning OFF indicator light illumination command signal	• OFF • ON	—
Lane Departure Warning Function	ON/OFF status of the lane departure warning function	• OFF • ON	—
Lane Departure Warning OFF SW	Lane departure warning OFF switch status	• OFF • ON • Open Load	—
Vehicle Speed Set Display	Cruise control set vehicle speed set value	• km/h • MPH	—

Items to be displayed	Content	Standard/Unit	Note
Cruise Control Set Speed	Set vehicle speed value for cruise control	• km/h • MPH	—
Drive Wheel Average Speed	Average wheel speed signal	km/h	—
CVT Target Revolution Speed Control Signal	CVT target revolution speed command signal	• No • Pre-Collision BA Operation	—
CVT Target Revolution Speed Value	CVT target revolution speed	rpm	—
Turbine Revolution Speed	AT turbine speed signal	rpm	—
Driver Torque Request	Torque value requested by driver	Nm	—
Accelerator wide opening judgment status	Signal that judges the accelerator opening angle to be “wide”	• Not established • Established	—
Intake Manifold Pressure Absolute	Engine intake manifold pressure	mmHg	—
Gear Ratio Actual	Current total reduction ratio signal	—	—
Barometric Pressure	Atmospheric pressure signal	mmHg	—
Adaptive Cruise Control Brake Control Status	Brake control permission signal for adaptive cruise control	• OFF • ON	—
Adaptive Cruise Control Braking Signal	Actuation signal of brake control	• Not performed • Perform	—
Adaptive Cruise Control Braking (ACC or Driver) Status (for CVT)	Adaptive cruise control braking (driver or control) signal (for CVT)	• Brakes non-enforcement • Braking applied	—
Brake Lamp Command	Brake lamp light up command signal	• No • Pre-Collision BA Operation	—
Adaptive Cruise Control Function	EyeSight function presence information (adaptive cruise control)	• No • Pre-Collision BA Operation	—
Left Front Wheel Speed (Pulse)	Front left wheel speed pulse signal (raw pulse value)	—	—
Right Front Wheel Speed (Pulse)	Front right wheel speed pulse signal (raw pulse value)	—	—

Items to be displayed	Content	Standard/Unit	Note
Left Rear Wheel Speed (Pulse)	Rear left wheel speed pulse signal (raw pulse value)	—	—
Right Rear Wheel Speed (Pulse)	Rear right wheel speed pulse signal (raw pulse value)	—	—
HOLD Display	HOLD display illumination signal (stop and hold)	• Light Off • Light On	—
READY Display	READY indicator illumination signal	• Light Off • Light On	—
Preceding vehicle distance	Preceding vehicle distance signal	Unit: m • 0 <= x < 5 • 5 <= x < 10 • 10 <= x < 15 • 15 <= x < 20 • 20 <= x < 25 • 25 <= x < 30 • 30 <= x < 35 • 35 <= x < 40 • 40 <= x < 45 • 45 <= x < 50 • 50 <= x < 55 • 55 <= x < 60 • 60 <= x < 65 • 65 <= x < 70 • 70 <= x < 75 • 75 <= x	—
Self-Vehicle Display	Display of your own vehicle	• Light Off • Light On	—
Vehicle Distance Setting Display	Vehicle distance setting indicator signal	• No Display • Distance(1st Step) • Distance(2nd Step) • Distance(3rd Step) • Distance(4th Step)	—
Preceding vehicle indication	Preceding vehicle indicator signal	• Light Off • Light On	—
Front left wheel speed	Front left wheel speed signal	km/h	—
Front right wheel speed	Front right wheel speed signal	km/h	—
Rear left wheel speed	Rear left wheel speed signal	km/h	—

Items to be displayed	Content	Standard/Unit	Note
Rear right wheel speed	Rear right wheel speed signal	km/h	—
EPB Activate Request	Electronic parking brake activate request	• No • Pre-Collision BA Operation	—
Adaptive Cruise Control Stop Hold Status	Signal of stop and hold status before reservation	• OFF • Stop is held	—
EPB Hill Hold Prohibited	Hill hold prohibition signal	• ON • OFF	—
Idle SW for EPB Control	Idle switch signal for electronic parking brake control	• OFF • ON	—
ACC/CC/MSL Mode	ACC/CC/MSA mode status	• ACC • CC • MSL	—
EyeSight Screen Migration Information	EyeSight display transition information	• Normal Display • EyeSight Screen Display	—
All Cylinder Fuel Cut Status	Fuel cut signal	• Normal • Cut	—
Low Speed Following	Low speed following mode signal	• No • Yes	—
Adaptive cruise control compulsory cancellation	Adaptive cruise control forced cancel signal	• No • Yes	—
Display for Adaptive Cruise Control Cancel Reason	Display for adaptive cruise control cancel reason	• No Display • Road Surface Steep Slope • MT Engine Speed (Low) • MT Speed (Low) • MT Gear Position • Other • Setting Disable • Step Strongly Brake • EyeSight during Startup • MT Engine Speed (High) • MT Speed (High) • Setting disable for	—

Items to be displayed	Content	Standard/Unit	Note
		Road Surface Steep Slope	
EyeSight Deceleration Request (VDC)	Deceleration request reception status signal from stereo camera	• Not yet received • Reception	—
Parking Brake Signal	Parking brake switch signal status	• OFF • ON	—
Driver Brake Detection	Driver brake detection signal	• OFF • ON	—
Driver Door Status	Driver’s door switch signal status	• Close • Open	—
Passenger Door Front Status	Passenger’s door switch signal status	• Close • Open	—
Right Rear Door Status	Right rear door switch signal status	• Close • Open	—
Left Rear Door Status	Left rear door switch signal status	• Close • Open	—
Driver's seat belt status	Status of driver’s seat belt	• ON • ON	—
VDC Over Steer Control	VDC operating status signal 1	—	—
VDC Under Steer Control	VDC operating status signal 2	—	—
ABS operation	Operating status signal of ABS	• Not Operate • Operate	—
TCS Operating Condition	Operating status signal of TCS	• Not Operate • Operate	—
RMI Operation	RMI operation signal	• Not during control • During control	—
Brake control actuate	Brake operation permission signal	• Not performed • Perform	—
Ignition SW ON Count When Pre-Collision Throttle Management at The Latest	Ignition switch ON count when AT false start prevention control is activated (the latest)	Time	—
Ignition SW ON Count When Pre-Collision Throttle Management at The 1 Time before	Ignition switch ON count when AT false start prevention control is activated (1 time before)	Time	—

Items to be displayed	Content	Standard/Unit	Note
Ignition SW ON Count When Pre-Collision Throttle Management at The 2 Time before	Ignition switch ON count when AT false start prevention control is activated (2 times before)	Time	—
Ignition SW ON Count When Following Distance Warning at The Latest	Ignition switch ON count when the vehicle distance alarm is activated (the latest)	Time	—
Ignition SW ON Count When Following Distance Warning at The 1 Time before	Ignition switch ON count when the vehicle distance alarm is activated (1 time before)	Time	—
Ignition SW ON Count When Following Distance Warning at The 2 Time before	Ignition switch ON count when the vehicle distance alarm is activated (2 times before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The Latest	Ignition switch ON count when the pre-collision 1st braking is operated (at the latest)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 1 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (1 time before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 2 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (2 times before)	Time	—
Ignition SW ON Count When Pre-Collision 1st Braking at The 3 Time before	Ignition switch ON count when the pre-collision 1st braking is operated (3 times before)	Time	—
Ignition SW ON Count When Pre-Collision 2nd Braking at The Latest	Ignition switch ON count when the pre-collision 2nd braking is operated (at the latest)	Time	—
Ignition SW ON Count When Pre-	Ignition switch ON count when the pre-collision 2nd braking is operated (1 time	Time	—

Items to be displayed	Content	Standard/Unit	Note
Collision 2nd Braking at The 1 Time before	before)		
Ignition SW ON Count When Pre-Collision 2nd Braking at The 2 Time before	Ignition switch ON count when the pre-collision 2nd braking is operated (2 times before)	Time	—
Ignition SW ON Count When Pre-Collision 2nd Braking at The 3 Time before	Ignition switch ON count when the pre-collision 2nd braking is operated (3 times before)	Time	—
Pre-Collision Brake Assist Command	Pre-collision brake assist command signal	• No • Pre-Collision BA Operation	—
Pre-Collision Brake Assist Operation	Pre-collision brake assist request reception status	• Not Operate • Operate	—
Pre-Collision Brake Action	Pre-collision brake command signal	• No • Pre-Collision BA Operation	—
Pre-crash brake operation	Pre-collision brake operation status	• Not Operate • Operate	—
Pre-Collision Brake Assist Threshold	Pre-collision brake threshold	• Normal • Threshold 1 • Threshold 2 • No request	—
Risk Avoidance Assist standby Command	Pre-collision steering assist, command signal	• Normal VDC State • AvoidRiskCmd	—
Risk Avoidance Assist Standby Status	Pre-collision steering assist stand-by status	• Normal VDC State • AvoidRiskStb	—
Risk Avoidance Assist State	Pre-collision steering assist, characteristic signal	• Normal • Parameter 1 • Parameter 2 • Invalid	—
Rear Wheel Slip Control Operation	Rear wheel slip detection signal	• Not operating • ON	—
VDC Health Check In	Information during VDC integrity confirmation	• OFF • ON	—
Brake-based torque vectoring presence/absence information	Brake-based torque vectoring presence/absence information	• Without DTV (15 inch brake) • With DTV (16 inch brake)	—

Items to be displayed	Content	Standard/Unit	Note
EyeSight Initialization(RAB)	Signal notifying the RAB CM of whether the EyeSight has already started	• Undefined • Completed	—
RAB Function Setting Existence	Reverse Automatic Braking function, presence/absence information of the RAB alarm function (RAB → EyeSight)	• EPB not Setup • Setting	—
RAB Fail Indication(EyeSight →RAB)	RAB function stop command information to RAB CM due to EyeSight failure	• No Indication • Indication	—
RAB Sonar System Failure(RAB→EyeSight)	Reverse Automatic Braking function, failure status of the RAB alarm function (RAB → EyeSight)	• Normal • Sonar Failure • System Failure • Undefined	—
RAB OFF Indication(EyeSight →RAB)	Reverse Automatic Braking function forced stop signal to RAB CM due to an EyeSight temporary stop etc.	• RAB ON • RAB Force OFF	—
Recession Control Permission(RAB)	Information of whether the Reverse Automatic Braking control is executable or not	• Prohibition • Permit	—
RAB Acceleration Suppression Control State(EyeSight→RAB)	Acceleration suppression control status of EyeSight by the command from RAB CM	• No Control • Precom • Recruitment	—
RAB Brake Control State(EyeSight→RAB)	Brake control status of EyeSight by the command from RAB CM	• No Control • Precompression • Brake Control In • Stopped and Held • Gradual Decrease	—
RAB Setting Information	Reverse Automatic Braking function, presence/absence information of the RAB alarm function (EyeSight → RAB)	• OFF • ON	—
Sonar System Image Display(RAB)	RAB display hide status notification for MFD	• Display • Not Display	—
RAB Function OFF Information	Reverse Automatic Braking function OFF status	• ON • OFF	—
Audible Alarm function OFF Information(RAB)	RAB alarm function OFF status	• ON • OFF	—
RAB Sonar System Failure(EyeSight→RAB)	Reverse Automatic Braking function, failure status of the RAB alarm function (EyeSight → RAB)	• Normal • Sonar Failure • System Failure • Undefined	—

Items to be displayed	Content	Standard/Unit	Note
Sonar System HALT(RAB)	Reverse Automatic Braking function, temporary stop status of the RAB alarm function (EyeSight → RAB)	• Normal • Fouling • Detection Error • Undefined	—
RAB Function pause Do Not Disturb	Disabled status of the Reverse Automatic Braking function temporary OFF switch for MFD	• Ready • Do Not Disturb	—
RAB Alarm pause Do Not Disturb	Disabled status of the RAB alarm function temporary OFF switch for MFD	• Ready • Do Not Disturb	—
Rear Sonar Distance Alarm Information (Rear Left Corner)	Rear sonar: Distance alert information of RLCorner (left corner, 3 stages)	• No Obstacle • Far • Middle • Short	—
Rear Sonar Distance Alarm Information (Rear Right Corner)	Rear sonar: Distance alert information of RRCorner (right corner, 3 stages)	• No Obstacle • Far • Middle • Short	—
Rear Sonar Distance Alarm Information (Rear Left Corner)	Rear sonar: Distance alert information of RLSide (left side, 3 stages)	• No Obstacle • Far • Middle • Short	—
Rear Sonar Distance Alarm Information (Rear Right Corner)	Rear sonar: Distance alert information of RRSide (left side, 3 stages)	• No Obstacle • Far • Middle • Short	—
Rear Sonar Distance Alarm Information (Rear Center)	Rear sonar: Distance alert information of RCenter (center, 4 stages)	• No Obstacle • Far • Middle • Short	—
RAB Alarm Level	Reverse Automatic Braking function, alarm sound level information of the RAB alarm function	• OFF • Level1 • Level2 • Level3 • Continuous Sound	—
RAB Alarm Interrupt Display Instruction	Alarm interruption display information when the Reverse Automatic Braking function is activated	• No display • Backward Note • Encourage Stepping Brake • Undefined	—
Active Lane Keep System	Lane keep assist function presence/absence signal	• No • ON	—

Items to be displayed	Content	Standard/Unit	Note
Active Lane Keep System Main Display	Lighting request of lane keep display	• Light Off • ON(White) • ON(Green) • Green Flashing	—
Display for Lane Keep Assist Cancel Reason	Display of the lane keep assist canceling reason	• No Display • Sharp_Curve • Let Go • Other • Speed Low • Speed High	—
Left-Line Display	Left-line display	• Light Off • Light On • Blink	—
Right-Line Display	Right-line display	• Light Off • Light On • Blink	—
Left-Line Color	Left-line color	• Sub • White • Other	—
Right-Line Color	Right-line color	• Sub • White • Other	—
Warning Code(Display)	Warning code (display only, without alarm)	• No alarm • LKSA Warning(Handle-free operation) • MT Shift Up Request • MT Shift Down Request • Encourage MT Gear Input • Accelerator Operation Priority In	—
EyeSight Function Presence Information (ACC Acceleration Characteristic)	Information of presence/absence of ACC acceleration characteristics customization function	• ACC Acceleration Characteristic Customize None • ACC Acceleration Characteristic Customize There	—

Items to be displayed	Content	Standard/Unit	Note
EyeSight Customize Current Value Setting(ACC Acceleration Characteristic) (EyeSight→Combination Meter)	Current setup information of ACC acceleration characteristics	• Lv.1(ECO) • Lv.2(Comfort) • Lv.3(Standard) • Lv.4(Dynamic)	—
Turn SW (Left)	Operation status of left turn switch	• OFF • ON	—
Turn SW (Right)	Operation status of right turn switch	• OFF • ON	—
Calibration (EPS)	Calibration signal	• Not set • Set	—
Steering Control Active	Lane keep control operation instruction	• Not Operate • Operate	—
Steering Assistance Operation Status	Lane keep control operation status	• Normal • Assist stop • Assist limitation	—
EyeSight Recognition Status (EPS)	EyeSight recognition status signal	• Not Detect • Detect	—
Absolute Steering Angle Detection	Absolute angle detection signal (not used)	• No • Yes	—
Steer Angle Sensor Op	Steering angle sensor signal	deg	—
Yaw Rate Value (Right -) (Left +)	Yaw rate value signal	rad/sec	—
Lateral G Sensor Value (Right -) (Left +)	Lateral acceleration signal	m/s^2	—
Steering Control Torque Target	Steering control instruction signal	Nm	—
Additional Steering Torque(Active Lane Keep System)	Additional steering torque signal (lane keep)	Nm	—
EPS Motor Operation Current	Motor operation current value	A	—
EPS Torque	Torque sensor main value	Nm	—
EPS Torque (Detailed)	Torque sensor value (resolution improved)	Nm	—
Target Current Value (EPS)	Final target current value	Arms	—

Items to be displayed	Content	Standard/Unit	Note
EPS Motor Absolute Angle	Motor absolute angle	deg	—
EPS Motor Operation Current (Steering Support High Speed)	Motor operation current value (high speed steering support)	Arms	—
HBA(EyeSight) Function Presence Information	HBA function presence/absence information	• No • HBA of EyeSight • HBA other than EyeSight	—
Light Auto Switch Configuration Information	Light switch at Auto	• OFF • ON	—
Dimmer Switch High	Dimmer switch at High	• OFF • ON	—
Dimmer Switch Pass	Dimmer switch at Pass	• OFF • ON	—
Driver Throttle Input Override Control	Instruction signal of AT false start prevention control Or instruction signal of AT false start (reverse) prevention control	• No • Pre-Collision BA Operation	—
Adaptive Cruise Control Torque Down	Torque down prohibition signal of stereo camera	• ON • OFF	—
Initial inspection distance accuracy rate	Accuracy rate of initial inspection distance	%	—
Initial inspection distance	Initial inspection distance	—	—
Initial Optical Axis (X-Axis)	Initial optical axis (X-axis)	pix	—
Initial Optical Axis (X-Axis2)	Initial optical axis (X-axis 2)	pix	—
Initial Optical Axis (Y-Axis)	Initial optical axis (Y-axis)	pix	—
Initial left image, rotation deviation correction value	Initial left image, rotation deviation correction value	—	—
Initial left image, vertical deviation correction value	Initial left image, vertical deviation correction value	—	—
Initial Right Image Rotation Deviation Correction Value	Initial right image, rotation deviation correction value	—	—

Items to be displayed	Content	Standard/Unit	Note
Initial distance correction value	Initial distance correction value	—	—
Initial Invalid Distance Data Count	Number of initial invalid distance data	—	—
Initial Other Inspection	Another initial inspection	—	—
Initial Error Code	Initial error code	—	—
D C-Ratio	Accuracy rate of inspection distance	%	—
Distance	Inspection distance	—	—
Optical Axis (X-Axis)	Optical axis (X-axis)	pix	—
Optical Axis (X-Axis2)	Optical axis (X-axis 2)	pix	—
Optical Axis (Y-Axis)	Optical axis (Y-axis)	pix	—
Left image, rotation deviation correction value	Left image, rotation deviation correction value	—	—
Left image, vertical deviation correction value	Left image, vertical deviation correction value	—	—
Right Image Rotation Deviation Correction Value	Right image, rotation deviation correction value	—	—
Distance correction value	Distance correction value	—	—
Ineffective distance data count	Number of invalid distance data	—	—
Other Inspection	Other inspection	—	—
Error Code	Error code detailed information	—	—
Camera Battery Open Status (+B)	Display of stereo camera battery (+B circuit) status	• Connect • Open Load	—
Image ON/OFF status	ON/OFF status of present image sensor	• OFF • ON	—
Camera Temperature (Current)	Current temperature display of stereo camera internal circuit	Celsius	—
Camera temperature, operation status	Camera temperature and operation status	• Normal • High temperature • Low temperature	—
Camera Temperature (Previous Maximum Value)	Display of stereo camera internal circuit temperature (past MAX value)	Celsius	—

Items to be displayed	Content	Standard/Unit	Note
Ignition SW ON Count When Camera Temperature (Previous Maximum Value)	Ignition switch ON count when stereo camera internal circuit temperature is displayed (past MAX value)	Time	—
Camera Temperature (Previous Minimum Value)	Display of stereo camera internal circuit temperature (past MIN value)	Celsius	—
Ignition SW ON Count When Camera Temperature (Previous Minimum Value)	Ignition switch ON count when stereo camera internal circuit temperature is displayed (past MIN value)	Time	—
EyeSight Temporary 0 Continuation Count	Continuation count of EyeSight temporary stop 0	Time	—
EyeSight Temporary 1 Continuation Count	Continuation count of EyeSight temporary stop 1	Time	—
EyeSight Temporary 2 Continuation Count	Continuation count of EyeSight temporary stop 2	Time	—
EyeSight Temporary 3 Continuation Count	Continuation count of EyeSight temporary stop 3	Time	—
EyeSight Temporary 4 Continuation Count	Continuation count of EyeSight temporary stop 4	Time	—
EyeSight Temporary 5 Continuation Count	Continuation count of EyeSight temporary stop 5	Time	—
EyeSight Temporary 6 Continuation Count	Continuation count of EyeSight temporary stop 6	Time	—
EyeSight Temporary 7 Continuation Count	Continuation count of EyeSight temporary stop 7	Time	—
EyeSight HALT Code	EyeSight halt code signal	• No HALT • E1-1(No Camera View) • E2(Out of Temp. Range) • E3(Other) • HALT Notice	—
Ambient Air Temperature(Indication)	Ambient air temperature signal	Celsius	—
Head lamp : Clearance light	Headlight small signal status	• Light Off • Light On	—

Items to be displayed	Content	Standard/Unit	Note
Headlight SW (LO)	Headlight LO switch operation status	• OFF • ON	—
Head lamp : High Beam	Headlight Hi beam signal status	• Light Off • Light On	—
Wiper SW (Front)	Front wiper switch operation status	• OFF • ON	—
VDC OFF SW	VDC OFF signal	• OFF • ON	—
VDC "OFF" Indicator Status	VDC OFF indicator status	• Light Off • Light On	—
EyeSight Input Control Suspended Status (EPS)	Overheat protection limit signal	• No • Yes	—
Ambient Air Temperature(Diagnosis)	Ambient temperature for diagnosis	Celsius	—
Camera Failure Real-Time Check (At The Time of Failure)	Camera failure real-time information at the time of failure	—	—
Camera Temperature (At The Time of Failure)	Camera temperature sensor at the time of failure	Celsius	—
Image ON/OFF Status/Sensor Ready Status (At The Time of Failure)	Image ON/OFF status at the time of failure	• OFF • ON	—
Adaptive Cruise Control Failure (EyeSight→Combination Meter)	Stereo camera failure signal for combination meter	• Normal • FAIL	—
VDC Sensor Failure	VDC sensor failure signal	• Normal • FAIL	—
ABS System Failure	ABS system failure signal	• Normal • FAIL	—
Vehicle Speed Sensor Failure	Vehicle speed sensor failure signal	• Normal • FAIL	—
Adaptive Cruise Control Failure (EyeSight→VDC)	Failure signal of stereo camera to VDC control module	• Normal • FAIL	—
EyeSight Reception (VDC)	Failure signal of stereo camera	• Not yet received • Reception	—

Items to be displayed	Content	Standard/Unit	Note
Hill Descent Control Status	Hill descent control status signal	• System OFF • Waiting • Operating • Infinitive	—
Hill Start Assist Operation Status	Hill start assist operation status signal	• Not Operate • Operate	—
EyeSight Failure	EyeSight failure signal	• Normal • FAIL	—
Engine Failure	Engine failure signal	• Normal • FAIL	—
Transmission Failure	TCM failure signal	• Normal • FAIL	—
EyeSight Failure (EPS→EyeSight)	Failure signal of EPS	• Normal • FAIL	—
EyeSight Failure (EPS→EyeSight)	Failure signal for EyeSight (EPS)	• Normal • FAIL	—
Adaptive Cruise Control Failure (EyeSight→EPS)	Stereo camera failure signal for EPS control module	• Normal • FAIL	—
ETC Failure	Electronic throttle control failure signal	• Normal • FAIL	—
EEPROM Failure	Failure signal of combination meter	• Normal • FAIL	—
Brake Lamp SW Fail Status	Brake light switch failure signal	• Normal • FAIL	—
Brake Lamp Relay Drive	Brake light relay drive status signal	• Not Operating • Function check is in progress! Press Exit to abort.	—
EyeSight Communication Error (VDC)	Stereo camera communication failure signal	• Normal • FAIL	—
Judgment of Lost Communication with Adaptive Cruise Control ECM CAN	No-receive signal of EyeSight CAN data	• Normal • Not Receive	—
EyeSight Received Data (ECM)	NG signal of stereo camera data	• Normal • FAIL	—
Steering Angle Sensor Status	Steering angle sensor status	• Normal • FAIL	—

Items to be displayed	Content	Standard/Unit	Note
Steering Angle Sensor Error Code	Steering angle sensor error code signal	• Normal • Failure EEPROM • IG Voltage Drop • Counter Overflow • ROM Trouble • Random Access Memory (RAM) Error • Magnetometric Sensor Trouble	—
EyeSight Customization Change Request (Combination Meter→EyeSight)	EyeSight customization change request signal	• No • Pre-Collision BA Operation	—
EyeSight Customization Reset Request (Combination Meter→EyeSight)	EyeSight customization reset request signal	• No • Pre-Collision BA Operation	—
Pedestrian Airbag Presence Information (Combination Meter → EyeSight)	Pedestrian protection A/B presence/absence information	• No • Yes	—
EyeSight Customize Change Setting(Combination Meter → EyeSight)	Current setup information of ACC acceleration characteristics	• Lv.1(ECO) • Lv.2(Comfort) • Lv.3(Standard) • Lv.4(Dynamic)	—
CVT 8-speed Mode Control	CVT multi-stage speed control signal when EyeSight operates	• Not Operate • Operate	—
Lock up status	Lock up information	• Converter • Slip Lock Up • Lock-Up	—
Brake Lamp Status	Brake light state signal	• Light Off • Light On	—
Brake Vectoring Control Operation	Active torque vectoring control operation status	• Not Operate • Operate	—
Shift Position	Shift position information	• " "(blank) • D • N • R	—

Items to be displayed	Content	Standard/Unit	Note
		• P • L	
Manual Mode Information(TCU→EyeSight)	Manual mode information	• Non-Manual Mode • Manual Mode	—
Automatic Neutral Control(TCU→EyeSight)	Automatic neutral controlled signal	• Not Operate • Operate	—
Speedometer / Distance Display Unit	Speedometer / distance display unit	• km/h • mile	—
EyeSight Specification	EyeSight judgment signal	• No • Yes	—
Vehicle Height	Vehicle height information	• Unknown • OBK • Standard	—
Fuel type	Fuel type	• Gasoline • Diesel	—
Engine Displacement	Engine displacement	• 1500cc • 2000cc • 2500cc • 3000cc • 3600cc • 1600cc	—
Number of Cylinders	Number of cylinder for engine	• 4 Cylinder • 6 Cylinder	—
Turbo	Presence or absence of turbo	• Turbo • NA	—
Vehicle Type	Vehicle type information signal	• Impreza Type • Forester Type • Exiga Type • Legacy/Outback Type • WRX Type	—
Destination	Destination code signal	• Japan • U.S(U4,U5,U6) • Canada(C0) • EURO(Left) (EC,EA,E2,EL) • General(Left)(K4) & Latin America(C4) • Middle & Near	—

Items to be displayed	Content	Standard/Unit	Note
		East(KS) • U.K(EK) • Thailand/Singapore(ER,EN) • Australia(KA,KC) • China(EH) • South Korea(C6)	
Tire Diameter	Tire diameter judgment signal	• Standard • Special	—
WGN/SDN	Vehicle type signal	• Sedan • Wagon	—
Drive System	Driving method of AWD	• AWD • VTD • 2WD	—
Idling Stop Specification	Auto Start Stop judgment signal	• No • Yes	—
Transmission Type	Transmission type	• AT or CVT • MT	—
Steering Control Check 1	Stereo camera transmission data abnormal	• Normal • FAIL	—
Steering Control Check 2	Steering control instruction value from stereo camera abnormal	• Normal • FAIL	—
Active Lane Keep System Standby Status	Active lane keep assist stand-by status	• NG • OK	—
Lane Departure Prevention Assist Canceled Reason Control Check	Active lane keep, reason of cancelling the lane departure prevention assist	—	—
Active Lane Keep System Canceled Reason Control Check	Reason of cancelling the lane keep assist (system failure)	—	—
Active Lane Keep System Recognition Check 1	Lane keep assist - recognition data detailed information 1	—	—
Active Lane Keep System Recognition Check 2	Lane keep assist - recognition data detailed information 2	—	—
Active Lane Keep System Recognition Check 4	Lane keep assist - recognition data detailed information 4	—	—

Items to be displayed	Content	Standard/Unit	Note
Active Lane Keep System Recognition Check 6	Lane keep assist - recognition data detailed information 6	—	—
Lane Departure Prevention Assist Control Check 3	Lane departure prevention assist - control data detailed information 3	—	—
Active Lane Keep System Control Check 3	Lane keep assist - control data detailed information 3	—	—
Active Lane Keep System Control Check 4	Lane keep assist - control data detailed information 4	—	—
Active Lane Keep System Control Check 5	Lane keep assist - control data detailed information 5	—	—
Camera Battery Voltage (At The Time of EyeSight Temporary)	ECM power supply voltage (at an EyeSight temporary stop)	V	—
Camera Temperature Sensor (At The Time of EyeSight Temporary)	Camera temperature (at an EyeSight temporary stop)	Celsius	—
Automatic Adjustment Status Check (At The Time of EyeSight Temporary)	Automatic adjustment status (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 1 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 1 (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 2 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 2 (at an EyeSight temporary stop)	—	—
Camera Adjustment Value 3 (At The Time of EyeSight Temporary)	Camera adjustment value detailed information 3 (at an EyeSight temporary stop)	—	—
EyeSight Temporary Detail Check 1	EyeSight temporary stop. Detailed information 1	—	—

Items to be displayed	Content	Standard/Unit	Note
EyeSight Temporary Detail Check 2	EyeSight temporary stop. Detailed information 2	—	—
EyeSight Temporary Detail Check 3	EyeSight temporary stop. Detailed information 3	—	—
EyeSight Temporary Detail Check 4	EyeSight temporary stop. Detailed information 4	—	—
Details Check 1 (At The Time of EyeSight Temporary)	Detailed information 1 at the time of EyeSight temporary stop	—	—
Details Check 2 (At The Time of EyeSight Temporary)	Detailed information 2 at the time of EyeSight temporary stop	—	—
Details Check 3 (At The Time of EyeSight Temporary)	Detailed information 3 at the time of EyeSight temporary stop	—	—
Details Check 4 (At The Time of EyeSight Temporary)	Detailed information 4 at the time of EyeSight temporary stop	—	—
Camera Temperature Operation Status (At The Time of EyeSight Temporary)	Stereo camera operation status at the time of EyeSight temporary stop	• Normal • High temperature • Low temperature	—
Camera failure real-time information	Current camera failure information	—	—
Camera Failure Details Cumulative Check 1	Camera failure details. Cumulative information 1	—	—
Camera Failure Details Cumulative Check 2	Camera failure details. Cumulative information 2	—	—
Camera Failure Details Cumulative Check 3	Camera failure details. Cumulative information 3	—	—
Camera Failure Details Cumulative Check 4	Camera failure details. Cumulative information 4	—	—
Camera Failure Details Cumulative Check 5	Camera failure details. Cumulative information 5	—	—
Camera Failure Details Cumulative Check 6	Camera failure details. Cumulative information 6	—	—

Items to be displayed	Content	Standard/Unit	Note
Camera Failure Details Cumulative Check 7	Camera failure details. Cumulative information 7	—	—
Camera Failure Details Cumulative Check 8	Camera failure details. Cumulative information 8	—	—
Camera Failure Details Cumulative Check 9	Camera failure details. Cumulative information 9	—	—
Camera Failure Details Cumulative Check 10	Camera failure details. Cumulative information 10	—	—
Camera Failure Details Cumulative Check 11	Camera failure details. Cumulative information 11	—	—
Camera Failure Details Cumulative Check 12	Camera failure details. Cumulative information 12	—	—
Camera Failure Details Cumulative Check 13	Camera failure details. Cumulative information 13	—	—
Camera Failure Details Cumulative Check 14	Camera failure details. Cumulative information 14	—	—
Camera Temperature Abnormality Ignition SW ON Count Check 1	Camera temperature abnormal IG ON count 1	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 2	Camera temperature abnormal IG ON count 2	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 3	Camera temperature abnormal IG ON count 3	Time	—
Camera Temperature Abnormality Ignition SW ON Count Check 4	Camera temperature abnormal IG ON count 4	Time	—

Items to be displayed	Content	Standard/Unit	Note
Camera Temperature Abnormality Ignition SW ON Count Check 5	Camera temperature abnormal IG ON count 5	Time	—
Camera Adjustment Value 1	Camera adjustment value detailed information 1	—	—
Camera Adjustment Value 2	Camera adjustment value detailed information 2	—	—
Camera Adjustment Value 3	Camera adjustment value detailed information 3	—	—
Camera Status Check 1	Camera status detailed information 1	—	—
Camera Status Check 2	Camera status detailed information 2	—	—
Camera Status Check 3	Camera status detailed information 3	—	—
Camera Status Check 4	Camera status detailed information 4	—	—
Camera Status Check 5	Camera status detailed information 5	—	—
Camera Status Check 6	Camera status detailed information 6	—	—
Camera Status Check 7	Camera status detailed information 7	—	—
Camera Status Check 8	Camera status detailed information 8	—	—
Camera Status Check 9	Camera status detailed information 9	—	—
Camera Status Check 10	Camera status detailed information 10	—	—
Camera Status Check 11	Camera status detailed information 11	—	—
Camera Status Check 12	Camera status detailed information 12	—	—
Camera Status Check 13	Camera status detailed information 13	—	—
Camera Status Check 14	Camera status detailed information 14	—	—
Camera Status Check 15	Camera status detailed information 15	—	—

Items to be displayed	Content	Standard/Unit	Note
Camera Status Check 16	Camera status detailed information 16	—	—
Camera Status Check 17	Camera status detailed information 17	—	—
Camera Status Check 18	Camera status detailed information 18	—	—
Camera Status Check 19	Camera status detailed information 19	—	—
Camera Status Check 20	Camera status detailed information 20	—	—
Camera Status Check 21	Camera status detailed information 21	—	—
Camera Status Check 22	Camera status detailed information 22	—	—
Camera Status Check 23	Camera status detailed information 23	—	—
Camera Status Check 24	Camera status detailed information 24	—	—
Camera Status Check 25	Camera status detailed information 25	—	—
Front Axle Average Wheel Speed (At The Time of EyeSight Temporary)	Front axle wheel average speed at the time of EyeSight temporary stop	km/h	—
Ignition SW ON Count (At The Time of EyeSight Temporary)	IG ON count at the time of EyeSight temporary stop	Time	—
EyeSight Failure (ADB/HBA)	EyeSight failure information (ADB/HBA)	• Normal • EyeSight FailureFailure	—
EyeSight Halt (ADB/HBA)	EyeSight temporary stop information (ADB/HBA)	• OFF • HALT	—
EyeSight Initialization(ADB/HBA)	Camera initialization completion flag (ADB/HBA)	• During Initialization • Started	—
HBA Control Permission	HBA permission flag	• Prohibition • Permit	—
Adjust Sensitivity Flag(ADB/HBA)	Sensitivity adjustment flag	• Not Adjust Sensitivity • Adjust Sensitivity	—

Items to be displayed	Content	Standard/Unit	Note
Judgment Night	Night-time judging flag	• Other Than Night • Night	—
Compressor Type(CAN→EyeSight)	Compressor type	• Fixed Type • Variable Type	—

EyeSight (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to EyeSight (DIAGNOSTICS)>Freeze Frame Data>LIST.**
- **Freeze frame data is cleared by Clear Memory. Ref. to COMMON(diag)>Clear memory.**

EyeSight (DIAGNOSTICS) > Freeze Frame Data

LIST

Note:

Freeze frame data is stored for three DTCs. Allocation of the three DTCs are as follows:

- **DTC that occurred first.**
- **DTC that occurred first during the latest driving cycle (from IGN ON to IGN OFF).**
- **DTC that occurred first during the second latest driving cycle.**
- **However, DTCs will be stored in order of occurrence until these three DTCs are stored.**

Items to be displayed	Content	Standard/Unit	Note
ECU Power Supply Voltage (IG)	Display of input voltage of stereo camera	V	—
Engine Speed	Engine speed	rpm	—
Accel. Opening Angle	Acceleration opening angle signal	%	—
Brake Fluid Target Pressure	Target value of brake fluid pressure	MPa	—
Master Cylinder Actual Fluid Pressure	Brake pressure	MPa	—
Right Front Wheel W/C Actual Fluid Pressure	Right front wheel cylinder fluid pressure	MPa	—
Left Front Wheel W/C Actual Fluid Pressure	Left front wheel cylinder fluid pressure	MPa	—
Brake SW Input	Brake switch signal status	• OFF • ON	—
Brake Lamp SW (BIU)	Brake light switch signal status	• OFF • ON	—
Brake Lamp SW (VDC)	Brake light switch status	• OFF • ON	—
Trip Count [count]	Number of ignition ON	Time	—
Brake Lamp Command	Brake lamp light up command signal	• No • Pre-Collision BA Operation	—

Items to be displayed	Content	Standard/Unit	Note
EPB Activate Request	Electronic parking brake activate request	• No • Pre-Collision BA Operation	—
Idle SW for EPB Control	Idle switch signal for electronic parking brake control	• OFF • ON	—
Driver Brake Detection	Driver brake detection signal	• OFF • ON	—
Brake control actuate	Brake operation permission signal	• No • Perform	—
Pre-Collision Brake Assist Command	Pre-collision brake assist command signal	• No • Pre-Collision BA Operation	—
Pre-Collision Brake Action	Pre-collision brake command signal	• No • Pre-Collision BA Operation	—
Risk Avoidance Assist standby Command	Pre-collision steering assist, command signal	• Normal VDC State • AvoidRiskCmd	—
Adaptive Cruise Control Torque Down	Torque down prohibition signal of stereo camera	• ON • OFF	—
Hill Descent Control Status	Hill descent control status signal	• System OFF • Waiting • Operating • Infinitive	—
Engine Failure	Engine failure signal	• Normal • FAIL	—
Brake Lamp SW Fail Status	Brake light switch failure signal	• Normal • FAIL	—

EyeSight (DIAGNOSTICS) > Real-time Diagnosis

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Data monitor].
6. Check that the display changes and the contents are correct when performing the operations as follows.
   - Depress and release the brake pedal. (Stop light switch and brake switch are turned ON.)
     – Item [Brake Lamp SW (BIU)][Brake SW Input][Brake Lamp SW (VDC)]
   - Turn the cruise switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Turn the {SET/−} switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Turn the {RES/+} switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Turn the “F.D. Set+” switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Turn the “Following distance -” switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Turn the “Lane keep” switch to ON.
     – Item [Cruise Control SW Voltage (Port14)][Cruise Control SW Voltage (Port16)]
   - Operate the shift lever.
     – Item [Current gear position]
   - Press and hold the pre-collision brake OFF switch.
     – Item [Pre-Collision Brake OFF Indicator]
   - Press and hold the lane departure warning OFF switch.
     – Item [Lane Departure Warning OFF Indicator]

   Note:
   For detailed operation procedures, refer to “Application help”.

EyeSight (DIAGNOSTICS) > Clear Active Lane Keep System Learning Value

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Clear Active Lane Keep System Learning Value].

   Note:

   - **When suspension parts are replaced or wheel alignment is adjusted, perform [Clear Active Lane Keep System Learning Value].**
   - **For detailed operation procedures, refer to "Application help".**

EyeSight (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [DTC].

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**
- **Up to ten codes can be stored. When more than ten codes are output, they will not be stored.**
- **The same code is stored only once, and even when the same code occurs several times, information will not be updated.**

EyeSight (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2801	TCM Abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2801 TCM ABNORMAL.
B2802	ETC Abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2802 ETC ABNORMAL.
B2806	ECM Abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2806 ECM ABNORMAL.
B2807	ECM Abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2807 ECM ABNORMAL.
B2809	VDC Malfunction	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2809 VDC MALFUNCTION.
B280A	VDC Echo Back Disagreement	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B280A VDC ECHO BACK DISAGREEMENT.

Code	Description & trouble part	Reference
B280B	VDC Brake Fluid Pressure	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B280B VDC BRAKE FLUID PRESSURE.
B280F	Meter Failure	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B280F COMBINATION METER MALFUNCTION.
B2810	Incompatible with EyeSight (Combination Meter)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2810 INCOMPATIBLE WITH EyeSight (COMBINATION METER).
B2811	EPS Abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2811 EPS ABNORMAL.
B2814	Power Supply Low Voltage	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.
B2815	Power Supply High Voltage	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2815 POWER SUPPLY HIGH VOLTAGE.
B2817	Brake Lamp	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2817 BRAKE LAMP.
B281B	Steering Angle Sensor abnormal	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281B STEERING ANGLE SENSOR FAIL.
B281C	Incompatible with EyeSight (EPS)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281C INCOMPATIBLE WITH EyeSight (EPS).
B281E	RAB Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281E RAB CONTROL MODULE.

Code	Description & trouble part	Reference
B281F	Reverse Automatic Braking Override	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B281F REVERSE AUTOMATIC BRAKING OVERRIDE.
B2821	Reverse Automatic Braking Control Prohibition	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2821 REVERSE AUTOMATIC BRAKING CONTROL PROHIBITION.
B2822	TCM DATA ABNORMAL	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2822 TCM DATA ABNORMAL.
B28A0	Vehicle Model Judgment	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A0 VEHICLE MODEL JUDGMENT.
B28A1	EyeSight Communication(ECM)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A1 EyeSight COMMUNICATION(ECM).
B28A2	EyeSight Communication(VDC)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A2 EyeSight COMMUNICATION(VDC).
B28A3	EyeSight Communication(Meter)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A3 EyeSight COMMUNICATION(METER).
B28A4	EyeSight Communication(EPS)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A4 EyeSight COMMUNICATION(EPS).
B28A5	Engine Torque Limiter Control Prohibit	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A5 ENGINE TORQUE LIMITER CONTROL PROHIBIT.
B28A6	Internal Stereo Camera Communication 1	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC

Code	Description & trouble part	Reference
		B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.
B28A7	Stereo Camera Recognition(Target)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A7 STEREO CAMERA RECOGNITION(TARGET).
B28A8	Internal Stereo Camera Communication 2	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A8 INTERNAL STEREO CAMERA COMMUNICATION 2.
B28A9	Stereo Camera Synchronized Recognition Data	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A9 STEREO CAMERA SYNCHRONIZED RECOGNITION DATA.
B28AA	Stereo Camera Microcomputer 1	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AA STEREO CAMERA MICROCOMPUTER 1.
B28AB	Stereo Camera Microcomputer 2	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AB STEREO CAMERA MICROCOMPUTER 2.
B28AC	Stereo Camera ASIC	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AC STEREO CAMERA ASIC.
B28AD	Stereo Camera Image Recognition	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AD STEREO CAMERA IMAGE RECOGNITION.
B28AE	Internal Stereo Camera Power Supply	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28AE INTERNAL STEREO CAMERA POWER SUPPLY.
B28AF	Stereo Camera Adjustment Incomplete	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure

Code	Description & trouble part	Reference
		with Diagnostic Trouble Code (DTC)>DTC B28AF STEREO CAMERA ADJUSTMENT INCOMPLETE.
B28B1	Stereo Camera Automatic Adjustment	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B1 STEREO CAMERA AUTOMATIC ADJUSTMENT.
B28B2	Stereo Camera High Temperature	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B2 STEREO CAMERA HIGH TEMPERATURE.
B28B3	Stereo Camera Low Temperature	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B3 STEREO CAMERA LOW TEMPERATURE.
B28B5	+B Circuit Open	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B5 +B CIRCUIT OPEN.
B28B6	Pre-Collision OFF Switch	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.
B28B7	LDP OFF Switch	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.
B28B8	EyeSight Steering Switch 1	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight STEERING SWITCH 1.
B28B9	EyeSight Steering Switch 2	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B9 EyeSight STEERING SWITCH 2.
B28BA	STEERING ANGLE AND STEREO CAMERA CORRELATION MISALIGNED	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28BA STEERING ANGLE AND STEREO CAMERA CORRELATION MISALIGNED.

Code	Description & trouble part	Reference
U0073	Control Module Communication Bus Off	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	Lost Communication With ECM/PCM "A"	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	Lost Communication With TCM	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	Lost Communication With Vehicle Dynamics Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0126	Lost Communication With Steering Angle Sensor Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0131	Lost Communication With Power Steering Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	Lost Communication With Body Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC)

Code	Description & trouble part	Reference
		CONTROL MODULE.
U0401	Invalid Data Received From ECM/PCM "A"	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	Invalid Data Received From TCM	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	Invalid Data Received From Vehicle Dynamics Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0420	Invalid Data Received From Power Steering Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE.
U0422	Invalid Data Received From Body Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	Invalid Data Received From Instrument Panel Cluster Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0428	Invalid Data Received From Steering Angle Sensor Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE.
U1073	Control Module Communication Bus "SONAR-CAN" Off	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF.

Code	Description & trouble part	Reference
U1233	Lost Communication with RAB Control Module	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE.
U1534	Invalid Data Received from Sonar ECU	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2801 TCM ABNORMAL

Detected when error occurs in the automatic transmission.
When lost communication with TCM and TCM abnormal occur simultaneously, perform diagnosis for lost communication with TCM first.

Note:

Check the automatic transmission. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2802 ETC ABNORMAL

Detected when error occurs in the electronic throttle control.

Note:

Perform check of the ECM. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2806 ECM ABNORMAL

Detected when error occurs in the engine control module (ECM).

Note:

Perform check of the ECM. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2807 ECM ABNORMAL

Detected when cruise indicator illumination request from ECM and ON/OFF information of cruise function do not match.

Note:

- **Perform check of the ECM. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.**
- **Check the ECM cruise control cancel code. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2809 VDC MALFUNCTION

Detected when error occurs in the VDC. (VDC failure)
When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:

Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280A VDC ECHO BACK DISAGREEMENT

Detected when error occurs in the VDC. (VDC brake control malfunction 1)
When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:

Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280B VDC BRAKE FLUID PRESSURE

Detected when error occurs in the VDC. (VDC brake control malfunction 3)

Note:

Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B280F COMBINATION METER MALFUNCTION

Malfunction is detected in the combination meter.

DTC detecting condition:

Defective combination meter

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light blinks or illuminates.
- Combination meter does not illuminate.

Note:

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2810 INCOMPATIBLE WITH EYESIGHT (COMBINATION METER)

Detected when the combination meter, which is not designed exclusively for EyeSight is installed.

DTC detecting condition:

Incorrect specifications of combination meter

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

Replace the combination meter with the one designed for EyeSight. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2811 EPS ABNORMAL

Malfunction is detected in the electric power steering.

Note:

Check the electric power steering. Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2814 POWER SUPPLY LOW VOLTAGE

Detected when the status of 7.0 V or less continues approximately for 5 seconds and is judged to be low-voltage malfunction, or when the +B harness of the stereo camera is broken.

DTC detecting condition:

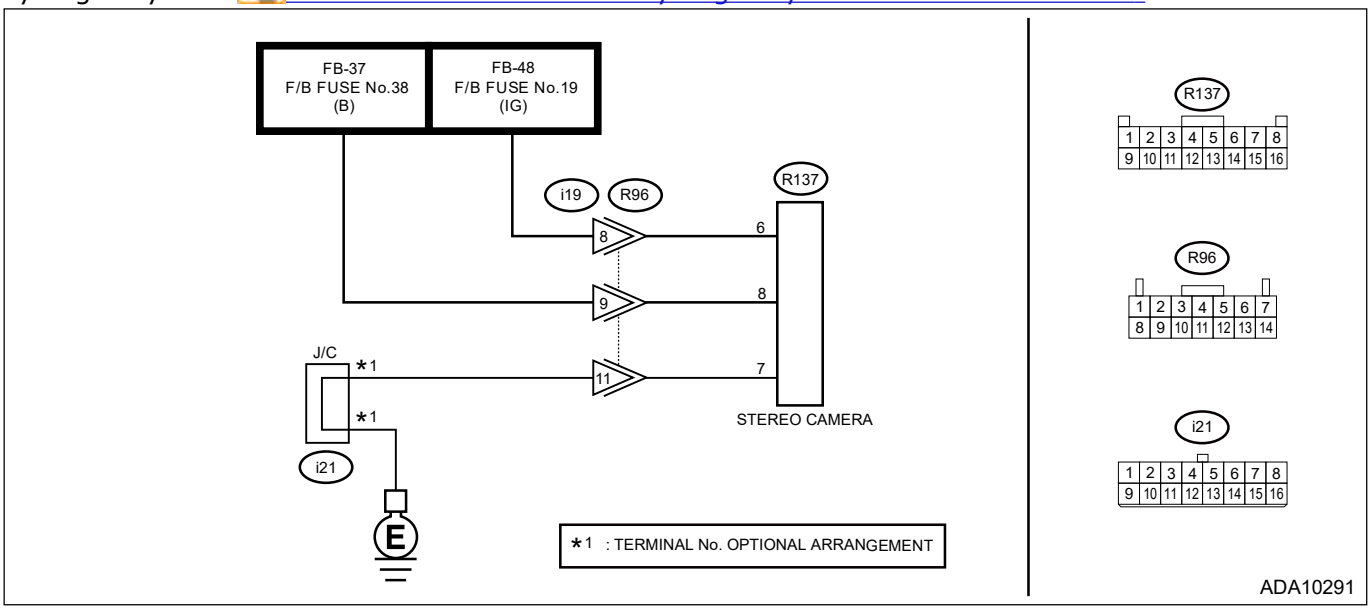
- Input voltage to stereo camera is out of specifications.
- Defective stereo camera control harness (open circuit in +B harness)
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light blinks or illuminates.
- Cruise indicator light blinks.
- Malfunction indicator light illuminates.
- VDC warning light illuminates.
- ATF temperature warning light illuminates.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK GENERATOR.

1. Start the engine and idle for a while.
2. Measure the voltage between generator terminal B and chassis ground.
   Connector & terminal
   Generator terminal B (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Check the generator. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Generator.

2. CHECK BATTERY TERMINAL.

Turn the ignition switch to OFF.

Is the battery terminal connected securely?

Yes	Go to 3.
No	Tighten the battery terminal securely.

3. CHECK FUSE.

Check fuses No. 19 and No. 38 in the fuse & relay box. Ref. to EyeSight>Relay and Fuse.

Is the fuse OK?

Yes	Go to 4.
No	Replace the defective fuse. When the replaced fuse blows out easily, check the short circuit in harness.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the stereo camera.
2. Turn the ignition switch to ON.
3. Measure the voltage between connector of stereo camera and chassis ground.
   Connector & terminal
   (R137) No. 6 (+) — Chassis ground (−):
   (R137) No. 8 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Check the power supply system circuit, and if any fault is found, repair the defective parts or replace the harness.

5. CHECK HARNESS (GROUND CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery.
3. Measure the resistance between stereo camera and chassis ground.
   Connector & terminal
   (R137) No. 7 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Check the ground system circuit, and if any fault is found, repair the defective parts or replace the harness.

6. CHECK POOR CONTACT OF CONNECTORS.

Check stereo camera connector.

Is there poor contact of connector?

Yes	Repair the connector.
No	Go to 7.

7. CHECK STEREO CAMERA.

1. Connect all connectors and battery terminals securely.
2. Start the engine, drive the vehicle at 40 km/h (24.9 MPH) or more, stop the vehicle and then stop the engine.
3. After 3 seconds or more have elapsed, restart the engine.
4. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



5. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2814 or B2815 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2815 POWER SUPPLY HIGH VOLTAGE

Detected when the status for the battery voltage of 16 V or more continues approximately for 5 seconds and is judged to be abnormally high voltage.
Refer to DTC B2814 for DTC detecting condition, trouble symptom and diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2817 BRAKE LAMP

DTC detecting condition:
- Defective brake light relay
- Defective brake light switch
- Defective VDC

Trouble symptom:
- All functions of EyeSight system do not operate.

- EyeSight warning light illuminates.
- Brake light does not go off or illuminate.

Note:

When this DTC is detected, check VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281B STEERING ANGLE SENSOR FAIL

DTC detecting condition:

Defective steering angle sensor

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

When this DTC is detected, check VDC system. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281C INCOMPATIBLE WITH EYESIGHT (EPS)

Detected when the EPS CM which is not exclusively for EyeSight is installed.

DTC detecting condition:

Incorrect specifications of EPS CM.

Trouble symptom:

All functions of EyeSight system do not operate.

Note:

Replace the EPS CM with the one exclusively designed for EyeSight. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281E RAB CONTROL MODULE

Detected when error occurs in sonar or RAB CM.

DTC detecting condition:

- Defective RAB CM.
- Defective unit that is cooperatively controlled with stereo camera.

Trouble symptom:

- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.
- All functions of EyeSight system do not operate. (Functions terminated due to a cooperative control unit failure)
- EyeSight warning light illuminates. (Functions terminated due to a cooperative control unit failure)

1. CHECK DTCS (DETERMINING A FAILURE OF COOPERATIVE CONTROL UNIT).

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC other than DTC B281E displayed?

Yes	Perform the diagnosis for DTC other than DTC B281E.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Finish the diagnosis.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B281F REVERSE AUTOMATIC BRAKING OVERRIDE

DTC detecting condition:
Defective RAB CM.
Trouble symptom:
- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.

Note:
Check the Reverse Automatic Braking when this DTC is displayed. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2821 REVERSE AUTOMATIC BRAKING CONTROL PROHIBITION

DTC detecting condition:
Defective RAB CM.
Trouble symptom:
- The Reverse Automatic Braking function does not operate.
- RAB warning light illuminates.

Note:
Check the Reverse Automatic Braking when this DTC is displayed. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2822 TCM DATA ABNORMAL

DTC detecting condition:
Detected when there are no AT turbine speed inputs during driving and the TCM is determined as abnormal. Detected when all of the following conditions are met:
- Drive wheels' average wheel speed is 15 km/h or more.
- Engine speed is 1000 rpm or more.
- Turbine speed is 0 or less.

Trouble symptom:
- Standing start problems
- All functions of EyeSight system do not operate.
- EyeSight warning light blinks or illuminates.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A0 VEHICLE MODEL JUDGMENT

Detected when the model code for stereo camera and the model code used for CAN data are different.
DTC detecting condition:

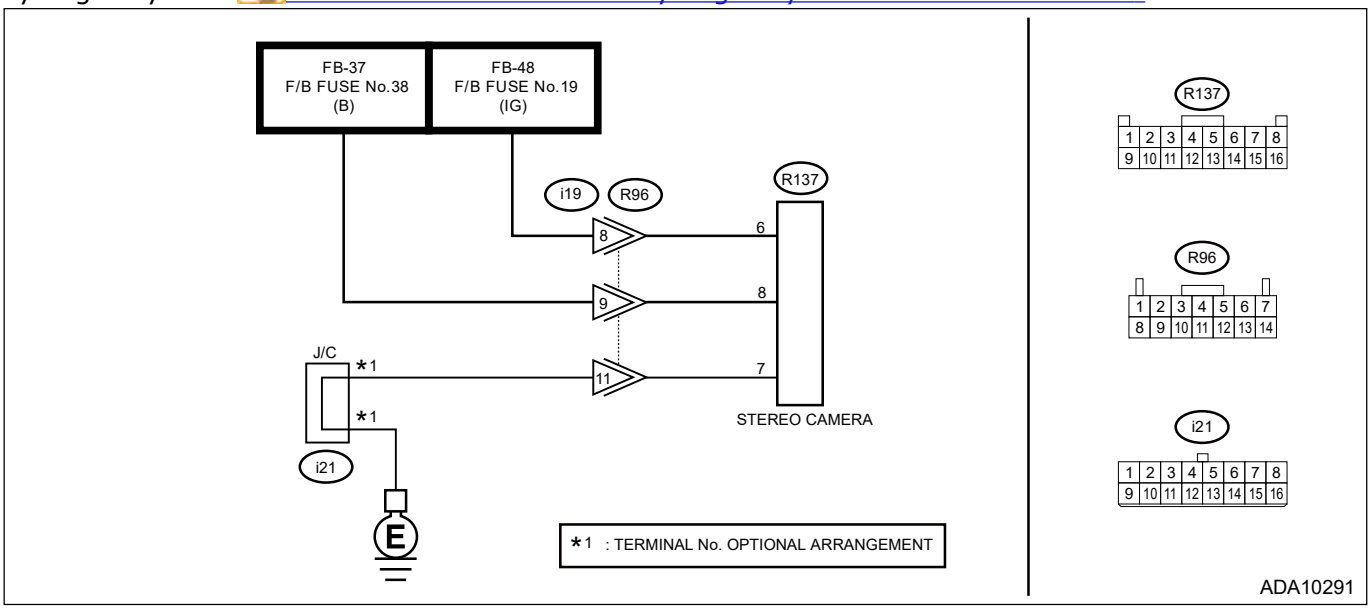
- Defective CAN system
- Defective stereo camera
- In the aiming operation, there is an open circuit in the +B harness of the stereo camera.
- In the completion of the aiming operation, the switching from IGN OFF to IGN ON takes place too early, and the recording of the model information has not yet been finished.

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK RELATED CM.

Check the part number of the ECM, TCM, VDC CM and combination meter.

Is each CM a genuine part?

Yes	Go to 2.
No	Replace the non-genuine CM with a genuine one.

2. CHECK STEREO CAMERA.

1. Remove the camera cover.
2. Check the part number of the stereo camera.

Is the stereo camera genuine?

Yes	Go to 3.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 4.
No	Perform the diagnosis for LAN system.

4. CHECK MODEL REGISTRATION INFORMATION.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight].
Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Model registration information]

Does vehicle and [Model registration information] correspond?

Yes	Perform the adjustment or inspection of the camera. Ref. to EyeSight>Camera Adjustment, Inspection.
No	Go to 5.

5. CHECK FUSE.

Check fuses No. 19 and No. 38 in the fuse & relay box. Ref. to EyeSight>Relay and Fuse.

Is the check result OK?

Yes	Go to 6.
No	Replace the defective fuse. When the replaced fuse blows out easily, check the short circuit in harness.

6. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the stereo camera.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between connector of stereo camera and chassis ground.

Connector & terminal

(R137) No. 6 (+) — Chassis ground (−):

(R137) No. 8 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 7.
No	Check the power supply system circuit, and if any fault is found, repair the defective parts or replace the harness.

7. CHECK HARNESS (GROUND CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the ground cable from battery.
3. Using a tester, measure the resistance between stereo camera and chassis ground.
   Connector & terminal
   (R137) No. 7 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 8.
No	Check the ground system circuit, and if any fault is found, repair the defective parts or replace the harness.

8. CHECK POOR CONTACT OF CONNECTORS.

Check stereo camera connector.

Is there poor contact of connector?

Yes	Repair the connector.
No	Go to 9.

9. CHECK STEREO CAMERA.

1. Connect all connectors and battery terminals securely.
2. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A0 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A1 EYESIGHT COMMUNICATION(ECM)

Detected when the engine control module (ECM) detects the malfunction of stereo camera, or when the stereo camera or ECM is assembled incorrectly.

DTC detecting condition:

- Defective CAN system
- Defective engine control module (ECM)
- Defective stereo camera
- Incorrect assembly of stereo camera (when the stereo camera designed for EyeSight (Ver. 2) type vehicle is installed to the EyeSight (Ver. 3) type vehicle, etc.)
- Incorrect assembly of ECM (when the ECM designed for another model is installed, etc.)

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK ECM.

Check the part number of the ECM.

Is the ECM genuine?

Yes	Go to 2.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.

2. CHECK STEREO CAMERA.

1. Remove the camera cover.
2. Check the part number of the stereo camera.

Is the stereo camera genuine?

Yes	Go to 3.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

3. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 4.
No	Perform the diagnosis for LAN system.

4. CHECK ECM.

Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 5.
No	Perform the diagnosis for the engine.

5. CHECK CONNECTOR.

Check the ECM connector and the stereo camera connector.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace the connector.

6. CHECK STEREO CAMERA.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC other than DTC B28A1 displayed?

Yes	Perform the diagnosis for DTC other than DTC B28A1.
No	Go to 7.

7. CHECK STEREO CAMERA.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A1 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A2 EYESIGHT COMMUNICATION(VDC)

Detected when the VDC control module (VDCCM) detects the malfunction of stereo camera.

DTC detecting condition:

- Defective CAN system
- Defective VDC control module (VDCCM)
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the diagnosis of DTCs for LAN system.

2. CHECK VDC.

Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for VDC.

3. CHECK CONNECTOR.

Check the VDC connector and the stereo camera connector.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the connector.

4. CHECK STEREO CAMERA.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC other than DTC B28A2 displayed?

Yes	Perform the diagnosis for DTC other than DTC B28A2.
No	Go to 5.

5. CHECK STEREO CAMERA.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A2 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A3 EYESIGHT COMMUNICATION(METER)

Detected when the combination meter detects the malfunction of stereo camera.

DTC detecting condition:

- Defective CAN system
- Defective combination meter

- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Perform the diagnosis of DTCs for LAN system.
No	Go to 2.

2. CHECK COMBINATION METER.

Perform the diagnosis for combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for combination meter.

3. CHECK CONNECTOR.

Check the combination meter connector and the stereo camera connector.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the connector.

4. CHECK STEREO CAMERA.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC other than DTC B28A3 displayed?

Yes	Perform the diagnosis for DTC other than DTC B28A3.
No	Go to 5.

5. CHECK STEREO CAMERA.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A3 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A4 EYESIGHT COMMUNICATION(EPS)

Detected when the power steering control module (EPS CM) detects the malfunction of stereo camera.

DTC detecting condition:

- Defective CAN system
- Defective EPS CM

- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the diagnosis for LAN system.

2. CHECK EPS CM.

Perform the diagnosis for the power steering system. Ref. to POWER STEERING (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for the power steering system.

3. CHECK CONNECTOR.

Check the EPS CM connector and the stereo camera connector.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the connector.

4. CHECK STEREO CAMERA.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC other than DTC B28A4 displayed?

Yes	Perform the diagnosis for DTC other than DTC B28A4.
No	Go to 5.

5. CHECK STEREO CAMERA.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A4 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A5 ENGINE TORQUE LIMITER CONTROL PROHIBIT

Detected when abnormal data is transmitted from stereo camera to engine control module (ECM) and the engine control module (ECM) prohibits the AT rapid start prevention control, or when the engine control module (ECM) prohibits the AT rapid start prevention control.

DTC detecting condition:

- Defective CAN system
- Defective engine control module (ECM)
- Defective stereo camera
- Defective combination meter
- Incorrect assembly of combination meter (when the combination meter that is not for EyeSight is installed.)

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

1. CHECK COMBINATION METER.

Check the part number of the combination meter.

Is the combination meter genuine?

Yes	Go to 2.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Perform the diagnosis for LAN system.
No	Go to 3.

3. CHECK ECM.

Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 4.
No	Perform the diagnosis for the engine.

4. CHECK CONNECTOR.

Check the ECM connector and the stereo camera connector.

Is the check result OK?

Yes	Go to 5.
No	Repair or replace the connector.

5. CHECK STEREO CAMERA.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC other than DTC B28A5 displayed?

Yes	Perform the diagnosis for DTC other than DTC B28A5.
No	Go to 6.

6. CHECK STEREO CAMERA.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28A5 displayed?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1

Detected when communication error occurs inside the stereo camera.
DTC detecting condition:
Communication error occurs inside the stereo camera.
Trouble symptom:
All functions of EyeSight system do not operate.

1. CHECK RESTARTING.

1. Turn the ignition switch to OFF.
2. Start the engine.
3. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC 28A6 displayed after restarting the engine?
(When malfunction is detected after restarting the engine, 0 is registered in IG counter. Other values can be regarded as DTCs detected in the past.)

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Temporary poor communication have occurred. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A7 STEREO CAMERA RECOGNITION(TARGET)

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:

If the same DTC is still detected after restarting the engine, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A8 INTERNAL STEREO CAMERA COMMUNICATION 2

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:

If the same DTC is still detected after restarting the engine, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28A9 STEREO CAMERA SYNCHRONIZED RECOGNITION DATA

Detected when error occurs in the communication data inside the control module caused by external factors such as noises.

Note:

If the same DTC is still detected after restarting the engine, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AA STEREO CAMERA MICROCOMPUTER 1

Detected when communication error occurs due to malfunction of microcomputer inside the stereo camera.
DTC detecting condition:
Communication error occurs due to malfunction of microcomputer inside the stereo camera.
Trouble symptom:
All functions of EyeSight system do not operate.
Refer to DTC B28A6 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AB STEREO CAMERA MICROCOMPUTER 2

Detected when communication error occurs due to malfunction of microcomputer inside the stereo camera.
DTC detecting condition:
Communication error occurs due to malfunction of microcomputer inside the stereo camera.
Trouble symptom:
All functions of EyeSight system do not operate.
For the diagnostic procedure, refer to DTC B28A6. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AC STEREO CAMERA ASIC

Detected when communication error occurs due to malfunction of ASIC.
DTC detecting condition:
Communication error occurs due to malfunction of ASIC.
Trouble symptom:
All functions of EyeSight system do not operate.
Refer to DTC B28A6 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AD STEREO CAMERA IMAGE RECOGNITION

Detected when improper image recognition occurs in the microcomputer inside the stereo camera.
DTC detecting condition:
Improper image recognition occurs in the microcomputer inside the stereo camera.
Trouble symptom:
All functions of EyeSight system do not operate.

For the diagnostic procedure, refer to DTC B28A6. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AE INTERNAL STEREO CAMERA POWER SUPPLY

Detected when improper power supply inside the stereo camera occurs.
DTC detecting condition:
Improper power supply inside the stereo camera occurs.
Trouble symptom:
All functions of EyeSight system do not operate.
For the diagnostic procedure, refer to DTC B28A6. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28A6 INTERNAL STEREO CAMERA COMMUNICATION 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28AF STEREO CAMERA ADJUSTMENT INCOMPLETE

Detected when adjustment or inspection of stereo camera has not been completed normally.
DTC detecting condition:
- Operation is aborted during adjustment or inspection of the stereo camera.
- After the replacement of the stereo camera, adjustment or inspection of camera has not yet been performed.

Trouble symptom:
All functions of EyeSight system do not operate.
For diagnostic procedure, perform adjustment/inspection of camera. Ref. to EyeSight>Camera Adjustment, Inspection. When the adjustment or inspection of camera is performed, and if it is not completed successfully, replace the camera. Ref. to EyeSight>Stereo Camera.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B1 STEREO CAMERA AUTOMATIC ADJUSTMENT

Detected when the optical axis of stereo camera is deviated in lateral direction or when the fluctuation range of automatic adjustment value has expanded.
Note:
Perform the adjustment of the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE.
If the same DTC is still detected after adjustment, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B2 STEREO CAMERA HIGH TEMPERATURE

Detected when the temperature of the stereo camera excessively increases.

Note:

When this DTC is detected, performing adjustment or inspection of the camera will not return it to the normal state. In this case, always replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B3 STEREO CAMERA LOW TEMPERATURE

Detected when the temperature of the stereo camera excessively decreases.

Note:

When this DTC is detected, performing adjustment or inspection of the camera will not return it to the normal state. In this case, always replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B5 +B CIRCUIT OPEN

Detected when there is an open circuit in power supply line.

Note:

Refer to DTC B2814 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B6 PRE-COLLISION OFF SWITCH

Detected when pre-collision brake OFF switch circuit is not installed, open-circuited or is stuck to ON.

DTC detecting condition:

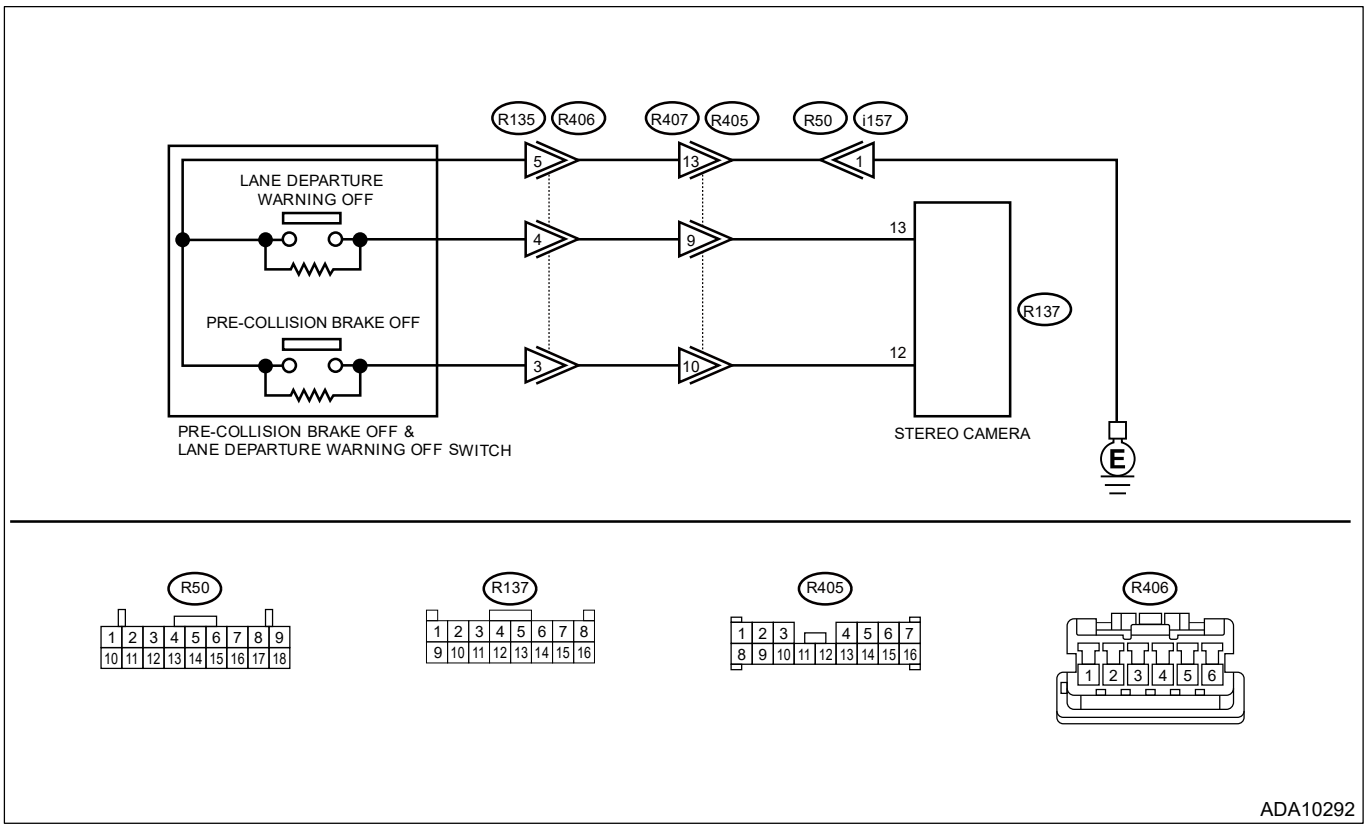
- Wiring of pre-collision brake OFF switch is not connected.
- Pre-collision brake OFF switch circuit is open.
- Pre-collision brake OFF switch circuit stays ON for 45 seconds or more.

Trouble symptom:

All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight].
Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

Data Monitor

- Pre-Collision Brake OFF SW Status (BIU)

Does the display change according to ON/OFF operation of the pre-collision brake OFF switch?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK HARNESS.

1. Disconnect the stereo camera connector and the pre-collision brake OFF switch connector.
2. Using the tester, measure the resistance between the stereo camera connector and pre-collision brake OFF switch connector as well as chassis ground.
   Connector & terminal
   (R406) No. 3 — (R137) No. 12:
   (R406) No. 5 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace an open circuit in harness between the stereo camera connector and pre-collision brake OFF switch connector.

3. CHECK HARNESS.

Using the tester, measure the resistance between the pre-collision brake OFF switch connector and chassis ground.
Connector & terminal
(R406) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Check the pre-collision brake OFF switch. Ref. to EyeSight>Switches and Harness>INSPECTION.
No	Repair or replace the short circuit to ground in harness between the stereo camera connector and pre-collision brake OFF switch connector.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B7 LDP OFF SWITCH

Detected when lane departure warning OFF switch circuit is not installed, open-circuited, or is stuck to ON.

DTC detecting condition:

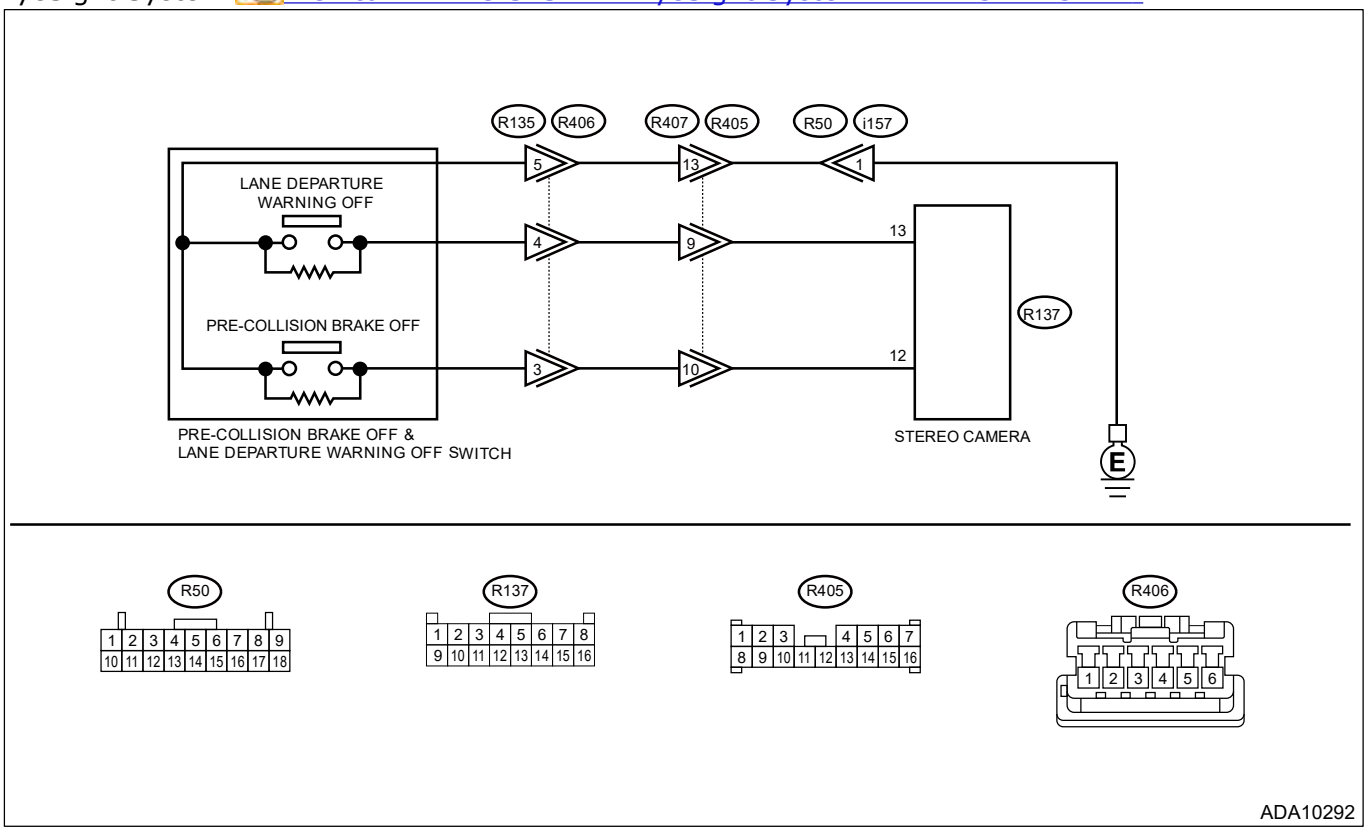
- Wiring of lane departure warning OFF switch is not connected.
- Lane departure warning OFF switch circuit is open.
- Lane departure warning OFF switch circuit stays ON for 45 seconds or more.

Trouble symptom:

All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight].
Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Lane Departure Warning OFF SW (BIU)]

Does the display change according to the lane departure warning OFF switch ON/OFF operation?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK HARNESS.

1. Disconnect the stereo camera connector and the lane departure warning OFF switch connector.
2. Using the tester, measure the resistance between the stereo camera connector and lane departure warning OFF switch connector.
   Connector & terminal
   (R406) No. 4 — (R137) No. 13:
   (R406) No. 5 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace an open circuit in harness between the stereo camera connector and lane departure warning OFF switch connector.

3. CHECK HARNESS.

Using the tester, measure the resistance between the lane departure warning OFF switch connector and chassis ground.
Connector & terminal
(R406) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Check the lane departure warning OFF switch. Ref. to EyeSight>Switches and Harness>INSPECTION.
No	Repair or replace the short circuit to ground in harness between the stereo camera connector and lane departure warning OFF switch connector.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B8 EYESIGHT STEERING SWITCH 1

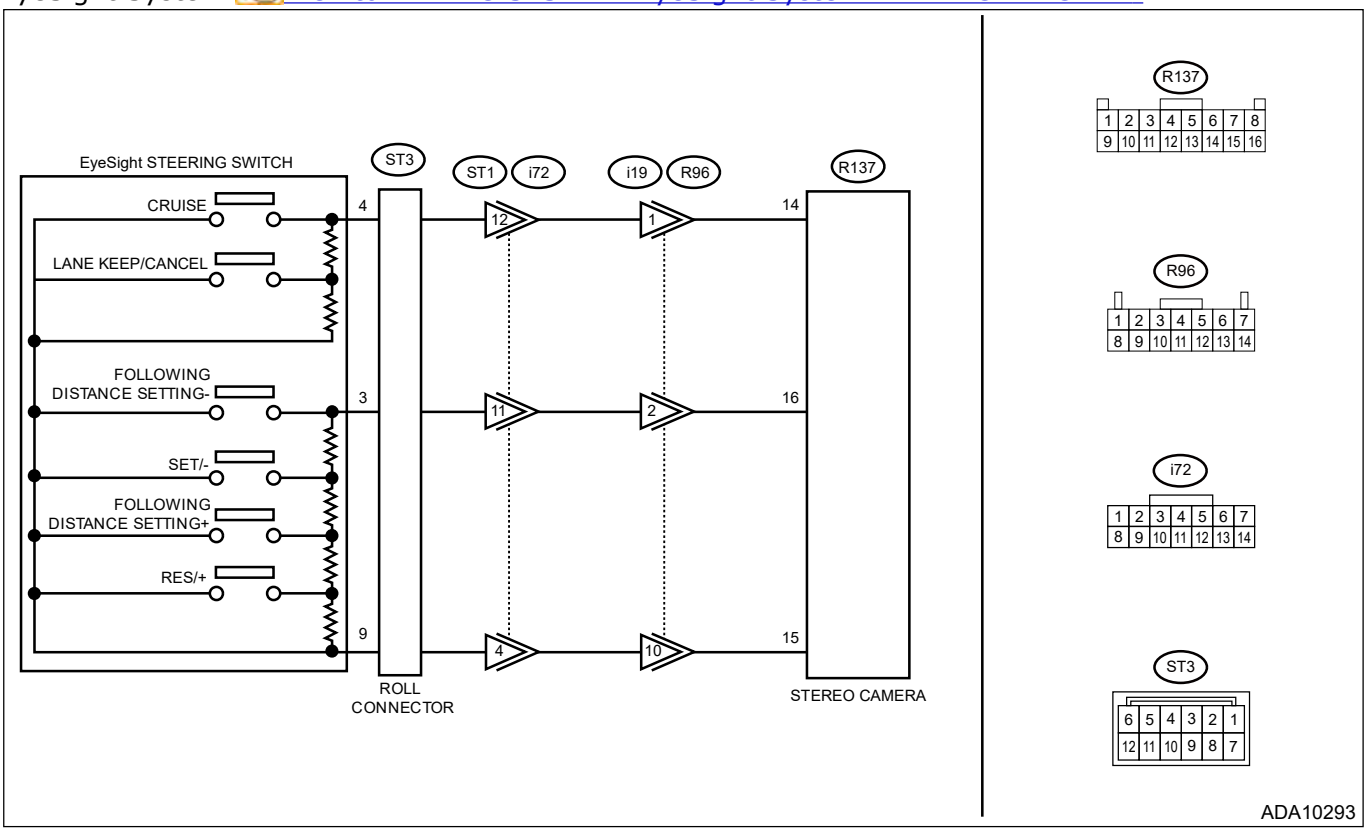
Detected when EyeSight steering switch is not installed or has malfunction, or when the harness is faulty or open-circuited or in stuck ON condition.
DTC detecting condition:
- Wiring of the EyeSight steering switch is not connected.
- EyeSight steering switch circuit is open.
- EyeSight steering switch circuit stays ON.

Trouble symptom:

All functions of EyeSight system do not operate.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight].
Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Cruise Control SW Voltage (Port14)]
- [Cruise Control SW Voltage (Port16)]

Is the voltage according to the pressed EyeSight steering switch displayed?

Yes — Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.

Note:

In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

No — Go to 2.

2. CHECK HARNESS.

1. Disconnect the stereo camera connector and EyeSight steering switch connector.
2. Using the tester, measure the resistance between stereo camera connector and EyeSight steering switch connector.

Connector & terminal

(ST3) No. 4 — (R137) No. 14:
(ST3) No. 3 — (R137) No. 16:
(ST3) No. 9 — (R137) No. 15:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace an open circuit in harness between the stereo camera connector and the EyeSight steering switch connector.

3. CHECK HARNESS.

Using the tester, measure the resistance between EyeSight steering switch connector and chassis ground.

Connector & terminal

(ST3) No. 4 — Chassis ground:
(ST3) No. 3 — Chassis ground:
(ST3) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Check the EyeSight steering switch. Ref. to EyeSight>Switches and Harness>INSPECTION.
No	Repair or replace the short circuit to ground in harness between the stereo camera connector and the EyeSight steering switch connector.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28B9 EYESIGHT STEERING SWITCH 2

Detected when steering switch for EyeSight is not installed, is open-circuited or is stuck to ON.
Refer to DTC B28B8 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B8 EyeSight STEERING SWITCH 1.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B28BA STEERING ANGLE AND STEREO CAMERA CORRELATION MISALIGNED

- Detected when the center point of the steering angle sensor is misaligned.
- Detected when the alignment is extremely misaligned.

DTC detecting condition:

- Defective wheel alignment
- Defective VDC CM
- Defective stereo camera

Trouble symptom:

- All functions of EyeSight system do not operate.
- EyeSight warning light illuminates.

Note:

- **Prior confirmation is required to check if the work related to alignment has been performed or there is an accident history.**
- **Using the Subaru Select Monitor, display the [Data monitor] of [EyeSight], and record the value of [Active Lane Keep System Control Learning Value 3 (Steering Wheel Angles Offset)] in advance. Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.**

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC related to steering angle sensor displayed?

Yes	Perform the diagnosis according to DTC, and Go to 2.
No	Go to 2.

2. CHECK DRIVING CONDITION.

Check the driving condition.

Is the steering wheel obviously tilted when the vehicle is in the straight ahead position? (Check if it is obviously tilted at the closest point between the column cover and the steering wheel.)

Yes	Perform the wheel alignment adjustment Ref. to FRONT SUSPENSION>Wheel Alignment., Go to 3.
No	Go to 3.

3. CHECK CURRENT DATA.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight]. Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.



- [Steering Angle Sensor Signal]

Note:
Do not check with [Steering Angle Sensor Value (Right +) (Left -)].

2. Check the value when the vehicle is in the straight ahead position.

Is the value within −2 — +2 deg?

Yes	Go to 4.
No	Perform [VSC(VDC) Centering Mode] of VDC. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE. Repeat the step 3. Go to 3.

4. CHECK JOB CONTENT.

Check the job contents performed so far. (To identify whether the problem belongs to the vehicle or the stereo camera.)

Is one of the following actions performed: steering angle sensor diagnosis, wheel alignment adjustment or VDC sensor centering mode?

Yes	Go to 5.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.

5. LANE KEEP ASSIST LEARNING VALUE CLEAR.

1. Perform [Clear Active Lane Keep System Learning Value]. Ref. to EyeSight (DIAGNOSTICS)>Clear Active Lane Keep System Learning Value.
2. Turn the ignition switch OFF → ON.
3. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [EyeSight]. Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.



- [Active Lane Keep System Control Learning Value 3 (Steering Wheel Angles Offset)]

Is the value of [Active Lane Keep System Control Learning Value 3 (Steering Wheel Angles Offset)] 0?

Yes	Go to 6.
No	Performing [Clear Active Lane Keep System Learning Value] is not complete. Go to 7.

6. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [EyeSight]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B28BA displayed?

Yes	Clearing the memory is not complete. Go to 7.
No	Currently, it is normal. Finish the diagnosis.

7. CHECK SUBARU SELECT MONITOR CONNECTION.

Check the connection of Subaru Select Monitor.

Is there any fault in the harness and connection between Subaru Select Monitor and stereo camera?

Yes	Replace the harness or repair the connection. In case that the step 5 is not performed Go to 5. In case that the step 5 has been performed Go to 6.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from engine control module (ECM) is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM is not transmitted to stereo camera.
When lost communication with TCM and TCM abnormal occur simultaneously, perform diagnosis for lost communication with TCM first.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM is not transmitted to stereo camera.
When lost communication with vehicle dynamics control and vehicle dynamics control module abnormal

or VDC echo back disagreement occur simultaneously, perform diagnosis for lost communication with vehicle dynamics control first.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

Detected when CAN data from steering angle sensor is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

Detected when CAN data from VDC is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

Detected when CAN data from EPS CM is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data from body integrated unit is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter is not transmitted to stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Failure counter diagnosis of engine control module (ECM)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Failure counter diagnosis of automatic transmission control module (TCM)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Failure counter diagnosis of VDC control module (VDC CM)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE

Failure counter diagnosis of EPS CM

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Failure counter diagnosis of body integrated unit

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Failure counter diagnosis of combination meter

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE

Failure counter diagnosis of steering angle sensor

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF

Detected when the bus off status (the stereo camera detects the failure and is disconnected from the local CAN line) occurs.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE

Detected when CAN data from RAB CM did not reach the stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU

Failure counter diagnosis of RAB CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

EyeSight (DIAGNOSTICS) > EyeSight HALT Code

OPERATION

If the EyeSight pause code is detected from the stereo camera, all the functions of the EyeSight excluding the conventional cruise control stop temporarily and cannot be used. When the failure is resolved, the function starts operating.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [EyeSight HALT Code].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **Temporary stop is not released even if the lane departure warning OFF switch or pre-collision brake OFF switch is pressed.**
- **Depending on the situation, temporary stop may not be released even if the ignition switch is turned off.**
- **Up to 20 codes can be stored.**
- **Stored codes will be cleared by Clear Memory. Ref. to COMMON(diag)>Clear memory.**
- **For details on EyeSight temporary stop codes, refer to List of EyeSight temporary stop code. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST.**

EyeSight (DIAGNOSTICS) > EyeSight HALT Code

LIST

- List of EyeSight temporary stop code

EyeSight HALT Code	Item	Contents of diagnosis	Note
E5	Stereo Camera Temporary Stop	The operation stopped temporarily due to vertical deviation of the optical axis of the stereo camera. (During CRUISE MAIN ON, "Halt" is displayed in the multi-information display.)	Perform inspection concerning the item for E5 of the "CHECK LIST (CAMERA TEMPORARY STOP)". Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST > CHECK LIST (CAMERA TEMPORARY STOP). This code may be displayed when the rear of the vehicle is lowered by the overload. When the failure is resolved, and the operation returns from the temporary stop status after driving for a while, it is normal. If this code is displayed in an ordinary use under which the vehicle is not tilted, readjust

EyeSight HALT Code	Item	Contents of diagnosis	Note
			the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE. If the same cancel code is still detected after readjustment, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
CC		Temporary stop was performed due to the bad weather, backlight, fogged window or dirty window interfering with the recognition function of the stereo camera. And this code may be displayed also when the front of the camera is blocked by the hand or when it is very dark around the vehicle or when the vehicle is surrounded by the blanket of snow and nothing can be seen from the stereo camera. (During CRUISE MAIN ON, "Temporary stop Camera view defectiveness" is displayed in the multi-information display.)	Investigate the following items No. 1 and No. 2, and check that the possible cause of the temporary stop is applied either to No. 1 or No. 2. 1. Perform inspection concerning the item for CC and CD of the "CHECK LIST (CAMERA TEMPORARY STOP)". Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST > CHECK LIST (CAMERA TEMPORARY STOP). When there is a relevant item in the check list, it can be the cause of malfunction. 2. Read the temporary stop count stored in the temporary stop count of data monitor, and check the cause of the temporary stop occurred in the past from "LIST OF CONTENTS FOR CAMERA TEMPORARY STOP: 0 — 23 COUNTS". Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST > LIST OF CONTENTS FOR CAMERA TEMPORARY STOP.
CD			When the causes of the temporary stop for No. 1 and No. 2 correspond, drive the vehicle for a while after the cause of the temporary stop has been eliminated. If the operation returns from the temporary stop status, it is normal. (However, when the occurrence and cancellation••• of the temporary stop take place repeatedly, the temporary stop status is held to prevent the irritation, delaying the

EyeSight HALT Code	Item	Contents of diagnosis	Note
			return of the operation.) When this is not the case, check the stereo camera and its periphery. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.
CE		The temperature of the stereo camera became excessively high or low, and the operation stopped temporarily. (During CRUISE MAIN ON, "Temporary stop Camera temperature range outside" is displayed in the multi-information display.)	Perform inspection concerning the item for CE of the "CHECK LIST (CAMERA TEMPORARY STOP)". Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code>LIST > CHECK LIST (CAMERA TEMPORARY STOP). When the operation returns from the temporary stop status after the failure is resolved, it is normal. When the operation does not return from the temporary status even if driving the vehicle for a while after the failure has been resolved, replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
33		Detected when engine speed is 300 rpm or less. (Not detected at an initial ignition switch ON.) (During CRUISE MAIN ON, "Halt" is displayed in the multi-information display.)	Detected when the engine speed drops below 300 rpm after the engine has started once. If the same EyeSight temporary stop code is detected again when the engine is restarted, check the ECM. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure>PROCEDURE.
C0	Pre-Collision Second Braking Activation	The operation stopped temporarily because the pre-collision secondary brake operated three	This code may be displayed when the pre-collision brake is operated intentionally. Turn the ignition switch to OFF, and restart after a while. If the

EyeSight HALT Code	Item	Contents of diagnosis	Note
		times between engine starting and stopping. (This is not a normal driving operation, or the system may be malfunctioning.) (During CRUISE MAIN ON, "Halt" is displayed in the multi-information display.)	operation returns from the temporary stop status, it is normal. When temporary stop status continues with a code other than C0 after restart, perform diagnosis according to the code. When temporary stop status continues with the code of C0 after restart, the stereo camera may be malfunctioning. Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
A0	CAN Diagnosis	The voltage dropped below 10 V immediately after IGN ON. (During CRUISE MAIN ON, "Halt" is displayed in the multi-information display.)	This code may be displayed when the engine is not started for a while with the ignition switch ON and when the engine has started after that. This is a normal operation. If this is not the case, the supply voltage may be malfunctioning. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2814 POWER SUPPLY LOW VOLTAGE.
A1	ECM Reprogramming	The operation stopped temporarily because the control module (CM) is being reprogrammed. (During CRUISE MAIN ON, "Halt" is displayed in the multi-information display.)	After the completion of the reprogramming operation, turn the ignition to OFF and restart. If the operation returns from the temporary stop status, it is normal.
F9	EPS Input Control Suspended	The operation stopped temporarily because an assist limitation (overheat prevention control) was operated in order to prevent the electric power steering malfunction due to overheat.	This code may be displayed when the steering wheel is operated repeatedly while the vehicle is stopped or running in very low speed. After stopping the engine, leave the vehicle for approximately 30 minutes to cool down, and restart the engine. If the operation returns from the temporary stop status, it is normal.
		The operation stopped temporarily because of an electric power steering	This code may be displayed when battery power is low. Replace or charge the battery, and restart the

EyeSight HALT Code	Item	Contents of diagnosis	Note
		voltage decrease.	engine. If the operation returns from the temporary stop status, it is normal.
		The operation stopped temporarily because of an electric power steering bus off.	Electric power steering detected a failure and was disconnected from CAN line.
FA	EPS Input Control Suspended	The operation stopped temporarily because the center point of steering angle sensor deviated.	This code may be displayed when the center point of steering angle sensor deviates when removing and installing the steering etc. If the system returns from the temporary stop status after inspecting/adjusting the center point and driving the vehicle for a while, it is normal.
		The operation stopped temporarily because there was an excessive deviation in the alignment. (During CRUISE MAIN ON, “Halt” is displayed in the multi-information display.)	This code may be displayed when vehicle underbody parts are damaged by a car accident etc, or when the underbody parts are replaced. If the system returns from the temporary stop status after replacing the parts and driving the vehicle for a while, it is normal.

1. CHECK LIST (CAMERA TEMPORARY STOP)

Even when the set status of the adaptive cruise control is canceled or when a temporary stop status occurs, the EyeSight temporary stop code will not be retained for the following conditions.

- When the VDC operation is stopped by pressing the VDC OFF switch
- When the pre-collision brake operation is stopped by pressing the pre-collision brake OFF switch
- When the lane departure warning is stopped by pressing the lane departure warning OFF switch
- Immediately after the engine start

When these cases does not apply but the EyeSight temporary stop code is displayed, perform the inspection according to the following items.

Item Name			**Yes/ No**	
[1]: EyeSight temporary stop code [CC, CD] (At this time, “Temporary stop Camera view defectiveness” is displayed in the multi-information display.)				
1	Check that the current status applies to the condition that are difficult to be recognized by the stereo camera.			
	1	It was bad weather (heavy rain, snowstorm, dense fog; especially when the oil film adheres to the windshield glass, the glass coating agent is used, or when the old wiper is used).	Yes	No
	2	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Yes	No
	3	The raindrops, water drops or dirt on the windshield glass are not wiped off sufficiently.	Yes	No
	4	The windshield glass is covered with fog, snow, dirt, frost or sandy dust, and either of them blocks the visibility of the stereo camera.	Yes	No
	5	The vehicle was tilted excessively by the heavy load.	Yes	No
	6	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Yes	No
	7	The field of view was insufficient due to water or snow raised by the preceding vehicle or oncoming vehicle, or the moisture, sand, smoke or sandy dust blown in the wind.	Yes	No
	8	The vehicle passed through the outlet or inlet of a tunnel.	Yes	No
	9	The rearmost area of preceding vehicle was small (trailer, etc.), low or uneven.	Yes	No
	10	The object was a fence or wall with even pattern (striped pattern or bricks) or unpatterned surface.	Yes	No
	11	The object was a plate of glass, mirror wall or door.	Yes	No
	12	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Yes	No
	13	The vehicle passed through the banners, flags, drooping branches or grass.	Yes	No

	Item Name	Yes/No	
14	The vehicle drove on the steep uphills or steep downhills.	Yes	No
15	Front of the camera was blocked by the hand.	Yes	No
16	It was very dark and there was no obstacle around the vehicle.	Yes	No
17	The surrounding ground surface was similarly colored. (There is snow as far as the eye can see.)	Yes	No
18	Dirt such as fingerprint adhered to the lens portion of the stereo camera.	Yes	No
19	Stable recognition was difficult because of reflection to the windshield glass.	Yes	No
20	The stereo camera was subject to impact, and the displacement or distortion occurred.	Yes	No

[2]: EyeSight temporary stop code [CE] (At this time, “Temporary stop Camera temperature range outside” is displayed in the multi-information display.)

1 Check that the current status applies to the condition that the temperature of the stereo camera becomes excessively high or low.

1	The compartment temperature was high. (For example: The vehicle was left under the scorching sun.) Or the compartment temperature was low. (For example: The vehicle was left under the frigid environment.)	Yes	No

[3]: EyeSight temporary stop code [E5] (At this time, “Temporary stop” is displayed in the multi-information display.)

1 Check that the current status applies to the condition that the vertical deviation occurs on the stereo camera optical axis.

1	The vehicle was tilted excessively by the heavy load.	Yes	No
2	The vehicle drove on the steep uphills or steep downhills.	Yes	No
3	The stereo camera was subject to impact, and the displacement or distortion occurred.	Yes	No

[4]: EyeSight temporary stop code [33] (At this time, “Temporary stop” is displayed in the multi-information display.)

1	Check that the current status applies to the condition that the engine speed drops to 300 rpm or below.	Yes	No

[5]: EyeSight temporary stop code [C0] (At this time, “Temporary stop” is displayed in the multi-information display.)

1	Check that the current status applies to the condition that the pre-collision secondary brake operated three times between starting and stopping of engine.	Yes	No

[6]: EyeSight temporary stop code [A0] (At this time, “Temporary stop” is displayed in the multi-information display.)

Item Name		Yes/No	
1	Check that the current status applies to the condition that the voltage dropped below 10 V immediately after the ignition ON.	Yes	No

[7]: EyeSight temporary stop code [A1] (At this time, “Temporary stop” is displayed in the multi-information display.)

1	Check that the control module (CM) is currently being reprogrammed.	Yes	No

[8]: EyeSight temporary stop code [F9] (At this time, “Temporary stop” is displayed in the multi-information display.)

1	Check that the current status applies to the condition that the steering wheel is operated repeatedly when the vehicle stops or moves very slowly.	Yes	No

[9]: EyeSight temporary stop code [FA] (At this time, “Temporary stop” is displayed in the multi-information display.)

1	Check that this is applied to the condition that the wheel alignment is extremely misaligned.	Yes	No
2	Check that this is applied to the condition that the center point of the steering angle sensor is misaligned.	Yes	No

2. LIST OF CONTENTS FOR CAMERA TEMPORARY STOP

Read the camera temporary stop count from Data Display & Save of Subaru Select Monitor, estimate the possible cause of the temporary stop according to the chart below. (After clearing the memory, the number of occurrences for each temporary stop is accumulated.)

Items to be displayed	**Main causes**	**Possible conditions for temporary stop (including events occurring less frequently)**
EyeSight Temporary 0 Count	Front of the camera is blocked by hand, dirty window glass	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle
EyeSight Temporary 1 Count	Front of the camera is blocked by hand, dirty window glass	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle, very dark and no obstacle around the vehicle, unpatterned wall, blanket of snow around the vehicle and no obstacle is found
EyeSight Temporary 2 Count	Fogged window glass, frost on the window glass	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle
EyeSight Temporary 3 Count	Backlight	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle
EyeSight Temporary 4 Count	Water raised by preceding vehicle	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water or snow raised by preceding vehicle, use of the window washer
EyeSight Temporary 5 Count	Dirty window glass, fogged window glass, oil film on the window glass	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle

Items to be displayed	Main causes	Possible conditions for temporary stop (including events occurring less frequently)
EyeSight Temporary 6 Count	Storm of rain	Dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, bad weather (heavy rain, snowstorm, dense fog), water or snow raised by preceding vehicle, use of the window washer
EyeSight Temporary 7 Count	Object on the dashboard reflected against the windshield glass	Object on the dashboard reflected against the windshield glass, snowstorm
EyeSight Temporary 8 Count	Dirty window glass, bad weather	Backlight, dirty window glass, fogged window glass, frost on the window glass, oil film on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens, deteriorated wiper, front of the camera is blocked by hand, object on the dashboard reflected against the windshield glass, bad weather (heavy rain, snowstorm, dense fog), unpatterned wall, water drop raised by preceding vehicle, steep slope, continuous sharp curve, banner, grass, preceding vehicle with large uneven surface (trailer, etc.), preceding vehicle driving in the night without illuminating the tail light, preceding vehicle with snow adhered, use of the window washer
EyeSight Temporary 9 Count	Not used	—
EyeSight Temporary 10 Count	Not used	—
EyeSight Temporary 11 Count	Not used	—
EyeSight Temporary 12 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 13 Count	Not used	—
EyeSight Temporary 14 Count	Not used	—
EyeSight Temporary 15 Count	Not used	—
EyeSight Temporary 16 Count	Not used	—

Items to be displayed	Main causes	Possible conditions for temporary stop (including events occurring less frequently)
EyeSight Temporary 17 Count	Not used	—
EyeSight Temporary 18 Count	Not used	—
EyeSight Temporary 19 Count	Not used	—
EyeSight Temporary 20 Count	Not used	—
EyeSight Temporary 21 Count	The vehicle is tilted excessively by the heavy load.	• The vehicle is tilted excessively by the heavy load. • The vehicle drives on the steep uphills or steep downhills. • The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 22 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 23 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 24 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 25 Count	Camera has been deformed by hitting it.	The stereo camera was subject to impact, and the displacement or distortion occurred.
EyeSight Temporary 26 Count	Dirty window glass left for a long time	Dirty window glass, fogged window glass, frost on the window glass, raindrop adhering to the window glass, fingerprint adhering to the lens
EyeSight Temporary 27 Count	Not used	—
EyeSight Temporary 28 Count	Can’t see anything in a complete darkness.	The vehicle drove in a complete darkness with the headlight turned off. Or, the camera was blinded when driving.
EyeSight Temporary 29 Count	Not used	—
EyeSight Temporary 30 Count	Not used	—
EyeSight Temporary 31 Count	In a high temperature of 70°C (158°F) or more or in a low	—

Items to be displayed	Main causes	Possible conditions for temporary stop (including events occurring less frequently)
	temperature of −10°C (14°F) or less	

EyeSight (DIAGNOSTICS) > ACC Cancel Code(s) Display

OPERATION

When the ACC cancel code is detected from the stereo camera, the cruise control will be cancelled.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [ACC Cancel Code(s) Display].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **Up to 8 codes can be stored. When more than eight codes are output, the oldest code will be deleted to store the latest code.**
- **Stored codes will be cleared by Clear Memory. Ref. to COMMON(diag)>Clear memory.**
- **For details on ACC cancel codes, refer to List of ACC cancel code. Ref. to EyeSight (DIAGNOSTICS)>ACC Cancel Code(s) Display>LIST.**

EyeSight (DIAGNOSTICS) > ACC Cancel Code(s) Display

LIST

- List of ACC cancel code(s)

ACC Cancel Code(s) Display	Item	Contents of diagnosis
02	ACC Mode:Maintaining Standstill Position	Displayed when the cruise control is cancelled after the own vehicle stops following the preceding vehicle.
04	ACC Mode:Stereo Camera Temporary Stop	Displayed when the cruise control is canceled by the EyeSight temporarily stop while driving in the adaptive cruise mode.
08	Common:Vehicle Speed Sensor Abnormal	Displayed when the cruise control is canceled due to a wheel speed sensor malfunction.
09	Common: Brake operation	Displayed when the cruise control is canceled by the brake operation of the driver.
0 A	Common: Pre-crash brake	Displayed when the cruise control is canceled because the AT manual mode is selected or paddle operation is performed.
0C	Common:VDC SW OFF	Displayed when the VDC function is turned OFF by the VDC OFF switch and the cruise control is canceled.
0D	Common:Any Door is Opened	Displayed when the cruise control is canceled because either of the driver's door, passenger's door, or rear doors is opened.

ACC Cancel Code(s) Display	Item	Contents of diagnosis
0E	Common:Driver Seat Belt Unfastened	Displayed when the cruise control is canceled because the driver’s seat belt is unfastened.
0F	Common:EPB Activation	Displayed when the cruise control is canceled because the EPB is activated.
10	Common:EPB Special Mode	Displayed when the cruise control is canceled by an irregular operation of a driver, which repeats activation/deactivation of the EPB.
12	Common:AT Gear Range	Displayed in the following situations: The driver performed the SET or RES operation to drive the vehicle either in the adaptive cruise mode or in the constant speed mode, but that operation was not accepted because it was done immediately after shifting into D range.
13	Common:Steep Sloping Road	Displayed when the road surface was judged to be too steep and therefore the cruise control is canceled.
14	Common:ABS Activation	Displayed when the cruise control is canceled because the ABS is activated.
15	Common:Steering Angle Excessive	Displayed when the cruise control is canceled because the steering wheel is fully turned.
16	ACC Mode:Vehicle Stop Judgement	Displayed when the cruise control is cancelled after the own vehicle stops following the preceding vehicle while driving in the adaptive cruise control mode.
17	Common:Parking Brake Activation	Displayed when the cruise control is cancelled because the parking brake is applied.
18	ACC Mode:Automatic Stop Cancellation	Displayed when the cruise control is cancelled under the following situations: The own vehicle stops following the preceding vehicle while driving in the adaptive cruise control mode, and the driver repeats the SET or RES operation and the automatic brake control continues for 120 seconds.
19	Common:X-Mode	Displayed when the cruise control is canceled because the X mode is activated.
1A	Common:TSM Activation	This item is displayed when the cruise control is cancelled by the operation of TSM commanded by VDC.
1B	Common:VDC Activation	Displayed when the cruise control is canceled because the VDC is activated.
1C	Common:Cancel SW Operation	This item is displayed when the cruise control is canceled by the operation of CANCEL switch.
1D	Common:Cruise SW OFF	This item is displayed when the cruise control is canceled by turning the cruise switch OFF.

ACC Cancel Code(s) Display	Item	Contents of diagnosis
1E	CC Mode:Max Speed Exceeded	Displayed when the cruise control is canceled because the own vehicle speed exceeds the controllable range while driving in the constant speed mode.
1F	ACC Mode:Max Speed Exceeded	Displayed when the cruise control is canceled because the own vehicle speed exceeds the controllable range while driving in the adaptive cruise mode.
20	Common:FF Slip Cancel	Displayed when the cruise control is canceled because tires slip in front-wheel drive vehicle.

Note:

- **“Adaptive cruise mode”: Adaptive cruise control**
- **“Constant speed mode”: Conventional cruise control**
- **“Common”: Adaptive cruise control and conventional cruise control**

EyeSight (DIAGNOSTICS) > Lane Departure Prevention Assist Deactivate Code(s) Display

OPERATION

Lane Departure Prevention Deactivate Code(s) Display: The lane departure prevention deactivate code is output, when the lane keep (lane departure prevention) is canceled during the operation or the standby state is canceled.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [EyeSight], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].
6. On [Cancel Code] display, select [Lane Departure Prevention Assist Deactivate Code(s) Display].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **Up to 8 codes can be stored. When more than eight codes are output, the oldest code will be deleted to store the latest code.**
- **Stored codes will be cleared by Clear Memory. Ref. to COMMON(diag)>Clear memory.**
- **For details on lane keep assist codes, refer to List of lane keep assist code. Ref. to EyeSight (DIAGNOSTICS)>Lane Departure Prevention Assist Deactivate Code(s) Display>LIST.**

EyeSight (DIAGNOSTICS) > Lane Departure Prevention Assist Deactivate Code(s) Display

LIST

- List of lane keep assist code

Code	Item	Contents of diagnosis
04	Lateral Acceleration is Large	Detected when control output value exceeds the controllable range by a driving operation such as rounding a curve at high speed or making a sharp turn.
0C	Lane Recognition Prohibition(Environmental Factor)	Detected when a driving lane width is narrowed.
18	Out of Control Return Possibility Range	Detected when lane departure prevention control continues for a predetermined time.
26	Real Yaw Rate Excessive	Detected when actual yaw rate exceeds the maximum value of target yaw rate by a specified amount.
37	Yaw Rate Sensor Abnormal(Control)	Detected when the difference between actual yaw rate and expected yaw rate becomes the specified value or more.
50	Camera Adjustment Abnormal 1	Detected when the accuracy of camera learning values is not sufficient. Usually detected after replacing the camera and performing an aiming, and resolved by an automatic adjustment while driving.

Code	Item	Contents of diagnosis
52	Yaw Rate Sensor Abnormal(Recognition)	Detected when the vehicle weaves all over the road or when the camera condition is not good and therefore white lines are not correctly recognized.

EyeSight (DIAGNOSTICS) > ECM Cancel Code(s) Display

OPERATION

1. On [Select System] display, select [Engine Control System].
2. Drive vehicle at 40 km/h (25 MPH) or more and set the cruise control.
   Caution:
   - **When performing diagnosis, observe the legal speed limit on the road.**
   - **The cancel code will also appear when the cruise control is cancelled by the driver's operation. Do not confuse them.**
   - **Be sure to get an assistant to support the diagnosis while driving, and have him/her operate the select monitor.**
3. When the set speed is canceled by itself (without any cancel operations such as applying brake) or when the cruise control could not be set by performing the setting operation, select [Cancel Code(s) Display] on the engine malfunction diagnosis screen.
   Note:
   The [Current] and [The past] are contained in the cancel code. The latest code recognized during current test drive is displayed in [Current]. Cancel codes resulting from fault diagnosis of switches relating to the system and cruise control are also displayed in [The past].
4. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.
   Cancel codes for switches relating to the system and cruise control are deleted by clearing memory on the engine side.
   Note:
   - **For detailed operation procedures, refer to "Application help".**
   - **The latest code will be cleared by turning ignition switch to OFF.**
   - **For details on cancel codes, refer to List of ECM cruise control cancel code. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display>LIST.**

EyeSight (DIAGNOSTICS) > ECM Cancel Code(s) Display

LIST

- List of ECM cruise control cancel code(s)
  When the cruise control is cancelled, the ECM outputs the following cancel codes.

Cancel Code	Item	Contents of diagnosis	Note
11	Main Switch	Main switch of the EyeSight steering switch is turned to OFF, and the cruise control is released.	This code is displayed without operating the main switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>11.

Cancel Code	Item	Contents of diagnosis	Note
12	Stop & Brake switch	Stop light switch or brake switch is turned to ON, and then the cruise control is released.	This DTC is displayed without depressing the brake pedal. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.
14	Neutral Position Switch	Neutral position switch is turned to ON, and then the cruise control is released.	This code is displayed without shifting to neutral position. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>14.
15	Cancel switch	Cancel switch is turned to ON, and then the cruise control is released.	This DTC is displayed without operating the cancel switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>15.
16	Ignition Switch	Ignition switch is turned to OFF, and then the cruise control is released.	This DTC is displayed without operating the ignition switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>16.
21	Abnormality of switches when Ignition switch on	When the ignition switch is turned to ON, each switch of the EyeSight steering switch is already turned ON.	This code is displayed when turning ignition switch to ON without operating the EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure

Cancel Code	Item	Contents of diagnosis	Note
			with ECU Cancel Code>21.
22	Abnormality of change in vehicle speed	Malfunction of vehicle speed signal variation is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.
24	Abnormality of switches related to cruise control	Open circuit of the EyeSight steering switch is detected during cruise driving. (The system is judged as model without cruise control.)	This DTC is displayed with normal operation. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>24.
31	Engine Speed	• Abnormal increase of engine speed is detected. • Gear is placed in Neutral, 1st or Reverse position.	Cruise in 2nd shift position or more. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>31.
32	Cruse Control out of Range	• Vehicle speed exceeds the controllable range during cruising. • Set operation was performed at vehicle speed unavailable for setting. • RESUME operation was performed without memorized vehicle speed.	This DTC is displayed, though the vehicle speed is increased to the speed available for cruise set and set operation was performed again. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>32.
34	Prohibition of cruise control at continuing big Accel. angle	The vehicle has been driven at higher speed than set vehicle speed for an abnormally long time (approximately 10 minutes) during cruise driving.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>34.
35	Prohibition of cruise control at vehicle speed F/B	Set vehicle speed cannot be kept because of some reasons (steep uphill, parking brake, abnormal decrease of engine output, etc.)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure

Cancel Code	Item	Contents of diagnosis	Note
	malfunction	during cruise driving.	with ECU Cancel Code>35.
41	VDC/TCS Operating	Vehicle dynamics control (VDC), TCS or EPB is operated during cruise driving or cruise setting.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>41.
43	ABS/VDC Failure	When the cruise switch is ON, ABS or vehicle dynamics control (VDC) system malfunction is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>43.
44	Body Integrated unit Failure	When the cruise switch is ON, body integrated unit system malfunction is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>44.
45	Meter Failure	When the cruise switch is ON, combination meter malfunction is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>45.
47	Adaptive cruise control ECM abnormal	When the cruise switch is ON, stereo camera malfunction is detected.	Check the DTCs related to stereo camera.
49	TCM Failure	Transmission control module (TCM) malfunction is detected during cruise driving or cruise setting.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>49.
53	Adaptive cruise control compulsory cancellation	Stereo camera detects the release command of the cruise control during cruise driving or cruise setting operation.	Check the stereo camera. Check the ACC cancel code. Ref. to EyeSight (DIAGNOSTICS)>ACC Cancel Code(s) Display.
54	Release SW	Brake control module detects the brake pedal operation by the driver during cruise driving or cruise setting operation.	If this code is detected when the brake pedal is not depressed intentionally, check

Cancel Code	Item	Contents of diagnosis	Note
			the release switch.
55	Adaptive cruise control reception data abnormal	When the cruise switch is ON, malfunction is detected in the reception data from the stereo camera.	Check the cancel code of stereo camera.
61	Brake Switch Failure	Malfunction in the stop light & brake switch is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>61.
62	Neutral Switch Failure	Neutral position switch malfunction is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.
63	Abnormality 1 of change in vehicle speed	Malfunction of vehicle speed signal variation is detected. This code may be displayed by a sudden starting of the vehicle on a road with low μ and with the VDC OFF. In this case, restart the engine and perform the cruise setting again. If the cancel code is not displayed, the vehicle is in normal status.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>63.
64	Engine Sensor Failure 1	Malfunction related to engine is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>64.
65	Abnormality 1 of switches related to cruise control	Malfunction of EyeSight steering switch is detected. (When the switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.)	Check EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>65.
66	Cruise Control Calculation Error	Malfunction of the cruise control calculation (microcomputer) is detected.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>66.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

11

When CRUISE switch is pressed, or a malfunction related to CRUISE switch occurs, this is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Check EyeSight steering switch. Ref. to EyeSight>Switches and Harness.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

12

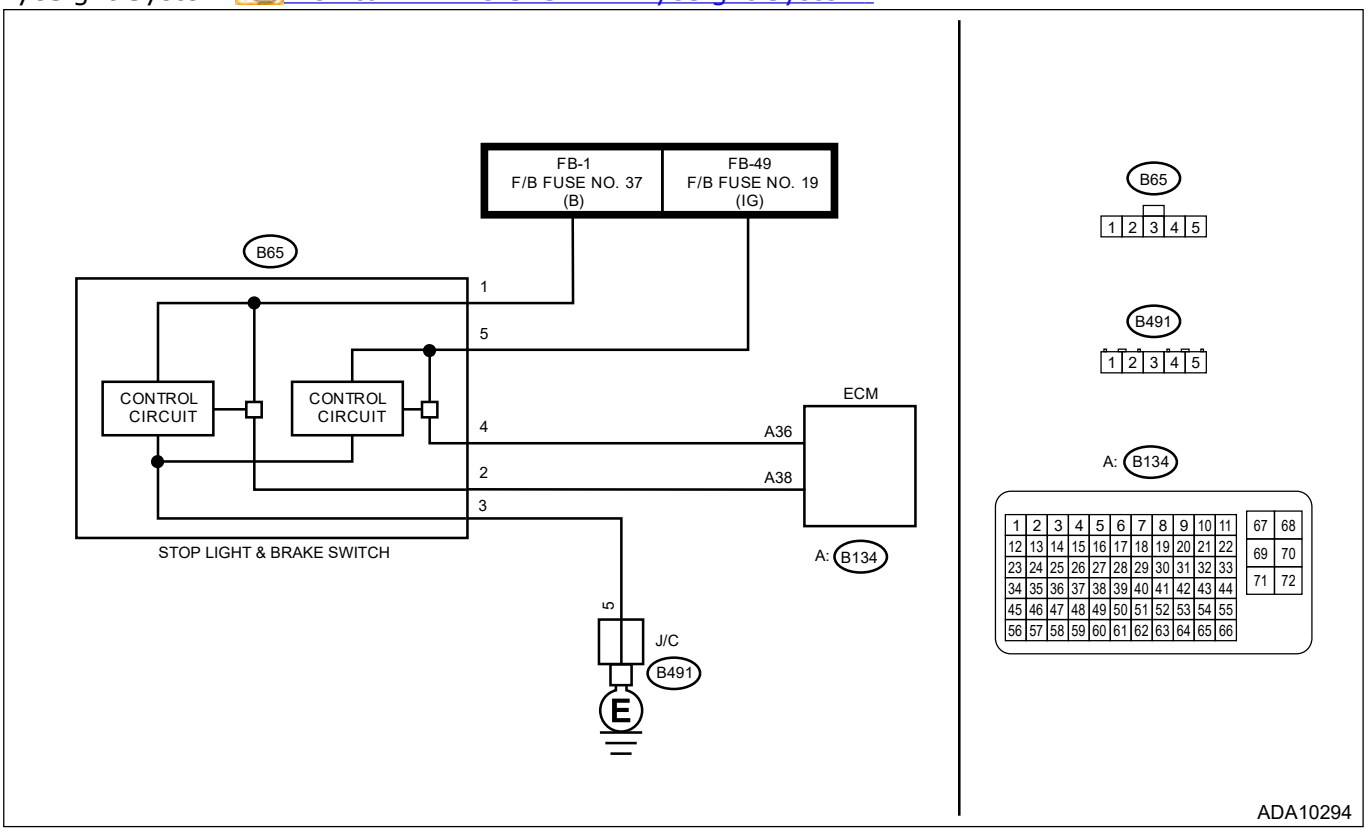
Detected when the brake pedal is depressed, or the error related to the stop light & brake switch occurred.

Trouble symptom:

- Cruise control cannot be set.
- Cruise control cannot be released.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System.



1. CHECK STOP LIGHT & BRAKE SWITCH.

Check the stop light & brake switch. Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.

Is the check result for the stop light & brake switch installation position OK?

Yes	Go to 2.
No	Replace the stop light & brake switch. Or adjust the installation position.

2. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light & brake switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between connector terminal and chassis ground.
   Connector & terminal
   (B65) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	• Check the fuse No. 37 (fuse & relay box). • Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

3. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

Measure the voltage between connector terminal and chassis ground.

Connector & terminal

(B65) No. 3 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	• Check fuse No. 19 (fuse & relay box). • Check for open or short circuit in harness between the stop light & brake switch and the fuse & relay box.

4. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Measure the resistance between ECM connector terminal and stop light & brake switch connector terminal.

   Connector & terminal

   (B65) No. 4 — (B134) No. 36:

   (B65) No. 2 — (B134) No. 38:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair the harness.

5. CHECK STOP LIGHT & BRAKE SWITCH CIRCUIT.

1. Connect the stop light & brake switch connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and chassis ground both when the brake pedal is depressed and when not depressed.
   Connector & terminal
   (B134) No. 36 (+) — Chassis ground (−):
   (B134) No. 38 (+) — Chassis ground (−):

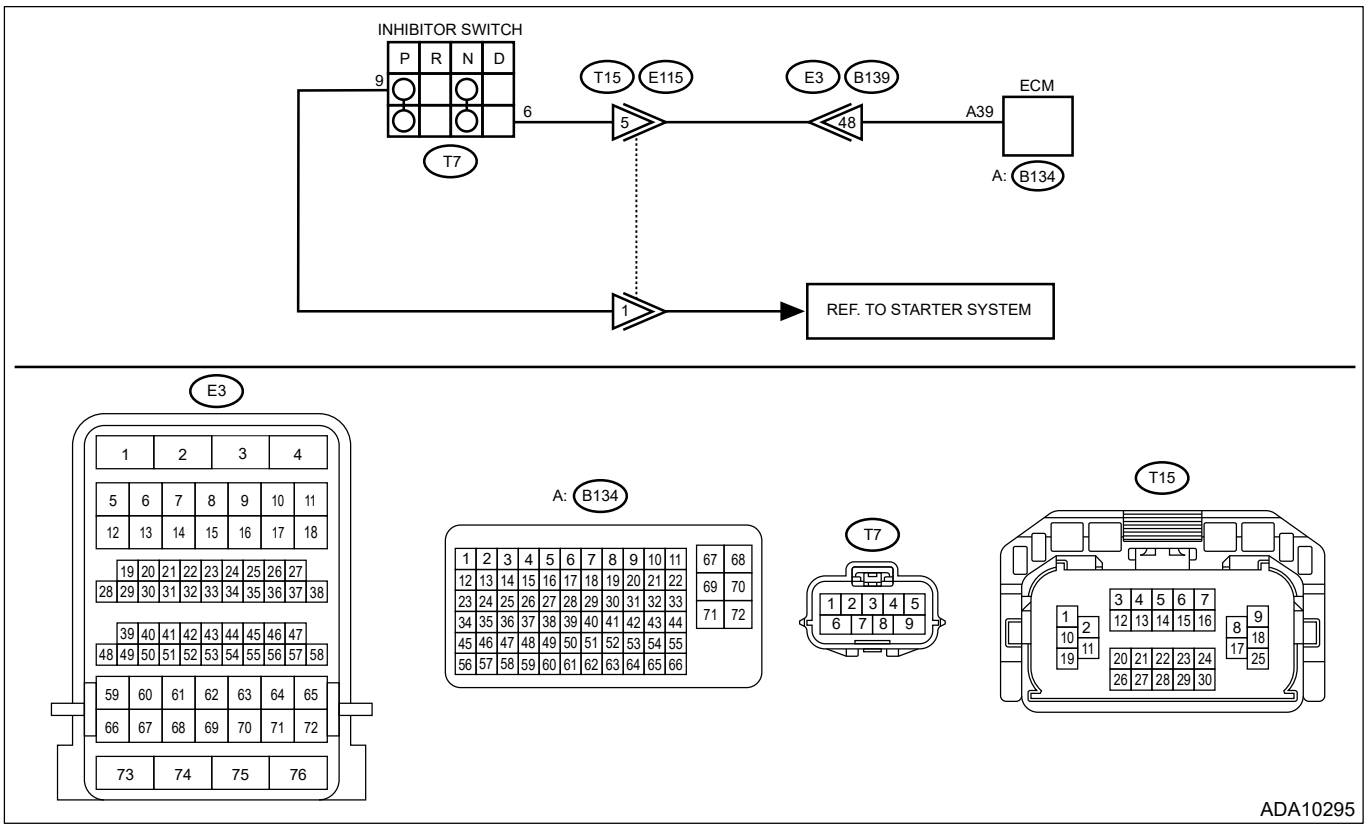
Does the voltage appear in (B134) No. 36 when the brake pedal is depressed? (0 V when the brake pedal is not depressed)
Does the voltage appear in (B134) No. 38 when the brake pedal is not depressed? (0 V when the brake pedal is depressed)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the stop light & brake switch. Ref. to CRUISE CONTROL SYSTEM>Stop Light & Brake Switch.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

14

Detected when the select lever is shifted to the neutral position, or when an error related to the neutral position switch occurs.
Trouble symptom:
Cruise control cannot be set.
Wiring diagram:
EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the inhibitor switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between connector terminal and chassis ground.

Connector & terminal

(T7) No. 6 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	• Check the fuse. • Check for open or short circuit in the harness between inhibitor switch and ECM.

2. CHECK INHIBITOR SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the starter motor connector.
3. Measure the resistance between the inhibitor switch connector terminal and the starter motor.
   Connector & terminal
   (T7) No. 9 — Starter motor:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair the harness.

3. CHECK INHIBITOR SWITCH.

Remove and check the inhibitor switch. Ref. to CRUISE CONTROL SYSTEM>Inhibitor Switch.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the inhibitor switch.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

15

Detected when CANCEL switch is pressed or malfunction related to CRUISE switch occurs.
Trouble symptom:
- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

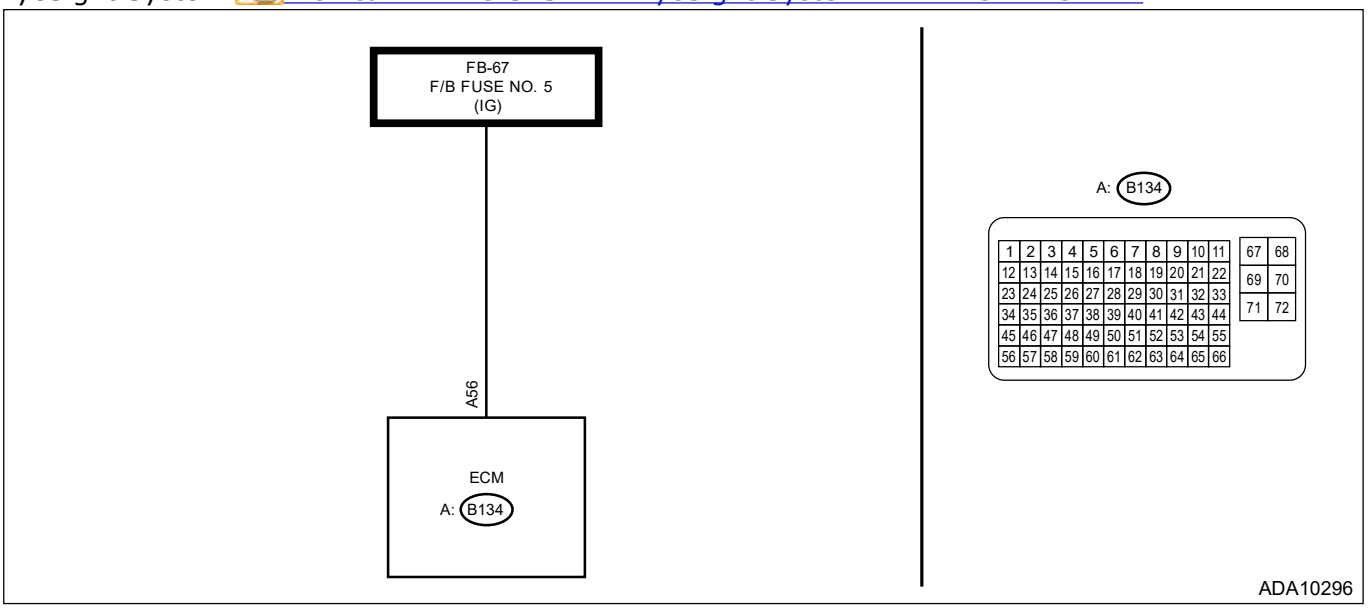
Refer to 11 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>11.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

16

Detected when ignition switch is turned to OFF or malfunction related to the ignition switch occurs.
Trouble symptom:
Cruise control cannot be set.
Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK IGNITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between connector terminal and chassis ground.
   Connector & terminal
   (B134) No. 56 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Check for poor contact of ECM connector.
No	• Check fuse No. 5 (fuse & relay box). • Check the harness for open or short circuit between ignition switch and ECM.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

21

Malfunction of EyeSight steering switch is detected.

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>11.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

22

Malfunction related to vehicle speed sensor is detected.
Diagnosis:
Open or short circuit in the vehicle speed sensor system.
Trouble symptom:
Cruise control cannot be set. (Cancelled immediately.)

1. CHECK ABS OR VDC WARNING LIGHT.

1. Turn the ignition switch to ON.
2. After the initial operation of the combination meter finished, check if the ABS or VDC warning light stays illuminated.

Does the warning light stay illuminated?

Yes	Check the VDCCM. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 2.

2. CHECK DTC OF LAN COMMUNICATION CIRCUIT.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform a check according to the displayed DTC.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

24

Switch malfunction related to cruise control is detected.
Trouble symptom:
- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with

ECU Cancel Code>11.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

31

Malfunction related to engine speed signal is detected.
Abnormal increase of engine speed is detected.
Gear is placed in 1st (only for MT vehicles) or Reverse position.
Drive with the gear in 2nd position or higher, and perform the cruise setting again. It is normal if the cancel code is not detected.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

32

Detected outside the system operation vehicle speed range.
Increase the vehicle speed to the speed available for cruise set and perform the cruise set operation again.
If the cancel code is detected even when the cruise setting is performed again, perform the diagnosis for 22.
Refer to 22 for diagnostic procedure.
Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

34

The vehicle was driven at higher speed than the set vehicle speed for a long time (approximately 10 minutes) during cruise driving.
The cancel code is detected when the vehicle was driven for a long time at the higher speed than the speed available for cruise set through the accelerator operation.
Perform the cruise setting again. It is normal if the cancel code is not detected.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

35

Detected when the vehicle speed feedback is not possible.
Set vehicle speed cannot be maintained because of some reasons (steep uphill, parking brake forgotten to be returned to the home position, etc.) during cruise driving.
The cancel code is detected when the driving condition is not suitable for cruise control.
Eliminate the probable cause, and perform the cruise set operation again.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

41

VDC/TCS/EPB is operated.
Vehicle dynamics control (VDC) or TCS/EPB is operated during cruise driving or cruise setting.
Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

43

ABS/VDC malfunction is detected.
VDC malfunction is detected during cruise driving or cruise setting. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

44

Body integrated unit malfunction is detected.
Body integrated unit system malfunction is detected during cruise driving or cruise setting operation.
Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

45

Combination meter malfunction is detected.
Combination meter malfunction is detected during cruise driving or cruise setting operation.
Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

49

Automatic transmission malfunction is detected.
Automatic transmission malfunction is detected during cruise driving or cruise setting operation.
Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

61

Malfunction in the stop light & brake switch is detected.
Trouble symptom:
- Cruise control cannot be set.
- Cruise control cannot be released.

Refer to 12 for diagnostic procedure.
Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

62

Neutral position switch malfunction is detected.
Trouble symptom:
Cruise control cannot be set.
Refer to 14 for diagnostic procedure.
Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>14.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

63

Malfunction of vehicle speed signal variation is detected.
Trouble symptom:
Cruise control cannot be set. (Cancelled immediately.)
Refer to 22 for diagnostic procedure.
Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.
Note:
This cancel code may be detected when the vehicle suddenly started with VDC OFF on low μ road surface. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

64

- Malfunction related to engine is detected.
- Abnormal decrease in engine speed is detected during cruise driving.

If the malfunction indicator light remains on or blinks, perform the diagnosis for engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.
If the malfunction indicator is not remaining on/blinking, this cancel code may be detected due to malfunction of the ECM. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal. (Temporary malfunction)

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

65

Malfunction of EyeSight steering switch is detected.
When the command switch is pressed ON for a long time (approximately two minutes), stuck ON condition is detected.
Trouble symptom:
- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Refer to 11 for diagnostic procedure.
Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>11.

EyeSight (DIAGNOSTICS) > Diagnostic Procedure with ECU Cancel Code

66

- Cruise control calculation malfunction is detected.
- Abnormal increase in target cruising vehicle speed is detected.
- Abnormal condition is detected in which cruise control is not deactivated even after the brake pedal is depressed.

If the malfunction indicator light remains on or blinks, perform the diagnosis for engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.
If the malfunction indicator is not remaining on/blinking, this cancel code may be detected due to

malfunction of the ECM. In this case, restart the engine and perform the cruise control setting operation again. If the cancel code is not detected, it is normal. (Temporary malfunction)

EyeSight (DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Reference
CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.
Check EyeSight steering switch.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.
Check EyeSight temporary stop.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > TEMPORARY STOP OF EYESIGHT.
Cruise control was cancelled without operating the cruise switch.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL WAS CANCELLED WITHOUT OPERATING THE CRUISE SWITCH.
Cruise control switch is not turned to ON. (CRUISE indicator light does not illuminate)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL SWITCH IS NOT TURNED TO ON. (CRUISE INDICATOR LIGHT DOES NOT ILLUMINATE).
Cruise control is cancelled without releasing operation.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL IS CANCELLED WITHOUT RELEASING OPERATION.
Cruise control cannot be set.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL CANNOT BE SET.
SET indicator does not illuminate.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > SET INDICATOR DOES NOT ILLUMINATE.
Vehicle speed is not held within set speed ±3 km/h (±2 MPH) on a level road.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > VEHICLE SPEED IS NOT HELD WITHIN SET SPEED ±3 KM/H (±2 MPH) ON A LEVEL ROAD.
Vehicle speed does not increase or does not return to set speed after RES/+ switch has been pressed.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > VEHICLE SPEED DOES NOT INCREASE OR DOES NOT RETURN TO SET SPEED AFTER RES/+ SWITCH HAS BEEN PRESSED.
Vehicle speed does not decrease after SET/− switch has been pressed.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > VEHICLE SPEED DOES NOT DECREASE AFTER SET/− SWITCH HAS BEEN PRESSED.

Symptoms	Reference
Cruise control is not deactivated after the cruise switch is pressed.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL IS NOT DEACTIVATED AFTER THE CRUISE SWITCH IS PRESSED.
Following distance does not change, even after the following distance switch is pressed.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FOLLOWING DISTANCE DOES NOT CHANGE, EVEN AFTER THE FOLLOWING DISTANCE SWITCH IS PRESSED.
Cruise control is not released after brake pedal has been depressed.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL IS NOT RELEASED AFTER BRAKE PEDAL HAS BEEN DEPRESSED.
Cruise control is not released after shifting to the neutral position.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL IS NOT RELEASED AFTER SHIFTING THE SHIFTING LEVER TO THE NEUTRAL POSITION.
Acceleration or deceleration does not occur according to the preceding vehicle. The preceding vehicle is difficult to be detected. Braking force is weaker than usual. Alarm for requiring more brake pedal force does not sound.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ACCELERATION OR DECELERATION DOES NOT OCCUR ACCORDING TO THE PRECEDING VEHICLE. THE PRECEDING VEHICLE IS DIFFICULT TO BE DETECTED. BRAKING FORCE IS WEAKER THAN USUAL. ALARM FOR REQUIRING MORE BRAKE PEDAL FORCE DOES NOT SOUND.
Pre-collision brake does not operate / Pre-collision brake operates but brake force is not sufficient to stop / Pre-collision brake operates but brake force is not sufficient to stop. Or the pre-collision brake assist does not operate.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRE-COLLISION BRAKE DOES NOT OPERATE / PRE-COLLISION BRAKE OPERATES BUT BRAKE FORCE IS NOT SUFFICIENT TO STOP / PRE-COLLISION BRAKE OPERATES BUT BRAKE FORCE IS NOT SUFFICIENT TO STOP. OR THE PRE-COLLISION BRAKE ASSIST DOES NOT OPERATE.
Pre-collision brake operates improperly / Pre-collision brake is not released / Pre-collision brake assist operates improperly.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRE-COLLISION BRAKE OPERATES IMPROPERLY / PRE-COLLISION BRAKE IS NOT RELEASED / PRE-COLLISION BRAKE ASSIST OPERATES IMPROPERLY.
Pre-collision brake OFF indicator light does not go off / Pre-collision brake OFF indicator light illuminates automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT GO OFF / PRE-COLLISION BRAKE OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY.
Pre-collision brake OFF indicator light does not go off / Pre-collision brake OFF indicator light illuminates automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT GO OFF / PRE-COLLISION BRAKE OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY.

Symptoms	Reference
Pre-collision brake OFF indicator light does not illuminate / Pre-collision brake OFF indicator light goes off automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT ILLUMINATE / PRE-COLLISION BRAKE OFF INDICATOR LIGHT GOES OFF AUTOMATICALLY.
AT rapid start prevention control does not operate / AT rapid start prevention control is released automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AT RAPID START PREVENTION CONTROL DOES NOT OPERATE / AT RAPID START PREVENTION CONTROL IS RELEASED AUTOMATICALLY.
AT rapid start prevention control operates improperly / AT rapid start prevention control is not released.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AT RAPID START PREVENTION CONTROL OPERATES IMPROPERLY / AT RAPID START PREVENTION CONTROL IS NOT RELEASED.
Lane departure warning does not operate / Lane departure warning is released automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE DEPARTURE WARNING DOES NOT OPERATE / LANE DEPARTURE WARNING IS RELEASED AUTOMATICALLY.
Lane departure warning operates improperly / Lane departure warning is not released.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE DEPARTURE WARNING OPERATES IMPROPERLY / LANE DEPARTURE WARNING IS NOT RELEASED.
Lane departure warning OFF indicator light does not go off / Lane departure warning OFF indicator light illuminates automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE DEPARTURE WARNING OFF INDICATOR LIGHT DOES NOT GO OFF / LANE DEPARTURE WARNING OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY.
Lane departure warning OFF indicator light does not illuminate / Lane departure warning OFF indicator light goes off automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE DEPARTURE WARNING OFF INDICATOR LIGHT DOES NOT ILLUMINATE / LANE DEPARTURE WARNING OFF INDICATOR LIGHT GOES OFF AUTOMATICALLY.
Sway warning does not operate / Sway warning is released automatically.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > SWAY WARNING DOES NOT OPERATE / SWAY WARNING IS RELEASED AUTOMATICALLY.
Sway warning operates improperly / Sway warning is not released.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > SWAY WARNING OPERATES IMPROPERLY / SWAY WARNING IS NOT RELEASED.
Forward vehicle’s start monitoring function does not operate.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FORWARD VEHICLE’S

Symptoms	Reference
	START MONITORING FUNCTION DOES NOT OPERATE.
Forward vehicle’s start monitoring function operates improperly / Forward vehicle’s start monitoring function is not released.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FORWARD VEHICLE’S START MONITORING FUNCTION OPERATES IMPROPERLY / FORWARD VEHICLE’S START MONITORING FUNCTION IS NOT RELEASED.
Lane keep switch is not turned to ON. (Lane keep indicator light does not illuminate in white.)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE KEEP SWITCH IS NOT TURNED TO ON. (LANE KEEP INDICATOR LIGHT DOES NOT ILLUMINATE IN WHITE.).
Lane keep (lane departure prevention) cannot be ready (lane indicator does not illuminate) / Lane keep (lane departure prevention) does not operate (lane keep indicator does not illuminate in green) / Though lane keep (lane departure prevention) is operating, the vehicle departs out of the lane due to poor assistance.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE KEEP (LANE DEPARTURE PREVENTION) CANNOT BE READY (LANE INDICATOR DOES NOT ILLUMINATE) / LANE KEEP (LANE DEPARTURE PREVENTION) DOES NOT OPERATE (LANE KEEP INDICATOR DOES NOT ILLUMINATE IN GREEN) / THOUGH LANE KEEP (LANE DEPARTURE PREVENTION) IS OPERATING, THE VEHICLE DEPARTS OUT OF THE LANE DUE TO POOR ASSISTANCE.
Lane keep (lane departure prevention) is cancelled without releasing operation.	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LANE KEEP (LANE DEPARTURE PREVENTION) IS CANCELLED WITHOUT RELEASING OPERATION.
Check list (adaptive cruise control)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (ADAPTIVE CRUISE CONTROL).
Check list (pre-collision brake)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (PRE-COLLISION BRAKE).
Check list (AT rapid start prevention control)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (AT RAPID START PREVENTION CONTROL).
Check list (lane departure warning, sway warning, forward vehicle’s start monitoring function)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE’S START MONITORING FUNCTION).
Check list (Active lane keep)	Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (ACTIVE LANE KEEP).

EyeSight (DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT

Trouble symptom:

Adaptive cruise control or conventional cruise control can be set, but adaptive cruise control indicator light/constant speed cruise control indicator light and cruise SET indicator light do not illuminate.

1. CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

Does adaptive cruise control indicator light/constant speed cruise control indicator light and cruise SET indicator light illuminate?

Yes	Go to 2.
No	Replace the meter case assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the diagnosis for LAN system.

3. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK EYESIGHT STEERING SWITCH.

Check EyeSight steering switch. Ref. to EyeSight>Switches and Harness.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Replace the EyeSight steering switch. Ref. to EyeSight>Switches and Harness.

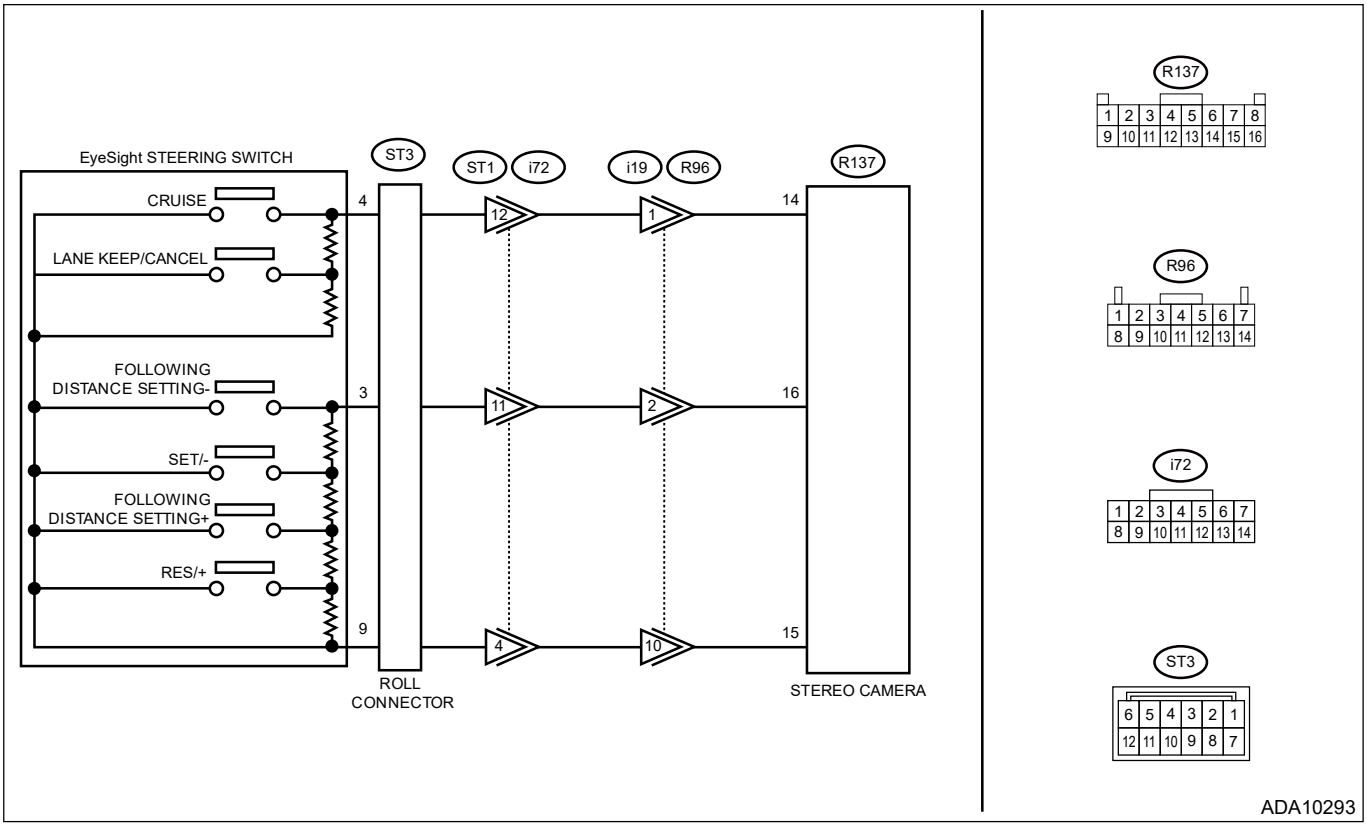
2. CHECK EYESIGHT STEERING SWITCH

Trouble symptom:

- Cruise control cannot be set. (Cancelled immediately.)
- Cruise control cannot be released.

Wiring diagram:

EyeSight System Ref. to WIRING SYSTEM>EyeSight System>WIRING DIAGRAM.



1. CHECK EYESIGHT STEERING SWITCH CIRCUIT.

1. Remove the driver's airbag module. Ref. to AIRBAG SYSTEM>Driver's Airbag Module>REMOVAL.
2. Disconnect the EyeSight steering switch connector.
3. Turn the ignition switch to ON.
4. Measure the voltage between connector terminal and chassis ground.

Connector & terminal

(ST3) No. 3 (+) — Chassis ground (−):

(ST3) No. 4 (+) — Chassis ground (−):

Is the voltage 5 V or more?

Yes	Go to 2.
No	Check for open/short circuit or poor contact in the harness between EyeSight steering switch and stereo camera and in the steering roll connector.

2. CHECK EYESIGHT STEERING SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Remove the EyeSight steering switch. Ref. to EyeSight>Switches and Harness.
3. Measure the resistance between connector terminal and chassis ground.
   Connector & terminal
   (ST3) No. 9 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Check for open circuit between EyeSight steering switch and chassis ground.

3. CHECK EYESIGHT STEERING SWITCH.

Check EyeSight steering switch. Ref. to EyeSight>Switches and Harness.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.
No	Replace the EyeSight steering switch. Ref. to EyeSight>Switches and Harness.

3. TEMPORARY STOP OF EYESIGHT

1. CHECK FOR PRESENCE OF TEMPORARY STOP CODES.

Check for the presence of the temporary stop codes. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is a temporary stop code displayed?

Yes	Check EyeSight temporary stop code. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.
No	Temporary stop does not occur. Make sure to interview with the customer, and also confirm that no DTCs are recorded.

4. CRUISE CONTROL WAS CANCELLED WITHOUT OPERATING THE CRUISE

SWITCH

1. CHECK FOR PRESENCE OF CANCEL CODE.

Check for the presence of ECM cancel codes. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display.

Is a cancel code displayed?

Yes	Perform the diagnosis for the displayed cancel code. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display.
No	Go to 2.

2. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	Go to 4.
No	Go to 3.

3. CHECK EYESIGHT STEERING SWITCH.

Check the EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the faulty portion of the steering switch.

4. CHECK COMBINATION METER.

Check the indicator readings using the active test of combination meter [All lamps lighted]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

Is the check result OK?

Yes	Go to 5.
No	Replace the meter case assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

5. INSPECTION OF CRUISE INDICATOR.

Check the CRUISE indicator. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair or replace the faulty portion according to the inspection result.

5. CRUISE CONTROL SWITCH IS NOT TURNED TO ON. (CRUISE INDICATOR LIGHT DOES NOT ILLUMINATE)

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	Go to 3.
No	Go to 2.

2. CHECK EYESIGHT STEERING SWITCH.

Check EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the faulty portion of the steering switch.

3. INSPECTION OF CRUISE INDICATOR.

Check the CRUISE indicator. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair or replace the faulty portion according to the inspection result.

6. CRUISE CONTROL IS CANCELLED WITHOUT RELEASING OPERATION

Note:

- **Do not turn the ignition switch to OFF after the cruise control is deactivated.**
- **Do not operate the EyeSight steering switch after the cruise control is deactivated.**

If the above is performed, the cancel code the ECM will be cleared.

1. CHECK FOR PRESENCE OF CANCEL CODE.

Check for the presence of ECM cancel codes. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display.

Is a cancel code displayed?

Yes	Perform the diagnosis for the displayed cancel code. Ref. to EyeSight (DIAGNOSTICS)>ECM Cancel Code(s) Display.
No	Go to 2.

2. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	Go to 6.
No	• When EyeSight steering switch signal is faulty, Go to 3. • When the stop light switch or brake switch signal is faulty, Go to 4. • When the sift lever signal is faulty, Go to 5.

3. CHECK EYESIGHT STEERING SWITCH.

Check the EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

4. INSPECTION OF STOP LIGHT SWITCH AND BRAKE SWITCH.

Check stop light switch and brake switch. Ref. to BRAKE>Brake Pedal. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the stop light switch or brake switch.

5. CHECK NEUTRAL POSITION SWITCH.

Check the neutral position switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the neutral position switch.

6. INSPECTION OF VEHICLE SPEED SENSOR.

Check the vehicle speed sensor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.

Is the check result OK?

Yes	Replace the VDCCM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Repair or replace the faulty portion of the vehicle speed sensor.

7. CRUISE CONTROL CANNOT BE SET

Note:

- **Do not turn the ignition switch to OFF after the cruise control is deactivated.**
- **Do not operate the EyeSight steering switch after the cruise control is deactivated.**

If the above is performed, the cancel code the ECM will be cleared.

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	Go to 5.
No	• When EyeSight steering switch signal is faulty, Go to 2. • When the stop light switch or brake switch signal is faulty, Go to 3. • When the sift lever signal is faulty, Go to 4.

2. CHECK EYESIGHT STEERING SWITCH.

Check the EyeSight steering switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

3. INSPECTION OF STOP LIGHT SWITCH AND BRAKE SWITCH.

Check stop light switch and brake switch. Ref. to BRAKE>Brake Pedal. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the stop light switch or brake switch.

4. CHECK NEUTRAL POSITION SWITCH.

Check the neutral position switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the neutral position switch.

5. INSPECTION OF VEHICLE SPEED SENSOR.

Check the vehicle speed sensor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.

Is the check result OK?

Yes	Replace the VDCCM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Repair or replace the faulty portion of the vehicle speed sensor.

8. SET INDICATOR DOES NOT ILLUMINATE

1. INSPECTION OF SET INDICATOR.

Check the SET indicator. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK ADAPTIVE CRUISE CONTROL INDICATOR LIGHT/CONSTANT SPEED CRUISE CONTROL INDICATOR LIGHT AND CRUISE SET INDICATOR LIGHT.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

9. VEHICLE SPEED IS NOT HELD WITHIN SET SPEED ±3 KM/H (±2 MPH) ON A

LEVEL ROAD

1. INSPECTION OF VEHICLE SPEED SENSOR.

Check the vehicle speed sensor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>22.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

10. VEHICLE SPEED DOES NOT INCREASE OR DOES NOT RETURN TO SET SPEED AFTER RES/+ SWITCH HAS BEEN PRESSED

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. INSPECTION OF RES/+ SWITCH.

Check the RES/+ switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

11. VEHICLE SPEED DOES NOT DECREASE AFTER SET/− SWITCH HAS BEEN PRESSED

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK SET/− SWITCH.

Check the SET/− switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

12. CRUISE CONTROL IS NOT DEACTIVATED AFTER THE CRUISE SWITCH IS PRESSED

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. INSPECTION OF CRUISE SWITCH.

Check the cruise switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

13. FOLLOWING DISTANCE DOES NOT CHANGE, EVEN AFTER THE FOLLOWING DISTANCE SWITCH IS PRESSED

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. INSPECTION OF FOLLOWING DISTANCE SWITCH.

Check the following distance switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion of the steering switch.

14. CRUISE CONTROL IS NOT RELEASED AFTER BRAKE PEDAL HAS BEEN DEPRESSED

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. INSPECTION OF STOP LIGHT SWITCH AND BRAKE SWITCH.

Check stop light switch and brake switch. Ref. to BRAKE>Brake Pedal. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

15. CRUISE CONTROL IS NOT RELEASED AFTER SHIFTING THE SHIFTING LEVER TO THE NEUTRAL POSITION

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	The circuit has returned to a normal condition at this time. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK NEUTRAL POSITION SWITCH.

Check the neutral position switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>12. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with ECU Cancel Code>62.

Is the check result OK?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

16. ACCELERATION OR DECELERATION DOES NOT OCCUR ACCORDING TO THE PRECEDING VEHICLE. THE PRECEDING VEHICLE IS DIFFICULT TO BE DETECTED. BRAKING FORCE IS WEAKER THAN USUAL. ALARM FOR REQUIRING MORE BRAKE PEDAL FORCE DOES NOT SOUND

1. CHECK USING CHECK LIST.

Using CHECK LIST (ADAPTIVE CRUISE CONTROL), check the condition and respond to it. Check list (adaptive cruise control) Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK LIST (ADAPTIVE CRUISE CONTROL).

- Check that the current status applies to the condition that the use of adaptive cruise control is not desired.
- Check that the current status applies to the condition or the object that is hard to be recognized by the stereo camera.
- Check that the current status applies to the driving condition that the preceding vehicle cannot be recognized or the vehicle on the next lane or the object on the roadside may be recognized by mistake.
- Check that the current status applies to the condition that brake force may become poor.
- Check that the current status applies to the condition that the alarm for requiring more brake pedal force does not sound even in a short vehicle distance.

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Go to 2.

2. INSPECTION OF WINDSHIELD GLASS AND DASHBOARD.

Check the windshield glass and the dashboard. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the faulty portion according to the inspection result.

3. INSPECTION OF FRONT WIPER.

Check the front wiper. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the faulty portion according to the inspection result.

4. CHECK STEREO CAMERA.

Check the stereo camera. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.

Is the check result OK?

Yes	Go to 5.
No	Repair or replace the faulty portion according to the inspection result.

5. CHECK BRAKE.

Bleed air from brake system. Ref. to BRAKE>Air Bleeding>PROCEDURE > BRAKE LINE.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace the faulty portion according to the inspection result.

6. ADJUST OPTICAL AXIS OF THE STEREO CAMERA.

Perform optical axis adjustment of the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

17. PRE-COLLISION BRAKE DOES NOT OPERATE / PRE-COLLISION BRAKE OPERATES BUT BRAKE FORCE IS NOT SUFFICIENT TO STOP / PRE-COLLISION BRAKE OPERATES BUT BRAKE FORCE IS NOT SUFFICIENT TO STOP. OR THE PRE-COLLISION BRAKE ASSIST DOES NOT OPERATE

1. CHECK PRE-COLLISION BRAKE OFF INDICATOR LIGHT.

Check the pre-collision brake OFF indicator light.

Is the pre-collision brake OFF indicator light off?

Yes	Go to 2.
No	This is normal. Operate the brake OFF switch to deactivate. When the indicator remains on after the deactivation, perform the diagnosis described in “Pre-collision brake OFF indicator light does not go off”.

2. CHECK USING CHECK LIST.

Using CHECK LIST (PRE-COLLISION BRAKE), check the followings and respond to it.
- Does it apply to the condition that the pre-collision brake does not operate, or there is a high possibility that the vehicle cannot stop safely before collision with the pre-collision brake?
- Does it apply to the condition that there is a high possibility that the pre-collision brake does not operate due to the recognition status of the stereo camera?
- Does it apply to the condition that the system does not operate correctly and the turning OFF of the pre-collision brake is desired?
- Does it apply to the condition that the pre-collision brake OFF indicator light illuminates?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

18. PRE-COLLISION BRAKE OPERATES IMPROPERLY / PRE-COLLISION BRAKE IS NOT RELEASED / PRE-COLLISION BRAKE ASSIST OPERATES IMPROPERLY

1. CHECK USING CHECK LIST.

Using CHECK LIST (PRE-COLLISION BRAKE), check the followings and respond to it.
- Does it apply to the condition that turning OFF of the pre-collision brake is desired?
- Does it apply to the condition that the pre-collision brake may operate?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

19. PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT GO OFF / PRE-COLLISION BRAKE OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. CHECK FOR PRESENCE OF TEMPORARY STOP CODES.

Check for the presence of the temporary stop codes. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is a temporary stop code displayed?

Yes	Check EyeSight temporary stop code. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.
No	Go to 3.

3. INSPECTION OF PRE-COLLISION BRAKE OFF SWITCH.

Check the pre-collision brake OFF switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

20. PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT GO OFF / PRE-COLLISION BRAKE OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. CHECK FOR PRESENCE OF TEMPORARY STOP CODES.

Check for the presence of the temporary stop codes. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is a temporary stop code displayed?

Yes	Check EyeSight temporary stop code. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.
No	Go to 3.

3. INSPECTION OF PRE-COLLISION BRAKE OFF SWITCH.

Check the pre-collision brake OFF switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

21. PRE-COLLISION BRAKE OFF INDICATOR LIGHT DOES NOT ILLUMINATE / PRE-COLLISION BRAKE OFF INDICATOR LIGHT GOES OFF AUTOMATICALLY

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. INSPECTION OF PRE-COLLISION BRAKE OFF SWITCH.

Check the pre-collision brake OFF switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B6 PRE-COLLISION OFF SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

22. AT RAPID START PREVENTION CONTROL DOES NOT OPERATE / AT RAPID START PREVENTION CONTROL IS RELEASED AUTOMATICALLY

1. CHECK PRE-COLLISION BRAKE OFF INDICATOR LIGHT.

Check the pre-collision brake OFF indicator light.

Is the pre-collision brake OFF indicator light off?

Yes	Go to 2.
No	This is normal. Operate the brake OFF switch to deactivate. When the indicator remains on after the deactivation, perform the diagnosis described in “Pre-collision brake OFF indicator light does not go off”.

2. CHECK USING CHECK LIST.

Using CHECK LIST (AT RAPID START PREVENTION CONTROL), check the following and respond to it.

- Does it apply to the condition that the AT rapid start prevention control may not operate?
- Does it apply to the condition that the pre-collision brake OFF indicator light illuminates?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

23. AT RAPID START PREVENTION CONTROL OPERATES IMPROPERLY / AT RAPID START PREVENTION CONTROL IS NOT RELEASED

1. CHECK USING CHECK LIST.

Using CHECK LIST (AT RAPID START PREVENTION CONTROL), check the following and respond to it.

- Does it apply to the condition that turning OFF of the AT rapid start prevention control is desired?
- Does it apply to the condition that the AT rapid start prevention control may operate?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

24. LANE DEPARTURE WARNING DOES NOT OPERATE / LANE DEPARTURE WARNING IS RELEASED AUTOMATICALLY

1. INSPECTION OF LANE DEPARTURE WARNING OFF INDICATOR LIGHT.

Check the lane departure warning OFF indicator light.

Is the lane departure warning OFF indicator light off?

Yes	Go to 2.
No	This is normal. Operate the lane departure warning OFF switch to deactivate. When the indicator remains on after the deactivation, perform the diagnosis described in “Lane departure warning OFF indicator light does not go off”.

2. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE’S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the lane departure warning does not operate or is difficult to operate?
- Does it apply to the condition that the lane departure warning OFF indicator light illuminates?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

25. LANE DEPARTURE WARNING OPERATES IMPROPERLY / LANE DEPARTURE WARNING IS NOT RELEASED

1. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the vehicle lane is recognized erroneously and the lane departure warning may operate?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

26. LANE DEPARTURE WARNING OFF INDICATOR LIGHT DOES NOT GO OFF / LANE DEPARTURE WARNING OFF INDICATOR LIGHT ILLUMINATES AUTOMATICALLY

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. CHECK FOR PRESENCE OF TEMPORARY STOP CODES.

Check for the presence of the temporary stop codes. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is a temporary stop code displayed?

Yes	Check EyeSight temporary stop code. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.
No	Go to 3.

3. CHECK LANE DEPARTURE WARNING OFF SWITCH.

Check the lane departure warning OFF switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

27. LANE DEPARTURE WARNING OFF INDICATOR LIGHT DOES NOT ILLUMINATE / LANE DEPARTURE WARNING OFF INDICATOR LIGHT GOES OFF AUTOMATICALLY

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. CHECK LANE DEPARTURE WARNING OFF SWITCH.

Check the lane departure warning OFF switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B28B7 LDP OFF SWITCH.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion according to the inspection result.

28. SWAY WARNING DOES NOT OPERATE / SWAY WARNING IS RELEASED AUTOMATICALLY

1. INSPECTION OF LANE DEPARTURE WARNING OFF INDICATOR LIGHT.

Check the lane departure warning OFF indicator light.

Is the lane departure warning OFF indicator light off?

Yes	Go to 2.
No	This is normal. Operate the lane departure warning OFF switch to deactivate. When the indicator remains on after the deactivation, perform the diagnosis described in "Lane departure warning OFF indicator light does not go off".

2. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the sway warning may not operate?
- Does it apply to the condition that the lane departure warning OFF indicator light illuminates?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

29. SWAY WARNING OPERATES IMPROPERLY / SWAY WARNING IS NOT RELEASED

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it occurs when the engine is started.

Does it occur when starting the engine?

Yes	This is normal. (Light illumination for a while after the engine start is normal.)
No	Go to 2.

2. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the sway warning may operate improperly?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

30. FORWARD VEHICLE'S START MONITORING FUNCTION DOES NOT OPERATE

1. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the forward vehicle's start monitoring function operates even when the preceding vehicle has not yet started?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

31. FORWARD VEHICLE'S START MONITORING FUNCTION OPERATES IMPROPERLY / FORWARD VEHICLE'S START MONITORING FUNCTION IS NOT RELEASED

1. CHECK USING CHECK LIST.

Using CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION), check the following and respond to it.

- Does it apply to the condition that the forward vehicle's start monitoring function operates even when the preceding vehicle has not yet started?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

32. LANE KEEP SWITCH IS NOT TURNED TO ON. (LANE KEEP INDICATOR LIGHT DOES NOT ILLUMINATE IN WHITE.)

1. PERFORM REAL TIME DIAGNOSIS.

Check the input signal of cruise control system. Ref. to EyeSight (DIAGNOSTICS)>Real-time Diagnosis.

Is the check result OK?

Yes	Go to 3.
No	Go to 2.

2. CHECK LANE KEEP SWITCH.

Check the lane keep switch. Ref. to EyeSight (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK EYESIGHT STEERING SWITCH.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the faulty portion of the steering switch.

3. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.
No	Repair or replace the faulty portion of the combination meter.

33. LANE KEEP (LANE DEPARTURE PREVENTION) CANNOT BE READY (LANE INDICATOR DOES NOT ILLUMINATE) / LANE KEEP (LANE DEPARTURE PREVENTION) DOES NOT OPERATE (LANE KEEP INDICATOR DOES NOT ILLUMINATE IN GREEN) / THOUGH LANE KEEP (LANE DEPARTURE PREVENTION) IS OPERATING, THE VEHICLE DEPARTS OUT OF THE LANE DUE TO POOR ASSISTANCE

1. CHECK FOR PRESENCE OF LANE DEPARTURE PREVENTION DEACTIVATION CODES.

Check for the presence of ECM lane departure prevention deactivation codes. Ref. to EyeSight (DIAGNOSTICS)>Lane Departure Prevention Assist Deactivate Code(s) Display.

Is a lane departure prevention deactivation code displayed?

Yes	Perform the diagnosis for the displayed lane departure prevention deactivation code. Ref. to EyeSight (DIAGNOSTICS)>Lane Departure Prevention Assist Deactivate Code(s) Display.
No	Go to 2.

2. CHECK USING CHECK LIST.

Using CHECK LIST (LANE KEEP), check the following and respond to it.
- Does it apply to the condition that use of lane keeping is not desired?
- Does it apply to the condition or the object that is hard to be recognized by the stereo camera?
- Does it apply to the road condition that the white line is difficult to be recognized?

Is there a relevant item in the check list?

Yes	When there is a relevant item, it can be the cause of malfunction. Eliminate the cause, and check that the malfunction has been improved.
No	Go to 3.

3. INSPECTION OF WINDSHIELD GLASS AND DASHBOARD.

Check the windshield glass and the dashboard. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > WINDSHIELD GLASS AND DASHBOARD.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the faulty portion according to the inspection result.

4. INSPECTION OF FRONT WIPER.

Check the front wiper. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > FRONT WIPER.

Is the check result OK?

Yes	Go to 5.
No	Repair or replace the faulty portion according to the inspection result.

5. CHECK OPTICAL AXIS OF HEADLIGHT.

Check the optical axis of the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace the faulty portion according to the inspection result.

6. CHECK STEREO CAMERA.

Check the stereo camera. Ref. to EyeSight (DIAGNOSTICS)>General Description>INSPECTION > STEREO CAMERA.

Is the check result OK?

Yes	Go to 7.
No	Repair or replace the faulty portion according to the inspection result.

7. CHECK TIRE AND WHEEL ALIGNMENT.

Check the tires and wheel alignment.

Is the check result OK?

Yes	Go to 8.
No	Repair or replace the faulty portion according to the inspection result.

8. ADJUST OPTICAL AXIS OF THE STEREO CAMERA.

Perform optical axis adjustment of the stereo camera. Perform optical axis adjustment of the stereo camera. Ref. to EyeSight>Camera Adjustment, Inspection>PROCEDURE.

Was the fault fixed after adjusting the optical axis?

Yes	The current state is normal.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

34. LANE KEEP (LANE DEPARTURE PREVENTION) IS CANCELLED WITHOUT RELEASING OPERATION

1. CHECK CONDITION OF OCCURRENCE.

Interview the customer to check if it was canceled by the cancel conditions described in OM.

Is it cancelled by the cancel conditions (releasing of lane departure prevention function) described in the OM?

Yes	This is normal.
No	Go to 2.

2. CHECK FOR PRESENCE OF LANE DEPARTURE PREVENTION DEACTIVATION CODES.

Check for the presence of ECM lane departure prevention deactivation codes. Ref. to EyeSight (DIAGNOSTICS)>Lane Departure Prevention Assist Deactivate Code(s) Display.

Is a lane departure prevention deactivation code displayed?

Yes	Perform the diagnosis for the displayed lane departure prevention deactivation code. Ref. to EyeSight (DIAGNOSTICS)>Lane Departure Prevention Assist Deactivate Code(s) Display.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera>REMOVAL.

35. CHECK LIST (ADAPTIVE CRUISE CONTROL)

Item Name			Yes/No	
[1]: When the vehicle does not accelerate or decelerate according to the preceding vehicle, or when it is difficult to detect the preceding vehicle.				
1	Check that the current status applies to the condition that the use of adaptive cruise control is not desired.			
	1	Tire pressure is not correct.	Yes	No
	2	The vehicle is equipped with the temporary spare tire.	Yes	No
	3	The vehicle is equipped with worn tire or tires with excessive wear difference.	Yes	No
	4	The vehicle is equipped with the tires out of specification.	Yes	No
	5	The suspension has been modified.	Yes	No
	6	The vehicle is equipped with the tire chain.	Yes	No
	7	Headlight is dirty or the optical axis is deviated. (The vehicle cannot correctly emit the headlight beam against the object and recognize it.)	Yes	No
	8	The driving of own vehicle is unstable due to an accident or failure.	Yes	No
	9	The brake warning light illuminates.	Yes	No
	10	Vehicle is tilted by the heavy load.	Yes	No
	11	Passenger capacity is exceeded.	Yes	No
	12	The vehicle is towing the trailer or other vehicle.	Yes	No
	13	The vehicle drives on the general road (other than limited highway). (Depending on the road environment (complicated roads etc.), the vehicle may not be able to drive according to the traffic condition, which may lead to the traffic accident.)	Yes	No
	14	The vehicle drives on the sharp bend.	Yes	No
	15	The vehicle drives on the slippery roads such as icy road or snow-covered road. (Tires can spin, losing the vehicle control.)	Yes	No
	16	The vehicle drives under the traffic condition that the certain vehicle distance is difficult to be maintained due to frequent acceleration and deceleration. (The vehicle may not be able to drive according to the traffic condition.)	Yes	No
	17	There is a steep downhill. (The vehicle may drive at higher speed than the set vehicle speed.)	Yes	No
	18	The vehicle performs adaptive driving while recognizing the preceding vehicle on the steep downhills. (Brake can be overheated.)	Yes	No
	19	The vehicle drives on the road with repeated steep uphills and downhills or crossover. (The vehicle may not be able to recognize the preceding vehicle or may recognize the road surface, and appropriate control may not be performed.)	Yes	No
	20	The vehicle is entering the interchange, service area, parking area, junction or tollgate. (The vehicle may not be able to recognize the preceding vehicle.)	Yes	No

Item		Name	Yes/No
	21	When the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changes.	Yes No
	22	There are water, snow or sandy dust raised by the preceding vehicle or oncoming vehicle, or sand or smoke blown in the wind, or moisture in front of own vehicle. (The vehicle may not be able to recognize the preceding vehicle or may recognize the water, and appropriate control may not be performed.)	Yes No
	23	The windshield glass is covered with fog, snow, dirt, frost or sandy dust.	Yes No
	24	The raindrops, water drops or dirt on the windshield glass are not wiped off sufficiently. (The vehicle may not be able to recognize the preceding vehicle, and appropriate control may not be performed.)	Yes No
	25	Canoes etc. loaded on the roof block the visibility of the stereo camera.	Yes No
2		Check that the current status applies to the condition or the object that is hard to be recognized by the stereo camera.	
	1	That was a vehicle with large speed difference (low-speed driving vehicle, stopping vehicle, oncoming vehicle).	Yes No
	2	That was a cutting-in vehicle.	Yes No
	3	That was a motorcycle, bicycle, pedestrian or animal, etc.	Yes No
	4	It was dim in the evening or in the morning.	Yes No
	5	The headlight did not illuminate during nighttime hours or inside the tunnel.	Yes No
	6	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Yes No
	7	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Yes No
	8	The rearmost surface of the preceding vehicle was small, low or uneven. That was a truck equipped with an unloaded platform without gate, a vehicle that the luggage was protruding from the rear end of the vehicle, a vehicle of special shape (carrier car, side car, etc.) or a vehicle with low vehicle height.	Yes No
	9	There was an object extremely close to the bumper of the own vehicle.	Yes No
3		Check that the current status applies to the driving condition that the preceding vehicle cannot be recognized or the vehicle on the next lane or the object on the roadside may be recognized by mistake.	
	1	The vehicle began adaptive cruise control from the condition that the vehicle distance was short immediately after the preceding vehicle was cut in.	Yes No
	2	The vehicle drives on the curve, outlet and inlet of the curve, or the road with many curves in succession. (Recognition may not be performed properly, because the preceding vehicle is out of recognition area.)	Yes No
	3	The position against the preceding vehicle deviated laterally.	Yes No
	4	There were some objects just near the road side.	Yes No
	5	The speed difference against the preceding vehicle was large.	Yes No

Item Name		Yes/No
6	Other vehicle cut ahead of the own vehicle.	Yes No
7	The vehicle distance was extremely short.	Yes No
8	The own vehicle swayed in the vehicle lane.	Yes No
9	The road surface was uneven due to roll or unpaved track.	Yes No
10	The vehicle drove on the narrow lane because of the lane closure or construction work.	Yes No
11	The driving of own vehicle was unstable due to an accident or failure.	Yes No
12	The own vehicle was loaded with the extremely heavy load in the luggage compartment or on the rear seat.	Yes No

[2]: When braking force is weaker than usual.

1 Check that the current status applies to the condition that brake force may become poor.

1	The vehicle status (loading amount, passenger, etc.) was inappropriate.	Yes No
2	The road surface was very steep, slippery, sharp turn, or uneven.	Yes No
3	The service maintenance condition of the vehicle (brake system, tire wear, tire pressure, spare tire, etc.) was inappropriate.	Yes No
4	The brake was cold at low ambient temperature or immediately after the driving had started.	Yes No
5	The symptom occurred between immediately after engine started and after a while the vehicle started driving. (Completion of warming up operation can be used as an indication.)	Yes No
6	The brake force becomes poor due to the overheating of the brake on the downhills.	Yes No
7	The brake force becomes poor because of the wet brake after driving onto the puddle or washing the vehicle.	Yes No

[3]: When the alarm for requiring more brake pedal force does not sound.

1 Check that the current status applies to the condition that the alarm for requiring more brake pedal force does not sound even in a short vehicle distance.

1	The speed difference between own vehicle and preceding vehicle (when the vehicle speed of the own vehicle was approximately the same as that of the preceding vehicle) was small.	Yes No
2	The vehicle speed of the preceding vehicle was faster than that of the own vehicle (when the vehicle distance was getting longer).	Yes No
3	Other vehicle cut in extremely close to the own vehicle.	Yes No
4	The preceding vehicle decelerated abruptly.	Yes No
5	There are many continuous uphills and downhills.	Yes No

36. CHECK LIST (PRE-COLLISION BRAKE)

Item Name	Yes/No
[1]: When pre-collision brake did not operate, or when vehicle could not stop safely before collision in spite of pre-collision brake operation.	

Item	Name	Yes/No
1	Check that the current status applies to the condition that the pre-collision brake does not operate, or there is a high possibility that the vehicle cannot stop safely before collision in spite of pre-collision brake operation.	
1	Conditions such as the followings occurred: 1) Vehicle speed difference with the preceding vehicle is small. 2) Distance from the preceding vehicle is long. 3) Lateral deviation (offset amount) is large.	Yes No
2	The vehicle status (loading amount, number of passenger, etc.) was inappropriate.	Yes No
3	The road surface was very steep, slippery, sharp turn, or uneven.	Yes No
4	There was problem for the frontal visibility. (Rain, snow, fog, smoke, etc.)	Yes No
5	The objects were livestock, animals, guardrail, telephone pole, tree, fence, wall, etc.	Yes No
6	The object was motorcycle, bicycle, or pedestrian. However, the system could not recognize the object due to surrounding brightness, motion, posture, and/or angle.	Yes No
7	Crash avoidance operation (accelerator pedal, brake pedal, steering wheel, etc.) was performed.	Yes No
8	The service maintenance condition of the vehicle (brake system, tire wear, tire pressure, spare tire, etc.) was inappropriate.	Yes No
9	The vehicle is towing the trailer or other vehicle.	Yes No
10	The brake was cold at low ambient temperature or immediately after the driving had started.	Yes No
11	The brake force becomes poor due to the overheating of the brake on the downhills.	Yes No
12	The brake force becomes poor because of the wet brake after driving onto the puddle or washing the vehicle.	Yes No
2	Check that the current status applies to the condition that there is a high possibility that the pre-collision brake does not operate depending on the recognition status of the stereo camera.	
1	It was bad weather (heavy rain, snowstorm, dense fog).	Yes No
2	The field of view was insufficient due to water, snow or sandy dust raised by the preceding vehicle or oncoming vehicle, or the moisture, sand or smoke blown in the wind.	Yes No
3	The headlight did not illuminate during nighttime hours or inside the tunnel.	Yes No
4	The tail light of the preceding vehicle did not illuminate during nighttime hours or inside the tunnel.	Yes No
5	The vehicle approached the motorcycle, bicycle or pedestrian in the night.	Yes No
6	It was dark in the evening or in the morning.	Yes No
7	The rearmost surface of the preceding vehicle was small, low or uneven. That was a truck equipped with an unloaded platform without gate, a vehicle that the luggage was protruding from the rear end of the vehicle, a vehicle of special shape (carrier car, side car, etc.) or a vehicle with low vehicle height.	Yes No
8	There was a wall in front of the stopping vehicle.	Yes No

Item	Name	Yes/No
9	There was an object close to the vehicle.	Yes No
10	That was a vehicle stopped sideways.	Yes No
11	That was a vehicle which was oncoming or driving in reverse.	Yes No
12	The object was small seen from the stereo camera. (Small animals, infants, person squatting down or lying down)	Yes No
13	The preceding vehicle made a sharp turn, or performed abrupt acceleration or deceleration.	Yes No
14	Other vehicle, motorcycle, bicycle or pedestrian existed extremely close to the bumper of the own vehicle.	Yes No
15	The speed difference was 5 km/h (3.1 MPH) or less. (The control is performed in close distance. Depending on the objects shape and size, the rear end surface may be outside the camera visibility area.)	Yes No
16	Other vehicle, motorcycle, bicycle or pedestrian cut in from the side or jumped in front of the own vehicle.	Yes No
17	The own vehicle changed the vehicle lane, and followed the preceding vehicle right behind.	Yes No
18	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Yes No
19	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Yes No
20	The windshield glass has not yet been wiped off sufficiently during or after the use of the window washer.	Yes No
21	The recognition of the object was imperfect due to the raindrop or droplet of the window washer or the wiper blade blocking the visibility of the stereo camera.	Yes No
22	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Yes No
23	Other vehicle, motorcycle, bicycle or pedestrian existed out of the illuminating area of the headlight.	Yes No
24	The vehicle drove on the sharp turn, steep uphills or steep downhills.	Yes No
25	The road surface was uneven due to roll or unpaved track.	Yes No
26	The vehicle passed through the outlet or inlet of a tunnel.	Yes No
27	The object was fence or wall.	Yes No
28	The object was a plate of glass, mirror wall or door.	Yes No
3	Check that the current status applies to the condition that the system does not operate correctly and the turning OFF of the pre-collision brake is desired.	
1	Tire pressure is not correct.	Yes No
2	The vehicle is equipped with the temporary spare tire.	Yes No
3	The vehicle is equipped with worn tire or tires with excessive wear difference.	Yes No
4	The vehicle is equipped with the tires out of specification.	Yes No
5	The suspension has been modified.	Yes No
6	The vehicle is equipped with the tire chain.	Yes No

Item Name			Yes/No
	7	Headlight is dirty or the optical axis is deviated. (The vehicle cannot correctly emit the headlight beam against the object and recognize it.)	Yes No
	8	The driving status of own vehicle is unstable due to an accident or failure.	Yes No
	9	The brake warning light illuminates.	Yes No
	10	Vehicle is tilted by the heavy load. Or, passenger capacity is exceeded.	Yes No
4	Check that the current status applies to the condition that the pre-collision brake OFF indicator light illuminates. (When the pre-collision brake OFF indicator light illuminates, the pre-collision brake does not operate.)		
	1	The pre-collision brake is turned off, using the pre-collision brake OFF switch.	Yes No
	2	Approximately for 7 seconds after the engine has started.	Yes No
	3	EyeSight is malfunctioning.	Yes No
	4	EyeSight is stopped temporarily.	Yes No
[2]: When pre-collision brake operated improperly.			
1	Check that the current status applies to the condition that turning OFF of the pre-collision brake is desired.		
	1	The vehicle is towed.	Yes No
	2	The vehicle is loaded on the carrier car.	Yes No
	3	The chassis dynamometer or free roller is used.	Yes No
	4	The vehicle is lifted up, engine is started and the tire is spun.	Yes No
	5	The vehicle passes through the banners, flags, drooping branches or grass while making contact with them.	Yes No
	6	The vehicle performs sporty driving on the circuit.	Yes No
	7	When the vehicle uses the movable type car wash machine.	Yes No
2	Check that the current status applies to the condition that the pre-collision brake may operate.		
	1	The vehicle passes through the ETC gate at a speed exceeding the specification.	Yes No
	2	The vehicle drives close to the preceding vehicle.	Yes No
	3	The vehicle drives on the place where the road surface gradient changed suddenly.	Yes No
	4	The vehicle passes through the moisture or mass of smoke.	Yes No
	5	When the exhaust gas emitted from the preceding vehicle is visible clearly at cold weather.	Yes No
	6	There is an obstacle on the curve or crossing.	Yes No
	7	The vehicle passes through close to other vehicle or obstacle.	Yes No
	8	The vehicle parks close to the wall in front or to other vehicle.	Yes No

37. CHECK LIST (AT RAPID START PREVENTION CONTROL)

Item Name	Yes/No
[1]: When AT rapid start prevention control did not operate.	

Item	Name	Yes/No
1	Check that the current status applies to the condition that the AT rapid start prevention control may not operate.	
1	Conditions such as the followings occurred: 1) Distance from the front object is long. 2) Vehicle speed difference is small. 3) Lateral deviation (offset amount) is large.	Yes No
2	It was bad weather (heavy rain, snowstorm, dense fog).	Yes No
3	The visibility was insufficient due to sand or smoke blown in the air.	Yes No
4	The vehicle approached the object in the evening, in the morning or in the night.	Yes No
5	The vehicle approached the object in the dark place (e.g. closed-in parking lot).	Yes No
6	The height of the object was low. (low wall, low guardrail, vehicle with low height etc.)	Yes No
7	The object was small seen from the stereo camera. (Small animals, infants, person squatting down or lying down)	Yes No
8	The object or rearmost area of the preceding vehicle (trailer, etc.) was small. Or the vehicle approached them too close. (The system triggers the operation by recognizing the area other than the rearmost section, resulting in insufficient control.)	Yes No
9	The object such as other vehicle, motorcycle, bicycle or pedestrian cut in from the side or jumped in front of the own vehicle.	Yes No
10	The own vehicle changed the vehicle lane when it started, and approached right behind the object.	Yes No
11	The vehicle was exposed to the intense light (backlight such as sunlight or headlight high-beam light) from the front of the vehicle.	Yes No
12	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Yes No
13	The windshield glass has not yet been wiped off sufficiently during or after the use of the window washer.	Yes No
14	The recognition of the object was imperfect due to the raindrop or droplet of the window washer or the wiper blade blocking the visibility of the stereo camera.	Yes No
15	Canoes etc. loaded on the roof blocked the visibility of the stereo camera.	Yes No
16	The object existed out of the illuminating area of the headlight.	Yes No
17	The vehicle drove on the sharp turn, steep uphills or steep downhills.	Yes No
18	The object was a fence or wall with even pattern (striped pattern or bricks) or unpatterned surface.	Yes No
19	The object was a plate of glass, mirror wall or door.	Yes No
20	Crash avoidance operation (accelerator pedal, brake pedal, steering wheel, etc.) was performed.	Yes No
2	Check that the current status applies to the condition that the pre-collision brake OFF indicator light illuminates. (When the pre-collision brake OFF indicator light illuminates, the AT rapid start prevention control does not operate.)	

Item Name			Yes/No	
	1	The pre-collision brake was turned off, using the pre-collision brake OFF switch.	Yes	No
	2	Approximately for 7 seconds after the engine has started.	Yes	No
	3	EyeSight is malfunctioning.	Yes	No
	4	EyeSight is stopped temporarily.	Yes	No

[2]: When AT rapid start prevention control operated improperly.

1	Check that the current status applies to the condition that the releasing of the AT rapid start prevention control is desired.			
	1	The vehicle is towed.	Yes	No
	2	The vehicle is loaded on the carrier car.	Yes	No
	3	The chassis dynamometer or free roller is used.	Yes	No
	4	The vehicle is lifted up, engine is started and the tire is spun.	Yes	No
	5	The vehicle passes through the banners, flags, drooping branches or grass while making contact with them.	Yes	No
	6	The vehicle performs sporty driving on the circuit.	Yes	No
2	Check that the current status applies to the condition that the AT rapid start prevention control may operate.			
	1	The vehicle passes through the ETC gate at a speed exceeding the specification.	Yes	No
	2	The vehicle drives close to the preceding vehicle.	Yes	No
	3	The vehicle drives on the place where the road surface gradient changed suddenly.	Yes	No
	4	The vehicle passes through the moisture or mass of smoke.	Yes	No
	5	There is an obstacle on the curve or crossing.	Yes	No
	6	The vehicle passes through close to other vehicle or obstacle.	Yes	No
	7	The vehicle parks close to the wall in front or to other vehicle.	Yes	No

38. CHECK LIST (LANE DEPARTURE WARNING, SWAY WARNING, FORWARD VEHICLE'S START MONITORING FUNCTION)

Item Name			Yes/No	
[1]: When the lane departure warning did not operate.				
1	Check that the current status applies to the condition that the lane departure warning does not operate or is difficult to operate.			
	1	The lane departure warning is turned off.	Yes	No
	2	The vehicle speed of the own vehicle is approximately less than 50 km/h (31 MPH).	Yes	No
	3	That was approximately 7 seconds period after the lane departure warning had occurred once.	Yes	No
	4	The steering wheel was turned fully or rapidly.	Yes	No
	5	The brake pedal is depressed.	Yes	No

Item Name			Yes/No	
	6	The vehicle is accelerated by depressing the accelerator pedal.	Yes	No
	7	The vehicle distance from the preceding vehicle is short.	Yes	No
	8	That was approximately 7 seconds period while the turn signal indicator was operating or after the lever was returned.	Yes	No
	9	The vehicle has not returned inside the vehicle lane after the operation of the lane departure warning.	Yes	No
	10	The width of the vehicle lane is narrow.	Yes	No
	11	The vehicle lane is difficult to be recognized seen from the stereo camera. (The lane division line (white line, etc.) does not exist or is almost disappearing. Or the color of the lane division line is similar to that of the road surface, which is difficult to be recognized. Or the lane division line is narrow, etc.)	Yes	No
	12	The preceding vehicle performed crash avoidance action to avoid the obstacle, and the own vehicle performed steering operation after the preceding vehicle.	Yes	No
2	Check that the current status applies to the condition that the lane departure warning OFF indicator light illuminates. (When the lane departure warning OFF indicator light illuminates, the lane departure warning does not operate.)			
	1	The lane departure warning is turned off, using the lane departure warning OFF switch.	Yes	No
	2	Approximately for 7 seconds after the engine has started.	Yes	No
	3	EyeSight is malfunctioning.	Yes	No
	4	EyeSight is stopped temporarily.	Yes	No
[2]: When the lane departure warning malfunctioned.				
1	Check that the current status applies to the condition that the vehicle lane is recognized erroneously and the lane departure warning may operate.			
	1	There was the tire track on the wet road or snow-covered road.	Yes	No
	2	There was the boundary line between snow-covered area and asphalt or on the trace of road repair.	Yes	No
	3	There was the double vehicle lane.	Yes	No
	4	The shadow of the guardrail was detected by mistake.	Yes	No
[3]: When the sway warning did not operate.				
1	Check that the current status applies to the condition that the sway warning may not operate.			
	1	The vehicle drove on the road with many curves in succession.	Yes	No
	2	The vehicle speed changed greatly.	Yes	No
	3	That was immediately after the vehicle lane had changed.	Yes	No
	4	The vehicle lane was difficult to be recognized seen from the stereo camera. (The lane division line (white line, etc.) does not exist or is almost disappearing. Or the color of the lane division line is similar to that of the road surface, which is difficult to be recognized. Or the lane division line is narrow, etc.)	Yes	No

Item	Name		Yes/No
	5	That was immediately after the sway had begun.	Yes No
2	Check that the current status applies to the condition that the lane departure warning OFF indicator light illuminates. (When the lane departure warning OFF indicator light illuminates, the sway warning does not operate.)		
	1	The lane departure warning is turned off, using the lane departure warning OFF switch.	Yes No
	2	Approximately for 7 seconds after the engine has started.	Yes No
	3	EyeSight is malfunctioning.	Yes No
	4	EyeSight is stopped temporarily.	Yes No
[4]: When the sway warning malfunctioned.			
1	Check that the current status applies to the condition that the sway warning may operate.		
	1	That was after the sway had stopped.	Yes No
	2	The driver lost concentration on driving the vehicle due to fatigue or looking away.	Yes No
[5]: When the forward vehicle’s start monitoring function did not operate or when it malfunctioned.			
1	Check that the current status applies to the condition that the forward vehicle’s start monitoring function does not operate even when the preceding vehicle has already started, or that the forward vehicle’s start monitoring function operates even when the preceding vehicle has not yet started.		
	1	The motorcycle cut in the space between the own vehicle and the stopped preceding vehicle.	Yes No
	2	The vehicle could not recognize the preceding vehicle properly due to the weather condition or road shape.	Yes No
	3	The stereo camera lost sight of the preceding vehicle.	Yes No
	4	The driver did not depress the brake pedal with select lever in D, M or N range. (At this time, forward vehicle’s start monitoring function does not operate.)	Yes No
	5	The forward vehicle’s start monitoring function was turned OFF via the customization function.	Yes No

39. CHECK LIST (ACTIVE LANE KEEP)

Item	Name		Yes/No
1	Check that the current status applies to the condition that use of lane keeping is not desired.		
	1	An object was placed on the dashboard.	Yes No
	2	Tire pressure is not correct.	Yes No
	3	The vehicle is equipped with the temporary spare tire.	Yes No
	4	The vehicle is equipped with worn tire or tires with excessive wear difference.	Yes No
	5	The vehicle is equipped with the tires out of specification.	Yes No
	6	The flat tire is repaired using the temporary repair kit.	Yes No
	7	The suspension (including STI parts) has been modified.	Yes No

Item	Name	Yes/No	
8	Wheel balance is abnormal (balance weight falls off, slides off, etc.).	Yes	No
9	Wheel alignment is out of the specified value.	Yes	No
10	The steering wheel has been replaced with a non-genuine part.	Yes	No
11	The steering wheel is off-center.	Yes	No
12	The lighting devices, such as headlights and fog lights, have been modified.	Yes	No
13	An abnormal vibration can be felt on the steering wheel.	Yes	No
14	The steering wheel operation is heavier than usual.	Yes	No
15	An error occurs, for example, no display appears in the combination meter or no alarm sounds.	Yes	No
16	The headlight cannot illuminate the road surface sufficiently because the headlight is dirty, attached with ice, snow or mud, or the optical axis is deviated.	Yes	No
17	The driving status of own vehicle was unstable due to an accident or failure.	Yes	No
18	The vehicle carried heavy load.	Yes	No
19	Passenger capacity was exceeded.	Yes	No
20	The vehicle towed another vehicle.	Yes	No
21	The vehicle drove on a general road (other than limited highways).	Yes	No
22	The vehicle drove on a road with sharp curves, such as an urban highway.	Yes	No
23	The vehicle drove on a slippery road such as icy roads or snow-covered roads.	Yes	No
24	The vehicle drove on a lane restricted road or a temporary road due to road construction.	Yes	No
25	The vehicle drove on a road where obsolete white lines did not disappear completely.	Yes	No
26	On the road surface there were some snow, puddles, snow melting agent, cracks, road repair traces, obsolete white lines.	Yes	No
27	The vehicle entered the interchange, service area, parking area, junction or tollgate.	Yes	No
28	The vehicle drove on a road where the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changed.	Yes	No
29	The vehicle drove on a road where there was some water or sandy dust raised by a preceding vehicle or oncoming vehicle, or sand or smoke blown in the wind, or moisture in front of own vehicle.	Yes	No
30	The windshield glass was covered with fog, snow, dirt, frost or sandy dust.	Yes	No
31	The raindrops, water drops or dirt on the windshield glass were not wiped off sufficiently.	Yes	No
32	Canoes etc. loaded on the roof block the visibility of the stereo camera.	Yes	No
33	The vehicle drove immediately after the stereo camera was replaced or adjusted.	Yes	No
2	Check that the current status applies to the condition or the object, such as a white line, that is hard to be recognized by the stereo camera.		
1	The vehicle drove when it was dark in the evening or in the morning.	Yes	No

Item		Name	Yes/No	
	2	The vehicle drove under the road condition, such as rainy or snowy weather, that the white line was difficult to be recognized.	Yes	No
	3	The headlight did not illuminate during nighttime hours or inside the tunnel.	Yes	No
	4	The vehicle was exposed to the intense light (backlight such as sunlight or headlight) from the front of the vehicle.	Yes	No
	5	The vehicle drove on a road where the driving lane was yellow.	Yes	No
	6	The vehicle drove on a road where the color of the lane division line was similar to the color of the road surface, which was difficult to be recognized.	Yes	No
	7	The vehicle drove on a road where the width of the lane division line was narrow.	Yes	No
	8	The vehicle drove on a road where the lane division line did not exist or almost disappeared.	Yes	No
	9	The vehicle drove on a road where the width of the driving lane was narrow.	Yes	No
	10	The vehicle drove on a road where there was a fork lane, such as an interchange outlet of the highway, or an intersection.	Yes	No
	11	The vehicle drove on a road where the surrounding brightness (such as inlet and outlet of a tunnel) suddenly changed.	Yes	No
	12	The vehicle drove on a road where the white line had a special shape, such as a double line.	Yes	No
	13	The vehicle drove under the condition that the white line was difficult to be recognized due to the short distance to the preceding vehicle.	Yes	No
	14	Another vehicle cut in ahead of the vehicle from the next lane, or the preceding vehicle changed the driving lane.	Yes	No
	15	The vehicle drove on a road where the curve shape changed suddenly.	Yes	No
	16	A shadow of the guardrail formed on the white line.	Yes	No
3		Check that the current status applies to the condition that sufficient performance of lane keeping cannot be achieved.		
	1	The vehicle was subjected to cross wind.	Yes	No
	2	The vehicle is equipped with winter tires or non-genuine tires.	Yes	No
	3	The vehicle drove on a uphill or a downhill where the road surface gradient suddenly changed.	Yes	No
	4	The vehicle drove on an uneven, rolling or jointed road surface.	Yes	No
	5	The vehicle drove on a road where the road surface cross gradient changed suddenly or was large.	Yes	No
	6	The acceleration or deceleration speed was large.	Yes	No
	7	The vehicle drove immediately after the tire was replaced or the tire air pressure was changed.	Yes	No
	8	The vehicle drove immediately after the vehicle weight was extremely changed.	Yes	No
	9	The vehicle drove immediately after the stereo camera was repaired, adjusted or replaced.	Yes	No

Item	Name	Yes/No
10	The vehicle drove immediately after the suspension or steering system was repaired or replaced.	Yes No
11	The vehicle drove immediately after the engine was started at a low outside temperature.	Yes No

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)

RVD(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
13. Cancel Code
14. Diagnostic Procedure with Cancel Code
15. Diagnostics with Phenomenon

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Check List for Interview.

2. PERFORM BASIC INSPECTION.

Perform basic inspection.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)].
   Note:
   For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC AND CANCEL CODE.

Using the Subaru Select Monitor, read the DTCs and cancel codes of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code.

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

DTC Check

•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

DTC Check

Is any DTC or cancel code displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs or cancel codes. (Perform the diagnosis for the side that displayed DTCs or cancel codes.) Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
   •[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   •[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

4. Execute the inspection mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.
5. Using the Subaru Select Monitor, read the DTCs or cancel codes of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code.
   •[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   •[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

Is any DTC or cancel code displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="2">Blind Spot Detection/Rear Cross Traffic Alert
Check List for Interview</td><td colspan="2">Date of Vehicle Bring-in Year
Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date when problem occurred</td><td>Year Month
Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy •
Rainy • Snowy •
Others ( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td></td><td>Occurrence location</td><td></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Confirmation of trouble condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
</table>

CAUTION

1. BSD/RCTA

1. In some cases, BSD/RCTA may not work correctly under the following conditions.
   - In bad weather such as heavy rain, fog, snow, sand storm, etc.
   - When ice, snow, dirt, etc. cover the rear bumper.
   - When the rear bumper has scratches or deformation in the area of the radar sensor.
   - When a difference of vehicle speeds between your own vehicle and another vehicle within the detection range is too large.
   - When there is another vehicle remaining within the detection range while your own vehicle starts from stationary state.
   - While driving on a steep slope with a series of uphills and downhills.
   - While driving on a wet road with such as puddles.
   - When more than one vehicle is approaching one after another with a short distance.
   - When vehicle speed of your own vehicle is almost the same as that of the vehicle within the detection range.
   - When a difference of the vehicle heights between your own vehicle and another vehicle in the next lane is too large.
   - Immediately after operating the BSD/RCTA OFF switch.
   - On wide lanes, when another vehicle of the next lane drives along the opposite edge so the distance is too large for the detection.
2. Basically, BSD/RCTA does not detect the following types of vehicle as well as objects other than vehicles; however, it may detect them depending on circumstances.
   - Oncoming vehicle
   - Small motorcycle, bike, pedestrian, etc.
   - Vehicle following behind on the same lane
   - Stationary objects such as guardrail, wall, sign and parked vehicle
   - Another vehicle driving on two lanes away
3. BSD/RCTA may perform unnecessary detection in the following conditions.
   - When guardrails or walls are close enough to be within the detection range.
   - When distance from the vehicle behind is short.
   - On narrow lanes, when another vehicle driving on two lanes away enters the detection range.
4. Radar sensors of BSD/RCTA are each located on LH and RH sides. Always observe the followings for proper operation of the system.
   - Always clean the vicinity of radar sensors.
   - Do not give a strong impact to the radar sensor areas. Displacement of the radar sensors may result in improper operation of the system such that it may not detect the vehicle entering the detection range.
   - Do not disassemble the radar sensors.
   - Do not scratch or deform the bumper areas with the radar sensors.

Note:

Replace the rear bumper in the following cases.

– When there is any collision trace or dent inside the radar projection area.

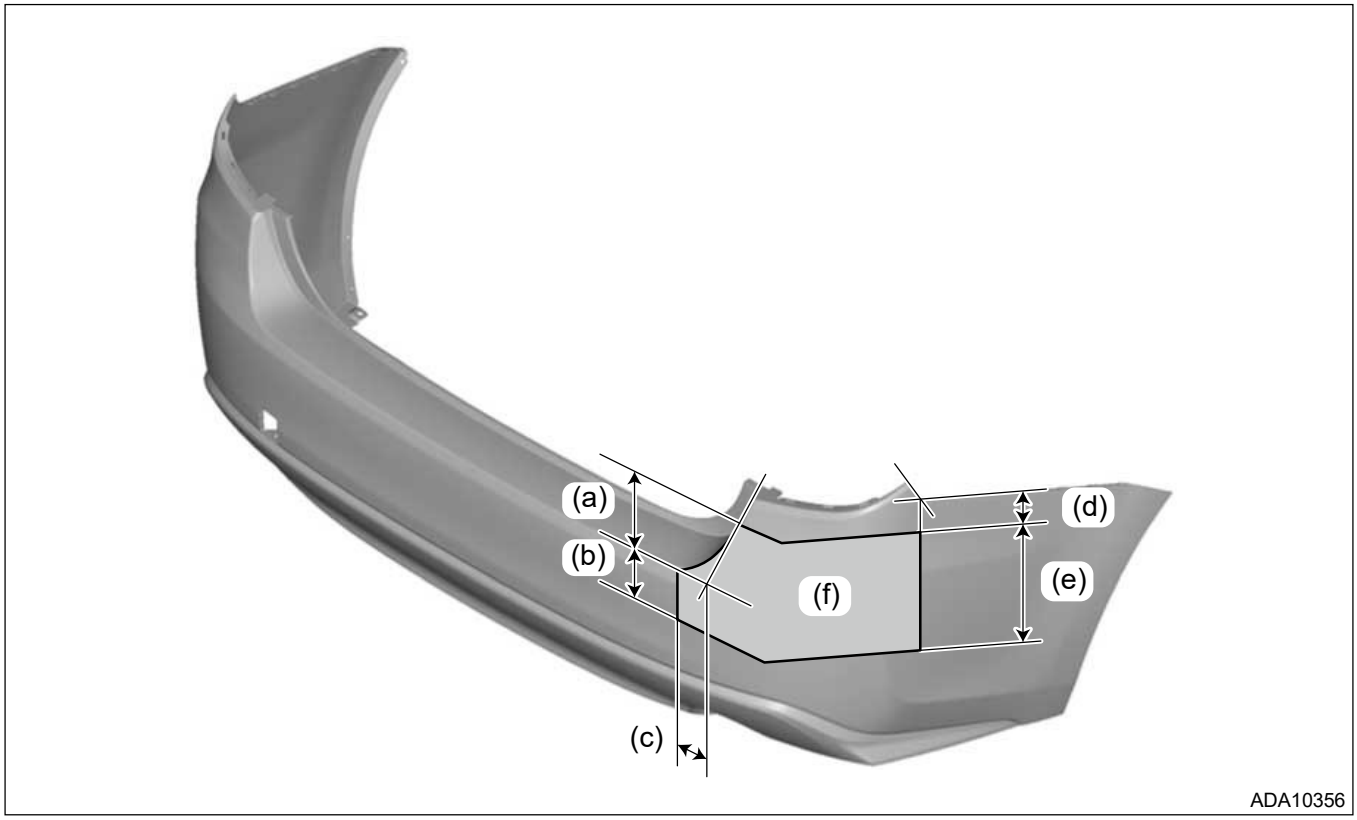
– When there is any scuffed (chipped off) section inside the radar projection area on the resin bumper.

– When there is any crack inside the radar projection area.

Note:

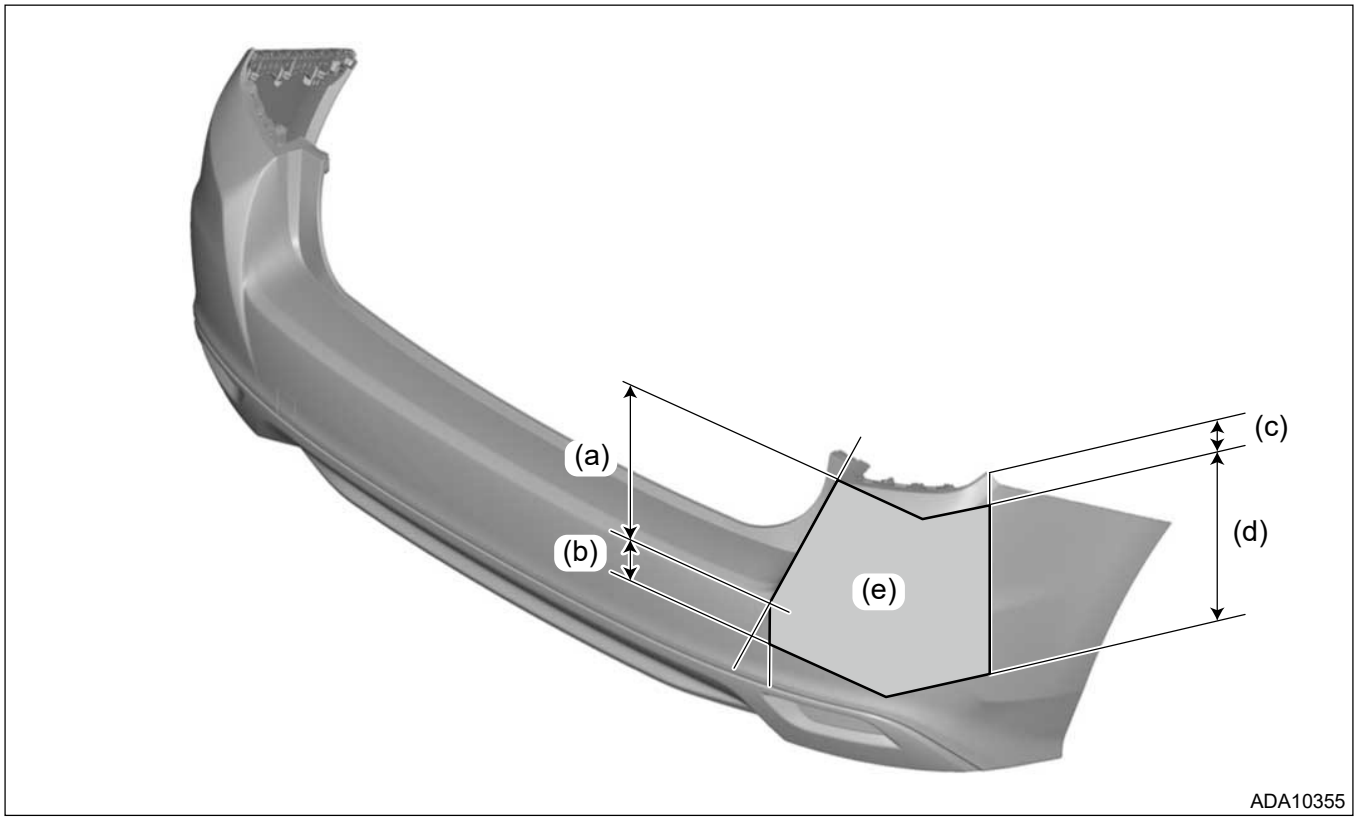
Radar projection area

- **Sedan model**



(a) 130 mm (5.1 in)
(b) 100 mm (3.9 in)
(c) 40 mm (1.6 in)
(d) 50 mm (1.9 in)
(e) 230 mm (9.1 in)
(f) Radar projection area

- **5 door model**



(a) 180 mm (7.1 in)
(b) 50 mm (2.0 in)
(c) 40 mm (1.6 in)
(d) 230 mm (9.1 in)
(e) Radar projection area

For other flaws, perform the sensor readjustment. If no problem is found, replacement is unnecessary.

- Do not put a sticker, etc. on/around the radar sensors.
- Do not retrofit the radar sensors or the bumper close to the radar sensors.
- Do not repaint the radar sensors or the bumper close to the radar sensors.

Note:

If there is any painting defect inside the radar projection area, replace the rear bumper without trying to repair it.

- Do not give a strong impact, force or drop-off to the radar sensors because they are precision devices.
- Do not reuse the radar sensors that were affected by strong impact, force, or fell off.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items that might provoke the problems related to BSD/RCTA.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.
2. Check the relay and fuse condition. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.
3. Check the connecting condition of harness and connector. Also check grounding.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

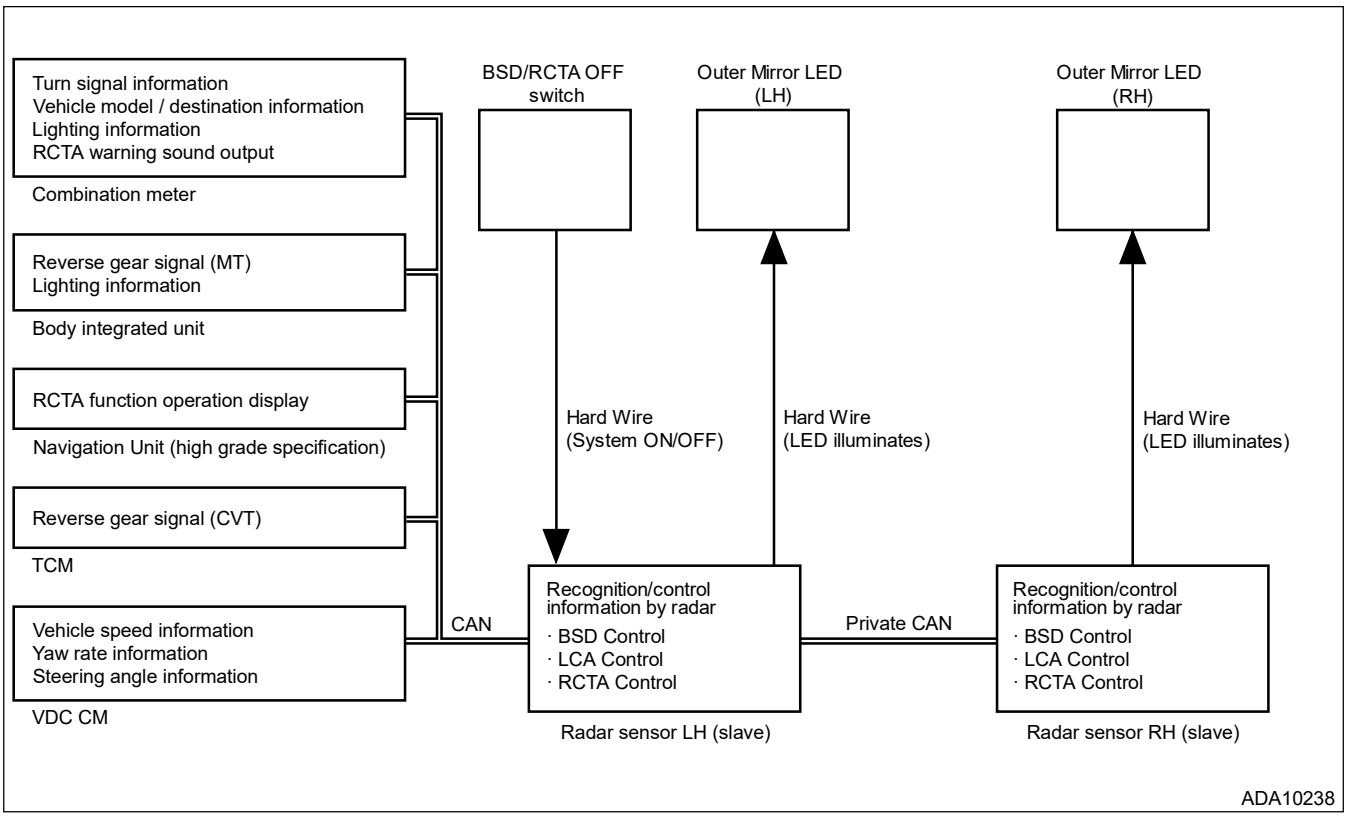
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > General Description

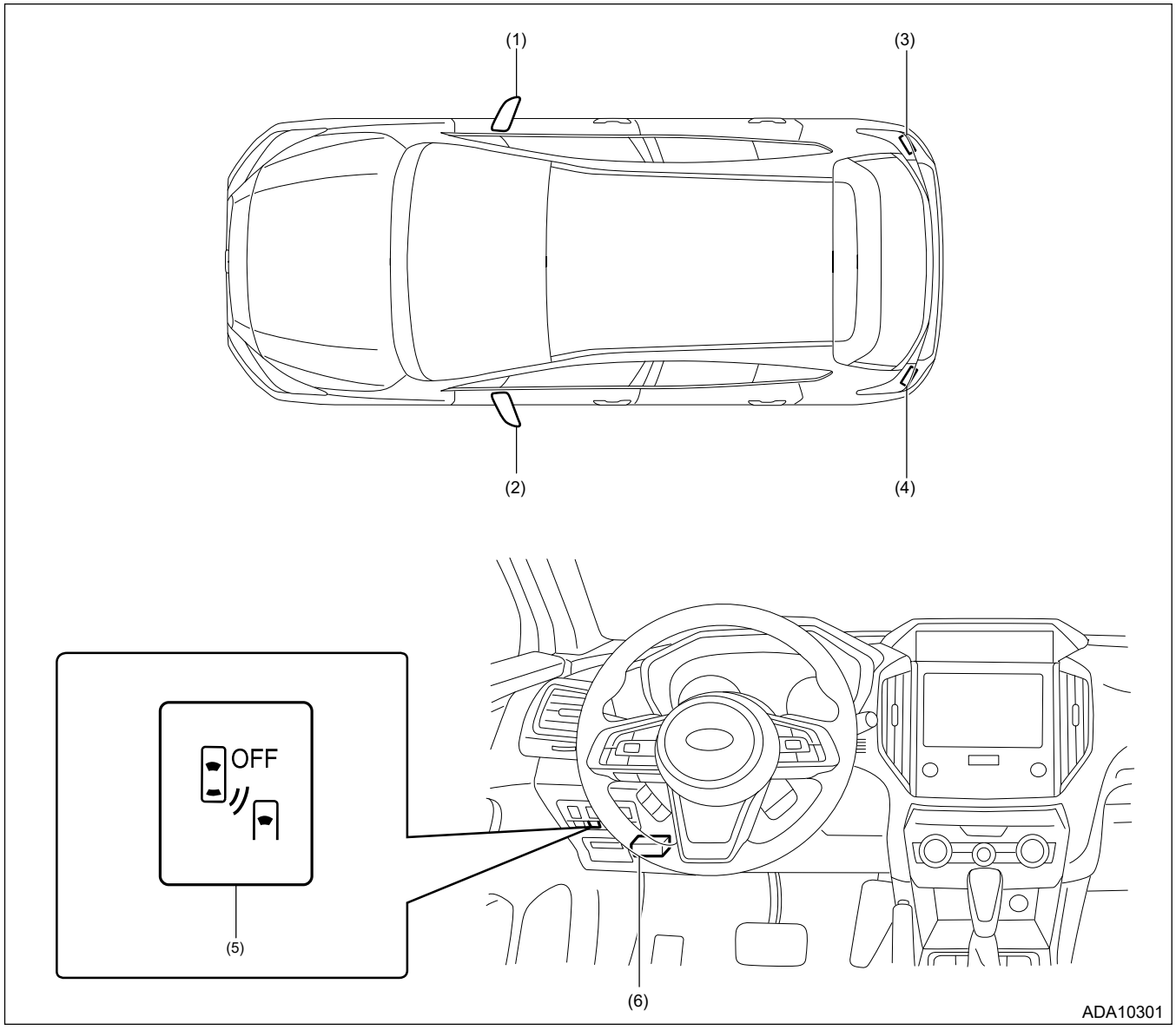
SYSTEM BLOCK DIAGRAM

- BSD/RCTA system is configured by the following components.
- There is a control ECM in the radar sensor main body, which performs the vehicle identification and the alert judgment control.
- The LH/RH radar sensors are identified as Master/Slave for control purposes. They are connected by the private CAN to execute the controls through mutual communication. The radar on the Master side receives the input from the vehicle CAN and the BSD/RCTA OFF switch, so information necessary for control can be obtained from other modules via the vehicle CAN.
- The outer mirror LED is directly driven by the signal from the radar sensor.


Turn signal information
Vehicle model / destination information
Lighting information
RCTA warning sound output
Combination meter
Reverse gear signal (MT)
Lighting information
Body integrated unit
RCTA function operation display
Navigation Unit (high grade specification)
Reverse gear signal (CVT)
TCM
Vehicle speed information
Yaw rate information
Steering angle information
VDC CM
CAN
BSD/RCTA OFF switch
Outer Mirror LED (LH)
Outer Mirror LED (RH)
Hard Wire (System ON/OFF)
Hard Wire (LED illuminates)
Hard Wire (LED illuminates)
Recognition/control information by radar
· BSD Control
· LCA Control
· RCTA Control
Radar sensor LH (slave)
Private CAN
Recognition/control information by radar
· BSD Control
· LCA Control
· RCTA Control
Radar sensor RH (slave)
ADA10238

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Electrical Component Location

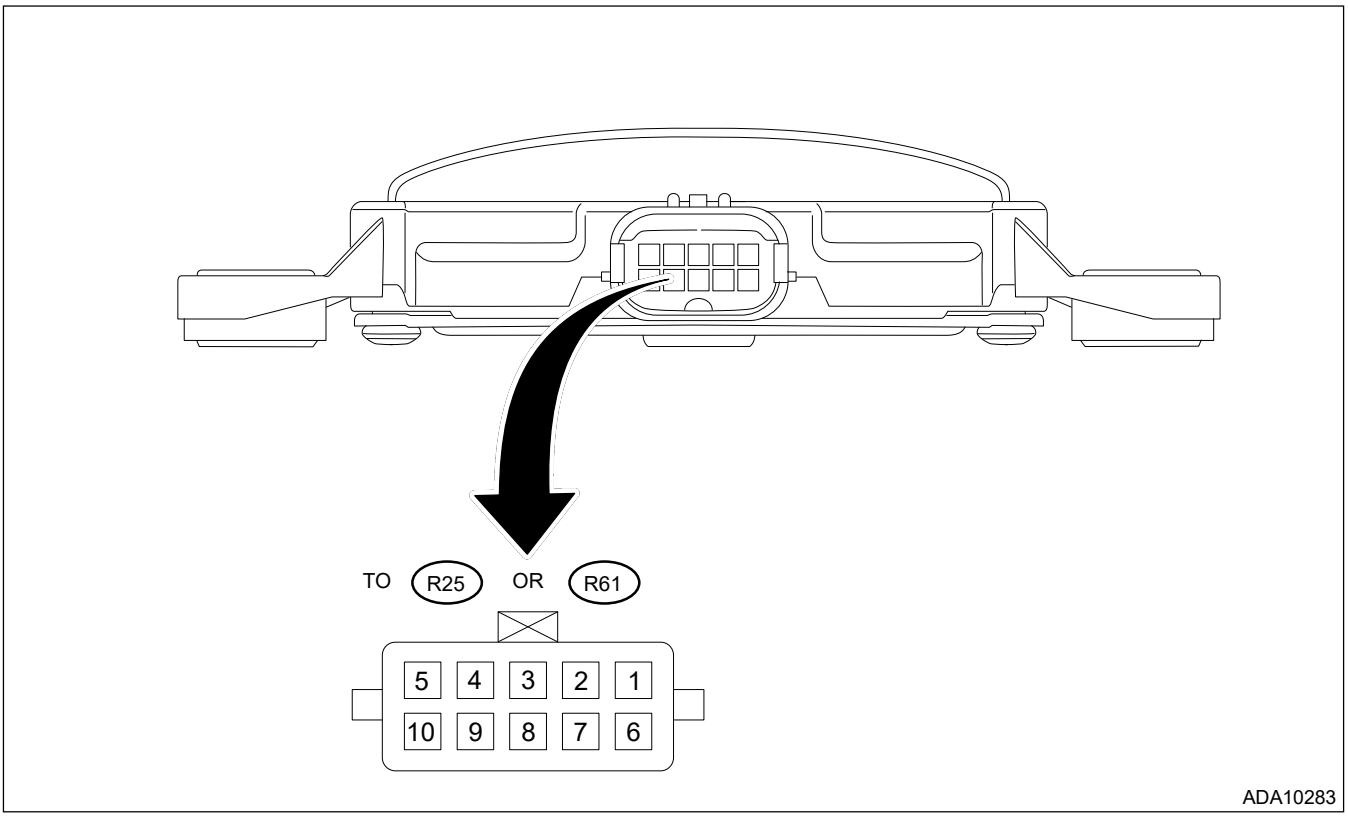
LOCATION



(1) Outer mirror ASSY RH
(2) Outer mirror ASSY LH
(3) Radar sensor RH (slave)
(4) Radar sensor LH (master)
(5) BSD/RCTA OFF switch
(6) Data link connector

ELECTRICAL SPECIFICATION

1. RADAR SENSOR



Terminal No.	Contents		Measuring condition	Standard
	Radar sensor LH (master)	Radar sensor RH (slave)		
(R25) or (R61) No. 1 ←→ Chassis ground	Private CAN H	Private CAN H	Always	1 MΩ or more
(R25) or (R61) 2 ←→ Chassis ground	Master CAN H	—	Always	1 MΩ or more
(R25) or (R61) 3 ←→ Chassis ground	—	—	—	—
(R25) or (R61) 4 ←→ Chassis ground	Left mirror LED output	Right mirror LED output	• Ignition switch OFF → ON • BSD/RCTA OFF switch OFF → ON	• When indicator is ON: 2.5 — 10.5 V • When indicator is blinking: 0 ←→ 2.5 —

Terminal No.	Contents Radar sensor LH (master)	 Radar sensor RH (slave)	Measuring condition	Standard
				10.5 V • When indicator is OFF: Less than 1 V
(R25) or (R61) 5 ←→ Chassis ground	Ignition power supply	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 — 16 V
(R25) or (R61) 6 ←→ Chassis ground	Private CAN L	Private CAN L	Always	1 MΩ or more
(R25) or (R61) 7 ←→ Chassis ground	Master CAN L	—	Always	1 MΩ or more
(R25) or (R61) 8 ←→ Chassis ground	BSD/RCTA OFF switch	—	• Ignition switch ON • BSD/RCTA OFF switch OFF → ON (while pressing and holding the switch)	Less than 1 V → 9 — 16 V
(R25) or (R61) 9 ←→ Chassis ground	—	—	—	—
(R25) or (R61) 10 ←→ Chassis ground	GND	GND	Always	Less than 1 Ω

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Inspection Mode

OPERATION

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B2304	Rear RADAR ON-OFF Switch Stuck	—
B2311	Rear RADAR Detect TCM	—
B2313	Rear RADAR Detect VDC	—
B2327	Rear RADAR internal failure (internal electric circuit)	—
B2350	Rear RADAR Communication error between Master and Slave	—
B2351	Rear RADAR Lost Communication between Master and Slave	—
B2352	RADAR ASSY B&S reprogramming error	—
U0073	Control Module Communication Bus Off	—
U0101	LOST COMMUNICATION WITH TCM	—
U0122	Lost Communication With Vehicle Dynamics Control Module	—
U0140	Lost Communication With Body Control Module	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0402	INVALID DATA RECEIVED FROM TCM	—
U0416	Invalid Data Received From VDC	—
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—

1. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
2. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Start the engine and wait for 30 seconds or more.
4. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

2. INSPECTION MODE 2

DTC	Item	Note
B2300	REAR RADAR CIRCUIT LOW	—
B2301	REAR RADAR CIRCUIT HIGH	—

1. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
2. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Start the engine.
4. Using the Subaru Select Monitor, execute the following items under the [Active Test] of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Active Test.
   - [Door mirror indicator active test]
5. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

3. INSPECTION MODE 3

DTC	Item	Note
B2329	REAR RADAR AXIS ALIGNMENT INCOMPLETE	—

1. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
2. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Perform the adjustment of radar axis.

4. Read the DTC of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

When communication with the radar sensor is impossible

Detecting condition:

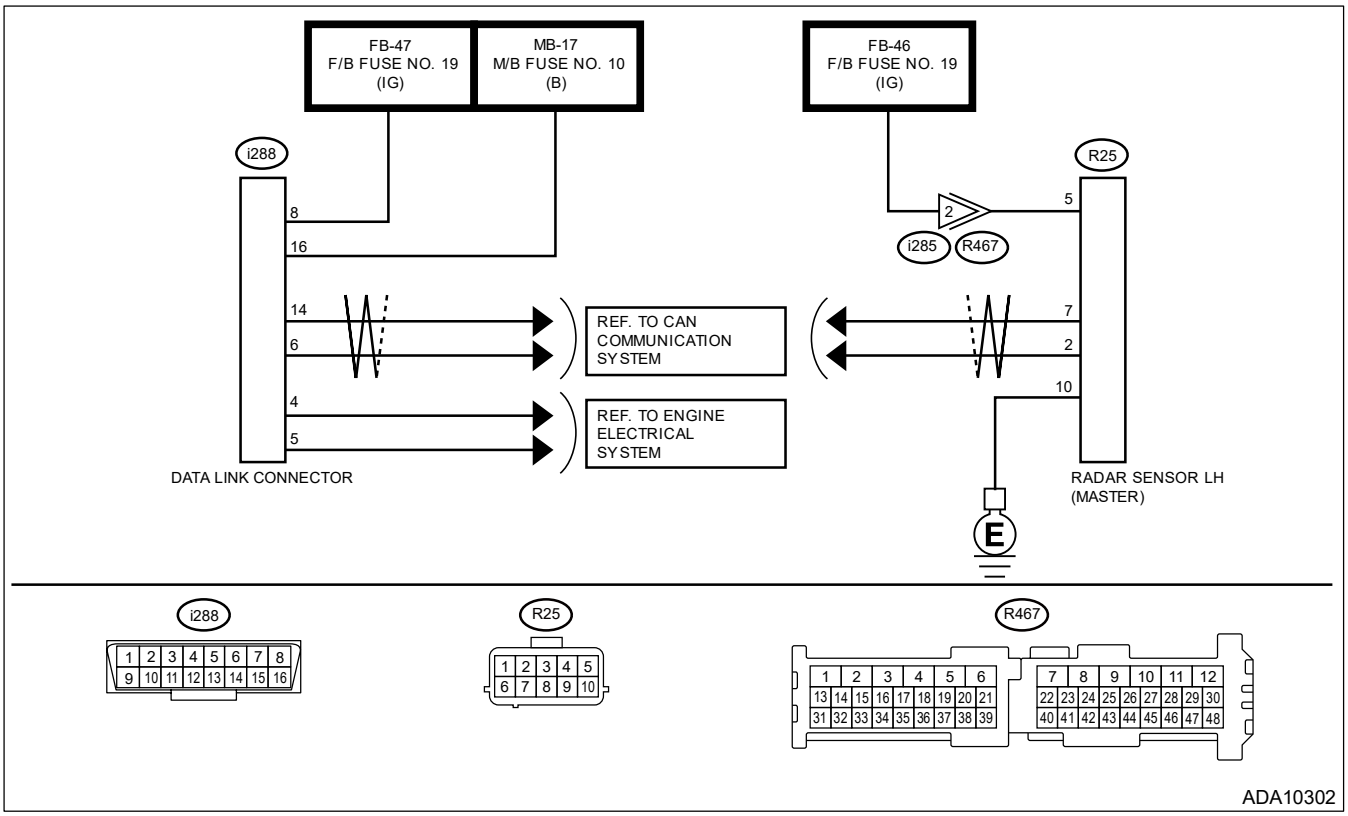
- Defective harness connector
- Power supply circuit malfunction
- Defective radar sensor
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between radar sensor and Subaru Select Monitor.

Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.



1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse for radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between fuse — radar sensor LH.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the radar sensor LH connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between radar sensor LH connector (harness side) and chassis ground.

   Connector & terminal

   (R25) No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the open circuit of harness between fuse — radar sensor LH connector.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between radar sensor LH connector (harness side) and chassis ground.
   Connector & terminal
   (R25) No. 10 – Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit in harness between radar sensor and chassis ground.

4. CHECK LAN SYSTEM.

1. Connect the radar sensor LH connector.
2. Inspect LAN system. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK SUBARU SELECT MONITOR.

1. Connect the select monitor to another vehicle.
2. Check whether the communication for initializing can be executed normally.

Is communication normal?

Yes	Go to 6.
No	Repair or replace the select monitor.

6. CHECK RADAR SENSOR.

Communicate with the radar sensor.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Data Monitor>LIST.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Data Monitor

LIST

- [Blind Spot Detection/Rear Cross Traffic Alert(LH)]

Item	Contents	Standard/ Unit	Note
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	• Normal • Fail	—
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of −40°C (−40°F) — 85°C (185°F). Temporarily stops when the direction of the radar sensor is not correct.	• Normal • Halt	—
SRVD System ON-OFF flag	ON/OFF status of BSD/RCTA system is displayed. If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] are [Normal], the BSD/RCTA system is set to OFF by the BSD/RCTA OFF switch.	• OFF • ON	—
LH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the left side is activated (when the outer mirror assembly illuminates).	• OFF • ON	—
LH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the left side is activated (when the outer mirror assembly illuminates).	• OFF • ON	—
LH-Side RCTA caution flag	ON is displayed when the RCTA warning on the left side is activated (when the outer mirror assembly illuminates and buzzer sounds).	• OFF • ON	—
LH-Side Radar Voltage value	Power supply voltage of the radar sensor LH is displayed.	0 — 25.5 V	—
LH-Side Temperature value	Ambient temperature of the radar sensor LH is displayed.	−128 — 127°C	—

Item	Contents	Standard/ Unit	Note
Vehicle Series status	Vehicle recognition status	• Impreza Type • Forester Type • – • B Series • WRX Type	—
Vehicle Type Series status	Vehicle type recognition status	• SDN • WGN • OBK/XV	—
brightness Mode	Indicator brightness	• Day • Night	—
Destination Type	Destination status	• Japan • U.S.A • Canada • EU • EK • reserve • Australia • China • –	—
LH-Side Autoalignment Result	Left side radar auto alignment result	−3276.8 — 3276.8 deg	—

- Blind Spot Detection/Rear Cross Traffic Alert(RH)

Item	Contents	Standard/ Unit	Note
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	• Normal • NG	—
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of −40°C (−40°F) — 85°C (185°F). Temporarily stops when the direction of the radar sensor is not correct.	• Normal • Halt	—
SRVD System ON-OFF flag	ON/OFF status of BSD/RCTA system is displayed. If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] are [Normal], the BSD/RCTA system is set to OFF by the	• OFF • ON	—

Item	Contents	Standard/ Unit	Note
	BSD/RCTA OFF switch.		
RH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the right side is activated (outer mirror assembly illuminates).	• OFF • ON	—
RH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the right side is activated (outer mirror assembly illuminates).	• OFF • ON	—
RH-Side RCTA caution flag	ON is displayed when the RCTA warning on the right side is activated (when the outer mirror assembly illuminates and buzzer sounds).	• OFF • ON	—
RH-Side Radar Voltage value	Power supply voltage of the radar sensor RH is displayed.	0 — 25.5 V	—
RH-Side Temperature value	Ambient temperature of the radar sensor RH is displayed.	−128 — 127°C	—
RH-Side Autoalignment Result	Right side radar auto alignment result	−3276.8 — 3276.8 deg	—

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Freeze Frame Data>LIST.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Freeze Frame Data

LIST

- [Blind Spot Detection/Rear Cross Traffic Alert(LH)]

Item	Contents	Standard/ Unit	Note
Ignition SW ON Count	Time stamp information Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	-	-
Count		-	-
Time Count		-	-
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	• No occurrence • Failure	-
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of −40°C (−40°F) — 85°C (185°F). Temporarily stops when the direction of the radar sensor is not correct.	• No occurrence • Halt	-
SRVD System ON-OFF flag	If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] (which show the ON/OFF status of the BSD/RCTA system) are [Normal], the BSD/RCTA system is set to OFF by the BSD/RCTA OFF switch.	• OFF • ON	-
LH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the left side is activated (when the outer mirror assembly illuminates).	• OFF • ON	-
LH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the left side is activated (when the outer mirror assembly illuminates).	• OFF • ON	-
LH-Side RCTA caution flag	ON is displayed when the RCTA warning on the left side is activated (when the outer mirror assembly illuminates and buzzer	• OFF • ON	-

Item	Contents	Standard/ Unit	Note
	sounds).		
LH-Side Radar Voltage value	Power supply voltage of the radar sensor LH is displayed.	0 — 25.5 V	-
LH-Side Temperature value	Ambient temperature of the radar sensor LH is displayed.	−128 — 127°C	-
Vehicle Series status	Vehicle recognition status	• Impreza Type • Forester Type • – • B Series • WRX Type	-
Vehicle Type Series status	Vehicle type recognition status	• SDN • WGN • OBK/XV	-
brightness Mode	Indicator brightness	• Day • Night	-
Destination Type	Destination status	• Japan • U.S.A • Canada • EU • EK • reserve • Australia • China • –	-
LH-Side Autoalignment Result	Left side radar auto alignment result	−3276.8 — 3276.8 deg	-
SSMID	Identification Option Vehicle Manufacturer Specific Data Identifier	-	-
ROMID	application Data Identification Data Identifier	-	-
ECM Software Ver.	vehicle Manufacturer ECM Software Version Number Data Identifier	-	-
ECM Part No.	vehicle Manufacturer Kit Assembly Part Number Data Identifier	-	-
System	system Name Or Engine Type Data Identifie	-	-

- [Blind Spot Detection/Rear Cross Traffic Alert(RH)]

Item	Contents	Standard/ Unit	Note
Ignition SW ON Count	Time stamp information Ref. to LAN SYSTEM (DIAGNOSTICS)>General	-	-
Count		-	-

Item	Contents	Standard/ Unit	Note
Time Count	Description>CAUTION > TIME STAMP.	-	-
SRVD System fail flag	Current failure status of BSD/RCTA system is displayed.	• No occurrence • Failure	-
SRVD System HALT flag	Current temporary stop status of BSD/RCTA system is displayed. Temporary stop: Temporarily stops when reception of radar sensor waves failed due to some obstacles or when the temperature is not within the range of −40°C (−40°F) — 85°C (185°F). Temporarily stops when the direction of the radar sensor is not correct.	• No occurrence • Halt	-
SRVD System ON-OFF flag	If this flag is set to [OFF] while the values of [SRVD System fail flag] and [SRVD System HALT flag] (which show the ON/OFF status of the BSD/RCTA system) are [Normal], the BSD/RCTA system is set to OFF by the BSD/RCTA OFF switch.	• OFF • ON	-
RH-Side BSD caution 1st flag	ON is displayed when the 1st stage BSD warning on the right side is activated (outer mirror assembly illuminates).	• OFF • ON	-
RH-Side LCA caution 1st flag	ON is displayed when the 1st stage LCA warning on the right side is activated (outer mirror assembly illuminates).	• OFF • ON	-
RH-Side RCTA caution flag	ON is displayed when the RCTA warning on the right side is activated (when the outer mirror assembly illuminates and buzzer sounds).	• OFF • ON	-
RH-Side Radar Voltage value	Power supply voltage of the radar sensor RH is displayed.	0 — 25.5 V	-
RH-Side Temperature value	Ambient temperature of the radar sensor RH is displayed.	−128 — 127°C	-
RH-Side Autoalignment Result	Right side radar auto alignment result	−3276.8 — 3276.8 deg	-
SSMID	Identification Option Vehicle Manufacturer Specific Data Identifier	-	-
ROMID	application Data Identification Data Identifier	-	-
ECM Software Ver.	vehicle Manufacturer ECM Software Version Number Data Identifier	-	-

Item	Contents	Standard/ Unit	Note
ECM Part No.	vehicle Manufacturer Kit Assembly Part Number Data Identifier	-	-
System	system Name Or Engine Type Data Identifie	-	-

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [Active Test].

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **For details on active tests, refer to the list. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Active Test>LIST.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Active Test

LIST

Active test items	Range	Contents	Execution condition
Door mirror indicator active test	-	Outer mirror assembly indicator is illuminated.	-

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on the DTC, refer to the list. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2300	Rear RADAR Circuit Low	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2300 REAR RADAR CIRCUIT LOW.
B2301	Rear RADAR Circuit High	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2301 REAR RADAR CIRCUIT HIGH.
B2304	Rear RADAR ON-OFF Switch Stuck	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2304 REAR RADAR ON-OFF SWITCH STUCK. **Note:** **Detect the radar sensor LH (master) only.**
B2311	Rear RADAR Detect TCM	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2311 REAR RADAR DETECT TCM.
B2313	Rear RADAR Detect VDC	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2313 REAR RADAR DETECT VDC.
B2327	Rear RADAR internal failure (internal electric circuit)	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2327 REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT).
B2329	Rear RADAR axis alignment incomplete	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2329 REAR RADAR AXIS ALIGNMENT INCOMPLETE.

Code	Description & trouble part	Reference
B2350	Rear RADAR Communication error between Master and Slave	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2350 REAR RADAR COMMUNICATION ERROR BETWEEN MASTER AND SLAVE.
B2351	Rear RADAR Lost Communication between Master and Slave	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2351 REAR RADAR LOST COMMUNICATION BETWEEN MASTER AND SLAVE.
B2352	RADAR ASSY B&S reprogramming error	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2352 RADAR ASSY B&S REPROGRAMMING ERROR.
U0073	Control Module Communication Bus Off	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0101	Lost Communication With TCM	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	Lost Communication With Vehicle Dynamics Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	Lost Communication With Body Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0402	Invalid Data Received From TCM	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	Invalid Data Received From Vehicle Dynamics Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE

Code	Description & trouble part	Reference
		DYNAMICS CONTROL MODULE.
U0422	Invalid Data Received From Body Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	Invalid Data Received From Instrument Panel Cluster Control Module	Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2300 REAR RADAR CIRCUIT LOW

DTC detecting condition:

- Short circuit to ground in the harness between radar sensor — outer mirror assembly.
- Ground short circuit of the harness in outer mirror assembly module (Malfunction of the outer mirror assembly)
- Defective radar sensor

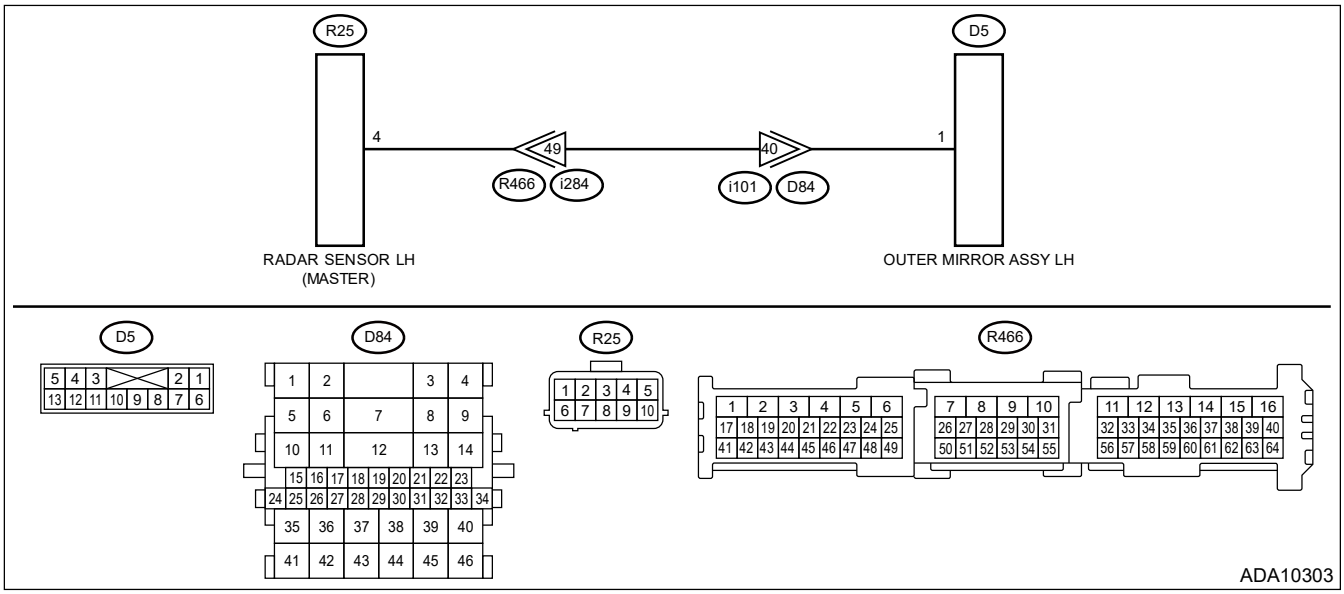
Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

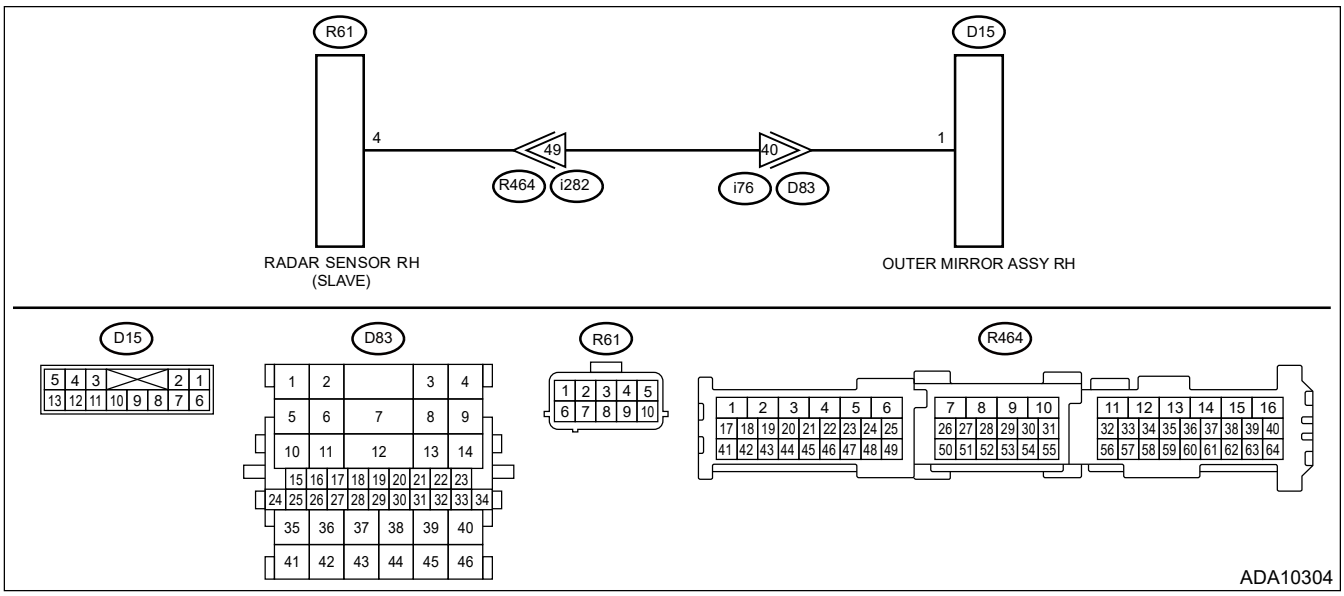
Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.

- Radar sensor LH



- Radar sensor RH



Note:

Check and replace the side that displayed the DTC.

1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

DTC Check

•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

DTC Check

Is DTC B2327 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B2327. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2327 REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT).
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]



•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]



Is DTC B2300 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK OUTER MIRROR ASSEMBLY INDICATOR.

Using the Subaru Select Monitor, execute the following items under the [Active Test] of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Active Test.

• [Door mirror indicator active test]

Does the outer mirror assembly indicator illuminate?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the radar sensor connector.
2. Disconnect the outer mirror assembly connector.
3. Using a tester, measure the resistance between radar sensor connector (harness side) and the chassis ground.

Connector & terminal

Radar sensor LH

(R25) No. 4 — Chassis ground:

Radar sensor RH

(R61) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the short to ground in harness between radar sensor connector and outer mirror assembly connector.

5. CHECK CONNECTOR.

Check the radar sensor connector and the outer mirror assembly connector. (Insecure connection, poor contact, etc.)

Is the check result OK?

Yes	Go to 6.
No	Repair the connector.

6. CHECK OUTER MIRROR ASSEMBLY.

Perform unit-check for the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.

Is the check result OK?

Yes	Go to 7.
No	Replace the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.

7. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2300 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2301 REAR RADAR CIRCUIT HIGH

DTC detecting condition:

- Open circuit or short circuit to power supply in harness between radar sensor — outer mirror assembly.
- Open circuit or short circuit to power supply of harness in the outer mirror assembly module. (Malfunction of the outer mirror assembly)
- Open circuit or short circuit to power supply of harness between outer mirror assembly — ground.
- Defective radar sensor

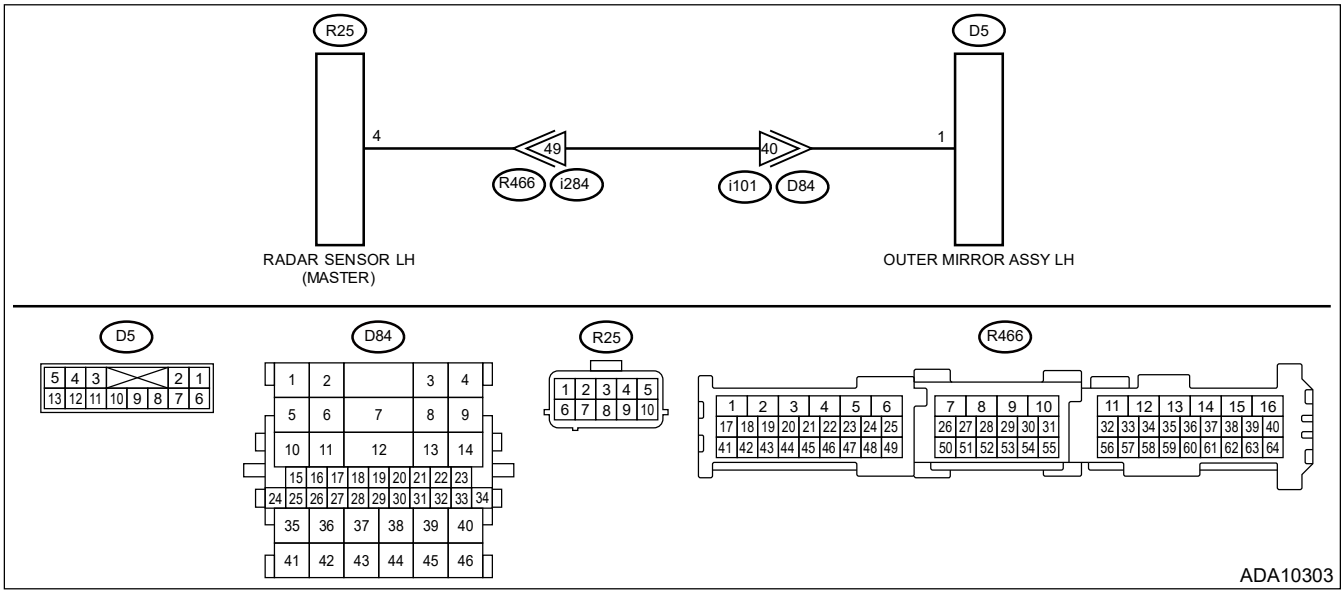
Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

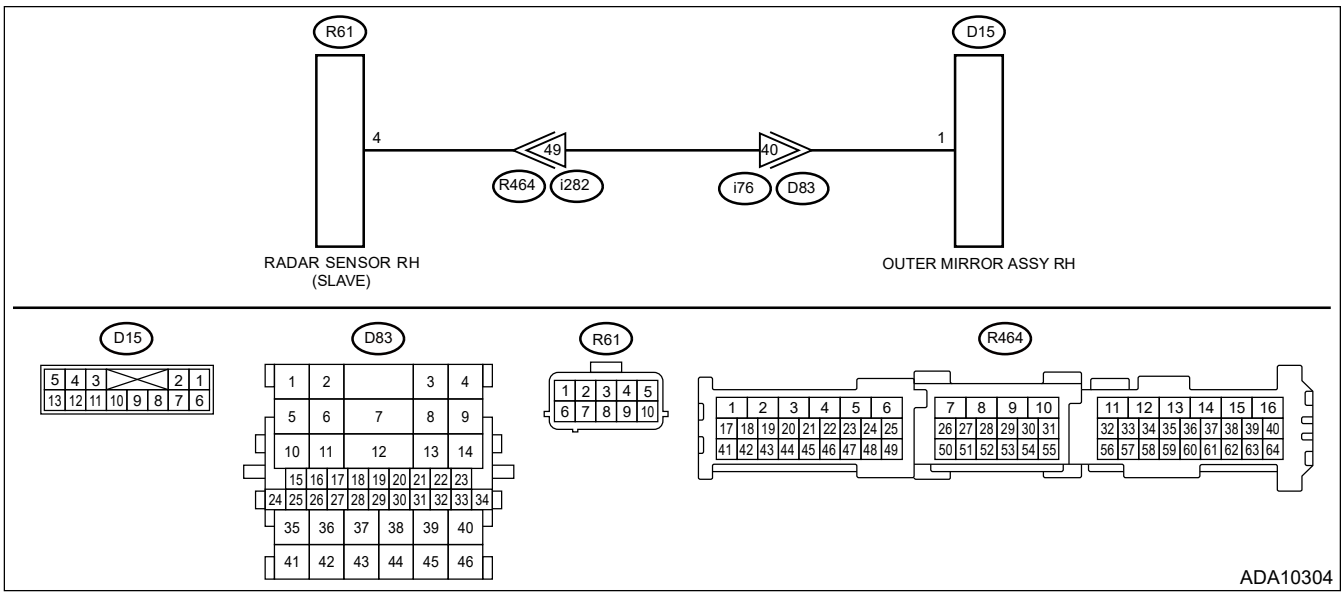
Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.

- Radar sensor LH



- Radar sensor RH



Note:

Check and replace the side that displayed the DTC.

1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

DTC Check

•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

DTC Check

Is DTC B2327 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B2327. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2327 REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT).
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]



•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]



Is DTC B2301 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK OUTER MIRROR ASSEMBLY INDICATOR.

Using the Subaru Select Monitor, execute the following items under the [Active Test] of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Active Test.

• [Door mirror indicator active test]

Does the outer mirror assembly indicator illuminate?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the radar sensor connector.
2. Disconnect the outer mirror assembly connector.
3. Using a tester, measure the resistance between radar sensor connector (harness side) and outer mirror assembly connector (harness side).

Connector & terminal

Radar sensor LH

(R25) No. 4 — (D5) No. 1

Radar sensor RH

(R61) No. 4 — (D15) No. 1

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair the open circuit of harness between radar sensor connector and outer mirror assembly connector.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between radar sensor connector (harness side) and the chassis ground.

Connector & terminal

Radar sensor LH

(R25) No. 4 (+) — Chassis ground (−):

Radar sensor RH

(R61) No. 4 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair the short circuit to power supply in harness between radar sensor connector and outer mirror assembly connector.

6. CHECK CONNECTOR.

Check the radar sensor connector and the outer mirror assembly connector. (Insecure connection, poor contact, etc.)

Is the check result OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK OUTER MIRROR ASSEMBLY.

Perform unit-check for the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.

Is the check result OK?

Yes	Go to 8.
No	Replace the outer mirror assembly. Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.

8. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2301 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2304 REAR RADAR ON-OFF SWITCH STUCK

DTC detecting condition:

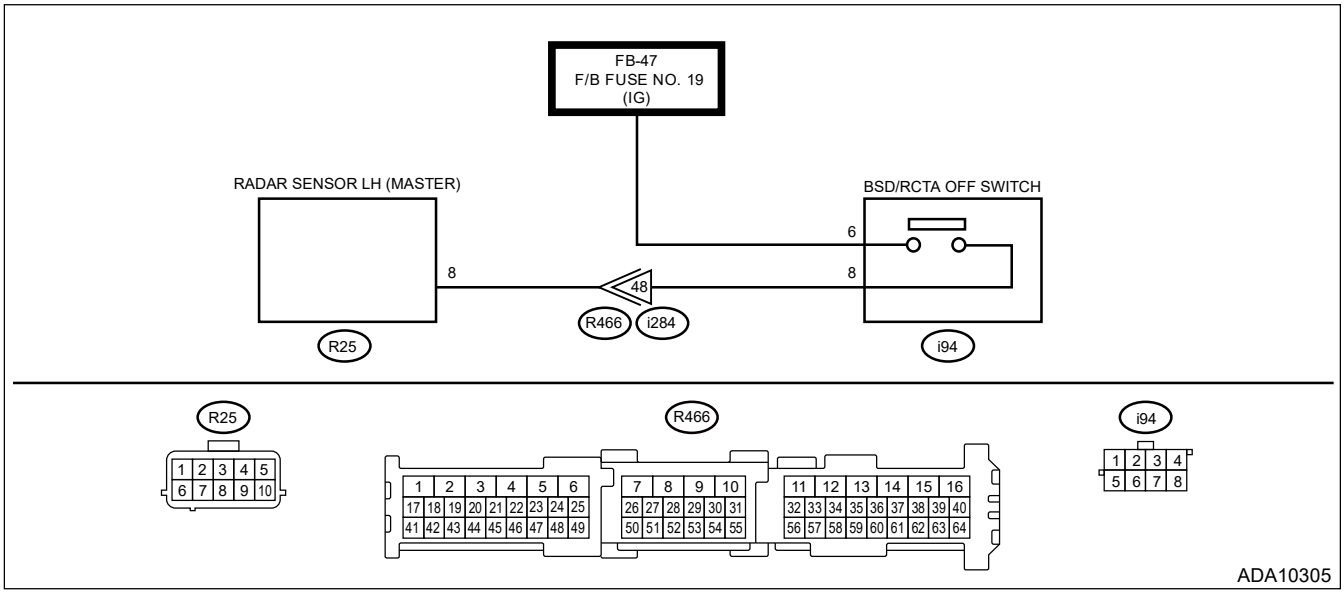
- BSD/RCTA OFF switch is stuck to ON. (Switch malfunction)
- Switch was left pressed for a prolonged time.
- Defective radar sensor

Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.



1. CHECK METER DISPLAY.

1. Turn the ignition switch to ON.
2. Check the display of OFF indicator in the combination meter LCD display.

Does the display change according to operation of BSD/RCTA OFF switch?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** • **Temporary poor contact of connector, temporary open or short circuit of harness may be the cause.** • **User may have kept pressing the switch for 30 seconds or more.**
No	Go to 2.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [SRVD System ON-OFF flag]

Does the display change according to operation of BSD/RCTA OFF switch?

Yes	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. INSPECTION OF SWITCH UNIT.

Perform unit inspection of the BSD/RCTA OFF switch. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Switches and Harness.

Is the check result OK?

Yes	Go to 4.
No	Replace the BSD/RCTA OFF switch. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Switches and Harness.

4. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 5.
No	Charge or replace the battery.

5. CHECK FUSE.

Check the fuse of BSD/RCTA OFF switch. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.

Is the check result OK?

Yes	Go to 6.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the fuse — the SRVD OFF switch.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the BSD/RCTA OFF switch connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between BSD/RCTA OFF switch connector and chassis ground.

   Connector & terminal

   (i94) No. 6 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 7.
No	Repair the open circuit of harness between the fuse — the BSD/RCTA OFF switch.

7. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the radar sensor LH connector.
3. Using a tester, measure the resistance between BSD/RCTA OFF switch connector and radar sensor LH connector (harness side).

   Connector & terminal

   (i94) No. 8 — (R25) No. 8:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair the open circuit of harness between BSD/RCTA OFF switch — radar sensor LH.

8. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the BSD/RCTA OFF switch connector (harness side) and the chassis ground.

Connector & terminal

(i94) No. 8 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 9.
No	Repair the short circuit to ground in harness between BSD/RCTA OFF switch — radar sensor LH.

9. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the BSD/RCTA OFF switch connector (harness side) and the chassis ground.

   Connector & terminal

   (i94) No. 8 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 10.
No	Repair the short circuit to power supply in harness between BSD/RCTA OFF switch — radar sensor LH.

10. CHECK CONNECTOR.

Check the radar sensor LH connector. (Insecure connection, poor contact, etc.)

Is the check result OK?

Yes	Go to 11.
No	Repair the connector.

11. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2304 displayed? (Current malfunction)

Yes	Replace the radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2311 REAR RADAR DETECT TCM

DTC detecting condition:
Automatic transmission fails.
Trouble symptom:
- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.
- AT OIL TEMP light blinks in the combination meter.

Note:
Check and replace the side that displayed the DTC.

1. CHECK TRANSMISSION.

Check the transmission. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis of the transmission.

2. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2311 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2313 REAR RADAR DETECT VDC

DTC detecting condition:
Vehicle dynamics control (VDC) fails.
Trouble symptom:
- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.
- VDC warning light illuminates in the combination meter.

Note:
Check and replace the side that displayed the DTC.

1. CHECK VDC.

Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the VDC diagnosis.

2. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2313 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2327 REAR RADAR INTERNAL FAILURE (INTERNAL ELECTRIC CIRCUIT)

DTC detecting condition:
Defective radar sensor
Trouble symptom:
- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Note:
Check and replace the side that displayed the DTC.

1. CHECK BSD/RCTA.

1. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
   •[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   •[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

2. Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   •[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   •[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

Is DTC B2327 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2329 REAR RADAR AXIS ALIGNMENT INCOMPLETE

DTC detecting condition:
Axis adjustment of the radar sensor has failed.
(Forced termination of the Subaru Select Monitor, improper location of the target reflector, or deviation of the radar sensor due to impact.)
Trouble symptom:
- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.

- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Note:

Check and replace the side that displayed the DTC.

1. CHECK REAR BUMPER.

Check the rear bumper. (Stickered, trace of repainting, etc.)

Is the check result OK?

Yes	Go to 2.
No	Replace or repair the bumper. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper. Go to 2.

2. CHECK RADAR SENSOR BRACKET.

1. Remove the rear bumper. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper.
2. Check the mounting bracket of the radar sensor as well as its installation position. (Visible damage, deformation, etc.) Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

Is the check result OK?

Yes	Go to 3.
No	Replace the mounting bracket of the radar sensor, or repair the installation position. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor. Go to 3.

3. ADJUSTMENT OF RADAR SENSOR AXIS.

1. Install the rear bumper.
2. Perform the adjustment of radar axis. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor>ADJUSTMENT.
3. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2329 displayed? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2350 REAR RADAR COMMUNICATION ERROR BETWEEN MASTER AND SLAVE

DTC detecting condition:

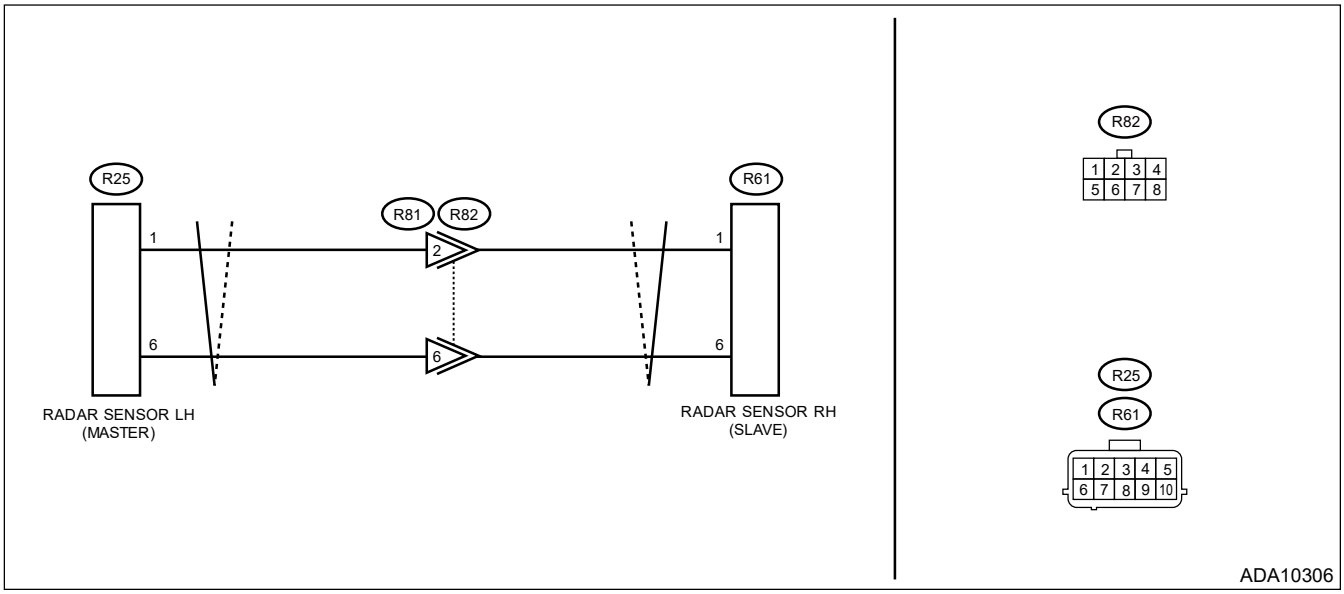
- Defective harness for CAN communication between radar sensor LH — radar sensor RH.
- Defective radar sensor

Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]

DTC Check

•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]

DTC Check

Is DTC B2350 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the radar sensor connectors LH and RH.
2. Using a tester, measure the resistance between radar sensor RH connector (harness side) and radar sensor LH connector (harness side).
   Connector & terminal
   (R25) No. 1 — (R61) No. 1:
   (R25) No. 6 — (R61) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between radar sensor RH connector and radar sensor LH connector.

3. CHECK HARNESS (SHORT BETWEEN LINES, GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between radar sensor LH connectors (harness side) and the resistance between radar sensor LH connector (harness side) and chassis ground.

Connector & terminal

(R25) No. 1 — (R25) No. 6:

(R25) No. 1 — Chassis ground:

(R25) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit of harness between radar sensor RH connector and radar sensor LH connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between radar sensor LH connector (harness side) and chassis ground.

   Connector & terminal

   (R25) No. 1 (+) — Chassis ground (−):

   (R25) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the short to power supply in harness between radar sensor RH connector and radar sensor LH connector.

5. CHECK RADAR SENSOR. (INTERNAL IMPEDANCE).

Using a tester, measure the internal impedance between radar sensor LH and radar sensor RH terminals.

Terminals

Radar sensor LH
No. 1 — No. 6:
Radar sensor RH
No. 1 — No. 6:

Is the resistance approximately 120 Ω?

Yes	Go to 6.
No	Replace the radar sensor RH or radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

6. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Using the Subaru Select Monitor, perform the clear memory of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
   - [Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   - [Blind Spot Detection/Rear Cross Traffic Alert(LH)]

3. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2350 displayed? (Current malfunction)

Yes	Replace the radar sensor on the opposite side of the sensor that displayed the DTC. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2351 REAR RADAR LOST COMMUNICATION BETWEEN MASTER AND SLAVE

DTC detecting condition:

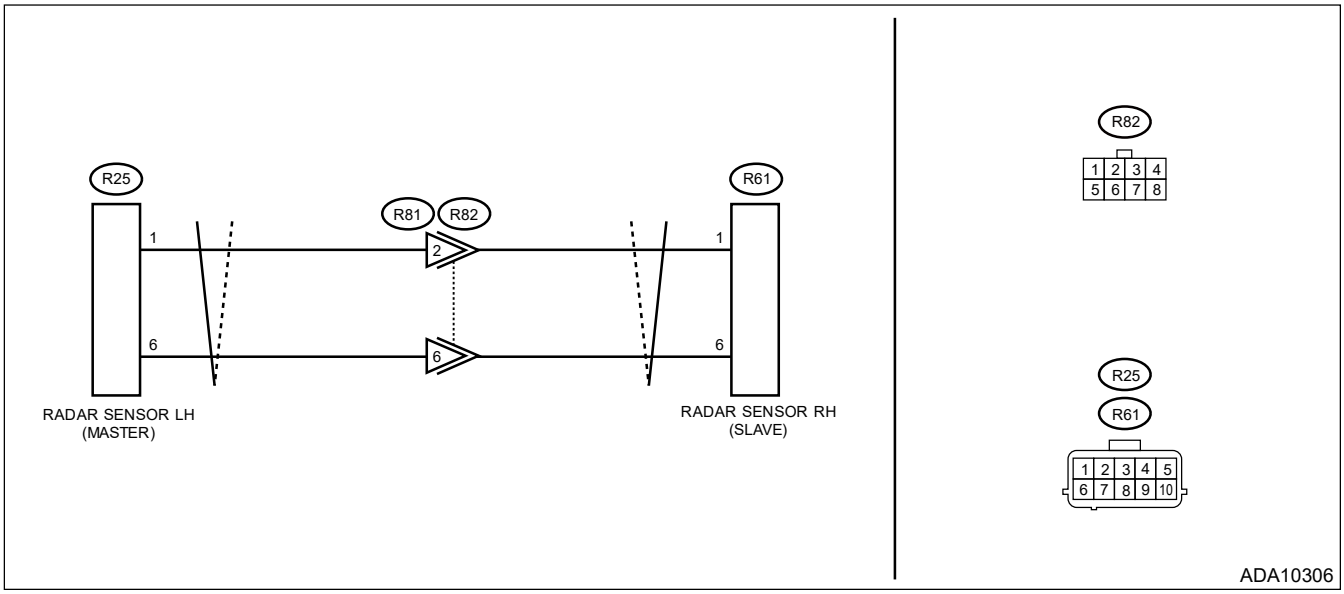
- Defective harness for CAN communication between radar sensor LH — radar sensor RH.
- Defective radar sensor

Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]



•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]



Is DTC B2351 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the radar sensor connectors LH and RH.
2. Using a tester, measure the resistance between radar sensor RH connector (harness side) and radar sensor LH connector (harness side).
   Connector & terminal
   (R25) No. 1 — (R61) No. 1:
   (R25) No. 6 — (R61) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between radar sensor RH connector and radar sensor LH connector.

3. CHECK HARNESS (SHORT BETWEEN LINES, GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between radar sensor LH connectors (harness side) and the resistance between radar sensor LH connector (harness side) and chassis ground.

Connector & terminal

(R25) No. 1 — (R25) No. 6:

(R25) No. 1 — Chassis ground:

(R25) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit of harness between radar sensor RH connector and radar sensor LH connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between radar sensor LH connector (harness side) and chassis ground.

   Connector & terminal

   (R25) No. 1 (+) — Chassis ground (−):

   (R25) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the short to power supply in harness between radar sensor RH connector and radar sensor LH connector.

5. CHECK RADAR SENSOR. (INTERNAL IMPEDANCE).

Using a tester, measure the internal impedance between radar sensor LH and radar sensor RH terminals.

Terminals

Radar sensor LH

No. 1 — No. 6:

Radar sensor RH

No. 1 — No. 6:

Is the resistance approximately 120 Ω?

Yes	Go to 6.
No	Replace the radar sensor RH or radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

6. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Using the Subaru Select Monitor, perform the clear memory of Blind Spot Detection/Rear Cross Traffic Alert(RH) or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Clear memory.
   - [Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   - [Blind Spot Detection/Rear Cross Traffic Alert(LH)]

3. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2351 displayed? (Current malfunction)

Yes	Replace the radar sensor on the side that displayed the DTC. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2352 RADAR ASSY B&S REPROGRAMMING ERROR

DTC detecting condition:

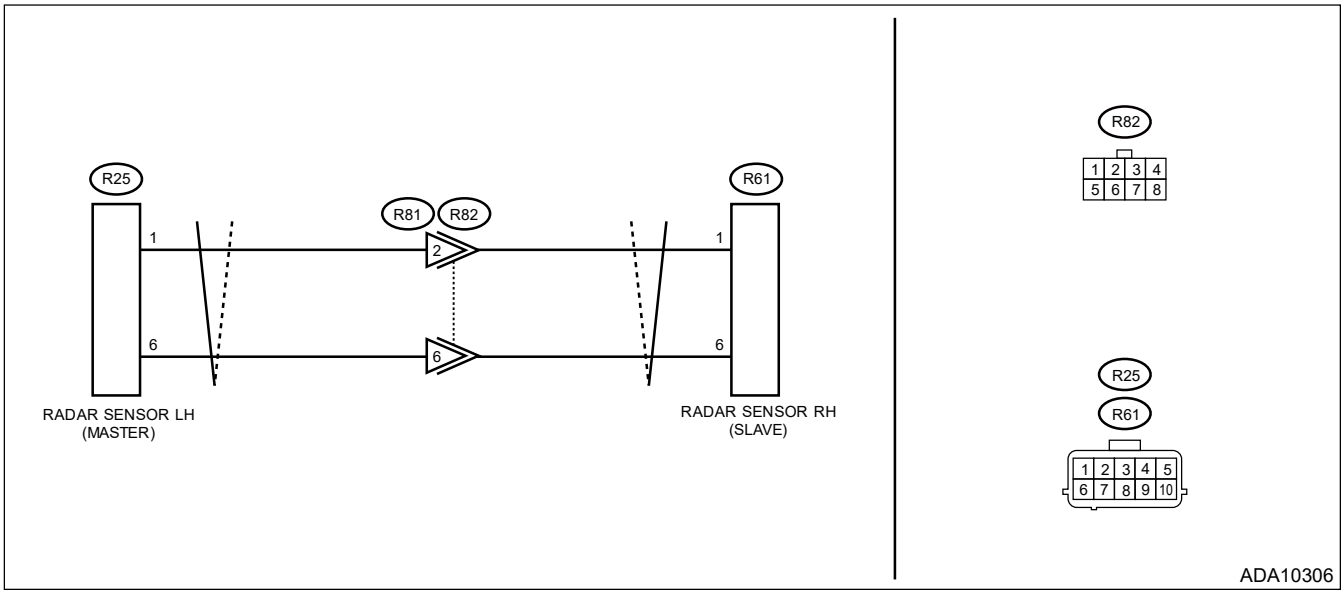
- Defective harness for CAN communication between radar sensor LH — radar sensor RH.
- Defective radar sensor

Trouble symptom:

- All functions of BSD/RCTA stop.
- Fail icon is displayed in the combination meter LCD display.
- Failure-related notification is displayed for approx. two seconds on LCD display in the combination meter.

Wiring diagram:

BSD/RCTA system Ref. to WIRING SYSTEM>Blind Spot Detection/Rear Cross Traffic Alert>WIRING DIAGRAM.



1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

•[Blind Spot Detection/Rear Cross Traffic Alert(RH)]



•[Blind Spot Detection/Rear Cross Traffic Alert(LH)]



Is DTC B2352 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the radar sensor connectors LH and RH.
2. Using a tester, measure the resistance between radar sensor RH connector (harness side) and radar sensor LH connector (harness side).
   Connector & terminal
   (R25) No. 1 — (R61) No. 1:
   (R25) No. 6 — (R61) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between radar sensor RH connector and radar sensor LH connector.

3. CHECK HARNESS (SHORT BETWEEN LINES, GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between radar sensor LH connectors (harness side) and the resistance between radar sensor LH connector (harness side) and chassis ground.

Connector & terminal

(R25) No. 1 — (R25) No. 6:

(R25) No. 1 — Chassis ground:

(R25) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the short circuit of harness between radar sensor RH connector and radar sensor LH connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between radar sensor LH connector (harness side) and chassis ground.

   Connector & terminal

   (R25) No. 1 (+) — Chassis ground (−):

   (R25) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the short to power supply in harness between radar sensor RH connector and radar sensor LH connector.

5. CHECK RADAR SENSOR. (INTERNAL IMPEDANCE).

Using a tester, measure the internal impedance between radar sensor LH and radar sensor RH terminals.

Terminals

Radar sensor LH

No. 1 — No. 6:

Radar sensor RH

No. 1 — No. 6:

Is the resistance approximately 120 Ω?

Yes	Go to 6.
No	Replace the radar sensor RH or radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

6. CHECK BSD/RCTA.

1. Restore the vehicle to its original state.
2. Using the Subaru Select Monitor, perform the clear memory of Blind Spot Detection/Rear Cross Traffic Alert(RH) or Blind Spot Detection/Rear Cross Traffic Alert(LH). Ref. to COMMON(diag)>Clear memory.
   - [Blind Spot Detection/Rear Cross Traffic Alert(RH)]

   - [Blind Spot Detection/Rear Cross Traffic Alert(LH)]

3. Perform the Inspection Mode. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Inspection Mode.

Is DTC B2352 displayed? (Current malfunction)

Yes	Replace the radar sensor on the side that displayed the DTC. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data from BIU does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with

Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Received error data from TCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Received error data from VDC CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

Received error data from BIU.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Received error data from combination meter.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].

   Note:
   - **For detailed operation procedures, refer to "Application help".**
   - **For details concerning cancel codes, refer to the List of Cancel Codes. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code>LIST.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Cancel Code

LIST

Code	Item	Contents of diagnosis
B2320	Rear RADAR Low Voltage (less than 9V)	Temporarily stops because the voltage supplied to radar drops to or below 9 V. Returns to normal when the voltage becomes normal.
B2321	Rear RADAR High Voltage (more than 16V)	Temporarily stops because the voltage supplied to radar rises to or above 16 V. Returns to normal when the voltage becomes normal.
B2328	Rear RADAR internal failure (RADAR misalignment)	Deviation of the radar axis prevents normal detection. Returns to normal when the radar axis becomes normal. When B2328 is frequently detected, perform "Diagnostic Procedure with Cancel Code". Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Procedure with Cancel Code>DTC B2328 REAR RADAR INTERNAL FAILURE (RADAR MISALIGNMENT).
B2340	RADAR ASSY B&S out of operation temperature range	Temporarily stops because the temperature is outside the operative range (−40°C (−40°F) — 85°C (185°F)). Returns to normal when the ambient temperature falls within the operative range.
B2341	Rear RADAR degradation of detecting performance	Temporarily stops because some obstacles blocked radar waves of the back and side radar. Returns to normal when the transmission and reception of radar signals becomes normal.

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostic Procedure with Cancel Code

DTC B2328 REAR RADAR INTERNAL FAILURE (RADAR MISALIGNMENT)

Detecting condition:

- Excessive impact was given to the installation area of the radar sensor, which resulted in deviation of the radar sensor axis.
- Mounting bracket for the radar sensor is deformed.
- Defective radar sensor

TROUBLE SYMPTOMS:

- All functions of BSD/RCTA are temporarily suspended.
- The icon indicating function suspended will be displayed in the combination meter LCD display.
- Function-suspended confirmation will be displayed for approx. two seconds on LCD display in the combination meter.

Note:

If DTC B2328 is detected repeatedly, check or replace the part corresponding to the cancel code.

1. CHECK REAR BUMPER.

Check the rear bumper. (Stickered, trace of repainting, etc.)

Is the check result OK?

Yes	Go to 2.
No	Replace or repair the bumper. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper. Go to 2.

2. CHECK RADAR SENSOR BRACKET.

1. Remove the rear bumper. Ref. to EXTERIOR/INTERIOR TRIM>Rear Bumper.
2. Check the mounting bracket of the radar sensor as well as its installation position. (Visible damage, deformation, etc.) Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.

Is the check result OK?

Yes	Go to 3.
No	Replace the mounting bracket of the radar sensor, or repair the installation position. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor. Go to 3.

3. ADJUSTMENT OF RADAR SENSOR AXIS.

1. Install the rear bumper.
2. Perform the adjustment of radar axis. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor>ADJUSTMENT.
3. Read the [Cancel Code] of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)] using the Subaru Select Monitor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code.

Is B2328 displayed?

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

Symptoms	Maintenance parts
BSD/RCTA does not operate.	Fuse Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Relay and Fuse.
	LAN system Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
	Body control system Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
	Radar sensor LH
	Radar sensor RH
BSD/RCTA cannot be turned OFF.	BSD/RCTA OFF switch Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Switches and Harness.
	LAN system Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
	Body control system Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.
	Radar sensor LH
Error message appears in the combination meter.	CHECK CANCEL CODE. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Cancel Code.
	Radar sensor LH
	Radar sensor RH
	Combination meter Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.
Outer mirror assembly (LH) indicator does not illuminate.	Outer mirror assembly Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.
	Radar sensor LH
Outer mirror assembly (RH) indicator does not illuminate.	Outer mirror assembly Ref. to GLASS/WINDOWS/MIRRORS>Outer Mirror Assembly.
	Radar sensor RH
Outer mirror assembly (LH) indicator remains on.	Radar sensor LH
Outer mirror assembly (RH) indicator remains on.	Radar sensor RH
Outer mirror assembly (LH) indicator does not blink.	Radar sensor LH

Symptoms	Maintenance parts
Outer mirror assembly (RH) indicator does not blink.	Radar sensor RH
Outer mirror assembly (LH) indicator keeps blinking.	Radar sensor LH
Outer mirror assembly (RH) indicator keeps blinking.	Radar sensor RH

Reverse Automatic Braking(DIAGNOSTICS)

RAB(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Customize
12. Work Support
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. Cancel Code

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Reverse Automatic Braking].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

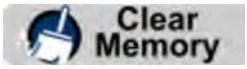
DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and go to next. Go to 5.
No	Reverse Automatic Braking is normal.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Reverse Automatic Braking]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Basic Diagnostic Procedure.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

Reverse Automatic Braking(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="2">Reverse Automatic Braking Check List for Interview</td><td colspan="2">Received Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content</td></tr>
<tr><td rowspan="2">Date and time when the trouble occurred</td><td rowspan="2"></td><td rowspan="2">Frequency of trouble occurrence</td><td>Always occurs</td></tr>
<tr><td>Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Location where the trouble occurred</td><td rowspan="2"></td><td>Weather</td><td>❑Fine ❑Cloudy ❑Rainy ❑Snowy ❑Others</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Condition of warning light</td><td colspan="3">❑On ❑Off ❑Blink</td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic trouble code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/ver</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence
(How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

Reverse Automatic Braking(DIAGNOSTICS) > General Description

CAUTION

1. REVERSE AUTOMATIC BRAKING

When removing the parts related to Reverse Automatic Braking, refer to the caution of the Reverse Automatic Braking.

2. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

Reverse Automatic Braking(DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnostics, check the following item which might affect the Reverse Automatic Braking problems.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check for proper grounding.

Reverse Automatic Braking(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

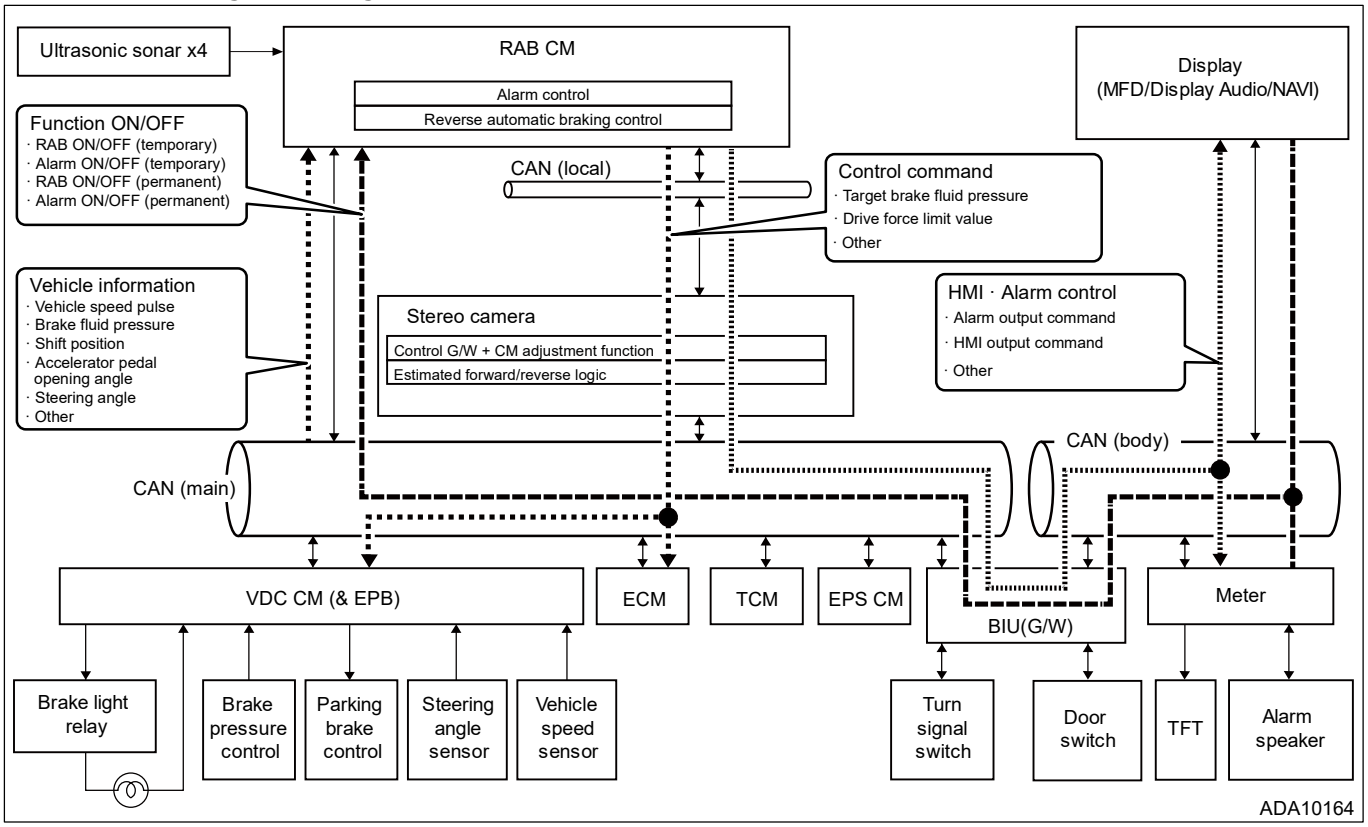
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

Reverse Automatic Braking(DIAGNOSTICS) > General Description

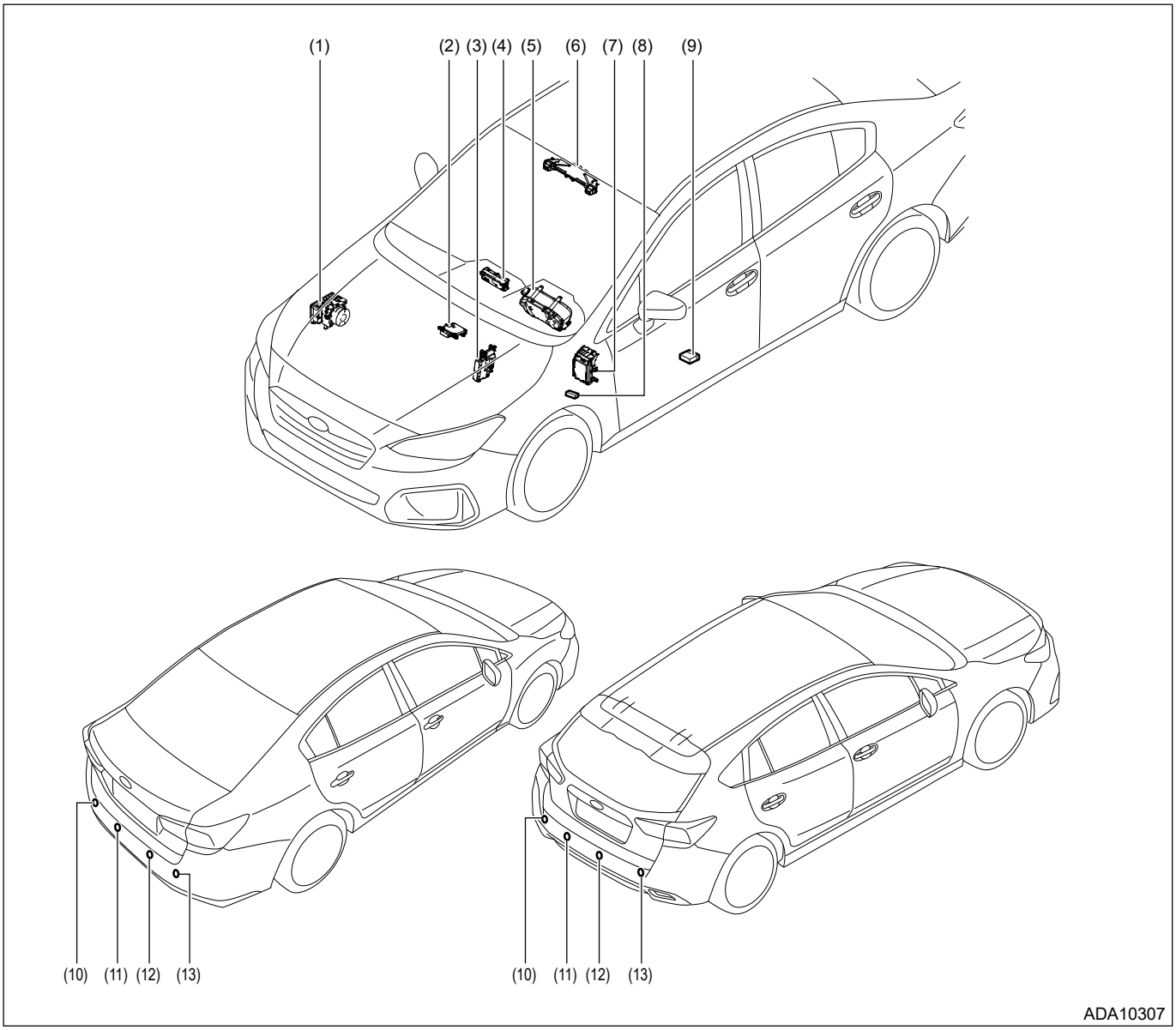
SYSTEM BLOCK DIAGRAM

The Reverse Automatic Braking is a system to avoid collision or reduce collision damage by informing with sound and operating the brake automatically, when the vehicle may collide with walls or obstacles on the rear during reversing.



Reverse Automatic Braking(DIAGNOSTICS) > Electrical Component Location

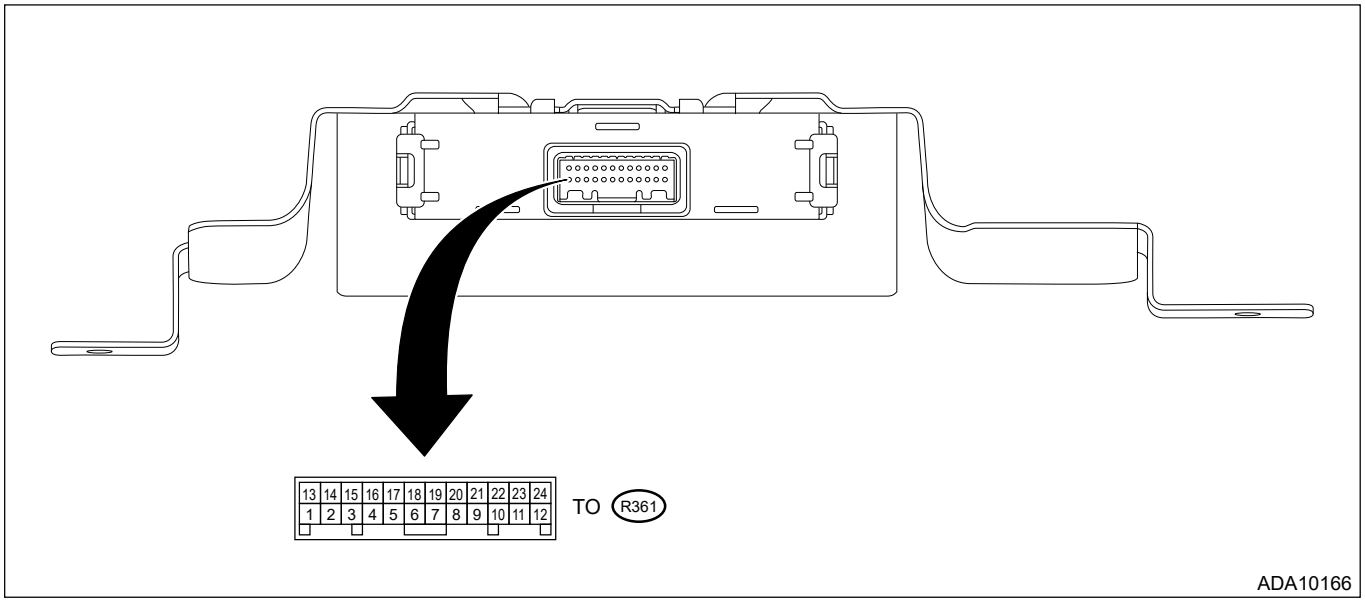
LOCATION



(1) VDC CM
(2) Transmission CM
(3) Engine CM
(4) MFD
(5) Combination meter
(6) Stereo camera
(7) Body integrated unit
(8) Data link connector
(9) RAB CM
(10) Sonar sensor (left corner)
(11) Sonar sensor (left inner)
(12) Sonar sensor (right corner)
(13) Sonar sensor (right inner)

ELECTRICAL SPECIFICATION

1. RAB CM



Terminal No.	Contents	Measuring condition	Standard
(R361) No.1 ←→ Chassis ground:	Ignition power supply	Ignition switch ON	Battery voltage
(R361) No.2 ←→ Chassis ground:	Ground	Always	1 Ω or less
(R361) No. 3	Blank	—	—
(R361) No. 4	Main CAN-L	—	—
(R361) No. 5	Local CAN-H (stereo camera communication line)	—	—
(R361) No. 6	Blank	—	—
(R361) No. 7	Blank	—	—
(R361) No. 8	Sonar sensor communication line (left corner −)	—	—
(R361) No. 9	Sonar sensor communication line (right inner −)	—	—
(R361) No. 10	Blank	—	—
(R361) No. 11	Sonar sensor communication line (left inner +)	—	—
(R361) No. 12	Sonar sensor communication line (right corner +)	—	—
(R361) No.13 ←→ Chassis ground:	Battery power supply	Always	Battery voltage

Terminal No.	Contents	Measuring condition	Standard
(R361) No. 14	Blank	—	—
(R361) No. 15	Blank	—	—
(R361) No. 16	Main CAN-H	—	—
(R361) No. 17	Blank	—	—
(R361) No. 18	Local CAN-L (stereo camera communication line)	—	—
(R361) No. 19	Blank	—	—
(R361) No. 20	Blank	—	—
(R361) No. 21	Sonar sensor communication line (left inner −)	—	—
(R361) No. 22	Sonar sensor communication line (right corner −)	—	—
(R361) No. 23	Sonar sensor communication line (left corner +)	—	—
(R361) No. 24	Sonar sensor communication line (right inner +)	—	—

Reverse Automatic Braking(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform the inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. Turn the ignition switch to ON, and wait for 6 seconds or more. (*1)
2. Confirm that the RAB warning light (RAB malfunction indicator light) of MID in the combination meter is off.
3. Read the DTC and check that the DTC is not displayed. (*2)

*1: Even with normal condition, “RAB warning light (RAB OFF indicator light)” illuminates for 6 seconds after turning the ignition switch to ON, and then goes off after 6 seconds.

*2: Perform all DTC diagnosis within 3 seconds after the ignition switch is turned to ON. It is not necessary to shift the gear in the R range to operate the function.

Reverse Automatic Braking(DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

- When the Reverse Automatic Braking is error
  "RAB" illuminates in MID in the combination meter.
- When the Reverse Automatic Braking is stopped temporarily
  "RAB OFF" illuminates in MID in the combination meter.

Note:

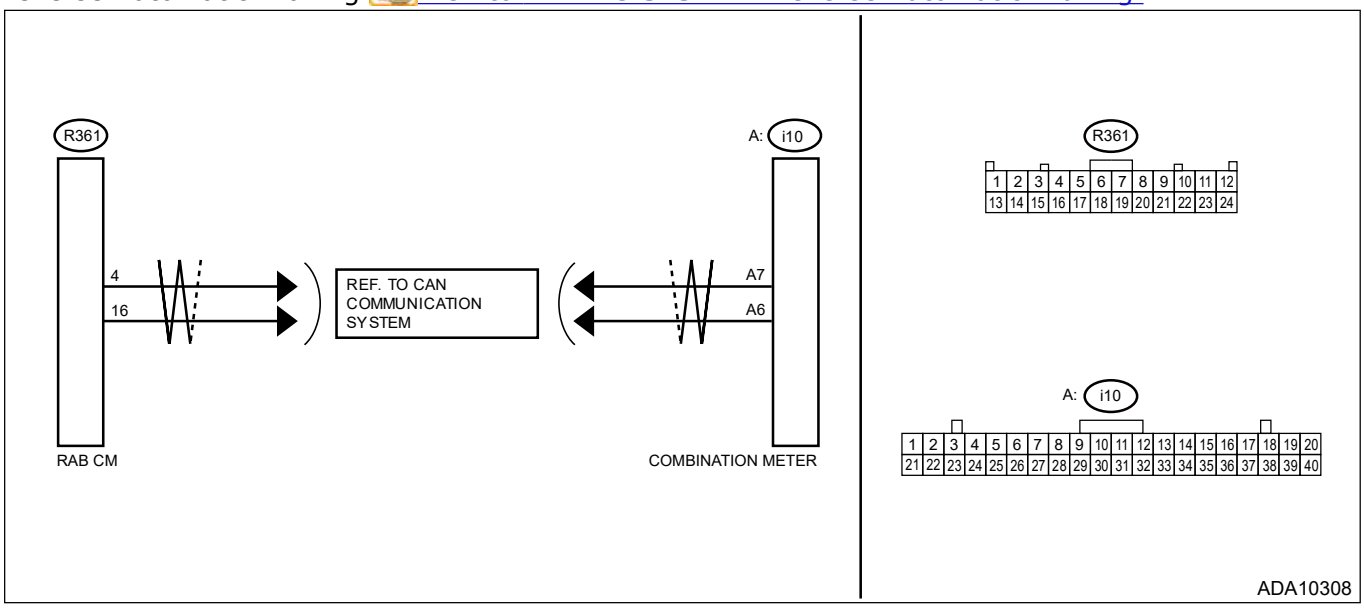
Even with normal condition, "RAB warning light (RAB OFF indicator light)" illuminates for 6 seconds after turning the ignition switch to ON, and then goes off after 6 seconds.

Reverse Automatic Braking(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT DOES NOT ILLUMINATE

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



1. CHECK OTHER INDICATOR.

Turn the ignition switch to ON.

Do other indicators illuminate?

Yes	Go to 2.
No	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. ACTIVE TEST FOR THE COMBINATION METER.

Using the Subaru Select Monitor, perform [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [All lamps lighted]

Does the indicator illuminate?

Yes	Go to 3.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

3. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 4.

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Perform the inspection according to the diagnosis for LAN system.

Reverse Automatic Braking(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:

For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT COME ON". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

1. COMMUNICATION FOR INITIALIZING IMPOSSIBLE

Trouble symptom:

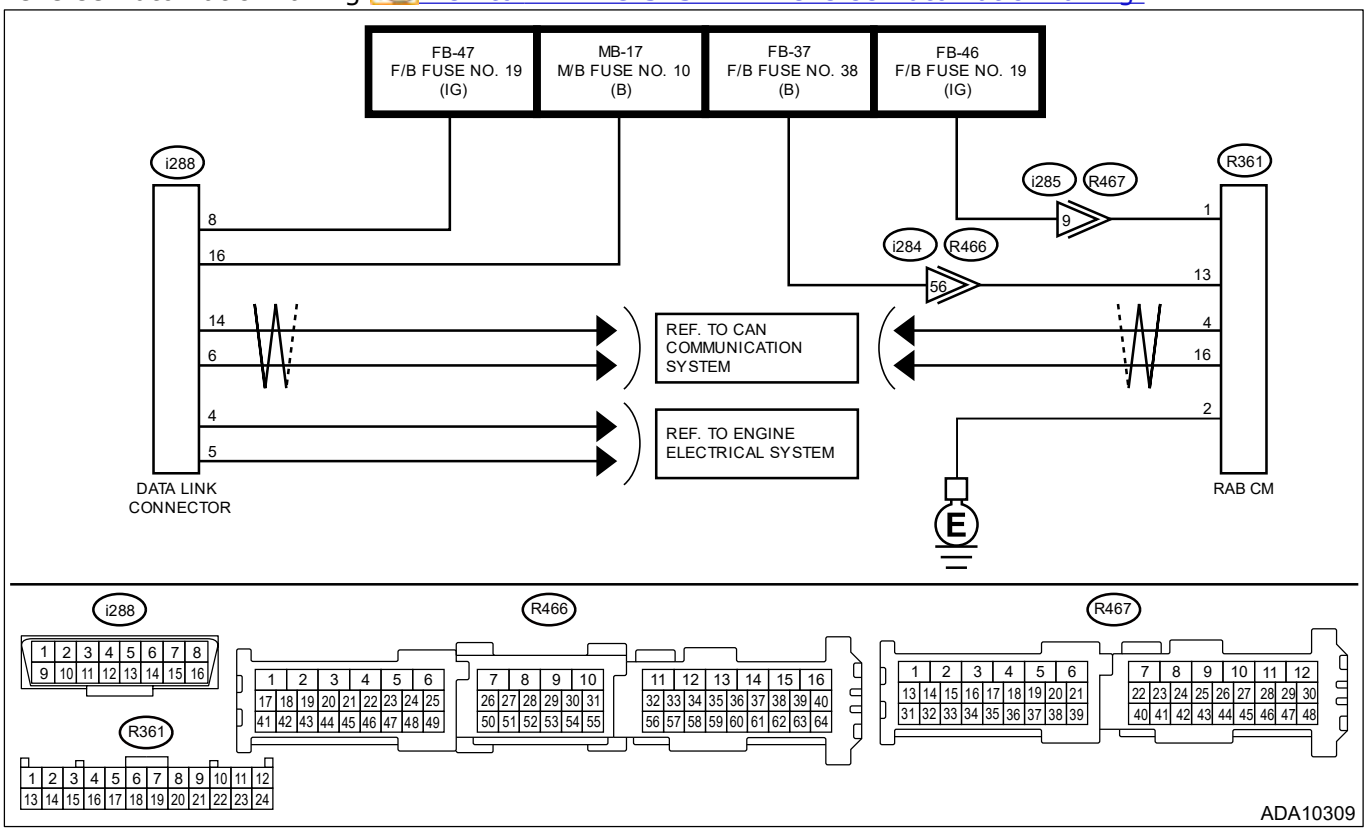
Cannot communicate with [Reverse Automatic Braking].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective RAB CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



1. CHECK FUSE.	no →	Perform the instructed procedures.

yes ↓

2. CHECK POWER SUPPLY CIRCUIT (OPEN).	no →	Perform the instructed procedures.

yes

3. CHECK GROUND CIRCUIT (OPEN). → no → Perform the instructed procedures.

yes

4. CHECK LAN SYSTEM. → no → Perform the instructed procedures.

yes

5. CHECK SUBARU SELECT MONITOR. → no → Perform the instructed procedures.

yes

6. CHECK RAB CM. → yes → Perform the instructed procedures.

6. CHECK RAB CM. → no → Perform the instructed procedures.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between fuse — RAB CM.

2. CHECK POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the RAB CM connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between the RAB CM connector and chassis ground.
   Connector & terminal
   (R361) No. 1 (+) — Chassis ground (−):
   (R361) No. 13 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the open circuit in the harness between fuse and RAB CM connector.

3. CHECK GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between the RAB CM connector and chassis ground.
   Connector & terminal
   (R361) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between RAB CM connector and chassis ground.

4. CHECK LAN SYSTEM.

1. Connect the RAB CM connector.
2. Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle.

Is the communication possible with the vehicle?

Yes	Go to 6.
No	Replace or repair the Subaru Select Monitor.

6. CHECK RAB CM.

Communicate with [Reverse Automatic Braking] using the select monitor.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Data Monitor>LIST.**

Reverse Automatic Braking(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Battery Voltage	System information	0 — 24.5 V	-
Ignition Voltage	System information	0 — 17.85 V	-
Sonar	System information	0 — 24.5 V	-
RAB Detection Distance(Coordinate:X)	Sonar sensor detection information	0 — 510 cm	-
RAB Detection Distance(Coordinate:Y)	Sonar sensor detection information	−255 — 254 cm	-
RR Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
RRC Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
RL Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
RLC Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
Drive Wheel Average Speed	Vehicle information	0 — 3686.4 km/h	-
Wheel Speed for Fail Safe	Vehicle information	0 — 3686.4 km/h	-
Vehicle Height Sensor Voltage	Vehicle information	0 — 5.1 V	-
Ambient Air Temperature	Vehicle information	−40 — 87°C	-
Shift Position	Vehicle information	-	-
EPB Equipment Information	Operation instruction from EyeSight	• Vehicle without EPB • Vehicle with EPB	-
EyeSight Initialization(RAB)	Operation instruction from EyeSight	• During initialization of EyeSight • Initialization completion	-
Recession Control Permission(RAB)	Operation instruction from EyeSight	• Can not Reverse Control • Permit	-
RAB Fail Indication(EyeSight→RAB)	Operation instruction from EyeSight	• No failure • NG	-

RAB OFF Indication(EyeSight→RAB)	Operation instruction from EyeSight	• RAB ON • RAB Force OFF	-
RAB Acceleration Suppression Control State(EyeSight→RAB)	Operation instruction from EyeSight	• No Control • Precom • Recruitment	-
RAB Brake Control State(EyeSight→RAB)	Operation instruction from EyeSight	• No Control • Precompression • Brake Control In • Stop holding • Recruitment	-
RAB Precompression Control	Braking control instruction from RAB CM	• No • Yes	-
RAB Acceleration Suppression Control	Braking control instruction from RAB CM	• No • Yes	-
Recession Pre-Collision Brake Control	Braking control instruction from RAB CM	• No • RAB activated	-
RAB Function OFF Information	HMI control instruction from RAB CM	• ON • OFF	-
Audible Alarm function OFF Information(RAB)	HMI control instruction from RAB CM	• ON • OFF	-
Sonar System HALT(RAB)	HMI control instruction from RAB CM	• NORMAL • Extraneous Matter on Sonar • Detection Abnormality	-
RAB Sonar System Failure(EyeSight→RAB)	HMI control instruction from RAB CM	• NORMAL • Sonar Failure • System Failure	-
RAB Function pause Do Not Disturb	HMI control instruction from RAB CM	• Ready • Do Not Disturb	-
RAB Alarm pause Do Not Disturb	HMI control instruction from RAB CM	• Ready • Do Not Disturb	-
Rear Sonar Distance Alarm Information (Rear_Center)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short • Closest Approach	-
Rear Sonar Distance Alarm Information (Rear Right Corner)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short • Closest Approach	-

Rear Sonar Distance Alarm Information (Rear Left Corner)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short • Closest Approach	-
RAB Alarm Level	HMI control instruction from RAB CM	• OFF • LEVEL1 • Level2 • Level3 • LEVEL4 • LEVEL5	-
RAB Alarm Interrupt Display Instruction	HMI control instruction from RAB CM	• No display • Backward Note • Encourage Stepping Brake	-
RAB Function Pause Information(MFD)	HMI settings instruction from MFD/navigation	• ON • OFF	-
RAB Alarm Pause Information(MFD)	HMI settings instruction from MFD/navigation	• ON • OFF	-
RAB Function Pause Information Change Request(MFD)	HMI settings instruction from MFD/navigation	• support • no support	-
RAB Function ON/OFF Information(MET)	HMI settings instruction from the combination meter	• ON • OFF	-
RAB Alarm ON/OFF Information(MET)	HMI settings instruction from the combination meter	• ON • OFF	-
RAB Function ON/OFF Information Change Request(MET)	HMI settings instruction from the combination meter	• support • no support	-

Reverse Automatic Braking(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Freeze Frame Data>LIST.**
- **The system conditions when malfunction occurred (when DTC code was confirmed) can be stored up to 15 conditions.**

Reverse Automatic Braking(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count	Time stamp information. Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	time	-
Count		-	-
Time Count		ms	-
Battery Voltage	System information	0 — 24.5 V	-
[Ignition Voltage]	System information	0 — 17.85 V	-
Sonar	System information	0 — 24.5 V	-
RAB Operation Times	System information	0 — 255 times (in one IGN_ON)	-
RAB Cancel Times	System information	0 — 255 times (in one IGN_ON)	-
Stop Hold Cancel Times	System information	0 — 255 times (in one IGN_ON)	-
FAIL times	System information	0 — 255 times (in one IGN_ON)	-
HALT times	System information	0 — 255 times (in one IGN_ON)	-
RR Sonar Sensitivity	System information	–128 — 127	-
RRC Sonar Sensitivity	System information	–128 — 127	-
RL Sonar Sensitivity	System information	–128 — 127	-
RLC Sonar Sensitivity	System information	–128 — 127	-
RAB Detection Distance(Coordinate:X)	Sonar sensor detection information	0 — 510 cm	-
RAB Detection Distance(Coordinate:Y)	Sonar sensor detection information	–255 — 254 cm	-
RR Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-

RRC Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
RL Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
RLC Sonar Detection Distance	Sonar sensor detection information	0 — 510 cm	-
Drive Wheel Average Speed	Vehicle information	0 — 3686.4 km/h	-
Wheel Speed for Fail Safe	Vehicle information	0 — 3686.4 km/h	-
Driver Brake Detection	Vehicle information	• ON • OFF	-
Vehicle Height Sensor Voltage	Vehicle information	0 — 5.1 V	-
Ambient Air Temperature	Vehicle information	–40 — 87°C	-
Shift Position	Vehicle information	-	-
EPB Equipment Information	Operation instruction from EyeSight	• Vehicle without EPB • Vehicle with EPB	-
EyeSight Initialization(RAB)	Operation instruction from EyeSight	• During initialization of EyeSight • Initialization completion	-
Recession Control Permission(RAB)	Operation instruction from EyeSight	• Can not Reverse Control • Permit	-
RAB Fail Indication(EyeSight→RAB)	Operation instruction from EyeSight	• No failure • NG	-
RAB OFF Indication(EyeSight→RAB)	Operation instruction from EyeSight	• RAB ON • RAB Force OFF	-
RAB Acceleration Suppression Control State(EyeSight→RAB)	Operation instruction from EyeSight	• No Control • Precom • Recruitment	-
RAB Brake Control State(EyeSight→RAB)	Operation instruction from EyeSight	• No Control • Precompression • Brake Control In • Stop holding • Recruitment	-
RAB Precompression Control	Braking control instruction from RAB CM	• No • Yes	-
RAB Acceleration Suppression Value	Braking control instruction from RAB CM	0 — 2.55 G	-
RAB Acceleration Suppression Control	Braking control instruction from RAB CM	• No • Yes	-
Deceleration Braking Instruction	Braking control instruction from RAB CM	0 — 2.55 G	-
Recession Pre-Collision Brake Control	Braking control instruction from RAB CM	• No • RAB activated	-

RAB Function OFF Information	HMI control instruction from RAB CM	• ON • OFF	-
Audible Alarm function OFF Information(RAB)	HMI control instruction from RAB CM	• ON • OFF	-
Sonar System HALT(RAB)	HMI control instruction from RAB CM	• NORMAL • Extraneous Matter on Sonar • Detection Abnormality	-
RAB Sonar System Failure(EyeSight→RAB)	HMI control instruction from RAB CM	• NORMAL • Sonar Failure • System Failure	-
RAB Function pause Do Not Disturb	HMI control instruction from RAB CM	• Ready • Do Not Disturb	-
RAB Alarm pause Do Not Disturb	HMI control instruction from RAB CM	• Ready • Do Not Disturb	-
Rear Sonar Distance Alarm Information (Rear_Center)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short • Closest Approach	-
Rear Sonar Distance Alarm Information (Rear Right Corner)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short	-
Rear Sonar Distance Alarm Information (Rear Left Corner)	HMI control instruction from RAB CM	• No Obstacle • Far • Middle • Short	-
RAB Alarm Level	HMI control instruction from RAB CM	• OFF • LEVEL1 • Level2 • Level3 • LEVEL4 • LEVEL5	-
RAB Alarm Interrupt Display Instruction	HMI control instruction from RAB CM	• No display • Backward Note • Encourage Stepping Brake	-
RAB Function Pause Information(MFD)	HMI settings instruction from MFD/navigation	• ON • OFF	-
RAB Alarm Pause Information(MFD)	HMI settings instruction from MFD/navigation	• ON • OFF	-

RAB Function Pause Information Change Request(MFD)	HMI settings instruction from MFD/navigation	• support • no support	-
RAB Function ON/OFF Information(MET)	HMI settings instruction from the combination meter	• ON • OFF	-
RAB Alarm ON/OFF Information(MET)	HMI settings instruction from the combination meter	• ON • OFF	-
RAB Function ON/OFF Information Change Request(MET)	HMI settings instruction from the combination meter	• support • no support	-
DTC Sub Code FS A001	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A002	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A003	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A004	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A005	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A006	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A007	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A008	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A009	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A010	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A011	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A012	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A013	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A014	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A015	Information for failure analysis	• 0 • 1	-
DTC Sub Code FS A016	Information for failure analysis	• 0 • 1	-

DTC Sub Code FS A017 Count	Information for failure analysis	-	-
DTC Sub Code FS A018 Count	Information for failure analysis	-	-
RRC <A-01> Count	Information for failure analysis	-	-
RRC <A-02> Count	Information for failure analysis	-	-
RRC <A-03> Count	Information for failure analysis	-	-
RRC <A-04> Count	Information for failure analysis	-	-
RRC <A-05> Count	Information for failure analysis	-	-
RRC <B-01> Count	Information for failure analysis	-	-
RRC <B-02> Count	Information for failure analysis	-	-
RRC <B-03> Count	Information for failure analysis	-	-
RRC <B-04> Count	Information for failure analysis	-	-
RRC <B-05> Count	Information for failure analysis	-	-
RRC <C-01> Count	Information for failure analysis	-	-
RRC <C-02> Count	Information for failure analysis	-	-
RRC <C-03> Count	Information for failure analysis	-	-
RRC <C-04> Count	Information for failure analysis	-	-
RRC <C-05> Count	Information for failure analysis	-	-
RRC <D-02> Count	Information for failure analysis	-	-
RRC <D-05> Count	Information for failure analysis	-	-
RLC <A-01> Count	Information for failure analysis	-	-
RLC <A-02> Count	Information for failure analysis	-	-

RLC <A-03> Count	Information for failure analysis	-	-
RLC <A-04> Count	Information for failure analysis	-	-
RLC <A-05> Count	Information for failure analysis	-	-
RLC <B-01> Count	Information for failure analysis	-	-
RLC <B-02> Count	Information for failure analysis	-	-
RLC <B-03> Count	Information for failure analysis	-	-
RLC <B-04> Count	Information for failure analysis	-	-
RLC <B-05> Count	Information for failure analysis	-	-
RLC <C-01> Count	Information for failure analysis	-	-
RLC <C-02> Count	Information for failure analysis	-	-
RLC <C-03> Count	Information for failure analysis	-	-
RLC <C-04> Count	Information for failure analysis	-	-
RLC <C-05> Count	Information for failure analysis	-	-
RLC <D-02> Count	Information for failure analysis	-	-
RLC <D-05> Count	Information for failure analysis	-	-
RR <A-01> Count	Information for failure analysis	-	-
RR <A-02> Count	Information for failure analysis	-	-
RR <A-03> Count	Information for failure analysis	-	-
RR <A-04> Count	Information for failure analysis	-	-
RR <A-05> Count	Information for failure analysis	-	-
RR <B-01> Count	Information for failure analysis	-	-

RR <B-02> Count	Information for failure analysis	-	-
RR <B-03> Count	Information for failure analysis	-	-
RR <B-04> Count	Information for failure analysis	-	-
RR <B-05> Count	Information for failure analysis	-	-
RR <C-01> Count	Information for failure analysis	-	-
RR <C-02> Count	Information for failure analysis	-	-
RR <C-03> Count	Information for failure analysis	-	-
RR <C-04> Count	Information for failure analysis	-	-
RR <C-05> Count	Information for failure analysis	-	-
RR <D-02> Count	Information for failure analysis	-	-
RR <D-05> Count	Information for failure analysis	-	-
RL <A-01> Count	Information for failure analysis	-	-
RL <A-02> Count	Information for failure analysis	-	-
RL <A-03> Count	Information for failure analysis	-	-
RL <A-04> Count	Information for failure analysis	-	-
RL <A-05> Count	Information for failure analysis	-	-
RL <B-01> Count	Information for failure analysis	-	-
RL <B-02> Count	Information for failure analysis	-	-
RL <B-03> Count	Information for failure analysis	-	-
RL <B-04> Count	Information for failure analysis	-	-
RL <B-05> Count	Information for failure analysis	-	-

RL <C-01> Count	Information for failure analysis	-	-
RL <C-02> Count	Information for failure analysis	-	-
RL <C-03> Count	Information for failure analysis	-	-
RL <C-04> Count	Information for failure analysis	-	-
RL <C-05> Count	Information for failure analysis	-	-
RL <D-02> Count	Information for failure analysis	-	-
RL <D-05> Count	Information for failure analysis	-	-

Reverse Automatic Braking(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking] and select [Enter].
5. On [Select Function] display, select [Customize] and select [Next].

Note:

For detailed operation procedures, refer to "Application help".

Reverse Automatic Braking(DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Contents
RAB Function ON/OFF Information(SSM)	Always ON	Always ON Always OFF	ON/OFF of the RAB function can be selected.

Reverse Automatic Braking(DIAGNOSTICS) > Work Support

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select Reverse Automatic Braking and select [Enter].
5. On [Select Function] display, select [Work Support] and select [Next].

Note:

For detailed operation procedures, refer to "Application help".

Reverse Automatic Braking(DIAGNOSTICS) > Work Support

LIST

Item	Contents
RAB Operation Record Data Save	When ignition switch ON counts of "Latest", "1 block before", "2 blocks before" ... "4 blocks before" all shows "0", it can be judges that there is no data. The display shows the latest data and the data in the previous 4 times in the order of their occurrence. Blue letter means that the data exists, and black letter means that there is no data. Select the blue letters and read out the details.
ECU Initialize	RAB CM is reset to the factory settings.
ECM part number display	RAB CM part number is displayed.
Software information display	Software information is displayed.

Sensitivity of each sonar sensor can NOT be adjusted.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2C00	SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C00 SONAR CONTROL MODULE CIRCUIT.
B2C01	RR SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C01 RR SONAR CONTROL MODULE CIRCUIT.
B2C02	RRC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C02 RRC SONAR CONTROL MODULE CIRCUIT.
B2C03	RL SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C03 RL SONAR CONTROL MODULE CIRCUIT.
B2C04	RLC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C04 RLC SONAR CONTROL MODULE CIRCUIT.
B2C05	SONAR CONTROL MODULE POWER SUPPLY	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C05 SONAR CONTROL MODULE POWER SUPPLY.
B2C06	RR SONAR SENSOR CIRCUIT / NO SIGNAL	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C07	RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C07 RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.

B2C08	RRC SONAR SENSOR CIRCUIT / NO SIGNAL	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C08 RRC SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C09	RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C09 RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0A	RL SONAR SENSOR CIRCUIT / NO SIGNAL	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C0B	RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0B RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0C	RLC SONAR SENSOR CIRCUIT / NO SIGNAL	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL.
B2C0D	RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0D RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT.
B2C0E	RR SONAR HARNESS HIGH	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0E RR SONAR HARNESS HIGH.
B2C0F	RR SONAR HARNESS LOW	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0F RR SONAR HARNESS LOW.
B2C10	RRC SONAR HARNESS HIGH	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C10 RRC SONAR HARNESS HIGH.
B2C11	RRC SONAR HARNESS LOW	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C11 RRC SONAR HARNESS LOW.

B2C12	RL SONAR HARNESS HIGH	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C12 RL SONAR HARNESS HIGH.
B2C13	RL SONAR HARNESS LOW	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C13 RL SONAR HARNESS LOW.
B2C14	RLC SONAR HARNESS HIGH	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C14 RLC SONAR HARNESS HIGH.
B2C15	RLC SONAR HARNESS LOW	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C15 RLC SONAR HARNESS LOW.
B2C16	RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C16 RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT.
B2C17	RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C17 RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT.
B2C18	RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C18 RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT.
B2C19	RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C19 RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT.
B2C1A	RRC SONAR SENSOR	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1A RRC SONAR SENSOR.
B2C1B	RLC SONAR SENSOR	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1B RLC SONAR SENSOR.

B2C1C	RR SONAR SENSOR	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1C RR SONAR SENSOR.
B2C1D	RL SONAR SENSOR	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1D RL SONAR SENSOR.
B2C1E	RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1E RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT.
B2C1F	RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C1F RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT.
B2C20	RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C20 RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT.
B2C21	RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C21 RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT.
B2C22	Eyesight System	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C22 Eyesight System.
U0077	LOCAL CAN COMMUNICATION BUS OFF	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0077 LOCAL CAN COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.

U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0457	INVALID DATA RECEIVED FROM INFORMATION CENTER "A"	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A".
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433

INVALID DATA RECEIVED FROM EyeSight.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C00 SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:
Detect the malfunction of the RAB CM.
Time needed for diagnosis:
10 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are DTCs other than DTC B2C00 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B2C00. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C01 RR SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:
Detect the malfunction of the RAB CM.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is a DTC other than DTC B2C01 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B2C01. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C02 RRC SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:
Detect the malfunction of the RAB CM.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is a DTC other than DTC B2C02 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B2C02. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C03 RL SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:
Detect the malfunction of the RAB CM.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC other than DTC B2C03 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B2C03. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C04 RLC SONAR CONTROL MODULE CIRCUIT

Outline of diagnosis:
Detect the malfunction of the RAB CM.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

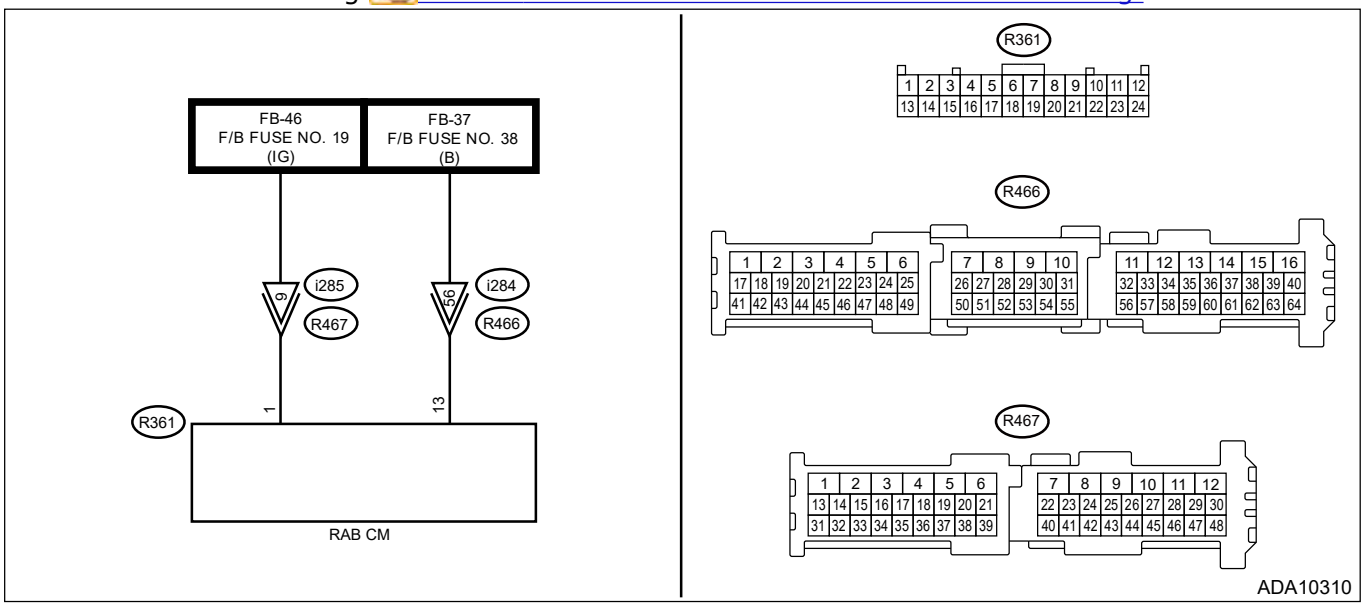
Is a DTC other than DTC B2C04 displayed? (Current malfunction) Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

Yes	Perform the diagnosis for DTC other than DTC B2C04.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C05 SONAR CONTROL MODULE POWER SUPPLY

Outline of diagnosis:
Voltage supply to the ignition power supply terminal and the battery power supply terminal was 16 V or more.
Time needed for diagnosis:
200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C05 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK RAB CM POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the RAB CM connector and chassis ground.
   Connector & terminal
   (R361) No. 1 (+) — Chassis ground (−):
   (R361) No. 13 (+) — Chassis ground (−):

Is the voltage 16 V or less?

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Check the harness between the RAB CM connector and power supply.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (right corner) harness is open.

Time needed for diagnosis:

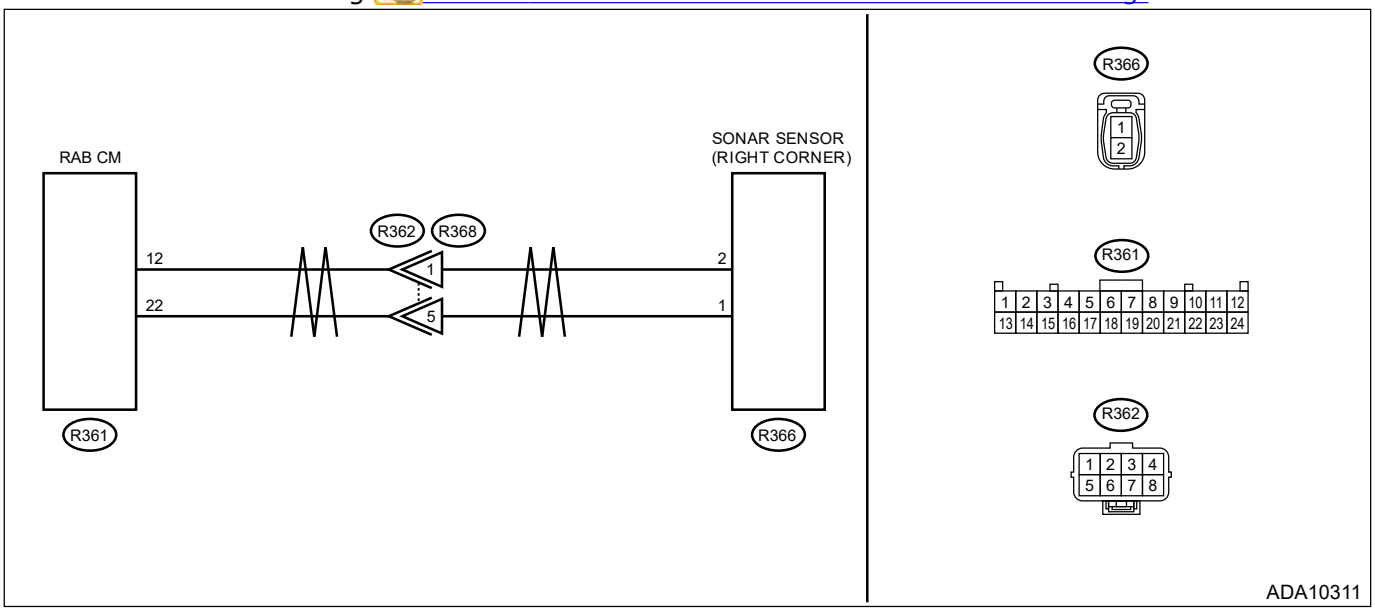
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C06 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (right corner) connector and RAB CM connector.
   Connector & terminal
   (R361) No. 12 — (R366) No. 2:
   (R361) No. 22 — (R366) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C06 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C07 RR SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

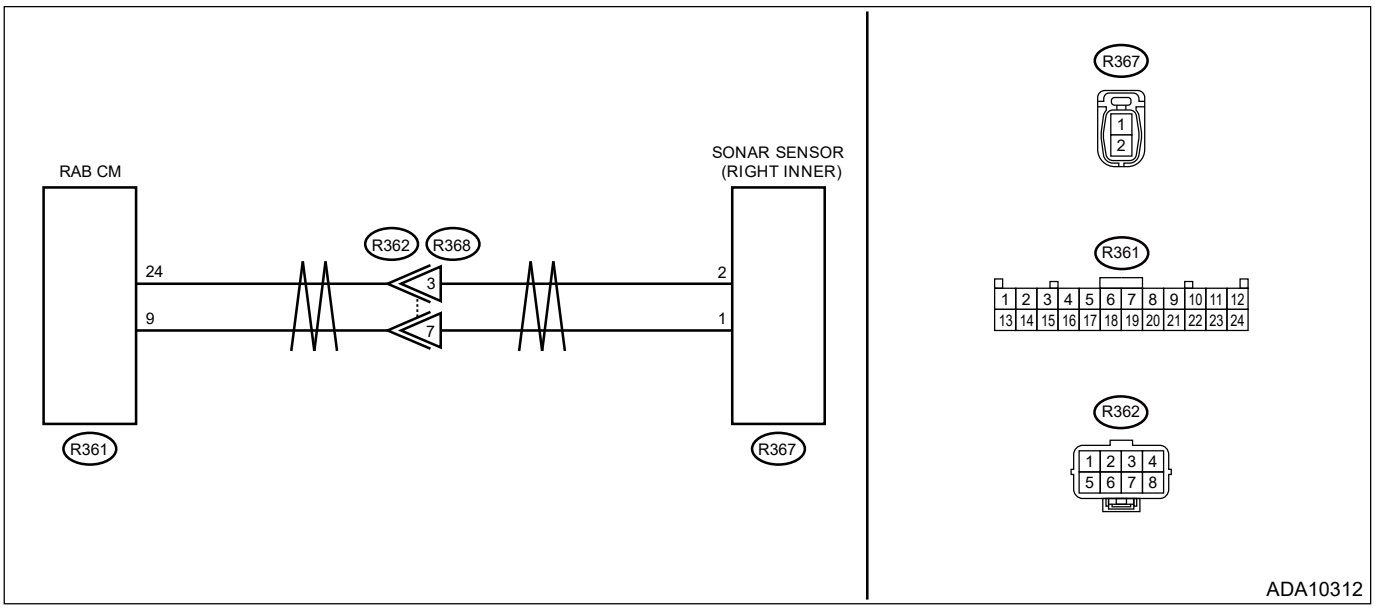
Note:

For the diagnostic procedure, refer to DTC B2C06. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C06 RR SONAR SENSOR CIRCUIT / NO SIGNAL.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C08 RRC SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:
Sonar sensor (right inner) harness is open.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2C08 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (right inner) connector and RAB CM connector.

Connector & terminal

(R361) No. 24 — (R367) No. 2:
(R361) No. 9 — (R367) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C08 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C09 RRC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C08. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C08 RRC SONAR SENSOR CIRCUIT / NO SIGNAL.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (left corner) harness is open.

Time needed for diagnosis:

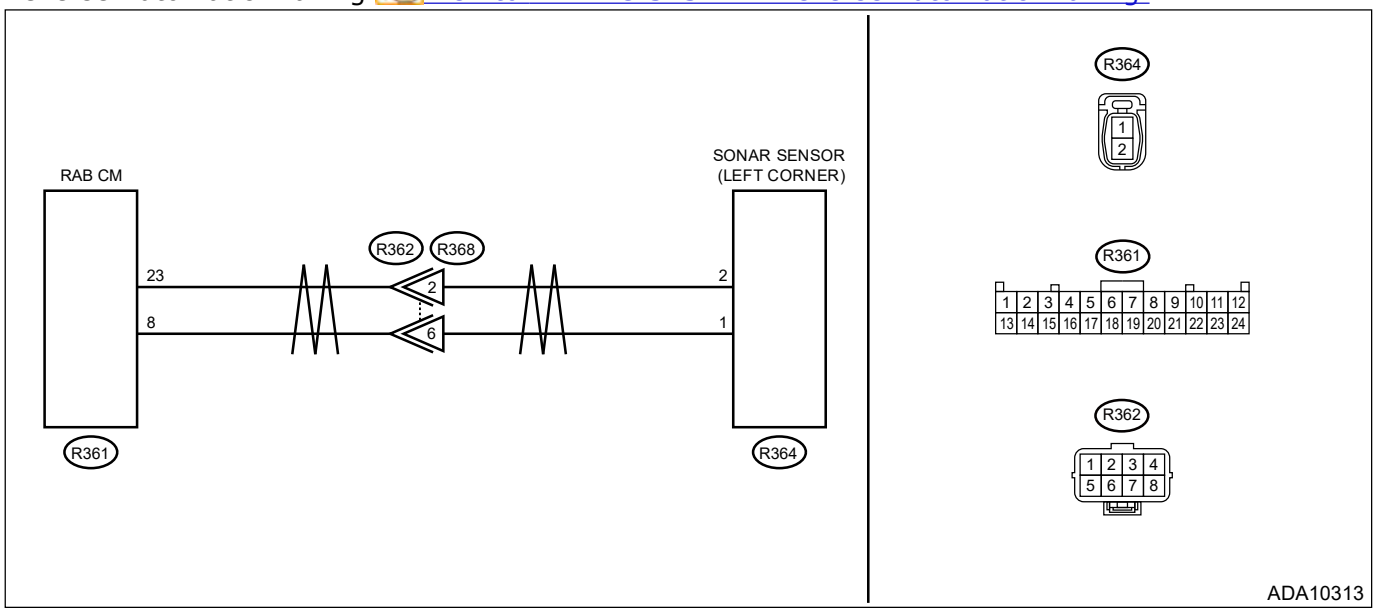
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C0A displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (left corner) connector and RAB CM connector.
   Connector & terminal
   (R361) No. 8 — (R364) No. 1:
   (R361) No. 23 — (R364) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C0A displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0B RL SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C0A. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0A RL SONAR SENSOR CIRCUIT / NO SIGNAL.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL

Outline of diagnosis:

Sonar sensor (left inner) harness is open.

Time needed for diagnosis:

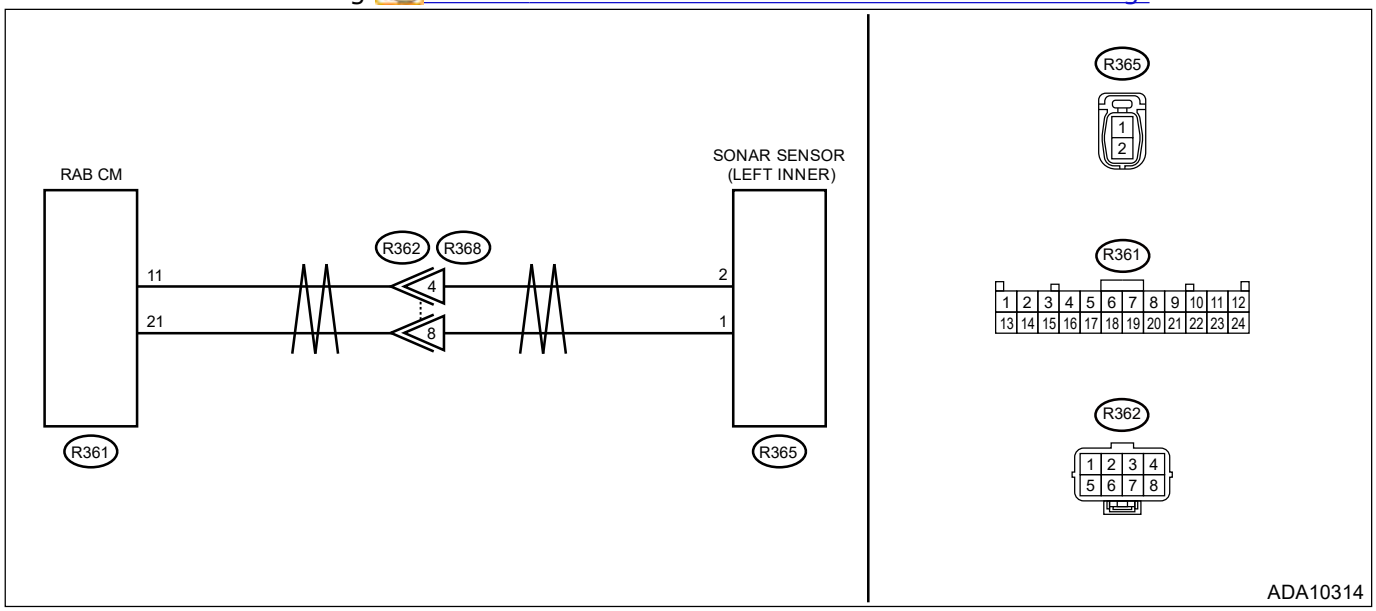
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C0C displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Using a tester, measure resistance value of the harness between the sonar sensor (left inner) connector and RAB CM connector.
   Connector & terminal
   (R361) No. 11 — (R365) No. 2:
   (R361) No. 21 — (R365) No. 1:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C0C displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0D RLC SONAR SENSOR / SONAR CONTROL MODULE CIRCUIT

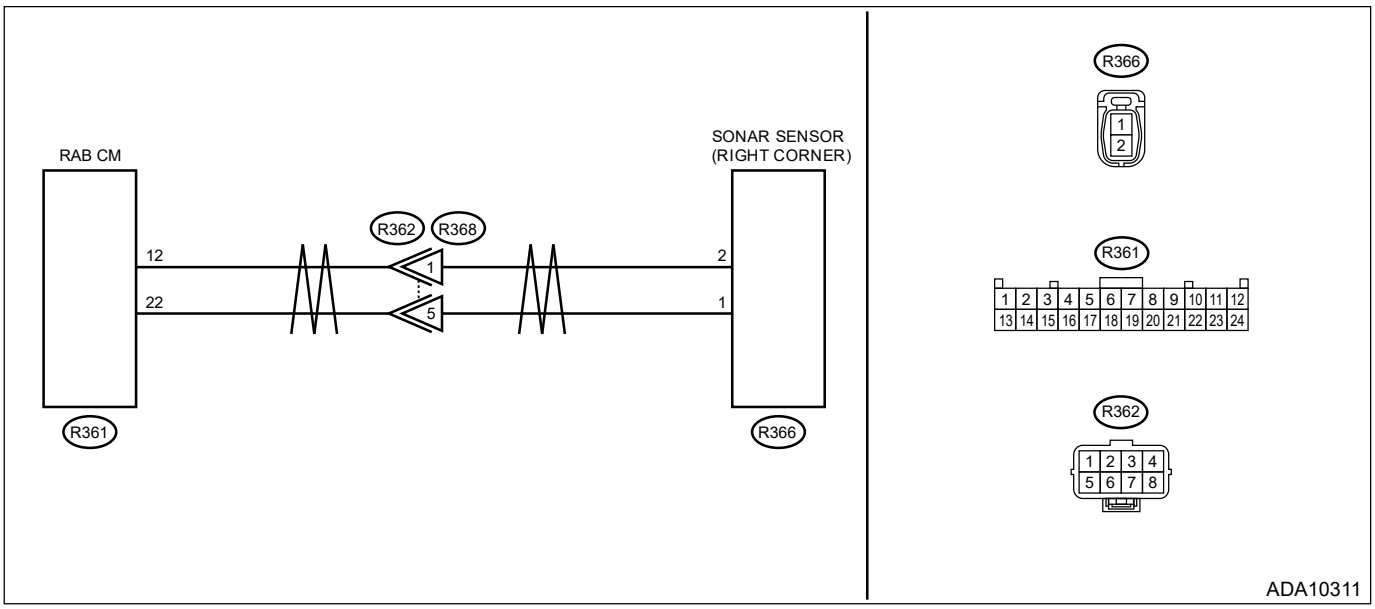
Note:

For the diagnostic procedure, refer to DTC B2C0C. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0C RLC SONAR SENSOR CIRCUIT / NO SIGNAL.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0E RR SONAR HARNESS HIGH

Outline of diagnosis:
Sonar sensor (right corner) harness is shorted to power supply.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2C0E displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (right corner) connector and chassis ground.
   Connector & terminal
   (R366) No. 2 (+) — Chassis ground (-):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Turn the ignition switch to OFF.
2. Switch the sonar sensor (right corner) and sonar sensor (right inner).
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B2C0E displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C0F RR SONAR HARNESS LOW

Outline of diagnosis:

Sonar sensor (right corner) harness is shorted to ground.

Time needed for diagnosis:

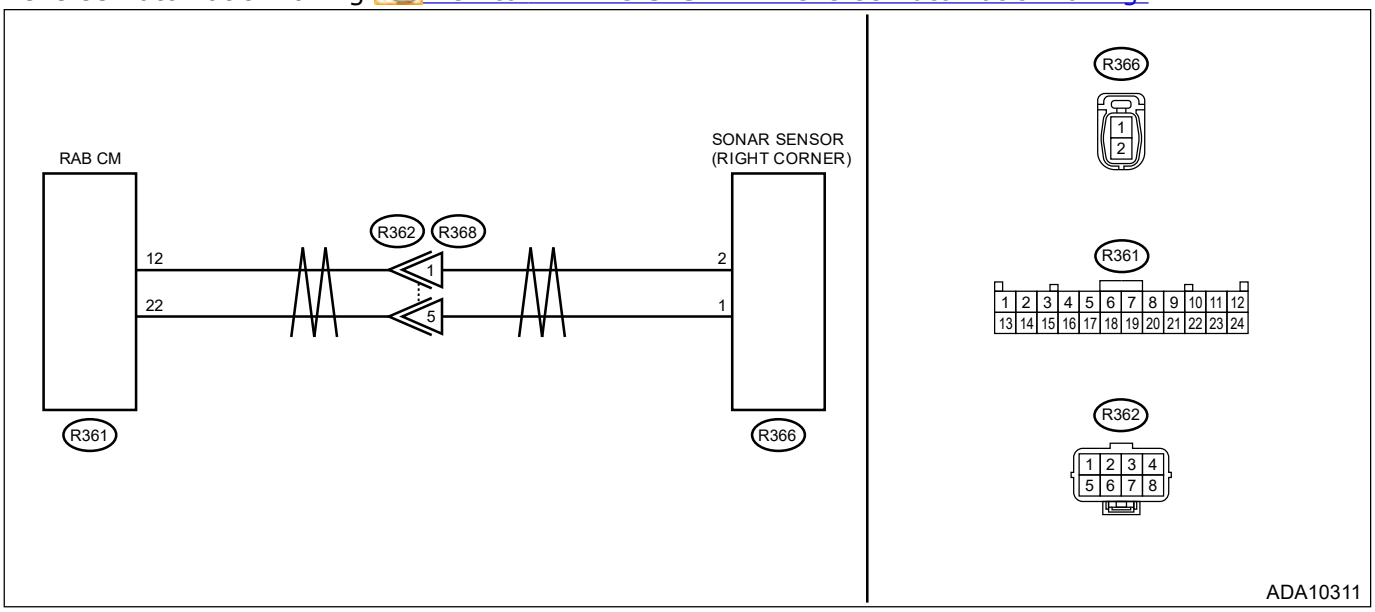
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C0F displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (right corner) connector and chassis ground.
   Connector & terminal
   (R366) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



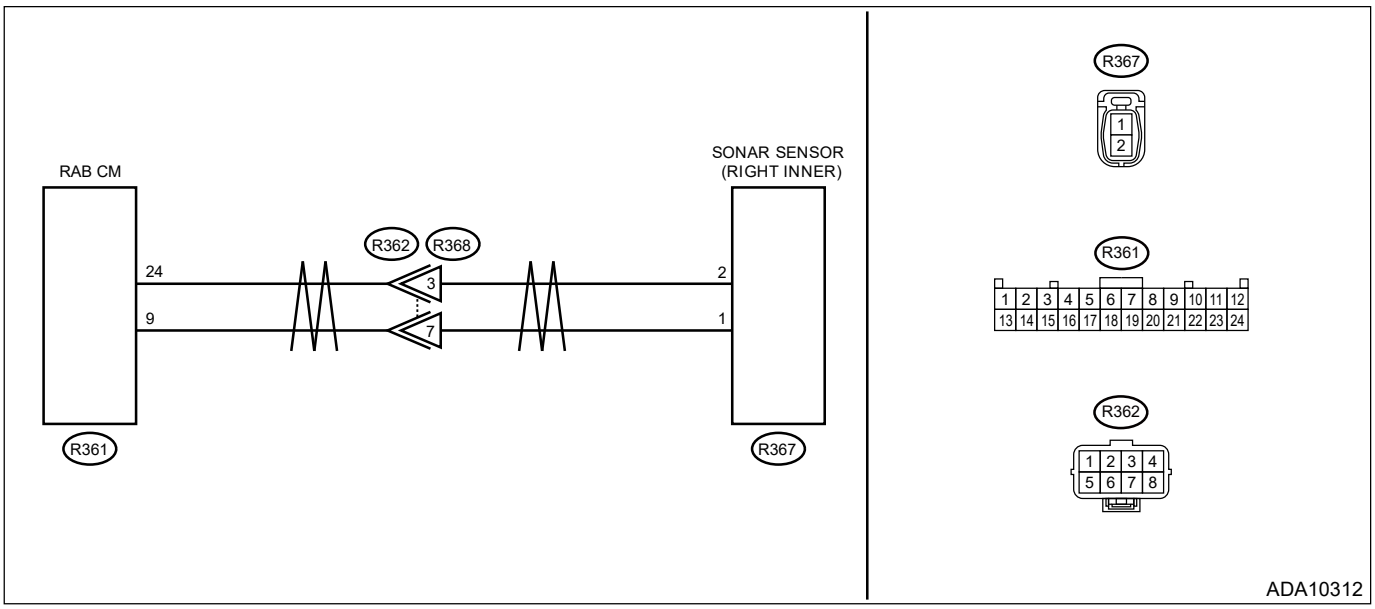
Is DTC B2C0F displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C10 RRC SONAR HARNESS HIGH

Outline of diagnosis:
Sonar sensor (right inner) harness is shorted to power supply.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2C10 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Using a tester, measure the voltage between sonar sensor (right inner) connector and chassis ground.
   Connector & terminal
   (R367) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B2C10 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C11 RRC SONAR HARNESS LOW

Outline of diagnosis:
Sonar sensor (right inner) harness is shorted to ground.
Time needed for diagnosis:

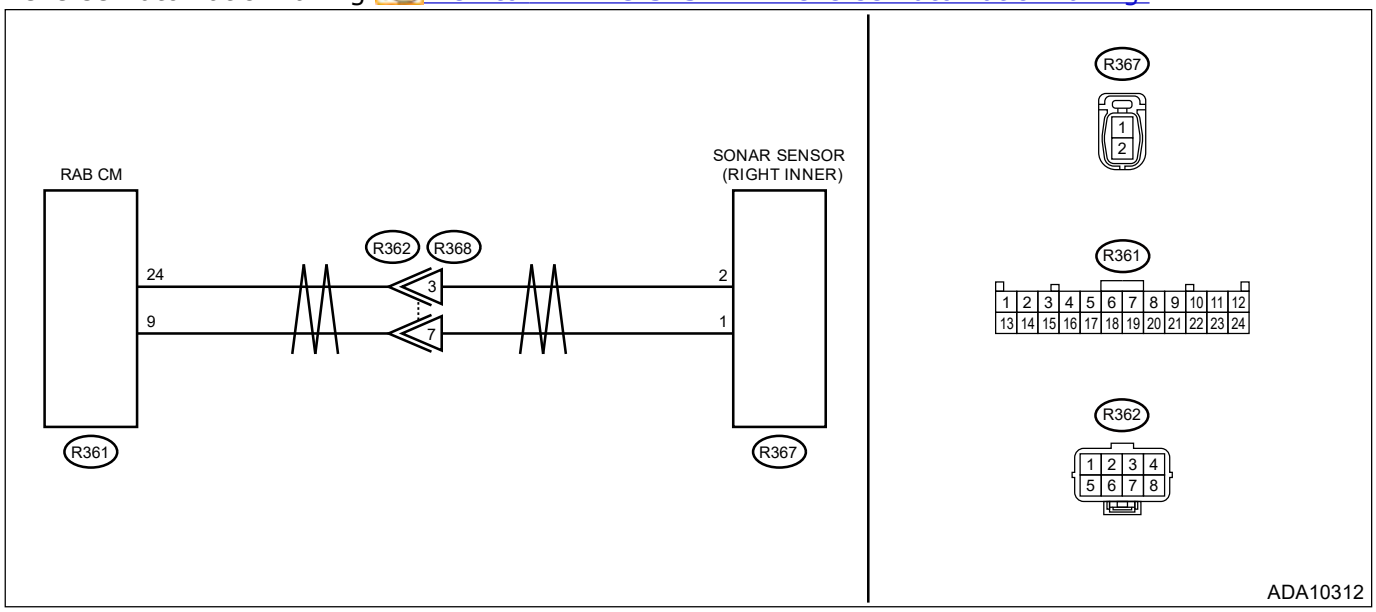
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C11 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (right inner) connector and chassis ground.
   Connector & terminal
   (R367) No. 2 — Chassis ground:

Is the resistance less than 1 MΩ?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



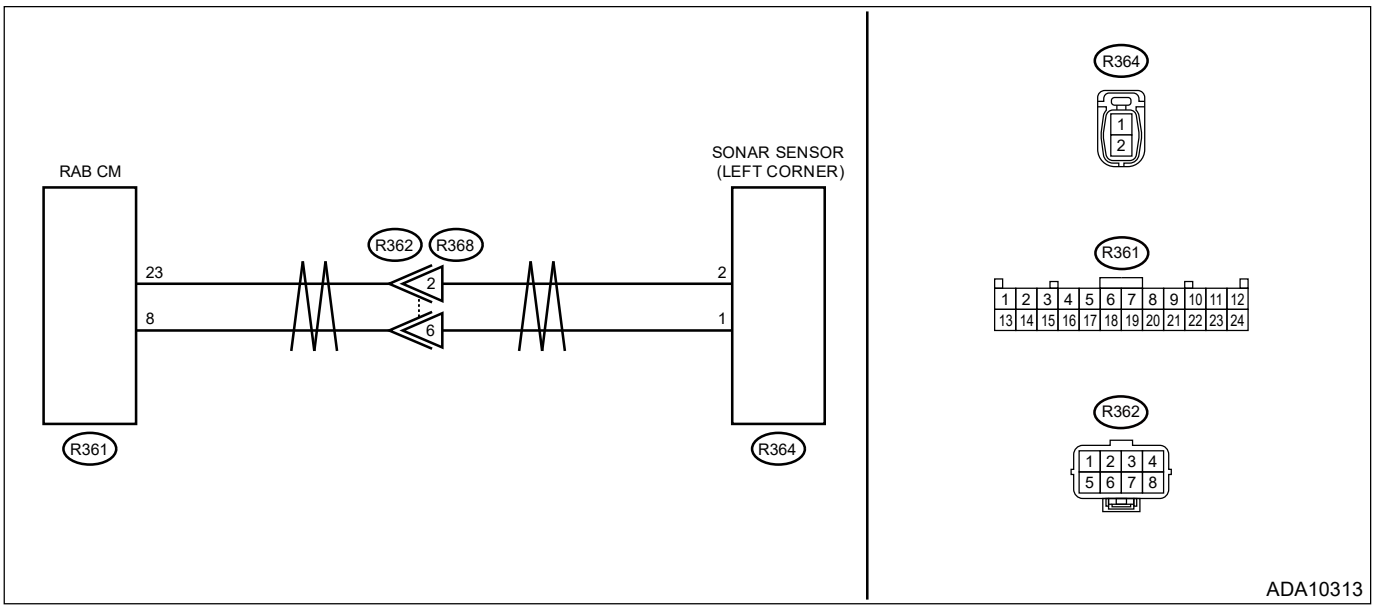
Is DTC B2C11 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C12 RL SONAR HARNESS HIGH

Outline of diagnosis:
Sonar sensor (left corner) harness is shorted to power supply.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2C12 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (left corner) connector and chassis ground.
   Connector & terminal
   (R364) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B2C12 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C13 RL SONAR HARNESS LOW

Outline of diagnosis:
Sonar sensor (left corner) harness is shorted to ground.

Time needed for diagnosis:

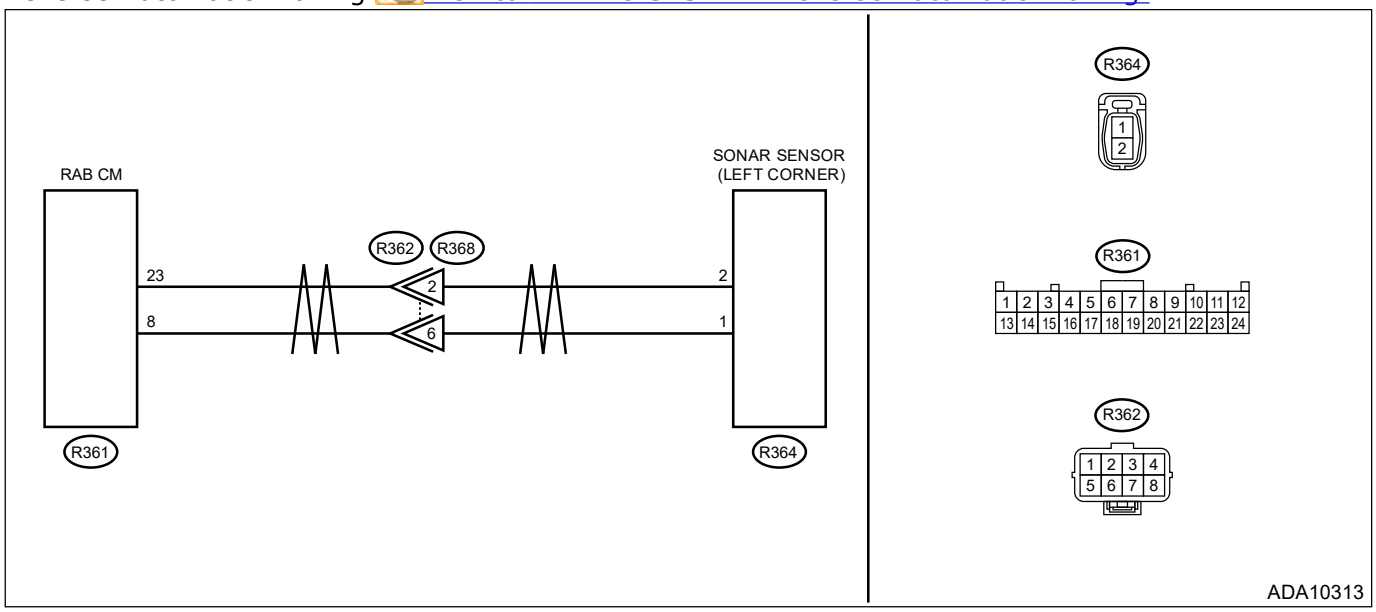
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C13 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (left corner) connector and chassis ground.
   Connector & terminal
   (R364) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



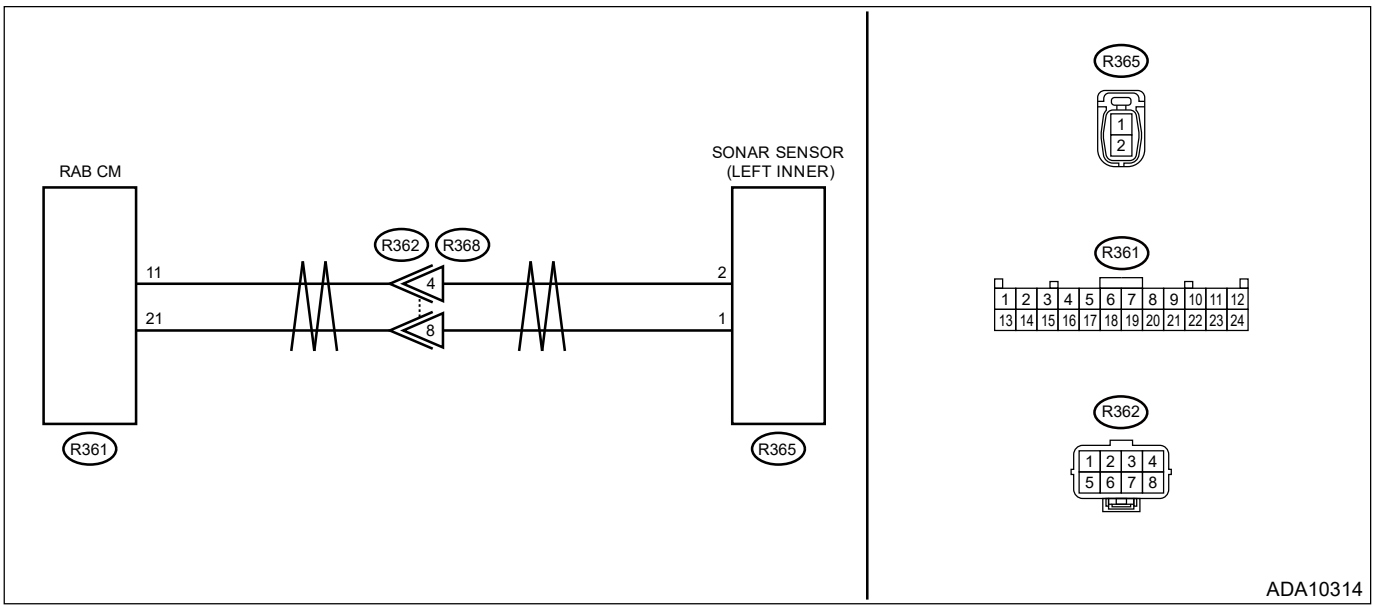
Is DTC B2C13 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C14 RLC SONAR HARNESS HIGH

Outline of diagnosis:
Sonar sensor (left inner) harness is shorted to power supply.
Time needed for diagnosis:
1200 ms
Recovery conditions:
Ignition switch OFF → ON
Wiring diagram:
Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2C14 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between sonar sensor (left inner) connector and chassis ground.
   Connector & terminal
   (R365) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B2C14 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C15 RLC SONAR HARNESS LOW

Outline of diagnosis:
Sonar sensor (left inner) harness is shorted to ground.

Time needed for diagnosis:

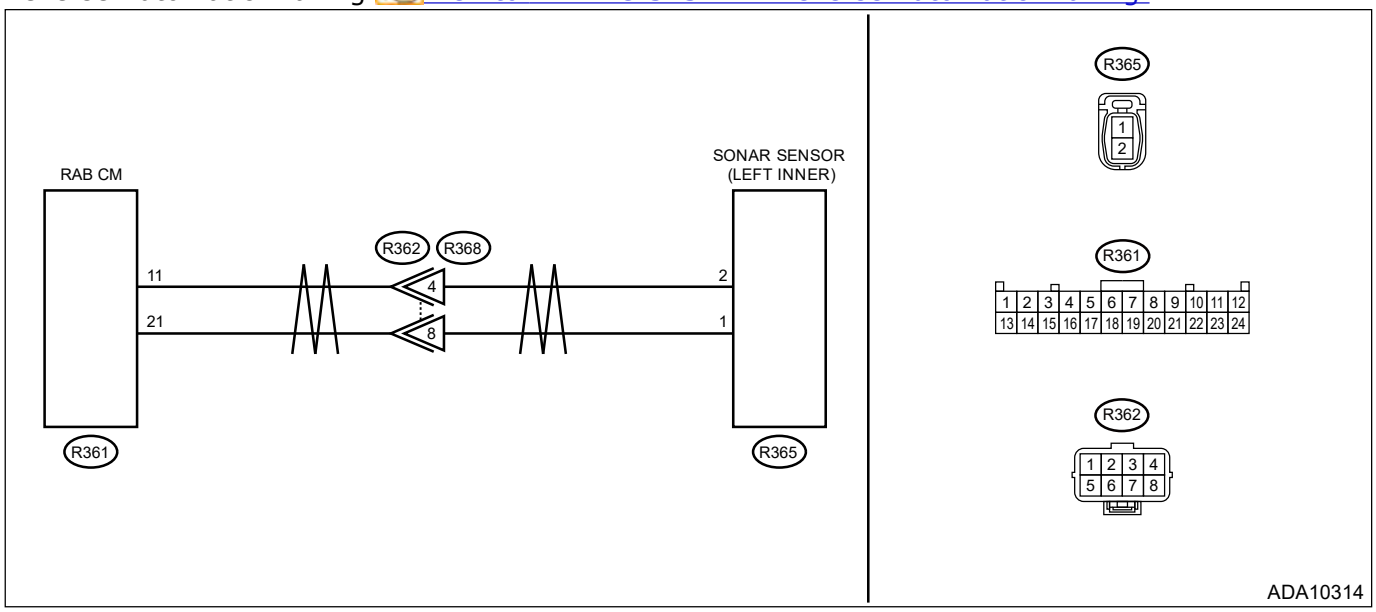
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C15 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS BETWEEN SONAR SENSOR CONNECTOR AND RAB CM CONNECTOR. (SHORTED TO GROUND).

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector and the RAB CM connector.
3. Using a tester, measure the resistance between sonar sensor (left inner) connector and chassis ground.
   Connector & terminal
   (R365) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 3.
No	Repair or replace the short circuit in the harness between sonar sensor connector and RAB CM connector.

3. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C15 displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C16 RRC SONAR HARNESS HIGH / RRC SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C10. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C10 RRC SONAR HARNESS HIGH.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C17 RLC SONAR HARNESS HIGH / RLC SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C14. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C14 RLC SONAR HARNESS HIGH.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C18 RR SONAR HARNESS HIGH / RR SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C0E. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0E RR SONAR HARNESS HIGH.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C19 RL SONAR HARNESS HIGH / RL SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C12. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C12 RL SONAR HARNESS HIGH.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1A RRC SONAR SENSOR

Outline of diagnosis:

Sonar sensor (right inner) is faulty.

Time needed for diagnosis:

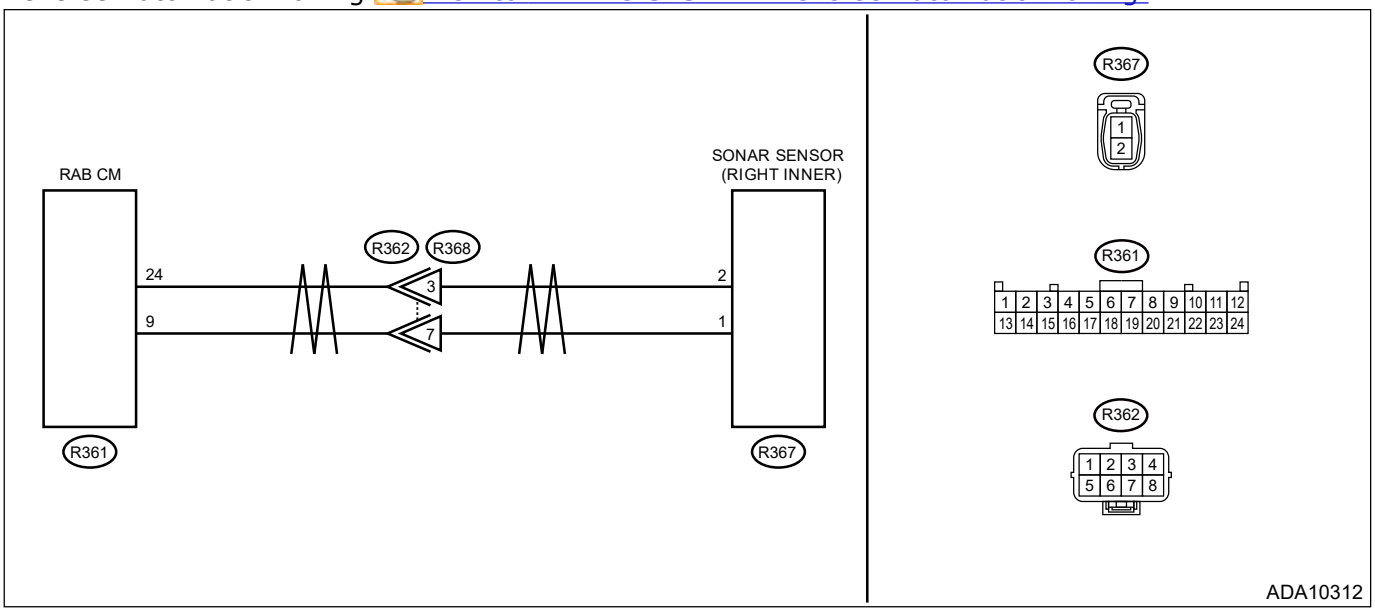
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1A displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right inner) and sonar sensor (right corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1A displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1B RLC SONAR SENSOR

Outline of diagnosis:

Sonar sensor (left inner) is faulty.

Time needed for diagnosis:

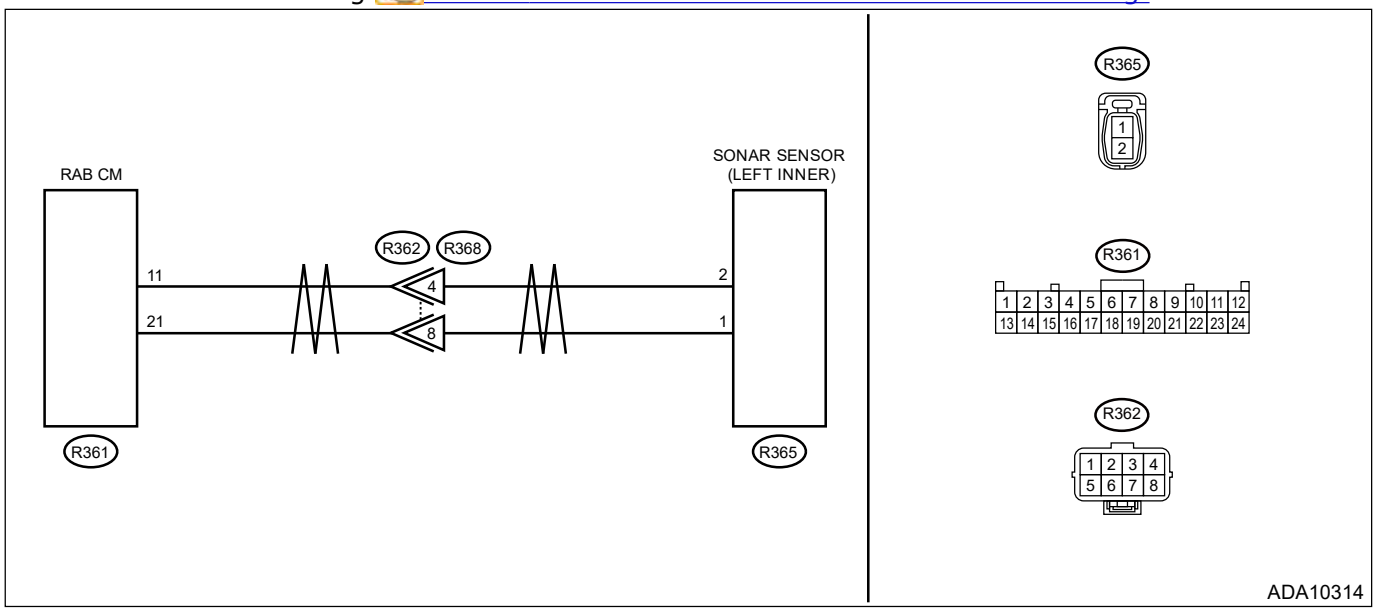
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left inner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1B displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left inner) and sonar sensor (left corner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1B displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left inner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1C RR SONAR SENSOR

Outline of diagnosis:

Sonar sensor (right corner) is shorted to power supply.

Time needed for diagnosis:

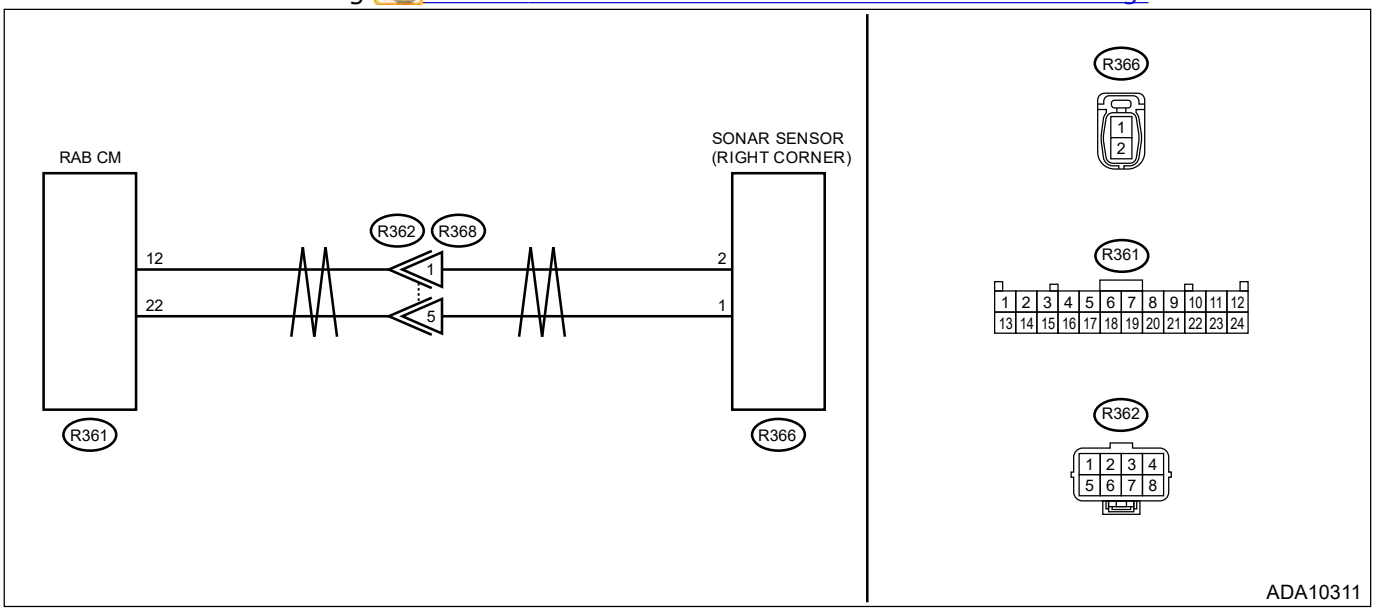
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (right corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1C displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SONAR SENSOR.

1. Switch the sonar sensor (right corner) and sonar sensor (right inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1C displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (right corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1D RL SONAR SENSOR

Outline of diagnosis:

Sonar sensor (left corner) is shorted to ground.

Time needed for diagnosis:

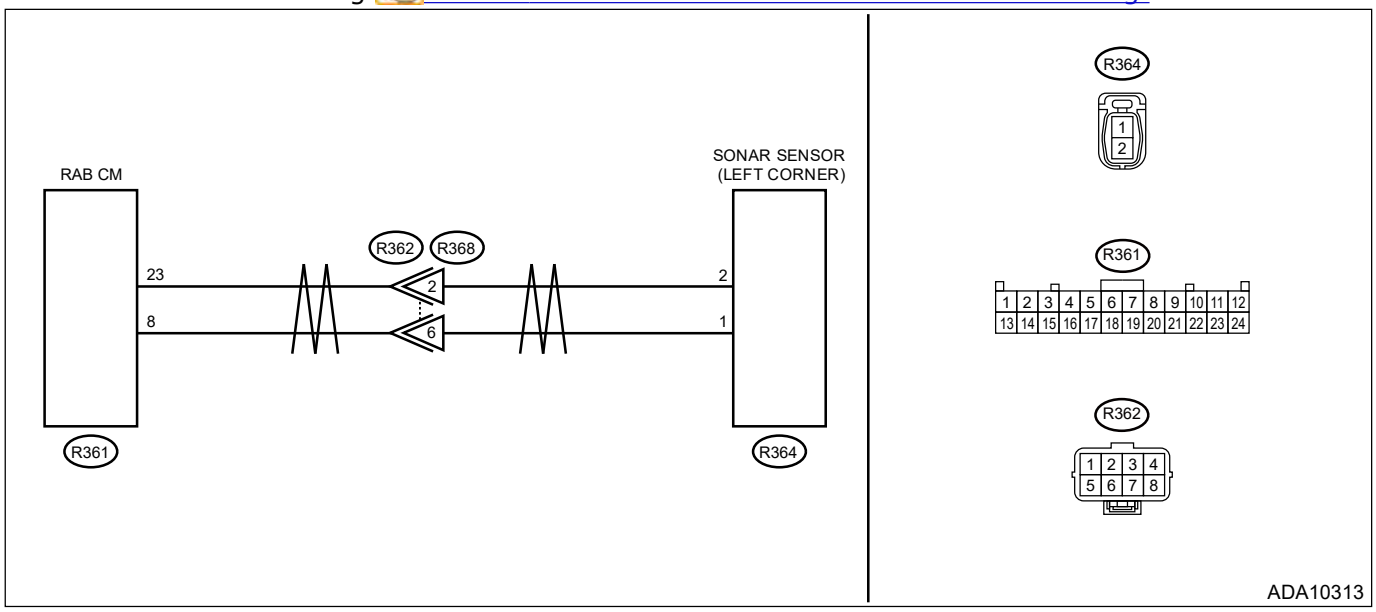
1200 ms

Recovery conditions:

Ignition switch OFF → ON

Wiring diagram:

Reverse Automatic Braking Ref. to WIRING SYSTEM>Reverse Automatic Braking.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the sonar sensor (left corner) connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1D displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK SONAR SENSOR.

1. Switch the sonar sensor (left corner) and sonar sensor (left inner).
2. Connect the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2C1D displayed? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the sensor installed as a sonar sensor (left corner). Ref. to Reverse Automatic Braking>Sensor and Harness.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1E RRC SONAR HARNESS LOW / RRC SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C11. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C11 RRC SONAR HARNESS LOW.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C1F RLC SONAR HARNESS LOW / RLC SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C15. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C15 RLC SONAR HARNESS LOW.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C20 RR SONAR HARNESS LOW / RR SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C0F. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C0F RR SONAR HARNESS LOW.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C21 RL SONAR HARNESS LOW / RL SONAR CONTROL MODULE CIRCUIT

Note:

For the diagnostic procedure, refer to DTC B2C13. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2C13 RL SONAR HARNESS LOW.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2C22 EYESIGHT SYSTEM

Outline of diagnosis:
EyeSight is faulty.
Time needed for diagnosis:
800 ms
Recovery conditions:
Ignition switch OFF → ON
Note:
Perform the diagnosis for EyeSight. Ref. to EyeSight (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0077 LOCAL CAN COMMUNICATION BUS OFF

Outline of diagnosis:
Local communication is faulty.
Time needed for diagnosis:
500 ms
Recovery conditions:
Ignition switch OFF → ON
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to Reverse Automatic Braking(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Reverse Automatic Braking] using the Subaru Select Monitor. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC other than DTC U0077 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC U0077. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Note:
Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A"

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Reverse Automatic Braking(DIAGNOSTICS) > Cancel Code

NOTE

When the cancel codes are detected from the RAB CM, the Reverse Automatic Braking will be cancelled.

Reverse Automatic Braking(DIAGNOSTICS) > Cancel Code

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Reverse Automatic Braking], and then select [Enter].
5. On [Select Function] display, select [Cancel Code].

   Note:
   - **For detailed operation procedures, refer to "Application help".**
   - **Up to 3 codes can be stored. When there are four or more codes, the oldest code is deleted and the newest code is stored.**
   - **Stored codes will be cleared by Clear Memory. Ref. to COMMON(diag)>Clear memory.**

Reverse Automatic Braking(DIAGNOSTICS) > Cancel Code

LIST

Code	Description & trouble part	Contents
0X01	+B Low Voltage	The battery power supply of RAB CM is reduced.
0X02	IGN Low Voltage	The ignition power supply of RAB CM is reduced.
0X03	RRC Sonar Noise	Sonar sensor (right inner) signal is interfered due to noise.
0X04	RLC Sonar Noise	Sonar sensor (left inner) signal is interfered due to noise.
0X05	RR Sonar Noise	Sonar sensor (right corner) signal is interfered due to noise.
0X06	RL Sonar Noise	Sonar sensor (left corner) signal is interfered due to noise.
0X07	RRC Sonar Dirty HALT I	Substance adhered to the sonar sensor (right inner).
0X08	RLC Sonar Dirty HALT I	Substance adhered to the sonar sensor (left inner).
0X09	RR Sonar Dirty HALT I	Substance adhered to the sonar sensor (right corner).
0X0A	RL Sonar Dirty HALT I	Substance adhered to the sonar sensor (left corner).
0X0B	RRC Sonar Dirty HALT II	Substance adhered to the sonar sensor (right inner).
0X0C	RLC Sonar Dirty HALT II	Substance adhered to the sonar sensor (left inner).
0X0D	RR Sonar Dirty HALT II	Substance adhered to the sonar sensor (right corner).
0X0E	RL Sonar Dirty HALT II	Substance adhered to the sonar sensor (left corner).
0X0F	RRC Sonar Mount Error	Substance adhered to the sonar sensor (right inner).
0X10	RLC Sonar Mount Error	Substance adhered to the sonar sensor (left inner).

IMMOBILIZER (DIAGNOSTICS)

IM(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Inspection Mode
6. Warning Light Illumination Pattern
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Diagnostic Trouble Code (DTC)
11. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
12. Diagnostics with Phenomenon

PROCEDURE

1. WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

Caution:

When the body integrated unit (except for C5 model) or the immobilizer CM (C5 model) is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to IMMOBILIZER (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. CONFIRM NUMBER OF REGISTERED IMMOBILIZER KEY.

Confirm the number of registered immobilizer key. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the number of registration 0?

Yes	Register the immobilizer system.
No	Go to 3.

3. CHECK SECURITY INDICATOR LIGHT.

1. Remove the ignition key from ignition switch.
2. Wait at least 60 seconds.

Does the security indicator light blink?

Yes	Go to 4.
No	Check the security indicator light circuit. Ref. to IMMOBILIZER (DIAGNOSTICS)>Warning Light Illumination Pattern.

4. CHECK KEY SWITCH.

Insert the ignition key in the ignition switch. (OFF or ACC)

Does the security indicator light remain blinking?

Yes	Check the key switch circuit. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK KEY SWITCH CIRCUIT.
No	Go to 5.

5. CHECK SECURITY INDICATOR LIGHT.

Check the security indicator light status in the condition of step 4.

Does the security indicator light go off?

Yes	Go to 8.
No	Go to 6.

6. CHECK SECURITY INDICATOR LIGHT.

Turn the ignition switch to ON.

Does the security indicator light go off?

Yes	Go to 8.
No	Go to 7.

7. CHECK ENGINE START.

Turn the ignition switch to START.

Does the starter operate?

Yes	Check the LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 9.

8. CHECK ENGINE START.

Turn the ignition switch to START.

Does the engine start?

Yes	Immobilizer system is normal.
No	Go to 10.

9. CHECK DTC.

Read the following DTCs using Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



- [Body Control] (except for C5 model)
- [Immobilizer] (C5 model)

Note:

Check the Subaru Select Monitor communication if the communication is disabled. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

Are any DTCs displayed?

Yes	Record the DTC, time stamp and freeze frame data, and Go to 11.
No	Replace the body integrated unit (except for C5 model) or the immobilizer CM (C5 model). Ref. to SECURITY AND LOCKS>Body Integrated Unit.

10. CHECK DTC.

Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Note:

Check the Subaru Select Monitor communication if the communication is disabled. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 11.
No	Perform the diagnosis for engine system. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Basic Diagnostic Procedure>PROCEDURE.

11. CHECK FREEZE FRAME DATA.

Check the freeze frame data. Ref. to IMMOBILIZER (DIAGNOSTICS)>Freeze Frame Data.

Are the data recorded?

Yes	Record the data. Go to 12.
No	Go to 12.

12. CHECK DTC.

Check the displayed DTC.

Are DTCs irrelevant to the immobilizer displayed? (Current malfunction)

Yes	Perform the diagnosis according to DTCs irrelevant to the immobilizer first.
No	Go to 13.

13. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC).
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to IMMOBILIZER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC using Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 13 until DTC is not shown.
No	Finish the diagnosis.

2. WITH KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM

Note:

For immobilizer diagnosis of model with the keyless access with push button start system, refer to "Keyless Access with Push Button Start System". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.

IMMOBILIZER (DIAGNOSTICS) > Check List for Interview

CHECK

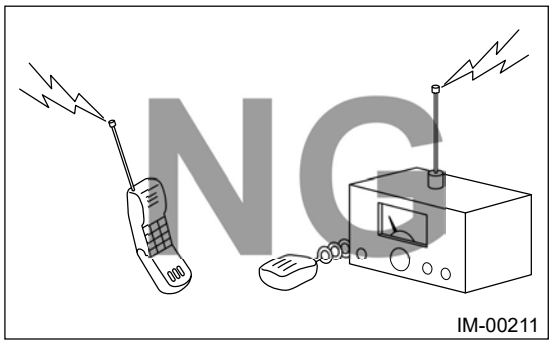
Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Immobilizer Check List for Interview Brought in on: MM/DD/YY</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>DTC</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

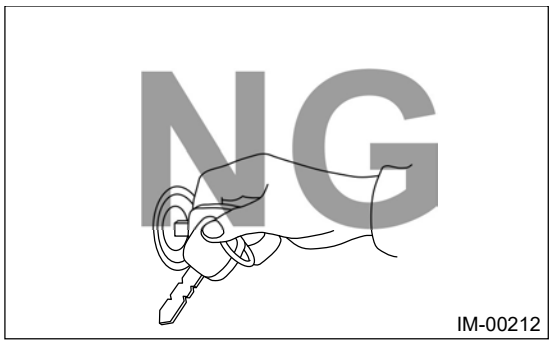
IMMOBILIZER (DIAGNOSTICS) > General Description

CAUTION

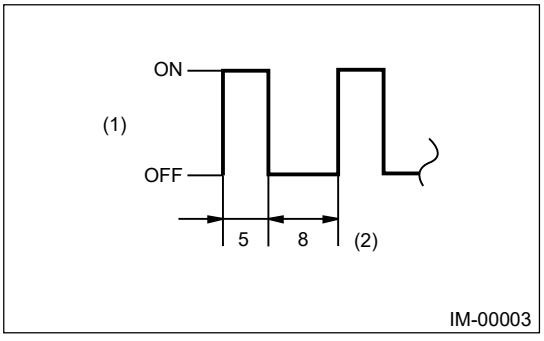
- Do not use the electrical test equipment on the airbag system wiring harnesses and connector circuits.
- Be careful not to damage the airbag system wiring harness.
- While diagnostic items are being checked, do not operate radios, portable telephones, etc. which emit electromagnetic waves near or inside the vehicle.



- When turning the ignition switch to ON or OFF while diagnostic items are being checked, do not allow keys with different ID codes close to the ignition switch. If the ignition key is on a key holder, remove it from the key holder before performing diagnoses.



- When repeatedly turning the ignition switch to ON or OFF while diagnostic items are being checked, it should be switched in cycles of "ON" for at least 5 seconds → "OFF" for at least 8 seconds.



(1) Ignition switch position

(2) Sec.

- If the engine fails to start with a registered ignition key, detach the ignition key from ignition switch and wait for approx. 1 second until security indicator light begins to flash. And then start the engine again.
- Before performing the diagnostics, obtain all keys for the vehicle from the owner.

- Do not register a body integrated unit already registered to another vehicle to diagnose failures or inspect functions.

IMMOBILIZER (DIAGNOSTICS) > General Description

INSPECTION

Before performing diagnosis, check the following items which might be related to immobilizer malfunction.

1. BASIC INSPECTION

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check for proper grounding.

IMMOBILIZER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

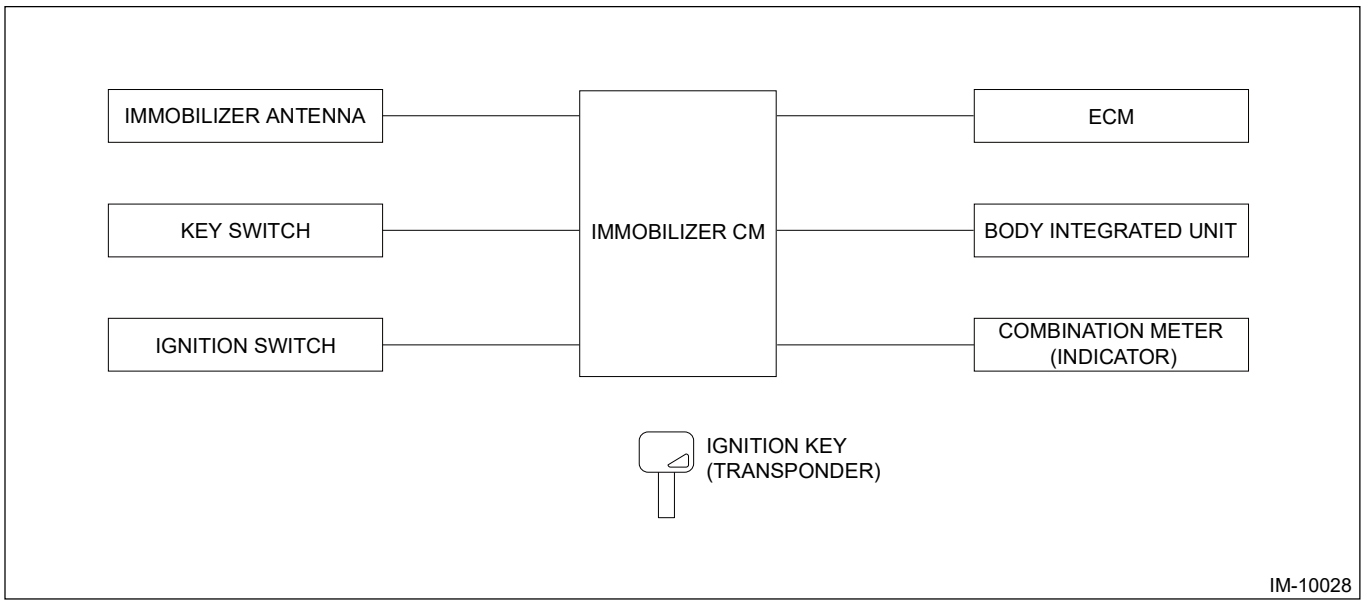
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Oscilloscope	Used for measuring the waveform.

IMMOBILIZER (DIAGNOSTICS) > General Description

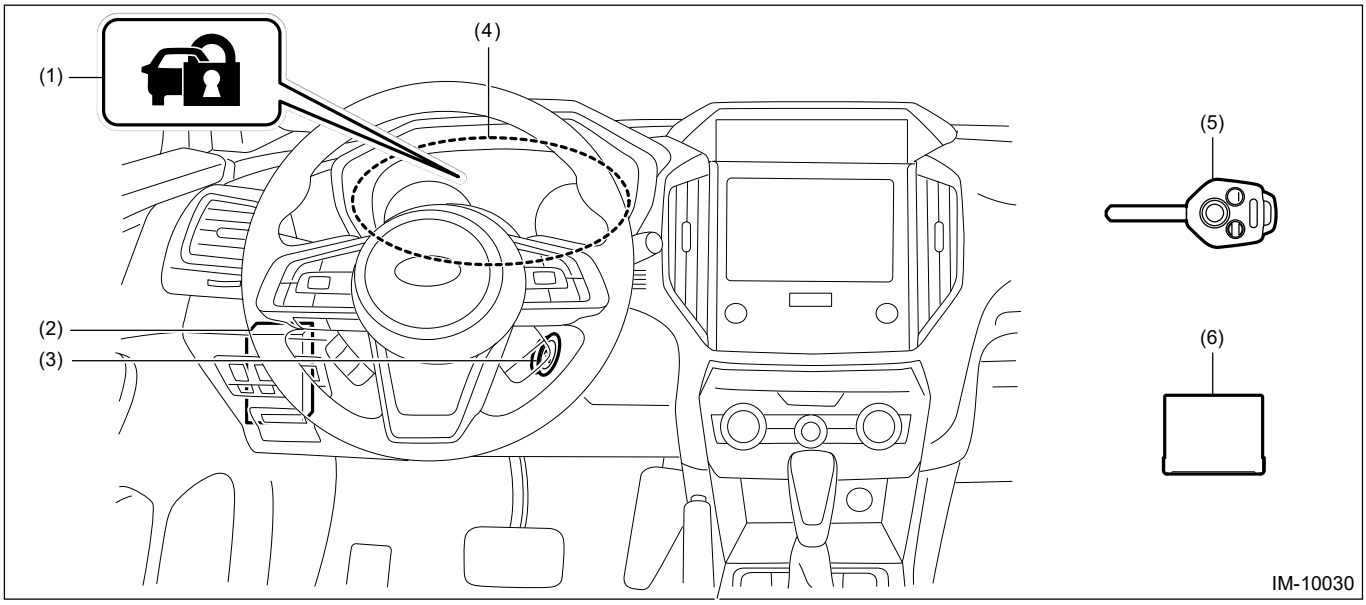
SYSTEM BLOCK DIAGRAM

- Other than for C5
  Refer to BODY CONTROL SYSTEM (DIAGNOSTICS). Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>SYSTEM BLOCK DIAGRAM.
- For C5


IMMOBILIZER ANTENNA
KEY SWITCH
IGNITION SWITCH
IMMOBILIZER CM
ECM
BODY INTEGRATED UNIT
COMBINATION METER
(INDICATOR)
IGNITION KEY
(TRANSPONDER)
IM-10028

IMMOBILIZER (DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Security indicator light
(2) Body integrated unit
(3) Immobilizer antenna
(4) Combination meter
(5) Ignition key
(6) Immobilizer control module (C5 model)

IMMOBILIZER (DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B1401	COMBINATION METER COLLATION	—
B1402	IMMOBILIZER KEY COLLATION	—
B1407	COMBINATION METER COMMUNICATION	—
B1408	COMBINATION METER NON-VOLATILE MEMORY	—
B1410	TRANSPONDER COMMUNICATION	—
B1411	IMMOBILIZER ANTENNA	—
B1413	IMMOBILIZER CONTROL MODULE BATTERY POWER SUPPLY	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control] or [Immobilizer]. Ref. to COMMON(diag)>Clear memory.
2. Read the DTC of [Body Control] or [Immobilizer] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Remove the ignition key from the ignition switch, and insert again.
4. Turn the ignition switch OFF → ON, and wait for 10 seconds or more.
5. Read the DTC of [Body Control] or [Immobilizer] using Subaru Select Monitor and check that the DTC is not displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

2. INSPECTION MODE 2

DTC	Item	Note
B1412	IMMOBILIZER CONTROL MODULE CAN REGISTER STUCK	—
B1414	IMMOBILIZER CONTROL MODULE NON-VOLATILE MEMORY	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to

COMMON(diag)>Clear memory.

2. Using the Subaru Select Monitor, read the DTC of [Immobilizer] to check that there is no DTC displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Disconnect and reconnect the battery, and then wait for one minute or more.
4. Turn the ignition switch to ON.
5. Using the Subaru Select Monitor, read the DTC of [Immobilizer] to check that there is no DTC displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

3. INSPECTION MODE 3

DTC	Item	Note
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	—
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	—
B1576	ECM EEPROM	—
B1577	IMMOBILIZER CM EEPROM	—
B1578	METER	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Engine Control System]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Engine Control System] to check that there is no DTC displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Start the engine, and then run the engine at idle for 10 seconds or more. Or, disconnect and reconnect the battery, then turn the ignition switch OFF → ON, and wait for 10 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Engine Control System] to check that there is no DTC displayed. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

IMMOBILIZER (DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

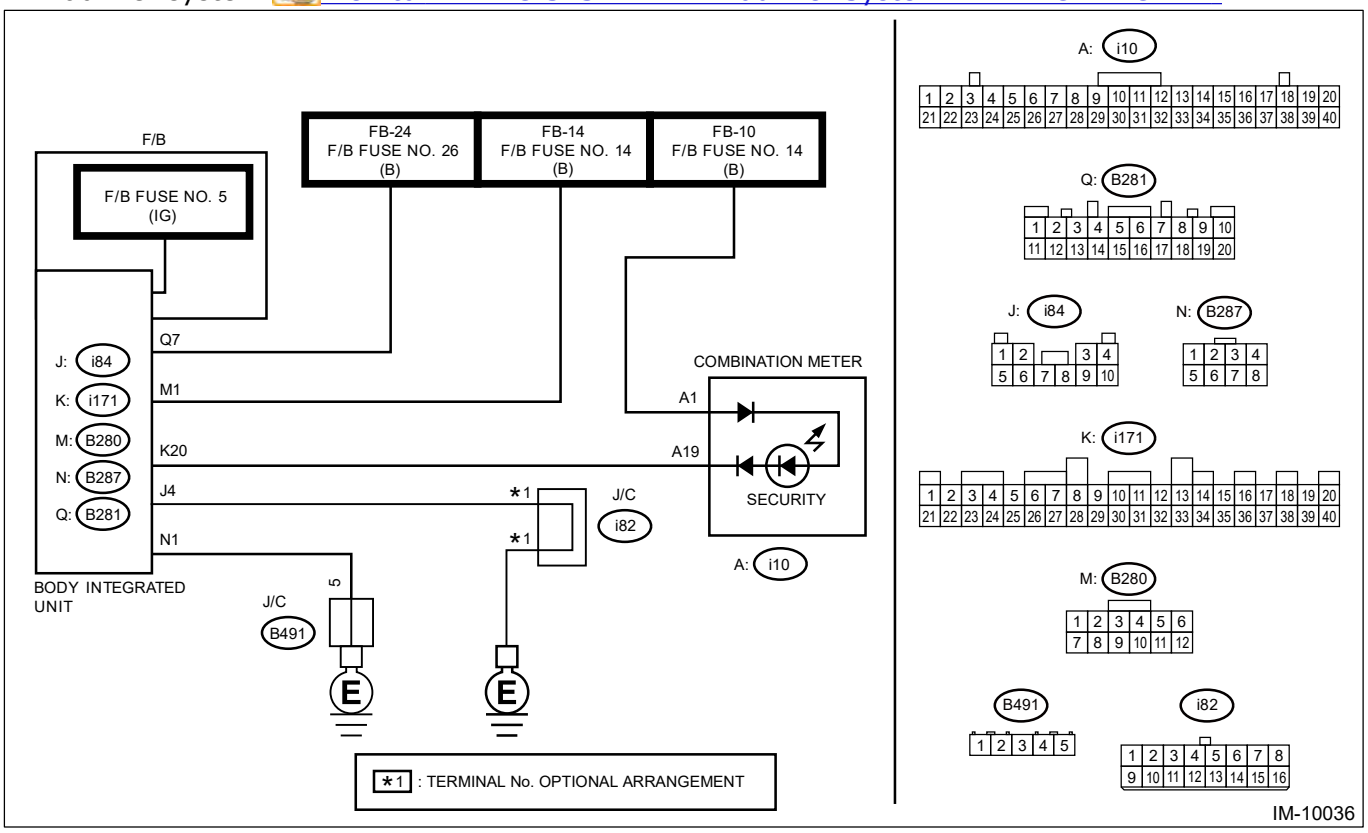
Blinks when the key is removed from the ignition switch.
Goes off when the registered key is inserted into the ignition switch.

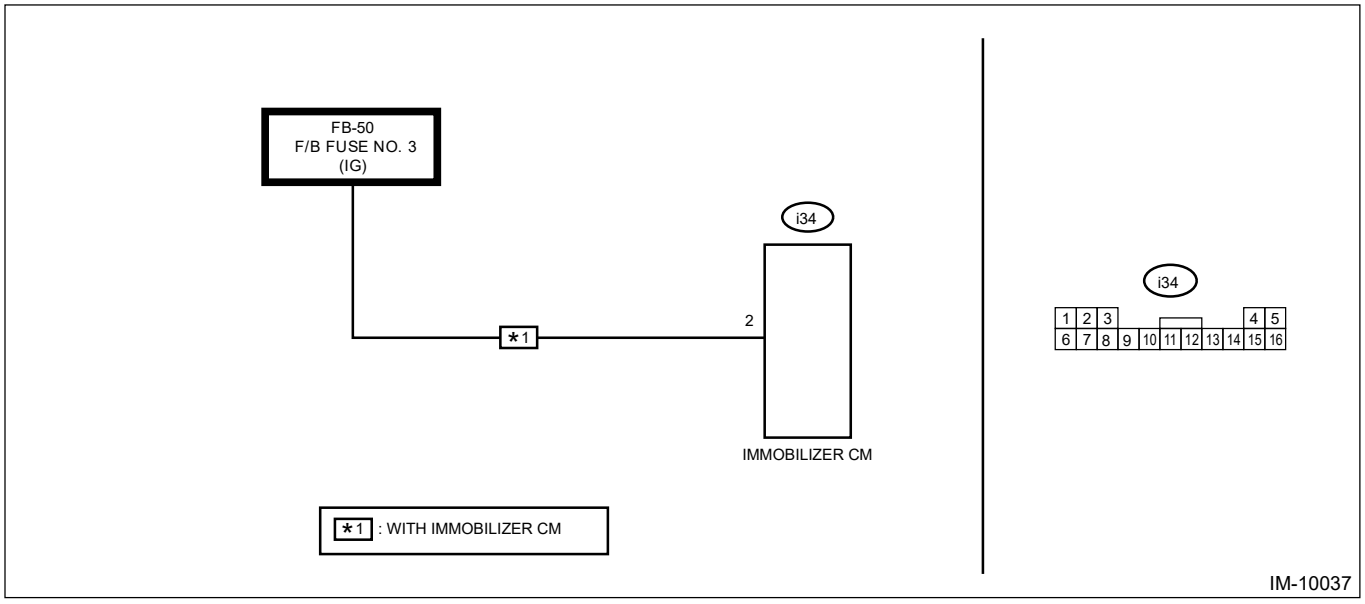
IMMOBILIZER (DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT DOES NOT ILLUMINATE

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.





Caution:

When the body integrated unit (except for C5 model) or the immobilizer CM (C5 model) is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK FUSE.

1. Remove the ignition key from ignition switch. Or, turn off the power.
2. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the short circuit in the harness between the fuse and body integrated unit.

2. CONFIRM DESTINATION.

Verify the destination of the vehicle.

Is destination for C5?

Yes	Go to 3.
No	Go to 9.

3. CHECK IMMOBILIZER CM.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Ignition SW input]

Does the display change in accordance with the ignition switch OFF ←→ ON?

Yes	Go to 7.
No	Go to 4.

4. CHECK IGNITION SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Remove the F/B fuse No. 3.
3. Measure the voltage between F/B fuse No. 3 (lower stream side) and chassis ground.
   Connector & terminal
   F/B fuse No. 3 (lower stream side) (+) — Chassis ground (−):

Is the voltage 6 V or more?

Yes	Repair the short circuit to power supply in harness between the immobilizer CM and fuse.
No	Go to 5.

5. CHECK IGNITION SWITCH CIRCUIT.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.



- [Ignition SW input]

Is «ON» displayed?

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Go to 6.

6. CHECK IGNITION SWITCH CIRCUIT.

1. Disconnect the connector from immobilizer CM.
2. Measure the resistance between immobilizer CM connector terminal and fuse.
   Connector & terminal
   (i34) No. 2 — F/B fuse No. 3 (lower stream side):

Is the resistance less than 10 Ω?

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Replace the open circuit of harness between the immobilizer CM and fuse.

7. CHECK IMMOBILIZER CM.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [key-lock warning SW]

Does the display change in accordance with the ignition key removal/insertion?

Yes	Go to 8.
No	Check the key switch circuit. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CHECK KEY SWITCH CIRCUIT.

8. CHECK IMMOBILIZER CM.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer]. Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.



   - [Immobilizer indicator output]
2. Remove the ignition key from ignition switch.
3. Wait at least 60 seconds.

Is [BLINK] displayed?

Yes	Go to 9.
No	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.

9. CHECK SECURITY INDICATOR LIGHT.

1. Disconnect the connector from body integrated unit.
2. Connect the resistor (100 Ω) between the body integrated unit connector terminal (i171) No. 20 and chassis ground.

Does the security indicator light illuminate?

Yes	Go to 10.
No	Go to 12.

10. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT.

Measure the resistance between the body integrated unit connector terminal and chassis ground.

Connector & terminal

(B287) No. 1 — Chassis ground:

(i84) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 11.
No	Repair the open circuit of the body integrated unit ground circuit.

11. CHECK BODY INTEGRATED UNIT POWER SUPPLY CIRCUIT.

Measure the voltage between the body integrated unit connector terminal and chassis ground.

Connector & terminal

(B281) No. 7 (+) — Chassis ground (−):

(B280) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Check the harness for open or short circuit between body integrated unit and fuse.

12. CHECK COMBINATION METER CIRCUIT.

1. Remove the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
2. Measure the voltage between combination meter connector terminal and chassis ground.
   Connector & terminal
   (i10) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 13.
No	Check for an open or short circuit in the harness between the combination meter and fuse.

13. CHECK COMBINATION METER CIRCUIT.

Measure the resistance between the body integrated unit connector terminal and combination meter connector terminal.
Connector & terminal
(i171) No. 20 — (i10) No. 19:

Is the resistance less than 10 Ω?

Yes	LED bulb is defective. Replace the combination meter case assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>DISASSEMBLY.
No	Repair the harness or connector.

IMMOBILIZER (DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:
For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT COME ON". Ref. to IMMOBILIZER (DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

1. Engine Control System

If the communication with [Engine Control System] is not possible, refer to ENGINE (DIAGNOSTICS). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

2. Body Control

If the communication with [Body Control] is not possible, refer to BODY CONTROL SYSTEM (DIAGNOSTICS). Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

3. Immobilizer

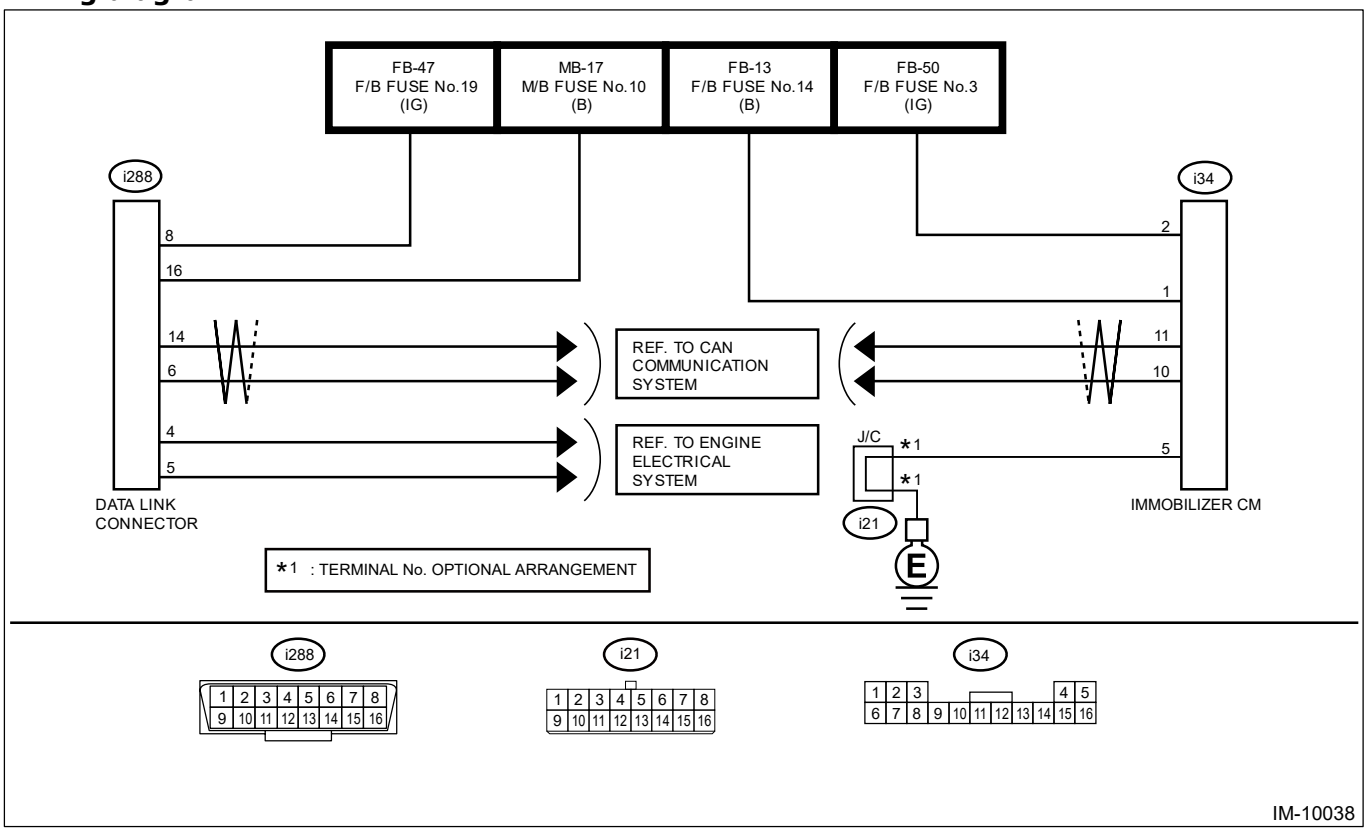
Detecting condition:

- Defective harness
- Power supply circuit malfunction
- Defective immobilizer CM
- Body integrated unit malfunctioning
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication with [Immobilizer] is faulty.

Wiring diagram:



1. CHECK FUSE.

Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the battery — immobilizer CM.

2. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for LAN system.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [BATT voltage]

Is the display 10 V or more?

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Go to 4.

4. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the immobilizer CM connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the immobilizer CM connector and chassis ground.

Connector & terminal

(i34) No. 2 (+) — Chassis ground (−):

(i34) No. 1 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 5.
No	Repair the open circuit of harness between the immobilizer CM connector and fuse.

5. CHECK HARNESS.

Using a tester, measure the resistance between the immobilizer CM connector and chassis ground.

Connector & terminal

(i34) No. 5 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness between the immobilizer CM connector and chassis ground.

6. CHECK IMMOBILIZER CM.

1. Turn the ignition switch to OFF.
2. Connect the immobilizer CM connector.
3. Perform communication with the immobilizer CM.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.

IMMOBILIZER (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor>LIST.**

IMMOBILIZER (DIAGNOSTICS) > Data Monitor

LIST

1. Engine Control System

For data monitor of [Engine Control System], refer to ENGINE (DIAGNOSTICS). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Data Monitor.

2. Body Control

Note:

Other than for C5

Refer to BODY CONTROL SYSTEM (DIAGNOSTICS) for the data monitor of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

3. Immobilizer

Note:

For C5

Items to be displayed	Content / display range	Standard	Note
Trip Count [count]	Time stamp information	—	—
Count	Time stamp information	—	—
Time Count [msec]	Time stamp information	—	—
BATT voltage	Immobilizer CM battery voltage	6 — 16 V	—
Ignition SW input	Ignition switch status	ON: When the switch is ON OFF: When the switch is OFF	—
key-lock warning SW	Key warning switch status	ON: When the switch is ON OFF: When the switch is OFF	—
Immobilizer indicator output	Security indicator output status	Turn Off: Indicator OFF Blink: Indicator blinking ON: Indicator ON blink (one): Registration of one ignition key	—

Items to be displayed	Content / display range	Standard	Note
		blink (two): Registration of two ignition keys blink (three): Registration of three ignition keys blink (four): Registration of four ignition keys	

IMMOBILIZER (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to IMMOBILIZER (DIAGNOSTICS)>Freeze Frame Data>LIST.**

IMMOBILIZER (DIAGNOSTICS) > Freeze Frame Data

LIST

1. Engine Control System

For freeze frame data of [Engine Control System], refer to ENGINE (DIAGNOSTICS). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Freeze Frame Data.

2. Body Control

Note:

Other than for C5

For freeze frame data of Body Control, refer to BODY CONTROL SYSTEM (DIAGNOSTICS). Ref. to BODY CONTROL(DIAGNOSTICS)>Freeze Frame Data.

3. Immobilizer

Note:

For C5

Item	Content / display range
Trip Count [count]	Time stamp information Ref. to COMMON(diag)>Time Stamp.
Count	
Time [msec]	
Battery Voltage	Immobilizer CM battery voltage
Ignition SW input	Ignition switch status
key-lock warning SW	Key warning switch status
Immobilizer indicator output	Security indicator output status
Immobilizer SET/ UNSET status	Immobilizer SET/UNSET status

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Note:

If DTCs irrelevant to the immobilizer are displayed, perform diagnosis according to the DTCs irrelevant to the immobilizer first.

1. Engine Control System

Code	Description & trouble part	Reference
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1576	ECM EEPROM	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.
B1577	IMMOBILIZER CM EEPROM	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.
B1578	METER	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1578 METER.

2. Body Control

Note:

Other than for C5

Code	Description & trouble part	Reference	Relation between ECM and DTC

Code	Description & trouble part	Reference	Relation between ECM and DTC
B1401	COMBINATION METER COLLATION	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1401 METER COLLATION.	B1578
B1402	IMMOBILIZER KEY COLLATION	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.	B1572
B1407	COMBINATION METER COMMUNICATION	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1407 MET COMMUNICATION.	B1578
B1408	COMBINATION METER NON-VOLATILE MEMORY	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1408 METER NON-VOLATILE MEMORY.	B1578
B1410	TRANSPONDER COMMUNICATION	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.	B1572
B1411	IMMOBILIZER ANTENNA	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.	B1572

Note:

The starter relay control is performed in immobilizer system. When the body integrated unit detects a nonconformity of reference code, it immediately outputs a starter relay cut signal to ECM, and then ECM stops the starter relay operation. In this case, engine does not start, and DTC is not recorded in ECM. Therefore, check DTC on the body integrated unit to identify the cause of the engine not starting.

3. Immobilizer

Note:

For C5

Code	Description & trouble part	Reference	Relation between ECM and DTC
B1402	IMMOBILIZER KEY	Ref. to IMMOBILIZER	B1572

Code	Description & trouble part	Reference	Relation between ECM and DTC
	COLLATION	(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.	
B1410	TRANSPONDER COMMUNICATION	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.	B1572
B1411	IMMOBILIZER ANTENNA	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.	B1572
B1412	IMMOBILIZER CONTROL MODULE CAN REGISTER STUCK	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1412 IMMOBILIZER CONTROL MODULE CAN REGISTER STUCK.	—
B1413	IMMOBILIZER CONTROL MODULE BATTERY POWER SUPPLY	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1413 IMMOBILIZER CONTROL MODULE BATTERY POWER SUPPLY.	—
B1414	IMMOBILIZER CONTROL MODULE NON-VOLATILE MEMORY	Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1414 IMMOBILIZER CONTROL MODULE NON-VOLATILE MEMORY.	B1577

Note:

The starter relay control is performed in immobilizer system. When the immobilizer CM detects a nonconformity of reference code, it immediately outputs a starter relay cut signal to ECM, and then ECM stops the starter relay operation. In this case, engine does not start, and DTC is not recorded in ECM. Therefore, check DTC on the immobilizer CM to identify the cause of the engine not starting.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1401 METER COLLATION

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Reference code incompatibility between combination meter and body integrated unit

Trouble symptom:
- Engine will not start.
- The security indicator illuminates.

Caution:

When the combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK COMBINATION METER REGISTRATION.

Perform registration of combination meter. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Currently, it is normal. (Combination meter registration is not complete.)
No	Refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. If the registration still does not work properly, replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1402 IMMOBILIZER KEY COLLATION

1. OTHER THAN FOR C5

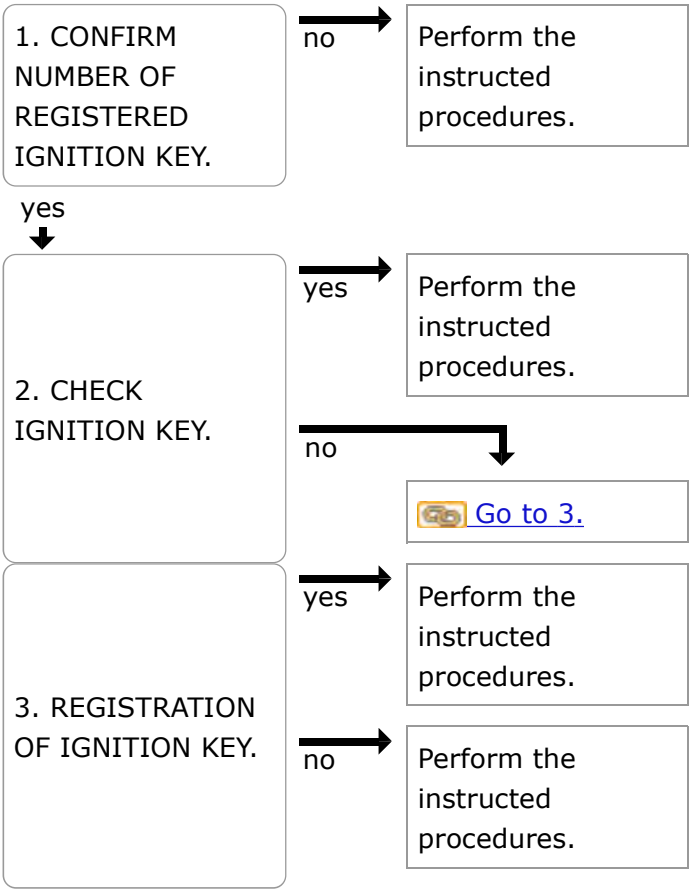
Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Use of unregistered key in body integrated unit.

Trouble symptom:
- Engine will not start.
- The security indicator illuminates, when the ignition key is inserted into the ignition switch or when the ignition switch is turned to ON.

Caution:

When the body integrated unit or combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.



1. CONFIRM NUMBER OF REGISTERED IGNITION KEY.

Using the Subaru Select Monitor, check the number of registered ignition keys. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is one or more ignition key(s) registered?

Yes	Go to 2.
No	Register the immobilizer.

2. CHECK IGNITION KEY.

1. Prepare all the pre-registered ignition keys.
2. Insert the ignition key in the ignition switch.
3. Turn the ignition switch to ON.
4. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



5. Perform step 2) to 4) with another registered ignition key.

Is DTC B1402 displayed for all ignition keys? (Current malfunction)

Yes	Refer to "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume, and perform the actions for the case that all keys are faulty/lost.
No	Go to 3.

3. REGISTRATION OF IGNITION KEY.

Register the key. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the key registration completed normally?

Yes	Malfunction occurred in ignition key.
No	Replace the ignition key.

2. FOR C5

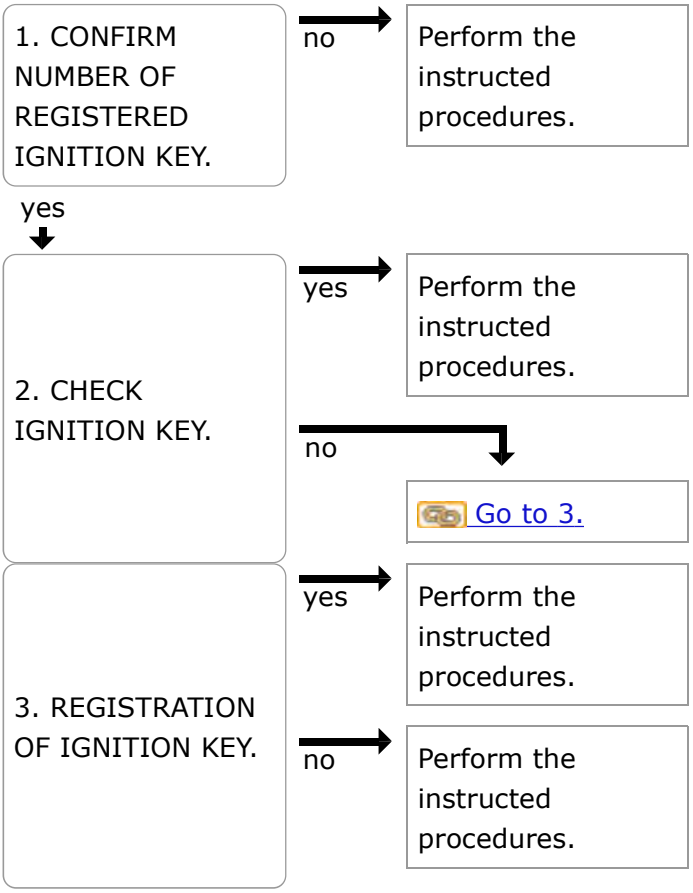
Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Use of unregistered key in immobilizer CM.

Trouble symptom:
- Engine will not start.
- The security indicator illuminates, when the ignition key is inserted into the ignition switch or when the ignition switch is turned to ON.

Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.



1. CONFIRM NUMBER OF REGISTERED IGNITION KEY.

Using the Subaru Select Monitor, check the number of registered ignition keys. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is one or more ignition key(s) registered?

Yes	Go to 2.
No	Register the immobilizer.

2. CHECK IGNITION KEY.

1. Prepare all the pre-registered ignition keys.
2. Insert the ignition key in the ignition switch.
3. Turn the ignition switch to ON.
4. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



5. Perform step 2) to 4) with another registered ignition key.

Is DTC B1402 displayed for all ignition keys? (Current malfunction)

Yes	Refer to "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume, and perform the actions for the case that all keys are faulty/lost.
No	Go to 3.

3. REGISTRATION OF IGNITION KEY.

Register the key. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the key registration completed normally?

Yes	Malfunction occurred in ignition key.
No	Replace the ignition key.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1407 MET COMMUNICATION

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Communication failure between body integrated unit and combination meter

Trouble symptom:
- Engine will not start.
- The security indicator illuminates.

Caution:
When the combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is a DTC other than DTC B1407 displayed for [Body Control]? (Current malfunction)

Yes	Perform the diagnosis for DTC other than B1407.
No	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1408 METER NON-VOLATILE MEMORY

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Defective combination meter

Trouble symptom:
- Engine will not start.
- The security indicator illuminates.

Caution:
When the combination meter is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK COMBINATION METER REGISTRATION.

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control] and [Combination Meter]. Ref. to COMMON(diag)>Clear memory.



2. Perform registration of combination meter. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.
3. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1408 displayed? (Current malfunction)

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1410 TRANSPONDER COMMUNICATION

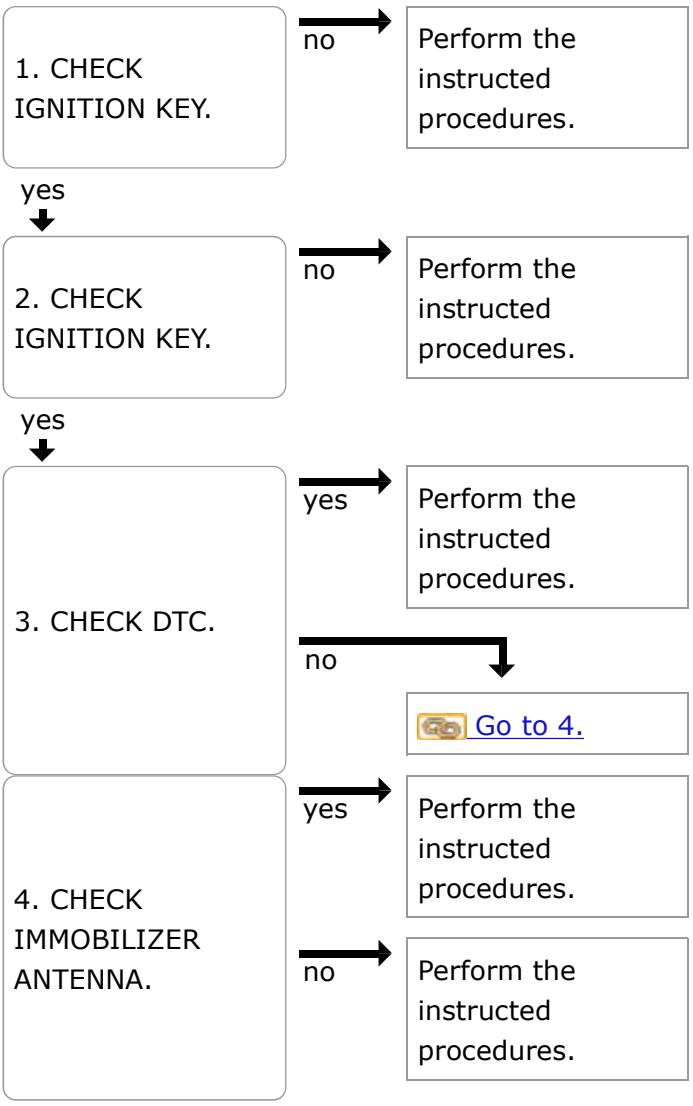
1. OTHER THAN FOR C5

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
Communication failure between ignition key and body integrated unit

Trouble symptom:
- Engine will not start.
- The security indicator illuminates.

Caution:
When the body integrated unit is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.


1. CHECK IGNITION KEY.
no
Perform the instructed procedures.
yes
2. CHECK IGNITION KEY.
no
Perform the instructed procedures.
yes
3. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 4.
4. CHECK IMMOBILIZER ANTENNA.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK IGNITION KEY.

1. Remove the ignition key from the ignition switch.
2. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **It is possible that the surrounding radio wave environment was poor.**

2. CHECK IGNITION KEY.

1. Prepare a spare ignition key that is already registered.
2. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
3. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Go to 3.
No	Malfunction occurred in ignition key. Or the key has not been registered.

3. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1411 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B1411. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.
No	Go to 4.

4. CHECK IMMOBILIZER ANTENNA.

1. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Malfunction occurred in the immobilizer antenna, ignition key or body integrated unit.

2. FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

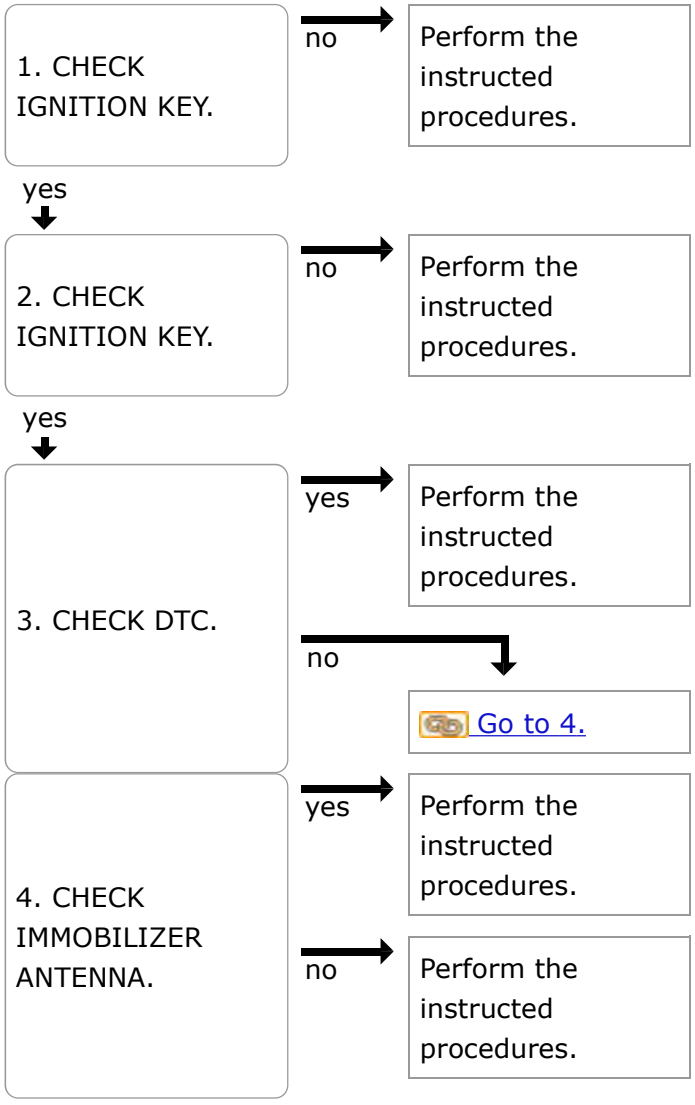
Communication failure between ignition key and immobilizer CM

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.



1. CHECK IGNITION KEY.

1. Remove the ignition key from the ignition switch.
2. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
3. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **It is possible that the surrounding radio wave environment was poor.**

2. CHECK IGNITION KEY.

1. Prepare a spare ignition key that is already registered.
2. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
3. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Go to 3.
No	Malfunction occurred in ignition key. Or the key has not been registered.

3. CHECK DTC.

Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1411 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B1411. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.
No	Go to 4.

4. CHECK IMMOBILIZER ANTENNA.

1. Insert the ignition key into the ignition switch, and then turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1410 displayed? (Current malfunction)

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Malfunction occurred in the immobilizer antenna, ignition key or immobilizer CM.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1411 IMMOBILIZER ANTENNA

1. OTHER THAN FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.

- The remote engine starter was not used to start the engine.

DTC detecting condition:

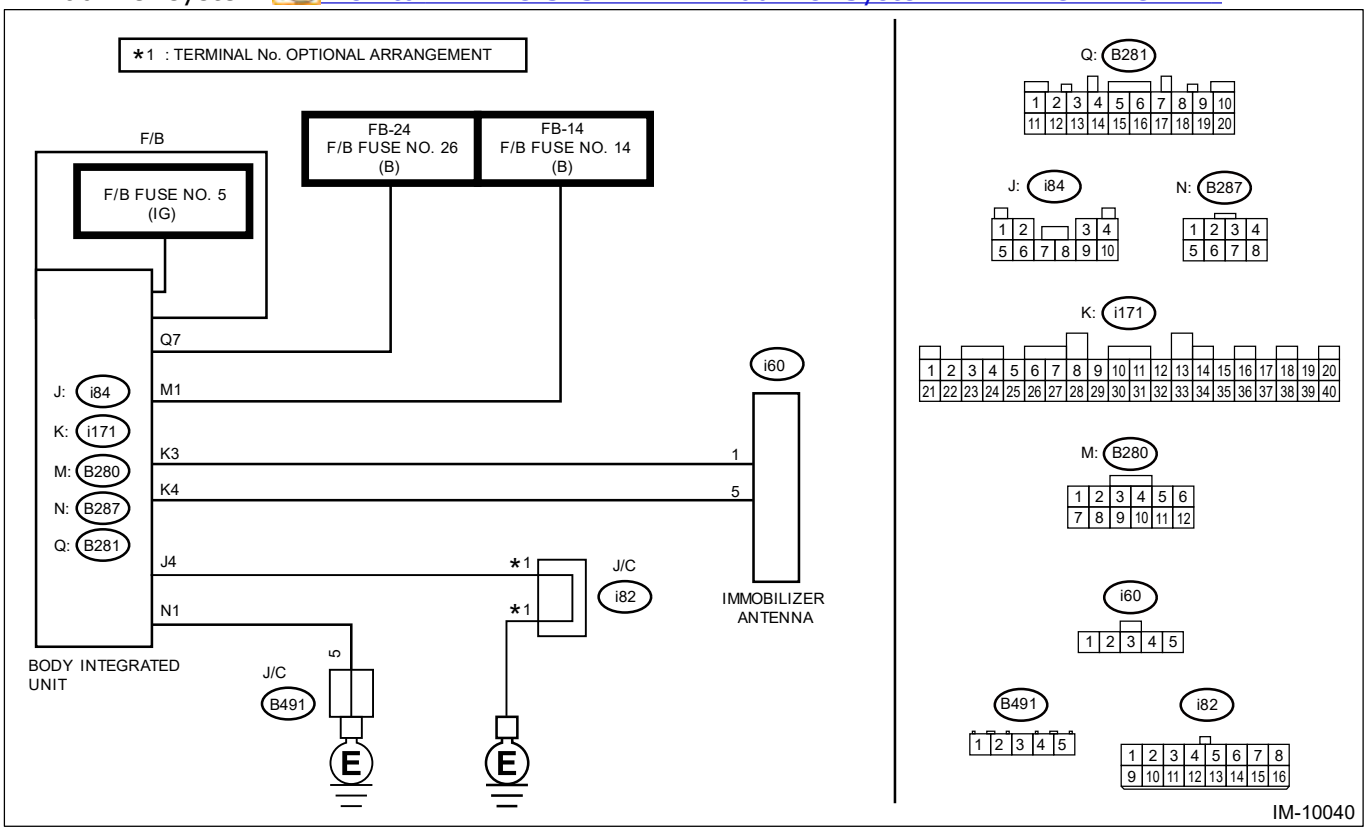
Received an immobilizer antenna malfunction signal during unit collation

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

When the body integrated unit is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK IMMOBILIZER ANTENNA UNIT.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK IMMOBILIZER ANTENNA COMMUNICATION CIRCUIT (OPEN CIRCUIT).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit to power supply in harness between the battery and body integrated unit.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Body Control].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [BATT voltage (control)]

Is the display 10 V or more?

Yes	Go to 3.
No	Check the power supply circuit for body integrated unit.

3. CHECK IMMOBILIZER ANTENNA UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from immobilizer antenna.
3. Using a tester, measure the resistance between the immobilizer antenna connector terminals.
   Connector & terminal
   No. 1 — No. 5:

Is the resistance less than 8 Ω?

Yes	Replace the immobilizer antenna. Ref. to SECURITY AND LOCKS>Immobilizer Antenna.
No	Go to 4.

4. CHECK IMMOBILIZER ANTENNA COMMUNICATION CIRCUIT (OPEN CIRCUIT).

1. Disconnect the connector from body integrated unit.
2. Measure the resistance between the body integrated unit connector and immobilizer antenna connector.

Connector & terminal

(i171) No. 3 — (i60) No. 1:

(i171) No. 4 — (i60) No. 5:

Is the resistance less than 10 Ω?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair or replace the open circuit of harness between the body integrated unit connector and immobilizer antenna connector.

2. FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

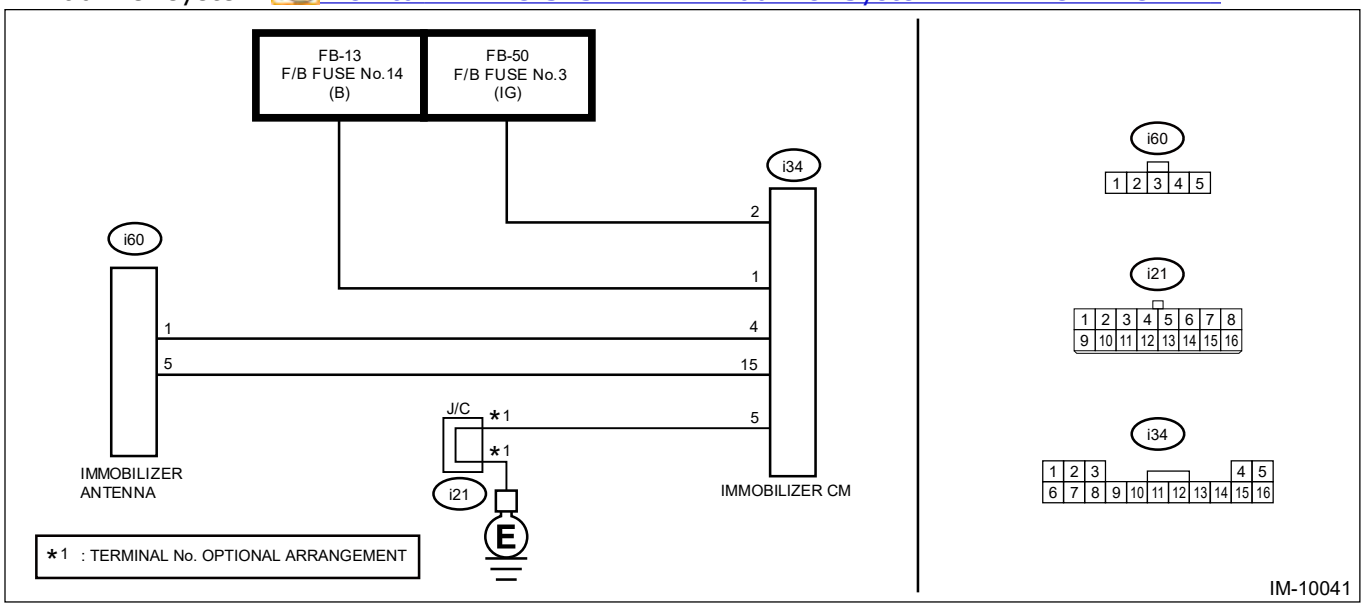
Immobilizer antenna is faulty.

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK IMMOBILIZER ANTENNA UNIT.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK IMMOBILIZER ANTENNA COMMUNICATION CIRCUIT (OPEN CIRCUIT).
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit to power supply in harness between the battery and immobilizer CM.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [BATT voltage]

Is the display 10 V or more?

Yes	Go to 3.
No	Check the power supply circuit of immobilizer CM.

3. CHECK IMMOBILIZER ANTENNA UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from immobilizer antenna.
3. Using a tester, measure the resistance between the immobilizer antenna connector terminals.
   Connector & terminal
   No. 1 — No. 5:

Is the resistance less than 8 Ω?

Yes	Replace the immobilizer antenna. Ref. to SECURITY AND LOCKS>Immobilizer Antenna.
No	Go to 4.

4. CHECK IMMOBILIZER ANTENNA COMMUNICATION CIRCUIT (OPEN CIRCUIT).

1. Disconnect the immobilizer CM connector.
2. Measure the resistance between immobilizer CM connector and immobilizer antenna connector.
   Connector & terminal
   (i34) No. 4 — (i60) No. 1:
   (i34) No. 15 — (i60) No. 5:

Is the resistance less than 10 Ω?

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Repair the open circuit of harness between the immobilizer CM connector and immobilizer antenna connector.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1412 IMMOBILIZER CONTROL MODULE CAN REGISTER STUCK

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
- Defective immobilizer CM
- Failed to access the ROM of immobilizer CM

Trouble symptom:
- The security indicator does not blink after the ignition key is turned to OFF.
- The security indicator remains off.

Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DTC.

1. Disconnect the ground cable from battery.
2. Wait for at least 10 seconds.
3. Connect the ground cable to battery.
4. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



5. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1412 displayed? (Current malfunction)

Yes	Go to 2.
No	Currently, it is normal.

2. CHECK DTC.

1. Disconnect the ground cable from battery.
2. Wait for at least 10 seconds.
3. Connect the ground cable to battery.
4. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



5. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1412 displayed? (Current malfunction)

Yes	Go to 3.
No	Currently, it is normal.

3. CHECK DTC.

1. Disconnect the ground cable from battery.
2. Wait for at least 10 seconds.
3. Connect the ground cable to battery.
4. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



5. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1412 displayed? (Current malfunction)

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Currently, it is normal.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1413 IMMOBILIZER CONTROL MODULE BATTERY POWER SUPPLY

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

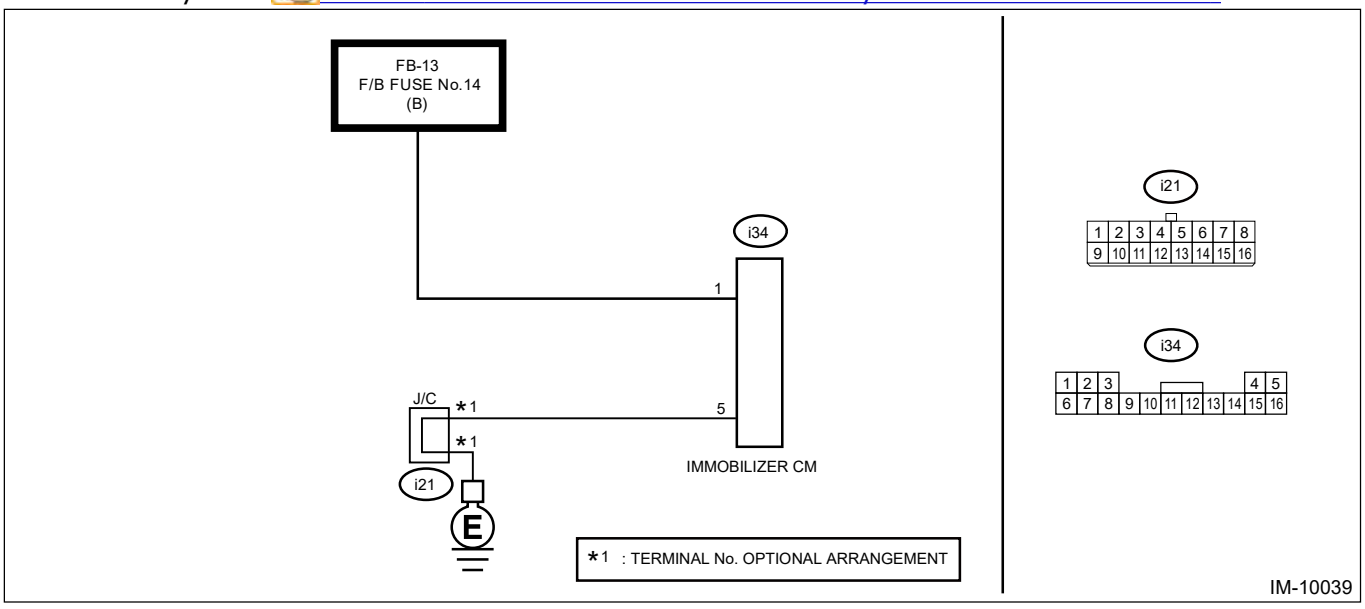
Battery voltage for the immobilizer CM was outside the specification for a certain period of time.

Trouble symptom:

The security indicator does not blink after the ignition key is turned to OFF.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit to power supply in harness between the battery and immobilizer CM.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [BATT voltage]

Is the display 10 V or more?

Yes	Go to 3.
No	Go to 5.

3. CHECK DATA MONITOR.

1. Disconnect the ground cable from battery.
2. Wait for at least 10 seconds.
3. Connect the ground cable to battery.
4. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer]. Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Battery Voltage]

Is the display 10 V or more?

Yes	Go to 4.
No	Go to 5.

4. CHECK DTC.

Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1413 displayed? (Current malfunction)

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

5. CHECK IMMOBILIZER CM POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the connector from immobilizer CM.
3. Measure the voltage between immobilizer CM connector and chassis ground.
   Connector & terminal
   (i34) No. 1(+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Repair the open circuit of harness between the immobilizer CM and fuse.

6. CHECK IMMOBILIZER CM GROUND CIRCUIT.

Measure the resistance between immobilizer CM connector and chassis ground.

Connector & terminal

(i34) No. 5(+) — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Repair the open circuit of harness between the immobilizer CM connector and chassis ground.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1414 IMMOBILIZER CONTROL MODULE NON-VOLATILE MEMORY

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

- Defective immobilizer CM
- Failed to access the ROM in immobilizer CM.

Trouble symptom:

Engine will not start.

Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK DTC.

1. Disconnect the ground cable from battery.
2. Wait for at least 10 seconds.
3. Connect the ground cable to battery.
4. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

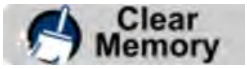


Is DTC B1414 displayed? (Current malfunction)

Yes	Go to 2.
No	The system has returned to a normal condition at this time. Finish the diagnosis.

2. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Immobilizer]. Ref. to COMMON(diag)>Clear memory.



2. Disconnect the ground cable from battery.
3. Wait for at least 10 seconds.
4. Connect the ground cable to battery.
5. Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1414 displayed? (Current malfunction)

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	The system has returned to a normal condition at this time. Finish the diagnosis.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)

1. OTHER THAN FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

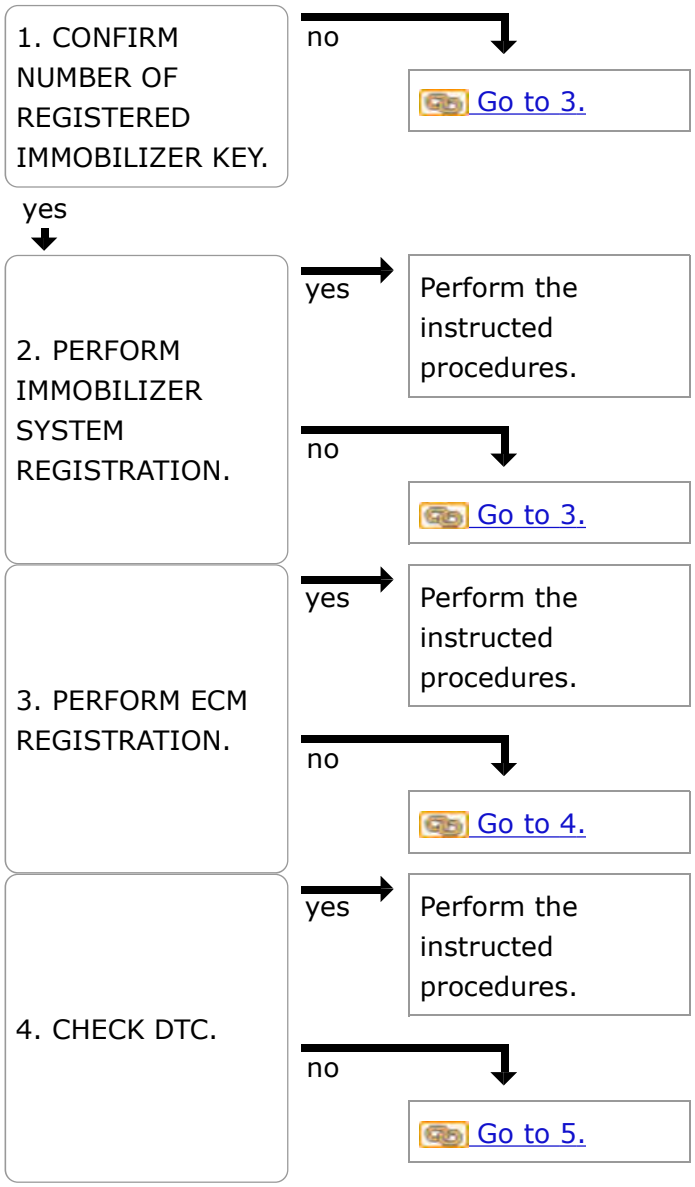
Reference code incompatibility between body integrated unit and ECM

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Caution:

When the body integrated unit or ECM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.



5. PERFORM ECM REGISTRATION.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CONFIRM NUMBER OF REGISTERED IMMOBILIZER KEY.

Confirm the number of registered immobilizer key. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the number of registration 0?

Yes	Go to 2.
No	Go to 3.

2. PERFORM IMMOBILIZER SYSTEM REGISTRATION.

Register the immobilizer system. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 3.

3. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 4.

4. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are DTCs other than DTC B1571 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B1571.
No	Go to 5.

5. PERFORM ECM REGISTRATION.

1. Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. If the registration still does not work properly, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

2. FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

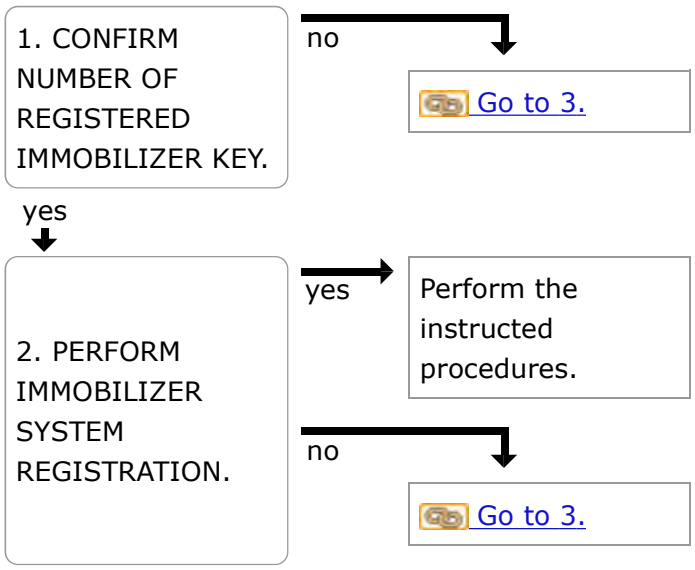
Reference code incompatibility between immobilizer CM and ECM

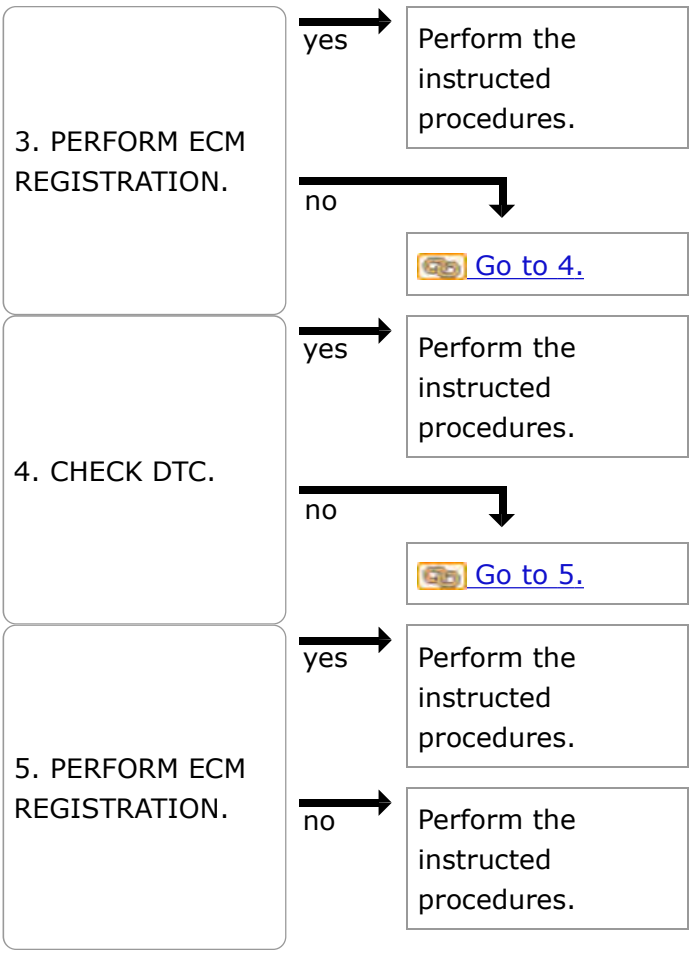
Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Caution:

When the immobilizer CM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.





1. CONFIRM NUMBER OF REGISTERED IMMOBILIZER KEY.

Confirm the number of registered immobilizer key. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is the number of registration 0?

Yes	Go to 2.
No	Go to 3.

2. PERFORM IMMOBILIZER SYSTEM REGISTRATION.

Register the immobilizer system. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 3.

3. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 4.

4. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are DTCs other than DTC B1571 displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than DTC B1571.
No	Go to 5.

5. PERFORM ECM REGISTRATION.

1. Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. If the registration still does not work properly, replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT

1. OTHER THAN FOR C5

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

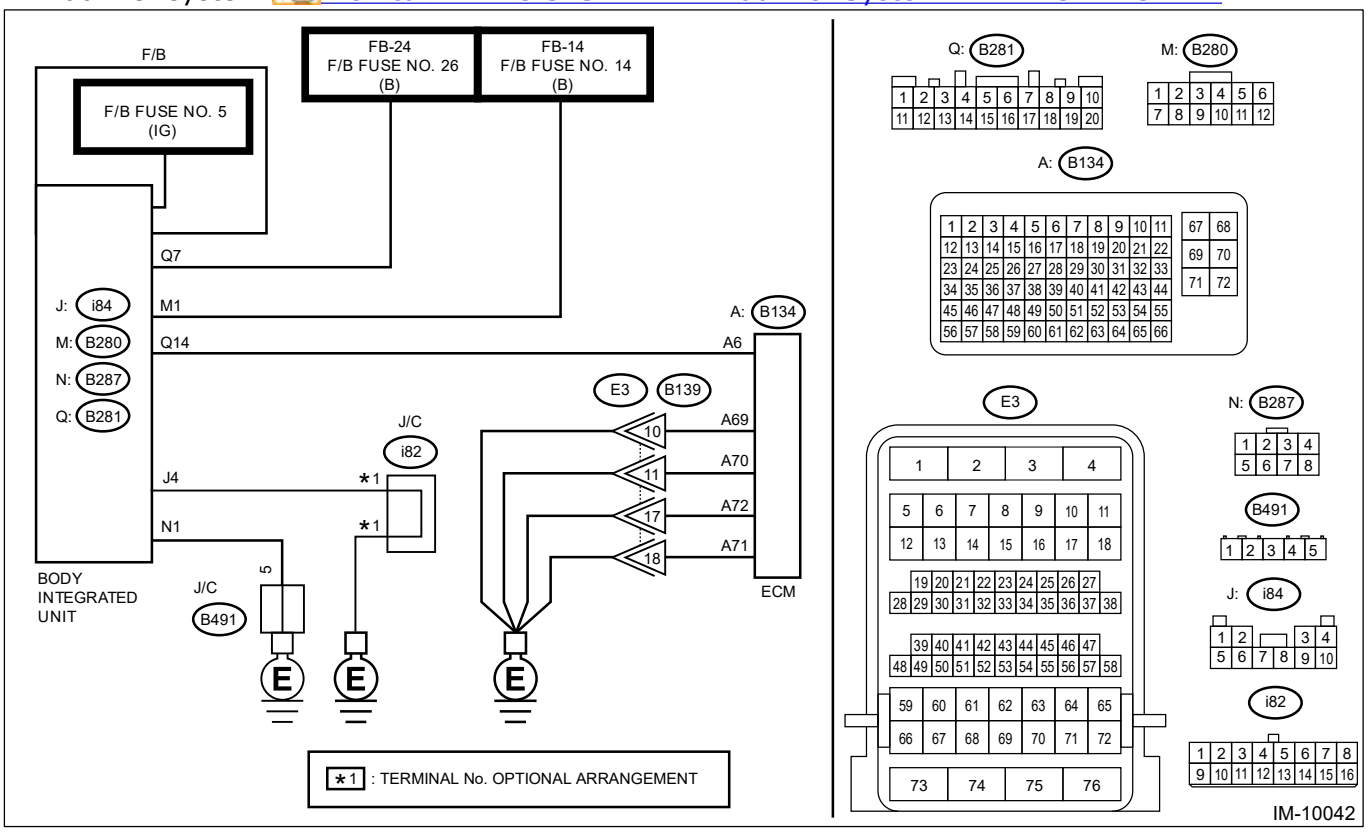
Communication failure between body integrated unit and ECM

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

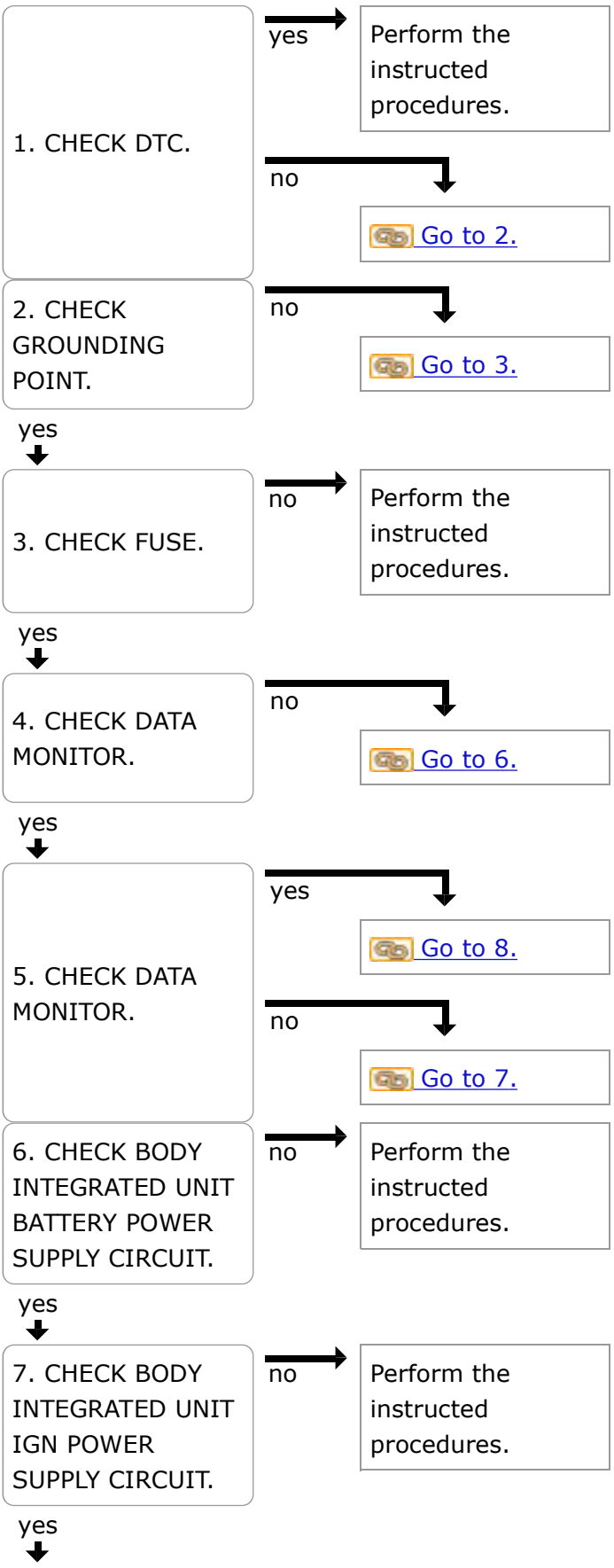
Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

When the body integrated unit or ECM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.


1. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 2.
2. CHECK GROUNDING POINT.
no
Go to 3.
yes
3. CHECK FUSE.
no
Perform the instructed procedures.
yes
4. CHECK DATA MONITOR.
no
Go to 6.
yes
5. CHECK DATA MONITOR.
yes
Go to 8.
no
Go to 7.
6. CHECK BODY INTEGRATED UNIT BATTERY POWER SUPPLY CIRCUIT.
no
Perform the instructed procedures.
yes
7. CHECK BODY INTEGRATED UNIT IGN POWER SUPPLY CIRCUIT.
no
Perform the instructed procedures.
yes

8. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

9. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

10. CHECK HARNESS (OPEN CIRCUIT) BETWEEN BODY INTEGRATED UNIT AND ECM.

no → Perform the instructed procedures.

yes ↓

11. CHECK COMMUNICATION LINE HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 12.

12. CHECK COMMUNICATION CIRCUIT HARNESS (SHORT CIRCUIT TO GROUND).

yes → Perform the instructed procedures.

no → Go to 13.

13. CHECK ECM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC for [Body Control] displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface? Are there any oil-soiled areas?

Yes	Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Read the DTC Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)., and when DTC B1572 is still displayed, Go to 3.
No	Go to 3.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit to power supply in harness between the battery and body integrated unit.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Body Control].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.



- [BATT voltage (control)]

Is the display 10 V or more?

Yes — Go to 5.

No — Go to 6.

5. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Body Control].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.



- [IGN voltage]

Is the display 10 V or more?

Yes — Go to 8.

No — Go to 7.

6. CHECK BODY INTEGRATED UNIT BATTERY POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Measure the voltage between body integrated unit connector and chassis ground.
   Connector & terminal
   (B281) No. 7 (+) — Chassis ground (−):
   (B280) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 7.
No	Repair the open or short circuit of harness between the body integrated unit connector and fuse.

7. CHECK BODY INTEGRATED UNIT IGN POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between F/B fuse No. 5 and chassis ground.
   Connector & terminal
   F/B fuse No. 5 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the open or short circuit of harness between the body integrated unit connector and ignition switch.

8. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between body integrated unit connector and chassis ground.
   Connector & terminal
   (B287) No. 1 — Chassis ground:
   (i84) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the open circuit of harness between the body integrated unit connector and chassis ground.

9. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the ECM connector.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B134) No. 69 — Engine ground:
   (B134) No. 70 — Engine ground:
   (B134) No. 72 — Engine ground:
   (B134) No. 71 — Engine ground:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit in harness between ECM connector and chassis ground.

10. CHECK HARNESS (OPEN CIRCUIT) BETWEEN BODY INTEGRATED UNIT AND ECM.

1. Disconnect the ECM connector.
2. Measure the resistance between the body integrated unit connector and ECM.
   Connector & terminal
   (B281) No. 14 — (B134) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 11.
No	Repair the open circuit of harness between the body integrated unit connector and ECM.

11. CHECK COMMUNICATION LINE HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Disconnect the body integrated unit connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B134) No. 6 (+) — Chassis ground (-):

Is the voltage 6 V or more?

Yes	Repair the short circuit to power supply in harness between body integrated unit connector and ECM connector.
No	Go to 12.

12. CHECK COMMUNICATION CIRCUIT HARNESS (SHORT CIRCUIT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B134) No. 6 — Chassis ground:
   (B134) No. 6 — Engine ground:

Is the resistance less than 10 Ω?

Yes	Repair the ground short circuit of harness between body integrated unit connector and ECM connector.
No	Go to 13.

13. CHECK ECM.

1. Replace the ECM. (Do not perform ECM registration.) Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
2. Connect all connectors.
3. Turn the ignition switch to ON.
4. Wait for 5 seconds.
5. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1572 displayed? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Register the ECM. Refer to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume.

2. FOR C5

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

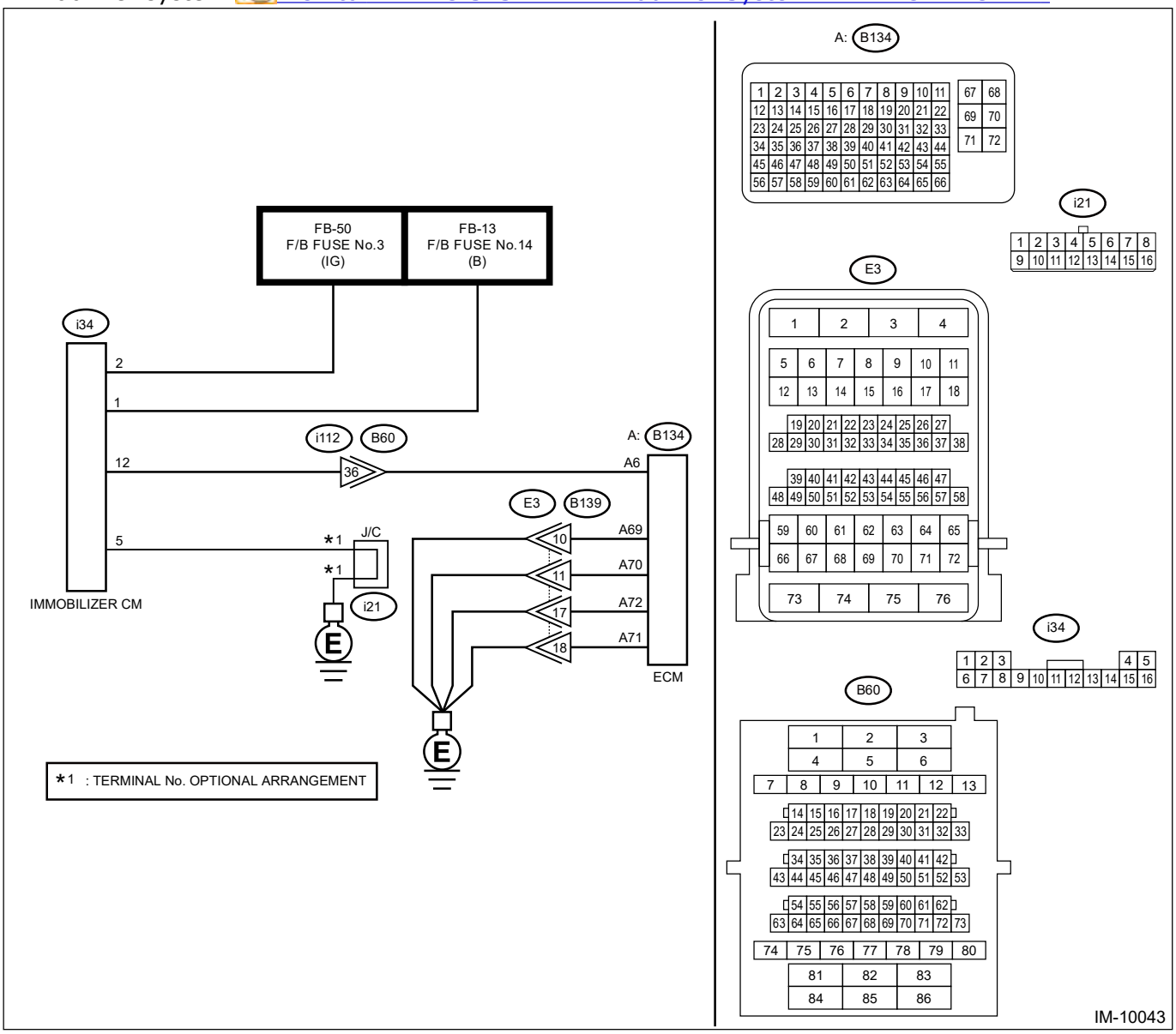
Communication failure between immobilizer CM and ECM

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

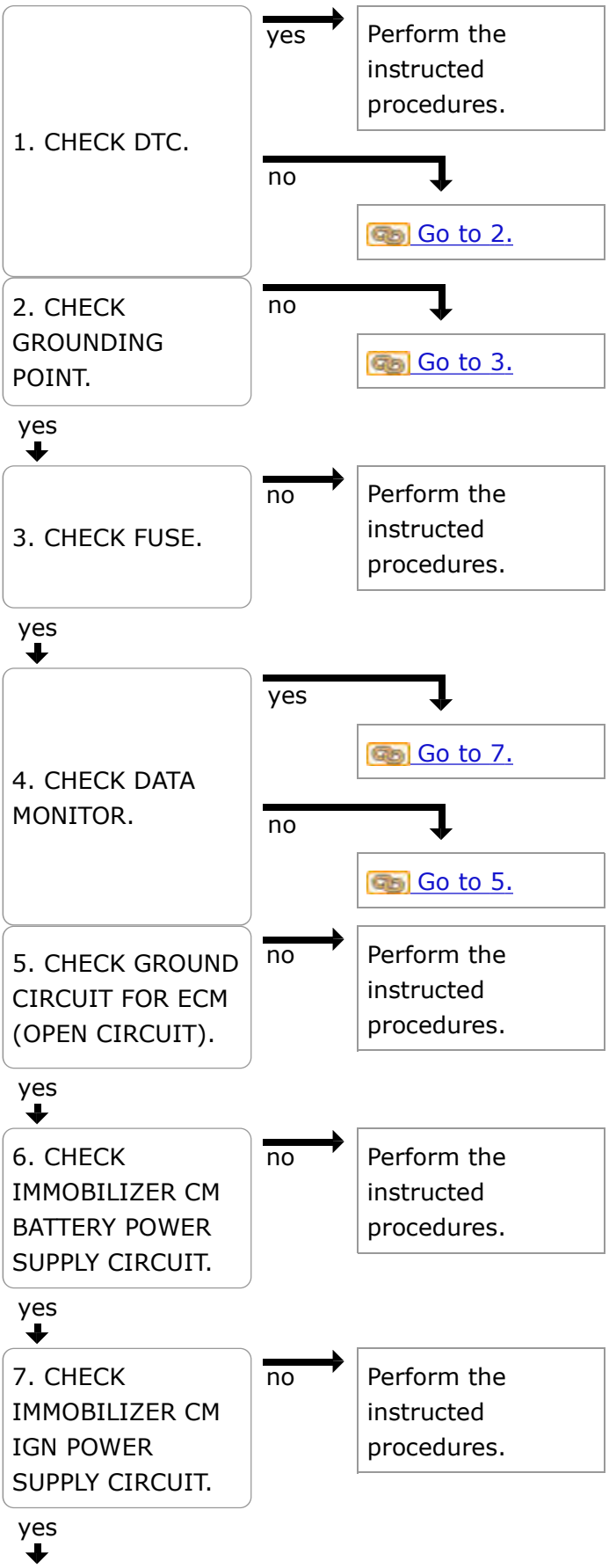
Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

When the immobilizer CM or ECM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.


1. CHECK DTC.
yes
Perform the instructed procedures.
no
Go to 2.
2. CHECK GROUNDING POINT.
no
Go to 3.
yes
3. CHECK FUSE.
no
Perform the instructed procedures.
yes
4. CHECK DATA MONITOR.
yes
Go to 7.
no
Go to 5.
5. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
6. CHECK IMMOBILIZER CM BATTERY POWER SUPPLY CIRCUIT.
no
Perform the instructed procedures.
yes
7. CHECK IMMOBILIZER CM IGN POWER SUPPLY CIRCUIT.
no
Perform the instructed procedures.
yes

8. CHECK IMMOBILIZER CM GROUND CIRCUIT (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

9. CHECK HARNESS BETWEEN IMMOBILIZER CM AND ECM (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

10. CHECK COMMUNICATION LINE HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

yes → Perform the instructed procedures.

no → Go to 11.

11. CHECK COMMUNICATION CIRCUIT HARNESS (SHORT CIRCUIT TO GROUND).

yes → Perform the instructed procedures.

no → Go to 12.

12. CHECK ECM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Immobilizer] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC for [Immobilizer] displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface? Are there any oil-soiled areas?

Yes	Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Read the DTC Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)., and when DTC B1572 is still displayed, Go to 3.
No	Go to 3.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the fuse. If the fuse blows out easily, repair the short circuit to power supply in harness between the battery and immobilizer CM.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Immobilizer].
Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.



- [Battery Voltage]

Is the display 10 V or more?

Yes	Go to 7.
No	Go to 5.

5. CHECK GROUND CIRCUIT FOR ECM (OPEN CIRCUIT).

1. Disconnect the ECM connector.
2. Measure the resistance between the ECM connector and engine ground.
   Connector & terminal
   (B134) No. 69 — Engine ground:
   (B134) No. 70 — Engine ground:
   (B134) No. 72 — Engine ground:
   (B134) No. 71 — Engine ground:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair the open circuit in harness between ECM connector and chassis ground.

6. CHECK IMMOBILIZER CM BATTERY POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the immobilizer CM connector.
3. Measure the voltage between immobilizer CM connector and chassis ground.
   Connector & terminal
   (i34) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 7.
No	Repair the open or short circuit of harness between the immobilizer CM connector and fuse.

7. CHECK IMMOBILIZER CM IGN POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Measure the voltage between immobilizer CM connector and chassis ground.
   Connector & terminal
   (i34) No. 2 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 8.
No	Repair the open or short circuit of harness between the immobilizer CM connector and ignition switch.

8. CHECK IMMOBILIZER CM GROUND CIRCUIT (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Measure the resistance between immobilizer CM connector and chassis ground.
   Connector & terminal
   (i34) No. 5 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the open circuit of harness between the immobilizer CM connector and chassis ground.

9. CHECK HARNESS BETWEEN IMMOBILIZER CM AND ECM (OPEN CIRCUIT).

Measure the resistance between immobilizer CM connector and ECM connector.
Connector & terminal
(i34) No. 12 — (B134) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 10.
No	Repair the open circuit of harness between the immobilizer CM connector and ECM.

10. CHECK COMMUNICATION LINE HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between ECM connector and engine ground.
   Connector & terminal
   (B134) No. 6 (+) — Engine ground (-):

Is the voltage 6 V or more?

Yes	Repair the short circuit to power supply in harness between immobilizer CM connector and ECM connector.
No	Go to 11.

11. CHECK COMMUNICATION CIRCUIT HARNESS (SHORT CIRCUIT TO GROUND).

1. Turn the ignition switch to OFF.
2. Measure the resistance between immobilizer CM connector and each ground.
   Connector & terminal
   (i34) No. 12 — Chassis ground:
   (I34) No. 12 — Engine ground:

Is the resistance less than 10 Ω?

Yes	Repair the short circuit to ground in harness between immobilizer CM connector and ECM connector.
No	Go to 12.

12. CHECK ECM.

1. Replace the ECM. (Do not perform ECM registration.) Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
2. Connect all connectors.
3. Turn the ignition switch to ON.
4. Wait for 5 seconds.
5. Read the DTC of [Engine Control System] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1572 displayed? (Current malfunction)

Yes	Replace the immobilizer CM. Ref. to SECURITY AND LOCKS>Immobilizer Control Module.
No	Malfunction occurred in ECM. Register the ECM. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1576 EGI CONTROL MODULE EEPROM

Diagnosis start condition:
- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:
- ECM malfunctioning
- Failed to access ROM in ECM during key registration.

Trouble symptom:
- Engine will not start.
- The security indicator illuminates.

Caution:

When the ECM is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 2.

2. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 3.

3. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. If the registration still does not work properly, replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1577 IMM CONTROL MODULE EEPROM

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

- Defective body integrated unit (except for C5 model) or immobilizer CM (C5 model)
- Failed to access ROM in the body integrated unit (except for C5 model) or the immobilizer CM (C5 model)

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

Caution:

When the body integrated unit (except for C5 model) or the immobilizer CM (C5 model) is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Finish the diagnosis.
No	Go to 2.

2. PERFORM ECM REGISTRATION.

1. Using the Subaru Select Monitor, perform the clear memory of [Engine] and [Immobilizer].
   Ref. to COMMON(diag)>Clear memory.

2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is registration complete?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. If the registration still does not work properly, replace the following parts. • Body integrated unit (except for C5 model) Ref. to SECURITY AND LOCKS>Body Integrated Unit. • Immobilizer CM (C5 model) Ref. to SECURITY AND LOCKS>Immobilizer Control Module.

IMMOBILIZER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1578 METER

Diagnosis start condition:

- Battery voltage is 10 V or more.
- The remote engine starter was not used to start the engine.

DTC detecting condition:

Reference code incompatibility between combination meter and body integrated unit or communication failure between body integrated unit and ECM

Trouble symptom:

- Engine will not start.
- The security indicator illuminates.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1401, B1407, or B1408 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B1401, B1407 or B1408.
No	Perform the diagnosis of DTC B1572. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.

INSPECTION

1. CHECK KEY SWITCH CIRCUIT

Trouble symptom:

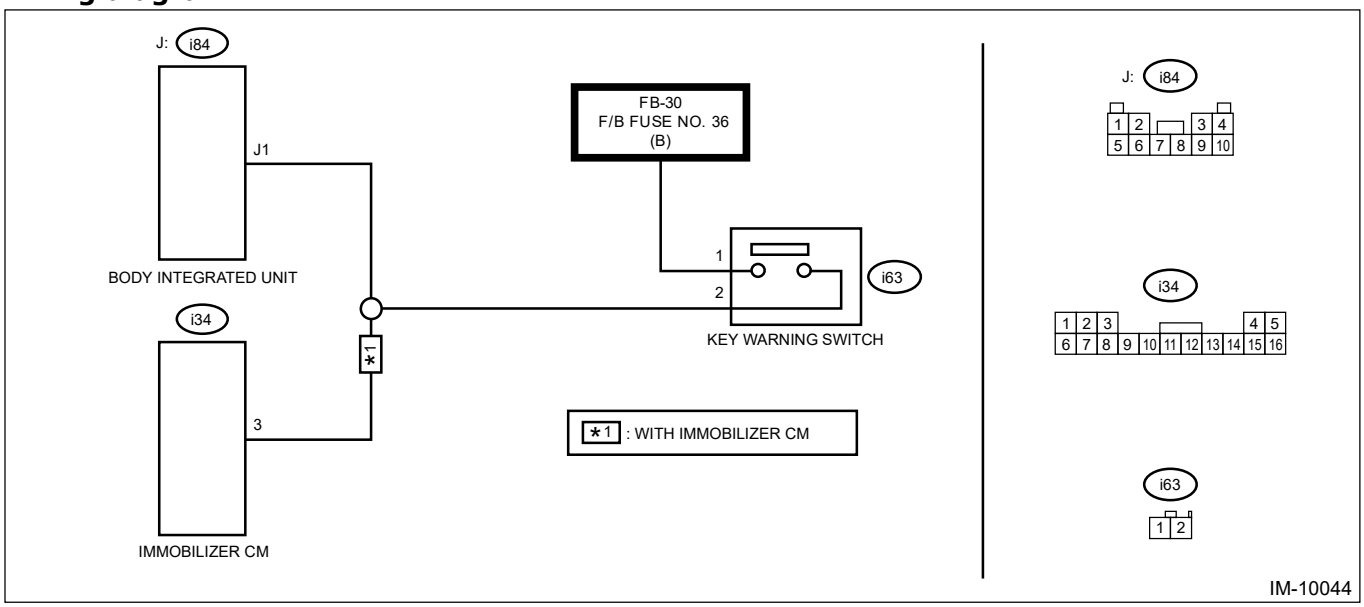
Engine does not start.

Trouble causes:

- Key warning switch circuit malfunction
- Key warning switch malfunction

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.

Wiring diagram:



Caution:

When the body integrated unit (except for C5 model) or the immobilizer CM (C5 model) is replaced, registration of the immobilizer system is required. For details, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

1. CHECK POWER SUPPLY CIRCUIT.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK KEY WARNING SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK KEY WARNING SWITCH.

no → Perform the instructed procedures.

yes ↓

4. CHECK DATA MONITOR.

yes → Perform the instructed procedures.

no → Go to 5.

5. CHECK HARNESS BETWEEN KEY WARNING SWITCH AND BODY INTEGRATED UNIT (EXCEPT FOR C5 MODEL) OR IMMOBILIZER CM (C5 MODEL).

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the connector from key warning switch.
2. Measure the voltage between key warning switch connector terminal and chassis ground.

Connector & terminal

(i63) No. 1 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Check the harness for an open or short between the key warning switch and fuse.

2. CHECK KEY WARNING SWITCH.

1. Insert the ignition key in the ignition switch. (OFF or ACC)
2. Measure the resistance between key warning switch connector terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Replace the key warning switch. Ref. to SECURITY AND LOCKS>Key Lock Cylinders.

3. CHECK KEY WARNING SWITCH.

1. Remove the ignition key from ignition switch.
2. Measure the resistance between key warning switch connector terminals.
   Terminals
   No. 1 — No. 2:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Replace the key warning switch. Ref. to SECURITY AND LOCKS>Key Lock Cylinders.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items under the [Data monitor] of [Body Control] or [Immobilizer]. Ref. to IMMOBILIZER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [key-lock warning SW] (body integrated unit)
- [key-lock warning SW Input] (immobilizer CM)

Is the display 10 V or more?

Yes	Replace the body integrated unit (except for C5 model) Ref. to SECURITY AND LOCKS>Body Integrated Unit. or the immobilizer CM (C5 model) Ref. to SECURITY AND LOCKS>Immobilizer Control Module..
No	Go to 5.

5. CHECK HARNESS BETWEEN KEY WARNING SWITCH AND BODY INTEGRATED UNIT (EXCEPT FOR C5 MODEL) OR IMMOBILIZER CM (C5 MODEL).

1. Disconnect the connector from the body integrated unit (except for C5 model) or the immobilizer CM (C5 model).
2. Measure the resistance between key warning switch connector terminal and body integrated unit (except for C5 model) or immobilizer CM (C5 model) connector terminal.
   Connector & terminal
   Body integrated unit (except for C5 model)
   (i63) No. 2 — (i84) No. 1:
   Immobilizer CM (C5 model)
   (i63) No. 2 — (i34) No. 3:

Is the resistance less than 10 Ω?

Yes	Replace the body integrated unit (except for C5 model) Ref. to SECURITY AND LOCKS>Body Integrated Unit. or the immobilizer CM (C5 model) Ref. to SECURITY AND LOCKS>Immobilizer Control Module..
No	Repair harness between key warning switch and body integrated unit (except for C5 model) or immobilizer CM (C5 model).

LAN SYSTEM (DIAGNOSTICS)

LAN(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Diagnostic Procedure for Subaru Select Monitor Communication
7. CAN bus check
8. CAN Communication Circuit Check
9. Diagnostic Trouble Code (DTC)
10. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
11. Diagnostics with Phenomenon

LAN SYSTEM (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

- **Remove foreign matter (dust, water, oil, etc.) from each control module connector during removal and installation.**
- **Registration of immobilizer may be needed after the replacement of control modules, etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

Note:

- **Check harness for open or short circuits, shake the suspected trouble spot or connector.**
- **Perform the diagnosis, and when the control module is replaced as a result of judgment that malfunction is the control module, re-check that the control module was actually malfunctioning. Replace to a new control module, and confirm that the malfunction is eliminated. Then, install the previously removed control module again and check that the malfunction reproduces again.**

1. CHECK PRE-INSPECTION.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to LAN SYSTEM (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION (CAN DIAGNOSTIC IS NOT USED).

Check the power supply circuit of the module which might affect CAN communication problem. Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>INSPECTION > INSPECTION WITHOUT USING CAN DIAGNOSTIC.

Is the power supply circuit of each module that is performing CAN communication normal?

Yes	Go to 3.
No	Repair or replace the faulty portion, and Go to 3.

3. BASIC INSPECTION (CAN DIAGNOSTIC IS USED).

Check the registration status of the body integrated unit which might affect CAN communication problem. Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>INSPECTION > INSPECTION USING CAN DIAGNOSTIC.

Does the registration status of the body integrated unit match with the vehicle specification? (When the Subaru Select Monitor and the body integrated unit cannot communicate, and the registration status cannot be checked, Go to 5.)

Yes	Go to 4.
No	Match the registration status of the body integrated unit with the vehicle specification, and Go to 4.

4. CHECK COMMUNICATION FOR INITIALIZING.

Communicate with the all systems by connecting the Subaru Select Monitor.

Is the communication for initializing finished for all modules?

Yes	Go to 5.
No	Check the error of communication for initializing. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION.

5. CHECK DTC.

1. Start the engine and read all DTCs.



Note:

- **When the engine does not start, perform the diagnosis for the engine start malfunction. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon.**
- **For detailed operation procedures, refer to "Application help".**

2. Record all DTCs (current malfunction and past malfunction), time stamp and freeze frame data.

Note:

For time stamp, refer to "TIME STAMP" of Common (Diagnostics). Ref. to COMMON(diag)>Time Stamp.

Is DTC U**** displayed on Subaru Select Monitor? (Current malfunction)

Yes	Go to 6.
No	Using the diagnostics with phenomenon, perform inspection. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon.

6. CHECK USING THE DTC CHECK SHEET.

Perform the inspection using the DTC check sheet. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST > CHECK USING THE DTC CHECK SHEET.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness. And then, Go to 7.
No	Perform the diagnosis for the displayed DTCs. And then, Go to 7.

7. PERFORM DIAGNOSIS.

1. Using the Subaru Select Monitor, perform the clear memory of all DTCs. Ref. to COMMON(diag)>Clear memory.



2. Start the engine and read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat the Basic Diagnostic Procedure from the beginning until DTC is not shown.
No	Finish the diagnosis.

CHECK

Inspect the following items regarding the vehicle’s state.

1. DISPLAY STATUS IN THE COMBINATION METER

Display status in the combination meter	Engine coolant temperature gauge display	❑ OK / ❑ NG
	Fuel gauge display	❑ OK / ❑ NG
	Tachometer display	❑ Normal /❑ Abnormal (0 rpm at idling, etc.)
Display of other indicators	Malfunction indicator light	❑ ON / ❑ Blink / ❑ OFF
	Sport indicator light (AT warning light)	❑ ON / ❑ Blink / ❑ OFF
	ABS warning light	❑ ON / ❑ Blink / ❑ OFF
	VDC warning light	❑ ON / ❑ Blink / ❑ OFF
	Security indicator light	❑ ON / ❑ Blink / ❑ OFF
	AT OIL TEMP warning light	❑ ON / ❑ Blink / ❑ OFF
	Tire pressure warning light	❑ ON / ❑ Blink / ❑ OFF
	Engine coolant temperature warning light	❑ Blue light ON / ❑ Red light ON / ❑ Red light blinks / ❑ Blue and red lights blink
	CRUISE indicator	❑ ON / ❑ Blink / ❑ OFF
	Shift indicator	❑ OK / ❑ NG
	Fuel level warning light	❑ ON / ❑ Blink / ❑ OFF
	Airbag warning light	❑ ON / ❑ OFF
	VDC OFF indicator	❑ ON / ❑ OFF
	Brake warning light	❑ ON / ❑ OFF
	EyeSight warning light	❑ ON / ❑ Blink / ❑ OFF
	Lane departure warning OFF indicator light	❑ ON / ❑ OFF
	Pre-collision brake OFF indicator light	❑ ON / ❑ OFF
	Headlight beam leveler indicator	❑ ON / ❑ OFF

2. CONDITIONS UNDER WHICH TROUBLE OCCURS

Driving condition	❑ At standstill (while idling)	
	❑ When the vehicle is running	Vehicle speed km/h (MPH)
	❑ While accelerating	Acceleration km/h (MPH) to km/h (MPH)
	❑ Decelerating (with braking)	Deceleration km/h (MPH) to km/h (MPH)
	❑ Decelerating (without braking)	Deceleration km/h (MPH) to km/h (MPH)
	❑ Flat road ❑ Uphill ❑ Downhill	

❑ Gravel road
❑ Bumpy road
❑ Snowy road

Does it occur when operating any part?
Operated part:
Trouble symptom:

Are there any other troubles occurred?
From where:
Trouble symptom:

LAN SYSTEM (DIAGNOSTICS) > General Description

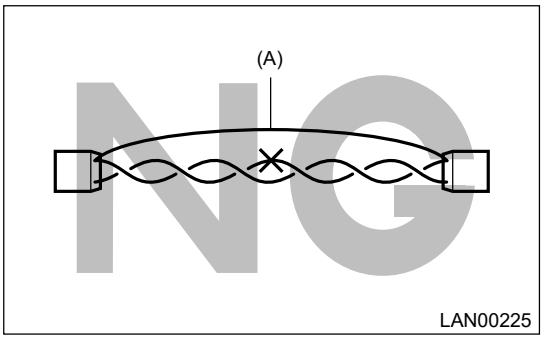
CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

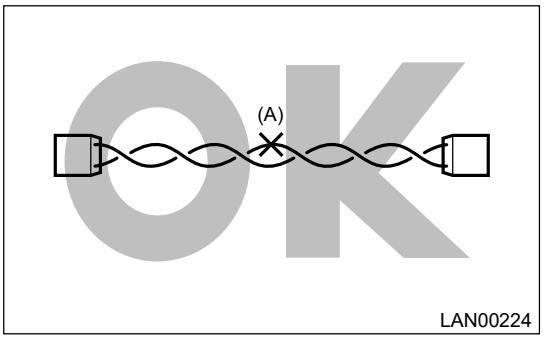
2. LAN SYSTEM

- Bus line of LAN system is twisted pair line. Be careful not to by-pass or partly unbind the twisted pair line.
- Do not make clearance between bus lines (CAN High, CAN Low).
- Difference of bus line length should be within 10 cm (3.94 in).
- Fray near the connector should be within 8 cm (3.14 in).



(A) Bypass wire connection

- If the characteristics of the twisted pair line are changed, it may extremely weaken against noise.
- When repairing the harness, connect the wires using soldering and protect it with electrical tape etc.



(A) Soldering and protection with electrical tape

3. TIME STAMP

There are three types of record data for the information of time stamp, and they are stored together with diagnostic codes. For time stamp, refer to Common (Diagnostics). Ref. to COMMON(diag)>Time Stamp.

LAN SYSTEM (DIAGNOSTICS) > General Description

INSPECTION

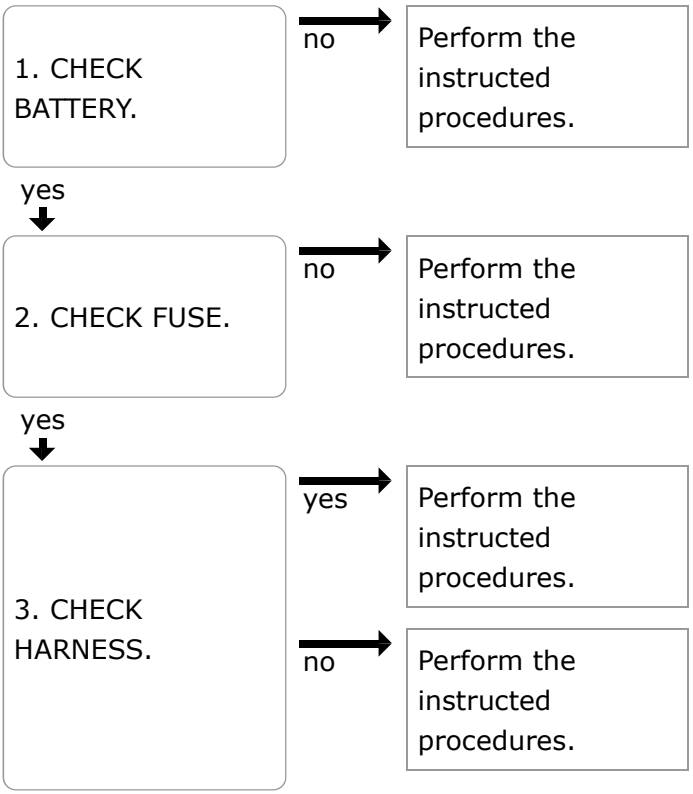
1. INSPECTION WITHOUT USING CAN DIAGNOSTIC

Trouble causes:

- Electrical system malfunction
- Faulty harness and harness connector

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION.



1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK FUSE.

Check the fuse which might affect the problem.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse. If the replaced fuse blows out easily, some type of fault is present. Therefore, repair the faulty portion.

3. CHECK HARNESS.

Check the harness and harness connector connection which might affect the problem.

Is the check result OK?

Yes	Go to step 3 in the Basic Diagnostic Procedure. Ref. to LAN SYSTEM (DIAGNOSTICS) > Basic Diagnostic Procedure > PROCEDURE > >FLOW1>BASIC INSPECTION (CAN DIAGNOSTIC IS USED)..
No	Repair or replace the faulty harness or harness connector.

2. INSPECTION USING CAN DIAGNOSTIC

Trouble causes:

Improper body integrated unit setting

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK BODY INTEGRATED UNIT REGISTRATION STATUS.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK BODY INTEGRATED UNIT CUSTOMIZE SETTING.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK FACTORY INITIAL SETTING OF BODY INTEGRATED UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK BODY INTEGRATED UNIT REGISTRATION STATUS.

Check that settings of body integrated unit correspond to vehicle equipment. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit.

Does the vehicle equipment correspond to settings?

Yes	Go to 2.
No	Match the settings of the body integrated unit with the vehicle equipment.

2. CHECK BODY INTEGRATED UNIT CUSTOMIZE SETTING.

Check that settings of body integrated unit correspond to vehicle condition. Ref. to BODY CONTROL(DIAGNOSTICS)>Customize.

Do the customize settings correspond to the vehicle condition?

Yes	Go to 3.
No	Match the settings of the body integrated unit with the vehicle condition.

3. CHECK FACTORY INITIAL SETTING OF BODY INTEGRATED UNIT.

Confirm [Factory initial setting] of body integrated unit registrations is [Market]. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit.

Is it set to [Market]?

Yes	Go to step 4 in the Basic Diagnostic Procedure. Ref. to LAN SYSTEM (DIAGNOSTICS) > Basic Diagnostic Procedure > PROCEDURE > >FLOW1>CHECK COMMUNICATION FOR INITIALIZING..
No	Switch from [Factory] to [Market].

LAN SYSTEM (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

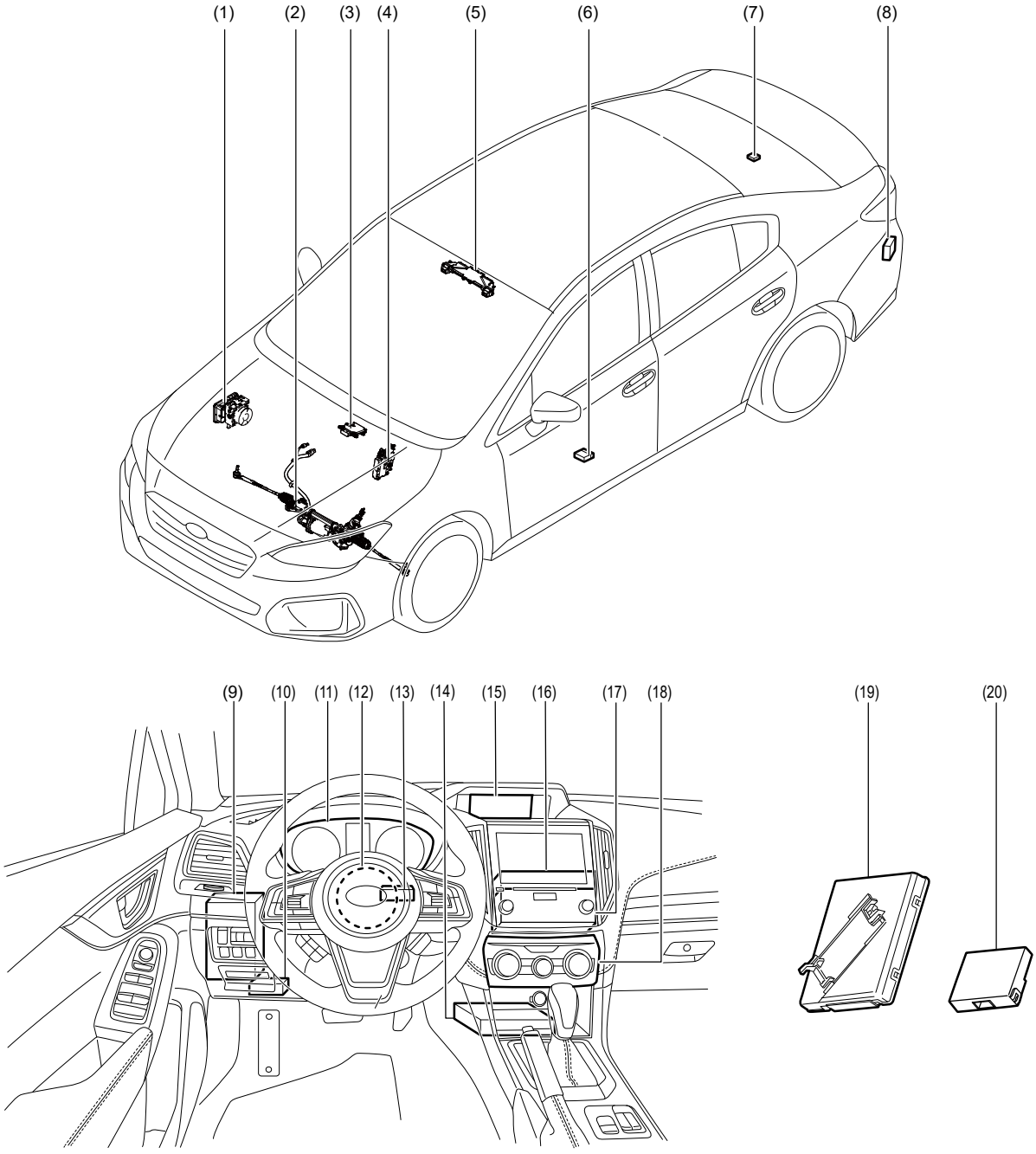
3. PREPARATION ITEMS

ITEM NAME	REMARKS
120 Ω resistance element (1/4 W or more)	Used as an alternative to end resistance.

LAN SYSTEM (DIAGNOSTICS) > Electrical Component Location

LOCATION

- 4 door model

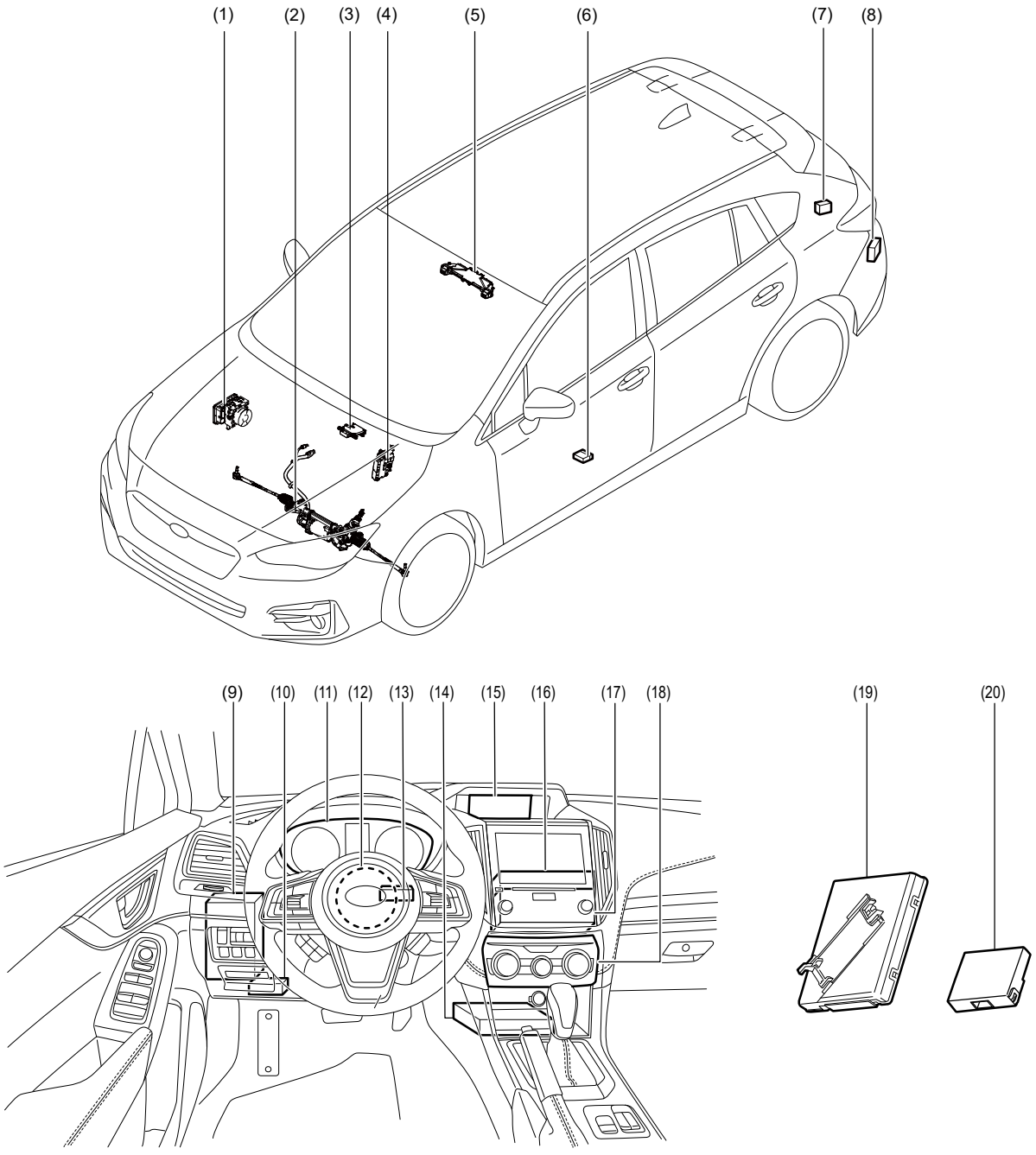


LAN10887

(1) VDC CM
(2) Power steering CM
(8) Radar sensor LH
(9) Body integrated unit
(15) MFD
(16) Data communication module (DCM)

(3) TCM
(4) ECM
(5) Stereo camera
(6) RAB CU (under seat)
(7) TPMS & keyless entry CM, TPMS CM or keyless entry CM
(10) Data link connector
(11) Combination meter
(12) Steering angle sensor
(13) Auto headlight beam leveler CM (AHL CM)
(14) Airbag CM
(17) Audio or navigation unit
(18) A/C control panel
(19) Keyless access CM
(20) Immobilizer CM (models without the keyless access with push button start system for C5 model)

- 5 door model



LAN10888

(1) VDC CM
(2) Power steering CM
(3) TCM
(4) ECM
(5) Stereo camera
(8) Radar sensor LH
(9) Body integrated unit
(10) Data link connector
(11) Combination meter
(12) Steering angle sensor
(15) MFD
(16) Data communication module (DCM)
(17) Audio or navigation unit
(18) A/C control panel
(19) Keyless access CM

(6) RAB CU (under seat)

(7) TPMS & keyless entry CM, TPMS CM or keyless entry CM

(13) Auto headlight beam leveler CM (AHL CM)

(14) Airbag CM

(20) Immobilizer CM (models without the keyless access with push button start system for C5 model)

LAN SYSTEM (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION

- Body integrated unit
  For I/O signals of the body integrated unit, refer to BODY CONTROL SYSTEM (DIAGNOSTICS). Ref. to BODY CONTROL(DIAGNOSTICS)>Control Module I/O Signal.
- ECM
  For I/O signals of ECM, refer to ENGINE (DIAGNOSTICS). Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Control Module I/O Signal.
- TCM
  For I/O signals of TCM, refer to TRANSMISSION (DIAGNOSTICS). Ref. to TRANSMISSION (DIAGNOSTICS)>Transmission Control Module (TCM) I/O Signal.
- VDC CM
  For I/O signals of VDC CM, refer to BRAKE CONTROL (DIAGNOSTICS). Ref. to BRAKE CONTROL (DIAGNOSTICS)>Control Module I/O Signal.
- Power steering CM
  For unit I/O signals of power steering CM, refer to POWER STEERING (DIAGNOSTICS). Ref. to POWER STEERING (DIAGNOSTICS)>Control Module I/O Signal.
- A/C control panel
  For unit I/O signals of A/C control panel, refer to AIR CONDITIONER (DIAGNOSTICS). Ref. to AIR CONDITIONER(DIAGNOSTICS)>Control Module I/O Signal.
- Combination meter
  For I/O signals of combination meter, refer to COMBINATION METER (DIAGNOSTICS). Ref. to COMBINATION METER (DIAGNOSTICS)>Control Module I/O Signal.
- MFD
  For I/O signals of MFD, refer to MFD (DIAGNOSTICS). Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Control Module I/O Signal.
- Airbag CM
  For I/O signals of the airbag CM, refer to AIRBAG SYSTEM (DIAGNOSTICS). Ref. to AIRBAG(DIAGNOSTICS)>Control Module I/O Signal.
- Keyless access CM
  For I/O signals of keyless access CM, refer to KEYLESS ACCESS WITH PUSH BUTTON START (DIAGNOSTICS). Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Control Module I/O Signal.
- Keyless entry CM
  For I/O signals of keyless entry CM, refer to KEYLESS ENTRY (DIAGNOSTICS). Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Control Module I/O Signal.
- TPMS CM
  For I/O signals of TPMS CM, refer to TIRE PRESSURE MONITOR (DIAGNOSTICS). Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Control Module I/O Signal.
- Auto headlight beam leveler CM
  For I/O signals of auto headlight beam leveler CM, refer to AUTO HEADLIGHT BEAM LEVELER SYSTEM (DIAGNOSTICS). Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Control Module I/O Signal.
- Radar sensor
  For I/O signals of the radar sensor, refer to BSD/RCTA (DIAGNOSTICS). Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Control Module I/O Signal.

- Audio or navigation unit
  For I/O signals of the audio or navigation, refer to INFOTAINMENT SYSTEM (DIAGNOSTICS). Ref. to INFOTAINMENT(DIAGNOSTICS) >Control Module I/O Signal.
- Data communication module (DCM)
  For I/O signals of DCM, refer to TELEMATICS (DIAGNOSTICS). Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Control Module I/O Signal.
- RAB CM
  For I/O signals of the RAB CM, refer to Reverse Automatic Braking (DIAGNOSTICS). Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Control Module I/O Signal.
- Stereo camera
  For I/O signals of stereo camera, refer to EyeSight (DIAGNOSTICS). Ref. to EyeSight (DIAGNOSTICS)>Control Module I/O Signal.
- Data link connector
  For I/O signals of data link connector, refer to COMMON (DIAGNOSTICS). Ref. to COMMON(diag)>Data Link Connector.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Diagnosis:

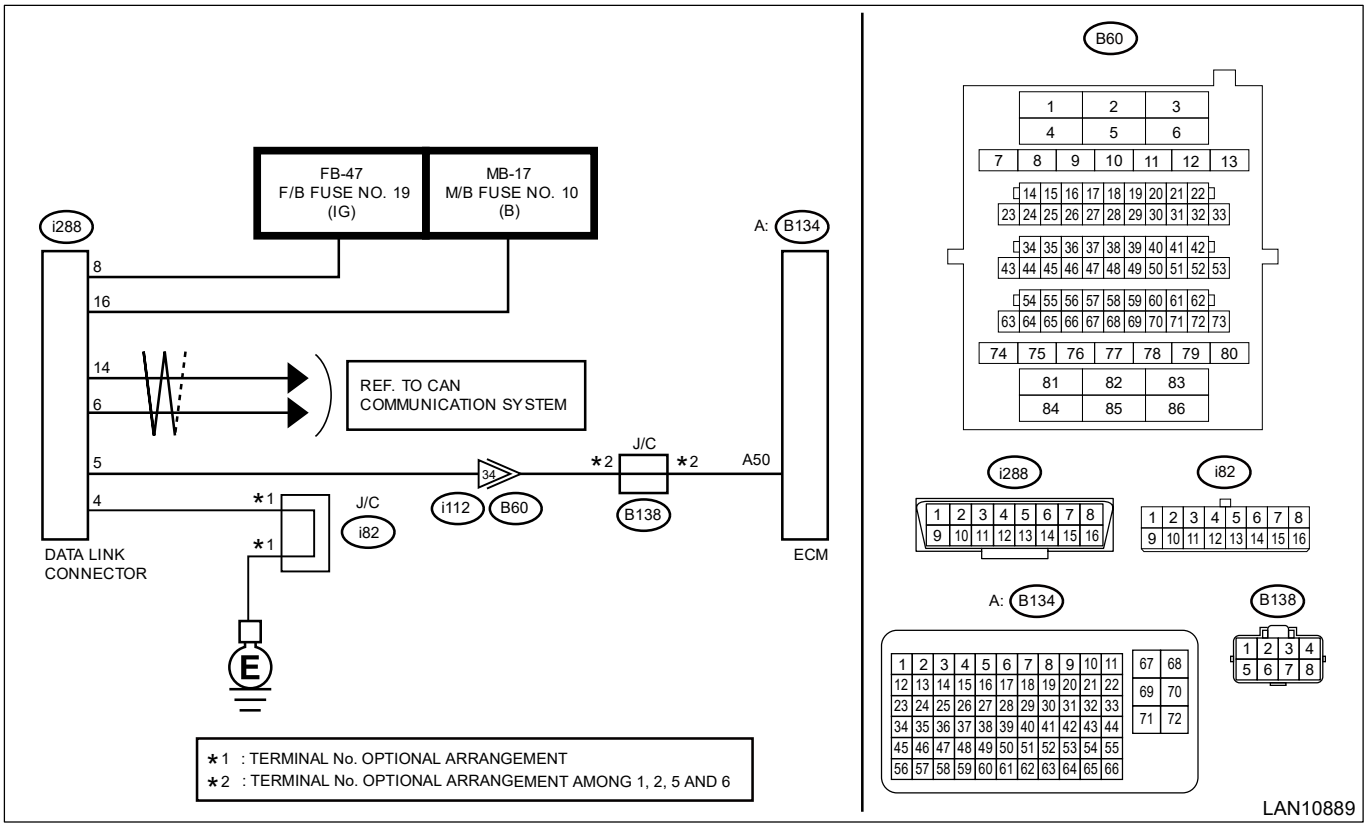
Subaru Select Monitor communication line is open or shorted.

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to another vehicle.
2. Check communication condition between Subaru Select Monitor and vehicle.

Is communication performed normally?

Yes	Go to 2.
No	Subaru Select Monitor unit or diagnosis cable is faulty. Or check the fuse on the vehicle side.

2. CHECK DATA LINK CONNECTOR.

Use a tester to check for continuity in the ground circuit.

Connector & terminal

(i288) No. 4 — Chassis ground:

(i288) No. 5 — (B134) No. 56:

Is there continuity?

Yes	Go to 3.
No	Repair or replace the open circuit.

3. CHECK DATA LINK CONNECTOR.

1. Turn the ignition switch to ON.
2. Using a tester, check the power supply of data link connector.

Connector & terminal

(i288) No. 8 (+) — Chassis ground (−):

(i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 4.
No	Check the power supply circuits to the data link connector.

4. CHECK COMMUNICATION FOR INITIALIZING ERROR.

Perform the communication for initializing with each module by connecting the Subaru Select Monitor. (For systems whose module can communicate with diagnostic devices)

Note:

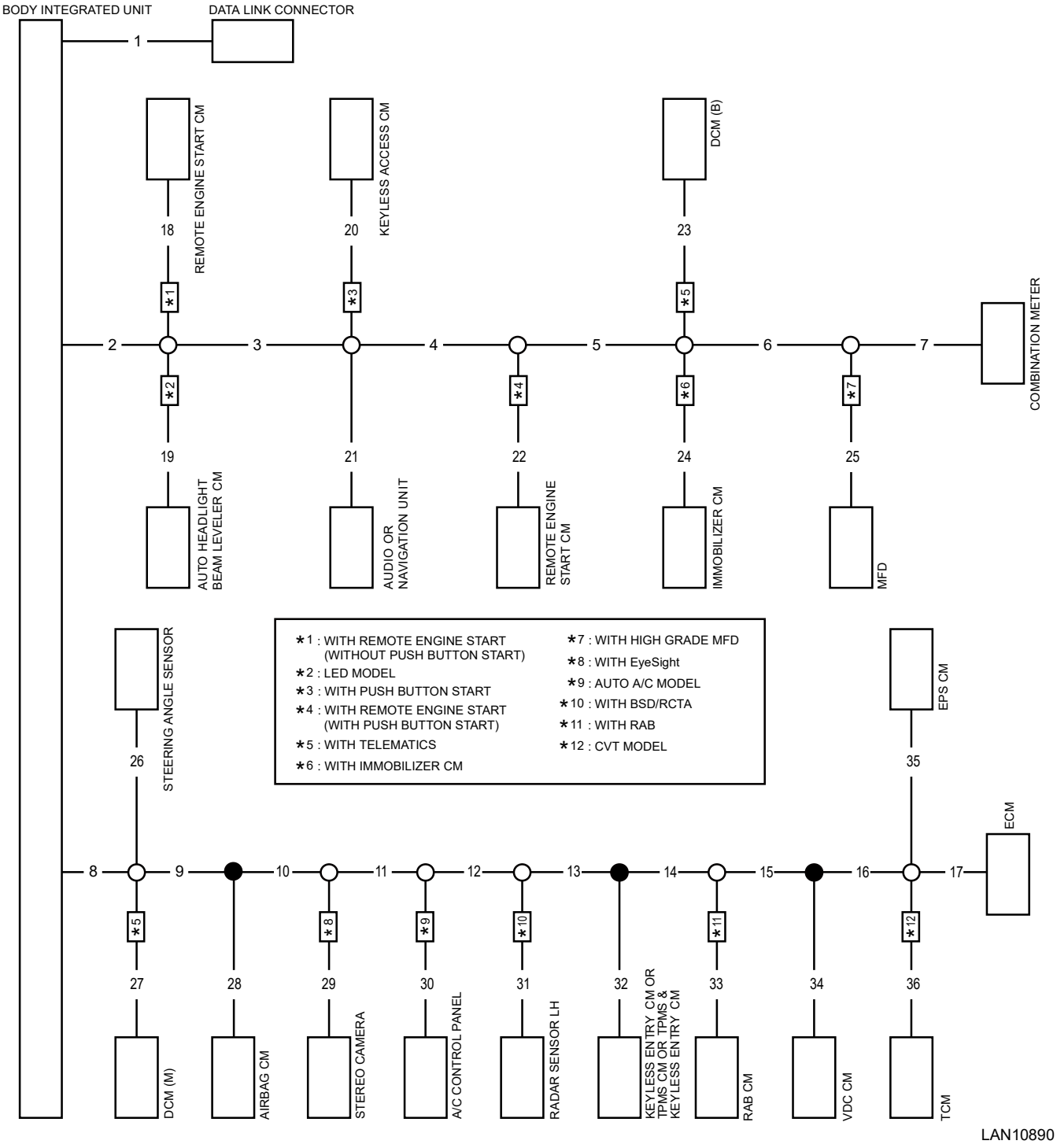
By performing [CAN bus connected ECU], confirmation of minimal connection modules is possible. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN bus check.

Is the communication possible with all modules?

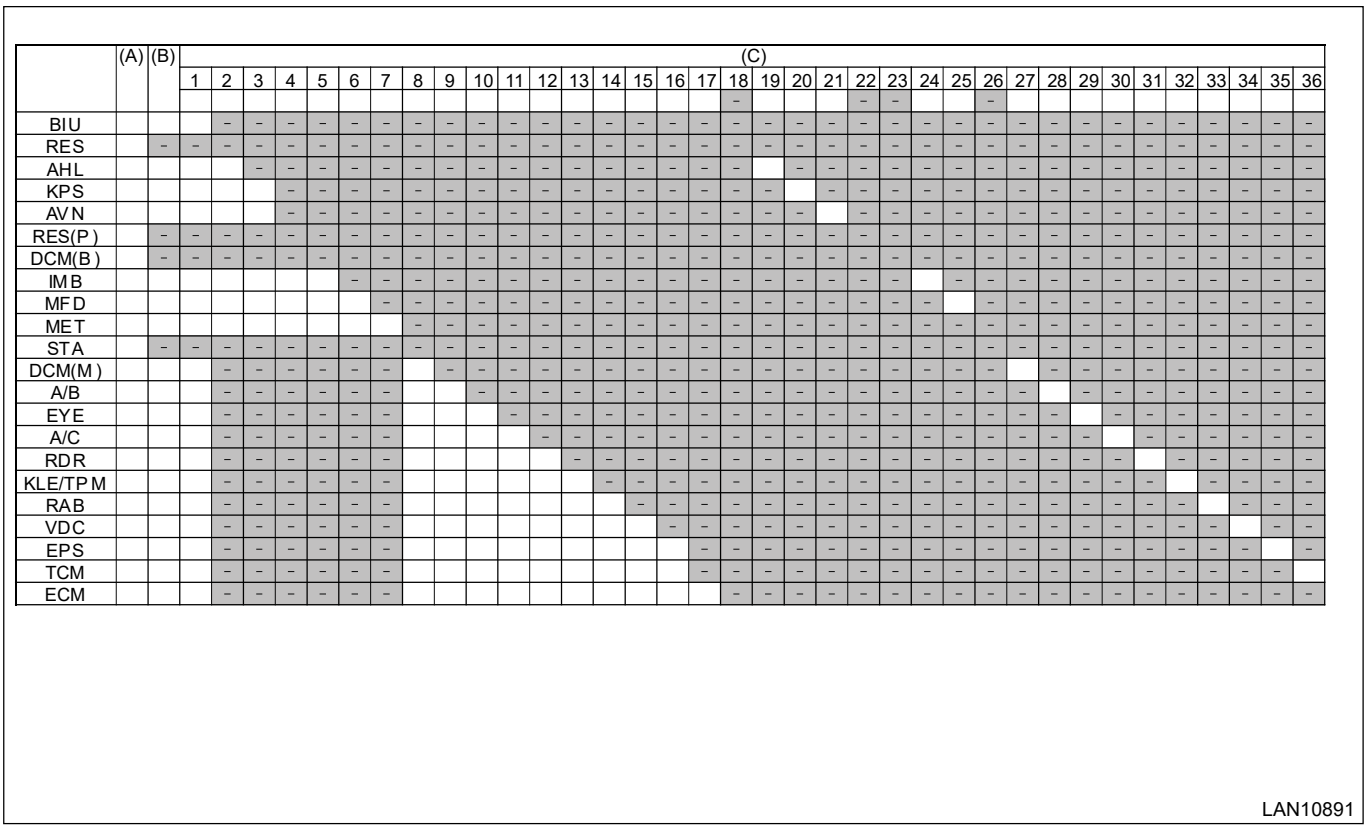
Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Perform the inspection using the check sheet of communication for initializing. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION > CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING.

1. CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING

- Network diagram



- Check sheet of communication for initializing



(A) Installation check

(B) Communication initialization

(C) Wiring location

BIU: Body integrated unit

RES: Remote engine start CM (without push button start)

AHL: Auto headlight beam leveler CM

KPS: Keyless access CM

AVN: Audio or navigation unit

RES (P): Remote engine start CM (with push button start)

DCM(B): Data communication module (BODY CAN)

IMB: Immobilizer CM

MFD: MFD

MET: Combination meter

STA: Steering angle sensor

DCM(M): Data communication module (MAIN CAN)

A/B: Airbag CM

EYE: Stereo camera

A/C: A/C control panel

RDR: Radar sensor

KLE/TPM: TPMS & keyless entry CM, TPMS CM or keyless entry CM

RAB: RAB CM

VDC: VDC CM

EPS: Power steering CM

TCM: TCM

ECM: ECM

1. MODULE INSTALLATION CHECK.

1. Using the check sheet for communication for initializing, check the vehicle installation module (module targeted for CAN communication).
2. Write "-" marks in the field for installation check (A) if the vehicle to be inspected does not have relevant module.
3. Write "-" marks in all blank fields on the same row that the "-" mark has filled in.

Was the module installation check above performed?

Yes	Go to 2.
No	Perform the module installation check, Go to 2.

2. SUBARU SELECT MONITOR COMMUNICATION INITIALIZATION CHECK.

1. Connect the Subaru Select Monitor to the vehicle.
2. Check if communication with the module installed on the vehicle is possible.
3. Write "○" marks in the field for communication initialization (B) if the module succeeded in the communication for initializing with Subaru Select Monitor. If the module failed in the communication, write a "×".
4. Write "○" marks in all blank fields on the same row that the "○" mark has filled in.
5. When at least one field in a column of wiring location (C) is filled with the "○" mark, then the wiring for that location is normal. Write "○" marks in all blank fields on the same column that the "○" mark has filled in under the circled number.

Was the communication checked with all the modules installed on the vehicle?

Yes	Go to 3.
No	Perform the communication check, Go to 3.

3. CHECK FIELD FOR COMMUNICATION FOR INITIALIZING (B).

Check if communication with all the modules installed on the vehicle was possible.

Is "×" written in all the fields for communication for initializing (B)? (Communication is not possible between all the modules and the Subaru Select Monitor)

Yes	Go to 6.
No	Go to 4.

4. CHECK WIRING LOCATION OF MODULE THAT CANNOT PERFORM COMMUNICATION.

Using the check sheet for communication for initializing, check open circuit of the modules which have no "○" mark in their columns of the wiring location (C) in ascending order by referring to the network diagram.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Go to 5.

5. CHECK POWER SUPPLY CIRCUIT OF CONTROL MODULE.

Check power supply circuit of the control module that cannot perform communication. (Check the harness between control module connector and battery, and check the fuse.)

Is power supply circuit faulty?

Yes	Repair or replace the faulty portion of the power supply circuit.
No	Go to step 5 in the Basic Diagnostic Procedure. Ref. to LAN SYSTEM (DIAGNOSTICS) > Basic Diagnostic Procedure > PROCEDURE > >FLOW1>CHECK DTC..

6. CHECK CAN COMMUNICATION LINE.

Check for short circuit to ground of CAN communication line. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Go to 7.

7. CHECK CAN COMMUNICATION LINE.

Check for short circuit to power supply of CAN communication line. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > CHECK POWER SUPPLY SHORT.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Go to 8.

8. CHECK CAN COMMUNICATION LINE.

Check for short circuit between the CAN communication lines. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 52 Ω OR LESS.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Go to 9.

9. CHECK CAN COMMUNICATION LINE.

Check the data link connector harness. (Check for open circuit of network diagram No. 1)

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Go to 10.

10. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle to check whether the communication can be executed normally.

Is the Subaru Select Monitor OK?

Yes	It is possible that poor contact occurs at the data link connector.
No	The Subaru Select Monitor is faulty. Replace with a normal Subaru Select Monitor, and perform the diagnosis.

2. EXAMPLE OF WRITING FOR THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING

- When No. 1 is open

Note:

Perform the inspection from step 6 using the check sheet of communication for initializing. (There may be a malfunction other than open circuit) Go to 6.

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
BIU	○	×		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	×			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	×				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	×				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	×								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	×		–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–
A/B	○	×		–	–	–	–	–	–			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
EYE	○	×		–	–	–	–	–	–				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
A/C	○	×		–	–	–	–	–	–					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
RDR	○	×		–	–	–	–	–	–						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
KLE/TPM	○	×		–	–	–	–	–	–							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
RAB	○	×		–	–	–	–	–	–								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
VDC	○	×		–	–	–	–	–	–									–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–
EPS	○	×		–	–	–	–	–	–										–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–
TCM	○	×		–	–	–	–	–	–											–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
ECM	○	×		–	–	–	–	–	–												–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10892

- When No. 2 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○							○	○	○	○	○	○	○	○	○	○	–				–	–			–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	×	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	×	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	×	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10893

- When No. 3 is open

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○						○	○	○	○	○	○	○	○	○	○	–	○			–	–			–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	×	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	×	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10894

- When No. 4 is open

Note:

When the remote engine starter does not operate: No. 4 is open. When the remote engine starter operates: No. 5 is open.

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○					○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–			–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10895

- When No. 5 is open

Note:

When the remote engine starter does not operate: No. 4 is open. When the remote engine starter operates: No. 5 is open.

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○					○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–			–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10895

- When No. 6 is open

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○			○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○		–	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10896

- When No. 7 is open

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○		○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	×	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10897

- When No. 8 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○											–	○	○	○	–	–	○	○	–										
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	×	○	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–
A/B	○	×	○	–	–	–	–	–	–			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
EYE	○	×	○	–	–	–	–	–	–				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
A/C	○	×	○	–	–	–	–	–	–					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
RAB	○	×	○	–	–	–	–	–	–								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
VDC	○	×	○	–	–	–	–	–	–									–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	×	○	–	–	–	–	–	–										–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
TCM	○	×	○	–	–	–	–	–	–											–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
ECM	○	×	○	–	–	–	–	–	–												–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–

LAN10898

- When No. 9 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○										–	○	○	○	–	–	○	○	–	○										
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	×	○	–	–	–	–	–	–	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
EYE	○	×	○	–	–	–	–	–	–	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
A/C	○	×	○	–	–	–	–	–	–	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
RAB	○	×	○	–	–	–	–	–	–	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
VDC	○	×	○	–	–	–	–	–	–	○								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	×	○	–	–	–	–	–	–	○									–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
TCM	○	×	○	–	–	–	–	–	–	○										–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
ECM	○	×	○	–	–	–	–	–	–	○											–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–

LAN10899

- When No. 10 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○									–	○	○	○	–	–	○	○	–	○	○								
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
EYE	○	×	○	–	–	–	–	–	–	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
A/C	○	×	○	–	–	–	–	–	–	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○								–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
TCM	○	×	○	–	–	–	–	–	–	○	○									–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	
ECM	○	×	○	–	–	–	–	–	–	○	○									–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10900

- When No. 11 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○								–	○	○	○	–	–	○	○	–	○	○	○							
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	×	○	–	–	–	–	–	–	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○								–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	
ECM	○	×	○	–	–	–	–	–	–	○	○	○								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10901

- When No. 12 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○							–	○	○	○	–	–	○	○	–	○	○	○	○						
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○								–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10902

- When No. 13 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○						–	○	○	○	–	–	○	○	–	○	○	○	○	○					
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○	○							–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10903

- When No. 14 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○					–	○	○	○	–	–	○	○	–	○	○	○	○	○	○				
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○						–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10904

- When No. 15 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○				–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○				
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○				–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○					–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10905

- When No. 16 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○			–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○		
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○			–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10906

- When No. 17 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○		–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10907

- When No. 18 is open

Note:

This is the same as for No. 23 and No. 26, but if the remote engine starter does not operate even though no DTC has been detected, check the lines of the remote engine starter.

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10908

- When No. 19 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–		○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	×	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10909

- When No. 20 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○		○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	×	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10910

- When No. 21 is open

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○		–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	×	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10911

- When No. 22 is open

Note:

This is the same as for No. 23 and No. 26, but if the remote engine starter does not operate even though no DTC has been detected, check the lines of the remote engine starter.

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10908

- When No. 23 is open

Note:

This is the same as for No. 18, No. 22 and No. 26, but it is possible to diagnose using examples of lost communication detection in each module.

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10908

- When No. 24 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–		○	–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	×	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10912

- When No. 25 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○		–	○	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	×	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10913

- When No. 26 is open

Note:

This is the same as for No. 18, No. 22 and No. 23, but it is possible to diagnose using examples of lost communication detection in each module.

	(A)	(B)	(C)																																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10908

- When No. 27 is open

	(A)	(B)	(C)																																	
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–		○	○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	×	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10914

- When No. 28 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○		○	○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	×	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10915

- When No. 29 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○		○	○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	×	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10916

- When No. 30 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○		○	○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	×	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10917

- When No. 31 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○		○	○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	×	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10918

- When No. 32 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○		○	○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10919

- When No. 33 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○		○	○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10920

- When No. 34 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○		○	○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10921

- When No. 35 is open

	(A)	(B)	(C)																																			
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
			○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○			○
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
EPS	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–
TCM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10922

- When No. 36 is open

	(A)	(B)	(C)																																					
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36		
	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	–	○	○	○	–	–	○	○	–	○	○	○	○	○	○	○	○	○			
BIU	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AHL	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
KPS	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
AVN	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
RES(P)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(B)	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
IMB	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–
MFD	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–
MET	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
STA	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
DCM(M)	○	○	○	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–	–
A/B	○	○	○	–	–	–	–	–	–	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–	–
EYE	○	○	○	–	–	–	–	–	–	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–	–
A/C	○	○	○	–	–	–	–	–	–	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–	–
RDR	○	○	○	–	–	–	–	–	–	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–	–
KLE/TPM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–	–
RAB	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–	–
VDC	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–	–
EPS	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	○	–	–	–
TCM	○	×	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
ECM	○	○	○	–	–	–	–	–	–	○	○	○	○	○	○	○	○	○	○	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

LAN10923

LAN SYSTEM (DIAGNOSTICS) > CAN bus check

OPERATION

Systems connected to vehicle CAN bus and require communicating with the Subaru Select Monitor will be displayed.
List of the systems displayed does not mean the confirmation of communication. It displays presence or absence of the systems required. And, even when a system is equipped, it may not be displayed because of a communication trouble etc.

1. Turn the ignition switch to ON.
2. On [Start] display, select [Diagnosis].
3. On [Vehicle selection] display, input the target vehicle information and select [OK].
4. On [Main Menu] display, select [CAN bus check].
5. After a while, systems connected to vehicle CAN bus will be displayed.
6. In communication for initializing, communication is confirmed in each control module.
   Note:
   - **This function does not function normally, when the ignition switch is OFF.**
   - **Optional control modules and control modules that are equipped differently depending on grades may not be displayed.**
   - **For detailed operation procedures, refer to "Application help".**

LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

PROCEDURE

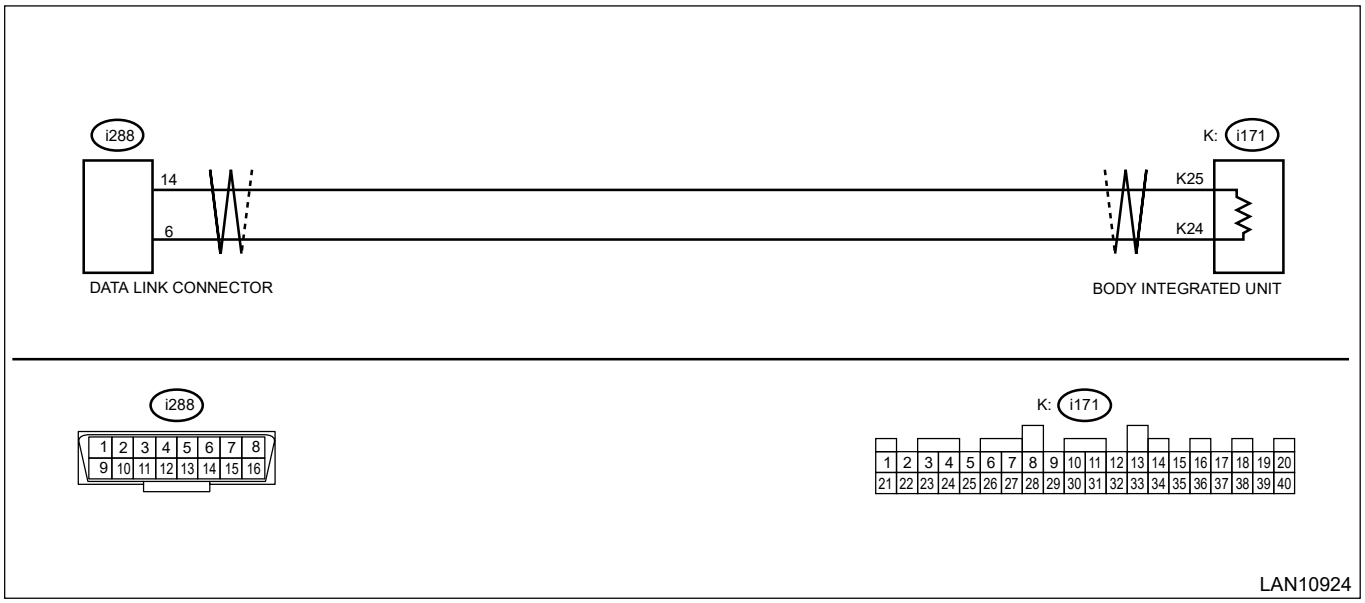
1. DIAG-CAN

Trouble causes:

- DIAG-CAN communication circuit is shorted to ground.
- DIAG-CAN communication circuit is shorted to power supply.
- DIAG-CAN communication circuit is shorted between lines.
- Body integrated unit malfunction

Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

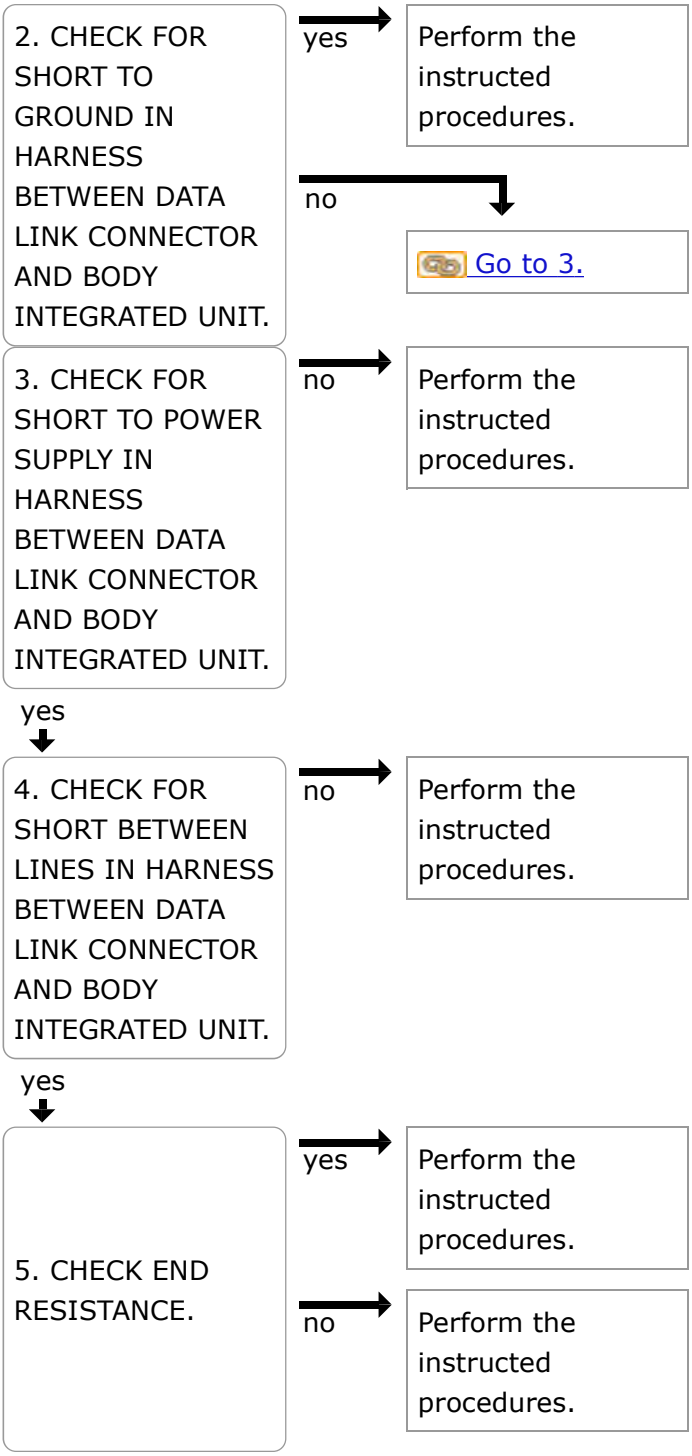
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

Note:

When measuring the resistance of CAN communication circuit, measure it in sleep status.
To enter sleep status
– With ignition switch OFF and key or switch operation stopped, keep the doors, trunk, and rear gate all closed for one minute or more.
– On model with the keyless access with push button start, keep the access key 2 m or more away from the vehicle.

1. CHECK BASIC DIAGNOSTIC PROCEDURE.	no →	Perform the instructed procedures.

yes ↓


2. CHECK FOR SHORT TO GROUND IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.
yes
Perform the instructed procedures.
no
Go to 3.
3. CHECK FOR SHORT TO POWER SUPPLY IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.
no
Perform the instructed procedures.
yes
4. CHECK FOR SHORT BETWEEN LINES IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.
no
Perform the instructed procedures.
yes
5. CHECK END RESISTANCE.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK BASIC DIAGNOSTIC PROCEDURE.

Check that the basic diagnosis has been performed up to STEP 3.

Note:

Possible defective parts can be narrowed easily by inspection using Subaru Select Monitor before performing "CHECK CAN COMMUNICATION CIRCUIT" using a tester.

Was the basic diagnostic procedure performed?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK FOR SHORT TO GROUND IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Using the tester, measure the resistance between data link connector and chassis ground.

Connector & terminal

(i288) No. 6 — Chassis ground:

(i288) No. 14 — Chassis ground:

Is the resistance 10 Ω or less?

Yes	Repair or replace the short circuit to ground of the harness between data link connector and body integrated unit.
No	Go to 3.

3. CHECK FOR SHORT TO POWER SUPPLY IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 6 (+) — Chassis ground (−):
   (i288) No. 14 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	Go to 4.
No	Repair or replace the short circuit to power supply of the harness between data link connector and body integrated unit.

4. CHECK FOR SHORT BETWEEN LINES IN HARNESS BETWEEN DATA LINK CONNECTOR AND BODY INTEGRATED UNIT.

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i288) No. 6 — (i288) No. 14:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit between lines of the harness between data link connector and body integrated unit.

5. CHECK END RESISTANCE.

1. Connect the body integrated unit connector.
2. Using a tester, measure the resistance between terminals of data link connector.
   Connector & terminal
   (i288) No. 6 — (i288) No. 14:

Is the resistance 114 — 126 Ω?

Yes	CAN communication circuit is normal.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

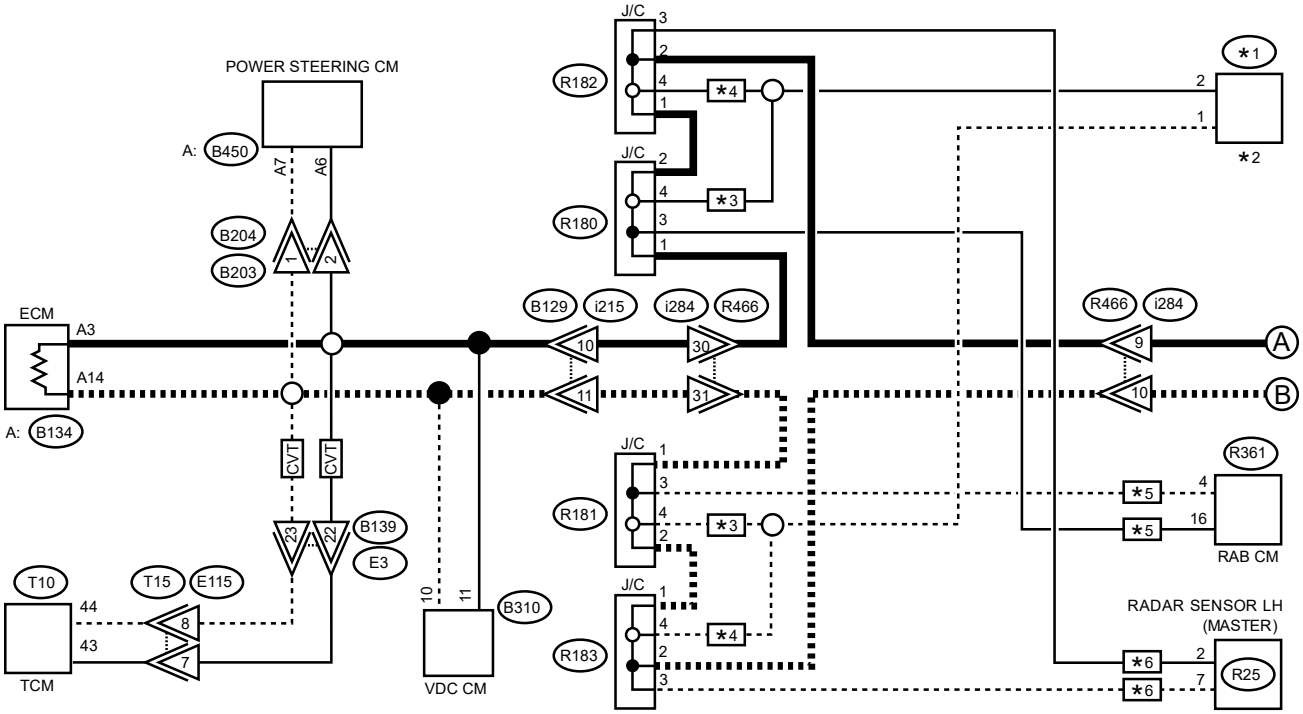
2. MAIN-CAN

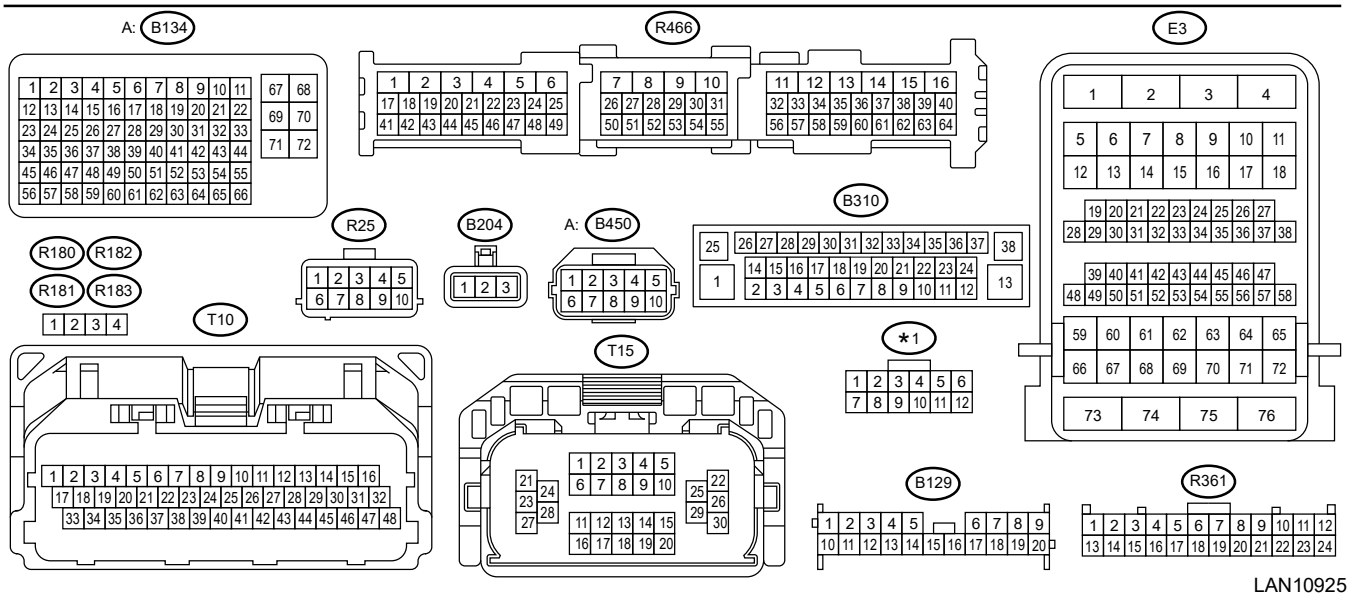
Trouble causes:

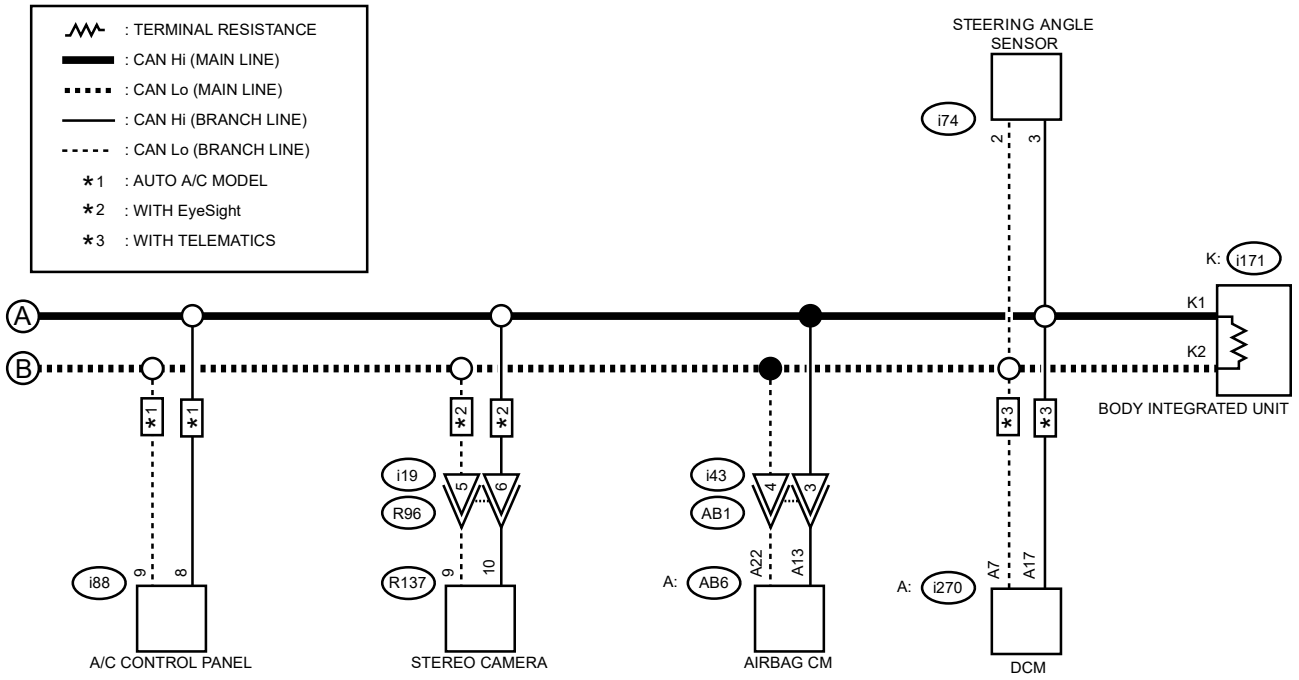
- MAIN-CAN communication circuit is shorted to ground.
- MAIN-CAN communication circuit is shorted to power supply.
- MAIN-CAN communication circuit is shorted between lines.

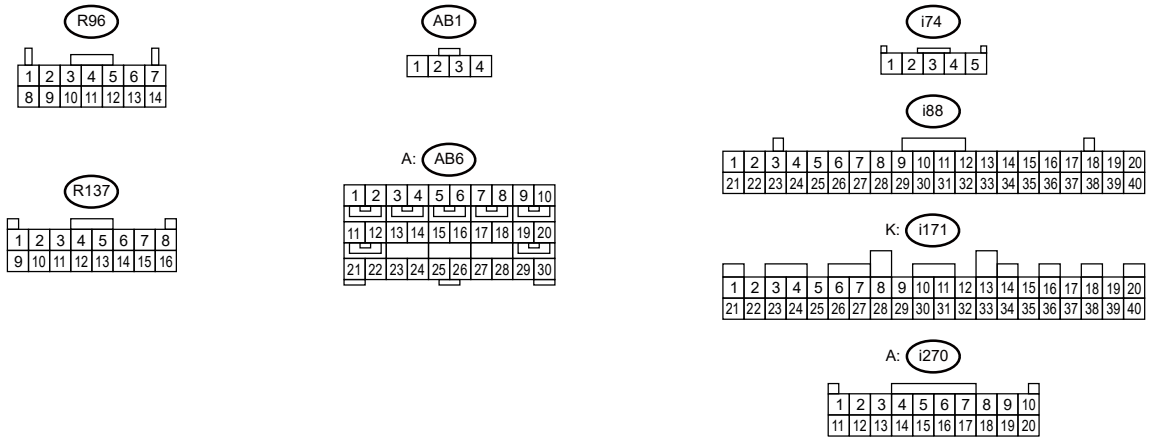
Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925





LAN10926

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

Note:

- **When measuring the resistance of CAN communication circuit, measure it in sleep status.**
  To enter sleep status
  – With ignition switch OFF and key or switch operation stopped, keep the doors, trunk, and rear gate all closed for one minute or more.
  – On model with the keyless access with push button start, keep the access key 2 m or more away from the vehicle.
- **When the bus line is measured, combined resistance of the end resistance (120 Ω) in ECM and the end resistance (120 Ω) in body integrated unit can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. If the measured resistance value becomes 52 Ω or less, main wiring harness or related lines may be shorted. Or, the combined resistance may have changed because of a resistance other than the end resistance created on the circuit. If the measured value is 62 Ω or more, there may be a malfunction such as open circuit in one of the end resistances, in the stabilizing circuit, or in the main wiring harness.**
  Also, even when the resistance value falls within approx. 53 — 61 Ω, related lines may be open if an error of communication for initializing or a CAN system U-code has occurred. (The resistance cannot be between approx. 53 — 61 Ω if the main wiring harness is open.)

1. CHECK BASIC DIAGNOSTIC PROCEDURE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FOR SHORT TO GROUND IN MAIN-CAN COMMUNICATION CIRCUIT.
   - yes → Perform the instructed procedures.
   - no → Go to 3.
3. CHECK FOR SHORT TO POWER SUPPLY IN MAIN-CAN COMMUNICATION CIRCUIT.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK FOR SHORT IN MAIN-CAN COMMUNICATION CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Go to 5.
5. CHECK FOR OPEN CIRCUIT IN MAIN-CAN COMMUNICATION CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK BASIC DIAGNOSTIC PROCEDURE.

Check that the basic diagnosis has been performed up to STEP 3.

Note:

Possible defective parts can be narrowed easily by inspection using Subaru Select Monitor before performing "CHECK CAN COMMUNICATION CIRCUIT" using a tester.

Was the basic diagnostic procedure performed?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK FOR SHORT TO GROUND IN MAIN-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the steering sensor connector.
3. Using a tester, measure the resistance between the steering sensor connector and chassis ground.

   Connector & terminal

   (i74) No. 2 — Chassis ground:

   (i74) No. 3 — Chassis ground:

Is the resistance 10 Ω or less?

Yes	Check for ground short. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.
No	Go to 3.

3. CHECK FOR SHORT TO POWER SUPPLY IN MAIN-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the steering sensor connector and chassis ground.

   Connector & terminal

   (i74) No. 2 (+) — Chassis ground (−):

   (i74) No. 3 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	Go to 4.
No	Check for power supply short. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > CHECK POWER SUPPLY SHORT.

4. CHECK FOR SHORT IN MAIN-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between terminals of steering sensor connector.
   Connector & terminal
   (i74) No. 2 — (i74) No. 3:

Is the resistance 52 Ω or less?

Yes	Perform the inspection for resistance of 52 Ω or less. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 52 Ω OR LESS.
No	Go to 5.

5. CHECK FOR OPEN CIRCUIT IN MAIN-CAN COMMUNICATION CIRCUIT.

Using a tester, measure the resistance between terminals of steering sensor connector.
Connector & terminal
(i74) No. 2 — (i74) No. 3:

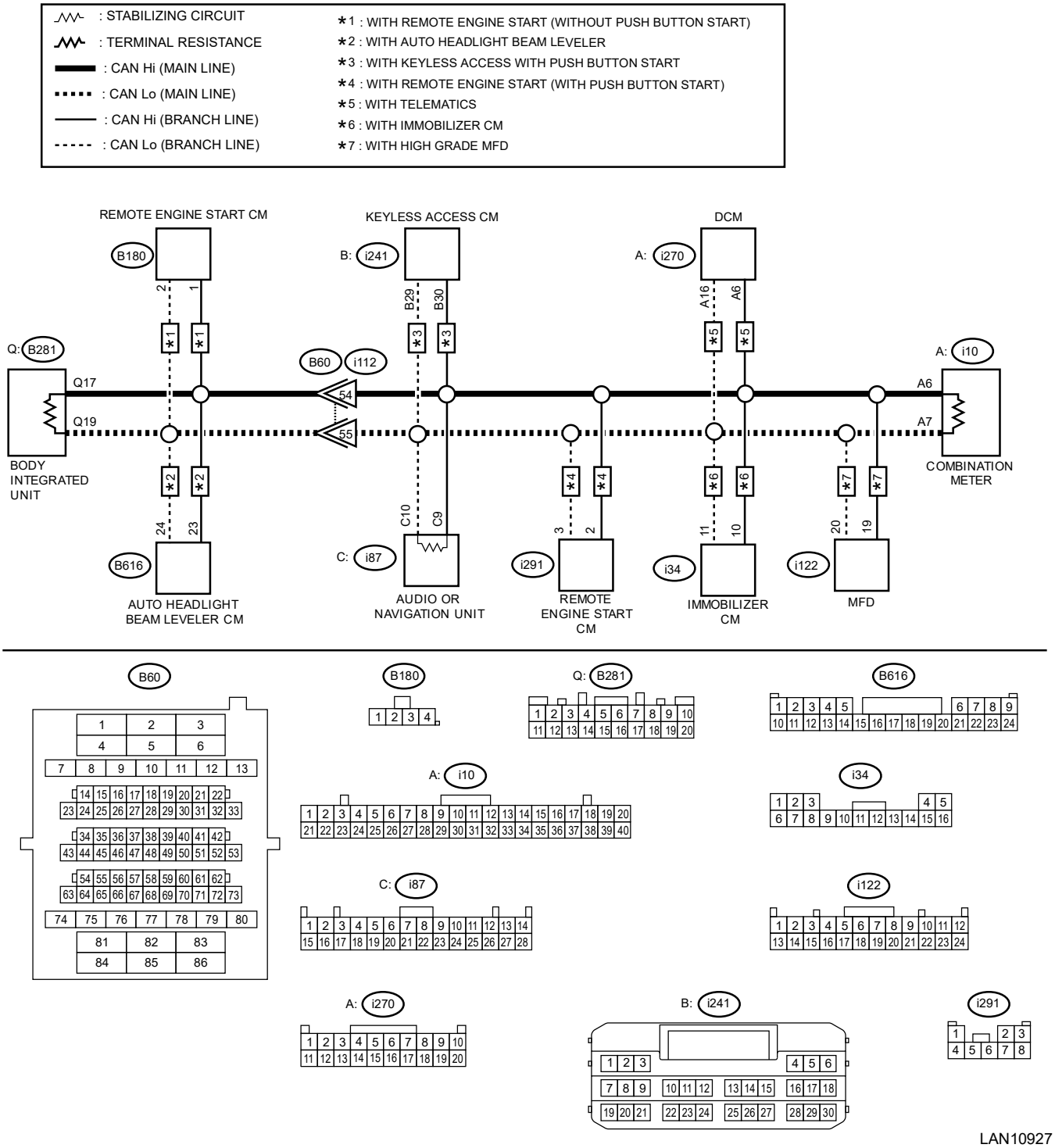
Is the resistance 62 Ω or more?

Yes	Perform the inspection for resistance of 62 Ω or more. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 62 Ω OR MORE.
No	If the display of CAN system U-code disappears from the current malfunction, the CAN network is currently normal. If the U-code has detected as current malfunction, related lines may be open. Perform the inspection for the related line corresponding to the detected DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>LIST.

3. BODY-CAN

Trouble causes:
- BODY-CAN communication circuit is shorted to ground.
- BODY-CAN communication circuit is shorted to power supply.
- BODY-CAN communication circuit is shorted between lines.

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



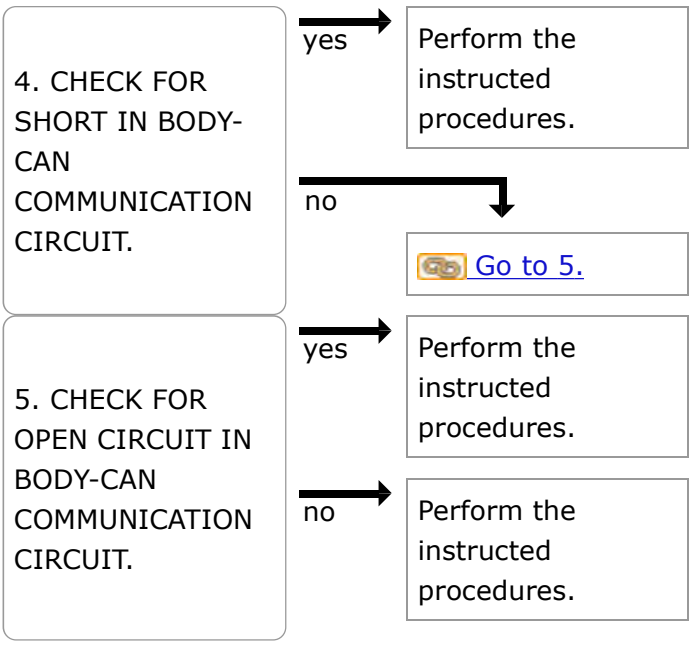
Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

Note:

- **When measuring the resistance of CAN communication circuit, measure it in sleep status.**
  To enter sleep status
  – With ignition switch OFF and key or switch operation stopped, keep the doors, trunk, and rear gate all closed for one minute or more.
  – On model with the keyless access with push button start, keep the access key 2 m or more away from the vehicle.
- **When the bus line is measured, combined resistance of the end resistance (120 Ω) in body integrated unit and the end resistance (120 Ω) in combination meter can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. If the measured resistance value becomes 52 Ω or less, main wiring harness or related lines may be shorted. Or, the combined resistance may have changed because of a resistance other than the end resistance created on the circuit. If the measured value is 62 Ω or more, there may be a malfunction such as open circuit in one of the end resistances, in the stabilizing circuit, or in the main wiring harness.**
  Also, even when the resistance value falls within approx. 53 — 61 Ω, related lines may be open if an error of communication for initializing or a CAN system U-code has occurred. (The resistance cannot be between approx. 53 — 61 Ω if the main wiring harness is open.)

1. CHECK BASIC DIAGNOSTIC PROCEDURE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FOR SHORT TO GROUND IN BODY-CAN COMMUNICATION CIRCUIT.
   - yes → Perform the instructed procedures.
   - no → Go to 3.
3. CHECK FOR SHORT TO POWER SUPPLY IN BODY-CAN COMMUNICATION CIRCUIT.
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK BASIC DIAGNOSTIC PROCEDURE.

Check that the basic diagnosis has been performed up to STEP 3.

Note:

Possible defective parts can be narrowed easily by inspection using Subaru Select Monitor before performing "CHECK CAN COMMUNICATION CIRCUIT" using a tester.

Was the basic diagnostic procedure performed?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

2. CHECK FOR SHORT TO GROUND IN BODY-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation unit connector.
3. Using a tester, measure the resistance between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 — Chassis ground:

(i87) No. 10 — Chassis ground:

Is the resistance 10 Ω or less?

Yes	Check for ground short. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.
No	Go to 3.

3. CHECK FOR SHORT TO POWER SUPPLY IN BODY-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 (+) — Chassis ground (−):

(i87) No. 10 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	Go to 4.
No	Check for power supply short. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > CHECK POWER SUPPLY SHORT.

4. CHECK FOR SHORT IN BODY-CAN COMMUNICATION CIRCUIT.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between audio or navigation unit connector terminals.
   Connector & terminal
   (i87) No. 9 — (i87) No. 10:

Is the resistance 52 Ω or less?

Yes	Perform the inspection for resistance of 52 Ω or less. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 52 Ω OR LESS.
No	Go to 5.

5. CHECK FOR OPEN CIRCUIT IN BODY-CAN COMMUNICATION CIRCUIT.

Using a tester, measure the resistance between audio or navigation unit connector terminals.
Connector & terminal
(i87) No. 9 — (i87) No. 10:

Is the resistance 62 Ω or more?

Yes	Perform the inspection for resistance of 62 Ω or more. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 62 Ω OR MORE.
No	If the display of CAN system U-code disappears from the current malfunction, the CAN network is currently normal. If the U-code has detected as current malfunction, related lines may be open. Perform the inspection for the related line corresponding to the detected DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>LIST.

LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

LIST

Resistance value between CAN Hi and Lo	Contents of inspection	Remarks
Ground short inspection	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > GROUND SHORT INSPECTION.	Shorted to ground in the communication circuit or control module.

Resistance value between CAN Hi and Lo	Contents of inspection	Remarks
Check power supply short	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > CHECK POWER SUPPLY SHORT.	Shorted to battery power supply in the communication circuit or control module.
53 — 61 Ω	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 53 — 61 Ω.	Combined resistance of end resistance does not have malfunction; short to ground or +B short of the CAN communication circuit is possible, however.
52 Ω or less	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 52 Ω OR LESS.	Resistance is lower than combined resistance of end resistance. Short to CAN Hi and CAN Lo on the CAN communication circuit is possible.
62 Ω or more	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > 62 Ω OR MORE.	Resistance is higher than combined resistance of end resistance. Open circuit of CAN communication circuit is possible.
Related lines 53 — 61 Ω (TCM)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (TCM).	No TCM data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (steering angle sensor)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (STEERING ANGLE SENSOR).	No steering angle sensor data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (A/C control panel)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (A/C CONTROL PANEL).	No A/C data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (power steering CM)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED	No power steering data is received. Perform inspection when faulty is detected.

Resistance value between CAN Hi and Lo	Contents of inspection	Remarks
	LINES 53 — 61 Ω (POWER STEERING).	
Related lines 53 — 61 Ω (combination meter)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (COMBINATION METER).	No meter data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (infotainment system)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (INFOTAINMENT SYSTEM).	No infotainment data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (airbags)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (AIRBAG CM SYSTEM).	No airbag data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (keyless access system)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (KEYLESS ACCESS SYSTEM).	No keyless access CM data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (BSD/RCTA)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (BSD/RCTA).	No BSD/RCTA data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (headlight beam leveler)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (HEADLIGHT BEAM LEVELER).	No headlight beam leveler data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (remote engine starter)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (REMOTE ENGINE STARTER).	Perform inspection when the remote engine starter does not operate, while the mobile key side operates normally.

Resistance value between CAN Hi and Lo	Contents of inspection	Remarks
Related lines 53 — 61 Ω (stereo camera)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (STEREO CAMERA).	No stereo camera data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (immobilizer system)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (IMMOBILIZER SYSTEM).	No immobilizer data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (Telematics)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (TELEMATICS).	No telematics data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (RAB)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (RAB).	Perform inspection when no RAB data is received, or invalid data is detected.
Related lines 53 — 61 Ω (VDC)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (VDC).	No VDC data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (Keyless entry/TPMS)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (KEYLESS ENTRY/TPMS).	No keyless entry/TPMS data is received. Perform inspection when faulty is detected.
Related lines 53 — 61 Ω (MFD)	Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>INSPECTION > RELATED LINES 53 — 61 Ω (MFD).	No MFD data is received. Perform inspection when faulty is detected.

LAN SYSTEM (DIAGNOSTICS) > CAN Communication Circuit Check

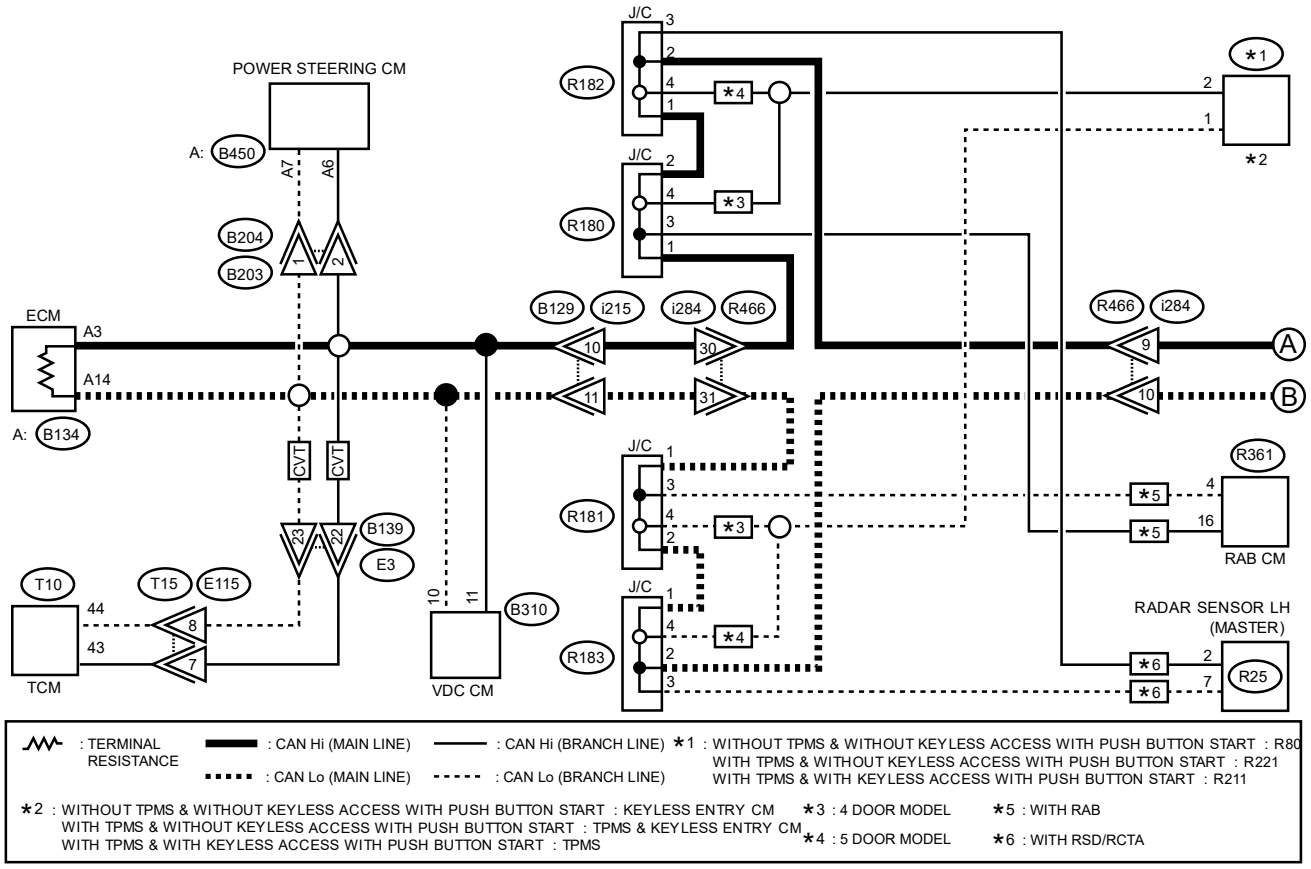
INSPECTION

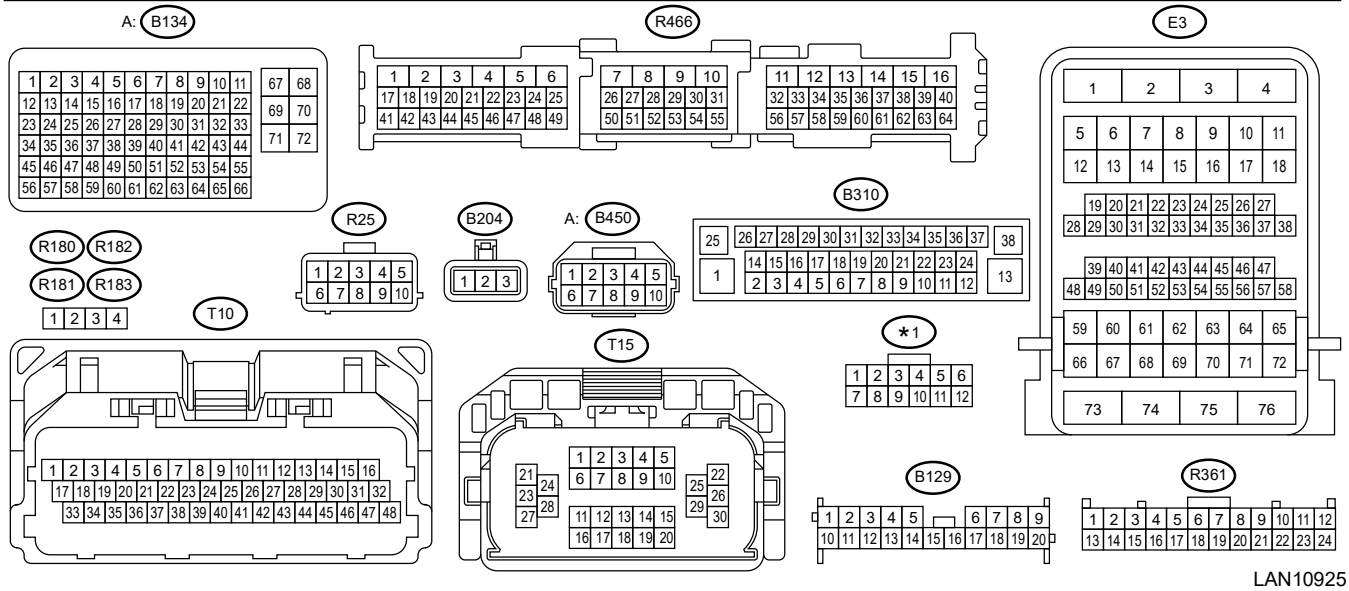
1. GROUND SHORT INSPECTION

- MAIN-CAN

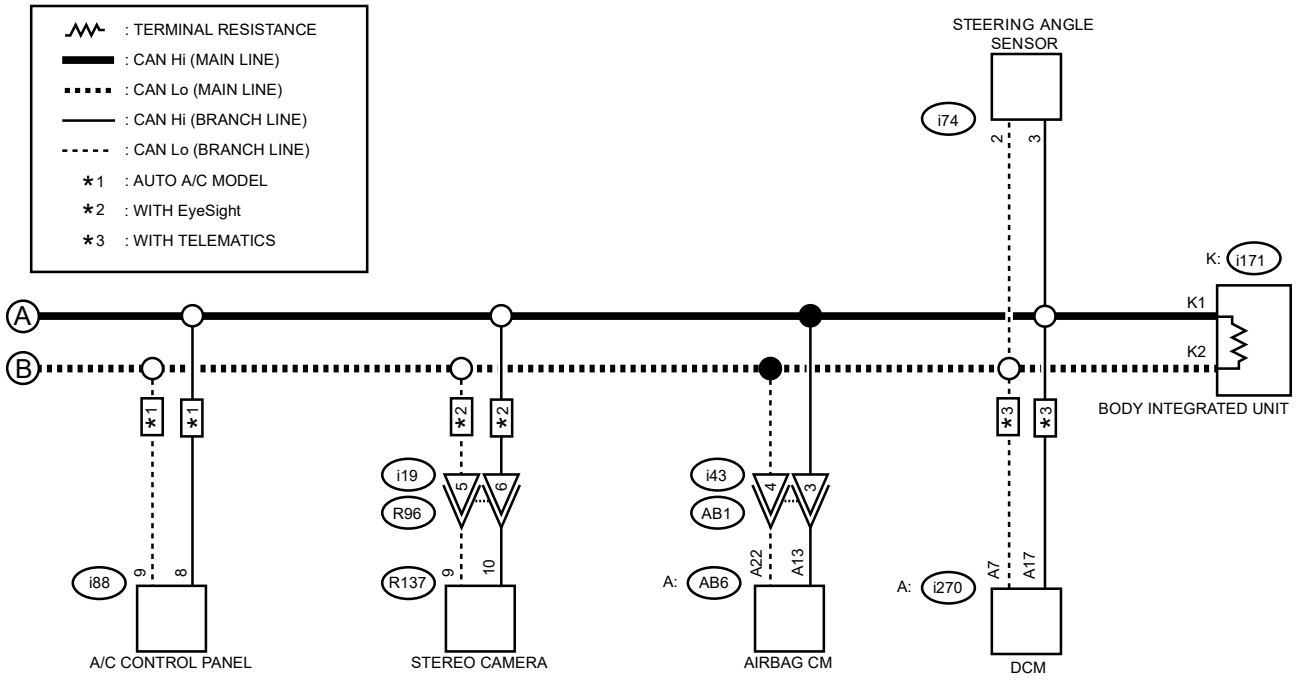
Wiring diagram:

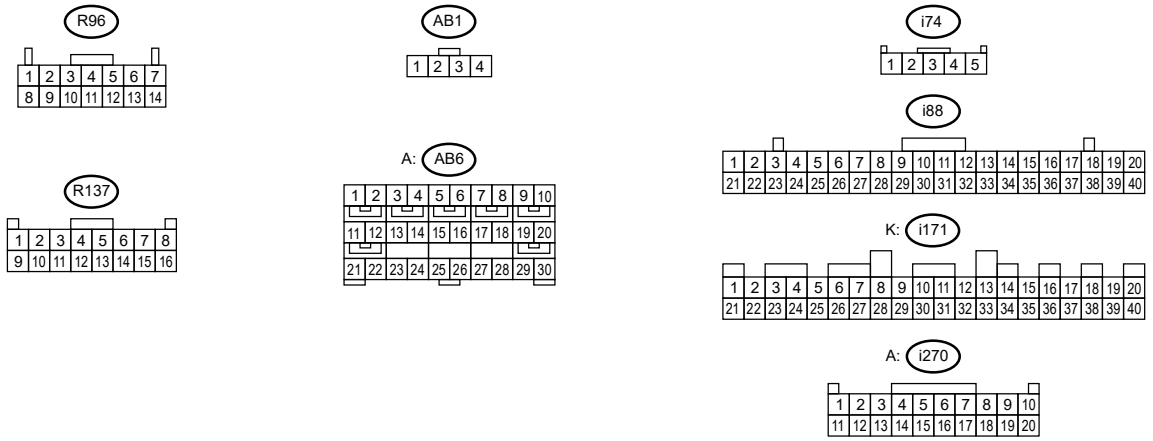
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.





LAN10925





LAN10926

Note:

Main wiring harness or related lines may be shorted to ground, or shorted to ground in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the steering sensor connector.
3. Using a tester, measure the resistance between the steering sensor connector and chassis ground.

Connector & terminal

(i74) No. 2 — Chassis ground:

(i74) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Currently, it is normal.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i74) No. 2 — Chassis ground:

(i74) No. 3 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, Go to 3.
No	Repair or replace the short circuit of the main wiring harness and related lines between body integrated unit and ECM.

3. CHECK BETWEEN MAIN WIRING HARNESSES.

Measure the resistance between body integrated unit connector and chassis ground using tester.

Connector & terminal

(i171) No. 1 — Chassis ground:

(i171) No. 2 — Chassis ground:

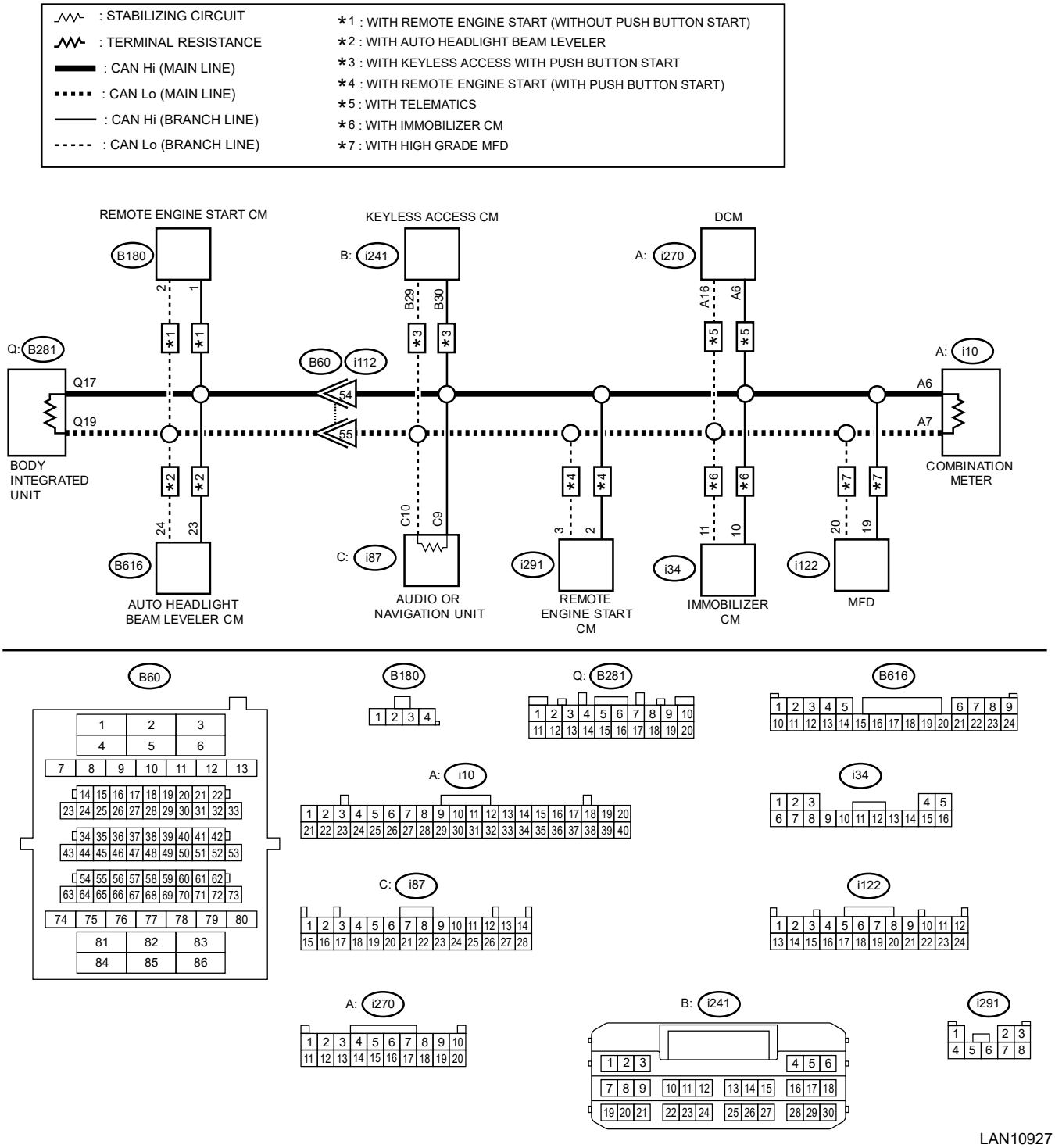
Is the resistance less than 10 Ω?

Yes	Repair or replace the short circuit of the main wiring harness and related lines between ECM — body integrated unit.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.

- BODY-CAN

  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Note:

Main wiring harness or related lines may be shorted to ground, or shorted to ground in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation unit connector.
3. Using a tester, measure the resistance between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 — Chassis ground:

(i87) No. 10 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Currently, it is normal.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i87) No. 9 — Chassis ground:

(i87) No. 10 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, Go to 3.
No	Repair or replace the short circuit of the main wiring harness and related lines between body integrated unit — combination meter.

3. CHECK BETWEEN MAIN WIRING HARNESSES.

Measure the resistance between body integrated unit connector and chassis ground using tester.

Connector & terminal

(B281) No. 17 — Chassis ground:

(B281) No. 19 — Chassis ground:

Is the resistance less than 10 Ω?

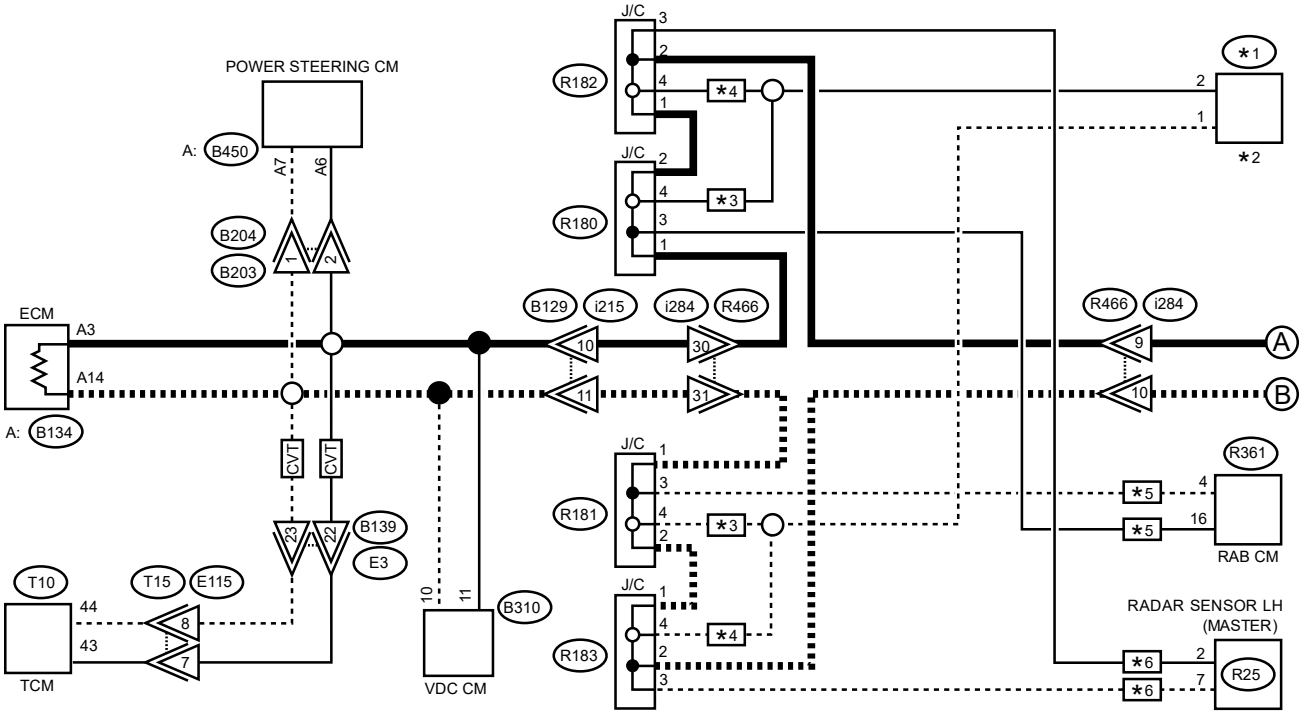
Yes	Repair or replace the short circuit of the main wiring harness and related lines between combination meter — body integrated unit.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.

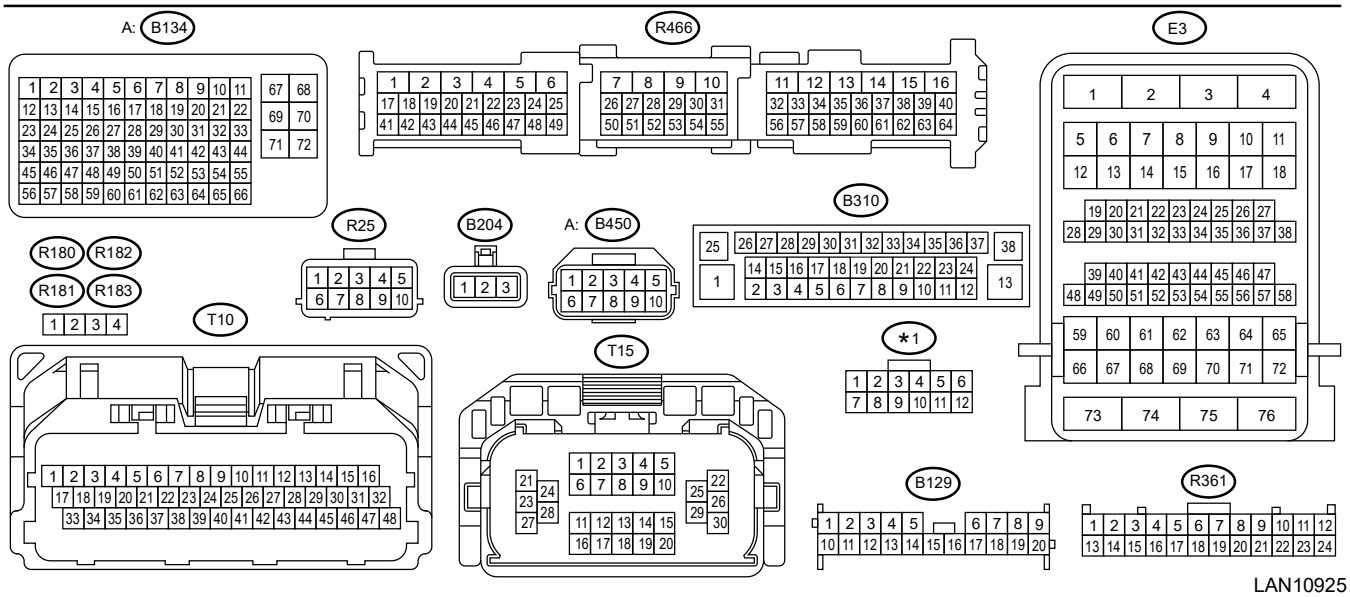
2. CHECK POWER SUPPLY SHORT

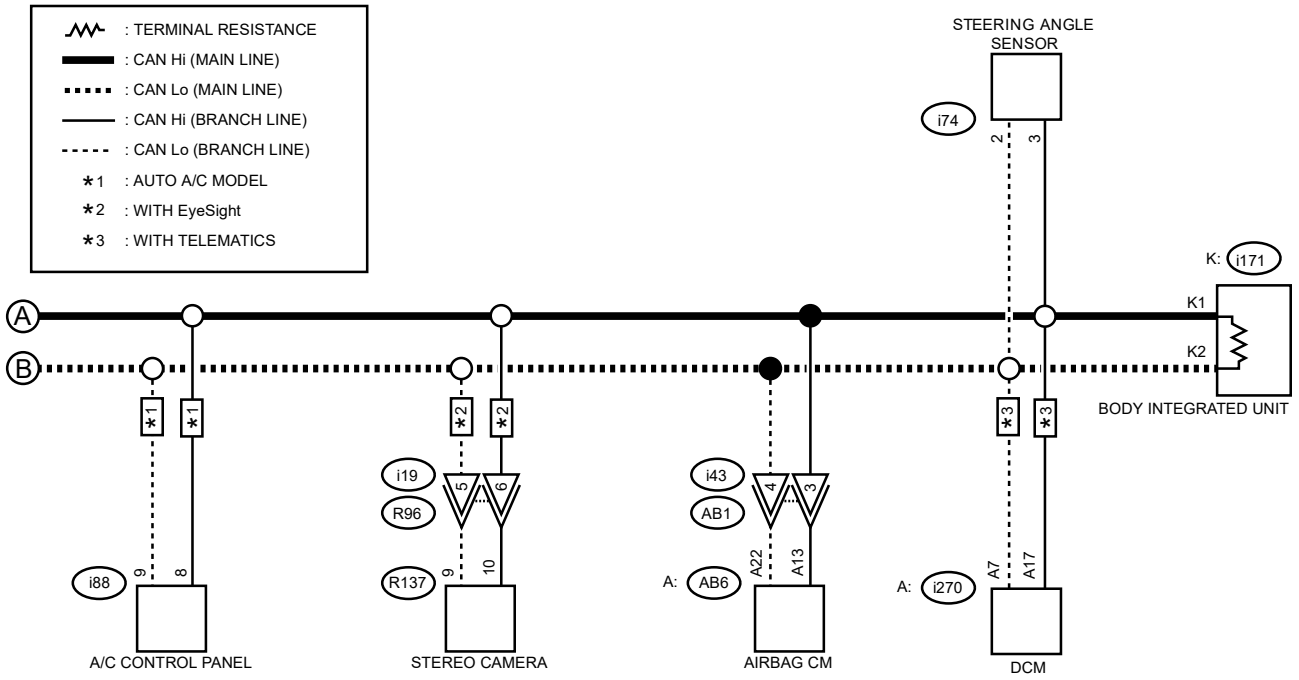
- MAIN-CAN

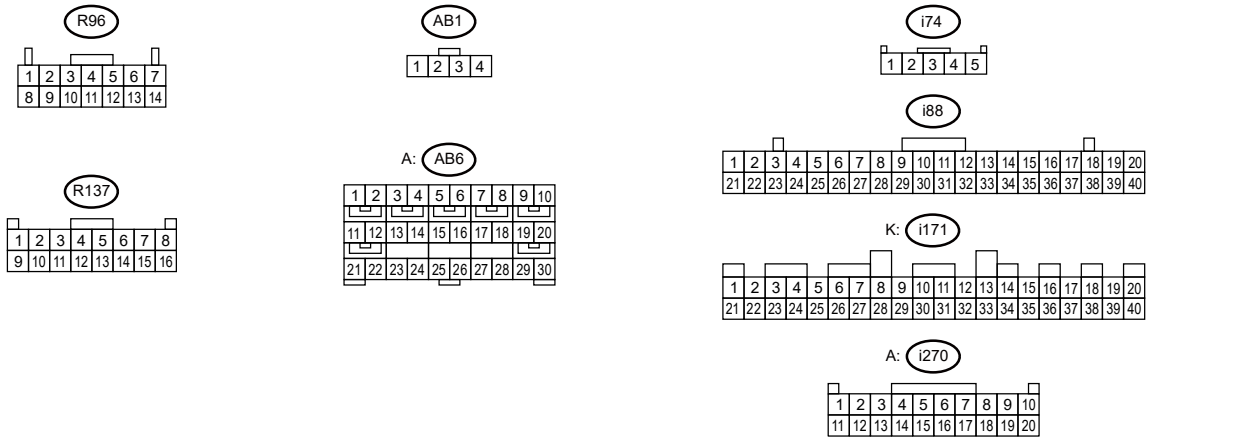
  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925





LAN10926

Note:

Main wiring harness or related lines may be shorted to battery circuit, or shorted to battery circuit in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the steering sensor connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the steering sensor connector and chassis ground.

Connector & terminal

(i74) No. 2 (+) — Chassis ground (−):

(i74) No. 3 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	Currently, it is normal.
No	Go to 2.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i74) No. 2 (+) — Chassis ground (−):

(i74) No. 3 (+) — Chassis ground (−):

Did the voltage change to 5 V or less?

Yes	Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit, Go to 3.
No	Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK BETWEEN MAIN WIRING HARNESSES.

Measure the voltage between body integrated unit connector and chassis ground using tester.

Connector & terminal

(i171) No. 1 (+) — Chassis ground (−):

(i171) No. 2 (+) — Chassis ground (−):

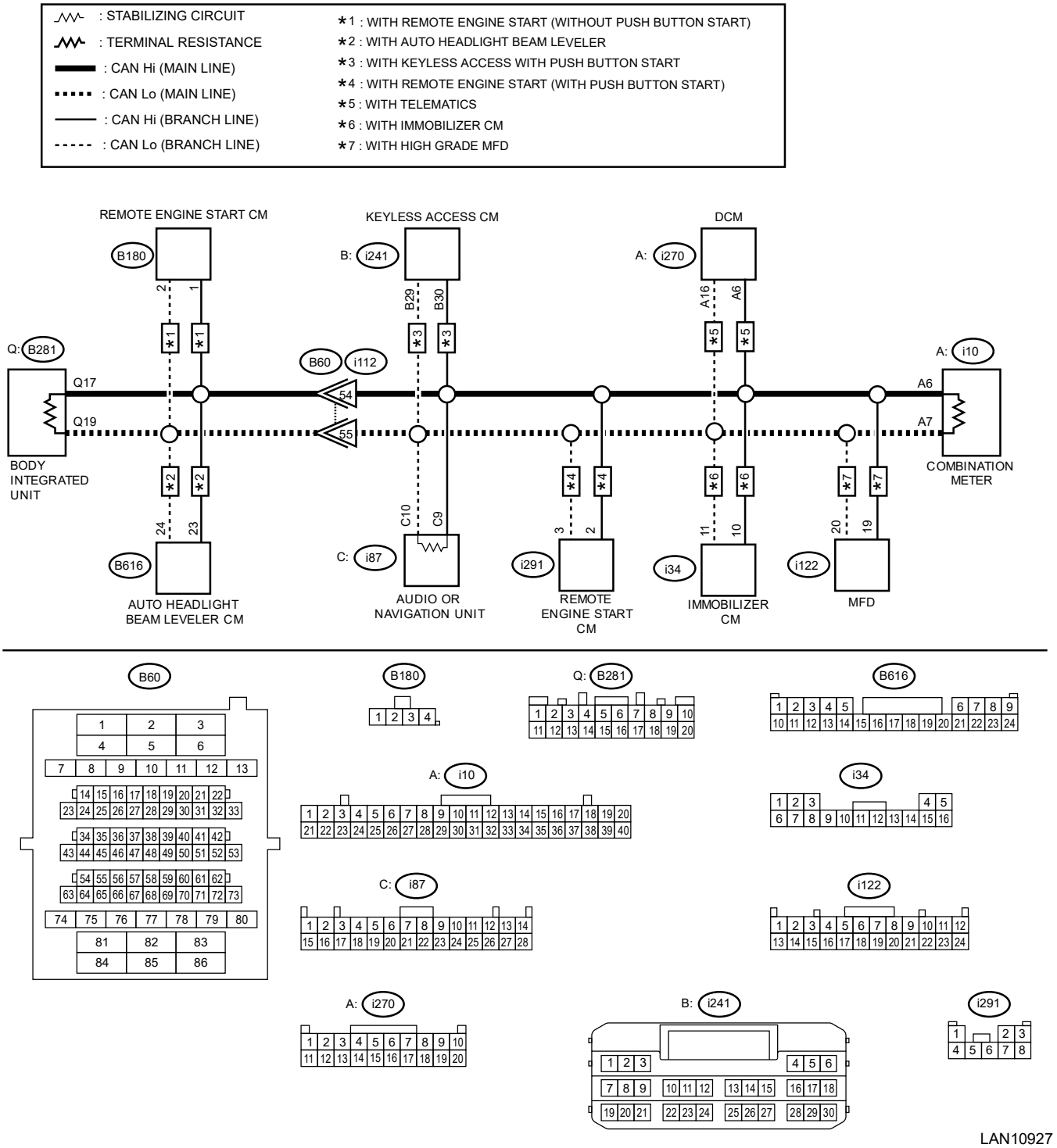
Is the voltage 5 V or less?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.
No	Repair or replace the short circuit to power supply of the harness between ECM — body integrated unit.

- BODY-CAN

  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Note:

Main wiring harness or related lines may be shorted to battery circuit, or shorted to battery circuit in one of the control modules.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation unit connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 (+) — Chassis ground (−):

(i87) No. 10 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	Currently, it is normal.
No	Go to 2.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i87) No. 9 (+) — Chassis ground (−):

(i87) No. 10 (+) — Chassis ground (−):

Did the voltage change to 5 V or less?

Yes	Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit, Go to 3.
No	Repair or replace the short circuit of the harness between body integrated unit — audio or navigation unit.

3. CHECK BETWEEN MAIN WIRING HARNESSES.

Using the tester, measure the voltage between terminals.

Connector & terminal

(B281) No. 17 (+) — Chassis ground (−):

(B281) No. 19 (+) — Chassis ground (−):

Is the voltage 5 V or less?

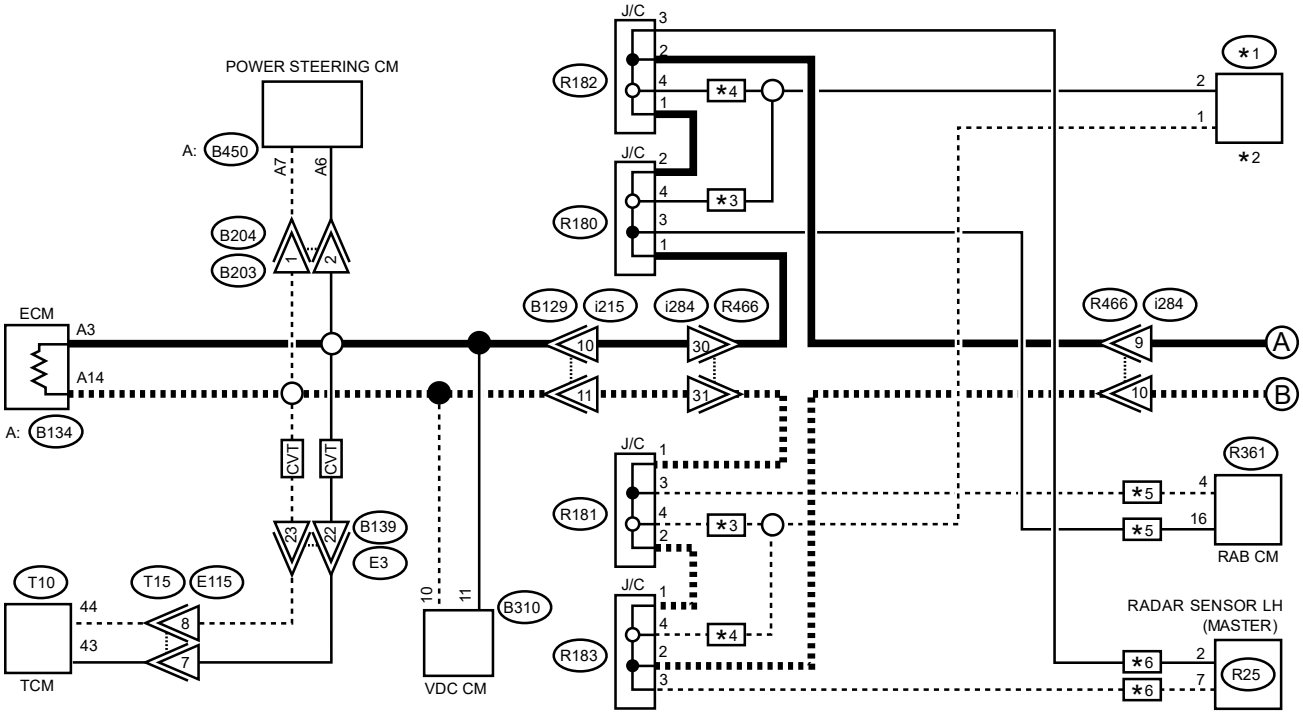
Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.
No	Repair or replace the short circuit of the harness between combination meter — body integrated unit.

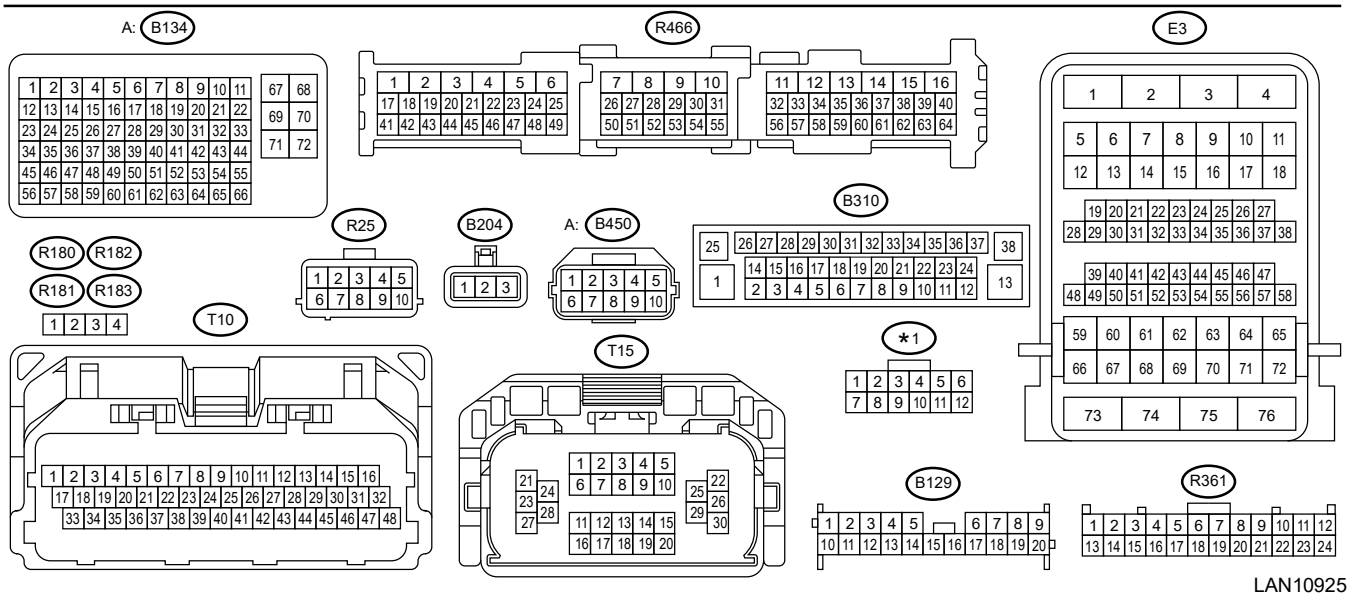
3. 53 — 61 Ω

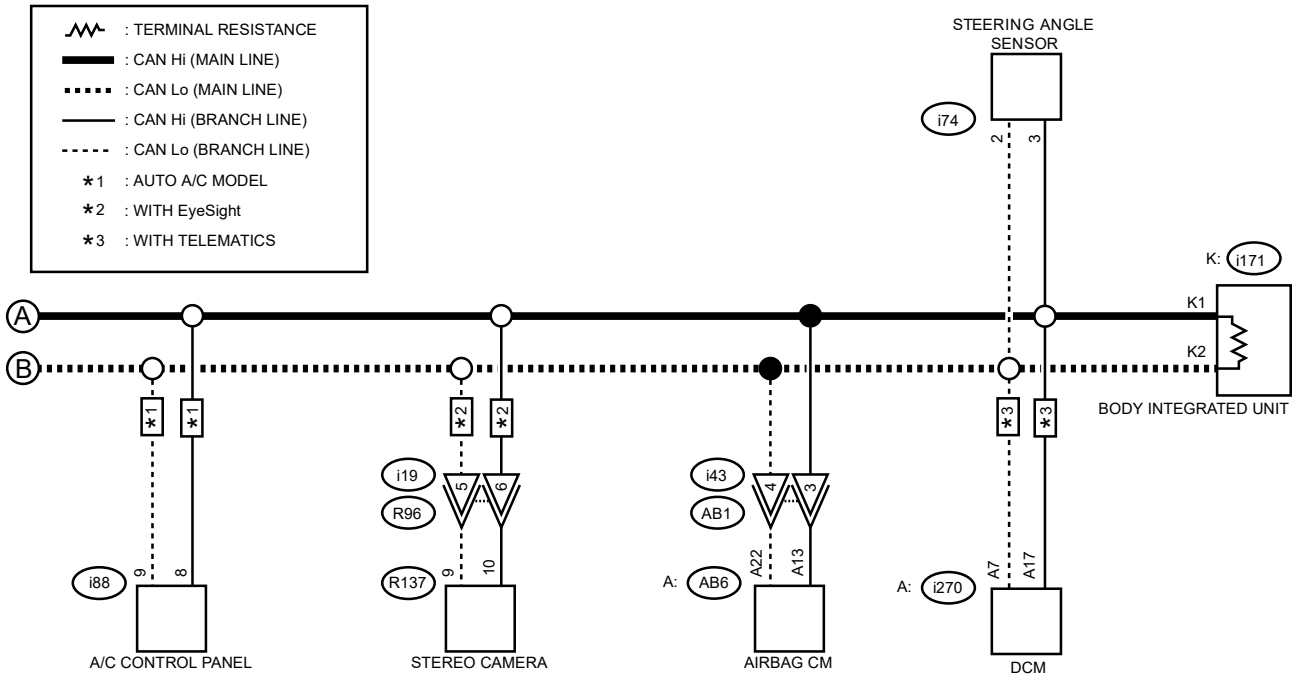
- MAIN-CAN

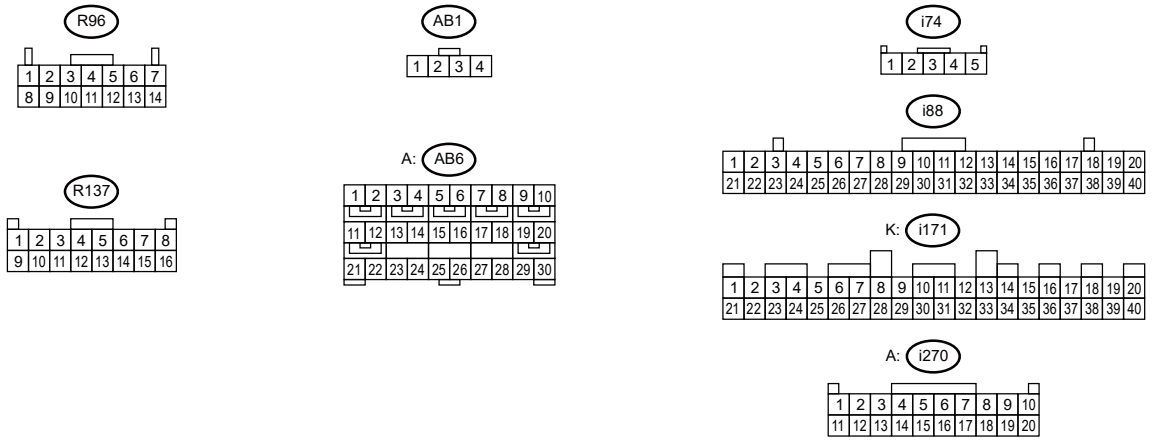
  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925





LAN10926

Note:

When the measured resistance value is 53 — 61 Ω, main wiring harness or related lines may be shorted to ground, or shorted to power supply line, or related lines may be open.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the steering sensor connector.
3. Using a tester, measure the resistance between the steering sensor connector and chassis ground.

Connector & terminal

(i74) No. 2 — Chassis ground:

(i74) No. 3 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i74) No. 2 — Chassis ground:

(i74) No. 3 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 3.
No	Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the steering sensor connector and chassis ground.
   Connector & terminal
   (i74) No. 2 (+) — Chassis ground (−):
   (i74) No. 3 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	CAN communication circuit is normal.
No	Go to 4.

4. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.
Note:
Disconnect the body integrated unit at the end.
Connector & terminal
(i74) No. 2 (+) — Chassis ground (−):
(i74) No. 3 (+) — Chassis ground (−):

Did the voltage change to 5 V or less?

Yes	Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 5.
No	Repair or replace the short circuit of the harness between body integrated unit and ECM.

5. CHECK HARNESS.

Measure the voltage between body integrated unit connector and chassis ground using tester.

Connector & terminal

(i171) No. 1 (+) — Chassis ground (−):

(i171) No. 2 (+) — Chassis ground (−):

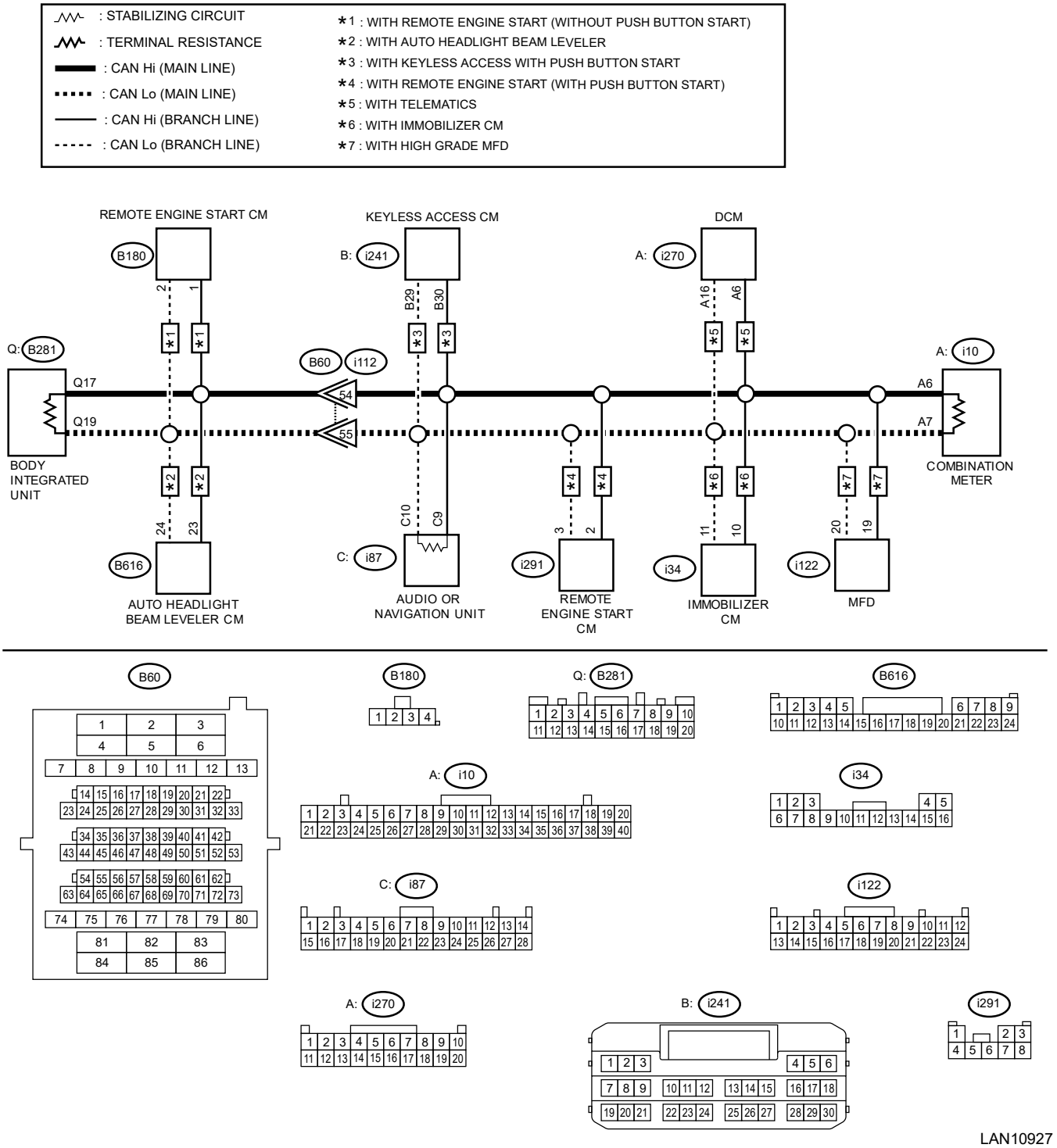
Is the voltage 5 V or less?

Yes	CAN communication circuit is normal.
No	Repair or replace the short circuit of the harness between ECM — body integrated unit.

- BODY-CAN

  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Note:

When the measured resistance value is 53 — 61 Ω, main wiring harness or related lines may be shorted to ground, or shorted to power supply line, or related lines may be open.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation unit connector.
3. Using a tester, measure the resistance between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 — Chassis ground:

(i87) No. 10 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i87) No. 9 — Chassis ground:

(i87) No. 10 — Chassis ground:

Did the resistance change to 10 Ω or more?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 3.
No	Repair or replace the short circuit of harness between body integrated unit — combination meter.

3. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between audio or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 9 (+) — Chassis ground (−):

(i87) No. 10 (+) — Chassis ground (−):

Is the voltage 5 V or less?

Yes	CAN communication circuit is normal.
No	Go to 4.

4. CHECK CONTROL MODULE.

With the tester connected, disconnect control module.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i87) No. 9 (+) — Chassis ground (−):

(i87) No. 103 (+) — Chassis ground (−):

Did the voltage change to 5 V or less?

Yes	Replace the control module whose voltage has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 5.
No	Repair or replace the short circuit of the harness between body integrated unit and ECM.

5. CHECK HARNESS.

Measure the voltage between body integrated unit connector and chassis ground using tester.

Connector & terminal

(B281) No. 17 (+) — Chassis ground (−):

(B281) No. 19 (+) — Chassis ground (−):

Is the voltage 5 V or less?

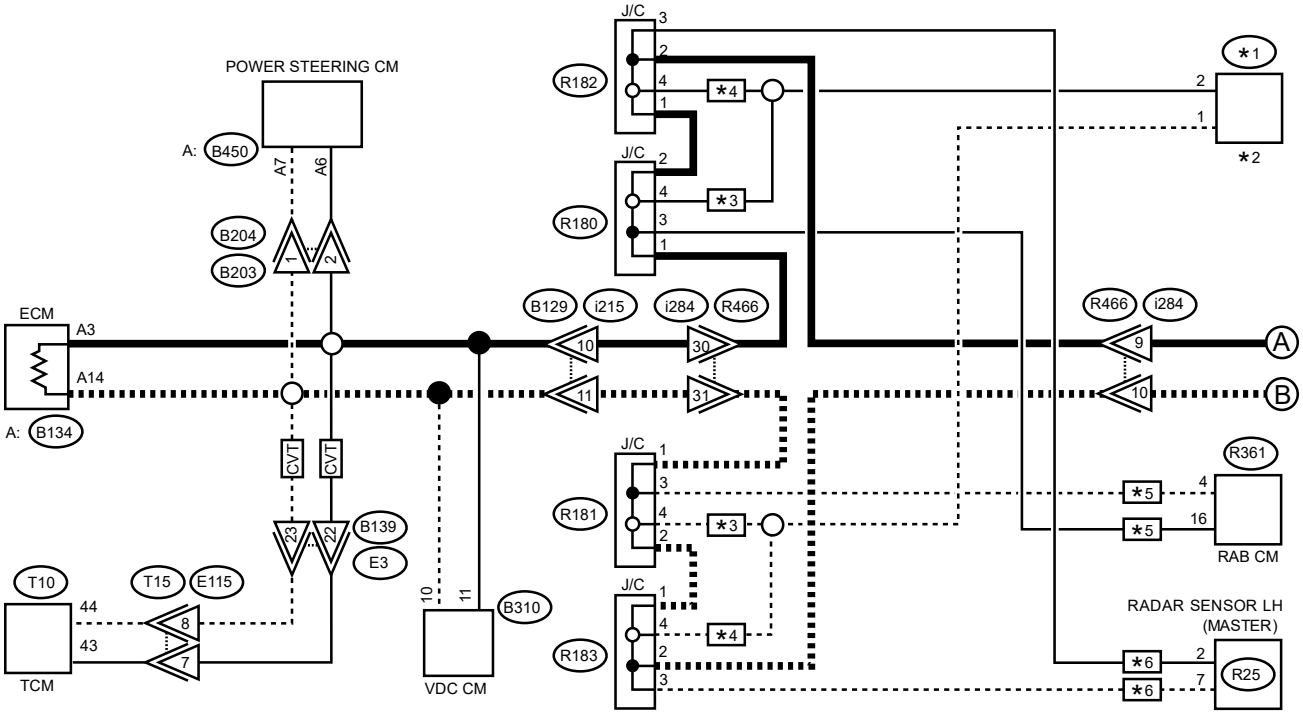
Yes	CAN communication circuit is normal.
No	Repair or replace the short circuit of the harness between combination meter — body integrated unit.

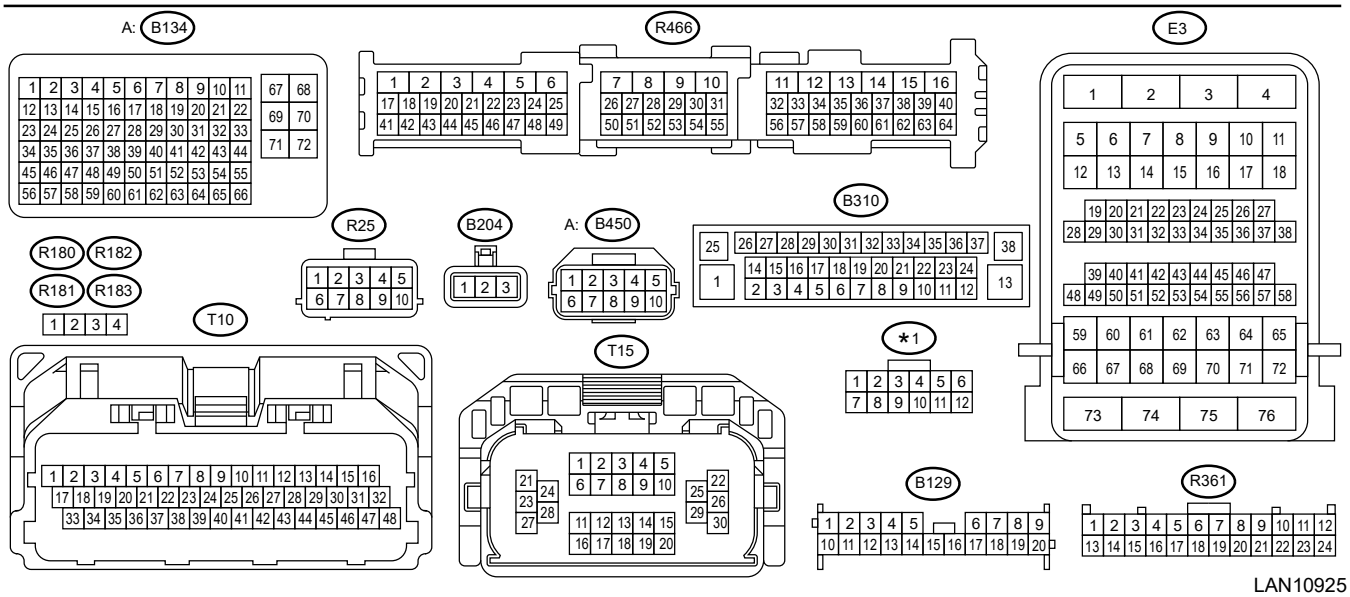
4. 52 Ω OR LESS

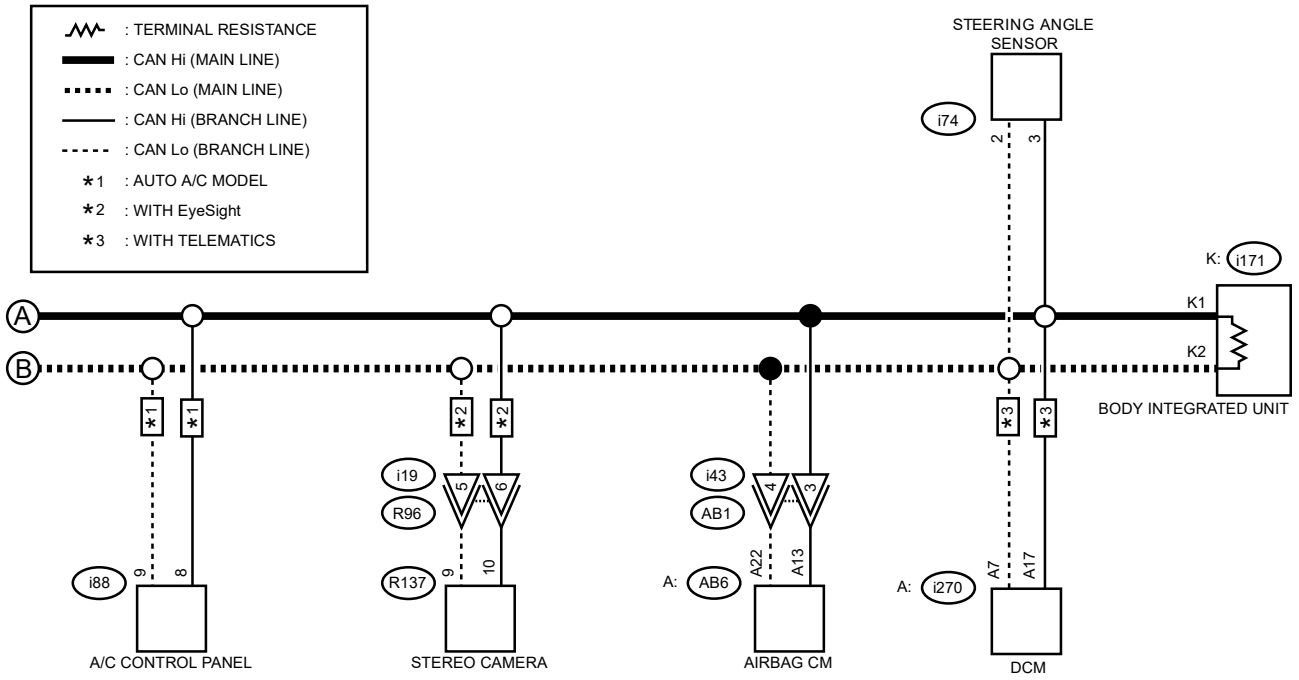
- MAIN-CAN

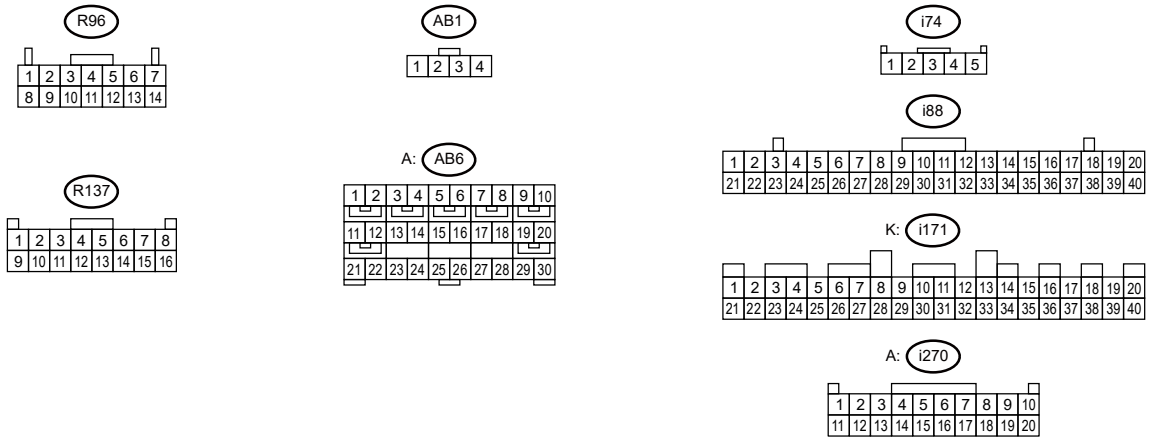
  Wiring diagram:

  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
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B203
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CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925





LAN10926

Note:

When the bus line is measured, combined resistance of the end resistance (120 Ω) in ECM and the end resistance (120 Ω) in body integrated unit can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. When the measured resistance value is 52 Ω or less, main wiring harness or related lines may be shorted, or combined resistance may have changed because resistance other than end resistance is created on the circuit.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the steering sensor connector.
3. Using a tester, measure the resistance between the steering sensor connector and chassis ground.
   Connector & terminal
   (i74) No. 2 — (i74) No. 3:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK MAIN WIRING HARNESS AND RELATED LINES.

With a tester connected, disconnect control module connectors in order.

Note:
Disconnect the body integrated unit at the end.

Connector & terminal
(i74) No. 2 — (i74) No. 3:

Is there any control module whose condition has changed from short state?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 3.
No	Repair or replace the short circuit of the harness between body integrated unit and ECM.

3. CHECK CONTROL MODULE.

1. Disconnect the connectors of ECM and body integrated unit.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B134) No. 3 — (B134) No. 14:

(i171) No. 1 — (i171) No. 2:

Is the resistance 114 — 126 Ω?

Yes	Go to 4.
No	Replace the control module whose end resistance value is out of the specified range.

4. CHECK HARNESS.

Measure the resistance between body integrated unit connector terminals using tester.

Connector & terminal

(i171) No. 1 — (i171) No. 2:

Is the resistance 1 MΩ or more?

Yes	CAN communication circuit is normal.
No	Go to 5.

5. CHECK CONTROL MODULE.

With a tester connected, disconnect control modules in order.

Connector & terminal

(i171) No. 1 — (i171) No. 2:

Are there any control modules whose resistance changed to 1 MΩ or more?

Yes	Replace the control module that has changed.
No	Repair or replace the harness part which has resistance component.

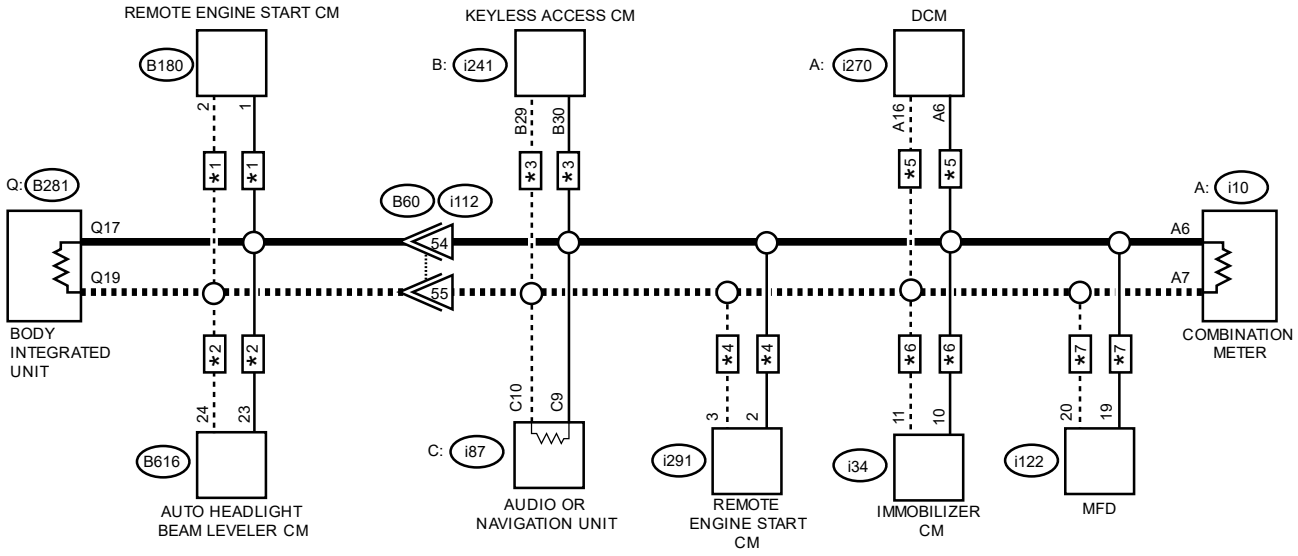
- BODY-CAN

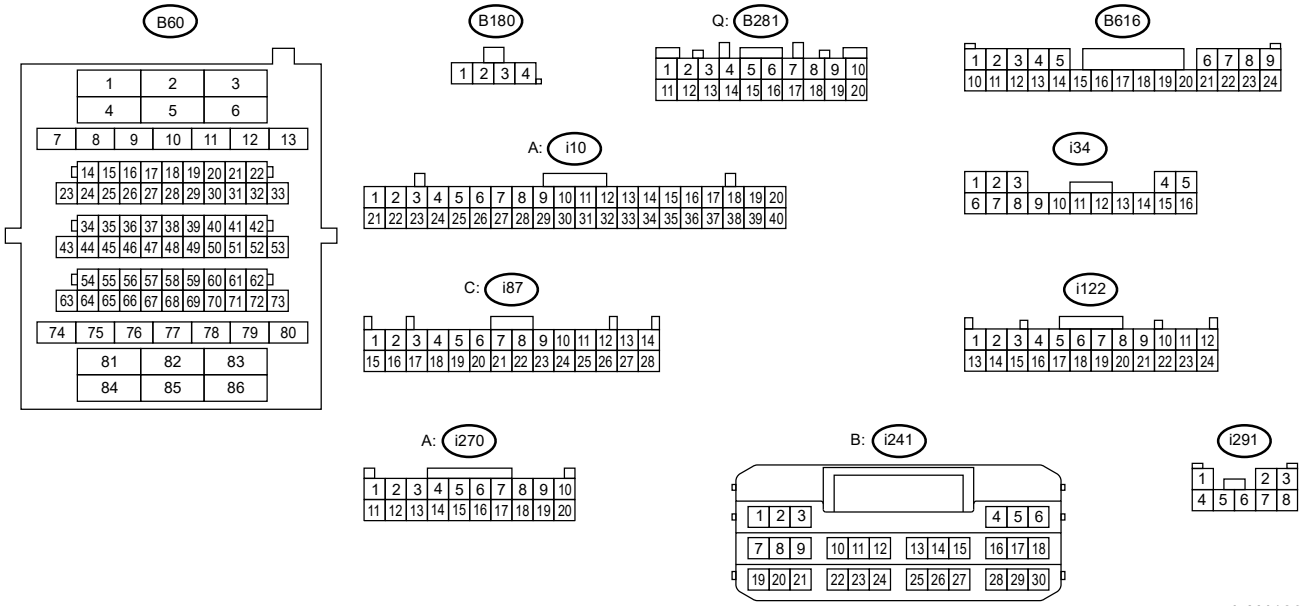
Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

Note:

When the bus line is measured, combined resistance of the end resistance (120 Ω) in body integrated unit and the end resistance (120 Ω) in combination meter can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. When the measured resistance value is 52 Ω or less, main wiring harness or related lines may be shorted, or combined resistance may have changed because resistance other than end resistance is created on the circuit.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation unit connector.
3. Using a tester, measure the resistance between audio or navigation unit connector terminals.
   Connector & terminal
   (i87) No. 9 — (i87) No. 10:

Is the resistance less than 10 Ω?

Yes	Go to 2.
No	Go to 3.

2. CHECK MAIN WIRING HARNESS AND RELATED LINES.

With a tester connected, disconnect control module connectors in order.

Note:

Disconnect the body integrated unit at the end.

Connector & terminal

(i87) No. 9 — (i87) No. 10:

Is there any control module whose condition has changed from short state?

Yes	Replace the control module whose resistance has changed. When the value changed at disconnecting the body integrated unit, replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL. Go to 3.
No	Repair or replace the short circuit of harness between body integrated unit — combination meter.

3. CHECK CONTROL MODULE.

1. Disconnect the connectors of the body integrated unit and combination meter.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B281) No. 17 — (B281) No. 19:

(i10) No. 6 — (i10) No. 7:

Is the resistance 114 — 126 Ω?

Yes	Go to 4.
No	Replace the control module whose end resistance value is out of the specified range.

4. CHECK HARNESS.

Using a tester, measure the resistance between the combination meter connector terminals.

Connector & terminal

(i10) No. 6 1 — (i10) No. 7:

Is the resistance 1 MΩ or more?

Yes	CAN communication circuit is normal.
No	Go to 5.

5. CHECK CONTROL MODULE.

With a tester connected, disconnect control modules in order.

Connector & terminal

(i10) No. 6 — (i10) No. 7:

Are there any control modules whose resistance changed to 1 MΩ or more?

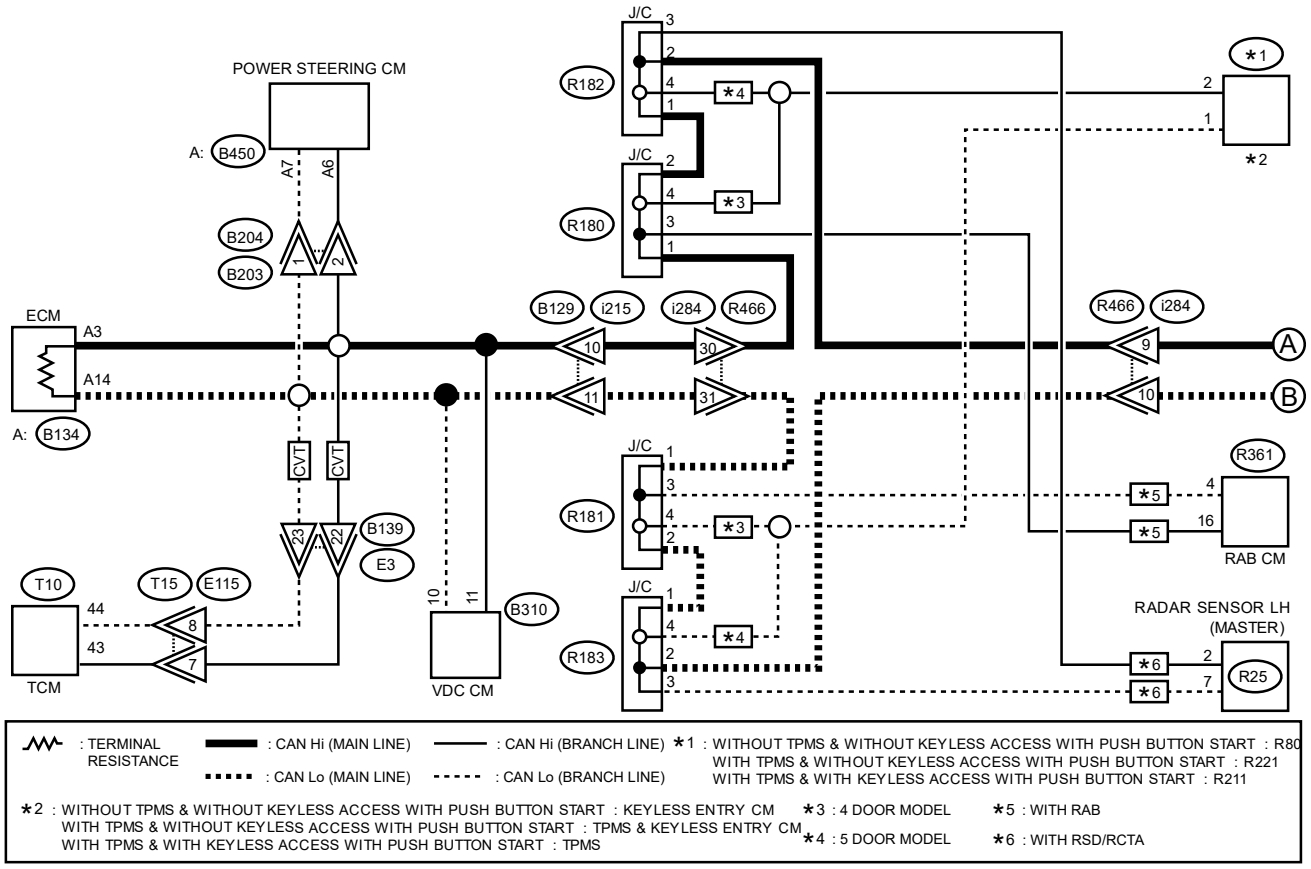
Yes	Replace the control module that has changed.
No	Repair or replace the harness part which has resistance component.

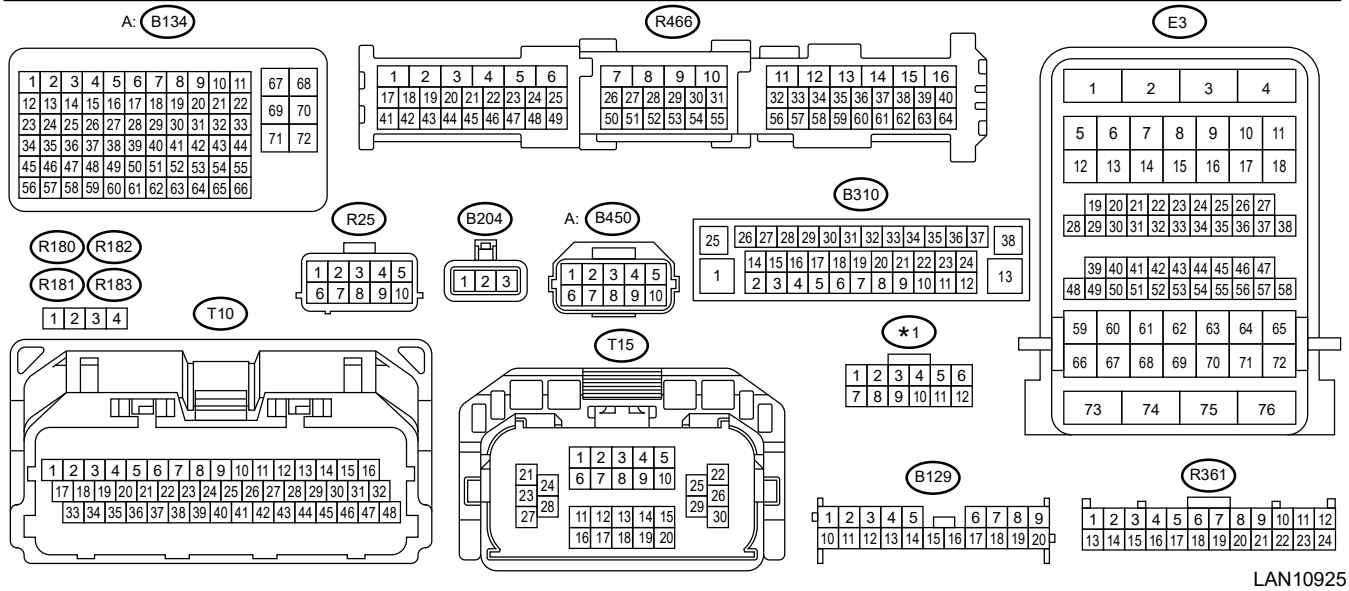
5. 62 Ω OR MORE

- MAIN-CAN

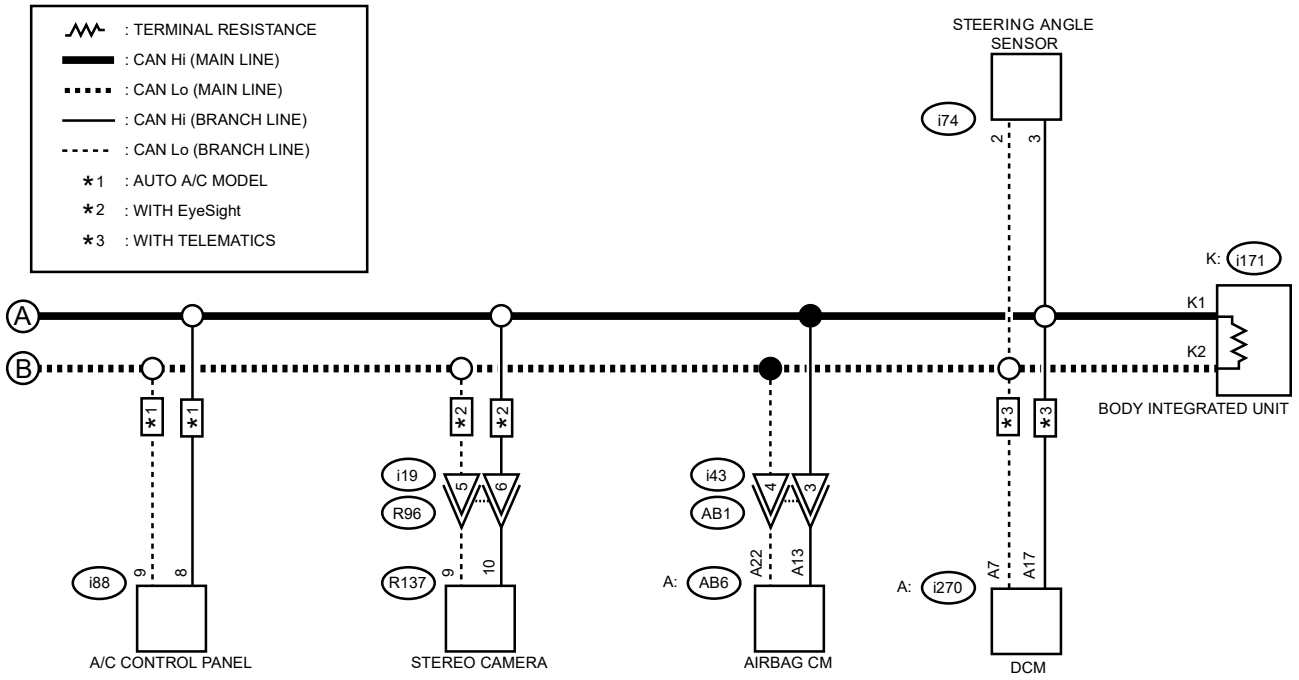
Wiring diagram:

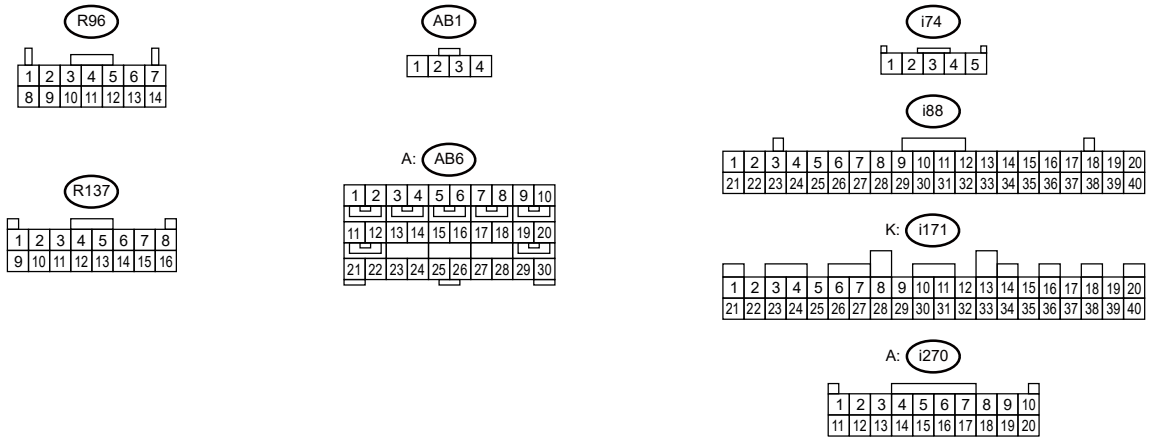
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.





LAN10925





LAN10926

Note:

When the CAN communication circuit is measured, combined resistance of the end resistance (120 Ω) in ECM and the end resistance (120 Ω) in body integrated unit can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. When the measured resistance value is 62 Ω or more, either one of the end resistances, or stabilizing circuit, or main wiring harness may have malfunction such as open circuit.

1. CHECK CONTROL MODULE.

1. Disconnect the connectors of ECM and body integrated unit.
2. Using a tester, measure the resistance between control module terminals.

Connector & terminal

(B134) No. 3 — (B134) No. 14:

(i171) No. 1 — (i171) No. 2:

Is the resistance 114 — 126 Ω?

Yes	Go to 2.
No	Replace the control module whose value is out of the specification.

2. CHECK HARNESS.

1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between steering sensor connector and ECM connector, and between steering sensor connector and body integrated unit connector.

Connector & terminal

(i74) No. 3 — (B134) No. 3:

(i74) No. 2 — (B134) No. 14:

(i74) No. 3 — (i171) No. 1:

(i74) No. 2 — (i171) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

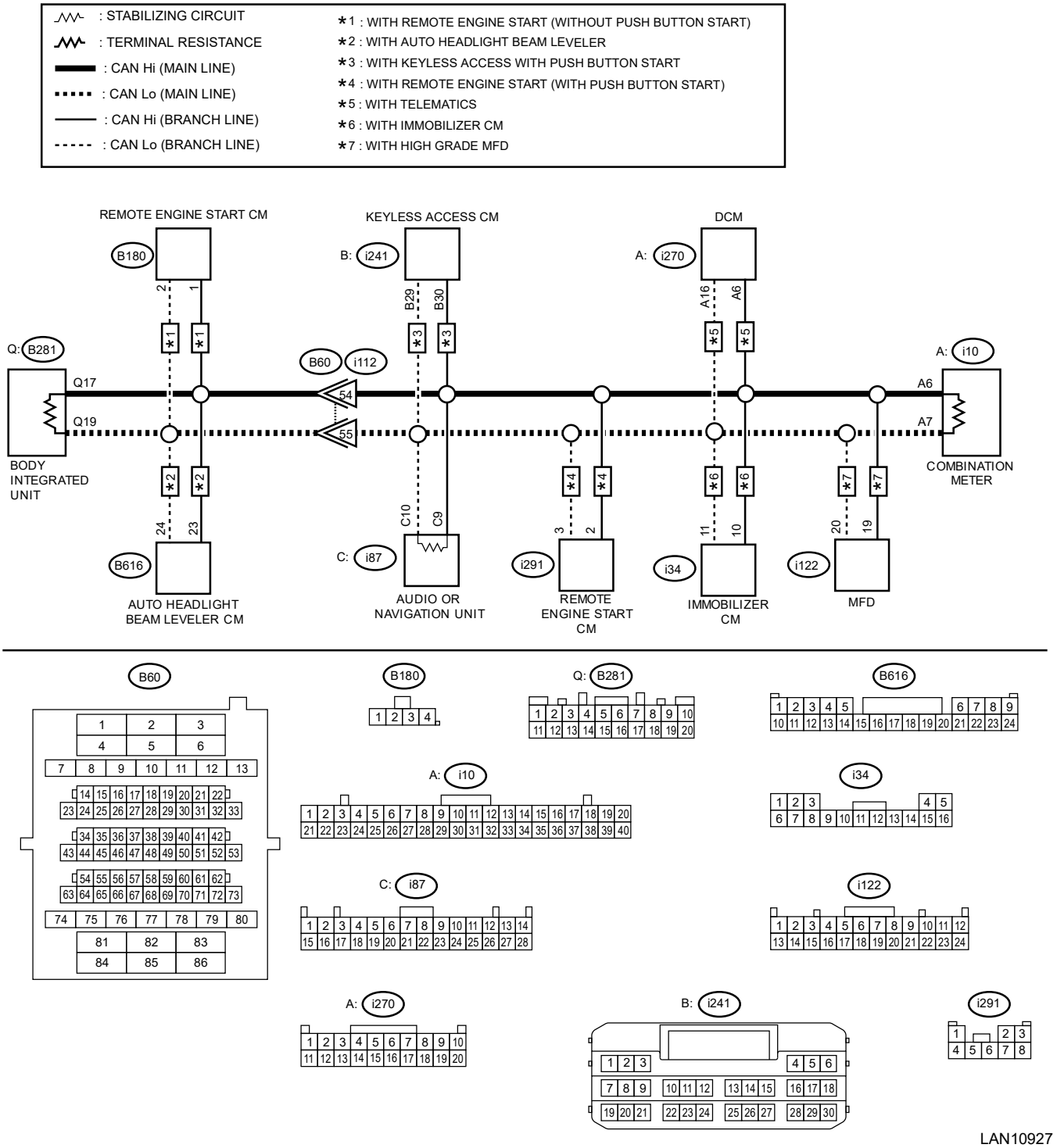
3. CHECK HARNESS.

1. Disconnect the combination meter connector.
2. Using a tester, measure the resistance between the combination meter connector and body integrated unit connector.
   Connector & terminal
   (B281) No. 17 — (i10) No. 6:
   (B281) No. 19 — (i10) No. 7:

Is the resistance less than 10 Ω?

Yes	It is possible that temporary poor communication occurs.
No	Repair or replace the open circuit of harness.

- BODY-CAN
  Wiring diagram:
  CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Note:

When the CAN communication circuit is measured, combined resistance of the end resistance (120 Ω) in body integrated unit and the end resistance (120 Ω) in combination meter can be measured. The combined resistance is approximately 53 — 61 Ω with the stabilizing circuit included. When the measured resistance value is 62 Ω or more, either one of the end resistances, or stabilizing circuit, or main wiring harness may have malfunction such as open circuit.

1. CHECK CONTROL MODULE.

1. Disconnect the connectors of the body integrated unit and combination meter.
2. Using a tester, measure the resistance between control module terminals.
   Connector & terminal
   (B281) No. 17 — (B281) No. 19:
   (i10) No. 6 — (i10) No. 7:

Is the resistance 114 — 126 Ω?

Yes	Go to 2.
No	Replace the control module whose value is out of the specification.

2. CHECK HARNESS.

1. Disconnect the steering sensor connector.
2. Disconnect the ECM connector.
3. Disconnect the body integrated unit connector.
4. Using a tester, measure the resistance between steering sensor connector and ECM connector, and between steering sensor connector and body integrated unit connector.
   Connector & terminal
   (i74) No. 3 — (B134) No. 3:
   (i74) No. 2 — (B134) No. 14:
   (i74) No. 3 — (i171) No. 1:
   (i74) No. 2 — (i171) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS.

Using a tester, measure the resistance between the combination meter connector and body integrated unit connector.

Connector & terminal

(B281) No. 17 — (i10) No. 6:

(B281) No. 19 — (i10) No. 7:

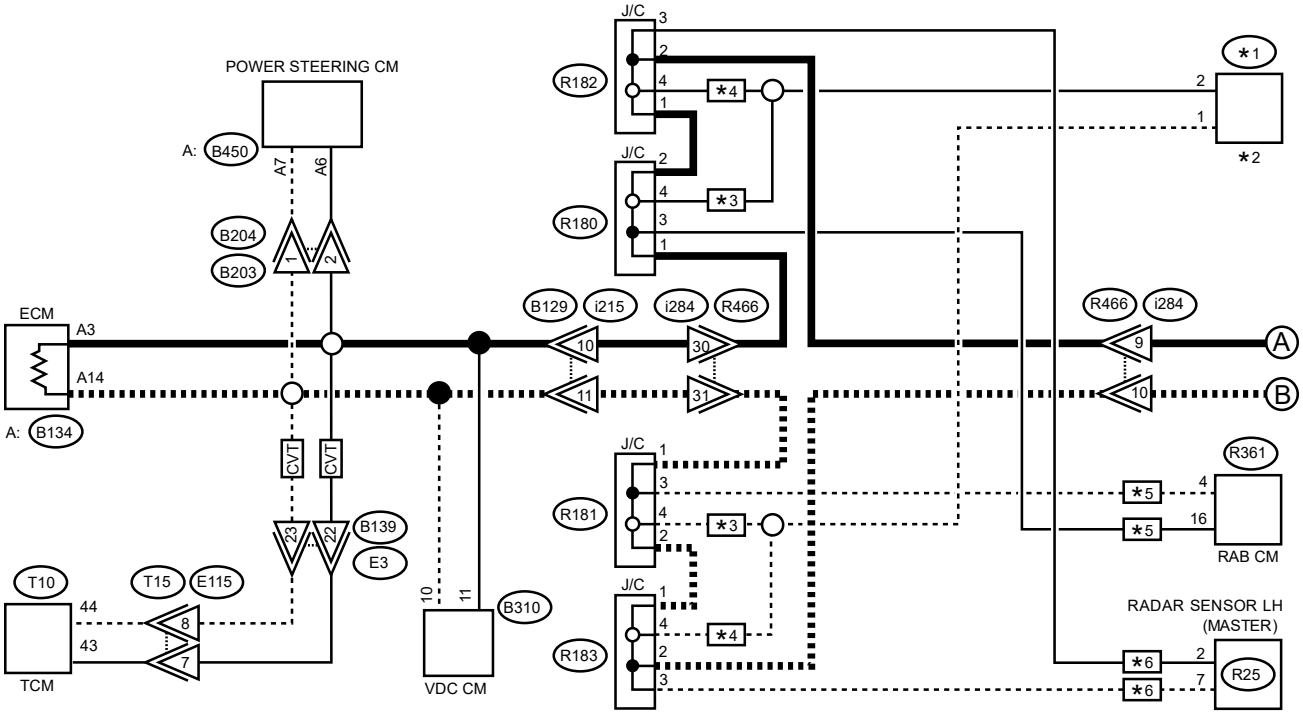
Is the resistance less than 10 Ω?

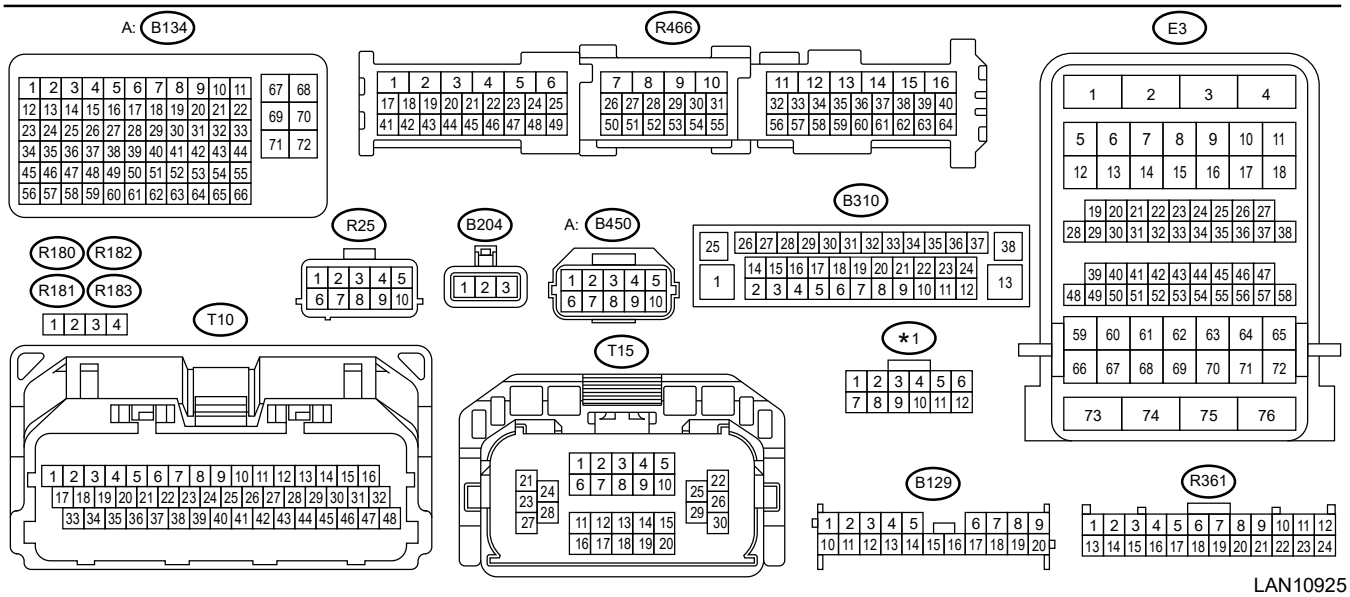
Yes	It is possible that temporary poor communication occurs.
No	Repair or replace the open circuit of harness.

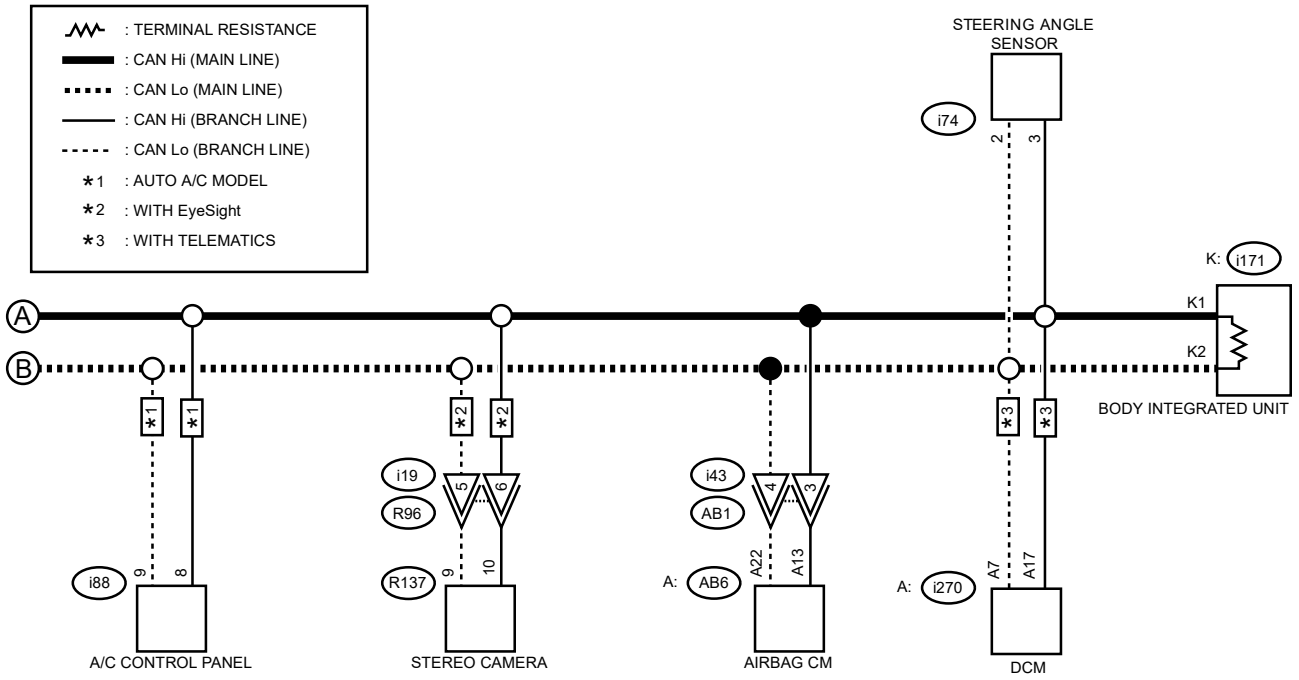
6. RELATED LINES 53 — 61 Ω (TCM)

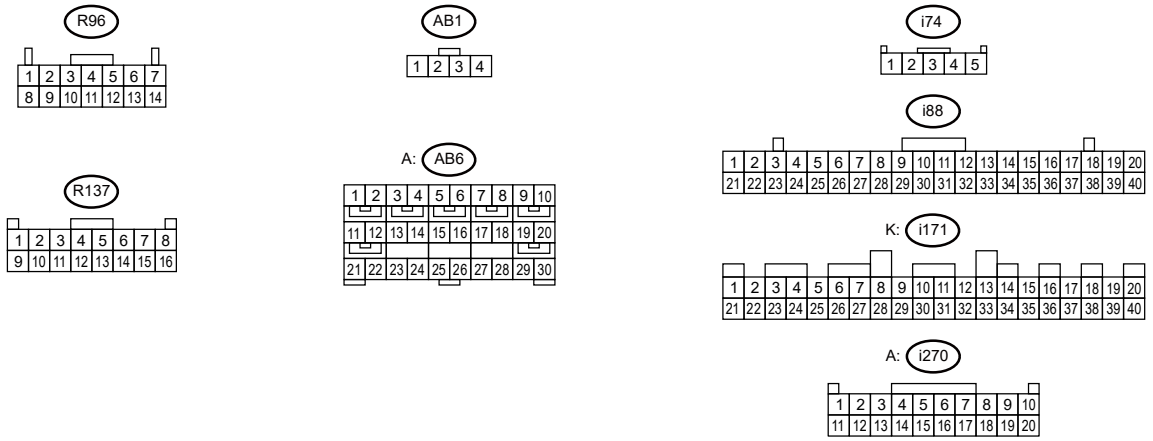
Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925





LAN10926

Note:

Perform inspection when no data is received, or faulty is detected. This is different from power supply shorted or ground shorted.

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the TCM connector.
2. Using a tester, measure the resistance between terminals in TCM connector.
   Connector & terminal
   (T10) No. 43 — (T10) No. 44:

Is the resistance 400 Ω or more?

Yes	A related line between TCM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

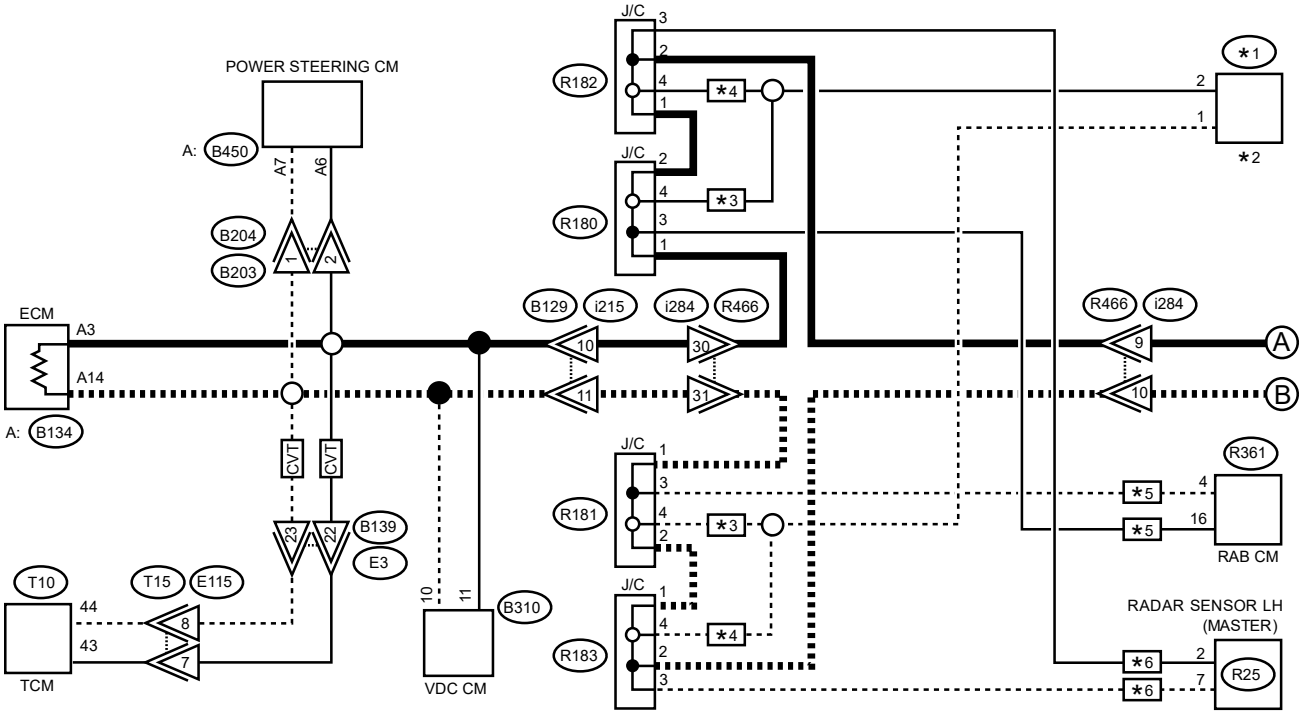
1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between the TCM connector and steering sensor connector.
   Connector & terminal
   (T10) No. 43 — (i74) No. 3:
   (T10) No. 44 — (i74) No. 2:

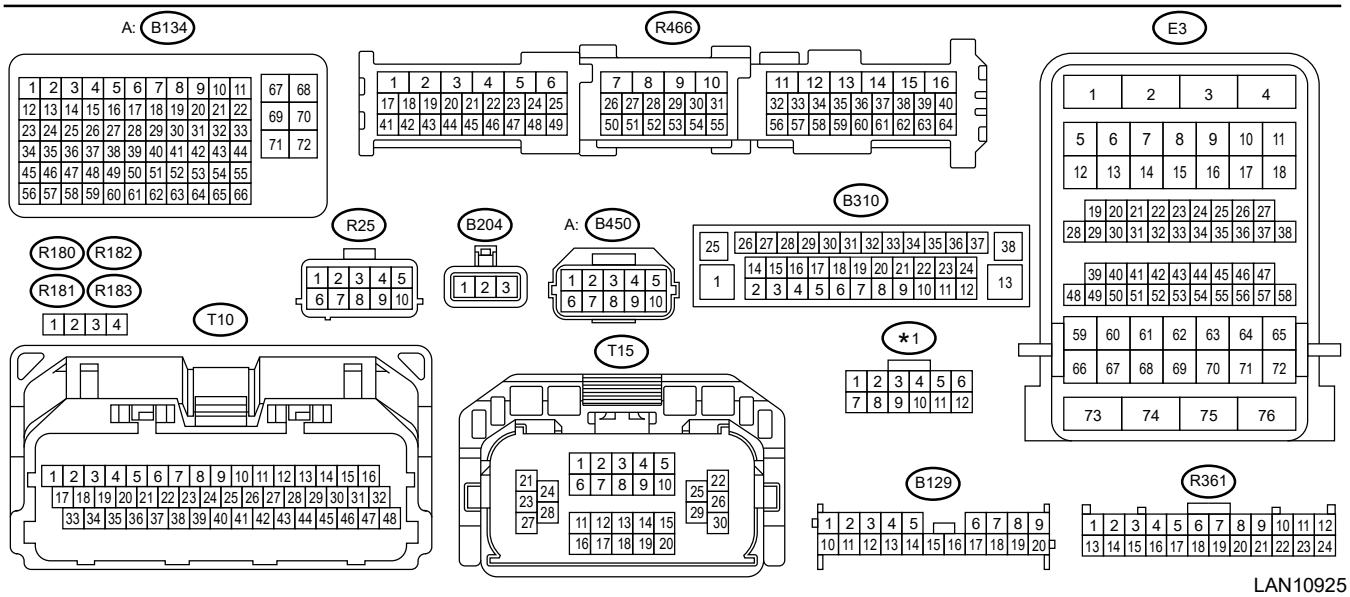
Is the resistance 10 Ω or more?

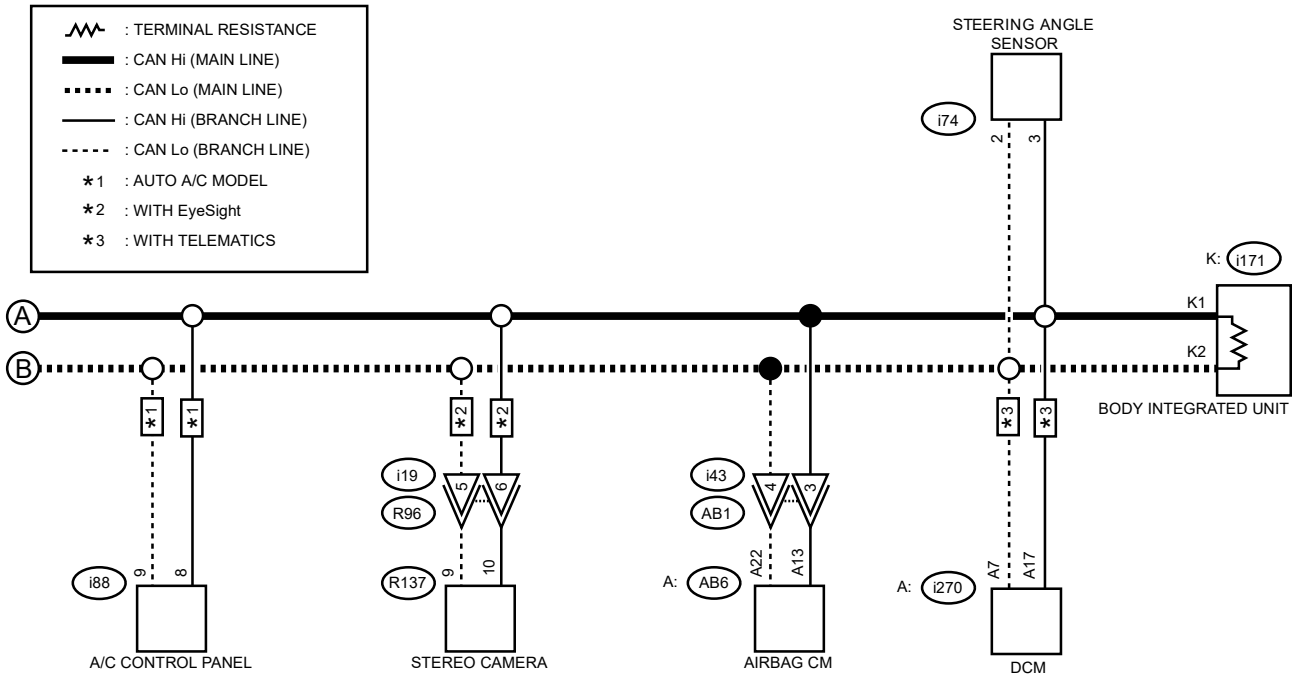
Yes	Repair or replace the open circuit of TCM related lines.
No	Check DTC of TCM. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

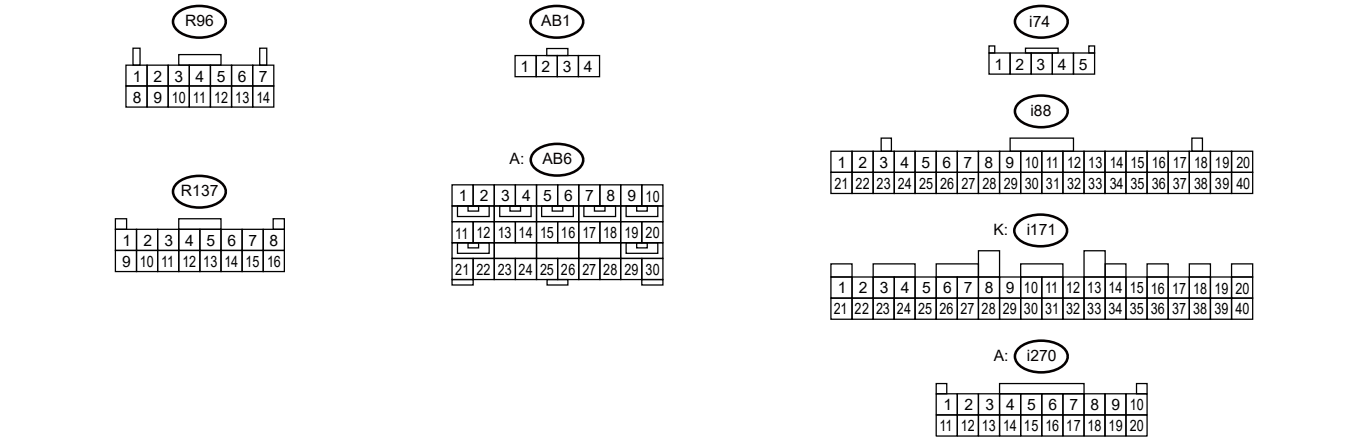
7. RELATED LINES 53 — 61 Ω (STEERING ANGLE SENSOR)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the steering angle sensor connector.
2. Using a tester, measure the resistance between terminals of steering angle sensor connector.
   Connector & terminal
   (i74) No. 2 — (i74) No. 3:

Is the resistance 400 Ω or more?

Yes	A related line between steering angle sensor and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

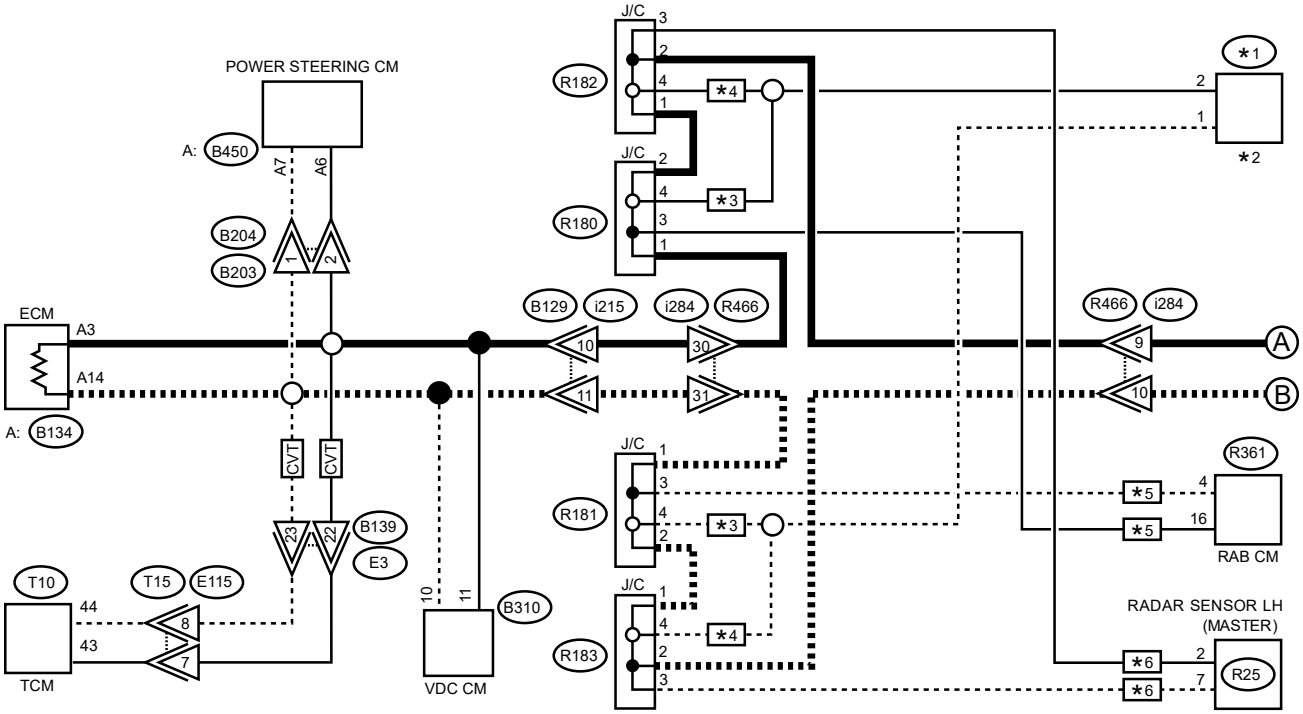
1. Disconnect the body integrated unit connector.
2. Using a tester, measure the resistance between steering angle sensor connector and body integrated unit.
   Connector & terminal
   (i74) No. 2 — (i171) No. 2:
   (i74) No. 3 — (i171) No. 1:

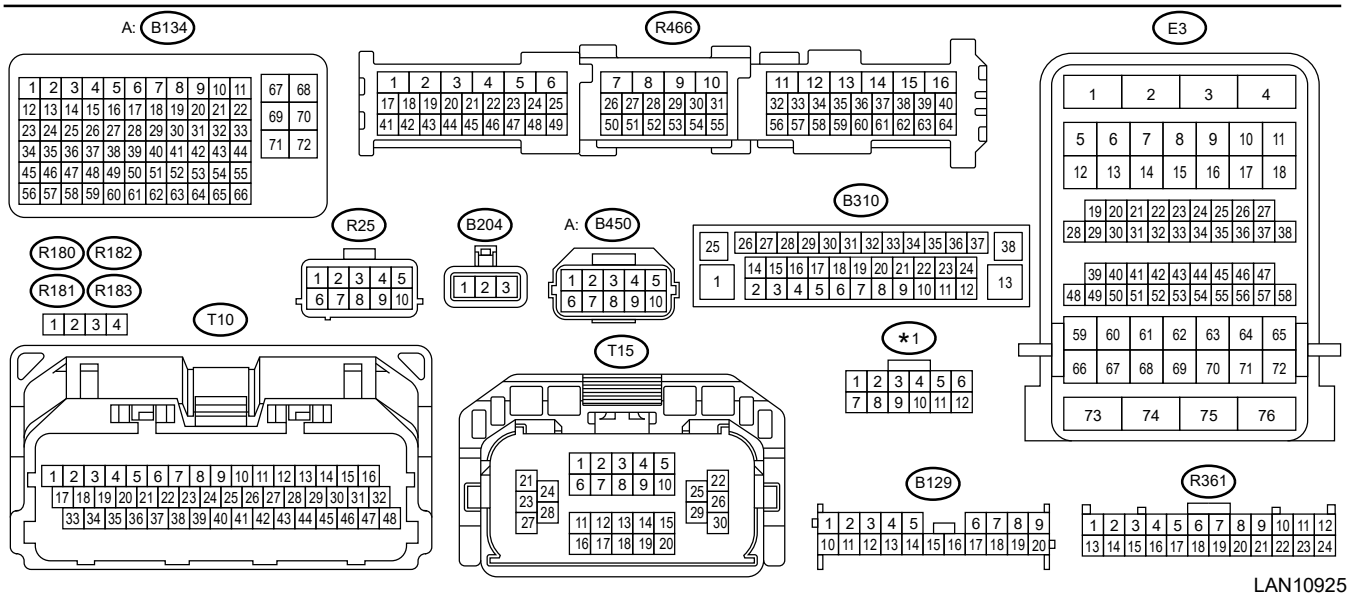
Is the resistance 10 Ω or more?

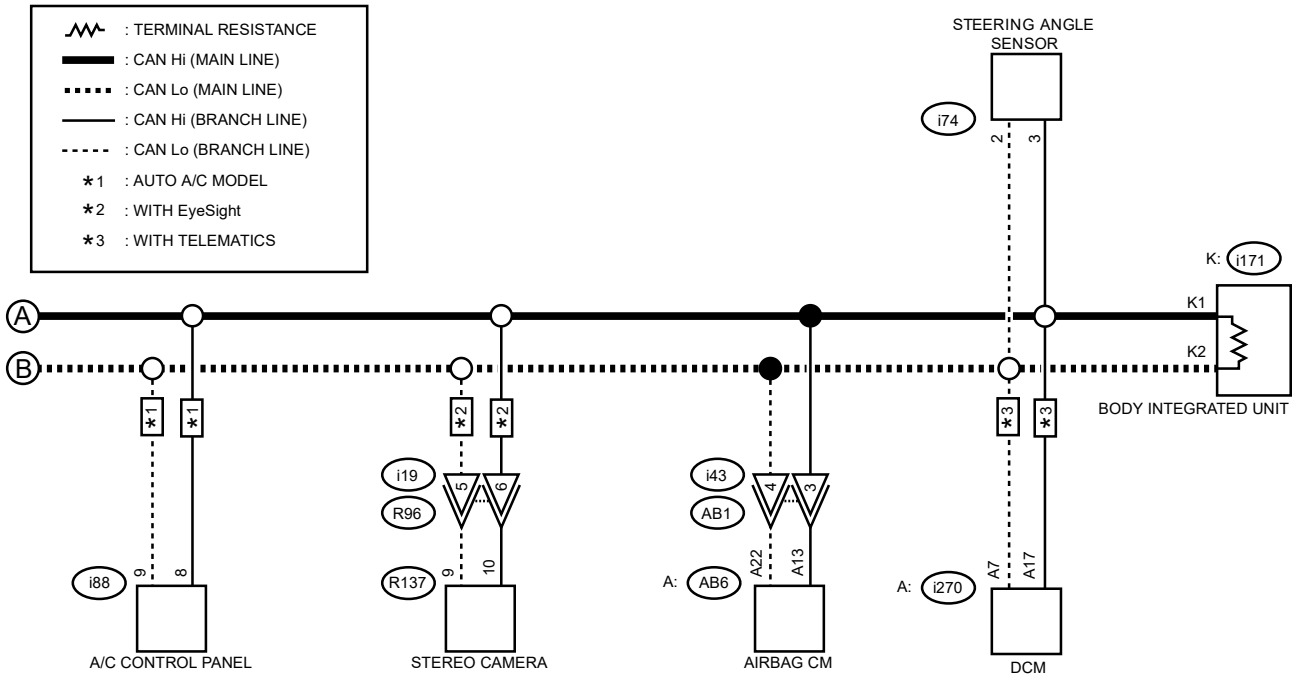
Yes	Repair or replace the open circuit of steering angle sensor related lines.
No	Check DTC of VDC CM. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

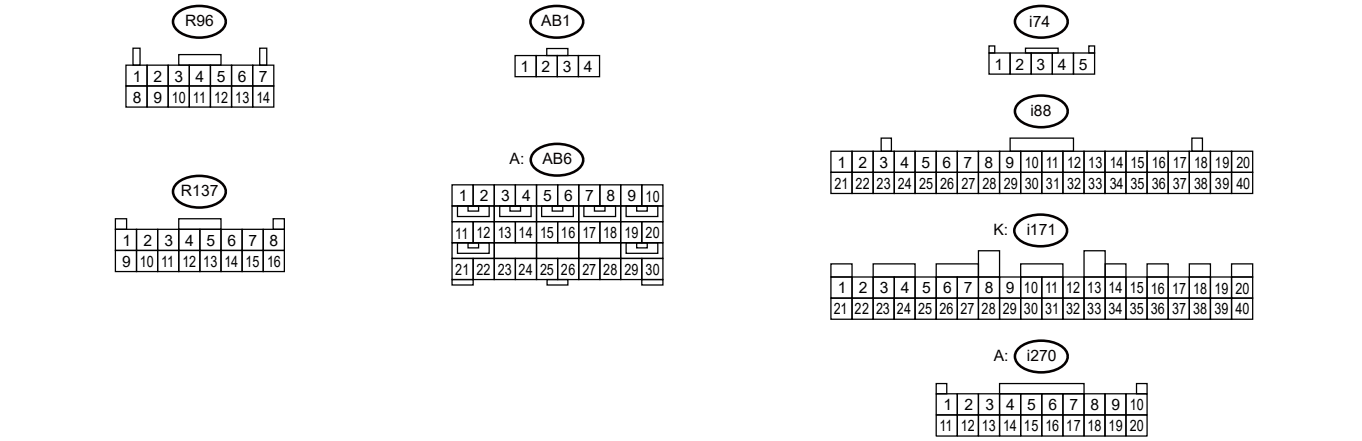
8. RELATED LINES 53 — 61 Ω (A/C CONTROL PANEL)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the A/C control panel connector.
2. Using a tester, measure the resistance between the A/C control panel connector terminals.
   Connector & terminal
   (i88) No. 8 — (i88) No. 9:

Is the resistance 400 Ω or more?

Yes	A related line between A/C control panel and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

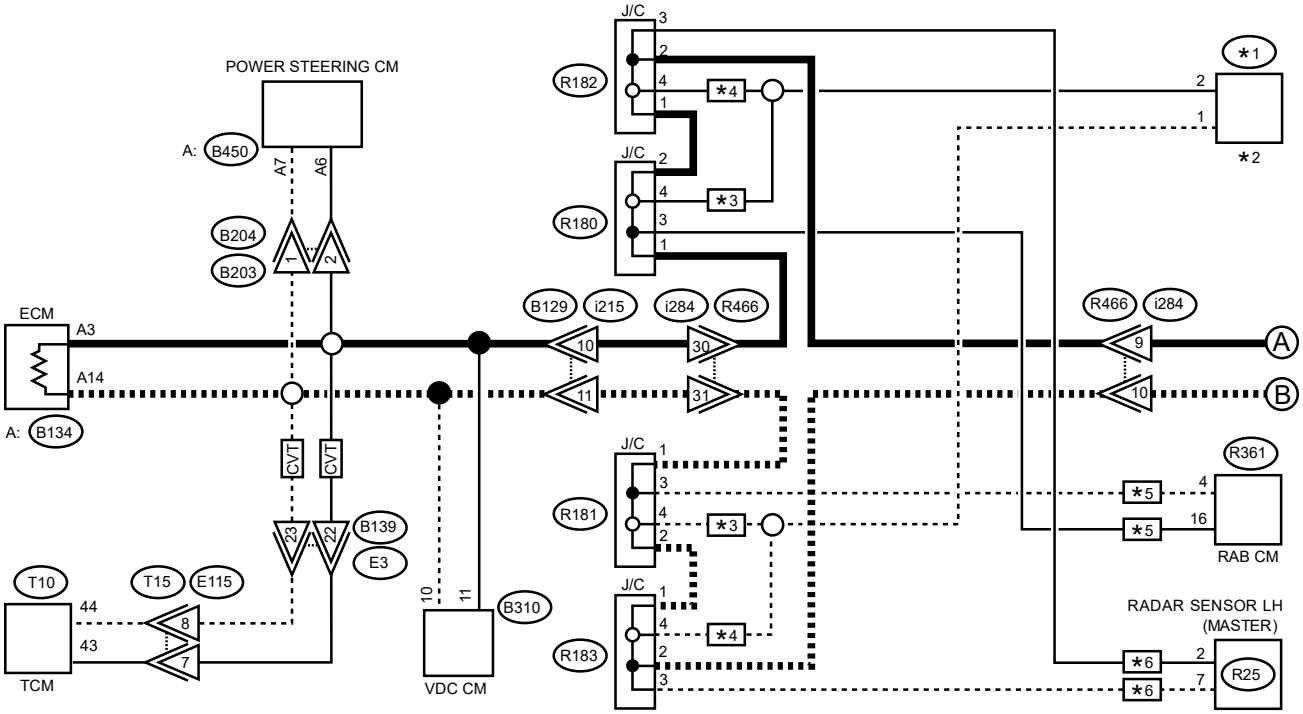
1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between the A/C control panel connector and steering sensor connector.
   Connector & terminal
   (i88) No. 8 — (i74) No. 3:
   (i88) No. 9 — (i74) No. 2:

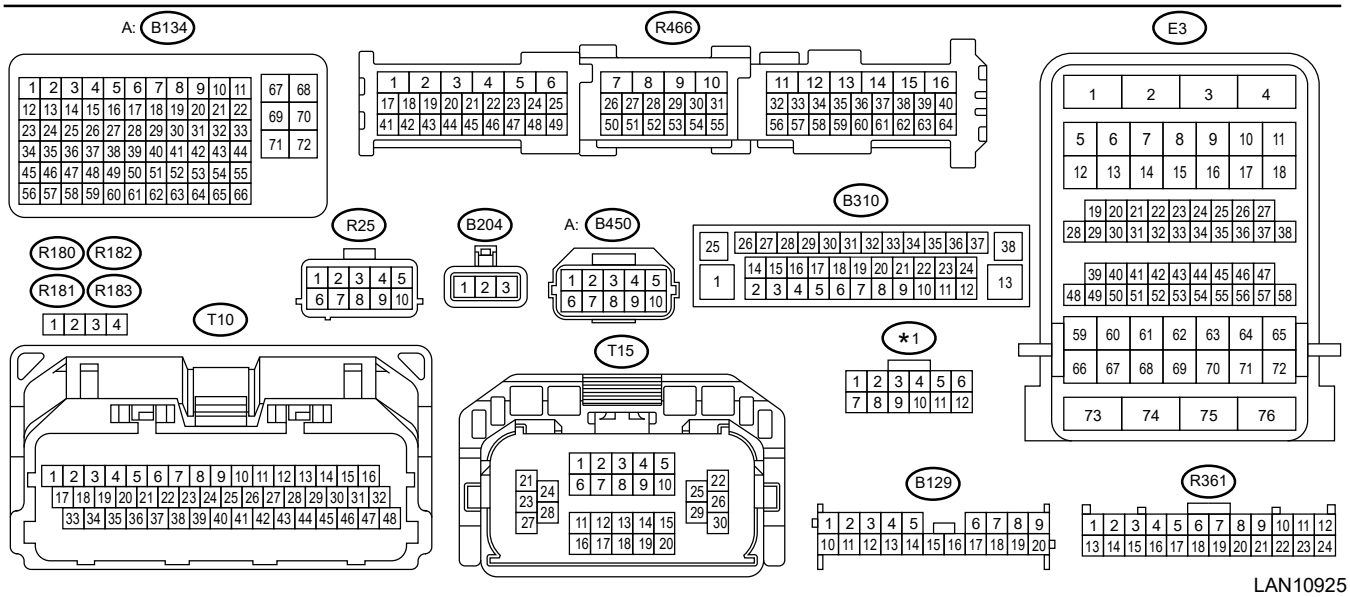
Is the resistance 10 Ω or more?

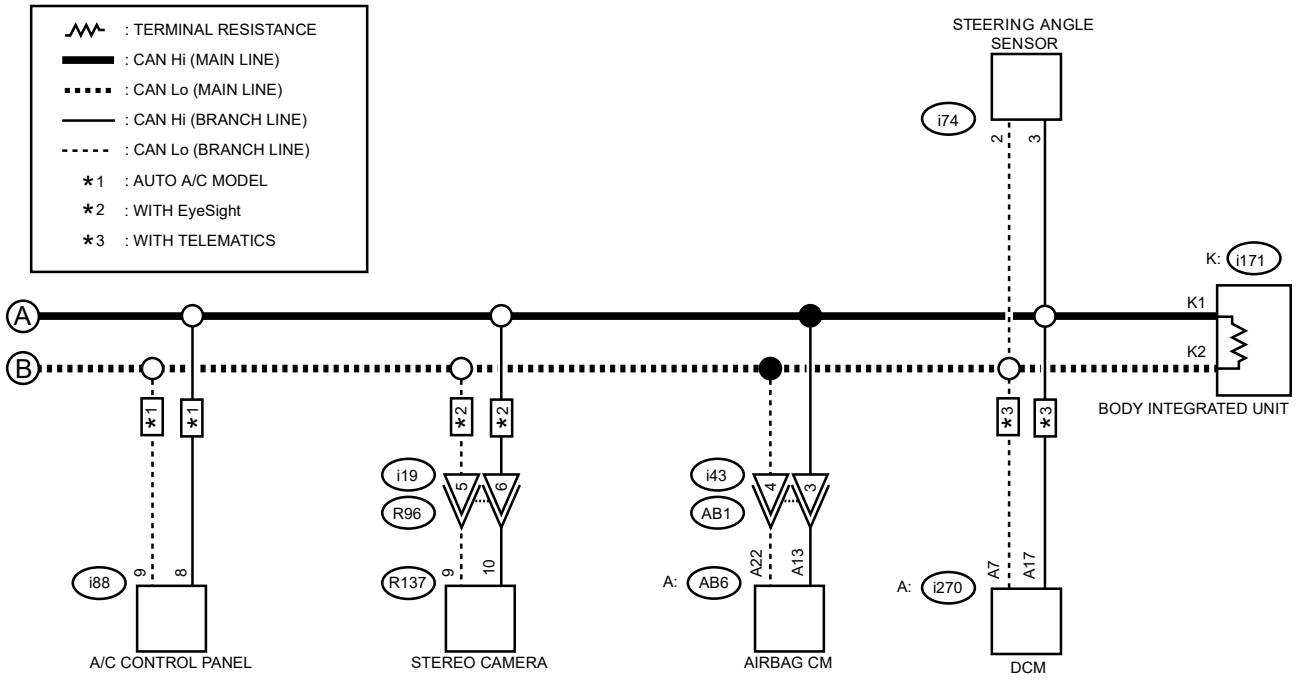
Yes	Repair or replace the open circuit of A/C control panel related lines.
No	Check the DTC of A/C control panel. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

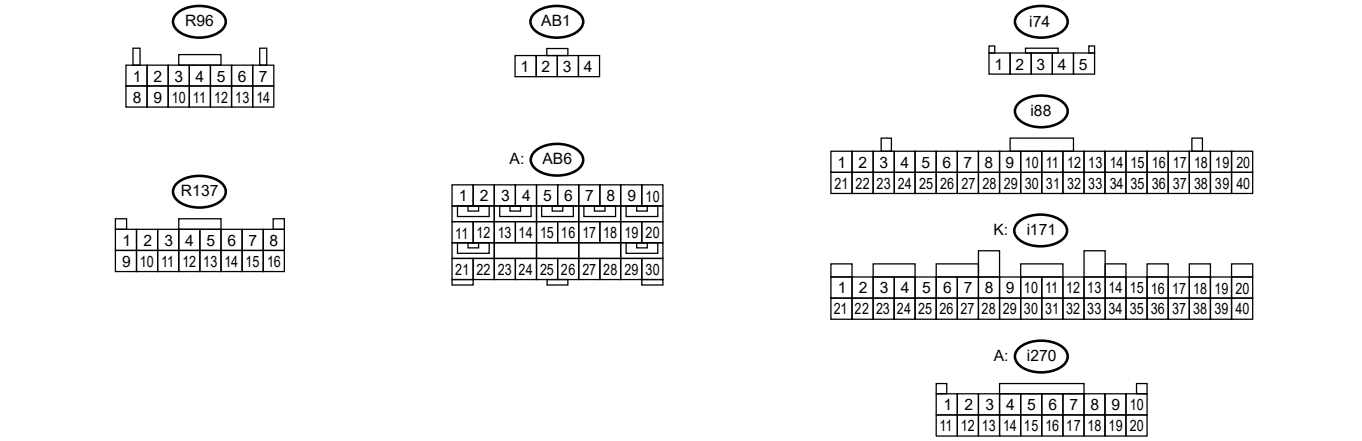
9. RELATED LINES 53 — 61 Ω (POWER STEERING)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the power steering CM connector.
2. Using a tester, measure the resistance between terminals of power steering CM connector.
   Connector & terminal
   (B450) No. 6 — (B450) No. 7:

Is the resistance 400 Ω or more?

Yes	A related line or main wiring harness between power steering CM and main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between the power steering CM connector and steering sensor connector.
   Connector & terminal
   (B450) No. 6 — (i74) No. 3:
   (B450) No. 7 — (i74) No. 2:

Is the resistance 10 Ω or more?

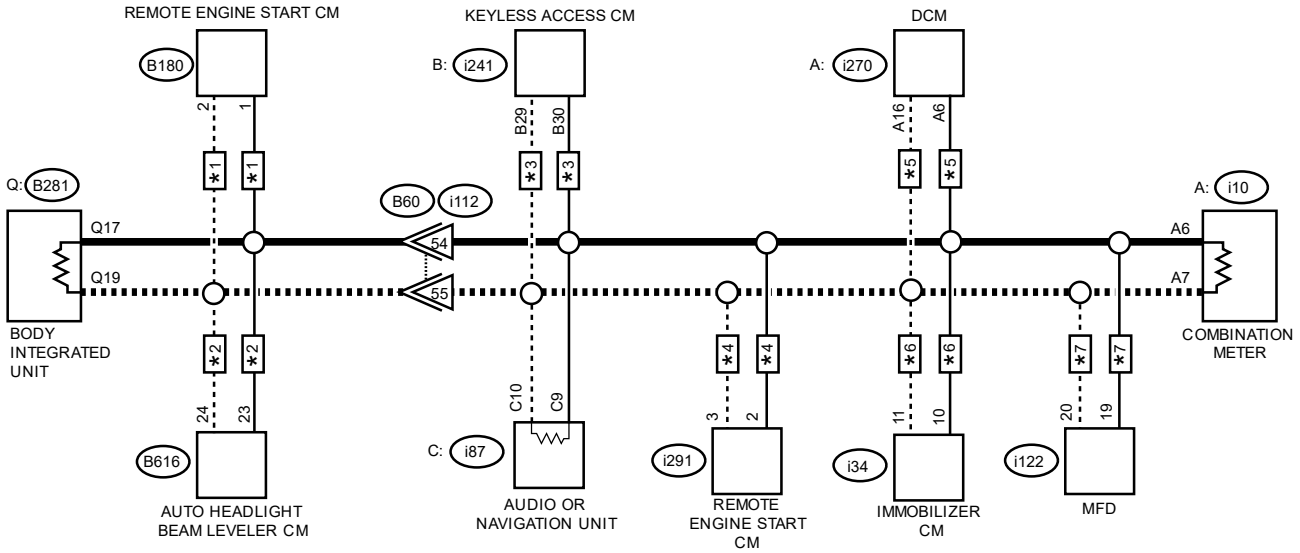
Yes	Repair or replace the open circuit portion of power steering CM related lines.
No	Check DTC of power steering CM. Ref. to POWER STEERING (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

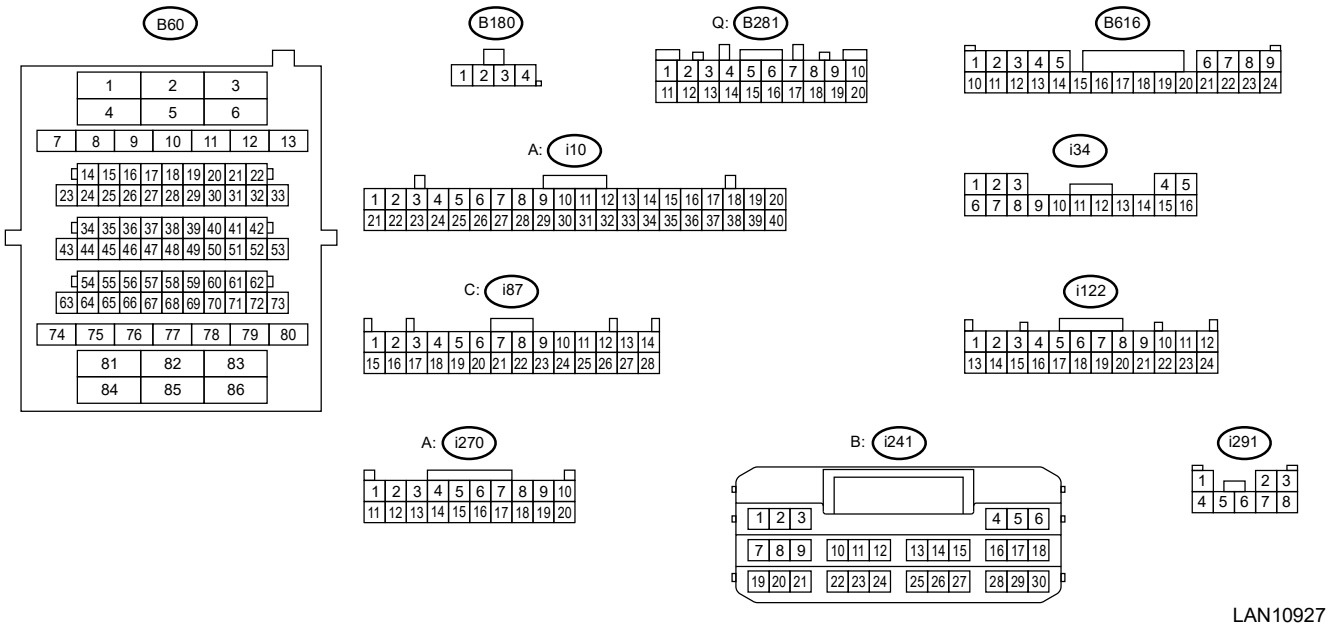
10. RELATED LINES 53 — 61 Ω (COMBINATION METER)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the combination meter connector.
2. Using a tester, measure the resistance between the combination meter connector terminals.
   Connector & terminal
   (i10) No. 6 — (i10) No. 7:

Is the resistance 400 Ω or more?

Yes	A related line between combination meter and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and combination meter connector.
   Connector & terminal
   (i10) No. 6 — (i87) No. 9:
   (i10) No. 7 — (i87) No. 10:

Is the resistance 10 Ω or more?

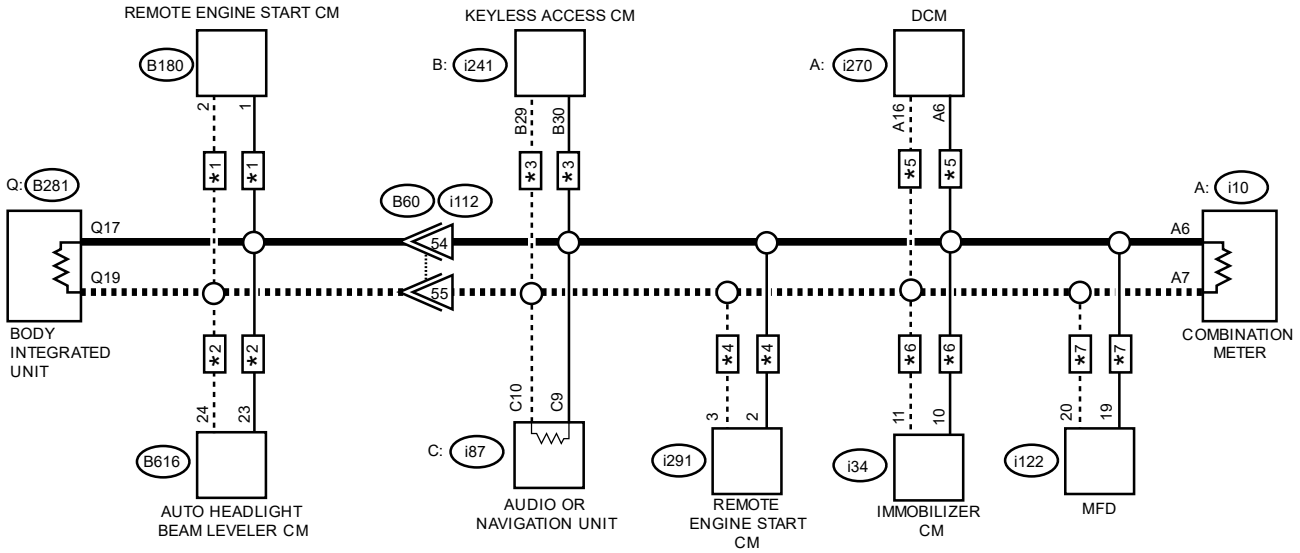
Yes	Repair or replace the open circuit of combination meter related lines.
No	Check DTC of combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

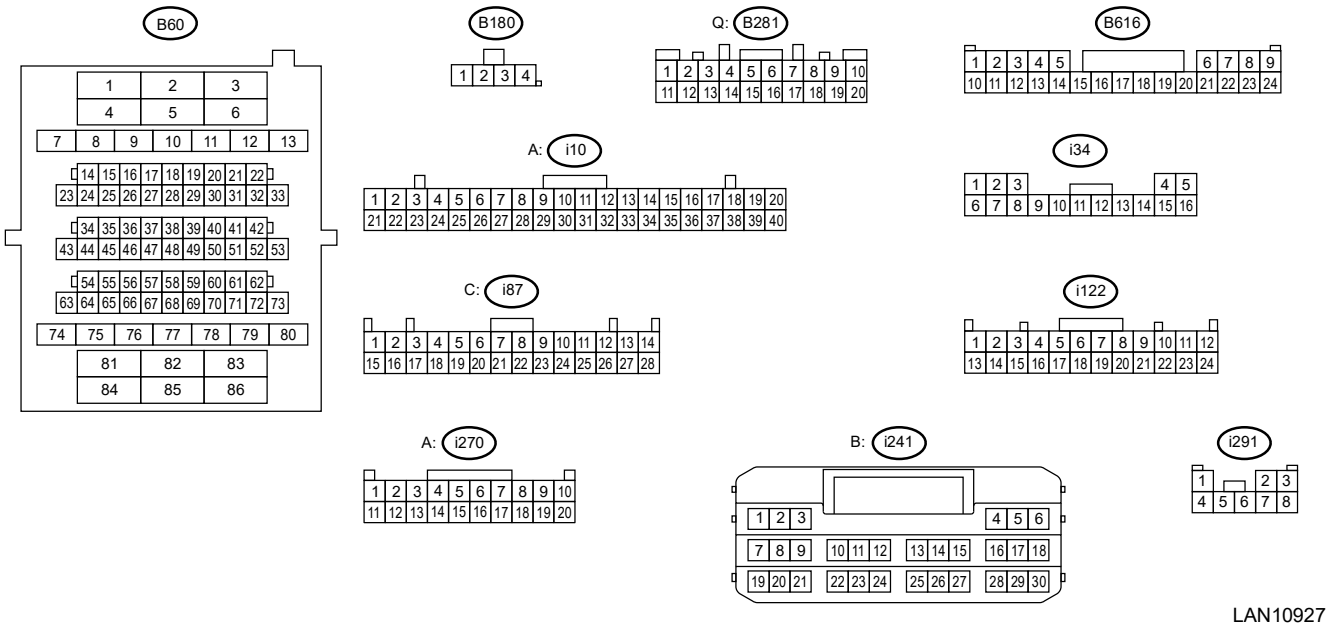
11. RELATED LINES 53 — 61 Ω (INFOTAINMENT SYSTEM)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector terminals.
   Connector & terminal
   (i87) No. 9 — (i87) No. 10:

Is the resistance 400 Ω or more?

Yes	A related line between the navigation unit and the main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

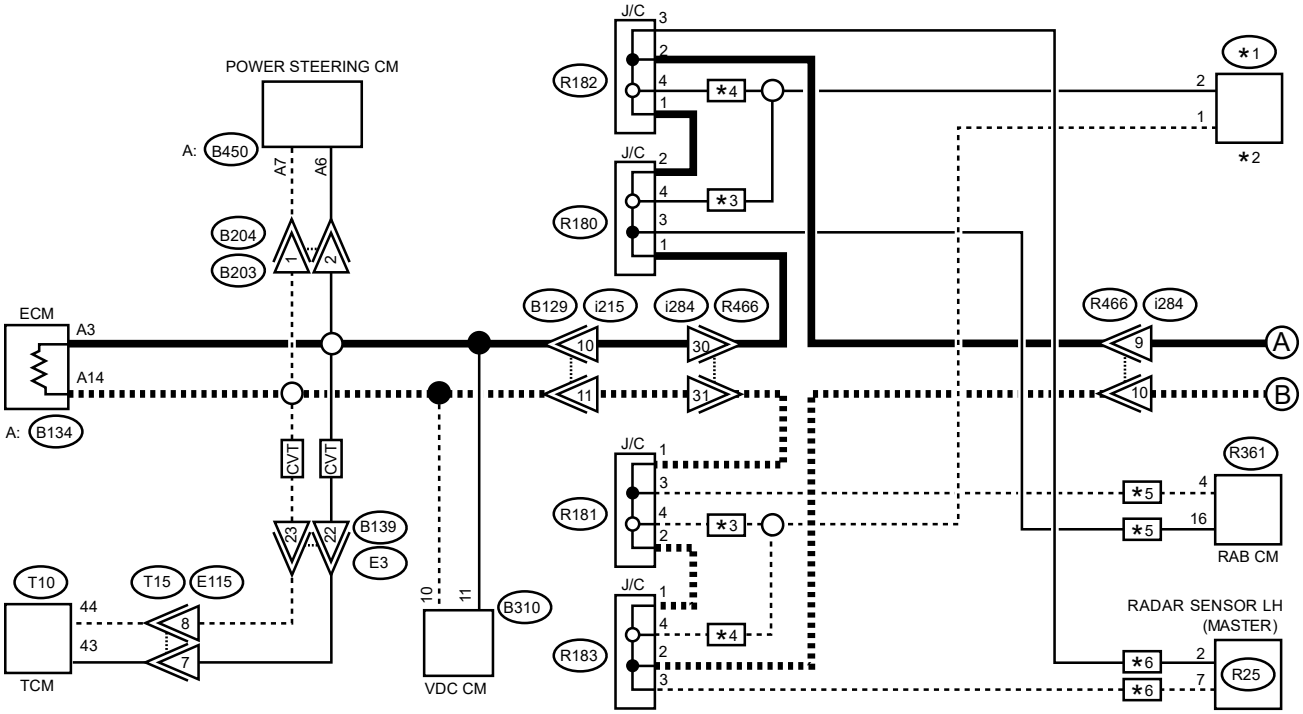
1. Disconnect the body integrated unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and body integrated unit.
   Connector & terminal
   (i87) No. 9 — (B281) No. 17:
   (i87) No. 10 — (B281) No. 19:

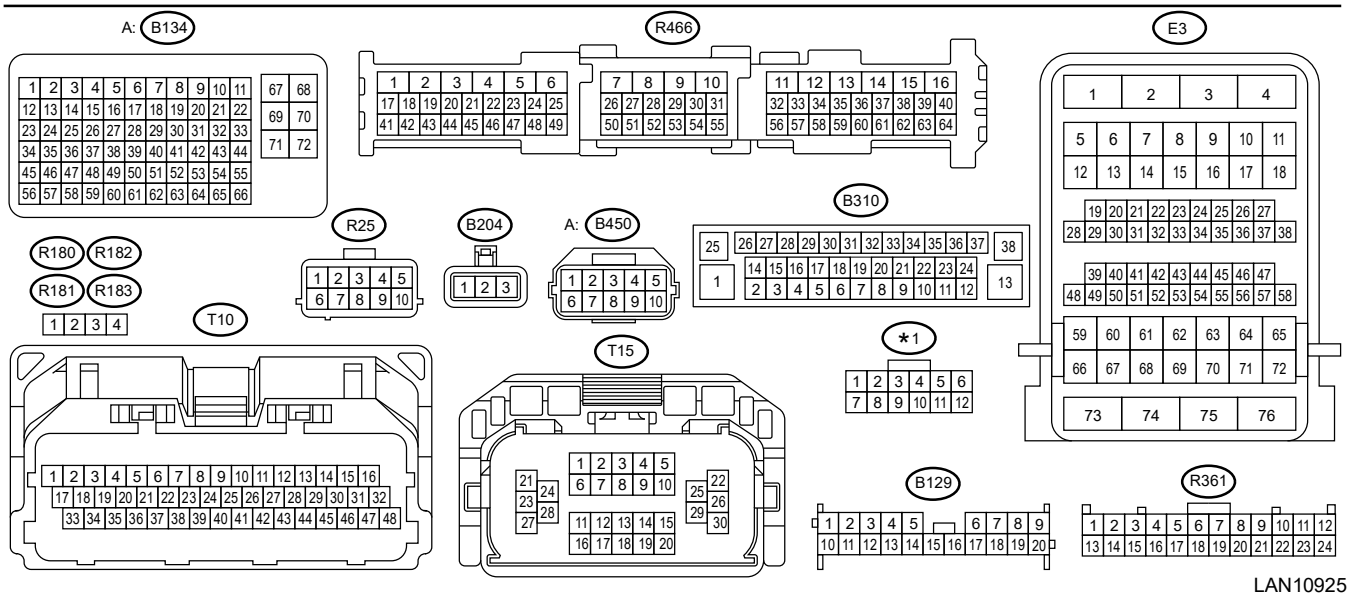
Is the resistance 10 Ω or more?

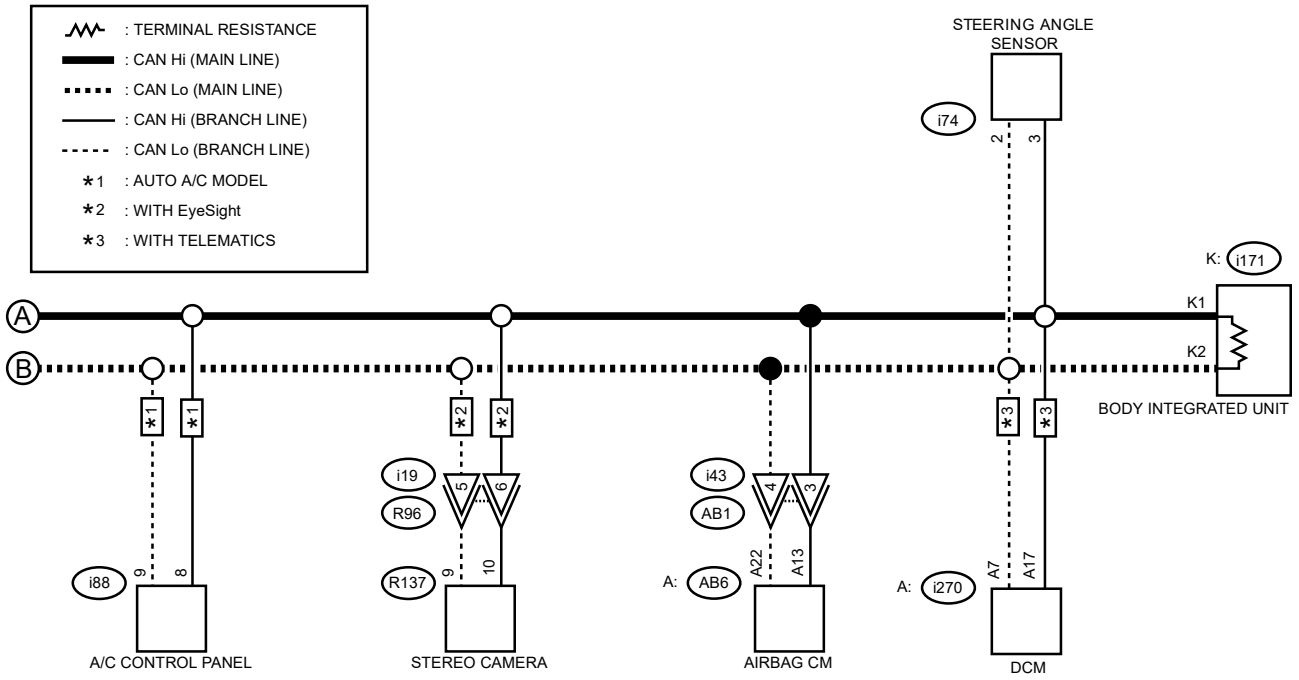
Yes	Repair or replace the open circuit of infotainment system related lines.
No	Check DTC of infotainment system. Ref. to INFOTAINMENT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

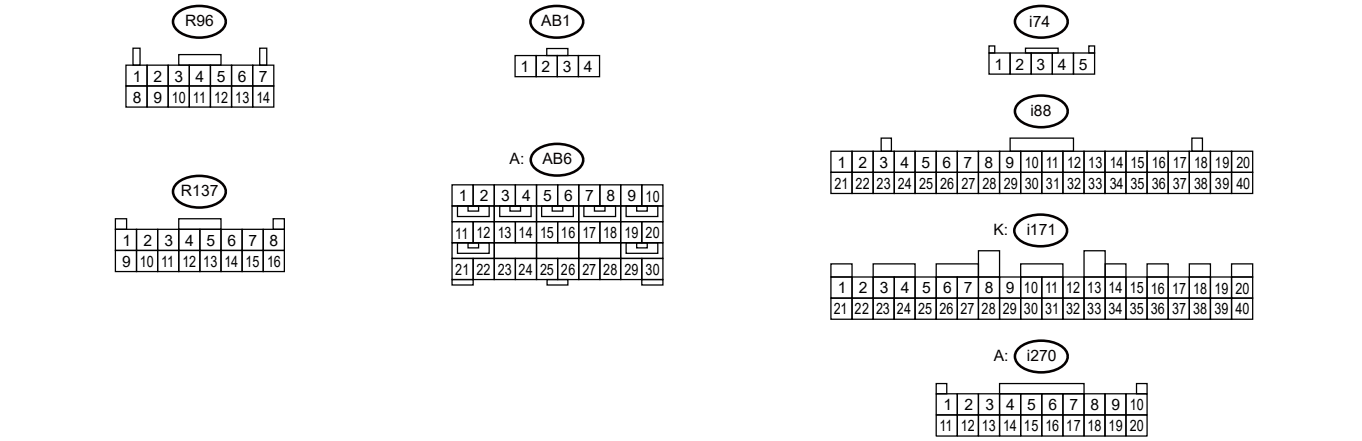
12. RELATED LINES 53 — 61 Ω (AIRBAG CM SYSTEM)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the airbag CM connector.
2. Using a tester, measure the resistance between terminals in airbag CM connector.

Caution:

To measure the voltage and resistance of airbag system component, be sure to use the specified test harness. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL.

Connector & terminal

(AB6) No. 13 — (AB6) No. 22:

Is the resistance 400 Ω or more?

Yes	A related line between airbag CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between the steering sensor connector and airbag CM connector.

Caution:

To measure the voltage and resistance of airbag system component, be sure to use the specified test harness. Ref. to AIRBAG(DIAGNOSTICS)>General Description>PREPARATION TOOL.

Connector & terminal

(AB6) No. 13 — (i74) No. 3:

(AB6) No. 22 — (i74) No. 2:

Is the resistance 10 Ω or more?

Yes	Repair or replace the open circuit portion of airbag CM related lines.
No	Check DTC of airbag CM. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

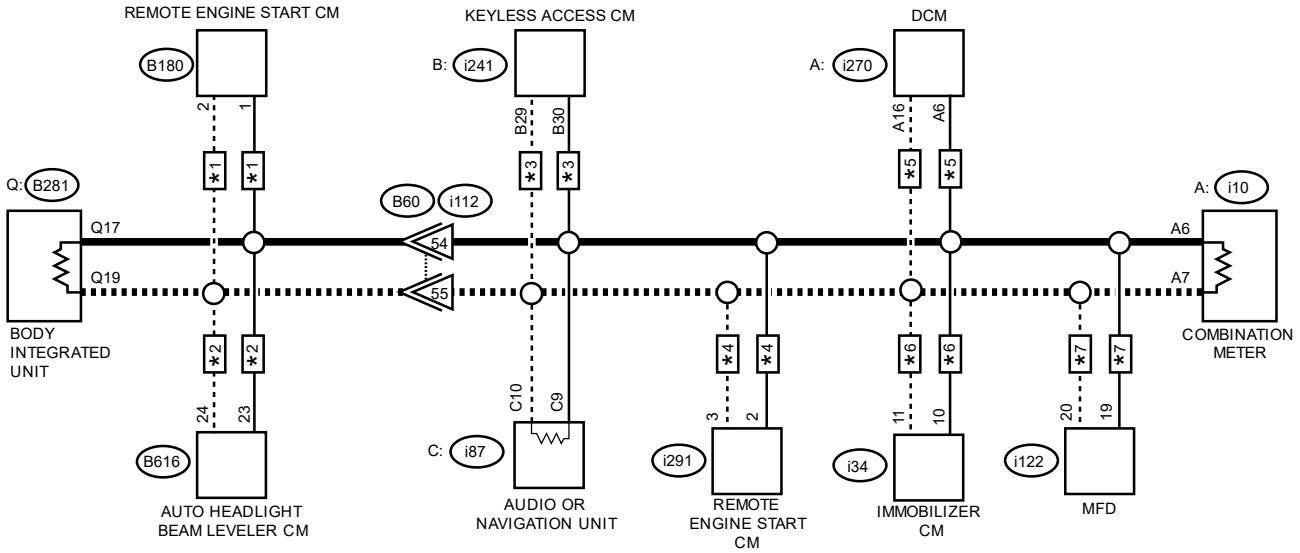
13. RELATED LINES 53 — 61 Ω (KEYLESS ACCESS SYSTEM)

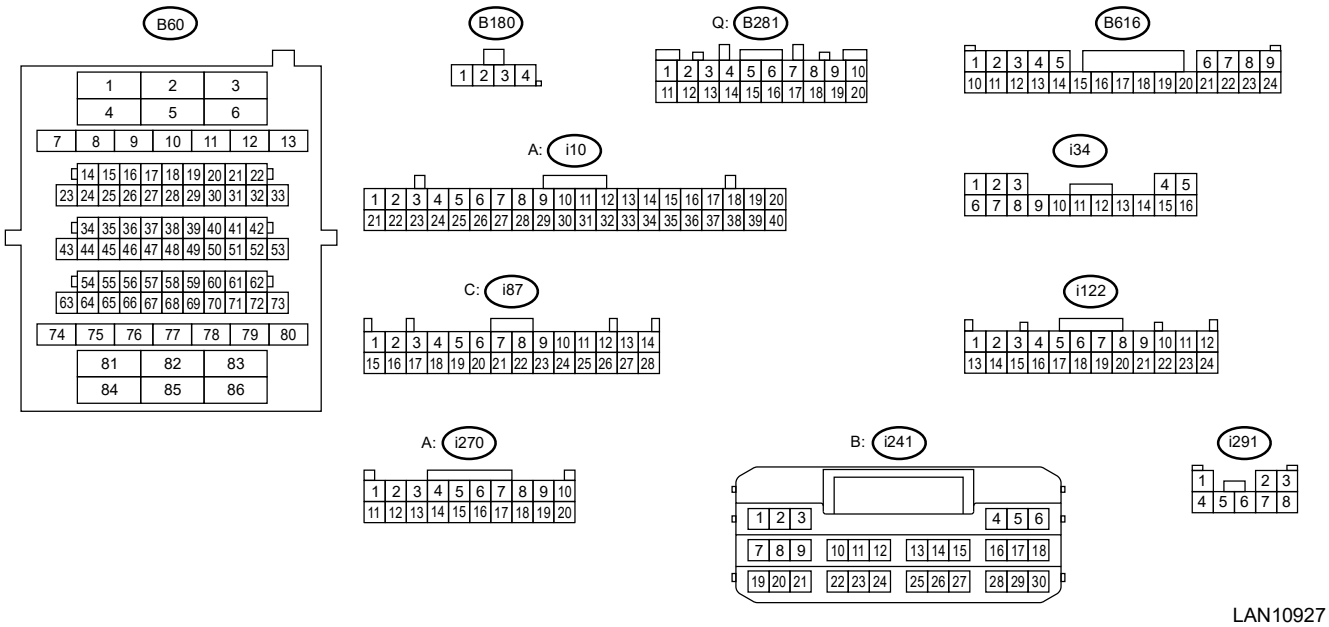
Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the keyless access CM connector.
2. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i241) No. 29 — (i241) No. 30:

Is the resistance 400 Ω or more?

Yes	A related line between keyless access CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and keyless access CM connector.
   Connector & terminal
   (i241) No. 30 — (i87) No. 9:
   (i241) No. 29 — (i87) No. 10:

Is the resistance 10 Ω or more?

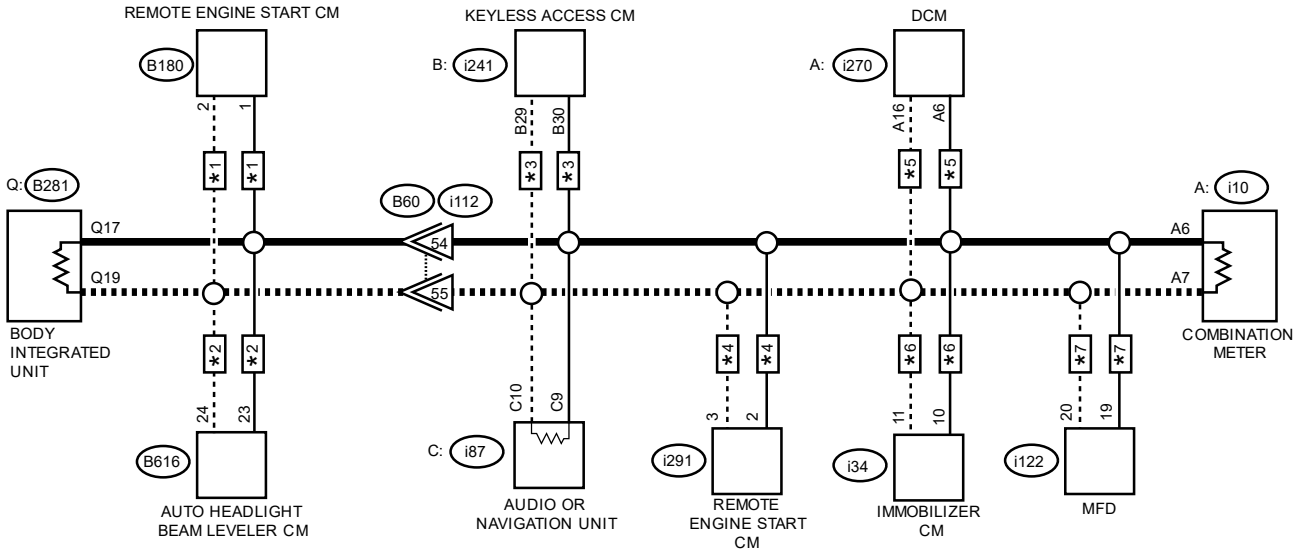
Yes	Repair or replace the open circuit of keyless access CM related lines.
No	Check DTC of keyless access CM. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

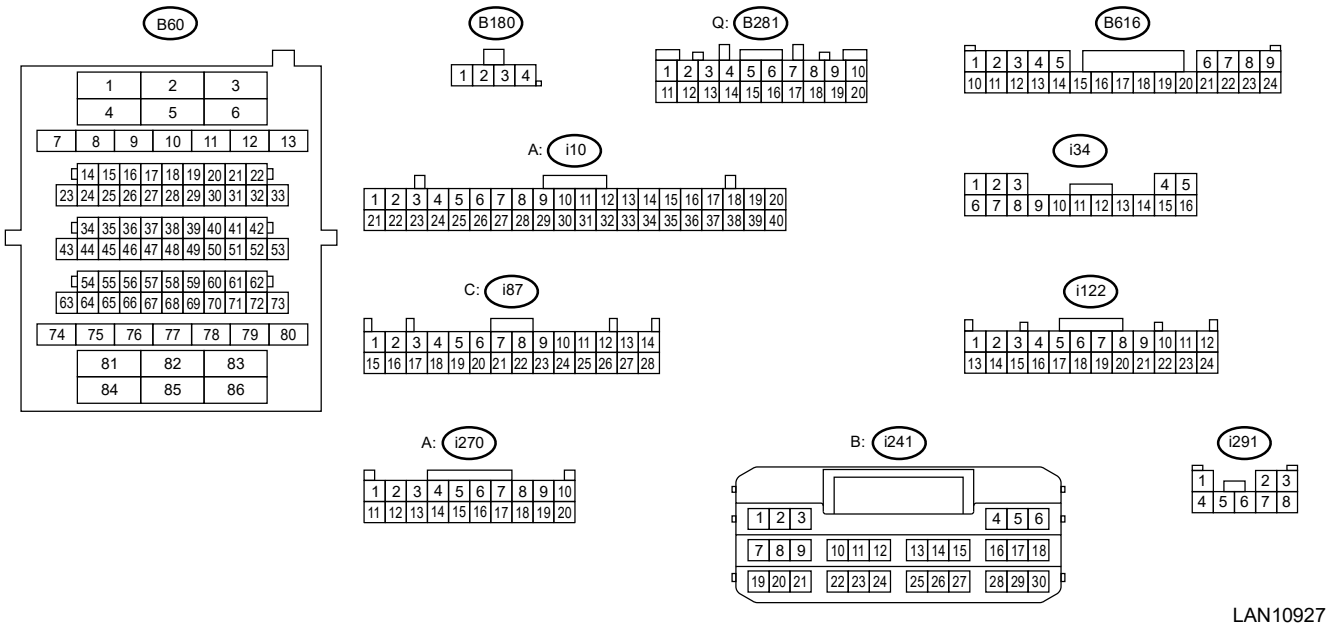
14. RELATED LINES 53 — 61 Ω (HEADLIGHT BEAM LEVELER)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the headlight beam leveler CM connector.
2. Using a tester, measure the resistance between the headlight beam leveler CM connector terminals.
   Connector & terminal
   (B616) No. 23 — (B616) No. 24:

Is the resistance 400 Ω or more?

Yes	A related line between headlight beam leveler CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and headlight beam leveler CM connector.
   Connector & terminal
   (B616) No. 23 — (i87) No. 9:
   (B616) No. 24 — (i87) No. 10:

Is the resistance 10 Ω or more?

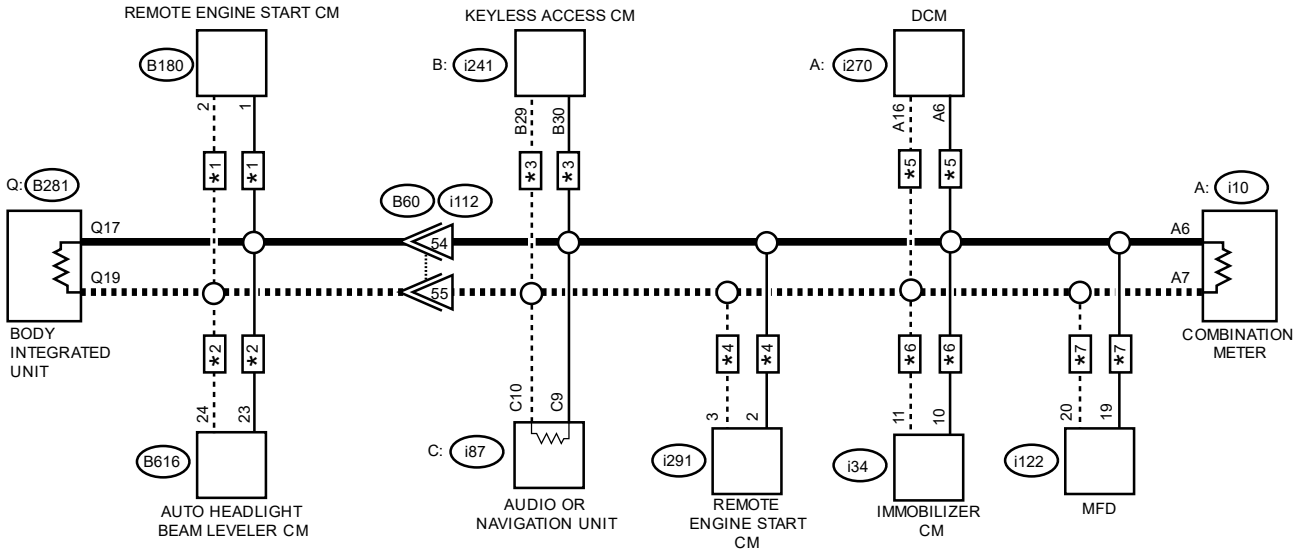
Yes	Repair or replace the open circuit of headlight leveler related lines.
No	Check DTC of headlight beam leveler system. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

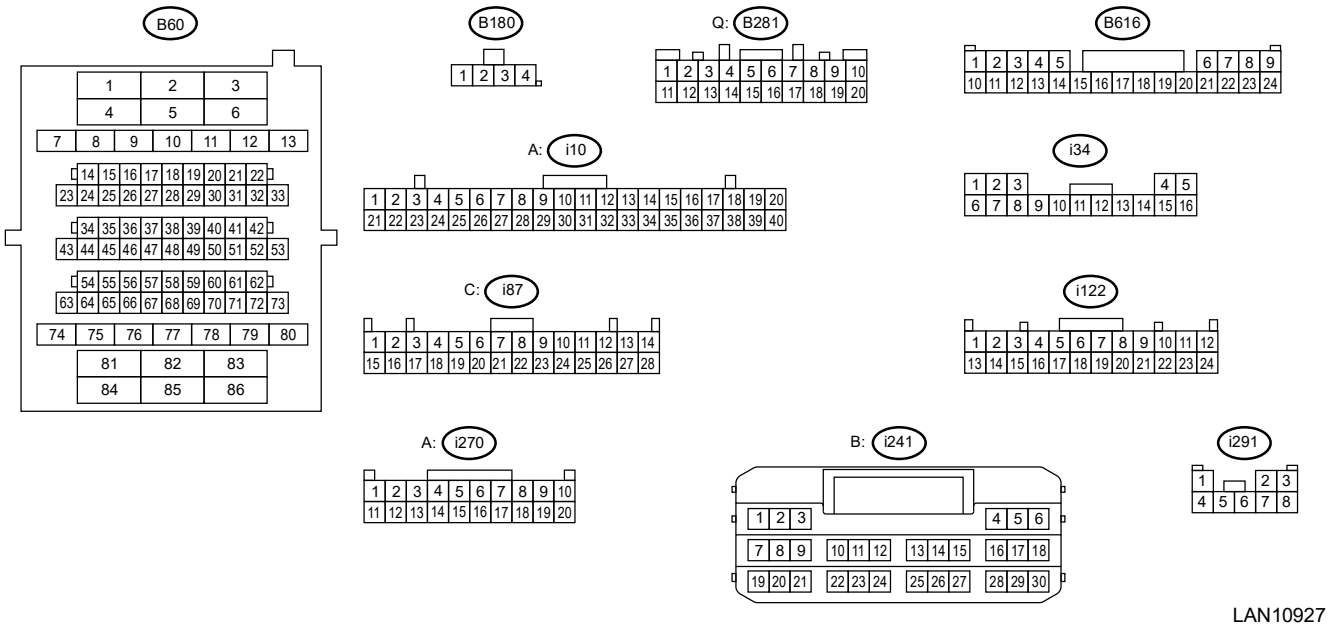
15. RELATED LINES 53 — 61 Ω (REMOTE ENGINE STARTER)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the remote engine start CM connector.
2. Using a tester, measure the resistance between remote engine start CM connector terminals.
   Connector & terminal
   Without keyless access with push button start
   (B180) No. 2 — (B180) No. 1:
   With keyless access with push button start
   (i291) No. 3 — (i291) No. 2:

Is the resistance 400 Ω or more?

Yes	A related line between remote engine start CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

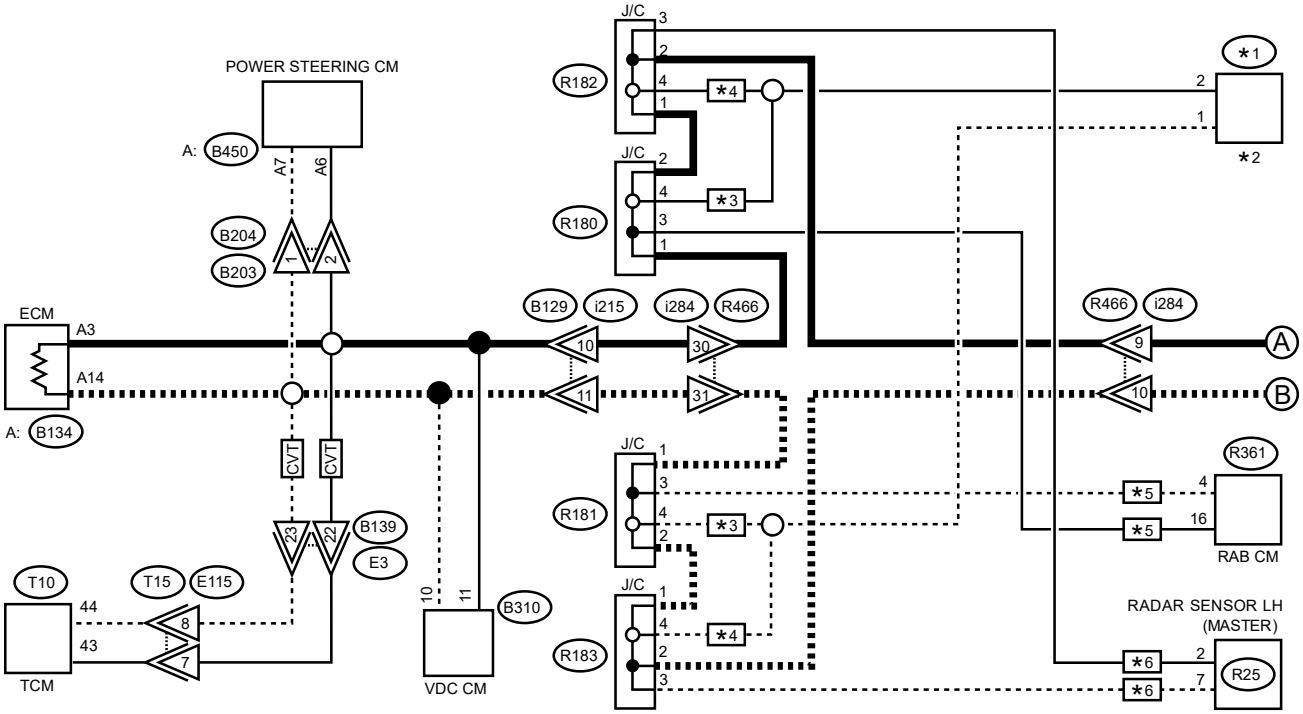
1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and remote engine start CM connector.
   Connector & terminal
   Without keyless access with push button start
   (B180) No. 1 — (i87) No. 9:
   (B180) No. 2 — (i87) No. 10:
   With keyless access with push button start
   (i291) No. 2 — (i87) No. 9:
   (i291) No. 3 — (i87) No. 10:

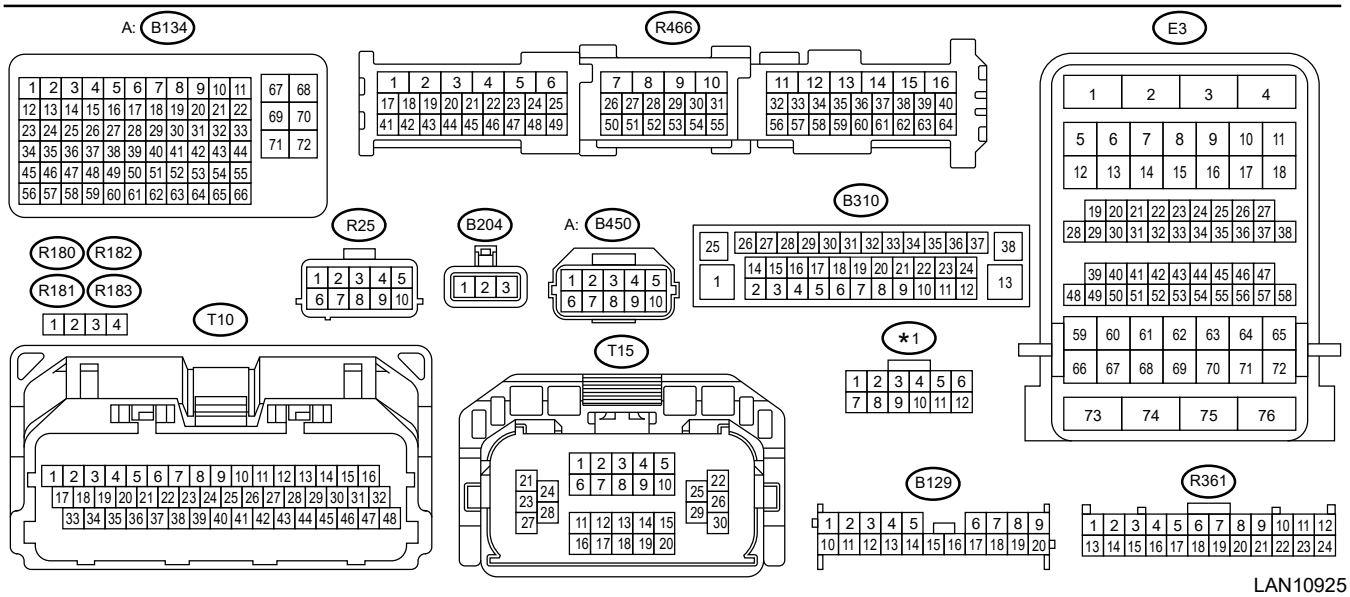
Is the resistance 10 Ω or more?

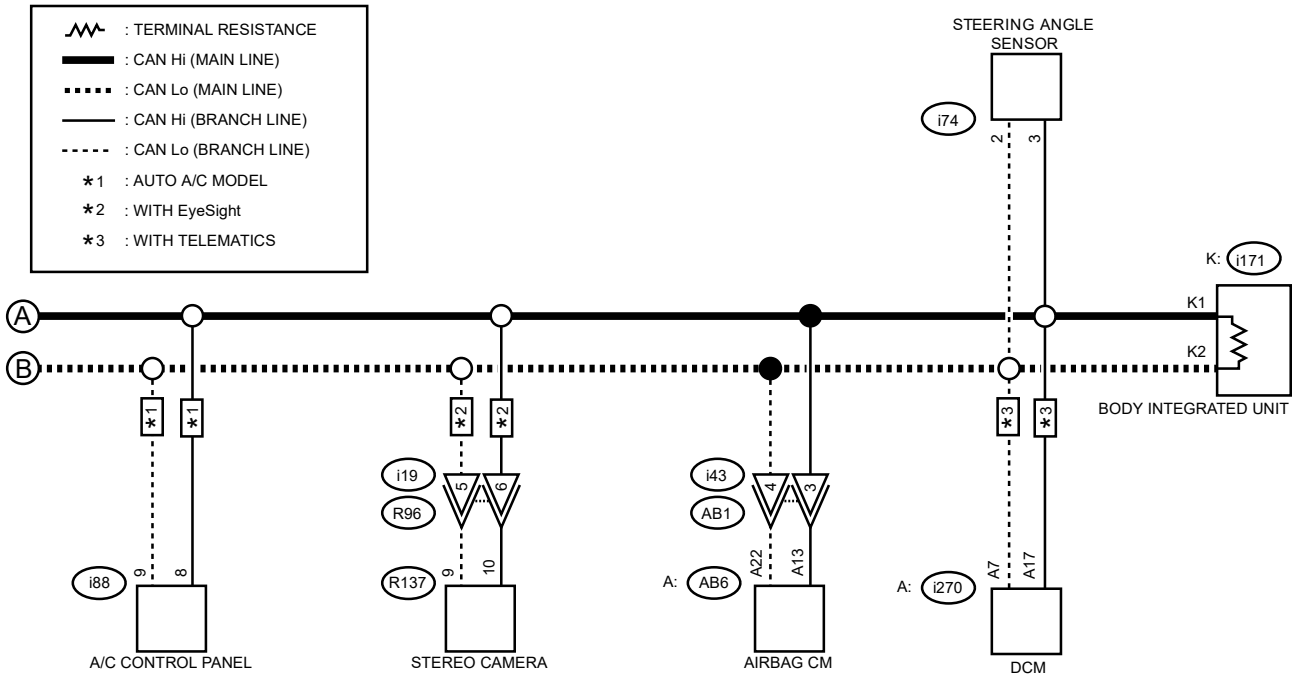
Yes	Repair or replace the open circuit of remote engine start CM related lines.
No	The communication harness is normal. Check the remote engine starter CM or the mobile key.

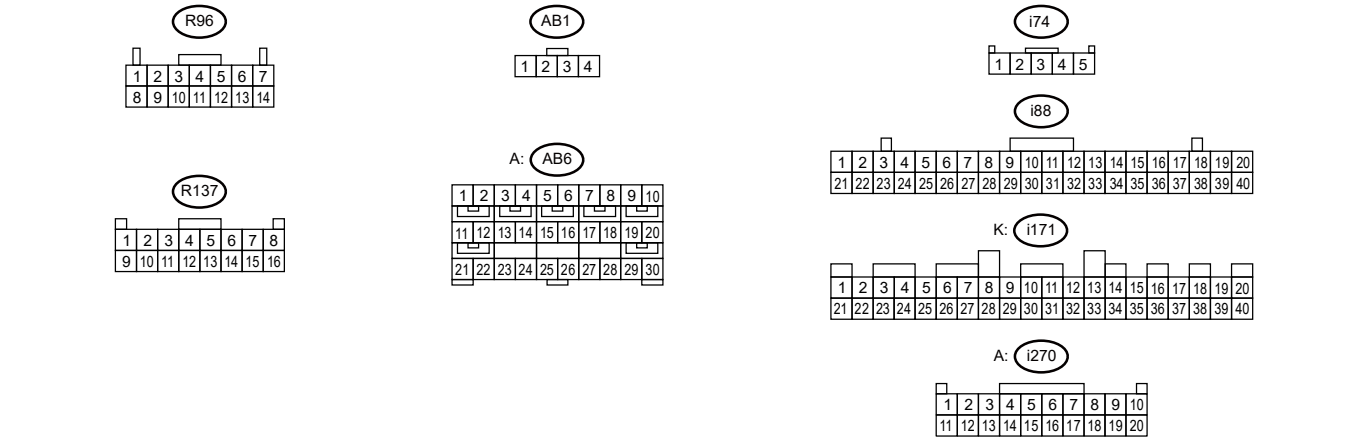
16. RELATED LINES 53 — 61 Ω (BSD/RCTA)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the radar sensor LH connector.
2. Using a tester, measure the resistance between terminals in radar sensor LH connector.
   Connector & terminal
   (R25) No. 2 — (R25) No. 7:

Is the resistance 400 Ω or more?

Yes	A related line between radar sensor LH and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

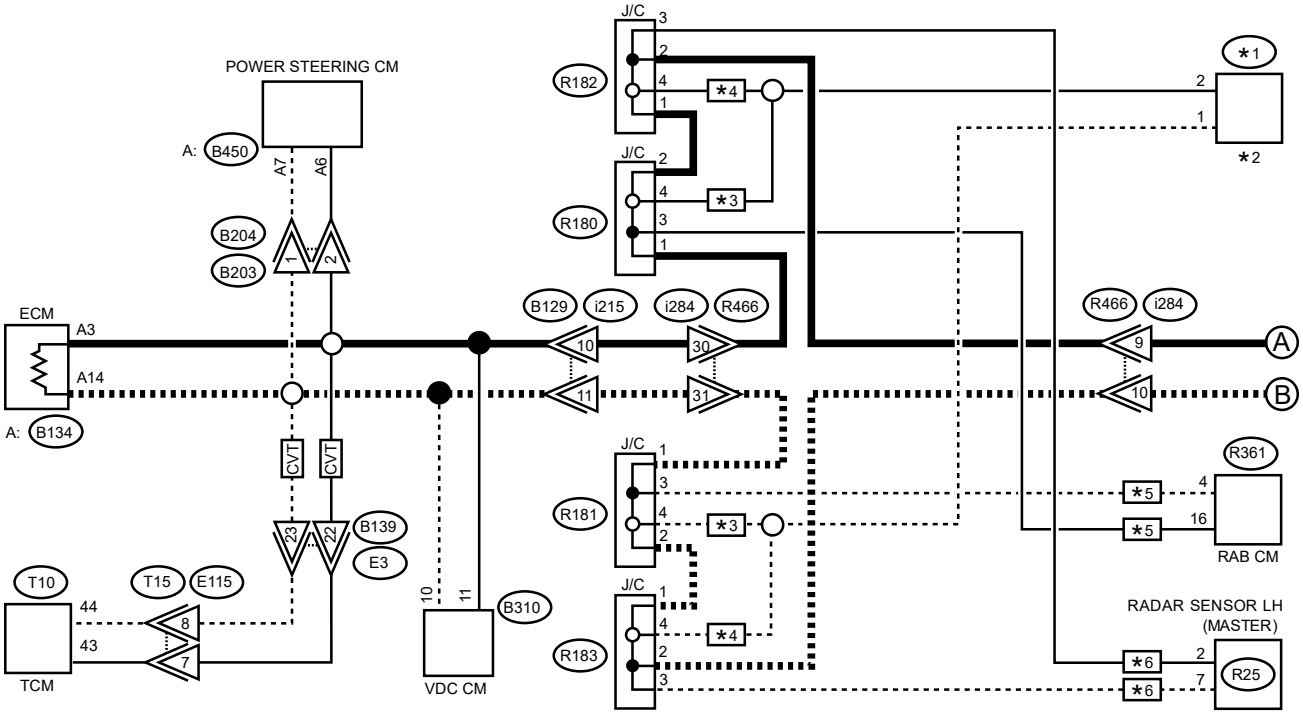
1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between the radar sensor LH connector and steering sensor connector.
   Connector & terminal
   (B25) No. 2 — (i74) No. 3:
   (R25) No. 7 — (i74) No. 2:

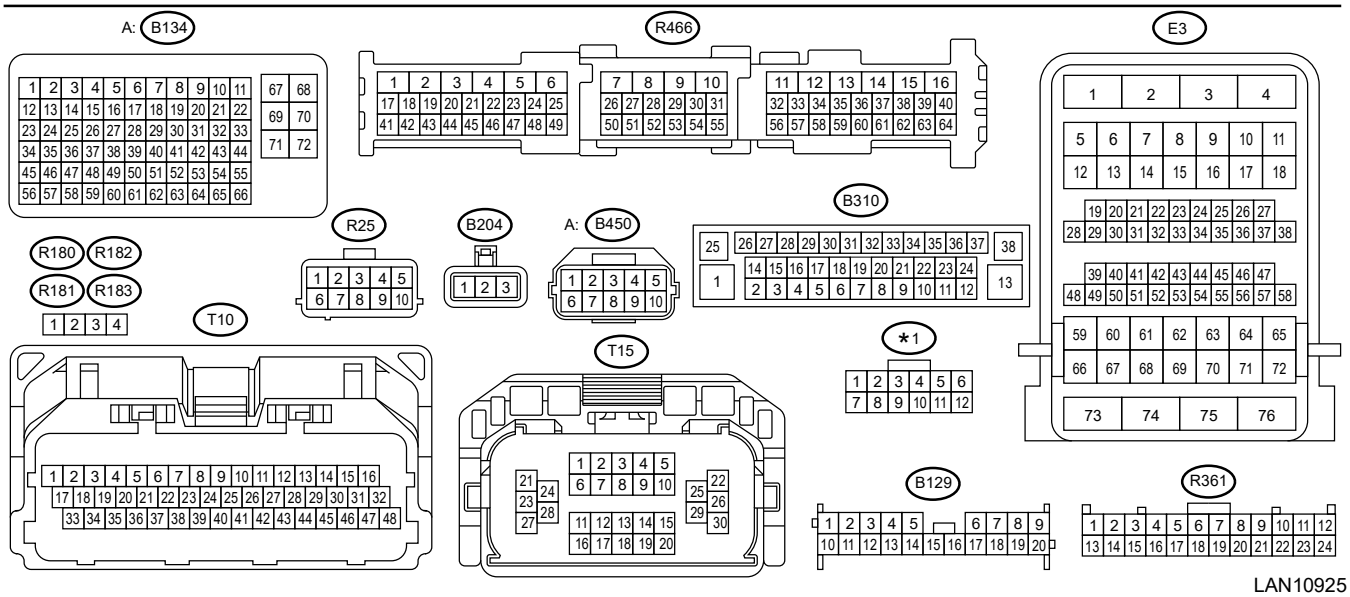
Is the resistance 10 Ω or more?

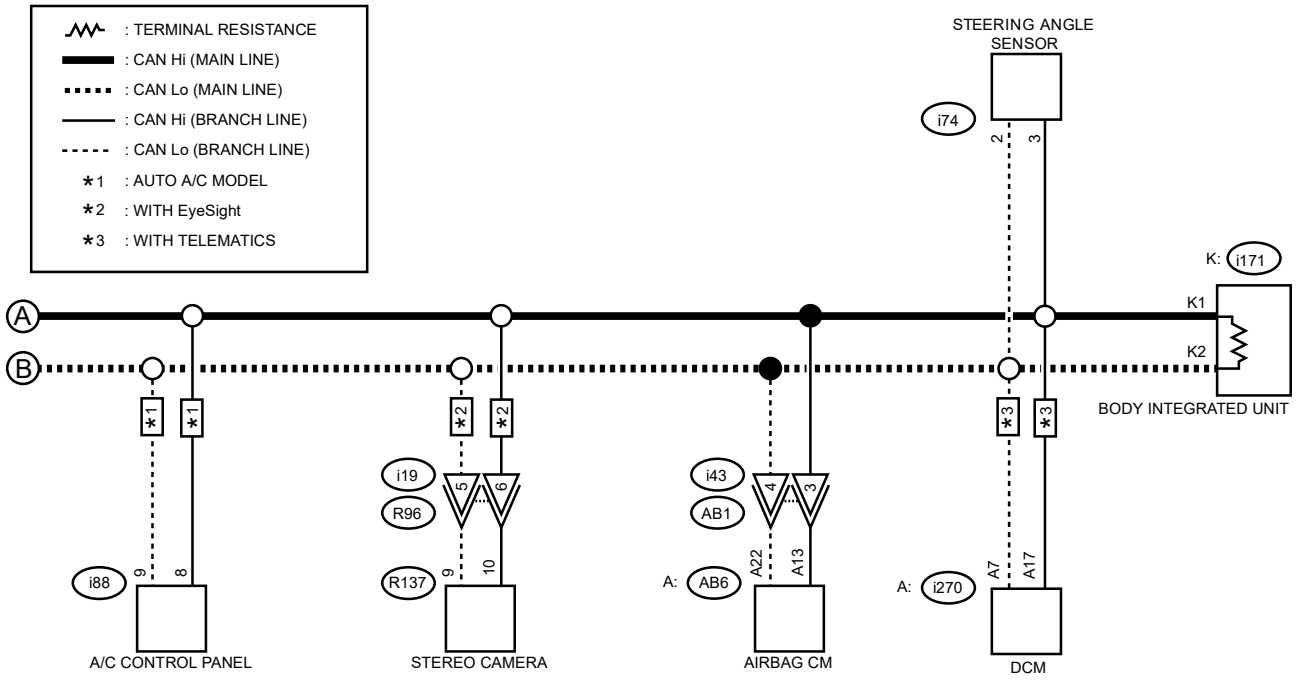
Yes	Repair or replace the open circuit of the Blind Spot Detection/Rear Cross Traffic Alert related lines.
No	The communication harness is normal. Check DTC of radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

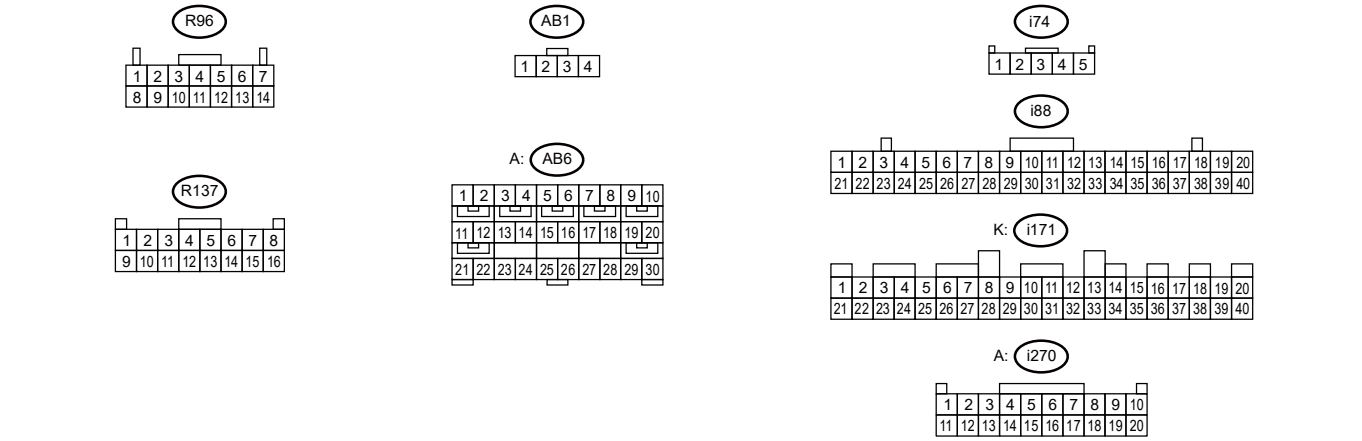
17. RELATED LINES 53 — 61 Ω (STEREO CAMERA)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the stereo camera connector.
2. Using a tester, measure the resistance between terminals in stereo camera connector.
   Connector & terminal
   (R137) No. 10 — (R137) No. 9:

Is the resistance 400 Ω or more?

Yes	A related line between stereo camera and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between stereo camera connector and steering sensor connector.
   Connector & terminal
   (R137) No. 10 — (i74) No. 3:
   (R137) No. 9 — (i74) No. 2:

Is the resistance 10 Ω or more?

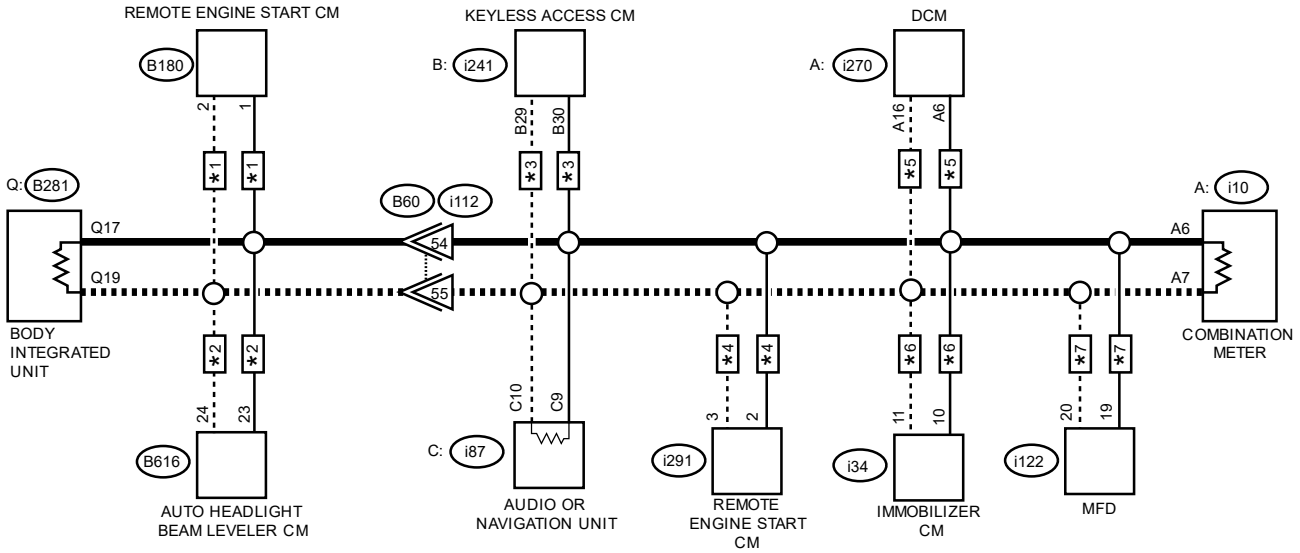
Yes	Repair or replace the open circuit of stereo camera related lines.
No	Check DTC of stereo camera. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

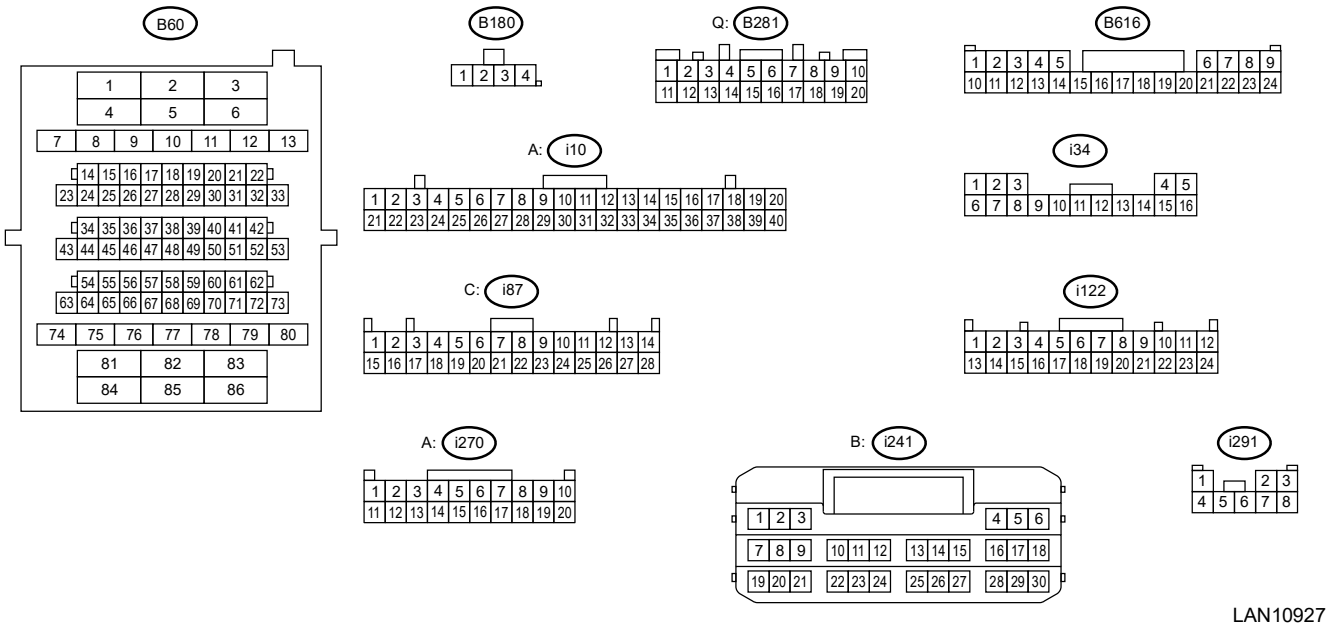
18. RELATED LINES 53 — 61 Ω (IMMOBILIZER SYSTEM)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the immobilizer CM connector.
2. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i34) No. 10 — (i34) No. 11:

Is the resistance 400 Ω or more?

Yes	A related line between immobilizer CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between audio or navigation unit connector and immobilizer CM connector.
   Connector & terminal
   (i34) No. 11 — (i87) No. 10:
   (i34) No. 10 — (i87) No. 9:

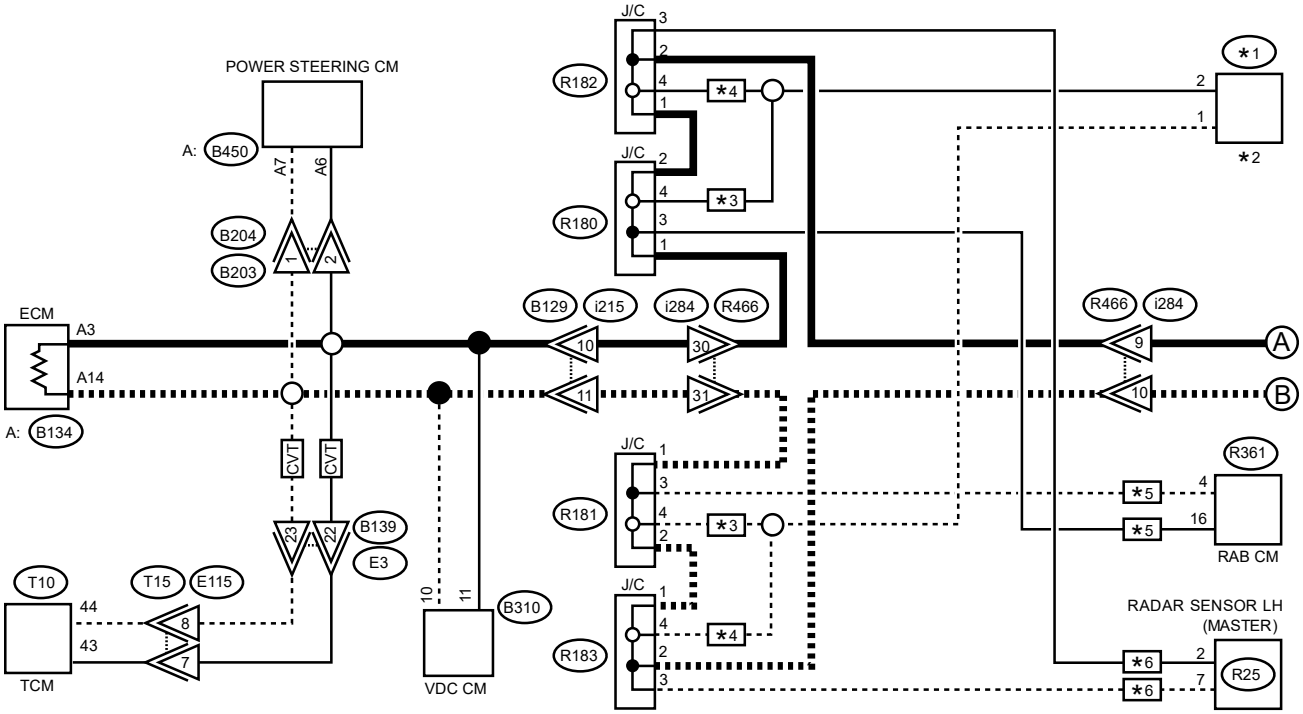
Is the resistance 10 Ω or more?

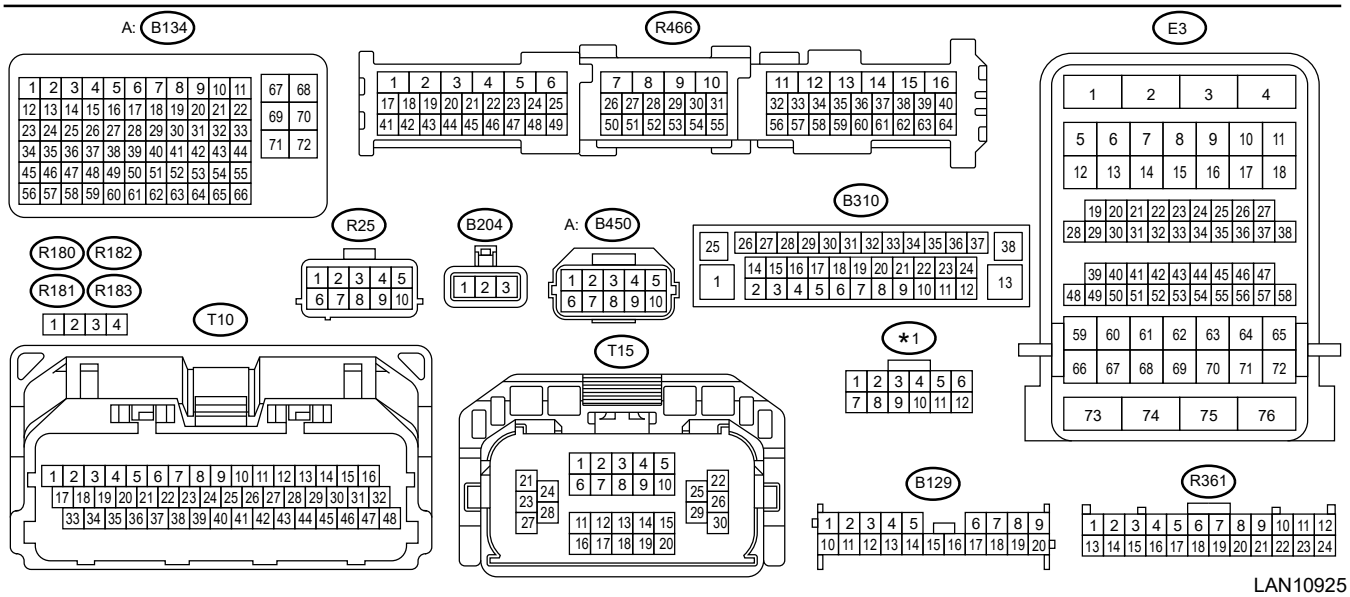
Yes	Repair or replace the open circuit of immobilizer related lines.
No	The communication harness is normal. Check DTC of immobilizer system. Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

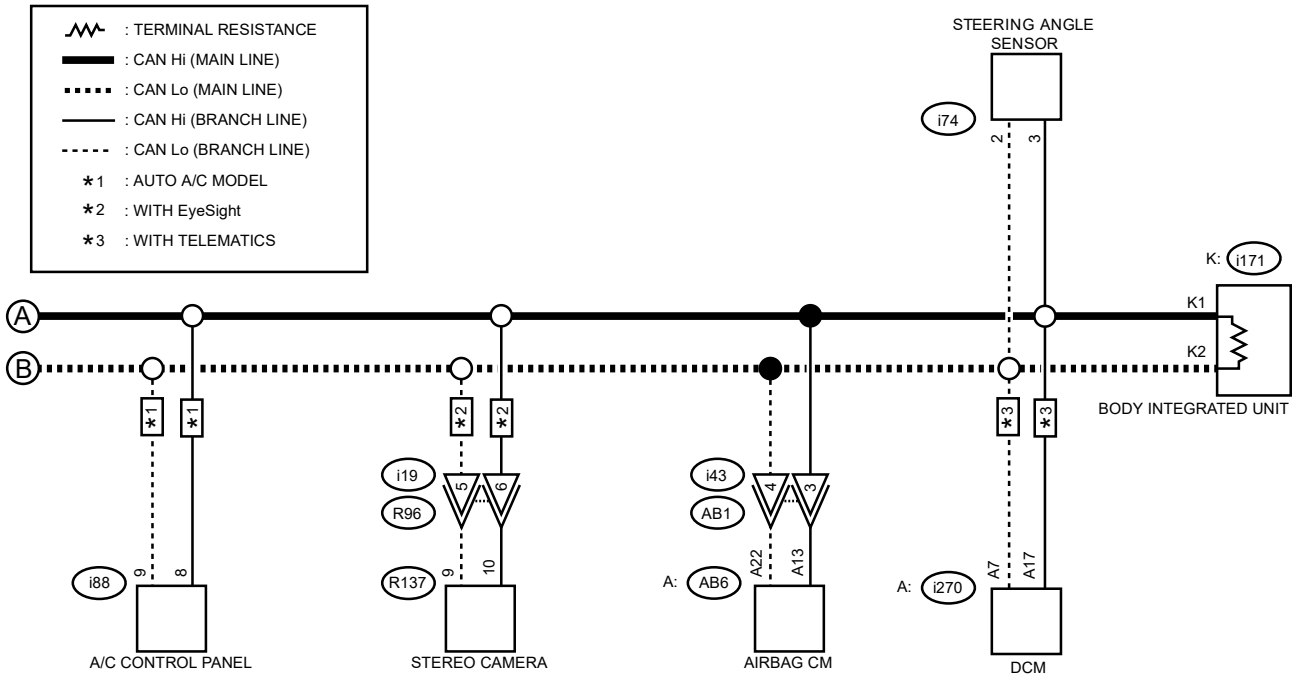
19. RELATED LINES 53 — 61 Ω (TELEMATICS)

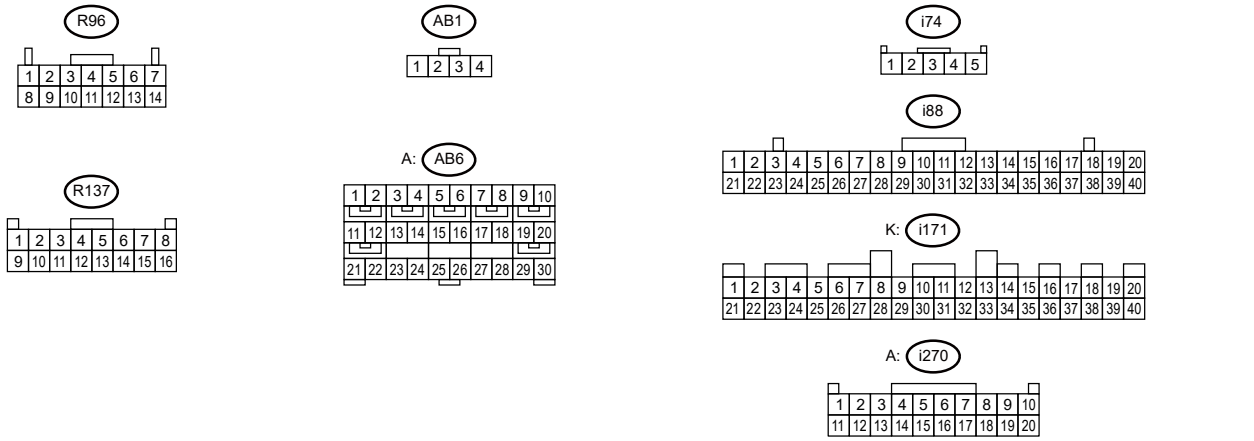
Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

- MAIN-CAN


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925



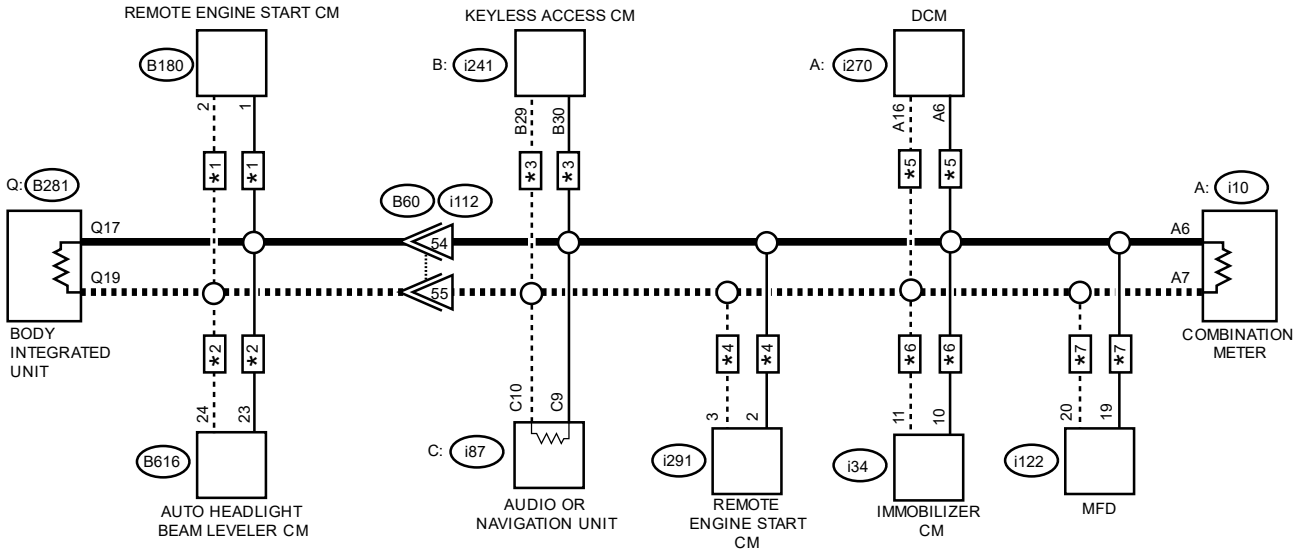


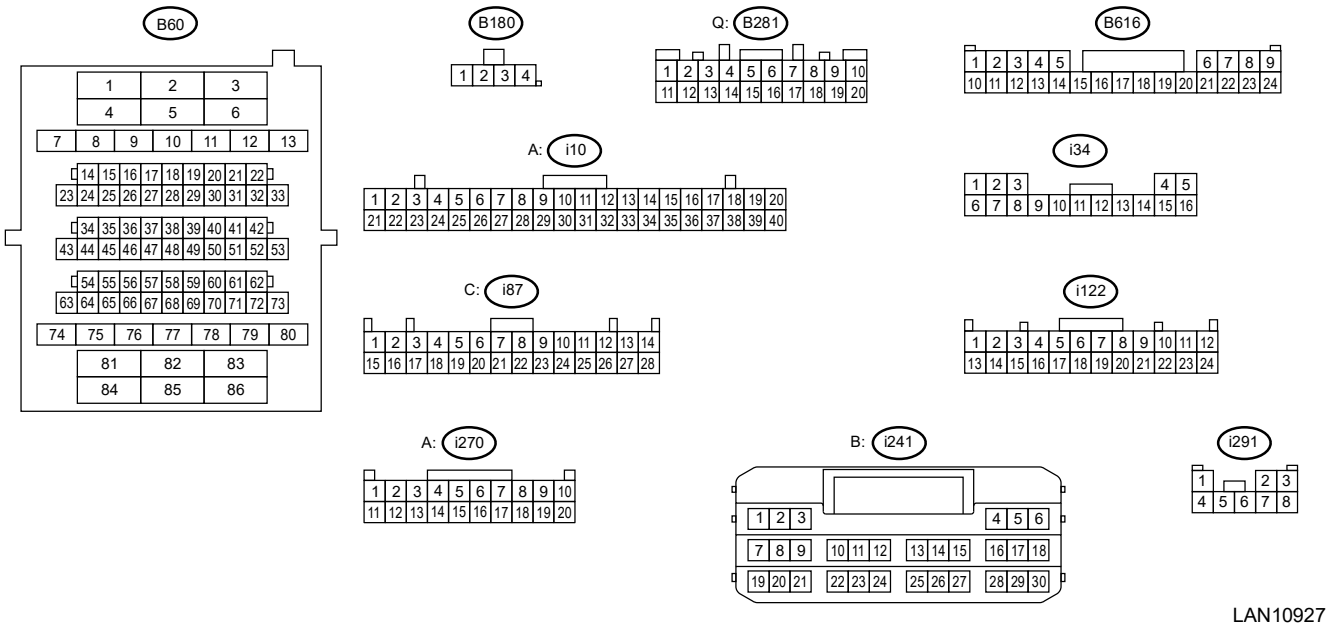
LAN10926

- BODY-CAN

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the DCM connector.
2. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i270) No. 7 — No. 17: (MAIN-CAN)
   (i270) No. 6 — No. 16: (BODY-CAN)

Is the resistance 400 Ω or more?

Yes	A related line between DCM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

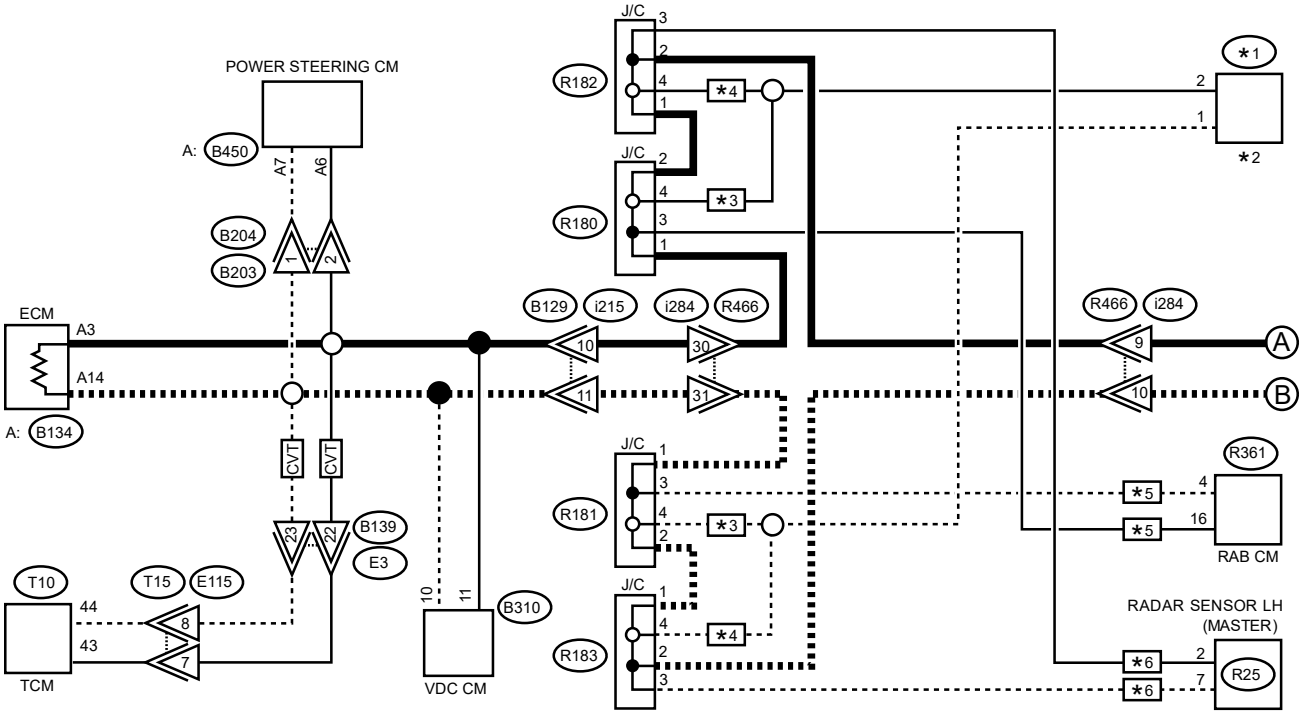
1. Disconnect the steering sensor connector. (MAIN-CAN)
2. Disconnect the audio or navigation unit connector. (BODY-CAN)
3. Using the tester, measure the resistance between terminals.
   Connector & terminal
   MAIN-CAN
   (i270) No. 17 — (i74) No. 3:
   (i270) No. 7 — (i74) No. 2:
   BODY-CAN
   (i270) No. 6 — (i87) No. 9:
   (i270) No. 16 — (i87) No. 10:

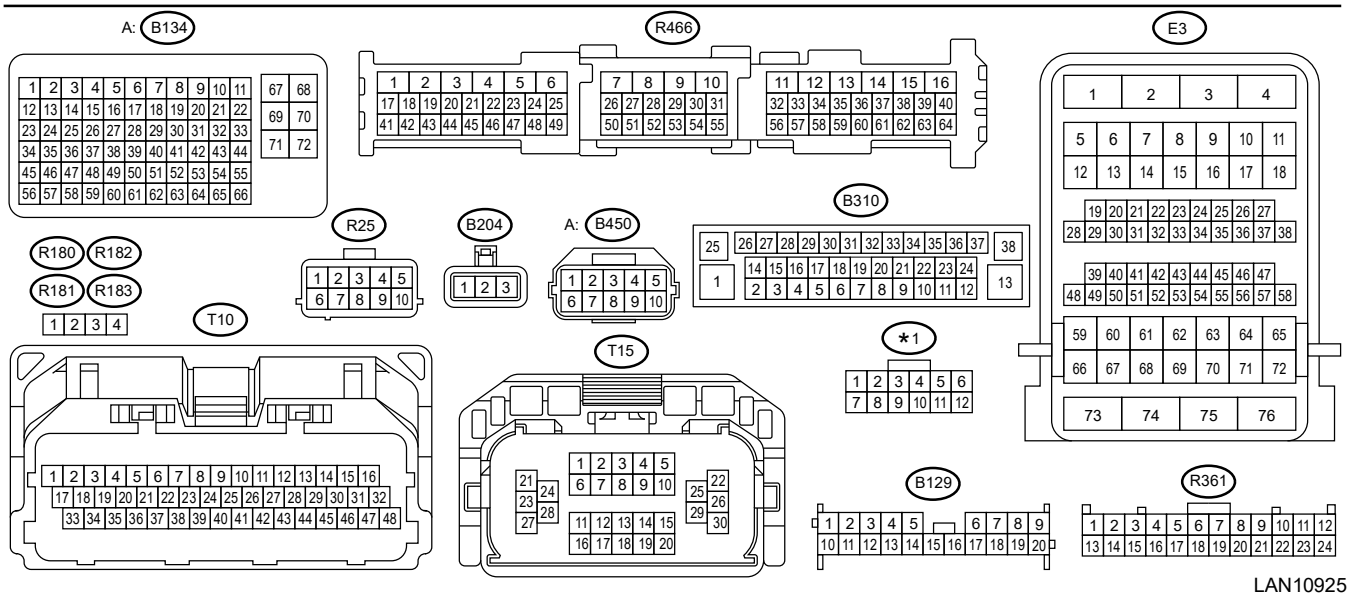
Is the resistance 10 Ω or more?

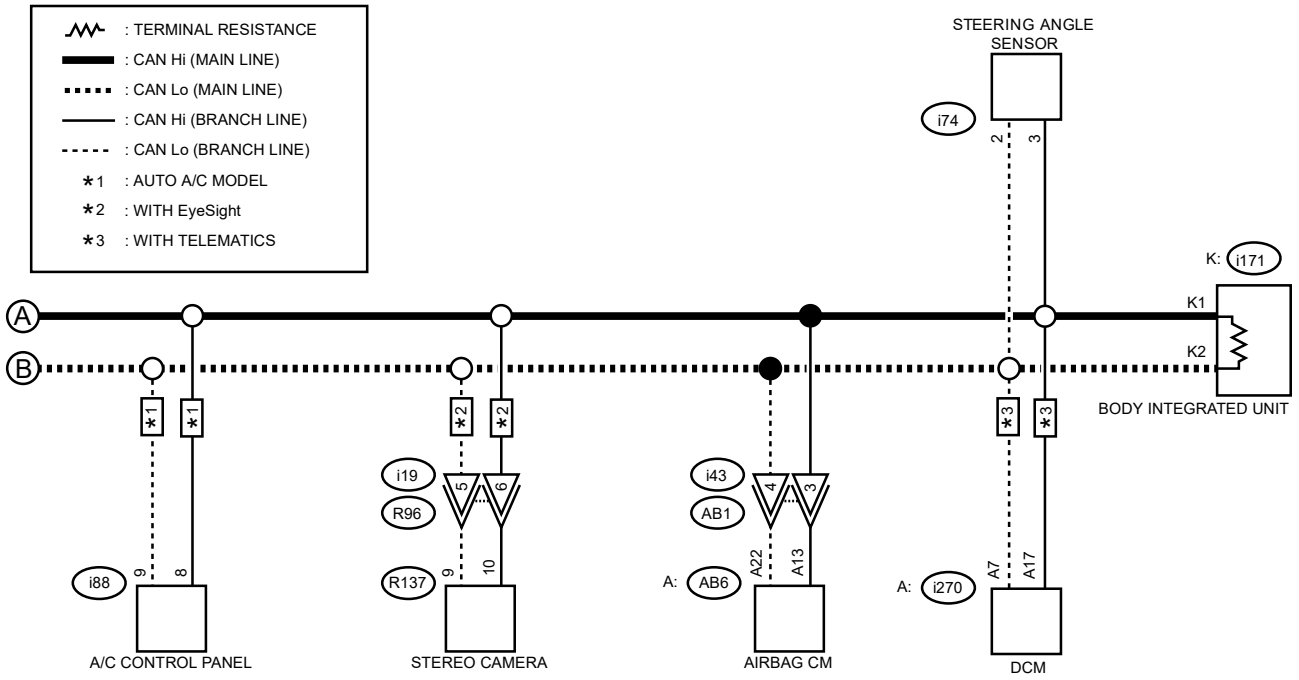
Yes	Repair or replace the open circuit of telematics system related lines.
No	The communication harness is normal. Check DTC of the telematics. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

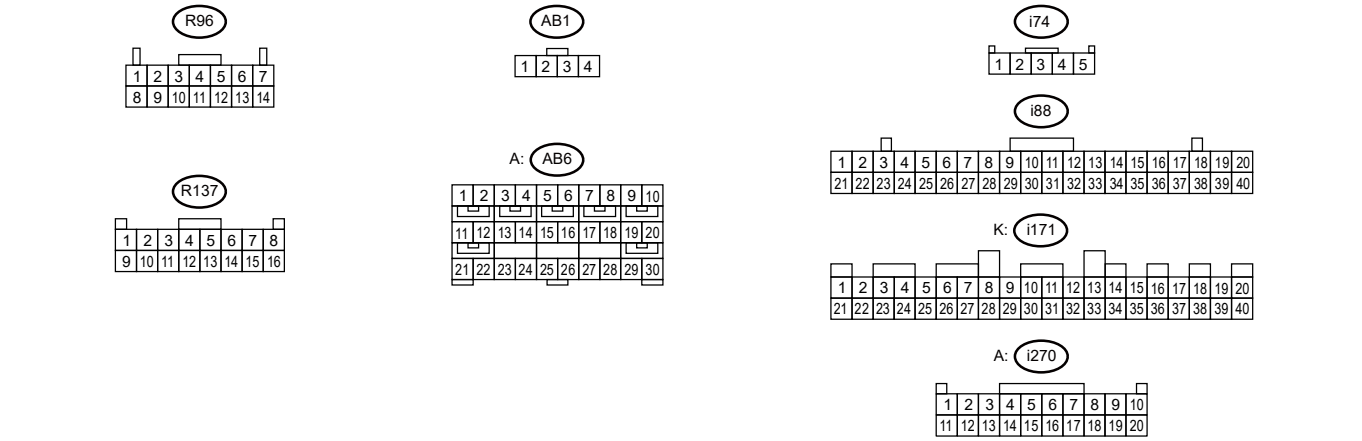
20. RELATED LINES 53 — 61 Ω (RAB)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the RAB CM connector.
2. Using a tester, measure the resistance between terminals in RAB CM connector.
   Connector & terminal
   (R361) No. 4 — (R361) No. 16:

Is the resistance 400 Ω or more?

Yes	A related line between RAB CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

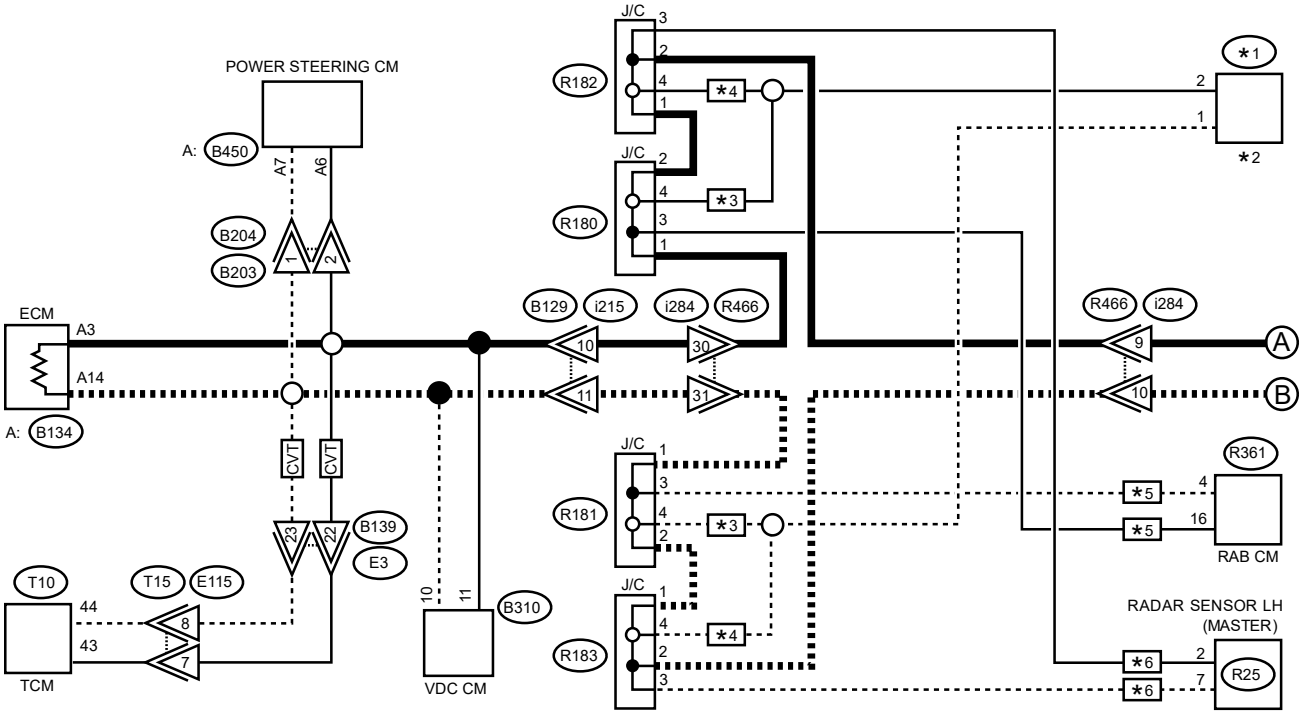
1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between RAB CM connector and steering sensor connector.
   Connector & terminal
   (R25) No. 2 — (i74) No. 3:
   (R25) No. 7 — (i74) No. 2:

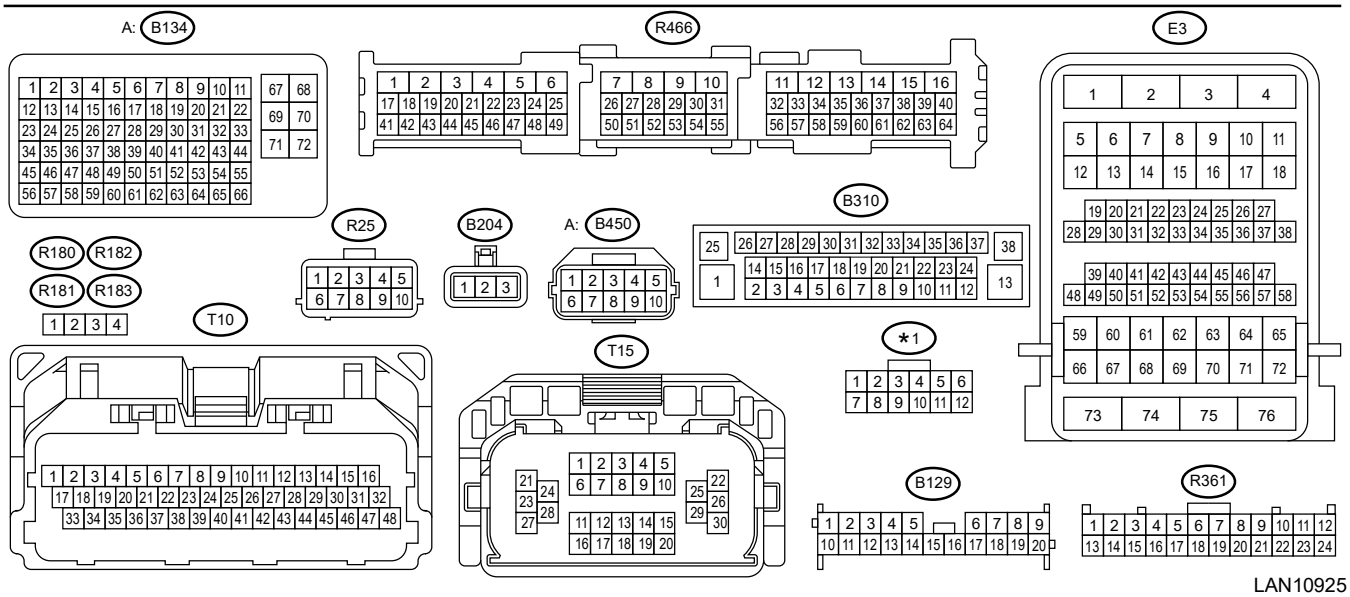
Is the resistance 10 Ω or more?

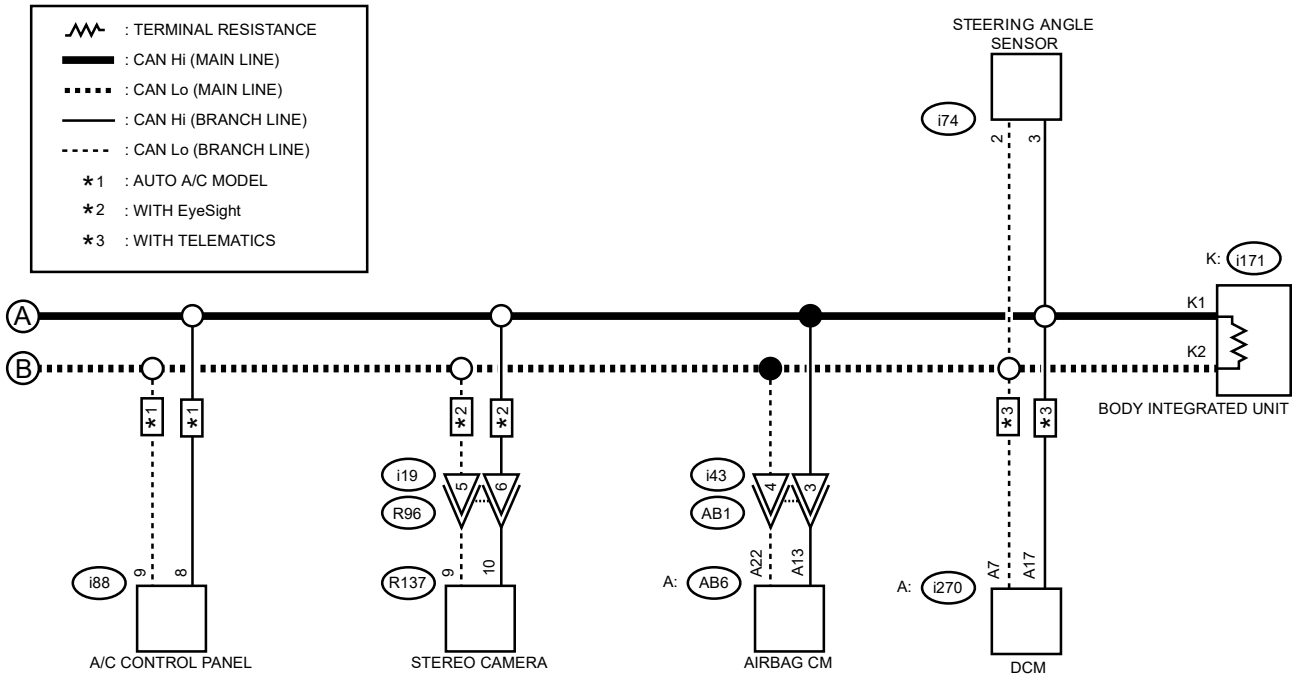
Yes	Repair or replace the open circuit of RAB related lines.
No	The communication harness is normal. Check DTC of RAB. Ref. to Reverse Automatic Braking(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

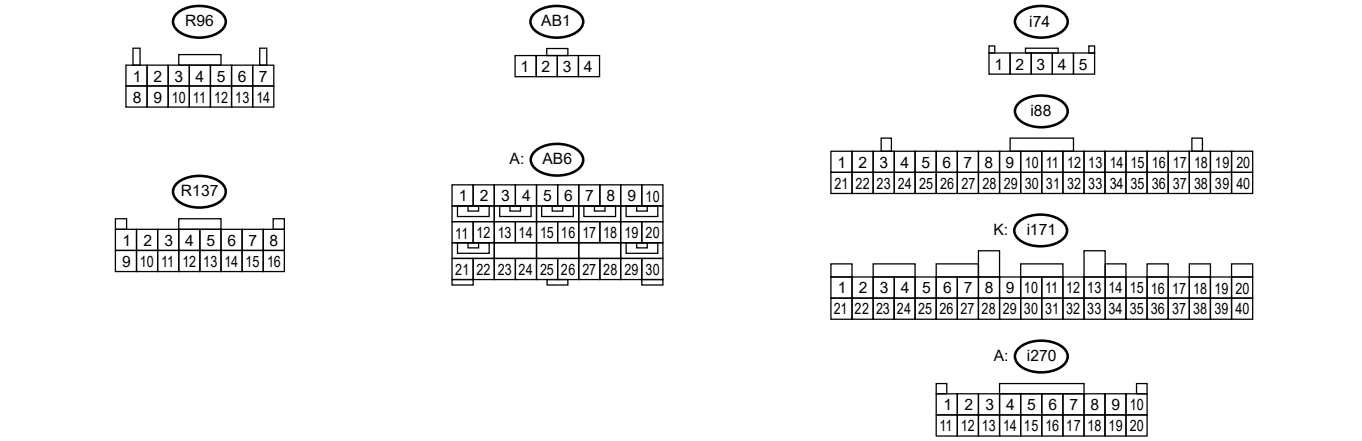
21. RELATED LINES 53 — 61 Ω (VDC)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the VDC CM connector.
2. Using a tester, measure the resistance between terminals in VDC CM connector.
   Connector & terminal
   (B310) No. 10 — (B310) No. 11:

Is the resistance 400 Ω or more?

Yes	A related line between VDC CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

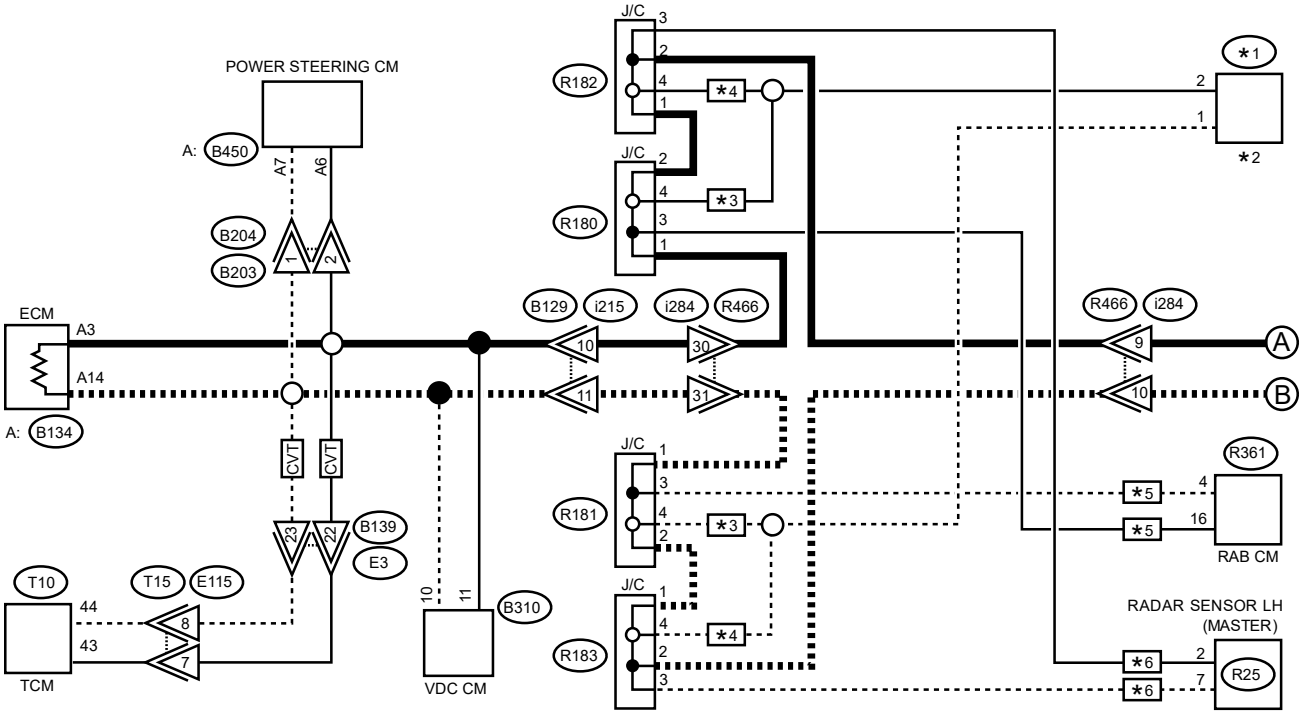
1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between VDC CM connector and steering sensor connector.
   Connector & terminal
   (B310) No. 11 — (i74) No. 3:
   (B310) No. 10 — (i74) No. 2:

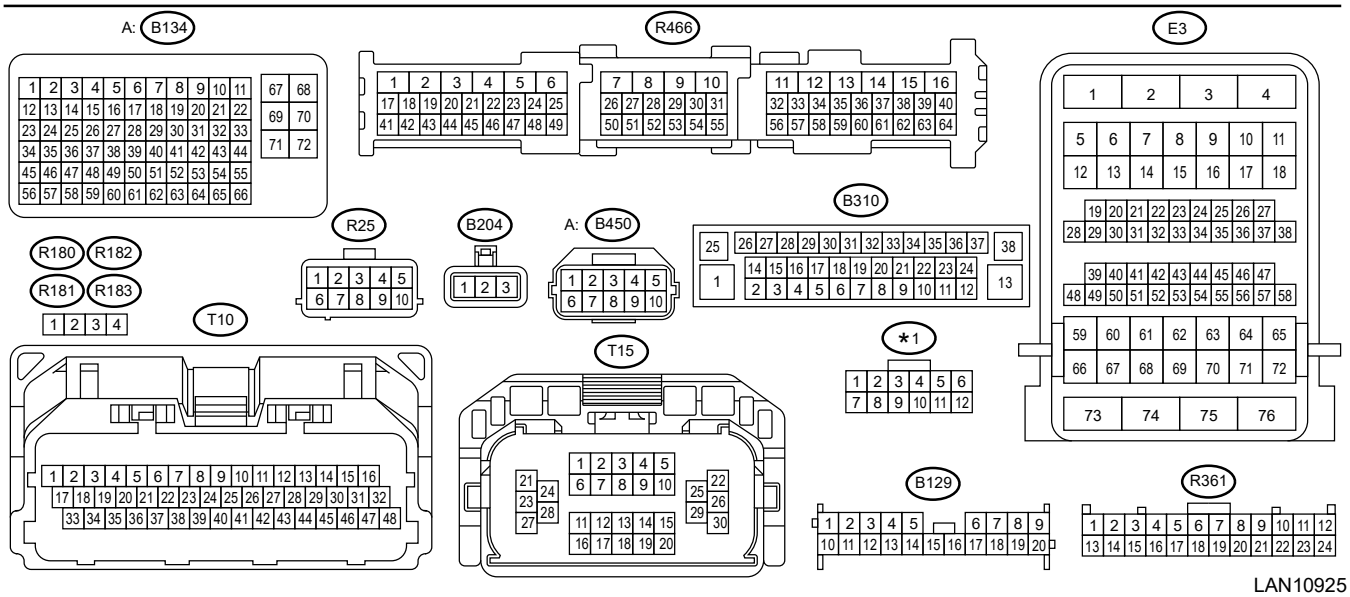
Is the resistance 10 Ω or more?

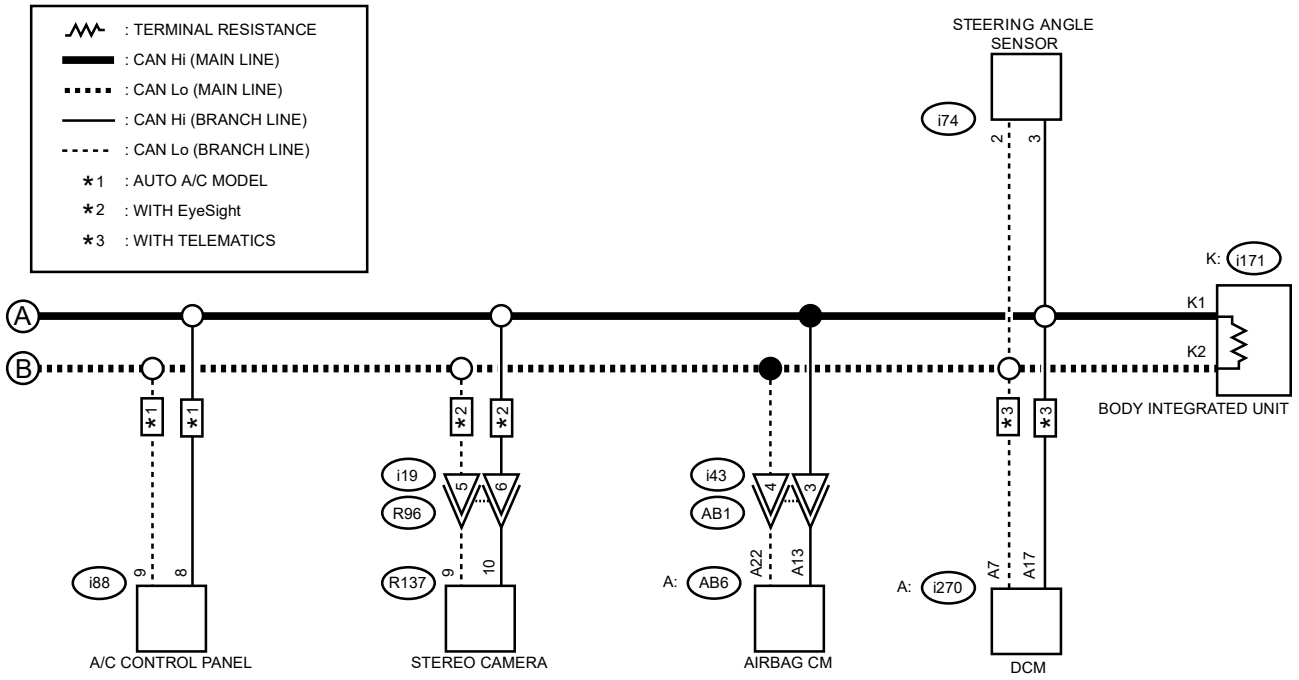
Yes	Repair or replace the open circuit of VDC related lines.
No	The communication harness is normal. Check DTC of VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

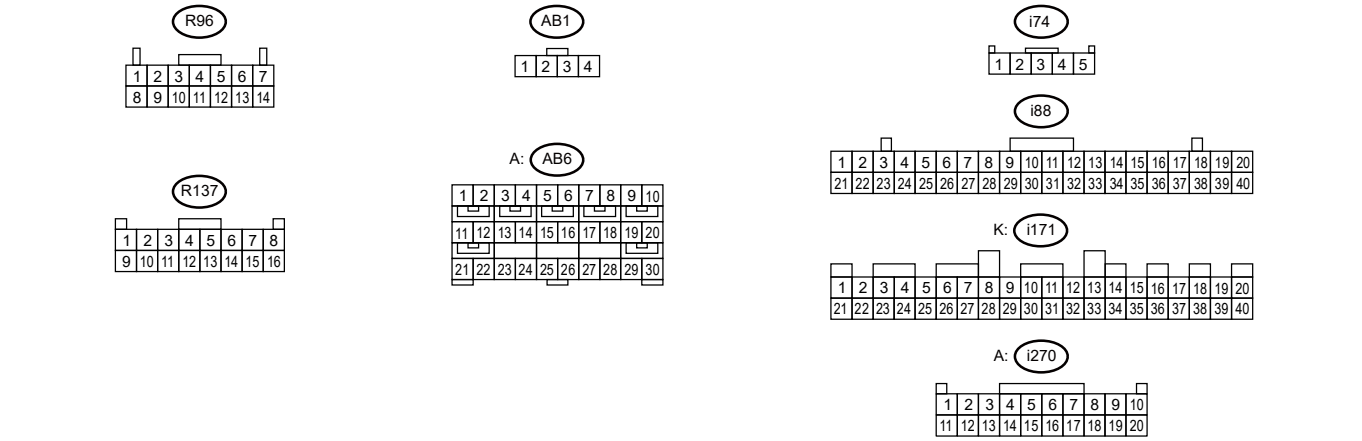
22. RELATED LINES 53 — 61 Ω (KEYLESS ENTRY/TPMS)

Wiring diagram:
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.


POWER STEERING CM
A: B450
A7
A6
B204
B203
ECM
A3
A14
A: B134
CVT
CVT
B139
E3
T10
T15
E115
44
43
8
7
TCM
10
11
B310
VDC CM
J/C
R182
R180
R181
R183
*4
*3
*1
*2
B129
i215
i284
R466
10
30
11
31
R466
i284
9
10
A
B
R361
*5
*5
4
16
RAB CM
RADAR SENSOR LH
(MASTER)
*6
*6
2
7
R25
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R80
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : R221
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : R211
*2 : WITHOUT TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : KEYLESS ENTRY CM
WITH TPMS & WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START : TPMS & KEYLESS ENTRY CM
WITH TPMS & WITH KEYLESS ACCESS WITH PUSH BUTTON START : TPMS
*3 : 4 DOOR MODEL
*4 : 5 DOOR MODEL
*5 : WITH RAB
*6 : WITH RSD/RCTA


A: B134
R466
E3
R25
B204
A: B450
B310
R180
R182
R181
R183
T10
T15
*1
B129
R361
LAN10925


: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)
*1 : AUTO A/C MODEL
*2 : WITH EyeSight
*3 : WITH TELEMATICS
STEERING ANGLE SENSOR
i74
2
3
K: i171
K1
K2
BODY INTEGRATED UNIT
A
B
*1
*2
*3
i19
R96
i43
AB1
A: AB6
A: i270
i88
R137
A/C CONTROL PANEL
STEREO CAMERA
AIRBAG CM
DCM


R96
AB1
i74
i88
R137
A: AB6
K: i171
A: i270

LAN10926

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the keyless entry CM, TPMS CM or keyless entry & TPMS CM connector.
2. Using a tester, measure the resistance between keyless entry CM, TPMS CM or keyless entry & TPMS CM connector terminals.

Connector & terminal

Keyless entry CM

(R80) No. 2 — (R80) No. 1:

TPMS CM

(R211) No. 2 — (R211) No. 1:

Keyless entry & TPMS CM

(R221) No. 2 — (R221) No. 1:

Is the resistance 400 Ω or more?

Yes	A related line between VDC CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the steering sensor connector.
2. Using a tester, measure the resistance between keyless entry CM, TPMS CM or keyless entry & TPMS CM connector and steering sensor connector.

Connector & terminal

Keyless entry CM

(R80) No. 2 — (i74) No. 3:

(R80) No. 1 — (i74) No. 2:

TPMS CM

(R211) No. 2 — (i74) No. 3:

(R211) No. 1 — (i74) No. 2:

Keyless entry & TPMS CM

(R221) No. 2 — (i74) No. 3:

(R221) No. 1 — (i74) No. 2:

Is the resistance 10 Ω or more?

Yes	Repair or replace the open circuit of keyless entry/TPMS related lines.
No	The communication harness is normal. Check DTC of keyless entry/TPMS. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC). Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

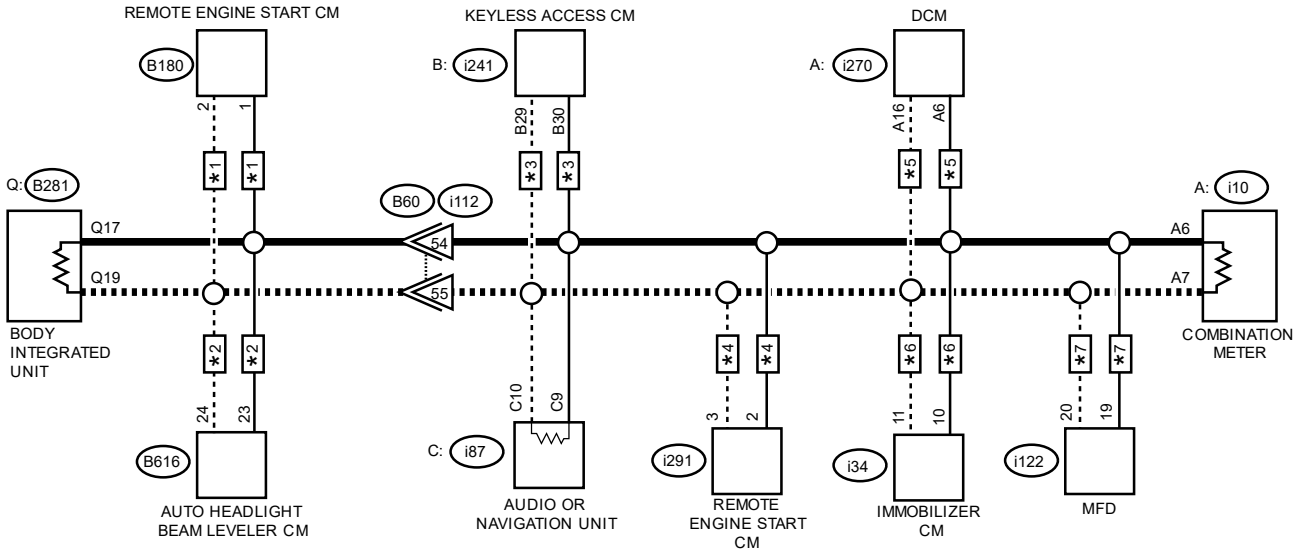
23. RELATED LINES 53 — 61 Ω (MFD)

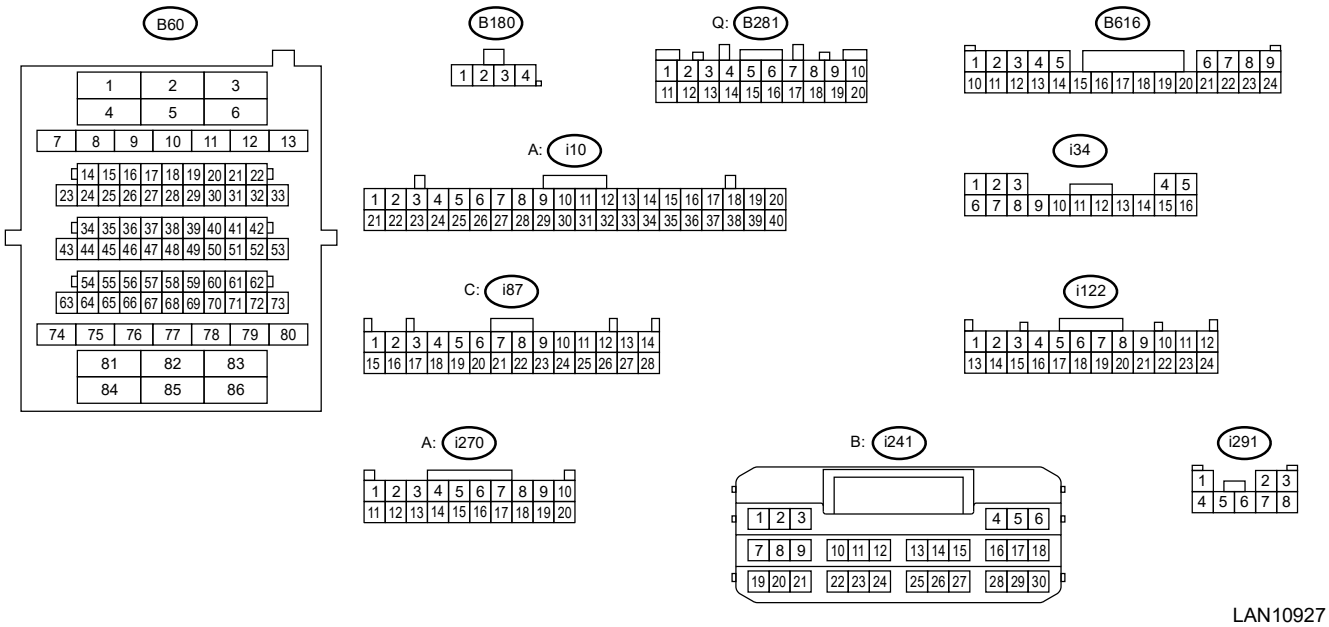
Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.

: STABILIZING CIRCUIT
: TERMINAL RESISTANCE
: CAN Hi (MAIN LINE)
: CAN Lo (MAIN LINE)
: CAN Hi (BRANCH LINE)
: CAN Lo (BRANCH LINE)

*1 : WITH REMOTE ENGINE START (WITHOUT PUSH BUTTON START)
*2 : WITH AUTO HEADLIGHT BEAM LEVELER
*3 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*4 : WITH REMOTE ENGINE START (WITH PUSH BUTTON START)
*5 : WITH TELEMATICS
*6 : WITH IMMOBILIZER CM
*7 : WITH HIGH GRADE MFD





LAN10927

1. CHECK BETWEEN RELATED LINES AND MAIN WIRING HARNESS.

1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between terminals in MFD connector.
   Connector & terminal
   (i122) No. 19 — (i122) No. 20:

Is the resistance 400 Ω or more?

Yes	A related line between VDC CM and main wiring harness is open, or main wiring harness is open at two places or more.
No	Go to 2.

2. CHECK RELATED LINES.

1. Disconnect the audio or navigation unit connector.
2. Using a tester, measure the resistance between MFD connector and audio or navigation unit connector.
   Connector & terminal
   (i122) No. 19 — (i87) No. 9:
   (i122) No. 20 — (i87) No. 10:

Is the resistance 10 Ω or more?

Yes	Repair or replace the open circuit of MFD related lines.
No	The communication harness is normal. Check DTC of MFD. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [All diagnosis code].

Note:

- **For detailed operation procedures, refer to “Application help”.**
- **For details on DTCs, refer to the list. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>LIST.**

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Note
U0073	CAN FAILURE, BUS ‘OFF’ DETECTION	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0126	LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE.

Code	Description & trouble part	Note
U0127	LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0156	LOST COMMUNICATION WITH INFORMATION CENTER "A"	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A".
U0162	LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.

Code	Description & trouble part	Note
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0181	LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE.
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE.
U0420	INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.

Code	Description & trouble part	Note
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0427	INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE.
U0428	INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE.
U0430	INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0430 INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1073	CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF.

Code	Description & trouble part	Note
U1140	LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN.
U1232	LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE.
U1233	Lost Communication with RAB Control Module	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1533	INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE.
U1534	INVALID DATA RECEIVED FROM SONAR ECU	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU.

1. CHECK USING THE DTC CHECK SHEET

DTC check sheet

| | (A) | (C) | | | | | | | | | | | | | | | | | | | | | | | | | | (D) | | | | | | | | | | | | | | | | | | |

1. MODULE INSTALLATION CHECK.

1. Using the check sheet for communication for initializing, check the vehicle installation module (module targeted for CAN communication).
2. Write "-" marks in the field for installation check (A) if the vehicle to be inspected does not have relevant module.
3. Write "-" marks in all blank fields on the same row that the "-" mark has filled in.

Was the module installation check above performed?

Yes	Go to 2.
No	Perform the module installation check, Go to 2.

2. CHECK DTC (BUS OFF DETECTION / DATA NOT RECEIVED).

Check the DTC. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Note:

It becomes impossible for CAN diagnostic module to read DTC, if there is a current malfunction of open harness (data not received). If this occurs, perform the "Check using the check sheet of communication for initializing" Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication>INSPECTION > CHECK USING THE CHECK SHEET OF COMMUNICATION FOR INITIALIZING., and use this check sheet to confirm that the corresponding part becomes the past malfunction.

Is DTC bus off or data not received?

Yes	Go to 3.
No	Perform the diagnosis for the displayed DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

3. CHECK DTC (BUS OFF DETECTION / DATA NOT RECEIVED).

Mark “X” in the field corresponding to the DTCs that has been detected by each module in the DTC check sheet.

Were all the corresponding field in the DTC check sheet filled?

Yes	Go to 4.
No	Fill all the corresponding field in the DTC check sheet, Go to 4.

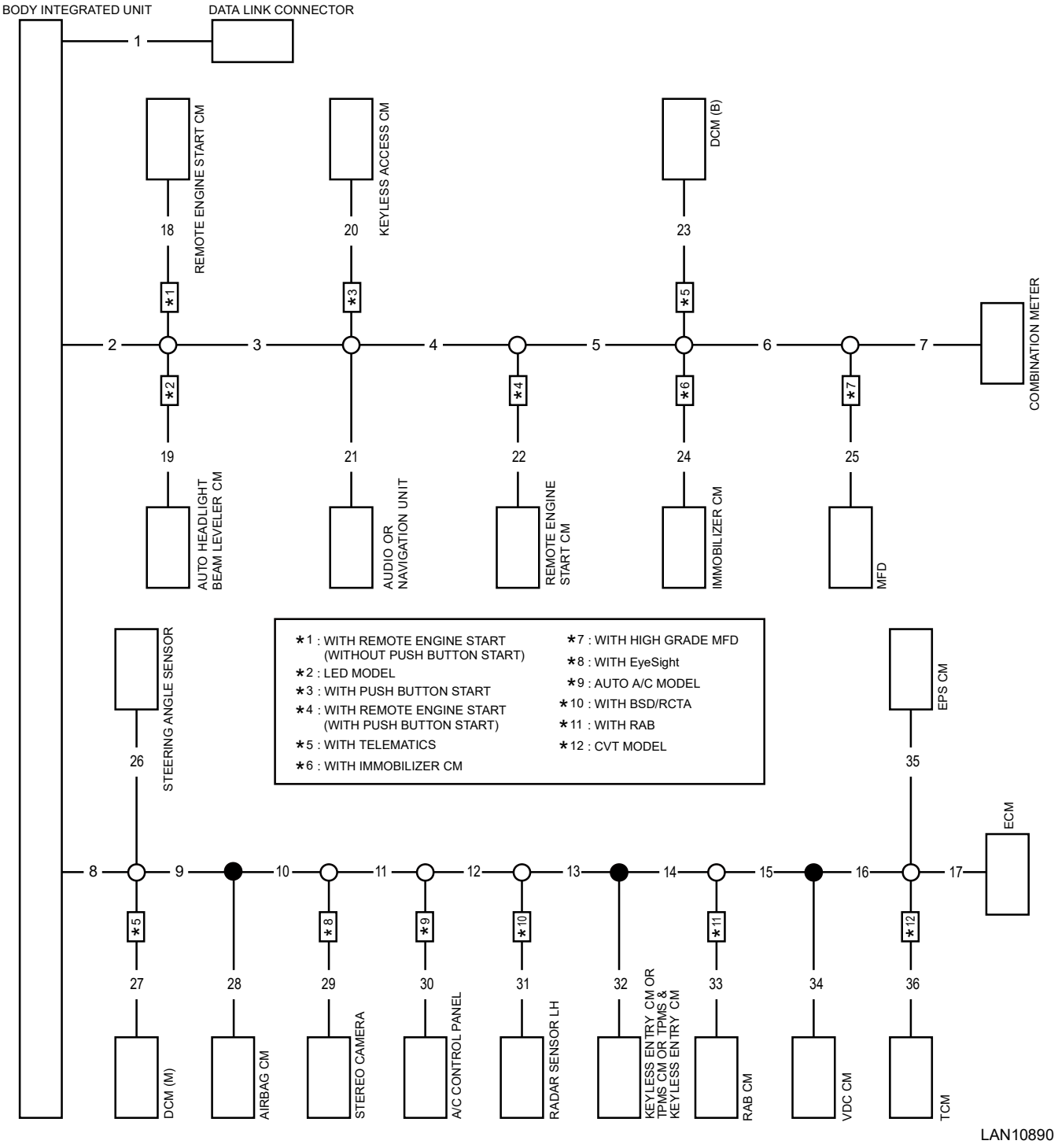
4. CHECK CAN COMMUNICATION LINE.

Check the CAN communication line by referring to the example of DTC data not received.

Is CAN communication line faulty?

Yes	Repair or replace the faulty portion of the harness.
No	Perform the diagnosis for the displayed DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

2. EXAMPLE OF DTC DATA NOT RECEIVED



Vicinity of No. 21 DCM (BODY CAN)

| | (A) | (C) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | (D) | | | | | | | | | | | | | | | | | | |

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

DTC detecting condition:
Integrated unit communication is shut down because of high speed CAN error.
Trouble symptom:
CAN communication is not normal.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0073 displayed? (Current malfunction)

Yes	Go to 3.
No	It may be a temporary poor contact. Perform the clear memory. Ref. to COMMON(diag)>Clear memory.

3. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>PROCEDURE.

Is CAN communication circuit faulty?

Yes	Repair the faulty portion, following the diagnosis procedure.
No	Go to 4.

4. CHECK DTC.

1. Perform the inspection using the DTC check sheet. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST > CHECK USING THE DTC CHECK SHEET.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0073 displayed? (Current malfunction)

Yes	Go to 5.
No	System is normal.

5. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.
   Note:
   When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is there any control module that U0073 is not detected as current malfunction?

Yes	Replace the control module.
No	Repeat step 5 until U0073 is not detected.

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

DTC detecting condition:
Integrated unit communication is shut down because of high speed CAN error.
Trouble symptom:
CAN communication is not normal.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0074 displayed? (Current malfunction)

Yes	Go to 3.
No	It may be a temporary poor contact. Perform the clear memory.

3. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>PROCEDURE.

Is CAN communication circuit faulty?

Yes	Repair the faulty portion, following the diagnosis procedure.
No	Go to 4.

4. CHECK DTC.

1. Perform the inspection using the DTC check sheet. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST > CHECK USING THE DTC CHECK SHEET.
2. Using the Subaru Select Monitor, read DTC of CAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0074 displayed? (Current malfunction)

Yes	Go to 5.
No	System is normal.

5. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.
   Note:
   When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is there any control module that U0074 is not detected as current malfunction?

Yes	Replace the control module.
No	Repeat step 5 until U0074 is not detected.

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

DTC detecting condition:
No data is received from ECM.
Trouble symptom:
Cooperation control of transmission may not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0100 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0100 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the engine data no-receive detected in several modules? (Current malfunction)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0100 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

LAN SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

DTC detecting condition:
No data is received from TCM.
Trouble symptom:
Cooperation control with transmission is not performed.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0101 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0101 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the transmission data no-receive detected in several modules? (Current malfunction)

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0101 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:
No data is received from VDC CM.
Trouble symptom:
ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0122 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0122 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the VDC data no-receive detected in several modules? (Current malfunction)

Yes	Replace the VDC CM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0122 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0126 LOST COMMUNICATION WITH STEERING ANGLE SENSOR MODULE

DTC detecting condition:
No data is received from steering angle sensor.
Trouble symptom:
VDC CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0126 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0126 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read DTC of all the systems. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the steering angle sensor data no-receive detected in several modules? (Current malfunction)

Yes	Replace the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0126 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE

DTC detecting condition:
Data does not arrive from TPMS & keyless entry CM or keyless entry CM.
Trouble symptom:
Keyless entry does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is DTC U0127 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0127 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the keyless entry data no-receive detected in combination meter? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or keyless entry CM. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Read the DTC using Subaru Select Monitor. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0127 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

DTC detecting condition:
No data is received from VDC CM.
Trouble symptom:
ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (CURRENT MALFUNCTION).

Check the displayed DTC.

Is DTC U0128 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0128 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the electronic parking data no-receive detected in several modules? (Current malfunction)

Yes	Replace the VDC CM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0128 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

DTC detecting condition:
No data is received from power steering CM.
Trouble symptom:
Cooperation control with power steering CM does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0131 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0131 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the electric power steering data no-receive detected in several modules? (Current malfunction)

Yes	Replace the power steering CM. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0131 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

DTC detecting condition:
No data is received from body integrated unit.
Trouble symptom:
Cooperation control with body integrated unit does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0140 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0140 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the body integrated data no-receive detected in several modules? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0140 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

DTC detecting condition:
No data is received from airbag CM.
Trouble symptom:
Cooperation control with airbag CM does not operate properly.
Caution:
When checking the airbag system, refer to the cautions regarding the airbag system prior to the inspection. Ref. to AIRBAG(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0151 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0151 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the airbag data no-receive detected in several modules? (Current malfunction)

Yes	Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0151 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:
No data is received from combination meter.
Trouble symptom:
Display of combination meter does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0155 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0155 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the meter data no-receive detected in several modules? (Current malfunction)

Yes	Replace the meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0155 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A"

DTC detecting condition:
No data is received from MFD.
Trouble symptom:
Display of MFD does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0156 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0156 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the MFD data no-receive detected in several modules? (Current malfunction)

Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0156 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

DTC detecting condition:
No data is received from audio or navigation.
Trouble symptom:
The audio or navigation does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0162 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0162 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the AVN data no-receive detected in several modules? (Current malfunction)

Yes	Replace the audio or navigation. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0162 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

DTC detecting condition:
No data is received from A/C control panel.
Trouble symptom:
Cooperation control of air conditioner does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0164 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0164 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the air conditioner data no-receive detected in several modules? (Current malfunction)

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0164 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE

DTC detecting condition:
No data is received from auto headlight beam leveler CM.
Trouble symptom:
Coordination control of auto headlight beam leveler CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0181 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0181 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the auto headlight beam leveler data no-receive detected in several modules? (Current malfunction)

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0181 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

DTC detecting condition:
No data is received from keyless access CM.
Trouble symptom:
Cooperation control of keyless access does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U0327 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0327 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the smart data no-receive detected in several modules? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0327 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

DTC detecting condition:
Defective data from ECM.
Trouble symptom:
Defective data on CAN communication occurs.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0401 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0401 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the engine data abnormal detected in several modules? (Current malfunction)

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0401 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0402 INVALID DATA RECEIVED FROM TCM

DTC detecting condition:
Received error data from TCM.
Trouble symptom:
Sport indicator light blinks.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0402 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the TCM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0402 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the transmission data abnormal detected in several modules? (Current malfunction)

Yes	Replace the TCM. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Transmission Control Module (TCM).
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0402 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:
Data from VDC CM is faulty.
Trouble symptom:
ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0416 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the VDC CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0416 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the VDC data abnormal detected in several modules? (Current malfunction)

Yes	Replace the VDC CM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0416 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE

DTC detecting condition:
Data from VDC CM is faulty.
Trouble symptom:
ABS warning light and VDC warning light illuminate.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0417 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the VDC CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0417 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the electronic parking data abnormal detected in several modules? (Current malfunction)

Yes	Replace the VDC CM. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U).
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0417 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0420 INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from EPS CM.
Trouble symptom:
Cooperation control with EPS CM does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0420 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the power steering CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0420 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the electric power steering data abnormal detected in several modules? (Current malfunction)

Yes	Replace the power steering CM. Ref. to POWER ASSISTED SYSTEM (POWER STEERING)>Power Steering Control Module.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0420 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from body integrated unit.
Trouble symptom:
Cooperation control with body integrated unit does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0422 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0422 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the body integrated data abnormal detected in several modules? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0422 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from combination meter.
Trouble symptom:
Display of combination meter does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0423 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0423 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the meter data abnormal detected in several modules? (Current malfunction)

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0423 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from A/C control panel.
Trouble symptom:
Cooperation control of air conditioner does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0424 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the A/C control panel connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0424 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the air conditioner data abnormal detected in several modules? (Current malfunction)

Yes	Replace the A/C control panel. Ref. to AIR CONDITIONER>Control Panel.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0424 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from keyless access CM.
Trouble symptom:
Cooperation control of keyless access does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0427 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0427 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the smart data abnormal detected in several modules? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0427 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0428 INVALID DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE

DTC detecting condition:
Defective data was transmitted from steering angle sensor.
Trouble symptom:
VDC CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0428 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the steering angle sensor connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0428 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the steering angle sensor data abnormal detected in several modules? (Current malfunction)

Yes	Replace the steering angle sensor. Ref. to VEHICLE DYNAMICS CONTROL (VDC)>Steering Angle Sensor.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0428 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0430 INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from TPMS & keyless entry CM or keyless entry CM.
Trouble symptom:
Keyless entry or TPMS does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0430 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the TPMS & keyless entry CM or keyless entry CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0430 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the keyless entry invalid data detected in several modules? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or keyless entry CM. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0430 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE

DTC detecting condition:
Invalid data was transmitted from airbag CM.
Trouble symptom:
The airbag does not operate normally.
Caution:
When checking the airbag system, refer to the cautions regarding the airbag system prior to the inspection. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0452 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the airbag CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0452 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the airbag CM data abnormal detected in several modules? (Current malfunction)

Yes	Replace the airbag CM. Ref. to AIRBAG SYSTEM>Airbag Control Module.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0452 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0457 INVALID DATA RECEIVED FROM INFORMATION CENTER "A"

DTC detecting condition:
Defective data was transmitted from MFD.
Trouble symptom:
MFD does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0457 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the airbag CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0457 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the MFD invalid data detected in several modules? (Current malfunction)

Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0457 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE

DTC detecting condition:
Defective data was transmitted from audio or navigation.
Trouble symptom:
The audio or navigation does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U0463 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the airbag CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0463 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the AVN invalid data detected in several modules? (Current malfunction)

Yes	Replace the audio or navigation. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U0463 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1073 CONTROL MODULE COMMUNICATION BUS "SONAR-CAN" OFF

DTC detecting condition:
RAB CM communication is shut down because of high speed CAN error.
Trouble symptom:
CAN communication is not normal.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

DTC Check

Is DTC U1073 displayed? (Current malfunction)

Yes	Go to 3.
No	It may be a temporary poor contact. Perform the clear memory.

3. CHECK CAN COMMUNICATION CIRCUIT.

Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check>PROCEDURE.

Is CAN communication circuit faulty?

Yes	Repair the faulty portion, following the diagnosis procedure.
No	Go to 4.

4. CHECK DTC.

1. Perform the inspection using the DTC check sheet. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST > CHECK USING THE DTC CHECK SHEET.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1073 displayed? (Current malfunction)

Yes	Go to 5.
No	System is normal.

5. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the control modules other than body integrated unit in order.
   Note:
   When disconnecting ECM or VDC CM, connect resistance of 120 Ω between CAN Hi and CAN Lo as an alternative of end resistance.
3. Turn the ignition switch to ON.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is there any control module that U1073 is not detected as a current malfunction?

Yes	Replace the control module.
No	Repeat step 5 until U1073 is not detected.

DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN

DTC detecting condition:
No data is received from body integrated unit.
Trouble symptom:
Cooperation control with body integrated unit does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U1140 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1140 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the body integrated data no-receive detected in several modules? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1140 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE

DTC detecting condition:
No data is received from radar sensor.
Trouble symptom:
Cooperation control of radar sensor does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U1232 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1232 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the Blind Spot Detection/Rear Cross Traffic Alert data no-receive detected in several modules? (Current malfunction)

Yes	Replace the radar sensor LH. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1232 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1233 LOST COMMUNICATION WITH RAB CONTROL MODULE

DTC detecting condition:
No data is received from RAB CM.
Trouble symptom:
Coordination control of RAB CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U1233 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

1. Check CAN communication circuit. Ref. to LAN SYSTEM (DIAGNOSTICS)>CAN Communication Circuit Check.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1233 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the sonar data no-receive detected from stereo camera? (Current malfunction)

Yes	Replace the RAB CM. Ref. to Reverse Automatic Braking>Reverse Automatic Braking CM.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1233 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

DTC detecting condition:
No data from stereo camera is received.
Trouble symptom:
Cooperation control of EyeSight does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC.

Check the displayed DTC.

Is DTC U1235 displayed? (Current malfunction)

Yes	Go to 4.
No	Go to 6.

4. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1235 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 6.

5. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the EyeSight data no-receive detected in several modules? (Current malfunction)

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.
No	Replace the module that the DTC has been detected.

6. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1235 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 7.

7. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN

DTC detecting condition:
Defective data was transmitted from body integrated unit.
Trouble symptom:
Cooperation control with body integrated unit does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U1422 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1422 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the body integrated data abnormal detected in several modules? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1422 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

DTC detecting condition:
Defective data was transmitted from stereo camera.
Trouble symptom:
Cooperation control of EyeSight does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U1433 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the stereo camera connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1433 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the EyeSight data abnormal detected in several modules? (Current malfunction)

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1433 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE

DTC detecting condition:
Defective data was transmitted from radar sensor.
Trouble symptom:
Cooperation control of radar sensor does not operate properly.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U1533 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the radar sensor LH connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1533 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the Blind Spot Detection/Rear Cross Traffic Alert data error detected in several modules? (Current malfunction)

Yes	Replace the radar sensor. Ref. to Blind Spot Detection/Rear Cross Traffic Alert>Radar Sensor.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1533 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

DTC U1534 INVALID DATA RECEIVED FROM SONAR ECU

DTC detecting condition:
Defective data was transmitted from RAB CM.
Trouble symptom:
Coordination control of RAB CM does not operate normally.

1. CHECK CAN COMMUNICATION HARNESS.

Perform the basic diagnostic procedure to check for fault in CAN communication harness. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Was the basic diagnostic procedure performed up to step 7?

Yes	Go to 2.
No	Perform the basic diagnostic procedure. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

2. CHECK DTC (OTHER THAN U-CODE).

Check the displayed DTC.

Is DTC other than U*** displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs other than the displayed U-code.
No	Go to 3.

3. CHECK DTC (U-CODE).

Check the displayed DTC.

Is DTC for the bus off or the data no-receive displayed? (Current malfunction)

Yes	Perform the diagnosis for DTCs for the displayed bus off or the data no-receive.
No	Go to 4.

4. CHECK DTC.

Check the displayed DTC.

Is DTC U1534 displayed? (Current malfunction)

Yes	Go to 5.
No	Go to 7.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the RAB CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1534 displayed? (Current malfunction)

Yes	Go to 6.
No	Go to 7.

6. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is the sonar invalid data detected in several modules? (Current malfunction)

Yes	Replace the RAB CM.
No	Replace the module that the DTC has been detected.

7. CHECK HARNESS.

1. Shake the harness, and check for poor contact.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U1534 displayed? (Current malfunction)

Yes	Repair the poor contact of harness, or replace the harness.
No	Go to 8.

8. CHECK CONNECTOR.

Check the connector used for high speed CAN for poor contact.

Is there poor contact of connector?

Yes	Repair the connector that has poor contact, or replace harness.
No	It is possible that temporary poor communication occurs. Delete the DTC.

LAN SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Reference
DTC other than U-code is displayed.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > DTC OTHER THAN U-CODE IS DISPLAYED.
Faster/slower vehicle speed than the actual speed is displayed.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FASTER/SLOWER VEHICLE SPEED THAN THE ACTUAL SPEED IS DISPLAYED.
More/less fuel than the actual amount is displayed.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > MORE/LESS FUEL THAN THE ACTUAL AMOUNT IS DISPLAYED.
Fuel level warning light illuminates despite of sufficient fuel.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FUEL LEVEL WARNING LIGHT ILLUMINATES DESPITE OF SUFFICIENT FUEL.
Engine coolant temperature light blinks in red and blue alternately.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE COOLANT TEMPERATURE LIGHT BLINKS IN RED AND BLUE ALTERNATELY.
[S], [I] or [S#] indicator is blinking.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > [S], [I] OR [S#] INDICATOR IS BLINKING.
The VDC warning light illuminates.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE VDC WARNING LIGHT ILLUMINATES.
VDC-OFF indicator illuminates.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > VDC-OFF INDICATOR ILLUMINATES.
Brake warning light illuminates.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > BRAKE WARNING LIGHT ILLUMINATES.

Symptoms	Reference
Shift position is not displayed.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > SHIFT POSITION IS NOT DISPLAYED.
AT oil temperature warning light is blinking.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AT OIL TEMPERATURE WARNING LIGHT IS BLINKING.
Door indicator is not displayed.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > DOOR INDICATOR IS NOT DISPLAYED.
Clearance indicator does not illuminate.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CLEARANCE INDICATOR DOES NOT ILLUMINATE.
HI beam indicator does not illuminate.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HI BEAM INDICATOR DOES NOT ILLUMINATE.
Front fog light indicator does not illuminate.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > FRONT FOG LIGHT INDICATOR DOES NOT ILLUMINATE.
Illumination is fixed at the maximum brightness.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ILLUMINATION IS FIXED AT THE MAXIMUM BRIGHTNESS.
Cruise control indicator does not illuminate.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CRUISE CONTROL INDICATOR DOES NOT ILLUMINATE.
AWD indicator illuminates.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > AWD INDICATOR ILLUMINATES.
Hill hold indicator does not illuminate.	Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HILL HOLD INDICATOR DOES NOT ILLUMINATE.

LAN SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. DTC OTHER THAN U-CODE IS DISPLAYED

Trouble causes:

Many and unspecified

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC (CURRENT MALFUNCTION).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC (CURRENT MALFUNCTION).

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC other than U-code displayed? (Current malfunction)

Yes	Perform the diagnosis for DTC other than the U-code.
No	Perform troubleshooting according to phenomenon of the problem. (If no phenomenon of the problem is present, it is normal currently.)

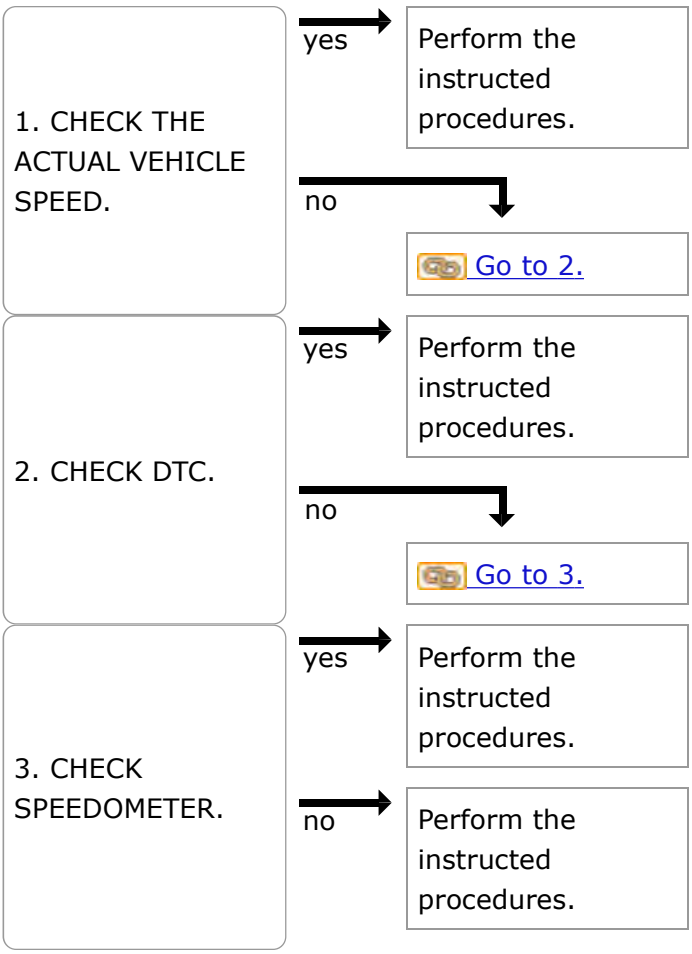
2. FASTER/SLOWER VEHICLE SPEED THAN THE ACTUAL SPEED IS DISPLAYED

Trouble causes:

- CAN communication failure
- Vehicle speed sensor malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK THE ACTUAL VEHICLE SPEED.

Check that the vehicle speed indicated in the meter matches with the actual vehicle speed.

Does the vehicle speed match?

Yes	Currently, it is normal.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK SPEEDOMETER.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Speedometer]

Do the indicated vehicle speed on Subaru Select Monitor and the speedometer indication match?

Yes	Perform a unit inspection for the vehicle speed sensor.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

3. MORE/LESS FUEL THAN THE ACTUAL AMOUNT IS DISPLAYED

Trouble causes:

- CAN communication failure
- Fuel level sensor malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to “CAUTION” in “General Description”.

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK FUEL GAUGE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is [FUEL SENDER OPEN DETECTED] displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK FUEL GAUGE.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Fuel Meter Operation]

Do the indicated amount on Subaru Select Monitor and the fuel gauge indication match?

Yes	Check the fuel level sensor as a single part. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. FUEL LEVEL WARNING LIGHT ILLUMINATES DESPITE OF SUFFICIENT FUEL

Trouble causes:

- CAN communication failure
- Fuel level sensor malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK FUEL LEVEL WARNING LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is [FUEL SENDER OPEN DETECTED] displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK FUEL LEVEL WARNING LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Remaining fuel warning]

Do the indicated amount on Subaru Select Monitor and the fuel level warning light indication match?

Yes	Check the fuel level sensor as a single part. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

5. ENGINE COOLANT TEMPERATURE LIGHT BLINKS IN RED AND BLUE ALTERNATELY

Trouble causes:

- CAN communication failure
- Engine coolant temperature sensor malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Data Monitor.

DTC Check

Is any of [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT RANGE/PERFORMANCE], [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW], [ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH] displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Water temperature (HOT)]
- [Water temperature (COOL)]

Do the indicated amount on Subaru Select Monitor and the engine coolant temperature light indication match?

Yes	Perform a unit inspection of the engine coolant temperature sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Coolant Temperature Sensor.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

6. [S], [I] OR [S#] INDICATOR IS BLINKING

Trouble causes:

- CAN communication failure
- ECM failure
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs of [Engine] and [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK THE ENGINE COOLANT TEMPERATURE LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [[S]indicator]
- [[I]indicator]
- [[S#]indicator]

Do the indicated amount on Subaru Select Monitor and the SI-DRIVE indication match?

Yes	Check the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

7. THE VDC WARNING LIGHT ILLUMINATES

Trouble causes:

- CAN communication failure
- VDC warning light malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK VDC WARNING LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK VDC WARNING LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [VDC operation/failure indicator]

Do the indicated amount on Subaru Select Monitor and the [VDC operation/failure indicator] indication match?

Yes	Check the VDC warning light. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

8. VDC-OFF INDICATOR ILLUMINATES

Trouble causes:

- CAN communication failure
- VDC OFF indicator light malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK VDC OFF INDICATOR LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK VDC OFF INDICATOR LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [VDC OFF indicator]

Do the indicated amount on Subaru Select Monitor and the [VDC OFF indicator] indication match?

Yes	Check the VDC OFF indicator light. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

9. BRAKE WARNING LIGHT ILLUMINATES

Trouble causes:

- CAN communication failure
- Brake warning light malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK BRAKE WARNING LIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK BRAKE WARNING LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [BRAKE warning]

Do the indicated amount on Subaru Select Monitor and the [BRAKE warning] indication match?

Yes	Check the brake warning light. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

10. SHIFT POSITION IS NOT DISPLAYED

Trouble causes:

- CAN communication failure
- Shift indicator malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK SHIFT INDICATOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK SHIFT INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Shift Display]

Do the indication on Subaru Select Monitor and the shift indicator indication match?

Yes	Check the shift indicator. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

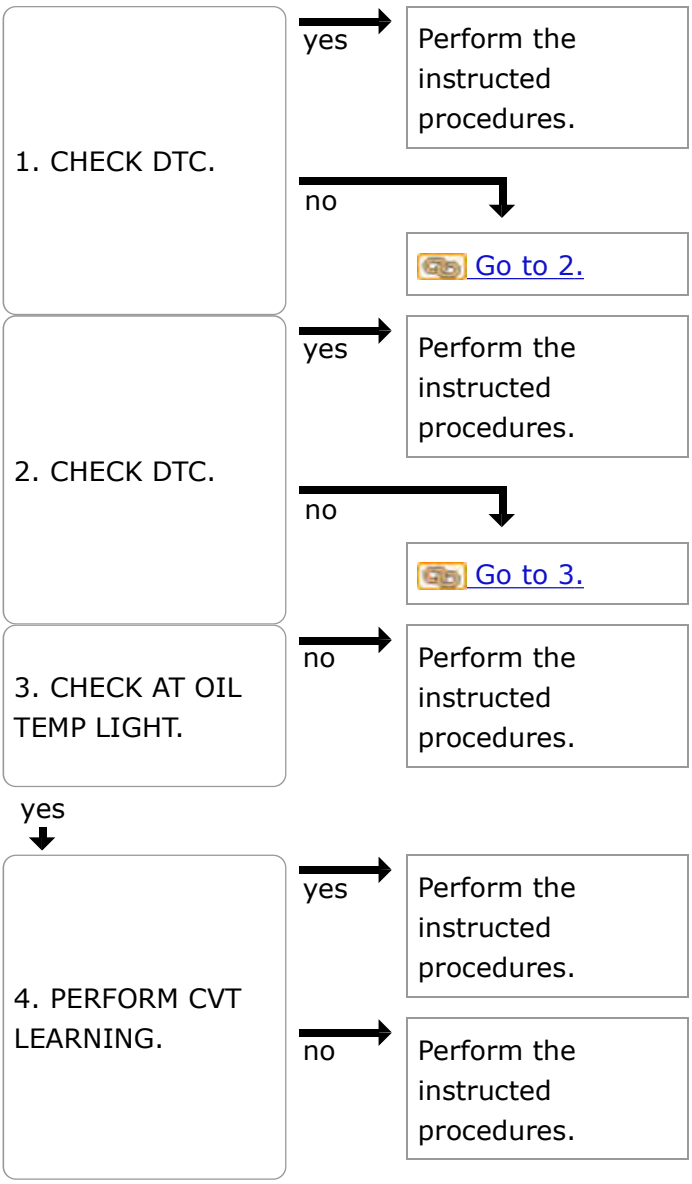
11. AT OIL TEMPERATURE WARNING LIGHT IS BLINKING

Trouble causes:

- CAN communication failure
- AT OIL TEMP light malfunction
- Combination meter malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK AT OIL TEMP LIGHT.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

- [AT (CVT) oil temperature warning]

Do the indicated amount on Subaru Select Monitor and the [AT (CVT) oil temperature warning] indication match?

Yes	Go to 4.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. PERFORM CVT LEARNING.

Connect the Subaru Select Monitor and perform the CVT learning. Ref. to TRANSMISSION (DIAGNOSTICS)>Learning Control.

Does the AT oil temperature warning light go off?

Yes	Currently, it is normal.
No	Check the AT OIL TEMP light. Ref. to TRANSMISSION (DIAGNOSTICS)>AT OIL TEMP Warning Light Display.

12. DOOR INDICATOR IS NOT DISPLAYED

Trouble causes:

- CAN communication failure
- Body integrated unit malfunction
- Combination meter malfunction
- Door switch circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 3.
3. CHECK DOOR INDICATOR.
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK DOOR INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [All seats door]
- [Driver side door]
- [Passenger side door]
- [Rear side (right) door]
- [Rear side (left) door]

Do the indication on Subaru Select Monitor and the door indicator indication match?

Yes	Go to 4.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- Driver's door SW input
- P-door SW input
- Rear right door SW input
- Rear left door SW input

Do the door open/close and data indication match?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Inspect door switch circuit. Ref. to SECURITY AND LOCKS>Keyless Entry System>INSPECTION.

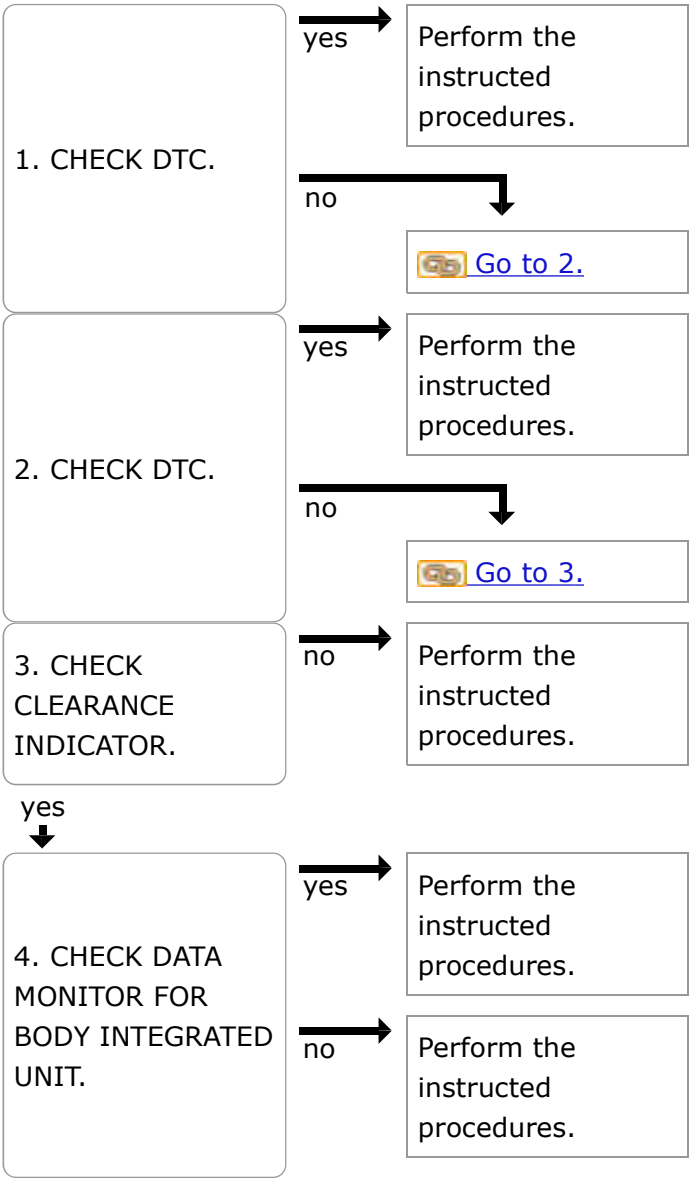
13. CLEARANCE INDICATOR DOES NOT ILLUMINATE

Trouble causes:

- CAN communication failure
- Body integrated unit malfunction
- Combination meter malfunction
- Clearance light circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK CLEARANCE INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Position light indicator]

Do the indication on Subaru Select Monitor and the clearance indicator indication match?

Yes	Go to 4.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Lighting I Switch Input]

Do the switch operation and data indication match?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Check the clearance light. Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System.

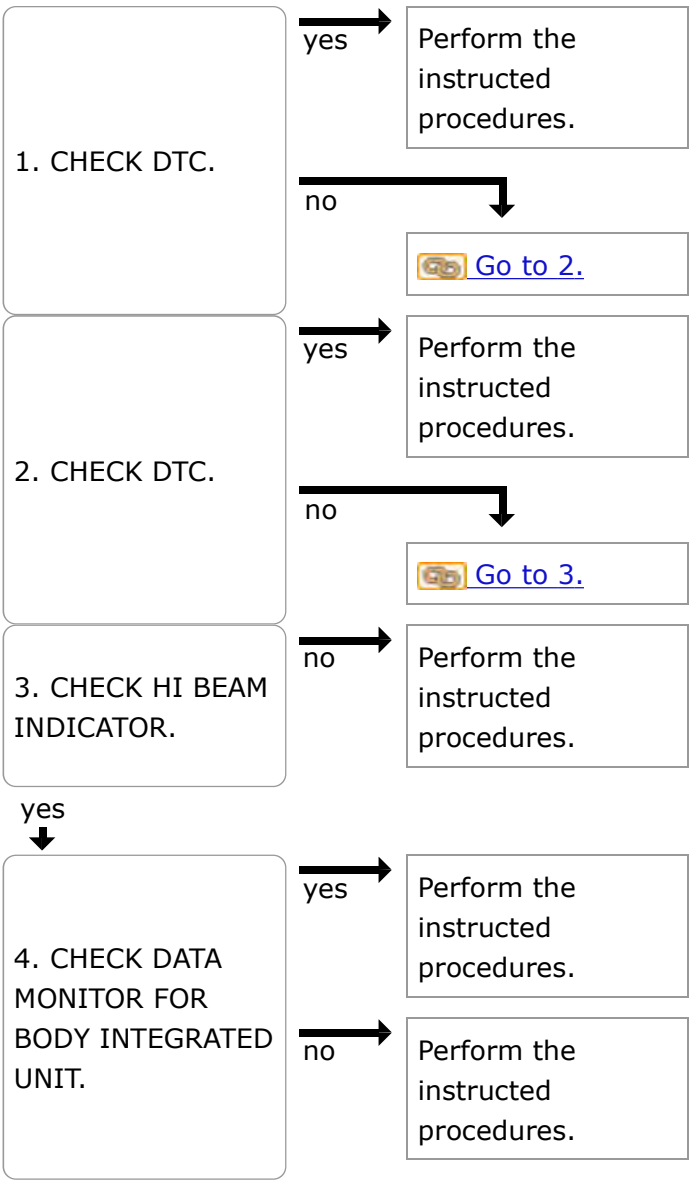
14. HI BEAM INDICATOR DOES NOT ILLUMINATE

Trouble causes:

- CAN communication failure
- Body integrated unit malfunction
- Combination meter malfunction
- Headlight system circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK HI BEAM INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [High-beam indicator]

Do the indication on Subaru Select Monitor and the HI beam indicator indication match?

Yes	Go to 4.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control].
Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Dimmer Hi Switch Input]

Do the switch operation and data indication match?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Check the headlight system. Ref. to LIGHTING SYSTEM>Headlight System.

15. FRONT FOG LIGHT INDICATOR DOES NOT ILLUMINATE

Trouble causes:

- CAN communication failure
- Body integrated unit malfunction
- Combination meter malfunction
- Front fog light system circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK THE FRONT FOG LIGHT INDICATOR.	no →	Perform the instructed procedures.

yes

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.

DTC Check

Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK THE FRONT FOG LIGHT INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Front fog light indicator]

Do the indication on Subaru Select Monitor and the front fog light indicator indication match?

Yes	Go to 4.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

4. CHECK DATA MONITOR FOR BODY INTEGRATED UNIT.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Front fog lamp SW input]

Do the switch operation and data indication match?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Check the front fog light system. Ref. to LIGHTING SYSTEM>Front Fog Light System.

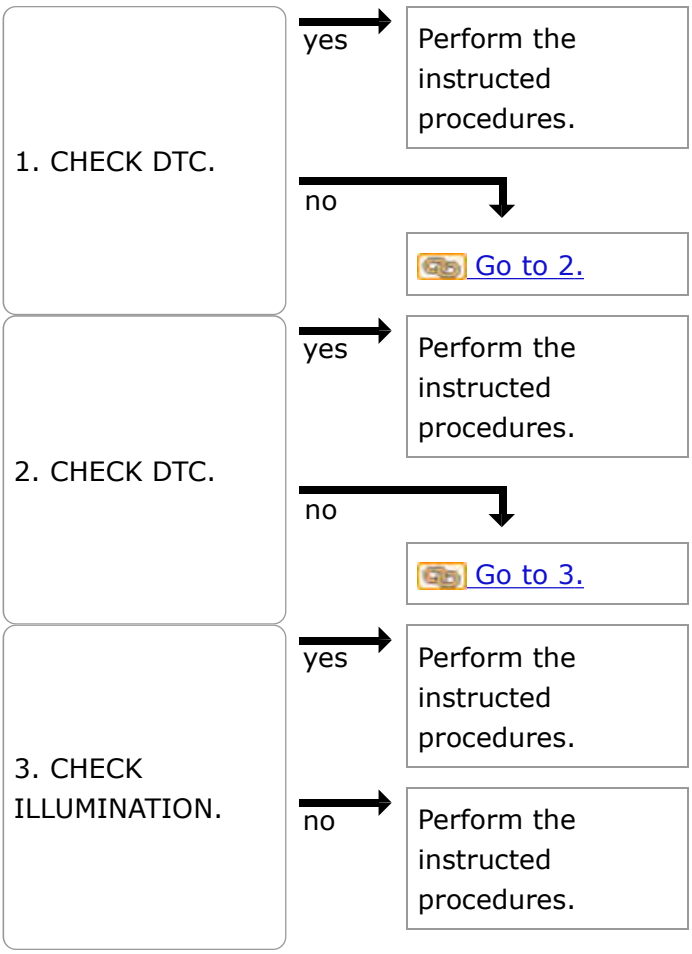
16. ILLUMINATION IS FIXED AT THE MAXIMUM BRIGHTNESS

Trouble causes:

- CAN communication failure
- Body integrated unit malfunction
- Combination meter malfunction
- Illumination system circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK ILLUMINATION.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [Illumination check]

Do the indication on Subaru Select Monitor and the indicator indication match?

Yes	Check the clearance light & illumination light system. Ref. to LIGHTING SYSTEM>Clearance Light and Illumination Light System.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

17. CRUISE CONTROL INDICATOR DOES NOT ILLUMINATE

Trouble causes:

- CAN communication failure
- Combination meter malfunction
- Cruise control command switch circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK DATA MONITOR OF ENGINE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 2.

2. CHECK DATA MONITOR OF ENGINE.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Engine]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Main Switch]

Do the switch operation and data indication match?

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Check the cruise control command switch. Ref. to CRUISE CONTROL SYSTEM>Cruise Control Command Switch.

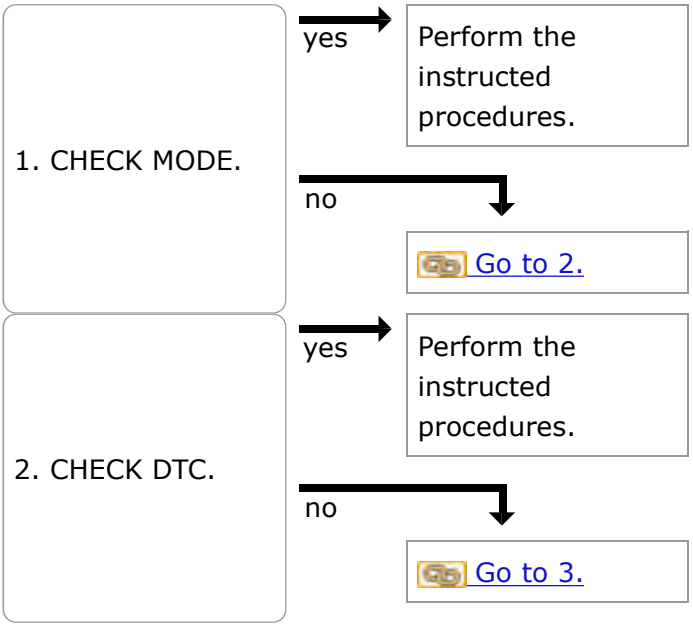
18. AWD INDICATOR ILLUMINATES

Trouble causes:

- CAN communication failure
- Combination meter malfunction
- TCM failure
- AWD indicator circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



3. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK AWD INDICATOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK MODE.

Connect the Subaru Select Monitor and change to AWD mode.

Note:

When AWD ON/OFF switching mode is not available, go to step 2.

Did the AWD indicator go off?

Yes	Currently, it is normal.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Transmission] using the Subaru Select Monitor. Ref. to TRANSMISSION (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 3.

3. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 4.

4. CHECK AWD INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to TRANSMISSION (DIAGNOSTICS)>Active Test.

- [AWD warning]

Do the indication on Subaru Select Monitor and the AWD indicator indication match?

Yes	Check the AWD indicator. Ref. to TRANSMISSION (DIAGNOSTICS)>AWD Warning Light Display.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

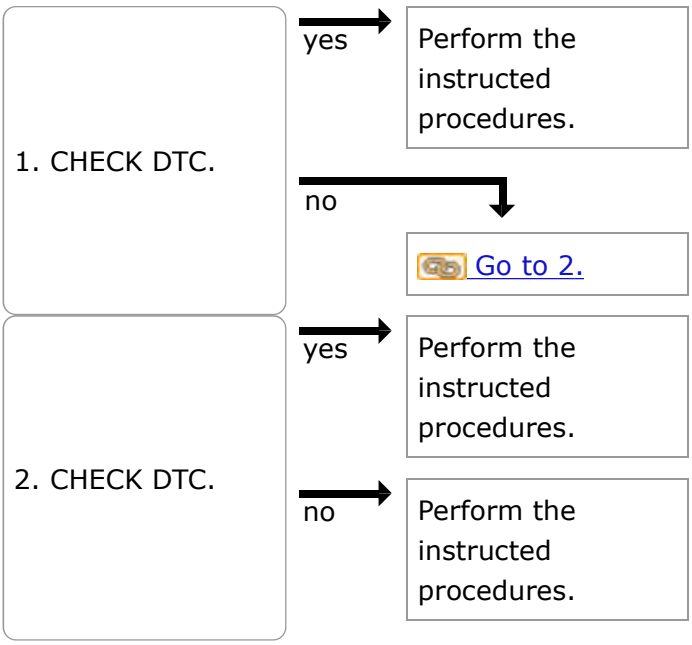
19. HILL HOLD INDICATOR DOES NOT ILLUMINATE

Trouble causes:

- CAN communication failure
- Combination meter malfunction
- Hill hold indicator light circuit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description".



1. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DTC.

1. Start the engine.
2. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>OPERATION.



Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis according to the basic diagnostic procedure in LAN SYSTEM (DIAGNOSTICS). Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Check the hill hold indicator light. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Warning Light Illumination Pattern.

KEYLESS ENTRY(DIAGNOSTICS)

KLE(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Work Support
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
13. Diagnostics with Phenomenon

KEYLESS ENTRY(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Keyless Entry].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Keyless Entry] using the Subaru Select Monitor. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

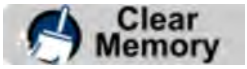
DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Keyless entry system is normal.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Keyless Entry]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Inspection Mode.
5. Read the DTC of [Keyless Entry] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

KEYLESS ENTRY(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Keyless Entry Check List for Interview Date of Vehicle Bring-in Year Month Day</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

KEYLESS ENTRY(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. KEYLESS ENTRY

When removing keyless entry-related components, refer to cautions in the security&lock section. Ref. to SECURITY AND LOCKS>General Description>CAUTION.

KEYLESS ENTRY(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect keyless entry related problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the fuse condition. Ref. to SECURITY AND LOCKS>Relay and Fuse.
   Make sure that ampere of the fuse is setting value, and it is not blown out.
3. Check the connecting condition of harness and harness connector.

KEYLESS ENTRY(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

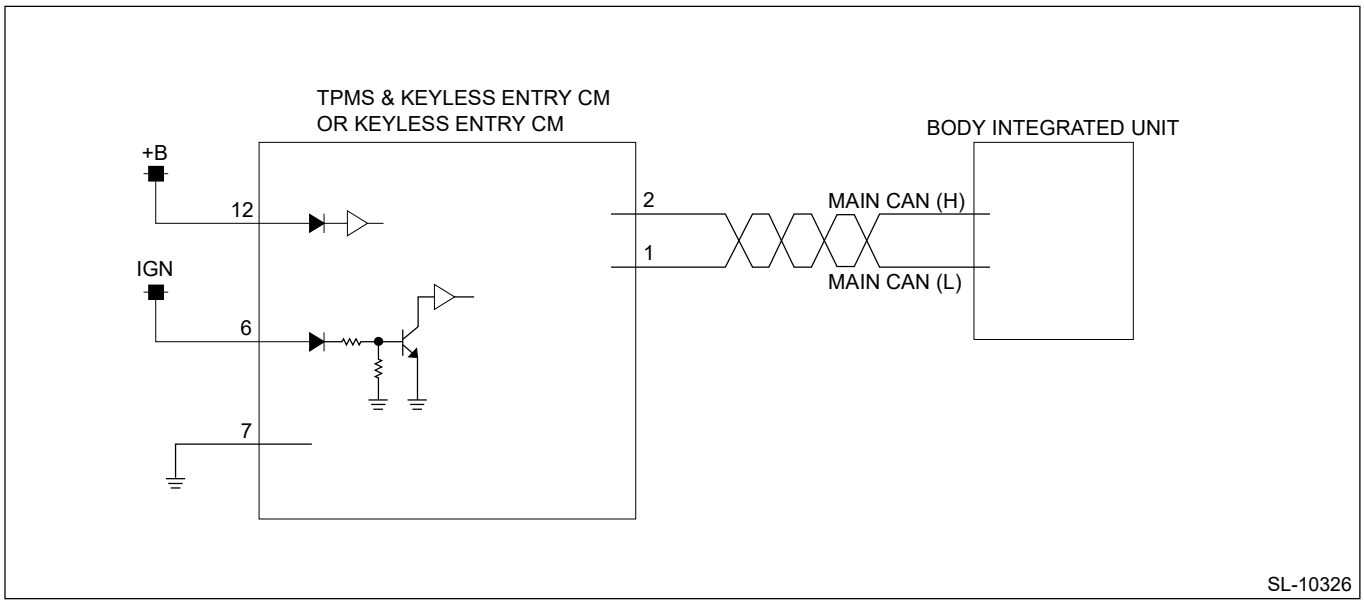
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

KEYLESS ENTRY(DIAGNOSTICS) > General Description

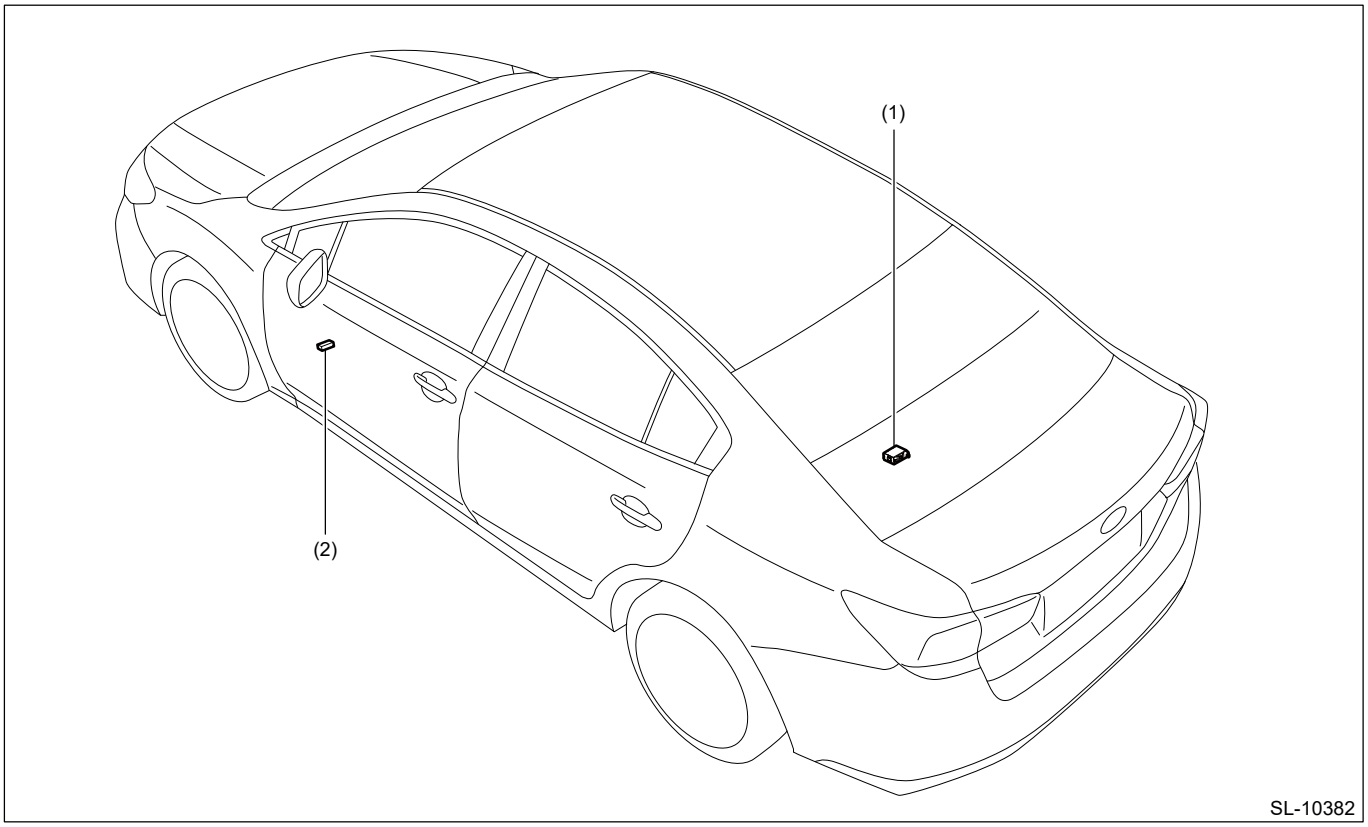
SYSTEM BLOCK DIAGRAM



KEYLESS ENTRY(DIAGNOSTICS) > Electrical Component Location

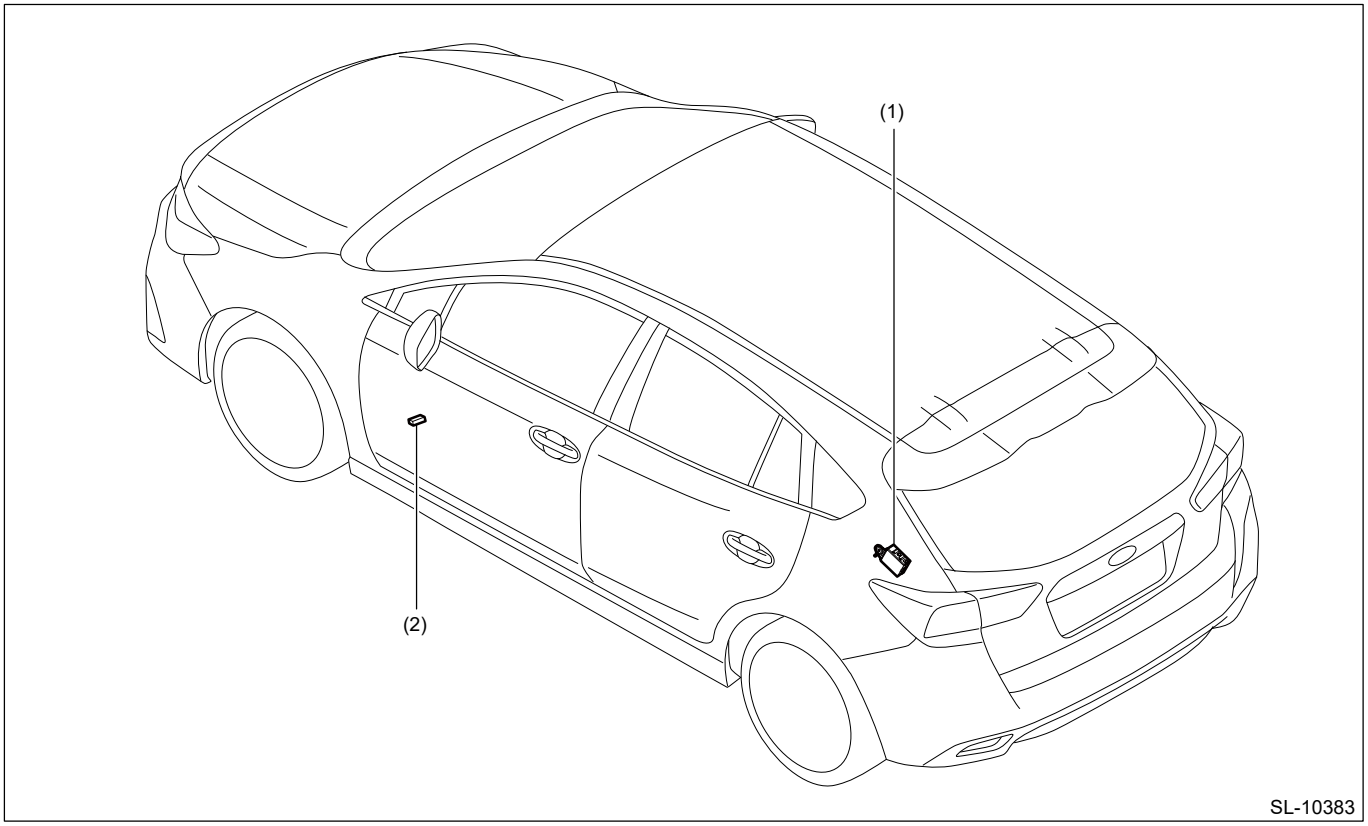
LOCATION

- 4 door model



(1) TPMS & keyless entry CM or the keyless entry CM
(2) Data link connector

- 5 door model

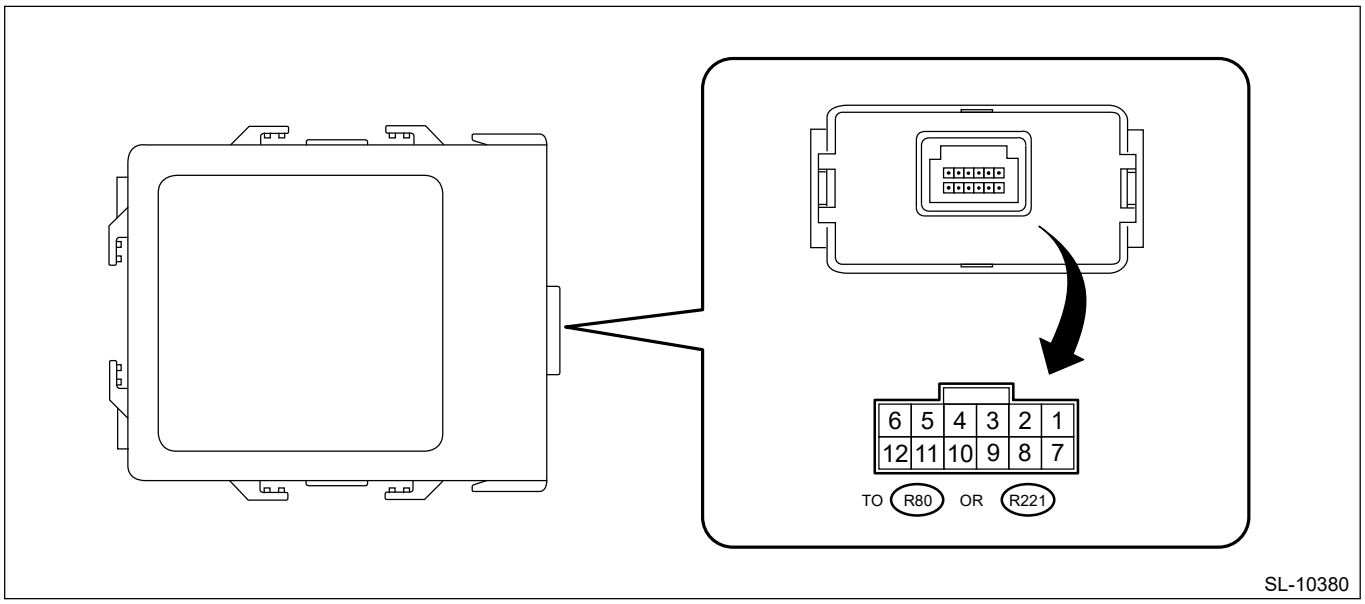


(1) TPMS & keyless entry CM or the keyless entry CM

(2) Data link connector

KEYLESS ENTRY(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Item	Measuring condition	Standard
(R221) or (R80) No. 1	CAN-L	Digital signal; can not be measured	—
(R221) or (R80) No. 2	CAN-H	Digital signal; can not be measured	—
(R221) or (R80) No. 3	—	—	—
(R221) or (R80) No. 4	—	—	—
(R221) or (R80) No. 5	—	—	—
(R221) or (R80) No. 6 ←→ Chassis ground	Ignition power supply	When ignition switch is ON	9 — 16 V
(R221) or (R80) No. 7 ←→ Chassis ground	GND	Always	1 Ω or less
(R221) or (R80) No. 8	—	—	—
(R221) or (R80) No. 9	—	—	—
(R221) or (R80) No. 10	—	—	—
(R221) or (R80) No. 11	—	—	—
(R221) or (R80) No. 12 ←→ Chassis ground	Battery power supply	Always	9 — 16 V

KEYLESS ENTRY(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B2771	EEPROM PERFORMANCE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2771 EEPROM PERFORMANCE.
B2772	CAN COMMUNICATION (AUDIO) STUCK	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2772 CONTROL MODULE COMMUNICATION STUCK.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Entry]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Keyless Entry] to check that there is no DTC

displayed.

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. Remove the ignition key from the ignition switch, and insert again.
4. Turn the ignition switch OFF → ON, and wait for 10 seconds or more.
5. Using the Subaru Select Monitor, read the DTC of [Keyless Entry] to check that there is no DTC displayed.

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Detecting condition:

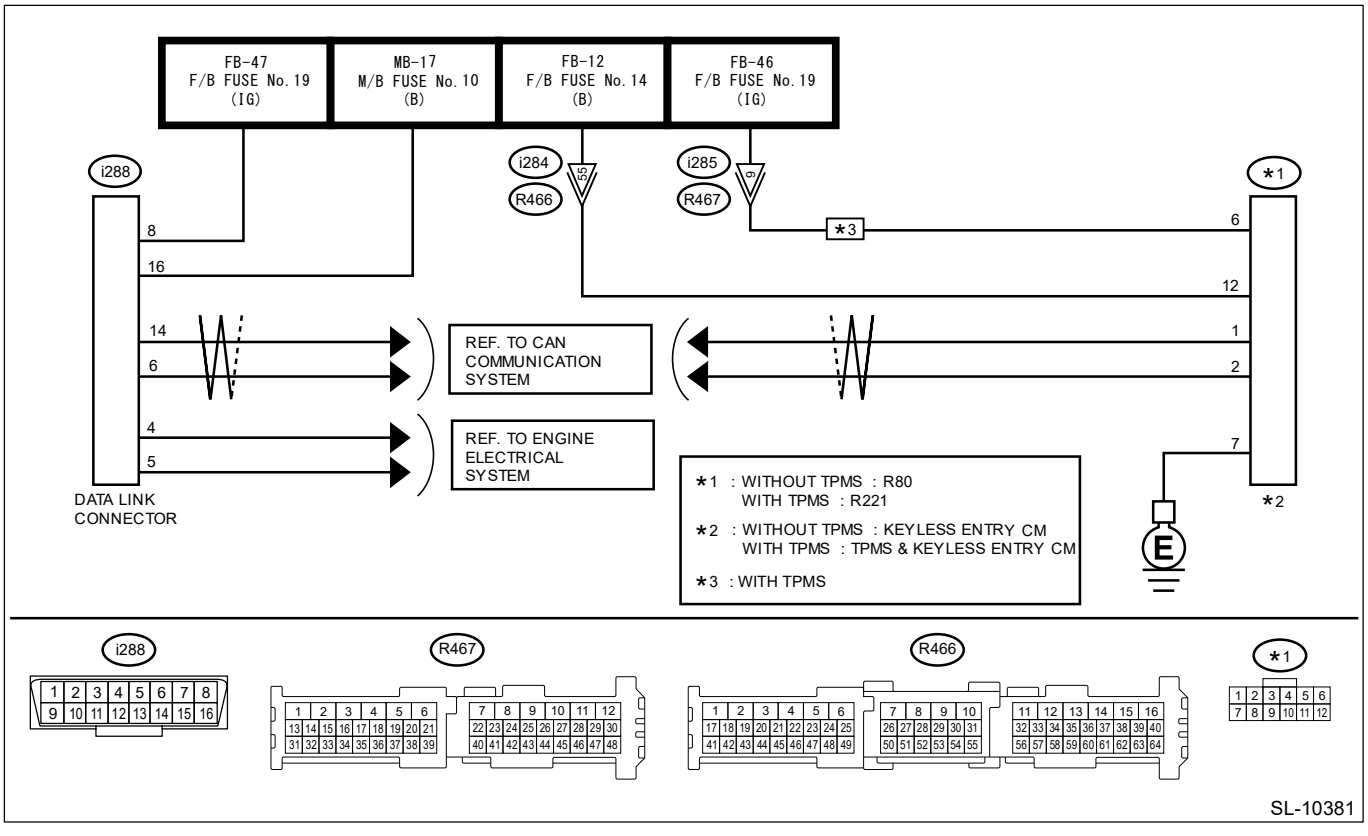
- Defective harness
- Power supply circuit malfunction
- Defective TPMS & keyless entry CM or keyless entry CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

- Keyless entry system Ref. to WIRING SYSTEM>Keyless Entry System.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY CIRCUIT.

Connect DST-i to data link connector.

Does DST-i turn ON?

Yes	Go to 4.
No	Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 8 (+) — Chassis ground (−):
   (i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the power supply circuit. **Note:** **In this case, repair the following item:** • **Open or ground short circuit of harness between battery and data link connector** • **Blown out of fuse**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 4 — Chassis ground:
   (i288) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, Go to 4.
No	Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and establish communication between the Subaru Select Monitor and vehicle.

Is communication possible?

Yes	Go to 5.
No	Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is LAN system OK?

Yes	Go to 6.
No	Perform the inspection according to the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check TPMS & keyless entry CM connector or keyless entry CM connector, data link connector or intermediate connector for poor contact.

Is the connector OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove a fuse from the fuse box.
3. Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the fuse OK?

Yes	Go to 8.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the TPMS & keyless entry CM or keyless entry CM and fuse.

8. CHECK POWER SUPPLY CIRCUIT FOR TPMS & KEYLESS ENTRY CM OR KEYLESS ENTRY CM CONNECTOR (OPEN CIRCUIT).

1. Disconnect the TPMS & keyless entry CM or keyless entry CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the TPMS & keyless entry CM or the keyless entry CM connector and chassis ground.

Connector & terminal

Without TPMS

(R80) No. 12 (+) — Chassis ground (−):

With TPMS

(R221) No. 6 (+) — Chassis ground (−):

(R221) No. 12 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 9.
No	Check for open or short circuit in the harness between the TPMS & keyless entry CM or keyless entry CM and fuses.

9. CHECK GROUND CIRCUIT FOR TPMS & KEYLESS ENTRY CM OR KEYLESS ENTRY CM (OPEN CIRCUIT).

Measure the resistance in harness between TPMS & keyless entry CM or keyless entry CM connector and chassis ground.

Connector & terminal

Without TPMS

(R80) No. 7 — Chassis ground:

With TPMS

(R221) No. 7 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

KEYLESS ENTRY(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Data Monitor>LIST.**

KEYLESS ENTRY(DIAGNOSTICS) > Data Monitor

LIST

Item	Content / display range	Standard	Note
Trip Count [count]	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count			—
Time Count		ms	—
Battery Voltage	Battery voltage	0 — 32 V	—
Ignition Signal(Line)	Condition of ignition power supply (direct line)	ON: When the switch is ON OFF: When the switch is OFF	Keyless entry CM, always OFF
Ignition Signal (CAN)	Condition of ignition power supply (CAN communication)	ON: When the switch is ON OFF: When the switch is OFF	—
Number of Registered Keys	Number of registered keyless entry	0 — 7	—
Max Number of Register Keys	Maximum number of registered keyless entry	0 — 7	—
Key-lock Warning SW	Key warning switch status	ON: When the switch is ON OFF: When the switch is OFF	—
Power Saving Mode	Electricity save mode condition	Normal: Normal Brownout: Saving	—
Keyless ID Registration Mode	Registration mode condition	Normal: Normal Factory Reg: Factory registration mode Dealer Reg: After market registration mode Delete: Delete mode	—

KEYLESS ENTRY(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Freeze Frame Data>LIST.**

KEYLESS ENTRY(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Content / display range	Standard	Note
Trip Count	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count			—
Time Count		ms	—
Battery Voltage	Battery voltage	0 — 32 V	—
Ignition Signal(Line)	Condition of ignition power supply (direct line)	ON: When the switch is ON OFF: When the switch is OFF	Keyless entry CM, always OFF
Ignition Signal (CAN)	Condition of ignition power supply (CAN communication)	ON: When the switch is ON OFF: When the switch is OFF	—
Number of Registered Keys	Number of registered keyless entry	0 — 7	—
Max Number of Register Keys	Maximum number of registered keyless entry	0 — 7	—
Key-lock Warning SW	Key warning switch status	ON: When the switch is ON OFF: When the switch is OFF	—
Power Saving Mode	Electricity save mode condition	OFF: Normal Brownout: Saving	—
Keyless ID Registration Mode	Registration mode condition	Normal: Normal Factory Reg: Factory registration mode Dealer Reg: After market registration mode Delete: Delete mode	—

KEYLESS ENTRY(DIAGNOSTICS) > Work Support

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Entry].
5. On [Select Function] display, select [Work Support].
6. Select a process item.

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on items, refer to the list. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Freeze Frame Data>LIST.**

KEYLESS ENTRY(DIAGNOSTICS) > Work Support

LIST

Item	Remarks	Note
Keyless ID Registration	Registration of keyless ID	—
Keyless ID Deletion	Removal of keyless ID	—
ECM specifications information	Displays information of TPMS & keyless entry CM or the keyless entry CM.	—

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.**

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2771	EEPROM PERFORMANCE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2771 EEPROM PERFORMANCE.
B2772	CONTROL MODULE COMMUNICATION STUCK	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2772 CONTROL MODULE COMMUNICATION STUCK.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2771 EEPROM PERFORMANCE

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Clear memory is not in process.
- Attempt to reading/writing EEPROM fails twice consecutively.

Trouble symptom:

- The key cannot be registered.
- Can not be locked/unlocked with keyless entry system.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ENTRY(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the TPMS & keyless entry CM connector or keyless entry CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Keyless Entry]. Ref. to COMMON(diag)>Clear memory.



5. Turn the ignition switch to OFF.
6. Turn the ignition switch to ON.
7. Read the DTC of [Keyless Entry] using the Subaru Select Monitor. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2771 displayed? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or keyless entry CM. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness, or temporary EEPROM access error has occurred.**

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2772 CONTROL MODULE COMMUNICATION STUCK

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Clear memory is not in process.
- CAN message register freezes in the TPMS & keyless entry CM or the keyless entry CM

Trouble symptom:

- Communication is impossible with Subaru Select Monitor.
- Can not be locked/unlocked with keyless entry system.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ENTRY(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect the TPMS & keyless entry CM connector or keyless entry CM connector.
3. Connect the disconnected connectors.
4. Using the Subaru Select Monitor, perform the clear memory of [Keyless Entry]. Ref. to COMMON(diag)>Clear memory.



5. Turn the ignition switch to OFF.
6. Turn the ignition switch to ON.
7. Read the DTC of [Keyless Entry] using the Subaru Select Monitor. Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2772 displayed? (Current malfunction)

Yes	Replace the TPMS & keyless entry CM or keyless entry CM. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Buss off state detected by ISO11898 compliant CAN function is found.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Not transitioned to CAN data transmission stop mode.
- When one of reception IDs of body integrated unit becomes and remains in one of the following states for [periodic transmission time (ms)×40 (frame)].
  - No reception
  - Message length of reception ID is shorter than communication software definition length.
  - Message length of reception ID is longer than 8.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Not transitioned to CAN data transmission stop mode.
- When one of reception IDs of combination meter becomes and remains in one of the following states for [periodic transmission time (ms)×40 (frame)].
  - No reception
  - Message length of reception ID is shorter than communication software definition length.
  - Message length of reception ID is longer than 8.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

DTC detecting condition:

When all the following conditions are met.

- Battery voltage stays at 10 V or more for longer than one second.
- CAN bus is not in sleep state.
- Not transitioned to CAN data transmission stop mode.
- When one of reception IDs of body integrated unit becomes and remains in one of the following states.
  - Lost communication has not been determined.
  - The targeted message counter of reception ID has not been updated 32 times or more consecutively. Or check sum error has been consecutively detected 3 times.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Note
Both lock and unlock do not function with keyless entry system.	Ref. to KEYLESS ENTRY(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BOTH LOCK AND UNLOCK DO NOT FUNCTION WITH KEYLESS ENTRY SYSTEM.

KEYLESS ENTRY(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. BOTH LOCK AND UNLOCK DO NOT FUNCTION WITH KEYLESS ENTRY SYSTEM

Trouble causes:

- Power supply circuit malfunction in TPMS & keyless entry CM or the keyless entry CM
- Malfunction in TPMS & keyless entry CM or the keyless entry CM
- Keyless key malfunction

Caution:

- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the TPMS & keyless entry CM or keyless entry CM is functioning.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ENTRY(DIAGNOSTICS) >General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (POWER SUPPLY CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

5. CHECK HARNESS (GROUND SHORT CIRCUIT).
no → Perform the instructed procedures.
yes ↓

6. CHECK KEYLESS TRANSMITTER.
no → Perform the instructed procedures.
yes ↓

7. CHECK TPMS & KEYLESS ENTRY CM OR KEYLESS ENTRY CM.
yes → Perform the instructed procedures.
no → Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that lock/unlock operates by operating the keyless transmitter.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse.

3. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Disconnect the TPMS & keyless entry CM connector or keyless entry CM connector.
2. Using a tester, measure the voltage between TPMS & keyless entry CM connector or TPMS CM connector and chassis ground.

Connector & terminal

Keyless entry CM

(R80) No. 12 (+) — Chassis ground (−):

Keyless entry & TPMS CM

(R221) No. 12 (+) — Chassis ground (−):

Is the voltage 9 — 16 V?

Yes	Go to 4.
No	Repair the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector.
2. Using a tester, measure the resistance between TPMS & keyless entry CM connector or keyless entry CM connector and body integrated unit.

Connector & terminal

Keyless entry CM

(R80) No. 2 — (i74) No. 3:

(R80) No. 1 — (i74) No. 2:

Keyless entry & TPMS CM

(R221) No. 2 — (i74) No. 3:

(R221) No. 1 — (i74) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between TPMS & keyless entry CM connector or keyless entry CM connector and chassis ground.

Connector & terminal

Keyless entry CM

(R80) No. 2 — Chassis ground:

(R80) No. 1 — Chassis ground:

Keyless entry & TPMS CM

(R221) No. 2 — Chassis ground:

(R221) No. 1 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK KEYLESS TRANSMITTER.

Check the keyless transmitter battery. Ref. to SECURITY AND LOCKS>Keyless Transmitter>INSPECTION.

Is the battery OK?

Yes	Go to 7.
No	Replace the keyless transmitter battery. Ref. to SECURITY AND LOCKS>Keyless Transmitter.

7. CHECK TPMS & KEYLESS ENTRY CM OR KEYLESS ENTRY CM.

1. Connect the TPMS & keyless entry CM connector or keyless entry CM connector.
2. Turn the ignition switch to OFF and close all doors.
3. Perform lock/unlock operation using the keyless key.

Does the door lock?

Yes	Currently, it is normal.
No	Replace the TPMS & keyless entry CM or keyless entry CM. Ref. to WHEEL AND TIRE SYSTEM>Tire Pressure Monitoring System. Ref. to SECURITY AND LOCKS>Keyless Entry Control Module.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)

KPS(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Warning Light Illumination Pattern
8. Diagnostic Procedure for Subaru Select Monitor Communication
9. Data Monitor
10. Freeze Frame Data
11. Active Test
12. Customize
13. Keyless Access with Push Button Start Check
14. Diagnostic Trouble Code (DTC)
15. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
16. Diagnostics with Phenomenon

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

- **Subaru Select Monitor kit is required for reading DTC, performing diagnosis and reading data monitor.**
- **Before removal or installation, be sure to remove any foreign matter (dust, moisture, oil, etc.).**
- **Registration of immobilizer may be needed after the replacement of control modules, etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

Note:

Using the Function Setting (Customize), check that the keyless access system is not in a cancelled state. Ref. to SECURITY AND LOCKS>Function Setting (Customize)>OPERATION.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select keyless access with push button start.
   Note:
   For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read DTCs of Keyless Access with Push Button Start using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

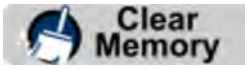
DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Go to 6.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis according to DTC.
2. Repair or replace the cause of trouble.
3. Clear the memory of Keyless Access with Push Button Start using the Subaru Select Monitor. Ref. to COMMON(diag)>Data Monitor.



4. Execute the inspection mode. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Inspection Mode.
5. Read DTCs of Keyless Access with Push Button Start using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat Go to 5. until DTC is not shown.
No	Finish the diagnosis.

6. CHECK LIST OF DIAGNOSTICS WITH PHENOMENON.

Check “Diagnostics with Phenomenon”. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon.

Is there a symptom that corresponds in the phenomenon list?

Yes	Perform diagnosis according to the procedures in the phenomenon list.
No	Keyless access with push button start system is normal.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Keyless Access with Push Button Start System Trouble Check List for Interview Received Year
Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td></td></tr>
<tr><td>Condition of trouble occurrence</td><td></td><td>Weather</td><td></td></tr>
<tr><td>Road conditions</td><td></td><td>Occurrence location</td><td></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td colspan="4">Trouble condition</td></tr>
<tr><td colspan="3">❑ DTC</td><td>❑( )</td></tr>
<tr><td rowspan="2">❑ Immobilizer system</td><td colspan="2">Engine does not start</td><td>❑ The starter does not turn
❑ Starter operates but engine does not start
❑ Engine starts but stops immediately</td></tr>
<tr><td colspan="3">Does not start with remote engine starter</td></tr>
<tr><td rowspan="2">❑ Steering lock system</td><td colspan="3">The steering lock is not released</td></tr>
<tr><td colspan="3">The steering lock does not lock</td></tr>
<tr><td rowspan="6">❑ Keyless access system</td><td colspan="3">Can not lock/unlock using the touch sensor (lock), touch sensor (unlock), trunk opener button or rear gate opener button and rear lock button</td></tr>
<tr><td colspan="2">Cannot lock with the touch sensor (lock)
Cannot unlock with the touch sensor (unlock)
Cannot lock nor unlock with the touch sensor (lock), touch sensor (unlock)
Trunk does not open with the trunk opener button.
Rear gate can not be locked with the rear lock button</td><td>❑ Driver's side door
❑ Passenger's side door
❑ Rear gate/trunk</td></tr>
<tr><td colspan="3">Cannot unlock with the rear gate opener button</td></tr>
<tr><td colspan="2">The access key lockout prevention feature does not function</td><td>❑ Passenger room
❑ Luggage room</td></tr>
<tr><td colspan="3">The LED does not illuminate when the access key button is pressed</td></tr>
</table>

	The external buzzer does not beep
	The passenger room buzzer does not sound
❑ Other	The room light or map light does not illuminate
	( )

Note:

- **Perform the diagnosis according to the basic diagnostic procedure. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Basic Diagnostic Procedure.**
- **If the room light or map light does not illuminate and the keyless access does not function at the same time, the back-up fuse may be loose or blown.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. KEYLESS ACCESS WITH PUSH BUTTON START

When removing keyless access with push button start related parts, refer to Cautions in SECURITY AND LOCKS. Ref. to SECURITY AND LOCKS>General Description>CAUTION.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect keyless access with push button start system problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the fuse condition. Ref. to SECURITY AND LOCKS>Relay and Fuse.
   Make sure that ampere of the fuse is setting value, and it is not blown out.
3. Check the connecting condition of harness and harness connector.

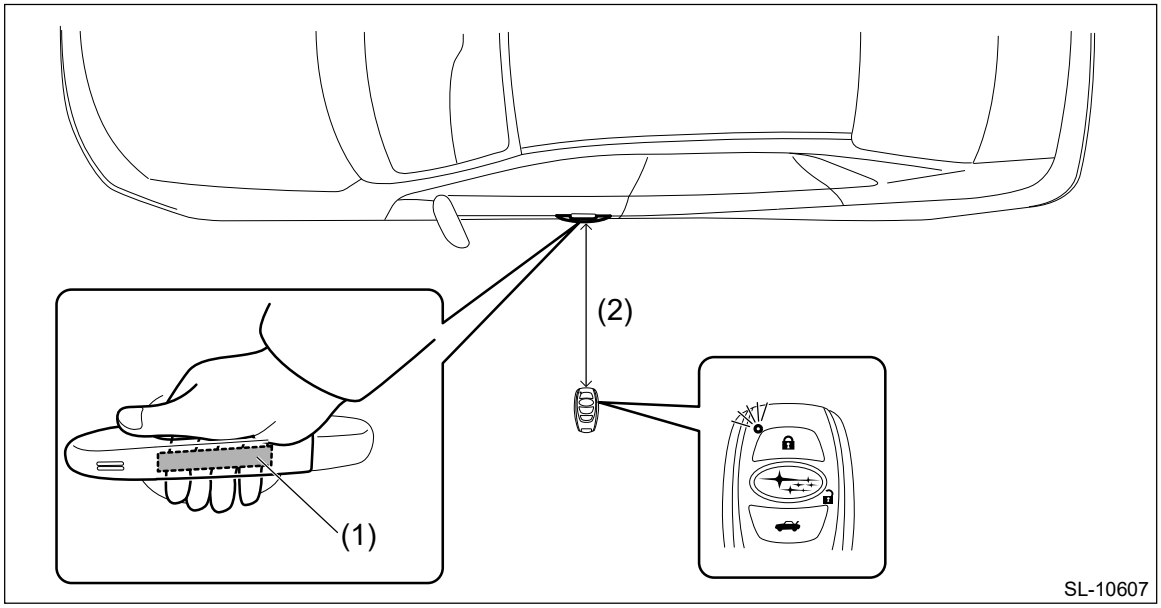
2. CHECK OPERATION

Note:

- **Using the function setting (ECM customizing), check that the keyless access system is not OFF. Ref. to SECURITY AND LOCKS>Function Setting (Customize)>OPERATION.**
- **The dark current is approx. 400 mA if there is communication between the vehicle and access key.**
- **The dark current is approx. 40 mA if there is no communication between the vehicle and access key.***

*** No communication with the vehicle means that the keyless access function has been cancelled or that the access key has not been near the vehicle for 15 minutes or more after door locking.**

1. Keyless access door unlock function check



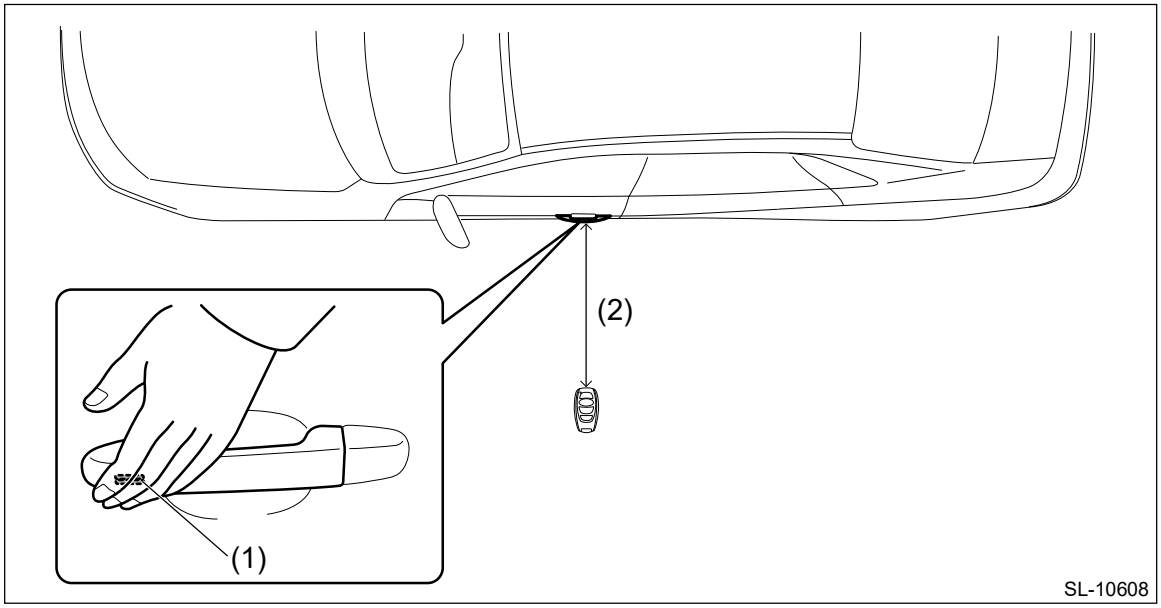
(1) Touch sensor (unlock) (back face of steering wheel)
(2) 40 — 80 cm

(1) When carrying the access key with all doors locked by keyless lock operation, check that when the touch sensor (unlock) built in to the back side surface of door outer handle of front door is touched, the driver's door will unlock (when touched on the driver's side) or all doors will unlock (when touched on the passenger's side) and the answer-back function operates (hazard light blinks twice, access buzzer sounds twice).
(2) In the keyless access door unlock detection area, hold the access key at the same height as the outer handle (approx. 80 cm from the ground) and in the direction shown in the figure, and check that the vehicle becomes unlock mode [access key LED (red) blinks] at 40 to 80 cm from the vehicle.

Note:

Check the access key battery if the LED (red) does not illuminates when the access key button is pressed. Ref. to SECURITY AND LOCKS>Access Key>INSPECTION.

2. Keyless access door lock function check



(1) Touch sensor (lock) (2) Approx. 30 cm

(1) When carrying the access key outside of the vehicle with all doors closed and unlocked, check that when the touch sensor (lock) on the surface of door outer handle of front door is touched, all doors will lock and the answer-back function operates (hazard light blinks once, access buzzer sounds once).

Caution:

If the access key is within the vehicle but not within the detection area (in the instrument panel, on the rear tray, in the glove box, on the floor, or in the door trim pocket), then lockout protection will not function when the doors are locked and the access key will be locked into the vehicle.

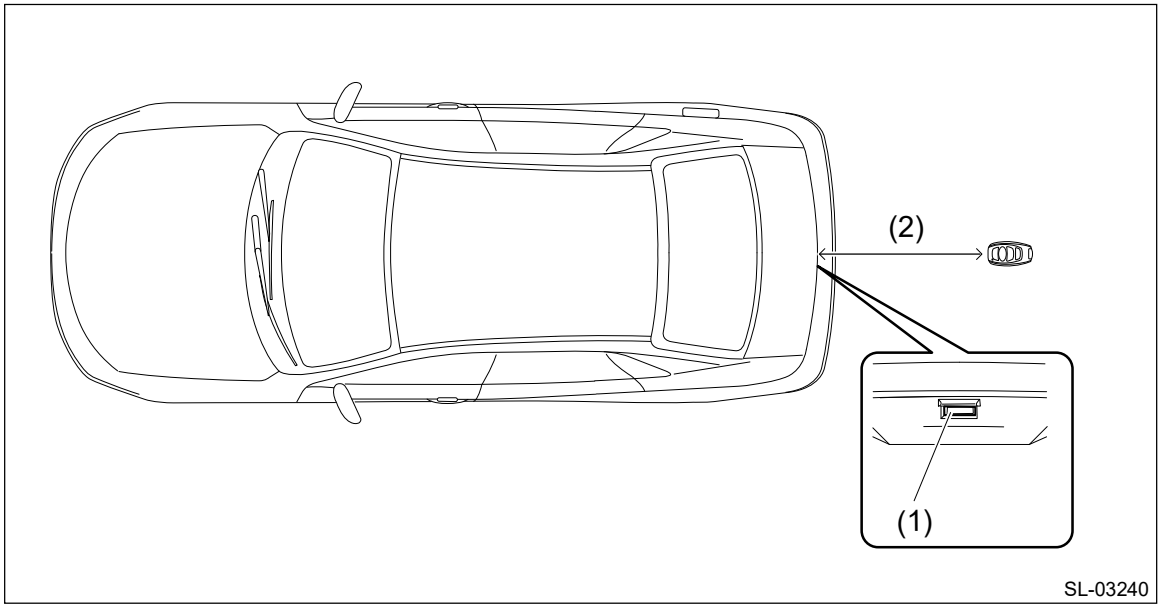
(2) To check the keyless access door lock operation range, hold the access key at a height of 10 cm under the bottom edge of the door glass (approx. 80 cm from the ground), point it in the direction shown in the figure at a distance of approx. 30 cm from the vehicle, and check that all doors lock and the answer-back function operates (hazard light blinks once, access buzzer sounds once) when you touch the touch sensor (lock).

(3) Check the passenger's side door in the same manner.

Note:

- **When the door cannot lock if the touch sensor (lock) is touched, touch the touch sensor (lock) with palm.**
- **Since communication is not possible within close range (20 cm or less) of the door outer handle, the access key may not operate if you touch the touch sensor (lock) with the same hand you are holding the access key.**
- **If the lockout prevention buzzer sounds, it is possible that the interior transmitter has radio wave leakage.**

3. Check of the keyless access trunk open function

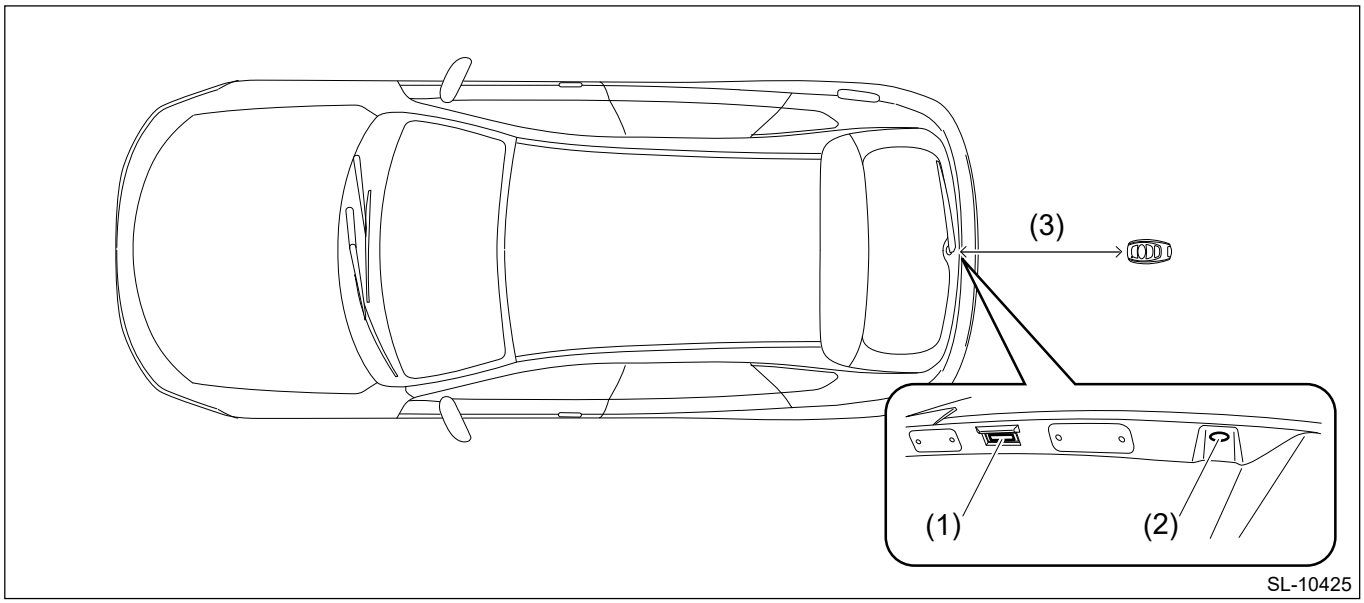


(1) Trunk opener button (2) 40 — 80 cm

(1) With the trunk closed, check that the trunk opens and the answer-back function operates (hazard light blinks twice, access buzzer sounds twice) when you press the trunk opener button while carrying the access key.

(2) To check the keyless access trunk open operation range, hold the access key behind and in the center of the vehicle at the same height as the trunk opener button (90 cm from the ground), point it in the direction shown in the figure at a distance of 40 to 80 cm from the vehicle, and check that the trunk opens and the answer-back function operates (hazard light blinks twice, access buzzer sounds twice) when the trunk opener button is pressed.

4. Check of the keyless access rear gate function



(1) Rear gate opener button (2) Rear lock button (3) 40 — 80 cm

(1) With the rear gate locked, the all doors unlocks and the rear gate opens simultaneously and the answer-back function operates (hazard light blinks twice, external buzzer sounds twice) when you

press the rear gate opener button while carrying the access key.

(2) To check the range for keyless access rear gate open operation, hold the access key behind and in the center of the vehicle at the same height as the rear gate opener button (90 cm from the ground), point it in the direction shown in the figure at a distance of 40 to 80 cm from the vehicle, and check that the all doors unlocks and the rear gate opens simultaneously and the answer-back function operates (hazard light blinks twice, external buzzer sounds twice) when the rear gate opener button is pressed.

(3) With the rear gate unlock, check that the all doors lock and the answer-back function operates (hazard light blinks once, external buzzer sounds once) when rear lock button is pressed while carrying the access key.

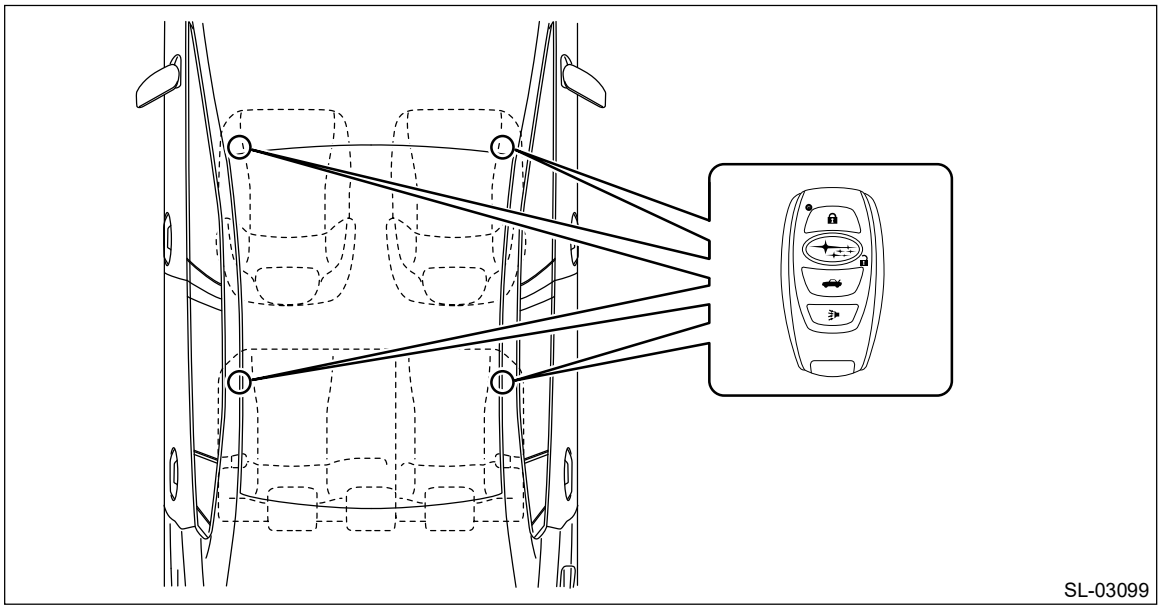
5. Keyless access ignition switching function check

(1) With the ignition OFF, enter the vehicle while carrying the access key. With the shift lever in the P range, check that the push button ignition switch indicator illuminates in green when you depress the brake pedal, then check that the engine starts when you press the push button ignition switch while the indicator green light is on.

(2) While carrying the access key, check that the status changes as follows each time you press the push button ignition switch without depressing the brake pedal: 'Ignition OFF'→'ACC ON'→'Ignition ON'→'Ignition OFF'. However, if the shift lever is a range other than the P range and the push button ignition switch is pressed from ignition ON, then the status does not change to ignition OFF and instead will change to ACC ON.

(3) After the vehicle has stopped, press the push button ignition switch and ignition is turned OFF (engine stopped • all power supplies OFF). However, if the shift lever is in any range except for the P range and the push button ignition switch is pressed with the vehicle stopped, then the ignition is not turned OFF and instead the power supplies changes to ACC ON. Check that the steering lock operates if you open the door in the ignition OFF state (the shift lever must be in P range).

(4) To check the range of the keyless access ignition operation, check that the engine can start when you set the access key at the check position on the seat in the direction indicated in the figure.



Caution:

The access key may not be correctly detected even though it is within the detection area within the passenger room, if it is on the instrument panel, on the rear tray, in the glove box, on the floor, or in the door trim pocket.

Note:

Perform the check multiple times, once each with the access key positioned on the driver's seat, on the passenger's seat, and on the rear seat in 2 locations.

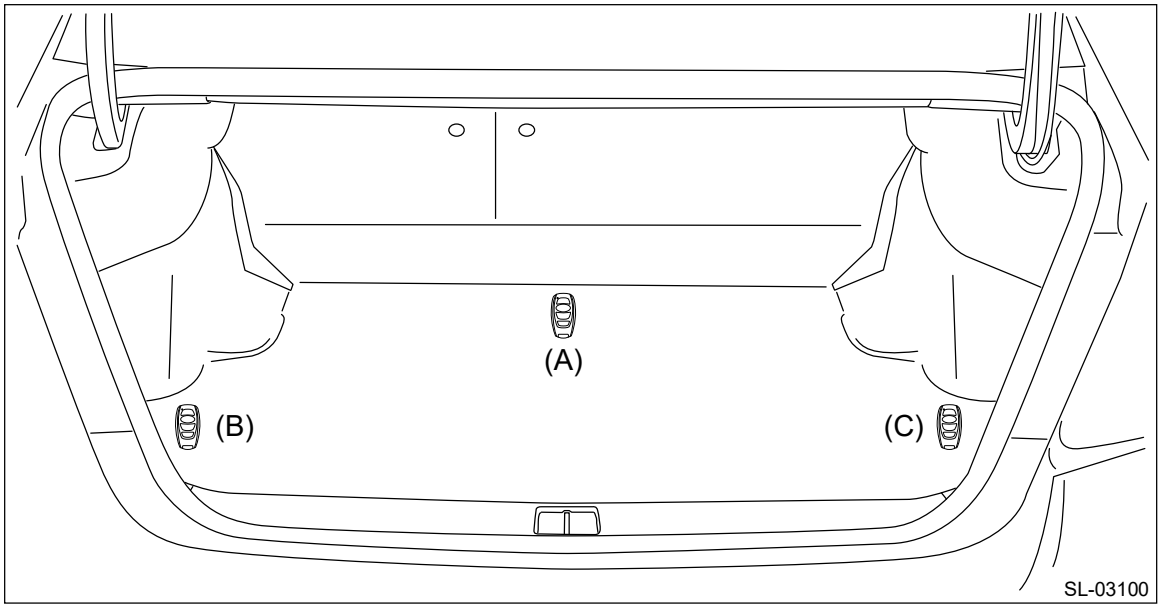
6. Lockout protection function check with the access key in the trunk

Caution:

Open one of the windows before performing this check in order to prevent the key from being locked inside the vehicle.

(1) With all doors closed and locked, and with the access key in the trunk room and the trunk closed, check that the access buzzer sounds (approx. 2 seconds). Also check that the trunk opens when you press the trunk opener button.

(2) To check the detection range of the lockout protection function with the access key in the trunk, position the access key in the direction shown in the figure, and check that the lockout protection function operates normally when you check the lockout protection function for the access key locked in the trunk.



Caution:

The lockout protection function will not operate if the access key is any of the locations described below.

- **Near the spare tire or on the edge of the trunk room.**
- **Inside a bag made of metallic material or near metal objects.**

Note:

Check the trunk in two locations or more.

7. Lockout protection function check (in the passenger room)

Caution:

Open one of the windows before performing this check in order to prevent the key from being locked inside the vehicle.

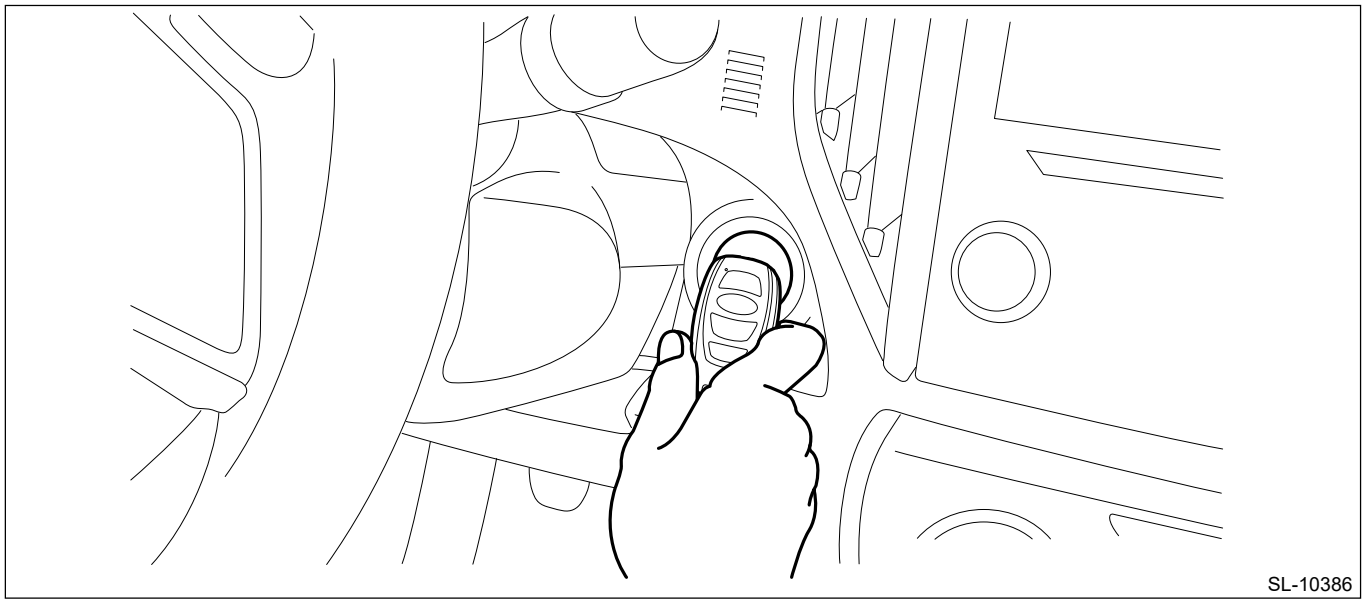
(1) Position the access key on the driver's or passenger's seat.

(2) Close all doors. (With all doors unlocked)
(3) Check that the doors do not lock and the lockout protection buzzer (exterior) sounds for 2 seconds when you touch the touch sensor (lock) of either the driver's or passenger's door.

8. Keyless access cancel function check
(1) After setting the keyless access cancel function, check that all keyless access and start system (keyless access) functions are inoperable. (For cancel setting, refer to Ref. to SECURITY AND LOCKS>Function Setting (Customize)>OPERATION..)

Note:

When keyless access is cancelled, door lock and unlock can be operated by access key button operation and the starter system can be operated by passing the access key over the push button ignition switch with the access key button toward you.



9. Access key diagnostic mode
(1) Connect the Subaru Select Monitor and select Diagnosis on [Start] display.
(2) On [Vehicle selection] display, input the target vehicle information and select [OK].
(3) On [Main Menu] display, select Each System.
(4) On [Select System] display, select Keyless Access with Push Button Start, and then select [Enter].
(5) On Select Function display, select Work Support.
(6) On Work Support display, select [Keyless access system check].
(7) Select the transmitter to check from the items.
(8) Check that the door lock buzzer sounds (short blips, a continuous beeping sound for the center room antenna) when the access key is near the selected transmitter or antenna.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS

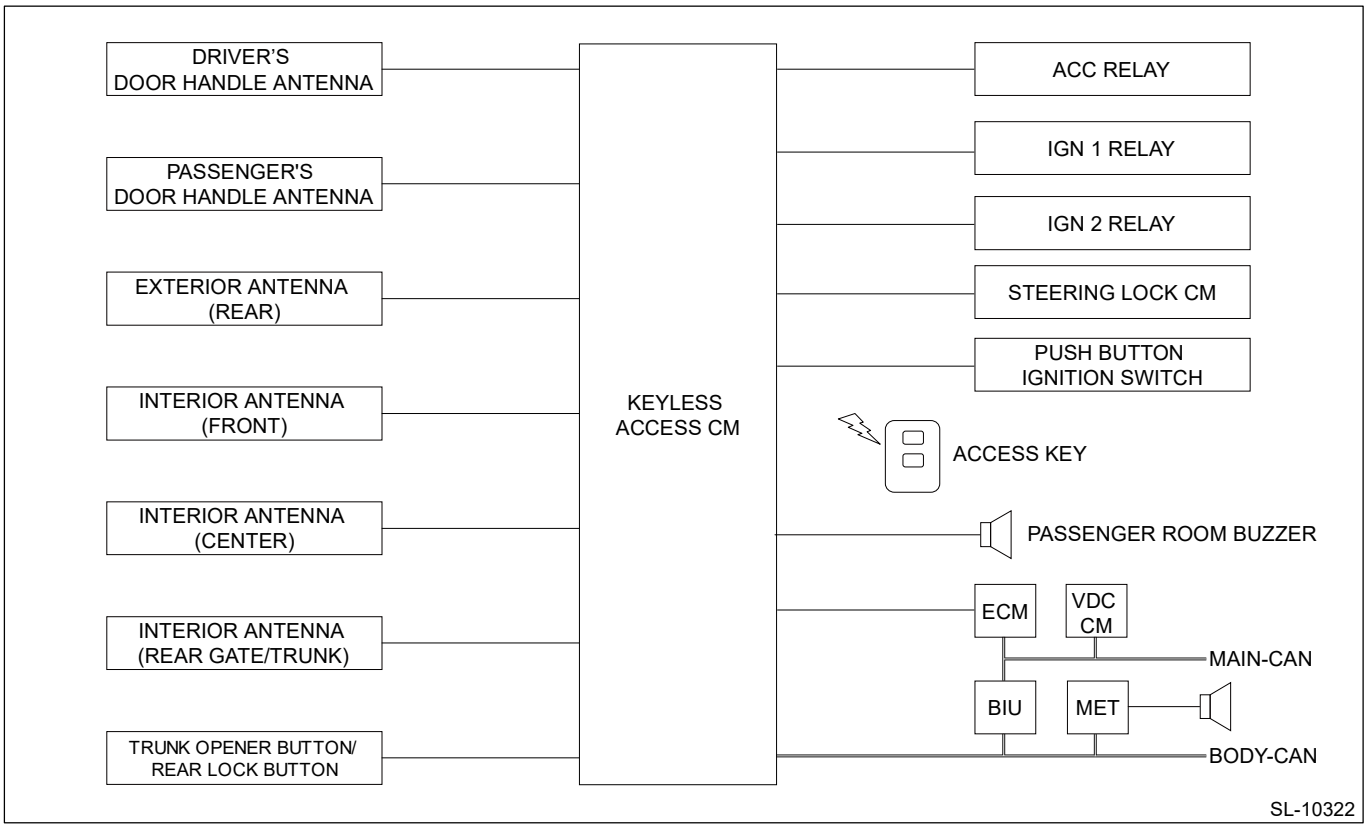
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.
Oscilloscope	Used for measuring the waveform.

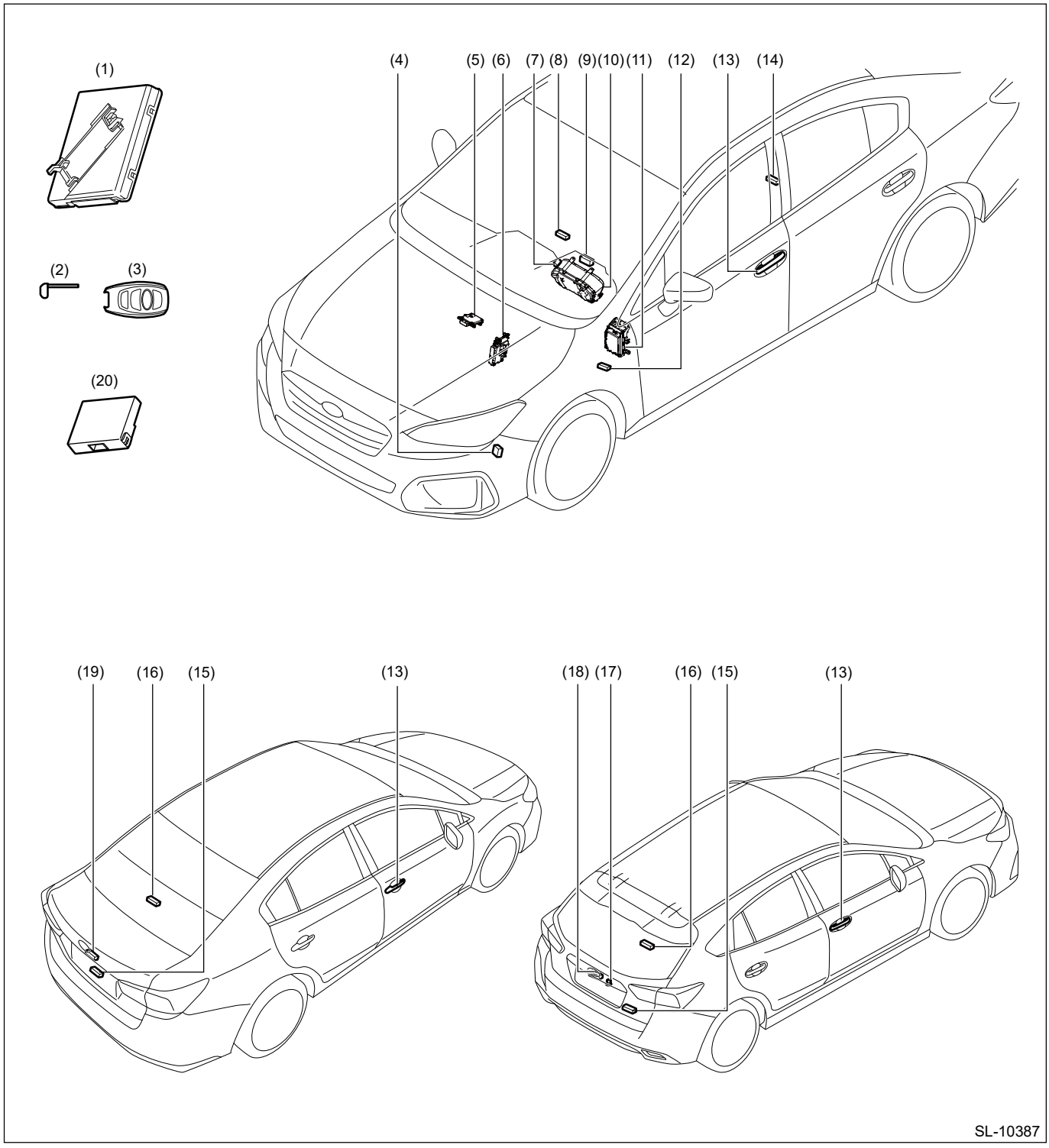
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM



KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Keyless access CM
(2) Mechanical key
(8) Front interior antenna
(9) Steering lock CM
(15) Rear exterior antenna
(16) Rear interior antenna

(3) Access key

(4) Access buzzer

(5) TCM

(6) ECM

(7) Push button ignition switch

(10) Combination meter

(11) Body integrated unit

(12) Data link connector

(13) Front outer handle
- Touch sensor (lock)
- Touch sensor (unlock)
- Front exterior antenna

(14) Center

(17) Rear lock button (5 door model)

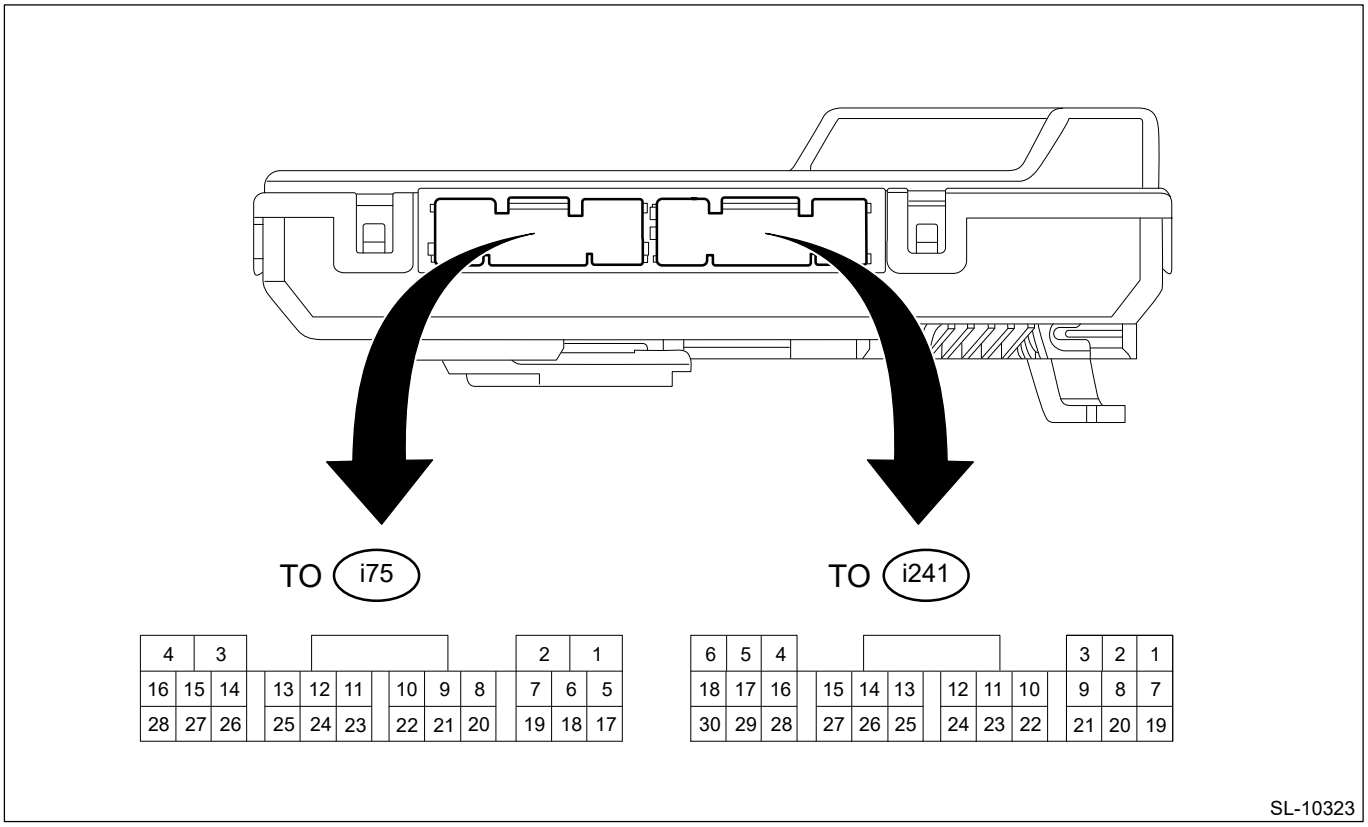
(18) Rear gate opener button (5 door model)

(19) Trunk opener button (4 door model)

(20) ID code box (for C5 model only)

ELECTRICAL SPECIFICATION

1. KEYLESS ACCESS CM



Terminal No.	Contents	Measuring condition	Standard
(i75) No. 1 (+B2) ←→ Chassis ground	+B power supply (DCDC)	Always *1	9.5 V — 16 V
(i75) No. 2	—	—	—
(i75) No. 3	—	—	—
(i75) No. 4 (+B1) ←→ (i75) No. 20 (GND1)	+B power supply (MAIN)	Always *1	9.5 V — 16 V
(i75) No. 5	—	—	—
(i75) No. 6 (TACH) ←→ Chassis ground	Engine speed	While engine idling	Waveform 2
(i75) No. 7 (SPD) ←→ Chassis ground	Vehicle speed input	Always	30 kΩ or more
(i75) No. 8 (SSW1) ←→ (i75) No. 20 (GND1)	Start switch input 1	Push button ignition switch released → pressed *1	Less than 1 Ω → 10 kΩ or more
(i75) No. 9 (SSW2) ←→ (i75) No. 20 (GND1)	Start switch input 2	Push button ignition switch released → pressed *1	Less than 1 Ω → 10 kΩ or more

Terminal No.	Contents	Measuring condition	Standard
(i75) No. 10 (SLR+) ←→ Chassis ground	Steering lock motor power supply signal output	Always *1	10 kΩ or more
(i75) No. 11 (SLP) ←→ (i75) No. 20 (GND1)	Steering lock position input	With ignition switch OFF and shift position P, and with push button ignition switch pressed, Steering lock → Steering unlock	9.5 V or more → 1.2 V or less
(i75) No. 12 (INDW) ←→ (i75) No. 20 (GND1)	Indicator output (orange)	With ACC ON or IG ON, brake pedal (CVT model) or clutch pedal (MT model) not depressed.	9.5 V or more
(i75) No. 13	—	—	—
(i75) No. 14 (CLUT) ←→ Chassis ground	Clutch input	Clutch pedal depressed → Released	9.5 V or more → 1 V or less
(i75) No. 15	—	—	—
(i75) No. 16 (ACCD) ←→ Chassis ground	ACC relay drive request	Always *1	Depending on ACC circuit in vehicle
(i75) No. 17 (TSW5) ←→ (i75) No. 20 (GND1)	Request SW input	Power supply OFF, all doors closed, trunk opener button or rear gate lock button OFF → ON	9.5 V or more → Less than 2 V
(i75) No. 18 (IDW) ←→ Chassis ground	ID code box presence judgment	Always *1	With ID code box: Less than 1 Ω Without ID code box: 1 MΩ or more
(i75) No. 19 (ACCR) ←→ (i75) No. 20 (GND1)	ACC cutoff input	When brake pedal (CVT model) or clutch pedal (MT model) depressed, push button ignition switch pressed (while cranking) → Except when cranking	Less than 2 V → 9.5 V or more
(i75) No. 20 (GND1) ←→ Chassis ground	GND	Always *1	Less than 1 Ω
(i75) No. 21	—	—	—
(i75) No. 22	—	—	—
(i75) No. 23 (STSW) ←→ (i75) No. 20 (GND1)	Starter drive request output	Shift lever is in position P or position N and access key is in	Less than 2 V → 9.5 V or more

Terminal No.	Contents	Measuring condition	Standard
		passenger compartment. While depressing the brake pedal (CVT model) or clutch pedal (MT model), press the push button ignition switch (engine starts).	
(i75) No. 24	—	—	—
(i75) No. 25 (INDS) ←→ Chassis ground	Indicator output (green)	With ACC ON or IG ON, brake pedal (CVT model) or clutch pedal (MT model) depressed.	9.5 V or more
(i75) No. 26 (SWIL) ←→ Chassis ground	Start switch character illumination	When illumination of start switch goes off, the headlight is OFF → ON, after setting the illumination control to MAX	Less than 2 V → 9.5 V or more
(i75) No. 27 (IG2D) ←→ Chassis ground	IG2 relay drive output	Always *1	Depending on relay circuit in vehicle
(i75) No. 28 (IG1D) ←→ Chassis ground	IG1 relay drive output	Always *1	Depending on relay circuit in vehicle
(i241) No. 1 (CG7B) ←→ (i241)No. 17 (GND2)	Trunk/luggage room antenna-	All doors closed, power OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(i241) No. 2 (CLG7) ←→ (i241) No. 17 (GND2)	Trunk/luggage room antenna+	All doors closed, power OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(i241) No. 3 (CG6B) ←→ (i241)No. 17 (GND2)	Rear interior antenna-	All doors closed, power OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(i241) No. 4 (CLG2) ←→ (i241) No. 17 (GND2)	Passenger side external antenna+	Power OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(i241) No. 5 (CG1B) ←→ (i241)No. 17 (GND2)	Driver side external antenna-	Power OFF, all doors closed, all doors locked	No pulse output → Pulse output detected

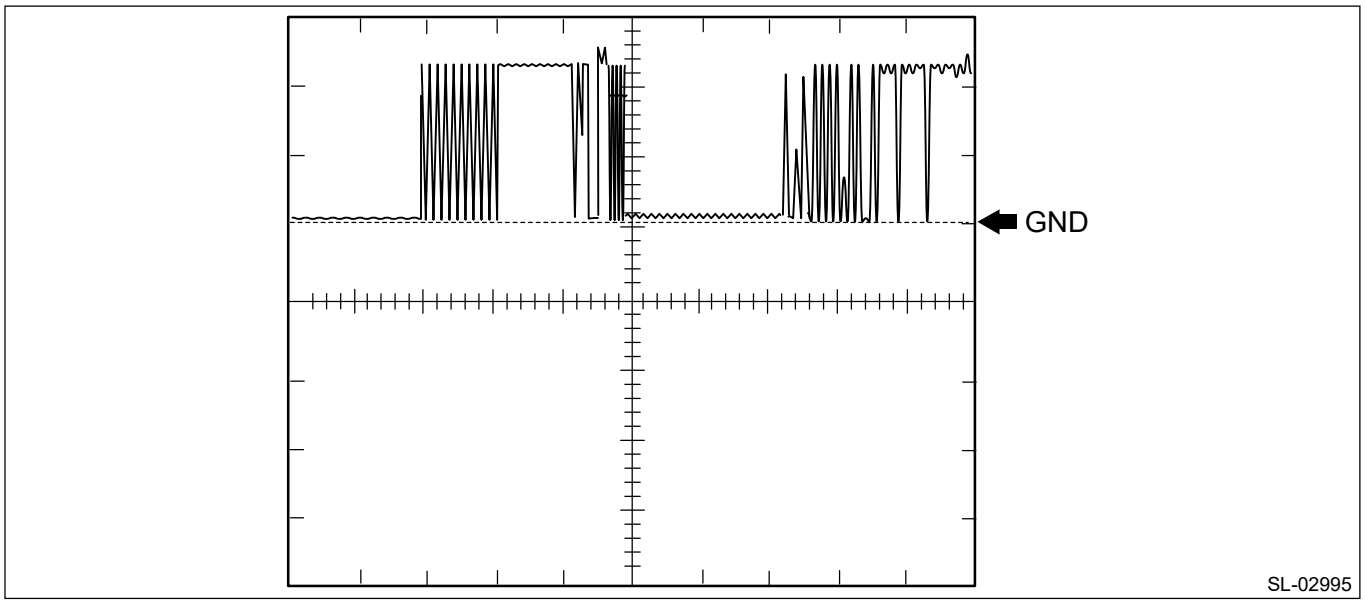
Terminal No.	Contents	Measuring condition	Standard
		by lock operation with wireless remote control, access key not in passenger room	
(i241) No. 6 (CLG1) ←→ (i241)No. 17 (GND2)	Driver side external antenna+	Power OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(i241) No. 7 (CG8B) ←→ (i241)No. 17 (GND2)	Rear exterior antenna-	Power OFF, all doors closed, all doors locked, trunk or rear gate opener button OFF → ON	No pulse output → Pulse output detected
(i241) No. 8 (CLG8) ←→ (i241)No. 17 (GND2)	Rear exterior antenna+	Power OFF, all doors closed, all doors locked, trunk or rear gate opener button OFF → ON	No pulse output → Pulse output detected
(i241) No. 9 (CLG6) ←→ (i241)No. 17 (GND2)	Rear interior antenna+	Power OFF, all doors closed, all doors locked, trunk or rear gate opener button OFF → ON	No pulse output → Pulse output detected
(i241) No. 10	—	—	—
(i241) No. 11	—	—	—
(i241) No. 12 (CG5B) ←→ (i241)No. 17 (GND2)	Front interior antenna-	All doors closed, power OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(i241) No. 13	—	—	—
(i241) No. 14	—	—	—
(i241) No. 15 (EGIO) ←→ (i241)No. 17 (GND2)	Immobilizer collation communication line	Ignition switch ON	7 V or more → pulse generates temporarily
(i241) No. 16 (CG2B) ←→ (i241)No. 17 (GND2)	Passenger side external antenna-	Power OFF, all doors closed, all doors locked by lock operation with wireless remote control, access key not in passenger room	No pulse output → Pulse output detected
(i241) No. 17 (GND2) ←→ Chassis ground	GND	Always	Less than 1 Ω

Terminal No.	Contents	Measuring condition	Standard
(i241) No. 18 8P) ←→ Chassis ground	Shift P position input	Except for shift positions P → Shift position P	Depending on shift position internal resistance
(i241) No. 19 (TXCT) ←→ (i241)No. 17 (GND2)	Immobilizer signal reception (start switch)	Wait for 30 seconds or more after the door was opened or closed with IGN OFF and the brake pedal (CVT model) or clutch pedal (MT model) released.	1 V or less
		Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch. (with the access key battery removed)	Waveform 3
(i241) No. 20 (LIN) ←→ (i241) No. 17 (GND2)	LIN communication	ACC ON or IGN ON or power OFF, and open/close the door	Pulse generation
(i241) No. 21 (VC5) ←→ (i241) No. 17 (GND2)	Immobilizer amplifier power supply	Wait for 30 seconds or more after the door was opened or closed with IGN OFF and the brake pedal (CVT model) or clutch pedal (MT model) released.	1 V or less
		Within 30 seconds after the push button ignition switch is pressed with IGN OFF and access key not in the passenger room	Waveform 4
(i241) No. 22 (CODE) ←→ (i241) No. 17 (GND2)	Immobilizer signal reception (start switch)	Wait for 30 seconds or more after the door was opened or closed with IGN OFF and the brake pedal (CVT model) or clutch pedal (MT model) released.	1 V or less
		Within 30 seconds after the push button ignition switch is pressed with	Waveform 1

Terminal No.	Contents	Measuring condition	Standard
		IGN OFF and access key not in the passenger room	
(i241) No. 23	—	—	—
(i241) No. 24 (AGND) ←→ Chassis ground	Immobilizer amplifier GND	Always *1	Less than 1 Ω
(i241) No. 25 (CLG5) ←→ (i241)No. 17 (GND2)	Front interior antenna+	All doors closed, power OFF, access key not in passenger room, touch sensor (lock) OFF → ON	No pulse output → Pulse output detected
(i241) 26	—	—	—
(i241) No. 27 (STP1) ←→ Chassis ground	Stop light switch input	Brake pedal depressed → released	9.5 V or more → 1 V or less
(i241) No. 28	—	—	—
(i241) No. 29 (CANL) ←→ Chassis ground	CAN communication (L)	ACC ON or IGN ON or power OFF, and open/close the door	Pulse generation
(i241) No. 30 (CANH) ←→ Chassis ground	CAN communication (H)	ACC ON or IGN ON or power OFF, and open/close the door	Pulse generation

*1: Executed with the keyless access CM connector disconnected.

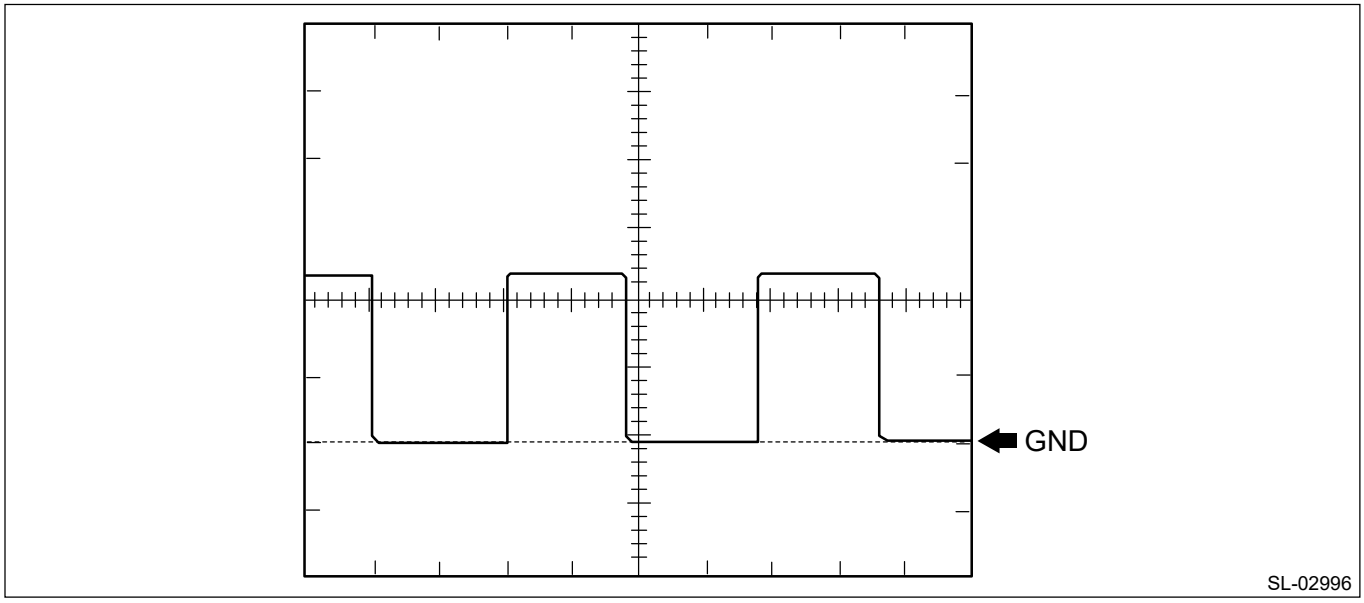
1. Waveform 1



Item	Contents
Measured terminal	(i241) No. 22 (CODE) ←→ (i241) No. 17 (GND2)
Equipment setting	2 V/DIV, 20 ms/DIV

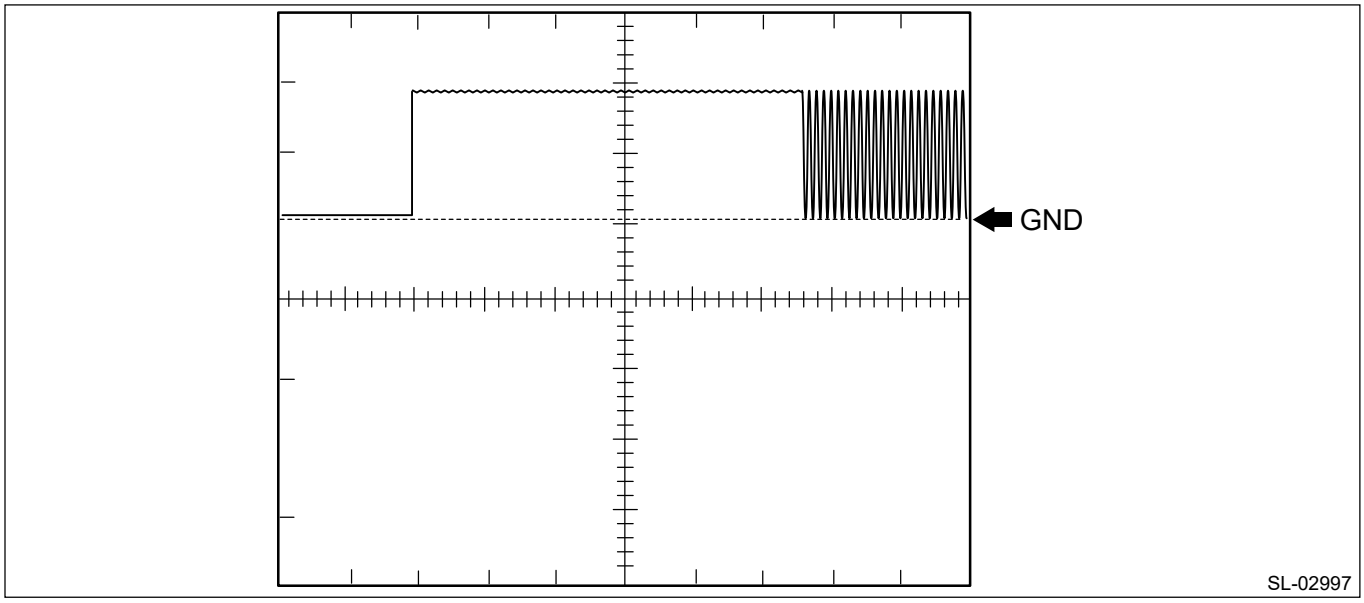
Item	Contents
Measuring condition	Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch (with the access key battery removed).

2. Waveform 2



Item	Contents
Measured terminal	(i75) No. 6 (TACH) ⟷ Chassis ground
Equipment setting	5 V/DIV, 100 ms/DIV
Measuring condition	While engine idling

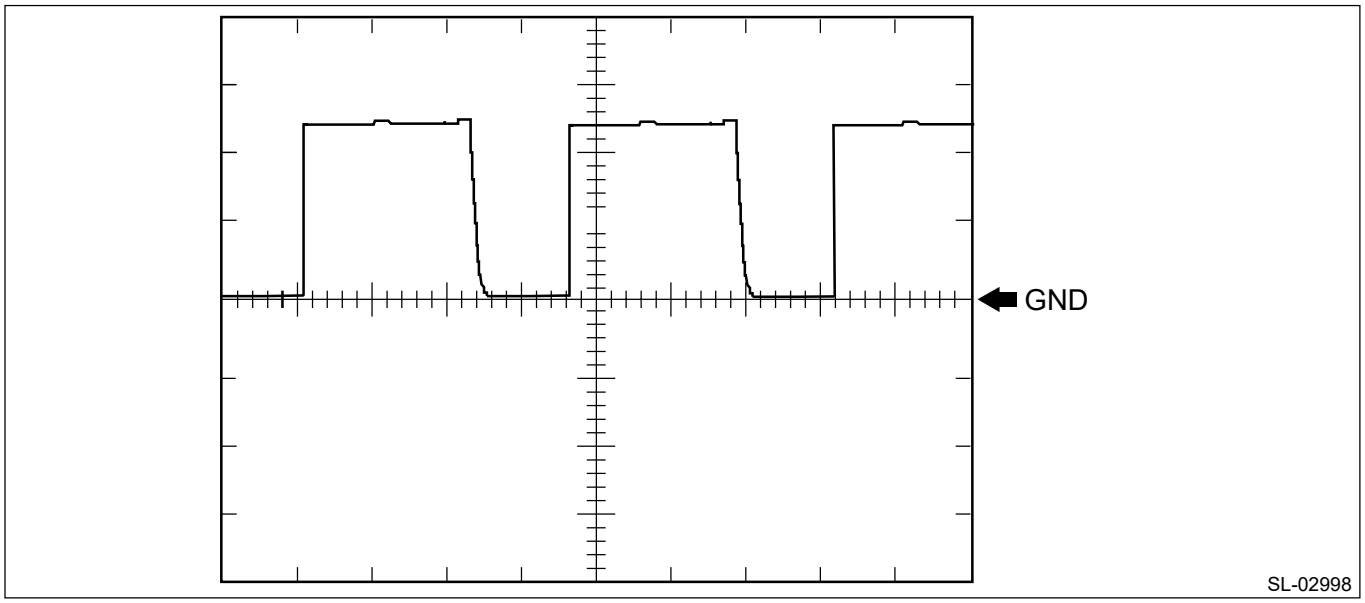
3. Waveform 3



Item	Contents
Measured terminal	(i241) No. 19 (TXCT) ⟷ (i241) No. 17 (GND2)

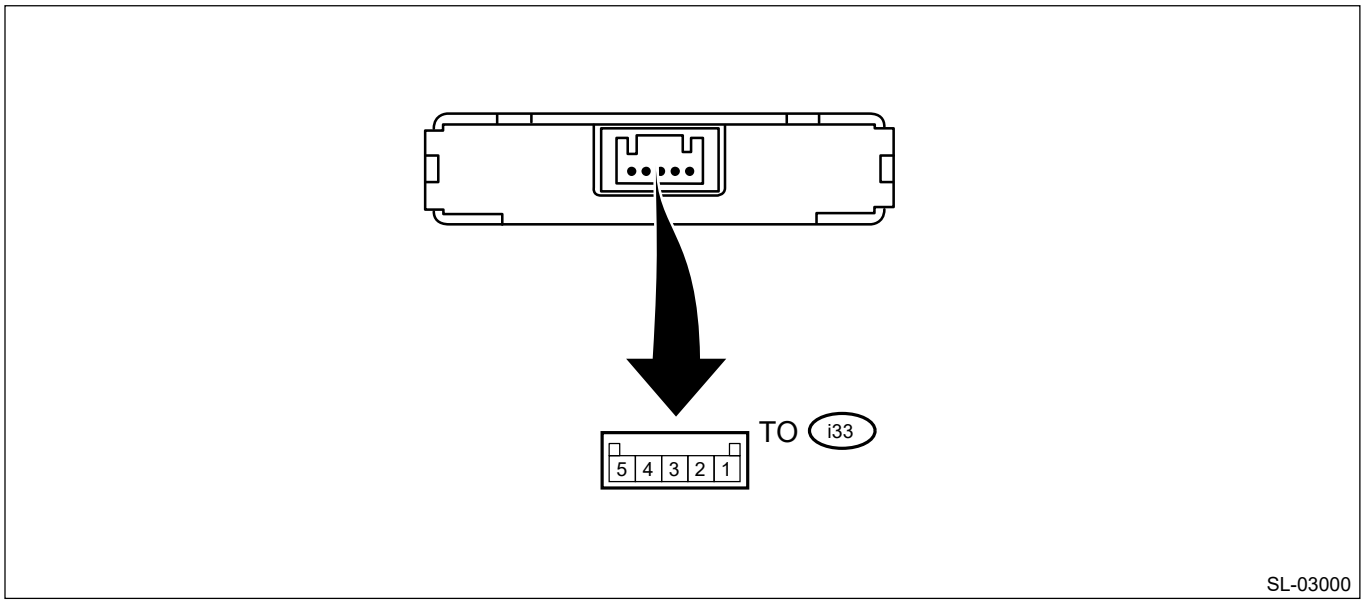
Item	Contents
Equipment setting	2 V/DIV, 20 ms/DIV
Measuring condition	Turn the ignition switch to OFF and with the access key near the push button ignition switch, press the push button ignition switch (with the access key battery removed).

4. Waveform 4



Item	Contents
Measured terminal	(i241) No. 21 8VC5) ←→ (i241) No. 17 (GND2)
Equipment setting	2 V/DIV, 200 ms/DIV
Measuring condition	Within 30 seconds after the push button ignition switch is pressed with IG OFF and access key not in the passenger room

2. ID CODE BOX



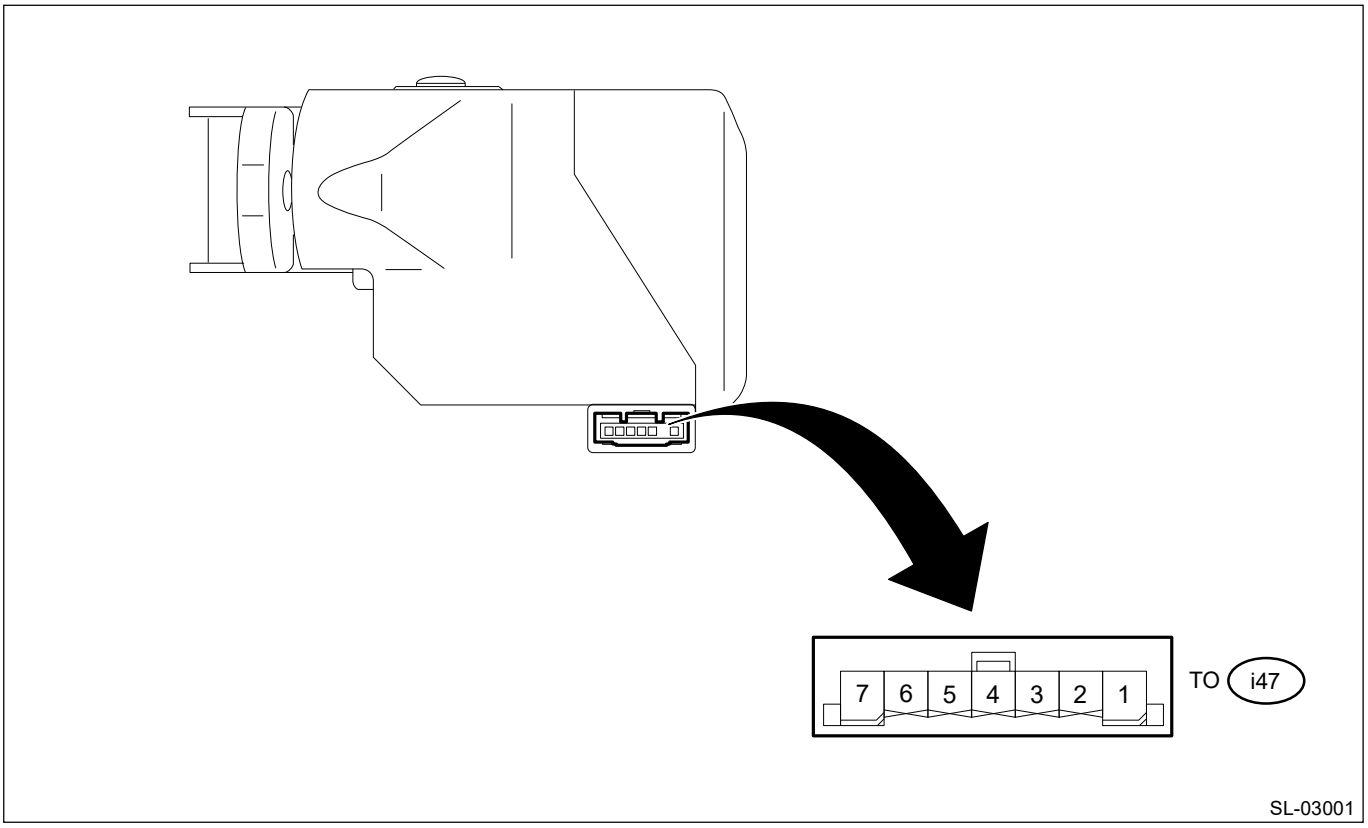
Terminal No.	Contents	Measuring condition	Standard
(i33) No. 1 ←→ 5	Battery power supply	Always *1	9.5 V or more
(i33) No. 2	LIN communication	ACC ON, IGN ON or power OFF, and open/close the door	Pulse generation
(i33) No. 3	—	—	—
(i33) No. 4 ←→ 5	Immobilizer communication 1	Ignition switch OFF	0 V
		Ignition switch ON	7 V or more → pulse generates temporarily
(i33) No. 5 ←→ Chassis ground	Ground	Always *1	Less than 1 Ω

*1: Executed with the ID code box connector disconnected.

3. BODY INTEGRATED UNIT

For I/O signals of the body integrated unit, refer to Body Control (Diagnostics). Ref. to BODY CONTROL(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

4. STEERING LOCK CM



Terminal No.	Contents	Measuring condition	Standard
(i47) No. 1 ←→ Chassis ground	Ground	Always *1	Less than 1 Ω
(i47) No. 2	—	—	—
(i47) No. 3 ←→ Chassis ground	Steering lock motor drive power supply	Motor not operating → Motor operating	9.5 V or more → 1 V or less

Terminal No.	Contents	Measuring condition	Standard
(i47) No. 4 ←→ Chassis ground	Unlock position output	Lock → Unlock	9.5 V or more → 1 V or less
(i47) No. 5	LIN communication	ACC ON, IGN ON or power OFF, and open/close the door	Pulse generation
(i47) No. 6 ←→ Chassis ground	Ignition power supply	Ignition switch ON *1	9.5 V or more
(i47) No. 7 ←→ Chassis ground	Battery power supply	Always *1	9.5 V or more

*1: Executed with the ID code box connector disconnected.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	—
U0100	Lost Communication With ECM/PCM "A"	—
U0101	Lost Communication With TCM	—
U0122	Lost Communication With Vehicle Dynamics Control Module	—
U0140	Lost Communication With Body Control Module	—
U0155	Lost Communication With Instrument Panel Cluster (IPC) Control Module	—
U0401	Invalid Data Received From ECM/PCM "A"	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—
U1422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN	—
B2271	IGN relay control circuit	—
B2274	ACC relay control circuit	—
B2275	Engine start request control circuit	—
B2276	ACC relay off signal	—
B2277	Keyless access control module (water detection)	—
B227B	PUSH ENGINE START SWITCH INPUT PERFORMANCE	—
B227C	P RANGE SIGNAL PERFORMANCE	—
B2285	Steering lock position signal correlation	—
B2286	Engine speed signal(without Auto Start Stop)	—
B228A	ENGINE SPEED SIGNAL(WITH AUTO START STOP)	—
B2781	Steering Lock CM control circuit	—
B2782	Steering lock drive request signal correlation	—
B2785	LIN communication	—
B2786	Steering Lock CM communication	—
B2788	IGN signal correlation (Steering Lock CM)	—
B2789	ID Code Box communication	—
B278B	CAN CONTROL MODULE STUCK	—

DTC	Item	Note
B278D	ID Code Box judgment circuit	—
B2793	BACKUP POWER	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
4. Start the engine, and let it idle for 40 seconds or more.
5. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

2. INSPECTION MODE 2

DTC	Item	Note
B2779	Remote control engine starter collation	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
4. Register the remote engine starter, and operate it.
5. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

3. INSPECTION MODE 3

DTC	Item	Note
B2784	Antenna circuit (Push Engine Switch)	—
B2790	ID Code Box circuitB2790B2790	—
B27A1	Driver side external antenna open	—
B27A2	Passenger side external antenna open	—
B27A5	Front internal antenna open	—
B27A6	Rear internal antenna open	—
B27A7	Trunk/rear gate internal antenna open	—
B27A8	Trunk/rear gate external antenna open	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

4. INSPECTION MODE 4

DTC	Item	Note
B2282	Vehicle speed signal correlation	—
B2283	Vehicle speed sensor	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
4. Drive for 20 seconds or more at a vehicle speed of 25 km/h (15.5 MPH) or more.
5. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

5. INSPECTION MODE 5

DTC	Item	Note
B2784	Antenna circuit (Push Engine Switch)	—
B278A	Push Engine Switch power supply circuit	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
4. Hold the access key that doesn't have a battery over the push button start SW for collation.
5. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

6. INSPECTION MODE 6

DTC	Item	Note
B2284	Brake signal correlation	—

Diagnostic procedure:

1. Check that the battery voltage is 12 V or more and fuel remains approx. half [20 — 40 L (5.3 — 10.6 US gal, 4.4 — 8.8 Imp gal)].
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.
3. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
4. Turn the ignition switch to ON, depress and hold the brake pedal for 20 seconds of more, then release the brake pedal and wait for 20 seconds and more.

5. Using Subaru Select Monitor, read the DTC of [Keyless Access with Push Button Start] to check that there is no DTC displayed. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Warning Light Illumination Pattern

INSPECTION

- Security indicator light
  Blinks slowly once with the push button ignition switch not pressed.
  Goes off when the push button ignition switch is pressed while carrying the regular access key.
  The indicator light continues to blink and the engine is not allowed to start when the push button ignition switch is pressed while carrying a key other than the regular access key.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Warning Light Illumination Pattern

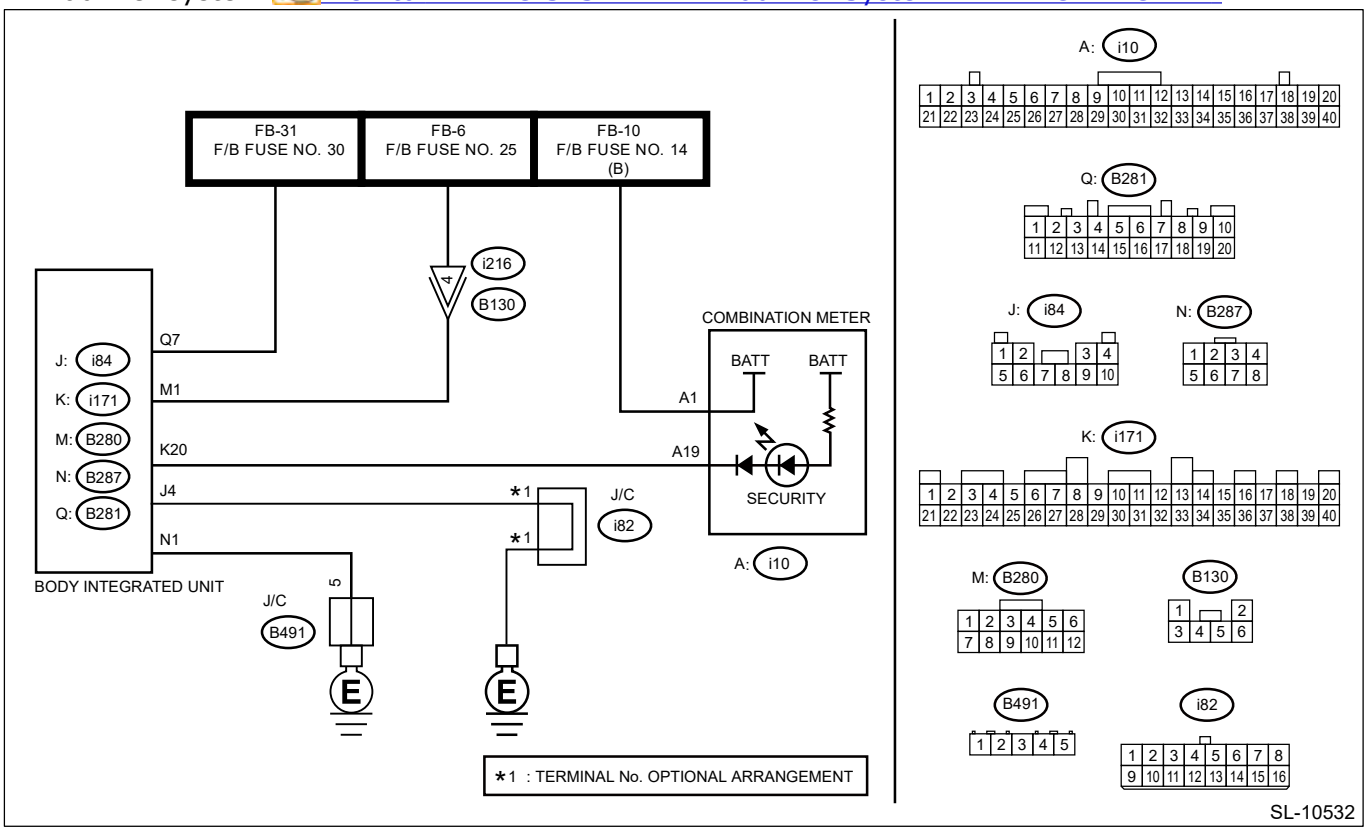
WARNING LIGHT DOES NOT ILLUMINATE

Trouble causes:

- Power supply circuit malfunction
- Ground circuit malfunction
- Body integrated unit malfunction
- Combination meter malfunction
- Malfunction of harness between combination meter and body integrated unit

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse (F/B No. 25, 30). Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the short circuit in the harness between the fuse and body integrated unit.

2. CHECK SECURITY INDICATOR LIGHT.

1. Disconnect the connector from body integrated unit. Disconnect the connector from body integrated unit.
2. Connect the resistor (100 Ω) between the body integrated unit connector terminal (i171) No. 20 and chassis ground.

Does the security indicator light illuminate?

Yes	Go to 3.
No	Go to 5.

3. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT.

Measure the resistance between the body integrated unit connector terminal and chassis ground.

Connector & terminal

(i84) No. 4 — Chassis ground:

(B287) No. 1 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair the open circuit of the body integrated unit ground circuit.

4. CHECK BODY INTEGRATED UNIT POWER SUPPLY CIRCUIT.

Measure the voltage between the body integrated unit connector terminal and chassis ground.

Connector & terminal

(B281) No. 7 (+) — Chassis ground (−):

(B280) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Check the harness for open or short circuit between body integrated unit and fuse.

5. CHECK COMBINATION METER CIRCUIT.

1. Remove the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
2. Measure the voltage between combination meter connector terminal and chassis ground.
   Connector & terminal
   (i10) No. 1 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 6.
No	Check for an open or short circuit in the harness between the combination meter and fuse.

6. CHECK COMBINATION METER CIRCUIT.

Measure the resistance between the body integrated unit connector terminal and combination meter connector terminal.
Connector & terminal
(i171) No. 20 — (i10) No. 19:

Is the resistance less than 10 Ω?

Yes	LED bulb is defective. Replace the combination meter case assembly. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Repair the harness or connector.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Warning Light Illumination Pattern

WARNING LIGHT REMAINS ON

Note:
For the diagnostic procedures, refer to "WARNING LIGHT DOES NOT COME ON". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Warning Light Illumination Pattern>WARNING LIGHT DOES NOT ILLUMINATE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Detecting condition:

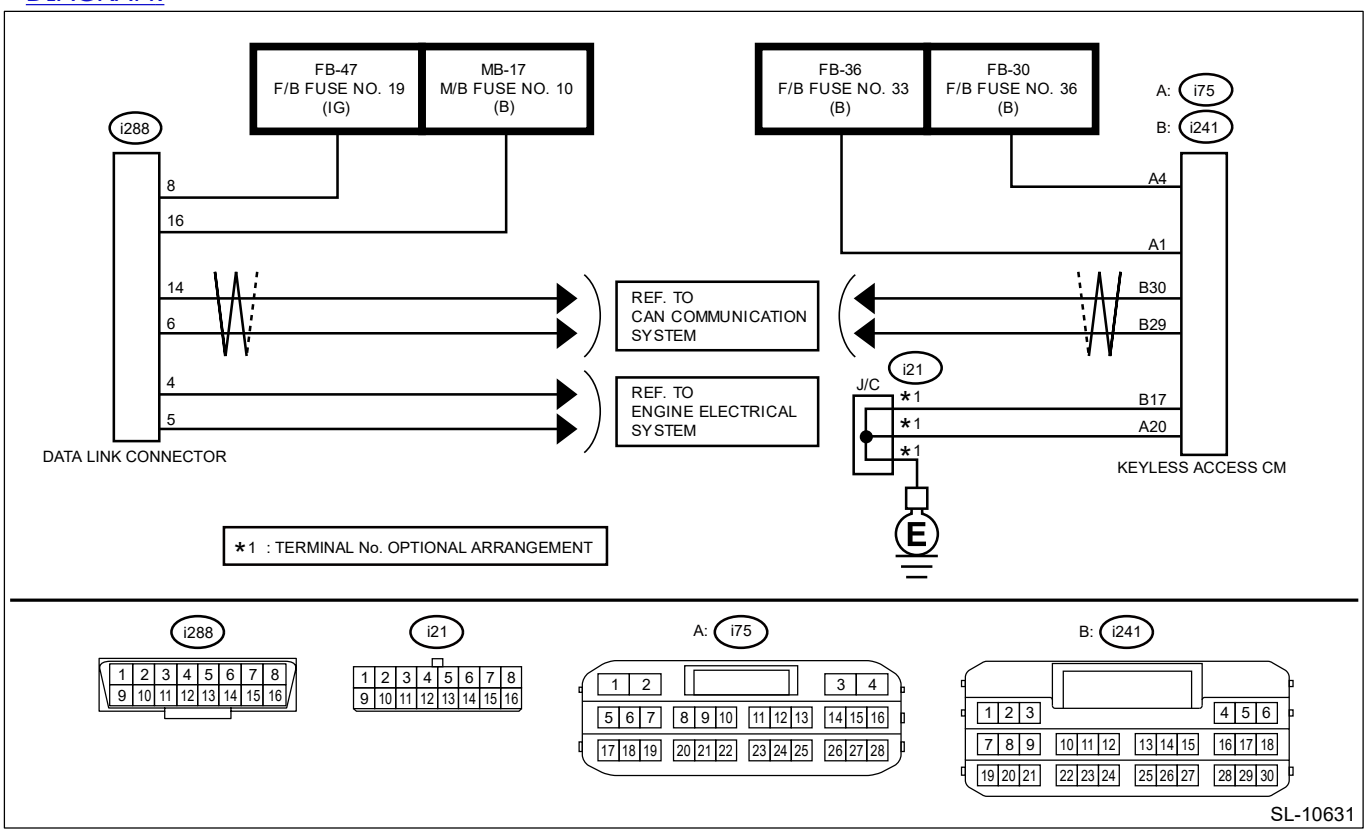
- Defective harness
- Power supply circuit malfunction
- Defective keyless access CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Not communicable with Subaru Select Monitor.

Wiring diagram:

- Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK POWER SUPPLY CIRCUIT.

Connect DST-i to data link connector.

Does DST-i turn ON?

Yes	Go to 4.
No	Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 8 (+) — Chassis ground (–):
   (i288) No. 16 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the power supply circuit. **Note:** **In this case, repair the following item:** • **Open or ground short circuit of harness between battery and data link connector** • **Blown out of fuse**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 4 — Chassis ground:
   (i288) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found, Go to 4.
No	Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and perform communication between the Subaru Select Monitor and vehicle.

Is communication possible?

Yes	Go to 5.
No	Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check poor contact of keyless access CM connector, data link connector and coupling connector.

Is the check result OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse of keyless access CM. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 8.
No	Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between keyless access CM and fuse.

8. CHECK KEYLESS ACCESS CM CONNECTOR POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the keyless access CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (–):

(i75) No. 1 (+) — Chassis ground (–):

Is the voltage 10 V or more?

Yes	Go to 9.
No	Check for open or short circuit in the harness between keyless access CM and fuse.

9. CHECK GROUND CIRCUIT OF KEYLESS ACCESS CM (OPEN).

Measure the resistance in harness between keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 20 — Chassis ground:

(i241) No. 17 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor>LIST.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count [count]	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count		—	—
Time Count [msec]		ms	—
Driver's unlock touch sensor switch	Status of the touch sensor (unlock) built on the back surface of the driver's door outer handle	ON: ON when the touch sensor is touched OFF: OFF when the touch sensor is not touched	—
Passenger's unlock touch sensor switch	Status of the touch sensor (unlock) built on the back surface of the passenger's door outer handle	ON: ON when the touch sensor is touched OFF: OFF when the touch sensor is not touched	—
Driver's lock touch sensor SW	Status of the touch sensor (lock) built on the surface of the driver's door outer handle	ON: ON when the touch sensor is touched OFF: OFF when the touch sensor is not touched	—
Passenger's lock touch sensor SW	Status of the touch sensor (unlock) built on the back surface of the passenger's door outer handle	ON: ON when the touch sensor is touched OFF: OFF when the touch sensor is not touched	—
Rear Gate Request SW	Rear gate lock/unlock button status (5 door model	ON: When the switch is ON OFF: When the switch is OFF	—

Item	Contents	Standard/Unit	Note
	only)		
Trunk Request SW	Trunk opener button status (4 door model only)	ON: When the switch is ON OFF: When the switch is OFF	—
Secret code Keyless registration	Secret code keyless registration status	Unregistered: When not registered Registered: When registered	—
Control Module Voltage	Keyless access CM power supply voltage status	ON: When the voltage is present OFF: When the voltage is not present	—
Control Module Voltage(Backup)	Keyless access CM back-up power supply voltage status	ON: When the voltage is present OFF: When the voltage is not present	—
IGN SW	Ignition switch status	ON: When the ignition switch is ON OFF: When the ignition switch is OFF	—
B/up fuse	Keyless access CM back-up fuse status	Connecting: When the fuse is connected OFF: When the fuse is not connected	—
Incorrect vehicle ID	ID information when performing the keyless access	No: Registered access key Yes: Unregistered access key	—
No response	Access key response status	No: There is a response from the access key when keyless access is performed Yes: There is no response from the access key when keyless access is performed	—

Item	Contents	Standard/Unit	Note
Incorrect response code, format	Response status from the access key	No: Response from the access key is normal when keyless access is performed Yes: Response from the access key differs when keyless access is performed	—
Exhausted battery	Access key battery status	No: When the access key battery is not depleted Yes: When the access key battery is depleted	—
Incorrect response code, ID code	Access key response status when performing the keyless access	No: Response from the access key is normal when keyless access is performed Yes: Response from the access key differs when keyless access is performed	—
Incorrect response code, collation result	Access key response status when performing the keyless access	[No]: Response from the access key is normal when keyless access is performed Yes: Response from the access key differs when keyless access is performed	—
Incorrect ID code	Access key response status when performing the keyless access	No: Response from the access key is normal when keyless access is performed Yes: Response from the access key differs when keyless access is performed	—
Incorrect rolling code	Access key response status when performing the keyless access	No: Response from the access key is normal when keyless access is performed Yes: Response from the access key	—

Item	Contents	Standard/Unit	Note
		differs when keyless access is performed	
Smart Cancel	Keyless access function status	Normal: Keyless access function is activated Cancel: Keyless access function is deactivated	—
Trunk Position	Trunk locked status (4 door model only)	Lock: When the trunk is closed Unlock: When the trunk is open	—
ID Code Box W/H Connection State	Connecting status of the terminal (i241) No. 23	OFF: ID code box is not connected Connecting: ID code box is connected	—
ID Code Box Existence Judging	ID code box connection setting	—	Normal [Existence Judging]
Immobilizer	Immobilizer set status	Set: When the immobilizer is set Unset: When the immobilizer is not set	—
Remote engine starter communication ID confirmation	Remote control engine starter communication confirmation status	NG: When using an unregistered remote control engine starter OK: When using a registered remote control engine starter	—
Remote engine starter code registration confirmation	Remote control engine starter registration status	unregistered: When the code is not registered Registered: When the code is registered	—
STLC sleep possible status	Steering lock CM sleep possible status	Impossible: Sleep is not possible Possible: Sleep is possible	—
STLC wake-up transmission status	Steering lock CM wake-up	[No transmission]: Wake-up signal is	—

Item	Contents	Standard/Unit	Note
	transmission status	not transmitted Transmission: Wake-up signal is transmitted	
Lock side sensor status	Steering lock CM status	ON: Locked status OFF: Unlocked status	—
Unlock side sensor status	Steering lock CM status	ON: Locked status OFF: Unlocked status	—
Lock confirmation	Steering lock CM status	Unconfirmed: When not locked Confirmed: When locked	—
Unlock confirmation	Steering lock CM status	Unconfirmed: When not unlocked Confirmed: When unlocked	—
Sensor initialization	Steering lock CM status	Initialization not completed: Sensor initial operation not completed Initialization completed: Sensor initial operation completed	—
Motor protection control status	Steering lock CM status	Permitted range: Motor protection control is activated Rejected range: Motor protection control is not activated	—
Motor operation prohibition voltage evaluation	Steering lock CM status	Operating Permission: Motor operation is permitted Operation prohibit: Motor operation is prohibited	—
Diagnosis response	Steering lock CM status	Normal: Diagnostic communication is not in progress response: Diagnostic communication is in progress	—

Item	Contents	Standard/Unit	Note
Sensor abnormal	Steering lock CM status	Normal: When the steering lock CM is normal FAIL: When the steering lock CM is not normal	—
Motor power supply short-circuit abnormal	Steering lock CM status	Normal: When the steering lock CM is normal FAIL: When the steering lock CM is not normal	—
Motor driver short-circuit abnormal	Steering lock CM status	FAIL: When the steering lock CM is not normal Normal: When the steering lock CM is normal	—
IGN input open abnormal	IGN input status	Receive: When the IGN input is normal FAIL: When the IGN input is not normal	—
Lock bar engagement abnormal	Steering lock bar status	Normal: Steering lock bar is normal FAIL: Steering lock bar is stuck	—
Lock side relay operation	Steering lock CM status	Yes: When not unlocked ? locked Operating: When unlocked ? locked	—
Unlock side relay operation	Steering lock CM status	Yes: When not unlocked ? locked Operating: When unlocked ? locked	—
Motor drive FET drive	Steering lock CM status	Yes: Not when the motor drive FET is operating Operating: When the motor drive FET is operating	—
Motor reversal protection control	Steering lock CM status	Operating: When the motor drive FET is operating Yes: Not when the	—

Item	Contents	Standard/Unit	Note
		motor drive FET is operating	
Engine start	Engine start permission status	E/G Start Permission: When the ignition switch is ON [Engine start prohibition]: When the ignition switch is OFF	—
Sensor abnormal (past)	Steering lock CM status	FAIL: When the steering lock CM is not normal Normal: When the steering lock CM is normal	—
Motor power supply short-circuit abnormal (past)	Steering lock CM status	FAIL: When the steering lock CM is not normal Normal: When the steering lock CM is normal	—
Motor driver short-circuit abnormal (past)	Normal: When the steering lock CM is normal	FAIL: When the steering lock CM is not normal Normal: When the steering lock CM is normal	—
Steering lock lock/unlock command reception history	Steering lock CM status	No Support: — ON (keep 10 sec): When the steering lock is locked ? unlocked or unlocked ? locked	—
Lock bar engagement abnormal (past)	Steering lock bar status	Normal: Steering lock bar is normal FAIL: Steering lock bar was stuck in the past	—
IGN input open abnormal (past)	IGN input status	Receive: When the IGN input is normal FAIL: When the IGN input is not normal	—

Item	Contents	Standard/Unit	Note
STLC Abnormal EEPROM access	Steering lock CM status	Receive: When the steering lock CM is normal FAIL: When the steering lock CM is not normal	—
ID code BOX sleep possible status	ID code box status	Impossible: Sleep is not possible Possible: Sleep is possible	—
ID code BOX wake-up transmission status	ID code box status	No transmission: Wake-up signal is not transmitted Transmission: Wake-up signal is transmitted	—
ID code BOX Abnormal EEPROM access (now)	ID code box status	Normal: When the ID code box is normal FAIL: When the ID code box is not normal	—
EGI code reception status	Engine start operation status	Receive: When the engine start operation is performed Not yet received: When the engine start operation is not performed	—
Engine start permission request reception status	Engine start permission request reception status	Reception: Ignition ON Not yet received: Ignition OFF	—
Code collation result between smart ECM and ID code box	Check result of collation code between keyless access CM and ID code box	Normal: When the engine start is possible FAIL: When the engine start is not possible	—
Code collation result between steering locked ECM and ID code box	Check result of collation code between steering lock CM and ID	FAIL: When the steering lock operation is possible Normal: When the	—

Item	Contents	Standard/Unit	Note
	code box	steering lock operation is not possible	
Steering lock unlock request reception status	Steering lock CM unlock request reception status	Reception (keep 10 sec): When the steering lock is performing unlock operation Not yet received: —	—
Steering lock lock request reception status	Steering lock CM lock request reception status	Reception (keep 10 sec): When the steering lock is performing lock operation Not yet received: —	—
Driver's external transmitter output circuit abnormal	Transmitter output circuit status	Receive: When the transmitter output circuit is normal FAIL: When the transmitter output circuit is not normal	—
Passenger's external transmitter output circuit abnormal	Transmitter output circuit status	Receive: When the transmitter output circuit is normal FAIL: When the transmitter output circuit is not normal	—
Driver's external transmitter output circuit abnormal (past)	Transmitter output circuit status	Receive: When the transmitter output circuit is normal FAIL: There was a transmitter output error in the past	—
Passenger's external transmitter output circuit abnormal (past)	Transmitter malfunction (past) output circuit status	Receive: When the transmitter output circuit is normal FAIL: There was a transmitter output error in the past	—
ID code registration mode status	Immobilizer registration status	Normal: Not while registering/deleting Regist.: While registering Deletion: While	—

Item	Contents	Standard/Unit	Note
		deleting	
Smart related ECM code registration mode status	Immobilizer registration status	Normal: When not in the smart related ECM code registration mode On mode: When in the smart related ECM code registration mode	—
ID code collation completion confirmation	Immobilizer registration status	Normal: Not when the ID code collation is complete Started: When the ID code collation is complete	—
ID code registration completion confirmation	Immobilizer registration status	Normal: Not when the ID code registration is complete Started: When the ID code registration is complete	—
Smart related ECM code registration completion confirmation	Immobilizer registration status	Normal: Not when the smart related ECM code registration is complete Started: When the smart related ECM code registration is complete	—
Registered smart key confirmation status	Immobilizer registration status	Normal: Not while confirming the registered access keys Confirming: While confirming the registered access keys	—
Smart related ECM code confirmation status	Immobilizer registration status	Normal: Not while confirming the smart related ECM code Confirming: While confirming the smart	—

Item	Contents	Standard/Unit	Note
		related ECM code	
ID code registration status	Immobilizer registration status	Normal: Not during the ID code registration Confirming: During the ID code registration	—
Registration abnormal confirmation	Registration malfunction status	Normal: At normal condition FAIL: Abnormal	—
ID code collation status	Immobilizer registration status	Normal: Not during the ID code registration Collating the immobilizer: During the ID code collation (immobilizer collation) Collating the smart: During the ID code collation (smart collation)	—
All registered keys confirmation status	Immobilizer registration status	Normal: Not while confirming all registered keys Confirming: While confirming all registered keys	—
Confirmed number of all registered keys	Immobilizer registration status	Display range: 0 — 7	—
Number of required registrations (smart)	Immobilizer registration status	Display range: 0 — 7	—
Number of collation completed (smart)	Immobilizer registration status	Display range: 0 — 7	—
Number of registration completed (smart)	Number of recognized keyless access CM	Display range: 0 — 7	—
ID Code Box	ID code box connection status	OFF: ID code box is not connected Connecting: ID code box is connected	—
Steer Lock ECM	Steering lock CM connection status	OFF: The steering lock CM is not	—

Item	Contents	Standard/Unit	Note
		connected Connecting: The steering lock CM is connected	
Driver's lock request SW/touch sensor switch ON edge record	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	When confirming the data on the left, confirm after performing Keyless access with push button start system check. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
[Passenger's lock request SW/touch sensor switch ON edge record]	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Rear gate lock request SW ON edge history	Collation history is displayed (5 door model only)	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Driver's unlock touch sensor switch ON edge record	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Passenger's unlock touch sensor switch ON edge record	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	

Item	Contents	Standard/Unit	Note
Trunk unlock request SW ON edge history	Collation history is displayed (4 door model only)	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (driver's external transmitter + interior tuner)	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (passenger's external transmitter + interior tuner)	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (front interior transmitter + interior tuner)	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (rear interior transmitter + interior tuner)	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (transmitter in the trunk + room tuner)	Collation history is displayed (4 door model only)	OFF: When the collation has never been completed before	

Item	Contents	Standard/Unit	Note
		ON: When the collation has succeeded at least once in the past	
Collation OK result history (trunk external transmitter + interior tuner)	Collation history is displayed (4 door model only)	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (rear gate internal transmitter + interior tuner)	Collation history is displayed (5 door model only)	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (rear gate external transmitter + interior tuner)	Collation history is displayed (5 door model only)	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Collation OK result history (immobilizer amplifier + immobilizer amplifier)	Collation history is displayed	OFF: When the collation has never been completed before ON: When the collation has succeeded at least once in the past	
Trunk Open Without Key	Trunk open customization without key status (4 door model only)	ON: When customizing is ON OFF: When customizing is OFF	——

Item	Contents	Standard/Unit	Note
Push start SW 1	Push button start SW1 status	ON: When the push button start SW is pressed OFF: When the push button start SW is not pressed	——
Push start SW 2	Push button start SW2 status	ON: When the push button start SW is pressed OFF: When the push button start SW is not pressed	—
Stop Light Switch	Brake pedal SW status (CVT model only)	ON: When the brake pedal is depressed OFF: When the brake pedal is not depressed	—
Steering unlock SW	Steering lock CM status	ON: When the steering lock is unlocked OFF: Not when the steering lock is unlocked	—
Shift P signal(AT only)	Shift (P) status (CVT model only)	ON: When the shift position is “P” OFF: When the shift position is other than “P”	—
Clutch SW(MT only)	Clutch switch status (MT model only)	ON: When the clutch pedal is depressed OFF: When the clutch pedal is not depressed	—
Shift N signal(AT only)	Shift (N) status (CVT model only)	ON: When the shift position is “N” OFF: When the shift position is other than “N”	—
Delivery mode signal(AT only)	Delivery mode status	ON: When in delivery mode OFF: When in other than the delivery mode	—

Item	Contents	Standard/Unit		Note
ACC relay monitor	ACC relay drive status	ON: While the accessory relay drive is output OFF: While the accessory relay drive stops	—	
IGN latch monitor	IGN latch status	ON: While the IGN latch signal is output OFF: While the IGN latch signal stops	—	
STSW signal monitor	Engine start permission signal output status	ON: When pressing the push button ignition switch while depressing the brake pedal (except for MT model) or the clutch pedal (MT model) OFF: Other than ON	—	
IGN1/2 relay monitor (drive output)	Drive output monitoring status of IG relay	ON: While the IG relay 1/2 drive is output OFF: While the IG relay stops	—	
IGN1/2 relay monitor (coil voltage)	Coil voltage monitoring status of IG relay	ON: While the IG relay 1/2 drive is output OFF: While the IG relay stops	—	
ACCR signal	Accessory cut relay drive status	ON: While the accessory cut relay drive is output OFF: While the accessory cut relay drive stops	—	
Vehicle speed signal	Driving condition	Stopped status: During vehicle stoppage Drive status: While driving	—	
Engine Speed	Condition of the engine	Yes: While the engine stops Rotating: While the engine is running	—	

Item	Contents	Standard/Unit		Note
Vehicle identification	Vehicle recognition status	Vehicle types are displayed. GAS MT GAS AT HEV AT Auto Start Stop MT Auto Start Stop AT	—	
Power supply status	Power supply status	All OFF: IG 1 relay, IG 2 relay, and ACC relay is all OFF ACC Relay ON: Accessory ON IGN1 relay ON status: Ignition ON STSW: The push button ignition switch is pressed while the brake pedal (except for MT model) or the clutch pedal (MT model) is depressed	—	
Steering lock unlock wait time-out	Detecting status of the steering lock unlock waiting time out	Angle Not Detected: Steering lock unlock time out has not occurred Angle Detected: Steering lock unlock time out occurred	—	
Key collation waiting time out	Detecting status of the key collation waiting time out	Angle Not Detected: Key collation time out has not occurred Angle Detected: Key collation time out occurred	—	
IGN1/2 external circuit abnormal	IGN relay output status	Angle Not Detected: IGN 1/2 external circuit is normal Angle Detected: IGN 1/2 external circuit is not normal	—	

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Freeze Frame Data>LIST.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count [count]	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count			—
[Time Count [msec]]		ms	—

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select «Enter».
5. On Select Function display, select [Active Test].
6. Select a location to be inspected.

Note:

For detailed operation procedures, refer to "Application help".

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Active Test

LIST

Note:

Each output check continues to run for five seconds before stopping automatically.

Active test items	Range	Contents	Execution condition
Driver seat sensor power supply	Output	Perform the output check for the driver's door touch sensor.	—
	Stop		
Passenger seat sensor power supply	Output	Perform the output check for the passenger's door touch sensor.	—
	Stop		
STSW	Output	Turn on the STSW.* 2	—
	Stop		
ACC	Output	Turn on the ACC.	—
	Stop		
IGN1/2	Output	Turn on the IGN1/2.	—
	Stop		
Start SW character illumination lighted	Output	Perform ON output of the push button ignition switch back-up light.* 1	—
	Stop		
Start SW indicator lighted (green)	Output	Perform ON output of the push button ignition switch back-up light.* 1	—
	Stop		
Start SW indicator lighted (orange)	Output	Perform ON output of the push button ignition switch back-up light.* 1	—
	Stop		

Active test items	Range	Contents	Execution condition
Steering lock power supply	Output Stop	Output the power supply signal from keyless access CM to steering lock CM.	—

*1: When lit by a condition other than for active test, it will not become unlit even when set to either OFF or no output.

*2: When performed with ignition switch ON, engine will start. Therefore, great care must be exercised.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Customize

OPERATION

Note:

4 door model only.

1. On «Start» display, select Diagnosis.
2. On «Vehicle selection» display, input the target vehicle information and select «Confirmed».
3. On «Main Menu» display, select Each System.
4. On «Select System» display, select Keyless Access with Push Button Start and select «Enter».
5. On Select Function display, select «Customize».

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on customization, refer to the list.** **Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Customize>LIST.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Note
Trunk Open Without Key*1	ON	OFF	When the vehicle is unlocked, trunk cannot be opened when smart key is not carried.
		ON	When the vehicle is unlocked, trunk can be opened even when smart key is not carried.

*1: 4 door model only

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Keyless Access with Push Button Start Check

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Select Vehicle] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Keyless Access with Push Button Start], and then select [Next].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Keyless Access with Push Button Start Check].
7. Select a transmitter to be checked.

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on items, refer to the list. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check>LIST.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Keyless Access with Push Button Start Check

LIST

Item	Customize setting	Note
Keyless Access with Push Button Start Check	Driver side external transmitter - internal tuner	When the setting content on the left is selected, the access key is neared to the selected transmitter (access antenna) and collation matches, the buzzer will sound.
	PR seat external transmitter - internal tuner	
	Fr internal transmitter - internal tuner	
	Rr internal transmitter - internal tuner	
	Trunk-internal transmitter - trunk-internal tuner	
	Trunk-external transmitter - trunk-internal tuner	
	R gate internal transmitter - internal tuner	
	R gate external transmitter - internal tuner	
	Immobilizer amplifier transmission	
Collation inspection history deletion	Execution	—
	—	

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

1. Keyless access CM

Code	Description & trouble part	Reference
B2271	IGN RELAY CONTROL CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2271 IGN RELAY CONTROL CIRCUIT.
B2274	ACC RELAY CONTROL CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2274 ACC RELAY CONTROL CIRCUIT.
B2275	ENGINE START REQUEST CONTROL CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2275 ENGINE START REQUEST CONTROL CIRCUIT.
B2276	ACC RELAY OFF SIGNAL	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2276 ACC RELAY OFF SIGNAL.
B2277	KEYLESS ACCESS CONTROL MODULE (WATER DETECTION)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2277 SUBMERGING CIRCUIT.

Code	Description & trouble part	Reference
B227B	PUSH ENGINE START SWITCH INPUT PERFORMANCE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B227B PUSH ENGINE START SWITCH INPUT PERFORMANCE.
B227C	P RANGE SIGNAL PERFORMANCE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B227C P RANGE SIGNAL PERFORMANCE.
B2282	VEHICLE SPEED SIGNAL CORRELATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2282 VEHICLE SPEED SIGNAL CORRELATION.
B2283	VEHICLE SPEED SENSOR	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2283 VEHICLE SPEED SENSOR.
B2284	BRAKE SIGNAL CORRELATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2284 BRAKE SIGNAL CORRELATION.
B2285	STEERING LOCK POSITION SIGNAL CORRELATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2285 STEERING LOCK POSITION SIGNAL CORRELATION.
B2286	ENGINE SPEED SIGNAL(WITHOUT AUTO START STOP)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2286 ENGINE SPEED SIGNAL(WITHOUT AUTO

Code	Description & trouble part	Reference
		START STOP).
B228A	ENGINE SPEED SIGNAL(WITH AUTO START STOP)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B228A ENGINE SPEED SIGNAL(WITH AUTO START STOP).
B2779	REMOTE CONTROL ENGINE STARTER COLLATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION.
B2781	STEERING LOCK CM CONTROL CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2781 STEERING LOCK CM CONTROL CIRCUIT.
B2782	STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2782 STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION.
B2784	ANTENNA CIRCUIT (PUSH ENGINE SWITCH)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH).
B2785	LIN COMMUNICATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
B2786	STEERING LOCK CM COMMUNICATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble

Code	Description & trouble part	Reference
		Code (DTC)>DTC B2786 STEERING LOCK CM COMMUNICATION.
B2788	IGN SIGNAL CORRELATION (STEERING LOCK CM)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2788 IGN SIGNAL CORRELATION (STEERING LOCK CM).
B2789	ID CODE BOX COMMUNICATION	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2789 ID CODE BOX COMMUNICATION.
B278A	PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT.
B278B	CAN CONTROL MODULE STUCK	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278B CAN CONTROL MODULE STUCK.
B278D	ID CODE BOX JUDGMENT CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278D ID CODE BOX JUDGMENT CIRCUIT.
B2790	ID CODE BOX CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2790 ID CODE BOX CIRCUIT.
B2793	BACKUP POWER	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2793 BACKUP

Code	Description & trouble part	Reference
		POWER.
B27A1	DRIVER SIDE EXTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A1 DRIVER SIDE EXTERNAL ANTENNA OPEN.
B27A2	PASSENGER SIDE EXTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A2 PASSENGER SIDE EXTERNAL ANTENNA OPEN.
B27A5	FRONT INTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A5 FRONT INTERNAL ANTENNA OPEN.
B27A6	REAR INTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A6 REAR INTERNAL ANTENNA OPEN.
B27A7	TRUNK/REAR GATE INTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A7 TRUNK/REAR GATE INTERNAL ANTENNA OPEN.
B27A8	TRUNK/REAR GATE EXTERNAL ANTENNA OPEN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B27A8 TRUNK/REAR GATE EXTERNAL ANTENNA OPEN.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL

Code	Description & trouble part	Reference
		MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.

Code	Description & trouble part	Reference
U1120	LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE.
U1140	LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN.
U1422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN.

2. ECM

Code	Description & trouble part	Reference
B1571	REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM).
B1572	IMM CIRCUIT EXCEPT ANTENNA CIRCUIT	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT.
B1576	ECM EEPROM	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1576 EGI CONTROL MODULE EEPROM.

Code	Description & trouble part	Reference
B1577	IMMOBILIZER CM EEPROM	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1577 IMM CONTROL MODULE EEPROM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1571 REFERENCE CODE INCOMPATIBILITY (IMMOBILIZER CM TO ECM)

DTC detecting condition:

Incompatibility of reference code between keyless access CM (model without ID code box) or ID code box (model with ID code box) and ECM occurs.

Trouble symptom:

Engine will not start.

Caution:

- **For replacement procedure of keyless access CM (model without ID code BOX) or ID code box (model with ID code BOX), refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK ECM.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes	ECM registration was not performed properly.
No	Go to 2.

2. REPLACE ECM.

1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL. Install the ECM from other vehicle to the original vehicle.
No	Replace the keyless access CM (model without ID code box) Ref. to SECURITY AND LOCKS>Keyless Access CM. or the ID code box (model with ID code box). Ref. to SECURITY AND LOCKS>ID Code Box.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1572 IMM CIRCUIT EXCEPT ANTENNA CIRCUIT

1. EXCEPT FOR C5 MODEL

DTC detecting condition:

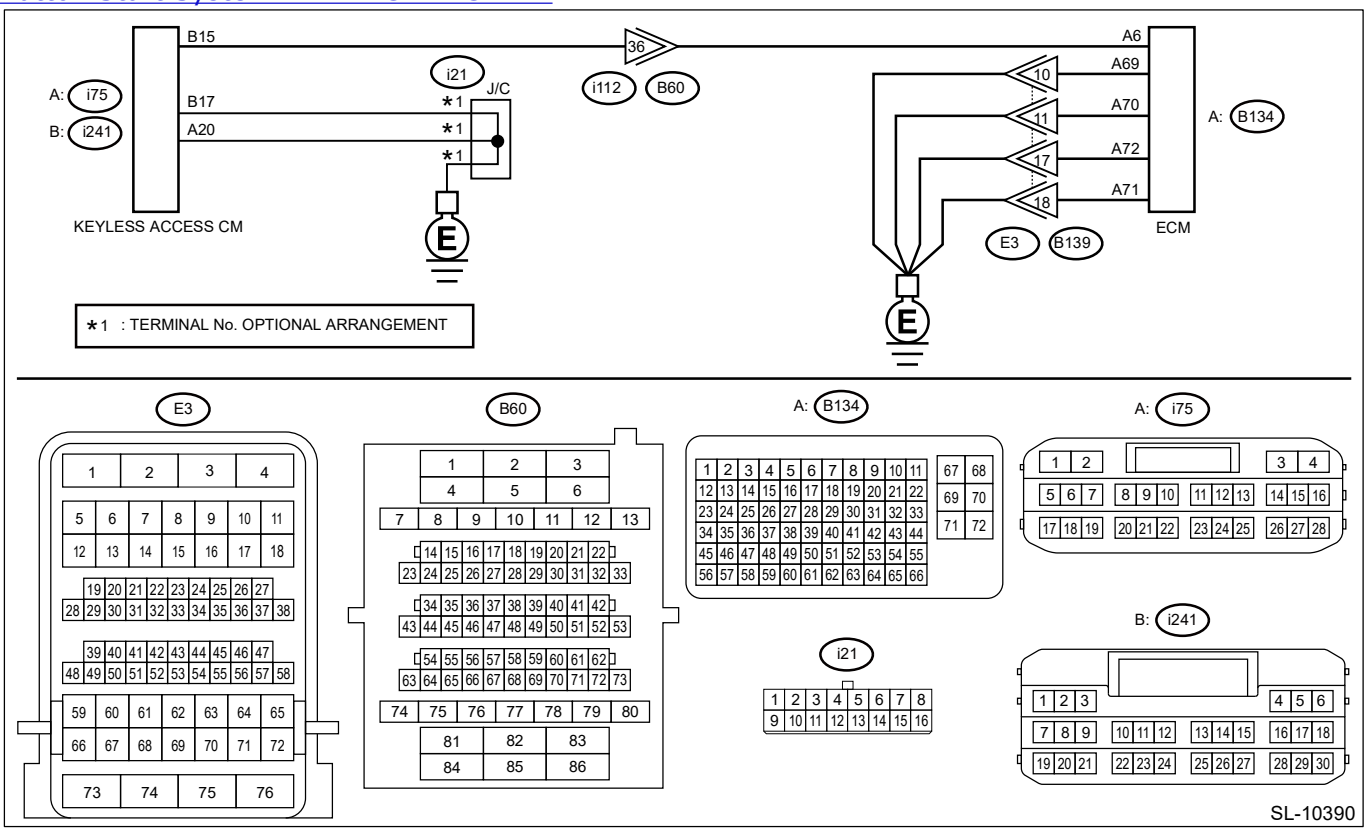
Communication error between keyless access CM and ECM

Trouble symptom:

Engine will not start.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and ECM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK GROUNDING POINT.

no → Go to 2.

yes ↓

2. CHECK DATA MONITOR.
- no → Perform the instructed procedures.
- yes ↓

3. CHECK DATA MONITOR.
- no → Perform the instructed procedures.
- yes ↓

4. CHECK HARNESS (OPEN CIRCUIT).
- no → Perform the instructed procedures.
- yes ↓

5. CHECK HARNESS (OPEN CIRCUIT).
- no → Perform the instructed procedures.
- yes ↓

6. CHECK ECM.
- yes → Perform the instructed procedures.
- no → Perform the instructed procedures.

1. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface? Are there any oil-soiled areas?

Yes	Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Check the DTC, and when DTC B1572 is still displayed, Go to 2.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check [Data monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.
3. Display the next data. [Immobilizer] [Engine start] [Unlock confirmation]

Data Monitor

Data

[Immobilizer] = [Unset]
[Engine start] = [E/G Start Permission]
[Unlock confirmation] = [Confirmed]

Is the data displayed as described above?

Yes	Go to 3.
No	Perform diagnostics with phenomenon. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon.

3. CHECK DATA MONITOR.

Use the Subaru Select Monitor to check the following items with [Data monitor] of [Keyless Access with Push Button Start] when holding down the push button ignition switch while depressing the brake pedal (CVT model) or the clutch pedal (MT model). Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

Data

[EGI code reception status] = [Receive]

Note:

If [Receive] is displayed, the status changes to [No receive] in 10 seconds. When performing the check again, perform the check after turning the ignition switch to OFF.

Is the data displayed as described above?

Yes	Go to 4.
No	Repair or replace the harness between keyless access CM and ECM.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector and ECM connector.
3. Using a tester, measure the resistance between the keyless access CM connector and ECM connector.

Connector & terminal

(i241) No. 15 — (B134) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK ECM.

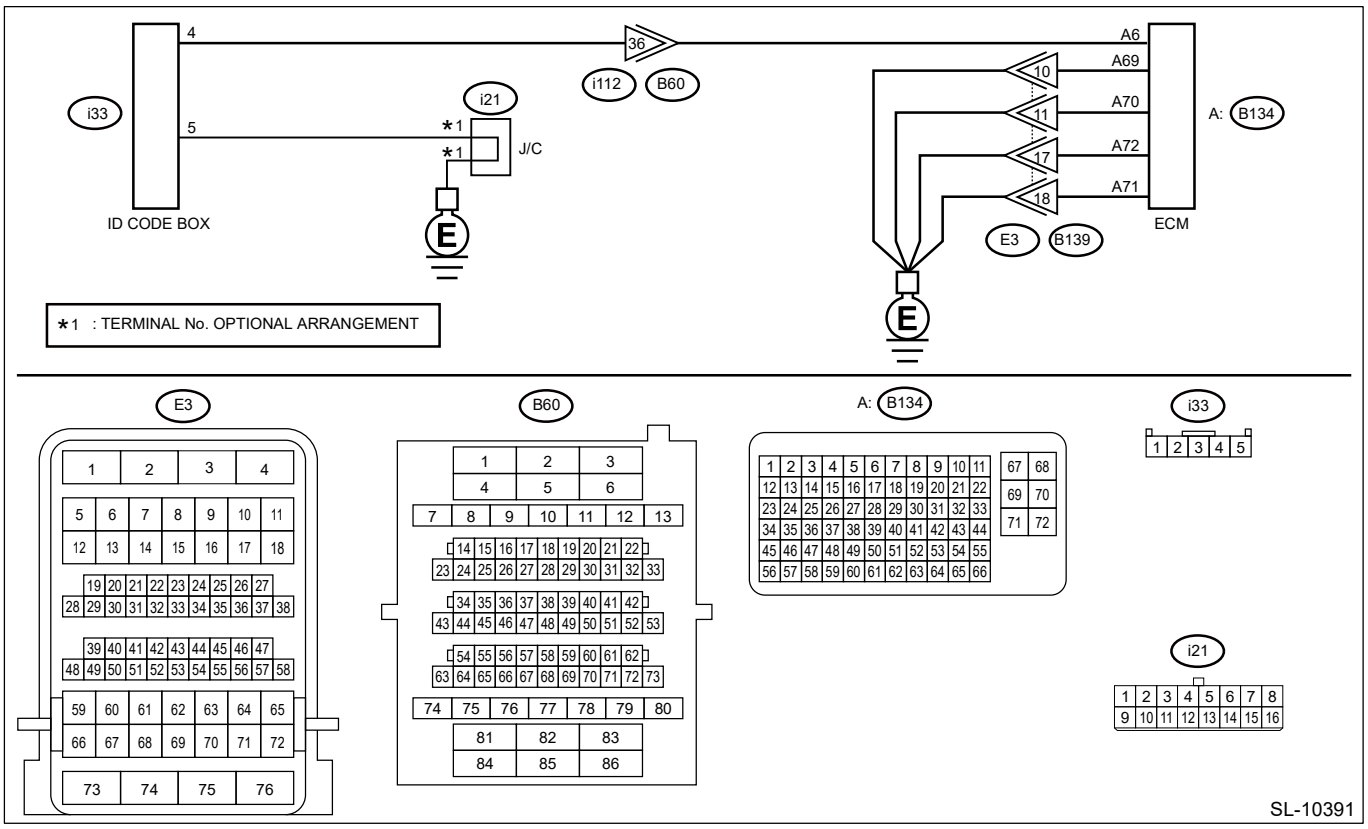
1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL. Install the ECM from other vehicle to the original vehicle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

2. C5 MODEL

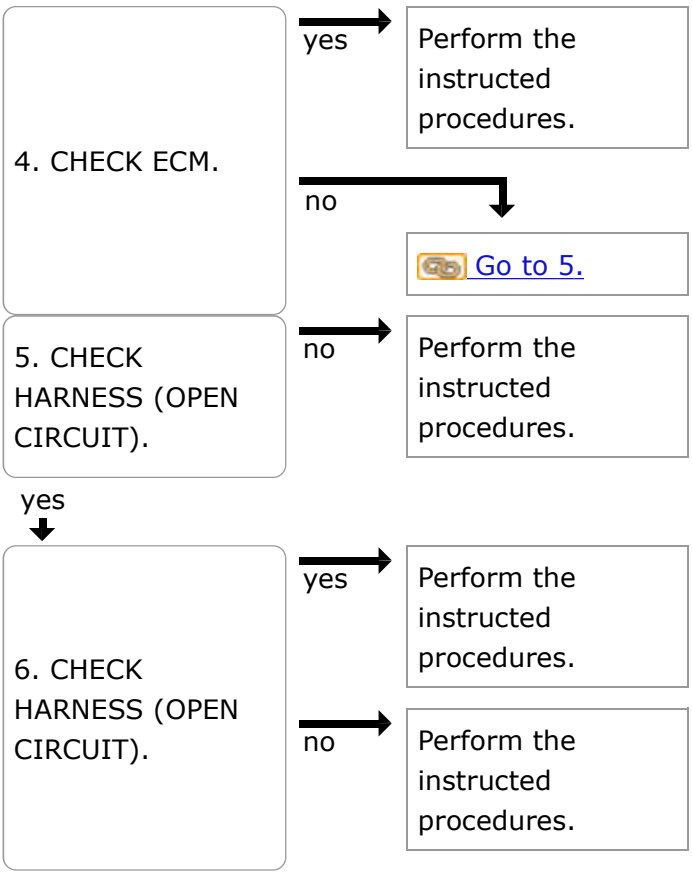
DTC detecting condition:
Communication error between ID code box and ECM
Trouble symptom:
Engine will not start.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of ID code box and ECM, refer to "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK GROUNDING POINT.
   - no → Go to 2.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK GROUNDING POINT.

Check the grounding point of the engine ground and chassis ground.

Is there any looseness? Are there any foreign matters caught on the ground or contact surface? Are there any oil-soiled areas?

Yes	Remove the foreign matters, and tighten to the specified torque. Then start the engine, and check that the fault was removed. Check the DTC, and when DTC B1572 is still displayed, Go to 2.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check [Data monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.
3. Display the next data. [Immobilizer] [Engine start] [Unlock confirmation]

Data Monitor

Data

[Immobilizer] = [Unset]
[Engine start] = [E/G Start Permission]
[Unlock confirmation] = [Confirmed]

Is the data displayed as described above?

Yes	Go to 3.
No	Perform diagnostics with phenomenon. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon.

3. CHECK DATA MONITOR.

Use the Subaru Select Monitor to check the following items with [Data Monitor] of [Keyless Access with Push Button Start] when holding down the push button ignition switch while depressing the brake pedal (CVT model) or the clutch pedal (MT model).

Data Monitor

Data

[EGI code reception status] = [Receive]

Note:

If [Receive] is displayed, the status changes to [No receive] in 10 seconds. When performing the check again, perform the check after turning the ignition switch to OFF.

Is the data displayed as described above?

Yes	Go to 4.
No	Repair or replace the harness between ID code box and ECM.

4. CHECK ECM.

1. Install the ECM from other normal operating vehicle (with push button start) which use same ECM to the vehicle to be diagnosed.
2. Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration finished? And does the engine start?

Yes	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL. Install the ECM from other vehicle to the original vehicle.
No	Go to 5.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the ID code box connector and the ECM connector.
3. Using a tester, measure the resistance between ID code box connector and ECM connector.
   Connector & terminal
   (i33) No. 4 — (B134) No. 6:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between ID code box connector and chassis ground.
Connector & terminal
(i33) No. 5 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
No	Repair or replace the open circuit of harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1576 EGI CONTROL MODULE EEPROM

DTC detecting condition:

- ECM malfunctioning
- When the ROM in ECM was inaccessible during registration.

Trouble symptom:

Engine cannot be started.

Caution:

- **For replacement procedure of ECM, refer to "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration complete?

Yes	Make sure that the engine can start. This completes the work.
No	Go to 2.

2. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration complete?

Yes	Make sure that the engine can start. This completes the work.
No	Go to 3.

3. PERFORM ECM REGISTRATION.

Perform ECM registration. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.

Is ECM registration complete?

Yes	Make sure that the engine can start. This completes the work.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1577 IMM CONTROL MODULE EEPROM

1. EXCEPT FOR C5 MODEL

DTC detecting condition:

- Defective keyless access CM
- When inaccessible to ROM in keyless access CM.

Trouble symptom:

Engine cannot be started.

Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF.
4. Remove and install the battery.
5. Turn the ignition switch to ON.
6. After 5 seconds or more elapse, read the DTC of [Engine] using the Subaru Select Monitor. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC B1577 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. C5 MODEL

DTC detecting condition:

- ID code box malfunction
- When inaccessible to ROM in ID code box.

Trouble symptom:

Engine cannot be started.

Caution:

- **For replacement procedure of ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Engine]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF.
4. Register the ID code box.
5. Read the DTC of [Engine] using the Subaru Select Monitor again. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).



Is DTC B1577 displayed? (Current malfunction)

Yes	Replace the ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

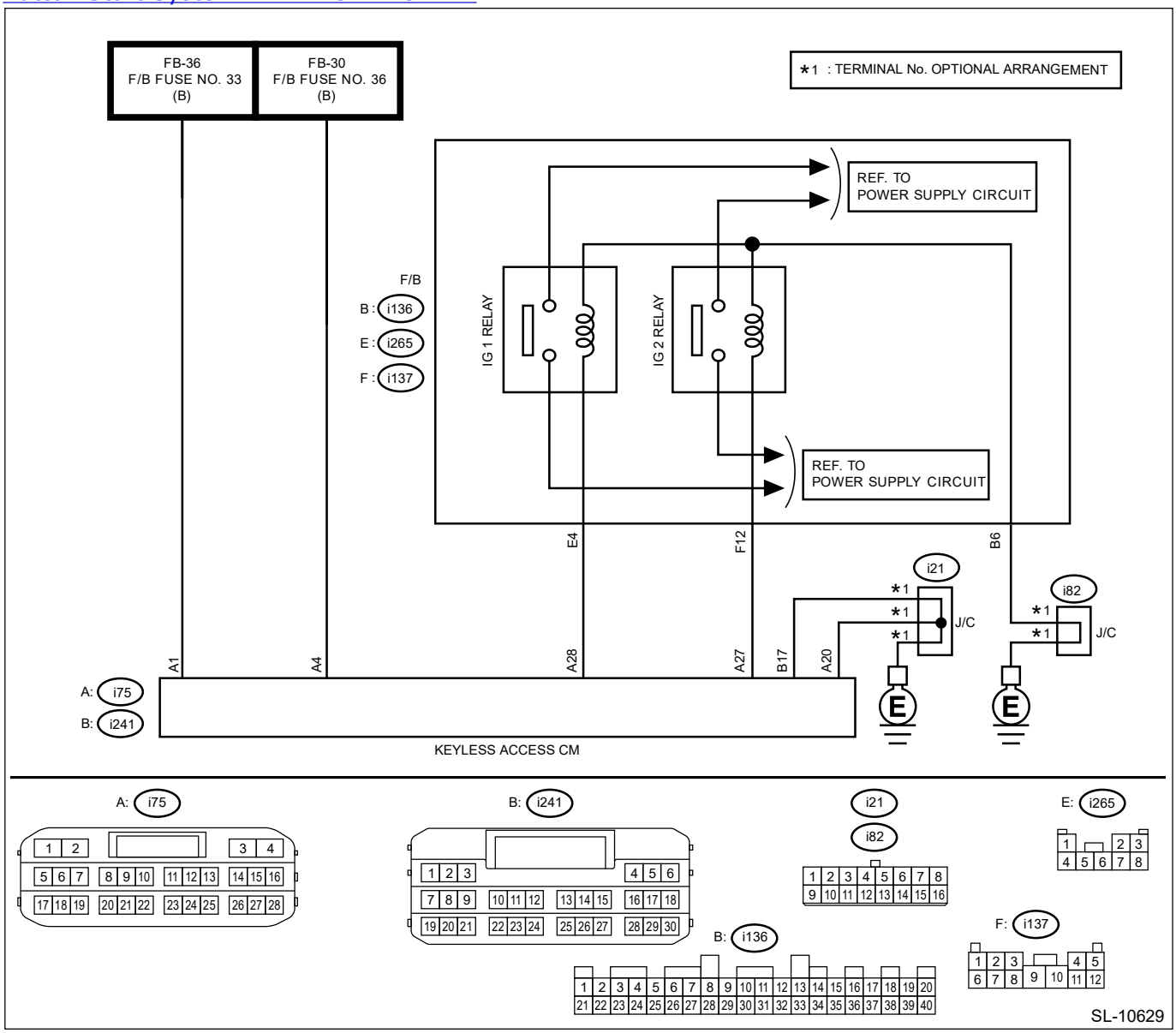
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2271 IGN RELAY CONTROL CIRCUIT

DTC detecting condition:
When malfunction judgment (difference occurs between output value and monitoring result) continues 3 times at one second interval (periodical check) during transition of power supply status from ACC ON → IGN SW ON (initial check) or with IGN SW ON.
Trouble symptom:
Not all functions operate at IGN ON.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

3. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

   Connector & terminal

   (i75) No. 27 — Chassis ground:

Is the resistance 74.15 — 460.88 Ω? (at 20°C)

Yes	Go to 6.
No	Check IG relay 2. Go to 7.

6. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 28 — Chassis ground:

Is the resistance 50.87 — 72.17 Ω? (at 20°C)

Yes	Go to 8.
No	Check IG relay 1. Go to 7.

7. CHECK RELAY.

Perform unit inspection of IG relay 1 and IG relay 2. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION > CHECK RELAY.

Is the check result OK?

Yes	Go to 8.
No	Replace the relay. Ref. to SECURITY AND LOCKS>Relay and Fuse.

8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 27 (+) — Chassis ground (−):

(i75) No. 28 (+) — Chassis ground (−):

Does the voltage change as 1 V or less → 9.5 — 16 V according to the operation of ACC → IGN ON?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2274 ACC RELAY CONTROL CIRCUIT

DTC detecting condition:

When any of the following conditions is established.

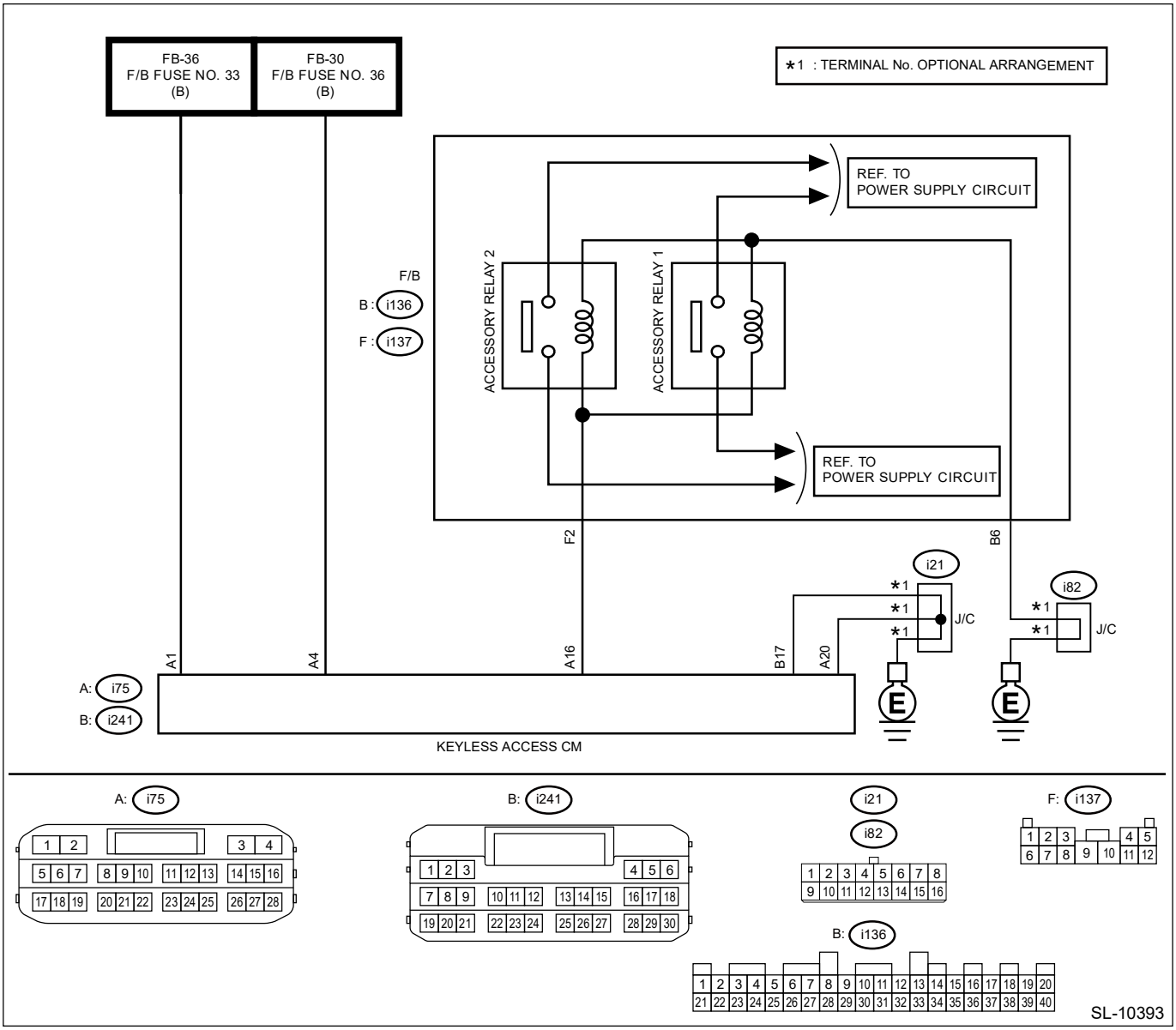
- Both ACC output ON and output circuit monitor result OFF continues for 10 seconds.
- Starter output OFF, output circuit monitor result ON and remote engine starter not under control all continue for 10 seconds.

Trouble symptom:

Each function does not operate at the ACC position.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

3. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

   Connector & terminal

   (i75) No. 16 — Chassis ground:

Is the resistance 152.61 — 216.5 Ω? (at 20°C)

Yes	Go to 7.
No	Go to 6.

6. CHECK RELAY.

Perform inspection of ACC relay unit. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the relay OK?

Yes	Go to 7.
No	Replace the relay.

7. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and the accessory relay (push button start), and between the accessory relay (push button start) and chassis ground.

Connector & terminal

(i75) No. 16 — (i137) No. 2:

(i136) No. 6 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace the open circuit of harness.

8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between keyless access CM connectors.

Connector & terminal

(i75) No. 16 (+) — Chassis ground (−):

Does the voltage change as 1 V or less → 9.5 — 16 V according to the operation of OFF → ACC ON?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2275 ENGINE START REQUEST CONTROL CIRCUIT

DTC detecting condition:

When any of the following conditions is established with ignition switch ON.

- Both starter output ON and output circuit monitor result OFF are successful 3 times in a row.
- Starter output OFF, output circuit monitor result ON and remote engine starter not under control all

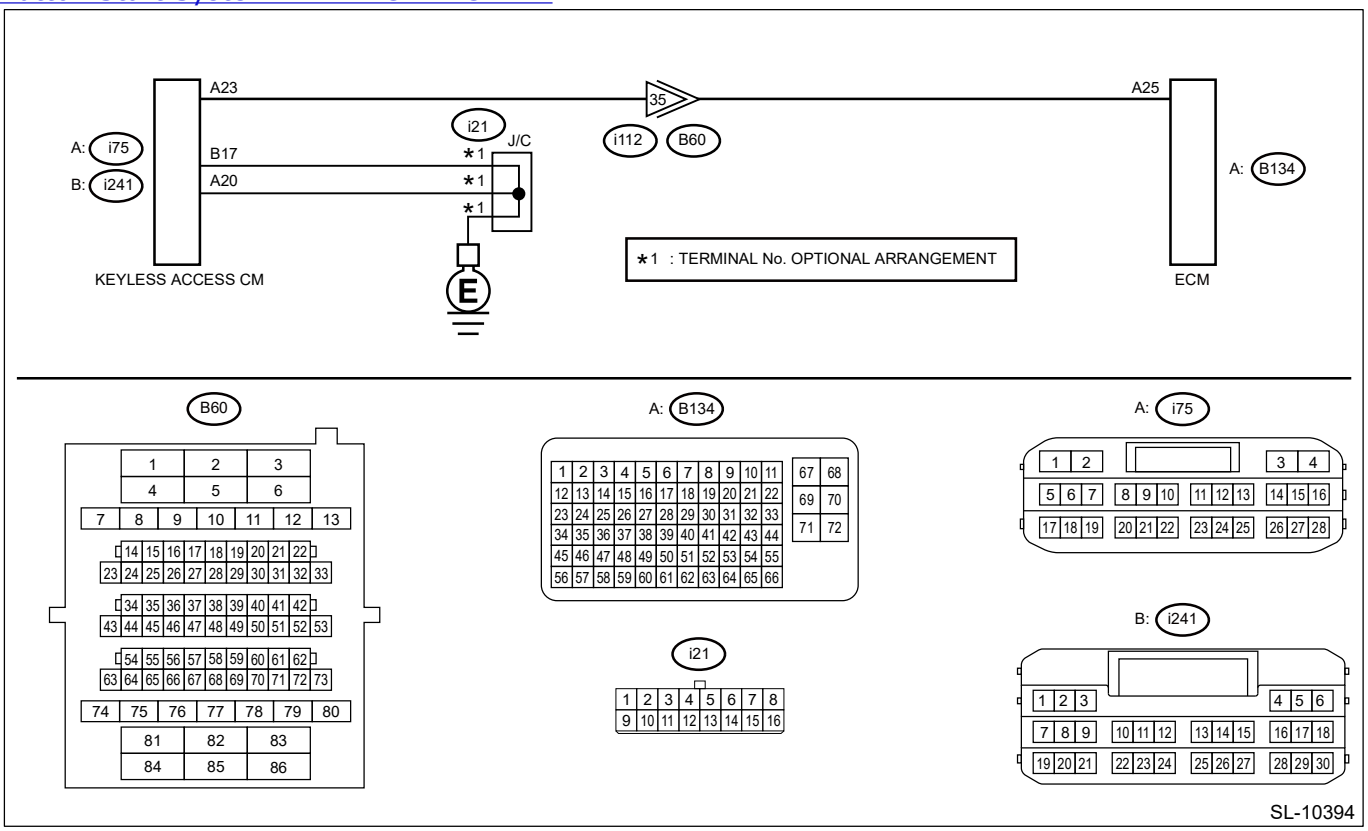
continue for 10 seconds.

Trouble symptom:

Engine will not start.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and ECM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and ECM.
   Connector & terminal
   (i241) No. 23 — (B134) No. 25:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 23 (+) — Chassis ground (−):

Is the voltage 1 V or less?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 23 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 7.
No	Repair or replace the short circuit of the harness.

7. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector and ECM connector.
2. Using a tester, measure the voltage between the terminals of keyless access CM connector.
   Connector & terminal
   (i75) No. 23 (+) — (i175) No. 20 (−):

Does the voltage change as 2 V or less → 9 V or more when the push button ignition switch is turned on while depressing the brake pedal with the shift position in P or N (CVT model) or while depressing clutch pedal (MT model)?

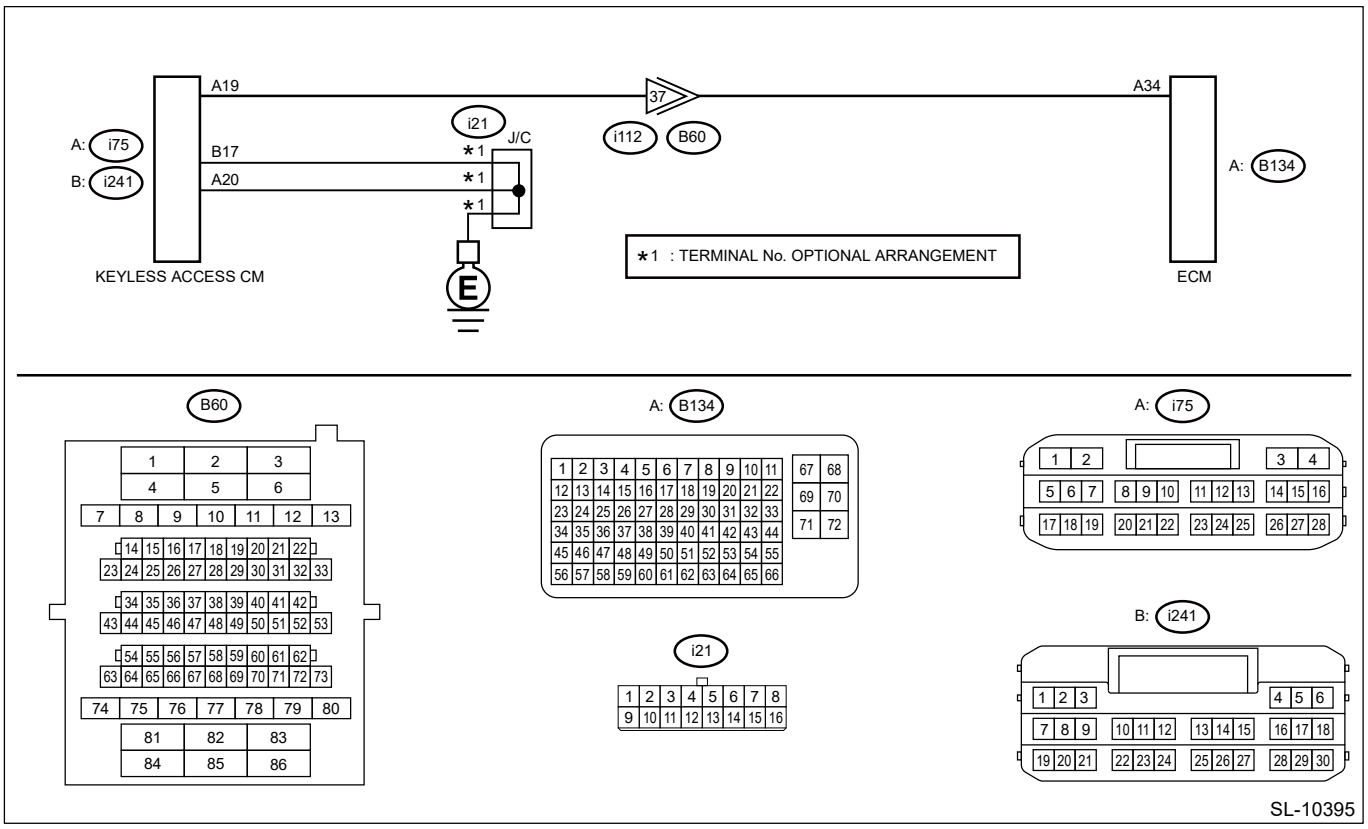
Yes	Perform inspection according to the diagnosis of engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2276 ACC RELAY OFF SIGNAL

DTC detecting condition:
When ACC cut input ON (“L” level) continues for 40 seconds with ignition switch ON.
Trouble symptom:
- The accessory power supply is not cut during engine start.
- Starter rotation is slow.

Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and ECM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and ECM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and ECM.
   Connector & terminal
   (i75) No. 19 — (B134) No. 34:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal
(i75) No. 19 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 (+) — Chassis ground (−):

(i75) No. 20 (+) — Chassis ground (−):

Is the voltage 1 V or less?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector and ECM connector.
2. Using a tester, measure the voltage between terminals of the keyless access CM connector when the push button ignition switch is pressed, while depressing the brake pedal with the shift lever in the "P" range (for CVT model) or while depressing the clutch pedal (for MT model).

   Connector & terminal

   (i75) No. 19 (+) — (i75) No. 20 (−):

Does the voltage show 9.5 — 16 V → 1 V or less?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM)>REMOVAL.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2277 SUBMERGING CIRCUIT

DTC detecting condition:

Submersion circuit monitor result ON continues for 300 seconds.

Trouble symptom:

- The ignition can be turned ON, but cannot be turned OFF.
- Engine will not start.

Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK SUBMERSION CONDITION.

Check the keyless access CM and environment of equipment, and check the harness for any trace of water submersion.

Is there any trace of water submersion?

Yes	Take necessary measures against water submersion and replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B227B PUSH ENGINE START SWITCH INPUT PERFORMANCE

DTC detecting condition:

When any of the following conditions is established.

- Judgment of Switch ON stuck is present. (When any of the following conditions is established)
  1. The status continues for 40 seconds where push button ignition switch input (SSW1 terminal) is ON ("L" level) and push button ignition switch input (SSW2 terminal) is OFF ("H" level).
  2. The status continues for 40 seconds where push button ignition switch input (SSW1 terminal) is OFF ("H" level) and push button ignition switch input (SSW2 terminal) is ON ("L" level).
- Judgment of OFF stuck is present. (When any of the following conditions is established 10 times in a

row)

Only when a series of judgment is continuously made with the same judgment condition under either condition of 1 or 2.

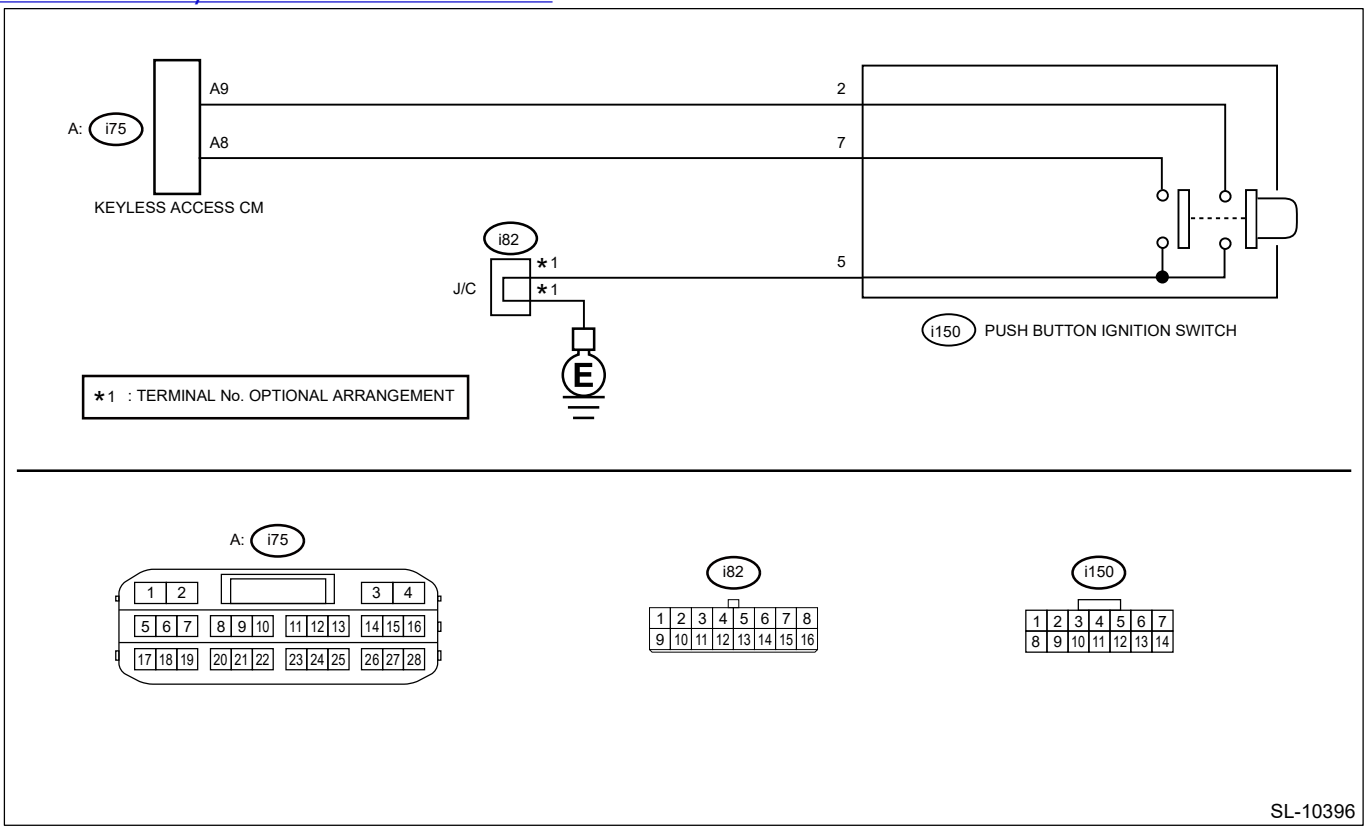
1. Push button ignition switch input (SSW1 terminal) is OFF (“H” level) → ON (“L” level) → OFF, and push button ignition switch input (SSW2 terminal) is OFF (“H” level).
2. Push button ignition switch input (SSW1 terminal) is OFF (“H” level), and push button ignition switch input (SSW2 terminal) is OFF (“H” level) → ON (“L” level) → OFF.

Trouble symptom:

- Power supply cannot be turned ON.
- Power supply cannot be turned OFF.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume.**
- **Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Press the push button ignition switch to perform OFF → ACC ON → IGN ON respectively for one minute.
3. Disconnect and reconnect the keyless access CM connector.
4. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B227B displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the push button ignition switch connector.
2. Disconnect the keyless access CM connector.
3. Using a tester, measure the resistance between the push button ignition switch connector and the keyless access CM connector.
   Connector & terminal
   (i150) No. 2 — (i75) No. 9:
   (i150) No. 7 — (i75) No. 8:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK PUSH BUTTON IGNITION SWITCH UNIT.

Perform individual inspection of the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

Is the check result OK?

Yes	Go to 4.
No	Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Push start SW 1]
- [Push start SW 2]

Is it turned ON when pressing the push button ignition switch?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B227C P RANGE SIGNAL PERFORMANCE

DTC detecting condition:

When any of the following conditions is established for CVT model.

- The status continues for 20 seconds where the ignition switch is ON, and the shift position (P terminal) is in shift P (“L” level), and the shift information on CAN is other than P.
- The status continues for 20 seconds where the ignition switch is ON, and the shift position (P terminal)

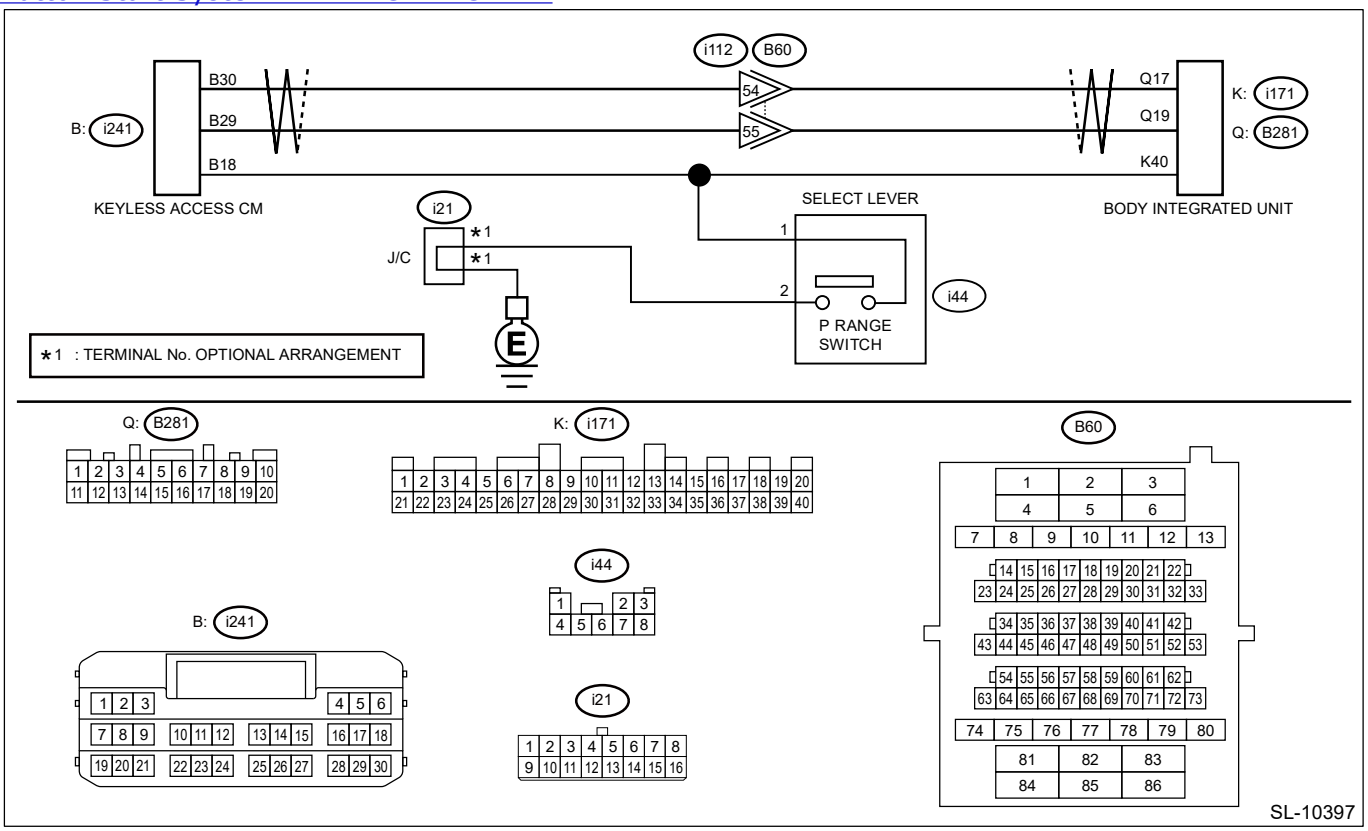
is in other than shift P (“H” level), and the shift information on CAN is P.

Trouble symptom:

- Engine will not start.
- Power supply control cannot be executed.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the “REGISTRATION MANUAL FOR IMMOBILIZER” provided as a separate volume.**
- **Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Turn the IGN switch to ON.
3. Place the shift lever in other than P and leave it for one minute.
4. Disconnect and reconnect the keyless access CM connector.
5. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



Is DTC B227C displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the P range switch connector.
2. Disconnect the keyless access CM connector.
3. Using a tester, measure the resistance between the P range switch connector and the keyless access CM connector.
   Connector & terminal
   (i44) No. 1 — (i241) No. 18:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the P range switch connector.
2. Using a tester, measure the resistance between body integrated unit connector and keyless access CM connector.
   Connector & terminal
   (B281) No. 17 — (i241) No. 30
   (B281) No. 19 — (i241) No. 29

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start].

Data Monitor

- [Shift P signal(AT only)]

Is it turned ON when the shift position is "P"? Is it turned OFF when the shift position is other than "P"?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2282 VEHICLE SPEED SIGNAL CORRELATION

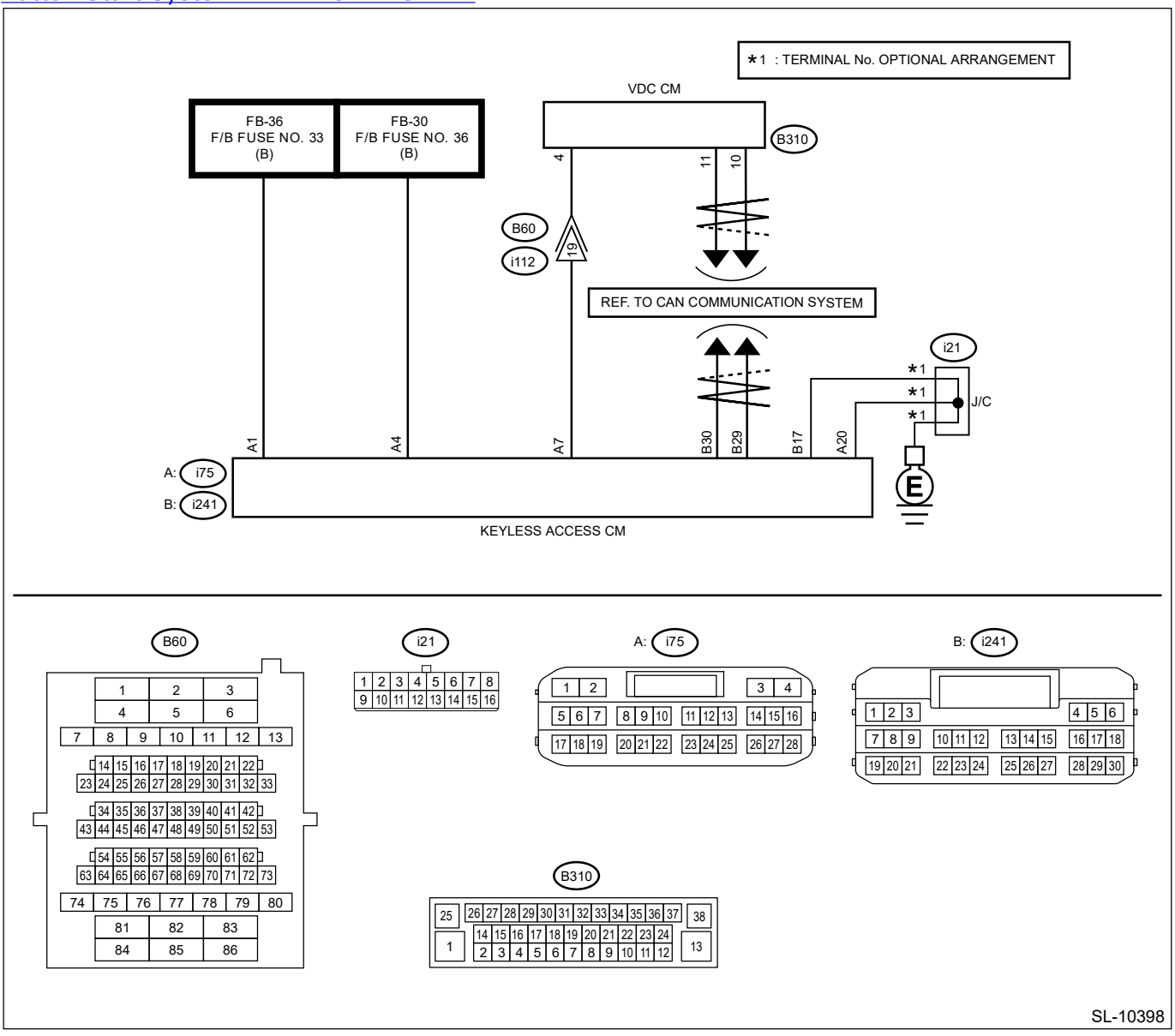
DTC detecting condition:
When any of the following conditions is established with ignition switch ON.
- The status continues for 20 seconds where a vehicle speed signal on direct line is less than 5 km/h and

a vehicle speed signal on CAN is 25 km/h or more.

- The status continues for 20 seconds where a vehicle speed signal on direct line is 25 km/h or more and a vehicle speed signal on CAN is less than 5 km/h.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK COMBINATION METER.

Check that the speedometer is displayed normally.

Is the meter display normal?

Yes	Go to 3.
No	Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Vehicle speed signal]

Is the display normal according to the parked state or driving state?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the combination meter connector.
3. Using a tester, measure the resistance between the keyless access CM connector and VDC CM connector.

Connector & terminal

(i75) No. 7 — (B310) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 7 — Chassis ground:

Is the resistance 30 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK KEYLESS ACCESS CM.

1. Connect each connector.
2. Using an oscilloscope, measure the waveform between the keyless access CM connector and chassis ground.
   Connector & terminal
   (i75) No. 7 — Chassis ground:

Is 3.54 Hz displayed when the vehicle is driven approx. at 5 km/h (3 MPH)? Or does the value change from 3.54 Hz when the vehicle stops?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2283 VEHICLE SPEED SENSOR

DTC detecting condition:

When any of the following conditions is established with ignition switch ON.

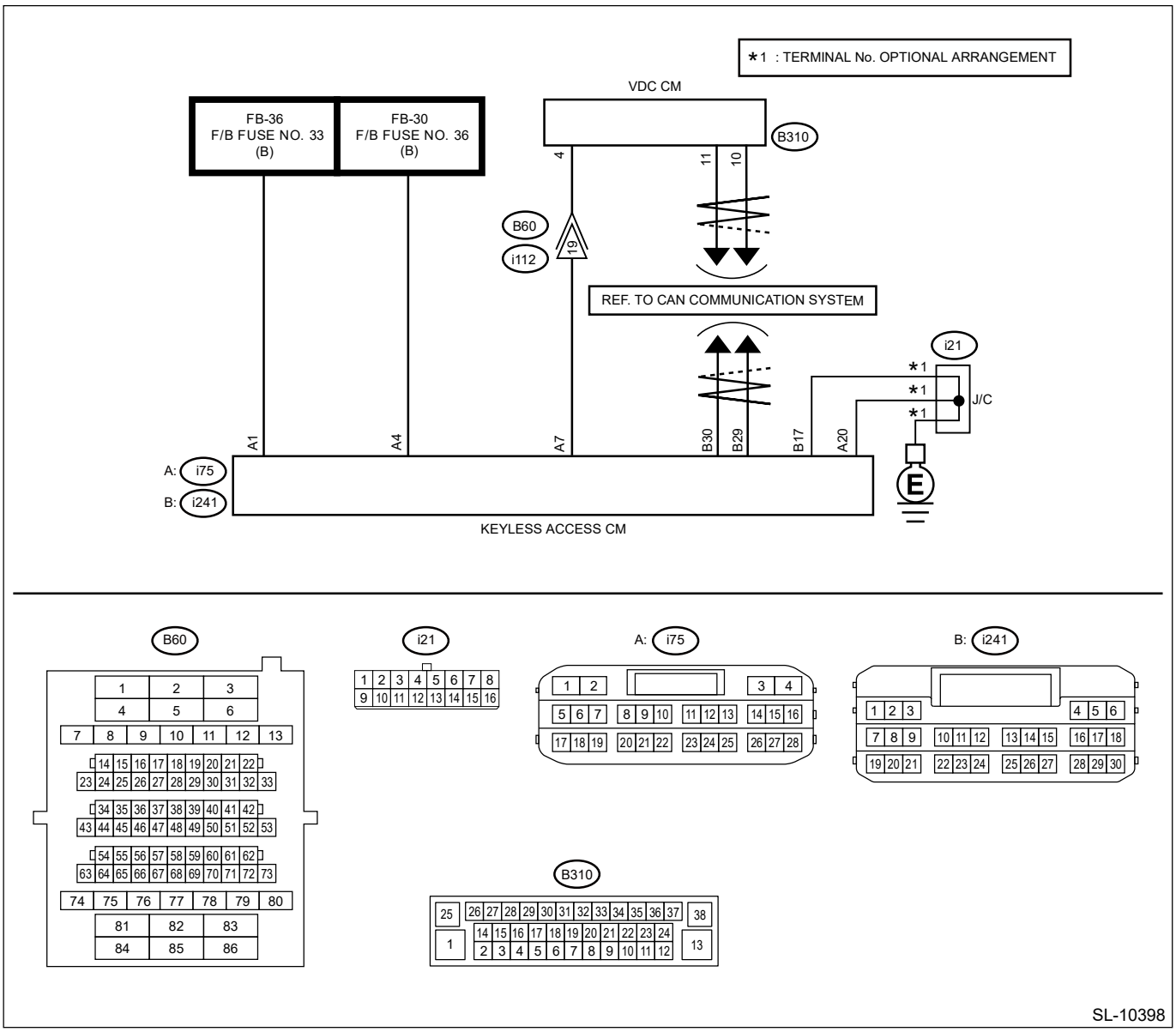
- After the status continues for 10 seconds where a vehicle speed signal on CAN or direct line is 50 km/h or more, the vehicle speed signal on CAN and direct line becomes 0 km/h within one second.
- For CVT model, the status continues for 300 seconds where a vehicle speed signal on CAN and direct line is 0 km/h, or an engine speed signal on CAN or direct line is 2000 rpm or more, and the sift position is in other than P (P-SW or CAN) or N (CAN) range, and accessory cut relay signal input information level is ≈ “L”.
- For MT model, the status continues for 300 seconds where vehicle speed (CAN = 0 km/h and direct line = 0 km/h) and engine speed (CAN or direct line) is equal to or greater than 2000 rpm with clutch SW OFF and accessory cut relay signal input information ≈ “L” level.

Trouble symptom:

The steering lock cannot be released.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK COMBINATION METER.

Check that the speedometer is displayed normally.

Is the check result OK?

Yes	Go to 3.
No	Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Vehicle speed signal]

Is the display normal according to the parked state or driving state?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the combination meter connector.
3. Using a tester, measure the resistance between the keyless access CM connector and VDC CM connector.

Connector & terminal

(i75) No. 7 — (B310) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (SHORT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 7 — Chassis ground:

Is the resistance 30 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK KEYLESS ACCESS CM.

1. Connect each connector.
2. Using an oscilloscope, measure the waveform between the keyless access CM connector and chassis ground.
   Connector & terminal
   (i75) No. 7 — Chassis ground:

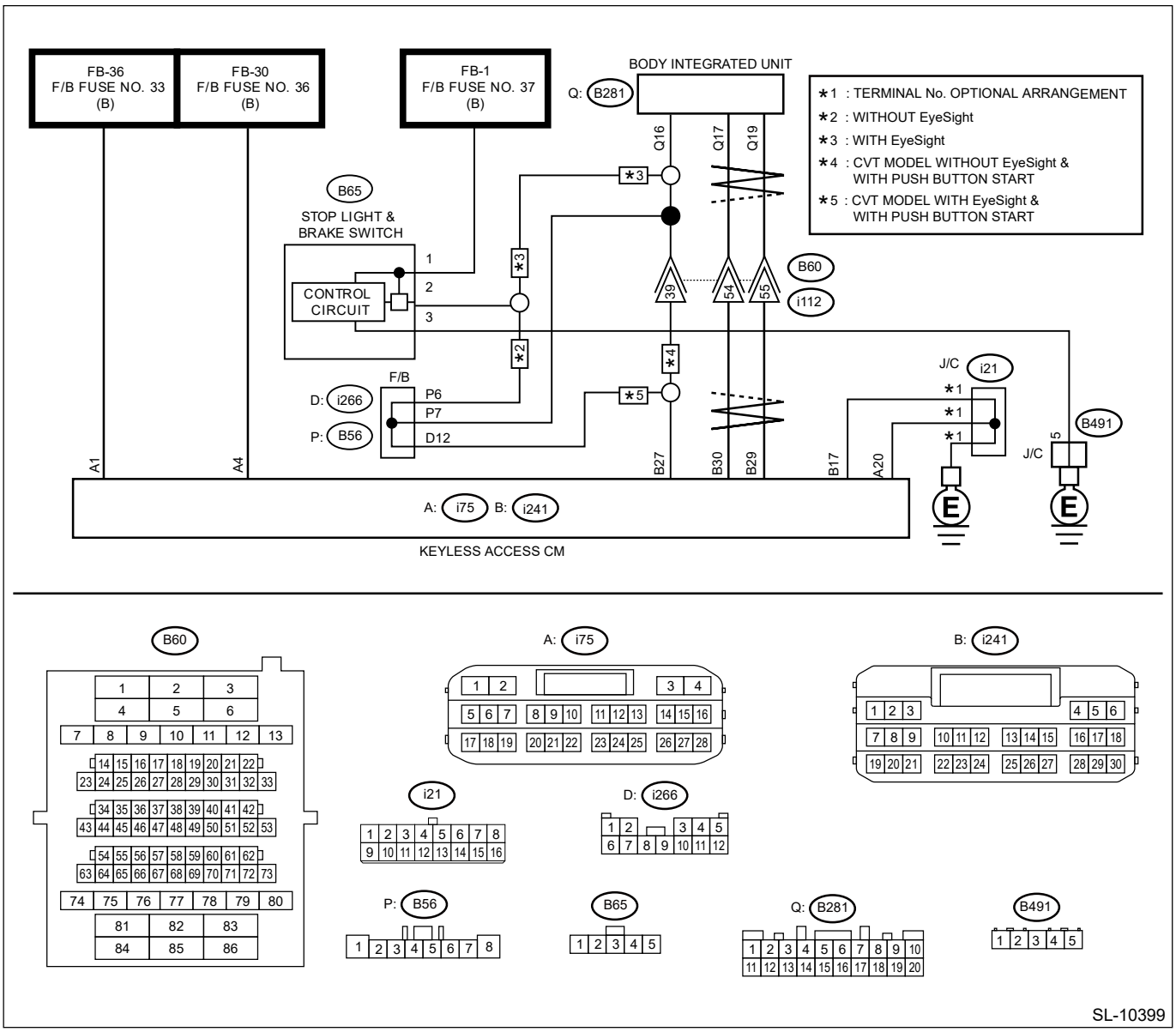
Is 3.54 Hz displayed when the vehicle is driven approx. at 5 km/h (3 MPH)? Or does the value change from 3.54 Hz when the vehicle stops?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Check the VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2284 BRAKE SIGNAL CORRELATION

DTC detecting condition:
For CVT model, the status continues for 20 seconds where brake signals (ON/OFF) between direct line and CAN do not match with ignition switch ON.
Trouble symptom:
If the hard-wired brake signal is faulty, the engine will not start.
Wiring diagram:
Stop light system Ref. to WIRING SYSTEM>Stop Light System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.



- [Stop Light Switch]

Is DTC displayed normally according to the brake pedal operation?

Yes	Go to 3.
No	Check the stop light system.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Data Monitor

- [Stop Light Switch]

Is DTC displayed normally according to the brake pedal operation?

Yes	Go to 4.
No	Check the body integrated unit and the stop light switch circuit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 5.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

5. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 6.
No	Check the power supply circuit.

6. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the stop light switch connector.
2. Using a tester, measure the resistance between the keyless access CM connector and stop light switch connector.

Connector & terminal

(i75) No. 27 — (B65) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace the open circuit of harness.

8. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 27 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 9.
No	Repair or replace the short circuit of the harness.

9. CHECK HARNESS.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the brake pedal is depressed.

Connector & terminal

(i75) No. 27 (+) — Chassis ground (−):

Does the voltage change as follows? Brake pedal not depressed: 1 V or less → Brake pedal depressed: 11 — 14 V

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.
No	Check the power supply circuit of stop light switch.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2285 STEERING LOCK POSITION SIGNAL CORRELATION

DTC detecting condition:

When any of the following conditions is established with ignition switch ON.

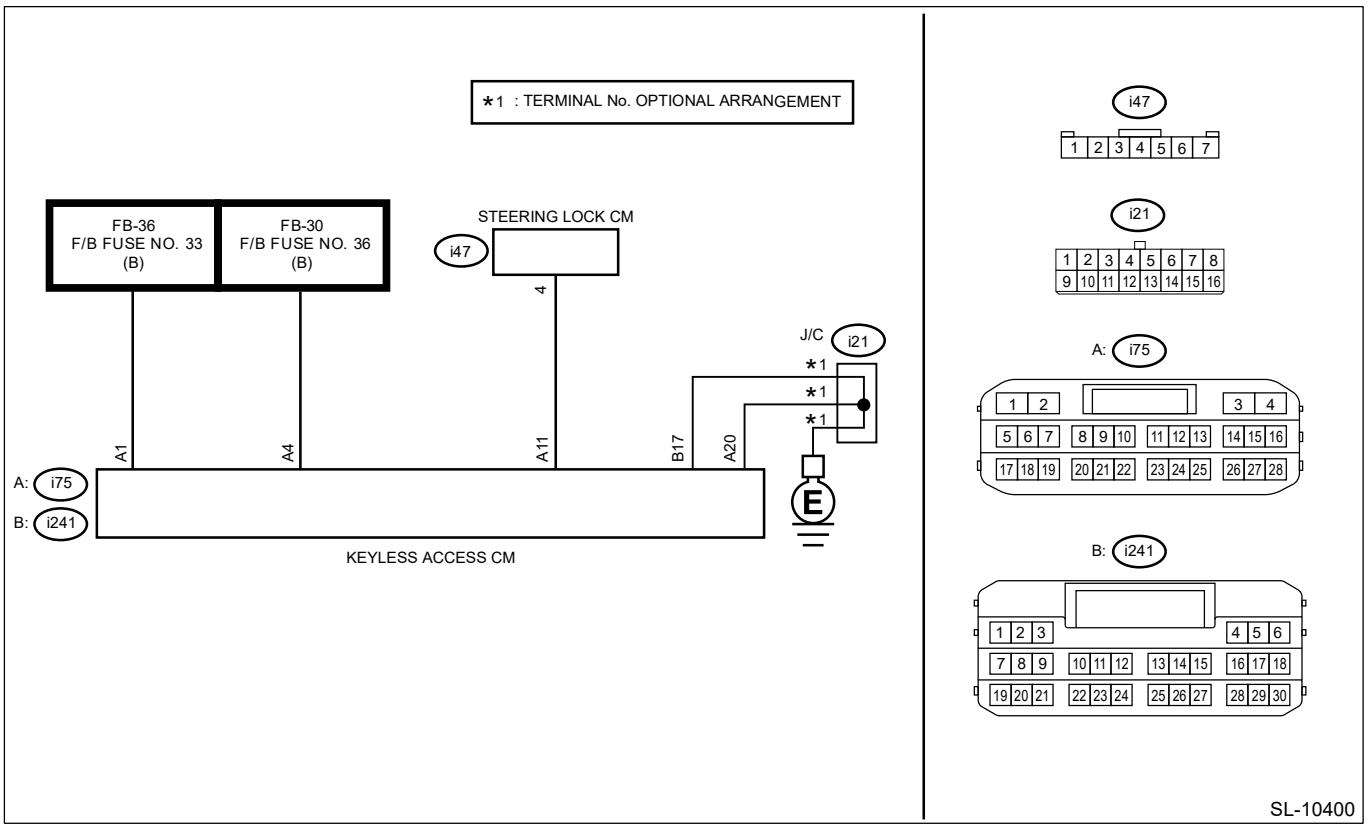
- The status continues for 40 seconds where steering lock position information on direct line is unlock ("L" level), and steering lock position information on LIN communication is other than unlock.
- The status continues for 40 seconds where steering lock position information on direct line is other than unlock ("H" level), and steering lock position information on LIN communication is unlock.

Trouble symptom:

- There are conditions when the steering lock is not released.
- Engine will not start.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B2785. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
No	Go to 3.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.



When locked:
- [Lock side sensor status]: ON
- [Unlock side sensor status]: OFF
- [Lock confirmation]: Set
- [Unlock confirmation]: Unconfirmed

When unlocked:
- [Lock side sensor status]: OFF
- [Unlock side sensor status]: ON
- [Lock confirmation]: Unconfirmed
- [Unlock confirmation]: OK

Note:
To lock the steering lock, turn off the power, and open → close, or close → open the driver's door. To unlock the steering lock, turn the ignition switch to ACC ON or IGN ON.

Is the display shown as above according to the steering lock status?

Yes	Go to 4.
No	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.



When locked:
- [Steering unlock SW]: OFF

When unlocked:
- [Steering unlock SW]: ON

Note:
To lock the steering lock, turn off the power, and open → close, or close → open the driver's door. To unlock the steering lock, turn the ignition switch to ACC ON or IGN ON.

Is the display shown as above according to the steering lock status?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.
No	Go to 5.

5. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

6. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between keyless access CM connectors.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 7.
No	Check the power supply circuit.

7. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 8.
No	Repair or replace the open circuit of harness.

8. CHECK STEERING LOCK CM.

Using a tester, measure the resistance between the steering lock CM connector and chassis ground.

Connector & terminal

(i47) No. 4 — Chassis ground:

Does the following occur? Steering lock: 10 kΩ or more → Steering unlock: less than 1 Ω

Yes	Go to 9.
No	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.

9. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the steering lock CM connector.
3. Using a tester, measure the resistance between the keyless access CM connector and steering lock CM connector.

   Connector & terminal

   (i75) No. 11 — (i47) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 10.
No	Repair or replace the open circuit of harness.

10. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 11 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.
No	Repair or replace the short circuit of the harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2286 ENGINE SPEED SIGNAL(WITHOUT AUTO START STOP)

DTC detecting condition:

For model without Auto Start Stop, when any of the following conditions continues for 20 seconds with ignition switch ON.

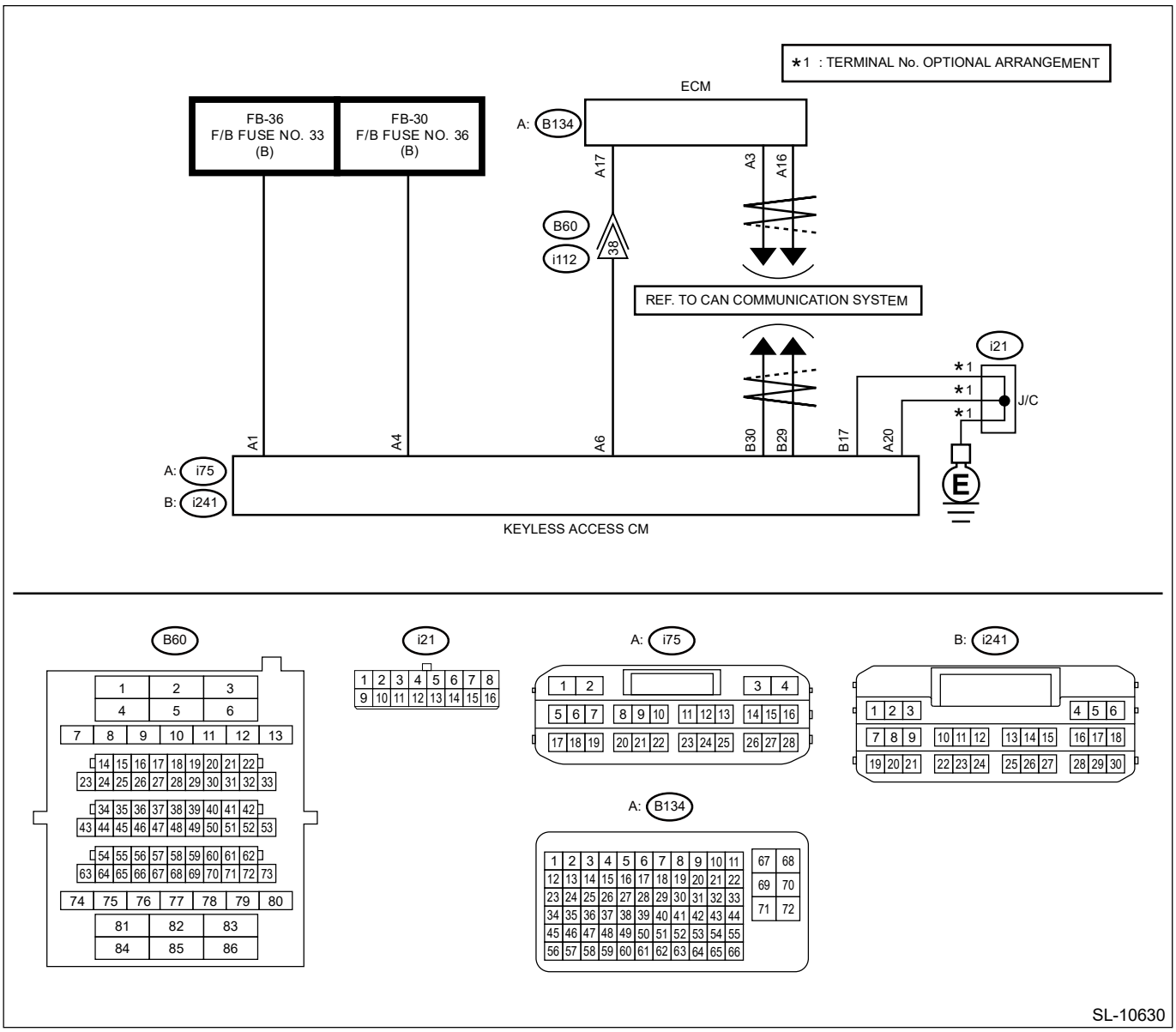
- Engine speed signal on direct line is more than 200 rpm, and engine speed signal on CAN is 1000 rpm or less.
- Engine speed signal on direct line is 1000 rpm or more, and engine speed signal on CAN is less than 200 rpm.

Trouble symptom:

Cannot start the engine, or the engine stops after starting.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK COMBINATION METER.

Confirm that the speedometer is displayed normally.

Is combination meter display OK?

Yes	Go to 3.
No	Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Engine Speed]

Can the data be read normally?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the ECM connector.
3. Using a tester, measure the resistance between the keyless access CM connector and ECM connector.

Connector & terminal

(i241) No. 6 — (B134) No. 17:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 6 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK HARNESS.

1. Connect the keyless access CM connector and ECM connector.
2. Using an oscilloscope, measure the waveform between the keyless access CM connector and chassis ground.

   Connector & terminal

   (i75) No. 6 — Chassis ground:

Does the pulse stop when the engine is stopped, and does the pulse generate when the engine is started?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B228A ENGINE SPEED SIGNAL(WITH AUTO START STOP)

DTC detecting condition:

For model with Auto Start Stop, when any of the following conditions continues for 20 seconds with ignition switch ON.

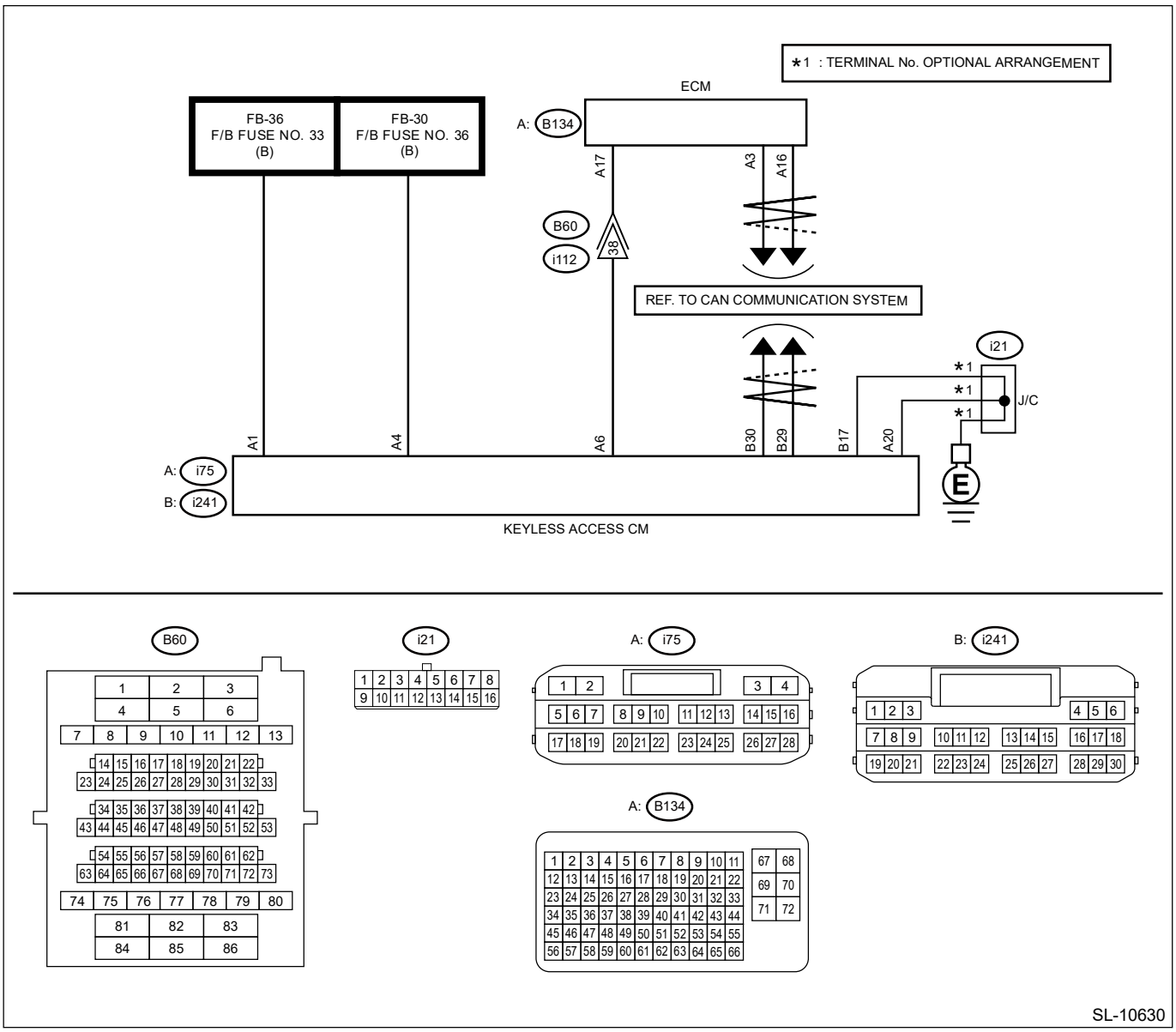
- Engine speed signal on direct line is more than 200 rpm, and engine speed signal on CAN is 1000 rpm or less.
- Engine speed signal on direct line is 1000 rpm or more, and engine speed signal on CAN is less than 200 rpm.

Trouble symptom:

Cannot start the engine, or the engine stops after starting.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK COMBINATION METER.

Confirm that the speedometer is displayed normally.

Is combination meter display OK?

Yes	Go to 3.
No	Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Engine Speed]

Can the data be read normally?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the ECM connector.
3. Using a tester, measure the resistance between the keyless access CM connector and ECM connector.

Connector & terminal

(i75) No. 6 — (B134) No. 17:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 6 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK HARNESS.

1. Connect the keyless access CM connector and ECM connector.
2. Using an oscilloscope, measure the waveform between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 6 — Chassis ground:

Does the pulse stop when the engine is stopped, and does the pulse generate when the engine is started?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Perform the diagnosis for the engine. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION

DTC detecting condition:

When any of the following conditions is established regarding remote control engine starter registration or remote control engine starter operation.

- No response is obtained from remote control engine starter (including retry).
- Cryptographic communication does not match with remote control engine starter (including retry).

Trouble symptom:

Remote engine starter does not function.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.

1. REGISTER THE REMOTE ENGINE STARTER.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Register the remote engine starter using the Subaru Select Monitor. (Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.)
Note:
When the registration failed, refer to "Correspondence table when registration is not possible" in the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.
3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2779 displayed? (Current malfunction)

Yes	Replace the remote engine starter.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2781 STEERING LOCK CM CONTROL CIRCUIT

DTC detecting condition:
When any of the following conditions is established.
- Steering lock position (inside steering lock CM) sensor malfunction
- Steering lock motor driver (inside steering lock CM) short circuit malfunction
- Steering lock motor driver (inside steering lock CM) open circuit malfunction

Trouble symptom:
- The steering lock cannot be released.
- Engine will not start.

Caution:

- **For replacement procedure of steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

Note:

When all ECMs connected to collation system LIN bus cannot communicate with the keyless access CM, DTC B2785 is output. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.

1. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2785 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B2785. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
No	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2782 STEERING LOCK DRIVE REQUEST SIGNAL CORRELATION

DTC detecting condition:

When any of the following conditions is established.

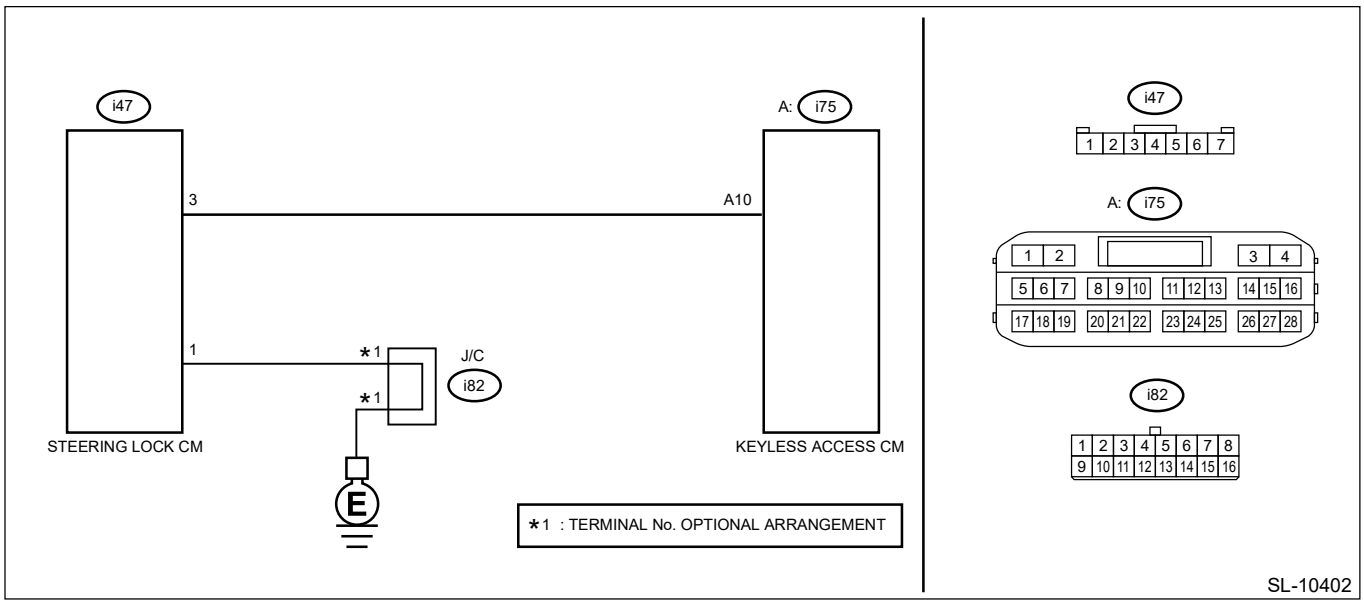
- Motor power supply terminal (SLR+terminal) short circuit malfunction
- Motor power supply terminal (SLR+terminal) open circuit malfunction

Trouble symptom:

- The steering lock cannot be released.
- Engine will not start.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the steering lock CM connector.
2. Using a tester, measure the resistance between the steering lock CM connector and chassis ground.

   Connector & terminal

   (i47) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair or replace the open circuit of harness.

2. CHECK STEERING LOCK CM.

1. Connect the steering lock CM connector.
2. Set to ACC OFF, IGN OFF, and shift position P.
3. Using a tester, open the door, and measure the voltage between terminals of steering CM connector when the steering lock motor is driven.

   Connector & terminal

   (i47) No. 3 (+) — (i47) No. 1 (−):

Does the voltage change as follows? When steering lock motor is in operation, 1 V or less → When steering lock motor is not in operation, 11 — 14 V

Yes	Go to 3.
No	Go to 4.

3. CHECK DTC.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF.
4. Disconnect the battery ground cable and reconnect it, and then clear the abnormal information displayed on [Data Monitor].
5. Turn the ignition switch to ON.
6. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2782 displayed? (Current malfunction)

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

4. CHECK CONNECTOR.

1. Disconnect the steering lock CM connector.
2. Disconnect the keyless access CM connector.
3. Check each connector.

Is the check result OK?

Yes	Go to 5.
No	Repair or replace the connector.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between steering lock CM connector and keyless access CM connector.

Connector & terminal

(i75) No. 10 — (i47) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(B574) No. 29 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the short circuit of the harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH)

DTC detecting condition:

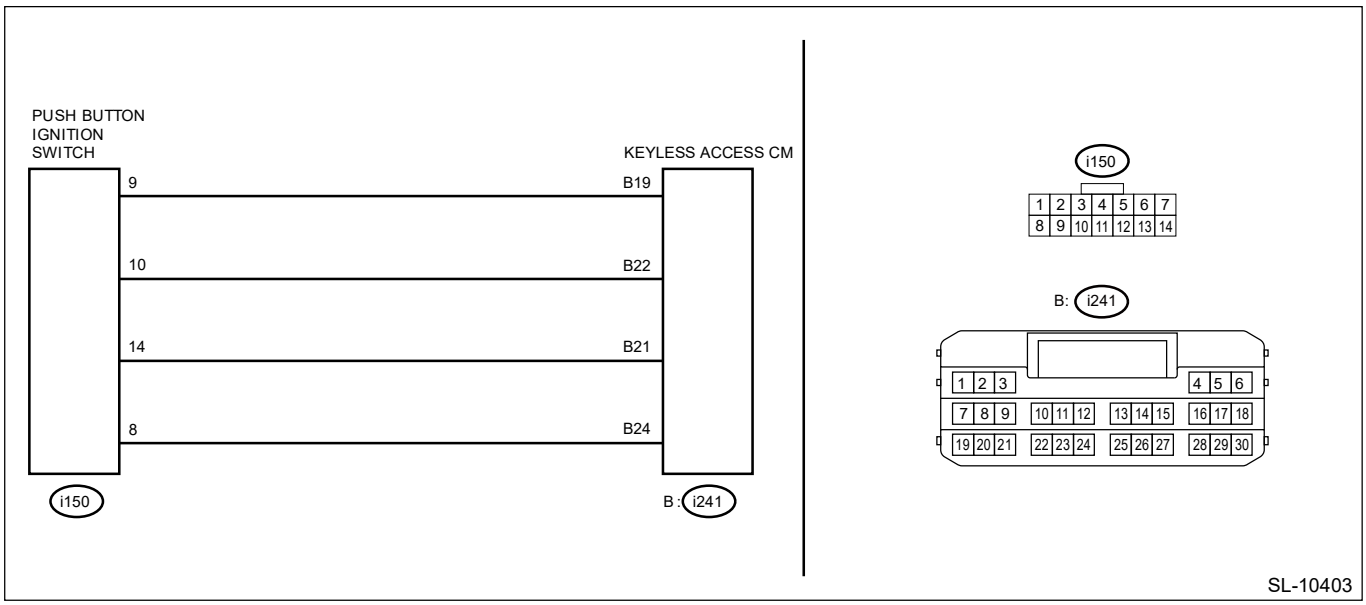
When data of Abnormal antenna coil is received from transponder key amplifier by keyless access CM via transponder communication (communication between keyless access CM - push button ignition SW) during initial operation of transponder collation.

Trouble symptom:

The keyless access function may not be operable.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System.



Caution:

- **For replacement procedure of keyless access CM and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK STEERING LOCK CM.

1. Disconnect the push button ignition switch connector.
2. Disconnect the keyless access CM connector.
3. Using a tester, measure the resistance between the push button ignition switch connector and the keyless access CM connector.

   Connector & terminal

   (i150) No. 9 — (i241) No. 19:
   (i150) No. 10 — (i241) No. 22:
   (i150) No. 14 — (i241) No. 21:
   (i150) No. 8 — (i241) No. 24:

Is the resistance less than 1 Ω?

Yes	Go to 2.
No	Repair or replace the open circuit of harness.

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the push button ignition switch connector and chassis ground.

Connector & terminal

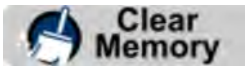
(i150) No. 14 — Chassis ground:
(i150) No. 9 — Chassis ground:
(i150) No. 10 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 3.
No	Repair or replace the short circuit of the harness.

3. CHECK PUSH BUTTON IGNITION SWITCH.

1. Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2784 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Malfunction occurred in the push button ignition switch.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2785 LIN COMMUNICATION

DTC detecting condition:

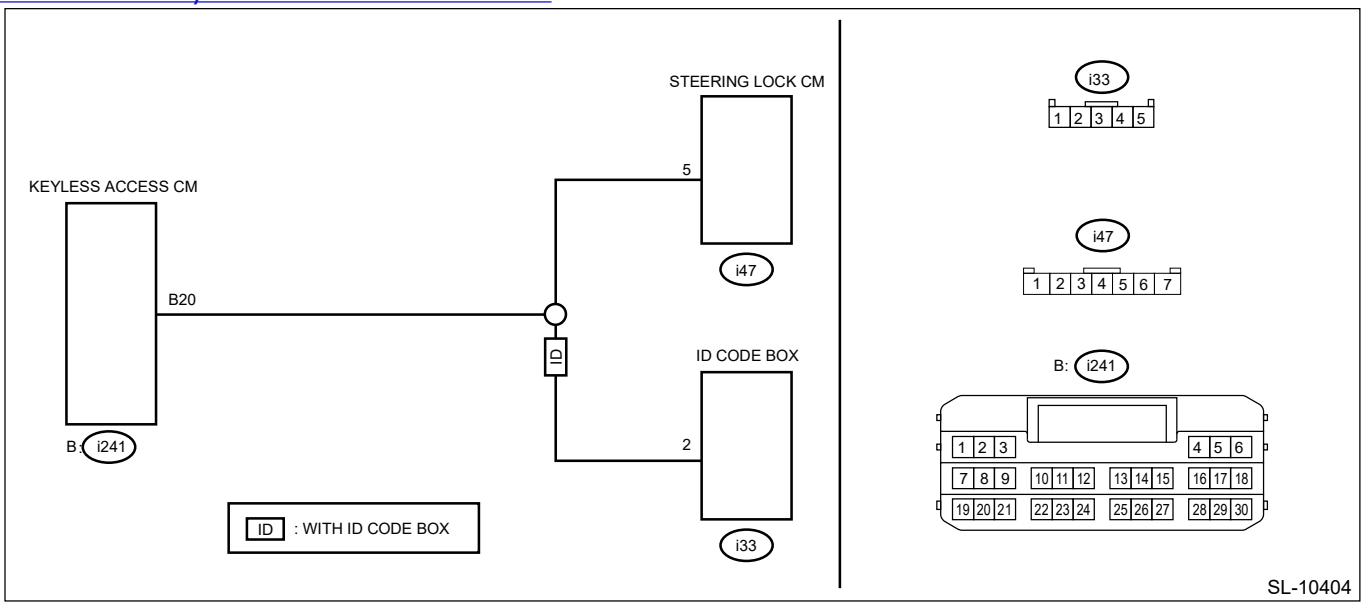
When LIN communication error is detected 3 times in a row.
(Communication cannot be received because a problem occurs such as a series of noise continuously generated in LIN communication bus during power supply or ground short circuit in LIN communication bus)

Trouble symptom:

The keyless access function may not be operable.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (BETWEEN KEYLESS ACCESS CM AND STEERING LOCK CM).

1. Disconnect the ground cable from battery.
2. Disconnect the keyless access CM connector.
3. Disconnect the steering lock CM connector.
4. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i241) No. 20 — (i47) No. 5:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector or steering lock CM connector and chassis ground.

Connector & terminal

(i241) No. 20 — Chassis ground:

(i47) No. 5 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Using a tester, measure the voltage between the keyless access CM connector or steering lock CM connector and chassis ground.

Connector & terminal

(i241) No. 20 — Chassis ground:

(i47) No. 5 — Chassis ground:

Is the voltage 1 V or less?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK HARNESS (BETWEEN KEYLESS ACCESS CM AND ID CODE BOX).

1. Disconnect the ID code box connector.
2. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i241) No. 20 — (i33) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 7.

7. CHECK STEERING LOCK CM.

1. Connect the steering lock CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed? (Current malfunction)

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Go to 8.

8. CHECK ID CODE BOX.

1. Connect the ID code box connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



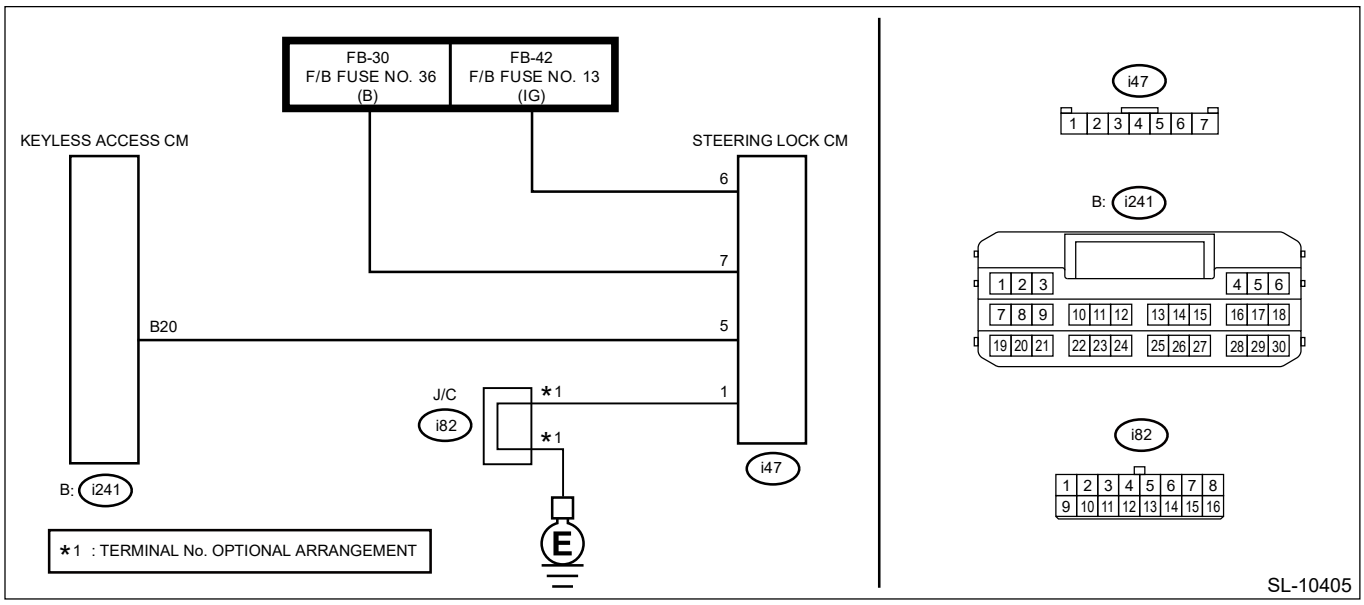
Is DTC B2785 displayed? (Current malfunction)

Yes	Replace the ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2786 STEERING LOCK CM COMMUNICATION

DTC detecting condition:
When LIN transmission frame is received from steering lock CM once, but cannot be received for 10 seconds in a row during LIN bus Wake-up.
Trouble symptom:
The steering lock cannot be released.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are DTCs other than DTC B2786 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTCs other than B2786. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the steering lock CM connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i241) No. 20 — (i47) No. 5:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM and chassis ground.

Connector & terminal

(i241) No. 20 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the steering lock CM connector and chassis ground.

Connector & terminal

(i47) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS.

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the steering lock CM connector and chassis ground.
   Connector & terminal
   (i47) No. 6 (+) — Chassis ground (−):
   (i47) No. 7 (+) — Chassis ground (−):

Is the voltage 11 — 14 V?

Yes	Go to 6.
No	Repair or replace the faulty portion of the power supply circuit.

6. CHECK STEERING LOCK CM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 7.

7. CHECK STEERING LOCK CM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



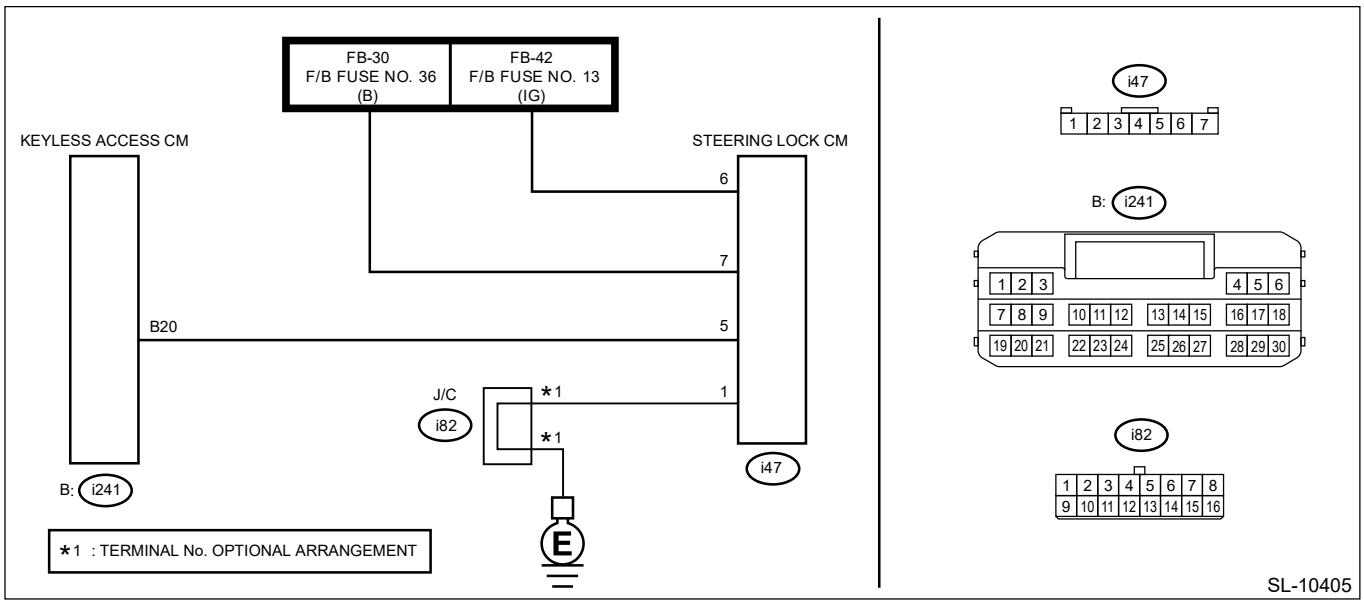
Is DTC B2786 displayed? (Current malfunction)

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2788 IGN SIGNAL CORRELATION (STEERING LOCK CM)

DTC detecting condition:
When one second elapses while the ignition switch status is not compatible between LIN communication and direct line.
Trouble symptom:
The steering lock cannot be released.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [IGN SW]

Is the display normal according to the ignition switch operation?

Yes	Go to 3.
No	Go to 5.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the steering lock CM connector.
2. Using a tester, measure the resistance between the steering lock CM connector and chassis ground.
   Connector & terminal
   (i47) No. 1 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS.

1. Connect the steering lock CM connector.
2. Using a tester, measure the voltage between the steering lock CM connector terminals.
   Connector & terminal
   (i47) No. 6 (+) — (i47) No. 1 (−):

Is the voltage 11 — 14 V with IG ON?
Is the voltage less than 1 V with IG OFF?

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Check the DC power supply circuit.

5. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

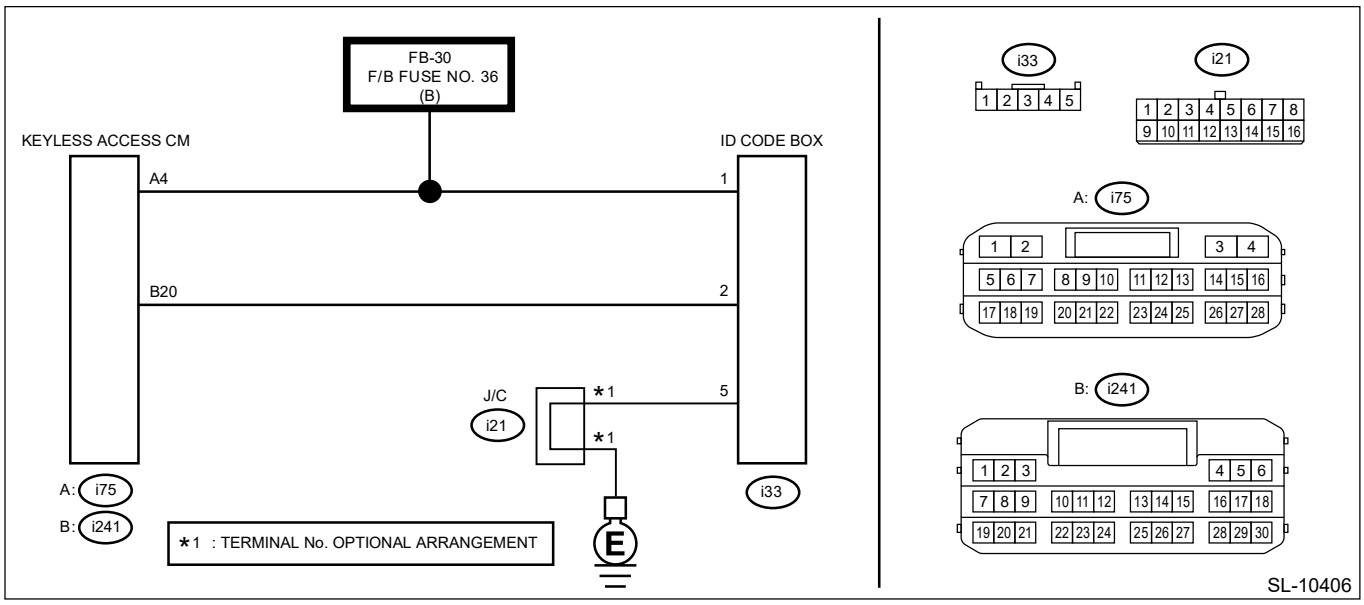
Is DTC B2271 displayed? (Current malfunction)

Yes	Perform the diagnosis of DTC B2271. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2271 IGN RELAY CONTROL CIRCUIT.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2789 ID CODE BOX COMMUNICATION

DTC detecting condition:
When LIN transmission frame is received from ID code BOX once, but cannot be received for 10 seconds in a row during LIN bus Wake-up.
Trouble symptom:
Engine will not start.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM and ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.

   Clear Memory

2. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   DTC Check

Is DTC B2789 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 20 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 3.
No	Repair or replace the short circuit of the harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the ID code box connector.
2. Using a tester, measure the resistance between the keyless access CM connector and the ID code box connector.

Connector & terminal

(i241) No. 20 — (i33) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between ID code box connector and chassis ground.

Connector & terminal

(i33) No. 5 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS.

Using a tester, measure the voltage between ID code box connector and chassis ground.

Connector & terminal

(i33) No. 1 (+) — Chassis ground (−):

Is the voltage 11 — 14 V?

Yes	Go to 6.
No	Repair or replace the faulty portion of the power supply circuit.

6. CHECK ID CODE BOX.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2785 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 7.

7. CHECK STEERING LOCK CM.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2789 displayed? (Current malfunction)

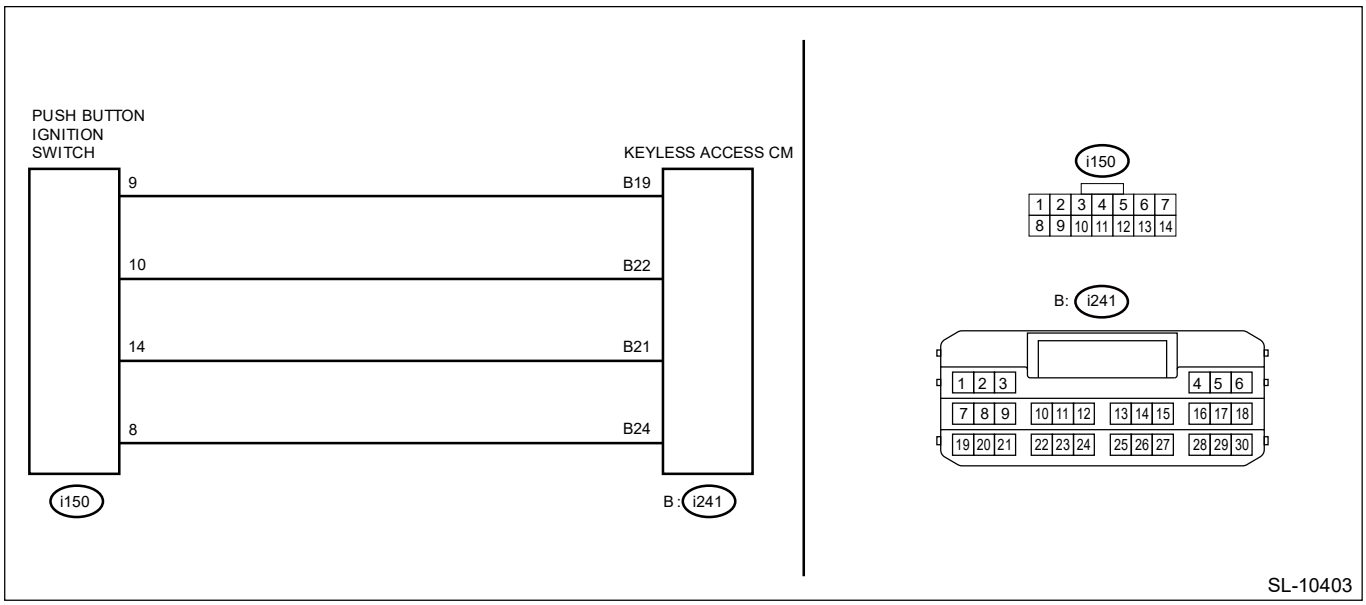
Yes	Replace the ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT

DTC detecting condition:
Short circuit to ground in transponder power supply (VC5 terminal) at initial operation of transponder collation.
(determined as short circuit to ground when judged as “L” level for transponder power supply (VC5 terminal) by monitoring transponder power supply (VC5 terminal) output level inside keyless access CM at “H” level output.)
Trouble symptom:
- Engine will not start.
- The keyless access with push button start system function does not operate.

Wiring diagram:
Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

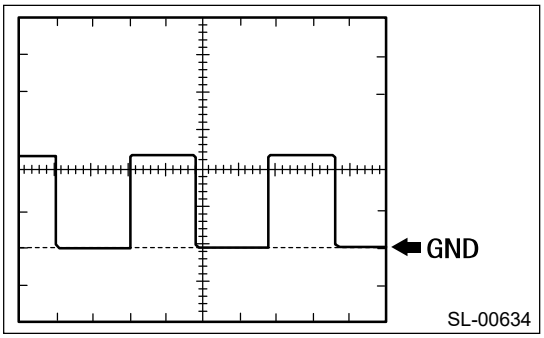
- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK KEYLESS ACCESS CM.

1. Turn the ignition switch to OFF.
2. Take the access key out of the passenger room.
3. Using an oscilloscope, measure the waveform between the push button ignition switch connectors. (waveform within 30 seconds after push button ignition switch is pressed)

Connector & terminal

(i150) No. 14 — (i150) No. 8:



Is a waveform as above displayed?

Yes	Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch.
No	Go to 2.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the push button ignition switch connector.
3. Using a tester, measure the resistance between the push button ignition switch connector and the keyless access CM connector.

Connector & terminal

(i150) No. 14 — (i241) No. 21:

(i150) No. 8 — (i241) No. 24:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 21 — Chassis ground:

(i241) No. 24 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B278A displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B278B CAN CONTROL MODULE STUCK

DTC detecting condition:

When incompatible state is detected two times in a row in every Wake-up of microcomputer, after detecting incompatible state between written data and read-out data to/from register for CAN check after resetting.

(When incompatible state is detected three times in a row which consist of one time at resetting + two times at Wake-up of microcomputer)

Trouble symptom:

The operation is performed with information of the last value as right, but basically the system operation is deactivated.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B278D ID CODE BOX JUDGMENT CIRCUIT

DTC detecting condition:

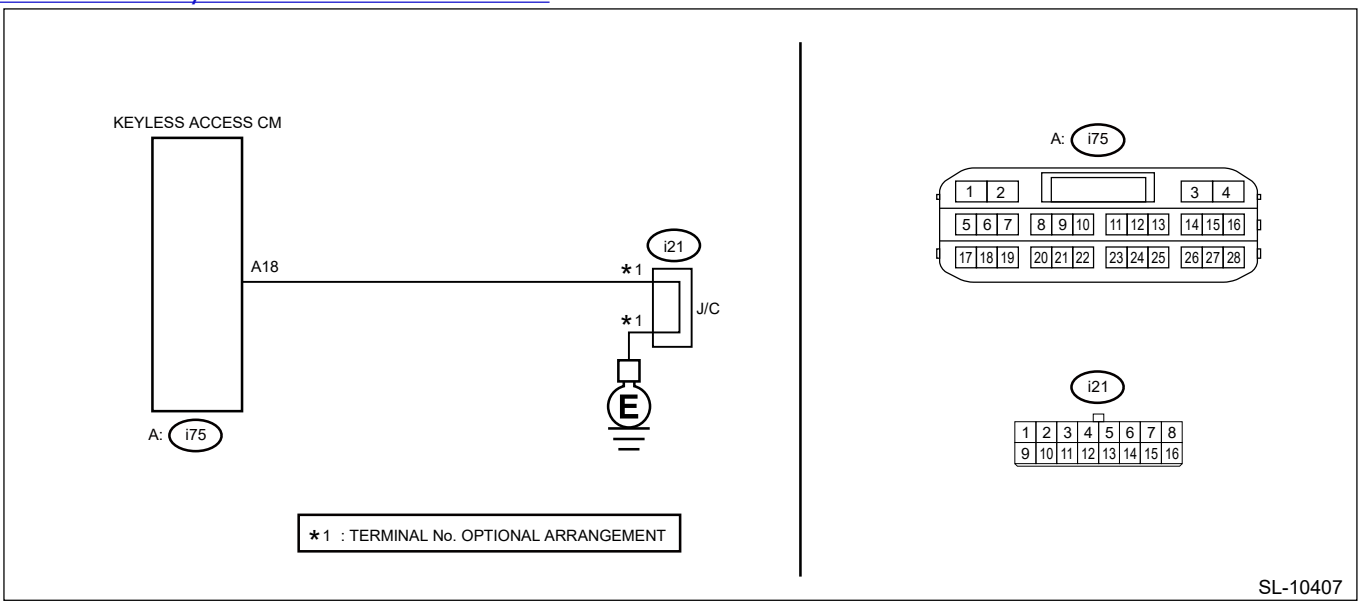
When there is no connection of harness for ID code BOX presence judgment and ID code BOX LIN response is present while keyless access CM has no key registration.

Trouble symptom:

Initial registration for the access key is not possible.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF → ON.
4. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B278D displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Measure the resistance between keyless access CM connector and chassis ground.
   Connector & terminal
   (i75) No. 18 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the short circuit of the harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

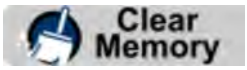
DTC B2790 ID CODE BOX CIRCUIT

DTC detecting condition:
When EEPROM cannot be written in or readout response is absent.
Trouble symptom:
Engine will not start.
Caution:

- **For replacement procedure of ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF → ON.
4. Register the ID code box. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.
5. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2790 displayed? (Current malfunction)

Yes	Replace the ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
No	ID code box registration was not performed properly.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

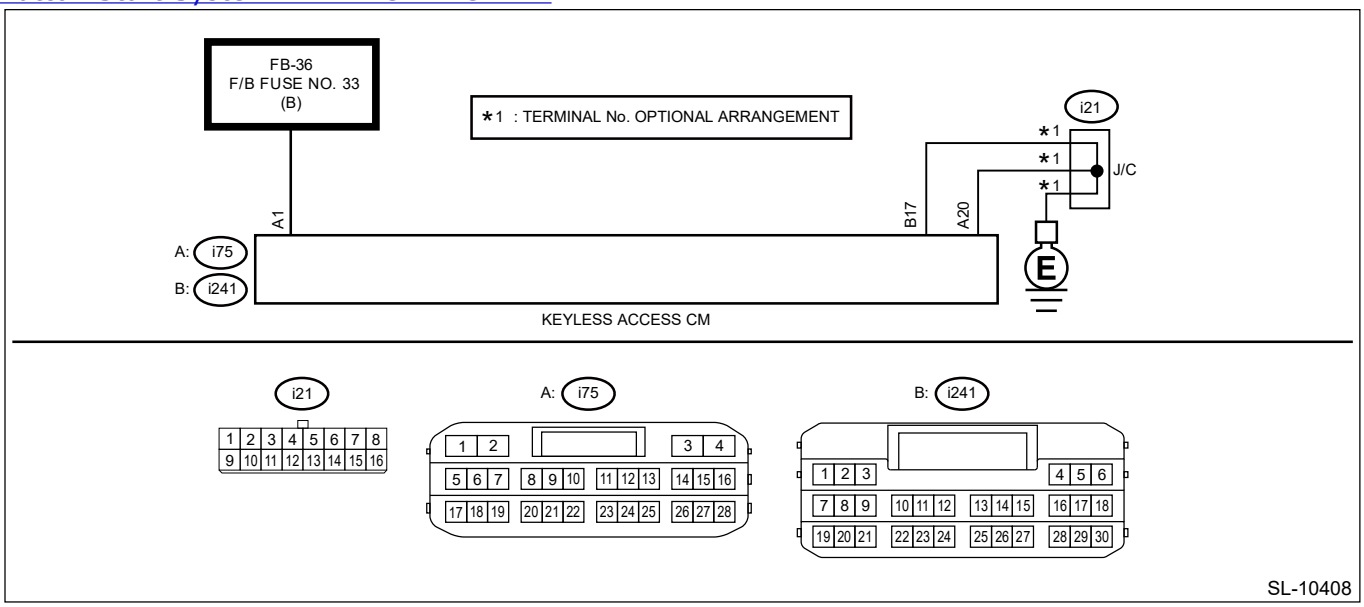
DTC B2793 BACKUP POWER

DTC detecting condition:
When backup power supply input is less than 8.5 V continuously for 10 seconds with ignition switch ON. (Voltage check is executed every one second)
Trouble symptom:

- Entry cannot be made.
- Power supply control cannot be executed.

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Control Module Voltage(Backup)]

Is [ON] displayed?

Yes	Go to 2.
No	Go to 3.

2. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



2. Start the engine, and let it idle for 40 seconds or more.
3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2793 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 4.
No	Replace the fuse. When the replaced fuse is blown immediately, check the power supply circuit for short-circuited.

4. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.
   Connector & terminal
   (i241) No. 1 (+) — Chassis ground (−):

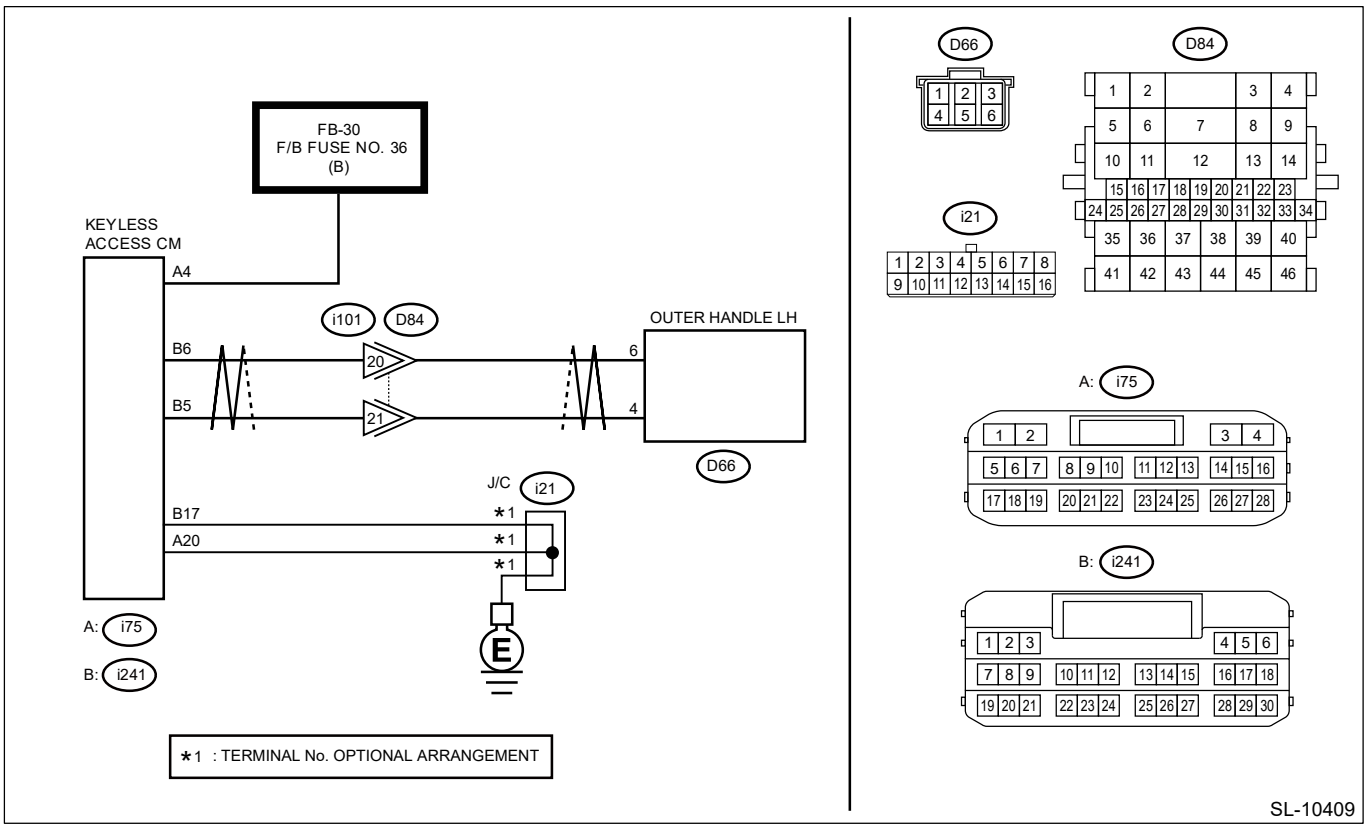
Is the voltage 9.5 — 16 V?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the open circuit of harness.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A1 DRIVER SIDE EXTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and driver's side front door outer handle.
Trouble symptom:
The keyless access with push button start system does not operate.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the front door outer handle connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and front door outside handle connector, and between keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 5 — (D66) No. 4:
(i241) No. 6 — (D66) No. 6:
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 5 — Chassis ground:

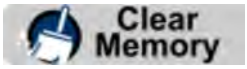
(i241) No. 6 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B27A1 displayed? (Current malfunction)

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK FRONT DOOR OUTER HANDLE.

1. Replace the driver's side front door outer handle with the passenger's front door outer handle.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



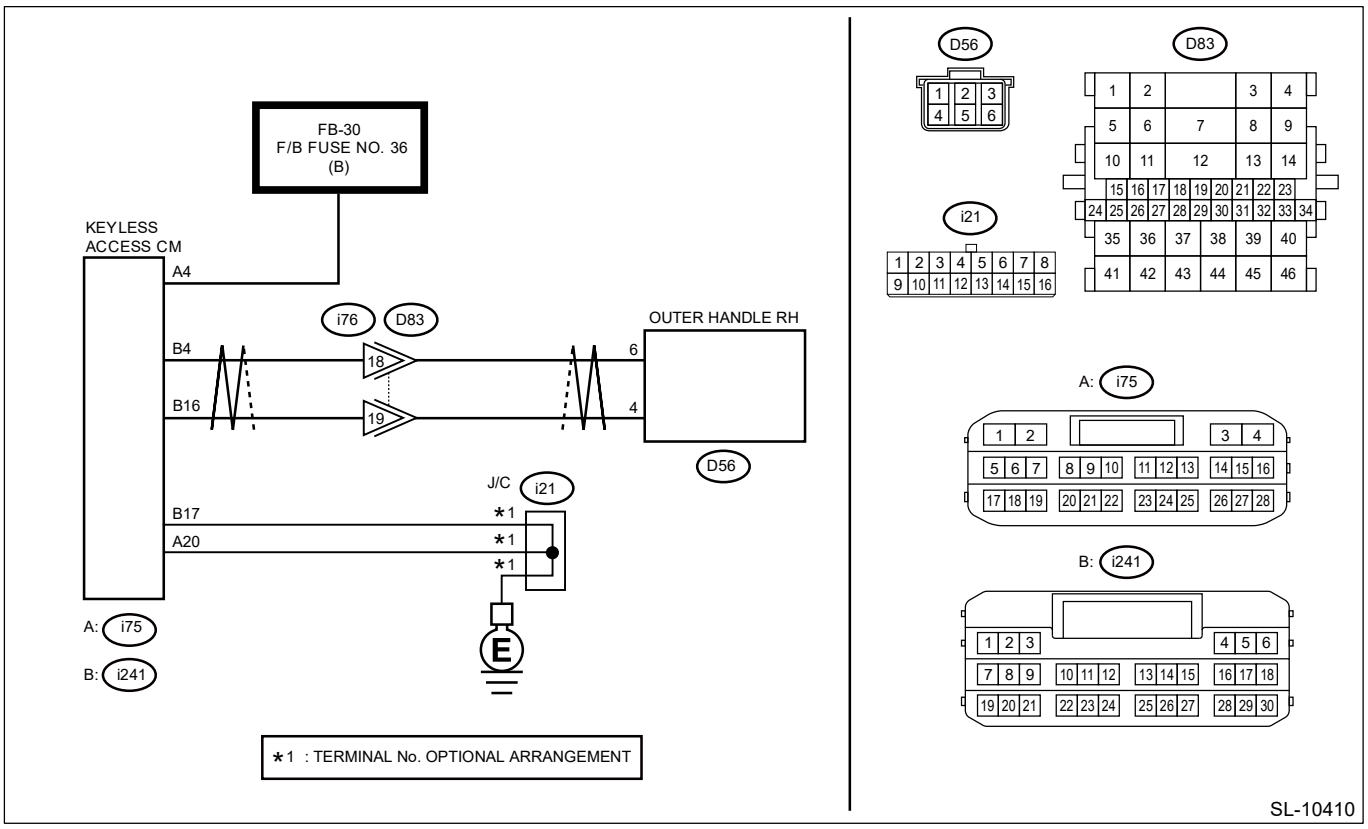
Is DTC B27A1 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the driver's side front door outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A2 PASSENGER SIDE EXTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and passenger's side front door outer handle.
Trouble symptom:
The keyless access with push button start system does not operate.
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the front door outer handle connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and front door outside handle connector, and between keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 4 — (D56) No. 6:
(i241) No. 16 — (D56) No. 4:
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 4 — Chassis ground:

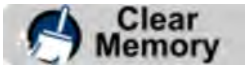
(i241) No. 16 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B27A2 displayed? (Current malfunction)

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK FRONT DOOR OUTER HANDLE.

1. Replace the passenger's side front door outer handle with the driver's front door outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



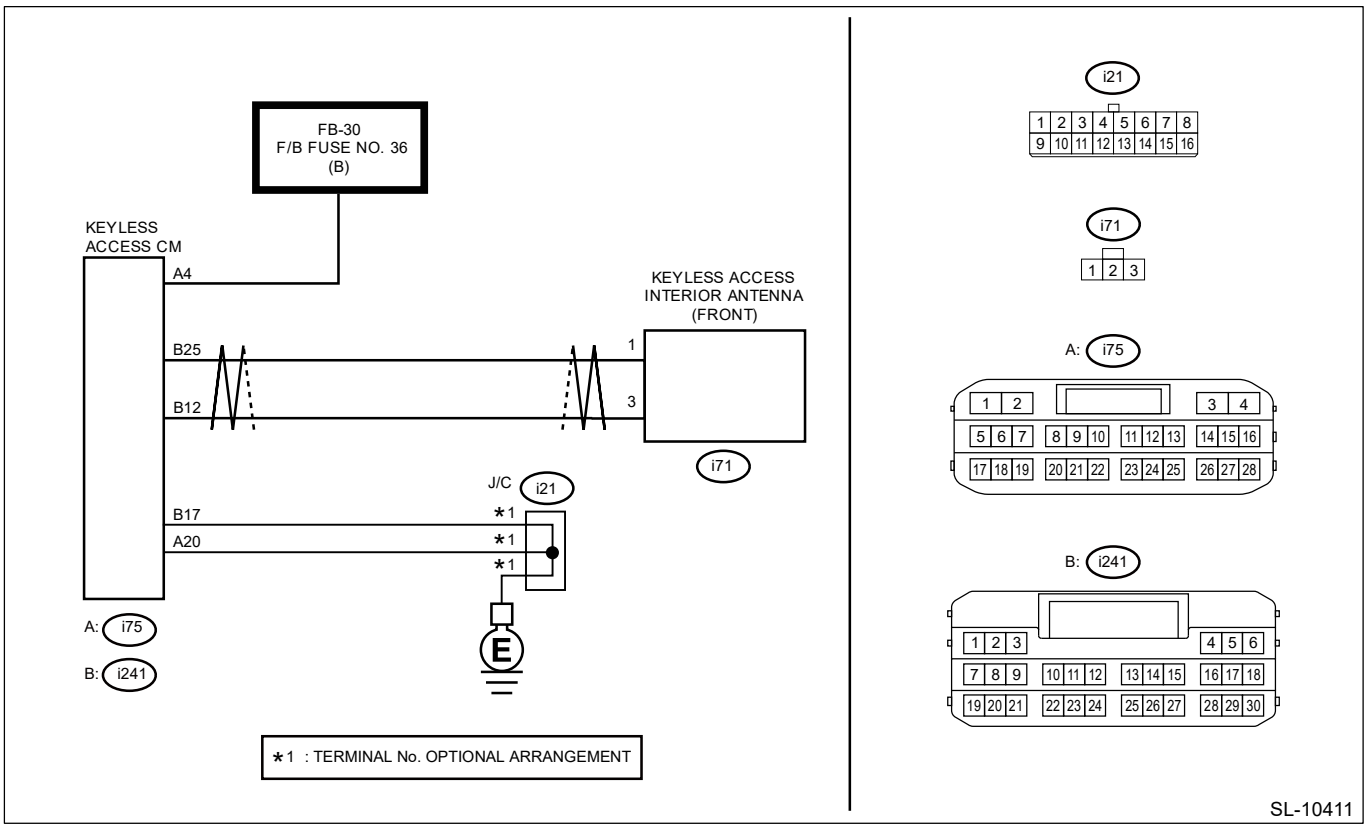
Is DTC B27A2 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the passenger's side front door outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A5 FRONT INTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and front interior antenna.
Trouble symptom:
The keyless access with push button start system does not operate. (When the access key is in the front area of the passenger room)
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the front interior antenna connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and front interior antenna connector, and between keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 25 — (i71) No. 1:
(i241) No. 12 — (i71)No. 3:
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 25 — Chassis ground:

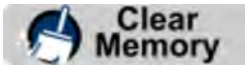
(i241) No. 12 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B27A5 displayed?

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK FRONT INTERIOR ANTENNA.

1. Replace the rear interior antenna with the front interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



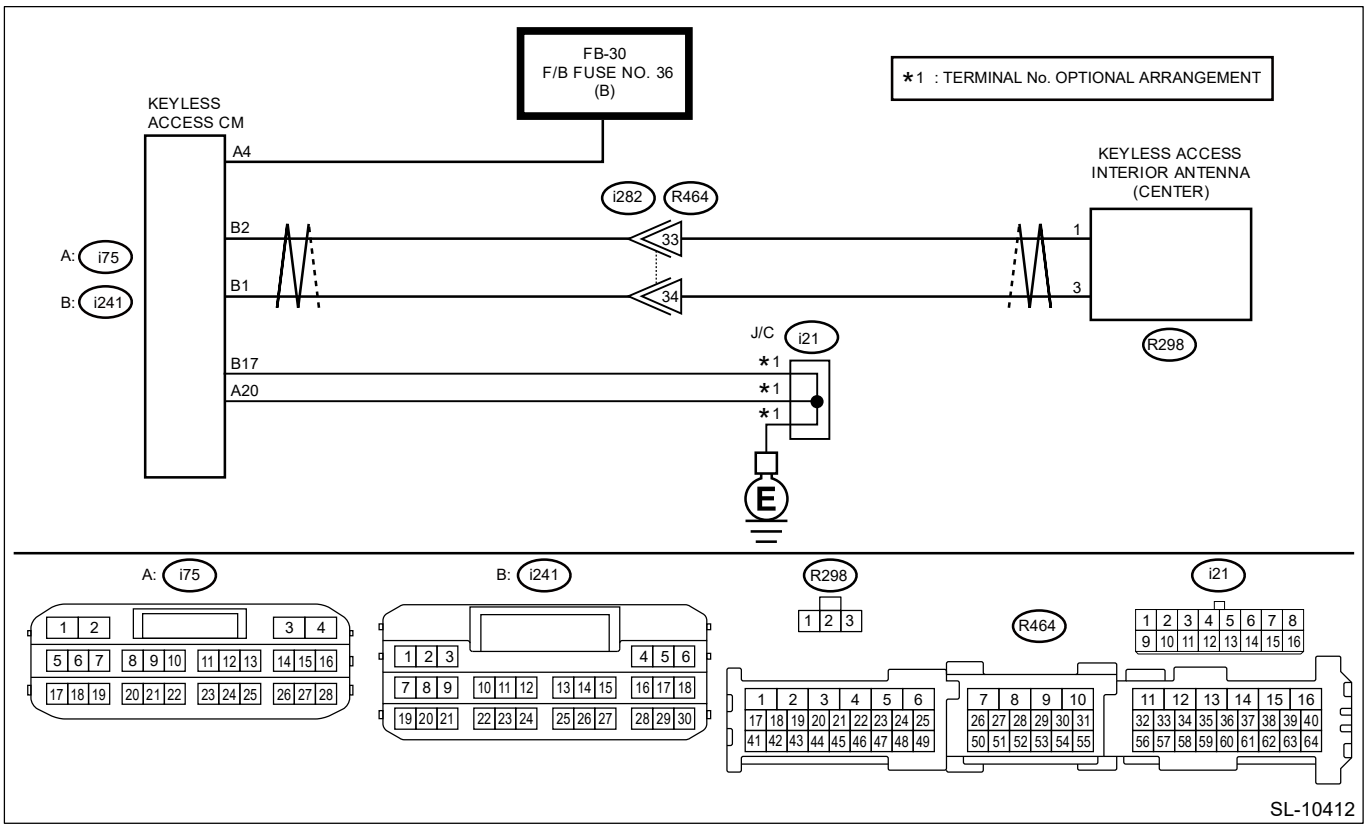
Is DTC B27A5 displayed?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Malfunction occurred in the front interior antenna.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A6 REAR INTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and center interior antenna.
Trouble symptom:
Keyless access system does not function. (when the access key is in the rear area of the passenger room (near the seat))
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the center interior antenna connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and center interior antenna connector, and between keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 2 — (R298) No. 1:
(i241) No. 1 — (R298) No. 3:
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 2 – Chassis ground:

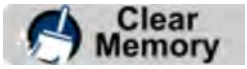
(i241) No. 1 – Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

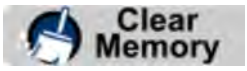


Is DTC B27A6 displayed? (Current malfunction)

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK CENTER INTERIOR ANTENNA.

1. Replace the center interior antenna with the front interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



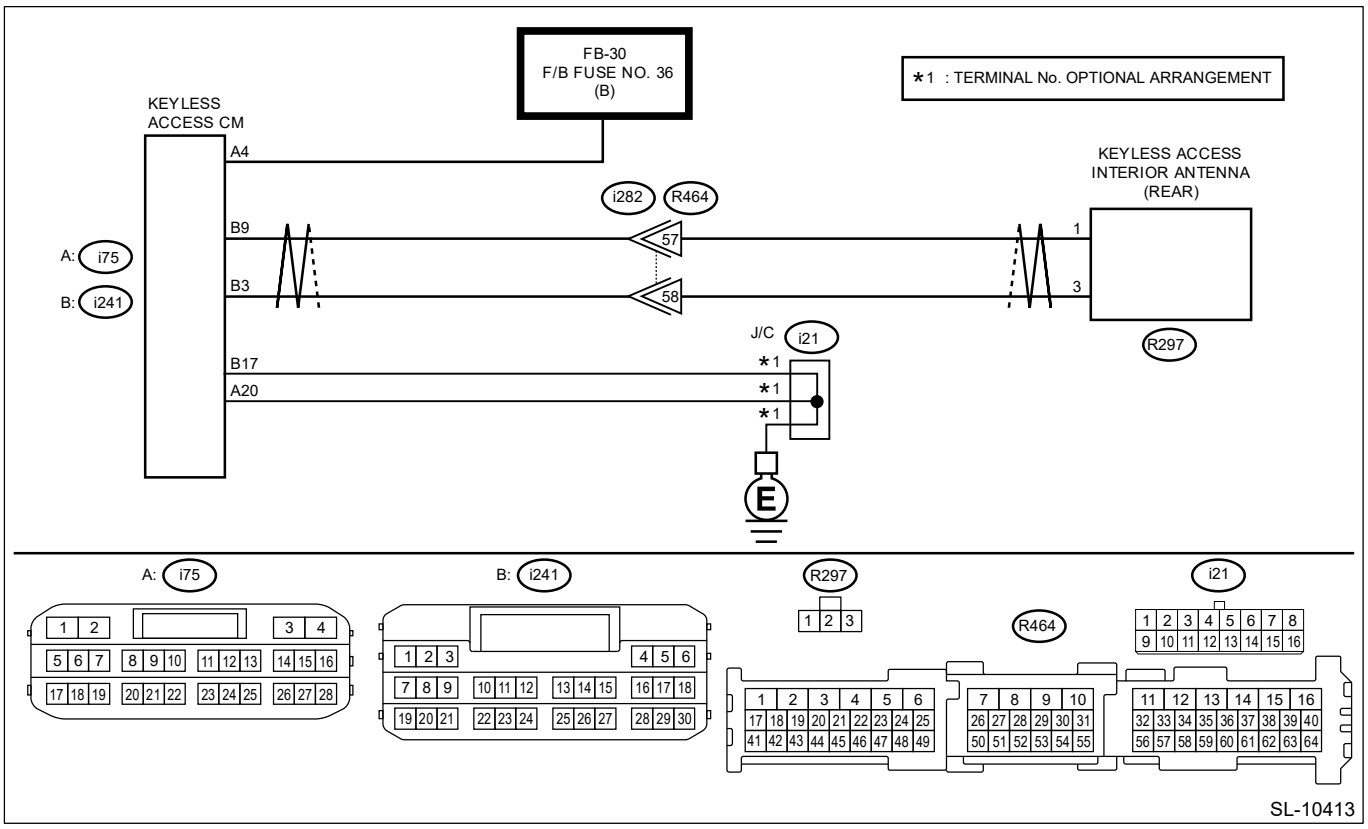
Is DTC B27A6 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Malfunction occurred in the center interior antenna.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A7 TRUNK/REAR GATE INTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and rear interior antenna.
Trouble symptom:
The keyless access with push button start system does not operate. (When the access key is in the rear area of the passenger room (in the luggage room or trunk))
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the rear interior antenna connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and rear interior antenna connector, and between keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 9 — (R297) No. 1:
(i241) No. 3 — (R297) No. 3:
(i241) No. 17 — Chassis ground:
(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 2 — Chassis ground:

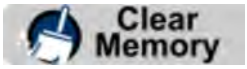
(i241) No. 1 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

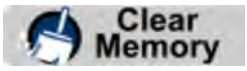


Is DTC B27A7 displayed? (Current malfunction)

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK REAR INTERIOR ANTENNA.

1. Replace the rear interior antenna with the front interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



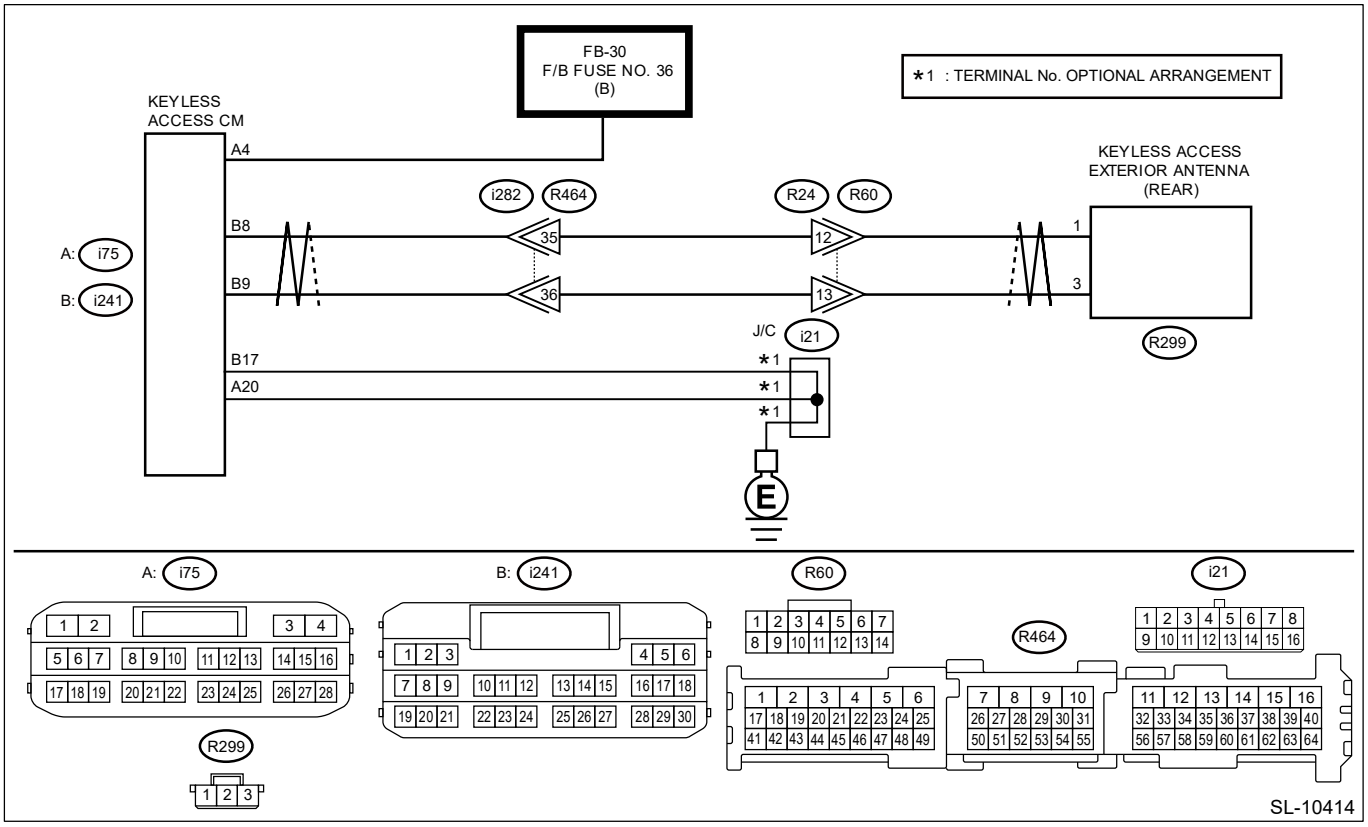
Is DTC B27A7 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Malfunction occurred in the rear interior antenna.

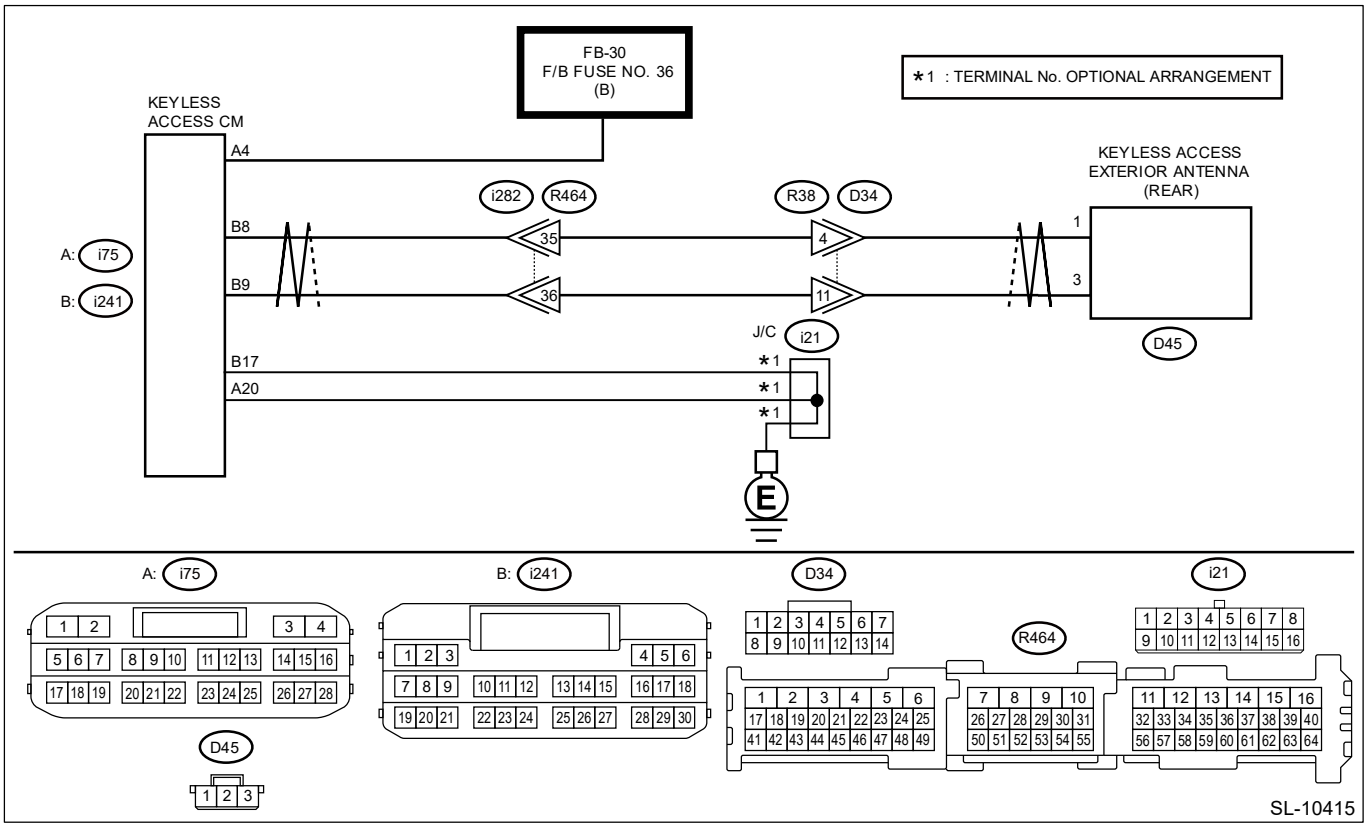
KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B27A8 TRUNK/REAR GATE EXTERNAL ANTENNA OPEN

DTC detecting condition:
When open circuit occurs in the harness between keyless access CM and rear exterior antenna.
Trouble symptom:
Keyless access system does not function.
(Unable to unlock with the rear gate opener button, or unable to lock with the rear lock button. Or trunk does not open or close with the trunk opener button)
Wiring diagram:
Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.
- 4 door model


FB-30
F/B FUSE NO. 36
(B)
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
KEYLESS
ACCESS CM
A4
B8
B9
B17
A20
A: i75
B: i241
i282
R464
R24
R60
35
36
12
13
1
3
KEYLESS ACCESS
EXTERIOR ANTENNA
(REAR)
R299
J/C
i21
*1
*1
*1
E
A: i75
B: i241
R60
i21
R464
R299
SL-10414

- 5 door model


FB-30
F/B FUSE NO. 36
(B)
*1 : TERMINAL No. OPTIONAL ARRANGEMENT
KEYLESS
ACCESS CM
A4
B8
B9
B17
A20
A: i75
B: i241
i282
R464
R38
D34
35
36
4
11
1
3
KEYLESS ACCESS
EXTERIOR ANTENNA
(REAR)
D45
J/C
i21
*1
*1
*1
E
A: i75
B: i241
D34
i21
R464
D45
SL-10415

Caution:

- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK CONNECTOR.

1. Disconnect the keyless access CM connector.
2. Disconnect the rear exterior antenna connector.
3. Check the connector.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the connector.

3. CHECK POWER SUPPLY CIRCUIT.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 4.
No	Check the power supply circuit.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and rear exterior antenna connector, and between keyless access CM connector and chassis ground.

Connector & terminal

4 door model

(i241) No. 8 — (R299) No. 1:

(i241) No. 9 — (R299) No. 3:

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

5 door model

(i241) No. 8 — (D45) No. 1:

(i241) No. 9 — (D45) No. 3:

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 8 — Chassis ground:

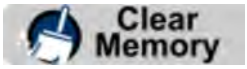
(i241) No. 9 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B27A8 displayed? (Current malfunction)

Yes	Go to 7.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

7. CHECK KEYLESS ACCESS CM.

1. Replace the rear exterior antenna with the rear interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna. Ref. to SECURITY AND LOCKS>Keyless Access Outdoor Antenna.
2. Using the Subaru Select Monitor, perform the clear memory of [Keyless Access with Push Button Start]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B27A8 displayed? (Current malfunction)

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Malfunction occurred in the rear external antenna.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

DTC detecting condition:

When bus off is detected 6 times in a row by CAN function complying with ISO 11898.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds, with ignition switch ON.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds, with ignition switch ON.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds, with ignition switch ON.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds during CAN bus Wake-up.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

DTC detecting condition:

When the following conditions are all established.

- Data no-receive DTC of monitored node is not in current malfunction.
- Fail detection counter of monitored node is not updated 32 times in a row. Or checksum error is detected 3 times in a row.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

DTC detecting condition:

When the following conditions are all established.

- Data no-receive DTC of monitored node is not in current malfunction.
- Fail detection counter of monitored node is not updated 32 times in a row. Or checksum error is detected 3 times in a row.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1120 LOST COMMUNICATION WITH AUTOSTART STOP CONTROL MODULE

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds, with ignition switch ON.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN

DTC detecting condition:

When reception ID frame is not normally and continuously received for 10 seconds during CAN bus Wake-up.

(Including when frame is abandoned by DLC (data length code) check error)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN

DTC detecting condition:

When the following conditions are all established.

- Data no-receive DTC of monitored node is not in current malfunction.
- Fail detection counter of monitored node is not updated 32 times in a row.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

1. IMMOBILIZER SYSTEM

Symptoms	Note
Engine does not start	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ENGINE DOES NOT START.
	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2784 ANTENNA CIRCUIT (PUSH ENGINE SWITCH).
	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B278A PUSH ENGINE SWITCH POWER SUPPLY CIRCUIT.
	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2785 LIN COMMUNICATION.
	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2789 ID CODE BOX COMMUNICATION.
	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2790 ID CODE BOX CIRCUIT.
	Check the brake switch. Ref. to BRAKE>Stop Light Switch>INSPECTION.
	Check the parking switch signal. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and “P” Range Switch>INSPECTION.
	Check DTC of ECM. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).
Cannot register the immobilizer.	Refer to the “REGISTRATION MANUAL FOR IMMOBILIZER”.
Engine does not start with the remote engine starter.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2779 REMOTE CONTROL ENGINE STARTER COLLATION.

2. KEYLESS ACCESS SYSTEM

Symptoms	Note

All doors cannot be locked/unlocked with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF THE DOORS.
Cannot lock with keyless access from the driver’s door.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER’S DOOR.
Cannot lock/unlock from the driver’s door with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER’S DOOR.
Cannot unlock from the driver’s door with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER’S DOOR.
Cannot lock from the passenger’s door with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE PASSENGER’S DOOR.
Cannot lock/unlock from the passenger’s door with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER’S DOOR.
Cannot unlock from the passenger’s door with keyless access.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER’S DOOR.
Trunk does not open with the trunk opener button.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > TRUNK WILL NOT OPEN WITH KEYLESS ACCESS.
Access key lockout protection function in the trunk does not operate.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ACCESS KEY LOCKOUT PROTECTION FUNCTION IN THE TRUNK DOES NOT OPERATE.
Keyless access passenger room buzzer does not sound.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS PASSENGER ROOM BUZZER DOES NOT SOUND.
Keyless access external buzzer does not beep.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > KEYLESS ACCESS EXTERNAL BUZZER DOES NOT BEEP.

Interior collation does not function.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > INTERIOR COLLATION DOES NOT FUNCTION.
Rear gate cannot be unlocked with the rear gate opener button.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REAR GATE CANNOT BE UNLOCKED WITH THE REAR GATE OPENER BUTTON.
Rear gate can not be locked when using the rear lock button.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CAN NOT LOCK WHEN USING THE REAR LOCK BUTTON.

3. STEERING LOCK SYSTEM

Symptoms	Note
The steering lock cannot be released (Cannot start the engine).	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING LOCK IS NOT RELEASED.
The steering lock does not operate.	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING LOCK DOES NOT OPERATE.

4. POWER SUPPLY SWITCHING SYSTEM

Symptoms	Note
Power will not turn ON (both accessory and ignition).	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (BOTH ACCESSORY AND IGNITION).
Power will not turn ON (accessory only).	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (ACCESSORY DOES NOT TURN ON, BUT IGNITION TURNS ON).
Power will not turn ON (ignition only).	Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON (ACCESSORY TURNS ON, BUT IGNITION DOES NOT TURN ON).

KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. KEYLESS ACCESS LOCK/UNLOCK CANNOT BE PERFORMED FROM ANY OF

THE DOORS

Trouble causes:

- Malfunction of exterior antenna, oscillator, touch sensor, lock/unlock buttons
- Malfunction of access key, access key battery
- Malfunction of door lock control system
- Malfunction of keyless access CM power supply circuit
- Keyless access CM malfunction

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK OPERATION OF KEYLESS DOOR LOCK.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK ACCESS KEY.
   - no → Go to 4.
   - yes ↓
3. CHECK ACCESS KEY.
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.
4. CHECK DOOR LOCK.
   - no → Perform the instructed procedures.
   - yes ↓

5. CHECK HARNESS.

no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK OPERATION OF KEYLESS DOOR LOCK.

Using the keyless function of the access key, check the operation of the door lock.

Does it lock/unlock normally?

Yes	Check the exterior antenna, oscillator, touch sensor, lock/unlock buttons.
No	Go to 2.

2. CHECK ACCESS KEY.

Check for whether lock and unlock is possible with the registered access key.

Is there any access key which can lock/unlock when the touch sensor is operated?

Yes	Check the access key that does not operate. Go to 3.
No	Go to 4.

3. CHECK ACCESS KEY.

Measure the battery voltage of the access key that does not operate.

Is the voltage 2.5 — 3.2 V?

Yes	Replace the access key.
No	Replace the battery.

4. CHECK DOOR LOCK.

Operate the driver’s center door lock switch.

Does the door lock operate?

Yes	Go to 5.
No	Check the door lock control system. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

5. CHECK HARNESS.

Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage 10 V or more when the ignition switch is turned to ON?

Yes	Go to 6.
No	Check the keyless access CM power supply circuit.

6. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 20 — Chassis ground:

(i241) No. 17 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.
No	Repair or replace the open circuit of harness.

2. CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

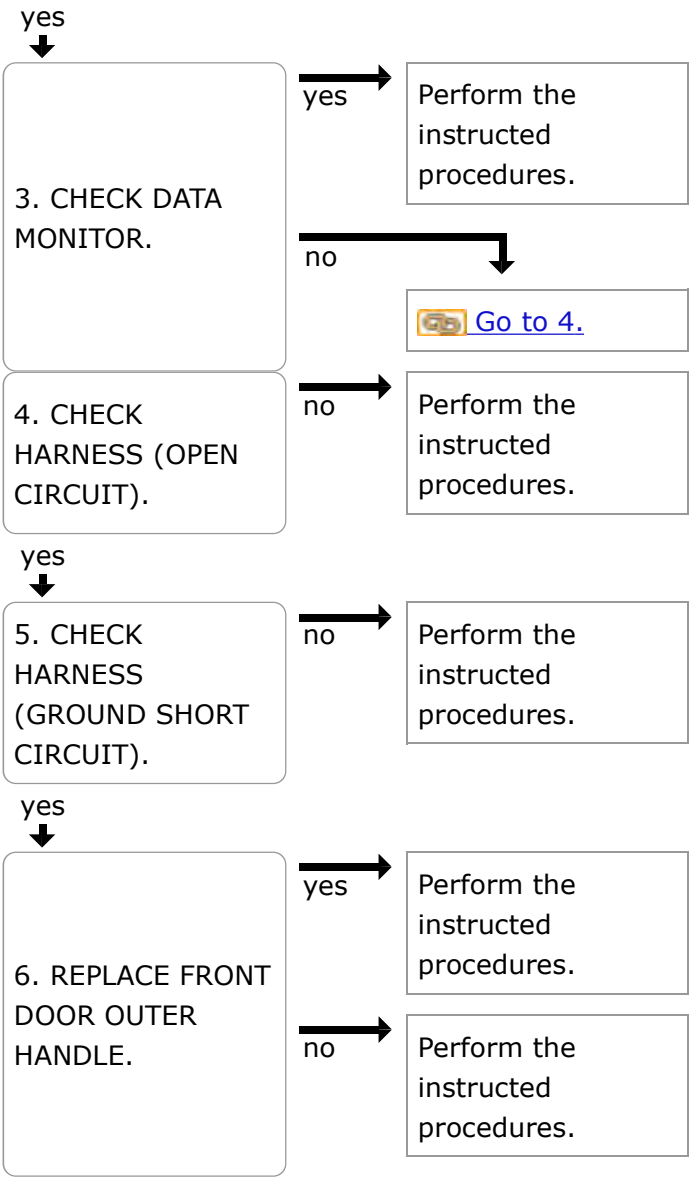
Trouble causes:

- Malfunction of door lock control system
- Door lock switch circuit malfunction
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK DATA MONITOR.	no →	Perform the instructed procedures.



1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Driver's seat lock status SW input]
2. Read the data when locking/unlocking the driver’s side lock actuator.

Does the data change from ON/OFF?

Yes	Go to 3.
No	Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Driver's lock touch sensor SW]

Does the data change from ON/OFF according to the sensor operation?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(i241) No. 6 — (D66) No. 6:

(i241) No. 5 — (D66) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 6 — Chassis ground:

(i241) No. 5 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the driver's side front outer handle with the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

3. CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

Trouble causes:

- Malfunction of door lock control system
- Malfunction of keyless access CM power supply circuit
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK HARNESS.
no → Perform the instructed procedures.
yes ↓

4. CHECK HARNESS (GROUND SHORT CIRCUIT).
no → Perform the instructed procedures.
yes ↓

5. CHECK KEYLESS ACCESS CM.
no → Perform the instructed procedures.
yes ↓

6. REPLACE FRONT DOOR OUTER HANDLE.
yes → Perform the instructed procedures.
no → Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse.

3. CHECK HARNESS.

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(i241) No. 6 — (D66) No. 6:

(i241) No. 5 — (D66) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 6 — Chassis ground:

(i241) No. 5 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Turn the ignition switch to OFF, close all doors and take the access key out of passenger room.
3. Use the Subaru Select Monitor, measure the waveform between the keyless access CM connectors.
   Connector & terminal
   (D66) No. 6 — (D66) No. 4:

Does pulse output change from pulse output OFF → pulse output ON by the lock operation using access key?

Yes	Go to 6.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the driver's side front outer handle with the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

4. CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR

Trouble causes:

- Malfunction of door lock control system
- Door lock switch circuit malfunction
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DATA MONITOR.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

6. REPLACE FRONT DOOR OUTER HANDLE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Driver's seat lock status SW input]
2. Read the data when locking/unlocking the driver’s side lock actuator.

Does the data change from ON/OFF?

Yes	Go to 3.
No	Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Driver's unlock touch sensor switch]
2. Read the data when operating the touch sensor (unlock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.
   Connector & terminal
   (i241) No. 6 — (D66) No. 6:
   (i241) No. 5 — (D66) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 6 — Chassis ground:

(i241) No. 5 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the driver's side front outer handle with the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

5. CANNOT LOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Trouble causes:

- Malfunction of door lock control system
- Door lock switch circuit malfunction
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DATA MONITOR.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

6. REPLACE FRONT DOOR OUTER HANDLE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Passenger's seat lock status SW input]
2. Read the data when locking/unlocking the passenger’s side lock actuator.

Does the data change from ON/OFF?

Yes	Go to 3.
No	Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Passenger's lock touch sensor SW]
2. Read the data when operating the touch sensor (lock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.
   Connector & terminal
   (i241) No. 4 — (D56) No. 6:
   (i241) No. 16 — (D56) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 4 — Chassis ground:

(i241) No. 16 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the passenger's side front outer handle with the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

6. CANNOT LOCK/UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Trouble causes:

- Malfunction of door lock control system
- Malfunction of keyless access CM power supply circuit
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK KEYLESS ACCESS CM.
   - no → Perform the instructed procedures.
   - yes ↓

6. REPLACE FRONT DOOR OUTER HANDLE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Replace the fuse.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.

Connector & terminal

(i241) No. 4 — (D56) No. 6:

(i241) No. 16 — (D56) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 4 — Chassis ground:

(i241) No. 16 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Turn the ignition switch to OFF, close all doors and take the access key out of passenger room.
3. Use the Subaru Select Monitor, measure the waveform between the keyless access CM connectors.
   Connector & terminal
   (D56) No. 6 — (D56) No. 4:

Does pulse output change from pulse output OFF → pulse output ON by the lock operation using access key?

Yes	Go to 6.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the passenger's side front outer handle with the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

7. CANNOT UNLOCK WITH KEYLESS ACCESS FROM THE PASSENGER'S DOOR

Trouble causes:

- Malfunction of door lock control system
- Door lock switch circuit malfunction
- Malfunction of harness between keyless access CM and front door outer handle
- Keyless access CM malfunction
- Malfunction of front door outer handle

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DOOR LOCK SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DATA MONITOR.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK DATA MONITOR.
   - yes → Perform the instructed procedures.
   - no → Go to 4.
4. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓

6. REPLACE FRONT DOOR OUTER HANDLE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check that the lock/unlock operates with the driver’s door lock switch.

Does it lock/unlock normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Passenger's seat lock status SW input]
2. Read the data when locking/unlocking the passenger’s side lock actuator.

Does the data change from ON/OFF?

Yes	Go to 3.
No	Check the door lock switch circuit.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Passenger's unlock touch sensor switch]
2. Read the data when operating the touch sensor (unlock) of the door outer handle.

Does the data change from ON/OFF according to the sensor operation?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Disconnect the front outer handle connector.
3. Using a tester, measure the resistance between the keyless access CM connector and front outer handle connector.
   Connector & terminal
   (i241) No. 4 — (D56) No. 6:
   (i241) No. 16 — (D56) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 4 — Chassis ground:

(i241) No. 16 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. REPLACE FRONT DOOR OUTER HANDLE.

Replace the passenger's side front outer handle with the driver's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.

Does it operate properly?

Yes	Replace the passenger's side front outer handle. Ref. to SECURITY AND LOCKS>Door Outer Handle.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

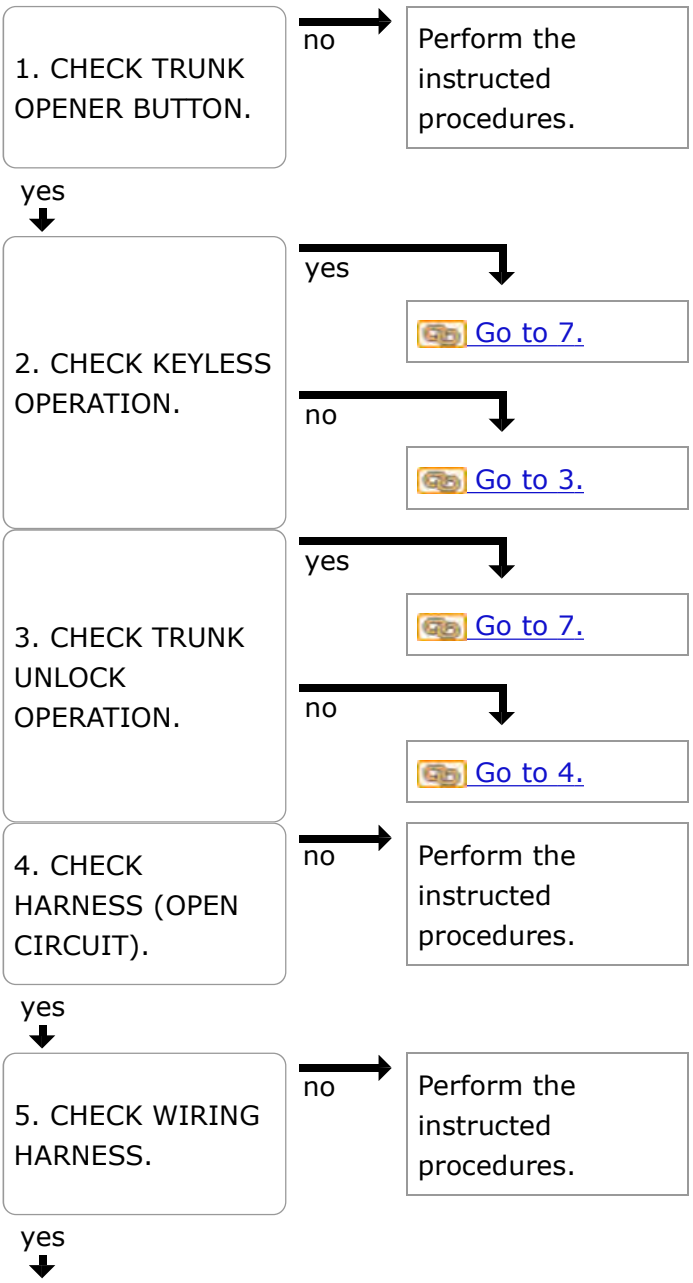
8. TRUNK WILL NOT OPEN WITH KEYLESS ACCESS

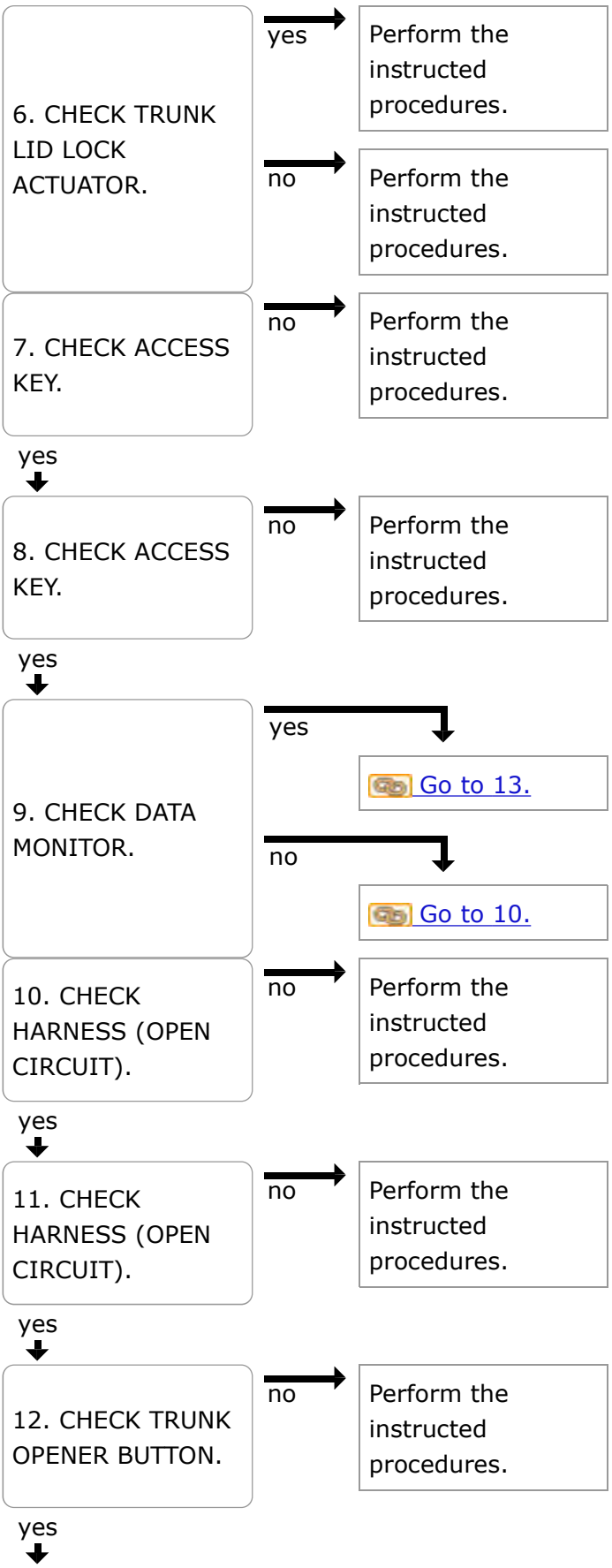
Trouble causes:

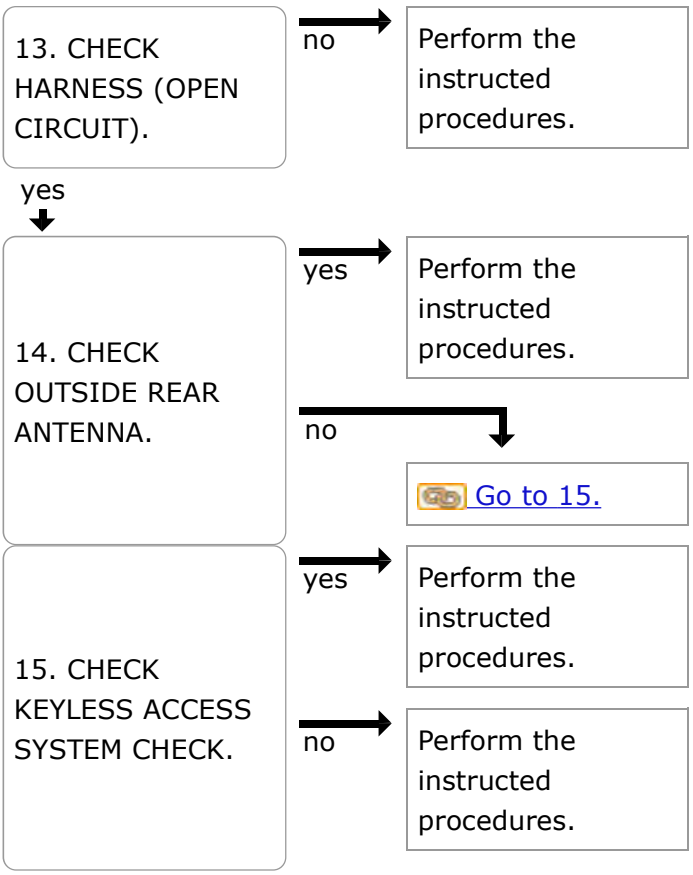
- Malfunction of door lock control system
- Malfunction of harness between the body integrated unit and trunk lid lock actuator
- Trunk lid lock actuator malfunction
- Body integrated unit malfunction
- Access key malfunction
- Malfunction of harness between trunk opener button and keyless access CM
- Trunk opener button malfunction
- Keyless access CM malfunction
- Malfunction of harness between exterior rear antenna and keyless access CM
- Exterior rear antenna malfunction

Caution:

- **Check that there are no other registered access keys inside the trunk.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**




6. CHECK TRUNK LID LOCK ACTUATOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
7. CHECK ACCESS KEY.
no
Perform the instructed procedures.
yes
8. CHECK ACCESS KEY.
no
Perform the instructed procedures.
yes
9. CHECK DATA MONITOR.
yes
Go to 13.
no
Go to 10.
10. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
11. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
12. CHECK TRUNK OPENER BUTTON.
no
Perform the instructed procedures.
yes



1. CHECK TRUNK OPENER BUTTON.

Check that the trunk opens with the driver's seat trunk opener button.

Does it open normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION > SYMPTOM CHART.

2. CHECK KEYLESS OPERATION.

Check that the trunk opens when the trunk opener button of the access key is operated.

Does it open normally?

Yes	Go to 7.
No	Go to 3.

3. CHECK TRUNK UNLOCK OPERATION.

1. Using the Subaru Select Monitor, check the following items of [Active Test] of [Body Control].
   Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.
   - [R gate/trunk UNLK output]
2. Check that the trunk opens when the R gate/trunk UNLK signal is output.

Does it open normally?

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector and trunk lid lock actuator connector.
2. Check the continuity between body integrated unit connector and trunk lid lock actuator connector.
   Connector & terminal
   (i266) No. 7 — (R186) No. 1:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK WIRING HARNESS.

Check the continuity between the trunk lid lock actuator connector and chassis ground.

Connector & terminal

(R186) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK TRUNK LID LOCK ACTUATOR.

Check the trunk lid lock actuator. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly.

Is trunk lid actuator normal?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the trunk lid latch & actuator assembly. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly.

7. CHECK ACCESS KEY.

Check the access key LED when the trunk opener button of the access key is operated.

Does the access key LED illuminate?

Yes	Go to 8.
No	Replace the access key. Ref. to SECURITY AND LOCKS>Access Key>REPLACEMENT.

8. CHECK ACCESS KEY.

1. Prepare all access keys registered to the vehicle.
2. Check that the trunk opens with each access key.

Does it open normally?

Yes	Go to 9.
No	Replace the access key. Ref. to SECURITY AND LOCKS>Access Key>REPLACEMENT.

9. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   - [Trunk Request SW]
2. Read the data when pressing the trunk opener button.

Does the data display ON?

Yes	Go to 13.
No	Go to 10.

10. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the trunk opener button connector and the keyless access CM connector.
2. Using a tester, check continuity between the trunk opener button connector and keyless access CM connector.
   Connector & terminal
   (R294) No. 1 — (i75) No. 17:

Is there continuity?

Yes	Go to 11.
No	Repair or replace the open circuit of harness.

11. CHECK HARNESS (OPEN CIRCUIT).

1. Using a tester, check the continuity between the trunk opener button connector and chassis ground.
   Connector & terminal
   (R294) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 12.
No	Repair or replace the open circuit of harness.

12. CHECK TRUNK OPENER BUTTON.

Using a tester, check the continuity between trunk opener button connector terminals.
Terminals
No. 1 — No. 2:

Is there continuity when pressing the switch?

Yes	Go to 13.
No	Replace the trunk opener button. Ref. to SECURITY AND LOCKS>Trunk Opener Button.

13. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the exterior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the exterior rear antenna connector and keyless access CM connector.

Connector & terminal

(R299) No. 1 — (i241) No. 8:
(R299) No. 2 — (i241) No. 9:

Is there continuity?

Yes	Go to 14.
No	Repair or replace the open circuit of harness.

14. CHECK OUTSIDE REAR ANTENNA.

Replace the outside rear antenna with new or properly working parts.

Does it operate properly?

Yes	Replace the outside rear antenna. Ref. to SECURITY AND LOCKS>Keyless Access Outdoor Antenna>REMOVAL.
No	Go to 15.

15. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Out of trunk transmitter + room tuner]

Does the outside buzzer sound?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

9. ACCESS KEY LOCKOUT PROTECTION FUNCTION IN THE TRUNK DOES NOT OPERATE

Trouble causes:

- Malfunction of door lock control system
- Malfunction of harness between the body integrated unit and trunk lid lock actuator
- Trunk lid lock actuator malfunction
- Body integrated unit malfunction
- Access key malfunction
- Keyless access CM malfunction
- Malfunction of harness between interior rear antenna and keyless access CM
- Interior rear antenna malfunction

Caution:

- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK TRUNK OPENER BUTTON.	no →	Perform the instructed procedures.

yes

2. CHECK KEYLESS OPERATION.

yes → Go to 7.

no → Go to 3.

3. CHECK TRUNK UNLOCK OPERATION.

yes → Go to 7.

no → Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes

5. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes

6. CHECK TRUNK LID LOCK ACTUATOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

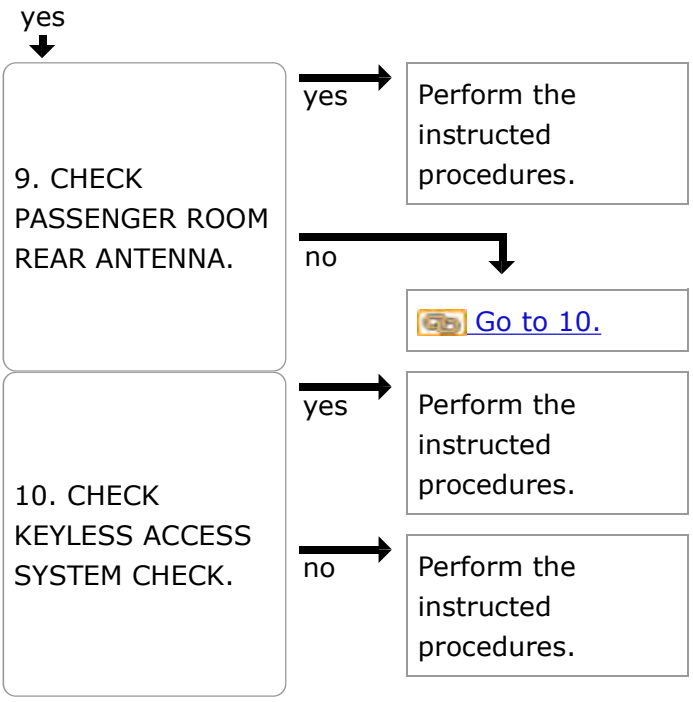
7. CHECK ACCESS KEY.

no → Perform the instructed procedures.

yes

8. CHECK HARNESS.

no → Perform the instructed procedures.



1. CHECK TRUNK OPENER BUTTON.

Check that the trunk opens with the driver's seat trunk opener button.

Does it open normally?

Yes	Go to 2.
No	Check the door lock circuit. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

2. CHECK KEYLESS OPERATION.

Check that the trunk opens when the trunk opener button of the access key is operated.

Does it open normally?

Yes	Go to 7.
No	Go to 3.

3. CHECK TRUNK UNLOCK OPERATION.

1. Using the Subaru Select Monitor, select the function check «R gate/trunk UNLK output» of the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.
2. Check that the trunk opens when the R gate/trunk UNLK signal is output.

Does it open normally?

Yes	Go to 7.
No	Go to 4.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector and trunk lid lock actuator connector.
2. Check the continuity between body integrated unit connector and trunk lid lock actuator connector.

Connector & terminal

(i266) No. 7 — (R186) No. 1:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Check the continuity between the trunk lid lock actuator connector and chassis ground.

Connector & terminal

(R186) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK TRUNK LID LOCK ACTUATOR.

Check the trunk lid lock actuator. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly.

Is the check result OK?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the trunk lid latch & actuator assembly. Ref. to SECURITY AND LOCKS>Trunk Lid Latch and Actuator Assembly.

7. CHECK ACCESS KEY.

1. Prepare all access keys registered to the vehicle.
2. Check that the trunk opens with each access key.

Does it open normally?

Yes	Go to 8.
No	Replace the access key. Ref. to SECURITY AND LOCKS>Access Key>REPLACEMENT.

8. CHECK HARNESS.

1. Disconnect the interior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the interior rear antenna connector and keyless access CM connector.

   Connector & terminal

   (R297) No. 1 — (i241) No. 9:

   (R297) No. 3 — (i241) No. 8:

Is there continuity?

Yes	Go to 9.
No	Repair or replace the open circuit of harness.

9. CHECK PASSENGER ROOM REAR ANTENNA.

Replace the passenger room rear antenna with a new or properly functioning part.

Does it operate properly?

Yes	Replace the passenger room rear antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.
No	Go to 10.

10. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Trunk Internal Transmitter + Interior Tuner]
2. Hold the access key 1 m or more away from the center of inside the trunk, then come closer to within 0.8 m.

Does the outside buzzer sound?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

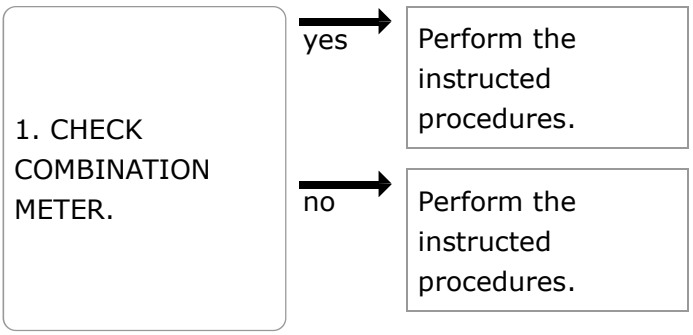
10. KEYLESS ACCESS PASSENGER ROOM BUZZER DOES NOT SOUND

Trouble causes:

- Combination meter malfunction
- Keyless access CM malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.



1. CHECK COMBINATION METER.

Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter>REMOVAL.

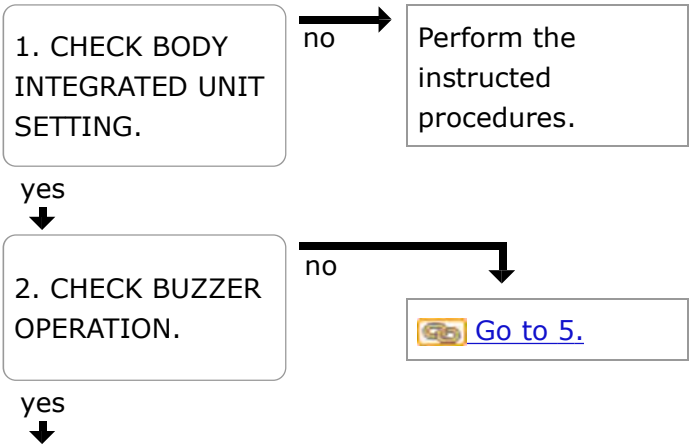
11. KEYLESS ACCESS EXTERNAL BUZZER DOES NOT BEEP

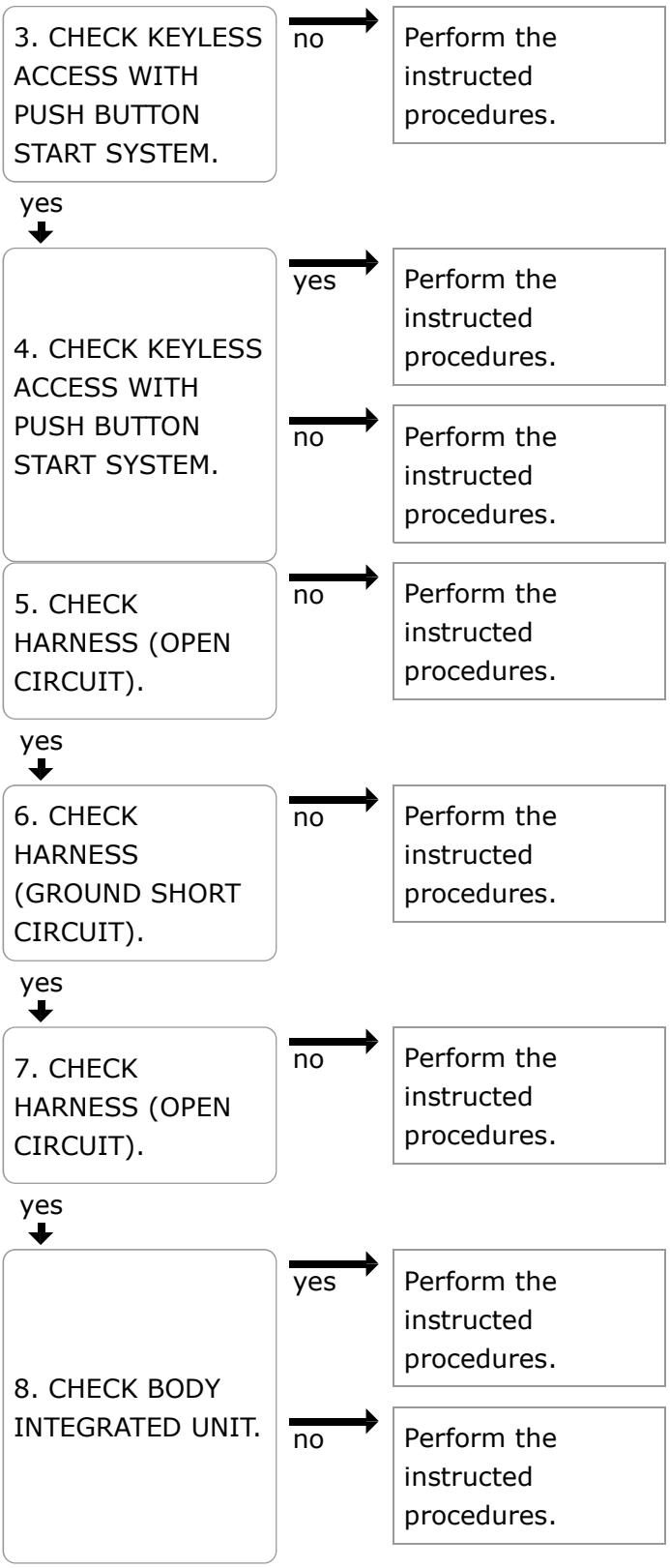
Trouble causes:

- Improper body integrated unit setting
- Malfunction of harness between body integrated unit and keyless buzzer
- Keyless access CM malfunction
- Keyless buzzer malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.




3. CHECK KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM.
no
Perform the instructed procedures.
yes
4. CHECK KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
5. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
6. CHECK HARNESS (GROUND SHORT CIRCUIT).
no
Perform the instructed procedures.
yes
7. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
8. CHECK BODY INTEGRATED UNIT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK BODY INTEGRATED UNIT SETTING.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control].
Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.



- [Answer-back Buzzer]

Is the setting in the [Support]?

Yes	Go to 2.
No	Change the setting to [Support].

2. CHECK BUZZER OPERATION.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Body Control].
Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.

- [Keyless Buzzer Output]

Does the buzzer sound?

Yes	Go to 3.
No	Go to 5.

3. CHECK KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM.

1. Turn to IGN ON.
2. With all doors closed and the access key carried, touch the touch sensor (lock) on the driver's door handle.

Does the door lock?

Yes	Go to 4.
No	Refer to "CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR" and perform inspection. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > CANNOT LOCK WITH KEYLESS ACCESS FROM THE DRIVER'S DOOR.

4. CHECK KEYLESS ACCESS WITH PUSH BUTTON START SYSTEM.

1. Open the door glass.
2. Place the access key on the driver's seat, and close the door.
3. Touch the touch sensor (lock) on the driver's door handle.

Does the buzzer sound? (Lockout prevention alert)

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Turn to IGN OFF.
2. Disconnect the connectors of the body integrated unit and keyless buzzer.
3. Measure the resistance between body integrated unit connector and keyless buzzer connector.
   Connector & terminal
   (B490) No. 1 — (B281) No. 2:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between keyless buzzer connector and chassis ground.
Connector & terminal
(B490) No. 1 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 7.
No	Repair or replace the short circuit of the harness.

7. CHECK HARNESS (OPEN CIRCUIT).

Measure the resistance between keyless buzzer connector and chassis ground.
Connector & terminal
(B490) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 8.
No	Repair or replace the open circuit of harness.

8. CHECK BODY INTEGRATED UNIT.

1. Connect the connector of body integrated unit.
2. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.
   - [Keyless Buzzer Output]
3. Measure the voltage between body integrated unit connector and chassis ground using an oscilloscope.
   Connector & terminal
   (B281) No. 2 (+) — Chassis ground (−):

Is the frequency 2kHz, voltage 9 V or more?

Yes	Replace the keyless buzzer. Ref. to SECURITY AND LOCKS>Keyless Buzzer>REMOVAL.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

12. INTERIOR COLLATION DOES NOT FUNCTION

Trouble causes:

- Access key battery malfunction
- Malfunction of keyless access CM power supply circuit
- Malfunction of harness between keyless access CM and each interior antenna
- Interior antenna malfunction

Caution:

- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK ACCESS KEY. → no → Perform the instructed procedures.

yes ↓

2. CHECK POWER SUPPLY CIRCUIT. → no → Perform the instructed procedures.

yes ↓

3. CHECK INTERIOR ANTENNA (FRONT).

no → Perform the instructed procedures.

yes ↓

4. CHECK INTERIOR ANTENNA (CENTER).

no → Perform the instructed procedures.

yes ↓

5. CHECK INTERIOR ANTENNA (REAR).

no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

7. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

8. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

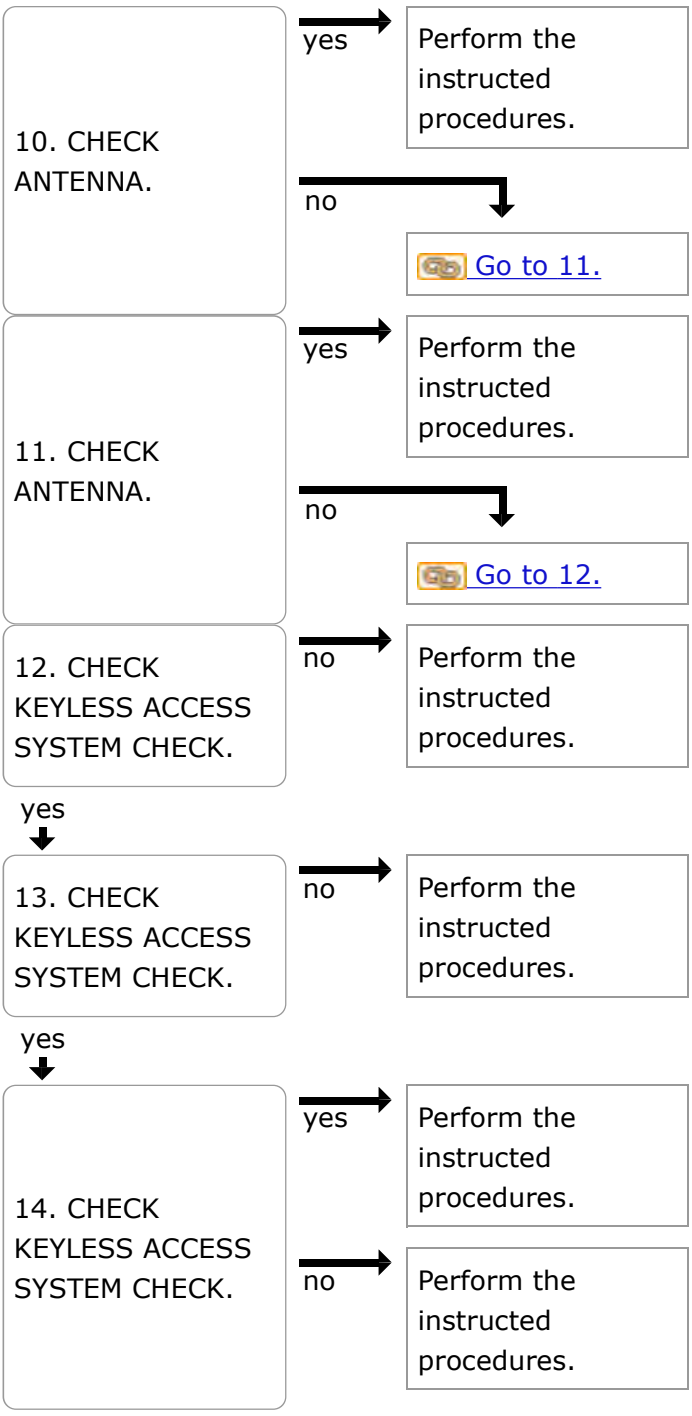
yes ↓

9. CHECK ANTENNA.

yes → Perform the instructed procedures.

no ↓

Go to 10.


10. CHECK ANTENNA.
yes
Perform the instructed procedures.
no
Go to 11.
11. CHECK ANTENNA.
yes
Perform the instructed procedures.
no
Go to 12.
12. CHECK KEYLESS ACCESS SYSTEM CHECK.
no
Perform the instructed procedures.
yes
13. CHECK KEYLESS ACCESS SYSTEM CHECK.
no
Perform the instructed procedures.
yes
14. CHECK KEYLESS ACCESS SYSTEM CHECK.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK ACCESS KEY.

Check the battery of the access key. Ref. to SECURITY AND LOCKS>Access Key>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the battery.

2. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 4 (+) — Chassis ground (−):

(i75) No. 1 (+) — Chassis ground (−):

Is the voltage 9.5 — 16 V?

Yes	Go to 3.
No	Check the power supply circuit.

3. CHECK INTERIOR ANTENNA (FRONT).

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Fr internal transmitter - internal tuner]
2. Using a tester, check the output between keyless access CM connector terminals while performing [Keyless Access with Push Button Start].
   Connector & terminal
   (i241) No. 25 — (i241) No. 12:

Is a pulse output?

Yes	Go to 4.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

4. CHECK INTERIOR ANTENNA (CENTER).

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Rr internal transmitter - internal tuner]
2. Using a tester, check the output between keyless access CM connector terminals while performing [Keyless Access with Push Button Start].
   Connector & terminal
   (i241) No. 1 — (i241) No. 2:

Is a pulse output?

Yes	Go to 5.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

5. CHECK INTERIOR ANTENNA (REAR).

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Trunk-internal transmitter - trunk-internal tuner]
     or
   - [R gate internal transmitter - internal tuner]
2. Using a tester, check the output between keyless access CM connector terminals while performing [Keyless Access with Push Button Start].
   Connector & terminal
   (i241) No. 3 — (i241) No. 9:

Is a pulse output?

Yes	Go to 6.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the front interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the front interior antenna connector and the keyless access CM connector.
   Connector & terminal
   (i241) No. 25 — (i71) No. 1:
   (i241) No. 12 — (i71) No. 3:

Is there continuity?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the center interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the center interior antenna connector and the keyless access CM connector.
   Connector & terminal
   (i241) No. 2 — (R298) No. 1:
   (i241) No. 1 — (R298) No. 3:

Is there continuity?

Yes	Go to 8.
No	Repair or replace the open circuit of harness.

8. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the rear interior antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the rear interior antenna connector and the keyless access CM connector.
   Connector & terminal
   (i241) No. 9 — (R297) No. 1:
   (i241) No. 3 — (R297) No. 3:

Is there continuity?

Yes	Go to 9.
No	Repair or replace the open circuit of harness.

9. CHECK ANTENNA.

Replace the front interior antenna with a new or properly functioning part.

Does it operate properly?

Yes	Replace the front interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.
No	Go to 10.

10. CHECK ANTENNA.

Replace the center interior antenna with a new or properly functioning part.

Does it operate properly?

Yes	Replace the center interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.
No	Go to 11.

11. CHECK ANTENNA.

Replace the rear interior antenna with a new or properly functioning part.

Does it operate properly?

Yes	Replace the rear interior antenna. Ref. to SECURITY AND LOCKS>Keyless Access Indoor Antenna>REMOVAL.
No	Go to 12.

12. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Fr internal transmitter - internal tuner]
2. Hold the access key 1 m or more away from the audio panel, then come closer to within 0.8 m.

Does the buzzer sound?

Yes	Go to 13.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

13. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Rr internal transmitter - internal tuner]
2. Hold the access key 1 m or more away from the center of the second row seats, then come closer to within 0.8 m.

Does the buzzer sound?

Yes	Go to 14.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

14. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [Trunk-internal transmitter - trunk-internal tuner]
     or
   - [R gate internal transmitter - internal tuner]
2. Hold the access key 1 m or more away from the back of the rear seat, then come closer to within 0.8 m.

Does the buzzer sound?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

13. REAR GATE CANNOT BE UNLOCKED WITH THE REAR GATE OPENER BUTTON

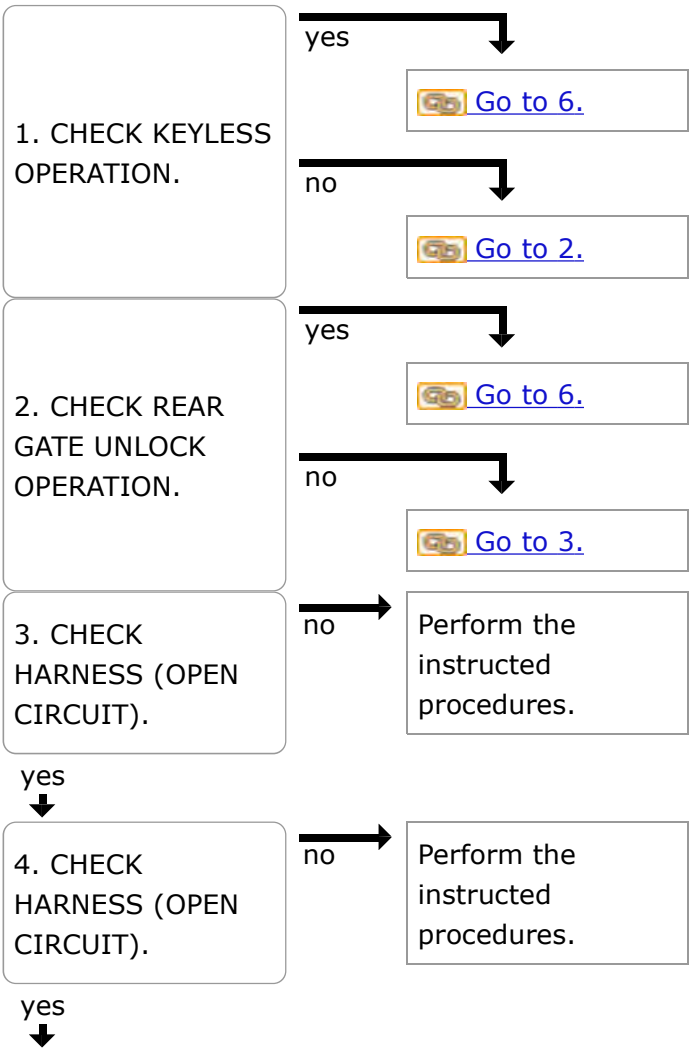
Trouble causes:

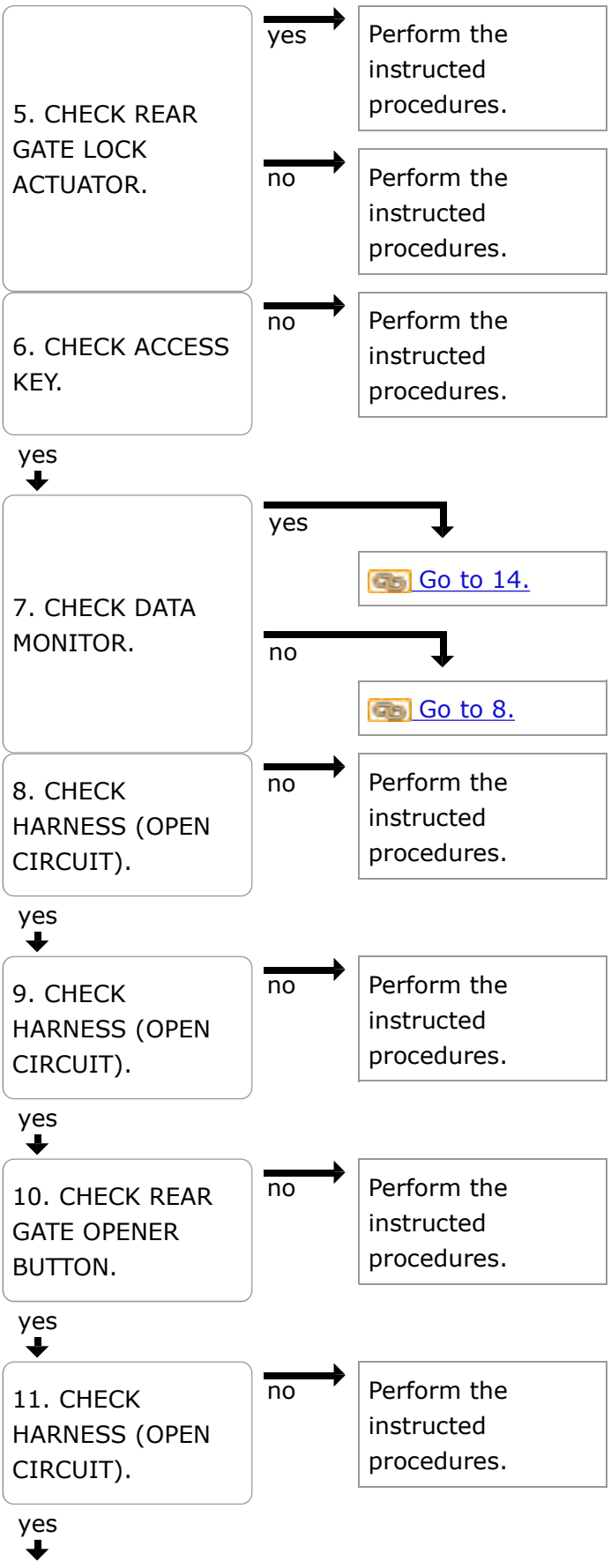
- Malfunction of harness between the body integrated unit and rear gate lock actuator
- Body integrated unit malfunction

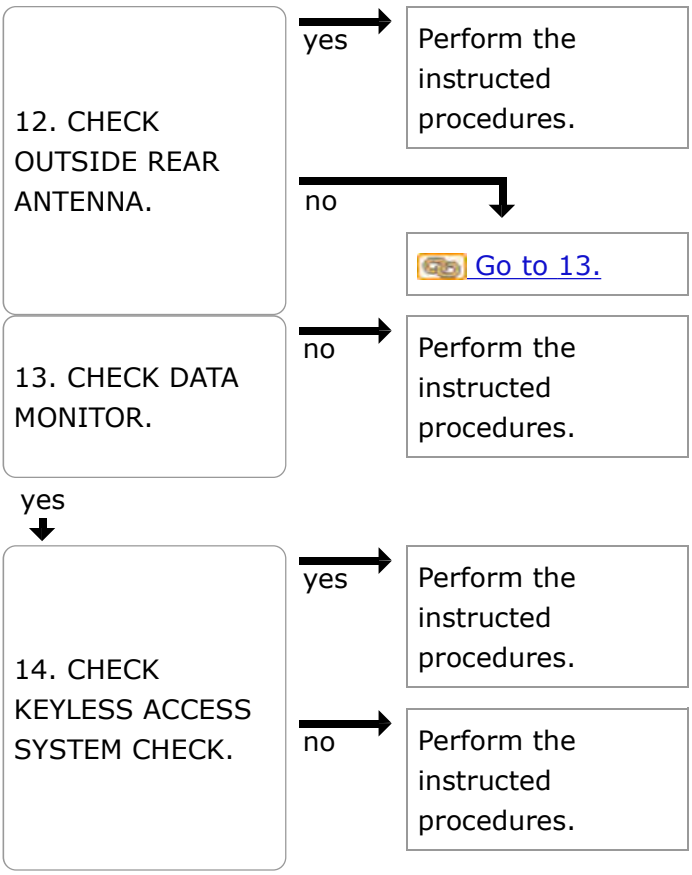
- Rear gate lock actuator malfunction
- Access key malfunction
- Malfunction of harness between body integrated unit and rear gate opener button
- Rear gate opener button malfunction
- Malfunction of harness between keyless access CM and exterior rear antenna
- Keyless access CM malfunction
- Exterior rear antenna malfunction

Caution:

- **Check that there are no other registered access keys inside the rear gate.**
- **Inspect LAN system according to the basic diagnostic procedure, and make sure that there is no fault.**
- **Check that the keyless access function is not stopped.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**




5. CHECK REAR GATE LOCK ACTUATOR.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
6. CHECK ACCESS KEY.
no
Perform the instructed procedures.
yes
7. CHECK DATA MONITOR.
yes
Go to 14.
no
Go to 8.
8. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
9. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
10. CHECK REAR GATE OPENER BUTTON.
no
Perform the instructed procedures.
yes
11. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes



1. CHECK KEYLESS OPERATION.

Check that the rear gate unlocks when the trunk open button of the access key is pressed.

Does it operate properly?

Yes	Go to 6.
No	Go to 2.

2. CHECK REAR GATE UNLOCK OPERATION.

1. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.
   - [R gate/trunk UNLK output]
2. Check that the rear gate unlocks when [R gate/trunk UNLK output] is output.

Does it operate properly?

Yes	Go to 6.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector and rear gate lock actuator connector.
2. Check the continuity between body integrated unit connector and rear gate lock actuator connector.
   Connector & terminal
   (i266) No. 7 — (D46) No. 1:

Is there continuity?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Check the continuity between the rear gate lock actuator connector and chassis ground.
   Connector & terminal
   (D46) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK REAR GATE LOCK ACTUATOR.

1. Check the rear gate lock actuator. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSPECTION.

Is the check result OK?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the rear gate latch and actuator assembly. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly.

6. CHECK ACCESS KEY.

1. Prepare all access keys registered to the vehicle.
2. Check that the rear gate lock can be unlocked with each access key.

Is the check result OK?

Yes	Go to 7.
No	Replace the access key. Ref. to SECURITY AND LOCKS>Access Key>REPLACEMENT.

7. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [R Gate Release SW input]
2. Read the data when pressing the rear gate opener button.

Does the data display ON?

Yes	Go to 14.
No	Go to 8.

8. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the rear gate opener button connector and body integrated unit connector.
2. Using a tester, check the continuity between the rear gate opener button connector and body integrated unit connector.
   Connector & terminal
   (D77) No. 1 — (i171) No. 6:

Is there continuity?

Yes	Go to 9.
No	Repair or replace the open circuit of harness.

9. CHECK HARNESS (OPEN CIRCUIT).

1. Using a tester, check the continuity between the rear gate opener button connector and chassis ground.
   Connector & terminal
   (D77) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 10.
No	Repair or replace the open circuit of harness.

10. CHECK REAR GATE OPENER BUTTON.

Using a tester, check the continuity between rear gate opener button connector terminals.
Terminals
No. 1 — No. 2:

Is there continuity when pressing the switch?

Yes	Go to 11.
No	Replace the rear gate opener button. Ref. to SECURITY AND LOCKS>Rear Gate Opener Button.

11. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the exterior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the exterior rear antenna connector and keyless access CM connector.

Connector & terminal

(D45) No. 1 — (i241) No. 8:

(D45) No. 3 — (i241) No. 9:

Is there continuity?

Yes	Go to 12.
No	Repair or replace the open circuit of harness.

12. CHECK OUTSIDE REAR ANTENNA.

Replace the outside rear antenna with new or properly working parts.

Does it operate properly?

Yes	The outside rear antenna has a failure.
No	Go to 13.

13. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [R gate lock status SW input]
2. Read the data when locking/unlocking the rear gate lock actuator.

Does the data change from ON ←→ OFF?

Yes	Go to 14.
No	Check body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit>REMOVAL.

14. CHECK KEYLESS ACCESS SYSTEM CHECK.

1. Using the Subaru Select Monitor, check the following items in the [Keyless Access with Push Button Start Check] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Keyless Access with Push Button Start Check.
   - [R gate external transmitter - internal tuner]
2. Hold the access key 1 m or more away from the trunk, then come closer to within 0.8 m.

Does the outside buzzer sound?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

14. CAN NOT LOCK WHEN USING THE REAR LOCK BUTTON

Trouble causes:

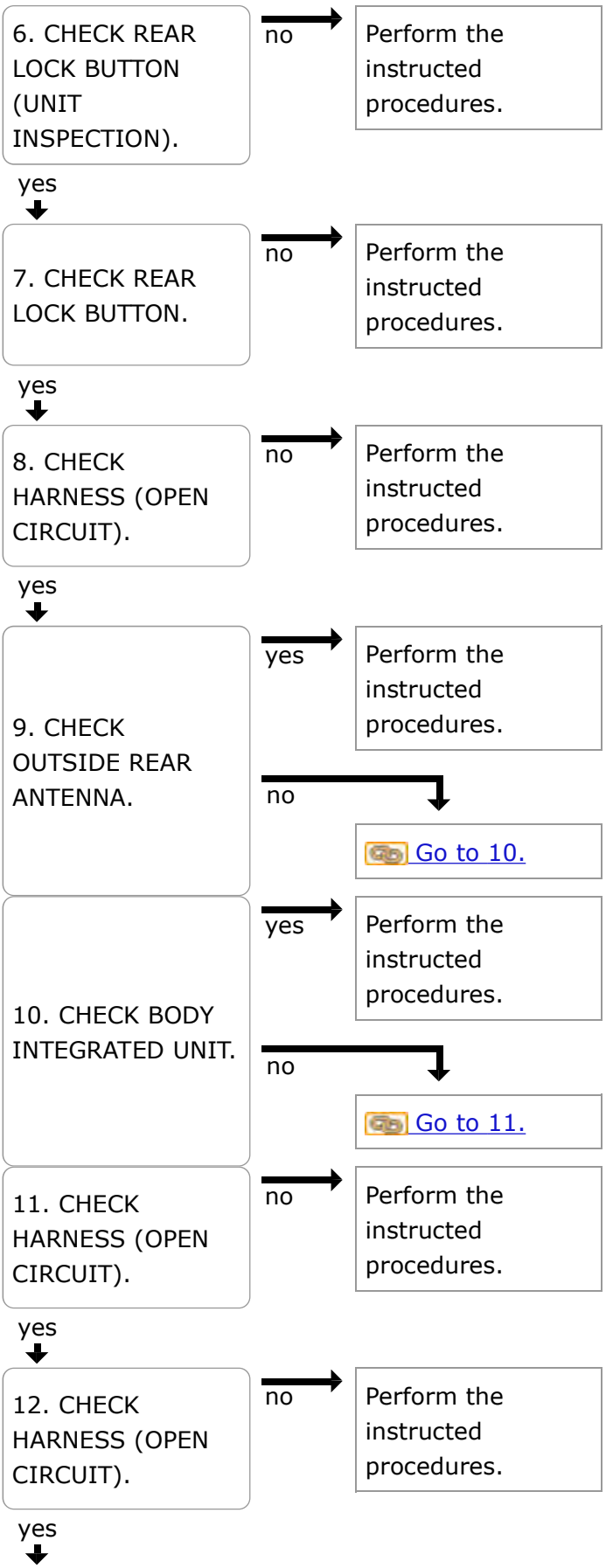
- Malfunction of harness between keyless access CM and rear lock button
- Rear lock button malfunction
- Malfunction of harness between keyless access CM and exterior rear antenna
- Keyless access CM malfunction
- Exterior rear antenna malfunction

- Malfunction of harness between the body integrated unit and rear gate lock actuator
- Body integrated unit malfunction
- Rear gate lock actuator malfunction

Caution:

- **Check that there are no other registered access keys inside the vehicle.**
- **Check that the keyless access function is not stopped.**
- **Inspect LAN system or keyless access with push button start system according to the basic diagnostic procedure, and make sure that DTC is not input.**
- **When the access key or keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK REAR GATE ACTUATOR.
   - no → Go to 10.
   - yes ↓
2. CHECK REAR LOCK BUTTON.
   - yes → Go to 8.
   - no → Go to 3.
3. CHECK HARNESS (OPEN CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK HARNESS (GROUND SHORT CIRCUIT).
   - no → Perform the instructed procedures.
   - yes ↓
5. CHECK HARNESS (OPEN CIRCUIT).
   - yes → Go to 7.
   - no → Perform the instructed procedures.


6. CHECK REAR LOCK BUTTON (UNIT INSPECTION).
no
Perform the instructed procedures.
yes
7. CHECK REAR LOCK BUTTON.
no
Perform the instructed procedures.
yes
8. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
9. CHECK OUTSIDE REAR ANTENNA.
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK BODY INTEGRATED UNIT.
yes
Perform the instructed procedures.
no
Go to 11.
11. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes
12. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes

13. CHECK REAR GATE LOCK ACTUATOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK REAR GATE ACTUATOR.

While carrying the access key, operate the touch sensor (lock) and touch sensor (unlock).

When the switch is operated, does the rear gate lock/unlock?

Yes	Go to 2.
No	Go to 10.

2. CHECK REAR LOCK BUTTON.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Rear Gate Request SW]

Does the data change between ON/OFF?

Yes	Go to 8.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the rear lock button connector and the keyless access CM connector.
2. Using a tester, measure the resistance between harness.
   Connector & terminal
   (D77) No. 3 — (i75) No. 17:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of the harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between harness and chassis ground.
Connector & terminal
(D77) No. 3 — Chassis ground:

Is the resistance 10 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between harness and chassis ground.
Connector & terminal
(D77) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Repair or replace the open circuit of the harness.

6. CHECK REAR LOCK BUTTON (UNIT INSPECTION).

Using a tester, measure the resistance between harness and chassis ground.

Terminals

No. 3 — No. 4:

Did the resistance change from 1 MΩ or more to less than 10 Ω?

Yes	Go to 7.
No	Replace the rear lock button. Ref. to SECURITY AND LOCKS>Rear Lock Button>REMOVAL.

7. CHECK REAR LOCK BUTTON.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Rear Gate Request SW]
2. Read the data when operating the rear lock button.

Does the data change between ON/OFF?

Yes	Go to 8.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

8. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the exterior rear antenna connector and the keyless access CM connector.
2. Using a tester, check continuity between the exterior rear antenna connector and keyless access CM connector.
   Connector & terminal
   (D45) No. 1 — (i241) No. 8:
   (D45) No. 3 — (i241) No. 9:

Is there continuity?

Yes	Go to 9.
No	Repair or replace the open circuit of harness.

9. CHECK OUTSIDE REAR ANTENNA.

Replace the outside rear antenna with new or properly working parts. Ref. to SECURITY AND LOCKS>Keyless Access Outdoor Antenna>REMOVAL.

Does it operate properly?

Yes	The outside rear antenna has a failure.
No	Go to 10.

10. CHECK BODY INTEGRATED UNIT.

1. Connect the disconnected connectors.
2. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Active Test.
   - [lock actuator LOCK output]
3. Actuate the door lock actuator LOCK output.

Does the rear gate lock actuator lock?

Yes	It is possible that temporary poor communication occurs.
No	Go to 11.

11. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector and rear gate lock actuator connector.
2. Check the continuity between body integrated unit connector and rear gate lock actuator connector.
   Connector & terminal
   (i266) No. 7 — (D46) No. 1:

Is there continuity?

Yes	Go to 12.
No	Repair or replace the open circuit of harness.

12. CHECK HARNESS (OPEN CIRCUIT).

1. Check the continuity between the rear gate lock actuator connector and chassis ground.
   Connector & terminal
   (D46) No. 2 — Chassis ground:

Is there continuity?

Yes	Go to 13.
No	Repair or replace the open circuit of harness.

13. CHECK REAR GATE LOCK ACTUATOR.

1. Check the rear gate lock actuator. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly>INSPECTION.

Is the check result OK?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Replace the rear gate latch and actuator assembly. Ref. to SECURITY AND LOCKS>Rear Gate Latch and Actuator Assembly.

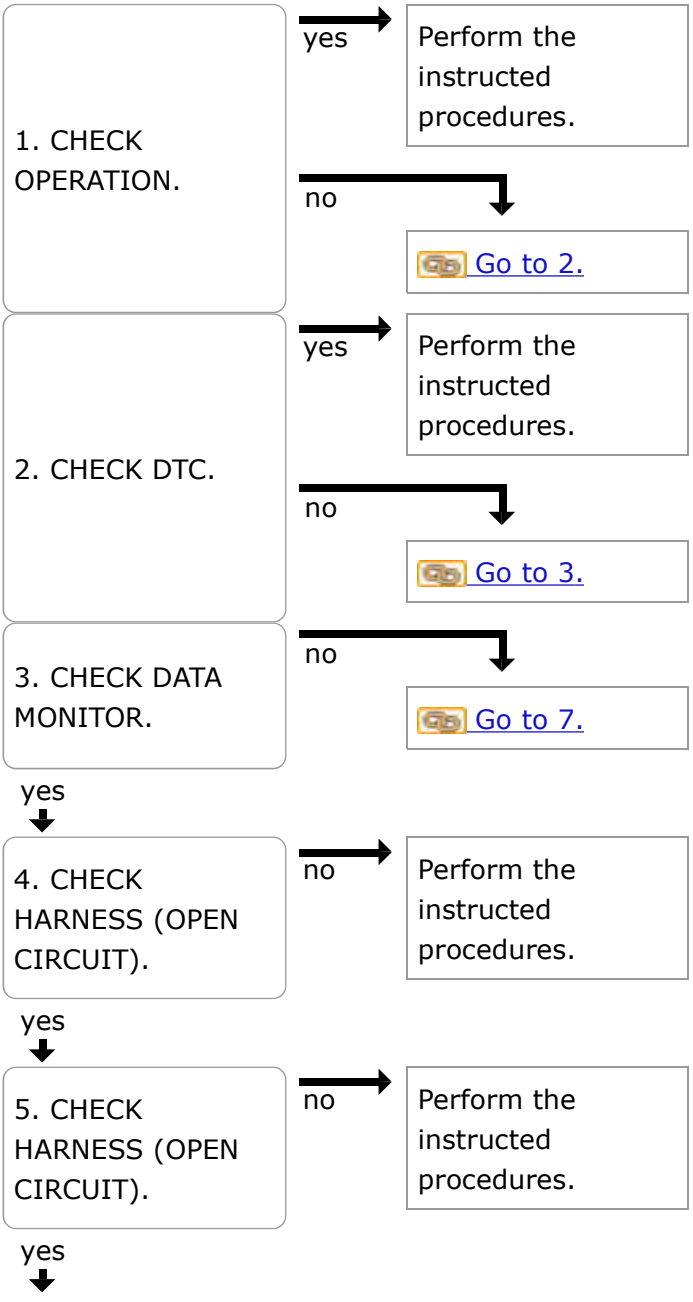
15. THE STEERING LOCK IS NOT RELEASED

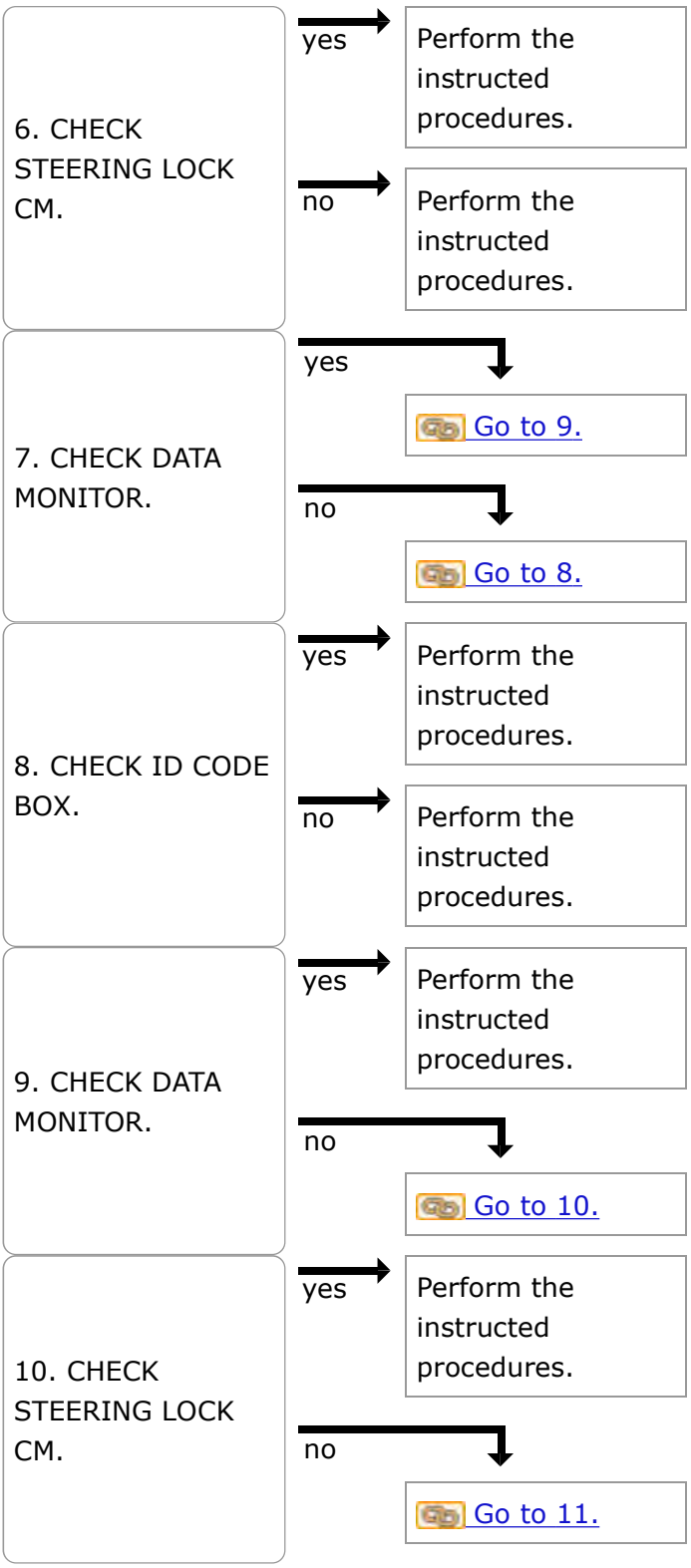
Trouble causes:

- ECM failure
- Steering lock circuit malfunction
- Steering lock CM malfunction
- Keyless access CM malfunction

Caution:

- **For replacement procedure of keyless access CM or steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**




6. CHECK STEERING LOCK CM.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
7. CHECK DATA MONITOR.
yes
Go to 9.
no
Go to 8.
8. CHECK ID CODE BOX.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
9. CHECK DATA MONITOR.
yes
Perform the instructed procedures.
no
Go to 10.
10. CHECK STEERING LOCK CM.
yes
Perform the instructed procedures.
no
Go to 11.

11. CHECK ID CODE BOX.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK OPERATION.

1. Depress the brake pedal.
2. While turning the steering wheel lightly to the left and right, press the push button ignition switch.
3. Confirm that the steering lock is released and the engine starts.

Does the engine fail to start with the steering lock released?

Yes	Perform the diagnosis for engine system. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>Diagnostics with Phenomenon.
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Steering lock unlock request reception status]
     and
   - [Steering lock lock/unlock command reception history]
2. Read the data when the push button ignition switch is pressed while carrying the access key. (Maintain for 10 seconds after switch operation)

Does the data change from "Not yet received" to "Reception", and from "OFF" to "ON"?

Yes	Go to 4.
No	Go to 7.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the steering lock CM connector.
2. Using a tester, measure the voltage between the steering lock CM connector and chassis ground.
   Connector & terminal
   (i47) No. 7 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check continuity between the steering lock CM connector and chassis ground.

Connector & terminal

(i47) No. 1 — Chassis ground:

Is there continuity?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK STEERING LOCK CM.

1. Connect the disconnected connectors.
2. Using a tester, measure the voltage between steering lock CM terminals right after the ignition switch is turned to ON.

   Connector & terminal

   (i47) No. 3 (+) — (i47) No. 1 (−):

Is the voltage 1 V or less right after the ignition ON?

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Repair or replace the open circuit of harness.

7. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Code collation result between smart ECM and ID code box]

Is data displayed as being normal?

Yes	Go to 9.
No	Go to 8.

8. CHECK ID CODE BOX.

1. Replace with a properly functioning or new ID code box. Ref. to SECURITY AND LOCKS>ID Code Box.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Code collation result between smart ECM and ID code box]

Is data displayed as being normal?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

9. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Code collation result between steering locked ECM and ID code box]

Is data displayed as being normal?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 10.

10. CHECK STEERING LOCK CM.

1. Replace with a properly functioning or new steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
2. After registering, the steering lock operates when the ignition is turned to OFF and the driver's door is opened and closed.
3. Turn the ignition to ON.
4. Operate the steering and check for whether the steering lock is released.

Is the steering lock released, and does the engine start?

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Go to 11.

11. CHECK ID CODE BOX.

1. Replace with a properly functioning or new ID code box. Ref. to SECURITY AND LOCKS>ID Code Box>NOTE.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.



- [Code collation result between steering locked ECM and ID code box]

Is data displayed as being normal?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

16. THE STEERING LOCK DOES NOT OPERATE

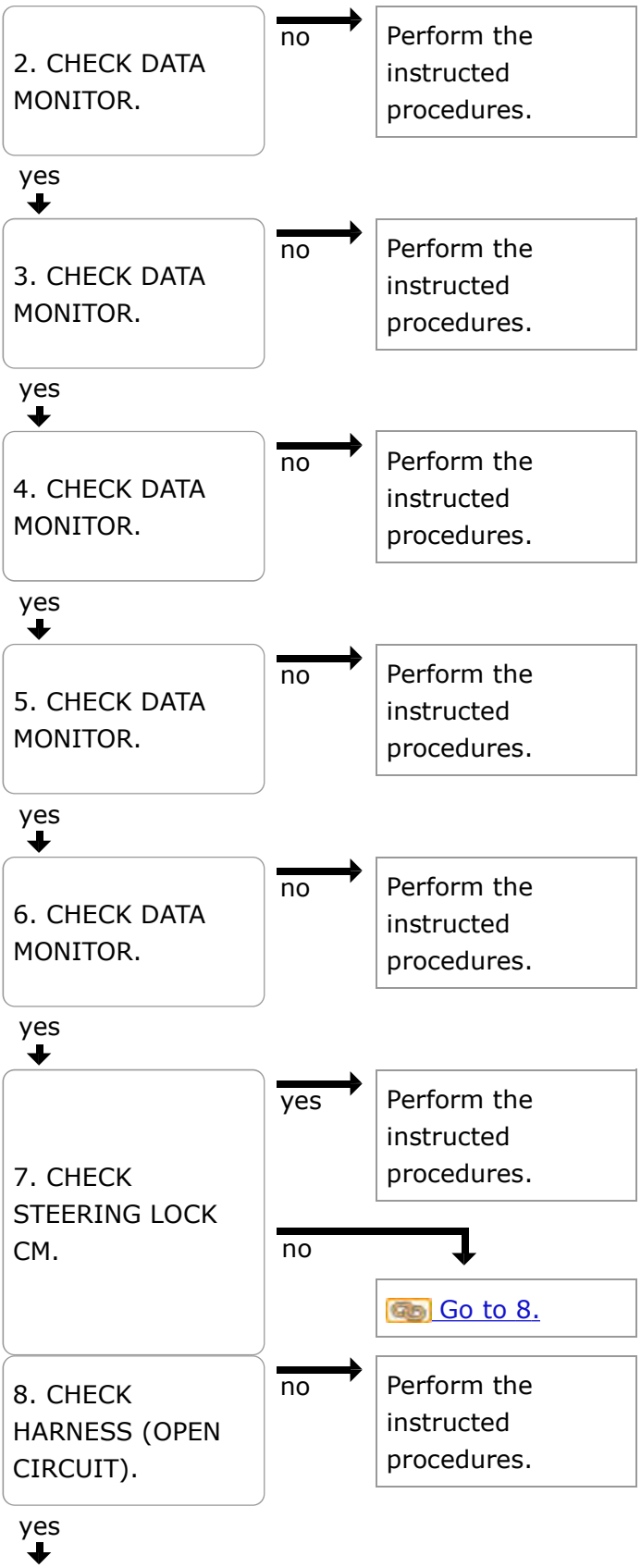
Trouble causes:

- Door switch circuit malfunction
- P range switch circuit malfunction
- Steering lock circuit malfunction
- Steering lock CM malfunction
- Keyless access CM malfunction

Caution:

- **For replacement procedure of keyless access CM or steering lock CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.


2. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
3. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
4. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
5. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
6. CHECK DATA MONITOR.
no
Perform the instructed procedures.
yes
7. CHECK STEERING LOCK CM.
yes
Perform the instructed procedures.
no
Go to 8.
8. CHECK HARNESS (OPEN CIRCUIT).
no
Perform the instructed procedures.
yes

9. CHECK HARNESS (OPEN CIRCUIT).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 2.

2. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control]. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

   - [Driver's door SW input]
2. Read the data when opening and closing the driver’s door.

Does the data change from ON to OFF according to the opening and closing?

Yes	Go to 3.
No	Inspect door switch circuit.

3. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Shift P signal(AT only)]

Is the status displayed correctly when the shift lever is shifted from P to other than P?

Yes	Go to 4.
No	Check the P range switch and harness.

4. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Code collation result between smart ECM and ID code box]

Is the status normal?

Yes	Go to 5.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

5. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Code collation result between steering locked ECM and ID code box]

Is the status normal?

Yes	Go to 6.
No	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.

6. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Steering lock lock/unlock command reception history]
2. While in possession of the access key, perform engine start operations, and read data within 10 seconds after starting.

Is data displayed as ON?

Yes	Go to 7.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.

7. CHECK STEERING LOCK CM.

Using an oscilloscope, measure the waveform between steering lock CM terminals immediately after the following operations.
Perform ignition ON, driver's side door close → shift lever "P" range, ignition OFF, and close → open the driver's side door.

Connector & terminal

(i47) No. 3 — (i47) No. 1:

Is the waveform immediately after opening the driver's side door abnormal?

Yes	Replace the steering lock CM. Ref. to SECURITY AND LOCKS>Steering Lock CM.
No	Go to 8.

8. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and the steering lock CM connector.
2. Using a tester, check continuity between the keyless access CM connector and steering lock CM connector.

   Connector & terminal

   (i47) No. 3 — (i75) No. 10:

Is there continuity?

Yes	Go to 9.
No	Repair or replace the open circuit of harness.

9. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is there continuity?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM>REMOVAL.
No	Repair or replace the open circuit of harness.

17. POWER WILL NOT TURN ON (BOTH ACCESSORY AND IGNITION)

Trouble causes:

- Malfunction of keyless access CM power supply circuit
- Relay failure
- Push button ignition switch circuit malfunction

Caution:

- **When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.**
- **When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK FUSE.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK POWER SUPPLY.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK CONNECTOR.

no → Perform the instructed procedures.

yes ↓

4. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

5. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

6. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 7.

7. CHECK DATA MONITOR.

no → Go to 13.

yes ↓

8. CHECK RELAY (PUSH BUTTON START).

no → Perform the instructed procedures.

yes ↓

9. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

10. CHECK HARNESS (GROUND SHORT CIRCUIT).

yes → Perform the instructed procedures.

no → Go to 11.

11. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

12. CHECK KEYLESS ACCESS CM.

no → Perform the instructed procedures.

yes ↓

13. CHECK PUSH BUTTON IGNITION SWITCH UNIT.

no → Perform the instructed procedures.

yes ↓

14. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

15. CHECK WIRING HARNESS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse.

2. CHECK POWER SUPPLY.

1. Remove IG relay 1 (push button start), IG relay 2 (push button start) and accessory relay (push button start).
2. Using a tester, measure the voltage between the relay block connector and chassis ground.

Is the voltage 10 V or more?

Yes	Go to 3.
No	Check the DC power supply circuit.

3. CHECK CONNECTOR.

Check the engagement of each connector and terminal for any deformation or looseness.

Is the check result OK?

Yes	Go to 4.
No	Repair the connector, or replace harness.

4. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage between 8 V and 16 V?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i241) No. 17 — Chassis ground:

(i75) No. 20 — Chassis ground:

Is there continuity?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK DTC.

1. Connect the keyless access CM connector.
2. While in possession of the access key, depress the brake pedal, and push the push button ignition switch.
3. Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 7.

7. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.



   - [Push start SW 1]
   - [Push start SW 2]
2. Read the data when pressing the push button ignition switch.

Does it change from OFF to ON along with the operation?

Yes	Go to 8.
No	Go to 13.

8. CHECK RELAY (PUSH BUTTON START).

Check IG relay 1 and 2 (push button start), and accessory relay (push button start). Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is each check result OK?

Yes	Go to 9.
No	Replace the faulty relay.

9. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and F/B connector.
2. Using a tester, check continuity between keyless access CM connector and F/B connector.

Connector & terminal

(i75) No. 28 — (i265) No. 4:
(i75) No. 27 — (i137) No. 12:
(i75) No. 16 — (i137) No. 2:

Is there continuity?

Yes	Go to 10.
No	Repair or replace the open circuit of harness.

10. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 28 — Chassis ground:
(i75) No. 27 — Chassis ground:
(i75) No. 16 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Go to 11.

11. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check the continuity between F/B connector and chassis ground.

Connector & terminal

(i136) No. 6 — Chassis ground:

Is there continuity?

Yes	Go to 12.
No	Repair or replace the open circuit of harness.

12. CHECK KEYLESS ACCESS CM.

1. Connect all the disconnected connectors.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

   Connector & terminal

   (i75) No. 28 (+) — Chassis ground (−):
   (i75) No. 28 (+) — Chassis ground (−):
   (i75) No. 16 (+) — Chassis ground (−):

Did the voltage change from 1 V or less to +B-2 V or more?

Yes	Go to 13.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

13. CHECK PUSH BUTTON IGNITION SWITCH UNIT.

1. Disconnect the push button ignition switch connector.
2. Using a tester, check the continuity between the push button ignition switch connector terminals.

Terminals

No. 7 — No. 5:
No. 2 — No. 5:

Did it change to continuity exists, when the button was pressed? (No continuity when button is released)

Yes	Go to 14.
No	Replace the push button ignition switch. Ref. to SECURITY AND LOCKS>Push Button Ignition Switch>REMOVAL.

14. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check the continuity between the push button ignition switch connector and chassis ground.

Connector & terminal

(i150) No. 4 — Chassis ground:
(i150) No. 5 — Chassis ground:

Is there continuity?

Yes	Go to 15.
No	Repair or replace the open circuit of harness.

15. CHECK WIRING HARNESS.

1. Disconnect the keyless access CM connector.
2. Using a tester, check continuity between the keyless access CM connector and push button ignition switch.
   Connector & terminal
   (i150) No. 7 — (i75) No. 8:
   (i150) No. 2 — (i75) No. 9:

Is there continuity?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Repair or replace the open circuit of harness.

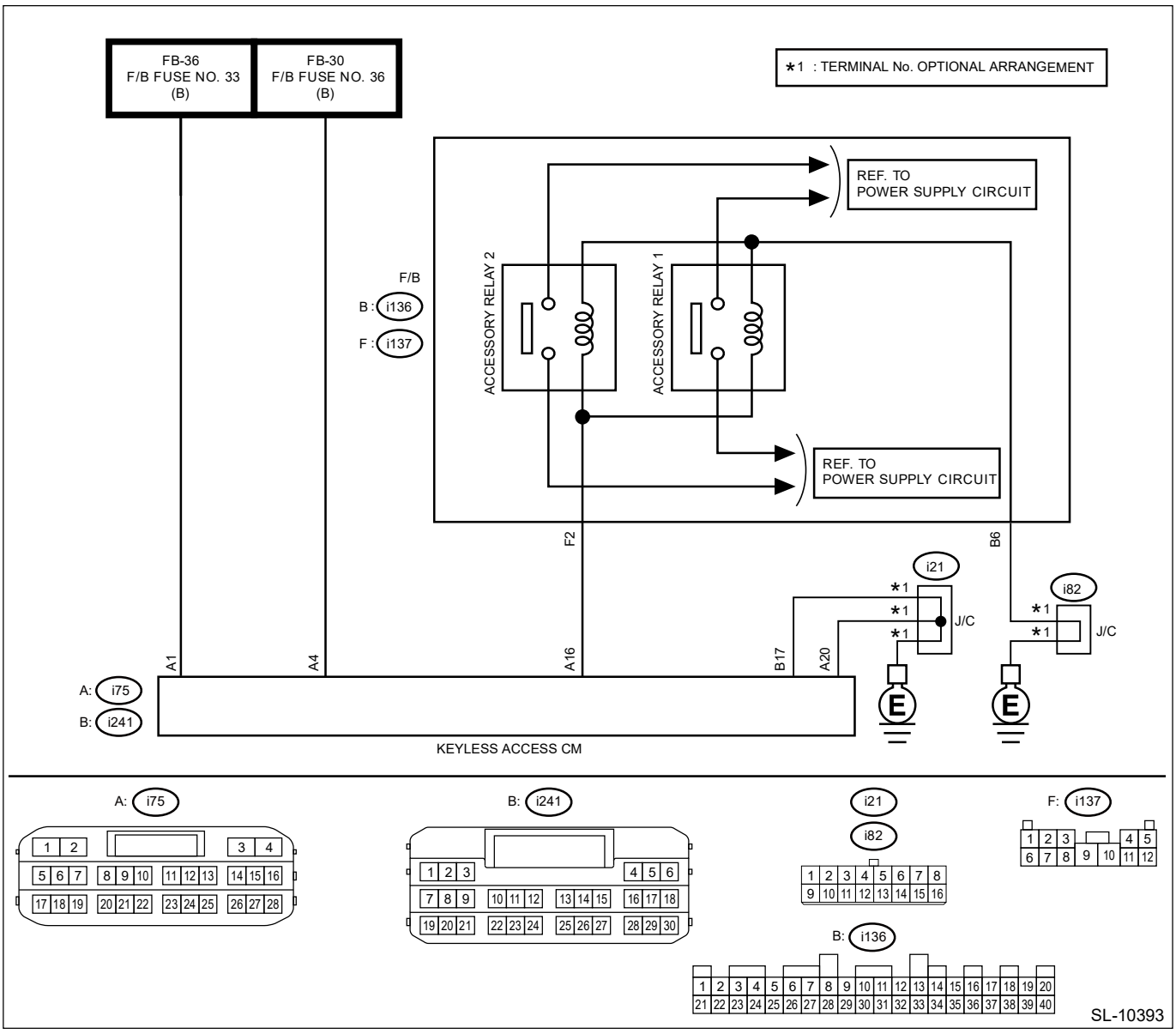
18. POWER WILL NOT TURN ON (ACCESSORY DOES NOT TURN ON, BUT IGNITION TURNS ON)

Trouble causes:

- Malfunction of keyless access CM power supply circuit
- Relay failure
- Push button ignition switch circuit malfunction

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.**
- **When the keyless access CM is replaced, registration of the immobilizer is required. For the relevant procedures, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK FUSE.

no → Perform the instructed procedures.

yes ↓

2. CHECK CONNECTOR.

no → Perform the instructed procedures.

yes ↓

3. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

4. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

5. CHECK ACCESSORY RELAY (PUSH BUTTON START) (UNIT INSPECTION).

no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

yes → Perform the instructed procedures.

no → Go to 8.

8. CHECK KEYLESS ACCESS CM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse.

2. CHECK CONNECTOR.

Check the engagement of each connector and terminal for any deformation or looseness.

Is the check result OK?

Yes	Go to 3.
No	Repair the connector, or replace harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage between 8 V and 16 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 20 — Chassis ground:

(i241) No. 17 — Chassis ground:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK ACCESSORY RELAY (PUSH BUTTON START) (UNIT INSPECTION).

Check the accessory relay (push button start). Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 6.
No	Replace the relay.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and F/B connector.
2. Using a tester, check continuity between keyless access CM connector and F/B connector.

Connector & terminal

(i75) No. 16 — (i137) No. 2:

Is there continuity?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 16 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Go to 8.

8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

   Connector & terminal

   (i75) No. 16 (+) — Chassis ground (−):

Did the voltage change from 1 V or less → +B-2 V or more?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

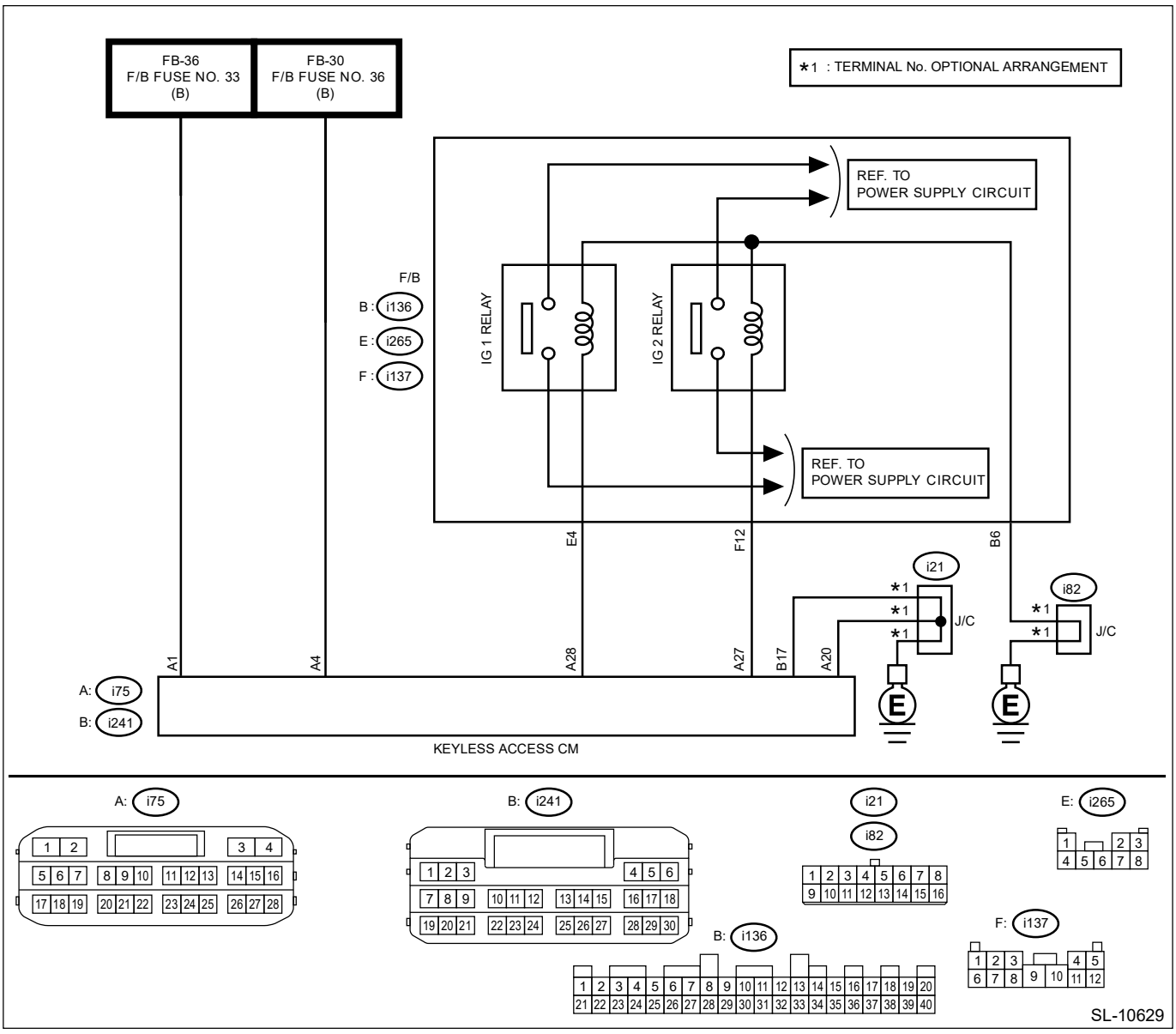
19. POWER WILL NOT TURN ON (ACCESSORY TURNS ON, BUT IGNITION DOES NOT TURN ON)

Trouble causes:

- Malfunction of keyless access CM power supply circuit
- Relay failure
- Push button ignition switch circuit malfunction

Wiring diagram:

Keyless access with push button start system Ref. to WIRING SYSTEM>Keyless Access With Push Button Start System>WIRING DIAGRAM.



Caution:

- **When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.**
- **For replacement procedure of keyless access CM, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK FUSE.	no →	Perform the instructed procedures.

yes ↓

2. CHECK CONNECTOR.

no → Perform the instructed procedures.

yes ↓

3. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

4. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

5. CHECK IG Relay 1 AND 2 (PUSH BUTTON START) (UNIT INSPECTION).

no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).

no → Perform the instructed procedures.

yes ↓

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

yes → Perform the instructed procedures.

no → Go to 8.

8. CHECK KEYLESS ACCESS CM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK FUSE.

Check the fuse. Ref. to SECURITY AND LOCKS>Relay and Fuse>INSPECTION.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse.

2. CHECK CONNECTOR.

Check the engagement of each connector and terminal for any deformation or looseness.

Is the check result OK?

Yes	Go to 3.
No	Repair the connector, or replace harness.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 1 (+) — Chassis ground (−):

(i75) No. 4 (+) — Chassis ground (−):

Is the voltage between 8 V and 16 V?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 20 — Chassis ground:

(i241) No. 17 — Chassis ground:

Is there continuity?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK IG Relay 1 AND 2 (PUSH BUTTON START) (UNIT INSPECTION).

Check IG relay 1 (push button start) and IG relay 2 (push button start). Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the check result OK?

Yes	Go to 6.
No	Replace the relay.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the keyless access CM connector and F/B connector.
2. Using a tester, check continuity between keyless access CM connector and F/B connector.

Connector & terminal

(i75) No. 28 — (i265) No. 4:

(i75) No. 27 — (i137) No. 12:

Is there continuity?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, check continuity between the keyless access CM connector and chassis ground.

Connector & terminal

(i75) No. 28 — Chassis ground:

(i75) No. 27 — Chassis ground:

Is there continuity?

Yes	Repair or replace the short circuit of the harness.
No	Go to 8.

8. CHECK KEYLESS ACCESS CM.

1. Connect the keyless access CM connector.
2. Using a tester, measure the voltage between the keyless access CM connector and chassis ground when the ignition is turned from OFF to ON.

   Connector & terminal

   (i75) No. 28 (+) — Chassis ground (−):

   (i75) No. 27 (+) — Chassis ground (−):

Did the voltage change from 1 V or less → +B-2 V or more?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

20. ENGINE DOES NOT START

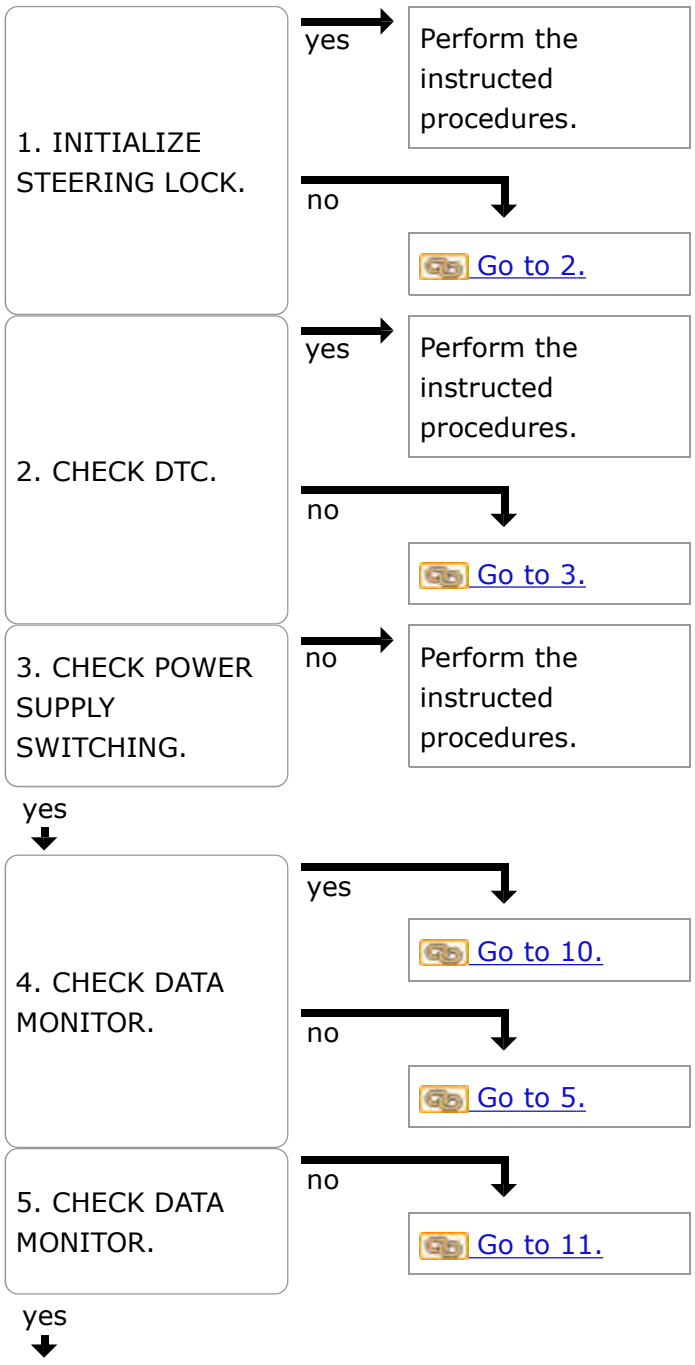
Trouble causes:

- Engine system failure
- Keyless access CM malfunction
- Keyless access with push button start system power supply malfunction
- Steering lock system malfunction
- P range switch circuit malfunction
- Stop light switch circuit malfunction
- Inhibitor switch circuit malfunction

- Clutch switch circuit malfunction

Caution:

- **When the keyless access CM is replaced with a new unit, and the battery ground terminal is connected, it will become ignition ON. Also, if the battery is disconnected, it will resume to a condition with the battery cut off.**
- **For replacement procedure of keyless access CM or ID code box, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>General Description>CAUTION.**



6. CHECK DATA MONITOR.

no → Go to 13.

yes ↓

7. CHECK DATA MONITOR.

no → Go to 15.

yes ↓

8. CHECK STEERING LOCK.

no → Perform the instructed procedures.

yes ↓

9. CHECK KEYLESS ACCESS CM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

10. CHECK DATA MONITOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

11. CHECK P RANGE SWITCH ONLY.

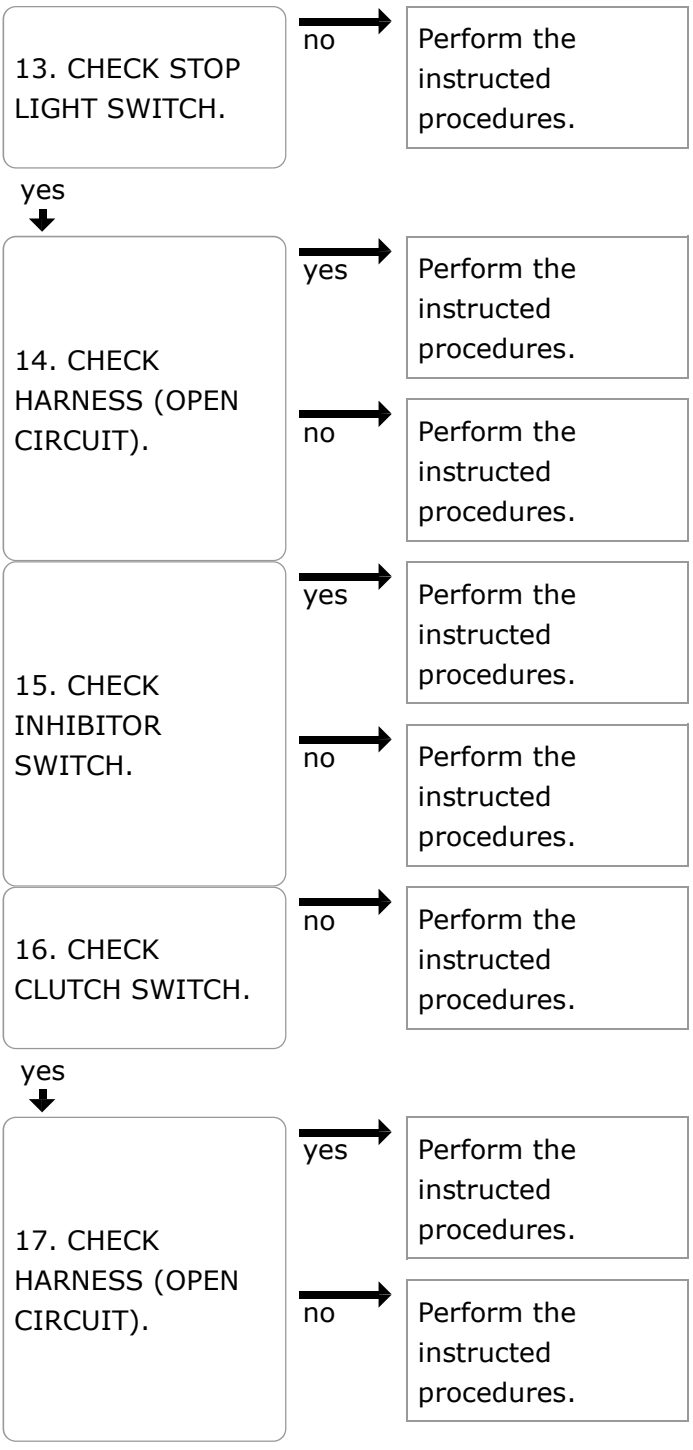
no → Perform the instructed procedures.

yes ↓

12. CHECK HARNESS (OPEN CIRCUIT).

yes → Perform the instructed procedures.

no → Perform the instructed procedures.


13. CHECK STOP LIGHT SWITCH.
no
Perform the instructed procedures.
yes
14. CHECK HARNESS (OPEN CIRCUIT).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
15. CHECK INHIBITOR SWITCH.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
16. CHECK CLUTCH SWITCH.
no
Perform the instructed procedures.
yes
17. CHECK HARNESS (OPEN CIRCUIT).
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. INITIALIZE STEERING LOCK.

1. Shift the shift lever to parking (except for MT model), or neutral for MT model.
2. Operate the driver's door switch ON/OFF with the ignition switch OFF.
3. Wait for 10 seconds.
4. Place the access key on the driver's seat.
5. Depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch.

Can the engine start?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Keyless Access with Push Button Start] using the Subaru Select Monitor. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to the DTC. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK POWER SUPPLY SWITCHING.

1. Place the access key on the driver's seat.
2. Without depressing the brake pedal (except for MT model) or clutch pedal (MT model), push the push button ignition switch.

When the switch is operated, does it change as <IG-OFF> → <ACC-ON> → <IG-ON> → <IG-OFF>?

Yes	Go to 4.
No	Perform the diagnostics according to the symptom for power supply switching system in General Diagnostic Table.

4. CHECK DATA MONITOR.

1. Place the access key on the driver's seat.
2. Depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch. Depress the brake pedal (except for MT model) or clutch pedal (MT model), and push the push button ignition switch.
3. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   - [STSW signal monitor]

   Note:

   If it is difficult to confirm, press the push button ignition switch for approximately five seconds longer.

Does the data change from OFF → ON?

Yes	Go to 10.
No	Except for MT model: Go to 5. MT model: Go to 7.

5. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Shift P signal(AT only)]

Is ON displayed in parking position, and OFF displayed in other positions?

Yes	Go to 6.
No	Go to 11.

6. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Stop Light Switch]

Is ON displayed when brake pedal depressed, and OFF displayed when brake pedal not depressed?

Yes	Go to 7.
No	Go to 13.

7. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Clutch SW(MT only)]
- [Shift N signal(AT only)]

Except for MT model: is ON displayed in parking and neutral position and OFF displayed in other positions? MT model: is ON displayed when clutch pedal depressed and OFF displayed when clutch pedal not depressed?

Yes	Go to 8.
No	CVT model: Go to 15. MT model: Go to 17.

8. CHECK STEERING LOCK.

Operate the push button ignition switch to perform the power supply switching and check steering lock condition during ACC-ON condition.

Is the steering lock in unlocked condition?

Yes	Go to 9.
No	Perform the diagnostics according to the symptom for steering lock system in General Diagnostic Table.

9. CHECK KEYLESS ACCESS CM.

1. Turn the ignition switch to OFF.
2. Disconnect the ECM connector.
3. Using a tester, measure the voltage between the ECM connector and chassis ground in the following procedures.
   1. Press the push button ignition switch with the brake pedal depressed (MT model: clutch pedal depressed). (Measure within 10 seconds.)
   2. Release the push button ignition switch from the condition of step 1. above.

   Connector & terminal

   (i241) No. 15 (+) — Chassis ground (−):

Does the value change from 1 V or less to +B-2 V or more in the step 1, and return to 1 V or less in the step 2?

Yes	Perform the diagnosis for engine system. Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostics with Phenomenon.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

10. CHECK DATA MONITOR.

1. Connect the disconnected connectors.
2. Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Keyless Access with Push Button Start]. Ref. to KEYLESS ACCESS WITH PUSH BUTTON START(DIAGNOSTICS)>Data Monitor.

   - [Engine start permission request reception status]

Is “Reception” displayed with ignition switch ON, and “Not yet received” displayed in other positions?

Yes	Perform the diagnosis for engine system.
No	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.

11. CHECK P RANGE SWITCH ONLY.

1. Turn the ignition switch to OFF.
2. Disconnect the AT shift lever connector.
3. Using a tester, check the continuity of "P" range switch.
   Connector & terminal
   No. 1 — No. 2:

Does it change from Continuity ←→ No continuity according to shift lever operation?

Yes	Go to 12.
No	Replace the "P" range switch. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>REMOVAL.

12. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the keyless access CM connector.
3. Using a tester, check continuity between the keyless access CM connector and the AT select lever connector, and between the AT select lever connector and chassis ground.
   Connector & terminal
   (i44) No. 1 — (i241) No. 18:
   (i44) No. 2 — Chassis ground:

Is there continuity?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the open circuit of harness.

13. CHECK STOP LIGHT SWITCH.

1. Turn the ignition switch to OFF.
2. Disconnect the stop light switch connector.
3. Using a tester, check continuity of the stop light switch connector.
   Connector & terminal
   No. 1 — No. 2:

Does it change from Continuity ←→ No continuity according to brake pedal operation?

Yes	Go to 14.
No	Replace the stop light switch. Ref. to BRAKE>Stop Light Switch>REMOVAL.

14. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, check continuity between the keyless access CM connector and the stop light switch connector, and between the stop light switch connector and fuse.
   Connector & terminal
   (i241) No. 27 — (B65) No. 2:
   (B65) No. 1 — F/B fuse No. 37:

Is there continuity?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the open circuit of harness.

15. CHECK INHIBITOR SWITCH.

Check the inhibitor switch.

Is the inhibitor switch working normal?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Replace the inhibitor switch.

16. CHECK CLUTCH SWITCH.

Check the clutch lower switch. Ref. to CLUTCH SYSTEM>Clutch Switch>INSPECTION.

Is clutch switch OK?

Yes	Go to 17.
No	Replace the inhibitor switch. Ref. to CLUTCH SYSTEM>Clutch Switch>REMOVAL.

17. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the clutch lower switch connector.
3. Using a tester, measure continuity between the keyless access CM connector and the clutch lower switch connector and between the clutch lower switch connector and fuse.
   Connector & terminal
   (i75) No. 14 — (B501) No. 7:
   (B501) No. 2 — F/B fuse No. 33:

Is there continuity?

Yes	Replace the keyless access CM. Ref. to SECURITY AND LOCKS>Keyless Access CM.
No	Repair or replace the open circuit of harness.

BODY CONTROL(DIAGNOSTICS)

BIU(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Registration Body Integrated Unit
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. General Diagnostic Table
16. Diagnostics with Phenomenon

BODY CONTROL(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

- **Subaru Select Monitor is required for reading DTC, performing diagnosis and reading data monitor.**
- **Remove foreign matter (dust, water, oil, etc.) from the body integrated unit connector during removal and installation.**
- **Registration of immobilizer may be needed after the replacement of control modules, etc. For detailed procedure, refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

Note:

To check harness for open or short circuits, shake the suspected trouble spot or connector.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to BODY CONTROL(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Body Control].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

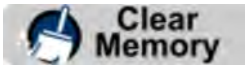


Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Go to 6.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to BODY CONTROL(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

6. PERFORM DIAGNOSTICS WITH PHENOMENON.

Check the "Phenomenon List". Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>LIST > HIGH BEAM ASSIST SYSTEM.

Is there a symptom that corresponds in the phenomenon list?

Yes	Perform diagnosis according to the procedures in the phenomenon list.
No	Go to 7.

7. PERFORM GENERAL DIAGNOSTICS.

Check “General Diagnostic Table”. Ref. to BODY CONTROL(DIAGNOSTICS)>General Diagnostic Table.

Is the check result OK?

Yes	The body control system is normal.
No	Perform inspection using “General Diagnostic Table”.

CHECK

1. BODY CONTROL

Inspect the following items regarding the vehicle's state.

Body Control System Check List for Interview Date of Vehicle Bring-in Year Month Day			
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content			
Date and time when the trouble occurred		Frequency of trouble occurrence	
Condition of trouble occurrence		Weather	
Road conditions		Occurrence location	
Accessory installation condition			
Trouble condition			
❑ DTC		❑ ( )	

- CONDITION OF IGNITION POWER SUPPLY

Ignition position	❑ OFF ❑ ACC ❑ ON (before starting engine) ❑ START ❑ ON (after starting engine, engine is running) ❑ ON (after starting engine, engine is at a standstill)
Timing	❑ Immediately after turning the ignition ON. ❑ Immediately after turning the ignition to START.

- Symptoms

Note:

The items vary depending on destinations and equipment.

Vehicle condition	Clearance light does not illuminate.	❑Yes / ❑ No
	Clearance light indicator does not illuminate.	❑Yes / ❑ No

Low beam does not illuminate.	❑Yes / ❑ No
High beam does not illuminate.	❑Yes / ❑ No
High beam indicator does not illuminate.	❑Yes / ❑ No
Front fog light does not illuminate.	❑Yes / ❑ No
Front fog light indicator does not illuminate.	❑Yes / ❑ No
Key cannot be removed from key cylinder.	❑Yes / ❑ No
Key can be removed with the shift in a range other than P.	❑Yes / ❑ No
Shift lever can not be operated.	❑Yes / ❑ No
Shift lock does not operate.	❑Yes / ❑ No
Warning buzzer for key left in ignition does not beep.	❑Yes / ❑ No
Immobilizer indicator does not illuminate.	❑Yes / ❑ No
Wiper deicer does not operate.	❑Yes / ❑ No
Combination meter does not dim when headlights are ON.	❑Yes / ❑ No
Rear wiper does not operate.	❑Yes / ❑ No
Doors can not be locked/unlocked with central door lock switch.	❑Yes / ❑ No
Doors and rear gate can not be locked/unlocked with keyless entry system or keyless access.	❑Yes / ❑ No
Trunk can not be opened with keyless entry system or keyless access.	❑Yes / ❑ No
Rear gate can not be opened when rear gate opener button is pressed.	❑Yes / ❑ No
Rear gate can not be opened when rear gate opener button is pressed.	❑Yes / ❑ No
Hazard answer-back does not operate.	❑Yes / ❑ No
Ignition key illumination does not light.	❑Yes / ❑ No
Ignition key illumination blinks.	❑Yes / ❑ No
Room light does not operate in accordance with door open/close operations.	❑Yes / ❑ No
Room light blinks.	❑Yes / ❑ No
Map light does not operate in accordance with door open/close operations.	❑Yes / ❑ No
Map light blinks.	❑Yes / ❑ No
Luggage/trunk room light does not operate in accordance with rear gate/trunk open/close operations.	❑Yes / ❑ No
Luggage/trunk room light is blinking.	❑Yes / ❑ No

Security monitoring does not start	❑Yes / ❑ No
Security cannot be cancelled	❑Yes / ❑ No
Hazard does not blink during security monitoring	❑Yes / ❑ No
Horn does not sound during security monitoring	❑Yes / ❑ No
Alarm operates as soon as security monitor condition occurs.	❑Yes / ❑ No
Engine does not start.	❑Yes / ❑ No

- CONDITIONS UNDER WHICH TROUBLE OCCURS

Driving condition	❑ At standstill (while idling)			
	❑ When the vehicle is running	Vehicle speed	km/h (MPH)	
	❑ While accelerating	Acceleration (MPH)	km/h (MPH) to	km/h
	❑ Decelerating (with braking)	Deceleration (MPH)	km/h (MPH) to	km/h
	❑ Decelerating (without braking)	Deceleration (MPH)	km/h (MPH) to	km/h
	❑ Flat road ❑ Uphill ❑ Downhill ❑ Gravel road ❑ Bumpy road ❑ Snowy road			
	Does it occur when operating any part? Operated part: Trouble symptom:			
	Are there any other troubles occurred? From where: Trouble symptom:			

2. HIGH BEAM ASSIST

Inspect the following items regarding the vehicle’s state.

High Beam Assist Check List for Interview Date of Vehicle Bring-in Year Month Day			
Customer’s name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content			

Date and time when the symptom occurred	Year Month Date Approximate time		
Frequency of symptom occurrence	Always occurs Sometimes occurs (times per day/ times per month)		
Conditions upon symptom occurrence	Weather	•Fine •Cloudy •Rainy •Snowy•Foggy •Other ( )	
	Temperature	°C (°F) — °C (°F)	
	Vehicle speed	km/h (MPH) — km/h (MPH)	
	Road condition	•Dry •Wet •Accumulated snow •Unpaved road •Bumps (uneven) Other ( )	
	Road conditions	Own vehicle	•Straight •Gentle right-hand curve •Gentle left-hand curve •Sharp right-hand curve •Sharp left-hand curve •Uphill •Downhill •Intersection •Top of the hill •Other ( )
		Oncoming vehicle * Relative position from user’s viewpoint	•No oncoming vehicle •Straight •Gentle right-hand curve •Gentle left-hand curve •Sharp right-hand curve •Sharp left-hand curve •Uphill •Downhill •Intersection •Top of the hill •Other ( )
		Headlight of oncoming vehicle * When the type is unknown, indicate the color.	•HID/LED (white) •Halogen •Only one side was lit •Other ( )
		Preceding vehicle	•No preceding vehicle •Straight •Gentle right-hand curve •Gentle left-hand curve

			•Sharp right-hand curve •Sharp left-hand curve •Uphill •Downhill •Intersection •Top of the hill •Other ( )
		Number of street light ahead	•0 •1 •2 •3 •4 •5 •More ( )
		Reflection board/Signs	•0 •1 •2 •3 •4 •5 •More ( ) •Red •White •Blue •Other ( )
	Vehicle status	Number of passengers: , (Front seats: /Rear seats:)	
		Cargo room load capacity kg (lb)	
		Tire inflation pressure (when vehicle was brought in) •Front wheel kPa (psi) •Rear wheel kPa (psi)	
	Driving duration and distance with the described load condition	•Distance km (mile) •Time minutes	
	Driving environment before symptom occurrence (Approximately 10 minutes before the occurrence)	•Inner city (surroundings are bright by street lights) •Suburbs (surroundings are relatively dark due to sparse street lights)	
Accessory installation condition			
DTC			

Other

Note:

- **Describe things that were noticed, if any.**
- **Attach illustration or photo of the road ahead of the vehicle at the time of the symptom occurrence.**

BODY CONTROL(DIAGNOSTICS) > General Description

CAUTION

1. BODY CONTROL

When removing body control related parts, refer to Cautions in SECURITY AND LOCKS. Ref. to SECURITY AND LOCKS>General Description>CAUTION.

2. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

BODY CONTROL(DIAGNOSTICS) > General Description

INSPECTION

1. BODY CONTROL SYSTEM

Before performing diagnosis, check the following items which might affect body control system problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the fuse condition. Ref. to SECURITY AND LOCKS>Relay and Fuse.
   Make sure that ampere of the fuse is setting value, and it is not blown out.
3. Check the connecting condition of harness and harness connector.
4. Confirm settings of body integrated unit are corresponded to vehicle equipment. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit.
5. Make sure that the customizing of the body integrated unit matches the vehicle equipment. Ref. to BODY CONTROL(DIAGNOSTICS)>Customize.
6. Confirm [Factory initial setting] of body integrated unit registrations is [Market].

BODY CONTROL(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

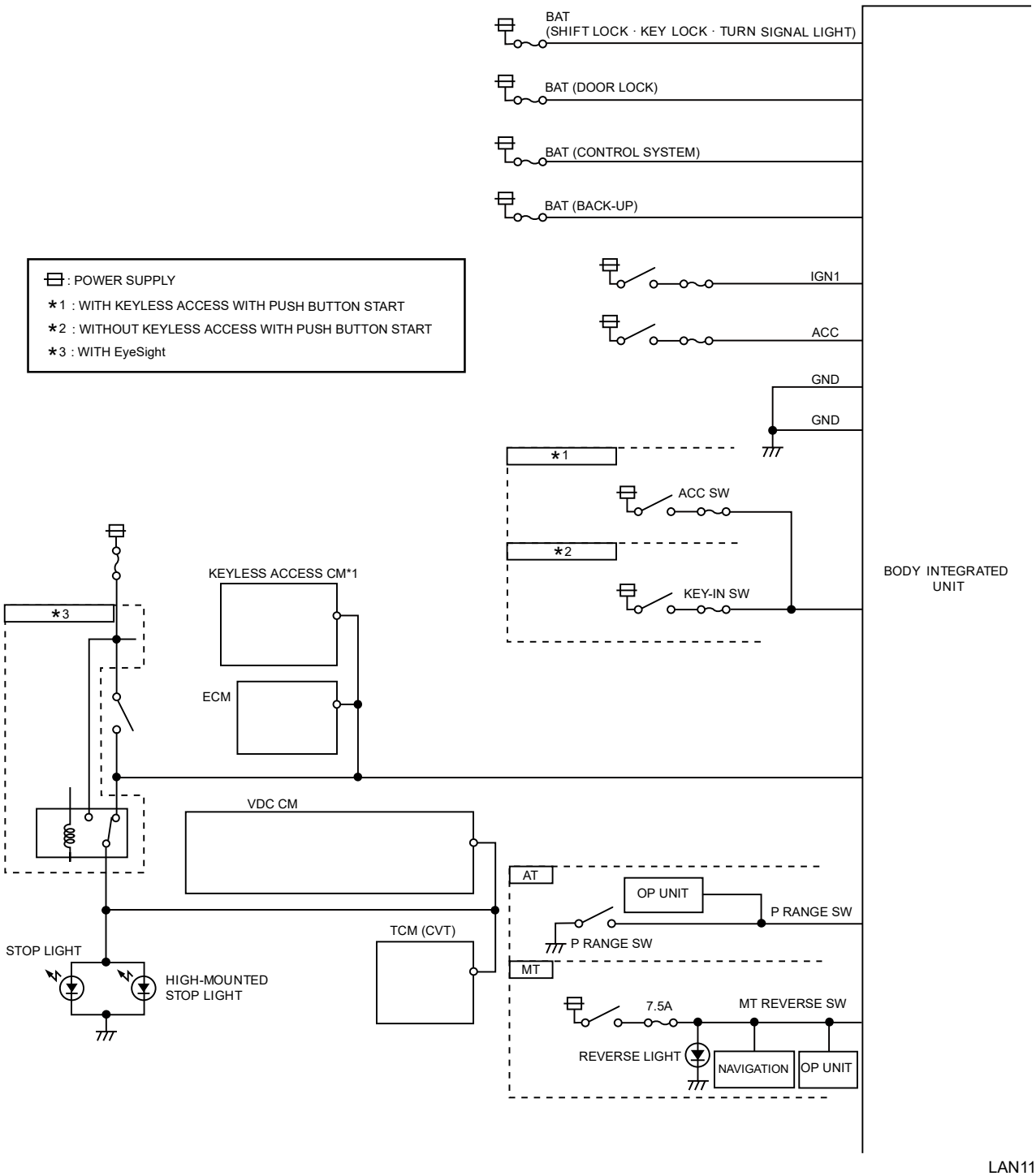
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

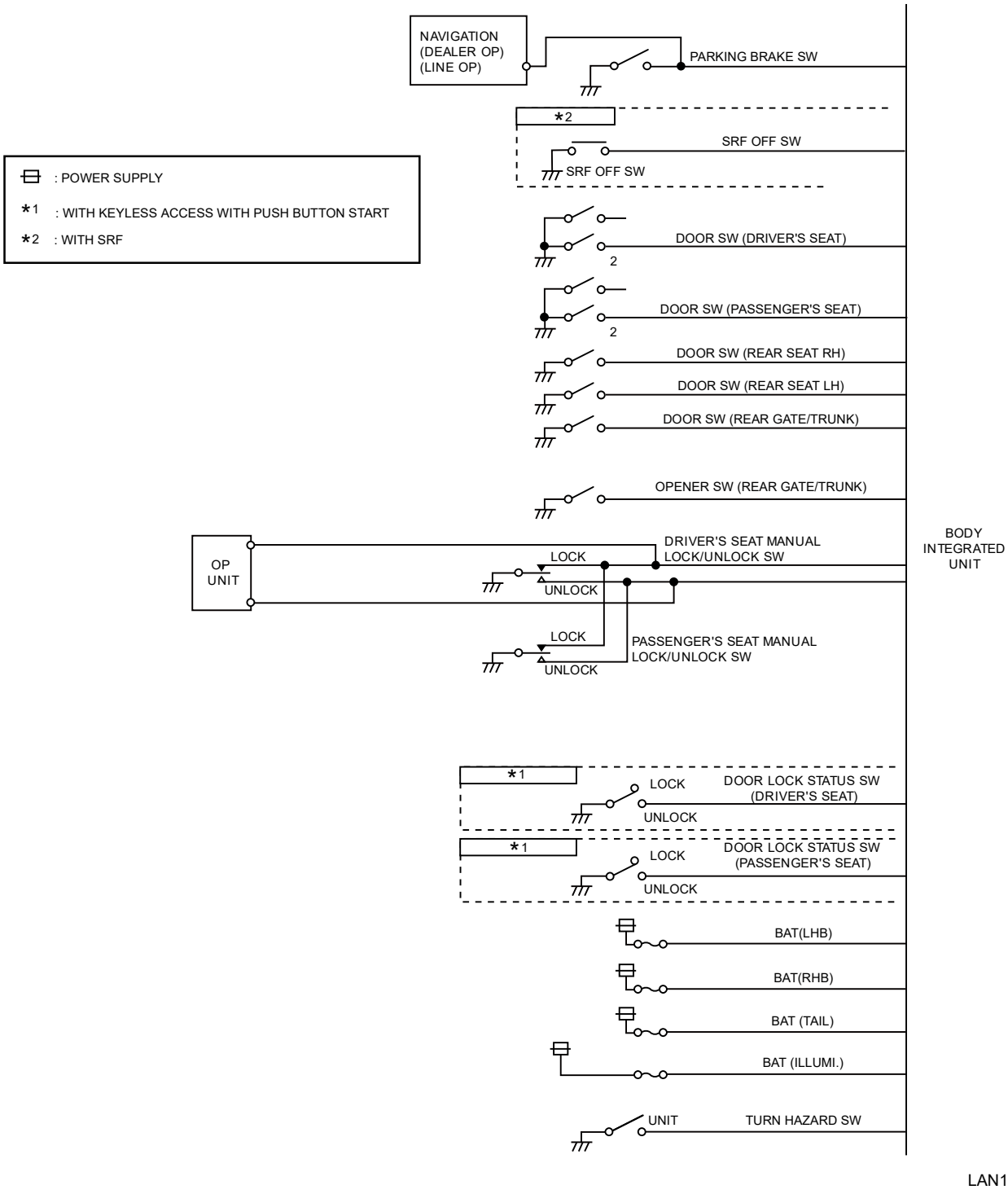
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

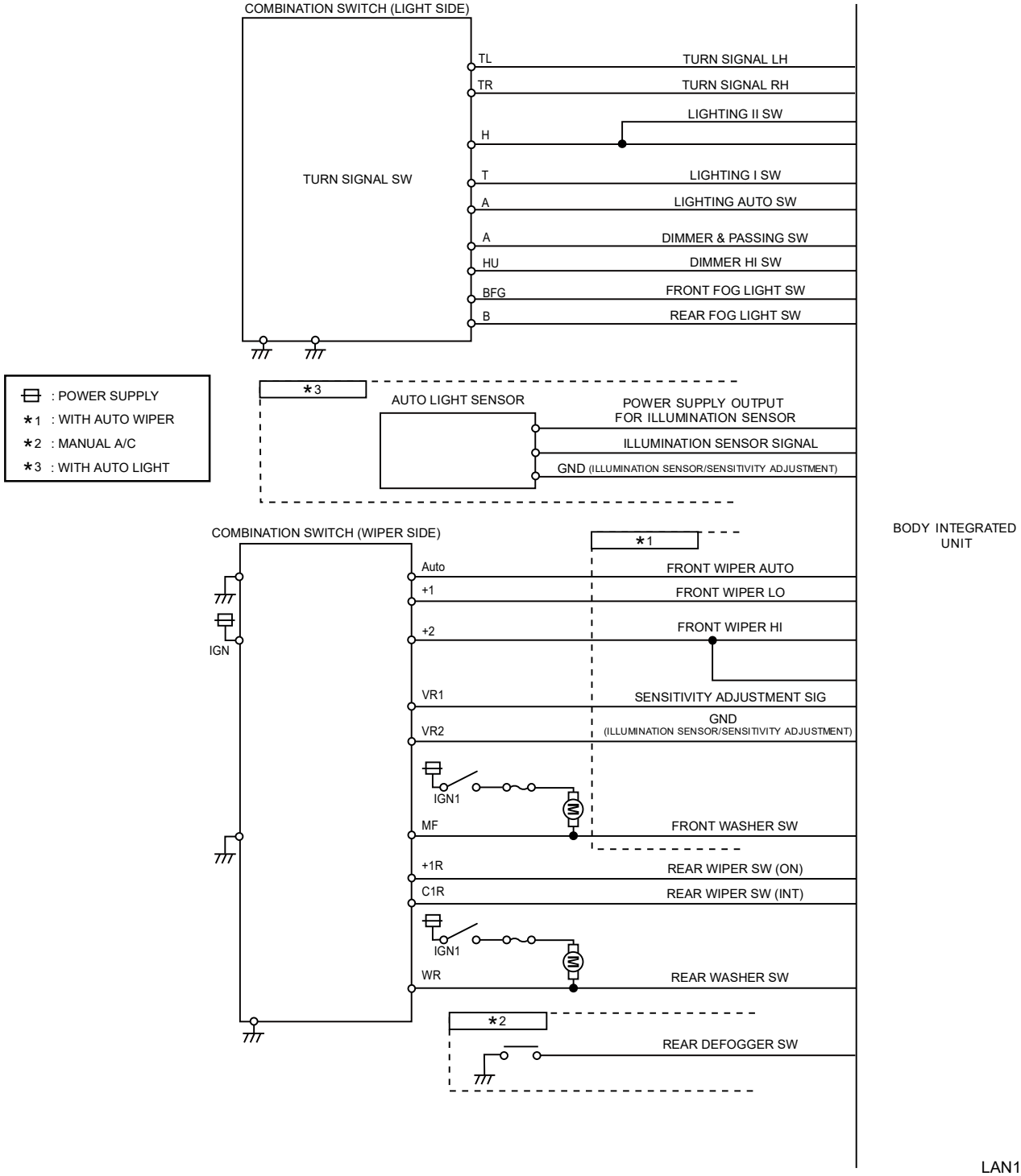
BODY CONTROL(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

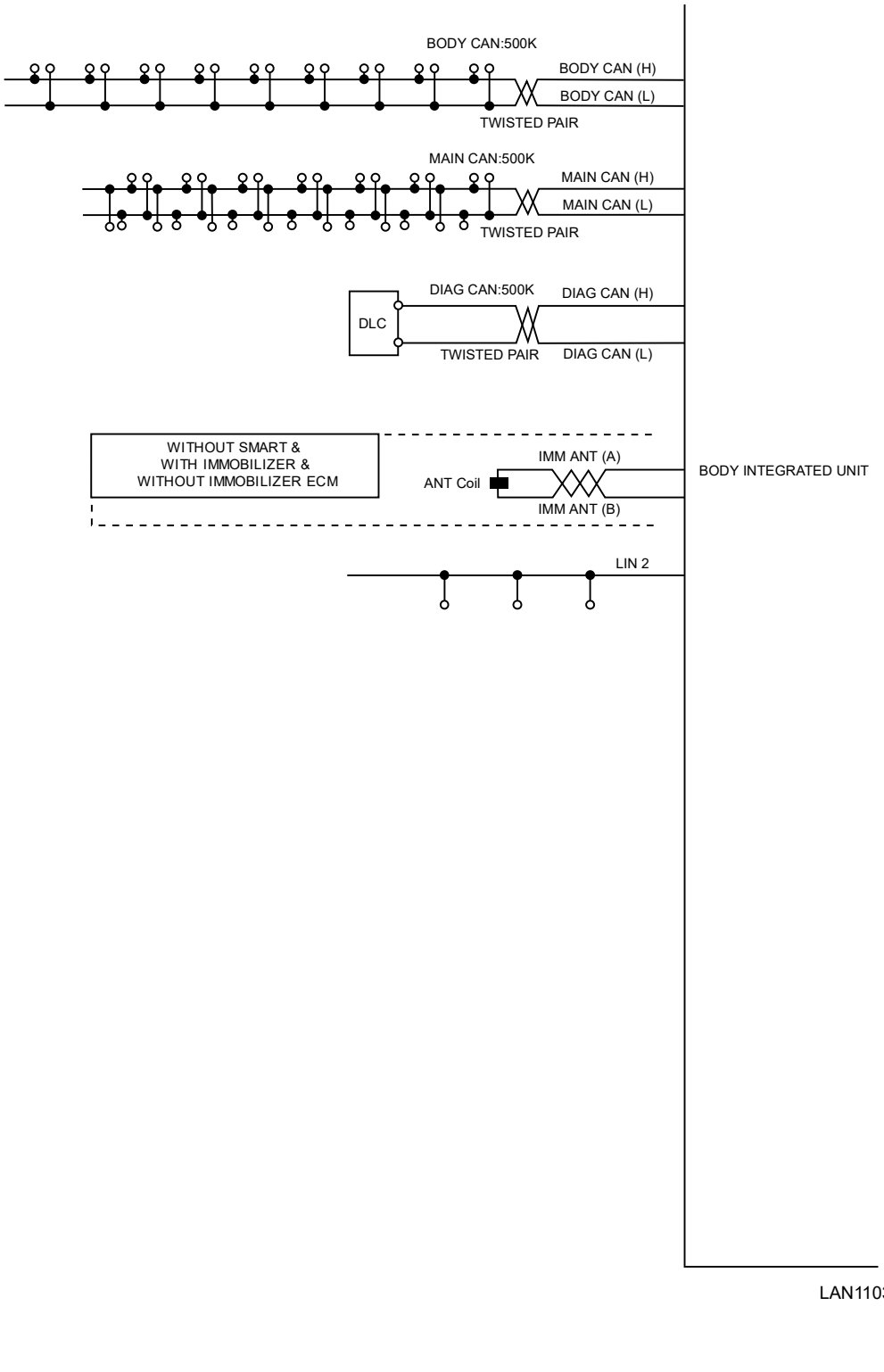



: POWER SUPPLY
*1 : WITH KEYLESS ACCESS WITH PUSH BUTTON START
*2 : WITH SRF
NAVIGATION (DEALER OP) (LINE OP)
PARKING BRAKE SW
*2
SRF OFF SW
SRF OFF SW
DOOR SW (DRIVER'S SEAT)
2
DOOR SW (PASSENGER'S SEAT)
2
DOOR SW (REAR SEAT RH)
DOOR SW (REAR SEAT LH)
DOOR SW (REAR GATE/TRUNK)
OPENER SW (REAR GATE/TRUNK)
OP UNIT
DRIVER'S SEAT MANUAL LOCK/UNLOCK SW
LOCK
UNLOCK
LOCK
UNLOCK
PASSENGER'S SEAT MANUAL LOCK/UNLOCK SW
BODY INTEGRATED UNIT
*1
LOCK
UNLOCK
DOOR LOCK STATUS SW (DRIVER'S SEAT)
*1
LOCK
UNLOCK
DOOR LOCK STATUS SW (PASSENGER'S SEAT)
BAT(LHB)
BAT(RHB)
BAT (TAIL)
BAT (ILLUMI.)
UNIT
TURN HAZARD SW

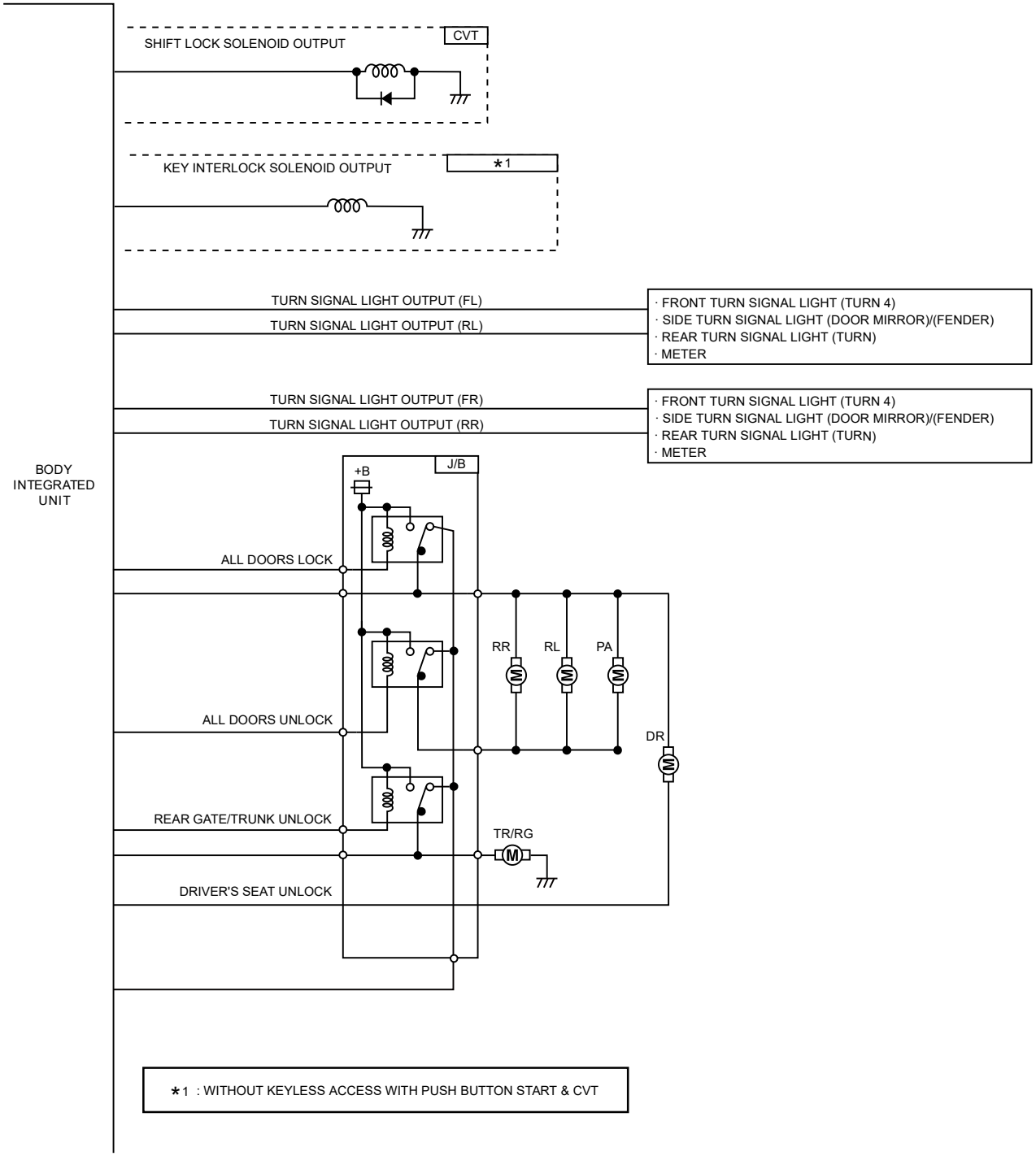
LAN11035


COMBINATION SWITCH (LIGHT SIDE)
TURN SIGNAL SW
TL
TURN SIGNAL LH
TR
TURN SIGNAL RH
H
LIGHTING II SW
T
LIGHTING I SW
A
LIGHTING AUTO SW
A
DIMMER & PASSING SW
HU
DIMMER HI SW
BFG
FRONT FOG LIGHT SW
B
REAR FOG LIGHT SW
: POWER SUPPLY
*1 : WITH AUTO WIPER
*2 : MANUAL A/C
*3 : WITH AUTO LIGHT
*3
AUTO LIGHT SENSOR
POWER SUPPLY OUTPUT FOR ILLUMINATION SENSOR
ILLUMINATION SENSOR SIGNAL
GND (ILLUMINATION SENSOR/SENSITIVITY ADJUSTMENT)
COMBINATION SWITCH (WIPER SIDE)
IGN
*1
BODY INTEGRATED UNIT
Auto
FRONT WIPER AUTO
+1
FRONT WIPER LO
+2
FRONT WIPER HI
VR1
SENSITIVITY ADJUSTMENT SIG
VR2
GND
(ILLUMINATION SENSOR/SENSITIVITY ADJUSTMENT)
IGN1
MF
FRONT WASHER SW
+1R
REAR WIPER SW (ON)
C1R
REAR WIPER SW (INT)
IGN1
WR
REAR WASHER SW
*2
REAR DEFOGGER SW

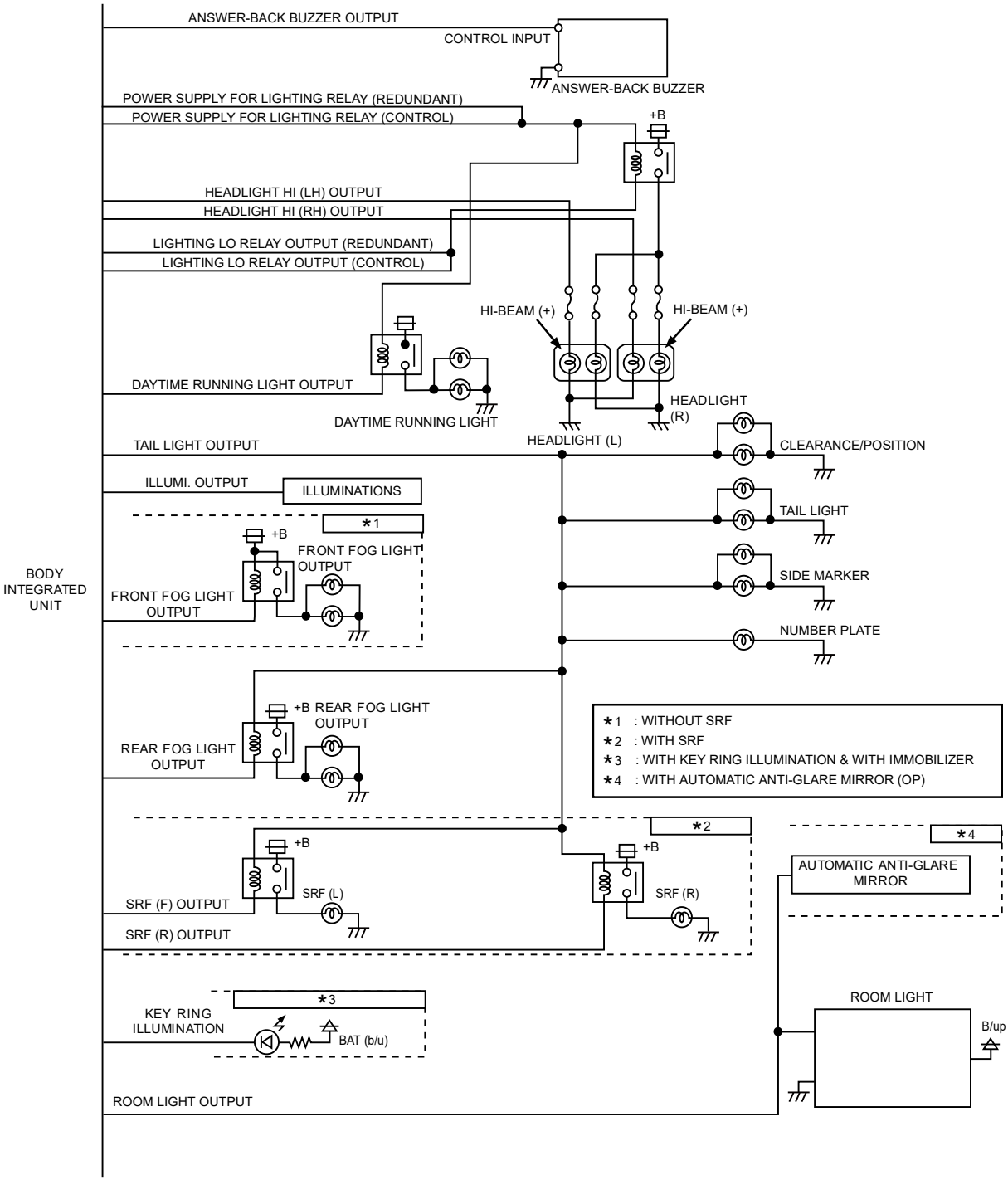
LAN11036


BODY CAN:500K
BODY CAN (H)
BODY CAN (L)
TWISTED PAIR
MAIN CAN:500K
MAIN CAN (H)
MAIN CAN (L)
TWISTED PAIR
DIAG CAN:500K
DIAG CAN (H)
DLC
TWISTED PAIR
DIAG CAN (L)
WITHOUT SMART &
WITH IMMOBILIZER &
WITHOUT IMMOBILIZER ECM
IMM ANT (A)
ANT Coil
IMM ANT (B)
BODY INTEGRATED UNIT
LIN 2

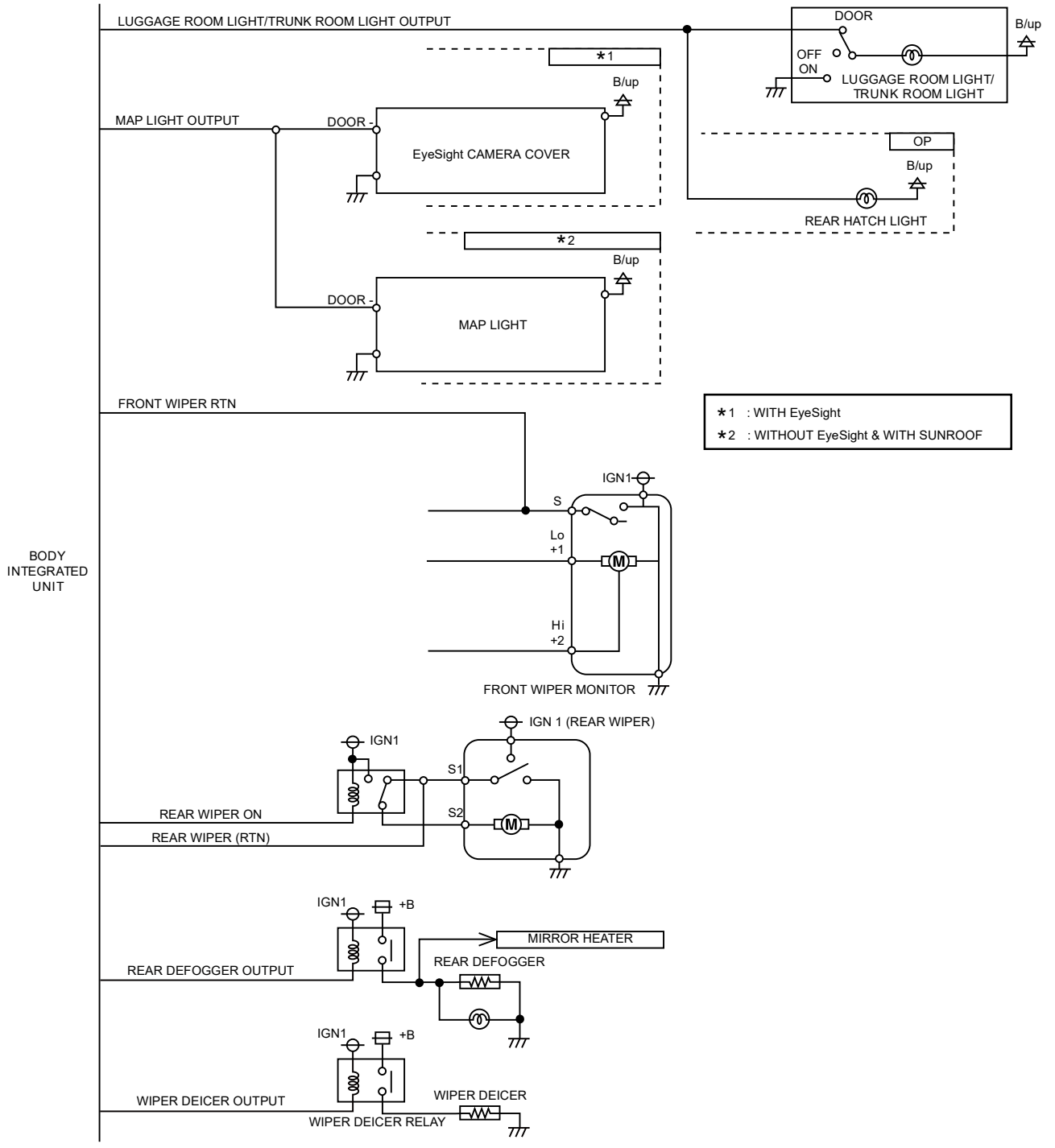
LAN11037


SHIFT LOCK SOLENOID OUTPUT
CVT
KEY INTERLOCK SOLENOID OUTPUT
*1
TURN SIGNAL LIGHT OUTPUT (FL)
TURN SIGNAL LIGHT OUTPUT (RL)
· FRONT TURN SIGNAL LIGHT (TURN 4)
· SIDE TURN SIGNAL LIGHT (DOOR MIRROR)/(FENDER)
· REAR TURN SIGNAL LIGHT (TURN)
· METER
TURN SIGNAL LIGHT OUTPUT (FR)
TURN SIGNAL LIGHT OUTPUT (RR)
· FRONT TURN SIGNAL LIGHT (TURN 4)
· SIDE TURN SIGNAL LIGHT (DOOR MIRROR)/(FENDER)
· REAR TURN SIGNAL LIGHT (TURN)
· METER
BODY INTEGRATED UNIT
J/B
+B
ALL DOORS LOCK
ALL DOORS UNLOCK
REAR GATE/TRUNK UNLOCK
DRIVER'S SEAT UNLOCK
RR
RL
PA
DR
TR/RG
M
*1 : WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START & CVT

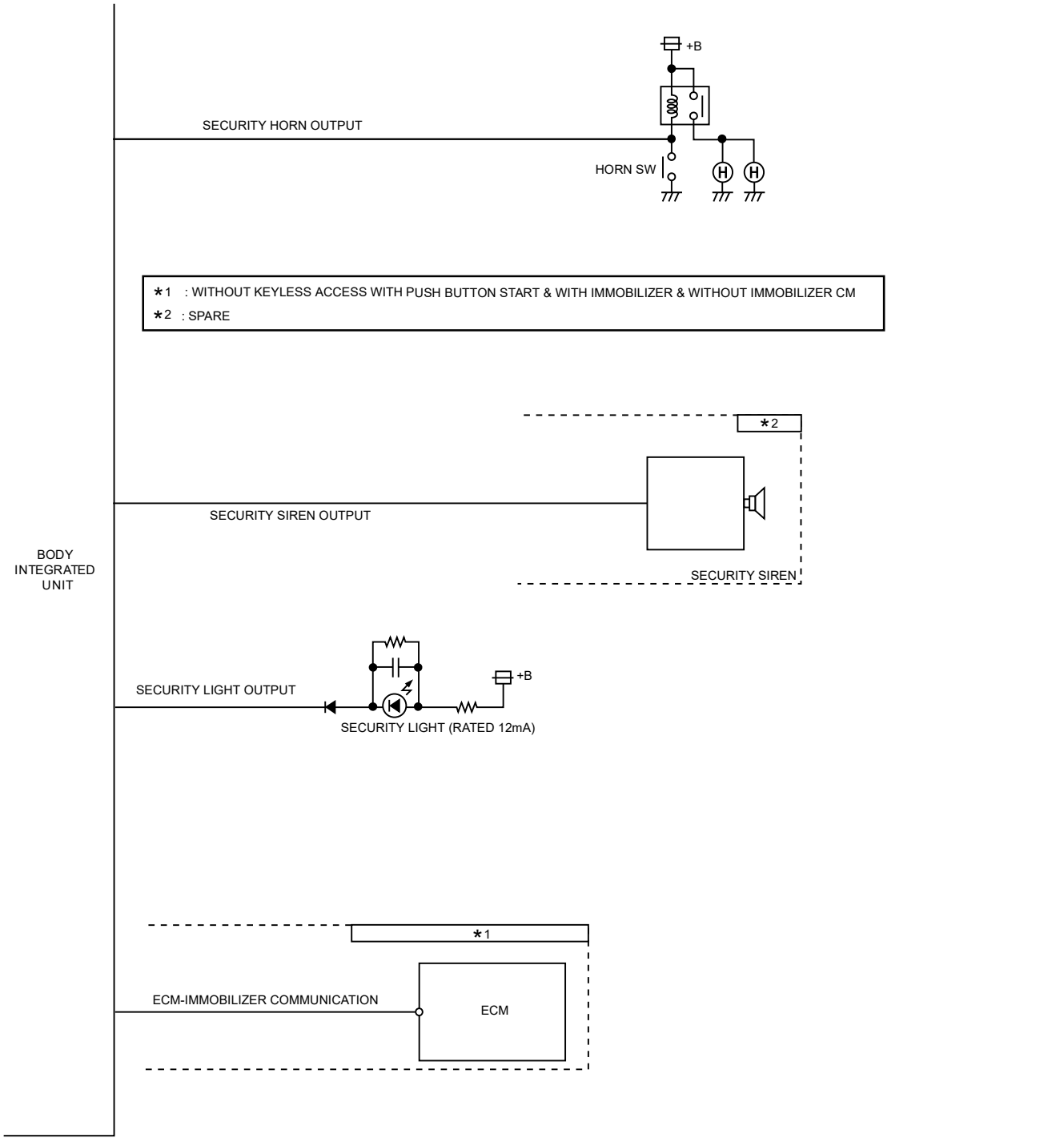
LAN11038


ANSWER-BACK BUZZER OUTPUT
CONTROL INPUT
ANSWER-BACK BUZZER
POWER SUPPLY FOR LIGHTING RELAY (REDUNDANT)
POWER SUPPLY FOR LIGHTING RELAY (CONTROL)
+B
HEADLIGHT HI (LH) OUTPUT
HEADLIGHT HI (RH) OUTPUT
LIGHTING LO RELAY OUTPUT (REDUNDANT)
LIGHTING LO RELAY OUTPUT (CONTROL)
HI-BEAM (+)
HI-BEAM (+)
DAYTIME RUNNING LIGHT OUTPUT
DAYTIME RUNNING LIGHT
HEADLIGHT (L)
HEADLIGHT (R)
TAIL LIGHT OUTPUT
CLEARANCE/POSITION
ILLUMI. OUTPUT
ILLUMINATIONS
TAIL LIGHT
*1
+B
FRONT FOG LIGHT OUTPUT
SIDE MARKER
BODY INTEGRATED UNIT
FRONT FOG LIGHT OUTPUT
NUMBER PLATE
+B REAR FOG LIGHT OUTPUT
REAR FOG LIGHT OUTPUT
*1 : WITHOUT SRF
*2 : WITH SRF
*3 : WITH KEY RING ILLUMINATION & WITH IMMOBILIZER
*4 : WITH AUTOMATIC ANTI-GLARE MIRROR (OP)
*2
*4
+B
+B
AUTOMATIC ANTI-GLARE MIRROR
SRF (L)
SRF (R)
SRF (F) OUTPUT
SRF (R) OUTPUT
*3
ROOM LIGHT
KEY RING ILLUMINATION
BAT (b/u)
B/up
ROOM LIGHT OUTPUT

LAN11039


LUGGAGE ROOM LIGHT/TRUNK ROOM LIGHT OUTPUT
DOOR
B/up
OFF
ON
LUGGAGE ROOM LIGHT/
TRUNK ROOM LIGHT
*1
B/up
MAP LIGHT OUTPUT
DOOR
EyeSight CAMERA COVER
OP
B/up
REAR HATCH LIGHT
*2
B/up
DOOR
MAP LIGHT
FRONT WIPER RTN
*1 : WITH EyeSight
*2 : WITHOUT EyeSight & WITH SUNROOF
IGN1
S
Lo
+1
Hi
+2
FRONT WIPER MONITOR
BODY
INTEGRATED
UNIT
IGN 1 (REAR WIPER)
IGN1
S1
S2
REAR WIPER ON
REAR WIPER (RTN)
IGN1
+B
MIRROR HEATER
REAR DEFOGGER
REAR DEFOGGER OUTPUT
IGN1
+B
WIPER DEICER OUTPUT
WIPER DEICER
WIPER DEICER RELAY

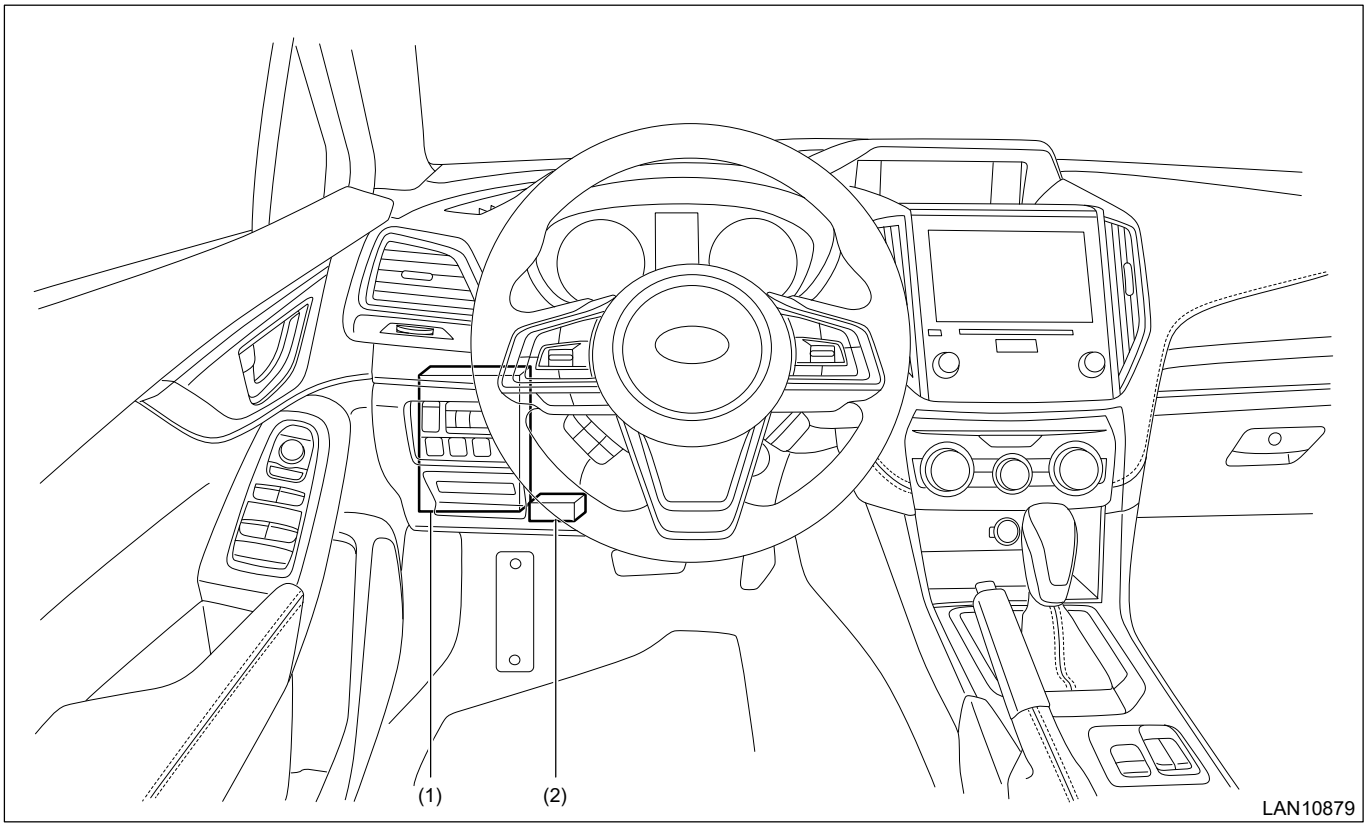
LAN11040


+B
SECURITY HORN OUTPUT
HORN SW
*1 : WITHOUT KEYLESS ACCESS WITH PUSH BUTTON START & WITH IMMOBILIZER & WITHOUT IMMOBILIZER CM
*2 : SPARE
*2
SECURITY SIREN OUTPUT
SECURITY SIREN
BODY
INTEGRATED
UNIT
+B
SECURITY LIGHT OUTPUT
SECURITY LIGHT (RATED 12mA)
*1
ECM-IMMOBILIZER COMMUNICATION
ECM

LAN11041

BODY CONTROL(DIAGNOSTICS) > Electrical Component Location

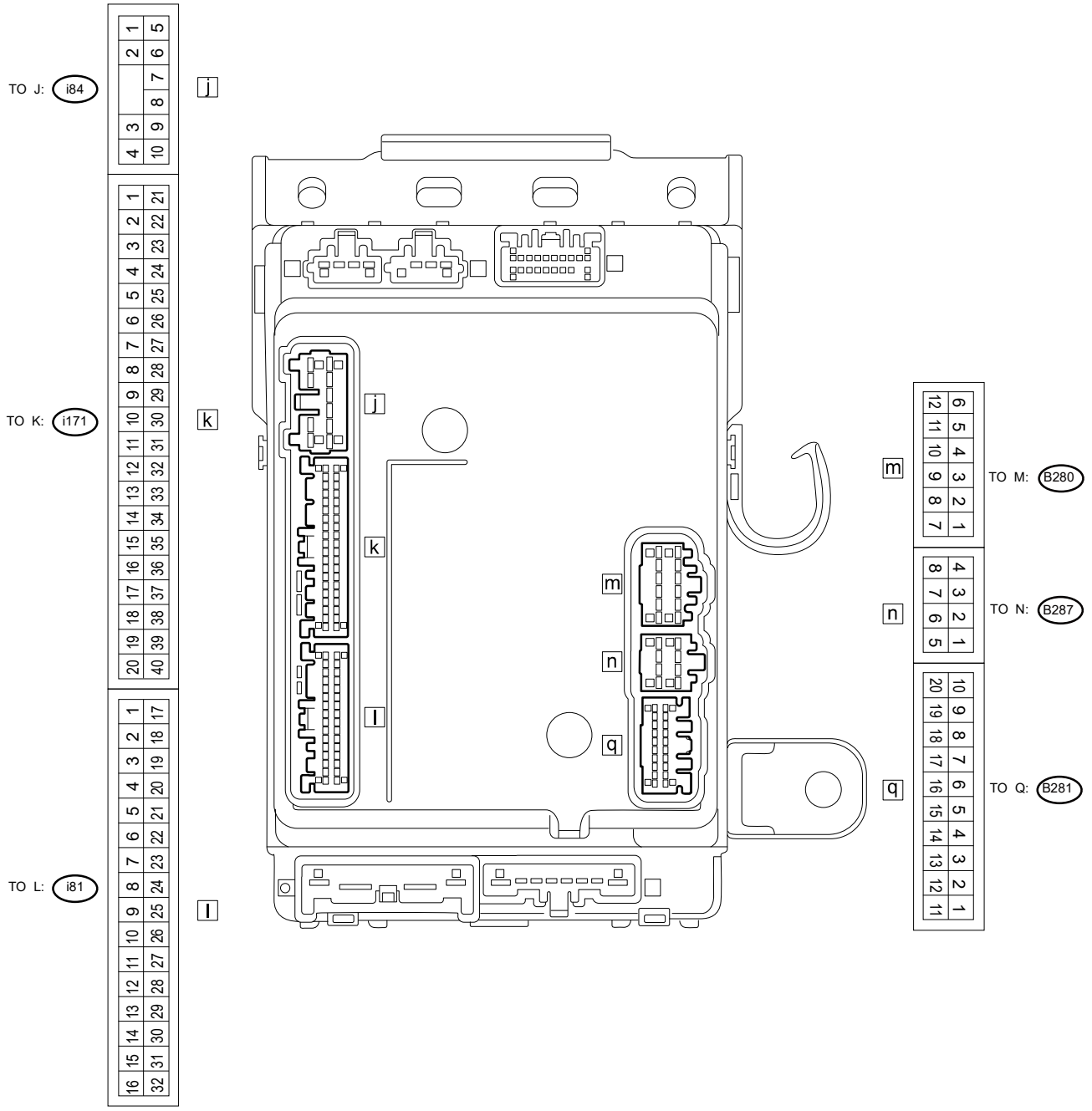
LOCATION



(1) Body integrated unit (2) Data link connector

ELECTRICAL SPECIFICATION

1. BODY INTEGRATED UNIT



LAN10781

Terminal No.	Contents	Measuring condition	Standard
(B280) No. 1 ←→ Chassis ground	BAT power supply (control)	Always	9 — 16 V

Terminal No.	Contents	Measuring condition	Standard
(B280) No. 2 ←→ Chassis ground	Turn light output right front	Right front turn signal OFF → ON	Less than 1 V → 9 — 16 V
(B280) No. 3 ←→ Chassis ground	BAT power supply (head Hi right side) (RHB)	Always	9 — 16 V
(B280) No. 4 ←→ Chassis ground	BAT power supply (illumination)	Always	9 — 16 V
(B280) No. 5 ←→ Chassis ground	Rear wiper RTN	Rear wiper stop position → in operation	Less than 1 V → 9 — 16 V
(B280) No. 6 ←→ Chassis ground	Front wiper RTN	Front wiper stop position → in operation	Less than 1 V → 9 — 16 V
(B280) No. 7 ←→ Chassis ground	BAT power supply (tail)	Always	9 — 16 V
(B280) No. 8 ←→ Chassis ground	Turn light output left front	Left front turn signal OFF → ON	Less than 1 V → 9 — 16 V
(B280) No. 9 ←→ Chassis ground	Headlight Hi right side output	Headlight Hi OFF → ON	Less than 1 V → 9 — 16 V
(B280) No. 10 ←→ Chassis ground	Tail light output	Tail light OFF → ON	Less than 1 V → 9 — 16 V
(B280) No. 11 ←→ Chassis ground	Illumination output	Illumination OFF → ON	Less than 1 V → 9 — 16 V
(B280) No. 12 ←→ Chassis ground	Key lock solenoid output (CVT Model without the keyless access with push button start system)	• Ignition key inserted • Shift lever, P range → other than P range	Less than 1 V → 9 — 16 V
(B287) No. 1 ←→ Chassis ground	GND	Always	Less than 1 Ω
(B287) No. 2 ←→ Chassis ground	Rear wiper relay output	Rear wiper OFF → ON	9 — 16 V → Less than 1 V
(B287) No. 3 ←→ Chassis ground	BAT power supply (head Hi left side) (LHB)	Always	9 — 16 V
(B287) No. 4 ←→ Chassis ground	BAT power supply (shift lock/key lock/turn light)	Always	9 — 16 V
(B287) No. 5 ←→ Chassis ground	DRL output	DRL OFF → ON	9 — 16 V → Less than 1 V
(B287) No. 6 ←→ Chassis ground	Lighting relay power supply (control)	ACC OFF → ON (with keyless access with push button start system), or ignition key	Less than 1 V → 9 — 16 V

Terminal No.	Contents	Measuring condition	Standard
		not inserted → inserted (without keyless access with push button start system)	
(B287) No. 7 ←→ Chassis ground	Headlight Hi left side output	Headlight Hi OFF → ON	Less than 1 V → 9 — 16 V
(B287) No. 8	—	—	—
(B281) No. 1 ←→ Chassis ground	Front fog light relay output	Front fog light switch OFF → ON (Without SRF)	9 — 16 V → Less than 1 V
(B281) No. 2 ←→ Chassis ground	Answer-back buzzer (Models equipped with the keyless access with push button start system)	Answer-back buzzer OFF → ON	Less than 1 V → 9 — 16 V
(B281) No. 3	—	—	—
(B281) No. 4 ←→ Chassis ground	Wiper deicer output	Rear window defogger switch OFF → ON	9 — 16 V → Less than 1 V
(B281) No. 5 ←→ Chassis ground	Rear defogger output	Rear window defogger switch OFF → ON	9 — 16 V → Less than 1 V
(B281) No. 6 ←→ Chassis ground	Diagnosis related CAN (H)	—	—
(B281) No. 7 ←→ Chassis ground	BAT (backup)	Always	9 — 16 V
(B281) No. 8 ←→ Chassis ground	Diagnosis related CAN (L)	—	—
(B281) No. 9 ←→ Chassis ground	Security horn output	Security horn, not operating → operating	9 — 16 V → Less than 1 V
(B281) No. 10	—	—	—
(B281) No. 11 ←→ Chassis ground	Rear fog light relay output	Front fog light switch OFF → ON	9 — 16 V → Less than 1 V
(B281) No. 12	—	—	—
(B281) No. 13	—	—	—
(B281) No. 14 ←→ Chassis ground	EGI immobilizer communication	Always (Without keyless access with push button start system)	1 MΩ or more
(B281) No. 15	—	—	—
(B281) No. 16 ←→ Chassis ground	Stop light switch	Stop light switch OFF → ON	Less than 1 V → 9 — 16 V
(B281) No. 17	Body CAN (H)	—	—

Terminal No.	Contents	Measuring condition	Standard
(B281) No. 18 ←→ Chassis ground	MT reverse switch	MT shift lever, other than reverse → reverse (MT model)	Less than 1 V → 9 — 16 V
(B281) No. 19	Body CAN (L)	—	—
(B281) No. 20 ←→ Chassis ground	Lighting Lo relay output (control)	Lighting switch 2 OFF → ON	9 — 16 V → Less than 1 V
(i84) No. 1 ←→ Chassis ground	Key-in switch (model without keyless access with push button start system)	Always	Less than 1 V → 9 — 16 V
(i84) No. 2 ←→ Chassis ground	Turn light output left rear	Left rear turn signal OFF → ON	Less than 1 V → 9 — 16 V
(i84) No. 3 ←→ Chassis ground	Shift lock solenoid	• IG ON • Shift lever P range • Stop light switch OFF (brake pedal not depressed) → ON (brake pedal depressed)	Less than 1 V → 9 — 16 V
(i84) No. 4 ←→ Chassis ground	GND	Always	Less than 1 Ω
(i84) No. 5 ←→ Chassis ground	Turn light output right rear	Right rear turn signal OFF → ON	Less than 1 V → 9 — 16 V
(i84) No. 6 ←→ Chassis ground	Door lock output (driver’s seat unlock)	When UNLOCK signal is output	Less than 1 V → 9 — 16 V
(i84) No. 7 ←→ Chassis ground	—	—	—
(i84) No. 8 ←→ Chassis ground	Luggage/trunk light output	Luggage/trunk light OFF → ON	Less than 1 V → 9 — 16 V
(i84) No. 9 ←→ Chassis ground	Room light output	Room light OFF → ON	Less than 1 V → 9 — 16 V
(i84) No. 10 ←→ Chassis ground	—	—	—
(i171) No. 1	Main system CAN (H)	—	—
(i171) No. 2	Main system CAN (L)	—	—
(i171) No. 3 ←→ Chassis ground	Immobilizer antenna (A)	When ignition key inserted (Without keyless access with push button start system)	Pulse generation
(i171) No. 4 ←→ Chassis ground	Immobilizer antenna (B281)	When ignition key inserted	Pulse generation

Terminal No.	Contents	Measuring condition	Standard
		(Without keyless access with push button start system)	
(i171) No. 5 ←→ Chassis ground	Rear defogger switch	Rear window defogger switch OFF → ON (Manual A/C)	9 — 16 V → Less than 1 V
(i171) No. 6 ←→ Chassis ground	Opener switch (rear gate/trunk)	Rear gate/trunk opener button OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 7	—	—	—
(i171) No. 8	Illumination sensor GND	—	—
(i171) No. 9 ←→ Chassis ground	Key ring illumination output	Key ring OFF → ON (With key ring illumination and without keyless access with push button start system)	Less than 1 V → 9 — 16 V
(i171) No. 10 ←→ Chassis ground	Map light output	Map light OFF → ON	Less than 1 V → 9 — 16 V
(i171) No. 11 ←→ Chassis ground	SRF (right) relay output	SRF (right) OFF → ON (With SRF)	Less than 1 V → 9 — 16 V
(i171) No. 12 ←→ Chassis ground	Manual unlock switch	Door unlock switch OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 13 ←→ Chassis ground	Door switch (passenger’s seat)	Passenger’s door closed → open	9 — 16 V → Less than 1 V
(i171) No. 14 ←→ Chassis ground	Door switch (rear seat LH)	Rear seat LH door closed → open	9 — 16 V → Less than 1 V
(i171) No. 15 ←→ Chassis ground	Door switch (rear gate/trunk)	Rear gate/trunk closed → open	9 — 16 V → Less than 1 V
(i171) No. 16	—	—	—
(i171) No. 17 ←→ Chassis ground	SRF switch	SRF (right) OFF → ON (With SRF)	9 — 16 V → Less than 1 V
(i171) No. 18 ←→ Chassis ground	Lighting Lo relay output (redundant circuit)	Lighting switch 2 OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 19 ←→ Chassis ground	Lighting switch 2 (redundant circuit)	Lighting switch 2 OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 20 ←→ Chassis ground	Security indicator light output	When security light is illuminating	Pulse generation
(i171) No. 21	—	—	—
(i171) No. 22	—	—	—

Terminal No.	Contents	Measuring condition	Standard
(i171) No. 23 ←→ Chassis ground	Lighting relay power supply (redundant circuit)	ACC OFF → ON (with keyless access with push button start system), or ignition key not inserted → inserted (without keyless access with push button start system)	Less than 1 V → 9 — 16 V
(i171) No. 24	Diagnosis related CAN (H)	—	—
(i171) No. 25	Diagnosis related CAN (L)	—	—
(i171) No. 26 ←→ Chassis ground	Dimmer Hi switch	Dimmer switch Hi beam OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 27 ←→ Chassis ground	Door switch (rear seat RH)	Rear seat RH door closed → open	9 — 16 V → Less than 1 V
(i171) No. 28 ←→ (i171) No. 8	Illumination sensor signal	When lighting switch is at AUTO	0 — 5 V
(i171) No. 29 ←→ Chassis ground	—	—	—
(i171) No. 30 ←→ Chassis ground	SRF (left) relay output	SRF (left) OFF → ON (With SRF)	Less than 1 V → 9 — 16 V
(i171) No. 31 ←→ Chassis ground	—	—	—
(i171) No. 32 ←→ Chassis ground	Manual lock switch	Door lock switch OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 33 ←→ Chassis ground	Turn signal switch right	Turn signal switch right OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 34 ←→ (i171) No. 8	Illumination sensor power supply output	Ignition switch OFF → ON	Less than 1 V → 5 V
(i171) No. 35 ←→ Chassis ground	Lighting I switch	Lighting switch 1 OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 36 ←→ Chassis ground	Dimmer Pass switch	Dimmer switch Pass OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 37 ←→ Chassis ground	Turn hazard switch	Turn hazard switch OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 38 ←→ Chassis ground	Turn signal switch left	Turn signal switch left OFF → ON	9 — 16 V → Less than 1 V
(i171) No. 39 ←→ Chassis ground	Door switch (driver’s seat)	Driver’s door closed → open	9 — 16 V → Less than 1 V
(i171) No. 40 ←→ Chassis ground	P range switch	Shift lever, other than P range → P range	9 — 16 V → Less than 1 V

Terminal No.	Contents	Measuring condition (CVT model)	Standard
(i81) No. 1	—	—	—
(i81) No. 2	LIN communication	—	—
(i81) No. 3 ←→ Chassis ground	Rear wiper switch (INT)	Rear wiper switch INT OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 4	—	—	—
(i81) No. 5 ←→ Chassis ground	Parking brake switch	Parking brake OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 6	—	—	—
(i81) No. 7	—	—	—
(i81) No. 8	—	—	—
(i81) No. 9 ←→ Chassis ground	Towing switch	Towing switch OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 10 ←→ Chassis ground	Rear washer switch	Rear washer switch OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 11	—	—	—
(i81) No. 12	—	—	—
(i81) No. 13	—	—	—
(i81) No. 14	—	—	—
(i81) No. 15	—	—	—
(i81) No. 16	—	—	—
(i81) No. 17	—	—	—
(i81) No. 18	—	—	—
(i81) No. 19 ←→ Chassis ground	Rear wiper switch (ON)	Rear wiper switch OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 20 ←→ Chassis ground	Lighting switch AUTO	Lighting switch AUTO OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 21	—	—	—
(i81) No. 22 ←→ Chassis ground	Door lock status switch driver’s seat	Driver’s door lock → unlock (With keyless access with push button start system)	9 — 16 V → Less than 1 V
(i81) No. 23	—	—	—
(i81) No. 24	—	—	—
(i81) No. 25	—	—	—
(i81) No. 26 ←→ Chassis ground	Front fog light switch	Front fog light switch OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 27 ←→ Chassis ground	Rear fog light switch	Rear fog light switch OFF → ON	9 — 16 V → Less than 1 V

Terminal No.	Contents	Measuring condition	Standard
(i81) No. 28 ←→ Chassis ground	Lighting switch 2 (control)	Lighting switch 2 OFF → ON	9 — 16 V → Less than 1 V
(i81) No. 29	—	—	—
(i81) No. 30 ←→ Chassis ground	—	—	—
(i81) No. 31 ←→ Chassis ground	—	—	—
(i81) No. 32 ←→ Chassis ground	—	—	—

BODY CONTROL(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
B1010	BODY CONTROL SYSTEM (BIU) MALFUNCTION	—
B1011	BATTERY CONTROL POWER SUPPLY	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. Disconnect and reconnect the battery, and then wait for one minute or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

2. INSPECTION MODE 2

DTC	Item	Note
B1012	BATTERY BACKUP POWER SUPPLY	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. Disconnect and reconnect the back-up fuse, and then wait for one minute or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC

displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

3. INSPECTION MODE 3

DTC	Item	Note
B1013	IGNITION POWER	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. After the ignition switch is ON, wait for one minute or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

4. INSPECTION MODE 4

DTC	Item	Note
B1014	ACC POWER	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. After ACC is ON, wait for one minute or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

5. INSPECTION MODE 5

DTC	Item	Note
B1015	KEY INTERLOCK CIRCUIT	CVT Model without the keyless access with push button start system

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. After the ignition switch is ON, press the shift knob switch and wait for 10 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

6. INSPECTION MODE 6

DTC	Item	Note
B1016	SHIFT LOCK CIRCUIT	CVT model

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. After the ignition switch is ON, wait for 10 seconds or more without depressing the brake pedal. Or, after the ignition switch is ON, press the shift knob switch with the brake pedal depressed and wait for 10 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

7. INSPECTION MODE 7

DTC	Item	Note
B1107	CAN COMMUNICATION (BIU) STUCK	—
B1401	COMBINATION METER COLLATION	Model without immobilizer CM
B1402	IMMOBILIZER KEY COLLATION	
B1407	COMBINATION METER COMMUNICATION	
B1408	COMBINATION METER NON-VOLATILE MEMORY	
B1410	TRANSPONDER COMMUNICATION	
B1411	IMMOBILIZER ANTENNA	—
U0073	CONTROL MODULE COMMUNICATION BUS OFF	—
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	—
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	—
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	—
U0127	LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	—
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	—
U0222	LOST COMMUNICATION WITH DRIVER'S DOOR POWER WINDOW	—
U0223	LOST COMMUNICATION WITH PASSENGER'S DOOR POWER WINDOW	—
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Model with keyless access with push button start system
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	—
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	—
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	—

DTC	Item	Note
U0427	INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE	Model with keyless access with push button start system
U0430	INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	—
U1235	LOST COMMUNICATION WITH EyeSight	—
U1674	LIN COMMUNICATION BUS 2 ERROR BODY CONTROL MODULE	—
U1822	LOST COMMUNICATION WITH MASTER MAIN SWITCH	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
3. Turn the ignition switch OFF → ON, and wait for 10 seconds or more.
4. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

8. INSPECTION MODE 8

DTC	Item	Note
U0101	LOST COMMUNICATION WITH TCM	—
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	—
U0402	INVALID DATA RECEIVED FROM TCM	—
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Body Control]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1). Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

3. Confirm that [Customize] items of [Body Control] correspond to the vehicle. Ref. to BODY CONTROL(DIAGNOSTICS)>Customize.
4. Turn the ignition switch OFF → ON, and wait for 10 seconds or more.
5. Using the Subaru Select Monitor, read the DTC of [Body Control] to check that there is no DTC displayed. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Note:

If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:

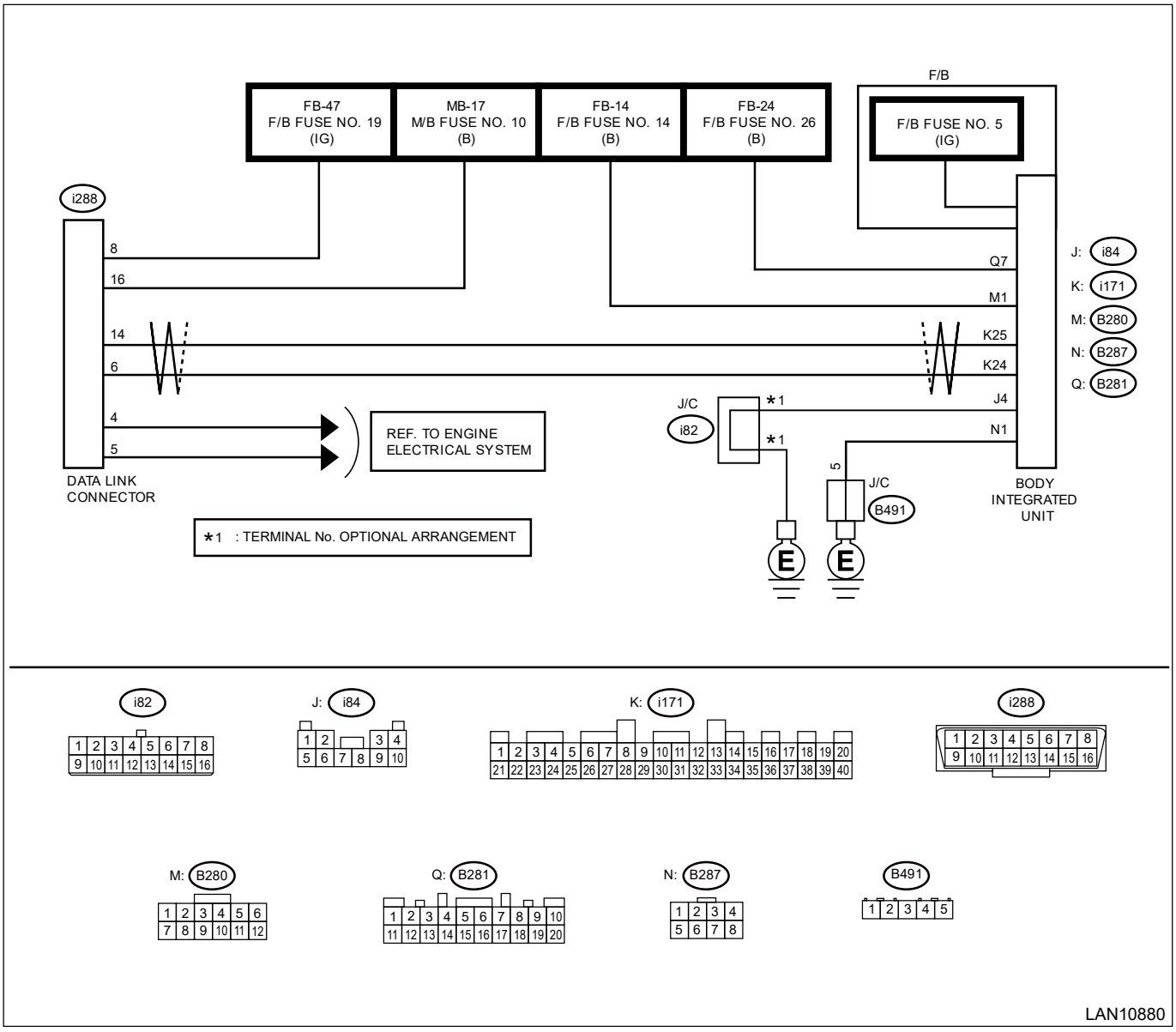
Cannot communicate with [Body Control].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POWER SUPPLY CIRCUIT.

Connect DST-i to data link connector.

Does DST-i turn ON?

Yes	Go to 4.
No	Go to 2.

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between data link connector and chassis ground.

Connector & terminal

(i288) No. 8 (+) — Chassis ground (−):

(i288) No. 16 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the power supply circuit.

Note:

In this case, repair the following item:

- **Open or ground short circuit of harness between battery and data link connector**
- **Blown out of fuse (M/B No. 10, F/B fuse No. 19)**

3. CHECK HARNESS BETWEEN DATA LINK CONNECTOR AND CHASSIS GROUND (OPEN).

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between data link connector and chassis ground.
   Connector & terminal
   (i288) No. 4 — Chassis ground:
   (i288) No. 5 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check for poor contact of the data link connector, and repair a fault, if any. When no fault is found,
No	Repair the harness and connector.

4. CHECK SUBARU SELECT MONITOR.

1. Connect the Subaru Select Monitor to a normal vehicle.
2. Start the engine and establish communication between the Subaru Select Monitor and vehicle.

Is communication possible?

Yes	Go to 5.
No	Use another Subaru Select Monitor because the CAN communication circuit of the Subaru Select Monitor is faulty.

5. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system.

Is the check result OK?

Yes	Go to 6.
No	Perform the diagnosis for LAN system.

6. CHECK CONNECTOR.

Check poor contact of body integrated unit connector, data link connector and coupling connector.

Is the check result OK?

Yes	Go to 7.
No	Repair the connector.

7. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Remove the F/B fuses No. 5, 14, 26 from fuse box.
3. Check the fuse.

Is the check result OK?

Yes	Go to 8.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the body integrated unit and fuse.

8. CHECK BODY INTEGRATED UNIT CONNECTOR POWER SUPPLY CIRCUIT (OPEN).

1. Disconnect the body integrated unit connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between body integrated unit connector and chassis ground.

Connector & terminal

(B281) No. 7 (+) — Chassis ground (−):

(B280) No. 1 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 9.
No	Check the harness for open or short circuit between body integrated unit and fuse.

9. CHECK BODY INTEGRATED UNIT GROUND CIRCUIT (OPEN CIRCUIT).

Measure the resistance in harness between body integrated unit connector and chassis ground.

Connector & terminal

(i84) No. 4 — Chassis ground:

(B287) No. 1 — Chassis ground:

Is the resistance less than 5 Ω?

Yes	Check the connection between the data link connector and Subaru Select Monitor.
No	Repair the harness for ground line.

BODY CONTROL(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor>LIST.**

BODY CONTROL(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
BATT voltage (control)	Constant power supply from the battery. Input value to the body integrated unit.	0 — 21.5 V	-
BATT voltage (BACKUP)	Constant power supply from the battery. Input value to the body integrated unit.	0 — 21.5 V	-
IGN voltage	IG system circuit voltage. Input value to the body integrated unit.	0 — 21.5 V	-
ACC voltage	ACC system circuit voltage. Input value to the body integrated unit.	0 — 21.5 V	-
Front Wheel Speed	Front wheel average speed. CAN data input value. Received from the VDC CM.	km/h	-
Fuel consumption	Injection quantity per 1 sec calculated from an instantaneous fuel injection quantity per 50 msec. CAN data input value. Received from the ECM.	cc/s	-
Coolant Temp.	Engine coolant temperature. CAN data input value. Received from the ECM.	−40 — 215°C	-
Shift Position	Shift position. CAN data input value. Received from the TCM.	1 — 3, D-S, D, N, R, P	-
Buzzer beeping request	Passenger room buzzer beeping request. CAN data output value. Sent to the combination meter.	Status for 'beeping deactivated' Reverse warning Key warning buzzer Light Remained Buzzer	-

Item	Contents	Standard/Unit	Note
		Customize 1 Customize 2 Registration completed 1 Registration completed 2 registered Registration NG	
EPB operating status	EPB operating status. CAN data input value, received from the VDC.	Error Released Operate Operating Releasing Parking	-
Destination	Vehicle destination information. CAN data receiving value. Received from the combination meter.	JPN U4, U5, U6 C0 EC, EA, E2, EL K4, C4, C6 KS EK ER, EN KA, KC EH C6	—
Illumination Sensor Output	Output voltage from the illumination sensor. Body integrated unit input value.	0 — 5 V	—
Off delay time	Interior light off delay time. Body integrated unit custom setting values.	OFF 10 Sec 20 Sec 30 Sec	-
Auto Light Sensitivity Adjustment	Sensitivity of auto light function. Body integrated unit custom setting values.	Dull Normal Sensitive Very sensitive	-
Key-lock Warning SW	Key warning switch ON/OFF status. Body integrated unit input value. Set to ON when the ignition key is inserted.	ON/OFF	Model without keyless access with push button start system
ACC Input	ACC ON/OFF status. Body integrated unit input value. Set to ON when the ignition switch is turned to ACC.	ON/OFF	Model with keyless access with push button start system

Item	Contents	Standard/Unit	Note
Stop Light Switch	Brake switch ON/OFF status. Body integrated unit input value. Set to ON when the brake pedal is pressed.	ON/OFF	-
Front fog lamp SW input	Front fog light switch ON/OFF status. Body integrated unit input value. Set to ON when the front fog light switch is ON.	ON/OFF	-
Driver's door SW input	Driver’s door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
P-door SW input	Passenger’s door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
Rear right door SW input	Rear right door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
Rear left door SW input	Rear left door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
R Gate SW input	Rear gate / trunk switch ON/OFF status. Body integrated unit input value. Set to ON when the rear gate / trunk is open.	ON/OFF	-
Manual lock SW input	ON/OFF status of the manual lock switch located on the power window main switch (or on the passenger’s side power window switch). Body integrated unit input value. Set to ON when the manual lock switch is set to lock.	ON/OFF	-
Manual unlock SW input	ON/OFF status of the manual lock switch located on the power window main switch (or on the passenger’s side power window switch). Body integrated unit input value. Set to ON when the manual lock switch is set to unlock.	ON/OFF	-
P SW	P range switch ON/OFF status. Body integrated unit input value. Set to ON in the P range.	ON/OFF	-

Item	Contents	Standard/Unit	Note
MT Reverse SW	MT back-up light switch ON/OFF status. Body integrated unit input value. Set to ON when the shift lever is set to R range and the back-up light switch is ON.	ON/OFF	-
R wiper ON SW input	Rear wiper ON switch ON/OFF status. Body integrated unit input value. Set to ON when the rear wiper switch is ON.	ON/OFF	-
R wiper INT SW input	Rear wiper INT switch ON/OFF status. Body integrated unit input value. Set to ON when the rear wiper switch is in the INT position.	ON/OFF	-
R washer SW input	Rear washer switch ON/OFF status. Body integrated unit input value. Set to ON when the rear washer switch is ON.	ON/OFF	-
Fr wiper input	Front wiper return switch ON/OFF status. Body integrated unit input value. Set to ON when the front wiper is outside of the stop position.	ON/OFF	-
Driver's seat lock status SW input	ON/OFF status of the driver’s seat lock status switch. Body integrated unit input value. Set to ON when the door status is LOCK.	ON/OFF	Model with keyless access with push button start system
Passenger's seat lock status SW input	ON/OFF status of the passenger’s seat lock status switch. Body integrated unit input value. Set to ON when the door status is LOCK.	ON/OFF	Model with keyless access with push button start system
R gate lock status SW input	ON/OFF status of the rear gate lock status switch. Body integrated unit input value. Set to ON when the rear gate status is LOCK.	ON/OFF	-
R Gate Release SW input	ON/OFF status of the rear gate release switch / trunk opener switch. Body integrated unit input value. Set to ON when the rear gate release switch / trunk opener switch is pressed.	ON/OFF	-
Rr Defogger output	Rear defogger relay output ON/OFF status. Body integrated unit output value. Set to ON when the rear	ON/OFF	-

Item	Contents	Standard/Unit	Note
	defogger is activated.		
lock actuator LOCK output	Door lock actuator output ON/OFF status. Body integrated unit output value. Set to ON when a lock signal is output.	ON/OFF	-
All seat UNLOCK output	ON/OFF status of the all door lock actuator output. Body integrated unit output value. Set to ON when an all door unlock signal is output.	ON/OFF	-
D-seat UNLOCK output	ON/OFF status of the driver’s door lock actuator output Body integrated unit output value. Set to ON when a driver’s door / all door unlock signal is output.	ON/OFF	-
R gate/trunk UNLK output	Rear gate / trunk lock actuator ON/OFF status. Body integrated unit output value. Set to ON when an unlock signal is output.	ON/OFF	-
R wiper output	Rear wiper relay output ON/OFF status. Body integrated unit output value. Set to ON when the rear wiper is activated.	ON/OFF	-
Shift lock solenoid output	Shift lock solenoid output ON/OFF status. Body integrated unit output value. Solenoid is activated to set this item to ON when depressing the brake pedal with the shift lever in P range.	ON/OFF	-
Key lock solenoid output	Key lock solenoid output ON/OFF status. Body integrated unit output value. Solenoid is activated to set this item to ON when the key is inserted with the shift lever in other than P range.	ON/OFF	Model without keyless access with push button start system
wiper deicer output	Wiper deicer output ON/OFF status. Body integrated unit output value. Set to ON while the wiper deicer is operating.	ON/OFF	-
Keyless Buzzer Output	Keyless buzzer ON/OFF status. Body integrated unit output value. Set to ON while the keyless buzzer is sounding.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Horn Output	Security horn output ON/OFF status. Body integrated unit output value. Set to ON while the horn is sounding due to a security breach.	ON/OFF	-
Room lamp output	Room light output ON/OFF status. Body integrated unit output value. Set to ON while the room light illuminates with the switch in DOOR position.	ON/OFF	-
key illumination lamp o/p	Key illumination light output ON/OFF status. Body integrated unit output value. Set to ON while the key illumination light illuminates.	ON/OFF	Model without keyless access with push button start system
Immobilizer lamp output	Security indicator output ON/OFF status. Body integrated unit output value. Set to ON while the security indicator in the combination meter illuminates.	ON/OFF	-
Small Light SW	Lighting 1 relay CAN output ON/OFF status. CAN data sending value. Set to ON when the position light indicator in the combination meter illuminates.	ON/OFF	-
Headlamp	Lighting Lo relay CAN output ON/OFF status. CAN data output value. Set to ON when the headlight Lo illuminates.	ON/OFF	-
High Beam	Lighting Hi relay CAN output ON/OFF status. CAN data output value. Set to ON when the headlight Hi illuminates.	ON/OFF	-
Lane change signal setting	Presence or absence of the one-touch blinker control. Body integrated unit custom setting values.	Support / Not Exist	-
Rear wiper auto setting	Presence or absence of the rear wiper control linked with reverse shift. Body integrated unit custom setting values.	Support / Not Exist	-
Left turn signal input	Left turn signal switch ON/OFF status. Body integrated unit input value. Set to ON while the left turn	ON/OFF	-

Item	Contents	Standard/Unit	Note
	signal switch is ON.		
Right turn signal input	Right turn signal switch ON/OFF status. Body integrated unit input value. Set to ON while the right turn signal switch is ON.	ON/OFF	-
Left turn signal output	Left turn signal light output ON/OFF status. Body integrated unit output value. Set to ON while the left turn signal light illuminates.	ON/OFF	-
Right turn signal output	Right turn signal light output ON/OFF status. Body integrated unit output value. Set to ON while the right turn signal light illuminates.	ON/OFF	-
Driver's Door Unlock Setting	Presence or absence of the driver’s seat select unlock control. Body integrated unit custom setting values.	Selection / ALL	Model with keyless access with push button start system
Rear Gate Unlock Setting	Presence or absence of the rear gate select unlock control. Body integrated unit custom setting values.	Selection / ALL	Model with keyless access with push button start system
Wiper link Auto Light Setup	ON/OFF status of the wiper interlock auto light function control. Body integrated unit custom setting values.	ON/OFF	-
High Beam Assist Function Setting (mirror/EyeSight)	Presence or absence of high beam assist. Body integrated unit custom setting values.	Not Exist / mirror HBA / EyeSight HBA	-
Head Lamp Low Beam Specification	Headlight low beam light source type. Body integrated unit custom setting values.	Halogen / HID / LED	-
Head Lamp High Beam Specification	Headlight high beam light source type. Body integrated unit custom setting values.	Halogen / HID / LED	-
High Beam Assist Current Setting	Presence or absence of high beam assist. Body integrated unit custom setting values.	ON/OFF	-

Item	Contents	Standard/Unit	Note
High Beam Assist Active Indicator	Set to ON when high beam assist is activated. CAN data output value.	Turn_OFF / Turn_ON / Flashing	-
High Beam Assist Failure Indicator	Set to ON when high beam assist fails. CAN data output value.	Turn_OFF / Turn_ON	-
High Beam Assist Failure Message	Sends display status of high beam assist related words. CAN data output value.	No message / HALT / Fail	-
<HBA>High Beam Request Status	Set to Request when high beam is requested for high beam assist module. High beam assist module CAN data output value.	Non Request / Request	-
<HBA>R Range Signal	Set to ON when shift lever is at reverse position. High beam assist module CAN data input value.	ON/OFF	-
<HBA>Head Lamp Low Beam Signal	Set to ON when the headlight low beam illuminates. High beam assist module CAN data input value.	ON/OFF	-
<HBA>Head Lamp High Beam Signal	Set to ON when the headlight high beam illuminates. High beam assist module CAN data input value.	ON/OFF	-
<HBA>High Beam Assist Status	High beam assist module internal status. High beam assist module CAN data output value.	Initialization/No Camera View/Nothing Sensed/Headlight Detect/Tail light Detect/Speed Under Threshold/Day Detect/Village Mode/Yaw Not Used/FAIL /Delay/SAE Mode/Temp Malfunction	-

Item	Contents	Standard/Unit	Note
<HBA>Yaw Rate & Speed Signal	Set to ON during high beam suppression when rounding a curve. High beam assist module CAN data output value.	ON/OFF	-
<HBA>Brightness & Color Detection	Set to Detect when a tunnel is detected. High beam assist module CAN data output value.	No detection / detection	-
<HBA>Street Lamp & Surrounding Detection	Set to Detect when an urban area is detected. High beam assist module CAN data output value.	No detection / detection	-
<HBA>High Speed Signal	Set to ON in high speed mode. High beam assist module CAN data output value.	ON/OFF	-
<HBA>High Beam Assist Camera	Set to Abnormal when camera is faulty. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>ECU	Set to Abnormal when high beam assist module is malfunctioning. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Camera Position Correlation	Set to Abnormal when camera’s angle of view is outside the tolerance. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Adjustment	Set to Completed when high beam assist operation becomes enabled. High beam assist module CAN data output value.	incomplete / Completed	-
<HBA>Registration	Set to Abnormal when specifications are not confirmed. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Lost Communication with VDC	Set to Abnormal when VDC data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received From Vehicle	Set to Abnormal when VDC data is abnormal.	NORMAL / FAIL	-

Item	Contents	Standard/Unit	Note
Dynamics Control Module	High beam assist module CAN data output value.		
<HBA>Lost Communication with Body Integrated Unit(BIU)	Set to Abnormal when body integrated unit data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received from Body Integrated Unit(BIU)	Set to Abnormal when body integrated unit data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Lost Communication with Combination Meter (MET)	Set to Abnormal when combination meter data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received from Combination Meter (MET)	Set to Abnormal when combination meter data is abnormal. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Head Lamp Low Beam Specification	High beam assist module CAN data input value. High beam assist module CAN data output value.	Halogen / HID / LED	-
<HBA>Head Lamp High Beam Specification	High beam assist module CAN data input value. High beam assist module CAN data output value.	Halogen / HID / LED	-
<HBA>Lane Recognition Status	High beam assist module lane recognition status. High beam assist module CAN data output value.	Right / Left	-
<HBA>Street Lamp & Surrounding Status	When Street Lamp & Surrounding Status mode is activated, set to Enable. High beam assist module CAN data output value.	Disable / Enable	-
<HBA>Vehicle Yaw Direction	Vehicle input in the yaw direction. High beam assist module CAN data output value.	CENTER / Right / Left	-
<HBA>Destination Code	Vehicle destination. High beam assist module CAN data	JPN U4, U5, U6	-

Item	Contents	Standard/Unit	Note
	output value.	C0 EC, EA, E2, EL K4, C4, C6 KS EK ER, EN KA, KC EH C6	
<HBA>Vehicle Model Information	Vehicle model. High beam assist module CAN data output value.	G/V system/B system/S system	-
<HBA>Vehicle Speed	Vehicle speed (resolution: low). High beam assist module CAN data output value.	-	-
Camera X direction Coordinate	High beam assist module, correction value of the angle of view center position (X coordinate). High beam assist module CAN data output value.	-	-
Camera Y direction Coordinate	High beam assist module, correction value of the angle of view center position (Y coordinate). High beam assist module CAN data output value.	-	-
Lighting I Switch Input	Lighting 1 switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting 1 switch is ON.	ON/OFF	-
Lighting II Switch Input	Lighting 2 switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting 2 switch is ON.	ON/OFF	-
Lighting AUTO input	Lighting AUTO switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting AUTO switch is ON.	ON/OFF	-
Dimmer Hi Switch Input	Dimmer Hi switch ON/OFF status. Body integrated unit input value. Set to ON while the dimmer Hi switch is ON.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Dimmer Pass Switch Input	Dimmer Pass switch ON/OFF status. Body integrated unit input value. Set to ON while the dimmer Pass switch is ON.	ON/OFF	-
Illumination sensor flag	Presence or absence of the illumination sensor. Body integrated unit internal data.	Support / Not Exist	-
Lighting I Lamp Output	Lighting 1 relay output ON/OFF status. Body integrated unit output value. Set to ON while the position light illuminates.	ON/OFF	-
Lighting II Lamp Output	Lighting Lo relay output ON/OFF status. Body integrated unit output value. Set to ON while the lighting Lo illuminates.	ON/OFF	-
Lighting Hi Lamp Output	Lighting Hi relay output ON/OFF status. Body integrated unit output value. Set to ON while the lighting Hi illuminates.	ON/OFF	-
Front Fog Lamp Output	Front fog light relay output ON/OFF status. Body integrated unit output value. Set to ON while the front fog light illuminates.	ON/OFF	-
Power Supply Transistor	Lighting power supply relay output ON/OFF status. Body integrated unit output value. Set to ON while the light illuminates with the key removed or while the key is inserted (including ACC and IGN ON).	ON/OFF	-
Map lamp output	Map light output ON/OFF status. Body integrated unit output value. Set to ON while the map light illuminates with the switch in DOOR position.	ON/OFF	-
Luggage/Trunk lamp output	Luggage/trunk light output ON/OFF status. Body integrated unit output value. Set to ON while the luggage/trunk light illuminates with the switch in DOOR position.	ON/OFF	-
Front washer switch input	ON when the front wiper washer switch is ON. Body integrated unit input value.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Rr Defogger op. mode	Status of the rear defogger operation mode. Body integrated unit custom setting values.	Continuous / Normal	-
Security Alarm Setup	Alarm ON/OFF status when the security system is activated. Body integrated unit custom setting values.	ON/OFF	-
Impact Sensor Setup	Impact sensor ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Alarm delay setup	Alarm monitoring delay function ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Lockout prevention	Key lockout prevention function ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Impact sensor	Presence or absence of the impact sensor. Body integrated unit custom setting values.	Support / Not Exist	-
Answer-back buzzer setup	Answer-back buzzer sounding ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Hazard answer-back setup	Hazard answer-back ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Answer-back Buzzer	Presence or absence of the answer-back buzzer. Body integrated unit custom setting values.	Support / Not Exist	-
Automatic lock YES/NO	Presence or absence of the auto lock function. Body integrated unit custom setting values.	Support / Not Exist	-
Door open warning	Presence or absence of the door open warning function. Body integrated unit custom setting values.	Support / Not Exist	-
Dome Light Alarm Setting	Room light illumination ON/OFF status when the alarm is activated. Body integrated unit custom setting values.	ON/OFF	-
Auto A/C Setting	Presence or absence of the A/C ECM. Body integrated unit custom setting values.	Support / Not Exist	-

Item	Contents	Standard/Unit	Note
wiperdeicer	Presence or absence of the wiper deicer. Body integrated unit custom setting values.	Support / Not Exist	-
Sedan/Wagon Setting	Vehicle type, Sedan/Wagon (OBK). Body integrated unit custom setting values.	Sedan / Wagon	-
MT/AT Setting	Transmission type, MT/AT (CVT). Body integrated unit custom setting values.	MT/AT	-
Destination Setting	Vehicle destination information. Body integrated unit internal data.	JPN KA,KC KS EU LHD Other than KS Canada (C0, C5) USA (U4, U5, U6, C6) EK,ER	-
Illumination Sensor Setting	Presence or absence of the illumination sensor. Body integrated unit custom setting values.	Support / Not Exist	-
Factory initial setting	Status of the Factory/Market mode. Body integrated unit custom setting values.	Market / Factory	-
Trip Count	Time stamp information.	0 — 65534	Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.
Count	Time stamp information.	Common / Originally	
Time Count [msec]	Time stamp information.	0 — 53687091000	
Welcome Lighting (Exiting)	Time setting to turn off the light for the welcome lighting (exiting) function. Body integrated unit custom setting values.	OFF 30s 60 Sec 90 Sec	-
Welcome Light Off Delay Time(Approaching)	Time setting to turn off the light for the welcome lighting (approaching) function. Body integrated unit custom setting values.	OFF 30s 60 Sec 90 Sec	-
Keyless Buzzer Volume	Volume of the keyless buzzer. Body integrated unit custom setting values.	1 — 7	-

Item	Contents	Standard/Unit	Note
Hazard switch Input	Turn hazard switch input ON/OFF status. Body integrated unit input value. Set to ON when the turn hazard switch is ON.	ON/OFF	-
Towing switch input	Towing switch ON/OFF status. Body integrated unit input value. Set to ON when the towing switch is ON.	ON/OFF	-
Door handle Light output	Door handle light output ON/OFF status. Body integrated unit output value. Set to ON when the pull handle LED illuminates.	ON/OFF	-
Auto Dimmer Cancel setting	Sensitivity of auto dimmer cancel function. Body integrated unit custom setting values.	0 (OFF) Least 2 Normal 4 Most	-
Alarm operation history	History of alarm operation	No history ALARM with door open ALARM with trunk open ALARM with impact sensor ALARM with ultrasonic sensor WARNING with impact sensor WARNING with ultrasonic sensor ALARM with hood open	-
IGN number at theft occurrence	Time stamp information at alarm operation	0 to 65535	-

BODY CONTROL(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to BODY CONTROL(DIAGNOSTICS)>Freeze Frame Data>LIST.**

BODY CONTROL(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
BATT voltage (control)	Constant power supply from the battery. Input value to the body integrated unit.	0 — 21.5 V	-
BATT voltage (BACKUP)	Constant power supply from the battery. Input value to the body integrated unit.	0 — 21.5 V	-
IGN voltage	IG system circuit voltage. Input value to the body integrated unit.	0 — 21.5 V	-
ACC voltage	ACC system circuit voltage. Input value to the body integrated unit.	0 — 21.5 V	-
Front Wheel Speed	Front wheel average speed. CAN data input value. Received from the VDC CM.	km/h	-
Fuel consumption	Injection quantity per 1 sec calculated from an instantaneous fuel injection quantity per 50 msec. CAN data input value. Received from the ECM.	cc/s	-
Coolant Temp.	Engine coolant temperature. CAN data input value. Received from the ECM.	−40 — 215°C	-
Shift Position	Shift position. CAN data input value. Received from the TCM.	1 — 3, D-S, D, N, R, P	-
Buzzer beeping request	Passenger room buzzer beeping request. CAN data output value. Sent to the combination meter.	Status for 'beeping deactivated' Reverse warning Key warning buzzer Light Remained Buzzer	-

Item	Contents	Standard/Unit	Note
		Customize 1 Customize 2 Registration completed 1 Registration completed 2 registered Registration NG	
EPB operating status	EPB operating status. CAN data input value, received from the VDC.	Error Released Operate Operating Releasing Parking	-
Destination	Vehicle destination information. CAN data receiving value. Received from the combination meter.	JPN U4, U5, U6 C0 EC, EA, E2, EL K4, C4, C6 KS EK ER, EN KA, KC EH C6	—
Illumination Sensor Output	Output voltage from the illumination sensor. Body integrated unit input value.	0 — 5 V	—
Off delay time	Interior light off delay time. Body integrated unit custom setting values.	OFF 10 Sec 20 Sec 30 Sec	-
Auto Light Sensitivity Adjustment	Sensitivity of auto light function. Body integrated unit custom setting values.	Dull Normal Sensitive Very sensitive	-
Key-lock Warning SW	Key warning switch ON/OFF status. Body integrated unit input value. Set to ON when the ignition key is inserted.	ON/OFF	Model without keyless access with push button start system
ACC Input	ACC ON/OFF status. Body integrated unit input value. Set to ON when the ignition switch is turned to ACC.	ON/OFF	Model with keyless access with push button start system

Item	Contents	Standard/Unit	Note
Stop Light Switch	Brake switch ON/OFF status. Body integrated unit input value. Set to ON when the brake pedal is pressed.	ON/OFF	-
Front fog lamp SW input	Front fog light switch ON/OFF status. Body integrated unit input value. Set to ON when the front fog light switch is ON.	ON/OFF	-
Driver's door SW input	Driver’s door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
P-door SW input	Passenger’s door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
Rear right door SW input	Rear right door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
Rear left door SW input	Rear left door switch ON/OFF status. Body integrated unit input value. Set to ON when the door is open.	ON/OFF	-
R Gate SW input	Rear gate / trunk switch ON/OFF status. Body integrated unit input value. Set to ON when the rear gate / trunk is open.	ON/OFF	-
Manual lock SW input	ON/OFF status of the manual lock switch located on the power window main switch (or on the passenger’s side power window switch). Body integrated unit input value. Set to ON when the manual lock switch is set to lock.	ON/OFF	-
Manual unlock SW input	ON/OFF status of the manual lock switch located on the power window main switch (or on the passenger’s side power window switch). Body integrated unit input value. Set to ON when the manual lock switch is set to unlock.	ON/OFF	-
P SW	P range switch ON/OFF status. Body integrated unit input value. Set to ON in the P range.	ON/OFF	-

Item	Contents	Standard/Unit	Note
MT Reverse SW	MT back-up light switch ON/OFF status. Body integrated unit input value. Set to ON when the shift lever is set to R range and the back-up light switch is ON.	ON/OFF	-
R wiper ON SW input	Rear wiper ON switch ON/OFF status. Body integrated unit input value. Set to ON when the rear wiper switch is ON.	ON/OFF	-
R wiper INT SW input	Rear wiper INT switch ON/OFF status. Body integrated unit input value. Set to ON when the rear wiper switch is in the INT position.	ON/OFF	-
R washer SW input	Rear washer switch ON/OFF status. Body integrated unit input value. Set to ON when the rear washer switch is ON.	ON/OFF	-
Fr wiper input	Front wiper return switch ON/OFF status. Body integrated unit input value. Set to ON when the front wiper is outside of the stop position.	ON/OFF	-
Driver's seat lock status SW input	ON/OFF status of the driver’s seat lock status switch. Body integrated unit input value. Set to ON when the door status is LOCK.	ON/OFF	Model with keyless access with push button start system
Passenger's seat lock status SW input	ON/OFF status of the passenger’s seat lock status switch. Body integrated unit input value. Set to ON when the door status is LOCK.	ON/OFF	Model with keyless access with push button start system
R gate lock status SW input	ON/OFF status of the rear gate lock status switch. Body integrated unit input value. Set to ON when the rear gate status is LOCK.	ON/OFF	-
R Gate Release SW input	ON/OFF status of the rear gate release switch / trunk opener switch. Body integrated unit input value. Set to ON when the rear gate release switch / trunk opener switch is pressed.	ON/OFF	-
Rr Defogger output	Rear defogger relay output ON/OFF status. Body integrated unit output value. Set to ON when the rear	ON/OFF	-

Item	Contents	Standard/Unit	Note
	defogger is activated.		
lock actuator LOCK output	Door lock actuator output ON/OFF status. Body integrated unit output value. Set to ON when a lock signal is output.	ON/OFF	-
All seat UNLOCK output	ON/OFF status of the all door lock actuator output. Body integrated unit output value. Set to ON when an all door unlock signal is output.	ON/OFF	-
D-seat UNLOCK output	ON/OFF status of the driver’s door lock actuator output Body integrated unit output value. Set to ON when a driver’s door / all door unlock signal is output.	ON/OFF	-
R gate/trunk UNLK output	Rear gate / trunk lock actuator ON/OFF status. Body integrated unit output value. Set to ON when an unlock signal is output.	ON/OFF	-
R wiper output	Rear wiper relay output ON/OFF status. Body integrated unit output value. Set to ON when the rear wiper is activated.	ON/OFF	-
Shift lock solenoid output	Shift lock solenoid output ON/OFF status. Body integrated unit output value. Solenoid is activated to set this item to ON when depressing the brake pedal with the shift lever in P range.	ON/OFF	-
Key lock solenoid output	Key lock solenoid output ON/OFF status. Body integrated unit output value. Solenoid is activated to set this item to ON when the key is inserted with the shift lever in other than P range.	ON/OFF	Model without keyless access with push button start system
wiper deicer output	Wiper deicer output ON/OFF status. Body integrated unit output value. Set to ON while the wiper deicer is operating.	ON/OFF	-
Keyless Buzzer Output	Keyless buzzer ON/OFF status. Body integrated unit output value. Set to ON while the keyless buzzer is sounding.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Horn Output	Security horn output ON/OFF status. Body integrated unit output value. Set to ON while the horn is sounding due to a security breach.	ON/OFF	-
Room lamp output	Room light output ON/OFF status. Body integrated unit output value. Set to ON while the room light illuminates with the switch in DOOR position.	ON/OFF	-
key illumination lamp o/p	Key illumination light output ON/OFF status. Body integrated unit output value. Set to ON while the key illumination light illuminates.	ON/OFF	Model without keyless access with push button start system
Immobilizer lamp output	Security indicator output ON/OFF status. Body integrated unit output value. Set to ON while the security indicator in the combination meter illuminates.	ON/OFF	-
Small Light SW	Lighting 1 relay CAN output ON/OFF status. CAN data sending value. Set to ON when the position light indicator in the combination meter illuminates.	ON/OFF	-
Headlamp	Lighting Lo relay CAN output ON/OFF status. CAN data output value. Set to ON when the headlight Lo illuminates.	ON/OFF	-
High Beam	Lighting Hi relay CAN output ON/OFF status. CAN data output value. Set to ON when the headlight Hi illuminates.	ON/OFF	-
Lane change signal setting	Presence or absence of the one-touch blinker control. Body integrated unit custom setting values.	Support / Not Exist	-
Rear wiper auto setting	Presence or absence of the rear wiper control linked with reverse shift. Body integrated unit custom setting values.	Support / Not Exist	-
Left turn signal input	Left turn signal switch ON/OFF status. Body integrated unit input value. Set to ON while the left turn	ON/OFF	-

Item	Contents	Standard/Unit	Note
	signal switch is ON.		
Right turn signal input	Right turn signal switch ON/OFF status. Body integrated unit input value. Set to ON while the right turn signal switch is ON.	ON/OFF	-
Left turn signal output	Left turn signal light output ON/OFF status. Body integrated unit output value. Set to ON while the left turn signal light illuminates.	ON/OFF	-
Right turn signal output	Right turn signal light output ON/OFF status. Body integrated unit output value. Set to ON while the right turn signal light illuminates.	ON/OFF	-
Driver's Door Unlock Setting	Presence or absence of the driver’s seat select unlock control. Body integrated unit custom setting values.	Selection / ALL	Model with keyless access with push button start system
Rear Gate Unlock Setting	Presence or absence of the rear gate select unlock control. Body integrated unit custom setting values.	Selection / ALL	Model with keyless access with push button start system
Wiper link Auto Light Setup	ON/OFF status of the wiper interlock auto light function control. Body integrated unit custom setting values.	ON/OFF	-
High Beam Assist Function Setting (mirror/EyeSight)	Presence or absence of high beam assist. Body integrated unit custom setting values.	Not Exist / mirror HBA / EyeSight HBA	-
Head Lamp Low Beam Specification	Headlight low beam light source type. Body integrated unit custom setting values.	Halogen / HID / LED	-
Head Lamp High Beam Specification	Headlight high beam light source type. Body integrated unit custom setting values.	Halogen / HID / LED	-
High Beam Assist Current Setting	Presence or absence of high beam assist. Body integrated unit custom setting values.	ON/OFF	-

Item	Contents	Standard/Unit	Note
High Beam Assist Active Indicator	Set to ON when high beam assist is activated. CAN data output value.	Turn_OFF / Turn_ON / Flashing	-
High Beam Assist Failure Indicator	Set to ON when high beam assist fails. CAN data output value.	Turn_OFF / Turn_ON	-
High Beam Assist Failure Message	Sends display status of high beam assist related words. CAN data output value.	No message / HALT / Fail	-
[<HBA>High Beam Request Status]	Set to Request when high beam is requested for high beam assist module. High beam assist module CAN data output value.	Non Request / Request	-
<HBA>R Range Signal	Set to ON when shift lever is at reverse position. High beam assist module CAN data input value.	ON/OFF	-
<HBA>Head Lamp Low Beam Signal	Set to ON when the headlight low beam illuminates. High beam assist module CAN data input value.	ON/OFF	-
<HBA>Head Lamp High Beam Signal	Set to ON when the headlight high beam illuminates. High beam assist module CAN data input value.	ON/OFF	-
<HBA>High Beam Assist Status	High beam assist module internal status. High beam assist module CAN data output value.	Initialization/No Camera View/Nothing Sensed/Headlight Detect/Tail light Detect/Speed Under Threshold/Day Detect/Village Mode/Yaw Not Used/FAIL /Delay/SAE Mode/Temp Malfunction	-

Item	Contents	Standard/Unit	Note
<HBA>Yaw Rate & Speed Signal	Set to ON during high beam suppression when rounding a curve. High beam assist module CAN data output value.	ON/OFF	-
<HBA>Brightness & Color Detection	Set to Detect when a tunnel is detected. High beam assist module CAN data output value.	No detection / detection	-
<HBA>Street Lamp & Surrounding Detection	Set to Detect when an urban area is detected. High beam assist module CAN data output value.	No detection / detection	-
<HBA>High Speed Signal	Set to ON in high speed mode. High beam assist module CAN data output value.	ON/OFF	-
<HBA>High Beam Assist Camera	Set to Abnormal when camera is faulty. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA> ECU	Set to Abnormal when high beam assist module is malfunctioning. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Camera Position Correlation	Set to Abnormal when camera’s angle of view is outside the tolerance. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA> Adjustment	Set to Completed when high beam assist operation becomes enabled. High beam assist module CAN data output value.	incomplete / Completed	-
<HBA> Registration	Set to Abnormal when specifications are not confirmed. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Lost Communication with VDC	Set to Abnormal when VDC data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received from VDC	Set to Abnormal when VDC data is abnormal.	NORMAL / FAIL	-

Item	Contents	Standard/Unit	Note
	High beam assist module CAN data output value.		
<HBA>Lost Communication with Body Integrated Unit(BIU)	Set to Abnormal when body integrated unit data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received from Body Integrated Unit(BIU)	Set to Abnormal when body integrated unit data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Lost Communication with Combination Meter (MET)	Set to Abnormal when combination meter data has not yet arrived. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Invalid Data Received from Combination Meter (MET)	Set to Abnormal when combination meter data is abnormal. High beam assist module CAN data output value.	NORMAL / FAIL	-
<HBA>Head Lamp Low Beam Specification	High beam assist module CAN data input value. High beam assist module CAN data output value.	Halogen / HID / LED	-
<HBA>Head Lamp High Beam Specification	High beam assist module CAN data input value. High beam assist module CAN data output value.	Halogen / HID / LED	-
<HBA>Lane Recognition Status	High beam assist module lane recognition status. High beam assist module CAN data output value.	Right / Left	-
<HBA>Street Lamp & Surrounding Status	When Street Lamp & Surrounding Status mode is activated, set to Enable. High beam assist module CAN data output value.	Disable / Enable	-
<HBA>Vehicle Yaw Direction	Vehicle input in the yaw direction. High beam assist module CAN data output value.	CENTER / Right / Left	-
<HBA>Destination Code	Vehicle destination. High beam assist module CAN data	JPN U4, U5, U6	-

Item	Contents	Standard/Unit	Note
	output value.	C0 EC, EA, E2, EL K4, C4, C6 KS EK ER, EN KA, KC EH C6	
<HBA>Vehicle Model Information	Vehicle model. High beam assist module CAN data output value.	G/V system/B system/S system	-
<HBA>Vehicle Speed	Vehicle speed (resolution: low). High beam assist module CAN data output value.	-	-
Camera X direction Coordinate	High beam assist module, correction value of the angle of view center position (X coordinate). High beam assist module CAN data output value.	-	-
Camera Y direction Coordinate	High beam assist module, correction value of the angle of view center position (Y coordinate). High beam assist module CAN data output value.	-	-
Lighting I Switch Input	Lighting 1 switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting 1 switch is ON.	ON/OFF	-
Lighting II Switch Input	Lighting 2 switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting 2 switch is ON.	ON/OFF	-
Lighting AUTO input	Lighting AUTO switch ON/OFF status. Body integrated unit input value. Set to ON while the lighting AUTO switch is ON.	ON/OFF	-
Dimmer Hi Switch Input	Dimmer Hi switch ON/OFF status. Body integrated unit input value. Set to ON while the dimmer Hi switch is ON.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Dimmer Pass Switch Input	Dimmer Pass switch ON/OFF status. Body integrated unit input value. Set to ON while the dimmer Pass switch is ON.	ON/OFF	-
Illumination sensor flag	Presence or absence of the illumination sensor. Body integrated unit internal data.	Support / Not Exist	-
Lighting I Lamp Output	Lighting 1 relay output ON/OFF status. Body integrated unit output value. Set to ON while the position light illuminates.	ON/OFF	-
Lighting II Lamp Output	Lighting Lo relay output ON/OFF status. Body integrated unit output value. Set to ON while the lighting Lo illuminates.	ON/OFF	-
Lighting Hi Lamp Output	Lighting Hi relay output ON/OFF status. Body integrated unit output value. Set to ON while the lighting Hi illuminates.	ON/OFF	-
Front Fog Lamp Output	Front fog light relay output ON/OFF status. Body integrated unit output value. Set to ON while the front fog light illuminates.	ON/OFF	-
Power Supply Transistor	Lighting power supply relay output ON/OFF status. Body integrated unit output value. Set to ON while the light illuminates with the key removed or while the key is inserted (including ACC and IGN ON).	ON/OFF	-
Map lamp output	Map light output ON/OFF status. Body integrated unit output value. Set to ON while the map light illuminates with the switch in DOOR position.	ON/OFF	-
Luggage/Trunk lamp output	Luggage/trunk light output ON/OFF status. Body integrated unit output value. Set to ON while the luggage/trunk light illuminates with the switch in DOOR position.	ON/OFF	-
Front washer switch input	ON when the front wiper washer switch is ON. Body integrated unit input value.	ON/OFF	-

Item	Contents	Standard/Unit	Note
Rr Defogger op. mode	Status of the rear defogger operation mode. Body integrated unit custom setting values.	Continuous / Normal	-
Security Alarm Setup	Alarm ON/OFF status when the security system is activated. Body integrated unit custom setting values.	ON/OFF	-
Impact Sensor Setup	Impact sensor ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Alarm delay setup	Alarm monitoring delay function ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Lockout prevention	Key lockout prevention function ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Impact sensor	Presence or absence of the impact sensor. Body integrated unit custom setting values.	Support / Not Exist	-
Answer-back buzzer setup	Answer-back buzzer sounding ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Hazard answer-back setup	Hazard answer-back ON/OFF status. Body integrated unit custom setting values.	ON/OFF	-
Answer-back Buzzer	Presence or absence of the answer-back buzzer. Body integrated unit custom setting values.	Support / Not Exist	-
Automatic lock YES/NO	Presence or absence of the auto lock function. Body integrated unit custom setting values.	Support / Not Exist	-
Door open warning	Presence or absence of the door open warning function. Body integrated unit custom setting values.	Support / Not Exist	-
Dome Light Alarm Setting	Room light illumination ON/OFF status when the alarm is activated. Body integrated unit custom setting values.	ON/OFF	-
Auto A/C Setting	Presence or absence of the A/C ECM. Body integrated unit custom setting values.	Support / Not Exist	-

Item	Contents	Standard/Unit	Note
wiperdeicer	Presence or absence of the wiper deicer. Body integrated unit custom setting values.	Support / Not Exist	-
Sedan/Wagon Setting	Vehicle type, Sedan/Wagon (OBK). Body integrated unit custom setting values.	Sedan / Wagon	-
MT/AT Setting	Transmission type, MT/AT (CVT). Body integrated unit custom setting values.	MT/AT	-
Destination Setting	Vehicle destination information. Body integrated unit internal data.	JPN KA,KC KS EU LHD Other than KS Canada (C0, C5) USA (U4, U5, U6, C6) EK,ER	-
Illumination Sensor Setting	Presence or absence of the illumination sensor. Body integrated unit custom setting values.	Support / Not Exist	-
Factory initial setting	Status of the Factory/Market mode. Body integrated unit custom setting values.	Market / Factory	-
Trip Count	Time stamp information.	0 — 65534	Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.
Count	Time stamp information.	Common / Originally	
Time Count [msec]	Time stamp information.	0 — 53687091000	
Welcome Lighting (Exiting)	Time setting to turn off the light for the welcome lighting (exiting) function. Body integrated unit custom setting values.	OFF 30s 60 Sec 90 Sec	-
Welcome Light Off Delay Time(Approaching)	Time setting to turn off the light for the welcome lighting (approaching) function. Body integrated unit custom setting values.	OFF 30s 60 Sec 90 Sec	-
Keyless Buzzer Volume	Volume of the keyless buzzer. Body integrated unit custom setting values.	1 — 7	-

Item	Contents	Standard/Unit	Note
Hazard switch Input	Turn hazard switch input ON/OFF status. Body integrated unit input value. Set to ON when the turn hazard switch is ON.	ON/OFF	-
Towing switch input	Towing switch ON/OFF status. Body integrated unit input value. Set to ON when the towing switch is ON.	ON/OFF	-
Door handle Light output	Door handle light output ON/OFF status. Body integrated unit output value. Set to ON when the pull handle LED illuminates.	ON/OFF	-
Auto Dimmer Cancel setting	Sensitivity of auto dimmer cancel function. Body integrated unit custom setting values.	0 (OFF) Least 2 Normal 4 Most	-

BODY CONTROL(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

For detailed operation procedures, refer to "Application help".

BODY CONTROL(DIAGNOSTICS) > Active Test

LIST

Note:

If not equipped (depending on destination area or vehicle equipment condition), process will not go on.

Active test items	Range	Execution condition	Contents
lock actuator LOCK output	ON/OFF		
All seat UNLOCK output	ON/OFF		
R gate/trunk UNLOCK output	ON/OFF		
Shift lock solenoid output	ON/OFF		
Key lock solenoid output	ON/OFF		
Keyless Buzzer	ON/OFF		
Horn Output	ON/OFF		

BODY CONTROL(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. When the setting is complete, make sure that the alterations by [Data monitor] are consistent with the actual equipment on the vehicle.

Note:

- **For detailed operation procedures, refer to "Application help".**
- **If not equipped (depending on destination area or vehicle equipment condition), process will not go on.**

BODY CONTROL(DIAGNOSTICS) > Customize

LIST

Caution:

- **The setting items must match the actual vehicle equipment.**
- **Do not change settings except for setting below while setting the functions.**
- **Be sure not to change Factory initial setting except when installing a new body integrated unit.**

Data	Initial setting value	Customize setting	Remarks
Off delay time	30s	OFF 10 Sec 20 Sec 30s	Room light off delay time can be selected.
Auto Light Sensitivity Adjustment	Sensitive	Dull Normal Sensitive Very sensitive	Sensitivity of the automatic lighting can be adjusted.
Lane change signal setting	ON	ON OFF	ON: One-touch blinker function operates. OFF: One-touch blinker function does not operate.
Rear wiper auto setting	OFF (U0, U4, U5 model) ON (C0, C5 model)	ON OFF	ON: Rear wiper operates in sync with the reverse shift. OFF: Rear wiper does not operate in sync with the reverse shift.
Driver's Door Unlock Setting	Selection	Selection ALL	Selection: When the touch sensor (unlock) on the driver's side is touched,

Data	Initial setting value	Customize setting	Remarks
			only the driver’s door is unlocked. When the touch sensor (unlock) on the passenger’s side is touched, all doors are unlocked. ALL: When the touch sensor (unlock) on the driver’s side is touched, all doors are unlocked. When the touch sensor (unlock) on the passenger’s side is touched, all doors are unlocked.
Rear Gate Unlock Setting	Selection	Selection ALL	Selection: When the rear gate opener button is pressed, only the rear gate is unlocked. ALL: When the rear gate opener button is pressed, all doors are unlocked.
Wiper link Auto Light Setup	ON	ON OFF	ON: Wiper interlock auto light function is activated. OFF: Wiper interlock auto light function is deactivated.
High Beam Assist Function Setting (mirror/EyeSight)	— (*1)	None mirror HBA EyeSight HBA	Set to ON for models with high beam assist.
Head Lamp Low Beam Specification	— (*1)	Halogen HID LED	Set according to the headlight type.
Head Lamp High Beam Specification	— (*1)	Halogen HID LED	Set according to the headlight type.
High Beam Assist Current Setting	— (*1)	ON OFF	Set to ON for models with high beam.
Rear defogger operation mode	Normal	Normal Continuous	Normal: Automatically stops in 15 minutes after the switch is turned to ON. Continuous: Repeats the cycle of 15-minute active condition and 2-minute inactive condition until the switch is turned to OFF.
Security Alarm Setup	ON	ON OFF	ON: Warning function (hazard, horn) is activated. OFF: Warning function (hazard, horn) is deactivated.

Data	Initial setting value	Customize setting	Remarks
Impact Sensor Setup	OFF	ON OFF	ON: Impact sensor is activated. OFF: Impact sensor is deactivated. (Set to “OFF” in models without the impact sensor.)
Alarm delay setup	ON	ON OFF	ON: The alarm monitor starts 30 seconds after the keyless lock operation. OFF: The alarm monitor starts immediately after the keyless lock operation.
Lockout prevention	ON	ON OFF	ON: Key lockout prevention function is activated. (The function does not operate if safety knob is locked by hand.) OFF: Key lockout prevention function is deactivated.
Impact sensor	None	ON None	ON: Vehicle is controlled in impact sensor equipped mode. (Make sure to set to “OFF” for models without the impact sensor. When set to “ON”, hazard, horn or siren become activated by keyless lock (alarm monitor start).) OFF: Vehicle is controlled in no impact sensor mode.
Buzzer sounding setting	ON	ON OFF	ON: Buzzer sounds when lock/unlock is selected by keyless entry system. OFF: Buzzer does not sound when lock/unlock is selected by keyless entry system.
Abnormal warning lamp flashing setting	ON	ON OFF	ON: Buzzer sounds when lock/unlock is selected by keyless entry system. OFF: Buzzer does not sound when lock/unlock is selected by keyless entry system.
Initial keyless setting	—	— Execution	—
Initial button setting	—	— Execution	—
Initial Security setting	—	— Execution	—
Door open warning	ON	ON None	ON: If a door stays half shut for 20 minutes, interior lighting linked with the

Data	Initial setting value	Customize setting	Remarks
			door such as room light, map light, luggage room light, trunk room light and key ring illumination go off to prevent battery run-out. OFF: Room light, map light, luggage room light, trunk room light, key ring illumination and door warning light remain lit.
Dome Light Alarm Setting	OFF	ON OFF	ON: Room light illumination is interlocked with the alarm. OFF: Room light illumination is not interlocked with the alarm.
Welcome Light Off Delay Time(Exiting)	30 seconds	OFF 30 seconds 60 seconds 90 seconds	Lighting time length of the welcome lighting (exiting) function can be set.
Welcome Light Off Delay Time(Approaching)	30 seconds	OFF 30 seconds 60 seconds 90 seconds	Lighting time length of the welcome lighting (approaching) function can be set.
Keyless Buzzer Volume	5	1 — 7	Buzzer volume can be set.
Auto Dimmer Cancel Setting	3	0 (OFF) Least 2 Normal 4 Most	Auto dimmer cancel sensitivity can be set.

*1: Customization item according to the actual vehicle equipment

OPERATION

1. CONFIRM CURRENT SETTING

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. Save the setting.

REQUIRED ITEMS FOR NEW REGISTRATION. (EXCEPT FOR SYSTEM NOT EQUIPPED)

Item	Item to confirm				Remarks
number of regist.	1	2	3	4	Number of registered key
Off delay time	OFF	10 Sec	20 Sec	30s	—
Auto Light Sensitivity Adjustment	Dull	Normal	3rd	Very sensitive	—
Lane change signal setting	Exist		Not Exist		—
Rear wiper auto setting	Exist		Not Exist		—
Driver's Door Unlock Setting	ALL		Selection		—
Rear Gate Unlock Setting	ALL		Selection		—
Wiper link Auto Light Setup	ON		OFF		—
High Beam Assist Function Setting (mirror/EyeSight)	Not Exist	mirror	HBA	EyeSight HBA	—
Head Lamp Low Beam Specification	Halogen	HID	LED		—
Head Lamp High Beam Specification	Halogen	HIDLED			—
High Beam Assist Current Setting	ON		OFF		—
Illumination sensor flag	Exist		Not Exist		—
Rr Defogger op. mode	Normal		Continuous		—
Security Alarm Setup	ON		OFF		—
Impact Sensor Setup	ON		OFF		Option setting
Alarm delay setup	ON		OFF		—
Lockout prevention	ON		OFF		—
Impact sensor	Exist		Not Exist		Option setting
Answer-back buzzer setup	ON		OFF		—
Hazard answer-back setup	ON		OFF		—
Automatic locking setup	Exist		Not Exist		—
Door open warning	Exist		Not Exist		—
Dome Light Alarm Setting	ON		OFF		—

Item	Item to confirm		Remarks
Auto A/C Setting	Exist	Not Exist	—
wiperdeicer	Exist	Not Exist	—
Sedan/Wagon Setting	Wagon	Sedan	—
MT/AT Setting	MT	AT	—
Illumination Sensor Setting	Exist	Not Exist	—
Factory initial setting	Factory	Market	Do not change to factory mode.
Welcome Light Off Delay Time(Approaching)	OFF 30 seconds 60 seconds 90 seconds		—
Welcome Lighting (Exiting)	OFF 30 seconds 60 seconds 90 seconds		—
Keyless Buzzer Volume	1 2 3 4 5 6 7		—
Auto Dimmer Cancel Setting	0 (OFF) 1 stage (dull) 2 3 stage (standard) 4 5 stage (sensitive)		—

2. REGISTRATION BODY INTEGRATED UNIT (FUNCTION SETTING)

Caution:

For the body integrated unit, function selection is available to control the entire vehicle systems. It is possible to control the original functions of vehicle when registrations of body integrated unit and function setting are corresponded to vehicle equipment.
If registrations and function setting are different from vehicle equipment, vehicle system does not operate normally and diagnosis cannot be performed correctly. Pay attention to following item.

- **Be sure to match registrations or customizing settings with vehicle equipment.**
- **Do not change the settings of vehicle improperly.**
- **Make sure that the key illumination does not blink with ignition switch ON, or that the body integrated unit registration item [Factory initial setting] is set to [Market]. If [Factory initial setting] is set to [Factory], the key illumination blinks when the ignition switch is turned ON, to notify that the settings are not confirmed. (If the vehicle is a model with the keyless access with push button start system, check by the data monitor of Subaru Select Monitor because no key illumination is available.)**
- **Key illumination does not blink with ignition switch turned to ON and go off with door closed. (Except for model with the keyless access with push button start system)**
- **Be sure to register immobilizer if body integrated unit is replaced with a new part. (Except for model with the keyless access with push button start system)**
- **Make a registration of immobilizer when the parts related to immobilizer have been replaced. Refer to the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume.**

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Body Control], and then select [Enter].
5. On [Select Function] display, select [Customize].

Note:

For the vehicle requiring the destination setting, if the destination setting is not finished, display can not be shifted into customizing screen. Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION > DESTINATION SETTING.

6. Change the setting to the contents saved at confirmation of current setting.

Caution:

- **To perform normal operation of vehicle and diagnosis, the above settings must match the actual vehicle equipment.**
- **When the body integrated unit is new or in Factory mode, the key illumination blinks, and customizing is incomplete. Check the customizing settings. (For models with keyless access with push button start system, the room light illuminates.)**
- **Be sure not to change Factory initial setting except when installing a new body integrated unit.**

Note:

"Factory" mode:

- **Body integrated unit has not been set yet. It can be recognized by key illumination blinking with ignition switch turned to ON. (Except for model with the keyless access with push button start system)**
- **All replacement body integrated units are set to "Factory" mode. When replacing a body integrated unit, be sure to perform the registration operation.**

"Market" mode:

- **Each settings have been set. It can be recognized by key ring illumination coming on in concocting with room light and going off with ignition switch turned to ON. (Except for model with the keyless access with push button start system)**

7. Perform the factory initial setting. Select Factory initial setting on [Customize] of Subaru Select Monitor.

8. Change the mode from Factory to Market.

9. Turn the ignition switch to OFF to settle the setting.

10. Perform the customizing. Ref. to BODY CONTROL(DIAGNOSTICS)>Customize.

11. Register the immobilizer key. Follow the procedure of the "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume. (Models without the keyless access with push button start system, and except for C5 model)

12. For vehicles with remote engine starter, refer to "REGISTRATION MANUAL FOR IMMOBILIZER" provided as a separate volume and perform registration of the remote engine starter. (Models without the keyless access with push button start system)

3. DESTINATION SETTING

Note:

For the vehicle requiring the destination setting, if the destination setting is not finished, display can not be shifted into customizing screen.

1. CONFIRM CURRENT SETTING.

Always perform confirmation of current setting before replacing the module.
Record the contents of the "Destination Setting".

Note:

Refer to Read Data Monitor and Confirm Current Setting to confirm the current setting.
Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor. **Ref. to BODY CONTROL(DIAGNOSTICS)>Registration Body Integrated Unit>OPERATION > CONFIRM CURRENT SETTING.**

Is the current setting recorded?

Yes	Go to 2.
No	Confirm the current setting. Go to 1.

2. CONFIRM DESTINATION SETTING.

1. Connect the Subaru Select Monitor, and run the application.
2. On [Start] display, select [Diagnosis].
3. On [Vehicle selection] display, input the target vehicle information and select [OK].
4. On [Main Menu] display, select [Each System].
5. On [Select System] display, select [Body Control], and then select [Enter].
6. On [Select Function] display, select [Customize].
7. The vehicle destination screen is displayed.

Is the vehicle destination setting screen displayed?

Yes	Go to 3.
No	Go to 4.

3. CONFIRM DESTINATION SETTING.

Confirm the screen displayed on Subaru Select Monitor and the actual vehicle destination.

Is it necessary to change the destination setting?

Yes	Select Yes, and Go to 4.
No	Select No, and Go to 5.

4. ENTER DESTINATION CODE.

Enter the appropriate code in the screen.
JPN: JP00
KA, KC: KA00
KS: KS00
U4, U5, U6, C6 and C0, C5 (with the keyless access with push button start system): U400
C0, C5 (without the keyless access with push button start system): C000
EK, ER: EK00
Except above: EC00

Is the appropriate code entered?

Yes	Select [OK]. Go to 5.
No	Enter the destination code. Go to 4.

5. REGISTER VEHICLE EQUIPMENT.

Customizing screen is displayed.

Note:

Match the each item setting of body integrated unit registration item list with the vehicle equipment.

Do all setting contents match with the vehicle equipment specification?

Yes	Go to 6.
No	Change the items until each content setting match with the vehicle equipment specification. Go to 5.

6. CONFIRM MARKET MODE.

1. On the customizing screen, select the "Factory initial setting" to change the setting from "Factory mode" to "Market mode".
2. Turn the ignition switch to OFF.
   Note:
   When the setting is changed from "Factory" mode to "Market" mode, turning the ignition switch from ON → OFF confirms the setting.
3. Turn the ignition switch to ON, and check the contents of settings.

Is the mode changed to "Market" mode?

Yes	Go to 7.
No	Perform the destination setting from the first step. Go to 1.

7. CONFIRM MARKET MODE.

Check the following.
Make sure that the "Destination Setting" in the data monitor is the same as the one you confirmed in step 1.

Is the display the same as indicated?

Yes	Registration of body integrated unit is finished.
No	It is possible that harness malfunction may occur. Perform the diagnosis.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B1010	BODY CONTROL SYSTEM (BIU) MALFUNCTION	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1010 BODY CONTROL SYSTEM (BIU) MALFUNCTION.
B1011	BATTERY CONTROL POWER SUPPLY	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1011 BATTERY CONTROL POWER SUPPLY.
B1012	BATTERY BACKUP POWER SUPPLY	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1012 BATTERY BACKUP POWER SUPPLY.
B1013	IGNITION POWER	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1013 IGNITION POWER.
B1014	ACC POWER	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1014 ACC POWER.
B1015	KEY INTERLOCK CIRCUIT	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1015 KEY INTERLOCK CIRCUIT.
B1016	SHIFT LOCK CIRCUIT	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1016 SHIFT LOCK CIRCUIT.
B1107	CAN COMMUNICATION (BIU) STUCK	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1107 CONTROL MODULE COMMUNICATION STICKING.

Code	Description & trouble part	Reference
B1401	COMBINATION METER COLLATION	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1401 METER COLLATION.
B1402	IMMOBILIZER KEY COLLATION	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.
B1407	COMBINATION METER COMMUNICATION	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1407 MET COMMUNICATION.
B1408	COMBINATION METER NON-VOLATILE MEMORY	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1408 METER NON-VOLATILE MEMORY.
B1410	TRANSPONDER COMMUNICATION	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.
B1411	IMMOBILIZER ANTENNA	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST

Code	Description & trouble part	Reference
		COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0127	LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0222	LOST COMMUNICATION WITH DRIVER'S DOOR POWER WINDOW	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0222 LOST COMMUNICATION WITH DRIVER'S DOOR POWER WINDOW.
U0223	LOST COMMUNICATION WITH PASSENGER'S DOOR POWER WINDOW	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0223 LOST COMMUNICATION WITH PASSENGER'S DOOR POWER WINDOW.
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with

Code	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.
U0427	INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE.
U0430	INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0430 INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1674	LIN COMMUNICATION BUS 2 ERROR BODY CONTROL MODULE	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1674 LIN COMMUNICATION BUS 2 ERROR BODY CONTROL MODULE.
U1822	LOST COMMUNICATION WITH MASTER MAIN SWITCH	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Procedure with

Code	Description & trouble part	Reference
		Diagnostic Trouble Code (DTC)>DTC U1822 LOST COMMUNICATION WITH MASTER MAIN SWITCH.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1010 BODY CONTROL SYSTEM (BIU) MALFUNCTION

DTC detecting condition:
System error in body integrated unit
Trouble symptom:
LAN communication immobilizer function may not be executed normally.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1010 displayed? (Current malfunction)

Yes	Go to 2.
No	Temporary EEPROM access error occurred.

2. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1010 displayed? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Temporary EEPROM access error occurred.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1011 BATTERY CONTROL POWER SUPPLY

DTC detecting condition:

- Voltage failure caused by poor contact of battery power supply control circuit
- Battery voltage of body integrated unit is not within the range of 8.5 — 16.5 V.

Trouble symptom:

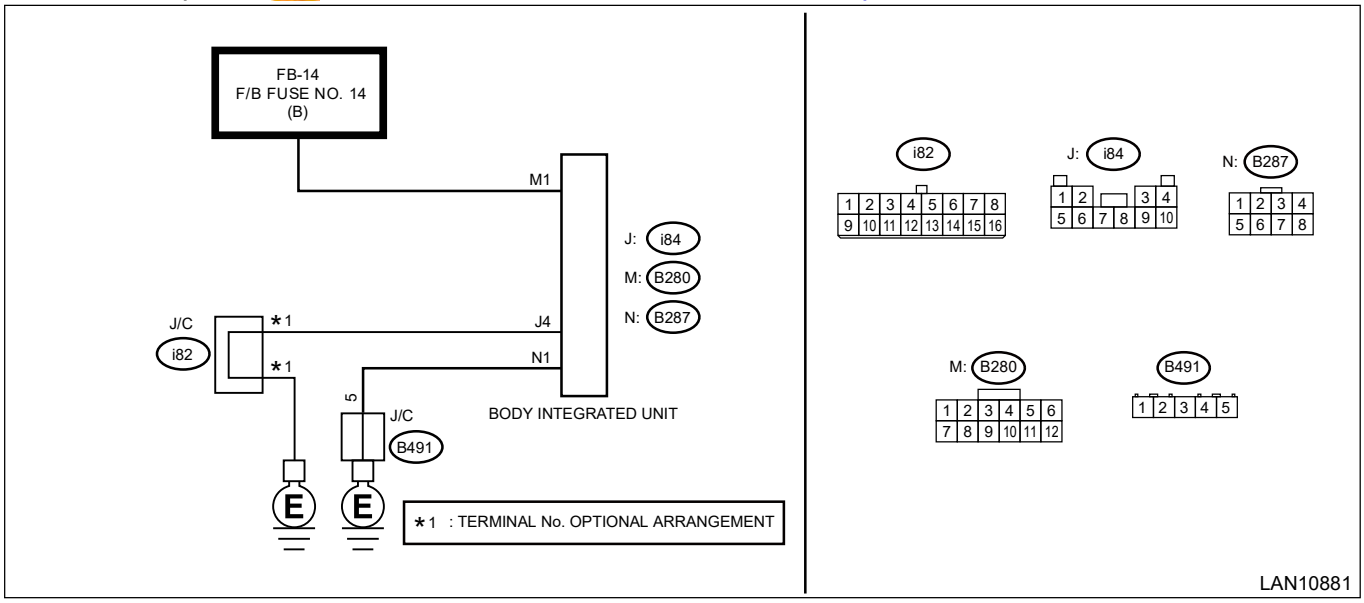
Functions of body integrated unit stop.

Note:

When [DTC B1012 BATTERY BACKUP POWER SUPPLY] is output at the same time, all function of body integrated unit may not operate.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1011 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 5.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1011 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 5.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the defective fuse.

4. CHECK HARNESS.

1. Disconnect the body integrated unit connector.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B280) No. 1 (+) — Chassis ground (−):

Is the voltage 8.5 — 16.5 V?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the harness between body integrated unit and fuse.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.

Is there poor contact of connector?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1012 BATTERY BACKUP POWER SUPPLY

DTC detecting condition:

Voltage failure caused by poor contact of battery power supply backup circuits

Trouble symptom:

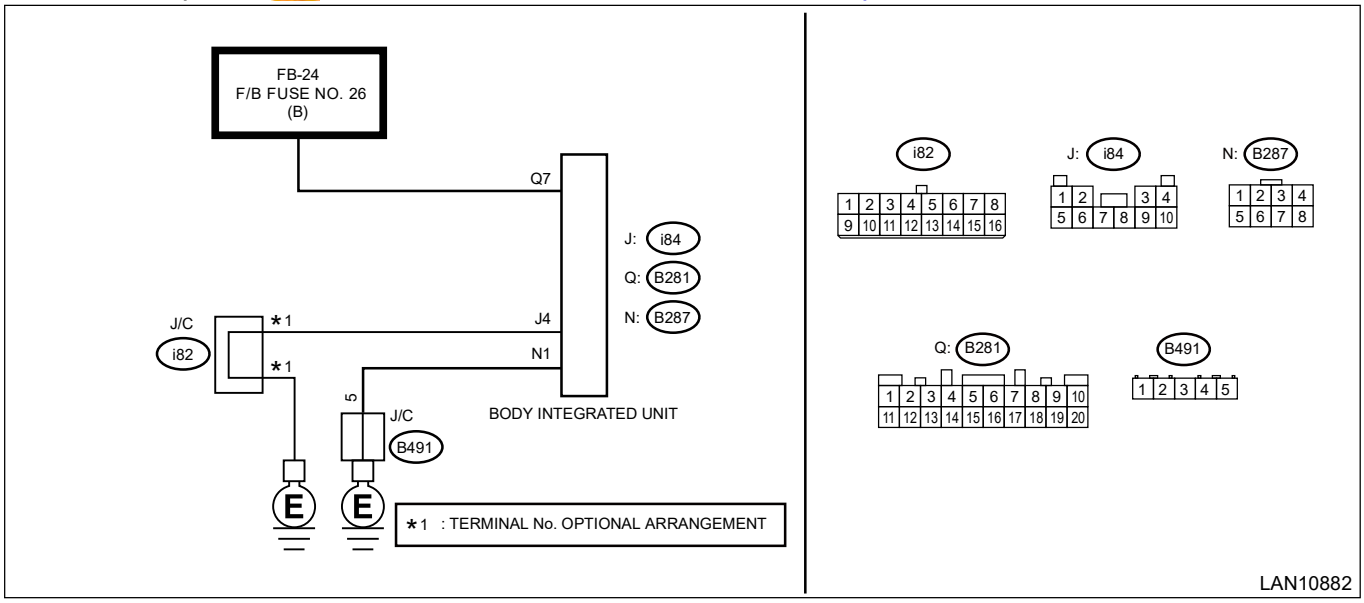
Illuminations for the keyless entry, map light, luggage light, trunk light, room light, and ignition switch do not turn on.

Note:

When [DTC B1011 BATTERY CONTROL POWER SUPPLY] is output at the same time, all function of body integrated unit may not operate.

Wiring diagram:

Immobilizer system Ref. to WIRING SYSTEM>Immobilizer System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1012 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 5.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1012 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 5.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the defective fuse.

4. CHECK HARNESS.

1. Disconnect the body integrated unit connector.
2. Using the tester, measure the voltage between terminals.

Connector & terminal

(B281) No. 7 (+) — Chassis ground (−):

Is the voltage 8.5 — 16.5 V?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the harness between body integrated unit and fuse.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.

Is there poor contact of connector?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1013 IGNITION POWER

DTC detecting condition:

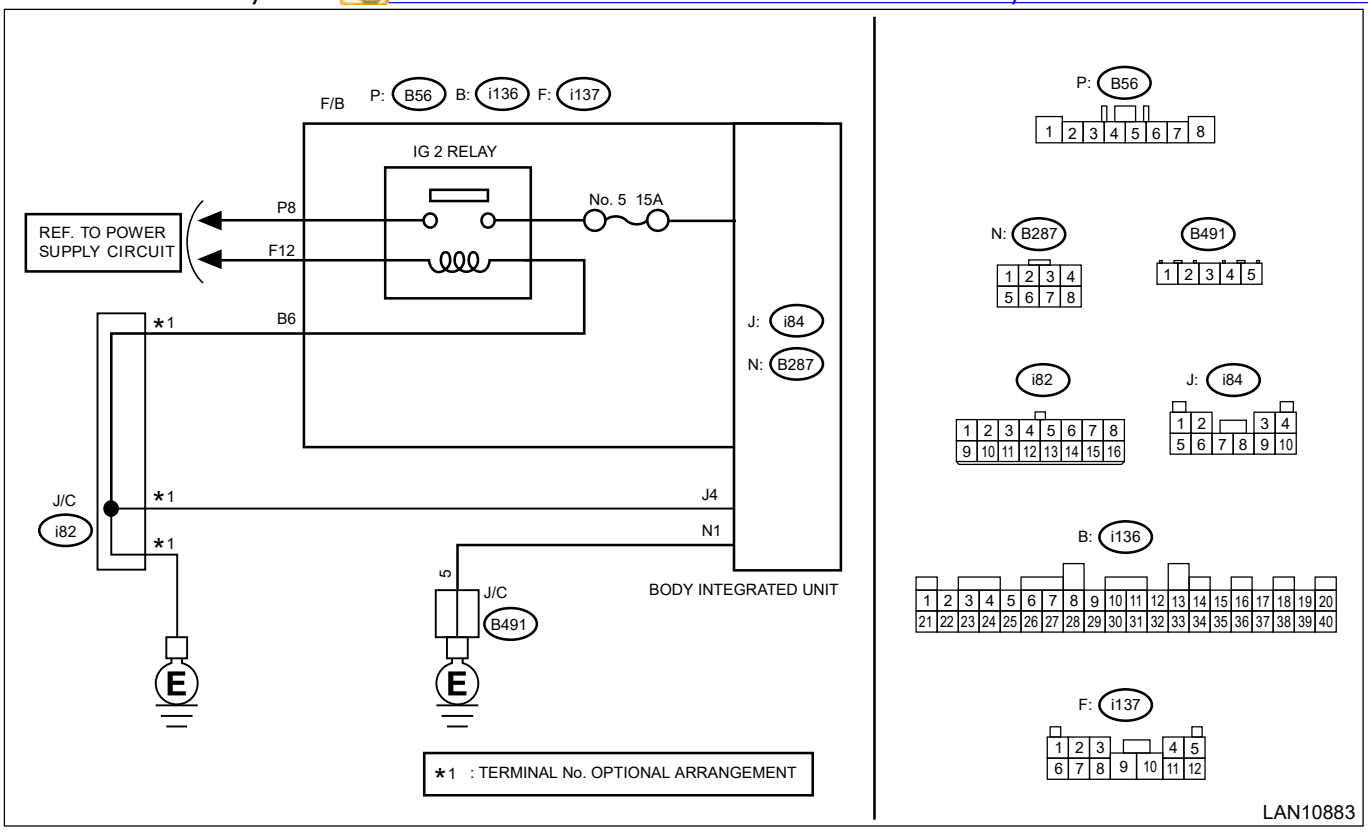
Voltage failure caused by poor contact of IGN power supply circuits

Trouble symptom:

Symptoms such as shift lock or wiper not operating may occur.

Wiring diagram:

Shift lock control system Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1013 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 6.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1013 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 6.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the defective fuse.

4. CHECK HARNESS.

1. Disconnect the F/B connector.
2. Use a tester to measure the voltage between the battery and F/B connector.
   Connector & terminal
   (B56) No. 8 (+) — Chassis ground (−):

Is the voltage 8.5 — 16.5 V?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Go to 5.

5. CHECK RELAY.

Perform individual inspection of IG2 relay.

Is the relay OK?

Yes	Repair the harness between F/B and M/B.
No	Replace the relay.

6. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.

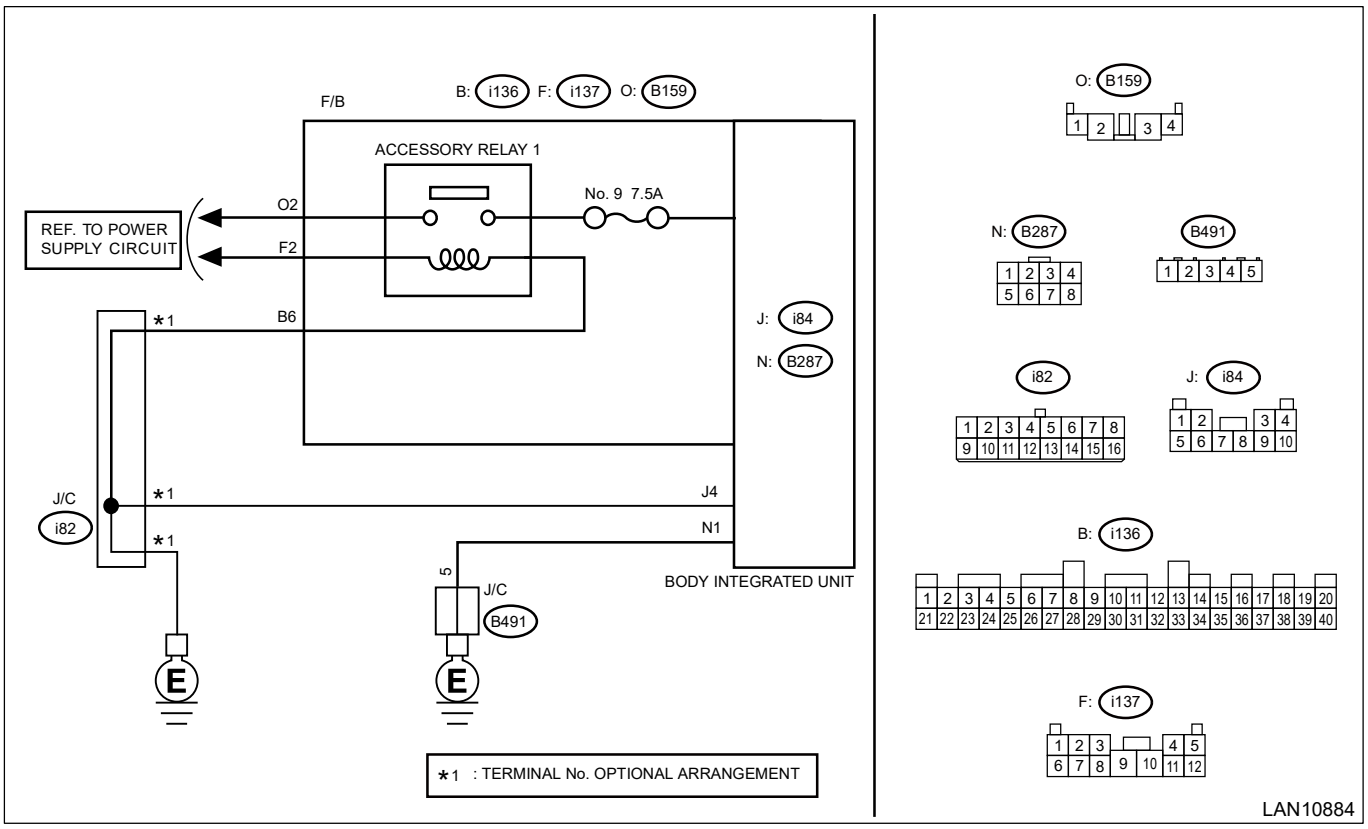
Is there poor contact of connector?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1014 ACC POWER

DTC detecting condition:
Voltage failure caused by poor contact of ACC power supply circuit
Trouble symptom:
DRL may not illuminate.
Wiring diagram:
Shift lock control system Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1014 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 6.

2. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Disconnect and then connect the body integrated unit connector.
3. Wait approx. 2 minutes.
4. Turn the ignition switch to ON.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1014 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 6.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the defective fuse.

4. CHECK HARNESS.

1. Disconnect the F/B connector.
2. Use a tester to measure the voltage between the battery and F/B connector.
   Connector & terminal
   (B159) No. 2 (+) — Chassis ground (−):

Is the voltage 8.5 — 16.5 V?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the harness between body integrated unit and fuse.

5. CHECK RELAY.

Perform individual inspection of the accessory relay 1. Ref. to SECURITY AND LOCKS>Relay and Fuse.

Is the relay OK?

Yes	Repair the harness between F/B and M/B.
No	Replace the relay.

6. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.

Is the check result OK?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1015 KEY INTERLOCK CIRCUIT

DTC detecting condition:

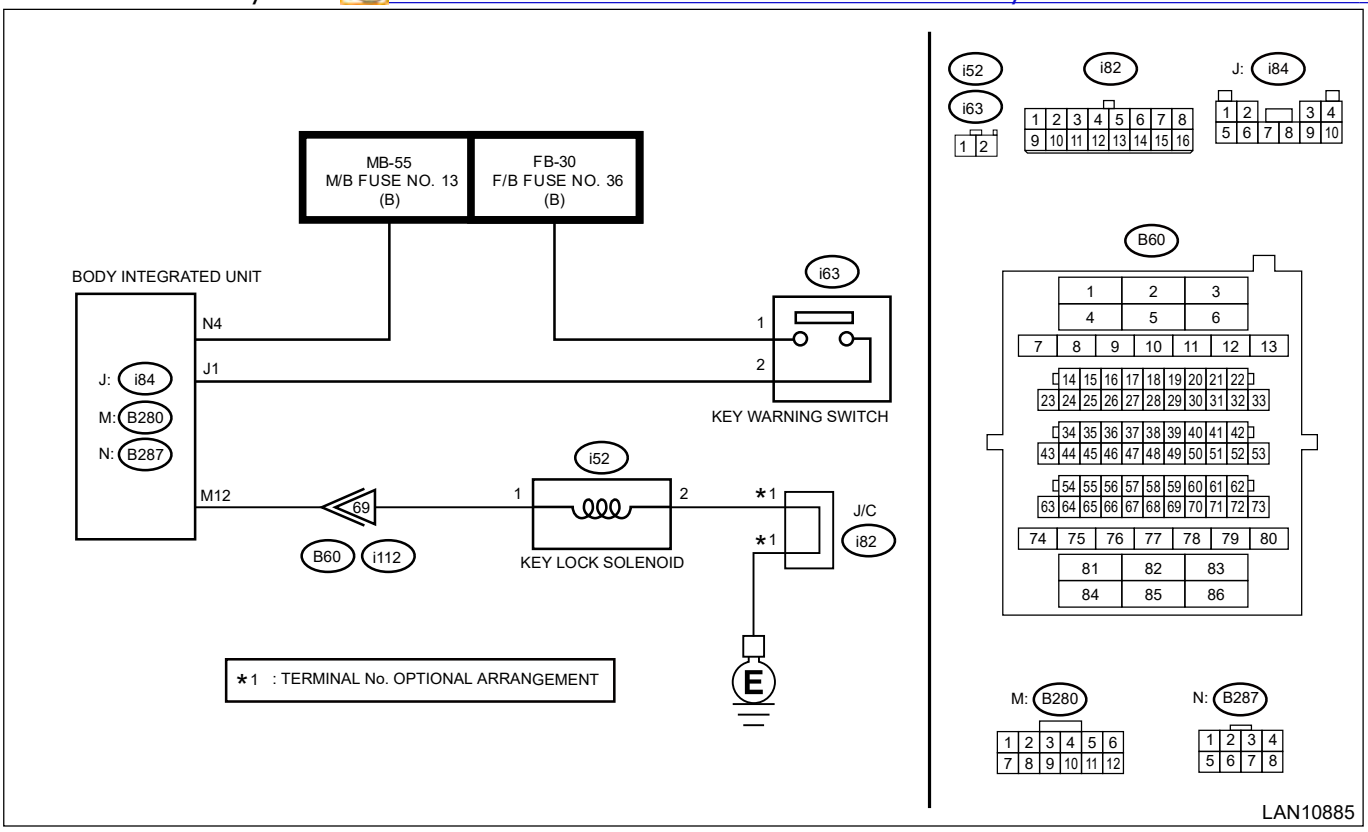
Ground short of key interlock circuit

Trouble symptom:

Key interlock does not keep lock condition.

Wiring diagram:

Shift lock control system Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Insert the ignition key.
2. Turn the ignition switch to ON.
3. Shift to the Neutral range.
4. Shift into P range.
5. Shift to the Neutral range.
6. Shift into P range.
7. Shift to the Neutral range.
8. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1015 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 8.

2. CHECK DTC.

1. Shift the select lever to P range.
2. Remove the ignition key.
3. Disconnect the key actuator connector (i52) and body integrated unit connector (B280).
4. Connect the disconnected connectors.
5. Insert the ignition key.
6. Turn the ignition switch to ON and shift into Neutral.
7. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1015 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 8.

3. CHECK KEY ACTUATOR.

1. Turn the ignition switch to OFF.
2. Disconnect the key actuator connector (i52).
3. Measure the resistance between key actuator connectors.
   Terminals
   Key actuator
   No. 1 — No. 2:

Is the resistance 103 — 115 Ω?

Yes	Go to 4.
No	Replace the key actuator. Ref. to SECURITY AND LOCKS>Key Lock Cylinders.

4. CHECK KEY ACTUATOR.

Connect the battery terminals to the key actuator.
Terminals
Key actuator
No. 1 — Positive terminal:
No. 2 — Ground terminal:

Is the actuator activated and then key locked?

Yes	Go to 5.
No	Replace the key actuator. Ref. to SECURITY AND LOCKS>Key Lock Cylinders.

5. CHECK HARNESS.

1. Disconnect the body integrated unit connector (B280).
2. Measure the resistance between body integrated unit and key actuator using tester.
   Connector & terminal
   (i52) No. 1 — (B280) No. 12:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between body integrated unit and chassis ground using tester.
Connector & terminal
(B280) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 7.
No	Repair or replace the short circuit of the harness.

7. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Connect the body integrated unit.
2. Turn the ignition switch to ON.
3. Measure the voltage between body integrated unit and chassis ground using tester.
   Connector & terminal
   (B287) No. 4 (+) — Chassis ground (−):

Is the voltage 6 V or more?

Yes	Go to 8.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

8. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector (B281) and key actuator connector (i52).

Is there poor contact at disconnected connector terminal?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1016 SHIFT LOCK CIRCUIT

DTC detecting condition:

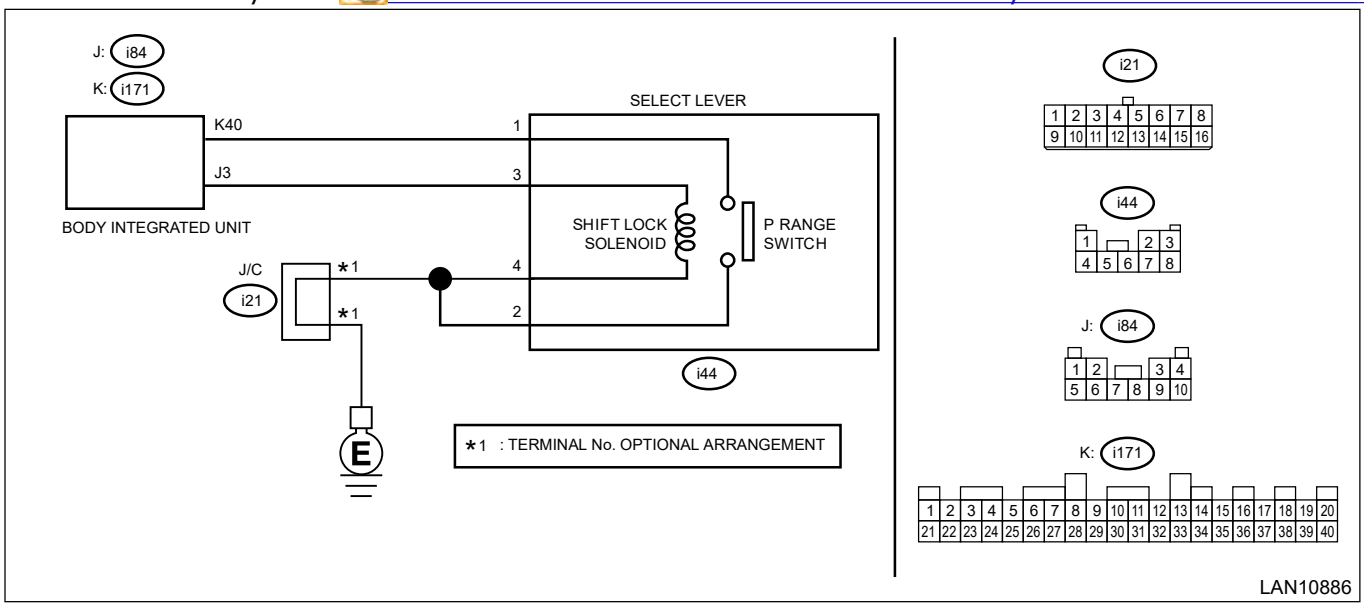
Shift lock circuit is open, or shorted to power or ground.

Trouble symptom:

Shift lock does not be released or remain locked.

Wiring diagram:

Shift lock control system Ref. to WIRING SYSTEM>Shift Lock Control System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Maintain the shift lever in P range for five seconds or more.
3. Maintain the brake pedal depressed for one second or more.
4. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1016 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the shift lock solenoid connector.
3. Using the tester, measure the resistance between terminals.
   Connector & terminal
   (i44) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK SHIFT LOCK SOLENOID.

Using a tester, measure the resistance between shift lock solenoid terminals.
Terminals
Shift lock solenoid
No. 3 — No. 4:

Is the resistance between 27.6 — 30.5Ω?

Yes	Go to 4.
No	Replace the shift lock solenoid. Ref. to CONTROL SYSTEMS>AT Shift Lock Solenoid and "P" Range Switch>REMOVAL.

4. CHECK HARNESS (OPEN CIRCUIT).

Use a tester to measure the resistance between harness terminals.
Connector & terminal
(i44) No. 3 — (i84) No. 3:
Note:
If body integrated unit and shift lock connector are not disconnected, disconnect them first and then perform measurement.

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between body integrated unit and chassis ground using a tester.
Connector & terminal
(i84) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 6.
No	Repair or replace the ground short circuit of the harness.

6. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between body integrated unit and chassis ground using a tester.

Connector & terminal

(i84) No. 3 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 7.
No	Repair or replace the ground short circuit of the harness.

7. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector and shift lock connector.

Is there poor contact of connector terminal?

Yes	Repair or replace the poor contact of terminal.
No	Go to 8.

8. CHECK DTC.

1. Connect all the disconnected connectors.
2. Turn the ignition switch to ON.
3. Maintain the shift lever in P range and the brake pedal depressed for five seconds or more.
4. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1016 displayed? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1107 CONTROL MODULE COMMUNICATION STICKING

DTC detecting condition:
CAN message in the body integrated unit stuck in register
Time needed for diagnosis:
Immediately
Trouble symptom:
CAN communication can not be executed normally.

1. CHECK DTC.

1. Turn the ignition switch to ON.
2. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1017 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Connect the disconnected connectors.
4. Turn the ignition switch to ON.
5. Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1017 displayed? (Current malfunction)

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1401 METER COLLATION

For diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1401 METER COLLATION.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1402 IMMOBILIZER KEY COLLATION

For diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1402 IMMOBILIZER KEY COLLATION.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1407 MET COMMUNICATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1407 MET

COMMUNICATION.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1408 METER NON-VOLATILE MEMORY

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1408 METER NON-VOLATILE MEMORY.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1410 TRANSPONDER COMMUNICATION

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1410 TRANSPONDER COMMUNICATION.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1411 IMMOBILIZER ANTENNA

For detailed diagnosis procedure, refer to IMMOBILIZER (DIAG). Ref. to IMMOBILIZER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1411 IMMOBILIZER ANTENNA.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when malfunction occurs in CAN line. (Bus off)

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

No data is received from ECM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

No data is received from TCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

No data is received from VDCCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE

Data does not arrive from TPMS & keyless entry CM, TPMS CM or keyless entry CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

No data is received from VDCCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

No data is received from combination meter.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

No data is received from A/C control panel.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0167 LOST COMMUNICATION WITH IMMOBILIZER CONTROL MODULE

No data is received from immobilizer CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0222 LOST COMMUNICATION WITH DRIVER'S DOOR POWER WINDOW

DTC detecting condition:

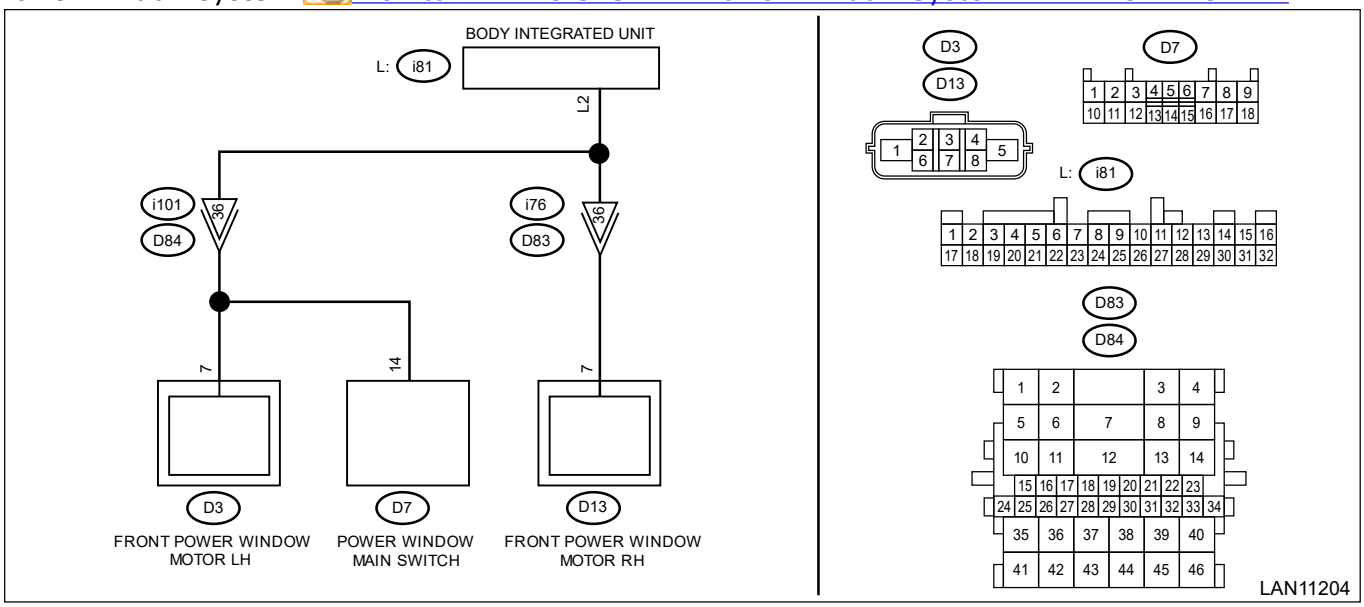
Data does not arrive from driver's front power window motor.

Trouble symptom:

LIN communication is not normal.

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Wait for 5 seconds.
4. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0222 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Disconnect the front power window motor LH connector.
4. Measure the resistance between body integrated unit connector and front power window motor LH connector.
   Connector & terminal
   (i81) No. 2 — (D3) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between front power window motor LH connector and body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D3) No. 7 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Repair the short circuit to power supply in harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between front power window motor LH connector and body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D3) No. 7 (+) — Chassis ground (−):

Is the voltage 1 MΩ or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the ground short circuit of harness.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0223 LOST COMMUNICATION WITH PASSENGER'S DOOR POWER WINDOW

DTC detecting condition:

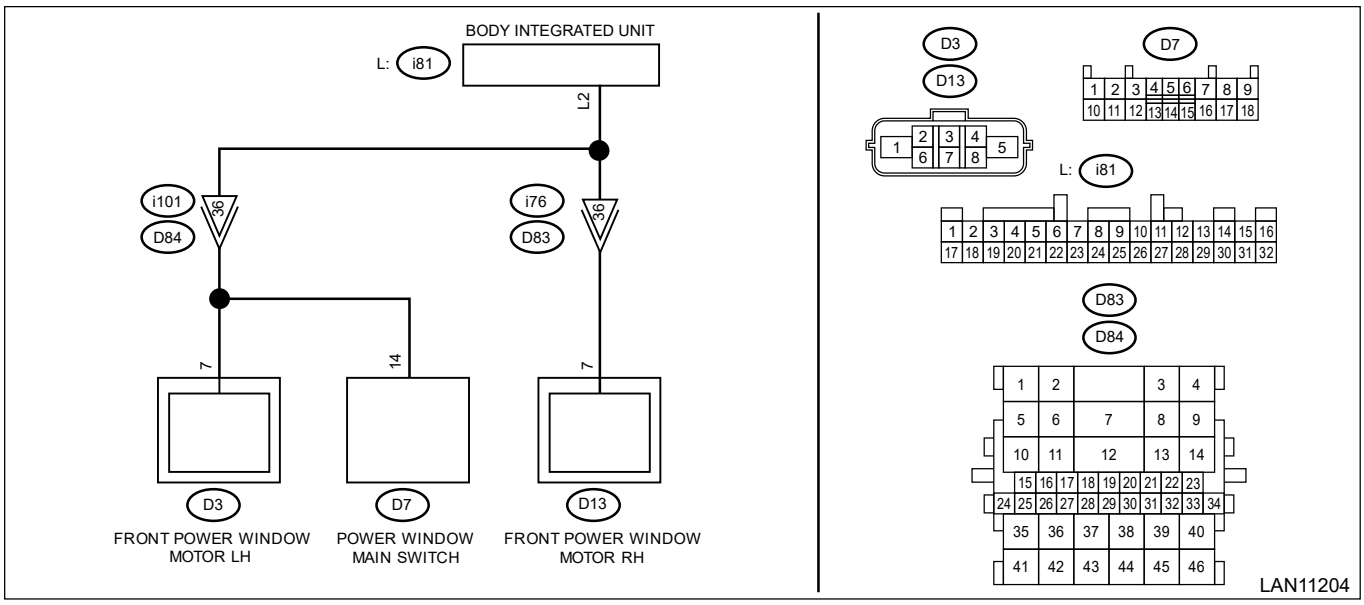
Data does not arrive from passenger’s front power window motor.

Trouble symptom:

LIN communication is not normal.

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Wait for 5 seconds.
4. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC U0223 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Disconnect the front power window motor RH connector.
4. Measure the resistance between body integrated unit connector and front power window motor RH connector.

Connector & terminal

(i81) No. 2 — (D13) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between front power window motor RH connector and body integrated unit and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D13) No. 7 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Repair the short circuit to power supply in harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between front power window motor RH connector and body integrated unit and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D13) No. 7 (+) — Chassis ground (−):

Is the voltage 1 MΩ or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the ground short circuit of harness.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

No data is received from keyless access CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Received error data from ECM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Received error data from TCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Received error data from VDCCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE

Received error data from VDCCM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

Received error data from combination meter.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

Received error data from A/C control panel.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0427 INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE

Received error data from keyless access CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0430 INVALID DATA RECEIVED FROM TIRE PRESSURE MONITOR CONTROL MODULE

AND/OR KEYLESS ENTRY CONTROL MODULE

Invalid data is received from TPMS & keyless entry CM, TPMS CM or keyless entry CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Data does not arrive from stereo camera.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1674 LIN COMMUNICATION BUS 2 ERROR BODY CONTROL MODULE

DTC detecting condition:

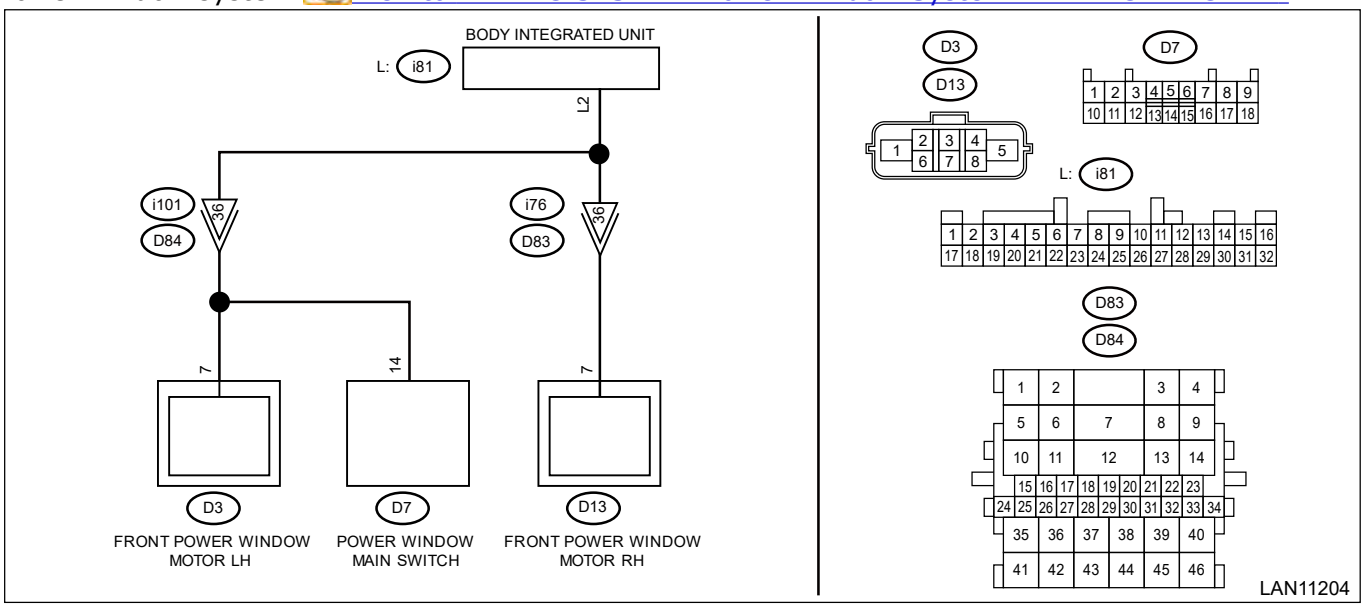
Integrated unit communication is shut down because of LIN error.

Trouble symptom:

LIN communication is not normal.

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Wait for 5 seconds.
4. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0222 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the power window main switch connector.
3. Turn the ignition switch to ON.
4. Wait for 5 seconds.
5. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0222 displayed? (Current malfunction)

Yes	Go to 3.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

3. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the front power window motor LH connector. (With the power window main switch connector disconnected)
3. Turn the ignition switch to ON.
4. Wait for 5 seconds.
5. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0222 displayed? (Current malfunction)

Yes	Go to 4.
No	Replace the front power window motor LH. Ref. to GLASS/WINDOWS /MIRRORS>Front Regulator and Motor Assembly.

4. CHECK CONTROL MODULE.

1. Turn the ignition switch to OFF.
2. Disconnect the front power window motor RH connector. (With the power window main switch connector, front power window motor LH connector disconnected)
3. Turn the ignition switch to ON.
4. Wait for 5 seconds.
5. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0222 displayed? (Current malfunction)

Yes	Go to 5.
No	Replace the power window motor RH. Ref. to GLASS/WINDOWS /MIRRORS>Front Regulator and Motor Assembly.

5. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Measure the resistance between body integrated unit connector and each unit connector.

Connector & terminal

(i81) No. 2 — (D7) No. 14:
(i81) No. 2 — (D3) No. 7:
(i81) No. 2 — (D13) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness.

6. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between each unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):
(D7) No. 14 (+) — Chassis ground (−):
(D3) No. 7 (+) — Chassis ground (−):
(D13) No. 7 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 7.
No	Repair the short circuit to power supply in harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between each unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D7) No. 14 (+) — Chassis ground (−):

(D3) No. 7 (+) — Chassis ground (−):

(D13) No. 7 (+) — Chassis ground (−):

Is the voltage 1 MΩ or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the ground short circuit of harness.

BODY CONTROL(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1822 LOST COMMUNICATION WITH MASTER MAIN SWITCH

DTC detecting condition:

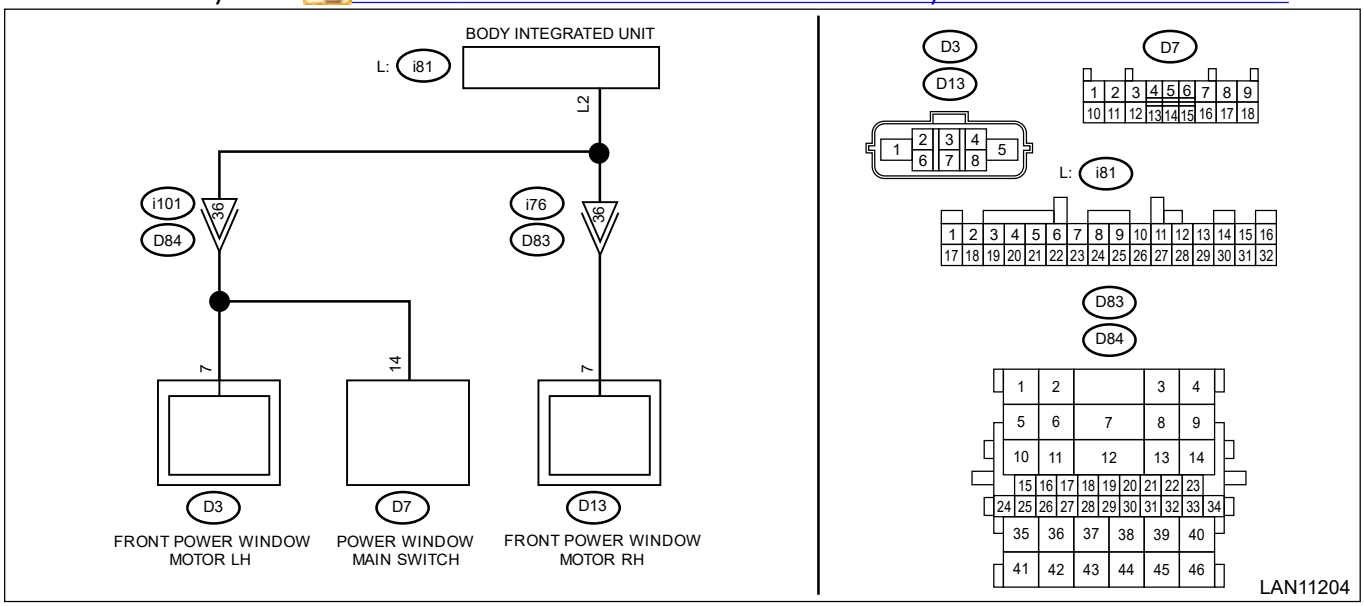
Data does not arrive from power window main switch.

Trouble symptom:

LIN communication is not normal.

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Wait for 5 seconds.
4. Read the DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U1822 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the body integrated unit connector.
3. Disconnect the power window main switch connector.
4. Measure the resistance between body integrated unit connector and power window main switch connector.
   Connector & terminal
   (i81) No. 2 — (D7) No. 14:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness.

3. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between power window main switch connector and body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 4.
No	Repair the short circuit to power supply in harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between power window main switch connector and body integrated unit connector and chassis ground.

Connector & terminal

(i81) No. 2 (+) — Chassis ground (−):

(D7) No. 14 (+) — Chassis ground (−):

Is the voltage 1 MΩ or more?

Yes	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.
No	Repair the ground short circuit of harness.

BODY CONTROL(DIAGNOSTICS) > General Diagnostic Table

INSPECTION

Read the DTC using Subaru Select Monitor. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Or check the following data under the data monitor display screen. Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Item	Operation	Specifications		Note
		YES	NO	
DTC	DTC is not displayed when inspecting all DTCs.	DTC is not displayed.	Perform the diagnosis for the displayed DTCs.	—
Clearance light (Low beam) (High beam)	Clearance light and low/high beams illuminate normally when the switch is operated. Indicator in the meter illuminates at the same time.	System is normal.	Check the lighting system, combination meter system and LAN system.	—
Auto light	When the area around the light control sensor is darkened after the ignition switch and the lighting switch (AUTO) are turned to ON, the clearance light and the low beam illuminate after 15 seconds. Indicator in the combination meter illuminates at the same time.	System is normal.	Check the lighting system, combination meter system and LAN system.	—
	When the ignition switch and the lighting switch (AUTO) are turned to ON after the area around the light control sensor is darkened, the clearance light and the low beam illuminate immediately. Indicator in the combination meter illuminates at the same time.			—
Fog light	Front and rear fog lights illuminate when the switch is operated. Indicator in the meter illuminates at the	System is normal.	Check the lighting system, combination	—

Item	Operation	Specifications		Note
		YES	NO	
	same time.		meter system and LAN system.	
Rear defogger	Rear defogger operates when the switch is operated. The indicator illuminates at the same time.	System is normal.	Check the rear window defogger system and A/C system.	—
Wiper deicer	Wiper deicer operates by operating the switch. The indicator illuminates at the same time. When the ambient temperature is 5°C (41°F) or higher, press the switch 3 seconds or more to forcibly activate the system.	System is normal.	Check the wiper deicer system and A/C system.	Wiper deicer operates when "Wiper deicer setting" of the body integrated unit is set to on.
DRL	After starting the engine and releasing the parking brake with shift lever in other than P range, the DRL illuminates.	System is normal.	Check the lighting system and LAN system.	—
Rear wiper	Rear wiper operates when the switch is operated.	System is normal.	Check wiper or washer system.	Depending on customizing "Sedan/Wagon Setting" of the body integrated unit, vehicle sensory time varies.
Key interlock	• Key cannot be removed in other than P range. • Key can be removed in other than P range.	System is normal.	Check the body control system.	—
Shift lock	The select lever can be moved from the P range to other ranges only when the brake pedal is depressed with IG ON.	System is normal.	Check the body control system.	—
Key warning switch alarm	When the driver's door is open without the key removed, the buzzer sounds.	System is normal.	Check the combination meter and body control system.	—

Item	Operation	Specifications		Note
		YES	NO	
Door lock	The doors lock/unlock when the door switch is operated. Rear gate/trunk opens when the rear gate/trunk release switch is operated.	System is normal.	Check the security & lock and body control system.	If customizing "Sedan/Wagon Setting" is different, trunk and rear gate do not open.
Keyless entry	The lock locks/unlocks when the keyless transmitter is operated. Trunk/rear gate unlocks when trunk/rear gate unlock button is operated.	System is normal.	Check the keyless entry and body control system.	—
Keyless access with push button start system	The lock locks/unlocks when the access key is operated. With the access key held, the touch sensor (lock) operation locks/touch sensor (unlock) operation unlocks. Rear gate unlocks by operating the rear gate unlock button.	System is normal.	Check the keyless access with push button start system and the body control system.	—
Answer back	Answer-back operates when the keyless entry / keyless access with push button start system locks/unlocks.	System is normal.	Check the security & lock, keyless access with push button start system, and LAN system.	—
Room light	Turns ON/OFF according to the door open/close operation, the lock/unlock operation with the keyless entry/keyless access with push button start system, and the ignition operation.	System is normal.	Check the room light system, security & lock, keyless access with push button start system, and LAN system.	For vehicle with the keyless access with push button start system, the room light blinks when "Factory mode" is selected. For vehicles with the keyless entry, the room light blinks when the keyless registration mode connector is connected.

Item	Operation	Specifications		Note
		YES	NO	
Map light	Turns ON/OFF according to the door open/close operation, the lock/unlock operation with the keyless entry/keyless access with push button start system, and the ignition operation. (Except for rear gate)	System is normal.	Check the spot map light, security & lock, keyless access with push button start system, and LAN system.	For vehicle with the keyless access with push button start system, the map light blinks when "Factory mode" is selected. For vehicles with the keyless entry, the map light blinks when the keyless registration mode connector is connected.
Luggage room light	The light illuminates/goes off according to the rear gate open/close. The light goes off, when the doors are locked with the keyless entry/keyless access with push button start system, or the ignition is turned to ON, while the light is illuminating.	System is normal.	Check the lighting system (interior light system), security & lock, keyless access with push button start system, and LAN system.	—
Trunk room light	The light illuminates/goes off according to the trunk open/close.	System is normal.	Check the lighting system (interior light system), security & lock, keyless access with push button start system, and LAN system.	—
Turn signal & hazard	Each turn signal light illuminates, when the turn signal switch is turned ON. The hazard light and indicator in the combination meter blink, when the hazard switch is turned ON.	System is normal.	Check the lighting system (turn signal light and hazard light system).	—
Key illumination	The light illuminates/goes off according to the driver's	System is normal.	Check the ignition switch	For vehicles with keyless entry, the

Item	Operation	Specifications		Note
		YES	NO	
	door open/close. The light goes off when the doors are locked with the keyless entry and the ignition is turned ON while illuminating.		illumination, security & lock, and LAN system.	key illumination blinks when "Factory" mode is selected.
Engine start	Engine starts.	System is normal.	Check the engine system, immobilizer, and LAN system.	Model without keyless access with push button start system
Vehicle security	Security monitoring/security canceling can be performed by operating the keyless entry/keyless access with push button start system.	System is normal.	Check the security & lock, keyless access with push button start system, and LAN system.	Security monitoring starts and at the same time the warning buzzer sounds, when impact sensor is not connected and user customizing "Impact Sensor" of the body integrated unit is set to on.
Welcome lighting (enter)	When dimming out around the light control sensor after turning the lighting switch (AUTO) to ON, use keyless transmitter or access key to unlock. At this time, the clearance light and headlight low beam illuminates for the preset time. And, use keyless transmitter or access key to lock. At this time, the clearance light and headlight low beam go off.	System is normal.	Check the lighting system (auto light), security & lock (keyless entry) or keyless access with push button start system.	Operates when customization item "Illumination Sensor Setting" in body integrated unit is set to ON and "Welcome Light Off Delay Time (Approaching)" is set to other than OFF.
Welcome lighting (exit)	The clearance light and headlight low beam continues to illuminate, when the ignition switch is OFF (or when the key is removed for vehicles	System is normal.	Check the lighting system (auto light), security & lock (keyless entry) or keyless	Operates when customization item "Illumination Sensor Setting" in body integrated unit is set to ON and "Welcome

Item	Operation	Specifications		Note
		YES	NO	
	without keyless access with push button start system) while the auto light function is operating. Use keyless transmitter or access key to lock two consecutive times. At this time, the clearance light and headlight low beam go off.		access with push button start system.	Light (Exit)” is set to other than OFF.

BODY CONTROL(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

1. HIGH BEAM ASSIST SYSTEM

Symptoms	Note
High beam assist indicator does not illuminate.	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > HIGH BEAM ASSIST INDICATOR DOES NOT ILLUMINATE.
The lighting does not switch from low beam to high beam automatically	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE LIGHTING DOES NOT SWITCH FROM LOW BEAM TO HIGH BEAM AUTOMATICALLY.
The lighting does not switch from high beam to low beam automatically	Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE LIGHTING DOES NOT SWITCH FROM HIGH BEAM TO LOW BEAM AUTOMATICALLY.

BODY CONTROL(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. HIGH BEAM ASSIST INDICATOR DOES NOT ILLUMINATE

Trouble symptom:

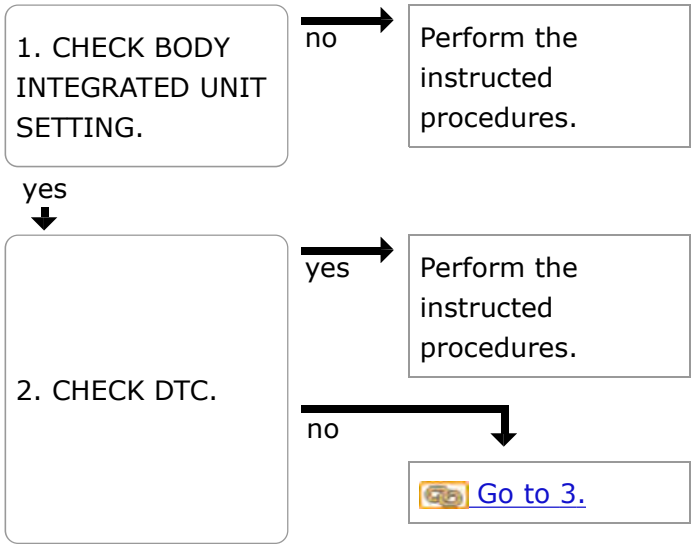
High beam assist indicator light does not illuminate though the operating conditions for the high beam assist are met.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

Note:

When there is faulty in the combination switch, combination meter, illumination sensor for the auto lighting or the operation of auto lighting, perform the diagnosis for each system in advance.



3. CHECK "EYESIGHT TEMPORARY STOP INDICATOR".	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK HIGH BEAM ASSIST INDICATOR.	yes →	Perform the instructed procedures.
	no →	Go to 5.
5. CHECK HIGH BEAM ASSIST INDICATOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK BODY INTEGRATED UNIT SETTING.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Body Control].
Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [High Beam Assist Function Setting (mirror/EyeSight)]
- [High Beam Assist Current Setting]

Is [High Beam Assist Function Setting (mirror/EyeSight)] set to [ON], and [High Beam Assist Current Setting] set to [EyeSight HBA]?

Yes	Go to 2.
No	Set [High Beam Assist Function Setting (mirror/EyeSight)] to [ON], and set [High Beam Assist Current Setting] to [EyeSight HBA].

2. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK “EYESIGHT TEMPORARY STOP INDICATOR”.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Check “EyeSight temporary stop indicator”. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is “EyeSight temporary stop indicator” displayed?

Yes	Perform inspection according to “EyeSight temporary stop code” in “ES (DIAGNOSTICS)”.
No	Go to 4.

4. CHECK HIGH BEAM ASSIST INDICATOR.

1. Turn the ignition switch to ON.
2. Set the light SW position to Auto.
3. Set the dimmer Hi SW to ON.
4. Shade the illumination sensor for the auto lighting.

Does the high beam assist indicator illuminate?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 5.

5. CHECK HIGH BEAM ASSIST INDICATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

- [HBA indicator]

Does the high beam assist indicator illuminate?

Yes	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Replace the body integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

2. THE LIGHTING DOES NOT SWITCH FROM LOW BEAM TO HIGH BEAM AUTOMATICALLY

Trouble symptom:

High beam light does not turn on while the high beam assist indicator is illuminating, even when there is no object in front of the vehicle.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).
→ no → Perform the instructed procedures.

yes ↓

2. CHECK DTC.
→ yes → Perform the instructed procedures.
→ no → Go to 3.

3. CHECK "EYESIGHT TEMPORARY STOP INDICATOR".
→ yes → Perform the instructed procedures.
→ no → Go to 4.

4. PERFORM RECOGNIZATION TEST (JUDGMENT OF NIGHT STATUS).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).

Check for the activation of the high beam.

- Light SW position: Second notch
- Dimmer Hi SW: ON

Does the high beam light come on?

Yes	Go to 2.
No	Check the headlight system. Ref. to LIGHTING SYSTEM>Headlight System.

2. CHECK DTC.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to EyeSight (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs.
No	Go to 3.

3. CHECK “EYESIGHT TEMPORARY STOP INDICATOR”.

1. Turn the ignition switch to OFF.
2. Turn the ignition switch to ON.
3. Check “EyeSight temporary stop indicator”. Ref. to EyeSight (DIAGNOSTICS)>EyeSight HALT Code.

Is “EyeSight temporary stop indicator” displayed?

Yes	Perform inspection according to “EyeSight temporary stop code” in “ES (DIAGNOSTICS)”.
No	Go to 4.

4. PERFORM RECOGNIZATION TEST (JUDGMENT OF NIGHT STATUS).

1. Set the light SW position to Auto.
2. Set the dimmer Hi SW to ON.
3. With the vehicle stopped, turn the ignition switch to OFF.
4. Shade the front of the stereo camera.

   Note:

   It is recommended to perform the test under complete dark environment where all illumination is turned off and there is no windows in the room. If it is not possible to perform the test in complete dark environment, perform the test in a room where the direct sunlight is shielded and illumination is turned off, while the windshield, driver's seat, and passenger's seat are covered from outside of the vehicle with cloth etc. having high light-blocking effect.

   Caution:

   In order to avoid touching the lens of the stereo camera, do not apply light-blocking measures directly at the lens portion.
5. Turn the ignition switch to ON.
6. Using the Subaru Select Monitor, check [Data monitor] of [EyeSight]. Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Judgment Night]

Is [Judgment Night] set to [Night]?

Yes	System is normal. It is considered that the conditions for the high beam activation are not satisfied enough for an environmental reason.
No	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.

3. THE LIGHTING DOES NOT SWITCH FROM HIGH BEAM TO LOW BEAM AUTOMATICALLY

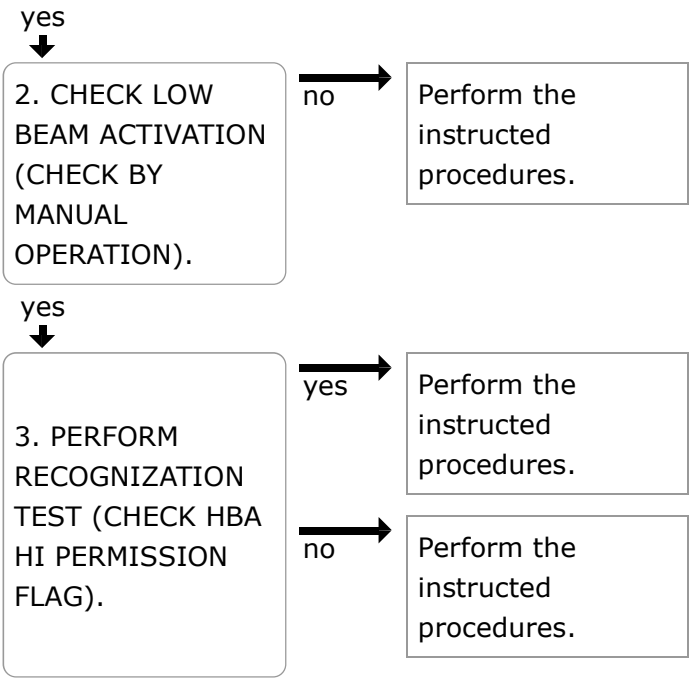
Trouble symptom:

High beam light does not go off automatically even when the high beam assist indicator is illuminating.

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to BODY CONTROL(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).	→ no	Perform the instructed procedures.



1. CHECK HIGH BEAM ACTIVATION (CHECK BY MANUAL OPERATION).

Check for the activation of the high beam.

- Light SW position: Second notch
- Dimmer Hi SW: ON

Does the high beam light come on?

Yes	Go to 2.
No	Check the headlight system. Ref. to LIGHTING SYSTEM>Headlight System.

2. CHECK LOW BEAM ACTIVATION (CHECK BY MANUAL OPERATION).

From the condition in step 1), turn the dimmer Hi SW to OFF.

Does it switch to low beam?

Yes	Go to 3.
No	Check the headlight system. Ref. to LIGHTING SYSTEM>Headlight System.

3. PERFORM RECOGNITION TEST (CHECK HBA HI PERMISSION FLAG).

1. Set the vehicle in a stopped state.
2. Set the light SW position to Auto.
3. Set the dimmer Hi SW to ON.
4. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [EyeSight].
   Ref. to EyeSight (DIAGNOSTICS)>Data Monitor.

   - [HBA Control Permission]

Is [HBA Control Permission] set to [Allowance]?

Yes	Replace the stereo camera. Ref. to EyeSight>Stereo Camera.
No	Check the headlight system. Ref. to LIGHTING SYSTEM>Headlight System.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS)

MFD(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
14. Diagnostics with Phenomenon

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Multi-Function Display].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK CAN COMMUNICATION.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK MFD.

Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 7.
No	Go to 6.

6. CHECK MFD.

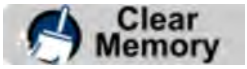
Check MFD operation. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Active Test.

Is the check result OK?

Yes	System is normal. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Active Test.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

7. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Multi-Function Display]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode.
5. Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 7 until DTC is not shown. Go to 7.
No	Finish the diagnosis.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Multi Function Display Check List for Interview Date of Vehicle Bring-in Year Month Day</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td></td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (
times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others
( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. MULTI FUNCTION DISPLAY

When removing MFD-related components, refer to cautions in the instrumentation/driver information section. Ref. to INSTRUMENTATION/DRIVER INFO>General Description>CAUTION.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect MFD problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.
3. Verify the destination of the vehicle.
4. Verify type of wheel-drive.
5. Verify availability and grade of the head unit installed to the vehicle.
6. Verify availability of EyeSight.
7. Verify availability of RAB.
8. Verify availability of BSD/RCTA.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

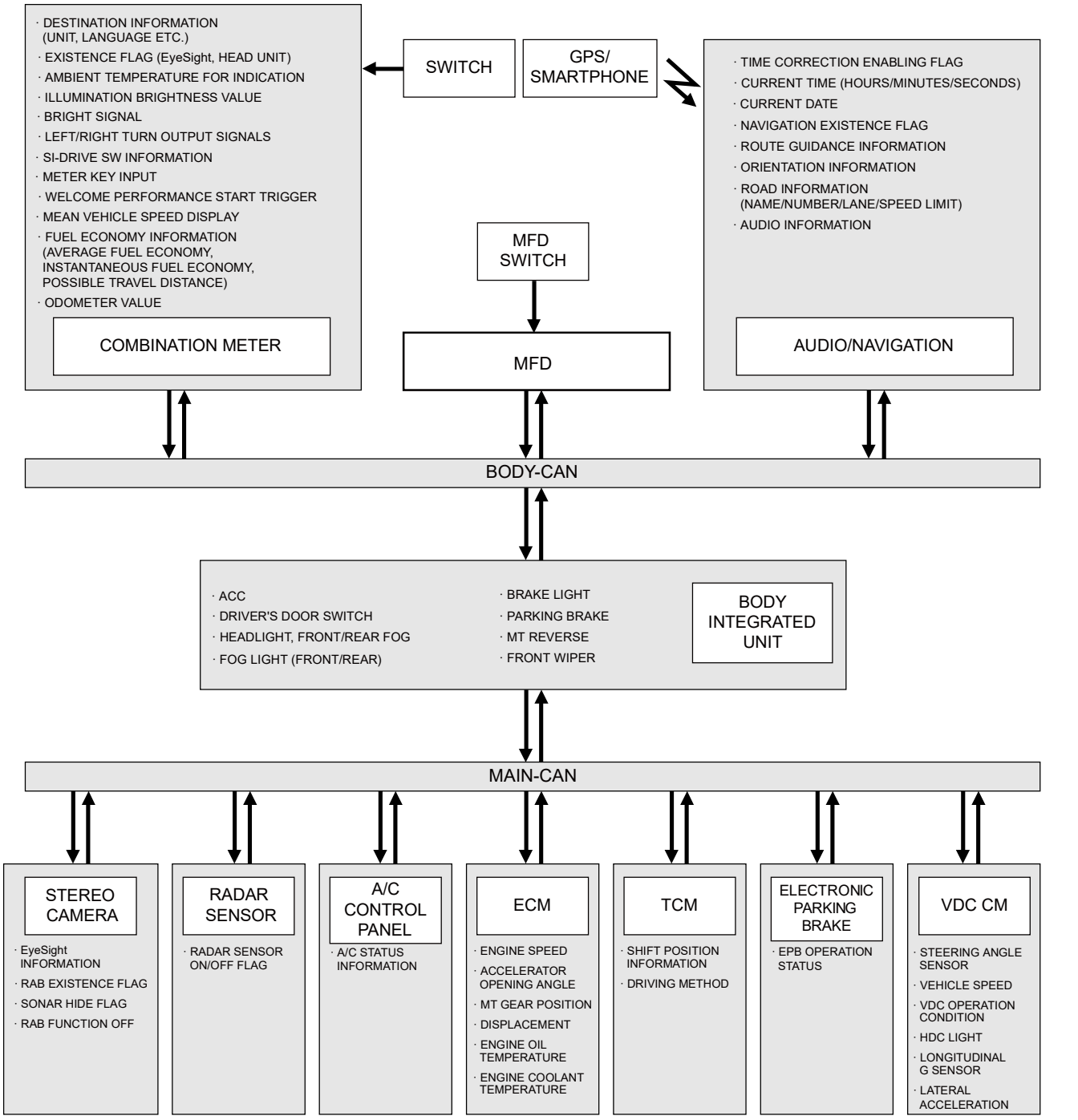
2. GENERAL TOOL

TOOL NAME	REMARKS

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > General Description

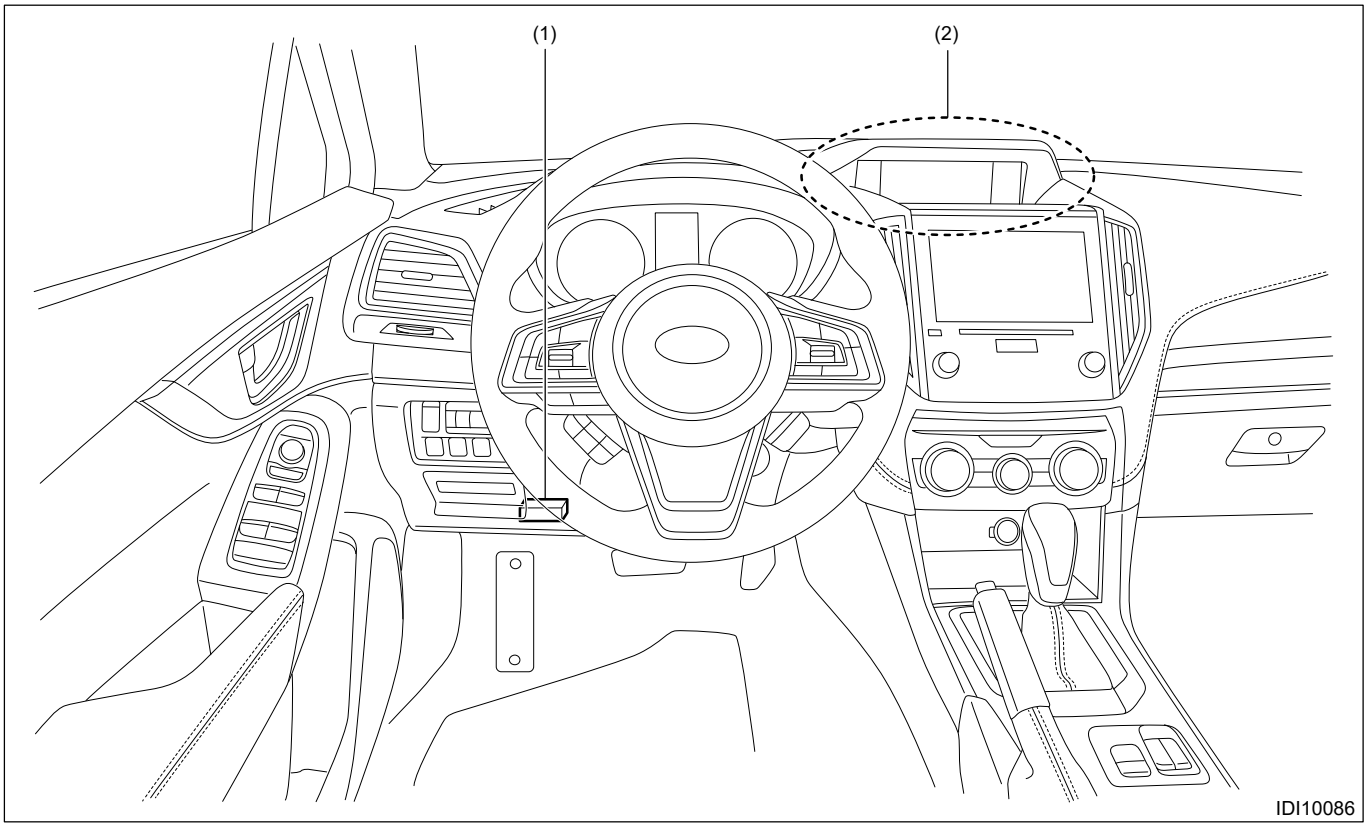
SYSTEM BLOCK DIAGRAM



IDI10184

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Electrical Component Location

LOCATION

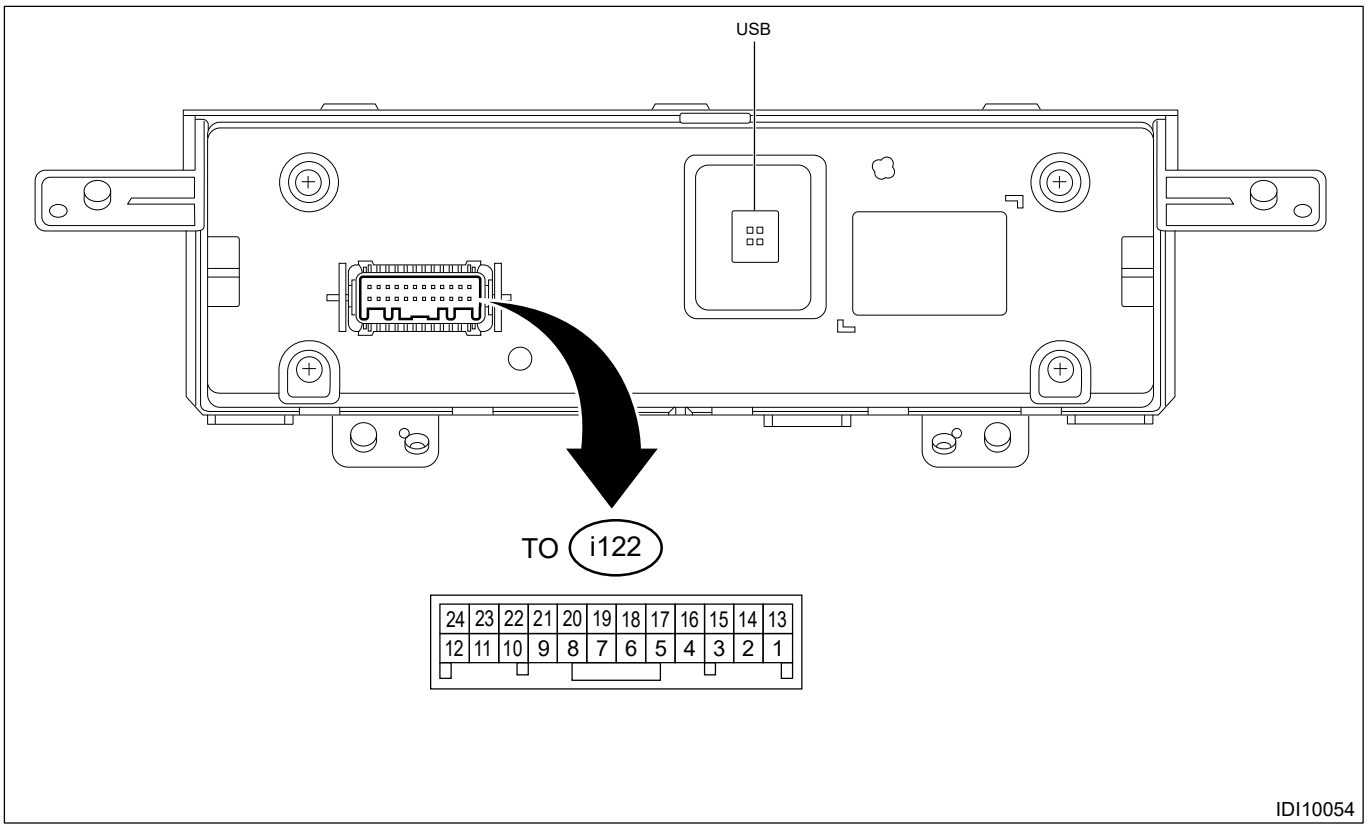


(1) MFD

(2) Data link connector

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Content	Measuring condition	Standard
(i122) No. 1	—	—	—
(i122) No. 2	—	—	—
(i122) No. 3	—	—	—
(i122) No. 4	—	—	—
(i122) No. 5	—	—	—
(i122) No. 6	—	—	—
(i122) No. 7	—	—	—
(i122) No. 8	—	—	—
(i122) No. 9	—	—	—
(i122) No. 10	—	—	—
(i122) No. 11	—	—	—
(i122) No. 12	—	—	—
(i122) No. 13	—	—	—
(i122) No. 14	—	—	—
(i122) No. 15	MFD SW +	When the battery is connected	When MFD SW pushed: 0 V (1.3 V or less) Other than when MFD SW pushed:

Terminal No.	Content	Measuring condition	Standard
			3.3 V (2.3 V or more)
(i122) No. 16	—	—	—
(i122) No. 17	—	—	—
(i122) No. 18	—	—	—
(i122) No. 19	CAN-H	—	—
(i122) No. 20	CAN-L	—	—
(i122) No. 21(+) ←→ Chassis ground (−)	GND	Always	0 V
(i122) No. 22	—	—	—
(i122) No. 23(+) ←→ Chassis ground (−)	Ignition power supply	Ignition switch ON	Battery voltage
(i122) No. 24(+) ←→ Chassis ground (−)	Battery power supply	When the battery is connected	Battery voltage

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Inspection Mode

OPERATION

After the ignition switch is ON, wait for 5 seconds.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:

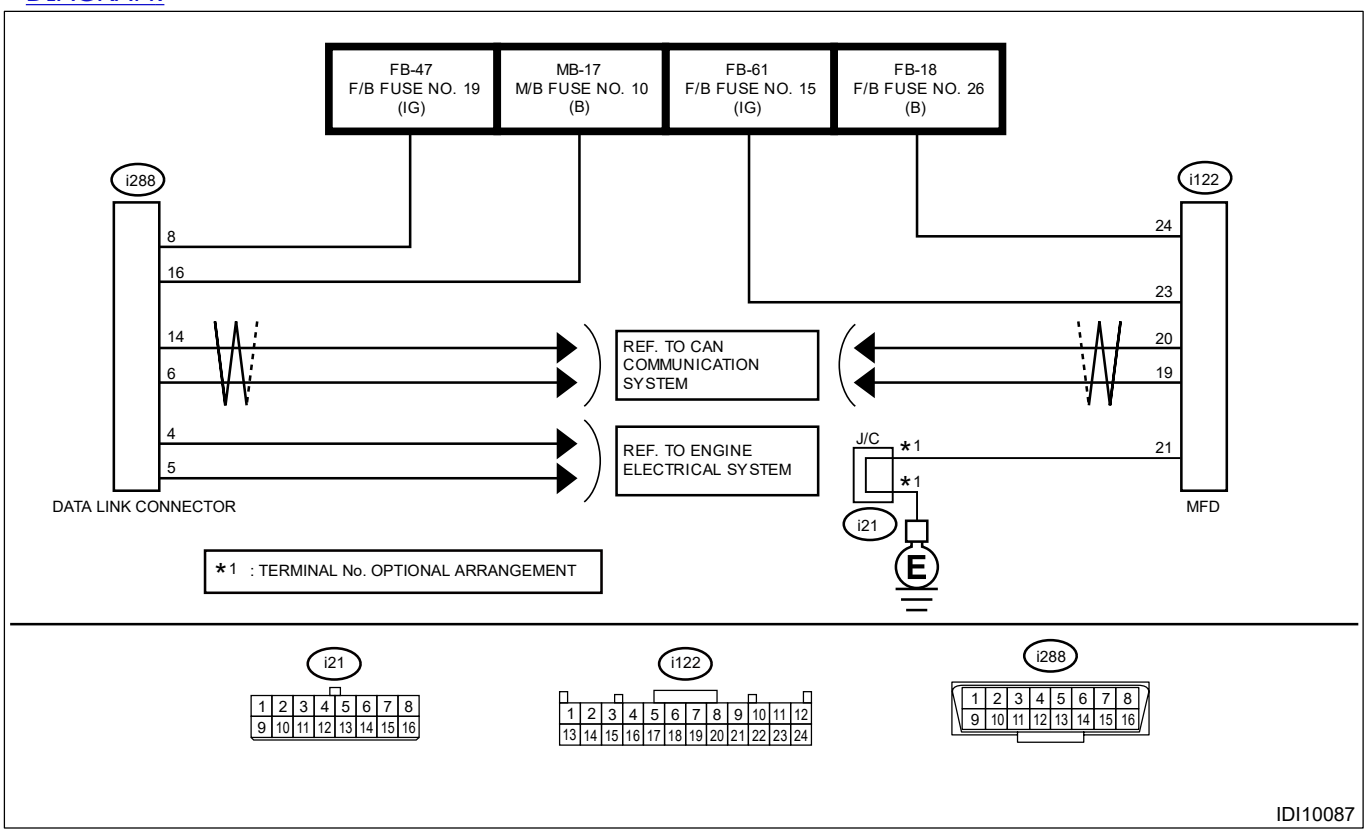
Cannot communicate with [Multi-Function Display].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective MFD
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK IGNITION SWITCH.

Check the ignition switch.

Is the ignition switch ON?

Yes	Go to 2.
No	Turn the ignition switch to ON, and select the [Multi-Function Display] using the Subaru Select Monitor.

2. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Charge or replace the battery.

3. CHECK INSTALLATION OF MFD CONNECTOR.

Check the MFD connector.

Is the MFD connector inserted into the MFD until it locks?

Yes	Go to 4.
No	Be sure to insert the MFD connector into the MFD until it is locked.

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is there any fault in LAN system?

Yes	Perform the inspection according to the diagnosis for LAN system.
No	Go to 5.

5. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Check whether communication to MFD can be executed normally.

Is communication with [Multi-function Display] possible?



Yes	Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Go to 7.

6. CHECK SUBARU SELECT MONITOR.

Connect the Subaru Select Monitor to another vehicle to verify that the communication for initializing can be executed normally.

Is communication for initializing possible?

Yes	Go to 7.
No	Repair or replace the Subaru Select Monitor.

7. CHECK MFD POWER SUPPLY CIRCUIT (OPEN AND SHORT CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the MFD connector and chassis ground.

Connector & terminal

(i122) No. 23 (+) — Chassis ground (−):

(i122) No. 24 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 8.
No	Repair the open or short circuit of harness, or poor contact of connector.

8. CHECK MFD GROUND CIRCUIT (OPEN).

1. Turn the ignition switch to OFF.
2. Measure the resistance between MFD connector and chassis ground.

Connector & terminal

(i122) No. 21 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 9.
No	Repair the open circuit of the MFD ground circuit or poor contact of connector.

9. CHECK POOR CONTACT OF CONNECTOR.

Check MFD power supply, ground circuit and data link connector for poor contact.

Is there poor contact?

Yes	Repair the poor contact.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Data Monitor>LIST.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Data Monitor

LIST

Items to be displayed	Remarks	Standard/Unit	Note
IGN Counter	Shows number of IGN ON times	—	—
Count	Shows count status	—	—
IG-ON Elapsed Time	Shows the elapsed time after IGN ON	—	—
+B voltage	Battery voltage value	0 — 25 V	—
IGN voltage	Ignition power supply voltage value	0 — 25 V	—
MFD Switch Input State	Shows the status of MFD switch	Switch OFF status Switch ON status	—
Meter Switch Input State	Shows the status of combination meter switch	Switch OFF status Shift Up Switch ON status i/SET Switch ON status Shift Down Switch ON status	—
Illumination control switch input state	Shows the status of illumination control switch	0 — 100%	—
Bright switch input state	Shows the status of bright switch	Bright OFF status Bright ON status	—

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Freeze Frame Data>LIST.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Freeze Frame Data

LIST

Items to be displayed	Remarks	Standard/Unit	Note
IGN Counter	Shows number of IGN ON times	—	—
Count	Shows count status	—	—
IG-ON Elapsed Time	Shows the elapsed time after IGN ON	—	—

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Multi-function Display], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

- **For detailed operation procedures, refer to "Application help".**
- **For details on active tests, refer to the list.** **Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Active Test>LIST.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Active Test

LIST

Active test item		Remarks	Execution condition
Color check	White indication	By forcibly making the whole screen white, it is possible to check whether white color is properly displayed.	Ignition switch ON (Engine OFF)
	Black indication	By forcibly making the whole screen black, it is possible to check whether black color is properly displayed.	
	Red indication	By forcibly making the whole screen red, it is possible to check whether red color is properly displayed.	
	Green indication	By forcibly making the whole screen green, it is possible to check whether green color is properly displayed.	
	Blue indication	By forcibly making the whole screen blue, it is possible to check whether blue color is properly displayed.	

Active test item			Remarks	Execution condition
Brightness check	Noon Brightness Check	Most Bright	By forcibly changing brightness of the current screen to the brightest level of daytime light, it is possible to check whether the brightness is changed.	
		Bright	By forcibly changing brightness of the current screen to a brighter level of daytime light, it is possible to check whether the brightness is changed.	
		Standard	By forcibly changing brightness of the current screen to a normal level of daytime light, it is possible to check whether the brightness is changed.	
		Dark	By forcibly changing brightness of the current screen to a darker level of daytime light, it is possible to check whether the brightness is changed.	
		Most Dark	By forcibly changing brightness of the current screen to the minimum level of daytime light, it is possible to check whether the brightness is changed.	
	Night Brightness Check	Most Bright	By forcibly changing brightness of the current screen to the maximum level of night-time light, it is possible to check whether the brightness is changed.	

Active test item		Remarks	Execution condition
	Bright	By forcibly changing brightness of the current screen to a brighter level of night-time light, it is possible to check whether the brightness is changed.	
	Standard	By forcibly changing brightness of the current screen to a normal level of night-time light, it is possible to check whether the brightness is changed.	
	Dark	By forcibly changing brightness of the current screen to a darker level of night-time light, it is possible to check whether the brightness is changed.	
	Most Dark	By forcibly changing brightness of the current screen to the minimum level of night-time light, it is possible to check whether the brightness is changed.	

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Multi-function Display], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. On [Customize] display, select an item to be customized.

   Note:
   - **For detailed operation procedures, refer to "Application help".**
   - **For details on customization, refer to the list. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Customize>LIST.**
   - **If not equipped (depending on destination area or vehicle equipment condition), some items are not displayed.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Customize

LIST

Item		Initial setting value	Setting value	Note	
Maintenance Customizing	Periodic Inspection Update	—	Non-update / Update	Set the periodic inspection update value (distance/time) to the updated value.	This is performed when the value being shown in the MFD display is updated. **Note:** **It is not possible to simultaneously update this value and the setting inside the MFD.**
	Tire Check Update	—	Non-update / Update	Set the tire inspection update value (distance•time) to the updated value.	
	Oil Filter Update	—	Non-update / Update	Set the oil filter update value (distance•time) to the updated value.	
	Engine Oil Update	—	Non-update / Update	Set the engine oil update value (distance•time) to the updated value.	

Item	Initial setting value	Setting value	Note	
All Maintenance Item Update	—	Non-update / Update	Set all maintenance item values (distance•time) to the updated values.	
Periodic Inspection Update Level Change (Distance)	For U5: 6000 For C5: 10000 For C4: 15000	1000 — 50000	Set the values to be updated when periodic inspection update time comes.	It is performed when setting values inside MFD are changed. **Note:** **It is not possible to simultaneously update those values and the values being displayed in MFD.**
Tire Check Update Level Change (Distance)	For U5: 7500 For C5: 12000 For C4: 12000	1000 — 50000	Set the values to be updated when tire inspection update time comes.	
Oil Filter Update Level Change (Distance)	For U5: 6000 For C5: 10000 For C4: 15000	1000 — 50000	Set the values to be updated when oil filter update time comes.	
Engine Oil Update Level Change (Distance)	For U5: 6000 For C5: 10000 For C4: 15000	1000 — 50000	Set the values to be updated when engine oil update time comes.	
Periodic Inspection Update Level Change (Time)	—	0 Months—60 Months	Set the values to be updated when periodic inspection update time comes.	
Tire Check Update Level Change (Time)	For U5: 8 Months For C5: 12 Months For C4: None	0 Months—60 Months	Set the values to be updated when tire inspection update time comes.	

Item	Initial setting value	Setting value	Note
Oil Filter Update Level Change (Time)	For U5: 6 Months For C5: 6 Months For C4: 12 Months	0 Months—60 Months	Set the values to be updated when oil filter check update time comes.
Engine Oil Update Level Change (Time)	For U5: 6 Months For C5: 6 Months For C4: 12 Months	0 Months—60 Months	Set the values to be updated when engine oil check update time comes.
Brightness Customization	—	−10 % —+10 %	Adjust the target brightness level.
Contrast Customization	—	−5 % —+5 %	Adjust the display setting.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2225	MFD INTERNAL COMMUNICATION	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2225 MFD INTERNAL COMMUNICATION.
B2226	MFD INTERNAL CIRCUIT	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2226 MFD INTERNAL CIRCUIT.
B2227	MFD VIDEO MICROCOMPUTER	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2227 MFD VIDEO MICROCOMPUTER.
B2228	MFD SDRAM	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2228 MFD SDRAM.
B2229	MFD FLASH MEMORY	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2229 MFD FLASH MEMORY.
B2230	MFD LED	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2230 MFD LED.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

Code	Description & trouble part	Reference
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0162	LOST COMMUNICATION WITH AUTO VISUAL NAVIGATION DISPLAY MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0164	LOST COMMUNICATION WITH HVAC CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code

Code	Description & trouble part	Reference
		(DTC)>DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0417	INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE.
U0422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE.
U0423	INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE.
U0424	INVALID DATA RECEIVED FROM HVAC CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE.

Code	Description & trouble part	Reference
U0463	INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE.
U1232	LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1533	INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2225 MFD INTERNAL COMMUNICATION

DTC detecting condition:

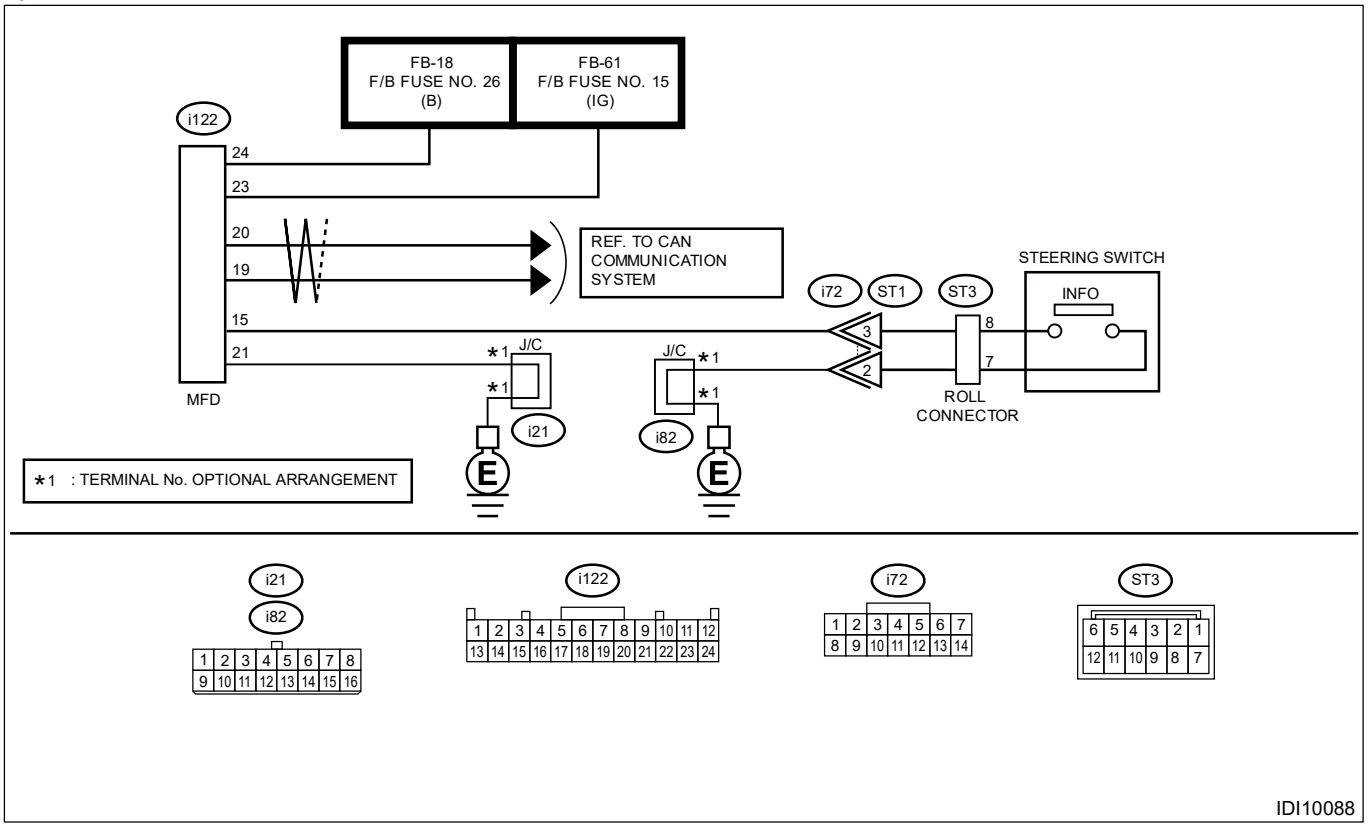
- When response to the request from control microcomputer to image microcomputer is not received, if the system is not restored within 30 to 60 seconds after sending another request.
- Likewise, when response to the request from CPU2 side is not received, if the system is not restored within 30 to 60 seconds after resending the specified request.

Trouble symptom:

- MFD does not start.
- It malfunctions in each operation.

Wiring diagram:

Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Multi-Function Display]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Disconnect the MFD connector and reconnect it.
4. Turn the ignition switch to ON.
5. Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2225 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC (past malfunction) is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 1 — 24 (except No. 1, 6, 21) — chassis ground:

Is the resistance 10 kΩ or more?

Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2226 MFD INTERNAL CIRCUIT

DTC detecting condition:

- If the system is not restored within 30 to 60 seconds after restarting the control microcomputer due to timeout of startup sequence.
- When CAN controller register freeze check detects malfunction immediately after startup.

Trouble symptom:

MFD does not start.

Note:

For the diagnostic procedure, refer to DTC B2225. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2225 MFD INTERNAL COMMUNICATION.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2227 MFD VIDEO MICROCOMPUTER

DTC detecting condition:

- When the image microcomputer does not respond to the request from the control microcomputer immediately after starting the system, if the system is not restored within 30 to 60 seconds after restart.
- If the system is not restored within 30 to 60 seconds after restart due to WDP malfunction.

Trouble symptom:

- MFD does not start.
- It malfunctions in each operation.

Note:

For the diagnostic procedure, refer to DTC B2225. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2225 MFD INTERNAL COMMUNICATION.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2228 MFD SDRAM

DTC detecting condition:

When test data is written to a given area of SDRAM immediately after startup and verification detects malfunction.

Trouble symptom:

It malfunctions in each operation.

Note:

For the diagnostic procedure, refer to DTC B2225. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2225 MFD INTERNAL COMMUNICATION.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2229 MFD FLASH MEMORY

DTC detecting condition:

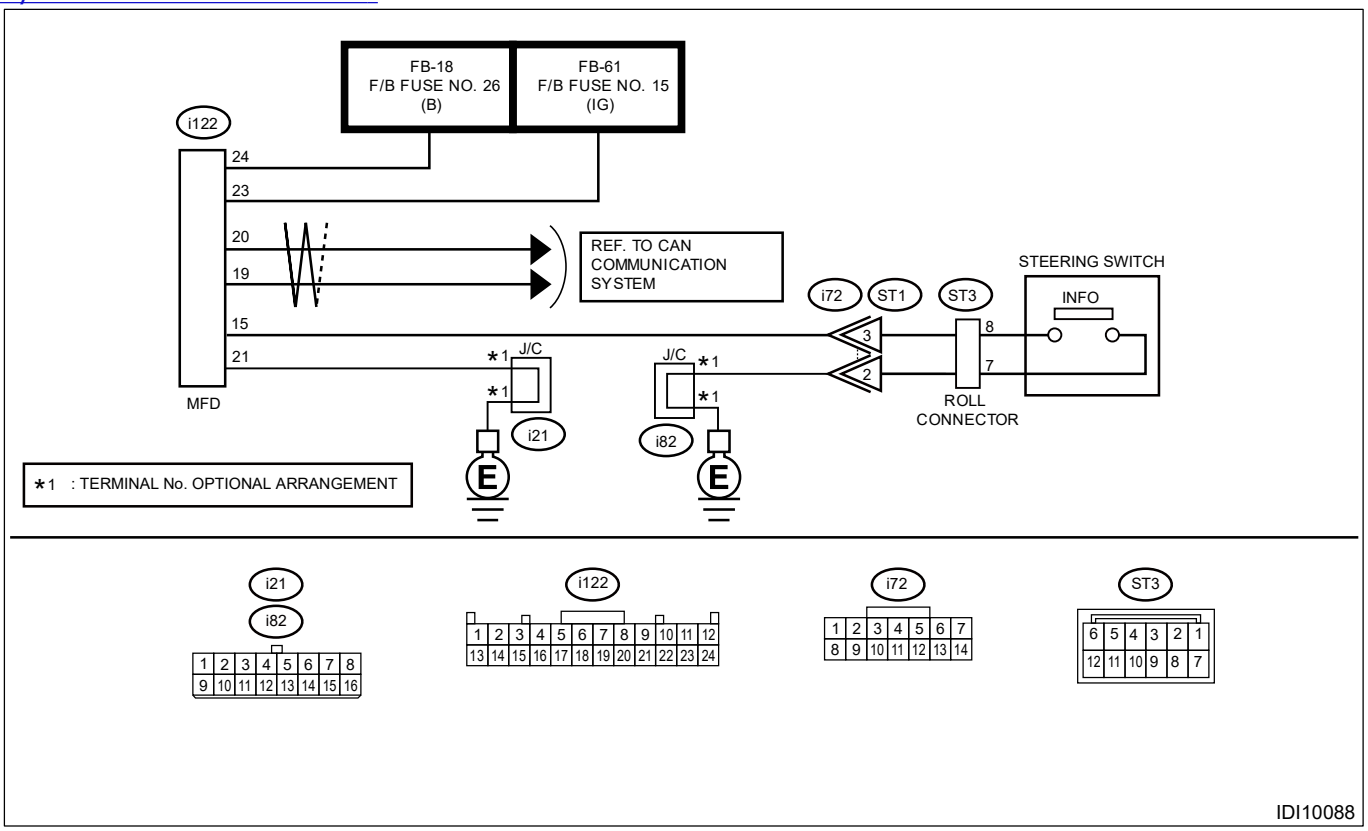
When malfunction of backup operation still remains after restarting it 10 times.

Trouble symptom:

- It malfunctions in each operation.
- Backup is not possible. (When an interruption occurs, a screen which is different from the last displayed screen is shown in the return destination screen.)

Wiring diagram:

Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK MFD LAST MEMORY.

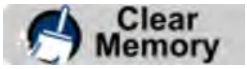
1. Turn the ignition switch to ON.
2. Press MFD switch and select a screen other than the fuel economy screen.
3. Turn the ignition switch to OFF. (ACC OFF)
4. Turn the ignition switch to ON.

Is the MFD screen the same as the screen shown before the ignition switch is turned to OFF?

Yes	Go to 2.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

2. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Multi-Function Display]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Disconnect the MFD connector and reconnect it.
4. Turn the ignition switch to ON.
5. Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2229 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC (past malfunction) is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 1 — 24 (except No. 1, 6, 21) — chassis ground:

Is the resistance 10 kΩ or more?

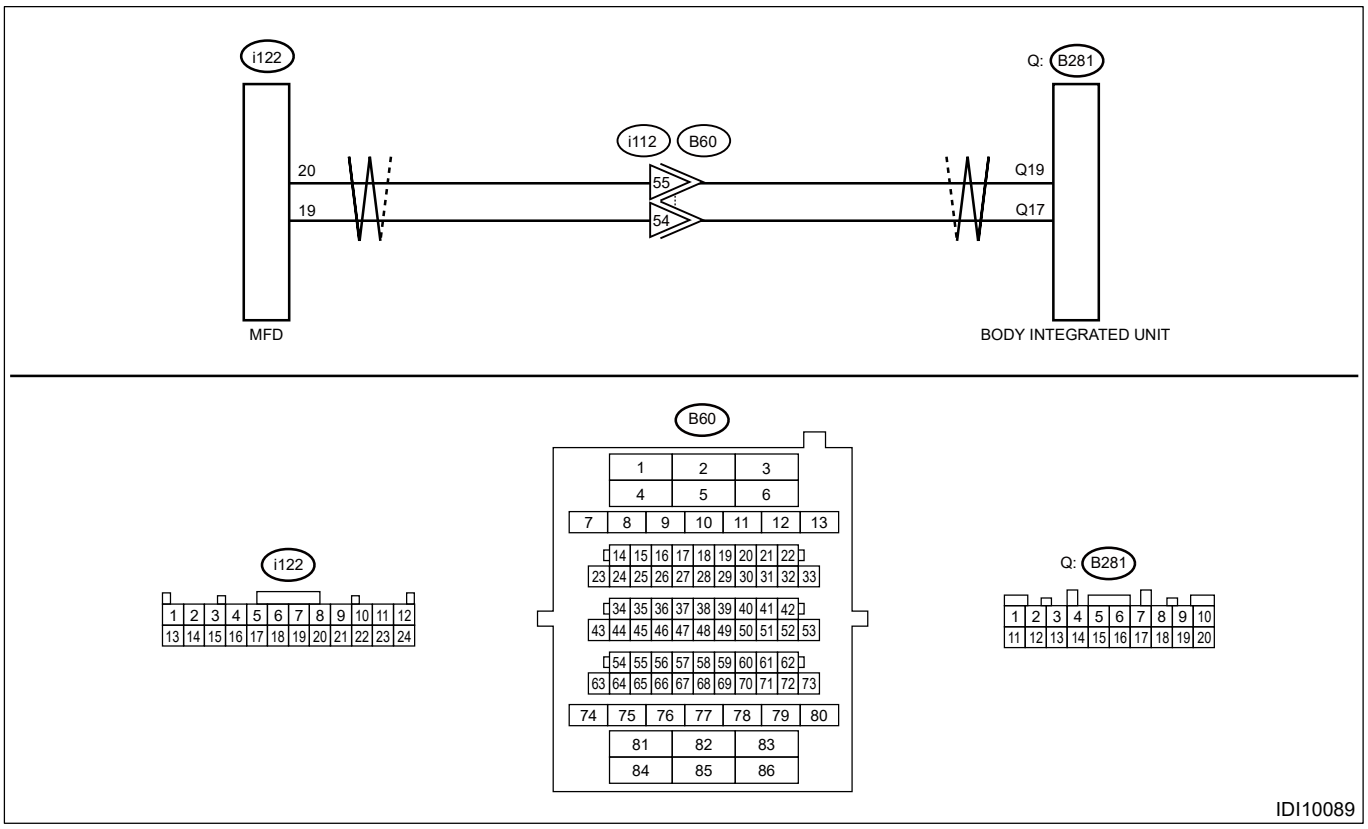
Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2230 MFD LED

DTC detecting condition:
When the image microcomputer performs periodical monitoring and after malfunction is detected, malfunction is detected by four consecutive judgments.
Trouble symptom:
- Back-up light illumination fault
- Faulty illumination operation

Wiring diagram:
- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Multi-Function Display]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Disconnect the MFD connector and reconnect it.
4. Turn the ignition switch to ON.
5. Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2230 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC (past malfunction) is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 19 — Chassis ground:
   (i122) No. 20 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector.
2. Using a tester, measure the resistance between the MFD connector and body integrated unit connector.
   Connector & terminal
   (i122) No. 19 — (B281) No. 17:
   (i122) No. 20 — (B281) No. 19:

Is the resistance 10 Ω or less?

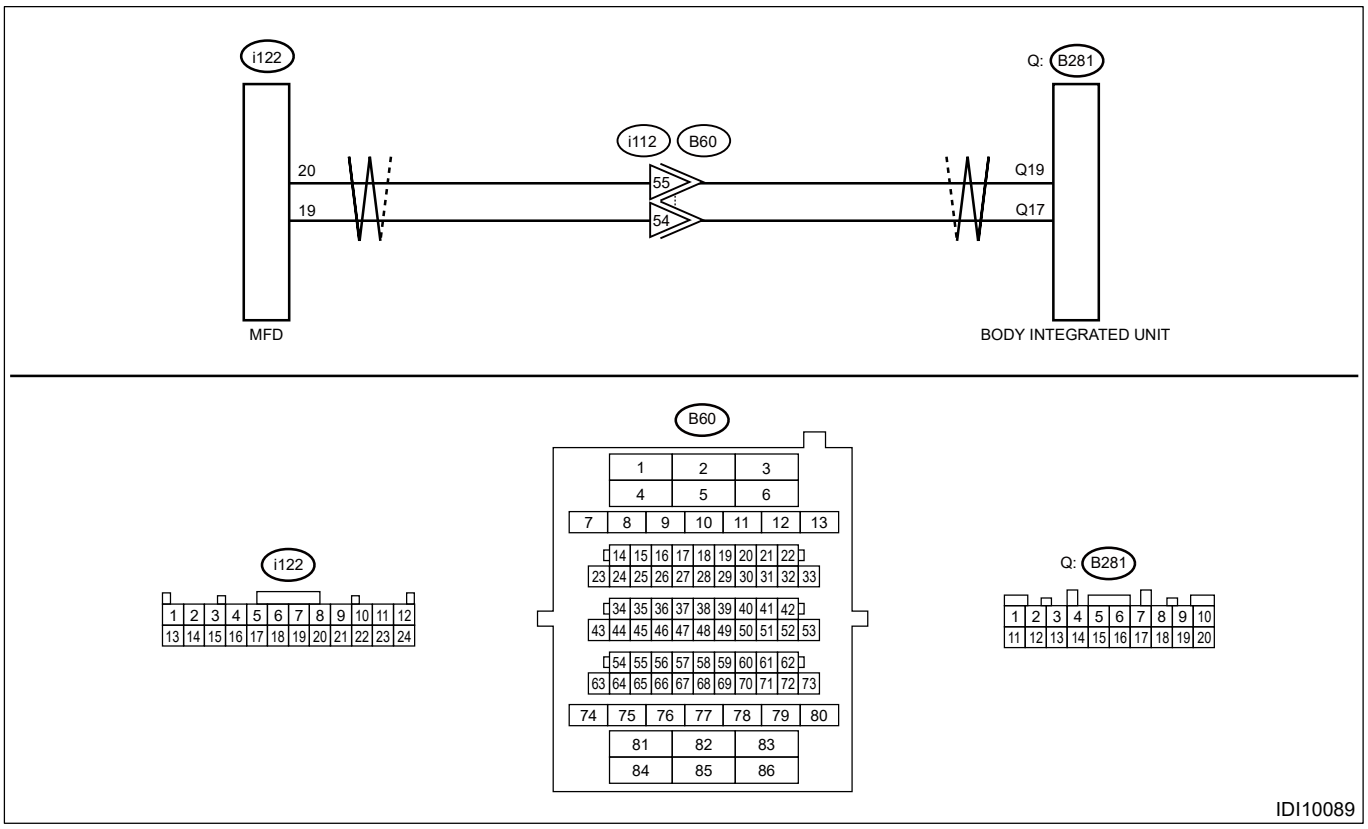
Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Repair or replace the open circuit of harness.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

DTC detecting condition:
Detected when malfunction occurs in CAN line. (Bus off).
Trouble symptom:
In each screen, there are some items that are not displayed.
- Favorite screen is not properly displayed.
- Fuel economy screen is not properly displayed.
- Ambient air temperature is displayed in bar display.
- Only electrical parts operation status screen, preventive safety screen, Favorite screen, fuel economy screen, clock screen, and setting transition screen are displayed.

Wiring diagram:
- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Multi-Function Display]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch to OFF.
3. Disconnect the MFD connector and reconnect it.
4. Turn the ignition switch to ON.
5. Read the DTC of [Multi-Function Display] using the Subaru Select Monitor. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC U0074 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC (past malfunction) is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (GROUND SHORT CIRCUIT).

1. Disconnect the MFD connector.
2. Using a tester, measure the resistance between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 19 — Chassis ground:
   (i122) No. 20 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the body integrated unit connector.
2. Using a tester, measure the resistance between the MFD connector and body integrated unit connector.

Connector & terminal

(i122) No. 19 — (B281) No. 17:

(i122) No. 20 — (B281) No. 19:

Is the resistance 10 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Perform the inspection according to the diagnosis for LAN system.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

DTC detecting condition:

CAN data from ECM is abnormal.

Trouble symptom:

- Favorite screen Accelerator opening angle does not change.
- Favorite screen Oil temperature does not change.
- Favorite screen Water temperature does not change.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

DTC detecting condition:
CAN data from TCM is abnormal.
Trouble symptom:
Left side of preventive safety screen (powertrain display) is different between AWD model and 2WD model.
Note:
For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:
CAN data from VDCCM is abnormal.
Trouble symptom:
- The on-screen tire angle in the left side of the preventive safety screen (powertrain display) does not change.
- The on-screen tire display in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The on-screen powertrain in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The X-MODE icon in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The VDC operation icon in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The HDC operation icon in the left side of the preventive safety screen (powertrain display) is not shown properly.

Note:
For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

DTC detecting condition:
CAN data from VDCCM is abnormal.
Trouble symptom:
Frequency of advice to take a rest increases. (head unit display)

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

DTC detecting condition:

CAN data from body integrated unit is abnormal.

Trouble symptom:

- After the "Welcome" is displayed, even if the ignition is turned to ACC ON, the screen remains in black and the system does not startup.
- When the ignition is turned to ACC ON while the "Welcome" screen is being displayed, the screen remains the same.
- When the driver's door is opened while the "Good-bye" screen is being displayed, the screen remains the same.
- Frequency of advice to take a rest increases.
- Brightness of multi-function display does not change.
- Brake light status is not displayed correctly in the electrical parts operation status screen.
- Headlight status is not displayed correctly in the electrical parts operation status screen.
- Front fog light status is not displayed correctly in the electrical parts operation status screen.
- Rear fog light status is not displayed correctly in the electrical parts operation status screen.
- Headlight AUTO switch status is not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

DTC detecting condition:

CAN data from combination meter is abnormal.

Trouble symptom:

- Displayed units are incorrect. (temperature, fuel economy, distance, speed)
- The display order of date (year, month, day) is incorrect.
- Ambient air temperature reading in the regularly displayed bar is not correct. (bar display).
- EyeSight screen is not displayed.
- EyeSight status is not displayed correctly in the electrical parts operation status screen.
- RAB status is not displayed correctly in the electrical parts operation status screen.
- Turn signal status is not displayed correctly in the electrical parts operation status screen.
- Favorite screen Average speed does not change.

- Favorite screen Instantaneous fuel economy does not change.
- Favorite screen Orientation is not displayed.
- Favorite screen Weather is not displayed.
- Favorite screen Speed limit are not displayed.
- Fuel economy screen Instantaneous fuel economy does not change.
- Fuel economy screen Average fuel economy is not displayed.
- Fuel economy screen Remaining fuel cruising distance value is not displayed.
- Illumination brightness is not changed by the bright switch.
- "Welcome" display is not displayed.
- The language shown is different from the language displayed in the combination meter.
- A screen cannot be switched to the setting screen.
- When the setting screen is on, the switches are disabled.
- Orientation screen is not displayed.
- Turn by turn screen is not displayed.
- Weather screen is not displayed.
- Audio screen is not displayed.
- Time is not shared with audio.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

DTC detecting condition:

CAN data from AVN is abnormal.

Trouble symptom:

- Time is not shared with audio.
- Orientation screen is not displayed.
- Turn by turn screen is not displayed.
- Weather screen is not displayed.
- Audio screen is not displayed.
- Favorite screen Orientation is not displayed.
- Favorite screen Weather is not displayed.
- Favorite screen Speed limit are not displayed.
- Orientation is not displayed properly in the orientation screen.
- Orientation shown in the orientation screen is different from one in the navigation system.
- Names of streets and symbols shown in the orientation screen are different from those in the navigation system.
- Speed limit and signs shown in the orientation screen are different from those in the navigation system.
- Arrows shown in the turn by turn screen are different from those in the navigation system.
- Remaining distance shown in the turn by turn screen is different from one in the navigation system.
- Names of the next streets shown in the turn by turn screen are different from those in the navigation

system.

- Weather shown in the weather screen is different from one in the head unit.
- The source display shown in the audio screen is different from one in the head unit.
- Audio information shown in the audio screen is different from one in the head unit.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

DTC detecting condition:

CAN data from A/C control panel is abnormal.

Trouble symptom:

- Air conditioner status is not displayed in the regularly display bar.
- Air conditioner status is not displayed correctly in the regularly display bar.
- Setting temperature reading in the regularly displayed bar is not displayed.
- Operating the air conditioner does not display air conditioner interruption.
- Air conditioner status is not displayed correctly in the air conditioner interruption display.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

DTC detecting condition:

CAN data from ECM is abnormal.

Trouble symptom:

- Favorite screen Accelerator opening angle does not change.
- Favorite screen Oil temperature does not change.
- Favorite screen Water temperature does not change.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

DTC detecting condition:

CAN data from TCM is abnormal.

Trouble symptom:
Left side of preventive safety screen (powertrain display) is different between AWD model and 2WD model.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

DTC detecting condition:
CAN data from VDCCM is abnormal.

Trouble symptom:

- The on-screen tire angle in the left side of the preventive safety screen (powertrain display) does not change.
- The on-screen tire display in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The on-screen powertrain in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The X-MODE icon in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The VDC operation icon in the left side of the preventive safety screen (powertrain display) is not shown properly.
- The HDC operation icon in the left side of the preventive safety screen (powertrain display) is not shown properly.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0417 INVALID DATA RECEIVED FROM PARK BRAKE CONTROL MODULE

DTC detecting condition:
CAN data from VDCCM is abnormal.

Trouble symptom:
Frequency of advice to take a rest increases.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE

DTC detecting condition:

CAN data from body integrated unit is abnormal.

Trouble symptom:

- After the “Welcome” is displayed, even if the ignition is turned to ACC ON, the screen remains in black and the system does not startup.
- When the ignition is turned to ACC ON while the “Welcome” screen is being displayed, the screen remains the same.
- When the driver’s door is opened while the “Good-bye” screen is being displayed, the screen remains the same.
- Frequency of advice to take a rest increases.
- Brightness of multi-function display does not change.
- Brake light status is not displayed correctly in the electrical parts operation status screen.
- Headlight status is not displayed correctly in the electrical parts operation status screen.
- Front fog light status is not displayed correctly in the electrical parts operation status screen.
- Rear fog light status is not displayed correctly in the electrical parts operation status screen.
- Headlight AUTO switch status is not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0423 INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL MODULE

DTC detecting condition:

CAN data from combination meter is abnormal.

Trouble symptom:

- Displayed units are incorrect. (temperature, fuel economy, distance, speed)
- The display order of date (year, month, day) is incorrect.
- Ambient air temperature reading in the regularly displayed bar is not correct. (bar display)
- EyeSight screen is not displayed.
- EyeSight status is not displayed correctly in the electrical parts operation status screen.
- RAB status is not displayed correctly in the electrical parts operation status screen.
- Turn signal status is not displayed correctly in the electrical parts operation status screen.
- Favorite screen Average speed does not change.
- Favorite screen Instantaneous fuel economy does not change.
- Favorite screen Orientation is not displayed.
- Favorite screen Weather is not displayed.
- Favorite screen Speed limit are not displayed.
- Fuel economy screen Instantaneous fuel economy does not change.
- Fuel economy screen Average fuel economy is not displayed.
- Fuel economy screen Remaining fuel cruising distance value is not displayed.

- Illumination brightness is not changed by the bright switch.
- "Welcome" display is not displayed.
- The language shown is different from the language displayed in the combination meter.
- A screen cannot be switched to the setting screen.
- When the setting screen is on, the switches are disabled.
- Orientation screen is not displayed.
- Turn by turn screen is not displayed.
- Weather screen is not displayed.
- Audio screen is not displayed.
- Time is not shared with audio.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0424 INVALID DATA RECEIVED FROM HVAC CONTROL MODULE

DTC detecting condition:

CAN data from A/C control panel is abnormal.

Trouble symptom:

- Air conditioner status is not displayed in the regularly display bar.
- Air conditioner status is not displayed correctly in the regularly display bar.
- Setting temperature reading in the regularly displayed bar is not displayed.
- Operating the air conditioner does not display air conditioner interruption.
- Air conditioner status is not displayed correctly in the air conditioner interruption display.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0463 INVALID DATA RECEIVED FROM NAVIGATION DISPLAY MODULE

DTC detecting condition:

CAN data from AVN is abnormal.

Trouble symptom:

- Time is not shared with audio.
- Orientation screen is not displayed.
- Turn by turn screen is not displayed.
- Weather screen is not displayed.
- Audio screen is not displayed.
- Favorite screen Orientation is not displayed.
- Favorite screen Weather is not displayed.

- Favorite screen Speed limit are not displayed.
- Orientation is not displayed properly in the orientation screen.
- Orientation shown in the orientation screen is different from one in the navigation system.
- Names of streets and symbols shown in the orientation screen are different from those in the navigation system.
- Speed limit and signs shown in the orientation screen are different from those in the navigation system.
- Arrows shown in the turn by turn screen are different from those in the navigation system.
- Remaining distance shown in the turn by turn screen is different from one in the navigation system.
- Names of the next streets shown in the turn by turn screen are different from those in the navigation system.
- Weather shown in the weather screen is different from one in the head unit.
- The source display shown in the audio screen is different from one in the head unit.
- Audio information shown in the audio screen is different from one in the head unit.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE

DTC detecting condition:

CAN data from Blind Spot Detection/Rear Cross Traffic Alert is abnormal.

Trouble symptom:

Blind Spot Detection/Rear Cross Traffic Alert status are not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

DTC detecting condition:

CAN data from stereo camera is abnormal.

Trouble symptom:

- EyeSight screen is not displayed.
- Forward vehicle is not displayed in the EyeSight screen.
- When EyeSight detects white lines, the white lines are not displayed in the EyeSight screen.
- In lane keep status, lanes are not displayed in the EyeSight screen.
- Braking status of driver’s own vehicle is not displayed correctly in the EyeSight screen.
- Lane departure warning OFF indicator is not displayed correctly in the electrical parts operation status

screen.
- Pre-collision OFF indicator is not displayed correctly in the electrical parts operation status screen.
- RAB status is not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

DTC detecting condition:

CAN data from stereo camera is abnormal.

Trouble symptom:

- EyeSight screen is not displayed.
- Forward vehicle is not displayed in the EyeSight screen.
- When EyeSight detects white lines, the white lines are not displayed in the EyeSight screen.
- In lane keep status, lanes are not displayed in the EyeSight screen.
- Braking status of driver’s own vehicle is not displayed correctly in the EyeSight screen.
- Lane departure warning OFF indicator is not displayed correctly in the electrical parts operation status screen.
- Pre-collision OFF indicator is not displayed correctly in the electrical parts operation status screen.
- RAB status is not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE

DTC detecting condition:

CAN data from Blind Spot Detection/Rear Cross Traffic Alert is abnormal.

Trouble symptom:

Blind Spot Detection/Rear Cross Traffic Alert status are not displayed correctly in the electrical parts operation status screen.

Note:

For the diagnostic procedure, refer to DTC U0074. Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms		Reference
1	No display is shown.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > NO DISPLAY IS SHOWN.
2	Light AUTO display is not displayed in the electrical parts operation status screen.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > LIGHT AUTO DISPLAY IS NOT DISPLAYED IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN.
3	EyeSight main display is not displayed in the electrical parts operation status screen.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > EYESIGHT MAIN DISPLAY IS NOT DISPLAYED IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN.
4	In the electrical parts operation status screen, RAB ON/OFF display cannot be switched.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN, RAB ON/OFF DISPLAY CANNOT BE SWITCHED.
5	In the electrical parts operation status screen, Blind Spot Detection/Rear Cross Traffic Alert ON/OFF display cannot be switched.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN, Blind Spot Detection/Rear Cross Traffic Alert ON/OFF DISPLAY CANNOT BE SWITCHED.
6	Only weather screen is not displayed.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ONLY WEATHER SCREEN IS NOT DISPLAYED.
7	Only orientation & Turn by turn screens are not displayed.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > ONLY ORIENTATION & AND TURN BY TURN SCREENS ARE NOT DISPLAYED.
8	Pressing the INFO switch does not change the screen.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PRESSING THE INFO SWITCH DOES NOT CHANGE THE SCREEN.
9	Average fuel economy is not displayed.	Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>Diagnostics with

Symptoms	Reference
	Phenomenon>INSPECTION > AVERAGE FUEL ECONOMY IS NOT DISPLAYED.

MULTI-FUNCTION DISPLAY(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

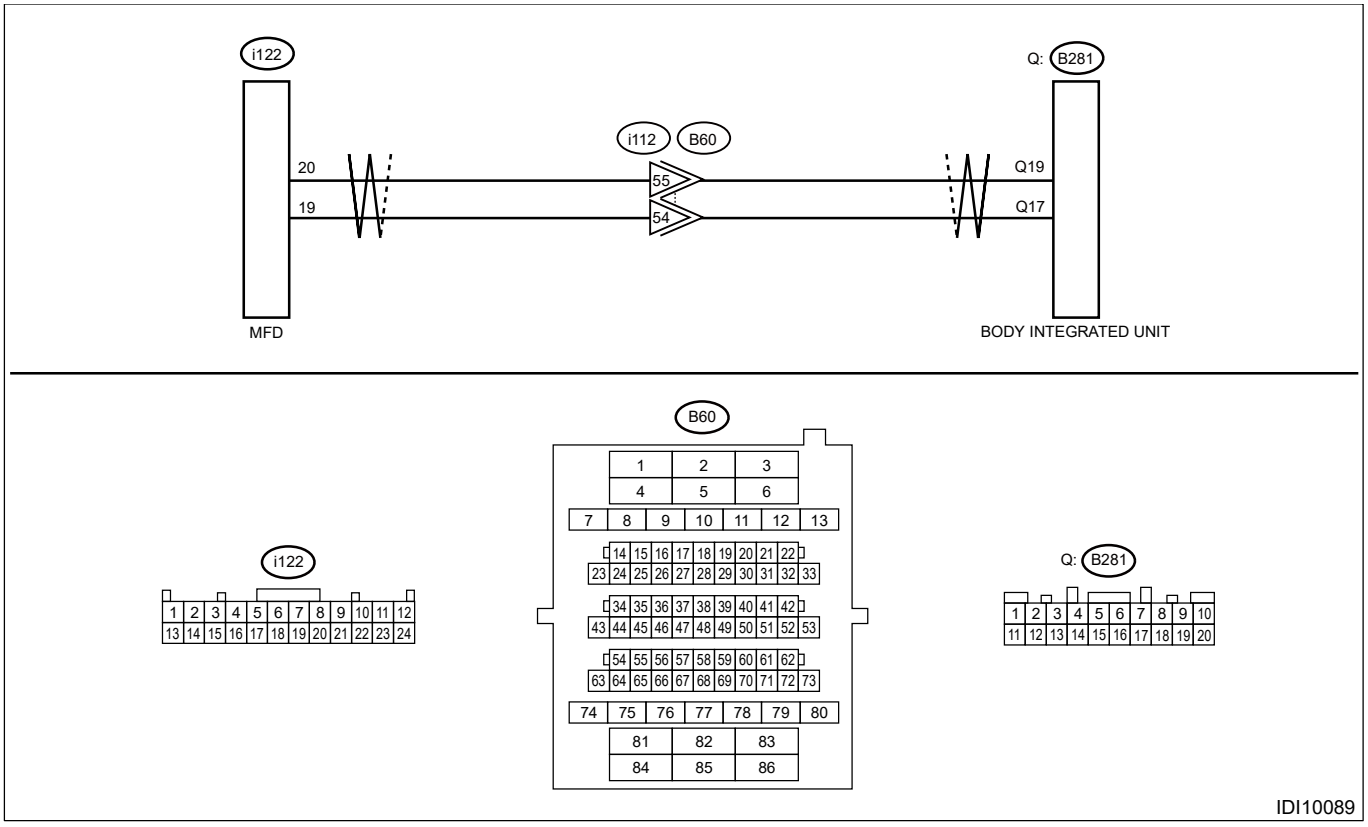
1. NO DISPLAY IS SHOWN

Detecting condition:

Power supply circuit, ground circuit, communication circuit or MFD is abnormal.

Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POWER SUPPLY CIRCUIT.	no →	Perform the instructed procedures.

yes ↓

2. CHECK GROUND CIRCUIT (OPEN).
→ no → Perform the instructed procedures.
yes ↓

3. CHECK COMMUNICATION CIRCUIT (SHORT CIRCUIT TO GROUND).
→ no → Perform the instructed procedures.
yes ↓

4. CHECK HARNESS BETWEEN MFD AND BODY INTEGRATED UNIT.
→ no → Perform the instructed procedures.
yes ↓

5. CHECK BODY INTEGRATED UNIT.
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Using a tester, measure the voltage between the MFD connector and chassis ground.

Connector & terminal

(i122) No. 24 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 2.
No	Repair or replace the open circuit of harness. (Check battery as well as fuse.)

2. CHECK GROUND CIRCUIT (OPEN).

Using a tester, measure the resistance between MFD connector and chassis ground.

Connector & terminal

(i122) No. 21 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK COMMUNICATION CIRCUIT (SHORT CIRCUIT TO GROUND).

Using a tester, measure the resistance between MFD connector and chassis ground.

Connector & terminal

(i122) No. 19 — Chassis ground:

(i122) No. 20 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS BETWEEN MFD AND BODY INTEGRATED UNIT.

1. Disconnect the body integrated unit connector.
2. Measure the resistance of the harness between MFD connector and body integrated unit connector.

   Connector & terminal

   (i122) No. 19 — (B281) No. 17:

   (i122) No. 20 — (B281) No. 19:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK BODY INTEGRATED UNIT.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

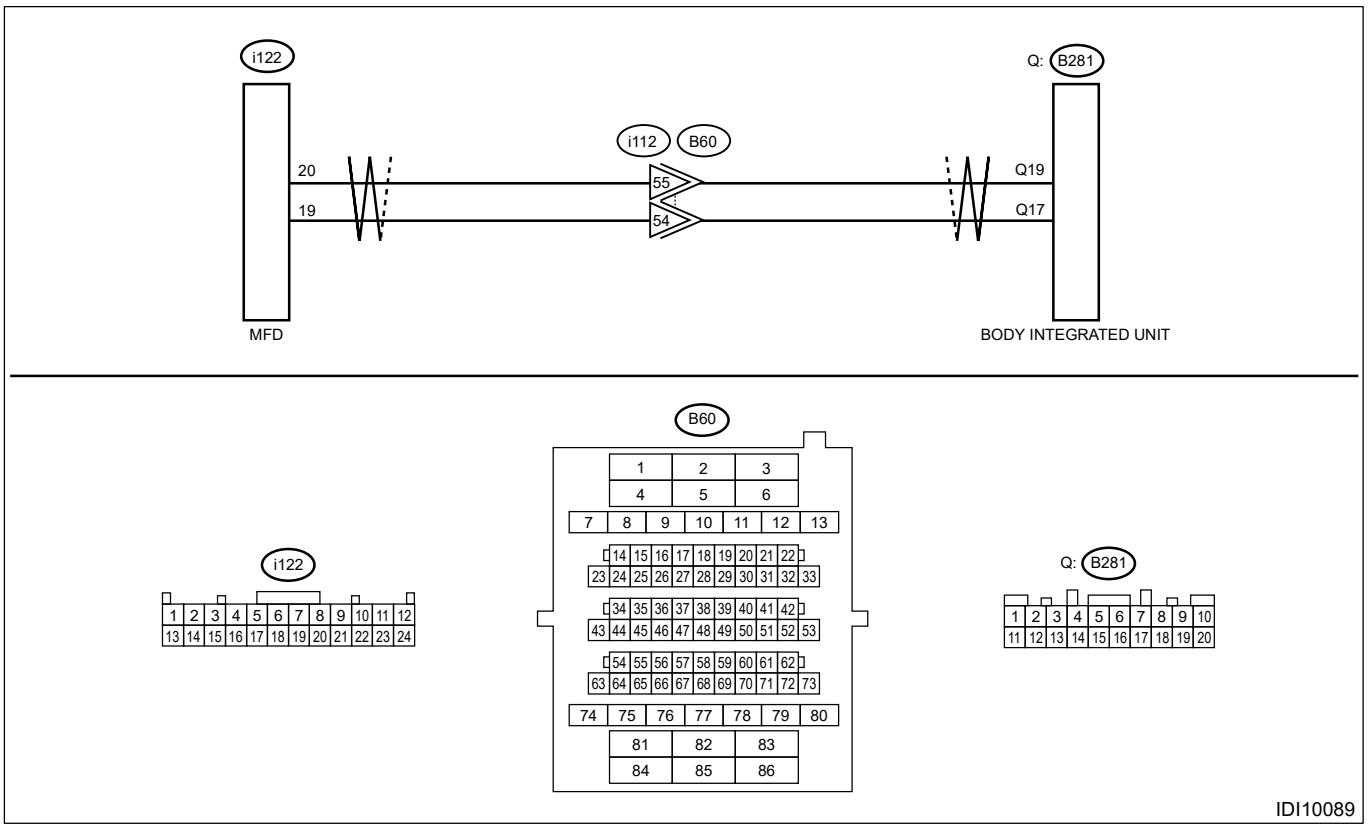
2. LIGHT AUTO DISPLAY IS NOT DISPLAYED IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN

Detecting condition:

MFD initial setting, communication circuit or MFD is abnormal.

Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. INITIAL SETTING.
   - yes → Perform the instructed procedures.
   - no → Go to 2.
2. CHECK HARNESS BETWEEN MFD AND BODY INTEGRATED UNIT.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK BODY INTEGRATED UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. INITIAL SETTING.

1. Switch the MFD display screen to the electrical parts operation status screen.
2. Move the light switch to AUTO position.

Is AUTO light displayed?

Yes	Initial setting has not been made.
No	Go to 2.

2. CHECK HARNESS BETWEEN MFD AND BODY INTEGRATED UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Disconnect the body integrated unit connector.
4. Measure the resistance of the harness between MFD connector and body integrated unit connector.

   Connector & terminal

   (i122) No. 19 — (B281) No. 17:

   (i122) No. 20 — (B281) No. 19:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK BODY INTEGRATED UNIT.

Read the DTC of [Body Control] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

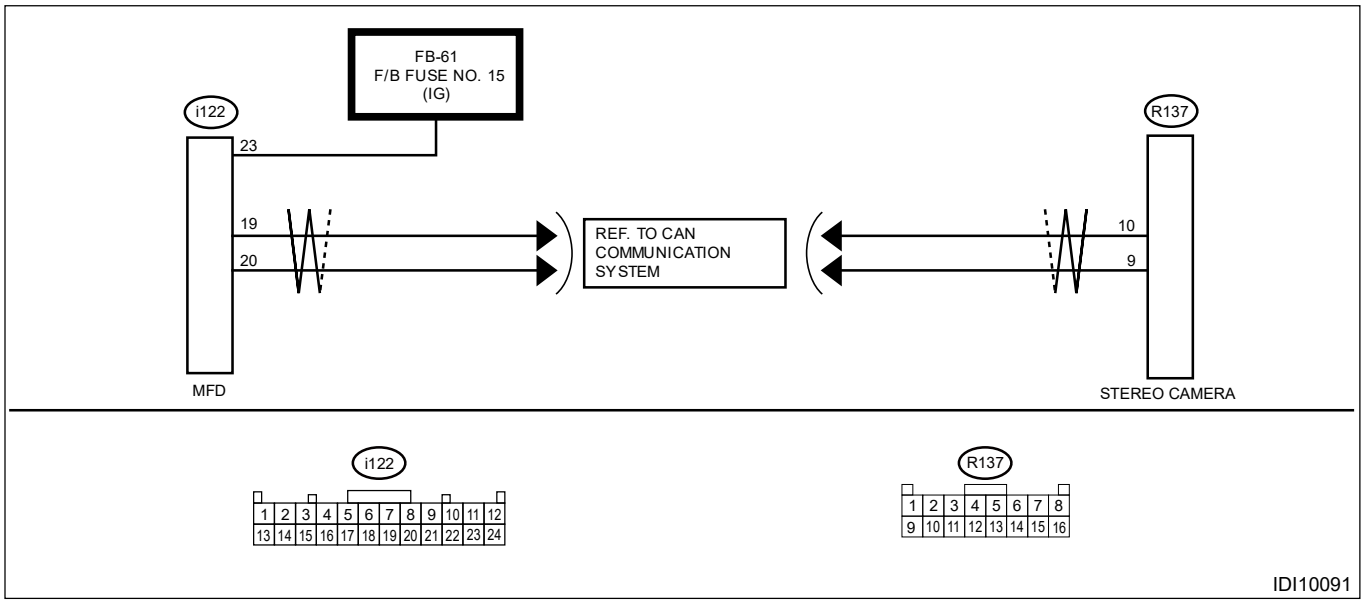
3. EYESIGHT MAIN DISPLAY IS NOT DISPLAYED IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN

Detecting condition:

Communication circuit, stereo camera or MFD is abnormal.

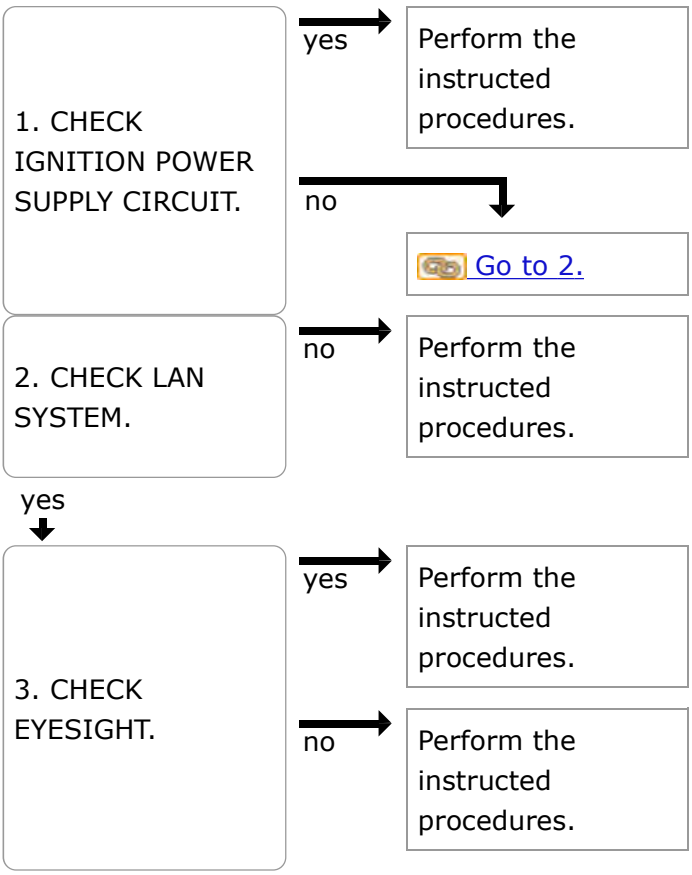
Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.



1. CHECK IGNITION POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the MFD connector and chassis ground.

Connector & terminal

(i122) No. 23 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair or replace the open circuit of harness. (Check battery as well as fuse.)
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for LAN system.

3. CHECK EYESIGHT.

Read the DTC of [EyeSight] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

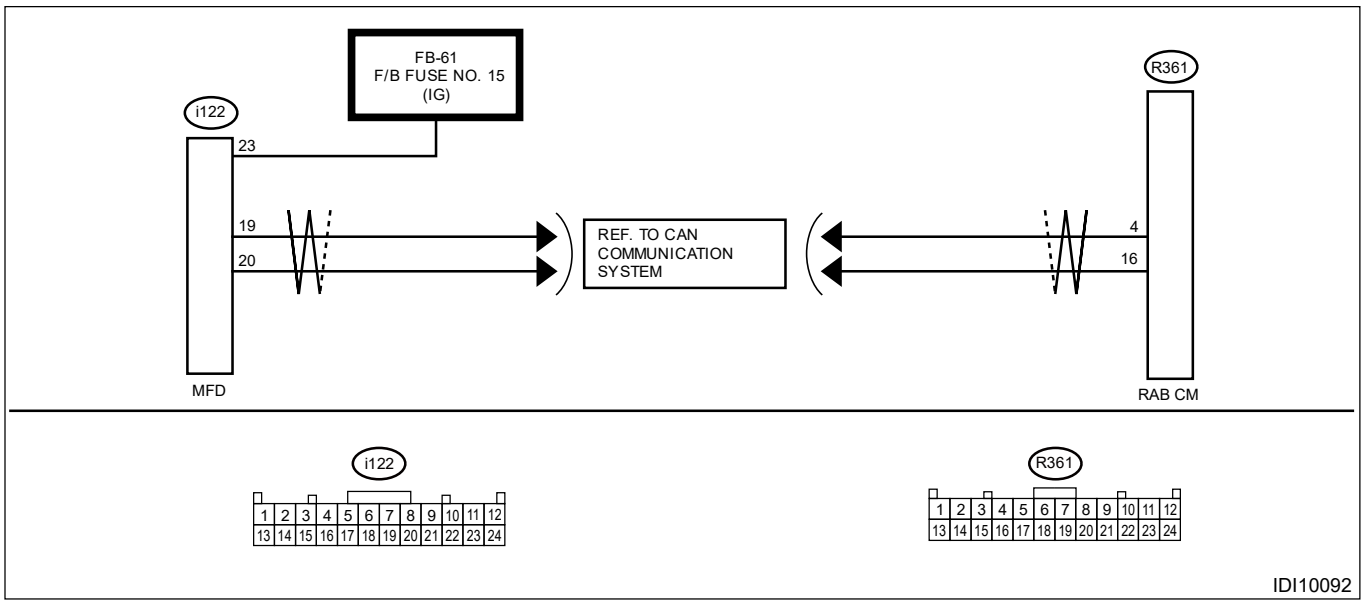
4. IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN, RAB ON/OFF DISPLAY CANNOT BE SWITCHED

Detecting condition:

Communication circuit, stereo camera, RAB CM or MFD is abnormal.

Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK IGNITION POWER SUPPLY CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK LAN SYSTEM.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK RAB AND EYESIGHT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK IGNITION POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 23 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair or replace the open circuit of harness. (Check battery as well as fuse.)
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for LAN system.

3. CHECK RAB AND EYESIGHT.

Using the Subaru Select Monitor, read the DTCs of [EyeSight] and [Reverse Automatic Braking].
Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC.
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

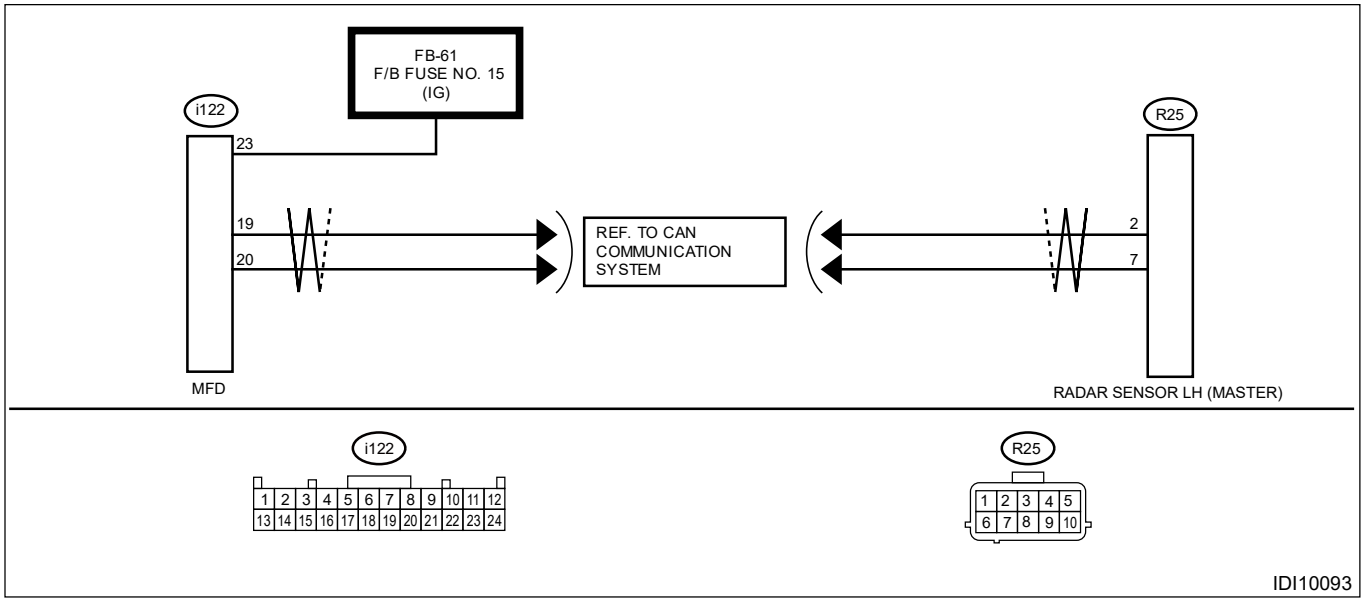
5. IN THE ELECTRICAL PARTS OPERATION STATUS SCREEN, Blind Spot Detection/Rear Cross Traffic Alert ON/OFF DISPLAY CANNOT BE SWITCHED

Detecting condition:

Communication circuit, radar sensor or MFD is abnormal.

Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK IGNITION POWER SUPPLY CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK LAN SYSTEM.	no →	Perform the instructed procedures.
	yes ↓	

3. CHECK Blind Spot Detection/Rear Cross Traffic Alert.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK IGNITION POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 23 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Repair or replace the open circuit of harness. (Check battery as well as fuse.)
No	Go to 2.

2. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for LAN system.

3. CHECK Blind Spot Detection/Rear Cross Traffic Alert.

Using the Subaru Select Monitor, read the DTCs of [Blind Spot Detection/Rear Cross Traffic Alert(RH)] or [Blind Spot Detection/Rear Cross Traffic Alert(LH)]. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to Blind Spot Detection/Rear Cross Traffic Alert (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

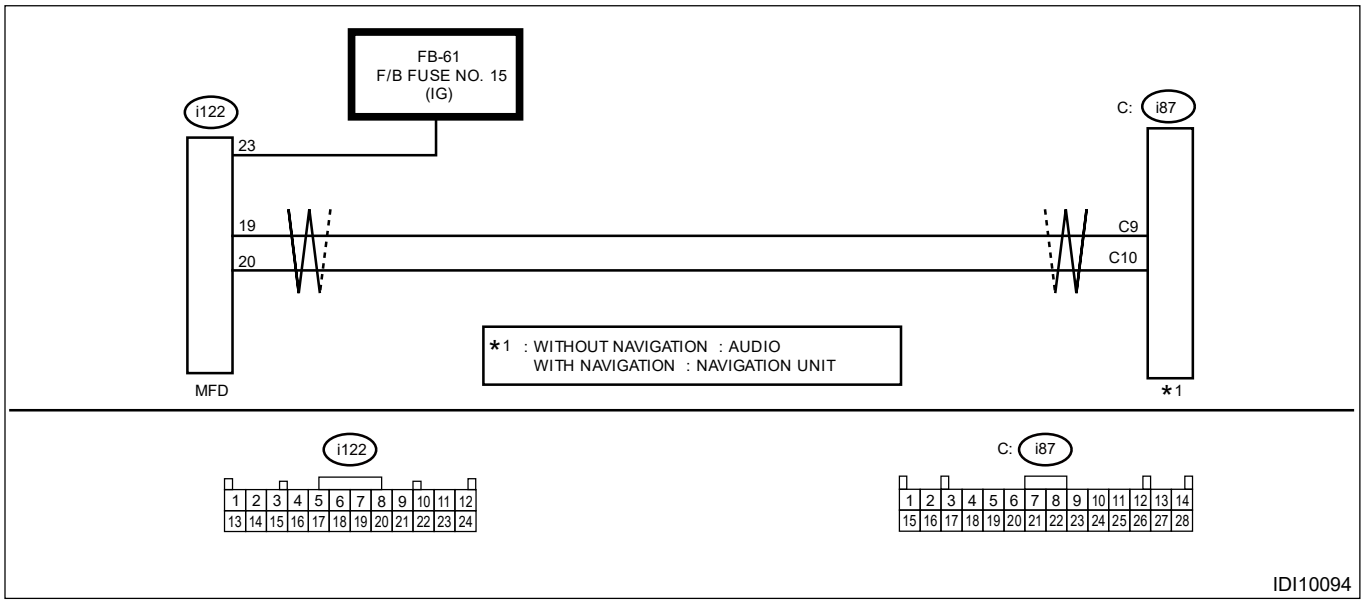
6. ONLY WEATHER SCREEN IS NOT DISPLAYED

Detecting condition:

Communication circuit, audio or navigation, or MFD is abnormal.

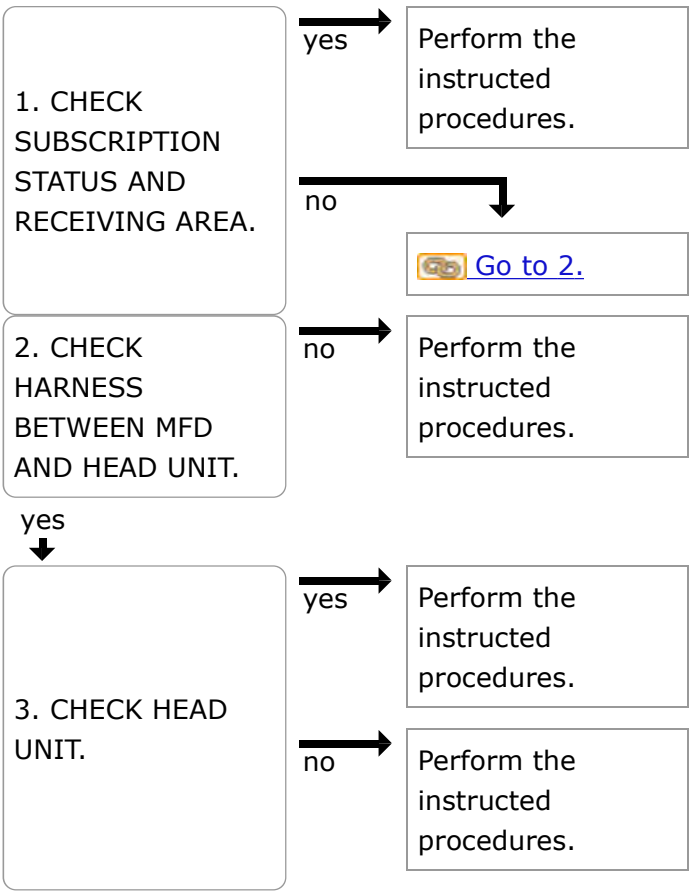
Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.



1. CHECK SUBSCRIPTION STATUS AND RECEIVING AREA.

Check user’s XM subscription status, and also areas where displays were not available.

Is there problem in XM subscription status and the areas?

Yes	System is normal. Displays are available only in subscription status and receiving areas.
No	Go to 2.

2. CHECK HARNESS BETWEEN MFD AND HEAD UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Disconnect the navigation unit or audio connector.
4. Using a tester, measure the resistance of harness between MFD connector and navigation unit or audio connector.
   Connector & terminal
   (i122) No. 19 — (i87) No. 9:
   (i122) No. 20 — (i87) No. 10:

Is the resistance less than 10 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HEAD UNIT.

Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

DTC Check

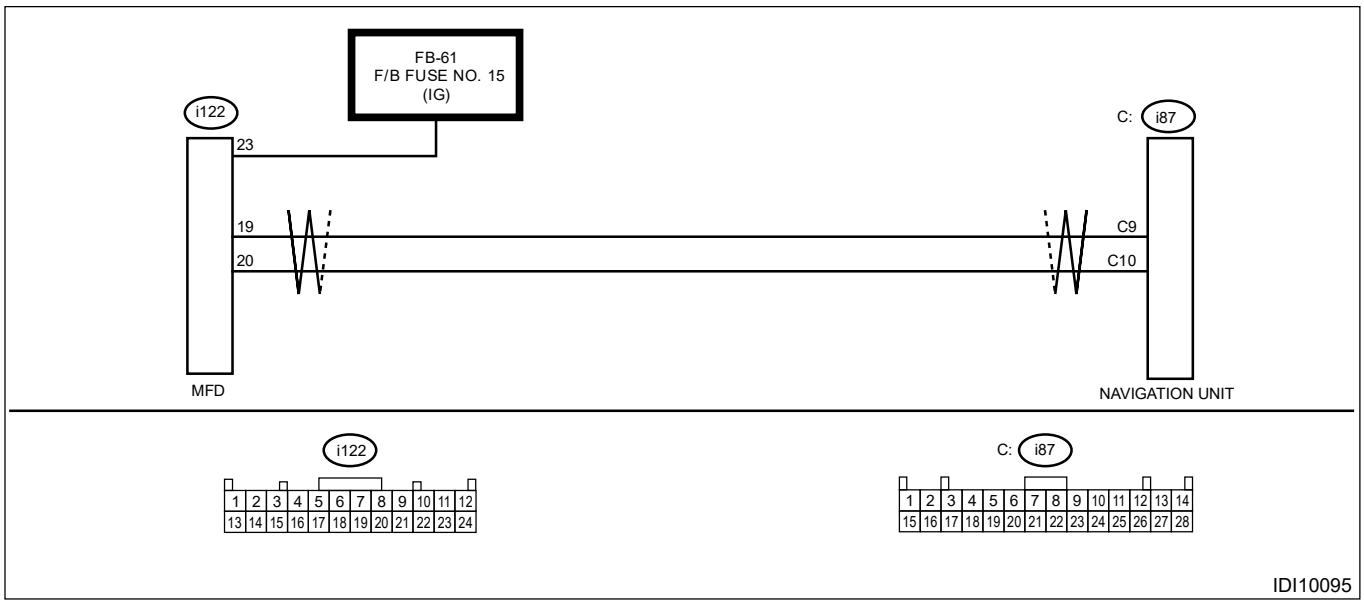
Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

7. ONLY ORIENTATION & AND TURN BY TURN SCREENS ARE NOT DISPLAYED

Detecting condition:
Communication circuit, navigation or MFD is abnormal.
Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK HEAD UNIT.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK POWER SUPPLY CIRCUIT.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS BETWEEN MFD AND HEAD UNIT.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK HEAD UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK HEAD UNIT.

Check the grade of the head unit.

Is it equipped with Hi (with navigation)?

Yes	Go to 2.
No	System is normal. Display is available only on Hi (with navigation).

2. CHECK POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between the MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 23 (+) — Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair or replace the open circuit of harness. (Check battery as well as fuse.)

3. CHECK HARNESS BETWEEN MFD AND HEAD UNIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Disconnect the head unit connector.
4. Using a tester, measure the resistance in harness between the MFD connector and head unit connector.
   Connector & terminal
   (i122) No. 19 — (i87) No. 9:
   (i122) No. 20 — (i87) No. 10:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HEAD UNIT.

Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).

DTC Check

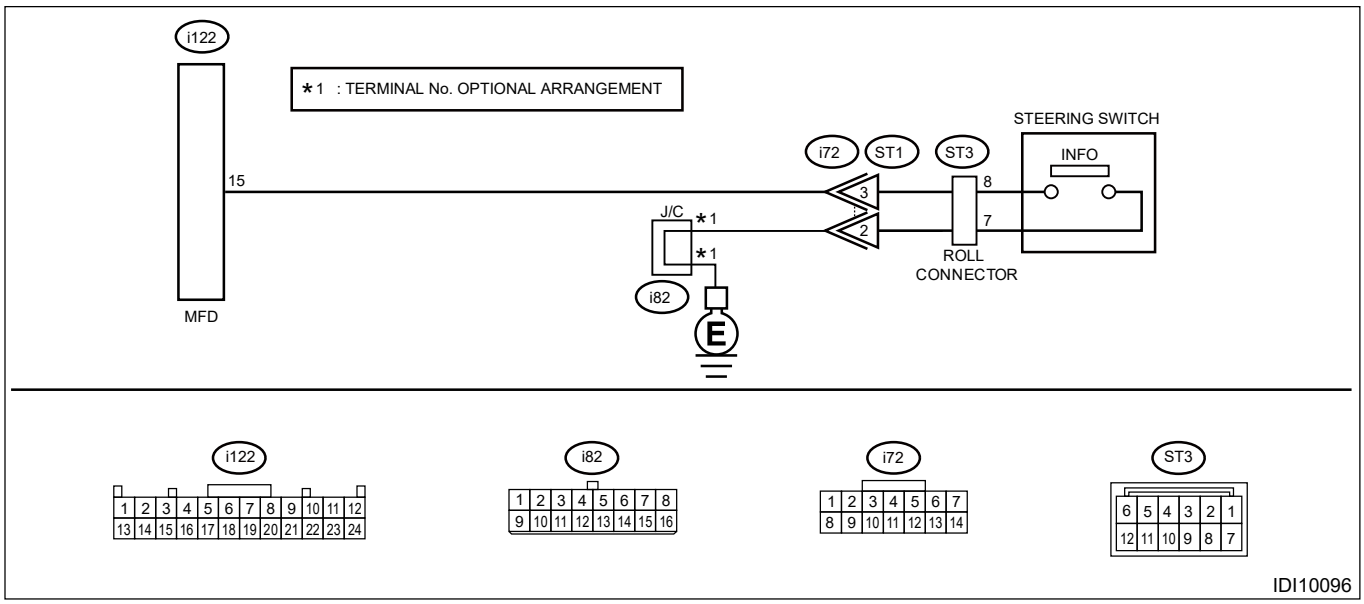
Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

8. PRESSING THE INFO SWITCH DOES NOT CHANGE THE SCREEN

Detecting condition:
Communication circuit or MFD is abnormal.
Wiring diagram:

- Multi-function display (MFD) system Ref. to WIRING SYSTEM>Multi-function Display (MFD) System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK INFO SWITCH CIRCUIT.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK INFO SWITCH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK INFO SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Using a tester, measure the resistance between MFD connector and chassis ground.
   Connector & terminal
   (i122) No. 15 — Chassis ground:

Is the resistance less than 10 Ω when switch is pushed? Is the resistance 10 kΩ or more when switch is not pushed?

Yes	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).
No	Go to 2.

2. CHECK INFO SWITCH.

Perform the inspection of INFO switch unit. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD) System>INSPECTION.

Is the check result OK?

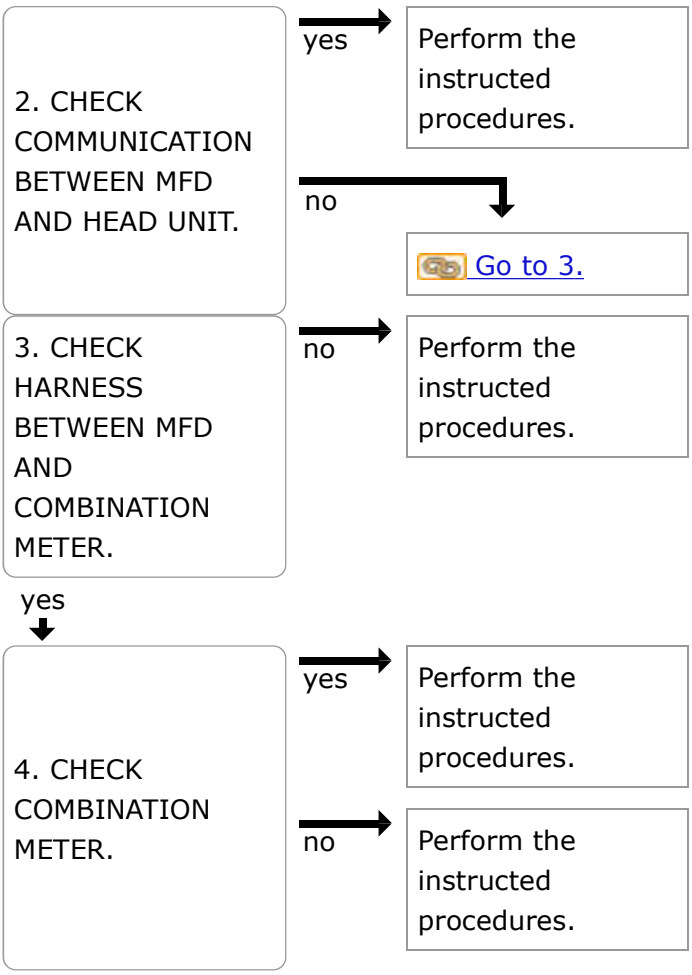
Yes	Repair or replace the open circuit of harness.
No	Replace the INFO switch.

9. AVERAGE FUEL ECONOMY IS NOT DISPLAYED

Detecting condition:
Initial condition, communication circuit or MFD is abnormal.

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to MULTI-FUNCTION DISPLAY(DIAGNOSTICS)>General Description>CAUTION.

1. CHECK INITIAL CONDITION.
   - no → Perform the instructed procedures.
   - yes ↓



1. CHECK INITIAL CONDITION.

Check TRIP value.

Is the 1 km (0.6 mile) or more?

Yes	Go to 2.
No	After driving 1 km (0.6 mile), check the value.

2. CHECK COMMUNICATION BETWEEN MFD AND HEAD UNIT.

1. Switch the screen to the electrical parts operation status screen.
2. Turn ON the headlight and check the headlight illumination on the electrical parts operation status screen.

is the headlight displayed?

Yes	Currently, system is normal.
No	Go to 3.

3. CHECK HARNESS BETWEEN MFD AND COMBINATION METER.

1. Turn the ignition switch to OFF.
2. Disconnect the MFD connector.
3. Disconnect the head unit connector.
4. Using a tester, measure the resistance in harness between the MFD connector and head unit connector.

Connector & terminal

(i122) No. 19 — (i87) No. 6:

(i122) No. 20 — (i87) No. 7:

Is the resistance less than 10 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK COMBINATION METER.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis according to displayed DTC. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Replace the MFD. Ref. to INSTRUMENTATION/DRIVER INFO>Multi-function Display (MFD).

COMBINATION METER (DIAGNOSTICS)

MET(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)

COMBINATION METER (DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to COMBINATION METER (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to COMBINATION METER (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Combination Meter].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK CAN COMMUNICATION.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the diagnosis for LAN system.

5. CHECK COMBINATION METER.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 7.
No	Go to 6.

6. CHECK COMBINATION METER.

Check the operation of combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.

Is the operation of combination meter OK?

Yes	System is normal.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

7. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Combination Meter]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to COMBINATION METER (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 7 until DTC is not shown. Go to 7.
No	Finish the diagnosis.

COMBINATION METER (DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

Combination Meter Check List for Interview Brought in on: MM/DD/YY			
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ( )
		Temperature	°C (°F) — °C (°F)
Road conditions			
Road condition			
Accessory installation condition			
DTC			
Time stamp			
Control module item number/Ver.			
Condition of trouble occurrence (How the trouble occurs)			
Vehicle bring-in history information			

COMBINATION METER (DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. COMBINATION METER

When removing combination meter related parts, refer to CAUTIONS in INSTRUMENTATION/DRIVER INFO. Ref. to INSTRUMENTATION/DRIVER INFO>General Description>CAUTION.

COMBINATION METER (DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items that might provoke the problems in the combination meter.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, harnesses and connectors. Also check grounding.

COMBINATION METER (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

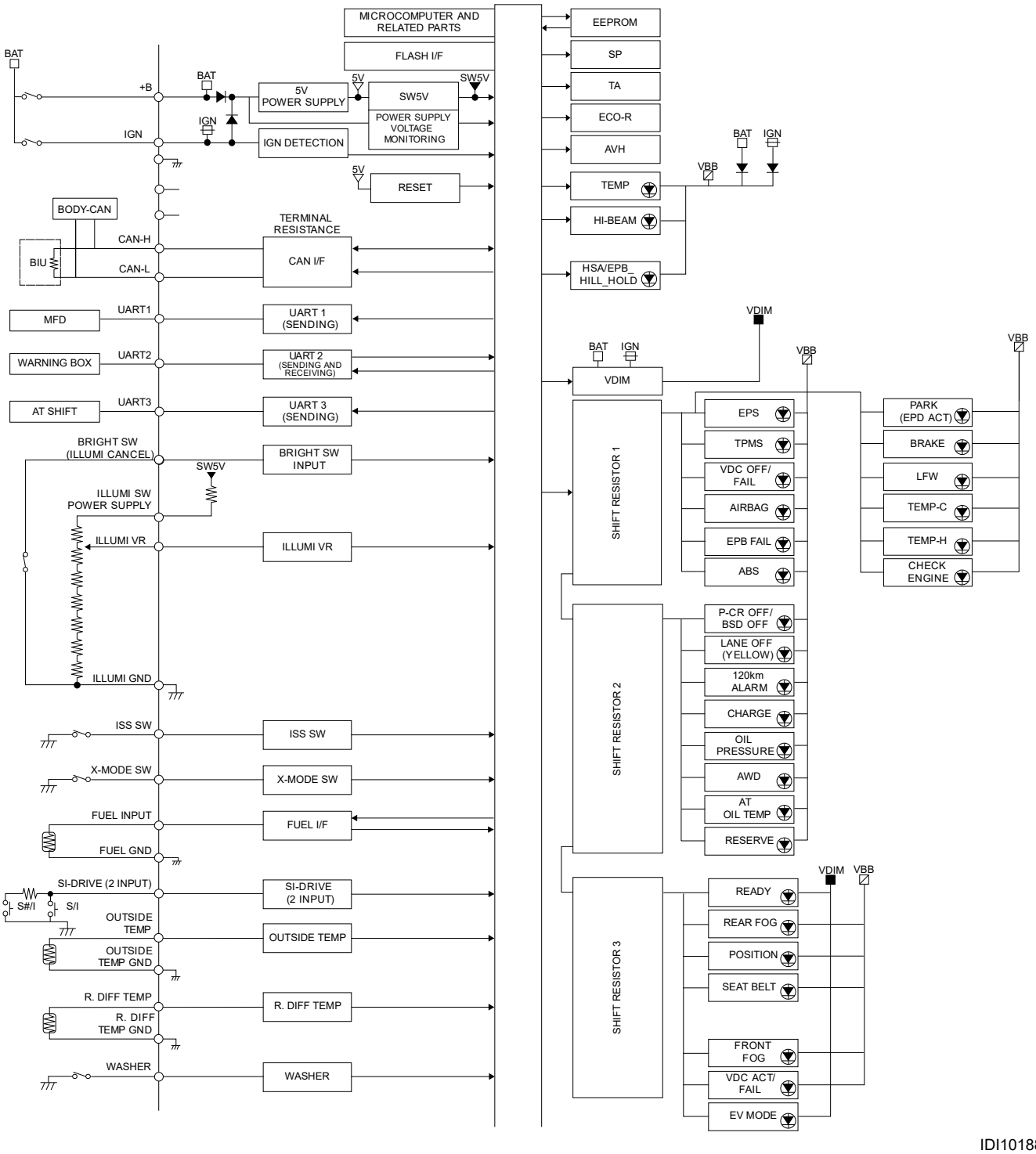
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

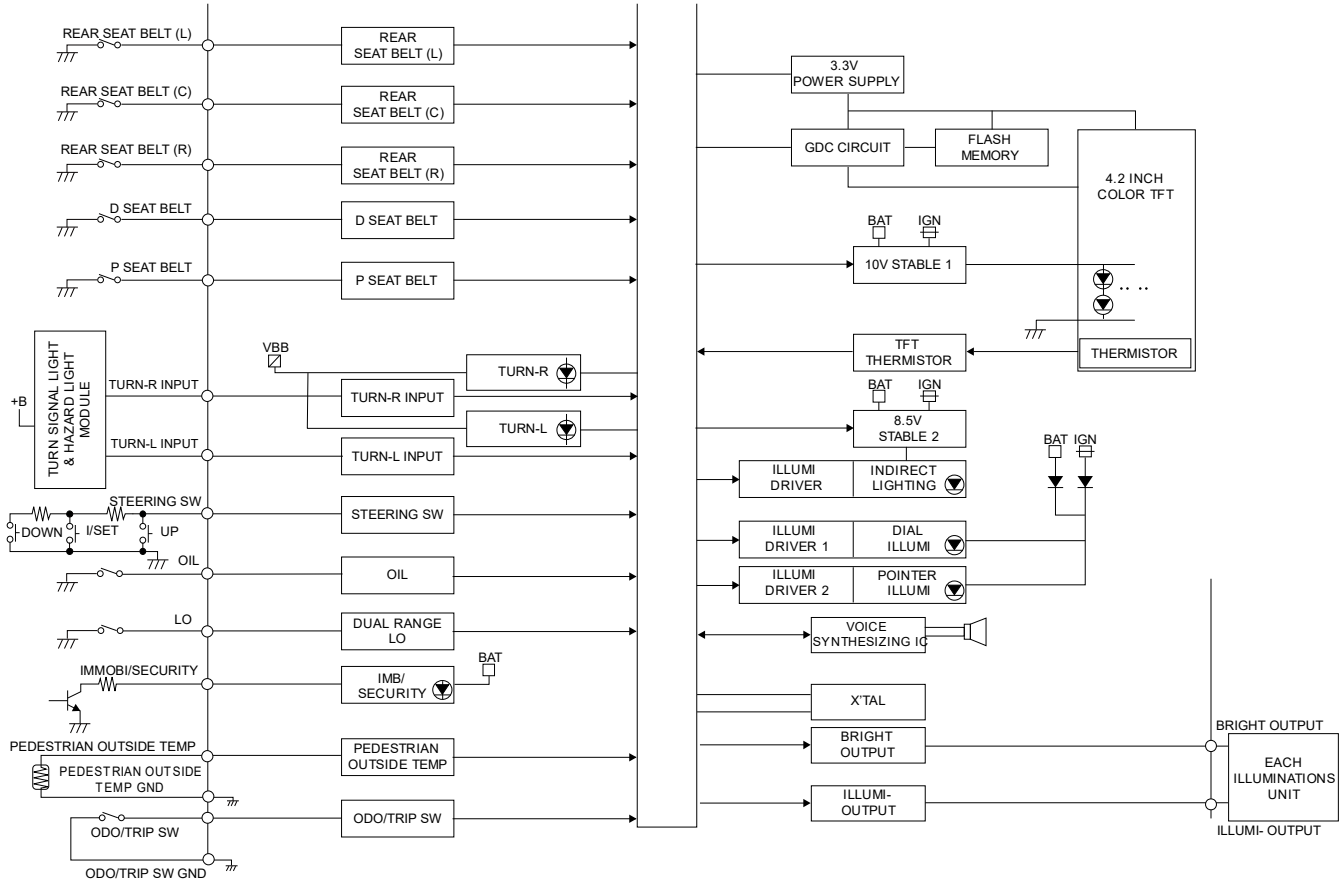
COMBINATION METER (DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

- Color TFT meter

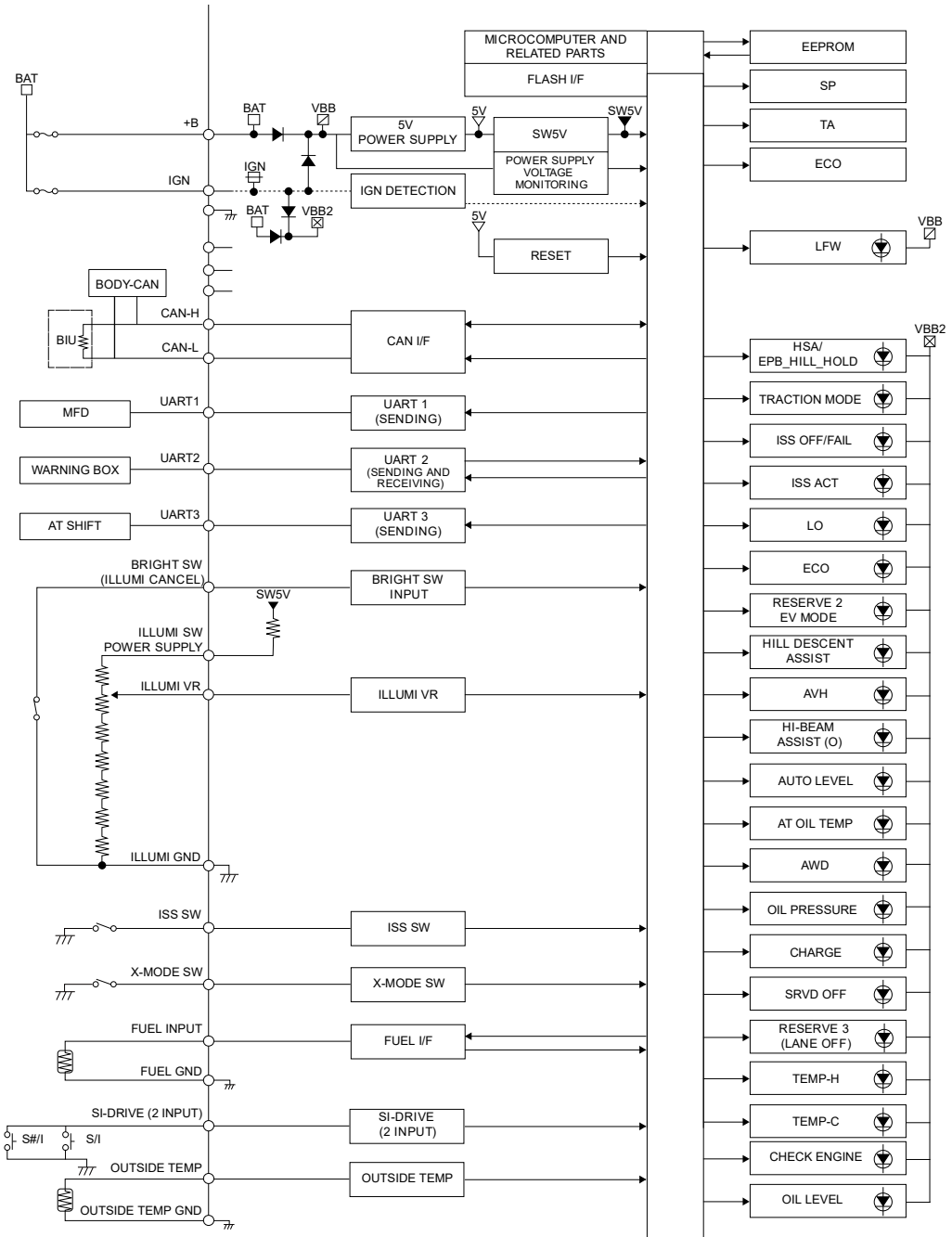


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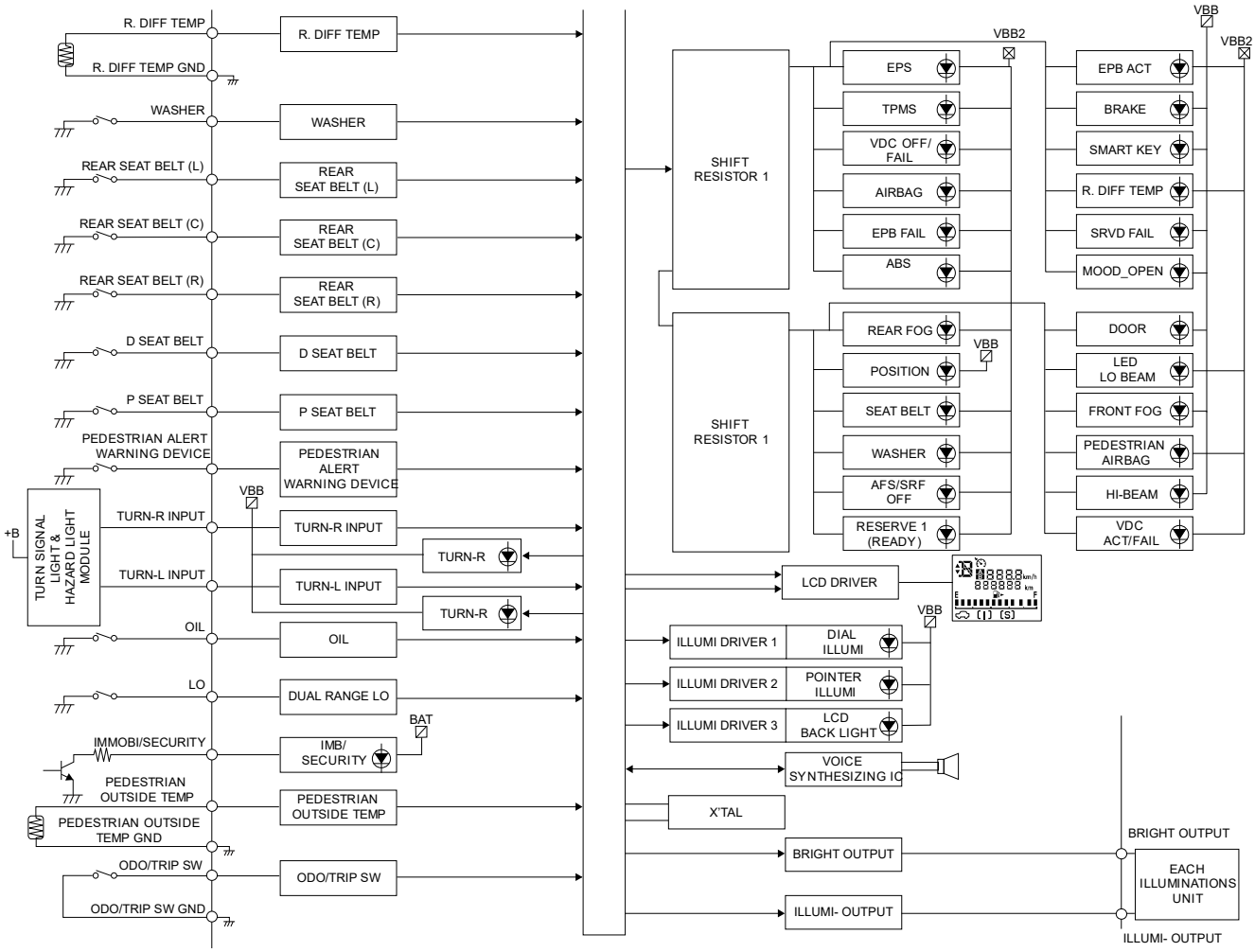


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- Normal meter


MICROCOMPUTER AND RELATED PARTS
FLASH I/F
EEPROM
SP
TA
ECO
LFW
VBB
BAT
+B
IGN
BAT
VBB
IGN
BAT
VBB2
5V POWER SUPPLY
5V
SW5V
SW5V
POWER SUPPLY VOLTAGE MONITORING
IGN DETECTION
5V
RESET
BODY-CAN
BIU
CAN-H
CAN-L
CAN I/F
VBB2
HSA/ EPB_HILL_HOLD
MFD
UART1
UART 1 (SENDING)
TRACTION MODE
WARNING BOX
UART2
UART 2 (SENDING AND RECEIVING)
ISS OFF/FAIL
ISS ACT
AT SHIFT
UART3
UART 3 (SENDING)
LO
BRIGHT SW (ILLUMI CANCEL)
BRIGHT SW INPUT
ECO
SW5V
RESERVE 2 EV MODE
ILLUMI SW POWER SUPPLY
HILL DESCENT ASSIST
ILLUMI VR
ILLUMI VR
AVH
HI-BEAM ASSIST (O)
AUTO LEVEL
ILLUMI GND
AT OIL TEMP
AWD
ISS SW
ISS SW
OIL PRESSURE
X-MODE SW
X-MODE SW
CHARGE
SRVD OFF
FUEL INPUT
FUEL I/F
RESERVE 3 (LANE OFF)
FUEL GND
TEMP-H
SI-DRIVE (2 INPUT)
SI-DRIVE (2 INPUT)
TEMP-C
S#/I
S/I
CHECK ENGINE
OUTSIDE TEMP
OUTSIDE TEMP
OIL LEVEL
OUTSIDE TEMP GND

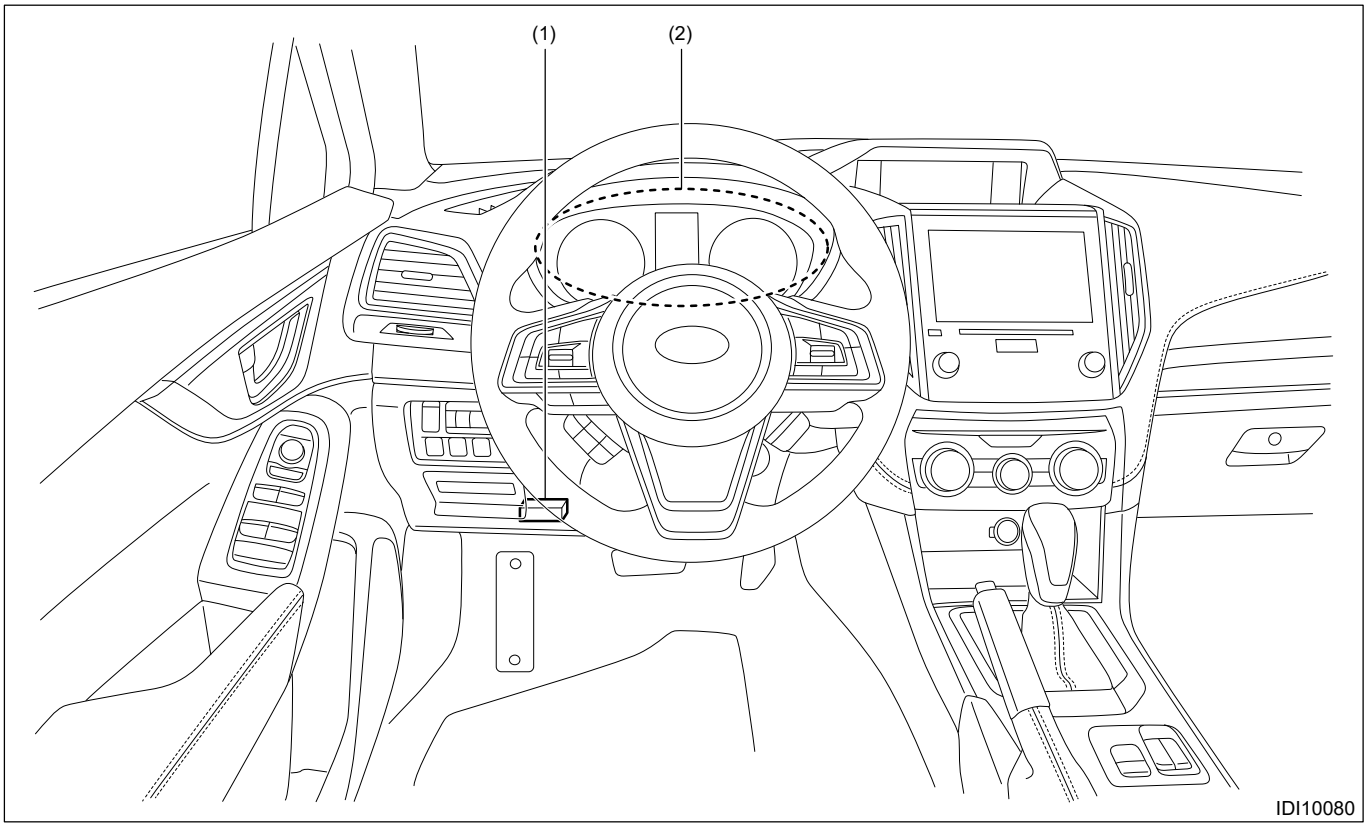
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R. DIFF TEMP
R. DIFF TEMP GND
WASHER
REAR SEAT BELT (L)
REAR SEAT BELT (C)
REAR SEAT BELT (R)
D SEAT BELT
P SEAT BELT
PEDESTRIAN ALERT WARNING DEVICE
+B
TURN SIGNAL LIGHT & HAZARD LIGHT MODULE
TURN-R INPUT
TURN-L INPUT
OIL
LO
IMMOBI/SECURITY
PEDESTRIAN OUTSIDE TEMP
PEDESTRIAN OUTSIDE TEMP GND
ODO/TRIP SW
ODO/TRIP SW GND
VBB
BAT
TURN-R
TURN-R
IMB/ SECURITY
DUAL RANGE LO
PEDESTRIAN ALERT WARNING DEVICE
PEDESTRIAN OUTSIDE TEMP
SHIFT RESISTOR 1
SHIFT RESISTOR 1
EPS
TPMS
VDC OFF/ FAIL
AIRBAG
EPB FAIL
ABS
REAR FOG
POSITION
SEAT BELT
WASHER
AFS/SRF OFF
RESERVE 1 (READY)
VBB2
VBB
EPB ACT
BRAKE
SMART KEY
R. DIFF TEMP
SRVD FAIL
MOOD_OPEN
DOOR
LED LO BEAM
FRONT FOG
PEDESTRIAN AIRBAG
HI-BEAM
VDC ACT/FAIL
LCD DRIVER
ILLUMI DRIVER 1
ILLUMI DRIVER 2
ILLUMI DRIVER 3
DIAL ILLUMI
POINTER ILLUMI
LCD BACK LIGHT
VOICE SYNTHESIZING IC
X'TAL
BRIGHT OUTPUT
ILLUMI- OUTPUT
BRIGHT OUTPUT
EACH ILLUMINATIONS UNIT
ILLUMI- OUTPUT

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COMBINATION METER (DIAGNOSTICS) > Electrical Component Location

LOCATION

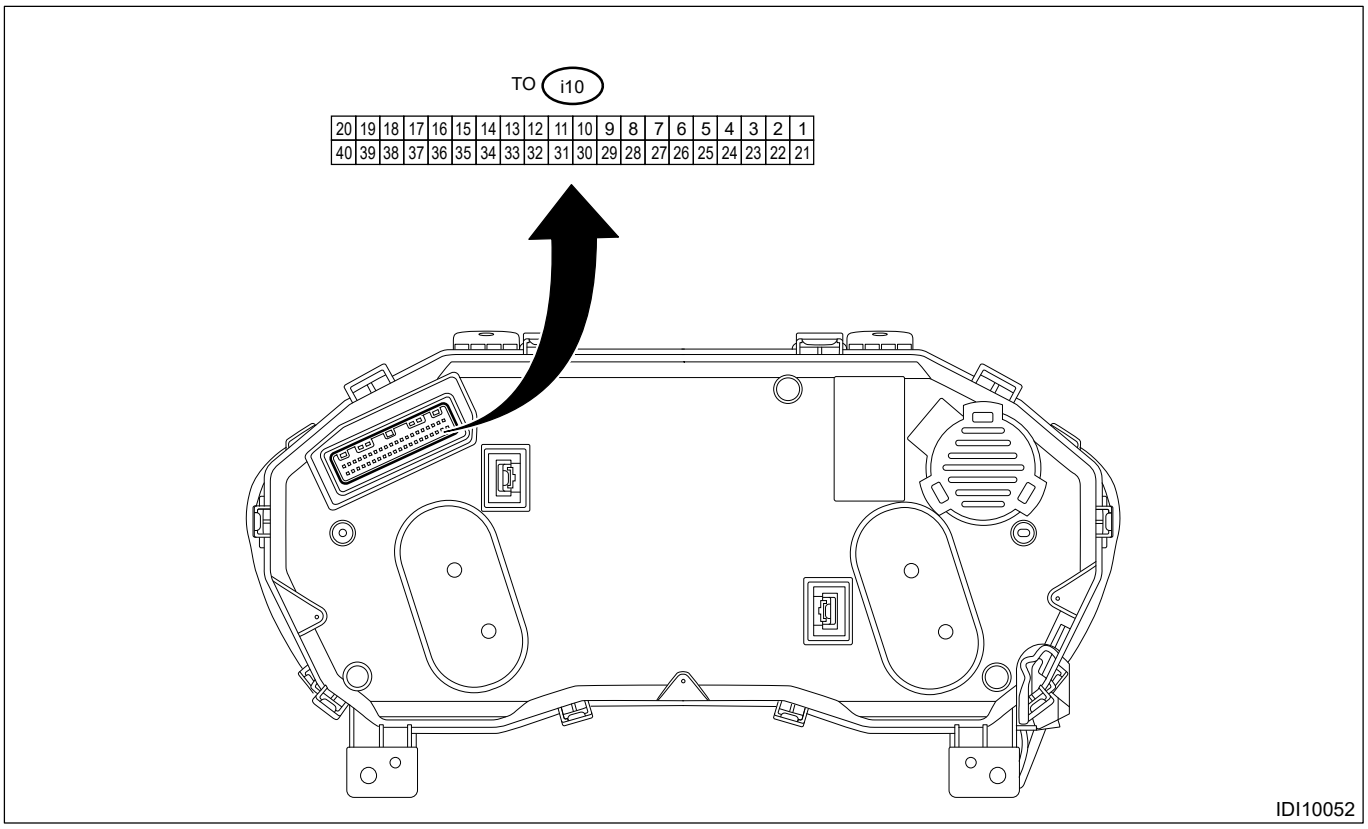


(1) Data link connector

(2) Combination meter

COMBINATION METER (DIAGNOSTICS) > Control Module I/O Signal

ELECTRICAL SPECIFICATION



Terminal No.	Contents	Measuring condition	Standard
(i10) No. 1(+) ←→ Chassis ground (−)	Battery power supply	Always	8 — 16 V
(i10) No. 2(+) ←→ Chassis ground (−)	Ignition power supply (main)	Ignition switch ON	8 — 16 V
(i10) No. 3	—	—	—
(i10) No. 4(+) ←→ Chassis ground (−)	Seat belt (driver’s seat)	Seat belt not fastened → fastened	8 — 16 V → 0 V
(i10) No. 5	Seat belt (passenger’s seat)	Seat belt not fastened → fastened	8 — 16 V → 0 V
(i10) No. 6	CAN H (CAN communication line)	—	—
(i10) No. 7	CAN L (CAN communication line)	—	—
(i10) No. 8	—	—	—
(i10) No. 9	—	—	—
(i10) No. 10	—	—	—

Terminal No.	Contents	Measuring condition	Standard
(i10) No. 11	MFD (UART communication line)	—	—
(i10) No. 12	WARNING BOX (UART communication line)	—	—
(i10) No. 13	—	—	—
(i10) No. 14	Washer fluid level sensor	Washer fluid level sensor OFF → ON	8 — 16 V → 0 V
(i10) No. 15	—	—	—
(i10) No. 16	—	—	—
(i10) No. 17	Charge warning light	—	—
(i10) No. 18	Oil pressure warning light	Oil pressure sensor OFF → ON	8 — 16 V → 0 V
(i10) No. 19	Security indicator	—	—
(i10) No. 20 ←→ Chassis ground	GND	Always	Less than 1 Ω
(i10) No. 21	RH turn indicator	—	—
(i10) No. 22	LH turn indicator	—	—
(i10) No. 23 ←→ (i10) No. 24	Ambient sensor (+)	Always	1 Ω — 35 Ω
(i10) No. 24	Ambient sensor (−)	—	—
(i10) No. 25 ←→ (i10) No. 26	Fuel level sensor (+)	Always	10 Ω — 600 Ω
(i10) No. 26	Fuel level sensor (−)	—	—
(i10) No. 27	Select lever (UART communication line)	—	—
(i10) No. 28	—	—	—
(i10) No. 29	Illumination control switch (GND)	—	—
(i10) No. 30	Illumination control switch (VR)	—	—
(i10) No. 31	Illumination control switch (+)	—	—
(i10) No. 32	Bright switch signal input	—	—
(i10) No. 33	Bright switch signal output	—	—
(i10) No. 34	Illumi. (−) PWM	—	—
(i10) No. 35	—	—	—
(i10) No. 36	—	—	—
(i10) No. 37 ←→ Chassis ground	—	—	—
(i10) No. 38 ←→ Chassis ground	TFT switch (TFT color meter only)	Switch ON	Continuity exists
(i10) No. 39	—	—	—

Terminal No.	Contents	Measuring condition	Standard
(i10) No. 40 ←→ Chassis ground	GND	Always	Less than 1 Ω

COMBINATION METER (DIAGNOSTICS) > Inspection Mode

OPERATION

After the ignition switch is ON, wait for 10 seconds.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Trouble symptom:

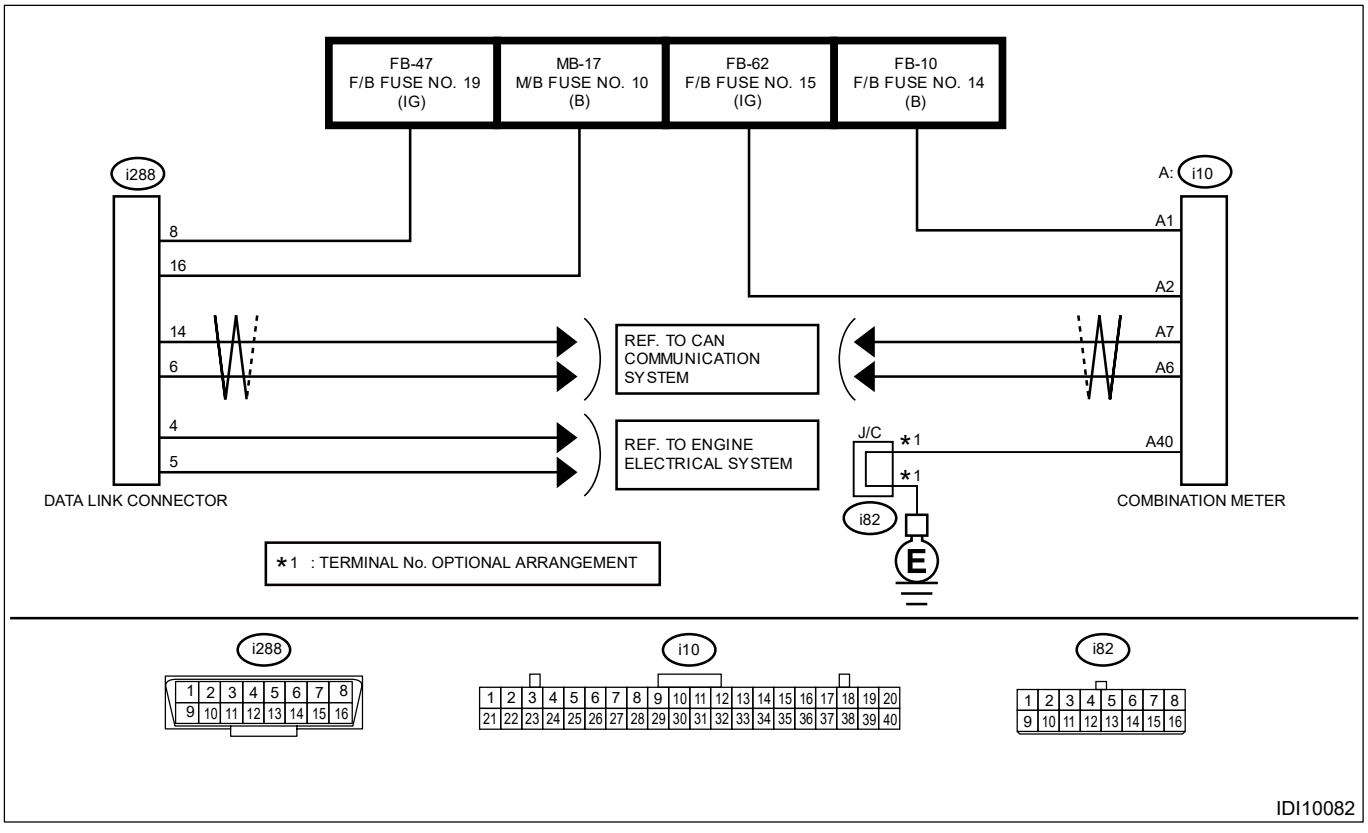
Cannot communicate with [Combination Meter].

Detecting condition:

- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

- Combination meter system Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.
- CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



1. CHECK FUSE.

Check the fuse.

Is the fuse OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the battery — combination meter.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector of combination meter.
3. Turn the ignition switch to ON.
4. Use a tester to measure the voltage between the combination meter connector and chassis ground.

Connector & terminal

(i10) No. 1 (+) — Chassis ground (–):

(i10) No. 2 (+) — Chassis ground (–):

Is the voltage 10 — 13 V?

Yes	Go to 3.
No	Repair the open circuit of harness between combination meter connector and fuse.

3. CHECK HARNESS.

Use a tester to measure the resistance between the combination meter connector and chassis ground.

Connector & terminal

(i10) No. 40 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between combination meter connector and chassis ground.

4. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK COMBINATION METER.

1. Turn the ignition switch to OFF.
2. Connect the combination meter connector.
3. Communicate with [Combination Meter] using the Subaru Select Monitor.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

COMBINATION METER (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to COMBINATION METER (DIAGNOSTICS)>Data Monitor>LIST.**

COMBINATION METER (DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
IG on trip number	Time stamp information	—	—
IG on supply system	Time stamp information	—	—
IG-ON Elapsed Time	Time stamp information	—	—
+B voltage	Battery voltage value	0 — 25 V	—
IGN voltage	Ignition power supply voltage value	0 — 25 V	—
Vehicle speed data	Vehicle speed value detected by meter	0 — 360 km/h	—
Engine speed	Engine speed value detected by meter	0 — 16383	—
Engine coolant water temperature	Engine coolant temperature detected by meter	−40 — 214	—
Fuel level resistance [Ω]	Fuel sensor value display	0 — 511.5Ω	—
Fuel residual quantity indication value [L]	Remaining fuel quantity value display	0 — 80 L	—
Ambient air temperature	External temperature sensor value display	−40 — 80°C	—
Ambient air temperature	Correction value for displaying ambient temperature	−40 — 80°C	—
Outside temperature for diagnosis	External temperature sensor value display	−400 — 419.1°C	—
R.DIFF oil temperature sensing level	Rear differential oil temperature display	−50 — 200°C	—
Drivers seat seat-belt wearing state	Driver's seat belt fastened status	Driver's seat belt seated status Driver's seat belt not fastened status	—
Passenger side seat belt state	Passenger's seat belt fastened status	Passenger's seat belt seated status Passenger's seat belt not fastened status	—

Item	Contents	Standard/Unit	Note
Rear side (right) seat belt state	Rear right seat belt fastened status	Rear right seat belt seated status Rear right seat belt not fastened status	—
Rear seat center seat-belt wearing state	Rear center seat belt fastened status	Rear center seat belt seated status Rear center seat belt not fastened status	—
Rear side (left) seat belt state	Rear left seat belt fastened status	Rear left seat belt seated status Rear left seat belt not fastened status	—
ODO/TRIP switch input state	Input condition of ODO/TRIP switch is displayed	Switch OFF status Switch ON status	—
TFT display reshuffling switch input state	Input condition of TFT display change switch is displayed	Switch OFF status △Switch ON status ▽Switch ON status i/SET switch ON status Input unidentified status	—
Illumination control switch input state	Input condition of illumination control switch is displayed	0 — 100%	—
Bright switch input state	Input condition of bright switch is displayed	Bright OFF status Bright ON status	—
Si-DRIVE switch input state	Input condition of SI-DRIVE switch is displayed	Switch OFF status [S/I] switch input [S#/I] switch [I] switch input [S] switch input [S#] switch input Input unidentified status	—
X mode switch input state	Input condition of X mode switch is displayed	Switch OFF status Switch ON status	—
LO switch input state	Input condition of dual range LO switch is displayed	Switch OFF status Switch ON status	—
idling stop OFF switch input state	Input condition of Auto Start Stop OFF switch is displayed	Switch OPEN status Switch GND status	—
Act place information	Destination information is displayed	Destination is displayed.	—
Fuel tank volume	Fuel tank capacity is displayed	50L / 52L / 55L / 60L / 65L / 70L	—

Item	Contents	Standard/Unit	Note
Tire information	Tire diameter information is displayed	Standard Large diameter	—
Eyesight presence information	Presence/absence information of EyeSight is displayed	Without function With function	—
RADAR ASSY B&S presence information	SRVD function information is displayed.	Without function With function	—
SI-X presence information	X mode information is displayed	Without function With function	—
Auto start & stop presence information	Presence/absence information of Auto Start Stop function is displayed	Without function With function	—
Autoleveler presence information	Presence/absence information of auto headlight beam leveling function is displayed	Without function With function	—
AVN presence information	AVN equipment information is displayed	Without function With function	—
LED headlamp presence information	LED headlight equipment information is displayed	Without function With function	—
Rear DIFF temperature presence information	R.DIFF TEMP light equipment information is displayed	Without function With function	—
SRF OFF information	SRF OFF light equipment information is displayed	Without function With function	—
Gear shift up indicator presence information	GSI equipment information is displayed	Without function With function	—
Warning-BOX presence information	WA-BOX equipment information is displayed	Without function With function	—
Pedestrian airbag presence information	Pedestrian protection airbag equipment information is displayed	Without function With function	—
Rear seat belt warning specification	Rear seat belt warning specification is displayed	Type 1 (with occupant detection at all rear seats) Type 2 (with occupant detection at left/right rear seats only) Type 3 (without occupant detection at any rear seat) Type 4 (undefined. Operating as Type 1)	—
SRH presence information	SRH equipment information is displayed	Without function With function	—
MFD presence information	MFD equipment information is displayed	Standard MFD High grade MFD	—

Item	Contents	Standard/Unit	Note
Vehicle Type information	Vehicle information is displayed.	SDN 5D (WGN) X-SPORT XV (OBK)	—
DCCD presence information	DCCD equipment information is displayed	Without function With function	—
Rear seat belt warning presence information	Presence/absence information of rear seat belt warning function is displayed	Without function With function	—
TPMS presence information	TPMS equipment information is displayed	Without function With function	—
Passenger’s seat belt warning specification	Passenger’s seat belt warning specification is displayed	Type 1 (CAN input) Type 2 (hard wire input)	—

COMBINATION METER (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on the data monitor, refer to the list. Ref. to COMBINATION METER (DIAGNOSTICS)>Freeze Frame Data>LIST.**

COMBINATION METER (DIAGNOSTICS) > Freeze Frame Data

LIST

Items to be displayed	Contents	Standard/Unit	Note
IG on trip number	Time stamp information Ref. to COMMON(diag)>Time Stamp.	—	—
IG on supply system	Time stamp information Ref. to COMMON(diag)>Time Stamp.	—	—
IG-ON Elapsed Time	Time stamp information Ref. to COMMON(diag)>Time Stamp.	—	—

COMBINATION METER (DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [Active Test].
6. On [Active Test] display, select an item to be checked.

Note:

- **For detailed operation procedures, refer to "Application help".**
- **If not equipped (depending on destination area or vehicle equipment condition), process will not go on.**

Caution:

After executing the active test, perform the memory clear. Ref. to COMMON(diag)>Clear memory.

COMBINATION METER (DIAGNOSTICS) > Active Test

LIST

Check meter & gauge operation	Speedometer	0 km/h(MPH)
		40 km/h(MPH)
		80 km/h(MPH)
		120 km/h(MPH)
		160 km/h(MPH)
		200 km/h(MPH)
		240 km/h(MPH)
		280 km/h(MPH)
		Back
	Tacho meter	0 rpm
		1000 rpm
		2000 rpm
		3000 rpm
		4000 rpm
		5000 rpm
		6000 rpm
		7000 rpm
		Back
	Temp gauge	H-Lock
		H Point
		Z Point
		Dial 2 instructions
		Intermediate stability indication

		Dial 1 instructions
		C Point
		C-Lock
		Back
	Fuel gauge	Fuel sender F-point command
		F dial
		Meter 3/4 scale command
		Meter 1/2 scale command
		1/4 dial
		Low fuel warning indicate point
		E dial
		Fuel sender E-point command
		Back
	Eco gauge	+ side MAX
		+ side middle
		0
		- side middle
		- side MAX
		Back
	Back	
Check display operation	Color check	White indication
		Black indication
		Red indication
		Green indication
		Blue indication
		Gradation indication
		Flicker indication
		Cross talking indication
		Back
	Odometer	Display "9"
		Display "8"
		Display "7"
		Display "6"
		Display "5"
		Display "4"
		Display "3"
		Display "2
		Display "1"
		Display "0"
		Back

	Shift Display	Display "P"
		Display "R"
		Display "N"
		Display "D"
		Display "L"
		Display "8"
		Display "7"
		Display "6"
		Display "5"
		Display "4"
		Display "3"
		Display "2
		Display "1"
		Shift up
		Shift down
		Back
	Back	
Check light operation	All lamps lighted	
	High	
	Front fog light	
	Rear fog light	
	Position light	
	HID auto leveler	
	LED LO beam	
	SRH OFF	
	SRF OFF	
	High Beam Assist Active Indicator	
	HBA OFF/FAIL	
	RH turn indicator	
	LH turn indicator	
	BRAKE	
	ABS	
	VDC operation/failure	
	VDC OFF	
	EPB failure	
	EPB active	
	EPB hill hold	
	Hill start assist OFF/failure	
	Hill descent assist	

Vacuum pump failure
VDC TRAC. MODE
EPS
Check E/G
Oil pressure
Charge
E/G remaining oil
Water temperature (HOT)
Water temperature (COOL)
Idling Stop
Auto start stop system OFF/failure
ECO
AWD
AT (CVT) oil temperature
R.DIFF oil temperature
EYESIGHT failure
LANE OFF
P-CR OFF
All seats door
Driver side door
Passenger side door
Rear side (right) door
Rear side (left) door
Reargate open
Trunk open
No-key warning
Driver side seat belt
Airbag
TPMS
Pedestrian airbag
Remaining washer fluid
Remaining fuel
120km/h
Dual-range LO indicator
SRVD
SRVD OFF
CRUISE indicator
SET indicator
[S]indicator

[I]indicator
[S#]indicator
[X]indicator
Back

Check illumination operation
Brightness check

Check buzzer operation

Check external ECM output operation
Warning Lamp Box
Shift indicator

Back

COMBINATION METER (DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Combination Meter], and then select [Enter].
5. On [Select Function] display, select [Customize].
6. On [Customize] display, select an item to be customized.

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **For details on customization, refer to the list. Ref. to COMBINATION METER (DIAGNOSTICS)>Customize>LIST.**
   - **If not equipped (depending on destination area or vehicle equipment condition), some items are not displayed.**

COMBINATION METER (DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Note
Air temperature correction	±0°C	−5°C —+5°C	Temperature compensation can only be performed by 1°C (1°C = 1.8°F) interval.
Mean fuel efficiency correction	±0%	+10% ——10%	—
Demonstration mode permission / fault permission	OFF	OFF / ON	Demonstration mode must not be permitted when used by a customer.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

COMBINATION METER (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B1500	FUEL SENDER OPEN DETECTED	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1500 FUEL SENDER OPEN DETECTED.
B1501	POWER SUPPLY SYSTEM ERROR DETECTION	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1501 POWER SUPPLY SYSTEM ERROR DETECTION.
B1502	WARNING BOX COMMUNICATION MALFUNCTION	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1502 WARNING BOX COMMUNICATION MALFUNCTION.
B1503	METER CONTROL MODULE CAN REGISTER STUCK	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1503 METER CONTROL MODULE CAN REGISTER STUCK.
B1507	OUTSIDE TEMPERATURE SENSOR OPEN DETECTED	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B1507 OUTSIDE TEMPERATURE SENSOR OPEN DETECTED.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.

Code	Description & trouble part	Reference
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0101	LOST COMMUNICATION WITH TCM	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0127	LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE.
U0128	LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE.
U0131	LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0156	LOST COMMUNICATION WITH INFORMATION CENTER "A"	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A".

Code	Description & trouble part	Reference
U0162	LOST COMMUNICATION WITH AUTO VISUAL NAVIGATION DISPLAY MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE.
U0181	LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE.
U0327	SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE.
U1232	LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE.
U1235	LOST COMMUNICATION WITH EyeSight	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1235 LOST COMMUNICATION WITH EyeSight.
U1433	INVALID DATA RECEIVED FROM EyeSight	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1433 INVALID DATA RECEIVED FROM EyeSight.
U1533	INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE	Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1500 FUEL SENDER OPEN DETECTED

DTC detecting condition:

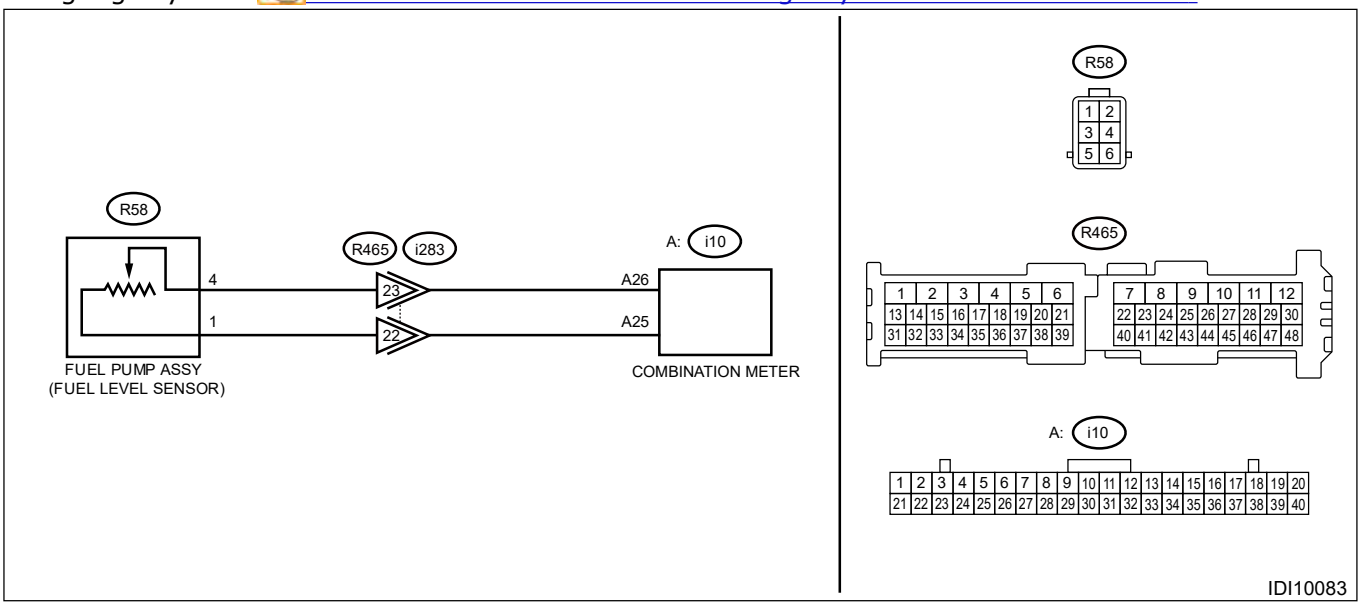
Open circuit in fuel gauge circuit

Trouble symptom:

- Defective fuel gauge.
- Fuel level warning light blinks.

Wiring diagram:

Fuel gauge system Ref. to WIRING SYSTEM>Fuel Gauge System>WIRING DIAGRAM.



1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1500 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 6.

2. CHECK COMBINATION METER.

1. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Active Test.
   - [Fuel Meter Operation]
   - [Remaining fuel warning]

Is the operation of [Fuel Meter Operation] and [Remaining fuel warning] OK?

Yes	Go to 3.
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector and fuel level sensor connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 25 — (R58) No. 1:

(i10) No. 26 — (R58) No. 4:

Is the resistance 10 Ω or less?

Yes	Go to 4.
No	Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 25 — Chassis ground:

(i10) No. 26 — Chassis ground:

Is the resistance 10 Ω or less?

Yes	Repair the short circuit of harness or replace harness.
No	Go to 5.

5. CHECK FUEL LEVEL SENSOR.

Check the fuel sub level sensor as a single part. Ref. to FUEL INJECTION (FUEL SYSTEMS) (H4DO)>Fuel Level Sensor.

Is the check result OK?

Yes	Go to 6.
No	Replace the sensor. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Fuel Level Sensor.

6. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect connectors.

Is there poor contact of connector?

Yes	Repair or replace the poor contact of connector.
No	Go to 7.

7. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Fuel level resistance]

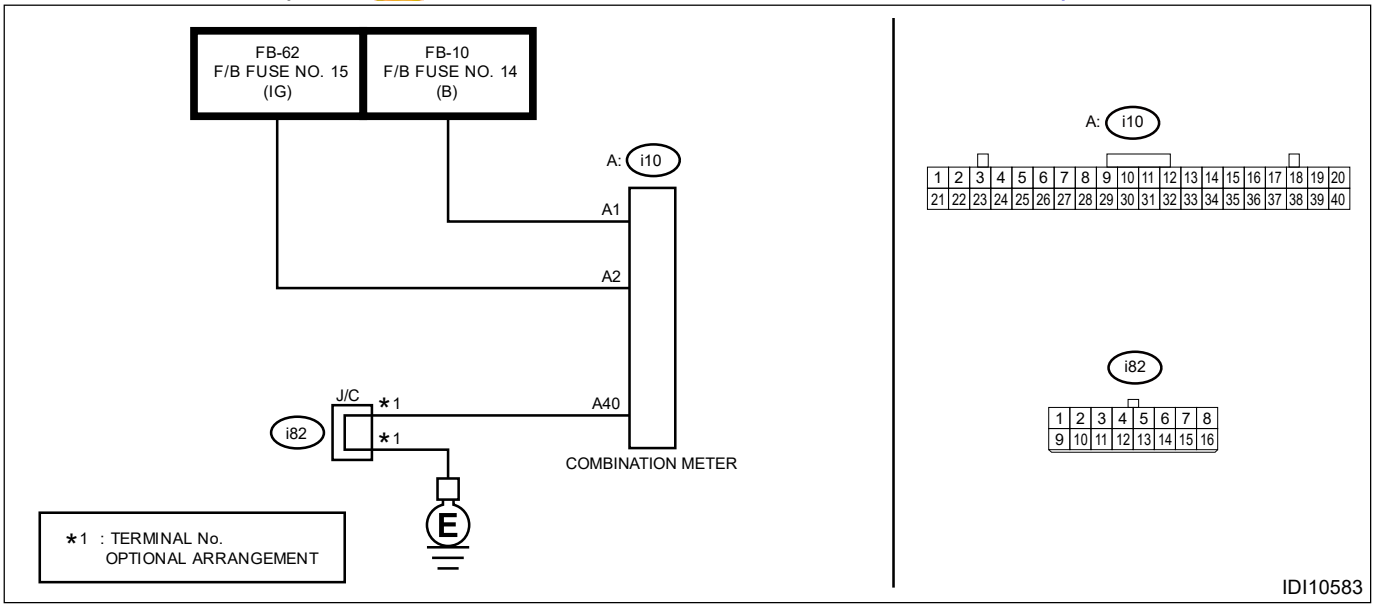
Does [Fuel level resistance] indicate 15 — 480 Ω?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the combination meter. Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1501 POWER SUPPLY SYSTEM ERROR DETECTION

DTC detecting condition:
Open or short in combination meter power supply circuit
Trouble symptom:
Defective operation of combination meter
Wiring diagram:
Combination meter system Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to COMBINATION METER (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK POWER SUPPLY CIRCUIT.

Turn the ignition switch to ON, and confirm that the illumination of combination meter lights.

Does the illumination light?

Yes	Go to 2.
No	Go to 3.

2. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1501 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 5.

3. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse. Ref. to INSTRUMENTATION/DRIVER INFO>Relay and Fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the defective fuse.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the meter connector.
3. Using the tester, measure the voltage between terminals.

Connector & terminal

(i10) No. 1 (+) — Chassis ground (−):

(i10) No. 2 (+) — Chassis ground (−):

Is the voltage 8.5 — 16.5 V?

Yes	Go to 5.
No	Repair the open circuit of harness or replace harness.

5. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect connectors.
3. Check for poor contact of connector.

Is the check result OK?

Yes	A temporary change of voltage occurred.
No	Repair or replace the poor contact of connector.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1502 WARNING BOX COMMUNICATION MALFUNCTION

DTC detecting condition:

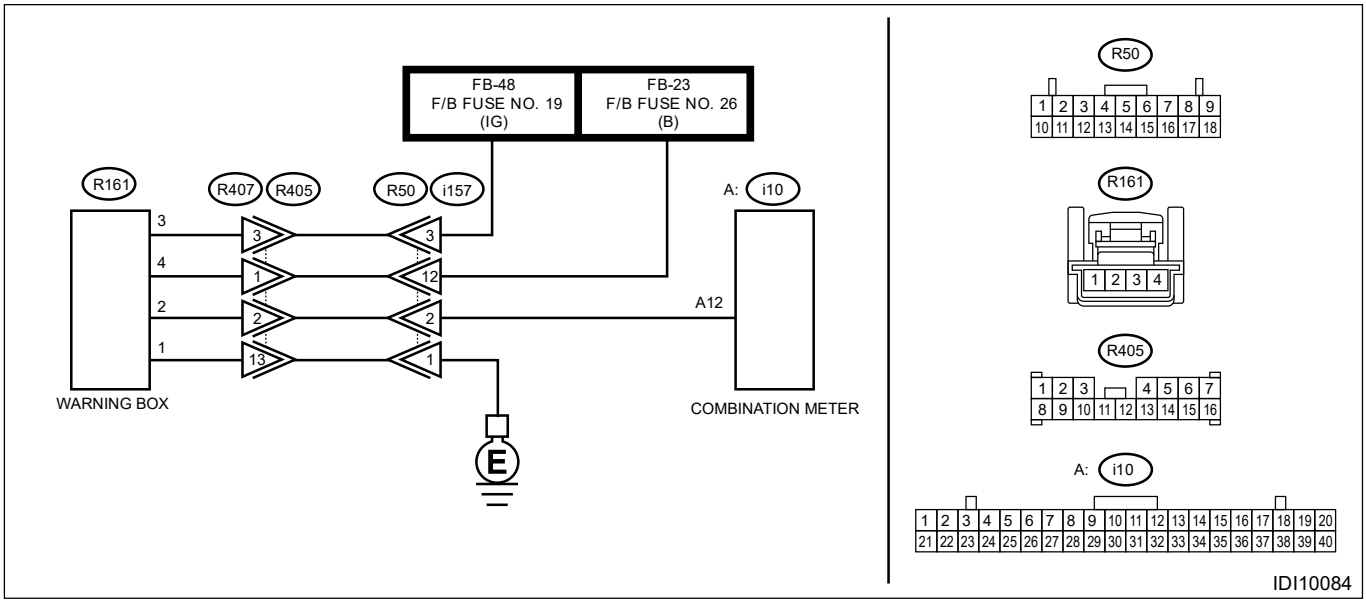
Communication error between combination meter and spot map light

Trouble symptom:

Malfunction of the warning light inside the spot map light

Wiring diagram:

Combination meter system Ref. to WIRING SYSTEM>Combination Meter System>WIRING DIAGRAM.



1. CHECK POWER SUPPLY CIRCUIT.

Turn the ignition switch to ON, and make sure that the combination meter operates properly.

Is the check result OK?

Yes	Go to 2.
No	Check the combination meter power supply circuit.

2. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1502 displayed? (Current malfunction)

Yes	Go to 3.
No	Go to 4.

3. CHECK COMMUNICATION CIRCUIT (HARNESS) (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector.
3. Disconnect the warning box connector.
4. Measure the resistance between combination meter connector and warning box connector.
   Connector & terminal
   (i10) No. 12 — (R161) No. 2:

Is the resistance less than 10 Ω?

Yes	Replace the warning box. Ref. to INSTRUMENTATION/DRIVER INFO>Warning Box.
No	Repair the open circuit of harness between combination meter connector and warning box connector.

4. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect the combination meter connector.
3. Disconnect the warning box connector.

Is there any fault in the connector?

Yes	Repair or replace the connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1503 METER CONTROL MODULE CAN REGISTER STUCK

DTC detecting condition:
Combination meter CAN controller malfunction
Trouble symptom:
Normal operation becomes impossible because the communication with other parts is not established.

1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B1502 displayed? (Current malfunction)

Yes	Replace the combination meter. (Defective hardware or software) Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.
No	Replace the combination meter. (Temporarily defective hardware or software) Ref. to INSTRUMENTATION/DRIVER INFO>Combination Meter.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B1507 OUTSIDE TEMPERATURE SENSOR OPEN DETECTED

DTC detecting condition:

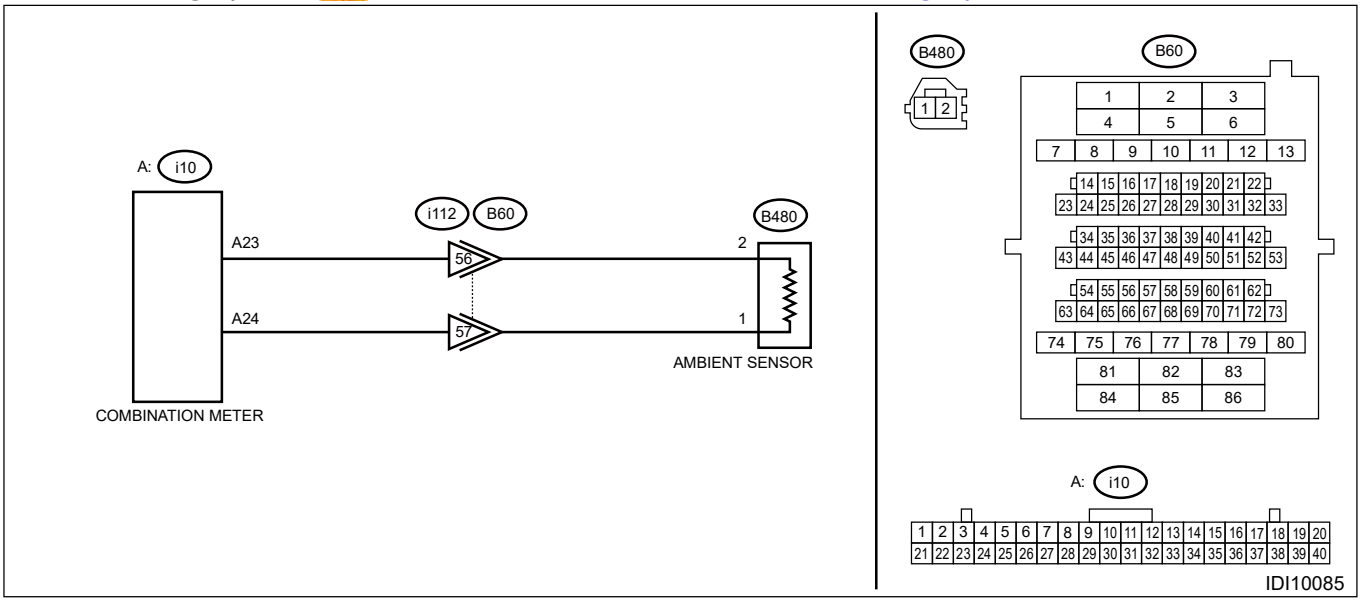
Open or short circuit in ambient sensor

Trouble symptom:

- Defective ambient temperature display
- Defective air conditioner operation

Wiring diagram:

Air conditioning system Ref. to WIRING SYSTEM>Air Conditioning System>WIRING DIAGRAM.



1. CHECK DTC.

Read the DTC of [Combination Meter] using the Subaru Select Monitor. Ref. to COMBINATION METER (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B1507 displayed? (Current malfunction)

Yes	Go to 2.
No	Go to 6.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Combination Meter]. Ref. to COMBINATION METER (DIAGNOSTICS)>Data Monitor.



- [Ambient air temperature]

Is [Ambient air temperature] displayed?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the meter connector and ambient sensor connector.
3. Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 23 — (B480) No. 2:

(i10) No. 24 — (B480) No. 1:

Is the resistance 10 Ω or less?

Yes	Go to 4.
No	Repair the open circuit of harness or replace harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between terminals.

Connector & terminal

(i10) No. 23 — Chassis ground:

(i10) No. 24 — Chassis ground:

Is the resistance 10 Ω or less?

Yes	Repair the short circuit of harness or replace harness.
No	Go to 5.

5. CHECK AMBIENT SENSOR.

Perform the inspection of ambient sensor unit. Ref. to AIR CONDITIONER>Ambient Sensor.

Is the check result OK?

Yes	Go to 6.
No	Replace the sensor. Ref. to AIR CONDITIONER>Ambient Sensor.

6. CHECK CONNECTOR.

1. Turn the ignition switch to OFF.
2. Disconnect connectors.

Is there poor contact of connector?

Yes	Repair or replace the poor contact of connector.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from the engine control module (ECM) does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0127 LOST COMMUNICATION WITH TIRE PRESSURE MONITOR CONTROL MODULE AND/OR KEYLESS ENTRY CONTROL MODULE

Detected when CAN data from keyless entry CM or TPMS CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0128 LOST COMMUNICATION WITH PARK BRAKE CONTROL MODULE

Detected when CAN data from VDC CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0131 LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE

Detected when CAN data from electric power steering CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data is not received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

Detected when CAN data is not received from airbag CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0156 LOST COMMUNICATION WITH INFORMATION CENTER "A"

Detected when CAN data from MFD does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0162 LOST COMMUNICATION WITH AUDIO VISUAL NAVIGATION DISPLAY MODULE

Detected when CAN data from AVN does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0164 LOST COMMUNICATION WITH HVAC CONTROL MODULE

Detected when CAN data from A/C control panel does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0167 LOST COMMUNICATION WITH IMMOBILIZER CONTROL MODULE

Detected when CAN data from immobilizer CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0181 LOST COMMUNICATION WITH HEADLAMP LEVELING CONTROL MODULE

Detected when CAN data is not received from auto headlight beam leveler CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0327 SOFTWARE INCOMPATIBILITY WITH VEHICLE SECURITY CONTROL MODULE

Detected when CAN data from keyless access CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN

Detected when CAN data is not received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1232 LOST COMMUNICATION WITH REAR/SIDE RADAR CONTROL MODULE

Detected when CAN data from the radar sensor does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1235 LOST COMMUNICATION WITH EYESIGHT

Detected when CAN data from stereo camera does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1433 INVALID DATA RECEIVED FROM EYESIGHT

Detected when CAN data from stereo camera is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

COMBINATION METER (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1533 INVALID DATA RECEIVED FROM REAR/SIDE RADAR CONTROL MODULE

Detected when CAN data from radar sensor is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

INFOTAINMENT(DIAGNOSTICS)

INF(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Customize
12. Work Support
13. Diagnostic Trouble Code (DTC)
14. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
15. Diagnostics with Phenomenon
16. Service Diagnostics Mode

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to INFOTAINMENT(DIAGNOSTICS) >Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Infotainment].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

DTC Check

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to INFOTAINMENT(DIAGNOSTICS) >Inspection Mode.
5. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

INFOTAINMENT(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="2">Infotainment Check List for Interview</td><td colspan="2">Brought in on: Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•
•</td></tr>
<tr><td rowspan="3">Product information</td><td>Part No.</td><td>Manufacturer model number</td><td>Serial No.</td></tr>
<tr><td colspan="3">Software version*1</td></tr>
<tr><td colspan="3">Connected device (example: iPod connected via USB cable)</td></tr>
<tr><td>SUBARU STARLINK connection ID*1</td><td colspan="3"></td></tr>
<tr><td>SUBARU STARLINK app version</td><td colspan="3"></td></tr>
<tr><td rowspan="3">Mobile phone</td><td colspan="3">Mobile phone carrier (example: AT&T)</td></tr>
<tr><td colspan="3">Mobile phone model (example: Apple iPhone 6)</td></tr>
<tr><td colspan="3">Mobile phone OS version (example: software version information)</td></tr>
<tr><td>Date when problem occurred</td><td colspan="3">Year Month Date</td></tr>
<tr><td rowspan="3">Conditions at event</td><td colspan="3">Weather
❑Fine ❑Cloudy ❑Rainy ❑Snowy ❑Others ( )</td></tr>
<tr><td colspan="3">Temperature
°C (°F)</td></tr>
<tr><td colspan="3">How often
❑Always (Check here if reproduced.) ❑Once in the past ❑Sometimes (times a day / times a week / times a month)</td></tr>
<tr><td>When</td><td colspan="3">Example: It occurs about 30 minutes after driving.</td></tr>
<tr><td>Occurrence condition 1 (In what situations did it occur?)</td><td colspan="3">❑Fast Driving ❑Rough Roads ❑Parked ❑Unknown ❑Others</td></tr>
<tr><td>Occurrence condition 2 (In what operations did</td><td colspan="3">❑ACC On ❑Insert Disc ❑Press Specific Button or Mode ❑Press Specific Button or Mode ❑Unknown ❑Others</td></tr>
</table>

it occur?)	
Recovering condition (What helped the status return to normal?)	❑Recover on its own ❑ACC Off and On ❑Does not recover ❑Others
Occurrence location	❑Unknown ❑Any Place ❑Driving around open areas like in the country ❑ Driving around hills or mountains ❑Driving around cities with large buildings ❑Driving around residential areas or no large buildings ❑Driving around areas with power
Error message content (error message displayed)	
Display trouble	❑Black screen ❑White screen ❑Blue screen ❑Dim ❑Vertical/horizontal noise (lines) ❑Poor color tone ❑Unclear ❑Display corruption ❑No picture ❑Others
Occurrence conditions (screen display related problems)	❑Navigation ❑CD ❑Radio ❑External devices ❑Others
Operating problems	❑Display does not switch ❑Display changes unexpectedly ❑Response is dull•slow ❑Does not respond to key entry ❑Does not respond to steering switch entry ❑Does not change to night mode screen ❑Discs cannot be inserted or ejected ❑Others
Display/touch switch malfunction	❑Brightness / Contrast ❑Discoloration ❑No rear camera ❑Partial Display ❑ Lines in screen ❑No Audio Control Screen ❑No Navi Map on Screen ❑Others
Voice recognition malfunction	❑Voice recognition is not ready ❑Not recognize commands ❑Others
BEEP on operation entry	❑Yes ❑No
Radio malfunction	❑AM: Station (Hz) ❑FM: Station (Hz) ❑SXM: Station (channel) (only for North America) ❑HD: Station (channel) (only for North America) ❑No Sound ❑No / Poor Sound ❑Noise / Static ❑Sound cuts in / out ❑Others
SW color change at operation	❑Yes ❑No
Audio malfunction	❑Does not sound ❑Front (❑R ❑L) ❑Rear (❑R ❑L)❑Others ( ) ❑Operation related problems ❑Cannot adjust volume level ❑Cannot use tone control or adjust tone range ❑Cannot record ❑Sound skipping ❑CD ❑DVD ❑Others ( ) •Specific mode/disc ( )
CD/USB/SD/iPod malfunction	❑Will not accept ❑Will not eject (CD) ❑Will not play ❑Skips / Jump Chapter ❑No Sound ❑Noise / Static ❑Sound cuts in / out ❑Shows Error ❑Others

Fault in navigation system	❑Cursor or map rotating ❑Wrong location of vehicle ❑Cursor hopping during driving ❑Map image incomplete ❑No GPS marks displayed ❑Incorrect time display ❑Guide not initiated ❑No route search ❑Caution remains on navigation screen ❑Unexpected return back to opening screen ❑No Voice Guidance ❑ Guidance Volume too Low ❑Will Not Read Data ❑Will Not Update ❑Destination / Route Problem ❑Display Does Not Change (Frozen) ❑Overall Navi Operation Slow ❑No GPS reception ❑Others
Bluetooth Audio related malfunction	❑Will Not Pair ❑Will Not Play ❑No Sound ❑Noise / Static ❑Disconnect on its own ❑Others
Bluetooth handsfree related malfunction	❑Will Not Pair ❑Cannot Hear (Receiver) ❑Cannot Hear (Caller) ❑Sounds Garbled ❑Address Book Will Not Transfer ❑Disconnect on its own
SUBARU STARLINK malfunction	❑Bluetooth connection not established ❑SUBARU STARLINK app disabled ❑Communication gets out of service ❑Pandora disabled ❑AHA disabled ❑ USB connection not established ❑Others
Check result	Reproductivity ❑Reproduced ❑Always ❑Sometimes ❑Cannot be reproduced ❑Others Condition ❑Cold ❑Warm ❑At starting ❑Immediately after starting ❑During warm-up ❑At idling ❑When start driving ❑While driving ❑At acceleration ❑At deceleration ❑ When applying brake

*1: For each confirmation procedure, refer to the corresponding service diagnostics mode. Ref. to INFOTAINMENT(DIAGNOSTICS) >Service Diagnostics Mode.

INFOTAINMENT(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Refer to "CAUTION" in "General Description" in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. INFOTAINMENT SYSTEM

Refer to "CAUTION" in "General Description" in ENTERTAINMENT & MONITORING. Ref. to ENTERTAINMENT & MONITORING>General Description>CAUTION.

INFOTAINMENT(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect the problems related to infotainment.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the relay and fuse condition. Ref. to ENTERTAINMENT & MONITORING>Relay and Fuse.
3. Check the connecting condition of harness and harness connector.

INFOTAINMENT(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

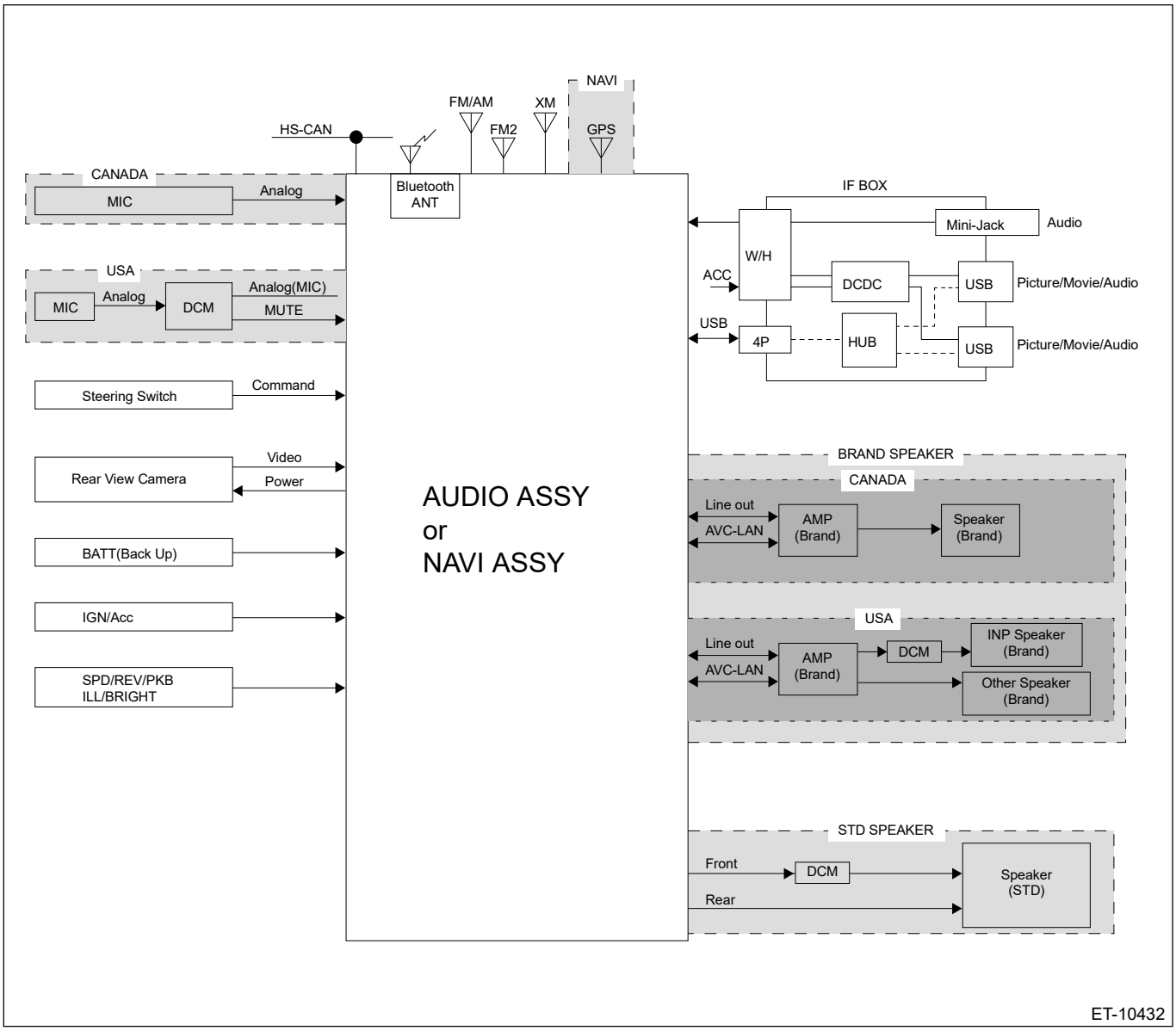
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

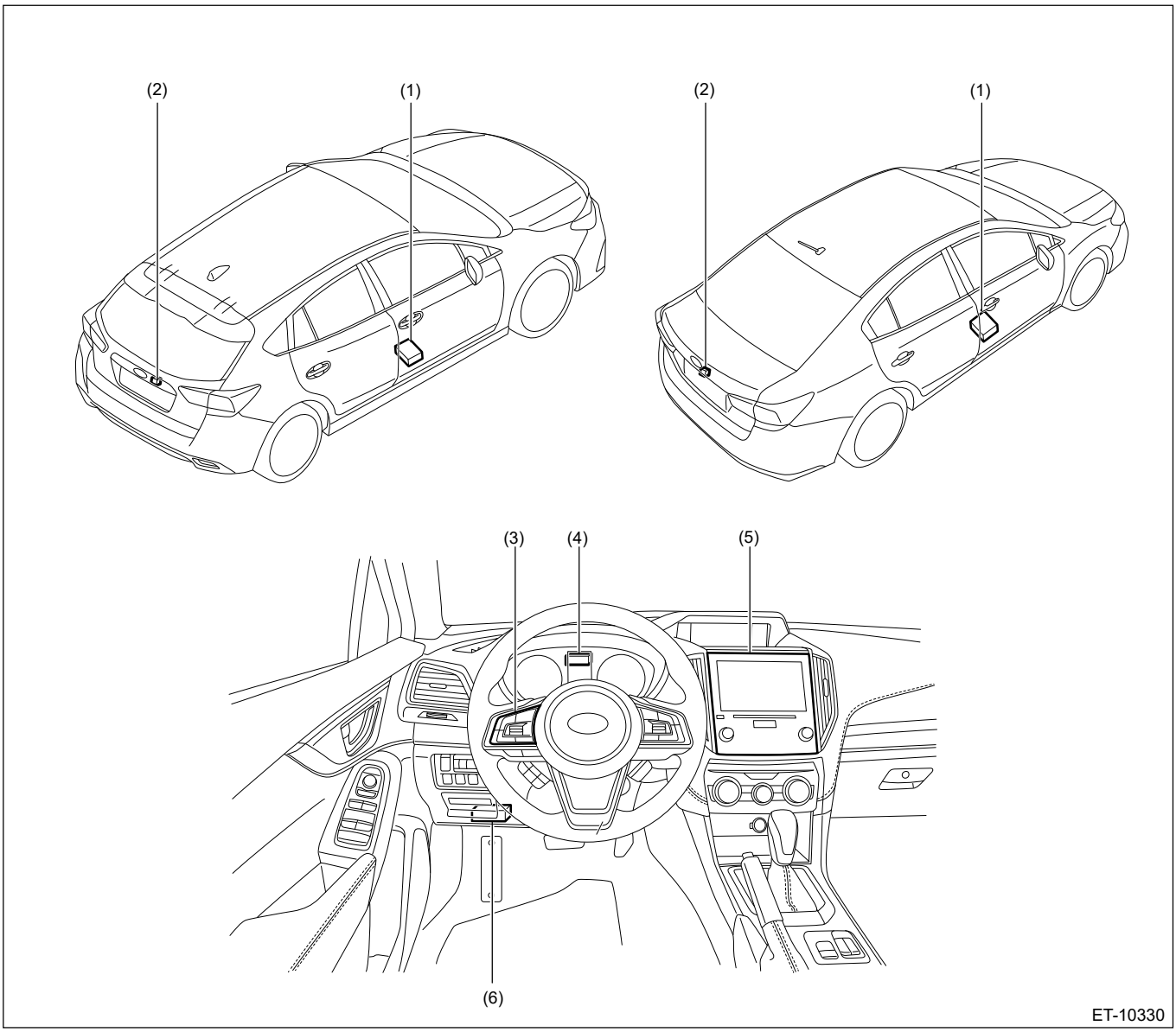
INFOTAINMENT(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM



INFOTAINMENT(DIAGNOSTICS) > Electrical Component Location

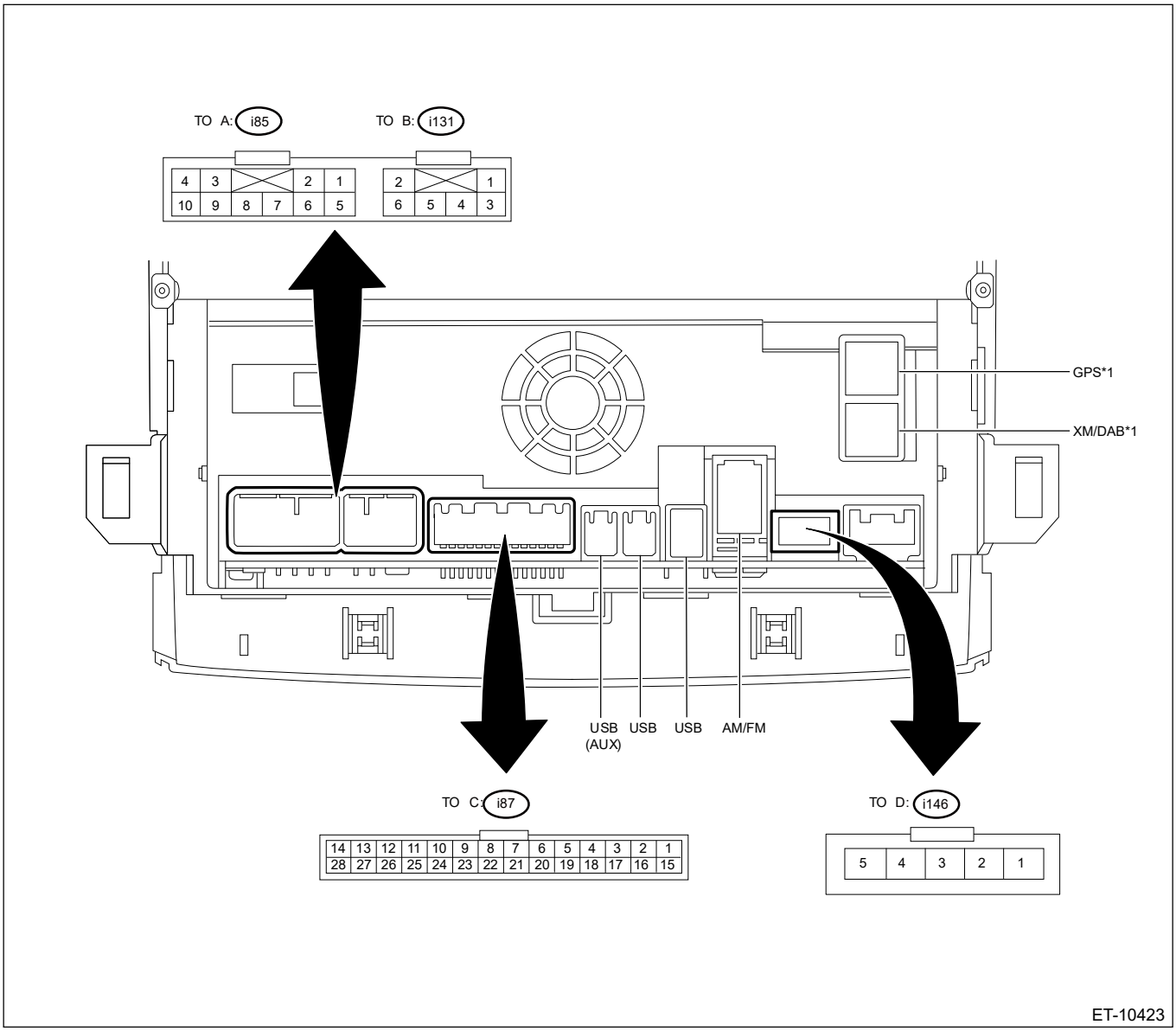
LOCATION



(1) Audio amplifier (if equipped)
(2) Rearview camera (if equipped)
(3) Satellite switch
(4) GPS antenna (if equipped)
(5) Audio or navigation unit
(6) Data link connector

ELECTRICAL SPECIFICATION

1. NAVIGATION UNIT OR AUDIO



*1: Equipped with unit

- Power supply and speaker output terminal

Terminal No.	Contents	Measuring condition	Standard
(i85) No. 1	FR+	—	—
(i85) No. 2	FL+	—	—
(i85) No. 3 ←→ Chassis ground	+ACC	ACC ON	11 — 15 V
(i85) No. 4 ←→ Chassis ground	+B	Always	11 — 15 V

Terminal No.	Contents	Measuring condition	Standard
(i85) No. 5	FR−	—	—
(i85) No. 6	FL−	—	—
(i85) No. 7 ←→ Chassis ground	GND	Always	0 V
(i85) No. 8	ANT-ON	—	—
(i85) No. 9	—	—	—
(i85) No. 10	IILL+	—	—
(i131) No. 1	RR+	—	—
(i131) No. 2	RL+	—	—
(i131) No. 3	RR−	—	—
(i131) No. 4	—	—	—
(i131) No. 5	ILL−	—	—
(i131) No. 6	RL−	—	—

- Steering switch and AUX input terminal for microphone etc.

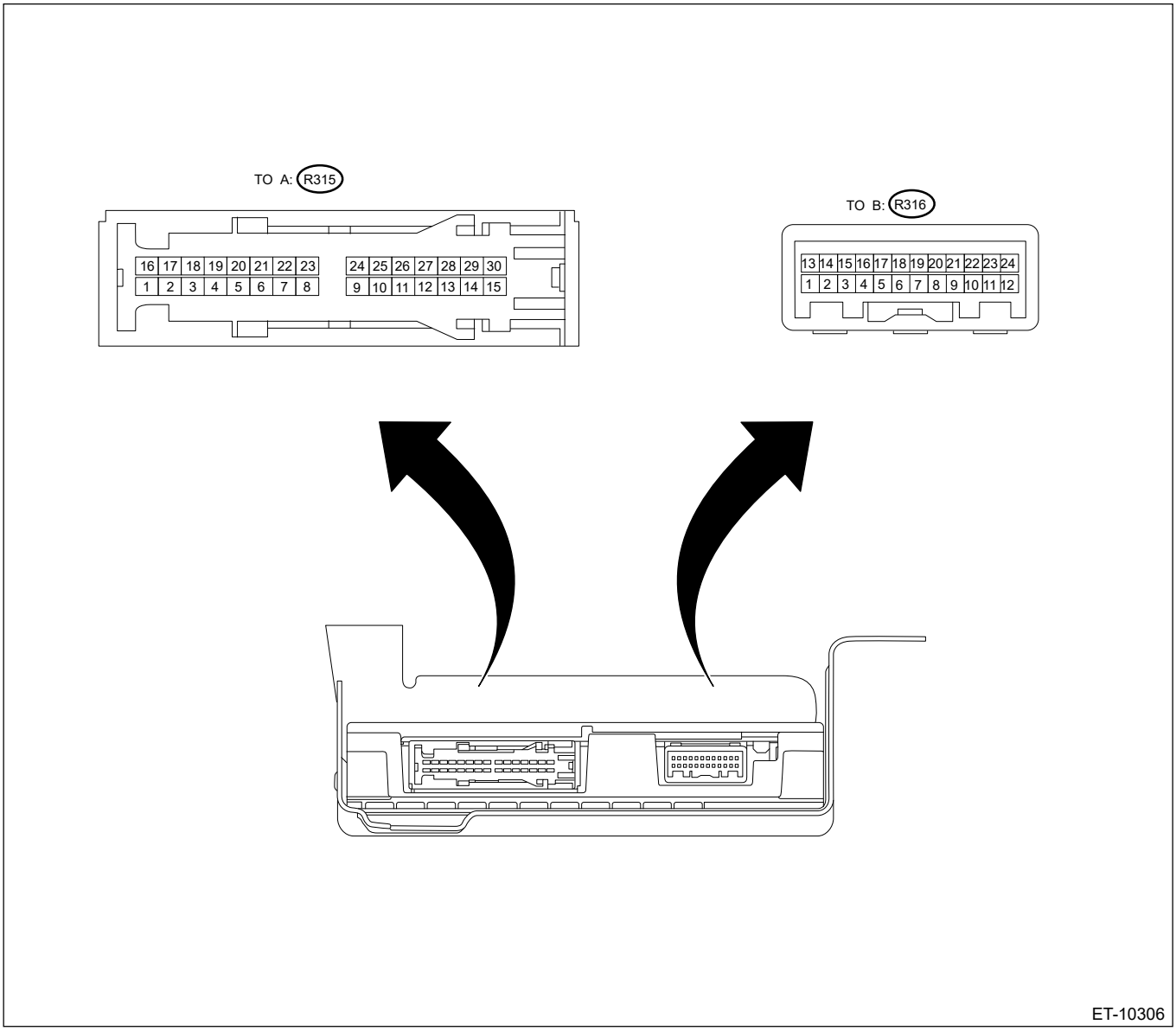
Terminal No.	Contents	Measuring condition	Standard
(i87) No. 1 ←→ Chassis ground	IGN	IGN ON	11 — 15 V
(i87) No. 2	REVERSE	—	—
(i87) No. 3	BRIGHT	—	—
(i87) No. 4	VCC	—	—
(i87) No. 5	MIC+	—	—
(i87) No. 6	MIC DET	—	—
(i87) No. 7	AMP CAN+	—	—
(i87) No. 8	AMP CAN−	—	—
(i87) No. 9	CAN+	—	—
(i87) No. 10	CAN−	—	—
(i87) No. 11	AC-UART (+)	—	—
(i87) No. 12	AC-UART (−)	—	—
(i87) No. 13	MIC2+	—	—
(i87) No. 14	MIC2−	—	—
(i87) No. 15 ←→ Chassis ground	PKB	At parking ON	1 V or less
(i87) No. 16	AMP MUTE	—	—
(i87) No. 17	—	—	—
(i87) No. 18	SGND	—	—
(i87) No. 19	MIC−	—	—
(i87) No. 20	TEST	—	—
(i87) No. 21	STEERING SW1+	—	—
(i87) No. 22	STEERING SW2+	—	—

Terminal No.	Contents	Measuring condition	Standard
(i87) No. 23	STEERING GND	—	—
(i87) No. 24	DCM MUTE	—	—
(i87) No. 25	FRONT ON	—	—
(i87) No. 26	R SIG	—	—
(i87) No. 27	R/L SIG	—	—
(i87) No. 28	L SIG	—	—

- Rearview camera

Terminal No.	Contents	Measuring condition	Standard
(i146) No. 1 ←→ Chassis ground	GND	Always	0 V
(i146) No. 2	6V+	—	—
(i146) No. 3	CA+	—	—
(i146) No. 4	CV−	—	—
(i146) No. 5	—	—	—

2. POWER AMPLIFIER



Terminal No.	Contents	Measuring condition	Standard
(R315) No. 1 ←→ Chassis ground	+B	Always	Battery voltage
(R315) No. 2	—	—	—
(R315) No. 3 ←→ Chassis ground	GND	Always	0 V
(R315) No. 4	—	—	—
(R315) No. 5	—	—	—
(R315) No. 6	—	—	—
(R315) No. 7	—	—	—
(R315) No. 8	—	—	—
(R315) No. 9	TWR+	—	—
(R315) No. 10	—	—	—
(R315) No. 11	FL+	—	—

Terminal No.	Contents	Measuring condition	Standard
(R315) No. 12	FR+	—	—
(R315) No. 13	TWL+	—	—
(R315) No. 14	RL+	—	—
(R315) No. 15	RR+	—	—
(R315) No. 16	+B2	Always	Battery voltage
(R315) No. 17	—	—	—
(R315) No. 18	GND2	Always	0 V
(R315) No. 19	—	—	—
(R315) No. 20	—	—	—
(R315) No. 21	—	—	—
(R315) No. 22	—	—	—
(R315) No. 23	—	—	—
(R315) No. 24	TWR−	—	—
(R315) No. 25	—	—	—
(R315) No. 26	FL−	—	—
(R315) No. 27	FR−	—	—
(R315) No. 28	TWL−	—	—
(R315) No. 29	RL−	—	—
(R315) No. 30	RR−	—	—
(R316) No. 1	MUTE	—	—
(R316) No. 2	L−	—	—
(R316) No. 3	L+	—	—
(R316) No. 4	R−	—	—
(R316) No. 5	R+	—	—
(R316) No. 6	SLD	—	—
(R316) No. 7	TX−	—	—
(R316) No. 8	TX+	—	—
(R316) No. 9	—	—	—
(R316) No. 10	—	—	—
(R316) No. 11	—	—	—
(R316) No. 12	ACC	—	—
(R316) No. 13	NC	—	—
(R316) No. 14	II1−	—	—
(R316) No. 15	II1+	—	—
(R316) No. 16	NC	—	—
(R316) No. 17	NC	—	—
(R316) No. 18	SLD2	—	—
(R316) No. 19	NC	—	—
(R316) No. 20	NC	—	—

Terminal No.	Contents	Measuring condition	Standard
(R316) No. 21	—	—	—
(R316) No. 22	—	—	—
(R316) No. 23	—	—	—
(R316) No. 24	—	—	—

INFOTAINMENT(DIAGNOSTICS) > Inspection Mode

PROCEDURE

DTC can be diagnosed by executing the Inspection Mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Infotainment] to check that there is no DTC displayed. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Turn the ignition switch to ON, and wait for 1 minute or more.
4. Using the Subaru Select Monitor, read the DTC of [Infotainment] to check that there is no DTC displayed. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

When communication with the navigation unit is impossible

Detecting condition:

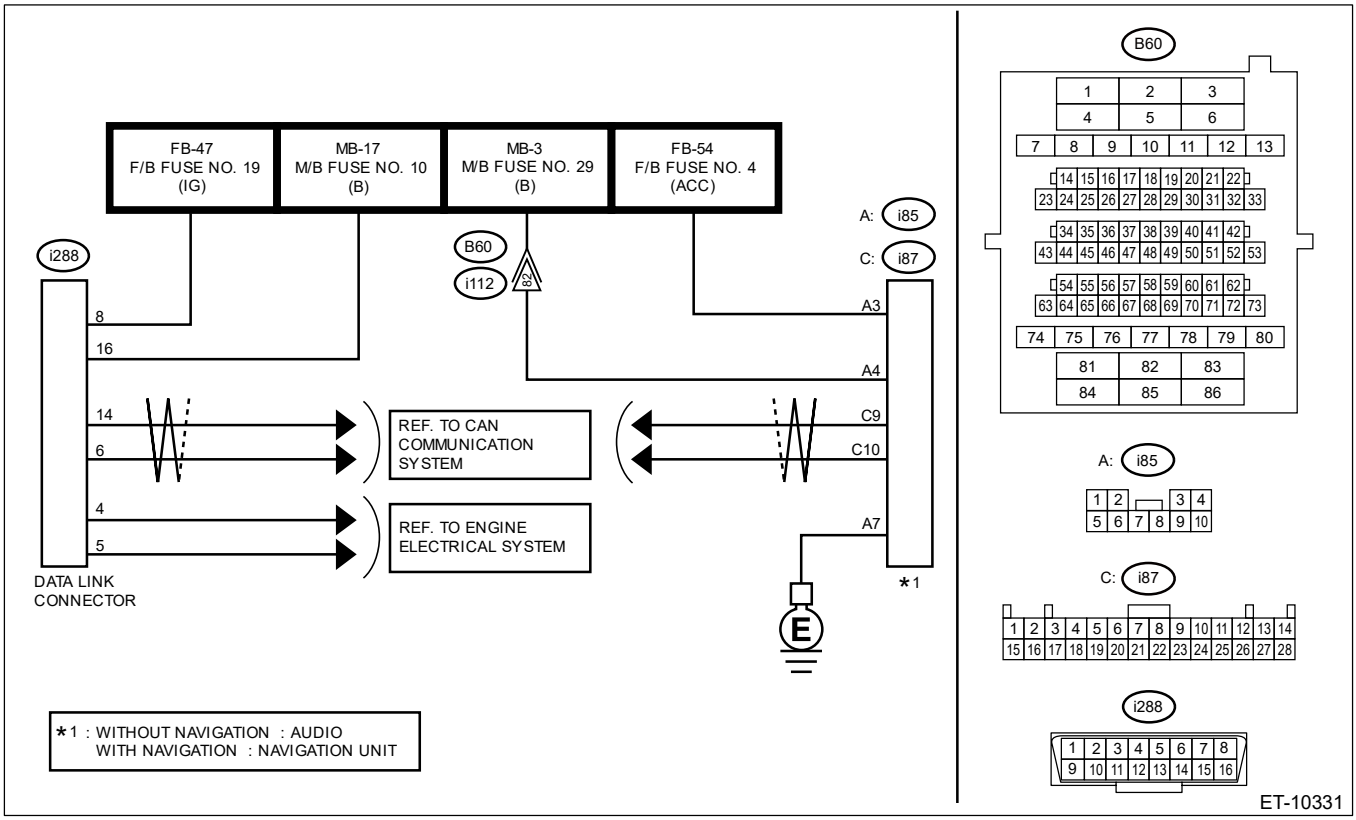
- Defective harness connector
- Power supply circuit malfunction
- Infotainment system module malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between the infotainment system module and Subaru Select Monitor.

Wiring diagram:

- Audio system Ref. to ENTERTAINMENT & MONITORING>Audio System>WIRING DIAGRAM.
- Navigation system Ref. to ENTERTAINMENT & MONITORING>Navigation System>WIRING DIAGRAM.



1. CHECK OTHER COMMUNICATION.

Communicate with the system other than the infotainment using the Subaru Select Monitor.

Is the communication to other control module possible?

Yes	Go to 2.
No	Perform the “Communication for Initializing Impossible” of LAN system.

2. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 3.
No	Perform the inspection according to the diagnosis for LAN system.

3. CHECK FUSE.

Check the fuse of the infotainment. Ref. to ENTERTAINMENT & MONITORING>Relay and Fuse.

Is the check result OK?

Yes	Go to 4.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit of the harness between the battery and audio connector, or between the navigation unit connectors.

4. CHECK HARNESS (POWER SUPPLY CIRCUIT).

1. Turn off the audio or navigation unit.
2. Disconnect the audio connector or navigation unit connector.
3. Turn the ignition switch to ON.
4. Using the tester, measure the voltage between audio connector or navigation unit connector and chassis ground.
   Connector & terminal
   (i85) No. 3 (+) — Chassis ground (−):
   (i85) No. 4 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 5.
No	Repair the open circuit of harness between audio connector or navigation unit connector and fuse.

5. CHECK HARNESS (GROUND CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using the tester, measure the resistance between audio connector or navigation unit connector and chassis ground.
   Connector & terminal
   (i85) No. 7 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 6.
No	Repair the open circuit of harness between audio connector or navigation unit connector and fuse.

6. CHECK INFOTAINMENT SYSTEM MODULE.

1. Turn the ignition switch to OFF.
2. Connect the audio connector or navigation unit connector.
3. Perform the communication with the infotainment system.

Is communication possible?

Yes	It is possible that temporary poor communication occurs.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

INFOTAINMENT(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to INFOTAINMENT(DIAGNOSTICS) >Data Monitor>LIST.**

INFOTAINMENT(DIAGNOSTICS) > Data Monitor

LIST

Item	Contents	Standard/Unit	Note
Trip Count [count]	Number of IG ON judged by the body integrated unit (CAN communication data) Ref. to COMMON(diag)>Time Stamp.	—	—
Count	Number of IG ON, synchronous/asynchronous identification information of the elapsed time after IG ON Ref. to COMMON(diag)>Time Stamp.	—	—
Time Count [msec]	Elapsed time (detail) after IG ON calculated by the infotainment system Ref. to COMMON(diag)>Time Stamp.	—	—
ACC Power connection state	ACC power supply connection status	ON: Connected OFF: Not connected	—
IGN Power connection state	IGN power supply connection status	ON: Connected OFF: Not connected	—
Reverse connection state	Reverse signal connection status	ON: Connected OFF: Not connected	—
PKB connection state	Parking brake signal connection status	ON: Connected OFF: Not connected	—
Illumi connection state	Illumination signal connection status	ON: Connected OFF: Not connected	—
RADIO ant connection state	Antenna (radio) connection status	ON: Connected OFF: Not connected	—
XM ant connection state	Antenna (XM) connection status	ON: Connected OFF: Not connected	—

Item	Contents	Standard/Unit	Note
GPS ant connection state	Antenna (GPS) connection status	ON: Connected OFF: Not connected	Only for models with navigation
MIC connection state	Microphone connection status	ON: Connected OFF: Not connected	—
Steering switch connection state	Steering switch connection status	ON: Connected OFF: Not connected	—
Rear camera connection state	Rear camera connection status	ON: Connected OFF: Not connected	—
AUX connection state	AUX connection status	ON: Connected OFF: Not connected	—
USB1 connection state	USB1 connection status	ON: Connected OFF: Not connected	—
CAN connection state	CAN connection status	ON: Connected OFF: Not connected	—
Steering Switch2 Connection State	Steering switch 2 connection status	ON: Connected OFF: Not connected	—
Battery Voltage	Battery voltage	0 — 21.50 V	—
BRIGHT Connection State	BRIGHT connection status	ON: Connected OFF: Not connected	—
Speed	Speed	0 — 300	—
Driver's Door SW Connection State	Driver’s side door connection status	ON: Connected OFF: Not connected	—
Steering Angle Sensor	Steering angle sensor	−3276.8 — 3276.8 deg	—
AMP(MUTE) Connection State	AMP (MUTE) connection status	ON: Connected OFF: Not connected	Only for model with H/K AMP
AMP(TX+) Connection State	AMP (TX+) connection status	ON: Connected OFF: Not connected	Only for model with H/K AMP
AMP(TX-) Connection State	AMP (TX-) connection status	ON: Connected OFF: Not connected	Only for model with H/K AMP
Amplifier Type	AMP type	• Without AMP • With internal AMP • Cloth specifications with external AMP • Leather specifications with external AMP	—
ANT-ON Input Value	ANT-ON input value	ON: Connected OFF: Not connected	—
DCM Connection State	DCM connection status	ON: Connected OFF: Not connected	Only for model with telematics
Switch Detect (HARD)	Detected SW result (hard SW)	ON: Connected OFF: Not connected	—

Item	Contents	Standard/Unit	Note
Push SW Number (HARD)	Pressed SW count (hard SW)	ON: Connected OFF: Not connected	—
Rotary Switch Check (Rightside Switch)	Rotary type switch inspection (right side switch)	No SW operation: when operation is not performed Right turn: switch turned clockwise Left turn: switch turned counterclockwise	—
Rotary Switch Check (Leftside Switch)	Rotary type switch inspection (left side switch)	No SW operation: when operation is not performed Right turn: switch turned clockwise Left turn: switch turned counterclockwise	—
MIC1 Input Level Check	Microphone 1 input level (8 levels)	0 — 255	—
MIC2 Input Level Check	Microphone 2 input level (8 levels)	0 — 255	—
GPS Received Number	GPS Reception number	0 — 255	Only for models with navigation
Global Positioning System Level	GPS positioning level	0 — 255	Only for models with navigation
Time and Date Settings :Year	Current date and time: Year	Year 2000 — 2255	Only for models with navigation
Time and Date Settings :Month	Current date and time: Month	0 — 255 months	Only for models with navigation
Time and Date Settings :Date	Current date and time: Day	0 — 255 days	Only for models with navigation
Time and Date Settings :Hour	Current date and time: Hour	0 — 255 hours	Only for models with navigation
Time and Date Settings :Minute	Current date and time: Minute	0 — 255 minutes	Only for models with navigation
Time and Date Settings :Second	Current date and time: Second	0 — 255 seconds	Only for models with navigation
GPS Current Location; Latitude N/S	GPS current position: Latitude N/S	N S	Only for models with navigation
GPS Current Location; Latitude °	GPS current position: Latitude °	0 — 255°	Only for models with navigation
GPS Current Location; Latitude '	GPS current position: Latitude ’	0 — 255’	Only for models with navigation
GPS Current Location; Latitude ''	GPS current position: Latitude ’’	0 — 255’’	Only for models with navigation

Item	Contents	Standard/Unit	Note
GPS Current Location; Longitude E/W	GPS current position: Longitude E/W	E W	Only for models with navigation
GPS Current Location; Longitude °	GPS current position: Longitude °	0 — 255°	Only for models with navigation
GPS Current Location; Longitude '	GPS current position: Longitude ’	0 — 255’	Only for models with navigation
GPS Current Location; Longitude ''	GPS current position: Latitude ’’	0 — 255’’	Only for models with navigation

INFOTAINMENT(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to INFOTAINMENT(DIAGNOSTICS) >Freeze Frame Data>LIST.**

INFOTAINMENT(DIAGNOSTICS) > Freeze Frame Data

LIST

Item	Contents	Standard/Unit	Note
Trip Count [count]	Number of IG ON judged by the body integrated unit (CAN communication data) Ref. to COMMON(diag)>Time Stamp.	-	-
Count	Number of IG ON, synchronous/asynchronous identification information of the elapsed time after IG ON Ref. to COMMON(diag)>Time Stamp.	-	-
Time Count [msec]	Elapsed time (detail) after IG ON calculated by the infotainment Ref. to COMMON(diag)>Time Stamp.	-	-
ACC Power connection state	ACC power supply connection status	ON: Connected OFF: Not connected	-
IGN Power connection state	IGN power supply connection status	ON: Connected OFF: Not connected	-
Reverse connection state	Reverse signal connection status	ON: Connected OFF: Not connected	-
PKB connection state	Parking brake signal connection status	ON: Connected OFF: Not connected	-
Battery Voltage	Battery voltage	0 — 21.50 V	Only for models with navigation
Speed	Speed	0 — 300	Only for models with navigation
GPS Received Number	GPS Reception number	0 — 255	Only for models with navigation

Item	Contents	Standard/Unit	Note
Global Positioning System Level	GPS positioning level	0 — 255	Only for models with navigation
Time and Date Settings :Year	Current date and time: Year	Year 2000 — 2255	Only for models with navigation
Time and Date Settings :Month	Current date and time: Month	0 — 255 months	Only for models with navigation
Time and Date Settings :Date	Current date and time: Day	0 — 255 days	Only for models with navigation
Time and Date Settings :Hour	Current date and time: Hour	0 — 255 hours	Only for models with navigation
Time and Date Settings :Minute	Current date and time: Minute	0 — 255 minutes	Only for models with navigation
Time and Date Settings :Second	Current date and time: Second	0 — 255 seconds	Only for models with navigation

INFOTAINMENT(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Infotainment], and then select [Enter].
5. On [Select Function] display, select [Active Test] and select [Next].

Note:

For detailed operation procedures, refer to "Application help".

INFOTAINMENT(DIAGNOSTICS) > Active Test

LIST

Item	Content
FM Seek Up/Down	Check the FM SEEK operation.
AM Seek Up/Down	Check the AM SEEK operation.
Speaker Output Volume Adjustment	Check the speaker output (sound volume) operation.
Speker Output Check	Check speaker output.
Diag Recorder Data Delete	Initialize the log for manufacturer's analysis.

INFOTAINMENT(DIAGNOSTICS) > Customize

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Infotainment] and select [Enter].
5. On [Select Function] display, select [Customize] and select [Next].

Note:

For detailed operation procedures, refer to "Application help".

INFOTAINMENT(DIAGNOSTICS) > Customize

LIST

Item	Initial setting value	Setting value	Contents
Camera Guide Line Settings	ON	ON/OFF	Set guide line display.
Camera Caution Display Settings	ON	ON/OFF	Set warning indicator display.
Diag Recorder Settings	ON	ON/OFF	Software debug analysis (for analysis by manufacturer)

INFOTAINMENT(DIAGNOSTICS) > Work Support

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, enter vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Infotainment], and then select [Enter].
5. On [Select Function] display, select [Work Support] and select [Next].

Note:

For detailed operation procedures, refer to "Application help".

INFOTAINMENT(DIAGNOSTICS) > Work Support

LIST

Item	Contents
ECU Parts Number	Display item number of the audio or navigation.
Software information	Software information is displayed.
Memory Initialization	Reset to the factory settings.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.**

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2240	CAN COMMUNICATION (AUDIO) STUCK	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2240 CAN COMMUNICATION (AUDIO) STUCK.
B2241	CAN COMMUNICATION	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2241 CAN COMMUNICATION.
B2244	AMPLIFIER COMMUNICATION	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2244 AMPLIFIER COMMUNICATION.
B2247	CD MECHANICAL	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2247 CD MECHANICAL.
B2249	BLUETOOTH MODULE	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2249 BLUETOOTH MODULE.
B224A	BACKUP CAMERA	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B224A BACKUP CAMERA.
B224B	RADIO ANTENNA FAULTS(SHORTED OR OPEN)	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B224B RADIO ANTENNA FAULTS(SHORTED OR OPEN).
B224D	XM / SATELLITE DIGITAL AUDIO RADIO SERVICE ANTENNA FAULTS(SHORTED OR OPEN)	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B224D XM / SATELLITE DIGITAL AUDIO RADIO SERVICE ANTENNA FAULTS(SHORTED OR OPEN).
B2250	USB-BOX OVERCURRENT FAULTS	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2250 USB-BOX OVERCURRENT FAULTS.

Code	Description & trouble part	Reference
B2251	SPEAKER LINE SHORTS TO +B	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2251 SPEAKER LINE SHORTS TO +B.
B2252	SPEAKER LINE SHORTS TO GND	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2252 SPEAKER LINE SHORTS TO GND.
B2253	DAMAGING A COIL DUE TO THE ELECTRIC CURRENT TO THE SPEAKER COIL	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2253 DAMAGING A COIL DUE TO THE ELECTRIC CURRENT TO THE SPEAKER COIL.
B2254	GPS ANTENNA FAULTS	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2254 GPS ANTENNA FAULTS.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U1140	LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN.

DTC B2240 CAN COMMUNICATION (AUDIO) STUCK

DTC detecting condition:
Detected when the resistor is stuck during the CAN bus communication process.
Trouble symptom:
Screen display does not link with combination meter or vehicle.

1. CHECK DTC.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK NAVIGATION UNIT.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2240 displayed? (Current malfunction)

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2241 CAN COMMUNICATION

DTC detecting condition:
Detected when there has been no proper communication in 10 seconds with the driver control of serial communication between CAN microcomputer and main microcomputer.
Trouble symptom:
Screen display does not link with combination meter or vehicle.

1. CHECK DTC.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is the check result OK?

Yes	Go to 2.
No	Perform the inspection according to the diagnosis for LAN system.

2. CHECK AUDIO OR NAVIGATION UNIT.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



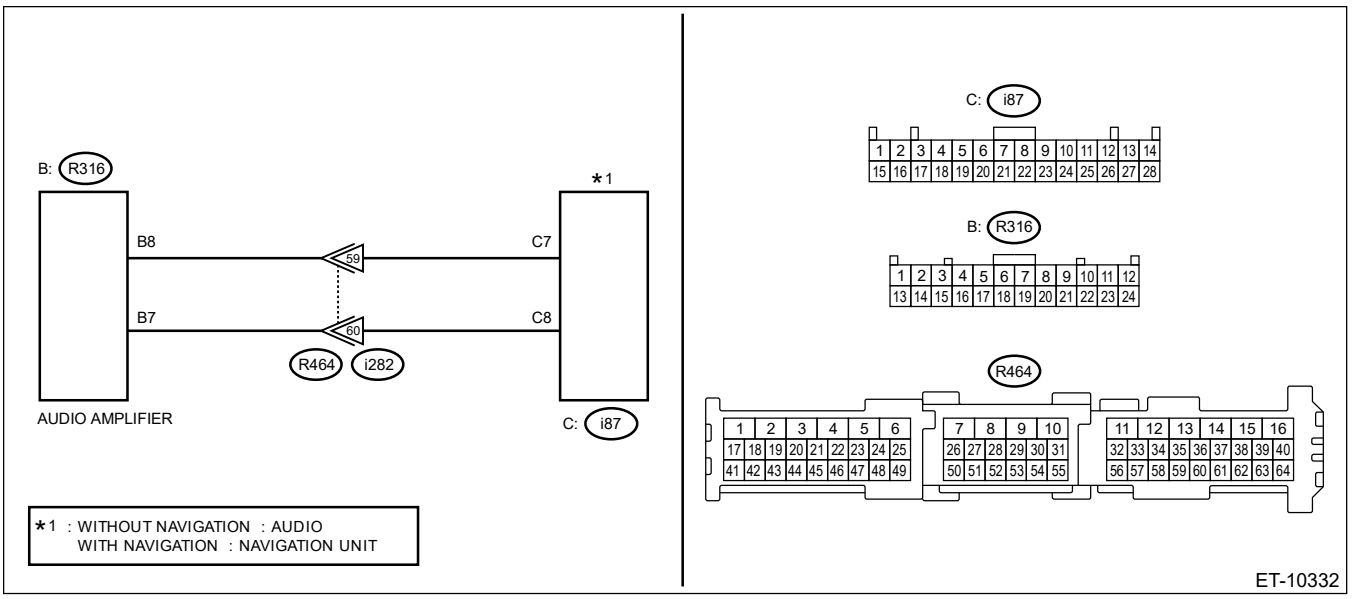
Is DTC B2241 displayed? (Current malfunction)

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2244 AMPLIFIER COMMUNICATION

DTC detecting condition:
Detected when no connection is established because there is no communication with the audio amplifier after the ACC is ON.
Trouble symptom:
Sound does not come out from the speaker.
Wiring diagram:
Audio system Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM.
Navigation system Ref. to WIRING SYSTEM>Navigation System.



1. CHECK FUSE.

Check the fuse. Ref. to ENTERTAINMENT & MONITORING>Relay and Fuse.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in the harness between the battery and audio amplifier.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the audio connector or navigation unit connector.
2. Disconnect the amplifier connector.
3. Using the tester, measure the resistance of harness between audio connector or navigation unit connector and audio amplifier connector.

Connector & terminal

(i87) No. 7 — (R316) No. 8:

(i87) No. 8 — (R316) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of harness between audio connector or navigation unit connector and audio amplifier.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance between audio connector or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 7 — Chassis ground:

(i87) No. 8 — Chassis ground:

Is the resistance 1 Ω or more?

Yes	Go to 4.
No	Repair the ground short circuit of the harness between audio connector or navigation unit connector and audio amplifier.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between audio connector or navigation unit connector and chassis ground. (With each connector disconnected)
   Connector & terminal
   (i87) No. 7 (+) — Chassis ground (−):
   (i87) No. 8 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the short circuit to power supply in the harness between audio connector or navigation unit connector and audio amplifier.

5. CHECK DTC.

1. Connect all the disconnected connectors.
2. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch OFF → ON.
4. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2244 displayed? (Current malfunction)

Yes	Replace the audio amplifier. Ref. to ENTERTAINMENT & MONITORING>Power Amplifier.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2247 CD MECHANICAL

DTC detecting condition:

- If EJECT error is detected
- If over-current is detected
- If DSP error is detected
- If playback failure is detected

Trouble symptom:

- CD and DVD cannot be played back.
- Cannot be inserted or ejected.

1. CHECK MEDIA.

1. Check for dirt on the disc surface of the media, and clean the disc softly using soft and dry cloth such as a plastic eyeglasses cleaning cloth. When cleaning, make sure that wiping direction is from the center to the edge of the disc.
   Caution:
   To avoid any scratch on the surface, do not apply excessive force with hand or do not use a rough cloth. Do not use solvent such as alcohol, benzene, thinner, etc. as well as chemical cloth to avoid damaging the disc.
2. Insert the media and make sure that it can be played back.

Is the check result OK?

Yes	There were some problems with the media.
No	Go to 2.

2. CHECK MEDIA.

Insert another media which is properly functioning.

Note:

Supported media type: Audio CD, CD-R, CD-RW

Is the check result OK?

Yes	There were some problems with the media.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

DTC B2249 BLUETOOTH MODULE

DTC detecting condition:

- Detected when a connection between the Bluetooth module is lost (or there has already been no connection) and the connection cannot be established even after trying to reset the Bluetooth module hardware three times.
- Detected when the connection with the Bluetooth module has established but the module does not respond to the initialization request, and there is no response from the module even after trying to reset the Bluetooth module three times.

Trouble symptom:

Cannot connect with the Bluetooth device.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2249 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK BLUETOOTH DEVICE.

1. Restart the Bluetooth device, and connect again.
2. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch OFF → ON.
4. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2249 displayed? (Current malfunction)

Yes	Go to 3.
No	Bluetooth device was faulty.

3. CHECK BLUETOOTH DEVICE.

1. Connect another Bluetooth device.
   Note:
   Supported network type: Ver. 3.0 +EDR compatible
   - **Bluetooth Phone**
     Profile
     – HFP: Ver. 1.6
     – OPP: Ver. 1.1
     – PBAP: Ver. 1.1.1
     – MAP: Ver. 1.1
     – SPP: Ver. 1.1
   - **Bluetooth Audio Device**
     Profile
     – A2DP: Ver. 1.3
     – AVRCP: Ver. 1.5
2. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch OFF → ON.
4. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2249 displayed? (Current malfunction)

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Bluetooth device was faulty.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B224A BACKUP CAMERA

DTC detecting condition:

Detected when the synchronization error occurs in the condition of the picture input.

Trouble symptom:

Camera image does not appear.

Wiring diagram:

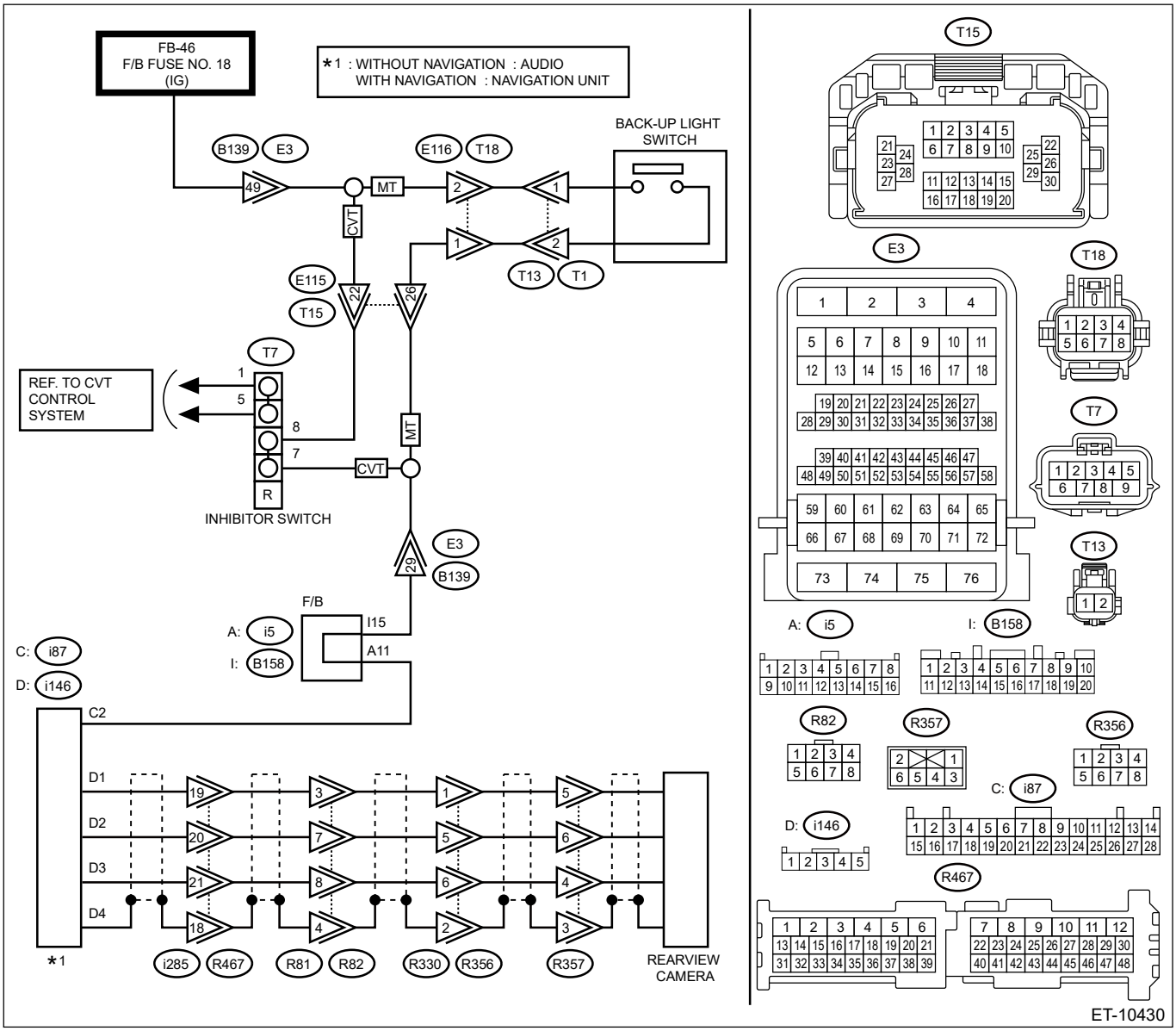
Rearview camera system Ref. to WIRING SYSTEM>Rearview Camera System>WIRING DIAGRAM.

Navigation system Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM.

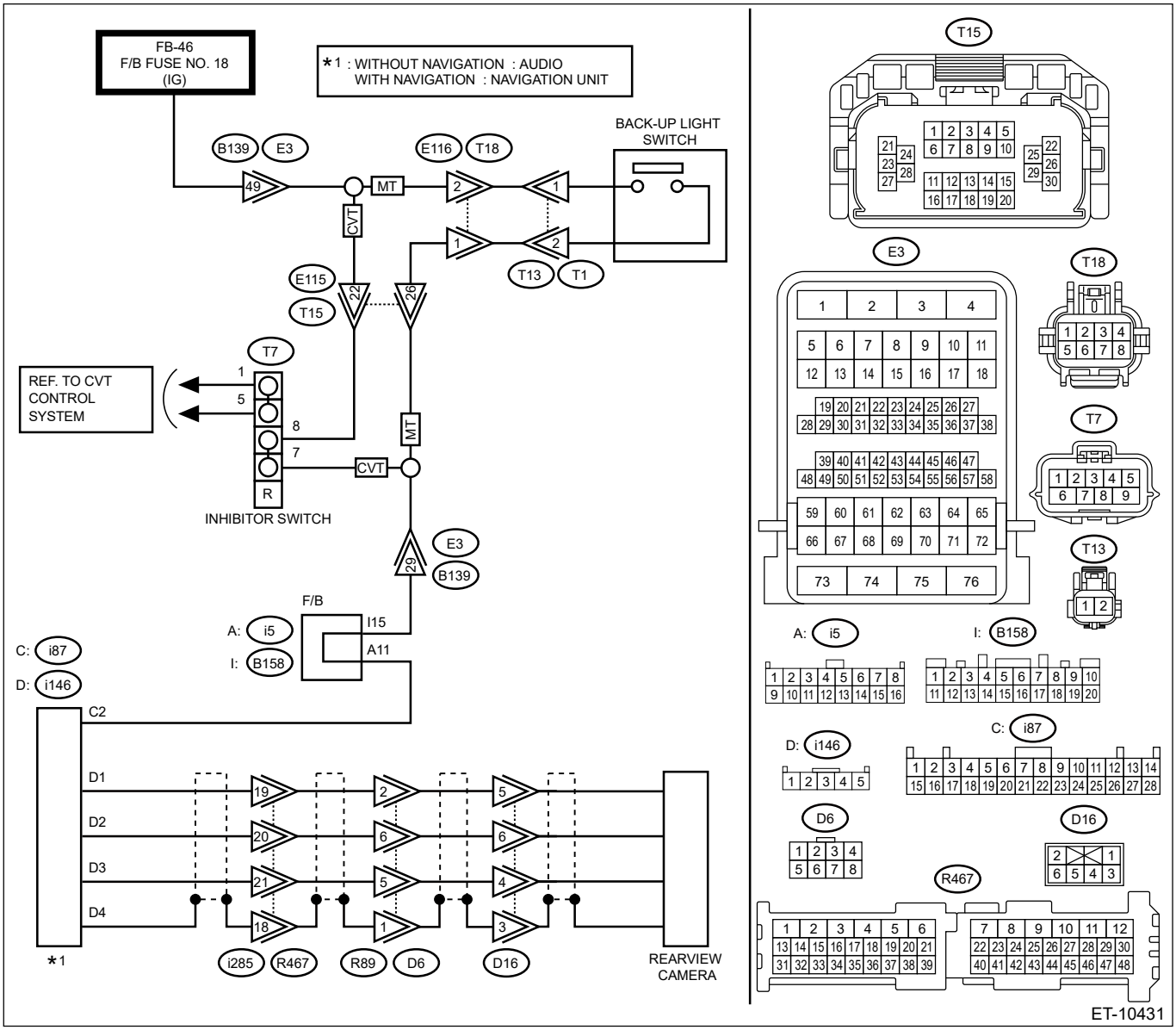
Audio system Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM.

Back-up light system Ref. to WIRING SYSTEM>Back-up Light System>WIRING DIAGRAM.

- 4 door model



- 5 door model



1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Infotainment].
Ref. to INFOTAINMENT(DIAGNOSTICS) >Data Monitor.

Data Monitor

- [Rear camera connection state]

Is [ON] displayed?

Yes — Go to 2.

No — Go to 3.

2. CHECK CURRENT DATA.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Infotainment].
Ref. to INFOTAINMENT(DIAGNOSTICS) >Data Monitor.

Data Monitor

- [Reverse connection state]

Is [ON] displayed when the shift lever is set to the reverse range?

Yes	Go to 3.
No	Go to 6.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the audio connector or navigation unit connector.
2. Disconnect the rearview camera connector.
3. Using the tester, measure the resistance of harness between rearview camera connector and audio connector or navigation unit connector.

Connector & terminal

4 door model

(i146) No. 1 — (R357) No. 5:
(i146) No. 2 — (R357) No. 6:
(i146) No. 3 — (R357) No. 4:
(i146) No. 4 — (R357) No. 3:

5 door model

(i146) No. 1 — (D16) No. 5:
(i146) No. 2 — (D16) No. 6:
(i146) No. 3 — (D16) No. 4:
(i146) No. 4 — (D16) No. 3:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between audio connector or navigation unit connector and rearview camera.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance of harness between audio connector or navigation unit connector and chassis ground.

Connector & terminal

(i146) No. 1 — Chassis ground:
(i146) No. 2 — Chassis ground:
(i146) No. 3 — Chassis ground:
(i146) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the ground short circuit of the harness between audio connector or navigation unit connector and rearview camera.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between audio connector or navigation unit connector and chassis ground. (With each connector disconnected)

   Connector & terminal

   (i146) No. 1 (+) — Chassis ground (−):
   (i146) No. 2 (+) — Chassis ground (−):
   (i146) No. 3 (+) — Chassis ground (−):
   (i146) No. 4 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair the short circuit to power supply in the harness between audio connector or navigation unit connector and rearview camera.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the audio connector or navigation unit connector.
2. Disconnect the inhibitor switch connector.
3. Using the tester, measure the resistance of the harness between inhibitor switch connector or back-up light switch connector and audio connector or navigation unit connector.

Connector & terminal

CVT model

(i87) No. 2 — (T7) No. 7:

MT model

(i87) No. 2 — (T13) No. 2:

Is the resistance less than 1 Ω?

Yes	Go to 7.
No	Repair the open circuit of harness between audio connector or navigation unit connector and inhibitor switch connector or back-up light switch connector.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using the tester, measure the resistance of harness between audio connector or navigation unit connector and chassis ground.

Connector & terminal

(i87) No. 2 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 8.
No	Repair the ground short circuit of the harness between audio connector or navigation unit connector and inhibitor switch connector or back-up light switch connector.

8. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using the tester, measure the voltage between audio connector or navigation unit connector and chassis ground. (With each connector disconnected)

Connector & terminal

(i87) No. 2 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 9.
No	Repair the short circuit to power supply in the harness between audio connector or navigation unit connector and inhibitor switch connector or back-up light switch connector.

9. CHECK REARVIEW CAMERA.

Check the rearview camera according to the instructions of rearview camera operation manual.

Is there any fault?

Yes	Replace the rearview camera. Ref. to ENTERTAINMENT & MONITORING>Rearview Camera System.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B224B RADIO ANTENNA FAULTS(SHORTED OR OPEN)

Trouble symptom:
Radio is not received.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B224B displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK RADIO CONDITION.

Select station in the condition where radio is received.

Is radio received?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 3.

3. CHECK ANTENNA.

Visually check the antenna and check the connectors. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

DTC B224D XM / SATELLITE DIGITAL AUDIO RADIO SERVICE ANTENNA FAULTS(SHORTED OR OPEN)

Trouble symptom:
SXM is not received.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B224D displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. RECEIVING SUBSCRIPTION CHECK.

Confirm that user is subscribed to SXM.

Is the user subscribed to SXM?

Yes	Go to 3.
No	Cannot receive because of no subscription.

3. CHECK SXM CONDITION.

Select station in the condition where SXM is received.

Is SXM received?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 4.

4. CHECK ANTENNA.

Visually check the antenna and check the connectors. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2250 USB-BOX OVERCURRENT FAULTS

Trouble symptom:
USB is connected but not detected.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2250 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK USB CHARGE.

Confirm that USB charge is possible.

Is the USB charge possible?

Yes	Go to 3.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

3. CHECK OTHER USB DEVICES.

Check the condition by connecting a USB device that was connected in the past.

Is this USB device detected?

Yes	The device was faulty.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2251 SPEAKER LINE SHORTS TO +B

Trouble symptom:
Does not sound.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2251 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK CONNECTOR.

Check the harness between audio connector or navigation unit connector and audio amplifier.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Repair the harness or replace the components.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2252 SPEAKER LINE SHORTS TO GND

Trouble symptom:
Does not sound.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2252 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK CONNECTOR.

Check the harness between audio connector or navigation unit connector and audio amplifier.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Repair the harness or replace the components.

DTC B2253 DAMAGING A COIL DUE TO THE ELECTRIC CURRENT TO THE SPEAKER COIL

Trouble symptom:
Does not sound.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2253 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK CONNECTOR.

Check the harness between audio connector or navigation unit connector and audio amplifier.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Repair the harness or replace the components.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2254 GPS ANTENNA FAULTS

Trouble symptom:
Navigation system does not operate.

1. CHECK DTC.

1. Using the Subaru Select Monitor, perform the clear memory of [Infotainment]. Ref. to COMMON(diag)>Clear memory.



2. Turn the ignition switch OFF → ON.
3. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2254 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Infotainment]. Ref. to INFOTAINMENT(DIAGNOSTICS) >Data Monitor.

Data Monitor

- [GPS Current Location; Latitude °]
- [GPS Current Location; Longitude °]

Is the displayed data properly received?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 3.

3. CHECK ANTENNA.

Visually check the antenna and check the connectors. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the navigation unit. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

INFOTAINMENT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN

Detected when CAN data is not received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

LIST

1. AUDIO SYSTEM

Symptoms	Reference
Power will not turn ON.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON.
The screen freezes and does not accept any operation entry.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > THE SCREEN FREEZES AND DOES NOT ACCEPT ANY OPERATION ENTRY.
The screen is blacked out, or the screen is not displayed.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > THE SCREEN IS BLACKED OUT, OR THE SCREEN IS NOT DISPLAYED.
System is reset.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > SYSTEM IS RESET.
CDs cannot be played back.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CDS CANNOT BE PLAYED BACK.
Sound does not come out from the speaker.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > SOUND DOES NOT COME OUT FROM THE SPEAKER.
Bluetooth connection cannot be established.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH CONNECTION CANNOT BE ESTABLISHED.
Bluetooth does not operate.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH DOES NOT OPERATE.
Radio volume is low or interference noise occurs.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > RADIO VOLUME IS LOW OR INTERFERENCE NOISE OCCURS.
Error message is displayed.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>LIST > ERROR MESSAGE IS DISPLAYED.
SUBARU STARLINK is faulty.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>LIST > CHECK ABNORMALITY OF SUBARU STARLINK.

2. NAVIGATION SYSTEM

Symptoms	Reference
Power will not turn ON.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON.
The screen freezes and does not accept any operation entry.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > THE SCREEN FREEZES AND DOES NOT ACCEPT ANY OPERATION ENTRY.
The screen is blacked out, or the screen is not displayed.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > THE SCREEN IS BLACKED OUT, OR THE SCREEN IS NOT DISPLAYED.
System is reset.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > SYSTEM IS RESET.
CDs cannot be played back.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CDS CANNOT BE PLAYED BACK.
Sound does not come out from the speaker.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > SOUND DOES NOT COME OUT FROM THE SPEAKER.
Bluetooth connection cannot be established.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH CONNECTION CANNOT BE ESTABLISHED.
Bluetooth does not operate.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH DOES NOT OPERATE.
Radio volume is low or interference noise occurs.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > RADIO VOLUME IS LOW OR INTERFERENCE NOISE OCCURS.
Wrong location of vehicle, or no GPS reception.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > WRONG LOCATION OF VEHICLE, NO GPS RECEPTION.
Error message is displayed.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>LIST > ERROR MESSAGE IS DISPLAYED.
SUBARU STARLINK is faulty.	Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>LIST > CHECK ABNORMALITY OF SUBARU STARLINK.

3. CHECK ABNORMALITY OF SUBARU STARLINK

Symptoms	Counter-measure
SUBARU STARLINK app was terminated.	Perform the procedures described on "Check connection between smartphone and unit". Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CHECK CONNECTION BETWEEN SMARTPHONE AND UNIT.
Smartphone was powered off while connecting via the SUBARU STARLINK.	
Bluetooth connection stops while connecting via the SUBARU STARLINK.	
Communication gets out of service while connecting via the SUBARU STARLINK.	
Radio wave reception becomes worse while connecting via the SUBARU STARLINK.	

Note:

Possible error messages with relation to the above symptoms. When the message below is displayed, perform inspection according to "Inspection when an error message is displayed (SUBARU STARLINK)". Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>LIST > INSPECTION WHEN AN ERROR MESSAGE IS DISPLAYED (SUBARU STARLINK).

Details of message
Please disconnect mobile device and install the STARLINK application on your mobile device and try again. Bluetooth disconnected, please reconnect and try again. Smartphone data connection is poor, please try to connect again.

4. INSPECTION WHEN AN ERROR MESSAGE IS DISPLAYED (SUBARU STARLINK)

No	Inspection	Possible cause	Action 1	Action 2
1	Check internet connection of smartphone	Check that the Internet sites can be viewed with a web browser of the smartphone. **Note:** **Make sure that the displayed contents are not from previously loaded screen (cache) and that new contents can be reloaded.**	When connection to the Internet fails, confirm that connection can be established where the radio wave condition is good, and go to No. 2.	Check that the smartphone can perform communication.
2	Activate SUBARU STARLINK	Activate the "SUBARU STARLINK" application for the smartphone.	Check that the SUBARU STARLINK application is activated, and go to	If the SUBARU STARLINK application is not installed, go to No.

No	Inspection	Possible cause	Action 1	Action 2
	application for the smartphone		No. 5.	3 and 4.
3	Install the SUBARU STARLINK application (Android)	Search the SUBARU STARLINK on Google Play, and install the application.	After installation, go to No. 2.	When installation cannot be completed, check the setting of the smartphone. (Communication environment, account, etc.)
4	Install the SUBARU STARLINK application (iPhone)	Search the SUBARU STARLINK on APP Store, and install the app.	After installation, go to No. 2.	When installation cannot be completed, check the setting of the smartphone. (Communication environment, account, etc.)
5	Check connection to the SUBARU STARLINK server	Select "SETTING" tab from the SUBARU STARLINK application for the smartphone, and select "Press to check network status".	When "The network connection is good" is displayed, go to No. 8.	For the case other than shown on the left, go to No. 6 or No. 7.
6		When "NETWORK PROBLEMS" is displayed.	Move to a location where the radio wave condition is good, and go to No. 5.	—
7		When "SERVER MAINTENANCE" is displayed.	Wait until the server maintenance completes, and go to No. 5.	—
8	Check the smartphone type	Check the phone type (iPhone or Android).	For iPhone, go to No. 10 or 12.	For Android, go to No. 10.
9	Check Bluetooth connection between smartphone — on-vehicle device	On the on-vehicle device, select [HOME]-[SETTINGS]-Bluetooth tab-"BT devices Connection", and check that Bluetooth setting at the upper right is ON.	When the setting is OFF, switch to ON and go to No. 10.	When the setting is ON, switch to OFF once and to ON again, then go to No. 10.
10		From the Setting app for the smartphone, select Bluetooth and check that it is set to ON. (Note that procedures vary depending on a device.)	When the setting is OFF, switch to ON and go to No. 11.	When the setting is ON, switch to OFF once and to ON again, then go to No. 11.

No	Inspection	Possible cause	Action 1	Action 2
11		Check that Bluetooth pairing is established between the smartphone and on-vehicle device. • The selected smartphone icon is displayed on the on-vehicle device. • The smartphone BT is connected to the on-vehicle device.	If the connection cannot be confirmed, go to No. 9.	—
12	Check USB connection between smartphone — on-vehicle device (with iPhone)	Check that the smartphone and on-vehicle device are connected via USB.	After connecting via USB, go to No. 13.	—
13	Check the SUBARU STARLINK initial screen	On the on-vehicle device, press down [APPS] - [SUBARU STARLINK], and check that the SUBARU STARLINK initial screen is displayed.	If the activation cannot be confirmed, go to No. 14.	—
14	Delete the SUBARU STARLINK connection information inside the on-vehicle device.	Clear the Browser cache on the on-vehicle device. (Select the tool tab from the SETTING menu, select Browser cache “Delete”, and select “OK”. Then, press [SETTINGS] from the APPS screen. From SETTING, select the Bluetooth-tab, and select BT Devices Connection. Select the “Trash can” icon of the registered device. Select “OK” on the confirmation pop-up screen.)	For Android, go to No. 15. For iPhone, go to No. 15 or No. 17.	—
15		Clear the Bluetooth connection information inside the on-vehicle device.	Go to No. 16.	—
16		Turn OFF the power supply of the on-vehicle device, and wait	Go to No. 17.	—

No	Inspection	Possible cause	Action 1	Action 2
		for 30 seconds or more before turning ON the power supply again.		
17	Delete the SUBARU STARLINK connection information inside the smartphone.	Delete data in the SUBARU STARLINK app. (Click the “SETTING” icon of the “SUBARU STARLINK” application. Then, press [CONFIG] from the APPS list screen. Select “Delete the SUBARU STARLINK application data” to delete the data in the application. Activate the Setting app for the smartphone. From SETTING, select the Bluetooth-tab, and select BT Devices Connection. Select the Bluetooth setting item. Select the connection information. Select the “Trash can” icon of the registered device. Select “Forget This Device” to delete the connection information.)	Go to No. 18.	—
18		Delete the Bluetooth connection information.	Go to No. 19.	—
19		Turn OFF the power of the smartphone, then turn it ON again.	Go to No. 20.	—
20	Re-connect SUBARU STARLINK	Establish connection according to the SUBARU STARLINK connection procedure.	—	—

5. ERROR MESSAGE IS DISPLAYED

Mode	Message	Cause	Action
aha	“Information acquisition error. (Information acquisition error.)”	When not able to get the requested information.	Please try again (Refresh etc.) later or reconnect it.

Mode	Message	Cause	Action
	"Poor wireless reception. (Poor wireless reception.)"	When a communication error has been detected.	Please try again in a better communications environment.
	"Entry not recognized. (Entry not recognized.)"	When an invalid operation has been executed.	Please try again (Refresh etc.) later or reconnect it.
	"The station list cannot be acquired. (The station list cannot be acquired.)"	When not able to get the requested information.	Please try again (Refresh etc.) later or reconnect it.
	"The content cannot be acquired. (The content cannot be acquired.)"	• When not able to get the content information. • When not able to switch to the Top content when touching.	• Please try again (Refresh etc.) later or reconnect it. • Select the desired station again when the station list appears.
	"Action not available. (Action not available.)"	When content-specific operations such as "fast forward" or "reverse" are not available.	Please try again (Refresh etc.) later or reconnect it.
	"Failed. (Failed.)"	When data transmission failed when touching.	Please try again later.
	"aha communication error - Please check Owner's Manual. (aha communication error - Please check Owner's Manual.)"	• When invalid data is received from the aha application or there is no response. • When the connection to the aha application via Bluetooth is not available. • When the data reception from this unit is rejected.	Please try again (Refresh etc.) later or reconnect it. If it is still not improved, restart the aha application.
	"Please select the type of connection in "aha Settings". (Please select the type of connection in "aha Settings".)"	When aha radio setting is set to (USB) when the Android device is going to be paired via Bluetooth.	When you want to connect to the aha application with the Android device, select (Bluetooth) in the aha radio setting from the setting screen.
Pandora	"No stations have been added to your list. (No stations have been added to your list.)"	When no stations have been registered.	Please register stations.
	"Your ratings information was not saved. (Your ratings information was not saved.)"	When ratings information has not been updated to the Pandora server.	Please try again later.
	"Bookmark not saved. (Bookmark not saved.)"	When bookmark registration information has not been updated to the Pandora	Please try again later.

Mode	Message	Cause	Action
		server.	
	“Pandora is not available at your current location. (Pandora is not available at your current location.)”	When Pandora is used in an area where it is not available.	Please try again at a different location.
	“The selected Pandora station is no longer available. (The selected Pandora station is no longer available.)”	When the selected station has been deleted, or has expired.	Please select another station.
	“Pandora Error. (Pandora Error.)”	When the Pandora server is undergoing maintenance, or another error has occurred.	Please try again later.

INFOTAINMENT(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

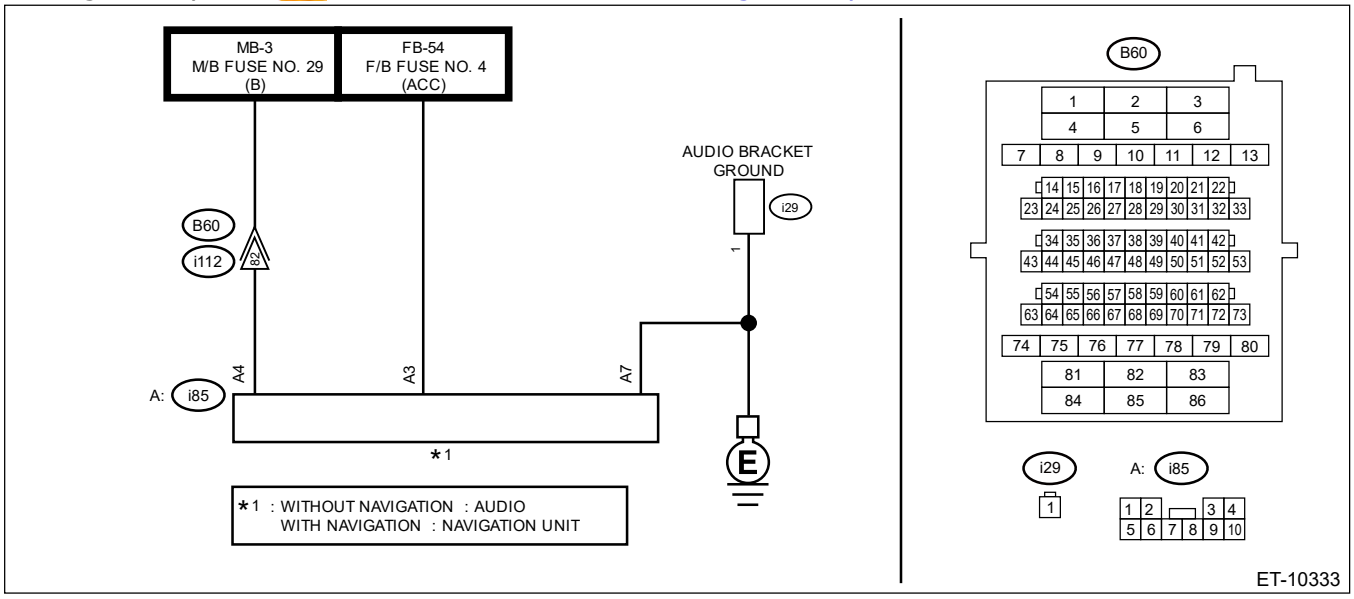
1. POWER WILL NOT TURN ON

Probable cause:

Power supply circuit malfunction, unit body malfunction

Wiring diagram:

- Audio system Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM.
- Navigation system Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to “CAUTION” in “General Description”. Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK CONNECTOR CONNECTION.
- no → Perform the instructed procedures.
- yes ↓

2. CHECK CONNECTOR.
- no → Perform the instructed procedures.
- yes ↓

3. CHECK POWER SUPPLY VOLTAGE.
- yes → Go to 8.
- no → Go to 4.

4. CHECK FUSE.
- no → Perform the instructed procedures.
- yes ↓

5. CHECK HARNESS (POWER SUPPLY).
- no → Perform the instructed procedures.
- yes ↓

6. CHECK HARNESS (GROUND).
- no → Perform the instructed procedures.
- yes ↓

7. CHECK BATTERY.
- no → Perform the instructed procedures.
- yes ↓

8. CHECK OPERATION.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK CONNECTOR CONNECTION.

Check that the connector is connected to the unit.

Is the check result OK?

Yes	Go to 2.
No	Connect the connector.

2. CHECK CONNECTOR.

Check for poor contact of connectors or terminals.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the harness.

3. CHECK POWER SUPPLY VOLTAGE.

1. Disconnect the connector.
2. Turn the ignition switch to ACC.
3. Using a tester, measure the voltage between connector and chassis ground.

Note:

- **Turn the electrical parts to OFF.**

Connector & terminal

(i85) No. 4 (+) — Chassis ground (−):

(i85) No. 3 (+) — Chassis ground (−):

Is the voltage 12 V or more?

Yes	Go to 8.
No	Go to 4.

4. CHECK FUSE.

1. Turn the ignition to OFF.
2. Check the fuse No. 29 inside M/B and fuse No. 4 inside F/B.

Is the check result OK?

Yes	Go to 5.
No	Replace the fuse. If the fuse is blown again, check or replace the short circuit of the power supply harness.

5. CHECK HARNESS (POWER SUPPLY).

Measure the resistance between main fuse box and connector.

Connector & terminal

M/B fuse No. 29 — (i85) No. 4:

F/B fuse No. 4 — (i85) No. 3:

Is the resistance 1 Ω or less?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK HARNESS (GROUND).

Measure the resistance between connector and chassis ground.

Connector & terminal

(i85) No. 7 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 8.
No	Charge or replace the battery.

8. CHECK OPERATION.

1. Connect all connectors.
2. Turn the ignition switch to ACC and the power supply switch of the unit to ON.

Does the power turn ON?

Yes	Currently no failure is found.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

2. THE SCREEN FREEZES AND DOES NOT ACCEPT ANY OPERATION ENTRY

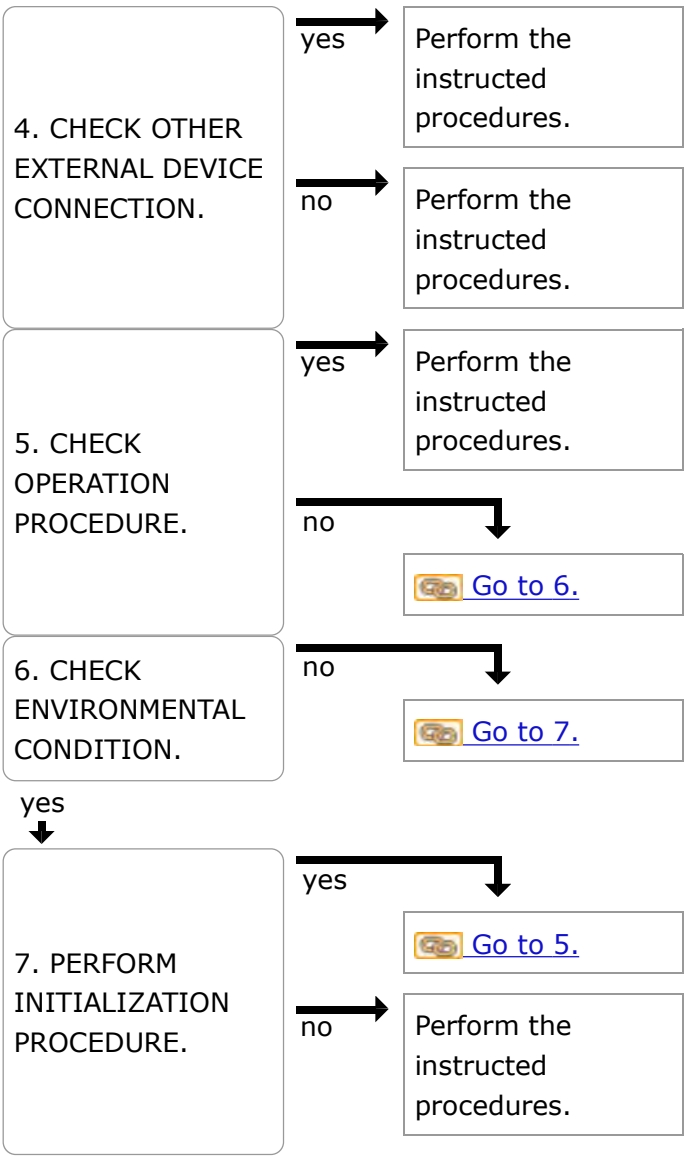
Probable cause:

External device malfunction•influence, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK RESTARTING DISPLAY.
   - yes → Go to 5.
   - no → Go to 2.
2. REMOVE OTHER MEDIA OR EXTERNAL DEVICES.
   - no → Go to 6.
   - yes ↓
3. CHECK OTHER EXTERNAL DEVICE CONNECTION.
   - no → Go to 5.
   - yes ↓



1. CHECK RESTARTING DISPLAY.

Turn the ignition switch OFF → leave it for three minutes or more after the display turns off, then turn it to ACC. (The door should be closed at this time.)

Is the screen freeze eliminated?

Yes	Go to 5.
No	Go to 2.

2. REMOVE OTHER MEDIA OR EXTERNAL DEVICES.

Remove the external devices connected to CD and USB. Also, remove the external devices with Bluetooth.

Is the screen freeze eliminated?

Yes	Go to 3.
No	Go to 6.

3. CHECK OTHER EXTERNAL DEVICE CONNECTION.

When screen freeze is eliminated, connect external devices one by one to identify the device that causes screen freeze.

Is the device that reproduces screen freeze identified?

Yes	Go to 4.
No	Go to 5.

4. CHECK OTHER EXTERNAL DEVICE CONNECTION.

1. Replace the identified device with the one that has the same performance.
2. Turn the ignition switch to ACC.

Does the screen freeze occur?

Yes	Replace the unit. Ref. to ENTERTAINMENT & MONITORING>Audio.
No	The external device may be defective.

5. CHECK OPERATION PROCEDURE.

Ask how the user operates when screen freeze occurs, and perform using the same procedure.

Is the check result OK?

Yes	Currently no failure is found.
No	Go to 6.

6. CHECK ENVIRONMENTAL CONDITION.

Check if any external devices which emit strong electromagnetic waves and noises, such as a radio antenna, is installed inside the vehicle.

Is the check result OK?

Yes	Go to 7.
No	Remove the external device and perform the inspection from step 2 again. If the fault is not fixed: Go to 7.

7. PERFORM INITIALIZATION PROCEDURE.

Perform the initialization procedure for the unit.

Caution:

When the initialization procedure is performed, the data, telephone directory, etc. recorded in the unit body will be deleted. Before initialization, obtain permission from the user.

- **Audio system: Ref. to INFOTAINMENT(DIAGNOSTICS) >Work Support>OPERATION. Ref. to INFOTAINMENT(DIAGNOSTICS) >Service Diagnostics Mode>OPERATION.**
- **Navigation system: Ref. to INFOTAINMENT(DIAGNOSTICS) >Work Support>OPERATION. Ref. to INFOTAINMENT(DIAGNOSTICS) >Service Diagnostics Mode>OPERATION.**

Is the screen freeze eliminated?

Yes	Go to 5. If the screen freeze occurs again, replace the unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

3. THE SCREEN IS BLACKED OUT, OR THE SCREEN IS NOT DISPLAYED

Probable cause:

Power supply circuit malfunction, illumination circuit malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK RESTARTING DISPLAY.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK POWER SUPPLY BUTTON.	yes →	Perform the instructed procedures.
	no →	Go to 3.

3. CHECK BUTTON ILLUMINATION.

no → Perform the instructed procedures.

yes ↓

4. CHECK INDICATION WITH ILLUMINATION ON.

yes → Go to 7.

no → Go to 5.

5. CHECK HARNESS.

no → Perform the instructed procedures.

yes ↓

6. CHECK INTEGRATED UNIT.

no → Perform the instructed procedures.

yes ↓

7. CHECK UNDER OVERLOAD CONDITION.

no → Perform the instructed procedures.

yes ↓

8. OPERATIONAL CHECK.

yes → Perform the instructed procedures.

no → Go to 9.

9. CHECK EXTERNAL DEVICE.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK RESTARTING DISPLAY.

Turn the ignition switch OFF → leave it for three minutes or more after the display turns off, then turn it to ACC. (The door should be closed at this time.)

Is the screen properly displayed?

Yes	Currently no failure is found.
No	Go to 2.

2. CHECK POWER SUPPLY BUTTON.

Check if the screen OFF mode is turned on by pressing the power supply button of the unit body.

Is the screen properly displayed?

Yes	The screen OFF mode might be activated. Currently no failure is found.
No	Go to 3.

3. CHECK BUTTON ILLUMINATION.

Turn the ignition switch to ACC.

Do the buttons located at bottom of the screen illuminate?

Yes	Go to 4.
No	Perform “Power will not turn ON” in Diagnostics with Phenomenon. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > POWER WILL NOT TURN ON.

4. CHECK INDICATION WITH ILLUMINATION ON.

Turn the lighting switch to ON.

Does the screen brightness change?

Yes	Go to 7.
No	Go to 5.

5. CHECK HARNESS.

Check for poor contact of the harnesses, connectors and terminals that are connected to the unit body.

Is the check result OK?

Yes	Go to 6.
No	Repair or replace the harness.

6. CHECK INTEGRATED UNIT.

Using the Subaru Select Monitor, check the following items in the [Data Monitor] of [Body Control].
Ref. to BODY CONTROL(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Lighting I Switch Input]

Is the input signal OK?

Yes	Go to 7.
No	Replace the integrated unit. Ref. to SECURITY AND LOCKS>Body Integrated Unit.

7. CHECK UNDER OVERLOAD CONDITION.

1. Turn the ignition to OFF.
2. Leave as is for 10 minutes (cooling down), and then turn the ignition to ACC to check the operation.

Is the screen properly displayed?

Yes	Go to 8.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

8. OPERATIONAL CHECK.

Obtain the information about the audio device that the user used (SD, Bluetooth, CD, etc.), and connect the same device. Then play the device for 10 minutes or more.

Is the screen properly displayed?

Yes	Currently no failure is found.
No	Go to 9.

9. CHECK EXTERNAL DEVICE.

1. Replace the external device that might cause trouble with another device. (If trouble occurs while using a CD, replace the CD with another one. If trouble occurs while using an external device that is connected via USB, replace the external device with another device.)
2. Operate for 10 minutes or more.

Is the screen properly displayed?

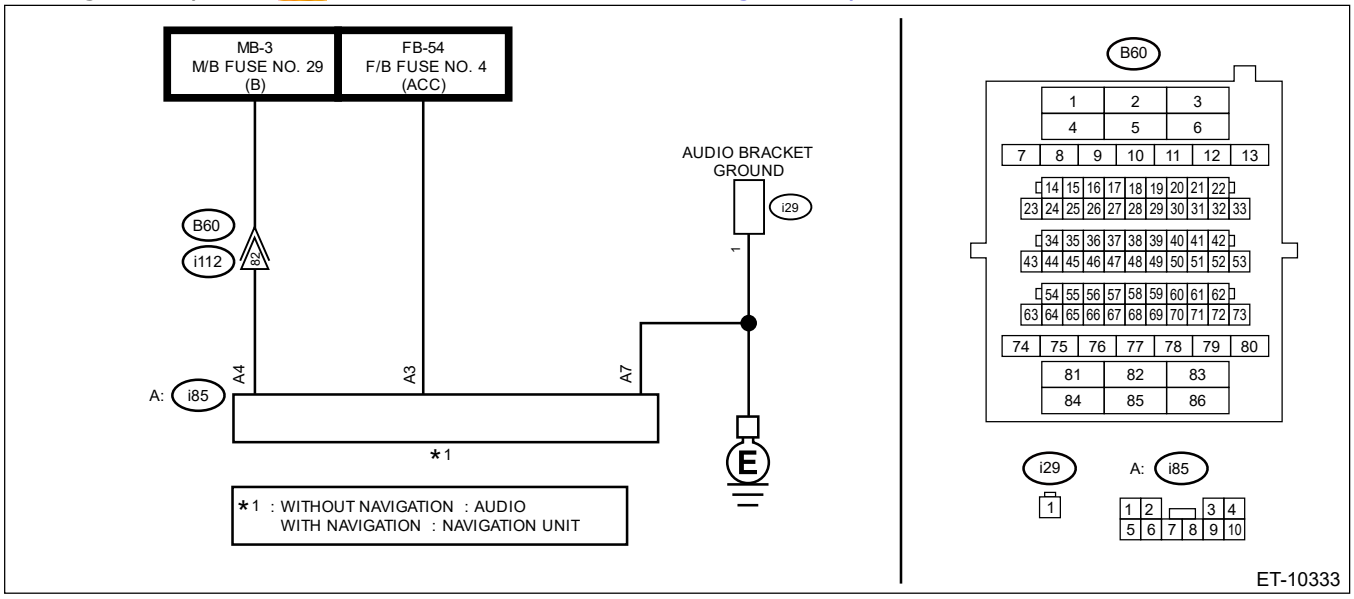
Yes	The external device might have trouble, resulting in the overload state.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

4. SYSTEM IS RESET

Probable cause:

Influence by external devices, power supply circuit malfunction, unit body malfunction
Wiring diagram:

- Audio system Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM.
- Navigation system Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK ENVIRONMENTAL CONDITION.
   - no → Go to 2.
   - yes ↓
2. CHECK CONNECTOR CONNECTION.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK CONNECTOR.
   - no → Perform the instructed procedures.
   - yes ↓
4. CHECK POWER SUPPLY VOLTAGE.
   - yes → Go to 8.
   - no → Go to 5.

5. CHECK OPEN CIRCUIT IN HARNESS (POWER SUPPLY).
→ no: Perform the instructed procedures.
↓ yes

6. CHECK OPEN CIRCUIT IN HARNESS (GROUND).
→ no: Perform the instructed procedures.
↓ yes

7. CHECK BATTERY.
→ no: Perform the instructed procedures.
↓ yes

8. CHECK UNIT OPERATION.
→ yes: Perform the instructed procedures.
→ no: Perform the instructed procedures.

1. CHECK ENVIRONMENTAL CONDITION.

Check if any external devices which emit strong electromagnetic waves and noises, such as a radio antenna, is installed inside the vehicle.

Is the check result OK?

Yes	Go to 2.
No	Remove the external device to check the operation. If the fault is not fixed: Go to 2.

2. CHECK CONNECTOR CONNECTION.

Check that the connector is connected to the unit.

Is the check result OK?

Yes	Go to 3.
No	Connect the connector.

3. CHECK CONNECTOR.

Check for poor contact of connectors or terminals.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the harness.

4. CHECK POWER SUPPLY VOLTAGE.

1. Turn the ignition switch to ACC.
2. Using a tester, measure the voltage between connector and chassis ground.

Note:

Turn the electrical parts to OFF.

Connector & terminal

(i85) No. 4 (+) — Chassis ground (−):

(i85) No. 3 (+) — Chassis ground (−):

Is the voltage 12 V or more?

Yes	Go to 8.
No	Go to 5.

5. CHECK OPEN CIRCUIT IN HARNESS (POWER SUPPLY).

Using the tester, measure the resistance between connector and chassis ground while shaking the harness.

Connector & terminal

(i85) No. 4 — Chassis ground:

(i85) No. 3 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 6.
No	Repair or replace the open circuit of harness.

6. CHECK OPEN CIRCUIT IN HARNESS (GROUND).

Using the tester, measure the resistance between connector and chassis ground while shaking the harness.

Connector & terminal

(i85) No. 7 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

Is the check result OK?

Yes	Go to 8.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

8. CHECK UNIT OPERATION.

1. Connect all connectors.
2. Turn the ignition switch to ACC and the power supply switch of the unit to ON.

Is the reset eliminated?

Yes	Currently no failure is found.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

5. CDS CANNOT BE PLAYED BACK

Probable cause:
CD malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CONFIRM CD INSERTION CONDITION.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK CD.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK CD.
   - yes → Perform the instructed procedures.
   - no ↓ Go to 4.

4. CHECK DEW CONDENSATION IN UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CONFIRM CD INSERTION CONDITION.

Check that the CD is inserted properly.

Is the check result OK?

Yes	Go to 2.
No	Insert the CD properly.

2. CHECK CD.

Check the CD surfaces are free from scratches or dirt.

Is the check result OK?

Yes	Go to 3.
No	The CD is defective.

3. CHECK CD.

Replace the CD with another one. (Use a playable CD. Refer to owner’s manual for details.)

Is the CD played back?

Yes	The CD is defective.
No	Go to 4.

4. CHECK DEW CONDENSATION IN UNIT.

1. After starting the engine, turn ON the air conditioner and dry inside the vehicle for 10 minutes or more.
2. Check the CD operation.

Is the CD played back?

Yes	Dew condensation occurred inside the unit.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

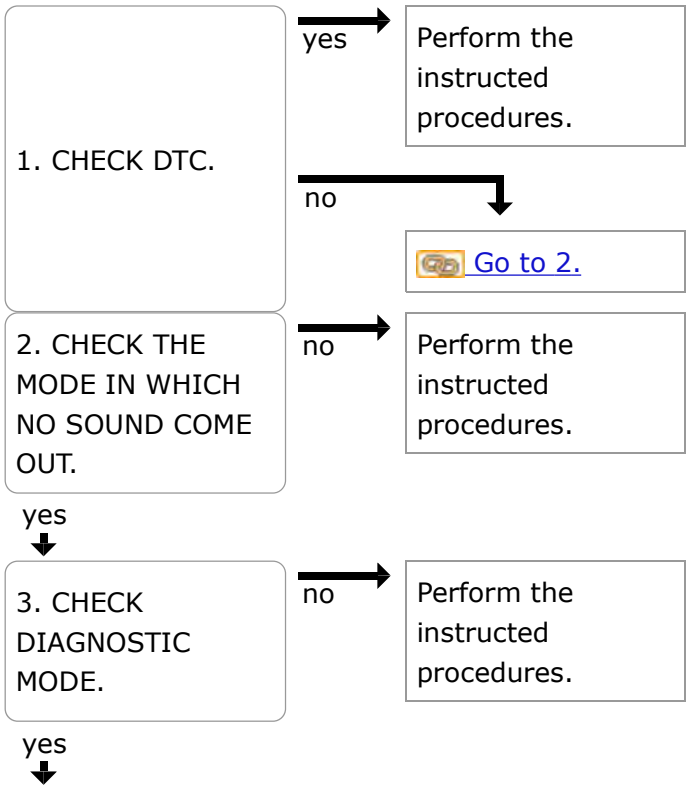
6. SOUND DOES NOT COME OUT FROM THE SPEAKER

Probable cause:

Speaker malfunction, amplifier malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.



4. CHECK MUTE MODE.	yes →	Perform the instructed procedures.
	no →	Go to 5.
5. CHECK DTC (MODEL WITH TELEMATICS).	yes →	Perform the instructed procedures.
	no →	Go to 6.
6. CHECK CONNECTOR.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch OFF → ON.
2. Read the DTC of [Infotainment] using the Subaru Select Monitor. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2244 displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTC B2244. Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2244 AMPLIFIER COMMUNICATION.
No	Go to 2.

2. CHECK THE MODE IN WHICH NO SOUND COME OUT.

Check if sound comes out in each mode such as CD, radio, etc.

Does it have no sound in all modes?

Yes	Go to 3.
No	Check each mode in which no sound come out. For CD: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CDS CANNOT BE PLAYED BACK. For radio: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > RADIO VOLUME IS LOW OR INTERFERENCE NOISE OCCURS. For Bluetooth audio: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH CONNECTION CANNOT BE ESTABLISHED.

3. CHECK DIAGNOSTIC MODE.

Perform {Audio Check} on the {Line Diag} screen. Ref. to ENTERTAINMENT & MONITORING>Audio System>OPERATION > CHECK SPEAKER OUTPUT WITH LINE DIAG MODE AND ANTENNA CONNECTION.

Does it have no sound in all speakers?

Yes	Go to 4.
No	Model with power amplifier: Check the harnesses between the unit and power amplifier and between power amplifier and speaker for open circuit or short circuit. If no fault is found, replace the speaker. Model without power amplifier: Check the harness between the unit and speaker for open circuit or short circuit. If no fault is found, replace the speaker.

4. CHECK MUTE MODE.

Check if the MUTE mode is turned on when the MUTE button is installed.

Is the volume level set to the minimum?

Yes	Since the MUTE mode is on or the volume level is set to the minimum, sound does not come out.
No	Go to 5.

5. CHECK DTC (MODEL WITH TELEMATICS).

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are B2A0E (mute line circuit), B2A05 (left speaker/audio circuit) and B2A06 (right speaker/audio circuit) displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK CONNECTOR.

Check for poor contact in the connector of the unit and the connector of each speaker. Check for poor contact in the amplifier connector for models with amplifier.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Repair or replace the harness.

7. BLUETOOTH CONNECTION CANNOT BE ESTABLISHED

Probable cause:
Bluetooth device malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK BLUETOOTH DEVICE.	yes →	Perform the instructed procedures.
	no →	Go to 2.
2. CHECK BLUETOOTH DEVICE.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK BLUETOOTH DEVICE.	yes →	Perform the instructed procedures.
	no →	Go to 4.
4. CHECK ENVIRONMENTAL CONDITION.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK BLUETOOTH DEVICE.

Restart the Bluetooth device, and connect again.

Does it start properly?

Yes	Currently no failure is found.
No	Go to 2.

2. CHECK BLUETOOTH DEVICE.

Re-register the Bluetooth device, and connect again.

Is communication successful?

Yes	Currently no failure is found.
No	Go to 3.

3. CHECK BLUETOOTH DEVICE.

1. Connect other Bluetooth device.

Note:

Supported Bluetooth type: Ver. 3.0 +EDR compatible

- **Bluetooth Phone**
  Profile
  – HFP: Ver. 1.6
  – OPP: Ver. 1.1
  – PBAP: Ver. 1.1.1
  – MAP: Ver. 1.1
  – SPP: Ver. 1.1
- **Bluetooth Audio Device**
  Profile
  – A2DP: Ver. 1.3
  – AVRCP: Ver. 1.5

Is communication successful?

Yes	Bluetooth device which cannot be connected might be faulty.
No	Go to 4.

4. CHECK ENVIRONMENTAL CONDITION.

Check if any external devices which emit strong electromagnetic waves and noises, such as a radio antenna, is installed inside the vehicle.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Remove the external device and perform the inspection from step 1 again.

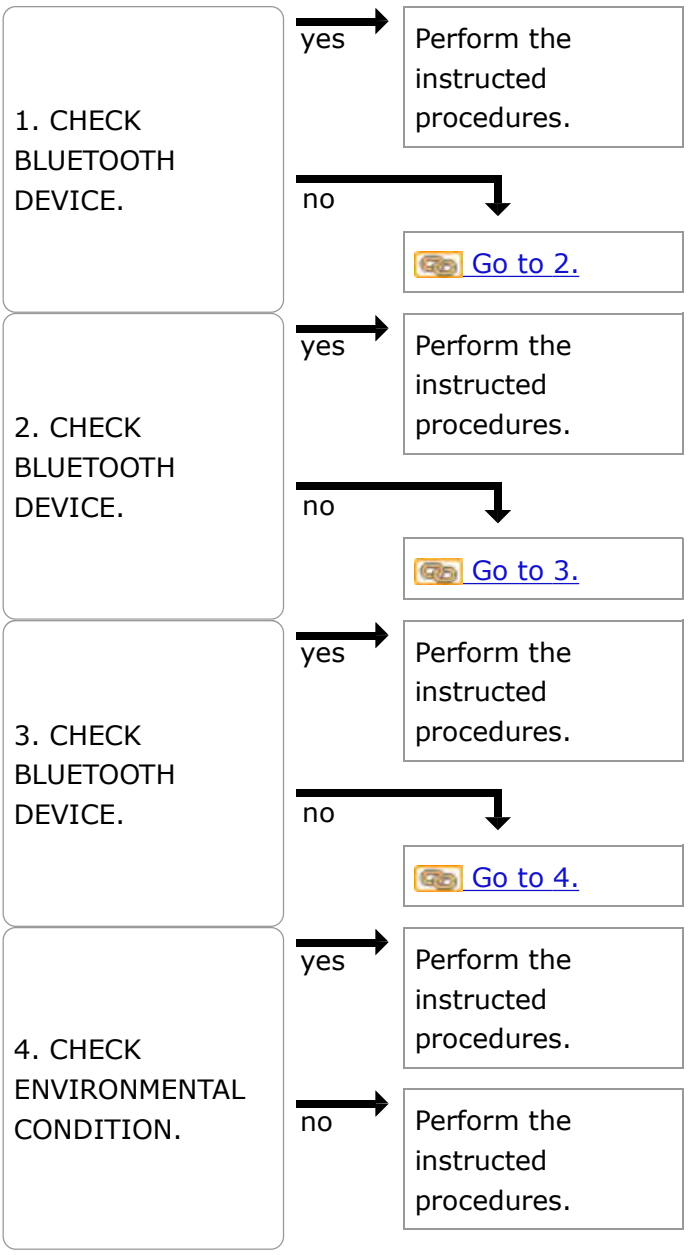
8. BLUETOOTH DOES NOT OPERATE

Probable cause:

Bluetooth device malfunction, influence by external devices, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.



1. CHECK BLUETOOTH DEVICE.

Restart the Bluetooth device, and connect again.

Does it start properly?

Yes	Currently no failure is found.
No	Go to 2.

2. CHECK BLUETOOTH DEVICE.

Re-register the Bluetooth device, and connect again.

Is communication successful?

Yes	Currently no failure is found.
No	Go to 3.

3. CHECK BLUETOOTH DEVICE.

1. Connect other Bluetooth device.

Note:

Supported Bluetooth type: Ver. 3.0 +EDR compatible

- **Bluetooth Phone Profile**
  - **– HFP: Ver. 1.6**
  - **– OPP: Ver. 1.1**
  - **– PBAP: Ver. 1.1.1**
  - **– MAP: Ver. 1.1**
  - **– SPP: Ver. 1.1**
- **Bluetooth Audio Device Profile**
  - **– A2DP: Ver. 1.3**
  - **– AVRCP: Ver. 1.5**

Is communication successful?

Yes	Bluetooth device which cannot be connected might be faulty.
No	Go to 4.

4. CHECK ENVIRONMENTAL CONDITION.

Check if any external devices which emit strong electromagnetic waves and noises, such as a radio antenna, is installed inside the vehicle.

Is the check result OK?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Remove the external device and perform the inspection from step 1 again.

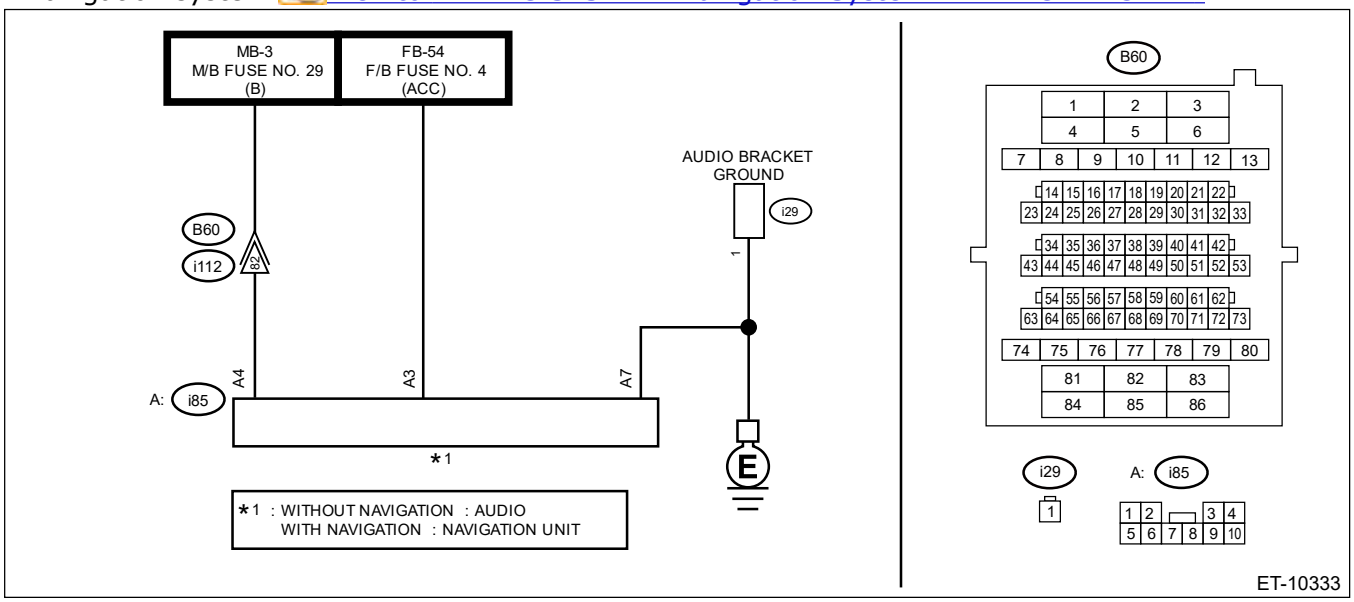
9. RADIO VOLUME IS LOW OR INTERFERENCE NOISE OCCURS

Probable cause:

Reception environment, antenna circuit malfunction, Influence by external devices, ground circuit malfunction, unit body malfunction

Wiring diagram:

- Audio system Ref. to WIRING SYSTEM>Audio System>WIRING DIAGRAM.
- Navigation system Ref. to WIRING SYSTEM>Navigation System>WIRING DIAGRAM.



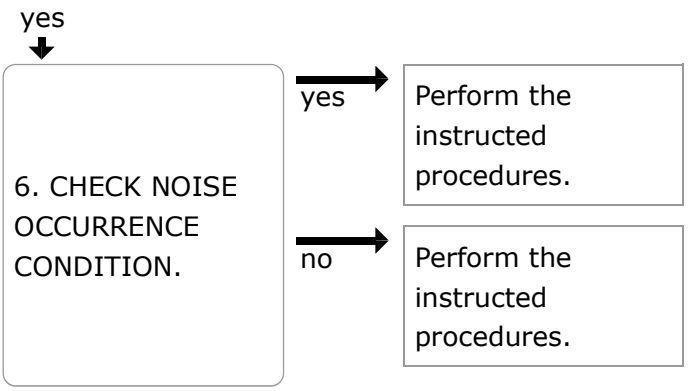
Caution:

- **If non-genuine electrical parts are installed, they may cause interference noise.**
- **Refer to the following diagnostic procedure if equipped with the digital radio using the Internet connection.**
- **Check SUBARU STARLINK service: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CHECK SUBARU STARLINK SERVICE.**
- **Bluetooth connection cannot be established: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > BLUETOOTH CONNECTION CANNOT BE ESTABLISHED.**
- **Check connection between smartphone and unit: Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CHECK CONNECTION BETWEEN SMARTPHONE AND UNIT.**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.**

Note:

When the volume of AHA and Pandora is low, connect the smartphone to the Internet, and check that AHA and Pandora is audible on the smartphone itself. When it is inaudible, or the volume is too low, there is a problem with the smartphone, Internet connection or service provider. When it is audible with the smartphone without any troubles, there is a problem with connection to the vehicle (USB connection or Bluetooth connection).

1. CHECK SYMPTOM.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK ANTENNA.	no →	Perform the instructed procedures.
yes ↓		
3. CHECK HARNESS.	no →	Perform the instructed procedures.
yes ↓		
4. CHECK UNIT GROUND CIRCUIT.	no →	Perform the instructed procedures.
yes ↓		
5. CHECK ENVIRONMENTAL CONDITION.	no →	Go to 6.



1. CHECK SYMPTOM.

Check in which condition (place) the noise occurs.

Does it occur in any places?

Yes	Go to 2.
No	Radio wave reception condition is poor. (In tunnel, buildings, etc.) There is no failure on the vehicle.

2. CHECK ANTENNA.

Check for poor contact of connectors or terminals.

Is the check result OK?

Yes	Go to 3.
No	Repair or replace the harness.

3. CHECK HARNESS.

Check the antenna harness for an open or short circuit, and check the booster.

Is the check result OK?

Yes	Go to 4.
No	Repair or replace the harness.

4. CHECK UNIT GROUND CIRCUIT.

Check the unit ground connector (1P on back side).

Is the check result OK?

Yes	Go to 5.
No	Repair or replace the ground circuit.

5. CHECK ENVIRONMENTAL CONDITION.

Check if any external devices which emit strong electromagnetic waves and noises, such as a radio antenna, is installed inside the vehicle.

Is the check result OK?

Yes	Go to 6.
No	Remove the external device. There is no failure if it returns to normal. If the fault is not fixed: Go to 6.

6. CHECK NOISE OCCURRENCE CONDITION.

Stop the engine, and turn the ignition switch to ON to check for noise occurrence.

Does the noise occur while the engine stops?

Yes	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Check that the engine ignition system, generator, engine ground circuit and chassis ground circuit are connected securely.

10. WRONG LOCATION OF VEHICLE, NO GPS RECEPTION

Probable cause:

Influence by external devices, GPS antenna circuit malfunction, vehicle seed sensor circuit malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK SYMPTOM.
   - no → Go to 4.
   - yes ↓
2. CHECK EXTERNAL DEVICE INSTALLATION.
   - no → Go to 3.
   - yes ↓
3. CHECK DIAGNOSTIC MODE.
   - yes → Go to 5.
   - no → Go to 4.

4. CHECK GPS ANTENNA.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.
5. INSPECTION OF VEHICLE SPEED SENSOR.	yes →	Perform the instructed procedures.
	no →	Go to 6.
6. CHECK VEHICLE SPEED SIGNAL.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK SYMPTOM.

Check in which condition (place) the vehicle is located out of position.

Does it occur in any places?

Yes	Go to 2.
No	Go to 4.

2. CHECK EXTERNAL DEVICE INSTALLATION.

Check if an external device is installed near the GPS antenna or unit.

Is the check result OK?

Yes	Go to 3.
No	Remove the external device. There is no failure if it returns to normal. If the fault is not fixed: Go to 3.

3. CHECK DIAGNOSTIC MODE.

Check the GPS item on the {Line Diag} screen.

Is the display OK?

Yes	Go to 5.
No	Go to 4.

4. CHECK GPS ANTENNA.

Check that the GPS antenna connector is connected.

Is the connector connected?

Yes	Replace the navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Replace the GPS antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

5. INSPECTION OF VEHICLE SPEED SENSOR.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK VEHICLE SPEED SIGNAL.

Check the [Speed] of [Data Monitor] using Subaru Select Monitor.

Is the check result OK?

Yes	Replace the navigation assembly. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.
No	Check the VDC CM. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

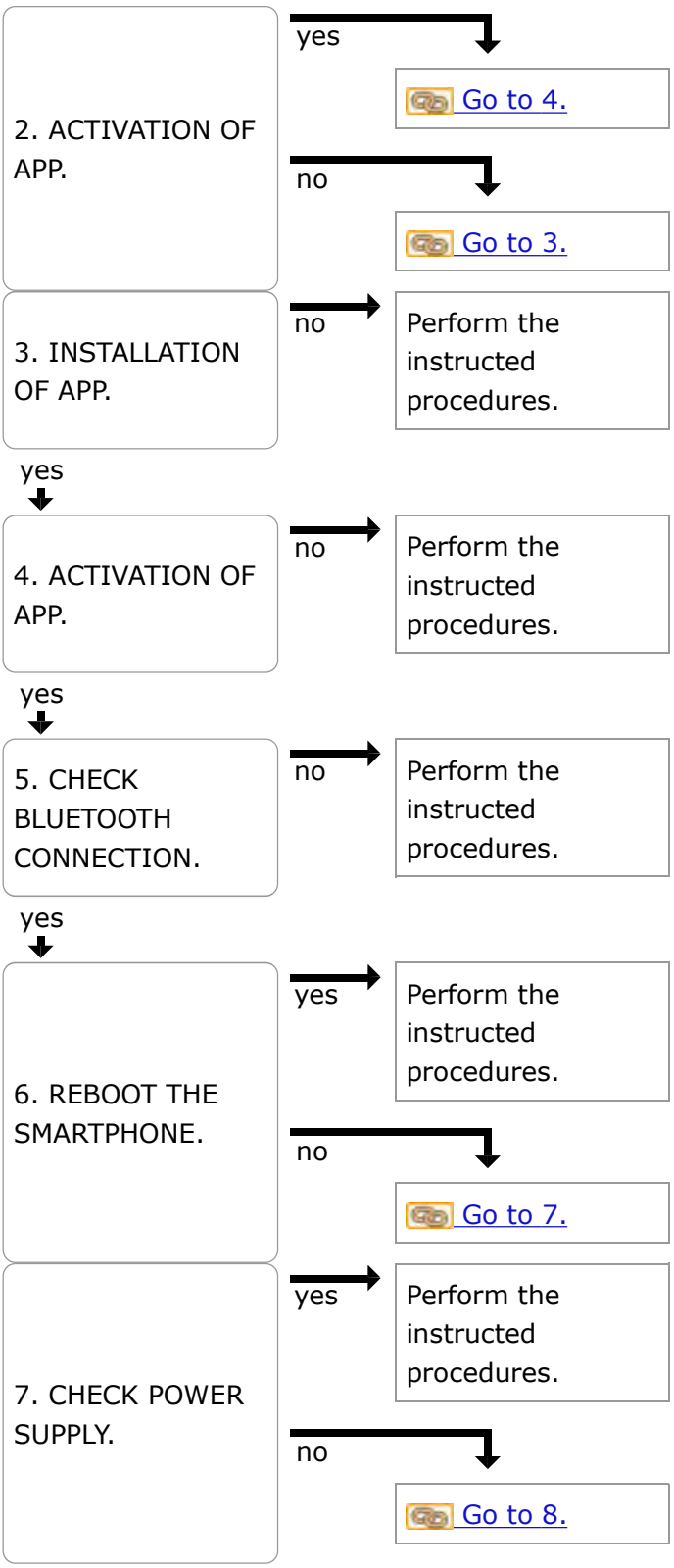
11. CHECK CONNECTION BETWEEN SMARTPHONE AND UNIT

Probable cause:
Smartphone malfunction, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK COMPATIBILITY OF SMARTPHONE.
   - no → Perform the instructed procedures.
   - yes ↓


2. ACTIVATION OF APP.
yes
Go to 4.
no
Go to 3.
3. INSTALLATION OF APP.
no
Perform the instructed procedures.
yes
4. ACTIVATION OF APP.
no
Perform the instructed procedures.
yes
5. CHECK BLUETOOTH CONNECTION.
no
Perform the instructed procedures.
yes
6. REBOOT THE SMARTPHONE.
yes
Perform the instructed procedures.
no
Go to 7.
7. CHECK POWER SUPPLY.
yes
Perform the instructed procedures.
no
Go to 8.

8. DELETE CACHE INFORMATION OF THE UNIT.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK COMPATIBILITY OF SMARTPHONE.

Check that the customer's smartphone is compatible with the system.
- iPhone: iOS 4.3.5 or later
- Android: Android 4.0 or later

Is it compatible?

Yes	Go to 2.
No	The smartphone is not compatible; therefore, it does not work with the system.

2. ACTIVATION OF APP.

Check the SUBARU STARLINK app of the smartphone.

Is it installed?

Yes	Go to 4.
No	Go to 3.

3. INSTALLATION OF APP.

Install SUBARU STARLINK app to smartphone.

Is installation successful?

Yes	Go to 4.
No	Reboot the smartphone, and install the SUBARU STARLINK.

4. ACTIVATION OF APP.

Activate SUBARU STARLINK app.

Is SUBARU STARLINK app activated?

Yes	Go to 5.
No	Reinstall the app and activate it. If you still fail to activate it, the smartphone may be defective.

5. CHECK BLUETOOTH CONNECTION.

Confirm the Bluetooth connection with the unit.

Is Bluetooth connection established?

Yes	Go to 6.
No	Check that the unit can connect with other smartphones. If successful, the smartphone may be defective. If the unit cannot communicate with other smartphones, replace the unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

6. REBOOT THE SMARTPHONE.

1. Reboot the smartphone.
2. Reinstall the SUBARU STARLINK app.

Is it operating normally?

Yes	The system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.
No	Go to 7.

7. CHECK POWER SUPPLY.

Turn the ignition to OFF → ACC ON.

Is it operating normally?

Yes	The system has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again.
No	Go to 8.

8. DELETE CACHE INFORMATION OF THE UNIT.

Delete cache information of the unit.

Note:

1. **Select SUBARU STARLINK from the APPS screen.**
2. **On the SUBARU STARLINK display (including an error message screen), press and hold the right bottom corner of the screen for 30 seconds or more.**
3. **Lift your finger off the screen. If the message [Select Audio Source] appears when you lift your finger off the screen, the cache information is successfully deleted.**

Is it operating normally?

Yes	Cache information temporary stored in the unit was corrupted. Currently, it is normal.
No	Perform the procedures described on "Check SUBARU STARLINK service". Ref. to INFOTAINMENT(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > CHECK SUBARU STARLINK SERVICE.

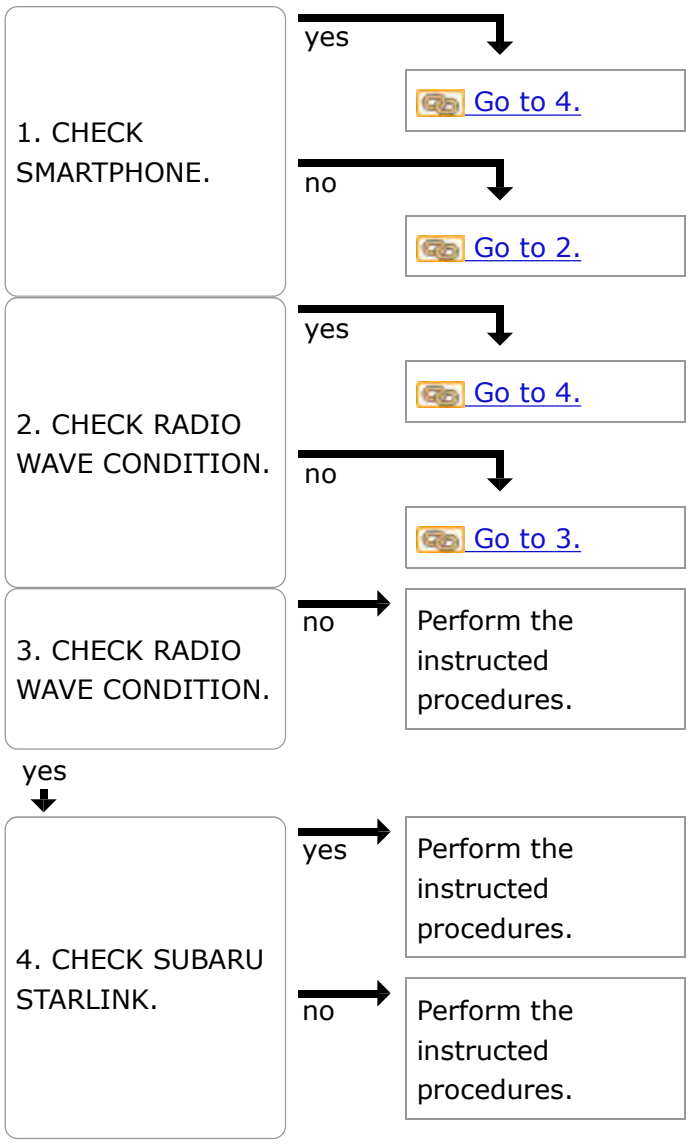
12. CHECK SUBARU STARLINK SERVICE

Probable cause:

Smartphone malfunction, influence by radio wave condition, influence by STARLINK service side, unit body malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to INFOTAINMENT(DIAGNOSTICS) >General Description>CAUTION.



1. CHECK SMARTPHONE.

Check the smartphone connection.

Can the smartphone connect the Internet?

Yes	Go to 4.
No	Go to 2.

2. CHECK RADIO WAVE CONDITION.

Move to a location where the radio wave condition is good, and confirm the connection.

Can the smartphone connect the Internet?

Yes	Go to 4.
No	Go to 3.

3. CHECK RADIO WAVE CONDITION.

Communication network gets busy at times even in a good radio wave location. In this case, wait for some time and then try again.

Can the smartphone connect the Internet?

Yes	Go to 4.
No	The smartphone may be defective.

4. CHECK SUBARU STARLINK.

Check service provision status with SUBARU STARLINK.

Is there any problem in the service provision status?

Yes	Try to connect after the problem in service provision is solved.
No	Replace the audio or navigation unit. Ref. to ENTERTAINMENT & MONITORING>Audio. Ref. to ENTERTAINMENT & MONITORING>Navigation Body.

OPERATION

Note:

Contents indicated in this section generally describe inspection procedures to be performed when Subaru Select Monitor cannot be used. However, some of the inspections described here cannot be performed with Subaru Select Monitor.
For the items that Subaru Select Monitor is not supporting, perform the inspections by referring to information indicated in this section.

1. PROCEDURE TO SWITCH TO SERVICE DIAGNOSTICS MODE

1. Turn the ignition switch to ACC.
2. Press "TUNE/SCROLL" six times while pressing "HOME" button.

2. SERVICE INSPECTION

CONNECTION

On Service Menu, click "Connection" to display the following items.
OK: Each connection device is connected properly.
NG: Connection is not established, or connection status (including harness) is faulty.

Note:

Check the external connection terminals (USB 1, USB 2 and AUX) by connecting memory or a pin jack for inspection.

Check the connection status of the connector and harness. If there are no problems, the connection device or unit could be faulty.

The following shows information to be displayed and its description.

Item	Item detection method	OK judgment condition	Note
GPS	Direct line	GPS antenna is connected. (NG is displayed when short circuit is detected.)	With navigation only
MIC	Direct line	(i87) No. 6 falls to GND level.	—
Rr_CAM	Direct line	Synchronized signals from the camera are input to (i146) No. 3.	—
AUX	Direct line	(i87) No. 25 falls to GND level.	—
USB1	Communication	USB device is connected to USB-HUB to obtain USB device information properly. (Should be recognizable as a supported USB device.)	—
USB2	Communication	USB device is connected to USB-HUB to obtain USB device information properly. (Should be recognizable as a supported USB device.)	—
SXM	Direct line	XM-ANT is connected. (NG is displayed when short circuit is detected.)	It takes approx. 30 seconds to become recognizable.
CAN	Communication	CAN communication is completed properly.	—

FUNCTION CHECK

On Service Menu, click "Function Check" to display the following items.

1. Panel•Steering Switch Check Panel&Steering Switch Touch Switch

Once the screen is displayed, press the push switches to check that the number of pushed switches matches the number shown in Pushed SW.

If the number of SW does not match, SW conditions are not properly recognized. Therefore, perform inspection for unrecognized switches.

In addition, turn the rotary switch clockwise or counterclockwise to check that the screen indicates correct status according to the operation. If the screen display does not match the actual operation, the rotary SW may be faulty. Perform inspection for the rotary SW.

Note:

The following shows information to be displayed and its description.

Item	Display	Contents
Result	Pressed	Pressing of switch is detected.
Number of switch pushed	1	One pressed switch is detected.
	2	Two pressed switches are detected.
	3	Three pressed switches are detected.
	4	Four pressed switches are detected.
Direction of switch rotation	+ direction	The rotary switch is turned clockwise.
	- direction	The rotary switch is turned counterclockwise.

2. Touch Switch Check

Note:

The Subaru Select Monitor does not have the Touch Switch Check function.

Once the screen appears, touch the screen. + (cursor) appears where you touched.

Note:

The following shows information to be displayed and its description.

Item	Contents
+ (Cursor)	Appears when the screen is touched. The displayed white-outlined + (cursor) stays on, even when a touching finger is removed, until the screen is switched.

3. Microphone Check

On the Function Check/Setting screen, click Microphone Check to perform inspection for microphone.

With the microphone input level screen displayed, make sound toward the microphone.

Fluctuate the sound volume to check that the microphone input level changes accordingly.

If the input level does not become green or the input level does not change even when the sound volume is fluctuated, the microphone may be faulty.

Note:

The microphone input function is enabled while this screen is displayed.

- **The sound volume is indicated in eight levels.**
  The maximum input volume of microphone is equally divided into eight levels from level 0 to level 7.
- **The microphone input level is sampled every 100 ms, and the result is indicated in eight levels.**
  Display of the input level is also updated every 100 ms.
  The microphone input level gauge is updated even during recording.

4. System Sensors Check

GPS related check: Status of the GPS signal reception can be checked. When there is faulty in reception status, position detection or date indication, re-check the reception status at a location

with a fine view and no obstacles around that will interrupt the signal reception. When normal condition is still not obtained, the GPS antenna may be faulty.

- GPS/Reception number: Normal when it is indicated in blue.
- GPS/Status: Normal when OK is indicated.
- GPS/Measurement ratio 3D:
- GPS/Measurement ratio 2D:
- GPS/Date: Normal when current time is indicated. When current date/time is not indicated, click the Date Setting button to set the current date on the displayed date setting screen.
- GPS/Position: Normal when longitude and latitude of the current position are indicated.

SPD check: Status of the vehicle speed sensor signal can be checked.

1. Before starting inspections, check the safety around the vehicle. (Lift up the vehicle as necessary.)
2. When VDC CM detected DTC, clear the DTC.
3. Drive the vehicle at 9 km/h (6 MPH) or more.
4. Check that SPD indicates vehicle speed that is almost equivalent to the figure displayed on the combination meter.
5. Vehicle speed is not displayed. Or, when different vehicle speed is indicated, check if CAN system DTC is stored. If so, perform the diagnosis according to the DTC. When CAN system DTC is not stored, check if the DTC related to the vehicle sensor is stored for the VDC system, and perform inspection according to the procedure. If no fault is found with the CAN system and vehicle speed sensor, and the vehicle speed is displayed on the combination meter, the unit itself may be faulty.

Gyro sensor related check: Status of the Gyro sensor signal can be checked. If fault is found with the Gyro sensor related indications, the main unit could be faulty.

- Gyro sensor/Gyro Voltage: Shake the vehicle to the left and right to check that the voltage changes.
- Gyro/Distance correction study situation: Study situation can be checked.
- Reset: Press and hold the Reset button for three seconds to reset the pulse count of SPD, relative bearing of Gyro sensor, relative angle of inclined angle sensor.

Note:

The following shows information to be displayed and its description.

Item	Display	Contents
GPS/Reception number	Blue	When notification of “Positioning with collected data is used” is received from the GPS reception device. (Status: In-use)
	Yellow	When notification of “Tracking in progress” is received from the GPS reception device. (Status: Reception in progress)
	Transparent	When notification of “Positioning with collected data is not used” or “Searching in progress” is received from the GPS reception device. (Status: Not used)

Item	Display	Contents
GPS/Status	OK (H3D)	When three-dimensional positioning (Hyper 3D positioning) using satellites with less accuracy degradation is used.
	OK (H2D)	When two-dimensional positioning (Hyper 2D positioning) using satellites with less accuracy degradation is used.
	OK (3D)	When three-dimensional positioning is used.
	OK (2D)	When two-dimensional positioning is used.
	NG	When the positioning data is not available.
	error	When a reception error occurred.
	—	For cases other than above.
GPS/Measurement ratio 3D		Displays ratio of three-dimensional positioning satellites.
GPS/Measurement ratio 2D		Displays ratio of two-dimensional positioning satellites.
GPS/Measurement ratio NG		Displays ratio of non-positioning satellites.
GPS/Date	Current date and time	Displays date information obtained from GPS in four digits for year and 24-hour clock for time. Date information is displayed as [Y/M/D].
GPS/Position (latitude)	Current position, latitude information	Displays latitude information of the current position in “degree”, “minute” and “second”. When positioning information is not obtained, it appears as 00° 00’ 00”.
GPS/Position (longitude)	Current position, longitude information	Displays longitude information of the current position in “degree”, “minute” and “second”. When positioning information is not obtained, it appears as 00° 00’ 00”.
SPD/Pulse Count	Pulse count	Displays SPD signal status in the following format. • The number of input pulses accumulated since this screen is displayed. (Indicated in four-digit DEC code.) • The number returns to 0 after 9999. • Reset with ACC OFF/ON.

Item	Display	Contents
SPD/Speed	Speed	Displays SPD signal status in the following format. • LSB: Displays in km-per-hour as 1 [km/h]. • Displays 255 [km/h] for MAX value or more, and 0 [km/h] for MIN value or less.
Gyro sensor/Gyro Voltage	Voltage value.	Voltage value (unit: V, LSB: 1 mV).
Gyro/Distance correction study situation	Gyro/Distance correction study situation.	
Reset	Reset the following display items to [0]. • SPD pulse count • Relative bearing of Gyro sensor • Relative angle of inclined angle sensor	Press and hold the reset button for three seconds or more.

VEHICLE SIGNAL

On Service Menu, click “Vehicle Signal” to display the following items.

- Battery: Status of the battery voltage signal input can be checked.
  Measure the battery voltage using a tester. System is normal when the indicated voltage is almost equivalent to the tester value. When the indicated voltage is different from the tester value, perform inspection for the power supply circuit of main unit.
- Vehicle speed: Status of the vehicle speed signal input can be checked.
  1. Before starting inspections, check the safety around the vehicle. (Lift up the vehicle as necessary.)
  2. When VDC CM detected DTC, clear the DTC.
  3. Drive the vehicle at 9 km/h (6 MPH) or more.
  4. Check that SPD indicates vehicle speed that is almost equivalent to the figure displayed on the combination meter.
  5. Vehicle speed is not displayed. Or, when different vehicle speed is indicated, check if CAN system DTC is stored. If so, perform the diagnosis according to the DTC. When CAN system DTC is not stored, check if the DTC related to the vehicle sensor is stored for the VDC system, and perform inspection according to the procedure. If no fault is found with the CAN system and vehicle speed sensor, and the vehicle speed is displayed on the combination meter, the unit itself may be faulty.
- IG: Status of the IG signal input can be checked.
  Turn the ignition switch to ON, and check that the IG indication appears as ON. If the indication does not appear as ON, check the IG signal line.
- ILL+: Status of the illumination signal input can be checked.
  1. Before starting inspections, turn the ignition switch to ON.
  2. Set the lighting switch to TAIL (small) position.
     Make sure that the bright switch is not turned ON at this time.
  3. Check that ON lights in ILL+ and then the screen becomes dim.
     ON: Normal.
     OFF: Abnormal. Check the signal line and connector. If no faulty is found, the unit itself may be

faulty.

- PKB: Status of the parking brake signal input can be checked.
- GPS/Position: Normal when longitude and latitude of the current position are indicated.
  Pull the parking brake switch. Check that ON is displayed in PKB.
  ON: Normal.
  OFF: Abnormal. Check the signal line and connector. If no faulty is found, the unit itself may be faulty.
- Bright: Status of the Bright signal input can be checked.
  Operate the dial-type bright switch next to the wheel steering. System is normal when the signal indicates ON.
  If the signal does not indicate ON, check the bright switch.
- REV: Status of the reverse range signal input can be checked.
  1. Before starting inspections, check the safety around the rear end of the vehicle and then turn the ignition switch to ON.
  2. Pull the parking brake switch and depress the brake pedal, then place the select lever in reverse.
  3. Check that ON is displayed in REV.
     ON: Normal.
     OFF: Abnormal. Check the signal line and connector. If no faulty is found, the unit itself may be faulty.

Note:

The following shows information to be displayed and its description.

Item	Display	Contents
Battery voltage	Status of battery voltage	0 [V] — 24.0 [V] (Minimum unit: 0.1 [V])
Vehicle speed	Status of vehicle speed	0 [km/h] — 255 [km/h] (Minimum unit 1 [km/h])
IG	ON	IG power supply ON
	OFF	IG power supply OFF
ILL+	ON	ILL+ signal ON
	OFF	LL+ signal OFF
PKB	ON	PKB signal ON
	OFF	PKB signal OFF
Bright	ON	Bright with dimmer
	OFF	Bright without dimmer
REV	ON	REV signal ON
	OFF	REV signal OFF

SYSTEM INFORMATION

On Service Menu, click “System Information” to display the following items.

- Pandora ID: ID that is required upon using Pandora. When this ID is not indicated, Pandora is not accessible.
- Memory Initialization: This function is used to initialize information stored in the main unit memory.

Caution:

When this function is used, music information and navigation setting information saved in the main unit will be deleted. Therefore, obtain permission from the user before using this function.

When initializing the memory, perform procedures by following the indicated messages.

PRODUCT INFORMATION

On Service Menu, click “Product Information” to display the following items.

- Product Information: Displays the product number of the main unit.
- Connectivity ID: ID that is required upon using the STARLINK functions. When this ID is not indicated, the STARLINK functions are not accessible.
- Pandora ID: ID that is required upon using Pandora. When this ID is not indicated, Pandora is not accessible.

DIAGNOSTIC RECORDER

On Service Menu, click “Diagnostic Recorder” to display the following items.

- ON/OFF: Set diagnostic recorder to ON/OFF.
- Data download: Output the data of diagnostic recorder to USB.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS)

LT(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
13. Diagnostics with Phenomenon

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

Caution:

For the steering responsive fog light system, perform the diagnosis for the "BODY CONTROL SYSTEM (DIAGNOSTICS)". Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Headlight / Foglight].
   Note:
   For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

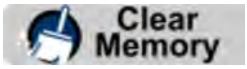
1. Record all DTCs, time stamp and freeze frame data.
   Note:
   For time stamp, refer to "LAN SYSTEM". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis according to the displayed DTC.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



4. Execute the inspection mode. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

CHECK

Inspect the following items regarding the vehicle's state.

1. AUTO HEADLIGHT BEAM LEVELER SYSTEM

Auto Headlight Beam Leveler System Check List for Interview Received Year Month Day			Date the Vehicle is
Customer's name		Registration No.	Initial year of registration Year Month Date
		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ( )
		Temperature	°C (°F) — °C (°F)
Road conditions		Occurrence location	
Accessory installation condition			
Confirmation of trouble condition			
❑ Diagnostic trouble code			

2. STEERING RESPONSIVE HEADLIGHT

Steering • Responsive • Headlight Check List for Interview Received Year Month Day		Date the Vehicle is
Customer's name	Registration No.	Initial year of registration Year Month Date

		Vehicle model	Frame number
Interviewer	Inspector	Engine type	Odometer reading
Customer specified content • • •			
Date and time when the trouble occurred		Frequency of trouble occurrence	Always occurs Sometimes occurs (times per day, times per month)
Condition of trouble occurrence (How the trouble occurs)		Weather	Fine • Cloudy • Rainy • Snowy • Others ( )
		Temperature	°C (°F) — °C (°F)
Road conditions			
Accessory installation condition			
Confirmation of trouble condition	Curve of trouble occurrence	❑ Right-hand curve ❑ Left-hand curve ❑ Both	
	Information on curve of trouble occurrence **Note:** **Check the location and curve on the map.**	❑ Specific location ❑ Gentle curve ❑ Sharp curve ❑ Uphill ❑ Downhill ❑ Other	
	Vehicle speed at trouble occurrence	Approximately km/h (MPH)	
	SRH OFF indicator status	❑ Light OFF ❑ Light ON ❑ Blink	
	Headlight switch operation	❑ Lo-Hi switch available ❑ Lo-Hi switch unavailable	
	Range inspection for CVT vehicle	❑ Shift indicator operates according to the shift position ❑ Shift indicator does not operate according to the shift position	
❑ Diagnostic trouble code			

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Before performing diagnosis, refer to "CAUTION" in "General Description" in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. AUTO HEADLIGHT BEAM LEVELER SYSTEM / STEERING RESPONSIVE HEADLIGHT / LED HEADLIGHT SYSTEM

Before performing diagnosis, refer to "CAUTION" in "General Description" in LIGHTING SYSTEM. Ref. to LIGHTING SYSTEM>General Description>CAUTION.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect the problems related to auto headlight beam leveler system or steering responsive headlight.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the relay and fuse condition. Ref. to LIGHTING SYSTEM>Relay and Fuse.
3. Check the connecting condition of harness and harness connector.

2. FUNCTION CHECK

AUTO HEADLIGHT BEAM LEVELER SYSTEM

1. Turn the ignition switch to ON.
2. Turn on the headlight low beam.
3. Check that the beam axes move when the vehicle condition is kept for three seconds or more after the vehicle posture is changed with the vehicle stopped.

LED HEADLIGHT SYSTEM

1. Turn the ignition switch to ON.
2. Turn on the headlight low beam.
3. Check that the headlight Low beam illuminates with normal brightness.

STEERING RESPONSIVE HEADLIGHT (THE INITIALIZE FUNCTION)

1. Stop the vehicle at approximately 1 m (3.3 ft) away and perpendicular to the wall.
2. Make the vehicle vicinity dark.
3. Set the vehicle headlight switch to Low beam.
4. Make sure that the headlight cut line moves to left and right immediately after the engine started.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** **For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

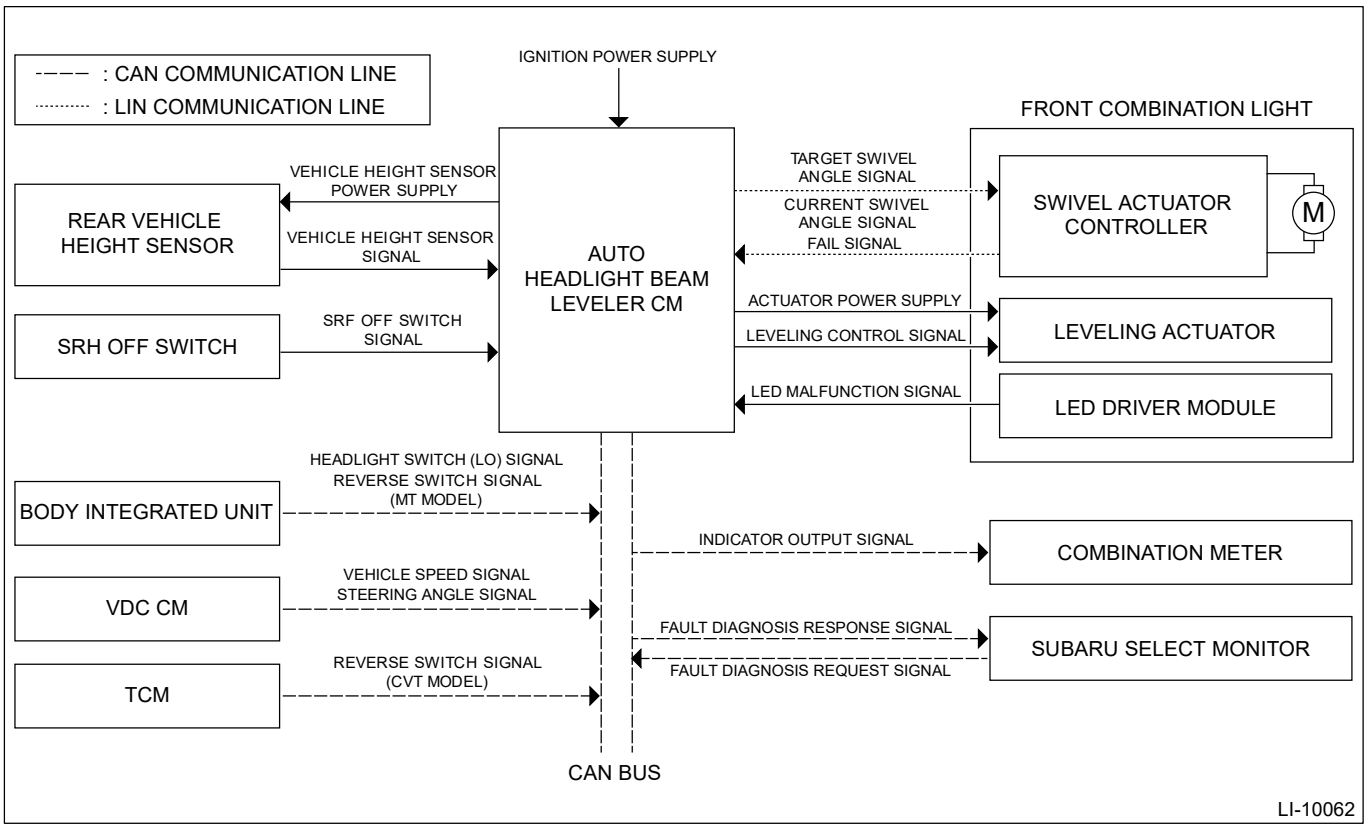
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > General Description

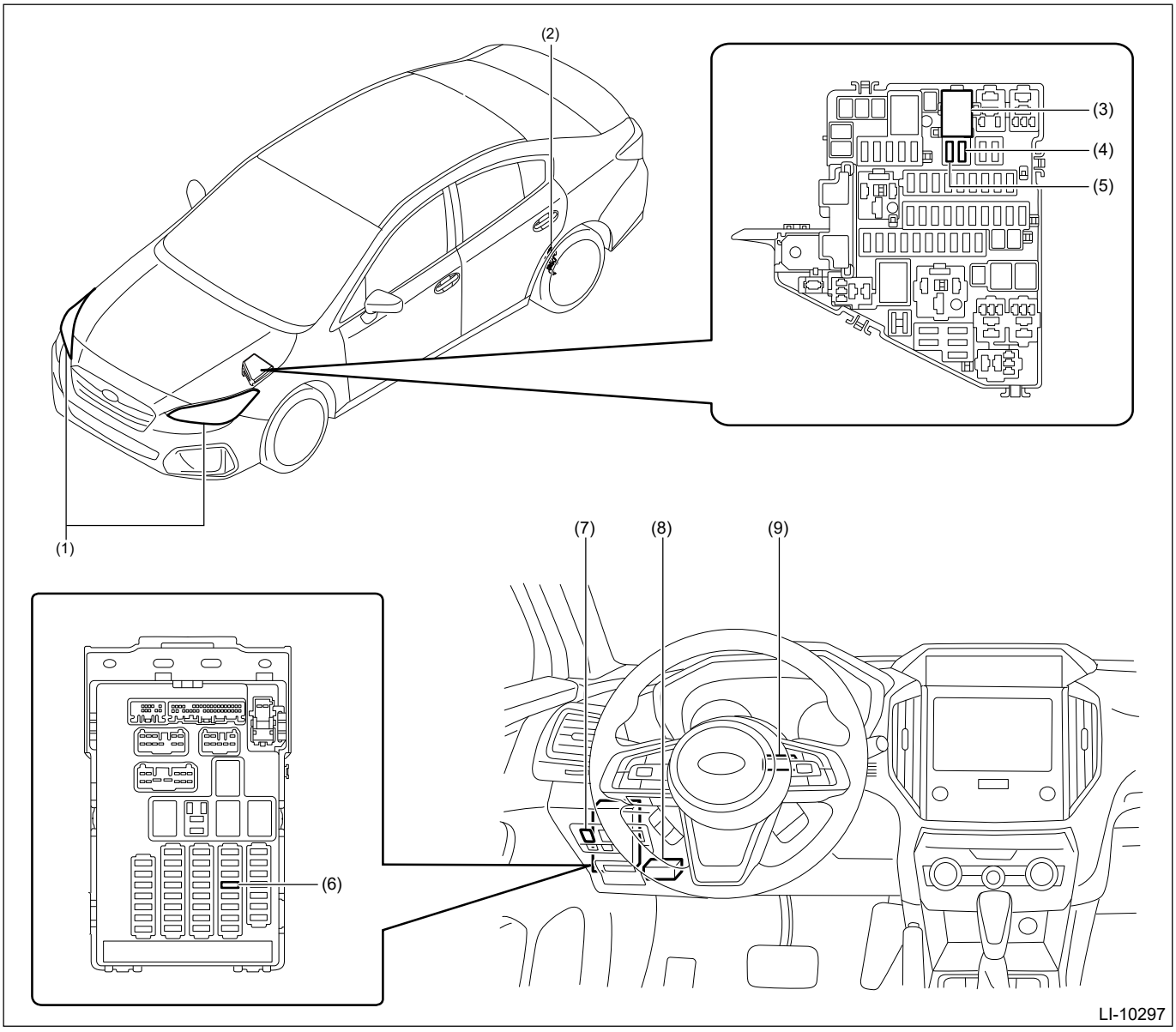
SYSTEM BLOCK DIAGRAM

- The auto headlight beam leveler is a system that automatically adjusts the headlight beam level (vertical directions) according to the longitudinal inclination angle of the vehicle due to heavy load or passengers' getting in/off a car.
- The steering responsive headlight is a system that calculates the corner R from the steering angle and vehicle speed to illuminate beyond the corner by moving the headlight beam to left and right.


: CAN COMMUNICATION LINE
: LIN COMMUNICATION LINE
IGNITION POWER SUPPLY
FRONT COMBINATION LIGHT
VEHICLE HEIGHT SENSOR POWER SUPPLY
REAR VEHICLE HEIGHT SENSOR
VEHICLE HEIGHT SENSOR SIGNAL
AUTO HEADLIGHT BEAM LEVELER CM
SRH OFF SWITCH
SRF OFF SWITCH SIGNAL
TARGET SWIVEL ANGLE SIGNAL
CURRENT SWIVEL ANGLE SIGNAL
FAIL SIGNAL
SWIVEL ACTUATOR CONTROLLER
M
ACTUATOR POWER SUPPLY
LEVELING CONTROL SIGNAL
LEVELING ACTUATOR
LED MALFUNCTION SIGNAL
LED DRIVER MODULE
HEADLIGHT SWITCH (LO) SIGNAL
REVERSE SWITCH SIGNAL (MT MODEL)
BODY INTEGRATED UNIT
INDICATOR OUTPUT SIGNAL
COMBINATION METER
VEHICLE SPEED SIGNAL
STEERING ANGLE SIGNAL
VDC CM
FAULT DIAGNOSIS RESPONSE SIGNAL
FAULT DIAGNOSIS REQUEST SIGNAL
SUBARU SELECT MONITOR
REVERSE SWITCH SIGNAL (CVT MODEL)
TCM
CAN BUS
LI-10062

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Electrical Component Location

LOCATION



(1) Headlight ASSY
- Headlight beam leveler actuator
- SRH swivel actuator

(2) Rear vehicle height sensor

(3) Headlight relay Lo

(4) M/B fuse No. 3

(5) M/B fuse No. 4

(6) F/B fuse No. 18

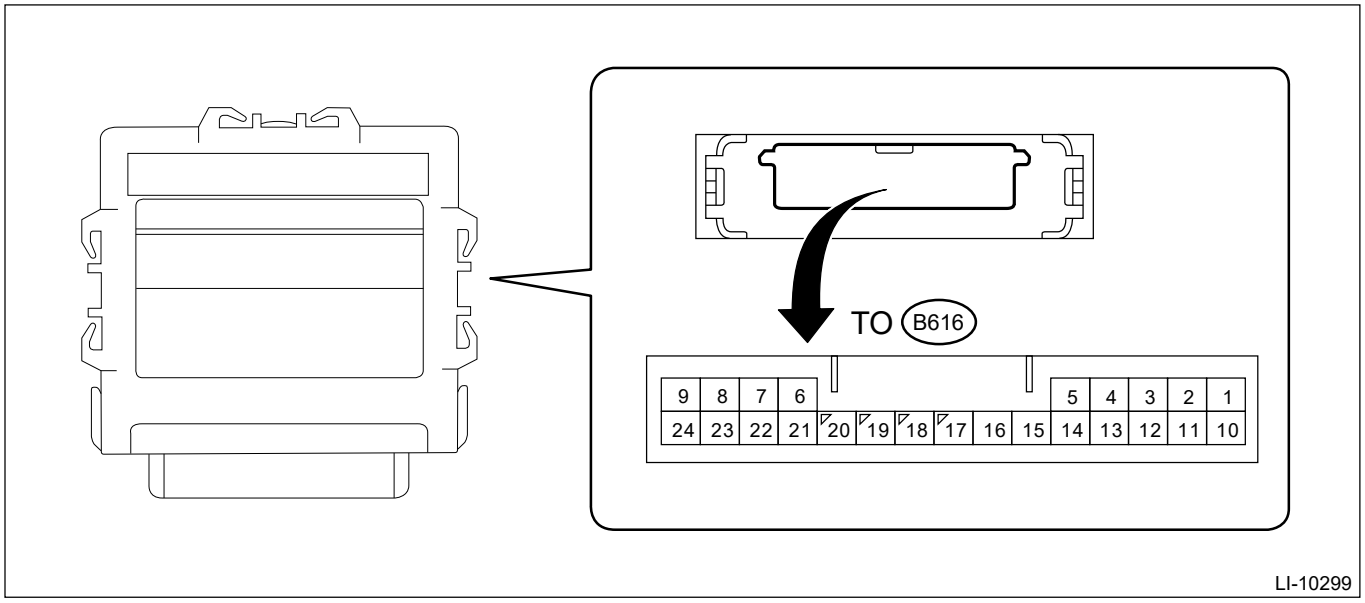
(7) SRH OFF switch

(8) Data link connector

(9) Auto headlight beam leveler CM

ELECTRICAL SPECIFICATION

1. AUTO HEADLIGHT BEAM LEVELER CM



Terminal No.	Contents	Measuring condition	Standard
(B616) No. 1 ←→ Chassis ground	Ignition power supply	Ignition switch ON	8 — 16 V
(B616) No. 2 ←→ Chassis ground	GND	Always	Less than 1 Ω
(B616) No. 3 ←→ Chassis ground	Rr vehicle height sensor GND	Always	Less than 1 Ω
(B616) No. 4	—	—	—
(B616) No. 5 ←→ Chassis ground	RH headlight malfunction signal	Always	1 MΩ or more
(B616) No. 6	—	—	—
(B616) No. 7 ←→ Chassis ground	SRH signal (LIN)*1	Always	1 MΩ or more
(B616) No. 8	—	—	—
(B616) No. 9 ←→ Chassis ground	SRH GND*1	Always	Less than 1 Ω
(B616) No. 10 ←→ Chassis	Leveling actuator power supply	Ignition switch ON	8 — 16 V

Terminal No.	Contents	Measuring condition	Standard
ground			
(B616) No. 11 ←→ Chassis ground	Leveling actuator GND	Always	Less than 1 Ω
(B616) No. 12 ←→ (B616) No. 3	Rr vehicle height sensor power supply	Ignition switch ON	4.75 — 5.25 V
(B616) No. 13	—	—	—
(B616) No. 14	—	—	—
(B616) No. 15	—	—	—
(B616) No. 16 ←→ Chassis ground	LH headlight malfunction signal	Always	1 MΩ or more
(B616) No. 17 ←→ Chassis ground	Leveling actuator signal	Headlight off → on Headlight on, no vehicle height change → change and hold vehicle height for 3 seconds or more	Less than 1 V → 1.0 — 14.4 V (for 17 seconds)
(B616) No. 18	—	—	—
(B616) No. 19 ←→ Chassis ground	Rr sensor signal	IG ON (with no passenger, no load and vehicle stopped)	Approx. 2.5 V (changes according to vehicle condition)
(B616) No. 20	—	—	—
(B616) No. 21	—	—	—
(B616) No. 22 ←→ Chassis ground	SRH OFF switch*1	Switch OFF → ON (at SRH OFF)	1 MΩ or more → less than 1 Ω
(B616) No. 23	CAN-H	Always	1 MΩ or more
(B616) No. 24	CAN-L	Always	1 MΩ or more

*1: Models with steering responsive headlight

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Inspection Mode

PROCEDURE

1. Turn the ignition switch to ON.
2. Turn on the headlight low beam.
3. Check that the beam axes move when the vehicle condition is kept for three seconds or more after the vehicle posture is changed with the vehicle stopped.
4. Using the Subaru Select Monitor, read the DTC of [Headlight / Foglight] to check that there is no DTC displayed. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

   Note:

   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

Communication error with auto headlight beam leveler CM

Detecting condition:

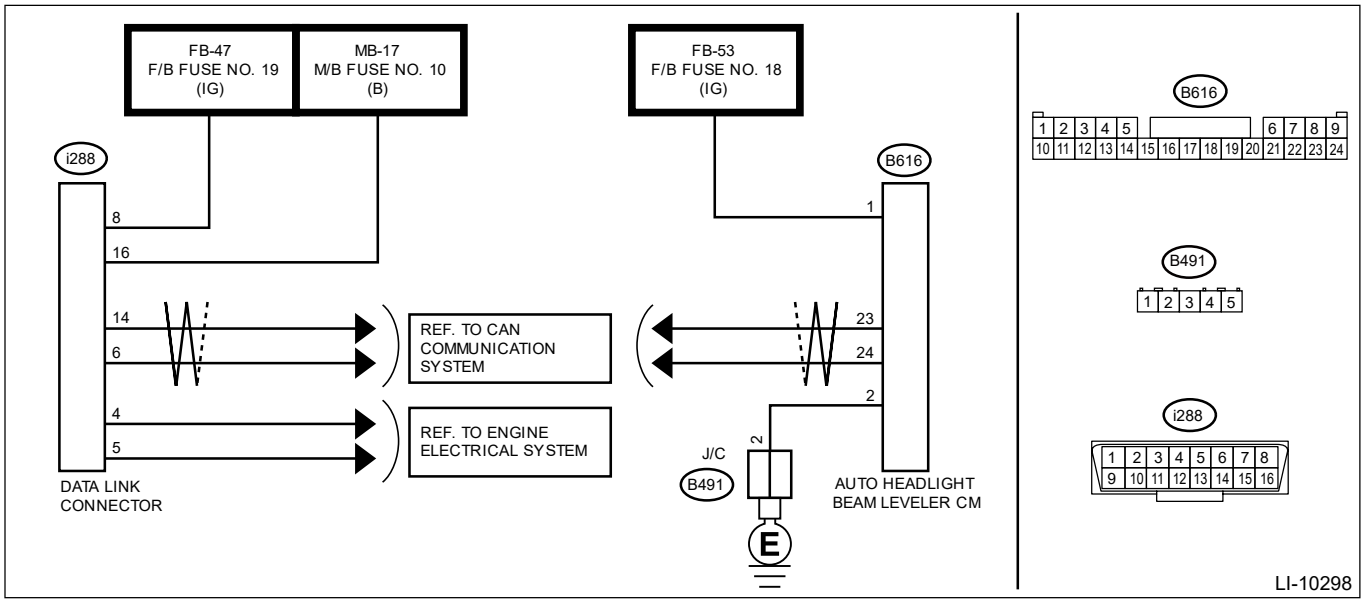
- Defective harness connector
- Power supply circuit malfunction
- Defective auto headlight beam leveler CM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between auto headlight beam leveler CM and Subaru Select Monitor.

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

1. CHECK FUSE.

Check the fuse. Ref. to LIGHTING SYSTEM>Relay and Fuse.

Is the fuse OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse has blown out immediately, repair the short circuit to ground in harness between battery and auto headlight beam leveler CM.

2. CHECK HARNESS.

1. Turn the ignition switch to OFF.
2. Disconnect the connector of combination meter.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 1 (+) — Chassis ground (–):

Is the voltage 10 — 13 V?

Yes	Go to 3.
No	Repair the open circuit in the harness between auto headlight beam leveler CM connector and fuse.

3. CHECK HARNESS.

Using a tester, measure the resistance between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 2 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of harness between auto headlight beam leveler CM connector and chassis ground.

4. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK SUBARU SELECT MONITOR.

1. Connect the select monitor to another vehicle.
2. Check whether the communication for initializing can be executed normally.

Is communication normal?

Yes	Go to 6.
No	Repair or replace the select monitor.

6. CHECK AUTO HEADLIGHT BEAM LEVELER CM.

1. Turn the ignition switch to OFF.
2. Connect the auto headlight beam leveler CM connector.
3. Communicate with [Headlight / Foglight] using the Subaru Select Monitor.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor>LIST.**

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Data Monitor

LIST

Item Name	Contents	Standard/Unit	Note
Trip Count	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count	Time stamp information, original counter identification information		—
Time Count	Time stamp information, time counter	ms	—
R Sensor Signal	Output voltage value from rear vehicle height sensor	Approx. 2.5 V	Changes according to vehicle condition.
Actuator Signal	Power supply voltage value to headlight beam leveler actuator	Not in operation: 0% In operation: 10 — 90% (17 Sec)	Changes according to vehicle condition.
Control module voltage	IG voltage condition of auto headlight beam leveler CM	8 — 16 V	—
Vehicle speed signal	Status of vehicle speed	Shows vehicle speed	—
H/L Lo Signal	Headlight lighting condition	Light Off: Light switch is OFF ON: Light sensor in operation when light switch is in HEAD or AUTO position	—
LED HEADLAMP(LH) error Signal	Open circuit detection signal status	Light Off: Open circuit undetected ON: Open circuit detected	—
LED HEADLAMP(RH) error Signal	Open circuit detection signal status	Light Off: Open circuit undetected ON: Open circuit detected	—

Item Name	Contents	Standard/Unit	Note
Steering Angle Signal	Steering angle status	−3276.7 — 3276.7 deg	—
Shift Position Signal	Shift lever position	P, R, N, D, D-S, 3 range, 2 range, 1 range	—
MT Reverse SW	Displays reverse switch signal status (MT).	ON: When shift lever is set in reverse position OFF: When shift lever is set in other than reverse position	—
SRH-OFF SW	SRH OFF switch signal	ON: When SRH OFF switch is ON OFF: When SRH OFF switch is OFF	—
Engine Speed	Engine speed signal	0 — 65535 rpm	—
Vehicle Height	Vehicle height signal	Unknown: When other than the followings XV/OBK: When XV/OBK SDN/WGN: When other than SDN/WGN	—
Left Steering Responsive Headlight Current Angle	SRH swivel actuator current angle (LH) signal	−3276.7 — 3276.7 deg	—
Right Steering Responsive Headlight Current Angle	SRH swivel actuator current angle (RH) signal	−3276.7 — 3276.7 deg	—
Left Steering Responsive Headlight Target Angle	SRH swivel actuator target angle (LH) signal	−3276.7 — 3276.7 deg	—
Right Steering Responsive Headlight Target Angle	SRH swivel actuator target angle (RH) signal	−3276.7 — 3276.7 deg	—
Left Steering Responsive Headlight Power Supply Failure	SRH swivel actuator power supply failure (LH) signal	Avail.: At normal condition FAIL: Abnormal	—
Right Steering Responsive Headlight Power Supply Failure	SRH swivel actuator power supply failure (RH) signal	Avail.: At normal condition FAIL: Abnormal	—
Left Steering Responsive Headlight Motor Failure	SRH swivel actuator motor failure (LH) signal	Avail.: At normal condition FAIL: Abnormal	—
Right Steering Responsive Headlight Motor Failure	SRH swivel actuator motor failure (RH) signal	Avail.: At normal condition FAIL: Abnormal	—
Left Steering Responsive Headlight Sensor Failure	SRH swivel actuator sensor error (LH) signal	Avail.: At normal condition FAIL: Abnormal	—
Right Steering Responsive Headlight Sensor Failure	SRH swivel actuator sensor error (RH) signal	Avail.: At normal condition FAIL: Abnormal	—

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on the data monitor, refer to the list. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Freeze Frame Data>LIST.**

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Freeze Frame Data

LIST

Items to be displayed	Contents	Standard/Unit	Note
Trip Count	Time stamp information Ref. to COMMON(diag)>Time Stamp.	time	—
Count	Time stamp information, original counter identification information	—	—
Time Count [msec]	Time stamp information, time counter	ms	—

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Active Test

OPERATION

Available only for models with steering responsive headlight.

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Headlight / Foglight], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

For detailed operation procedures, refer to "Application help".

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Active Test

LIST

Active test items	Range	Contents	Execution condition
Right Steering Responsive Headlight	−5 — 18deg	SRH swivel actuator on the right side operates. **Note:** **Used for unit inspection etc. of the SRH swivel actuator.**	—
Left Steering Responsive Headlight	−5 — 18deg	SRH swivel actuator on the left side operates. **Note:** **Used for unit inspection etc. of the SRH swivel actuator.**	—

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble position	Reference
B2900	AHL CONTROL	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2900 AHL CONTROL.
B2902	REAR HEIGHT SENSOR CIRCUIT	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2902 REAR HEIGHT SENSOR CIRCUIT.
B2904	LED HEADLIGHT CIRCUIT RH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2904 LED HEADLIGHT CIRCUIT RH.
B2905	LED HEAD LIGHT CIRCUIT LH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2905 LED HEAD LIGHT CIRCUIT LH.
B2908	STEERING RESPONSIVE HEADLIGHT ACTUATOR RH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2908 STEERING RESPONSIVE HEADLIGHT ACTUATOR RH.
B2909	STEERING RESPONSIVE HEADLIGHT ACTUATOR LH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2909 STEERING RESPONSIVE HEADLIGHT ACTUATOR LH.
B2910	STEERING RESPONSIVE HEADLIGHT COMMUNICATION RH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2910 STEERING RESPONSIVE

Code	Description & trouble position	Reference
		HEADLIGHT COMMUNICATION RH.
B2911	STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2911 STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH.
U0074	CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0101	LOST COMMUNICATION WITH TCM	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0101 LOST COMMUNICATION WITH TCM.
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0402	INVALID DATA RECEIVED FROM TCM	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0402 INVALID DATA RECEIVED FROM TCM.
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U1140	LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN.
U1422	INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2900 AHL CONTROL

DTC detecting condition:
Detected when internal malfunction occurs in the auto headlight beam leveler CM.
Trouble symptom:
The auto headlight beam leveler does not operate.
Caution:
Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

1. CHECK DTC.

1. Turn the ignition switch OFF → ON.
2. Turn on the headlight low beam.
3. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2900 displayed? (Current malfunction)

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

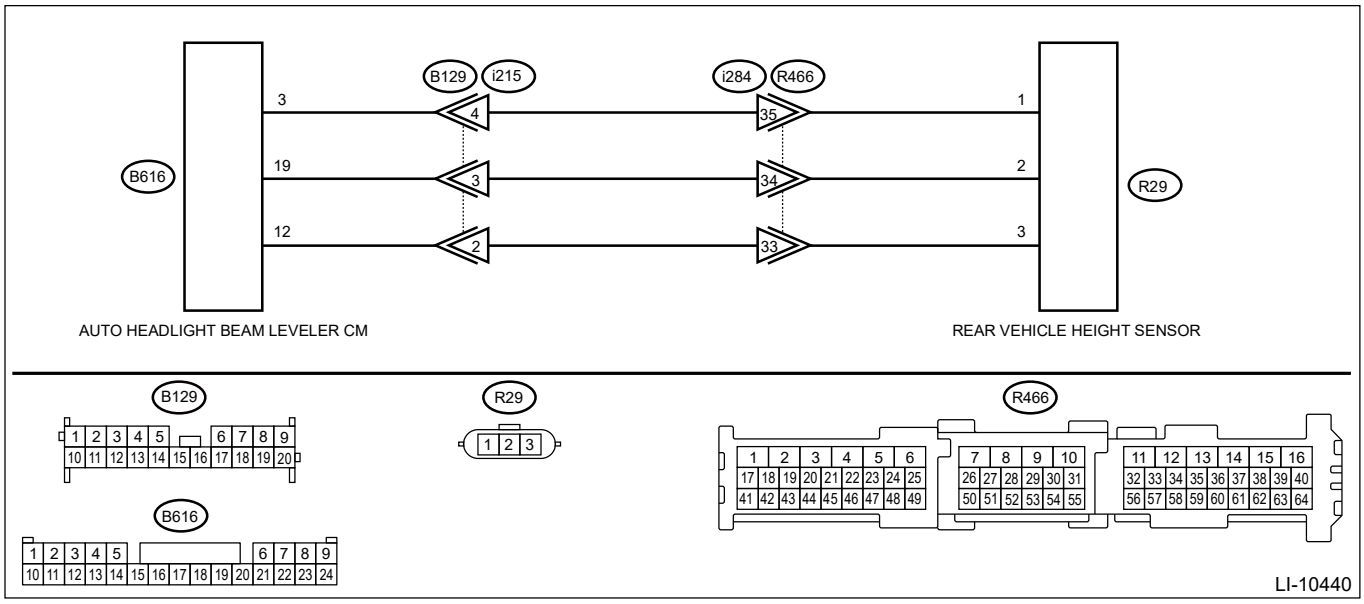
DTC B2902 REAR HEIGHT SENSOR CIRCUIT

DTC detecting condition:
Rear vehicle height sensor error is detected for 10 seconds or more.
Trouble symptom:

The auto headlight beam leveler does not operate.

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.

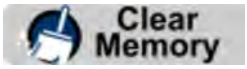


Caution:

Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.

1. CHECK DTC.

1. Turn the ignition switch to OFF → ON.
2. Turn on the headlight low beam.
3. Using the Subaru Select Monitor, clear the memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2902 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



- [R Sensor Signal]

Does the data indicate the standard value (approx. 2.5 V when on a level road with one person in the vehicle)?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Go to 3.

3. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



   - [R Sensor Signal]
2. Change the vehicle posture.

Does the data change?

Yes	Go to 6.
No	Go to 4.

4. CHECK OUTPUT VOLTAGE BETWEEN AUTO HEADLIGHT BEAM LEVELER CM AND REAR VEHICLE HEIGHT SENSOR.

1. Disconnect the connector from the rear vehicle height sensor.
2. Turn the ignition switch to ON.
3. Measure the voltage between the rear vehicle height sensor connector and chassis ground.
   Connector & terminal
   (R29) No. 3 (+) — Chassis ground (−):

Is the voltage 5 V±0.25?

Yes	Go to 5.
No	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

5. PERFORM UNIT INSPECTION OF REAR VEHICLE HEIGHT SENSOR.

1. Remove the rear vehicle height sensor.
2. Perform the inspection of rear height sensor unit. Ref. to LIGHTING SYSTEM>Rear Height Sensor>INSPECTION.

Is the check result OK?

Yes	Go to 6.
No	Replace the rear height sensor. Ref. to LIGHTING SYSTEM>Rear Height Sensor.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the auto headlight beam leveler CM connector.
2. Using a tester, measure the resistance between the auto headlight beam leveler CM connector and rear height sensor connector.

Connector & terminal

(B616) No. 3 — (R29) No. 1:
(B616) No. 19 — (R29) No. 2:
(B616) No. 12 — (R29) No. 3:

Is there continuity?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 3 — Chassis ground:

(B616) No. 19 — Chassis ground:

(B616) No. 12 — Chassis ground:

Is the resistance 10 kΩ or more?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Repair or replace the short circuit of the harness.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2904 LED HEADLIGHT CIRCUIT RH

DTC detecting condition:

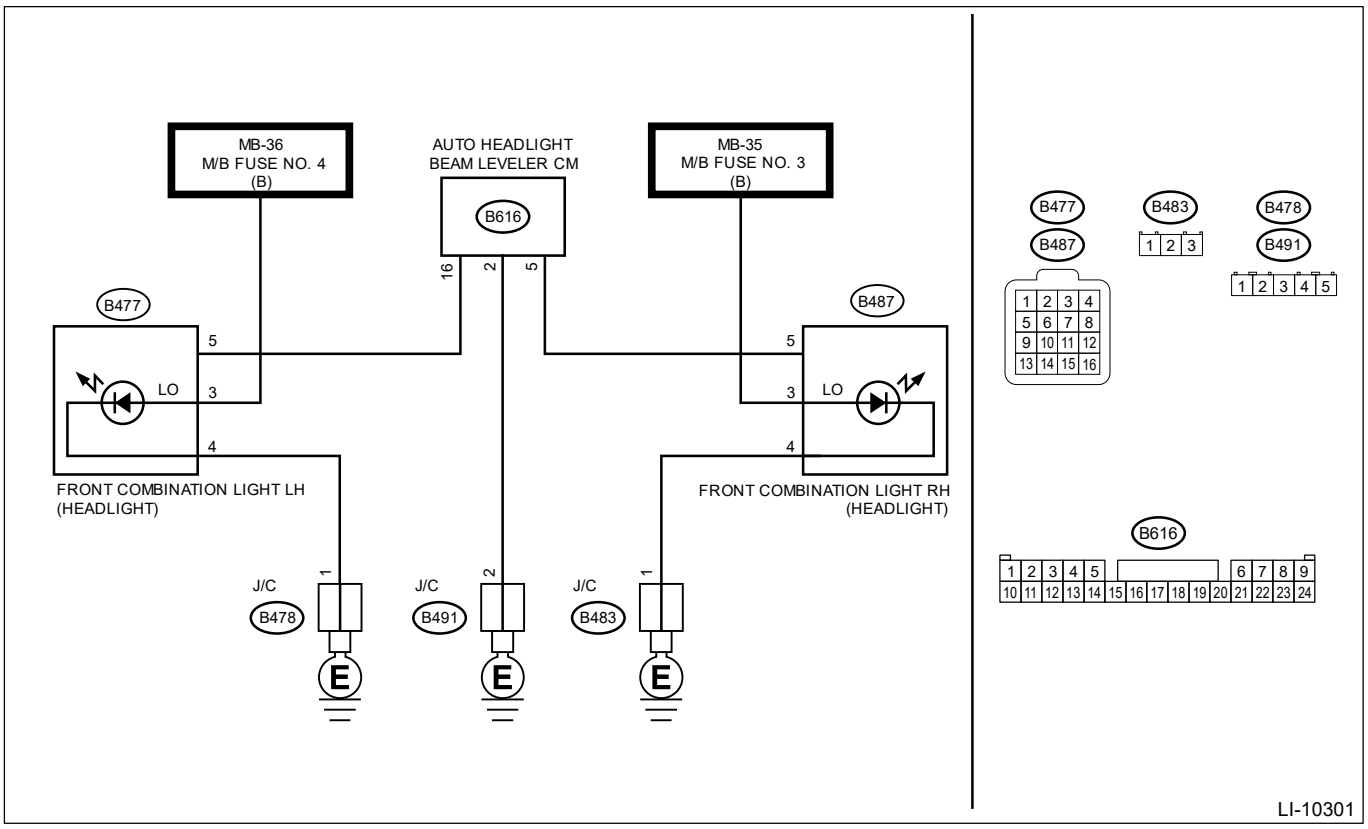
LED headlight (RH) malfunction signal line error is detected for 2 seconds or more.

Trouble symptom:

LED headlight malfunction, LED headlight indicator illuminates.

Wiring diagram:

- Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.
- Headlight system Ref. to WIRING SYSTEM>Headlight System and Daytime Running Light System.



Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF → ON.
4. Turn the lighting switch to 2 (HEAD).
5. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2904 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



- [LED HEADLAMP(RH) error Signal]

Does the data indicate [Light off]?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Go to 3.

3. CHECK THE HEADLIGHT SYSTEM POWER SUPPLY CIRCUIT.

1. Disconnect the headlight assembly RH and LH connectors.
2. Turn the ignition switch to OFF → ON.
3. Turn the lighting switch to 2 (HEAD).
4. Using a tester, measure the voltage between headlight assembly RH connector and chassis ground.

Connector & terminal

(B487) No. 3 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 4.
No	Repair the headlight system.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between headlight assembly RH connector and chassis ground.

Connector & terminal

(B487) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HEADLIGHT SYSTEM.

1. Connect the headlight assembly RH connector.
2. Turn the ignition switch to OFF → ON.
3. Turn the lighting switch to 2 (HEAD).

Does the headlight come on at normal brightness?

Yes	Go to 6.
No	Replace the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the auto headlight beam leveler CM connector.
2. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly RH connector.

Connector & terminal

(B616) No. 5 — (B487) No. 5:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Repair or replace the open circuit of harness.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2905 LED HEAD LIGHT CIRCUIT LH

DTC detecting condition:

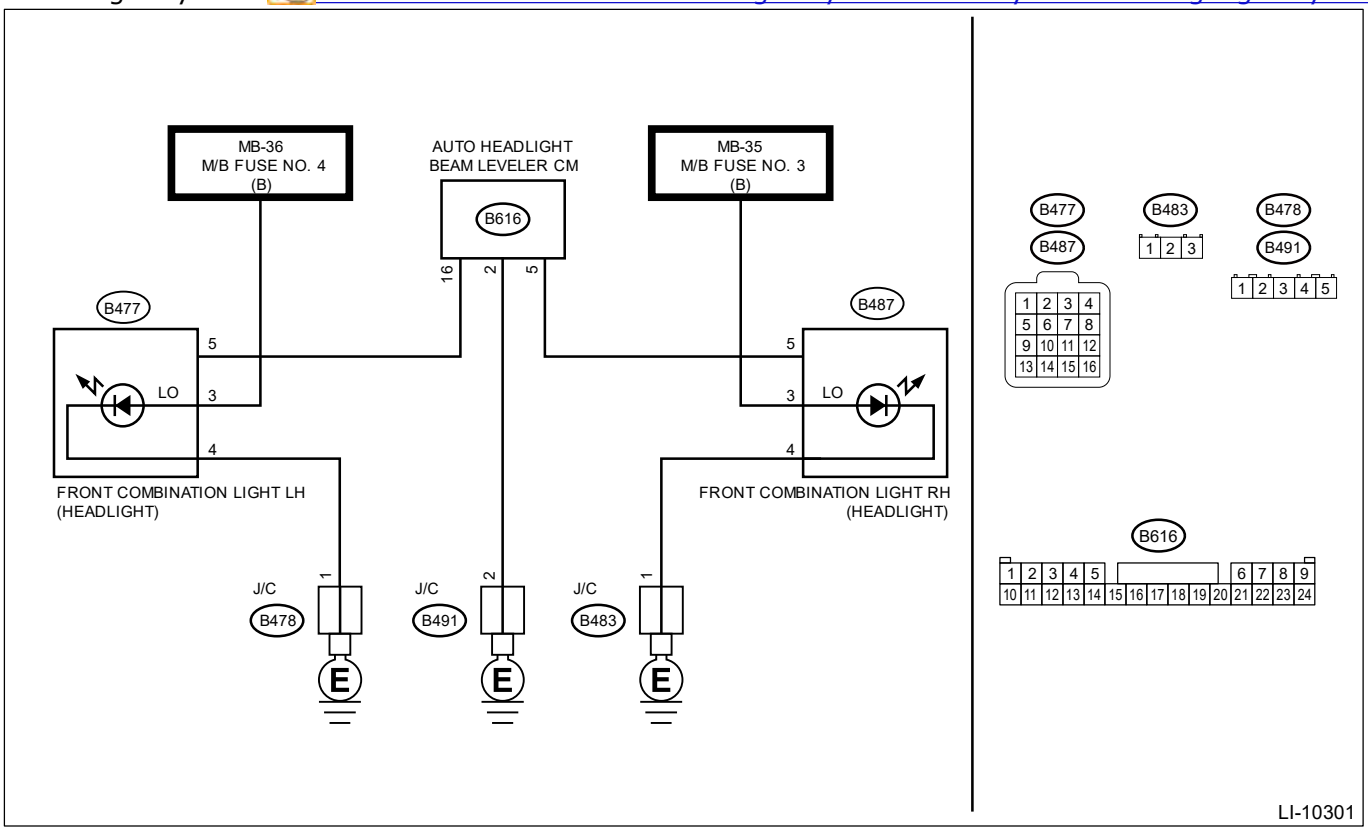
LED headlight (LH) malfunction signal line error is detected for 2 seconds or more.

Trouble symptom:

LED headlight malfunction, LED headlight indicator illuminates.

Wiring diagram:

- Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.
- Headlight system Ref. to WIRING SYSTEM>Headlight System and Daytime Running Light System.



Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



3. Turn the ignition switch to OFF → ON.
4. Turn the lighting switch to 2 (HEAD).
5. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2905 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



- [LED HEADLAMP(LH) error Signal]

Does the data display [Extinction]?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Go to 3.

3. CHECK THE HEADLIGHT SYSTEM POWER SUPPLY CIRCUIT.

1. Disconnect the headlight assembly LH and RH connectors.
2. Turn the ignition switch to OFF → ON.
3. Turn the lighting switch to 2 (HEAD).
4. Using a tester, measure the voltage between headlight assembly LH connector and chassis ground.

Connector & terminal

(B477) No. 3 (+) — Chassis ground (−):

Is the voltage 10 — 13 V?

Yes	Go to 4.
No	Repair the headlight system.

4. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between headlight assembly LH connector and chassis ground.

Connector & terminal

(B477) No. 4 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Go to 5.
No	Repair or replace the open circuit of harness.

5. CHECK HEADLIGHT SYSTEM.

1. Connect the headlight assembly LH connector.
2. Turn the ignition switch to OFF → ON.
3. Turn the lighting switch to 2 (HEAD).

Does the headlight come on at normal brightness?

Yes	Go to 6.
No	Replace the headlight. Ref. to LIGHTING SYSTEM>Headlight Assembly.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the auto headlight beam leveler CM connector.
2. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly LH connector.

Connector & terminal

(B616) No. 16 — (B477) No. 5:

Is the resistance less than 10 Ω?

Yes	Go to 7.
No	Repair or replace the open circuit of harness.

7. CHECK HARNESS (OPEN CIRCUIT).

Using a tester, measure the resistance between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 2 — Chassis ground:

Is the resistance less than 10 Ω?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Repair or replace the open circuit of harness.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2908 STEERING RESPONSIVE HEADLIGHT ACTUATOR RH

DTC detecting condition:

Fail flag (failures shown below) of the SRH actuator is detected for 1 second or more.

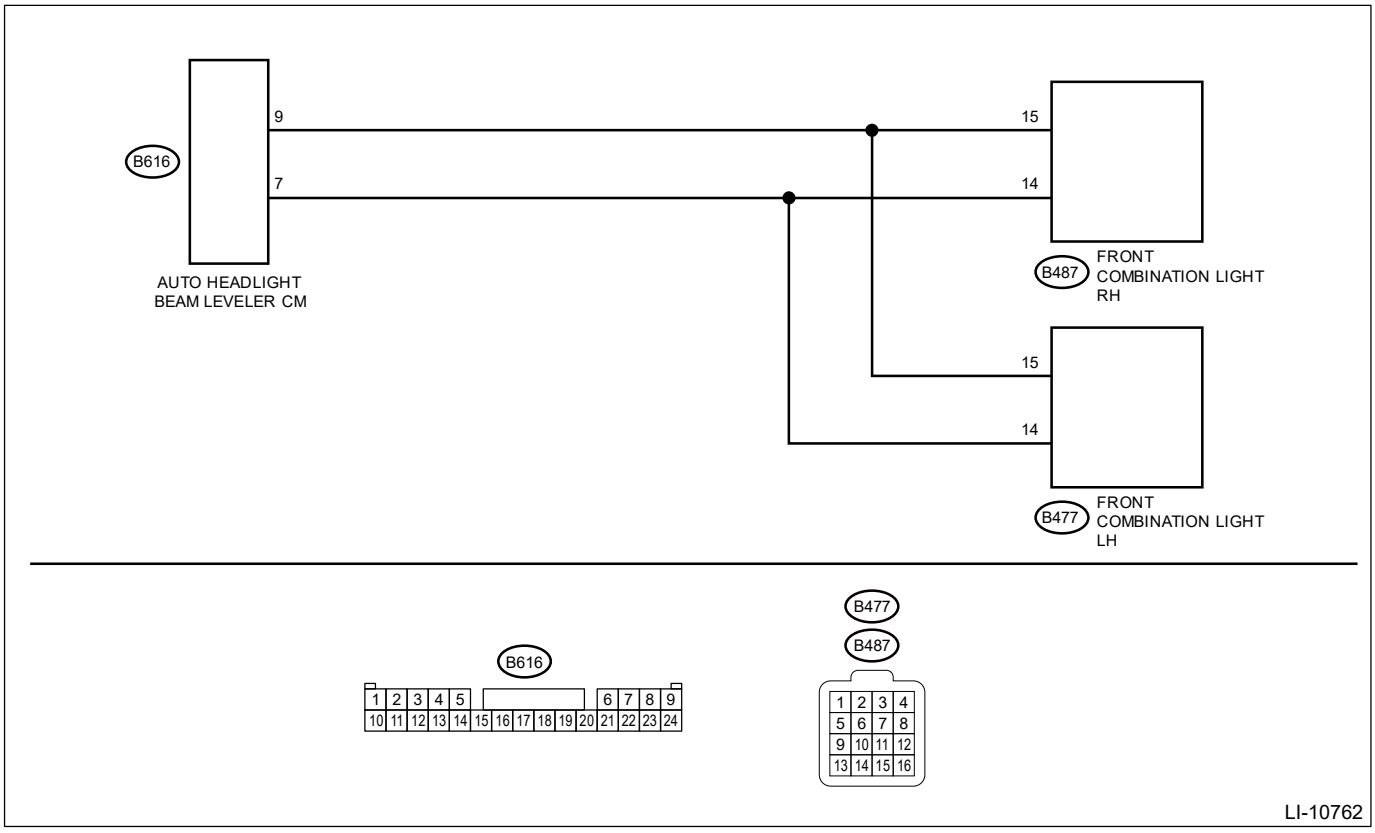
- Overheating of the actuator driving IC is detected.
- Short circuit, open circuit of the motor coil is detected.
- Abnormality of the motor position sensor is detected.
- Motor lock is detected.

Trouble symptom:

The steering responsive headlight does not operate. SRH indicator blinks.

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.

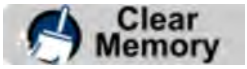


Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Start the engine.
3. Using the Subaru Select Monitor, perform the clear memory for the [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2908 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DTC.

Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is a DTC other than DTC B2908 displayed?

Yes	Perform the diagnosis other than for DTC B2908 first. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly RH and LH connectors.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly RH connector.

Connector & terminal

(B616) No. 7 — (B487) No. 14:

(B616) No. 9 — (B487) No. 15:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between headlight assembly RH connector and chassis ground.

Connector & terminal

(B616) No. 7 — Chassis ground:

(B616) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between auto headlight beam leveler CM connector and chassis ground.
   Connector & terminal
   (B616) No. 7 (+) — Chassis ground (−):
   (B616) No. 9 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK ACTIVE TEST FOR SWIVEL ACTUATOR.

1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Start the engine.
4. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Active Test.
   - [Right Steering Responsive Headlight]

Is the actuator current position value approximately the same as the input value of the actuator control position?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Replace the headlight assembly RH. Ref. to LIGHTING SYSTEM>Headlight Assembly.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2909 STEERING RESPONSIVE HEADLIGHT ACTUATOR LH

DTC detecting condition:
Fail flag (failures shown below) of the SRH actuator is detected for 1 second or more.
- Overheating of the actuator driving IC is detected.
- Short circuit, open circuit of the motor coil is detected.
- Abnormality of the motor position sensor is detected.

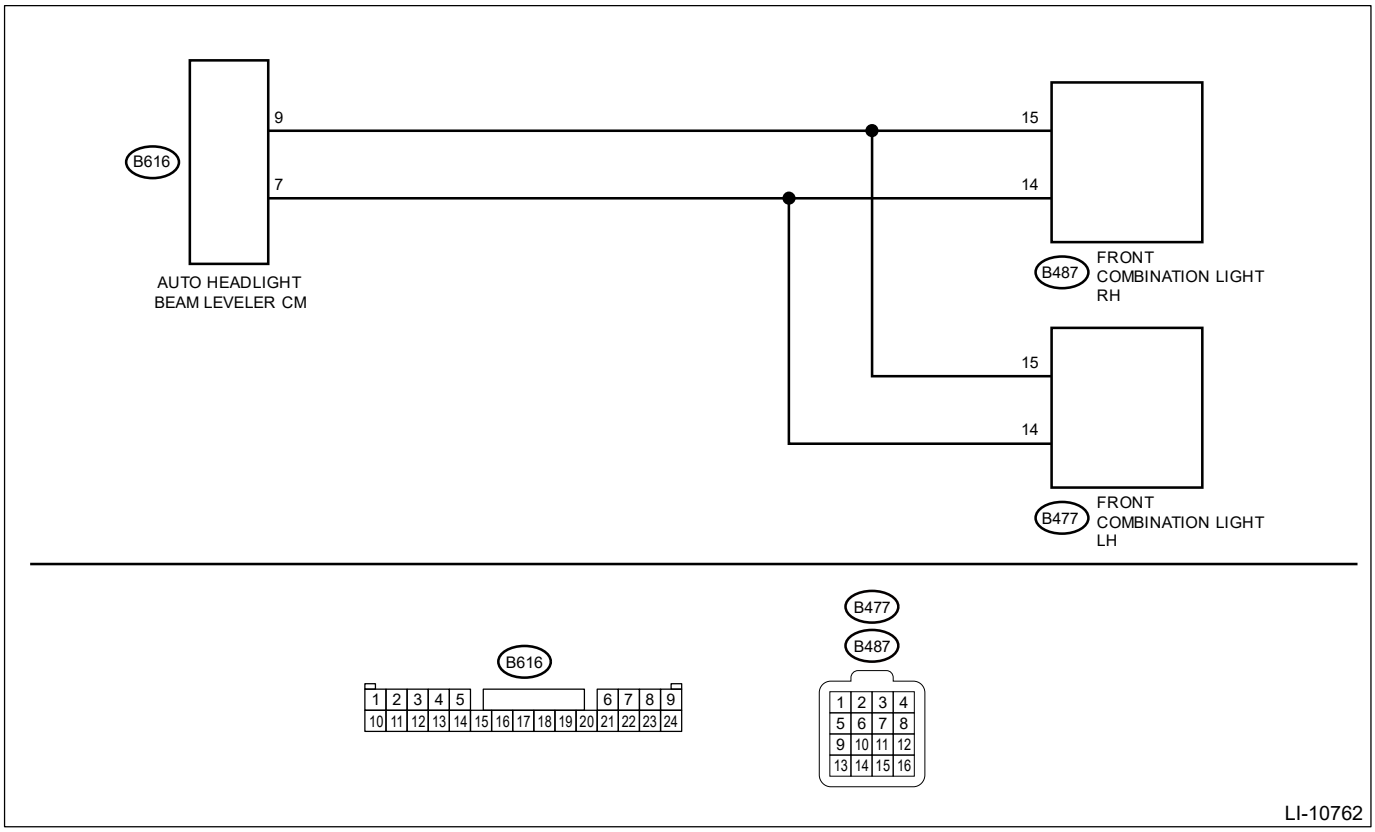
- Motor lock is detected.

Trouble symptom:

The steering responsive headlight does not operate. SRH indicator blinks.

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2909 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK DTC.

Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is a DTC other than DTC B2909 displayed? (Current malfunction)

Yes	Perform the diagnosis other than for DTC B2909 first. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly LH and RH connectors.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly LH connector.

   Connector & terminal

   (B616) No. 7 — (B477) No. 14:

   (B616) No. 9 — (B477) No. 15:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between headlight assembly LH connector and chassis ground.

Connector & terminal

(B616) No. 7 — Chassis ground:

(B616) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between auto headlight beam leveler CM connector and chassis ground.
   Connector & terminal
   (B616) No. 7 (+) — Chassis ground (−):
   (B616) No. 9 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK ACTIVE TEST OF SWIVEL ACTUATOR.

1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Start the engine.
4. Using the Subaru Select Monitor, check the following items in the [Active Test] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Active Test.
   - [Left Steering Responsive Headlight]

Is the actuator current position value approximately the same as the input value of the actuator control position?

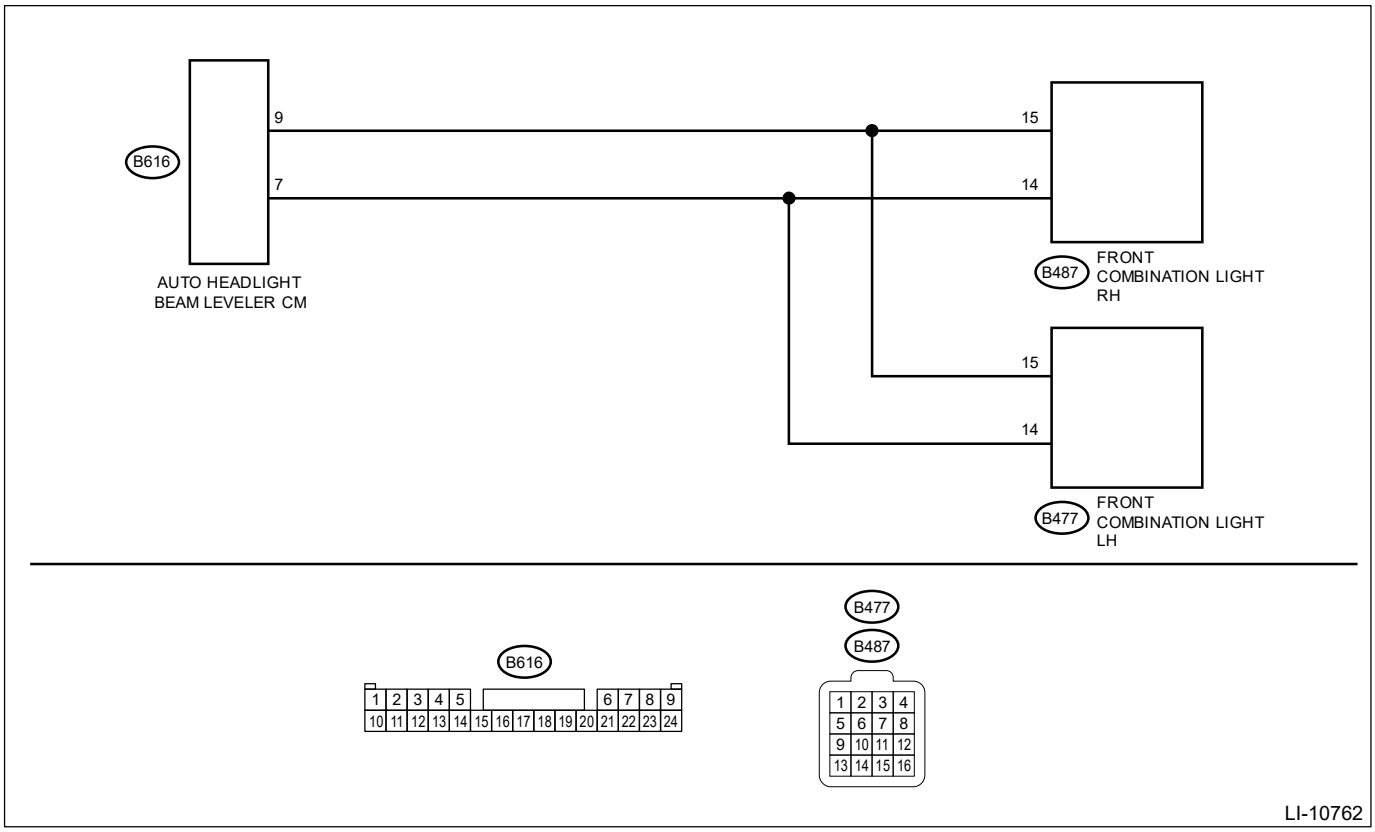
Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Replace the headlight assembly LH. Ref. to LIGHTING SYSTEM>Headlight Assembly.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2910 STEERING RESPONSIVE HEADLIGHT COMMUNICATION RH

DTC detecting condition:
LIN data no-receive or data abnormal of the SRH actuator is detected (1 or more).
Trouble symptom:
The steering responsive headlight does not operate. SRH indicator blinks.
Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2910 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly RH and LH connectors.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly RH connector.
   Connector & terminal
   (B616) No. 7 — (B487) No. 14:
   (B616) No. 9 — (B487) No. 15:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between headlight assembly RH connector and chassis ground.

Connector & terminal

(B616) No. 7 — Chassis ground:

(B616) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between auto headlight beam leveler CM connector and chassis ground.

   Connector & terminal

   (B616) No. 7 (+) — Chassis ground (−):

   (B616) No. 9 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



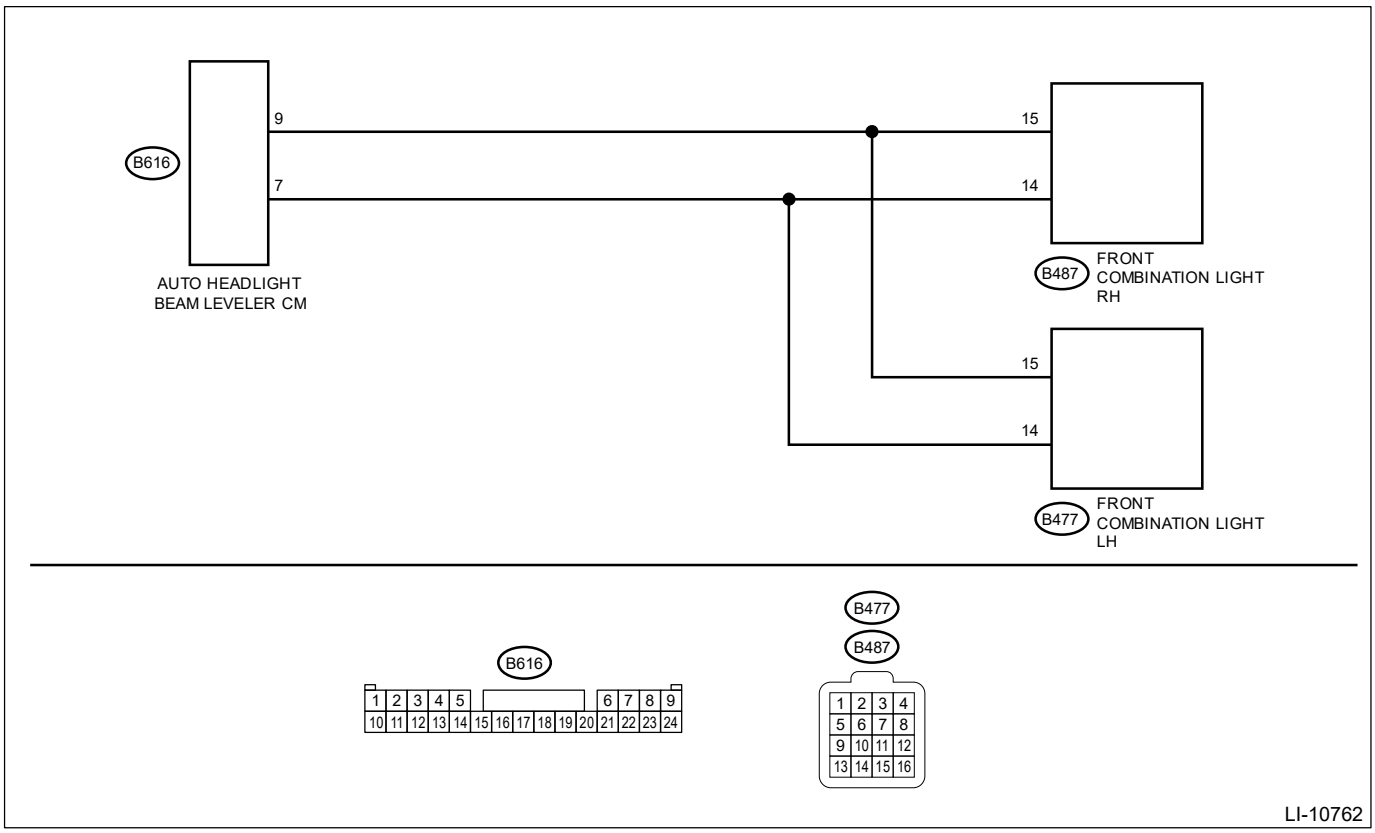
Is DTC B2911 displayed in addition to B2910? (Current malfunction)

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Replace the headlight assembly RH. Ref. to LIGHTING SYSTEM>Headlight Assembly.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2911 STEERING RESPONSIVE HEADLIGHT COMMUNICATION LH

DTC detecting condition:
LIN data no-receive or data abnormal of the SRH actuator is detected (1 or more).
Trouble symptom:
The steering responsive headlight does not operate. SRH indicator blinks.
Wiring diagram:
Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**
- **After replacing the headlight assembly, headlight beam adjustment is required. Ref. to LIGHTING SYSTEM>Headlight Assembly>ADJUSTMENT.**

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



3. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2911 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly LH and RH connectors.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between auto headlight beam leveler CM connector and headlight assembly LH connector.
   Connector & terminal
   (B616) No. 7 — (B477) No. 14:
   (B616) No. 9 — (B477) No. 15:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between headlight assembly LH connector and chassis ground.

Connector & terminal

(B616) No. 7 — Chassis ground:

(B616) No. 9 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between auto headlight beam leveler CM connector and chassis ground.

   Connector & terminal

   (B616) No. 7 (+) — Chassis ground (−):

   (B616) No. 9 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Turn the ignition switch to ON.
4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2910 displayed in addition to B2911? (Current malfunction)

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Replace the headlight assembly LH. Ref. to LIGHTING SYSTEM>Headlight Assembly.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0101 LOST COMMUNICATION WITH TCM

Detected when CAN data from TCM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data (vehicle speed signal) is not received from VDC CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0402 INVALID DATA RECEIVED FROM TCM

Detected when data from TCM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Detected when data (vehicle speed signal) from VDC CM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1140 LOST COMMUNICATION WITH BODY CONTROL MODULE BODY-CAN

Detected when CAN data from body integrated unit (headlight ON signal) does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U1422 INVALID DATA RECEIVED FROM BODY CONTROL MODULE BODY-CAN

Detected when CAN data from body integrated unit (headlight ON signal) is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Reference
1. The auto headlight beam leveler does not operate.	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE AUTO HEADLIGHT BEAM LEVELER DOES NOT OPERATE.
2. The steering responsive headlight does not operate.	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING RESPONSIVE HEADLIGHT DOES NOT OPERATE.
3. The steering responsive headlight operates in a direction different from the target.	Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE STEERING RESPONSIVE HEADLIGHT OPERATES IN A DIRECTION DIFFERENT FROM THE TARGET.

HEADLIGHT / FOGLIGHT(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

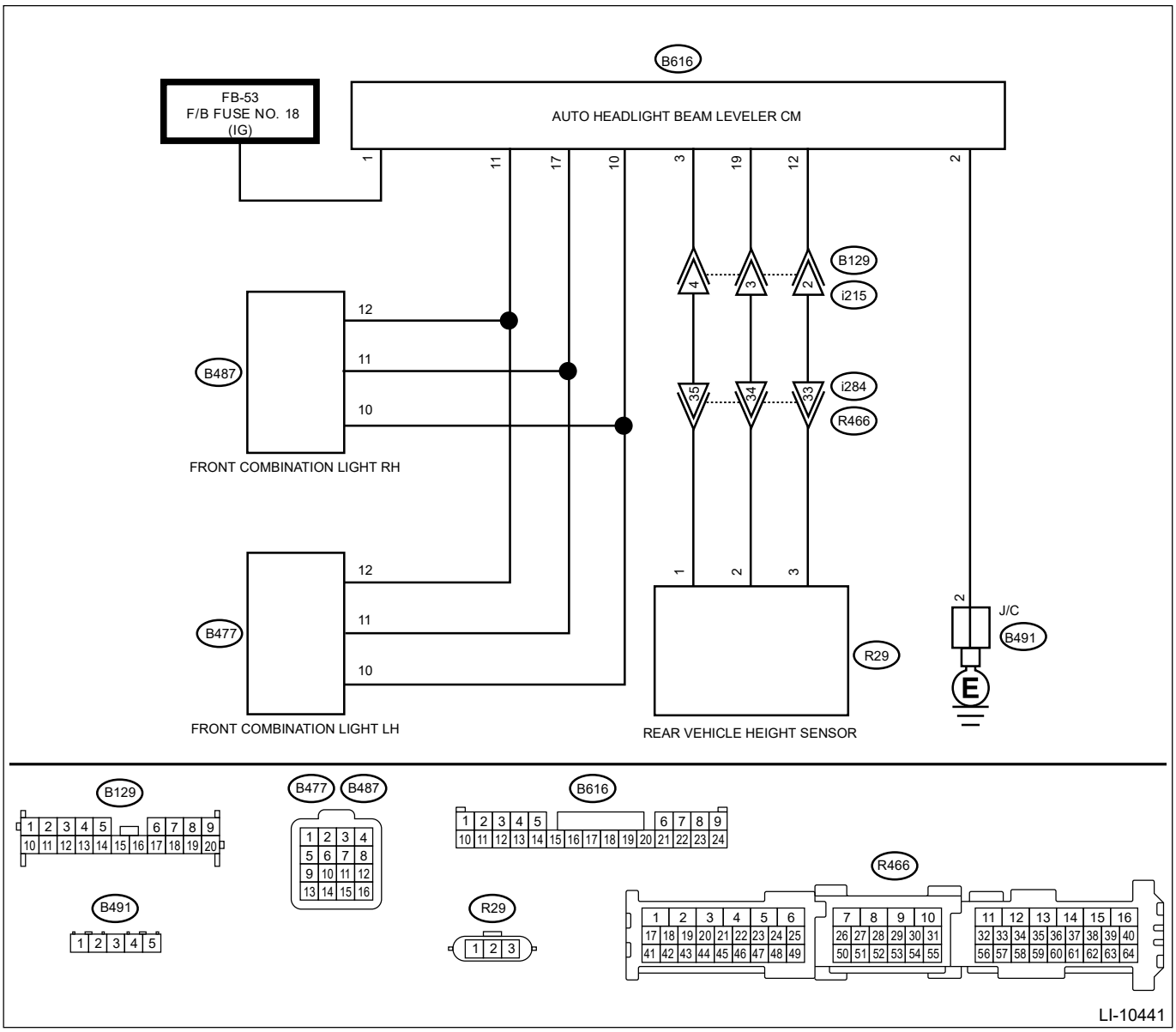
1. THE AUTO HEADLIGHT BEAM LEVELER DOES NOT OPERATE

Detecting condition:

Malfunction of power supply circuit, output circuit, and auto headlight beam leveler CM

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, check the fuse in this circuit. Ref. to LIGHTING SYSTEM>Relay and Fuse.**
- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**

1. CHECK DATA MONITOR.	yes	Go to 3.
	no	Go to 2.

2. CHECK HARNESS BETWEEN POWER SUPPLY — AUTO HEADLIGHT BEAM LEVELER CM.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

3. CHECK INDICATOR OUTPUT.

yes → Go to 5.

no → Go to 4.

4. CHECK DATA MONITOR.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

5. CHECK INDICATOR OUTPUT.

no → Go to 10.

yes

6. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) DRIVE.

yes → Perform the instructed procedures.

no → Go to 7.

7. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) OUTPUT.

no → Perform the instructed procedures.

yes

8. CHECK OUTPUT VOLTAGE BETWEEN HEADLIGHT ASSEMBLY (ACTUATOR).	yes →	Perform the instructed procedures.
	no →	Go to 9.
9. CHECK HARNESS BETWEEN AUTO HEADLIGHT BEAM LEVELER CM AND HEADLIGHT ASSEMBLY (ACTUATOR).	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.
10. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Control module voltage]

Does the data monitor indicate the standard value?

Yes	Go to 3.
No	Go to 2.

2. CHECK HARNESS BETWEEN POWER SUPPLY — AUTO HEADLIGHT BEAM LEVELER CM.

1. Disconnect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the auto headlight beam leveler CM connector and chassis ground.

Connector & terminal

(B616) No. 1 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Repair or replace the harness.

3. CHECK INDICATOR OUTPUT.

Turn the ignition switch to ON.

Does the warning indicator turn on for three seconds?

Yes	Go to 5.
No	Go to 4.

4. CHECK DATA MONITOR.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



   - [Indicator Signal]
2. Turn the ignition switch to ON.

Is it set as ON for 3 seconds?

Yes	Check the combination meter. Ref. to COMBINATION METER (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
No	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

5. CHECK INDICATOR OUTPUT.

Leave the ignition switch to ON for 10 seconds.

Does the warning indicator light go off?

Yes	Go to 6.
No	Go to 10.

6. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) DRIVE.

1. Connect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON, and within 10 seconds, repeat the OFF → Low beam of headlight switch 5 times.
3. Check that the headlight beam drops once, then returns to normal.
4. Then, after waiting for 30 seconds or more with the ignition ON, turn the ignition switch to OFF.

Does the headlight beam drop down once, and then return?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Go to 7.

7. CHECK HEADLIGHT ASSEMBLY (ACTUATOR) OUTPUT.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Actuator Signal]
2. Turn the ignition switch to ON, and within 10 seconds, repeat the OFF → Low beam of headlight switch 5 times.
3. Check that the headlight beam drops once, then returns to normal.
4. Then, after waiting for 30 seconds or more with the ignition ON, turn the ignition switch to OFF.

Does the data monitor indicate the standard value? (Does the value change at 10 — 90 %?)

Yes	Go to 8.
No	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

8. CHECK OUTPUT VOLTAGE BETWEEN HEADLIGHT ASSEMBLY (ACTUATOR).

1. Disconnect the auto headlight beam leveler CM connector.
2. Turn the ignition switch to ON.
3. Measure the voltage between the auto headlight beam leveler CM connector and chassis ground.
   Connector & terminal
   (B616) No. 10 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Replace the headlight assembly. Ref. to LIGHTING SYSTEM>Headlight Assembly.
No	Go to 9.

9. CHECK HARNESS BETWEEN AUTO HEADLIGHT BEAM LEVELER CM AND HEADLIGHT ASSEMBLY (ACTUATOR).

1. Disconnect the connector of headlight assembly.
2. Measure the continuity between the auto headlight beam leveler CM connector and headlight assembly (actuator) connector.
   Connector & terminal
   - **Headlight beam leveler RH**
     (B616) No. 10 — (B487) No. 10:
     (B616) No. 17 — (B487) No. 11:
     (B616) No. 11 — (B487) No. 12:
   - **Headlight beam leveler LH**
     (B616) No. 10 — (B477) No. 10:
     (B616) No. 17 — (B477) No. 11:
     (B616) No. 11 — (B477) No. 12:

Is there continuity?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Repair the open circuit or poor contact of the connector in the harness between headlight assembly and auto headlight beam leveler CM.

10. CHECK DTC.

Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

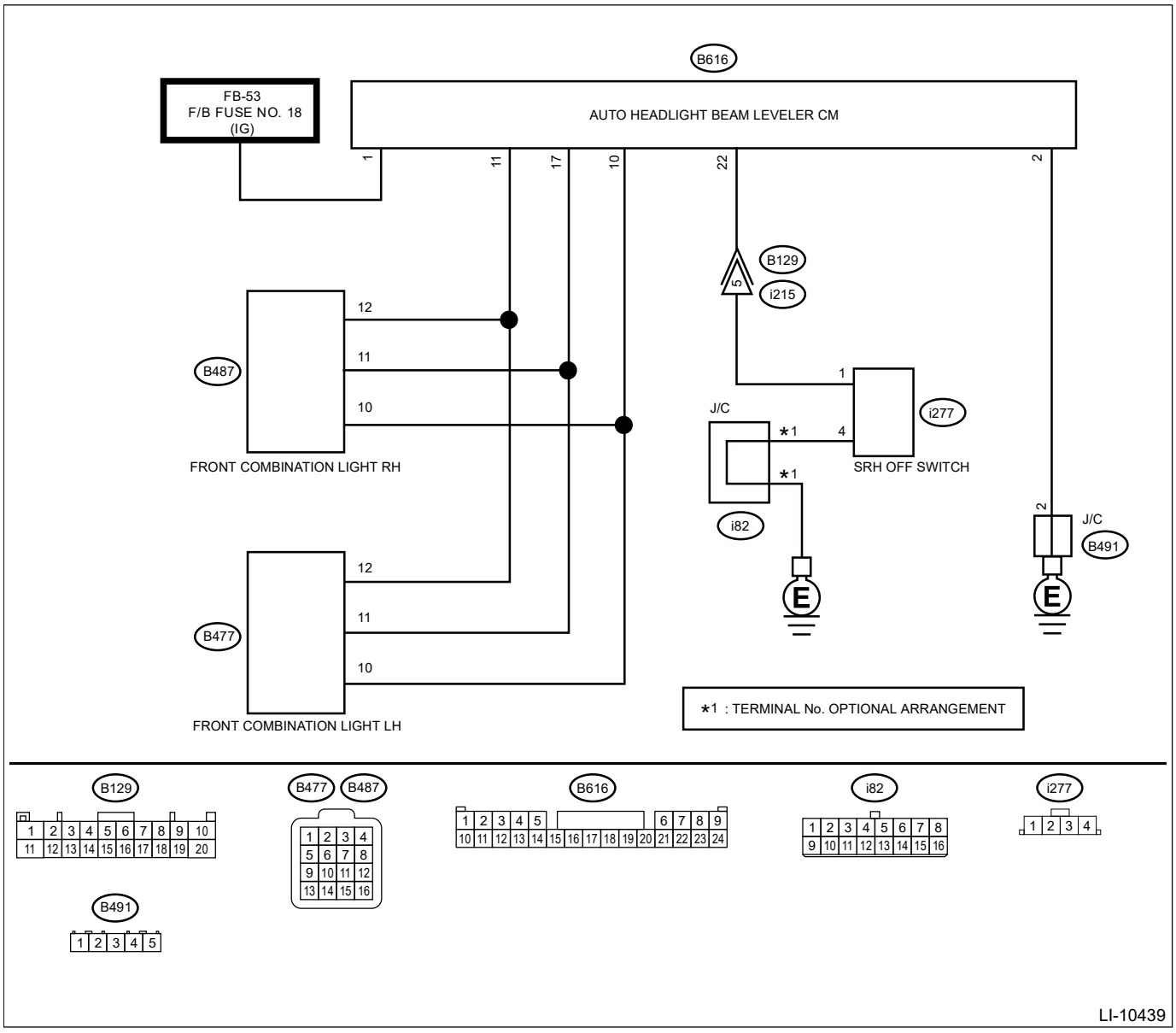
2. THE STEERING RESPONSIVE HEADLIGHT DOES NOT OPERATE

Detecting condition:

Malfunction of VDC CM, LAN communication circuit, actuator power supply circuit, reverse signal circuit, switch circuit, actuator, auto headlight beam leveler CM power supply circuit, auto headlight beam leveler CM

Wiring diagram:

Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, check the fuse in this circuit. Ref. to LIGHTING SYSTEM>Relay and Fuse.**
- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**

1. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 2.

2. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 3.

3. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK INITIALIZE FUNCTION.

yes → Go to 6.

no → Go to 5.

5. CHECK SWIVEL ACTUATOR POWER SUPPLY.

yes → Perform the instructed procedures.

no → Go to 12.

6. CHECK SRH OFF SWITCH.

yes → Go to 8.

no → Go to 7.

7. CHECK SRH OFF SWITCH CIRCUIT.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

8. CHECK REVERSE SIGNAL.

yes → Perform the instructed procedures.

no → Go to 9.

9. CHECK SWIVEL ACTUATOR POWER SUPPLY.

no → Go to 11.

yes

10. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

no → Perform the instructed procedures.

yes

11. CHECK SRH OPERATION.

yes → Perform the instructed procedures.

no → Go to 12.

12. CHECK ACTIVE TEST OF SWIVEL ACTUATOR.

yes → Go to 14.

no → Go to 13.

13. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.
14. DRIVING CHECK.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Start the engine.
3. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DTC.

Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC of U-code displayed? (Current malfunction)

Yes	Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Brake Control System] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any DTC related to the vehicle speed and steering angle sensor displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK INITIALIZE FUNCTION.

Perform the function check (the initialize function) for the steering responsive headlight. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>General Description>INSPECTION > BASIC INSPECTION.

Do the left and right headlights operate?

Yes	Go to 6.
No	• Only one side does not operate: Go to 5. • Both sides do not operate: Go to 6.

5. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Power Supply Failure]
- [Right Steering Responsive Headlight Power Supply Failure]

Is [FAIL] displayed?

Yes	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.
No	Go to 12.

6. CHECK SRH OFF SWITCH.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [SRH-OFF SW]

Is [ON] displayed when the ignition switch is turned OFF → ON?

Yes	Go to 8.
No	Go to 7.

7. CHECK SRH OFF SWITCH CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the SRH OFF switch connector.
3. Disconnect the auto headlight beam leveler CM connector.
4. Using a tester, measure the resistance between the auto headlight beam leveler CM connector and the SRH OFF switch connector, and between the SRH OFF switch connector and chassis ground.
   Connector & terminal
   (B616) No. 22 — (i277) No. 1:
   (i277) No. 4 — Chassis ground:

Is the resistance less than 1 Ω?

Yes	Repair or replace the open circuit of harness.
No	Perform unit inspection of the SRH OFF switch. Ref. to LIGHTING SYSTEM>SRF OFF Switch.

8. CHECK REVERSE SIGNAL.

1. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

   - MT model: [MT Reverse Switch]
   - CVT model: [Shift Position Signal]
2. Place the shift in reverse.

For MT model, is [ON] displayed? For CVT model, is [R] displayed?

Yes	For MT model, check the reverse switch or reverse switch harness. Ref. to MANUAL TRANSMISSION AND DIFFERENTIAL(5MT)>Switches and Harness. For CVT model, perform the diagnosis for CVT. Ref. to TRANSMISSION (DIAGNOSTICS)>Basic Diagnostic Procedure. When DTC is not stored, check the inhibitor switch or inhibitor switch harness. Ref. to CONTINUOUSLY VARIABLE TRANSMISSION(TR580)>Inhibitor Switch.
No	Go to 9.

9. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Power Supply Failure]
- [Right Steering Responsive Headlight Power Supply Failure]

Is [FAIL] displayed?

Yes	Go to 10.
No	Go to 11.

10. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.
   Connector & terminal
   (B487) No. 13 (+) — Chassis ground (−):
   (B477) No. 13 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Go to 11.
No	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

11. CHECK SRH OPERATION.

1. Turn the ignition switch to OFF.
2. Connect all the disconnected connectors.
3. Drive the vehicle to verify on which side, LH side or RH side, the SRH improper operation occurred.

Note:

At night, drive a curve of steering wheel angle approximately 45 degrees or more with vehicle speed at 40 km/h (25 MPH) or more, or drive a curve of steering wheel angle approximately 80 degrees or more with vehicle speed at 15 km/h (9 MPH) or more to check the SRH operation.

Is the improper operation occurring on either left or right side only?

Yes	Perform «VDC sensor midpoint setting mode». Ref. to VEHICLE DYNAMICS CONTROL (VDC)>VDC Control Module and Hydraulic Control Unit (VDCCM&H/U)>ADJUSTMENT > VDC SENSOR MIDPOINT SETTING MODE.
No	If the fault is not fixed even after the process: Go to 12.

12. CHECK ACTIVE TEST OF SWIVEL ACTUATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

- [Right Steering Responsive Headlight]
- [Left Steering Responsive Headlight]

Is the actuator current position value approximately the same as the input value of the actuator control position? (Within 1.2 seconds)

Yes	Go to 14.
No	When the value is not the same on one side only, replace the headlight assembly of the side where the same value is not achieved. When the value is not the same on both sides, Go to 13.

13. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



- [Control module voltage]

Is the voltage 8 — 16 V?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

14. DRIVING CHECK.

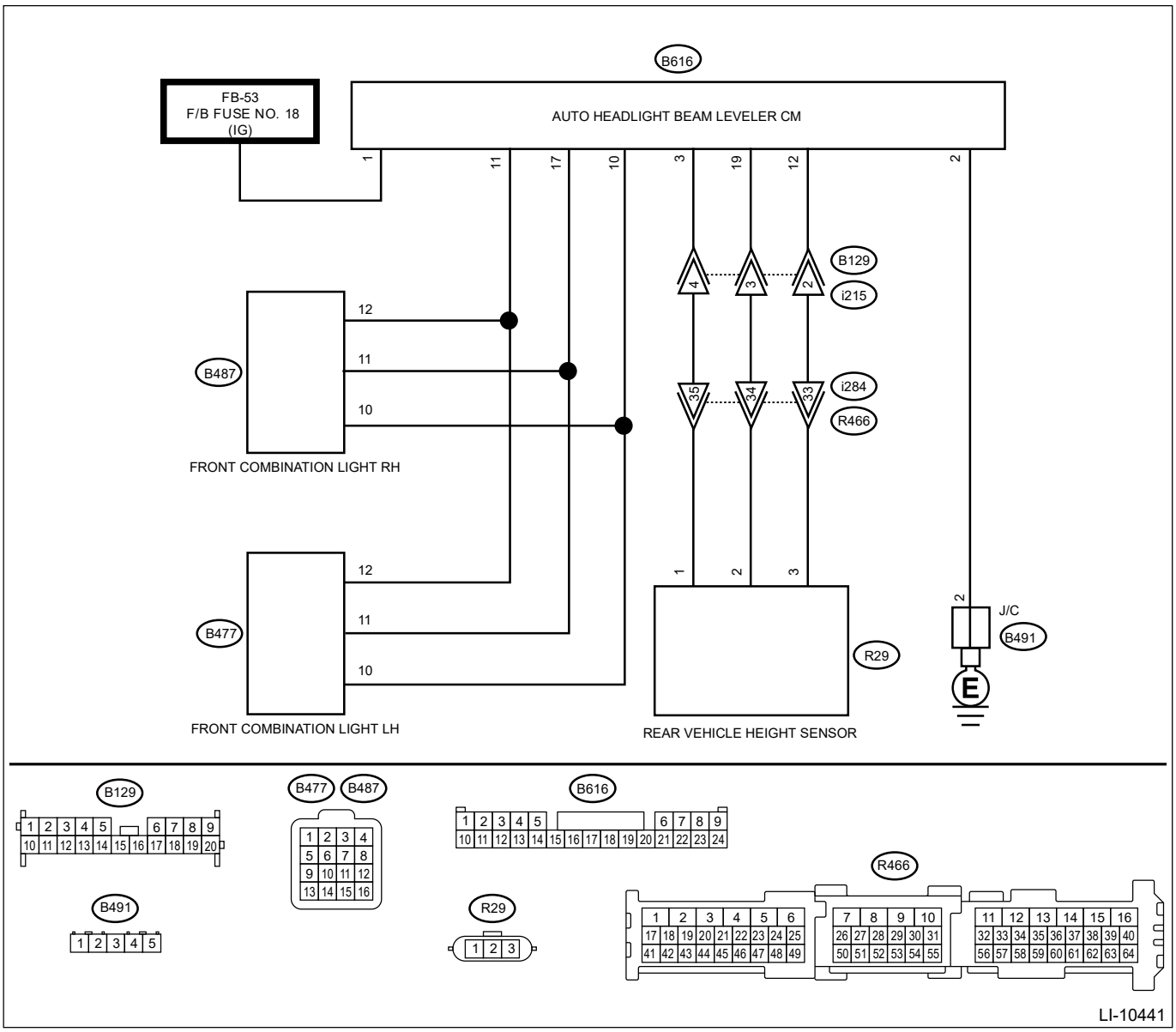
Perform the road test to make sure there is no yawing.

Is it yawing?

Yes	Check the vehicle alignment. Ref. to FRONT SUSPENSION>Wheel Alignment.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. THE STEERING RESPONSIVE HEADLIGHT OPERATES IN A DIRECTION DIFFERENT FROM THE TARGET

Detecting condition:
Malfunction of VDC CM, LAN communication circuit, actuator power supply circuit, reverse signal circuit, switch circuit, actuator, auto headlight beam leveler CM power supply circuit, auto headlight beam leveler CM, alignment
Wiring diagram:
Headlight beam leveler system Ref. to WIRING SYSTEM>Headlight Beam Leveler System>WIRING DIAGRAM.



Caution:

- **Before performing diagnosis, check the fuse in this circuit. Ref. to LIGHTING SYSTEM>Relay and Fuse.**
- **Initialization is required after replacing the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler System>PROCEDURE.**

1. CHECK DTC.	yes →	Perform the instructed procedures.
	no →	Go to 2.

2. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 3.

3. CHECK DTC.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK INITIALIZE FUNCTION.

no → Go to 13.

yes

5. CHECK INPUT SIGNAL.

no → Perform the instructed procedures.

yes

6. CHECK SWIVEL ACTUATOR POWER SUPPLY.

yes → Go to 9.

no → Go to 7.

7. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

no → Perform the instructed procedures.

yes

8. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

9. CHECK SRH SWIVEL ACTUATOR CURRENT ANGLE.

yes → Go to 12.

no → Go to 10.

10. CHECK SWIVEL ACTUATOR POWER SUPPLY.

yes → Perform the instructed procedures.

no → Go to 11.

11. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

12. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

no → Perform the instructed procedures.

yes

13. CHECK SWIVEL ACTUATOR POWER SUPPLY.

yes → Perform the instructed procedures.

no → Go to 14.

14. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.
no → Perform the instructed procedures.
yes ↓

15. CHECK ACTIVE TEST OF SWIVEL ACTUATOR.
no → Perform the instructed procedures.
yes ↓

16. DRIVING CHECK.
yes → Perform the instructed procedures.
no → Perform the instructed procedures.

1. CHECK DTC.

1. Turn the ignition switch to OFF.
2. Start the engine.
3. Using the Subaru Select Monitor, perform the clear memory of [Headlight / Foglight]. Ref. to COMMON(diag)>Clear memory.



4. Read the DTC of [Headlight / Foglight] using the Subaru Select Monitor. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK DTC.

1. Using the Subaru Select Monitor, read all DTCs. Ref. to LAN SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Is DTC of U-code displayed? (Current malfunction)

Yes	Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.
No	Go to 3.

3. CHECK DTC.

Read the DTC of [Brake Control] using the Subaru Select Monitor. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any DTC related to the vehicle speed and steering angle sensor displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK INITIALIZE FUNCTION.

Perform the function check (the initialize function) for the steering responsive headlight. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>General Description>INSPECTION > BASIC INSPECTION.

Do the left and right headlights operate?

Yes	Go to 5.
No	• Only one side does not operate: Go to 13. • Both sides do not operate: Go to 12.

5. CHECK INPUT SIGNAL.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Vehicle speed signal]
- [Steering Angle Signal]

Is [Vehicle speed signal] 8 km/h (5 MPH) or less, and [Steering Angle Signal] 8.5 deg or less?

Yes	Go to 6.
No	Perform the diagnosis for VDC. Ref. to BRAKE CONTROL (DIAGNOSTICS)>Basic Diagnostic Procedure.

6. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Power Supply Failure]
- [Right Steering Responsive Headlight Power Supply Failure]

Is the target angle 0 degree?

Yes	Go to 9.
No	Go to 7.

7. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.



- [Control module voltage]

Is the voltage 8 — 16 V?

Yes	Go to 8.
No	Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

8. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.
   Connector & terminal
   (B487) No. 13 (+) — Chassis ground (−):
   (B477) No. 13 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.
No	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

9. CHECK SRH SWIVEL ACTUATOR CURRENT ANGLE.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Current Angle]
- [Right Steering Responsive Headlight Current Angle]

Is the current angle 0 degree?

Yes	Go to 12.
No	Go to 10.

10. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Power Supply Failure]
- [Right Steering Responsive Headlight Power Supply Failure]

Is [FAIL] displayed?

Yes	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.
No	Go to 11.

11. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.
   Connector & terminal
   (B487) No. 13 (+) — Chassis ground (−):
   (B477) No. 13 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Replace the headlight assembly. Ref. to LIGHTING SYSTEM>Headlight Assembly.
No	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

12. CHECK AUTO HEADLIGHT BEAM LEVELER CM POWER SUPPLY.

1. Turn the ignition switch to OFF.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [Control module voltage]

Is the voltage 8 — 16 V?

Yes	Go to 13.
No	Check the battery and fuse. If no fault is found, check the auto headlight beam leveler CM power supply circuit.

13. CHECK SWIVEL ACTUATOR POWER SUPPLY.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Left Steering Responsive Headlight Power Supply Failure]
- [Right Steering Responsive Headlight Power Supply Failure]

Is [FAIL] displayed?

Yes	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.
No	Go to 14.

14. CHECK SWIVEL ACTUATOR POWER SUPPLY CIRCUIT.

1. Turn the ignition switch to OFF.
2. Disconnect the headlight assembly connector.
3. Turn the ignition switch to ON.
4. Using a tester, measure the voltage between headlight assembly connector and chassis ground.
   Connector & terminal
   (B487) No. 13 (+) — Chassis ground (−):
   (B477) No. 13 (+) — Chassis ground (−):

Is the voltage 8 — 16 V?

Yes	Go to 15.
No	Check the battery and fuse. If no fault is found, check the swivel actuator power supply circuit.

15. CHECK ACTIVE TEST OF SWIVEL ACTUATOR.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Headlight / Foglight]. Ref. to HEADLIGHT / FOGLIGHT(DIAGNOSTICS)>Active Test.

- [Right Steering Responsive Headlight]
- [Left Steering Responsive Headlight]

Is the actuator current position value approximately the same as the input value of the actuator control position? (Within 1.2 seconds)

Yes	Go to 16.
No	When the value is not the same on one side only, replace the headlight assembly of the side where the same value is not achieved. Ref. to LIGHTING SYSTEM>Headlight Assembly. When the value is not the same on both sides, replace the auto headlight beam leveler CM. Ref. to LIGHTING SYSTEM>Auto Headlight Beam Leveler Control Module.

16. DRIVING CHECK.

Perform the road test to make sure there is no yawing.

Is it yawing?

Yes	Check the vehicle alignment. Ref. to FRONT SUSPENSION>Wheel Alignment.
No	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

TELEMATICS SYSTEM (DIAGNOSTICS)

TEL(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Diagnostic Trouble Code (DTC)
12. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
13. Diagnostics with Phenomenon

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview, and Go to 2.

2. PERFORM BASIC INSPECTION.

Perform basic inspection. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Telematics].

Note:
For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

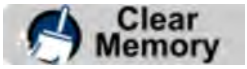
Note:
If DTC is detected, only RED LED will illuminate. For details, refer to "LED operation status list". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.

Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

1. Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Telematics]. Ref. to COMMON(diag)>Clear memory>OPERATION.



4. Execute the inspection mode. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Inspection Mode.
5. Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown. Go to 5.
No	Finish the diagnosis.

CHECK

1. CHECK LIST FOR INTERVIEW

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="2">Telematics Check List for Interview</td><td colspan="2">Received Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td colspan="2">Registration No. Initial year of registration
Year Month Date</td></tr>
<tr><td colspan="2">Vehicle model Frame number</td></tr>
<tr><td>Interviewer
( )</td><td>Inspector
( )</td><td>Engine type
( )</td><td>Odometer reading
( )</td></tr>
<tr><td colspan="4">Customer specified content</td></tr>
<tr><td>Date when problem occurred</td><td>Year Month
Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="4">Conditions at event</td><td colspan="3">Weather ❑Fine ❑Cloudy ❑Rainy ❑Snowy ❑Others ( )</td></tr>
<tr><td colspan="3">Temperature °C (°F)</td></tr>
<tr><td colspan="3">How often ❑Always ❑Once before ❑Sometimes (times a day / times a week / times a month)</td></tr>
<tr><td colspan="3">When and how</td></tr>
<tr><td>Situations at event</td><td colspan="3">In what situations did it occur?
❑Fast Driving ❑Rough Roads ❑Parked ❑Unknown ❑Other</td></tr>
<tr><td></td><td colspan="3">In what operations did it occur?
❑ACC On ❑ Press i-button or SOS button
❑Operating door lock function with mobile phone
❑Operating door unlock function with mobile phone
❑Operating horn & hazard function with mobile phone
❑Operating own vehicle positioning function
❑Unknown ❑Other</td></tr>
<tr><td>Situations at restoration</td><td colspan="3">What helped the status return to normal?
❑Recover on its own ❑ ACC Off and On ❑ Does not recover ❑ Other</td></tr>
<tr><td>Location at event</td><td colspan="3">❑Unknown ❑ Any Place
❑Driving around open areas like in the country
❑Driving around hills or mountains
❑Driving around cities with large buildings
❑Driving around residential areas or no large buildings
❑Driving around areas with power lines
❑Driving around rough roads or railway tracks</td></tr>
<tr><td>Error message</td><td colspan="3">Error message displayed</td></tr>
<tr><td>Mobile phone</td><td colspan="3">Mobile phone carrier (Example: Docomo)</td></tr>
</table>

	Mobile phone model (Example: Apple Iphone6) Mobile phone OS version (software version information)
Telematics subscription status	❑ Subscription (Year Month Date) ❑ Non-contract
LED illumination status Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.	RED LED ❑OFF ❑ON ❑Blink GREEN LED ❑OFF ❑ON ❑Blink
Check result	Reproductivity ❑Reproduced ❑Always ❑Sometimes ❑Cannot be reproduced Condition ❑Cold ❑Warm ❑At starting ❑Immediately after starting ❑During warm-up ❑At idle ❑When start driving ❑While driving ❑At acceleration ❑At deceleration ❑When applying brake
MSISDN No. of SIM	Check in [Data Monitor]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.
DTC	

2. LED ILLUMINATION STATUS LIST

LED	Light OFF	Blink	Light ON
RED	Communication with the server and DCM are operating normally (communication failure with the STARLINK server. DTCs are not found within the vehicle unit.)	It is possible that communication with the server/DCM are malfunctioning.	It is possible that communication with the server/DCM are malfunctioning.
GREEN	—	Connection to the server is being attempted and in progress.	Communication status with the server is READY.
RED and GREEN	Telematics function is not activated.	Collation with the server is in progress.	Collation with the server failed. It is possible that the server/DCM are malfunctioning.

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

CAUTION

1. AIRBAG SYSTEM

Before performing diagnosis, refer to "CAUTION" in "General Description" in AIRBAG SYSTEM. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

2. TELEMATICS

Before performing diagnosis, refer to "CAUTION" in "General Description" in ENTERTAINMENT AND MONITORING. Ref. to ENTERTAINMENT & MONITORING>General Description>CAUTION.

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing the diagnosis, check the following items which may affect the problems relating to the telematics system.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the relay and fuse condition. Ref. to ENTERTAINMENT & MONITORING>Relay and Fuse.
3. Check harness and connector. Also check grounding.

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

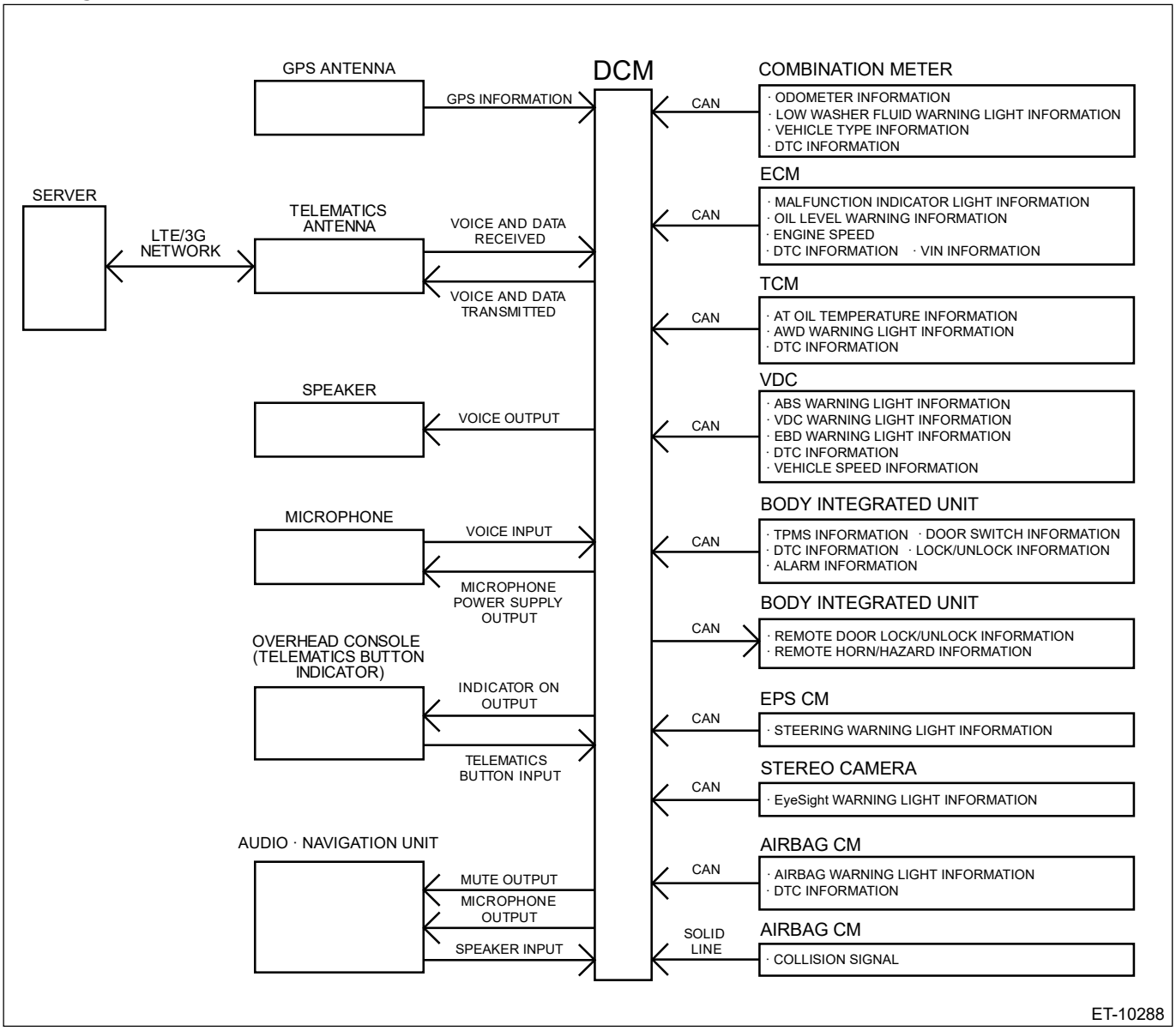
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

TELEMATICS SYSTEM (DIAGNOSTICS) > General Description

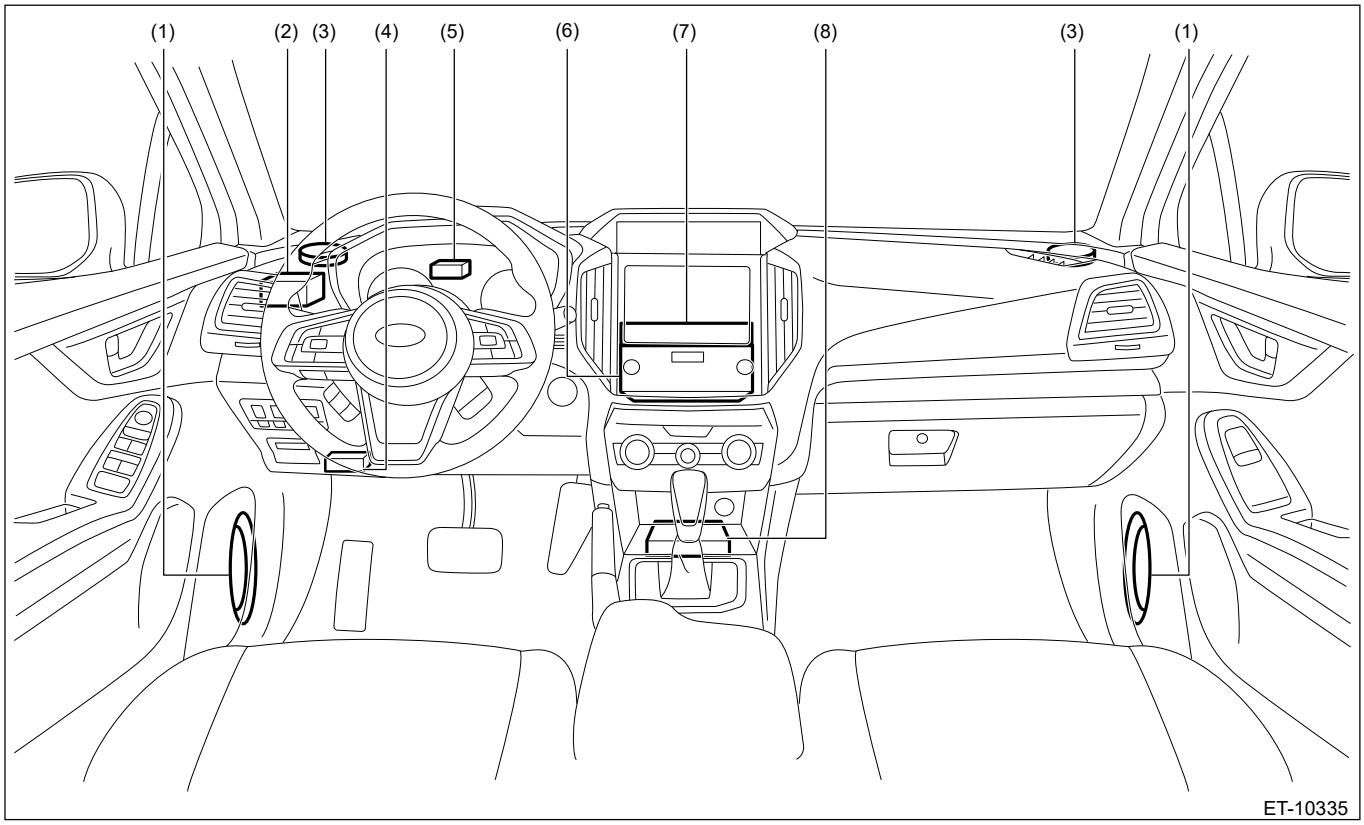
SYSTEM BLOCK DIAGRAM

Main signals used between DCM and relevant CM

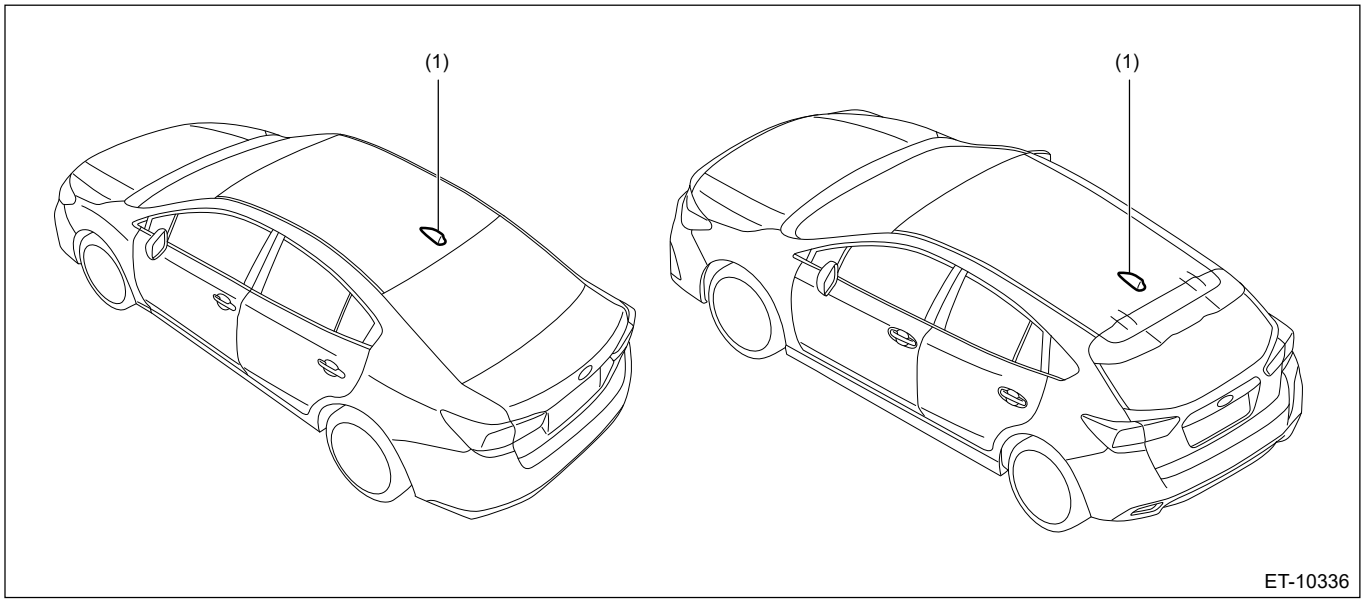


TELEMATICS SYSTEM (DIAGNOSTICS) > Electrical Component Location

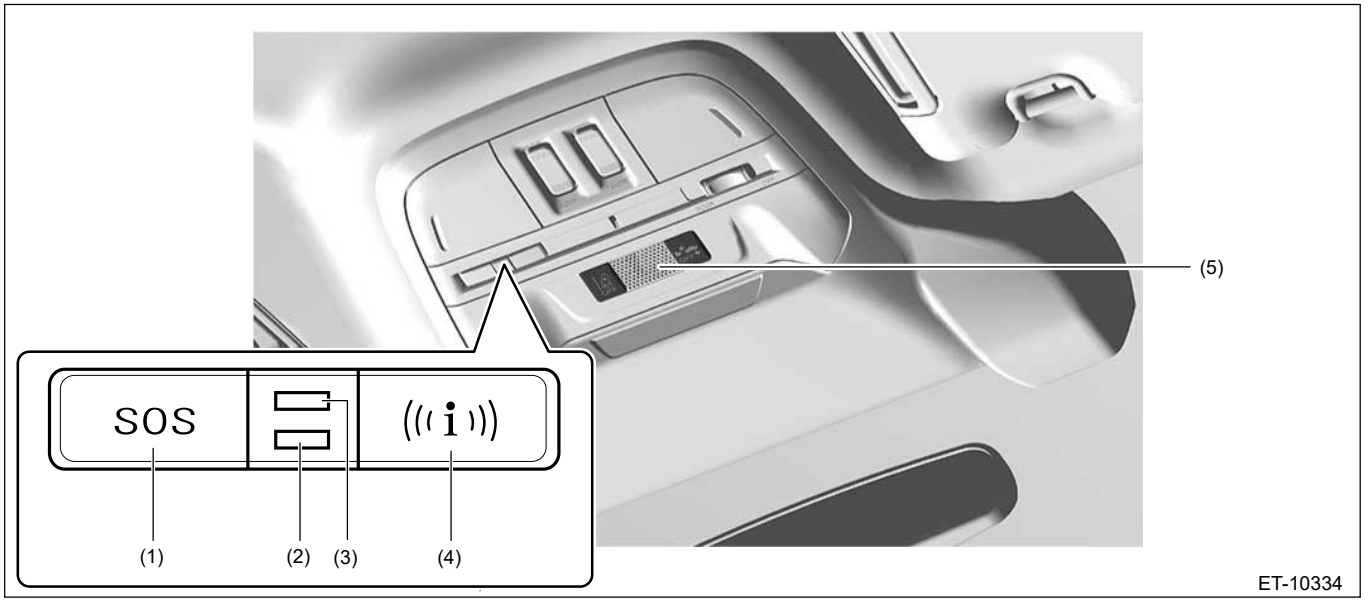
LOCATION



(1)	Door speaker	(4)	Data link connector	(7)	Data communication module (DCM)
(2)	Telematics sub antenna	(5)	GPS antenna	(8)	Airbag CM
(3)	Instrument panel speaker	(6)	Audio or navigation unit		



(1) Telematics antenna



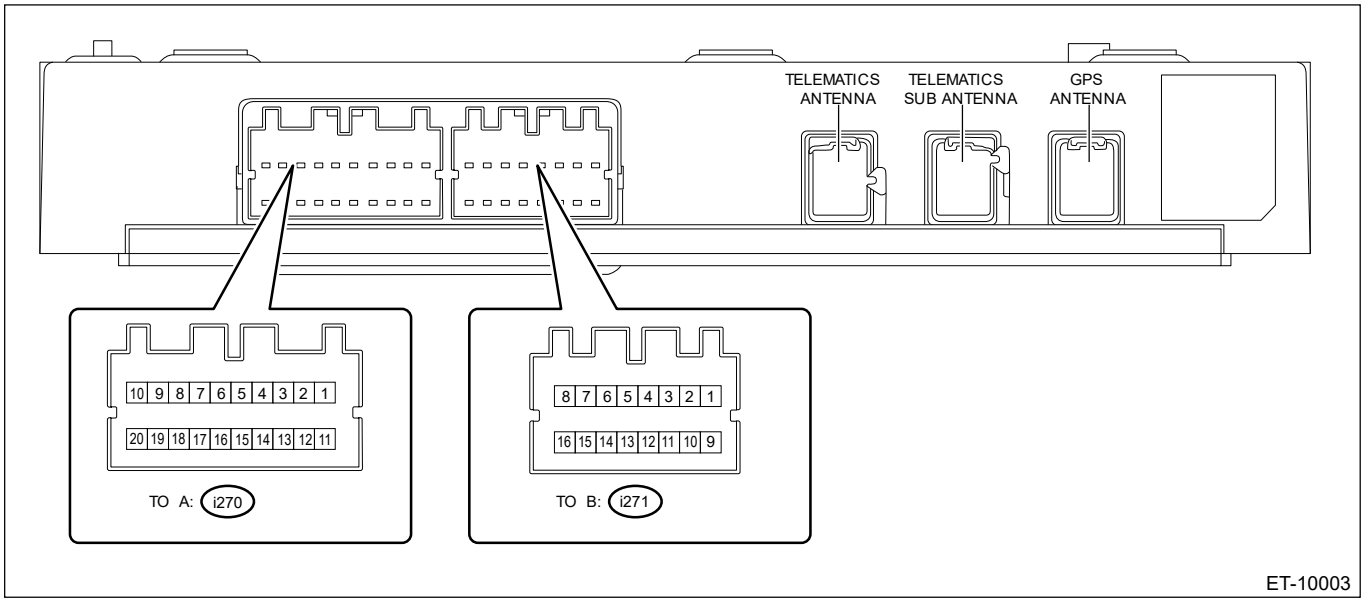
(1) SOS button
(2) RED LED
(3) GREEN LED
(4) i-button
(5) Microphone

Note:

For the LED operation condition, refer to "LED operation condition" in "Check List for Interview". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Check List for Interview>CHECK > LED ILLUMINATION STATUS LIST.

SPECIFICATION

1. DATA COMMUNICATION MODULE (DCM)



Terminal No.	Contents	Measuring condition	Standard
(i270) No. 1	—	—	—
(i270) No. 2	—	—	—
(i270) No. 3	LED GREEN	—	—
(i270) No. 4 ←→ Chassis ground	i-button	i-button OFF → ON	1 MΩ or more → less than 1 Ω
(i270) No. 5 ←→ Chassis ground	SOS button	SOS button OFF → ON	1 MΩ or more → less than 1 Ω
(i270) No. 6	BODY CAN H	—	—
(i270) No. 7	MAIN CAN L	—	—
(i270) No. 8	Ignition power supply	Ignition switch OFF → ON	Less than 1 V → 9 — 16 V
(i270) No. 9	—	—	—
(i270) No. 10	Battery power supply	Always	9 — 16 V
(i270) No. 11	—	—	—
(i270) No. 12	—	—	—
(i270) No. 13	LED RED	—	—
(i270) No. 14 ←→ Chassis ground	GND	Always	Less than 1 Ω
(i270) No. 15	—	—	—
(i270) No. 16	BODY CAN L	—	—
(i270) No. 17	MAIN CAN H	—	—

Terminal No.	Contents	Measuring condition	Standard
(i270) No. 18	Collision detection signal	—	—
(i270) No. 19	MUTE	—	—
(i270) No. 20 ←→ Chassis ground	ACC	Ignition switch OFF → ACC ON	Less than 1 V → 9 — 16 V
(i271) No. 1	Front speaker input LH −	—	—
(i271) No. 2	Front speaker output LH −	—	—
(i271) No. 3	Front speaker input RH −	—	—
(i271) No. 4	Front speaker output RH −	—	—
(i271) No. 5	MIC signal OUT	—	—
(i271) No. 6	MIC signal	—	—
(i271) No. 7	MIC DET	—	—
(i271) No. 8	MIC 5 V	—	—
(i271) No. 9	Front speaker input LH +	—	—
(i271) No. 10	Front speaker output LH +	—	—
(i271) No. 11	Front speaker input RH +	—	—
(i271) No. 12	Front speaker output RH +	—	—
(i271) No. 13 ←→ Chassis ground	MIC GND OUT	Always	Less than 1 Ω
(i271) No. 14	MIC GND IN	—	—
(i271) No. 15	—	—	—
(i271) No. 16	—	—	—

TELEMATICS SYSTEM (DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode.
After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

DTC	Item	Note
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	Control Module Communication Bus "BODY-CAN" Off	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic

DTC	Item	Note
	CONTROL MODULE	Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.
B2A00	VIN READING	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A00 VIN READING.
B2A01	LTE1 Antenna Circuit	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A01 LTE1 ANTENNA CIRCUIT.
B2A02	LTE2 Antenna Circuit	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A02 LTE2 ANTENNA CIRCUIT.
B2A03	GPS ANTENNA CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A03 GPS ANTENNA CIRCUIT.
B2A07	BACKUP BATTERY CHARGE SYSTEM PERFORMANCE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE.
B2A08	SOS BUTTON CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A08 SOS BUTTON CIRCUIT.
B2A09	I-CALL BUTTON CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A09 I-CALL BUTTON CIRCUIT.
B2A0C	DCM Internal fault	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0C DCM INTERNAL FAULT.
B2A0D	Airbag Signal	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0D AIRBAG SIGNAL.
B2A0E	MUTE LINE CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0E MUTE LINE CIRCUIT.
B2A0F	BACKUP BATTERY DEGRADATION	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic

DTC	Item	Note
		Trouble Code (DTC)>DTC B2A0F BACKUP BATTERY DEGRADATION.
B2A10	Battery Voltage High	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A10 BATTERY VOLTAGE HIGH.

Inspection steps:

1. Using the Subaru Select Monitor, perform the clear memory of [Telematics]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Telematics] to check that there is no DTC displayed. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis according to DTC. After solving the DTC, repeat from step 1).
3. Turn the ignition switch to OFF.
4. Turn the ignition switch to ON, and wait for 5 seconds or more.
5. Using the Subaru Select Monitor, read the DTC of [Telematics] to check that there is no DTC displayed. Ref. to AIR CONDITIONER(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis according to DTC.

2. INSPECTION MODE 2

DTC	Item	Note
B2A04	MIC CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT.
B2A05	LEFT SPEAKER/AUDIO CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT.
B2A06	RIGHT SPEAKER/AUDIO CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.
B2A0A	RED LED CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0A RED LED CIRCUIT.
B2A0B	GREEN LED CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0B GREEN LED CIRCUIT.

Inspection steps:

1. Using the Subaru Select Monitor, perform the clear memory of [Telematics]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Telematics] to check that there is no DTC displayed. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis according to DTC. After solving the DTC, repeat from step 1).
3. Turn the ignition switch to OFF.
4. Close all doors. (The vehicle enters CAN sleep state.)
5. Wait for approx. 1 minute. After the indicator goes off, wait for another 1 minute. (DCM standby mode)
6. Turn the ignition switch to ON, and wait for 5 seconds or more.
7. Using the Subaru Select Monitor, read the DTC of [Telematics] to check that there is no DTC displayed. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis according to DTC. After solving the DTC, repeat from step 1).

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

INSPECTION

When communication with DCM is impossible

Detecting condition:

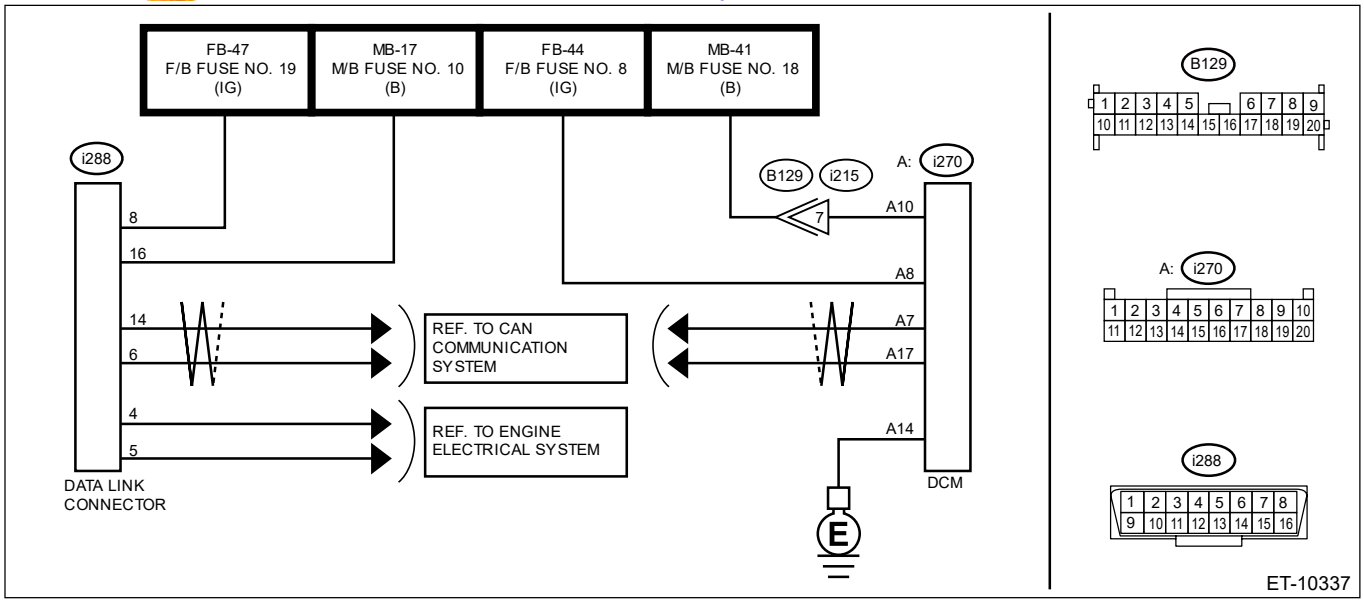
- Defective harness connector
- Power supply circuit malfunction
- Defective DCM
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Trouble symptom:

Communication is impossible between DCM and Subaru Select Monitor.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**

1. CHECK FUSE.

1. Turn the ignition switch to OFF.
2. Check the fuse of the DCM.

Is the check result OK?

Yes	Go to 2.
No	Replace the fuse. If the replaced fuse blows out easily, repair the ground short circuit in harness between the fuse — DCM connector.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the DCM connector.
2. Turn the ignition switch to ON.
3. Using a tester, measure the voltage between DCM connector (harness side) and the chassis ground.

   Connector & terminal

   (i270) No. 8 (+) Chassis ground (−):

   (i270) No. 10 (+) Chassis ground (−):

Is the voltage 10 V or more?

Yes	Go to 3.
No	Repair the open circuit in the wiring harness between fuse and DCM connector.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance between DCM connector (harness side) and the chassis ground.
   Connector & terminal
   (i270) No. 14 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair the open circuit in the wiring harness between fuse and DCM connector.

4. CHECK LAN SYSTEM.

Inspect LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.

Is the check result OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK TELEMATICS.

Communicate with [Telematics] using the Subaru Select Monitor.

Is communication possible?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

TELEMATICS SYSTEM (DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor>LIST.**

TELEMATICS SYSTEM (DIAGNOSTICS) > Data Monitor

LIST

Display	Contents	Standard/Unit	Unit
Trip Count [count]	Refer to "LAN SYSTEM (DIAGNOSTICS)". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	time	-
Count		-	-
Time Count [msec]		ms	-
Current GPS Data	Current GPS information	-	-
Signal Strength	Current signal strength	-	-
MSISDN	Phone number of DCM built-in SIM	-	-
GPS Data at ACN Event	GPS information at ACN event occurrence	-	-
TimeStamp at ACN Event	Time stamp information at ACN event occurrence	**Note:** **The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].**	-
Call Type at ACN Event	Information of ACN event occurrence	No Attempt ACN	-
RSSI at ACN Event	Signal strength at ACN event occurrence	0 — 100%	-
Call Status at ACN Event	Result of call connection at ACN event occurrence	Call Not Started Service Not Provisioned No Network Service	-

Display	Contents	Standard/Unit	Unit
		Call Ended by Agero Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	
ACN Active	Subscription information on ACN function	FALSE TRUE	-
SOS Active	Subscription information on SOS function	FALSE TRUE	-
ICALL Active	Subscription information on I-CALL function	FALSE TRUE	-
Security Alarm Active	Subscription information on Security Alarm function	FALSE TRUE	-
Maintenance Alert Active	Subscription information on Maintenance Alert function	FALSE TRUE	-
MVR Active	Subscription information on MVR function	FALSE TRUE	-
Diagnostic Alert Active	Subscription information on Diagnostic Alert function	FALSE TRUE	-
Account Status	Basic subscription information	FALSE TRUE	-
Power Source Status	Operation power supply information (main battery or DCM built-in BUB)	DCM Currently Running On BUB DCM Currently Running On VBATT	-
Subscription Status	DCM mode information	Factory Mode Comm Check Unsubscribed Subscribed	-
Battery Voltage	Voltage information on main battery	0 — 18.5 V	-
Stored VIN	VIN information stored in DCM	-	-
GPS Data at Time of Button Push(1)	GPS information at SOS/I-CALL event occurrence (record 1)	-	-
Timestamp at Time of Button Push(1)	Time stamp information at SOS/I-CALL event occurrence (record 1)		-

Display	Contents	Standard/Unit	Unit
		Note: **The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].**	
Call Type at SOS/ICALL Event(1)	Information of SOS/I-CALL event occurrence (record 1)	No Call SOS I-Call	-
RSSI at SOS/ICALL(1)	Signal strength at SOS/I-CALL event occurrence (record 1)	0 — 100%	-
Call status at SOS/ICALL Event(1)	Result of call connection at SOS/I-CALL event occurrence (record 1)	Call Not Started Service Not Provisioned No Network Service Call Ended by Agero Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
GPS Data at Time of Button Push(2)	GPS information at SOS/I-CALL event occurrence (record 2)	-	-
Timestamp at Time of Button Push(2)	Time stamp information at SOS/I-CALL event occurrence (record 2)		-

Display	Contents	Standard/Unit	Unit
		Note: **The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].**	
Call Type at SOS/ICALL Event(2)	Information of SOS/I-CALL event occurrence (record 2)	No Call SOS I-Call	-
RSSI at SOS/ICALL(2)	Signal strength at SOS/I-CALL event occurrence (record 2)	0 — 100%	-
Call status at SOS/ICALL Event(2)	Result of call connection at SOS/I-CALL event occurrence (record 2)	Call Not Started Service Not Provisioned No Network Service Call Ended by Agero Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
GPS Data at Time of Button Push(3)	GPS information at SOS/I-CALL event occurrence (record 3)	-	-
Timestamp at Time of Button Push(3)	Time stamp information at SOS/I-CALL event occurrence (record 3)		-

Display	Contents	Standard/Unit	Unit
		Note: **The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use. Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].**	
Call Type at SOS/ICALL Event(3)	Information of SOS/I-CALL event occurrence (record 3)	No Call SOS I-Call	-
RSSI at SOS/ICALL(3)	Signal strength at SOS/I-CALL event occurrence (record 3)	0 — 100%	-
Call status at SOS/ICALL Event(3)	Result of call connection at SOS/I-CALL event occurrence (record 3)	Call Not Started Service Not Provisioned No Network Service Call Ended by Agero Call Ended by Driver Call Ended by Exhausted Retry Call Started Call Connected	-
Speaker Gain Level	Speaker specification information (standard or H/K)	Standard Radio/2 Speakers Premium Radio/4 Speakers	-
GREEN LED Voltage	GREEN LED voltage information	0 — 18.5 V	-
RED LED Voltage	RED LED voltage information	0 — 18.5 V	-
Left Speaker Status	Left speaker connection status	No Speaker Diagnostic Fault(Default) Output Short to PVDD Output Short to Ground Open Load Shorted Load	-

Display	Contents	Standard/Unit	Unit
		Fault Condition Load Diagnostics Speaker Muted Speaker in Play Mode	
Right Speaker Status	Right speaker connection status	No Speaker Diagnostic Fault(Default) Output Short to PVDD Output Short to Ground Open Load Shorted Load Fault Condition Load Diagnostics Speaker Muted Speaker in Play Mode	-

TELEMATICS SYSTEM (DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on the data monitor, refer to the list. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Freeze Frame Data>LIST.**

TELEMATICS SYSTEM (DIAGNOSTICS) > Freeze Frame Data

LIST

Display	Contents	Standard/Unit	Note
Trip Count	Refer to "LAN SYSTEM (DIAGNOSTICS)". Ref. to LAN SYSTEM (DIAGNOSTICS)>General Description>CAUTION > TIME STAMP.	time	-
Count		-	-
Time Count		ms	-

TELEMATICS SYSTEM (DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Telematics], and then select [Enter].
5. On [Select Function] display, select [Active Test].

Note:

For detailed operation procedures, refer to "Application help".

TELEMATICS SYSTEM (DIAGNOSTICS) > Active Test

LIST

Active test items	Contents	Execution condition
GREEN LED Lighting	Turn GREEN LED to ON/flashing/OFF.	-
GREEN LED Flashing		-
GREEN LED OFF		-
RED LED Lighting	Turn RED LED to ON/flashing/OFF.	-
RED LED Flashing		-
RED LED OFF		-
Speaker ON	Outputs to speaker.	-

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.**

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2A00	VIN READING	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A00 VIN READING.
B2A01	LTE1 Antenna Circuit	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A01 LTE1 ANTENNA CIRCUIT.
B2A02	LTE2 Antenna Circuit	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A02 LTE2 ANTENNA CIRCUIT.
B2A03	GPS ANTENNA CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A03 GPS ANTENNA CIRCUIT.
B2A04	MIC CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT.
B2A05	LEFT SPEAKER/AUDIO CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT.
B2A06	RIGHT SPEAKER/AUDIO CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.
B2A07	BACKUP BATTERY CHARGE SYSTEM PERFORMANCE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE.
B2A08	SOS BUTTON CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A08 SOS BUTTON CIRCUIT.

Code	Description & trouble part	Reference
B2A09	I-CALL BUTTON CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A09 I-CALL BUTTON CIRCUIT.
B2A0A	RED LED CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0A RED LED CIRCUIT.
B2A0B	GREEN LED CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0B GREEN LED CIRCUIT.
B2A0C	DCM Internal fault	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0C DCM INTERNAL FAULT.
B2A0D	Airbag Signal	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0D AIRBAG SIGNAL.
B2A0E	MUTE LINE CIRCUIT	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0E MUTE LINE CIRCUIT.
B2A0F	BACKUP BATTERY DEGRADATION	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0F BACKUP BATTERY DEGRADATION.
B2A10	Battery Voltage High	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A10 BATTERY VOLTAGE HIGH.
U0073	CONTROL MODULE COMMUNICATION BUS OFF	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF.
U0074	Control Module Communication Bus "BODY-CAN" Off	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF.
U0100	LOST COMMUNICATION WITH ECM/PCM "A"	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A".
U0122	LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE.

Code	Description & trouble part	Reference
U0140	LOST COMMUNICATION WITH BODY CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE.
U0151	LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE.
U0155	LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE.
U0401	INVALID DATA RECEIVED FROM ECM/PCM "A"	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A".
U0416	INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE.
U0452	INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A00 VIN READING

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
When ignition switch is ON, VIN information (CAN) sent from ECM cannot be read.
Trouble symptom:
- Telematics function cannot be used.
- RED LED illuminates.

Caution:
- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A00 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Read the following DTCs using Subaru Select Monitor.



- [Telematics] Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
- [Engine Control System] Ref. to ENGINE (DIAGNOSTICS)(H4DO)>Diagnostic Trouble Code (DTC).

Is DTC U**** displayed? (Current malfunction)

Yes	Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure.
No	Go to 3.

3. CHECK DATA MONITOR.

Confirm VIN information from the engine OBD mode. Ref. to ENGINE (DIAGNOSTICS) (H4DO)>General Scan Tool>OPERATION > MODE $09 (REQUEST VEHICLE INFORMATION).

Is VIN information displayed?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the ECM. Ref. to FUEL INJECTION (FUEL SYSTEMS)(H4DO)>Engine Control Module (ECM).

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

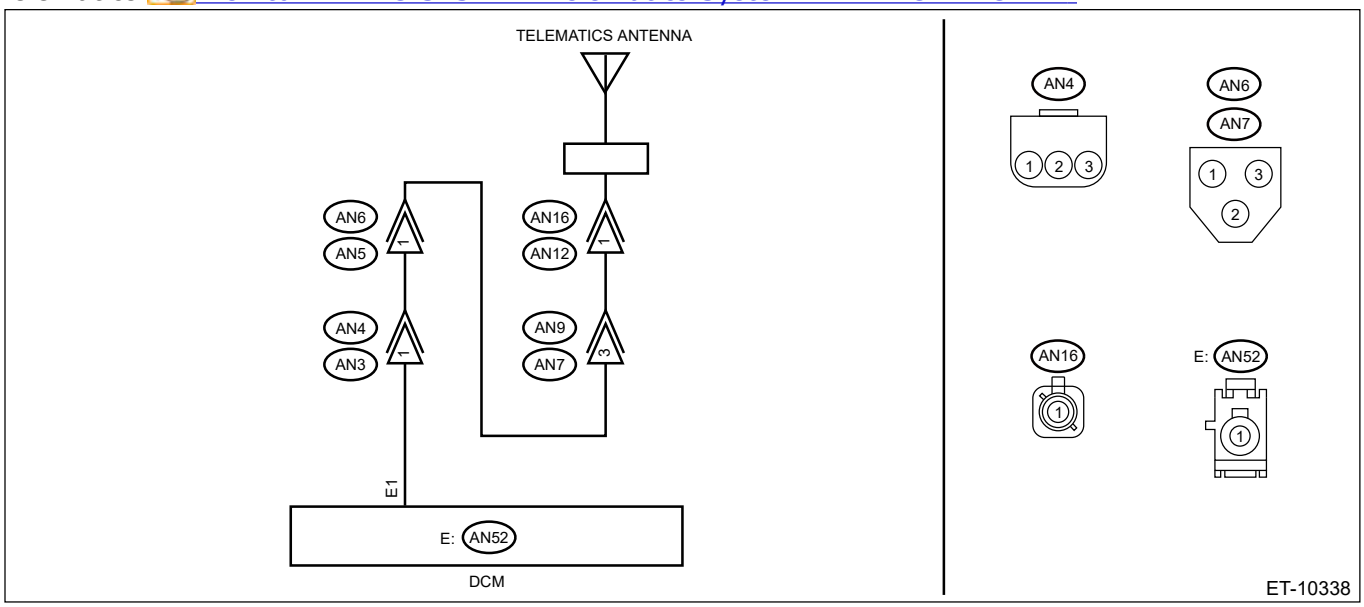
DTC B2A01 LTE1 ANTENNA CIRCUIT

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
Any of the followings continues for 5 seconds or more.
- LTE1 impedance is more than 1 MΩ. (Detached antenna, etc.)
- LTE1 impedance is less than 1 kΩ. (Short-circuited antenna, etc.)

Trouble symptom:
- Telematics function cannot be used.
- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A01 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the antenna connector.
3. Disconnect the DCM connector.
4. Measure the resistance between antenna connector and DCM connector.
   Connector & terminal
   (AN52) No. 1 — (AN12) No. 1:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.
Connector & terminal
(AN52) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Measure the voltage between DCM connector and chassis ground.
   Connector & terminal
   (AN52) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK ANTENNA.

Check the telematics antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A02 LTE2 ANTENNA CIRCUIT

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
Any of the followings continues for 5 seconds or more.
- LTE2 impedance is more than 1 MΩ. (Detached antenna, etc.)
- LTE2 impedance is less than 1 kΩ. (Short-circuited antenna, etc.)

Trouble symptom:
- Telematics function cannot be used.
- RED LED illuminates.

Caution:
- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A02 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK ANTENNA.

Visually check the telematics sub antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics sub antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A03 GPS ANTENNA CIRCUIT

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
Any of the followings continues for 5 seconds or more.
- GPS antenna impedance is more than 1 MΩ. (Detached antenna, etc.)
- GPS antenna impedance is less than 10 Ω. (Short-circuited antenna, etc.)

Trouble symptom:
- Telematics function cannot be used.
- RED LED illuminates.

Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A03 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK GPS ANTENNA.

Visually check the GPS antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the GPS antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A04 MIC CIRCUIT

Diagnosis start condition:
When ACC is ON.
DTC detecting condition:
Any of the followings continues for 1 second or more.

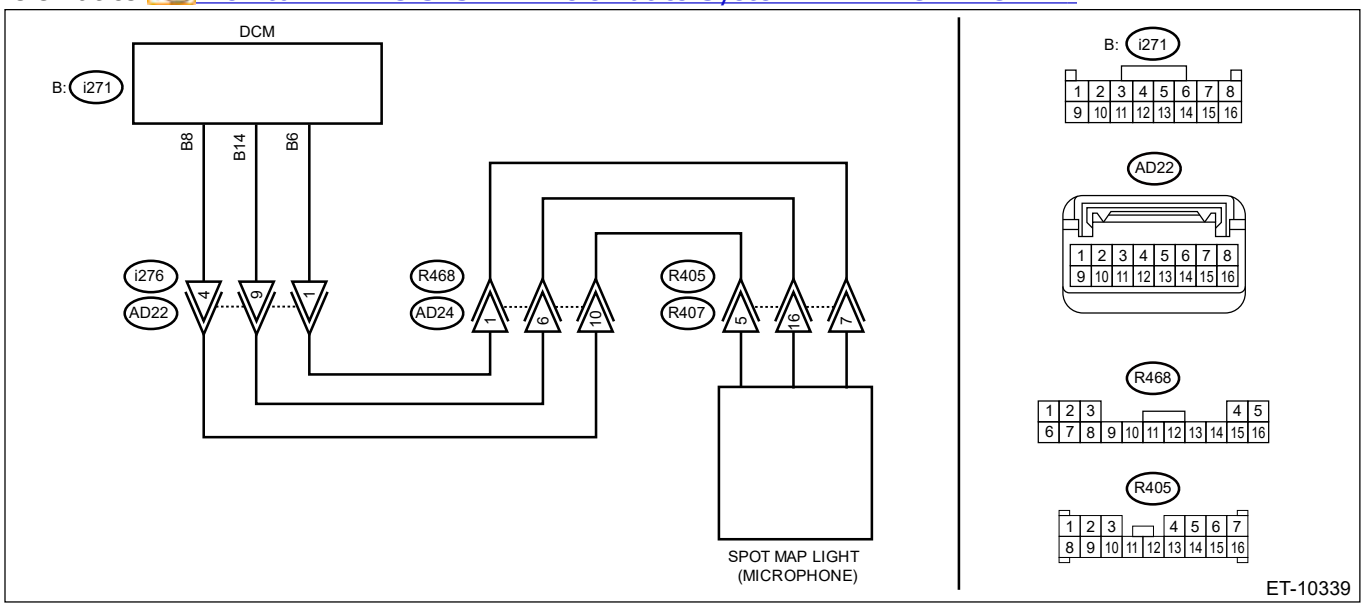
- MIC impedance is more than 10 kΩ. (Detached MIC, etc.)
- MIC impedance is less than 10 Ω. (Short-circuited MIC, etc.)

Trouble symptom:

- Call function cannot be used.
- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A04 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the microphone connector.
3. Disconnect the DCM connector.
4. Measure the resistance between microphone connector and DCM connector.

Connector & terminal

(R405) No. 5 — (i271) No. 8:
(R405) No. 16 — (i271) No. 14:
(R405) No. 7 — (i271) No. 6:

Is the resistance 1 Ω or less?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i271) No. 8 — Chassis ground:
(i271) No. 14 — Chassis ground:
(i271) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i271) No. 8 (+) — Chassis ground (−):

(i271) No. 14 (+) — Chassis ground (−):

(i271) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK MICROPHONE.

Confirm the microphone voice input.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the microphone. Ref. to ENTERTAINMENT & MONITORING>Microphone.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT

Diagnosis start condition:

When ACC is ON.

DTC detecting condition:

Speaker impedance is more than 10 kΩ for 100 ms. (Detached speaker connection, etc.)

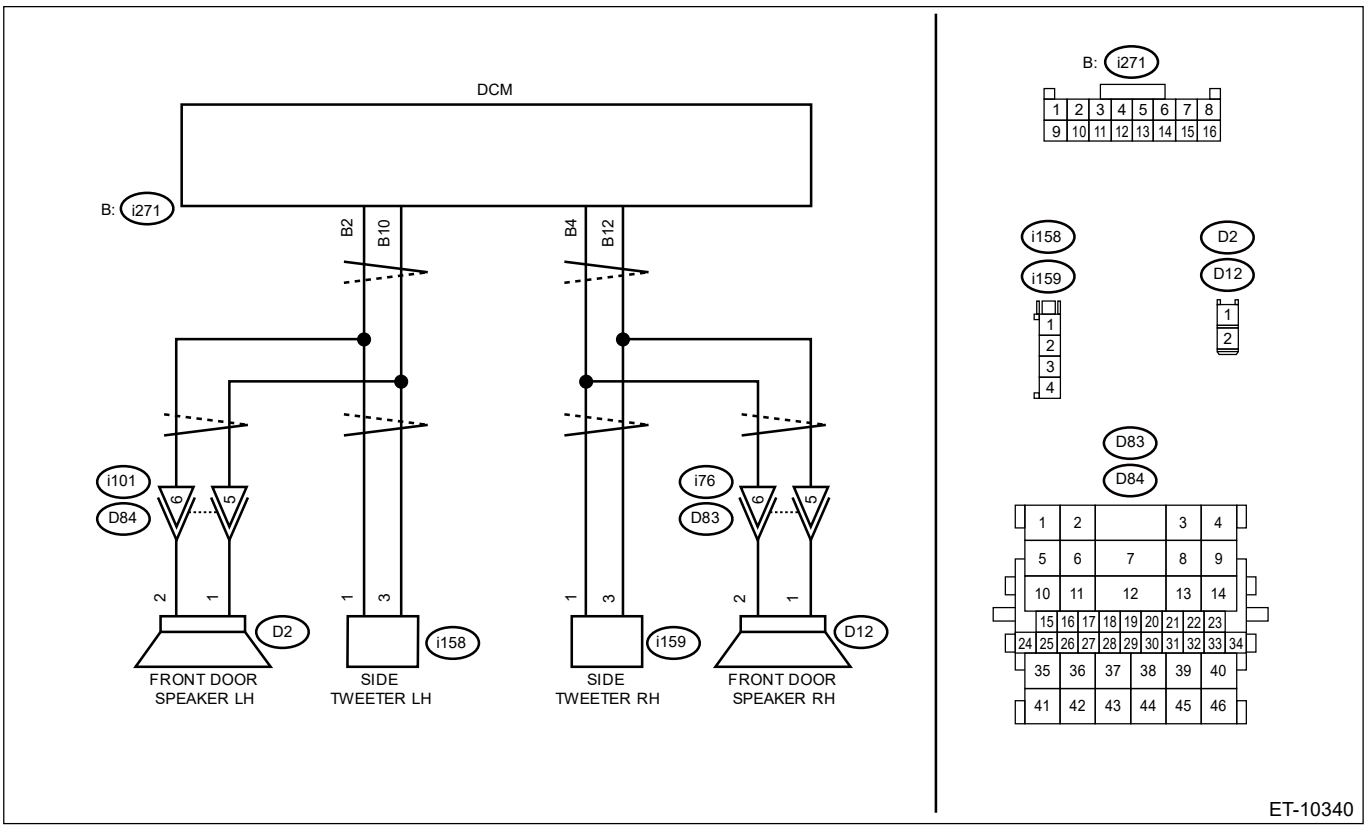
Trouble symptom:

- Call function cannot be used.
- RED LED illuminates.

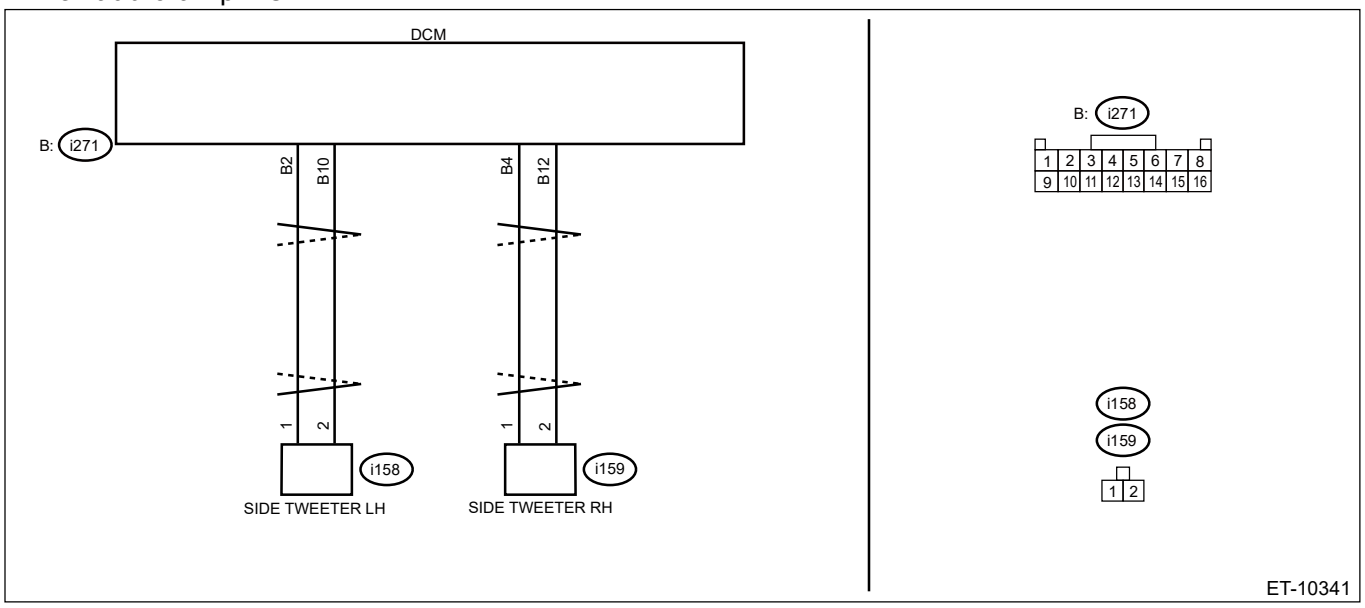
Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.

- Without audio amplifier



- With audio amplifier



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A05 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. PERFORM ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- [Speaker ON]

Does it sound?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the speaker connector and tweeter connector.
3. Disconnect the DCM connector.
4. Measure the resistance between speaker connector and tweeter connector and DCM connector.

Connector & terminal

Without audio amplifier

(i271) No. 2 — (D2) No. 2:
(i271) No. 2 — (i158) No. 1:
(i271) No. 10 — (D2) No. 1:
(i271) No. 10 — (i158) No. 3:

With audio amplifier

(i271) No. 2 — (i158) No. 2:
(i271) No. 10 — (i158) No. 1:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i271) No. 2 — Chassis ground:
(i271) No. 10 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i271) No. 2 (+) — Chassis ground (−):

(i271) No. 10 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK THE SPEAKER.

Perform the inspection of speaker unit and tweeter unit. Ref. to ENTERTAINMENT & MONITORING>Front Speaker.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the speaker and tweeter. Ref. to ENTERTAINMENT & MONITORING>Front Speaker.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT

Diagnosis start condition:

When ACC is ON.

DTC detecting condition:

Speaker impedance is more than 10 kΩ for 100 ms. (Detached speaker connection, etc.)

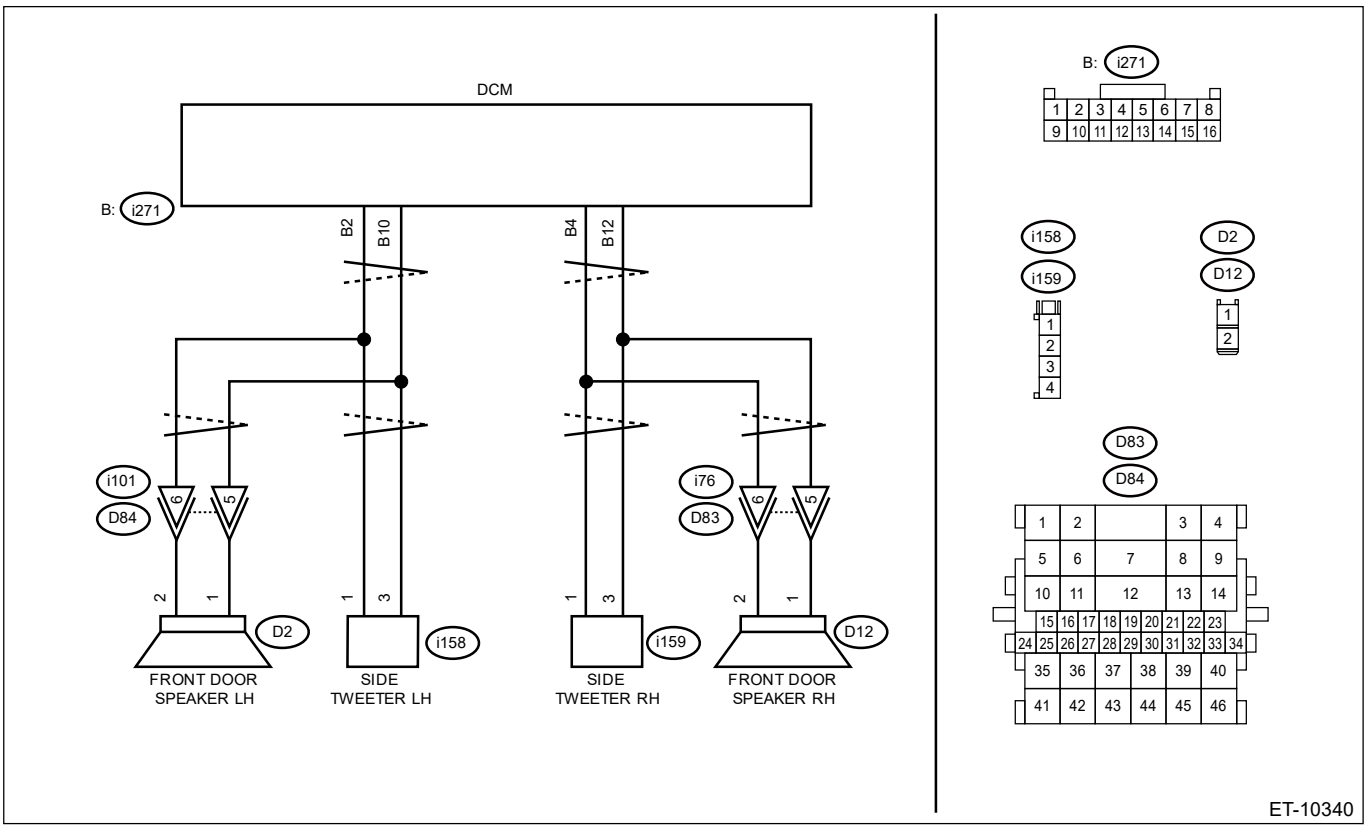
Trouble symptom:

- Call function cannot be used.
- RED LED illuminates.

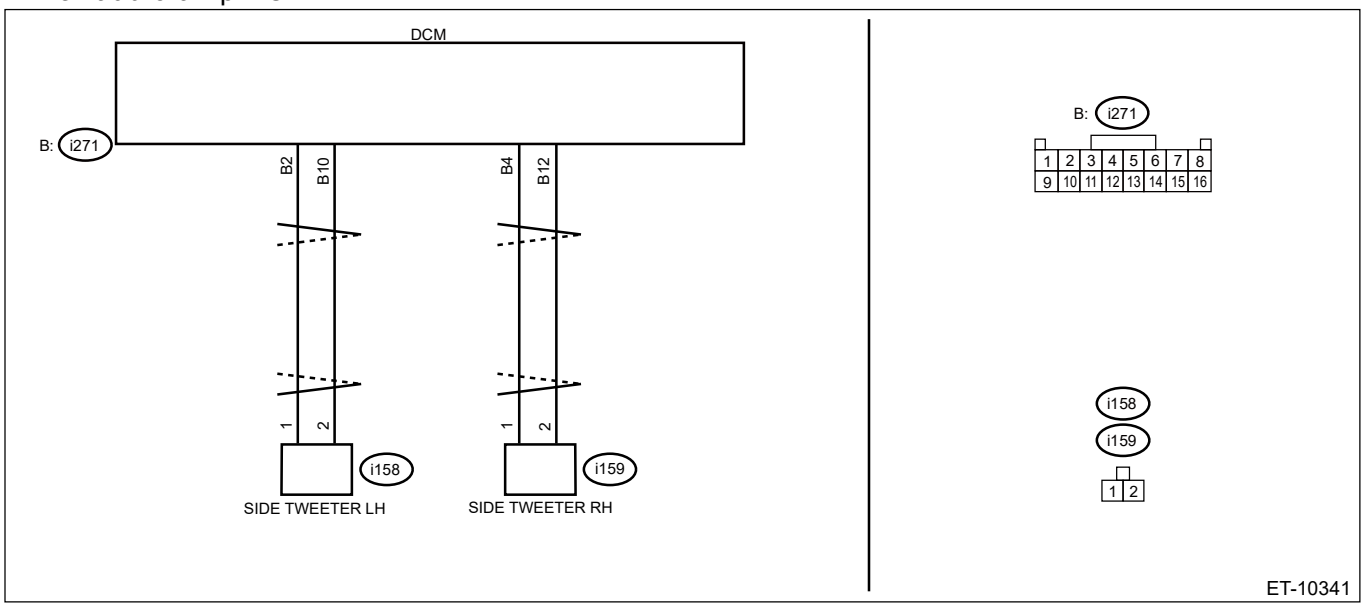
Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.

- Without audio amplifier



- With audio amplifier



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A06 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. PERFORM ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- [Speaker ON]

Does it sound?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the speaker connector and tweeter connector.
3. Disconnect the DCM connector.
4. Measure the resistance between speaker connector and tweeter connector and DCM connector.

Connector & terminal

Without audio amplifier

(i271) No. 4 — (D12) No. 2:
(i271) No. 4 — (i159) No. 1:
(i271) No. 12 — (D12) No. 1:
(i271) No. 12 — (i159) No. 3:

With audio amplifier

(i271) No. 4 — (i159) No. 2:
(i271) No. 12 — (i159) No. 1:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i271) No. 4 — Chassis ground:
(i271) No. 12 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i271) No. 4 (+) — Chassis ground (−):

(i271) No. 12 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK THE SPEAKER.

Perform the inspection of speaker unit and tweeter unit. Ref. to ENTERTAINMENT & MONITORING>Front Speaker.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the speaker and tweeter. Ref. to ENTERTAINMENT & MONITORING>Front Speaker.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A07 BACKUP BATTERY CHARGE SYSTEM PERFORMANCE

Diagnosis start condition:

When ignition switch is ON.

DTC detecting condition:

Backup battery is disconnected for at least 5 seconds when the ignition switch is turned ON. (Detached backup battery connection, etc.)

Trouble symptom:

- ACN/SOS function cannot be used when the main battery is disconnected.
- RED LED illuminates.

Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A07 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK THE BACKUP BATTERY.

1. Remove the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
2. Remove the backup battery cover.
3. Disconnect the backup battery connector.
4. Measure the backup battery voltage.

Is the voltage 2.0 V or more?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the backup battery. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A08 SOS BUTTON CIRCUIT

Diagnosis start condition:
When ignition switch is ON.

DTC detecting condition:

The following conditions occur for at least 50 ms.

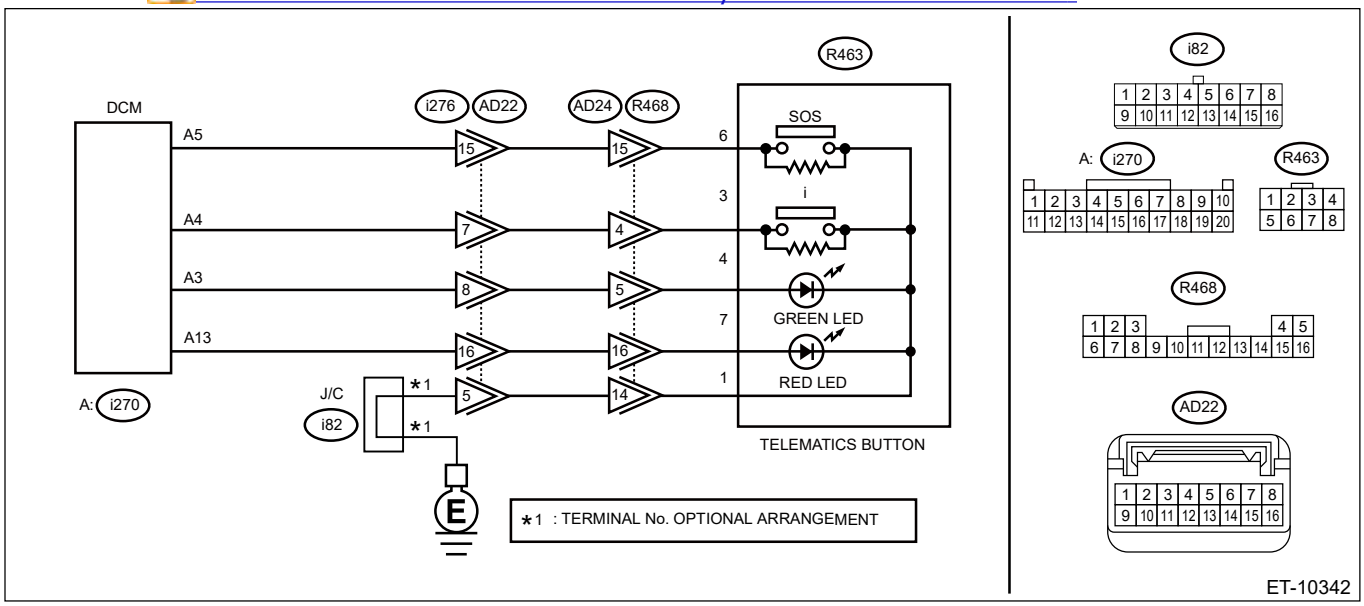
- SOS button impedance is more than 10 kΩ.
- SOS button is stuck for at least 60 seconds.

Trouble symptom:

- SOS function cannot be used.
- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A08 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the telematics button connector.
3. Disconnect the DCM connector.
4. Measure the resistance between telematics button connector and DCM connector.

Connector & terminal

(i270) No. 5 — (AD24) No. 6:

(R463) No. 14 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i270) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i270) No. 5 (+) — Chassis ground (−):

(R463) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE SOS BUTTON UNIT.

Measure the resistance of the SOS button unit.

Terminals

No. 6 — No. 1:

Is the resistance 1 Ω or less when SOS button is ON, and 1.6 (±5%) kΩ or more when SOS button is OFF?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A09 I-CALL BUTTON CIRCUIT

Diagnosis start condition:

When ignition switch is ON.

DTC detecting condition:

The following conditions occur for at least 50 ms.

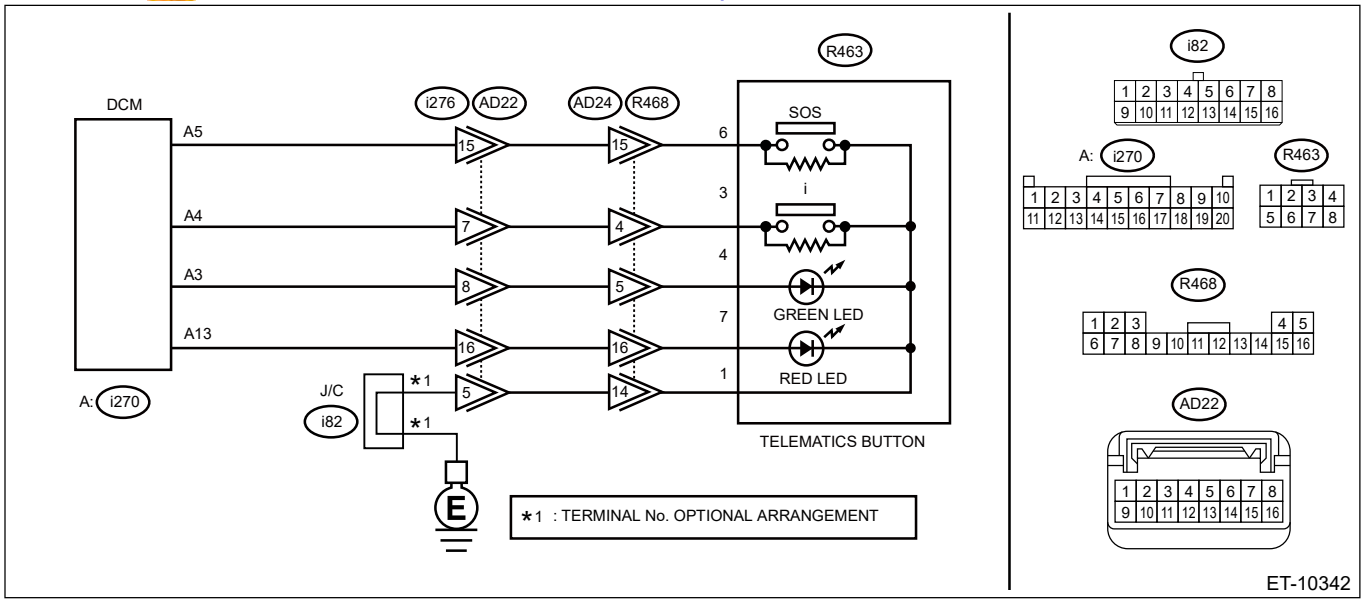
- i-button impedance is more than 10 kΩ.
- i-button is stuck for at least 60 seconds.

Trouble symptom:

- i-Call function cannot be used.
- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A09 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the telematics button connector.
3. Disconnect the DCM connector.
4. Measure the resistance between telematics button connector and DCM connector.

Connector & terminal

(i270) No. 4 — (R463) No. 3:

(AR463) No. 1 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i270) No. 4 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i270) No. 4 (+) — Chassis ground (−):

(R463) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE I-BUTTON.

Measure the resistance of the i-button unit.

Terminals

No. 3 — No. 1:

Is the resistance 1 Ω or less when i-button is ON, and 1.6 (5%) kΩ or more when i-button is OFF?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

(DTC)

DTC B2A0A RED LED CIRCUIT

Diagnosis start condition:

When ACC is ON.

DTC detecting condition:

The following conditions occur for at least 50 ms.

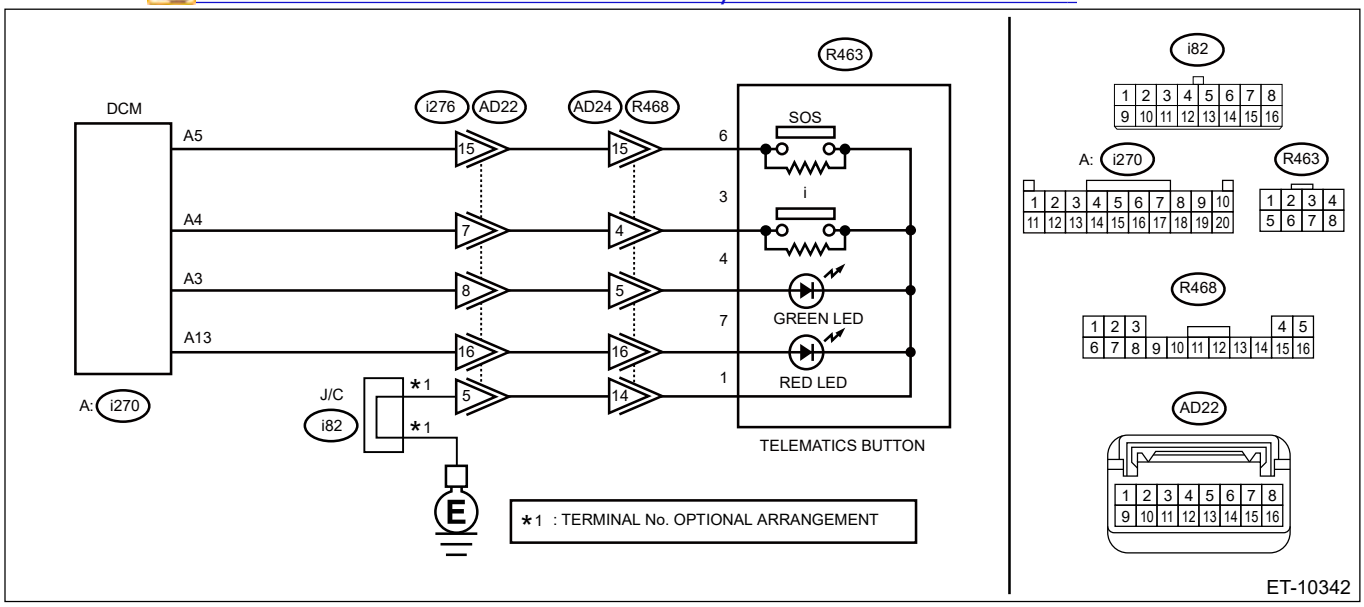
- Current in LED is less than 1 mA. (Improper LED connection, etc.)
- Current in LED is more than 200 mA. (Short-circuited LED, etc.)

Trouble symptom:

LED does not illuminate.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A0A displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. PERFORM ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- RED LED Lighting

Does the LED light illuminate?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the telematics button connector.
3. Disconnect the DCM connector.
4. Measure the resistance between telematics button connector and DCM connector.

Connector & terminal

(i270) No. 13 — (R463) No. 7:

(R463) No. 1 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i270) No. 13 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i270) No. 13 (+) — Chassis ground (−):

(R463) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK THE TELEMATICS BUTTON (LED) UNIT.

Measure the resistance of the telematics button (LED) unit.

Terminals

No. 7 — No. 1:

Is there continuity?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0B GREEN LED CIRCUIT

Diagnosis start condition:

When ACC is ON.

DTC detecting condition:

The following conditions occur for at least 50 ms.

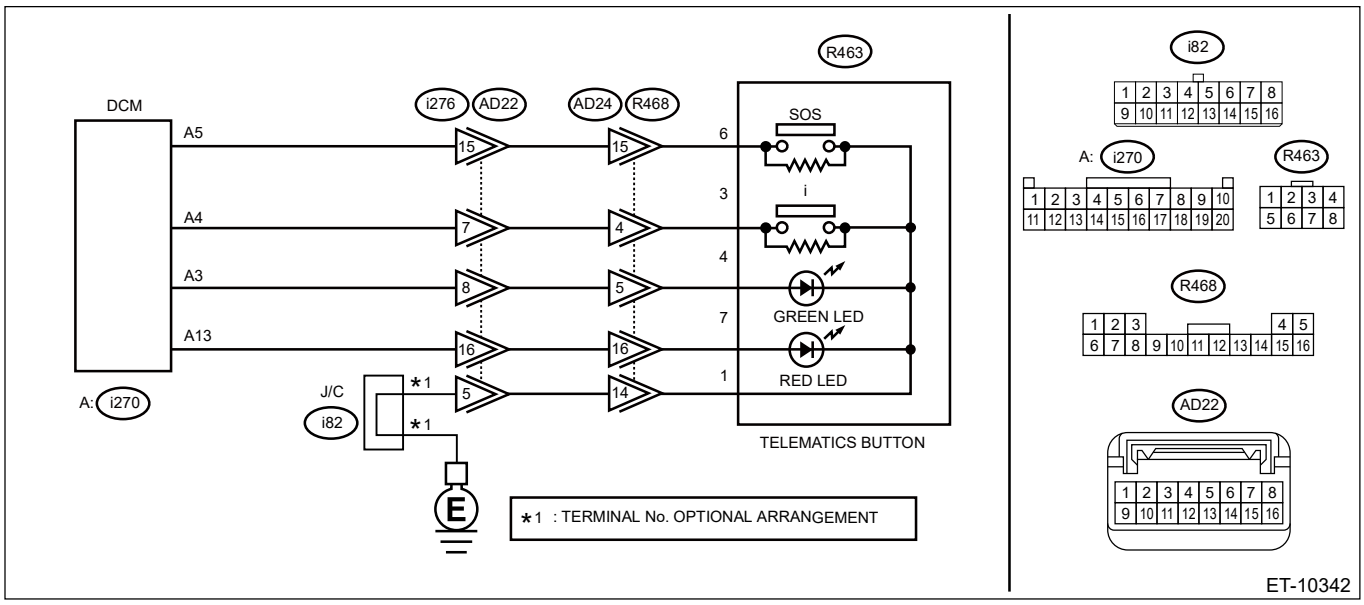
- Current in LED is less than 1 mA. (Improper LED connection, etc.)
- Current in LED is more than 200 mA. (Short-circuited LED, etc.)

Trouble symptom:

RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A0B displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. PERFORM ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- [GREEN LED Lighting]

Does the LED light illuminate?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the telematics button connector.
3. Disconnect the DCM connector.
4. Measure the resistance between telematics button connector and DCM connector.

Connector & terminal

(i270) No. 3 — (R463) No. 4:

(R463) No. 1 — Chassis ground:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i270) No. 3 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i270) No. 3 (+) — Chassis ground (−):

(R463) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair or replace the short circuit of the harness.

6. CHECK THE TELEMATICS BUTTON (LED) UNIT.

Measure the resistance of the telematics button (LED) unit.

Terminals

No. 4 — No. 1:

Is there continuity?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

(DTC)

DTC B2A0C DCM INTERNAL FAULT

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
- Main microcomputer and communication circuit IC cannot communicate. (Defective IPC)
- SIM (communication chip) cannot be read. (Defective SIM)

Trouble symptom:
- Telematics function cannot be used.
- RED LED illuminates.

Caution:
- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A0C displayed? (Current malfunction)

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

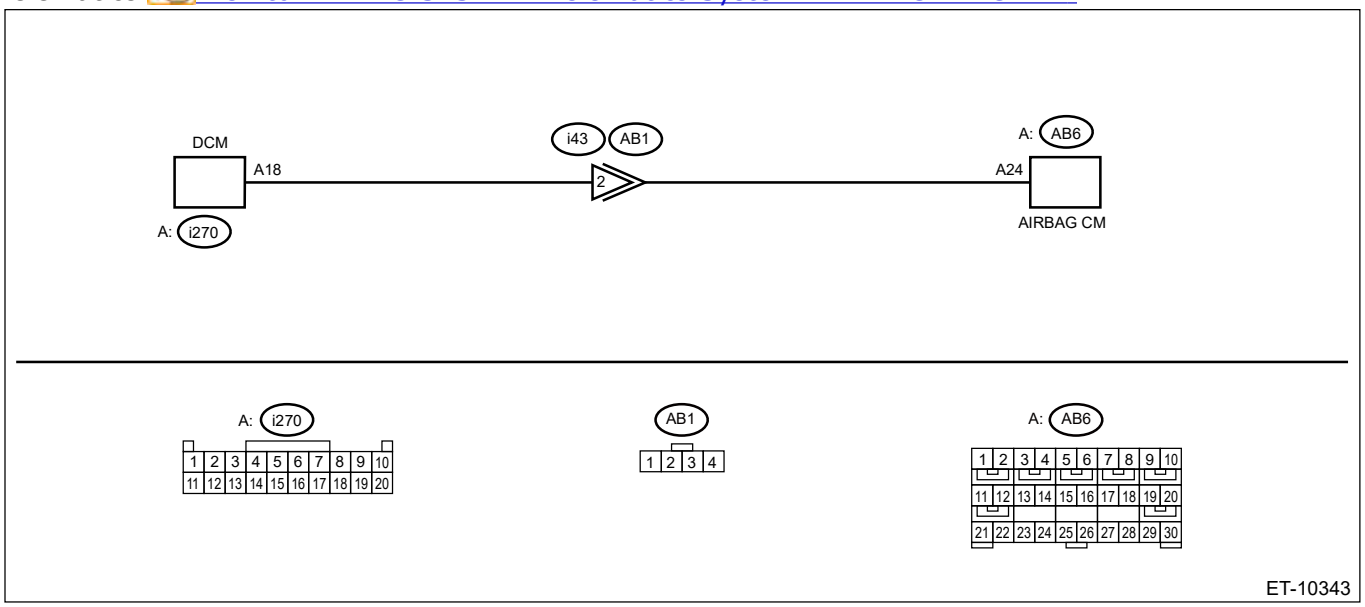
DTC B2A0D AIRBAG SIGNAL

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
Either the regular signal or collision detection signal cannot be detected from the airbag CM for at least 30 seconds.
Trouble symptom:
- ACN function does not operate.

- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A0D displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DTC.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs of airbag. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the airbag CM connector.
3. Disconnect the DCM connector.
4. Measure the resistance between airbag CM connector and DCM connector.

Caution:

To measure the voltage and resistance of airbag system component, be sure to use the specified test harness. Ref. to AIRBAG(DIAGNOSTICS)>General Description.

Connector & terminal

(i270) No. 18 — (AB6) No. 24:

Is the resistance 1 Ω or less?

Yes	Go to 4.
No	Repair or replace the open circuit of harness.

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.

Connector & terminal

(i270) No. 18 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair or replace the short circuit of the harness.

5. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.

Connector & terminal

(i270) No. 18 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Repair or replace the short circuit of the harness.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0E MUTE LINE CIRCUIT

Diagnosis start condition:

When ignition switch is ON.

DTC detecting condition:

Any of the following conditions occurs continuously for five seconds or more after the ignition switch is turned to ON when DCM does not mute the audio or navigation system.

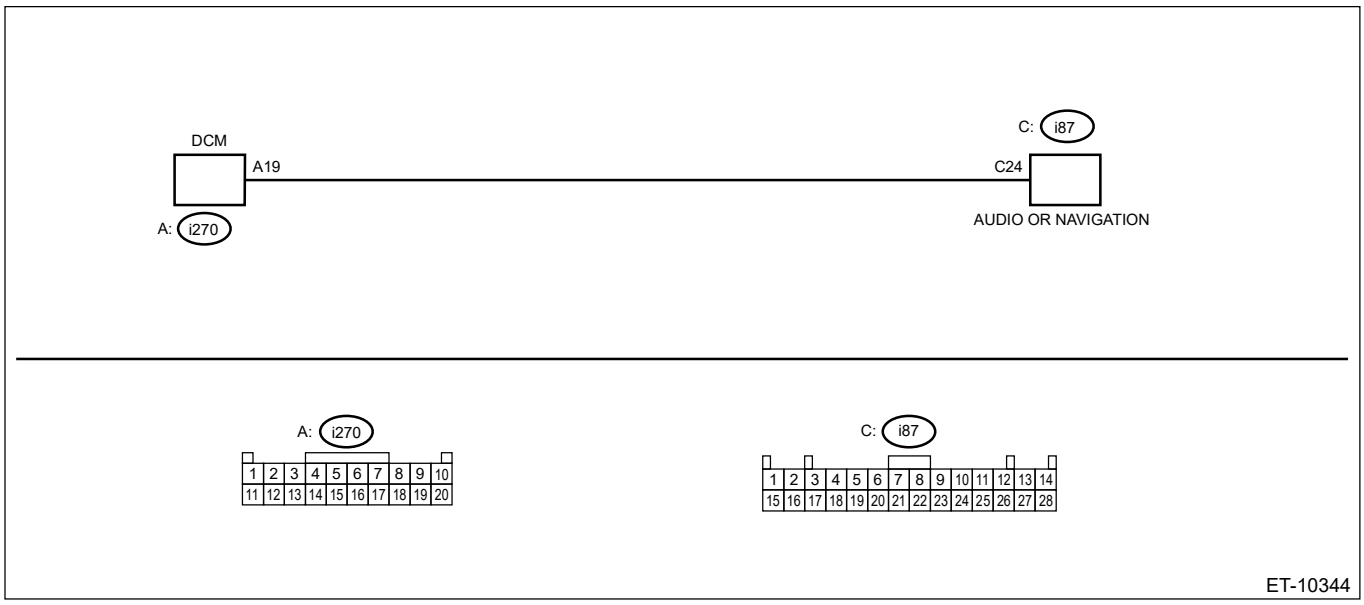
- Current in the mute line is less than 1 mA. (Improper line connection, etc.)
- Current exceeds 50 mA. (Short-circuited line, etc.)

Trouble symptom:

- The mute function of audio or navigation system does not operate.
- RED LED illuminates.

Wiring diagram:

Telematics Ref. to WIRING SYSTEM>Telematics System>WIRING DIAGRAM.



Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

DTC Check

Is DTC B2A0E displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Turn the ignition switch to OFF.
2. Disconnect the audio or navigation connector.
3. Disconnect the DCM connector.
4. Measure the resistance between audio or navigation connector and DCM connector.
   Connector & terminal
   (i270) No. 19 — (i87) No. 24:

Is the resistance 1 Ω or less?

Yes	Go to 3.
No	Repair or replace the open circuit of harness.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Measure the resistance between DCM connector and chassis ground.
Connector & terminal
(i270) No. 19 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair or replace the short circuit of the harness.

4. CHECK THE CONNECTOR (SHORT CIRCUIT TO POWER SUPPLY).

Measure the voltage between DCM connector and chassis ground.
Connector & terminal
(i270) No. 19 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Repair or replace the short circuit of the harness.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A0F BACKUP BATTERY DEGRADATION

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
The voltage does not reach 4.1 V after the backup battery is charged for 7 hours in total (not continuously).
Trouble symptom:
RED LED illuminates.
Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A0F displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK THE BACKUP BATTERY.

Check the backup battery unit. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the backup battery. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2A10 BATTERY VOLTAGE HIGH

Diagnosis start condition:
When ignition switch is ON.
DTC detecting condition:
DCM battery power supply input of 16 V or more continues for 5 seconds.
Trouble symptom:
RED LED illuminates.
Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK DTC.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A10 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. CHECK DATA MONITOR.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Battery voltage]

Is the [Battery voltage] OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Go to 3.

3. CHECK BATTERY.

Check the battery unit. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0073 CONTROL MODULE COMMUNICATION BUS OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0074 CONTROL MODULE COMMUNICATION BUS "BODY-CAN" OFF

Detected when CAN line abnormality is detected.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0100 LOST COMMUNICATION WITH ECM/PCM "A"

Detected when CAN data from ECM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0122 LOST COMMUNICATION WITH VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0140 LOST COMMUNICATION WITH BODY CONTROL MODULE

Detected when CAN data is not received from body integrated unit.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0151 LOST COMMUNICATION WITH RESTRAINTS CONTROL MODULE

Detected when CAN data is not received from airbag CM.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0155 LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER (IPC) CONTROL MODULE

Detected when CAN data from combination meter does not arrive.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0401 INVALID DATA RECEIVED FROM ECM/PCM "A"

Detected when CAN data from ECM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0416 INVALID DATA RECEIVED FROM VEHICLE DYNAMICS CONTROL MODULE

Detected when CAN data from VDC CM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC U0452 INVALID DATA RECEIVED FROM RESTRAINTS CONTROL MODULE

Detected when CAN data from airbag CM is abnormal.

Note:

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

No.	Symptoms	Reference
1	The system does not notify the Telematics Service Provider Center automatically after collision.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE TELEMATICS SERVICE PROVIDER CENTER AUTOMATICALLY AFTER COLLISION.
2	The system does not notify the center even if the SOS button is pressed.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE SOS BUTTON IS PRESSED.
3	The system places an SOS call unintentionally during driving.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN SOS CALL UNINTENTIONALLY DURING DRIVING.
4	The system places an I-CALL unintentionally during driving.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN I-CALL UNINTENTIONALLY DURING DRIVING.
5	The system does not notify the center even if the i-button is pressed upon vehicle malfunction.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE I-BUTTON IS PRESSED UPON VEHICLE MALFUNCTION.
6	Remote Vehicle Locator cannot locate the vehicle.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE VEHICLE LOCATOR CANNOT LOCATE THE VEHICLE.
7	Remote Vehicle Locator indicates an incorrect location and therefore the vehicle cannot be located.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE VEHICLE LOCATOR INDICATES AN INCORRECT LOCATION FOR THE VEHICLE.
8	Remote Door Lock does not lock the doors of the vehicle.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE DOOR LOCK DOES NOT LOCK THE DOORS OF THE VEHICLE.

No.	Symptoms	Reference
9	The doors lock unintentionally.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE DOORS LOCK UNINTENTIONALLY.
10	The doors unlock unintentionally.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE DOORS UNLOCK UNINTENTIONALLY.
11	Remote Horn & HAZARD Lights do not operate upon request.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > REMOTE HORN & HAZARD LIGHTS DO NOT OPERATE UPON REQUEST.
12	When the Vehicle Security Alarm is activated, notification is not sent.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WHEN THE VEHICLE SECURITY ALARM IS ACTIVATED, NOTIFICATION IS NOT SENT.
13	When a Malfunction indicator light/warning light is lit, notification is not sent.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > WHEN A MALFUNCTION INDICATOR LIGHT/WARNING LIGHT IS LIT, NOTIFICATION IS NOT SENT.
14	Maintenance Notifications are not sent.	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > MAINTENANCE NOTIFICATIONS ARE NOT SENT.
15	The LED does not display the status. (LED malfunction)	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > THE SYSTEM PLACES AN I-CALL UNINTENTIONALLY DURING DRIVING.
16	Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)	Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.).

TELEMATICS SYSTEM (DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

1. THE SYSTEM DOES NOT NOTIFY THE TELEMATICS SERVICE PROVIDER

CENTER AUTOMATICALLY AFTER COLLISION

Probable cause:

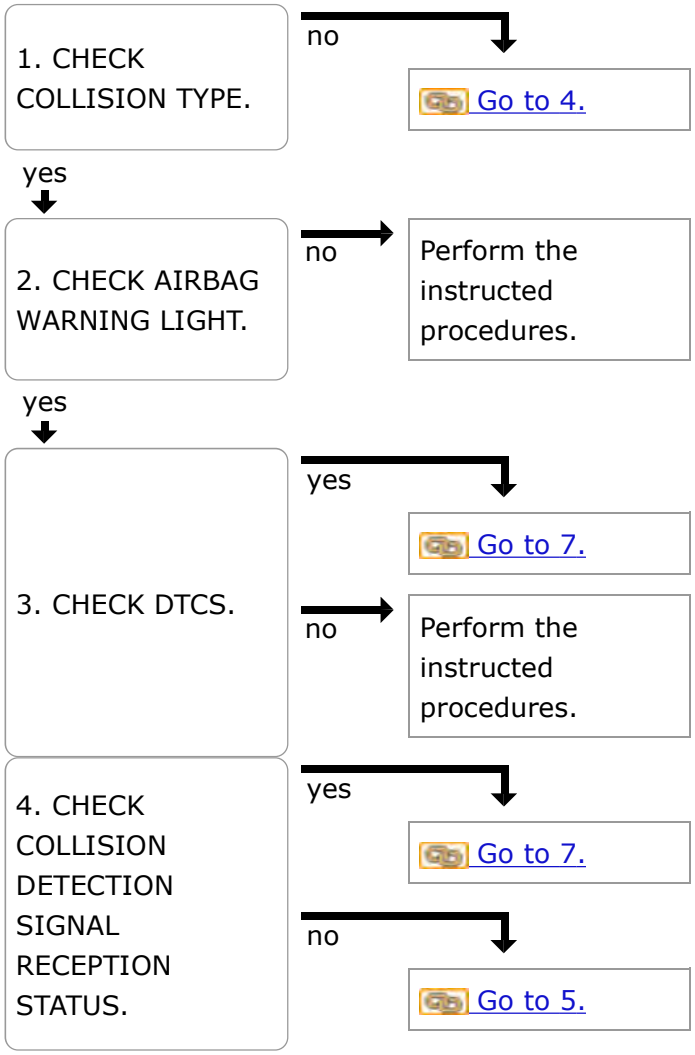
Airbag CM malfunction, no contract agreement, out of service area, DCM malfunction, antenna malfunction, server side malfunction

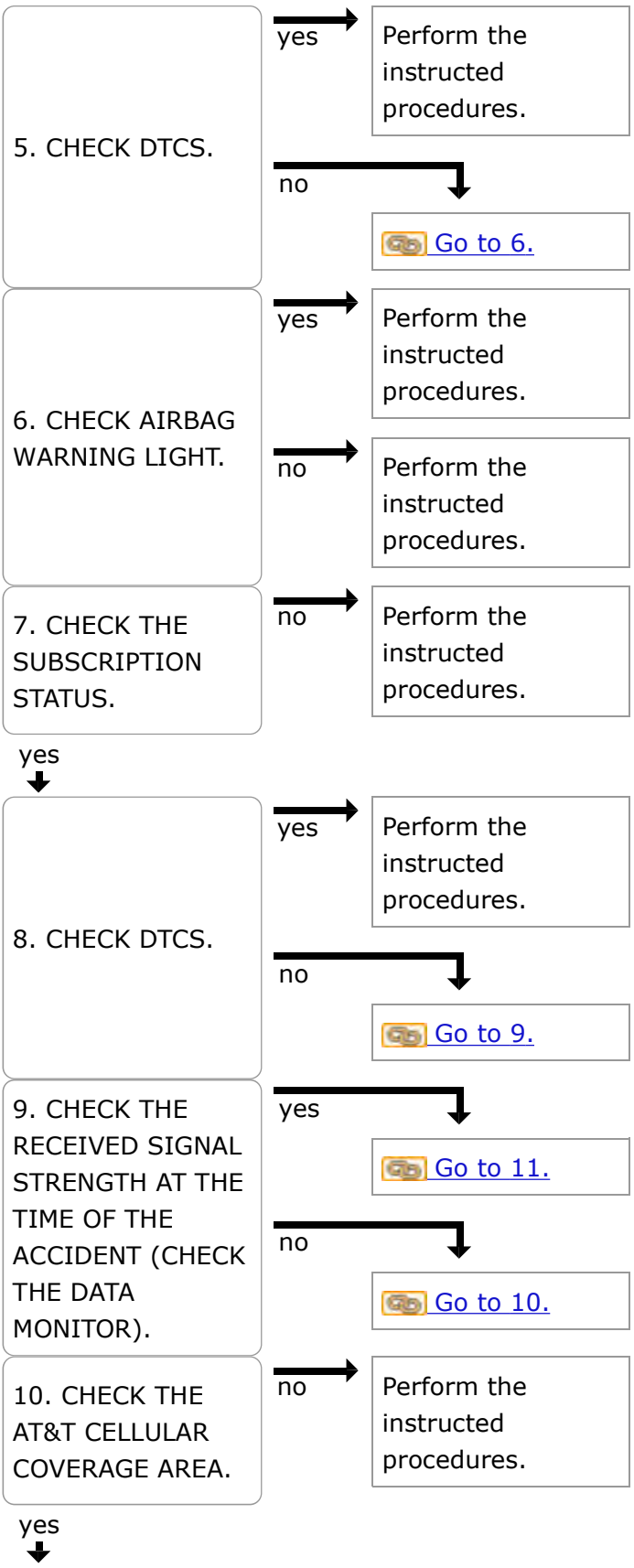
Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

Note:

Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.).




5. CHECK DTCS.
yes
Perform the instructed procedures.
no
Go to 6.
6. CHECK AIRBAG WARNING LIGHT.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.
7. CHECK THE SUBSCRIPTION STATUS.
no
Perform the instructed procedures.
yes
8. CHECK DTCS.
yes
Perform the instructed procedures.
no
Go to 9.
9. CHECK THE RECEIVED SIGNAL STRENGTH AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).
yes
Go to 11.
no
Go to 10.
10. CHECK THE AT&T CELLULAR COVERAGE AREA.
no
Perform the instructed procedures.
yes

11. CHECK THE COMMUNICATION STATUS AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).

no → Perform the instructed procedures.

yes ↓

12. CHECK THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK COLLISION TYPE.

Check the type of collision of the vehicle.

Is it a frontal collision, or a side collision, or a rollover?

Yes	Go to 2.
No	For rear collision, Go to 4.

2. CHECK AIRBAG WARNING LIGHT.

Check the airbag warning light.

Does the airbag warning light illuminate at all times?

Yes	Go to 3.
No	There is no malfunction in the airbag system. Since the airbag CM does not transmit the collision detection signal in the event of a minor collision, it is normal that the automatic notification function does not work.

3. CHECK DTCS.

Read the DTC of [Airbag] using the Subaru Select Monitor. Ref. to AIRBAG(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is any of the DTC [Front Impact Deployment], [Side Impact Deployment], or [Rollover Ignition] displayed?

Yes	There is no malfunction in the airbag system. Go to 7.
No	Perform the diagnosis for the airbag system. Ref. to AIRBAG(DIAGNOSTICS)>Basic Diagnostic Procedure.

4. CHECK COLLISION DETECTION SIGNAL RECEPTION STATUS.

Using the Subaru Select Monitor, check the following items of [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [TimeStamp at ACN Event:Date]
- [TimeStamp at ACN Event:UTC ⁎UTC is the basis for local times worldwide.]

Is a time stamp recorded?

Yes	Go to 7. (Rear collision detection was activated)
No	Go to 5.

5. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 6.

6. CHECK AIRBAG WARNING LIGHT.

Check the airbag warning light.

Does the airbag warning light illuminate at all times?

Yes	Perform the diagnosis for the airbag system. Ref. to AIRBAG(DIAGNOSTICS)>Basic Diagnostic Procedure.
No	There is no malfunction in the airbag system. Since the airbag CM does not transmit the collision detection signal in the event of a minor collision, it is normal that the automatic notification function does not work.

7. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [ACN Active]

Is the data [TRUE]?

Yes	Go to 8.
No	The user does not have a service subscription; therefore, it is not a failure.

8. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 9.

9. CHECK THE RECEIVED SIGNAL STRENGTH AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [RSSI at ACN Event]

Is the data 26% or more?

Yes	Go to 11.
No	Go to 10.

10. CHECK THE AT&T CELLULAR COVERAGE AREA.

1. Check whether the collision occurred within the cellular coverage area.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [GPS Data at ACN Event]

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 11.
No	The collision occurred outside the cellular coverage area.

11. CHECK THE COMMUNICATION STATUS AT THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Call Type at ACN Event]

If the data shows [Call Started] or [Call Connected]; Go to A.
If the data shows [Call Not Started]; Go to B.
If the data shows [No Network Service]; Go to C.
If the data shows [Call Ended by SXM]; Go to D.

Yes	A: Go to 12. B: Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module. C: Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna. D: The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.
No	—

12. CHECK THE TIME OF THE ACCIDENT (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [TimeStamp at ACN Event:Date]
- [TimeStamp at ACN Event:UTC *UTC is the basis for local times worldwide.]

Note:
The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.
Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the accident match with the data?

Yes	Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna.
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

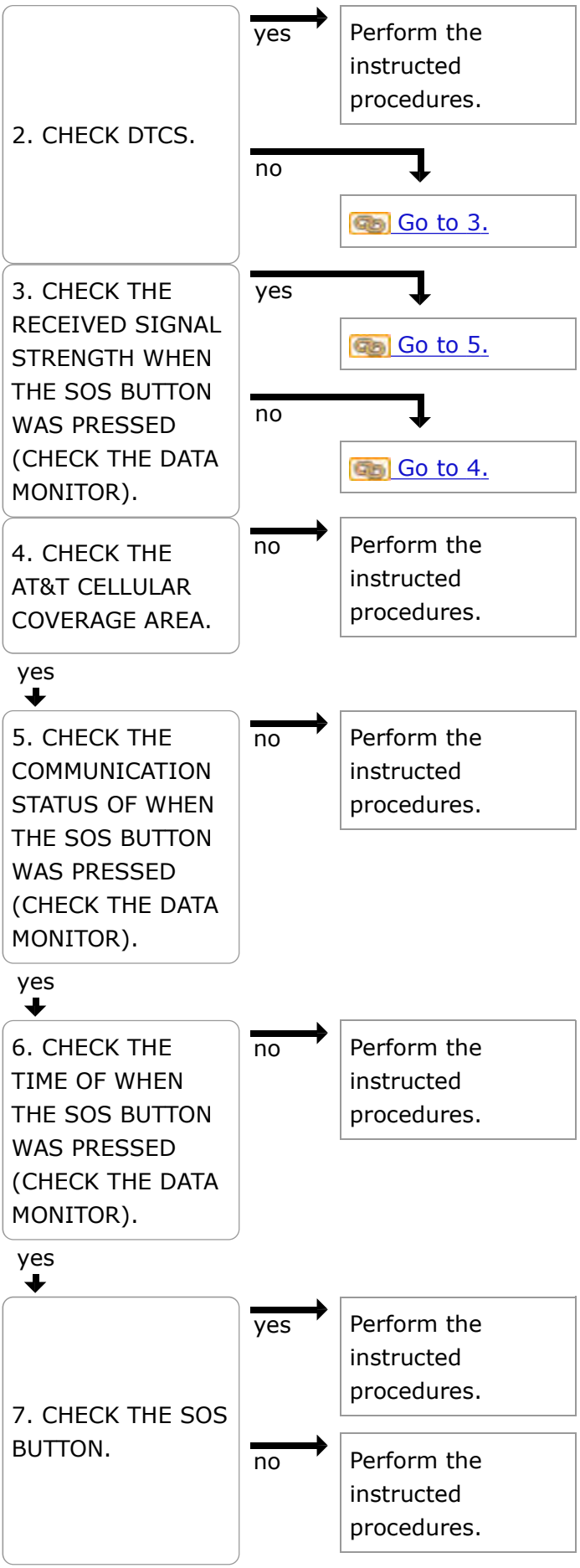
2. THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE SOS BUTTON IS PRESSED

Probable cause:
No contract agreement, out of service area, DCM malfunction, antenna malfunction, server side malfunction, SOS button malfunction

Caution:
- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

Note:
Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.).

1. CHECK THE SUBSCRIPTION STATUS.
   - no → Perform the instructed procedures.
   - yes ↓


2. CHECK DTCS.
yes
Perform the instructed procedures.
no
Go to 3.
3. CHECK THE RECEIVED SIGNAL STRENGTH WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).
yes
Go to 5.
no
Go to 4.
4. CHECK THE AT&T CELLULAR COVERAGE AREA.
no
Perform the instructed procedures.
yes
5. CHECK THE COMMUNICATION STATUS OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).
no
Perform the instructed procedures.
yes
6. CHECK THE TIME OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).
no
Perform the instructed procedures.
yes
7. CHECK THE SOS BUTTON.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [SOS Active]

Is the data [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK THE RECEIVED SIGNAL STRENGTH WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [RSSI at SOS/ICALL(1)]

Is the data 26% or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK THE AT&T CELLULAR COVERAGE AREA.

1. Check whether the SOS button was pressed within the cellular coverage area.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [GPS Data at Time of Button Push(1):Latitude]
   - [GPS Data at Time of Button Push(1):Longitude]
   - [GPS Data at Time of Button Push(1):Heading]
   - [GPS Data at Time of Button Push(1):Speed]

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 5.
No	The SOS button was pressed outside the cellular coverage area.

5. CHECK THE COMMUNICATION STATUS OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Call status at SOS/ICALL Event(1)]

If the data shows [Call Started] or [Call Connected]; Go to A.
If the data shows [Call Not Started]; Go to B.
If the data shows [No Network Service]; Go to C.
If the data shows [Call Ended by SXM]; Go to D.

Yes	A: Go to 6. B: Go to 7. C: Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna. D: The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.
No	—

6. CHECK THE TIME OF WHEN THE SOS BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Timestamp at Time of Button Push(1):Date]
- [Timestamp at Time of Button Push(1):UTC *UTC is the basis for local times worldwide.]

Note:

The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.

Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the SOS button operation match with the data?

Yes	Go to 7.
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

7. CHECK THE SOS BUTTON.

Check the SOS button. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A08 SOS BUTTON CIRCUIT.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the SOS button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

3. THE SYSTEM PLACES AN SOS CALL UNINTENTIONALLY DURING DRIVING

Probable cause:

DCM malfunction, SOS button malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTCS.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the SOS button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

4. THE SYSTEM PLACES AN I-CALL UNINTENTIONALLY DURING DRIVING

Probable cause:
DCM malfunction, i-button malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DTCS.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the i-button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

5. THE SYSTEM DOES NOT NOTIFY THE CENTER EVEN IF THE I-BUTTON IS PRESSED UPON VEHICLE MALFUNCTION

Probable cause:

No contract agreement, out of service area, DCM malfunction, antenna malfunction, server side malfunction, i-button malfunction

Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

Note:

Perform the diagnostics for "Phone conversation is not possible. (The microphone does not respond to a voice. No sound is heard from the speaker.)". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostics with Phenomenon>INSPECTION > PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.).

1. CHECK THE SUBSCRIPTION STATUS.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK DTCS.
   - yes → Perform the instructed procedures.
   - no → Go to 3.

3. CHECK THE RECEIVED SIGNAL STRENGTH WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

yes → Go to 5.

no → Go to 4.

4. CHECK THE AT&T CELLULAR COVERAGE AREA.

no → Perform the instructed procedures.

yes ↓

5. CHECK THE COMMUNICATION STATUS OF WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

no → Perform the instructed procedures.

yes ↓

6. CHECK THE COMMUNICATION STATUS OF WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

no → Perform the instructed procedures.

yes ↓

7. CHECK THE I-BUTTON.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [ICALL Active]

Is the data [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK THE RECEIVED SIGNAL STRENGTH WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [RSSI at SOS/ICALL(1)]

Is the data 26% or more?

Yes	Go to 5.
No	Go to 4.

4. CHECK THE AT&T CELLULAR COVERAGE AREA.

1. Check whether the i-button was pressed within the cellular coverage area.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

   Data Monitor

   - [GPS Data at Time of Button Push(1):Latitude]
   - [GPS Data at Time of Button Push(1):Longitude]
   - [GPS Data at Time of Button Push(1):Heading]
   - [GPS Data at Time of Button Push(1):Speed]

Is the displayed location data indicated within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 5.
No	The i-button was pressed outside the cellular coverage area.

5. CHECK THE COMMUNICATION STATUS OF WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Call status at SOS/ICALL Event(1)]

If the data shows [Call Started] or [Call Connected]; Go to A.
If the data shows [Call Not Started]; Go to B.
If the data shows [No Network Service]; Go to C.
If the data shows [Call Ended by SXM]; Go to D.

Yes	A: Go to 6. B: Go to 7. C: Replace the antenna. Ref. to ENTERTAINMENT & MONITORING>Antenna. D: The connection ended due to a server-side reason; therefore, there is no failure on the vehicle.
No	—

6. CHECK THE COMMUNICATION STATUS OF WHEN THE I-BUTTON WAS PRESSED (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Timestamp at Time of Button Push(1):Date]
- [Timestamp at Time of Button Push(1):UTC ⁎UTC is the basis for local times worldwide.]

Note:

The time stamp is displayed in the Coordinated Universal Time (UTC), which is different from actual time at each location. Therefore, time difference needs to be corrected for use.

Example: [12/22 01:30 in UTC time] is corrected as [12/21 20:30 in New York time].

Does the time of the i-button operation match with the data?

Yes	Go to 7.
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

7. CHECK THE I-BUTTON.

Check the i-button. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A09 I-CALL BUTTON CIRCUIT.

Is the check result OK?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module>REMOVAL > DATA COMMUNICATION MODULE.
No	Replace the i-button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

6. REMOTE VEHICLE LOCATOR CANNOT LOCATE THE VEHICLE

Probable cause:

No contract agreement, smartphone malfunction, out of service area, DCM malfunction, server side malfunction, body integrated unit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK THE SUBSCRIPTION STATUS.

no → Perform the instructed procedures.

yes ↓

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

no → Perform the instructed procedures.

yes ↓

3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

yes → Go to 6.

no → Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

no → Perform the instructed procedures.

yes ↓

6. CHECK DTCS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Account Status]

Is the data [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes	Go to 3.
No	The user's smartphone or the Internet environment has a problem.

3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can display the current location.

Is the current location displayed?

Yes	Currently no failure is found. If the current location is not displayed, the user's Internet environment (radio waves, etc.) possibly had a problem.
No	Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].



- [Signal Strength]

Is the data 26% or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 6.
No	The location of the remote control operation was outside the cellular coverage area.

6. CHECK DTCS.

Read the following DTCs using Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



- [Body Control] Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
- [Telematics] Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs of body control, or of telematics. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

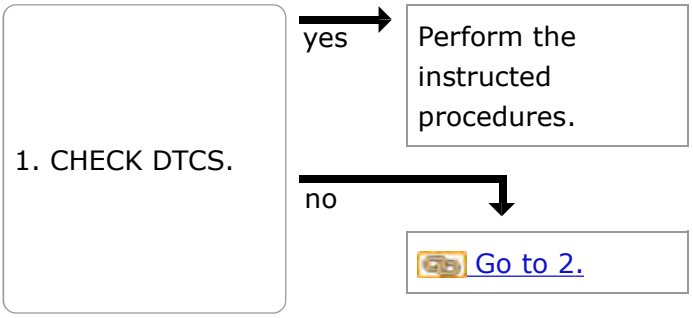
7. REMOTE VEHICLE LOCATOR INDICATES AN INCORRECT LOCATION FOR THE VEHICLE

Probable cause:

GPS reception environment failure, DCM malfunction

Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**



2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.	yes →	Perform the instructed procedures.
	no →	Go to 3.
3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 2.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can display the current location.

Is it displayed correctly? (Is a deviation, if any, less than 100 m (328 ft)?)

Yes	Currently no failure is found. When the user had a problem, there was a failure with the GPS antenna reception environment, etc.
No	Go to 3.

3. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check again that the user's smartphone can display the current location in a place where the sky is open.

Is it displayed correctly? (Is a deviation, if any, less than 100 m (328 ft)?)

Yes	Currently no failure is found. When the user had a problem, there was a failure with the GPS antenna reception environment, etc.
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

8. REMOTE DOOR LOCK DOES NOT LOCK THE DOORS OF THE VEHICLE

Probable cause:

No contract agreement, smartphone malfunction, out of service area, door lock control system malfunction, server side malfunction, DCM malfunction, body integrated unit malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK THE SUBSCRIPTION STATUS.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.
   - no → Perform the instructed procedures.
   - yes ↓
3. CHECK THE DOOR LOCK FUNCTION.
   - yes → Perform the instructed procedures.
   - no → Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

yes → Go to 6.

no → Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

no → Perform the instructed procedures.

yes ↓

6. CHECK THE DOOR LOCK FUNCTION.

no → Perform the instructed procedures.

yes ↓

7. CHECK DTCS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Account Status]

Is the data [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes	Go to 3.
No	The user's smartphone or the Internet environment has a problem.

3. CHECK THE DOOR LOCK FUNCTION.

Check that the user's smartphone can lock the doors in the current situation.

Are the doors locked?

Yes	Currently no failure is found. When the user had a problem, there was a failure with the Internet connection environment, etc.
No	Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Signal Strength]

Is the data 26% or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 6.
No	The location of the remote control operation was outside the cellular coverage area.

6. CHECK THE DOOR LOCK FUNCTION.

Check that the keyless transmitter can lock the doors of the vehicle.

Are the doors locked?

Yes	Go to 7.
No	Perform the diagnosis according to the inspection for the door lock control system. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

7. CHECK DTCS.

Read the following DTCs using Subaru Select Monitor.

DTC Check

- [Body Control] Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
- [Telematics] Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs of body control, or of telematics. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
No	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

9. THE DOORS LOCK UNINTENTIONALLY

Probable cause:
Server side malfunction, door lock switch malfunction

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DOOR LOCK SWITCH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check the door lock switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

Is the check result OK?

Yes	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.
No	Perform the diagnosis according to the inspection for the door lock switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

10. THE DOORS UNLOCK UNINTENTIONALLY

Probable cause:

Server side malfunction, door lock switch malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK DOOR LOCK SWITCH.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK DOOR LOCK SWITCH.

Check the door unlock switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

Is the check result OK?

Yes	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.
No	Perform the diagnosis according to the inspection for the door lock switch. Ref. to SECURITY AND LOCKS>Door Lock Control System>INSPECTION.

11. REMOTE HORN & HAZARD LIGHTS DO NOT OPERATE UPON REQUEST

Probable cause:

No contract agreement, smartphone malfunction, out of service area, server side malfunction, keyless transmitter malfunction, horn circuit malfunction, body integrated unit malfunction, DCM malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK THE SUBSCRIPTION STATUS.
   - no → Perform the instructed procedures.
   - yes ↓
2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.
   - no → Perform the instructed procedures.
   - yes ↓

3. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

yes → Go to 6.

no → Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

no → Perform the instructed procedures.

yes

6. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

yes → Go to 8.

no → Go to 7.

7. CHECK HORN OPERATION.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

8. CHECK DTCS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Account Status]

Does the data display [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes	Go to 3.
No	The user's smartphone or the Internet environment has a problem.

3. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

Check that the horn and hazard light currently operate by the user's smartphone.

Do the horn and hazard light operate?

Yes	Currently no failure is found. When the user had a problem, there was a failure with the Internet connection environment, etc.
No	Go to 4.

4. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].



- [Signal Strength]

Does the data indicate 26% or more?

Yes	Go to 6.
No	Go to 5.

5. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 6.
No	The location of the remote control operation was outside the cellular coverage area.

6. CHECK THE HORN AND HAZARD LIGHT FUNCTIONS.

Check that the horn and hazard light operate by the keyless transmitter. (Press the lock button three times.)

Do the horn and hazard light operate?

Yes	Go to 8.
No	Go to 7.

7. CHECK HORN OPERATION.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Body Control].
- [Horn Output]

Does the horn sound?

Yes	Check the keyless transmitter. Ref. to SECURITY AND LOCKS>Keyless Transmitter. Ref. to SECURITY AND LOCKS>Access Key.
No	Check the horn circuit. Ref. to WIRING SYSTEM>Horn System.

8. CHECK DTCS.

Read the following DTCs using Subaru Select Monitor.



- [Body Control] Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
- [Telematics] Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

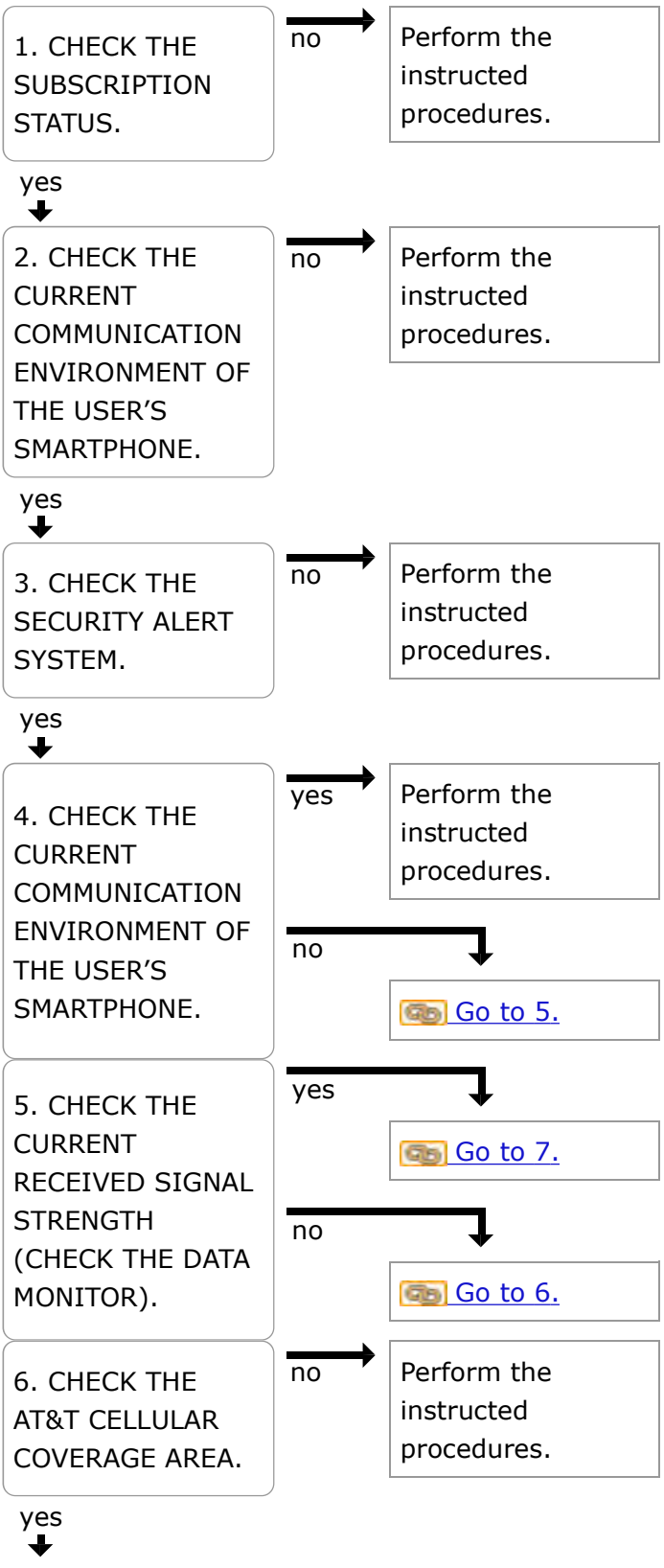
Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs of body control, or of telematics. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

12. WHEN THE VEHICLE SECURITY ALARM IS ACTIVATED, NOTIFICATION IS NOT SENT

Probable cause:
No contract agreement, smartphone malfunction, security alert system malfunction, out of service area, server side malfunction, body integrated unit malfunction, DCM malfunction

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.


1. CHECK THE SUBSCRIPTION STATUS.
no
Perform the instructed procedures.
yes
2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.
no
Perform the instructed procedures.
yes
3. CHECK THE SECURITY ALERT SYSTEM.
no
Perform the instructed procedures.
yes
4. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.
yes
Perform the instructed procedures.
no
Go to 5.
5. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).
yes
Go to 7.
no
Go to 6.
6. CHECK THE AT&T CELLULAR COVERAGE AREA.
no
Perform the instructed procedures.
yes

7. CHECK DTCS.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Account Status]

Does the data display [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that the user's smartphone can be connected to the Internet.

Can it be connected to the Internet?

Yes	Go to 3.
No	The user's smartphone or the Internet environment has a problem.

3. CHECK THE SECURITY ALERT SYSTEM.

Operate the security alert system.

Does it operate?

Yes	Go to 4.
No	Check the security alert system. Ref. to SECURITY AND LOCKS>Security System>INSPECTION.

4. CHECK THE CURRENT COMMUNICATION ENVIRONMENT OF THE USER'S SMARTPHONE.

Check that a notification is sent to the user's smartphone after the security alert is activated.

Does the smartphone receive a notification?

Yes	Currently no failure is found.
No	Go to 5.

5. CHECK THE CURRENT RECEIVED SIGNAL STRENGTH (CHECK THE DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Signal Strength]

Does the data indicate 26% or more?

Yes	Go to 7.
No	Go to 6.

6. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she operated the remote control.

Is the location of the remote control operation within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Go to 7.
No	The location of the remote control operation was outside the cellular coverage area.

7. CHECK DTCS.

Read the following DTCs using Subaru Select Monitor.



- [Body Control] Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC).
- [Telematics] Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).

Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs of body control, or of telematics. Ref. to BODY CONTROL(DIAGNOSTICS)>Diagnostic Trouble Code (DTC). Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

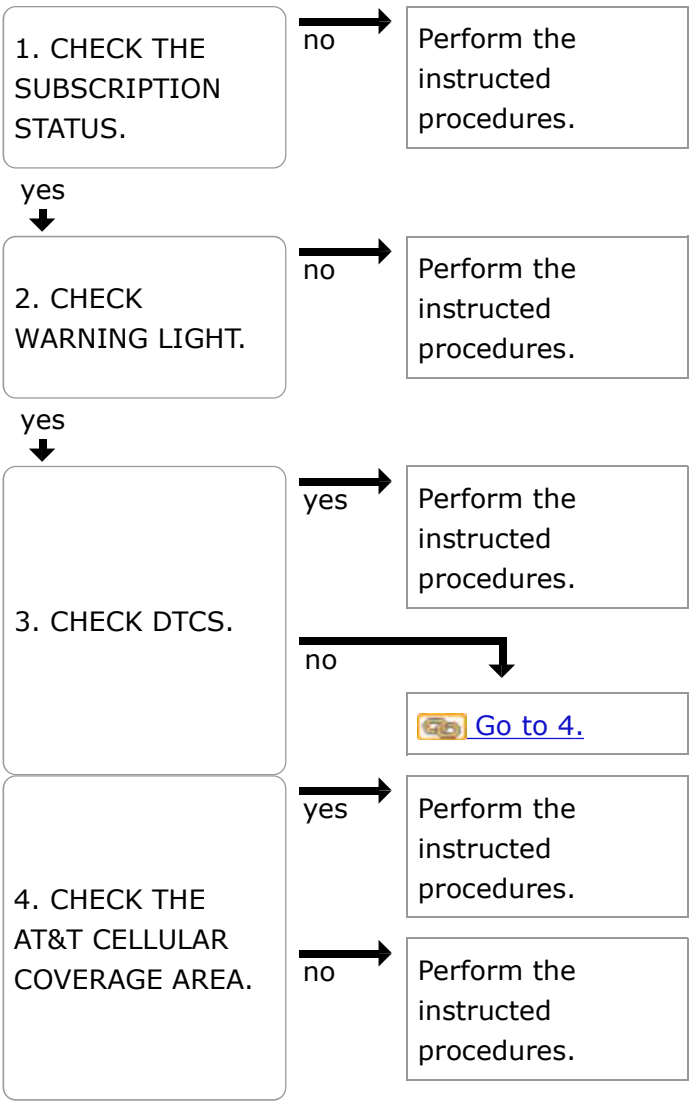
13. WHEN A MALFUNCTION INDICATOR LIGHT/WARNING LIGHT IS LIT, NOTIFICATION IS NOT SENT

Probable cause:

No contract agreement, out of service area, server side malfunction, DCM malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.



1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.

Data Monitor

- [Diagnostic Alert Active]

Does the data display [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK WARNING LIGHT.

Check if the warning light illuminates.

Does it Illuminate?

Yes	Go to 3.
No	Currently no failure is found. Since the warning light is not lit, notification is not sent.

3. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Go to 4.

4. CHECK THE AT&T CELLULAR COVERAGE AREA.

Ask the user where he/she turned the ignition switch to OFF after the warning light was lit.

Is the location, where the ignition switch was turned to OFF after the warning light was lit, within the AT&T cellular coverage area? (For the AT&T cellular coverage area, refer to the AT&T website. The system operates only on 3G and 4G technology.)

Yes	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.
No	The location where the ignition switch was turned to OFF (where warning light illumination information was sent) was outside the cellular coverage area.

14. MAINTENANCE NOTIFICATIONS ARE NOT SENT

Probable cause:

No contract agreement, server side malfunction, DCM malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.

1. CHECK THE SUBSCRIPTION STATUS.	no →	Perform the instructed procedures.
yes ↓		
2. CHECK DTCS.	yes →	Perform the instructed procedures.
	no →	Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Maintenance Alert Active]

Does the data display [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure.

2. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Are any DTCs displayed?

Yes	Perform the diagnosis for the displayed DTCs. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC)>LIST.
No	Check the Starlink Server report to verify that there was no server outage that coincides with the day/time the customer reported that the issue occurred. (Refer to STARLINK Server Maintenance/Down Report under Reports and Starlink section in Subarunet.) If no outage exists for that time frame, it is possible that there was environmental interference (radio waves, etc.) when the user performed the operation. No further actions are recommended.

15. THE LED DOES NOT DISPLAY THE STATUS. (LED MALFUNCTION)

Probable cause:
No contract agreement, DCM malfunction, telematics button malfunction

Caution:

- **CommCheck is required after replacing the DCM. Ref. to ENTERTAINMENT & MONITORING>Telematics System>OPERATION > REGISTRATION (COMM CHECK).**
- **Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.**

1. CHECK THE SUBSCRIPTION STATUS.

no → Perform the instructed procedures.

yes ↓

2. CHECK THE LED.

yes → Perform the instructed procedures.

no → Go to 3.

3. CHECK DTCS.

yes → Perform the instructed procedures.

no → Go to 4.

4. CHECK THE LED ILLUMINATION CONDITION.

no → Go to 6.

yes ↓

5. CHECK THE LED.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

6. CHECK THE LED.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK THE SUBSCRIPTION STATUS.

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Telematics].
Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Data Monitor.



- [Account Status]

Is the data [TRUE]?

Yes	Go to 2.
No	The user does not have a service subscription; therefore, it is not a failure. (Both LEDs are turned off.)

2. CHECK THE LED.

1. Turn the ignition switch to ON.
2. Check the LED condition.

Does the RED LED go off and the GREEN LED illuminate?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 3.

3. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A0A or B2A0B displayed?

Yes	Perform the diagnosis for the displayed DTC B2A0A or B2A0B. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0A RED LED CIRCUIT. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A0B GREEN LED CIRCUIT.
No	Go to 4.

4. CHECK THE LED ILLUMINATION CONDITION.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- [RED LED Lighting]
- [GREEN LED Lighting]

Is the LED turned on or off?

Yes	Go to 5.
No	Go to 6.

5. CHECK THE LED.

1. Turn the ignition switch to ON.
2. Check the LED condition.

Does the RED LED go off and the GREEN LED illuminate?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.

6. CHECK THE LED.

Measure the continuity of the telematics button (LED) unit.

Terminals

No. 7 —No. 1:

No. 4 — No. 1:

Is there continuity?

Yes	Replace the DCM. Ref. to ENTERTAINMENT & MONITORING>Data Communication Module.
No	Replace the telematics button. Ref. to ENTERTAINMENT & MONITORING>Switches and Harness.

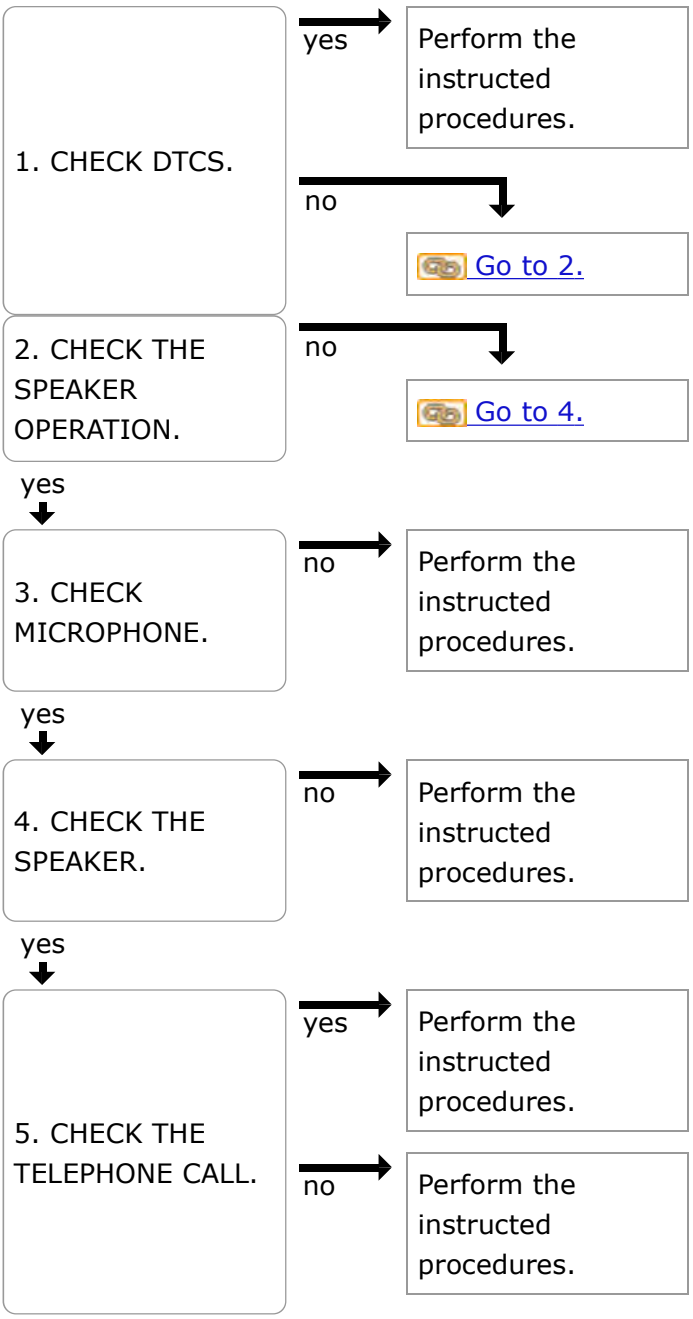
16. PHONE CONVERSATION IS NOT POSSIBLE. (THE MICROPHONE DOES NOT RESPOND TO A VOICE. NO SOUND IS HEARD FROM THE SPEAKER.)

Probable cause:

Microphone malfunction, speaker malfunction, DCM malfunction

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>General Description>CAUTION.


1. CHECK DTCS.
yes
Perform the instructed procedures.
no
Go to 2.
2. CHECK THE SPEAKER OPERATION.
no
Go to 4.
yes
3. CHECK MICROPHONE.
no
Perform the instructed procedures.
yes
4. CHECK THE SPEAKER.
no
Perform the instructed procedures.
yes
5. CHECK THE TELEPHONE CALL.
yes
Perform the instructed procedures.
no
Perform the instructed procedures.

1. CHECK DTCS.

Read the DTC of [Telematics] using the Subaru Select Monitor. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Trouble Code (DTC).



Is DTC B2A04, B2A05 or B2A06 displayed?

Yes	Perform the diagnosis for the displayed DTC B2A04, B2A05 or B2A06. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A05 LEFT SPEAKER/AUDIO CIRCUIT. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A06 RIGHT SPEAKER/AUDIO CIRCUIT.
No	Go to 2.

2. CHECK THE SPEAKER OPERATION.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Telematics]. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Active Test.

- [Speaker ON]

Does it sound?

Yes	Go to 3.
No	Go to 4.

3. CHECK MICROPHONE.

Perform the microphone voice input.

Is the voice recognized?

Yes	Go to 4.
No	Replace the microphone.

4. CHECK THE SPEAKER.

Check the speaker.

Is the check result OK?

Yes	Go to 5.
No	Replace the speaker.

5. CHECK THE TELEPHONE CALL.

1. Place the mobile phone in the vehicle.
2. Establish a Bluetooth connection between the mobile phone in the vehicle and the vehicle unit.
3. Make a call from outside to the mobile phone in the vehicle.
4. Check that a telephone call is available through the in-vehicle microphone with the hands-free function.

Is a telephone call successful?

Yes	The circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Perform the diagnosis according to inspection for DTC B2A04 MIC CIRCUIT. Ref. to TELEMATICS SYSTEM (DIAGNOSTICS)>Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2A04 MIC CIRCUIT.

POWER WINDOW(DIAGNOSTICS)

PW(diag)

1. Basic Diagnostic Procedure
2. Check List for Interview
3. General Description
4. Electrical Component Location
5. Control Module I/O Signal
6. Inspection Mode
7. Diagnostic Procedure for Subaru Select Monitor Communication
8. Data Monitor
9. Freeze Frame Data
10. Active Test
11. Work Support
12. Diagnostic Trouble Code (DTC)
13. Diagnostic Procedure with Diagnostic Trouble Code (DTC)
14. Diagnostics with Phenomenon

POWER WINDOW(DIAGNOSTICS) > Basic Diagnostic Procedure

PROCEDURE

1. PERFORM CUSTOMER INTERVIEW.

Ask the customer when and how the trouble occurred using the interview check list. Ref. to POWER WINDOW(DIAGNOSTICS) >Check List for Interview.

Did you interview the customer?

Yes	Go to 2.
No	Perform the interview.

2. BASIC INSPECTION.

Perform basic inspection. Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>INSPECTION.

Is the check result OK?

Yes	Go to 3.
No	Repair the faulty part found in basic inspection, and Go to 3.

3. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to OFF.
2. Connect the Subaru Select Monitor to data link connector. Ref. to COMMON(diag)>Data Link Connector.
3. Turn the ignition switch to ON and run the Subaru Select Monitor.
4. Select [Power Window (Switch)], [Power Window (Driver)] and [Power Window (Passenger)].
   Note:
   For detailed operation procedures, refer to "Application help".

Is communication possible?

Yes	Go to 4.
No	Check the communication circuit. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure for Subaru Select Monitor Communication.

4. CHECK DTC.

Using the Subaru Select Monitor, read the DTCs in [Power Window (Switch)], [Power Window (Driver)] and [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

•[Power Window (Switch)]



•[Power Window (Driver)]



•[Power Window (Passenger)]

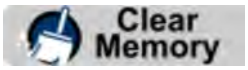


Are any DTCs displayed? (Current malfunction)

Yes	Record the DTC, time stamp and freeze frame data, and Go to 5.
No	Perform diagnosis according to the procedures in the diagnostics with phenomenon. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostics with Phenomenon.

5. PERFORM DIAGNOSIS.

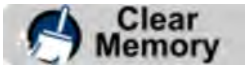
1. Perform the diagnosis for the displayed DTCs. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.
2. Repair or replace the cause of trouble.
3. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Switch)], [Power Window (Driver)] and [Power Window (Passenger)]. Ref. to COMMON(diag)>Clear memory.
   - [Power Window (Switch)]

   - [Power Window (Driver)]

   - [Power Window (Passenger)]

4. Execute the inspection mode. Ref. to POWER WINDOW(DIAGNOSTICS) >Inspection Mode.
5. Using the Subaru Select Monitor, read the DTCs in [Power Window (Switch)], [Power Window (Driver)] and [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   - [Power Window (Switch)]

   - [Power Window (Driver)]

   - [Power Window (Passenger)]

Are any DTCs displayed? (Current malfunction)

Yes	Repeat step 5 until DTC is not shown.
No	Finish the diagnosis.

POWER WINDOW(DIAGNOSTICS) > Check List for Interview

CHECK

Inspect the following items regarding the vehicle's state.

<table>
<tr><td colspan="4">Power window Trouble Check List for Interview Store visit Year Month Date</td></tr>
<tr><td colspan="2" rowspan="2">Customer's name</td><td>Registration No.</td><td>Initial year of registration
Year Month
Date</td></tr>
<tr><td>Vehicle model</td><td>Frame number</td></tr>
<tr><td>Interviewer</td><td>Inspector</td><td>Engine type</td><td>Odometer reading</td></tr>
<tr><td colspan="4">Customer specified content
•
•
•</td></tr>
<tr><td>Date and time when the trouble occurred</td><td>Year Month
Date</td><td>Frequency of trouble occurrence</td><td>Always occurs
Sometimes occurs (times per day, times per month)</td></tr>
<tr><td rowspan="2">Condition of trouble occurrence
(How the trouble occurs)</td><td rowspan="2"></td><td>Weather</td><td>Fine • Cloudy • Rainy • Snowy • Others ( )</td></tr>
<tr><td>Temperature</td><td>°C (°F) — °C (°F)</td></tr>
<tr><td>Road conditions</td><td colspan="3"></td></tr>
<tr><td>Road condition</td><td colspan="3"></td></tr>
<tr><td>Accessory installation condition</td><td colspan="3"></td></tr>
<tr><td>Diagnostic code</td><td colspan="3"></td></tr>
<tr><td>Time stamp</td><td colspan="3"></td></tr>
<tr><td>Control module item number/Ver.</td><td colspan="3"></td></tr>
<tr><td>Condition of trouble occurrence (How the trouble occurs)</td><td colspan="3"></td></tr>
<tr><td>Vehicle bring-in history information</td><td colspan="3"></td></tr>
</table>

POWER WINDOW(DIAGNOSTICS) > General Description

CAUTION

1. POWER WINDOW

When removing power windows-related components, refer to cautions in the glass/windows/mirrors section. Ref. to GLASS/WINDOWS/MIRRORS>General Description>CAUTION.

2. AIRBAG

When removing airbag related parts, refer to Cautions for Airbags. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

POWER WINDOW(DIAGNOSTICS) > General Description

INSPECTION

1. BASIC INSPECTION

Before performing diagnosis, check the following items which might affect power windows related problems.

1. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.
2. Check the main and other fuses, and harnesses. Also check for proper grounding.

POWER WINDOW(DIAGNOSTICS) > General Description

PREPARATION TOOL

1. SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note: For detailed operation procedures of Subaru Select Monitor 4, refer to "Application help".**

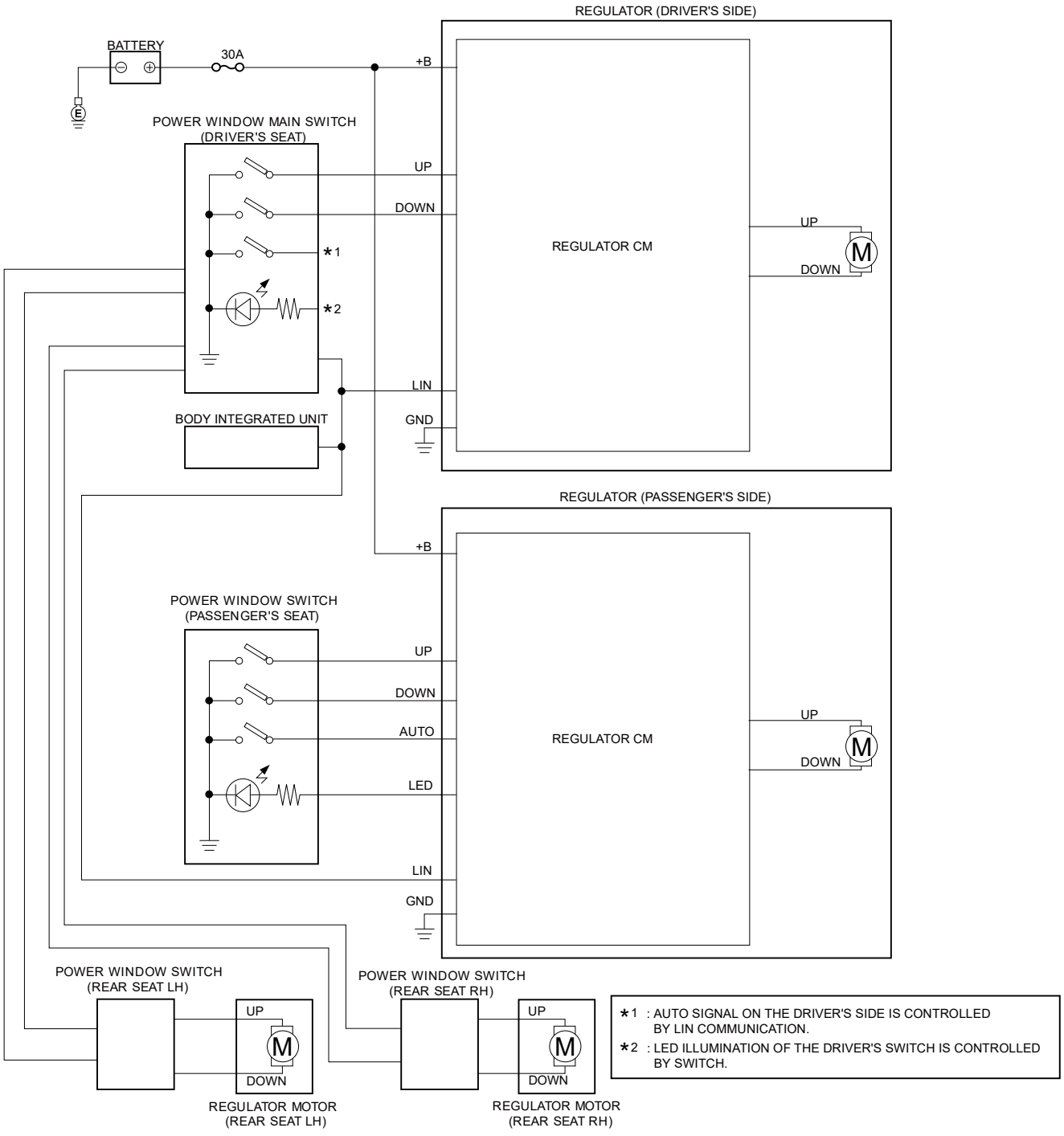
2. GENERAL TOOL

TOOL NAME	REMARKS
Circuit tester	Used for measuring resistance, voltage and current.
DST-i	Used together with Subaru Select Monitor 4.

POWER WINDOW(DIAGNOSTICS) > General Description

SYSTEM BLOCK DIAGRAM

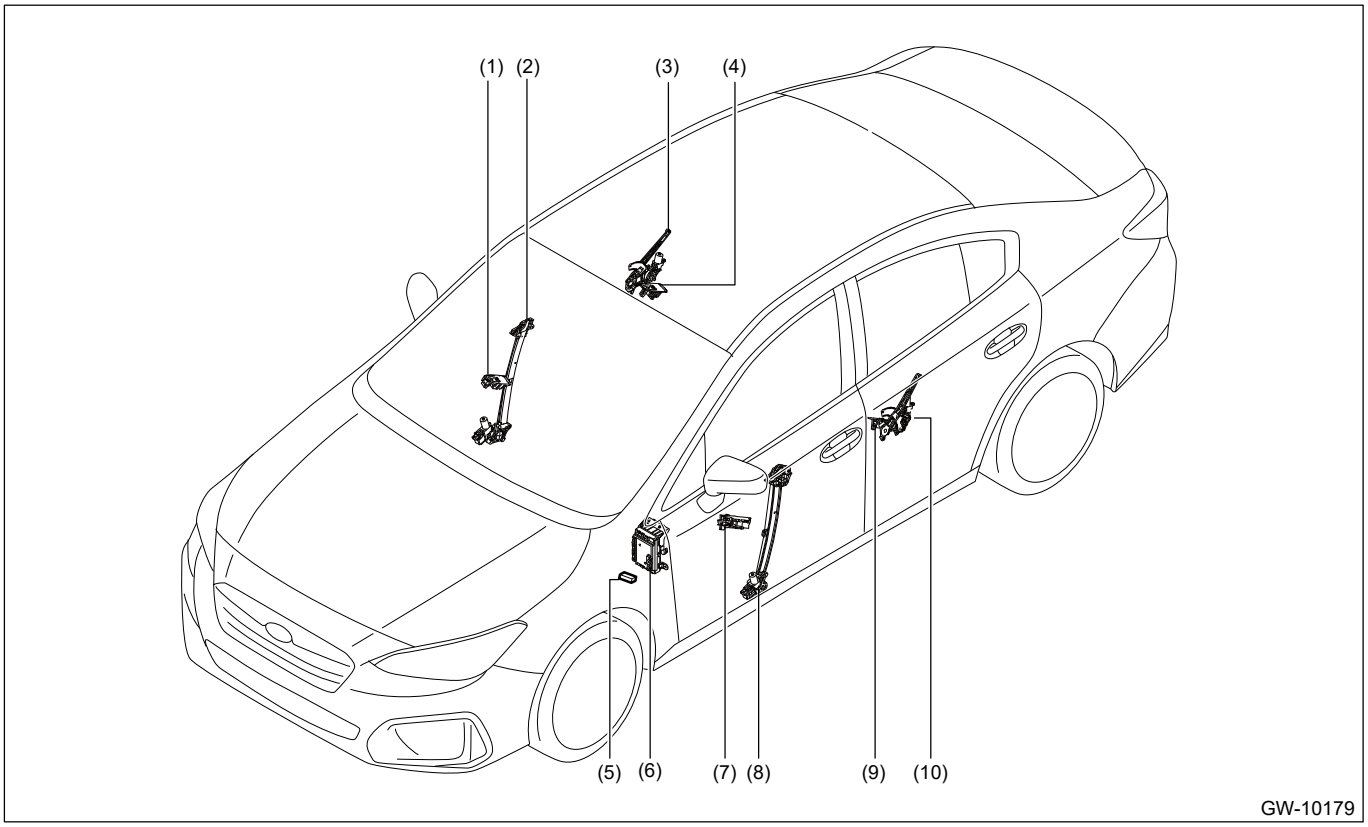
The front regulator is equipped with a control module that controls the operational speed. It is connected with the body integrated unit via LIN communication. They are operated by individual switches. Only front windows use PLS signals of motors for reversing and controlling operational speed.



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POWER WINDOW(DIAGNOSTICS) > Electrical Component Location

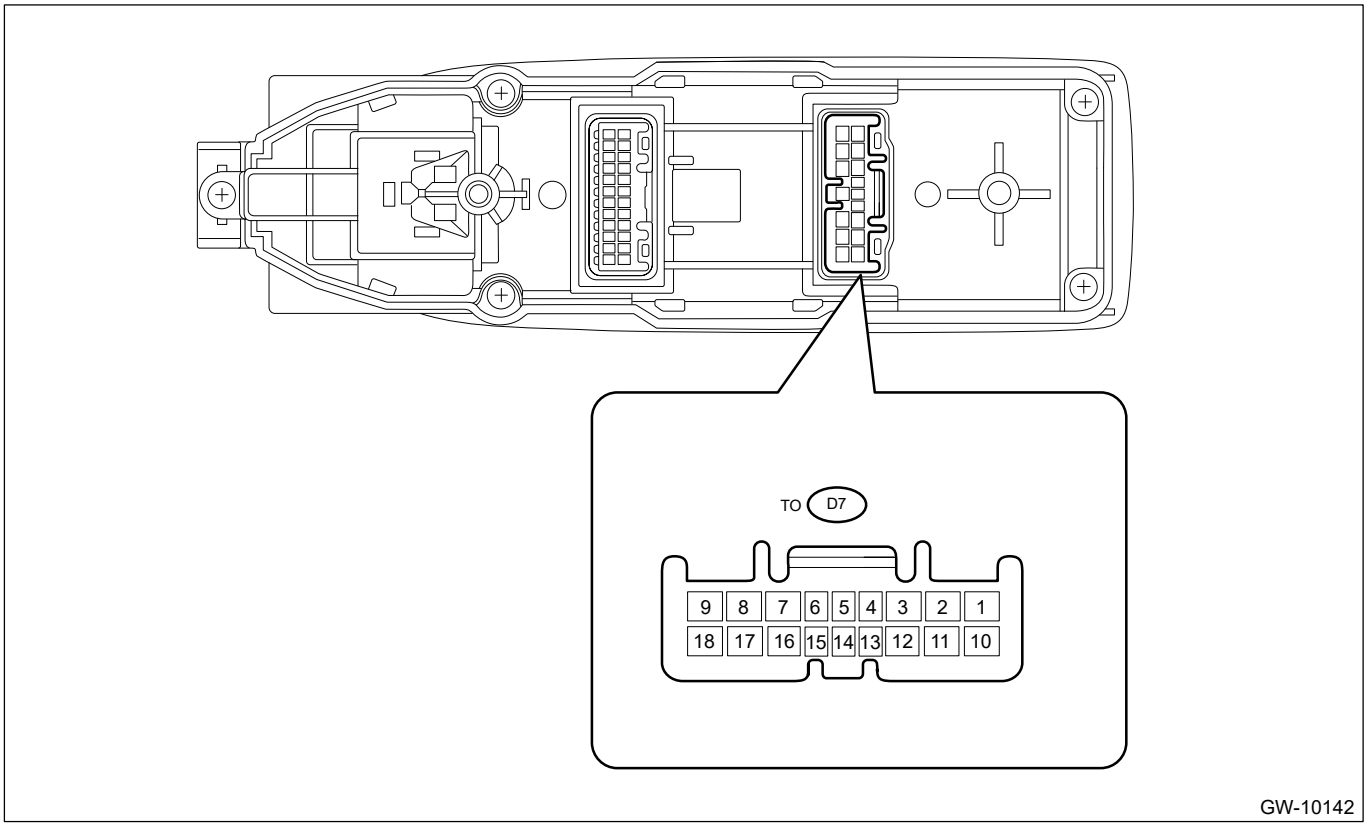
LOCATION



(1) Front power window sub-switch
(2) Front regulator & motor assembly RH
(3) Rear regulator & motor assembly RH
(4) Rear power window sub-switch RH
(5) Data link connector
(6) Body integrated unit
(7) Power window main switch
(8) Front regulator & motor assembly LH
(9) Rear power window sub-switch LH
(10) Rear regulator & motor assembly LH

ELECTRICAL SPECIFICATION

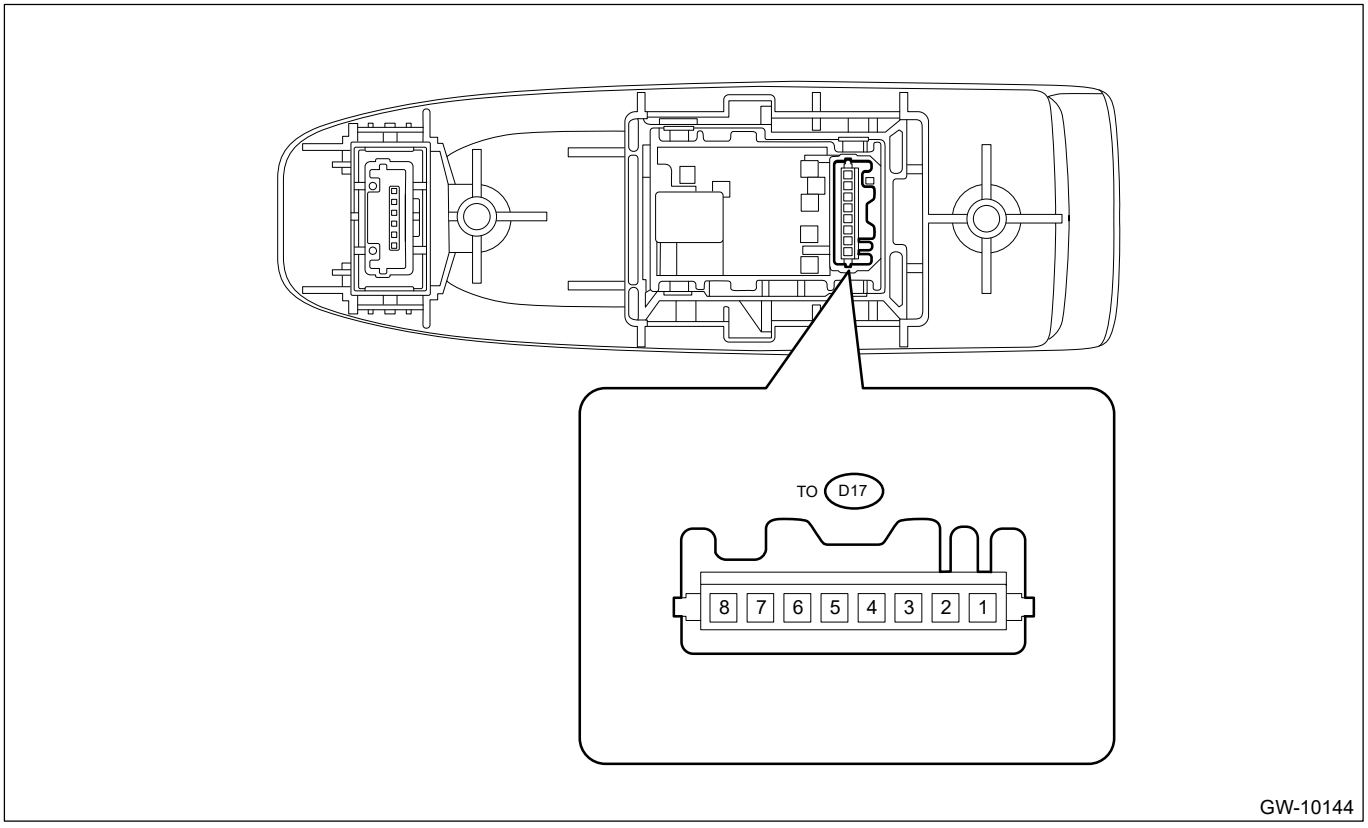
1. POWER WINDOW MASTER SWITCH



Terminal No.	Content	Measuring condition	Standard
(D7) No. 1 ←→ Chassis ground	Power window switch UP (rear seat RH)	—	—
(D7) No. 2 ←→ Chassis ground	Power window switch DOWN (rear seat RH)	—	—
(D7) No. 3	—	—	—
(D7) No. 4	—	—	—
(D7) No. 5	—	—	—
(D7) No. 6	—	—	—
(D7) No. 7 ←→ Chassis ground	GND	Always	Less than 1 Ω
(D7) No. 8	Power window switch DOWN (rear seat LH)	—	—
(D7) No. 9	Power window switch UP (rear seat LH)	—	—
(D7) No. 10 ←→ Chassis ground	Battery power supply	Always	Battery voltage

Terminal No.	Content	Measuring condition	Standard
(D7) No. 11	Power window switch DOWN (driver's seat)	—	—
(D7) No. 12	Power window switch UP (driver's seat)	—	—
(D7) No. 13	—	—	—
(D7) No. 14	LIN communication	—	—
(D7) No. 15	—	—	—
(D7) No. 16 ←→ Chassis ground	—	—	—
(D7) No. 17 ←→ Chassis ground	—	—	—
(D7) No. 18 ←→ Chassis ground	Ignition power supply	Always	Battery voltage

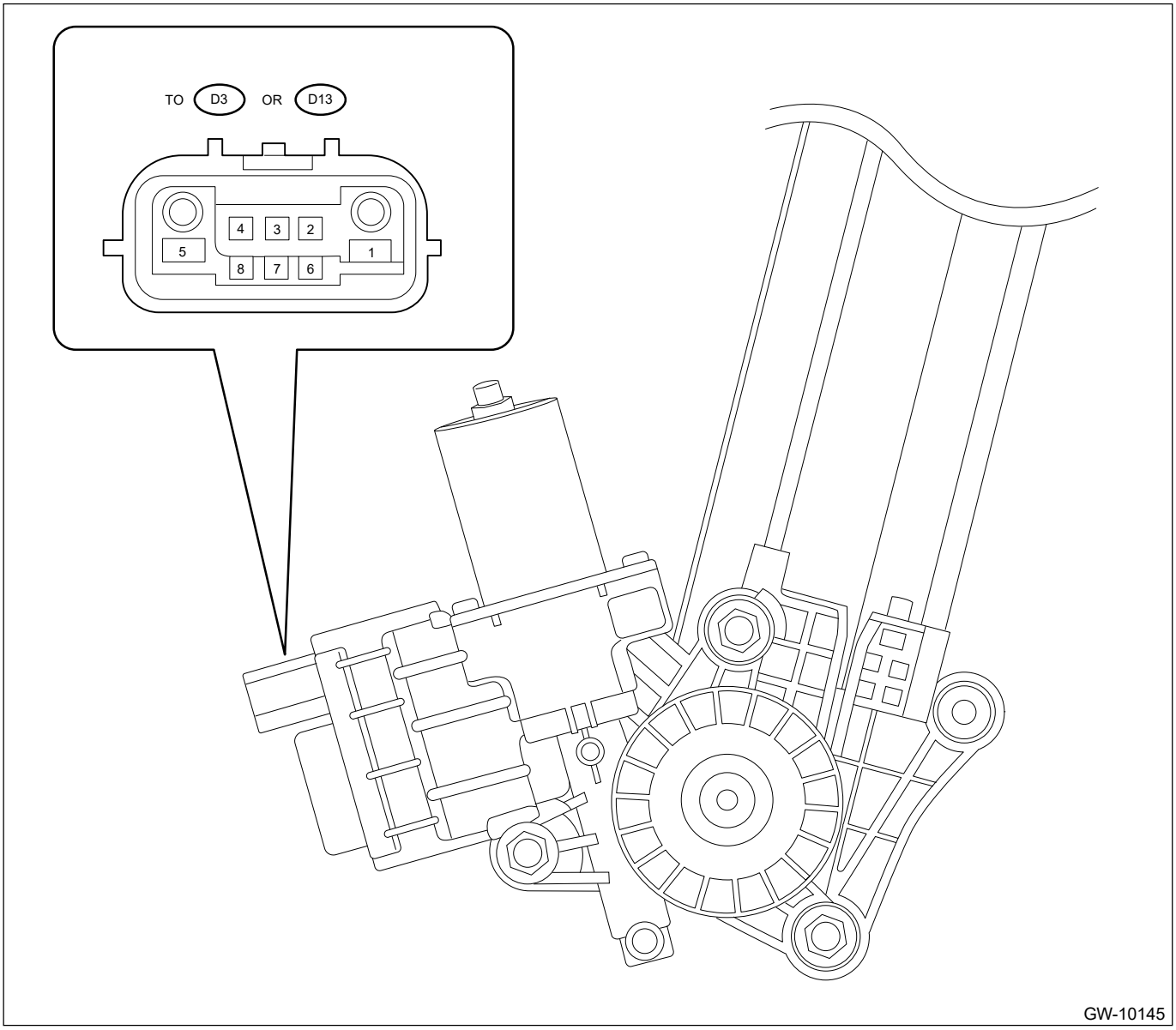
2. POWER WINDOW SUB-SWITCH (PASSENGER'S SEAT)



Terminal No.	Content	Measuring condition	Standard
(D17) No. 1	Power window switch AUTO	—	—
(D17) No. 2 ←→ Chassis ground	Power window switch GND	Always	Less than 1 Ω
(D17) No. 3 ←→ Chassis ground	Door lock switch GND	Always	Less than 1 Ω

Terminal No.	Content	Measuring condition	Standard
(D17) No. 4	—	—	—
(D17) No. 5	Power window switch DOWN	—	—
(D17) No. 6	Power window switch UP	—	—
(D17) No. 7	Power window switch LED	—	—
(D17) No. 8	—	—	—

3. POWER WINDOW REGULATOR



Terminal No.	Content	Measuring condition	Standard
(D3) or (D13) No. 1 ←→ Chassis ground	GND	Always	Less than 1 Ω

Terminal No.	Content	Measuring condition	Standard
(D3) or (D13) No. 2	—	—	—
(D13) No. 3 ←→ Chassis ground	SW ASSY PW SUB LED output (Passenger’s side only)	—	—
(D3) or (D13) No. 4	SW ASSY PW AUTO operation input	—	—
(D3) or (D13) No. 5 ←→ Chassis ground	Power supply for regulator	Always	Battery voltage
(D3) or (D13) No. 6 ←→ Chassis ground	SW ASSY PW DOWN operation input	—	—
(D3) or (D13) No. 7	UP AND DOWN LIN signal input	—	—
(D3) or (D13) No. 8 ←→ Chassis ground	SW ASSY PW UP operation input	—	—

POWER WINDOW(DIAGNOSTICS) > Inspection Mode

PROCEDURE

It is possible to diagnose the DTC by performing the indicated inspection mode. After correcting the DTC, perform a necessary inspection mode and make sure that the function is resumed correctly and the DTC is recorded.

1. INSPECTION MODE 1

Code	Description & trouble part	Note
B2B00	Driver's Door Power Window Auto Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Using the driver's side power window switch, operate the automatic up/down feature and check that the window rolls up and down.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

2. INSPECTION MODE 2

Code	Description & trouble part	Note
B2B01	Driver's Door Power Window Manual Up Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Pull up the driver's side power window switch and check that the window rolls up.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

3. INSPECTION MODE 3

Code	Description & trouble part	Note
B2B02	Driver's Door Power Window Manual Down Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Press down the driver's side power window switch and check that the window rolls down.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

4. INSPECTION MODE 4

Code	Description & trouble part	Note
B2B03	Driver's Door Power Window Pulse1 and 2 No Signal	—
B2B04	Driver's Door Power Window Pulse 1 No Signal	—
B2B05	Driver's Door Power Window Pulse 2 No Signal	—
B2B06	Driver's Door Power Window Pulse Direction	—
B2B07	Driver's Door Power Window Position	—
B2B08	Driver's Door Power Window Continuous Reversal	—
B2B09	Driver's Door Power Window Control Module EEPROM	—
B2B23	Passenger's Door Power Window Pulse 1 and 2 No Signal	—
B2B24	Passenger's Door Power Window Pulse 1 No Signal	—
B2B25	Passenger's Door Power Window Pulse 2 No Signal	—
B2B26	Passenger's Door Power Window Pulse Direction	—
B2B27	Passenger's Door Power Window Position	—

Code	Description & trouble part	Note
B2B28	Passenger's Door Power Window Continuous Reversal	—
B2B29	Passenger's Door Power Window Control Module EEPROM	—
B2B50	POWER WINDOW MAIN SWITCH FAILURE	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Switch)], [Power Window (Driver)] or [Power Window (Passenger)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the [Power Window (Switch)], [Power Window (Driver)] or [Power Window (Passenger)] DTC and check that the concerned DTC is not displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. After initialization operation Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>NOTE., pull up and press down power window switch at a passenger's own seat, and check that the window rolls up and down automatically.
4. Using the Subaru Select Monitor, read the [Power Window (Switch)], [Power Window (Driver)] or [Power Window (Passenger)] DTC and check that the concerned DTC is not displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

5. INSPECTION MODE 5

Code	Description & trouble part	Note
B2B10	Passenger's Door Power Window Driver's Door Auto Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Using the automatic up and down feature of the driver's side main switch and check that the window operates automatically.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

Note:
If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

6. INSPECTION MODE 6

Code	Description & trouble part	Note
B2B11	Passenger's Door Power Window Driver's Door Manual Up Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Pull up the driver's side main switch and check that the window rolls up.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

7. INSPECTION MODE 7

Code	Description & trouble part	Note
B2B12	Passenger's Door Power Window Driver's Door Manual Down Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Driver)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Press down the driver's side main switch and check that the window rolls down.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Driver)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

8. INSPECTION MODE 8

Code	Description & trouble part	Note
B2B20	Passenger's Door Power Window Auto Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Passenger)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Using the passenger's side power window switch, operate the automatic up/down feature and check that the window rolls up and down.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

9. INSPECTION MODE 9

Code	Description & trouble part	Note
B2B21	Passenger's Door Power Window Manual Up Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of Power Window (Passenger). Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Pull up the passenger's side power window switch and check that the window rolls up.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

10. INSPECTION MODE 10

Code	Description & trouble part	Note
B2B22	Passenger's Door Power Window Manual Down Switch Stuck	—

Diagnostic procedure:

1. Using the Subaru Select Monitor, perform the clear memory of [Power Window (Passenger)]. Ref. to COMMON(diag)>Clear memory.
2. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs. After solving the DTC, repeat from step 1).
3. Press down the passenger's side power window switch and check that the window rolls down.
4. Using the Subaru Select Monitor, read the DTC of [Power Window (Passenger)] to check that there is no DTC displayed. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
   Note:
   If the DTC is displayed on the screen, the trouble is still present. Perform the diagnosis for the displayed DTCs.

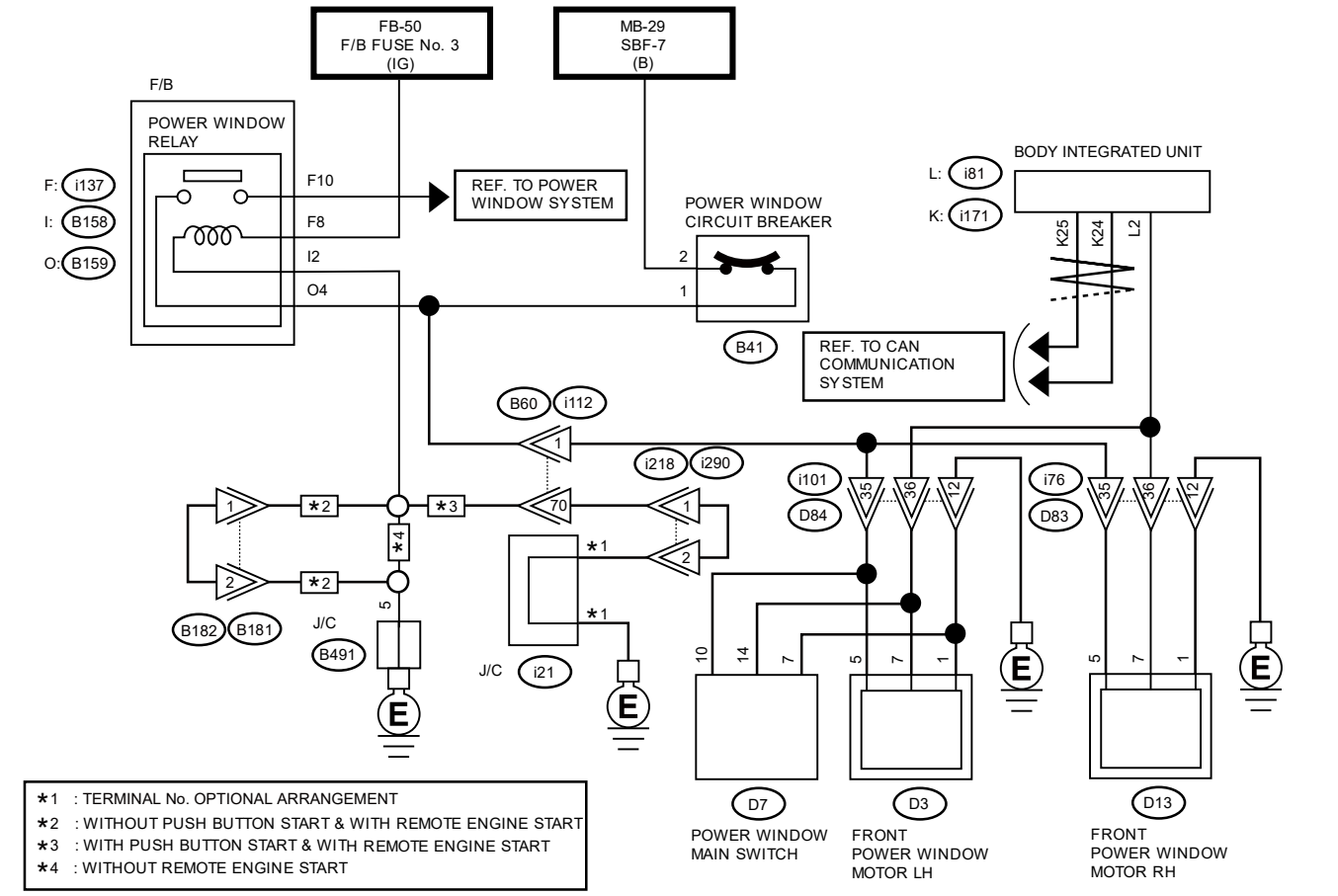
POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure for Subaru Select Monitor Communication

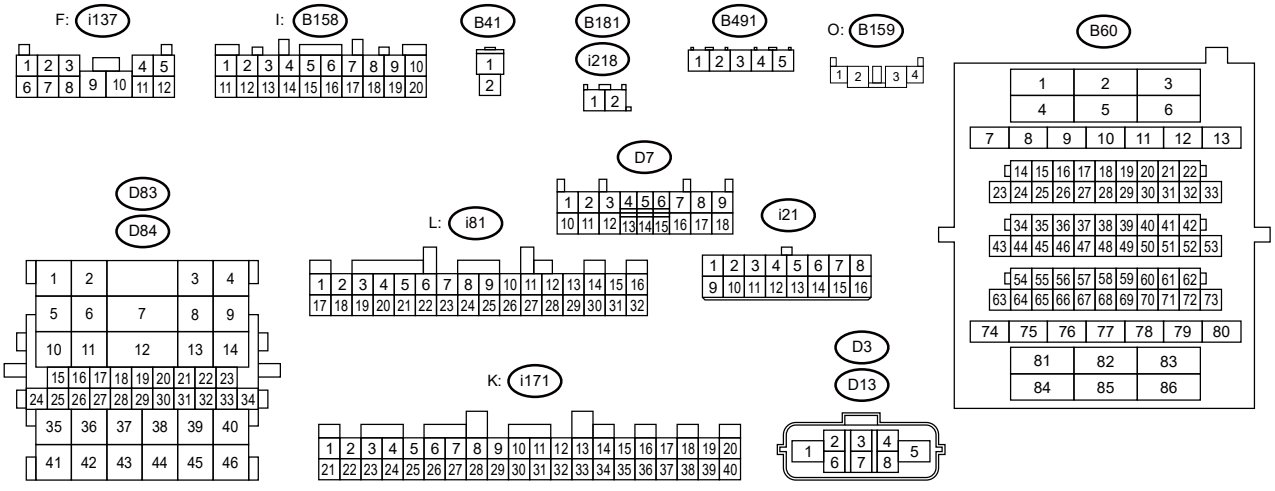
INSPECTION

1. POWER WINDOW REGULATOR

Trouble symptom:
Cannot communicate with [Power Window (Driver)] or [Power Window (Passenger)].
Detecting condition:
- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:
Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.





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Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK BATTERY TERMINAL.
- yes → Perform the instructed procedures.
- no → Go to 2.

2. CHECK IGNITION SWITCH.
- no → Go to 3.
- yes ↓

3. CHECK BATTERY.
- no → Perform the instructed procedures.
- yes ↓

4. CHECK LAN SYSTEM.
- no → Perform the instructed procedures.
- yes ↓

5. CHECK POWER WIDOW REGULATOR CONNECTOR.
- no → Perform the instructed procedures.
- yes ↓

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.
- yes → Perform the instructed procedures.
- no → Go to 7.

7. CHECK POWER SUPPLY CIRCUIT.
- no → Perform the instructed procedures.
- yes ↓

8. CHECK HARNESS BETWEEN POWER WIDOW REGULATOR AND CHASSIS GROUND.

no → Perform the instructed procedures.

yes ↓

9. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK BATTERY TERMINAL.

Check battery terminal.

Is there poor contact at battery terminal?

Yes	Replace or tighten the battery terminal.
No	Go to 2.

2. CHECK IGNITION SWITCH.

Check the ignition switch.

Is the ignition switch ON?

Yes	Go to 3.
No	Turn the ignition switch to ON, and Go to 3.

3. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the battery OK?

Yes	Go to 4.
No	Charge or replace the battery.

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is LAN system OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK POWER WIDOW REGULATOR CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check power window regulator connector.

Is the power window regulator connector inserted into the power window regulator until the clamp locks?

Yes	Go to 6.
No	Insert the power window regulator connector into the power window regulator.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether the communication with [Power Window (Driver)] and [Power Window (Passenger)] can be executed normally.

Is communication performed normally?

Yes	Read [Power Window (Driver)] and [Power Window (Passenger)] DTCs, and perform the diagnosis for the displayed DTCs. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the power window regulator connector.
2. Turn the ignition switch to ON. (Engine OFF)
3. Using a tester, measure the ignition power supply voltage between the power window regulator connector and chassis ground.

Connector & terminal

LH seat

(D3) No. 5 (+) — Chassis ground (−):

RH seat

(D13) No. 5 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 8.
No	Repair the open circuit of harness between the power window regulator and battery.

8. CHECK HARNESS BETWEEN POWER WIDOW REGULATOR AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Using a tester to measure the harness resistance between the power window regulator connector and chassis ground.
   Connector & terminal
   LH seat
   (D3) No. 1 (+) — Chassis ground (−):
   RH seat
   (D13) No. 1 (+) — Chassis ground (−):

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair the open circuit of the power window regulator ground circuit and the poor contact of connector.

9. CHECK POOR CONTACT OF CONNECTORS.

Check the power window regulator power supply circuit, ground circuit, or data link connector for poor contact.

Is there poor contact in the power window regulator power supply circuit, ground circuit, or data link connector?

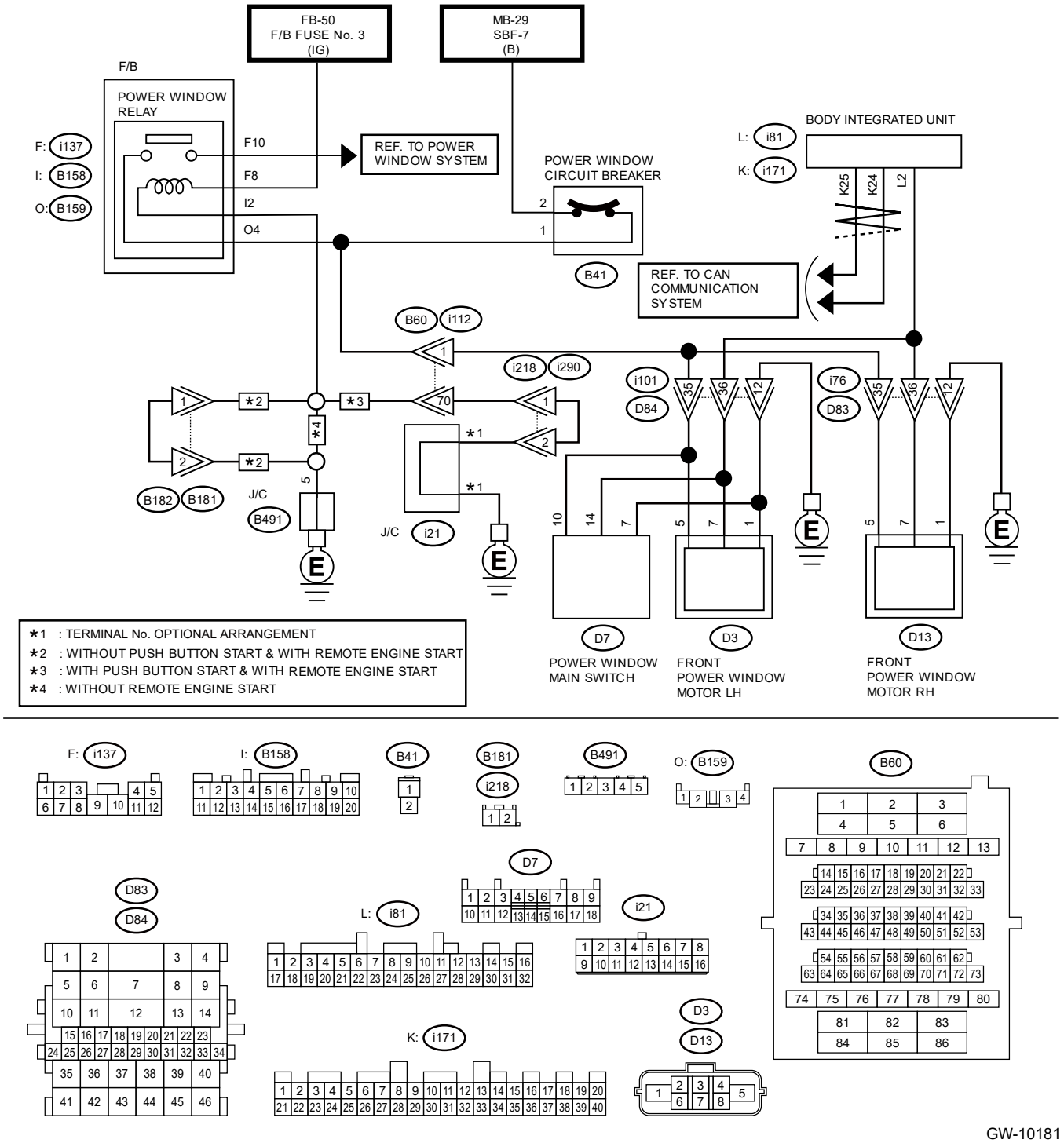
Yes	Repair the poor contact of connector.
No	If initialization communication using Select Monitor is impossible at this time, replace the power window regulator. If the communication is possible, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

2. POWER WINDOW MAIN SWITCH

Trouble symptom:
Cannot communicate with [Power Window (Switch)].
Detecting condition:
- Defective harness connector
- Power supply circuit malfunction
- Defective CAN communication circuit
- Defective Subaru Select Monitor

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.
CAN communication system Ref. to WIRING SYSTEM>CAN Communication System>WIRING DIAGRAM.



GW-10181

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK BATTERY TERMINAL.
- yes → Perform the instructed procedures.
- no → Go to 2.

2. CHECK IGNITION SWITCH.
- no → Go to 3.
- yes ↓

3. CHECK BATTERY.
- no → Perform the instructed procedures.
- yes ↓

4. CHECK LAN SYSTEM.
- no → Perform the instructed procedures.
- yes ↓

5. CHECK POWER WINDOW MAIN SWITCH CONNECTOR.
- no → Perform the instructed procedures.
- yes ↓

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.
- yes → Perform the instructed procedures.
- no → Go to 7.

7. CHECK POWER SUPPLY CIRCUIT.
- no → Perform the instructed procedures.
- yes ↓

8. CHECK HARNESS BETWEEN POWER WINDOW MAIN SWITCH AND CHASSIS GROUND.

no → Perform the instructed procedures.

yes ↓

9. CHECK POOR CONTACT OF CONNECTORS.

yes → Perform the instructed procedures.

no → Perform the instructed procedures.

1. CHECK BATTERY TERMINAL.

Check battery terminal.

Is there poor contact at battery terminal?

Yes	Replace or tighten the battery terminal.
No	Go to 2.

2. CHECK IGNITION SWITCH.

Check the ignition switch.

Is the ignition switch ON?

Yes	Go to 3.
No	Turn the ignition switch to ON, and Go to 3.

3. CHECK BATTERY.

1. Turn the ignition switch to OFF.
2. Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the battery OK?

Yes	Go to 4.
No	Charge or replace the battery.

4. CHECK LAN SYSTEM.

Perform the diagnosis for LAN system. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.

Is LAN system OK?

Yes	Go to 5.
No	Perform the inspection according to the diagnosis for LAN system.

5. CHECK POWER WINDOW MAIN SWITCH CONNECTOR.

1. Turn the ignition switch to OFF.
2. Check the power window main switch connector.

Is the power window main switch connector inserted into the power window main switch until the clamp locks?

Yes	Go to 6.
No	Insert the power window main switch connector into the power window main switch.

6. CHECK SUBARU SELECT MONITOR COMMUNICATION.

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check whether the communication with [Power Window (Switch)] can be executed normally.

Is communication performed normally?

Yes	Read [Power Window (Switch)] DTCs, and perform the diagnosis for the displayed DTCs. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).
No	Go to 7.

7. CHECK POWER SUPPLY CIRCUIT.

1. Disconnect the power window main switch connector.
2. Turn the ignition switch to ON. (Engine OFF)
3. Using a tester, measure the ignition power supply voltage between the power window main switch connector and chassis ground.
   Connector & terminal
   (D7) No. 10 (+) — Chassis ground (−):

Is the voltage 10 — 15 V?

Yes	Go to 8.
No	Repair the open circuit of harness between the power window main switch and the battery.

8. CHECK HARNESS BETWEEN POWER WINDOW MAIN SWITCH AND CHASSIS GROUND.

1. Turn the ignition switch to OFF.
2. Using a tester, measure the resistance of the harness between the power window main switch connector and chassis ground.
   Connector & terminal
   (D7) No. 7 (+) — Chassis ground (−):

Is the resistance less than 1 Ω?

Yes	Go to 9.
No	Repair the open circuit of the power window main switch ground circuit and the poor contact of connector.

9. CHECK POOR CONTACT OF CONNECTORS.

Check the power window main switch power supply circuit, ground circuit, or data link connector for poor contact.

Is there poor contact in the power window main switch power supply circuit, ground circuit, or data link connector?

Yes	Repair the poor contact of connector.
No	If initialization communication using Select Monitor is impossible at this time, replace the power window main switch. If the communication is possible, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.

POWER WINDOW(DIAGNOSTICS) > Data Monitor

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Data Monitor.**
- **For details on the data monitor, refer to the list. Ref. to POWER WINDOW(DIAGNOSTICS) >Data Monitor>LIST.**

POWER WINDOW(DIAGNOSTICS) > Data Monitor

LIST

- [Power Window (Driver)] and [Power Window (Passenger)]

Display	Remarks	Standard	Note
Power supply voltage	Power supply voltage	0 — 20.95 V	—
Courtesy Switch	Courtesy switch status	Close Open	—
One's Seat Switch	Status of switch at passenger's own seat	OFF DOWN UP UP/DOWN AUTO AUTO DOWN AUTO UP UP/DOWN/AUTO	—
Remote switch	Remote switch status	OFF DOWN UP UP/DOWN AUTO AUTO DOWN AUTO UP UP/DOWN/AUTO	—
Window Lock Switch Signal	Window lock switch status	Unlock Lock	—
Remote Control Key Signal	Remote control key signal	OFF DOWN ON	—
Operation Enable Signal	Operation permission signal	OFF ON	—
Open Position Pulse Count	Full open position pulse count	-32767 — 32767 edge	—
Current Position Pulse Count	Current position pulse count	-32767 — 32767 edge	—

Display	Remarks	Standard	Note
Motor Control Mode	Motor control status	Stop One's Seat Manual Down One's Seat Manual Up One's Seat Auto Down One's Seat Auto Up Remote Manual Down Remote Manual Up Remote Auto Up Remote Key Interlocking Down Remote Key Interlocking Up Reversal Down Active Test Down Active Test Up	—
ECU Control Mode	ECM control status	Uninitialized 1 No_definition Uninitialized 2 Initialized	—
With / Without Forget Closing Window	History wherein window position is within a sensing area when key off timer is prohibited.	OFF ON	—
Record Forget Closing Window Latest	Number of times key off timer has been prohibited since key off timer prohibition was detected most recently when the window’s position is not in the full close state.	0 — 255 times	—
Record Forget Closing Window 1	Number of times key off timer has been prohibited since key off timer prohibition was detected second last time when the	0 — 255 times	—

Display	Remarks	Standard	Note
	window’s position is not in the full close state.		
Record Forget Closing Window 2	Number of times key off timer has been prohibited since key off timer prohibition was detected the third last time when the window’s position is not in the full close state.	0 — 255 times	—
Record Forget Closing Window 3	Number of times key off timer has been prohibited since key off timer prohibition was detected the fourth last time when the window’s position is not in the full close state.	0 — 255 times	—
Reason Down Glass Latest	Latest DOWN factor information record (Auto, Reverse, etc.)	Default One's Seat Manual Down One's Seat Auto Down Remote Manual Down Remote Auto Down Remote Key Interlocking Down Reversal Down Active Test Down	—
Reason Down Glass 1	Second latest DOWN factor information record (Auto, Reverse, etc.)	Default One's Seat Manual Down One's Seat Auto Down Remote Manual Down Remote Auto Down Remote Key Interlocking Down	—

Display	Remarks	Standard	Note
		Reversal Down Active Test Down	
Position when Reversed Glass Latest	Window position of the latest reverse operation	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 1
Reverse Parameter Mask Latest	Reverse parameters 1 of the latest reverse operation	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Reverse Parameter Speed Latest	Reverse parameters 2 of the latest reverse operation	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Reversed Glass 1	Window position of the second latest reverse operation	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 1
Reverse Parameter Mask 1	Reverse parameters 1 of the second latest reverse operation	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Reverse Parameter Speed 1	Reverse parameters 2 of the second latest reverse operation	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Reversed Glass 2	Window position of the second latest reverse operation	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 1

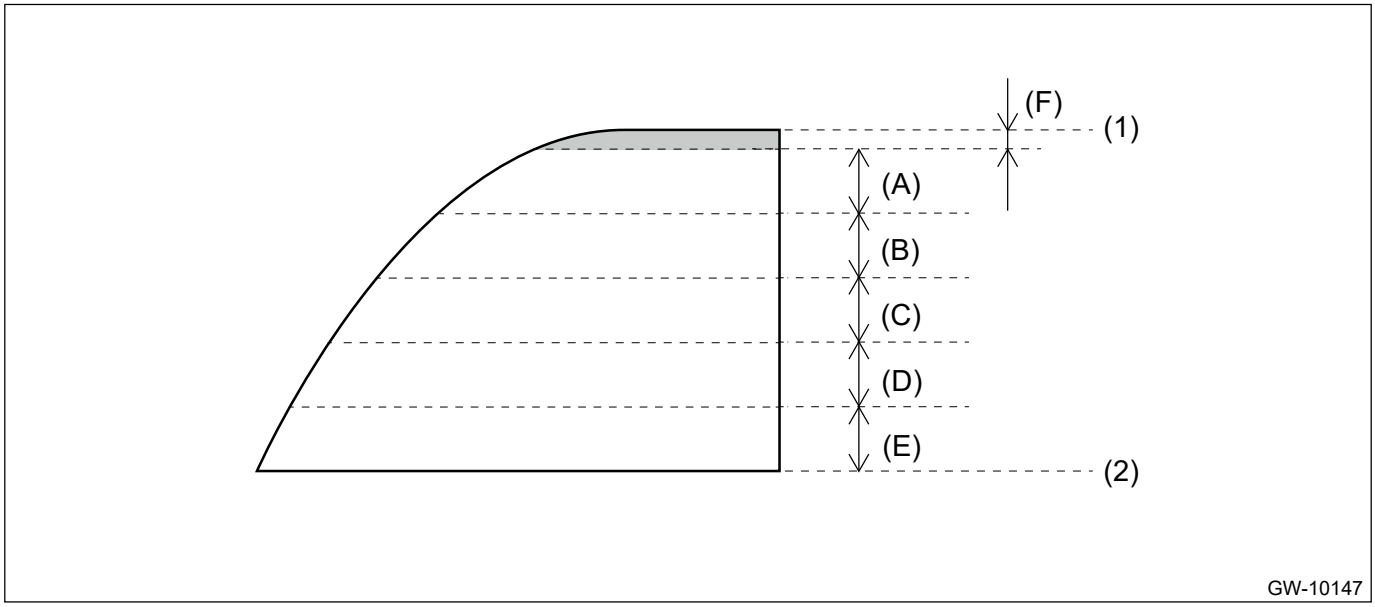
Display	Remarks	Standard	Note
Reverse Parameter Mask 2	Reverse parameters 1 of the second latest reverse operation	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Reverse Parameter Speed 2	Reverse parameters 2 of the second latest reverse operation	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Reversed Glass 3	Window position of the second latest reverse operation	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 1
Reverse Parameter Mask 3	Reverse parameters 1 of the second latest reverse operation	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Reverse Parameter Speed 3	Reverse parameters 2 of the second latest reverse operation	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Stop Glass Latest	Window position of the latest window stop operation due to drawing foreign matters	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 2
Stop Parameter Mask Latest	Parameters 1 of the latest window stop operation due to drawing foreign matters	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—

Display	Remarks	Standard	Note
Stop Parameter Speed Latest	Parameters 2 of the latest window stop operation due to drawing foreign matters	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Stop Glass 1	Window position of the second latest window stop operation due to drawing foreign matters	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 2
Stop Parameter Mask 1	Parameters 1 of the second latest window stop operation due to drawing foreign matters	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Stop Parameter Speed 1	Parameters 2 of the second latest window stop operation due to drawing foreign matters	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Stop Glass 2	Window position of the third latest window stop operation due to drawing foreign matters	No Reverse Area 5 Area 4 Area 3 Area 2 Area 1	Note 2
Stop Parameter Mask 2	Parameters 1 of the third latest window stop operation due to drawing foreign matters	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Stop Parameter Speed 2	Parameters 2 of the third latest window stop operation due to drawing foreign matters	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—
Position when Stop Glass 3	Window position of the fourth latest window stop operation due to	No Reverse Area 5 Area 4	Note 2

Display	Remarks	Standard	Note
	drawing foreign matters	Area 3 Area 2 Area 1	
Stop Parameter Mask 3	Parameters 1 of the fourth latest window stop operation due to drawing foreign matters	First Motion Mask within Two of the Interval First Motion Mask without Two of the Interval	—
Stop Parameter Speed 3	Parameters 3 of the third latest window stop operation due to drawing foreign matters	Less than Vehicle Speed 5km/h More than Vehicle Speed 5km/h	—

Note:

1. Definition of window position when it reverses

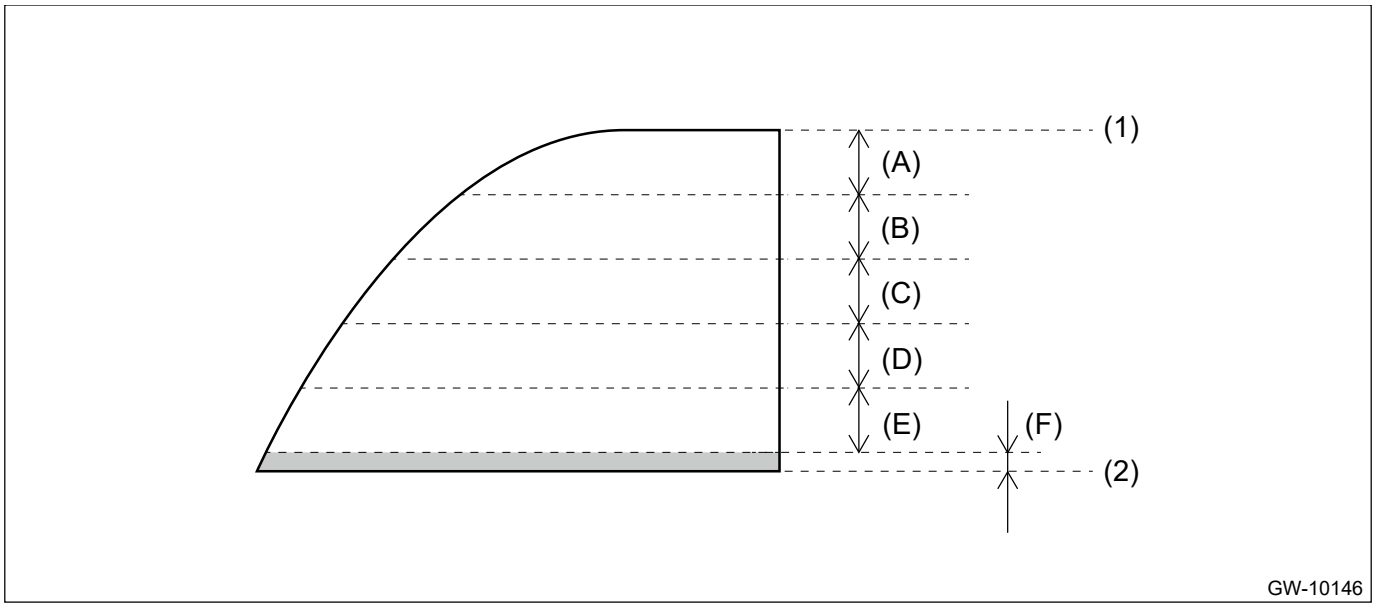


(1) Top dead position
(2) Bottom dead position

(A) Area 1
(B) Area 2
(C) Area 3
(D) Area 4
(E) Area 5
(F) Non-sensing areas

Area 1 — Area 5 are equal

2. Definition of window position when it stops due to drawing foreign matters



(1) Top dead position
(2) Bottom dead position

(A) Area 1
(B) Area 2
(C) Area 3
(D) Area 4

Area 1 — Area 5 are equal

(E) Area 5

(F) Non-sensing areas

- [Power Window (Switch)]

Display	Remarks	Standard	Note
Drivers seat AUTO SW state	Driver’s side AUTO SW status	ON OFF	—
Passenger seat AUTO SW state	Passenger’s side AUTO SW status	ON OFF	—
Passenger seat MANUAL UP SW state	Passenger’s side MANUAL UP SW status	ON OFF	—
Drivers seat AUTO SW Present ON trouble	Driver’s side AUTO SW current ON malfunction	Yes No detection	—
Passenger seat AUTO SW Present ON trouble	Passenger’s side AUTO SW current ON malfunction	Yes No detection	—
Passenger seat MANUAL UP SW Present ON trouble	Passenger’s side MANUAL UP SW current ON malfunction	Yes No detection	—
Passenger seat MANUAL DOWN SW state	Passenger’s side MANUAL DOWN SW status	ON OFF	—
Window lock switch status	Window lock switch status	ON OFF	—
Passenger seat MANUAL DOWN SW Present ON trouble	Passenger’s side MANUAL DOWN SW status	Yes No detection	—

POWER WINDOW(DIAGNOSTICS) > Freeze Frame Data

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Freeze Frame Data.**
- **For details on freeze frame data, refer to the list. Ref. to POWER WINDOW(DIAGNOSTICS) >Freeze Frame Data>LIST.**

POWER WINDOW(DIAGNOSTICS) > Freeze Frame Data

LIST

- [Power Window (Driver)] and [Power Window (Passenger)]

  Note:

  Freeze frame data is stored for three DTCs. Up to three DTCs are allowed to be stored for past malfunction.

Item	Remarks	Standard/Unit	Note
Power supply voltage	Power supply voltage	0 — 20.95 V	—
Courtesy Switch	Courtesy switch status	Close Open	—
One's Seat Switch	Status of switch at passenger's own seat	OFF DOWN UP UP/DOWN AUTO AUTO DOWN AUTO UP UP/DOWN/AUTO	—
Remote switch	Remote switch status	OFF DOWN UP UP/DOWN AUTO AUTO DOWN AUTO UP UP/DOWN/AUTO	—
Window Lock Switch Signal	Window lock switch status	Unlock Lock	—
Remote Control Key Signal	Remote control key signal	OFF DOWN ON	—
Operation Enable Signal	Operation permission signal	OFF ON	—
Open Position Pulse Count	Full open position pulse count	-32767 — 32767 edge	—

Item	Remarks	Standard/Unit	Note
Current Position Pulse Count	Current position pulse count	-32767 — 32767 edge	—
Motor Control Mode	Motor control status	Stop One's Seat Manual Down One's Seat Manual Up One's Seat Auto Down One's Seat Auto Up Remote Manual Down Remote Manual Up Remote Auto Up Remote Key Interlocking Down Remote Key Interlocking Up Reversal Down Active Test Down Active Test Up	—
ECU Control Mode	ECM control status	Uninitialized 1 No_definition Uninitialized 2 Initialized	—

POWER WINDOW(DIAGNOSTICS) > Active Test

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Window (Driver)] or [Power Window (Passenger)], and then select [Enter].
5. On [Select Function] display, select [Active Test].

POWER WINDOW(DIAGNOSTICS) > Active Test

LIST

Active test items	Range	Remarks	Execution condition
Power Window Operation Test	UP DOWN cancel	By forcibly operating the power window motor, it is possible to determine whether motor's up, down, and stop functions work normally.	• Ignition switch ON • Initialized state • Pulse fail not detected • UP terminal input OFF • DN terminal input OFF • AUTO terminal input OFF • Power window stops
LED Switch Lighting Test (Passenger's side only)	Check cancel	It is possible to determine whether ON and OFF functions of power window passenger's side switch LED work normally. (when Diagnosis mode is switched) **Note:** **The LED should comes on and off as the ignition switch is turned OFF and OFF.**	Ignition switch ON

POWER WINDOW(DIAGNOSTICS) > Work Support

OPERATION

1. SYSTEM INITIALIZATION

Sometimes top dead position or bottom dead position becomes misaligned even if it is initialized by operating the power window switches.
With this procedure, the following data can be initialized.

- Top dead position
- Bottom dead position
- Sliding resistance
- DTC/FFD
- Data monitor history items

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Window (Driver)] or [Power Window (Passenger)], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Initialization Mode].
7. On [Initialization Mode] display, select [System Initialization].
8. Perform operation following directions in the Subaru Select Monitor.

2. CLEARING HISTORY

With this procedure, the following data can be initialized.

- Data monitor history items

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select [Power Window (Driver)] or [Power Window (Passenger)], and then select [Enter].
5. On [Select Function] display, select [Work Support].
6. On [Work Support] display, select [Initialization Mode].
7. On [Initialization Mode] display, select [History Clear].
8. Perform operation following directions in the Subaru Select Monitor.

POWER WINDOW(DIAGNOSTICS) > Work Support

NOTE

1. INITIALIZATION BY POWER WINDOW SWITCH (DRIVER'S SIDE)

Perform registration when any of the following procedures are taken.

- With the ignition switch ON, when a power window is rolled up/down and then the power supply is cut. (This is because the positional information is updated at the moment the power window is moved after the ignition switch is turned ON.)
- When regulator or regulator motor is replaced. (Registration is not necessary when the battery is

replaced.)

1. Turn the ignition switch to ON.
2. Operate the switch - power window main in “DOWN” direction to fully open the driver’s side glass assembly - front door. Once the window is fully opened, hold the switch for longer than one second.
   Note:
   Wherever the glass is at any position, operate the switch in “DOWN” direction.
3. Operate the power window main switch in “UP” direction to fully close the driver’s side glass assembly - front door. Once the window is fully closed, hold the switch for longer than one second.
   Note:
   At this time, do not move the vehicle.
4. Operate the power window main switch in “AUTO DOWN” direction to check whether the window fully opens properly. Also, operate the switch in “AUTO UP” direction to check whether the window fully closed properly.
   Note:
   If the window does not fully open/close properly, repeat steps 1) to 4).

2. INITIALIZATION BY POWER WINDOW SWITCH (PASSENGER’S SIDE)

Perform registration when any of the following procedures are taken.

- With the ignition switch ON, when a power window is rolled up/down and then the power supply is cut. (This is because the positional information is updated at the moment the power window is moved after the ignition switch is turned ON.)
- When regulator or regulator motor is replaced. (Registration is not necessary when the battery is replaced.)

1. Turn the ignition switch to ON.
2. Operate the switch - power window main or passenger’s side switch - power window in “DOWN” direction to fully open the driver’s side glass assembly - front door. Once the window is fully opened, hold the switch for longer than one second.
   Note:
   - **Wherever the glass is at any position, operate the switch in “DOWN” direction.**
   - **The operation can be done from both switch - power window main and passenger’s side switch - power window.**
3. Operate the switch - power window main or passenger’s side switch - power window in “UP” direction to fully close the driver’s side glass assembly - front door. Once the window is fully closed, hold the switch for longer than one second.
   Note:
   At this time, do not move the vehicle.
4. Operate the switch - power window main or passenger’s side switch - power window in “AUTO DOWN” direction to check whether the window fully opens properly. Also, operate the switch in “AUTO UP” direction to check whether the window fully closed properly.
   Note:
   - **If the window does not fully open/close properly, repeat steps 1) to 4).**
   - **The operation can be done from both switch - power window main and passenger’s side switch - power window.**

3. HOW TO RESET THE FULL OPEN STOP POSITION

When the full open stop position becomes misaligned, it can be reset by performing the following

procedure.

1. Turn the ignition switch to ON.
2. Operate and hold the switch - power window in “AUTO DOWN” direction (fully pull up the switch) for three seconds.

   Note:

   For the driver’s side window, this can be done with the switch - power window main, and for the passenger’s side window the switch - power window main or the passenger’s side switch - power window can be used.
3. Check that the glass assembly - front door starts rolling down and fully opens.
4. Operate the switch - power window in “AUTO UP” direction to check whether the window fully closes properly.

4. HOW TO RESET THE FULL CLOSE STOP POSITION

When the full close stop position becomes misaligned, it can be reset by performing the following procedure.

1. Turn the ignition switch to ON.
2. Operate and hold the switch - power window in “AUTO UP” direction (fully pull up the switch) for three seconds.

   Note:

   For the driver’s side window, this can be done with the switch - power window main, and for the passenger’s side window the switch - power window main or the passenger’s side switch - power window can be used.
3. Check that the glass assembly - front door starts rolling down and fully closes.
4. Operate the switch - power window in “AUTO DOWN” direction to check whether the window fully opens properly.

POWER WINDOW(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

OPERATION

Note:

- **Refer to "COMMON (diag)". Ref. to COMMON(diag)>Diagnostic Trouble Code (DTC).**
- **For details on DTCs, refer to the list. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.**
- **Up to three DTCs are stored for past malfunction.**
- **If the number of DTCs exceeds the number of allowed DTCs, new DTCs are not stored.**
- **Any recorded DTCs for current malfunctions are displayed.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Trouble Code (DTC)

LIST

Code	Description & trouble part	Reference
B2B00	DRIVER'S DOOR POWER WINDOW AUTO SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B00 DRIVER'S DOOR POWER WINDOW AUTO SWITCH STUCK.
B2B01	DRIVER'S DOOR POWER WINDOW MANUAL UP SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B01 DRIVER'S DOOR POWER WINDOW MANUAL UP SWITCH STUCK.
B2B02	DRIVER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B02 DRIVER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK.
B2B03	DRIVER'S DOOR POWER WINDOW PULSE1 AND 2 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B03 DRIVER'S DOOR POWER WINDOW PULSE1 AND 2 NO SIGNAL.
B2B04	DRIVER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B04 DRIVER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL.
B2B05	DRIVER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B05 DRIVER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL.
B2B06	DRIVER'S DOOR POWER WINDOW PULSE DIRECTION	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B06 DRIVER'S DOOR POWER WINDOW PULSE DIRECTION.

Code	Description & trouble part	Reference
B2B07	DRIVER'S DOOR POWER WINDOW POSITION	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B07 DRIVER'S DOOR POWER WINDOW POSITION .
B2B08	DRIVER'S DOOR POWER WINDOW CONTINUOUS REVERSAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B08 DRIVER'S DOOR POWER WINDOW CONTINUOUS REVERSAL.
B2B09	DRIVER'S DOOR POWER WINDOW CONTROL MODULE EEPROM	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B09 DRIVER'S DOOR POWER WINDOW CONTROL MODULE EEPROM.
B2B10	PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR AUTO SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B10 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR AUTO SWITCH STUCK.
B2B11	PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL UP SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B11 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL UP SWITCH STUCK.
B2B12	PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL DOWN SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B12 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL DOWN SWITCH STUCK.
B2B20	PASSENGER'S DOOR POWER WINDOW AUTO SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B20 PASSENGER'S DOOR POWER WINDOW AUTO SWITCH STUCK.
B2B21	PASSENGER'S DOOR POWER WINDOW MANUAL UP SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B22 PASSENGER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK.
B2B22	PASSENGER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B22 PASSENGER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK.
B2B23	PASSENGER'S DOOR POWER WINDOW PULSE 1 AND 2 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B23 PASSENGER'S DOOR POWER WINDOW PULSE 1 AND 2 NO SIGNAL.

Code	Description & trouble part	Reference
B2B24	PASSENGER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B24 PASSENGER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL.
B2B25	PASSENGER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B25 PASSENGER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL.
B2B26	PASSENGER'S DOOR POWER WINDOW PULSE DIRECTION	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B26 PASSENGER'S DOOR POWER WINDOW PULSE DIRECTION.
B2B27	PASSENGER'S DOOR POWER WINDOW POSITION	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B27 PASSENGER'S DOOR POWER WINDOW POSITION .
B2B28	PASSENGER'S DOOR POWER WINDOW CONTINUOUS REVERSAL	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B28 PASSENGER'S DOOR POWER WINDOW CONTINUOUS REVERSAL.
B2B29	PASSENGER'S DOOR POWER WINDOW CONTROL MODULE EEPROM	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B29 PASSENGER'S DOOR POWER WINDOW CONTROL MODULE EEPROM.
B2B50	POWER WINDOW MAIN SWITCH FAILURE	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Procedure with Diagnostic Trouble Code (DTC)>DTC B2B50 POWER WINDOW MAIN SWITCH FAILURE.

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B00 DRIVER'S DOOR POWER WINDOW AUTO SWITCH STUCK

DTC detecting condition:

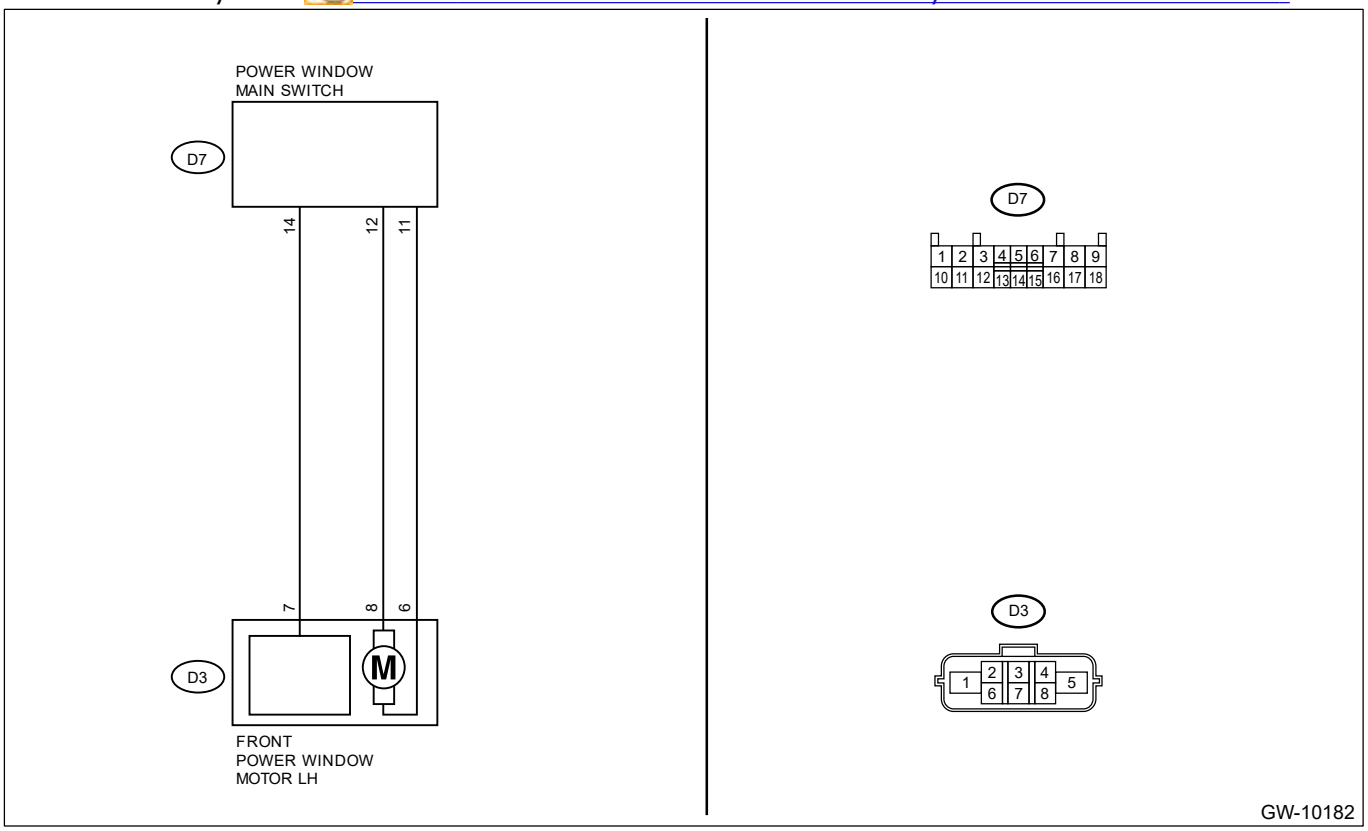
When AUTO Terminal Input ON state continues for 20±1 second or longer.

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector.
   Connector & terminal
   (D7) No. 14 — (D3) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & motor assembly connector.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.

   Connector & terminal

   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

5. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B00 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B01 DRIVER'S DOOR POWER WINDOW MANUAL UP SWITCH STUCK

DTC detecting condition:

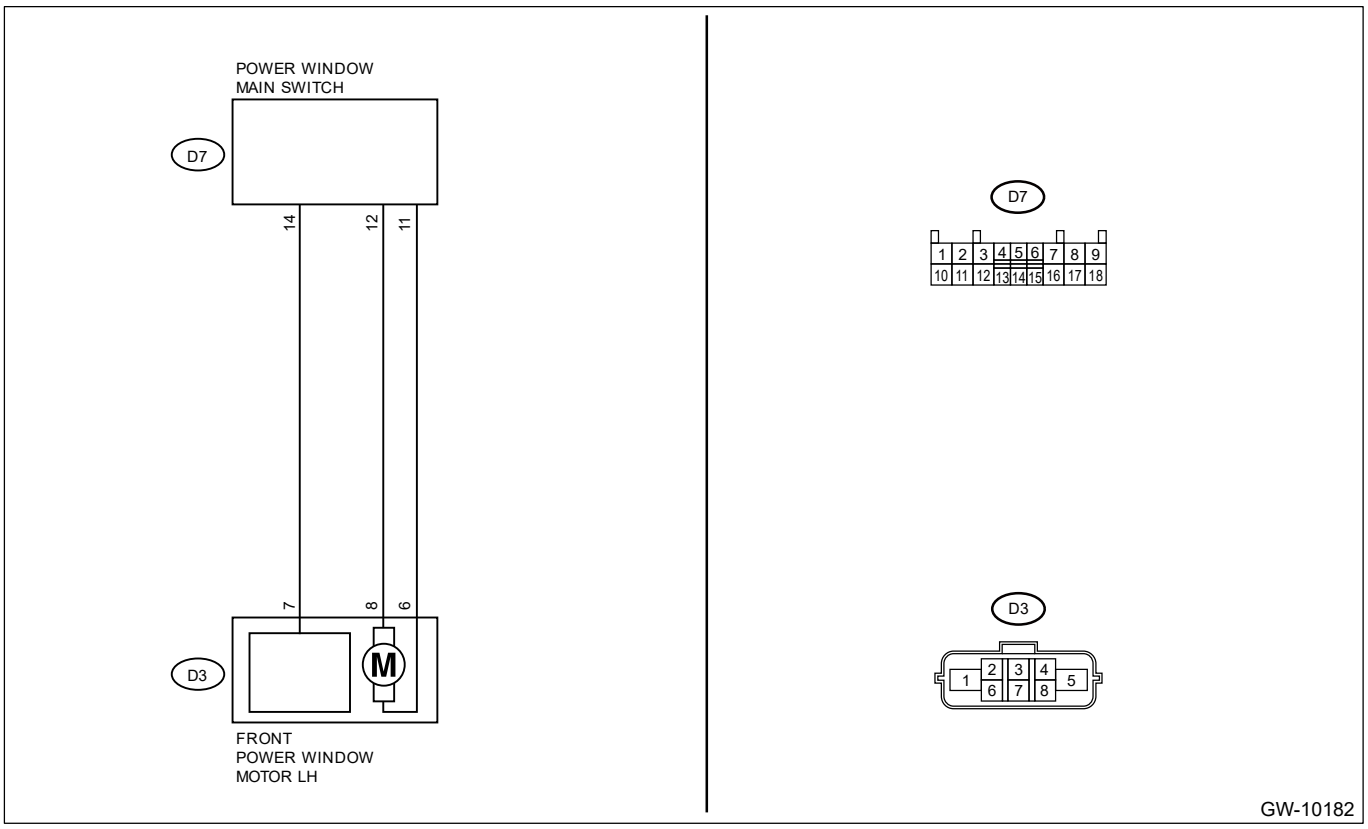
UP Terminal Input ON state continues for 20±1 second or longer.

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector.

Connector & terminal

(D7) No. 14 — (D3) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & motor assembly connector.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.
   Connector & terminal
   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

5. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B01 displayed? (Current malfunction)

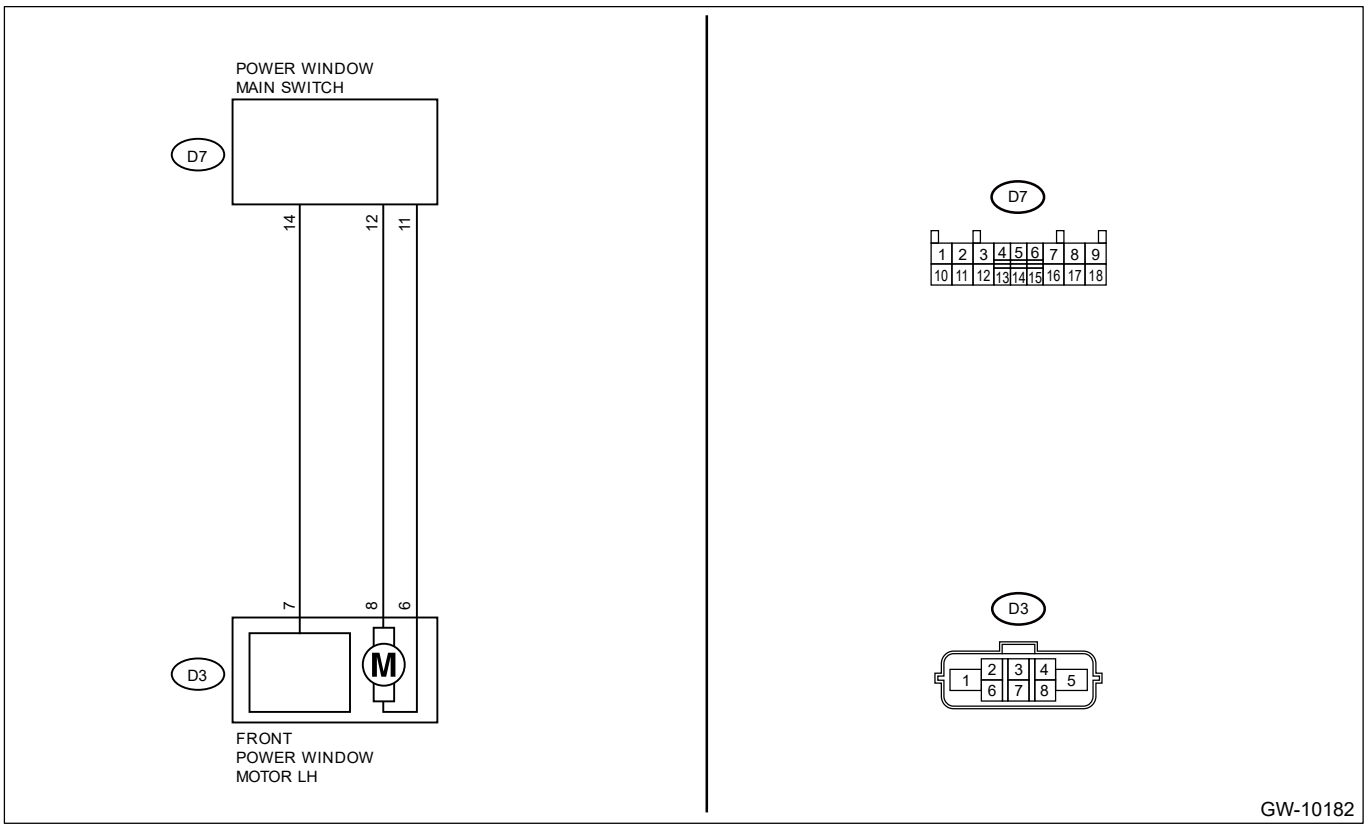
Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B02 DRIVER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK

DTC detecting condition:
UP Terminal Input ON state continues for 20±1 second or longer.
Trouble symptom:
- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:
Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector.

Connector & terminal

(D7) No. 14 — (D3) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & motor assembly connector.

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector.

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.
   Connector & terminal
   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

5. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B02 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B03 DRIVER'S DOOR POWER WINDOW PULSE1 AND 2 NO SIGNAL

DTC detecting condition:

When all the following conditions are established.

1. When sensing areas are recognized.
2. When no-pulse-input state continues in both pulse 1 and 2 phases.
3. When "absolute value judgment" is detected during UP operation.
4. After the condition 3 is met, when motor lock (no-pulse-input state in both pulses 1 and 2 phases for 300±10 milliseconds) is detected during reverse operation.

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window main switch and roll driver's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B03 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B04 DRIVER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL

DTC detecting condition:

When the power window is rolling up (except in fully closed zone), change in pulse 1 phase (edge) is not detected while pulse 2 phase is producing 10 edges.

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)].
   Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window main switch and roll driver's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B04 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B05 DRIVER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL

DTC detecting condition:

When the power window is rolling up (except in fully closed zone), change in pulse 2 phase (edge) is not detected while pulse 1 phase is producing 10 edges.

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window main switch and roll driver's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B05 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B06 DRIVER'S DOOR POWER WINDOW PULSE DIRECTION

DTC detecting condition:
In UP/DOWN operation, when one hour of initial masking has elapsed since the motor is started, six edges of continuous pulse that are opposite to the window's moving direction are detected.
Trouble symptom:
- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)].
   Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window main switch and roll driver's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B06 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B07 DRIVER'S DOOR POWER WINDOW POSITION

DTC detecting condition:

Top dead position error: In UP operation, when the window position counter reads -80 edge or less. (except uninitialized state)

Bottom dead position error: In DOWN operation, when the window position counter reads +130 edge or less of the bottom dead position. (except uninitialized state)

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. INITIALIZATION BY POWER WINDOW SWITCH (DRIVER'S SIDE).

1. Perform initialization using the power window switch. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>NOTE.
2. Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B07 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).

Is DTC B2B07 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B08 DRIVER'S DOOR POWER WINDOW CONTINUOUS REVERSAL

DTC detecting condition:
When the number of times for detected continuous reverse operation counts 10 times or more. (Condition for addition: completion of reserve operation due to anti-pinch feature)
Trouble symptom:
- When the power window main switch is operated, driver's side window does not work.
- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK GLASS SLIDING SURFACE.

Check sliding surface of glass and running channel.

Is it free from any foreign matter?

Yes	Go to 2.
No	Remove the foreign matter, and Go to 2.

2. PERFORM SYSTEM RESTORATION PROCEDURES.

1. Operate the power window main switch and roll down the window to the full open position.
2. Operate the power window main switch and roll up the window to the full close position.
3. Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B08 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 4.
No	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

4. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B08 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B09 DRIVER'S DOOR POWER WINDOW CONTROL MODULE EEPROM

DTC detecting condition:

When one of the following data cannot be read from the non-volatile memory as the CPU is reset.

- Window position
- Sliding learn value
- Initialization completed state
- Full open stop position

Trouble symptom:

- When the power window main switch is operated, driver's side window does not work.

- When the power window main switch is operated, driver's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. INITIALIZATION BY POWER WINDOW SWITCH (DRIVER'S SIDE).

1. Perform initialization using the power window switch. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>NOTE.
2. Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B09 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B09 displayed? (Current malfunction)

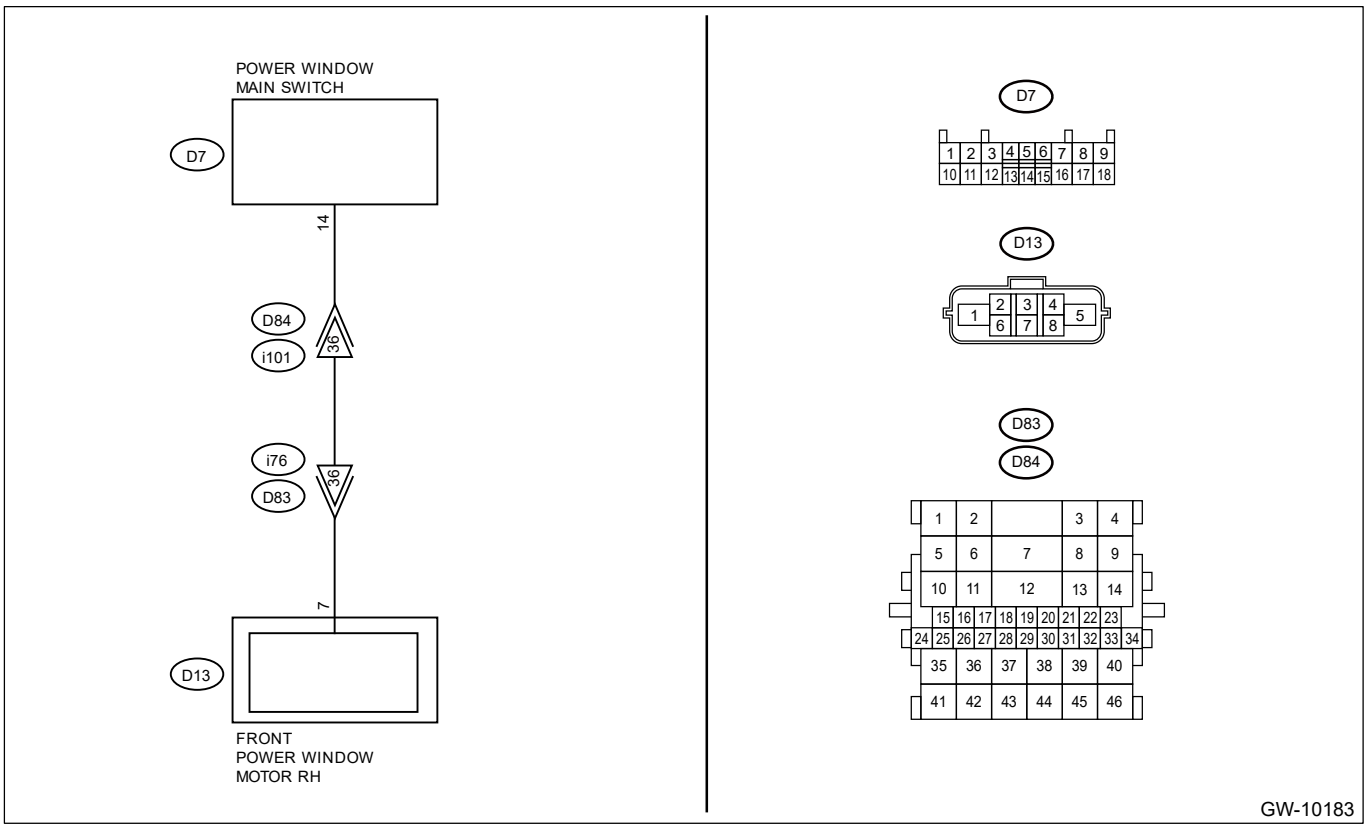
Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B10 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR AUTO SWITCH STUCK

DTC detecting condition:
When AUTO SW signal ON is received for 20±1 second or longer.
Trouble symptom:
- When the power window main switch is operated, passenger's side window does not work.
- When the power window main switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:
Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK [Remote switch] (DATA MONITOR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

   Data Monitor

   - [Remote switch]

Is «AUTO UP/ DOWN» displayed?

Yes	Go to 6.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D7) No. 14 — (D13) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & assembly connector (passenger's side).

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector (passenger's side).

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.

   Connector & terminal

   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

6. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 7.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

7. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B10 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B11 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL UP SWITCH STUCK

DTC detecting condition:

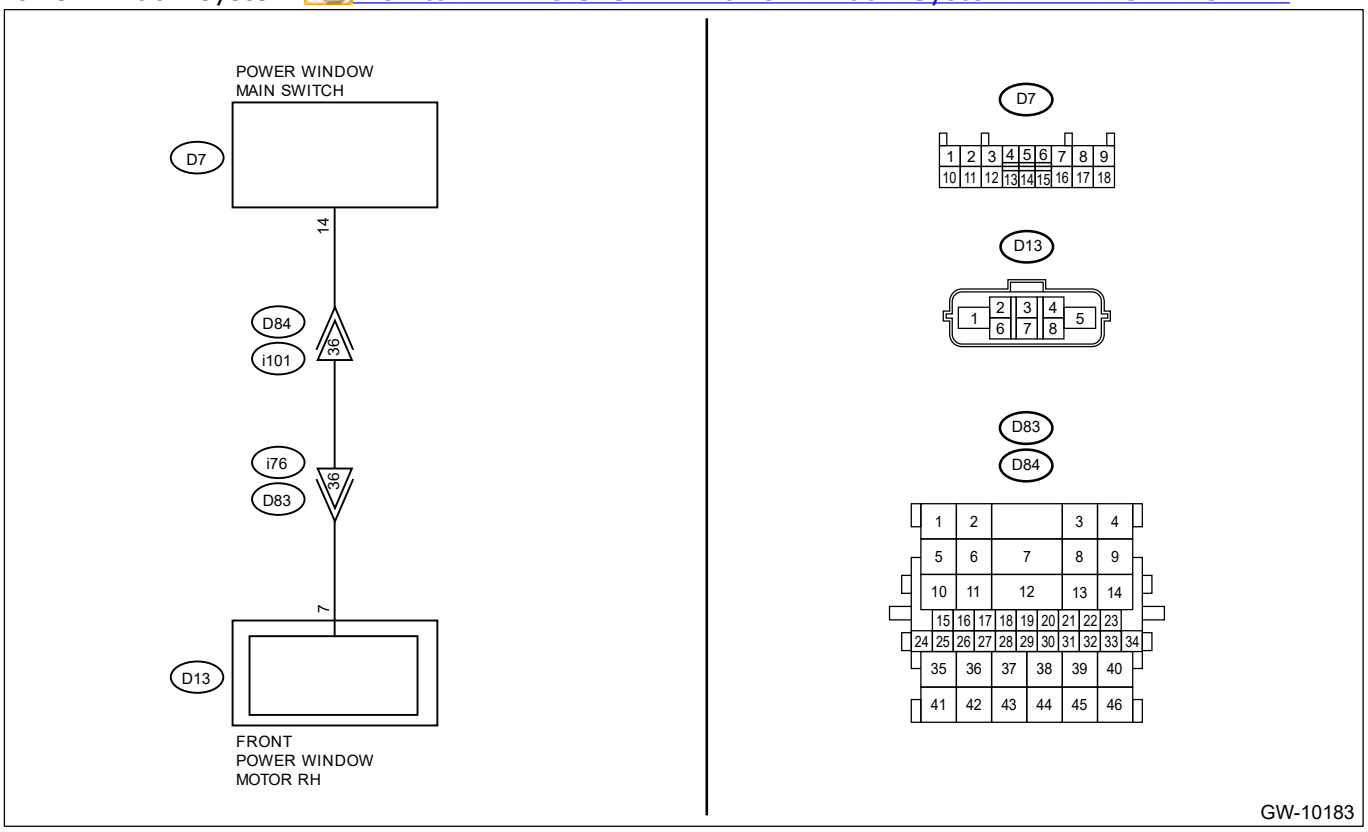
When Remote P/W signal UP is received for 20±1 second or longer.

Trouble symptom:

- When the power window main switch is operated, passenger's side window does not work.
- When the power window main switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK [Remote switch] (DATA MONITOR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.



- [Remote switch]

Is [UP] displayed?

Yes	Go to 6.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D7) No. 14 — (D13) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & assembly connector (passenger's side).

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector (passenger's side).

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.

   Connector & terminal

   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

6. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 7.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

7. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B11 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B12 PASSENGER'S DOOR POWER WINDOW DRIVER'S DOOR MANUAL DOWN SWITCH STUCK

DTC detecting condition:

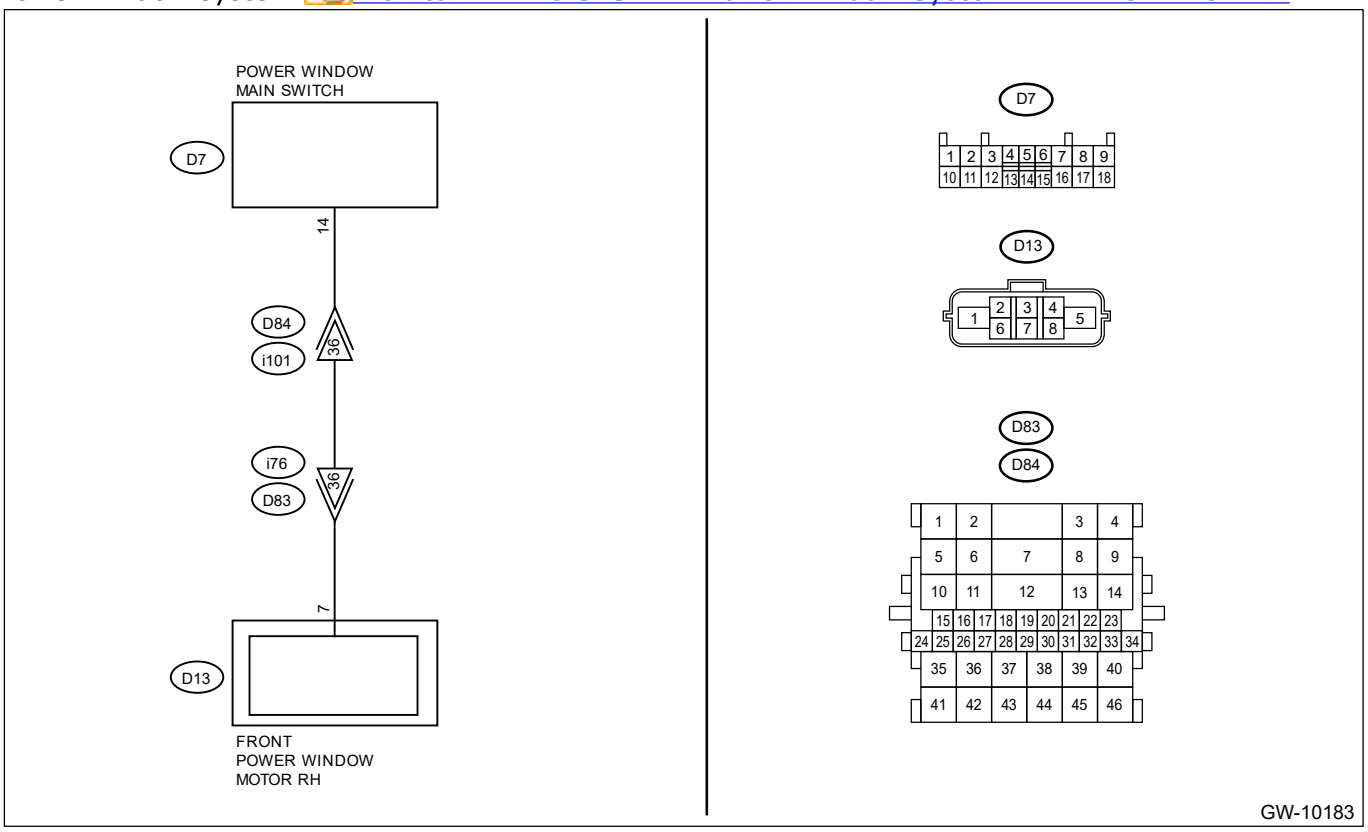
When Remote P/W signal DOWN is received for 20±1 second or longer.

Trouble symptom:

- When the power window main switch is operated, passenger's side window does not work.
- When the power window main switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK POWER WINDOW MAIN SWITCH UNIT.

Perform the inspection of power window main switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the power window main switch OK?

Yes	Go to 2.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK [Remote switch] (DATA MONITOR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.



- [Remote switch]

Is [DOWN] displayed?

Yes	Go to 6.
No	Go to 3.

3. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly LH connector.
3. Disconnect the front regulator & motor assembly RH connector.
4. Disconnect the body integrated unit connector.
5. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D7) No. 14 — (D13) No. 7:

Is the resistance less than 1 Ω?

Yes	Go to 4.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & assembly connector (passenger's side).

4. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the power window main switch connector and chassis ground.

Connector & terminal

(D7) No. 14 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 5.
No	Repair the open harness causing short-to ground condition between power window main switch connector and front regulator & motor assembly connector (passenger's side).

5. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the power window main switch connector and chassis ground.

   Connector & terminal

   (D7) No. 14 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 6.
No	Repair the open harness causing short-to power supply condition between power window main switch connector and front regulator & motor assembly connector.

6. CHECK FRONT REGULATOR & MOTOR ASSEMBLY.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 7.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

7. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B12 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B20 PASSENGER'S DOOR POWER WINDOW AUTO SWITCH STUCK

DTC detecting condition:

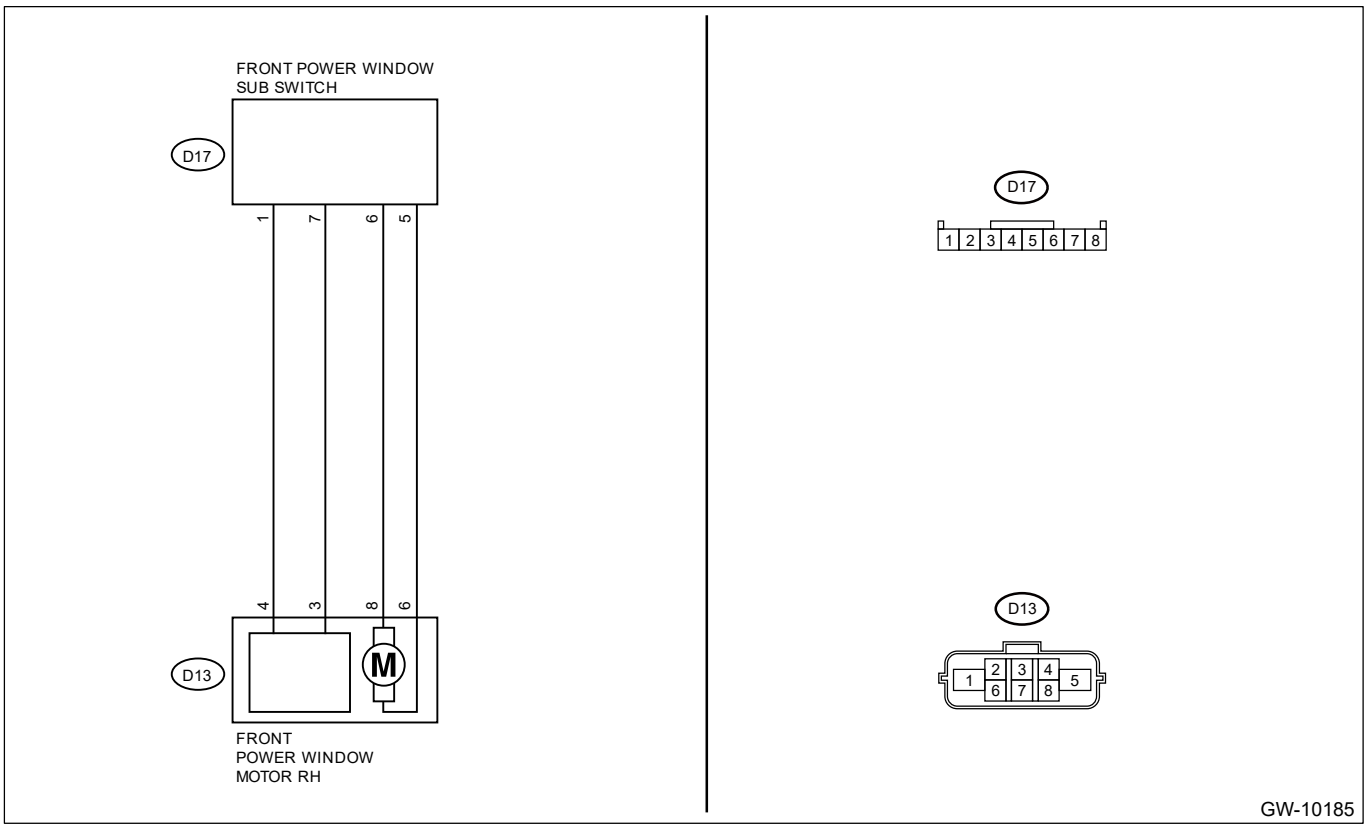
When AUTO Terminal Input ON is received for 20±1 second or longer.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK FRONT POWER WINDOW SUB-SWITCH UNIT.

Perform the inspection of front power window sub-switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the front power window sub-switch OK?

Yes	Go to 2.
No	Replace the front power window sub-switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the front power window sub-switch connector.
2. Disconnect the front regulator & motor assembly connector (passenger's side).
3. Disconnect the body integrated unit connector.
4. Using a tester, measure the resistance between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D17) No. 1 — (D13) No. 4:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the front power window sub-switch connector and chassis ground.

Connector & terminal
(D17) No. 1 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the front power window sub-switch connector and chassis ground.
   Connector & terminal
   (D17) No. 1 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

5. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B20 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B21 PASSENGER'S DOOR POWER WINDOW MANUAL UP SWITCH STUCK

DTC detecting condition:

When UP Terminal Input ON is received for 20±1 second or longer.

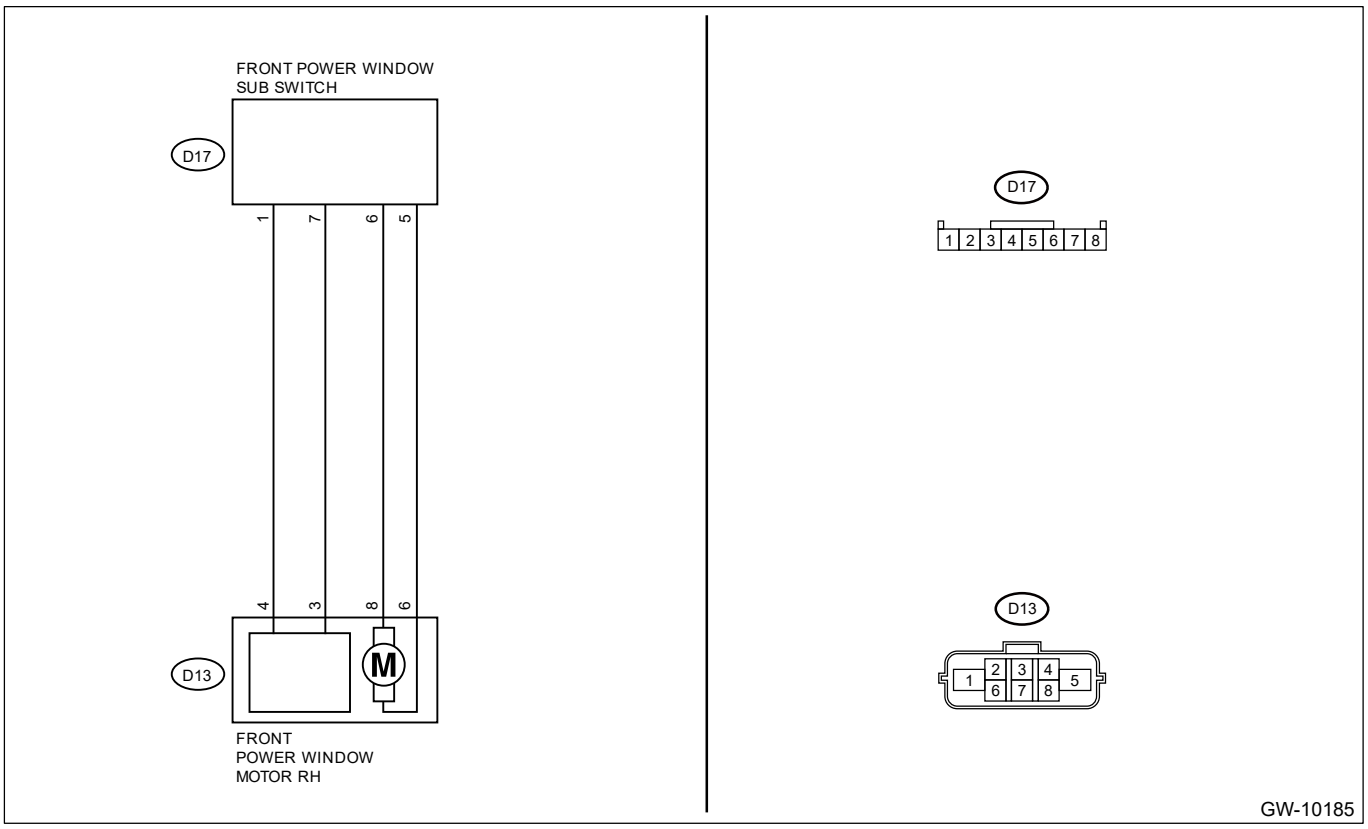
When the front power window sub-switch is operated, passenger's side window does not work.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK FRONT POWER WINDOW SUB-SWITCH UNIT.

Perform the inspection of front power window sub-switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the front power window sub-switch OK?

Yes	Go to 2.
No	Replace the front power window sub-switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the front power window sub-switch connector.
2. Disconnect the front regulator & motor assembly connector (passenger's side).
3. Disconnect the body integrated unit connector.
4. Using a tester, measure the resistance between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D17) No. 6 — (D13) No. 8:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the front power window sub-switch connector and chassis ground.

Connector & terminal
(D17) No. 6 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the front power window sub-switch connector and chassis ground.
   Connector & terminal
   (D17) No. 6 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

5. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B21 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B22 PASSENGER'S DOOR POWER WINDOW MANUAL DOWN SWITCH STUCK

DTC detecting condition:

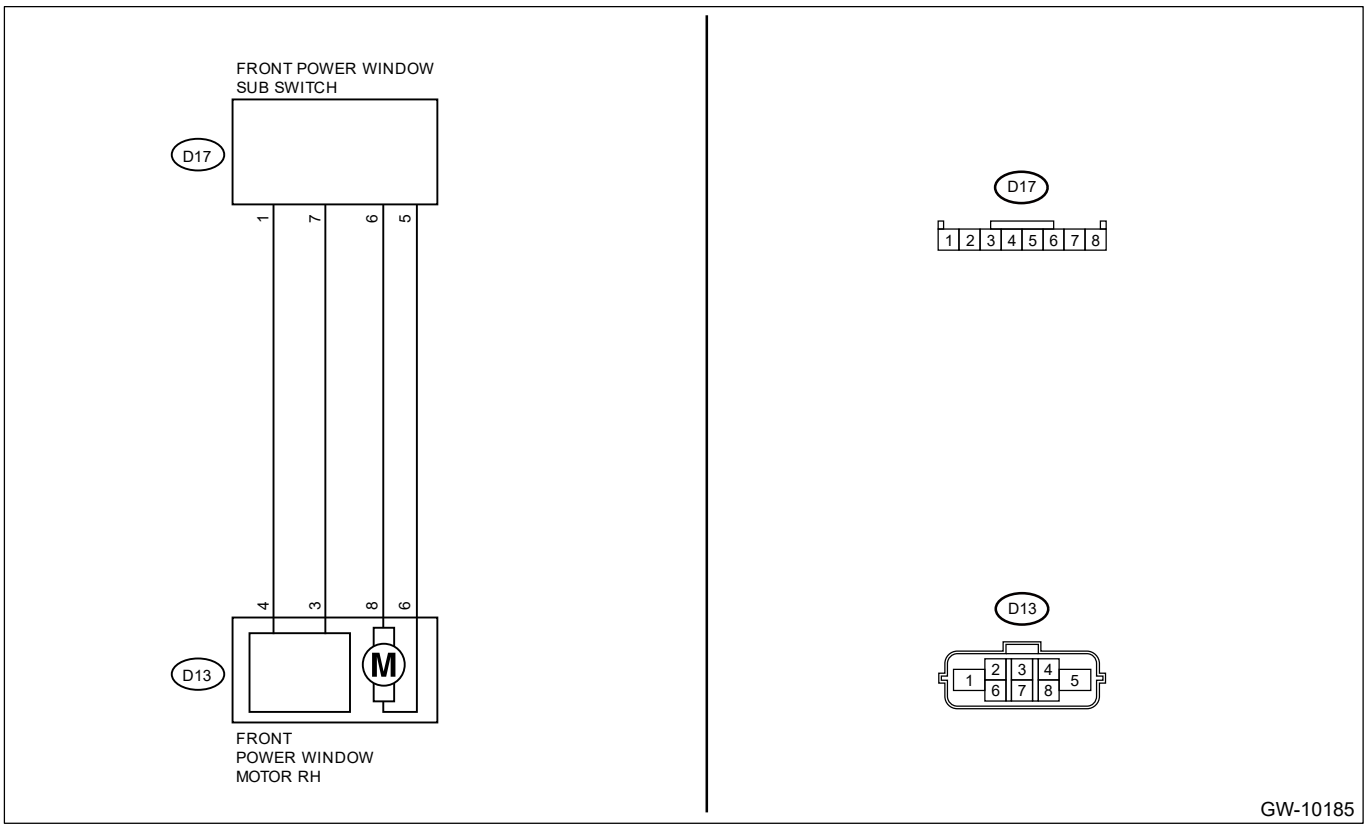
When DOWN Terminal Input ON is received for 20±1 second or longer.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK FRONT POWER WINDOW SUB-SWITCH UNIT.

Perform the inspection of front power window sub-switch unit. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

Is the front power window sub-switch OK?

Yes	Go to 2.
No	Replace the front power window sub-switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

2. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the front power window sub-switch connector.
2. Disconnect the front regulator & motor assembly connector (passenger's side).
3. Disconnect the body integrated unit connector.
4. Using a tester, measure the resistance between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (D17) No. 5 — (D13) No. 6:

Is the resistance less than 1 Ω?

Yes	Go to 3.
No	Repair the open circuit of the harness between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

3. CHECK HARNESS (GROUND SHORT CIRCUIT).

Using a tester, measure the resistance between the front power window sub-switch connector and chassis ground.

Connector & terminal
(D17) No. 5 — Chassis ground:

Is the resistance 1 MΩ or more?

Yes	Go to 4.
No	Repair the open harness causing short-to ground condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

4. CHECK HARNESS (SHORT CIRCUIT TO POWER SUPPLY).

1. Turn the ignition switch to ON.
2. Using a tester, measure the voltage between the front power window sub-switch connector and chassis ground.
   Connector & terminal
   (D17) No. 5 (+) — Chassis ground (−):

Is the voltage less than 1 V?

Yes	Go to 5.
No	Repair the open harness causing short-to power supply condition between front power window sub-switch connector and front regulator & motor assembly connector (passenger's side).

5. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 6.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

6. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B22 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B23 PASSENGER'S DOOR POWER WINDOW PULSE 1 AND 2 NO SIGNAL

DTC detecting condition:

When all the following conditions are established.

1. When sensing areas are recognized.
2. When no-pulse-input state continues in both pulse 1 and 2 phases.
3. When "absolute value judgment" is detected during UP operation.
4. After the condition 3 is met, when motor lock (no-pulse-input state in both pulses 1 and 2 phases for 300±10 milliseconds) is detected during reverse operation.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window sub-switch and roll passenger's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B23 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B24 PASSENGER'S DOOR POWER WINDOW PULSE 1 NO SIGNAL

DTC detecting condition:

When the power window is rolling up (except in fully closed zone), change in pulse 1 phase (edge) is not detected while pulse 2 phase is producing 10 edges.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.

   Note:

   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window sub-switch and roll passenger's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B24 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B25 PASSENGER'S DOOR POWER WINDOW PULSE 2 NO SIGNAL

DTC detecting condition:

When the power window is rolling up (except in fully closed zone), change in pulse 2 phase (edge) is not detected while pulse 1 phase is producing 10 edges.

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window sub-switch and roll passenger's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B25 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B26 PASSENGER'S DOOR POWER WINDOW PULSE DIRECTION

DTC detecting condition:
In UP/DOWN operation, when one hour of initial masking has elapsed since the motor is started, six edges of continuous pulse that are opposite to the window's moving direction are detected.
Trouble symptom:
- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Operate the power window sub-switch and roll passenger's side window up and down.

Does the window roll up and down?

Yes	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**
No	Go to 2.

2. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B26 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B27 PASSENGER'S DOOR POWER WINDOW POSITION

DTC detecting condition:

Top dead position error: In UP operation, when the window position counter reads -80 edge or less. (except uninitialized state)

Bottom dead position error: In DOWN operation, when the window position counter reads +130 edge or less of the bottom dead position. (except uninitialized state)

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. INITIALIZATION BY POWER WINDOW SWITCH (PASSENGER'S SIDE).

1. Perform initialization using the power window switch. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>NOTE.
2. Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B27 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B27 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B28 PASSENGER'S DOOR POWER WINDOW CONTINUOUS REVERSAL

DTC detecting condition:
When the number of times for detected continuous reverse operation counts 10 times or more. (Condition for addition: completion of reserve operation due to anti-pinch feature)
Trouble symptom:
- When the power window sub-switch is operated, passenger's side window does not work.
- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK GLASS SLIDING SURFACE.

Check sliding surface of glass and running channel.

Is it free from any foreign matter?

Yes	Go to 2.
No	Remove the foreign matter, and Go to 2.

2. PERFORM SYSTEM RESTORATION PROCEDURES.

1. Operate the power window sub-switch and roll down the window to the full open position.
2. Operate the power window sub-switch and roll up the window to the full close position.
3. Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B28 displayed? (Current malfunction)

Yes	Go to 3.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

3. ACTIVE TEST.

Using the Subaru Select Monitor, check the following items in the [Active Test] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Active Test.

- [Power Window Operation Test]

Does the window roll up and down?

Yes	Go to 4.
No	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

4. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B28 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B29 PASSENGER'S DOOR POWER WINDOW CONTROL MODULE EEPROM

DTC detecting condition:

When one of the following data cannot be read from the non-volatile memory as the CPU is reset.

- Window position
- Sliding learn value
- Initialization completed state
- Full open stop position

Trouble symptom:

- When the power window sub-switch is operated, passenger's side window does not work.

- When the power window sub-switch is operated, passenger's side window rolls down only in manual down operation, or inches up. (Inch up: Operating the switch rolls up the window about 10 mm only)

Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. INITIALIZATION BY POWER WINDOW SWITCH (PASSENGER'S SIDE).

1. Perform initialization using the power window switch. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>NOTE.
2. Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B29 displayed? (Current malfunction)

Yes	Go to 2.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

2. SYSTEM INITIALIZATION.

1. Using the Subaru Select Monitor, perform [System Initialization] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Work Support>OPERATION > SYSTEM INITIALIZATION.
   Note:
   Record the DTCs and FFD because they will be erased when the initialization is performed.
2. Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Is DTC B2B29 displayed? (Current malfunction)

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Even if DTC is displayed, the circuit has returned to a normal condition at this time. Reproduce the failure, and then perform the diagnosis again. **Note:** **In this case, temporary poor contact of connector, temporary open or short circuit of harness may be the cause.**

POWER WINDOW(DIAGNOSTICS) > Diagnostic Procedure with Diagnostic Trouble Code (DTC)

DTC B2B50 POWER WINDOW MAIN SWITCH FAILURE

DTC detecting condition:
When D-seat AUTO SW, P-seat MANUAL UP SW, P-seat MANUAL DOWN SW, or P-seat AUTO SW is ON for 20±1 second or longer.
Trouble symptom:
Switch cannot be turned OFF.
Caution:
Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.
Note:
Replace the power window main switch when this DTC is detected. Ref. to GLASS/WINDOWS/MIRRORS>Power Window Control Switch.

POWER WINDOW(DIAGNOSTICS) > Diagnostics with Phenomenon

LIST

Symptoms	Reference
Driver's side power window does not work.	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > DRIVER'S SIDE POWER WINDOW DOES NOT WORK.
Passenger's side power window does not work.	Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostics with Phenomenon>INSPECTION > PASSENGER'S SIDE POWER WINDOW DOES NOT WORK.

POWER WINDOW(DIAGNOSTICS) > Diagnostics with Phenomenon

INSPECTION

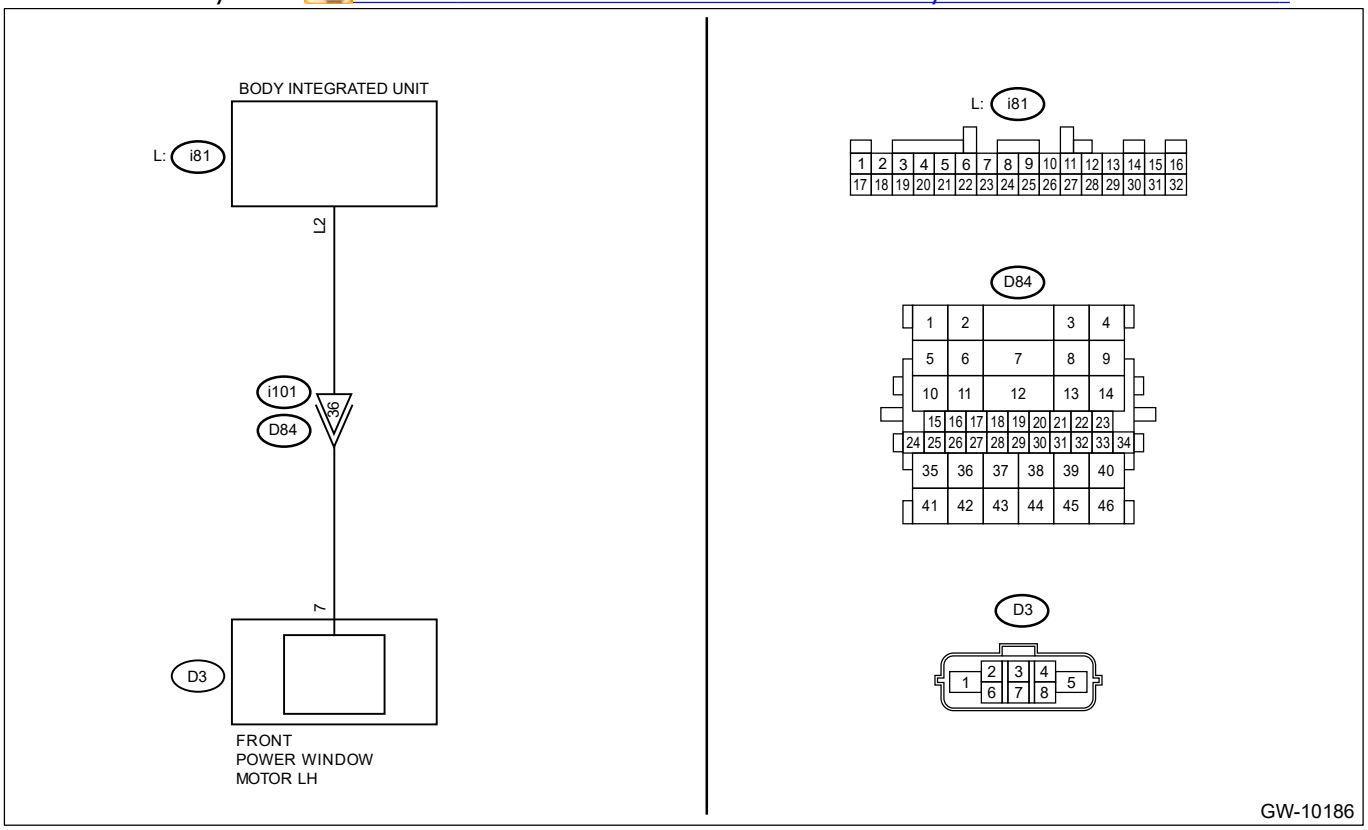
1. DRIVER'S SIDE POWER WINDOW DOES NOT WORK

Trouble causes:

- Front regulator & motor assembly (driver's side) power supply circuit failure
- Front regulator & motor assembly (driver's side) failure
- Power window main switch failure
- LIN communication error
- Body integrated unit malfunction

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 3.

3. CHECK Power Supply Voltage (DATA MONITOR).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK Operation Enable Signal (DATA MONITOR).
   - no → Perform the instructed procedures.
   - yes ↓

5. CHECK POWER WINDOW MAIN SWITCH.
   - no → Perform the instructed procedures.
   - yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).
   - yes → Perform the instructed procedures.
   - no → Perform the instructed procedures.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the battery OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK DTC.

Read the DTC of [Power Window (Driver)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK [Power Supply Voltage] (DATA MONITOR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Data Monitor.



- [Power Supply Voltage]

Is the displayed voltage approximately 8.0 V or more?

Yes	Go to 4.
No	Inspect the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. If no fault is found in the body integrated unit, replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

4. CHECK [Operation Enable Signal] (DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Driver)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Data Monitor.



- [Operation Enable Signal]

Is [ON] displayed?

Yes	Go to 5.
No	Inspect the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. If no fault is found in the body integrated unit, replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

5. CHECK POWER WINDOW MAIN SWITCH.

Operate the power window main switch and roll down the window to the full open position. Operate the power window main switch and roll up the window to the full close position.

Does the window roll up and down?

Yes	Go to 6.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly connector (driver's side).
3. Using a tester, measure the resistance between power window main switch connector and front regulator&motor assembly connector (driver's side).
   Connector & terminal
   (i81) No. 2 — (D3) No. 7:

Is the resistance less than 10 Ω?

Yes	Replace the front regulator & motor assembly (driver's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & motor assembly connector (driver's side).

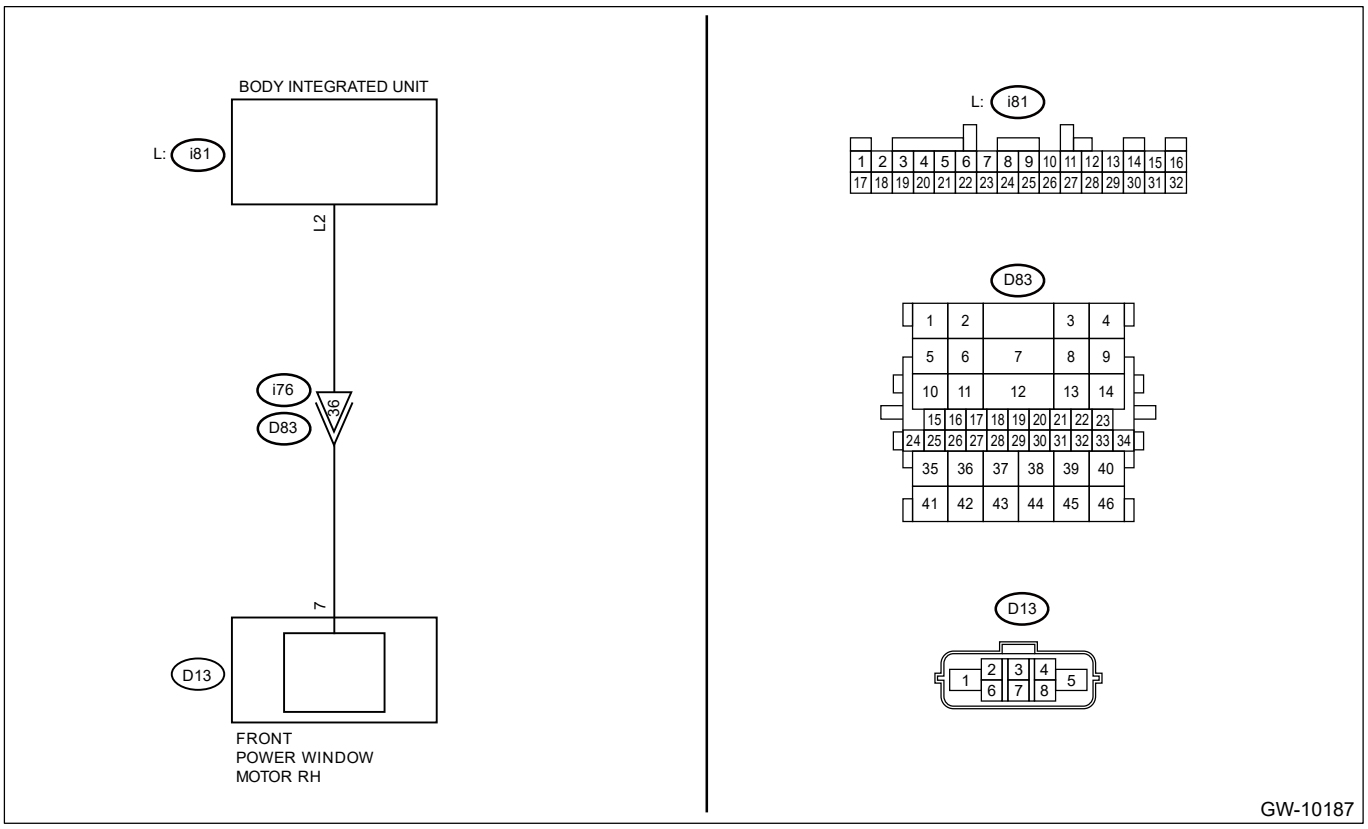
2. PASSENGER'S SIDE POWER WINDOW DOES NOT WORK

Trouble causes:

- Front regulator & motor assembly (passenger's side) power supply circuit failure
- Front regulator & motor assembly (passenger's side) failure
- Power window main switch failure
- LIN communication error
- Body integrated unit malfunction

Wiring diagram:

Power window system Ref. to WIRING SYSTEM>Power Window System>WIRING DIAGRAM.



Caution:

Before performing diagnosis, refer to "CAUTION" in "General Description". Ref. to POWER WINDOW(DIAGNOSTICS) >General Description>CAUTION.

1. CHECK BATTERY.
   - no → Perform the instructed procedures.
   - yes ↓

2. CHECK DTC.
   - yes → Perform the instructed procedures.
   - no → Go to 3.

3. CHECK Power Supply Voltage (DATA MONITOR).
   - no → Perform the instructed procedures.
   - yes ↓

4. CHECK Operation Enable Signal (DATA MONITOR).
→ no → Perform the instructed procedures.

yes ↓

5. CHECK POWER WINDOW MAIN SWITCH.
→ no → Perform the instructed procedures.

yes ↓

6. CHECK HARNESS (OPEN CIRCUIT).
→ yes → Perform the instructed procedures.
→ no → Perform the instructed procedures.

1. CHECK BATTERY.

Check the battery. Ref. to STARTING/CHARGING SYSTEMS(H4DO)>Battery>INSPECTION.

Is the battery OK?

Yes	Go to 2.
No	Charge or replace the battery.

2. CHECK DTC.

Read the DTC of [Power Window (Passenger)] using the Subaru Select Monitor. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC).



Are any DTCs displayed? (Current malfunction)

Yes	Perform the diagnosis for the displayed DTCs. Ref. to POWER WINDOW(DIAGNOSTICS) >Diagnostic Trouble Code (DTC)>LIST.
No	Go to 3.

3. CHECK [Power Supply Voltage] (DATA MONITOR).

1. Turn the ignition switch to ON.
2. Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Data Monitor.



- [Power Supply Voltage]

Is the displayed voltage approximately 8.0 V or more?

Yes	Go to 4.
No	Inspect the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. If no fault is found in the body integrated unit, replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

4. CHECK [Operation Enable Signal] (DATA MONITOR).

Using the Subaru Select Monitor, check the following items in the [Data monitor] of [Power Window (Passenger)]. Ref. to POWER WINDOW(DIAGNOSTICS) >Data Monitor.



- [Operation Enable Signal]

Is [ON] displayed?

Yes	Go to 5.
No	Inspect the body integrated unit. Ref. to BODY CONTROL(DIAGNOSTICS)>Basic Diagnostic Procedure. If no fault is found in the body integrated unit, replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.

5. CHECK POWER WINDOW MAIN SWITCH.

Operate the power window main switch and roll down the window to the full open position. Operate the power window main switch and roll up the window to the full close position.

Does the window roll up and down?

Yes	Go to 6.
No	Replace the power window main switch. Ref. to GLASS/WINDOWS /MIRRORS>Power Window Control Switch.

6. CHECK HARNESS (OPEN CIRCUIT).

1. Disconnect the power window main switch connector.
2. Disconnect the front regulator & motor assembly connector (passenger's side).
3. Using a tester, measure the resistance between power window main switch connector and front regulator & motor assembly connector (passenger's side).
   Connector & terminal
   (i81) No. 2 — (D13) No. 7:

Is the resistance less than 10 Ω?

Yes	Replace the front regulator & motor assembly (passenger's side). Ref. to GLASS/WINDOWS/MIRRORS>Front Regulator and Motor Assembly.
No	Repair the open circuit of the harness between power window main switch connector and front regulator & motor assembly connector (passenger's side).

CMN(diag)

1. Data Link Connector
2. Diagnostic Trouble Code (DTC)
3. Clear memory
4. Data Monitor
5. Freeze Frame Data
6. Time Stamp

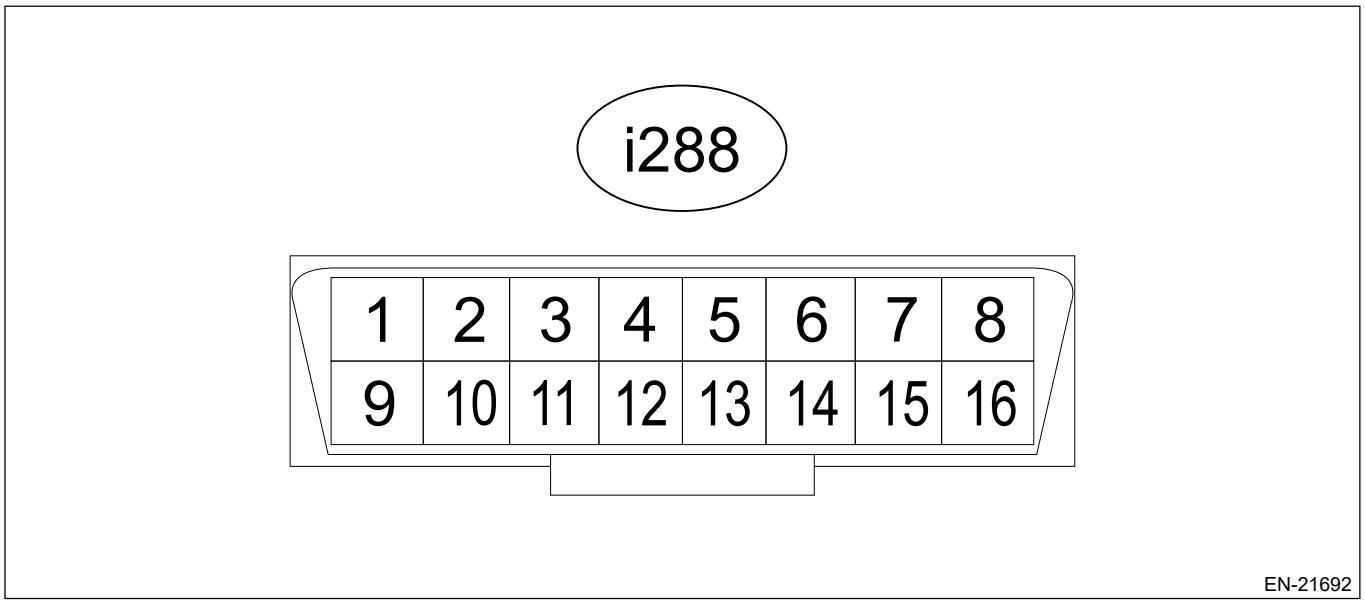
COMMON(diag) > Data Link Connector

NOTE

This connector is used for Subaru Select Monitor.
For detailed connection procedures, refer to “Application help”.

Caution:

Do not connect any tools other than Subaru Select Monitor or general scan tool because the circuit for Subaru Select Monitor may be damaged.

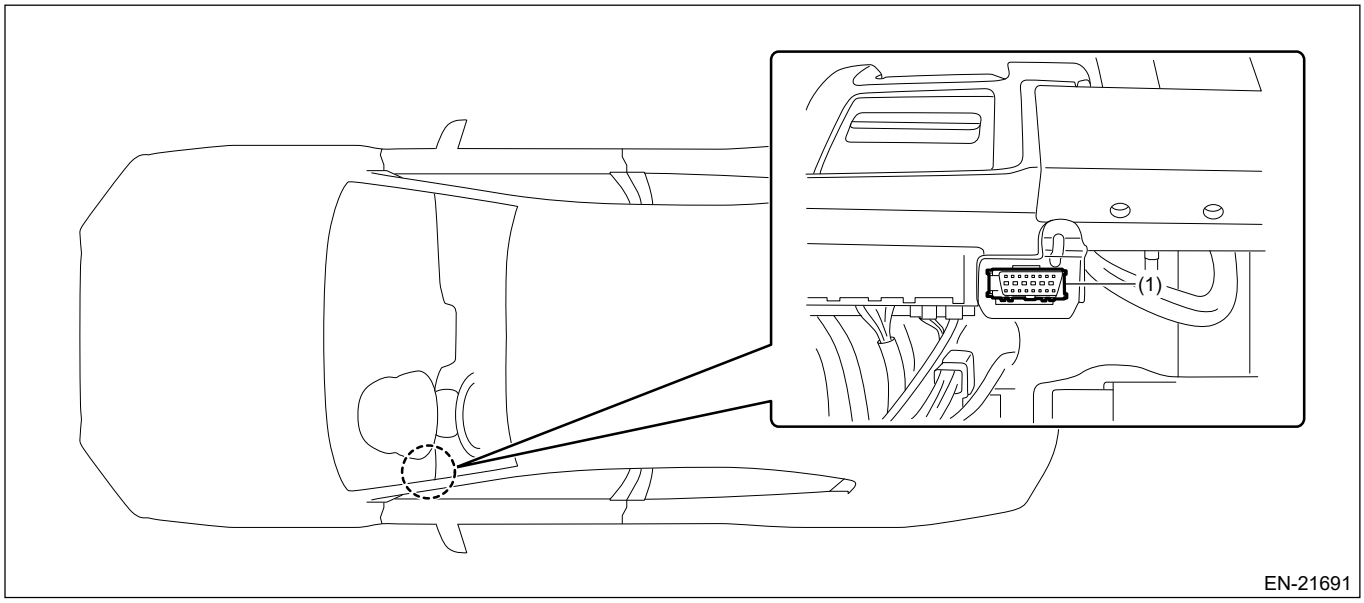


Terminal No.	Contents	Measuring condition	Standard
(i288) No. 1	—	—	—
(i288) No. 2	—	—	—
(i288) No. 3	—	—	—
(i288) No. 4 ←→ Chassis ground	GND	Always	10 Ω or less
(i288) No. 5 ←→ Chassis ground	GND	Always	10 Ω or less
(i288) No. 6	CAN-H	—	—
(i288) No. 7	—	—	—
(i288) No. 8 ←→ Chassis ground	Ignition power supply	When ignition switch is ON	Battery voltage
(i288) No. 9	—	—	—
(i288) No. 10	—	—	—
(i288) No. 11	—	—	—
(i288) No. 12	—	—	—
(i288) No. 13	—	—	—
(i288) No. 14	CAN-L	—	—
(i288) No. 15	—	—	—

Terminal No.	Contents	Measuring condition	Standard
(i288) No. 16 ←→ Chassis ground	Battery power supply	Always	Battery voltage

COMMON(diag) > Data Link Connector

LOCATION



(1) Data link connector

COMMON(diag) > Diagnostic Trouble Code (DTC)

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select the corresponding system and select [Enter].
5. On [Select Function] display, select [DTC].

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **Sub screen may appear in the system selection display. In that case, select appropriate items in accordance with the contents of the display.**
   - **Current malfunction is a diagnostic code displayed when the system is judging the current malfunction. However, if a DTC is recorded due to poor contact etc., the code remains displayed as current malfunction during the drive cycle even after the poor contact has resolved.**
   - **Past malfunction is a diagnostic code recorded when the current malfunction is not occurring but the system has detected a malfunction in the past. When the current malfunction is recorded, it is also recorded to the past malfunction at the same time.**

COMMON(diag) > Clear memory

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select the corresponding system and select [Enter].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [Clear memory].

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **Sub screen may appear in the system selection display. In that case, select appropriate items in accordance with the contents of the display.**
   - **When the clear memory is performed, diagnostic code (DTC) and freeze frame data (FFD) necessary in diagnosis will also be deleted.**
   - **Before performing the clear memory, be sure to save the diagnostic code (DTC) and freeze frame data (FFD) stored in the module.**
   - **Initial diagnosis of electronic throttle control is performed after memory clearance. Wait for 10 seconds or more after turning the ignition switch to ON, and then start the engine.**

COMMON(diag) > Data Monitor

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select the corresponding system and select [Next].
5. On [Select Function] display, select [Data monitor].

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **Sub screen may appear in the system selection display. In that case, select appropriate items in accordance with the contents of the display.**

COMMON(diag) > Freeze Frame Data

OPERATION

1. On [Start] display, select [Diagnosis].
2. On [Vehicle selection] display, input the target vehicle information and select [OK].
3. On [Main Menu] display, select [Each System].
4. On [Select System] display, select the corresponding system and select [Next].
5. On [Select Function] display, select [DTC].
6. On [DTC] display, select [FFD].

   Note:

   - **For detailed operation procedures, refer to "Application help".**
   - **Sub screen may appear in the system selection display. In that case, select appropriate items in accordance with the contents of the display.**
   - **Freeze frame data is cleared by clearing memory.**

COMMON(diag) > Time Stamp

GENERAL DESCRIPTION

There are three types of record data for the information of time stamp, and they are stored together with diagnostic codes.

Note:

Depending on DTCs, time stamp may not be stored.

a. **Trip Count [count]**

This indicates the number of times that the ignition has been turned to ON since the vehicle was manufactured. The ignition ON count of when the diagnostic code is stored is displayed on the diagnostic code check screen.

Note:

Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	**Trip Count [count]**	Time Count	Group
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	**983**	18000	Common
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	**984**	117800	Common

Furthermore, the current IG ON count (times) can be checked at the data monitor of body control. By comparing the current Trip Count and the Trip Count of when the diagnostic code was stored, it is possible to determine that it is how many ignition-ON operations ago that DTC was stored.

b. **Time Count**

The elapsed time from when the ignition is turned to ON to when the diagnostic code is stored is displayed on the diagnostic code check screen. It is possible to determine the length of time that passed between when the user started driving and when the diagnostic code was stored. Therefore, if Trip Count until the vehicle-received-date is determined by interviewing the user, it is possible to estimate where the user was driving when the diagnostic code was stored, using the information such as Trip Count and Time Count. This estimate is useful information to perform diagnosis including checking of repeatability.

Note:

Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	Trip Count [count]	**Time [msec]**	Group
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	983	**18000**	Common
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	984	**117800**	Common

When multiple diagnostic codes are recorded for one trouble, it is extremely important to determine the diagnostic code that was stored first. (It is important to perform the diagnosis for the first recorded diagnostic code.) In this case, it is also possible to immediately determine which diagnostic

code was recorded first, using the information such as Trip Count and Time Count.

c. **Group**

Each unit individually counts the elapsed time since the ignition is turned to ON. However, these time counts may have some errors, and therefore, the control modules need to be adjusted to the time carried by the master-time unit (the body integrated unit). When the count is set as common, it means that each control module is already adjusted to the master time, and the display for the master integrated unit is always indicated as Common. When the count is indicated as Originally, it means that the time is not synchronized with the master time. In this case, check the communication between the corresponding control module and integrated unit. When all controls other than the body integrated unit is indicated as Originally, perform the basic inspection for the body integrated unit.< xref id="s059501e45">

Note:

Subaru Select Monitor 4 screen (A/C system diagnostic code and time stamp)

Code	Description & trouble part	Trip Count [count]	Time Count [msec]	**Group**
B14E1	AIR MIX DOOR ACTUATOR STEPPING MOTOR CIRCUIT WIRE BREAK (DRIVER'S SEAT)	983	18000	**Common**
B14E7	HEATER CORE REAR SENSOR CIRCUIT WIRE BREAK	984	117800	**Common**

Even when multiple diagnostic codes are stored in multiple control modules, it is possible to determine the code stored first through the count function.

Note:

Troubleshooting for CAN system U-code occurrence

When the first stored diagnostic code is a U-code for CAN system, perform the troubleshooting as a U code combination, instead of a U code alone. In addition, when CAN open circuit occurs, communication of the diagnostic device itself becomes impossible beyond the particular areas. However, trouble positions can also be determined by the combination of initial communication success/failure. Thus, by performing the basic diagnostic procedure in LAN system, trouble positions can be determined efficiently on the principle above. Ref. to LAN SYSTEM (DIAGNOSTICS)>Basic Diagnostic Procedure>PROCEDURE.